0092910

U.S. Department of Energy
Office of River Protection
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

10-TPD-176

DEC 28 2010

Ms. Jane A. Hedges, Program Manager
Nuclear Waste Program
Washington State
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99354

Dear Ms. Hedges:

SUBMITTAL OF DOCUMENTATION IN FULFILLMENT OF *HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (HFFACO)* MILESTONES M-045-100 AND M-045-101

Reference: Federal Facility Agreement and Consent Order Change Control Form M-45-09-01, dated October 5, 2010.

The U.S Department of Energy, Office of River Protection (ORP) is providing two documents as required by *Hanford Federal Facility Agreement and Consent Order* (HFFACO) Milestones M-045-80 and M-045-81. These are:

1. *Single-Shell Tank System Catch Tank Assumed Leak Response Plan* (RPP-PLAN-48438, Revision 0) in response to Milestone M-045-100, and

2. *Single-Shell Tank System Component Identification and Proposed Closure Strategy* (RPP-PLAN-41977, Revision 1) in response to Milestone M-045-101.

Both of these documents have a due date of "60 days after this milestone is adopted by the Parties." Because of this short time frame, the preferred collaborative process to develop document scope and content was not able to be utilized in their preparation. As such, further discussion and revision of these documents may be required.

M-045-101
M-045-100
5-24

If you have any questions, please contact Mr. Chris Kemp for issues concerning these documents.

Sincerely,

Hay Charbonneau for

Thomas W. Fletcher, Acting Assistant Manager
Tank Farms Project

TPD:CJK

Attachments (2)

cc w/attachs:
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ATTACHMENT 1

***Single-Shell Tank System Catch Tank Assumed Leak Response Plan* (RPP-PLAN-48438, Revision 0) in response to Milestone M-045-100**

(10 pages, not including cover page)

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Single-Shell Tank System Catch Tank Assumed Leak Response Plan

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Washington River Protection Solutions, LLC
Richland, WA 99352
U.S. Department of Energy Contract DE-AC27-08RV14800

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Key Words: single-shell tank, double-contained receiver tank, leak response planning, miscellaneous underground tanks, monitored, unmonitored, formal leak assessment process

Abstract: This report contains information for completion of Hanford Federal Facility Agreement and Consent Order milestone M-045-100, and specifically discusses leak response planning for those catch tanks associated with the Single-Shell Tank System that are required to be monitored pursuant to RPP-9937, Single-Shell Tank System Leak Detection and Monitoring Functions and Requirements Document and that are also identified in the Hanford Facility Dangerous Waste Part A Permit Application, Form 3, Revision 12, for the Single-Shell Tank System.

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RPP-PLAN-48438
Revision 0

Single-Shell Tank System Catch Tank Assumed Leak Response Plan

J. W. Badden
Washington River Protection Solutions LLC

Date Published
December 2010

washington river protection solutions

Prepared for the U.S. Department of Energy
Office of River Protection

Contract No. DE-AC27-08RV14800

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LIST OF TERMS

Acronyms and Abbreviations

DCRT	double-contained receiver tank
Ecology	State of Washington Department of Ecology
SST	single-shell tank
SST System Part A	*Hanford Facility Dangerous Waste Part A Permit Application, Form 3, Revision 12, for the Single-Shell Tank System*

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This report contains information for completion of *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1989) milestone M-045-100, which states:

> *Submit to Ecology as an Agreement Primary Document a Catch Tank "assumed leak" response plan. This Plan will include criteria for declaring a tank an assumed leaker, response actions that will be taken, notifications, and provisions to ensure initiation of liquid removal within 90 days.*

This report specifically discusses leak response planning for those catch tanks associated with the Single-Shell Tank (SST) System that are required to be monitored pursuant to RPP-9937, *Single-Shell Tank System Leak Detection and Monitoring Functions and Requirements Document* and that are also identified in the *Hanford Facility Dangerous Waste Part A Permit Application, Form 3, Revision 12, for the Single-Shell Tank System* [WRPS 2010] (SST System Part A).

1.2 IDENTIFICATION AND DESCRIPTION OF SINGLE-SHELL TANK SYSTEM CATCH TANKS

Miscellaneous underground tanks consist of a number of different components. These include catch tanks, vaults and their associated tanks, cells/sumps, and double-contained receiver tanks (DCRT). For the purposes of this report, these component types are termed "catch tanks". Catch tanks discussed in this report do not include 100- or 200-series SSTs, valve pits or boxes, diversion boxes, seal pots, or other miscellaneous pits.

There are three basic types of catch tanks. The first is a single tank with no vault or secondary containment. The second type is a primary tank within a vault or secondary containment. The third type is a DCRT, which was typically used to support waste transfers prior to being taken out of service. It consists of a primary tank within a cement vault, but also had additional instrumentation and active ventilation to support waste transfers. Ventilation systems for DCRTs have been inactivated or isolated. This section addresses leak detection and intrusion detection requirements for all three types of tanks.

RPP-9937 identifies which catch tanks are required to be monitored as well as the frequency of monitoring. RPP-9937 is a primary document approved by the State of Washington Department of Ecology (Ecology) under the *Hanford Federal Facility Agreement and Consent Order* Action Plan, Section 9.0. A listing of monitored and unmonitored SST System catch tanks contained in the SST System Part A Permit Application and required to be monitored in RPP-9937 is shown in Table 1.

Table 1. Monitored and Unmonitored Catch Tanks Associated with the Single-Shell Tank System

Monitored Catch Tanks	Unmonitored Catch Tanks	
240-S-302[a]	241-AX-151	244-BXR Vault
241-A-302A	241-AZ-154[b]	Tank 011, 001, 002, 003
241-A-302B[a]	241-B-301	Sump 011,001, 002, 003
241-A-350	241-B-302B	244-CR Vault
241-A-417	241-BX-302A	Tank 001, 002, 011
241-AX-152	241-BX-302B	Sump 011, 001, 002, 003
241-AZ-151*	241-BX-302C	244-U[c] (Tank and Sump)
241-ER-311	241-BY-1TS1-TK1*	244-UR Vault
241-EW-151	241-BY-1TS1-TK2*	Tank 001, 002, 003, 004
241-S-304	241-C-301	Sump 001, 002, 003, 004
241-TX-302B[a]	241-ER-311A	244-TXR Vault
241-TX-302C	241-S-302A	Tank 001, 002, 003
241-U-301B	241-S-302B	Sump 001, 002, 003
241-UX-302A	241-SX-302	
244-A DCRT (Tank and Sump)	241-T-301B	
244-AR Vault	241-TX-302A	
Tank 001, 002, 003, 004	241-TX-302BR	
Sump 001, 002, 003	241-TX-302XB	
244-CR Vault	241-TY-302A	
Tank 003	241-TY-302B	
244-BX(Tank and Sump)		
244-S(Tank and Sump)		
244-TX(Tank and Sump)		

DCRT = Double Contained Receiver Tank

* Tank is not part of the SST System as noted in the Part A Permit Application, Revision 12, but has been added for completeness as these tanks have been previously discussed in other documentation associated with the SST System.

[a] Tank is not required to be monitored per RPP-9937, *Single-Shell Tank System Leak Detection and Monitoring Functions and Requirements Document*.

[b] Stopped monitoring in July 2008

[c] Never in service

The majority of unmonitored catch tanks have little or no current information available to ascertain whether a leak occurred. Most of these do not have any history of data being collected since at least 1980. These tanks are not discussed further in this plan.

2.0 CRITERIA FOR DECLARING A MONITORED CATCH TANK AN ASSUMED LEAKER

Tank Farm operational guidance documentation (TFC-ENG-CHEM-D-42, "Tank Leak Assessment Process") identifies a process for investigating, evaluating, and reporting a potential leak from a tank being monitored in accordance with RPP-9937. The process will result in the classification of a catch tank as either "sound" or as an "assumed leaker."

2.1 SPECIFICATION LIMITS FOR CATCH TANKS

Specification limits for triggering the TFC-ENG-CHEM-D-42 tank leak assessment for catch tanks and miscellaneous vessels are established in Section 4.0 of OSD-T-151-00031, *Operating Specifications for Tank Farm Leak Detection and Single-Shell Tank Intrusion Detection.* According to OSD-T-151-00031, trend analysis is conducted on each catch tank that is monitored. Trend analysis consists of monitoring for a decrease from the trend established by previous readings. In general, tanks with very stable levels have baselines assigned and are subject to a fixed decrease criterion that is dependent on the accuracy of the instrumentation and stability of the tank. Tanks that change significantly on a regular basis, such that maintaining a valid baseline is impractical, are evaluated using trend analysis. Trend analysis compares the most recent value with the previous data trend and looks for a change that exceeds the specification limit. The technical basis for establishment of these limits is also contained in Section 4.0 of OSD-T-151-00031.

2.2 EXCEEDENCE OF TANK LEVEL SPECIFICATION LIMITS

Any data point that is outside allowable specification limits will require evaluation according to TFC-ENG-CHEM-D-42. This evaluation will include:

- Rechecking monitoring equipment
- Resampling data to verify repeatability
- Resampling data on a weekly basis
- Evaluating alternate causes for exceedance
- If exceedance is verified, commencing a formal leak assessment process
- Preparing final assessment report and releasing it as an engineering document.

The formal leak assessment process as specified in TFC-ENG-CHEM-D-42 is based on probabilistic analysis to assess the mathematical likelihood (probability) that a specific tank is leaking or has leaked. Should the formal leak assessment process verify that a catch tank leak is likely occurring based on the probability analysis, the catch tank will be declared an assumed leaking tank.

3.0 RESPONSE ACTIONS FOR A CATCH TANK ASSUMED LEAKER

An options analysis will be initiated on any verified assumed leaking catch tank to recommend appropriate response actions immediately following verification of a leak. Response actions will be specific to the circumstances surrounding the leaking catch tank. Factors such as volume of liquid and solid residuals, composition of residuals, tank access, presence of secondary containment, and availability of sampling and analysis data will need to be considered. Specific mitigation actions for catch tanks may include:

a. Initiating of sampling and analysis of the tank where data is inadequate for analysis

b. Performing no mitigation actions for tanks with little or no free liquid; continued monitoring and surveillance

c. Pumping free liquids

d. Using absorbents to stabilize free liquids

e. Evaporating tank contents.

The tank-specific options analysis will be developed in a report and made available to Ecology for their review.

4.0 NOTIFICATIONS AND PROVISIONS FOR INITIATION OF LIQUID REMOVAL WITHIN NINETY DAYS

Within 90 days of a determination that a leak has occurred in a catch tank, mitigation activities shall commence. The U.S. Department of Energy's primary mission for the SST system focuses on retrieval and closure, while maintaining safe operation of the system. Thus baseline work addresses the items known to be of highest risk. An emerging issue, such as discovery of a leaking catch tank, requires two steps before actual remediation work can begin:

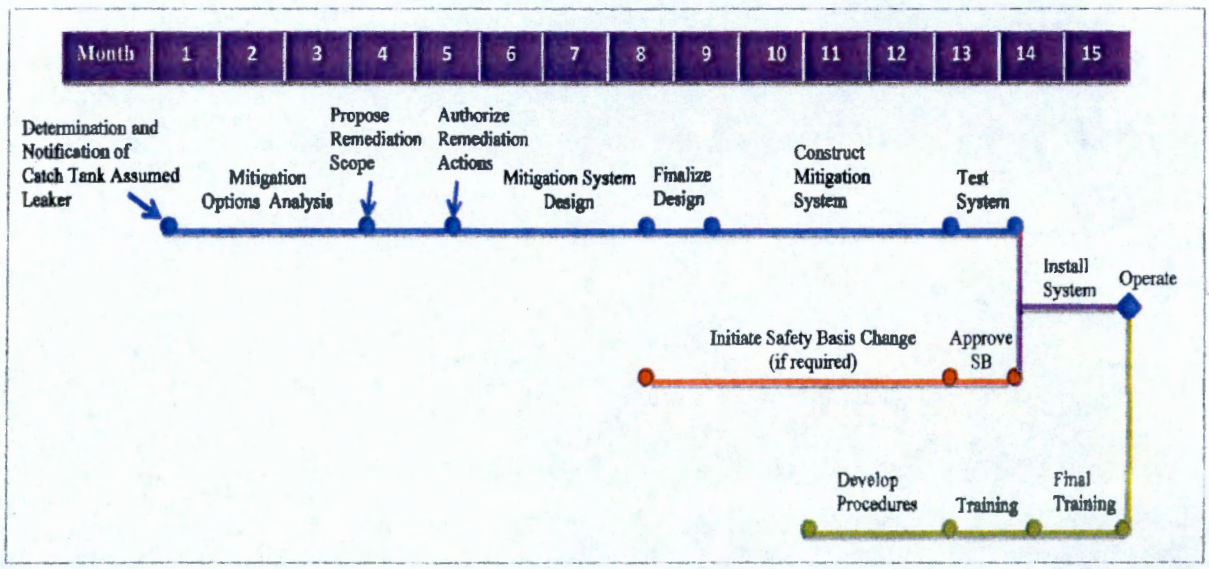
1. Planning the remediation scope (which cannot be planned in advance due to the many possible causes of the problem in different catch tanks)

2. Formal approval to proceed with implementation of the remediation scope (which may require displacing other scope).

A summary schedule of key activities that will be required for mitigation is shown in Figure 1.

After determination that a leak has occurred in a catch tank, notifications to Tank Operations Contractor environmental and management staff, DOE's Office of River Protection, and Ecology will be made in accordance with the requirements of *Washington Administrative Code* 173-303-640, "Tank Systems," subsection (7)(d).

Figure 1. Generalized Schedule for Performing Mitigation Actions at Catch Tank Assumed Leakers



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OSD-T-151-00031, 2010, *Operating Specifications for Tank Farm Leak Detection and Single-Shell Tank Intrusion Detection*, Rev. G-4, Washington River Protection Solutions, LLC, Richland, Washington.

RPP-9937, 2008, *Single-Shell Tank System Leak Detection and Monitoring Functions and Requirements Document*, Rev. 3, CH2M HILL Hanford Group, Inc., Richland, Washington.

TFC-ENG-CHEM-D-42, Rev. B-2, "Tank Leak Assessment Process," Washington River Protection Solutions, LLC, Richland, Washington.

WRPS, 2010, *Hanford Facility Dangerous Waste Part A Permit Application, Form 3, Revision 12, for the Single-Shell Tank System*, Washington River Protection Solutions, LLC, Richland, Washington.

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ATTACHMENT 2

***Single-Shell Tank System Component Identification and Proposed Closure Strategy* (RPP-PLAN-41977, Revision 1) in response to Milestone M-045-101**

(52 pages, not including cover page)

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Single-Shell Tank System Component Identification and Proposed Closure Strategy

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U.S. Department of Energy Contract DE-AC27-08RV14800

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Abstract: This report contains information for use in the formulation of final closure decisions by the U.S. Department of Energy, Office of River Protection (ORP) and the Washington State Department of Ecology (Ecology) for components that are associated with the single-shell tank (SST) system. This information includes a comprehensive listing of SST system components and a proposed strategy for closure for each. The rationale for the proposed closure strategy and its regulatory basis are also identified for each component.

