

AUG 23 1995

ENGINEERING DATA TRANSMITTAL

0042256

Page 1 of 1

1. EDT No 613357

9613457.0809

2. To: (Receiving Organization) DISTRIBUTION	3. From: (Originating Organization) TWRS/TECHNICAL BASIS INTEGRATION	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: TWRS ENG/CHAR SUPPORT	6. Cog. Engr.: C. S. HOMI	7. Purchase Order No.: N/A
8. Originator Remarks: N/A		9. Equip./Component No.: N/A
11. Receiver Remarks:		10. System/Bldg./Facility: 2750E/200E
		12. Major Assm. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: 08/28/95



15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-WM-TP-403		0	TANK 241-TX-116 TANK CHARACTERIZATION PLAN	N/A	1	1	

16. KEY		
Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)										(G)	(H)
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1		Cog. Mgr. S. J. EBERLEIN	<i>[Signature]</i>	8/25/95							
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18. C. S. HOMI <i>[Signature]</i> Signature of EDT Originator Date: 8/25/95	19. Authorized Representative Date for Receiving Organization	20. S. J. EBERLEIN <i>[Signature]</i> Cognizant Manager Date: 8/25/95	21. DOE APPROVAL (if required) Ctrl. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments
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9613457.0810

SUPPORTING DOCUMENT

1. Total Pages 10

2. Title

TANK 241-TX-116 TANK CHARACTERIZATION PLAN

3. Number

WHC-SD-WM-TP-403

4. Rev No.

0

5. Key Words

CHARACTERIZATION, GENERAL SAFETY ISSUES, SPECIFIC SAFETY ISSUES, INFORMATION REQUIREMENTS, PRIORITY

6. Author

Name: C. S. HOMI

Signature

[Handwritten Signature] 8/25/95

Organization/Charge Code 75320/N4169

7. Abstract

This document is a plan identifies the information needed to address relevant issues concerning short-term and long-term safe storage and long-term management of Single-Shell Tank (SST) 241-TX-116.

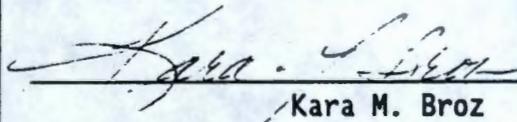
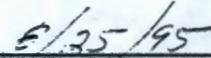
8. RELEASE STAMP

OFFICIAL RELEASE *(58)*
BY WHC
DATE AUG 23 1995
Sta. # 4

RELEASE AUTHORIZATION**Document Number:** WHC-SD-WM-TP-403, REV 0**Document Title:** Tank 241-TX-116 Tank Characterization Plan**Release Date:** 8/25/95

**This document was reviewed following the
procedures described in WHC-CM-3-4 and is:**

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WHC Information Release Administration Specialist:
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8/25/95

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Tank 241-TX-116 Tank Characterization Plan

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Date Published
August 1995

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



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P.O. Box 1970
Richland, Washington

Management and Operations Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

Approved for Public Release

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LIST OF ABBREVIATIONS

DQO	Data Quality Objective
NCPLX	Non-complexed
SUMMA®	Trademark of Molectrics, Inc.
SST	Single-Shell Tank
TCP	Tank Characterization Plan
TOC	Total Organic Carbon
TX-116	Tank 241-TX-116
WHC	Westinghouse Hanford Company

1.0 INTRODUCTION

This Tank Characterization Plan (TCP) identifies the information needed to address relevant issues concerning short-term safe storage and long-term management of Single-Shell Tank (SST) 241-TX-116 (TX-116). It should be understood that the various needs and issues surrounding tank TX-116 are evolving as new information about the tank is uncovered. As a result of this progression, this Tank Characterization Plan addresses only the issues that, to this date, have been identified. It is expected that deviations from this plan may occur as additional issues or needs arise which impact the management of SST TX-116. This Tank Characterization Plan will be revised as necessary to reflect those changes or deviations.

