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ENGINEERING CHANGE NOTICE

Page 1 of 2

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13a. Justification (mark one)

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13b. Justification Details
 Changed to comply with new template and DOE-RL recommended modifications.

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



Tank 241-S-112 Tank Characterization Plan

C. S. Homi
Westinghouse Hanford Company, Richland, WA 99352
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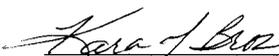
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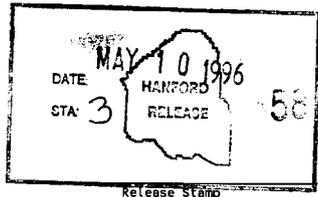
Abstract: This document is a plan that identifies the information needed to address relevant issues concerning short-term and long-term storage and long-term management of single-shell tank 241-S-112.

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Tank 241-S-112 Tank Characterization Plan

J. H. Baldwin
Westinghouse Hanford Company

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**Westinghouse
Hanford Company**

P.O. Box 1970

Richland, Washington

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1.0 INTRODUCTION

This Tank Characterization Plan (TCP) identifies the information needed to address relevant issues concerning short-term safe storage and long-term management of single-shell tank 241-S-112 (S-112). It should be understood that the various needs and issues surrounding tank S-112 are evolving as new information about the tank is uncovered. As a result of this progression, this TCP 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 S-112. This TCP will be revised as necessary to reflect those changes or deviations. This plan reflects the best information available as of May 1996.

Tank S-112 was constructed between 1950 and 1951 and was put into service in 1952. Initially tank S-112 received Reduction Oxidation (REDOX) waste, from the third quarter of 1952 until the fourth quarter of 1973. The tank received bottoms and recycle streams from the 242-S Evaporator from the first quarter of 1974 until the first quarter of 1975 when the tank was salt-filled. The tank continued to hold evaporator type waste until the first quarter of 1978. Tank S-112 contained partial neutralized feed waste from the second quarter of 1978 until reclassified as non-complexed waste in the fourth quarter of 1980. The tank is sound and was labeled inactive in 1976. Tank S-112 is passively ventilated and was partially isolated in December 1982. The tank is awaiting interim stabilization (Brevick 1995).

Tank S-112 currently contains a total waste volume of 2,411 kL (637 kgal), which is equivalent to 607 cm (239 in) of waste as measured from the baseline of the tank (Hanlon 1996).

This tank is on the Flammable Gas Watch List.

Near-term sampling and analysis activities are focused on either verifying or changing the Watch List tank status, and identifying any new safety issues. 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-S-112

This section identifies the various program elements, and identifies which of these programs require characterization data from tank S-112.

2.1 GENERAL SAFETY ISSUES

The *Tank Safety Screening Data Quality Objective* (Dukelow et al. 1995) describes the sampling and analytical requirements that are used to screen waste tanks for unidentified safety issues. Analytical requirements for the safety screening of a tank are energetics, total alpha activity, moisture content, density and flammable gas concentration.

2.2 SPECIFIC SAFETY ISSUES

2.2.1 Ferrocyanide

This tank is not on the Ferrocyanide Watch List; therefore, no information needs are currently identified for this program element.

2.2.2 Organic

This tank is not on the Organic Watch List; 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; therefore, no information needs are currently identified for this program element.

2.2.4 Flammable Gas

Tank S-112 is on the Flammable Gas Watch List. The applicable data quality objective (DQO) for this safety issue is: *Flammable Gas Safety Program: Data Requirements for Core Sample Analysis Developed through the Data Quality Objectives Process* (McDuffie 1995). However, the DQO states that core sampling of the single-shell tanks that are part of the Flammable Gas Watch List is not planned at this time.

2.2.5 Vapor

All 177 underground tanks must be vapor-sampled for organic solvent screening as per *Recommendation 93-5 Implementation Plan* (DOE-RL 1996). Some tanks may require additional vapor sampling due to other program needs. These tanks 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 exhauster permit requirements); (2) tanks on the Organic or Ferrocyanide Watch Lists; (3) tanks in C farm; and (4) tank 241-BX-104, due to vapor exposure. Information needs must satisfy *Data Quality Objectives for Tank Hazardous Vapor Safety Screening* (Osborne and Buckley 1995), and for rotary mode only, *Rotary Core Vapor Sampling Data Quality Objective* (Price 1994) and *Data Quality Objective for Regulatory Requirements for Hazardous and Radioactive Air Emissions Sampling and Analysis* (Mulkey and Markillie 1995) as amended by *Status of the Current Understanding of the Toxic Air Pollutants (TAPS)* and *Hanford Tank Farm Vapor Space Characterization; Recommended Path Forward and Justification for Continued RMCS Exhauster Operations* (Laws 1996).