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RPP-PLAN-41977
Revision 1

Single-Shell Tank System Component Identification and Proposed Closure Strategy

J. W. Badden
Washington River Protection Solutions, LLC

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washington **river** **protection** *solutions*

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LIST OF TERMS

Abbreviations and Acronyms

CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CPP	CERCLA past practice
DCRT	double-contained receiver tank
DOE	U.S. Department of Energy
DST	double-shell tank
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
HFFACO	*Hanford Federal Facility Agreement and Consent Order*
NEPA	*National Environmental Policy Act of 1969*
ORP	U.S. Department of Energy, Office of River Protection
OU	operable unit
PUREX	Plutonium Uranium Extraction (Plant)
RCRA	*Resource Conservation and Recovery Act of 1976*
RCW	*Revised Code of Washington*
REDOX	Reduction-Oxidation (S Plant)
RL	U.S. Department of Energy, Richland Operations Office
ROD	record of decision
RPP	RCRA past practice
SEPA	*State Environmental Policy Act of 1971*
SST	single-shell tank
TC&WM	Tank Closure and Waste Management
TSD	treatment, storage, or disposal
WAC	*Washington Administrative Code*
WIDS	Waste Information Data System
WMA	waste management area

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This report contains information for use in the formulation of final closure decisions by the U.S. Department of Energy (DOE), Office of River Protection (ORP) and the Washington State Department of Ecology (Ecology) for components that are associated with the single-shell tank (SST) system. This report is a requirement of *Hanford Federal Facility Agreement and Consent Order* (Ecology et al. 1989) (HFFACO) milestone M-045-101 which states:

> *Submit to Ecology as an agreement primary document a report on all Catch Tanks and associated pipelines that are identified in the SST System Part A or that have otherwise been known to be used for SST tank system operations. The report will identify DOE's proposed closure strategy for each of these tanks, and ancillary equipment. For items that are outside of the WMA boundaries, these items will be assigned either to a specific waste site operable unit (200-IS-1) or to a specific WMA for closure. The report shall provide the regulatory basis and supporting information for such assignments. For items assigned to an Operable Unit, M-16-00 processes and milestones will be followed to ensure completion of remedial actions for all non-tank farm operable units by 9/30/2024 (M-16-00). The schedules for remedial action implementation will be established by regulatory agency approval of the Remedial Design/Remedial Action work plans and is enforceable as a HFFACO requirement. For items assigned to WMAs for closure, closure milestones will be included within the applicable WMA closure schedule and milestones.*

1.2 SINGLE-SHELL TANK COMPONENT IDENTIFICATION

The *Resource Conservation and Recovery Act of 1976* (RCRA) regulations [as implemented through *Washington Administrative Code* (WAC) 173-303, "Dangerous Waste Regulations"] contain definitions that are central to the identification of SST components in this report. Key definitions are contained in WAC 173-303-040, "Definitions," and are as follows.

a. **Tank system** means a dangerous waste storage or treatment tank and its associated ancillary equipment and containment system.

b. **Ancillary equipment** means any device including, but not limited to, such devices as piping, fittings, flanges, valves, and pumps, that is used to distribute, meter, or control the flow of dangerous waste from its point of generation to a storage or treatment tank(s), between dangerous waste storage and treatment tanks to a point of disposal onsite, or to a point of shipment for disposal offsite.

c. **Component** means either the tank or ancillary equipment of a tank system.

Excluded from this report are the main tanks in the SST system, which are referred to as the 100- and 200-series tanks. This report focuses on the other structures associated with the SST system, including the miscellaneous tanks (e.g., catch tanks, vaults, double-contained receiver tanks, sumps, cells) and the ancillary equipment of the SST system. For consistency, these other structures are identified as "SST system components" throughout this report.

A simplified schematic of the SST system components that are within and excluded from the scope of this report is shown in Figure 1-1.

1.2.1 Components Within the Scope of Report

Components meeting the definition of a tank system (SST components) historically fell into two categories in accordance with the HFFACO Action Plan, Sections 6 and 7:

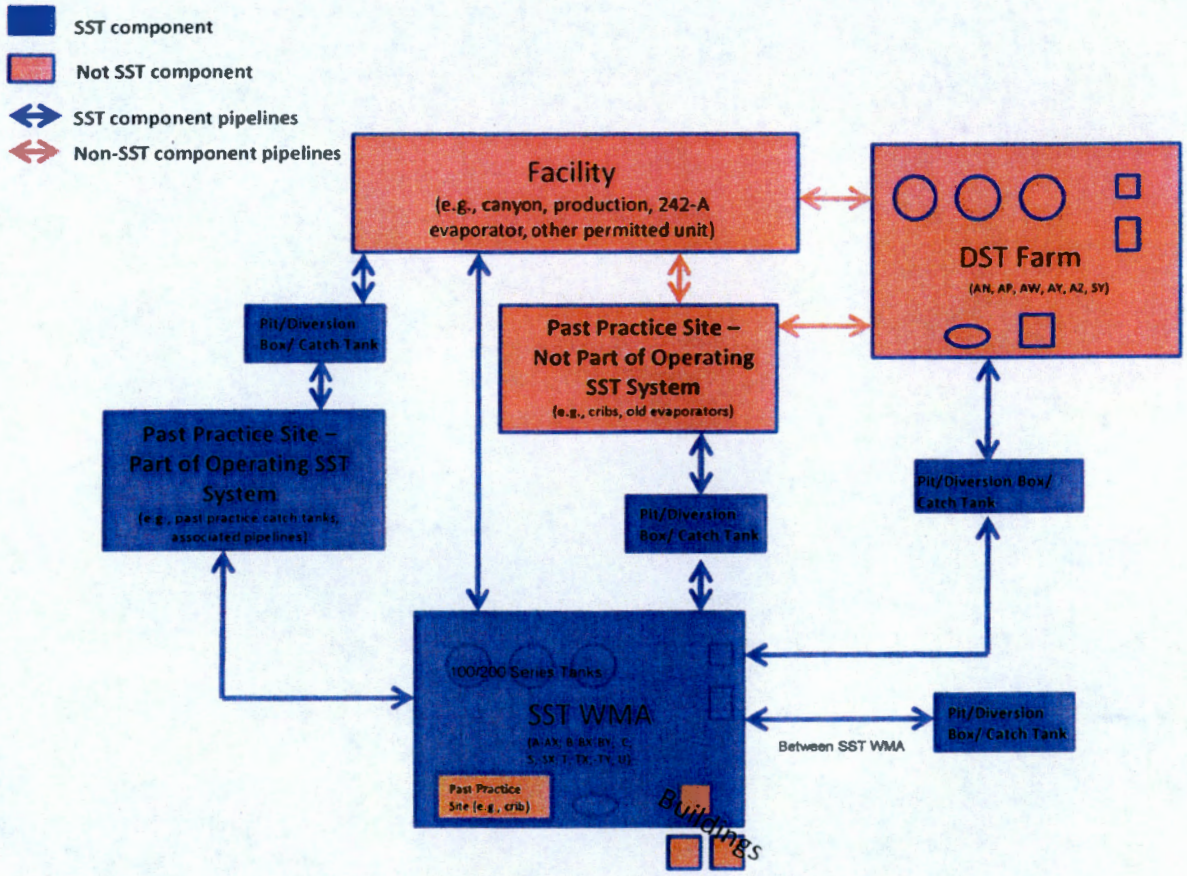
a. **Treatment, storage, or disposal (TSD) components** – The TSD components are identified in the most recent revision to the RCRA Part A Permit Application for the SST system (*Hanford Facility Dangerous Waste Part A Permit Application, Form 3, Revision 12, for the Single-Shell Tank System* [WRPS 2010]). The HFFACO Action Plan Appendix B also maintains a list of SST TSD components; however the Part A is considered a more up-to-date listing for this purpose.

b. **Past practice components** – Other components have historically been used for SST system operations. The HFFACO Action Plan Appendix C, as expanded through the Waste Information Data System (WIDS) (in accordance with HFFACO Action Plan Section 3.3), has identified these components as "past practice" sites.

The most recent SST Part A revision (Revision 12) added Appendix C past practice SST component sites to the SST Part A and therefore these sites are now defined as TSD components. Other past practice components, although not part of the SST system by definition, may be located within or adjacent to the waste management area (WMA) boundary.

At the time of this report's issuance, Appendices B and C of the HFFACO are outdated and do not reflect accurate listings of TSD or past practice components associated with the SST system. The SST System Part A Permit Application should be considered the source for identification of a TSD component regardless of its identification in the current HFFACO appendices or WIDS.

Figure 1-1. Simplified Schematic of Single-Shell Tank Components



Single-shell tank components are located both inside and outside of the SST WMA fencelines. The WMA boundaries generally delineate the geographic area that is expected to undergo common closure actions, such as capping and post-closure groundwater monitoring. There are seven WMAs within the SST system (Figure 1-2) which comprise one or more contiguous tank farm boundaries:

- WMA A-AX
- WMA B-BX-BY
- WMA C
- WMA S-SX
- WMA T
- WMA TX-TY
- WMA U.

1.2.2 Components Not Within the Scope of Report

Not included in this report are components that

a. Are or were physically isolated from the SST system (i.e., not used to distribute, meter, or control the flow of dangerous waste from, between, or to other components within the tank system).

b. Are currently or were historically separate TSD units under RCRA definition such as double-shell tanks (DSTs), evaporators, and cribs.

c. Were generating facilities that sent waste to the SST system such as canyon facilities, research and development facilities, and laboratories.

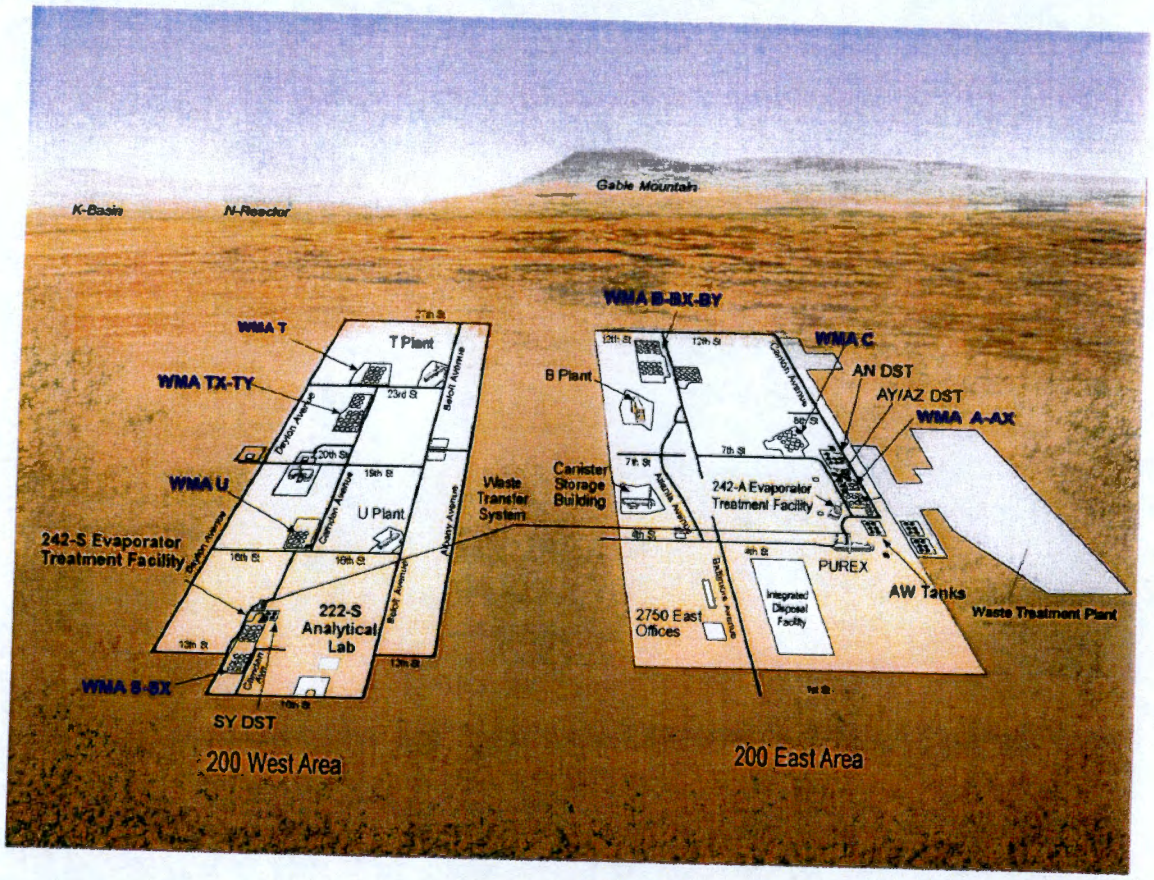
d. Are buildings such as control buildings, change rooms, and chemical makeup buildings.

e. Are transfer pipelines between the above structures or waste sites.

Some of those out-of-scope components have been identified in tank farm historical and operating documents as within SST system scope; however, they are not part of the SST system pursuant to regulatory definition. These components are miscellaneous tanks and are included in the proposed closure strategy (Chapter 4) for completeness as follows:

- 241-AX-IX ion exchange tank
- 241-BY-ITS1 in-tank solid system
- 241-BY-ITS2-TK1 in-tank solid system
- 241-BY-ITS2-TK2 in-tank solid system
- 216-BY-201 flush tank
- 242-T-135 storage tank
- 242-TA-R1 receiver tank
- 200-W-7 decontamination tank
- 200-W-126 tank farm equipment vertical storage units
- 241-Z-8 settling tank.

Figure 1-2. Single-Shell Tank Waste Management Areas and Adjacent Facilities in the 200 East Area and 200 West Area of the Hanford Site



1.3 ASSUMPTIONS

The majority of closure decisions for SST system components and remedial action decisions for other Central Plateau waste sites are yet to be made. By necessity, assumptions have been developed in this plan to form an initial planning basis for SST system component closure strategies. These assumptions were formulated based on current and best technical judgment regarding cleanup actions required by the various regulatory processes. Should these assumptions change due to new direction or information, the associated closure planning will be revised.

Key assumptions include the following.

a. Landfill closure (waste remains in place) is assumed for all WMAs including placement of a cap.

b. Assumptions have been made in this report regarding the extent of WMA. Waste management area caps are assumed to encompass the area within the current WMA fence line but will likely be extended beyond the fence line, particularly where it would be advantageous to close adjacent components under the landfill cap.

c. Landfill closure is assumed for the following waste sites that are contiguous with some of the SST components: Central Plateau canyon facilities and BY cribs.

d. Single-shell tank system components located within an assumed cap area will be closed through the decision process associated with the WMA, canyon, or other major waste site(s) for which the capping remedy was selected.

e. Single-shell tank system components outside of the effective edge of assumed caps will be closed in association with the decision process for 200-IS-1 Operable Unit (OU) or another OU based on geographic proximity and practicality of remedy implementation (e.g., excavation of an SST component that is within a geographic area that will be excavated).

f. The schedules for past practice remedial action will be established by regulatory agency [U.S. Environmental Protection Agency (EPA) and/or Ecology] approval of the Remedial Design/Remedial Action work plans.

g. The schedules for WMA closure will be included with the applicable WMA closure plan application and will be incorporated into the RCRA Site-Wide Permit (WA7 89000 8967, *Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion for the Treatment, Storage, and Disposal of Dangerous Waste*) by Ecology. The HFFACO Milestones M-045-84 and M-045-85 will require selection and schedules for submittal of WMA closure plans and risk assessments for the second and remaining WMAs by January 31, 2017 and January 31, 2021, respectively.

2.0 REGULATORY FRAMEWORK

This section provides a summary of the regulatory requirements associated with the closure of SST system components.

2.1 *HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER*

The HFFACO is a legally enforceable agreement for achieving compliance with the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) and the RCRA regulations on the Hanford Site. The HFFACO defines and ranks CERCLA and RCRA cleanup commitments, establishes responsibilities, provides a basis for budgeting, and reflects the goal of the EPA, Ecology, and ORP for achieving regulatory compliance and cleanup under its enforceable schedule.

The HFFACO classifies SST components into two categories: TSD units or past practice units. Generally, the difference between a TSD unit and a past practice unit is based on whether the unit stopped treating, storing, or disposing of RCRA regulated waste after the effective date of RCRA regulation. Because the SST system (i.e., the tank system as defined under WAC 173-303-040) stored regulated mixed waste after this effective date, which in Washington State was November 23, 1987 (52 FR 35556, "Environmental Protection Agency; 40 CFR Part 271; Washington; Final Authorization of State Hazardous Waste Management Program Revisions; Immediate Final Rule"), all of the SSTs and most of the SST components are currently defined as part of the TSD unit in the SST System Part A (Section 2.2.1.2) regardless of the date an individual tank system component may have ceased "storing" regulated mixed waste.

