

ENGINEERING CHANGE NOTICE

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ECN

2. ECN Category (mark one) Supplemental <input type="checkbox"/> Direct Revision <input checked="" type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedure <input type="checkbox"/> Cancel/Void <input type="checkbox"/>	3. Originator's Name, Organization, MSIN, and Telephone No. Charles H. Mulkey, Environmental, R1-51, 373-0956	4. USQ Required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Date 01/24/01	
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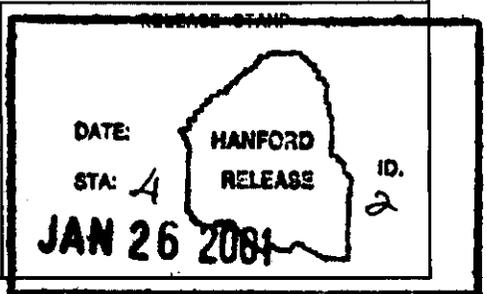
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13a. Description of Change Complete revision.	13b. Design Baseline Document? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
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14a. Justification (mark one)			
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As-Found <input type="checkbox"/>	Facilitate Const <input type="checkbox"/>	Const. Error/Omission <input type="checkbox"/>	Design Error/Omission <input type="checkbox"/>

14b. Justification Details
 The Office of River Protection has requested incorporation of revised waste acceptance criteria for polychlorinated biphenyls (PCBs).

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



DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	Environmental	Date 01/24/01
Project Title/Work Order		EDT No. N/A
RPP-6623, Rev. 1, "Management of the Polychlorinated Biphenyl Inventory in the Double-Shell Tank System"		ECN No. ECN-660373

Name	MSIN	Text With All Attach.	Text Only	Attach./Appendix Only	EDT/ECN Only
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Management of the Polychlorinated Biphenyl Inventory in the Double-Shell Tank System

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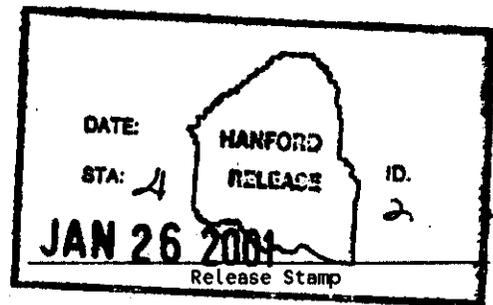
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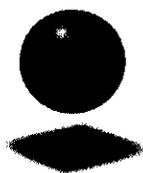
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RPP-6623
Revision 1

**MANAGEMENT OF THE POLYCHLORINATED BIPHENYL
INVENTORY IN THE DOUBLE-SHELL TANK SYSTEM**

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Hanford Group, Inc.

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TABLE OF CONTENTS

1.0 INTRODUCTION 1
 1.1 Purpose 1
 1.2 Scope..... 1
2.0 PCB WASTE ACCEPTANCE LIMITS..... 1
 2.1 PCB Waste Acceptance Criteria for External Wastes Entering The DST system 2
 2.2 Approval Criteria for Intra-TANK FARM (DST and SST) PCB Waste Transfers 3
3.0 PCB INVENTORY SYSTEM..... 3
4.0 IMPLEMENTATION OF THE PCB MANAGEMENT PLAN 5
5.0 RESPONSIBILITIES 6
6.0 REFERENCES 7

LIST OF TERMS

CHG	CH2M HILL Hanford Group, Inc.
DOE-ORP	U.S. Department of Energy, Office of River Protection
DQO	Data quality objective
DST	Double-shell tank
EPA	U.S. Environmental Protection Agency
FY	Fiscal year
PCB	Polychlorinated biphenyl
ppb	Parts per billion
ppm	Parts per million
RCRA	Resource Conservation and Recovery Act
RPP	River Protection Project
SST	Single-shell tank
TSAP	Tank Sampling and Analysis Plan
TSCA	Toxic Substance Control Act
TFC	Tank Farm Contractor
%	Percent

DEFINITIONS OF TERMS AS USED IN THIS DOCUMENT

Aroclor: An Aroclor is any of several commercial polychlorinated biphenyl mixtures and is a registered trademark of Monsanto Chemical Company for their polychlorinated biphenyls (PCBs).

