ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN № 624008

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	T. M. Brown, R2-12, 373-4437	[] Yes [X] No	02/13/97
	6. Project Title/No./Work Order No. Historical Tank Content Estimate for the Southeast Quadrant of the Hanford 200 Areas	7. Bldg./Sys./Fac. No. 2750/200E	8. Approval Designator N/A
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-WM-ER-350, Rev. 0a	10. Related ECN No(s). N/A	11. Related PO No. N/A

12a. Modification Work	12b. Work Package No.	12c. Modification Work Complete	12d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

13b. Design Baseline Document? [] Yes [X] No

1. Performed a complete rewrite and reformat of all pages of the HTCE document.
2. Almost all of the narrative description of the tank farm section and the individual tank sections were replaced by summary tables.
3. The single solids composite inventory table provided by Los Alamos National Laboratory has been replaced by 3 tables:
   - Total Inventory Estimate table of 33 chemical analytes and 46 radionuclides
   - Tank Layer Model Solids Composite Inventory Estimate table
   - Supernatant Mixing Model table.
4. The Tank Layer Model graph is enlarged and on a separate page.
5. The Tank Riser Location and Tank Cross Section sketches are enlarged.
6. The glossary and reference sections are placed in Appendix A and B, respectively.
7. The document prefix number has changed from WHC-SD-WM-ER-350, Rev. 0a to HNF-SD-WM-ER-350, Rev. 1

14a. Justification (mark one)

Criteria Change	[]	Design Improvement	[X]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

14b. Justification Details

To update historical tank content estimate documents with more recent tank waste characterization information and expanded radionuclides and updated chemical analyte information for the inventory estimates.

15. Distribution (include name, MSIN, and no. of copies)

See attached distribution sheet.

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1. ECN (use no. from pg. 1): 624008

16. Design Verification Required	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]	N/A	[X]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
N/A		

21. Approvals

	Signature	Date		Signature	Date
Design Authority			Design Agent J. L. Stroup	J L Stroup	3/12/97
Cog. Eng. T. M. Brown	Todd Brown	3/13/97	PE		
Cog. Mgr. J. W. Cammann	JW Cammann	3/13/97	QA		
QA			Safety		
Safety			Design		
Environ.			Environ.		
Other			Other		
			Lead Engineer J. W. Funk	J. W. Funk	3/12/97
			Project Mgr C. H. Brevick	CH Brevick	3/13/97
			DEPARTMENT OF ENERGY		
			Signature or a Control Number that tracks the Approval Signature		
			ADDITIONAL		

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Historical Tank Content Estimate for the Southeast Quadrant of the Hanford 200 Areas

C. H. Brevick, J. L. Stroup, J. W. Funk
Fluor Daniel Northwest Inc., Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

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Key Words: Southeast quadrant, Historical Tank Content Estimate, tank farms, tank level, tank temperature, tank farm aerial photos, in-tank montages, TLM, SMM, inventory estimates, riser locations

Abstract: The Historical Tank Content Estimate for the Quadrant provides historical information on a tank-by- tank basis of the radioactive mixed wastes stored in the underground single-shell tanks for the Hanford 200 Areas. This report summarized historical information such as waste history, level history, temperature history, riser configuration, tank integrity, and inventory estimates on a tank-by-tank basis. Tank farm aerial photographs and interior tank montages are also provided for each tank. A description of the development of data for the document of the inventory estimates provided by Los Alamos National Laboratory are also given in this report.

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RECORD OF REVISION	(1) Document Number HNF-SD-WM-ER-350	Page 1

(2) Title

Historical Tank Content Estimate for the Southeast Quadrant of the Hanford 200 Areas

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release (5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) Initial issue, EDT 607290, 6/29/95	T. M. Brown	S. J. Eberlein
0a	1. Mark out inventory estimates on pages 38, 39, 43, 44, 49, 50, 55, 56, 61, 62, 67, 68, 72, 73, 81, 82, 86, 87, 91, 92, 96, 97, 101, 102, 106, 107, 111, 112, 116, 117, 125, 126, 131, 132, 136, 137, 142, 143, 148, 149, 153, 154, 163, 164, 169, 170, 179, 180, 186, 187, 196, 197, 202, 203, 209, 210. 2. Add pages 39a, 39b, 39c, 39d, 39e, 44a, 44b, 44c, 44d, 44e, 50a, 50b, 50c, 50d, 50e, 56a, 56b, 56c, 56d, 56e, 62a, 62b, 62c, 62d, 62e, 68a, 68b, 68c, 68d, 68e, 73a, 73b, 73c, 73d, 73e, 82a, 82b, 82c, 82d, 82e, 87a, 87b, 87c, 87d, 87e, 92a, 92b, 92c, 92d, 92e, 97a, 97b, 97c, 97d, 97e, 102a, 102b, 102c, 102d, 102e, 107a, 107b, 107c, 107d, 107e, 112a, 112b, 112c, 112d, 112e, 117a, 117b, 117c, 117d, 117e, 126a, 126b, 126c, 126d, 126e, 132a, 132b, 132c, 132d, 132e, 137a, 137b, 137c, 137d, 137e, 143a, 143b, 143c, 143d, 143e, 149a, 149b, 149c, 149d, 149e, 154a, 154b, 154c, 154d, 154e, 164a, 164b, 164c, 164d, 164e, 170a, 170b, 170c, 170d, 170e, 180a, 180b, 180c, 180d, 180e, 187a, 187b, 187c, 187d, 187e, 197a, 197b, 197c, 197d, 197e, 203a, 203b, 203c, 203d, 203e, 210a, 210b, 210c, 210d, 210e. 3. Add pages A-1 and A-2 as Appendix A. Incorporates ECN 634829	T. M. Brown	J. W. Cammann 09/25/96
1 RS	1. Preformed a complete rewrite and reformat of all pages of the HTCE document. 2. Almost all of the narrative description of the tank farm section and the individual tank sections were replaced by summary tables. 3. The single solids composite inventory table provided by Los Alamos National Laboratory has been replaced by 3 tables: • Total Inventory Estimate Table of 33 chemical analytes and 46 radionuclides • Tank Layer Model Solids Composite Inventory Estimate Table • Supernatant Mixing Model table. 4. The Tank Layer model graph is enlarged and on a separate page. 5. The Tank Riser Location and Tank Cross Section sketches are enlarged. 6. The glossary and reference sections are placed in Appendix A and B, respectively. 7. The document prefix number has changed from WHC-SD-WM-ER-350, Rev. 0a to HNF-SD-WM-ER-350, Rev. 1 Incorporates ECN No. 624008	T. M. Brown Todd Brown	J. W. Cammann JW Cammann 3/13/97

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HISTORICAL TANK CONTENT ESTIMATE FOR THE SOUTHEAST QUADRANT OF THE HANFORD 200 AREAS

Prepared for

Lockheed Martin Hanford Corporation

February 1997

Prepared by

J. W. Funk
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Richland, Washington

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HISTORICAL TANK CONTENT ESTIMATE FOR THE SOUTHEAST QUADRANT OF THE HANFORD 200 AREAS

WORK ORDER E18675

APPROVED:

Fluor Daniel Northwest

Technical Documents	3-13-97 Date
Lead Engineer	3/12/97 Date
Design Agent	3/12/97 Date
Project Manager	03/13/97 Date

Lockheed Martin Hanford Corporation

Technical Lead, TWRS DQO, Models and Inventory	3/13/97 Date

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A project of the this magnitude would not be possible without the help of a significant number of persons and organizations. Fluor Daniel Northwest, would like to acknowledge the contributions made by our Los Alamos National Laboratory counterparts: Stephen F. Agnew, Kenneth A. Jurgensen, Robert A. Corbin, Tomasita B. Duran, Bonnie L. Young, Theodore P. Ortiz, John FitzPatrick, and James Boyer. Also, Todd Brown, Brett Simpson and Jerry Cammann of Lockheed Martin Hanford Corporation are recognized for their contributions.

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HISTORICAL TANK CONTENT ESTIMATE FOR THE SOUTHEAST QUADRANT OF THE HANFORD 200 AREAS

COMMENTS AND CONTRIBUTIONS

The reader is requested to use this card to comment on this document, report any discrepancies, or contribute new information to improve the accuracy and content of the document. Please use the space provided, add additional pages if necessary, and return the comments to the person noted at the address listed below.

Send Comments to: Mr. Jerry W. Cammann
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Richland, WA 99352

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1.0 Introduction

1.0.1 Purpose

The purpose of this historical characterization document is to present the synthesized summaries of the historical records concerning the physical characteristics, and radiological, and chemical composition of mixed wastes stored in underground double-shell tanks and the physical conditions of these tanks. The double-shell tanks are located on the United States Department of Energy's Hanford Site, approximately 25 miles northwest of Richland, Washington. The document will be used to assist in characterizing the waste in the tanks in conjunction with the current program of sampling and analyzing the tank wastes. Los Alamos National Laboratory ((LANL) developed computer models that used the historical data to attempt to characterize the wastes and to generate estimates of each tank's inventory. A historical review of the tanks may reveal anomalies or unusual contents that could be critical to characterization and post characterization activities.

This document was developed by reviewing the operating plant process histories, waste transfer data, and available physical and chemical data from numerous resources. These resources were generated by numerous contractors from 1945 to the present.

Waste characterization, the process of describing the character or quality of a waste, is required by Federal law (Resource Conservation and Recovery Act [RCRA]) and state law (Washington Administrative Code [WAC] 173-303, Dangerous Waste Regulations). Characterizing the waste is necessary to determine methods to safely retrieve, transport, and/or treat the wastes.

This document is not intended for use as a total design basis document. Further investigations of the information may be required before using this data for design purposes or safety analysis.

1.0.2 Scope

The scope of this document is to provide a summary of the Supporting Documents (Brevick et al.,1997a, b, c, d, e, f) for the Southeast Quadrant (SE). The SE Quadrant covers six double-shell tank farms. Five of the tank farms, AN, AP, AW, AY and AZ, are located in the 200 East Area and are shown on the map in Figure 1. The other tank farm SY is located in the 200 West Area and is shown on the map in Figure 2. This summary includes waste transfer and level data, tank physical information, and surveillance data of the tanks and wastes for the SE Quadrant. The inventory estimates of waste types and volumes generated by the computer modeling programs developed by LANL are also included. A flow diagram showing the relationships between the sources of data, the HTCE, and the supporting documents is in Figure 3. The HTCE document also includes information on the safety issues affecting the tanks and the plants and processes that produced the waste in the underground waste storage tanks. For further explanation and development of the information, see the supporting documents.

1.0.3 Approach

This document was compiled from work performed by Fluor Daniel Northwest (FDNW), LANL, and Lockheed Martin Hanford Corporation (LHMC). FDNW reviewed the historical records

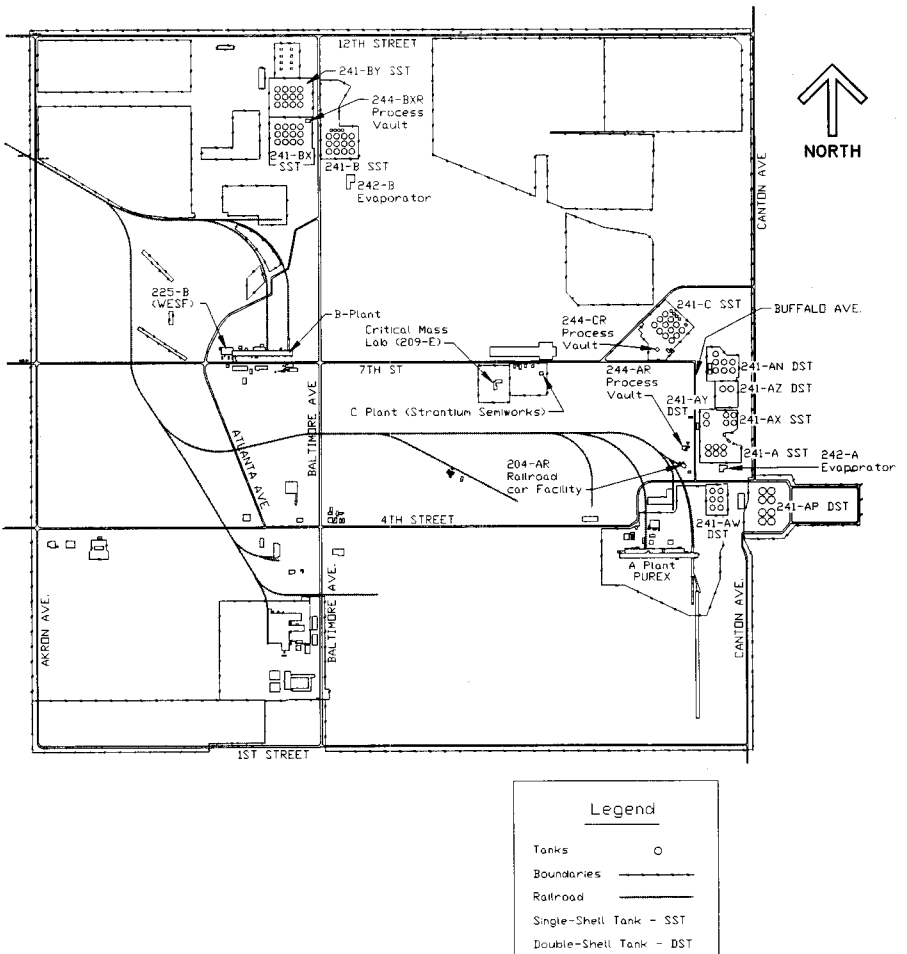


Figure 1. 200 East Area.

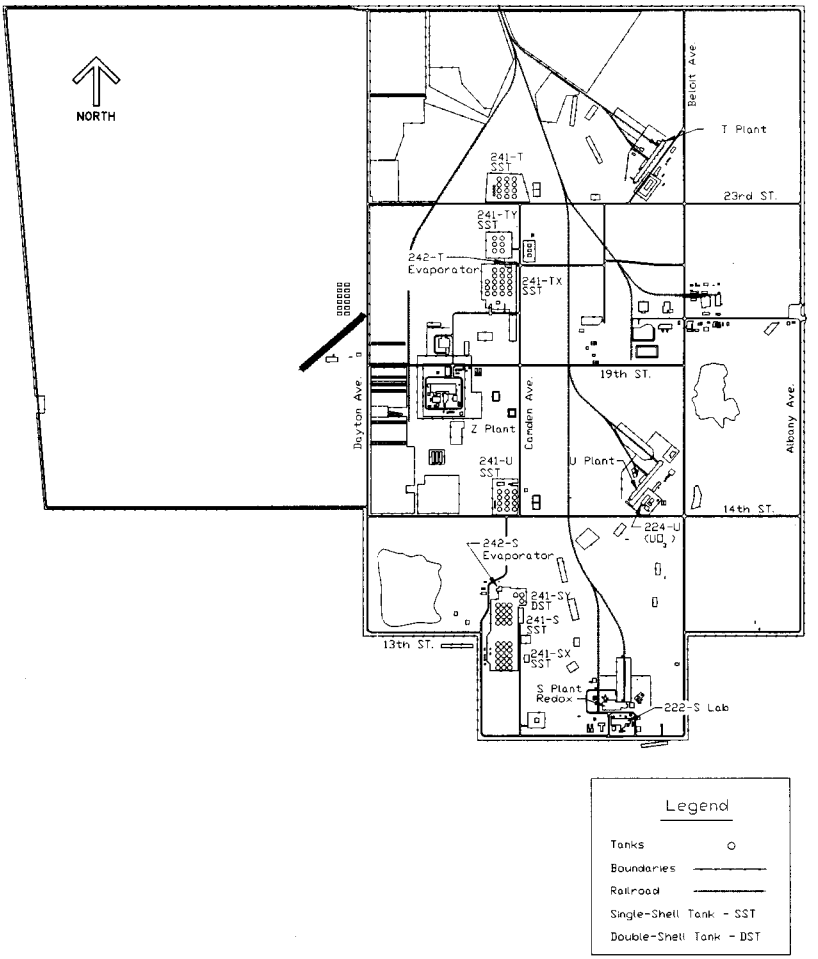
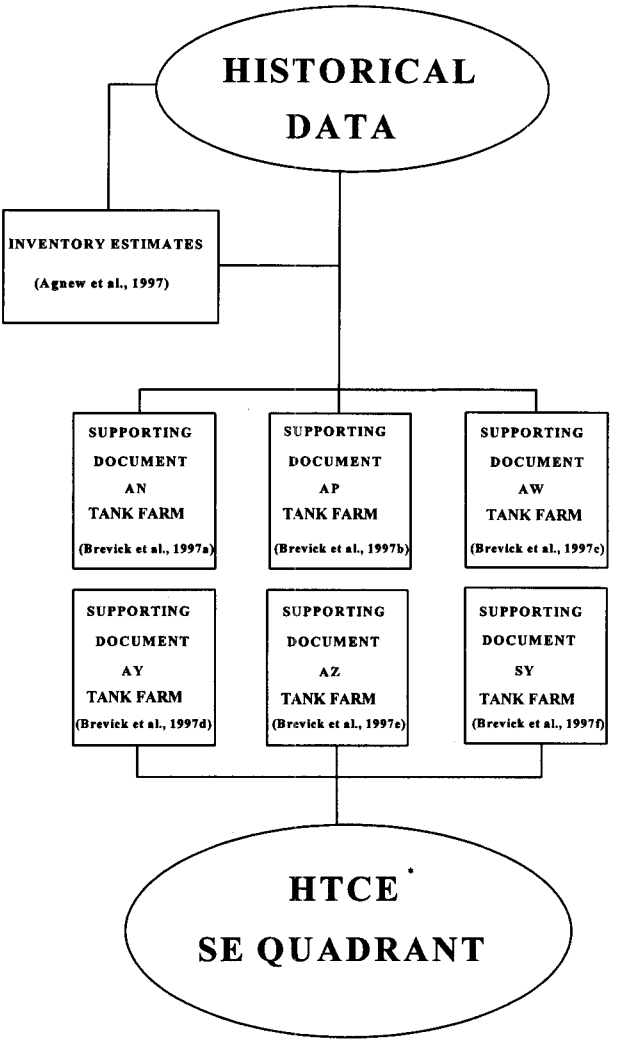


Figure 2. 200 West Area.



* HISTORICAL TANK CONTENT ESTIMATE

Figure 3. HTCE and Supporting Document Flow Diagram.

of the tanks and incorporated the inventory estimates and models of waste layers in the tanks being developed by LANL into this document.

1.1 Safety Issues

The safety issues that affect the tanks can be divided into two groups: watch list and non-watch list. The watch lists are listings of tanks believed to pose potential safety hazards to workers, the environment, and the public. Non-watch list issues are of concern because of their possible effect on workers and the environment. Occurrences are unusual events on the Hanford Site that sometimes are related to safety issues.

1.1.1 Watch List Safety Issues

Watch list safety issues for these tanks were identified as "issues/situations that contain most of the necessary conditions that could lead to worker (onsite) or offsite radiation exposure through an uncontrolled release of fission products" under Public Law 101-510, Section 3137, of the *National Defense Authorization Act of Fiscal Year 1991* (i.e., the Wyden Amendment). As of September 30, 1996, 32 single-shell tanks and 6 double-shell tanks are on watch lists (Hanlon, 1996l). See the *Approach for Tank Safety Characterization of Hanford Site Waste* (Eberlein et al., 1995) for more information on the watch list issues.

1.1.2 Non-Watch List Safety Issues

Non-watch list issues include safety hazards such as leaking tanks. Tank leaks are a safety hazard because of their potential to release chemicals and radioactive liquids into the ground. Corrosion is the main cause of tank leaks. Three other safety issues that do not require a watch list and continual monitoring under the Wyden Amendment include criticality, tank bumps, and toxic vapor releases. The following sections provide a general description of the different non-watch list safety issues. See the *Hanford Site Tank Farm Facilities Interim Safety Basis* (Leach and Stahl, 1993) for more information.

- **Corrosion**

Corrosion is the most probable degradation mechanism of the steel tank liners resulting from contact with liquid, liquid-vapor, vapor, and solid phases of the wastes. The corrosion mechanisms that reduce the thickness of the carbon steel liners can be divided into two categories: localized and general or uniform. Localized corrosion occurs on a localized area of the liner surface. Some of the localized corrosion mechanisms include pitting corrosion, stress corrosion cracking, and crevice corrosion. General or uniform corrosion occurs over the entire liner surface. Corrosion of the steel tank liners may involve more than one of these mentioned mechanisms. Corrosion is a safety issue because it has the potential to degrade the tank liner to the point of causing a leak or, more seriously, structural failure of the tank. Either condition could release contamination to the environment.

- **Criticality**

Criticality is a self-sustained, nuclear chain reaction that can occur when a sufficient mass of fissile material is present in the proper configuration along with a neutron source to start the nuclear reaction. Criticality in the tank farms has been declared an unreviewed safety question, even though

the *Hanford Site Tank Farm Facilities Interim Safety Basis* (Leach and Stahl, 1993) indicates that a "nuclear criticality accident in the tank farms is probably not an imminent risk." The unreviewed safety question on criticality in the tank farms remains because the inventory of fissile material and its distribution within the tanks cannot be confirmed as being within the approved safety envelope defined in the current safety analysis reports. Criticality is a safety issue because of the potential to release contamination to the environment.

- **Tank Bumps**

A tank bump is the sudden pressurization of the tank. This phenomenon occurs when solids overheat in the lower portion of the tank followed by uncontrolled mixing of these solids. The stirred hot solids rapidly transfer heat to the liquid in the tank, some of which quickly vaporizes. The rapid vapor generation causes a sudden internal tank pressurization that causes a bump. Uncontrolled mixing of heated solids can occur when an airlift circulator fails allowing the solids to heat up followed by rapid startup of the airlift circulator which causes rapid mixing. Uncontrolled mixing can also occur when a natural "rollover" of waste occurs in the tank. Tank bumps are a safety issue because of their potential to release contamination to the environment.

- **Toxic Vapor Releases**

Toxic vapor releases are a recently analyzed safety concern at the Hanford Site. The entire issue of toxic gas releases at the tank farms is being investigated (Leach and Stahl, 1993).

1.1.3 Occurrences

Over the years, unusual events (occurrences) have occurred at several tanks in the SE Quadrant tank farms. An occurrence is an event that falls outside the normal operating, maintenance and/or construction procedures of the tank farm. Occurrences have been documented by various reporting methods including unusual occurrences reports, off-normal reports, event fact sheets, and occurrence reports. Before it was included in the supporting document, the occurrence documentation that could be located was evaluated for its significance in determining the waste content of the tanks. The types of significant occurrences included in the supporting documents are occurrences written about surface level changes, and temperature changes. This document does not contain information from the reports. For more information on occurrences, refer to the Occurrences Section for the specific tank in the supporting documents.

1.2 Waste Generating Plants and Processes

1.2.1 Plants Processes

Brief descriptions and histories of the plants and processes that generated waste now contained in the single-shell and double-shell tanks are presented in alphabetical order. Typically, the name of the plant and the process are synonymous. The dates and events described in the following brief histories are presented on time lines in Figures 4 and 5. Although not all of the processes listed below contributed waste directly to tanks in the Southeast Quadrant, the waste they generated could have been transferred indirectly from tank to tank.

- **A Plant (PUREX)**

The Plutonium Uranium Extraction (PUREX) plant (i.e., A Plant) began operating in January 1956 (Gerber, 1993a). "The PUREX process is an advanced solvent extraction process that uses a tributyl phosphate in kerosene solvent for recovering uranium and plutonium from nitric acid solutions of irradiated uranium. Nitric acid is used instead of metallic nitrates to promote the extraction of uranium and plutonium from aqueous phase to an organic phase." (Wilson and Reep, 1991, p. B-4). Two campaigns of the Thorex process were conducted in 1966 and 1971 (Jungfleisch, 1984). The Thorex process recovered ^{233}U from thorium irradiated in the Hanford Site reactors (Wilson and Reep, 1991). PUREX reprocessed aluminum-clad fuel elements and zirconium alloy-clad fuel elements, and provided plutonium for research reactor development, safety programs, and defense. Also, PUREX recovered slightly enriched uranium to be recycled as fuel in reactors generating electricity and plutonium (Rockwell, 1985). PUREX was put on standby in 1972 (Gerber, 1993a).

The PUREX plant was restarted in November 1983 but was shut down in December 1988 (see Figure 4). The plant was shut down due to the lack of steam pressure needed to operate the support backup safety equipment. There was a brief stabilization run in early 1990. In October 1990, PUREX was placed on standby by Secretary of Energy James Watkins. DOE issued the final closure order in December 1992 (Gerber, 1993b).

- **B Plant**

B Plant used the bismuth phosphate process at first, and later changed its processing capabilities to strontium and cesium fractionation. The bismuth phosphate process "separated plutonium from uranium and the bulk of fission products in irradiated fuel by co-precipitation with bismuth phosphate from a uranium nitrate solution. The plutonium was then separated from fission products by successive precipitation cycles using bismuth phosphate and lanthanum fluoride. The plutonium was isolated as a peroxide and, after dissolving in nitric acid, was concentrated as plutonium nitrate. The waste containing the uranium from which the plutonium had been separated, was made alkaline (neutralized) and stored in underground single-shell tanks. Other acid waste (which included most of the fission products) generated by this process was neutralized and stored in other single-shell tanks" (Wilson and Reep, 1991, p. B-3). "Some of the strontium and cesium fission products were removed (fractionated) from the waste and separately isolated to reduce the heat generation in the tanks. B Plant . . . was modified in 1968 to permit removal of these fission products by a combination of precipitation, solvent extraction, and ion-exchange steps. The residual acid waste from the processing was neutralized and stored in single-shell tanks" (Wilson and Reep, 1991, pp. B-4 and B-5).

B Plant began its first batch run on April 13, 1945 (Anderson, 1990), and was shutdown in 1952 (Gerber, 1993b) (see Figure 4). Shortly after the renovations to B Plant were completed in December 1955, the 4X Program was abandoned. The 4X Program "planned to utilize the capabilities of all four Hanford processing plants (B, T, REDOX, and PUREX)" (Gerber, 1993b, p. 12); however, the large production and economic efficiency of the PUREX plant caused the 4X Program to be abandoned (Gerber, 1993b). B Plant restarted in 1968 to recover cesium and strontium from stored liquid waste. Cesium and strontium recovery was completed in September 1983 and February 1985, respectively (Rockwell, 1985).

- **225-B (WESF)**

The Waste Encapsulation and Storage Facility (WESF) converted solutions of cesium and strontium nitrates recovered in B Plant to strontium fluoride and cesium chloride solids that are doubly encapsulated in metal (Ballinger and Hall, 1991). "Strontium and cesium capsules have been used in applications of fission byproducts for gamma and heat sources" (Wilson and Reep, 1991, p. B-5).

WESF was constructed in 1974 (see Figure 4). The process optimization for cesium and strontium was completed in 1978 and 1981, respectively (Rockwell, 1985). The cesium processing ended in 1983 and strontium encapsulation in 1985. The capsule return program started in 1988 and ended in 1995 (Gerber, 1996).

- **C Plant (Strontium Semiworks)**

The Strontium or Hot Semiworks Facility (i.e., C Plant) began operating in 1952 as a hot pilot plant for the REDOX process (see Figure 4). In 1954, the plant was converted to a pilot plant for the PUREX process and continued operating until 1956 (Ballinger and Hall, 1991). "The process building (201-C) contains three hot cells equipped only for contact maintenance and is supported by an aqueous makeup and control building (271-C) and a solvent handling building (276-C). The facility also includes a fiberglass exhaust filter and a 200-ft stack." (PNL, 1991, Vol. 1, p. 3.6). In 1960, the plant was reactivated as a pilot plant used to recover ^{90}Sr, ^{147}Pm, and ^{144}Cs from PUREX waste. The plant was shut down in 1967 and the building and the site have been decontaminated and decommissioned (PNL, 1991).

- **S Plant (REDOX)**

The Reduction and Oxidation extraction (REDOX) plant (i.e., S Plant) began processing on January 9, 1952 (Anderson, 1990) (see Figure 4). "The REDOX extraction process was a second-generation recovery process and the first process to recover both plutonium and uranium. It used a continuous solvent extraction process to extract plutonium and uranium from dissolved fuel into a methyl isobutyl ketone (hexone) solvent. The slightly acidic wastestream contained the fission products and large quantities of aluminum nitrate that were used to promote the extraction of plutonium and uranium. This waste was neutralized and stored in single-shell tanks. The volume of high-level waste from this process was much smaller than that from the bismuth phosphate process, but larger than that from the PUREX process" (Wilson and Reep, 1991, pp. B-3 and B-4). REDOX operated until 1967 (Rockwell, 1985).

- **T Plant**

T Plant was the first full-scale separations plant at the Hanford Site. T Plant used the bismuth phosphate process to separate plutonium from uranium and the bulk of fission products in irradiated fuel (B Plant used the same process). "The waste containing the uranium from which the plutonium had been separated was made alkaline (neutralized) and stored in underground single-shell tanks. Other acid waste (which included most of the fission products) generated by this process was neutralized and stored in other single-shell tanks" (Wilson and Reep, 1991, p. B-3).

T Plant began operating in 1944 (Rockwell, 1985) as a separations plant and continued until March 1956 (Gerber, 1994) (see Figure 5). T Plant's mission was changed in 1957 to the repair and high-level decontamination of equipment (Rockwell, 1985). T Plant was converted to a "central decontamination facility for the site. As such, failed and contaminated equipment was assessed and

either repaired or discarded there for over three decades" (Gerber, 1994, p. 1). Early decontamination operations used steam, sand, chemicals, and detergents. "Smaller equipment pieces were immersed in decontamination solutions in 'thimble tanks,' and larger pieces were flushed with water, chemical solutions, sand-blasted, steam-blasted, high-pressure sprayed (using pressures up to 10,000 pounds per square inch), and/or scrubbed with detergents. During the initial years, a strong nitric acid flush (approximately 60%) usually began the decontamination process, followed by a caustic wash with sodium hydroxide combined with sodium phosphate, boric acid, versene, sodium dichromate, sodium tartrate, or sodium citrate. However, it was learned that versene and tartrate, in particular, adversely affected the ability of soil cribs to absorb the rinsate materials. High-pressure sprays often used 1,1,1 trichloroethane or perchloroethylene, and detergents generally were chloride-based. By the mid-1960s, commercially prepared and trademarked chemical mixtures had replaced most of the simpler chemicals used in the early years. Many commercial products were based on oxalic acid, phosphates, nitric acid-ferrous ammonium sulfate combinations, potassium permanganate, and sodium bisulfate, with some unknown additives" (Gerber, 1994, pp. 40–42). The facility was modified in 1978 to store pressurized water reactor (PWR) core II fuel assemblies (Rockwell, 1985).

- **U Plant**

U Plant (221-U) was built as one of three original bismuth phosphate process facilities, but it was not used for that purpose. U Plant was modified extensively and used for the uranium recovery process, operating from 1952 to 1958 (see Figure 5). Uranium in waste from the bismuth phosphate process initially was stored in the single-shell tanks. Later, the waste was sluiced, dissolved in nitric acid, and processed through a solvent extraction process using tributyl phosphate in kerosene to recover the uranium. The process was similar to that used later in the plutonium-uranium extraction (PUREX) process except that plutonium was not recovered. The acid waste from the uranium recovery process was made alkaline and returned to single-shell tanks. The tributyl phosphate waste was treated with potassium ferrocyanide as a cesium and strontium scavenger. The recovery process resulted in an increase in nonradioactive salts and a small increase in waste volume (Wilson and Reep, 1991).

- **224-U (UO_3, Uranium Trioxide Plant)**

The 224-U Building was converted to a uranium trioxide (UO_3) plant that began operating in 1952 (see Figure 5). The UO_3 plant was capable of handling the uranyl nitrate hexahydrate (UNH) stream from REDOX, U Plant, and PUREX. "The basic UO_3 process, calcining, consisted of concentrating and then heating liquid UNH until it converted to a stable, orange-yellow powder The nitric acid in the UNH solution could be recovered in the same process. The UO_3 powder was the base material needed for the manufacture of uranium hexafluoride (UF_6), the primary feed material for the United States' gaseous diffusion plants. Because the largest of these plants was located in Ohio and Tennessee, it was considered safer to ship the material across the country in powder rather than in liquid form" (Gerber, 1993b, pp. 33–34). The UO_3 plant was shut down in 1972, but restarted in 1984 Since 1984, there have been 17 campaigns at the plant averaging 8 days each. Final deactivation of the plant was ordered in 1992. In April 1993, the UO_3 plant resumed operations to convert 200,000 gallons of remaining UNH to UO_3 powder. A final deactivation plan was written in the summer of 1993 (Gerber, 1993b).

- **Z Plant (PFP, Plutonium Finishing Plant)**

The Plutonium Finishing Plant (PFP) or Z Plant, previously called Plutonium Recovery and Finishing Operations, processed plutonium and prepared plutonium products. "Waste from this plant

contained only minor amounts of fission products but did contain low concentration of plutonium and other transuranic elements and was high in metallic nitrates. Initially, this waste was discharged via cribs to soil columns, which absorbed the transuranic elements and retained them close to the point of discharge. Beginning in 1973, waste from PFP was stored with other waste in underground tanks" (Wilson and Reep, 1991, p. B-4). "Three types of feed materials are processed at the PFP to produce plutonium metal. Feed material types are handled differently in different process lines . . . . Historically, the main feed for the PFP was purified plutonium nitrate solution that was produced elsewhere in a fuel reprocessing plant. This feed was charged directly to one of the main process lines, which was initially a glovebox line. The glovebox line was replaced by remote mechanical lines, which were upgraded over the years. In time, processes were added to handle rework and scrap plutonium. These processes were used to convert the rework and scrap materials into a purified plutonium nitrate solution that could be handled by the main process" (Duncan and Mayancsik, 1993, pp. 2-1–2-2).

In July 1949, PFP began operations with a glovebox line (see Figure 5). The remote mechanical A line replaced the glovebox line in May 1953. Installment of the Recuplex Facility at PFP was completed in April 1955. The remote mechanical C line was installed in July 1960. In September 1961, the 232-Z Building had an incinerator and leaching equipment installed. In June 1964, the Plutonium Reclamation Facility (PRF) replaced the functions of the Recuplex Facility. Fabrication of plutonium metal nuclear weapon components ceased at the PFP in December 1965. In April 1973, the 232-Z Incinerator was shut down and the remote mechanical C line was placed on standby. The PRF was placed on standby in February 1979, and the remote mechanical A line was shutdown in December 1979. In January 1984, the PRF was restarted for a series of campaigns. The remote mechanical C line was restarted in June 1985 for a series of campaigns. In September 1986, operations at PFP were halted for nine months. This partial listing of the process history in the PFP is from Duncan et al. (1993).

1.2.2 Waste Management Operations

This section describes the different methods used to concentrate waste in the 200 Areas. Evaporating, and in-tank solidification are methods used to reduce the volumes of supernate. Brief descriptions and histories of the operations are presented in alphabetical order. The events and dates described in the brief histories are presented on a time line (Figure 6).

- **242-A Evaporator-Crystallizer**

"The program objective was to reduce the volume of tanked waste liquors through the boiloff of water. This was accomplished by boiling the liquor in an enclosed vessel at reduced pressure. The evaporation was carried out until a slurry containing about 30 wt% solids was formed. The slurry was returned to underground waste tanks for cooling, crystallization, and settling. The principal products of waste solidification have been large volumes of sodium nitrate salt cakes and waste liquors that are rich in sodium hydroxide and sodium aluminate" (Wilson and Reep, 1991, p. B-5).

The 242-A Evaporator-Crystallizer began operating on March 18, 1977 (Anderson, 1990) (see Figure 6). In 1981, the evaporator was shut down for ten months to tie AW Tank Farm into the process (Rockwell, 1985). The evaporator was shut down in 1989 because of regulatory issues, but was restarted in 1994 after extensive modifications (Gerber, 1996).

- **242-B Evaporator**

"The first type of waste solidification facility, the 242-B and 242-T Concentrators, was originally used for concentration of bismuth phosphate process waste. In 1951, they began to concentrate cladding/first cycle waste. These concentrators were steam-heated pot evaporators operated outside the waste tanks and at atmospheric pressure. The liquors were partially boiled down and cycled to underground waste storage tanks" (Jungfleisch, 1984, p. 1-5). This evaporator ran for approximately four years (Anderson, 1990) (see Figure 6).

- **242-S Evaporator-Crystallizer**

The 242-S Evaporator-Crystallizer was designed to boil off water from the waste in an enclosed vessel at reduced pressure, similar to the 242-A Evaporator-Crystallizer. "The evaporation was carried out until a slurry containing about 30 wt% solids was formed. The slurry was returned to underground waste tanks for cooling, crystallization, and settling. The principal products of waste solidification have been large volumes of sodium nitrate salt cakes and waste liquors that are rich in sodium hydroxide and sodium aluminate" (Wilson and Reep, 1991, p. B-5). The evaporator began operating on November 1, 1973 (Anderson, 1990) and was shut down in 1981 (Gerber, 1996) (see Figure 6).

- **242-T Evaporator**

The 242-T Evaporator, like the 242-B Evaporator, began operating in 1951 (Gerber, 1992) to reclaim nonboiling waste storage capacity in existing tanks (see Figure 6). The evaporator was shut down in the summer of 1955 and modified for tributyl phosphate scavenging (Godfrey, 1965), although scavenging was never performed in this evaporator. The evaporator was restarted on December 3, 1965, and operated until April 15, 1976 (Anderson, 1990).

- **In-Tank Solidification**

The in-tank solidification systems immobilized high level wastes, that were not self-boiling, by concentrating the waste directly inside the tanks to form radionuclide-bearing salt cakes (Shefcik, 1964). The first in-tank solidification unit (ITS-1) and the second in-tank solidification unit (ITS-2) operated in tanks in the BY Tank Farm (Caudill, 1965 and 1967). "...[O]ne used a hot air sparge (ITS-1) and the other used an immersed electrical heater (ITS-2). The ITS-1 operations were conducted in individual tanks. The ITS-2 concentrations were performed by heating the contents of one tank and moving the heated liquor through a series of other tanks" (Wilson and Reep, 1991, p. B-5).

ITS units 1 and 2 began operating on March 19, 1965, and February 17, 1968, respectively (see Figure 6). ITS-1 was converted to a cooler for ITS-2 on August 24, 1971. Both units were shut down on June 30, 1974 (Anderson, 1990).

1.2.3 Miscellaneous Waste Sources and Equipment

Wastes from various other sources on the Hanford Site have been added to the tanks. Some wastes are from the 300 Area, the 100 Area production reactors, various laboratories, and catch tanks.

- **Critical Mass Laboratories**

The critical mass laboratories were used to study the physics of plutonium solutions and solids to avoid accidently creating a criticality or self-sustained nuclear reaction. The first facility began operating in the 120 Building near 100 F in April 1950 and closed in December 1951. The second

facility, the 209-E Building, was located next to the Strontium Semiworks and began operating in July 1961 (Ballinger and Hall, 1991). The plutonium used in the lab was reprocessed in PUREX.

- **244-AR, -BXR, and -CR Process Vaults**

Three of the process vaults are the 244-AR Vault, the 244-BXR Vault, and the 244-CR Vault. These vaults were composed of several process vessels or tanks used to prepare waste for treatment or storage. Specific wastes from tanks can be pumped temporarily to the vaults and later sent directly to desired tanks or processing facilities.

The AR Vault, located north and west of the A Tank Farm, was constructed in 1966. The vault facilities include a canyon building with process cells containing tanks. The AR Vault has been on standby since 1978 (Leach and Stahl, 1993).

The 244-BXR Vault, located south of the BX Tank Farm, began operating in 1952 (Rodenhizer, 1987) and became inactive in 1956. The waste in the vault was difficult to handle so the vault was jetted with high-pressure steam in 1976. The 244-BXR Vault was used to process sludge in the recovery of uranium from bismuth phosphate metal waste in the tanks (Rodenhizer, 1987).

The 244-CR Vault, constructed in 1952, is located south of the C Tank Farm (Leach and Stahl, 1993). Salt-well waste from the C Tank Farm is interimly stored in the CR Vault. The 244-CR Vault was used to process sludge in the recovery of uranium from bismuth phosphate metal waste in the tanks (Rodenhizer, 1987).

- **204-AR and 204-S Railroad Car Facilities**

The 204-AR rail car unloading facility built in 1981 (Leach and Stahl, 1993), replaced the 204-S rail car unloading facility. The facilities were built for pumping liquid radioactive waste from tank cars and sending the waste to 200 East Area tank farms (Leach and Stahl, 1993).

1.2.4 Time Lines

Time lines presented on the following pages represent many of the events that occurred during the history of the major plants and waste management operations on the Hanford Site. These are the same events as those described in the description of each facility. The plants, associated processes, and methods for managing waste are the main sources of the wastes stored in the tanks. Abbreviations are defined in the preceding text and in the glossary in Appendix A.

One time line represents the history of each of the tank farms in the Southeast Quadrant of the 200 East and West Areas (Figure 7). The events represented include the dates of construction, the individual tank's entry into service and removal from service, and the deactivation of each tank farm.

PLANTS / PROCESS - TIME LINE

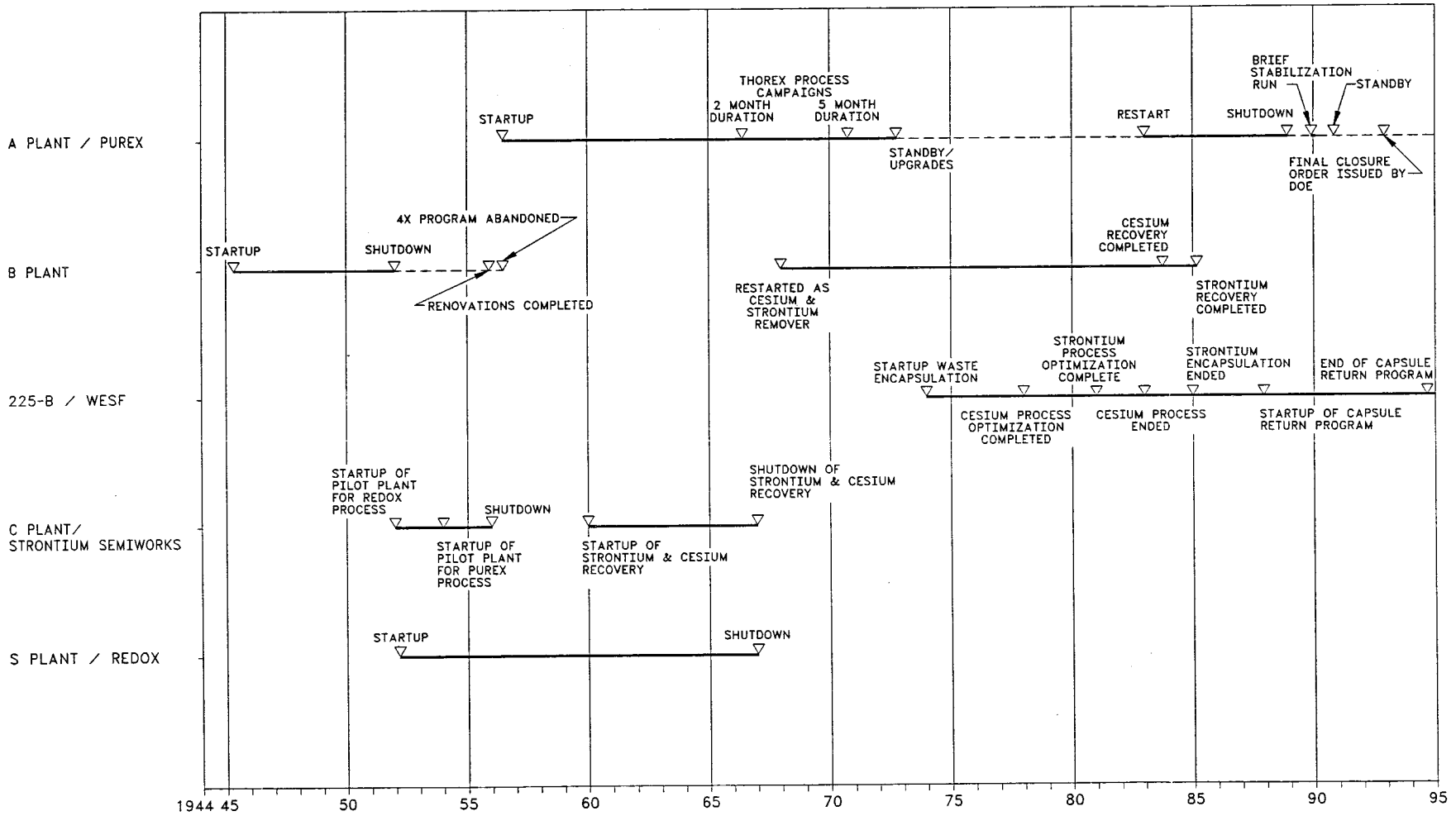


FIGURE 4

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PLANTS / PROCESS - TIME LINE

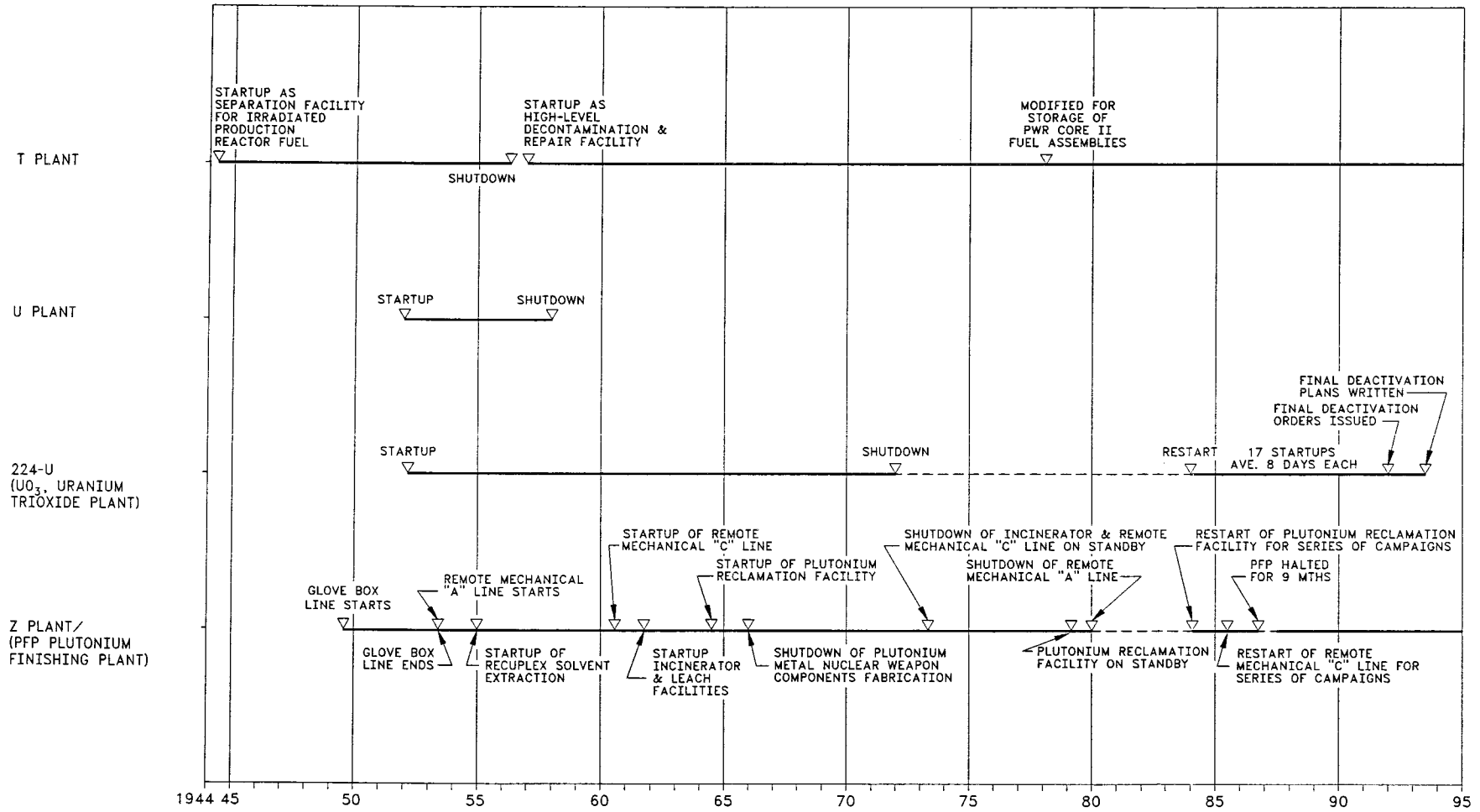

FIGURE 5

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WASTE MANAGEMENT – TIME LINE

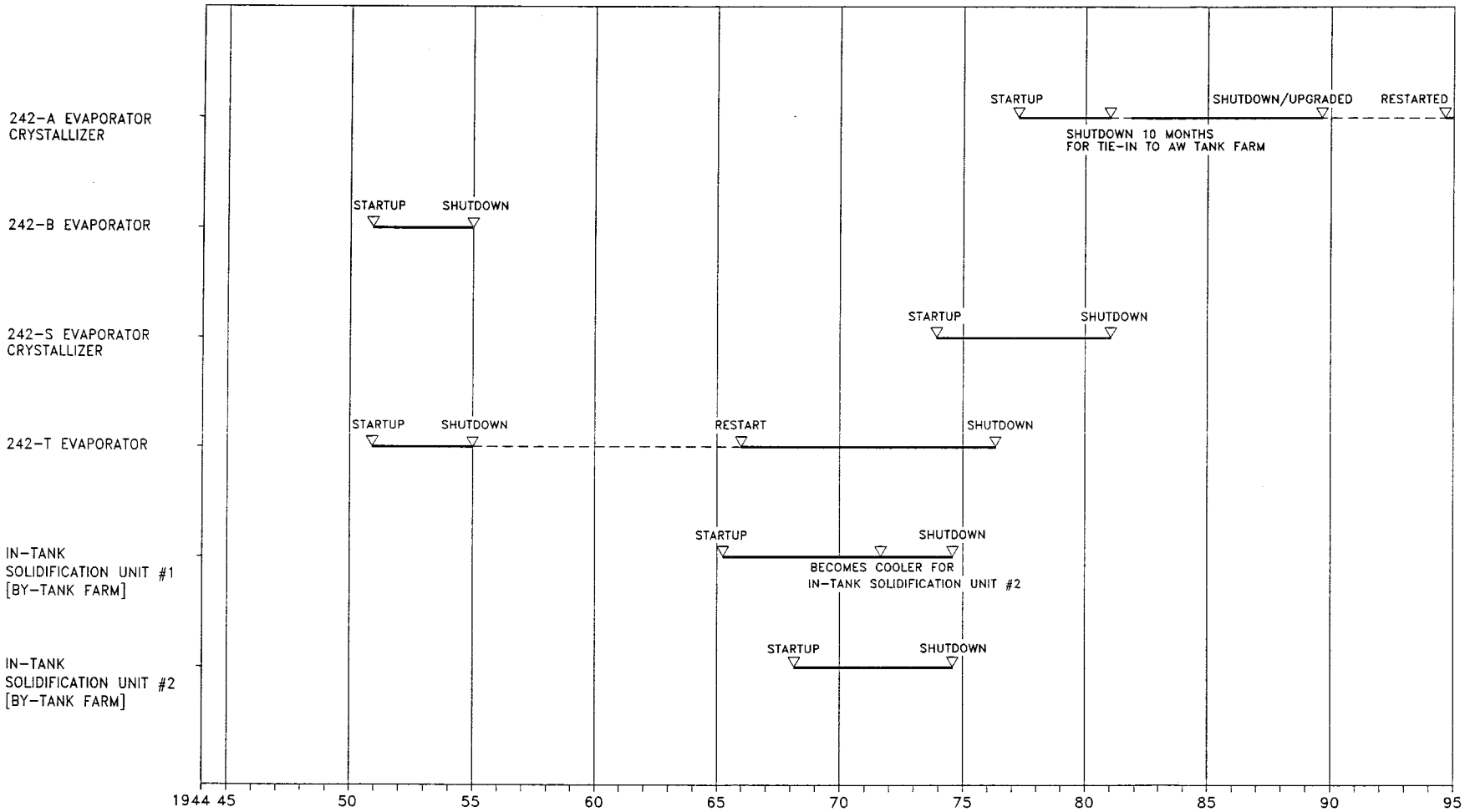

FIGURE 6

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SE QUADRANT TANK FARMS - TIMELINE

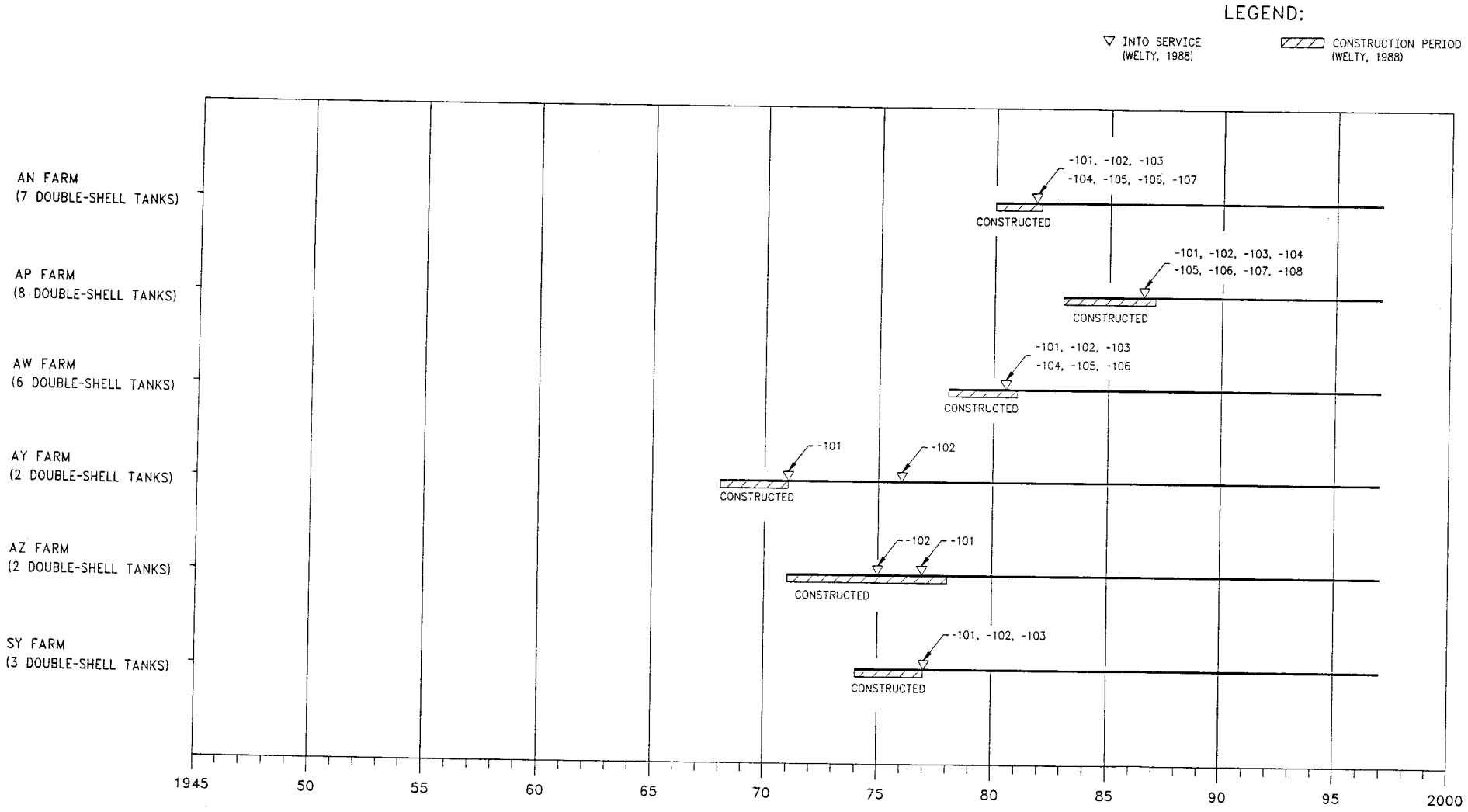

FIGURE 7

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1.3 Tank and Tank Farm Summary Tables: Source and Development

The summary tables for each tank farm and each tank in the SE Quadrant comprise information from the supporting documents and the *Waste Tank Summary Report for Month Ending September 30, 1996* (Hanlon, 1996l).

The information on the Tank Farm Summary tables includes the Tank Farm Description, Integrity, Tank Volumes, and Watch Lists sections selected from the supporting documents. The Waste Volume section information was taken from the *Waste Tank Summary Report for Month Ending September 30, 1996* (Hanlon, 1996l).

The information on the Tank Summary tables includes the Tank History, Tentatively Available Risers, Tank Temperature, Tank Description, Interior Photographs and Waste Surface Level sections selected from the supporting documents. The Waste Volume Section information was taken from the *Waste Tank Summary Report for Month Ending September 30, 1996* (Hanlon, 1996l).

The "-" in the tank summary tables indicates the information is unknown, not applicable, and/or not available in the supporting documents.

The risers referred to in the Tentatively Available Riser section are risers that are available for interior tank waste sampling (Lipnicki, 1996). For more information, see the supporting documents.

The temperature and waste surface level data presented in the Tank Summary tables are from a continually updated database. Therefore there are limits on the temperature and waste surface level data presented in the tables. All other information on the Tank Summary tables is from referenced documents.

The temperature data were queried from the Surveillance Analysis Computer System (SACS) database. The temperature data were queried for the period from January 1, 1950, through December 17, 1996. The end date for the queries varies for each tank farm (see supporting documents for further information). The temperature information presented is for data from 1979 through the date of the query for the specific tank. For a graphical representation of the data, further explanation about the development of the data, and the references, see the supporting documents.

The waste surface level data also were queried from the Surveillance Analysis Computer System (SACS) database. The waste surface level data were queried for the period from January 1, 1991 through January 23, 1997. The end date for the queries varies for each tank farm (see supporting documents for further information). The waste surface level information presented is for data from January 1, 1991 through the date of the query for the specific tank. The waste surface level device indicated on the Tank Summary tables is the most recent device being used based on the queried data. The maximum and minimum waste surface levels indicated on the Tank Summary tables do not always correlate to the most recent device indicated on the Tank Summary tables. For a graphical representation of the data, further explanation about the development of the data, and the references, see the supporting documents.

For further information on the development of the data and more specific references on the Farm Summary tables and Tank Summary tables see the supporting documents.

1.4 Waste and Level History: Source and Development

The Waste and Level Histories combine the level history of the tank and the wastes types in the tank through out history. The Waste and Level History's were incorporated from the Supporting Document for each tank. The supporting data were not included in this document. For the supporting data, further information on the development of the Waste and Level History sketches, and the references, see the supporting documents.

1.5 Riser Configuration: Source and Development

The riser configurations were incorporated directly from the supporting documents for each particular farm. The riser configurations were developed from numerous drawings and documents. For further information on the sizes of the risers, uses of the risers, references and the development of the riser configurations, see the supporting documents.

1.6 Tank Layer Model: Source and Development

The Tank Layer Model (TLM) graphs present the estimated waste types from the *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997). The Tank Layer Model graphs were reformatted into individual tank graphs from Agnew's document to better illustrate what waste types Agnew has estimated. For further information on the TLM, see the supporting documents and Agnew's document..

1.7 Inventory Estimates: Source and Development

The Inventory Estimates present the estimated waste contents of the tanks from the *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997). The Inventory Estimates predict the physical characteristics, and the chemical, and radiological constituents of the supernatant, the solids and the total volume for each tank. The inventory estimates for each tank include a Supernatant Mixing Model (SMM) Composite Inventory Estimate, a Tank Layer Model (TLM) Solids Composite Inventory Estimate and a Total Inventory Estimate. The SMM Composite Inventory Estimate is based on the output of the Supernatant Mixing Model and the TLM Solids Composite Inventory Estimate is based on the output of the Tank Layer Model. The Total Inventory Estimate is a combination of the SMM Composite Inventory Estimate and the TLM Solids Composite Inventory Estimate. The Inventory Estimates were incorporated directly from the supporting document which were incorporated directly from Agnew's document for each tank. For further information on the Inventory Estimates, see the supporting documents and Agnew's document..

1.8 Tank Farm Photographs and Tank Montages: Source and Development

The tank farm photographs and tank montages were incorporated directly from the supporting documents for each particular farm. The tank farm photographs and interior tank montages were

reviewed in January 1996 to determine the clearest and most recent representation. For further information on the tank farm photograph and the interior tank montages, see the supporting documents.

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2.0 241-AN Tank Farm

The AN Tank Farm is located in the 200 East Area at the intersection of 7th Street and Buffalo Avenue. The farm contains seven flat bottom design, double-shell tanks built between 1980 and 1981. The tanks are 75 feet in diameter with an operating capacity of 1,160,000 gallons. For more information on the design, construction, and waste contents of the tanks, refer to the AN Tank Farm Supporting Document, HNF-SD-WM-ER-314, Rev. 1 (Brevick et al., 1997a).

The AN Tank Farm tanks were designed with slurry bottoms for storage of double-shell slurry waste produced at the 242-A Evaporator. The tanks are essentially identical except for tank 241-AN-101, which has two additional concrete process pits and tank 241-AN-107, which has 80 risers because of the 21 airlift circulator assemblies installed in the tank. The tank farm is an integrated facility with dedicated service and ventilation equipment (Leach and Stahl, 1993). The primary additions to the tanks were B Plant low-level waste (BL), slurry growth (GAS), dilute non-complexed waste (SWLIQ), PUREX low-level waste (PL2), unknown waste (UNK), and water (WTR) (Agnew et al., 1995).

The following table presents a summary of the 241-AN Tank Farm. Refer to the glossary for waste type terminology.

TANK FARM 241-AN SUMMARY

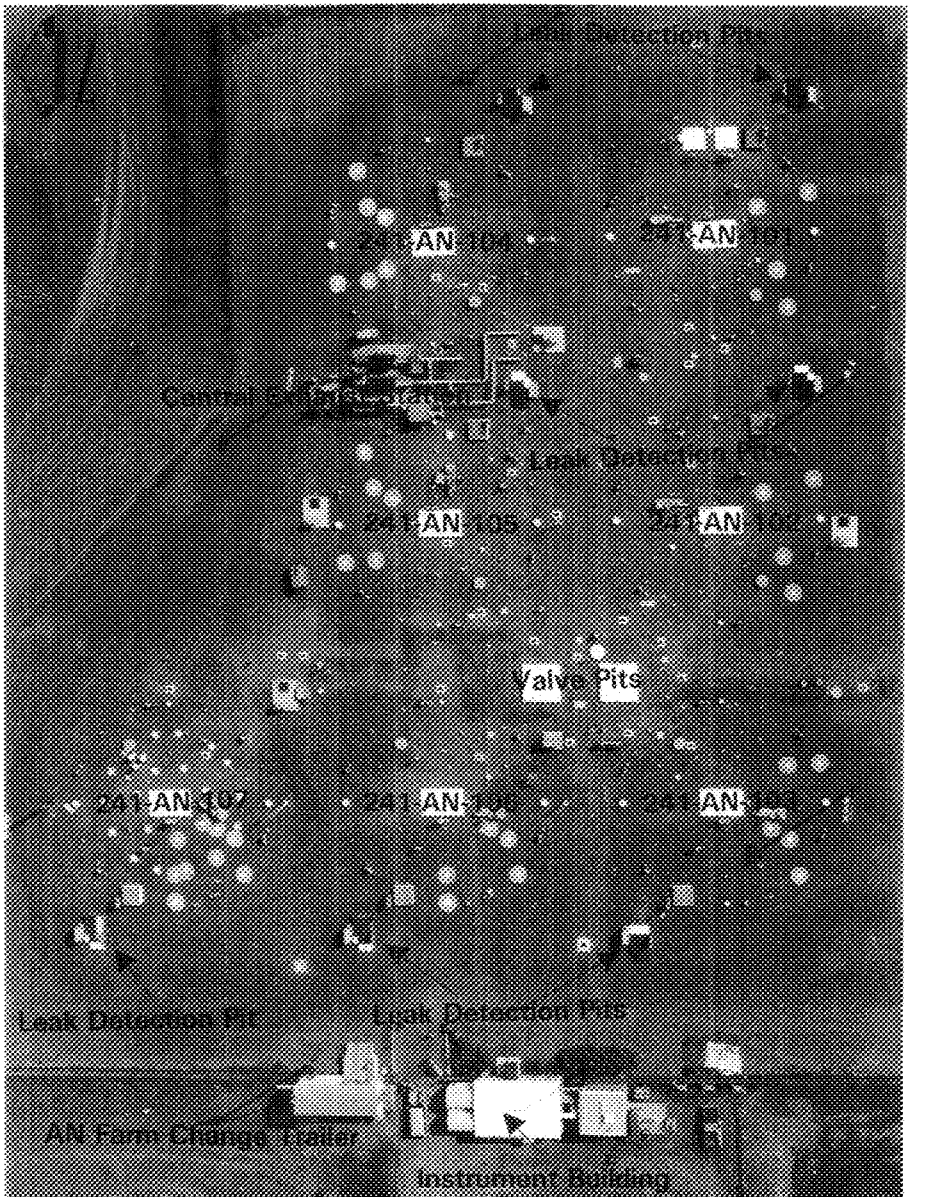
TANK FARM DESCRIPTION		WASTE VOLUME (HANLON 1996I)	
Shell Type	Double	Total Waste Volume	5,810,000 gal
Number of Tanks	7	Waste Type	DSSF, DSS, DN, CC
Construction Date	1980 -1981	Drainable Interstitial Liquids	51,000 gal
INTEGRITY		Pumpable Liquids	4,227,000 gal
Sound	101, 102	Saltcake	0 gal
	103, 104	Sludge	650,000 gal
	105, 106	Supernatant	4,223,000 gal
	107	**WATCH LISTS**	
TANK VOLUMES		Hydrogen	103, 104, 105
7@1,160,000 gal		Organic	none
		High Heat	none

The historical characterization and waste inventory information for each tank is assembled into a set of tables, sketches, graphs, and interior tank montage. The set consists of the following for each tank in AN Tank Farm:

- Tank Summary table
- Waste and Level History sketch
- Riser configuration sketch
- Tank Layer Model Estimate graph
- TLM Solids Composite Inventory Estimate tables
- SMM Composite Inventory Estimate tables
- Total Inventory Estimate tables
- Interior tank montage

The supporting document for this tank farm provides backup data and further explanation of the above tables, sketches, and graphs.

AN TANK FARM


Leak Detection Pits
241-AN-104
241-AN-101
Central Pump Pit
Leak Detection Pits
241-AN-105
241-AN-102
Valve Pits
241-AN-107
241-AN-106
241-AN-103
Leak Detection Pit
Leak Detection Pits
AN Farm Change Trailer
Instrument Building

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TANK 241-AN-101 SUMMARY

TANK HISTORY	
Entered Service	Sept 1981
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
13A, 16B, 21A	4 in
7B, 12A	12 in
TANK TEMPERATURE	
Average Tank Temperature	73°F
Maximum Temperature	79.34°F
Date	Sept 25 - Nov 6, 1996*
Elevation from tank bottom	14.33 ft
Riser Number	4A
Minimum Temperature	61.7°F
Date	Dec 11 - 15, 1996
Elevation from tank bottom	38.33 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	61
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	116,000 gal
Waste Type	DN
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	83,000 gal
Saltcake	0 gal
Sludge	33,000 gal
Supernatant	83,000 gal
INTERIOR PHOTOGRAPHS	
Date	not available
Montage Number	not available
Photo Set Number	not available
WASTE SURFACE LEVEL	
Devices	Manual ENRAF & Tape
Max Level	394.25 in
Date	Jan 31, - Aug 17, 1996*
Min Level	41.5 in
Date	Nov 11, 1996

* Numerous dates in this time span.

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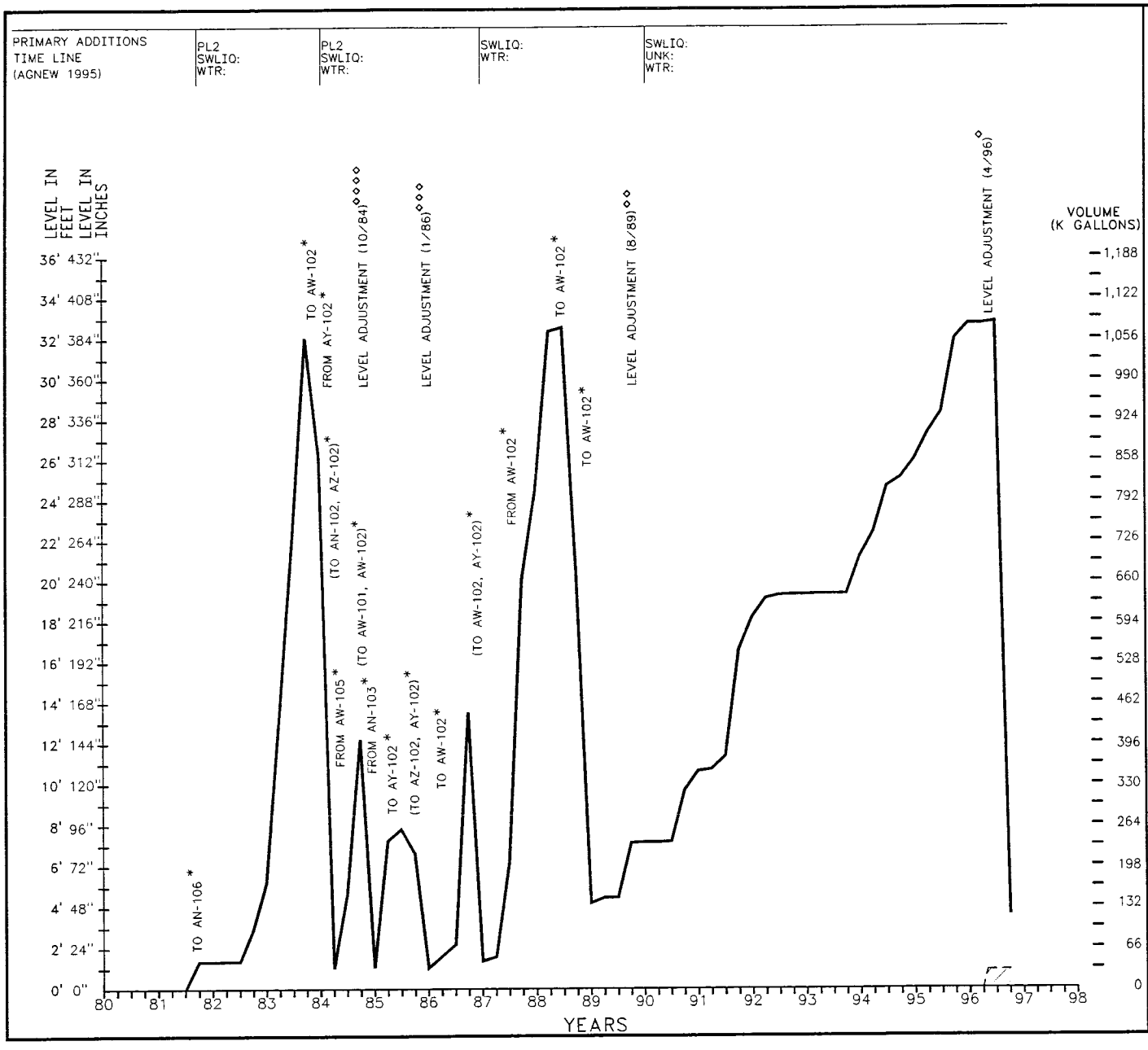


TANK INFO:

CONSTRUCTED 1980-1981
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- ◇ HANLON 1996l
- ◇◇ THURMAN 1989j
- ◇◇◇ VAIL AND MURRY 1986b
- ◇◇◇◇ McCANN AND VAIL 1984k

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

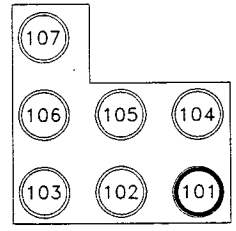
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

PL2:	PUREX LOW-LEVEL WASTE 1983-88
SWLIQ:	DILUTE, NON-COMPLEXED WASTE
UNK:	UNKNOWN
WTR:	WATER

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

AN TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AN-101 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1981-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E150	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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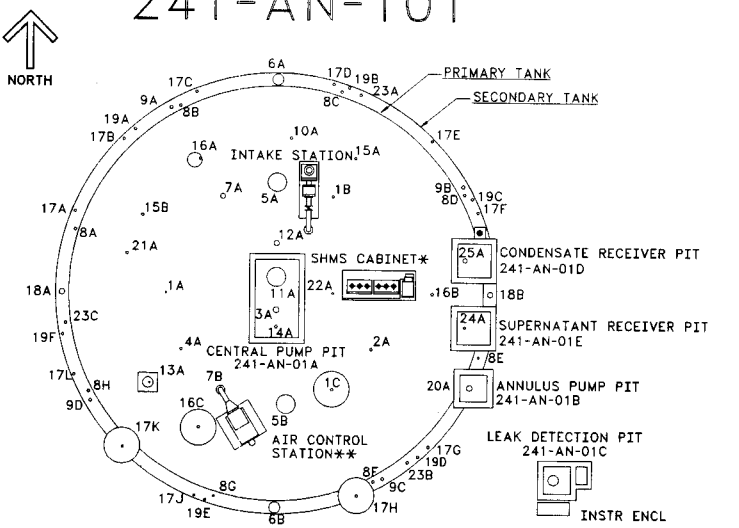
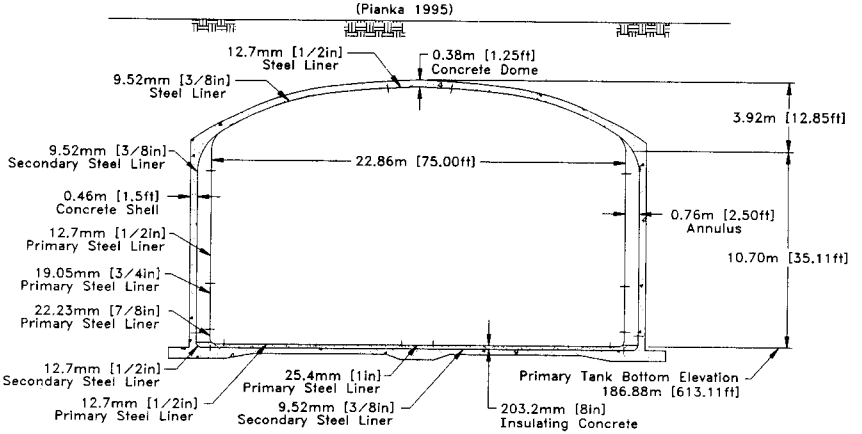
241-AN-101



Ref: Salazar 1994
H-14-010501, Sh.1, Rev.3
H-2-71991, Rev.10
* ECN-637589 & ECN-W-369-59
** ECN-624520 & ECN-624521

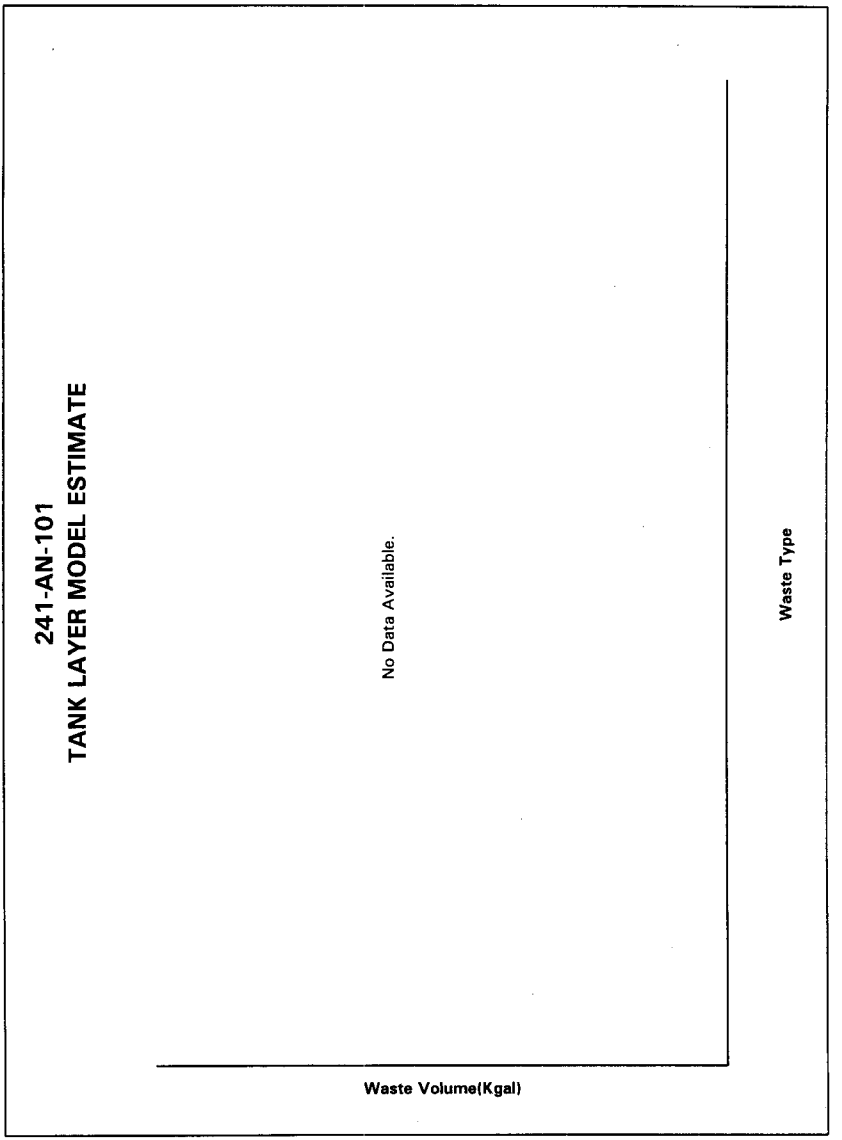
TANK RISER LOCATION

Approximate Grade Elevation 203.64m [668.11ft]
(Pianka 1995)



Ref: H-2-71975, Rev.2

NOT TO SCALE



Tank Layer Model (LNS) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AN-101

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

HDW Model Rev. 4

Double-Shell Tank 241-AN-101

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	3.50E+06 (kg)	(740 kgal)	----	----	----	----	----
Heat Load	2.11 (kW)	(7.20E+03 BTU/hr)	----	2.01	2.05	2.17	2.19
Bulk Density*	1.25 (g/cc)	----	----	1.23	1.24	1.26	1.26
Water wt%	64.8	----	----	63.5	64.1	65.6	66.8
TOC wt% C (wet	0.273	----	----	0.210	0.240	0.305	0.336

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	5.78	1.06E+05	3.72E+05	5.35	5.59	5.93	6.07
Al3+	0.750	1.62E+04	5.67E+04	0.673	0.710	0.795	0.778
Fe3+ (total Fe)	3.72E-03	166	582	3.14E-03	3.42E-03	4.01E-03	4.29E-03
Cr3+	6.96E-02	2.90E+03	1.01E+04	5.39E-02	6.24E-02	7.12E-02	7.27E-02
Bi3+	6.06E-04	101	355	5.71E-04	5.88E-04	6.24E-04	6.41E-04
La3+	3.37E-06	0.374	1.31	2.48E-06	2.91E-06	3.82E-06	4.26E-06
Hg2+	3.76E-06	0.603	2.11	3.55E-06	3.71E-06	3.79E-06	3.82E-06
Zr (as ZrO(OH)2)	1.58E-04	11.5	40.2	1.09E-04	1.51E-04	1.64E-04	1.70E-04
Pb2+	3.83E-04	63.5	223	3.38E-04	3.60E-04	4.07E-04	4.29E-04
Ni2+	2.39E-03	112	393	2.32E-03	2.36E-03	2.42E-03	2.45E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	1.69E-03	74.2	260	1.41E-03	1.55E-03	1.83E-03	1.97E-03
Ca2+	1.26E-02	404	1.42E+03	1.14E-02	1.20E-02	1.32E-02	1.38E-02
K+	3.25E-02	1.02E+03	3.56E+03	2.57E-02	2.90E-02	3.61E-02	3.96E-02
OH-	4.44	6.03E+04	2.11E+05	3.95	4.18	4.70	4.61
NO3-	1.99	9.84E+04	3.45E+05	1.86	1.92	2.04	2.04
NO2-	1.04	3.84E+04	1.34E+05	0.925	0.980	1.10	1.16
CO32-	0.150	7.18E+03	2.52E+04	0.139	0.142	0.159	0.160
PO43-	3.99E-02	3.03E+03	1.06E+04	3.73E-02	3.84E-02	4.12E-02	4.25E-02
SO42-	9.22E-02	7.08E+03	2.48E+04	7.69E-02	8.42E-02	0.100	0.108
Si (as SiO32-)	2.83E-02	637	2.23E+03	2.44E-02	2.63E-02	3.04E-02	3.23E-02
F-	3.51E-02	534	1.87E+03	2.81E-02	3.31E-02	3.68E-02	3.86E-02
Cl-	0.101	2.85E+03	9.99E+03	9.20E-02	9.61E-02	0.106	0.106
C6H5O73-	9.78E-03	1.48E+03	5.18E+03	9.22E-03	9.50E-03	1.01E-02	1.05E-02
EDTA4-	3.28E-03	756	2.65E+03	1.35E-03	2.29E-03	4.28E-03	5.25E-03
HEDTA3-	5.36E-03	1.17E+03	4.11E+03	1.49E-03	3.38E-03	7.35E-03	9.30E-03
glycolate-	2.16E-02	1.30E+03	4.55E+03	1.42E-02	1.78E-02	2.55E-02	2.92E-02
acetate-	3.85E-03	182	637	3.15E-03	3.45E-03	4.29E-03	4.95E-03
oxalate2-	4.41E-06	0.310	1.09	3.93E-06	4.17E-06	4.65E-06	4.89E-06
DBP	7.33E-03	1.23E+03	4.31E+03	6.36E-03	6.83E-03	7.81E-03	8.34E-03
butanol	7.33E-03	434	1.52E+03	6.36E-03	6.83E-03	7.81E-03	8.34E-03
NH3	5.35E-02	727	2.55E+03	2.99E-02	4.13E-02	6.59E-02	7.81E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-101

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	3.50E+06 (kg)	(740 kgal)	----	----	----	----	----
Heat Load	2.11 (kW)	(7.20E+03 BTU/hr)	----	2.01	2.05	2.17	2.19
Bulk Density†	1.25 (g/cc)	----	----	1.23	1.24	1.26	1.26
Water wt%†	64.8	----	----	63.5	64.1	65.6	66.8
TOC wt% C (wet	0.273	----	----	0.210	0.240	0.305	0.336

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	5.78	1.06E+05	3.72E+05	5.35	5.59	5.93	6.07
Al3+	0.750	1.62E+04	5.67E+04	0.673	0.710	0.795	0.778
Fe3+ (total Fe)	3.72E-03	166	582	3.14E-03	3.42E-03	4.01E-03	4.29E-03
Cr3+	6.96E-02	2.90E+03	1.01E+04	5.39E-02	6.24E-02	7.12E-02	7.27E-02
Bi3+	6.06E-04	101	355	5.71E-04	5.88E-04	6.24E-04	6.41E-04
La3+	3.37E-06	0.374	1.31	2.48E-06	2.91E-06	3.82E-06	4.26E-06
Hg2+	3.76E-06	0.603	2.11	3.55E-06	3.71E-06	3.79E-06	3.82E-06
Zr (as ZrO(OH)2)	1.58E-04	11.5	40.2	1.09E-04	1.51E-04	1.64E-04	1.70E-04
Pb2+	3.83E-04	63.5	223	3.38E-04	3.60E-04	4.07E-04	4.29E-04
Ni2+	2.39E-03	112	393	2.32E-03	2.36E-03	2.42E-03	2.45E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	1.69E-03	74.2	260	1.41E-03	1.55E-03	1.83E-03	1.97E-03
Ca2+	1.26E-02	404	1.42E+03	1.14E-02	1.20E-02	1.32E-02	1.38E-02
K+	3.25E-02	1.02E+03	3.56E+03	2.57E-02	2.90E-02	3.61E-02	3.96E-02
OH-	4.44	6.03E+04	2.11E+05	3.95	4.18	4.70	4.61
NO3-	1.99	9.84E+04	3.45E+05	1.86	1.92	2.04	2.04
NO2-	1.04	3.84E+04	1.34E+05	0.925	0.980	1.10	1.16
CO32-	0.150	7.18E+03	2.52E+04	0.139	0.142	0.159	0.160
PO43-	3.99E-02	3.03E+03	1.06E+04	3.73E-02	3.84E-02	4.12E-02	4.25E-02
SO42-	9.22E-02	7.08E+03	2.48E+04	7.69E-02	8.42E-02	0.100	0.108
Si (as SiO32-)	2.83E-02	637	2.23E+03	2.44E-02	2.63E-02	3.04E-02	3.23E-02
F-	3.51E-02	534	1.87E+03	2.81E-02	3.31E-02	3.68E-02	3.86E-02
Cl-	0.101	2.85E+03	9.99E+03	9.20E-02	9.61E-02	0.106	0.106
C6H5O73-	9.78E-03	1.48E+03	5.18E+03	9.22E-03	9.50E-03	1.01E-02	1.05E-02
EDTA4-	3.28E-03	756	2.65E+03	1.35E-03	2.29E-03	4.28E-03	5.25E-03
HEDTA3-	5.36E-03	1.17E+03	4.11E+03	1.49E-03	3.38E-03	7.35E-03	9.30E-03
glycolate-	2.16E-02	1.30E+03	4.55E+03	1.42E-02	1.78E-02	2.55E-02	2.92E-02
acetate-	3.85E-03	182	637	3.15E-03	3.45E-03	4.29E-03	4.95E-03
oxalate2-	4.41E-06	0.310	1.09	3.93E-06	4.17E-06	4.65E-06	4.89E-06
DBP	7.33E-03	1.23E+03	4.31E+03	6.36E-03	6.83E-03	7.81E-03	8.34E-03
butanol	7.33E-03	434	1.52E+03	6.36E-03	6.83E-03	7.81E-03	8.34E-03
NH3	5.35E-02	727	2.55E+03	2.99E-02	4.13E-02	6.59E-02	7.81E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-101

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AN-101

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	3.50E+06 (kg)	(740 kgal)	----	----	----	----	----
Heat Load	2.11 (kW)	(7.20E+03 BTU/hr)	----	2.01	2.05	2.17	2.19
Bulk Density*	1.25 (g/cc)	----	----	1.23	1.24	1.26	1.26
Water wt%†	64.8	----	----	63.5	64.1	65.6	66.8
TOC wt% C (wet	0.273	----	----	0.210	0.240	0.305	0.336

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	9.46E-05	7.56E-02	265	5.93E-05	5.93E-05	9.90E-05	9.80E-05
C-14	1.30E-05	1.04E-02	36.3	5.59E-06	5.59E-06	1.32E-05	1.32E-05
Ni-59	8.03E-07	6.42E-04	2.25	4.56E-07	4.56E-07	8.21E-07	8.38E-07
Ni-63	7.84E-05	6.27E-02	219	4.40E-05	4.40E-05	8.01E-05	8.18E-05
Co-60	1.46E-05	1.16E-02	40.8	6.12E-06	6.12E-06	1.48E-05	1.49E-05
Se-79	1.31E-06	1.05E-03	3.67	8.39E-07	8.39E-07	1.48E-06	1.64E-06
Sr-90	4.21E-02	33.7	1.18E+05	3.98E-02	4.09E-02	4.33E-02	4.44E-02
Y-90	4.21E-02	33.7	1.18E+05	2.58E-02	2.58E-02	4.33E-02	4.44E-02
Zr-93	6.41E-06	5.13E-03	18.0	4.06E-06	4.06E-06	7.26E-06	8.08E-06
Nb-93m	4.71E-06	3.76E-03	13.2	3.06E-06	3.06E-06	5.30E-06	5.88E-06
Tc-99	9.51E-05	7.60E-02	266	6.76E-05	8.10E-05	1.09E-04	1.23E-04
Ru-106	2.46E-09	1.96E-06	6.88E-03	1.37E-09	1.37E-09	2.70E-09	2.92E-09
Cd-113m	3.26E-05	2.61E-02	91.3	1.85E-05	1.85E-05	3.77E-05	4.26E-05
Sb-125	6.51E-05	5.21E-02	182	2.86E-05	2.86E-05	6.66E-05	6.81E-05
Sn-126	1.98E-06	1.58E-03	5.55	1.28E-06	1.28E-06	2.24E-06	2.48E-06
I-129	1.83E-07	1.47E-04	0.513	1.30E-07	1.56E-07	2.11E-07	2.37E-07
Cs-134	2.40E-06	1.92E-03	6.72	1.13E-06	1.75E-06	3.06E-06	3.72E-06
Cs-137	0.100	80.1	2.80E+05	9.23E-02	9.60E-02	0.105	0.106
Ba-137m	9.47E-02	75.7	2.65E+05	7.43E-02	7.43E-02	9.90E-02	0.100
Sm-151	4.62E-03	3.69	1.29E+04	2.97E-03	2.97E-03	5.21E-03	5.78E-03
Eu-152	1.30E-06	1.04E-03	3.65	7.18E-07	7.18E-07	1.36E-06	1.41E-06
Eu-154	2.25E-04	0.180	629	1.07E-04	1.07E-04	2.67E-04	2.84E-04
Eu-155	7.61E-05	6.09E-02	213	4.14E-05	4.14E-05	7.94E-05	8.26E-05
Ra-226	5.96E-11	4.76E-08	1.67E-04	4.48E-11	4.50E-11	6.71E-11	7.43E-11
Ra-228	6.88E-08	5.50E-05	0.193	2.81E-08	2.81E-08	7.88E-08	8.95E-08
Ac-227	3.63E-10	2.90E-07	1.02E-03	2.78E-10	2.78E-10	4.07E-10	4.34E-10
Pa-231	1.62E-09	1.29E-06	4.54E-03	1.15E-09	1.15E-09	1.79E-09	1.95E-09
Th-229	1.61E-09	1.29E-06	4.50E-03	6.68E-10	6.68E-10	1.83E-09	2.06E-09
Th-232	6.90E-09	5.52E-06	1.93E-02	1.87E-09	1.87E-09	8.28E-09	9.60E-09
U-232	2.44E-07	1.95E-04	0.684	1.76E-07	2.09E-07	2.84E-07	3.27E-07
U-233	9.36E-07	7.49E-04	2.62	6.76E-07	8.03E-07	1.09E-06	1.25E-06
U-234	3.61E-07	2.89E-04	1.01	3.41E-07	3.50E-07	3.72E-07	3.69E-07
U-235	1.47E-08	1.17E-05	4.11E-02	1.38E-08	1.42E-08	1.52E-08	1.50E-08
U-236	1.25E-08	1.00E-05	3.51E-02	1.14E-08	1.23E-08	1.27E-08	1.28E-08
U-238	3.93E-07	3.14E-04	1.10	3.72E-07	3.82E-07	4.04E-07	4.00E-07
Np-237	3.60E-07	2.88E-04	1.01	2.71E-07	3.14E-07	4.07E-07	4.51E-07
Pu-238	5.60E-07	4.48E-04	1.57	4.54E-07	5.06E-07	6.14E-07	6.65E-07
Pu-239	1.77E-05	1.42E-02	49.6	1.50E-05	1.63E-05	1.91E-05	2.04E-05
Pu-240	3.03E-06	2.42E-03	8.48	2.52E-06	2.77E-06	3.28E-06	3.53E-06
Pu-241	4.10E-05	3.28E-02	115	3.38E-05	3.74E-05	4.47E-05	4.83E-05
Pu-242	2.06E-10	1.64E-07	5.76E-04	1.63E-10	1.84E-10	2.28E-10	2.49E-10
Am-241	2.20E-05	1.76E-02	61.5	1.70E-05	1.94E-05	2.45E-05	2.70E-05
Am-243	8.06E-10	6.45E-07	2.26E-03	6.49E-10	7.24E-10	8.90E-10	9.70E-10
Cm-242	4.62E-08	3.69E-05	0.129	2.22E-08	2.22E-08	4.85E-08	5.07E-08
Cm-243	4.32E-09	3.46E-06	1.21E-02	2.04E-09	2.04E-09	4.60E-09	4.88E-09
Cm-244	4.28E-08	3.42E-05	0.120	1.93E-08	1.93E-08	5.08E-08	5.59E-08

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	2.28E-04 (g/L)	----	0.640	1.77E-04	2.02E-04	2.54E-04	2.79E-04
U	4.09E-03	778	2.72E+03	3.83E-03	3.95E-03	4.24E-03	4.18E-03

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-101							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	3.50E+06 (kg)	(740 kgal)	----	----	----	----	----
Heat Load	2.11 (kW)	(7.20E+03 BTU/hr)	----	2.01	2.05	2.17	2.19
Bulk Density†	1.25 (g/cc)	----	----	1.23	1.24	1.26	1.26
Water wt%†	64.8	----	----	63.5	64.1	65.6	66.8
TOC wt% C (wet	0.273	----	----	0.210	0.240	0.305	0.336
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	9.46E-05	7.56E-02	265	5.93E-05	5.93E-05	9.90E-05	9.80E-05
C-14	1.30E-05	1.04E-02	36.3	5.59E-06	5.59E-06	1.32E-05	1.32E-05
Ni-59	8.03E-07	6.42E-04	2.25	4.56E-07	4.56E-07	8.21E-07	8.38E-07
Ni-63	7.84E-05	6.27E-02	219	4.40E-05	4.40E-05	8.01E-05	8.18E-05
Co-60	1.46E-05	1.16E-02	40.8	6.12E-06	6.12E-06	1.48E-05	1.49E-05
Se-79	1.31E-06	1.05E-03	3.67	8.39E-07	8.39E-07	1.48E-06	1.64E-06
Sr-90	4.21E-02	33.7	1.18E+05	3.98E-02	4.09E-02	4.33E-02	4.44E-02
Y-90	4.21E-02	33.7	1.18E+05	2.58E-02	2.58E-02	4.33E-02	4.44E-02
Zr-93	6.41E-06	5.13E-03	18.0	4.06E-06	4.06E-06	7.26E-06	8.08E-06
Nb-93m	4.71E-06	3.76E-03	13.2	3.06E-06	3.06E-06	5.30E-06	5.88E-06
Tc-99	9.51E-05	7.60E-02	266	6.76E-05	8.10E-05	1.09E-04	1.23E-04
Ru-106	2.46E-09	1.96E-06	6.88E-03	1.37E-09	1.37E-09	2.70E-09	2.92E-09
Cd-113m	3.26E-05	2.61E-02	91.3	1.85E-05	1.85E-05	3.77E-05	4.26E-05
Sb-125	6.51E-05	5.21E-02	182	2.86E-05	2.86E-05	6.66E-05	6.81E-05
Sn-126	1.98E-06	1.58E-03	5.55	1.28E-06	1.28E-06	2.24E-06	2.48E-06
I-129	1.83E-07	1.47E-04	0.513	1.30E-07	1.56E-07	2.11E-07	2.37E-07
Cs-134	2.40E-06	1.92E-03	6.72	1.13E-06	1.75E-06	3.06E-06	3.72E-06
Cs-137	0.100	80.1	2.80E+05	9.23E-02	9.60E-02	0.105	0.106
Ba-137m	9.47E-02	75.7	2.65E+05	7.43E-02	7.43E-02	9.90E-02	0.100
Sm-151	4.62E-03	3.69	1.29E+04	2.97E-03	2.97E-03	5.21E-03	5.78E-03
Eu-152	1.30E-06	1.04E-03	3.65	7.18E-07	7.18E-07	1.36E-06	1.41E-06
Eu-154	2.25E-04	0.180	629	1.07E-04	1.07E-04	2.67E-04	2.84E-04
Eu-155	7.61E-05	6.09E-02	213	4.14E-05	4.14E-05	7.94E-05	8.26E-05
Ra-226	5.96E-11	4.76E-08	1.67E-04	4.48E-11	4.50E-11	6.71E-11	7.43E-11
Ra-228	6.88E-08	5.50E-05	0.193	2.81E-08	2.81E-08	7.88E-08	8.95E-08
Ac-227	3.63E-10	2.90E-07	1.02E-03	2.78E-10	2.78E-10	4.07E-10	4.34E-10
Pa-231	1.62E-09	1.29E-06	4.54E-03	1.15E-09	1.15E-09	1.79E-09	1.95E-09
Th-229	1.61E-09	1.29E-06	4.50E-03	6.68E-10	6.68E-10	1.83E-09	2.06E-09
Th-232	6.90E-09	5.52E-06	1.93E-02	1.87E-09	1.87E-09	8.28E-09	9.60E-09
U-232	2.44E-07	1.95E-04	0.684	1.76E-07	2.09E-07	2.84E-07	3.27E-07
U-233	9.36E-07	7.49E-04	2.62	6.76E-07	8.03E-07	1.09E-06	1.25E-06
U-234	3.61E-07	2.89E-04	1.01	3.41E-07	3.50E-07	3.72E-07	3.69E-07
U-235	1.47E-08	1.17E-05	4.11E-02	1.38E-08	1.42E-08	1.52E-08	1.50E-08
U-236	1.25E-08	1.00E-05	3.51E-02	1.14E-08	1.23E-08	1.27E-08	1.28E-08
U-238	3.93E-07	3.14E-04	1.10	3.72E-07	3.82E-07	4.04E-07	4.00E-07
Np-237	3.60E-07	2.88E-04	1.01	2.71E-07	3.14E-07	4.07E-07	4.51E-07
Pu-238	5.60E-07	4.48E-04	1.57	4.54E-07	5.06E-07	6.14E-07	6.65E-07
Pu-239	1.77E-05	1.42E-02	49.6	1.50E-05	1.63E-05	1.91E-05	2.04E-05
Pu-240	3.03E-06	2.42E-03	8.48	2.52E-06	2.77E-06	3.28E-06	3.53E-06
Pu-241	4.10E-05	3.28E-02	115	3.38E-05	3.74E-05	4.47E-05	4.83E-05
Pu-242	2.06E-10	1.64E-07	5.76E-04	1.63E-10	1.84E-10	2.28E-10	2.49E-10
Am-241	2.20E-05	1.76E-02	61.5	1.70E-05	1.94E-05	2.45E-05	2.70E-05
Am-243	8.06E-10	6.45E-07	2.26E-03	6.49E-10	7.24E-10	8.90E-10	9.70E-10
Cm-242	4.62E-08	3.69E-05	0.129	2.22E-08	2.22E-08	4.85E-08	5.07E-08
Cm-243	4.32E-09	3.46E-06	1.21E-02	2.04E-09	2.04E-09	4.60E-09	4.88E-09
Cm-244	4.28E-08	3.42E-05	0.120	1.93E-08	1.93E-08	5.08E-08	5.59E-08
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	2.28E-04 (g/L)	----	0.640	1.77E-04	2.02E-04	2.54E-04	2.79E-04
U	4.09E-03	778	2.72E+03	3.83E-03	3.95E-03	4.24E-03	4.18E-03

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

No photographs available for interior montage.

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TANK 241-AN-102 SUMMARY

TANK HISTORY	
Entered Service	Sept 1981
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
10A, 13A, 15A, 21A	4 in
7A, 12A	12 in
TANK TEMPERATURE	
Average Tank Temperature	95°F
Maximum Temperature	100.94°F
Date	Nov 12 and Dec 1, 1995
Elevation from tank bottom	14.33 ft
Riser Number	4A
Minimum Temperature	87.44°F
Date	Dec 12 - 15, 1995
Elevation from tank bottom	0.33 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	59
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	1,079,000 gal
Waste Type	CC
Drainable Interstitial Liquids	3,000 gal
Pumpable Liquids	990,000 gal
Saltcake	0 gal
Sludge	89,000 gal
Supernatant	990,000 gal
INTERIOR PHOTOGRAPHS	
Date	not available
Montage Number	not available
Photo Set Number	not available
WASTE SURFACE LEVEL	
Devices	Auto/Man FIC, Man Tape
Max Level	402.6 in
Date	July 17, 1992
Min Level	391 in
Date	Jan 10 - 12, 1997

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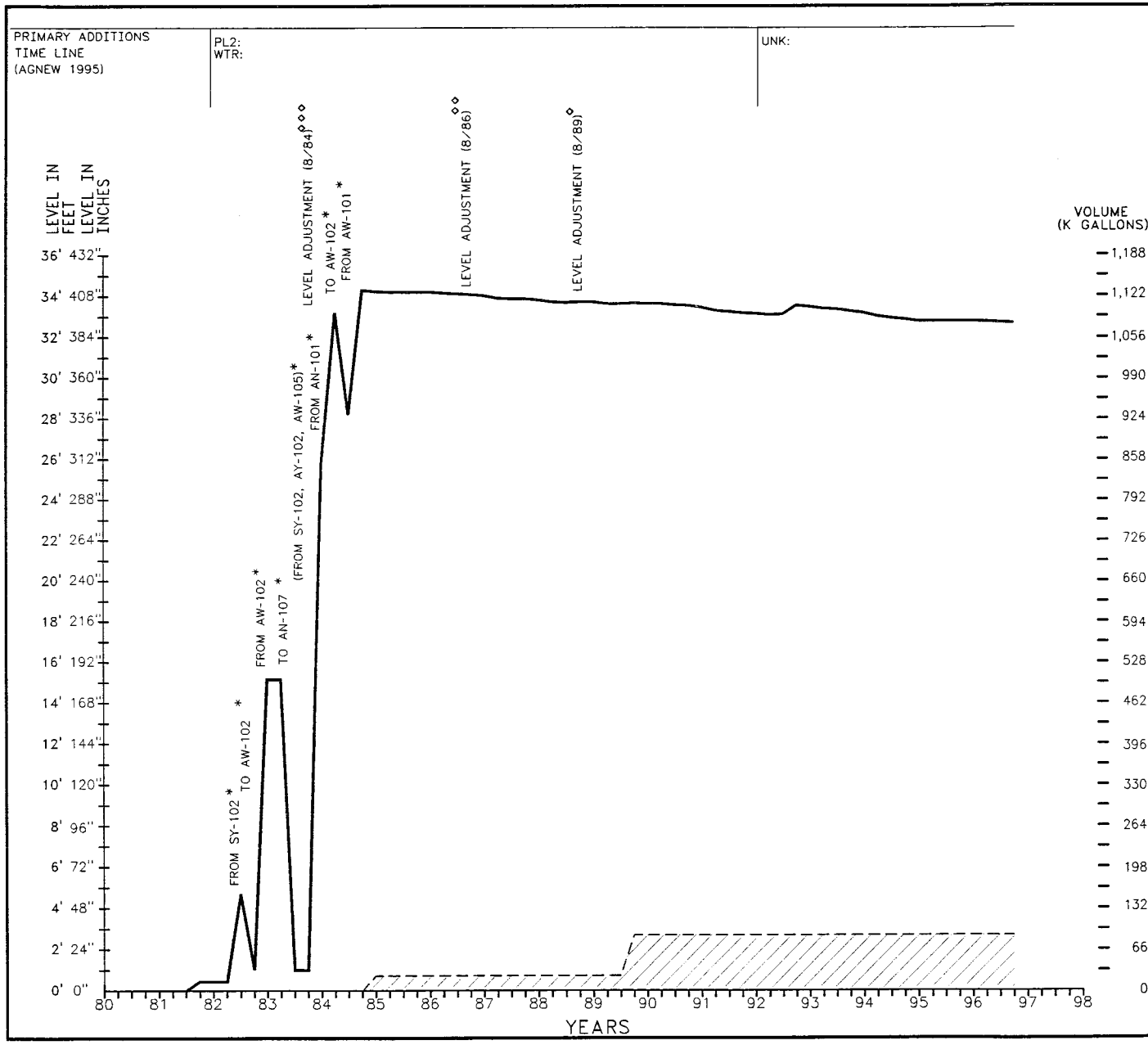


TANK INFO:

CONSTRUCTED 1980-1981
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- ◇ HANLON 1996l
- ◇◇ CARTER 1986f
- ◇◇◇ McCANN AND VAIL 1984i

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

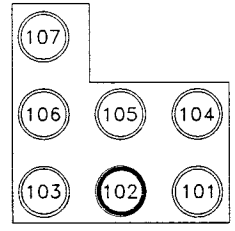
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

PL2: PUREX LOW-LEVEL WASTE 1983-88
UNK: UNKNOWN
WTR: WATER

LEGEND

TOTAL WASTE LEVEL (SUPERNATE)
SOLIDS LEVEL
SOLIDS

AN TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AN-102 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1981-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E151	2/97
SCALE NONE		JOB NO.	SHEET 1 OF 1

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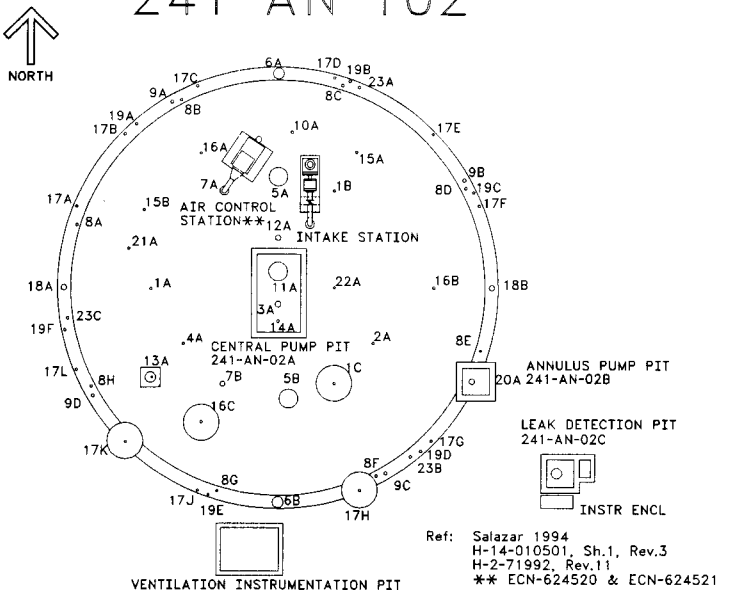
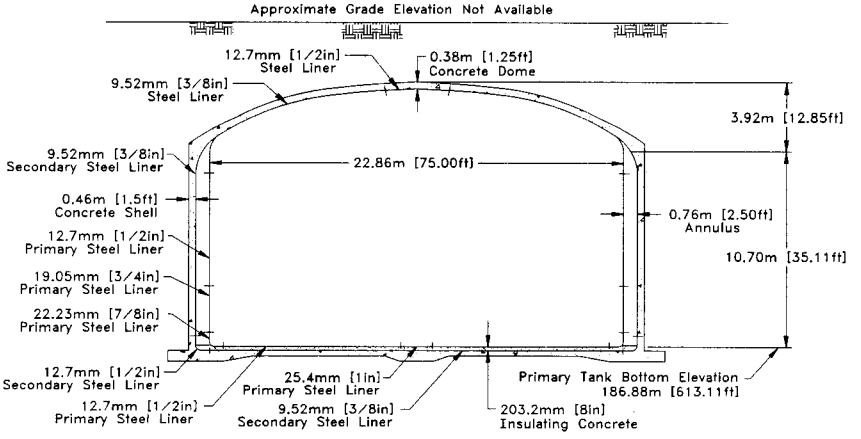
241-AN-102



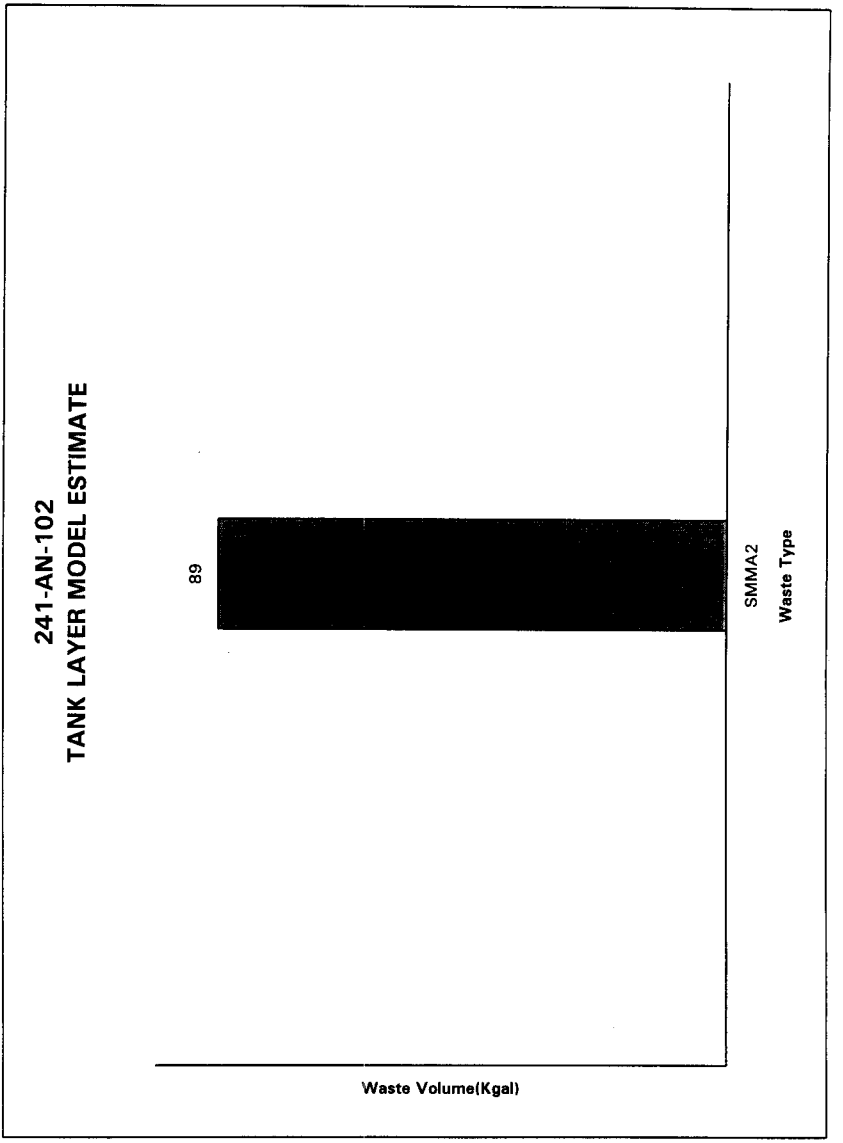
Ref: Salazar 1994
H-14-010501, Sh.1, Rev.3
H-2-71992, Rev.11
** ECN-624520 & ECN-624521

TANK RISER LOCATION



Ref: H-2-71975, Rev.2

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AN-102							
TLM Solids Composite Inventory Estimate*							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AN-102							
SMM Composite Inventory Estimate							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	7.28E+06 (kg)	(1.09E+03 kgal)	----	----	----	----	----
Heat Load	11.0 (kW)	(3.75E+04 BTU/hr)	----	10.1	10.6	11.3	11.9
Bulk Density*	1.76 (g/cc)	----	----	1.70	1.74	1.79	1.81
Water wt%	23.6	----	----	21.1	22.2	25.1	26.8
TOC wt% C (wet	1.45	----	----	0.890	1.17	1.74	2.01
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	17.7	2.31E+05	1.68E+06	16.3	17.0	18.3	18.8
Al3+	2.12	3.24E+04	2.36E+05	1.82	2.05	2.17	2.22
Fe3+ (total Fe)	1.31E-02	416	3.03E+03	1.09E-02	1.20E-02	1.43E-02	1.54E-02
Cr3+	0.157	4.63E+03	3.37E+04	0.140	0.149	0.163	0.172
Bi3+	1.49E-03	177	1.29E+03	1.41E-03	1.45E-03	1.53E-03	1.59E-03
La3+	2.50E-05	1.97	14.3	1.84E-05	2.16E-05	2.83E-05	3.16E-05
Hg2+	1.17E-05	1.33	9.67	1.12E-05	1.15E-05	1.19E-05	1.21E-05
Zr (as ZrO(OH)2)	2.03E-04	10.5	76.6	1.89E-04	1.94E-04	2.09E-04	2.18E-04
Pb2+	1.56E-03	183	1.33E+03	1.23E-03	1.39E-03	1.73E-03	1.89E-03
Ni2+	7.27E-03	242	1.76E+03	7.03E-03	7.14E-03	7.35E-03	7.43E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	7.17E-03	223	1.63E+03	6.08E-03	6.61E-03	7.73E-03	8.26E-03
Ca2+	3.89E-02	884	6.43E+03	3.56E-02	3.72E-02	4.06E-02	4.22E-02
K+	8.56E-02	1.90E+03	1.38E+04	7.56E-02	7.98E-02	9.24E-02	0.102
OH-	12.3	1.18E+05	8.60E+05	10.8	11.9	12.6	13.0
NO3-	5.65	1.98E+05	1.44E+06	5.36	5.53	5.77	5.89
NO2-	3.16	8.25E+04	6.00E+05	2.63	2.86	3.50	3.64
CO32-	0.701	2.38E+04	1.74E+05	0.635	0.668	0.734	0.757
PO43-	0.125	6.74E+03	4.91E+04	0.112	0.118	0.131	0.139
SO42-	0.367	2.00E+04	1.45E+05	0.305	0.331	0.409	0.428
Si (as SiO32-)	0.101	1.61E+03	1.17E+04	8.57E-02	9.34E-02	0.109	0.117
F-	8.03E-02	864	6.29E+03	6.95E-02	7.40E-02	8.72E-02	9.76E-02
Cl-	0.306	6.14E+03	4.47E+04	0.270	0.286	0.318	0.328
C6H5O73-	4.78E-02	5.12E+03	3.72E+04	4.40E-02	4.58E-02	4.97E-02	5.27E-02
EDTA4-	3.69E-02	6.03E+03	4.39E+04	1.22E-02	2.43E-02	4.97E-02	6.21E-02
HEDTA3-	6.61E-02	1.03E+04	7.47E+04	1.66E-02	4.07E-02	9.15E-02	0.116
glycolate-	0.171	7.28E+03	5.30E+04	0.122	0.146	0.197	0.222
acetate-	2.48E-02	831	6.05E+03	1.97E-02	2.19E-02	2.80E-02	3.28E-02
oxalate2-	3.27E-05	1.63	11.9	2.91E-05	3.09E-05	3.45E-05	3.63E-05
DBP	3.55E-02	4.23E+03	3.08E+04	3.07E-02	3.28E-02	3.84E-02	4.28E-02
butanol	3.55E-02	1.49E+03	1.08E+04	3.07E-02	3.28E-02	3.84E-02	4.28E-02
NH3	8.36E-02	805	5.86E+03	6.60E-02	7.29E-02	9.71E-02	0.113
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-102							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	7.28E+06 (kg)	(1.09E+03 kgal)	----	----	----	----	----
Heat Load	11.0 (kW)	(3.75E+04 BTU/hr)	----	10.1	10.6	11.3	11.9
Bulk Density†	1.76 (g/cc)	----	----	1.70	1.74	1.79	1.81
Water wt%†	23.6	----	----	21.1	22.2	25.1	26.8
TOC wt% C (wet	1.45	----	----	0.890	1.17	1.74	2.01
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	17.7	2.31E+05	1.68E+06	16.3	17.0	18.3	18.8
Al3+	2.12	3.24E+04	2.36E+05	1.82	2.05	2.17	2.22
Fe3+ (total Fe)	1.31E-02	416	3.03E+03	1.09E-02	1.20E-02	1.43E-02	1.54E-02
Cr3+	0.157	4.63E+03	3.37E+04	0.140	0.149	0.163	0.172
Bi3+	1.49E-03	177	1.29E+03	1.41E-03	1.45E-03	1.53E-03	1.59E-03
La3+	2.50E-05	1.97	14.3	1.84E-05	2.16E-05	2.83E-05	3.16E-05
Hg2+	1.17E-05	1.33	9.67	1.12E-05	1.15E-05	1.19E-05	1.21E-05
Zr (as ZrO(OH)2)	2.03E-04	10.5	76.6	1.89E-04	1.94E-04	2.09E-04	2.18E-04
Pb2+	1.56E-03	183	1.33E+03	1.23E-03	1.39E-03	1.73E-03	1.89E-03
Ni2+	7.27E-03	242	1.76E+03	7.03E-03	7.14E-03	7.35E-03	7.43E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	7.17E-03	223	1.63E+03	6.08E-03	6.61E-03	7.73E-03	8.26E-03
Ca2+	3.89E-02	884	6.43E+03	3.56E-02	3.72E-02	4.06E-02	4.22E-02
K+	8.56E-02	1.90E+03	1.38E+04	7.56E-02	7.98E-02	9.24E-02	0.102
OH-	12.3	1.18E+05	8.60E+05	10.8	11.9	12.6	13.0
NO3-	5.65	1.98E+05	1.44E+06	5.36	5.53	5.77	5.89
NO2-	3.16	8.25E+04	6.00E+05	2.63	2.86	3.50	3.64
CO32-	0.701	2.38E+04	1.74E+05	0.635	0.668	0.734	0.757
PO43-	0.125	6.74E+03	4.91E+04	0.112	0.118	0.131	0.139
SO42-	0.367	2.00E+04	1.45E+05	0.305	0.331	0.409	0.428
Si (as SiO32-)	0.101	1.61E+03	1.17E+04	8.57E-02	9.34E-02	0.109	0.117
F-	8.03E-02	864	6.29E+03	6.95E-02	7.40E-02	8.72E-02	9.76E-02
Cl-	0.306	6.14E+03	4.47E+04	0.270	0.286	0.318	0.328
C6H5O73-	4.78E-02	5.12E+03	3.72E+04	4.40E-02	4.58E-02	4.97E-02	5.27E-02
EDTA4-	3.69E-02	6.03E+03	4.39E+04	1.22E-02	2.43E-02	4.97E-02	6.21E-02
HEDTA3-	6.61E-02	1.03E+04	7.47E+04	1.66E-02	4.07E-02	9.15E-02	0.116
glycolate-	0.171	7.28E+03	5.30E+04	0.122	0.146	0.197	0.222
acetate-	2.48E-02	831	6.05E+03	1.97E-02	2.19E-02	2.80E-02	3.28E-02
oxalate2-	3.27E-05	1.63	11.9	2.91E-05	3.09E-05	3.45E-05	3.63E-05
DBP	3.55E-02	4.23E+03	3.08E+04	3.07E-02	3.28E-02	3.84E-02	4.28E-02
butanol	3.55E-02	1.49E+03	1.08E+04	3.07E-02	3.28E-02	3.84E-02	4.28E-02
NH3	8.36E-02	805	5.86E+03	6.60E-02	7.29E-02	9.71E-02	0.113
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-102

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AN-102

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	7.28E+06 (kg)	(1.09E+03 kgal)	----	----	----	----	----
Heat Load	11.0 (kW)	(3.75E+04 BTU/hr)	----	10.1	10.6	11.3	11.9
Bulk Density*	1.76 (g/cc)	----	----	1.70	1.74	1.79	1.81
Water wt%†	23.6	----	----	21.1	22.2	25.1	26.8
TOC wt% C (wet	1.45	----	----	0.890	1.17	1.74	2.01

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	3.33E-04	0.189	1.37E+03	1.94E-04	1.94E-04	3.53E-04	3.77E-04
C-14	5.33E-05	3.02E-02	220	2.42E-05	2.42E-05	5.41E-05	5.48E-05
Ni-59	2.79E-06	1.58E-03	11.5	1.43E-06	1.43E-06	2.86E-06	2.93E-06
Ni-63	2.75E-04	0.156	1.14E+03	1.40E-04	1.40E-04	2.82E-04	2.89E-04
Co-60	6.64E-05	3.76E-02	274	3.31E-05	3.31E-05	6.77E-05	6.92E-05
Se-79	5.06E-06	2.87E-03	20.9	3.21E-06	3.21E-06	5.73E-06	6.38E-06
Sr-90	0.159	90.1	6.56E+05	0.149	0.154	0.164	0.168
Y-90	0.159	90.1	6.56E+05	9.49E-02	9.49E-02	0.164	0.168
Zr-93	2.49E-05	1.41E-02	103	1.56E-05	1.56E-05	2.83E-05	3.15E-05
Nb-93m	1.79E-05	1.01E-02	73.8	1.14E-05	1.14E-05	2.02E-05	2.25E-05
Tc-99	3.98E-04	0.226	1.64E+03	2.90E-04	3.43E-04	4.54E-04	5.08E-04
Ru-106	1.18E-08	6.67E-06	4.85E-02	7.46E-09	7.46E-09	1.27E-08	1.36E-08
Cd-113m	1.37E-04	7.76E-02	565	8.12E-05	8.12E-05	1.57E-04	1.76E-04
Sb-125	3.06E-04	0.174	1.26E+03	1.62E-04	1.62E-04	3.14E-04	3.22E-04
Sn-126	7.64E-06	4.33E-03	31.5	4.86E-06	4.86E-06	8.65E-06	9.62E-06
I-129	7.69E-07	4.36E-04	3.17	5.59E-07	6.62E-07	8.77E-07	9.81E-07
Cs-134	1.50E-05	8.50E-03	61.9	1.19E-05	1.34E-05	1.66E-05	1.81E-05
Cs-137	0.340	193	1.40E+06	0.304	0.319	0.358	0.386
Ba-137m	0.321	182	1.33E+06	0.269	0.269	0.338	0.354
Sm-151	1.78E-02	10.1	7.34E+04	1.13E-02	1.13E-02	2.02E-02	2.24E-02
Eu-152	6.62E-06	3.75E-03	27.3	4.32E-06	4.32E-06	7.31E-06	7.98E-06
Eu-154	1.02E-03	0.580	4.22E+03	5.59E-04	5.59E-04	1.19E-03	1.26E-03
Eu-155	3.98E-04	0.226	1.64E+03	2.62E-04	2.62E-04	4.40E-04	4.82E-04
Ra-226	1.93E-10	1.09E-07	7.95E-04	1.35E-10	1.35E-10	2.14E-10	2.34E-10
Ra-228	4.17E-07	2.36E-04	1.72	1.21E-07	1.21E-07	4.60E-07	5.06E-07
Ac-227	1.19E-09	6.73E-07	4.90E-03	8.54E-10	8.54E-10	1.31E-09	1.43E-09
Pa-231	5.70E-09	3.23E-06	2.35E-02	3.84E-09	3.84E-09	6.37E-09	7.02E-09
Th-229	9.68E-09	5.48E-06	3.99E-02	2.86E-09	2.86E-09	1.06E-08	1.16E-08
Th-232	4.45E-08	2.52E-05	0.183	7.97E-09	7.97E-09	5.44E-08	6.40E-08
U-232	1.29E-06	7.33E-04	5.33	1.00E-06	1.13E-06	1.48E-06	1.68E-06
U-233	4.96E-06	2.81E-03	20.4	3.84E-06	4.32E-06	5.68E-06	6.45E-06
U-234	1.02E-06	5.79E-04	4.22	9.90E-07	1.01E-06	1.04E-06	1.05E-06
U-235	4.06E-08	2.30E-05	0.168	3.94E-08	4.00E-08	4.13E-08	4.19E-08
U-236	3.63E-08	2.06E-05	0.150	3.37E-08	3.57E-08	3.68E-08	3.73E-08
U-238	1.30E-06	7.36E-04	5.36	1.27E-06	1.28E-06	1.31E-06	1.34E-06
Np-237	1.39E-06	7.86E-04	5.72	1.03E-06	1.21E-06	1.57E-06	1.75E-06
Pu-238	2.28E-06	1.29E-03	9.39	1.86E-06	2.06E-06	2.49E-06	2.69E-06
Pu-239	7.02E-05	3.98E-02	290	5.95E-05	6.48E-05	7.56E-05	8.08E-05
Pu-240	1.24E-05	7.01E-03	51.1	1.04E-05	1.14E-05	1.34E-05	1.44E-05
Pu-241	1.63E-04	9.23E-02	672	1.35E-04	1.48E-04	1.77E-04	1.91E-04
Pu-242	8.71E-10	4.94E-07	3.59E-03	7.02E-10	7.85E-10	9.57E-10	1.04E-09
Am-241	8.49E-05	4.81E-02	350	6.52E-05	7.48E-05	9.50E-05	1.05E-04
Am-243	3.34E-09	1.89E-06	1.38E-02	2.58E-09	2.93E-09	3.81E-09	4.22E-09
Cm-242	2.36E-07	1.34E-04	0.975	1.42E-07	1.42E-07	2.62E-07	2.88E-07
Cm-243	2.25E-08	1.27E-05	9.28E-02	1.35E-08	1.35E-08	2.48E-08	2.71E-08
Cm-244	1.95E-07	1.10E-04	0.804	1.02E-07	1.02E-07	2.26E-07	2.46E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	7.98E-04 (g/L)	----	3.29	5.96E-04	6.95E-04	9.00E-04	9.98E-04
U	1.14E-02	1.53E+03	1.12E+04	1.10E-02	1.12E-02	1.15E-02	1.17E-02

*Density is calculated based on Na, OH-, and AlO2-

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-102

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	7.28E+06 (kg)	(1.09E+03 kgal)	----	----	----	----	----
Heat Load	11.0 (kW)	(3.75E+04 BTU/hr)	----	10.1	10.6	11.3	11.9
Bulk Density†	1.76 (g/cc)	----	----	1.70	1.74	1.79	1.81
Water wt%†	23.6	----	----	21.1	22.2	25.1	26.8
TOC wt% C (wet	1.45	----	----	0.890	1.17	1.74	2.01

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	3.33E-04	0.189	1.37E+03	1.94E-04	1.94E-04	3.53E-04	3.77E-04
C-14	5.33E-05	3.02E-02	220	2.42E-05	2.42E-05	5.41E-05	5.48E-05
Ni-59	2.79E-06	1.58E-03	11.5	1.43E-06	1.43E-06	2.86E-06	2.93E-06
Ni-63	2.75E-04	0.156	1.14E+03	1.40E-04	1.40E-04	2.82E-04	2.89E-04
Co-60	6.64E-05	3.76E-02	274	3.31E-05	3.31E-05	6.77E-05	6.92E-05
Se-79	5.06E-06	2.87E-03	20.9	3.21E-06	3.21E-06	5.73E-06	6.38E-06
Sr-90	0.159	90.1	6.56E+05	0.149	0.154	0.164	0.168
Y-90	0.159	90.1	6.56E+05	9.49E-02	9.49E-02	0.164	0.168
Zr-93	2.49E-05	1.41E-02	103	1.56E-05	1.56E-05	2.83E-05	3.15E-05
Nb-93m	1.79E-05	1.01E-02	73.8	1.14E-05	1.14E-05	2.02E-05	2.25E-05
Tc-99	3.98E-04	0.226	1.64E+03	2.90E-04	3.43E-04	4.54E-04	5.08E-04
Ru-106	1.18E-08	6.67E-06	4.85E-02	7.46E-09	7.46E-09	1.27E-08	1.36E-08
Cd-113m	1.37E-04	7.76E-02	565	8.12E-05	8.12E-05	1.57E-04	1.76E-04
Sb-125	3.06E-04	0.174	1.26E+03	1.62E-04	1.62E-04	3.14E-04	3.22E-04
Sn-126	7.64E-06	4.33E-03	31.5	4.86E-06	4.86E-06	8.65E-06	9.62E-06
I-129	7.69E-07	4.36E-04	3.17	5.59E-07	6.62E-07	8.77E-07	9.81E-07
Cs-134	1.50E-05	8.50E-03	61.9	1.19E-05	1.34E-05	1.66E-05	1.81E-05
Cs-137	0.340	193	1.40E+06	0.304	0.319	0.358	0.386
Ba-137m	0.321	182	1.33E+06	0.269	0.269	0.338	0.354
Sm-151	1.78E-02	10.1	7.34E+04	1.13E-02	1.13E-02	2.02E-02	2.24E-02
Eu-152	6.62E-06	3.75E-03	27.3	4.32E-06	4.32E-06	7.31E-06	7.98E-06
Eu-154	1.02E-03	0.580	4.22E+03	5.59E-04	5.59E-04	1.19E-03	1.26E-03
Eu-155	3.98E-04	0.226	1.64E+03	2.62E-04	2.62E-04	4.40E-04	4.82E-04
Ra-226	1.93E-10	1.09E-07	7.95E-04	1.35E-10	1.35E-10	2.14E-10	2.34E-10
Ra-228	4.17E-07	2.36E-04	1.72	1.21E-07	1.21E-07	4.60E-07	5.06E-07
Ac-227	1.19E-09	6.73E-07	4.90E-03	8.54E-10	8.54E-10	1.31E-09	1.43E-09
Pa-231	5.70E-09	3.23E-06	2.35E-02	3.84E-09	3.84E-09	6.37E-09	7.02E-09
Th-229	9.68E-09	5.48E-06	3.99E-02	2.86E-09	2.86E-09	1.06E-08	1.16E-08
Th-232	4.45E-08	2.52E-05	0.183	7.97E-09	7.97E-09	5.44E-08	6.40E-08
U-232	1.29E-06	7.33E-04	5.33	1.00E-06	1.13E-06	1.48E-06	1.68E-06
U-233	4.96E-06	2.81E-03	20.4	3.84E-06	4.32E-06	5.68E-06	6.45E-06
U-234	1.02E-06	5.79E-04	4.22	9.90E-07	1.01E-06	1.04E-06	1.05E-06
U-235	4.06E-08	2.30E-05	0.168	3.94E-08	4.00E-08	4.13E-08	4.19E-08
U-236	3.63E-08	2.06E-05	0.150	3.37E-08	3.57E-08	3.68E-08	3.73E-08
U-238	1.30E-06	7.36E-04	5.36	1.27E-06	1.28E-06	1.31E-06	1.34E-06
Np-237	1.39E-06	7.86E-04	5.72	1.03E-06	1.21E-06	1.57E-06	1.75E-06
Pu-238	2.28E-06	1.29E-03	9.39	1.86E-06	2.06E-06	2.49E-06	2.69E-06
Pu-239	7.02E-05	3.98E-02	290	5.95E-05	6.48E-05	7.56E-05	8.08E-05
Pu-240	1.24E-05	7.01E-03	51.1	1.04E-05	1.14E-05	1.34E-05	1.44E-05
Pu-241	1.63E-04	9.23E-02	672	1.35E-04	1.48E-04	1.77E-04	1.91E-04
Pu-242	8.71E-10	4.94E-07	3.59E-03	7.02E-10	7.85E-10	9.57E-10	1.04E-09
Am-241	8.49E-05	4.81E-02	350	6.52E-05	7.48E-05	9.50E-05	1.05E-04
Am-243	3.34E-09	1.89E-06	1.38E-02	2.58E-09	2.93E-09	3.81E-09	4.22E-09
Cm-242	2.36E-07	1.34E-04	0.975	1.42E-07	1.42E-07	2.62E-07	2.88E-07
Cm-243	2.25E-08	1.27E-05	9.28E-02	1.35E-08	1.35E-08	2.48E-08	2.71E-08
Cm-244	1.95E-07	1.10E-04	0.804	1.02E-07	1.02E-07	2.26E-07	2.46E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	7.98E-04 (g/L)	----	3.29	5.96E-04	6.95E-04	9.00E-04	9.98E-04
U	1.14E-02	1.53E+03	1.12E+04	1.10E-02	1.12E-02	1.15E-02	1.17E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

No photographs available for interior montage.

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TANK 241-AN-103 SUMMARY

TANK HISTORY	
Entered Service	Sept 1981
Removed from Service	-
Inactive	Jan 1991
Watch Lists	Hydrogen
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
10A, 15A, 21A	4 in
7B, 12A	12 in
TANK TEMPERATURE	
Average Tank Temperature	106°F
Maximum Temperature	118.4°F
Date	Oct 20, 1994
Elevation from tank bottom	14.33 ft
Riser Number	4A
Minimum Temperature	84.38°F
Date	Feb 3 and 28, 1996
Elevation from tank bottom	34.33 ft, 38.33 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	59
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	957,000 gal
Waste Type	DSS
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	20 gal
Saltcake	0 gal
Sludge	0 gal
Supernatant	20 gal
INTERIOR PHOTOGRAPHS	
Date	Oct 29, 1987
Montage Number	94080233-53CN
Photo Set Number	8706607
SURFACE LEVELS	
Devices	Manual ENRAF & Tape
Max Level	348.9 in
Date	Oct 25, 1996
Min Level	344.5 in
Date	July 12, 1991, Aug 26, 1991

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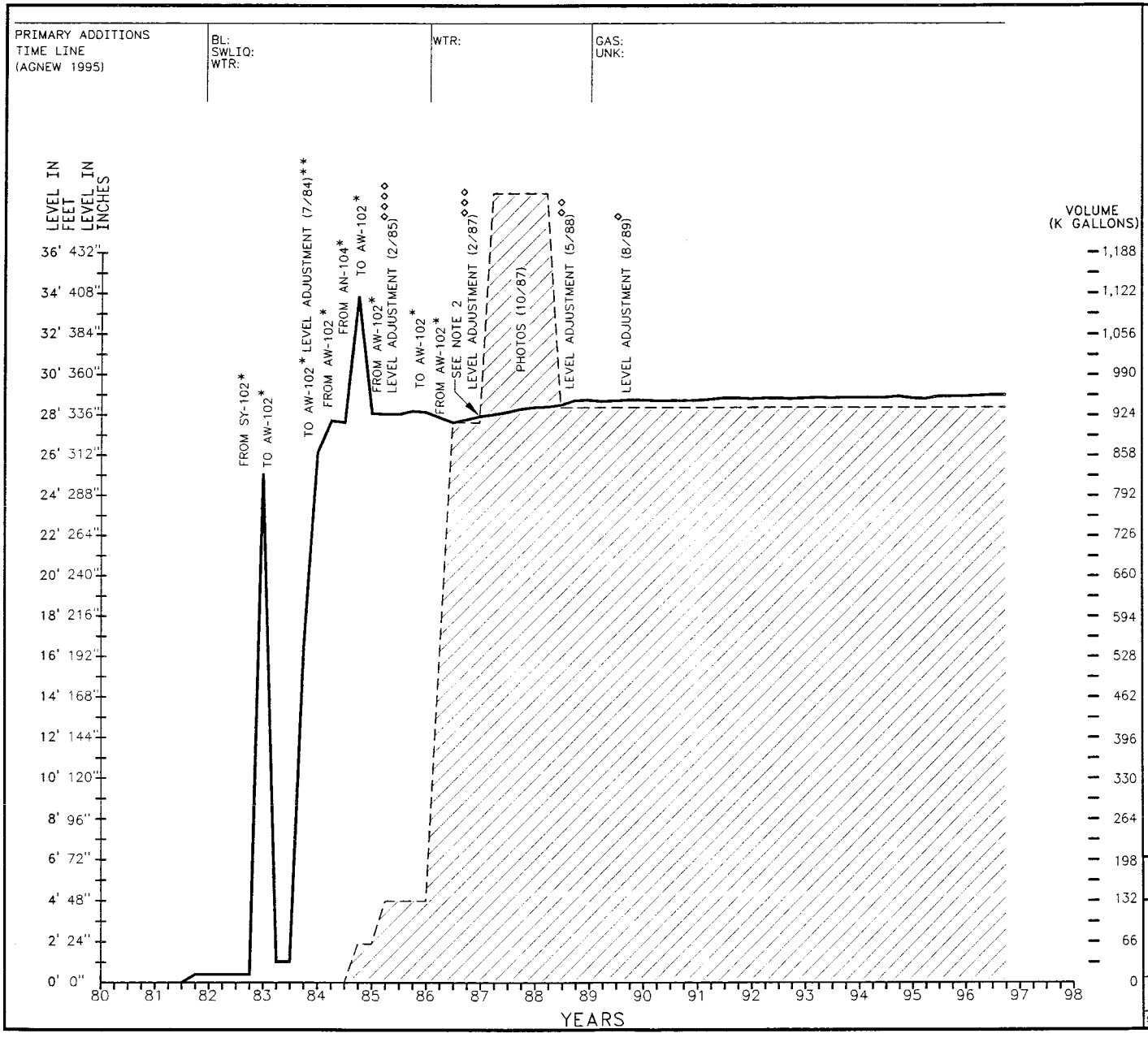


TANK INFO:

CONSTRUCTED 1980-1981
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- ** McCANN 1984h
- ◇ HANLON 1996l
- ◇◇ THURMAN 1988f
- ◇◇◇ McCANN 1987a
- ◇◇◇◇ McCANN AND VAIL 1985c

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.
2) DATA IS QUESTIONABLE BECAUSE MONTHLY WASTE STATUS REPORTS INDICATE SOLIDS WASTE IS GREATER THAN TOTAL WASTE.