The HFFACO Action Plan Sections 6 and 7 describe the processes for cleanup of TSD units and past practice units, respectively. Past practice units are organized into OUs and either EPA or Ecology is assigned as the lead regulatory agency for operable unit cleanup. Cleanup of past practice units will occur either through CERCLA remedial action or RCRA corrective action (WAC 173-303-646, "Corrective Action"). Single-shell tank system components that were recognized as TSD components were included in Appendix B of the HFFACO Action Plan and those that were recognized as past practice components were included in Appendix C in association with their assigned operable unit. However, since the development of these appendices, the SST System Part A Permit Application has updated the identification of TSD components to include some, but not all, of the components from Appendix B as well as some from Appendix C and has also included components that are not in either appendix. Similarly, the WIDS has updated the identification of past practice components in Appendix C. The HFFACO Action Plan Section 7.2.1 specifies that WIDS is to be used to "maintain a current listing of OU boundaries and priorities."

The HFFACO Action Plan Milestone M-045-00 in Appendix D states that closure of all units within the boundaries of the tank farms is to occur in accordance with the RCRA-authorized dangerous waste regulations contained in WAC 173-303-610, "Closure and Post-Closure." In addition, the HFFACO requires that all work completed under the Milestone M-45 series be

conducted in compliance with HFFACO Action Plan Appendix I, "Single-Shell Tank System Waste Retrieval and Closure Process." Appendix I describes the RCRA regulatory process for closure of the SST system, as defined by the Part A Permit Application and associated soil and groundwater releases. Appendix I does not include a description of the process for past practice SST system component corrective actions.

Section 2.2.2 of HFFACO Appendix I contains a discussion of ancillary equipment closure actions. This HFFACO section discusses the need to close all SST TSD components in accordance with WAC 173-303-610 and that components outside of the WMA boundary may be closed "in tandem" with CERCLA remedial actions associated with the OU in which they reside.

2.2 *RESOURCE CONSERVATION AND RECOVERY ACT OF 1976*

2.2.1 Tank System Closure Requirements

All TSD units undergoing closure must comply with the general closure performance standard specified in WAC 173-303-610 subsection (2) "Closure performance standard." In addition closures must achieve standards specific to the type of dangerous waste unit being closed; e.g., tank systems must comply with standards at WAC 173-303-640, "Tank Systems," subsection (8) "Closure and post-closure care."

The general closure performance standard is WAC 173-303-610(2). It requires that the owner/operator must close the facility in a manner that

a. Minimizes the need for further maintenance.

b. Controls, minimizes, or eliminates to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated run-off, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere.

c. Returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity.

Unit-specific closure requirements for tank systems are specified in WAC 173-303-640(8). In addition to meeting the general closure performance standard, owner/operators of tank systems must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated soils, and structures and equipment contaminated with dangerous waste. If the owner/operator demonstrates that it is not practicable to remove or decontaminate all contaminated soils at closure, the tank system must be closed as a landfill and post-closure care must be performed as specified in WAC 173-303-665, "Landfills," subsection (6) "Closure and post-closure care." Note that although the regulations identify only consideration of "contaminated soil," generally landfill closure is required any time that unit structures, equipment, containment systems, or environmental media cannot be removed or decontaminated to clean closure levels specified in WAC 173-303-610(2).

If closure as a landfill is required, the tank system is then considered to be a landfill for purposes of closure and post-closure and requirements for landfills in WAC 173-303-610 and WAC 173-303-620, "Financial Requirements," must be met. These requirements state that the affected area must be covered with a final cover designed and constructed to meet the following requirements:

a. Provide long-term minimization of migration of liquids through the closed landfill.

b. Function with minimum maintenance.

c. Promote drainage and minimize erosion and abrasion of the cover.

d. Accommodate settling and subsidence so that the cover's integrity is maintained.

e. Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

Once the cover is in place, units that are closed as landfills must be monitored as part of "post-closure care." The purpose of post-closure care is to ensure that caps or covers function as intended and that dangerous waste remains sufficiently contained so as to protect human health and the environment. At a minimum, post-closure care monitoring includes groundwater monitoring. Post-closure care generally is required for 30 years, although a shorter or longer period may be specified in accordance with WAC 173-303-610(7)(b) as necessary to protect human health and the environment.

2.2.2 Single-Shell Tank System Part A Permit Application

The SST System Part A Permit Application is currently in Revision 12 (WRPS 2010). Early in the process of Part A development, the decision was made by Ecology and ORP to specifically list individual SST system components in tables within the SST System Part A. Through time, as new information was discovered or new decisions were made, these tables have been expanded. The SST System Part A (Revision 12) listings include components identified in HFFACO Appendix B (TSD components) and Appendix C (past practice components) and past practice components identified in WIDS.

2.2.3 Single-Shell Tank Closure Permit Process and Draft Permit Conditions

The Site-Wide Permit is expected to be modified in the near future to include general closure requirements for the SST system. Specific closure activities to meet these requirements will be developed in RCRA closure plan applications for individual SST system components or groups of components. Closure plan applications will form the basis for further modifications to the Site-Wide Permit to authorize the implementation of specific component closure activities. The SST system closure plans are depicted in HFFACO Action Plan Appendix I as a three-tiered document process. The highest level document section (Tier 1) addresses closure topics and issues pertaining to the SST system. The mid-level section (Tier 2) addresses specific WMA

closure activities. The lowest level document in the hierarchy (Tier 3) addresses closure activities for specific components within a particular WMA.

The RCRA closure approval process is defined in Figure 9-2 of the HFFACO Action Plan. This process is typically initiated by ORP submittal of a draft closure plan followed by Ecology review and resolution of issues. On resolution, Ecology typically drafts permit conditions based on the closure plans and then provides for public notification and public review. On resolution of any public comments, Ecology will issue the permit modification. The time frames for completing this work are variable depending on the complexity of the closure and the urgency needed for authorizing the decisions; however, Figure 9-2 of the HFFACO Action Plan gives general time frames for completion of this process.

2.3 *ATOMIC ENERGY ACT OF 1954* AND DOE O 435.1, *RADIOACTIVE WASTE MANAGEMENT*

Under authority of the *Atomic Energy Act of 1954*, DOE regulates the closure of its facilities containing radioactive materials. The primary mechanism for this regulation is DOE O 435.1, *Radioactive Waste Management*, and the associated documents (particularly DOE M 435.1-1, *Radioactive Waste Management Manual*).

The DOE requires a multistep process for closure of the SST system:

a. Classification of waste.

b. DOE Tier 1 closure plan.

c. DOE Tier 2 closure plan.

d. Post-closure monitoring plan.

The DOE Tier 1 closure plan defines the approach and plans by which closure of each facility within the site is to be accomplished. A DOE Tier 2 closure plan provides the detailed information related to a specific unit or facility closure action that is bounded by the analyses contained in the Tier 1 plan. The Tier 2 closure plan should demonstrate that the performance objectives identified in the Tier 2 closure plan documentation can be met and maintained. The final documentation shows that the as-closed facility meets the requirements established in the DOE Tier 1 closure plan.

2.4 *NATIONAL ENVIRONMENTAL POLICY ACT OF 1969*/"STATE ENVIRONMENTAL POLICY ACT OF 1971"

Resource Conservation and Recovery Act closure and corrective actions, in contrast to CERCLA remedial actions, require separate determinations under the *National Environmental Policy Act of 1969* (NEPA) and RCW 43.21C, "State Environmental Policy Act of 1971" (SEPA). The Tank Closure and Waste Management (TC&WM) Environmental Impact Statement (EIS) is currently under development and will in part analyze SST system closure alternatives, including clean and

landfill closure. After the final EIS is complete, DOE will issue a record of decision (ROD). The decisions from the TC&WM EIS ROD and SEPA determinations will outline a path for closure of the WMAs.

Federal agencies must comply with NEPA for any irreversible actions that may impact the environment. The SEPA is intended to ensure that environmental values are considered during decision making by State and local agencies during the permitting process. It gives State and local agencies the tools to allow them to both consider and mitigate environmental impacts of proposed actions.

The SEPA rules state that no action that would foreclose options shall be taken until a SEPA analysis is completed. The SEPA requires decision-making agencies, such as Ecology, to conduct an evaluation of proposals in accordance with WAC 197-11, "SEPA Rules," to determine the potential significance of impacts to the environment and public health. In lieu of preparing a separate SEPA EIS, Ecology has the option to adopt a NEPA EIS if certain requirements in WAC 197-11-610, "Use of NEPA Documents," subsection (3) are met or if they cooperated with a Federal agency that is preparing an EIS. As a cooperating agency, Ecology may participate in a range of activities associated with the preparation of an EIS, including coauthoring a document, providing input to development of alternatives, or similar actions. The decisions that result from both the final TC&WM EIS and subsequent ROD and Ecology's SEPA determinations will impact closure and corrective actions at WMAs.

2.5 CENTRAL PLATEAU INTEGRATION OF PAST PRACTICE CLEANUP ACTIONS

The cleanup of SST system TSD and past practice components will require integration with Central Plateau cleanup actions to be performed under either the CERCLA or RCRA past practice process.

Three situations exist that will require integration of SST system component closures with a Central Plateau past practice decision path:

a. Past practice waste sites within the WMA fenceline.

b. Past practice waste sites outside of the WMA fenceline.

c. 200-IS-1 OU waste sites.

2.5.1 Past Practice Waste Sites Within the Waste Management Area Fenceline

Some non-SST component past practice waste sites are situated within a WMA fenceline. Some of these waste sites are currently scheduled to undergo remedy decision making as part of Central Plateau past practice activities. However, because of the potential impact of WMA remedy selection on these sites, and vice versa, coordination of the sequence and implementation of the remedy needs to be considered when making SST system component decisions and schedules for WMA closure.

2.5.2 Past Practice Waste Sites Outside of the Waste Management Area Fenceline

Outside of the WMAs, contiguous past practice contaminated soil sites may be impacted by WMA-selected remedies and vice versa. Cleanup activities for these waste sites will require close coordination with SST system component characterization, corrective actions, and closure activities. For example, waste sites that are in close proximity to a surface barrier for a WMA may most effectively be remediated through expansion of the WMA barrier.

2.5.3 200-IS-1 Operable Unit

One specific RCRA past practice OU, the 200-IS-1 OU, encompasses SST system pipelines and components outside of the WMAs and Central Plateau facilities DOE/RL-2002-14, *Tanks/Lines/Pits/Boxes/Septic Tank and Drain Field Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan; Includes: 200-IS-1 and 200-ST-1 Operable Units* was issued in 2008 for purposes of directing characterization activities in support of remedy decision making. Recent changes to the HFFACO reflect DOE's new approach to cleaning up the Central Plateau. Changes call for the development of a revised Work Plan for the 200-IS-1 OU. This revised Work Plan is currently going through a scoping process with EPA and Ecology which will describe characterization needs and the approach to remedy development and selection for 200-IS-1. Cleanup and closure of these pipelines and components will be accomplished in a manner consistent with the Central Plateau cleanup strategy.

3.0 SINGLE-SHELL TANK COMPONENT IDENTIFICATION AND ATTRIBUTES

3.1 DIVERSION BOXES

The classification of diversion boxes includes valve pits, a diverter station, and actual diversion boxes. This classification of diversion boxes mostly consists of reinforced-concrete boxes located below grade that are used to direct the flow of waste from one point to another point in the tank farm facilities. Inside the box, the transfer of waste is accomplished by either movable jumper pipes, jumper pipes with valves, or a receiver tank with a movable spout.

Diversion boxes provided a flexible method of redirecting the liquid waste flow path to various locations in the 200 East and 200 West Areas. They also provided for the capture and containment of leaks in transfer pipes (which drain back to the boxes via concrete or pipe-in-pipe encasements) and leaks at jumper-nozzle connections. The box structures have floor drains to prevent the buildup of contaminated waste from spills and leaks. The waste would drain from the concrete boxes to catch tanks, catch stations, or, in some cases, to the tank themselves including some DSTs. The floors and walls of some of these boxes are lined with special coatings or stainless steel to protect the concrete from the chemicals in the waste and to prevent leakage to the environment.

Some diversion boxes are large, covered, underground, reinforced-concrete structures that received at least two sets of pipelines. The pipe sets entered the diversion box at different levels through one wall. Each pipe had a special end-fitting that permitted the secure attachment of either flexible or rigid pipes, also known as "jumpers" (Figure 3-1).

Transfer routes can be changed by moving the jumper pipes to connect to different nozzles in the box (nozzles are pipeline and connectors inside of the box), by resetting the valves to different positions, or by rotating the spout and connecting to different exit pipe funnels, depending on the existing equipment in the box (see Figures 3-2 and 3-3 for a typical diversion box layout).

Some diversion boxes are large, covered, underground, reinforced-concrete structures that received at least two (and up to four) sets of pipelines. The pipe sets entered the diversion box at different levels through one wall. Each pipe had a special end-fitting that permitted the secure attachment of either flexible or rigid pipes, also known as "jumpers" (Figure 3-1).

All connections were made manually using remote equipment. Each jumper was fabricated to custom fit to the desired pair of incoming and outgoing pipes. To assist with gravity flow, pipelines coming in from the facility were located on the higher elevation of pipes, while lines leading to tank farms were on the lower elevation. Connections could be routed for flow in either direction, as several of the separations processes retrieved wastes from the tank farms and transferred the material to the facility.

Diversion boxes vary in size but were typically constructed 17 to 20 ft deep, by 6 to 10 ft wide, by 25 to 40 ft long. All but the uppermost portion of the diversion box is below ground. Each diversion box is covered with a series of thick-stepped cover blocks that prevented ready

migration of contaminants out of the box. Cover blocks were removed when a routing change was required (Figure 3-4).

Figure 3-1. Pipe Penetrations/Jumper Connection 241-C-151 Diversion Box (1985)

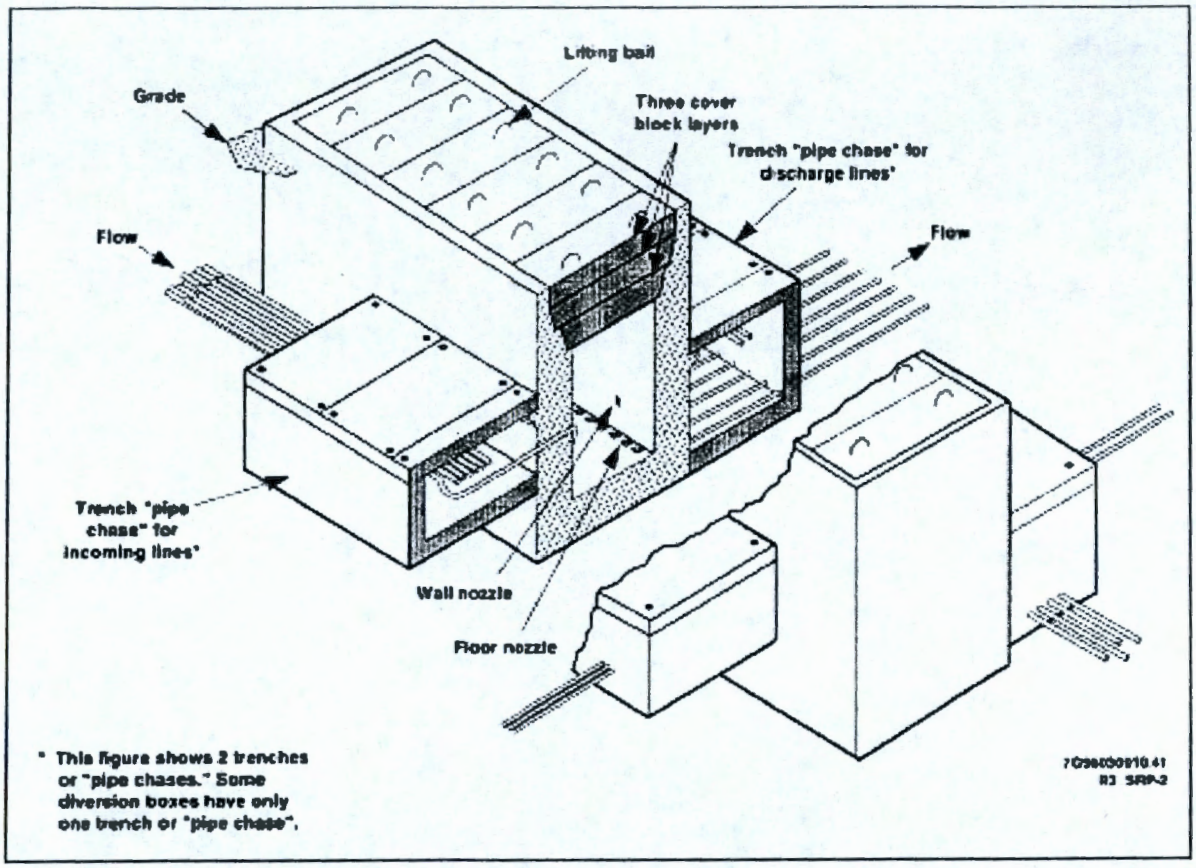
Connecting pipelines were either direct buried or were encased up to the outside wall of the diversion box. There they mated with preinstalled pipe that penetrated the box wall. Catch tanks were built at an elevation below that of the floor of the diversion box and collected liquid wastes spilled in the box when routings were changed, thereby containing the release. The jumpers are thought to have been allowed to drain onto the floor when the connection was broken, leading to internal contamination of the box. Figure 3-1 illustrates the type of contamination a diversion box would likely contain. Figure 3-5 shows the configuration of a typical diversion and catch tank.