Tank TX-116 was constructed between 1947 and 1948 and was put into service in 1952. Tank 241-TX-116 began receiving evaporator bottoms in the second quarter of 1952. The tank received evaporator bottoms periodically until the second quarter of 1972 when 95 tons of diatomaceous earth was added to the tank in November 1972. Presently, the waste is classified as non-complexed. This tank currently contains waste with a total volume of 2,388.7 kL (631 kgal), which is equivalent to 601.7 centimeters (236.9 inches) of waste as measured from the baseline of the tank. The waste is comprised of 2,313 kL (611 kgal) of saltcake and 75.7 kL (20 kgal) of diatomaceous earth with no pumpable liquid remaining (Brevick 1994a).

The tank was declared an assumed leaker in 1977 and was removed from service in 1972. Tank TX-116 is passively ventilated and was interim stabilized in April 1983 with intrusion prevention completed in August 1984. The last photo was taken on October 17, 1989. The 1989 photographic montage displays a surface color that is most likely due to the 41 tons of diatomaceous earth that was added to the tank (Brevick 1994a). Where the surface is breached, it appears that the waste is dark brown or black. The last solids volume update was obtained on March 31, 1972 (Hanlon 1995).

This tank is presently not on a Watch List. Near-term sampling and analysis activities are focused on either verification of the non-watchlist tank status, identification of any new safety issues or the addition of TX-116 to a Watch List. Should any safety issues be identified additional analysis will occur consistent with the identified issue.

In addition to the resolution of the safety issues, it is intended that all tank waste will be subject to pretreatment and retrieval to prepare for final storage or disposal.

2.0 PROGRAM ELEMENTS REQUIRING INFORMATION FOR TANK 241-TX-116

This section identifies the various program elements, and identifies which of these programs require characterization data from tank TX-116.

2.1 GENERAL SAFETY ISSUES

The *Tank Safety Screening Data Quality Objective* (Babad et al. 1995) describes the sampling and analytical requirements that are used to screen waste tanks for unidentified safety issues. The primary analytical requirements for the safety screening of a tank are energetics, total alpha activity, moisture content, and flammable gas concentration.

2.2 SPECIFIC SAFETY ISSUES

2.2.1 Ferrocyanide

This tank is not on the Ferrocyanide Watch List and; therefore, no information needs are currently identified for this program element.

2.2.2 Organic

This tank is not on the Organics Watch List and; therefore, no information needs are currently identified for this program element.

2.2.3 High Heat

This tank is not on the High Heat Watch List and; therefore, no information needs are currently identified for this program element.

2.2.4 Flammable Gas

This tank is not on the Flammable Gas Watch List and; therefore, no information needs are currently identified for this program element.

2.2.5 Vapor

The tanks currently scheduled to be vapor sampled may be classified into four categories: (1) those tanks which are to be rotary mode core sampled (a prerequisite to rotary sampling); (2) tanks on the Organic or Ferrocyanide Watch Lists; (3) tanks in C farm; and (4) tank BX-104, due to vapor exposure. Since tank TX-116 is categorized in one of the above four groups, information needs must satisfy *Data Quality Objectives for Generic In-Tank Health and Safety Vapor Issue Resolution* (Osborne et al. 1995) and *Rotary Sampling Core Vapor Sampling Data Quality Objective* (Price 1994). Characterization of the tank headspace is needed to: 1) identify those tanks which can be sampled safely with intrusive equipment without risk of gas ignition; 2) identify and estimate concentrations of toxicologically significant compounds present in the tank headspace to establish worker safety precautions; and 3) support the startup and operation of the portable exhauster used during rotary-mode core sampling.

2.2.6 Criticality

No information separate from that for the general safety issue of tank TX-116 are currently identified for this program element. However, if the general safety screening of tank TX-116 identifies a potential criticality concern, analyses for fissile materials and neutron absorbers and poisons will be performed as identified in the safety screening data quality objective.

2.2.7 Screening Approach Evaluation

The safety screening approach is currently under review. Information is required from key tanks to determine if a revised approach to screening may be adopted, as proposed in Meacham, 1995.

2.3 CONTINUING OPERATIONS

2.3.1 Compatibility/Stabilization

No information needs are currently identified for this program element.

2.3.2 Evaporator

No information needs are currently identified for this program element.

