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TANK 241BX103 TANK CHARACTERIZATION PLAN

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7. Abstract <p>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-BX-103.</p>		
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(2) Title
TANK 241-BX-103 TANK CHARACTERIZATION PLAN

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TANK 241-BX-103 TANK CHARACTERIZATION PLAN

CHANGE CONTROL RECORD

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Tank 241-BX-103 Tank Characterization Plan

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Westinghouse Hanford Company

Date Published
October 1995

Prepared for the U.S. Department of Energy
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LIST OF ABBREVIATIONS

BX-103	Tank 241-BX-103
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-BX-103 (BX-103). It should be understood that the various needs and issues surrounding tank BX-103 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 BX-103. As necessary, this Tank Characterization Plan will be revised to reflect those changes or deviations.

Tank BX-103 was constructed between 1946 and 1947 and was put into service in September 1948. Initially tank BX-103 received metal waste from September 1948 until January 1949. The tank received and transferred waste, via cascade lines, from the third quarter of 1948 until the first quarter of 1951. In the fourth quarter of 1954 the tank was scavenged to recover the uranium from the metal waste. In the fourth quarter of 1956, BX-103 waste was sent to ditches. Between the third quarter of 1956 until the fourth quarter of 1963, tank BX-103 contained U Plant waste. From the fourth quarter of 1962 to the fourth quarter of 1963, the tank contained U Plant waste. From the first quarter of 1969 to the first quarter of 1970, BX-103 contained coating waste and organic wash waste. Between the second quarter of 1970 and the first quarter of 1975, tank BX-103 contained various types of waste, which did not originate from other tanks or processes. Also, from the first quarter of 1970 until the fourth quarter of 1973, BX-103 received wastewater. BX-103 contained ion exchange waste from the second quarter of 1975 to the second quarter of 1976. From the third quarter of 1976 until the first quarter of 1977, tank BX-103 contained evaporator feed waste. Presently, BX-103 contains non-complexed waste. This tank currently contains waste with a total waste volume of 249.9 kL (66 kgal), which is equivalent to 49.4 centimeters (19.5 inches) of waste as measured from the baseline of the tank. The waste is comprised of 15 kL (4 kgal) of supernate; 30 kL (8 kgal) of unknown waste and 204 kL (54 kgal) of sludge with no pumpable liquid remaining (Brevick 1994a).

The tank is categorized as sound and was declared inactive in 1977. Tank BX-103 is passively ventilated and interim stabilized in November 1983 with intrusion prevention completed. The last photo was taken on October 31, 1986. The 1986 montage is of poor quality and waste surface features are unidentifiable. The surface may be black (Brevick 1994b). There have been no changes in the tank since this montage was obtained; therefore, this montage description is representative of current tank contents. The last solids volume update was obtained on November 29, 1983 (Hanlon 1995).

Samples were obtained of BX-103 waste, between November of 1974 and October of 1975. All samples were liquid and remained in the liquid state even when cooled to 5°C. Two samples had a yellow color, two were brown and one was amber or light brown.

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-BX-103

This section identifies the various program elements, and identifies which of these programs require characterization data from tank BX-103.

2.1 GENERAL SAFETY ISSUES

The Tank Safety Screening Data Quality Objective (Babad 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 BX-103 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 BX-103 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 BX-103 are currently identified for this program element. However, if the general safety screening of tank BX-103 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 BX-103 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 BX-103.

2.5.2 Pretreatment/Vitrification

Tank BX-103 has 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 BX-103 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 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 BX-103 is comprised of supernatant and sludge.

The best current estimate of the water content in tank BX-103 solids, as determined from the process records, is 59.0%; based on the HTCE (Brevick 1994a). Estimated (Toth et al 1995) water content in tank BX-103 sludge is 38.2% (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. The TOC contained within the sludge is estimated (Toth et al 1995) to be 0.2% (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 show that four tank BX-103 risers have truck access. Two Push Mode samples with 1 segment each were collected from tank BX-103 in May 1995.

4.0 PRIORITY OF INFORMATION REQUIREMENTS

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

Table 4-1: Integrated DQO Requirements

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

5.0 WHEN INFORMATION IS NEEDED

Data are required for Tank BX-103 during FY 1996 for safety screening and to prepare a Tank Characterization Report.

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