3.2 DIVERTER STATION

The diverter station was used to allow waste streams coming into the diverter station to be routed to various waste receiving tanks in the tank farms. Waste was piped into small diverter tanks located in individual cells and routed, through the use of an adjustable spout on the bottom of the diverter tank, to a storage tank. Each of these four diverter cells and a pump pit had floor drains,

which led to the common catch tank located directly below the diverter stations. Figure 3-6 illustrates a typical diverter station.

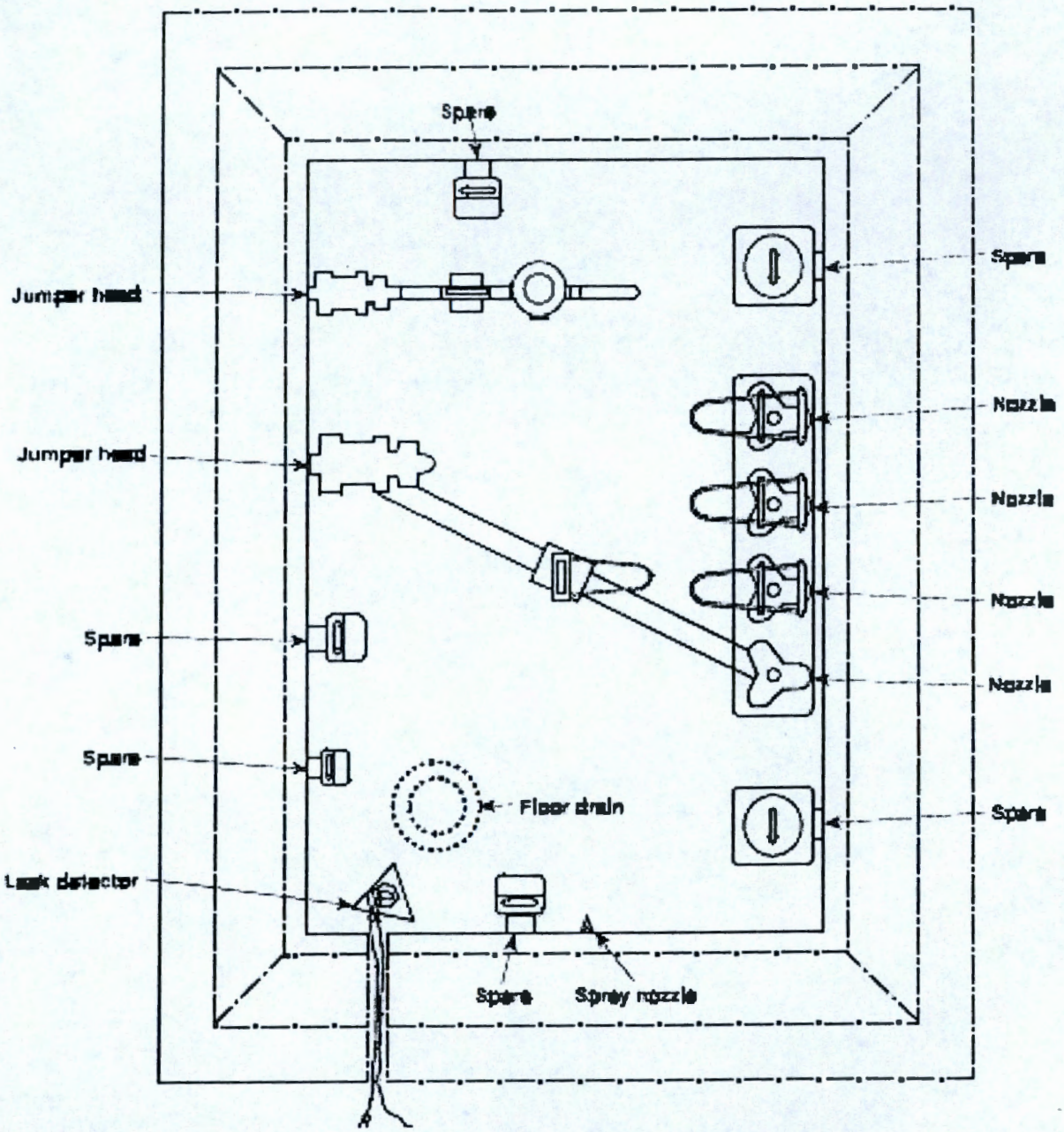
Figure 3-2. Typical Diversion Box



The 241-AX-152 diverter station is perhaps the most complex of its type on the Hanford Site. For example, there are a total of 53 penetrations that enter into the station (HNF-3441, *AX Tank Farm Ancillary Equipment Study*). Another indication of its complexity is the physical number of drawings associated with the structure; as many as 32 drawings. This diverter station is used to describe the elements of diverter stations.

The AX-152 diverter station structure is a rectangular two-tier reinforced-concrete vault designed and built in 1962 and 1963. The upper tier has two compartments (H-2-44580, *Structural 241-AX-152 – Diverter Station Plans & Sections*), a pump pit, and a diverter pit that house diverter operators A and B (H-2-44681, *241-AX-152 Diverter Sta. Piping & Equipment Arrangement – Plans*). The lower compartment designated as the catch tank vault serves as the main reservoir for temporary waste storage. The exterior of the vault on the north side, a system of buttress type reinforced-concrete walls and a beam supports a 24-in.-diameter vapor vent header.

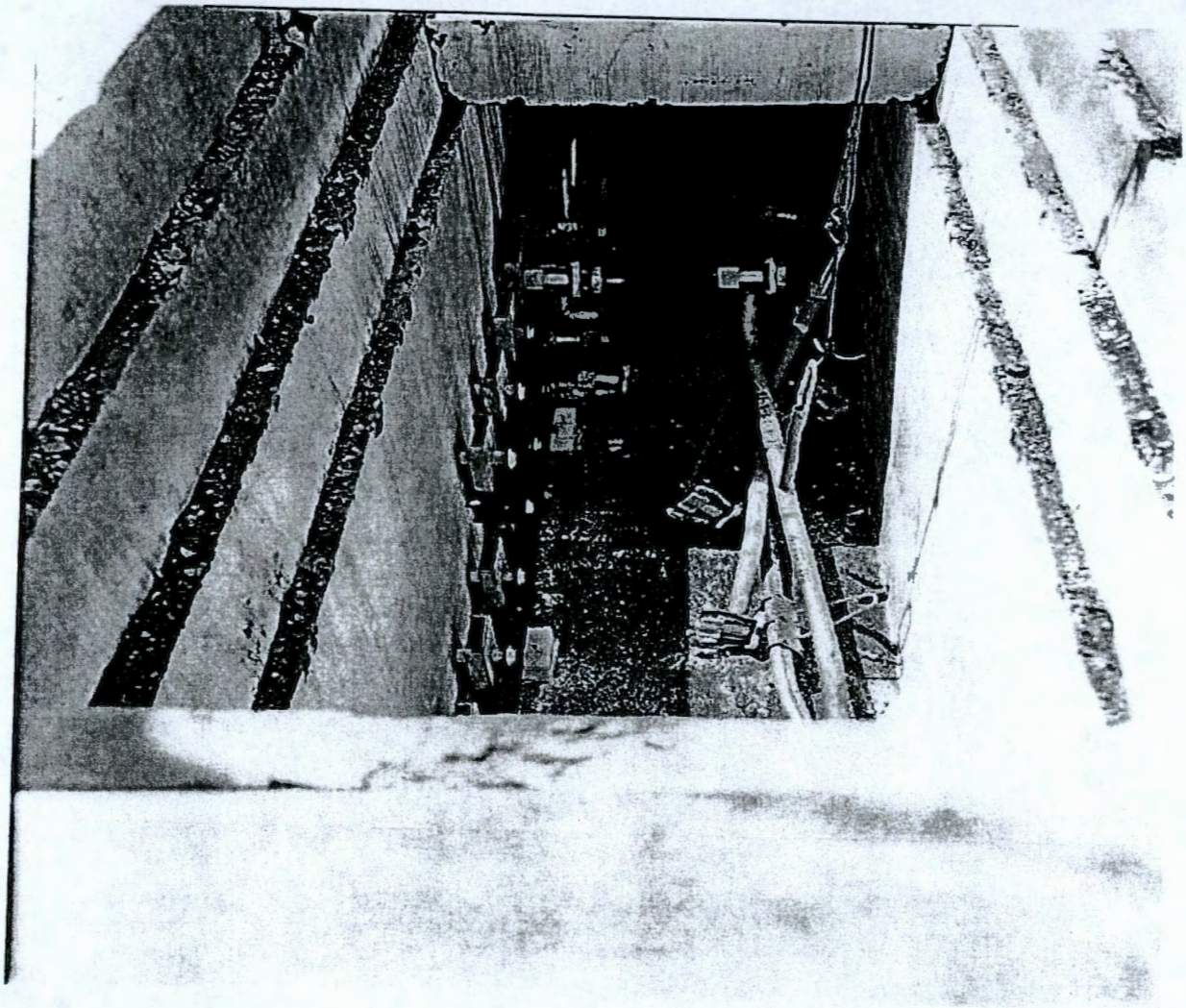
Figure 3-3. Typical Diversion Box Operating Connections



The bottom slab of the AX-152 diverter station is approximately 30 ft below grade. The overall dimensions are approximately 13 ft wide by 37 ft long by 30 ft deep (H-2-44580). For inside dimensions, geometric details, as well as the catch tank sump details, refer to Hanford drawing numbers H-2-44580 and H-2-44581, *Structural-241-AX-152 Diverter Station & Valve Pit Sections & Details*. The upper cell floor slab is sloped towards a floor drain that empties into the catch tank vault below (HNF-SD-WM-BIO-001, *Tank Waste Remediation System Basis for Interim Operation*). The diverter cell floor and up to 11-ft high of each wall are lined with 1/8-in.-thick ASTM International (ASTM) A240-61T, Type 304L stainless steel plate

(WHC-SD-WM-ER-573, *Catch Tanks Inhibitor Addition 200-East and 200-West Areas*). The inside surfaces of the pump pit walls, floor slab, and all cover block are coated with a protective coating (HNF-SD-WM-BIO-001). There are a total of 53 pipe penetrations into the AX-152 diverter station (HNF-3441).

Figure 3-4. 241-C-252 Diversion Box (three sets of cover blocks removed)



3.2.1 Diverter Station Pump Pit

The pump pit (reinforced concrete about 8 ft deep by 6 ft long, by 6 ft wide) houses the submersible pump, jumpers, and other ancillary equipment, and serves as secondary containment to the transfer lines and directs any leakage, such as transfer waste, rainwater, and snowmelt, into the AX-152 catch tank vault. Both upper cells, the pump, and diverter pits have a system of interlocking and removable concrete cover blocks for external access at ground level (H-2-44582, *Structural-241-AX-152 Diverter Station Removable Cover Blocks*).

