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Title/Desc:

TANK 241B101 TANK CHARACTERIZATION PLAN

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN **№ 625714**

Proj.
ECN

2. ECN Category (mark one) <input type="checkbox"/> Supplemental <input checked="" type="checkbox"/> Direct Revision <input type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedure <input type="checkbox"/> Cancel/Void	3. Originator's Name, Organization, MSIN, and Telephone No. C. S. HOMI, 75320, R2-12, 373-1097	3a. USQ Required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	4. Date 10/04/95	
	5. Project Title/No./Work Order No. TANK 241-B-101 TANK CHARACTERIZATION PLAN	6. Bldg./Sys./Fac. No. B-101	7. Approval Designator N/A	
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-WM-TP-350 REV <u>1</u> ^{KMB} _{10/4/95}	9. Related ECN No(s). N/A	10. Related PO No. N/A	

11a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 11b) <input checked="" type="checkbox"/> No (NA Blks. 11b, 11c, 11d)	11b. Work Package No. N/A	11c. Modification Work Complete N/A _____ Cog. Engineer Signature & Date	11d. Restored to Original Condition (Temp. or Standby ECN only) N/A _____ Cog. Engineer Signature & Date
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12. Description of Change
 Complete revision.

13a. Justification (mark one)

Criteria Change <input checked="" type="checkbox"/>	Design Improvement <input type="checkbox"/>	Environmental <input type="checkbox"/>	Facility Deactivation <input type="checkbox"/>
As-Found <input type="checkbox"/>	Facilitate Const <input type="checkbox"/>	Const. Error/Omission <input type="checkbox"/>	Design Error/Omission <input type="checkbox"/>

13b. Justification Details
 Format change.

14. Distribution (include name, MSIN, and no. of copies) See attached Distribution Sheet	RELEASE STAMP OFFICIAL RELEASE BY WHC 7 DATE OCT 04 1995 <i>Sta 4.</i>
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ENGINEERING CHANGE NOTICE

15. Design Verification Required <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	16. Cost Impact <table style="width:100%; border: none;"> <tr> <td align="center" colspan="2">ENGINEERING</td> <td align="center" colspan="2">CONSTRUCTION</td> </tr> <tr> <td>Additional</td> <td><input type="checkbox"/> \$</td> <td>Additional</td> <td><input type="checkbox"/> \$</td> </tr> <tr> <td>Savings</td> <td><input type="checkbox"/> \$</td> <td>Savings</td> <td><input type="checkbox"/> \$</td> </tr> </table>	ENGINEERING		CONSTRUCTION		Additional	<input type="checkbox"/> \$	Additional	<input type="checkbox"/> \$	Savings	<input type="checkbox"/> \$	Savings	<input type="checkbox"/> \$	17. Schedule Impact (days) Improvement <input type="checkbox"/> Delay <input type="checkbox"/>
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18. 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 12. Enter the affected document number in Block 19.

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

19. 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
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20. Approvals

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RELEASE AUTHORIZATION

Document Number: WHC-SD-WM-TP-350, REV 1

Document Title: Tank 241-B-101 Tank Characterization Plan

Release Date: 10/4/95

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

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:


Kara Broz


10/4/95

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SUPPORTING DOCUMENT

1. Total Pages 11

2. Title

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3. Number

WHC-SD-WM-TP-350

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5. Key Words

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

6. Author

Name: C. S. HOMI

Signature

Organization/Charge Code 75320/N4G6A

7. Abstract

This document is a plan that 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-B-101.

8. RELEASE STAMP

OFFICIAL RELEASE
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RECORD OF REVISION

(1) Document Number
 WHC-SD-WM-TP-350

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CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release		
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Tank 241-B-101 Tank Characterization Plan

C. S. Homi
Westinghouse Hanford Company

Date Published
October 1995

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



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Hanford Company

P.O. Box 1970
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TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 PROGRAM ELEMENTS REQUIRING INFORMATION FOR 241-B-101 2

 2.1 GENERAL SAFETY ISSUES 2

 2.2 SPECIFIC SAFETY ISSUES 2

 2.2.1 Ferrocyanide 2

 2.2.2 Organic 2

 2.2.3 High Heat 2

 2.2.4 Flammable Gas 2

 2.2.5 Vapor 2

 2.2.6 Criticality 3

 2.2.7 Screening Approach Evaluation 3

 2.3 CONTINUING OPERATIONS 3

 2.2.1 Compatibility/Stabilization 3

 2.2.2 Evaporator 3

 2.4 DOUBLE-SHELL TANK WASTE ANALYSIS PLAN 3

 2.5 DISPOSAL 3

 2.5.1 Retrieval 3

 2.5.2 Pretreatment/Vitrification 3

 2.6 HISTORICAL MODEL EVALUATION 3

3.0 HOW INFORMATION WILL BE OBTAINED 4

4.0 PRIORITY OF INFORMATION REQUIREMENTS 4

5.0 WHEN INFORMATION IS NEEDED 4

6.0 REFERENCES 5

LIST OF TABLES

Table 4-1: Integrated DQO Requirements 4

LIST OF ABBREVIATIONS

B-101	Tank 241-B-101
DQO	Data Quality Objective
HTCE	Historical Tank Content Estimate
DSSF	Double Shell Slurry Feed
NCPLX	Non-complexed
SST	Single-Shell Tank
TCP	Tank Characterization Plan
TOC	Total Organic Carbon
USQ	Unreviewed Safety Question
WHC	Westinghouse Hanford Company

1.0 INTRODUCTION

This Tank Characterization Plan (TCP) identifies the information needed to address relevant issues concerning short-term and long-term safe storage and long-term management of Single-Shell Tank 241-B-101 (B-101). It should be understood that the various needs and issues surrounding tank B-101 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 B-101. As necessary, this Tank Characterization Plan will be revised to reflect those changes or deviations.