GLOSSARY OF WASTE TERMS:

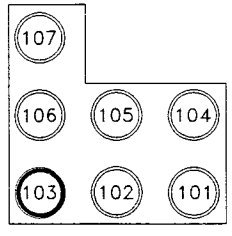
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

BL:	B-PLANT LOW-LEVEL WASTE
GAS:	SLURRY GROWTH
SWLIQ:	DILUTE, NON-COMPLEXED WASTE
UNK:	UNKNOWN
WTR:	WATER

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

AN TANK FARM
PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AN-103 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1981-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E152	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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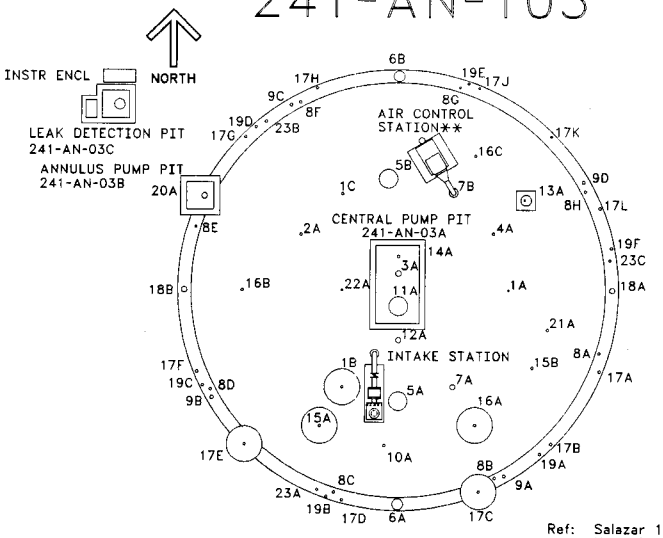
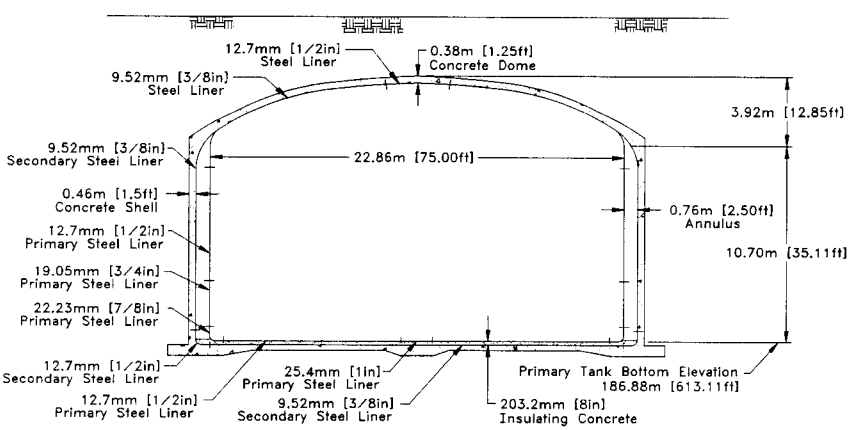
241-AN-103



Ref: Salazar 1994
H-14-010501, Sh.1, Rev.3
H-2-71993, Rev.8
** ECN-624520 & ECN-624521

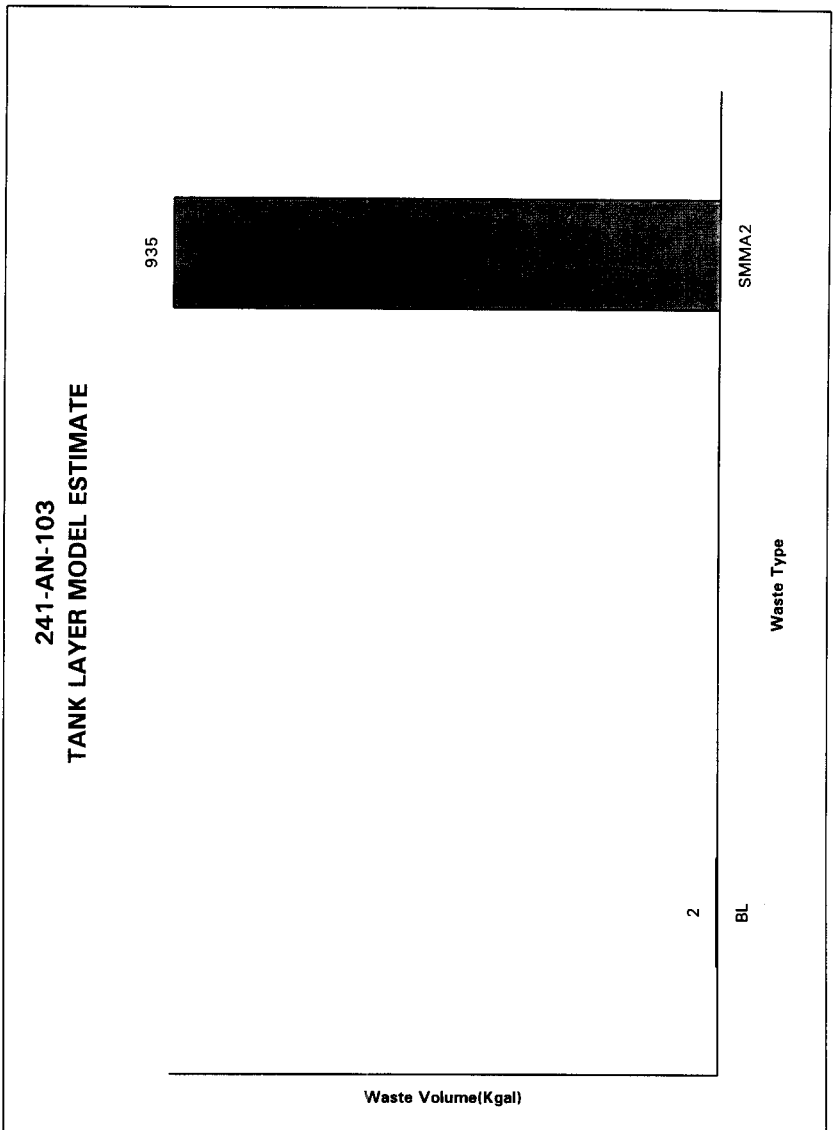
TANK RISER LOCATION

Approximate Grade Elevation Not Available



Ref: H-2-71975, Rev.2

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AN-103

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	1.22E+04 (kg)	(2.00 kgal)	----	----	----	----	----
Heat Load	0.379 (kW)	(1.29E+03 BTU/hr)	----	7.14E-02	0.280	0.434	0.469
Bulk Density	1.62 (g/cc)	----	----	1.35	1.44	1.74	1.78
Void Fraction	0.668	----	----	0.542	0.575	0.796	0.830
Water wt%	45.1	----	----	41.2	41.5	51.5	57.0
TOC wt% C (wet	0.244	----	----	0.164	0.210	0.281	0.353

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	7.00	9.96E+04	1.22E+03	1.29	2.82	9.42	11.5
Al3+	3.06	5.10E+04	624	2.98	3.03	3.07	3.16
Fe3+ (total Fe)	2.21	7.63E+04	933	1.85	2.09	2.27	2.34
Cr3+	1.34E-07	4.31E-03	5.27E-05	7.53E-08	1.15E-07	1.48E-07	2.12E-07
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	1.21	4.39E+04	536	0.888	1.11	1.27	1.30
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0.203	5.04E+03	61.7	3.89E-03	5.93E-03	0.492	0.716
K+	9.02E-03	218	2.67	5.07E-03	7.74E-03	9.94E-03	1.43E-02
OH-	19.2	2.02E+05	2.47E+03	16.8	18.5	19.7	20.6
NO3-	8.76E-06	0.336	4.11E-03	9.98E-07	1.91E-06	1.34E-04	3.89E-02
NO2-	0.592	1.69E+04	206	0.294	0.508	0.653	0.936
CO32-	0.377	1.40E+04	171	-0.137	0.155	0.684	0.874
PO43-	6.70E-03	394	4.81	3.76E-03	5.74E-03	7.38E-03	1.06E-02
SO42-	2.95E-02	1.75E+03	21.4	1.66E-02	2.53E-02	3.25E-02	4.66E-02
Si (as SiO32-)	2.38	4.14E+04	506	1.88E-02	0.451	3.64	4.84
F-	0	0	0	0	0	0	0
Cl-	4.15E-02	910	11.1	2.33E-02	3.56E-02	4.57E-02	6.56E-02
C6H5O73-	1.00E-02	1.18E+03	14.4	5.65E-03	8.62E-03	1.11E-02	1.59E-02
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0.134	6.22E+03	76.0	7.53E-02	0.115	0.148	0.212
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	9.23E-02	970	11.9	1.33E-02	7.21E-02	0.111	0.179
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AN-103

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	5.78E+06 (kg)	(951 kgal)	----	----	----	----	----
Heat Load	6.31 (kW)	(2.15E+04 BTU/hr)	----	5.92	6.11	6.48	6.75
Bulk Density*	1.60 (g/cc)	----	----	1.55	1.58	1.63	1.66
Water wt%	32.6	----	----	29.0	30.6	34.2	36.1
TOC wt% C (wet	1.04	----	----	0.741	0.886	1.19	1.34

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	14.3	2.04E+05	1.18E+06	12.8	13.5	15.0	15.7
Al3+	1.56	2.63E+04	1.52E+05	1.39	1.51	1.62	1.68
Fe3+ (total Fe)	1.25E-02	435	2.51E+03	1.14E-02	1.20E-02	1.30E-02	1.35E-02
Cr3+	0.111	3.60E+03	2.08E+04	9.72E-02	0.105	0.115	0.120
Bi3+	1.16E-03	151	874	1.10E-03	1.13E-03	1.20E-03	1.23E-03
La3+	1.24E-05	1.07	6.19	9.15E-06	1.07E-05	1.40E-05	1.56E-05
Hg2+	1.39E-05	1.73	10.0	1.03E-05	1.36E-05	1.41E-05	1.44E-05
Zr (as ZrO(OH)2)	1.72E-03	98.0	566	8.92E-04	1.62E-03	1.83E-03	1.93E-03
Pb2+	1.16E-03	149	862	9.70E-04	1.06E-03	1.25E-03	1.34E-03
Ni2+	8.11E-03	297	1.71E+03	7.87E-03	7.99E-03	8.20E-03	8.29E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	9.26E-03	317	1.83E+03	5.76E-03	7.47E-03	1.11E-02	1.23E-02
Ca2+	4.68E-02	1.17E+03	6.75E+03	4.22E-02	4.50E-02	4.86E-02	5.03E-02
K+	0.185	4.51E+03	2.60E+04	6.91E-02	0.125	0.246	0.306
OH-	9.38	9.94E+04	5.74E+05	8.40	8.88	9.89	10.4
NO3-	4.98	1.93E+05	1.11E+06	4.63	4.80	5.16	5.34
NO2-	1.99	5.71E+04	3.30E+05	1.69	1.82	2.18	2.23
CO32-	0.675	2.52E+04	1.46E+05	0.561	0.617	0.732	0.772
PO43-	0.163	9.64E+03	5.57E+04	0.122	0.142	0.184	0.204
SO42-	0.246	1.47E+04	8.50E+04	0.211	0.225	0.270	0.274
Si (as SiO32-)	7.74E-02	1.35E+03	7.83E+03	6.43E-02	7.07E-02	8.40E-02	8.99E-02
F-	0.185	2.19E+03	1.27E+04	6.51E-02	0.165	0.205	0.225
Cl-	0.242	5.35E+03	3.09E+04	0.216	0.229	0.256	0.269
C6H5O73-	3.22E-02	3.80E+03	2.19E+04	2.58E-02	2.90E-02	3.55E-02	3.87E-02
EDTA4-	1.83E-02	3.28E+03	1.90E+04	6.43E-03	1.22E-02	2.44E-02	3.03E-02
HEDTA3-	3.16E-02	5.40E+03	3.12E+04	7.94E-03	1.95E-02	4.38E-02	5.57E-02
glycolate-	0.196	9.15E+03	5.28E+04	0.110	0.152	0.240	0.281
acetate-	1.57E-02	579	3.34E+03	1.28E-02	1.41E-02	1.75E-02	2.02E-02
oxalate2-	1.62E-05	0.890	5.14	1.45E-05	1.53E-05	1.71E-05	1.80E-05
DBP	2.27E-02	2.97E+03	1.71E+04	2.00E-02	2.11E-02	2.43E-02	2.68E-02
butanol	2.27E-02	1.05E+03	6.04E+03	2.00E-02	2.11E-02	2.43E-02	2.68E-02
NH3	0.463	4.90E+03	2.83E+04	5.89E-02	0.255	0.676	0.884
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-103							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	5.79E+06 (kg)	(953 kgal)	----	----	----	----	----
Heat Load	6.69 (kW)	(2.28E+04 BTU/hr)	----	6.30	6.49	6.86	7.13
Bulk Density†	1.60 (g/cc)	----	----	1.55	1.58	1.63	1.66
Water wt%†	32.6	----	----	29.0	30.6	34.3	36.1
TOC wt% C (wet	1.04	----	----	0.740	0.885	1.19	1.33
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	14.2	2.04E+05	1.18E+06	12.8	13.5	15.0	15.6
Al3+	1.57	2.63E+04	1.52E+05	1.39	1.51	1.62	1.68
Fe3+ (total Fe)	1.71E-02	595	3.44E+03	1.61E-02	1.66E-02	1.76E-02	1.81E-02
Cr3+	0.111	3.59E+03	2.08E+04	9.70E-02	0.104	0.114	0.119
Bi3+	1.16E-03	151	874	1.09E-03	1.13E-03	1.19E-03	1.23E-03
La3+	1.24E-05	1.07	6.19	9.13E-06	1.07E-05	1.40E-05	1.56E-05
Hg2+	1.38E-05	1.73	10.0	1.03E-05	1.36E-05	1.41E-05	1.44E-05
Zr (as ZrO(OH)2)	1.72E-03	97.8	566	8.91E-04	1.62E-03	1.83E-03	1.93E-03
Pb2+	1.15E-03	149	862	9.68E-04	1.06E-03	1.25E-03	1.34E-03
Ni2+	1.06E-02	389	2.25E+03	9.96E-03	1.04E-02	1.07E-02	1.08E-02
Sr2+	0	0	0	0	0	0	0
Mn4+	9.24E-03	316	1.83E+03	5.75E-03	7.46E-03	1.10E-02	1.22E-02
Ca2+	4.71E-02	1.18E+03	6.81E+03	4.25E-02	4.53E-02	4.89E-02	5.06E-02
K+	0.185	4.50E+03	2.61E+04	6.90E-02	0.125	0.246	0.305
OH-	9.40	9.96E+04	5.77E+05	8.41	8.90	9.91	10.4
NO3-	4.97	1.92E+05	1.11E+06	4.62	4.79	5.15	5.33
NO2-	1.99	5.70E+04	3.30E+05	1.69	1.82	2.18	2.23
CO32-	0.674	2.52E+04	1.46E+05	0.560	0.616	0.732	0.770
PO43-	0.162	9.62E+03	5.57E+04	0.122	0.142	0.183	0.203
SO42-	0.245	1.47E+04	8.50E+04	0.210	0.225	0.269	0.273
Si (as SiO32-)	8.22E-02	1.44E+03	8.33E+03	6.84E-02	7.82E-02	8.63E-02	8.98E-02
F-	0.185	2.19E+03	1.27E+04	6.50E-02	0.165	0.205	0.224
Cl-	0.242	5.34E+03	3.09E+04	0.215	0.228	0.256	0.269
C6H5O73-	3.22E-02	3.79E+03	2.20E+04	2.58E-02	2.89E-02	3.55E-02	3.86E-02
EDTA4-	1.82E-02	3.28E+03	1.90E+04	6.42E-03	1.22E-02	2.43E-02	3.03E-02
HEDTA3-	3.16E-02	5.39E+03	3.12E+04	7.92E-03	1.95E-02	4.37E-02	5.56E-02
glycolate-	0.196	9.14E+03	5.29E+04	0.110	0.152	0.239	0.281
acetate-	1.57E-02	578	3.34E+03	1.28E-02	1.40E-02	1.75E-02	2.02E-02
oxalate2-	1.62E-05	0.888	5.14	1.44E-05	1.53E-05	1.71E-05	1.79E-05
DBP	2.26E-02	2.96E+03	1.71E+04	1.99E-02	2.11E-02	2.43E-02	2.67E-02
butanol	2.26E-02	1.04E+03	6.04E+03	1.99E-02	2.11E-02	2.43E-02	2.67E-02
NH3	0.462	4.90E+03	2.83E+04	5.90E-02	0.254	0.674	0.883
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-103							
TLM Solids Composite Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total TLM Wast	1.22E+04 (kg)	(2.00 kgal)	----	----	----	----	----
Heat Load	0.379 (kW)	(1.29E+03 BTU/hr)	----	7.14E-02	0.280	0.434	0.469
Bulk Density	1.62 (g/cc)	----	----	1.35	1.44	1.74	1.78
Void Fraction	0.668	----	----	0.542	0.575	0.796	0.830
Water wt%	45.1	----	----	41.2	41.5	51.5	57.0
TOC wt% C (wet	0.244	----	----	0.164	0.210	0.281	0.353
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	1.65E-05	1.02E-02	0.125	4.24E-06	1.03E-05	2.32E-05	3.99E-05
C-14	1.11E-06	6.88E-04	8.42E-03	6.25E-07	9.54E-07	1.23E-06	1.28E-05
Ni-59	1.89E-04	0.117	1.43	1.39E-04	1.73E-04	1.98E-04	2.05E-04
Ni-63	1.87E-02	11.6	142	1.38E-02	1.71E-02	1.96E-02	2.03E-02
Co-60	2.50E-06	1.55E-03	1.89E-02	1.41E-06	2.15E-06	2.76E-06	3.96E-06
Se-79	7.55E-07	4.67E-04	5.71E-03	4.22E-07	5.41E-07	2.62E-05	1.73E-04
Sr-90	7.43	4.60E+03	5.62E+04	1.40	5.50	8.52	9.20
Y-90	7.44	4.60E+03	5.63E+04	1.40	5.50	8.53	9.20
Zr-93	3.39E-06	2.10E-03	2.57E-02	1.91E-06	2.33E-06	4.76E-05	7.80E-04
Nb-93m	2.72E-06	1.68E-03	2.06E-02	1.42E-06	1.97E-06	1.08E-04	6.21E-04
Tc-99	7.44E-06	4.61E-03	5.63E-02	4.18E-06	6.38E-06	8.20E-06	1.18E-05
Ru-106	1.59E-06	9.87E-04	1.21E-02	7.07E-07	1.30E-06	1.89E-06	2.17E-06
Cd-113m	1.16E-05	7.16E-03	8.76E-02	6.51E-06	9.93E-06	1.68E-05	2.50E-03
Sb-125	1.53E-05	9.47E-03	0.116	8.60E-06	1.31E-05	1.69E-05	2.42E-05
Sn-126	1.19E-06	7.37E-04	9.02E-03	6.58E-07	8.71E-07	5.23E-05	2.72E-04
I-129	1.45E-08	8.96E-06	1.10E-04	8.14E-09	1.24E-08	1.60E-08	2.29E-08
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	2.73E-03	1.69	20.7	1.50E-03	1.99E-03	0.112	0.625
Eu-152	1.51E-04	9.31E-02	1.14	1.50E-04	1.50E-04	1.51E-04	1.51E-04
Eu-154	7.57E-05	4.68E-02	0.573	4.25E-05	6.33E-05	8.81E-05	4.54E-03
Eu-155	8.62E-03	5.34	65.3	8.61E-03	8.62E-03	8.63E-03	8.65E-03
Ra-226	6.30E-09	3.90E-06	4.77E-05	3.93E-11	1.57E-09	1.10E-08	1.56E-08
Ra-228	8.01E-14	4.95E-11	6.06E-10	7.99E-14	8.00E-14	8.01E-14	8.03E-14
Ac-227	2.75E-08	1.70E-05	2.08E-04	2.05E-10	3.26E-10	5.50E-08	8.14E-08
Pa-231	6.70E-10	4.15E-07	5.07E-06	2.86E-10	4.57E-10	7.59E-09	1.54E-07
Th-229	1.19E-11	7.37E-09	9.01E-08	1.19E-11	1.19E-11	1.19E-11	1.19E-11
Th-232	4.46E-16	2.76E-13	3.37E-12	2.51E-16	3.83E-16	4.92E-16	7.05E-16
U-232	1.59E-12	9.84E-10	1.20E-08	8.93E-13	1.36E-12	1.75E-12	2.51E-12
U-233	2.15E-14	1.33E-11	1.62E-10	1.21E-14	1.84E-14	2.36E-14	3.39E-14
U-234	5.99E-09	3.71E-06	4.53E-05	3.37E-09	5.14E-09	6.60E-09	9.47E-09
U-235	2.32E-10	1.43E-07	1.75E-06	1.30E-10	1.99E-10	2.55E-10	3.67E-10
U-236	4.36E-10	2.70E-07	3.30E-06	2.45E-10	3.74E-10	4.80E-10	6.89E-10
U-238	4.62E-09	2.86E-06	3.49E-05	2.59E-09	3.96E-09	5.09E-09	7.30E-09
Np-237	2.38E-08	1.47E-05	1.80E-04	1.34E-08	2.04E-08	2.62E-08	3.76E-08
Pu-238	2.52E-04	0.156	1.91	1.65E-04	2.20E-04	2.84E-04	3.13E-04
Pu-239	4.42E-03	2.73	33.4	2.88E-03	3.76E-03	5.08E-03	5.72E-03
Pu-240	9.59E-04	0.593	7.26	6.26E-04	8.23E-04	1.09E-03	1.22E-03
Pu-241	1.77E-02	10.9	134	1.15E-02	1.54E-02	1.99E-02	2.19E-02
Pu-242	1.15E-07	7.12E-05	8.71E-04	7.51E-08	1.01E-07	1.29E-07	1.42E-07
Am-241	4.08E-03	2.52	30.9	2.17E-05	1.79E-03	6.37E-03	8.56E-03
Am-243	3.09E-07	1.91E-04	2.34E-03	1.64E-09	1.45E-07	4.52E-07	5.75E-07
Cm-242	8.00E-06	4.95E-03	6.06E-02	7.99E-06	8.00E-06	8.01E-06	8.02E-06
Cm-243	8.52E-07	5.27E-04	6.45E-03	8.50E-07	8.52E-07	8.53E-07	8.54E-07
Cm-244	2.28E-05	1.41E-02	0.173	5.08E-06	1.70E-05	2.87E-05	3.43E-05
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	7.55E-02 (g/L)	----	0.571	4.93E-02	6.42E-02	8.68E-02	9.77E-02
U	5.82E-05	8.57	0.105	3.27E-05	4.99E-05	6.41E-05	9.20E-05

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AN-103

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	5.78E+06 (kg)	(951 kgal)	----	----	----	----	----
Heat Load	6.31 (kW)	(2.15E+04 BTU/hr)	----	5.92	6.11	6.48	6.75
Bulk Density*	1.60 (g/cc)	----	----	1.55	1.58	1.63	1.66
Water wt%†	32.6	----	----	29.0	30.6	34.2	36.1
TOC wt% C (wet	1.04	----	----	0.741	0.886	1.19	1.34

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	2.23E-04	0.139	804	1.59E-04	1.59E-04	2.36E-04	2.50E-04
C-14	2.92E-05	1.82E-02	105	1.58E-05	1.58E-05	2.96E-05	3.00E-05
Ni-59	1.71E-06	1.07E-03	6.15	1.08E-06	1.08E-06	1.74E-06	1.77E-06
Ni-63	1.68E-04	0.105	605	1.06E-04	1.06E-04	1.71E-04	1.74E-04
Co-60	3.85E-05	2.40E-02	139	2.32E-05	2.32E-05	3.96E-05	4.06E-05
Se-79	3.42E-06	2.13E-03	12.3	2.57E-06	2.57E-06	3.73E-06	4.03E-06
Sr-90	0.108	67.2	3.88E+05	0.103	0.106	0.110	0.112
Y-90	0.108	67.2	3.88E+05	7.82E-02	7.82E-02	0.110	0.112
Zr-93	1.66E-05	1.03E-02	59.6	1.23E-05	1.23E-05	1.81E-05	1.96E-05
Nb-93m	1.22E-05	7.57E-03	43.7	9.15E-06	9.15E-06	1.32E-05	1.43E-05
Tc-99	2.18E-04	0.136	784	1.68E+04	1.92E-04	2.44E-04	2.72E-04
Ru-106	1.14E-08	7.13E-06	4.12E-02	8.68E-09	9.46E-09	1.29E-08	1.42E-08
Cd-113m	8.38E-05	5.23E-02	302	5.81E-05	5.81E-05	9.31E-05	1.02E-04
Sb-125	2.40E-04	0.150	865	1.74E-04	1.74E-04	2.66E-04	2.91E-04
Sn-126	5.21E-06	3.25E-03	18.8	3.93E-06	3.93E-06	5.68E-06	6.12E-06
I-129	4.21E-07	2.62E-04	1.51	3.24E-07	3.71E-07	4.71E-07	5.25E-07
Cs-134	5.24E-05	3.26E-02	189	3.07E-05	4.12E-05	6.38E-05	7.49E-05
Cs-137	0.219	137	7.89E+05	0.199	0.207	0.229	0.245
Ba-137m	0.207	129	7.46E+05	0.178	0.178	0.216	0.225
Sm-151	1.21E-02	7.54	4.36E+04	9.10E-03	9.10E-03	1.32E-02	1.42E-02
Eu-152	4.08E-06	2.54E-03	14.7	3.02E-06	3.02E-06	4.41E-06	4.73E-06
Eu-154	6.11E-04	0.381	2.20E+03	3.97E-04	3.97E-04	6.88E-04	7.19E-04
Eu-155	2.57E-04	0.160	926	1.94E-04	1.94E-04	2.77E-04	2.97E-04
Ra-226	1.48E-10	9.20E-08	5.31E-04	1.13E-10	1.21E-10	1.65E-10	1.66E-10
Ra-228	2.91E-07	1.81E-04	1.05	1.24E-07	1.24E-07	3.35E-07	3.82E-07
Ac-227	9.27E-10	5.78E-07	3.34E-03	7.28E-10	7.73E-10	1.03E-09	1.04E-09
Pa-231	3.98E-09	2.48E-06	1.43E-02	3.12E-09	3.12E-09	4.29E-09	4.58E-09
Th-229	6.75E-09	4.21E-06	2.43E-02	2.90E-09	2.90E-09	7.72E-09	8.75E-09
Th-232	2.85E-08	1.78E-05	0.103	7.91E-09	7.91E-09	3.42E-08	3.96E-08
U-232	9.99E-07	6.22E-04	3.59	7.00E-07	8.46E-07	1.18E-06	1.36E-06
U-233	3.83E-06	2.39E-03	13.8	2.69E-06	3.24E-06	4.50E-06	5.22E-06
U-234	1.35E-06	8.43E-04	4.87	1.12E-06	1.30E-06	1.38E-06	1.40E-06
U-235	5.25E-08	3.27E-05	0.189	4.36E-08	5.06E-08	5.34E-08	5.43E-08
U-236	7.90E-08	4.93E-05	0.285	5.97E-08	7.48E-08	8.10E-08	8.29E-08
U-238	1.35E-06	8.39E-04	4.84	1.18E-06	1.31E-06	1.36E-06	1.38E-06
Np-237	7.83E-07	4.88E-04	2.82	6.20E-07	6.99E-07	8.67E-07	9.58E-07
Pu-238	2.96E-06	1.84E-03	10.6	2.22E-06	2.58E-06	3.34E-06	3.70E-06
Pu-239	5.59E-05	3.48E-02	201	4.99E-05	5.28E-05	5.90E-05	6.19E-05
Pu-240	1.16E-05	7.21E-03	41.6	9.74E-06	1.06E-05	1.25E-05	1.34E-05
Pu-241	2.57E-04	0.160	925	1.81E-04	2.18E-04	2.96E-04	3.33E-04
Pu-242	1.14E-09	7.10E-07	4.10E-03	8.57E-10	9.95E-10	1.28E-09	1.42E-09
Am-241	7.71E-05	4.81E-02	278	6.05E-05	6.87E-05	8.56E-05	9.14E-05
Am-243	5.16E-09	3.21E-06	1.86E-02	3.04E-09	4.06E-09	6.27E-09	6.68E-09
Cm-242	1.56E-07	9.74E-05	0.562	1.13E-07	1.13E-07	1.69E-07	1.81E-07
Cm-243	1.58E-08	9.83E-06	5.68E-02	1.16E-08	1.16E-08	1.70E-08	1.82E-08
Cm-244	1.92E-07	1.19E-04	0.690	1.36E-07	1.49E-07	2.20E-07	2.47E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	7.78E-04 (g/L)	----	2.80	6.73E-04	7.25E-04	8.32E-04	8.84E-04
U	1.34E-02	1.98E+03	1.14E+04	1.13E-02	1.29E-02	1.36E-02	1.38E-02

*Density is calculated based on Na, OH-, and AlO2-

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-103							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	5.79E+06 (kg)	(953 kgal)	----	----	----	----	----
Heat Load	6.69 (kW)	(2.28E+04 BTU/hr)	----	6.30	6.49	6.86	7.13
Bulk Density†	1.60 (g/cc)	----	----	1.55	1.58	1.63	1.66
Water wt%†	32.6	----	----	29.0	30.6	34.3	36.1
TOC wt% C (wet	1.04	----	----	0.740	0.885	1.19	1.33
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	2.23E-04	0.139	805	1.59E-04	1.59E-04	2.35E-04	2.49E-04
C-14	2.91E-05	1.82E-02	105	1.57E-05	1.57E-05	2.96E-05	3.00E-05
Ni-59	2.10E-06	1.31E-03	7.58	1.47E-06	1.47E-06	2.13E-06	2.16E-06
Ni-63	2.07E-04	0.129	747	1.45E-04	1.45E-04	2.10E-04	2.13E-04
Co-60	3.85E-05	2.40E-02	139	2.31E-05	2.31E-05	3.95E-05	4.06E-05
Se-79	3.42E-06	2.13E-03	12.3	2.56E-06	2.56E-06	3.73E-06	4.02E-06
Sr-90	0.123	76.7	4.44E+05	0.110	0.119	0.125	0.127
Y-90	0.123	76.8	4.44E+05	9.36E-02	9.36E-02	0.125	0.127
Zr-93	1.65E-05	1.03E-02	59.6	1.23E-05	1.23E-05	1.81E-05	1.96E-05
Nb-93m	1.21E-05	7.56E-03	43.8	9.14E-06	9.14E-06	1.32E-05	1.43E-05
Tc-99	2.17E-04	0.135	784	1.67E-04	1.92E-04	2.43E-04	2.71E-04
Ru-106	1.48E-08	9.20E-06	5.33E-02	1.28E-08	1.28E-08	1.57E-08	1.66E-08
Cd-113m	8.37E-05	5.22E-02	302	5.80E-05	5.80E-05	9.30E-05	1.02E-04
Sb-125	2.40E-04	0.149	865	1.73E-04	1.73E-04	2.65E-04	2.90E-04
Sn-126	5.20E-06	3.24E-03	18.8	3.92E-06	3.92E-06	5.67E-06	6.11E-06
I-129	4.20E-07	2.62E-04	1.51	3.23E-07	3.70E-07	4.70E-07	5.24E-07
Cs-134	5.23E-05	3.26E-02	189	3.07E-05	4.11E-05	6.36E-05	7.48E-05
Cs-137	0.219	136	7.89E+05	0.198	0.207	0.229	0.245
Ba-137m	0.207	129	7.46E+05	0.177	0.177	0.216	0.225
Sm-151	1.21E-02	7.53	4.36E+04	9.09E-03	9.09E-03	1.32E-02	1.42E-02
Eu-152	4.39E-06	2.74E-03	15.8	3.33E-06	3.33E-06	4.72E-06	5.04E-06
Eu-154	6.10E-04	0.380	2.20E+03	3.96E-04	3.96E-04	6.87E-04	7.18E-04
Eu-155	2.75E-04	0.171	991	2.12E-04	2.12E-04	2.95E-04	3.14E-04
Ra-226	1.61E-10	1.00E-07	5.79E-04	1.34E-10	1.34E-10	1.70E-10	1.79E-10
Ra-228	2.90E-07	1.81E-04	1.05	1.24E-07	1.24E-07	3.34E-07	3.81E-07
Ac-227	9.83E-10	6.12E-07	3.54E-03	8.29E-10	8.29E-10	1.04E-09	1.09E-09
Pa-231	3.97E-09	2.47E-06	1.43E-02	3.11E-09	3.11E-09	4.28E-09	4.58E-09
Th-229	6.73E-09	4.20E-06	2.43E-02	2.89E-09	2.89E-09	7.70E-09	8.73E-09
Th-232	2.85E-08	1.77E-05	0.103	7.89E-09	7.89E-09	3.41E-08	3.95E-08
U-232	9.97E-07	6.21E-04	3.59	6.99E-07	8.44E-07	1.17E-06	1.36E-06
U-233	3.82E-06	2.38E-03	13.8	2.68E-06	3.24E-06	4.49E-06	5.21E-06
U-234	1.35E-06	8.42E-04	4.87	1.12E-06	1.30E-06	1.37E-06	1.40E-06
U-235	5.24E-08	3.27E-05	0.189	4.35E-08	5.05E-08	5.33E-08	5.42E-08
U-236	7.89E-08	4.92E-05	0.285	5.96E-08	7.47E-08	8.08E-08	8.27E-08
U-238	1.34E-06	8.37E-04	4.84	1.18E-06	1.31E-06	1.36E-06	1.37E-06
Np-237	7.82E-07	4.87E-04	2.82	6.18E-07	6.98E-07	8.66E-07	9.56E-07
Pu-238	3.48E-06	2.17E-03	12.6	2.74E-06	3.10E-06	3.86E-06	4.22E-06
Pu-239	6.51E-05	4.06E-02	235	5.91E-05	6.20E-05	6.81E-05	7.11E-05
Pu-240	1.35E-05	8.44E-03	48.9	1.17E-05	1.26E-05	1.45E-05	1.54E-05
Pu-241	2.93E-04	0.183	1.06E+03	2.18E-04	2.55E-04	3.32E-04	3.69E-04
Pu-242	1.38E-09	8.59E-07	4.97E-03	1.10E-09	1.23E-09	1.52E-09	1.66E-09
Am-241	8.55E-05	5.33E-02	308	7.40E-05	8.03E-05	9.08E-05	9.46E-05
Am-243	5.79E-09	3.61E-06	2.09E-02	3.68E-09	4.70E-09	6.91E-09	6.95E-09
Cm-242	1.73E-07	1.08E-04	0.623	1.29E-07	1.29E-07	1.85E-07	1.97E-07
Cm-243	1.75E-08	1.09E-05	6.32E-02	1.34E-08	1.34E-08	1.88E-08	2.00E-08
Cm-244	2.39E-07	1.49E-04	0.863	1.96E-07	1.96E-07	2.55E-07	2.70E-07
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	9.35E-04 (g/L)	----	3.37	8.30E-04	8.82E-04	9.89E-04	1.04E-03
U	1.33E-02	1.98E+03	1.14E+04	1.13E-02	1.29E-02	1.35E-02	1.37E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C

241-AN-103
Photo date: 10-29-87
N
Level Probe
FIC Level Probe
4" Riser 2A
Level Probe
4" Riser 1C
42" Riser 5B
Unknown
Saltwell Screen
12" Riser 7B
Level Probe
4" Riser 16C
Unknown
4" Riser 4A
4" Riser 21A
Level Probe
4" Riser 16B
High Level Sensor
4" Riser 15B
Unknown
12" Riser 7A
4" Riser 16A
Level Probe
42" Riser 5A
4" Riser 10A
4" Riser 1B
4" Riser 15A
Unknown

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TANK 241-AN-104 SUMMARY

TANK HISTORY	
Entered Service	Sept 1981
Removed from Service	-
Inactive	Jan 1991
Watch Lists	Hydrogen
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
10A, 15A, 21A	4 in
12A	12 in
TANK TEMPERATURE	
Average Tank Temperature	109°F
Maximum Temperature	124.16°F
Date	Feb 22 and 24, 1995
Elevation from tank bottom	6.33 ft
Riser Number	4A
Minimum Temperature	89.06°F
Date	Dec 9 - 15, 1996
Elevation from tank bottom	38.33 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	59
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	1,057,000 gal
Waste Type	DSSF
Drainable Interstitial Liquids	25,000 gal
Pumpable Liquids	796,000 gal
Saltcake	0 gal
Sludge	264,000 gal
Supernatant	793,000 gal
INTERIOR PHOTOGRAPHS	
Date	Aug 19, 1988
Montage Number	94080233-17CN
Photo Set Number	88081921
WASTE SURFACE LEVEL	
Devices	Manual ENRAF & Tape
Max Level	388.8 in
Date	Jan 10 - 15, 1991
Min Level	383.82 in
Date	Jan 12, 1997

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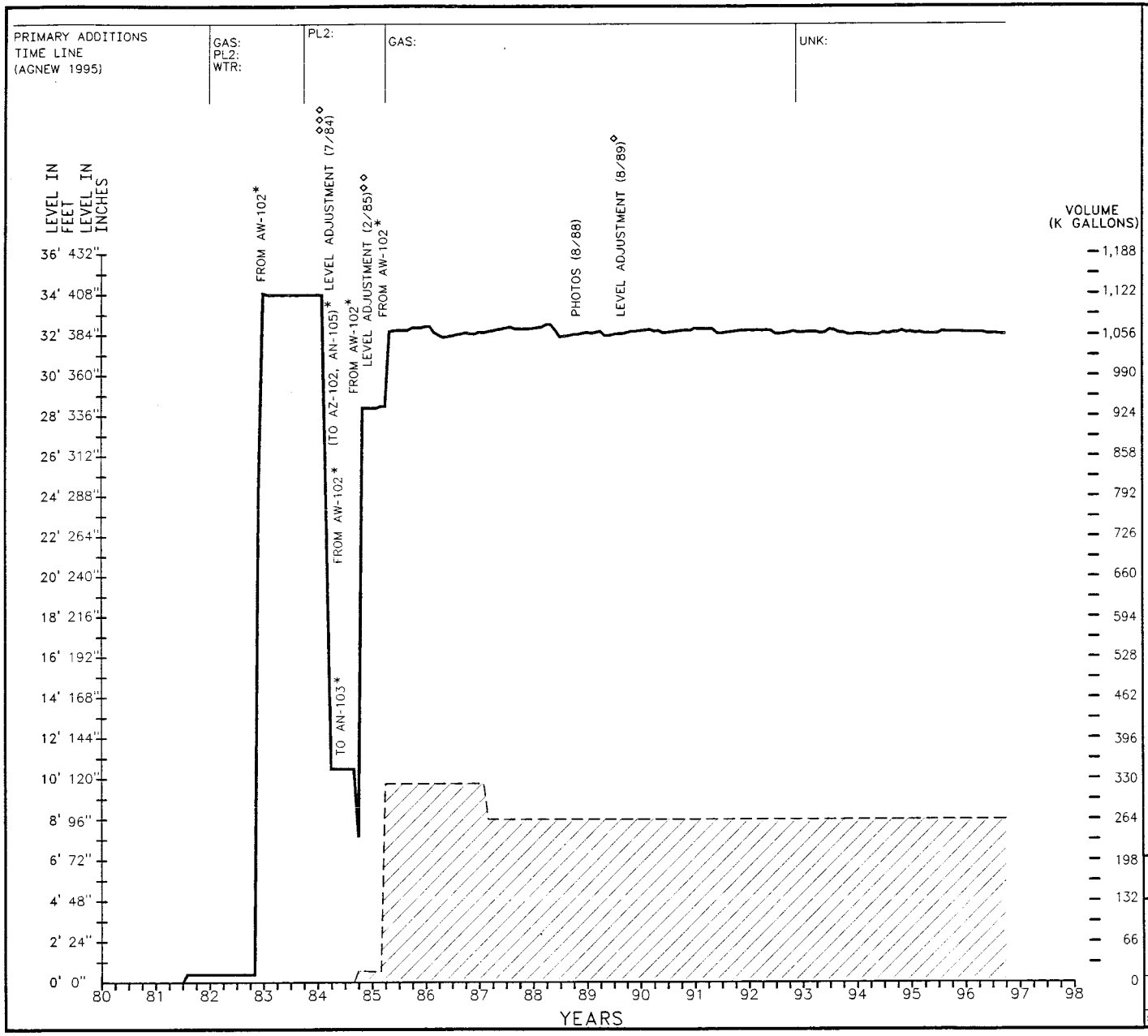


TANK INFO:

CONSTRUCTED 1980-1981
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- ◇ HANLON 1996l
- ◇◇ McCANN AND VAIL 1985c
- ◇◇◇ McCANN 1984h

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

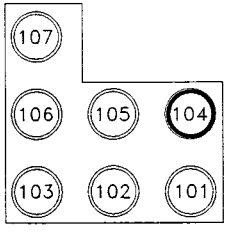
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

GAS:	SLURRY GROWTH
PL2:	PUREX LOW-LEVEL WASTE 1983-88
UNK:	UNKNOWN
WTR:	WATER

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

AN TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AN-104 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1981-1996
SOUND/INACTIVE TANK
WATCH LIST: HYDROGEN

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E153	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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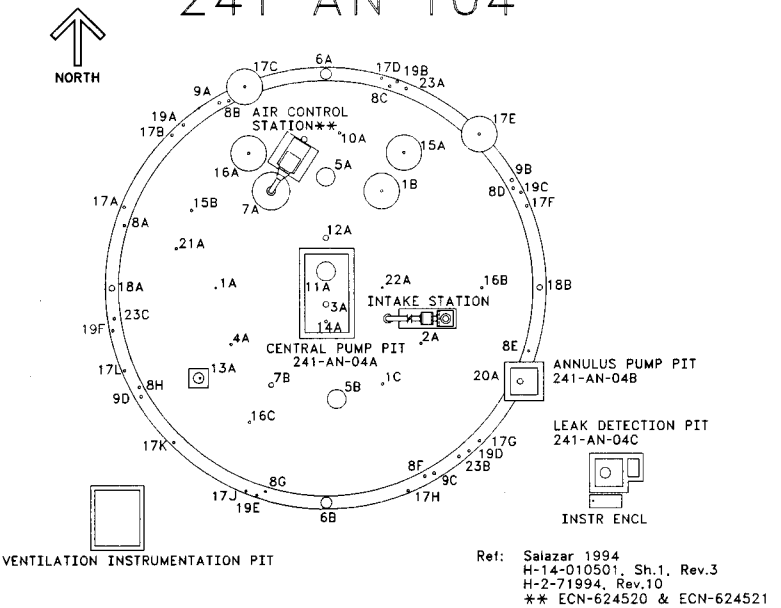
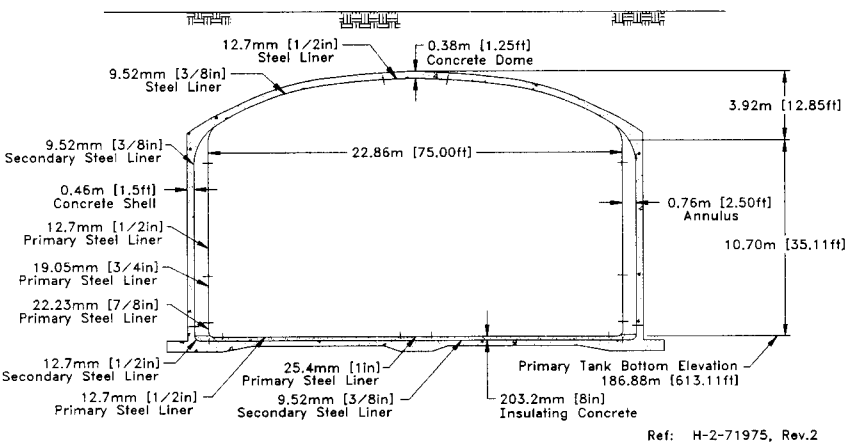
241-AN-104

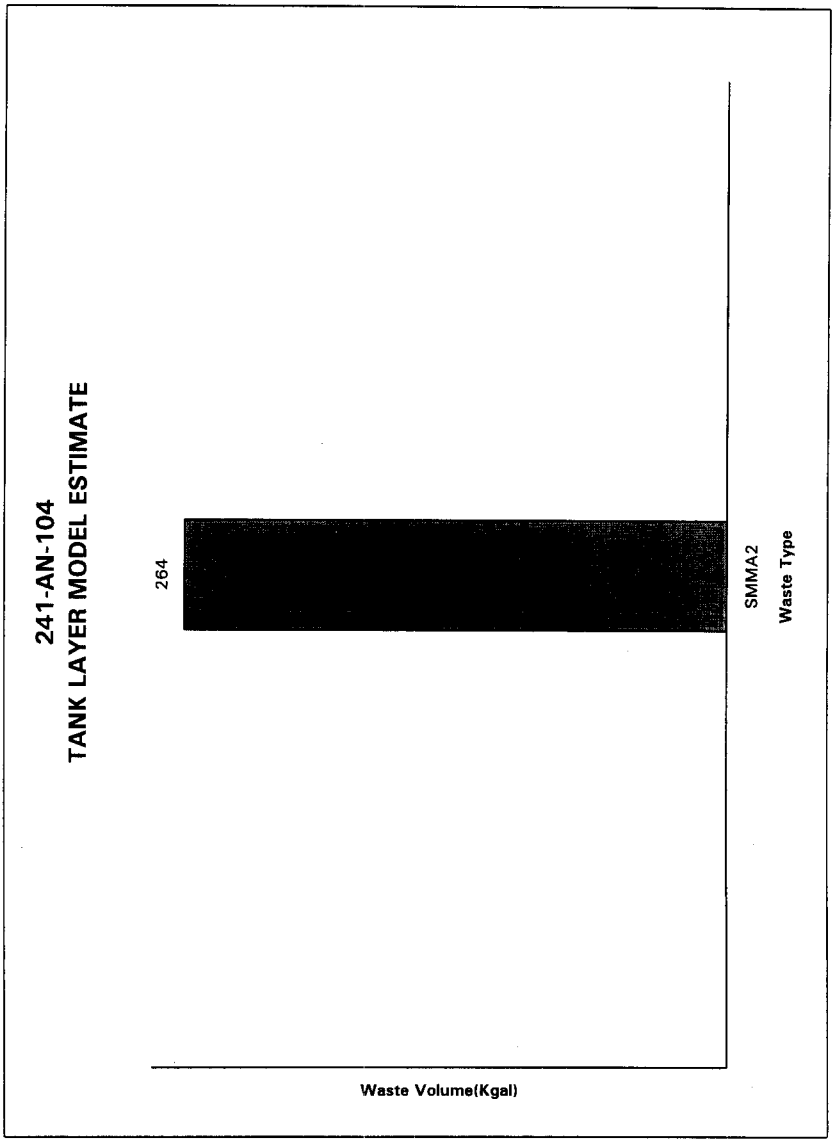


TANK RISER LOCATION

Approximate Grade Elevation Not Available



NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AN-104

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AN-104

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	5.89E+06 (kg)	(1.06E+03 kgal)	----	----	----	----	----
Heat Load	6.06 (kW)	(2.07E+04 BTU/hr)	----	5.54	5.82	6.27	6.58
Bulk Density*	1.47 (g/cc)	----	----	1.43	1.46	1.49	1.51
Water wt%	42.8	----	----	40.1	41.3	44.0	45.3
TOC wt% C (wet	1.05	----	----	0.666	0.856	1.25	1.44

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	11.1	1.73E+05	1.02E+06	10.2	10.6	11.5	12.0
Al3+	1.26	2.31E+04	1.36E+05	1.08	1.22	1.30	1.33
Fe3+ (total Fe)	9.06E-03	343	2.02E+03	8.19E-03	8.62E-03	9.50E-03	9.92E-03
Cr3+	8.91E-02	3.14E+03	1.85E+04	7.92E-02	8.45E-02	9.29E-02	9.83E-02
Bi3+	9.49E-04	134	793	8.90E-04	9.19E-04	9.79E-04	1.01E-03
La3+	1.27E-05	1.19	7.04	9.38E-06	1.10E-05	1.44E-05	1.60E-05
Hg2+	9.15E-06	1.25	7.34	7.76E-06	9.02E-06	9.29E-06	9.43E-06
Zr (as ZrO(OH)2)	7.49E-04	46.3	273	4.22E-04	7.07E-04	7.90E-04	8.29E-04
Pb2+	9.48E-04	133	785	7.49E-04	8.47E-04	1.05E-03	1.15E-03
Ni2+	5.71E-03	227	1.34E+03	5.56E-03	5.64E-03	5.77E-03	5.83E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	6.70E-03	250	1.47E+03	4.54E-03	5.59E-03	7.80E-03	8.55E-03
Ca2+	3.19E-02	868	5.11E+03	2.97E-02	3.08E-02	3.30E-02	3.41E-02
K+	0.100	2.65E+03	1.56E+04	5.45E-02	7.66E-02	0.124	0.148
OH-	7.38	8.51E+04	5.02E+05	6.50	7.07	7.70	7.99
NO3-	3.71	1.56E+05	9.19E+05	3.49	3.60	3.82	3.93
NO2-	1.72	5.35E+04	3.16E+05	1.39	1.53	1.92	1.97
CO32-	0.504	2.05E+04	1.21E+05	0.434	0.469	0.540	0.564
PO43-	0.115	7.42E+03	4.37E+04	9.01E-02	0.102	0.128	0.140
SO42-	0.210	1.37E+04	8.08E+04	0.173	0.188	0.236	0.238
Si (as SiO32-)	6.10E-02	1.16E+03	6.85E+03	5.30E-02	5.69E-02	6.51E-02	6.88E-02
F-	9.99E-02	1.29E+03	7.59E+03	5.28E-02	9.20E-02	0.108	0.116
Cl-	0.190	4.56E+03	2.69E+04	0.168	0.178	0.198	0.206
C6H5O73-	2.61E-02	3.34E+03	1.97E+04	2.21E-02	2.41E-02	2.81E-02	3.00E-02
EDTA4-	2.12E-02	4.14E+03	2.44E+04	6.95E-03	1.39E-02	2.85E-02	3.56E-02
HEDTA3-	3.78E-02	7.02E+03	4.14E+04	9.34E-03	2.32E-02	5.24E-02	6.67E-02
glycolate-	0.142	7.22E+03	4.25E+04	8.90E-02	0.115	0.169	0.195
acetate-	1.46E-02	584	3.44E+03	1.15E-02	1.28E-02	1.65E-02	1.94E-02
oxalate2-	1.66E-05	0.991	5.84	1.48E-05	1.57E-05	1.75E-05	1.84E-05
DBP	1.97E-02	2.81E+03	1.65E+04	1.68E-02	1.80E-02	2.15E-02	2.41E-02
butanol	1.97E-02	989	5.83E+03	1.68E-02	1.80E-02	2.15E-02	2.41E-02
NH3	0.206	2.37E+03	1.40E+04	4.68E-02	0.124	0.289	0.371
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-104							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	5.89E+06 (kg)	(1.06E+03 kgal)	----	----	----	----	----
Heat Load	6.06 (kW)	(2.07E+04 BTU/hr)	----	5.54	5.82	6.27	6.58
Bulk Density†	1.47 (g/cc)	----	----	1.43	1.46	1.49	1.51
Water wt%†	42.8	----	----	40.1	41.3	44.0	45.3
TOC wt% C (wet	1.05	----	----	0.666	0.856	1.25	1.44
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	11.1	1.73E+05	1.02E+06	10.2	10.6	11.5	12.0
Al3+	1.26	2.31E+04	1.36E+05	1.08	1.22	1.30	1.33
Fe3+ (total Fe)	9.06E-03	343	2.02E+03	8.19E-03	8.62E-03	9.50E-03	9.92E-03
Cr3+	8.91E-02	3.14E+03	1.85E+04	7.92E-02	8.45E-02	9.29E-02	9.83E-02
Bi3+	9.49E-04	134	793	8.90E-04	9.19E-04	9.79E-04	1.01E-03
La3+	1.27E-05	1.19	7.04	9.38E-06	1.10E-05	1.44E-05	1.60E-05
Hg2+	9.15E-06	1.25	7.34	7.76E-06	9.02E-06	9.29E-06	9.43E-06
Zr (as ZrO(OH)2)	7.49E-04	46.3	273	4.22E-04	7.07E-04	7.90E-04	8.29E-04
Pb2+	9.48E-04	133	785	7.49E-04	8.47E-04	1.05E-03	1.15E-03
Ni2+	5.71E-03	227	1.34E+03	5.56E-03	5.64E-03	5.77E-03	5.83E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	6.70E-03	250	1.47E+03	4.54E-03	5.59E-03	7.80E-03	8.55E-03
Ca2+	3.19E-02	868	5.11E+03	2.97E-02	3.08E-02	3.30E-02	3.41E-02
K+	0.100	2.65E+03	1.56E+04	5.45E-02	7.66E-02	0.124	0.148
OH-	7.38	8.51E+04	5.02E+05	6.50	7.07	7.70	7.99
NO3-	3.71	1.56E+05	9.19E+05	3.49	3.60	3.82	3.93
NO2-	1.72	5.35E+04	3.16E+05	1.39	1.53	1.92	1.97
CO32-	0.504	2.05E+04	1.21E+05	0.434	0.469	0.540	0.564
PO43-	0.115	7.42E+03	4.37E+04	9.01E-02	0.102	0.128	0.140
SO42-	0.210	1.37E+04	8.08E+04	0.173	0.188	0.236	0.238
Si (as SiO32-)	6.10E-02	1.16E+03	6.85E+03	5.30E-02	5.69E-02	6.51E-02	6.88E-02
F-	9.99E-02	1.29E+03	7.59E+03	5.28E-02	9.20E-02	0.108	0.116
Cl-	0.190	4.56E+03	2.69E+04	0.168	0.178	0.198	0.206
C6H5O73-	2.61E-02	3.34E+03	1.97E+04	2.21E-02	2.41E-02	2.81E-02	3.00E-02
EDTA4-	2.12E-02	4.14E+03	2.44E+04	6.95E-03	1.39E-02	2.85E-02	3.56E-02
HEDTA3-	3.78E-02	7.02E+03	4.14E+04	9.34E-03	2.32E-02	5.24E-02	6.67E-02
glycolate-	0.142	7.22E+03	4.25E+04	8.90E-02	0.115	0.169	0.195
acetate-	1.46E-02	584	3.44E+03	1.15E-02	1.28E-02	1.65E-02	1.94E-02
oxalate2-	1.66E-05	0.991	5.84	1.48E-05	1.57E-05	1.75E-05	1.84E-05
DBP	1.97E-02	2.81E+03	1.65E+04	1.68E-02	1.80E-02	2.15E-02	2.41E-02
butanol	1.97E-02	989	5.83E+03	1.68E-02	1.80E-02	2.15E-02	2.41E-02
NH3	0.206	2.37E+03	1.40E+04	4.68E-02	0.124	0.289	0.371
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-104

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

HDW Model Rev. 4

Double-Shell Tank 241-AN-104

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	5.89E+06 (kg)	(1.06E+03 kgal)	----	----	----	----	----
Heat Load	6.06 (kW)	(2.07E+04 BTU/hr)	----	5.54	5.82	6.27	6.58
Bulk Density*	1.47 (g/cc)	----	----	1.43	1.46	1.49	1.51
Water wt%†	42.8	----	----	40.1	41.3	44.0	45.3
TOC wt% C (wet	1.05	----	----	0.666	0.856	1.25	1.44

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.86E-04	0.126	744	1.33E-04	1.33E-04	1.97E-04	2.11E-04
C-14	2.59E-05	1.76E-02	104	1.48E-05	1.48E-05	2.64E-05	2.68E-05
Ni-59	1.40E-06	9.51E-04	5.61	8.82E-07	8.82E-07	1.43E-06	1.45E-06
Ni-63	1.38E-04	9.36E-02	552	8.65E-05	8.65E-05	1.41E-04	1.43E-04
Co-60	3.37E-05	2.29E-02	135	2.11E-05	2.11E-05	3.45E-05	3.54E-05
Se-79	2.83E-06	1.92E-03	11.3	2.13E-06	2.13E-06	3.09E-06	3.34E-06
Sr-90	8.87E-02	60.1	3.54E+05	8.30E-02	8.69E-02	9.05E-02	9.22E-02
Y-90	8.87E-02	60.2	3.55E+05	6.43E-02	6.43E-02	9.05E-02	9.22E-02
Zr-93	1.38E-05	9.38E-03	55.3	1.03E-05	1.03E-05	1.51E-05	1.63E-05
Nb-93m	1.00E-05	6.81E-03	40.2	7.57E-06	7.57E-06	1.09E-05	1.18E-05
Tc-99	1.96E-04	0.133	782	1.54E-04	1.74E-04	2.20E-04	2.54E-04
Ru-106	8.07E-09	5.48E-06	3.23E-02	6.37E-09	6.43E-09	8.94E-09	9.78E-09
Cd-113m	7.26E-05	4.93E-02	290	5.14E-05	5.14E-05	8.03E-05	8.77E-05
Sb-125	1.86E-04	0.126	745	1.31E-04	1.31E-04	1.96E-04	2.06E-04
Sn-126	4.30E-06	2.92E-03	17.2	3.24E-06	3.24E-06	4.69E-06	5.05E-06
I-129	3.78E-07	2.56E-04	1.51	2.98E-07	3.35E-07	4.26E-07	4.90E-07
Cs-134	3.09E-05	2.09E-02	123	2.24E-05	2.65E-05	3.54E-05	3.97E-05
Cs-137	0.196	133	7.83E+05	0.174	0.183	0.207	0.224
Ba-137m	0.185	126	7.41E+05	0.154	0.154	0.195	0.204
Sm-151	1.00E-02	6.78	4.00E+04	7.53E-03	7.53E-03	1.09E-02	1.18E-02
Eu-152	3.63E-06	2.46E-03	14.5	2.75E-06	2.75E-06	4.02E-06	4.41E-06
Eu-154	5.34E-04	0.362	2.13E+03	3.57E-04	3.57E-04	5.98E-04	6.31E-04
Eu-155	2.25E-04	0.153	899	1.73E-04	1.73E-04	2.49E-04	2.73E-04
Ra-226	1.16E-10	7.86E-08	4.63E-04	9.40E-11	9.40E-11	1.27E-10	1.32E-10
Ra-228	2.58E-07	1.75E-04	1.03	7.84E-08	7.84E-08	2.86E-07	3.16E-07
Ac-227	7.15E-10	4.85E-07	2.86E-03	5.88E-10	5.88E-10	7.77E-10	8.06E-10
Pa-231	3.21E-09	2.17E-06	1.28E-02	2.50E-09	2.50E-09	3.46E-09	3.71E-09
Th-229	5.98E-09	4.05E-06	2.39E-02	1.83E-09	1.83E-09	6.59E-09	7.25E-09
Th-232	2.72E-08	1.84E-05	0.109	5.01E-09	5.01E-09	3.32E-08	3.91E-08
U-232	7.93E-07	5.38E-04	3.17	6.03E-07	6.92E-07	9.08E-07	1.03E-06
U-233	3.04E-06	2.06E-03	12.1	2.31E-06	2.65E-06	3.48E-06	3.95E-06
U-234	8.98E-07	6.09E-04	3.59	7.64E-07	8.67E-07	9.13E-07	9.27E-07
U-235	3.50E-08	2.38E-05	0.140	2.99E-08	3.38E-08	3.56E-08	3.61E-08
U-236	4.82E-08	3.27E-05	0.193	3.71E-08	4.56E-08	4.94E-08	5.05E-08
U-238	9.65E-07	6.55E-04	3.86	8.73E-07	9.43E-07	9.75E-07	9.93E-07
Np-237	6.92E-07	4.69E-04	2.77	5.57E-07	6.21E-07	7.72E-07	8.81E-07
Pu-238	1.99E-06	1.35E-03	7.97	1.54E-06	1.76E-06	2.23E-06	2.45E-06
Pu-239	4.29E-05	2.91E-02	172	3.88E-05	4.08E-05	4.50E-05	4.70E-05
Pu-240	8.45E-06	5.73E-03	33.8	7.32E-06	7.87E-06	9.02E-06	9.57E-06
Pu-241	1.66E-04	0.113	664	1.19E-04	1.42E-04	1.90E-04	2.13E-04
Pu-242	7.67E-10	5.20E-07	3.06E-03	5.92E-10	6.78E-10	8.56E-10	9.41E-10
Am-241	5.58E-05	3.79E-02	223	4.56E-05	5.06E-05	6.11E-05	6.46E-05
Am-243	3.10E-09	2.10E-06	1.24E-02	2.26E-09	2.66E-09	3.60E-09	4.04E-09
Cm-242	1.31E-07	8.89E-05	0.524	9.51E-08	9.51E-08	1.46E-07	1.61E-07
Cm-243	1.29E-08	8.72E-06	5.14E-02	9.43E-09	9.43E-09	1.42E-08	1.55E-08
Cm-244	1.31E-07	8.85E-05	0.522	9.52E-08	9.52E-08	1.48E-07	1.65E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	5.63E-04 (g/L)	----	2.25	4.86E-04	5.24E-04	6.02E-04	6.40E-04
U	9.09E-03	1.47E+03	8.65E+03	7.93E-03	8.82E-03	9.22E-03	9.34E-03

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-104

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	5.89E+06 (kg)	(1.06E+03 kgal)	----	----	----	----	----
Heat Load	6.06 (kW)	(2.07E+04 BTU/hr)	----	5.54	5.82	6.27	6.58
Bulk Density†	1.47 (g/cc)	----	----	1.43	1.46	1.49	1.51
Water wt%†	42.8	----	----	40.1	41.3	44.0	45.3
TOC wt% C (wet	1.05	----	----	0.666	0.856	1.25	1.44

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.86E-04	0.126	744	1.33E-04	1.33E-04	1.97E-04	2.11E-04
C-14	2.59E-05	1.76E-02	104	1.48E-05	1.48E-05	2.64E-05	2.68E-05
Ni-59	1.40E-06	9.51E-04	5.61	8.82E-07	8.82E-07	1.43E-06	1.45E-06
Ni-63	1.38E-04	9.36E-02	552	8.65E-05	8.65E-05	1.41E-04	1.43E-04
Co-60	3.37E-05	2.29E-02	135	2.11E-05	2.11E-05	3.45E-05	3.54E-05
Se-79	2.83E-06	1.92E-03	11.3	2.13E-06	2.13E-06	3.09E-06	3.34E-06
Sr-90	8.87E-02	60.1	3.54E+05	8.30E-02	8.69E-02	9.05E-02	9.22E-02
Y-90	8.87E-02	60.2	3.55E+05	6.43E-02	6.43E-02	9.05E-02	9.22E-02
Zr-93	1.38E-05	9.38E-03	55.3	1.03E-05	1.03E-05	1.51E-05	1.63E-05
Nb-93m	1.00E-05	6.81E-03	40.2	7.57E-06	7.57E-06	1.09E-05	1.18E-05
Tc-99	1.96E-04	0.133	782	1.54E-04	1.74E-04	2.20E-04	2.54E-04
Ru-106	8.07E-09	5.48E-06	3.23E-02	6.37E-09	6.43E-09	8.94E-09	9.78E-09
Cd-113m	7.26E-05	4.93E-02	290	5.14E-05	5.14E-05	8.03E-05	8.77E-05
Sb-125	1.86E-04	0.126	745	1.31E-04	1.31E-04	1.96E-04	2.06E-04
Sn-126	4.30E-06	2.92E-03	17.2	3.24E-06	3.24E-06	4.69E-06	5.05E-06
I-129	3.78E-07	2.56E-04	1.51	2.98E-07	3.35E-07	4.26E-07	4.90E-07
Cs-134	3.09E-05	2.09E-02	123	2.24E-05	2.65E-05	3.54E-05	3.97E-05
Cs-137	0.196	133	7.83E+05	0.174	0.183	0.207	0.224
Ba-137m	0.185	126	7.41E+05	0.154	0.154	0.195	0.204
Sm-151	1.00E-02	6.78	4.00E+04	7.53E-03	7.53E-03	1.09E-02	1.18E-02
Eu-152	3.63E-06	2.46E-03	14.5	2.75E-06	2.75E-06	4.02E-06	4.41E-06
Eu-154	5.34E-04	0.362	2.13E+03	3.57E-04	3.57E-04	5.98E-04	6.31E-04
Eu-155	2.25E-04	0.153	899	1.73E-04	1.73E-04	2.49E-04	2.73E-04
Ra-226	1.16E-10	7.86E-08	4.63E-04	9.40E-11	9.40E-11	1.27E-10	1.32E-10
Ra-228	2.58E-07	1.75E-04	1.03	7.84E-08	7.84E-08	2.86E-07	3.16E-07
Ac-227	7.15E-10	4.85E-07	2.86E-03	5.88E-10	5.88E-10	7.77E-10	8.06E-10
Pa-231	3.21E-09	2.17E-06	1.28E-02	2.50E-09	2.50E-09	3.46E-09	3.71E-09
Th-229	5.98E-09	4.05E-06	2.39E-02	1.83E-09	1.83E-09	6.59E-09	7.25E-09
Th-232	2.72E-08	1.84E-05	0.109	5.01E-09	5.01E-09	3.32E-08	3.91E-08
U-232	7.93E-07	5.38E-04	3.17	6.03E-07	6.92E-07	9.08E-07	1.03E-06
U-233	3.04E-06	2.06E-03	12.1	2.31E-06	2.65E-06	3.48E-06	3.95E-06
U-234	8.98E-07	6.09E-04	3.59	7.64E-07	8.67E-07	9.13E-07	9.27E-07
U-235	3.50E-08	2.38E-05	0.140	2.99E-08	3.38E-08	3.56E-08	3.61E-08
U-236	4.82E-08	3.27E-05	0.193	3.71E-08	4.56E-08	4.94E-08	5.05E-08
U-238	9.55E-07	6.55E-04	3.86	8.73E-07	9.43E-07	9.75E-07	9.93E-07
Np-237	6.92E-07	4.69E-04	2.77	5.57E-07	6.21E-07	7.72E-07	8.81E-07
Pu-238	1.99E-06	1.35E-03	7.97	1.54E-06	1.76E-06	2.23E-06	2.45E-06
Pu-239	4.29E-05	2.91E-02	172	3.88E-05	4.08E-05	4.50E-05	4.70E-05
Pu-240	8.45E-06	5.73E-03	33.8	7.32E-06	7.87E-06	9.02E-06	9.57E-06
Pu-241	1.66E-04	0.113	664	1.19E-04	1.42E-04	1.90E-04	2.13E-04
Pu-242	7.67E-10	5.20E-07	3.06E-03	5.92E-10	6.78E-10	8.56E-10	9.41E-10
Am-241	5.58E-05	3.79E-02	223	4.56E-05	5.06E-05	6.11E-05	6.46E-05
Am-243	3.10E-09	2.10E-06	1.24E-02	2.26E-09	2.66E-09	3.60E-09	4.04E-09
Cm-242	1.31E-07	8.89E-05	0.524	9.51E-08	9.51E-08	1.46E-07	1.61E-07
Cm-243	1.29E-08	8.72E-06	5.14E-02	9.43E-09	9.43E-09	1.42E-08	1.55E-08
Cm-244	1.31E-07	8.85E-05	0.522	9.52E-08	9.52E-08	1.48E-07	1.65E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	5.63E-04 (g/L)	----	2.25	4.86E-04	5.24E-04	6.02E-04	6.40E-04
U	9.09E-03	1.47E+03	8.65E+03	7.93E-03	8.82E-03	9.22E-03	9.34E-03

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C

241-AN-104
Photo date: 8-19-88
Level Probe
Level Probe
Level Probe
FIC
Level Probe
Unknown
Level Probe
4" Riser 16C
Tank Pressure Port
(Behind)
Temperature Probe
Level Probe
Level Probe
N

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TANK 241-AN-105 SUMMARY

TANK HISTORY	
Entered Service	Sept 1981
Removed from Service	-
Inactive	Jan 1991
Watch Lists	Hydrogen
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
1B, 10A, 15A, 16B, 22A	4 in
7B, 12A	12 in
TANK TEMPERATURE	
Average Tank Temperature	103°F
Maximum Temperature	115°F
Date	March 15 - April 13, 1994*
Elevation from tank bottom	8.33 ft
Riser Number	4A
Minimum Temperature	70.16°F
Date	Dec 11, 1996
Elevation from tank bottom	34.33 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	59
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	1,128,000 gal
Waste Type	DSSF
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	1,128,000 gal
Saltcake	0 gal
Sludge	0 gal
Supernatant	1,128,000 gal
INTERIOR PHOTOGRAPHS	
Date	Jan 26, 1988
Montage Number	94080233-1CN
Photo Set Number	8800388
WASTE SURFACE LEVEL	
Devices	Manual ENRAF & Tape
Max Level	415.5 in
Date	May 16 - July 1, 1996*
Min Level	408.5 in
Date	July 8 - July 18, 1992*

* Numerous dates in this time span.

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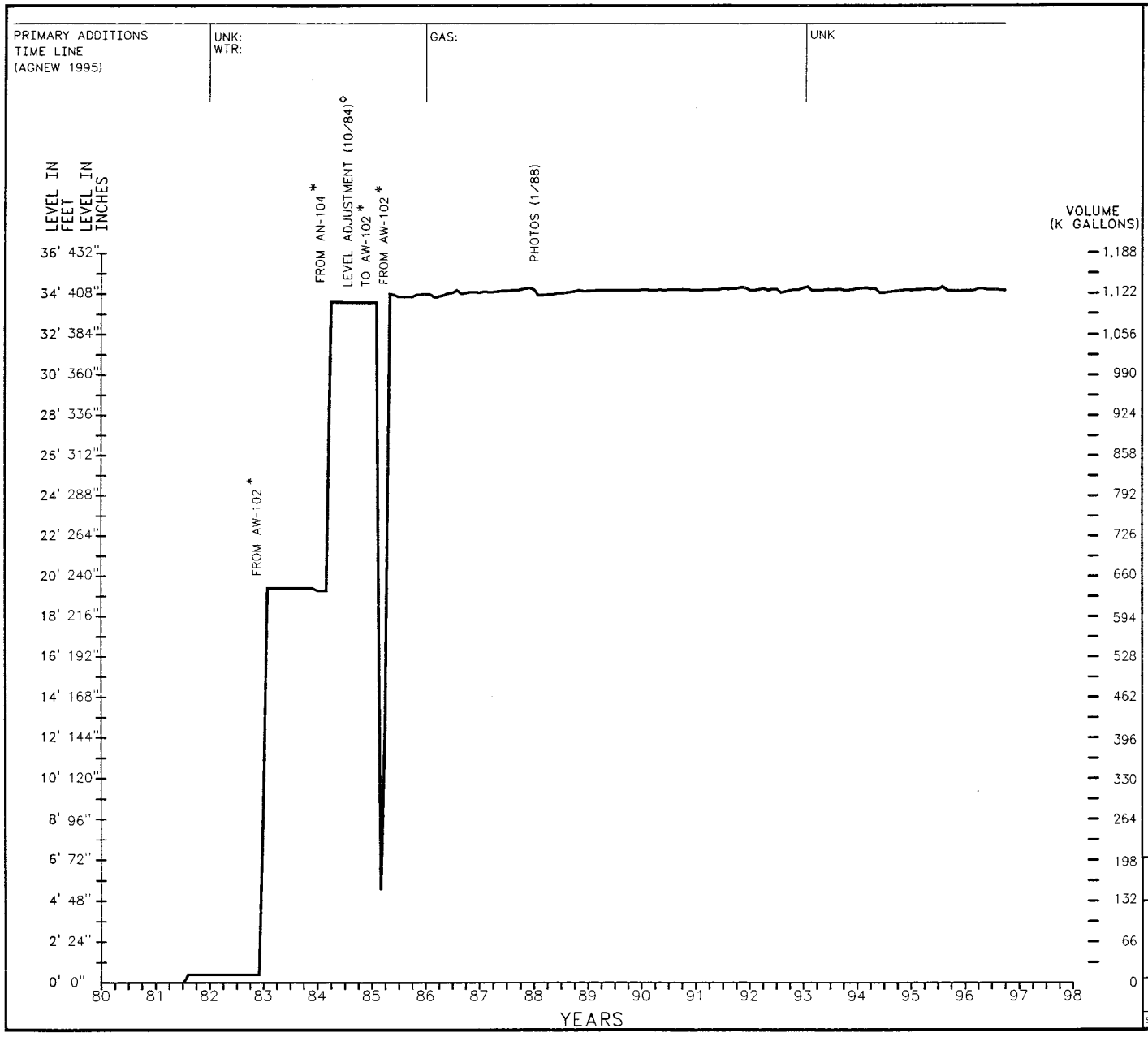


TANK INFO:

CONSTRUCTED 1980-1981
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

* AGNEW 1995
◇ HANLON 1996l

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

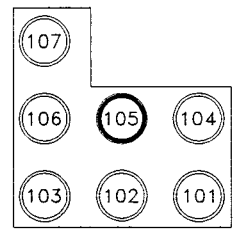
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

GAS: SLURRY GROWTH
UNK: UNKNOWN
WTR: WATER

LEGEND

TOTAL WASTE LEVEL (SUPERNATE)

AN TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AN-105 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1981-1996
SOUND/INACTIVE TANK
WATCH LIST: HYDROGEN

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E154	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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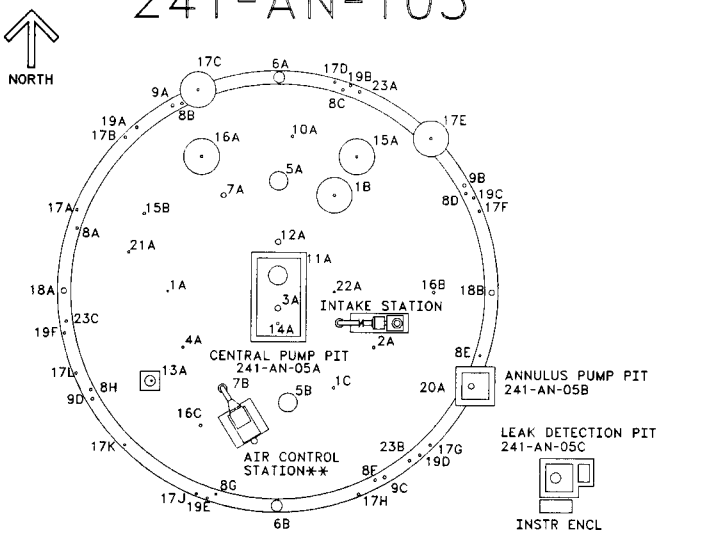
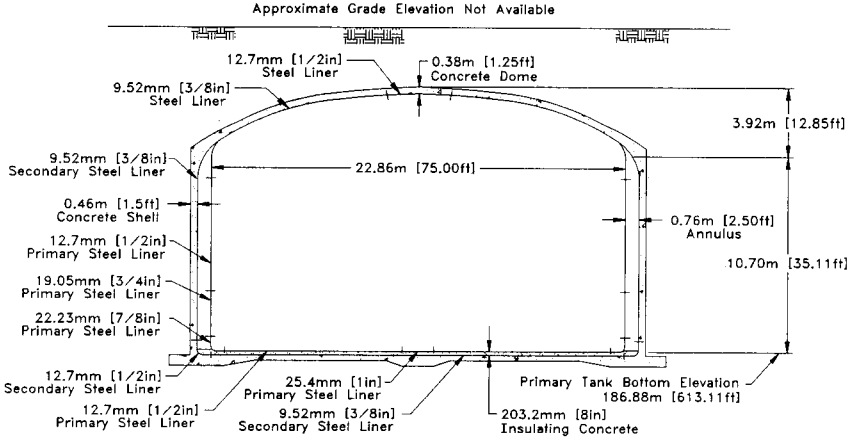
241-AN-105



Ref: Salazar 1994
H-14-010501, Sh.1, Rev.3
H-2-71995, Rev.12
** ECN-624520 & ECN-624521

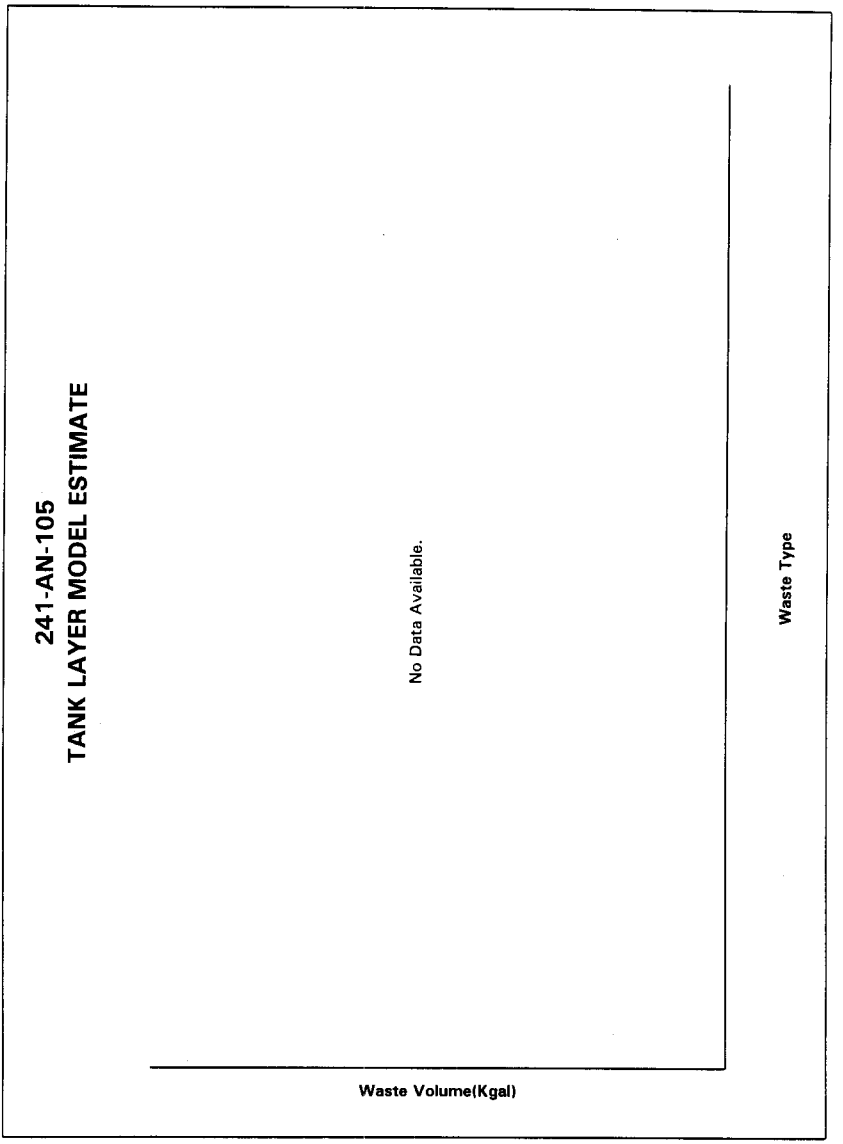
TANK RISER LOCATION

Approximate Grade Elevation Not Available



Ref: H-2-71975, Rev.2

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AN-105

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AN-105

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	8.04E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	11.4 (kW)	(3.90E+04 BTU/hr)	----	10.6	11.0	11.8	12.4
Bulk Density*	1.88 (g/cc)	----	----	1.80	1.85	1.91	1.94
Water wt%	17.2	----	----	14.0	15.4	18.7	20.4
TOC wt% C (wet	1.36	----	----	0.924	1.14	1.58	1.80

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	20.5	2.51E+05	2.02E+06	18.7	19.6	21.4	22.2
Al3+	2.35	3.38E+04	2.71E+05	2.02	2.28	2.42	2.49
Fe3+ (total Fe)	1.56E-02	464	3.73E+03	1.41E-02	1.48E-02	1.64E-02	1.71E-02
Cr3+	0.160	4.42E+03	3.56E+04	0.142	0.152	0.167	0.176
Bi3+	1.87E-03	208	1.67E+03	1.74E-03	1.80E-03	1.93E-03	1.99E-03
La3+	1.99E-05	1.47	11.8	1.47E-05	1.72E-05	2.25E-05	2.50E-05
Hg2+	1.38E-05	1.47	11.8	1.32E-05	1.35E-05	1.41E-05	1.43E-05
Zr (as ZrO(OH)2)	3.82E-04	18.5	149	3.22E-04	3.67E-04	3.91E-04	4.04E-04
Pb2+	1.74E-03	191	1.54E+03	1.38E-03	1.55E-03	1.92E-03	2.10E-03
Ni2+	1.06E-02	331	2.66E+03	1.03E-02	1.05E-02	1.07E-02	1.08E-02
Sr2+	0	0	0	0	0	0	0
Mn4+	9.35E-03	273	2.20E+03	6.99E-03	8.14E-03	1.06E-02	1.14E-02
Ca2+	5.57E-02	1.19E+03	9.56E+03	5.16E-02	5.40E-02	5.72E-02	5.87E-02
K+	0.106	2.22E+03	1.78E+04	9.54E-02	0.100	0.114	0.124
OH-	13.7	1.24E+05	9.97E+05	12.1	13.1	14.3	14.9
NO3-	7.08	2.34E+05	1.88E+06	6.60	6.83	7.31	7.52
NO2-	3.10	7.58E+04	6.09E+05	2.51	2.76	3.46	3.56
CO32-	0.910	2.91E+04	2.34E+05	0.769	0.839	0.980	1.03
PO43-	0.184	9.29E+03	7.47E+04	0.157	0.170	0.198	0.211
SO42-	0.386	1.97E+04	1.59E+05	0.318	0.347	0.433	0.436
Si (as SiO32-)	0.113	1.69E+03	1.36E+04	9.68E-02	0.105	0.121	0.128
F-	0.107	1.09E+03	8.72E+03	9.56E-02	0.100	0.115	0.126
Cl-	0.361	6.81E+03	5.48E+04	0.322	0.340	0.378	0.394
C6H5O73-	4.80E-02	4.83E+03	3.88E+04	4.01E-02	4.40E-02	5.21E-02	5.60E-02
EDTA4-	3.14E-02	4.82E+03	3.88E+04	1.09E-02	2.09E-02	4.20E-02	5.23E-02
HEDTA3-	5.48E-02	7.99E+03	6.42E+04	1.37E-02	3.38E-02	7.59E-02	9.65E-02
glycolate-	0.261	1.04E+04	8.38E+04	0.156	0.207	0.315	0.367
acetate-	2.59E-02	815	6.55E+03	2.03E-02	2.27E-02	2.94E-02	3.47E-02
oxalate2-	2.60E-05	1.22	9.80	2.32E-05	2.46E-05	2.74E-05	2.88E-05
DBP	3.40E-02	3.80E+03	3.06E+04	2.88E-02	3.10E-02	3.72E-02	4.20E-02
butanol	3.40E-02	1.34E+03	1.08E+04	2.88E-02	3.10E-02	3.72E-02	4.20E-02
NH3	0.114	1.03E+03	8.27E+03	8.48E-02	9.88E-02	0.129	0.144
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-

†Water wt% derived from the difference of density and total dissolved species

HDW Model Rev. 4

Double-Shell Tank 241-AN-105

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	8.04E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	11.4 (kW)	(3.90E+04 BTU/hr)	----	10.6	11.0	11.8	12.4
Bulk Density†	1.88 (g/cc)	----	----	1.80	1.85	1.91	1.94
Water wt%†	17.2	----	----	14.0	15.4	18.7	20.4
TOC wt% C (wet	1.36	----	----	0.924	1.14	1.58	1.80

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	20.5	2.51E+05	2.02E+06	18.7	19.6	21.4	22.2
Al3+	2.35	3.38E+04	2.71E+05	2.02	2.28	2.42	2.49
Fe3+ (total Fe)	1.56E-02	464	3.73E+03	1.41E-02	1.48E-02	1.64E-02	1.71E-02
Cr3+	0.160	4.42E+03	3.56E+04	0.142	0.152	0.167	0.176
Bi3+	1.87E-03	208	1.67E+03	1.74E-03	1.80E-03	1.93E-03	1.99E-03
La3+	1.99E-05	1.47	11.8	1.47E-05	1.72E-05	2.25E-05	2.50E-05
Hg2+	1.38E-05	1.47	11.8	1.32E-05	1.35E-05	1.41E-05	1.43E-05
Zr (as ZrO(OH)2)	3.82E-04	18.5	149	3.22E-04	3.67E-04	3.91E-04	4.04E-04
Pb2+	1.74E-03	191	1.54E+03	1.38E-03	1.55E-03	1.92E-03	2.10E-03
Ni2+	1.06E-02	331	2.66E+03	1.03E-02	1.05E-02	1.07E-02	1.08E-02
Sr2+	0	0	0	0	0	0	0
Mn4+	9.35E-03	273	2.20E+03	6.99E-03	8.14E-03	1.06E-02	1.14E-02
Ca2+	5.57E-02	1.19E+03	9.56E+03	5.16E-02	5.40E-02	5.72E-02	5.87E-02
K+	0.106	2.22E+03	1.78E+04	9.54E-02	0.100	0.114	0.124
OH-	13.7	1.24E+05	9.97E+05	12.1	13.1	14.3	14.9
NO3-	7.08	2.34E+05	1.88E+06	6.60	6.83	7.31	7.52
NO2-	3.10	7.58E+04	6.09E+05	2.51	2.76	3.46	3.56
CO32-	0.910	2.91E+04	2.34E+05	0.769	0.839	0.980	1.03
PO43-	0.184	9.29E+03	7.47E+04	0.157	0.170	0.198	0.211
SO42-	0.386	1.97E+04	1.59E+05	0.318	0.347	0.433	0.436
Si (as SiO32-)	0.113	1.69E+03	1.36E+04	9.68E-02	0.105	0.121	0.128
F-	0.107	1.09E+03	8.72E+03	9.56E-02	0.100	0.115	0.126
Cl-	0.361	6.81E+03	5.48E+04	0.322	0.340	0.378	0.394
C6H5O73-	4.80E-02	4.83E+03	3.88E+04	4.01E-02	4.40E-02	5.21E-02	5.60E-02
EDTA4-	3.14E-02	4.82E+03	3.88E+04	1.09E-02	2.09E-02	4.20E-02	5.23E-02
HEDTA3-	5.48E-02	7.99E+03	6.42E+04	1.37E-02	3.38E-02	7.59E-02	9.65E-02
glycolate-	0.261	1.04E+04	8.38E+04	0.156	0.207	0.315	0.367
acetate-	2.59E-02	815	6.55E+03	2.03E-02	2.27E-02	2.94E-02	3.47E-02
oxalate2-	2.60E-05	1.22	9.80	2.32E-05	2.46E-05	2.74E-05	2.88E-05
DBP	3.40E-02	3.80E+03	3.06E+04	2.88E-02	3.10E-02	3.72E-02	4.20E-02
butanol	3.40E-02	1.34E+03	1.08E+04	2.88E-02	3.10E-02	3.72E-02	4.20E-02
NH3	0.114	1.03E+03	8.27E+03	8.48E-02	9.88E-02	0.129	0.144
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-105

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AN-105

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	8.04E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	11.4 (kW)	(3.90E+04 BTU/hr)	----	10.6	11.0	11.8	12.4
Bulk Density*	1.88 (g/cc)	----	----	1.80	1.85	1.91	1.94
Water wt%†	17.2	----	----	14.0	15.4	18.7	20.4
TOC wt% C (wet	1.36	----	----	0.924	1.14	1.58	1.80

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	3.30E-04	0.176	1.41E+03	2.38E-04	2.38E-04	3.46E-04	3.66E-04
C-14	4.62E-05	2.46E-02	198	2.68E-05	2.68E-05	4.70E-05	4.78E-05
Ni-59	2.59E-06	1.38E-03	11.1	1.67E-06	1.67E-06	2.63E-06	2.68E-06
Ni-63	2.55E-04	0.136	1.09E+03	1.64E-04	1.64E-04	2.59E-04	2.64E-04
Co-60	5.92E-05	3.15E-02	253	3.70E-05	3.70E-05	6.03E-05	6.15E-05
Se-79	5.11E-06	2.72E-03	21.9	3.87E-06	3.87E-06	5.56E-06	5.99E-06
Sr-90	0.155	82.7	6.65E+05	0.147	0.152	0.159	0.162
Y-90	0.155	82.7	6.65E+05	0.113	0.113	0.159	0.162
Zr-93	2.49E-05	1.32E-02	106	1.87E-05	1.87E-05	2.71E-05	2.93E-05
Nb-93m	1.82E-05	9.66E-03	77.6	1.38E-05	1.38E-05	1.97E-05	2.12E-05
Tc-99	3.50E-04	0.186	1.50E+03	2.77E-04	3.10E-04	3.94E-04	4.54E-04
Ru-106	1.31E-08	6.97E-06	5.60E-02	9.69E-09	1.02E-08	1.48E-08	1.65E-08
Cd-113m	1.29E-04	6.87E-02	552	9.19E-05	9.19E-05	1.43E-04	1.55E-04
Sb-125	3.10E-04	0.165	1.33E+03	2.14E-04	2.14E-04	3.25E-04	3.39E-04
Sn-126	7.77E-06	4.13E-03	33.2	5.91E-06	5.91E-06	8.44E-06	9.09E-06
I-129	6.75E-07	3.59E-04	2.89	5.35E-07	5.98E-07	7.62E-07	8.78E-07
Cs-134	4.86E-05	2.59E-02	208	3.57E-05	4.20E-05	5.52E-05	6.16E-05
Cs-137	0.346	184	1.48E+06	0.307	0.323	0.366	0.397
Ba-137m	0.328	174	1.40E+06	0.270	0.270	0.342	0.356
Sm-151	1.81E-02	9.61	7.72E+04	1.37E-02	1.37E-02	1.96E-02	2.11E-02
Eu-152	6.30E-06	3.35E-03	26.9	4.76E-06	4.76E-06	6.87E-06	7.42E-06
Eu-154	9.39E-04	0.500	4.02E+03	6.30E-04	6.30E-04	1.05E-03	1.11E-03
Eu-155	3.88E-04	0.206	1.66E+03	2.96E-04	2.96E-04	4.22E-04	4.57E-04
Ra-226	2.14E-10	1.14E-07	9.14E-04	1.71E-10	1.75E-10	2.35E-10	2.41E-10
Ra-228	4.75E-07	2.53E-04	2.03	1.51E-07	1.51E-07	5.29E-07	5.87E-07
Ac-227	1.32E-09	7.02E-07	5.65E-03	1.07E-09	1.10E-09	1.44E-09	1.48E-09
Pa-231	5.82E-09	3.10E-06	2.49E-02	4.58E-09	4.58E-09	6.27E-09	6.70E-09
Th-229	1.10E-08	5.86E-06	4.71E-02	3.53E-09	3.53E-09	1.22E-08	1.35E-08
Th-232	4.96E-08	2.64E-05	0.212	9.60E-09	9.60E-09	6.05E-08	7.11E-08
U-232	1.48E-06	7.86E-04	6.32	1.11E-06	1.29E-06	1.70E-06	1.93E-06
U-233	5.66E-06	3.01E-03	24.2	4.25E-06	4.94E-06	6.50E-06	7.38E-06
U-234	1.29E-06	6.84E-04	5.50	1.14E-06	1.25E-06	1.30E-06	1.32E-06
U-235	5.05E-08	2.69E-05	0.216	4.49E-08	4.92E-08	5.11E-08	5.17E-08
U-236	5.83E-08	3.10E-05	0.249	4.62E-08	5.55E-08	5.96E-08	6.09E-08
U-238	1.53E-06	8.12E-04	6.53	1.43E-06	1.50E-06	1.54E-06	1.58E-06
Np-237	1.23E-06	6.57E-04	5.28	9.98E-07	1.11E-06	1.38E-06	1.57E-06
Pu-238	2.76E-06	1.47E-03	11.8	2.26E-06	2.51E-06	3.02E-06	3.26E-06
Pu-239	7.05E-05	3.75E-02	302	6.34E-05	6.69E-05	7.41E-05	7.76E-05
Pu-240	1.33E-05	7.08E-03	56.9	1.20E-05	1.26E-05	1.40E-05	1.46E-05
Pu-241	2.15E-04	0.115	920	1.64E-04	1.89E-04	2.41E-04	2.66E-04
Pu-242	1.07E-09	5.68E-07	4.57E-03	8.77E-10	9.71E-10	1.16E-09	1.26E-09
Am-241	1.00E-04	5.34E-02	429	7.99E-05	8.99E-05	1.11E-04	1.18E-04
Am-243	4.40E-09	2.34E-06	1.88E-02	2.78E-09	3.52E-09	5.40E-09	6.28E-09
Cm-242	2.31E-07	1.23E-04	0.987	1.68E-07	1.68E-07	2.52E-07	2.74E-07
Cm-243	2.29E-08	1.22E-05	9.78E-02	1.68E-08	1.68E-08	2.48E-08	2.67E-08
Cm-244	2.15E-07	1.14E-04	0.920	1.47E-07	1.53E-07	2.50E-07	2.83E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	9.21E-04 (g/L)	----	3.94	7.86E-04	8.52E-04	9.89E-04	1.05E-03
U	1.35E-02	1.71E+03	1.38E+04	1.23E-02	1.32E-02	1.37E-02	1.38E-02

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-105

Total Inventory Estimate*

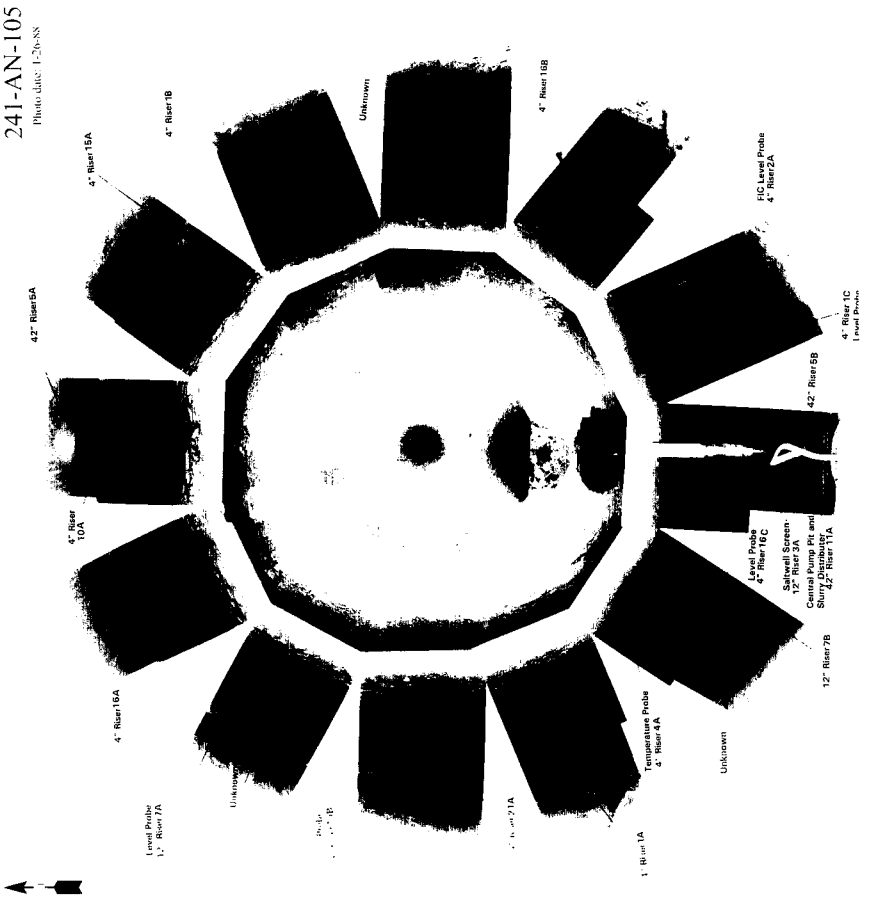
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	8.04E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	11.4 (kW)	(3.90E+04 BTU/hr)	----	10.6	11.0	11.8	12.4
Bulk Density†	1.88 (g/cc)	----	----	1.80	1.85	1.91	1.94
Water wt%†	17.2	----	----	14.0	15.4	18.7	20.4
TOC wt% C (wet	1.36	----	----	0.924	1.14	1.58	1.80

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	3.30E-04	0.176	1.41E+03	2.38E-04	2.38E-04	3.46E-04	3.66E-04
C-14	4.62E-05	2.46E-02	198	2.68E-05	2.68E-05	4.70E-05	4.78E-05
Ni-59	2.59E-06	1.38E-03	11.1	1.67E-06	1.67E-06	2.63E-06	2.68E-06
Ni-63	2.55E-04	0.136	1.09E+03	1.64E-04	1.64E-04	2.59E-04	2.64E-04
Co-60	5.92E-05	3.15E-02	253	3.70E-05	3.70E-05	6.03E-05	6.15E-05
Se-79	5.11E-06	2.72E-03	21.9	3.87E-06	3.87E-06	5.56E-06	5.99E-06
Sr-90	0.155	82.7	6.65E+05	0.147	0.152	0.159	0.162
Y-90	0.155	82.7	6.65E+05	0.113	0.113	0.159	0.162
Zr-93	2.49E-05	1.32E-02	106	1.87E-05	1.87E-05	2.71E-05	2.93E-05
Nb-93m	1.82E-05	9.66E-03	77.6	1.38E-05	1.38E-05	1.97E-05	2.12E-05
Tc-99	3.50E-04	0.186	1.50E+03	2.77E-04	3.10E-04	3.94E-04	4.54E-04
Ru-106	1.31E-08	6.97E-06	5.60E-02	9.69E-09	1.02E-08	1.48E-08	1.65E-08
Cd-113m	1.29E-04	6.87E-02	552	9.19E-05	9.19E-05	1.43E-04	1.55E-04
Sb-125	3.10E-04	0.165	1.33E+03	2.14E-04	2.14E-04	3.25E-04	3.39E-04
Sn-126	7.77E-06	4.13E-03	33.2	5.91E-06	5.91E-06	8.44E-06	9.09E-06
I-129	6.75E-07	3.59E-04	2.89	5.35E-07	5.98E-07	7.62E-07	8.78E-07
Cs-134	4.86E-05	2.59E-02	208	3.57E-05	4.20E-05	5.52E-05	6.16E-05
Cs-137	0.346	184	1.48E+06	0.307	0.323	0.366	0.397
Ba-137m	0.328	174	1.40E+06	0.270	0.270	0.342	0.356
Sm-151	1.81E-02	9.61	7.72E+04	1.37E-02	1.37E-02	1.96E-02	2.11E-02
Eu-152	6.30E-06	3.35E-03	26.9	4.76E-06	4.76E-06	6.87E-06	7.42E-06
Eu-154	9.39E-04	0.500	4.02E+03	6.30E-04	6.30E-04	1.05E-03	1.11E-03
Eu-155	3.88E-04	0.206	1.66E+03	2.96E-04	2.96E-04	4.22E-04	4.57E-04
Ra-226	2.14E-10	1.14E-07	9.14E-04	1.71E-10	1.75E-10	2.35E-10	2.41E-10
Ra-228	4.75E-07	2.53E-04	2.03	1.51E-07	1.51E-07	5.29E-07	5.87E-07
Ac-227	1.32E-09	7.02E-07	5.65E-03	1.07E-09	1.10E-09	1.44E-09	1.48E-09
Pa-231	5.82E-09	3.10E-06	2.49E-02	4.58E-09	4.58E-09	6.27E-09	6.70E-09
Th-229	1.10E-08	5.86E-06	4.71E-02	3.53E-09	3.53E-09	1.22E-08	1.35E-08
Th-232	4.96E-08	2.64E-05	0.212	9.60E-09	9.60E-09	6.05E-08	7.11E-08
U-232	1.48E-06	7.86E-04	6.32	1.11E-06	1.29E-06	1.70E-06	1.93E-06
U-233	5.66E-06	3.01E-03	24.2	4.25E-06	4.94E-06	6.50E-06	7.38E-06
U-234	1.29E-06	6.84E-04	5.50	1.14E-06	1.25E-06	1.30E-06	1.32E-06
U-235	5.05E-08	2.69E-05	0.216	4.49E-08	4.92E-08	5.11E-08	5.17E-08
U-236	5.83E-08	3.10E-05	0.249	4.62E-08	5.55E-08	5.96E-08	6.09E-08
U-238	1.53E-06	8.12E-04	6.53	1.43E-06	1.50E-06	1.54E-06	1.58E-06
Np-237	1.23E-06	6.57E-04	5.28	9.98E-07	1.11E-06	1.38E-06	1.57E-06
Pu-238	2.76E-06	1.47E-03	11.8	2.26E-06	2.51E-06	3.02E-06	3.26E-06
Pu-239	7.05E-05	3.75E-02	302	6.34E-05	6.69E-05	7.41E-05	7.76E-05
Pu-240	1.33E-05	7.08E-03	56.9	1.20E-05	1.26E-05	1.40E-05	1.46E-05
Pu-241	2.15E-04	0.115	920	1.64E-04	1.89E-04	2.41E-04	2.66E-04
Pu-242	1.07E-09	5.68E-07	4.57E-03	8.77E-10	9.71E-10	1.16E-09	1.26E-09
Am-241	1.00E-04	5.34E-02	429	7.99E-05	8.99E-05	1.11E-04	1.18E-04
Am-243	4.40E-09	2.34E-06	1.88E-02	2.78E-09	3.52E-09	5.40E-09	6.28E-09
Cm-242	2.31E-07	1.23E-04	0.987	1.68E-07	1.68E-07	2.52E-07	2.74E-07
Cm-243	2.29E-08	1.22E-05	9.78E-02	1.68E-08	1.68E-08	2.48E-08	2.67E-08
Cm-244	2.15E-07	1.14E-04	0.920	1.47E-07	1.53E-07	2.50E-07	2.83E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	9.21E-04 (g/L)	----	3.94	7.86E-04	8.52E-04	9.89E-04	1.05E-03
U	1.35E-02	1.71E+03	1.38E+04	1.23E-02	1.32E-02	1.37E-02	1.38E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.


241-AN-105
Photo date 1-26-88
42" Riser 5A
4" Riser 15A
4" Riser 1B
Unknown
4" Riser 1GB
FIC Level Probe
4" Riser 2A
4" Riser 1C
42" Riser 5B
4" Riser 10A
4" Riser 16A
Level Probe
4" Riser 16C
Saltwell Screen
12" Riser 3A
Central Pump Pit and
Slurry Distributor
42" Riser 11A
12" Riser 7B
Temperature Probe
4" Riser 4A
Unknown
Level Probe
12" Riser 7A
Unknown

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TANK 241-AN-106 SUMMARY

TANK HISTORY	
Entered Service	Sept 1981
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
10A, 13A, 15A, 21A	4 in
7A, 12A	12 in
TANK TEMPERATURE	
Average Tank Temperature	72°F
Maximum Temperature	94.1°F
Date	Sept 12, 1994
Elevation from tank bottom	10.33 ft
Riser Number	4A
Minimum Temperature	32.54°F
Date	Aug 28 and 29, 1996
Elevation from tank bottom	4.33 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	59
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	416,000 gal
Waste Type	DSSF
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	399,000 gal
Saltcake	0 gal
Sludge	17,000 gal
Supernatant	399,000 gal
INTERIOR PHOTOGRAPHS	
Date	July 29, 1994
Montage Number	n/a
Photo Set Number	94071120
WASTE SURFACE LEVEL	
Devices	Auto/Man FIC & Man Tape
Max Level	371.2 in
Date	Jan 1 - Jan 8, 1991*
Min Level	7.5 in
Date	Feb 9 - Sept 9, 1994*

* Numerous dates in this time span.

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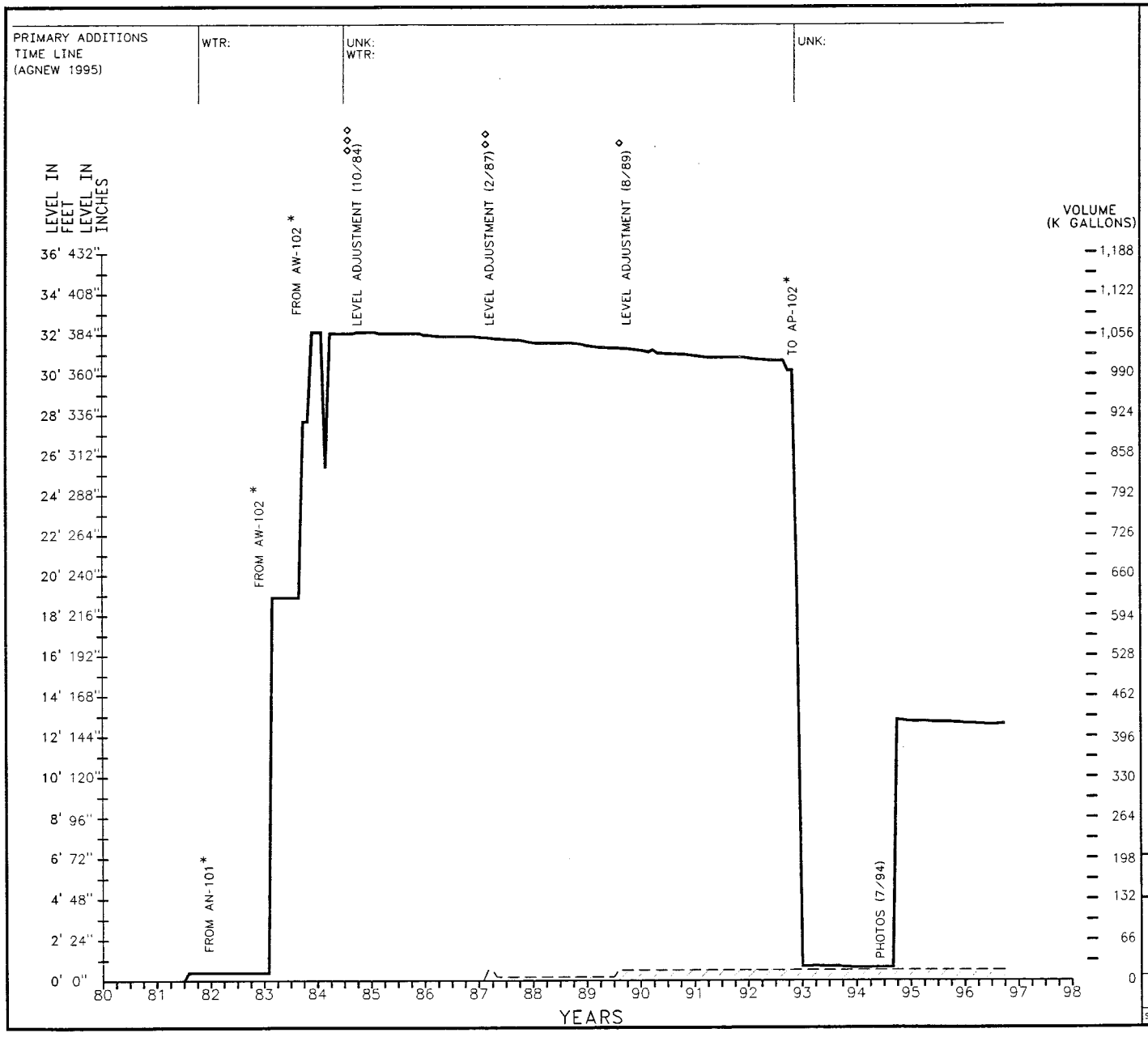


TANK INFO:

CONSTRUCTED 1980-1981
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- ◇ HANLON 1996l
- ◇◇ THURMAN 1987a
- ◇◇◇ McCANN AND VAIL 1984i

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

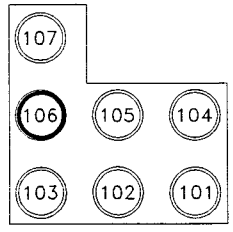
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

UNK: UNKNOWN
WTR: WATER

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

AN TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AN-106 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1981-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E155	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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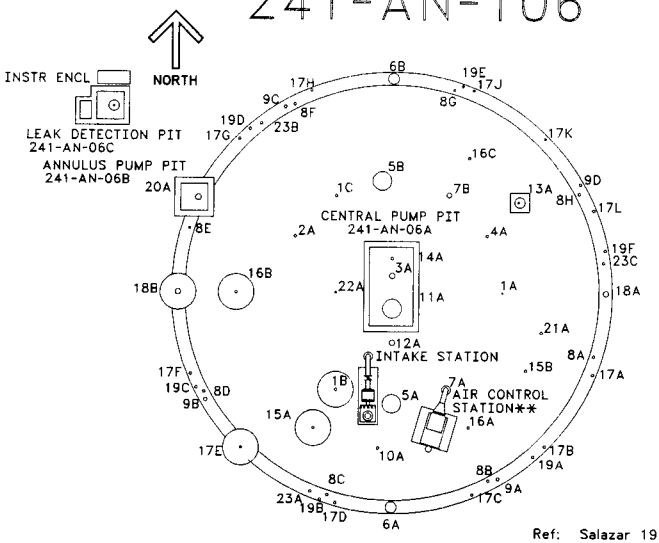
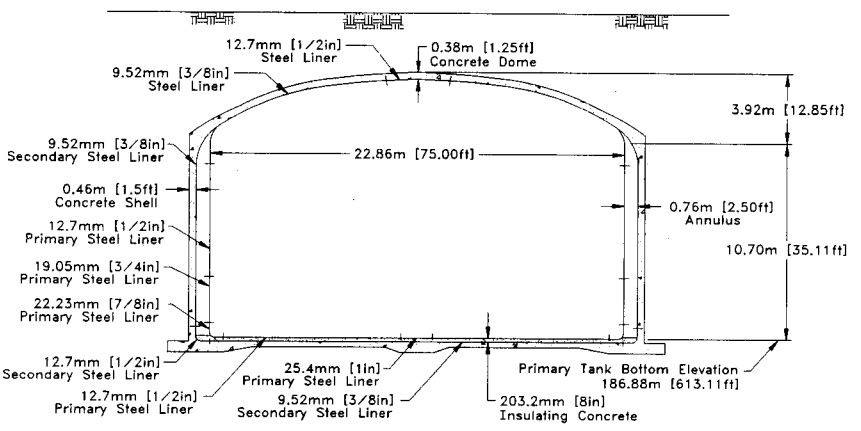
241-AN-106



Ref: Salazar 1994
H-14-010501, Sh.1, Rev.3
H-2-71996, Rev.8
** ECN-624520 & ECN-624521

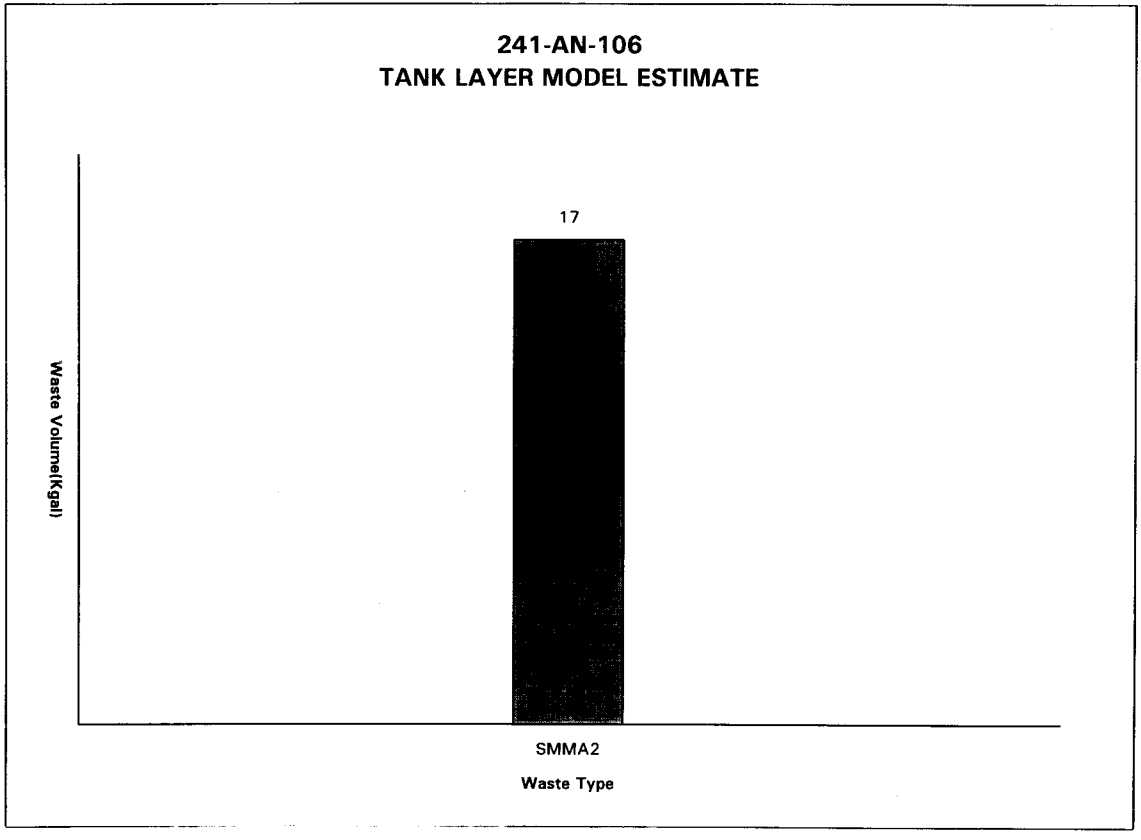
TANK RISER LOCATION

Approximate Grade Elevation Not Available



Ref: H-2-71975, Rev.2

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AN-106

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

HDW Model Rev. 4

Double-Shell Tank 241-AN-106

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	1.15E+05 (kg)	(21.0 kgal)	----	----	----	----	----
Heat Load	0.121 (kW)	(413 BTU/hr)	----	0.113	0.117	0.125	0.128
Bulk Density*	1.45 (g/cc)	----	----	1.42	1.43	1.46	1.47
Water wt%	45.5	----	----	43.7	44.5	46.5	47.7
TOC wt% C (wet	0.829	----	----	0.505	0.664	0.994	1.15

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	10.4	1.65E+05	1.90E+04	9.75	10.1	10.7	10.9
Al3+	1.20	2.24E+04	2.57E+03	1.08	1.16	1.23	1.27
Fe3+ (total Fe)	8.85E-03	342	39.3	7.78E-03	8.30E-03	9.39E-03	9.92E-03
Cr3+	9.91E-02	3.56E+03	410	8.61E-02	9.31E-02	0.102	0.105
Ba3+	9.01E-04	130	15.0	8.37E-04	8.68E-04	9.34E-04	9.65E-04
La3+	1.81E-05	1.74	0.200	1.33E-05	1.56E-05	2.06E-05	2.30E-05
Hg2+	6.73E-06	0.934	0.107	6.39E-06	6.59E-06	6.82E-06	6.91E-06
Zr (as ZrO(OH)2)	1.53E-04	9.63	1.11	1.41E-04	1.45E-04	1.58E-04	1.64E-04
Pb2+	8.32E-04	119	13.7	7.05E-04	7.67E-04	8.96E-04	9.59E-04
Ni2+	5.78E-03	235	27.0	5.62E-03	5.70E-03	5.86E-03	5.93E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	2.98E-03	113	13.0	2.47E-03	2.72E-03	3.24E-03	3.49E-03
Ca2+	3.03E-02	840	96.5	2.73E-02	2.88E-02	3.18E-02	3.32E-02
K+	4.80E-02	1.30E+03	149	4.41E-02	4.57E-02	5.06E-02	5.41E-02
OH-	7.00	8.23E+04	9.46E+03	6.44	6.79	7.22	7.33
NO3-	3.46	1.48E+05	1.71E+04	3.25	3.38	3.52	3.57
NO2-	1.73	5.52E+04	6.34E+03	1.52	1.62	1.86	1.96
CO32-	0.352	1.46E+04	1.68E+03	0.317	0.334	0.369	0.381
PO43-	0.184	1.21E+04	1.39E+03	0.165	0.174	0.193	0.203
SO42-	0.192	1.27E+04	1.46E+03	0.163	0.177	0.208	0.220
Si (as SiO32-)	5.50E-02	1.07E+03	123	4.77E-02	5.13E-02	5.88E-02	6.24E-02
F-	4.78E-02	629	72.2	4.22E-02	4.46E-02	5.06E-02	5.46E-02
Cl-	0.175	4.28E+03	492	0.161	0.167	0.181	0.185
C6H5O73-	2.18E-02	2.85E+03	327	1.98E-02	2.08E-02	2.28E-02	2.37E-02
EDTA4-	1.72E-02	3.43E+03	394	5.59E-03	1.13E-02	2.32E-02	2.90E-02
HEDTA3-	3.09E-02	5.86E+03	674	7.73E-03	1.91E-02	4.29E-02	5.45E-02
glycolate-	8.45E-02	4.59E+03	504	5.85E-02	7.12E-02	9.79E-02	0.111
acetate-	1.10E-02	450	51.7	9.04E-03	9.88E-03	1.22E-02	1.41E-02
oxalate2-	2.37E-05	1.45	0.166	2.11E-05	2.24E-05	2.51E-05	2.64E-05
DBP	1.64E-02	2.38E+03	273	1.45E-02	1.53E-02	1.75E-02	1.92E-02
butanol	1.64E-02	838	96.3	1.45E-02	1.53E-02	1.75E-02	1.92E-02
NH3	5.30E-02	623	71.6	4.47E-02	4.80E-02	5.94E-02	6.69E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-106

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	1.15E+05 (kg)	(21.0 kgal)	----	----	----	----	----
Heat Load	0.121 (kW)	(413 BTU/hr)	----	0.113	0.117	0.125	0.128
Bulk Density†	1.45 (g/cc)	----	----	1.42	1.43	1.46	1.47
Water wt%†	45.5	----	----	43.7	44.5	46.5	47.7
TOC wt% C (wet	0.829	----	----	0.505	0.664	0.994	1.15

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	10.4	1.65E+05	1.90E+04	9.75	10.1	10.7	10.9
Al3+	1.20	2.24E+04	2.57E+03	1.08	1.16	1.23	1.27
Fe3+ (total Fe)	8.85E-03	342	39.3	7.78E-03	8.30E-03	9.39E-03	9.92E-03
Cr3+	9.91E-02	3.56E+03	410	8.61E-02	9.31E-02	0.102	0.105
Bi3+	9.01E-04	130	15.0	8.37E-04	8.68E-04	9.34E-04	9.65E-04
La3+	1.81E-05	1.74	0.200	1.33E-05	1.56E-05	2.06E-05	2.30E-05
Hg2+	6.73E-06	0.934	0.107	6.39E-06	6.59E-06	6.82E-06	6.91E-06
Zr (as ZrO(OH)2)	1.53E-04	9.63	1.11	1.41E-04	1.45E-04	1.58E-04	1.64E-04
Pb2+	8.32E-04	119	13.7	7.05E-04	7.67E-04	8.96E-04	9.59E-04
Ni2+	5.78E-03	235	27.0	5.62E-03	5.70E-03	5.86E-03	5.93E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	2.98E-03	113	13.0	2.47E-03	2.72E-03	3.24E-03	3.49E-03
Ca2+	3.03E-02	840	96.5	2.73E-02	2.88E-02	3.18E-02	3.32E-02
K+	4.80E-02	1.30E+03	149	4.41E-02	4.57E-02	5.06E-02	5.41E-02
OH-	7.00	8.23E+04	9.46E+03	6.44	6.79	7.22	7.33
NO3-	3.46	1.48E+05	1.71E+04	3.25	3.38	3.52	3.57
NO2-	1.73	5.52E+04	6.34E+03	1.52	1.62	1.86	1.96
CO32-	0.352	1.46E+04	1.68E+03	0.317	0.334	0.369	0.381
PO43-	0.184	1.21E+04	1.39E+03	0.165	0.174	0.193	0.203
SO42-	0.192	1.27E+04	1.46E+03	0.163	0.177	0.208	0.220
Si (as SiO32-)	5.50E-02	1.07E+03	123	4.77E-02	5.13E-02	5.88E-02	6.24E-02
F-	4.78E-02	629	72.2	4.22E-02	4.46E-02	5.06E-02	5.46E-02
Cl-	0.175	4.28E+03	492	0.161	0.167	0.181	0.185
C6H5O73-	2.18E-02	2.85E+03	327	1.98E-02	2.08E-02	2.28E-02	2.37E-02
EDTA4-	1.72E-02	3.43E+03	394	5.59E-03	1.13E-02	2.32E-02	2.90E-02
HEDTA3-	3.09E-02	5.86E+03	674	7.73E-03	1.91E-02	4.29E-02	5.45E-02
glycolate-	8.45E-02	4.39E+03	504	5.85E-02	7.12E-02	9.79E-02	0.111
acetate-	1.10E-02	450	51.7	9.04E-03	9.88E-03	1.22E-02	1.41E-02
oxalate2-	2.37E-05	1.45	0.166	2.11E-05	2.24E-05	2.51E-05	2.64E-05
DBP	1.64E-02	2.38E+03	273	1.45E-02	1.53E-02	1.75E-02	1.92E-02
butanol	1.64E-02	838	96.3	1.45E-02	1.53E-02	1.75E-02	1.92E-02
NH3	5.30E-02	623	71.6	4.47E-02	4.80E-02	5.94E-02	6.69E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-106

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AN-106

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	1.15E+05 (kg)	(21.0 kgal)	----	----	----	----	----
Heat Load	0.121 (kW)	(413 BTU/hr)	----	0.113	0.117	0.125	0.128
Bulk Density*	1.45 (g/cc)	----	----	1.42	1.43	1.46	1.47
Water wt%†	45.5	----	----	43.7	44.5	46.5	47.7
TOC wt% C (wet	0.829	----	----	0.505	0.664	0.994	1.15

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.75E-04	0.121	13.9	1.10E-04	1.10E-04	1.84E-04	1.96E-04
C-14	2.62E-05	1.81E-02	2.08	1.25E-05	1.25E-05	2.66E-05	2.69E-05
Ni-59	1.54E-06	1.07E-03	0.123	9.00E-07	9.00E-07	1.58E-06	1.61E-06
Ni-63	1.52E-04	0.105	12.1	8.80E-05	8.80E-05	1.55E-04	1.58E-04
Co-60	3.16E-05	2.19E-02	2.51	1.59E-05	1.59E-05	3.22E-05	3.29E-05
Se-79	2.64E-06	1.83E-03	0.210	1.77E-06	1.77E-06	2.96E-06	3.26E-06
Sr-90	8.32E-02	57.5	6.61E+03	7.85E-02	8.10E-02	8.54E-02	8.75E-02
Y-90	8.32E-02	57.5	6.61E+03	5.30E-02	5.30E-02	8.54E-02	8.75E-02
Zr-93	1.30E-05	8.98E-03	1.03	8.62E-06	8.62E-06	1.46E-05	1.61E-05
Nb-93m	9.38E-06	6.49E-03	0.746	6.33E-06	6.33E-06	1.05E-05	1.16E-05
Tc-99	1.94E-04	0.134	15.4	1.43E-04	1.68E-04	2.20E-04	2.45E-04
Ru-106	5.74E-09	3.97E-06	4.56E-04	3.71E-09	3.71E-09	6.19E-09	6.60E-09
Cd-113m	6.96E-05	4.81E-02	5.53	4.34E-05	4.34E-05	7.91E-05	8.82E-05
Sb-125	1.42E-04	9.85E-02	11.3	7.45E-05	7.45E-05	1.46E-04	1.50E-04
Sn-126	4.00E-06	2.76E-03	0.318	2.68E-06	2.68E-06	4.47E-06	4.92E-06
I-129	3.74E-07	2.59E-04	2.97E-02	2.75E-07	3.24E-07	4.25E-07	4.74E-07
Cs-134	4.90E-06	3.39E-03	0.389	4.02E-06	4.45E-06	5.35E-06	5.79E-06
Cs-137	0.205	142	1.63E+04	0.185	0.195	0.215	0.225
Ba-137m	0.194	134	1.54E+04	0.164	0.164	0.204	0.213
Sm-151	9.31E-03	6.44	740	6.25E-03	6.25E-03	1.04E-02	1.15E-02
Eu-152	3.31E-06	2.29E-03	0.263	2.22E-06	2.22E-06	3.63E-06	3.94E-06
Eu-154	5.01E-04	0.346	39.8	2.82E-04	2.82E-04	5.80E-04	6.11E-04
Eu-155	1.97E-04	0.137	15.7	1.33E-04	1.33E-04	2.17E-04	2.36E-04
Ra-226	1.07E-10	7.38E-08	8.48E-06	7.97E-11	7.97E-11	1.17E-10	1.26E-10
Ra-228	1.97E-07	1.36E-04	1.57E-02	8.32E-08	8.32E-08	2.27E-07	2.59E-07
Ac-227	6.66E-10	4.61E-07	5.29E-05	5.09E-10	5.09E-10	7.23E-10	7.77E-10
Pa-231	3.11E-09	2.15E-06	2.47E-04	2.24E-09	2.24E-09	3.43E-09	3.73E-09
Th-229	4.59E-09	3.17E-06	3.65E-04	1.95E-09	1.95E-09	5.24E-09	5.93E-09
Th-232	1.95E-08	1.35E-05	1.55E-03	5.35E-09	5.35E-09	2.33E-08	2.70E-08
U-232	6.83E-07	4.73E-04	5.43E-02	4.82E-07	5.80E-07	8.02E-07	9.29E-07
U-233	2.62E-06	1.81E-03	0.208	1.85E-06	2.23E-06	3.08E-06	3.56E-06
U-234	5.56E-07	3.84E-04	4.42E-02	5.37E-07	5.47E-07	5.65E-07	5.71E-07
U-235	2.23E-08	1.54E-05	1.77E-03	2.15E-08	2.19E-08	2.27E-08	2.29E-08
U-236	1.79E-08	1.24E-05	1.42E-03	1.73E-08	1.77E-08	1.81E-08	1.83E-08
U-238	7.05E-07	4.88E-04	5.61E-02	6.88E-07	6.97E-07	7.15E-07	7.23E-07
Np-237	6.89E-07	4.76E-04	5.48E-02	5.22E-07	6.03E-07	7.75E-07	8.58E-07
Pu-238	1.06E-06	7.34E-04	8.43E-02	8.65E-07	9.61E-07	1.16E-06	1.26E-06
Pu-239	3.51E-05	2.43E-02	2.79	3.01E-05	3.25E-05	3.76E-05	4.01E-05
Pu-240	6.07E-06	4.20E-03	0.482	5.13E-06	5.59E-06	6.54E-06	7.00E-06
Pu-241	7.31E-05	5.05E-02	5.81	5.97E-05	6.63E-05	7.99E-05	8.65E-05
Pu-242	4.01E-10	2.77E-07	3.19E-05	3.21E-10	3.60E-10	4.42E-10	4.81E-10
Am-241	4.54E-05	3.14E-02	3.61	3.62E-05	4.07E-05	5.02E-05	5.47E-05
Am-243	1.72E-09	1.19E-06	1.36E-04	1.32E-09	1.50E-09	1.97E-09	2.18E-09
Cm-242	1.19E-07	8.20E-05	9.43E-03	7.41E-08	7.41E-08	1.31E-07	1.43E-07
Cm-243	1.12E-08	7.72E-06	8.87E-04	6.92E-09	6.92E-09	1.23E-08	1.33E-08
Cm-244	9.89E-08	6.84E-05	7.86E-03	5.52E-08	5.52E-08	1.14E-07	1.23E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	4.26E-04 (g/L)	----	3.38E-02	3.31E-04	3.77E-04	4.74E-04	5.20E-04
U	6.28E-03	1.03E+03	119	6.07E-03	6.17E-03	6.41E-03	6.46E-03

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-106

Total Inventory Estimate*

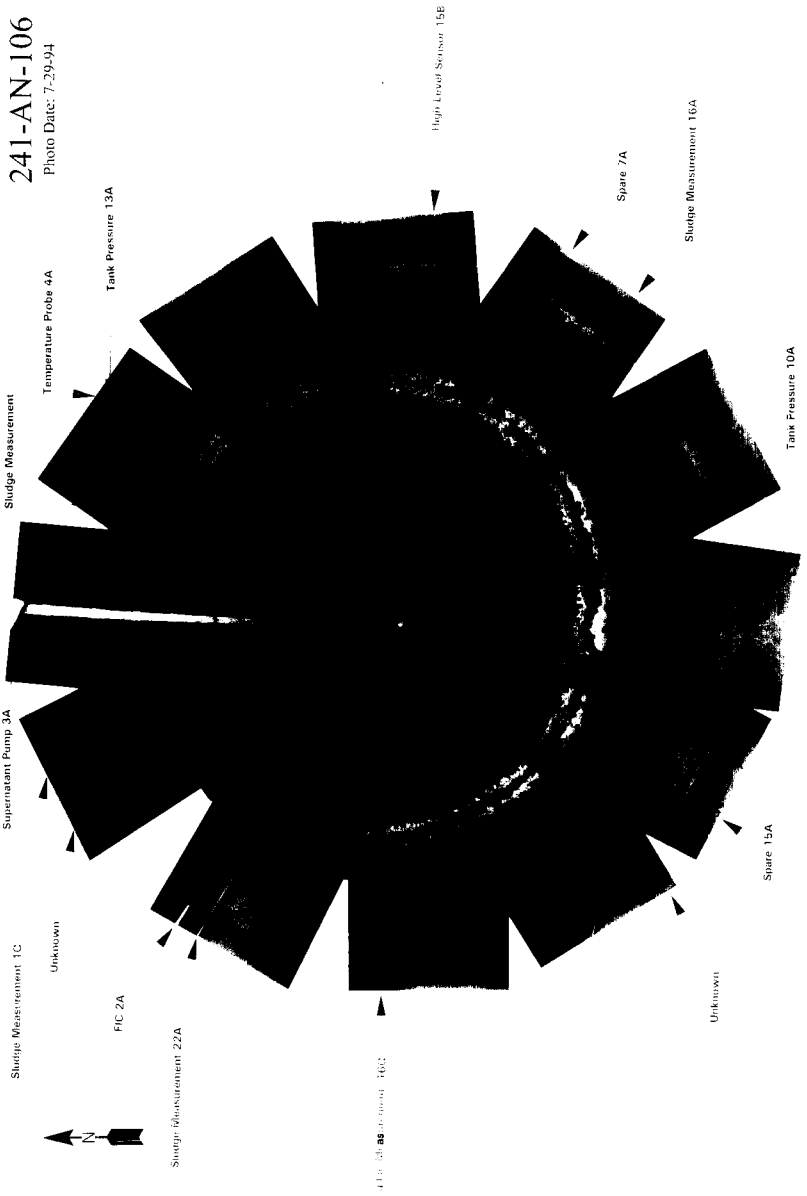
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	1.15E+05 (kg)	(21.0 kgal)	----	----	----	----	----
Heat Load	0.121 (kW)	(413 BTU/hr)	----	0.113	0.117	0.125	0.128
Bulk Density†	1.45 (g/cc)	----	----	1.42	1.43	1.46	1.47
Water wt%†	45.5	----	----	43.7	44.5	46.5	47.7
TOC wt% C (wet	0.829	----	----	0.505	0.664	0.994	1.15

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.75E-04	0.121	13.9	1.10E-04	1.10E-04	1.84E-04	1.96E-04
C-14	2.62E-05	1.81E-02	2.08	1.25E-05	1.25E-05	2.66E-05	2.69E-05
Ni-59	1.54E-06	1.07E-03	0.123	9.00E-07	9.00E-07	1.58E-06	1.61E-06
Ni-63	1.52E-04	0.105	12.1	8.80E-05	8.80E-05	1.55E-04	1.58E-04
Co-60	3.16E-05	2.19E-02	2.51	1.59E-05	1.59E-05	3.22E-05	3.29E-05
Se-79	2.64E-06	1.83E-03	0.210	1.77E-06	1.77E-06	2.96E-06	3.26E-06
Sr-90	8.32E-02	57.5	6.61E+03	7.85E-02	8.10E-02	8.54E-02	8.75E-02
Y-90	8.32E-02	57.5	6.61E+03	5.30E-02	5.30E-02	8.54E-02	8.75E-02
Zr-93	1.30E-05	8.98E-03	1.03	8.62E-06	8.62E-06	1.46E-05	1.61E-05
Nb-93m	9.38E-06	6.49E-03	0.746	6.33E-06	6.33E-06	1.05E-05	1.16E-05
Tc-99	1.94E-04	0.134	15.4	1.43E-04	1.68E-04	2.20E-04	2.45E-04
Ru-106	5.74E-09	3.97E-06	4.56E-04	3.71E-09	3.71E-09	6.19E-09	6.60E-09
Cd-113m	6.96E-05	4.81E-02	5.53	4.34E-05	4.34E-05	7.91E-05	8.82E-05
Sb-125	1.42E-04	9.85E-02	11.3	7.45E-05	7.45E-05	1.46E-04	1.50E-04
Sn-126	4.00E-06	2.76E-03	0.318	2.68E-06	2.68E-06	4.47E-06	4.92E-06
I-129	3.74E-07	2.59E-04	2.97E-02	2.75E-07	3.24E-07	4.25E-07	4.74E-07
Cs-134	4.90E-06	3.39E-03	0.389	4.02E-06	4.45E-06	5.35E-06	5.79E-06
Cs-137	0.205	142	1.63E+04	0.185	0.195	0.215	0.225
Ba-137m	0.194	134	1.54E+04	0.164	0.164	0.204	0.213
Sm-151	9.31E-03	6.44	740	6.25E-03	6.25E-03	1.04E-02	1.15E-02
Eu-152	3.31E-06	2.29E-03	0.263	2.22E-06	2.22E-06	3.63E-06	3.94E-06
Eu-154	5.01E-04	0.346	39.8	2.82E-04	2.82E-04	5.80E-04	6.11E-04
Eu-155	1.97E-04	0.137	15.7	1.33E-04	1.33E-04	2.17E-04	2.36E-04
Ra-226	1.07E-10	7.38E-08	8.48E-06	7.97E-11	7.97E-11	1.17E-10	1.26E-10
Ra-228	1.97E-07	1.36E-04	1.57E-02	8.32E-08	8.32E-08	2.27E-07	2.59E-07
Ac-227	6.66E-10	4.61E-07	5.29E-05	5.09E-10	5.09E-10	7.23E-10	7.77E-10
Pa-231	3.11E-09	2.15E-06	2.47E-04	2.24E-09	2.24E-09	3.43E-09	3.73E-09
Th-229	4.59E-09	3.17E-06	3.65E-04	1.95E-09	1.95E-09	5.24E-09	5.93E-09
Th-232	1.95E-08	1.35E-05	1.55E-03	5.35E-09	5.35E-09	2.33E-08	2.70E-08
U-232	6.83E-07	4.73E-04	5.43E-02	4.82E-07	5.80E-07	8.02E-07	9.29E-07
U-233	2.62E-06	1.81E-03	0.208	1.85E-06	2.23E-06	3.08E-06	3.56E-06
U-234	5.56E-07	3.84E-04	4.42E-02	5.37E-07	5.47E-07	5.65E-07	5.71E-07
U-235	2.23E-08	1.54E-05	1.77E-03	2.15E-08	2.19E-08	2.27E-08	2.29E-08
U-236	1.79E-08	1.24E-05	1.42E-03	1.73E-08	1.77E-08	1.81E-08	1.83E-08
U-238	7.05E-07	4.88E-04	5.61E-02	6.88E-07	6.97E-07	7.15E-07	7.23E-07
Np-237	6.89E-07	4.76E-04	5.48E-02	5.22E-07	6.03E-07	7.75E-07	8.58E-07
Pu-238	1.06E-06	7.34E-04	8.43E-02	8.65E-07	9.61E-07	1.16E-06	1.26E-06
Pu-239	3.51E-05	2.43E-02	2.79	3.01E-05	3.25E-05	3.76E-05	4.01E-05
Pu-240	6.07E-06	4.20E-03	0.482	5.13E-06	5.59E-06	6.54E-06	7.00E-06
Pu-241	7.31E-05	5.05E-02	5.81	5.97E-05	6.63E-05	7.99E-05	8.65E-05
Pu-242	4.01E-10	2.77E-07	3.19E-05	3.21E-10	3.60E-10	4.42E-10	4.81E-10
Am-241	4.54E-05	3.14E-02	3.61	3.62E-05	4.07E-05	5.02E-05	5.47E-05
Am-243	1.72E-09	1.19E-06	1.36E-04	1.32E-09	1.50E-09	1.97E-09	2.18E-09
Cm-242	1.19E-07	8.20E-05	9.43E-03	7.41E-08	7.41E-08	1.31E-07	1.43E-07
Cm-243	1.12E-08	7.72E-06	8.87E-04	6.92E-09	6.92E-09	1.23E-08	1.33E-08
Cm-244	9.89E-08	6.84E-05	7.86E-03	5.52E-08	5.52E-08	1.14E-07	1.23E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	4.26E-04 (g/L)	----	3.38E-02	3.31E-04	3.77E-04	4.74E-04	5.20E-04
U	6.28E-03	1.03E+03	119	6.07E-03	6.17E-03	6.41E-03	6.46E-03

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.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Sludge Measurement
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Tank Pressure 13A
Spare 15A
Unknown
Tank Pressure 10A
Spare 7A
Sludge Measurement 16A

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TANK 241-AN-107 SUMMARY

TANK HISTORY	
Entered Service	Sept 1981
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
10A, 13A, 15A, 21A	4 in
7B, 12A	12 in
TANK TEMPERATURE	
Average Tank Temperature	96°F
Maximum Temperature	102.74°F
Date	Sept 25, 1995
Elevation from tank bottom	38.33 ft
Riser Number	4A
Minimum Temperature	85.28°F
Date	Dec 8 -15, 1996*
Elevation from tank bottom	34.33 ft, 38.33 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	80
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	1,057,000 gal
Waste Type	CC
Drainable Interstitial Liquids	23,000 gal
Pumpable Liquids	811,000 gal
Saltcake	0 gal
Sludge	247,000 gal
Supernatant	810,000 gal
INTERIOR PHOTOGRAPHS	
Date	Sept 1, 1988
Montage Number	94080233-20CN
Photo Set Number	88090165
WASTE SURFACE LEVEL	
Devices	Auto/Man FIC & Man Tape
Max Level	392.75 in
Date	April 16, 1991
Min Level	383.7 in
Date	Dec 28, 1996 - Jan 12, 1997*

* Numerous dates in this time span.

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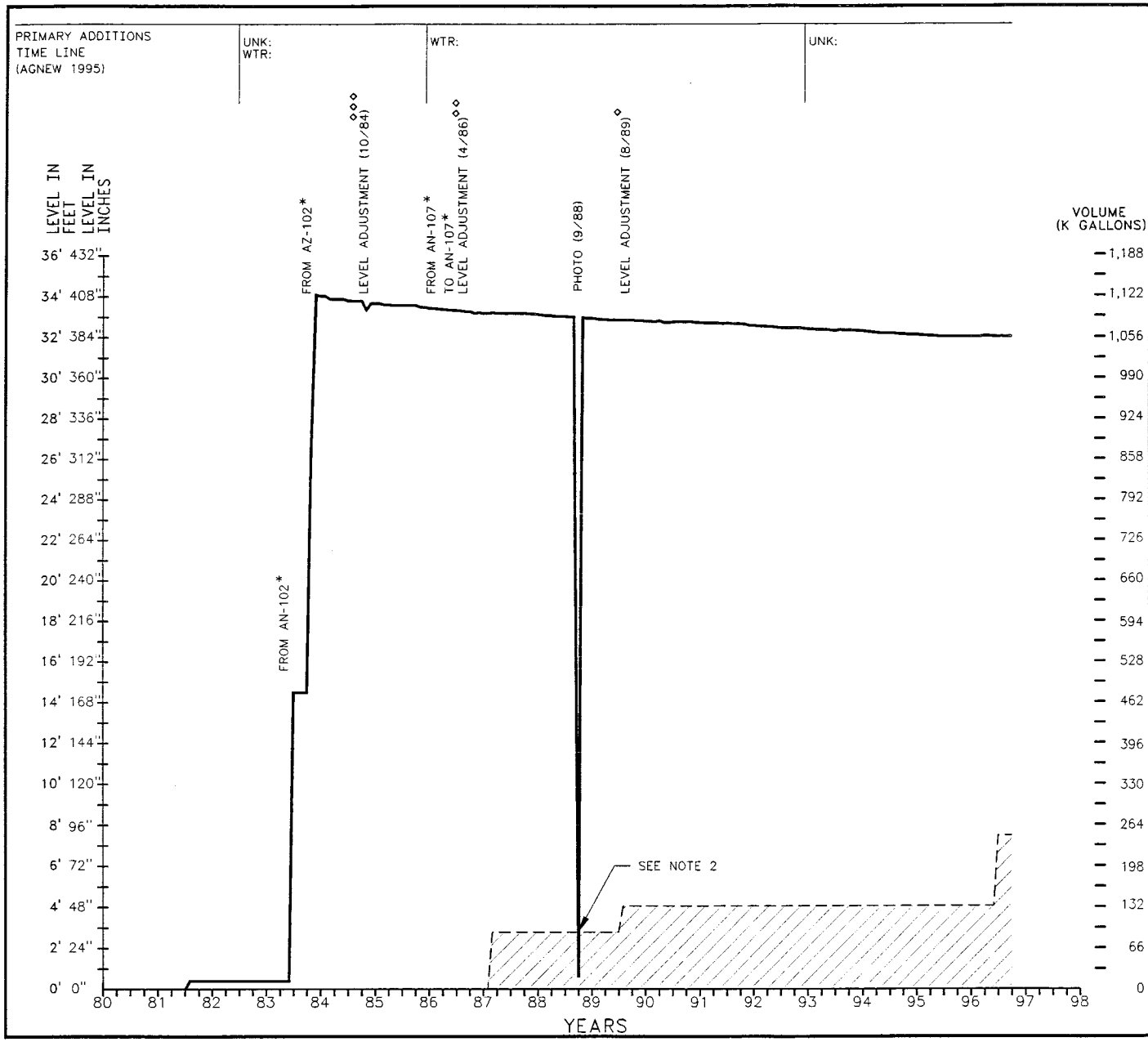


TANK INFO:

CONSTRUCTED 1980-1981
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- ◇ HANLON 1996l
- ◇◇ CARTER 1986a
- ◇◇◇ McCANN AND VAIL 1984k

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

2) DATA IS QUESTIONABLE BECAUSE MONTHLY WASTE STATUS REPORTS INDICATE SOLIDS WASTE IS GREATER THAN TOTAL WASTE.