Figure 3-5. Generalized Configuration of a Typical Diversion Box and Catch Tank

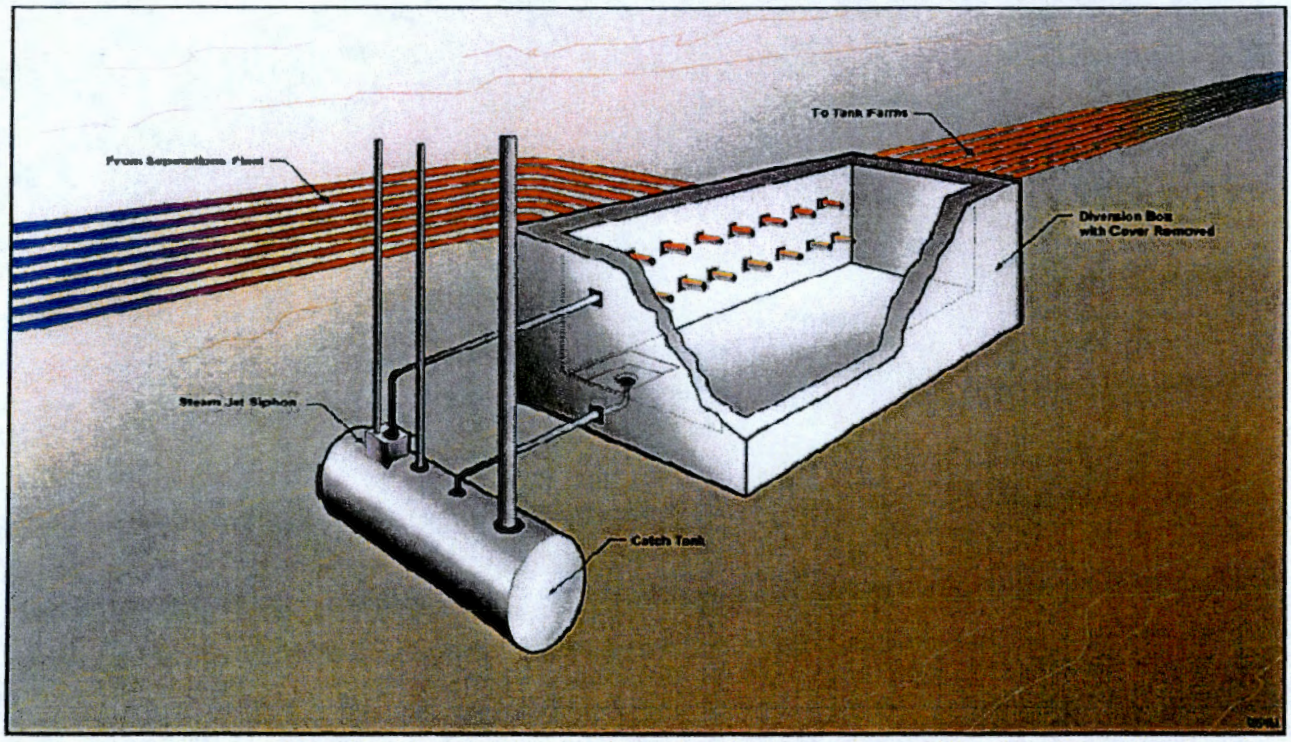
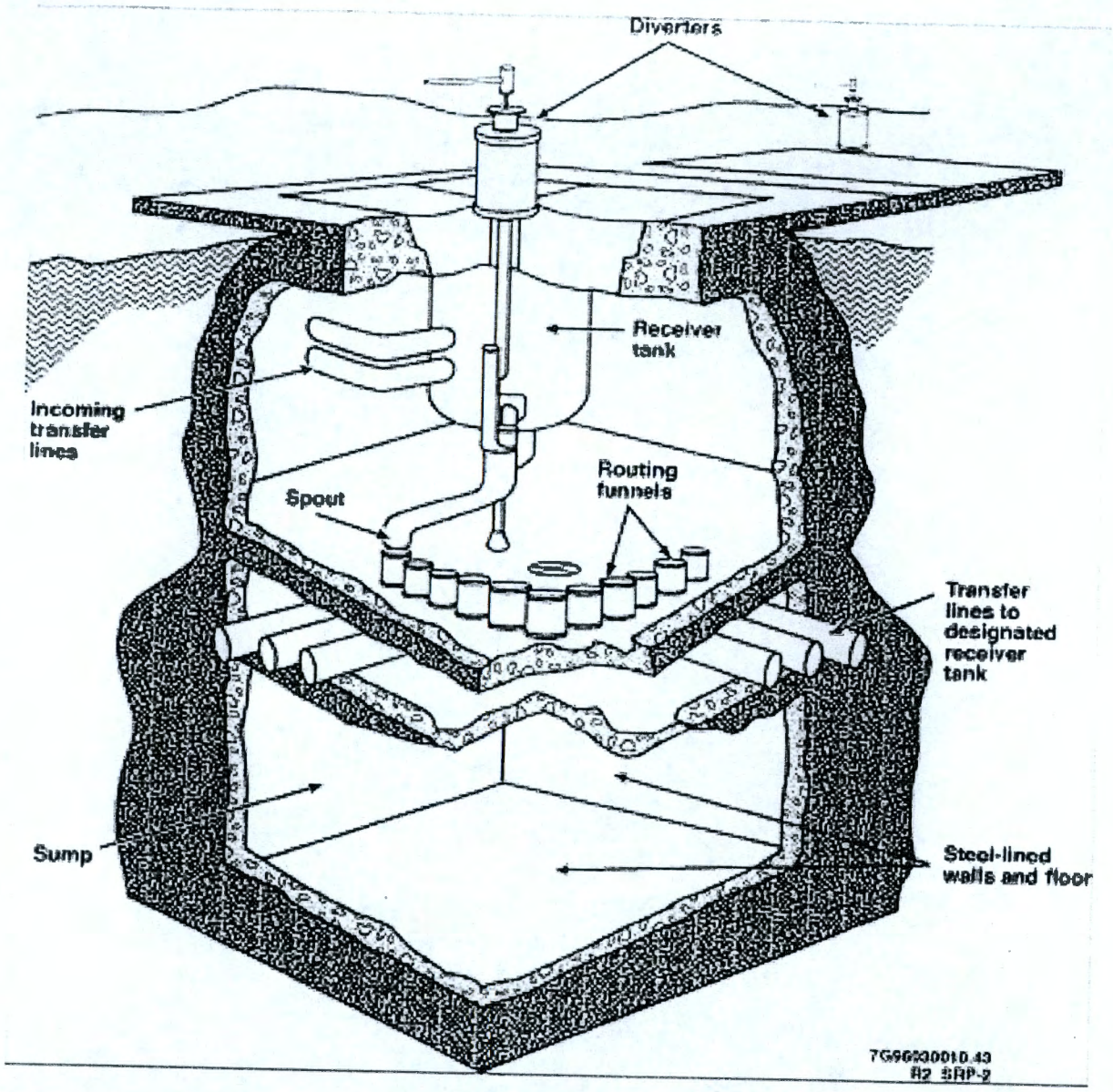


Figure 3-6. Typical Diverter Station



3.2.2 Diverter Station Diverter Pit

The diverter cell (reinforced concrete about 8 ft deep by 6 ft wide by 13 ft long) contains two vessels (operator A and operator B). The vessels are 29 1/8 in. in diameter and are constructed of stainless steel. The vessels have a maximum capacity of 50 gal and a movable spout is located on the bottom of the vessel, which can direct waste out of a vessel to one of several exit pipe nozzles. The spout is moved via a crank hoist mounted on top of the cover block (FDM-T-020-00002, *Waste Transfer and Routing Facility Description Manual*). The diverter cell provides only gravity flow from the vessels forward. Thus, waste flows in one direction only and is limited to a maximum flow rate of 75 gpm (FDM-T-020-00002).

3.2.3 Diverter Station Catch Tank Vault

The inside dimensions of the catch tank vault are 6 ft wide by 22 ft 2 in. long by 11 ft 5 in. deep. The catch tank inside surfaces (top, bottom, and side) are lined with 1/8-in.-thick ASTM A240-61T, Type 304L stainless steel plate (WHC-SD-WM-ER-573). The catch tank end walls are 30 in. thick while the longer sidewalls are 18 in. thick. The bottom floor slab is 24 in. thick at the outer edges and tapers (slopes) to a thickness of 18 in. at the sump pit. A pipe riser extends from the pump pit floor to the catch tank sump (WHC-SD-WM-EV-040, *Double Shell Tank Ancillary Equipment Secondary Containment Evaluation*). The catch tank has a maximum capacity of 11,000 gal, and the maximum liquid storage limit administratively allowed (when the tank was in service) was 8,800 gal (WHC-SD-WM-TI-352, *Technical Basis for OSD-151-00015*).

The drainage sources that are closest to the catch tank come from its overhead pump pit and diverter pit; the remaining sources are of leaks or spills. The diverter pit (with its two, nine-station, A and B diverter tanks) sits directly above the catch tank. Ostensibly there is no floor drain noted in the structural drawing (H-2-44583, *Structural 241-AX-1 Diverter Station Liners*). However, Detail "A" in drawing H-2-44682, *241-AX-152 Diverter Sta. Piping Details*, shows a small (unobtrusive) space between each of the nine piping penetrations (per each diverter tank A and B) that pass through the lined diverter pit floor. This space provides the drainage path for any leaks that collect in the approximately 11-in.-high diverter pit stainless steel pan. One 4-in. drain connects the pump pit with the catch tank.

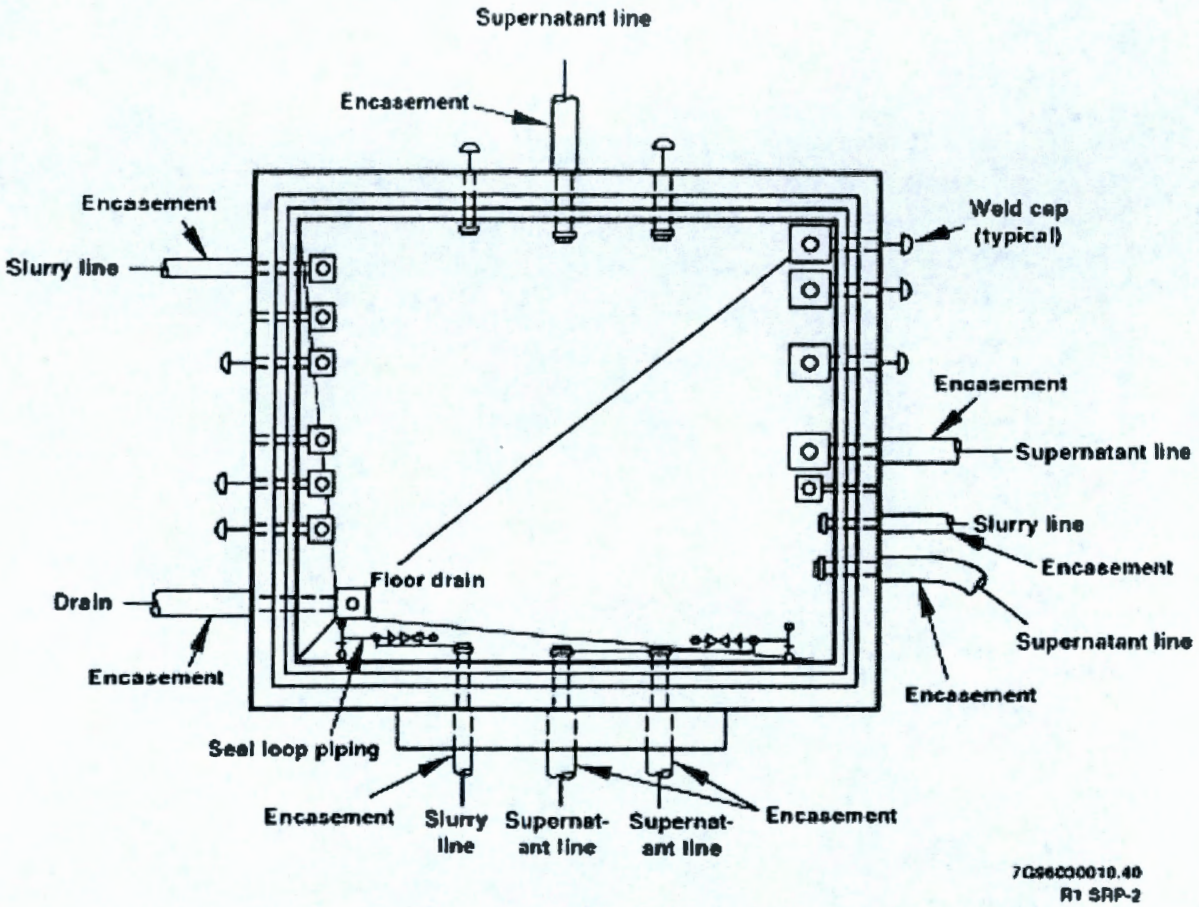
3.3 VALVE PITS

A valve pit or box is a below-ground, reinforced-concrete structure used to route wastes between pipelines leading to two waste sites. For a very long crib (up to 1,400 ft), valve pits were also used to more evenly distribute flow over both halves of the crib. These structures were most commonly associated with pipelines that relied on gravity flow of low-activity and moderate-activity waste streams that discharged to cribs, ponds, or ditches. Figure 3-7 shows a typical valve pit.

For some pits/boxes, pipelines passed through the structure with no open flow. Intersecting pipes were connected at tee or union fittings. Valves were built into the pipeline and were opened or closed to change flow routings. Other valve pits/boxes were designed to allow open wastewater flow within the pit. The incoming pipe terminated at the edge of the pit/box and water then flowed through the box before exiting at another pipeline. Changes in routing were through a series of movable dams, or stop logs, as well as slide gates that covered the opening of the receiving pipe. Valve and gate handles were extended through the pit/box cover to permit remote operation.

Valve pits were generally smaller structures than diversion boxes. Sizes ranged up to 15 ft by 10 ft at the surface and they were constructed to depths of 12 to 15 ft, depending on the depth of the buried pipeline. These structures usually carried a "216-" series prefix and a designation that was associated with the waste site to which the flow was directed. The interiors of the valve pits could be accessed through hatches in the cover.

Figure 3-7. Typical Valve Pit



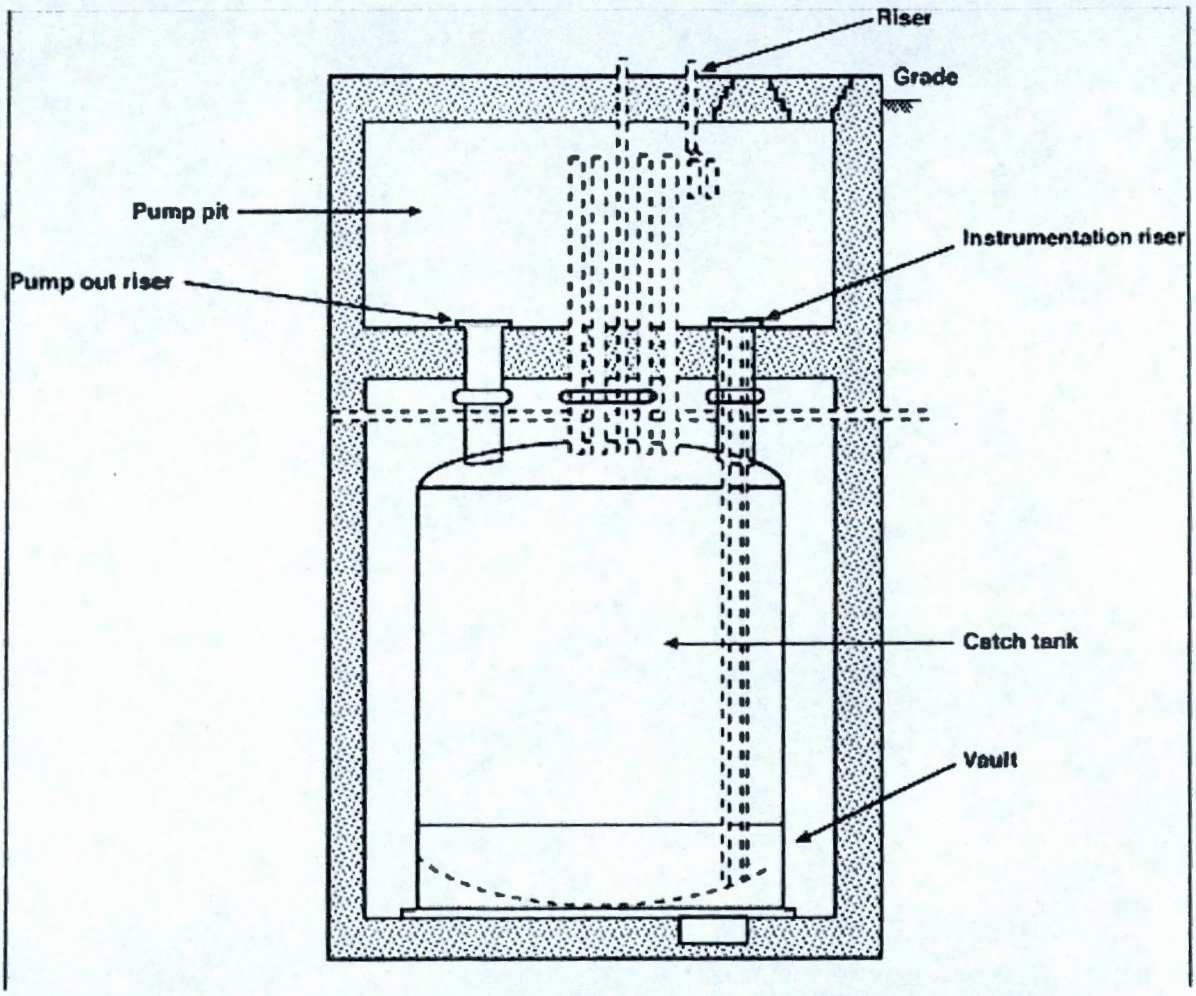
3.4 CATCH TANKS AND VAULTS

Catch tanks were built in conjunction with diversion boxes to contain high-activity wastes spilled during changes in pipeline routings. The tanks are direct-buried, underground storage tanks, generally constructed of carbon steel. Sump pits in the diversion box collected the liquid and were connected by piping to the catch tank. With the advent of encased pipelines, leaks were anticipated and a provision was made to collect the liquid released into the nearest down-gradient catch tank. In some cases, a catch tank served more than one diversion box, particularly around tank farms. The catch tanks were usually located within 50 ft of the diversion box. Catch tanks could be emptied to diversion boxes through an underground pump-out line. Each catch tank is equipped with a liquid-level sensor and a pump-pit leak indicator. Activation of the leak detection alarm caused a shutdown of transfer operations.