Tank B-101 was constructed between 1943 and 1944 and was put into service in May 1945. Initially tank B-101 received metal waste from the second quarter of 1945 until October 1945. The tank received and transferred waste via cascade lines from 1945 until 1963. During the first quarter of 1953, B-101 processed feed for U Plant. In late December of 1953, the sluicing of metal waste from B-101 was completed. From the fourth quarter of 1953 until the second quarter of 1963, the tank contained evaporator bottoms waste. During the third quarter of 1957, in-farm scavenged feed was sent to the 244-CR Vault. From the second quarter of 1960 until the first quarter of 1970, B-101 received wastewater. Also, it was found that during the second quarter of 1960 wastewater leaked into the pipe encasement which drained to B-101. During the fourth quarter of 1963 the tank received coating waste. B-101 received B Plant high level waste from the second quarter of 1969 until the second quarter of 1970. From the third quarter of 1970 until the first quarter of 1973, the tank received B Plant low level waste. Presently, the tank waste is classified as non-complexed. This tank currently contains waste with a total waste volume of 427.8 kL (113 kgal), which is equivalent to 92.8 centimeters (36.5 inches) of waste as measured from the baseline of the tank. The waste is comprised of 284 kL (75 kgal) of saltcake; 38 kL (10 kgal) of unknown waste and 106 kL (28 kgal) of sludge with no supernatant and pumpable liquid remaining (Brevick 1994a).

The tank is an assumed leaker (with a leak of approximately 30 kL [8 kgal] in 1974) and was removed from service in 1974. Tank B-101 is passively ventilated and interim stabilized in March 1981 with intrusion prevention completed. The last photo was taken on May 19, 1983. The 1983 photographic montage cannot be located but, a 1975 montage indicates a solid rough black surface with no visible liquid (Brevick 1994b). The level was adjusted and the supernatant was pumped after this montage was taken; therefore, this montage description does not represent current tank contents. The last solids volume update was obtained on April 28, 1982 (Hanlon 1995).

An analysis was conducted on a B-101 sludge sample in February 1976. The sample was found to have a consistency of soft mud and was dark brown. Particle size distribution, of sample solids, showed that the majority (90 wt%) of the solids was between 5 μm and 50 μm . A heat generation rate based on ^{89}Sr , ^{90}Sr and ^{137}Cs was calculated to be 0.0201 watts/liter of sludge.

This tank is not on any 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 changing the non-Watch List status. 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. Presently, these long-range plans have yet to be fully identified and are, therefore, not included in this document.

2.0 PROGRAM ELEMENTS REQUIRING INFORMATION FOR TANK 241-B-101

This section identifies the various program elements, and identifies which of these programs require characterization data from tank B-101.

2.1 GENERAL SAFETY ISSUES

The *Tank Safety Screening Data Quality Objective* (Redus 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

Tank B-101 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 (as a consequence of the rotary sampling system); (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 B-101 is NOT categorized in one of the above four groups, vapor sampling is not required for this tank.

2.2.6 Criticality

No information separate from that for the general safety issue of tank B-101 are currently identified for this program element. However, if the general safety screening of tank B-101 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

No information needs are currently identified for this program element, although work to identify these needs is in progress and expected to be completed in fiscal year 1995.

2.5 DISPOSAL

2.5.1 Retrieval

Current retrieval needs (Bloom 1995) do not call for test samples to be taken from tank B-101.

2.5.2 Pretreatment/Vitrification

Tank B-101 has not been identified as an alternate bounding tank for pretreatment/disposal process development (Kupfer 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 1995). Tank B-101 has been identified as an alternate bounding tank for any waste type, but will not be evaluated for this DQO unless directed by the program.

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. Only a push mode sampling event is scheduled and required. No other sampling is scheduled through fiscal year 1997 (Stanton 1995). The push 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 B-101 is comprised of supernatant and sludge.

The best current estimate of the water content in tank B-101 solids, as determined from the process records, is 54.0%; based on the HTCE (Brevick 1994a). Estimated (Toth et al 1995) water content in tank B-101 sludge is 34.5% (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 three cores are needed to demonstrate a water content above 17% at 95% confidence. The TOC contained within the sludge is estimated (Toth et al 1995) to be 0.1% (wet basis), which is significantly lower than the level of concern. Two core samples will be requested for this tank. Should the measured mean be lower than anticipated or the measured variance higher, additional samples may be required.

Present information indicate that six risers could be available for sampling in tank B-101. Two risers were used during the June 1995 Push Mode sampling event.

4.0 PRIORITY OF INFORMATION REQUIREMENTS

Vapor sampling is not required for this tank. Push mode sampling was completed in June 1995 (Stanton 1995).

Table 4-1: Integrated DQO Requirements

Sampling Event	Applicable DQO	Sampling Requirements	Analytical Requirements
Push Mode Sampling	-Safety Screening DQO	Core samples from 2 risers separated radially to the maximum extent possible (complete)	Energetics, Moisture, Total Alpha, Total Organic Carbon, SpG

5.0 WHEN INFORMATION IS NEEDED

Data are required for Tank B-101 during FY 1996 for safety screening and to prepare a Tank Characterization Report.

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