GLOSSARY OF WASTE TERMS:

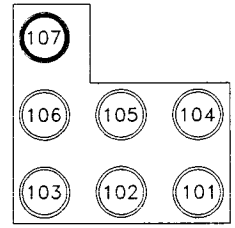
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

UNK: UNKNOWN
WTR: WATER

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

AN TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AN-107 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1981-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E156	2/97
SCALE NONE		JOB NO.	SHEET 1 OF 1

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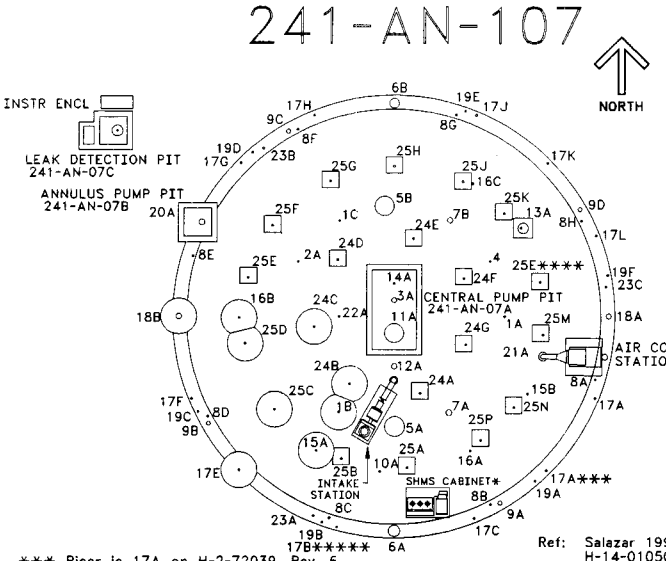
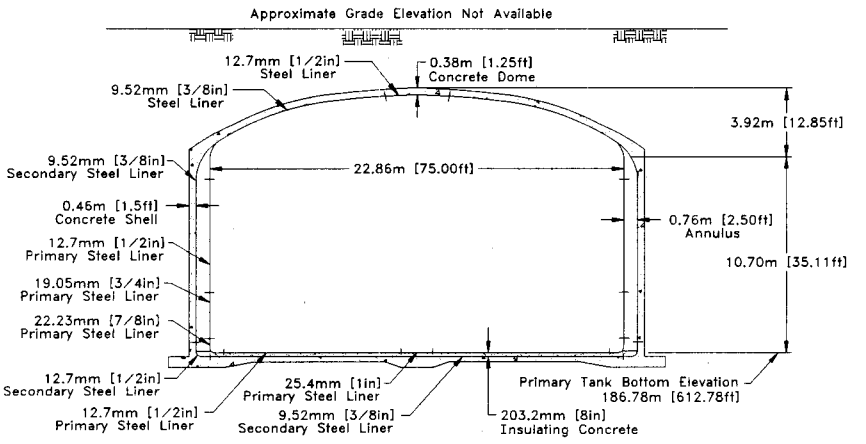
241-AN-107



*** Riser is 17A on H-2-72039, Rev. 6
and 17B on H-14-010501, Sht. 2, Rev. 1
**** Riser is 25E on H-2-72039, Rev. 6
and 25L on H-14-010501, Sht. 2, Rev. 1
**** Riser is 17B on H-2-72039, Rev. 6
and 17D on H-14-010501, Sht. 2, Rev. 1

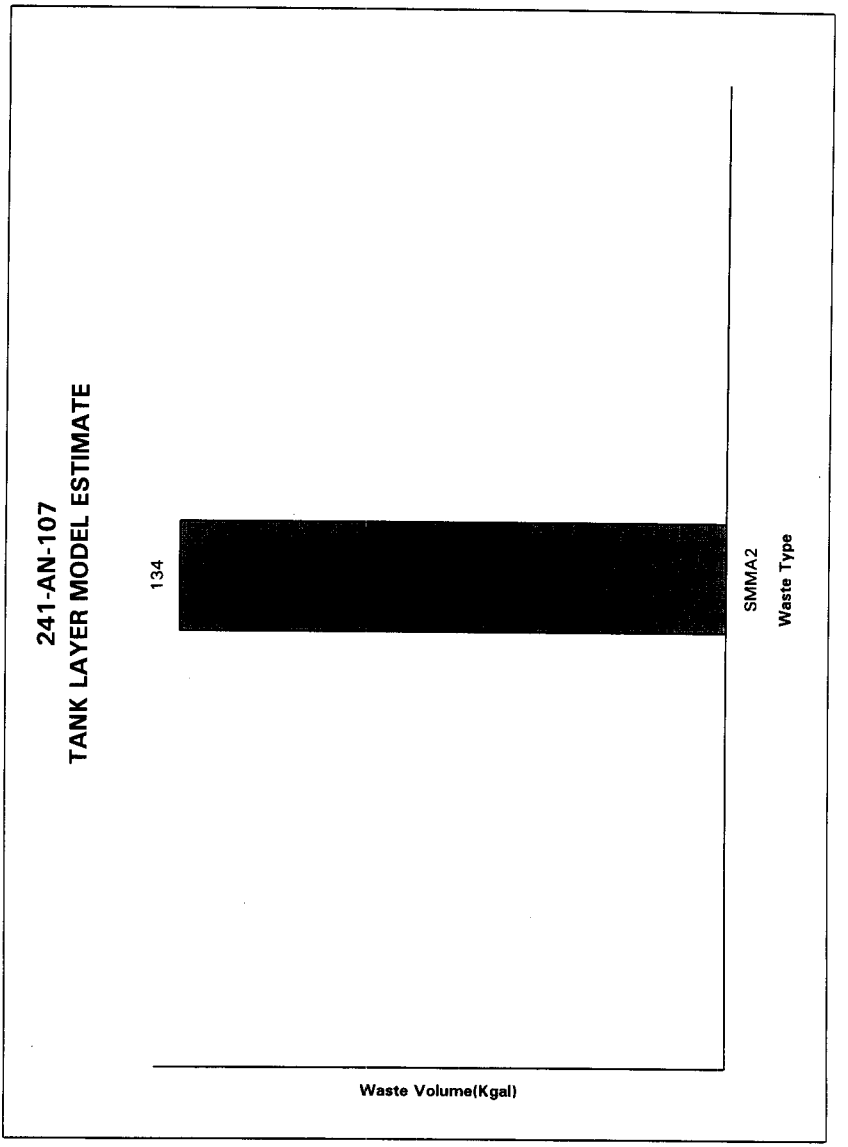
Ref: Salazar 1994
H-14-010501, Sh.2, Rev.1
H-2-72039, Rev.6
* ECN-637589
** ECN-624520 & ECN-624521

TANK RISER LOCATION



Ref: H-2-71160, Rev.1

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AN-107							
TLM Solids Composite Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AN-107

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	6.34E+06 (kg)	(1.06E+03 kgal)	----	----	----	----	----
Heat Load	7.77 (kW)	(2.65E+04 BTU/hr)	----	6.80	7.21	8.26	9.00
Bulk Density*	1.58 (g/cc)	----	----	1.48	1.54	1.60	1.62
Water wt%	36.2	----	----	32.7	33.9	38.6	41.7
TOC wt% C (wet	1.48	----	----	0.857	1.16	1.80	2.10

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	13.0	1.90E+05	1.20E+06	11.1	12.1	13.8	14.3
Al3+	1.68	2.88E+04	1.83E+05	1.25	1.59	1.72	1.76
Fe3+ (total Fe)	8.28E-03	293	1.86E+03	7.43E-03	7.85E-03	8.71E-03	9.13E-03
Cr3+	9.81E-02	3.23E+03	2.05E+04	8.20E-02	8.89E-02	0.107	0.120
Bi3+	1.24E-03	164	1.04E+03	1.12E-03	1.18E-03	1.30E-03	1.38E-03
La3+	1.20E-05	1.06	6.73	9.18E-06	1.06E-05	1.35E-05	1.49E-05
Hg2+	1.04E-05	1.33	8.41	9.78E-06	1.01E-05	1.07E-05	1.11E-05
Zr (as ZrO(OH)2)	1.20E-04	6.97	44.2	1.11E-04	1.14E-04	1.26E-04	1.36E-04
Pb2+	1.51E-03	198	1.26E+03	1.04E-03	1.27E-03	1.75E-03	1.98E-03
Ni2+	4.76E-03	177	1.12E+03	4.59E-03	4.67E-03	4.82E-03	4.87E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	5.08E-03	177	1.12E+03	4.38E-03	4.72E-03	5.44E-03	5.78E-03
Ca2+	2.61E-02	663	4.21E+03	2.38E-02	2.49E-02	2.72E-02	2.83E-02
K+	6.44E-02	1.60E+03	1.01E+04	5.01E-02	5.61E-02	7.41E-02	8.72E-02
OH-	9.09	9.80E+04	6.22E+05	7.03	8.52	9.30	9.59
NO3-	4.03	1.59E+05	1.01E+06	3.69	3.86	4.20	4.37
NO2-	2.38	6.94E+04	4.40E+05	1.62	1.94	2.85	2.98
CO32-	0.553	2.11E+04	1.34E+05	0.506	0.529	0.576	0.593
PO43-	0.100	6.03E+03	3.82E+04	8.08E-02	8.92E-02	0.109	0.120
SO42-	0.297	1.81E+04	1.15E+05	0.209	0.246	0.357	0.361
Si (as SiO32-)	7.03E-02	1.25E+03	7.95E+03	5.96E-02	6.49E-02	7.58E-02	8.11E-02
F-	7.10E-02	855	5.42E+03	5.57E-02	6.20E-02	8.09E-02	9.57E-02
Cl-	0.227	5.11E+03	3.24E+04	0.176	0.199	0.233	0.238
C6H5O73-	3.51E-02	4.21E+03	2.67E+04	3.07E-02	3.25E-02	3.78E-02	4.21E-02
EDTA4-	3.75E-02	6.86E+03	4.35E+04	1.29E-02	2.49E-02	5.02E-02	6.25E-02
HEDTA3-	6.53E-02	1.13E+04	7.20E+04	1.60E-02	4.01E-02	9.06E-02	0.115
glycolate-	0.144	6.87E+03	4.36E+04	9.53E-02	0.119	0.170	0.195
acetate-	3.13E-02	1.17E+03	7.43E+03	2.40E-02	2.71E-02	3.57E-02	4.26E-02
oxalate2-	1.58E-05	0.880	5.58	1.42E-05	1.50E-05	1.66E-05	1.73E-05
DBP	2.98E-02	3.97E+03	2.52E+04	2.30E-02	2.59E-02	3.40E-02	4.02E-02
butanol	2.98E-02	1.40E+03	8.89E+03	2.30E-02	2.59E-02	3.40E-02	4.02E-02
NH3	4.62E-02	499	3.16E+03	3.94E-02	4.19E-02	5.20E-02	6.08E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-107

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	6.34E+06 (kg)	(1.06E+03 kgal)	----	----	----	----	----
Heat Load	7.77 (kW)	(2.65E+04 BTU/hr)	----	6.80	7.21	8.26	9.00
Bulk Density†	1.58 (g/cc)	----	----	1.48	1.54	1.60	1.62
Water wt%†	36.2	----	----	32.7	33.9	38.6	41.7
TOC wt% C (wet	1.48	----	----	0.857	1.16	1.80	2.10

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	13.0	1.90E+05	1.20E+06	11.1	12.1	13.8	14.3
Al3+	1.68	2.88E+04	1.83E+05	1.25	1.59	1.72	1.76
Fe3+ (total Fe)	8.28E-03	293	1.86E+03	7.43E-03	7.85E-03	8.71E-03	9.13E-03
Cr3+	9.81E-02	3.23E+03	2.05E+04	8.20E-02	8.89E-02	0.107	0.120
Bi3+	1.24E-03	164	1.04E+03	1.12E-03	1.18E-03	1.30E-03	1.38E-03
La3+	1.20E-05	1.06	6.73	9.18E-06	1.06E-05	1.35E-05	1.49E-05
Hg2+	1.04E-05	1.33	8.41	9.78E-06	1.01E-05	1.07E-05	1.11E-05
Zr (as ZrO(OH)2)	1.20E-04	6.97	44.2	1.11E-04	1.14E-04	1.26E-04	1.36E-04
Pb2+	1.51E-03	198	1.26E+03	1.04E-03	1.27E-03	1.75E-03	1.98E-03
Ni2+	4.76E-03	177	1.12E+03	4.59E-03	4.67E-03	4.82E-03	4.87E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	5.08E-03	177	1.12E+03	4.38E-03	4.72E-03	5.44E-03	5.78E-03
Ca2+	2.61E-02	663	4.21E+03	2.38E-02	2.49E-02	2.72E-02	2.83E-02
K+	6.44E-02	1.60E+03	1.01E+04	5.01E-02	5.61E-02	7.41E-02	8.72E-02
OH-	9.09	9.80E+04	6.22E+05	7.03	8.52	9.30	9.59
NO3-	4.03	1.59E+05	1.01E+06	3.69	3.86	4.20	4.37
NO2-	2.38	6.94E+04	4.40E+05	1.62	1.94	2.85	2.98
CO32-	0.553	2.11E+04	1.34E+05	0.506	0.529	0.576	0.593
PO43-	0.100	6.03E+03	3.82E+04	8.08E-02	8.92E-02	0.109	0.120
SO42-	0.297	1.81E+04	1.15E+05	0.209	0.246	0.357	0.361
Si (as SiO32-)	7.03E-02	1.25E+03	7.95E+03	5.96E-02	6.49E-02	7.58E-02	8.11E-02
F-	7.10E-02	855	5.42E+03	5.57E-02	6.20E-02	8.09E-02	9.57E-02
Cl-	0.227	5.11E+03	3.24E+04	0.176	0.199	0.233	0.238
C6H5O73-	3.51E-02	4.21E+03	2.67E+04	3.07E-02	3.25E-02	3.78E-02	4.21E-02
EDTA4-	3.75E-02	6.86E+03	4.35E+04	1.29E-02	2.49E-02	5.02E-02	6.25E-02
HEDTA3-	6.53E-02	1.13E+04	7.20E+04	1.60E-02	4.01E-02	9.06E-02	0.115
glycolate-	0.144	6.87E+03	4.36E+04	9.53E-02	0.119	0.170	0.195
acetate-	3.13E-02	1.17E+03	7.43E+03	2.40E-02	2.71E-02	3.57E-02	4.26E-02
oxalate2-	1.58E-05	0.880	5.58	1.42E-05	1.50E-05	1.66E-05	1.73E-05
DBP	2.98E-02	3.97E+03	2.52E+04	2.30E-02	2.59E-02	3.40E-02	4.02E-02
butanol	2.98E-02	1.40E+03	8.89E+03	2.30E-02	2.59E-02	3.40E-02	4.02E-02
NH3	4.62E-02	499	3.16E+03	3.94E-02	4.19E-02	5.20E-02	6.08E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AN-107

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AN-107

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	6.34E+06 (kg)	(1.06E+03 kgal)	----	----	----	----	----
Heat Load	7.77 (kW)	(2.65E+04 BTU/hr)	----	6.80	7.21	8.26	9.00
Bulk Density*	1.58 (g/cc)	----	----	1.48	1.54	1.60	1.62
Water wt%†	36.2	----	----	32.7	33.9	38.6	41.7
TOC wt% C (wet	1.48	----	----	0.857	1.16	1.80	2.10

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	2.31E-04	0.147	929	1.23E-04	1.23E-04	2.50E-04	2.74E-04
C-14	3.67E-05	2.33E-02	148	1.89E-05	1.89E-05	3.78E-05	3.88E-05
Ni-59	1.61E-06	1.02E-03	6.49	1.10E-06	1.10E-06	1.64E-06	1.66E-06
Ni-63	1.59E-04	0.101	642	1.09E-04	1.09E-04	1.62E-04	1.65E-04
Co-60	4.98E-05	3.16E-02	200	2.35E-05	2.35E-05	5.11E-05	5.26E-05
Se-79	3.59E-06	2.28E-03	14.5	2.31E-06	2.31E-06	4.06E-06	4.50E-06
Sr-90	0.105	66.8	4.24E+05	9.54E-02	0.103	0.107	0.109
Y-90	0.105	66.8	4.24E+05	8.13E-02	8.13E-02	0.107	0.109
Zr-93	1.77E-05	1.12E-02	71.3	1.13E-05	1.13E-05	2.00E-05	2.23E-05
Nb-93m	1.27E-05	8.03E-03	51.0	8.19E-06	8.19E-06	1.43E-05	1.58E-05
Tc-99	2.89E-04	0.184	1.16E+03	1.96E-04	2.38E-04	3.47E-04	4.25E-04
Ru-106	8.85E-09	5.61E-06	3.56E-02	5.65E-09	5.65E-09	1.00E-08	1.11E-08
Cd-113m	9.91E-05	6.29E-02	399	6.07E-05	6.07E-05	1.13E-04	1.26E-04
Sb-125	2.36E-04	0.150	951	1.18E-04	1.18E-04	2.44E-04	2.52E-04
Sn-126	5.42E-06	3.44E-03	21.8	3.50E-06	3.50E-06	6.12E-06	6.78E-06
I-129	5.60E-07	3.55E-04	2.25	3.79E-07	4.60E-07	6.71E-07	8.23E-07
Cs-134	1.42E-05	8.99E-03	57.1	1.12E-05	1.27E-05	1.57E-05	1.72E-05
Cs-137	0.261	165	1.05E+06	0.209	0.231	0.287	0.326
Ba-137m	0.247	156	9.92E+05	0.173	0.173	0.263	0.279
Sm-151	1.26E-02	8.01	5.08E+04	8.15E-03	8.15E-03	1.43E-02	1.58E-02
Eu-152	4.97E-06	3.15E-03	20.0	3.64E-06	3.86E-06	5.65E-06	6.31E-06
Eu-154	7.52E-04	0.477	3.03E+03	4.32E-04	4.32E-04	8.68E-04	9.79E-04
Eu-155	3.02E-04	0.192	1.22E+03	2.21E-04	2.35E-04	3.44E-04	3.85E-04
Ra-226	1.31E-10	8.34E-08	5.29E-04	9.18E-11	9.18E-11	1.46E-10	1.60E-10
Ra-228	5.10E-07	3.23E-04	2.05	9.00E-08	9.00E-08	5.42E-07	5.76E-07
Ac-227	8.11E-10	5.15E-07	3.26E-03	5.81E-10	5.81E-10	8.95E-10	9.75E-10
Pa-231	3.98E-09	2.52E-06	1.60E-02	2.70E-09	2.70E-09	4.44E-09	4.88E-09
Th-229	1.18E-08	7.48E-06	4.74E-02	2.10E-09	2.10E-09	1.25E-08	1.32E-08
Th-232	5.76E-08	3.65E-05	0.232	5.74E-09	5.74E-09	7.18E-08	8.54E-08
U-232	1.36E-06	8.65E-04	5.48	9.69E-07	1.13E-06	1.63E-06	1.92E-06
U-233	5.22E-06	3.31E-03	21.0	3.72E-06	4.32E-06	6.25E-06	7.35E-06
U-234	6.68E-07	4.23E-04	2.69	6.45E-07	6.56E-07	6.79E-07	6.90E-07
U-235	2.59E-08	1.65E-05	0.104	2.50E-08	2.55E-08	2.64E-08	2.69E-08
U-236	2.36E-08	1.50E-05	9.51E-02	2.24E-08	2.32E-08	2.41E-08	2.45E-08
U-238	1.01E-06	6.42E-04	4.07	9.91E-07	1.00E-06	1.02E-06	1.08E-06
Np-237	9.88E-07	6.27E-04	3.98	6.86E-07	8.21E-07	1.18E-06	1.43E-06
Pu-238	1.49E-06	9.42E-04	5.98	1.29E-06	1.38E-06	1.59E-06	1.70E-06
Pu-239	4.65E-05	2.95E-02	187	4.12E-05	4.38E-05	4.92E-05	5.18E-05
Pu-240	8.22E-06	5.22E-03	33.1	7.23E-06	7.72E-06	8.74E-06	9.24E-06
Pu-241	1.07E-04	6.76E-02	429	9.24E-05	9.92E-05	1.14E-04	1.22E-04
Pu-242	5.70E-10	3.61E-07	2.29E-03	4.86E-10	5.26E-10	6.16E-10	6.62E-10
Am-241	6.02E-05	3.82E-02	242	4.66E-05	5.33E-05	6.72E-05	7.38E-05
Am-243	2.46E-09	1.56E-06	9.91E-03	1.92E-09	2.17E-09	2.80E-09	3.09E-09
Cm-242	1.57E-07	9.98E-05	0.633	1.07E-07	1.22E-07	1.83E-07	2.09E-07
Cm-243	1.50E-08	9.50E-06	6.03E-02	1.05E-08	1.16E-08	1.73E-08	1.96E-08
Cm-244	1.15E-07	7.29E-05	0.463	8.03E-08	8.03E-08	1.27E-07	1.38E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	5.18E-04 (g/L)	----	2.08	4.28E-04	4.72E-04	5.63E-04	6.07E-04
U	7.26E-03	1.10E+03	6.95E+03	7.00E-03	7.13E-03	7.39E-03	7.52E-03

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

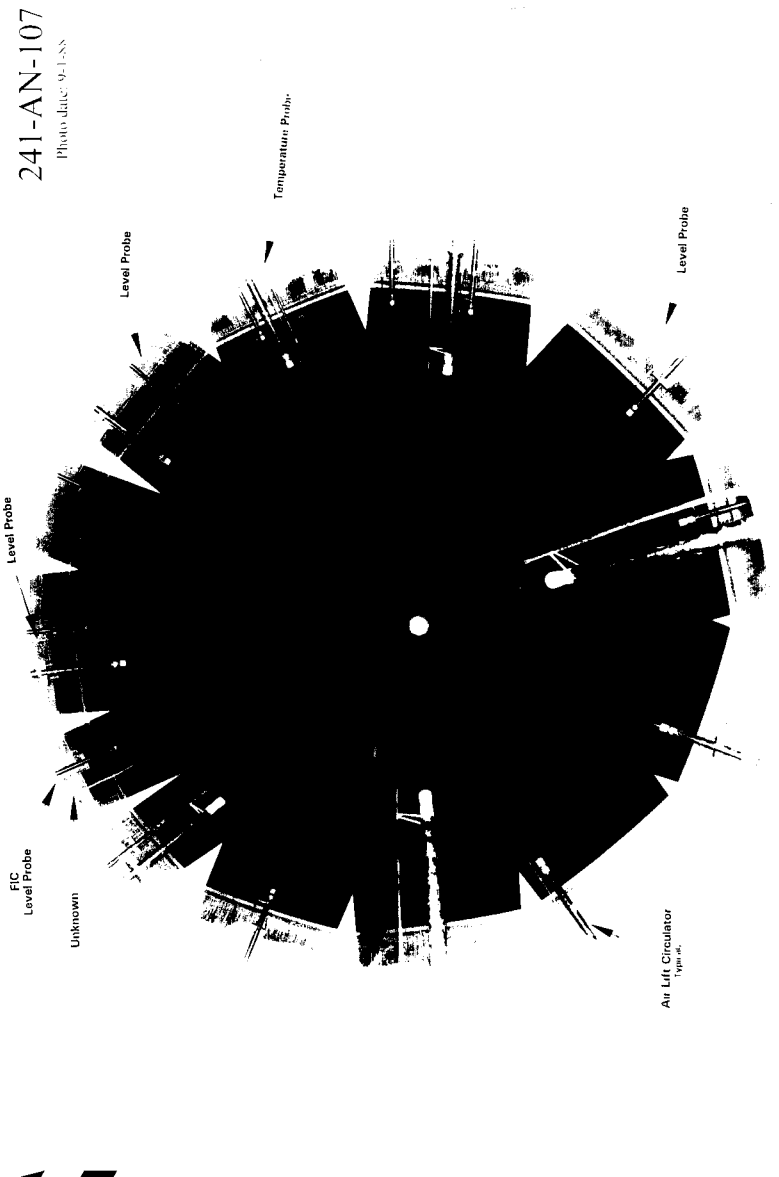
Double-Shell Tank 241-AN-107							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	6.34E+06 (kg)	(1.06E+03 kgal)	----	----	----	----	----
Heat Load	7.77 (kW)	(2.65E+04 BTU/hr)	----	6.80	7.21	8.26	9.00
Bulk Density†	1.58 (g/cc)	----	----	1.48	1.54	1.60	1.62
Water wt%†	36.2	----	----	32.7	33.9	38.6	41.7
TOC wt% C (wet	1.48	----	----	0.857	1.16	1.80	2.10

Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	2.31E-04	0.147	929	1.23E-04	1.23E-04	2.50E-04	2.74E-04
C-14	3.67E-05	2.33E-02	148	1.89E-05	1.89E-05	3.78E-05	3.88E-05
Ni-59	1.61E-06	1.02E-03	6.49	1.10E-06	1.10E-06	1.64E-06	1.66E-06
Ni-63	1.59E-04	0.101	642	1.09E-04	1.09E-04	1.62E-04	1.65E-04
Co-60	4.98E-05	3.16E-02	200	2.35E-05	2.35E-05	5.11E-05	5.26E-05
Se-79	3.59E-06	2.28E-03	14.5	2.31E-06	2.31E-06	4.06E-06	4.50E-06
Sr-90	0.105	66.8	4.24E+05	9.54E-02	0.103	0.107	0.109
Y-90	0.105	66.8	4.24E+05	8.13E-02	8.13E-02	0.107	0.109
Zr-93	1.77E-05	1.12E-02	71.3	1.13E-05	1.13E-05	2.00E-05	2.23E-05
Nb-93m	1.27E-05	8.03E-03	51.0	8.19E-06	8.19E-06	1.43E-05	1.58E-05
Tc-99	2.89E-04	0.184	1.16E+03	1.96E-04	2.38E-04	3.47E-04	4.25E-04
Ru-106	8.85E-09	5.61E-06	3.56E-02	5.65E-09	5.65E-09	1.00E-08	1.11E-08
Cd-113m	9.91E-05	6.29E-02	399	6.07E-05	6.07E-05	1.13E-04	1.26E-04
Sb-125	2.36E-04	0.150	951	1.18E-04	1.18E-04	2.44E-04	2.52E-04
Sn-126	5.42E-06	3.44E-03	21.8	3.50E-06	3.50E-06	6.12E-06	6.78E-06
I-129	5.60E-07	3.55E-04	2.25	3.79E-07	4.60E-07	6.71E-07	8.23E-07
Cs-134	1.42E-05	8.99E-03	57.1	1.12E-05	1.27E-05	1.57E-05	1.72E-05
Cs-137	0.261	165	1.05E+06	0.209	0.231	0.287	0.326
Ba-137m	0.247	156	9.92E+05	0.173	0.173	0.263	0.279
Sm-151	1.26E-02	8.01	5.08E+04	8.15E-03	8.15E-03	1.43E-02	1.58E-02
Eu-152	4.97E-06	3.15E-03	20.0	3.64E-06	3.86E-06	5.65E-06	6.31E-06
Eu-154	7.52E-04	0.477	3.03E+03	4.32E-04	4.32E-04	8.68E-04	9.79E-04
Eu-155	3.02E-04	0.192	1.22E+03	2.21E-04	2.35E-04	3.44E-04	3.85E-04
Ra-226	1.31E-10	8.34E-08	5.29E-04	9.18E-11	9.18E-11	1.46E-10	1.60E-10
Ra-228	5.10E-07	3.23E-04	2.05	9.00E-08	9.00E-08	5.42E-07	5.76E-07
Ac-227	8.11E-10	5.15E-07	3.26E-03	5.81E-10	5.81E-10	8.95E-10	9.75E-10
Pa-231	3.98E-09	2.52E-06	1.60E-02	2.70E-09	2.70E-09	4.44E-09	4.88E-09
Th-229	1.18E-08	7.48E-06	4.74E-02	2.10E-09	2.10E-09	1.25E-08	1.32E-08
Th-232	5.76E-08	3.65E-05	0.232	5.74E-09	5.74E-09	7.18E-08	8.54E-08
U-232	1.36E-06	8.65E-04	5.48	9.69E-07	1.13E-06	1.63E-06	1.92E-06
U-233	5.22E-06	3.31E-03	21.0	3.72E-06	4.32E-06	6.25E-06	7.35E-06
U-234	6.68E-07	4.23E-04	2.69	6.45E-07	6.56E-07	6.79E-07	6.90E-07
U-235	2.59E-08	1.65E-05	0.104	2.50E-08	2.55E-08	2.64E-08	2.69E-08
U-236	2.36E-08	1.50E-05	9.51E-02	2.24E-08	2.32E-08	2.41E-08	2.45E-08
U-238	1.01E-06	6.42E-04	4.07	9.91E-07	1.00E-06	1.02E-06	1.08E-06
Np-237	9.88E-07	6.27E-04	3.98	6.86E-07	8.21E-07	1.18E-06	1.43E-06
Pu-238	1.49E-06	9.42E-04	5.98	1.29E-06	1.38E-06	1.59E-06	1.70E-06
Pu-239	4.65E-05	2.95E-02	187	4.12E-05	4.38E-05	4.92E-05	5.18E-05
Pu-240	8.22E-06	5.22E-03	33.1	7.23E-06	7.72E-06	8.74E-06	9.24E-06
Pu-241	1.07E-04	6.76E-02	429	9.24E-05	9.92E-05	1.14E-04	1.22E-04
Pu-242	5.70E-10	3.61E-07	2.29E-03	4.86E-10	5.26E-10	6.16E-10	6.62E-10
Am-241	6.02E-05	3.82E-02	242	4.66E-05	5.33E-05	6.72E-05	7.38E-05
Am-243	2.46E-09	1.56E-06	9.91E-03	1.92E-09	2.17E-09	2.80E-09	3.09E-09
Cm-242	1.57E-07	9.98E-05	0.633	1.07E-07	1.22E-07	1.83E-07	2.09E-07
Cm-243	1.50E-08	9.50E-06	6.03E-02	1.05E-08	1.16E-08	1.73E-08	1.96E-08
Cm-244	1.15E-07	7.29E-05	0.463	8.03E-08	8.03E-08	1.27E-07	1.38E-07

Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	5.18E-04 (g/L)	----	2.08	4.28E-04	4.72E-04	5.63E-04	6.07E-04
U	7.26E-03	1.10E+03	6.95E+03	7.00E-03	7.13E-03	7.39E-03	7.52E-03

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

†Volume average for density, mass average Water wt% and TOC wt% C


241-AN-107
Photo date 9-1-88
Level Probe
FIC
Level Probe
Unknown
Level Probe
Temperature Probe
Level Probe
Air Lift Circulator

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3.0 241-AP Tank Farm

The AP Tank Farm is located in the 200 East Area south of 4th Street and east of Canton Avenue. The farm contains eight flat bottom design, double-shell tanks built between 1983 and 1986. The tanks are 75 feet in diameter with an operating capacity of 1,160,000 gallons. For more information on the design, construction, and waste contents of the tanks, refer to the AP Tank Farm Supporting Document, HNF-SD-WM-ER-315, Rev. 1 (Brevick et al., 1997b).

The 241-AP Tank Farm receives and/or sends liquid wastes via the 241-AW Tank Farm facilities (Leach and Stahl, 1993). The primary additions to the tanks were coating (cladding) waste (CWZr2), N-Reactor waste (N), PUREX ammonia scrubber feed waste (PASF), PUREX low-level waste (PL2), unknown waste (UNK), and water (WTR) (Agnew et al., 1995).

The following table presents a summary of the 241-AP Tank Farm. Refer to the glossary for waste type terminology.

TANK FARM 241-AP SUMMARY

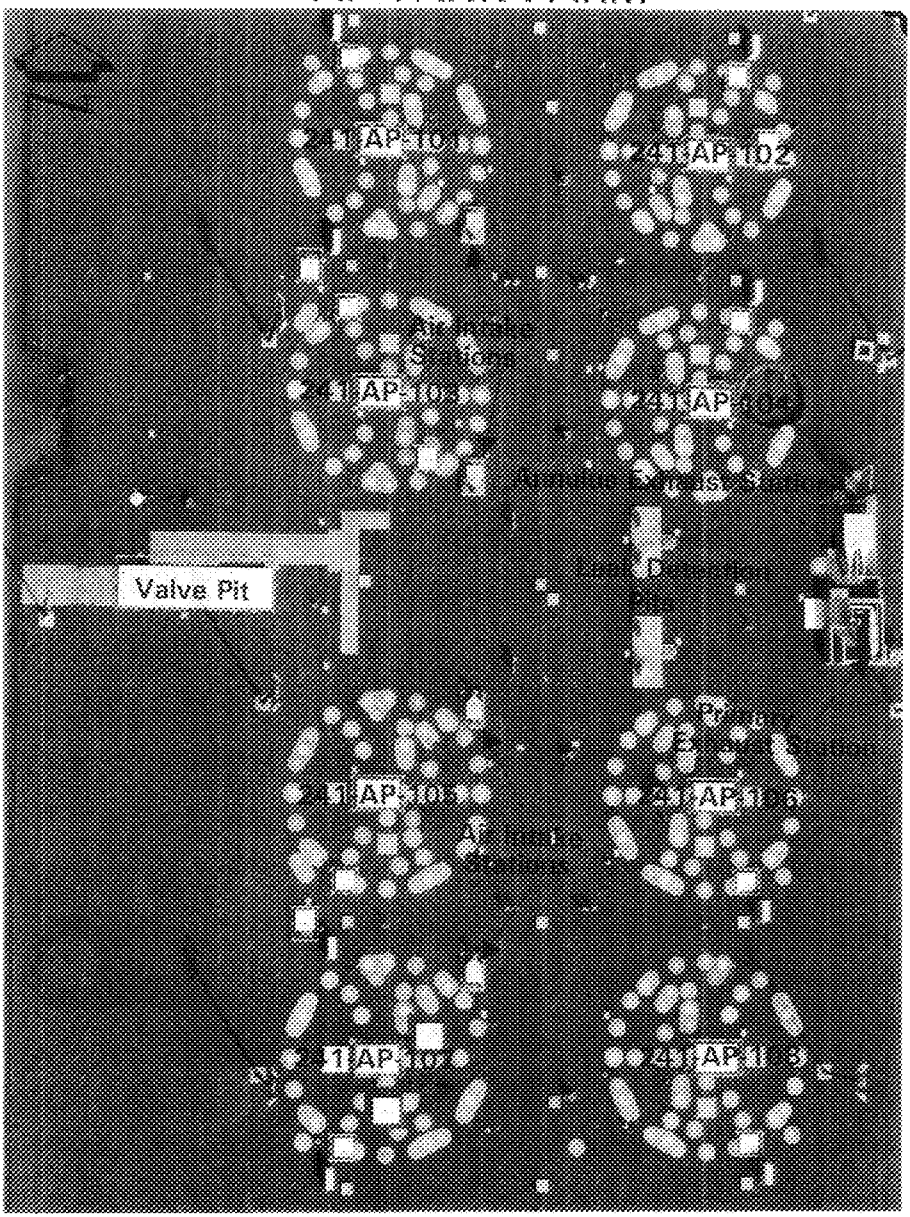
TANK FARM DESCRIPTION		WASTE VOLUME (HANLON 1996I)	
Shell Type	Double	Total Waste Volume	3,628,000 gal
Number of Tanks	8	Waste Type	DSSF, DN, PD
Construction Date	1983 - 1986	Drainable Interstitial Liquids	11,000 gal
INTEGRITY		Pumpable Liquids	3,473,000 gal
Sound	101, 102	Saltcake	0 gal
	103, 104	Sludge	155,000 gal
	105, 106	Supernatant	3,473,000 gal
	107, 108	**WATCH LISTS**	
TANK VOLUMES		Hydrogen	none
8@1,160,000 gal		Organic	none
		High Heat	none

The historical characterization and waste inventory information for each tank is assembled into a set of tables, sketches, graphs, and interior tank montage. The set consists of the following for each tank in AP Tank Farm:

- Tank Summary table
- Waste and Level History sketch
- Riser configuration sketch
- Tank Layer Model Estimate graph
- TLM Solids Composite Inventory Estimate tables
- SMM Composite Inventory Estimate tables
- Total Inventory Estimate tables
- Interior tank montage

The supporting document for this tank farm provides backup data and further explanation of the above tables, sketches, and graphs.

AP TANK FARM



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TANK 241-AP-101 SUMMARY

TANK HISTORY	
Entered Service	1986
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
1A, 1B, 1C, 15, 21, 24, 26, 28	4 in
10A, 10B, 12	12 in
TANK TEMPERATURE	
Average Tank Temperature	64°F
Maximum Temperature	74°F
Date	Sept 15, and Oct 16, 1995
Elevation from tank bottom	14.50 ft, 22.50 ft
Riser Number	4
Minimum Temperature	53°F
Date	April 3 and 17, 1995
Elevation from tank bottom	26.50 ft
Riser Number	4

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	71
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	1,043,000 gal
Waste Type	DSSF
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	1,043,000 gal
Saltcake	0 gal
Sludge	0 gal
Supernatant	1,043,000 gal
INTERIOR PHOTOGRAPHS	
Date	not available
Montage Number	not available
Photo Set Number	not available
WASTE SURFACE LEVEL	
Devices	Auto/Man FIC, Man Tape
Max Level	405.8 in
Date	Jan 14, 1997
Min Level	27 in
Date	Feb 27, and April 11, 1995

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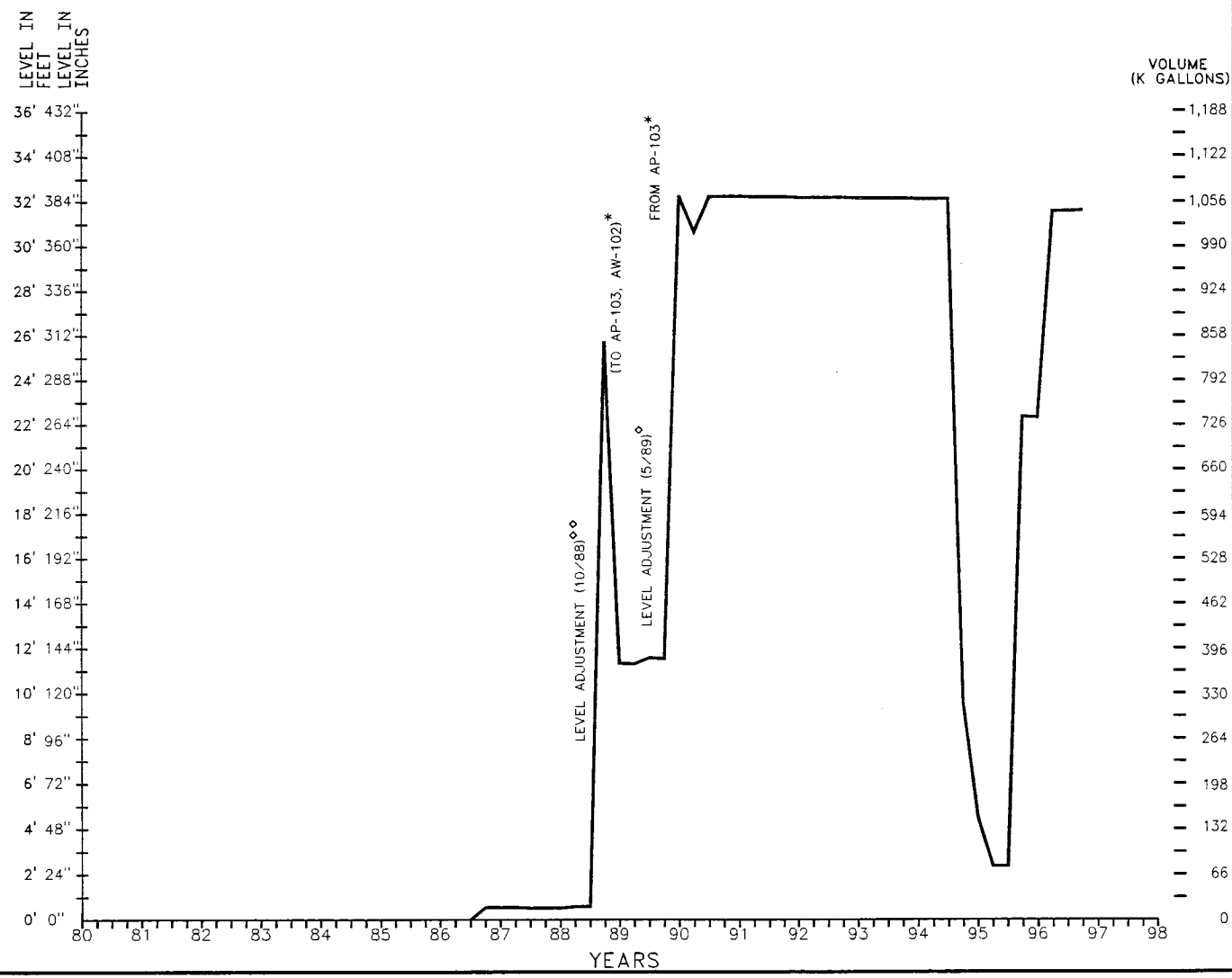
PRIMARY ADDITIONS
TIME LINE
(AGNEW 1995)

CWZR2
PASF:
UNK:
WTR:



TANK INFO:

CONSTRUCTED 1983-1986
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

* AGNEW 1995
◇ HANLON 1996l
◇◇ THURMAN 1988k

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

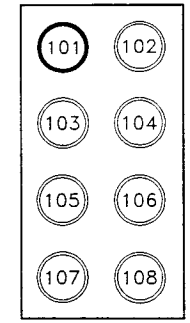
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

CWZR2: COATING (CLADDING) WASTE
PASF: PUREX AMMONIA SCRUBBER FEED
UNK: UNKNOWN
WTR: WATER

LEGEND

TOTAL WASTE LEVEL (SUPERNATE)

AP TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AP-101 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1986-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E157	2/97

SCALE NONE | JOB NO. | SHEET 1 OF 1

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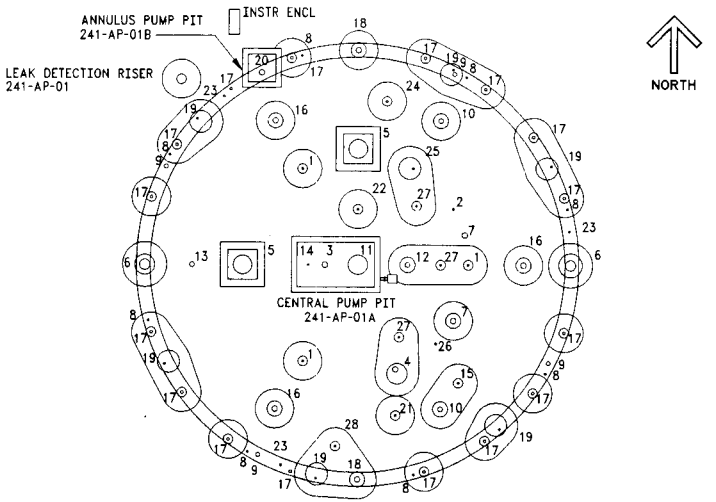
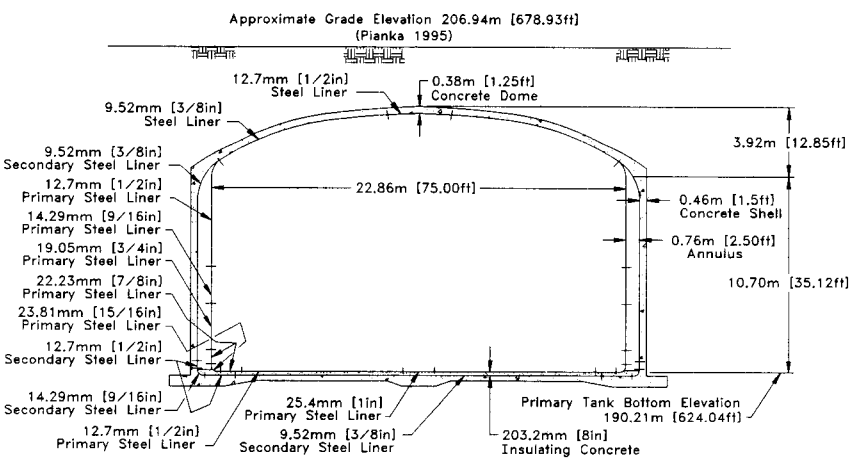
241-AP-101



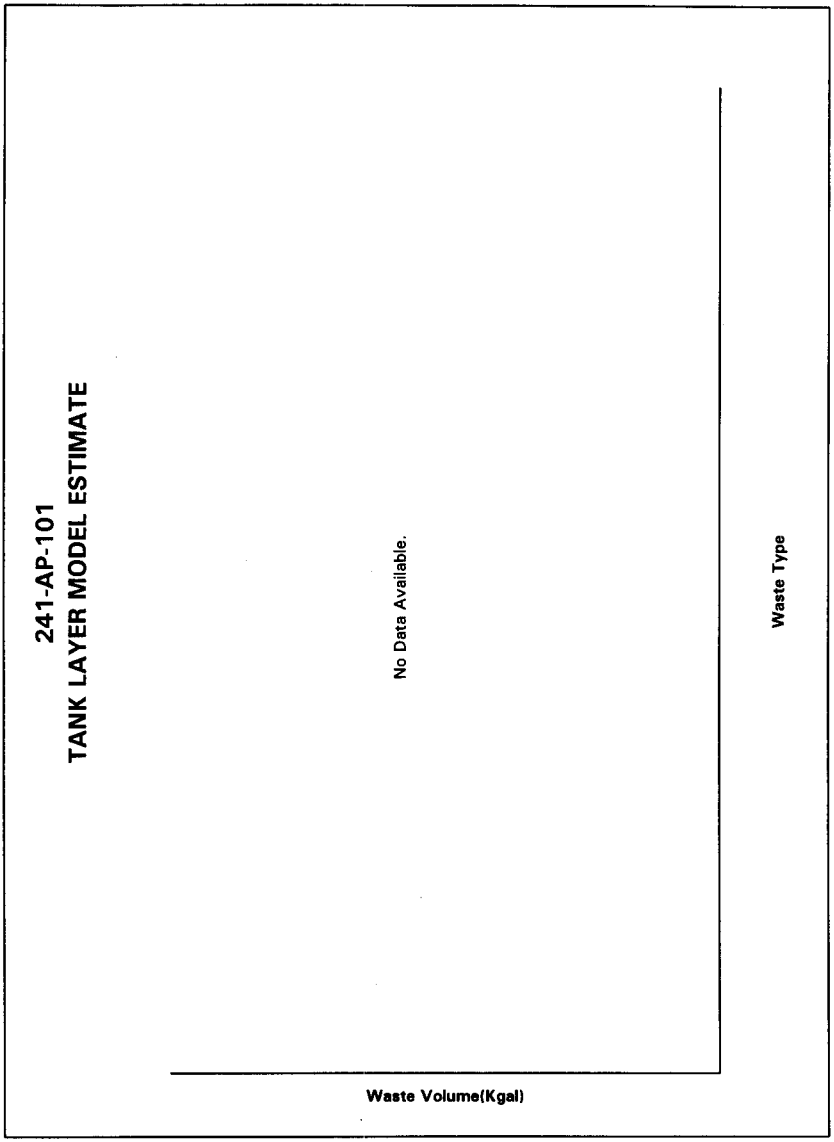
TANK RISER LOCATION

Ref: Salazar 1994
H-2-90538, Rev.1
H-2-90553, Rev.4



Ref: H-2-90442, Rev.1
H-2-90534, Rev.3

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AP-101

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AP-101

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.14E+06 (kg)	(1.06E+03 kgal)	----	----	----	----	----
Heat Load	0.301 (kW)	(1.03E+03 BTU/hr)	----	0.284	0.293	0.309	0.318
Bulk Density*	1.03 (g/cc)	----	----	1.03	1.03	1.04	1.04
Water wt%	94.0	----	----	93.2	93.5	94.3	94.7
TOC wt% C (wet	8.87E-02	----	----	6.69E-02	7.75E-02	9.98E-02	0.110

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0.811	1.80E+04	7.48E+04	0.679	0.744	0.877	0.938
Al3+	6.67E-02	1.74E+03	7.21E+03	5.65E-02	6.15E-02	7.18E-02	7.68E-02
Fe3+ (total Fe)	2.72E-03	147	609	1.88E-03	2.29E-03	3.15E-03	3.56E-03
Cr3+	4.69E-03	236	978	4.12E-03	4.40E-03	4.98E-03	5.26E-03
Bi3+	3.90E-05	7.89	32.7	3.68E-05	3.78E-05	4.01E-05	4.12E-05
La3+	1.16E-06	0.157	0.649	8.49E-07	1.00E-06	1.33E-06	1.48E-06
Hg2+	9.64E-07	0.187	0.776	5.14E-07	9.30E-07	9.98E-07	1.03E-06
Zr (as ZrO(OH)2)	2.05E-04	18.1	75.0	9.92E-05	1.92E-04	2.18E-04	2.31E-04
Pb2+	4.37E-05	8.77	36.3	3.78E-05	4.07E-05	4.68E-05	4.97E-05
Ni2+	5.54E-04	31.5	130	5.32E-04	5.42E-04	5.65E-04	5.76E-04
Sr2+	0	0	0	0	0	0	0
Mn4+	8.50E-04	45.2	187	4.26E-04	6.33E-04	1.07E-03	1.21E-03
Ca2+	1.19E-02	461	1.91E+03	8.57E-03	1.02E-02	1.35E-02	1.51E-02
K+	1.88E-02	713	2.95E+03	4.08E-03	1.12E-02	2.66E-02	3.42E-02
OH-	0.457	7.52E+03	3.12E+04	0.368	0.411	0.503	0.547
NO3-	0.335	2.01E+04	8.33E+04	0.302	0.318	0.351	0.367
NO2-	7.35E-02	3.27E+03	1.36E+04	6.38E-02	6.79E-02	7.96E-02	8.21E-02
CO32-	4.76E-02	2.76E+03	1.15E+04	3.72E-02	4.23E-02	5.27E-02	5.63E-02
PO43-	1.20E-02	1.11E+03	4.58E+03	7.11E-03	9.51E-03	1.45E-02	1.69E-02
SO42-	1.12E-02	1.04E+03	4.30E+03	9.45E-03	1.03E-02	1.20E-02	1.29E-02
Si (as SiO32-)	4.22E-03	115	476	3.03E-03	3.61E-03	4.82E-03	5.36E-03
F-	1.80E-02	331	1.37E+03	2.75E-03	1.54E-02	2.06E-02	2.31E-02
Cl-	1.33E-02	456	1.89E+03	1.09E-02	1.21E-02	1.45E-02	1.57E-02
C6H5O73-	1.81E-03	332	1.38E+03	1.23E-03	1.52E-03	2.11E-03	2.40E-03
EDTA4-	7.15E-04	200	827	2.42E-04	4.73E-04	9.58E-04	1.20E-03
HEDTA3-	1.26E-03	335	1.39E+03	3.15E-04	7.77E-04	1.75E-03	2.22E-03
glycolate-	1.57E-02	1.14E+03	4.73E+03	7.94E-03	1.17E-02	1.97E-02	2.35E-02
acetate-	5.43E-04	31.1	129	4.50E-04	4.90E-04	6.01E-04	6.88E-04
oxalate2-	1.53E-06	0.130	0.539	1.35E-06	1.44E-06	1.61E-06	1.70E-06
DBP	1.10E-03	223	925	8.56E-04	9.74E-04	1.22E-03	1.34E-03
butanol	1.10E-03	78.7	326	8.56E-04	9.74E-04	1.22E-03	1.34E-03
NH3	0.101	1.66E+03	6.88E+03	4.95E-02	7.44E-02	0.128	0.154
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-101							
Total Inventory Estimate*							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.14E+06 (kg)	(1.06E+03 kgal)	----	----	----	----	----
Heat Load	0.301 (kW)	(1.03E+03 BTU/hr)	----	0.284	0.293	0.309	0.318
Bulk Density†	1.03 (g/cc)	----	----	1.03	1.03	1.04	1.04
Water wt%†	94.0	----	----	93.2	93.5	94.3	94.7
TOC wt% C (wet	8.87E-02	----	----	6.69E-02	7.75E-02	9.98E-02	0.110
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	0.811	1.80E+04	7.48E+04	0.679	0.744	0.877	0.938
Al3+	6.67E-02	1.74E+03	7.21E+03	5.65E-02	6.15E-02	7.18E-02	7.68E-02
Fe3+ (total Fe)	2.72E-03	147	609	1.88E-03	2.29E-03	3.15E-03	3.56E-03
Cr3+	4.69E-03	236	978	4.12E-03	4.40E-03	4.98E-03	5.26E-03
Bi3+	3.90E-05	7.89	32.7	3.68E-05	3.78E-05	4.01E-05	4.12E-05
La3+	1.16E-06	0.157	0.649	8.49E-07	1.00E-06	1.33E-06	1.48E-06
Hg2+	9.64E-07	0.187	0.776	5.14E-07	9.30E-07	9.98E-07	1.03E-06
Zr (as ZrO(OH)2)	2.05E-04	18.1	75.0	9.92E-05	1.92E-04	2.18E-04	2.31E-04
Pb2+	4.37E-05	8.77	36.3	3.78E-05	4.07E-05	4.68E-05	4.97E-05
Ni2+	5.54E-04	31.5	130	5.32E-04	5.42E-04	5.65E-04	5.76E-04
Sr2+	0	0	0	0	0	0	0
Mn4+	8.50E-04	45.2	187	4.26E-04	6.33E-04	1.07E-03	1.21E-03
Ca2+	1.19E-02	461	1.91E+03	8.57E-03	1.02E-02	1.35E-02	1.51E-02
K+	1.88E-02	713	2.95E+03	4.08E-03	1.12E-02	2.66E-02	3.42E-02
OH-	0.457	7.52E+03	3.12E+04	0.368	0.411	0.503	0.547
NO3-	0.335	2.01E+04	8.33E+04	0.302	0.318	0.351	0.367
NO2-	7.35E-02	3.27E+03	1.36E+04	6.38E-02	6.79E-02	7.96E-02	8.21E-02
CO32-	4.76E-02	2.76E+03	1.15E+04	3.72E-02	4.23E-02	5.27E-02	5.63E-02
PO43-	1.20E-02	1.11E+03	4.58E+03	7.11E-03	9.51E-03	1.45E-02	1.69E-02
SO42-	1.12E-02	1.04E+03	4.30E+03	9.45E-03	1.03E-02	1.20E-02	1.29E-02
Si (as SiO32-)	4.22E-03	115	476	3.03E-03	3.61E-03	4.82E-03	5.36E-03
F-	1.80E-02	331	1.37E+03	2.75E-03	1.54E-02	2.06E-02	2.31E-02
Cl-	1.33E-02	456	1.89E+03	1.09E-02	1.21E-02	1.45E-02	1.57E-02
C6H5O73-	1.81E-03	332	1.38E+03	1.23E-03	1.52E-03	2.11E-03	2.40E-03
EDTA4-	7.15E-04	200	827	2.42E-04	4.73E-04	9.58E-04	1.20E-03
HEDTA3-	1.26E-03	335	1.39E+03	3.15E-04	7.77E-04	1.75E-03	2.22E-03
glycolate-	1.57E-02	1.14E+03	4.73E+03	7.94E-03	1.17E-02	1.97E-02	2.35E-02
acetate-	5.43E-04	31.1	129	4.50E-04	4.90E-04	6.01E-04	6.88E-04
oxalate2-	1.53E-06	0.130	0.539	1.35E-06	1.44E-06	1.61E-06	1.70E-06
DBP	1.10E-03	223	925	8.56E-04	9.74E-04	1.22E-03	1.34E-03
butanol	1.10E-03	78.7	326	8.56E-04	9.74E-04	1.22E-03	1.34E-03
NH3	0.101	1.66E+03	6.88E+03	4.95E-02	7.44E-02	0.128	0.154
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-101

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AP-101

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.14E+06 (kg)	(1.06E+03 kgal)	----	----	----	----	----
Heat Load	0.301 (kW)	(1.03E+03 BTU/hr)	----	0.284	0.293	0.309	0.318
Bulk Density*	1.03 (g/cc)	----	----	1.03	1.03	1.04	1.04
Water wt%†	94.0	----	----	93.2	93.5	94.3	94.7
TOC wt% C (wet	8.87E-02	----	----	6.69E-02	7.75E-02	9.98E-02	0.110

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	9.75E-06	9.44E-03	39.1	7.23E-06	7.23E-06	1.09E-05	1.21E-05
C-14	1.14E-06	1.11E-03	4.58	6.16E-07	6.16E-07	1.17E-06	1.20E-06
Ni-59	7.42E-08	7.19E-05	0.298	4.95E-08	4.95E-08	7.55E-08	7.67E-08
Ni-63	7.31E-06	7.08E-03	29.3	4.86E-06	4.86E-06	7.43E-06	7.55E-06
Co-60	1.74E-06	1.69E-03	6.99	1.14E-06	1.14E-06	1.88E-06	2.01E-06
Se-79	1.73E-07	1.68E-04	0.694	1.29E-07	1.39E-07	1.96E-07	2.17E-07
Sr-90	5.64E-03	5.46	2.26E+04	5.29E-03	5.46E-03	5.82E-03	5.99E-03
Y-90	5.64E-03	5.46	2.26E+04	4.48E-03	4.48E-03	5.82E-03	5.99E-03
Zr-93	8.21E-07	7.95E-04	3.29	6.24E-07	6.53E-07	9.22E-07	1.02E-06
Nb-93m	6.14E-07	5.95E-04	2.46	4.57E-07	4.97E-07	6.95E-07	7.72E-07
Tc-99	8.38E-06	8.12E-03	33.6	6.42E-06	7.38E-06	9.39E-06	1.04E-05
Ru-106	8.67E-10	8.40E-07	3.48E-03	6.16E-10	7.39E-10	9.95E-10	1.12E-09
Cd-113m	3.86E-06	3.74E-03	15.5	2.85E-06	2.85E-06	4.41E-06	4.57E-06
Sb-125	1.37E-05	1.32E-02	54.8	7.46E-06	1.05E-05	1.69E-05	2.01E-05
Sn-126	2.66E-07	2.58E-04	1.07	1.97E-07	2.16E-07	3.02E-07	3.36E-07
I-129	1.62E-08	1.57E-05	6.50E-02	1.24E-08	1.43E-08	1.82E-08	2.00E-08
Cs-134	3.32E-06	3.22E-03	13.3	5.71E-07	1.90E-06	4.77E-06	6.19E-06
Cs-137	7.90E-03	7.65	3.17E+04	7.24E-03	7.52E-03	8.23E-03	8.74E-03
Ba-137m	7.47E-03	7.24	3.00E+04	6.50E-03	6.50E-03	7.79E-03	8.10E-03
Sm-151	6.16E-04	0.597	2.47E+03	4.58E-04	4.98E-04	6.97E-04	7.75E-04
Eu-152	1.98E-07	1.92E-04	0.796	1.57E-07	1.57E-07	2.19E-07	2.38E-07
Eu-154	2.85E-05	2.76E-02	114	2.01E-05	2.01E-05	3.15E-05	3.29E-05
Eu-155	1.27E-05	1.23E-02	50.8	1.02E-05	1.02E-05	1.38E-05	1.49E-05
Ra-226	7.95E-12	7.70E-09	3.19E-05	4.84E-12	6.37E-12	9.54E-12	9.60E-12
Ra-228	9.92E-09	9.61E-06	3.98E-02	4.54E-09	4.54E-09	1.15E-08	1.33E-08
Ac-227	4.87E-11	4.72E-08	1.95E-04	3.06E-11	3.95E-11	5.78E-11	5.39E-11
Pa-231	1.86E-10	1.80E-07	7.48E-04	1.46E-10	1.53E-10	2.06E-10	2.25E-10
Th-229	2.31E-10	2.23E-07	9.25E-04	1.06E-10	1.06E-10	2.66E-10	3.04E-10
Th-232	9.55E-10	9.25E-07	3.83E-03	2.91E-10	2.91E-10	1.14E-09	1.31E-09
U-232	3.49E-08	3.38E-05	0.140	2.39E-08	2.93E-08	4.13E-08	4.82E-08
U-233	1.34E-07	1.29E-04	0.536	9.18E-08	1.12E-07	1.58E-07	1.85E-07
U-234	1.10E-07	1.07E-04	0.442	8.03E-08	1.04E-07	1.13E-07	1.16E-07
U-235	4.23E-09	4.09E-06	1.70E-02	3.09E-09	3.99E-09	4.34E-09	4.44E-09
U-236	7.92E-09	7.67E-06	3.18E-02	5.46E-09	7.41E-09	8.16E-09	8.38E-09
U-238	9.03E-08	8.75E-05	0.362	6.98E-08	8.61E-08	9.23E-08	9.42E-08
Np-237	3.02E-08	2.93E-05	0.121	2.38E-08	2.69E-08	3.35E-08	3.67E-08
Pu-238	2.68E-07	2.59E-04	1.07	1.78E-07	2.22E-07	3.13E-07	3.57E-07
Pu-239	3.60E-06	3.49E-03	14.5	2.88E-06	3.23E-06	3.97E-06	4.33E-06
Pu-240	8.59E-07	8.32E-04	3.45	6.38E-07	7.46E-07	9.72E-07	1.08E-06
Pu-241	2.50E-05	2.42E-02	100	1.58E-05	2.03E-05	2.97E-05	3.42E-05
Pu-242	1.04E-10	1.01E-07	4.17E-04	6.98E-11	8.66E-11	1.21E-10	1.38E-10
Am-241	5.18E-06	5.02E-03	20.8	3.68E-06	4.42E-06	5.95E-06	6.48E-06
Am-243	4.79E-10	4.63E-07	1.92E-03	2.09E-10	3.40E-10	6.20E-10	6.26E-10
Cm-242	8.50E-09	8.23E-06	3.41E-02	6.39E-09	6.79E-09	9.58E-09	1.06E-08
Cm-243	8.89E-10	8.61E-07	3.57E-03	6.65E-10	7.26E-10	1.00E-09	1.11E-09
Cm-244	1.49E-08	1.44E-05	5.98E-02	9.88E-09	1.23E-08	1.75E-08	1.99E-08

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	5.53E-05 (g/L)	----	0.222	4.25E-05	4.87E-05	6.18E-05	6.80E-05
U	1.01E-03	233	967	7.54E-04	9.59E-04	1.04E-03	1.06E-03

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-101

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.14E+06 (kg)	(1.06E+03 kgal)	----	----	----	----	----
Heat Load	0.301 (kW)	(1.03E+03 BTU/hr)	----	0.284	0.293	0.309	0.318
Bulk Density†	1.03 (g/cc)	----	----	1.03	1.03	1.04	1.04
Water wt%†	94.0	----	----	93.2	93.5	94.3	94.7
TOC wt% C (wet	8.87E-02	----	----	6.69E-02	7.75E-02	9.98E-02	0.110

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	9.75E-06	9.44E-03	39.1	7.23E-06	7.23E-06	1.09E-05	1.21E-05
C-14	1.14E-06	1.11E-03	4.58	6.16E-07	6.16E-07	1.17E-06	1.20E-06
Ni-59	7.42E-08	7.19E-05	0.298	4.95E-08	4.95E-08	7.55E-08	7.67E-08
Ni-63	7.31E-06	7.08E-03	29.3	4.86E-06	4.86E-06	7.43E-06	7.55E-06
Co-60	1.74E-06	1.69E-03	6.99	1.14E-06	1.14E-06	1.88E-06	2.01E-06
Se-79	1.73E-07	1.68E-04	0.694	1.29E-07	1.39E-07	1.96E-07	2.17E-07
Sr-90	5.64E-03	5.46	2.26E+04	5.29E-03	5.46E-03	5.82E-03	5.99E-03
Y-90	5.64E-03	5.46	2.26E+04	4.48E-03	4.48E-03	5.82E-03	5.99E-03
Zr-93	8.21E-07	7.95E-04	3.29	6.24E-07	6.53E-07	9.22E-07	1.02E-06
Nb-93m	6.14E-07	5.95E-04	2.46	4.57E-07	4.97E-07	6.95E-07	7.72E-07
Tc-99	8.38E-06	8.12E-03	33.6	6.42E-06	7.38E-06	9.39E-06	1.04E-05
Ru-106	8.67E-10	8.40E-07	3.48E-03	6.16E-10	7.39E-10	9.95E-10	1.12E-09
Cd-113m	3.86E-06	3.74E-03	15.5	2.85E-06	2.85E-06	4.41E-06	4.57E-06
Sb-125	1.37E-05	1.32E-02	54.8	7.46E-06	1.05E-05	1.69E-05	2.01E-05
Sn-126	2.66E-07	2.58E-04	1.07	1.97E-07	2.16E-07	3.02E-07	3.36E-07
I-129	1.62E-08	1.57E-05	6.50E-02	1.24E-08	1.43E-08	1.82E-08	2.00E-08
Cs-134	3.32E-06	3.22E-03	13.3	5.71E-07	1.90E-06	4.77E-06	6.19E-06
Cs-137	7.90E-03	7.65	3.17E+04	7.24E-03	7.52E-03	8.23E-03	8.74E-03
Ba-137m	7.47E-03	7.24	3.00E+04	6.50E-03	6.50E-03	7.79E-03	8.10E-03
Sm-151	6.16E-04	0.597	2.47E+03	4.58E-04	4.98E-04	6.97E-04	7.75E-04
Eu-152	1.98E-07	1.92E-04	0.796	1.57E-07	1.57E-07	2.19E-07	2.38E-07
Eu-154	2.85E-05	2.76E-02	114	2.01E-05	2.01E-05	3.15E-05	3.29E-05
Eu-155	1.27E-05	1.23E-02	50.8	1.02E-05	1.02E-05	1.38E-05	1.49E-05
Ra-226	7.95E-12	7.70E-09	3.19E-05	4.84E-12	6.37E-12	9.54E-12	9.60E-12
Ra-228	9.92E-09	9.61E-06	3.98E-02	4.54E-09	4.54E-09	1.15E-08	1.33E-08
Ac-227	4.87E-11	4.72E-08	1.95E-04	3.06E-11	3.95E-11	5.78E-11	5.39E-11
Pa-231	1.86E-10	1.80E-07	7.48E-04	1.46E-10	1.53E-10	2.06E-10	2.25E-10
Th-229	2.31E-10	2.23E-07	9.25E-04	1.06E-10	1.06E-10	2.66E-10	3.04E-10
Th-232	9.55E-10	9.25E-07	3.83E-03	2.91E-10	2.91E-10	1.14E-09	1.31E-09
U-232	3.49E-08	3.38E-05	0.140	2.39E-08	2.93E-08	4.13E-08	4.82E-08
U-233	1.34E-07	1.29E-04	0.536	9.18E-08	1.12E-07	1.58E-07	1.85E-07
U-234	1.10E-07	1.07E-04	0.442	8.03E-08	1.04E-07	1.13E-07	1.16E-07
U-235	4.23E-09	4.09E-06	1.70E-02	3.09E-09	3.99E-09	4.34E-09	4.44E-09
U-236	7.92E-09	7.67E-06	3.18E-02	5.46E-09	7.41E-09	8.16E-09	8.38E-09
U-238	9.03E-08	8.75E-05	0.362	6.98E-08	8.61E-08	9.23E-08	9.42E-08
Np-237	3.02E-08	2.93E-05	0.121	2.38E-08	2.69E-08	3.35E-08	3.67E-08
Pu-238	2.68E-07	2.59E-04	1.07	1.78E-07	2.22E-07	3.13E-07	3.57E-07
Pu-239	3.60E-06	3.49E-03	14.5	2.88E-06	3.23E-06	3.97E-06	4.33E-06
Pu-240	8.59E-07	8.32E-04	3.45	6.38E-07	7.46E-07	9.72E-07	1.08E-06
Pu-241	2.50E-05	2.42E-02	100	1.58E-05	2.03E-05	2.97E-05	3.42E-05
Pu-242	1.04E-10	1.01E-07	4.17E-04	6.98E-11	8.66E-11	1.21E-10	1.38E-10
Am-241	5.18E-06	5.02E-03	20.8	3.68E-06	4.42E-06	5.95E-06	6.48E-06
Am-243	4.79E-10	4.63E-07	1.92E-03	2.09E-10	3.40E-10	6.20E-10	6.26E-10
Cm-242	8.50E-09	8.23E-06	3.41E-02	6.39E-09	6.79E-09	9.58E-09	1.06E-08
Cm-243	8.89E-10	8.61E-07	3.57E-03	6.65E-10	7.26E-10	1.00E-09	1.11E-09
Cm-244	1.49E-08	1.44E-05	5.98E-02	9.88E-09	1.23E-08	1.75E-08	1.99E-08

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	5.53E-05 (g/L)	----	0.222	4.25E-05	4.87E-05	6.18E-05	6.80E-05
U	1.01E-03	233	967	7.54E-04	9.59E-04	1.04E-03	1.06E-03

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

No photographs available for interior montage.

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TANK 241-AP-102 SUMMARY

TANK HISTORY	
Entered Service	1986
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
1A, 1B, 1C, 15, 21, 27A, 27B, 27C, 28	4 in
7A, 10A, 12	12 in
TANK TEMPERATURE	
Average Tank Temperature	71°F
Maximum Temperature	78°F
Date	Oct 10, 1994
Elevation from tank bottom	22.50 ft
Riser Number	4
Minimum Temperature	56.4°F
Date	March 5, 1996
Elevation from tank bottom	2.50 ft
Riser Number	4

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	71
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	1,098,000 gal
Waste Type	CP
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	1,098,000 gal
Saltcake	0 gal
Sludge	0 gal
Supernatant	1,098,000 gal
INTERIOR PHOTOGRAPHS	
Date	not available
Montage Number	not available
Photo Set Number	not available
WASTE SURFACE LEVEL	
Devices	Auto/Man FIC, Man Tape
Max Level	403 in
Date	April 20 - May 14, 1993*
Min Level	48.3 in
Date	Oct 26, 1991 - Mar 26, 1992*

* Numerous dates in this time span.

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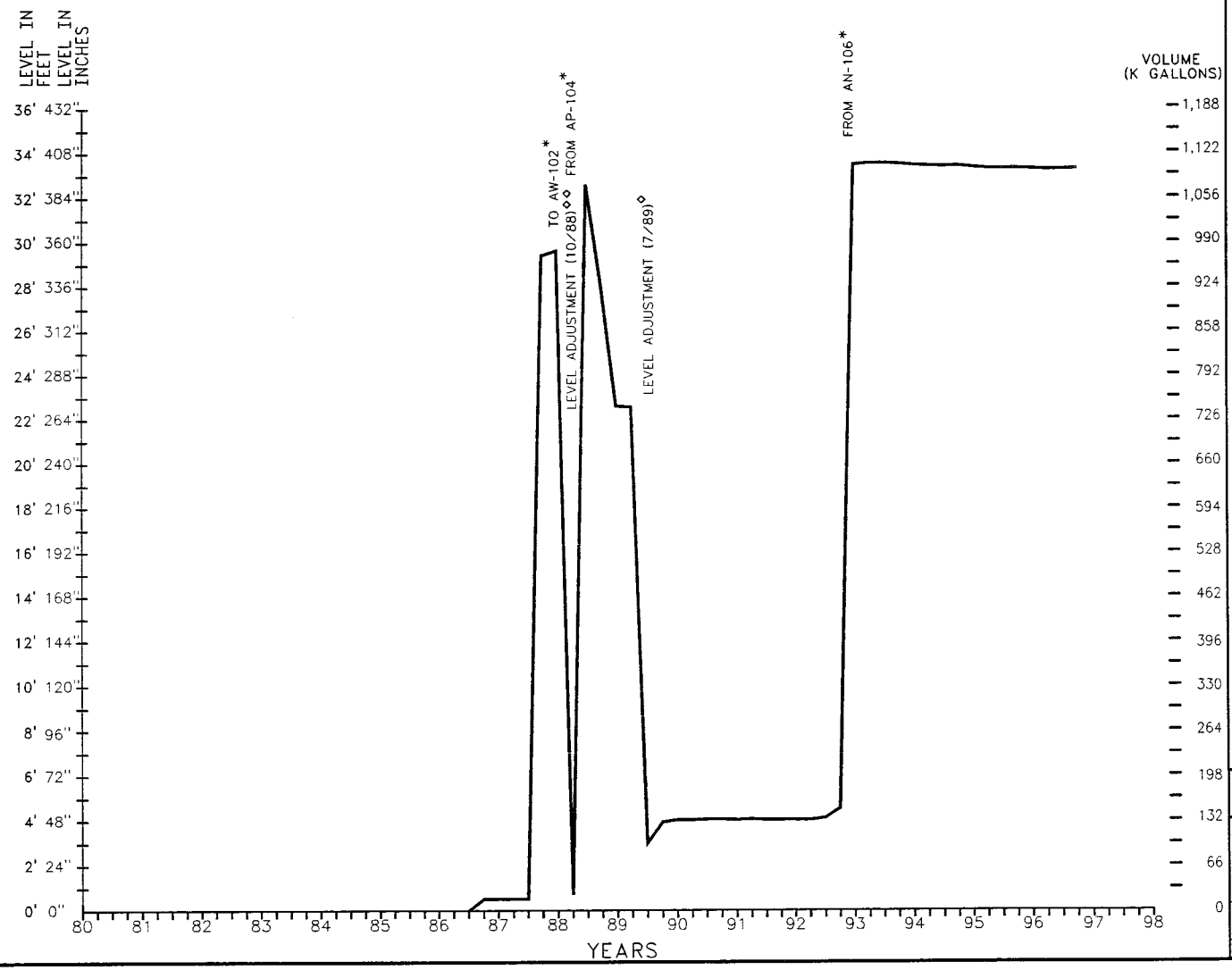
PRIMARY ADDITIONS
TIME LINE
(AGNEW 1995)

PASF:
WTR:

UNK:



TANK INFO:

CONSTRUCTED 1983-1986
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

* AGNEW 1995
◇ HANLON 1996l
◇◇ THURMAN 1988k

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

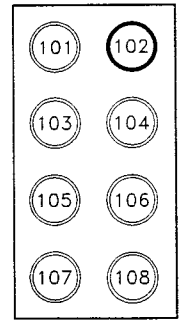
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

PASF: PUREX AMMONIA SCRUBBER FEED
UNK: UNKNOWN
WTR: WATER

LEGEND

TOTAL WASTE LEVEL (SUPERNATE)

AP TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AP-102 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1986-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E158	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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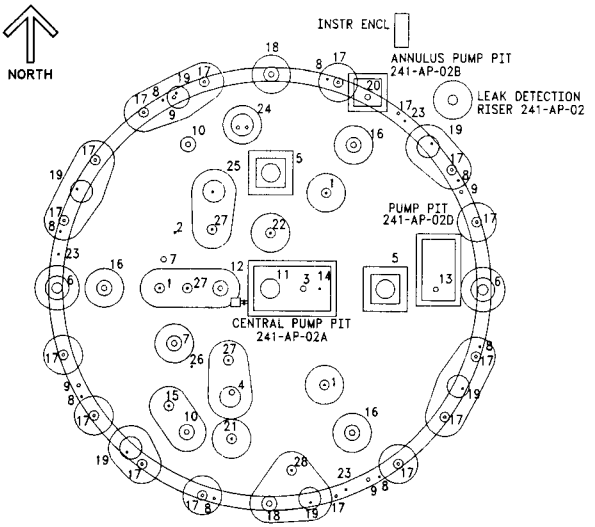
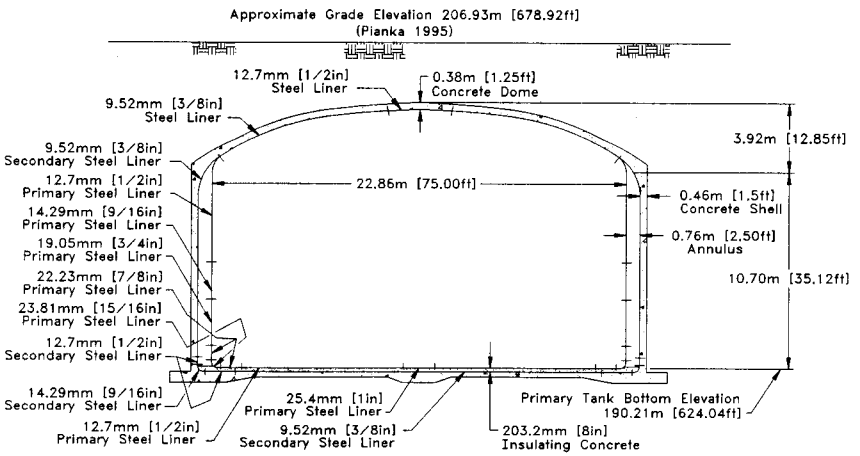
241-AP-102



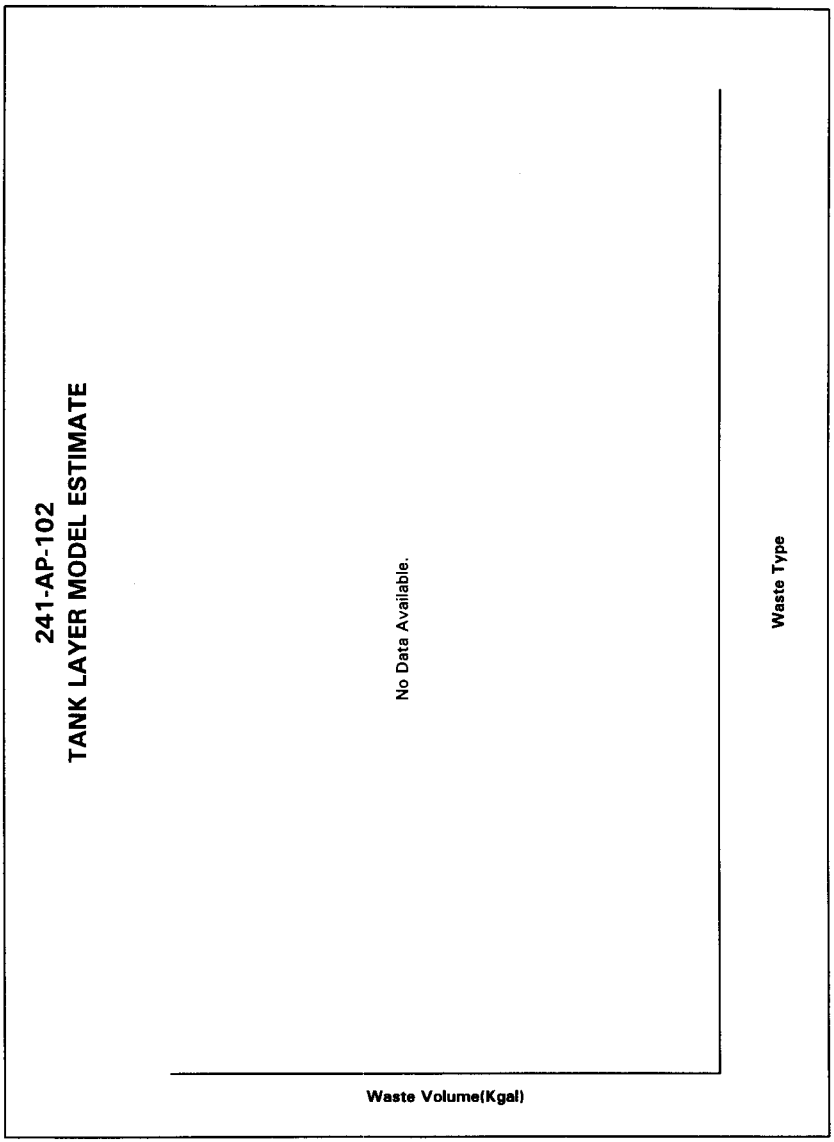
TANK RISER LOCATION

Ref: Salazar 1994
H-2-90539, Rev.1
H-2-90554, Rev.5



Ref: H-2-90442, Rev.1
H-2-90534, Rev.3

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AP-102

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AP-102

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	5.49E+06 (kg)	(1.10E+03 kgal)	----	----	----	----	----
Heat Load	4.48 (kW)	(1.53E+04 BTU/hr)	----	4.17	4.34	4.62	4.75
Bulk Density*	1.32 (g/cc)	----	----	1.30	1.31	1.32	1.33
Water wt%	57.6	----	----	56.1	56.8	58.4	59.4
TOC wt% C (wet	0.643	----	----	0.391	0.515	0.772	0.897

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	7.37	1.29E+05	7.07E+05	6.91	7.14	7.56	7.74
Al3+	0.845	1.73E+04	9.52E+04	0.762	0.821	0.871	0.893
Fe3+ (total Fe)	6.35E-03	269	1.48E+03	5.59E-03	5.96E-03	6.73E-03	7.10E-03
Cr3+	7.03E-02	2.78E+03	1.53E+04	6.11E-02	6.61E-02	7.20E-02	7.44E-02
Bi3+	6.36E-04	101	555	5.90E-04	6.12E-04	6.59E-04	6.81E-04
La3+	1.28E-05	1.35	7.42	9.35E-06	1.10E-05	1.46E-05	1.63E-05
Hg2+	4.75E-06	0.724	3.98	4.51E-06	4.65E-06	4.81E-06	4.87E-06
Zr (as ZrO(OH)2)	1.08E-04	7.47	41.0	9.94E-05	1.02E-04	1.11E-04	1.16E-04
Pb2+	5.87E-04	92.4	508	4.97E-04	5.41E-04	6.32E-04	6.76E-04
Ni2+	4.17E-03	186	1.02E+03	4.05E-03	4.11E-03	4.22E-03	4.28E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	2.10E-03	87.8	482	1.74E-03	1.92E-03	2.29E-03	2.46E-03
Ca2+	2.18E-02	665	3.65E+03	1.96E-02	2.07E-02	2.30E-02	2.41E-02
K+	3.39E-02	1.01E+03	5.53E+03	3.11E-02	3.23E-02	3.57E-02	3.82E-02
OH-	4.94	6.38E+04	3.51E+05	4.55	4.79	5.10	5.17
NO3-	2.45	1.15E+05	6.34E+05	2.30	2.39	2.49	2.53
NO2-	1.22	4.28E+04	2.35E+05	1.07	1.14	1.32	1.38
CO32-	0.248	1.13E+04	6.22E+04	0.224	0.236	0.261	0.269
PO43-	0.137	9.87E+03	5.42E+04	0.122	0.129	0.144	0.151
SO42-	0.135	9.89E+03	5.43E+04	0.116	0.125	0.147	0.156
Si (as SiO32-)	3.88E-02	829	4.55E+03	3.36E-02	3.62E-02	4.15E-02	4.40E-02
F-	3.38E-02	487	2.68E+03	2.98E-02	3.15E-02	3.57E-02	3.85E-02
Cl-	0.123	3.32E+03	1.83E+04	0.114	0.118	0.128	0.131
C6H5O73-	1.54E-02	2.21E+03	1.21E+04	1.40E-02	1.47E-02	1.61E-02	1.68E-02
EDTA4-	1.21E-02	2.66E+03	1.46E+04	3.94E-03	7.94E-03	1.63E-02	2.04E-02
HEDTA3-	2.18E-02	4.55E+03	2.50E+04	5.45E-03	1.34E-02	3.02E-02	3.85E-02
glycolate-	5.96E-02	3.40E+03	1.87E+04	4.13E-02	5.02E-02	6.91E-02	7.80E-02
acetate-	7.77E-03	349	1.92E+03	6.38E-03	6.97E-03	8.63E-03	9.94E-03
oxalate2-	1.68E-05	1.12	6.16	1.49E-05	1.58E-05	1.77E-05	1.86E-05
DBP	1.15E-02	1.84E+03	1.01E+04	1.02E-02	1.08E-02	1.23E-02	1.35E-02
butanol	1.15E-02	650	3.57E+03	1.02E-02	1.08E-02	1.23E-02	1.35E-02
NH3	3.76E-02	486	2.67E+03	3.18E-02	3.41E-02	4.21E-02	4.74E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-102

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	5.49E+06 (kg)	(1.10E+03 kgal)	----	----	----	----	----
Heat Load	4.48 (kW)	(1.53E+04 BTU/hr)	----	4.17	4.34	4.62	4.75
Bulk Density†	1.32 (g/cc)	----	----	1.30	1.31	1.32	1.33
Water wt%†	57.6	----	----	56.1	56.8	58.4	59.4
TOC wt% C (wet	0.643	----	----	0.391	0.515	0.772	0.897

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	7.37	1.29E+05	7.07E+05	6.91	7.14	7.56	7.74
Al3+	0.845	1.73E+04	9.52E+04	0.762	0.821	0.871	0.893
Fe3+ (total Fe)	6.35E-03	269	1.48E+03	5.59E-03	5.96E-03	6.73E-03	7.10E-03
Cr3+	7.03E-02	2.78E+03	1.53E+04	6.11E-02	6.61E-02	7.20E-02	7.44E-02
Bi3+	6.36E-04	101	555	5.90E-04	6.12E-04	6.59E-04	6.81E-04
La3+	1.28E-05	1.35	7.42	9.35E-06	1.10E-05	1.46E-05	1.63E-05
Hg2+	4.75E-06	0.724	3.98	4.51E-06	4.65E-06	4.81E-06	4.87E-06
Zr (as ZrO(OH)2)	1.08E-04	7.47	41.0	9.94E-05	1.02E-04	1.11E-04	1.16E-04
Pb2+	5.87E-04	92.4	508	4.97E-04	5.41E-04	6.32E-04	6.76E-04
Ni2+	4.17E-03	186	1.02E+03	4.05E-03	4.11E-03	4.22E-03	4.28E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	2.10E-03	87.8	482	1.74E-03	1.92E-03	2.29E-03	2.46E-03
Ca2+	2.18E-02	665	3.65E+03	1.96E-02	2.07E-02	2.30E-02	2.41E-02
K+	3.39E-02	1.01E+03	5.53E+03	3.11E-02	3.23E-02	3.57E-02	3.82E-02
OH-	4.94	6.38E+04	3.51E+05	4.55	4.79	5.10	5.17
NO3-	2.45	1.15E+05	6.34E+05	2.30	2.39	2.49	2.53
NO2-	1.22	4.28E+04	2.35E+05	1.07	1.14	1.32	1.38
CO32-	0.248	1.13E+04	6.22E+04	0.224	0.236	0.261	0.269
PO43-	0.137	9.87E+03	5.42E+04	0.122	0.129	0.144	0.151
SO42-	0.135	9.89E+03	5.43E+04	0.116	0.125	0.147	0.156
Si (as SiO32-)	3.88E-02	829	4.55E+03	3.36E-02	3.62E-02	4.15E-02	4.40E-02
F-	3.38E-02	487	2.68E+03	2.98E-02	3.15E-02	3.57E-02	3.85E-02
Cl-	0.123	3.32E+03	1.83E+04	0.114	0.118	0.128	0.131
C6H5O73-	1.54E-02	2.21E+03	1.21E+04	1.40E-02	1.47E-02	1.61E-02	1.68E-02
EDTA4-	1.21E-02	2.66E+03	1.46E+04	3.94E-03	7.94E-03	1.63E-02	2.04E-02
HEDTA3-	2.18E-02	4.55E+03	2.50E+04	5.45E-03	1.34E-02	3.02E-02	3.85E-02
glycolate-	5.96E-02	3.40E+03	1.87E+04	4.13E-02	5.02E-02	6.91E-02	7.80E-02
acetate-	7.77E-03	349	1.92E+03	6.38E-03	6.97E-03	8.63E-03	9.94E-03
oxalate2-	1.68E-05	1.12	6.16	1.49E-05	1.58E-05	1.77E-05	1.86E-05
DBP	1.15E-02	1.84E+03	1.01E+04	1.02E-02	1.08E-02	1.23E-02	1.35E-02
butanol	1.15E-02	650	3.57E+03	1.02E-02	1.08E-02	1.23E-02	1.35E-02
NH3	3.76E-02	486	2.67E+03	3.18E-02	3.41E-02	4.21E-02	4.74E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-102

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

HDW Model Rev. 4

Double-Shell Tank 241-AP-102

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	5.49E+06 (kg)	(1.10E+03 kgal)	----	----	----	----	----
Heat Load	4.48 (kW)	(1.53E+04 BTU/hr)	----	4.17	4.34	4.62	4.75
Bulk Density*	1.32 (g/cc)	----	----	1.30	1.31	1.32	1.33
Water wt%†	57.6	----	----	56.1	56.8	58.4	59.4
TOC wt% C (wet	0.643	----	----	0.391	0.515	0.772	0.897

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.24E-04	9.39E-02	516	7.74E-05	7.74E-05	1.30E-04	1.38E-04
C-14	1.85E-05	1.40E-02	77.1	8.81E-06	8.81E-06	1.87E-05	1.90E-05
Ni-59	1.09E-06	8.28E-04	4.55	6.35E-07	6.35E-07	1.11E-06	1.13E-06
Ni-63	1.07E-04	8.13E-02	447	6.21E-05	6.21E-05	1.09E-04	1.11E-04
Co-60	2.23E-05	1.70E-02	93.1	1.12E-05	1.12E-05	2.28E-05	2.32E-05
Se-79	1.87E-06	1.42E-03	7.79	1.25E-06	1.25E-06	2.09E-06	2.30E-06
Sr-90	5.87E-02	44.6	2.45E+05	5.54E-02	5.71E-02	6.02E-02	6.17E-02
Y-90	5.87E-02	44.6	2.45E+05	3.74E-02	3.74E-02	6.02E-02	6.17E-02
Zr-93	9.16E-06	6.97E-03	38.3	6.08E-06	6.08E-06	1.03E-05	1.14E-05
Nb-93m	6.62E-06	5.03E-03	27.6	4.46E-06	4.46E-06	7.40E-06	8.15E-06
Tc-99	1.37E-04	0.104	571	1.01E-04	1.18E-04	1.55E-04	1.73E-04
Ru-106	4.05E-09	3.08E-06	1.69E-02	2.62E-09	2.62E-09	4.37E-09	4.66E-09
Cd-113m	4.91E-05	3.73E-02	205	3.06E-05	3.06E-05	5.58E-05	6.22E-05
Sb-125	1.00E-04	7.63E-02	419	5.26E-05	5.26E-05	1.03E-04	1.06E-04
Sn-126	2.82E-06	2.14E-03	11.8	1.89E-06	1.89E-06	3.15E-06	3.47E-06
I-129	2.64E-07	2.01E-04	1.10	1.94E-07	2.28E-07	3.00E-07	3.35E-07
Cs-134	3.45E-06	2.63E-03	14.4	2.84E-06	3.14E-06	3.77E-06	4.08E-06
Cs-137	0.145	110	6.04E+05	0.131	0.138	0.152	0.159
Ba-137m	0.137	104	5.71E+05	0.116	0.116	0.144	0.150
Sm-151	6.57E-03	4.99	2.74E+04	4.41E-03	4.41E-03	7.35E-03	8.09E-03
Eu-152	2.33E-06	1.77E-03	9.74	1.57E-06	1.57E-06	2.56E-06	2.78E-06
Eu-154	3.53E-04	0.268	1.47E+03	1.99E-04	1.99E-04	4.09E-04	4.31E-04
Eu-155	1.39E-04	0.106	582	9.38E-05	9.38E-05	1.53E-04	1.67E-04
Ra-226	7.53E-11	5.72E-08	3.14E-04	5.62E-11	5.62E-11	8.22E-11	8.89E-11
Ra-228	1.39E-07	1.06E-04	0.581	5.87E-08	5.87E-08	1.60E-07	1.83E-07
Ac-227	4.70E-10	3.57E-07	1.96E-03	3.59E-10	3.59E-10	5.10E-10	5.48E-10
Pa-231	2.20E-09	1.67E-06	9.17E-03	1.58E-09	1.58E-09	2.42E-09	2.63E-09
Th-229	3.24E-09	2.46E-06	1.35E-02	1.38E-09	1.38E-09	3.70E-09	4.19E-09
Th-232	1.37E-08	1.04E-05	5.73E-02	3.78E-09	3.78E-09	1.65E-08	1.91E-08
U-232	4.82E-07	3.66E-04	2.01	3.40E-07	4.10E-07	5.66E-07	6.56E-07
U-233	1.85E-06	1.40E-03	7.71	1.30E-06	1.57E-06	2.17E-06	2.51E-06
U-234	3.92E-07	2.98E-04	1.64	3.79E-07	3.86E-07	3.99E-07	4.03E-07
U-235	1.57E-08	1.19E-05	6.56E-02	1.52E-08	1.55E-08	1.60E-08	1.61E-08
U-236	1.26E-08	9.60E-06	5.27E-02	1.22E-08	1.25E-08	1.28E-08	1.29E-08
U-238	4.98E-07	3.78E-04	2.08	4.85E-07	4.91E-07	5.05E-07	5.10E-07
Np-237	4.86E-07	3.69E-04	2.03	3.68E-07	4.26E-07	5.47E-07	6.05E-07
Pu-238	7.48E-07	5.69E-04	3.12	6.10E-07	6.78E-07	8.19E-07	8.87E-07
Pu-239	2.48E-05	1.88E-02	103	2.12E-05	2.30E-05	2.66E-05	2.83E-05
Pu-240	4.28E-06	3.25E-03	17.9	3.62E-06	3.94E-06	4.61E-06	4.94E-06
Pu-241	5.16E-05	3.92E-02	215	4.21E-05	4.68E-05	5.64E-05	6.10E-05
Pu-242	2.83E-10	2.15E-07	1.18E-03	2.27E-10	2.54E-10	3.12E-10	3.39E-10
Am-241	3.21E-05	2.44E-02	134	2.55E-05	2.87E-05	3.54E-05	3.86E-05
Am-243	1.21E-09	9.21E-07	5.06E-03	9.29E-10	1.06E-09	1.39E-09	1.54E-09
Cm-242	8.37E-08	6.36E-05	0.349	5.23E-08	5.23E-08	9.23E-08	1.01E-07
Cm-243	7.87E-09	5.98E-06	3.29E-02	4.88E-09	4.88E-09	8.65E-09	9.41E-09
Cm-244	6.98E-08	5.30E-05	0.291	3.89E-08	3.89E-08	8.02E-08	8.69E-08

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	3.00E-04 (g/L)	----	1.25	2.33E-04	2.66E-04	3.34E-04	3.67E-04
U	4.43E-03	802	4.41E+03	4.28E-03	4.35E-03	4.52E-03	4.56E-03

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-102

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	5.49E+06 (kg)	(1.10E+03 kgal)	----	----	----	----	----
Heat Load	4.48 (kW)	(1.53E+04 BTU/hr)	----	4.17	4.34	4.62	4.75
Bulk Density†	1.32 (g/cc)	----	----	1.30	1.31	1.32	1.33
Water wt%†	57.6	----	----	56.1	56.8	58.4	59.4
TOC wt% C (wet	0.643	----	----	0.391	0.515	0.772	0.897

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.24E-04	9.39E-02	516	7.74E-05	7.74E-05	1.30E-04	1.38E-04
C-14	1.85E-05	1.40E-02	77.1	8.81E-06	8.81E-06	1.87E-05	1.90E-05
Ni-59	1.09E-06	8.28E-04	4.55	6.35E-07	6.35E-07	1.11E-06	1.13E-06
Ni-63	1.07E-04	8.13E-02	447	6.21E-05	6.21E-05	1.09E-04	1.11E-04
Co-60	2.23E-05	1.70E-02	93.1	1.12E-05	1.12E-05	2.28E-05	2.32E-05
Se-79	1.87E-06	1.42E-03	7.79	1.25E-06	1.25E-06	2.09E-06	2.30E-06
Sr-90	5.87E-02	44.6	2.45E+05	5.54E-02	5.71E-02	6.02E-02	6.17E-02
Y-90	5.87E-02	44.6	2.45E+05	3.74E-02	3.74E-02	6.02E-02	6.17E-02
Zr-93	9.16E-06	6.97E-03	38.3	6.08E-06	6.08E-06	1.03E-05	1.14E-05
Nb-93m	6.62E-06	5.03E-03	27.6	4.46E-06	4.46E-06	7.40E-06	8.15E-06
Tc-99	1.37E-04	0.104	571	1.01E-04	1.18E-04	1.55E-04	1.73E-04
Ru-106	4.05E-09	3.08E-06	1.69E-02	2.62E-09	2.62E-09	4.37E-09	4.66E-09
Cd-113m	4.91E-05	3.73E-02	205	3.06E-05	3.06E-05	5.58E-05	6.22E-05
Sb-125	1.00E-04	7.63E-02	419	5.26E-05	5.26E-05	1.03E-04	1.06E-04
Sn-126	2.82E-06	2.14E-03	11.8	1.89E-06	1.89E-06	3.15E-06	3.47E-06
I-129	2.64E-07	2.01E-04	1.10	1.94E-07	2.28E-07	3.00E-07	3.35E-07
Cs-134	3.45E-06	2.63E-03	14.4	2.84E-06	3.14E-06	3.77E-06	4.08E-06
Cs-137	0.145	110	6.04E+05	0.131	0.138	0.152	0.159
Ba-137m	0.137	104	5.71E+05	0.116	0.116	0.144	0.150
Sm-151	6.57E-03	4.99	2.74E+04	4.41E-03	4.41E-03	7.35E-03	8.09E-03
Eu-152	2.33E-06	1.77E-03	9.74	1.57E-06	1.57E-06	2.56E-06	2.78E-06
Eu-154	3.53E-04	0.268	1.47E+03	1.99E-04	1.99E-04	4.09E-04	4.31E-04
Eu-155	1.39E-04	0.106	582	9.38E-05	9.38E-05	1.53E-04	1.67E-04
Ra-226	7.53E-11	5.72E-08	3.14E-04	5.62E-11	5.62E-11	8.22E-11	8.89E-11
Ra-228	1.39E-07	1.06E-04	0.581	5.87E-08	5.87E-08	1.60E-07	1.83E-07
Ac-227	4.70E-10	3.57E-07	1.96E-03	3.59E-10	3.59E-10	5.10E-10	5.48E-10
Pa-231	2.20E-09	1.67E-06	9.17E-03	1.58E-09	1.58E-09	2.42E-09	2.63E-09
Th-229	3.24E-09	2.46E-06	1.35E-02	1.38E-09	1.38E-09	3.70E-09	4.19E-09
Th-232	1.37E-08	1.04E-05	5.73E-02	3.78E-09	3.78E-09	1.65E-08	1.91E-08
U-232	4.82E-07	3.66E-04	2.01	3.40E-07	4.10E-07	5.66E-07	6.56E-07
U-233	1.85E-06	1.40E-03	7.71	1.30E-06	1.57E-06	2.17E-06	2.51E-06
U-234	3.92E-07	2.98E-04	1.64	3.79E-07	3.86E-07	3.99E-07	4.03E-07
U-235	1.57E-08	1.19E-05	6.56E-02	1.52E-08	1.55E-08	1.60E-08	1.61E-08
U-236	1.26E-08	9.60E-06	5.27E-02	1.22E-08	1.25E-08	1.28E-08	1.29E-08
U-238	4.98E-07	3.78E-04	2.08	4.85E-07	4.91E-07	5.05E-07	5.10E-07
Np-237	4.86E-07	3.69E-04	2.03	3.68E-07	4.26E-07	5.47E-07	6.05E-07
Pu-238	7.48E-07	5.69E-04	3.12	6.10E-07	6.78E-07	8.19E-07	8.87E-07
Pu-239	2.48E-05	1.88E-02	103	2.12E-05	2.30E-05	2.66E-05	2.83E-05
Pu-240	4.28E-06	3.25E-03	17.9	3.62E-06	3.94E-06	4.61E-06	4.94E-06
Pu-241	5.16E-05	3.92E-02	215	4.21E-05	4.68E-05	5.64E-05	6.10E-05
Pu-242	2.83E-10	2.15E-07	1.18E-03	2.27E-10	2.54E-10	3.12E-10	3.39E-10
Am-241	3.21E-05	2.44E-02	134	2.55E-05	2.87E-05	3.54E-05	3.86E-05
Am-243	1.21E-09	9.21E-07	5.06E-03	9.29E-10	1.06E-09	1.39E-09	1.54E-09
Cm-242	8.37E-08	6.36E-05	0.349	5.23E-08	5.23E-08	9.23E-08	1.01E-07
Cm-243	7.87E-09	5.98E-06	3.29E-02	4.88E-09	4.88E-09	8.65E-09	9.41E-09
Cm-244	6.98E-08	5.30E-05	0.291	3.89E-08	3.89E-08	8.02E-08	8.69E-08

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	3.00E-04 (g/L)	----	1.25	2.33E-04	2.66E-04	3.34E-04	3.67E-04
U	4.43E-03	802	4.41E+03	4.28E-03	4.35E-03	4.52E-03	4.56E-03

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

No photographs available for interior montage.

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TANK 241-AP-103 SUMMARY

TANK HISTORY	
Entered Service	1986
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
1A, 1B, 1C, 15, 21, 24, 27A, 27B, 27C, 28	4 in
10A, 10B, 12	12 in
TANK TEMPERATURE	
Average Tank Temperature	58°F
Maximum Temperature	69°F
Date	Aug 15, 1994 and Oct 2, 1995
Elevation from tank bottom	26.50 ft, 22.50 ft, 2.50 ft
Riser Number	4
Minimum Temperature	45.9°F
Date	March 4, 1996
Elevation from tank bottom	38.50 ft, 30.50 ft, 22.50 ft, 2.50 ft
Riser Number	4

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	71
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	23,000 gal
Waste Type	DN
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	22,000 gal
Saltcake	0 gal
Sludge	1,000 gal
Supernatant	22,000 gal
INTERIOR PHOTOGRAPHS	
Date	not available
Montage Number	not available
Photo Set Number	not available
SURFACE LEVELS	
Devices	Auto/Man FIC, Man Tape
Max Level	413.5 in
Date	July 29 - Aug 22, 1991*
Min Level	7.25 in
Date	Dec 10, 1996 - Jan 15, 1997*

* Numerous dates in this time span.

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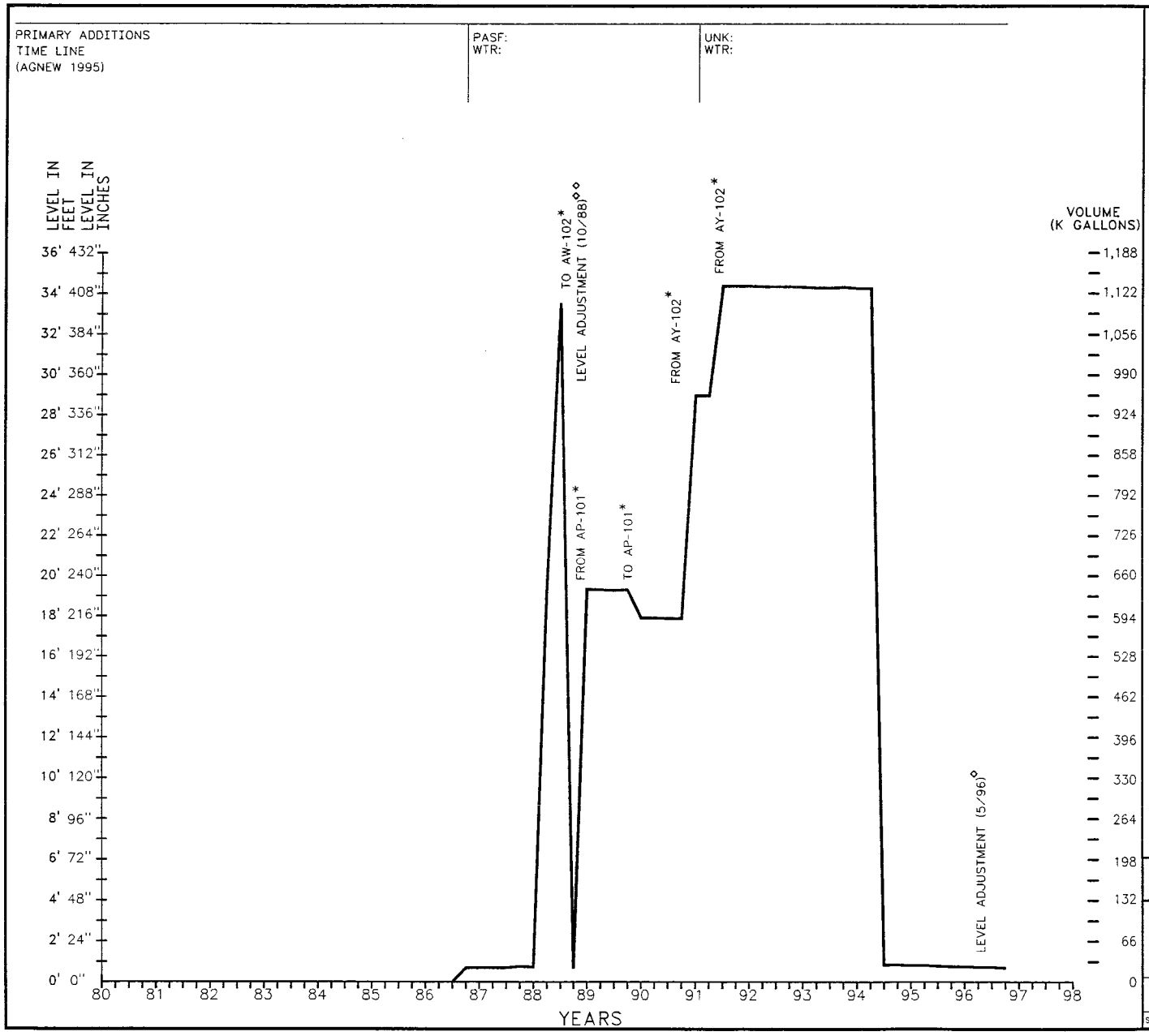


TANK INFO:

CONSTRUCTED 1983-1986
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

* AGNEW 1995
◇ HANLON 1996l
◇◇ THURMAN 1988k

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

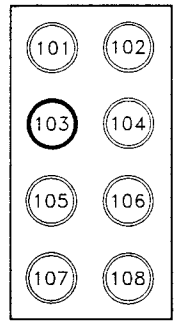
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

PASF: PUREX AMMONIA SCRUBBER FEED
UNK: UNKNOWN
WTR: WATER

LEGEND

TOTAL WASTE LEVEL (SUPERNATE)

AP TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AP-103 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1986-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E159	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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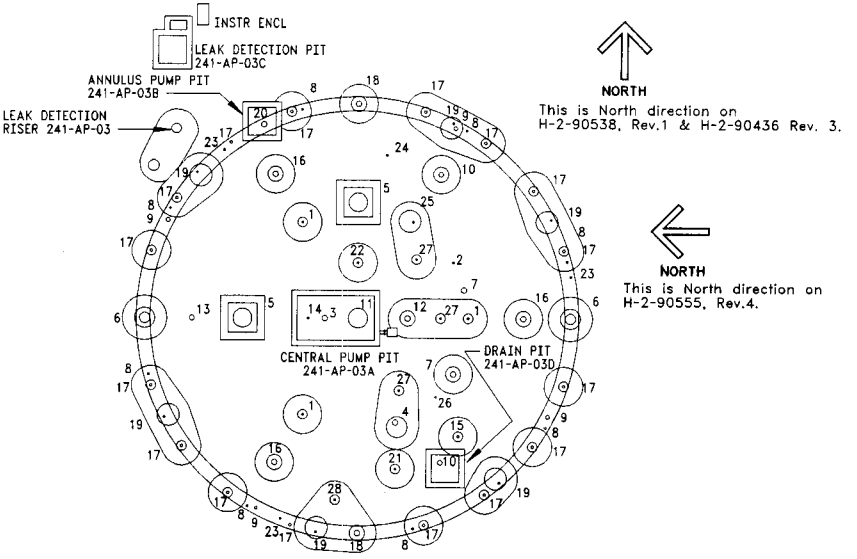
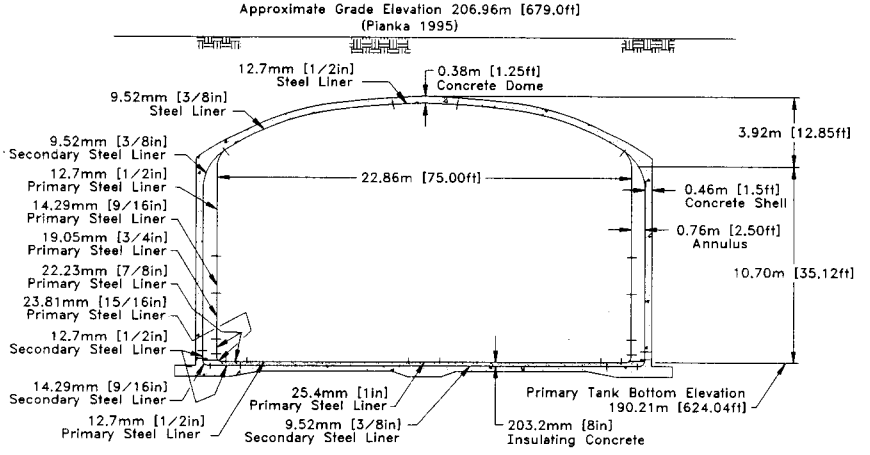
241-AP-103



TANK RISER LOCATION

Ref: Salazar 1994
H-2-90538, Rev.1
H-2-90555, Rev.4



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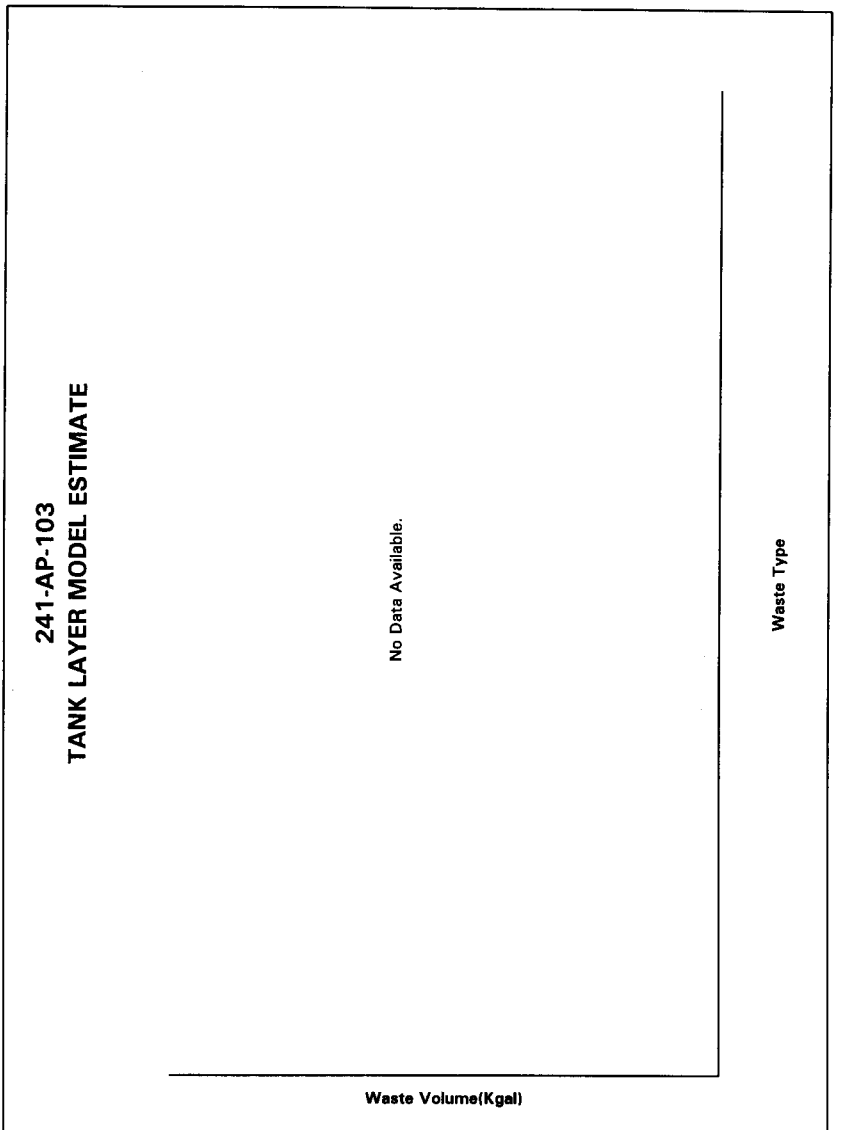
H-2-90534, Rev.3

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AP-103

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

HDW Model Rev. 4

Double-Shell Tank 241-AP-103

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.54E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	1.68 (kW)	(5.73E+03 BTU/hr)	----	1.29	1.48	1.87	2.06
Bulk Density*	1.06 (g/cc)	----	----	1.04	1.05	1.07	1.08
Water wt%	89.9	----	----	86.6	88.2	91.8	93.6
TOC wt% C (wet	0.194	----	----	9.61E-02	0.145	0.243	0.288

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	1.55	3.36E+04	1.52E+05	0.937	1.24	1.86	2.14
Al3+	0.119	3.02E+03	1.37E+04	7.17E-02	9.47E-02	0.143	0.166
Fe3+ (total Fe)	1.43E-03	75.2	341	1.13E-03	1.28E-03	1.58E-03	1.72E-03
Cr3+	3.16E-03	155	703	2.82E-03	2.99E-03	3.23E-03	3.29E-03
Bi3+	8.93E-06	1.76	7.99	8.40E-06	8.66E-06	9.20E-06	9.46E-06
La3+	1.95E-07	2.55E-02	0.116	1.43E-07	1.68E-07	2.22E-07	2.48E-07
Hg2+	2.05E-07	3.88E-02	0.176	1.13E-07	1.98E-07	2.12E-07	2.19E-07
Zr (as ZrO(OH)2)	4.21E-05	3.63	16.4	2.05E-05	3.94E-05	4.48E-05	4.75E-05
Pb2+	1.00E-05	1.96	8.91	8.60E-06	9.31E-06	1.08E-05	1.15E-05
Ni2+	1.13E-03	62.8	285	1.07E-03	1.10E-03	1.16E-03	1.19E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	1.98E-04	10.2	46.5	9.92E-05	1.47E-04	2.48E-04	2.82E-04
Ca2+	6.34E-03	240	1.09E+03	4.92E-03	5.75E-03	6.78E-03	7.02E-03
K+	9.25E-03	341	1.55E+03	6.23E-03	7.70E-03	1.08E-02	1.24E-02
OH-	0.973	1.56E+04	7.08E+04	0.558	0.761	1.19	1.39
NO3-	0.507	2.97E+04	1.35E+05	0.357	0.430	0.584	0.657
NO2-	4.96E-02	2.15E+03	9.77E+03	4.01E-02	4.47E-02	5.46E-02	5.92E-02
CO32-	0.107	6.04E+03	2.74E+04	5.84E-02	8.22E-02	0.131	0.147
PO43-	5.93E-03	531	2.41E+03	4.12E-03	5.00E-03	6.85E-03	7.73E-03
SO42-	2.06E-02	1.87E+03	8.47E+03	1.26E-02	1.65E-02	2.47E-02	2.85E-02
Si (as SiO32-)	1.24E-02	328	1.49E+03	6.85E-03	9.55E-03	1.52E-02	1.77E-02
F-	4.42E-03	79.2	359	1.30E-03	3.89E-03	4.94E-03	5.45E-03
Cl-	2.92E-02	977	4.43E+03	1.80E-02	2.35E-02	3.50E-02	4.04E-02
C6H5O73-	5.12E-03	913	4.14E+03	2.41E-03	3.73E-03	6.51E-03	7.83E-03
EDTA4-	1.74E-04	47.4	215	5.84E-05	1.15E-04	2.34E-04	2.92E-04
HEDTA3-	3.09E-04	79.9	363	7.70E-05	1.90E-04	4.28E-04	5.45E-04
glycolate-	6.63E-02	4.69E+03	2.13E+04	3.02E-02	4.78E-02	8.48E-02	0.102
acetate-	1.27E-04	7.08	32.1	1.05E-04	1.14E-04	1.41E-04	1.62E-04
oxalate2-	2.55E-07	2.12E-02	9.62E-02	2.27E-07	2.41E-07	2.70E-07	2.84E-07
DBP	2.56E-04	50.7	230	2.00E-04	2.27E-04	2.84E-04	3.12E-04
butanol	2.56E-04	17.9	81.1	2.00E-04	2.27E-04	2.84E-04	3.12E-04
NH3	1.34E-02	215	973	2.86E-03	7.96E-03	1.89E-02	2.43E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-103							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	4.54E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	1.68 (kW)	(5.73E+03 BTU/hr)	----	1.29	1.48	1.87	2.06
Bulk Density†	1.06 (g/cc)	----	----	1.04	1.05	1.07	1.08
Water wt%†	89.9	----	----	86.6	88.2	91.8	93.6
TOC wt% C (wet	0.194	----	----	9.61E-02	0.145	0.243	0.288
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	1.55	3.36E+04	1.52E+05	0.937	1.24	1.86	2.14
Al3+	0.119	3.02E+03	1.37E+04	7.17E-02	9.47E-02	0.143	0.166
Fe3+ (total Fe)	1.43E-03	75.2	341	1.13E-03	1.28E-03	1.58E-03	1.72E-03
Cr3+	3.16E-03	155	703	2.82E-03	2.99E-03	3.23E-03	3.29E-03
Bi3+	8.93E-06	1.76	7.99	8.40E-06	8.66E-06	9.20E-06	9.46E-06
La3+	1.95E-07	2.55E-02	0.116	1.43E-07	1.68E-07	2.22E-07	2.48E-07
Hg2+	2.05E-07	3.88E-02	0.176	1.13E-07	1.98E-07	2.12E-07	2.19E-07
Zr (as ZrO(OH)2)	4.21E-05	3.63	16.4	2.05E-05	3.94E-05	4.48E-05	4.75E-05
Pb2+	1.00E-05	1.96	8.91	8.60E-06	9.31E-06	1.08E-05	1.15E-05
Ni2+	1.13E-03	62.8	285	1.07E-03	1.10E-03	1.16E-03	1.19E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	1.98E-04	10.2	46.5	9.92E-05	1.47E-04	2.48E-04	2.82E-04
Ca2+	6.34E-03	240	1.09E+03	4.92E-03	5.75E-03	6.78E-03	7.02E-03
K+	9.25E-03	341	1.55E+03	6.23E-03	7.70E-03	1.08E-02	1.24E-02
OH-	0.973	1.56E+04	7.08E+04	0.558	0.761	1.19	1.39
NO3-	0.507	2.97E+04	1.35E+05	0.357	0.430	0.584	0.657
NO2-	4.96E-02	2.15E+03	9.77E+03	4.01E-02	4.47E-02	5.46E-02	5.92E-02
CO32-	0.107	6.04E+03	2.74E+04	5.84E-02	8.22E-02	0.131	0.147
PO43-	5.93E-03	531	2.41E+03	4.12E-03	5.00E-03	6.85E-03	7.73E-03
SO42-	2.06E-02	1.87E+03	8.47E+03	1.26E-02	1.65E-02	2.47E-02	2.85E-02
Si (as SiO32-)	1.24E-02	328	1.49E+03	6.85E-03	9.55E-03	1.52E-02	1.77E-02
F-	4.42E-03	79.2	359	1.30E-03	3.89E-03	4.94E-03	5.45E-03
Cl-	2.92E-02	977	4.43E+03	1.80E-02	2.35E-02	3.50E-02	4.04E-02
C6H5O73-	5.12E-03	913	4.14E+03	2.41E-03	3.73E-03	6.51E-03	7.83E-03
EDTA4-	1.74E-04	47.4	215	5.84E-05	1.15E-04	2.34E-04	2.92E-04
HEDTA3-	3.09E-04	79.9	363	7.70E-05	1.90E-04	4.28E-04	5.45E-04
glycolate-	6.63E-02	4.69E+03	2.13E+04	3.02E-02	4.78E-02	8.48E-02	0.102
acetate-	1.27E-04	7.08	32.1	1.05E-04	1.14E-04	1.41E-04	1.62E-04
oxalate2-	2.55E-07	2.12E-02	9.62E-02	2.27E-07	2.41E-07	2.70E-07	2.84E-07
DBP	2.56E-04	50.7	230	2.00E-04	2.27E-04	2.84E-04	3.12E-04
butanol	2.56E-04	17.9	81.1	2.00E-04	2.27E-04	2.84E-04	3.12E-04
NH3	1.34E-02	215	973	2.86E-03	7.96E-03	1.89E-02	2.43E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).
†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-103

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AP-103

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.54E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	1.68 (kW)	(5.73E+03 BTU/hr)	----	1.29	1.48	1.87	2.06
Bulk Density*	1.06 (g/cc)	----	----	1.04	1.05	1.07	1.08
Water wt%†	89.9	----	----	86.6	88.2	91.8	93.6
TOC wt% C (wet	0.194	----	----	9.61E-02	0.145	0.243	0.288

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	2.35E-04	0.222	1.01E+03	1.67E-04	2.00E-04	2.70E-04	3.03E-04
C-14	3.56E-06	3.36E-03	15.2	2.72E-06	3.13E-06	3.99E-06	4.40E-06
Ni-59	1.05E-07	9.94E-05	0.451	9.97E-08	9.97E-08	1.07E-07	1.08E-07
Ni-63	1.04E-05	9.84E-03	44.6	9.87E-06	9.87E-06	1.06E-05	1.07E-05
Co-60	3.82E-06	3.61E-03	16.4	2.23E-06	3.01E-06	4.64E-06	5.42E-06
Se-79	4.38E-07	4.14E-04	1.88	2.35E-07	3.33E-07	5.43E-07	6.42E-07
Sr-90	1.27E-02	12.0	5.43E+04	1.11E-02	1.19E-02	1.35E-02	1.43E-02
Y-90	1.27E-02	12.0	5.44E+04	1.11E-02	1.19E-02	1.35E-02	1.43E-02
Zr-93	2.00E-06	1.89E-03	8.58	1.09E-06	1.48E-06	2.47E-06	2.92E-06
Nb-93m	1.57E-06	1.48E-03	6.73	8.39E-07	1.20E-06	1.95E-06	2.30E-06
Tc-99	1.70E-05	1.61E-02	72.8	1.35E-05	1.52E-05	1.88E-05	2.05E-05
Ru-106	1.87E-09	1.76E-06	7.99E-03	7.02E-10	1.27E-09	2.46E-09	3.03E-09
Cd-113m	7.66E-06	7.23E-03	32.8	4.55E-06	6.07E-06	1.03E-05	1.08E-05
Sb-125	4.38E-04	0.413	1.87E+03	1.35E-04	2.83E-04	5.92E-04	7.41E-04
Sn-126	6.87E-07	6.48E-04	2.94	3.66E-07	5.23E-07	8.52E-07	1.01E-06
I-129	3.38E-08	3.19E-05	0.145	2.68E-08	3.02E-08	3.74E-08	4.09E-08
Cs-134	4.55E-04	0.430	1.95E+03	3.18E-04	3.85E-04	5.26E-04	5.94E-04
Cs-137	6.54E-02	61.7	2.80E+05	4.62E-02	5.56E-02	7.52E-02	8.47E-02
Ba-137m	6.18E-02	58.4	2.65E+05	4.37E-02	5.26E-02	7.11E-02	8.01E-02
Sm-151	1.58E-03	1.49	6.76E+03	8.43E-04	1.20E-03	1.96E-03	2.32E-03
Eu-152	1.49E-06	1.40E-03	6.37	1.15E-06	1.31E-06	1.66E-06	1.83E-06
Eu-154	5.33E-05	5.03E-02	228	3.29E-05	4.28E-05	6.37E-05	7.37E-05
Eu-155	2.25E-04	0.212	963	1.63E-04	1.93E-04	2.57E-04	2.87E-04
Ra-226	2.26E-11	2.13E-08	9.68E-05	8.16E-12	1.52E-11	3.00E-11	3.03E-11
Ra-228	2.29E-09	2.16E-06	9.81E-03	9.91E-10	9.91E-10	2.64E-09	3.02E-09
Ac-227	1.32E-10	1.24E-07	5.65E-04	4.79E-11	8.91E-11	1.74E-10	1.56E-10
Pa-231	4.02E-10	3.79E-07	1.72E-03	2.13E-10	2.97E-10	4.94E-10	5.82E-10
Th-229	5.32E-11	5.02E-08	2.28E-04	2.32E-11	2.32E-11	6.10E-11	6.92E-11
Th-232	2.24E-10	2.11E-07	9.59E-04	6.34E-11	6.34E-11	2.68E-10	3.10E-10
U-232	7.90E-09	7.46E-06	3.38E-02	5.52E-09	6.68E-09	9.32E-09	1.08E-08
U-233	3.03E-08	2.86E-05	0.130	2.11E-08	2.56E-08	3.57E-08	4.14E-08
U-234	3.79E-08	3.58E-05	0.162	3.18E-08	3.65E-08	3.87E-08	3.95E-08
U-235	1.45E-09	1.37E-06	6.22E-03	1.22E-09	1.40E-09	1.48E-09	1.51E-09
U-236	2.83E-09	2.67E-06	1.21E-02	2.33E-09	2.71E-09	2.89E-09	2.95E-09
U-238	2.97E-08	2.80E-05	0.127	2.54E-08	2.87E-08	3.03E-08	3.09E-08
Np-237	1.88E-07	1.77E-04	0.803	1.36E-07	1.62E-07	2.14E-07	2.39E-07
Pu-238	2.38E-07	2.25E-04	1.02	1.21E-07	1.77E-07	3.02E-07	3.67E-07
Pu-239	4.20E-06	3.97E-03	18.0	2.19E-06	3.17E-06	5.23E-06	6.22E-06
Pu-240	9.61E-07	9.07E-04	4.11	5.20E-07	7.34E-07	1.19E-06	1.42E-06
Pu-241	1.88E-05	1.78E-02	80.6	1.06E-05	1.46E-05	2.33E-05	2.78E-05
Pu-242	1.03E-10	9.71E-08	4.40E-04	4.92E-11	7.48E-11	1.32E-10	1.62E-10
Am-241	1.29E-05	1.22E-02	55.4	5.94E-06	9.37E-06	1.65E-05	1.89E-05
Am-243	9.56E-10	9.02E-07	4.09E-03	4.02E-10	6.56E-10	1.30E-09	1.60E-09
Cm-242	1.18E-07	1.11E-04	0.504	8.79E-08	1.03E-07	1.33E-07	1.48E-07
Cm-243	1.86E-08	1.75E-05	7.95E-02	1.36E-08	1.60E-08	2.11E-08	2.36E-08
Cm-244	3.68E-08	3.47E-05	0.158	1.35E-08	2.49E-08	4.87E-08	6.01E-08

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	7.06E-05 (g/L)	----	0.302	3.61E-05	5.30E-05	8.82E-05	1.05E-04
U	3.45E-04	77.4	351	2.92E-04	3.32E-04	3.53E-04	3.61E-04

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-103

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.54E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	1.68 (kW)	(5.73E+03 BTU/hr)	----	1.29	1.48	1.87	2.06
Bulk Density†	1.06 (g/cc)	----	----	1.04	1.05	1.07	1.08
Water wt%†	89.9	----	----	86.6	88.2	91.8	93.6
TOC wt% C (wet	0.194	----	----	9.61E-02	0.145	0.243	0.288

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	2.35E-04	0.222	1.01E+03	1.67E-04	2.00E-04	2.70E-04	3.03E-04
C-14	3.56E-06	3.36E-03	15.2	2.72E-06	3.13E-06	3.99E-06	4.40E-06
Ni-59	1.05E-07	9.94E-05	0.451	9.97E-08	9.97E-08	1.07E-07	1.08E-07
Ni-63	1.04E-05	9.84E-03	44.6	9.87E-06	9.87E-06	1.06E-05	1.07E-05
Co-60	3.82E-06	3.61E-03	16.4	2.23E-06	3.01E-06	4.64E-06	5.42E-06
Se-79	4.38E-07	4.14E-04	1.88	2.35E-07	3.33E-07	5.43E-07	6.42E-07
Sr-90	1.27E-02	12.0	5.43E+04	1.11E-02	1.19E-02	1.35E-02	1.43E-02
Y-90	1.27E-02	12.0	5.44E+04	1.11E-02	1.19E-02	1.35E-02	1.43E-02
Zr-93	2.00E-06	1.89E-03	8.58	1.09E-06	1.48E-06	2.47E-06	2.92E-06
Nb-93m	1.57E-06	1.48E-03	6.73	8.39E-07	1.20E-06	1.95E-06	2.30E-06
Tc-99	1.70E-05	1.61E-02	72.8	1.35E-05	1.52E-05	1.88E-05	2.05E-05
Ru-106	1.87E-09	1.76E-06	7.99E-03	7.02E-10	1.27E-09	2.46E-09	3.03E-09
Cd-113m	7.66E-06	7.23E-03	32.8	4.55E-06	6.07E-06	1.03E-05	1.08E-05
Sb-125	4.38E-04	0.413	1.87E+03	1.35E-04	2.83E-04	5.92E-04	7.41E-04
Sn-126	6.87E-07	6.48E-04	2.94	3.66E-07	5.23E-07	8.52E-07	1.01E-06
I-129	3.38E-08	3.19E-05	0.145	2.68E-08	3.02E-08	3.74E-08	4.09E-08
Cs-134	4.55E-04	0.430	1.95E+03	3.18E-04	3.85E-04	5.26E-04	5.94E-04
Cs-137	6.54E-02	61.7	2.80E+05	4.62E-02	5.56E-02	7.52E-02	8.47E-02
Ba-137m	6.18E-02	58.4	2.65E+05	4.37E-02	5.26E-02	7.11E-02	8.01E-02
Sm-151	1.58E-03	1.49	6.76E+03	8.43E-04	1.20E-03	1.96E-03	2.32E-03
Eu-152	1.49E-06	1.40E-03	6.37	1.15E-06	1.31E-06	1.66E-06	1.83E-06
Eu-154	5.33E-05	5.03E-02	228	3.29E-05	4.28E-05	6.37E-05	7.37E-05
Eu-155	2.25E-04	0.212	963	1.63E-04	1.93E-04	2.57E-04	2.87E-04
Ra-226	2.26E-11	2.13E-08	9.68E-05	8.16E-12	1.52E-11	3.00E-11	3.03E-11
Ra-228	2.29E-09	2.16E-06	9.81E-03	9.91E-10	9.91E-10	2.64E-09	3.02E-09
Ac-227	1.32E-10	1.24E-07	5.65E-04	4.79E-11	8.91E-11	1.74E-10	1.56E-10
Pa-231	4.02E-10	3.79E-07	1.72E-03	2.13E-10	2.97E-10	4.94E-10	5.82E-10
Th-229	5.32E-11	5.02E-08	2.28E-04	2.32E-11	2.32E-11	6.10E-11	6.92E-11
Th-232	2.24E-10	2.11E-07	9.59E-04	6.34E-11	6.34E-11	2.68E-10	3.10E-10
U-232	7.90E-09	7.46E-06	3.38E-02	5.52E-09	6.68E-09	9.32E-09	1.08E-08
U-233	3.03E-08	2.86E-05	0.130	2.11E-08	2.56E-08	3.57E-08	4.14E-08
U-234	3.79E-08	3.58E-05	0.162	3.18E-08	3.65E-08	3.87E-08	3.95E-08
U-235	1.45E-09	1.37E-06	6.22E-03	1.22E-09	1.40E-09	1.48E-09	1.51E-09
U-236	2.83E-09	2.67E-06	1.21E-02	2.33E-09	2.71E-09	2.89E-09	2.95E-09
U-238	2.97E-08	2.80E-05	0.127	2.54E-08	2.87E-08	3.03E-08	3.09E-08
Np-237	1.88E-07	1.77E-04	0.803	1.36E-07	1.62E-07	2.14E-07	2.39E-07
Pu-238	2.38E-07	2.25E-04	1.02	1.21E-07	1.77E-07	3.02E-07	3.67E-07
Pu-239	4.20E-06	3.97E-03	18.0	2.19E-06	3.17E-06	5.23E-06	6.22E-06
Pu-240	9.61E-07	9.07E-04	4.11	5.20E-07	7.34E-07	1.19E-06	1.42E-06
Pu-241	1.88E-05	1.78E-02	80.6	1.06E-05	1.46E-05	2.33E-05	2.78E-05
Pu-242	1.03E-10	9.71E-08	4.40E-04	4.92E-11	7.48E-11	1.32E-10	1.62E-10
Am-241	1.29E-05	1.22E-02	55.4	5.94E-06	9.37E-06	1.65E-05	1.89E-05
Am-243	9.56E-10	9.02E-07	4.09E-03	4.02E-10	6.56E-10	1.30E-09	1.60E-09
Cm-242	1.18E-07	1.11E-04	0.504	8.79E-08	1.03E-07	1.33E-07	1.48E-07
Cm-243	1.86E-08	1.75E-05	7.95E-02	1.36E-08	1.60E-08	2.11E-08	2.36E-08
Cm-244	3.68E-08	3.47E-05	0.158	1.35E-08	2.49E-08	4.87E-08	6.01E-08

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	7.06E-05 (g/L)	----	0.302	3.61E-05	5.30E-05	8.82E-05	1.05E-04
U	3.45E-04	77.4	351	2.92E-04	3.32E-04	3.53E-04	3.61E-04

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

No photographs available for interior montage.

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TANK 241-AP-104 SUMMARY

TANK HISTORY	
Entered Service	1986
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
1A, 1B, 1C, 15, 21, 27A, 27B, 27C, 28	4 in
7A. 10A, 12	12 in
TANK TEMPERATURE	
Average Tank Temperature	62°F
Maximum Temperature	70.2°F
Date	Nov 13, 1995
Elevation from tank bottom	14.50 ft
Riser Number	4
Minimum Temperature	51°F
Date	Jan 9 - April 3, 1995*
Elevation from tank bottom	38.50 ft, 30.50 ft, 26.50 ft, 22.50 ft, 14.50 ft
Riser Number	4

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	71
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	26,000 gal
Waste Type	DN
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	26,000 gal
Saltcake	0 gal
Sludge	0 gal
Supernatant	26,000 gal
INTERIOR PHOTOGRAPHS	
Date	not available
Montage Number	not available
Photo Set Number	not available
WASTE SURFACE LEVEL	
Devices	Auto/Man FIC, Man Tape
Max Level	409.25 in
Date	Feb 6 - March 8, 1996*
Min Level	5.5 in
Date	May 13, 1994

* Numerous dates in this time span.