Tank S-112 was vapor sampled in July 1995 in support of Osborne et al. (1995).

2.2.6 Criticality

No information separate from that for the general safety issue of tank S-112 are currently identified for this program element. However, if the general safety screening of tank S-112 identifies a potential criticality concern, analyses for fissile materials and neutron sorbers and poisons will be performed as identified in the safety screening DQO.

2.3 CONTINUING OPERATIONS

2.3.1 Compatibility/Stabilization

Tank S-112 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 such as ²³⁹Pu and ²⁴¹Am, Total Organic Content (TOC) and heat generation as determined by the amount of ⁹⁰Sr and ¹³⁷Cs.

2.3.2 Evaporator

This section does not apply to tank S-112.

2.4 DOUBLE-SHELL TANK WASTE ANALYSIS PLAN

This section does not apply because tank S-112 is a single-shell tank.

2.5 DISPOSAL

2.5.1 Retrieval

Current retrieval needs (Bloom and Nguyen 1995) do not call for test samples to be taken from tank S-112.

2.5.2 Pretreatment/Vitrification

Tank S-112 has not been identified as a bounding tank for pretreatment/disposal process development strategy (Kupfer et al. 1995). All tanks were prioritized using the pretreatment strategy in the *Tank Waste Characterization Basis* (Brown et al. 1995) document and a portion of archive sample material could be used for pretreatment testing if available. The strategy does not require any specific analyses to be done on the samples.

2.6 HISTORICAL MODEL EVALUATION

Bounding tanks and data requirements for historical model evaluations are found in DQO *Historical Model Evaluation Data Requirements* (Simpson and McCain 1995). Tank S-112 has been identified as a primary bounding tank for the saltcake waste type. All single shell tanks were prioritized in the *Tank Waste Characterization Basis* (Brown et al. 1995) document using the historical DQO.

3.0 HOW INFORMATION WILL BE OBTAINED

The number of samples required to characterize a tank is a function of waste heterogeneity and the desired confidence to make a correct decision. As directed by the safety screening DQO, if inadequate information exists to determine an appropriate number of samples, two vertical profiles will be obtained. These vertical profiles may be obtained using core, auger (for shallow tanks), or grab samples. The minimum sampling requirement of two samples is requested initially. If analysis of these profiles reveals that additional profiles are required to meet data needs, more sample profiles will be requested. Prior to rotary sampling, it is necessary to vapor sample the tank as per requirements of (Price 1994).

4.0 PRIORITY OF INFORMATION REQUIREMENTS

Vapor sampling was completed in July 1995. A 1995 grab sampling failed to retrieve any sample. Rotary mode sampling is scheduled to begin in April 1997. Grab sampling is scheduled to begin in May 1997 (Stanton 1996). Refer to Table 4-1 for the current DQO requirements and planned sampling and analytical requirements.

Table 4-1: Integrated DQO Requirements and Priorities

Sampling Event	Applicable Issues	Sampling Requirements*	Analytical Requirements*
Vapor Sampling	-Organic Solvent Layer 93-5 Vapor Issue -Rotary Mode Sampling DQO -Hazardous Vapor DQO	Steel canisters, Triple Sorbent Traps, Sorbent Trap Systems	Flammable Gas Organic Vapors Permanent Gases
Rotary Mode Core Sampling	-Safety Screening DQO -Historical Model DQO -Flammable Gas DQO (See Section 2.2.4)	Core samples from 2 risers separated to the maximum extent possible Combustible gas measurement	Flammability, Energetics, Moisture, Total alpha activity, Anions, Metals, Radionuclides, TOC
Grab Sampling	-Compatibility DQO	3 grab samples	Energetics, Moisture, Anions, Cations, Radionuclides, pH, Specific gravity, TOC, Separable organics, Total inorganic carbon, Percent solids

* Consult each applicable DQO in force at the time for analytical and sampling requirements.

5.0 WHEN INFORMATION WILL BE AVAILABLE

According to Stanton (1996), data are expected to be available from the rotary mode core sampling event for tank S-112 in August 1997. The grab sampling data are expected in September 1997. These times may be altered if the sampling schedule changes. Data are available from the July 1995 vapor sampling. Data are not available from the 1995 grab sampling.

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DISTRIBUTION SHEET

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