Catch tanks range between 7 and 9 ft in diameter and 25 to 35 ft long, with storage capacities of 8,000 to 12,000 gal. Catch tank designs changed as new diversion boxes were added to manage waste streams. Catch tanks were located at depths of 25 to 35 ft, considerably deeper than the floor of the diversion box to provide complete drainage of a leak or spill. A series of risers

extended to above the ground surface and were used to monitor liquid levels, collect samples, pump out tank contents, and permit chemical additions. Steam jets or in-tank pumps were later added with piping that led back to the diversion box for ready transfer to the facility or tank farm. Some catch tanks have been replaced due to leaks or vessel failure. Figures 3-8 and 3-9 show typical catch tank designs in vaults and direct buried, respectively.

Figure 3-8. Typical Catch Tank in Vault



Vaults consist of shielded enclosures housing waste processing equipment. Tanks and tank sumps are contained within the shielded vaults. There is an extensive network of pipelines that are integral elements of vaults. The vaults operated to collect, clarify and allow physical and chemical modification of waste before transfer to other system components. Vault tank storage capacities range from 1,000 to 50,000 gal. Figure 3-10 shows a typical 244-series vault, illustrated by the 244-CR Vault.

Figure 3-9. Typical Direct Buried Catch Tank Designs

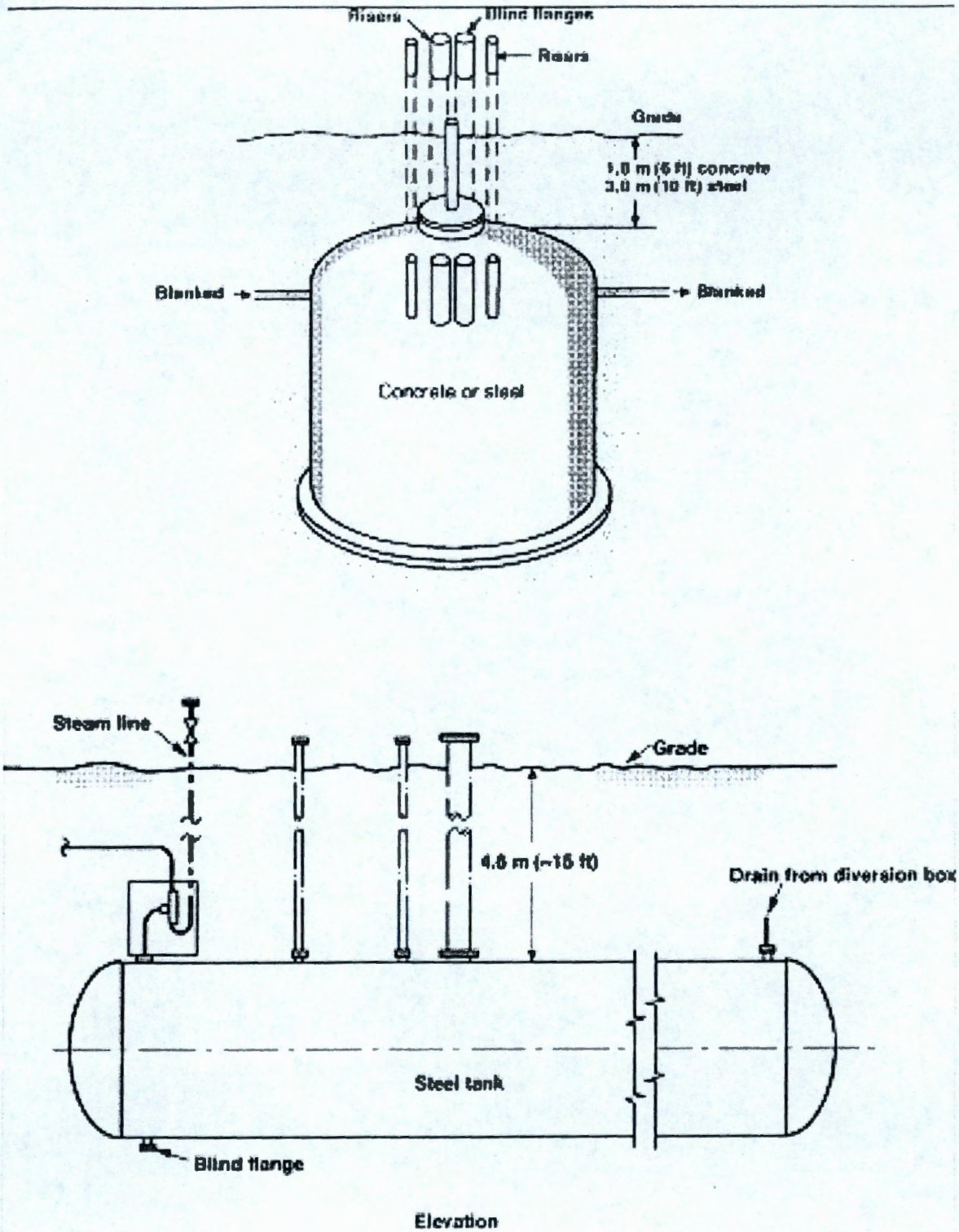
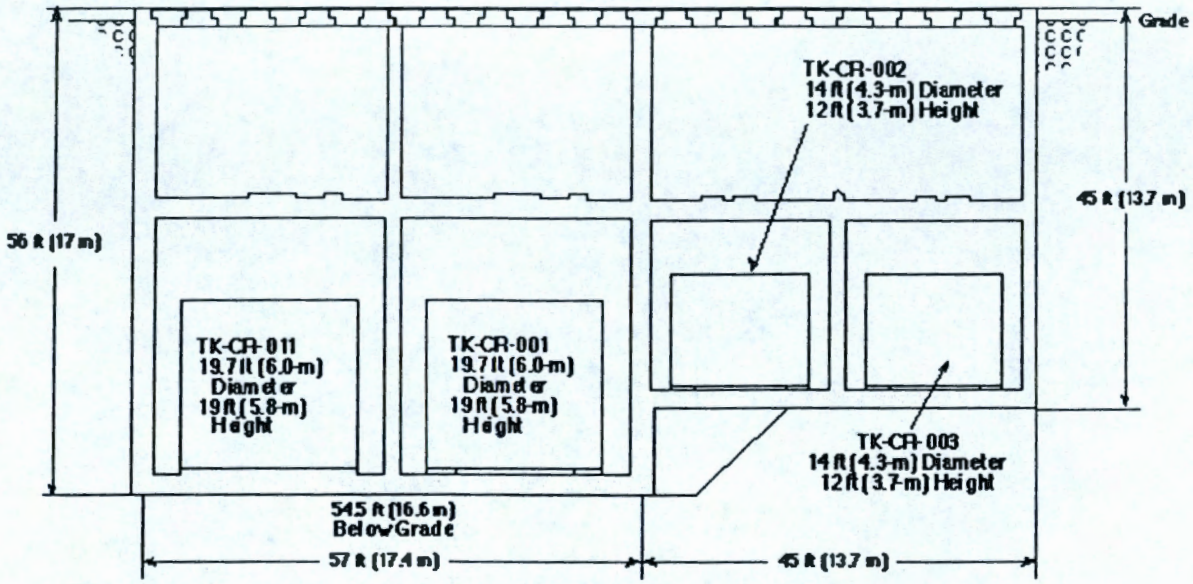


Figure 3-10. Schematic of the 244-CR Vault



The miscellaneous inactive storage facilities may contain low- or high-level radioactive wastes or nonradioactive materials and may be located belowground or aboveground. The inactive miscellaneous underground storage facilities are typically tanks buried directly in the ground or within vaults. The inactive miscellaneous aboveground storage facilities are typically tanks located on the surface or contained within inactive tank farm facilities.

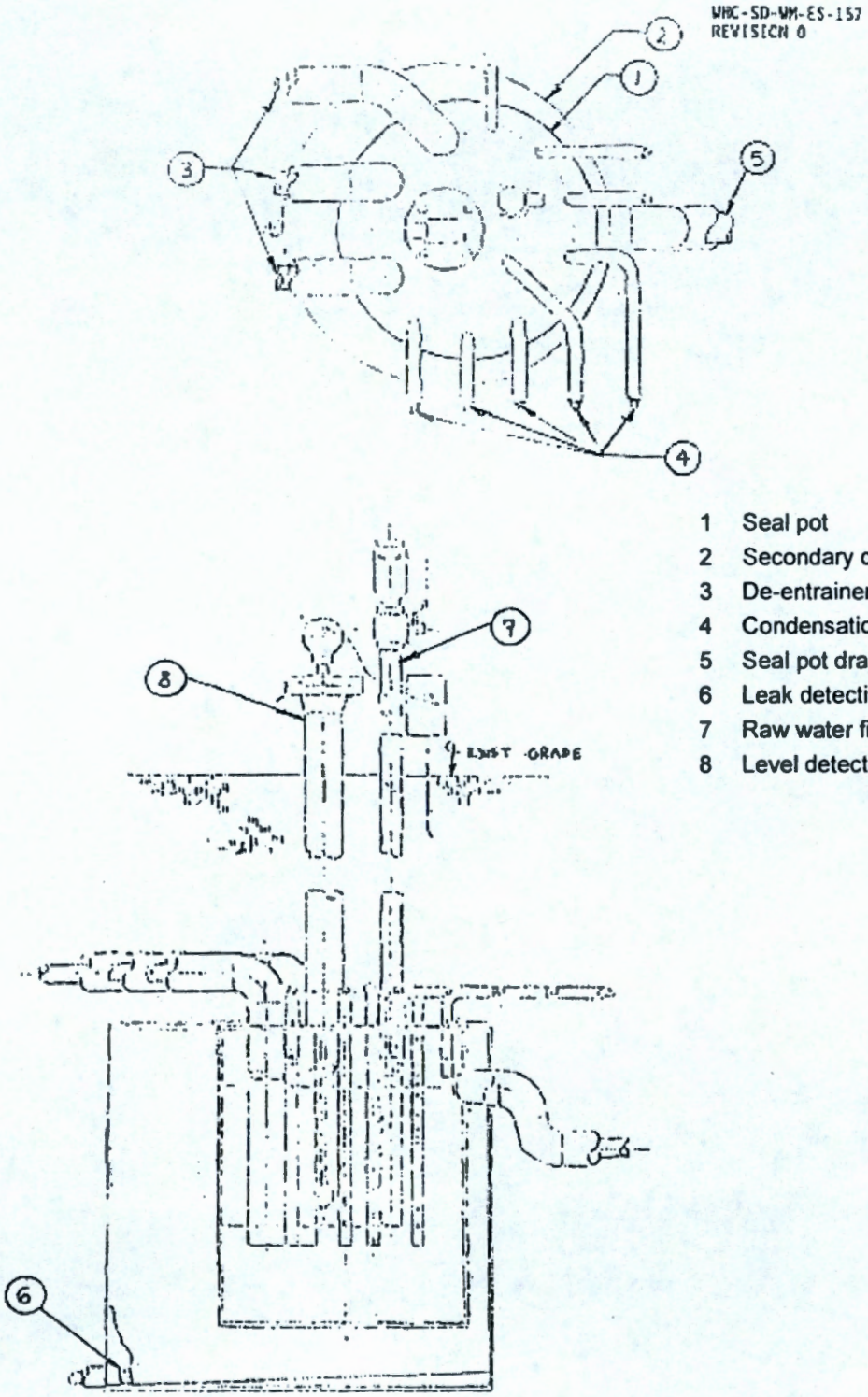
3.5 SEAL POTS

Seal pots, which are a part of the facilities used in the transfer of waste, are small buried tanks that function as large drain traps. A seal pot potentially can collect drainage from several sources and have one overflow to systems of dissimilar vapor environments while allowing liquid to drain. Figure 3-11 shows a typical below-grade seal pot, and Figure 3-12 shows a typical above-grade seal pot.

3.6 DOUBLE-CONTAINED RECEIVER TANKS

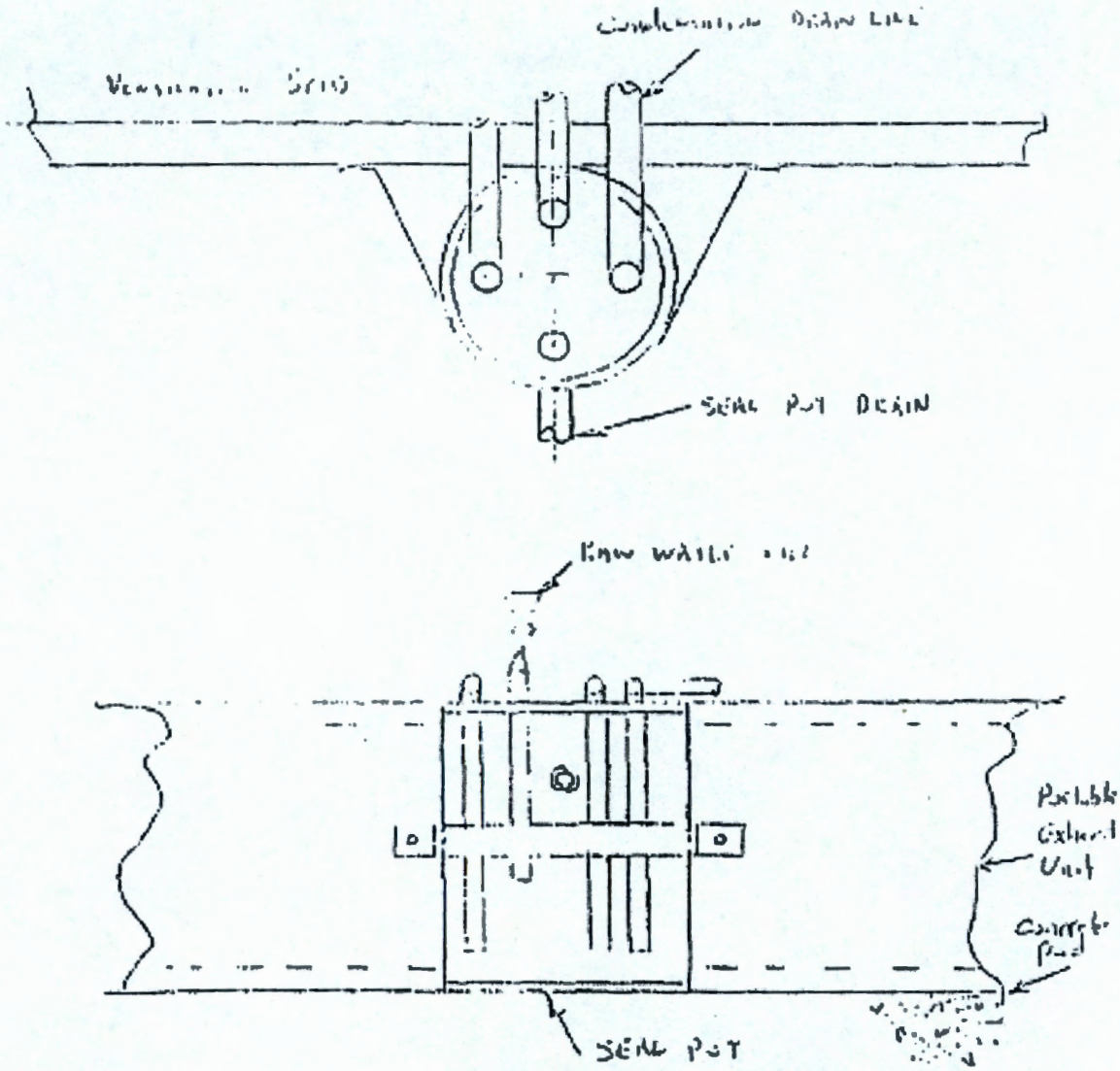
A double-contained receiver tank (DCRT), together with its related equipment, may function as an interim short-term storage facility for liquid wastes pumped from other storage sites or facilities or a valve pit to route wastes. A DCRT typically consists of an underground concrete structure that contains a filter pit, pump pit, instrument pit, flush pit, and vault in which a receiver tank is installed. A lift station may be a catch tank or DCRT located in a low point in a transfer line. Liquids collected in a lift station are pumped out. A typical DCRT is shown in Figure 3-13.