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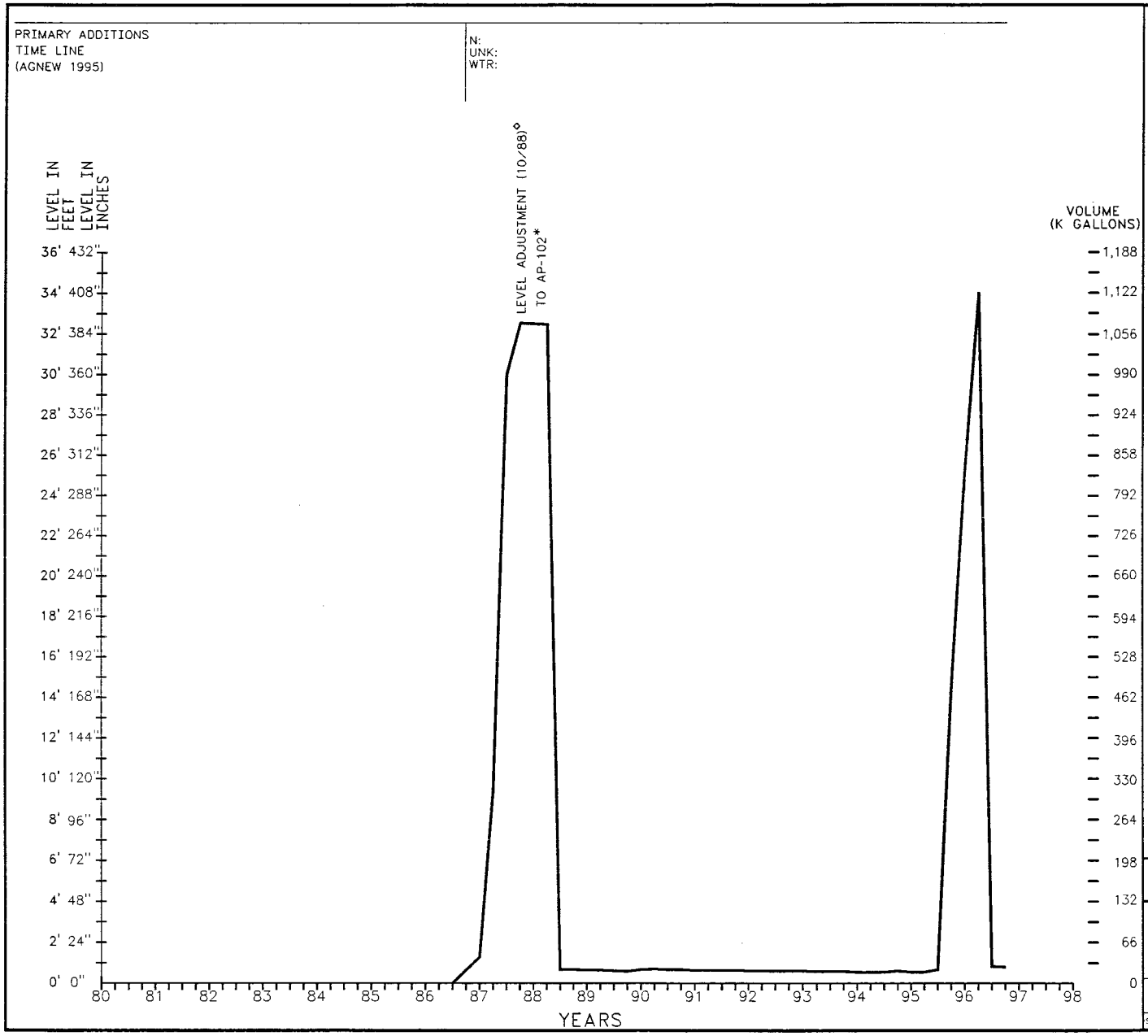


TANK INFO:

CONSTRUCTED 1983-1986
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

* AGNEW 1995
◇ HANLON 1996i

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

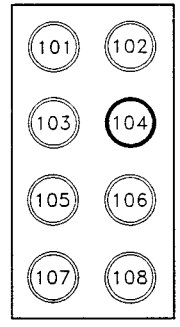
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

N: N-REACTOR WASTE
UNK: UNKNOWN
WTR: WATER

LEGEND

TOTAL WASTE LEVEL (SUPERNATE)

AP TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AP-104 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1986-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E160	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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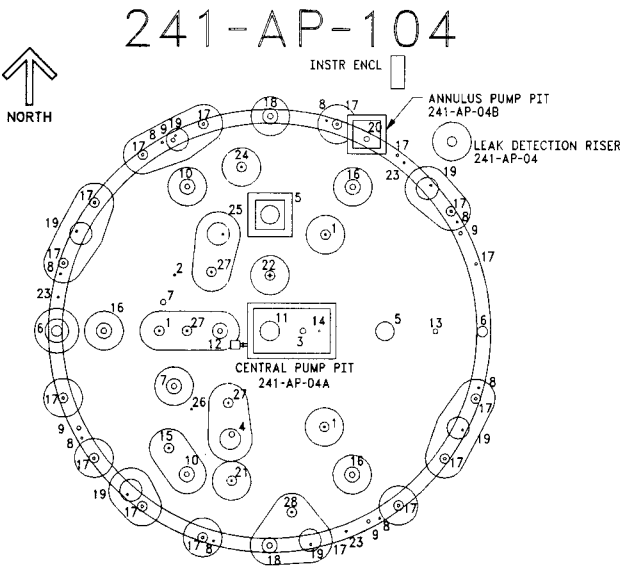
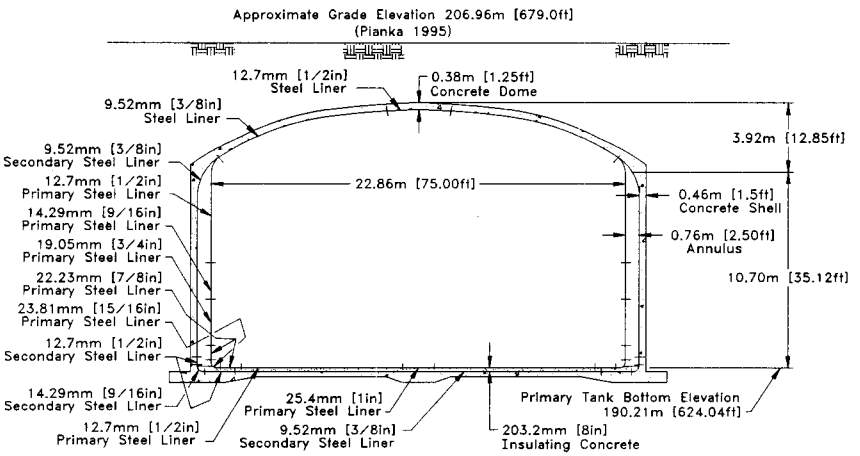


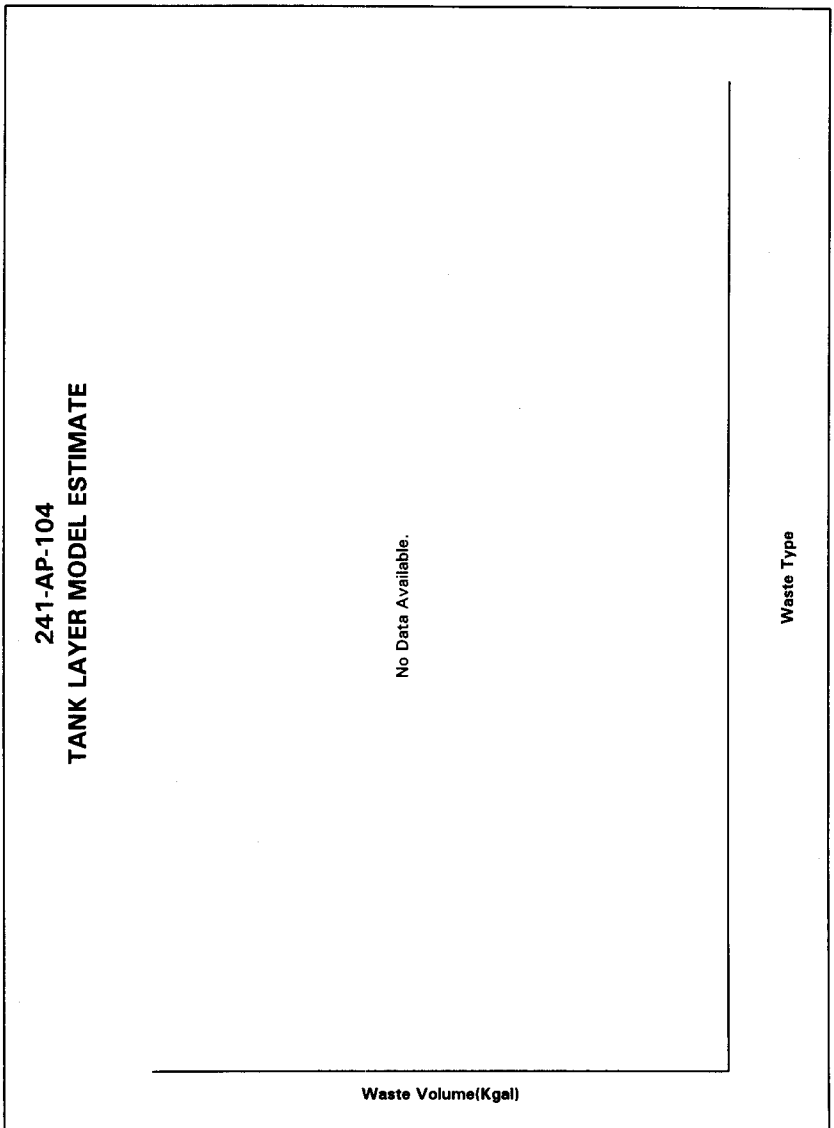
TANK RISER LOCATION

Ref: Salazar 1994
H-2-90539, Rev.1
H-2-90556, Rev.4



Ref: H-2-90442, Rev.1
H-2-90534, Rev.3

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AP-104

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

HDW Model Rev. 4

Double-Shell Tank 241-AP-104							
SMM Composite Inventory Estimate							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total SMM Wast	6.95E+04 (kg)	(18.0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density*	1.02 (g/cc)	----	----	1.02	1.02	1.02	1.02
Water wt%	96.5	----	----	96.2	96.3	96.6	96.8
TOC wt% C (wet	0	----	----	0	0	0	0
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	0.549	1.24E+04	860	0.490	0.519	0.579	0.608
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	1.73E-03	94.6	6.58	9.55E-04	1.33E-03	2.12E-03	2.50E-03
Cr3+	6.93E-03	353	24.6	6.93E-03	6.93E-03	6.93E-03	6.94E-03
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	1.56E-03	89.5	6.22	1.40E-03	1.48E-03	1.63E-03	1.71E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	7.78E-03	306	21.2	4.75E-03	6.23E-03	9.32E-03	1.08E-02
K+	5.98E-04	22.9	1.59	5.98E-04	5.98E-04	5.98E-04	5.98E-04
OH-	4.47E-02	745	51.8	4.24E-02	4.35E-02	4.59E-02	4.70E-02
NO3-	0.136	8.25E+03	574	0.136	0.136	0.136	0.136
NO2-	1.21E-02	547	38.0	1.21E-02	1.21E-02	1.21E-02	1.21E-02
CO32-	1.70E-03	100.0	6.95	-1.34E-03	1.49E-04	3.24E-03	4.73E-03
PO43-	0.130	1.21E+04	839	0.110	0.120	0.140	0.149
SO42-	3.47E-03	326	22.7	3.46E-03	3.47E-03	3.47E-03	3.47E-03
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	2.75E-03	95.5	6.64	2.75E-03	2.75E-03	2.75E-03	2.75E-03
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-104							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	6.95E+04 (kg)	(18.0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density†	1.02 (g/cc)	----	----	1.02	1.02	1.02	1.02
Water wt%†	96.5	----	----	96.2	96.3	96.6	96.8
TOC wt% C (wet	0	----	----	0	0	0	0
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	0.549	1.24E+04	860	0.490	0.519	0.579	0.608
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	1.73E-03	94.6	6.58	9.55E-04	1.33E-03	2.12E-03	2.50E-03
Cr3+	6.93E-03	353	24.6	6.93E-03	6.93E-03	6.93E-03	6.94E-03
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	1.56E-03	89.5	6.22	1.40E-03	1.48E-03	1.63E-03	1.71E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	7.78E-03	306	21.2	4.75E-03	6.23E-03	9.32E-03	1.08E-02
K+	5.98E-04	22.9	1.59	5.98E-04	5.98E-04	5.98E-04	5.98E-04
OH-	4.47E-02	745	51.8	4.24E-02	4.35E-02	4.59E-02	4.70E-02
NO3-	0.136	8.25E+03	574	0.136	0.136	0.136	0.136
NO2-	1.21E-02	547	38.0	1.21E-02	1.21E-02	1.21E-02	1.21E-02
CO32-	1.70E-03	100.0	6.95	-1.34E-03	1.49E-04	3.24E-03	4.73E-03
PO43-	0.130	1.21E+04	839	0.110	0.120	0.140	0.149
SO42-	3.47E-03	326	22.7	3.46E-03	3.47E-03	3.47E-03	3.47E-03
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	2.75E-03	95.5	6.64	2.75E-03	2.75E-03	2.75E-03	2.75E-03
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).
†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-104							
TLM Solids Composite Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AP-104

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	6 95E+04 (kg)	(18.0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density*	1 02 (g/cc)	----	----	1.02	1.02	1.02	1.02
Water wt%†	96.5	----	----	96.2	96.3	96.6	96.8
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-104

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	6.95E+04 (kg)	(18.0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density†	1.02 (g/cc)	----	----	1.02	1.02	1.02	1.02
Water wt%†	96.5	----	----	96.2	96.3	96.6	96.8
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

No photographs available for interior montage.

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TANK 241-AP-105 SUMMARY

TANK HISTORY	
Entered Service	1986
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
1A, 1B, 1C, 15, 21, 24, 28	4 in
7A, 10A, 10B, 12	12 in
TANK TEMPERATURE	
Average Tank Temperature	77°F
Maximum Temperature	111°F
Date	Feb 3, 1995
Elevation from tank bottom	14.50 ft
Riser Number	4
Minimum Temperature	55°F
Date	March 18, 1996
Elevation from tank bottom	38.50 ft, 30.50 ft, 26.50 ft
Riser Number	4

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	71
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	1,124,000 gal
Waste Type	DN
Drainable Interstitial Liquids	11,000 gal
Pumpable Liquids	970,000 gal
Saltcake	0 gal
Sludge	154,000 gal
Supernatant	970,000 gal
INTERIOR PHOTOGRAPHS	
Date	not available
Montage Number	not available
Photo Set Number	not available
WASTE SURFACE LEVEL	
Devices	Auto/Man FIC, Man Tape
Max Level	409.25 in
Date	Sept 6 and 7, 1996
Min Level	55 in
Date	Jan 12 and 13, 1996

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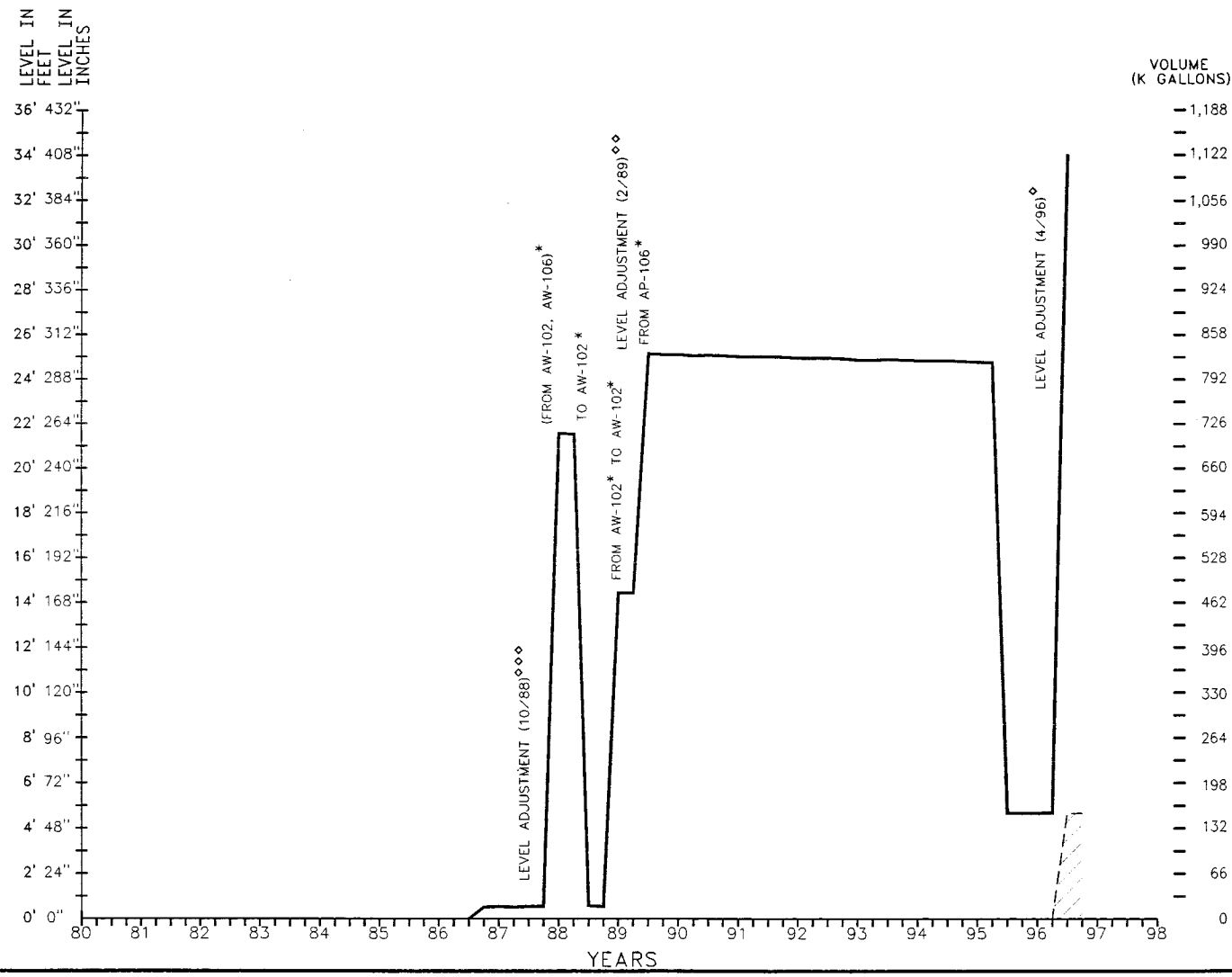
PRIMARY ADDITIONS
TIME LINE
(AGNEW 1995)

WTR:

UNK:



TANK INFO:

CONSTRUCTED 1983-1986
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

* AGNEW 1995
◇ HANLON 1996l
◇◇ THURMAN 1989b
◇◇◇ THURMAN 1988k

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

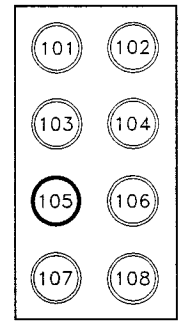
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

UNK: UNKNOWN
WTR: WATER

LEGEND

TOTAL WASTE LEVEL (SUPERNATE)
SOLIDS LEVEL
SOLIDS

AP TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AP-105 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1986-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E161	2/97
SCALE NONE		JOB NO.	SHEET 1 OF 1

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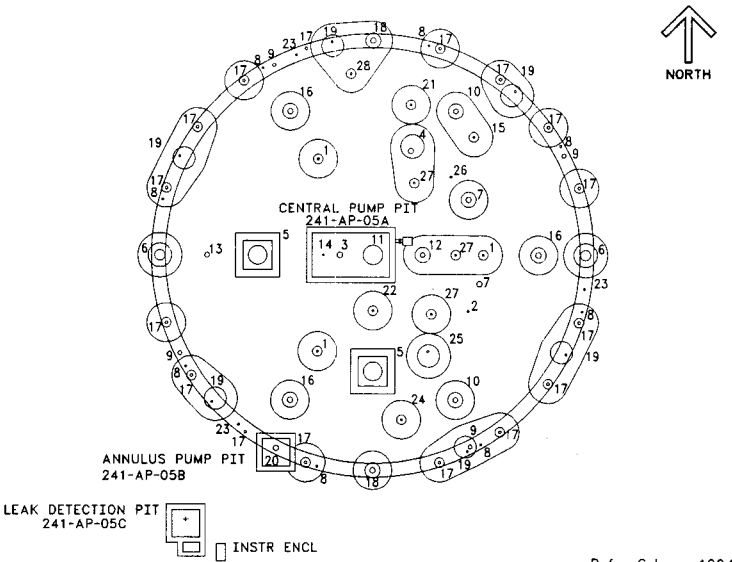
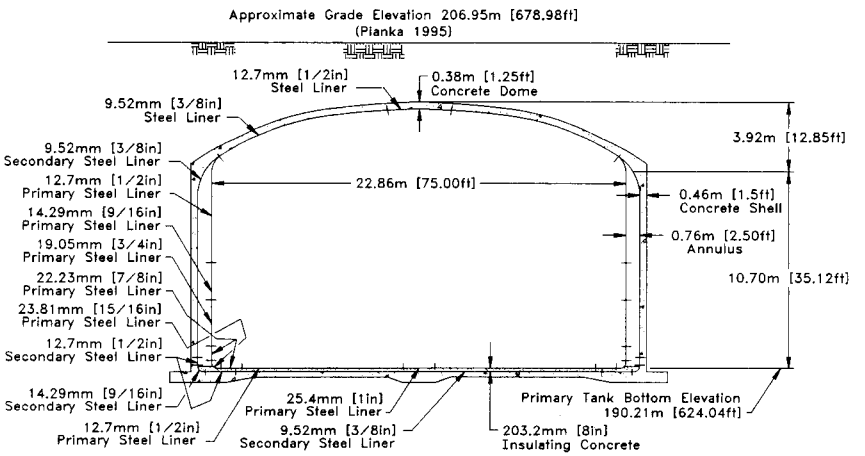
241-AP-105



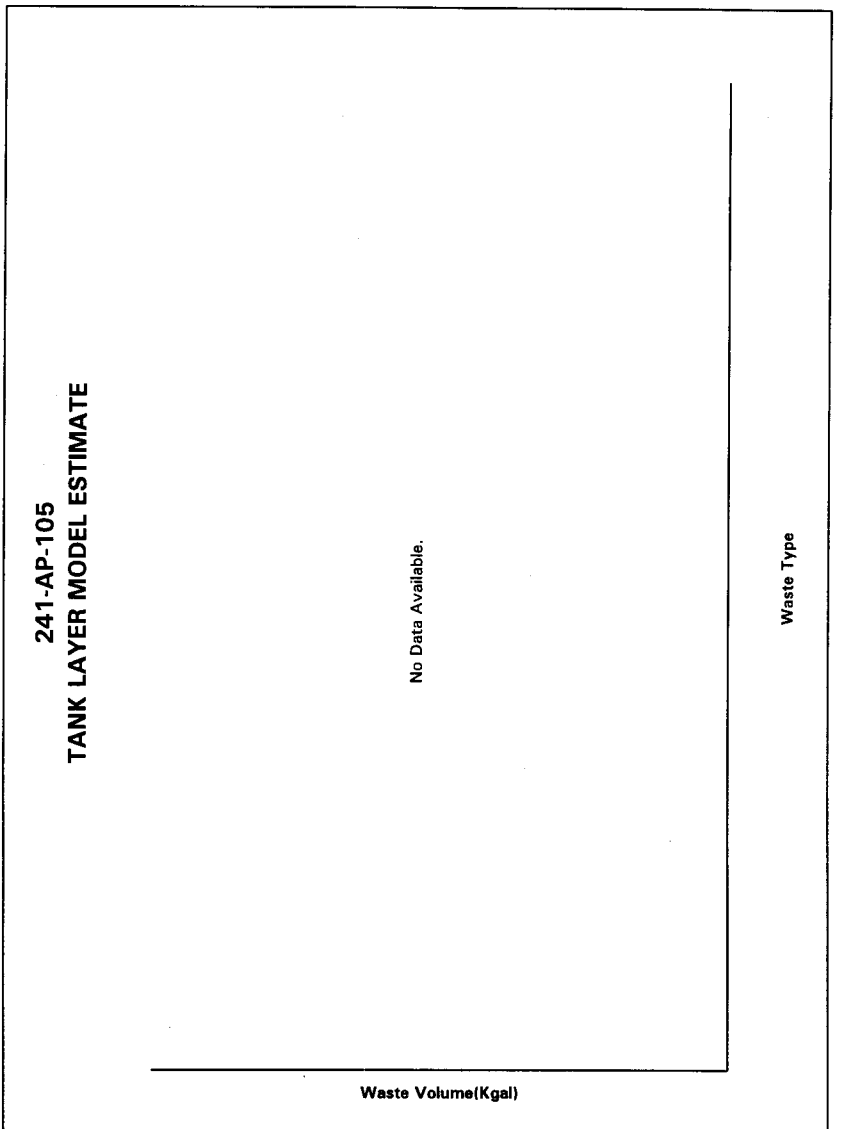
TANK RISER LOCATION

Ref: Salazar 1994
H-2-90535, Rev.2
H-2-90557, Rev.4



Ref: H-2-90442, Rev.1
H-2-90534, Rev.3

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AP-105

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AP-105

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.39E+06 (kg)	(820 kgal)	----	----	----	----	----
Heat Load	3.09 (kW)	(1.05E+04 BTU/hr)	----	2.91	2.99	3.18	3.27
Bulk Density*	1.41 (g/cc)	----	----	1.35	1.38	1.45	1.48
Water wt%	45.8	----	----	40.4	42.8	48.4	51.3
TOC wt% C (wet	0.863	----	----	0.681	0.771	0.953	1.04

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	10.2	1.66E+05	7.28E+05	8.47	9.33	11.1	11.9
Al3+	0.879	1.68E+04	7.36E+04	0.746	0.811	0.948	1.01
Fe3+ (total Fe)	1.34E-02	528	2.32E+03	1.17E-02	1.25E-02	1.42E-02	1.50E-02
Cr3+	6.38E-02	2.35E+03	1.03E+04	5.52E-02	5.94E-02	6.82E-02	7.24E-02
Bi3+	5.11E-04	75.6	332	4.82E-04	4.96E-04	5.26E-04	5.41E-04
La3+	1.41E-05	1.39	6.09	1.03E-05	1.22E-05	1.61E-05	1.80E-05
Hg2+	1.36E-05	1.94	8.49	7.07E-06	1.31E-05	1.41E-05	1.46E-05
Zr (as ZrO(OH)2)	2.98E-03	193	845	1.44E-03	2.79E-03	3.18E-03	3.37E-03
Pb2+	5.85E-04	85.7	376	5.06E-04	5.45E-04	6.25E-04	6.64E-04
Ni2+	7.75E-03	322	1.41E+03	7.42E-03	7.58E-03	7.92E-03	8.08E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	1.26E-02	491	2.16E+03	6.22E-03	9.36E-03	1.59E-02	1.82E-02
Ca2+	5.53E-02	1.57E+03	6.88E+03	4.68E-02	5.20E-02	5.86E-02	6.18E-02
K+	0.269	7.43E+03	3.26E+04	5.34E-02	0.158	0.382	0.493
OH-	5.87	7.05E+04	3.10E+05	4.68	5.26	6.47	7.05
NO3-	3.75	1.64E+05	7.22E+05	3.32	3.53	3.97	4.18
NO2-	0.971	3.16E+04	1.39E+05	0.843	0.897	1.05	1.08
CO32-	0.650	2.76E+04	1.21E+05	0.512	0.580	0.718	0.766
PO43-	0.175	1.18E+04	5.16E+04	0.101	0.137	0.213	0.250
SO42-	0.148	1.01E+04	4.41E+04	0.125	0.136	0.160	0.171
Si (as SiO32-)	5.57E-02	1.11E+03	4.85E+03	3.99E-02	4.76E-02	6.37E-02	7.07E-02
F-	0.260	3.49E+03	1.53E+04	3.72E-02	0.222	0.297	0.334
Cl-	0.166	4.17E+03	1.83E+04	0.135	0.150	0.183	0.198
C6H5O73-	2.39E-02	3.20E+03	1.40E+04	1.62E-02	2.00E-02	2.79E-02	3.16E-02
EDTA4-	9.43E-03	1.92E+03	8.43E+03	3.19E-03	6.24E-03	1.26E-02	1.58E-02
HEDTA3-	1.66E-02	3.22E+03	1.41E+04	4.15E-03	1.02E-02	2.30E-02	2.93E-02
glycolate-	0.208	1.10E+04	4.84E+04	0.105	0.155	0.260	0.311
acetate-	7.16E-03	299	1.31E+03	5.92E-03	6.45E-03	7.91E-03	9.07E-03
oxalate2-	1.85E-05	1.15	5.06	1.64E-05	1.75E-05	1.96E-05	2.06E-05
DBP	1.52E-02	2.27E+03	9.94E+03	1.16E-02	1.34E-02	1.71E-02	1.89E-02
butanol	1.52E-02	799	3.51E+03	1.16E-02	1.34E-02	1.71E-02	1.89E-02
NH3	0.824	9.91E+03	4.35E+04	7.46E-02	0.438	1.22	1.61
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-105							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	4.39E+06 (kg)	(820 kgal)	----	----	----	----	----
Heat Load	3.09 (kW)	(1.05E+04 BTU/hr)	----	2.91	2.99	3.18	3.27
Bulk Density†	1.41 (g/cc)	----	----	1.35	1.38	1.45	1.48
Water wt%†	45.8	----	----	40.4	42.8	48.4	51.3
TOC wt% C (wet	0.863	----	----	0.681	0.771	0.953	1.04
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	10.2	1.66E+05	7.28E+05	8.47	9.33	11.1	11.9
Al3+	0.879	1.68E+04	7.36E+04	0.746	0.811	0.948	1.01
Fe3+ (total Fe)	1.34E-02	528	2.32E+03	1.17E-02	1.25E-02	1.42E-02	1.50E-02
Cr3+	6.38E-02	2.35E+03	1.03E+04	5.52E-02	5.94E-02	6.82E-02	7.24E-02
Bi3+	5.11E-04	75.6	332	4.82E-04	4.96E-04	5.26E-04	5.41E-04
La3+	1.41E-05	1.39	6.09	1.03E-05	1.22E-05	1.61E-05	1.80E-05
Hg2+	1.36E-05	1.94	8.49	7.07E-06	1.31E-05	1.41E-05	1.46E-05
Zr (as ZrO(OH)2)	2.98E-03	193	845	1.44E-03	2.79E-03	3.18E-03	3.37E-03
Pb2+	5.85E-04	85.7	376	5.06E-04	5.45E-04	6.25E-04	6.64E-04
Ni2+	7.75E-03	322	1.41E+03	7.42E-03	7.58E-03	7.92E-03	8.08E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	1.26E-02	491	2.16E+03	6.22E-03	9.36E-03	1.59E-02	1.82E-02
Ca2+	5.53E-02	1.57E+03	6.88E+03	4.68E-02	5.20E-02	5.86E-02	6.18E-02
K+	0.269	7.43E+03	3.26E+04	5.34E-02	0.158	0.382	0.493
OH-	5.87	7.05E+04	3.10E+05	4.68	5.26	6.47	7.05
NO3-	3.75	1.64E+05	7.22E+05	3.32	3.53	3.97	4.18
NO2-	0.971	3.16E+04	1.39E+05	0.843	0.897	1.05	1.08
CO32-	0.650	2.76E+04	1.21E+05	0.512	0.580	0.718	0.766
PO43-	0.175	1.18E+04	5.16E+04	0.101	0.137	0.213	0.250
SO42-	0.148	1.01E+04	4.41E+04	0.125	0.136	0.160	0.171
Si (as SiO32-)	5.57E-02	1.11E+03	4.85E+03	3.99E-02	4.76E-02	6.37E-02	7.07E-02
F-	0.260	3.49E+03	1.53E+04	3.72E-02	0.222	0.297	0.334
Cl-	0.166	4.17E+03	1.83E+04	0.135	0.150	0.183	0.198
C6HSO73-	2.39E-02	3.20E+03	1.40E+04	1.62E-02	2.00E-02	2.79E-02	3.16E-02
EDTA4-	9.43E-03	1.92E+03	8.43E+03	3.19E-03	6.24E-03	1.26E-02	1.58E-02
HEDTA3-	1.66E-02	3.22E+03	1.41E+04	4.15E-03	1.02E-02	2.30E-02	2.93E-02
glycolate-	0.208	1.10E+04	4.84E+04	0.105	0.155	0.260	0.311
acetate-	7.16E-03	299	1.31E+03	5.92E-03	6.45E-03	7.91E-03	9.07E-03
oxalate2-	1.85E-05	1.15	5.06	1.64E-05	1.75E-05	1.96E-05	2.06E-05
DBP	1.52E-02	2.27E+03	9.94E+03	1.16E-02	1.34E-02	1.71E-02	1.89E-02
butanol	1.52E-02	799	3.51E+03	1.16E-02	1.34E-02	1.71E-02	1.89E-02
NH3	0.824	9.91E+03	4.35E+04	7.46E-02	0.438	1.22	1.61
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-105

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

HDW Model Rev. 4

Double-Shell Tank 241-AP-105

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.39E+06 (kg)	(820 kgal)	----	----	----	----	----
Heat Load	3.09 (kW)	(1.05E+04 BTU/hr)	----	2.91	2.99	3.18	3.27
Bulk Density*	1.41 (g/cc)	----	----	1.35	1.38	1.45	1.48
Water wt%†	45.8	----	----	40.4	42.8	48.4	51.3
TOC wt% C (wet	0.863	----	----	0.681	0.771	0.953	1.04

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.30E-04	9.22E-02	405	9.75E-05	9.75E-05	1.45E-04	1.62E-04
C-14	1.50E-05	1.06E-02	46.6	8.15E-06	8.15E-06	1.55E-05	1.58E-05
Ni-59	9.77E-07	6.91E-04	3.03	6.53E-07	6.53E-07	9.93E-07	1.01E-06
Ni-63	9.62E-05	6.80E-02	299	6.42E-05	6.42E-05	9.78E-05	9.94E-05
Co-60	2.33E-05	1.65E-02	72.2	1.54E-05	1.54E-05	2.52E-05	2.72E-05
Se-79	2.28E-06	1.62E-03	7.09	1.71E-06	1.85E-06	2.58E-06	2.86E-06
Sr-90	7.48E-02	52.9	2.32E+05	7.00E-02	7.23E-02	7.73E-02	7.97E-02
Y-90	7.48E-02	52.9	2.32E+05	5.96E-02	5.96E-02	7.73E-02	7.98E-02
Zr-93	1.08E-05	7.67E-03	33.6	8.24E-06	8.65E-06	1.22E-05	1.34E-05
Nb-93m	8.11E-06	5.73E-03	25.2	6.02E-06	6.57E-06	9.18E-06	1.02E-05
Tc-99	1.10E-04	7.80E-02	342	8.46E-05	9.71E-05	1.23E-04	1.36E-04
Ru-106	1.19E-08	8.42E-06	3.70E-02	8.47E-09	1.02E-08	1.37E-08	1.54E-08
Cd-113m	5.10E-05	3.60E-02	158	3.78E-05	3.78E-05	5.83E-05	6.03E-05
Sb-125	1.89E-04	0.134	586	9.83E-05	1.42E-04	2.36E-04	2.83E-04
Sn-126	3.52E-06	2.49E-03	10.9	2.60E-06	2.86E-06	3.99E-06	4.43E-06
I-129	2.13E-07	1.51E-04	0.661	1.64E-07	1.88E-07	2.39E-07	2.63E-07
Cs-134	4.78E-05	3.38E-02	148	7.63E-06	2.71E-05	6.89E-05	8.97E-05
Cs-137	0.105	74.0	3.25E+05	9.60E-02	9.97E-02	0.109	0.116
Ba-137m	9.90E-02	70.0	3.07E+05	8.62E-02	8.62E-02	0.103	0.107
Sm-151	8.13E-03	5.75	2.52E+04	6.04E-03	6.60E-03	9.21E-03	1.02E-02
Eu-152	2.62E-06	1.85E-03	8.14	2.08E-06	2.08E-06	2.89E-06	3.15E-06
Eu-154	3.78E-04	0.267	1.17E+03	2.68E-04	2.68E-04	4.18E-04	4.36E-04
Eu-155	1.68E-04	0.119	523	1.36E-04	1.36E-04	1.84E-04	1.99E-04
Ra-226	1.05E-10	7.42E-08	3.26E-04	6.38E-11	8.40E-11	1.26E-10	1.27E-10
Ra-228	1.30E-07	9.22E-05	0.405	5.94E-08	5.94E-08	1.52E-07	1.74E-07
Ac-227	6.42E-10	4.54E-07	1.99E-03	4.04E-10	5.21E-10	7.63E-10	7.11E-10
Pa-231	2.46E-09	1.74E-06	7.62E-03	1.92E-09	2.02E-09	2.72E-09	2.97E-09
Th-229	3.03E-09	2.14E-06	9.41E-03	1.39E-09	1.39E-09	3.49E-09	3.99E-09
Th-232	1.26E-08	8.89E-06	3.90E-02	3.80E-09	3.80E-09	1.50E-08	1.73E-08
U-232	4.58E-07	3.24E-04	1.42	3.15E-07	3.85E-07	5.42E-07	6.33E-07
U-233	1.75E-06	1.24E-03	5.44	1.21E-06	1.47E-06	2.08E-06	2.42E-06
U-234	1.61E-06	1.14E-03	4.98	1.17E-06	1.51E-06	1.65E-06	1.69E-06
U-235	6.16E-08	4.35E-05	0.191	4.50E-08	5.80E-08	6.32E-08	6.48E-08
U-236	1.17E-07	8.28E-05	0.363	8.12E-08	1.09E-07	1.21E-07	1.24E-07
U-238	1.30E-06	9.16E-04	4.02	9.96E-07	1.23E-06	1.33E-06	1.35E-06
Np-237	3.99E-07	2.82E-04	1.24	3.15E-07	3.56E-07	4.42E-07	4.84E-07
Pu-238	3.88E-06	2.74E-03	12.0	2.52E-06	3.18E-06	4.57E-06	5.24E-06
Pu-239	5.03E-05	3.56E-02	156	3.93E-05	4.47E-05	5.59E-05	6.13E-05
Pu-240	1.22E-05	8.61E-03	37.8	8.83E-06	1.05E-05	1.39E-05	1.55E-05
Pu-241	3.65E-04	0.258	1.13E+03	2.26E-04	2.94E-04	4.36E-04	5.04E-04
Pu-242	1.50E-09	1.06E-06	4.67E-03	9.86E-10	1.24E-09	1.77E-09	2.02E-09
Am-241	7.03E-05	4.97E-02	218	5.04E-05	6.01E-05	8.05E-05	8.74E-05
Am-243	6.70E-09	4.74E-06	2.08E-02	2.77E-09	4.68E-09	8.77E-09	8.86E-09
Cm-242	1.13E-07	7.98E-05	0.350	8.50E-08	9.05E-08	1.27E-07	1.41E-07
Cm-243	1.19E-08	8.39E-06	3.68E-02	8.90E-09	9.74E-09	1.34E-08	1.48E-08
Cm-244	2.04E-07	1.44E-04	0.632	1.32E-07	1.67E-07	2.37E-07	2.70E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	7.78E-04 (g/L)	----	2.42	5.85E-04	6.79E-04	8.77E-04	9.72E-04
U	1.47E-02	2.47E+03	1.08E+04	1.09E-02	1.39E-02	1.51E-02	1.54E-02

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species

HDW Model Rev. 4

Double-Shell Tank 241-AP-105

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.39E+06 (kg)	(820 kgal)	----	----	----	----	----
Heat Load	3.09 (kW)	(1.05E+04 BTU/hr)	----	2.91	2.99	3.18	3.27
Bulk Density†	1.41 (g/cc)	----	----	1.35	1.38	1.45	1.48
Water wt%†	45.8	----	----	40.4	42.8	48.4	51.3
TOC wt% C (wet	0.863	----	----	0.681	0.771	0.953	1.04

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.30E-04	9.22E-02	405	9.75E-05	9.75E-05	1.45E-04	1.62E-04
C-14	1.50E-05	1.06E-02	46.6	8.15E-06	8.15E-06	1.55E-05	1.58E-05
Ni-59	9.77E-07	6.91E-04	3.03	6.53E-07	6.53E-07	9.93E-07	1.01E-06
Ni-63	9.62E-05	6.80E-02	299	6.42E-05	6.42E-05	9.78E-05	9.94E-05
Co-60	2.33E-05	1.65E-02	72.2	1.54E-05	1.54E-05	2.52E-05	2.72E-05
Sc-79	2.28E-06	1.62E-03	7.09	1.71E-06	1.85E-06	2.58E-06	2.86E-06
Sr-90	7.48E-02	52.9	2.32E+05	7.00E-02	7.23E-02	7.73E-02	7.97E-02
Y-90	7.48E-02	52.9	2.32E+05	5.96E-02	5.96E-02	7.73E-02	7.98E-02
Zr-93	1.08E-05	7.67E-03	33.6	8.24E-06	8.65E-06	1.22E-05	1.34E-05
Nb-93m	8.11E-06	5.73E-03	25.2	6.02E-06	6.57E-06	9.18E-06	1.02E-05
Tc-99	1.10E-04	7.80E-02	342	8.46E-05	9.71E-05	1.23E-04	1.36E-04
Ru-106	1.19E-08	8.42E-06	3.70E-02	8.47E-09	1.02E-08	1.37E-08	1.54E-08
Cd-113m	5.10E-05	3.60E-02	158	3.78E-05	3.78E-05	5.83E-05	6.03E-05
Sb-125	1.89E-04	0.134	586	9.83E-05	1.42E-04	2.36E-04	2.83E-04
Sn-126	3.52E-06	2.49E-03	10.9	2.60E-06	2.86E-06	3.99E-06	4.43E-06
I-129	2.13E-07	1.51E-04	0.661	1.64E-07	1.88E-07	2.39E-07	2.63E-07
Cs-134	4.78E-05	3.38E-02	148	7.63E-06	2.71E-05	6.89E-05	8.97E-05
Cs-137	0.105	74.0	3.25E+05	9.60E-02	9.97E-02	0.109	0.116
Ba-137m	9.90E-02	70.0	3.07E+05	8.62E-02	8.62E-02	0.103	0.107
Sm-151	8.13E-03	5.75	2.52E+04	6.04E-03	6.60E-03	9.21E-03	1.02E-02
Eu-152	2.62E-06	1.85E-03	8.14	2.08E-06	2.08E-06	2.89E-06	3.15E-06
Eu-154	3.78E-04	0.267	1.17E+03	2.68E-04	2.68E-04	4.18E-04	4.36E-04
Eu-155	1.68E-04	0.119	523	1.36E-04	1.36E-04	1.84E-04	1.99E-04
Ra-226	1.05E-10	7.42E-08	3.26E-04	6.38E-11	8.40E-11	1.26E-10	1.27E-10
Ra-228	1.30E-07	9.22E-05	0.405	5.94E-08	5.94E-08	1.52E-07	1.74E-07
Ac-227	6.42E-10	4.54E-07	1.99E-03	4.04E-10	5.21E-10	7.63E-10	7.11E-10
Pa-231	2.46E-09	1.74E-06	7.62E-03	1.92E-09	2.02E-09	2.72E-09	2.97E-09
Th-229	3.03E-09	2.14E-06	9.41E-03	1.39E-09	1.39E-09	3.49E-09	3.99E-09
Th-232	1.26E-08	8.89E-06	3.90E-02	3.80E-09	3.80E-09	1.50E-08	1.73E-08
U-232	4.58E-07	3.24E-04	1.42	3.15E-07	3.85E-07	5.42E-07	6.33E-07
U-233	1.75E-06	1.24E-03	5.44	1.21E-06	1.47E-06	2.08E-06	2.42E-06
U-234	1.61E-06	1.14E-03	4.98	1.17E-06	1.51E-06	1.65E-06	1.69E-06
U-235	6.16E-08	4.35E-05	0.191	4.50E-08	5.80E-08	6.32E-08	6.48E-08
U-236	1.17E-07	8.28E-05	0.363	8.12E-08	1.09E-07	1.21E-07	1.24E-07
U-238	1.30E-06	9.16E-04	4.02	9.96E-07	1.23E-06	1.33E-06	1.35E-06
Np-237	3.99E-07	2.82E-04	1.24	3.15E-07	3.56E-07	4.42E-07	4.84E-07
Pu-238	3.88E-06	2.74E-03	12.0	2.52E-06	3.18E-06	4.57E-06	5.24E-06
Pu-239	5.03E-05	3.56E-02	156	3.93E-05	4.47E-05	5.59E-05	6.13E-05
Pu-240	1.22E-05	8.61E-03	37.8	8.83E-06	1.05E-05	1.39E-05	1.55E-05
Pu-241	3.65E-04	0.258	1.13E+03	2.26E-04	2.94E-04	4.36E-04	5.04E-04
Pu-242	1.50E-09	1.06E-06	4.67E-03	9.86E-10	1.24E-09	1.77E-09	2.02E-09
Am-241	7.03E-05	4.97E-02	218	5.04E-05	6.01E-05	8.05E-05	8.74E-05
Am-243	6.70E-09	4.74E-06	2.08E-02	2.77E-09	4.68E-09	8.77E-09	8.86E-09
Cm-242	1.13E-07	7.98E-05	0.350	8.50E-08	9.05E-08	1.27E-07	1.41E-07
Cm-243	1.19E-08	8.39E-06	3.68E-02	8.90E-09	9.74E-09	1.34E-08	1.48E-08
Cm-244	2.04E-07	1.44E-04	0.632	1.32E-07	1.67E-07	2.37E-07	2.70E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	7.78E-04 (g/L)	----	2.42	5.85E-04	6.79E-04	8.77E-04	9.72E-04
U	1.47E-02	2.47E+03	1.08E+04	1.09E-02	1.39E-02	1.51E-02	1.54E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

No photographs available for interior montage.

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TANK 241-AP-106 SUMMARY

TANK HISTORY	
Entered Service	1986
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
1A, 1B, 1C, 15, 21, 24, 27A, 27B, 27C	4 in
10A, 10B, 12	12 in
TANK TEMPERATURE	
Average Tank Temperature	74°F
Maximum Temperature	106°F
Date	Feb 13, 1995
Elevation from tank bottom	38.50 ft
Riser Number	4
Minimum Temperature	54°F
Date	March 18, 1996
Elevation from tank bottom	38.50 ft
Riser Number	4

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	71
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	246,000 gal
Waste Type	DN
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	246,000 gal
Saltcake	0 gal
Sludge	0 gal
Supernatant	246,000 gal
INTERIOR PHOTOGRAPHS	
Date	not available
Montage Number	not available
Photo Set Number	not available
WASTE SURFACE LEVEL	
Devices	Auto/Man FIC, Man Tape
Max Level	413 in
Date	Jan 5, 1991 - Feb 2, 1991*
Min Level	38.6 in
Date	Nov 30, 1995

* Numerous dates in this time span.

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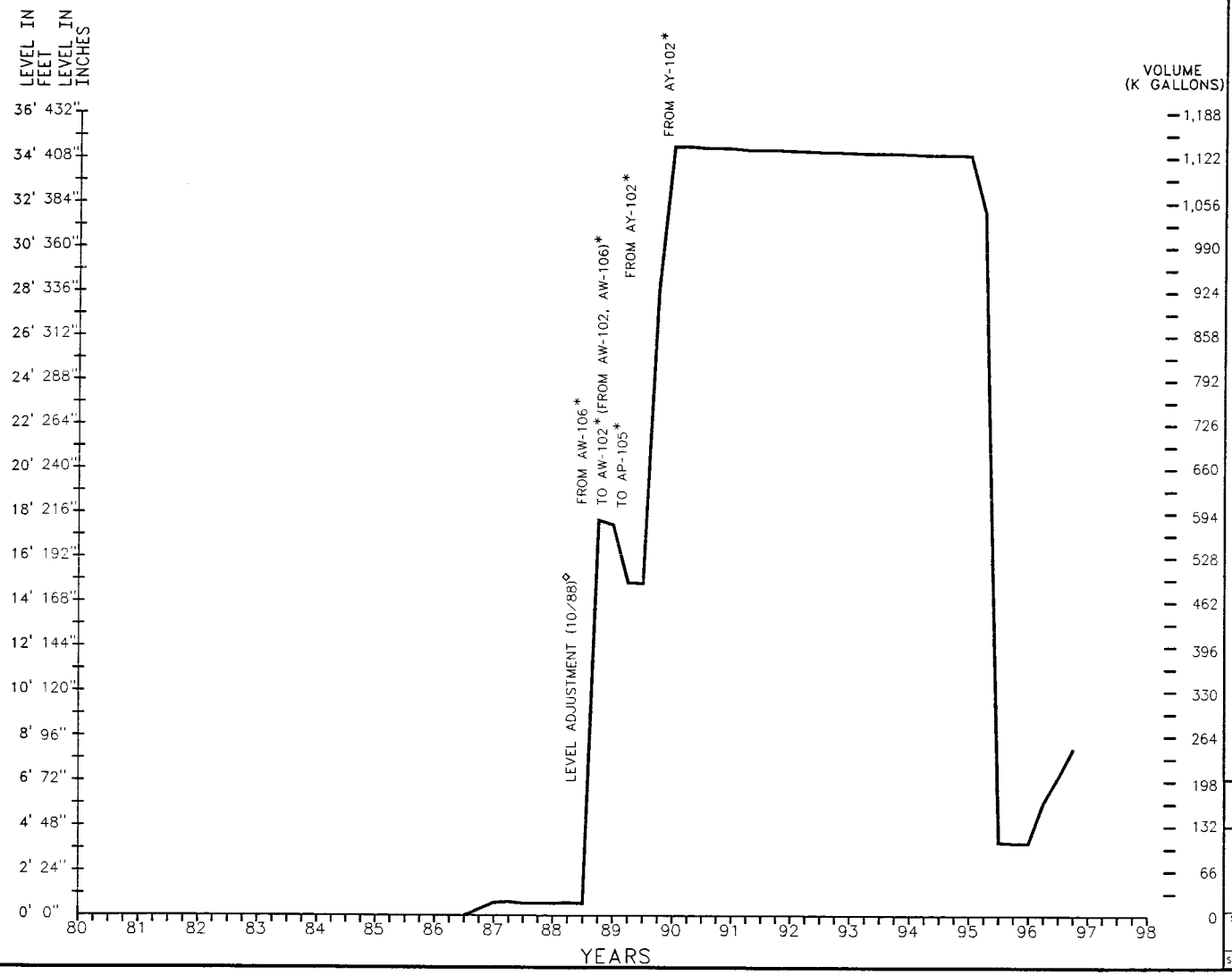
PRIMARY ADDITIONS
TIME LINE
(AGNEW 1995)

WTR:



TANK INFO:

CONSTRUCTED 1983-1986
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

* AGNEW 1995
◇ HANLON 1996I

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

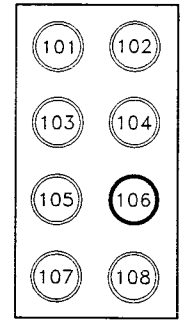
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

WTR: WATER

LEGEND

TOTAL WASTE LEVEL (SUPERNATE)

AP TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AP-106 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1986-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E162	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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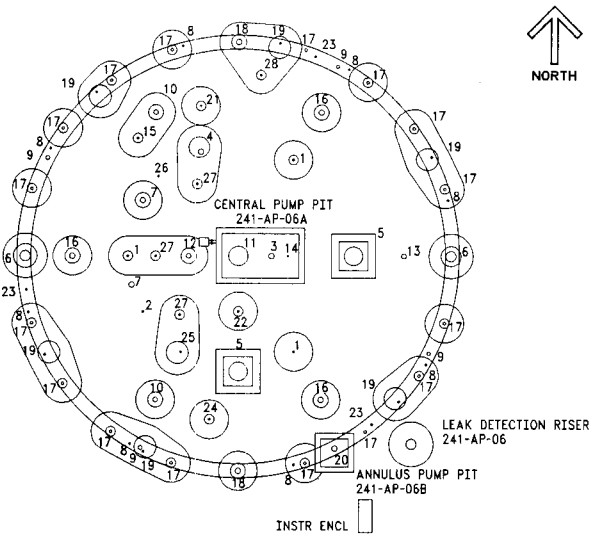
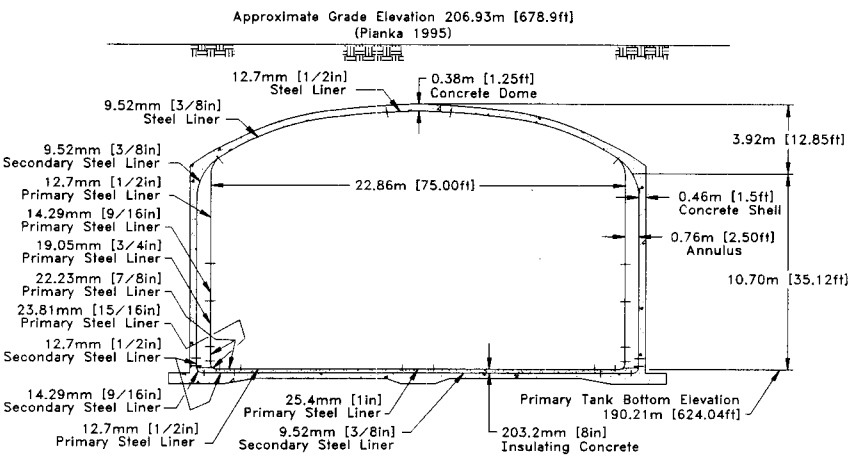
241-AP-106



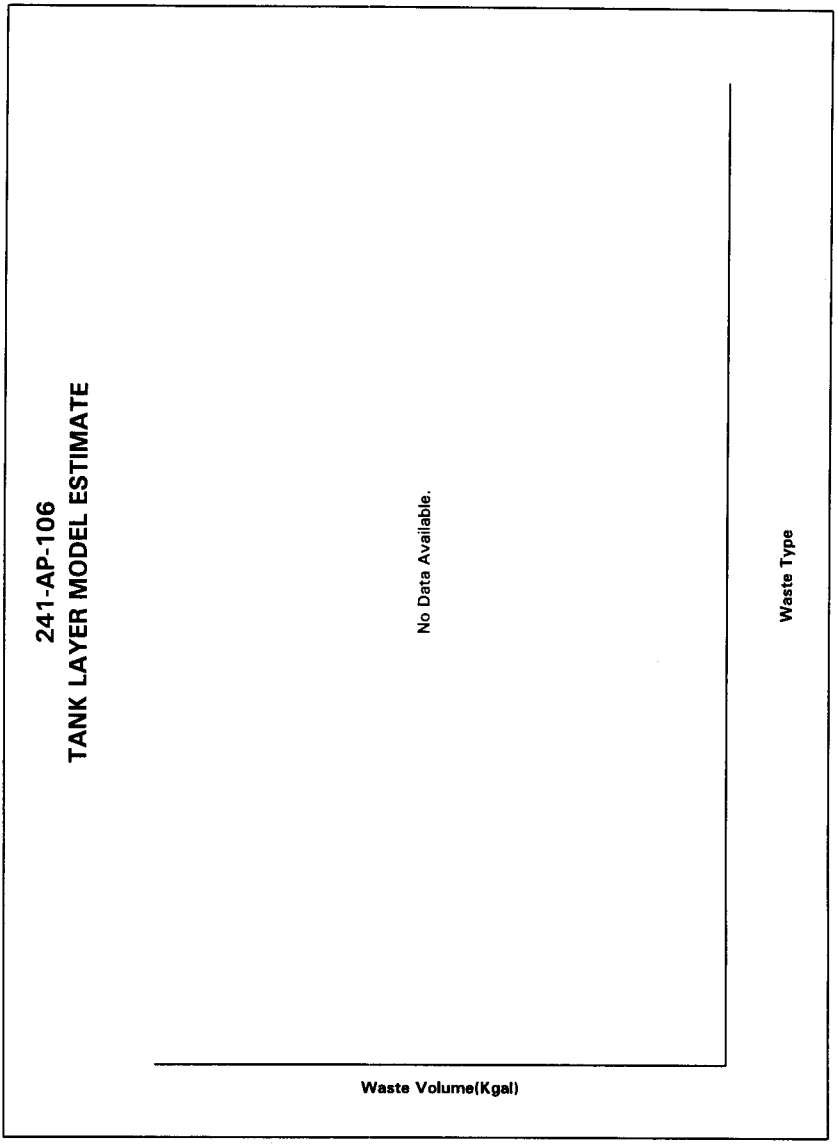
TANK RISER LOCATION

Ref: Salazar 1994
H-2-90536, Rev.2
H-2-90558, Rev.4



Ref: H-2-90442, Rev.1
H-2-90534, Rev.3

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AP-106							
TLM Solids Composite Inventory Estimate*							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AP-106

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.86E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	1.45 (kW)	(4.95E+03 BTU/hr)	----	1.38	1.42	1.48	1.52
Bulk Density*	1.14 (g/cc)	----	----	1.11	1.12	1.16	1.17
Water wt%	77.5	----	----	73.4	75.3	79.6	81.8
TOC wt% C (wet	0.392	----	----	0.269	0.330	0.453	0.509

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	3.50	7.06E+04	3.42E+05	2.65	3.07	3.93	4.33
Al3+	0.293	6.93E+03	3.37E+04	0.227	0.259	0.326	0.359
Fe3+ (total Fe)	4.19E-03	206	999	3.76E-03	3.97E-03	4.42E-03	4.63E-03
Cr3+	1.75E-02	798	3.88E+03	1.52E-02	1.63E-02	1.86E-02	1.98E-02
Bi3+	1.34E-04	24.6	120	1.26E-04	1.30E-04	1.38E-04	1.42E-04
La3+	3.50E-06	0.426	2.07	2.55E-06	3.02E-06	3.98E-06	4.45E-06
Hg2+	3.54E-06	0.623	3.03	1.84E-06	3.41E-06	3.67E-06	3.79E-06
Zr (as ZrO(OH)2)	7.71E-04	61.7	300	3.73E-04	7.21E-04	8.22E-04	8.70E-04
Pb2+	1.54E-04	27.9	136	1.33E-04	1.43E-04	1.64E-04	1.74E-04
Ni2+	2.57E-03	133	645	2.49E-03	2.53E-03	2.62E-03	2.66E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	3.34E-03	161	782	1.64E-03	2.47E-03	4.21E-03	4.80E-03
Ca2+	1.76E-02	619	3.01E+03	1.54E-02	1.67E-02	1.85E-02	1.93E-02
K+	7.28E-02	2.50E+03	1.21E+04	1.72E-02	4.42E-02	0.102	0.131
OH-	2.07	3.09E+04	1.50E+05	1.49	1.78	2.37	2.66
NO3-	1.23	6.66E+04	3.24E+05	1.02	1.12	1.33	1.44
NO2-	0.270	1.09E+04	5.29E+04	0.236	0.250	0.291	0.299
CO32-	0.233	1.22E+04	5.95E+04	0.165	0.198	0.266	0.290
PO43-	4.84E-02	4.03E+03	1.96E+04	2.87E-02	3.83E-02	5.85E-02	6.81E-02
SO42-	4.90E-02	4.13E+03	2.01E+04	3.79E-02	4.33E-02	5.47E-02	6.02E-02
Si (as SiO32-)	2.20E-02	542	2.64E+03	1.43E-02	1.81E-02	2.59E-02	2.94E-02
F-	6.73E-02	1.12E+03	5.46E+03	9.78E-03	5.76E-02	7.70E-02	8.64E-02
Cl-	5.91E-02	1.84E+03	8.93E+03	4.34E-02	5.11E-02	6.71E-02	7.48E-02
C6H5O73-	9.50E-03	1.58E+03	7.66E+03	5.71E-03	7.56E-03	1.14E-02	1.33E-02
EDTA4-	2.48E-03	627	3.05E+03	8.40E-04	1.64E-03	3.32E-03	4.15E-03
HEDTA3-	4.37E-03	1.05E+03	5.11E+03	1.09E-03	2.69E-03	6.06E-03	7.71E-03
glycolate-	9.76E-02	6.42E+03	3.12E+04	4.70E-02	7.18E-02	0.124	0.148
acetate-	1.88E-03	97.2	473	1.55E-03	1.69E-03	2.08E-03	2.38E-03
oxalate2-	4.58E-06	0.354	1.72	4.07E-06	4.32E-06	4.84E-06	5.10E-06
DBP	4.01E-03	740	3.60E+03	3.05E-03	3.52E-03	4.50E-03	4.98E-03
butanol	4.01E-03	261	1.27E+03	3.05E-03	3.52E-03	4.50E-03	4.98E-03
NH3	0.216	3.21E+03	1.56E+04	2.18E-02	0.116	0.318	0.418
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species

HDW Model Rev. 4

Double-Shell Tank 241-AP-106

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.86E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	1.45 (kW)	(4.95E+03 BTU/hr)	----	1.38	1.42	1.48	1.52
Bulk Density†	1.14 (g/cc)	----	----	1.11	1.12	1.16	1.17
Water wt%†	77.5	----	----	73.4	75.3	79.6	81.8
TOC wt% C (wet	0.392	----	----	0.269	0.330	0.453	0.509

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	3.50	7.06E+04	3.43E+05	2.65	3.07	3.93	4.33
Al3+	0.293	6.93E+03	3.37E+04	0.227	0.259	0.326	0.359
Fe3+ (total Fe)	4.19E-03	206	999	3.76E-03	3.97E-03	4.42E-03	4.63E-03
Cr3+	1.75E-02	798	3.88E+03	1.52E-02	1.63E-02	1.86E-02	1.98E-02
Bi3+	1.34E-04	24.6	120	1.26E-04	1.30E-04	1.38E-04	1.42E-04
La3+	3.50E-06	0.426	2.07	2.55E-06	3.02E-06	3.98E-06	4.45E-06
Hg2+	3.54E-06	0.623	3.03	1.84E-06	3.41E-06	3.67E-06	3.79E-06
Zr (as ZrO(OH)2)	7.71E-04	61.7	300	3.73E-04	7.21E-04	8.22E-04	8.70E-04
Pb2+	1.54E-04	27.9	136	1.33E-04	1.43E-04	1.64E-04	1.74E-04
Ni2+	2.57E-03	133	645	2.49E-03	2.53E-03	2.62E-03	2.66E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	3.34E-03	161	782	1.64E-03	2.47E-03	4.21E-03	4.80E-03
Ca2+	1.76E-02	619	3.01E+03	1.54E-02	1.67E-02	1.85E-02	1.93E-02
K+	7.28E-02	2.50E+03	1.21E+04	1.72E-02	4.42E-02	0.102	0.131
OH-	2.07	3.09E+04	1.50E+05	1.49	1.78	2.37	2.66
NO3-	1.23	6.66E+04	3.24E+05	1.02	1.12	1.33	1.44
NO2-	0.270	1.09E+04	5.29E+04	0.236	0.250	0.291	0.299
CO32-	0.233	1.22E+04	5.95E+04	0.165	0.198	0.266	0.290
PO43-	4.84E-02	4.03E+03	1.96E+04	2.87E-02	3.83E-02	5.85E-02	6.81E-02
SO42-	4.90E-02	4.13E+03	2.01E+04	3.79E-02	4.33E-02	5.47E-02	6.02E-02
Si (as SiO32-)	2.20E-02	542	2.64E+03	1.43E-02	1.81E-02	2.59E-02	2.94E-02
F-	6.73E-02	1.12E+03	5.46E+03	9.78E-03	5.76E-02	7.70E-02	8.64E-02
Cl-	5.91E-02	1.84E+03	8.93E+03	4.34E-02	5.11E-02	6.71E-02	7.48E-02
C6H5O73-	9.50E-03	1.58E+03	7.66E+03	5.71E-03	7.56E-03	1.14E-02	1.33E-02
EDTA4-	2.48E-03	627	3.05E+03	8.40E-04	1.64E-03	3.32E-03	4.15E-03
HEDTA3-	4.37E-03	1.05E+03	5.11E+03	1.09E-03	2.69E-03	6.06E-03	7.71E-03
glycolate-	9.76E-02	6.42E+03	3.12E+04	4.70E-02	7.18E-02	0.124	0.148
acetate-	1.88E-03	97.2	473	1.55E-03	1.69E-03	2.08E-03	2.38E-03
oxalate2-	4.58E-06	0.354	1.72	4.07E-06	4.32E-06	4.84E-06	5.10E-06
DBP	4.01E-03	740	3.60E+03	3.05E-03	3.52E-03	4.50E-03	4.98E-03
butanol	4.01E-03	261	1.27E+03	3.05E-03	3.52E-03	4.50E-03	4.98E-03
NH3	0.216	3.21E+03	1.56E+04	2.18E-02	0.116	0.318	0.418
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-106

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

HDW Model Rev. 4

Double-Shell Tank 241-AP-106

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.86E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	1.45 (kW)	(4.95E+03 BTU/hr)	----	1.38	1.42	1.48	1.52
Bulk Density*	1.14 (g/cc)	----	----	1.11	1.12	1.16	1.17
Water wt%†	77.5	----	----	73.4	75.3	79.6	81.8
TOC wt% C (wet	0.392	----	----	0.269	0.330	0.453	0.509

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	6.13E-05	5.38E-02	262	5.23E-05	5.27E-05	6.85E-05	7.69E-05
C-14	4.57E-06	4.01E-03	19.5	2.77E-06	2.77E-06	4.79E-06	4.94E-06
Ni-59	3.17E-07	2.78E-04	1.35	2.32E-07	2.32E-07	3.21E-07	3.25E-07
Ni-63	3.13E-05	2.74E-02	133	2.29E-05	2.29E-05	3.17E-05	3.21E-05
Co-60	7.12E-06	6.24E-03	30.4	5.06E-06	5.06E-06	7.63E-06	8.12E-06
Se-79	8.47E-07	7.43E-04	3.61	5.62E-07	7.00E-07	9.93E-07	1.13E-06
Sr-90	2.70E-02	23.7	1.15E+05	2.47E-02	2.59E-02	2.82E-02	2.93E-02
Y-90	2.70E-02	23.7	1.15E+05	2.30E-02	2.30E-02	2.82E-02	2.93E-02
Zr-93	3.96E-06	3.47E-03	16.9	2.68E-06	3.22E-06	4.62E-06	5.24E-06
Nb-93m	3.02E-06	2.65E-03	12.9	1.99E-06	2.49E-06	3.54E-06	4.05E-06
Tc-99	3.25E-05	2.85E-02	138	2.57E-05	2.90E-05	3.59E-05	3.93E-05
Ru-106	4.19E-09	3.68E-06	1.79E-02	2.56E-09	3.36E-09	5.02E-09	5.82E-09
Cd-113m	1.72E-05	1.51E-02	73.5	1.29E-05	1.38E-05	2.09E-05	2.16E-05
Sb-125	9.56E-05	8.39E-02	408	6.52E-05	8.01E-05	1.11E-04	1.26E-04
Sn-126	1.31E-06	1.15E-03	5.60	8.64E-07	1.08E-06	1.54E-06	1.76E-06
I-129	6.29E-08	5.51E-05	0.268	4.99E-08	5.62E-08	6.95E-08	7.60E-08
Cs-134	5.65E-05	4.96E-02	241	4.27E-05	4.95E-05	6.36E-05	7.04E-05
Cs-137	3.37E-02	29.6	1.44E+05	3.14E-02	3.24E-02	3.49E-02	3.66E-02
Ba-137m	3.19E-02	28.0	1.36E+05	2.85E-02	2.85E-02	3.30E-02	3.41E-02
Sm-151	3.03E-03	2.66	1.29E+04	2.00E-03	2.50E-03	3.56E-03	4.06E-03
Eu-152	1.02E-06	8.92E-04	4.34	7.59E-07	8.74E-07	1.15E-06	1.27E-06
Eu-154	1.25E-04	0.109	531	9.58E-05	9.58E-05	1.39E-04	1.53E-04
Eu-155	7.65E-05	6.71E-02	326	6.18E-05	6.80E-05	8.41E-05	9.13E-05
Ra-226	4.10E-11	3.60E-08	1.75E-04	2.08E-11	3.07E-11	5.14E-11	5.17E-11
Ra-228	3.42E-08	3.00E-05	0.146	1.55E-08	1.55E-08	3.97E-08	4.56E-08
Ac-227	2.47E-10	2.17E-07	1.05E-03	1.29E-10	1.87E-10	3.06E-10	2.81E-10
Pa-231	8.65E-10	7.58E-07	3.69E-03	6.00E-10	7.17E-10	9.94E-10	1.12E-09
Th-229	7.94E-10	6.97E-07	3.39E-03	3.64E-10	3.64E-10	9.16E-10	1.05E-09
Th-232	3.30E-09	2.89E-06	1.41E-02	9.94E-10	9.94E-10	3.93E-09	4.54E-09
U-232	1.20E-07	1.05E-04	0.512	8.25E-08	1.01E-07	1.42E-07	1.66E-07
U-233	4.59E-07	4.03E-04	1.96	3.16E-07	3.86E-07	5.44E-07	6.35E-07
U-234	4.24E-07	3.72E-04	1.81	3.11E-07	3.99E-07	4.36E-07	4.47E-07
U-235	1.63E-08	1.43E-05	6.94E-02	1.20E-08	1.53E-08	1.67E-08	1.71E-08
U-236	3.09E-08	2.71E-05	0.132	2.17E-08	2.89E-08	3.19E-08	3.28E-08
U-238	3.42E-07	3.00E-04	1.46	2.65E-07	3.25E-07	3.50E-07	3.58E-07
Np-237	1.29E-07	1.13E-04	0.549	1.07E-07	1.18E-07	1.40E-07	1.51E-07
Pu-238	1.13E-06	9.87E-04	4.80	7.66E-07	9.42E-07	1.31E-06	1.48E-06
Pu-239	1.52E-05	1.34E-02	65.0	1.23E-05	1.37E-05	1.67E-05	1.81E-05
Pu-240	3.65E-06	3.20E-03	15.6	2.76E-06	3.19E-06	4.10E-06	4.53E-06
Pu-241	1.03E-04	9.07E-02	441	6.67E-05	8.47E-05	1.22E-04	1.40E-04
Pu-242	4.44E-10	3.89E-07	1.89E-03	3.07E-10	3.74E-10	5.14E-10	5.81E-10
Am-241	2.55E-05	2.23E-02	109	1.57E-05	2.05E-05	3.05E-05	3.39E-05
Am-243	2.24E-09	1.97E-06	9.58E-03	1.23E-09	1.72E-09	2.78E-09	3.15E-09
Cm-242	5.09E-08	4.46E-05	0.217	3.72E-08	4.39E-08	5.79E-08	6.46E-08
Cm-243	5.96E-09	5.23E-06	2.54E-02	4.50E-09	5.21E-09	6.71E-09	7.42E-09
Cm-244	7.48E-08	6.56E-05	0.319	4.22E-08	5.82E-08	9.15E-08	1.07E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	2.39E-04 (g/L)	----	1.02	1.88E-04	2.13E-04	2.65E-04	2.90E-04
U	3.88E-03	810	3.94E+03	2.90E-03	3.66E-03	3.98E-03	4.07E-03

*Density is calculated based on Na, OH-, and AlO2-

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-106

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.86E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	1.45 (kW)	(4.95E+03 BTU/hr)	----	1.38	1.42	1.48	1.52
Bulk Density†	1.14 (g/cc)	----	----	1.11	1.12	1.16	1.17
Water wt%†	77.5	----	----	73.4	75.3	79.6	81.8
TOC wt% C (wet	0.392	----	----	0.269	0.330	0.453	0.509

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	6.13E-05	5.38E-02	262	5.23E-05	5.27E-05	6.85E-05	7.69E-05
C-14	4.57E-06	4.01E-03	19.5	2.77E-06	2.77E-06	4.79E-06	4.94E-06
Ni-59	3.17E-07	2.78E-04	1.35	2.32E-07	2.32E-07	3.21E-07	3.25E-07
Ni-63	3.13E-05	2.74E-02	133	2.29E-05	2.29E-05	3.17E-05	3.21E-05
Co-60	7.12E-06	6.24E-03	30.4	5.06E-06	5.06E-06	7.63E-06	8.12E-06
Se-79	8.47E-07	7.43E-04	3.61	5.62E-07	7.00E-07	9.93E-07	1.13E-06
Sr-90	2.70E-02	23.7	1.15E+05	2.47E-02	2.59E-02	2.82E-02	2.93E-02
Y-90	2.70E-02	23.7	1.15E+05	2.30E-02	2.30E-02	2.82E-02	2.93E-02
Zr-93	3.96E-06	3.47E-03	16.9	2.68E-06	3.22E-06	4.62E-06	5.24E-06
Nb-93m	3.02E-06	2.65E-03	12.9	1.99E-06	2.49E-06	3.54E-06	4.05E-06
Tc-99	3.25E-05	2.85E-02	138	2.57E-05	2.90E-05	3.59E-05	3.93E-05
Ru-106	4.19E-09	3.68E-06	1.79E-02	2.56E-09	3.36E-09	5.02E-09	5.82E-09
Cd-113m	1.72E-05	1.51E-02	73.5	1.29E-05	1.38E-05	2.09E-05	2.16E-05
Sb-125	9.56E-05	8.39E-02	408	6.52E-05	8.01E-05	1.11E-04	1.26E-04
Sn-126	1.31E-06	1.15E-03	5.60	8.64E-07	1.08E-06	1.54E-06	1.76E-06
I-129	6.29E-08	5.51E-05	0.268	4.99E-08	5.62E-08	6.95E-08	7.60E-08
Cs-134	5.65E-05	4.96E-02	241	4.27E-05	4.95E-05	6.36E-05	7.04E-05
Cs-137	3.37E-02	29.6	1.44E+05	3.14E-02	3.24E-02	3.49E-02	3.66E-02
Ba-137m	3.19E-02	28.0	1.36E+05	2.85E-02	2.85E-02	3.30E-02	3.41E-02
Sm-151	3.03E-03	2.66	1.29E+04	2.00E-03	2.50E-03	3.56E-03	4.06E-03
Eu-152	1.02E-06	8.92E-04	4.34	7.59E-07	8.74E-07	1.15E-06	1.27E-06
Eu-154	1.25E-04	0.109	531	9.58E-05	9.58E-05	1.39E-04	1.53E-04
Eu-155	7.65E-05	6.71E-02	326	6.18E-05	6.80E-05	8.41E-05	9.13E-05
Ra-226	4.10E-11	3.60E-08	1.75E-04	2.08E-11	3.07E-11	5.14E-11	5.17E-11
Ra-228	3.42E-08	3.00E-05	0.146	1.55E-08	1.55E-08	3.97E-08	4.56E-08
Ac-227	2.47E-10	2.17E-07	1.05E-03	1.29E-10	1.87E-10	3.06E-10	2.81E-10
Pa-231	8.65E-10	7.58E-07	3.69E-03	6.00E-10	7.17E-10	9.94E-10	1.12E-09
Th-229	7.94E-10	6.97E-07	3.39E-03	3.64E-10	3.64E-10	9.16E-10	1.05E-09
Th-232	3.30E-09	2.89E-06	1.41E-02	9.94E-10	9.94E-10	3.93E-09	4.54E-09
U-232	1.20E-07	1.05E-04	0.512	8.25E-08	1.01E-07	1.42E-07	1.66E-07
U-233	4.59E-07	4.03E-04	1.96	3.16E-07	3.86E-07	5.44E-07	6.35E-07
U-234	4.24E-07	3.72E-04	1.81	3.11E-07	3.99E-07	4.36E-07	4.47E-07
U-235	1.63E-08	1.43E-05	6.94E-02	1.20E-08	1.53E-08	1.67E-08	1.71E-08
U-236	3.09E-08	2.71E-05	0.132	2.17E-08	2.89E-08	3.19E-08	3.28E-08
U-238	3.42E-07	3.00E-04	1.46	2.65E-07	3.25E-07	3.50E-07	3.58E-07
Np-237	1.29E-07	1.13E-04	0.549	1.07E-07	1.18E-07	1.40E-07	1.51E-07
Pu-238	1.13E-06	9.87E-04	4.80	7.66E-07	9.42E-07	1.31E-06	1.48E-06
Pu-239	1.52E-05	1.34E-02	65.0	1.23E-05	1.37E-05	1.67E-05	1.81E-05
Pu-240	3.65E-06	3.20E-03	15.6	2.76E-06	3.19E-06	4.10E-06	4.53E-06
Pu-241	1.03E-04	9.07E-02	441	6.67E-05	8.47E-05	1.22E-04	1.40E-04
Pu-242	4.44E-10	3.89E-07	1.89E-03	3.07E-10	3.74E-10	5.14E-10	5.81E-10
Am-241	2.55E-05	2.23E-02	109	1.57E-05	2.05E-05	3.05E-05	3.39E-05
Am-243	2.24E-09	1.97E-06	9.58E-03	1.23E-09	1.72E-09	2.78E-09	3.15E-09
Cm-242	5.09E-08	4.46E-05	0.217	3.72E-08	4.39E-08	5.79E-08	6.46E-08
Cm-243	5.96E-09	5.23E-06	2.54E-02	4.50E-09	5.21E-09	6.71E-09	7.42E-09
Cm-244	7.48E-08	6.56E-05	0.319	4.22E-08	5.82E-08	9.15E-08	1.07E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	2.39E-04 (g/L)	----	1.02	1.88E-04	2.13E-04	2.65E-04	2.90E-04
U	3.88E-03	810	3.94E+03	2.90E-03	3.66E-03	3.98E-03	4.07E-03

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

No photographs available for interior montage.

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TANK 241-AP-107 SUMMARY

TANK HISTORY	
Entered Service	1986
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
1A, 1B, 1C, 15, 21, 24, 28	4 in
10A, 10B, 12	12 in
7A	42 in
TANK TEMPERATURE	
Average Tank Temperature	71°F
Maximum Temperature	102°F
Date	Feb 13, 1995
Elevation from tank bottom	14.50 ft
Riser Number	4
Minimum Temperature	48°F
Date	Feb 5, 1996
Elevation from tank bottom	38.50 ft, 30.50 ft, 26.50 ft, 22.50 ft, 14.50 ft, 2.50 ft
Riser Number	4

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	71
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	22,000 gal
Waste Type	DN
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	22,000 gal
Saltcake	0 gal
Sludge	0 gal
Supernatant	22,000 gal
INTERIOR PHOTOGRAPHS	
Date	not available
Montage Number	not available
Photo Set Number	not available
WASTE SURFACE LEVEL	
Devices	Auto/Man FIC, Man Tape
Max Level	411.7 in
Date	Jan 1 and 2, 1991
Min Level	6 in
Date	Jan 6 - Jan 16, 1997*

* Numerous dates in this time span.

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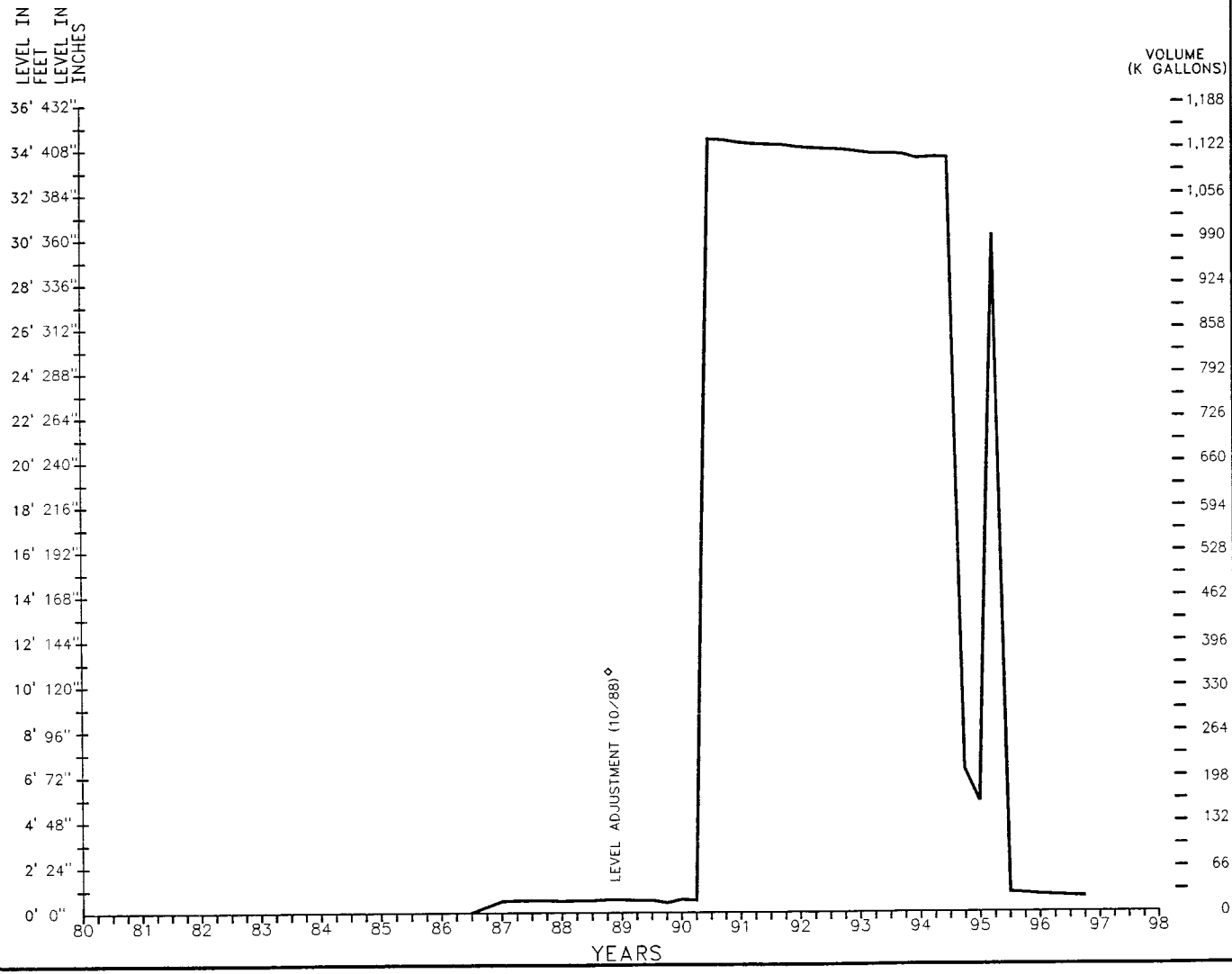
PRIMARY ADDITIONS
TIME LINE
(AGNEW 1995)

WTR:

PASF:
UNK:
WTR:



TANK INFO:

CONSTRUCTED 1983-1986
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

* AGNEW 1995
◇ HANLON 1996!

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

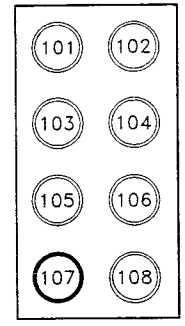
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

PASF: PUREX AMMONIA SCRUBBER FEED
UNK: UNKNOWN
WTR: WATER

LEGEND

TOTAL WASTE LEVEL (SUPERNATE)

AP TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AP-107 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1986-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E163	2/97
SCALE NONE		JOB NO.	SHEET 1 OF 1

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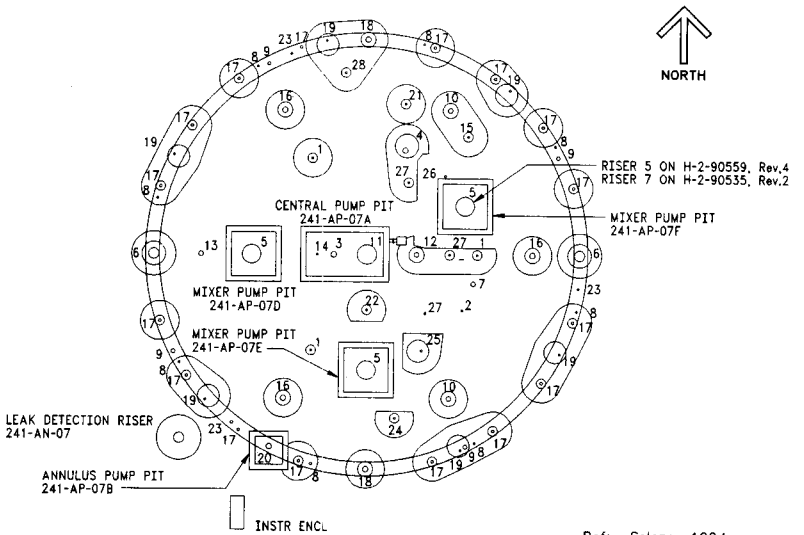
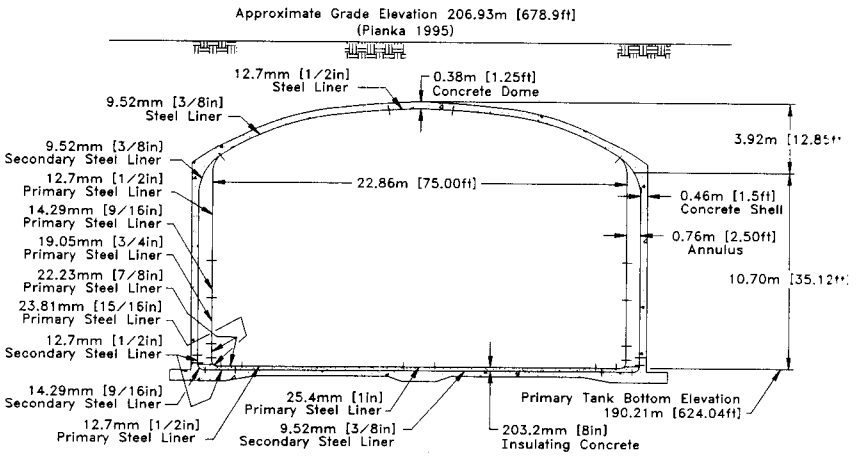
241-AP-107



TANK RISER LOCATION

Ref: Salazar 1994
H-2-90535, Rev.2
H-2-90559, Rev.4



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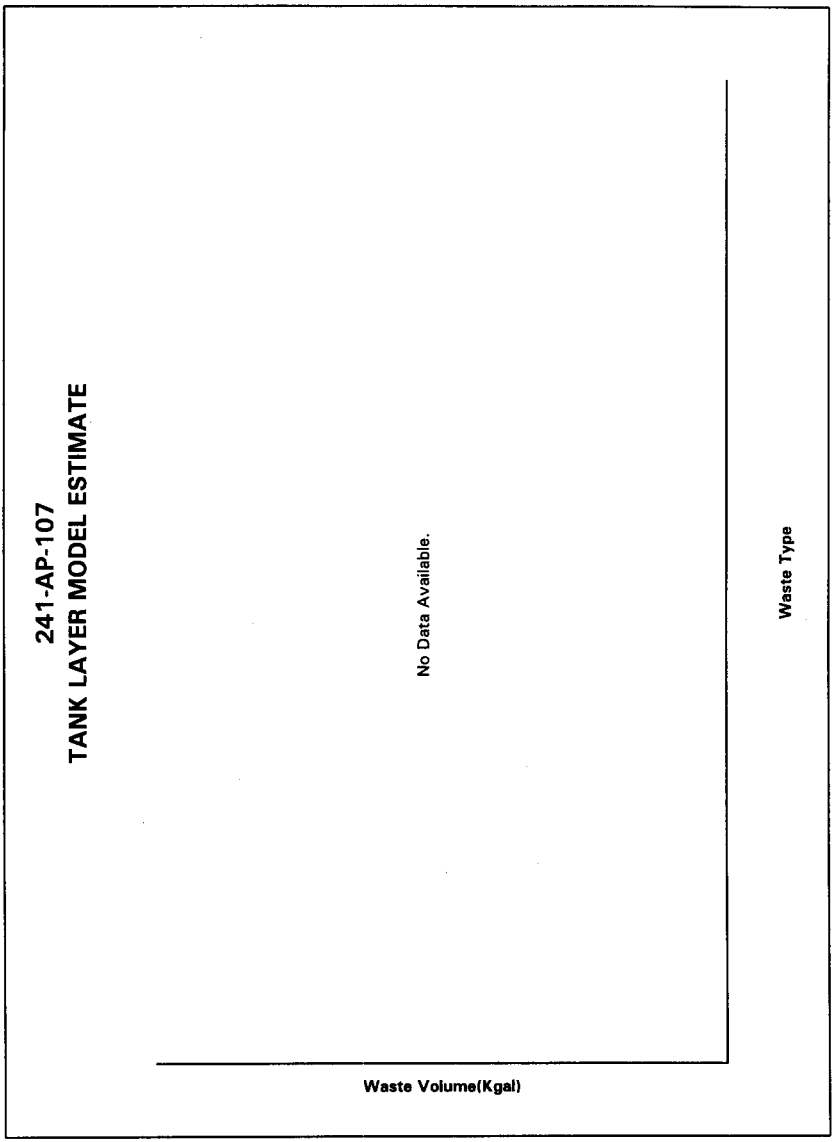
H-2-90534, Rev.3

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AP-107

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AP-107

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.21E+06 (kg)	(1.11E+03 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density*	1.00 (g/cc)	----	----	1.00	1.00	1.00	1.00
Water wt%	99.4	----	----	99.3	99.3	99.4	99.4
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	6.03E-02	1.38E+03	5.82E+03	5.20E-02	5.60E-02	6.45E-02	6.86E-02
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	2.01E-03	112	471	1.11E-03	1.55E-03	2.47E-03	2.91E-03
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	9.04E-03	362	1.52E+03	5.52E-03	7.24E-03	1.08E-02	1.26E-02
K+	2.01E-04	7.85	33.0	1.74E-04	1.87E-04	2.15E-04	2.29E-04
OH-	1.61E-02	273	1.15E+03	1.34E-02	1.47E-02	1.75E-02	1.88E-02
NO3-	6.66E-02	4.12E+03	1.73E+04	5.74E-02	6.19E-02	7.13E-02	7.58E-02
NO2-	0	0	0	0	0	0	0
CO32-	4.90E-04	29.3	124	-3.04E-03	-1.31E-03	2.29E-03	4.01E-03
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	9.25E-04	32.7	138	7.98E-04	8.60E-04	9.90E-04	1.05E-03
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	5.03E-02	853	3.59E+03	4.34E-02	4.68E-02	5.38E-02	5.72E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-107

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.21E+06 (kg)	(1.11E+03 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density†	1.00 (g/cc)	----	----	1.00	1.00	1.00	1.00
Water wt%†	99.4	----	----	99.3	99.3	99.4	99.4
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	6.03E-02	1.38E+03	5.82E+03	5.20E-02	5.60E-02	6.45E-02	6.86E-02
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	2.01E-03	112	471	1.11E-03	1.55E-03	2.47E-03	2.91E-03
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	9.04E-03	362	1.52E+03	5.52E-03	7.24E-03	1.08E-02	1.26E-02
K+	2.01E-04	7.85	33.0	1.74E-04	1.87E-04	2.15E-04	2.29E-04
OH-	1.61E-02	273	1.15E+03	1.34E-02	1.47E-02	1.75E-02	1.88E-02
NO3-	6.66E-02	4.12E+03	1.73E+04	5.74E-02	6.19E-02	7.13E-02	7.58E-02
NO2-	0	0	0	0	0	0	0
CO32-	4.90E-04	29.3	124	-3.04E-03	-1.31E-03	2.29E-03	4.01E-03
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	9.25E-04	32.7	138	7.98E-04	8.60E-04	9.90E-04	1.05E-03
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	5.03E-02	853	3.59E+03	4.34E-02	4.68E-02	5.38E-02	5.72E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-107

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AP-107

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.21E+06 (kg)	(1.11E+03 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density*	1.00 (g/cc)	----	----	1.00	1.00	1.00	1.00
Water wt%†	99.4	----	----	99.3	99.3	99.4	99.4
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-107

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.21E+06 (kg)	(1.11E+03 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density†	1.00 (g/cc)	----	----	1.00	1.00	1.00	1.00
Water wt%†	99.4	----	----	99.3	99.3	99.4	99.4
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

No photographs available for interior montage.

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TANK 241-AP-108 SUMMARY

TANK HISTORY	
Entered Service	1986
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
1A, 1B, 1C, 15, 21, 24, 26, 28	4 in
10A, 10B, 12	12 in
TANK TEMPERATURE	
Average Tank Temperature	75°F
Maximum Temperature	107°F
Date	Dec 5, 1994
Elevation from tank bottom	14.50 ft, 2.50 ft
Riser Number	4
Minimum Temperature	50°F
Date	March 29, 1996
Elevation from tank bottom	22.50 ft
Riser Number	4

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	71
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	46,000 gal
Waste Type	DC
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	46,000 gal
Saltcake	0 gal
Sludge	0 gal
Supernatant	46,000 gal
INTERIOR PHOTOGRAPHS	
Date	not available
Montage Number	not available
Photo Set Number	not available
WASTE SURFACE LEVEL	
Devices	Auto/Man FIC, Man Tape
Max Level	411.5 in
Date	April 4 & July 5, 1994
Min Level	9.5 in
Date	Feb 19 & April 23, 1995 March 8, 1996

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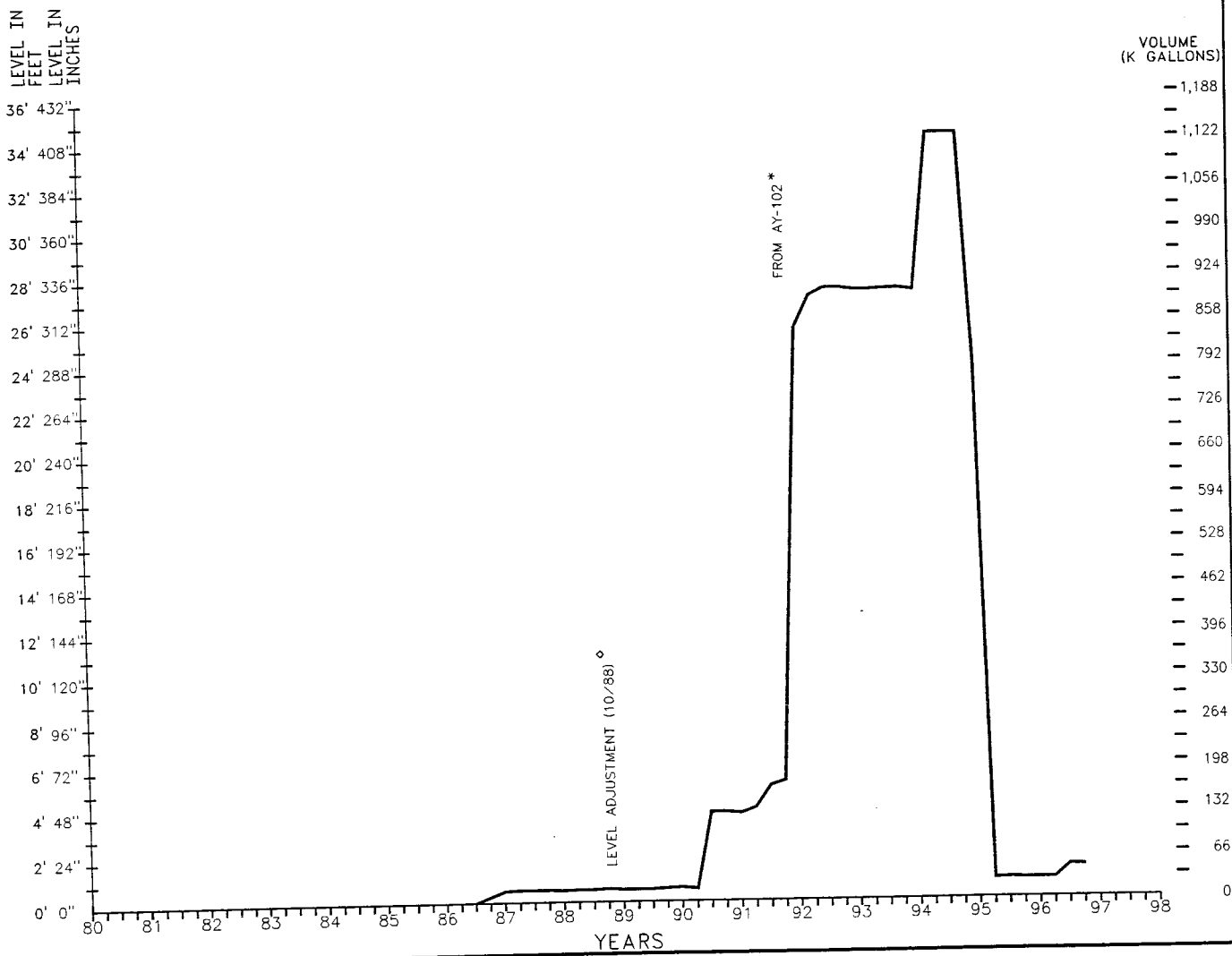
PRIMARY ADDITIONS
TIME LINE
(AGNEW 1995)

WTR:

PASF:
PL2:
WTR:



TANK INFO:

CONSTRUCTED 1983-1986
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

* AGNEW 1995
◇ HANLON 1996i

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

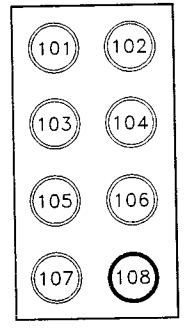
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

PASF: PUREX AMMONIA SCRUBBER FEED
PL2: PUREX LOW-LEVEL WASTE 1983-88
WTR: WATER

LEGEND

TOTAL WASTE LEVEL (SUPERNATE)

AP TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AP-108 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1986-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E164	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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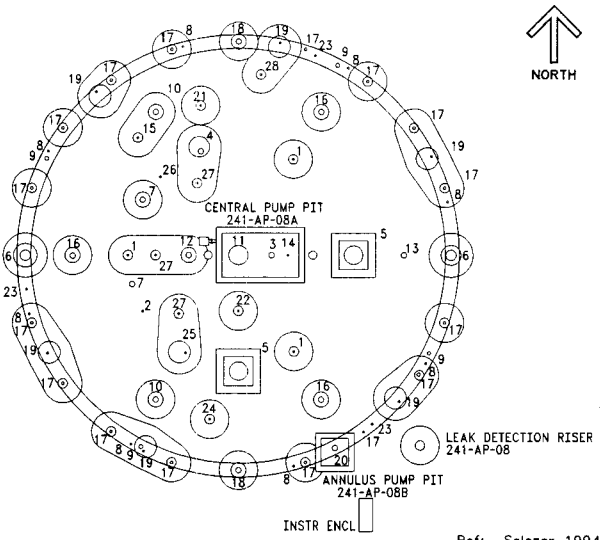
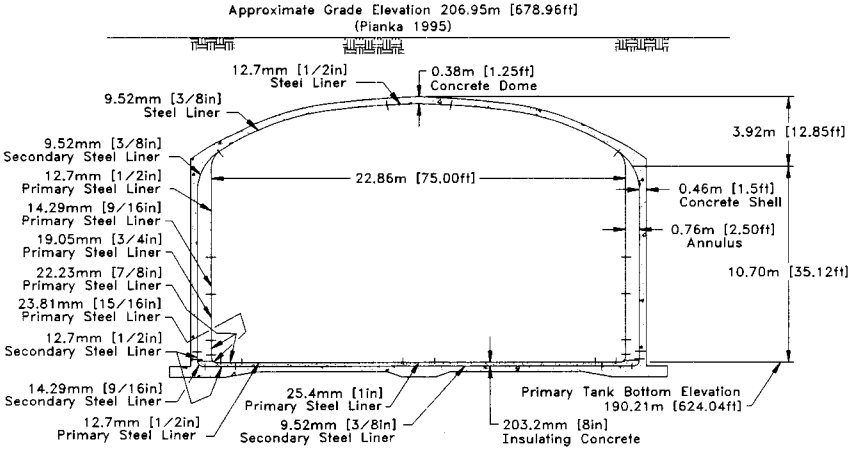
241-AP-108



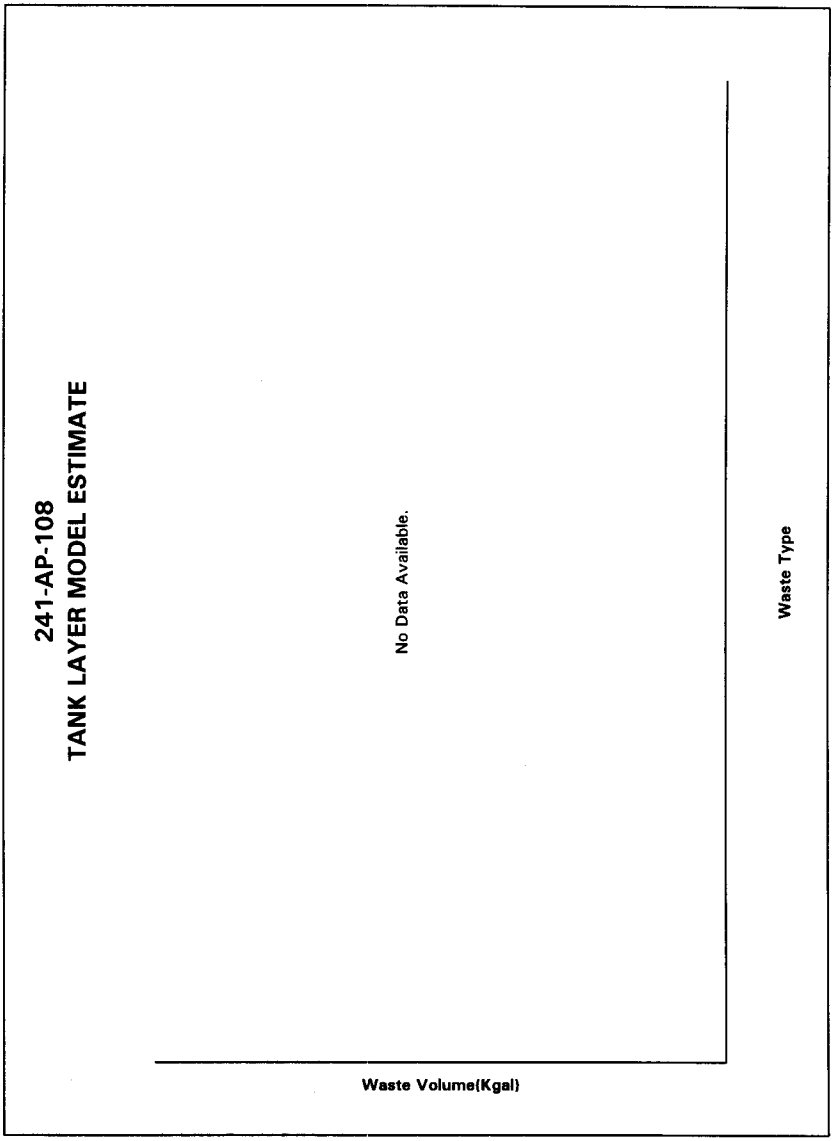
TANK RISER LOCATION

Ref: Salazar 1994
H-2-90536, Rev.2
H-2-90560, Rev.4



Ref: H-2-90442, Rev.1
H-2-90534, Rev.3

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AP-108

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

HDW Model Rev. 4

Double-Shell Tank 241-AP-108

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.48E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	0.992 (kW)	(3.39E+03 BTU/hr)	----	0.795	0.891	1.09	1.19
Bulk Density*	1.05 (g/cc)	----	----	1.02	1.04	1.06	1.07
Water wt%	92.1	----	----	88.6	90.3	93.9	95.7
TOC wt% C (wet	0.189	----	----	9.06E-02	0.139	0.238	0.283

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	1.25	2.75E+04	1.23E+05	0.647	0.946	1.56	1.84
Al3+	9.20E-02	2.37E+03	1.06E+04	4.55E-02	6.82E-02	0.116	0.139
Fe3+ (total Fe)	1.18E-03	62.9	282	8.88E-04	1.03E-03	1.33E-03	1.47E-03
Cr3+	1.32E-03	65.6	294	9.29E-04	1.12E-03	1.52E-03	1.72E-03
Bi3+	1.45E-06	0.289	1.29	1.36E-06	1.40E-06	1.49E-06	1.53E-06
La3+	3.06E-08	4.05E-03	1.82E-02	2.24E-08	2.64E-08	3.48E-08	3.88E-08
Hg2+	2.56E-08	4.90E-03	2.20E-02	1.58E-08	2.49E-08	2.63E-08	2.70E-08
Zr (as ZrO(OH)2)	4.53E-06	0.395	1.77	2.24E-06	4.24E-06	4.82E-06	5.10E-06
Pb2+	5.12E-06	1.01	4.54	2.99E-06	4.03E-06	6.21E-06	7.26E-06
Ni2+	8.56E-04	48.0	215	7.97E-04	8.26E-04	8.86E-04	9.14E-04
Sr2+	0	0	0	0	0	0	0
Mn4+	5.13E-04	26.9	121	2.19E-04	3.63E-04	6.63E-04	7.65E-04
Ca2+	5.29E-03	203	908	3.89E-03	4.71E-03	5.73E-03	5.73E-03
K+	5.63E-03	210	943	3.23E-03	4.40E-03	6.87E-03	8.04E-03
OH-	0.812	1.32E+04	5.91E+04	0.400	0.601	1.02	1.22
NO3-	0.332	1.96E+04	8.81E+04	0.183	0.256	0.408	0.481
NO2-	2.76E-02	1.21E+03	5.43E+03	1.81E-02	2.27E-02	3.25E-02	3.71E-02
CO32-	9.90E-02	5.67E+03	2.54E+04	5.12E-02	7.48E-02	0.123	0.139
PO43-	9.26E-03	839	3.76E+03	5.85E-03	7.51E-03	1.10E-02	1.27E-02
SO42-	1.68E-02	1.54E+03	6.92E+03	8.96E-03	1.28E-02	2.08E-02	2.47E-02
Si (as SiO32-)	1.15E-02	309	1.39E+03	6.06E-03	8.74E-03	1.43E-02	1.68E-02
F-	7.71E-04	14.0	62.7	4.40E-04	7.16E-04	8.27E-04	8.81E-04
Cl-	2.22E-02	752	3.37E+03	1.12E-02	1.66E-02	2.79E-02	3.33E-02
C6H5O73-	4.92E-03	889	3.98E+03	2.24E-03	3.55E-03	6.30E-03	7.61E-03
EDTA4-	3.12E-05	8.59	38.5	1.03E-05	2.05E-05	4.20E-05	5.25E-05
HEDTA3-	5.57E-05	14.6	65.3	1.38E-05	3.43E-05	7.72E-05	9.83E-05
glycolate-	6.53E-02	4.68E+03	2.10E+04	2.96E-02	4.70E-02	8.36E-02	0.101
acetate-	2.15E-05	1.21	5.43	1.75E-05	1.92E-05	2.39E-05	2.77E-05
oxalate2-	4.00E-08	3.36E-03	1.51E-02	3.56E-08	3.78E-08	4.23E-08	4.45E-08
DBP	3.15E-04	63.3	284	1.48E-04	2.30E-04	4.01E-04	4.83E-04
butanol	3.15E-04	22.3	100	1.48E-04	2.30E-04	4.01E-04	4.83E-04
NH3	6.43E-03	104	468	5.31E-03	5.85E-03	7.01E-03	7.59E-03
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-108

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.48E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	0.992 (kW)	(3.39E+03 BTU/hr)	----	0.795	0.891	1.09	1.19
Bulk Density†	1.05 (g/cc)	----	----	1.02	1.04	1.06	1.07
Water wt%†	92.1	----	----	88.6	90.3	93.9	95.7
TOC wt% C (wet	0.189	----	----	9.06E-02	0.139	0.238	0.283

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	1.25	2.75E+04	1.23E+05	0.647	0.946	1.56	1.84
Al3+	9.20E-02	2.37E+03	1.06E+04	4.55E-02	6.82E-02	0.116	0.139
Fe3+ (total Fe)	1.18E-03	62.9	282	8.88E-04	1.03E-03	1.33E-03	1.47E-03
Cr3+	1.32E-03	65.6	294	9.29E-04	1.12E-03	1.52E-03	1.72E-03
Bi3+	1.45E-06	0.289	1.29	1.36E-06	1.40E-06	1.49E-06	1.53E-06
La3+	3.06E-08	4.05E-03	1.82E-02	2.24E-08	2.64E-08	3.48E-08	3.88E-08
Hg2+	2.56E-08	4.90E-03	2.20E-02	1.58E-08	2.49E-08	2.63E-08	2.70E-08
Zr (as ZrO(OH)2)	4.53E-06	0.395	1.77	2.24E-06	4.24E-06	4.82E-06	5.10E-06
Pb2+	5.12E-06	1.01	4.54	2.99E-06	4.03E-06	6.21E-06	7.26E-06
Ni2+	8.56E-04	48.0	215	7.97E-04	8.26E-04	8.86E-04	9.14E-04
Sr2+	0	0	0	0	0	0	0
Mn4+	5.13E-04	26.9	121	2.19E-04	3.63E-04	6.63E-04	7.65E-04
Ca2+	5.29E-03	203	908	3.89E-03	4.71E-03	5.73E-03	5.73E-03
K+	5.63E-03	210	943	3.23E-03	4.40E-03	6.87E-03	8.04E-03
OH-	0.812	1.32E+04	5.91E+04	0.400	0.601	1.02	1.22
NO3-	0.332	1.96E+04	8.81E+04	0.183	0.256	0.408	0.481
NO2-	2.76E-02	1.21E+03	5.43E+03	1.81E-02	2.27E-02	3.25E-02	3.71E-02
CO32-	9.90E-02	5.67E+03	2.54E+04	5.12E-02	7.48E-02	0.123	0.139
PO43-	9.26E-03	839	3.76E+03	5.85E-03	7.51E-03	1.10E-02	1.27E-02
SO42-	1.68E-02	1.54E+03	6.92E+03	8.96E-03	1.28E-02	2.08E-02	2.47E-02
Si (as SiO32-)	1.15E-02	309	1.39E+03	6.06E-03	8.74E-03	1.43E-02	1.68E-02
F-	7.71E-04	14.0	62.7	4.40E-04	7.16E-04	8.27E-04	8.81E-04
Cl-	2.22E-02	752	3.37E+03	1.12E-02	1.66E-02	2.79E-02	3.33E-02
C6H5O73-	4.92E-03	889	3.98E+03	2.24E-03	3.55E-03	6.30E-03	7.61E-03
EDTA4-	3.12E-05	8.59	38.5	1.03E-05	2.05E-05	4.20E-05	5.25E-05
HEDTA3-	5.57E-05	14.6	65.3	1.38E-05	3.43E-05	7.72E-05	9.83E-05
glycolate-	6.53E-02	4.68E+03	2.10E+04	2.96E-02	4.70E-02	8.36E-02	0.101
acetate-	2.15E-05	1.21	5.43	1.75E-05	1.92E-05	2.39E-05	2.77E-05
oxalate2-	4.00E-08	3.36E-03	1.51E-02	3.56E-08	3.78E-08	4.23E-08	4.45E-08
DBP	3.15E-04	63.3	284	1.48E-04	2.30E-04	4.01E-04	4.83E-04
butanol	3.15E-04	22.3	100	1.48E-04	2.30E-04	4.01E-04	4.83E-04
NH3	6.43E-03	104	468	5.31E-03	5.85E-03	7.01E-03	7.59E-03
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-108

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AP-108

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.48E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	0.992 (kW)	(3.39E+03 BTU/hr)	----	0.795	0.891	1.09	1.19
Bulk Density*	1.05 (g/cc)	----	----	1.02	1.04	1.06	1.07
Water wt%†	92.1	----	----	88.6	90.3	93.9	95.7
TOC wt% C (wet	0.189	----	----	9.06E-02	0.139	0.238	0.283

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.24E-04	0.118	529	8.87E-05	1.06E-04	1.41E-04	1.59E-04
C-14	2.00E-06	1.91E-03	8.56	1.57E-06	1.78E-06	2.22E-06	2.43E-06
Ni-59	9.38E-08	8.96E-05	0.402	8.99E-08	9.19E-08	9.54E-08	9.66E-08
Ni-63	9.29E-06	8.87E-03	39.8	8.90E-06	9.11E-06	9.45E-06	9.58E-06
Co-60	2.43E-06	2.32E-03	10.4	1.61E-06	2.01E-06	2.84E-06	3.24E-06
Se-79	3.94E-07	3.76E-04	1.69	1.93E-07	2.90E-07	4.98E-07	5.96E-07
Sr-90	1.16E-02	11.1	4.96E+04	9.98E-03	1.08E-02	1.24E-02	1.32E-02
Y-90	1.16E-02	11.1	4.96E+04	9.99E-03	1.08E-02	1.24E-02	1.32E-02
Zr-93	1.79E-06	1.71E-03	7.65	8.81E-07	1.27E-06	2.25E-06	2.69E-06
Nb-93m	1.42E-06	1.35E-03	6.07	6.92E-07	1.05E-06	1.79E-06	2.14E-06
Tc-99	9.85E-06	9.40E-03	42.2	7.86E-06	8.83E-06	1.09E-05	1.18E-05
Ru-106	1.70E-09	1.62E-06	7.27E-03	5.46E-10	1.11E-09	2.29E-09	2.85E-09
Cd-113m	6.43E-06	6.14E-03	27.5	3.35E-06	4.86E-06	8.99E-06	9.53E-06
Sb-125	2.27E-04	0.216	970	7.15E-05	1.47E-04	3.06E-04	3.82E-04
Sn-126	6.21E-07	5.92E-04	2.66	3.03E-07	4.58E-07	7.84E-07	9.39E-07
I-129	1.95E-08	1.86E-05	8.36E-02	1.57E-08	1.76E-08	2.15E-08	2.34E-08
Cs-134	2.33E-04	0.222	996	1.62E-04	1.97E-04	2.69E-04	3.04E-04
Cs-137	3.28E-02	31.3	1.40E+05	2.30E-02	2.78E-02	3.78E-02	4.27E-02
Ba-137m	3.10E-02	29.6	1.33E+05	2.17E-02	2.63E-02	3.58E-02	4.04E-02
Sm-151	1.43E-03	1.36	6.10E+03	6.96E-04	1.05E-03	1.80E-03	2.16E-03
Eu-152	9.12E-07	8.71E-04	3.90	7.30E-07	8.19E-07	1.01E-06	1.09E-06
Eu-154	4.34E-05	4.15E-02	186	2.32E-05	3.31E-05	5.38E-05	6.36E-05
Eu-155	1.24E-04	0.118	529	9.21E-05	1.08E-04	1.40E-04	1.55E-04
Ra-226	2.10E-11	2.01E-08	9.00E-05	6.73E-12	1.37E-11	2.83E-11	2.86E-11
Ra-228	3.79E-10	3.62E-07	1.62E-03	1.50E-10	1.50E-10	4.33E-10	4.90E-10
Ac-227	1.22E-10	1.17E-07	5.23E-04	3.91E-11	7.98E-11	1.64E-10	1.46E-10
Pa-231	3.54E-10	3.38E-07	1.51E-03	1.67E-10	2.50E-10	4.46E-10	5.33E-10
Th-229	8.84E-12	8.44E-09	3.78E-05	3.55E-12	3.55E-12	1.00E-11	1.13E-11
Th-232	3.80E-11	3.62E-08	1.62E-04	9.62E-12	9.62E-12	4.57E-11	5.32E-11
U-232	1.28E-09	1.22E-06	5.48E-03	9.19E-10	1.10E-09	1.49E-09	1.72E-09
U-233	4.86E-09	4.64E-06	2.08E-02	3.48E-09	4.16E-09	5.68E-09	6.56E-09
U-234	4.88E-08	4.66E-05	0.209	3.05E-08	4.45E-08	5.08E-08	5.27E-08
U-235	1.86E-09	1.77E-06	7.95E-03	1.16E-09	1.69E-09	1.93E-09	2.01E-09
U-236	3.95E-09	3.77E-06	1.69E-02	2.44E-09	3.59E-09	4.11E-09	4.27E-09
U-238	3.43E-08	3.27E-05	0.147	2.17E-08	3.13E-08	3.57E-08	3.70E-08
Np-237	9.94E-08	9.49E-05	0.426	7.32E-08	8.60E-08	1.13E-07	1.26E-07
Pu-238	2.64E-07	2.52E-04	1.13	1.48E-07	2.03E-07	3.27E-07	3.91E-07
Pu-239	3.75E-06	3.58E-03	16.0	1.75E-06	2.73E-06	4.76E-06	5.74E-06
Pu-240	8.83E-07	8.43E-04	3.78	4.47E-07	6.59E-07	1.11E-06	1.34E-06
Pu-241	2.17E-05	2.08E-02	93.0	1.36E-05	1.75E-05	2.62E-05	3.06E-05
Pu-242	1.13E-10	1.07E-07	4.82E-04	5.95E-11	8.48E-11	1.42E-10	1.71E-10
Am-241	1.04E-05	9.92E-03	44.5	3.46E-06	6.85E-06	1.39E-05	1.63E-05
Am-243	8.20E-10	7.83E-07	3.51E-03	2.71E-10	5.23E-10	1.16E-09	1.46E-09
Cm-242	6.84E-08	6.54E-05	0.293	5.32E-08	6.06E-08	7.63E-08	8.38E-08
Cm-243	1.04E-08	9.91E-06	4.44E-02	7.81E-09	9.07E-09	1.17E-08	1.30E-08
Cm-244	3.39E-08	3.24E-05	0.145	1.08E-08	2.21E-08	4.57E-08	5.70E-08

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	6.41E-05 (g/L)	----	0.275	3.00E-05	4.67E-05	8.16E-05	9.83E-05
U	4.28E-04	97.2	436	2.70E-04	3.91E-04	4.45E-04	4.62E-04

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AP-108

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.48E+06 (kg)	(1.13E+03 kgal)	----	----	----	----	----
Heat Load	0.992 (kW)	(3.39E+03 BTU/hr)	----	0.795	0.891	1.09	1.19
Bulk Density†	1.05 (g/cc)	----	----	1.02	1.04	1.06	1.07
Water wt%†	92.1	----	----	88.6	90.3	93.9	95.7
TOC wt% C (wet	0.189	----	----	9.06E-02	0.139	0.238	0.283

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.24E-04	0.118	529	8.87E-05	1.06E-04	1.41E-04	1.59E-04
C-14	2.00E-06	1.91E-03	8.56	1.57E-06	1.78E-06	2.22E-06	2.43E-06
Ni-59	9.38E-08	8.96E-05	0.402	8.99E-08	9.19E-08	9.54E-08	9.66E-08
Ni-63	9.29E-06	8.87E-03	39.8	8.90E-06	9.11E-06	9.45E-06	9.58E-06
Co-60	2.43E-06	2.32E-03	10.4	1.61E-06	2.01E-06	2.84E-06	3.24E-06
Se-79	3.94E-07	3.76E-04	1.69	1.93E-07	2.90E-07	4.98E-07	5.96E-07
Sr-90	1.16E-02	11.1	4.96E+04	9.98E-03	1.08E-02	1.24E-02	1.32E-02
Y-90	1.16E-02	11.1	4.96E+04	9.99E-03	1.08E-02	1.24E-02	1.32E-02
Zr-93	1.79E-06	1.71E-03	7.65	8.81E-07	1.27E-06	2.25E-06	2.69E-06
Nb-93m	1.42E-06	1.35E-03	6.07	6.92E-07	1.05E-06	1.79E-06	2.14E-06
Tc-99	9.85E-06	9.40E-03	42.2	7.86E-06	8.83E-06	1.09E-05	1.18E-05
Ru-106	1.70E-09	1.62E-06	7.27E-03	5.46E-10	1.11E-09	2.29E-09	2.85E-09
Cd-113m	6.43E-06	6.14E-03	27.5	3.35E-06	4.86E-06	8.99E-06	9.53E-06
Sb-125	2.27E-04	0.216	970	7.15E-05	1.47E-04	3.06E-04	3.82E-04
Sn-126	6.21E-07	5.92E-04	2.66	3.03E-07	4.58E-07	7.84E-07	9.39E-07
I-129	1.95E-08	1.86E-05	8.36E-02	1.57E-08	1.76E-08	2.15E-08	2.34E-08
Cs-134	2.33E-04	0.222	996	1.62E-04	1.97E-04	2.69E-04	3.04E-04
Cs-137	3.28E-02	31.3	1.40E+05	2.30E-02	2.78E-02	3.78E-02	4.27E-02
Ba-137m	3.10E-02	29.6	1.33E+05	2.17E-02	2.63E-02	3.58E-02	4.04E-02
Sm-151	1.43E-03	1.36	6.10E+03	6.96E-04	1.05E-03	1.80E-03	2.16E-03
Eu-152	9.12E-07	8.71E-04	3.90	7.30E-07	8.19E-07	1.01E-06	1.09E-06
Eu-154	4.34E-05	4.15E-02	186	2.32E-05	3.31E-05	5.38E-05	6.36E-05
Eu-155	1.24E-04	0.118	529	9.21E-05	1.08E-04	1.40E-04	1.55E-04
Ra-226	2.10E-11	2.01E-08	9.00E-05	6.73E-12	1.37E-11	2.83E-11	2.86E-11
Ra-228	3.79E-10	3.62E-07	1.62E-03	1.50E-10	1.50E-10	4.33E-10	4.90E-10
Ac-227	1.22E-10	1.17E-07	5.23E-04	3.91E-11	7.98E-11	1.64E-10	1.46E-10
Pa-231	3.54E-10	3.38E-07	1.51E-03	1.67E-10	2.50E-10	4.46E-10	5.33E-10
Th-229	8.84E-12	8.44E-09	3.78E-05	3.55E-12	3.55E-12	1.00E-11	1.13E-11
Th-232	3.80E-11	3.62E-08	1.62E-04	9.62E-12	9.62E-12	4.57E-11	5.32E-11
U-232	1.28E-09	1.22E-06	5.48E-03	9.19E-10	1.10E-09	1.49E-09	1.72E-09
U-233	4.86E-09	4.64E-06	2.08E-02	3.48E-09	4.16E-09	5.68E-09	6.56E-09
U-234	4.88E-08	4.66E-05	0.209	3.05E-08	4.45E-08	5.08E-08	5.27E-08
U-235	1.86E-09	1.77E-06	7.95E-03	1.16E-09	1.69E-09	1.93E-09	2.01E-09
U-236	3.95E-09	3.77E-06	1.69E-02	2.44E-09	3.59E-09	4.11E-09	4.27E-09
U-238	3.43E-08	3.27E-05	0.147	2.17E-08	3.13E-08	3.57E-08	3.70E-08
Np-237	9.94E-08	9.49E-05	0.426	7.32E-08	8.60E-08	1.13E-07	1.26E-07
Pu-238	2.64E-07	2.52E-04	1.13	1.48E-07	2.03E-07	3.27E-07	3.91E-07
Pu-239	3.75E-06	3.58E-03	16.0	1.75E-06	2.73E-06	4.76E-06	5.74E-06
Pu-240	8.83E-07	8.43E-04	3.78	4.47E-07	6.59E-07	1.11E-06	1.34E-06
Pu-241	2.17E-05	2.08E-02	93.0	1.36E-05	1.75E-05	2.62E-05	3.06E-05
Pu-242	1.13E-10	1.07E-07	4.82E-04	5.95E-11	8.48E-11	1.42E-10	1.71E-10
Am-241	1.04E-05	9.92E-03	44.5	3.46E-06	6.85E-06	1.39E-05	1.63E-05
Am-243	8.20E-10	7.83E-07	3.51E-03	2.71E-10	5.23E-10	1.16E-09	1.46E-09
Cm-242	6.84E-08	6.54E-05	0.293	5.32E-08	6.06E-08	7.63E-08	8.38E-08
Cm-243	1.04E-08	9.91E-06	4.44E-02	7.81E-09	9.07E-09	1.17E-08	1.30E-08
Cm-244	3.39E-08	3.24E-05	0.145	1.08E-08	2.21E-08	4.57E-08	5.70E-08

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	6.41E-05 (g/L)	----	0.275	3.00E-05	4.67E-05	8.16E-05	9.83E-05
U	4.28E-04	97.2	436	2.70E-04	3.91E-04	4.45E-04	4.62E-04

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

No photographs available for interior montage.

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4.0 241-AW Tank Farm

The AW Tank Farm is located in the 200 East Area south of 4th Street and west of Canton Avenue. The farm contains six series flat bottom design, double-shell tanks built from 1978 through 1980. The tanks are 75 feet in diameter with an operating capacity of 1,160,000 gallons. For more information on the design, construction, and waste contents of the tanks, refer to the AW Tank Farm Supporting Document, HNF-SD-WM-ER-316, Rev. 1 (Brevick et al., 1997c).

The 241-AW Tank Farm was built to store low-heat radioactive liquid waste generated by PUREX and designed specifically for storage of 242-A Evaporator feed. Tanks 241-AW-103 and -105 initially received cladding removal waste, while tank 241-AW-104 initially received solvent extraction wash waste and miscellaneous sump waste. Tank 241-AW-102 is the feed tank for the 242-A Evaporator and tank 241-AW-101 was designed as a feed tank in case tank 241-AW-102 leaks. Tank 241-AW-106 is the slurry receiver tank from the 242-A Evaporator (Leach and Stahl, 1993). The primary additions to the tanks were B Plant low-level waste (BL), coating (cladding) waste (CWZr2), N-Reactor waste (N), PUREX low-level waste (PL2), dilute non-complexed waste (SWLIQ), unknown waste (UNK), and water (WTR) (Agnew et al., 1995).

The following table presents a summary of the 241-AW Tank Farm. Refer to the glossary for waste type terminology.

TANK FARM 241-AW SUMMARY

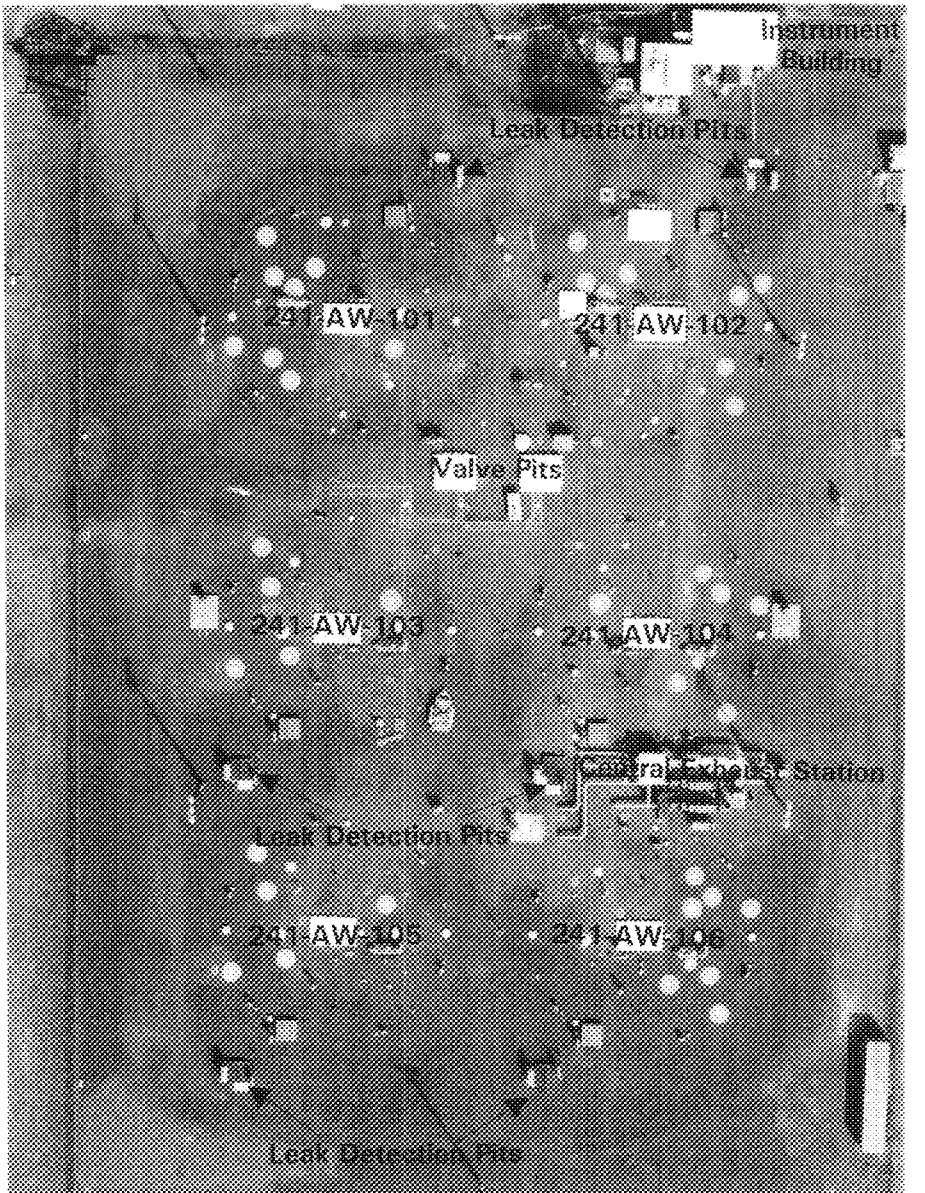
TANK FARM DESCRIPTION		WASTE VOLUME (HANLON 1996I)	
Shell Type	Double	Total Waste Volume	3,626,000 gal
Number of Tanks	6	Waste Type	DSSF, DN, PD
Construction Date	1978 - 1980	Drainable Interstitial Liquids	135,000 gal
INTEGRITY		Pumpable Liquids	2,395,000 gal
Sound	101, 102	Saltcake	111,000 gal
	103, 104	Sludge	1,167,000 gal
	105, 106	Supernatant	2,348,000 gal
		WATCH LISTS	
TANK VOLUMES		Hydrogen	101
6@1,160,000 gal		Organic	none
		High Heat	none

The historical characterization and waste inventory information for each tank is assembled into a set of tables, sketches, graphs, and interior tank montage. The set consists of the following for each tank in AW Tank Farm:

- Tank Summary table
- Waste and Level History sketch
- Riser configuration sketch
- Tank Layer Model Estimate graph
- Total Inventory Estimate tables
- TLM Solids Composite Inventory Estimate tables
- SMM Composite Inventory Estimate tables
- Interior tank montage

The supporting document for this tank farm provides backup data and further explanation of the above tables, sketches, and graphs.

AW TANK FARM


Instrument Building
Leak Detection Pits
241-AW-101
241-AW-102
Valve Pits
241-AW-103
241-AW-104
Central Exhaust Station
Leak Detection Pits
241-AW-105
241-AW-106
Leak Detection Pits

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TANK 241-AW-101 SUMMARY

TANK HISTORY	
Entered Service	July 1980
Removed from Service	-
Inactive	June 1993
Watch Lists	Hydrogen
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
10A, 13A, 15A, 16A	4 in
7B, 12A, 24A, 24B	12 in
TANK TEMPERATURE	
Average Tank Temperature	100°F
Maximum Temperature	109°F
Date	Feb 13 - July 7, 1995*
Elevation from tank bottom	4.33 ft
Riser Number	4A
Minimum Temperature	80°F
Date	March 25, April 1 & Dec 9, 1996
Elevation from tank bottom	34.33 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	64
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	1,128,000 gal
Waste Type	DSSF
Drainable Interstitial Liquids	2,000 gal
Pumpable Liquids	1,044,000 gal
Saltcake	0 gal
Sludge	84,000 gal
Supernatant	1,044,000 gal
INTERIOR PHOTOGRAPHS	
Date	March 17, 1986
Montage Number	94080233-52CN
Photo Set Number	88101404
WASTE SURFACE LEVEL	
Devices	Manual ENRAF and Tape
Max Level	419.5 in
Date	Sept 2, 1993
Min Level	406.7 in
Date	Feb 8, 1991

* Numerous dates in this time span

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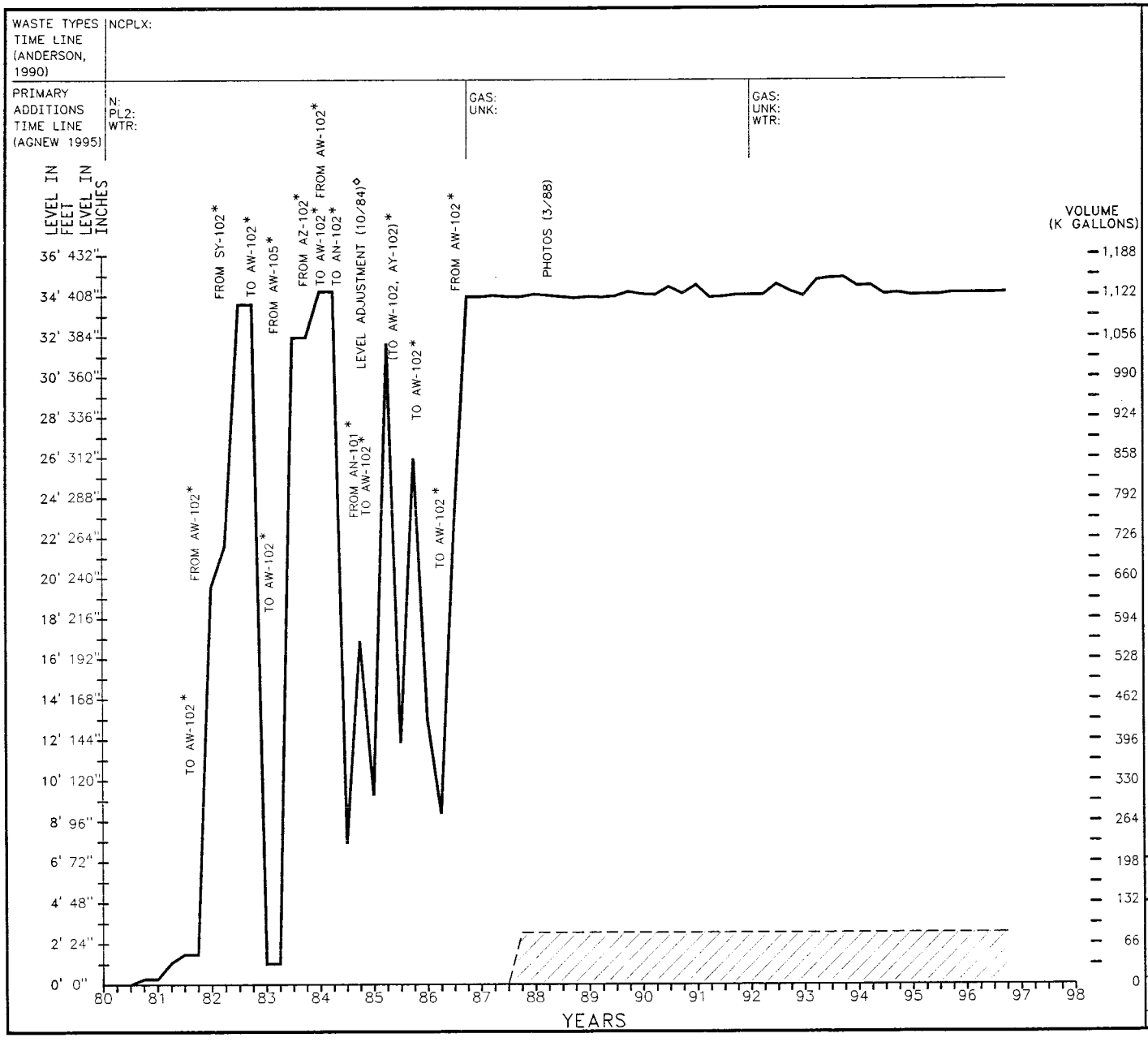


TANK INFO:

CONSTRUCTED 1978-1980
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

* AGNEW 1995
◇ HANLON 1996

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

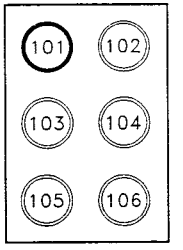
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

GAS:	SLURRY GROWTH
NCPLX:	NON-COMPLEXED WASTE
PL2:	PUREX LOW-LEVEL WASTE 1983-88
UNK:	UNKNOWN
WTR:	WATER

LEGEND

TOTAL WASTE LEVEL (SUPERNATE)
SOLIDS LEVEL
SOLIDS

AW TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AW-101 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1980-1996
SOUND/INACTIVE TANK
WATCH LIST: HYDROGEN

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E165	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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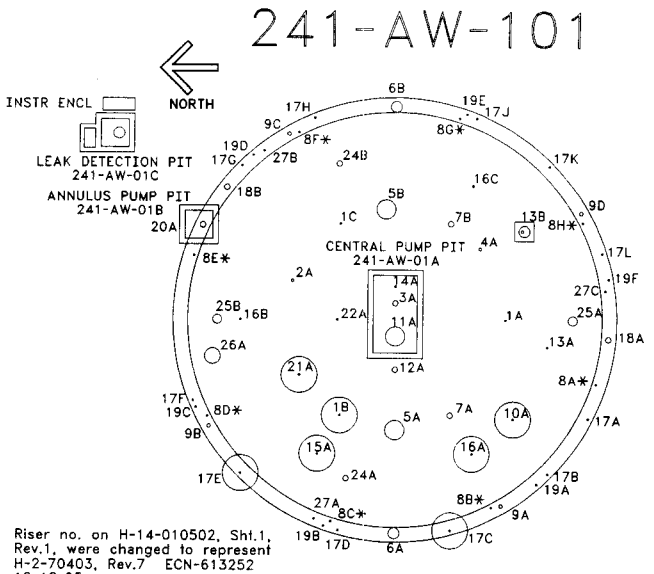
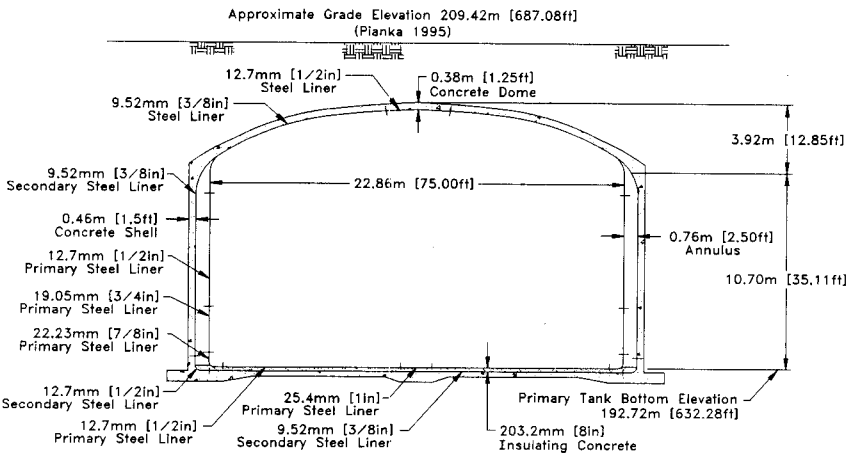


* Riser no. on H-14-010502, Sht.1, Rev.1, were changed to represent H-2-70403, Rev.7 ECN-613252 12-18-95.

