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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 Double-Shell Tank (DST) 241-AN-101.

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Tank 241-AN-101

Tank Characterization Plan

C. S. Homi
Westinghouse Hanford Company

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Westinghouse
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Richland, Washington

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TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	PROGRAM ELEMENTS REQUIRING INFORMATION FOR 241-AN-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
2.3.1	Compatibility/Stabilization	3
2.3.2	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	4
2.6	HISTORICAL MODEL EVALUATION	4
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

4-1	Integrated DQO Requirements	4
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LIST OF ABBREVIATIONS

AN-101	241-AN-101
DQO	Data Quality Objective
DSSF	Double-Shell Slurry Feed
HTCE	Historical Tank Content Estimate
NCPLX	Non-complexed waste
TCP	Tank Characterization Plan
TLM	Tank Layering Model
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 Double Shell Tank 241-AN-101 (AN-101). It should be understood that the various needs and issues surrounding tank AN-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 tank AN-101. As necessary, this Tank Characterization Plan will be revised to reflect those changes or deviations.

Tank AN-101 was constructed from 1978 to 1980 and entered into service in September 1981. From the third quarter of 1982 until the second quarter of 1985, AN-101 received PUREX low level waste. During the second quarter of 1984 and the third quarter of 1985, the tank received B Plant low level waste and N Reactor waste respectively. The tank received and transferred non-complexed waste until September 1990 when it began receiving dilute non-complexed waste. As of March 1994 the tank was only receiving dilute non-complexed waste. AN-101 is currently an active dilute receiver tank and has received non-complexed saltwell and 244-BX waste. This tank currently contains non-complexed waste with a total waste volume of 3,925 kL (1,013 kgal), which is equivalent to 936 centimeters (368.4 inches) of waste as measured from the baseline of the tank. The waste is comprised entirely of supernatant with 3,925 kL (1.013 kgal) of pumpable liquid remaining (Hanlon 1995).

Samples were taken of AN-101 waste during July, 1984, March 1985 and July 1988. The March 1985 sampling effort included analyses of the heel (supernatant), UNC sulfate waste and two UNC sandfilter backwashes. The samples have exhibited a large amount of sodium nitrates and sodium nitrites with other trace anions and cations within the solution. The primary radionuclides consist of cesium and strontium with traces of other components. Furthermore, all samples were supernatant that was yellow to brown in color with very few solids (Brevick 1995b).

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-AN-101

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

2.1 GENERAL SAFETY ISSUES

The Tank Safety Screening Data Quality Objective (Dukelow 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 Organic Watch List and; therefore, no information needs are currently identified for this program element.

2.2.3 High Heat

This tank is not listed as high heat 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. This tank is not categorized in one of the above four groups, therefore characterization of the tank headspace is not needed.

2.2.6 Criticality

No information separate from that for the general safety issue of tank AN-101 are currently identified for this program element. However, if the general safety screening of tank AN-101 identifies a potential criticality concern, analyses for fissile materials and neutron sorbers 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

Tank AN-101 waste will be sampled to determine compatibility. Sampling and analysis requirements must be performed as per *Data Quality Objectives for the Waste Compatibility Program* (Fowler 1995). The analyses employed will be for transuranics (TRUs) such as ^{239}Pu and ^{241}Am , Total Organic Content (TOC), heat generation (by determining the amount of ^{90}Sr and ^{137}Cs) and measuring the "pumpability" of the waste (i.e. density, viscosity, percent of volume composed of solids...etc).

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 AN-101.

2.5.2 Pretreatment/Vitrification

Tank AN-101 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 AN-101 is not identified as a primary bounding tank for historical model evaluations.

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. A grab sampling has been scheduled and completed (on 9/14/95) in fiscal year 1995. This grab sampling event did not satisfy the requirements of safety screening. No other sampling is scheduled through fiscal year 1996 (Stanton 1995).

4.0 PRIORITY OF INFORMATION REQUIREMENTS

Grab sampling was completed on 9/14/95. Additional samples may be required to satisfy the safety screening DQO.

Table 4-1: Integrated DQO Requirements

Sampling Event	Applicable DQO	Sampling Requirements	Analytical Requirements
Grab Sampling	-Compatibility DQO	3 grab samples	Energetics, Major Anions, Cations & Radionuclides, SpG & pH, Separable Organics

5.0 WHEN INFORMATION IS NEEDED

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

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