Figure 3-11. Typical Below-Grade Seal Pots (best available drawing)



1 Seal pot
2 Secondary containment
3 De-entrainer backflush lines
4 Condensation drain lines
5 Seal pot drain
6 Leak detection
7 Raw water fill
8 Level detectors

Figure 3-12. Typical Above-Grade Seal Pot (best available drawing)

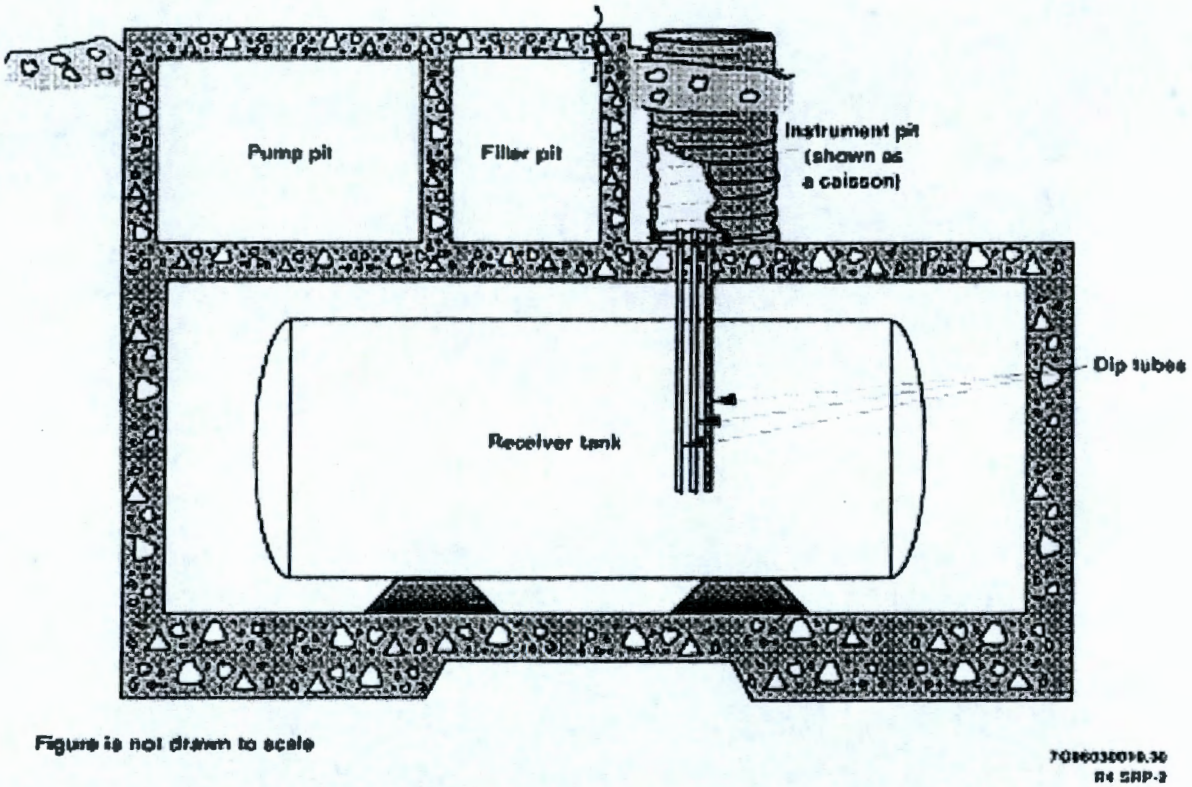


3.7 PIPELINES

The tank farm pipeline system consisted of a variety of pipelines and diversions boxes. Pipelines in the system include slurry lines, supernatant lines, cross-site lines, and jet-pump transfer lines. There are multiple miles of pipeline within the WMA boundaries. Outside of the WMA boundaries, there are approximately 350 transfer pipelines associated with 200-IS-1 OU that extend over 100 miles and there are over 100 diversion boxes and associated catch tanks. Waste stream characteristics (e.g., corrosiveness, acidity, and radiological activity) were considered

during design of the pipelines constructed at Hanford. Pipelines are buried anywhere from 8 to 15 ft below the ground surface. Materials selected for constructing the pipelines depended on the anticipated waste stream's composition and characteristics.

Figure 3-13. Typical Double-Contained Receiver Tank

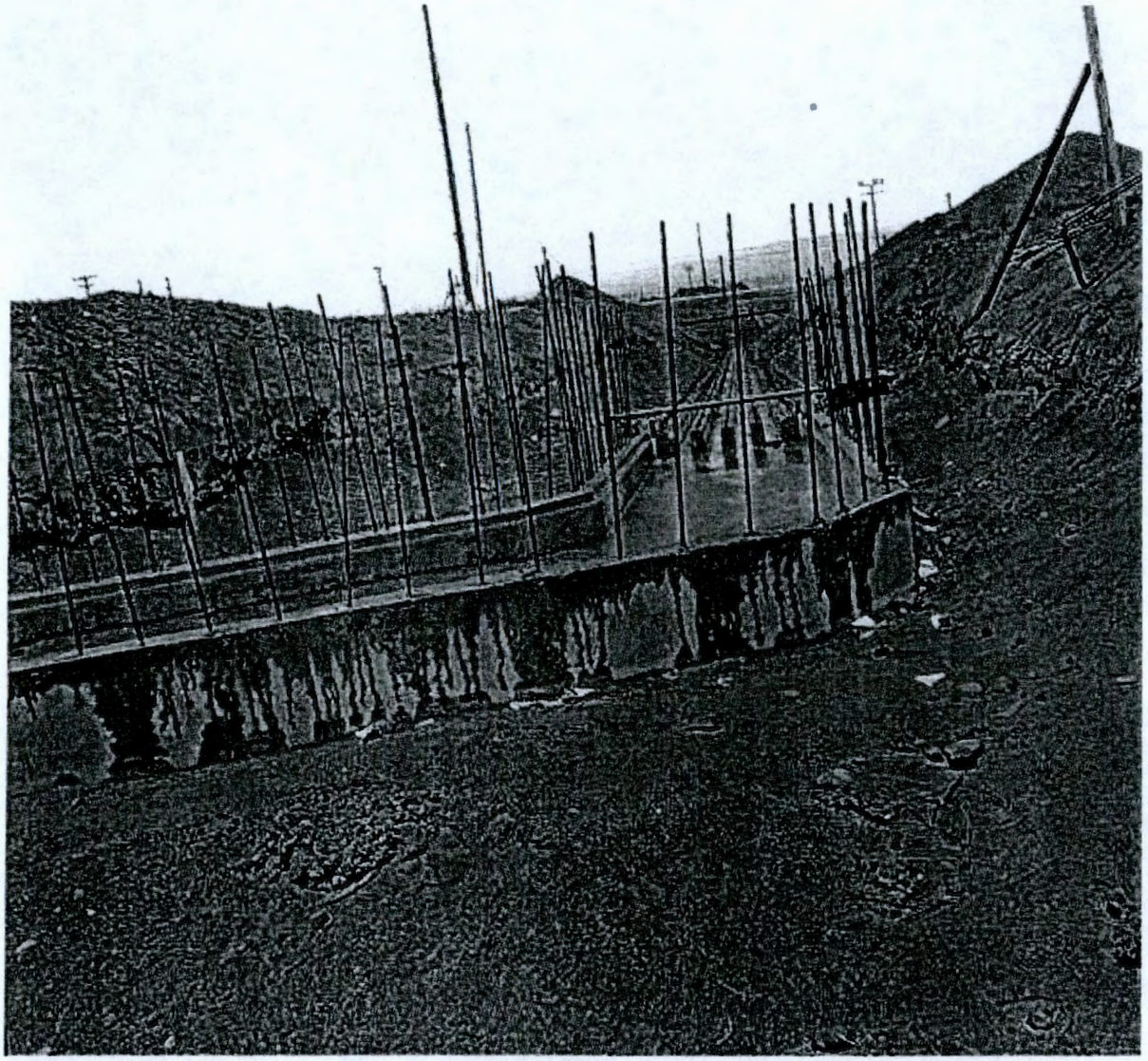


Pipe material types included carbon steel and stainless steel. Vitrified clay and fiberglass-reinforced thermosetting resin pipelines were also constructed to transfer lower concentrations of radionuclides than typically were transferred in the tank farm carbon or stainless-steel pipelines. Pipelines used to transfer high-level/high-activity wastes initially were buried directly in trenches without use of additional exterior encasements. The initial interior tank farm waste transfer pipelines installed in 1944 and 1945 were direct buried pipelines with some on concrete slabs. After 1947, all pipelines installed in the tank farms were either concrete encased or pipe-in-pipe encased.

As failures in these lines occurred in the 1940s, subsequent construction involved placement in concrete or pipe-in-pipe encasements. In addition, from 1948 forward cathode protection was maintained on all pipeline transfer systems to help mitigate early pipeline failures (HW-33504, *Cathodic Protection of Stainless Steel Waste Lines Interim Report No. 1 Underground Pipeline and Structure Corrosion Study Program*). The encasements extended between diversion boxes or concrete pits on top of the SSTs (occasionally drywells) and were designed so that any liquids lost due to leaks or pipeline failure would drain to a drain in the bottom of a diversion box (or to

the SST if from a concrete pit), which conveyed the release to a catch tank. Figure 3-14 shows a pipeline trench at C Farm being constructed.

Figure 3-14. Pipeline Trench Under Construction at 241-C Tank Farm



Radioactive waste transfers from the separations plants to the SSTs began in 1944. The tank farms were taken out of service and waste transfers ceased over several years between 1972 and 1980.

4.0 PROPOSED CLOSURE STRATEGY

4.1 DEVELOPMENT OF PROPOSED CLOSURE STRATEGIES FOR SINGLE-SHELL TANK COMPONENTS

The proposed closure strategies for SST components, the rationale for each closure strategy, and the associated regulatory basis are identified in Table 4-1 and are described in further detail in this section.

This section does not propose *closure decisions*. Closure decisions will be made through the regulatory processes established in the HFFACO and Site-Wide Permit. The *closure strategy* as discussed in this section proposes the regulatory process and associated timing (as it is identified in the HFFACO) for individual SST components based on the following criteria:

- Location of the component in relation to the probable effective edge of a cap or in relation to an alternate remedy
- Whether the component is a TSD component or a past practice component
- The HFFACO-established regulatory pathway and closure document process for the geographic area (i.e., WMA or geographic decision unit) in which the component resides.

The closure strategy for an SST component will largely be determined based on its location. This is because individual component closure decisions will be able to be optimized by evaluating them in concert with cleanup actions for the entire geographic area (i.e., the WMA or the OU) in which they are located. This is principally true for geographic areas that are likely to be covered by a cap as this remedy will encompass and remediate (or partially remediate) all components within it. The process and timing for closure of the individual SST components are expected to be the same as that applied to the geographic area in which they are located. Thus, closure actions for an SST system component that is within the WMA would be evaluated in the tiered RCRA closure plans pursuant to the schedules established in the permit and/or HFFACO. Closure actions for an SST system component that is within the boundaries of a RCRA past practice or CERCLA past practice geographic area along with actions determined for all proximate sites would be evaluated and selected through past practice processes pursuant to the schedules established in the HFFACO. Conditions authorizing the selected actions are also expected to be established through modification of the RCRA Site-Wide Permit.

4.1.1 Single-Shell Tank Components within Waste Management Areas

Single-shell tank WMAs are assumed to be closed as landfills pending determinations under NEPA, the *Atomic Energy Act of 1954*, and the RCRA Site-Wide Permit. Landfill closure will include placement of a cap over the WMA.

Table 4-1. Proposed Single-Shell Tank System Component Closure Strategy

Component Location	TSD or Past Practice Component	Associated Closure Action Pathway	Closure Document Process	Rationale for Closure Strategy	Regulatory Basis
Within the probable effective edge of a WMA cap	TSD	WMA	RCRA TSD Closure Plan	Within a common SST WMA landfill closure action that will be authorized through Site-Wide Permit	HFFACO Action Plan Sections 6 and 9.2.2; Appendix B as updated through SST System Part A Permit Application
	Past Practice	WMA	RCRA TSD Closure Plan	Within a common SST WMA landfill closure action that will be authorized through Site-Wide Permit	HFFACO Action Plan Sections 7 and 9.2.1; Site-Wide Permit Condition II.Y.2; HFFACO Appendix D Milestone M-045-00
Within the probable effective edge of a past practice cap or remedy	TSD	Inner Area Geographic Decision Unit	RPP or CPP Process and/or RCRA TSD Closure Plan	Within a geographic area's remedy that will be closed through HFFACO past practice processes and authorized through the Site-Wide Permit. As part of or separate from the past practice process, TSD closure plans may also be developed	HFFACO Action Plan Section 6.1 and Site-Wide Permit Condition II.K.7.
	Past Practice	Inner Area Geographic Decision Unit	RPP or CPP Process	Within a geographic area remedy that will be closed through HFFACO past practice processes and authorized through the Site-Wide Permit (RPP) or CERCLA ROD (CPP)	HFFACO Action Plan Section 7; HFFACO Appendix C as updated through WIDS; Site-Wide Permit Condition II.Y.2
Not within probable effective edge of WMA or past practice cap or remedy	TSD	Inner Area Geographic Decision Unit	RPP or CPP Process and/or RCRA TSD Closure Plan	Subject to remedy decisions developed through Central Plateau strategy; SST TSD component decisions through past practice process will be incorporated into the Site-Wide Permit. As part of or separate from the past practice process, TSD closure plans may also be developed	HFFACO Action Plan Section 6.1 and Site-Wide Permit Condition II.K.7.
	Past Practice	Inner Area Geographic Decision Unit	RPP or CPP Process	Subject to remedy decisions developed through Central Plateau inner area strategy; use of CPP process may require authorization through the Site-Wide Permit as well	HFFACO Action Plan Section 7; HFFACO Appendix C as updated through WIDS; Site-Wide Permit Condition II.Y.2

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CPP = CERCLA past practice
HFFACO = *Hanford Federal Facility Agreement and Consent Order*
RCRA = *Resource Conservation and Recovery Act of 1976*
RPP = RCRA past practice
SST = single-shell tank
TSD = treatment, storage, or disposal
WMA = waste management area

All SST components, both TSD and past practice, that are located under the active footprint of the landfill cap are expected to be closed under RCRA as part of the WMA through development of a WMA closure plan application and subsequent selection of closure actions in the SST system portion of the Site-Wide Permit pursuant to HFFACO Action Plan Appendix D Milestone M-045-00. In addition, components that are outside of the fenceline, but under the assumed effective edge of the WMA cap footprint, will also be closed as part of the WMA.

A common risk assessment and barrier design will accompany the closure plan application for the entire WMA. Other closure actions besides barrier construction and operation that are specific to the individual SST components within the WMA (e.g., waste removal, void space filling) will also be developed as part of a WMA closure plan application (the closure plan application for WMA closure may consist of more than one application covering a set of SST components for the purposes of final WMA closure).

4.1.2 Single-Shell Tank Components Outside of Waste Management Areas

Working with EPA and Ecology, DOE has developed a new cleanup strategy for the Central Plateau. This strategy has three distinct elements: an Outer Area which will be cleaned up to a level consistent with the River Corridor, a groundwater strategy, and an Inner Area strategy. The Inner Area has been defined as the smallest practical final footprint of the Central Plateau in which waste disposal and isolation will occur in perpetuity. The DOE, EPA and Ecology have made changes to the HFFACO to implement a streamlining concept for RCRA/CERCLA integration for all corrective actions that would apply to contaminated media containing past radionuclide releases. For the Inner Area, CERCLA decisions will be pursued that encompass geographic decision units inclusive of all CERCLA cleanup and RCRA corrective action sites that would follow a consistent set of logic in the development of remedies. This approach will ensure that there is consistency in CERCLA and RCRA remedy selection. In addition, documentation that supports these decisions will be prepared, which incorporates both CERCLA requirements and RCRA requirements with the intent of minimizing administrative workload and duplication of paperwork. The process for performing this function is currently being developed and will integrate the hazardous waste standards of RCRA corrective action and closure performance standards into the CERCLA process for remedial decision making, design, and remedial action. This process will include approval of the action in both a CERCLA ROD and in the RCRA Site-Wide Permit, where applicable.