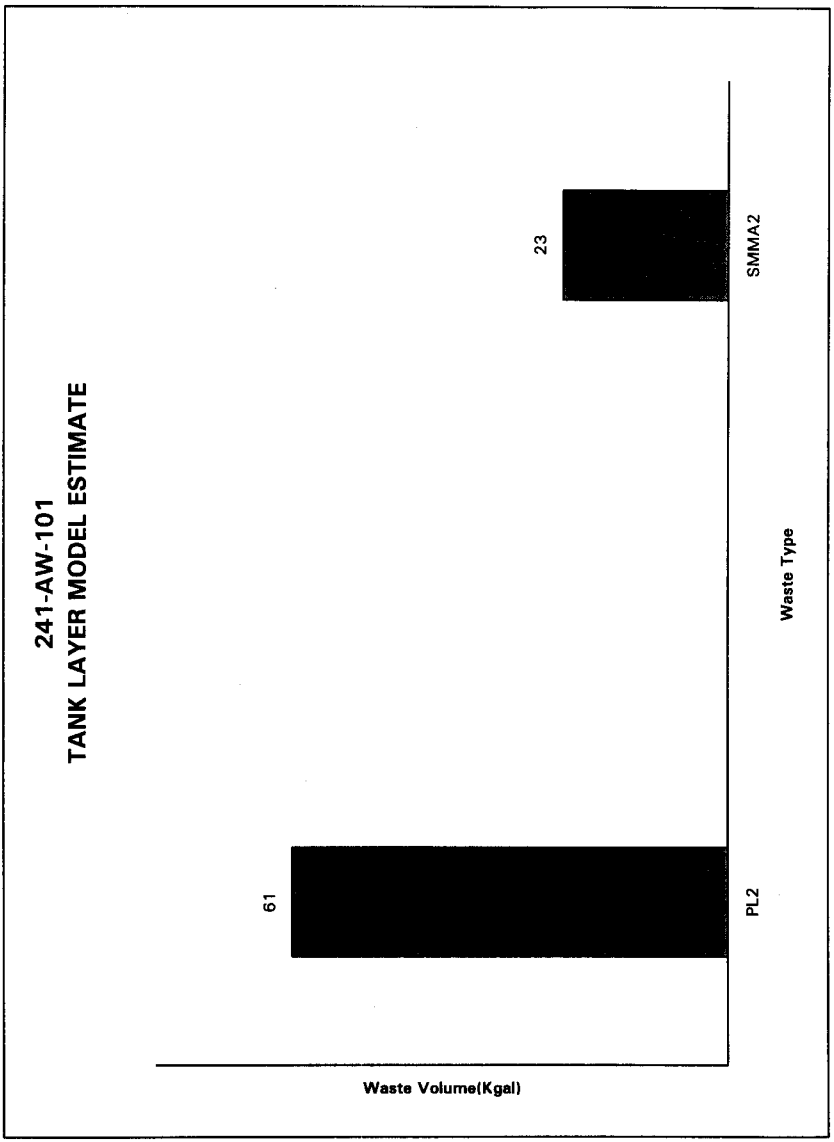
TANK RISER LOCATION

Ref: Salazar 1994
H-14-010502, Sh.1, Rev.1
H-2-70403, Rev.7



Ref: H-2-70394, Rev.2

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AW-101

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	2.78E+05 (kg)	(61.0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	1.20 (g/cc)	----	----	1.11	1.15	1.24	1.27
Void Fraction	0.888	----	----	0.866	0.875	0.913	0.948
Water wt%	73.5	----	----	69.0	70.9	77.2	81.3
TOC wt% C (wet	3.63E-02	----	----	1.76E-02	2.74E-02	4.49E-02	5.32E-02

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0.570	1.09E+04	3.03E+03	0.256	0.413	0.728	0.879
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	1.90	8.82E+04	2.45E+04	1.76	1.86	1.92	1.95
Cr3+	7.12E-03	308	85.5	3.20E-03	5.15E-03	9.09E-03	1.10E-02
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	3.87E-05	6.65	1.85	1.74E-05	2.80E-05	4.94E-05	5.97E-05
Ni2+	0.112	5.45E+03	1.52E+03	1.60E-03	7.41E-02	0.132	0.145
Sr2+	0	0	0	0	0	0	0
Mn4+	5.34E-03	244	67.7	2.40E-03	3.86E-03	6.82E-03	2.38E-02
Ca2+	0.460	1.53E+04	4.25E+03	7.21E-03	0.271	0.563	0.632
K+	6.10E-03	198	55.0	2.74E-03	4.41E-03	7.79E-03	9.41E-03
OH-	6.27	8.85E+04	2.46E+04	5.31	5.75	6.65	6.95
NO3-	0.229	1.18E+04	3.27E+03	0.103	0.165	0.292	0.353
NO2-	8.90E-03	340	94.5	4.00E-03	6.44E-03	1.14E-02	1.37E-02
CO32-	0.551	2.74E+04	7.63E+03	4.80E-02	0.337	0.679	0.765
PO43-	6.19E-02	4.88E+03	1.36E+03	2.78E-02	4.48E-02	7.90E-02	9.55E-02
SO42-	3.60E-03	287	79.8	1.62E-03	2.60E-03	4.60E-03	5.55E-03
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	3.48E-03	102	28.5	1.56E-03	2.52E-03	4.44E-03	5.37E-03
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	3.03E-03	529	147	1.36E-03	2.19E-03	3.87E-03	4.68E-03
butanol	3.03E-03	187	51.9	1.36E-03	2.19E-03	3.87E-03	4.68E-03
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AW-101

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	6.85E+06 (kg)	(1.08E+03 kgal)	----	----	----	----	----
Heat Load	7.45 (kW)	(2.55E+04 BTU/hr)	----	6.96	7.22	7.67	7.99
Bulk Density*	1.68 (g/cc)	----	----	1.62	1.65	1.71	1.74
Water wt%	26.4	----	----	22.7	24.3	28.1	30.0
TOC wt% C (wet	1.13	----	----	0.809	0.965	1.29	1.45

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	16.2	2.22E+05	1.52E+06	14.5	15.3	17.0	17.8
Al3+	1.63	2.63E+04	1.80E+05	1.45	1.57	1.70	1.76
Fe3+ (total Fe)	1.66E-02	552	3.78E+03	1.47E-02	1.56E-02	1.76E-02	1.85E-02
Cr3+	0.120	3.71E+03	2.54E+04	0.107	0.114	0.125	0.130
Bi3+	1.14E-03	142	973	1.08E-03	1.11E-03	1.17E-03	1.20E-03
La3+	1.46E-05	1.21	8.29	1.08E-05	1.27E-05	1.66E-05	1.85E-05
Hg2+	1.96E-05	2.34	16.0	1.24E-05	1.90E-05	2.01E-05	2.06E-05
Zr (as ZrO(OH)2)	3.31E-03	180	1.23E+03	1.64E-03	3.10E-03	3.52E-03	3.73E-03
Pb2+	1.27E-03	157	1.08E+03	1.07E-03	1.17E-03	1.37E-03	1.47E-03
Ni2+	1.07E-02	375	2.57E+03	1.03E-02	1.05E-02	1.09E-02	1.11E-02
Sr2+	0	0	0	0	0	0	0
Mn4+	1.60E-02	522	3.58E+03	8.66E-03	1.22E-02	1.97E-02	2.22E-02
Ca2+	6.47E-02	1.55E+03	1.06E+04	5.55E-02	6.10E-02	6.85E-02	7.21E-02
K+	0.316	7.36E+03	5.04E+04	8.23E-02	0.195	0.439	0.560
OH-	9.91	1.00E+05	6.88E+05	8.79	9.34	10.5	11.0
NO3-	5.93	2.19E+05	1.50E+06	5.51	5.72	6.15	6.36
NO2-	2.04	5.59E+04	3.83E+05	1.72	1.86	2.24	2.30
CO32-	0.871	3.11E+04	2.13E+05	0.740	0.804	0.936	0.995
PO43-	0.240	1.36E+04	9.29E+04	0.155	0.197	0.283	0.325
SO42-	0.265	1.52E+04	1.04E+05	0.228	0.243	0.291	0.294
Si (as SiO32-)	8.19E-02	1.37E+03	9.39E+03	6.69E-02	7.42E-02	8.95E-02	9.62E-02
F-	0.313	3.54E+03	2.43E+04	7.10E-02	0.272	0.354	0.393
Cl-	0.269	5.69E+03	3.90E+04	0.239	0.254	0.285	0.300
C6H5O73-	3.49E-02	3.93E+03	2.69E+04	2.76E-02	3.11E-02	3.87E-02	4.22E-02
EDTA4-	2.05E-02	3.52E+03	2.41E+04	7.19E-03	1.37E-02	2.74E-02	3.41E-02
HEDTA3-	3.56E-02	5.81E+03	3.98E+04	8.89E-03	2.19E-02	4.93E-02	6.27E-02
glycolate-	0.222	9.94E+03	6.80E+04	0.124	0.172	0.272	0.320
acetate-	1.75E-02	616	4.22E+03	1.44E-02	1.57E-02	1.94E-02	2.23E-02
oxalate2-	1.92E-05	1.00	6.88	1.71E-05	1.81E-05	2.02E-05	2.12E-05
DBP	2.73E-02	3.42E+03	2.34E+04	2.32E-02	2.52E-02	2.95E-02	3.17E-02
butanol	2.73E-02	1.21E+03	8.27E+03	2.32E-02	2.52E-02	2.95E-02	3.17E-02
NH3	0.878	8.89E+03	6.09E+04	6.40E-02	0.459	1.31	1.73
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-101

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	7.13E+06 (kg)	(1.14E+03 kgal)	----	----	----	----	----
Heat Load	7.45 (kW)	(2.55E+04 BTU/hr)	----	6.96	7.22	7.67	7.99
Bulk Density†	1.65 (g/cc)	----	----	1.59	1.62	1.68	1.71
Water wt%†	28.3	----	----	24.6	26.2	29.9	31.7
TOC wt% C (wet	1.09	----	----	0.779	0.929	1.24	1.39

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	15.3	2.13E+05	1.52E+06	13.8	14.6	16.1	16.9
Al3+	1.55	2.52E+04	1.80E+05	1.37	1.49	1.61	1.67
Fe3+ (total Fe)	0.118	3.97E+03	2.83E+04	0.110	0.115	0.119	0.120
Cr3+	0.114	3.58E+03	2.55E+04	0.102	0.108	0.119	0.123
Bi3+	1.08E-03	137	973	1.02E-03	1.05E-03	1.11E-03	1.14E-03
La3+	1.38E-05	1.16	8.29	1.02E-05	1.20E-05	1.57E-05	1.75E-05
Hg2+	1.85E-05	2.25	16.0	1.18E-05	1.80E-05	1.90E-05	1.95E-05
Zr (as ZrO(OH)2)	3.13E-03	173	1.23E+03	1.55E-03	2.93E-03	3.33E-03	3.53E-03
Pb2+	1.21E-03	151	1.08E+03	1.02E-03	1.11E-03	1.30E-03	1.39E-03
Ni2+	1.61E-02	573	4.08E+03	1.00E-02	1.41E-02	1.72E-02	1.79E-02
Sr2+	0	0	0	0	0	0	0
Mn4+	1.54E-02	511	3.64E+03	8.32E-03	1.18E-02	1.90E-02	2.23E-02
Ca2+	8.59E-02	2.08E+03	1.48E+04	5.89E-02	7.58E-02	9.14E-02	9.47E-02
K+	0.299	7.08E+03	5.05E+04	7.82E-02	0.185	0.416	0.530
OH-	9.72	9.99E+04	7.12E+05	8.65	9.17	10.3	10.8
NO3-	5.63	2.11E+05	1.50E+06	5.22	5.42	5.83	6.03
NO2-	1.93	5.37E+04	3.83E+05	1.63	1.76	2.12	2.17
CO32-	0.854	3.10E+04	2.21E+05	0.706	0.782	0.920	0.983
PO43-	0.230	1.32E+04	9.43E+04	0.148	0.189	0.272	0.313
SO42-	0.251	1.46E+04	1.04E+05	0.216	0.230	0.275	0.278
Si (as SiO32-)	7.75E-02	1.32E+03	9.39E+03	6.33E-02	7.03E-02	8.47E-02	9.10E-02
F-	0.296	3.40E+03	2.43E+04	6.72E-02	0.258	0.335	0.372
Cl-	0.255	5.47E+03	3.90E+04	0.227	0.241	0.270	0.284
C6H5O73-	3.30E-02	3.78E+03	2.69E+04	2.61E-02	2.95E-02	3.66E-02	4.00E-02
EDTA4-	1.94E-02	3.39E+03	2.41E+04	6.80E-03	1.30E-02	2.59E-02	3.23E-02
HEDTA3-	3.37E-02	5.58E+03	3.98E+04	8.41E-03	2.07E-02	4.67E-02	5.94E-02
glycolate-	0.210	9.55E+03	6.80E+04	0.118	0.163	0.258	0.303
acetate-	1.66E-02	592	4.22E+03	1.37E-02	1.49E-02	1.84E-02	2.11E-02
oxalate2-	1.81E-05	0.966	6.88	1.62E-05	1.71E-05	1.91E-05	2.01E-05
DBP	2.60E-02	3.31E+03	2.36E+04	2.20E-02	2.40E-02	2.81E-02	3.02E-02
butanol	2.60E-02	1.17E+03	8.32E+03	2.20E-02	2.40E-02	2.81E-02	3.02E-02
NH3	0.831	8.55E+03	6.09E+04	6.05E-02	0.434	1.24	1.63
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-101

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	2.78E+05 (kg)	(61.0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	1.20 (g/cc)	----	----	1.11	1.15	1.24	1.27
Void Fraction	0.888	----	----	0.866	0.875	0.913	0.948
Water wt%	73.5	----	----	69.0	70.9	77.2	81.3
TOC wt% C (wet	3.63E-02	----	----	1.76E-02	2.74E-02	4.49E-02	5.32E-02

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	1.44E-09	1.20E-06	3.32E-04	5.18E-11	8.34E-11	2.61E-09	3.32E-09
U-233	1.48E-11	1.23E-08	3.41E-06	5.31E-13	8.55E-13	2.68E-11	3.41E-11
U-234	6.48E-06	5.38E-03	1.50	2.33E-07	3.75E-07	1.17E-05	1.49E-05
U-235	2.46E-07	2.04E-04	5.68E-02	8.85E-09	1.43E-08	4.46E-07	5.68E-07
U-236	5.33E-07	4.43E-04	0.123	1.92E-08	3.09E-08	9.67E-07	1.23E-06
U-238	4.45E-06	3.69E-03	1.03	1.60E-07	2.57E-07	8.06E-06	1.03E-05
Np-237	0	0	0	0	0	0	0
Pu-238	2.78E-04	0.231	64.1	2.06E-04	2.56E-04	2.96E-04	3.14E-04
Pu-239	2.25E-03	1.87	519	1.67E-03	2.07E-03	2.40E-03	2.54E-03
Pu-240	6.83E-04	0.567	158	5.08E-04	6.30E-04	7.29E-04	7.72E-04
Pu-241	2.84E-02	23.6	6.55E+03	2.11E-02	2.61E-02	3.02E-02	3.20E-02
Pu-242	1.06E-07	8.78E-05	2.44E-02	7.86E-08	9.74E-08	1.13E-07	1.19E-07
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	3.95E-02 (g/L)	----	9.12	2.94E-02	3.64E-02	4.21E-02	4.46E-02
U	5.61E-02	1.11E+04	3.08E+03	2.02E-03	3.25E-03	0.102	0.129

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AW-101

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	6.85E+06 (kg)	(1.08E+03 kgal)	----	----	----	----	----
Heat Load	7.45 (kW)	(2.55E+04 BTU/hr)	----	6.96	7.22	7.67	7.99
Bulk Density*	1.68 (g/cc)	----	----	1.62	1.65	1.71	1.74
Water wt%†	26.4	----	----	22.7	24.3	28.1	30.0
TOC wt% C (wet	1.13	----	----	0.809	0.965	1.29	1.45

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	2.35E-04	0.140	958	1.69E-04	1.69E-04	2.49E-04	2.65E-04
C-14	3.03E-05	1.80E-02	124	1.65E-05	1.65E-05	3.07E-05	3.12E-05
Ni-59	1.76E-06	1.05E-03	7.18	1.11E-06	1.11E-06	1.79E-06	1.83E-06
Ni-63	1.73E-04	0.103	707	1.09E-04	1.09E-04	1.76E-04	1.80E-04
Co-60	4.23E-05	2.52E-02	173	2.65E-05	2.65E-05	4.45E-05	4.66E-05
Se-79	3.63E-06	2.16E-03	14.8	2.75E-06	2.75E-06	3.94E-06	4.25E-06
Sr-90	0.117	69.5	4.76E+05	0.111	0.114	0.119	0.122
Y-90	0.117	69.5	4.76E+05	8.62E-02	8.62E-02	0.119	0.122
Zr-93	1.75E-05	1.04E-02	71.5	1.31E-05	1.31E-05	1.91E-05	2.06E-05
Nb-93m	1.28E-05	7.65E-03	52.4	9.76E-06	9.76E-06	1.40E-05	1.50E-05
Tc-99	2.26E-04	0.135	922	1.74E-04	2.00E-04	2.52E-04	2.83E-04
Ru-106	1.49E-08	8.87E-06	6.07E-02	1.11E-08	1.28E-08	1.68E-08	1.86E-08
Cd-113m	8.88E-05	5.29E-02	362	6.24E-05	6.24E-05	9.84E-05	1.08E-04
Sb-125	2.90E-04	0.173	1.18E+03	1.92E-04	2.22E-04	3.42E-04	3.93E-04
Sn-126	5.53E-06	3.29E-03	22.6	4.21E-06	4.21E-06	6.01E-06	6.47E-06
I-129	4.37E-07	2.60E-04	1.78	3.37E-07	3.86E-07	4.88E-07	5.48E-07
Cs-134	6.51E-05	3.88E-02	265	2.14E-05	4.26E-05	8.80E-05	1.11E-04
Cs-137	0.222	132	9.07E+05	0.201	0.210	0.233	0.250
Ba-137m	0.210	125	8.58E+05	0.179	0.179	0.219	0.228
Sm-151	1.28E-02	7.64	5.24E+04	9.75E-03	9.75E-03	1.39E-02	1.50E-02
Eu-152	4.40E-06	2.62E-03	17.9	3.30E-06	3.30E-06	4.76E-06	5.13E-06
Eu-154	6.59E-04	0.392	2.69E+03	4.39E-04	4.39E-04	7.38E-04	7.70E-04
Eu-155	2.80E-04	0.167	1.14E+03	2.15E-04	2.15E-04	3.02E-04	3.24E-04
Ra-226	1.56E-10	9.31E-08	6.38E-04	1.17E-10	1.29E-10	1.76E-10	1.77E-10
Ra-228	3.21E-07	1.91E-04	1.31	1.43E-07	1.43E-07	3.71E-07	4.26E-07
Ac-227	9.86E-10	5.87E-07	4.02E-03	7.58E-10	8.27E-10	1.10E-09	1.10E-09
Pa-231	4.20E-09	2.50E-06	1.71E-02	3.32E-09	3.32E-09	4.52E-09	4.83E-09
Th-229	7.44E-09	4.44E-06	3.04E-02	3.34E-09	3.34E-09	8.56E-09	9.75E-09
Th-232	3.11E-08	1.85E-05	0.127	9.09E-09	9.09E-09	3.71E-08	4.29E-08
U-232	1.11E-06	6.62E-04	4.53	7.67E-07	9.35E-07	1.31E-06	1.53E-06
U-233	4.26E-06	2.54E-03	17.4	2.94E-06	3.58E-06	5.04E-06	5.87E-06
U-234	2.12E-06	1.26E-03	8.65	1.65E-06	2.01E-06	2.17E-06	2.22E-06
U-235	8.16E-08	4.86E-05	0.333	6.36E-08	7.75E-08	8.35E-08	8.53E-08
U-236	1.41E-07	8.42E-05	0.577	1.02E-07	1.33E-07	1.45E-07	1.49E-07
U-238	1.90E-06	1.13E-03	7.77	1.58E-06	1.83E-06	1.94E-06	1.97E-06
Np-237	8.11E-07	4.83E-04	3.31	6.42E-07	7.24E-07	8.97E-07	9.98E-07
Pu-238	4.75E-06	2.83E-03	19.4	3.20E-06	3.96E-06	5.54E-06	6.29E-06
Pu-239	7.29E-05	4.34E-02	298	6.04E-05	6.65E-05	7.93E-05	8.55E-05
Pu-240	1.64E-05	9.78E-03	67.0	1.26E-05	1.45E-05	1.84E-05	2.02E-05
Pu-241	4.37E-04	0.260	1.78E+03	2.79E-04	3.56E-04	5.17E-04	5.95E-04
Pu-242	1.82E-09	1.09E-06	7.45E-03	1.24E-09	1.52E-09	2.13E-09	2.41E-09
Am-241	9.50E-05	5.66E-02	388	7.48E-05	8.46E-05	1.06E-04	1.11E-04
Am-243	7.63E-09	4.55E-06	3.11E-02	3.36E-09	5.43E-09	9.88E-09	9.97E-09
Cm-242	1.71E-07	1.02E-04	0.698	1.26E-07	1.26E-07	1.85E-07	1.99E-07
Cm-243	1.74E-08	1.04E-05	7.12E-02	1.32E-08	1.32E-08	1.89E-08	2.03E-08
Cm-244	2.45E-07	1.46E-04	1.00	1.68E-07	2.01E-07	2.78E-07	3.09E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	1.06E-03 (g/L)	—	4.34	8.44E-04	9.52E-04	1.18E-03	1.28E-03
U	2.00E-02	2.84E+03	1.94E+04	1.59E-02	1.91E-02	2.04E-02	2.09E-02

*Density is calculated based on Na, OH-, and AlO2-.

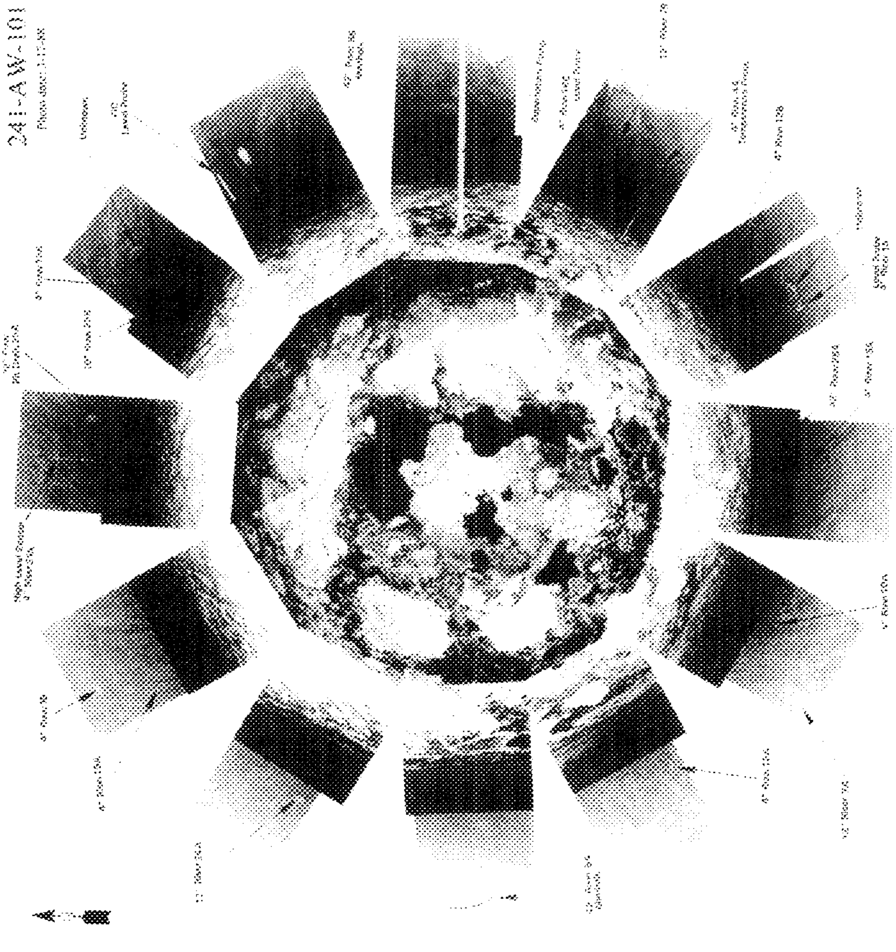
†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-101							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	7.13E+06 (kg)	(1.14E+03 kgal)	----	----	----	----	----
Heat Load	7.45 (kW)	(2.55E+04 BTU/hr)	----	6.96	7.22	7.67	7.99
Bulk Density†	1.65 (g/cc)	----	----	1.59	1.62	1.68	1.71
Water wt%†	28.3	----	----	24.6	26.2	29.9	31.7
TOC wt% C (wet	1.09	----	----	0.779	0.929	1.24	1.39
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	2.22E-04	0.134	958	1.60E-04	1.60E-04	2.35E-04	2.51E-04
C-14	2.87E-05	1.73E-02	124	1.56E-05	1.56E-05	2.91E-05	2.95E-05
Ni-59	1.67E-06	1.01E-03	7.18	1.05E-06	1.05E-06	1.70E-06	1.73E-06
Ni-63	1.64E-04	9.92E-02	707	1.03E-04	1.03E-04	1.67E-04	1.70E-04
Co-60	4.01E-05	2.42E-02	173	2.51E-05	2.51E-05	4.21E-05	4.41E-05
Se-79	3.43E-06	2.08E-03	14.8	2.60E-06	2.60E-06	3.73E-06	4.02E-06
Sr-90	0.110	66.8	4.76E+05	0.105	0.108	0.113	0.115
Y-90	0.110	66.8	4.76E+05	8.16E-02	8.16E-02	0.113	0.116
Zr-93	1.66E-05	1.00E-02	71.5	1.24E-05	1.24E-05	1.81E-05	1.95E-05
Nb-93m	1.22E-05	7.36E-03	52.4	9.24E-06	9.24E-06	1.32E-05	1.42E-05
Tc-99	2.14E-04	0.129	922	1.65E-04	1.89E-04	2.39E-04	2.68E-04
Ru-106	1.41E-08	8.52E-06	6.07E-02	1.05E-08	1.22E-08	1.59E-08	1.76E-08
Cd-113m	8.40E-05	5.08E-02	362	5.90E-05	5.90E-05	9.31E-05	1.02E-04
Sb-125	2.75E-04	0.166	1.18E+03	1.82E-04	2.10E-04	3.24E-04	3.72E-04
Sn-126	5.23E-06	3.17E-03	22.6	3.98E-06	3.98E-06	5.69E-06	6.12E-06
I-129	4.13E-07	2.50E-04	1.78	3.19E-07	3.65E-07	4.62E-07	5.19E-07
Cs-134	6.16E-05	3.72E-02	265	2.03E-05	4.03E-05	8.33E-05	1.05E-04
Cs-137	0.210	127	9.07E+05	0.190	0.198	0.221	0.237
Ba-137m	0.199	120	8.58E+05	0.169	0.169	0.208	0.216
Sm-151	1.21E-02	7.35	5.24E+04	9.23E-03	9.23E-03	1.32E-02	1.42E-02
Eu-152	4.16E-06	2.52E-03	17.9	3.13E-06	3.13E-06	4.51E-06	4.85E-06
Eu-154	6.23E-04	0.377	2.69E+03	4.15E-04	4.15E-04	6.99E-04	7.29E-04
Eu-155	2.65E-04	0.160	1.14E+03	2.03E-04	2.03E-04	2.86E-04	3.07E-04
Ra-226	1.48E-10	8.95E-08	6.38E-04	1.11E-10	1.22E-10	1.67E-10	1.68E-10
Ra-228	3.03E-07	1.84E-04	1.31	1.35E-07	1.35E-07	3.52E-07	4.03E-07
Ac-227	9.33E-10	5.64E-07	4.02E-03	7.18E-10	7.83E-10	1.04E-09	1.04E-09
Pa-231	3.98E-09	2.41E-06	1.71E-02	3.14E-09	3.14E-09	4.28E-09	4.57E-09
Th-229	7.05E-09	4.26E-06	3.04E-02	3.16E-09	3.16E-09	8.10E-09	9.23E-09
Th-232	2.94E-08	1.78E-05	0.127	8.60E-09	8.60E-09	3.51E-08	4.06E-08
U-232	1.05E-06	6.36E-04	4.53	7.26E-07	8.85E-07	1.24E-06	1.45E-06
U-233	4.03E-06	2.44E-03	17.4	2.78E-06	3.39E-06	4.77E-06	5.55E-06
U-234	2.35E-06	1.42E-03	10.1	1.59E-06	1.93E-06	2.63E-06	2.81E-06
U-235	9.04E-08	5.47E-05	0.390	6.14E-08	7.41E-08	1.01E-07	1.08E-07
U-236	1.62E-07	9.82E-05	0.700	9.95E-08	1.27E-07	1.86E-07	2.00E-07
U-238	2.04E-06	1.23E-03	8.79	1.52E-06	1.75E-06	2.23E-06	2.35E-06
Np-237	7.67E-07	4.64E-04	3.31	6.08E-07	6.86E-07	8.49E-07	9.44E-07
Pu-238	1.94E-05	1.17E-02	83.4	1.55E-05	1.82E-05	2.00E-05	2.04E-05
Pu-239	1.89E-04	0.115	817	1.59E-04	1.80E-04	1.95E-04	1.98E-04
Pu-240	5.21E-05	3.15E-02	225	4.27E-05	4.93E-05	5.37E-05	5.46E-05
Pu-241	1.93E-03	1.17	8.33E+03	1.54E-03	1.81E-03	2.00E-03	2.04E-03
Pu-242	7.39E-09	4.47E-06	3.19E-02	5.94E-09	6.94E-09	7.63E-09	7.78E-09
Am-241	9.00E-05	5.44E-02	388	7.08E-05	8.01E-05	1.00E-04	1.05E-04
Am-243	7.23E-09	4.37E-06	3.11E-02	3.18E-09	5.14E-09	9.35E-09	9.44E-09
Cm-242	1.62E-07	9.79E-05	0.698	1.19E-07	1.19E-07	1.75E-07	1.88E-07
Cm-243	1.65E-08	9.99E-06	7.12E-02	1.25E-08	1.25E-08	1.79E-08	1.92E-08
Cm-244	2.32E-07	1.40E-04	1.00	1.59E-07	1.90E-07	2.63E-07	2.92E-07
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	3.12E-03 (g/L)	----	13.5	2.58E-03	2.96E-03	3.21E-03	3.27E-03
U	2.19E-02	3.16E+03	2.25E+04	1.53E-02	1.82E-02	2.44E-02	2.59E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.


241-AW-101

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TANK 241-AW-102 SUMMARY

TANK HISTORY	
Entered Service	1980
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-

TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
15A, 16C	4 in
12A, 24B	12 in
25A	20 in

TANK TEMPERATURE	
Average Tank Temperature	71°F
Maximum Temperature	105°F
Date	July 17, 1995
Elevation from tank bottom	0.33 ft, 4.33 ft, 8.33 ft, 12.33 ft
Riser Number	4A
Minimum Temperature	53°F
Date	Feb 21, 1994
Elevation from tank bottom	34.33 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	64

WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	99,000 gal
Waste Type	DN
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	63,000 gal
Saltcake	0 gal
Sludge	36,000 gal
Supernatant	63,000 gal

INTERIOR PHOTOGRAPHS	
Date	not available
Montage Number	not available
Photo Set Number	not available

WASTE SURFACE LEVEL	
Devices	Manual ENRAF and Tape
Max Level	378.8 in
Date	Aug 12, 1992
Min Level	16.25 in
Date	June 13, 1994

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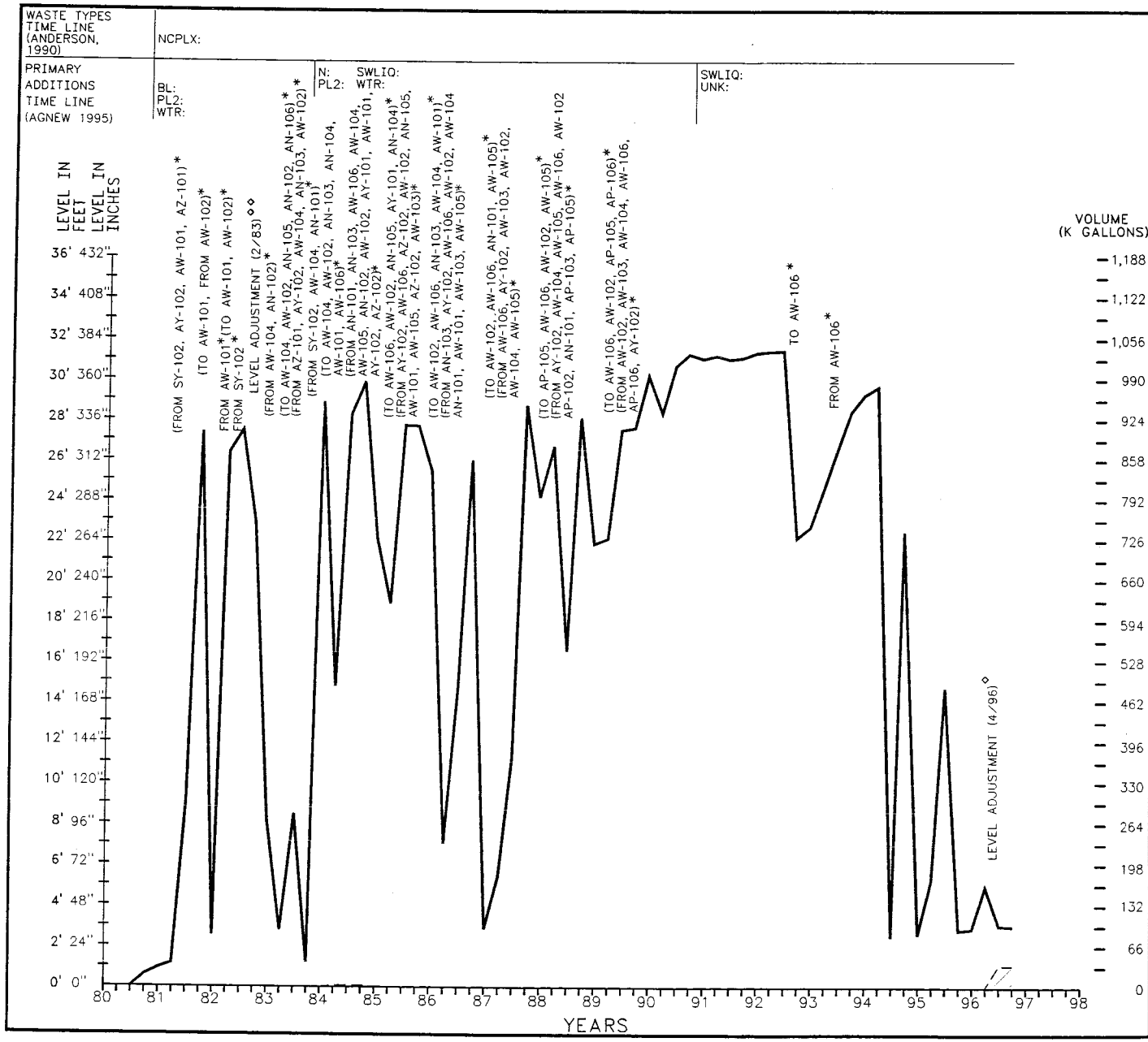


TANK INFO:

CONSTRUCTED 1978-1980
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

* AGNEW 1995
◇ HANLON 1996l
◇◇ HANLON 1996f

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

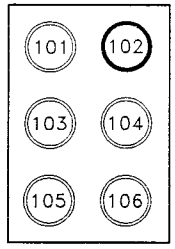
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

BL:	B-PLANT LOW-LEVEL WASTE
N:	N-REACTOR WASTE
NCPLX:	NON-COMPLEXED WASTE
PL2:	PUREX LOW-LEVEL WASTE 1983-88
SWLIQ:	DILUTE, NON-COMPLEXED WASTE
UNK:	UNKNOWN
WTR:	WATER

LEGEND

TOTAL WASTE LEVEL (SUPERNATE)
SOLIDS LEVEL
SOLIDS

AW TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AW-102 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1980-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E166	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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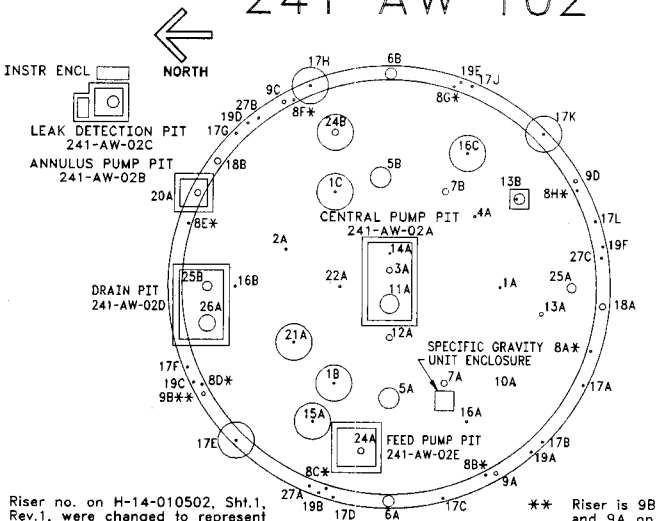
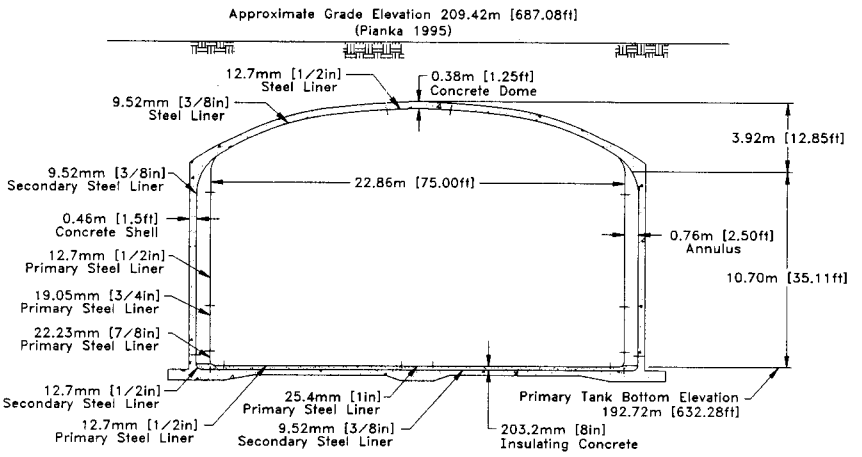


* Riser no. on H-14-010502, Sht.1, Rev.1, were changed to represent H-2-70404, Rev.13 ECN-613252 12-18-95.

** Riser is 9B on H-14-010502, Sht.1, and 9A on H-2-70404, Rev.13.

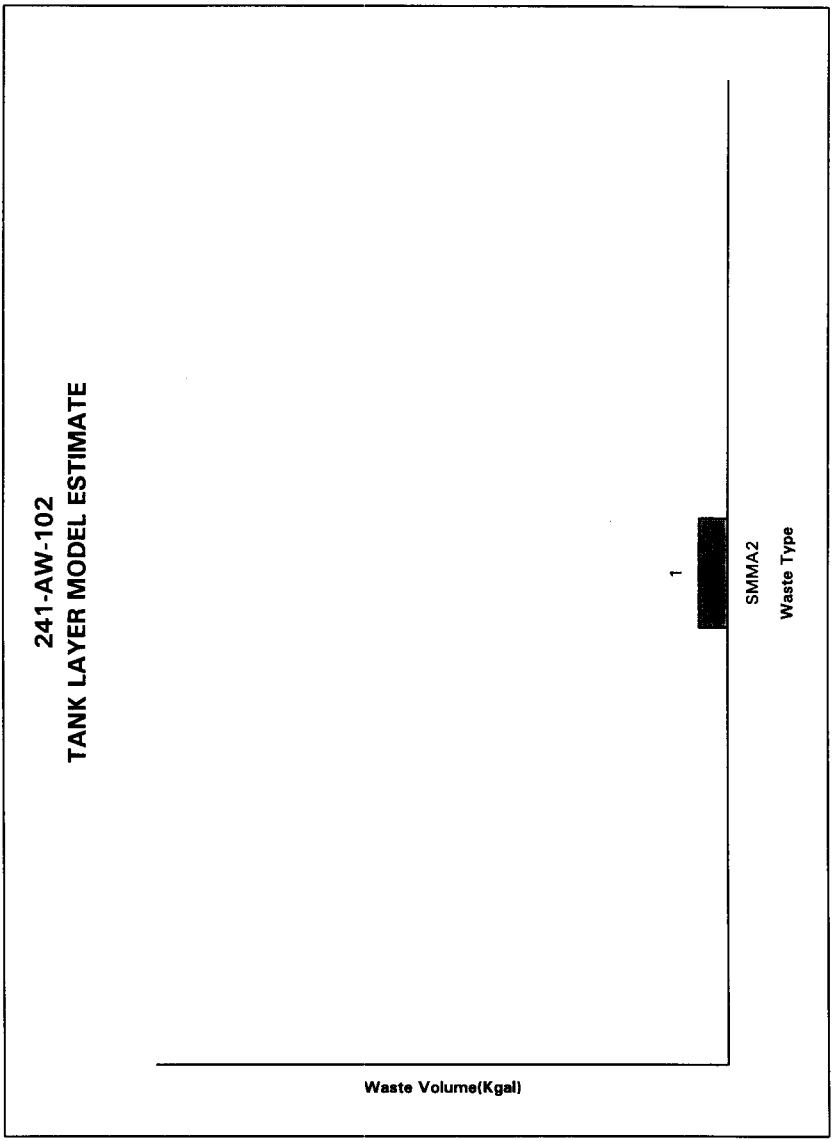
TANK RISER LOCATION

Ref: Salazar 1994
H-14-010502, Sh.1, Rev.1
H-2-70404, Rev.13



Ref: H-2-70394, Rev.2

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AW-102

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AW-102

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.65E+06 (kg)	(979 kgal)	----	----	----	----	----
Heat Load	2.36 (kW)	(8.05E+03 BTU/hr)	----	2.23	2.29	2.42	2.48
Bulk Density*	1.26 (g/cc)	----	----	1.22	1.24	1.27	1.29
Water wt%	62.3	----	----	58.4	60.1	64.2	66.2
TOC wt% C (wet	0.579	----	----	0.454	0.515	0.643	0.705

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	6.30	1.15E+05	5.36E+05	5.32	5.80	6.79	7.24
Al3+	0.548	1.18E+04	5.48E+04	0.473	0.510	0.587	0.624
Fe3+ (total Fe)	8.13E-03	362	1.68E+03	7.10E-03	7.60E-03	8.66E-03	9.17E-03
Cr3+	4.24E-02	1.76E+03	8.17E+03	3.70E-02	3.97E-02	4.51E-02	4.78E-02
Bi3+	3.84E-04	63.9	297	3.62E-04	3.73E-04	3.95E-04	4.05E-04
La3+	9.03E-06	0.999	4.65	6.58E-06	7.78E-06	1.03E-05	1.15E-05
Hg2+	8.16E-06	1.30	6.07	4.42E-06	7.88E-06	8.45E-06	8.72E-06
Zr (as ZrO(OH)2)	1.71E-03	124	579	8.34E-04	1.60E-03	1.82E-03	1.93E-03
Pb2+	3.63E-04	59.9	279	3.14E-04	3.38E-04	3.88E-04	4.12E-04
Ni2+	4.78E-03	223	1.04E+03	4.57E-03	4.67E-03	4.89E-03	4.99E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	7.94E-03	348	1.62E+03	3.92E-03	5.89E-03	1.00E-02	1.14E-02
Ca2+	3.33E-02	1.06E+03	4.94E+03	2.84E-02	3.12E-02	3.54E-02	3.73E-02
K+	0.156	4.85E+03	2.26E+04	3.30E-02	9.25E-02	0.220	0.284
OH-	3.63	4.92E+04	2.29E+05	2.97	3.29	3.97	4.30
NO3-	2.31	1.14E+05	5.31E+05	2.07	2.19	2.44	2.55
NO2-	0.635	2.33E+04	1.08E+05	0.558	0.593	0.677	0.714
CO32-	0.389	1.86E+04	8.66E+04	0.312	0.350	0.428	0.458
PO43-	0.112	8.44E+03	3.93E+04	6.49E-02	8.77E-02	0.135	0.158
SO42-	9.21E-02	7.05E+03	3.28E+04	7.94E-02	8.56E-02	9.87E-02	0.105
Si (as SiO32-)	3.42E-02	765	3.56E+03	2.53E-02	2.97E-02	3.87E-02	4.27E-02
F-	0.153	2.31E+03	1.07E+04	2.56E-02	0.131	0.174	0.195
Cl-	0.102	2.88E+03	1.34E+04	8.42E-02	9.29E-02	0.111	0.120
C6H5O73-	1.42E-02	2.14E+03	9.96E+03	9.88E-03	1.20E-02	1.64E-02	1.86E-02
EDTA4-	5.81E-03	1.33E+03	6.21E+03	1.93E-03	3.83E-03	7.81E-03	9.76E-03
HEDTA3-	1.03E-02	2.26E+03	1.05E+04	2.59E-03	6.38E-03	1.43E-02	1.82E-02
glycolate-	0.118	7.05E+03	3.28E+04	6.02E-02	8.84E-02	0.148	0.176
acetate-	4.08E-03	192	892	3.43E-03	3.71E-03	4.48E-03	5.09E-03
oxalate2-	1.18E-05	0.829	3.86	1.05E-05	1.12E-05	1.25E-05	1.32E-05
DBP	9.54E-03	1.60E+03	7.43E+03	7.26E-03	8.38E-03	1.07E-02	1.18E-02
butanol	9.54E-03	563	2.62E+03	7.26E-03	8.38E-03	1.07E-02	1.18E-02
NH3	0.473	6.41E+03	2.98E+04	4.60E-02	0.253	0.698	0.919
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-102							
Total Inventory Estimate*							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.65E+06 (kg)	(979 kgal)	----	----	----	----	----
Heat Load	2.36 (kW)	(8.05E+03 BTU/hr)	----	2.23	2.29	2.42	2.48
Bulk Density†	1.26 (g/cc)	----	----	1.22	1.24	1.27	1.29
Water wt%†	62.3	----	----	58.4	60.1	64.2	66.2
TOC wt% C (wet	0.579	----	----	0.454	0.515	0.643	0.705
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	6.30	1.15E+05	5.36E+05	5.32	5.80	6.79	7.24
Al3+	0.548	1.18E+04	5.48E+04	0.473	0.510	0.587	0.624
Fe3+ (total Fe)	8.13E-03	362	1.68E+03	7.10E-03	7.60E-03	8.66E-03	9.17E-03
Cr3+	4.24E-02	1.76E+03	8.17E+03	3.70E-02	3.97E-02	4.51E-02	4.78E-02
Bi3+	3.84E-04	63.9	297	3.62E-04	3.73E-04	3.95E-04	4.05E-04
La3+	9.03E-06	0.999	4.65	6.58E-06	7.78E-06	1.03E-05	1.15E-05
Hg2+	8.16E-06	1.30	6.07	4.42E-06	7.88E-06	8.45E-06	8.72E-06
Zr (as ZrO(OH)2)	1.71E-03	124	579	8.34E-04	1.60E-03	1.82E-03	1.93E-03
Pb2+	3.63E-04	59.9	279	3.14E-04	3.38E-04	3.88E-04	4.12E-04
Ni2+	4.78E-03	223	1.04E+03	4.57E-03	4.67E-03	4.89E-03	4.99E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	7.94E-03	348	1.62E+03	3.92E-03	5.89E-03	1.00E-02	1.14E-02
Ca2+	3.33E-02	1.06E+03	4.94E+03	2.84E-02	3.12E-02	3.54E-02	3.73E-02
K+	0.156	4.85E+03	2.26E+04	3.30E-02	9.25E-02	0.220	0.284
OH-	3.63	4.92E+04	2.29E+05	2.97	3.29	3.97	4.30
NO3-	2.31	1.14E+05	5.31E+05	2.07	2.19	2.44	2.55
NO2-	0.635	2.33E+04	1.08E+05	0.558	0.593	0.677	0.714
CO32-	0.389	1.86E+04	8.66E+04	0.312	0.350	0.428	0.458
PO43-	0.112	8.44E+03	3.93E+04	6.49E-02	8.77E-02	0.135	0.158
SO42-	9.21E-02	7.05E+03	3.28E+04	7.94E-02	8.56E-02	9.87E-02	0.105
Si (as SiO32-)	3.42E-02	765	3.56E+03	2.53E-02	2.97E-02	3.87E-02	4.27E-02
F-	0.153	2.31E+03	1.07E+04	2.56E-02	0.131	0.174	0.195
Cl-	0.102	2.88E+03	1.34E+04	8.42E-02	9.29E-02	0.111	0.120
C6H5O73-	1.42E-02	2.14E+03	9.96E+03	9.88E-03	1.20E-02	1.64E-02	1.86E-02
EDTA4-	5.81E-03	1.33E+03	6.21E+03	1.93E-03	3.83E-03	7.81E-03	9.76E-03
HEDTA3-	1.03E-02	2.26E+03	1.05E+04	2.59E-03	6.38E-03	1.43E-02	1.82E-02
glycolate-	0.118	7.05E+03	3.28E+04	6.02E-02	8.84E-02	0.148	0.176
acetate-	4.08E-03	192	892	3.43E-03	3.71E-03	4.48E-03	5.09E-03
oxalate2-	1.18E-05	0.829	3.86	1.05E-05	1.12E-05	1.25E-05	1.32E-05
DBP	9.54E-03	1.60E+03	7.43E+03	7.26E-03	8.38E-03	1.07E-02	1.18E-02
butanol	9.54E-03	563	2.62E+03	7.26E-03	8.38E-03	1.07E-02	1.18E-02
NH3	0.473	6.41E+03	2.98E+04	4.60E-02	0.253	0.698	0.919
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-102							
TLM Solids Composite Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AW-102

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.65E+06 (kg)	(979 kgal)	----	----	----	----	----
Heat Load	2.36 (kW)	(8.05E+03 BTU/hr)	----	2.23	2.29	2.42	2.48
Bulk Density*	1.26 (g/cc)	----	----	1.22	1.24	1.27	1.29
Water wt%†	62.3	----	----	58.4	60.1	64.2	66.2
TOC wt% C (wet	0.579	----	----	0.454	0.515	0.643	0.705

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	8.21E-05	6.54E-02	304	5.90E-05	5.90E-05	9.04E-05	9.99E-05
C-14	9.70E-06	7.72E-03	35.9	4.86E-06	4.86E-06	9.95E-06	1.01E-05
Ni-59	6.33E-07	5.04E-04	2.35	4.06E-07	4.06E-07	6.45E-07	6.56E-07
Ni-63	6.23E-05	4.96E-02	231	3.98E-05	3.98E-05	6.34E-05	6.45E-05
Co-60	1.44E-05	1.15E-02	53.4	8.88E-06	8.88E-06	1.55E-05	1.66E-05
Se-79	1.40E-06	1.12E-03	5.20	1.08E-06	1.09E-06	1.57E-06	1.73E-06
Sr-90	4.64E-02	37.0	1.72E+05	4.37E-02	4.50E-02	4.79E-02	4.93E-02
Y-90	4.65E-02	37.0	1.72E+05	3.58E-02	3.58E-02	4.79E-02	4.93E-02
Zr-93	6.68E-06	5.32E-03	24.7	5.13E-06	5.13E-06	7.43E-06	8.15E-06
Nb-93m	4.98E-06	3.96E-03	18.5	3.81E-06	3.90E-06	5.58E-06	6.15E-06
Tc-99	7.07E-05	5.63E-02	262	5.27E-05	6.15E-05	8.00E-05	8.90E-05
Ru-106	6.93E-09	5.52E-06	2.57E-02	4.97E-09	5.93E-09	7.93E-09	8.89E-09
Cd-113m	3.17E-05	2.53E-02	118	2.25E-05	2.25E-05	3.59E-05	3.83E-05
Sb-125	1.12E-04	8.93E-02	416	6.06E-05	8.56E-05	1.39E-04	1.66E-04
Sn-126	2.16E-06	1.72E-03	7.99	1.64E-06	1.69E-06	2.42E-06	2.67E-06
I-129	1.37E-07	1.09E-04	0.506	1.02E-07	1.19E-07	1.55E-07	1.72E-07
Cs-134	2.71E-05	2.15E-02	100	4.17E-06	1.53E-05	3.91E-05	5.09E-05
Cs-137	6.89E-02	54.9	2.55E+05	6.31E-02	6.60E-02	7.19E-02	7.48E-02
Ba-137m	6.52E-02	51.9	2.42E+05	5.59E-02	5.59E-02	6.81E-02	7.08E-02
Sm-151	4.99E-03	3.97	1.85E+04	3.81E-03	3.91E-03	5.59E-03	6.17E-03
Eu-152	1.61E-06	1.28E-03	5.97	1.23E-06	1.23E-06	1.76E-06	1.91E-06
Eu-154	2.34E-04	0.186	867	1.57E-04	1.57E-04	2.62E-04	2.73E-04
Eu-155	1.03E-04	8.19E-02	381	8.01E-05	8.01E-05	1.12E-04	1.20E-04
Ra-226	6.42E-11	5.11E-08	2.38E-04	4.10E-11	5.23E-11	7.60E-11	7.64E-11
Ra-228	7.54E-08	6.00E-05	0.279	3.80E-08	3.80E-08	8.89E-08	1.03E-07
Ac-227	3.94E-10	3.13E-07	1.46E-03	2.59E-10	3.25E-10	4.61E-10	4.33E-10
Pa-231	1.53E-09	1.22E-06	5.67E-03	1.22E-09	1.22E-09	1.68E-09	1.82E-09
Th-229	1.75E-09	1.40E-06	6.50E-03	8.89E-10	8.89E-10	2.05E-09	2.37E-09
Th-232	7.06E-09	5.62E-06	2.61E-02	2.43E-09	2.43E-09	8.32E-09	9.54E-09
U-232	2.76E-07	2.20E-04	1.02	1.85E-07	2.30E-07	3.30E-07	3.88E-07
U-233	1.06E-06	8.43E-04	3.92	7.08E-07	8.79E-07	1.27E-06	1.49E-06
U-234	9.96E-07	7.93E-04	3.69	7.46E-07	9.37E-07	1.02E-06	1.05E-06
U-235	3.83E-08	3.05E-05	0.142	2.88E-08	3.60E-08	3.93E-08	4.03E-08
U-236	7.16E-08	5.70E-05	0.265	5.11E-08	6.68E-08	7.39E-08	7.60E-08
U-238	8.06E-07	6.42E-04	2.99	6.35E-07	7.66E-07	8.25E-07	8.43E-07
Np-237	2.57E-07	2.04E-04	0.952	1.98E-07	2.27E-07	2.87E-07	3.17E-07
Pu-238	2.36E-06	1.88E-03	8.74	1.51E-06	1.92E-06	2.79E-06	3.21E-06
Pu-239	3.11E-05	2.48E-02	115	2.42E-05	2.76E-05	3.47E-05	3.80E-05
Pu-240	7.46E-06	5.94E-03	27.6	5.36E-06	6.39E-06	8.53E-06	9.56E-06
Pu-241	2.22E-04	0.177	822	1.35E-04	1.77E-04	2.66E-04	3.09E-04
Pu-242	9.13E-10	7.27E-07	3.38E-03	5.89E-10	7.48E-10	1.08E-09	1.24E-09
Am-241	4.14E-05	3.30E-02	153	3.02E-05	3.57E-05	4.71E-05	5.10E-05
Am-243	3.85E-09	3.07E-06	1.43E-02	1.61E-09	2.70E-09	5.03E-09	5.08E-09
Cm-242	6.88E-08	5.47E-05	0.255	5.30E-08	5.30E-08	7.68E-08	8.44E-08
Cm-243	7.16E-09	5.70E-06	2.65E-02	5.49E-09	5.66E-09	8.01E-09	8.83E-09
Cm-244	1.19E-07	9.51E-05	0.443	7.86E-08	9.84E-08	1.38E-07	1.57E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	4.79E-04 (g/L)	---	1.78	3.58E-04	4.17E-04	5.41E-04	6.00E-04
U	9.17E-03	1.74E+03	8.08E+03	7.00E-03	8.66E-03	9.40E-03	9.63E-03

*Density is calculated based on Na, OH-, and AlO2-

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-102							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	4.65E+06 (kg)	(979 kgal)	----	----	----	----	----
Heat Load	2.36 (kW)	(8.05E+03 BTU/hr)	----	2.23	2.29	2.42	2.48
Bulk Density†	1.26 (g/cc)	----	----	1.22	1.24	1.27	1.29
Water wt%†	62.3	----	----	58.4	60.1	64.2	66.2
TOC wt% C (wet	0.579	----	----	0.454	0.515	0.643	0.705
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	8.21E-05	6.54E-02	304	5.90E-05	5.90E-05	9.04E-05	9.99E-05
C-14	9.70E-06	7.72E-03	35.9	4.86E-06	4.86E-06	9.95E-06	1.01E-05
Ni-59	6.33E-07	5.04E-04	2.35	4.06E-07	4.06E-07	6.45E-07	6.56E-07
Ni-63	6.23E-05	4.96E-02	231	3.98E-05	3.98E-05	6.34E-05	6.45E-05
Co-60	1.44E-05	1.15E-02	53.4	8.88E-06	8.88E-06	1.55E-05	1.66E-05
Se-79	1.40E-06	1.12E-03	5.20	1.08E-06	1.09E-06	1.57E-06	1.73E-06
Sr-90	4.64E-02	37.0	1.72E+05	4.37E-02	4.50E-02	4.79E-02	4.93E-02
Y-90	4.65E-02	37.0	1.72E+05	3.58E-02	3.58E-02	4.79E-02	4.93E-02
Zr-93	6.68E-06	5.32E-03	24.7	5.13E-06	5.13E-06	7.43E-06	8.15E-06
Nb-93m	4.98E-06	3.96E-03	18.5	3.81E-06	3.90E-06	5.58E-06	6.15E-06
Tc-99	7.07E-05	5.63E-02	262	5.27E-05	6.15E-05	8.00E-05	8.90E-05
Ru-106	6.93E-09	5.52E-06	2.57E-02	4.97E-09	5.93E-09	7.93E-09	8.89E-09
Cd-113m	3.17E-05	2.53E-02	118	2.25E-05	2.25E-05	3.59E-05	3.83E-05
Sb-125	1.12E-04	8.93E-02	416	6.06E-05	8.56E-05	1.39E-04	1.66E-04
Sn-126	2.16E-06	1.72E-03	7.99	1.64E-06	1.69E-06	2.42E-06	2.67E-06
I-129	1.37E-07	1.09E-04	0.506	1.02E-07	1.19E-07	1.55E-07	1.72E-07
Cs-134	2.71E-05	2.15E-02	100	4.17E-06	1.53E-05	3.91E-05	5.09E-05
Cs-137	6.89E-02	54.9	2.55E+05	6.31E-02	6.60E-02	7.19E-02	7.48E-02
Ba-137m	6.52E-02	51.9	2.42E+05	5.59E-02	5.59E-02	6.81E-02	7.08E-02
Sm-151	4.99E-03	3.97	1.85E+04	3.81E-03	3.91E-03	5.59E-03	6.17E-03
Eu-152	1.61E-06	1.28E-03	5.97	1.23E-06	1.23E-06	1.76E-06	1.91E-06
Eu-154	2.34E-04	0.186	867	1.57E-04	1.57E-04	2.62E-04	2.73E-04
Eu-155	1.03E-04	8.19E-02	381	8.01E-05	8.01E-05	1.12E-04	1.20E-04
Ra-226	6.42E-11	5.11E-08	2.38E-04	4.10E-11	5.23E-11	7.60E-11	7.64E-11
Ra-228	7.54E-08	6.00E-05	0.279	3.80E-08	3.80E-08	8.89E-08	1.03E-07
Ac-227	3.94E-10	3.13E-07	1.46E-03	2.59E-10	3.25E-10	4.61E-10	4.33E-10
Pa-231	1.53E-09	1.22E-06	5.67E-03	1.22E-09	1.22E-09	1.68E-09	1.82E-09
Th-229	1.75E-09	1.40E-06	6.50E-03	8.89E-10	8.89E-10	2.05E-09	2.37E-09
Th-232	7.06E-09	5.62E-06	2.61E-02	2.43E-09	2.43E-09	8.32E-09	9.54E-09
U-232	2.76E-07	2.20E-04	1.02	1.85E-07	2.30E-07	3.30E-07	3.88E-07
U-233	1.06E-06	8.43E-04	3.92	7.08E-07	8.79E-07	1.27E-06	1.49E-06
U-234	9.96E-07	7.93E-04	3.69	7.46E-07	9.37E-07	1.02E-06	1.05E-06
U-235	3.83E-08	3.05E-05	0.142	2.88E-08	3.60E-08	3.93E-08	4.03E-08
U-236	7.16E-08	5.70E-05	0.265	5.11E-08	6.68E-08	7.39E-08	7.60E-08
U-238	8.06E-07	6.42E-04	2.99	6.35E-07	7.66E-07	8.25E-07	8.43E-07
Np-237	2.57E-07	2.04E-04	0.952	1.98E-07	2.27E-07	2.87E-07	3.17E-07
Pu-238	2.36E-06	1.88E-03	8.74	1.51E-06	1.92E-06	2.79E-06	3.21E-06
Pu-239	3.11E-05	2.48E-02	115	2.42E-05	2.76E-05	3.47E-05	3.80E-05
Pu-240	7.46E-06	5.94E-03	27.6	5.36E-06	6.39E-06	8.53E-06	9.56E-06
Pu-241	2.22E-04	0.177	822	1.35E-04	1.77E-04	2.66E-04	3.09E-04
Pu-242	9.13E-10	7.27E-07	3.38E-03	5.89E-10	7.48E-10	1.08E-09	1.24E-09
Am-241	4.14E-05	3.30E-02	153	3.02E-05	3.57E-05	4.71E-05	5.10E-05
Am-243	3.85E-09	3.07E-06	1.43E-02	1.61E-09	2.70E-09	5.03E-09	5.08E-09
Cm-242	6.88E-08	5.47E-05	0.255	5.30E-08	5.30E-08	7.68E-08	8.44E-08
Cm-243	7.16E-09	5.70E-06	2.65E-02	5.49E-09	5.66E-09	8.01E-09	8.83E-09
Cm-244	1.19E-07	9.51E-05	0.443	7.86E-08	9.84E-08	1.38E-07	1.57E-07
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	4.79E-04 (g/L)	----	1.78	3.58E-04	4.17E-04	5.41E-04	6.00E-04
U	9.17E-03	1.74E+03	8.08E+03	7.00E-03	8.66E-03	9.40E-03	9.63E-03

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

No photographs available for interior montage.

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TANK 241-AW-103 SUMMARY

TANK HISTORY	
Entered Service	1980
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
1C, 10A, 15A, 16C	4 in
7A, 12A	12 in
TANK TEMPERATURE	
Average Tank Temperature	66°F
Maximum Temperature	75°F
Date	Sept 29, 1995
Elevation from tank bottom	8.33 ft
Riser Number	4A
Minimum Temperature	58°F
Date	Feb 12, 1996
Elevation from tank bottom	34.33 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	59
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	515,000 gal
Waste Type	DN, PD
Drainable Interstitial Liquids	37,000 gal
Pumpable Liquids	167,000 gal
Saltcake	0 gal
Sludge	363,000 gal
Supernatant	152,000 gal
INTERIOR PHOTOGRAPHS	
Date	not available
Montage Number	not available
Photo Set Number	not available
SURFACE LEVELS	
Devices	Manual ENRAF and Tape
Max Level	236.9 in
Date	Feb 1, 1992
Min Level	184.75 in
Date	Nov 13, 1994

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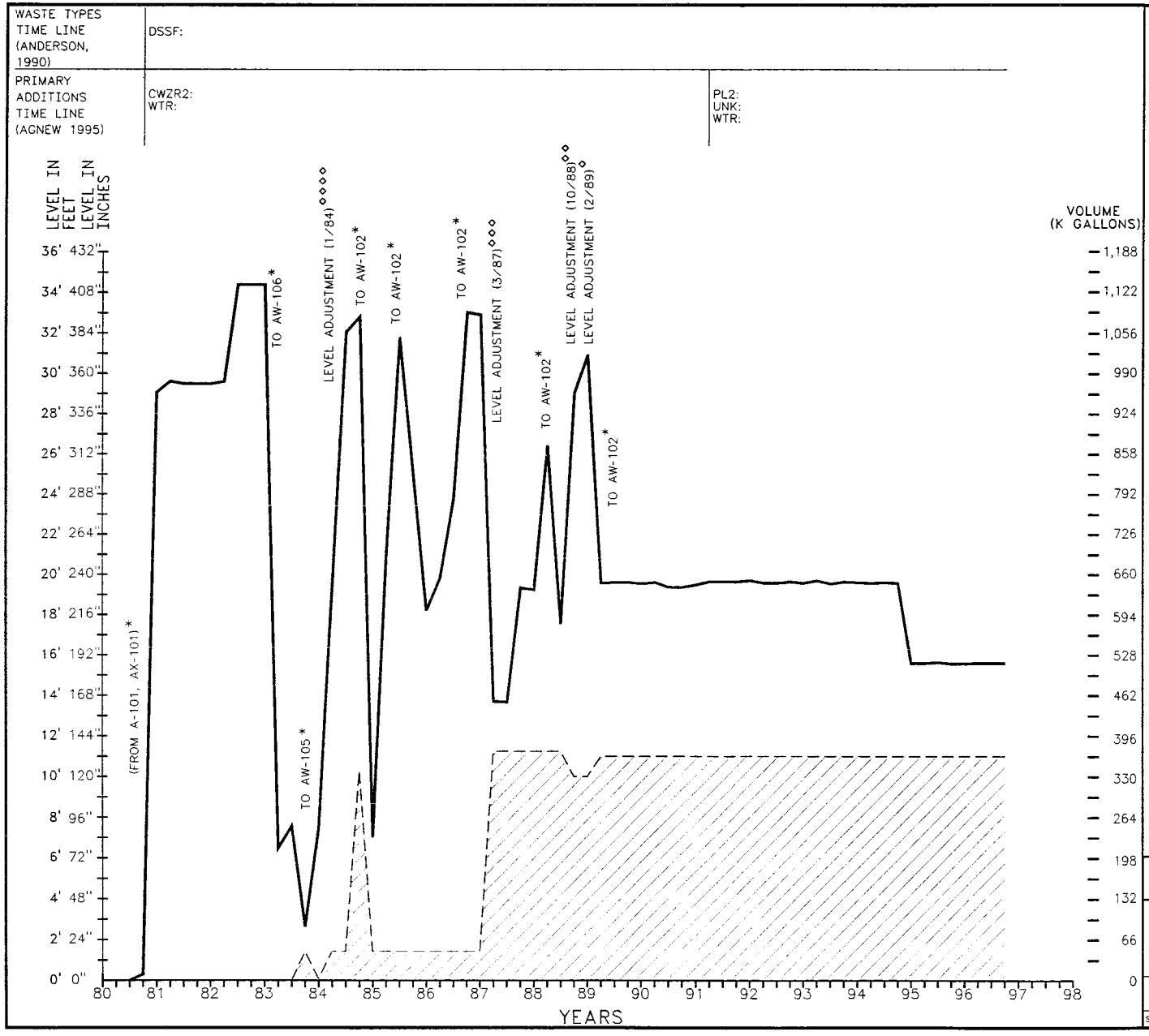


TANK INFO:

CONSTRUCTED 1978-1980
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- ◇ HANLON 1996l
- ◇◇ THURMAN 1988k
- ◇◇◇ THURMAN 1987b
- ◇◇◇◇ McCANN 1984b

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

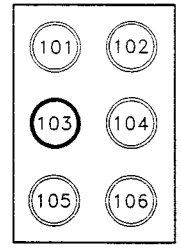
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

CWZR2:	COATING (CLADDING) WASTE
DSSF:	DOUBLE SHELL SLURRY FEED
PL2:	PUREX LOW-LEVEL WASTE 1983-88
UNK:	UNKNOWN
WTR:	WATER

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

AW TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AW-103 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1980-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E167	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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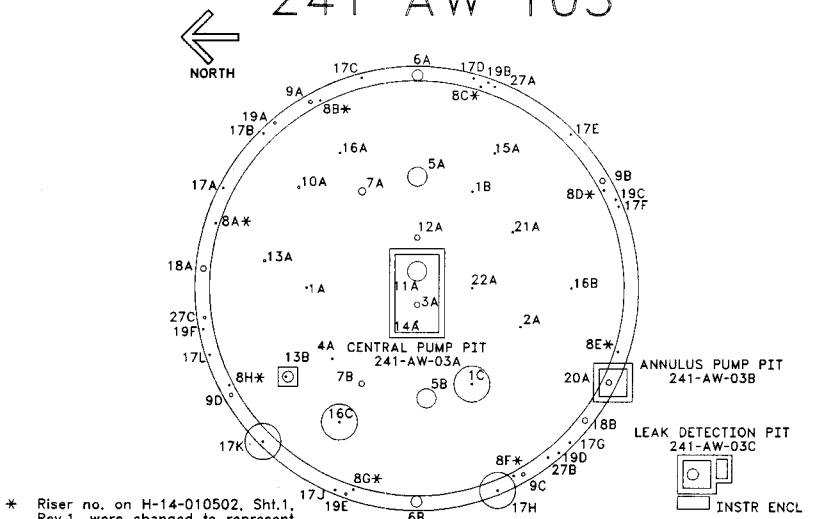
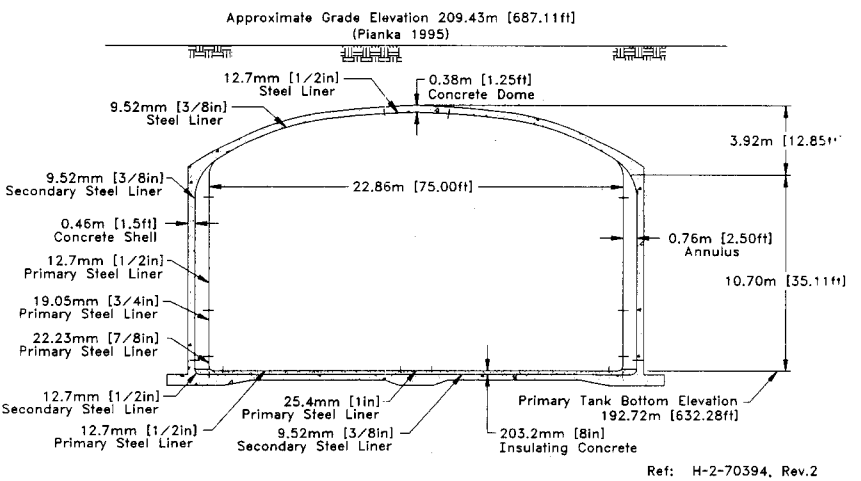
241-AW-103



* Riser no. on H-14-010502, Sht.1, Rev.1, were changed to represent H-2-70405, Rev.8 ECN-613252 12-18-95.

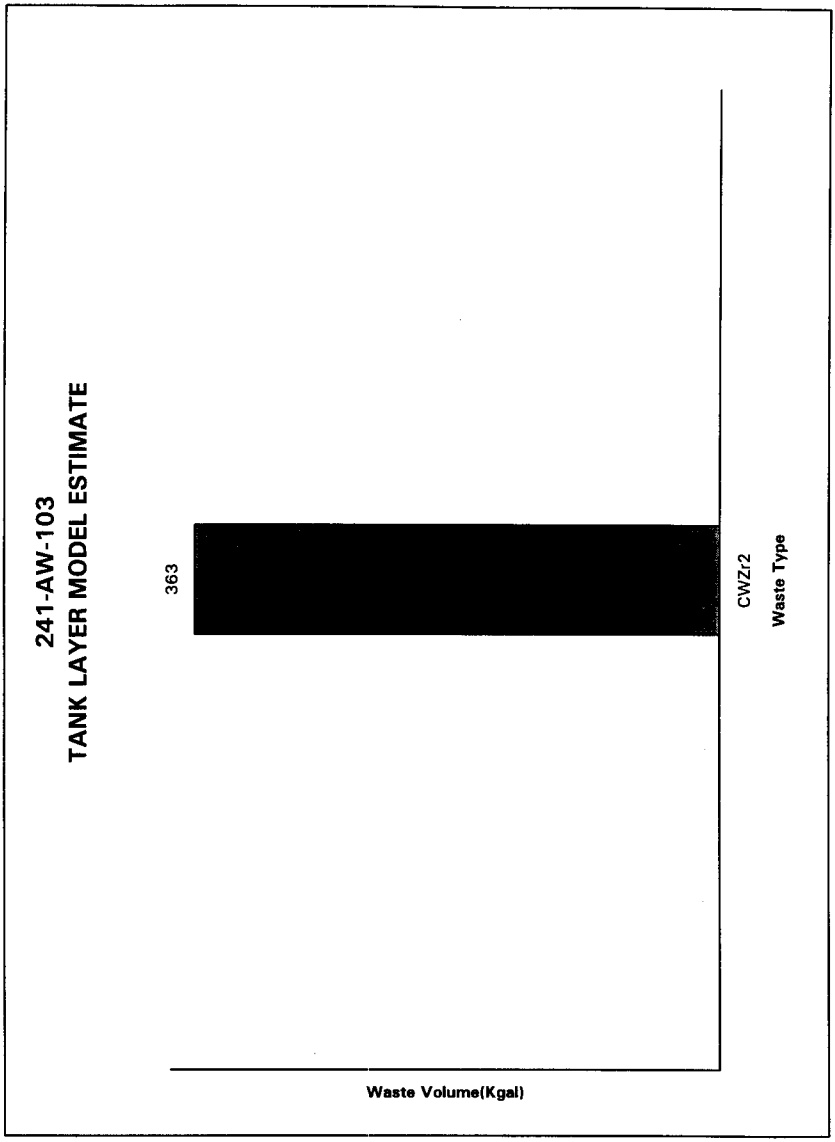
TANK RISER LOCATION

Ref: Salazar 1994
H-14-010502, Sh.1, Rev.1
H-2-70405, Rev.8



Ref: H-2-70394, Rev.2

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AW-103							
TLM Solids Composite Inventory Estimate*							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	1.77E+06 (kg)	(363 kgal)	----	----	----	----	----
Heat Load	7.10E-02 (kW)	(243 BTU/hr)	----	1.16E-03	3.70E-02	0.106	0.140
Bulk Density	1.29 (g/cc)	----	----	1.00	1.20	1.32	1.34
Void Fraction	0.850	----	----	0.826	0.834	0.901	1.00
Water wt%	63.1	----	----	56.6	59.2	72.5	99.9
TOC wt% C (wet	0	----	----	0	0	0	0
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	5.50	9.80E+04	1.74E+05	1.44E-02	3.09	6.37	6.84
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0.364	1.57E+04	2.79E+04	5.65E-04	0.345	0.370	0.373
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	2.10E-03	326	578	3.24E-06	2.00E-03	2.13E-03	2.14E-03
Zr (as ZrO(OH)2)	0.927	6.55E+04	1.16E+05	1.41E-03	0.898	0.936	0.941
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	9.49E-02	2.95E+03	5.23E+03	2.54E-04	8.11E-03	0.124	0.137
K+	0.191	5.78E+03	1.03E+04	3.12E-03	9.94E-02	0.284	0.376
OH-	5.10	6.72E+04	1.19E+05	8.99E-03	4.68	5.27	5.36
NO3-	0.332	1.59E+04	2.82E+04	5.47E-03	0.174	0.492	0.647
NO2-	9.19E-03	327	580	9.96E-05	3.98E-03	1.60E-02	2.42E-02
CO32-	9.49E-02	4.41E+03	7.82E+03	2.54E-04	8.11E-03	0.124	0.137
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	5.29	7.78E+04	1.38E+05	1.09E-02	2.97	6.05	6.42
Cl-	3.97E-03	109	193	6.50E-05	2.07E-03	5.92E-03	7.83E-03
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0.655	8.62E+03	1.53E+04	1.09E-02	0.345	0.965	1.26
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AW-103							
SMM Composite Inventory Estimate							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	1.09E+06 (kg)	(283 kgal)	----	----	----	----	----
Heat Load	5.22E-02 (kW)	(178 BTU/hr)	----	2.18E-03	2.64E-02	7.86E-02	0.104
Bulk Density*	1.01 (g/cc)	----	----	1.00	1.01	1.02	1.02
Water wt%	95.7	----	----	92.5	94.0	97.2	99.6
TOC wt% C (wet	3.09E-03	----	----	2.06E-03	2.56E-03	3.61E-03	4.11E-03
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	0.418	9.48E+03	1.03E+04	4.64E-02	0.319	0.520	0.620
Al3+	1.38E-03	36.8	40.0	1.23E-03	1.31E-03	1.46E-03	1.54E-03
Fe3+ (total Fe)	1.64E-03	90.2	98.1	5.21E-04	1.28E-03	2.00E-03	2.34E-03
Cr3+	3.75E-04	19.2	20.9	2.05E-04	2.88E-04	4.62E-04	5.45E-04
Bi3+	9.90E-07	0.204	0.222	9.46E-07	9.68E-07	1.01E-06	1.03E-06
La3+	8.62E-09	1.18E-03	1.28E-03	6.37E-09	7.47E-09	9.78E-09	1.09E-08
Hg2+	7.80E-06	1.54	1.68	2.53E-06	7.40E-06	8.20E-06	8.58E-06
Zr (as ZrO(OH)2)	2.34E-03	210	228	1.10E-03	2.18E-03	2.49E-03	2.64E-03
Pb2+	2.74E-06	0.560	0.609	1.82E-06	2.27E-06	3.21E-06	3.67E-06
Ni2+	7.15E-05	4.14	4.50	6.49E-05	6.81E-05	7.48E-05	7.81E-05
Sr2+	0	0	0	0	0	0	0
Mn4+	2.22E-04	12.0	13.1	9.51E-05	1.57E-04	2.87E-04	3.31E-04
Ca2+	7.37E-03	291	317	5.57E-04	5.98E-03	8.76E-03	1.01E-02
K+	0.175	6.75E+03	7.34E+03	2.73E-03	8.63E-02	0.266	0.355
OH-	9.74E-02	1.63E+03	1.77E+03	1.66E-02	6.88E-02	0.126	0.154
NO3-	0.319	1.95E+04	2.12E+04	1.77E-02	0.164	0.476	0.629
NO2-	9.10E-03	412	448	2.08E-03	5.10E-03	1.40E-02	1.96E-02
CO32-	1.16E-02	686	746	4.78E-03	1.02E-02	1.30E-02	1.43E-02
PO43-	2.62E-03	245	267	1.15E-03	1.87E-03	3.38E-03	4.10E-03
SO42-	3.57E-04	33.8	36.8	2.72E-04	3.13E-04	4.01E-04	4.43E-04
Si (as SiO32-)	7.04E-05	1.95	2.12	5.64E-05	6.32E-05	7.75E-05	8.38E-05
F-	0.187	3.50E+03	3.81E+03	8.52E-03	0.157	0.217	0.246
Cl-	3.99E-03	139	151	3.99E-04	2.14E-03	5.88E-03	7.73E-03
C6H5O73-	3.00E-05	5.58	6.07	2.31E-05	2.64E-05	3.35E-05	3.68E-05
EDTA4-	1.22E-05	3.45	3.76	4.88E-06	8.44E-06	1.59E-05	1.96E-05
HEDTA3-	1.96E-05	5.30	5.76	5.04E-06	1.22E-05	2.71E-05	3.44E-05
glycolate-	1.92E-04	14.2	15.5	1.01E-04	1.46E-04	2.39E-04	2.84E-04
acetate-	1.51E-05	0.878	0.954	1.32E-05	1.40E-05	1.63E-05	1.80E-05
oxalate2-	1.13E-08	9.80E-04	1.07E-03	1.01E-08	1.07E-08	1.19E-08	1.25E-08
DBP	1.41E-04	29.3	31.8	6.92E-05	1.05E-04	1.78E-04	2.14E-04
butanol	1.41E-04	10.3	11.2	6.92E-05	1.05E-04	1.78E-04	2.14E-04
NH3	0.609	1.02E+04	1.11E+04	8.51E-03	0.300	0.926	1.24
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-103							
Total Inventory Estimate*							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	2.86E+06 (kg)	(646 kgal)	----	----	----	----	----
Heat Load	0.123 (kW)	(421 BTU/hr)	----	3.34E-03	6.34E-02	0.184	0.244
Bulk Density†	1.17 (g/cc)	----	----	1.00	1.12	1.19	1.20
Water wt%†	75.5	----	----	70.0	72.2	82.3	99.8
TOC wt% C (wet	1.17E-03	----	----	7.83E-04	9.74E-04	1.37E-03	1.56E-03
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	3.27	6.43E+04	1.84E+05	2.84E-02	1.87	3.81	4.12
Al3+	6.06E-04	14.0	40.0	5.40E-04	5.73E-04	6.41E-04	6.73E-04
Fe3+ (total Fe)	0.205	9.79E+03	2.80E+04	5.46E-04	0.194	0.209	0.210
Cr3+	1.64E-04	7.30	20.9	9.00E-05	1.26E-04	2.02E-04	2.39E-04
Bi3+	4.34E-07	7.75E-02	0.222	4.15E-07	4.24E-07	4.43E-07	4.53E-07
La3+	3.78E-09	4.49E-04	1.28E-03	2.79E-09	3.27E-09	4.29E-09	4.77E-09
Hg2+	1.18E-03	203	580	2.93E-06	1.13E-03	1.20E-03	1.21E-03
Zr (as ZrO(OH)2)	0.522	4.07E+04	1.16E+05	1.28E-03	0.506	0.527	0.530
Pb2+	1.20E-06	0.213	0.609	7.98E-07	9.95E-07	1.41E-06	1.61E-06
Ni2+	3.13E-05	1.57	4.50	2.84E-05	2.98E-05	3.28E-05	3.42E-05
Sr2+	0	0	0	0	0	0	0
Mn4+	9.74E-05	4.57	13.1	4.17E-05	6.89E-05	1.26E-04	1.45E-04
Ca2+	5.66E-02	1.94E+03	5.54E+03	3.87E-04	7.79E-03	7.27E-02	8.05E-02
K+	0.184	6.15E+03	1.76E+04	2.95E-03	9.37E-02	0.276	0.367
OH-	2.91	4.23E+04	1.21E+05	1.23E-02	2.66	3.01	3.08
NO3-	0.326	1.73E+04	4.94E+04	1.08E-02	0.169	0.485	0.639
NO2-	9.15E-03	360	1.03E+03	9.66E-04	4.47E-03	1.51E-02	2.22E-02
CO32-	5.84E-02	3.00E+03	8.57E+03	2.24E-03	9.64E-03	7.45E-02	8.23E-02
PO43-	1.15E-03	93.2	267	5.03E-04	8.19E-04	1.48E-03	1.80E-03
SO42-	1.57E-04	12.8	36.8	1.19E-04	1.37E-04	1.76E-04	1.94E-04
Si (as SiO32-)	3.08E-05	0.741	2.12	2.47E-05	2.77E-05	3.40E-05	3.67E-05
F-	3.05	4.96E+04	1.42E+05	9.84E-03	1.75	3.48	3.69
Cl-	3.98E-03	121	345	2.11E-04	2.10E-03	5.90E-03	7.79E-03
C6H5O73-	1.31E-05	2.12	6.07	1.01E-05	1.16E-05	1.47E-05	1.61E-05
EDTA4-	5.33E-06	1.31	3.76	2.14E-06	3.70E-06	6.97E-06	8.58E-06
HEDTA3-	8.59E-06	2.01	5.76	2.21E-06	5.32E-06	1.19E-05	1.51E-05
glycolate-	8.43E-05	5.41	15.5	4.42E-05	6.38E-05	1.05E-04	1.25E-04
acetate-	6.61E-06	0.334	0.954	5.78E-06	6.14E-06	7.12E-06	7.90E-06
oxalate2-	4.95E-09	3.72E-04	1.07E-03	4.41E-09	4.68E-09	5.22E-09	5.49E-09
DBP	6.20E-05	11.1	31.8	3.03E-05	4.58E-05	7.81E-05	9.37E-05
butanol	6.20E-05	3.92	11.2	3.03E-05	4.58E-05	7.81E-05	9.37E-05
NH3	0.635	9.22E+03	2.64E+04	9.84E-03	0.325	0.948	1.25
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-103							
TLM Solids Composite Inventory Estimate*							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	1.77E+06 (kg)	(363 kgal)	----	----	----	----	----
Heat Load	7.10E-02 (kW)	(243 BTU/hr)	----	1.16E-03	3.70E-02	0.106	0.140
Bulk Density	1.29 (g/cc)	----	----	1.00	1.20	1.32	1.34
Void Fraction	0.850	----	----	0.826	0.834	0.901	1.00
Water wt%	63.1	----	----	56.6	59.2	72.5	99.9
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.75E-05	1.35E-02	24.0	2.85E-07	9.09E-06	2.60E-05	3.44E-05
C-14	2.15E-07	1.67E-04	0.295	3.51E-09	1.12E-07	3.20E-07	4.23E-07
Ni-59	1.42E-07	1.10E-04	0.195	1.42E-07	1.42E-07	1.42E-07	1.42E-07
Ni-63	1.64E-05	1.27E-02	22.5	1.64E-05	1.64E-05	1.64E-05	1.64E-05
Co-60	3.32E-06	2.57E-03	4.55	5.42E-08	1.73E-06	4.94E-06	6.53E-06
Se-79	2.69E-08	2.08E-05	3.69E-02	4.39E-10	1.40E-08	4.00E-08	5.29E-08
Sr-90	4.21E-03	3.26	5.79E+03	6.89E-05	2.20E-03	6.28E-03	8.30E-03
Y-90	4.22E-03	3.26	5.79E+03	6.89E-05	2.20E-03	6.28E-03	8.30E-03
Zr-93	1.30E-07	1.00E-04	0.178	2.12E-09	6.75E-08	1.93E-07	2.55E-07
Nb-93m	5.47E-08	4.24E-05	7.52E-02	8.95E-10	2.85E-08	8.15E-08	1.08E-07
Tc-99	8.98E-07	6.95E-04	1.23	1.47E-08	4.68E-07	1.34E-06	1.77E-06
Ru-106	5.17E-04	0.400	710	5.14E-04	5.17E-04	5.17E-04	5.17E-04
Cd-113m	1.40E-06	1.08E-03	1.92	2.29E-08	7.29E-07	2.08E-06	2.76E-06
Sb-125	8.03E-05	6.22E-02	110	1.31E-06	4.18E-05	1.20E-04	1.58E-04
Sn-126	4.24E-08	3.28E-05	5.82E-02	6.93E-10	2.21E-08	6.31E-08	8.34E-08
I-129	1.80E-09	1.40E-06	2.48E-03	2.95E-11	9.39E-10	2.69E-09	3.55E-09
Cs-134	3.56E-05	2.76E-02	48.9	5.82E-07	1.86E-05	5.31E-05	7.02E-05
Cs-137	4.98E-03	3.85	6.84E+03	8.13E-05	2.59E-03	7.41E-03	9.80E-03
Ba-137m	4.71E-03	3.65	6.47E+03	7.69E-05	2.45E-03	7.01E-03	9.27E-03
Sm-151	9.30E-05	7.20E-02	128	1.52E-06	4.84E-05	1.38E-04	1.83E-04
Eu-152	1.05E-06	8.11E-04	1.44	9.62E-07	1.01E-06	1.09E-06	1.13E-06
Eu-154	2.48E-05	1.92E-02	34.0	4.05E-07	1.29E-05	3.69E-05	4.88E-05
Eu-155	1.90E-04	0.147	261	1.74E-04	1.82E-04	1.98E-04	2.05E-04
Ra-226	2.17E-13	1.68E-10	2.98E-07	3.54E-15	1.13E-13	3.23E-13	4.27E-13
Ra-228	9.49E-17	7.35E-14	1.30E-10	8.71E-17	9.11E-17	9.87E-17	1.03E-16
Ac-227	1.25E-12	9.65E-10	1.71E-06	2.04E-14	6.49E-13	1.86E-12	2.45E-12
Pa-231	7.11E-12	5.51E-09	9.77E-06	1.16E-13	3.70E-12	1.06E-11	1.40E-11
Th-229	1.09E-14	8.40E-12	1.49E-08	9.96E-15	1.04E-14	1.13E-14	1.17E-14
Th-232	3.63E-17	2.81E-14	4.99E-11	5.93E-19	1.89E-17	5.41E-17	7.15E-17
U-232	1.02E-09	7.93E-07	1.41E-03	2.82E-12	8.97E-11	1.35E-09	1.51E-09
U-233	1.05E-11	8.13E-09	1.44E-05	2.89E-14	9.20E-13	1.39E-11	1.55E-11
U-234	4.60E-06	3.56E-03	6.32	1.27E-08	4.03E-07	6.07E-06	6.79E-06
U-235	1.75E-07	1.35E-04	0.240	4.81E-10	1.53E-08	2.31E-07	2.58E-07
U-236	3.79E-07	2.93E-04	0.521	1.04E-09	3.32E-08	5.00E-07	5.59E-07
U-238	3.16E-06	2.45E-03	4.34	8.69E-09	2.77E-07	4.17E-06	4.66E-06
Np-237	1.32E-08	1.02E-05	1.81E-02	2.15E-10	6.85E-09	1.96E-08	2.59E-08
Pu-238	1.21E-04	9.35E-02	166	1.92E-07	1.11E-04	1.24E-04	1.27E-04
Pu-239	9.78E-04	0.757	1.34E+03	1.56E-06	8.97E-04	1.00E-03	1.03E-03
Pu-240	2.97E-04	0.230	408	4.73E-07	2.72E-04	3.05E-04	3.12E-04
Pu-241	1.23E-02	9.55	1.69E+04	1.96E-05	1.13E-02	1.27E-02	1.30E-02
Pu-242	4.60E-08	3.56E-05	6.32E-02	7.32E-11	4.21E-08	4.72E-08	4.84E-08
Am-241	1.66E-05	1.28E-02	22.8	2.71E-07	8.63E-06	2.47E-05	1.08E-04
Am-243	3.49E-09	2.70E-06	4.79E-03	5.70E-11	1.82E-09	5.20E-09	2.28E-08
Cm-242	9.22E-08	7.14E-05	0.127	8.47E-08	8.86E-08	9.60E-08	9.97E-08
Cm-243	1.55E-08	1.20E-05	2.12E-02	1.42E-08	1.48E-08	1.61E-08	1.67E-08
Cm-244	6.35E-08	4.92E-05	8.73E-02	1.04E-09	3.31E-08	1.67E-07	4.52E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	1.72E-02 (g/L)	----	23.6	2.73E-05	1.57E-02	1.76E-02	1.81E-02
U	3.99E-02	7.35E+03	1.30E+04	1.10E-04	3.49E-03	5.26E-02	5.88E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AW-103

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	1.09E+06 (kg)	(283 kgal)	----	----	----	----	----
Heat Load	5.22E-02 (kW)	(178 BTU/hr)	----	2.18E-03	2.64E-02	7.86E-02	0.104
Bulk Density*	1.01 (g/cc)	----	----	1.00	1.01	1.02	1.02
Water wt%†	95.7	----	----	92.5	94.0	97.2	99.6
TOC wt% C (wet	3.09E-03	----	----	2.06E-03	2.56E-03	3.61E-03	4.11E-03

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.62E-05	1.59E-02	17.3	3.90E-07	8.03E-06	2.45E-05	3.26E-05
C-14	2.21E-07	2.18E-04	0.237	2.70E-08	1.21E-07	3.24E-07	4.24E-07
Ni-59	1.51E-09	1.49E-06	1.62E-03	9.14E-10	9.14E-10	1.54E-09	1.57E-09
Ni-63	1.49E-07	1.47E-04	0.160	8.97E-08	8.97E-08	1.52E-07	1.55E-07
Co-60	3.07E-06	3.02E-03	3.29	7.27E-08	1.52E-06	4.64E-06	6.19E-06
Se-79	2.76E-08	2.72E-05	2.96E-02	3.31E-09	1.51E-08	4.04E-08	5.29E-08
Sr-90	3.95E-03	3.90	4.24E+03	1.46E-04	1.99E-03	5.96E-03	7.92E-03
Y-90	3.95E-03	3.90	4.24E+03	1.46E-04	1.99E-03	5.96E-03	7.93E-03
Zr-93	1.33E-07	1.31E-04	0.143	1.59E-08	7.27E-08	1.95E-07	2.55E-07
Nb-93m	6.07E-08	5.98E-05	6.50E-02	1.13E-08	3.52E-08	8.67E-08	1.12E-07
Tc-99	1.00E-06	9.87E-04	1.07	1.91E-07	5.84E-07	1.43E-06	1.85E-06
Ru-106	3.90E-09	3.85E-06	4.18E-03	1.14E-09	2.49E-09	5.31E-09	6.67E-09
Cd-113m	1.35E-06	1.33E-03	1.45	8.78E-08	7.00E-07	2.02E-06	2.67E-06
Sb-125	7.37E-05	7.26E-02	79.0	1.17E-06	3.63E-05	1.12E-04	1.49E-04
Sn-126	4.34E-08	4.27E-05	4.64E-02	5.07E-09	2.36E-08	6.35E-08	8.33E-08
I-129	2.00E-09	1.97E-06	2.14E-03	3.69E-10	1.16E-09	2.86E-09	3.70E-09
Cs-134	3.26E-05	3.22E-02	35.0	4.63E-07	1.61E-05	4.96E-05	6.62E-05
Cs-137	4.72E-03	4.65	5.06E+03	2.25E-04	2.40E-03	7.09E-03	9.41E-03
Ba-137m	4.46E-03	4.40	4.78E+03	2.13E-04	2.27E-03	6.70E-03	8.90E-03
Sm-151	9.57E-05	9.43E-02	102	1.17E-05	5.24E-05	1.40E-04	1.83E-04
Eu-152	8.31E-08	8.19E-05	8.91E-02	4.46E-09	4.26E-08	1.25E-07	1.65E-07
Eu-154	2.32E-05	2.29E-02	24.9	8.18E-07	1.17E-05	3.50E-05	4.65E-05
Eu-155	1.47E-05	1.45E-02	15.7	4.02E-07	7.32E-06	2.22E-05	2.96E-05
Ra-226	3.32E-13	3.27E-10	3.56E-07	1.36E-13	2.31E-13	4.35E-13	5.36E-13
Ra-228	3.10E-10	3.05E-07	3.32E-04	1.90E-10	2.00E-10	3.81E-10	4.57E-10
Ac-227	2.03E-12	2.00E-09	2.17E-06	9.01E-13	1.45E-12	2.62E-12	3.20E-12
Pa-231	1.03E-11	1.01E-08	1.10E-05	3.83E-12	6.94E-12	1.36E-11	1.69E-11
Th-229	7.20E-12	7.10E-09	7.71E-06	4.57E-12	4.68E-12	8.76E-12	1.04E-11
Th-232	2.62E-11	2.58E-08	2.81E-05	1.27E-11	1.27E-11	2.99E-11	3.34E-11
U-232	1.32E-09	1.30E-06	1.42E-03	8.41E-10	1.08E-09	1.61E-09	1.91E-09
U-233	4.74E-09	4.68E-06	5.08E-03	2.90E-09	3.80E-09	5.84E-09	7.00E-09
U-234	3.77E-07	3.72E-04	0.404	2.74E-08	3.59E-07	3.96E-07	4.13E-07
U-235	1.43E-08	1.41E-05	1.54E-02	1.04E-09	1.36E-08	1.50E-08	1.57E-08
U-236	3.10E-08	3.06E-05	3.32E-02	2.22E-09	2.95E-08	3.25E-08	3.40E-08
U-238	2.59E-07	2.56E-04	0.278	1.92E-08	2.47E-07	2.72E-07	2.84E-07
Np-237	1.27E-08	1.25E-05	1.36E-02	8.00E-10	6.56E-09	1.89E-08	2.51E-08
Pu-238	8.49E-07	8.37E-04	0.910	1.89E-07	5.56E-07	1.14E-06	1.42E-06
Pu-239	6.91E-06	6.81E-03	7.40	1.56E-06	4.54E-06	9.29E-06	1.16E-05
Pu-240	2.09E-06	2.06E-03	2.24	4.69E-07	1.37E-06	2.82E-06	3.51E-06
Pu-241	8.67E-05	8.55E-02	92.9	1.93E-05	5.68E-05	1.17E-04	1.45E-04
Pu-242	3.24E-10	3.19E-07	3.47E-04	7.20E-11	2.12E-10	4.35E-10	5.42E-10
Am-241	1.52E-05	1.50E-02	16.3	2.70E-07	7.52E-06	2.31E-05	2.34E-05
Am-243	3.20E-09	3.15E-06	3.43E-03	4.73E-11	1.57E-09	4.86E-09	4.93E-09
Cm-242	7.16E-09	7.06E-06	7.67E-03	2.29E-10	3.59E-09	1.08E-08	1.44E-08
Cm-243	1.19E-09	1.17E-06	1.28E-03	2.93E-11	5.92E-10	1.80E-09	2.40E-09
Cm-244	5.83E-08	5.75E-05	6.25E-02	9.56E-10	2.88E-08	7.80E-08	7.80E-08

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	1.21E-04 (g/L)	—	0.130	2.72E-05	7.95E-05	1.63E-04	2.03E-04
U	3.27E-03	767	834	2.38E-04	3.11E-03	3.43E-03	3.58E-03

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-103							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	2.86E+06 (kg)	(646 kgal)	----	----	----	----	----
Heat Load	0.123 (kW)	(421 BTU/hr)	----	3.34E-03	6.34E-02	0.184	0.244
Bulk Density†	1.17 (g/cc)	----	----	1.00	1.12	1.19	1.20
Water wt%†	75.5	----	----	70.0	72.2	82.3	99.8
TOC wt% C (wet	1.17E-03	----	----	7.83E-04	9.74E-04	1.37E-03	1.56E-03
Radiological Constituents	**CI/L**	**µCI/g**	**CI**	**-95 CI (CI/L)**	**-67 CI (CI/L)**	**+67 CI (CI/L)**	**+95 CI (CI/L)**
H-3	1.69E-05	1.44E-02	41.3	3.31E-07	8.63E-06	2.53E-05	3.36E-05
C-14	2.18E-07	1.86E-04	0.532	1.38E-08	1.16E-07	3.22E-07	4.24E-07
Ni-59	8.03E-08	6.86E-05	0.196	8.00E-08	8.00E-08	8.03E-08	8.03E-08
Ni-63	9.27E-06	7.93E-03	22.7	9.25E-06	9.25E-06	9.27E-06	9.28E-06
Co-60	3.21E-06	2.74E-03	7.84	6.23E-08	1.64E-06	4.81E-06	6.38E-06
Se-79	2.72E-08	2.32E-05	6.65E-02	1.70E-09	1.45E-08	4.02E-08	5.29E-08
Sr-90	4.10E-03	3.50	1.00E+04	1.03E-04	2.11E-03	6.14E-03	8.14E-03
Y-90	4.10E-03	3.51	1.00E+04	1.03E-04	2.11E-03	6.14E-03	8.14E-03
Zr-93	1.31E-07	1.12E-04	0.321	8.17E-09	6.98E-08	1.94E-07	2.55E-07
Nb-93m	5.74E-08	4.90E-05	0.140	5.44E-09	3.15E-08	8.38E-08	1.10E-07
Tc-99	9.44E-07	8.06E-04	2.31	9.18E-08	5.19E-07	1.38E-06	1.80E-06
Ru-106	2.90E-04	0.248	710	2.89E-04	2.90E-04	2.90E-04	2.90E-04
Cd-113m	1.38E-06	1.18E-03	3.37	5.13E-08	7.16E-07	2.05E-06	2.72E-06
Sb-125	7.74E-05	6.62E-02	189	1.25E-06	3.94E-05	1.16E-04	1.54E-04
Sn-126	4.28E-08	3.66E-05	0.105	2.61E-09	2.28E-08	6.33E-08	8.34E-08
I-129	1.89E-09	1.61E-06	4.62E-03	1.78E-10	1.04E-09	2.76E-09	3.62E-09
Cs-134	3.43E-05	2.93E-02	83.9	5.30E-07	1.75E-05	5.15E-05	6.84E-05
Cs-137	4.86E-03	4.16	1.19E+04	1.44E-04	2.51E-03	7.27E-03	9.63E-03
Ba-137m	4.60E-03	3.93	1.12E+04	1.36E-04	2.37E-03	6.88E-03	9.11E-03
Sm-151	9.41E-05	8.05E-02	230	5.98E-06	5.02E-05	1.39E-04	1.83E-04
Eu-152	6.25E-07	5.34E-04	1.53	5.42E-07	5.84E-07	6.67E-07	7.08E-07
Eu-154	2.41E-05	2.06E-02	58.9	5.86E-07	1.24E-05	3.61E-05	4.78E-05
Eu-155	1.13E-04	9.68E-02	277	9.82E-05	1.06E-04	1.21E-04	1.28E-04
Ra-226	2.67E-13	2.28E-10	6.53E-07	6.16E-14	1.65E-13	3.72E-13	4.75E-13
Ra-228	1.36E-10	1.16E-07	3.32E-04	8.32E-11	8.78E-11	1.67E-10	2.00E-10
Ac-227	1.59E-12	1.36E-09	3.88E-06	4.06E-13	9.98E-13	2.19E-12	2.78E-12
Pa-231	8.49E-12	7.25E-09	2.07E-05	1.74E-12	5.12E-12	1.19E-11	1.53E-11
Th-229	3.16E-12	2.70E-09	7.73E-06	2.01E-12	2.05E-12	3.84E-12	4.57E-12
Th-232	1.15E-11	9.81E-09	2.81E-05	5.56E-12	5.56E-12	1.31E-11	1.47E-11
U-232	1.15E-09	9.86E-07	2.82E-03	5.47E-10	6.28E-10	1.34E-09	1.43E-09
U-233	2.08E-09	1.78E-06	5.10E-03	1.28E-09	1.67E-09	2.56E-09	3.07E-09
U-234	2.75E-06	2.35E-03	6.73	1.91E-08	3.87E-07	3.58E-06	3.98E-06
U-235	1.05E-07	8.94E-05	0.256	7.26E-10	1.47E-08	1.36E-07	1.51E-07
U-236	2.26E-07	1.94E-04	0.554	1.56E-09	3.19E-08	2.95E-07	3.27E-07
U-238	1.89E-06	1.61E-03	4.62	1.33E-08	2.66E-07	2.46E-06	2.73E-06
Np-237	1.29E-08	1.11E-05	3.17E-02	4.71E-10	6.72E-09	1.93E-08	2.55E-08
Pu-238	6.82E-05	5.83E-02	167	1.91E-07	6.25E-05	7.00E-05	7.15E-05
Pu-239	5.52E-04	0.472	1.35E+03	1.56E-06	5.07E-04	5.67E-04	5.79E-04
Pu-240	1.68E-04	0.143	410	4.71E-07	1.54E-04	1.72E-04	1.76E-04
Pu-241	6.96E-03	5.95	1.70E+04	1.95E-05	6.39E-03	7.15E-03	7.30E-03
Pu-242	2.60E-08	2.22E-05	6.35E-02	7.26E-11	2.38E-08	2.67E-08	2.72E-08
Am-241	1.60E-05	1.37E-02	39.1	2.71E-07	8.14E-06	2.40E-05	6.38E-05
Am-243	3.36E-09	2.87E-06	8.22E-03	5.28E-11	1.71E-09	5.05E-09	1.34E-08
Cm-242	5.50E-08	4.70E-05	0.134	4.77E-08	5.13E-08	5.87E-08	6.23E-08
Cm-243	9.20E-09	7.87E-06	2.25E-02	7.98E-09	8.60E-09	9.83E-09	1.04E-08
Cm-244	6.12E-08	5.23E-05	0.150	1.00E-09	3.12E-08	1.28E-07	2.64E-07
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	9.70E-03 (g/L)	----	23.7	2.73E-05	8.90E-03	9.97E-03	1.02E-02
U	2.38E-02	4.85E+03	1.39E+04	1.66E-04	3.35E-03	3.10E-02	3.45E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

No photographs available for interior montage.

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TANK 241-AW-104 SUMMARY

TANK HISTORY	
Entered Service	1980
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
1B, 10A, 13A, 15A, 16A	4 in
7B, 12A	12 in
TANK TEMPERATURE	
Average Tank Temperature	76°F
Maximum Temperature	88°F
Date	Feb 27, 1995, April 22, 1996
Elevation from tank bottom	0.33 ft, 8.33 ft
Riser Number	4A
Minimum Temperature	61°F
Date	March 18 and 25, 1996
Elevation from tank bottom	4.33 ft, 34.33 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	59
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	1,122,000 gal
Waste Type	DN
Drainable Interstitial Liquids	49,000 gal
Pumpable Liquids	859,000 gal
Saltcake	111,000 gal
Sludge	179,000 gal
Supernatant	832,000 gal
INTERIOR PHOTOGRAPHS	
Date	Feb 2, 1983
Montage Number	94080233-22CN
Photo Set Number	105815
WASTE SURFACE LEVEL	
Devices	Manual ENRAF and Tape
Max Level	410 in
Date	Feb 9 - April 7, 1996*
Min Level	362 in
Date	Jan 1 - Jan 12, 1991*

* Numerous dates in this time span

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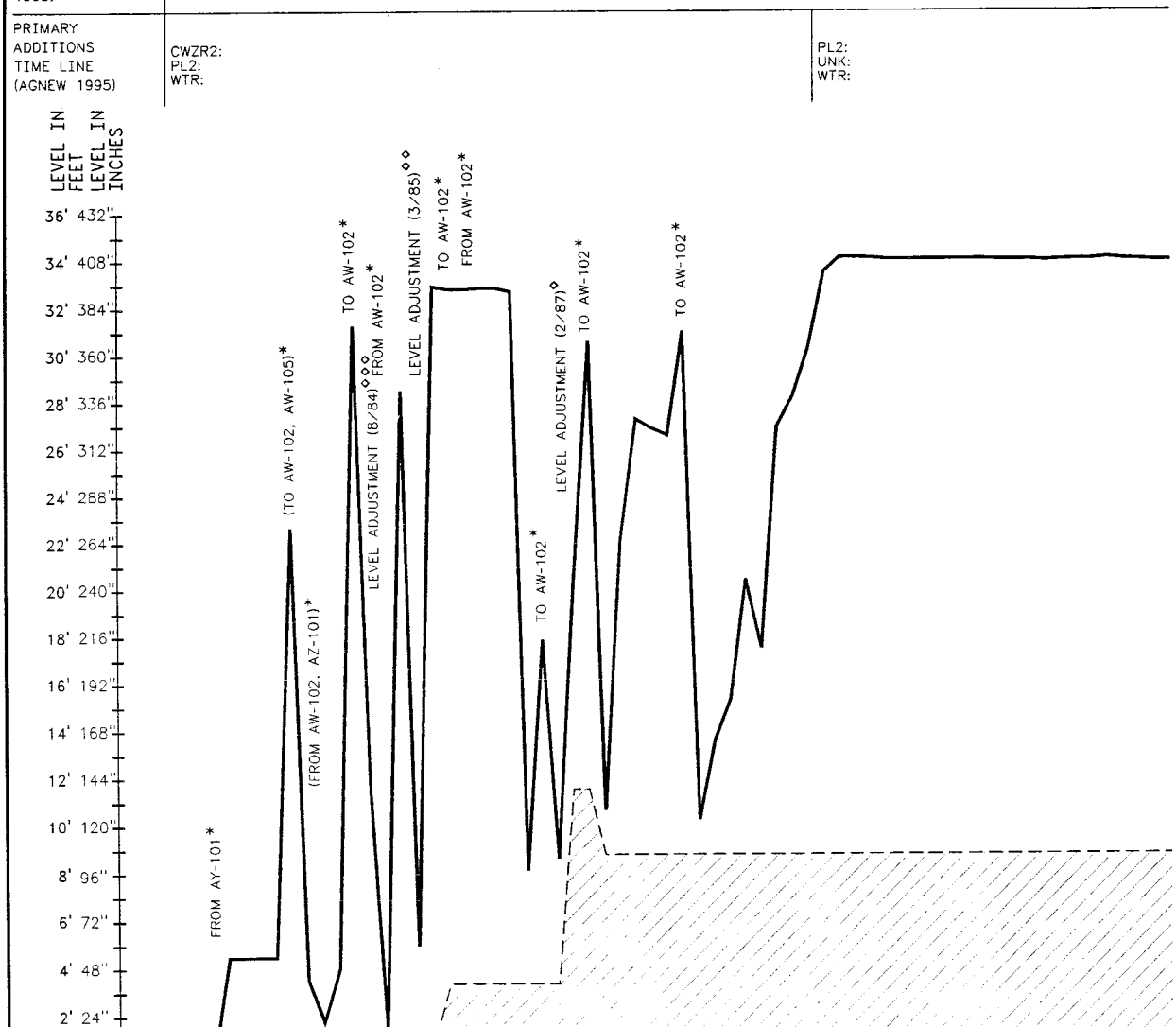
PRIMARY ADDITIONS TIME LINE (AGNEW 1995)
CWZR2:
PL2:
WTR:
PL2:
UNK:
WTR:
LEVEL IN FEET
LEVEL IN INCHES
36' 432"
34' 408"
32' 384"
30' 360"
28' 336"
26' 312"
24' 288"
22' 264"
20' 240"
18' 216"
16' 192"
14' 168"
12' 144"
10' 120"
8' 96"
6' 72"
4' 48"
2' 24"
FROM AY-101*
(TO AW-102, AW-105)*
(FROM AW-102, AZ-101)*
TO AW-102*
LEVEL ADJUSTMENT (8/84)◇◇◇ FROM AW-102*
LEVEL ADJUSTMENT (3/85)◇◇
TO AW-102*
FROM AW-102*
TO AW-102*
LEVEL ADJUSTMENT (2/87)◇
TO AW-102*
TO AW-102*

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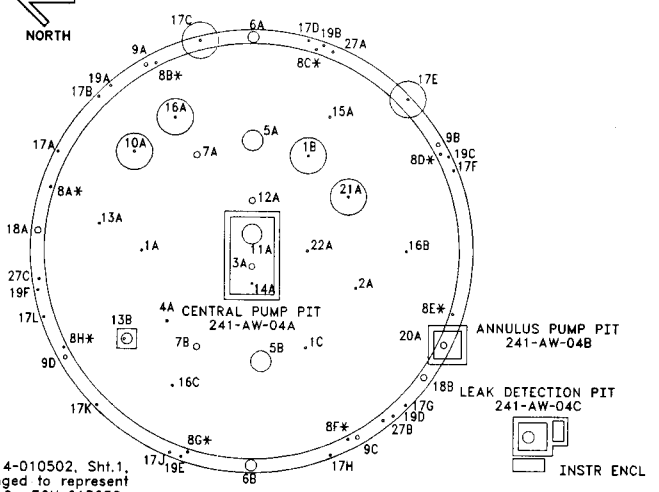
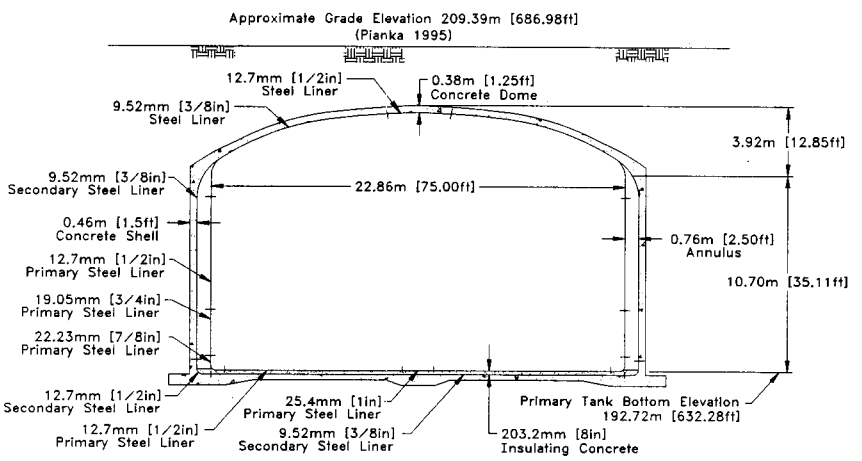
241-AW-104



* Riser no. on H-14-010502, Sht.1, Rev.1, were changed to represent H-2-70406, Rev.10 ECN-613252 12-18-95.

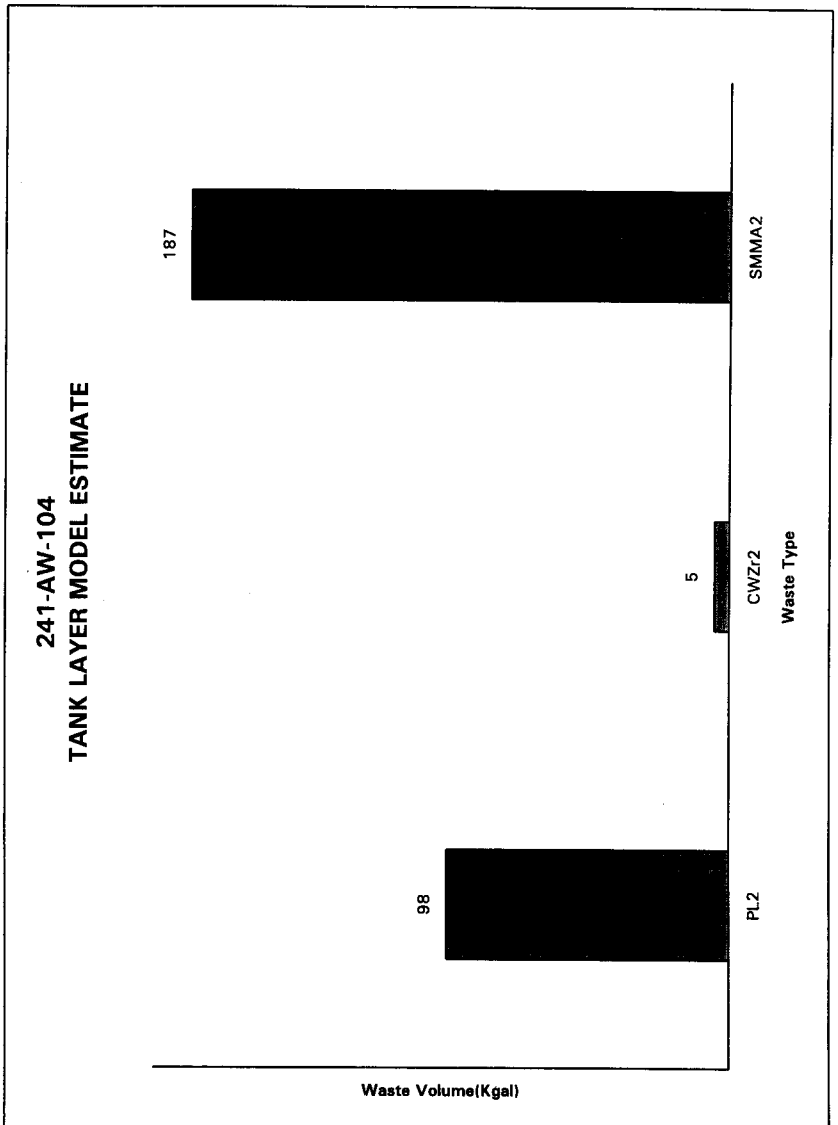
TANK RISER LOCATION

Ref: Salazar 1994
H-14-010502, Sh.1, Rev.1
H-2-70406, Rev.10



Ref: H-2-70394, Rev.2

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AW-104

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	4.71E+05 (kg)	(103 kgal)	----	----	----	----	----
Heat Load	9.78E-04 (kW)	(3.34 BTU/hr)	----	1.60E-05	5.10E-04	1.46E-03	1.93E-03
Bulk Density	1.21 (g/cc)	----	----	1.12	1.16	1.24	1.27
Void Fraction	0.886	----	----	0.866	0.874	0.910	0.943
Water wt%	72.9	----	----	68.7	70.5	76.4	80.3
TOC wt% C (wet	3.44E-02	----	----	1.66E-02	2.59E-02	4.27E-02	5.06E-02

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0.810	1.54E+04	7.25E+03	0.511	0.660	0.960	1.10
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	1.83	8.45E+04	3.98E+04	1.70	1.79	1.85	1.87
Cr3+	6.78E-03	292	137	3.05E-03	4.90E-03	8.65E-03	1.05E-02
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	1.02E-04	16.9	7.96	1.57E-07	9.71E-05	1.03E-04	1.04E-04
Zr (as ZrO(OH)2)	4.50E-02	3.40E+03	1.60E+03	6.85E-05	4.36E-02	4.55E-02	4.57E-02
Pb2+	3.68E-05	6.31	2.97	1.65E-05	2.66E-05	4.70E-05	5.68E-05
Ni2+	0.106	5.17E+03	2.43E+03	1.52E-03	7.05E-02	0.126	0.138
Sr2+	0	0	0	0	0	0	0
Mn4+	5.08E-03	231	109	2.28E-03	3.68E-03	6.49E-03	2.26E-02
Ca2+	0.442	1.47E+04	6.91E+03	1.15E-02	0.263	0.540	0.606
K+	1.51E-02	488	230	5.95E-03	1.06E-02	1.96E-02	2.41E-02
OH-	6.21	8.74E+04	4.12E+04	5.30	5.72	6.58	6.86
NO3-	0.234	1.20E+04	5.65E+03	0.114	0.174	0.294	0.352
NO2-	8.92E-03	339	160	4.25E-03	6.57E-03	1.13E-02	1.35E-02
CO32-	0.528	2.62E+04	1.24E+04	5.03E-02	0.325	0.650	0.732
PO43-	5.89E-02	4.63E+03	2.18E+03	2.65E-02	4.26E-02	7.52E-02	9.08E-02
SO42-	3.42E-03	272	128	1.54E-03	2.48E-03	4.37E-03	5.28E-03
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0.257	4.04E+03	1.90E+03	5.28E-04	0.144	0.294	0.312
Cl-	3.50E-03	103	48.4	1.68E-03	2.59E-03	4.42E-03	5.30E-03
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	2.89E-03	502	236	1.30E-03	2.09E-03	3.68E-03	4.45E-03
butanol	2.89E-03	177	83.4	1.30E-03	2.09E-03	3.68E-03	4.45E-03
NH3	3.18E-02	447	211	5.28E-04	1.67E-02	4.68E-02	6.13E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AW-104

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	3.95E+06 (kg)	(1.02E+03 kgal)	----	----	----	----	----
Heat Load	3.35E-03 (kW)	(11.4 BTU/hr)	----	3.07E-03	3.22E-03	3.45E-03	3.61E-03
Bulk Density*	1.02 (g/cc)	----	----	1.01	1.02	1.03	1.04
Water wt%	95.7	----	----	93.2	94.4	96.8	98.0
TOC wt% C (wet	4.49E-02	----	----	1.97E-02	3.21E-02	5.76E-02	6.97E-02

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0.594	1.34E+04	5.28E+04	0.254	0.420	0.769	0.936
Al3+	7.25E-04	19.1	75.5	6.27E-04	7.02E-04	7.48E-04	7.70E-04
Fe3+ (total Fe)	1.84E-03	100	396	1.02E-03	1.42E-03	2.26E-03	2.66E-03
Cr3+	7.39E-03	376	1.48E+03	3.14E-03	5.22E-03	9.57E-03	1.17E-02
Bi3+	5.23E-07	0.107	0.422	4.93E-07	5.07E-07	5.38E-07	5.56E-07
La3+	7.39E-09	1.00E-03	3.97E-03	5.46E-09	6.40E-09	8.39E-09	9.34E-09
Hg2+	6.60E-09	1.30E-03	5.11E-03	4.89E-09	6.47E-09	6.73E-09	6.86E-09
Zr (as ZrO(OH)2)	8.31E-07	7.41E-02	0.293	4.27E-07	7.80E-07	8.81E-07	9.30E-07
Pb2+	4.04E-05	8.20	32.3	1.73E-05	2.86E-05	5.22E-05	6.36E-05
Ni2+	1.65E-03	94.9	374	1.49E-03	1.57E-03	1.74E-03	1.82E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	5.51E-03	296	1.17E+03	2.32E-03	3.88E-03	7.14E-03	8.25E-03
Ca2+	8.27E-03	324	1.28E+03	5.05E-03	6.62E-03	9.90E-03	1.15E-02
K+	6.38E-03	244	962	2.73E-03	4.52E-03	8.24E-03	1.00E-02
OH-	3.87E-02	644	2.54E+03	2.61E-02	3.52E-02	4.00E-02	4.12E-02
NO3-	0.238	1.44E+04	5.70E+04	0.101	0.168	0.308	0.375
NO2-	1.01E-02	457	1.80E+03	4.83E-03	7.43E-03	1.29E-02	1.55E-02
CO32-	0.102	6.00E+03	2.37E+04	4.67E-02	7.45E-02	0.130	0.157
PO43-	6.39E-02	5.93E+03	2.34E+04	2.69E-02	4.50E-02	8.28E-02	0.101
SO42-	3.83E-03	360	1.42E+03	1.68E-03	2.73E-03	4.93E-03	5.99E-03
Si (as SiO32-)	3.58E-05	0.983	3.88	3.05E-05	3.31E-05	3.84E-05	4.08E-05
F-	8.87E-05	1.65	6.51	3.05E-05	7.89E-05	9.85E-05	1.08E-04
Cl-	3.70E-03	128	506	1.62E-03	2.64E-03	4.76E-03	5.79E-03
C6H5O73-	1.53E-05	2.83	11.2	1.27E-05	1.40E-05	1.66E-05	1.79E-05
EDTA4-	1.19E-05	3.35	13.2	3.92E-06	7.82E-06	1.60E-05	2.00E-05
HEDTA3-	2.12E-05	5.68	22.4	5.23E-06	1.30E-05	2.94E-05	3.74E-05
glycolate-	8.77E-05	6.44	25.4	5.36E-05	7.03E-05	1.05E-04	1.22E-04
acetate-	8.35E-06	0.482	1.90	6.70E-06	7.40E-06	9.36E-06	1.09E-05
oxalate2-	9.69E-09	8.34E-04	3.29E-03	8.64E-09	9.15E-09	1.02E-08	1.07E-08
DBP	3.14E-03	645	2.55E+03	1.33E-03	2.21E-03	4.07E-03	4.96E-03
butanol	3.14E-03	228	898	1.33E-03	2.21E-03	4.07E-03	4.96E-03
NH3	2.23E-04	3.71	14.7	2.75E-05	1.22E-04	3.26E-04	4.28E-04
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-104							
Total Inventory Estimate*							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.42E+06 (kg)	(1.12E+03 kgal)	----	----	----	----	----
Heat Load	4.32E-03 (kW)	(14.8 BTU/hr)	----	3.30E-03	3.83E-03	4.83E-03	5.33E-03
Bulk Density†	1.04 (g/cc)	----	----	1.02	1.03	1.05	1.06
Water wt%†	93.2	----	----	90.6	91.8	94.7	96.2
TOC wt% C (wet	4.38E-02	----	----	1.94E-02	3.15E-02	5.60E-02	6.76E-02
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	0.614	1.36E+04	6.00E+04	0.277	0.442	0.786	0.952
Al3+	6.59E-04	17.1	75.5	5.70E-04	6.38E-04	6.79E-04	6.99E-04
Fe3+ (total Fe)	0.169	9.09E+03	4.02E+04	0.157	0.166	0.171	0.172
Cr3+	7.34E-03	367	1.62E+03	3.13E-03	5.19E-03	9.49E-03	1.16E-02
Bi3+	4.75E-07	9.55E-02	0.422	4.48E-07	4.61E-07	4.88E-07	5.05E-07
La3+	6.72E-09	8.98E-04	3.97E-03	4.96E-09	5.82E-09	7.62E-09	8.49E-09
Hg2+	9.34E-06	1.80	7.97	1.88E-08	8.91E-06	9.48E-06	9.55E-06
Zr (as ZrO(OH)2)	4.13E-03	362	1.60E+03	6.67E-06	4.00E-03	4.17E-03	4.19E-03
Pb2+	4.01E-05	7.99	35.3	1.73E-05	2.84E-05	5.18E-05	6.30E-05
Ni2+	1.13E-02	636	2.81E+03	1.55E-03	7.96E-03	1.30E-02	1.41E-02
Sr2+	0	0	0	0	0	0	0
Mn4+	5.47E-03	289	1.28E+03	2.32E-03	3.86E-03	7.08E-03	9.57E-03
Ca2+	4.80E-02	1.85E+03	8.19E+03	7.39E-03	3.16E-02	5.70E-02	6.24E-02
K+	7.17E-03	270	1.19E+03	3.57E-03	5.34E-03	9.01E-03	1.08E-02
OH-	0.605	9.90E+03	4.37E+04	0.510	0.556	0.639	0.664
NO3-	0.238	1.42E+04	6.26E+04	0.103	0.169	0.307	0.373
NO2-	1.00E-02	444	1.96E+03	4.78E-03	7.35E-03	1.27E-02	1.53E-02
CO32-	0.141	8.16E+03	3.60E+04	4.70E-02	9.75E-02	0.178	0.209
PO43-	6.34E-02	5.80E+03	2.56E+04	2.69E-02	4.48E-02	8.21E-02	0.100
SO42-	3.79E-03	351	1.55E+03	1.67E-03	2.71E-03	4.88E-03	5.92E-03
Si (as SiO32-)	3.25E-05	0.878	3.88	2.77E-05	3.01E-05	3.49E-05	3.70E-05
F-	2.36E-02	432	1.91E+03	7.61E-05	1.33E-02	2.70E-02	2.87E-02
Cl-	3.68E-03	126	554	1.63E-03	2.63E-03	4.73E-03	5.74E-03
C6H5O73-	1.39E-05	2.53	11.2	1.16E-05	1.27E-05	1.51E-05	1.62E-05
EDTA4-	1.08E-05	2.99	13.2	3.56E-06	7.10E-06	1.45E-05	1.82E-05
HEDTA3-	1.92E-05	5.07	22.4	4.75E-06	1.18E-05	2.67E-05	3.39E-05
glycolate-	7.97E-05	5.75	25.4	4.87E-05	6.38E-05	9.56E-05	1.11E-04
acetate-	7.58E-06	0.431	1.90	6.09E-06	6.73E-06	8.50E-06	9.91E-06
oxalate2-	8.80E-09	7.45E-04	3.29E-03	7.84E-09	8.31E-09	9.28E-09	9.75E-09
DBP	3.12E-03	630	2.78E+03	1.32E-03	2.20E-03	4.03E-03	4.91E-03
butanol	3.12E-03	222	981	1.32E-03	2.20E-03	4.03E-03	4.91E-03
NH3	3.12E-03	51.0	225	7.34E-05	1.65E-03	4.59E-03	6.01E-03
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-104

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	4.71E+05 (kg)	(103 kgal)	----	----	----	----	----
Heat Load	9.78E-04 (kW)	(3.34 BTU/hr)	----	1.60E-05	5.10E-04	1.46E-03	1.93E-03
Bulk Density	1.21 (g/cc)	----	----	1.12	1.16	1.24	1.27
Void Fraction	0.886	----	----	0.866	0.874	0.910	0.943
Water wt%	72.9	----	----	68.7	70.5	76.4	80.3
TOC wt% C (wet	3.44E-02	----	----	1.66E-02	2.59E-02	4.27E-02	5.06E-02

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	8.48E-07	7.01E-04	0.330	1.39E-08	4.41E-07	1.26E-06	1.67E-06
C-14	1.04E-08	8.64E-06	4.07E-03	1.71E-10	5.44E-09	1.55E-08	2.06E-08
Ni-59	6.88E-09	5.70E-06	2.68E-03	6.88E-09	6.88E-09	6.88E-09	6.88E-09
Ni-63	7.96E-07	6.58E-04	0.310	7.96E-07	7.96E-07	7.96E-07	7.96E-07
Co-60	1.61E-07	1.13E-04	6.27E-02	2.63E-09	8.38E-08	2.40E-07	3.17E-07
Se-79	1.30E-09	1.08E-06	5.09E-04	2.13E-11	6.80E-10	1.94E-09	2.57E-09
Sr-90	2.05E-04	0.169	79.7	3.34E-06	1.07E-04	3.05E-04	4.03E-04
Y-90	2.05E-04	0.169	79.8	3.35E-06	1.07E-04	3.05E-04	4.03E-04
Zr-93	6.29E-09	5.21E-06	2.45E-03	1.03E-10	3.28E-09	9.37E-09	1.24E-08
Nb-93m	2.66E-09	2.20E-06	1.04E-03	4.34E-11	1.38E-09	3.96E-09	5.23E-09
Tc-99	4.36E-08	3.61E-05	1.70E-02	7.13E-10	2.27E-08	6.49E-08	8.59E-08
Ru-106	2.51E-05	2.08E-02	9.78	2.49E-05	2.51E-05	2.51E-05	2.51E-05
Cd-113m	6.79E-08	5.62E-05	2.65E-02	1.11E-09	3.54E-08	1.01E-07	1.34E-07
Sb-125	3.90E-06	3.23E-03	1.52	6.37E-08	2.03E-06	5.81E-06	7.68E-06
Sn-126	2.06E-09	1.70E-06	8.02E-04	3.36E-11	1.07E-09	3.06E-09	4.05E-09
I-129	8.75E-11	7.25E-08	3.41E-05	1.43E-12	4.56E-11	1.30E-10	1.72E-10
Cs-134	1.73E-06	1.43E-03	0.674	2.83E-08	9.01E-07	2.58E-06	3.41E-06
Cs-137	2.42E-04	0.200	94.1	3.95E-06	1.26E-04	3.60E-04	4.76E-04
Ba-137m	2.29E-04	0.189	89.1	3.73E-06	1.19E-04	3.40E-04	4.50E-04
Sm-151	4.51E-06	3.73E-03	1.76	7.38E-08	2.35E-06	6.72E-06	8.89E-06
Eu-152	5.08E-08	4.21E-05	1.98E-02	4.67E-08	4.88E-08	5.29E-08	5.49E-08
Eu-154	1.20E-06	9.95E-04	0.469	1.97E-08	6.27E-07	1.79E-06	2.37E-06
Eu-155	9.23E-06	7.64E-03	3.60	8.47E-06	8.86E-06	9.60E-06	9.97E-06
Ra-226	1.05E-14	8.70E-12	4.10E-09	1.72E-16	5.48E-15	1.57E-14	2.07E-14
Ra-228	4.61E-18	3.81E-15	1.80E-12	4.23E-18	4.42E-18	4.79E-18	4.98E-18
Ac-227	6.05E-14	5.00E-11	2.36E-08	9.88E-16	3.15E-14	9.01E-14	1.19E-13
Pa-231	3.45E-13	2.86E-10	1.34E-07	5.64E-15	1.80E-13	5.14E-13	6.80E-13
Th-229	5.27E-16	4.36E-13	2.05E-10	4.84E-16	5.06E-16	5.48E-16	5.69E-16
Th-232	1.76E-18	1.46E-15	6.87E-13	2.88E-20	9.18E-19	2.62E-18	3.47E-18
U-232	1.42E-09	1.18E-06	5.53E-04	9.90E-11	1.29E-10	2.53E-09	3.21E-09
U-233	1.46E-11	1.21E-08	5.68E-06	1.01E-12	1.32E-12	2.60E-11	3.29E-11
U-234	6.39E-06	5.29E-03	2.49	4.45E-07	5.80E-07	1.14E-05	1.44E-05
U-235	2.43E-07	2.01E-04	9.46E-02	1.69E-08	2.21E-08	4.33E-07	5.49E-07
U-236	5.26E-07	4.35E-04	0.205	3.66E-08	4.78E-08	9.38E-07	1.19E-06
U-238	4.38E-06	3.61E-03	1.71	3.06E-07	3.98E-07	7.82E-06	9.91E-06
Np-237	6.39E-10	5.28E-07	2.49E-04	1.04E-11	3.33E-10	9.51E-10	1.26E-09
Pu-238	2.70E-04	0.223	105	2.02E-04	2.49E-04	2.87E-04	3.04E-04
Pu-239	2.19E-03	1.81	853	1.64E-03	2.02E-03	2.33E-03	2.47E-03
Pu-240	6.64E-04	0.550	259	4.98E-04	6.13E-04	7.08E-04	7.49E-04
Pu-241	2.76E-02	22.8	1.07E+04	2.07E-02	2.55E-02	2.94E-02	3.11E-02
Pu-242	1.03E-07	8.51E-05	4.01E-02	7.70E-08	9.49E-08	1.10E-07	1.16E-07
Am-241	8.04E-07	6.65E-04	0.313	1.31E-08	4.19E-07	1.20E-06	5.25E-06
Am-243	1.69E-10	1.40E-07	6.60E-05	2.77E-12	8.82E-11	2.52E-10	1.11E-09
Cm-242	4.48E-09	3.71E-06	1.75E-03	4.11E-09	4.30E-09	4.66E-09	4.84E-09
Cm-243	7.50E-10	6.21E-07	2.92E-04	6.89E-10	7.20E-10	7.81E-10	8.11E-10
Cm-244	3.08E-09	2.55E-06	1.20E-03	5.04E-11	1.61E-09	8.08E-09	2.20E-08

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	3.84E-02 (g/L)	----	15.0	2.88E-02	3.55E-02	4.09E-02	4.33E-02
U	5.53E-02	1.09E+04	5.13E+03	3.85E-03	5.03E-03	9.87E-02	0.125

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AW-104

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	3.95E+06 (kg)	(1.02E+03 kgal)	----	----	----	----	----
Heat Load	3.35E-03 (kW)	(11.4 BTU/hr)	----	3.07E-03	3.22E-03	3.45E-03	3.61E-03
Bulk Density*	1.02 (g/cc)	----	----	1.01	1.02	1.03	1.04
Water wt%†	95.7	----	----	93.2	94.4	96.8	98.0
TOC wt% C (wet	4.49E-02	----	----	1.97E-02	3.21E-02	5.76E-02	6.97E-02

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.06E-07	1.04E-04	0.411	7.54E-08	7.54E-08	1.13E-07	1.20E-07
C-14	1.47E-08	1.44E-05	5.67E-02	8.18E-09	8.18E-09	1.49E-08	1.52E-08
Ni-59	8.12E-10	7.94E-07	3.13E-03	5.06E-10	5.06E-10	8.27E-10	8.42E-10
Ni-63	7.99E-08	7.81E-05	0.308	4.97E-08	4.97E-08	8.14E-08	8.29E-08
Co-60	1.96E-08	1.92E-05	7.57E-02	1.22E-08	1.22E-08	2.01E-08	2.06E-08
Se-79	1.65E-09	1.61E-06	6.36E-03	1.23E-09	1.23E-09	1.80E-09	1.94E-09
Sr-90	5.24E-05	5.12E-02	202	4.92E-05	5.13E-05	5.34E-05	5.44E-05
Y-90	5.24E-05	5.12E-02	202	3.81E-05	3.81E-05	5.34E-05	5.44E-05
Zr-93	8.01E-09	7.84E-06	3.09E-02	5.94E-09	5.94E-09	8.76E-09	9.48E-09
Nb-93m	5.84E-09	5.71E-06	2.25E-02	4.39E-09	4.39E-09	6.36E-09	6.87E-09
Tc-99	1.10E-07	1.08E-04	0.426	8.61E-08	9.80E-08	1.23E-07	1.41E-07
Ru-106	5.44E-12	5.32E-09	2.10E-05	4.33E-12	4.48E-12	6.00E-12	6.54E-12
Cd-113m	4.18E-08	4.09E-05	0.161	2.94E-08	2.94E-08	4.63E-08	5.06E-08
Sb-125	1.15E-07	1.13E-04	0.444	8.29E-08	8.29E-08	1.28E-07	1.40E-07
Sn-126	2.50E-09	2.45E-06	9.66E-03	1.88E-09	1.88E-09	2.73E-09	2.94E-09
I-129	2.13E-10	2.09E-07	8.23E-04	1.66E-10	1.89E-10	2.38E-10	2.73E-10
Cs-134	1.94E-08	1.90E-05	7.49E-02	8.90E-09	1.40E-08	2.49E-08	3.03E-08
Cs-137	1.10E-04	0.107	424	9.81E-05	1.03E-04	1.16E-04	1.25E-04
Ba-137m	1.04E-04	0.102	401	8.70E-05	8.70E-05	1.09E-04	1.14E-04
Sm-151	5.82E-06	5.69E-03	22.5	4.37E-06	4.37E-06	6.34E-06	6.85E-06
Eu-152	2.09E-09	2.05E-06	8.09E-03	1.58E-09	1.58E-09	2.31E-09	2.53E-09
Eu-154	3.09E-07	3.02E-04	1.19	2.05E-07	2.05E-07	3.46E-07	3.61E-07
Eu-155	1.30E-07	1.27E-04	0.503	9.96E-08	9.96E-08	1.44E-07	1.57E-07
Ra-226	6.81E-14	6.66E-11	2.63E-07	5.44E-14	5.52E-14	7.51E-14	7.72E-14
Ra-228	1.48E-10	1.45E-07	5.71E-04	5.29E-11	5.29E-11	1.67E-10	1.87E-10
Ac-227	4.24E-13	4.15E-10	1.64E-06	3.45E-13	3.50E-13	4.64E-13	4.77E-13
Pa-231	1.88E-12	1.84E-09	7.26E-06	1.47E-12	1.47E-12	2.03E-12	2.17E-12
Th-229	3.43E-12	3.36E-09	1.33E-05	1.24E-12	1.24E-12	3.85E-12	4.29E-12
Th-232	1.51E-11	1.48E-08	5.84E-05	3.38E-12	3.38E-12	1.83E-11	2.14E-11
U-232	5.71E-10	5.59E-07	2.20E-03	4.44E-10	5.06E-10	6.47E-10	7.27E-10
U-233	1.83E-09	1.79E-06	7.06E-03	1.34E-09	1.58E-09	2.12E-09	2.43E-09
U-234	4.24E-07	4.14E-04	1.64	2.25E-07	3.77E-07	4.45E-07	4.66E-07
U-235	1.61E-08	1.58E-05	6.22E-02	8.57E-09	1.43E-08	1.69E-08	1.77E-08
U-236	3.49E-08	3.41E-05	0.135	1.85E-08	3.10E-08	3.66E-08	3.83E-08
U-238	2.91E-07	2.85E-04	1.12	1.55E-07	2.59E-07	3.06E-07	3.20E-07
Np-237	3.91E-10	3.83E-07	1.51E-03	3.12E-10	3.51E-10	4.33E-10	4.91E-10
Pu-238	9.54E-07	9.33E-04	3.68	2.78E-07	6.09E-07	1.30E-06	1.63E-06
Pu-239	7.74E-06	7.58E-03	29.9	2.27E-06	4.95E-06	1.05E-05	1.32E-05
Pu-240	2.35E-06	2.30E-03	9.07	6.87E-07	1.50E-06	3.20E-06	4.01E-06
Pu-241	9.74E-05	9.53E-02	376	2.84E-05	6.22E-05	1.33E-04	1.66E-04
Pu-242	3.63E-10	3.55E-07	1.40E-03	1.06E-10	2.32E-10	4.95E-10	6.21E-10
Am-241	3.55E-08	3.47E-05	0.137	2.89E-08	3.21E-08	3.89E-08	4.12E-08
Am-243	2.40E-12	2.35E-09	9.26E-06	1.37E-12	1.87E-12	2.94E-12	3.01E-12
Cm-242	7.73E-11	7.56E-08	2.98E-04	5.62E-11	5.62E-11	8.57E-11	9.39E-11
Cm-243	7.64E-12	7.47E-09	2.95E-05	5.63E-12	5.63E-12	8.39E-12	9.13E-12
Cm-244	8.86E-11	8.67E-08	3.42E-04	6.65E-11	6.79E-11	9.99E-11	1.11E-10

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	1.36E-04 (g/L)	----	0.525	3.97E-05	8.68E-05	1.85E-04	2.32E-04
U	3.67E-03	854	3.37E+03	1.95E-03	3.26E-03	3.86E-03	4.04E-03

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-104

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.42E+06 (kg)	(1.12E+03 kgal)	----	----	----	----	----
Heat Load	4.32E-03 (kW)	(14.8 BTU/hr)	----	3.30E-03	3.83E-03	4.83E-03	5.33E-03
Bulk Density†	1.04 (g/cc)	----	----	1.02	1.03	1.05	1.06
Water wt%†	93.2	----	----	90.6	91.8	94.7	96.2
TOC wt% C (wet	4.38E-02	----	----	1.94E-02	3.15E-02	5.60E-02	6.76E-02

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.74E-07	1.68E-04	0.741	9.33E-08	1.35E-07	2.15E-07	2.55E-07
C-14	1.43E-08	1.37E-05	6.07E-02	8.39E-09	8.39E-09	1.48E-08	1.53E-08
Ni-59	1.37E-09	1.32E-06	5.82E-03	1.09E-09	1.09E-09	1.38E-09	1.40E-09
Ni-63	1.45E-07	1.40E-04	0.618	1.18E-07	1.18E-07	1.47E-07	1.48E-07
Co-60	3.26E-08	3.13E-05	0.138	1.72E-08	2.50E-08	4.03E-08	4.78E-08
Se-79	1.62E-09	1.56E-06	6.87E-03	1.24E-09	1.24E-09	1.75E-09	1.88E-09
Sr-90	6.63E-05	6.38E-02	282	4.67E-05	5.67E-05	7.61E-05	8.57E-05
Y-90	6.63E-05	6.38E-02	282	4.67E-05	5.33E-05	7.61E-05	8.57E-05
Zr-93	7.86E-09	7.56E-06	3.34E-02	5.97E-09	5.97E-09	8.54E-09	9.19E-09
Nb-93m	5.54E-09	5.34E-06	2.36E-02	4.23E-09	4.23E-09	6.02E-09	6.48E-09
Tc-99	1.04E-07	1.00E-04	0.443	8.22E-08	9.30E-08	1.16E-07	1.32E-07
Ru-106	2.30E-06	2.21E-03	9.78	2.29E-06	2.30E-06	2.30E-06	2.30E-06
Cd-113m	4.42E-08	4.25E-05	0.188	3.29E-08	3.29E-08	4.83E-08	5.22E-08
Sb-125	4.62E-07	4.45E-04	1.96	8.89E-08	2.80E-07	6.48E-07	8.31E-07
Sn-126	2.46E-09	2.37E-06	1.05E-02	1.90E-09	1.90E-09	2.67E-09	2.86E-09
I-129	2.02E-10	1.94E-07	8.57E-04	1.59E-10	1.80E-10	2.25E-10	2.56E-10
Cs-134	1.76E-07	1.70E-04	0.749	1.07E-08	9.53E-08	2.59E-07	3.40E-07
Cs-137	1.22E-04	0.117	518	9.87E-05	1.10E-04	1.33E-04	1.45E-04
Ba-137m	1.15E-04	0.111	490	9.33E-05	1.00E-04	1.26E-04	1.37E-04
Sm-151	5.70E-06	5.48E-03	24.2	4.38E-06	4.38E-06	6.17E-06	6.63E-06
Eu-152	6.56E-09	6.32E-06	2.79E-02	6.10E-09	6.10E-09	6.77E-09	6.96E-09
Eu-154	3.91E-07	3.76E-04	1.66	2.76E-07	2.97E-07	4.48E-07	5.05E-07
Eu-155	9.64E-07	9.28E-04	4.10	8.91E-07	9.28E-07	1.00E-06	1.04E-06
Ra-226	6.28E-14	6.04E-11	2.67E-07	5.04E-14	5.11E-14	6.92E-14	7.11E-14
Ra-228	1.34E-10	1.29E-07	5.71E-04	4.80E-11	4.80E-11	1.52E-10	1.70E-10
Ac-227	3.91E-13	3.76E-10	1.66E-06	3.19E-13	3.23E-13	4.27E-13	4.39E-13
Pa-231	1.74E-12	1.67E-09	7.39E-06	1.36E-12	1.36E-12	1.88E-12	2.01E-12
Th-229	3.12E-12	3.00E-09	1.33E-05	1.12E-12	1.12E-12	3.49E-12	3.89E-12
Th-232	1.37E-11	1.32E-08	5.84E-05	3.07E-12	3.07E-12	1.67E-11	1.95E-11
U-232	6.49E-10	6.24E-07	2.76E-03	4.88E-10	5.21E-10	7.51E-10	8.13E-10
U-233	1.66E-09	1.60E-06	7.07E-03	1.22E-09	1.44E-09	1.93E-09	2.21E-09
U-234	9.70E-07	9.34E-04	4.12	2.46E-07	3.96E-07	1.43E-06	1.71E-06
U-235	3.69E-08	3.55E-05	0.157	9.34E-09	1.50E-08	5.43E-08	6.49E-08
U-236	7.99E-08	7.69E-05	0.339	2.02E-08	3.25E-08	1.18E-07	1.41E-07
U-238	6.66E-07	6.41E-04	2.83	1.69E-07	2.72E-07	9.82E-07	1.17E-06
Np-237	4.14E-10	3.98E-07	1.76E-03	3.42E-10	3.77E-10	4.52E-10	5.05E-10
Pu-238	2.56E-05	2.47E-02	109	1.94E-05	2.37E-05	2.69E-05	2.82E-05
Pu-239	2.08E-04	0.200	882	1.57E-04	1.92E-04	2.18E-04	2.28E-04
Pu-240	6.31E-05	6.07E-02	268	4.78E-05	5.84E-05	6.62E-05	6.93E-05
Pu-241	2.62E-03	2.52	1.11E+04	1.98E-03	2.42E-03	2.75E-03	2.88E-03
Pu-242	9.76E-09	9.39E-06	4.15E-02	7.39E-09	9.04E-09	1.03E-08	1.07E-08
Am-241	1.06E-07	1.02E-04	0.450	2.90E-08	6.84E-08	1.44E-07	5.11E-07
Am-243	1.77E-11	1.70E-08	7.53E-05	1.50E-12	9.79E-12	2.58E-11	1.03E-10
Cm-242	4.81E-10	4.63E-07	2.04E-03	4.45E-10	4.62E-10	4.99E-10	5.16E-10
Cm-243	7.57E-11	7.29E-08	3.22E-04	6.98E-11	7.28E-11	7.87E-11	8.16E-11
Cm-244	3.63E-10	3.49E-07	1.54E-03	6.81E-11	2.19E-10	8.28E-10	2.08E-09

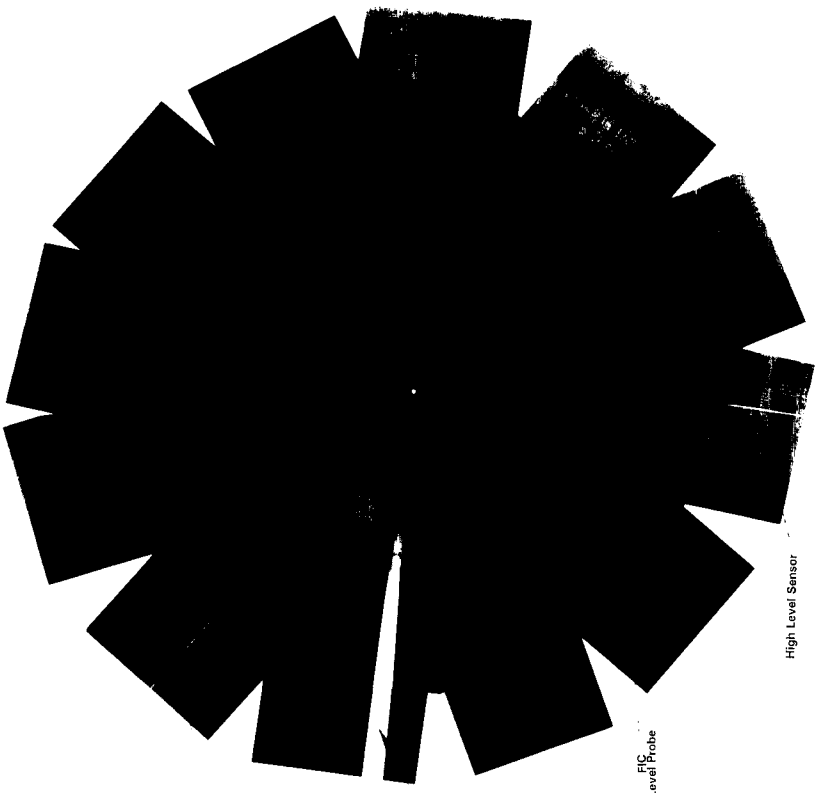
Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	3.65E-03 (g/L)	----	15.5	2.76E-03	3.38E-03	3.83E-03	4.01E-03
U	8.40E-03	1.92E+03	8.50E+03	2.13E-03	3.43E-03	1.24E-02	1.48E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

241-AW-104

Photo date: 2-2-83



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TANK 241-AW-105 SUMMARY

TANK HISTORY	
Entered Service	1980
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
1C, 10A, 13A, 15A	4 in
7A, 12A	12 in
TANK TEMPERATURE	
Average Tank Temperature	70°F
Maximum Temperature	83°F
Date	June 26 and 27, 1995
Elevation from tank bottom	12.33 ft, 20.33 ft, 34.33 ft
Riser Number	4A
Minimum Temperature	60°F
Date	Dec 9, 1996
Elevation from tank bottom	12.33 ft, 20.33 ft, 34.33 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	59
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	,440,000 gal
Waste Type	DN/PD
Drainable Interstitial Liquids	27,000 gal
Pumpable Liquids	165,000 gal
Saltcake	0 gal
Sludge	280,000 gal
Supernatant	160,000 gal
INTERIOR PHOTOGRAPHS	
Date	not available
Montage Number	not available
Photo Set Number	not available
WASTE SURFACE LEVEL	
Devices	Manual ENRAF and Tape
Max Level	397.4 in
Date	Nov 20 - 23, 1994
Min Level	106.25 in
Date	Nov 12 -14, 1995

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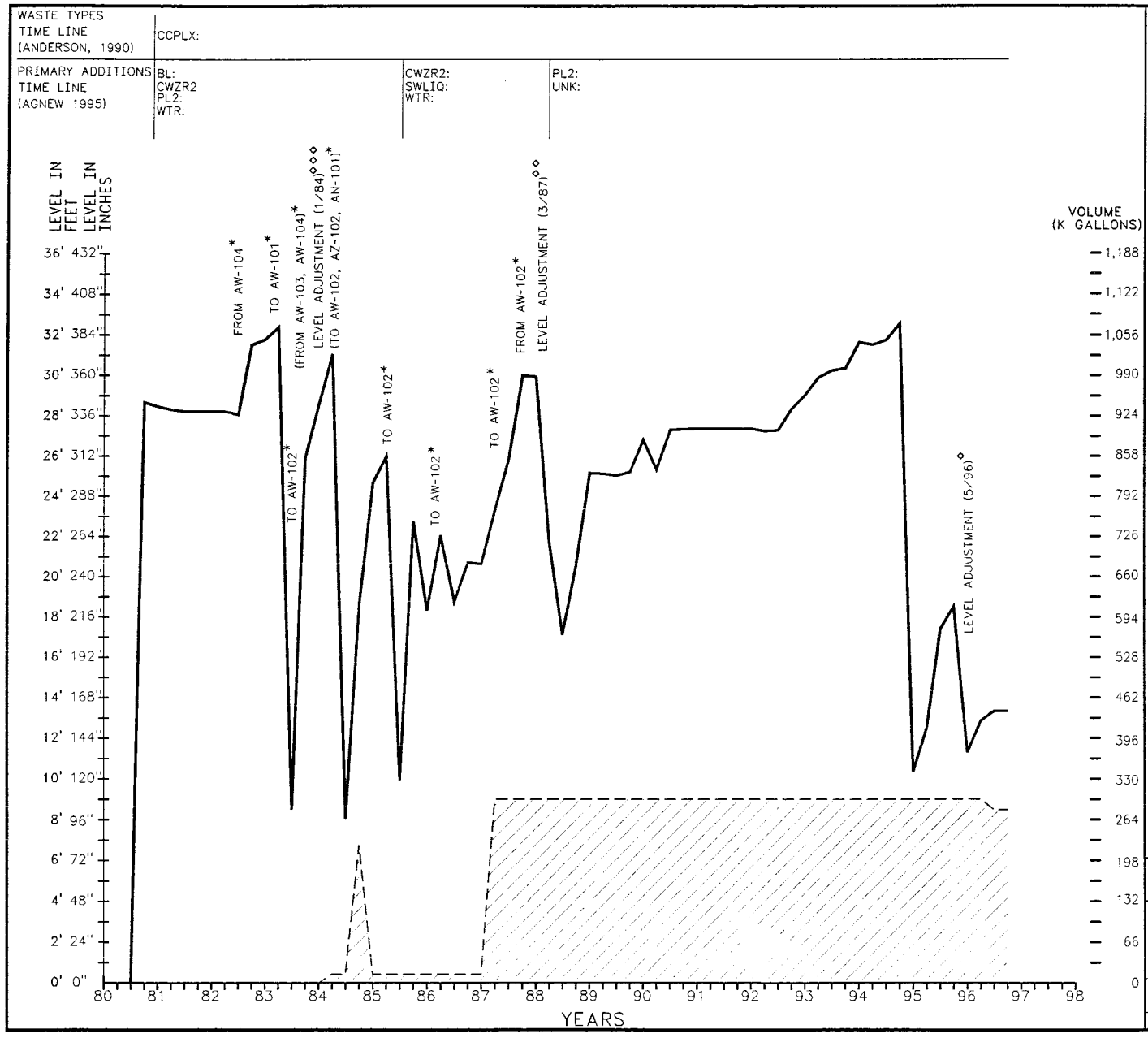


TANK INFO:

CONSTRUCTED 1978-1980
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- ◇ HANLON 1996l
- ◇◇ HANLON 1996g
- ◇◇◇ McCANN 1984b

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

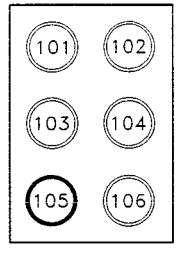
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

BL:	B-PLANT LOW-LEVEL WASTE
CCPLX:	COMPLEXANT CONCENTRATE
CWZR2:	COATING (CLADDING) WASTE
PL2:	PUREX LOW-LEVEL WASTE 1983-88
SWLIQ:	DILUTE, NON-COMPLEXED WASTE
UNK:	UNKNOWN
WTR:	WATER

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

AW TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AW-105 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1980-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E169	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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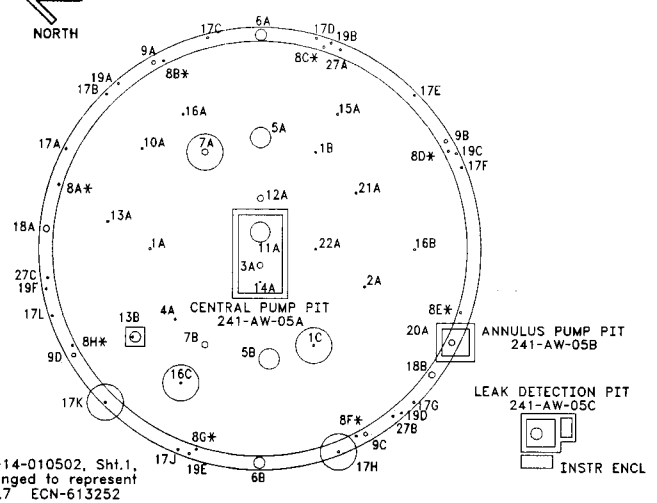
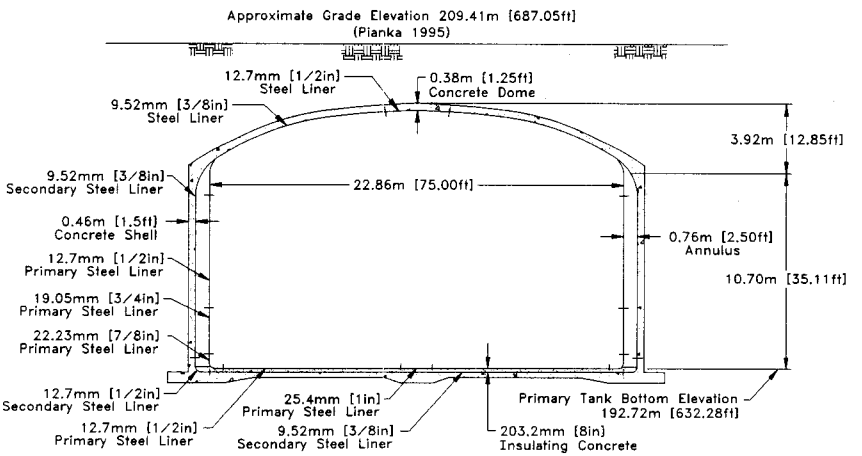
241-AW-105



* Riser no. on H-14-010502, Sht.1, Rev.1, were changed to represent H-2-70407, Rev.7 ECN-613252 12-18-95.