DST System: The DST system includes the double-shell tanks, catch tanks, double-contained receiver tanks (DCRT), the 204-AR unloading facility, and associated piping.

DOE-ORP Facilities: DOE-ORP facilities are the DST system, the single-shell tanks and the Waste Treatment Plant.

MANAGEMENT OF THE POLYCHLORINATED BIPHENYL INVENTORY IN THE DOUBLE-SHELL TANK SYSTEM

1.0 INTRODUCTION

Some Double-Shell Tanks (DST) have received small quantities of PCBs in historic waste shipments. For this reason at least some DST waste has been determined to be PCB remediation waste by the U.S. Department of Energy, Office of River Protection (ORP) and the United States Environmental Protection Agency (EPA). This determination was documented on August 31, 2000 in the "Framework Agreement for Management of Polychlorinated Biphenyls (PCBs) in Hanford Tank Waste" (Boston, et al.). PCB remediation waste is a new category of waste promulgated in the 1998 revision to the Toxic Substances Control Act (TSCA) commonly called the Mega-Rule. The applicability of TSCA to tank farm waste resulted in the application of new requirements and the necessity to manage and track PCBs in tank waste. Some Single-Shell Tanks (SST) may also contain PCBs and may become subject to TSCA requirements.

1.1 PURPOSE

This document describes the principal methods of managing PCBs in the DST system. This document also describes waste acceptance criteria to be used in evaluating the acceptability of waste containing PCBs. The main purpose behind the transfer controls and PCB waste acceptance criteria is to ensure that the waste can be adequately treated in the Waste Treatment (vitrification) Plant. These criteria are expected to change as additional information on the treatment plant's capability becomes available.

1.2 SCOPE

This document covers all waste currently in the DST System and all waste that is sent to the DST system, including SST waste. The DST System includes 28 underground tanks, the 204-AR unloading station, catch tanks, doubly-contained receiver tanks, sumps, diversion boxes and all associated piping. Specific equipment listings can be found in U.S. DOE (2000).

2.0 PCB WASTE ACCEPTANCE LIMITS

This PCB waste acceptance criteria is based on ensuring that the Waste Treatment Plant can adequately treat any PCBs in the waste. Limiting the types of TSCA regulated waste in the DST system will allow the Waste Treatment Plant to obtain a risk-based approval for the treatment of any TSCA regulated PCBs. One key element of the Waste Treatment Plant's risk assessment is the assumption for Waste Treatment Plant feed PCB concentration. The current assumptions being used for PCBs in the feed are that solids will not exceed 50 parts per million (ppm) (dry weight) and liquids will not exceed 2.9 ppm. Because of the low solubility of PCBs in an

aqueous solution, the PCB content in tank supernate is not expected to exceed 0.2 ppm. A number of assumptions have been made regarding PCB concentrations that will be acceptable from a risk standpoint. As more data becomes available which changes or modifies the assumptions it is understood that the PCB waste acceptance criteria will be revised as necessary to ensure adequate protection of human health and the environment.

2.1 PCB WASTE ACCEPTANCE CRITERIA FOR EXTERNAL WASTES ENTERING THE DST SYSTEM

Waste entering the DST system from non-tank farm sources that contains PCBs must be able to demonstrate that the waste is not subject to TSCA or meet the following requirements:

1. Wastes must be classified as PCB remediation waste (as defined in 40 CFR 761.3), analytical waste (as regulated under 40 CFR 761.64), or R&D waste (as defined in 40 CFR 761.3) if they have detectable PCB concentrations.
2. Waste to be accepted into the DST system must contain ≤ 450 ppm (dry weight basis) PCBs in the solids and ≤ 2.9 ppm in the liquid. Wastes exceeding these levels must have ORP approval in advance of the transfer.
3. The waste shall be analyzed so that total PCB concentration can be determined. Analysis of Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260 may be used to determine total PCBs. PCB detection limits for each Aroclor or total PCB shall be as low as reasonably possible but must be ≤ 5 ppm for solids and ≤ 0.29 ppm for liquids.
4. If a sample contains $\geq 0.5\%$ solids by weight, separate analyses shall be required for both solids and liquids.
5. The analysis for PCBs shall be done using approved EPA standard methods or an alternative procedure approved by EPA.
6. Incoming waste shall meet specified limits irrespective of any dilution other than the normal mixing and dilution that occurs as part of the waste accumulation for treatment.
7. A waste transfer will not be accepted into the DST system if the transfer causes the receiving tank to exceed the PCB inventory concentration limit of 50 ppm in the solid or 2.9 ppm in the liquid. Wastes exceeding these levels must have ORP approval in advance of the transfer.
8. Waste shall meet all other DST System waste acceptance criteria.

2.2 APPROVAL CRITERIA FOR INTRA-TANK FARM (DST AND SST) PCB WASTE TRANSFERS

The following are the criteria for approval for transfers within the DST system or from the SST system into the DST system. Wastes that do not fall within the criteria below require approval by DOE-ORP prior to transfer.

1. Transfers between DSTs shall have credible PCB concentration estimates or other appropriate inventory controls. Methods for tracking PCB concentrations are discussed in Section 4.0.
2. Waste cannot be transferred within the DST system if the transfer would cause the receiving tank to exceed the PCB inventory concentration limit of 50 ppm in the solid or 2.9 ppm in the liquid. If a tank is found to exceed the limit, no transfers of incoming waste containing PCBs in excess of the limit will be allowed into that tank. It is allowable to transfer waste with a PCB concentration below the limit into a tank that exceeds the limit.
3. PCB analysis shall be in accordance with the analytical requirements specified in Section 2.1. Specific analytical requirements are also contained in "Interim Basis for PCB Sampling and Analyses" (Banning 2001) and in individual Tank Sampling and Analysis Plans (TSAP).

3.0 PCB INVENTORY SYSTEM

A PCB inventory is updated to manage PCBs in the DST system. The PCB Inventory System will be used to ensure that the feed to the Waste Treatment plant does not exceed Waste Treatment Plant PCB limits. Currently the availability of PCB data is very limited but will increase as PCB analytical data becomes available. The PCB Inventory System, which is maintained on Microsoft Excel spreadsheets, tracks the PCBs currently in the DST system and is updated as new waste is accepted into the system, and as wastes are transferred within the system. Periodic audits will ensure the database is properly maintained.

The PCB Inventory System consists of a controlled database that resides on a network share drive (\\AP010\PCBINVNTY). Most users have read-only access. Several individuals are trained to create, modify, and perform peer reviews and audits on the database. The database is defined and controlled according to *Configuration Management of the Polychlorinated Biphenyl Inventory Tracking System for Double-Shell Tanks* (Lechelt 2000).

The salient features of the PCB Inventory System include:

1. As PCB concentration data become available for each tank, the data will be entered into the baseline PCB Inventory Tracking System.
2. Separate database elements (e.g., fields in a record or worksheets in a workbook) will be used for listing:
 - Tank number.

- The as-found PCB concentration reported for each tank.
 - The volume and/or weight % of liquids and solids in each tank.
 - The density and/or specific gravity of the waste.
 - The PCB concentrations in solids calculated on a dry weight basis for each tank.
 - The PCB concentrations in liquids reported or calculated on a weight per volume basis for each tank.
 - The volume of solids in each tank.
 - The volume of liquids for each tank.
 - The total PCB concentration calculated for each tank.
 - References for the elements above.
3. For analytical data, the average of the primary and duplicate PCB analyses (when available) will be used, unless there is a reason they should not be averaged. Results that are less than the detection limit will be treated as being equal to the detection limit but will be flagged as being based on values less than detection limits.
 4. PCB concentrations will be reported as total PCBs and not per Aroclors.
 5. If analytical PCB concentrations are reported for two or more separate locations in a tank, the data will be averaged to determine an average tank concentration. Layering of liquid and solid fractions will be evaluated if significant differences in PCB concentrations are encountered.
 6. In calculations used for tracking PCB inventory, concentrations and volumes of waste transfers are determined by the following:
 - For external waste entering the DST system, the maximum limit for PCB concentration on the Waste Stream Profile Sheets will be used as the concentration of PCBs to be transferred.
 - For transfers within the DST system, laboratory data, when available, will be used for the concentration of PCBs to be transferred.
 - The planned pre-transfer volume of waste will be used for the transferred volume, until the inventory reconciliation is completed.
 - The actual volume of waste transferred will be used, after inventory reconciliation is completed.
 7. Appropriate records will be maintained so that an independent reviewer can duplicate calculations and obtain consistent results.
 8. Until PCB concentration data is available for both receiver and source tank wastes, the following criteria will be used in evaluating whether a waste transfer will cause a PCB limit in the receiver tank to be exceeded.

