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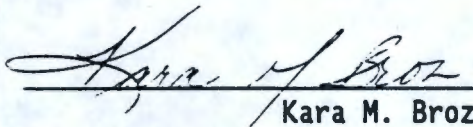
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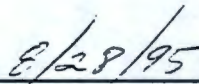
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7. Abstract This document is a plan identifies the information needed to address relevant issues concerning short-term and long-term safe storage and long-term management of Single-Shell Tank (SST) 241-TX-113.		
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# Tank 241-TX-113 Tank Characterization Plan

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## TABLE OF CONTENTS

1.0	INTRODUCTION . . . . .	1
2.0	PROGRAM ELEMENTS REQUIRING INFORMATION FOR 241-TX-113 . . . . .	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 . . . . .	5
5.0	WHEN INFORMATION IS NEEDED . . . . .	5
6.0	REFERENCES . . . . .	6

### LIST OF TABLES

Table 4-1:	Integrated DQO Requirements . . . . .	5
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## LIST OF ABBREVIATIONS

DQO	Data Quality Objective
HTCE	Historical Tank Content Estimate
NCPLX	Non-complexed
SUMMA®	Trademark of Molectrics, Inc.
SST	Single-Shell Tank
TCP	Tank Characterization Plan
TOC	Total Organic Carbon
TX-113	Tank 241-TX-113
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 (SST) 241-TX-113 (TX-113). It should be understood that the various needs and issues surrounding tank TX-113 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-113. This Tank Characterization Plan will be revised as necessary to reflect those changes or deviations.

Tank TX-113 was constructed between 1947 and 1948 and was put into service in 1950 when the tank received first cycle waste. The tank received first cycle decontamination waste until the fourth quarter of 1951. From the second quarter of 1952 until the third quarter of 1952, the tank received 242-T Evaporator saltcake waste. Presently, the waste is classified as non-complexed. This tank currently contains a total waste volume of 2,297.9 kL (607 kgal), which is equivalent to 579.6 centimeters (228.2 inches) of waste as measured from the baseline of the tank. The waste is comprised of 692.8 kL (183 kgal) of sludge and 1,605.1 kL (424 kgal) of saltcake with no pumpable liquid remaining (Brevick 1994a).

The tank was designated an assumed leaker in 1974 and was removed from service in 1977. Tank TX-113 is passively ventilated and was interim stabilized in April 1983 with intrusion prevention completed in August 1984. The last photo was taken on April 11, 1983. The 1983 photographic montage presents a waste surface that appears to be mostly all white or light yellow. There exists two reasonably large areas of a dark red material which may be due to liquid on the surface. There has been a level change since these photographs were taken and; therefore the montage is not representative of the existing tank contents. The last solids volume update was obtained on May 30, 1983 (Hanlon 1995).

One waste sample was obtained in January 1974. The sample was a yellow murky liquid containing 10% solids at room temperature. The tank was found to contain sodium, hydroxide, phosphate,  $^{134}\text{Cs}$  and  $^{137}\text{Cs}$  (Brevick 1994b).

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-113 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-113

This section identifies the various program elements, and identifies which of these programs require characterization data from tank TX-113.

## 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 has been identified by the Flammable Gas Safety Program as meeting the criteria that may indicate potential for flammable gas generation and retention. For this reason, a vapor sample is warranted (as discussed below). Not all potential flammable gas tanks require core sampling and application of the flammable gas core sampling DQO. The program has not requested application of the DQO for this tank.

### 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-113 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 exhaustor used during rotary-mode core sampling.

### 2.2.6 Criticality

No information separate from that for the general safety issue of tank TX-113 are currently identified for this program element. However, if the general safety screening of tank TX-113 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. Sampling of this tank is required to confirm the non-Watch List status.

## 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 section because tank TX-113 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-113.

### 2.5.2 Pretreatment/Vitrification

Tank TX-113 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 et al. 1995). Tank TX-113 has not been identified as a primary bounding tank.

### 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-113 are scheduled: one vapor sampling event and a rotary sampling event. No other sampling is scheduled through fiscal year 1997 (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-113 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-113 solids, as determined from the process records, is 42.5%; based on the HTCE (Brevick 1994a). Estimates (Toth et al 1995) of water content in tank TX-113 saltcake is 16.9% (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 is estimated (Toth et al 1995) to be 0.5% (wet basis), 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.

Presently there is no information on the availability of tank TX-113 risers. It is recommended that risers be chosen 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 2 risers and assessed to determine if more samples are required. Alternate sampling methods, installation of a riser or removal of equipment from risers 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 to be performed in fiscal year 1997 (Stanton 1995). Rotary mode sampling is scheduled for FY 1997 (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	Core samples from a minimum of 2 risers separated to the maximum extent possible	Energetics, Moisture, Total Alpha

## 5.0 WHEN INFORMATION IS NEEDED

Data are required for tank TX-113 during FY 1996 for safety screening and to prepare a Tank Characterization Report.

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