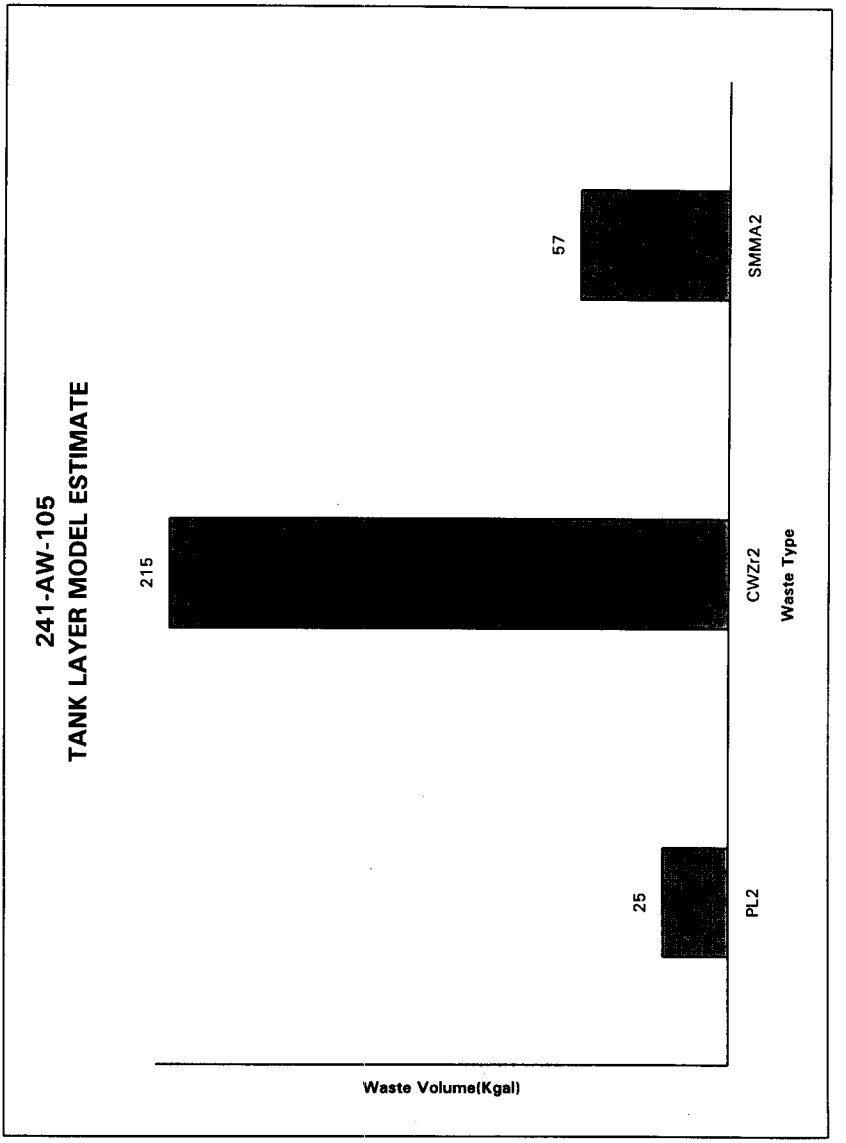
TANK RISER LOCATION

Ref: Salazar 1994
H-14-010502, Sh.1, Rev.1
H-2-70407, Rev.7



Ref: H-2-70394, Rev.2

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AW-105

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	1.16E+06 (kg)	(240 kgal)	----	----	----	----	----
Heat Load	4.21E-02 (kW)	(144 BTU/hr)	----	6.88E-04	2.19E-02	6.27E-02	8.29E-02
Bulk Density	1.28 (g/cc)	----	----	1.02	1.20	1.31	1.33
Void Fraction	0.854	----	----	0.832	0.839	0.899	0.988
Water wt%	64.1	----	----	58.2	60.5	72.6	96.6
TOC wt% C (wet	3.55E-03	----	----	1.61E-03	2.58E-03	4.52E-03	5.45E-03

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	4.99	8.94E+04	1.04E+05	7.22E-02	2.82	5.77	6.19
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0.524	2.28E+04	2.66E+04	0.199	0.507	0.530	0.533
Cr3+	7.42E-04	30.1	35.0	3.33E-04	5.37E-04	9.47E-04	1.14E-03
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	1.88E-03	294	342	2.90E-06	1.79E-03	1.91E-03	1.92E-03
Zr (as ZrO(OH)2)	0.830	5.91E+04	6.88E+04	1.26E-03	0.804	0.839	0.843
Pb2+	4.03E-06	0.651	0.758	1.81E-06	2.91E-06	5.14E-06	6.21E-06
Ni2+	1.16E-02	533	621	1.67E-04	7.71E-03	1.38E-02	1.51E-02
Sr2+	0	0	0	0	0	0	0
Mn4+	5.56E-04	23.8	27.8	2.50E-04	4.03E-04	7.10E-04	2.48E-03
Ca2+	0.133	4.15E+03	4.84E+03	4.81E-02	5.52E-02	0.159	0.171
K+	0.172	5.24E+03	6.10E+03	3.43E-03	8.97E-02	0.255	0.337
OH-	5.22	6.93E+04	8.07E+04	0.661	4.85	5.37	5.45
NO3-	0.321	1.55E+04	1.81E+04	2.87E-02	0.179	0.464	0.603
NO2-	9.16E-03	328	383	1.02E-03	4.49E-03	1.53E-02	2.26E-02
CO32-	0.142	6.66E+03	7.76E+03	5.76E-02	6.46E-02	0.168	0.181
PO43-	6.44E-03	477	556	2.90E-03	4.66E-03	8.23E-03	9.94E-03
SO42-	3.75E-04	28.1	32.7	1.68E-04	2.71E-04	4.79E-04	5.78E-04
Si (as SiO32-)	0	0	0	0	0	0	0
F-	4.74	7.02E+04	8.17E+04	9.74E-03	2.66	5.42	5.75
Cl-	3.92E-03	108	126	4.21E-04	2.22E-03	5.67E-03	7.37E-03
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	3.16E-04	51.8	60.3	1.42E-04	2.29E-04	4.03E-04	4.87E-04
butanol	3.16E-04	18.3	21.3	1.42E-04	2.29E-04	4.03E-04	4.87E-04
NH3	0.587	7.78E+03	9.06E+03	9.74E-03	0.309	0.864	1.13
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AW-105

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	3.47E+06 (kg)	(800 kgal)	----	----	----	----	----
Heat Load	1.07 (kW)	(3.64E+03 BTU/hr)	----	0.951	1.01	1.13	1.19
Bulk Density*	1.14 (g/cc)	----	----	1.13	1.13	1.15	1.16
Water wt%	76.0	----	----	73.5	74.6	77.2	78.6
TOC wt% C (wet	0.352	----	----	0.272	0.311	0.392	0.432

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	3.56	7.16E+04	2.48E+05	3.05	3.31	3.82	4.06
Al3+	0.296	6.98E+03	2.42E+04	0.257	0.276	0.316	0.336
Fe3+ (total Fe)	4.87E-03	238	824	3.95E-03	4.56E-03	5.18E-03	5.48E-03
Cr3+	2.23E-02	1.01E+03	3.51E+03	1.91E-02	2.07E-02	2.39E-02	2.55E-02
Bi3+	1.78E-04	32.4	112	1.68E-04	1.73E-04	1.83E-04	1.87E-04
La3+	3.22E-06	0.391	1.35	2.36E-06	2.78E-06	3.66E-06	4.08E-06
Hg2+	7.81E-06	1.37	4.74	3.46E-06	7.48E-06	8.14E-06	8.45E-06
Zr (as ZrO(OH)2)	1.95E-03	155	539	9.30E-04	1.82E-03	2.08E-03	2.20E-03
Pb2+	2.10E-04	38.1	132	1.80E-04	1.95E-04	2.26E-04	2.41E-04
Ni2+	2.67E-03	137	474	2.54E-03	2.60E-03	2.73E-03	2.79E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	4.62E-03	222	769	2.26E-03	3.41E-03	5.83E-03	6.65E-03
Ca2+	2.03E-02	711	2.46E+03	1.47E-02	1.91E-02	2.15E-02	2.27E-02
K+	0.161	5.51E+03	1.91E+04	1.91E-02	8.80E-02	0.236	0.310
OH-	1.97	2.92E+04	1.01E+05	1.62	1.79	2.15	2.32
NO3-	1.39	7.54E+04	2.61E+05	1.14	1.26	1.52	1.65
NO2-	0.339	1.36E+04	4.73E+04	0.290	0.311	0.371	0.379
CO32-	0.221	1.16E+04	4.02E+04	0.180	0.201	0.242	0.262
PO43-	6.35E-02	5.27E+03	1.83E+04	3.61E-02	4.95E-02	7.75E-02	9.10E-02
SO42-	4.99E-02	4.19E+03	1.45E+04	4.33E-02	4.65E-02	5.39E-02	5.66E-02
Si (as SiO32-)	1.76E-02	432	1.50E+03	1.30E-02	1.52E-02	2.00E-02	2.20E-02
F-	0.164	2.71E+03	9.41E+03	1.63E-02	0.139	0.188	0.212
Cl-	5.67E-02	1.76E+03	6.09E+03	4.73E-02	5.19E-02	6.15E-02	6.61E-02
C6H5O73-	7.58E-03	1.25E+03	4.34E+03	5.30E-03	6.41E-03	8.74E-03	9.85E-03
EDTA4-	3.40E-03	856	2.97E+03	1.17E-03	2.26E-03	4.55E-03	5.67E-03
HEDTA3-	5.95E-03	1.43E+03	4.94E+03	1.48E-03	3.67E-03	8.25E-03	1.05E-02
glycolate-	6.26E-02	4.10E+03	1.42E+04	3.23E-02	4.71E-02	7.81E-02	9.29E-02
acetate-	2.71E-03	140	484	2.23E-03	2.43E-03	3.00E-03	3.45E-03
oxalate2-	4.22E-06	0.324	1.12	3.75E-06	3.98E-06	4.46E-06	4.68E-06
DBP	5.49E-03	1.01E+03	3.50E+03	4.15E-03	4.81E-03	6.18E-03	6.84E-03
butanol	5.49E-03	356	1.23E+03	4.15E-03	4.81E-03	6.18E-03	6.84E-03
NH3	0.516	7.67E+03	2.66E+04	2.04E-02	0.261	0.777	1.03
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-105

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.63E+06 (kg)	(1.04E+03 kgal)	----	----	----	----	----
Heat Load	1.11 (kW)	(3.79E+03 BTU/hr)	----	0.951	1.03	1.19	1.27
Bulk Density†	1.18 (g/cc)	----	----	1.11	1.16	1.19	1.19
Water wt%†	73.0	----	----	69.7	71.1	75.9	82.5
TOC wt% C (wet	0.264	----	----	0.205	0.234	0.295	0.324

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	3.89	7.61E+04	3.52E+05	2.52	3.33	4.14	4.30
Al3+	0.228	5.23E+03	2.42E+04	0.198	0.212	0.243	0.258
Fe3+ (total Fe)	0.125	5.92E+03	2.74E+04	4.89E-02	0.121	0.126	0.127
Cr3+	1.73E-02	766	3.54E+03	1.48E-02	1.60E-02	1.86E-02	1.98E-02
Bi3+	1.37E-04	24.3	112	1.29E-04	1.33E-04	1.41E-04	1.44E-04
La3+	2.48E-06	0.293	1.35	1.82E-06	2.14E-06	2.82E-06	3.14E-06
Hg2+	4.40E-04	75.0	347	3.33E-06	4.20E-04	4.46E-04	4.49E-04
Zr (as ZrO(OH)2)	0.193	1.50E+04	6.93E+04	1.01E-03	0.187	0.195	0.196
Pb2+	1.63E-04	28.6	133	1.39E-04	1.51E-04	1.75E-04	1.86E-04
Ni2+	4.74E-03	236	1.09E+03	2.03E-03	3.83E-03	5.23E-03	5.53E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	3.68E-03	172	797	1.79E-03	2.72E-03	4.65E-03	5.69E-03
Ca2+	4.63E-02	1.58E+03	7.30E+03	2.24E-02	2.83E-02	5.22E-02	5.51E-02
K+	0.164	5.44E+03	2.52E+04	1.55E-02	8.84E-02	0.241	0.316
OH-	2.72	3.93E+04	1.82E+05	1.62	2.58	2.86	2.99
NO3-	1.14	6.03E+04	2.79E+05	0.886	1.01	1.28	1.41
NO2-	0.263	1.03E+04	4.77E+04	0.225	0.241	0.287	0.294
CO32-	0.203	1.04E+04	4.80E+04	0.159	0.182	0.222	0.239
PO43-	5.03E-02	4.06E+03	1.88E+04	2.84E-02	3.92E-02	6.15E-02	7.23E-02
SO42-	3.85E-02	3.14E+03	1.46E+04	3.34E-02	3.59E-02	4.16E-02	4.36E-02
Si (as SiO32-)	1.35E-02	324	1.50E+03	9.98E-03	1.17E-02	1.54E-02	1.70E-02
F-	1.22	1.97E+04	9.12E+04	1.48E-02	0.741	1.38	1.45
Cl-	4.45E-02	1.34E+03	6.21E+03	3.73E-02	4.08E-02	4.82E-02	5.18E-02
C6H5O73-	5.83E-03	937	4.34E+03	4.08E-03	4.93E-03	6.72E-03	7.58E-03
EDTA4-	2.62E-03	641	2.97E+03	8.97E-04	1.74E-03	3.50E-03	4.36E-03
HEDTA3-	4.58E-03	1.07E+03	4.94E+03	1.14E-03	2.82E-03	6.35E-03	8.07E-03
glycolate-	4.81E-02	3.07E+03	1.42E+04	2.48E-02	3.62E-02	6.01E-02	7.15E-02
acetate-	2.08E-03	104	484	1.71E-03	1.87E-03	2.31E-03	2.65E-03
oxalate2-	3.24E-06	0.243	1.12	2.89E-06	3.06E-06	3.43E-06	3.60E-06
DBP	4.30E-03	768	3.56E+03	3.22E-03	3.75E-03	4.85E-03	5.38E-03
butanol	4.30E-03	271	1.25E+03	3.22E-03	3.75E-03	4.85E-03	5.38E-03
NH3	0.532	7.69E+03	3.56E+04	1.80E-02	0.272	0.797	1.06
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-105							
TLM Solids Composite Inventory Estimate*							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	1.16E+06 (kg)	(240 kgal)	----	----	----	----	----
Heat Load	4.21E-02 (kW)	(144 BTU/hr)	----	6.88E-04	2.19E-02	6.27E-02	8.29E-02
Bulk Density	1.28 (g/cc)	----	----	1.02	1.20	1.31	1.33
Void Fraction	0.854	----	----	0.832	0.839	0.899	0.988
Water wt%	64.1	----	----	58.2	60.5	72.6	96.6
TOC wt% C (wet	3.55E-03	----	----	1.61E-03	2.58E-03	4.52E-03	5.45E-03
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	1.56E-05	1.22E-02	14.2	2.56E-07	8.15E-06	2.33E-05	3.08E-05
C-14	1.93E-07	1.50E-04	0.175	3.15E-09	1.00E-07	2.87E-07	3.79E-07
Ni-59	1.27E-07	9.90E-05	0.115	1.27E-07	1.27E-07	1.27E-07	1.27E-07
Ni-63	1.47E-05	1.14E-02	13.3	1.47E-05	1.47E-05	1.47E-05	1.47E-05
Co-60	2.97E-06	2.32E-03	2.70	4.85E-08	1.55E-06	4.42E-06	5.85E-06
Se-79	2.41E-08	1.88E-05	2.19E-02	3.94E-10	1.25E-08	3.59E-08	4.74E-08
Sr-90	3.78E-03	2.94	3.43E+03	6.17E-05	1.97E-03	5.62E-03	7.44E-03
Y-90	3.78E-03	2.95	3.43E+03	6.17E-05	1.97E-03	5.63E-03	7.44E-03
Zr-93	1.16E-07	9.06E-05	0.105	1.90E-09	6.05E-08	1.73E-07	2.29E-07
Nb-93m	4.90E-08	3.82E-05	4.45E-02	8.01E-10	2.55E-08	7.30E-08	9.66E-08
Tc-99	8.04E-07	6.27E-04	0.731	1.31E-08	4.19E-07	1.20E-06	1.58E-06
Ru-106	4.63E-04	0.361	421	4.60E-04	4.63E-04	4.63E-04	4.63E-04
Cd-113m	1.25E-06	9.78E-04	1.14	2.05E-08	6.53E-07	1.87E-06	2.47E-06
Sb-125	7.19E-05	5.61E-02	65.3	1.18E-06	3.75E-05	1.07E-04	1.42E-04
Sn-126	3.80E-08	2.96E-05	3.45E-02	6.20E-10	1.98E-08	5.65E-08	7.48E-08
I-129	1.62E-09	1.26E-06	1.47E-03	2.64E-11	8.42E-10	2.41E-09	3.18E-09
Cs-134	3.19E-05	2.49E-02	29.0	5.22E-07	1.66E-05	4.75E-05	6.29E-05
Cs-137	4.46E-03	3.48	4.05E+03	7.29E-05	2.32E-03	6.64E-03	8.78E-03
Ba-137m	4.22E-03	3.29	3.83E+03	6.89E-05	2.20E-03	6.28E-03	8.30E-03
Sm-151	8.33E-05	6.49E-02	75.6	1.36E-06	4.34E-05	1.24E-04	1.64E-04
Eu-152	9.38E-07	7.32E-04	0.852	8.61E-07	9.01E-07	9.76E-07	1.01E-06
Eu-154	2.22E-05	1.73E-02	20.2	3.63E-07	1.16E-05	3.31E-05	4.37E-05
Eu-155	1.70E-04	0.133	155	1.56E-04	1.63E-04	1.77E-04	1.84E-04
Ra-226	1.94E-13	1.51E-10	1.76E-07	3.17E-15	1.01E-13	2.89E-13	3.82E-13
Ra-228	8.50E-17	6.63E-14	7.72E-11	7.80E-17	8.16E-17	8.85E-17	9.19E-17
Ac-227	1.12E-12	8.70E-10	1.01E-06	1.82E-14	5.81E-13	1.66E-12	2.20E-12
Pa-231	6.37E-12	4.97E-09	5.78E-06	1.04E-13	3.32E-12	9.48E-12	1.25E-11
Th-229	9.72E-15	7.58E-12	8.83E-09	8.93E-15	9.33E-15	1.01E-14	1.05E-14
Th-232	3.25E-17	2.54E-14	2.95E-11	5.32E-19	1.69E-17	4.84E-17	6.40E-17
U-232	1.07E-09	8.32E-07	9.69E-04	1.53E-10	2.30E-10	1.36E-09	1.50E-09
U-233	1.09E-11	8.53E-09	9.94E-06	1.56E-12	2.36E-12	1.39E-11	1.54E-11
U-234	4.80E-06	3.74E-03	4.36	6.86E-07	1.04E-06	6.12E-06	6.75E-06
U-235	1.82E-07	1.42E-04	0.166	2.61E-08	3.94E-08	2.33E-07	2.57E-07
U-236	3.95E-07	3.08E-04	0.359	5.65E-08	8.53E-08	5.04E-07	5.56E-07
U-238	3.29E-06	2.57E-03	2.99	4.71E-07	7.11E-07	4.20E-06	4.64E-06
Np-237	1.18E-08	9.19E-06	1.07E-02	1.93E-10	6.14E-09	1.76E-08	2.32E-08
Pu-238	1.37E-04	0.107	124	2.91E-05	1.28E-04	1.40E-04	1.43E-04
Pu-239	1.11E-03	0.866	1.01E+03	2.36E-04	1.04E-03	1.13E-03	1.16E-03
Pu-240	3.37E-04	0.263	306	7.16E-05	3.15E-04	3.45E-04	3.51E-04
Pu-241	1.40E-02	10.9	1.27E+04	2.97E-03	1.31E-02	1.43E-02	1.46E-02
Pu-242	5.22E-08	4.07E-05	4.74E-02	1.11E-08	4.88E-08	5.33E-08	5.43E-08
Am-241	1.48E-05	1.16E-02	13.5	2.43E-07	7.73E-06	2.21E-05	9.69E-05
Am-243	3.13E-09	2.44E-06	2.84E-03	5.11E-11	1.63E-09	4.66E-09	2.04E-08
Cm-242	8.26E-08	6.44E-05	7.50E-02	7.59E-08	7.93E-08	8.60E-08	8.93E-08
Cm-243	1.38E-08	1.08E-05	1.26E-02	1.27E-08	1.33E-08	1.44E-08	1.50E-08
Cm-244	5.69E-08	4.44E-05	5.17E-02	9.30E-10	2.96E-08	1.49E-07	4.05E-07
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	1.95E-02 (g/L)	----	17.7	4.14E-03	1.82E-02	1.99E-02	2.03E-02
U	4.16E-02	7.71E+03	8.98E+03	5.94E-03	8.97E-03	5.30E-02	5.85E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AW-105

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	3.47E+06 (kg)	(800 kgal)	----	----	----	----	----
Heat Load	1.07 (kW)	(3.64E+03 BTU/hr)	----	0.951	1.01	1.13	1.19
Bulk Density*	1.14 (g/cc)	----	----	1.13	1.13	1.15	1.16
Water wt%†	76.0	----	----	73.5	74.6	77.2	78.6
TOC wt% C (wet	0.352	----	----	0.272	0.311	0.392	0.432

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	5.04E-05	4.40E-02	153	3.74E-05	3.97E-05	5.72E-05	6.39E-05
C-14	5.19E-06	4.53E-03	15.7	2.95E-06	2.95E-06	5.32E-06	5.41E-06
Ni-59	3.20E-07	2.79E-04	0.969	2.14E-07	2.14E-07	3.25E-07	3.30E-07
Ni-63	3.15E-05	2.75E-02	95.4	2.11E-05	2.11E-05	3.20E-05	3.25E-05
Co-60	9.11E-06	7.96E-03	27.6	6.55E-06	6.55E-06	1.04E-05	1.17E-05
Se-79	7.47E-07	6.53E-04	2.26	5.76E-07	6.04E-07	8.34E-07	9.18E-07
Sr-90	2.57E-02	22.4	7.77E+04	2.25E-02	2.41E-02	2.73E-02	2.89E-02
Y-90	2.57E-02	22.4	7.78E+04	2.07E-02	2.07E-02	2.73E-02	2.90E-02
Zr-93	3.56E-06	3.11E-03	10.8	2.79E-06	2.84E-06	3.95E-06	4.33E-06
Nb-93m	2.63E-06	2.30E-03	7.97	2.02E-06	2.13E-06	2.95E-06	3.25E-06
Tc-99	3.81E-05	3.33E-02	115	2.97E-05	3.38E-05	4.24E-05	4.70E-05
Ru-106	5.42E-09	4.74E-06	1.64E-02	3.14E-09	4.26E-09	6.58E-09	7.70E-09
Cd-113m	1.73E-05	1.52E-02	52.5	1.30E-05	1.30E-05	1.95E-05	2.04E-05
Sb-125	9.38E-05	8.20E-02	284	3.40E-05	6.30E-05	1.25E-04	1.56E-04
Sn-126	1.15E-06	1.00E-03	3.48	8.78E-07	9.33E-07	1.29E-06	1.42E-06
I-129	7.37E-08	6.44E-05	0.223	5.75E-08	6.54E-08	8.20E-08	9.10E-08
Cs-134	2.98E-05	2.60E-02	90.3	3.26E-06	1.61E-05	4.38E-05	5.75E-05
Cs-137	3.83E-02	33.5	1.16E+05	3.46E-02	3.64E-02	4.03E-02	4.26E-02
Ba-137m	3.63E-02	31.7	1.10E+05	3.14E-02	3.14E-02	3.81E-02	3.99E-02
Sm-151	2.65E-03	2.32	8.04E+03	2.04E-03	2.15E-03	2.97E-03	3.27E-03
Eu-152	8.94E-07	7.81E-04	2.71	7.16E-07	7.16E-07	9.73E-07	1.05E-06
Eu-154	1.35E-04	0.118	408	9.89E-05	9.89E-05	1.48E-04	1.54E-04
Eu-155	6.16E-05	5.38E-02	186	4.98E-05	5.10E-05	6.78E-05	7.39E-05
Ra-226	3.34E-11	2.92E-08	1.01E-04	2.13E-11	2.72E-11	3.96E-11	3.98E-11
Ra-228	4.84E-08	4.23E-05	0.147	2.08E-08	2.08E-08	5.58E-08	6.37E-08
Ac-227	2.05E-10	1.80E-07	6.22E-04	1.35E-10	1.70E-10	2.41E-10	2.26E-10
Pa-231	8.04E-10	7.03E-07	2.44E-03	6.46E-10	6.61E-10	8.82E-10	9.56E-10
Th-229	1.12E-09	9.82E-07	3.40E-03	4.86E-10	4.86E-10	1.29E-09	1.46E-09
Th-232	4.74E-09	4.14E-06	1.44E-02	1.33E-09	1.33E-09	5.68E-09	6.58E-09
U-232	1.66E-07	1.45E-04	0.503	1.16E-07	1.40E-07	1.96E-07	2.27E-07
U-233	6.36E-07	5.55E-04	1.92	4.44E-07	5.38E-07	7.49E-07	8.70E-07
U-234	7.16E-07	6.25E-04	2.17	4.27E-07	6.81E-07	7.32E-07	7.47E-07
U-235	2.74E-08	2.39E-05	8.29E-02	1.64E-08	2.61E-08	2.80E-08	2.86E-08
U-236	5.37E-08	4.69E-05	0.163	2.99E-08	5.09E-08	5.50E-08	5.63E-08
U-238	5.60E-07	4.90E-04	1.70	3.62E-07	5.37E-07	5.72E-07	5.82E-07
Np-237	1.41E-07	1.24E-04	0.428	1.14E-07	1.27E-07	1.56E-07	1.71E-07
Pu-238	1.68E-06	1.47E-03	5.08	1.13E-06	1.42E-06	1.93E-06	2.18E-06
Pu-239	1.99E-05	1.74E-02	60.3	1.55E-05	1.78E-05	2.20E-05	2.40E-05
Pu-240	5.02E-06	4.38E-03	15.2	3.67E-06	4.39E-06	5.65E-06	6.25E-06
Pu-241	1.61E-04	0.141	489	1.06E-04	1.35E-04	1.88E-04	2.13E-04
Pu-242	6.47E-10	5.65E-07	1.96E-03	4.39E-10	5.49E-10	7.44E-10	8.38E-10
Am-241	2.90E-05	2.53E-02	87.8	1.67E-05	2.26E-05	3.55E-05	3.58E-05
Am-243	3.47E-09	3.03E-06	1.05E-02	8.69E-10	2.13E-09	4.84E-09	4.89E-09
Cm-242	3.91E-08	3.42E-05	0.118	3.09E-08	3.18E-08	4.33E-08	4.73E-08
Cm-243	4.29E-09	3.75E-06	1.30E-02	3.33E-09	3.60E-09	4.79E-09	5.29E-09
Cm-244	8.82E-08	7.70E-05	0.267	4.08E-08	6.38E-08	1.04E-07	1.08E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	3.14E-04 (g/L)	----	0.950	2.36E-04	2.77E-04	3.50E-04	3.85E-04
U	6.46E-03	1.34E+03	4.66E+03	3.96E-03	6.16E-03	6.60E-03	6.73E-03

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-105							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	4.63E+06 (kg)	(1.04E+03 kgal)	----	----	----	----	----
Heat Load	1.11 (kW)	(3.79E+03 BTU/hr)	----	0.951	1.03	1.19	1.27
Bulk Density†	1.18 (g/cc)	----	----	1.11	1.16	1.19	1.19
Water wt%†	73.0	----	----	69.7	71.1	75.9	82.5
TOC wt% C (wet	0.264	----	----	0.205	0.234	0.295	0.324
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	4.24E-05	3.60E-02	167	2.88E-05	3.41E-05	4.94E-05	5.63E-05
C-14	4.04E-06	3.43E-03	15.9	2.31E-06	2.31E-06	4.14E-06	4.21E-06
Ni-59	2.75E-07	2.34E-04	1.08	1.94E-07	1.94E-07	2.79E-07	2.83E-07
Ni-63	2.76E-05	2.35E-02	109	1.96E-05	1.96E-05	2.80E-05	2.84E-05
Co-60	7.70E-06	6.54E-03	30.3	5.12E-06	5.72E-06	9.03E-06	1.03E-05
Se-79	5.80E-07	4.93E-04	2.28	4.49E-07	4.70E-07	6.47E-07	7.12E-07
Sr-90	2.06E-02	17.5	8.12E+04	1.73E-02	1.90E-02	2.23E-02	2.40E-02
Y-90	2.06E-02	17.5	8.12E+04	1.68E-02	1.68E-02	2.23E-02	2.40E-02
Zr-93	2.76E-06	2.35E-03	10.9	2.17E-06	2.21E-06	3.07E-06	3.35E-06
Nb-93m	2.04E-06	1.73E-03	8.01	1.56E-06	1.65E-06	2.28E-06	2.51E-06
Tc-99	2.95E-05	2.51E-02	116	2.31E-05	2.62E-05	3.28E-05	3.64E-05
Ru-106	1.07E-04	9.09E-02	421	1.06E-04	1.07E-04	1.07E-04	1.07E-04
Cd-113m	1.36E-05	1.16E-02	53.6	1.03E-05	1.03E-05	1.53E-05	1.60E-05
Sb-125	8.88E-05	7.55E-02	349	2.64E-05	5.71E-05	1.21E-04	1.53E-04
Sn-126	8.92E-07	7.58E-04	3.51	6.84E-07	7.27E-07	9.98E-07	1.10E-06
I-129	5.70E-08	4.85E-05	0.224	4.46E-08	5.07E-08	6.34E-08	7.04E-08
Cs-134	3.03E-05	2.58E-02	119	2.63E-06	1.62E-05	4.47E-05	5.87E-05
Cs-137	3.05E-02	25.9	1.20E+05	2.66E-02	2.85E-02	3.25E-02	3.45E-02
Ba-137m	2.89E-02	24.5	1.14E+05	2.51E-02	2.51E-02	3.08E-02	3.26E-02
Sm-151	2.06E-03	1.75	8.11E+03	1.59E-03	1.68E-03	2.30E-03	2.54E-03
Eu-152	9.04E-07	7.69E-04	3.56	7.68E-07	7.68E-07	9.65E-07	1.02E-06
Eu-154	1.09E-04	9.24E-02	428	8.12E-05	8.12E-05	1.19E-04	1.28E-04
Eu-155	8.66E-05	7.37E-02	341	7.44E-05	7.85E-05	9.30E-05	9.93E-05
Ra-226	2.58E-11	2.19E-08	1.01E-04	1.64E-11	2.10E-11	3.05E-11	3.07E-11
Ra-228	3.73E-08	3.17E-05	0.147	1.60E-08	1.60E-08	4.29E-08	4.90E-08
Ac-227	1.58E-10	1.35E-07	6.23E-04	1.04E-10	1.31E-10	1.86E-10	1.74E-10
Pa-231	6.20E-10	5.27E-07	2.44E-03	4.98E-10	5.10E-10	6.80E-10	7.37E-10
Th-229	8.65E-10	7.35E-07	3.40E-03	3.74E-10	3.74E-10	9.90E-10	1.12E-09
Th-232	3.65E-09	3.10E-06	1.44E-02	1.02E-09	1.02E-09	4.37E-09	5.06E-09
U-232	1.28E-07	1.09E-04	0.504	8.94E-08	1.08E-07	1.51E-07	1.75E-07
U-233	4.89E-07	4.16E-04	1.92	3.42E-07	4.14E-07	5.76E-07	6.69E-07
U-234	1.66E-06	1.41E-03	6.52	4.87E-07	7.83E-07	1.96E-06	2.11E-06
U-235	6.31E-08	5.37E-05	0.249	1.86E-08	2.99E-08	7.47E-08	8.03E-08
U-236	1.32E-07	1.13E-04	0.521	3.61E-08	6.04E-08	1.58E-07	1.70E-07
U-238	1.19E-06	1.01E-03	4.69	3.87E-07	5.91E-07	1.40E-06	1.50E-06
Np-237	1.12E-07	9.48E-05	0.439	9.05E-08	1.01E-07	1.22E-07	1.34E-07
Pu-238	3.29E-05	2.80E-02	130	7.58E-06	3.08E-05	3.36E-05	3.39E-05
Pu-239	2.71E-04	0.231	1.07E+03	6.63E-05	2.55E-04	2.77E-04	2.80E-04
Pu-240	8.17E-05	6.94E-02	321	1.93E-05	7.66E-05	8.33E-05	8.42E-05
Pu-241	3.35E-03	2.85	1.32E+04	7.67E-04	3.14E-03	3.42E-03	3.46E-03
Pu-242	1.25E-08	1.07E-05	4.94E-02	2.89E-09	1.18E-08	1.28E-08	1.29E-08
Am-241	2.57E-05	2.19E-02	101	1.29E-05	1.92E-05	3.24E-05	4.17E-05
Am-243	3.39E-09	2.88E-06	1.33E-02	6.80E-10	2.01E-09	4.80E-09	6.76E-09
Cm-242	4.92E-08	4.18E-05	0.193	4.28E-08	4.36E-08	5.24E-08	5.55E-08
Cm-243	6.49E-09	5.52E-06	2.56E-02	5.50E-09	5.96E-09	7.01E-09	7.52E-09
Cm-244	8.09E-08	6.88E-05	0.319	3.16E-08	5.59E-08	1.15E-07	1.47E-07
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	4.74E-03 (g/L)	----	18.7	1.14E-03	4.44E-03	4.84E-03	4.88E-03
U	1.46E-02	2.95E+03	1.36E+04	4.42E-03	6.98E-03	1.72E-02	1.85E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).
†Volume average for density, mass average Water wt% and TOC wt% C.

No photographs available for interior montage.

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TANK 241-AW-106 SUMMARY

TANK HISTORY	
Entered Service	1980
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
1B, 10A, 13A, 15A, 16A	4 in
7A, 12A	12 in
TANK TEMPERATURE	
Average Tank Temperature	94°F
Maximum Temperature	116°F
Date	July 24, 1995
Elevation from tank bottom	8.33 ft
Riser Number	4A
Minimum Temperature	66°F
Date	Feb 21 - April 11, 1994*
Elevation from tank bottom	34.33 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,160,000 gal
Total Risers	59
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	322,000 gal
Waste Type	DN
Drainable Interstitial Liquids	20,000 gal
Pumpable Liquids	97,000 gal
Saltcake	0 gal
Sludge	225,000 gal
Supernatant	97,000 gal
INTERIOR PHOTOGRAPHS	
Date	Feb 3, 1983
Montage Number	94080233-16CN
Photo Set Number	105816
WASTE SURFACE LEVEL	
Devices	Manual ENRAF and Tape
Max Level	403.4 in
Date	Jan 20 - Jan 25, 1994
Min Level	81.5 in
Date	March 16, 1996*

* Numerous dates in this time span.

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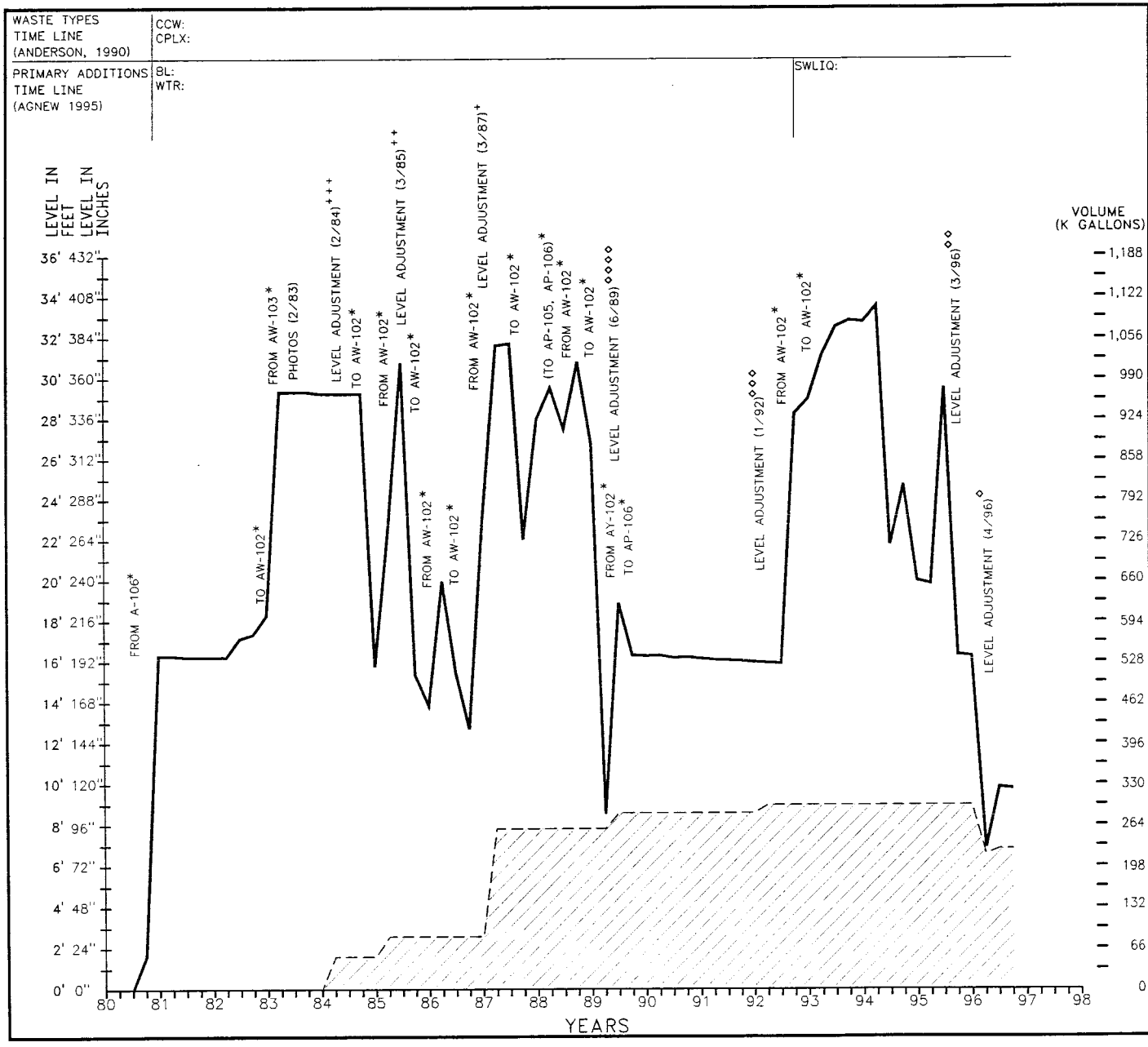


TANK INFO:

CONSTRUCTED 1978-1980
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- + THURMAN 1987b
- ++ VAIL 1985a
- +++ McCANN 1984c
- ◇ HANLON 1996l
- ◇◇ HANLON 1996f
- ◇◇◇ HANLON 1996e
- ◇◇◇◇ THURMAN 1989h

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

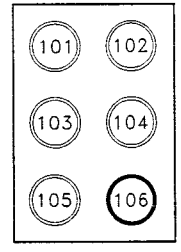
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

BL:	B-PLANT LOW-LEVEL WASTE
CCW:	COMPLEX CONCENTRATED WASTE
CPLX:	COMPLEXED WASTE
SWLIQ:	DILUTE, NON-COMPLEXED WASTE
WTR:	WATER

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

AW TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AW-106 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1980-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E170	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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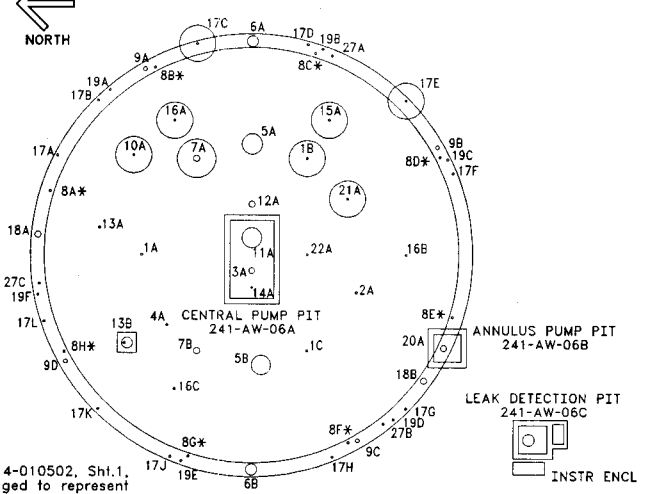
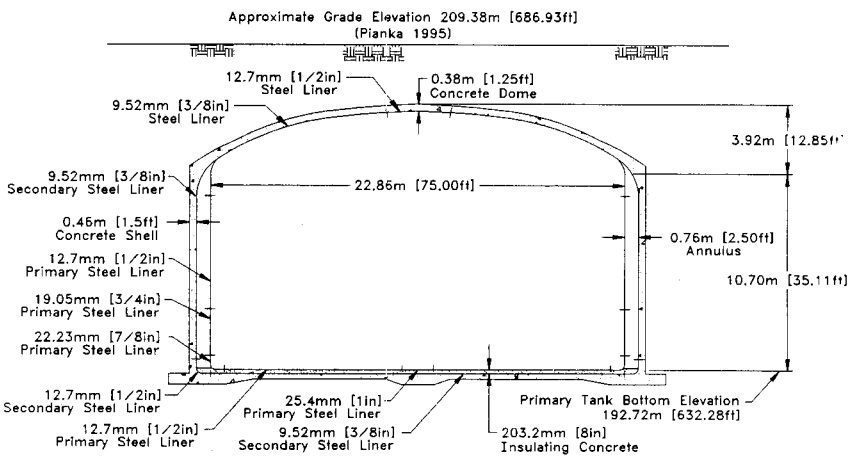
241-AW-106



* Riser no. on H-14-010502, Sht.1, Rev.1, were changed to represent H-2-70408, Rev.6 ECN-613252 12-18-95.

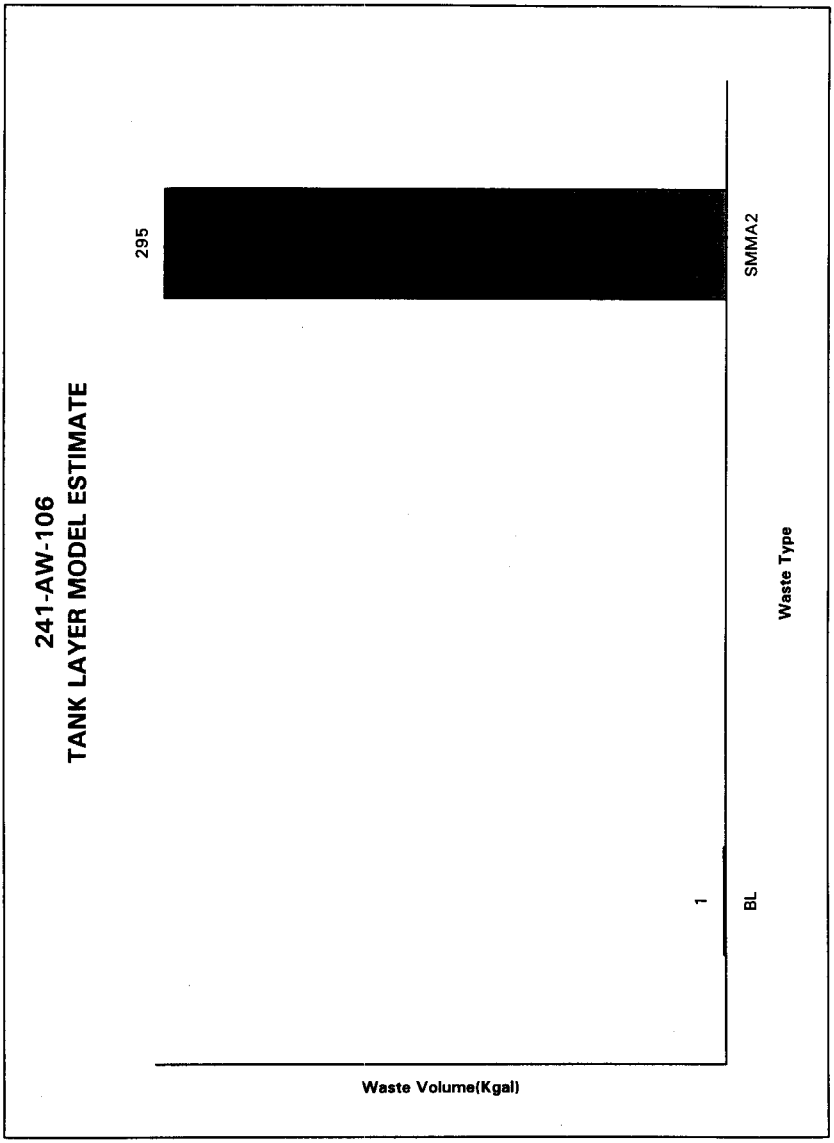
TANK RISER LOCATION

Ref: Salazar 1994
H-14-010502, Sh.1, Rev.
H-2-70408, Rev.6



Ref: H-2-70394, Rev.2

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AW-106

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	6.11E+03 (kg)	(0.999 kgal)	----	----	----	----	----
Heat Load	0.189 (kW)	(647 BTU/hr)	----	3.57E-02	0.140	0.217	0.234
Bulk Density	1.62 (g/cc)	----	----	1.35	1.44	1.74	1.78
Void Fraction	0.668	----	----	0.542	0.575	0.796	0.830
Water wt%	45.1	----	----	41.2	41.5	51.5	57.0
TOC wt% C (wet	0.244	----	----	0.164	0.210	0.281	0.353

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	7.00	9.96E+04	609	1.29	2.82	9.42	11.5
Al3+	3.06	5.10E+04	312	2.98	3.03	3.07	3.16
Fe3+ (total Fe)	2.21	7.63E+04	466	1.85	2.09	2.27	2.34
Cr3+	1.34E-07	4.31E-03	2.63E-05	7.53E-08	1.15E-07	1.48E-07	2.12E-07
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	1.21	4.39E+04	268	0.888	1.11	1.27	1.30
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0.203	5.04E+03	30.8	3.89E-03	5.93E-03	0.492	0.716
K+	9.02E-03	218	1.33	5.07E-03	7.74E-03	9.94E-03	1.43E-02
OH-	19.2	2.02E+05	1.24E+03	16.8	18.5	19.7	20.6
NO3-	8.76E-06	0.336	2.05E-03	9.98E-07	1.91E-06	1.34E-04	3.89E-02
NO2-	0.592	1.69E+04	103	0.294	0.508	0.653	0.936
CO32-	0.377	1.40E+04	85.6	-0.137	0.155	0.684	0.874
PO43-	6.70E-03	394	2.41	3.76E-03	5.74E-03	7.38E-03	1.06E-02
SO42-	2.95E-02	1.75E+03	10.7	1.66E-02	2.53E-02	3.25E-02	4.66E-02
Si (as SiO32-)	2.38	4.14E+04	253	1.88E-02	0.451	3.64	4.84
F-	0	0	0	0	0	0	0
Cl-	4.15E-02	910	5.56	2.33E-02	3.56E-02	4.57E-02	6.56E-02
C6H5O73-	1.00E-02	1.18E+03	7.18	5.65E-03	8.62E-03	1.11E-02	1.59E-02
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0.134	6.22E+03	38.0	7.53E-02	0.115	0.148	0.212
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	9.23E-02	970	5.93	1.33E-02	7.21E-02	0.111	0.179
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AW-106							
SMM Composite Inventory Estimate							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	5.27E+06 (kg)	(1.11E+03 kgal)	----	----	----	----	----
Heat Load	2.64 (kW)	(9.00E+03 BTU/hr)	----	2.50	2.57	2.71	2.78
Bulk Density*	1.26 (g/cc)	----	----	1.22	1.24	1.28	1.30
Water wt%	62.1	----	----	57.8	59.8	64.2	66.5
TOC wt% C (wet	0.586	----	----	0.450	0.518	0.652	0.714
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	6.36	1.16E+05	6.13E+05	5.28	5.81	6.91	7.41
Al3+	0.559	1.20E+04	6.32E+04	0.475	0.516	0.602	0.643
Fe3+ (total Fe)	8.09E-03	359	1.89E+03	7.10E-03	7.58E-03	8.60E-03	9.08E-03
Cr3+	4.11E-02	1.70E+03	8.95E+03	3.59E-02	3.85E-02	4.37E-02	4.63E-02
Bi3+	3.33E-04	55.3	292	3.11E-04	3.22E-04	3.44E-04	3.55E-04
La3+	8.21E-06	0.906	4.78	5.99E-06	7.07E-06	9.35E-06	1.04E-05
Hg2+	7.88E-06	1.26	6.63	4.23E-06	7.61E-06	8.16E-06	8.42E-06
Zr (as ZrO(OH)2)	1.67E-03	121	637	8.10E-04	1.56E-03	1.77E-03	1.88E-03
Pb2+	3.60E-04	59.3	313	3.13E-04	3.36E-04	3.84E-04	4.08E-04
Ni2+	4.75E-03	222	1.17E+03	4.55E-03	4.65E-03	4.85E-03	4.95E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	7.63E-03	333	1.76E+03	3.77E-03	5.66E-03	9.60E-03	1.09E-02
Ca2+	3.34E-02	1.06E+03	5.60E+03	2.86E-02	3.14E-02	3.53E-02	3.72E-02
K+	0.153	4.74E+03	2.50E+04	3.30E-02	9.09E-02	0.215	0.277
OH-	3.73	5.03E+04	2.65E+05	2.99	3.35	4.11	4.47
NO3-	2.31	1.14E+05	6.00E+05	2.04	2.17	2.45	2.58
NO2-	0.623	2.28E+04	1.20E+05	0.550	0.581	0.668	0.695
CO32-	0.398	1.90E+04	1.00E+05	0.312	0.354	0.440	0.470
PO43-	0.107	8.05E+03	4.25E+04	6.20E-02	8.39E-02	0.130	0.152
SO42-	9.25E-02	7.06E+03	3.72E+04	7.83E-02	8.53E-02	9.98E-02	0.107
Si (as SiO32-)	3.53E-02	787	4.15E+03	2.54E-02	3.02E-02	4.03E-02	4.47E-02
F-	0.147	2.21E+03	1.17E+04	2.31E-02	0.126	0.167	0.188
Cl-	0.104	2.93E+03	1.54E+04	8.40E-02	9.38E-02	0.114	0.124
C6H5O73-	1.49E-02	2.24E+03	1.18E+04	1.01E-02	1.24E-02	1.74E-02	1.97E-02
EDTA4-	5.35E-03	1.22E+03	6.45E+03	1.83E-03	3.55E-03	7.16E-03	8.93E-03
HEDTA3-	9.40E-03	2.05E+03	1.08E+04	2.36E-03	5.80E-03	1.30E-02	1.66E-02
glycolate-	0.129	7.68E+03	4.05E+04	6.46E-02	9.60E-02	0.162	0.193
acetate-	4.12E-03	193	1.02E+03	3.42E-03	3.72E-03	4.55E-03	5.20E-03
oxalate2-	1.08E-05	0.752	3.96	9.55E-06	1.01E-05	1.14E-05	1.20E-05
DBP	9.29E-03	1.55E+03	8.18E+03	7.10E-03	8.17E-03	1.04E-02	1.15E-02
butanol	9.29E-03	547	2.89E+03	7.10E-03	8.17E-03	1.04E-02	1.15E-02
NH3	0.463	6.25E+03	3.30E+04	4.65E-02	0.248	0.682	0.897
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-106							
Total Inventory Estimate*							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	5.28E+06 (kg)	(1.11E+03 kgal)	----	----	----	----	----
Heat Load	2.82 (kW)	(9.65E+03 BTU/hr)	----	2.67	2.76	2.90	2.97
Bulk Density†	1.26 (g/cc)	----	----	1.22	1.24	1.28	1.30
Water wt%†	62.1	----	----	57.8	59.8	64.2	66.5
TOC wt% C (wet	0.585	----	----	0.450	0.517	0.652	0.713
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	6.36	1.16E+05	6.13E+05	5.27	5.81	6.91	7.42
Al3+	0.561	1.20E+04	6.35E+04	0.477	0.518	0.604	0.645
Fe3+ (total Fe)	1.01E-02	447	2.36E+03	9.08E-03	9.57E-03	1.06E-02	1.11E-02
Cr3+	4.10E-02	1.70E+03	8.95E+03	3.59E-02	3.84E-02	4.37E-02	4.62E-02
Bi3+	3.33E-04	55.2	292	3.11E-04	3.22E-04	3.44E-04	3.54E-04
La3+	8.20E-06	0.905	4.78	5.98E-06	7.07E-06	9.34E-06	1.04E-05
Hg2+	7.88E-06	1.26	6.63	4.23E-06	7.60E-06	8.15E-06	8.42E-06
Zr (as ZrO(OH)2)	1.67E-03	121	637	8.09E-04	1.56E-03	1.77E-03	1.88E-03
Pb2+	3.60E-04	59.2	313	3.12E-04	3.36E-04	3.84E-04	4.07E-04
Ni2+	5.84E-03	272	1.44E+03	5.55E-03	5.73E-03	5.94E-03	6.03E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	7.62E-03	333	1.76E+03	3.77E-03	5.65E-03	9.60E-03	1.09E-02
Ca2+	3.35E-02	1.07E+03	5.63E+03	2.88E-02	3.15E-02	3.55E-02	3.74E-02
K+	0.152	4.73E+03	2.50E+04	3.30E-02	9.09E-02	0.215	0.277
OH-	3.74	5.05E+04	2.67E+05	3.00	3.36	4.12	4.48
NO3-	2.31	1.14E+05	6.00E+05	2.04	2.17	2.44	2.57
NO2-	0.623	2.28E+04	1.20E+05	0.550	0.581	0.668	0.695
CO32-	0.398	1.90E+04	1.00E+05	0.311	0.354	0.441	0.470
PO43-	0.107	8.04E+03	4.25E+04	6.19E-02	8.38E-02	0.129	0.151
SO42-	9.24E-02	7.05E+03	3.72E+04	7.83E-02	8.52E-02	9.97E-02	0.107
Si (as SiO32-)	3.74E-02	834	4.40E+03	2.86E-02	3.35E-02	4.13E-02	4.47E-02
F-	0.147	2.21E+03	1.17E+04	2.30E-02	0.126	0.167	0.187
Cl-	0.104	2.92E+03	1.54E+04	8.40E-02	9.37E-02	0.114	0.124
C6H5O73-	1.49E-02	2.24E+03	1.18E+04	1.01E-02	1.24E-02	1.74E-02	1.97E-02
EDTA4-	5.34E-03	1.22E+03	6.45E+03	1.82E-03	3.54E-03	7.15E-03	8.92E-03
HEDTA3-	9.39E-03	2.05E+03	1.08E+04	2.36E-03	5.80E-03	1.30E-02	1.65E-02
glycolate-	0.129	7.68E+03	4.06E+04	6.46E-02	9.61E-02	0.162	0.193
acetate-	4.12E-03	193	1.02E+03	3.42E-03	3.72E-03	4.54E-03	5.19E-03
oxalate2-	1.07E-05	0.751	3.96	9.54E-06	1.01E-05	1.14E-05	1.19E-05
DBP	9.28E-03	1.55E+03	8.18E+03	7.09E-03	8.16E-03	1.04E-02	1.15E-02
butanol	9.28E-03	547	2.89E+03	7.09E-03	8.16E-03	1.04E-02	1.15E-02
NH3	0.462	6.24E+03	3.30E+04	4.65E-02	0.248	0.681	0.896
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-106

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	6.11E+03 (kg)	(0.999 kgal)	----	----	----	----	----
Heat Load	0.189 (kW)	(647 BTU/hr)	----	3.57E-02	0.140	0.217	0.234
Bulk Density	1.62 (g/cc)	----	----	1.35	1.44	1.74	1.78
Void Fraction	0.668	----	----	0.542	0.575	0.796	0.830
Water wt%	45.1	----	----	41.2	41.5	51.5	57.0
TOC wt% C (wet	0.244	----	----	0.164	0.210	0.281	0.353

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	1.65E-05	1.02E-02	6.25E-02	4.24E-06	1.03E-05	2.32E-05	3.99E-05
C-14	1.11E-06	6.88E-04	4.21E-03	6.25E-07	9.54E-07	1.23E-06	1.28E-05
Ni-59	1.89E-04	0.117	0.715	1.39E-04	1.73E-04	1.98E-04	2.05E-04
Ni-63	1.87E-02	11.6	70.8	1.38E-02	1.71E-02	1.96E-02	2.03E-02
Co-60	2.50E-06	1.55E-03	9.47E-03	1.41E-06	2.15E-06	2.76E-06	3.96E-06
Se-79	7.55E-07	4.67E-04	2.85E-03	4.22E-07	5.41E-07	2.62E-05	1.73E-04
Sr-90	7.43	4.60E+03	2.81E+04	1.40	5.50	8.52	9.20
Y-90	7.44	4.60E+03	2.81E+04	1.40	5.50	8.53	9.20
Zr-93	3.39E-06	2.10E-03	1.28E-02	1.91E-06	2.33E-06	4.76E-05	7.80E-04
Nb-93m	2.72E-06	1.68E-03	1.03E-02	1.42E-06	1.97E-06	1.08E-04	6.21E-04
Tc-99	7.44E-06	4.61E-03	2.81E-02	4.18E-06	6.38E-06	8.20E-06	1.18E-05
Ru-106	1.59E-06	9.87E-04	6.03E-03	7.07E-07	1.30E-06	1.89E-06	2.17E-06
Cd-113m	1.16E-05	7.16E-03	4.38E-02	6.51E-06	9.93E-06	1.68E-05	2.50E-03
Sb-125	1.53E-05	9.47E-03	5.79E-02	8.60E-06	1.31E-05	1.69E-05	2.42E-05
Sn-126	1.19E-06	7.37E-04	4.51E-03	6.58E-07	8.71E-07	5.23E-05	2.72E-04
I-129	1.45E-08	8.96E-06	5.48E-05	8.14E-09	1.24E-08	1.60E-08	2.29E-08
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	2.73E-03	1.69	10.3	1.50E-03	1.99E-03	0.112	0.625
Eu-152	1.51E-04	9.31E-02	0.569	1.50E-04	1.50E-04	1.51E-04	1.51E-04
Eu-154	7.57E-05	4.68E-02	0.286	4.25E-05	6.33E-05	8.81E-05	4.54E-03
Eu-155	8.62E-03	5.34	32.6	8.61E-03	8.62E-03	8.63E-03	8.65E-03
Ra-226	6.30E-09	3.90E-06	2.38E-05	3.93E-11	1.57E-09	1.10E-08	1.56E-08
Ra-228	8.01E-14	4.95E-11	3.03E-10	7.99E-14	8.00E-14	8.01E-14	8.03E-14
Ac-227	2.75E-08	1.70E-05	1.04E-04	2.05E-10	3.26E-10	5.50E-08	8.14E-08
Pa-231	6.70E-10	4.15E-07	2.53E-06	2.86E-10	4.57E-10	7.59E-09	1.54E-07
Th-229	1.19E-11	7.37E-09	4.50E-08	1.19E-11	1.19E-11	1.19E-11	1.19E-11
Th-232	4.46E-16	2.76E-13	1.69E-12	2.51E-16	3.83E-16	4.92E-16	7.05E-16
U-232	1.59E-12	9.84E-10	6.01E-09	8.93E-13	1.36E-12	1.75E-12	2.51E-12
U-233	2.15E-14	1.33E-11	8.11E-11	1.21E-14	1.84E-14	2.36E-14	3.39E-14
U-234	5.99E-09	3.71E-06	2.26E-05	3.37E-09	5.14E-09	6.60E-09	9.47E-09
U-235	2.32E-10	1.43E-07	8.77E-07	1.30E-10	1.99E-10	2.55E-10	3.67E-10
U-236	4.36E-10	2.70E-07	1.65E-06	2.45E-10	3.74E-10	4.80E-10	6.89E-10
U-238	4.62E-09	2.86E-06	1.75E-05	2.59E-09	3.96E-09	5.09E-09	7.30E-09
Np-237	2.38E-08	1.47E-05	8.99E-05	1.34E-08	2.04E-08	2.62E-08	3.76E-08
Pu-238	2.52E-04	0.156	0.954	1.65E-04	2.20E-04	2.84E-04	3.13E-04
Pu-239	4.42E-03	2.73	16.7	2.88E-03	3.76E-03	5.08E-03	5.72E-03
Pu-240	9.59E-04	0.593	3.63	6.26E-04	8.23E-04	1.09E-03	1.22E-03
Pu-241	1.77E-02	10.9	66.9	1.15E-02	1.54E-02	1.99E-02	2.19E-02
Pu-242	1.15E-07	7.12E-05	4.35E-04	7.51E-08	1.01E-07	1.29E-07	1.42E-07
Am-241	4.08E-03	2.52	15.4	2.17E-05	1.79E-03	6.37E-03	8.56E-03
Am-243	3.09E-07	1.91E-04	1.17E-03	1.64E-09	1.45E-07	4.52E-07	5.75E-07
Cm-242	8.00E-06	4.95E-03	3.03E-02	7.99E-06	8.00E-06	8.01E-06	8.02E-06
Cm-243	8.52E-07	5.27E-04	3.22E-03	8.50E-07	8.52E-07	8.53E-07	8.54E-07
Cm-244	2.28E-05	1.41E-02	8.63E-02	5.08E-06	1.70E-05	2.87E-05	3.43E-05

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	7.55E-02 (g/L)	----	0.286	4.93E-02	6.42E-02	8.68E-02	9.77E-02
U	5.82E-05	8.57	5.24E-02	3.27E-05	4.99E-05	6.41E-05	9.20E-05

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AW-106

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	5.27E+06 (kg)	(1.11E+03 kgal)	----	----	----	----	----
Heat Load	2.64 (kW)	(9.00E+03 BTU/hr)	----	2.50	2.57	2.71	2.78
Bulk Density*	1.26 (g/cc)	----	----	1.22	1.24	1.28	1.30
Water wt%†	62.1	----	----	57.8	59.8	64.2	66.5
TOC wt% C (wet	0.586	----	----	0.450	0.518	0.652	0.714

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	8.15E-05	6.47E-02	341	6.01E-05	6.01E-05	9.06E-05	1.01E-04
C-14	9.47E-06	7.53E-03	39.7	4.99E-06	4.99E-06	9.75E-06	9.94E-06
Ni-59	6.29E-07	5.00E-04	2.64	4.18E-07	4.18E-07	6.40E-07	6.50E-07
Ni-63	6.19E-05	4.92E-02	259	4.11E-05	4.11E-05	6.30E-05	6.40E-05
Co-60	1.43E-05	1.13E-02	59.7	9.13E-06	9.13E-06	1.53E-05	1.64E-05
Se-79	1.44E-06	1.14E-03	6.03	1.08E-06	1.15E-06	1.63E-06	1.80E-06
Sr-90	4.69E-02	37.2	1.96E+05	4.40E-02	4.54E-02	4.83E-02	4.97E-02
Y-90	4.69E-02	37.2	1.96E+05	3.70E-02	3.70E-02	4.83E-02	4.97E-02
Zr-93	6.83E-06	5.43E-03	28.6	5.20E-06	5.40E-06	7.67E-06	8.46E-06
Nb-93m	5.12E-06	4.06E-03	21.4	3.81E-06	4.12E-06	5.78E-06	6.42E-06
Tc-99	6.93E-05	5.50E-02	290	5.26E-05	6.07E-05	7.79E-05	8.62E-05
Ru-106	7.10E-09	5.64E-06	2.97E-02	5.02E-09	6.04E-09	8.16E-09	9.17E-09
Cd-113m	3.19E-05	2.54E-02	134	2.34E-05	2.34E-05	3.65E-05	3.80E-05
Sb-125	1.11E-04	8.80E-02	464	6.05E-05	8.48E-05	1.37E-04	1.63E-04
Sn-126	2.22E-06	1.76E-03	9.29	1.64E-06	1.79E-06	2.51E-06	2.79E-06
I-129	1.34E-07	1.06E-04	0.561	1.02E-07	1.17E-07	1.51E-07	1.67E-07
Cs-134	2.65E-05	2.10E-02	111	4.18E-06	1.50E-05	3.82E-05	4.97E-05
Cs-137	6.69E-02	53.1	2.80E+05	6.12E-02	6.40E-02	6.98E-02	7.31E-02
Ba-137m	6.33E-02	50.3	2.65E+05	5.44E-02	5.44E-02	6.60E-02	6.87E-02
Sm-151	5.13E-03	4.07	2.15E+04	3.81E-03	4.13E-03	5.80E-03	6.44E-03
Eu-152	1.62E-06	1.29E-03	6.78	1.26E-06	1.26E-06	1.79E-06	1.95E-06
Eu-154	2.34E-04	0.186	981	1.63E-04	1.63E-04	2.60E-04	2.71E-04
Eu-155	1.03E-04	8.18E-02	431	8.19E-05	8.19E-05	1.13E-04	1.22E-04
Ra-226	6.67E-11	5.30E-08	2.79E-04	4.09E-11	5.35E-11	7.98E-11	8.03E-11
Ra-228	7.72E-08	6.13E-05	0.323	3.71E-08	3.71E-08	9.04E-08	1.05E-07
Ac-227	4.08E-10	3.24E-07	1.71E-03	2.58E-10	3.31E-10	4.83E-10	4.51E-10
Pa-231	1.55E-09	1.24E-06	6.51E-03	1.22E-09	1.27E-09	1.72E-09	1.88E-09
Th-229	1.79E-09	1.43E-06	7.52E-03	8.68E-10	8.68E-10	2.08E-09	2.39E-09
Th-232	7.33E-09	5.82E-06	3.07E-02	2.37E-09	2.37E-09	8.69E-09	9.99E-09
U-232	2.77E-07	2.20E-04	1.16	1.88E-07	2.31E-07	3.30E-07	3.87E-07
U-233	1.06E-06	8.43E-04	4.45	7.19E-07	8.87E-07	1.26E-06	1.48E-06
U-234	9.59E-07	7.62E-04	4.02	7.16E-07	9.02E-07	9.85E-07	1.01E-06
U-235	3.68E-08	2.92E-05	0.154	2.76E-08	3.47E-08	3.78E-08	3.88E-08
U-236	6.91E-08	5.49E-05	0.290	4.92E-08	6.45E-08	7.13E-08	7.34E-08
U-238	7.78E-07	6.18E-04	3.26	6.12E-07	7.39E-07	7.96E-07	8.13E-07
Np-237	2.51E-07	2.00E-04	1.05	1.97E-07	2.23E-07	2.79E-07	3.06E-07
Pu-238	2.31E-06	1.83E-03	9.67	1.49E-06	1.89E-06	2.72E-06	3.12E-06
Pu-239	3.05E-05	2.42E-02	128	2.38E-05	2.71E-05	3.38E-05	3.71E-05
Pu-240	7.31E-06	5.81E-03	30.6	5.30E-06	6.28E-06	8.33E-06	9.32E-06
Pu-241	2.16E-04	0.172	906	1.33E-04	1.74E-04	2.59E-04	3.00E-04
Pu-242	8.96E-10	7.12E-07	3.75E-03	5.84E-10	7.37E-10	1.05E-09	1.21E-09
Am-241	4.25E-05	3.37E-02	178	3.00E-05	3.61E-05	4.88E-05	5.32E-05
Am-243	3.91E-09	3.11E-06	1.64E-02	1.73E-09	2.79E-09	5.06E-09	5.11E-09
Cm-242	6.96E-08	5.53E-05	0.292	5.22E-08	5.51E-08	7.85E-08	8.70E-08
Cm-243	7.27E-09	5.78E-06	3.05E-02	5.42E-09	5.89E-09	8.22E-09	9.13E-09
Cm-244	1.23E-07	9.75E-05	0.514	8.11E-08	1.01E-07	1.44E-07	1.64E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	4.71E-04 (g/L)	----	1.97	3.54E-04	4.11E-04	5.30E-04	5.87E-04
U	8.81E-03	1.67E+03	8.79E+03	6.71E-03	8.32E-03	9.04E-03	9.25E-03

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AW-106							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	5.28E+06 (kg)	(1.11E+03 kgal)	----	----	----	----	----
Heat Load	2.82 (kW)	(9.65E+03 BTU/hr)	----	2.67	2.76	2.90	2.97
Bulk Density†	1.26 (g/cc)	----	----	1.22	1.24	1.28	1.30
Water wt%†	62.1	----	----	57.8	59.8	64.2	66.5
TOC wt% C (wet	0.585	----	----	0.450	0.517	0.652	0.713
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	8.14E-05	6.47E-02	341	6.00E-05	6.00E-05	9.06E-05	1.01E-04
C-14	9.46E-06	7.52E-03	39.7	4.99E-06	4.99E-06	9.74E-06	9.94E-06
Ni-59	7.99E-07	6.35E-04	3.35	5.88E-07	5.88E-07	8.09E-07	8.20E-07
Ni-63	7.87E-05	6.25E-02	330	5.79E-05	5.79E-05	7.98E-05	8.08E-05
Co-60	1.42E-05	1.13E-02	59.7	9.12E-06	9.12E-06	1.53E-05	1.64E-05
Se-79	1.44E-06	1.14E-03	6.04	1.08E-06	1.15E-06	1.62E-06	1.80E-06
Sr-90	5.35E-02	42.5	2.24E+05	4.81E-02	5.18E-02	5.49E-02	5.63E-02
Y-90	5.35E-02	42.5	2.25E+05	4.37E-02	4.37E-02	5.49E-02	5.63E-02
Zr-93	6.83E-06	5.42E-03	28.6	5.20E-06	5.40E-06	7.66E-06	8.46E-06
Nb-93m	5.11E-06	4.06E-03	21.4	3.81E-06	4.11E-06	5.78E-06	6.42E-06
Tc-99	6.92E-05	5.50E-02	290	5.25E-05	6.07E-05	7.78E-05	8.61E-05
Ru-106	8.53E-09	6.77E-06	3.58E-02	6.62E-09	7.55E-09	9.50E-09	1.04E-08
Cd-113m	3.19E-05	2.53E-02	134	2.33E-05	2.33E-05	3.65E-05	3.80E-05
Sb-125	1.11E-04	8.79E-02	464	6.04E-05	8.48E-05	1.37E-04	1.63E-04
Sn-126	2.22E-06	1.76E-03	9.29	1.64E-06	1.79E-06	2.51E-06	2.79E-06
I-129	1.34E-07	1.06E-04	0.561	1.01E-07	1.17E-07	1.50E-07	1.66E-07
Cs-134	2.64E-05	2.10E-02	111	4.17E-06	1.50E-05	3.82E-05	4.97E-05
Cs-137	6.68E-02	53.1	2.80E+05	6.12E-02	6.39E-02	6.98E-02	7.31E-02
Ba-137m	6.32E-02	50.2	2.65E+05	5.44E-02	5.44E-02	6.60E-02	6.87E-02
Sm-151	5.12E-03	4.07	2.15E+04	3.81E-03	4.12E-03	5.80E-03	6.44E-03
Eu-152	1.75E-06	1.39E-03	7.35	1.40E-06	1.40E-06	1.92E-06	2.08E-06
Eu-154	2.34E-04	0.186	982	1.63E-04	1.63E-04	2.60E-04	2.70E-04
Eu-155	1.11E-04	8.79E-02	464	8.96E-05	8.96E-05	1.20E-04	1.29E-04
Ra-226	7.23E-11	5.74E-08	3.03E-04	5.49E-11	6.34E-11	8.12E-11	8.03E-11
Ra-228	7.71E-08	6.13E-05	0.323	3.70E-08	3.70E-08	9.03E-08	1.04E-07
Ac-227	4.32E-10	3.43E-07	1.81E-03	3.31E-10	3.81E-10	4.83E-10	4.69E-10
Pa-231	1.55E-09	1.23E-06	6.52E-03	1.22E-09	1.27E-09	1.72E-09	1.88E-09
Th-229	1.79E-09	1.42E-06	7.52E-03	8.67E-10	8.67E-10	2.08E-09	2.39E-09
Th-232	7.32E-09	5.82E-06	3.07E-02	2.37E-09	2.37E-09	8.68E-09	9.98E-09
U-232	2.77E-07	2.20E-04	1.16	1.88E-07	2.31E-07	3.30E-07	3.86E-07
U-233	1.06E-06	8.43E-04	4.45	7.19E-07	8.86E-07	1.26E-06	1.48E-06
U-234	9.58E-07	7.61E-04	4.02	7.16E-07	9.02E-07	9.84E-07	1.01E-06
U-235	3.68E-08	2.92E-05	0.154	2.76E-08	3.46E-08	3.78E-08	3.87E-08
U-236	6.91E-08	5.49E-05	0.290	4.91E-08	6.44E-08	7.12E-08	7.33E-08
U-238	7.78E-07	6.18E-04	3.26	6.11E-07	7.39E-07	7.95E-07	8.13E-07
Np-237	2.51E-07	1.99E-04	1.05	1.97E-07	2.23E-07	2.79E-07	3.06E-07
Pu-238	2.53E-06	2.01E-03	10.6	1.72E-06	2.12E-06	2.95E-06	3.35E-06
Pu-239	3.44E-05	2.73E-02	144	2.78E-05	3.10E-05	3.78E-05	4.10E-05
Pu-240	8.17E-06	6.49E-03	34.2	6.16E-06	7.14E-06	9.19E-06	1.02E-05
Pu-241	2.32E-04	0.184	973	1.48E-04	1.89E-04	2.74E-04	3.15E-04
Pu-242	9.99E-10	7.93E-07	4.19E-03	6.87E-10	8.40E-10	1.16E-09	1.31E-09
Am-241	4.61E-05	3.66E-02	193	3.57E-05	4.08E-05	5.16E-05	5.31E-05
Am-243	4.19E-09	3.33E-06	1.76E-02	2.01E-09	3.06E-09	5.34E-09	5.38E-09
Cm-242	7.67E-08	6.10E-05	0.322	5.93E-08	6.22E-08	8.57E-08	9.42E-08
Cm-243	8.03E-09	6.38E-06	3.37E-02	6.18E-09	6.65E-09	8.98E-09	9.89E-09
Cm-244	1.43E-07	1.14E-04	0.600	1.03E-07	1.23E-07	1.59E-07	1.74E-07
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	5.38E-04 (g/L)	----	2.26	4.22E-04	4.79E-04	5.98E-04	6.55E-04
U	8.80E-03	1.66E+03	8.79E+03	6.70E-03	8.31E-03	9.03E-03	9.25E-03

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

241-AW-106
Photo date: 2-3-83

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5.0 241-AY Tank Farm

The AY Tank Farm is located in the 200 East Area north of 4th Street and east of Buffalo Avenue. The farm contains two flat bottom design, double-shell tanks built from 1968 through 1970. The tanks are 75 feet in diameter with an operating capacity of 1,000,000 gallons. For more information on the design, construction, and waste contents of the tanks, refer to the AY Tank Farm Supporting Document, HNF-SD-WM-ER-317, Rev. 1 (Brevick et al., 1997d).

The 241-AY Tank Farm is designated as an aging waste facility. Tank 241-AY-102 is used as a lag storage for double-shell slurry feed waste (Leach and Stahl, 1993). The primary additions to the tanks were B Plant high-level waste (B), B Plant low-level waste (BL), cesium recovery waste (CSR), decontamination waste (DW), PUREX high-level waste (P2), PUREX low-level waste (PL2), strontium recovery waste (SRR), dilute non-complexed waste (SWLIQ), unknown waste (UNK), and water (WTR) (Agnew et al., 1995).

The following table presents a summary of the 241-AY Tank Farm. Refer to the glossary for waste type terminology.

TANK FARM 241-AY SUMMARY

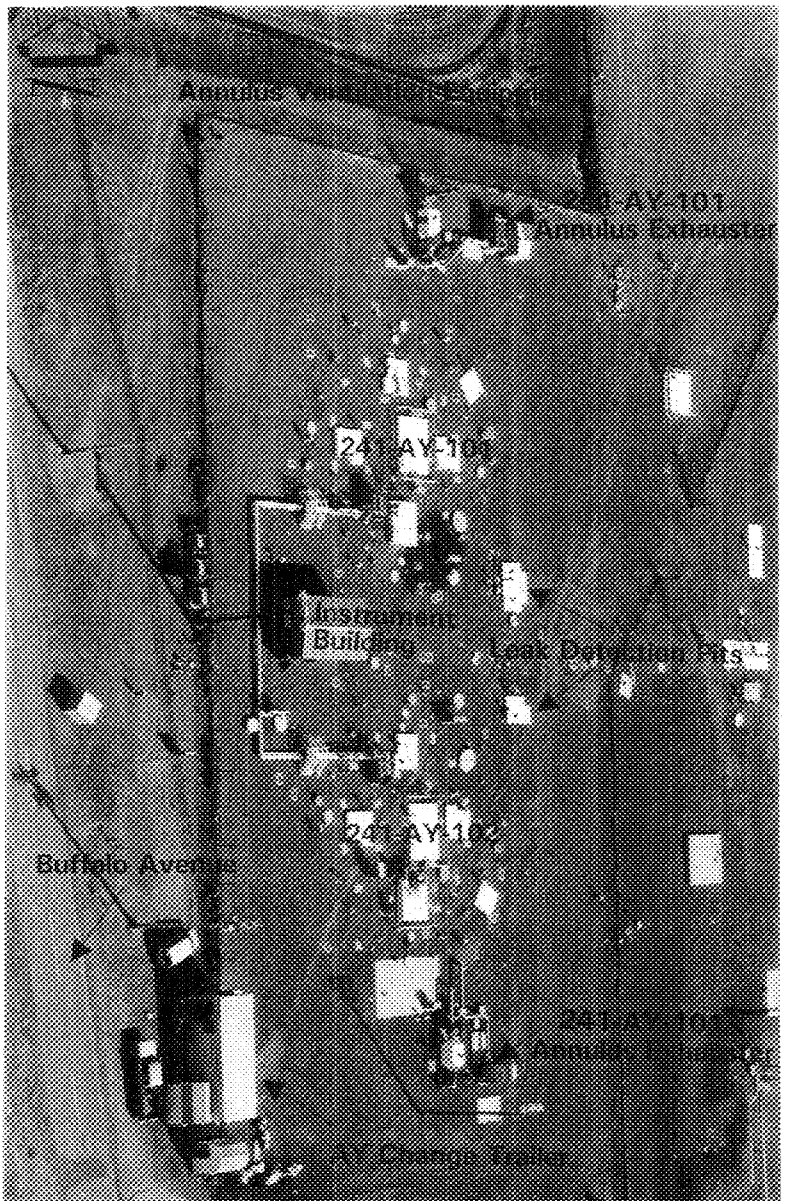
TANK FARM DESCRIPTION		WASTE VOLUME (HANLON 1996l)	
Shell Type	Double	Total Waste Volume	1,762,000 gal
Number of Tanks	2	Waste Type	DC, DN
Construction Date	1968 - 1970	Drainable Interstitial Liquids	4,000 gal
INTEGRITY		Pumpable Liquids	1,638,000 gal
Sound	101	Saltcake	0 gal
	102	Sludge	124,000 gal
		Supernatant	1,638,000 gal
TANK VOLUMES		**WATCH LISTS**	
2 @ 1,000,000 gal		Hydrogen	none
		Organic	none
		High Heat	none

The historical characterization and waste inventory information for each tank is assembled into a set of tables, sketches, graphs, and interior tank montage. The set consists of the following for each tank in AY Tank Farm:

- Tank Summary table
- Waste and Level History sketch
- Riser configuration sketch
- Tank Layer Model Estimate graph
- Total Inventory Estimate tables
- TLM Solids Composite Inventory Estimate tables
- SMM Composite Inventory Estimate tables
- Interior tank montage

The supporting document for this tank farm provides backup data and further explanation of the above tables, sketches, and graphs.

AY TANK FARM


Annulus Ventilation Exhauster
241-AY-101
Annulus Exhauster
241-AY-101
Instrument
Building
Leak Detection Pits
241-AY-102
Buffalo Avenue
241-AY-102
Annulus Exhauster
AY Change Trailer

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TANK 241-AY-101 SUMMARY

TANK HISTORY	
Entered Service	1971
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
5A, 5B	4 in
15A, 15G, 15K, 15M, 15O	6 in
TANK TEMPERATURE	
Average Tank Temperature	87°F
Maximum Temperature	119°F
Date	Sept 25, 1995 - Oct 7, 1996*
Elevation from tank bottom	0.25 ft
Location	ALC 4, ALC 10
Minimum Temperature	57°F
Date	Nov 4, 1996
Elevation from tank bottom	0.25 ft
Location	ALC 10

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,000,000 gal
Total Risers	126
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	922,000 gal
Waste Type	DC
Drainable Interstitial Liquids	4,000 gal
Pumpable Liquids	828,000 gal
Saltcake	0 gal
Sludge	94,000 gal
Supernatant	828,000 gal
INTERIOR PHOTOGRAPHS	
Date	Dec 28, 1982
Montage Number	94080233-10CN
Photo Set Number	105217
WASTE SURFACE LEVEL	
Devices	Manual ENRAF and Tape
Max Level	344 in
Date	Aug 19 - Aug 24, 1995*
Min Level	312.25 in
Date	Dec 5 and 7, 1994

* Numerous dates in this time span.

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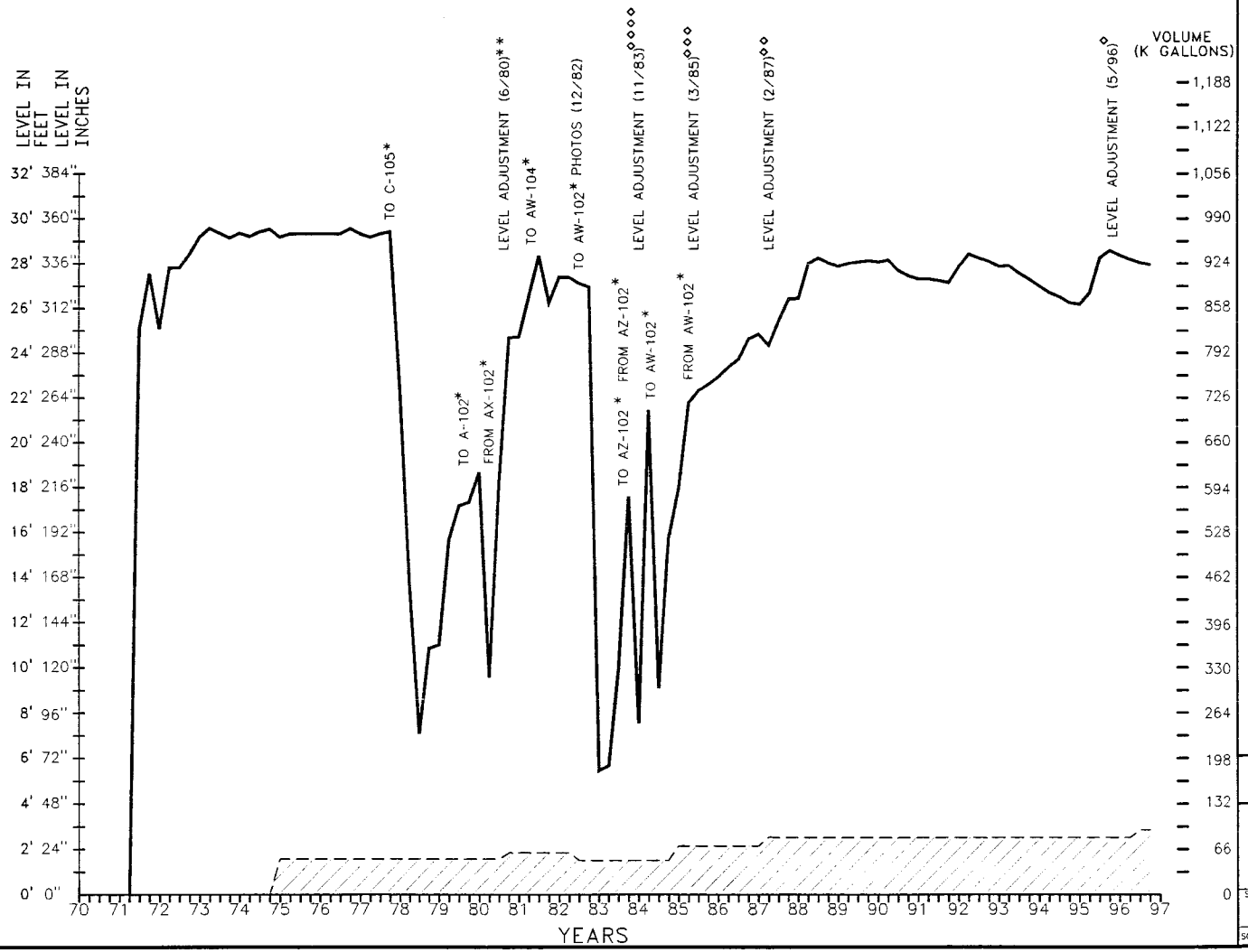
WASTE TYPES TIME LINE (ANDERSON 1990)	B:	AGING: CSFD: NCPLX:	CPLX:
PRIMARY ADDITIONS TIME LINE (AGNEW 1995)	B: P2: SRR: WTR:	BL: CSR: WTR:	CSR: PL2: SRR: WTR: / BL: SWLIQ: UNK: WTR:



TANK INFO:

CONSTRUCTED 1968-1970
NOMINAL CAPACITY: 1,000,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- ** ANDERSON 1990
- ◇ HANLON 1996i
- ◇◇ HANLON 1996g
- ◇◇◇ VAIL 1985a
- ◇◇◇◇ McCANN 1983i

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

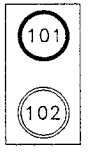
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

AGING:	AGING WASTE
B:	B-PLANT HIGH-LEVEL WASTE
BL:	B-PLANT LOW-LEVEL WASTE
CPLX:	COMPLEXED WASTE
CSFD:	CESIUM FEED
CSR:	CESIUM RECOVERY WASTE
NCPLX:	NON-COMPLEXED WASTE
P2:	PUREX HIGH-LEVEL WASTE 1963-67
SRR:	STRONTIUM RECOVERY WASTE
SWLIQ:	DILUTE, NON-COMPLEXED WASTE
UNK:	UNKNOWN
WTR:	WATER

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

AY TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AY-101 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1971-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E171	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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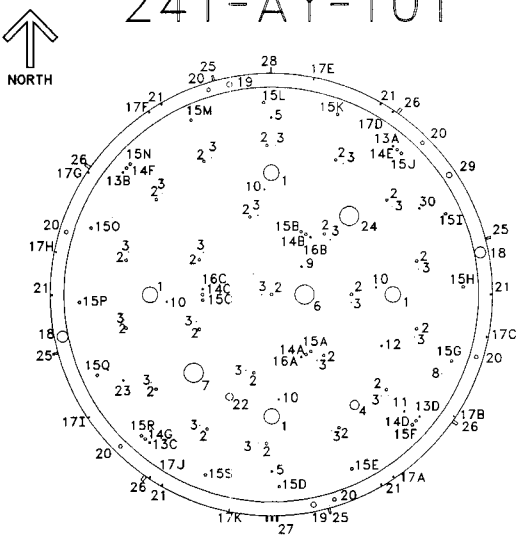
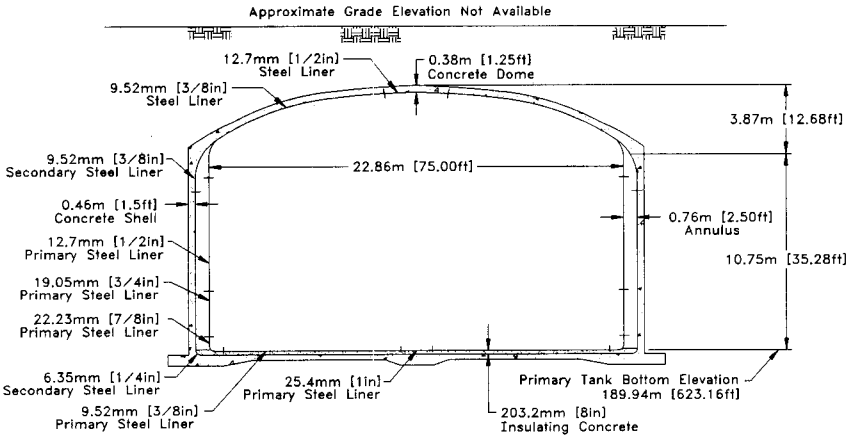
241-AY-101



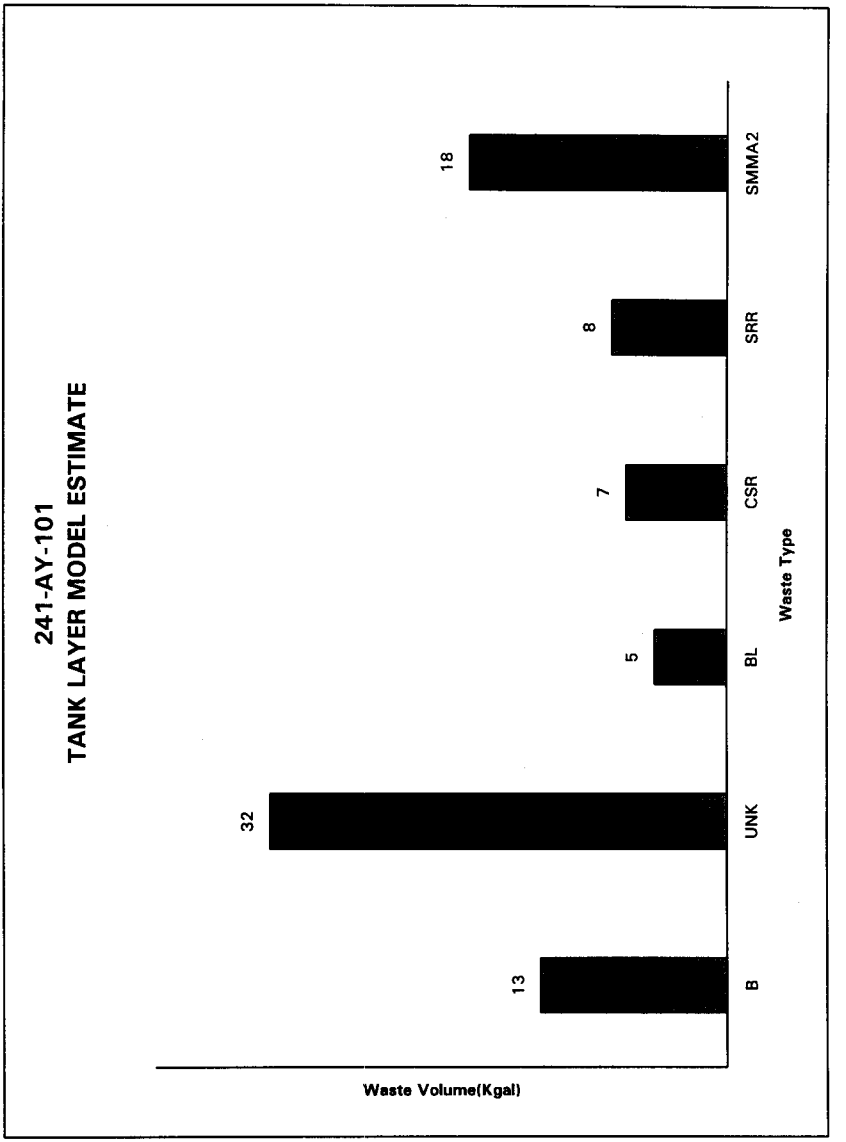
TANK RISER LOCATION

Ref: Salazar 1994
H-2-34689, Rev.0
H-2-64447, Rev.7



Ref: H-2-64307, Rev.4
H-2-64310, Rev.1
H-2-64449, Rev.6

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AY-101							
TLM Solids Composite Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total TLM Wast	1.73E+05 (kg)	(33.0 kgal)	----	----	----	----	----
Heat Load	5.69 (kW)	(1.94E+04 BTU/hr)	----	2.94	3.94	6.38	6.73
Bulk Density	1.39 (g/cc)	----	----	1.32	1.34	1.47	1.52
Void Fraction	0.779	----	----	0.673	0.709	0.817	0.825
Water wt%	61.3	----	----	55.8	57.6	64.3	67.1
TOC wt% C (wet	1.02	----	----	0.368	0.716	1.31	1.49
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	5.87	9.71E+04	1.68E+04	4.50	4.84	7.53	8.46
Al3+	1.01	1.96E+04	3.39E+03	0.987	0.999	1.01	1.02
Fe3+ (total Fe)	1.04	4.18E+04	7.25E+03	0.645	0.917	1.09	1.11
Cr3+	8.27E-03	309	53.7	6.19E-03	7.28E-03	8.89E-03	9.34E-03
Bi3+	1.65E-05	2.49	0.431	1.40E-05	1.52E-05	1.78E-05	2.02E-05
La3+	1.98E-10	1.98E-05	3.44E-06	1.76E-10	1.78E-10	2.26E-10	2.52E-10
Hg2+	1.72E-07	2.49E-02	4.31E-03	1.55E-07	1.63E-07	1.83E-07	1.99E-07
Zr (as ZrO(OH)2)	2.17E-06	0.142	2.47E-02	1.96E-06	2.04E-06	2.31E-06	2.49E-06
Pb2+	2.32E-05	3.47	0.601	1.30E-05	1.80E-05	2.85E-05	3.35E-05
Ni2+	0.265	1.12E+04	1.94E+03	0.216	0.248	0.308	0.330
Sr2+	0	0	0	0	0	0	0
Mn4+	5.25E-04	20.8	3.60	3.65E-04	4.43E-04	6.07E-04	6.85E-04
Ca2+	0.481	1.39E+04	2.41E+03	0.353	0.396	0.697	0.808
K+	8.36E-03	235	40.8	6.30E-03	7.38E-03	9.32E-03	9.93E-03
OH-	7.33	8.97E+04	1.56E+04	5.98	6.87	7.58	7.72
NO3-	0.195	8.71E+03	1.51E+03	0.173	0.184	0.207	0.220
NO2-	0.468	1.55E+04	2.69E+03	0.345	0.421	0.514	0.543
CO32-	0.587	2.53E+04	4.39E+03	0.462	0.501	0.803	0.914
PO43-	2.88E-03	197	34.1	2.43E-03	2.73E-03	2.99E-03	3.47E-03
SO42-	4.87E-02	3.37E+03	584	3.32E-02	4.13E-02	5.59E-02	6.05E-02
Si (as SiO32-)	1.98	4.01E+04	6.95E+03	1.50	1.50	2.80	3.30
F-	7.27E-04	9.94	1.72	6.27E-04	6.44E-04	8.21E-04	8.98E-04
Cl-	3.50E-02	892	155	2.55E-02	3.05E-02	3.94E-02	4.22E-02
C6H5O73-	8.68E-03	1.18E+03	205	5.89E-03	7.44E-03	9.14E-03	9.59E-03
EDTA4-	3.14E-02	6.51E+03	1.13E+03	8.57E-03	2.05E-02	4.20E-02	4.88E-02
HEDTA3-	6.27E-02	1.24E+04	2.15E+03	1.71E-02	4.11E-02	8.40E-02	9.76E-02
glycolate-	8.38E-02	4.52E+03	784	3.82E-02	6.21E-02	0.105	0.119
acetate-	0	0	0	0	0	0	0
oxalate2-	2.60E-10	1.64E-05	2.85E-06	2.30E-10	2.45E-10	2.75E-10	3.18E-10
DBP	2.43E-03	368	63.9	2.20E-03	2.24E-03	2.71E-03	2.97E-03
butanol	6.33E-06	0.338	5.86E-02	1.72E-06	4.14E-06	8.49E-06	9.86E-06
NH3	7.33E-02	897	156	4.09E-02	5.65E-02	8.81E-02	9.38E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

HDW Model Rev. 4

Double-Shell Tank 241-AY-101							
SMM Composite Inventory Estimate							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	3.74E+06 (kg)	(848 kgal)	----	----	----	----	----
Heat Load	2.50 (kW)	(8.55E+03 BTU/hr)	----	1.90	2.29	2.72	2.94
Bulk Density*	1.17 (g/cc)	----	----	1.14	1.15	1.18	1.19
Water wt%	73.5	----	----	70.5	71.9	75.2	77.1
TOC wt% C (wet	1.21	----	----	0.489	0.843	1.57	1.92
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	4.05	7.99E+04	2.99E+05	3.38	3.72	4.34	4.60
Al3+	0.357	8.27E+03	3.10E+04	0.308	0.336	0.380	0.402
Fe3+ (total Fe)	4.60E-03	220	825	3.50E-03	4.04E-03	5.17E-03	5.71E-03
Cr3+	3.36E-02	1.50E+03	5.61E+03	2.67E-02	3.03E-02	3.57E-02	3.73E-02
Bi3+	2.31E-04	41.3	155	2.21E-04	2.26E-04	2.36E-04	2.41E-04
La3+	8.67E-06	1.03	3.87	6.31E-06	7.46E-06	9.89E-06	1.11E-05
Hg2+	1.78E-06	0.305	1.14	1.72E-06	1.75E-06	1.80E-06	1.83E-06
Zr (as ZrO(OH)2)	3.18E-05	2.48	9.30	2.99E-05	3.06E-05	3.25E-05	3.36E-05
Pb2+	2.25E-04	40.0	150	1.91E-04	2.08E-04	2.43E-04	2.59E-04
Ni2+	1.42E-03	71.3	267	1.33E-03	1.37E-03	1.46E-03	1.50E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	2.13E-03	100	376	1.60E-03	1.86E-03	2.40E-03	2.66E-03
Ca2+	8.79E-03	302	1.13E+03	7.20E-03	7.98E-03	9.60E-03	1.04E-02
K+	1.95E-02	654	2.45E+03	1.63E-02	1.78E-02	2.13E-02	2.30E-02
OH-	2.26	3.30E+04	1.24E+05	1.91	2.10	2.43	2.60
NO3-	1.15	6.09E+04	2.28E+05	1.01	1.09	1.17	1.19
NO2-	0.721	2.84E+04	1.07E+05	0.494	0.600	0.840	0.952
CO32-	0.195	1.00E+04	3.75E+04	0.161	0.178	0.212	0.220
PO43-	1.88E-02	1.53E+03	5.73E+03	1.73E-02	1.81E-02	1.93E-02	2.00E-02
SO42-	1.00E-01	8.23E+03	3.08E+04	7.07E-02	8.46E-02	0.116	0.130
Si (as SiO32-)	2.78E-02	669	2.50E+03	2.02E-02	2.39E-02	3.16E-02	3.54E-02
F-	1.18E-02	193	721	1.09E-02	1.13E-02	1.24E-02	1.33E-02
Cl-	7.00E-02	2.13E+03	7.96E+03	5.70E-02	6.35E-02	7.60E-02	8.11E-02
C6H5O73-	1.48E-02	2.40E+03	8.97E+03	1.37E-02	1.42E-02	1.53E-02	1.59E-02
EDTA4-	2.77E-02	6.85E+03	2.57E+04	6.98E-03	1.71E-02	3.84E-02	4.89E-02
HEDTA3-	5.48E-02	1.29E+04	4.82E+04	1.32E-02	3.35E-02	7.62E-02	9.70E-02
glycolate-	6.88E-02	4.42E+03	1.66E+04	2.72E-02	4.75E-02	9.01E-02	0.111
acetate-	2.29E-03	116	434	1.85E-03	2.04E-03	2.56E-03	2.97E-03
oxalate2-	1.14E-05	0.857	3.21	1.01E-05	1.07E-05	1.20E-05	1.26E-05
DBP	9.85E-03	1.77E+03	6.64E+03	7.98E-03	8.90E-03	1.08E-02	1.17E-02
butanol	9.85E-03	626	2.34E+03	7.98E-03	8.90E-03	1.08E-02	1.17E-02
NH3	2.14E-02	311	1.17E+03	1.28E-02	1.62E-02	2.80E-02	3.57E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AY-101							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	3.92E+06 (kg)	(881 kgal)	----	----	----	----	----
Heat Load	8.20 (kW)	(2.80E+04 BTU/hr)	----	5.44	6.45	8.89	9.24
Bulk Density†	1.17 (g/cc)	----	----	1.15	1.16	1.19	1.20
Water wt%†	73.0	----	----	70.0	71.4	74.6	76.5
TOC wt% C (wet	1.20	----	----	0.484	0.837	1.56	1.90
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	4.12	8.06E+04	3.16E+05	3.44	3.79	4.40	4.66
Al3+	0.382	8.77E+03	3.43E+04	0.335	0.361	0.404	0.425
Fe3+ (total Fe)	4.33E-02	2.06E+03	8.07E+03	2.86E-02	3.88E-02	4.51E-02	4.61E-02
Cr3+	3.27E-02	1.45E+03	5.66E+03	2.59E-02	2.95E-02	3.47E-02	3.63E-02
Bi3+	2.23E-04	39.6	155	2.13E-04	2.18E-04	2.28E-04	2.32E-04
La3+	8.35E-06	0.987	3.87	6.07E-06	7.18E-06	9.52E-06	1.06E-05
Hg2+	1.72E-06	0.293	1.15	1.66E-06	1.69E-06	1.74E-06	1.77E-06
Zr (as ZrO(OH)2)	3.06E-05	2.38	9.32	2.89E-05	2.95E-05	3.14E-05	3.24E-05
Pb2+	2.18E-04	38.4	150	1.84E-04	2.01E-04	2.35E-04	2.51E-04
Ni2+	1.13E-02	563	2.21E+03	9.45E-03	1.07E-02	1.29E-02	1.37E-02
Sr2+	0	0	0	0	0	0	0
Mn4+	2.07E-03	96.9	380	1.55E-03	1.81E-03	2.34E-03	2.59E-03
Ca2+	2.65E-02	903	3.54E+03	2.01E-02	2.32E-02	3.46E-02	3.87E-02
K+	1.91E-02	636	2.49E+03	1.60E-02	1.74E-02	2.08E-02	2.25E-02
OH-	2.45	3.55E+04	1.39E+05	2.11	2.29	2.62	2.79
NO3-	1.11	5.86E+04	2.30E+05	0.975	1.05	1.14	1.15
NO2-	0.712	2.79E+04	1.09E+05	0.491	0.593	0.827	0.936
CO32-	0.209	1.07E+04	4.19E+04	0.174	0.191	0.227	0.239
PO43-	1.82E-02	1.47E+03	5.76E+03	1.68E-02	1.75E-02	1.87E-02	1.93E-02
SO42-	9.81E-02	8.02E+03	3.14E+04	6.96E-02	8.32E-02	0.113	0.127
Si (as SiO32-)	0.101	2.41E+03	9.45E+03	8.15E-02	8.30E-02	0.131	0.150
F-	1.14E-02	184	723	1.05E-02	1.09E-02	1.20E-02	1.28E-02
Cl-	6.87E-02	2.07E+03	8.12E+03	5.61E-02	6.24E-02	7.45E-02	7.95E-02
C6H5O73-	1.46E-02	2.34E+03	9.18E+03	1.35E-02	1.40E-02	1.51E-02	1.56E-02
EDTA4-	2.79E-02	6.84E+03	2.68E+04	7.04E-03	1.72E-02	3.86E-02	4.89E-02
HEDTA3-	5.51E-02	1.29E+04	5.03E+04	1.34E-02	3.38E-02	7.64E-02	9.70E-02
glycolate-	6.93E-02	4.43E+03	1.73E+04	2.76E-02	4.81E-02	9.07E-02	0.111
acetate-	2.21E-03	111	434	1.79E-03	1.97E-03	2.47E-03	2.86E-03
oxalate2-	1.09E-05	0.819	3.21	9.70E-06	1.03E-05	1.16E-05	1.22E-05
DBP	9.57E-03	1.71E+03	6.71E+03	7.77E-03	8.65E-03	1.05E-02	1.14E-02
butanol	9.48E-03	598	2.34E+03	7.68E-03	8.56E-03	1.04E-02	1.12E-02
NH3	2.33E-02	337	1.32E+03	1.50E-02	1.83E-02	2.97E-02	3.73E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AY-101							
TLM Solids Composite Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total TLM Wast	1.73E+05 (kg)	(33.0 kgal)	----	----	----	----	----
Heat Load	5.69 (kW)	(1.94E+04 BTU/hr)	----	2.94	3.94	6.38	6.73
Bulk Density	1.39 (g/cc)	----	----	1.32	1.34	1.47	1.52
Void Fraction	0.779	----	----	0.673	0.709	0.817	0.825
Water wt%	61.3	----	----	55.8	57.6	64.3	67.1
TOC wt% C (wet	1.02	----	----	0.368	0.716	1.31	1.49
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	6.09E-05	4.39E-02	7.60	4.05E-05	4.05E-05	7.82E-05	9.52E-05
C-14	1.16E-05	8.35E-03	1.45	6.99E-06	7.32E-06	1.24E-05	1.98E-05
Ni-59	2.57E-04	0.185	32.0	2.03E-04	2.03E-04	3.27E-04	3.63E-04
Ni-63	2.54E-02	18.3	3.18E+03	2.02E-02	2.02E-02	3.27E-02	3.65E-02
Co-60	2.19E-05	1.57E-02	2.73	1.08E-05	1.69E-05	2.37E-05	8.59E-04
Se-79	2.22E-04	0.160	27.7	1.22E-04	1.22E-04	2.79E-04	3.33E-04
Sr-90	6.73	4.85E+03	8.40E+05	3.46	4.65	7.55	7.97
Y-90	6.73	4.85E+03	8.40E+05	3.46	4.65	7.55	7.97
Zr-93	9.90E-04	0.713	124	5.53E-04	5.55E-04	1.27E-03	1.55E-03
Nb-93m	7.35E-04	0.529	91.8	4.45E-04	4.46E-04	9.34E-04	1.12E-03
Tc-99	7.90E-05	5.68E-02	9.86	4.83E-05	6.53E-05	8.71E-05	9.49E-05
Ru-106	1.31E-05	9.41E-03	1.63	1.07E-05	1.28E-05	1.32E-05	1.34E-05
Cd-113m	3.95E-03	2.85	493	1.77E-03	1.79E-03	5.65E-03	7.29E-03
Sb-125	1.26E-04	9.06E-02	15.7	5.66E-05	9.50E-05	1.37E-04	1.49E-04
Sn-126	3.51E-04	0.253	43.8	1.92E-04	1.93E-04	4.36E-04	5.18E-04
I-129	1.53E-07	1.10E-04	1.91E-02	9.36E-08	1.27E-07	1.69E-07	1.84E-07
Cs-134	3.04E-06	2.19E-03	0.380	1.32E-06	2.22E-06	3.85E-06	4.36E-06
Cs-137	5.71E-02	41.1	7.13E+03	2.59E-02	4.23E-02	7.17E-02	8.10E-02
Ba-137m	5.40E-02	38.9	6.74E+03	2.45E-02	4.00E-02	6.78E-02	7.66E-02
Sm-151	0.736	530	9.18E+04	0.447	0.448	0.934	1.13
Eu-152	5.79E-04	0.417	72.3	5.27E-04	5.27E-04	5.80E-04	5.80E-04
Eu-154	3.65E-02	26.3	4.56E+03	3.93E-03	5.92E-03	5.07E-02	6.43E-02
Eu-155	2.98E-02	21.5	3.72E+03	2.67E-02	2.67E-02	2.99E-02	2.99E-02
Ra-226	1.67E-08	1.20E-05	2.09E-03	1.23E-08	1.29E-08	1.85E-08	2.02E-08
Ra-228	2.30E-08	1.65E-05	2.87E-03	2.35E-13	2.35E-13	2.32E-08	2.34E-08
Ac-227	8.53E-08	6.14E-05	1.06E-02	6.40E-08	6.41E-08	9.55E-08	1.05E-07
Pa-231	1.21E-07	8.71E-05	1.51E-02	4.64E-08	7.77E-08	1.78E-07	2.32E-07
Th-229	1.06E-09	7.65E-07	1.33E-04	2.60E-11	2.60E-11	1.07E-09	1.07E-09
Th-232	6.09E-11	4.39E-08	7.60E-06	3.00E-15	3.00E-15	6.46E-11	6.82E-11
U-232	4.20E-07	3.02E-04	5.24E-02	9.23E-08	2.83E-07	5.39E-07	6.41E-07
U-233	1.63E-06	1.17E-03	0.203	3.58E-07	1.10E-06	2.09E-06	2.48E-06
U-234	2.22E-06	1.60E-03	0.277	4.42E-07	1.39E-06	3.07E-06	3.89E-06
U-235	9.16E-08	6.59E-05	1.14E-02	1.82E-08	5.74E-08	1.26E-07	1.60E-07
U-236	7.11E-08	5.12E-05	8.87E-03	1.51E-08	4.45E-08	9.87E-08	1.26E-07
U-238	2.13E-06	1.53E-03	0.266	4.20E-07	1.34E-06	2.93E-06	3.71E-06
Np-237	2.59E-07	1.86E-04	3.23E-02	1.60E-07	2.15E-07	2.86E-07	3.11E-07
Pu-238	1.42E-03	1.02	177	8.39E-04	1.34E-03	1.45E-03	1.49E-03
Pu-239	1.23E-02	8.87	1.54E+03	8.40E-03	1.18E-02	1.26E-02	1.28E-02
Pu-240	3.79E-03	2.73	474	2.39E-03	3.61E-03	3.88E-03	3.96E-03
Pu-241	9.83E-02	70.8	1.23E+04	5.82E-02	9.31E-02	0.101	0.103
Pu-242	6.98E-07	5.02E-04	8.71E-02	4.08E-07	6.60E-07	7.15E-07	7.32E-07
Am-241	3.24E-02	23.3	4.04E+03	1.82E-02	3.05E-02	3.32E-02	3.40E-02
Am-243	3.34E-06	2.40E-03	0.417	1.76E-06	3.14E-06	3.44E-06	3.53E-06
Cm-242	4.31E-05	3.10E-02	5.38	4.10E-05	4.10E-05	4.31E-05	4.32E-05
Cm-243	5.11E-06	3.68E-03	0.637	4.90E-06	4.90E-06	5.11E-06	5.11E-06
Cm-244	2.01E-04	0.145	25.1	1.54E-04	1.95E-04	2.04E-04	2.07E-04
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	0.216 (g/L)	----	27.0	0.146	0.207	0.220	0.225
U	2.62E-02	4.49E+03	779	5.16E-03	1.64E-02	3.62E-02	4.59E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

HDW Model Rev. 4

Double-Shell Tank 241-AY-101							
SMM Composite Inventory Estimate							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total SMM Wast	3.74E+06 (kg)	(848 kgal)	----	----	----	----	----
Heat Load	2.50 (kW)	(8.55E+03 BTU/hr)	----	1.90	2.29	2.72	2.94
Bulk Density*	1.17 (g/cc)	----	----	1.14	1.15	1.18	1.19
Water wt%†	73.5	----	----	70.5	71.9	75.2	77.1
TOC wt% C (wet	1.21	----	----	0.489	0.843	1.57	1.92
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	1.00E-04	8.59E-02	321	3.24E-05	3.24E-05	1.16E-04	1.37E-04
C-14	1.76E-05	1.51E-02	56.4	3.39E-06	3.39E-06	1.81E-05	1.84E-05
Ni-59	8.00E-07	6.86E-04	2.57	1.34E-07	1.34E-07	8.34E-07	8.66E-07
Ni-63	7.91E-05	6.78E-02	254	1.32E-05	1.32E-05	8.24E-05	8.56E-05
Co-60	2.18E-05	1.87E-02	69.9	5.56E-06	5.56E-06	2.29E-05	2.41E-05
Se-79	1.52E-06	1.30E-03	4.87	6.13E-07	6.13E-07	1.85E-06	2.16E-06
Sr-90	6.20E-02	53.1	1.99E+05	5.37E-02	5.97E-02	6.43E-02	6.64E-02
Y-90	6.20E-02	53.2	1.99E+05	3.08E-02	3.08E-02	6.43E-02	6.65E-02
Zr-93	7.55E-06	6.47E-03	24.2	3.02E-06	3.02E-06	9.18E-06	1.08E-05
Nb-93m	5.33E-06	4.57E-03	17.1	2.16E-06	2.16E-06	6.47E-06	7.57E-06
Tc-99	1.25E-04	0.107	402	7.25E-05	9.83E-05	1.53E-04	1.79E-04
Ru-106	3.63E-09	3.11E-06	1.17E-02	1.53E-09	1.53E-09	4.10E-09	4.52E-09
Cd-113m	4.40E-05	3.77E-02	141	1.69E-05	1.69E-05	5.38E-05	6.33E-05
Sb-125	1.00E-04	8.59E-02	322	3.00E-05	3.00E-05	1.07E-04	1.13E-04
Sn-126	2.28E-06	1.96E-03	7.32	9.25E-07	9.25E-07	2.77E-06	3.24E-06
I-129	2.42E-07	2.08E-04	0.777	1.40E-07	1.90E-07	2.95E-07	3.46E-07
Cs-134	3.18E-06	2.73E-03	10.2	1.61E-06	2.38E-06	3.99E-06	4.78E-06
Cs-137	7.74E-02	66.3	2.48E+05	4.89E-02	6.28E-02	9.20E-02	0.106
Ba-137m	7.32E-02	62.7	2.35E+05	4.63E-02	5.62E-02	8.70E-02	0.101
Sm-151	5.32E-03	4.56	1.71E+04	2.15E-03	2.15E-03	6.47E-03	7.57E-03
Eu-152	2.83E-06	2.43E-03	9.08	1.71E-06	1.71E-06	3.40E-06	3.97E-06
Eu-154	3.57E-04	0.306	1.15E+03	1.31E-04	1.31E-04	4.39E-04	4.72E-04
Eu-155	1.71E-04	0.147	549	1.03E-04	1.04E-04	2.06E-04	2.41E-04
Ra-226	5.10E-11	4.37E-08	1.64E-04	2.29E-11	2.29E-11	6.11E-11	7.09E-11
Ra-228	4.44E-08	3.81E-05	0.143	1.91E-08	1.91E-08	5.11E-08	5.81E-08
Ac-227	3.06E-10	2.62E-07	9.83E-04	1.43E-10	1.43E-10	3.65E-10	4.22E-10
Pa-231	1.60E-09	1.37E-06	5.14E-03	6.96E-10	6.96E-10	1.93E-09	2.24E-09
Th-229	1.04E-09	8.92E-07	3.34E-03	4.57E-10	4.57E-10	1.19E-09	1.34E-09
Th-232	4.49E-09	3.85E-06	1.44E-02	1.37E-09	1.37E-09	5.35E-09	6.17E-09
U-232	1.74E-07	1.49E-04	0.558	1.29E-07	1.51E-07	2.01E-07	2.29E-07
U-233	6.67E-07	5.72E-04	2.14	4.95E-07	5.80E-07	7.69E-07	8.78E-07
U-234	2.38E-07	2.04E-04	0.763	2.22E-07	2.30E-07	2.45E-07	2.53E-07
U-235	9.60E-09	8.23E-06	3.08E-02	8.97E-09	9.29E-09	9.92E-09	1.02E-08
U-236	8.37E-09	7.18E-06	2.69E-02	7.91E-09	8.14E-09	8.60E-09	8.83E-09
U-238	2.61E-07	2.23E-04	0.836	2.46E-07	2.53E-07	2.68E-07	2.75E-07
Np-237	4.26E-07	3.65E-04	1.37	2.53E-07	3.37E-07	5.15E-07	6.01E-07
Pu-238	8.01E-07	6.86E-04	2.57	5.98E-07	6.97E-07	9.04E-07	1.00E-06
Pu-239	2.39E-05	2.05E-02	76.6	1.87E-05	2.12E-05	2.65E-05	2.90E-05
Pu-240	4.26E-06	3.66E-03	13.7	3.30E-06	3.77E-06	4.76E-06	5.23E-06
Pu-241	5.69E-05	4.87E-02	182	4.30E-05	4.98E-05	6.39E-05	7.07E-05
Pu-242	3.16E-10	2.71E-07	1.01E-03	2.33E-10	2.74E-10	3.58E-10	3.99E-10
Am-241	2.38E-05	2.04E-02	76.3	1.42E-05	1.89E-05	2.87E-05	3.34E-05
Am-243	9.27E-10	7.94E-07	2.97E-03	6.25E-10	7.69E-10	1.09E-09	1.25E-09
Cm-242	1.10E-07	9.41E-05	0.352	6.38E-08	6.38E-08	1.32E-07	1.53E-07
Cm-243	1.02E-08	8.76E-06	3.28E-02	5.83E-09	5.83E-09	1.22E-08	1.41E-08
Cm-244	7.20E-08	6.17E-05	0.231	2.68E-08	2.68E-08	8.73E-08	9.71E-08
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	2.87E-04 (g/L)	---	0.921	1.89E-04	2.37E-04	3.37E-04	3.85E-04
U	2.70E-03	551	2.06E+03	2.52E-03	2.61E-03	2.79E-03	2.88E-03

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AY-101

Total Inventory Estimate*

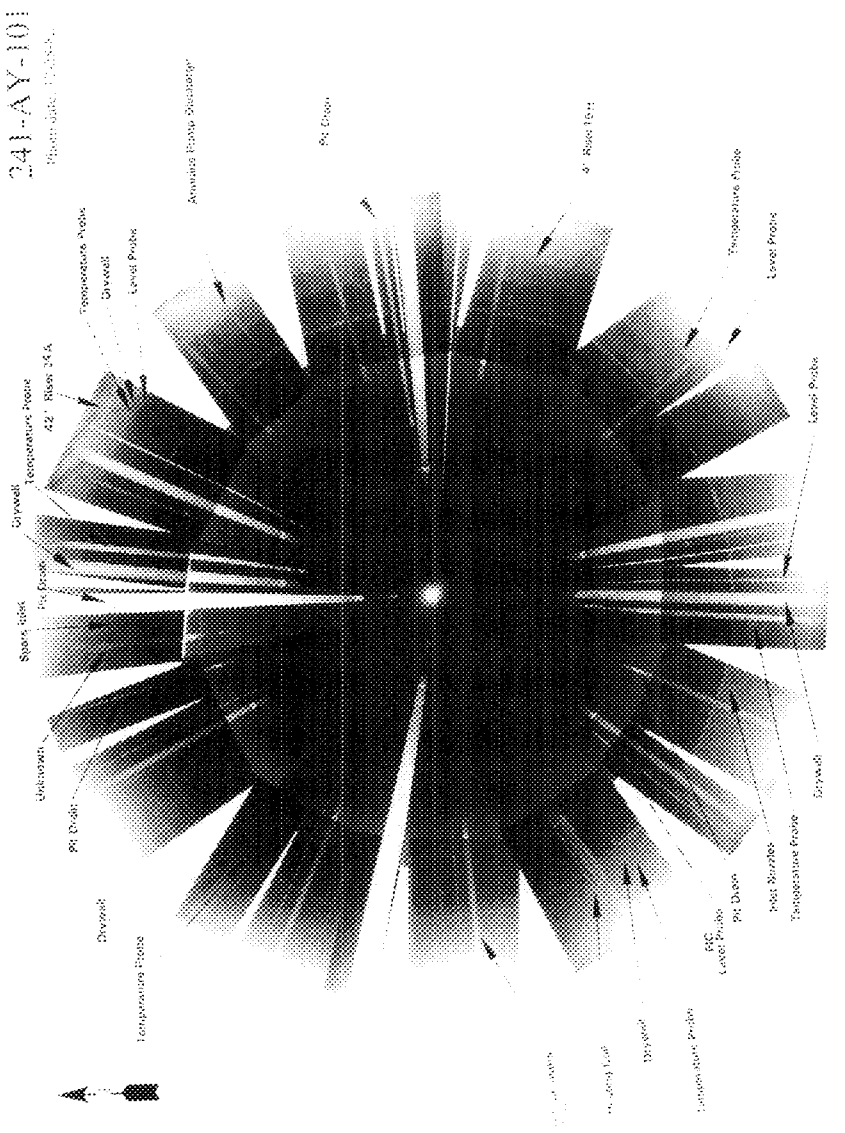
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	3.92E+06 (kg)	(881 kgal)	----	----	----	----	----
Heat Load	8.20 (kW)	(2.80E+04 BTU/hr)	----	5.44	6.45	8.89	9.24
Bulk Density†	1.17 (g/cc)	----	----	1.15	1.16	1.19	1.20
Water wt%†	73.0	----	----	70.0	71.4	74.6	76.5
TOC wt% C (wet	1.20	----	----	0.484	0.837	1.56	1.90

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	9.87E-05	8.40E-02	329	3.27E-05	3.27E-05	1.15E-04	1.35E-04
C-14	1.73E-05	1.48E-02	57.8	3.54E-06	3.54E-06	1.79E-05	1.85E-05
Ni-59	1.04E-05	8.83E-03	34.6	7.74E-06	7.74E-06	1.30E-05	1.44E-05
Ni-63	1.03E-03	0.876	3.43E+03	7.68E-04	7.68E-04	1.30E-03	1.44E-03
Co-60	2.18E-05	1.85E-02	72.6	5.98E-06	5.98E-06	2.29E-05	5.30E-05
Se-79	9.78E-06	8.32E-03	32.6	6.02E-06	6.04E-06	1.19E-05	1.39E-05
Sr-90	0.312	265	1.04E+06	0.189	0.234	0.342	0.358
Y-90	0.312	265	1.04E+06	0.189	0.234	0.342	0.358
Zr-93	4.43E-05	3.77E-02	148	2.79E-05	2.80E-05	5.49E-05	6.51E-05
Nb-93m	3.27E-05	2.78E-02	109	2.17E-05	2.18E-05	4.01E-05	4.72E-05
Tc-99	1.24E-04	0.105	412	7.23E-05	9.73E-05	1.50E-04	1.76E-04
Ru-106	4.93E-07	4.20E-04	1.64	4.05E-07	4.81E-07	4.98E-07	5.03E-07
Cd-113m	1.90E-04	0.162	635	1.08E-04	1.09E-04	2.54E-04	3.15E-04
Sb-125	1.01E-04	8.61E-02	337	3.28E-05	3.28E-05	1.08E-04	1.14E-04
Sn-126	1.53E-05	1.30E-02	51.1	9.37E-06	9.41E-06	1.85E-05	2.16E-05
I-129	2.39E-07	2.03E-04	0.797	1.40E-07	1.88E-07	2.90E-07	3.40E-07
Cs-134	3.18E-06	2.71E-03	10.6	1.60E-06	2.37E-06	3.99E-06	4.77E-06
Cs-137	7.66E-02	65.2	2.55E+05	4.81E-02	6.21E-02	9.12E-02	0.105
Ba-137m	7.25E-02	61.7	2.42E+05	4.55E-02	5.59E-02	8.63E-02	9.96E-02
Sm-151	3.27E-02	27.8	1.09E+05	2.18E-02	2.19E-02	4.01E-02	4.72E-02
Eu-152	2.44E-05	2.08E-02	81.4	2.14E-05	2.14E-05	2.50E-05	2.55E-05
Eu-154	1.71E-03	1.46	5.70E+03	4.89E-04	5.65E-04	2.24E-03	2.75E-03
Eu-155	1.28E-03	1.09	4.27E+03	1.10E-03	1.10E-03	1.32E-03	1.35E-03
Ra-226	6.75E-10	5.75E-07	2.25E-03	5.07E-10	5.33E-10	7.41E-10	8.04E-10
Ra-228	4.36E-08	3.71E-05	0.145	1.93E-08	1.93E-08	5.00E-08	5.68E-08
Ac-227	3.49E-09	2.97E-06	1.16E-02	2.69E-09	2.69E-09	3.87E-09	4.23E-09
Pa-231	6.07E-09	5.17E-06	2.02E-02	3.52E-09	3.58E-09	8.19E-09	1.02E-08
Th-229	1.04E-09	8.86E-07	3.47E-03	4.80E-10	4.80E-10	1.18E-09	1.33E-09
Th-232	4.33E-09	3.68E-06	1.44E-02	1.32E-09	1.32E-09	5.15E-09	5.94E-09
U-232	1.83E-07	1.56E-04	0.611	1.40E-07	1.61E-07	2.09E-07	2.36E-07
U-233	7.03E-07	5.99E-04	2.35	5.38E-07	6.19E-07	8.02E-07	9.06E-07
U-234	3.12E-07	2.66E-04	1.04	2.45E-07	2.81E-07	3.44E-07	3.75E-07
U-235	1.27E-08	1.08E-05	4.23E-02	9.91E-09	1.14E-08	1.40E-08	1.53E-08
U-236	1.07E-08	9.13E-06	3.57E-02	8.46E-09	9.65E-09	1.18E-08	1.29E-08
U-238	3.30E-07	2.81E-04	1.10	2.67E-07	3.01E-07	3.60E-07	3.89E-07
Np-237	4.20E-07	3.57E-04	1.40	2.52E-07	3.34E-07	5.06E-07	5.90E-07
Pu-238	5.38E-05	4.58E-02	180	3.22E-05	5.10E-05	5.51E-05	5.64E-05
Pu-239	4.84E-04	0.412	1.61E+03	3.37E-04	4.65E-04	4.93E-04	5.01E-04
Pu-240	1.46E-04	0.124	487	9.34E-05	1.39E-04	1.49E-04	1.52E-04
Pu-241	3.73E-03	3.18	1.25E+04	2.23E-03	3.54E-03	3.82E-03	3.91E-03
Pu-242	2.64E-08	2.25E-05	8.81E-02	1.56E-08	2.50E-08	2.71E-08	2.77E-08
Am-241	1.23E-03	1.05	4.12E+03	7.06E-04	1.17E-03	1.27E-03	1.30E-03
Am-243	1.26E-07	1.07E-04	0.420	6.68E-08	1.18E-07	1.29E-07	1.33E-07
Cm-242	1.72E-06	1.46E-03	5.74	1.59E-06	1.59E-06	1.74E-06	1.76E-06
Cm-243	2.01E-07	1.71E-04	0.670	1.89E-07	1.89E-07	2.03E-07	2.05E-07
Cm-244	7.60E-06	6.47E-03	25.3	5.84E-06	7.37E-06	7.71E-06	7.81E-06

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	8.36E-03 (g/L)	----	27.9	5.75E-03	8.02E-03	8.52E-03	8.67E-03
U	3.58E-03	726	2.84E+03	2.80E-03	3.22E-03	3.96E-03	4.32E-03

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.