2.4 DOUBLE-SHELL TANK WASTE ANALYSIS PLAN

This section does not apply because Tank TX-116 is a single shell tank.

2.5 DISPOSAL

2.5.1 Retrieval

Current retrieval needs (Bloom 1995) do not call for test samples to be taken from tank TX-116.

2.5.2 Pretreatment/Vitrification

Tank TX-116 is identified as a bounding tank for pretreatment/disposal process development (Kupfer et al. 1995).

2.6 HISTORICAL MODEL EVALUATION

Bounding tanks and data requirements for historical model evaluations are found in DQO *Historical Model Evaluation Data Requirements* (Simpson et al. 1995). Tank TX-116 has been identified as a primary bounding tank for the saltcake waste type.

3.0 HOW INFORMATION WILL BE OBTAINED

The safety screening DQO requires that a vertical profile of the tank waste be obtained from at least two widely spaced risers. This vertical profile may be obtained using core, auger (for shallow tanks), or grab samples. Several sampling events of tank TX-116 are scheduled: one vapor sampling event and a rotary sampling event. No other sampling is scheduled through fiscal year 1998 (Stanton 1995). The rotary mode sampling type has been chosen over other sampling modes due to both the depth of the tank (making auger sampling inadequate) and the fact that the surface of tank TX-116 is comprised of saltcake (which is not conducive to good push mode core sampling recovery). Prior to rotary sampling it is necessary to vapor sample the tank as per requirements of *Rotary Core Vapor Sampling Data Quality Objective* (Price 1994).

The best current estimate of the water content in tank TX-116 solids, as determined from the process records, is 44.1%; based on the HTCE (Brevick 1994a). Estimates (Toth et al 1995) of water content in tank TX-116 saltcake is 17% (generated from a model based on sample data from similar tanks). If the variance of water in tanks already sampled and a statistical power curve is used then a minimum of two cores are needed to demonstrate a water content above 17% at 95% confidence in the sludge. It may not be possible to establish through sampling whether the salt cake moisture content exceeds 17%. Should the measured mean be lower than anticipated or the measured variance higher, additional samples may be required. The TOC contained within the saltcake is estimated (Toth et al 1995) to be 0.5% (wet basis), which is significantly lower than the level of concern. This tank is of interest to the historic evaluation process due to the need to resolve conflicting historic inputs. This drives a need to obtain additional samples if possible. Ideally three core samples will be requested for this tank and this should meet the requirements for the above parameters.

The best current information indicates that 3 risers are available for sampling of tank TX-116, 12" riser R5, 4" riser R1, and 4" riser R10A. An additional 12" riser R7 may contain cut-off equipment in the riser. Initial information will be taken from these 3 risers and assessed to determine if more samples are required. Alternate sampling methods, installation of a riser or removal of equipment from risers presently considered unavailable, are possible future options.

4.0 PRIORITY OF INFORMATION REQUIREMENTS

Characterization of flammable and toxic vapors is a high priority for this tank. Vapor sampling is expected to be performed in 1995 and or early fiscal 1996 (Stanton 1995). Rotary mode sampling is scheduled for FY 1996 (Stanton 1995).

Table 4-1: Integrated DQO Requirements

Sampling Event	Applicable DQO	Sampling Requirements	Analytical Requirements
Vapor Sampling	-Health & Safety Vapor Issue Resolution DQO -Rotary Sampling Core Vapor Sampling DQO	3 SUMMA® canisters 6 Triple Sorbent Traps 8 Sorbent Trap Systems	Gas Flammability Gas Toxicity -Organic Vapors -Permanent Gases
Rotary Core Sampling	-Safety Screening DQO -Historical Model DQO	Core samples from 3 risers separated to the maximum extent possible	Energetics, Moisture, Total Alpha

5.0 WHEN INFORMATION IS NEEDED

Data are required for Tank TX-116 during FY 1996 for safety screening and to prepare a Tank Characterization Report.

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Project Title/Work Order		EDT No. 613357
Tank 241-TX-116 Tank Waste Characterization Plan (WHC-SD-WM-TP-403 REV 0)		ECN No.

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