- If there is no PCB data on the waste in the receiving tank, a conservative estimate of 25 ppm for solids and 0.2 ppm for liquids will be used to determine the receiver tank's initial PCB inventory concentration.
- When a transfer occurs, the assumption will be made that the solids remain in the source tank unless the transfer is specifically designed to move solids (e.g. sluicing).
- PCBs in the source tank supernate are assumed to be transferred to the receiving tank.
- For non-tank farm waste receipts, the maximum values for both the PCB concentration and solids loading in the source waste will be used in calculating the PCB inventory in the receiver tank.
- The PCB inventory will be adjusted to reflect more recent analyses as the information becomes available.

4.0 IMPLEMENTATION OF THE PCB MANAGEMENT PLAN

The three main features for the management of PCBs in the DST system are discussed below. Assuming an appropriate level of funding is provided, this plan for the management of PCB wastes in the DST system will be implemented as follows.

1. Define the criteria for waste acceptance into and within the DST system, as discussed in Section 2.0.

The *Tank Farm Waste Transfer Compatibility Program* (Fowler 2000) will act as the "gatekeeper" to ensure that only wastes meeting the criteria in Section 2.0 of this document will be allowed into the DST system. The interim restrictions on waste transfers are in place in Fowler (2000). A Waste Compatibility Assessment is used for every transfer of waste into and within the DST system. Early in FY 2001, the compatibility program is expected to be updated to incorporate the waste acceptance criteria set forth in Section 2.0 of this document.

2. Create and maintain a baseline PCB inventory, as discussed in Section 3.0.
3. The "backbone" of the PCB Inventory Database (i.e., a database populated by the limited data available) has been established. The management of the database is described in *Configuration Management of the Polychlorinated Biphenyl Inventory Tracking System for Double-Shell Tanks* (Lechelt 2000). The database will be updated to include results from waste transfers, archived results, and the results from other sampling activities.

5.0 RESPONSIBILITIES

The responsibilities describe in this section are assigned to named organizations. If an organization undergoes a name change (e.g., due to reorganization), the responsibility will remain with the organization, unless otherwise directed in writing. It is assumed that an appropriate level of funding to complete the work described below will be maintained.

Process Control is responsible to:

- Prepare and maintain the PCB Inventory Tracking System database.
- Update the Tank Farm Waste Transfer Compatibility Program to incorporate the PCB waste acceptance criteria discussed in Section 2.0 of this document.
- Prepare compatibility assessments that address PCB inventory controls.

Data Development & Interpretation is responsible to:

- Revise as necessary the characterization plan for PCB baseline inventory (Nguyen 2000).
- Prepare and issue other PCB sampling and analysis plans, as necessary.
- Notify the laboratory of upcoming PCB analytical needs.

The 222-S Laboratory is responsible to:

- Develop/modify procedures for analysis for PCB as required.
- Perform PCB analysis and report results in accordance with regulatory requirements, characterization plans, Interim Basis for PCB Sampling and Analyses (Banning 2001), and TSAPs.

The Environmental Services Organization is responsible to:

- Review and approve plans for the analysis of PCBs.
- Provide funding and direction of activities that are necessary to meet TSCA requirements.
- Update, as necessary, the Compatibility DQO (Mulkey et al. 1999).
- Approve compatibility assessments.

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