241-AY-101
Pit Drain
Temperature Probe
Drywall
Level Probe
Spare Inlet
Unknown
Pit Drain
Drywall
Temperature Probe
Level Probe
Level Probe
Drywall
Temperature Probe
Pit Drain
Inlet Nozzles
Temperature Probe
Drywall
Temperature Probe

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TANK 241-AY-102 SUMMARY

TANK HISTORY	
Entered Service	1976
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser Number	Size
5A, 5B	4 in
15A, 15G, 15K, 15M, 15O	6 in
TANK TEMPERATURE	
Average Tank Temperature	68°F
Maximum Temperature	89°F
Date	Sept 17, 1995
Elevation from tank bottom	unknown
Location	Sludge Thermocouple 73
Minimum Temperature	44°F
Date	May 15, 1995
Elevation from tank bottom	0.25 ft
Location	ALC 16

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	Flat
Nominal Capacity	1,000,000 gal
Total Risers	126
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	840,000 gal
Waste Type	DN
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	810,000 gal
Saltcake	0 gal
Sludge	30,000 gal
Supernatant	810,000 gal
INTERIOR PHOTOGRAPHS	
Date	April 28, 1981
Montage Number	94080233-18CN
Photo Set Number	95911
WASTE SURFACE LEVEL	
Devices	Auto/Man FIC & Man Tape
Max Level	362.75 in
Date	Nov 10, 1991
Min Level	109.8 in
Date	Nov 16, 1991

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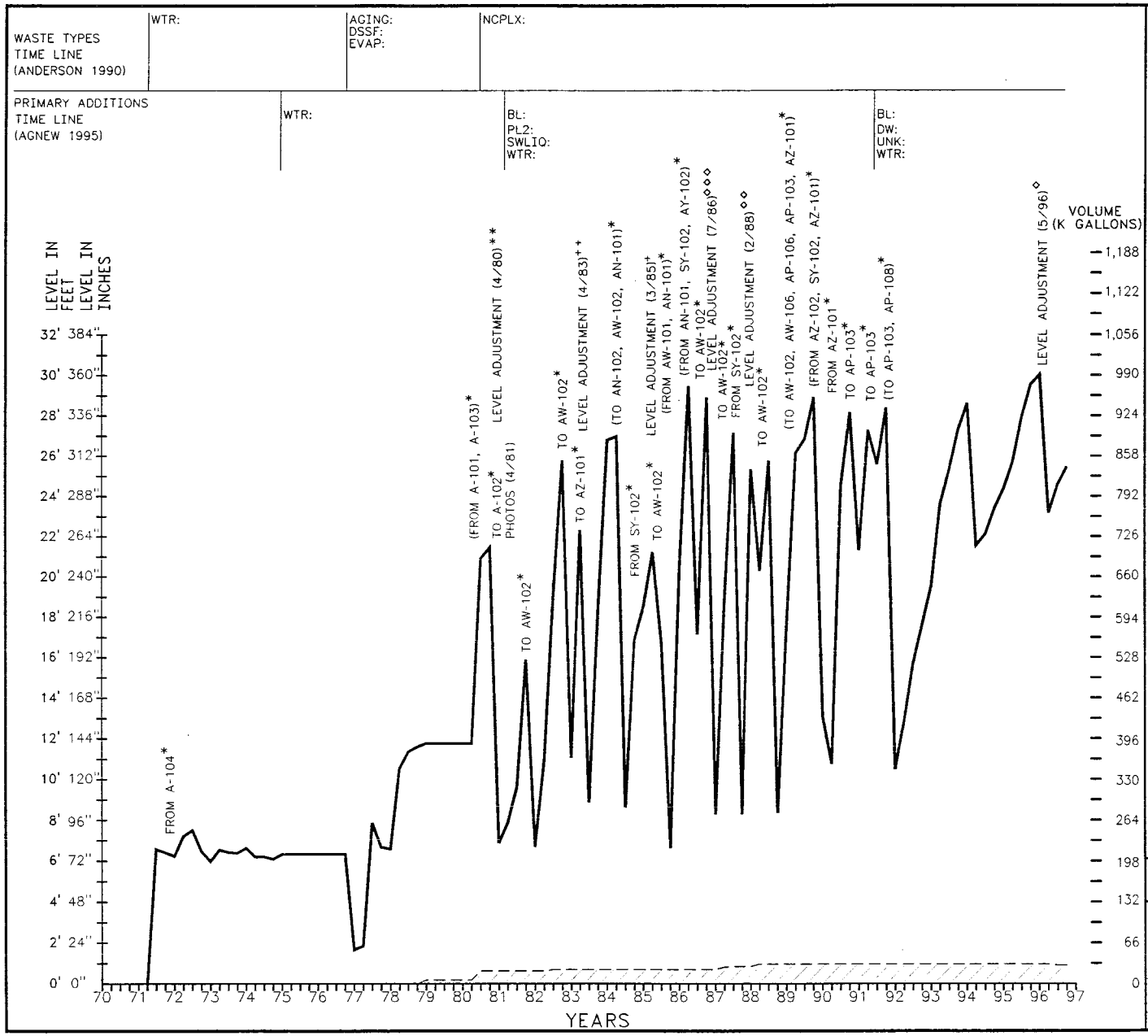


TANK INFO:

CONSTRUCTED 1968-1970
NOMINAL CAPACITY: 1,000,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- ** ANDERSON 1990
- \+ VAIL 1985a
- ++ McCANN 1983e
- ◇ HANLON 1996l
- ◇◇ THURMAN 1988c
- ◇◇◇ CARTER 1986d

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

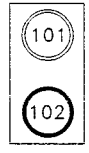
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

AGING:	AGING WASTE
BL:	B-PLANT LOW-LEVEL WASTE
DSSF:	DOUBLE-SHELL SLURRY FEED
DW:	DECONTAMINATION WASTE
EVAP:	EVAPORATOR FEED
NCPLX:	NON-COMPLEXED WASTE
PL2:	PUREX LOW-LEVEL WASTE 1983-88
SWLIQ:	DILUTE, NON-COMPLEXED WASTE
UNK:	UNKNOWN
WTR:	WATER

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

AY TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AY-102 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1971-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E172	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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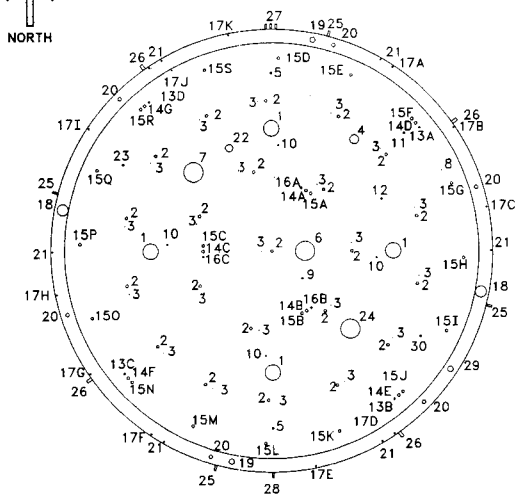
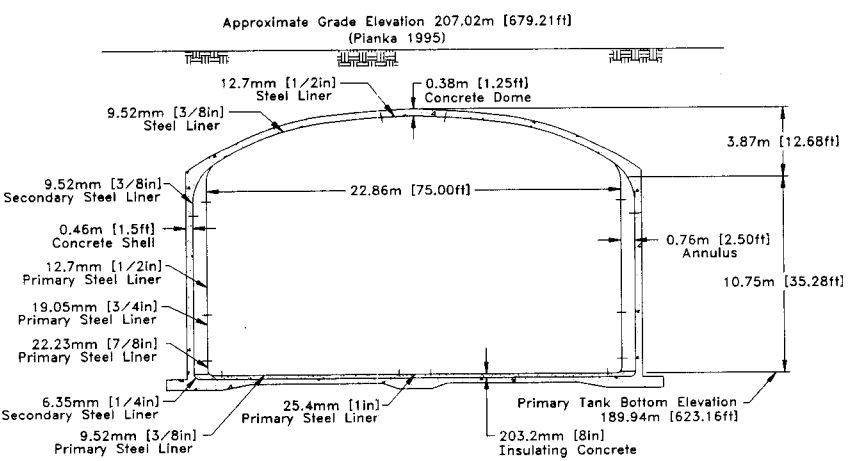
241-AY-102



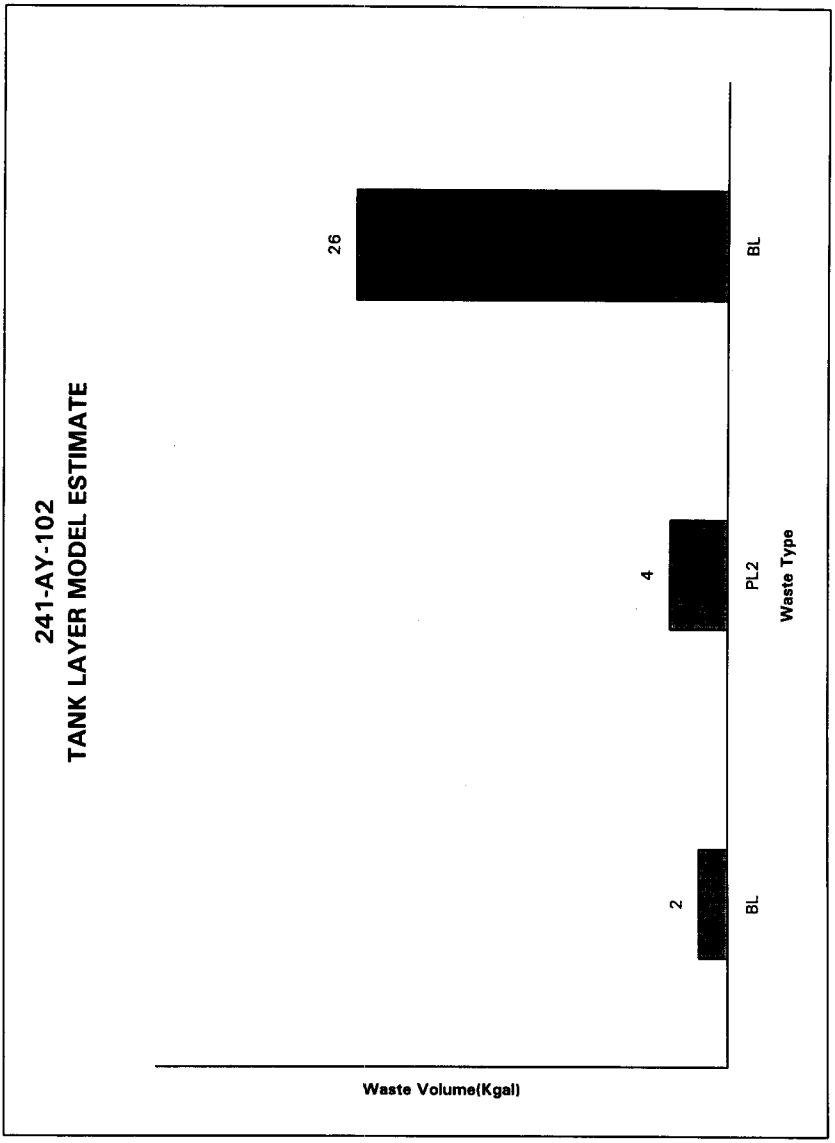
TANK RISER LOCATION

Ref: Salazar 1994
H-2-34690, Rev.0
H-2-64447, Rev.7



Ref: H-2-643107, Rev.4
H-2-64310, Rev.1
H-2-64449, Rev.6

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AY-102							
TLM Solids Composite Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total TLM Wast	1.89E+05 (kg)	(31.9 kgal)	----	----	----	----	----
Heat Load	5.29 (kW)	(1.81E+04 BTU/hr)	----	0.998	3.92	6.07	6.55
Bulk Density	1.56 (g/cc)	----	----	1.33	1.41	1.67	1.70
Void Fraction	0.696	----	----	0.586	0.614	0.807	0.837
Water wt%	47.8	----	----	44.1	44.4	53.9	58.8
TOC wt% C (wet	0.224	----	----	0.149	0.194	0.256	0.325
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	6.20	9.10E+04	1.72E+04	1.20	2.54	8.31	10.1
Al3+	2.67	4.61E+04	8.72E+03	2.61	2.65	2.69	2.76
Fe3+ (total Fe)	2.17	7.74E+04	1.46E+04	1.86	2.07	2.23	2.28
Cr3+	8.91E-04	29.6	5.60	4.01E-04	6.45E-04	1.14E-03	1.37E-03
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	4.84E-06	0.641	0.121	2.17E-06	3.50E-06	6.18E-06	7.46E-06
Ni2+	1.07	4.02E+04	7.59E+03	0.791	0.981	1.12	1.15
Sr2+	0	0	0	0	0	0	0
Mn4+	6.68E-04	23.5	4.43	3.00E-04	4.83E-04	8.53E-04	2.98E-03
Ca2+	0.235	6.03E+03	1.14E+03	6.09E-02	6.27E-02	0.488	0.684
K+	8.66E-03	216	40.9	5.20E-03	7.53E-03	9.46E-03	1.32E-02
OH-	17.6	1.91E+05	3.62E+04	15.5	16.9	18.0	18.8
NO3-	2.86E-02	1.13E+03	214	1.29E-02	2.07E-02	3.65E-02	6.26E-02
NO2-	0.519	1.53E+04	2.89E+03	0.258	0.445	0.572	0.820
CO32-	0.399	1.53E+04	2.89E+03	-5.07E-02	0.205	0.667	0.834
PO43-	1.36E-02	825	156	9.34E-03	1.15E-02	1.57E-02	1.78E-02
SO42-	2.62E-02	1.61E+03	304	1.49E-02	2.26E-02	2.89E-02	4.12E-02
Si (as SiO32-)	2.08	3.74E+04	7.08E+03	1.65E-02	0.395	3.18	4.23
F-	0	0	0	0	0	0	0
Cl-	3.68E-02	832	157	2.08E-02	3.16E-02	4.05E-02	5.78E-02
C6H5O73-	8.79E-03	1.06E+03	201	4.94E-03	7.54E-03	9.69E-03	1.39E-02
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0.117	5.62E+03	1.06E+03	6.59E-02	0.101	0.129	0.185
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	3.79E-04	51.0	9.64	1.71E-04	2.75E-04	4.84E-04	5.85E-04
butanol	3.79E-04	18.0	3.40	1.71E-04	2.75E-04	4.84E-04	5.85E-04
NH3	8.07E-02	877	166	1.16E-02	6.30E-02	9.68E-02	0.156
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM)

HDW Model Rev. 4

Double-Shell Tank 241-AY-102

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	2.75E+06 (kg)	(679 kgal)	----	----	----	----	----
Heat Load	0.592 (kW)	(2.02E+03 BTU/hr)	----	0.508	0.549	0.635	0.677
Bulk Density*	1.07 (g/cc)	----	----	1.03	1.05	1.09	1.10
Water wt%	88.7	----	----	83.5	85.9	91.5	94.3
TOC wt% C (wet	0.286	----	----	0.134	0.210	0.359	0.427

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	1.84	3.96E+04	1.09E+05	0.885	1.36	2.33	2.77
Al3+	0.140	3.52E+03	9.68E+03	6.59E-02	0.102	0.177	0.213
Fe3+ (total Fe)	1.39E-03	72.5	199	9.28E-04	1.15E-03	1.62E-03	1.85E-03
Cr3+	1.42E-03	69.2	190	1.40E-03	1.41E-03	1.43E-03	1.43E-03
Bi3+	1.03E-06	0.202	0.555	9.72E-07	1.00E-06	1.06E-06	1.09E-06
La3+	2.18E-08	2.83E-03	7.79E-03	1.60E-08	1.88E-08	2.48E-08	2.77E-08
Hg2+	1.83E-08	3.43E-03	9.42E-03	1.13E-08	1.77E-08	1.88E-08	1.93E-08
Zr (as ZrO(OH)2)	3.24E-06	0.276	0.759	1.60E-06	3.03E-06	3.44E-06	3.64E-06
Pb2+	1.13E-06	0.219	0.601	9.46E-07	1.04E-06	1.22E-06	1.31E-06
Ni2+	1.23E-03	67.4	185	1.14E-03	1.18E-03	1.28E-03	1.32E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	1.69E-05	0.869	2.39	9.06E-06	1.29E-05	2.09E-05	2.37E-05
Ca2+	6.24E-03	234	643	4.01E-03	5.32E-03	6.94E-03	6.94E-03
K+	7.52E-03	275	756	3.70E-03	5.57E-03	9.47E-03	1.13E-02
OH-	1.24	1.97E+04	5.41E+04	0.587	0.906	1.57	1.89
NO3-	0.472	2.74E+04	7.52E+04	0.237	0.352	0.593	0.708
NO2-	3.70E-02	1.59E+03	4.38E+03	2.20E-02	2.94E-02	4.48E-02	5.21E-02
CO32-	0.141	7.90E+03	2.17E+04	6.50E-02	0.102	0.178	0.205
PO43-	5.40E-03	480	1.32E+03	2.57E-03	3.96E-03	6.85E-03	8.24E-03
SO42-	2.47E-02	2.22E+03	6.11E+03	1.23E-02	1.84E-02	3.11E-02	3.72E-02
Si (as SiO32-)	1.79E-02	470	1.29E+03	9.20E-03	1.34E-02	2.23E-02	2.62E-02
F-	5.51E-04	9.78	26.9	3.14E-04	5.11E-04	5.90E-04	6.29E-04
Cl-	3.36E-02	1.11E+03	3.06E+03	1.60E-02	2.46E-02	4.25E-02	5.11E-02
C6H5O73-	7.77E-03	1.37E+03	3.78E+03	3.53E-03	5.60E-03	9.95E-03	1.20E-02
EDTA4-	2.23E-05	6.00	16.5	7.33E-06	1.46E-05	3.00E-05	3.75E-05
HEDTA3-	3.98E-05	10.2	28.0	9.86E-06	2.45E-05	5.51E-05	7.02E-05
glycolate-	0.103	7.25E+03	1.99E+04	4.68E-02	7.45E-02	0.132	0.160
acetate-	1.53E-05	0.847	2.33	1.25E-05	1.37E-05	1.71E-05	1.97E-05
oxalate2-	2.86E-08	2.35E-03	6.47E-03	2.54E-08	2.70E-08	3.02E-08	3.17E-08
DBP	2.69E-05	5.28	14.5	2.24E-05	2.46E-05	2.91E-05	3.13E-05
†butanol	2.69E-05	1.86	5.12	2.24E-05	2.46E-05	2.91E-05	3.13E-05
NH3	1.14E-03	18.2	50.0	3.49E-04	7.35E-04	1.56E-03	1.97E-03
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AY-102							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	2.94E+06 (kg)	(711 kgal)	----	----	----	----	----
Heat Load	5.88 (kW)	(2.01E+04 BTU/hr)	----	1.59	4.51	6.66	7.14
Bulk Density†	1.09 (g/cc)	----	----	1.05	1.07	1.11	1.13
Water wt%†	86.0	----	----	80.9	83.1	89.3	92.3
TOC wt% C (wet	0.282	----	----	0.135	0.210	0.351	0.421
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	2.04	4.29E+04	1.26E+05	0.900	1.41	2.59	3.03
Al3+	0.253	6.26E+03	1.84E+04	0.180	0.216	0.290	0.328
Fe3+ (total Fe)	9.87E-02	5.05E+03	1.48E+04	8.48E-02	9.43E-02	0.101	0.103
Cr3+	1.40E-03	66.6	196	1.37E-03	1.38E-03	1.42E-03	1.43E-03
Bi3+	9.87E-07	0.189	0.555	9.28E-07	9.57E-07	1.02E-06	1.05E-06
La3+	2.08E-08	2.65E-03	7.79E-03	1.53E-08	1.80E-08	2.37E-08	2.65E-08
Hg2+	1.75E-08	3.21E-03	9.42E-03	1.08E-08	1.70E-08	1.80E-08	1.84E-08
Zr (as ZrO(OH)2)	3.09E-06	0.258	0.759	1.53E-06	2.89E-06	3.29E-06	3.48E-06
Pb2+	1.29E-06	0.246	0.722	1.12E-06	1.21E-06	1.38E-06	1.47E-06
Ni2+	4.92E-02	2.65E+03	7.78E+03	3.67E-02	4.52E-02	5.15E-02	5.29E-02
Sr2+	0	0	0	0	0	0	0
Mn4+	4.62E-05	2.32	6.82	2.21E-05	3.40E-05	5.83E-05	1.56E-04
Ca2+	1.65E-02	607	1.78E+03	6.57E-03	8.01E-03	2.79E-02	3.49E-02
K+	7.57E-03	271	796	3.77E-03	5.66E-03	9.47E-03	1.14E-02
OH-	1.97	3.07E+04	9.03E+04	1.26	1.63	2.31	2.65
NO3-	0.452	2.57E+04	7.54E+04	0.229	0.337	0.567	0.677
NO2-	5.87E-02	2.47E+03	7.27E+03	3.26E-02	4.80E-02	6.84E-02	8.66E-02
CO32-	0.152	8.37E+03	2.46E+04	6.92E-02	0.107	0.200	0.193
PO43-	5.77E-03	502	1.47E+03	2.95E-03	4.35E-03	7.18E-03	8.63E-03
SO42-	2.48E-02	2.18E+03	6.41E+03	1.24E-02	1.86E-02	3.10E-02	3.74E-02
Si (as SiO32-)	0.111	2.85E+03	8.37E+03	1.22E-02	3.48E-02	0.156	0.199
F-	5.26E-04	9.15	26.9	3.00E-04	4.88E-04	5.64E-04	6.01E-04
Cl-	3.37E-02	1.09E+03	3.21E+03	1.62E-02	2.49E-02	4.25E-02	5.14E-02
C6H5O73-	7.82E-03	1.35E+03	3.98E+03	3.59E-03	5.69E-03	9.94E-03	1.21E-02
EDTA4-	2.13E-05	5.62	16.5	7.01E-06	1.40E-05	2.86E-05	3.58E-05
HEDTA3-	3.80E-05	9.53	28.0	9.42E-06	2.34E-05	5.27E-05	6.70E-05
glycolate-	0.104	7.15E+03	2.10E+04	4.77E-02	7.57E-02	0.132	0.161
acetate-	1.47E-05	0.792	2.33	1.19E-05	1.31E-05	1.63E-05	1.89E-05
oxalate2-	2.73E-08	2.20E-03	6.47E-03	2.43E-08	2.58E-08	2.88E-08	3.03E-08
DBP	4.27E-05	8.22	24.1	2.90E-05	3.58E-05	4.96E-05	5.62E-05
butanol	4.27E-05	2.90	8.52	2.90E-05	3.58E-05	4.96E-05	5.62E-05
NH3	4.72E-03	73.5	216	1.58E-03	3.91E-03	5.44E-03	8.15E-03
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AY-102							
TLM Solids Composite Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total TLM Wast	1.89E+05 (kg)	(31.9 kgal)	----	----	----	----	----
Heat Load	5.29 (kW)	(1.81E+04 BTU/hr)	----	0.998	3.92	6.07	6.55
Bulk Density	1.56 (g/cc)	----	----	1.33	1.41	1.67	1.70
Void Fraction	0.696	----	----	0.586	0.614	0.807	0.837
Water wt%	47.8	----	----	44.1	44.4	53.9	58.8
TOC wt% C (wet	0.224	----	----	0.149	0.194	0.256	0.325
Radiological Constituents	**CI/L**	**µCi/g**	**CI**	**-95 CI (CI/L)**	**-67 CI (CI/L)**	**+67 CI (CI/L)**	**+95 CI (CI/L)**
H-3	1.45E-05	9.24E-03	1.75	3.71E-06	8.99E-06	2.03E-05	3.49E-05
C-14	9.73E-07	6.22E-04	0.118	5.47E-07	8.35E-07	1.07E-06	1.12E-05
Ni-59	1.65E-04	0.106	20.0	1.22E-04	1.51E-04	1.73E-04	1.80E-04
Ni-63	1.64E-02	10.5	1.98E+03	1.21E-02	1.50E-02	1.72E-02	1.78E-02
Co-60	2.19E-06	1.40E-03	0.265	1.23E-06	1.88E-06	2.41E-06	3.46E-06
Se-79	6.60E-07	4.22E-04	7.98E-02	3.69E-07	4.73E-07	2.29E-05	1.51E-04
Sr-90	6.50	4.16E+03	7.86E+05	1.23	4.81	7.46	8.05
Y-90	6.51	4.16E+03	7.86E+05	1.23	4.81	7.46	8.05
Zr-93	2.97E-06	1.90E-03	0.359	1.67E-06	2.04E-06	4.17E-05	6.82E-04
Nb-93m	2.38E-06	1.52E-03	0.287	1.24E-06	1.72E-06	9.47E-05	5.43E-04
Tc-99	6.51E-06	4.16E-03	0.787	3.66E-06	5.59E-06	7.18E-06	1.03E-05
Ru-106	1.40E-06	8.92E-04	0.169	6.19E-07	1.14E-06	1.65E-06	1.89E-06
Cd-113m	1.01E-05	6.47E-03	1.22	5.69E-06	8.69E-06	1.47E-05	2.18E-03
Sb-125	1.34E-05	8.56E-03	1.62	7.53E-06	1.15E-05	1.48E-05	2.12E-05
Sn-126	1.04E-06	6.66E-04	0.126	5.76E-07	7.62E-07	4.58E-05	2.38E-04
I-129	1.27E-08	8.10E-06	1.53E-03	7.12E-09	1.09E-08	1.40E-08	2.00E-08
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	2.39E-03	1.53	289	1.31E-03	1.74E-03	9.79E-02	0.546
Eu-152	1.32E-04	8.42E-02	15.9	1.31E-04	1.32E-04	1.32E-04	1.32E-04
Eu-154	6.62E-05	4.23E-02	8.00	3.72E-05	5.54E-05	7.71E-05	3.97E-03
Eu-155	7.55E-03	4.82	912	7.53E-03	7.54E-03	7.55E-03	7.57E-03
Ra-226	5.51E-09	3.52E-06	6.66E-04	3.44E-11	1.37E-09	9.65E-09	1.36E-08
Ra-228	7.01E-14	4.48E-11	8.47E-09	6.99E-14	7.00E-14	7.01E-14	7.02E-14
Ac-227	2.41E-08	1.54E-05	2.91E-03	1.79E-10	2.86E-10	4.81E-08	7.12E-08
Pa-231	5.86E-10	3.75E-07	7.08E-05	2.51E-10	3.99E-10	6.64E-09	1.35E-07
Th-229	1.04E-11	6.66E-09	1.26E-06	1.04E-11	1.04E-11	1.04E-11	1.04E-11
Th-232	3.90E-16	2.49E-13	4.72E-11	2.19E-16	3.35E-16	4.30E-16	6.17E-16
U-232	1.82E-10	1.16E-07	2.19E-05	7.87E-12	1.18E-11	3.28E-10	4.17E-10
U-233	1.87E-12	1.19E-09	2.25E-07	8.52E-14	1.26E-13	3.37E-12	4.28E-12
U-234	8.16E-07	5.21E-04	9.85E-02	3.44E-08	5.21E-08	1.47E-06	1.87E-06
U-235	3.10E-08	1.98E-05	3.75E-03	1.31E-09	1.99E-09	5.60E-08	7.12E-08
U-236	6.71E-08	4.29E-05	8.11E-03	2.78E-09	4.24E-09	1.21E-07	1.54E-07
U-238	5.60E-07	3.58E-04	6.77E-02	2.40E-08	3.62E-08	1.01E-06	1.29E-06
Np-237	2.08E-08	1.33E-05	2.51E-03	1.17E-08	1.78E-08	2.29E-08	3.29E-08
Pu-238	2.55E-04	0.163	30.9	1.79E-04	2.27E-04	2.83E-04	3.08E-04
Pu-239	4.15E-03	2.65	501	2.80E-03	3.57E-03	4.73E-03	5.29E-03
Pu-240	9.24E-04	0.591	112	6.33E-04	8.06E-04	1.04E-03	1.15E-03
Pu-241	1.90E-02	12.2	2.30E+03	1.36E-02	1.70E-02	2.10E-02	2.27E-02
Pu-242	1.14E-07	7.28E-05	1.38E-02	7.89E-08	1.01E-07	1.26E-07	1.37E-07
Am-241	3.57E-03	2.28	431	1.89E-05	1.57E-03	5.57E-03	7.49E-03
Am-243	2.70E-07	1.73E-04	3.26E-02	1.43E-09	1.27E-07	3.96E-07	5.03E-07
Cm-242	7.00E-06	4.48E-03	0.846	6.99E-06	7.00E-06	7.01E-06	7.02E-06
Cm-243	7.46E-07	4.76E-04	9.01E-02	7.44E-07	7.45E-07	7.46E-07	7.48E-07
Cm-244	2.00E-05	1.28E-02	2.41	4.45E-06	1.49E-05	2.51E-05	3.00E-05
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	7.10E-02 (g/L)	----	8.58	4.80E-02	6.11E-02	8.09E-02	9.04E-02
U	7.07E-03	1.08E+03	203	3.03E-04	4.57E-04	1.28E-02	1.62E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AY-102

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	2.75E+06 (kg)	(679 kgal)	----	----	----	----	----
Heat Load	0.592 (kW)	(2.02E+03 BTU/hr)	----	0.508	0.549	0.635	0.677
Bulk Density*	1.07 (g/cc)	----	----	1.03	1.05	1.09	1.10
Water wt%†	88.7	----	----	83.5	85.9	91.5	94.3
TOC wt% C (wet	0.286	----	----	0.134	0.210	0.359	0.427

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	9.52E-05	8.90E-02	245	7.03E-05	8.25E-05	1.08E-04	1.20E-04
C-14	1.90E-06	1.78E-03	4.88	1.43E-06	1.66E-06	2.14E-06	2.31E-06
Ni-59	1.47E-07	1.37E-04	0.377	1.41E-07	1.44E-07	1.49E-07	1.51E-07
Ni-63	1.45E-05	1.36E-02	37.4	1.39E-05	1.42E-05	1.48E-05	1.50E-05
Co-60	2.79E-06	2.61E-03	7.18	1.73E-06	2.25E-06	3.34E-06	3.85E-06
Se-79	6.02E-07	5.62E-04	1.55	2.83E-07	4.37E-07	7.65E-07	9.21E-07
Sr-90	1.79E-02	16.7	4.60E+04	1.54E-02	1.66E-02	1.92E-02	2.04E-02
Y-90	1.79E-02	16.7	4.60E+04	1.54E-02	1.66E-02	1.92E-02	2.04E-02
Zr-93	2.72E-06	2.54E-03	6.98	1.28E-06	1.89E-06	3.45E-06	4.15E-06
Nb-93m	2.16E-06	2.02E-03	5.56	1.02E-06	1.58E-06	2.75E-06	3.31E-06
Tc-99	1.02E-05	9.53E-03	26.2	7.04E-06	8.58E-06	1.18E-05	1.33E-05
Ru-106	2.63E-09	2.46E-06	6.76E-03	8.02E-10	1.70E-09	3.56E-09	4.46E-09
Cd-113m	9.50E-06	8.89E-03	24.4	4.61E-06	7.00E-06	1.36E-05	1.44E-05
Sb-125	1.68E-04	0.157	433	5.75E-05	1.12E-04	2.25E-04	2.79E-04
Sn-126	9.48E-07	8.87E-04	2.44	4.45E-07	6.91E-07	1.21E-06	1.45E-06
I-129	2.01E-08	1.88E-05	5.16E-02	1.40E-08	1.70E-08	2.32E-08	2.62E-08
Cs-134	1.66E-04	0.155	427	1.16E-04	1.40E-04	1.92E-04	2.17E-04
Cs-137	2.34E-02	21.9	6.02E+04	1.64E-02	1.98E-02	2.70E-02	3.05E-02
Ba-137m	2.22E-02	20.7	5.69E+04	1.55E-02	1.88E-02	2.56E-02	2.88E-02
Sm-151	2.18E-03	2.04	5.60E+03	1.02E-03	1.59E-03	2.77E-03	3.33E-03
Eu-152	9.40E-07	8.79E-04	2.42	6.52E-07	7.93E-07	1.09E-06	1.23E-06
Eu-154	6.31E-05	5.90E-02	162	3.11E-05	4.68E-05	7.95E-05	9.52E-05
Eu-155	1.05E-04	9.80E-02	269	8.23E-05	9.33E-05	1.16E-04	1.27E-04
Ra-226	3.26E-11	3.05E-08	8.38E-05	9.91E-12	2.10E-11	4.42E-11	4.46E-11
Ra-228	2.71E-10	2.53E-07	6.96E-04	1.07E-10	1.07E-10	3.09E-10	3.50E-10
Ac-227	1.89E-10	1.77E-07	4.86E-04	5.76E-11	1.22E-10	2.56E-10	2.27E-10
Pa-231	5.37E-10	5.02E-07	1.38E-03	2.41E-10	3.72E-10	6.82E-10	8.21E-10
Th-229	6.33E-12	5.92E-09	1.63E-05	2.55E-12	2.55E-12	7.17E-12	8.06E-12
Th-232	2.71E-11	2.53E-08	6.97E-05	6.87E-12	6.87E-12	3.26E-11	3.79E-11
U-232	9.08E-10	8.49E-07	2.34E-03	6.51E-10	7.77E-10	1.06E-09	1.22E-09
U-233	3.47E-09	3.25E-06	8.93E-03	2.49E-09	2.97E-09	4.06E-09	4.68E-09
U-234	1.05E-08	9.86E-06	2.71E-02	8.01E-09	9.25E-09	1.18E-08	1.31E-08
U-235	4.05E-10	3.79E-07	1.04E-03	3.07E-10	3.55E-10	4.55E-10	5.03E-10
U-236	7.93E-10	7.42E-07	2.04E-03	6.09E-10	6.99E-10	8.88E-10	9.78E-10
U-238	8.02E-09	7.50E-06	2.06E-02	6.07E-09	7.03E-09	9.02E-09	9.98E-09
Np-237	8.11E-08	7.58E-05	0.208	6.23E-08	7.15E-08	9.07E-08	9.99E-08
Pu-238	2.68E-07	2.51E-04	0.689	8.41E-08	1.72E-07	3.68E-07	4.69E-07
Pu-239	4.64E-06	4.34E-03	11.9	1.47E-06	3.03E-06	6.25E-06	7.80E-06
Pu-240	1.01E-06	9.49E-04	2.61	3.23E-07	6.58E-07	1.38E-06	1.73E-06
Pu-241	1.92E-05	1.79E-02	49.3	6.28E-06	1.25E-05	2.62E-05	3.33E-05
Pu-242	1.21E-10	1.13E-07	3.12E-04	3.72E-11	7.73E-11	1.68E-10	2.15E-10
Am-241	1.59E-05	1.49E-02	40.9	4.95E-06	1.03E-05	2.15E-05	2.53E-05
Am-243	1.23E-09	1.15E-06	3.16E-03	3.60E-10	7.59E-10	1.77E-09	2.24E-09
Cm-242	6.43E-08	6.01E-05	0.165	4.89E-08	5.64E-08	7.21E-08	7.96E-08
Cm-243	9.05E-09	8.46E-06	2.33E-02	7.22E-09	8.11E-09	9.98E-09	1.09E-08
Cm-244	5.26E-08	4.91E-05	0.135	1.60E-08	3.39E-08	7.12E-08	8.91E-08

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	7.91E-05 (g/L)	----	0.203	2.50E-05	5.15E-05	1.07E-04	1.33E-04
U	9.78E-05	21.8	59.8	7.32E-05	8.52E-05	1.10E-04	1.22E-04

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AY-102

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	2.94E+06 (kg)	(711 kgal)	----	----	----	----	----
Heat Load	5.88 (kW)	(2.01E+04 BTU/hr)	----	1.59	4.51	6.66	7.14
Bulk Density†	1.09 (g/cc)	----	----	1.05	1.07	1.11	1.13
Water wt%†	86.0	----	----	80.9	83.1	89.3	92.3
TOC wt% C (wet	0.282	----	----	0.135	0.210	0.351	0.421

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	9.15E-05	8.39E-02	246	6.78E-05	7.94E-05	1.04E-04	1.15E-04
C-14	1.86E-06	1.70E-03	5.00	1.39E-06	1.62E-06	2.09E-06	2.71E-06
Ni-59	7.56E-06	6.93E-03	20.4	5.60E-06	6.93E-06	7.92E-06	8.20E-06
Ni-63	7.49E-04	0.686	2.02E+03	5.55E-04	6.87E-04	7.85E-04	8.12E-04
Co-60	2.77E-06	2.53E-03	7.44	1.71E-06	2.24E-06	3.29E-06	3.84E-06
Se-79	6.04E-07	5.53E-04	1.63	2.87E-07	4.38E-07	1.67E-06	7.09E-06
Sr-90	0.309	283	8.32E+05	7.22E-02	0.233	0.352	0.379
Y-90	0.309	283	8.32E+05	7.22E-02	0.233	0.352	0.379
Zr-93	2.73E-06	2.50E-03	7.34	1.30E-06	1.90E-06	5.11E-06	3.22E-05
Nb-93m	2.17E-06	1.99E-03	5.85	1.03E-06	1.59E-06	6.52E-06	2.55E-05
Tc-99	1.00E-05	9.18E-03	27.0	6.89E-06	8.45E-06	1.16E-05	1.32E-05
Ru-106	6.51E-08	5.97E-05	0.175	3.03E-08	5.40E-08	7.57E-08	8.58E-08
Cd-113m	9.53E-06	8.73E-03	25.7	4.66E-06	7.08E-06	1.36E-05	1.07E-04
Sb-125	1.61E-04	0.148	434	5.55E-05	1.07E-04	2.15E-04	2.67E-04
Sn-126	9.53E-07	8.73E-04	2.56	4.51E-07	7.00E-07	3.03E-06	1.11E-05
I-129	1.98E-08	1.81E-05	5.32E-02	1.37E-08	1.67E-08	2.28E-08	2.59E-08
Cs-134	1.59E-04	0.145	427	1.11E-04	1.34E-04	1.83E-04	2.07E-04
Cs-137	2.24E-02	20.5	6.02E+04	1.57E-02	1.89E-02	2.58E-02	2.91E-02
Ba-137m	2.12E-02	19.4	5.69E+04	1.48E-02	1.79E-02	2.44E-02	2.75E-02
Sm-151	2.19E-03	2.00	5.88E+03	1.04E-03	1.61E-03	6.66E-03	2.56E-02
Eu-152	6.81E-06	6.24E-03	18.3	6.52E-06	6.67E-06	6.95E-06	7.10E-06
Eu-154	6.33E-05	5.79E-02	170	3.14E-05	4.72E-05	7.92E-05	2.54E-04
Eu-155	4.39E-04	0.402	1.18E+03	4.17E-04	4.28E-04	4.50E-04	4.61E-04
Ra-226	2.79E-10	2.55E-07	7.50E-04	2.54E-11	1.04E-10	4.53E-10	6.21E-10
Ra-228	2.59E-10	2.37E-07	6.96E-04	1.02E-10	1.02E-10	2.95E-10	3.34E-10
Ac-227	1.26E-09	1.16E-06	3.40E-03	1.33E-10	2.57E-10	2.28E-09	3.25E-09
Pa-231	5.39E-10	4.94E-07	1.45E-03	2.41E-10	3.73E-10	9.46E-10	6.36E-09
Th-229	6.52E-12	5.97E-09	1.75E-05	2.91E-12	2.91E-12	7.32E-12	8.17E-12
Th-232	2.59E-11	2.37E-08	6.97E-05	6.56E-12	6.56E-12	3.12E-11	3.62E-11
U-232	8.76E-10	8.02E-07	2.36E-03	6.29E-10	7.50E-10	1.02E-09	1.18E-09
U-233	3.32E-09	3.04E-06	8.93E-03	2.37E-09	2.83E-09	3.88E-09	4.47E-09
U-234	4.67E-08	4.28E-05	0.126	1.11E-08	1.23E-08	7.63E-08	9.42E-08
U-235	1.78E-09	1.63E-06	4.79E-03	4.28E-10	4.72E-10	2.90E-09	3.58E-09
U-236	3.77E-09	3.45E-06	1.01E-02	8.44E-10	9.39E-10	6.20E-09	7.68E-09
U-238	3.28E-08	3.01E-05	8.83E-02	8.42E-09	9.22E-09	5.31E-08	6.54E-08
Np-237	7.84E-08	7.18E-05	0.211	6.05E-08	6.92E-08	8.75E-08	9.64E-08
Pu-238	1.17E-05	1.07E-02	31.5	8.28E-06	1.05E-05	1.29E-05	1.39E-05
Pu-239	1.91E-04	0.175	513	1.30E-04	1.66E-04	2.15E-04	2.39E-04
Pu-240	4.25E-05	3.89E-02	114	2.94E-05	3.75E-05	4.74E-05	5.20E-05
Pu-241	8.72E-04	0.799	2.35E+03	6.31E-04	7.88E-04	9.52E-04	1.03E-03
Pu-242	5.23E-09	4.79E-06	1.41E-02	3.66E-09	4.70E-09	5.73E-09	6.19E-09
Am-241	1.75E-04	0.161	472	1.41E-05	9.09E-05	2.60E-04	3.41E-04
Am-243	1.33E-08	1.22E-05	3.58E-02	1.09E-09	7.40E-09	1.85E-08	2.29E-08
Cm-242	3.76E-07	3.44E-04	1.01	3.60E-07	3.68E-07	3.83E-07	3.91E-07
Cm-243	4.21E-08	3.86E-05	0.113	4.04E-08	4.12E-08	4.30E-08	4.39E-08
Cm-244	9.47E-07	8.67E-04	2.55	2.50E-07	7.23E-07	1.16E-06	1.36E-06

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	3.26E-03 (g/L)	----	8.78	2.23E-03	2.85E-03	3.68E-03	4.08E-03
U	4.11E-04	89.5	263	1.03E-04	1.13E-04	6.67E-04	8.22E-04

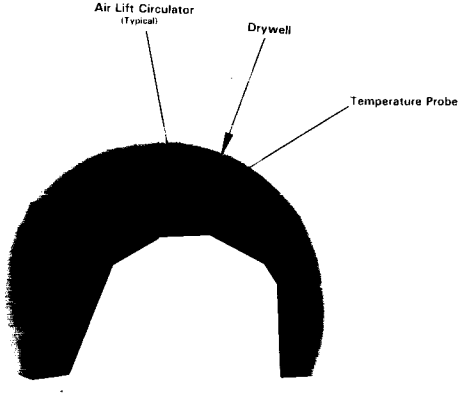
*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

241-AY-102

Photo date: 4-28-81

North
Unknown



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6.0 241-AZ Tank Farm

The AZ Tank Farm is located in the 200 East Area south of 7th Street and east of Buffalo Avenue. The farm contains two flat bottom design, double-shell tanks built from 1971 through 1977. The tanks are 75 feet in diameter with an operating capacity of 1,000,000 gallons. For more information on the design, construction, and waste contents of the tanks, refer to the AZ Tank Farm Supporting Document, HNF-SD-WM-ER-318, Rev. 1 (Brevick et al., 1997e).

The 241-AZ Tank Farm is designated as an aging waste facility. Tank 241-AZ-101, initially a receiver tank for high strontium content waste, was later used as a lag storage for double-shell slurry feed waste (Leach and Stahl, 1993). The primary additions to the tanks were B Plant low-level waste (BL), Aging waste supernatant (P3), PUREX low-level waste (PL2), dilute non-complexed waste (SWLIQ), unknown waste (UNK), and waste water (WTR) (Agnew et al., 1995).

The following table presents a summary of the 241-AZ Tank Farm. Refer to the glossary for waste type terminology.

TANK FARM 241-AZ SUMMARY

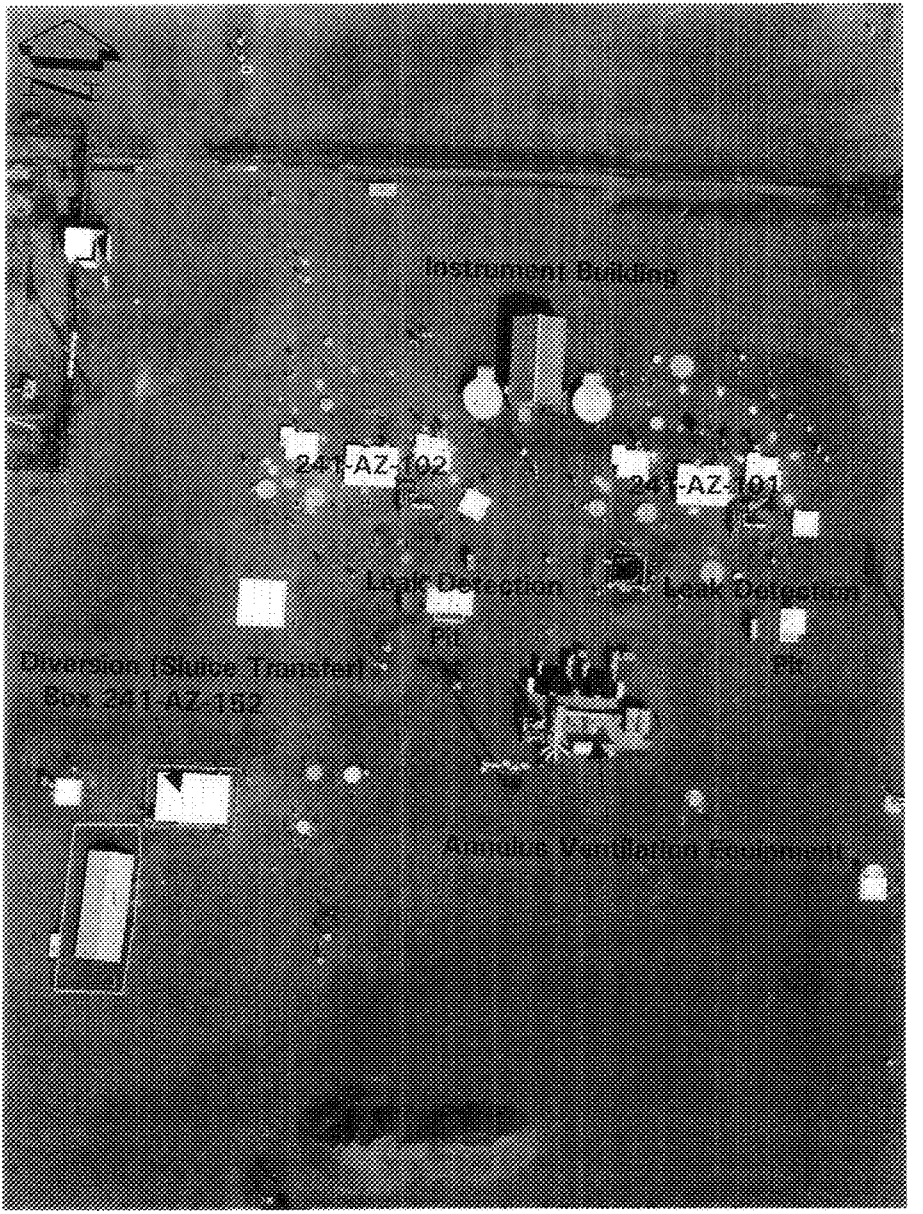
TANK FARM DESCRIPTION		WASTE VOLUME (HANLON 1996I)	
Shell Type	Double	Total Waste Volume	1,770,000 gal
Number of Tanks	2	Waste Type	AGING
Construction Date	1974 - 1976	Drainable Interstitial Liquids	4,000 gal
INTEGRITY		Pumpable Liquids	1,640,000 gal
Sound	101, 102	Saltcake	0 gal
		Sludge	130,000 gal
		Supernatant	1,640,000 gal
TANK VOLUMES		**WATCH LISTS**	
2 @ 1,000,000 gal		Hydrogen	none
		Organic	none
		High Heat	none

The historical characterization and waste inventory information for each tank is assembled into a set of tables, sketches, graphs, and interior tank montage. The set consists of the following for each tank in AZ Tank Farm:

- Tank Summary table
- Waste and Level History sketch
- Riser configuration sketch
- Tank Layer Model Estimate graph
- Total Inventory Estimate tables
- TLM Solids Composite Inventory Estimate tables
- SMM Composite Inventory Estimate tables
- Interior tank montage

The supporting document for this tank farm provides backup data and further explanation of the above tables, sketches, and graphs.

AZ TANK FARM


Instrument Building
241-AZ-102
241-AZ-101
Leak Detection Pit
Leak Detection Pit
Diversion Box 241-AZ-152
Aerial & Ventilation Equipment

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TANK 241-AZ-101 SUMMARY

TANK HISTORY	
Entered Service	Nov. 1976
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser	Size
5B, 11A, 30A	4 in
15A, 15B, 15C, 15D, 15E, 15G 15H, 15I, 15J, 15K, 15L	6 in
TANK TEMPERATURE	
Average Tank Temperature	153°F
Maximum Temperature	186°F
Date	Jan 16, 1995
Elevation from tank bottom	unknown
Location	Sludge Thermocouple 72
Minimum Temperature	127°F
Date	Oct 16, 1995
Elevation from tank bottom	25.00 ft
Location	Profile Thermocouple 59

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	flat
Nominal Capacity	1,000,000 gal
Total Risers	105
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	845,000 gal
Waste Type	Aging
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	810,000 gal
Saltcake	0 gal
Sludge	35,000 gal
Supernatant	810,000 gal
INTERIOR PHOTOGRAPHS	
Date	Aug 18, 1983
Montage Number	94080233-21CN
Photo Set Number	109097
WASTE SURFACE LEVEL	
Devices	Manual ENRAF and Tape
Max Level	359.5 in
Date	Jan 6, 1995
Min Level	306 in
Date	Sept 9 - Sept 20, 1996*

*Numerous dates in this time span

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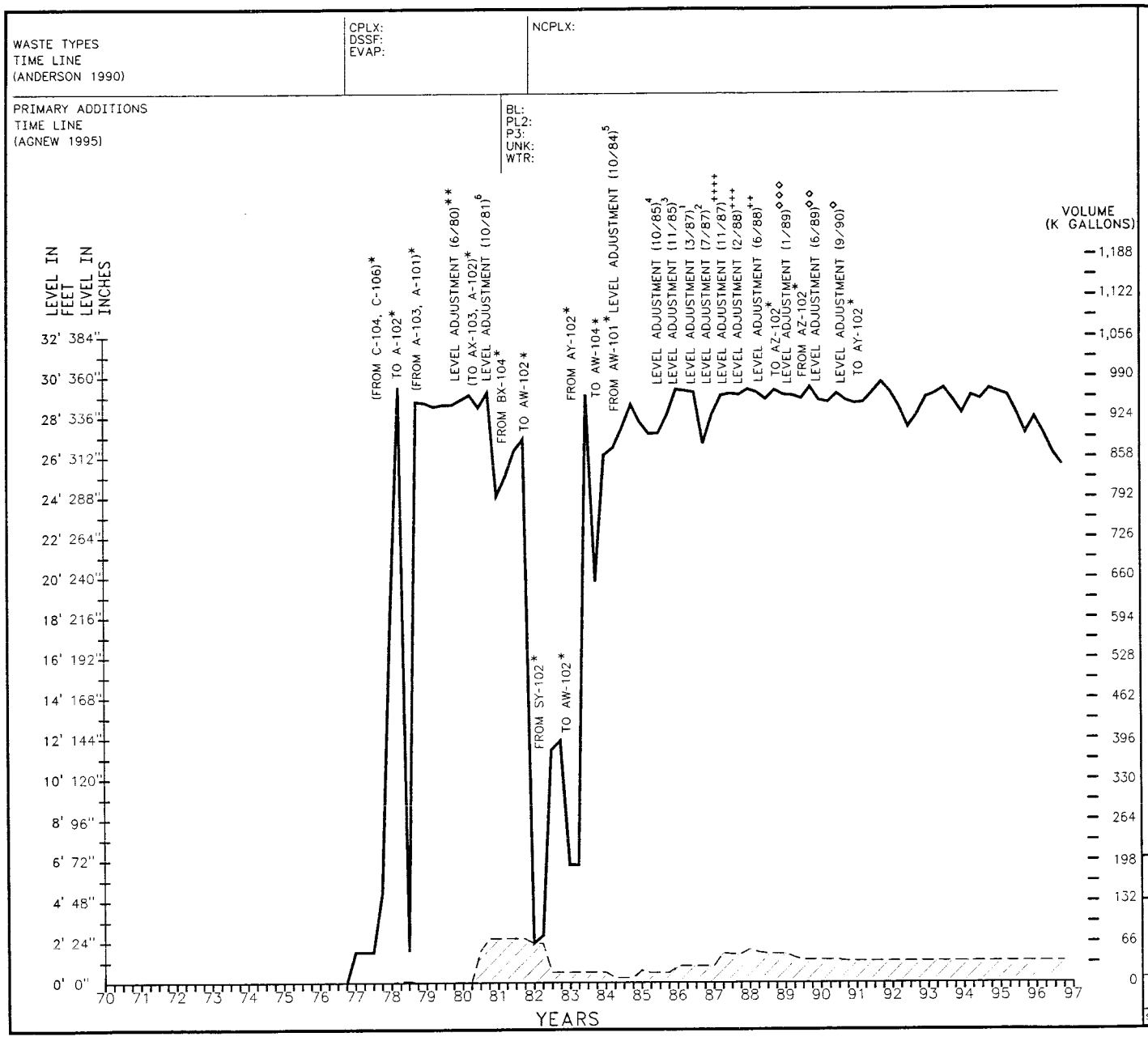


TANK INFO:

CONSTRUCTED 1971-1977
NOMINAL CAPACITY: 1,000,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- ** ANDERSON 1990
- + McCANN 1983i
- ++ THURMAN 1988g
- +++ THURMAN 1988c
- ++++ THURMAN 1987j
- ◇ HANLON 1996l
- ◇◇ THURMAN 1989h
- ◇◇◇ THURMAN 1989i
- 1 THURMAN 1987b
- 2 THURMAN 1987f
- 3 VAIL AND MURRY 1985c
- 4 McCANN AND VAIL 1985b
- 5 McCANN AND VAIL 1984k
- 6 McCANN 1981d

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

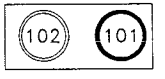
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

BL:	B-PLANT LOW-LEVEL WASTE
CPLX:	COMPLEXED WASTE
DSSF:	DOUBLE-SHELL SLURRY FEED
EVAP:	EVAPORATOR FEED
NCPLX:	NON-COMPLEXED WASTE
PL2:	PUREX LOW-LEVEL WASTE 1983-88
P3:	AGING WASTE SUPERNATANT
UNK:	UNKNOWN
WTR:	WATER

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

AZ TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AZ-101 SINGLE-SHELL TANK
WASTE & LEVEL HISTORY 1976-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E173	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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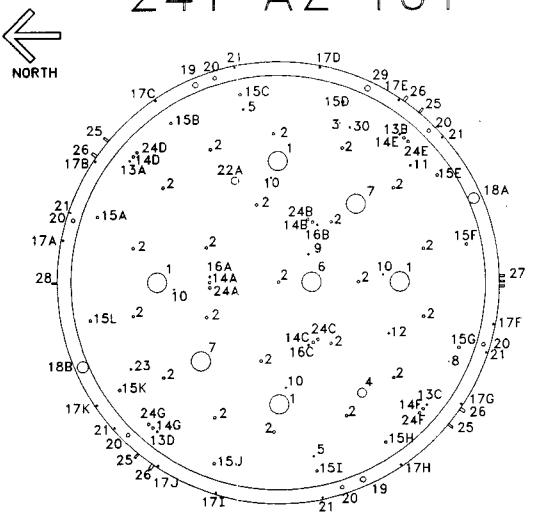
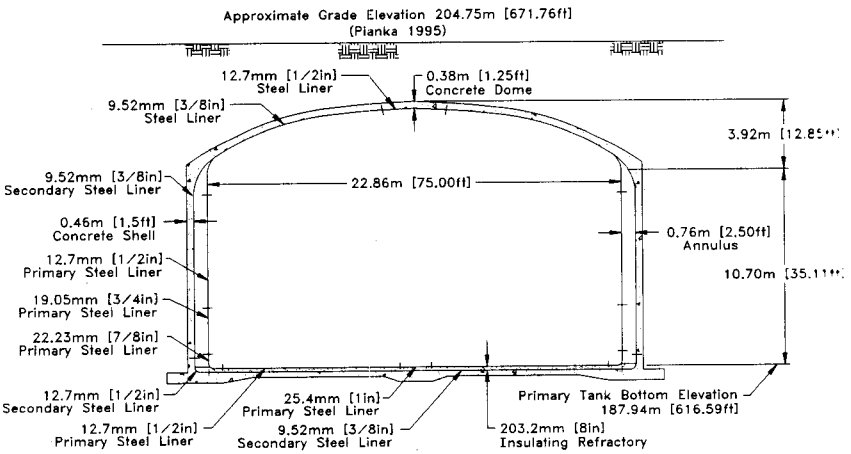
241-AZ-101



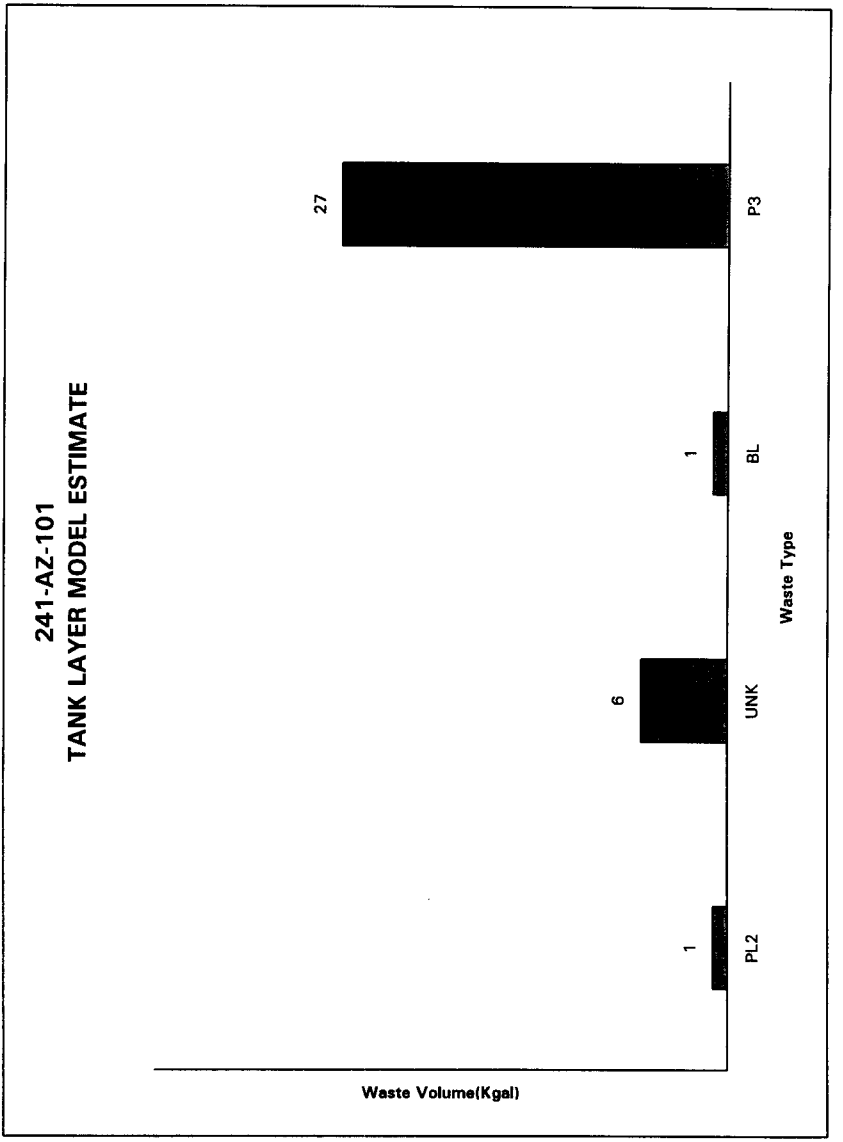
TANK RISER LOCATION

Ref: Salazar 1994
H-2-67314, Rev.1
H-2-70202, Rev.1



Ref: H-2-67317, Rev.1
H-2-70202, Rev.1

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-AZ-101							
TLM Solids Composite Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total TLM Wast	1.65E+05 (kg)	(29.0 kgal)	----	----	----	----	----
Heat Load	43.3 (kW)	(1.48E+05 BTU/hr)	----	42.7	43.0	43.5	43.7
Bulk Density	1.50 (g/cc)	----	----	1.43	1.47	1.53	1.55
Void Fraction	0.788	----	----	0.768	0.778	0.801	0.817
Water wt%	55.1	----	----	53.1	54.0	56.5	58.2
TOC wt% C (wet	1.00E-02	----	----	6.12E-03	8.79E-03	1.09E-02	1.52E-02
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	5.07	7.77E+04	1.28E+04	3.84	4.50	5.57	6.00
Al3+	0.908	1.63E+04	2.69E+03	0.844	0.875	0.941	0.973
Fe3+ (total Fe)	2.90	1.08E+05	1.78E+04	2.88	2.89	2.91	2.92
Cr3+	2.44E-04	8.46	1.39	1.10E-04	1.77E-04	3.12E-04	3.77E-04
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	1.33E-06	0.183	3.01E-02	5.96E-07	9.60E-07	1.69E-06	2.05E-06
Ni2+	4.55E-02	1.78E+03	293	3.45E-02	4.20E-02	4.75E-02	4.87E-02
Sr2+	0	0	0	0	0	0	0
Mn4+	1.83E-04	6.70	1.10	8.23E-05	1.33E-04	2.34E-04	8.16E-04
Ca2+	0.252	6.73E+03	1.11E+03	0.160	0.211	0.293	0.333
K+	8.67E-03	226	37.2	6.43E-03	7.53E-03	9.82E-03	1.09E-02
OH-	14.1	1.60E+05	2.63E+04	13.3	13.7	14.5	14.8
NO3-	7.84E-03	324	53.3	3.53E-03	5.68E-03	1.00E-02	1.21E-02
NO2-	0.478	1.46E+04	2.41E+03	0.353	0.414	0.543	0.605
CO32-	0.261	1.04E+04	1.72E+03	0.170	0.220	0.303	0.342
PO43-	2.35E-03	149	24.5	1.18E-03	1.77E-03	2.94E-03	3.51E-03
SO42-	0.101	6.46E+03	1.06E+03	7.36E-02	8.70E-02	0.115	0.129
Si (as SiO32-)	1.50	2.81E+04	4.63E+03	1.12	1.31	1.70	1.89
F-	2.22E-02	281	46.3	1.61E-02	1.91E-02	2.54E-02	2.84E-02
Cl-	3.90E-02	921	152	2.87E-02	3.38E-02	4.43E-02	4.94E-02
C6H5O73-	3.47E-04	43.6	7.19	1.95E-04	2.97E-04	3.82E-04	5.48E-04
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	4.62E-03	231	38.0	2.60E-03	3.96E-03	5.09E-03	7.31E-03
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	1.04E-04	14.6	2.40	4.68E-05	7.53E-05	1.33E-04	1.60E-04
butanol	1.04E-04	5.13	0.846	4.68E-05	7.53E-05	1.33E-04	1.60E-04
NH3	0.188	2.13E+03	351	0.141	0.164	0.212	0.236
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AZ-101							
SMM Composite Inventory Estimate							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	3.88E+06 (kg)	(931 kgal)	----	----	----	----	----
Heat Load	34.1 (kW)	(1.16E+05 BTU/hr)	----	24.0	29.0	39.2	44.2
Bulk Density*	1.10 (g/cc)	----	----	1.08	1.09	1.11	1.12
Water wt%	85.1	----	----	82.3	83.6	86.5	88.0
TOC wt% C (wet	7.91E-02	----	----	4.71E-02	6.27E-02	9.55E-02	0.112
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	2.55	5.33E+04	2.07E+05	1.97	2.25	2.85	3.13
Al3+	0.297	7.27E+03	2.82E+04	0.228	0.261	0.332	0.366
Fe3+ (total Fe)	1.85E-03	94.1	365	1.22E-03	1.53E-03	2.18E-03	2.49E-03
Cr3+	4.94E-03	233	905	4.34E-03	4.66E-03	5.13E-03	5.40E-03
Bi3+	4.98E-05	9.45	36.6	4.68E-05	4.82E-05	5.13E-05	5.29E-05
La3+	9.94E-07	0.126	0.487	7.30E-07	8.59E-07	1.13E-06	1.26E-06
Hg2+	3.85E-07	7.03E-02	0.272	3.70E-07	3.79E-07	3.92E-07	3.99E-07
Zr (as ZrO(OH)2)	6.84E-06	0.567	2.20	6.29E-06	6.49E-06	7.07E-06	7.38E-06
Pb2+	5.09E-05	9.58	37.1	4.09E-05	4.58E-05	5.60E-05	6.09E-05
Ni2+	2.57E-04	13.7	53.2	2.48E-04	2.52E-04	2.59E-04	2.61E-04
Sr2+	0	0	0	0	0	0	0
Mn4+	2.44E-04	12.2	47.3	2.04E-04	2.24E-04	2.65E-04	2.79E-04
Ca2+	7.79E-03	284	1.10E+03	5.29E-03	6.51E-03	9.06E-03	1.03E-02
K+	1.07E-02	381	1.48E+03	8.32E-03	9.49E-03	1.19E-02	1.31E-02
OH-	2.34	3.61E+04	1.40E+05	1.76	2.04	2.63	2.92
NO3-	0.301	1.70E+04	6.59E+04	0.287	0.295	0.307	0.312
NO2-	0.428	1.79E+04	6.93E+04	0.289	0.355	0.503	0.577
CO32-	3.06E-02	1.67E+03	6.46E+03	2.73E-02	2.89E-02	3.22E-02	3.33E-02
PO43-	4.59E-03	396	1.54E+03	4.12E-03	4.35E-03	4.83E-03	5.06E-03
SO42-	0.108	9.46E+03	3.67E+04	7.91E-02	9.34E-02	0.123	0.138
Si (as SiO32-)	2.77E-02	706	2.74E+03	1.57E-02	2.15E-02	3.37E-02	3.96E-02
F-	2.42E-02	418	1.62E+03	1.77E-02	2.09E-02	2.75E-02	3.08E-02
Cl-	4.65E-02	1.50E+03	5.80E+03	3.55E-02	4.08E-02	5.21E-02	5.75E-02
C6H5O73-	1.44E-03	247	957	1.25E-03	1.34E-03	1.53E-03	1.62E-03
EDTA4-	1.27E-03	332	1.29E+03	4.06E-04	8.27E-04	1.71E-03	2.14E-03
HEDTA3-	2.29E-03	570	2.21E+03	5.65E-04	1.41E-03	3.18E-03	4.04E-03
glycolate-	7.19E-03	490	1.90E+03	4.73E-03	5.93E-03	8.45E-03	9.65E-03
acetate-	7.91E-04	42.4	164	6.35E-04	7.01E-04	8.86E-04	1.03E-03
oxalate2-	1.30E-06	0.104	0.404	1.16E-06	1.23E-06	1.38E-06	1.45E-06
DBP	1.03E-03	197	763	8.85E-04	9.48E-04	1.12E-03	1.25E-03
butanol	1.03E-03	69.4	269	8.85E-04	9.48E-04	1.12E-03	1.25E-03
NH3	1.58E-02	244	947	8.48E-03	1.17E-02	2.06E-02	2.59E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AZ-101							
Total Inventory Estimate*							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.04E+06 (kg)	(960 kgal)	----	----	----	----	----
Heat Load	77.3 (kW)	(2.64E+05 BTU/hr)	----	66.8	72.0	82.7	87.9
Bulk Density†	1.11 (g/cc)	----	----	1.09	1.10	1.12	1.14
Water wt%†	83.9	----	----	81.1	82.4	85.3	86.8
TOC wt% C (wet	7.63E-02	----	----	4.56E-02	6.06E-02	9.20E-02	0.107
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	2.63	5.43E+04	2.19E+05	2.03	2.32	2.93	3.22
Al3+	0.315	7.64E+03	3.09E+04	0.247	0.280	0.350	0.384
Fe3+ (total Fe)	8.93E-02	4.48E+03	1.81E+04	8.87E-02	8.90E-02	8.95E-02	8.96E-02
Cr3+	4.80E-03	224	906	4.21E-03	4.53E-03	4.98E-03	5.24E-03
Bi3+	4.83E-05	9.06	36.6	4.54E-05	4.68E-05	4.97E-05	5.13E-05
La3+	9.64E-07	0.120	0.487	7.08E-07	8.33E-07	1.10E-06	1.22E-06
Hg2+	3.74E-07	6.74E-02	0.272	3.59E-07	3.67E-07	3.81E-07	3.87E-07
Zr (as ZrO(OH)2)	6.63E-06	0.544	2.20	6.10E-06	6.29E-06	6.85E-06	7.16E-06
Pb2+	4.94E-05	9.20	37.2	3.97E-05	4.44E-05	5.43E-05	5.91E-05
Ni2+	1.62E-03	85.6	346	1.29E-03	1.52E-03	1.68E-03	1.72E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	2.43E-04	12.0	48.4	2.00E-04	2.21E-04	2.64E-04	2.95E-04
Ca2+	1.52E-02	547	2.21E+03	1.24E-02	1.40E-02	1.60E-02	1.67E-02
K+	1.06E-02	374	1.51E+03	8.26E-03	9.43E-03	1.19E-02	1.30E-02
OH-	2.69	4.11E+04	1.66E+05	2.11	2.39	2.99	3.28
NO3-	0.293	1.63E+04	6.59E+04	0.278	0.286	0.298	0.303
NO2-	0.429	1.77E+04	7.17E+04	0.291	0.357	0.504	0.578
CO32-	3.75E-02	2.02E+03	8.19E+03	3.41E-02	3.57E-02	3.94E-02	3.97E-02
PO43-	4.52E-03	386	1.56E+03	4.03E-03	4.27E-03	4.77E-03	5.01E-03
SO42-	0.108	9.34E+03	3.78E+04	7.90E-02	9.32E-02	0.123	0.138
Si (as SiO32-)	7.21E-02	1.82E+03	7.36E+03	6.17E-02	6.77E-02	7.54E-02	7.78E-02
F-	2.41E-02	412	1.67E+03	1.76E-02	2.08E-02	2.75E-02	3.07E-02
Cl-	4.62E-02	1.47E+03	5.95E+03	3.53E-02	4.06E-02	5.19E-02	5.73E-02
C6H5O73-	1.40E-03	239	964	1.22E-03	1.31E-03	1.50E-03	1.59E-03
EDTA4-	1.23E-03	318	1.29E+03	3.94E-04	8.02E-04	1.66E-03	2.08E-03
HEDTA3-	2.22E-03	547	2.21E+03	5.48E-04	1.36E-03	3.08E-03	3.92E-03
glycolate-	7.11E-03	480	1.94E+03	4.67E-03	5.87E-03	8.35E-03	9.58E-03
acetate-	7.67E-04	40.7	164	6.16E-04	6.80E-04	8.59E-04	1.00E-03
oxalate2-	1.26E-06	1.00E-01	0.404	1.12E-06	1.19E-06	1.33E-06	1.40E-06
DBP	1.00E-03	189	766	8.61E-04	9.22E-04	1.09E-03	1.22E-03
butanol	1.00E-03	66.8	270	8.61E-04	9.22E-04	1.09E-03	1.22E-03
NH3	2.10E-02	321	1.30E+03	1.25E-02	1.63E-02	2.64E-02	3.23E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AZ-101

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	1.65E+05 (kg)	(29.0 kgal)	----	----	----	----	----
Heat Load	43.3 (kW)	(1.48E+05 BTU/hr)	----	42.7	43.0	43.5	43.7
Bulk Density	1.50 (g/cc)	----	----	1.43	1.47	1.53	1.55
Void Fraction	0.788	----	----	0.768	0.778	0.801	0.817
Water wt%	55.1	----	----	53.1	54.0	56.5	58.2
TOC wt% C (wet	1.00E-02	----	----	6.12E-03	8.79E-03	1.09E-02	1.52E-02

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	7.35E-03	4.89	806	5.33E-03	6.32E-03	8.38E-03	9.38E-03
C-14	9.05E-05	6.03E-02	9.93	6.57E-05	7.78E-05	1.03E-04	1.16E-04
Ni-59	1.81E-04	0.120	19.8	1.79E-04	1.80E-04	1.81E-04	1.81E-04
Ni-63	2.08E-02	13.9	2.28E+03	2.06E-02	2.08E-02	2.08E-02	2.09E-02
Co-60	4.27E-02	28.4	4.68E+03	4.10E-02	4.18E-02	4.35E-02	4.43E-02
Se-79	3.19E-04	0.212	35.0	2.86E-04	3.02E-04	3.35E-04	3.51E-04
Sr-90	56.6	3.77E+04	6.21E+06	56.3	56.5	56.7	56.8
Y-90	56.7	3.77E+04	6.22E+06	56.3	56.5	56.8	56.8
Zr-93	1.53E-03	1.02	168	1.37E-03	1.45E-03	1.61E-03	1.69E-03
Nb-93m	5.82E-04	0.387	63.8	4.68E-04	5.24E-04	6.40E-04	6.96E-04
Tc-99	3.78E-04	0.252	41.5	2.74E-04	3.25E-04	4.31E-04	4.83E-04
Ru-106	0.636	423	6.98E+04	0.636	0.636	0.636	0.636
Cd-113m	1.76E-02	11.7	1.93E+03	1.66E-02	1.71E-02	1.81E-02	1.86E-02
Sb-125	0.653	435	7.16E+04	0.344	0.495	0.811	0.962
Sn-126	5.06E-04	0.337	55.5	4.57E-04	4.81E-04	5.31E-04	5.55E-04
I-129	7.59E-07	5.06E-04	8.33E-02	5.51E-07	6.53E-07	8.66E-07	9.69E-07
Cs-134	1.97E-02	13.1	2.16E+03	1.56E-02	1.76E-02	2.18E-02	2.38E-02
Cs-137	2.75	1.83E+03	3.01E+05	2.18	2.46	3.04	3.32
Ba-137m	2.60	1.73E+03	2.85E+05	2.06	2.32	2.88	3.14
Sm-151	1.10	732	1.21E+05	0.986	1.04	1.16	1.21
Eu-152	1.22E-03	0.814	134	1.21E-03	1.22E-03	1.23E-03	1.23E-03
Eu-154	0.325	216	3.56E+04	0.316	0.320	0.329	0.333
Eu-155	0.221	147	2.43E+04	0.219	0.220	0.222	0.223
Ra-226	1.73E-09	1.15E-06	1.90E-04	7.24E-10	1.22E-09	2.25E-09	2.74E-09
Ra-228	1.13E-13	7.53E-11	1.24E-08	1.12E-13	1.13E-13	1.14E-13	1.14E-13
Ac-227	9.58E-09	6.38E-06	1.05E-03	3.73E-09	6.59E-09	1.26E-08	1.54E-08
Pa-231	5.05E-08	3.37E-05	5.54E-03	1.80E-08	3.39E-08	6.71E-08	8.31E-08
Th-229	1.30E-11	8.68E-09	1.43E-06	1.29E-11	1.30E-11	1.31E-11	1.31E-11
Th-232	1.53E-14	1.02E-11	1.68E-09	1.11E-14	1.31E-14	1.74E-14	1.95E-14
U-232	5.54E-09	3.69E-06	6.08E-04	4.49E-09	5.10E-09	5.87E-09	6.11E-09
U-233	5.68E-11	3.78E-08	6.23E-06	4.61E-11	5.23E-11	6.02E-11	6.26E-11
U-234	2.49E-05	1.66E-02	2.73	2.02E-05	2.29E-05	2.64E-05	2.75E-05
U-235	9.47E-07	6.31E-04	0.104	7.68E-07	8.71E-07	1.00E-06	1.04E-06
U-236	2.05E-06	1.37E-03	0.225	1.66E-06	1.89E-06	2.17E-06	2.26E-06
U-238	1.71E-05	1.14E-02	1.88	1.39E-05	1.57E-05	1.81E-05	1.89E-05
Np-237	5.54E-06	3.69E-03	0.607	4.02E-06	4.76E-06	6.31E-06	7.06E-06
Pu-238	1.59E-03	1.06	174	1.57E-03	1.58E-03	1.60E-03	1.60E-03
Pu-239	1.29E-02	8.62	1.42E+03	1.28E-02	1.29E-02	1.30E-02	1.31E-02
Pu-240	3.92E-03	2.61	430	3.88E-03	3.90E-03	3.94E-03	3.96E-03
Pu-241	0.162	108	1.78E+04	0.160	0.161	0.163	0.164
Pu-242	6.06E-07	4.03E-04	6.64E-02	5.99E-07	6.02E-07	6.09E-07	6.12E-07
Am-241	0.224	149	2.46E+04	0.224	0.224	0.224	0.225
Am-243	4.72E-05	3.14E-02	5.18	4.71E-05	4.71E-05	4.72E-05	4.73E-05
Cm-242	1.08E-04	7.16E-02	11.8	1.07E-04	1.07E-04	1.08E-04	1.08E-04
Cm-243	1.80E-05	1.20E-02	1.97	1.79E-05	1.79E-05	1.81E-05	1.82E-05
Cm-244	8.60E-04	0.573	94.3	8.58E-04	8.59E-04	8.61E-04	8.62E-04

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0.227 (g/L)	----	24.9	0.225	0.226	0.229	0.230
U	0.216	3.42E+04	5.64E+03	0.175	0.199	0.229	0.238

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AZ-101

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	3.88E+06 (kg)	(931 kgal)	----	----	----	----	----
Heat Load	34.1 (kW)	(1.16E+05 BTU/hr)	----	24.0	29.0	39.2	44.2
Bulk Density*	1.10 (g/cc)	----	----	1.08	1.09	1.11	1.12
Water wt%†	85.1	----	----	82.3	83.6	86.5	88.0
TOC wt% C (wet	7.91E-02	----	----	4.71E-02	6.27E-02	9.55E-02	0.112

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	7.14E-03	6.48	2.51E+04	4.98E-03	6.04E-03	8.24E-03	9.30E-03
C-14	8.93E-05	8.11E-02	315	6.28E-05	7.57E-05	1.03E-04	1.16E-04
Ni-59	8.54E-08	7.76E-05	0.301	5.17E-08	5.17E-08	8.71E-08	8.87E-08
Ni-63	8.41E-06	7.64E-03	29.6	5.08E-06	5.08E-06	8.58E-06	8.74E-06
Co-60	7.32E-05	6.65E-02	258	2.27E-05	4.74E-05	9.90E-05	1.24E-04
Se-79	1.59E-06	1.44E-03	5.59	5.77E-07	1.07E-06	2.10E-06	2.60E-06
Sr-90	2.93E-02	26.6	1.03E+05	2.58E-02	2.75E-02	3.11E-02	3.28E-02
Y-90	2.93E-02	26.6	1.03E+05	2.58E-02	2.75E-02	3.11E-02	3.28E-02
Zr-93	7.92E-06	7.20E-03	27.9	2.87E-06	5.34E-06	1.05E-05	1.30E-05
Nb-93m	5.56E-06	5.06E-03	19.6	2.03E-06	3.76E-06	7.37E-06	9.10E-06
Tc-99	3.78E-04	0.343	1.33E+03	2.67E-04	3.21E-04	4.35E-04	4.89E-04
Ru-106	3.95E-09	3.59E-06	1.39E-02	1.43E-09	2.66E-09	5.24E-09	6.48E-09
Cd-113m	4.70E-05	4.27E-02	166	1.67E-05	3.15E-05	6.25E-05	7.73E-05
Sb-125	1.35E-02	12.3	4.77E+04	3.95E-03	8.65E-03	1.84E-02	2.31E-02
Sn-126	2.38E-06	2.17E-03	8.40	8.68E-07	1.61E-06	3.16E-06	3.90E-06
I-129	7.58E-07	6.89E-04	2.67	5.36E-07	6.44E-07	8.72E-07	9.82E-07
Cs-134	1.44E-02	13.1	5.07E+04	1.00E-02	1.22E-02	1.66E-02	1.88E-02
Cs-137	2.02	1.84E+03	7.12E+06	1.41	1.71	2.33	2.63
Ba-137m	1.91	1.74E+03	6.74E+06	1.34	1.62	2.21	2.49
Sm-151	5.56E-03	5.05	1.96E+04	2.02E-03	3.76E-03	7.37E-03	9.10E-03
Eu-152	3.58E-05	3.25E-02	126	2.50E-05	3.03E-05	4.13E-05	4.66E-05
Eu-154	3.87E-04	0.352	1.36E+03	1.34E-04	2.58E-04	5.16E-04	6.40E-04
Eu-155	6.46E-03	5.87	2.28E+04	4.51E-03	5.47E-03	7.46E-03	8.43E-03
Ra-226	5.07E-11	4.61E-08	1.79E-04	1.94E-11	3.47E-11	6.67E-11	8.20E-11
Ra-228	1.35E-08	1.22E-05	4.74E-02	4.47E-09	4.47E-09	1.50E-08	1.67E-08
Ac-227	2.97E-10	2.70E-07	1.05E-03	1.15E-10	2.04E-10	3.90E-10	4.79E-10
Pa-231	1.61E-09	1.46E-06	5.67E-03	6.00E-10	1.09E-09	2.13E-09	2.62E-09
Th-229	3.13E-10	2.84E-07	1.10E-03	1.05E-10	1.05E-10	3.48E-10	3.85E-10
Th-232	1.40E-09	1.27E-06	4.93E-03	2.88E-10	2.88E-10	1.70E-09	1.99E-09
U-232	4.28E-08	3.89E-05	0.151	3.21E-08	3.73E-08	4.92E-08	5.60E-08
U-233	1.64E-07	1.49E-04	0.577	1.23E-07	1.43E-07	1.88E-07	2.14E-07
U-234	3.64E-07	3.31E-04	1.28	3.31E-07	3.48E-07	3.81E-07	3.97E-07
U-235	1.39E-08	1.26E-05	4.90E-02	1.27E-08	1.33E-08	1.45E-08	1.52E-08
U-236	2.85E-08	2.59E-05	0.100	2.58E-08	2.71E-08	2.99E-08	3.12E-08
U-238	2.70E-07	2.45E-04	0.950	2.47E-07	2.58E-07	2.81E-07	2.92E-07
Np-237	5.41E-06	4.91E-03	19.1	3.79E-06	4.58E-06	6.24E-06	7.04E-06
Pu-238	8.20E-07	7.45E-04	2.89	2.95E-07	5.52E-07	1.09E-06	1.35E-06
Pu-239	8.25E-06	7.49E-03	29.1	3.99E-06	6.07E-06	1.04E-05	1.25E-05
Pu-240	2.23E-06	2.02E-03	7.85	9.35E-07	1.57E-06	2.89E-06	3.52E-06
Pu-241	8.16E-05	7.42E-02	288	2.79E-05	5.42E-05	1.09E-04	1.35E-04
Pu-242	3.13E-10	2.84E-07	1.10E-03	1.13E-10	2.11E-10	4.15E-10	5.13E-10
Am-241	2.42E-05	2.20E-02	85.3	9.04E-06	1.65E-05	3.19E-05	3.94E-05
Am-243	4.62E-09	4.20E-06	1.63E-02	1.43E-09	2.99E-09	6.25E-09	7.82E-09
Cm-242	3.14E-06	2.85E-03	11.1	2.19E-06	2.65E-06	3.62E-06	4.09E-06
Cm-243	5.25E-07	4.77E-04	1.85	3.67E-07	4.44E-07	6.07E-07	6.85E-07
Cm-244	7.78E-08	7.07E-05	0.274	2.72E-08	5.20E-08	1.04E-07	1.28E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	1.32E-04 (g/L)	----	0.466	5.74E-05	9.40E-05	1.70E-04	2.07E-04
U	3.23E-03	699	2.71E+03	2.95E-03	3.09E-03	3.38E-03	3.52E-03

*Density is calculated based on Na, OH-, and AlO2-.

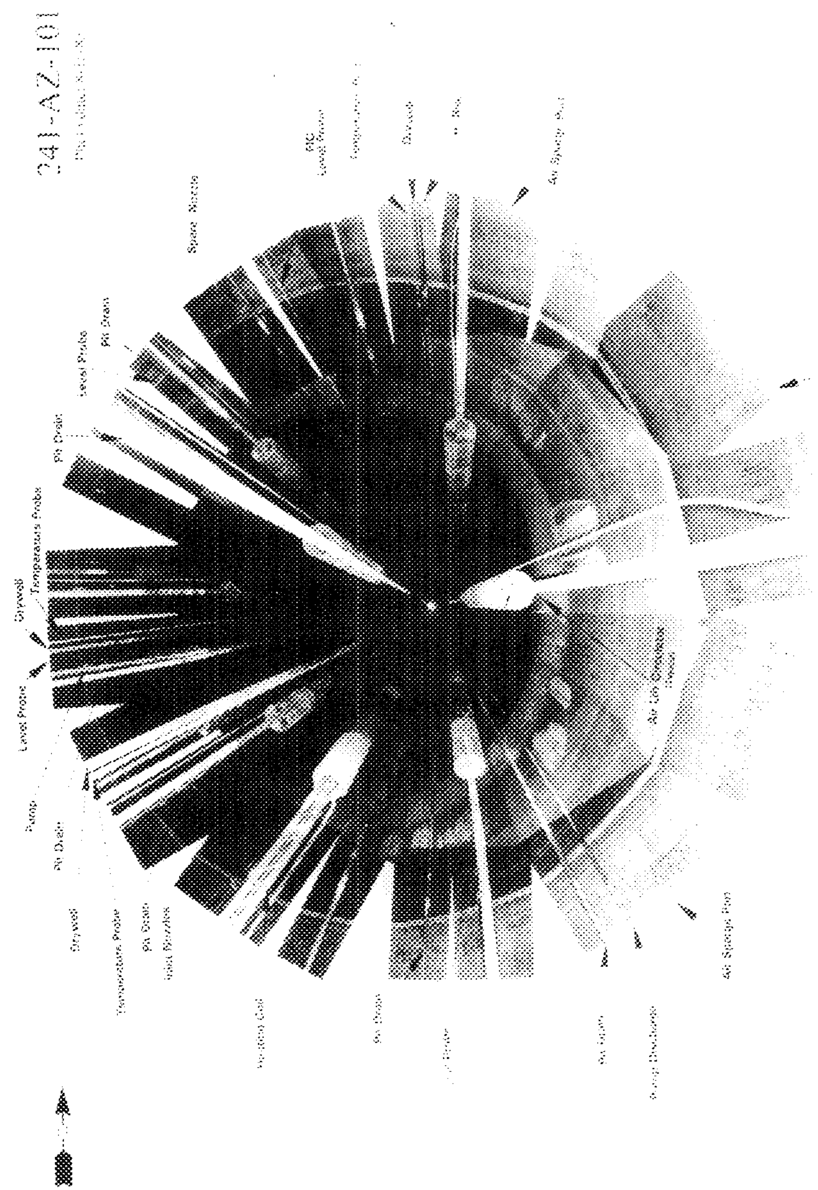
†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AZ-101							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	4.04E+06 (kg)	(960 kgal)	----	----	----	----	----
Heat Load	77.3 (kW)	(2.64E+05 BTU/hr)	----	66.8	72.0	82.7	87.9
Bulk Density†	1.11 (g/cc)	----	----	1.09	1.10	1.12	1.14
Water wt%†	83.9	----	----	81.1	82.4	85.3	86.8
TOC wt% C (wet	7.63E-02	----	----	4.56E-02	6.06E-02	9.20E-02	0.107
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	7.14E-03	6.42	2.60E+04	4.99E-03	6.04E-03	8.24E-03	9.31E-03
C-14	8.93E-05	8.03E-02	325	6.29E-05	7.58E-05	1.03E-04	1.16E-04
Ni-59	5.54E-06	4.98E-03	20.1	5.49E-06	5.51E-06	5.55E-06	5.56E-06
Ni-63	6.36E-04	0.572	2.31E+03	6.31E-04	6.33E-04	6.37E-04	6.38E-04
Co-60	1.36E-03	1.22	4.94E+03	1.33E-03	1.35E-03	1.37E-03	1.38E-03
Se-79	1.12E-05	1.00E-02	40.5	1.05E-05	1.09E-05	1.14E-05	1.15E-05
Sr-90	1.74	1.56E+03	6.32E+06	1.73	1.73	1.74	1.74
Y-90	1.74	1.56E+03	6.32E+06	1.73	1.73	1.74	1.74
Zr-93	5.38E-05	4.84E-02	196	5.08E-05	5.25E-05	5.48E-05	5.55E-05
Nb-93m	2.30E-05	2.06E-02	83.4	2.08E-05	2.20E-05	2.36E-05	2.41E-05
Tc-99	3.78E-04	0.340	1.37E+03	2.67E-04	3.21E-04	4.35E-04	4.89E-04
Ru-106	1.92E-02	17.3	6.98E+04	1.92E-02	1.92E-02	1.92E-02	1.92E-02
Cd-113m	5.77E-04	0.519	2.10E+03	5.58E-04	5.69E-04	5.83E-04	5.87E-04
Sb-125	3.29E-02	29.5	1.19E+05	2.70E-02	3.04E-02	3.47E-02	3.60E-02
Sn-126	1.76E-05	1.58E-02	63.9	1.67E-05	1.72E-05	1.79E-05	1.81E-05
I-129	7.58E-07	6.81E-04	2.75	5.36E-07	6.45E-07	8.72E-07	9.82E-07
Cs-134	1.46E-02	13.1	5.29E+04	1.02E-02	1.23E-02	1.68E-02	1.89E-02
Cs-137	2.04	1.84E+03	7.43E+06	1.44	1.73	2.35	2.65
Ba-137m	1.93	1.74E+03	7.03E+06	1.36	1.64	2.23	2.51
Sm-151	3.86E-02	34.7	1.40E+05	3.64E-02	3.77E-02	3.93E-02	3.98E-02
Eu-152	7.16E-05	6.44E-02	260	6.09E-05	6.61E-05	7.71E-05	8.24E-05
Eu-154	1.02E-02	9.15	3.70E+04	1.00E-02	1.01E-02	1.02E-02	1.03E-02
Eu-155	1.29E-02	11.6	4.71E+04	1.10E-02	1.20E-02	1.39E-02	1.49E-02
Ra-226	1.01E-10	9.12E-08	3.69E-04	8.23E-11	9.34E-11	1.07E-10	1.12E-10
Ra-228	1.30E-08	1.17E-05	4.74E-02	4.33E-09	4.33E-09	1.46E-08	1.62E-08
Ac-227	5.77E-10	5.19E-07	2.10E-03	4.66E-10	5.30E-10	6.12E-10	6.37E-10
Pa-231	3.09E-09	2.78E-06	1.12E-02	2.47E-09	2.83E-09	3.28E-09	3.42E-09
Th-229	3.04E-10	2.73E-07	1.10E-03	1.02E-10	1.02E-10	3.38E-10	3.74E-10
Th-232	1.36E-09	1.22E-06	4.93E-03	2.80E-10	2.80E-10	1.65E-09	1.93E-09
U-232	4.17E-08	3.75E-05	0.152	3.13E-08	3.64E-08	4.79E-08	5.45E-08
U-233	1.59E-07	1.43E-04	0.577	1.19E-07	1.38E-07	1.83E-07	2.08E-07
U-234	1.11E-06	9.94E-04	4.02	9.63E-07	1.05E-06	1.15E-06	1.18E-06
U-235	4.21E-08	3.78E-05	0.153	3.67E-08	3.98E-08	4.38E-08	4.50E-08
U-236	8.96E-08	8.05E-05	0.326	7.79E-08	8.46E-08	9.32E-08	9.59E-08
U-238	7.78E-07	6.99E-04	2.83	6.80E-07	7.37E-07	8.08E-07	8.31E-07
Np-237	5.41E-06	4.86E-03	19.7	3.79E-06	4.58E-06	6.24E-06	7.04E-06
Pu-238	4.87E-05	4.38E-02	177	4.84E-05	4.86E-05	4.88E-05	4.89E-05
Pu-239	3.99E-04	0.359	1.45E+03	3.96E-04	3.98E-04	4.00E-04	4.00E-04
Pu-240	1.21E-04	0.108	438	1.20E-04	1.20E-04	1.21E-04	1.21E-04
Pu-241	4.97E-03	4.47	1.81E+04	4.94E-03	4.95E-03	4.98E-03	4.99E-03
Pu-242	1.86E-08	1.67E-05	6.75E-02	1.85E-08	1.85E-08	1.86E-08	1.87E-08
Am-241	6.79E-03	6.10	2.47E+04	6.78E-03	6.78E-03	6.79E-03	6.79E-03
Am-243	1.43E-06	1.28E-03	5.19	1.43E-06	1.43E-06	1.43E-06	1.43E-06
Cm-242	6.29E-06	5.65E-03	22.9	5.35E-06	5.81E-06	6.77E-06	7.24E-06
Cm-243	1.05E-06	9.46E-04	3.83	8.95E-07	9.72E-07	1.13E-06	1.21E-06
Cm-244	2.60E-05	2.34E-02	94.6	2.60E-05	2.60E-05	2.60E-05	2.61E-05
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	6.99E-03 (g/L)	----	25.4	6.95E-03	6.97E-03	7.01E-03	7.02E-03
U	9.65E-03	2.07E+03	8.35E+03	8.42E-03	9.13E-03	1.00E-02	1.03E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.


241-AZ-101
Spare Nozzle
Pit Drain
Level Probe
Pit Drain
Temperature Probe
Drywell
Temperature Probe
Drywell
Level Probe
Pump
Pit Drain
Drywell
Temperature Probe
Pit Drain
Spare Nozzles
Air Sparge Port
Air Sparge Port
Air Sparge Port
Air Lift Circulator

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TANK 241-AZ-102 SUMMARY

TANK HISTORY	
Entered Service	1975
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Intrusion Prevention (IP)	-
TENTATIVELY AVAILABLE RISERS	
Riser	Size
5B, 11A	4 in
15A, 15B, 15C, 15D, 15E, 15F, 15G, 15H, 15I, 15J, 15K, 15L	6 in
TANK TEMPERATURE	
Average Tank Temperature	144°F
Maximum Temperature	188°F
Date	March 18, 1996
Elevation from tank bottom	unknown
Location	Sludge Thermocouple 72
Minimum Temperature	121°F
Date	March 3,1995 - May 13, 1996
Elevation from tank bottom	0.25 ft
Location	ALC 18, ALC 19

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	flat
Nominal Capacity	1,000,000 gal
Total Risers	105
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	925,000 gal
Waste Type	Aging
Drainable Interstitial Liquids	4,000 gal
Pumpable Liquids	830,000 gal
Saltcake	0 gal
Sludge	95,000 gal
Supernatant	830,000 gal
INTERIOR PHOTOGRAPHS	
Date	October 24, 1984
Montage Number	94080233-19CN
Photo Set Number	8407360
WASTE SURFACE LEVEL	
Devices	Man/Auto FIC, Man Tape
Max Level	356.75 in
Date	Nov. 12, 1991
Min Level	331.4 in
Date	Jan 22, 1997

*Numerous dates in this time span

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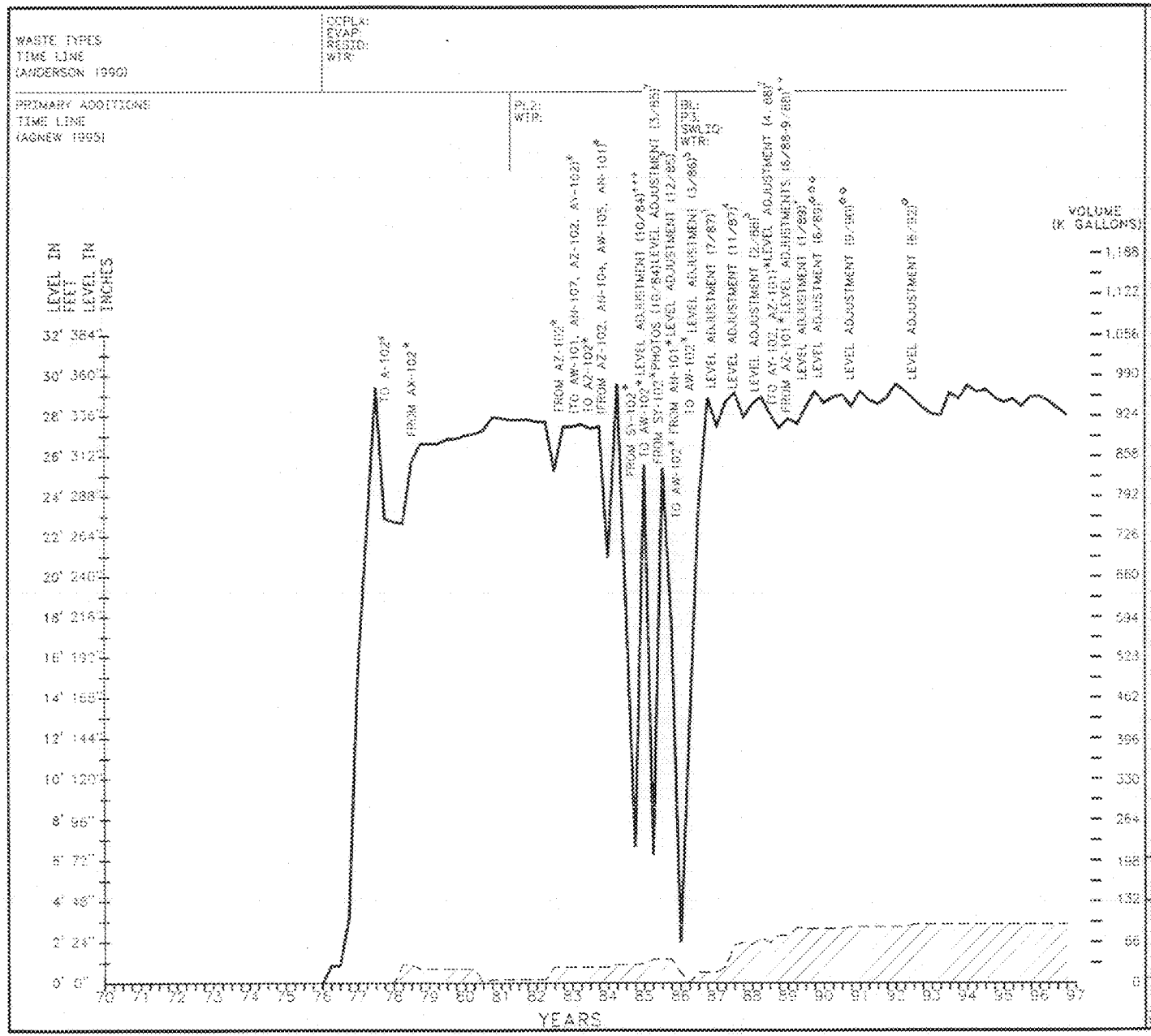

TANK INFO:

CONSTRUCTED 1971-1977
NOMINAL CAPACITY 1,000,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

* AGNEW 1995
* THURMAN 1989c
** THURMAN 1989g,h,i,j
*** VAIL 1989h
1 THURMAN 1987
2 THURMAN 1988e
3 THURMAN 1988c
4 THURMAN 1987
5 VAIL AND CARTER 1986d
6 VAIL AND MURPY 1985i
7 VAIL 1985a
◊ HANLON 1988i
◊◊ HANLON 1991c
◊◊◊ THURMAN 1989h

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

BL:	B-PLANT LOW-LEVEL WASTE
CCPLX:	COMPLEXANT CONCENTRATE
EVAP:	EVAPORATOR FEED
PL2:	PUREX LOW-LEVEL WASTE 1983-88
WTP:	ACTIVE WASTE SUPERNATANT
RESID:	HANFORD DEFENSE RESIDUAL LIQUOR
SWLIQ:	DILUTE, NON-COMPLEXED WASTE
WTR:	WATER

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

AZ TANK FARM PLAN

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-AZ-102 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1976-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	SCALE NO.	DWG NO.	DATE
B	241	ES-TKS-E174	2/97
SCALE	NONE	LOG NO.	SHEET 1 OF 1

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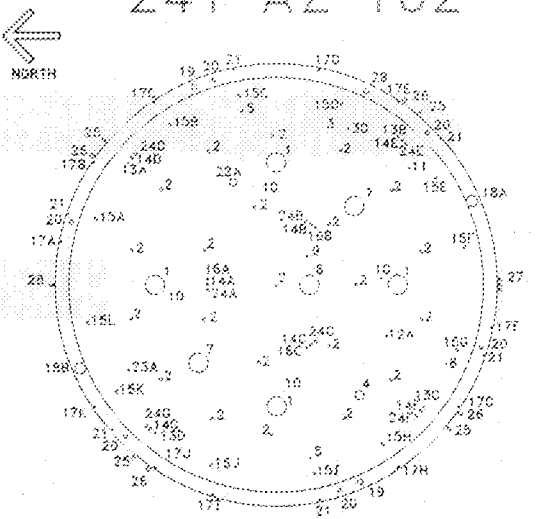
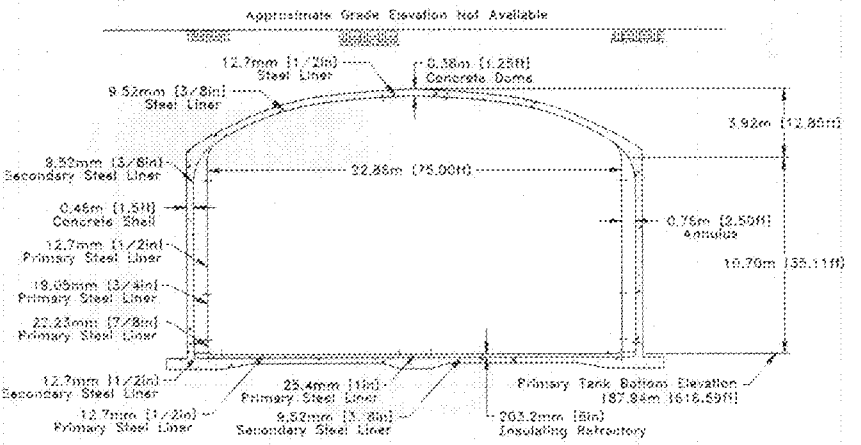
241-AZ-102



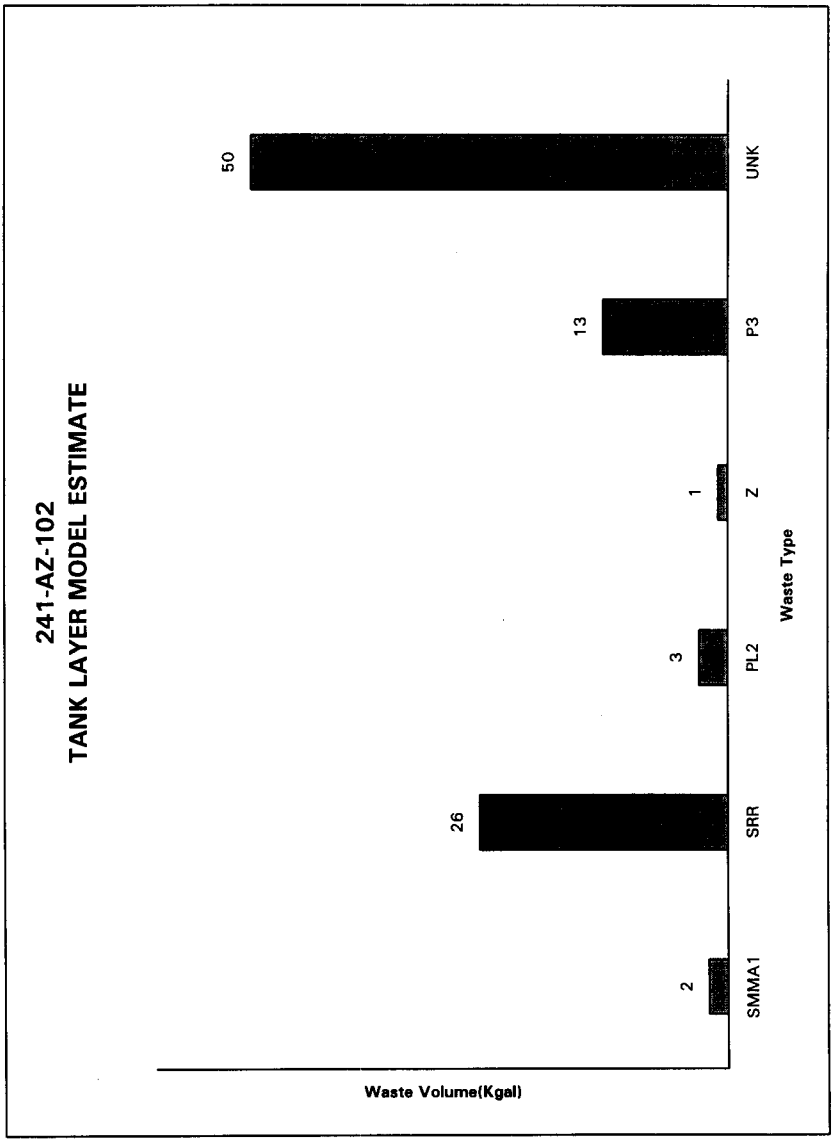
TANK RISER LOCATION

Ref: Saterar 1994
H-2-67315, Rev.1
H-2-70202, Rev.1



Ref: H-2-67317, Rev.1
H-2-70202, Rev.1

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

(Qhc Model Rev. 4)

Double-Shell Tank 241-AZ-102

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wgt	2.160E+07 (kg)	(47.6 kgal)	---	---	---	---	---
Non-Liquid	27.1 (kg)	(0.270 m³/100m³)	---	20.8	23.1	28.2	28.7
Bulk Density	1.39 (g/cc)	---	---	1.21	1.31	1.45	1.47
Void Fraction	0.808	---	---	0.787	0.801	0.816	0.819
Water wt%	58.5	---	---	51.2	54.5	64.4	66.9
TOC wt% C free	0.71	---	---	0.716	1.05	3.66	3.98

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	5.36	9.260E+04	2.000E+06	2.14	3.95	6.59	7.61
SO4 2-	0.510	1.010E+04	2.270E+05	0.465	0.500	0.537	0.557
PO4 3- (total P)	1.04	3.440E+04	1.070E+06	1.29	1.72	1.89	1.91
Cl-	0.180E-04	7.11	5.21	3.450E-04	4.910E-04	1.900E-04	3.000E-04
NO2-	0	0	0	0	0	0	0
CO3 2-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
Al (as Al(OH)4)	0	0	0	0	0	0	0
NO2-	2.700E-04	0.485	5.000E-03	1.310E-04	1.950E-04	3.440E-04	3.160E-04
NO3-	1.900E-01	858	90.3	2.385E-01	2.480E-01	2.150E-01	1.960E-01
SO4 2-	0	0	0	0	0	0	0
Na(s)	3.720E-04	16.8	3.23	1.620E-04	2.700E-04	4.960E-04	1.660E-03
Na2O	0.190	2.900E-03	1.300E-03	0.119	0.139	0.258	0.290
K+	3.910E-02	980	50.4	2.450E-02	7.040E-02	1.270E-01	1.420E-01
OH-	0.101	9.900E-04	2.320E-04	6.35	1.04	8.20	8.51
NO3-	4.910E-02	2.210E-03	4.91	3.890E-02	4.000E-02	0.115	0.110
SO4 2-	0.087	1.020E-04	3.000E-03	0.180	0.370	0.601	0.575
Al(OH)4-	0.231	1.460E-04	7.230E-03	0.180	0.316	0.532	0.600
NaAl	4.220E-03	0.97	36.7	1.940E-03	3.110E-03	5.910E-03	6.660E-03
NaNO2	4.500E-02	3.960E-03	3.340E-03	4.220E-02	6.740E-02	0.104	0.113
Al (as Al(OH)3)	1.55	2.160E-04	7.960E-03	0.472	1.05	1.77	1.93
Si	7.210E-03	90.3	50.2	5.735E-03	6.280E-03	8.210E-03	9.200E-03
Cl-	4.660E-03	1.080E-03	2.03	3.240E-02	3.480E-02	5.710E-02	6.410E-02
CaNaSO4-	0	0	0	0	0	0	0
NaNO3(s)	7.810E-02	1.100E-04	3.660E-03	2.125E-02	5.420E-02	0.103	0.121
NaNO3(l)	0.156	2.160E-04	6.960E-03	4.248E-02	0.102	0.209	0.243
Gibbsite-	0.156	8.460E-03	1.910E-02	4.248E-02	0.102	0.209	0.243
Boehm-	0	0	0	0	0	0	0
Boehm(s)	0	0	0	0	0	0	0
CaO	2.270E-04	16.0	2.79	1.110E-04	1.660E-04	2.860E-04	3.420E-04
Ca(OH)2	2.270E-04	12.2	2.79	1.110E-04	1.660E-04	2.860E-04	3.420E-04
NaCl	0.193	1.130E-02	190	0.030E-02	0.900E-02	0.270	0.193
Na2CO3(s)	0	0	0	0	0	0	0

*Constituents in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AZ-102							
SMM Composite Inventory Estimate							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total SMM Wast	3.65E+06 (kg)	(920 kgal)	----	----	----	----	----
Heat Load	19.3 (kW)	(6.59E+04 BTU/hr)	----	13.6	16.4	22.2	25.1
Bulk Density*	1.05 (g/cc)	----	----	1.04	1.04	1.06	1.06
Water wt%	92.6	----	----	90.8	91.6	93.5	94.4
TOC wt% C (wet	1.89E-02	----	----	1.04E-02	1.46E-02	2.32E-02	2.73E-02
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	1.27	2.77E+04	1.01E+05	0.931	1.09	1.44	1.60
Al3+	0.142	3.64E+03	1.33E+04	0.102	0.121	0.162	0.182
Fe3+ (total Fe)	9.27E-04	49.4	180	5.59E-04	7.39E-04	1.11E-03	1.29E-03
Cr3+	3.24E-04	16.1	58.6	2.63E-04	2.92E-04	3.55E-04	3.85E-04
Bi3+	2.15E-06	0.428	1.56	1.99E-06	2.06E-06	2.23E-06	2.35E-06
La3+	2.41E-08	3.20E-03	1.17E-02	1.81E-08	2.11E-08	2.72E-08	3.02E-08
Hg2+	1.78E-08	3.41E-03	1.25E-02	1.70E-08	1.74E-08	1.83E-08	1.87E-08
Zr (as ZrO(OH)2)	3.27E-07	2.84E-02	0.104	2.83E-07	3.15E-07	3.35E-07	3.48E-07
Pb2+	3.02E-06	0.596	2.18	2.37E-06	2.69E-06	3.35E-06	3.66E-06
Ni2+	8.94E-05	5.01	18.3	8.44E-05	8.69E-05	9.20E-05	9.44E-05
Sr2+	0	0	0	0	0	0	0
Mn4+	8.67E-05	4.54	16.6	4.08E-05	6.33E-05	1.10E-04	1.26E-04
Ca2+	4.15E-03	159	580	2.71E-03	3.42E-03	4.89E-03	5.59E-03
K+	5.16E-03	192	703	3.78E-03	4.46E-03	5.87E-03	6.55E-03
OH-	1.20	1.94E+04	7.09E+04	0.864	1.03	1.37	1.53
NO3-	0.105	6.21E+03	2.27E+04	9.24E-02	9.86E-02	0.111	0.118
NO2-	0.196	8.60E+03	3.14E+04	0.116	0.154	0.240	0.282
CO32-	1.38E-02	788	2.88E+03	9.72E-03	1.17E-02	1.58E-02	1.72E-02
PO43-	1.37E-03	124	453	8.40E-04	1.10E-03	1.64E-03	1.90E-03
SO42-	5.76E-02	5.28E+03	1.93E+04	4.08E-02	4.90E-02	6.63E-02	7.47E-02
Si (as SiO32-)	1.50E-02	403	1.47E+03	8.12E-03	1.15E-02	1.85E-02	2.19E-02
F-	1.26E-02	228	831	8.81E-03	1.06E-02	1.45E-02	1.64E-02
Cl-	2.33E-02	788	2.88E+03	1.70E-02	2.01E-02	2.66E-02	2.97E-02
C6H5O73-	4.62E-04	83.3	304	2.35E-04	3.46E-04	5.78E-04	6.89E-04
EDTA4-	4.74E-05	13.0	47.5	1.71E-05	3.19E-05	6.30E-05	7.82E-05
HEDTA3-	8.08E-05	21.1	77.1	2.01E-05	4.98E-05	1.12E-04	1.43E-04
glycolate-	5.63E-03	403	1.47E+03	2.60E-03	4.08E-03	7.19E-03	8.67E-03
acetate-	4.46E-05	2.51	9.17	3.46E-05	3.89E-05	5.08E-05	6.03E-05
oxalate2-	3.16E-08	2.65E-03	9.69E-03	2.83E-08	2.99E-08	3.33E-08	3.49E-08
DBP	9.10E-05	18.2	66.6	6.49E-05	7.76E-05	1.04E-04	1.17E-04
butanol	9.10E-05	6.43	23.5	6.49E-05	7.76E-05	1.04E-04	1.17E-04
NH3	7.77E-03	126	460	3.53E-03	5.40E-03	1.05E-02	1.36E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double Shell Tank 241-SY-102

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Water	2.88E+06 (kg)	(sec kgal)	----	----	----	----	----
Heat Load	46.1 (kW)	(1.59E+05 BTU/hr)	----	40.1	43.1	49.5	52.4
Bulk Density†	1.06 (g/cc)	----	----	1.05	1.06	1.07	1.08
Water wt%	90.5	----	----	89.5	90.7	91.5	92.4
TOC wt% C (sec)	0.113	----	----	5.70E-02	0.105	0.197	0.229

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	7.46	1.71E+04	1.20E+02	1.12	1.29	1.63	1.79
NO3-	0.158	9.80E+03	7.56E+04	0.126	0.149	0.178	0.197
NO2- (total N)	8.30E-02	4.30E+03	1.99E+04	5.60E-02	7.70E-02	8.90E-02	9.60E-02
OH-	1.19E-04	2.03	2.17	2.60E-06	1.10E-04	1.27E-04	4.90E-04
Al(OH)4-	2.80E-06	0.400	7.38	1.80E-06	1.97E-06	3.70E-06	2.34E-06
AlO2-	2.31E-02	2.21E+03	1.37E+02	1.70E-02	2.91E-02	2.60E-02	3.60E-02
Mg2+	1.79E-08	5.22E-03	1.29E-04	1.02E-08	1.60E-08	1.75E-08	1.79E-08
Zn (as Zn(OH)2)	5.13E-07	3.00E-02	0.000	2.90E-07	3.01E-07	3.20E-07	3.33E-07
Hg2+	1.90E-06	0.381	5.27	1.30E-06	1.80E-06	2.12E-06	2.60E-06
SO4 2-	5.13E-04	50.7	104	1.90E-04	5.17E-04	5.90E-04	5.17E-04
NO2-	0		0	0	0	0	0
Mn2+	3.90E-05	5.14	19.7	4.00E-05	3.80E-05	3.27E-05	3.09E-05
CO3 2-	3.30E-02	404	1.38E+03	9.00E-03	5.30E-02	1.35E-02	1.60E-02
K+	1.39E-02	538	758	4.00E-03	5.70E-03	5.00E-03	5.73E-03
Fe	1.36	2.42E+04	1.30E+04	1.17	1.33	1.87	1.61
NO3-	0.101	5.90E+03	2.22E+04	9.60E-02	9.60E-02	0.109	0.115
PO4 3-	0.109	9.04E+03	3.50E+04	0.101	0.108	0.152	0.209
SO3 2-	2.30E-02	1.50E+03	4.31E+03	2.00E-02	2.27E-02	2.29E-02	2.40E-02
NO2-	1.50E-02	354	959	8.00E-04	1.59E-02	1.42E-02	2.12E-02
SO4 2-	1.89E-02	1.30E+03	2.00E+04	4.20E-03	8.00E-02	4.70E-02	5.00E-02
Si (as SiO2)	8.30E-02	2.21E+03	5.30E+03	5.50E-02	6.10E-02	9.27E-02	0.159
Cl-	1.20E-02	220	369	8.00E-03	1.00E-02	1.42E-02	1.60E-02
F-	2.41E-02	451	1.30E+03	1.80E-02	2.12E-02	2.79E-02	3.00E-02
CO2(TOC)	4.30E-04	18.1	309	2.20E-04	3.00E-04	5.53E-04	6.70E-04
EDTA4-	3.19E-03	980	1.71E+03	9.80E-04	2.10E-03	4.70E-03	5.00E-03
HEDTA3-	7.90E-03	1.50E+03	1.04E+03	1.80E-03	4.60E-03	9.40E-03	1.10E-02
glycolate-	1.30E-02	893	1.38E+03	7.00E-03	9.91E-02	1.89E-02	1.60E-02
acetate-	4.20E-02	2.55	9.17	5.30E-03	1.91E-03	9.40E-03	5.00E-03
oxalate2-	3.00E-08	2.70E-03	5.00E-03	2.71E-08	2.80E-08	3.19E-08	3.30E-08
DBP	9.70E-05	19.2	39.4	6.00E-05	8.17E-05	1.12E-04	1.27E-04
butanol	9.70E-05	5.70	39.2	6.00E-05	8.17E-05	1.12E-04	1.27E-04
NPT	1.57E-02	510	540	8.00E-03	1.11E-02	1.67E-02	2.00E-02
NaCl/NaF	0	0	0	0	0	0	0

*Uncertainties in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-AZ-102

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	2.24E+05 (kg)	(43.0 kgal)	----	----	----	----	----
Heat Load	27.1 (kW)	(9.27E+04 BTU/hr)	----	20.8	24.9	28.2	28.7
Bulk Density	1.38 (g/cc)	----	----	1.21	1.31	1.43	1.47
Void Fraction	0.832	----	----	0.767	0.812	0.870	0.913
Water wt%	58.5	----	----	51.2	54.5	64.4	73.9
TOC wt% C (wet	2.31	----	----	0.716	1.60	3.00	3.38

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	2.43E-03	1.76	396	1.78E-03	2.10E-03	2.77E-03	3.09E-03
C-14	3.35E-05	2.42E-02	5.44	2.54E-05	2.93E-05	3.76E-05	5.40E-05
Ni-59	4.25E-04	0.308	69.2	3.99E-04	4.12E-04	4.39E-04	4.52E-04
Ni-63	4.28E-02	31.1	6.97E+03	4.02E-02	4.15E-02	4.42E-02	4.55E-02
Co-60	1.39E-02	10.0	2.25E+03	1.33E-02	1.36E-02	1.41E-02	1.44E-02
Se-79	3.09E-04	0.224	50.3	1.43E-04	2.07E-04	4.11E-04	5.09E-04
Sr-90	24.1	1.75E+04	3.92E+06	18.3	22.1	25.0	25.5
Y-90	24.1	1.75E+04	3.92E+06	18.4	22.1	25.0	25.5
Zr-93	1.38E-03	1.00	225	6.30E-04	8.74E-04	1.90E-03	2.39E-03
Nb-93m	9.51E-04	0.689	155	3.16E-04	5.93E-04	1.31E-03	1.65E-03
Tc-99	1.50E-04	0.109	24.4	1.17E-04	1.33E-04	1.68E-04	1.84E-04
Ru-106	0.206	150	3.36E+04	0.206	0.206	0.206	0.206
Cd-113m	7.60E-03	5.51	1.24E+03	5.73E-03	6.51E-03	1.02E-02	1.31E-02
Sb-125	0.212	154	3.45E+04	0.112	0.161	0.263	0.312
Sn-126	4.95E-04	0.359	80.5	2.32E-04	3.41E-04	6.48E-04	7.95E-04
I-129	3.00E-07	2.17E-04	4.88E-02	2.32E-07	2.65E-07	3.35E-07	3.68E-07
Cs-134	6.39E-03	4.63	1.04E+03	5.07E-03	5.71E-03	7.07E-03	7.72E-03
Cs-137	0.998	724	1.62E+05	0.814	0.904	1.09	1.18
Ba-137m	0.944	685	1.54E+05	0.770	0.855	1.03	1.12
Sm-151	1.13	816	1.83E+05	0.518	0.769	1.48	1.83
Eu-152	5.87E-04	0.426	95.5	5.84E-04	5.86E-04	5.89E-04	5.91E-04
Eu-154	0.110	79.6	1.79E+04	0.105	0.106	0.119	0.135
Eu-155	8.35E-02	60.5	1.36E+04	8.29E-02	8.32E-02	8.38E-02	8.41E-02
Ra-226	2.53E-08	1.83E-05	4.11E-03	1.91E-08	2.21E-08	2.84E-08	3.15E-08
Ra-228	1.48E-13	1.07E-10	2.41E-08	1.46E-13	1.47E-13	1.49E-13	1.49E-13
Ac-227	1.31E-07	9.50E-05	2.13E-02	9.51E-08	1.13E-07	1.49E-07	1.67E-07
Pa-231	2.08E-07	1.51E-04	3.39E-02	2.20E-08	1.06E-07	3.10E-07	4.08E-07
Th-229	2.28E-11	1.65E-08	3.71E-06	2.25E-11	2.27E-11	2.30E-11	2.30E-11
Th-232	6.47E-15	4.69E-12	1.05E-09	5.11E-15	5.78E-15	7.17E-15	7.84E-15
U-232	1.89E-09	1.37E-06	3.07E-04	1.55E-09	1.74E-09	1.99E-09	2.07E-09
U-233	1.94E-11	1.40E-08	3.15E-06	1.59E-11	1.79E-11	2.05E-11	2.13E-11
U-234	8.49E-06	6.15E-03	1.38	6.96E-06	7.84E-06	8.96E-06	9.31E-06
U-235	3.23E-07	2.34E-04	5.25E-02	2.64E-07	2.98E-07	3.41E-07	3.54E-07
U-236	6.98E-07	5.06E-04	0.114	5.72E-07	6.45E-07	7.38E-07	7.66E-07
U-238	5.83E-06	4.23E-03	0.948	4.78E-06	5.38E-06	6.16E-06	6.40E-06
Np-237	1.88E-06	1.37E-03	0.306	1.39E-06	1.63E-06	2.14E-06	2.38E-06
Pu-238	8.17E-04	0.592	133	7.19E-04	7.98E-04	8.36E-04	8.53E-04
Pu-239	1.27E-02	9.19	2.06E+03	1.00E-02	1.20E-02	1.33E-02	1.40E-02
Pu-240	2.90E-03	2.10	472	2.41E-03	2.79E-03	3.02E-03	3.12E-03
Pu-241	7.45E-02	54.0	1.21E+04	6.75E-02	7.31E-02	7.58E-02	7.71E-02
Pu-242	3.22E-07	2.33E-04	5.24E-02	2.81E-07	3.14E-07	3.29E-07	3.36E-07
Am-241	8.20E-02	59.5	1.33E+04	7.90E-02	8.05E-02	8.36E-02	8.51E-02
Am-243	1.58E-05	1.14E-02	2.56	1.56E-05	1.57E-05	1.58E-05	1.58E-05
Cm-242	4.21E-05	3.05E-02	6.85	4.18E-05	4.20E-05	4.23E-05	4.24E-05
Cm-243	6.49E-06	4.70E-03	1.06	6.44E-06	6.46E-06	6.51E-06	6.54E-06
Cm-244	3.05E-04	0.221	49.7	2.98E-04	3.04E-04	3.07E-04	3.09E-04

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0.218 (g/L)	----	35.4	0.173	0.206	0.229	0.240
U	7.35E-02	1.27E+04	2.85E+03	6.03E-02	6.79E-02	7.77E-02	8.07E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-AZ-102							
SMM Composite Inventory Estimate							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Waste	1.655E+06 (kg)	1820 (kgal)	---	---	---	---	---
Heat Load	19.3 (kW)	66,000 (kBtu/hr)	---	17.6	18.4	21.2	23.1
Bulk Density*	1.05 (g/cc)	---	---	1.04	1.04	1.06	1.08
Water w/%†	92.8	---	---	90.8	91.5	93.5	94.4
TOC wt% C (wet)	1.66E-01	---	---	1.04E-01	1.38E-01	2.13E-01	2.77E-01
Radiological Constituents	**Ci/L**	**pCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	4.11E-01	3.92	1.47E+04	3.97E-01	3.98E-01	4.27E-01	4.37E-01
C-14	2.08E-05	4.59E-02	77.1	2.55E-05	4.20E-05	5.96E-05	6.05E-05
Ni-59	1.05E-06	1.30E-01	3.88E+02	6.92E-06	6.92E-06	1.66E-06	1.67E-06
Ni-63	1.06E-06	9.61E-01	3.56	5.42E-07	9.92E-07	1.07E-06	1.66E-06
Co-60	2.13E-05	1.94E-02	1.41	1.51E-05	2.04E-05	3.62E-05	3.95E-05
Se-79	8.70E-07	2.19E-01	2.96	2.70E-07	7.61E-07	1.13E-06	1.46E-06
Sr-90	1.51E-02	14.3	2.26E+04	1.31E-02	1.30E-02	1.61E-02	1.71E-02
Y-90	1.51E-02	39.4	5.23E+04	1.31E-02	1.40E-02	1.61E-02	1.71E-02
Zr-93	4.86E-06	4.06E-02	14.7	1.36E-06	2.75E-06	5.77E-06	7.20E-06
Nb-93m	3.61E-06	2.97E-02	10.7	9.88E-07	1.97E-06	4.65E-06	5.02E-06
Tc-99	1.12E-04	0.202	79.1	1.08E-04	1.90E-04	2.47E-04	2.77E-04
Ru-106	2.51E-05	3.38E-06	7.06E-02	2.48E-10	1.40E-09	2.90E-08	1.00E-09
Cs-137/Ba	2.53E-03	2.40E-03	66.1	1.50E-03	1.64E-03	3.42E-03	4.00E-03
Sb-125	2.80E-05	7.85	2.78E+04	2.17E-05	4.90E-05	1.06E-02	1.34E-02
Sn-126	1.99E-06	1.20E-01	4.30	4.15E-07	8.45E-07	1.54E-06	1.77E-06
I-129	4.26E-07	4.07E-04	1.48	2.98E-07	3.61E-07	4.92E-07	5.36E-07
Cs-134	8.51E-02	7.92	2.88E+04	1.90E-02	7.99E-02	9.06E-02	1.09E-02
Cs-137	1.16	1.12E+03	4.04E+06	0.803	0.982	1.29	1.51
Ba-137m	1.10	1.06E+03	3.80E+06	0.766	0.935	1.27	1.48
Eu-151	3.01E-05	2.87	1.05E+04	2.08E-05	1.87E-05	4.08E-05	5.01E-05
Eu-152	2.06E-05	1.96E-02	71.2	1.04E-05	1.74E-05	2.37E-05	2.68E-05
Eu-154	2.10E-06	0.200	72.7	2.41E-07	1.38E-06	2.86E-06	3.30E-06
Eu-155	3.77E-07	3.59	1.30E+04	2.50E-10	2.15E-01	4.30E-07	8.60E-01
Ra-226	2.36E-11	2.01E-08	9.58E-05	9.12E-11	1.80E-11	3.66E-11	4.55E-11
Ra-228	7.78E-10	2.42E-07	2.77E-04	1.97E-10	1.47E-10	8.88E-10	9.23E-10
Ac-227	1.99E-10	1.95E-07	5.54E-04	5.62E-11	1.68E-10	2.13E-10	2.64E-10
Th-231	2.66E-10	8.17E-10	2.98E-07	2.25E-10	5.39E-10	1.15E-09	1.32E-09
Th-229	1.88E-11	1.74E-08	9.35E-05	4.80E-12	4.80E-12	1.99E-11	2.14E-11
Th-232	8.65E-11	8.04E-08	3.04E-04	1.25E-11	1.25E-11	1.04E-10	2.22E-10
U-233	3.28E-09	2.10E-06	2.99E-03	1.74E-09	1.00E-09	2.60E-09	3.07E-09
U-235	8.50E-09	4.35E-06	2.99E-03	5.60E-09	7.55E-09	1.00E-08	1.15E-08
U-234	1.99E-07	1.84E-04	0.082	1.78E-07	1.88E-07	2.07E-07	2.10E-07
U-238	7.13E-09	3.16E-06	2.61E-03	6.79E-09	3.14E-09	1.89E-08	2.32E-08
U-236	1.53E-08	1.34E-05	5.60E-03	1.40E-08	1.34E-08	1.70E-08	1.78E-08
U-238	1.34E-07	1.10E-04	0.477	1.20E-07	1.20E-07	1.50E-07	1.56E-07
Np-237	3.10E-06	1.96E-03	1.05	2.10E-06	2.52E-06	3.38E-06	4.06E-06
Pu-238	4.57E-07	4.30E-04	1.51	1.34E-07	3.08E-07	6.12E-07	7.01E-07
Pu-239	5.99E-06	5.23E-03	19.4	1.40E-06	3.62E-06	9.10E-06	9.17E-06
Pu-240	1.10E-06	1.00E-03	4.10	4.60E-07	7.75E-07	1.54E-06	1.56E-06
Pu-241	4.60E-05	4.41E-02	161	1.12E-05	3.04E-05	6.29E-05	7.72E-05
Pu-242	1.79E-10	1.69E-07	6.59E-04	1.96E-11	1.10E-10	2.54E-10	2.91E-10
Am-241	1.53E-05	1.35E-02	66.1	4.57E-06	8.96E-06	1.78E-05	1.91E-05
Am-243	2.60E-06	2.54E-03	9.26E-02	5.12E-07	1.72E-06	3.63E-06	4.51E-06
Cm-242	1.91E-06	1.72E-03	6.59	1.26E-06	1.23E-06	2.09E-06	2.26E-06
Cm-243	3.03E-07	2.90E-04	1.03	2.11E-07	2.06E-07	3.50E-07	3.58E-07
Cm-244	4.90E-06	4.20E-03	17.1	1.68E-06	2.92E-06	5.99E-06	7.12E-06
Totals				**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
H_2O	5.80E-01 (g/L)	---	9.37	2.40E-01	4.60E-01	6.90E-01	7.12E-01
H^+	1.70E-01	300	7.42E-01	1.50E-01	1.67E-01	1.80E-01	1.88E-01

*Density is calculated based on Na_2O, Al_2O_3, and NiO_2.

†Water w% derived from the difference of density and total dissolved species

HDW Model Rev. 4

Double-Shell Tank 241-AZ-102

Total Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	3.88E+06 (kg)	(963 kgal)	----	----	----	----	----
Heat Load	46.4 (kW)	(1.59E+05 BTU/hr)	----	40.1	43.4	49.5	52.4
Bulk Density†	1.06 (g/cc)	----	----	1.05	1.06	1.07	1.08
Water wt%†	90.6	----	----	88.8	89.7	91.5	92.4
TOC wt% C (wet	0.152	----	----	5.35E-02	0.105	0.197	0.226

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	4.04E-03	3.80	1.47E+04	2.82E-03	3.42E-03	4.66E-03	5.26E-03
C-14	5.00E-05	4.70E-02	182	3.50E-05	4.23E-05	5.77E-05	6.51E-05
Ni-59	1.90E-05	1.79E-02	69.2	1.78E-05	1.84E-05	1.96E-05	2.02E-05
Ni-63	1.91E-03	1.80	6.97E+03	1.80E-03	1.85E-03	1.97E-03	2.03E-03
Co-60	6.58E-04	0.619	2.40E+03	6.43E-04	6.51E-04	6.62E-04	6.66E-04
Se-79	1.46E-05	1.37E-02	53.2	7.20E-06	1.00E-05	1.92E-05	2.35E-05
Sr-90	1.09	1.02E+03	3.97E+06	0.833	0.999	1.13	1.15
Y-90	1.09	1.02E+03	3.97E+06	0.833	0.999	1.13	1.15
Zr-93	6.59E-05	6.20E-02	240	3.22E-05	4.31E-05	8.87E-05	1.11E-04
Nb-93m	4.53E-05	4.26E-02	165	1.70E-05	2.94E-05	6.13E-05	7.66E-05
Tc-99	2.10E-04	0.197	764	1.47E-04	1.78E-04	2.42E-04	2.73E-04
Ru-106	9.21E-03	8.66	3.36E+04	9.21E-03	9.21E-03	9.21E-03	9.21E-03
Cd-113m	3.64E-04	0.342	1.32E+03	2.80E-04	3.15E-04	4.80E-04	6.11E-04
Sb-125	1.69E-02	15.9	6.17E+04	1.41E-02	1.57E-02	1.78E-02	1.84E-02
Sn-126	2.33E-05	2.19E-02	85.0	1.16E-05	1.65E-05	3.01E-05	3.67E-05
I-129	4.21E-07	3.96E-04	1.53	2.95E-07	3.56E-07	4.85E-07	5.47E-07
Cs-134	8.22E-03	7.73	3.00E+04	5.77E-03	6.97E-03	9.48E-03	1.07E-02
Cs-137	1.15	1.08E+03	4.20E+06	0.810	0.978	1.33	1.50
Ba-137m	1.09	1.03E+03	3.98E+06	0.767	0.925	1.26	1.42
Sm-151	5.31E-02	50.0	1.94E+05	2.60E-02	3.72E-02	6.91E-02	8.44E-02
Eu-152	4.58E-05	4.31E-02	167	3.98E-05	4.27E-05	4.90E-05	5.20E-05
Eu-154	5.10E-03	4.80	1.86E+04	4.90E-03	4.91E-03	5.51E-03	6.21E-03
Eu-155	7.29E-03	6.85	2.66E+04	6.18E-03	6.72E-03	7.85E-03	8.39E-03
Ra-226	1.15E-09	1.09E-06	4.21E-03	8.77E-10	1.01E-09	1.30E-09	1.43E-09
Ra-228	7.43E-10	6.99E-07	2.71E-03	1.88E-10	1.88E-10	8.10E-10	8.82E-10
Ac-227	6.00E-09	5.65E-06	2.19E-02	4.39E-09	5.18E-09	6.82E-09	7.61E-09
Pa-231	1.01E-08	9.51E-06	3.68E-02	1.80E-09	5.55E-09	1.47E-08	1.90E-08
Th-229	1.84E-11	1.73E-08	6.72E-05	5.60E-12	5.60E-12	1.99E-11	2.15E-11
Th-232	8.06E-11	7.58E-08	2.94E-04	1.19E-11	1.19E-11	9.93E-11	1.17E-10
U-232	2.27E-09	2.13E-06	8.26E-03	1.74E-09	1.95E-09	2.62E-09	3.00E-09
U-233	8.20E-09	7.71E-06	2.99E-02	6.20E-09	7.00E-09	9.56E-09	1.10E-08
U-234	5.67E-07	5.34E-04	2.07	4.99E-07	5.39E-07	5.89E-07	6.04E-07
U-235	2.16E-08	2.03E-05	7.86E-02	1.90E-08	2.05E-08	2.24E-08	2.30E-08
U-236	4.66E-08	4.39E-05	0.170	4.10E-08	4.43E-08	4.84E-08	4.97E-08
U-238	3.91E-07	3.67E-04	1.42	3.44E-07	3.71E-07	4.05E-07	4.16E-07
Np-237	3.05E-06	2.87E-03	11.1	2.13E-06	2.58E-06	3.52E-06	3.97E-06
Pu-238	3.69E-05	3.47E-02	134	3.25E-05	3.60E-05	3.77E-05	3.85E-05
Pu-239	5.69E-04	0.535	2.07E+03	4.52E-04	5.40E-04	5.99E-04	6.27E-04
Pu-240	1.31E-04	0.123	476	1.09E-04	1.25E-04	1.36E-04	1.41E-04
Pu-241	3.37E-03	3.17	1.23E+04	3.06E-03	3.31E-03	3.43E-03	3.48E-03
Pu-242	1.45E-08	1.37E-05	5.30E-02	1.27E-08	1.42E-08	1.49E-08	1.52E-08
Am-241	3.67E-03	3.46	1.34E+04	3.54E-03	3.61E-03	3.74E-03	3.81E-03
Am-243	7.06E-07	6.64E-04	2.57	7.01E-07	7.04E-07	7.08E-07	7.09E-07
Cm-242	3.61E-06	3.39E-03	13.1	3.07E-06	3.33E-06	3.88E-06	4.15E-06
Cm-243	5.79E-07	5.44E-04	2.11	4.89E-07	5.33E-07	6.25E-07	6.69E-07
Cm-244	1.37E-05	1.29E-02	49.9	1.33E-05	1.36E-05	1.38E-05	1.38E-05

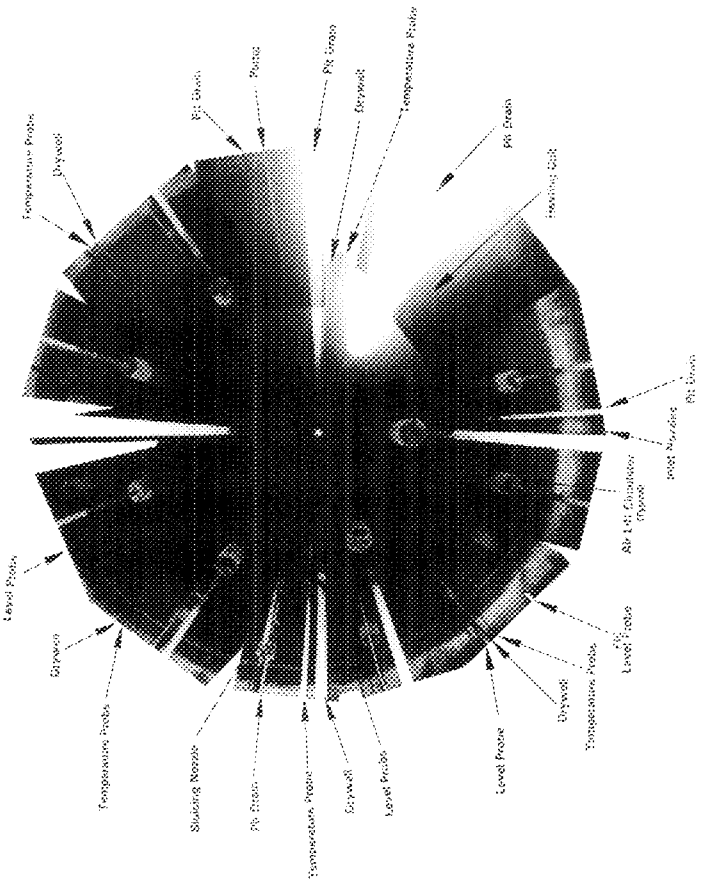
Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	9.78E-03 (g/L)	----	35.6	7.78E-03	9.28E-03	1.03E-02	1.08E-02
U	4.92E-03	1.10E+03	4.27E+03	4.33E-03	4.67E-03	5.10E-03	5.24E-03

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.

241-AZ-102

Photo date: 10-24-94



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7.0 241-SY Tank Farm

The SY Tank Farm is located in the 200 West Area south of 14th Street and north of S Tank Farm. The farm contains three flat bottom design, double-shell tanks built in 1974 through 1976. The tanks are 75 feet in diameter with an operating capacity of 1,160,000 gallons. For more information on the design, construction, and waste contents of the tanks, refer to the SY Tank Farm Supporting Document, HNF-SD-WM-ER-319, Rev. 1 (Brevick et al., 1997f).

The 241-SY Tank Farm is the only double-shell tank farm located in the 200 West Area. Tank 241-SY-101 was initially a slurry receiver for the 242-S Evaporator. Tank 241-SY-102 was a feed tank for the 242-S Evaporator (Anderson, 1990). The primary additions to the tanks were decontamination waste (DW), slurry growth (GAS), partial nuetralization feed (NIT), dilute non-complexed waste (SWLIQ), unknown waste (UNK), waste water (WTR), and Z Plant waste (Z) (Agnew et al., 1995).

The following table presents a summary of the 241-SY Tank Farm. Refer to the glossary for waste type terminology.

