COMPLETE

ENGINEERING CHANGE NOTICE

1. ECN No 625720
Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	3a. USQ Required?	4. Date
Supplemental [ ] Direct Revision [X] Change ECN [ ] Temporary [ ] Standby [ ] Supersedure [ ] Cancel/Void [ ]	C. S. HOMI, 75320, R2-12, 373-1097	[ ] Yes [X] No	10/04/95
	5. Project Title/No./Work Order No. TANK 241-A-102 TANK CHARACTERIZATION PLAN	6. Bldg./Sys./Fac. No. A-102	7. Approval Designator N/A
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-WM-TP-358 REV 0 KMB 10/4/95	9. Related ECN No(s). N/A	10. Related PO No. N/A

11a. Modification Work	11b. Work Package No.	11c. Modification Work Complete	11d. Restored to Original Condition (Temp. or Standby ECN only)
[ ] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)	N/A	N/A Cog. Engineer Signature & Date	N/A Cog. Engineer Signature & Date

12. Description of Change
Complete revision.

13a. Justification (mark one)

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

13b. Justification Details
Format change.

14. Distribution (include name, MSIN, and no. of copies)
See attached Distribution Sheet

RELEASE STAMP
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ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1) 625720

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

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	[]	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	[]		[]

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

20. Approvals

	Signature	Date
OPERATIONS AND ENGINEERING		
Cog. Eng. C. S. Homi	C. S. Homi	10/4/95
Cog. Mgr. S. J. Eberlein	S. J. Eberlein	10/4/95
QA		
Safety		
Environ.		
Other		

	Signature	Date
ARCHITECT-ENGINEER		
PE		
QA		
Safety		
Design		
Environ.		
Other		

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

RELEASE AUTHORIZATION

Document Number:	WHC-SD-WM-TP-358, REV 1
Document Title:	Tank 241-A-102 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

SUPPORTING DOCUMENT

1. Total Pages 12

2. Title	3. Number	4. Rev No.
TANK 241-A-102 TANK CHARACTERIZATION PLAN	WHC-SD-WM-TP-358	1

5. Key Words

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

6. Author

Name: C. S. HOMI

Signature 10/4/95

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-A-102.

8. RELEASE STAMP

OFFICIAL RELEASE BY WHC DATE OCT 04 1995

RECORD OF REVISION	(1) Document Number WHC-SD-WM-TP-358	Page 1

(2) Title
TANK 241-A-102 TANK CHARACTERIZATION PLAN

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
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Tank 241-A-102
Tank Characterization Plan

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Westinghouse Hanford Company

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LIST OF ABBREVIATIONS

A-102	Tank 241-A-102
DQO	Data Quality Objective
HTCE	Historical Tank Content Estimate
DSSF	Double Shell Slurry Feed
NCPLX	Non-complexed
SST	Single-Shell Tank
SUMMA®	Trademark of Molectrics, Inc.
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-A-102 (A-102). It should be understood that the various needs and issues surrounding tank A-102 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 A-102. As necessary, this Tank Characterization Plan will be revised to reflect those changes or deviations.

Tank A-102 was constructed between 1954 and 1955 and was put into service in 1956. Initially tank A-102 received PUREX high level waste and PUREX organic wash waste from the first quarter of 1956 until the third quarter of 1961 and the third quarter of 1963 respectively. During the second quarter of 1960, the tank received PUREX low level waste. The tank received wastewater from the third quarter of 1960 until the first quarter of 1976. The tank was sluiced for strontium and cesium recovery in 1964. The tank received and contained PUREX sludge supernatant waste from the fourth quarter of 1970 until the fourth quarter of 1972. The tank was sluiced, to reduce the sludge heel for saltcake storage, from the fourth quarter of 1972 until the February 1974. The tank received high level B plant waste from the third quarter of 1974 until the first quarter of 1976. Also, from the third quarter of 1974 until the second quarter of 1975, A-102 received strontium recovery waste. Again, the tank was sluiced , during the first two quarters of 1976, to prepare it for saltcake waste storage. From this point until the first quarter of 1978, A-102 received evaporator feed. Non-complexed waste was sent to A-102 the second and third quarters of 1978, the fourth quarter of 1979 and the second and third quarters of 1980. Also, A-102 received complexed waste, from B Plant, from the first through the third quarters of 1979. Presently, the tank waste is classified as DSSF. This tank currently contains a total waste volume of 155 kL (41 kgal), which is equivalent to 37.9 centimeters (14.9 inches) of waste as measured from the baseline of the tank. The waste is comprised of 15 kL (4 kgal) of supernatant; 83 kL (22 kgal) of saltcake and 57 kL (15 kgal) of sludge with no pumpable liquid remaining (Brevick 1994a).