TANK FARM 241-SY SUMMARY

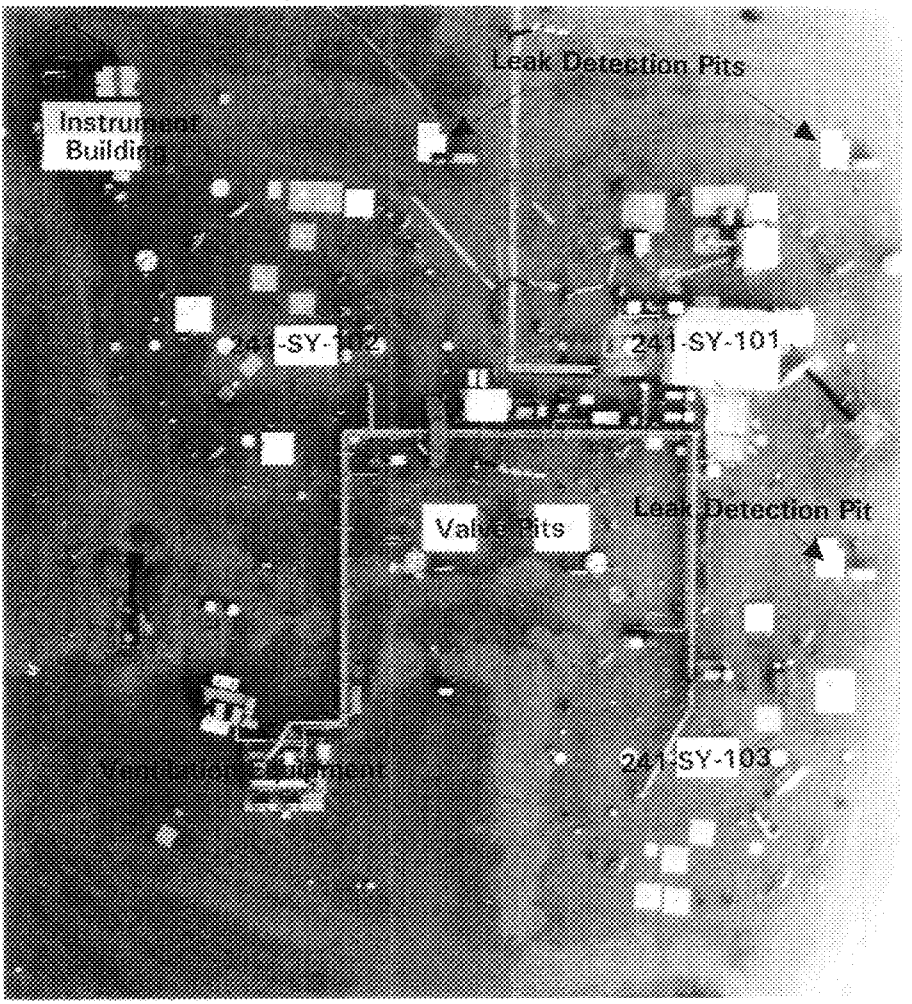
TANK FARM DESCRIPTION		WASTE VOLUME (HANLON 1996l)	
Shell Type	Double	Total Waste Volume	2,454,000 gal
Number of Tanks	3	Waste Type	CC, DN, PT
Construction Date	1974 - 1976	Drainable Interstitial Liquids	0 gal
INTEGRITY		Pumpable Liquids	1,976,000 gal
Sound	101	Saltcake	4,000 gal
	102	Sludge	474,000 gal
	103	Supernatant	1,976,000 gal
TANK VOLUMES		**WATCH LISTS**	
3@1,160,000 gal		Hydrogen	101, 103
		Organic	none
		High Heat	none

The historical characterization and waste inventory information for each tank is assembled into a set of tables, sketches, graphs, and interior tank montage. The set consists of the following for each tank in SY Tank Farm:

- Tank Summary table
- Waste and Level History sketch
- Riser configuration sketch
- Tank Layer Model Estimate graph
- Total Inventory Estimate tables
- TLM Solids Composite Inventory Estimate tables
- SMM Composite Inventory Estimate tables
- Interior tank montage

The supporting document for this tank farm provides backup data and further explanation of the above tables, sketches, and graphs.

SY TANK FARM


Leak Detection Pits
Instrument Building
241-SY-101
Leak Detection Pit
241-SY-103

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TANK 241-SY-101 SUMMARY

TANK HISTORY	
Entered Service	1977
Removed from Service	-
Inactive	Jan 1991
Watch Lists	Hydrogen
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser	Size
11A, 17B, 22A, 23A	4 in
7B, 13A	12 in
TANK TEMPERATURE	
Average Tank Temperature	113°F
Maximum Temperature	123.4°F
Date	Nov 25, 1995
Elevation from tank bottom	26.33 ft, 28.33 ft
Riser Number	17C
Minimum Temperature	66.92°F
Date	Jan 31, 1996
Elevation from tank bottom	35.58 ft
Riser Number	17C

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	flat
Nominal Capacity	1,160,000 gal
Total Risers	58
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	1,114,000 gal
Waste Type	CC
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	1,073,000 gal
Saltcake	0 gal
Sludge	41,000 gal
Supernatant	1,073,000 gal
INTERIOR PHOTOGRAPHS	
Date	April 12, 1989
Montage Number	94080233-9CN
Photo Set Number	89041306
WASTE SURFACE LEVEL	
Devices	Man Tape,Man Radar, Man/Auto ENRAF, Man FIC
Max Level	419.75 in
Date	Oct 25, 1991
Min Level	389 in
Date	Sept 14, 1992

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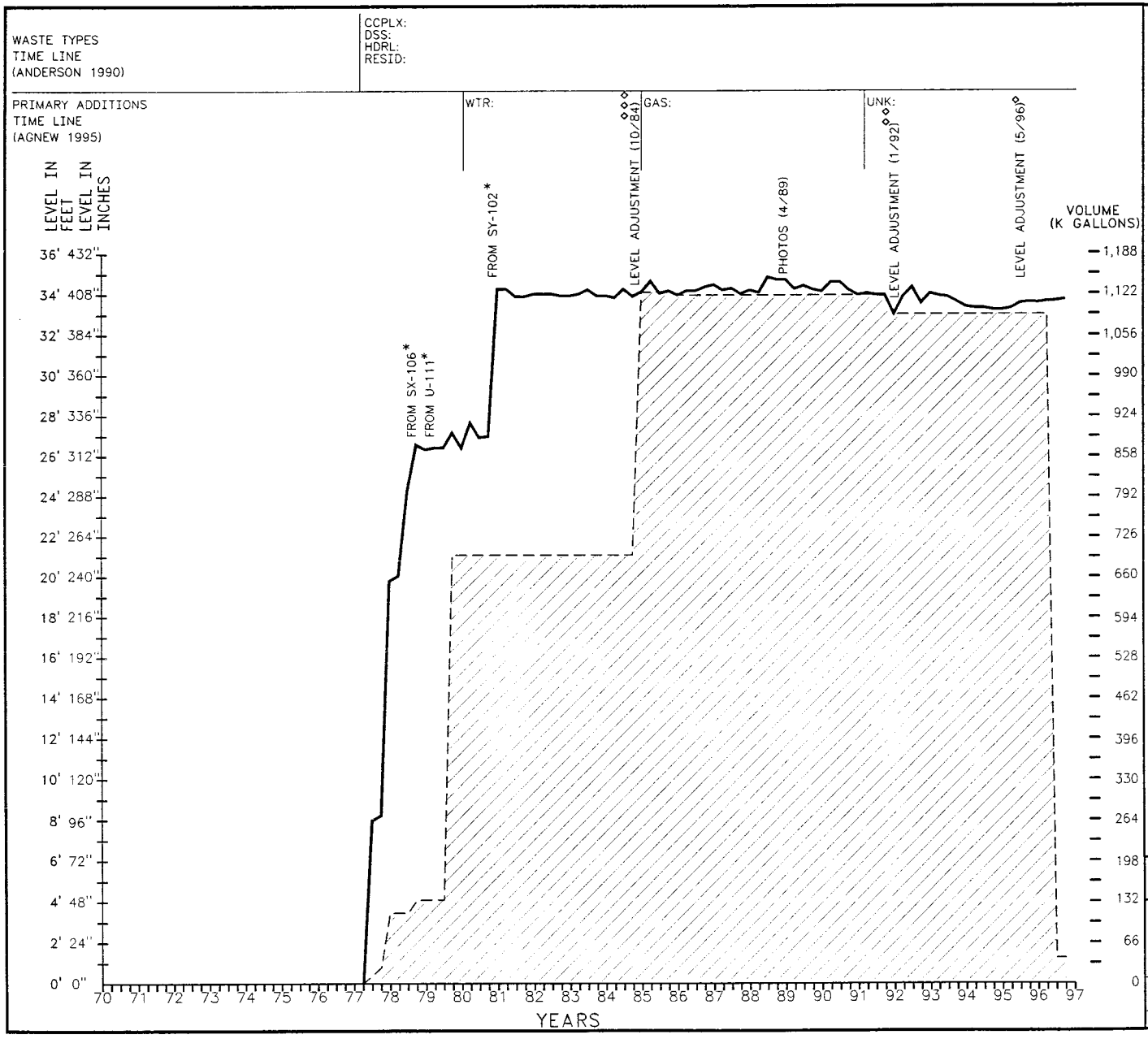


TANK INFO:

CONSTRUCTED 1974-1976
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- ◇ HANLON 1996l
- ◇◇ HANLON 1992d
- ◇◇◇ McCANN AND VAIL 1984k

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

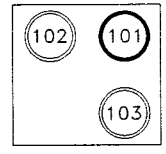
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

CCPLX:	COMPLEXANT CONCENTRATE
DSS:	DOUBLE-SHELL SLURRY CONCENTRATE
GAS:	SLURRY GROWTH
HDRL:	HANFORD DEFENSE RESIDUAL LIQUOR
RESID:	HANFORD DEFENSE RESIDUAL LIQUOR
UNK:	UNKNOWN
WTP:	WATER

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

SY TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-SY-101 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1977-1996
SOUND/INACTIVE TANK
WATCH LIST: HYDROGEN

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E175	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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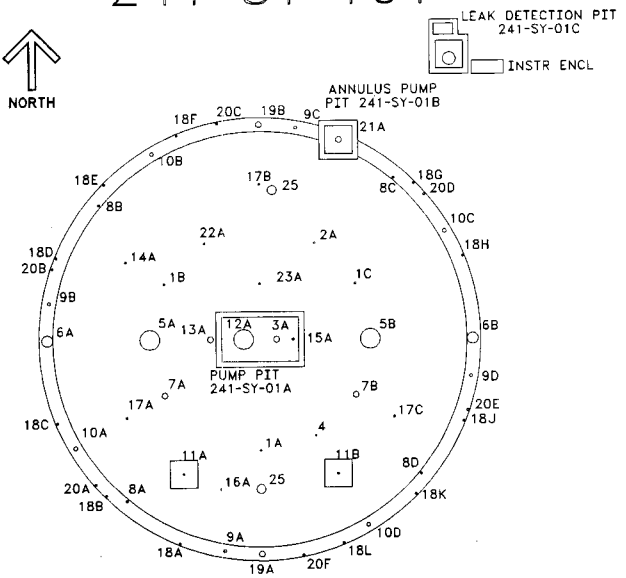
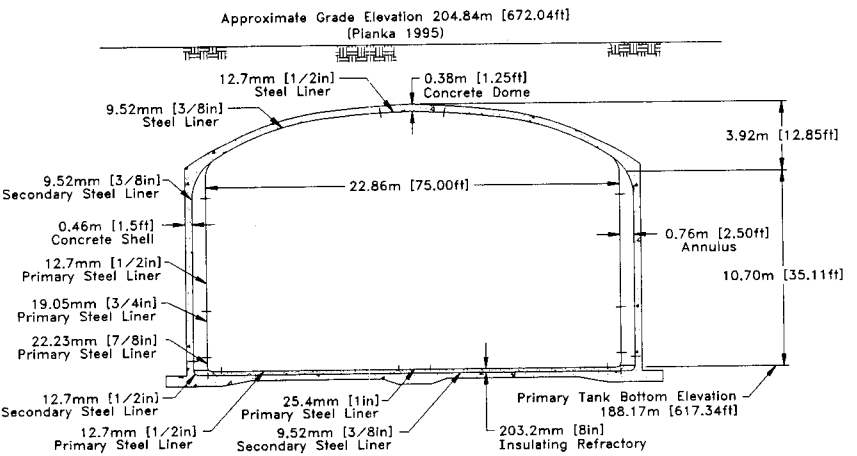
241-SY-101



TANK RISER LOCATION

Ref: H-2-37773, Rev.7
H-2-37801, Rev.7
H-2-72213, Rev.2



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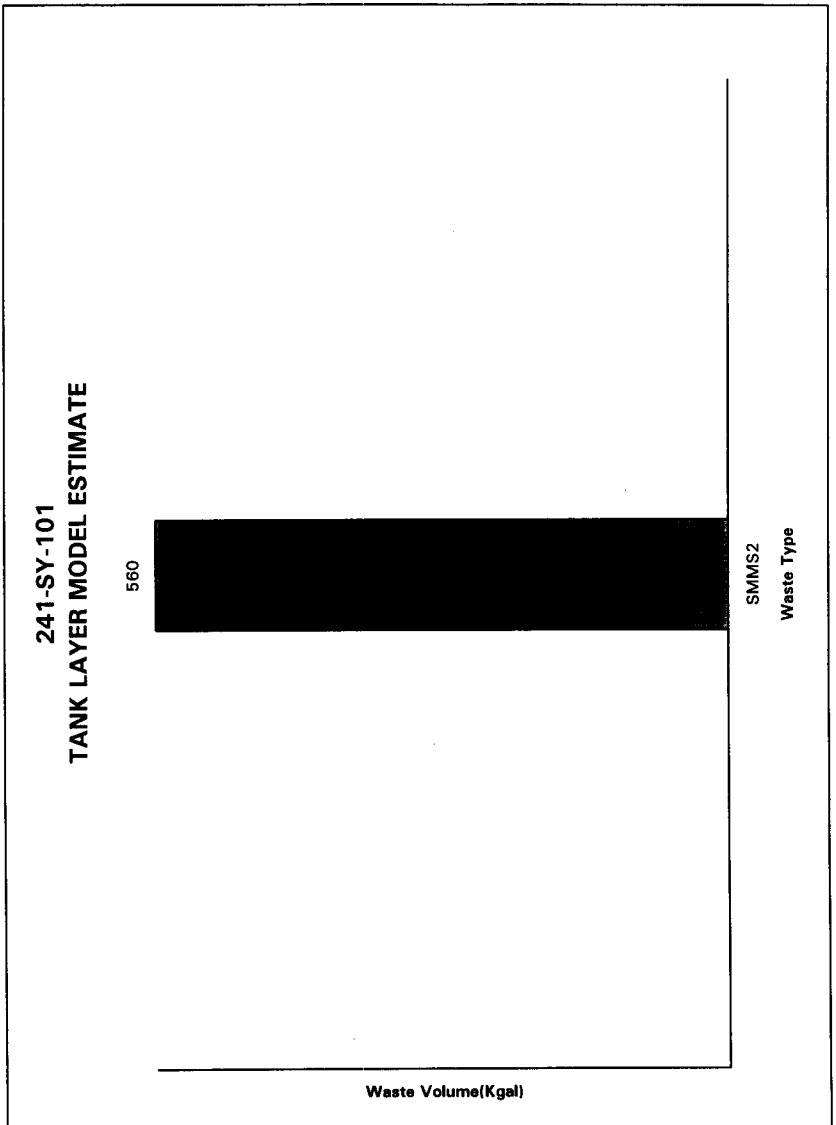
H-2-37772, Rev.2
H-2-72213, Rev.2

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-SY-101							
TLM Solids Composite Inventory Estimate*							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-SY-101							
SMM Composite Inventory Estimate							
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	7.45E+06 (kg)	(1.10E+03 kgal)	----	----	----	----	----
Heat Load	11.8 (kW)	(4.04E+04 BTU/hr)	----	11.1	11.5	12.2	12.6
Bulk Density*	1.79 (g/cc)	----	----	1.73	1.76	1.82	1.84
Water wt%	21.3	----	----	18.5	19.7	22.9	24.9
TOC wt% C (wet	1.04	----	----	0.638	0.835	1.24	1.44
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	18.5	2.38E+05	1.77E+06	16.9	17.7	19.2	19.9
Al3+	2.13	3.21E+04	2.39E+05	1.97	2.05	2.21	2.29
Fe3+ (total Fe)	1.48E-02	461	3.43E+03	1.21E-02	1.34E-02	1.61E-02	1.74E-02
Cr3+	0.186	5.40E+03	4.03E+04	0.157	0.173	0.191	0.196
Bi3+	1.82E-03	212	1.58E+03	1.66E-03	1.74E-03	1.90E-03	1.98E-03
La3+	6.15E-05	4.77	35.6	4.46E-05	5.28E-05	7.02E-05	7.86E-05
Hg2+	1.23E-05	1.38	10.3	1.14E-05	1.19E-05	1.25E-05	1.26E-05
Zr (as ZrO(OH)2)	3.36E-04	17.1	128	3.06E-04	3.17E-04	3.48E-04	3.65E-04
Pb2+	1.35E-03	156	1.16E+03	1.09E-03	1.21E-03	1.48E-03	1.61E-03
Ni2+	8.58E-03	282	2.10E+03	8.19E-03	8.38E-03	8.68E-03	8.78E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	5.22E-03	160	1.19E+03	3.95E-03	4.57E-03	5.87E-03	6.50E-03
Ca2+	4.53E-02	1.02E+03	7.57E+03	4.15E-02	4.34E-02	4.73E-02	4.92E-02
K+	8.68E-02	1.90E+03	1.41E+04	7.90E-02	8.27E-02	9.11E-02	9.51E-02
OH-	12.8	1.21E+05	9.04E+05	11.9	12.3	13.3	13.6
NO3-	6.54	2.27E+05	1.69E+06	6.02	6.33	6.63	6.72
NO2-	3.16	8.12E+04	6.05E+05	2.62	2.87	3.44	3.71
CO32-	0.602	2.02E+04	1.50E+05	0.544	0.570	0.642	0.651
PO43-	0.123	6.54E+03	4.87E+04	0.106	0.112	0.126	0.129
SO42-	0.333	1.79E+04	1.33E+05	0.262	0.296	0.371	0.404
Si (as SiO32-)	0.105	1.65E+03	1.23E+04	8.68E-02	9.57E-02	0.114	0.123
F-	8.95E-02	950	7.08E+03	7.54E-02	8.13E-02	9.64E-02	0.102
Cl-	0.321	6.35E+03	4.73E+04	0.290	0.302	0.335	0.348
C6H5O73-	3.79E-02	4.00E+03	2.98E+04	3.46E-02	3.62E-02	3.96E-02	4.12E-02
EDTA4-	2.53E-02	4.08E+03	3.04E+04	7.48E-03	1.62E-02	3.45E-02	4.35E-02
HEDTA3-	4.78E-02	7.32E+03	5.45E+04	1.21E-02	2.95E-02	6.62E-02	8.41E-02
glycolate-	0.134	5.61E+03	4.18E+04	9.02E-02	0.112	0.156	0.178
acetate-	9.25E-03	305	2.27E+03	7.62E-03	8.42E-03	1.01E-02	1.09E-02
oxalate2-	8.06E-05	3.96	29.5	7.14E-05	7.59E-05	8.53E-05	8.98E-05
DBP	2.55E-02	2.99E+03	2.23E+04	2.10E-02	2.32E-02	2.77E-02	2.99E-02
butanol	2.55E-02	1.06E+03	7.87E+03	2.10E-02	2.32E-02	2.77E-02	2.99E-02
NH3	0.113	1.08E+03	8.01E+03	9.27E-02	0.101	0.129	0.148
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-SY-101							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	7.45E+06 (kg)	(1.10E+03 kgal)	----	----	----	----	----
Heat Load	11.8 (kW)	(4.04E+04 BTU/hr)	----	11.1	11.5	12.2	12.6
Bulk Density†	1.79 (g/cc)	----	----	1.73	1.76	1.82	1.84
Water wt%†	21.3	----	----	18.5	19.7	22.9	24.9
TOC wt% C (wet	1.04	----	----	0.638	0.835	1.24	1.44
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	18.5	2.38E+05	1.77E+06	16.9	17.7	19.2	19.9
Al3+	2.13	3.21E+04	2.39E+05	1.97	2.05	2.21	2.29
Fe3+ (total Fe)	1.48E-02	461	3.43E+03	1.21E-02	1.34E-02	1.61E-02	1.74E-02
Cr3+	0.186	5.40E+03	4.03E+04	0.157	0.173	0.191	0.196
Bi3+	1.82E-03	212	1.58E+03	1.66E-03	1.74E-03	1.90E-03	1.98E-03
La3+	6.15E-05	4.77	35.6	4.46E-05	5.28E-05	7.02E-05	7.86E-05
Hg2+	1.23E-05	1.38	10.3	1.14E-05	1.19E-05	1.25E-05	1.26E-05
Zr (as ZrO(OH)2)	3.36E-04	17.1	128	3.06E-04	3.17E-04	3.48E-04	3.65E-04
Pb2+	1.35E-03	156	1.16E+03	1.09E-03	1.21E-03	1.48E-03	1.61E-03
Ni2+	8.58E-03	282	2.10E+03	8.19E-03	8.38E-03	8.68E-03	8.78E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	5.22E-03	160	1.19E+03	3.95E-03	4.57E-03	5.87E-03	6.50E-03
Ca2+	4.53E-02	1.02E+03	7.57E+03	4.15E-02	4.34E-02	4.73E-02	4.92E-02
K+	8.68E-02	1.90E+03	1.41E+04	7.90E-02	8.27E-02	9.11E-02	9.51E-02
OH-	12.8	1.21E+05	9.04E+05	11.9	12.3	13.3	13.6
NO3-	6.54	2.27E+05	1.69E+06	6.02	6.33	6.63	6.72
NO2-	3.16	8.12E+04	6.05E+05	2.62	2.87	3.44	3.71
CO32-	0.602	2.02E+04	1.50E+05	0.544	0.570	0.642	0.651
PO43-	0.123	6.54E+03	4.87E+04	0.106	0.112	0.126	0.129
SO42-	0.333	1.79E+04	1.33E+05	0.262	0.296	0.371	0.404
Si (as SiO32-)	0.105	1.65E+03	1.23E+04	8.68E-02	9.57E-02	0.114	0.123
F-	8.95E-02	950	7.08E+03	7.54E-02	8.13E-02	9.64E-02	0.102
Cl-	0.321	6.35E+03	4.73E+04	0.290	0.302	0.335	0.348
C6H5O73-	3.79E-02	4.00E+03	2.98E+04	3.46E-02	3.62E-02	3.96E-02	4.12E-02
EDTA4-	2.53E-02	4.08E+03	3.04E+04	7.48E-03	1.62E-02	3.45E-02	4.35E-02
HEDTA3-	4.78E-02	7.32E+03	5.45E+04	1.21E-02	2.95E-02	6.62E-02	8.41E-02
glycolate-	0.134	5.61E+03	4.18E+04	9.02E-02	0.112	0.156	0.178
acetate-	9.25E-03	305	2.27E+03	7.62E-03	8.42E-03	1.01E-02	1.09E-02
oxalate2-	8.06E-05	3.96	29.5	7.14E-05	7.59E-05	8.53E-05	8.98E-05
DBP	2.55E-02	2.99E+03	2.23E+04	2.10E-02	2.32E-02	2.77E-02	2.99E-02
butanol	2.55E-02	1.06E+03	7.87E+03	2.10E-02	2.32E-02	2.77E-02	2.99E-02
NH3	0.113	1.08E+03	8.01E+03	9.27E-02	0.101	0.129	0.148
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-SY-101							
TLM Solids Composite Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-SY-101

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	7.45E+06 (kg)	(1.10E+03 kgal)	----	----	----	----	----
Heat Load	11.8 (kW)	(4.04E+04 BTU/hr)	----	11.1	11.5	12.2	12.6
Bulk Density*	1.79 (g/cc)	----	----	1.73	1.76	1.82	1.84
Water wt%†	21.3	----	----	18.5	19.7	22.9	24.9
TOC wt% C (wet	1.04	----	----	0.638	0.835	1.24	1.44

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	3.31E-04	0.185	1.38E+03	1.69E-04	1.69E-04	3.45E-04	3.63E-04
C-14	4.89E-05	2.73E-02	204	1.49E-05	1.49E-05	4.96E-05	5.03E-05
Ni-59	3.13E-06	1.75E-03	13.0	1.53E-06	1.53E-06	3.21E-06	3.29E-06
Ni-63	3.07E-04	0.172	1.28E+03	1.49E-04	1.49E-04	3.15E-04	3.23E-04
Co-60	5.48E-05	3.06E-02	228	1.59E-05	1.59E-05	5.59E-05	5.69E-05
Se-79	4.87E-06	2.72E-03	20.3	2.70E-06	2.70E-06	5.66E-06	6.41E-06
Sr-90	0.164	91.6	6.83E+05	0.153	0.158	0.169	0.175
Y-90	0.164	91.6	6.83E+05	8.89E-02	8.89E-02	0.169	0.175
Zr-93	2.39E-05	1.34E-02	99.5	1.30E-05	1.30E-05	2.78E-05	3.16E-05
Nb-93m	1.73E-05	9.68E-03	72.1	9.72E-06	9.72E-06	2.01E-05	2.27E-05
Tc-99	3.48E-04	0.194	1.45E+03	2.21E-04	2.83E-04	4.13E-04	4.76E-04
Ru-106	1.00E-08	5.59E-06	4.16E-02	4.96E-09	4.96E-09	1.11E-08	1.21E-08
Cd-113m	1.26E-04	7.06E-02	526	6.13E-05	6.13E-05	1.50E-04	1.73E-04
Sb-125	2.38E-04	0.133	989	6.90E-05	6.90E-05	2.43E-04	2.49E-04
Sn-126	7.36E-06	4.11E-03	30.6	4.10E-06	4.10E-06	8.54E-06	9.67E-06
I-129	6.71E-07	3.75E-04	2.79	4.26E-07	5.46E-07	7.98E-07	9.20E-07
Cs-134	4.05E-06	2.26E-03	16.8	2.70E-06	3.36E-06	4.74E-06	5.42E-06
Cs-137	0.371	207	1.54E+06	0.334	0.352	0.390	0.409
Ba-137m	0.351	196	1.46E+06	0.282	0.282	0.369	0.387
Sm-151	1.71E-02	9.58	7.14E+04	9.54E-03	9.54E-03	1.99E-02	2.25E-02
Eu-152	5.91E-06	3.30E-03	24.6	3.22E-06	3.22E-06	6.41E-06	6.89E-06
Eu-154	8.96E-04	0.501	3.73E+03	3.53E-04	3.53E-04	1.09E-03	1.17E-03
Eu-155	3.51E-04	0.196	1.46E+03	1.91E-04	1.91E-04	3.81E-04	4.11E-04
Ra-226	2.05E-10	1.15E-07	8.54E-04	1.38E-10	1.38E-10	2.30E-10	2.53E-10
Ra-228	2.08E-07	1.16E-04	0.865	8.88E-08	1.47E-07	2.78E-07	3.53E-07
Ac-227	1.30E-09	7.27E-07	5.42E-03	9.10E-10	9.10E-10	3.44E-09	1.58E-09
Pa-231	6.00E-09	3.35E-06	2.50E-02	3.83E-09	3.83E-09	6.79E-09	7.54E-09
Th-229	4.87E-09	2.72E-06	2.03E-02	2.26E-09	3.54E-09	6.42E-09	8.06E-09
Th-232	1.40E-08	7.84E-06	5.84E-02	7.45E-09	1.07E-08	1.74E-08	2.06E-08
U-232	1.06E-06	5.91E-04	4.40	5.81E-07	8.14E-07	1.34E-06	1.64E-06
U-233	4.05E-06	2.26E-03	16.9	2.23E-06	3.12E-06	5.13E-06	6.29E-06
U-234	1.14E-06	6.37E-04	4.75	1.10E-06	1.12E-06	1.16E-06	1.18E-06
U-235	4.62E-08	2.58E-05	0.192	4.44E-08	4.53E-08	4.71E-08	4.77E-08
U-236	3.59E-08	2.00E-05	0.149	3.45E-08	3.53E-08	3.64E-08	3.70E-08
U-238	1.34E-06	7.46E-04	5.56	1.29E-06	1.32E-06	1.36E-06	1.37E-06
Np-237	1.26E-06	7.03E-04	5.24	8.44E-07	1.05E-06	1.47E-06	1.68E-06
Pu-238	2.07E-06	1.15E-03	8.60	1.58E-06	1.82E-06	2.31E-06	2.55E-06
Pu-239	7.02E-05	3.92E-02	292	5.77E-05	6.38E-05	7.65E-05	8.26E-05
Pu-240	1.20E-05	6.68E-03	49.8	9.63E-06	1.08E-05	1.31E-05	1.43E-05
Pu-241	1.40E-04	7.84E-02	584	1.07E-04	1.23E-04	1.57E-04	1.74E-04
Pu-242	7.72E-10	4.31E-07	3.21E-03	5.74E-10	6.71E-10	8.73E-10	9.70E-10
Am-241	8.29E-05	4.63E-02	345	5.98E-05	7.11E-05	9.47E-05	1.06E-04
Am-243	2.96E-09	1.65E-06	1.23E-02	2.24E-09	2.58E-09	3.38E-09	3.74E-09
Cm-242	2.25E-07	1.26E-04	0.938	1.15E-07	1.15E-07	2.44E-07	2.63E-07
Cm-243	2.09E-08	1.17E-05	8.70E-02	1.04E-08	1.04E-08	2.26E-08	2.42E-08
Cm-244	2.02E-07	1.13E-04	0.841	9.34E-08	9.34E-08	2.39E-07	2.62E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	8.59E-04 (g/L)	----	3.58	6.23E-04	7.39E-04	9.79E-04	1.09E-03
U	1.30E-02	1.73E+03	1.29E+04	1.25E-02	1.28E-02	1.33E-02	1.35E-02

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-SY-101

Total Inventory Estimate*

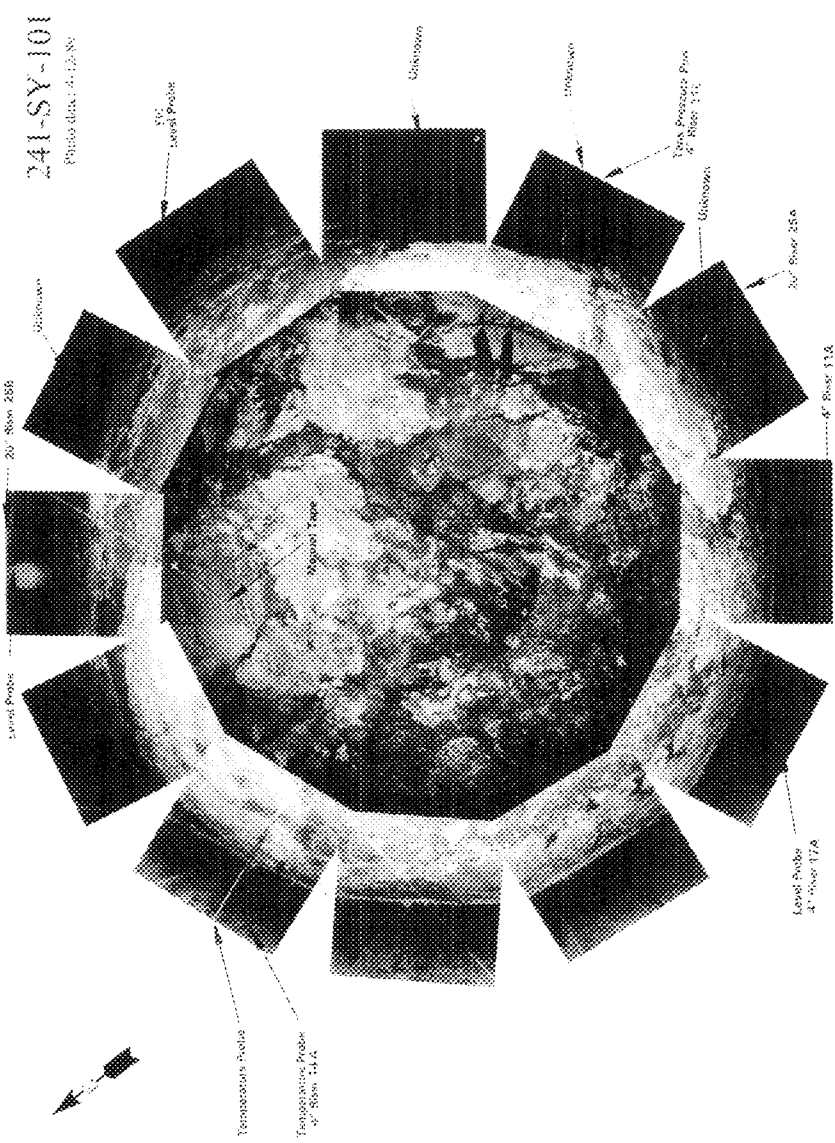
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	7.45E+06 (kg)	(1.10E+03 kgal)	----	----	----	----	----
Heat Load	11.8 (kW)	(4.04E+04 BTU/hr)	----	11.1	11.5	12.2	12.6
Bulk Density†	1.79 (g/cc)	----	----	1.73	1.76	1.82	1.84
Water wt%†	21.3	----	----	18.5	19.7	22.9	24.9
TOC wt% C (wet	1.04	----	----	0.638	0.835	1.24	1.44

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	3.31E-04	0.185	1.38E+03	1.69E-04	1.69E-04	3.45E-04	3.63E-04
C-14	4.89E-05	2.73E-02	204	1.49E-05	1.49E-05	4.96E-05	5.03E-05
Ni-59	3.13E-06	1.75E-03	13.0	1.53E-06	1.53E-06	3.21E-06	3.29E-06
Ni-63	3.07E-04	0.172	1.28E+03	1.49E-04	1.49E-04	3.15E-04	3.23E-04
Co-60	5.48E-05	3.06E-02	228	1.59E-05	1.59E-05	5.59E-05	5.69E-05
Se-79	4.87E-06	2.72E-03	20.3	2.70E-06	2.70E-06	5.66E-06	6.41E-06
Sr-90	0.164	91.6	6.83E+05	0.153	0.158	0.169	0.175
Y-90	0.164	91.6	6.83E+05	8.89E-02	8.89E-02	0.169	0.175
Zr-93	2.39E-05	1.34E-02	99.5	1.30E-05	1.30E-05	2.78E-05	3.16E-05
Nb-93m	1.73E-05	9.68E-03	72.1	9.72E-06	9.72E-06	2.01E-05	2.27E-05
Tc-99	3.48E-04	0.194	1.45E+03	2.21E-04	2.83E-04	4.13E-04	4.76E-04
Ru-106	1.00E-08	5.59E-06	4.16E-02	4.96E-09	4.96E-09	1.11E-08	1.21E-08
Cd-113m	1.26E-04	7.06E-02	526	6.13E-05	6.13E-05	1.50E-04	1.73E-04
Sb-125	2.38E-04	0.133	989	6.90E-05	6.90E-05	2.43E-04	2.49E-04
Sn-126	7.36E-06	4.11E-03	30.6	4.10E-06	4.10E-06	8.54E-06	9.67E-06
I-129	6.71E-07	3.75E-04	2.79	4.26E-07	5.46E-07	7.98E-07	9.20E-07
Cs-134	4.05E-06	2.26E-03	16.8	2.70E-06	3.36E-06	4.74E-06	5.42E-06
Cs-137	0.371	207	1.54E+06	0.334	0.352	0.390	0.409
Ba-137m	0.351	196	1.46E+06	0.282	0.282	0.369	0.387
Sm-151	1.71E-02	9.58	7.14E+04	9.54E-03	9.54E-03	1.99E-02	2.25E-02
Eu-152	5.91E-06	3.30E-03	24.6	3.22E-06	3.22E-06	6.41E-06	6.89E-06
Eu-154	8.96E-04	0.501	3.73E+03	3.53E-04	3.53E-04	1.09E-03	1.17E-03
Eu-155	3.51E-04	0.196	1.46E+03	1.91E-04	1.91E-04	3.81E-04	4.11E-04
Ra-226	2.05E-10	1.15E-07	8.54E-04	1.38E-10	1.38E-10	2.30E-10	2.53E-10
Ra-228	2.08E-07	1.16E-04	0.865	8.88E-08	1.47E-07	2.78E-07	3.53E-07
Ac-227	1.30E-09	7.27E-07	5.42E-03	9.10E-10	9.10E-10	1.44E-09	1.58E-09
Pa-231	6.00E-09	3.35E-06	2.50E-02	3.83E-09	3.83E-09	6.79E-09	7.54E-09
Th-229	4.87E-09	2.72E-06	2.03E-02	2.26E-09	3.54E-09	6.42E-09	8.06E-09
Th-232	1.40E-08	7.84E-06	5.84E-02	7.45E-09	1.07E-08	1.74E-08	2.06E-08
U-232	1.06E-06	5.91E-04	4.40	5.81E-07	8.14E-07	1.34E-06	1.64E-06
U-233	4.05E-06	2.26E-03	16.9	2.23E-06	3.12E-06	5.13E-06	6.29E-06
U-234	1.14E-06	6.37E-04	4.75	1.10E-06	1.12E-06	1.16E-06	1.18E-06
U-235	4.62E-08	2.58E-05	0.192	4.44E-08	4.53E-08	4.71E-08	4.77E-08
U-236	3.59E-08	2.00E-05	0.149	3.45E-08	3.53E-08	3.64E-08	3.70E-08
U-238	1.34E-06	7.46E-04	5.56	1.29E-06	1.32E-06	1.36E-06	1.37E-06
Np-237	1.26E-06	7.03E-04	5.24	8.44E-07	1.05E-06	1.47E-06	1.68E-06
Pu-238	2.07E-06	1.15E-03	8.60	1.58E-06	1.82E-06	2.31E-06	2.55E-06
Pu-239	7.02E-05	3.92E-02	292	5.77E-05	6.38E-05	7.65E-05	8.26E-05
Pu-240	1.20E-05	6.68E-03	49.8	9.63E-06	1.08E-05	1.31E-05	1.43E-05
Pu-241	1.40E-04	7.84E-02	584	1.07E-04	1.23E-04	1.57E-04	1.74E-04
Pu-242	7.72E-10	4.31E-07	3.21E-03	5.74E-10	6.71E-10	8.73E-10	9.70E-10
Am-241	8.29E-05	4.63E-02	345	5.98E-05	7.11E-05	9.47E-05	1.06E-04
Am-243	2.96E-09	1.65E-06	1.23E-02	2.24E-09	2.58E-09	3.38E-09	3.74E-09
Cm-242	2.25E-07	1.26E-04	0.938	1.15E-07	1.15E-07	2.44E-07	2.63E-07
Cm-243	2.09E-08	1.17E-05	8.70E-02	1.04E-08	1.04E-08	2.26E-08	2.42E-08
Cm-244	2.02E-07	1.13E-04	0.841	9.34E-08	9.34E-08	2.39E-07	2.62E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	8.59E-04 (g/L)	----	3.58	6.23E-04	7.39E-04	9.79E-04	1.09E-03
U	1.30E-02	1.73E+03	1.29E+04	1.25E-02	1.28E-02	1.33E-02	1.35E-02

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.


241-SY-101
Unknown
Level Probe
Temperature Probe

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TANK 241-SY-102 SUMMARY

TANK HISTORY	
Entered Service	1977
Removed from Service	-
Inactive	-
Watch Lists	none
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser	Size
11A, 17B, 22A, 23A	4 in
7A, 13A	12 in
TANK TEMPERATURE	
Average Tank Temperature	63°F
Maximum Temperature	71.42°F
Date	Sept 6, 1995
Elevation from tank bottom	0.74 ft
Riser Number	4A
Minimum Temperature	52.16°F
Date	Feb 3, 1996
Elevation from tank bottom	12.74 ft
Riser Number	4A

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	flat
Nominal Capacity	1,160,000 gal
Total Risers	59
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	593,000 gal
Waste Type	DN, PT
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	522,000 gal
Saltcake	0 gal
Sludge	71,000 gal
Supernatant	522,000 gal
INTERIOR PHOTOGRAPHS	
Date	April 29, 1981
Montage Number	94080233-14CN
Photo Set Number	95924
WASTE SURFACE LEVEL	
Devices	Manual ENRAF and Tape
Max Level	289.25 in
Date	June 5, 1995
Min Level	131.75 in
Date	Aug 10, 1995

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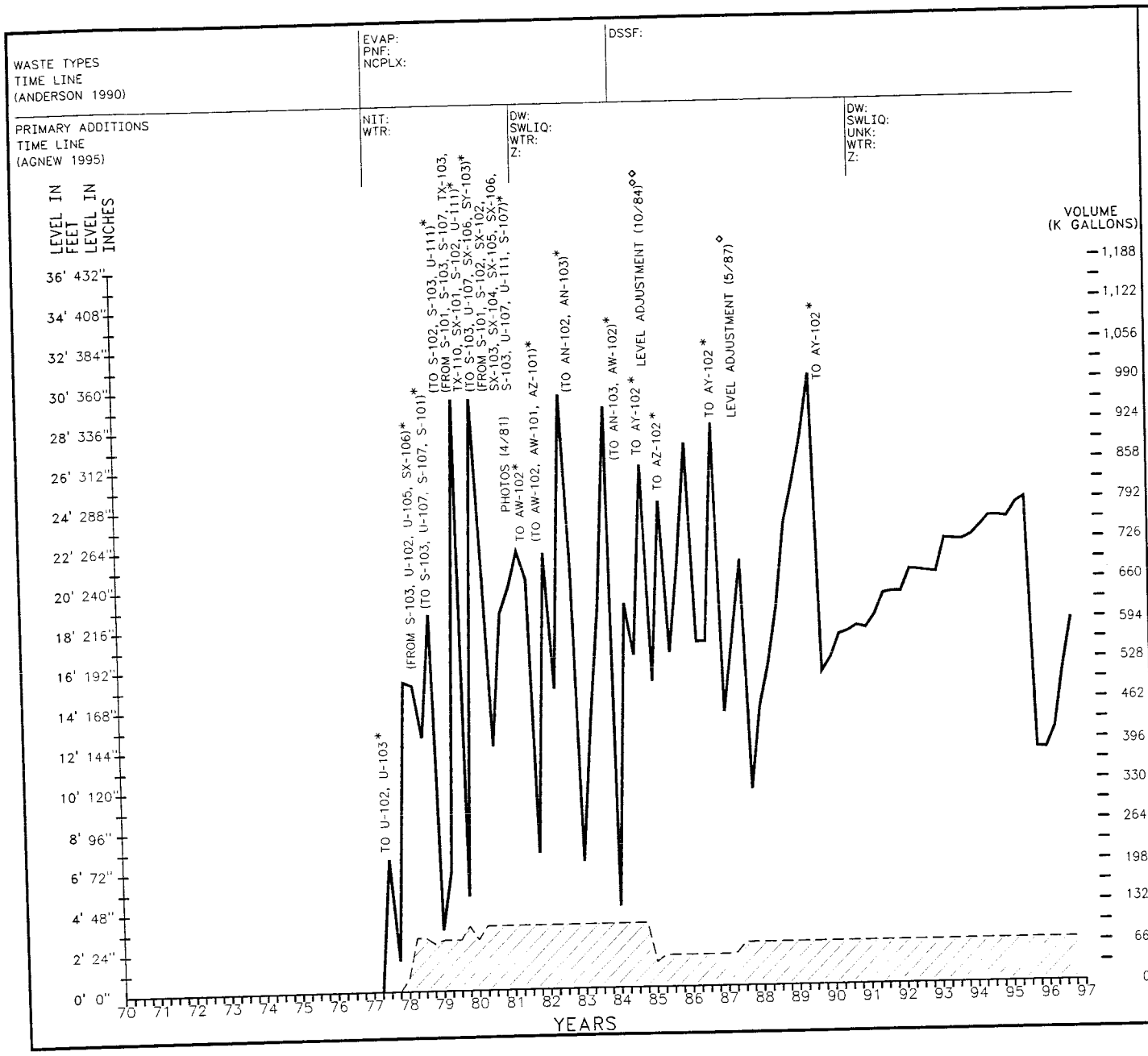


TANK INFO:

CONSTRUCTED 1974-1976
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

- * AGNEW 1995
- ◇ HANLON 1996l
- ◇◇ McCANN AND VAIL 1984k

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

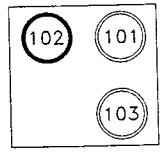
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

DSSF:	DOUBLE-SHELL SLURRY FEED
DW:	DECONTAMINATION WASTE
EVAP:	EVAPORATOR FEED
NCPLX:	NON-COMPLEXED WASTE
NIT:	PARTIAL NEUTRALIZATION FEED
PNF:	PARTIALLY NEUTRALIZED WASTE
SWLIQ:	DILUTE, NON-COMPLEXED WASTE
UNK:	UNKNOWN
WTR:	WATER
Z:	Z PLANT WASTE

LEGEND

- TOTAL WASTE LEVEL (SUPERNATE)
- SOLIDS LEVEL
- SOLIDS

SY TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-SY-102 SINGLE-SHELL TANK
WASTE & LEVEL HISTORY 1977-1996
SOUND/ACTIVE TANK
WATCH LIST: N/A

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E176	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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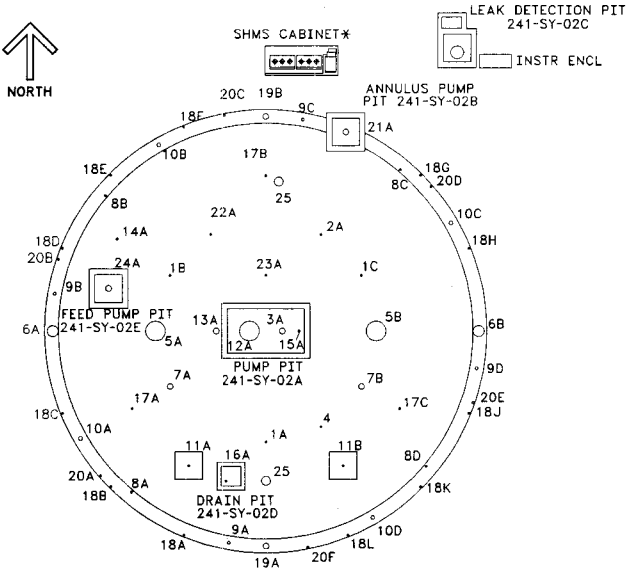
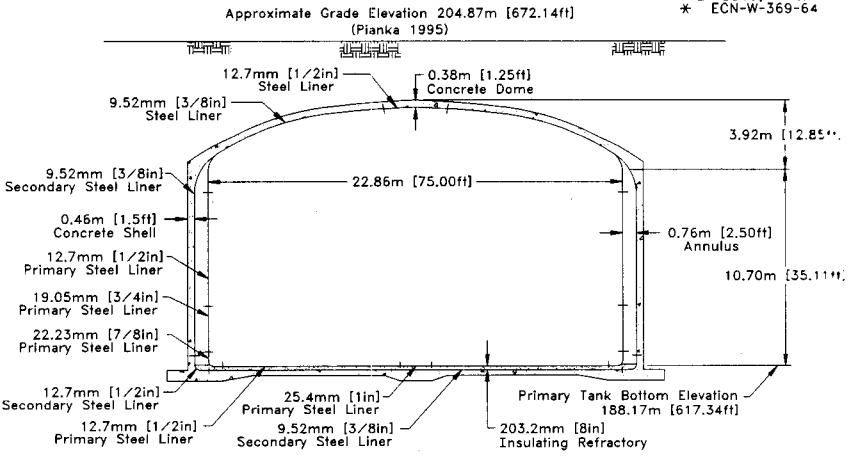
241-SY-102



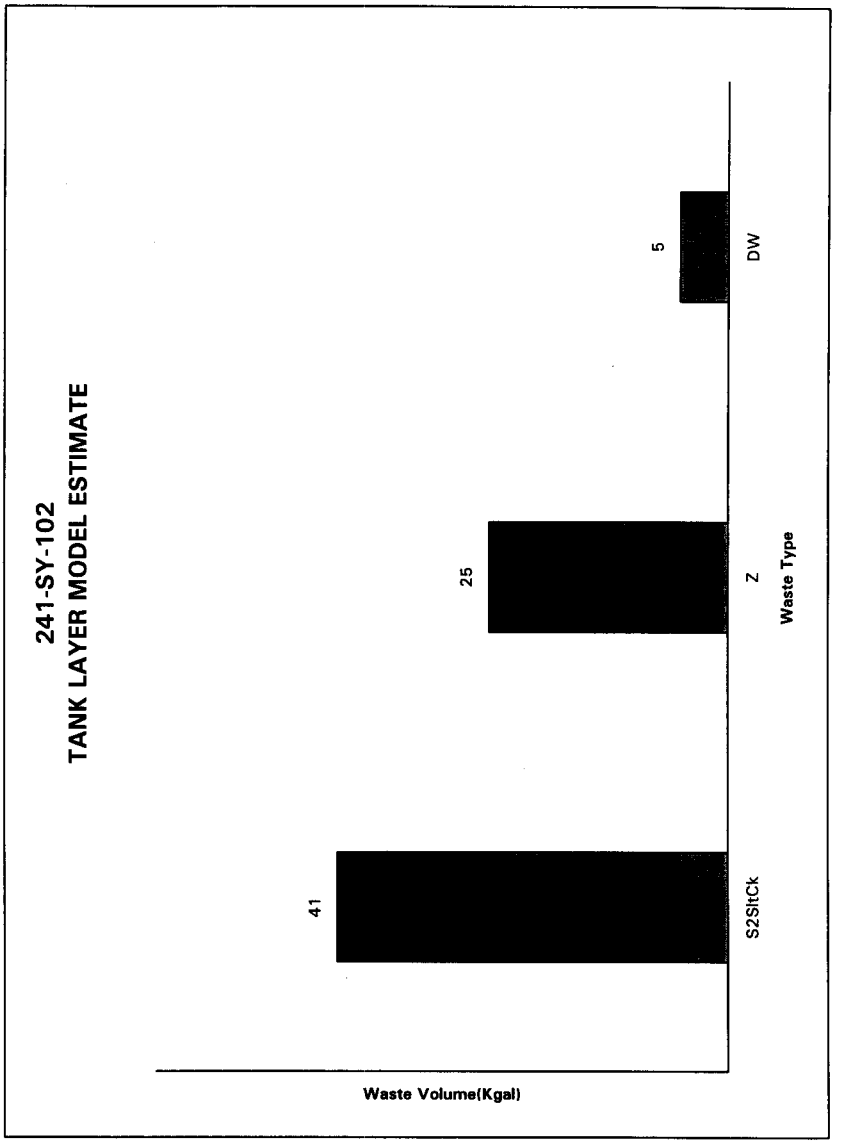
TANK RISER LOCATION

Ref: Salazar 1994
H-2-37773, Rev.7
H-2-37802, Rev.8
H-2-72213, Rev.2
* ECN-W-369-64



Ref: H-2-37706, Rev.2
H-2-37772, Rev.2
H-2-72213, Rev.2

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-SY-102

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	4.94E+05 (kg)	(70.9 kgal)	----	----	----	----	----
Heat Load	0.514 (kW)	(1.76E+03 BTU/hr)	----	0.285	0.392	0.621	0.729
Bulk Density	1.84 (g/cc)	----	----	1.62	1.72	1.93	2.01
Void Fraction	0.545	----	----	0.452	0.491	0.610	0.666
Water wt%	25.5	----	----	17.8	21.2	31.7	38.0
TOC wt% C (wet	0.820	----	----	0.416	0.620	1.00	1.17

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	13.8	1.72E+05	8.50E+04	8.42	10.9	16.1	18.1
Al3+	5.53	8.11E+04	4.01E+04	4.98	5.27	5.77	6.01
Fe3+ (total Fe)	0.873	2.65E+04	1.31E+04	0.830	0.860	0.880	0.887
Cr3+	0.136	3.86E+03	1.90E+03	0.112	0.123	0.144	0.149
Bi3+	3.36E-03	382	189	2.84E-03	3.10E-03	3.63E-03	3.88E-03
La3+	9.88E-06	0.746	0.368	6.70E-06	8.22E-06	1.14E-05	1.30E-05
Hg2+	1.42E-05	1.55	0.765	1.28E-05	1.35E-05	1.49E-05	1.55E-05
Zr (as ZrO(OH)2)	3.76E-04	18.6	9.20	2.50E-04	3.07E-04	4.36E-04	4.99E-04
Pb2+	1.29E-03	145	71.8	7.05E-04	9.92E-04	1.59E-03	1.88E-03
Ni2+	6.43E-02	2.05E+03	1.01E+03	3.03E-02	5.25E-02	6.57E-02	6.70E-02
Sr2+	0	0	0	0	0	0	0
Mn4+	1.39E-03	41.5	20.5	9.83E-04	1.18E-03	1.60E-03	1.80E-03
Ca2+	0.220	4.79E+03	2.37E+03	7.62E-02	0.161	0.247	0.273
K+	7.84E-02	1.67E+03	823	4.50E-02	5.96E-02	9.84E-02	0.116
OH-	24.7	2.29E+05	1.13E+05	21.3	23.0	26.3	27.9
NO3-	3.60	1.21E+05	5.98E+04	2.39	3.00	4.60	4.05
NO2-	2.43	6.08E+04	3.00E+04	1.26	1.78	3.03	3.58
CO32-	0.656	2.14E+04	1.06E+04	0.470	0.550	0.762	0.807
PO43-	0.199	1.02E+04	5.06E+03	0.137	0.165	0.209	0.218
SO42-	0.383	2.00E+04	9.87E+03	0.174	0.261	0.516	0.609
Si (as SiO32-)	4.33E-02	661	326	2.38E-02	3.34E-02	5.26E-02	6.08E-02
F-	7.08E-02	730	361	4.04E-02	5.45E-02	8.47E-02	8.84E-02
Cl-	9.56E-02	1.84E+03	909	5.82E-02	7.45E-02	0.115	0.127
C6H5O73-	3.22E-02	3.30E+03	1.63E+03	2.46E-02	2.82E-02	3.56E-02	3.89E-02
EDTA4-	1.94E-02	3.04E+03	1.50E+03	4.93E-03	1.18E-02	2.70E-02	3.45E-02
HEDTA3-	3.64E-02	5.43E+03	2.68E+03	8.05E-03	2.15E-02	5.13E-02	6.59E-02
glycolate-	0.105	4.27E+03	2.11E+03	3.67E-02	6.89E-02	0.140	0.174
acetate-	7.82E-03	251	124	5.83E-03	6.75E-03	8.84E-03	1.01E-02
oxalate2-	1.29E-05	0.619	0.306	1.15E-05	1.22E-05	1.37E-05	1.44E-05
DBP	2.33E-02	2.67E+03	1.32E+03	1.65E-02	1.97E-02	2.65E-02	2.98E-02
butanol	2.33E-02	940	464	1.65E-02	1.97E-02	2.65E-02	2.98E-02
NH3	4.86E-02	449	222	2.31E-02	3.44E-02	6.42E-02	8.15E-02
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-SY-102							
SMM Composite Inventory Estimate							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total SMM Wast	2.62E+06 (kg)	(676 kgal)	----	----	----	----	----
Heat Load	1.43E-03 (kW)	(4.87 BTU/hr)	----	1.32E-03	1.38E-03	1.47E-03	1.54E-03
Bulk Density*	1.03 (g/cc)	----	----	1.01	1.02	1.03	1.03
Water wt%	94.9	----	----	94.9	94.9	96.2	97.4
TOC wt% C (wet	5.74E-04	----	----	3.84E-04	4.77E-04	6.71E-04	7.67E-04
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	0.629	1.41E+04	3.70E+04	0.315	0.468	0.629	0.629
Al3+	3.81E-02	1.00E+03	2.63E+03	1.59E-02	2.67E-02	3.82E-02	3.81E-02
Fe3+ (total Fe)	1.24E-03	67.5	177	8.19E-04	1.02E-03	1.45E-03	1.66E-03
Cr3+	5.21E-03	264	693	4.38E-03	4.78E-03	5.21E-03	5.21E-03
Bi3+	3.67E-07	7.49E-02	0.196	3.42E-07	3.54E-07	3.80E-07	3.92E-07
La3+	3.79E-09	5.13E-04	1.35E-03	2.81E-09	3.29E-09	4.29E-09	4.78E-09
Hg2+	2.78E-09	5.44E-04	1.43E-03	2.65E-09	2.73E-09	2.83E-09	2.87E-09
Zr (as ZrO(OH)2)	9.97E-08	8.87E-03	2.33E-02	7.58E-08	9.67E-08	1.03E-07	1.06E-07
Pb2+	3.49E-07	7.04E-02	0.185	2.83E-07	3.15E-07	3.82E-07	4.15E-07
Ni2+	1.11E-03	63.8	167	1.03E-03	1.07E-03	1.16E-03	1.20E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	3.50E-06	0.188	0.492	2.07E-06	2.77E-06	4.23E-06	4.73E-06
Ca2+	5.57E-03	218	572	3.93E-03	4.73E-03	6.41E-03	7.22E-03
K+	2.25E-03	85.8	225	1.13E-03	1.68E-03	2.26E-03	2.25E-03
OH-	0.222	3.67E+03	9.64E+03	0.108	0.163	0.222	0.223
NO3-	0.461	2.79E+04	7.32E+04	0.234	0.345	0.461	0.462
NO2-	1.40E-02	628	1.65E+03	1.28E-02	1.34E-02	1.41E-02	1.41E-02
CO32-	2.98E-02	1.74E+03	4.58E+03	1.35E-02	2.16E-02	3.06E-02	3.14E-02
PO43-	7.75E-05	7.18	18.8	6.09E-05	6.90E-05	8.60E-05	9.41E-05
SO42-	2.98E-03	279	733	2.38E-03	2.67E-03	2.99E-03	2.99E-03
Si (as SiO32-)	2.47E-05	0.675	1.77	2.05E-05	2.25E-05	2.68E-05	2.86E-05
F-	2.29E-05	0.424	1.11	1.94E-05	2.16E-05	2.43E-05	2.64E-05
Cl-	1.50E-02	517	1.36E+03	7.08E-03	1.09E-02	1.50E-02	1.50E-02
C6H5O73-	1.03E-05	1.90	4.99	8.26E-06	9.26E-06	1.14E-05	1.24E-05
EDTA4-	7.10E-06	1.99	5.23	2.33E-06	4.66E-06	9.55E-06	1.20E-05
HEDTA3-	1.27E-05	3.39	8.90	3.14E-06	7.80E-06	1.76E-05	2.24E-05
glycolate-	6.52E-05	4.77	12.5	3.78E-05	5.12E-05	7.92E-05	9.25E-05
acetate-	4.82E-06	0.277	0.728	3.79E-06	4.23E-06	5.45E-06	6.42E-06
oxalate2-	4.96E-09	4.26E-04	1.12E-03	4.43E-09	4.69E-09	5.23E-09	5.49E-09
DBP	7.55E-06	1.55	4.06	6.59E-06	7.01E-06	8.14E-06	9.02E-06
butanol	7.55E-06	0.546	1.43	6.59E-06	7.01E-06	8.14E-06	9.02E-06
NH3	2.90E-05	0.481	1.26	1.74E-05	2.30E-05	3.51E-05	4.11E-05
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-SY-102							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	3.12E+06 (kg)	(747 kgal)	----	----	----	----	----
Heat Load	0.516 (kW)	(1.76E+03 BTU/hr)	----	0.286	0.394	0.622	0.731
Bulk Density†	1.10 (g/cc)	----	----	1.08	1.09	1.11	1.12
Water wt%†	84.0	----	----	81.8	82.8	85.5	86.9
TOC wt% C (wet	0.130	----	----	5.95E-02	9.34E-02	0.166	0.200
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	1.88	3.91E+04	1.22E+05	1.37	1.61	2.10	2.29
Al3+	0.560	1.37E+04	4.27E+04	0.507	0.535	0.582	0.604
Fe3+ (total Fe)	8.40E-02	4.25E+03	1.33E+04	7.99E-02	8.28E-02	8.46E-02	8.52E-02
Cr3+	1.77E-02	833	2.60E+03	1.53E-02	1.64E-02	1.84E-02	1.89E-02
Bi3+	3.19E-04	60.5	189	2.70E-04	2.94E-04	3.45E-04	3.69E-04
La3+	9.41E-07	0.119	0.370	6.39E-07	7.84E-07	1.09E-06	1.23E-06
Hg2+	1.35E-06	0.246	0.767	1.22E-06	1.28E-06	1.42E-06	1.48E-06
Zr (as ZrO(OH)2)	3.58E-05	2.96	9.22	2.38E-05	2.93E-05	4.15E-05	4.75E-05
Pb2+	1.23E-04	23.1	72.0	6.72E-05	9.45E-05	1.51E-04	1.78E-04
Ni2+	7.11E-03	379	1.18E+03	3.87E-03	5.99E-03	7.23E-03	7.34E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	1.35E-04	6.73	21.0	9.64E-05	1.15E-04	1.55E-04	1.74E-04
Ca2+	2.59E-02	942	2.94E+03	1.21E-02	2.04E-02	2.82E-02	3.04E-02
K+	9.48E-03	336	1.05E+03	6.31E-03	7.69E-03	1.14E-02	1.31E-02
OH-	2.55	3.93E+04	1.23E+05	2.22	2.39	2.70	2.85
NO3-	0.759	4.27E+04	1.33E+05	0.527	0.640	0.845	0.802
NO2-	0.244	1.02E+04	3.17E+04	0.132	0.181	0.301	0.352
CO32-	8.92E-02	4.85E+03	1.51E+04	5.89E-02	7.52E-02	9.93E-02	0.104
PO43-	1.89E-02	1.63E+03	5.08E+03	1.31E-02	1.57E-02	1.99E-02	2.08E-02
SO42-	3.90E-02	3.40E+03	1.06E+04	1.92E-02	2.75E-02	5.17E-02	6.04E-02
Si (as SiO32-)	4.13E-03	105	328	2.28E-03	3.20E-03	5.01E-03	5.79E-03
F-	6.74E-03	116	362	3.85E-03	5.19E-03	8.06E-03	8.41E-03
Cl-	2.26E-02	727	2.27E+03	1.46E-02	1.85E-02	2.44E-02	2.56E-02
C6H5O73-	3.06E-03	525	1.64E+03	2.35E-03	2.69E-03	3.38E-03	3.70E-03
EDTA4-	1.85E-03	484	1.51E+03	4.75E-04	1.13E-03	2.57E-03	3.28E-03
HEDTA3-	3.47E-03	863	2.69E+03	7.76E-04	2.05E-03	4.88E-03	6.27E-03
glycolate-	1.00E-02	680	2.12E+03	3.54E-03	6.60E-03	1.34E-02	1.66E-02
acetate-	7.47E-04	40.0	125	5.58E-04	6.45E-04	8.43E-04	9.58E-04
oxalate2-	1.23E-06	9.84E-02	0.307	1.09E-06	1.16E-06	1.30E-06	1.37E-06
DBP	2.22E-03	423	1.32E+03	1.57E-03	1.88E-03	2.53E-03	2.84E-03
butanol	2.22E-03	149	466	1.57E-03	1.88E-03	2.53E-03	2.84E-03
NH3	4.64E-03	71.5	223	2.22E-03	3.29E-03	6.12E-03	7.76E-03
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-SY-102							
TLM Solids Composite Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total TLM Wast	4.94E+05 (kg)	(70.9 kgal)	----	----	----	----	----
Heat Load	0.514 (kW)	(1.76E+03 BTU/hr)	----	0.285	0.392	0.621	0.729
Bulk Density	1.84 (g/cc)	----	----	1.62	1.72	1.93	2.01
Void Fraction	0.545	----	----	0.452	0.491	0.610	0.666
Water wt%	25.5	----	----	17.8	21.2	31.7	38.0
TOC wt% C (wet	0.820	----	----	0.416	0.620	1.00	1.17
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	2.76E-04	0.150	74.0	0	0	2.80E-04	2.80E-04
C-14	3.57E-05	1.94E-02	9.59	0	0	3.60E-05	3.61E-05
Ni-59	6.11E-07	3.32E-04	0.164	0	0	6.39E-07	6.65E-07
Ni-63	6.01E-05	3.27E-02	16.1	0	0	6.29E-05	6.55E-05
Co-60	2.55E-05	1.39E-02	6.84	0	0	2.57E-05	2.57E-05
Se-79	2.27E-06	1.23E-03	0.609	0	0	2.81E-06	3.27E-06
Sr-90	4.47E-02	24.3	1.20E+04	3.40E-02	4.09E-02	4.83E-02	5.12E-02
Y-90	4.48E-02	24.3	1.20E+04	0	0	4.73E-02	4.98E-02
Zr-93	1.11E-05	6.05E-03	2.99	0	0	1.38E-05	1.60E-05
Nb-93m	8.13E-06	4.42E-03	2.18	0	0	1.00E-05	1.16E-05
Tc-99	3.17E-04	0.172	85.1	1.46E-04	2.26E-04	4.07E-04	4.95E-04
Ru-106	4.29E-09	2.33E-06	1.15E-03	0	0	5.38E-09	6.39E-09
Cd-113m	5.77E-05	3.13E-02	15.5	0	0	7.10E-05	8.21E-05
Sb-125	1.12E-04	6.09E-02	30.1	0	0	1.13E-04	1.13E-04
Sn-126	3.43E-06	1.87E-03	0.921	0	0	4.24E-06	4.94E-06
I-129	6.12E-07	3.33E-04	0.164	2.82E-07	4.37E-07	7.85E-07	9.56E-07
Cs-134	3.27E-06	1.78E-03	0.879	0	0	3.30E-06	3.31E-06
Cs-137	0.345	187	9.25E+04	0.178	0.253	0.424	0.506
Ba-137m	0.326	177	8.75E+04	0	0	0.328	0.329
Sm-151	8.00E-03	4.35	2.15E+03	0	0	9.90E-03	1.15E-02
Eu-152	2.76E-06	1.50E-03	0.741	0	0	2.78E-06	2.78E-06
Eu-154	4.02E-04	0.218	108	0	0	4.97E-04	5.39E-04
Eu-155	1.64E-04	8.91E-02	44.0	0	0	1.65E-04	1.65E-04
Ra-226	1.01E-10	5.51E-08	2.72E-05	0	0	1.33E-10	1.60E-10
Ra-228	7.21E-08	3.92E-05	1.94E-02	0	0	7.27E-08	7.33E-08
Ac-227	6.23E-10	3.39E-07	1.67E-04	0	0	8.23E-10	9.68E-10
Pa-231	2.79E-09	1.52E-06	7.49E-04	0	0	3.40E-09	3.93E-09
Th-229	1.75E-09	9.52E-07	4.70E-04	0	0	1.76E-09	1.78E-09
Th-232	7.98E-09	4.33E-06	2.14E-03	0	0	9.70E-09	1.14E-08
U-232	1.74E-07	9.45E-05	4.67E-02	1.09E-07	1.37E-07	2.15E-07	2.58E-07
U-233	6.68E-07	3.63E-04	0.179	4.17E-07	5.28E-07	8.23E-07	9.90E-07
U-234	3.74E-07	2.03E-04	0.100	3.29E-07	3.53E-07	3.93E-07	4.10E-07
U-235	1.57E-08	8.51E-06	4.20E-03	1.39E-08	1.48E-08	1.64E-08	1.71E-08
U-236	8.99E-09	4.89E-06	2.41E-03	7.80E-09	8.46E-09	9.44E-09	9.85E-09
U-238	4.61E-07	2.50E-04	0.124	4.22E-07	4.40E-07	4.79E-07	4.94E-07
Np-237	1.16E-06	6.29E-04	0.311	5.69E-07	8.44E-07	1.47E-06	1.77E-06
Pu-238	5.62E-07	3.06E-04	0.151	2.78E-07	4.17E-07	7.09E-07	8.51E-07
Pu-239	9.84E-03	5.34	2.64E+03	9.65E-03	9.78E-03	9.88E-03	9.93E-03
Pu-240	2.46E-03	1.33	659	2.41E-03	2.44E-03	2.47E-03	2.48E-03
Pu-241	3.78E-05	2.05E-02	10.1	1.93E-05	2.83E-05	4.73E-05	5.66E-05
Pu-242	2.04E-10	1.11E-07	5.48E-05	9.96E-11	1.51E-10	2.59E-10	3.12E-10
Am-241	1.04E-02	5.63	2.78E+03	9.71E-03	1.02E-02	1.05E-02	1.07E-02
Am-243	2.50E-09	1.36E-06	6.70E-04	7.24E-10	1.59E-09	3.47E-09	4.41E-09
Cm-242	2.28E-10	1.24E-07	6.11E-05	0	0	2.30E-10	2.33E-10
Cm-243	4.65E-12	2.53E-09	1.25E-06	0	0	4.70E-12	4.76E-12
Cm-244	1.35E-10	7.36E-08	3.63E-05	0	0	1.37E-10	1.38E-10
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	0.172 (g/L)	----	46.1	0.169	0.171	0.173	0.173
U	4.46E-03	577	285	3.95E-03	4.22E-03	4.68E-03	4.87E-03

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-SY-102

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	2.62E+06 (kg)	(676 kgal)	----	----	----	----	----
Heat Load	1.43E-03 (kW)	(4.87 BTU/hr)	----	1.32E-03	1.38E-03	1.47E-03	1.54E-03
Bulk Density*	1.03 (g/cc)	----	----	1.01	1.02	1.03	1.03
Water wt%†	94.9	----	----	94.9	94.9	96.2	97.4
TOC wt% C (wet	5.74E-04	----	----	3.84E-04	4.77E-04	6.71E-04	7.67E-04

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	6.77E-08	6.60E-05	0.173	4.84E-08	4.84E-08	7.16E-08	7.61E-08
C-14	9.28E-09	9.05E-06	2.37E-02	5.25E-09	5.25E-09	9.43E-09	9.58E-09
Ni-59	5.29E-10	5.16E-07	1.35E-03	3.40E-10	3.40E-10	5.39E-10	5.48E-10
Ni-63	5.21E-08	5.08E-05	0.133	3.33E-08	3.33E-08	5.30E-08	5.39E-08
Co-60	1.19E-08	1.16E-05	3.04E-02	7.27E-09	7.27E-09	1.22E-08	1.24E-08
Se-79	1.09E-09	1.06E-06	2.79E-03	8.34E-10	8.34E-10	1.18E-09	1.27E-09
Sr-90	3.40E-05	3.32E-02	87.0	3.21E-05	3.34E-05	3.47E-05	3.53E-05
Y-90	3.40E-05	3.32E-02	87.1	2.51E-05	2.51E-05	3.47E-05	3.53E-05
Zr-93	5.29E-09	5.16E-06	1.35E-02	4.00E-09	4.00E-09	5.75E-09	6.20E-09
Nb-93m	3.88E-09	3.78E-06	9.93E-03	2.98E-09	2.98E-09	4.21E-09	4.52E-09
Tc-99	6.98E-08	6.81E-05	0.179	5.48E-08	6.21E-08	7.79E-08	8.90E-08
Ru-106	2.93E-12	2.86E-09	7.51E-06	2.05E-12	2.34E-12	3.38E-12	3.82E-12
Cd-113m	2.69E-08	2.62E-05	6.87E-02	1.91E-08	1.91E-08	2.97E-08	3.23E-08
Sb-125	6.19E-08	6.04E-05	0.159	4.20E-08	4.20E-08	6.44E-08	6.68E-08
Sn-126	1.66E-09	1.62E-06	4.25E-03	1.28E-09	1.28E-09	1.80E-09	1.94E-09
I-129	1.35E-10	1.32E-07	3.45E-04	1.06E-10	1.20E-10	1.51E-10	1.72E-10
Cs-134	8.88E-09	8.66E-06	2.27E-02	6.67E-09	7.75E-09	1.00E-08	1.11E-08
Cs-137	7.01E-05	6.84E-02	179	6.29E-05	6.59E-05	7.38E-05	7.94E-05
Ba-137m	6.63E-05	6.47E-02	170	5.59E-05	5.59E-05	6.95E-05	7.26E-05
Sm-151	3.86E-06	3.76E-03	9.88	2.96E-06	2.96E-06	4.19E-06	4.50E-06
Eu-152	1.34E-09	1.31E-06	3.44E-03	1.02E-09	1.02E-09	1.48E-09	1.60E-09
Eu-154	1.95E-07	1.90E-04	0.498	1.30E-07	1.30E-07	2.18E-07	2.27E-07
Eu-155	8.23E-08	8.02E-05	0.211	6.33E-08	6.33E-08	9.04E-08	9.83E-08
Ra-226	4.66E-14	4.55E-11	1.19E-07	3.57E-14	3.86E-14	5.22E-14	5.24E-14
Ra-228	8.95E-11	8.72E-08	2.29E-04	3.01E-11	3.01E-11	1.00E-10	1.12E-10
Ac-227	2.87E-13	2.79E-10	7.33E-07	2.23E-13	2.40E-13	3.19E-13	3.19E-13
Pa-231	1.23E-12	1.20E-09	3.14E-06	9.71E-13	9.71E-13	1.32E-12	1.41E-12
Th-229	2.07E-12	2.02E-09	5.31E-06	7.03E-13	7.03E-13	2.31E-12	2.57E-12
Th-232	9.25E-12	9.02E-09	2.37E-05	1.91E-12	1.91E-12	1.13E-11	1.32E-11
U-232	2.84E-10	2.77E-07	7.26E-04	2.11E-10	2.46E-10	3.27E-10	3.73E-10
U-233	1.09E-09	1.06E-06	2.78E-03	8.07E-10	9.44E-10	1.25E-09	1.43E-09
U-234	3.89E-10	3.79E-07	9.95E-04	3.00E-10	3.68E-10	3.98E-10	4.08E-10
U-235	1.51E-11	1.47E-08	3.87E-05	1.17E-11	1.43E-11	1.55E-11	1.58E-11
U-236	2.24E-11	2.19E-08	5.74E-05	1.51E-11	2.07E-11	2.32E-11	2.40E-11
U-238	3.92E-10	3.83E-07	1.00E-03	3.31E-10	3.78E-10	3.99E-10	4.05E-10
Np-237	2.47E-10	2.41E-07	6.32E-04	1.98E-10	2.22E-10	2.74E-10	3.10E-10
Pu-238	8.79E-10	8.57E-07	2.25E-03	5.76E-10	7.24E-10	1.03E-09	1.18E-09
Pu-239	1.28E-06	1.24E-03	3.27	3.83E-07	8.21E-07	1.73E-06	2.17E-06
Pu-240	3.18E-07	3.10E-04	0.815	9.50E-08	2.04E-07	4.32E-07	5.42E-07
Pu-241	7.53E-08	7.34E-05	0.193	4.44E-08	5.95E-08	9.11E-08	1.06E-07
Pu-242	3.40E-13	3.31E-10	8.69E-07	2.24E-13	2.81E-13	3.99E-13	4.55E-13
Am-241	4.48E-06	4.37E-03	11.5	1.32E-06	2.87E-06	6.10E-06	7.65E-06
Am-243	1.04E-12	1.01E-09	2.65E-06	6.16E-13	8.09E-13	1.30E-12	1.52E-12
Cm-242	4.99E-11	4.86E-08	1.28E-04	3.68E-11	3.68E-11	5.49E-11	5.98E-11
Cm-243	4.90E-12	4.77E-09	1.25E-05	3.65E-12	3.65E-12	5.35E-12	5.79E-12
Cm-244	4.99E-11	4.86E-08	1.28E-04	3.22E-11	3.70E-11	5.89E-11	6.75E-11

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	2.23E-05 (g/L)	----	5.69E-02	6.64E-06	1.43E-05	3.02E-05	3.79E-05
U	3.86E-06	0.895	2.35	3.09E-06	3.67E-06	3.94E-06	4.02E-06

*Density is calculated based on Na, OH-, and AlO2-.

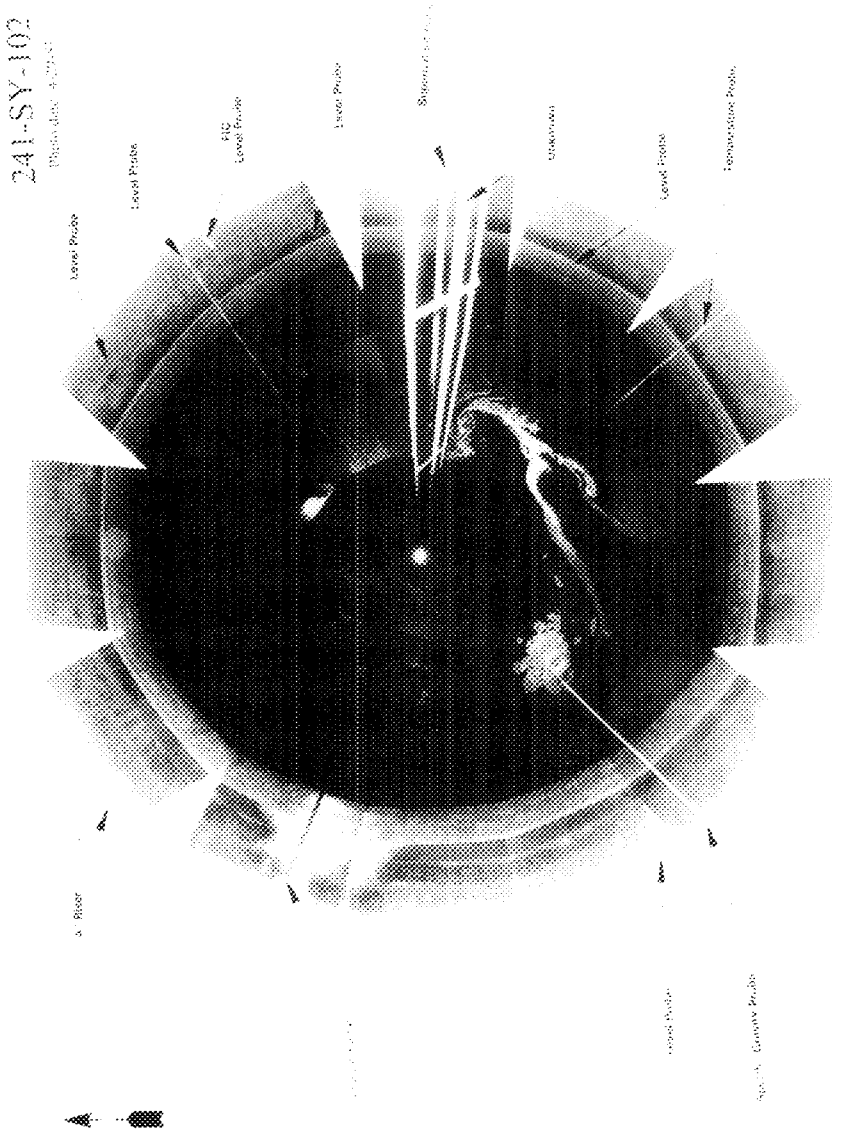
†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-SY-102							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	3.12E+06 (kg)	(747 kgal)	----	----	----	----	----
Heat Load	0.516 (kW)	(1.76E+03 BTU/hr)	----	0.286	0.394	0.622	0.731
Bulk Density†	1.10 (g/cc)	----	----	1.08	1.09	1.11	1.12
Water wt%†	84.0	----	----	81.8	82.8	85.5	86.9
TOC wt% C (wet	0.130	----	----	5.95E-02	9.34E-02	0.166	0.200
Radiological Constituents	**Ci/L**	**µCi/g**	**Ci**	**-95 CI (Ci/L)**	**-67 CI (Ci/L)**	**+67 CI (Ci/L)**	**+95 CI (Ci/L)**
H-3	2.62E-05	2.38E-02	74.1	6.13E-08	6.13E-08	2.66E-05	2.66E-05
C-14	3.40E-06	3.08E-03	9.61	8.40E-09	8.40E-09	3.42E-06	3.43E-06
Ni-59	5.85E-08	5.30E-05	0.165	4.79E-10	4.79E-10	6.11E-08	6.36E-08
Ni-63	5.75E-06	5.22E-03	16.3	4.71E-08	4.71E-08	6.01E-06	6.26E-06
Co-60	2.43E-06	2.20E-03	6.87	1.08E-08	1.08E-08	2.45E-06	2.45E-06
Se-79	2.16E-07	1.96E-04	0.612	9.88E-10	9.88E-10	2.68E-07	3.11E-07
Sr-90	4.28E-03	3.88	1.21E+04	3.26E-03	3.91E-03	4.61E-03	4.89E-03
Y-90	4.28E-03	3.88	1.21E+04	3.08E-05	3.08E-05	4.52E-03	4.76E-03
Zr-93	1.06E-06	9.63E-04	3.00	4.79E-09	4.79E-09	1.32E-06	1.52E-06
Nb-93m	7.75E-07	7.02E-04	2.19	3.51E-09	3.51E-09	9.56E-07	1.11E-06
Tc-99	3.02E-05	2.74E-02	85.3	1.39E-05	2.16E-05	3.87E-05	4.71E-05
Ru-106	4.10E-10	3.72E-07	1.16E-03	2.65E-12	2.65E-12	5.13E-10	6.09E-10
Cd-113m	5.50E-06	4.99E-03	15.5	2.43E-08	2.43E-08	6.76E-06	7.81E-06
Sb-125	1.07E-05	9.70E-03	30.2	5.61E-08	5.61E-08	1.08E-05	1.08E-05
Sn-126	3.27E-07	2.97E-04	0.925	1.50E-09	1.50E-09	4.04E-07	4.70E-07
I-129	5.82E-08	5.28E-05	0.165	2.69E-08	4.16E-08	7.47E-08	9.09E-08
Cs-134	3.19E-07	2.89E-04	0.901	8.03E-09	8.03E-09	3.21E-07	3.22E-07
Cs-137	3.28E-02	29.7	9.27E+04	1.69E-02	2.41E-02	4.03E-02	4.81E-02
Ba-137m	3.10E-02	28.1	8.77E+04	6.00E-05	6.00E-05	3.12E-02	3.13E-02
Sm-151	7.63E-04	0.692	2.16E+03	3.49E-06	3.49E-06	9.43E-04	1.10E-03
Eu-152	2.63E-07	2.39E-04	0.744	1.22E-09	1.22E-09	2.65E-07	2.65E-07
Eu-154	3.83E-05	3.47E-02	108	1.76E-07	1.76E-07	4.73E-05	5.13E-05
Eu-155	1.56E-05	1.42E-02	44.2	7.45E-08	7.45E-08	1.57E-05	1.58E-05
Ra-226	9.67E-12	8.77E-09	2.73E-05	4.22E-14	4.22E-14	1.27E-11	1.53E-11
Ra-228	6.93E-09	6.28E-06	1.96E-02	8.10E-11	8.10E-11	6.98E-09	7.03E-09
Ac-227	5.94E-11	5.39E-08	1.68E-04	2.59E-13	2.59E-13	7.83E-11	9.21E-11
Pa-231	2.66E-10	2.41E-07	7.53E-04	1.11E-12	1.11E-12	3.24E-10	3.74E-10
Th-229	1.68E-10	1.52E-07	4.75E-04	1.88E-12	1.88E-12	1.69E-10	1.70E-10
Th-232	7.66E-10	6.94E-07	2.16E-03	8.37E-12	8.37E-12	9.29E-10	1.09E-09
U-232	1.68E-08	1.52E-05	4.74E-02	1.06E-08	1.33E-08	2.06E-08	2.47E-08
U-233	6.43E-08	5.83E-05	0.182	4.06E-08	5.11E-08	7.91E-08	9.49E-08
U-234	3.58E-08	3.25E-05	0.101	3.16E-08	3.38E-08	3.76E-08	3.92E-08
U-235	1.50E-09	1.36E-06	4.24E-03	1.33E-09	1.42E-09	1.57E-09	1.64E-09
U-236	8.74E-10	7.92E-07	2.47E-03	7.60E-10	8.23E-10	9.16E-10	9.55E-10
U-238	4.41E-08	4.00E-05	0.125	4.04E-08	4.21E-08	4.58E-08	4.73E-08
Np-237	1.10E-07	9.98E-05	0.311	5.42E-08	8.03E-08	1.40E-07	1.68E-07
Pu-238	5.42E-08	4.91E-05	0.153	2.72E-08	4.04E-08	6.81E-08	8.16E-08
Pu-239	9.35E-04	0.847	2.64E+03	9.17E-04	9.29E-04	9.39E-04	9.42E-04
Pu-240	2.33E-04	0.212	660	2.29E-04	2.32E-04	2.34E-04	2.35E-04
Pu-241	3.65E-06	3.31E-03	10.3	1.90E-06	2.75E-06	4.56E-06	5.44E-06
Pu-242	1.97E-11	1.79E-08	5.57E-05	9.76E-12	1.46E-11	2.49E-11	2.99E-11
Am-241	9.87E-04	0.895	2.79E+03	9.25E-04	9.68E-04	1.00E-03	1.01E-03
Am-243	2.38E-10	2.16E-07	6.72E-04	6.96E-11	1.51E-10	3.31E-10	4.20E-10
Cm-242	6.67E-11	6.05E-08	1.89E-04	4.51E-11	4.51E-11	7.13E-11	7.57E-11
Cm-243	4.87E-12	4.42E-09	1.38E-05	3.74E-12	3.74E-12	5.28E-12	5.68E-12
Cm-244	5.80E-11	5.26E-08	1.64E-04	4.20E-11	4.51E-11	6.61E-11	7.40E-11
Totals	**M**	**µg/g**	**kg**	**-95 CI (M or g/L)**	**-67 CI (M or g/L)**	**+67 CI (M or g/L)**	**+95 CI (M or g/L)**
Pu	1.63E-02 (g/L)	----	46.2	1.60E-02	1.62E-02	1.64E-02	1.65E-02
U	4.27E-04	92.1	287	3.78E-04	4.04E-04	4.48E-04	4.66E-04

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.


241-SY-102
Level Probe
Level Probe
FIG
Level Probe
Level Probe
Level Probe
Level Probe
Temperature Probe
Level Probe
Gravity Probe

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TANK 241-SY-103 SUMMARY

TANK HISTORY	
Entered Service	1977
Removed from Service	-
Inactive	Jan 1991
Watch Lists	Hydrogen
Integrity	Sound
Assumed Leaker	-
TENTATIVELY AVAILABLE RISERS	
Riser	Size
11A, 17B, 22A, 23A	4 in
7B, 13A	12 in
TANK TEMPERATURE	
Average Tank Temperature	90°F
Maximum Temperature	116.6°F
Date	Feb 6, 1995
Elevation from tank bottom	6.33 ft
Riser Number	17B
Minimum Temperature	73°F
Date	April 23, 1995
Elevation from tank bottom	24.33 ft, 30.33 ft
Riser Number	17B

TANK DESCRIPTION	
Diameter	75 ft
Bottom Shape	flat
Nominal Capacity	1,160,000 gal
Total Risers	58
WASTE VOLUME (HANLON 1996I)	
Total Waste Volume	747,000 gal
Waste Type	CC
Drainable Interstitial Liquids	0 gal
Pumpable Liquids	381,000 gal
Saltcake	4,000 gal
Sludge	362,000 gal
Supernatant	381,000 gal
INTERIOR PHOTOGRAPHS	
Date	Oct 1, 1985
Montage Number	94080233-35CN
Photo Set Number	8506952
WASTE SURFACE LEVEL	
Devices	Manual ENRAF and Tape
Max Level	286.25 in
Date	Jan 5, 1995
Min Level	269 in
Date	Jan 5 and 16, 1997

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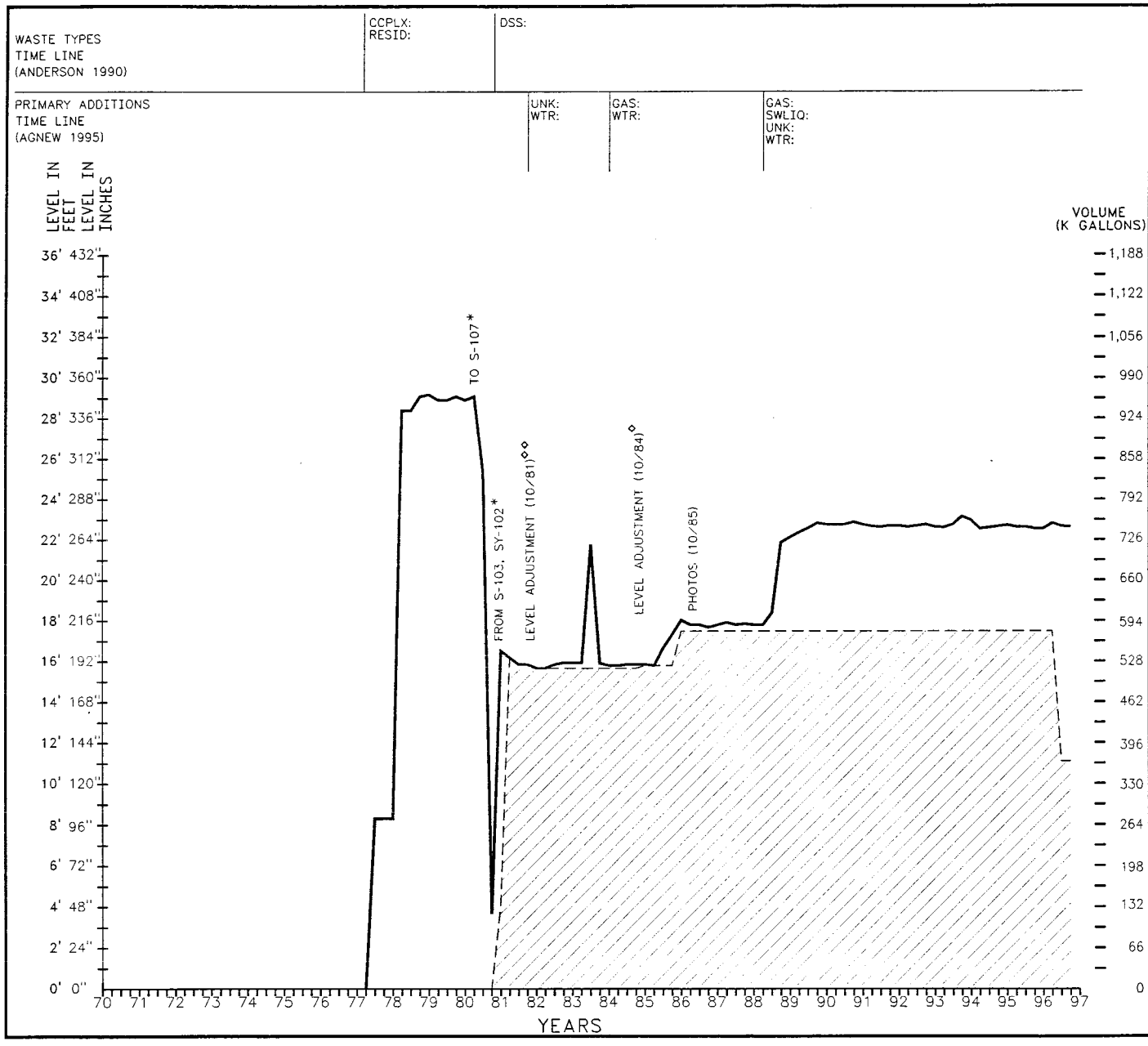


TANK INFO:

CONSTRUCTED 1974-1976
NOMINAL CAPACITY: 1,160,000 GAL
FLAT BOTTOM TANK
75 FOOT DIAMETER DOUBLE-SHELL TANK

REFERENCES

* AGNEW 1995
◇ HANLON 1996l
◇◇ McCANN 1981d

NOTES:

1) TRANSFER SOURCES AND DESTINATIONS ARE NOT AVAILABLE FOR ALL LEVEL CHANGES. FOR MORE DETAILS ABOUT TRANSFER INFORMATION SEE AGNEW 1995.

GLOSSARY OF WASTE TERMS:

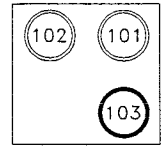
FOR MORE COMPLETE DEFINITIONS SEE APPENDIX A.

CCPLX:	COMPLEXANT CONCENTRATE
DSS:	DOUBLE-SHELL SLURRY CONCENTRATE
GAS:	SLURRY GROWTH
RESID:	HANFORD DEFENSE RESIDUAL LIQUOR
SWLIQ:	DILUTE, NON-COMPLEXED WASTE
UNK:	UNKNOWN
WTR:	WATER

LEGEND

TOTAL WASTE LEVEL (SUPERNATE)
SOLIDS LEVEL
SOLIDS

SY TANK FARM PLAN



U.S. DEPARTMENT OF ENERGY
Richland Operations Office
FLUOR DANIEL NORTHWEST

241-SY-103 DOUBLE-SHELL TANK
WASTE & LEVEL HISTORY 1977-1996
SOUND/INACTIVE TANK
WATCH LIST: HYDROGEN

SIZE	BLDG NO.	DWG NO.	DATE
B	241	ES-TKS-E177	2/97
SCALE NONE	JOB NO.	SHEET 1 OF 1	

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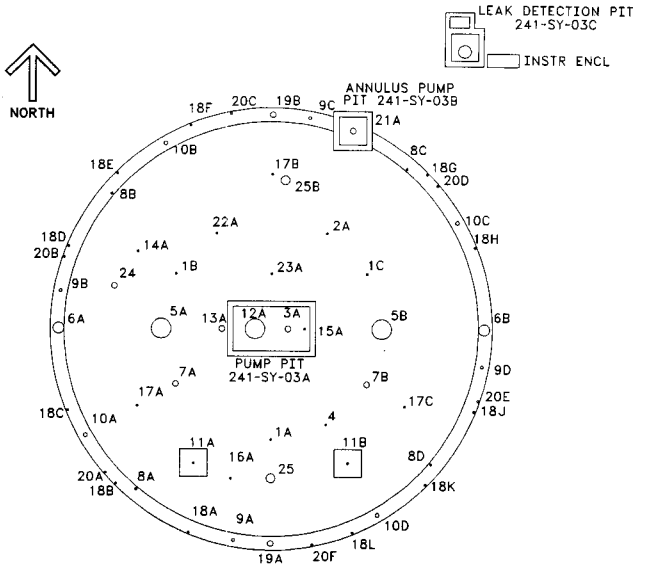
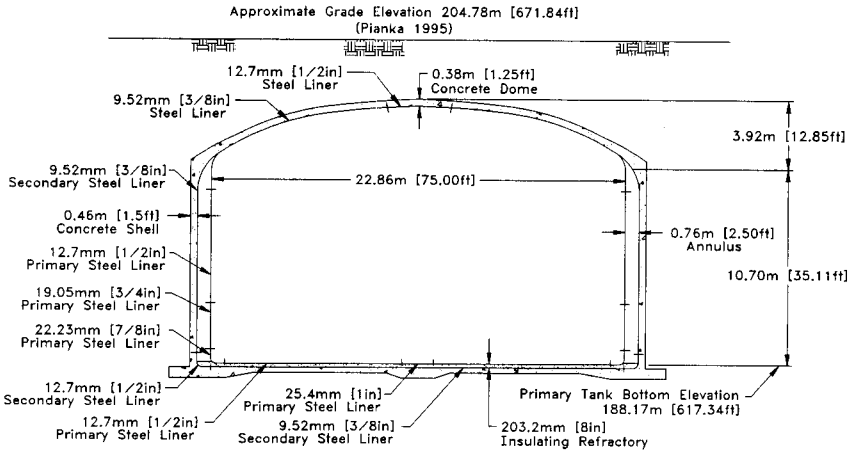
241-SY-103



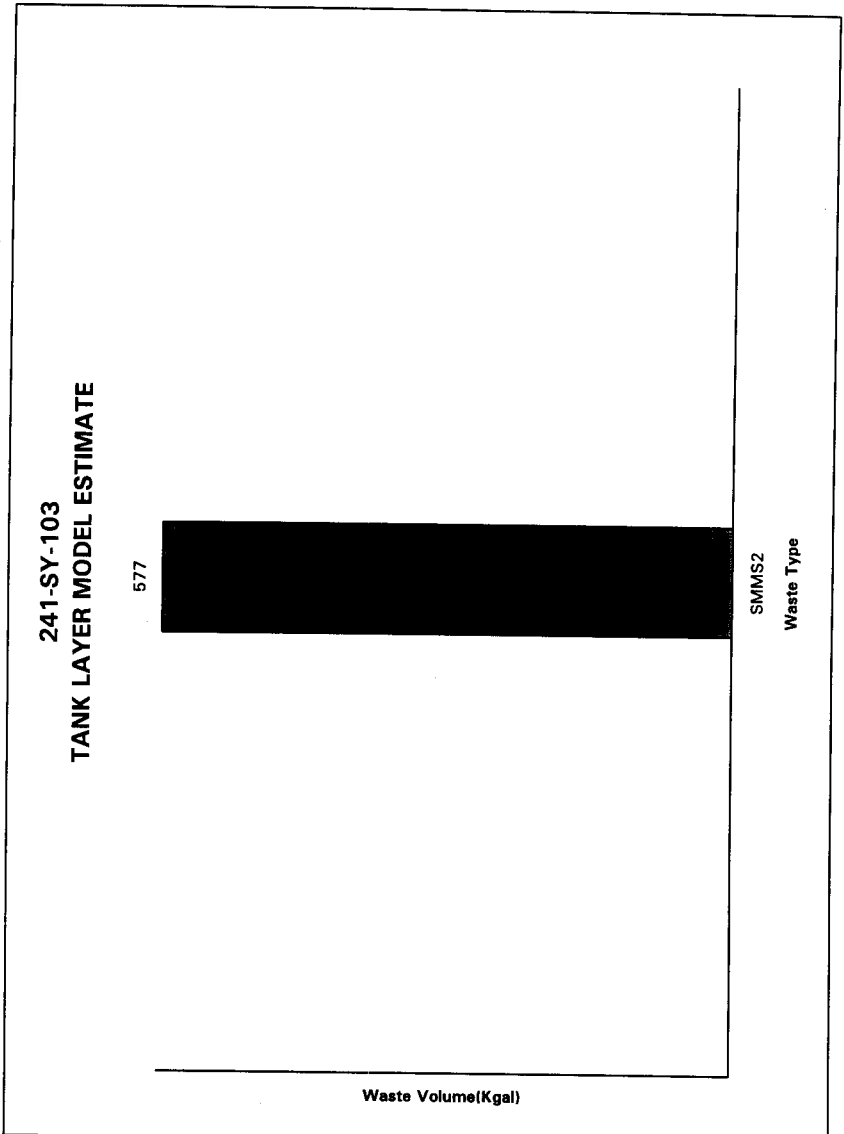
TANK RISER LOCATION

Ref: H-2-37773, Rev.7
H-2-37803, Rev.5
H-2-72213, Rev.2



Ref: H-2-37706, Rev.2
H-2-37772, Rev.2
H-2-72213, Rev.2

NOT TO SCALE



Tank Layer Model(TLM) Estimate from *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4* (Agnew et al., 1997).

HDW Model Rev. 4

Double-Shell Tank 241-SY-103

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	0	0	0	0	0	0	0
Al3+	0	0	0	0	0	0	0
Fe3+ (total Fe)	0	0	0	0	0	0	0
Cr3+	0	0	0	0	0	0	0
Bi3+	0	0	0	0	0	0	0
La3+	0	0	0	0	0	0	0
Hg2+	0	0	0	0	0	0	0
Zr (as ZrO(OH)2)	0	0	0	0	0	0	0
Pb2+	0	0	0	0	0	0	0
Ni2+	0	0	0	0	0	0	0
Sr2+	0	0	0	0	0	0	0
Mn4+	0	0	0	0	0	0	0
Ca2+	0	0	0	0	0	0	0
K+	0	0	0	0	0	0	0
OH-	0	0	0	0	0	0	0
NO3-	0	0	0	0	0	0	0
NO2-	0	0	0	0	0	0	0
CO32-	0	0	0	0	0	0	0
PO43-	0	0	0	0	0	0	0
SO42-	0	0	0	0	0	0	0
Si (as SiO32-)	0	0	0	0	0	0	0
F-	0	0	0	0	0	0	0
Cl-	0	0	0	0	0	0	0
C6H5O73-	0	0	0	0	0	0	0
EDTA4-	0	0	0	0	0	0	0
HEDTA3-	0	0	0	0	0	0	0
glycolate-	0	0	0	0	0	0	0
acetate-	0	0	0	0	0	0	0
oxalate2-	0	0	0	0	0	0	0
DBP	0	0	0	0	0	0	0
butanol	0	0	0	0	0	0	0
NH3	0	0	0	0	0	0	0
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-SY-103

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.53E+06 (kg)	(744 kgal)	----	----	----	----	----
Heat Load	6.10 (kW)	(2.08E+04 BTU/hr)	----	5.74	5.93	6.29	6.46
Bulk Density*	1.61 (g/cc)	----	----	1.56	1.59	1.63	1.65
Water wt%	32.8	----	----	30.3	31.4	34.2	35.8
TOC wt% C (wet	0.923	----	----	0.563	0.739	1.11	1.28

Chemical Constituents	mole/L	ppm	kg	-95 CI (mole/L)	-67 CI (mole/L)	+67 CI (mole/L)	+95 CI (mole/L)
Na+	14.2	2.03E+05	9.20E+05	13.1	13.7	14.7	15.1
Al3+	1.68	2.82E+04	1.28E+05	1.57	1.63	1.75	1.80
Fe3+ (total Fe)	1.08E-02	375	1.70E+03	8.94E-03	9.85E-03	1.18E-02	1.27E-02
Cr3+	0.143	4.62E+03	2.09E+04	0.121	0.133	0.147	0.151
Bi3+	1.34E-03	174	789	1.23E-03	1.28E-03	1.40E-03	1.45E-03
La3+	3.76E-05	3.24	14.7	2.73E-05	3.23E-05	4.29E-05	4.79E-05
Hg2+	9.40E-06	1.17	5.31	8.81E-06	9.15E-06	9.53E-06	9.65E-06
Zr (as ZrO(OH)2)	2.36E-04	13.4	60.6	2.15E-04	2.23E-04	2.44E-04	2.56E-04
Pb2+	1.08E-03	139	630	8.98E-04	9.87E-04	1.17E-03	1.26E-03
Ni2+	6.30E-03	230	1.04E+03	6.03E-03	6.16E-03	6.37E-03	6.44E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	4.07E-03	139	629	3.17E-03	3.61E-03	4.52E-03	4.96E-03
Ca2+	3.33E-02	830	3.76E+03	3.07E-02	3.20E-02	3.47E-02	3.60E-02
K+	6.64E-02	1.61E+03	7.31E+03	6.09E-02	6.35E-02	6.94E-02	7.22E-02
OH-	9.97	1.05E+05	4.77E+05	9.28	9.60	10.3	10.5
NO3-	4.94	1.90E+05	8.62E+05	4.58	4.79	5.01	5.07
NO2-	2.47	7.07E+04	3.20E+05	2.09	2.27	2.67	2.86
CO32-	0.460	1.71E+04	7.77E+04	0.418	0.438	0.488	0.495
PO43-	9.25E-02	5.46E+03	2.48E+04	8.06E-02	8.48E-02	9.47E-02	9.67E-02
SO42-	0.257	1.53E+04	6.95E+04	0.207	0.231	0.284	0.307
Si (as SiO32-)	7.89E-02	1.38E+03	6.24E+03	6.61E-02	7.24E-02	8.55E-02	9.18E-02
F-	6.71E-02	792	3.59E+03	5.74E-02	6.15E-02	7.19E-02	7.57E-02
Cl-	0.246	5.41E+03	2.45E+04	0.224	0.233	0.256	0.265
C6H5O73-	2.93E-02	3.44E+03	1.56E+04	2.69E-02	2.81E-02	3.05E-02	3.16E-02
EDTA4-	2.07E-02	3.71E+03	1.68E+04	6.37E-03	1.34E-02	2.81E-02	3.53E-02
HEDTA3-	3.84E-02	6.54E+03	2.96E+04	9.67E-03	2.37E-02	5.32E-02	6.76E-02
glycolate-	0.102	4.75E+03	2.15E+04	7.05E-02	8.58E-02	0.118	0.133
acetate-	9.81E-03	360	1.63E+03	8.66E-03	9.22E-03	1.04E-02	1.14E-02
oxalate2-	4.92E-05	2.69	12.2	4.36E-05	4.64E-05	5.21E-05	5.48E-05
DBP	2.06E-02	2.69E+03	1.22E+04	1.74E-02	1.90E-02	2.22E-02	2.37E-02
butanol	2.06E-02	948	4.30E+03	1.74E-02	1.90E-02	2.22E-02	2.37E-02
NH3	8.18E-02	863	3.91E+03	6.73E-02	7.30E-02	9.29E-02	0.106
Fe(CN)64-	0	0	0	0	0	0	0

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-SY-103							
Total Inventory Estimate*							
Physical Properties				**-95 CI**	**-67 CI**	**+67 CI**	**+95 CI**
Total Waste	4.53E+06 (kg)	(744 kgal)	----	----	----	----	----
Heat Load	6.10 (kW)	(2.08E+04 BTU/hr)	----	5.74	5.93	6.29	6.46
Bulk Density†	1.61 (g/cc)	----	----	1.56	1.59	1.63	1.65
Water wt%†	32.8	----	----	30.3	31.4	34.2	35.8
TOC wt% C (wet	0.923	----	----	0.563	0.739	1.11	1.28
Chemical Constituents	**mole/L**	**ppm**	**kg**	**-95 CI (mole/L)**	**-67 CI (mole/L)**	**+67 CI (mole/L)**	**+95 CI (mole/L)**
Na+	14.2	2.03E+05	9.20E+05	13.1	13.7	14.7	15.1
Al3+	1.68	2.82E+04	1.28E+05	1.57	1.63	1.75	1.80
Fe3+ (total Fe)	1.08E-02	375	1.70E+03	8.94E-03	9.85E-03	1.18E-02	1.27E-02
Cr3+	0.143	4.62E+03	2.09E+04	0.121	0.133	0.147	0.151
Bi3+	1.34E-03	174	789	1.23E-03	1.28E-03	1.40E-03	1.45E-03
La3+	3.76E-05	3.24	14.7	2.73E-05	3.23E-05	4.29E-05	4.79E-05
Hg2+	9.40E-06	1.17	5.31	8.81E-06	9.15E-06	9.53E-06	9.65E-06
Zr (as ZrO(OH)2)	2.36E-04	13.4	60.6	2.15E-04	2.23E-04	2.44E-04	2.56E-04
Pb2+	1.08E-03	139	630	8.98E-04	9.87E-04	1.17E-03	1.26E-03
Ni2+	6.30E-03	230	1.04E+03	6.03E-03	6.16E-03	6.37E-03	6.44E-03
Sr2+	0	0	0	0	0	0	0
Mn4+	4.07E-03	139	629	3.17E-03	3.61E-03	4.52E-03	4.96E-03
Ca2+	3.33E-02	830	3.76E+03	3.07E-02	3.20E-02	3.47E-02	3.60E-02
K+	6.64E-02	1.61E+03	7.31E+03	6.09E-02	6.35E-02	6.94E-02	7.22E-02
OH-	9.97	1.05E+05	4.77E+05	9.28	9.60	10.3	10.5
NO3-	4.94	1.90E+05	8.62E+05	4.58	4.79	5.01	5.07
NO2-	2.47	7.07E+04	3.20E+05	2.09	2.27	2.67	2.86
CO32-	0.460	1.71E+04	7.77E+04	0.418	0.438	0.488	0.495
PO43-	9.25E-02	5.46E+03	2.48E+04	8.06E-02	8.48E-02	9.47E-02	9.67E-02
SO42-	0.257	1.53E+04	6.95E+04	0.207	0.231	0.284	0.307
Si (as SiO32-)	7.89E-02	1.38E+03	6.24E+03	6.61E-02	7.24E-02	8.55E-02	9.18E-02
F-	6.71E-02	792	3.59E+03	5.74E-02	6.15E-02	7.19E-02	7.57E-02
Cl-	0.246	5.41E+03	2.45E+04	0.224	0.233	0.256	0.265
C6H5O73-	2.93E-02	3.44E+03	1.56E+04	2.69E-02	2.81E-02	3.05E-02	3.16E-02
EDTA4-	2.07E-02	3.71E+03	1.68E+04	6.37E-03	1.34E-02	2.81E-02	3.53E-02
HEDTA3-	3.84E-02	8.54E+03	2.96E+04	9.67E-03	2.37E-02	5.32E-02	6.76E-02
glycolate-	0.102	4.75E+03	2.15E+04	7.05E-02	8.58E-02	0.118	0.133
acetate-	9.81E-03	360	1.63E+03	8.66E-03	9.22E-03	1.04E-02	1.14E-02
oxalate2-	4.92E-05	2.69	12.2	4.36E-05	4.64E-05	5.21E-05	5.48E-05
DBP	2.06E-02	2.69E+03	1.22E+04	1.74E-02	1.90E-02	2.22E-02	2.37E-02
butanol	2.06E-02	948	4.30E+03	1.74E-02	1.90E-02	2.22E-02	2.37E-02
NH3	8.18E-02	863	3.91E+03	6.73E-02	7.30E-02	9.29E-02	0.106
Fe(CN)64-	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-SY-103

TLM Solids Composite Inventory Estimate*

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total TLM Wast	0 (kg)	(0 kgal)	----	----	----	----	----
Heat Load	0 (kW)	(0 BTU/hr)	----	0	0	0	0
Bulk Density	0 (g/cc)	----	----	0	0	0	0
Void Fraction	0	----	----	0	0	0	0
Water wt%	0	----	----	0	0	0	0
TOC wt% C (wet	0	----	----	0	0	0	0

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	0	0	0	0	0	0	0
C-14	0	0	0	0	0	0	0
Ni-59	0	0	0	0	0	0	0
Ni-63	0	0	0	0	0	0	0
Co-60	0	0	0	0	0	0	0
Se-79	0	0	0	0	0	0	0
Sr-90	0	0	0	0	0	0	0
Y-90	0	0	0	0	0	0	0
Zr-93	0	0	0	0	0	0	0
Nb-93m	0	0	0	0	0	0	0
Tc-99	0	0	0	0	0	0	0
Ru-106	0	0	0	0	0	0	0
Cd-113m	0	0	0	0	0	0	0
Sb-125	0	0	0	0	0	0	0
Sn-126	0	0	0	0	0	0	0
I-129	0	0	0	0	0	0	0
Cs-134	0	0	0	0	0	0	0
Cs-137	0	0	0	0	0	0	0
Ba-137m	0	0	0	0	0	0	0
Sm-151	0	0	0	0	0	0	0
Eu-152	0	0	0	0	0	0	0
Eu-154	0	0	0	0	0	0	0
Eu-155	0	0	0	0	0	0	0
Ra-226	0	0	0	0	0	0	0
Ra-228	0	0	0	0	0	0	0
Ac-227	0	0	0	0	0	0	0
Pa-231	0	0	0	0	0	0	0
Th-229	0	0	0	0	0	0	0
Th-232	0	0	0	0	0	0	0
U-232	0	0	0	0	0	0	0
U-233	0	0	0	0	0	0	0
U-234	0	0	0	0	0	0	0
U-235	0	0	0	0	0	0	0
U-236	0	0	0	0	0	0	0
U-238	0	0	0	0	0	0	0
Np-237	0	0	0	0	0	0	0
Pu-238	0	0	0	0	0	0	0
Pu-239	0	0	0	0	0	0	0
Pu-240	0	0	0	0	0	0	0
Pu-241	0	0	0	0	0	0	0
Pu-242	0	0	0	0	0	0	0
Am-241	0	0	0	0	0	0	0
Am-243	0	0	0	0	0	0	0
Cm-242	0	0	0	0	0	0	0
Cm-243	0	0	0	0	0	0	0
Cm-244	0	0	0	0	0	0	0

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	0 (g/L)	----	0	0	0	0	0
U	0	0	0	0	0	0	0

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

HDW Model Rev. 4

Double-Shell Tank 241-SY-103

SMM Composite Inventory Estimate

Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total SMM Wast	4.53E+06 (kg)	(744 kgal)	----	----	----	----	----
Heat Load	6.10 (kW)	(2.08E+04 BTU/hr)	----	5.74	5.93	6.29	6.46
Bulk Density*	1.61 (g/cc)	----	----	1.56	1.59	1.63	1.65
Water wt%†	32.8	----	----	30.3	31.4	34.2	35.8
TOC wt% C (wet	0.923	----	----	0.563	0.739	1.11	1.28

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	2.54E-04	0.158	715	1.40E-04	1.40E-04	2.65E-04	2.79E-04
C-14	3.74E-05	2.32E-02	105	1.34E-05	1.34E-05	3.79E-05	3.84E-05
Ni-59	2.31E-06	1.44E-03	6.51	1.19E-06	1.19E-06	2.37E-06	2.42E-06
Ni-63	2.27E-04	0.141	639	1.15E-04	1.15E-04	2.32E-04	2.38E-04
Co-60	4.27E-05	2.65E-02	120	1.53E-05	1.53E-05	4.35E-05	4.44E-05
Se-79	3.72E-06	2.31E-03	10.5	2.19E-06	2.19E-06	4.27E-06	4.80E-06
Sr-90	0.123	76.3	3.46E+05	0.115	0.119	0.127	0.130
Y-90	0.123	76.3	3.46E+05	7.00E-02	7.00E-02	0.127	0.130
Zr-93	1.83E-05	1.14E-02	51.5	1.06E-05	1.06E-05	2.10E-05	2.37E-05
Nb-93m	1.32E-05	8.22E-03	37.3	7.88E-06	7.88E-06	1.52E-05	1.70E-05
Tc-99	2.70E-04	0.168	759	1.80E-04	2.24E-04	3.16E-04	3.60E-04
Ru-106	7.66E-09	4.76E-06	2.16E-02	4.11E-09	4.11E-09	8.45E-09	9.17E-09
Cd-113m	9.71E-05	6.03E-02	273	5.12E-05	5.12E-05	1.14E-04	1.30E-04
Sb-125	1.86E-04	0.115	523	6.72E-05	6.72E-05	1.91E-04	1.95E-04
Sn-126	5.62E-06	3.49E-03	15.8	3.33E-06	3.33E-06	6.45E-06	7.25E-06
I-129	5.20E-07	3.23E-04	1.46	3.47E-07	4.32E-07	6.09E-07	6.95E-07
Cs-134	3.19E-06	1.98E-03	9.00	2.11E-06	2.64E-06	3.75E-06	4.30E-06
Cs-137	0.286	178	8.06E+05	0.260	0.273	0.300	0.313
Ba-137m	0.271	168	7.62E+05	0.219	0.219	0.284	0.296
Sm-151	1.31E-02	8.14	3.69E+04	7.74E-03	7.74E-03	1.50E-02	1.69E-02
Eu-152	4.51E-06	2.80E-03	12.7	2.62E-06	2.62E-06	4.91E-06	5.30E-06
Eu-154	6.90E-04	0.429	1.94E+03	3.08E-04	3.08E-04	8.28E-04	8.84E-04
Eu-155	2.68E-04	0.166	755	1.55E-04	1.55E-04	2.92E-04	3.16E-04
Ra-226	1.55E-10	9.62E-08	4.36E-04	1.07E-10	1.07E-10	1.72E-10	1.88E-10
Ra-228	1.98E-07	1.23E-04	0.556	1.14E-07	1.38E-07	2.47E-07	2.99E-07
Ac-227	9.76E-10	6.06E-07	2.75E-03	7.01E-10	7.01E-10	1.08E-09	1.17E-09
Pa-231	4.53E-09	2.81E-06	1.28E-02	3.00E-09	3.00E-09	5.08E-09	5.61E-09
Th-229	4.61E-09	2.87E-06	1.30E-02	2.79E-09	3.24E-09	5.70E-09	6.85E-09
Th-232	1.63E-08	1.01E-05	4.58E-02	8.92E-09	8.92E-09	1.86E-08	2.09E-08
U-232	8.54E-07	5.31E-04	2.41	5.21E-07	6.84E-07	1.05E-06	1.26E-06
U-233	3.28E-06	2.04E-03	9.22	2.00E-06	2.62E-06	4.03E-06	4.84E-06
U-234	8.48E-07	5.27E-04	2.39	8.17E-07	8.33E-07	8.65E-07	8.74E-07
U-235	3.43E-08	2.13E-05	9.65E-02	3.30E-08	3.36E-08	3.50E-08	3.53E-08
U-236	2.67E-08	1.66E-05	7.52E-02	2.58E-08	2.63E-08	2.71E-08	2.75E-08
U-238	1.02E-06	6.31E-04	2.86	9.87E-07	1.00E-06	1.03E-06	1.04E-06
Np-237	9.73E-07	6.04E-04	2.74	6.81E-07	8.24E-07	1.12E-06	1.27E-06
Pu-238	1.54E-06	9.56E-04	4.33	1.20E-06	1.36E-06	1.71E-06	1.88E-06
Pu-239	5.23E-05	3.25E-02	147	4.35E-05	4.79E-05	5.68E-05	6.11E-05
Pu-240	8.92E-06	5.54E-03	25.1	7.28E-06	8.09E-06	9.75E-06	1.05E-05
Pu-241	1.05E-04	6.51E-02	295	8.14E-05	9.28E-05	1.17E-04	1.28E-04
Pu-242	5.75E-10	3.57E-07	1.62E-03	4.35E-10	5.04E-10	6.46E-10	7.15E-10
Am-241	6.28E-05	3.90E-02	177	4.66E-05	5.45E-05	7.11E-05	7.91E-05
Am-243	2.24E-09	1.39E-06	6.32E-03	1.73E-09	1.98E-09	2.54E-09	2.80E-09
Cm-242	1.67E-07	1.04E-04	0.470	8.92E-08	8.92E-08	1.82E-07	1.97E-07
Cm-243	1.55E-08	9.61E-06	4.36E-02	8.06E-09	8.06E-09	1.68E-08	1.82E-08
Cm-244	1.46E-07	9.09E-05	0.412	6.99E-08	6.99E-08	1.72E-07	1.89E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	6.36E-04 (g/L)	----	1.79	4.70E-04	5.51E-04	7.20E-04	8.01E-04
U	9.68E-03	1.43E+03	6.49E+03	9.31E-03	9.48E-03	9.89E-03	9.98E-03

*Density is calculated based on Na, OH-, and AlO2-.

†Water wt% derived from the difference of density and total dissolved species.

HDW Model Rev. 4

Double-Shell Tank 241-SY-103

Total Inventory Estimate*

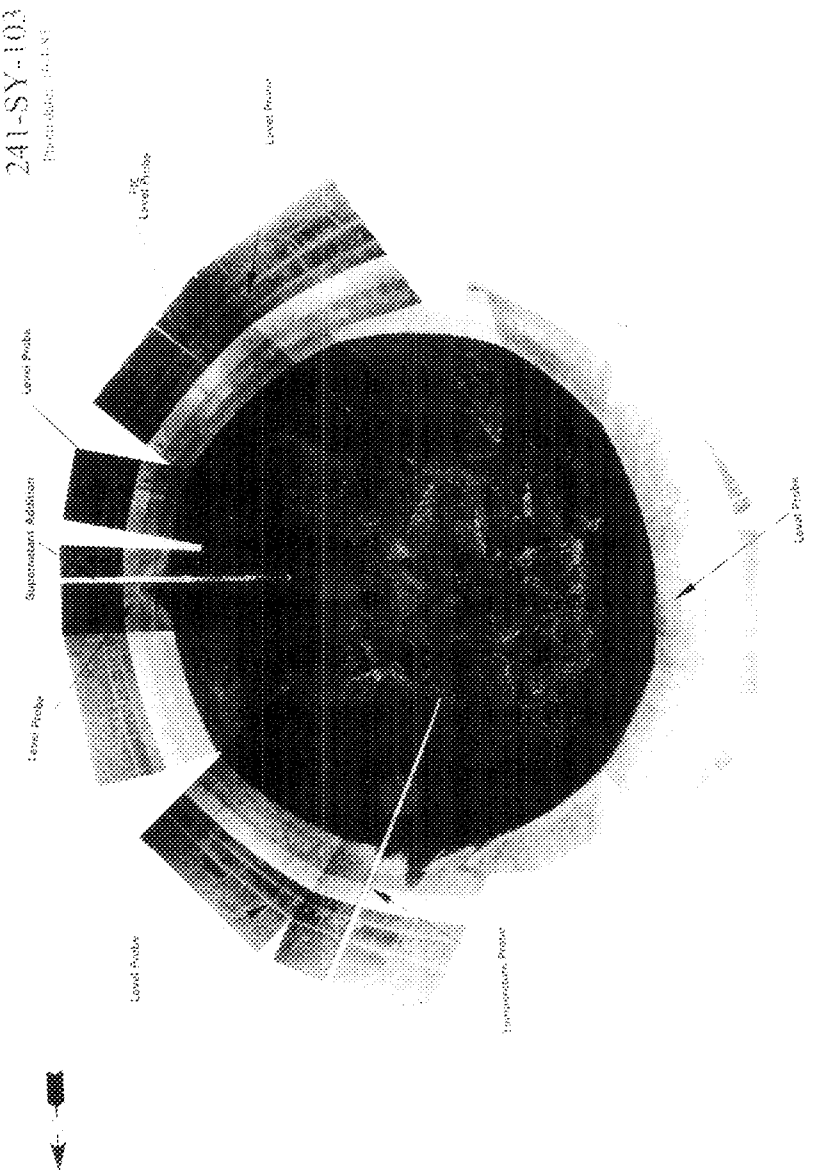
Physical Properties				-95 CI	-67 CI	+67 CI	+95 CI
Total Waste	4.53E+06 (kg)	(744 kgal)	----	----	----	----	----
Heat Load	6.10 (kW)	(2.08E+04 BTU/hr)	----	5.74	5.93	6.29	6.46
Bulk Density†	1.61 (g/cc)	----	----	1.56	1.59	1.63	1.65
Water wt%†	32.8	----	----	30.3	31.4	34.2	35.8
TOC wt% C (wet	0.923	----	----	0.563	0.739	1.11	1.28

Radiological Constituents	Ci/L	µCi/g	Ci	-95 CI (Ci/L)	-67 CI (Ci/L)	+67 CI (Ci/L)	+95 CI (Ci/L)
H-3	2.54E-04	0.158	715	1.40E-04	1.40E-04	2.65E-04	2.79E-04
C-14	3.74E-05	2.32E-02	105	1.34E-05	1.34E-05	3.79E-05	3.84E-05
Ni-59	2.31E-06	1.44E-03	6.51	1.19E-06	1.19E-06	2.37E-06	2.42E-06
Ni-63	2.27E-04	0.141	639	1.15E-04	1.15E-04	2.32E-04	2.38E-04
Co-60	4.27E-05	2.65E-02	120	1.53E-05	1.53E-05	4.35E-05	4.44E-05
Se-79	3.72E-06	2.31E-03	10.5	2.19E-06	2.19E-06	4.27E-06	4.80E-06
Sr-90	0.123	76.3	3.46E+05	0.115	0.119	0.127	0.130
Y-90	0.123	76.3	3.46E+05	7.00E-02	7.00E-02	0.127	0.130
Zr-93	1.83E-05	1.14E-02	51.5	1.06E-05	1.06E-05	2.10E-05	2.37E-05
Nb-93m	1.32E-05	8.22E-03	37.3	7.88E-06	7.88E-06	1.52E-05	1.70E-05
Tc-99	2.70E-04	0.168	759	1.80E-04	2.24E-04	3.16E-04	3.60E-04
Ru-106	7.66E-09	4.76E-06	2.16E-02	4.11E-09	4.11E-09	8.45E-09	9.17E-09
Cd-113m	9.71E-05	6.03E-02	273	5.12E-05	5.12E-05	1.14E-04	1.30E-04
Sb-125	1.86E-04	0.115	523	6.72E-05	6.72E-05	1.91E-04	1.95E-04
Sn-126	5.62E-06	3.49E-03	15.8	3.33E-06	3.33E-06	6.45E-06	7.25E-06
I-129	5.20E-07	3.23E-04	1.46	3.47E-07	4.32E-07	6.09E-07	6.95E-07
Cs-134	3.19E-06	1.98E-03	9.00	2.11E-06	2.64E-06	3.75E-06	4.30E-06
Cs-137	0.286	178	8.06E+05	0.260	0.273	0.300	0.313
Ba-137m	0.271	168	7.62E+05	0.219	0.219	0.284	0.296
Sm-151	1.31E-02	8.14	3.69E+04	7.74E-03	7.74E-03	1.50E-02	1.69E-02
Eu-152	4.51E-06	2.80E-03	12.7	2.62E-06	2.62E-06	4.91E-06	5.30E-06
Eu-154	6.90E-04	0.429	1.94E+03	3.08E-04	3.08E-04	8.28E-04	8.84E-04
Eu-155	2.68E-04	0.166	755	1.55E-04	1.55E-04	2.92E-04	3.16E-04
Ra-226	1.55E-10	9.62E-08	4.36E-04	1.07E-10	1.07E-10	1.72E-10	1.88E-10
Ra-228	1.98E-07	1.23E-04	0.556	1.14E-07	1.38E-07	2.47E-07	2.99E-07
Ac-227	9.76E-10	6.06E-07	2.75E-03	7.01E-10	7.01E-10	1.08E-09	1.17E-09
Pa-231	4.53E-09	2.81E-06	1.28E-02	3.00E-09	3.00E-09	5.08E-09	5.61E-09
Th-229	4.61E-09	2.87E-06	1.30E-02	2.79E-09	3.24E-09	5.70E-09	6.85E-09
Th-232	1.63E-08	1.01E-05	4.58E-02	8.92E-09	8.92E-09	1.86E-08	2.09E-08
U-232	8.54E-07	5.31E-04	2.41	5.21E-07	6.84E-07	1.05E-06	1.26E-06
U-233	3.28E-06	2.04E-03	9.22	2.00E-06	2.62E-06	4.03E-06	4.84E-06
U-234	8.48E-07	5.27E-04	2.39	8.17E-07	8.33E-07	8.65E-07	8.74E-07
U-235	3.43E-08	2.13E-05	9.65E-02	3.30E-08	3.36E-08	3.50E-08	3.53E-08
U-236	2.67E-08	1.66E-05	7.52E-02	2.58E-08	2.63E-08	2.71E-08	2.75E-08
U-238	1.02E-06	6.31E-04	2.86	9.87E-07	1.00E-06	1.03E-06	1.04E-06
Np-237	9.73E-07	6.04E-04	2.74	6.81E-07	8.24E-07	1.12E-06	1.27E-06
Pu-238	1.54E-06	9.56E-04	4.33	1.20E-06	1.36E-06	1.71E-06	1.88E-06
Pu-239	5.23E-05	3.25E-02	147	4.35E-05	4.79E-05	5.68E-05	6.11E-05
Pu-240	8.92E-06	5.54E-03	25.1	7.28E-06	8.09E-06	9.75E-06	1.05E-05
Pu-241	1.05E-04	6.51E-02	295	8.14E-05	9.28E-05	1.17E-04	1.28E-04
Pu-242	5.75E-10	3.57E-07	1.62E-03	4.35E-10	5.04E-10	6.46E-10	7.15E-10
Am-241	6.28E-05	3.90E-02	177	4.66E-05	5.45E-05	7.11E-05	7.91E-05
Am-243	2.24E-09	1.39E-06	6.32E-03	1.73E-09	1.98E-09	2.54E-09	2.80E-09
Cm-242	1.67E-07	1.04E-04	0.470	8.92E-08	8.92E-08	1.82E-07	1.97E-07
Cm-243	1.55E-08	9.61E-06	4.36E-02	8.06E-09	8.06E-09	1.68E-08	1.82E-08
Cm-244	1.46E-07	9.09E-05	0.412	6.99E-08	6.99E-08	1.72E-07	1.89E-07

Totals	M	µg/g	kg	-95 CI (M or g/L)	-67 CI (M or g/L)	+67 CI (M or g/L)	+95 CI (M or g/L)
Pu	6.36E-04 (g/L)	----	1.79	4.70E-04	5.51E-04	7.20E-04	8.01E-04
U	9.68E-03	1.43E+03	6.49E+03	9.31E-03	9.48E-03	9.89E-03	9.98E-03

*Unknowns in tank solids inventory are assigned by Tank Layering Model (TLM).

†Volume average for density, mass average Water wt% and TOC wt% C.


241-SY-101
Level Probe
Supernatant Addition
Level Probe
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Temperature Probe

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GLOSSARY

This glossary of Hanford terminology has been compiled from numerous sources. A lot of the terms have come from Anderson (1990), Jungfleisch (1984) and Agnew et al. (1997). These definitions may conflict with other sources.

1C	First-cycle decontamination waste from the bismuth phosphate ($BiPO_4$) process at B and T Plants consisting of by-products co-precipitated from a solution containing plutonium (contains 10% of the original fission product activity and 2% of the products). By-product cake solution was mixed with product waste and neutralized with 50% caustic. Coating waste from removing aluminum fuel element cladding was added and comprised about 24% of the waste.
1C1	First-cycle decontamination waste from the bismuth phosphate ($BiPO_4$) process, 1944-49 (LANL defined waste #3)
1C2	First-cycle decontamination waste from the bismuth phosphate ($BiPO_4$) process, 1950-56 (LANL defined waste #4)
1CFeCN	Ferrocyanide sludge produced by in-plant scavenging of 1C supernatant wastes (LANL defined waste #12)
224	224-U Waste. LaF_3 finishing waste from $BiPO_4$ process and uranium recovery in the 224 buildings by T Plant and B Plant and the Plutonium Finishing Plant (LANL defined waste #7)
2C	Second-cycle decontamination waste from the bismuth phosphate ($BiPO_4$) process at B and T Plants (see second-cycle decontamination waste)
2C1	Second-cycle decontamination waste from the bismuth phosphate ($BiPO_4$) process, 1944-49 (LANL defined waste #5)
2C2	Second-cycle decontamination waste from the bismuth phosphate ($BiPO_4$) process, 1950-56 (LANL defined waste #6)
AGING	Aging Waste, High level, first cycle solvent extraction waste from the PUREX Plant.
Airlift Circulator (ALC)	A device installed in aging waste tanks to promote mixing of the supernate. By maintaining motion within the body of the liquid, the circulators minimize superheat buildup and, consequently, minimize tank bumps.

AR	Washed PUREX sludge from the 244-AR Vault (LANL defined waste #31)
B	High-level waste from PUREX acidified waste processed through B Plant to extract strontium (LANL defined waste #32)
BG	Below grade
BL	B Plant low-level waste beginning 1968 (LANL defined waste #33)
BSLTCK	Salt cake waste generated from the 242-B Evaporator, 1951-53 (LANL defined waste #41)
BYSLTCK	Salt cake waste generated from in-tank solidification units 1 and 2 in BY Tank Farm, 1965-74 (LANL defined waste #44)
CASS	Computer Automated Surveillance System
Catch Tanks	Small capacity single-shell tanks associated with diversion boxes and diverter stations. The tanks are designed to receive any transfer line clean out, spills or leakage from the boxes, or leakage from the adjacent pipe encasement.
CEM	Cement (LANL defined waste #37)
CC	Complexant Concentrate waste
CCPLX	Complexant Concentrate
CCW	Concentrated customer waste; the product of concentrating waste received from 100N or the Fast Flux Test Facility having phosphate and/or sulfate concentrations which, after concentration, exhibit the characteristics of a complexed liquid
CP	Concentrated Phosphate Waste
Crib	An underground structure filled with aggregate designed to receive liquid waste, usually through a perforated pipe. The filtration and ion exchange properties of the soil in and around the crib were used to contain the radionuclides.
CSR	Waste (supernate) from cesium recovery of tank supernate at B Plant (LANL defined waste #35)
CVR	Cover

CW	Coating (cladding) waste produced at PUREX from dissolution of Zircaloy or aluminum fuel cladding.
CWP1	Coating (cladding) waste (PUREX); (LANL defined waste #21, CWP/Al, 1956-60)
CWP2	Cladding (coating) waste (PUREX), (LANL defined waste #22, CWP/Al, 1961-72)
CWP/ZR	Now called PD or NCRW
CWR1	REDOX cladding (coating) waste, (LANL defined waste #15, CWR/Al, 1952-60)
CWR2	Coating (cladding) waste (REDOX), (LANL defined waste #16, CWL/Al with some Zr, 1961-72)
CWZR1	Coating (cladding) waste (PUREX), Zircaloy cladding; 1968-72 (LANL defined waste #23)
CWZR2	Coating (cladding) waste (PUREX), Zircaloy cladding; 1983-88 (LANL defined waste #47); see NCRW and PD; also known as CWP/ZR2
DC	Dilute Complexed Waste
DE	Diatomaceous Earth; Diatomite (SiO_2); a light friable siliceous material derived from diatom (algal) remains; added to some underground waste storage tanks to absorb residual liquids. (LANL defined waste #36)
DN	Dilute Non-complexed waste
DSS	Double-shell slurry; is a concentrate of DSSF.
DSSF	Double-shell slurry feed; Waste concentrated in evaporators until the solution is nearly saturated with sodium aluminate without exceeding receiver tank composition limits. This form is not as concentrated as double-shell slurry.
DST	Double-Shell Tank
DW	Decontamination waste; a wash solution from equipment decontamination at T Plant (LANL defined waste #39)
ENRAF	Waste surface level device

EVAP	Evaporator feed (post 1976 designation)
FIC	Food Instrument Corporation, waste surface level device
GAS	Slurry growth as a result of gas generation
HDRL	Hanford defense residual liquor; late 1970s designation for terminal liquors remaining after evaporation; includes complexed and noncomplexed waste, partially neutralized waste, and DSSF (see RESID).
HS	Hot Semiworks (C Plant); a pilot facility with a variety of operations. Also, Hot or Strontium Semiworks waste (LANL defined waste #28); see SSW.
Level Adjustment	Any update in the waste inventory (or tank level) in a tank. The adjustments usually result from surveillance observations or historical investigations.
Mixed Waste	Waste containing both radioactive and hazardous (dangerous as defined in WAC 173-303) waste.
MW	Waste from the bismuth phosphate process (which extracted plutonium) containing all the uranium, approximately 90% of the original fission product activity, and approximately 1% of the product. This waste was brought to the neutral point with 50% caustic and then treated with an excess of sodium carbonate. This procedure yielded almost completely soluble waste at a minimum total volume. The exact composition of the carbonate compounds was not known, but was assumed to be a uranium phosphate carbonate mixture. The term "metal" was the code word for plutonium.
MW1	Metal waste from $BiPO_4$, 1944-49 (LANL defined waste #1, same as MW)
MW2	Metal waste from $BiPO_4$, 1950-56 (LANL defined waste #2, same as MW)
N	Phosphate decontamination waste from N Reactor (LANL defined waste #40)
NCAW	Neutralized current acid waste, primary high-level waste stream from PUREX process (LANL defined waste #45, formerly P3, 1983-88)

NCPLX	Non-complexed waste; general term for supernates and salt well liquors that did not contain organic complexants.
NCRW	Neutralized cladding removal waste, same as CWP/Zr (LANL defined waste # 47, formerly CWZr2).
NIT	$HNO_3/KMNO_4$ solution added during evaporator operation (LANL defined waste #38)
OBSV Port	Observation Port
OWW	Organic Wash Waste; The solvent used in PUREX was treated before reuse by washing with potassium permanganate and sodium carbonate, followed by dilute nitric acid.
OWW1	Organic wash waste, 1956-62, also known as CARB (LANL defined waste #24)
OWW2	Organic wash waste, 1963-67 (LANL defined waste #25)
OWW3	Organic wash waste, 1968-72 (LANL defined waste #26)
P	High-level neutralized acid waste from PUREX
P1	PUREX high-level waste, 1956-62 (LANL defined waste #17)
P2	PUREX high-level waste, 1963-67 (LANL defined waste #18)
P2'	1968-1972, assigned to P2. (LANL defined waste #19)
P3	1983-1988, now called PXNAW or NCAW. (LANL defined waste #45)
P/CP	Riser is recessed below a concrete pad with an access plate at grade
PASF	PUREX ammonia scrubber feed (LANL defined waste #48)
PD	PUREX Decladding; PUREX Neutralized Cladding Removal Waste is the solids portion of the PUREX plant neutralized cladding removal waste stream; received in Tank Farms as a slurry.
PFeCN1	Ferrocyanide sludge produced by in-plant scavenging (using 0.005 M ferrocyanide) of waste from uranium recovery (LANL defined waste #9)

PFeCN2	Same as PFeCN1 except 0.0025 M ferrocyanide used (LANL defined waste #10)
PL1	PUREX low-level waste (LANL defined waste #20)
PL2	1983-88, now called PXMSC, among other things. (LANL defined waste #46)
PNF	Partial Neutralization Feed. Indicates addition of nitric acid at an evaporator in an attempt to produce more salt cake during volume reduction.
Primary Addition	An addition of waste from a specific plant or process vault.
PT	PFP TRU Solids; TRU solids fraction from PFP Plant operations.
PXMSC	Dilute, non-complexed waste from PUREX misc. streams (LANL defined waste #46, formerly PL2)
PXNAW	Aging waste from PUREX high level waste; see NCAW (LANL defined waste #45, formerly P3, 1983-88)
R	High-level waste from REDOX
R1	REDOX waste, 1952-57 (LANL defined waste #13)
R2	REDOX waste, 1958-66 (LANL defined waste #14)
RESID	Hanford defense residual liquor (see HDRL)
Riser	A vertical pipe through a tank dome (access to the tank interior).
RSLTCK	Salt-cake waste from the REDOX concentrator (LANL defined waste #43)
S1SltCk	Salt cake waste generated from the 242-S Evaporator/Crystallizer from 1973 until 1976.
S2SltSlr	Salt cake waste generated from the 242-S Evaporator/Crystallizer from 1977 until 1980.
SACS	Surveillance Analysis Computer System
SHMS	Standard Hydrogen Monitoring System

SMM	Supernatant Mixing Model (created at LANL) that calculates the composition of tank liquids and concentrates as linear combinations of supernates.
SMMA1	Solids from concentrate calculated by SMM.
SMMA2	Solids from concentrate calculated by SMM.
SMMS2	Solids from concentrate calculated by SMM.
SMP	Sludge measuring port
Sound	The integrity classification of a waste storage tank for which surveillance data indicate no loss of liquid attributed to a breach of integrity.
SRR	Sluiced PUREX sludge from A and AX Tank Farms sent to B Plant to recover strontium from 1967-76 (LANL defined waste #34). The sludge returned from B Plant was sent to the AR Vault and the supernate was sent to 241-C-105.
Supernatant or Supernate	Liquid floating above the solids in the waste storage tanks. Supernate is usually derived by subtracting the solids level measurement from the liquid level measurement.
SWLIQ	Dilute, non-complexed waste from the 200 East Area Single-Shell Tanks
T1SLTCK	Salt-cake waste generated from the 242-T Evaporator, 1951-56 (LANL defined waste #42)
T2SLTCK	Salt-cake waste generated from the 242-T Evaporator, 1965-76
Tank Farm	An area containing underground storage tanks for storing waste.
TFeCN	Ferrocyanide sludge produced by in-tank or in-farm scavenging (LANL defined waste #11)
TH1	Thoria high-level or cladding waste, 1966 (LANL defined waste #29, formerly TH66)
TH2	Thoria high-level or cladding waste, 1970 (LANL defined waste #30, formerly TH70)
Thermocouple	Thermocouples are simple devices that develop a millivoltage when parts of the thermocouple are exposed to temperature

differentials. The millivoltage can be converted to a temperature reading based upon a specific voltage versus temperature curve inherent to the type of thermocouple being used. Thermocouples are attached to a fabricated assembly called a thermocouple tree.

Thermocouple Tree	Thermocouples are attached to a fabricated assembly called a thermocouple tree. The number of thermocouples attached to the tree varies as a function of the depth of the tank as well as the thermocouple tree design. For trees with multiple thermocouples, the thermocouples are spaced at intervals along the tree so that a vertical temperature profile of the tanks waste and vapor space can be developed. The thermocouple tree is installed in a riser and left in place inside the tank.
TLM	Tank Layer Model (created at LANL and derived from *Waste Status and Transaction Record Summary* (Agnew et al., 1995) database) models the volumes of wastes in the tanks.
UNK	Unknown
UR	Uranium recovery operation in U Plant, 1952-57. Created uranium recovery waste (UR) (LANL defined waste #8), also known as tributyl phosphate (TBP) waste, and FeCN (scavenging wastes). See TFeCN and PFeCN.
Watch List Tank	An underground storage tank requiring special safety precautions because the tank potentially could release high-level radioactive waste if uncontrolled increases in pressure or temperature occur. Special restrictions have been placed on the tanks by "Safety Measures for Waste Tanks at Hanford Nuclear Reservation," Section 3137, National Defense Authorization Act for Fiscal Year 1991, November 5, 1990, Public Law 101-501 (also called the Wyden Amendment).
WESF	Waste Encapsulation and Storage Facility
WTR	Water; flush water from miscellaneous sources.
Wyden Amendment	See watch list tank.
Z	Waste discharged from Z Plant (PFP) (LANL defined waste #27)

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