The tank was declared an inactive in November 1980. Tank A-102 is actively ventilated and was interim stabilized in August 1989 with intrusion prevention completed in 1982. The last photo was taken on July 20, 1989. The 1989 photographic montage indicates a thin gray to saltcake surface layer that is "cracked" in which supernate can be seen (Brevick 1994b). The last solids volume update was obtained on July 27, 1989 (Hanlon 1995).

Waste sample analyses were conducted on A-102 waste samples between May 1963 and May 1989. In December 1980, two waste samples were obtained from different levels within A-102. The results of the analyses conducted on the samples indicated that the deep sample contained solids measured to be 15 wt% while the shallow sample contained solids at 9 wt%. The solids were primarily sodium nitrate. in 1986 four samples were obtained and analyzed. These samples varied in color and texture. The most recent sample analysis was conducted in May 1989 on a sample of A-102 supernate. From this analysis it was found that A-102 contained a TOC content of 12.4 g/l.

This tank is 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 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-A-102

This section identifies the various program elements, and identifies which of these programs require characterization data from tank A-102.

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

This tank is not on the Organics Watch List, but recent work by the Organic Safety Program revealed a question regarding organic complexant salts. A potential problem with regard to the complexed salts exists if all the drainable liquid is pumped from the tank (Webb et al 1995). Sampling and analysis requirements must be performed as per *Data Quality Objective to Support Resolution of the Organic Fuel Rich Tank Safety Issue* (Babad et al 1994b). The analyses employed will determine the TOC, presence of a free organic liquid phase, moisture content and tank temperature.

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 A-102 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 A-102 are currently identified for this program element. However, if the general safety screening of tank A-102 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 A-102.

2.5.2 Pretreatment/Vitrification

Tank A-102 has not been identified as a 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 A-102 has not been identified as a primary bounding tank for any 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. Only an auger sampling event is scheduled and required. The auger sampling type has been chosen over other sampling modes due to both the depth of the tank (A-102 is a shallow tank making rotary core sampling unnecessary) and the fact that the surface of tank A-102 is comprised of saltcake.

The best current estimate of the water content in tank A-102 solids, as determined from the process records, is 45.4%; based on the HTCE (Brevick et al). Estimated (Toth et al 1995) water content in tank A-102 saltcake and sludge is 43.1% and 39.5% respectively (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. Should the measured mean be lower than anticipated or the measured variance higher, additional samples may be required. The TOC contained within the saltcake and sludge is estimated (Toth et al 1995) to be 0.6% (wet basis) for both, which is significantly lower than the level of concern. Two 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 A-102, 4 inch (10.2 cm) riser R5, 8 inch (20.3 cm) riser R2 and 12 inch (30.5 cm) riser R19. It is recommended that these risers be chosen because, they are risers that are separated radially to the maximum extent possible and; therefore, will provide a larger amount of data about the vertical and horizontal waste layers within the tank. Initial information will be taken from these 3 risers and assessed to determine if more samples are required. One additional riser is available but, equipment will have to be removed from each individual riser to utilize this riser for sampling. 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

Vapor sampling is scheduled for October 1995. Auger sampling was completed in June 1995 (Stanton 1995).

Table 4-1: Integrated DQO Requirements

Sampling Event	Applicable DQO	Sampling Requirements	Analytical Requirements
Vapor	-Health & Safety Vapor Issue Resolution DQO	3 SUMMA® canisters 6 Triple Sorbent Traps 8 Sorbent Trap Systems	Gas Flammability Gas Toxicity -Organic Vapors -Permanent Gases
Auger Sampling	-Safety Screening DQO -Organic DQO	Core samples from 2 risers separated radially to the maximum extent possible	Energetics, Moisture, Total Alpha, Total Organic Carbon, Sp.G, Cations, Anions, Radionuclides

5.0 WHEN INFORMATION IS NEEDED

Data are required for Tank A-102 during FY 1996 for safety screening and to prepare a Tank Characterization Report.

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