The SST system exists within the boundary of the Inner Area. Components located outside of the effective edge of the WMA cap are currently identified as part of the RPP 200-IS-1 OU, which includes both past practice and TSD SST components. The 200-IS-1 OU includes an extensive network of pipelines, diversion boxes, catch tanks, valve pits, related infrastructure, and associated unplanned releases. This network is defined as the process-waste pipeline systems. The systems were used to transport process waste from the separations facilities to the SSTs and DSTs and to control or divert flow to disposal waste sites that received liquid waste streams.

Some 200-IS-1 OU components will be under barrier footprints selected for other RCRA or CERCLA waste sites, or geographic areas. For example, the U Plant canyon building cleanup

has been authorized through a CERCLA ROD (October 2005) and the selected cleanup action includes construction of a cap. Two SST components, the 241-UX-302A catch tank and the 241-UX-154 Diversion Box, are within the footprint of this barrier (DOE/RL-2006-21, *Remedial Design/Remedial Action Work Plan for the 221-U Facility*). These components are both part of the 200-IS-1 OU and are also TSD components as identified in the SST System Part A Permit Application, Revision 12. In this case, evaluation and selection of cleanup actions for these components are expected to occur in association with the U Plant canyon geographic area decision process rather than the 200-IS-1 OU decision process. As with components near WMA barriers, SST components that are within close proximity to the effective edge of a WMA barrier would be evaluated to determine if it is cost effective for the footprint to be adjusted to capture the component.

Other SST components currently identified to be part of the 200-IS-1 OU may be within geographic areas not covered by a cap but in which a coordinated remedy selection process would be optimal. The closure strategy for these components would also be expected to be through the associated past practice decision-making process.

4.2 ASSIGNMENT OF PROPOSED CLOSURE STRATEGIES FOR SINGLE-SHELL TANK COMPONENTS

4.2.1 Non-Pipeline Single-Shell Tank Components

Proposed closure strategies for individual SST non-pipeline components are contained in Tables 4-2 through 4-4. These tables contain SST components as follows:

a. Table 4-2 contains SST non-pipeline components that are considered to be within the WMA cap.

b. Table 4-3 contains SST non-pipeline components that are considered to be within the assumed canyon or other waste site surface barriers.

c. Table 4-4 contains SST non-pipeline components that are outside of both WMA and other Central Plateau barriers.

Barrier surface area assumptions that were used to develop these tables were those used in the development of the DOE Richland Operations Office (RL) CP-22319-DEL, *Plan for Central Plateau Closure*. Generally the footprint of a barrier is defined as the outermost edge of the waste disposal area or waste site. The active footprint of a barrier would be inclusive of this outermost edge. The side slopes of the barrier would extend beyond the active barrier footprint. The side slopes would not be considered an active part of the barrier. The barrier size can be assumed to be the effective edge for purposes of determining proposed component closure strategies. Regardless of the complexity of the design, protection of the perimeter and surfaces of above-grade barriers require special design consideration to control water accumulation and to reduce erosion of the soil layers.

Table 4-2. Single-Shell Tank Non-Pipeline Components Expected to be Closed under Waste Management Area Barriers (3 sheets)

Waste Information Data System Site Code	Type	Waste Management Area	SST Part A? (TSD Component)	HFFACO Appendix B? (TSD Component)	HFFACO Appendix C? (Past Practice Component)
241-A-350	Catch Tank	WMA A-AX	Yes	Yes	No
241-A-417	Catch Tank	WMA A-AX	Yes	Yes	No
241-A-152	Diversion Box	WMA A-AX	Yes	Yes	No
241-A-153	Diversion Box	WMA A-AX	Yes	Yes	No
241-A-501	Valve Pit	WMA A-AX	Yes	No	No
241-A-A	Valve Pit	WMA A-AX	Yes	Yes	No
241-A-B	Valve Pit	WMA A-AX	Yes	Yes	No
241-AX-152 (CT or DS)	Diversion Box	WMA A-AX	Yes	Yes	No
241-AX-153	Diversion Box	WMA A-AX	Yes	No	No
241-AX-155	Diversion Box	WMA A-AX	Yes	Yes	No
241-AX-IX*	IMUST - Ion Exchanger	WMA A-AX	No	No	No
241-AX-501	Valve Pit	WMA A-AX	Yes	Yes	No
241-AX-A	Valve Pit	WMA A-AX	Yes	Yes	No
241-AX-B	Valve Pit	WMA A-AX	Yes	Yes	No
241-A-302B	IMUST - Catch Tank	WMA A-AX	Yes	No	Yes
241-B-151	Diversion Box	WMA B-BX-BY	Yes	Yes	No
241-B-152	Diversion Box	WMA B-BX-BY	Yes	Yes	No
241-B-153	Diversion Box	WMA B-BX-BY	Yes	Yes	No
241-B-252	Diversion Box	WMA B-BX-BY	Yes	Yes	No
242-B-151	Diversion Box	WMA B-BX-BY	Yes	Yes	No
241-B-301 (241-B-301B)	IMUST - Catch Tank	WMA B-BX-BY	Yes	Yes	No
244-BX DCRT	DCRT	WMA B-BX-BY	Yes	Yes	No
241-BX-153	Diversion Box	WMA B-BX-BY	Yes	Yes	No
241-BXR-151	Diversion Box	WMA B-BX-BY	Yes	Yes	No
241-BXR-152	Diversion Box	WMA B-BX-BY	Yes	Yes	No
241-BXR-153	Diversion Box	WMA B-BX-BY	Yes	Yes	No
241-BX-302A	IMUST - Catch Tank	WMA B-BX-BY	Yes	Yes	No
244-BXR Vault	IMUST - Receiving Vault	WMA B-BX-BY	Yes	Yes	No
241-BR-152	Diversion Box	WMA B-BX-BY	Yes	Yes	No
241-BYR-152	Diversion Box	WMA B-BX-BY	Yes	Yes	No
241-BYR-153	Diversion Box	WMA B-BX-BY	Yes	Yes	No
241-BYR-154	Diversion Box	WMA B-BX-BY	Yes	Yes	No
241-BY-ITS1*	In-Tank Solid System	WMA B-BX-BY	No	No	No
241-BY-ITS2-TK1 * (200-E-59)	IMUST - Storage Tank	WMA B-BX-BY	Yes	No	No

Table 4-2. Single-Shell Tank Non-Pipeline Components Expected to be Closed under Waste Management Area Barriers (3 sheets)

Waste Information Data System Site Code	Type	Waste Management Area	SST Part A? (TSD Component)	HFFACO Appendix B? (TSD Component)	HFFACO Appendix C? (Past Practice Component)
241-BY-ITS2-TK2* (200-E-60)	IMUST - Storage Tank	WMA B-BX-BY	No	No	No
241-C-151	Diversion Box	WMA C	Yes	Yes	No
241-C-152	Diversion Box	WMA C	Yes	Yes	No
241-C-153	Diversion Box	WMA C	Yes	Yes	No
241-C-252	Diversion Box	WMA C	Yes	Yes	No
241-CR-151	Diversion Box	WMA C	Yes	Yes	No
241-CR-152	Diversion Box	WMA C	Yes	Yes	No
241-CR-153	Diversion Box	WMA C	Yes	Yes	No
241-C-301	IMUST - Catch Tank	WMA C	Yes	Yes	No
244-CR Vault	Receiving Vault	WMA C	Yes	Yes	No
244-S DCRT	DCRT	WMA S-SX	Yes	Yes	No
241-S-151	Diversion Box	WMA S-SX	Yes	No	No
241-S-152	Diversion Box	WMA S-SX	Yes	Yes	No
241-S-302A	IMUST - Catch Tank	WMA S-SX	Yes	No	No
241-S-302B	IMUST- Catch Tank	WMA S-SX	Yes	Yes	No
241-S-304	Catch Tank	WMA S-SX	Yes	No	No
241-S-A	Valve Pit	WMA S-SX	Yes	Yes	No
241-S-B	Valve Pit	WMA S-SX	Yes	Yes	No
241-S-C	Valve Pit	WMA S-SX	Yes	Yes	No
241-S-D	Valve Pit	WMA S-SX	Yes	Yes	No
241-SX-151	Diversion Box	WMA S-SX	Yes	Yes	No
241-SX-152	Diversion Box	WMA S-SX	Yes	Yes	No
241-SX-302	IMUST - Catch Tank	WMA S-SX	Yes	No	Yes
241-SX-A	Valve Pit	WMA S-SX	Yes	No	No
241-SX-B	Valve Pit	WMA S-SX	Yes	No	No
241-T-301B	IMUST - Catch Tank	WMA T	Yes	Yes	No
241-T-151	Diversion Box	WMA T	Yes	Yes	No
241-T-152	Diversion Box	WMA T	Yes	Yes	No
241-T-153	Diversion Box	WMA T	Yes	Yes	No
241-T-252	Diversion Box	WMA T	Yes	Yes	No
241-TR-152	Diversion Box	WMA T	Yes	Yes	No
241-TR-153	Diversion Box	WMA T	Yes	Yes	No
200-W-126*	Vertical Storage Units	WMA T	Yes	No	No
242-T-135*	Storage Tank	WMA TX-TY	No	No	No

Table 4-2. Single-Shell Tank Non-Pipeline Components Expected to be Closed under Waste Management Area Barriers (3 sheets)

Waste Information Data System Site Code	Type	Waste Management Area	SST Part A? (TSD Component)	HFFACO Appendix B? (TSD Component)	HFFACO Appendix C? (Past Practice Component)
242-T-151	Diversion Box	WMA TX-TY	Yes	Yes	No
241-TX-153	Diversion Box	WMA TX-TY	Yes	Yes	No
241-TXR-151	Diversion Box	WMA TX-TY	Yes	No	No
241-TXR-152	Diversion Box	WMA TX-TY	Yes	Yes	No
241-TX-302A	IMUST - Catch Tank	WMA TX-TY	Yes	Yes	No
241-TX-302XB	IMUST - Catch Tank	WMA TX-TY	Yes	Yes	No
242-TA-R1*	IMUST - Receiving Tank	WMA TX-TY	No	No	No
244-TXR Vault	IMUST - Receiving Vault	WMA TX-TY	Yes	Yes	No
241-TXR-153	Diversion Box	WMA TX-TY	Yes	Yes	No
241-TY-153	Diversion Box	WMA TX-TY	Yes	Yes	No
241-TY-302A	IMUST - Catch Tank	WMA TX-TY	Yes	Yes	No
241-TY-302B	IMUST - Catch Tank	WMA TX-TY	Yes	Yes	No
244-TX DCRT	DCRT	WMA TX-TY	Yes	Yes	No
241-U-301 (241-U-301B)	Catch Tank	WMA U	Yes	Yes	No
241-U-153	Diversion Box	WMA U	Yes	Yes	No
241-U-252	Diversion Box	WMA U	Yes	Yes	No
241-UR-151	Diversion Box	WMA U	Yes	Yes	No
241-UR-152	Diversion Box	WMA U	Yes	Yes	No
241-UR-153	Diversion Box	WMA U	Yes	Yes	No
241-UR-154	Diversion Box	WMA U	Yes	Yes	No
244-UR Vault	IMUST - Receiving Vault	WMA U	Yes	Yes	No
241-U-A	Valve Pit	WMA U	Yes	Yes	No
241-U-B	Valve Pit	WMA U	Yes	Yes	No
241-U-C	Valve Pit	WMA U	Yes	Yes	No
241-U-D	Valve Pit	WMA U	Yes	Yes	No
244-U DCRT	DCRT	WMA U	Yes	Yes	No

*Not SST component – added for completeness (see Section 1.2.2).

DCRT = double-contained receiver tank
IMUST = inactive miscellaneous underground storage tank
TSD = treatment, storage, or disposal
HFFACO = *Hanford Federal Facility Agreement and Consent Order*
SST = single-shell tank
WMA = waste management area

Table 4-3. Non-Pipeline Components Expected to be Closed under Other Central Plateau Facility Barriers

Waste Information Data System Site Code	Type	Associated Facility Barrier	SST Part A? (SST TSD Component)	HFFACO Appendix B? (SST TSD Component)	HFFACO Appendix C? (SST Past Practice Component)
241-A-151	Diversion Box	PUREX Canyon (202-A)	Yes	No	Yes
241-A-302A	Catch Tank	PUREX Canyon (202-A)	Yes	No	Yes
241-AZ-154	Catch Tank	Double-Shell Tanks (241-AZ)	Yes	No	No
241-AX-501	Valve Pit	Double-Shell Tanks (241-AX)	Yes	No	No
241-BX-154	Diversion Box	B Plant Canyon (221-B)	Yes	No	Yes
241-BX-302B	IMUST - Catch Tank	B Plant Canyon (221-B)	Yes	No	Yes
241-BY-201*	Flush Tank	BY Cribs	No	No	No
240-S-151	Diversion Box	REDOX Canyon (202-S)	Yes	No	Yes
240-S-302	IMUST - Catch Tank	REDOX Canyon (202-S)	Yes	No	Yes
241-TX-154	Diversion Box	T Plant Canyon (221-T)	Yes	No	Yes
241-TX-302C	Catch Tank	T Plant Canyon (221-T)	Yes	No	Yes
241-UX-154	Diversion Box	U Plant Canyon (221-U)	Yes	No	Yes
241-UX-302A	Catch Tank	U Plant Canyon (221-U)	Yes	No	Yes

*Not SST component – added for completeness (see Section 1.2.2).

DCRT = double-contained receiver tank
HFFACO = *Hanford Federal Facility Agreement and Consent Order*
IMUST = inactive miscellaneous underground storage tank
PUREX = Plutonium Uranium Extraction (Plant)
REDOX = Reduction-Oxidation (S Plant)
SST = single-shell tank
TSD = treatment, storage, or disposal
WMA = waste management area

Table 4-4. Single-Shell Tank Non-Pipeline Components Expected to be Closed in Association with Inner Area Geographic Zone Process (Not under Barriers)

Waste Information Data System Site Code	Type	SST Part A? (SST TSD Component)	HFFACO Appendix B? (SST TSD Component)	HFFACO Appendix C? (SST Past Practice Component)
244-A (DCRT)	DCRT	Yes	Yes	No
241-AR-151	Diversion Box	Yes	Yes	No
241-AX-151	IMUST - Diverter Station	Yes	Yes	No
244-AR Vault**	Receiving Vault	Yes	Yes	No
241-B-154	Diversion Box	Yes	No	Yes
241-B-302B	IMUST - Catch Tank	Yes	No	Yes
241-BX-155	Diversion Box	Yes	No	Yes
241-BX-302C	IMUST - Catch Tank	Yes	No	Yes
241-C-154	Diversion Box	Yes	No	Yes
241-ER-151	Diversion Box	Yes	No	Yes
241-ER-152	Diversion Box	Yes	No	Yes
241-ER-153	Diversion Box	Yes	Yes	No
241-ER-311	Catch Tank	Yes	No	Yes
241-ER-311A	IMUST - Catch Tank	Yes	No	Yes
241-EW-151	Catch Tank	Yes	Yes	No
240-S-152	Diversion Box	Yes	No	Yes
241-TX-152	Diversion Box	Yes	No	Yes
241-TX-155	Diversion Box	Yes	No	Yes
241-TX-302B	IMUST - Catch Tank	Yes	No	Yes
241-TX-302BR	IMUST - Catch Tank	Yes	No	Yes
241-U-151	Diversion Box	Yes	Yes	Yes
241-U-152	Diversion Box	Yes	Yes	Yes
200-W-7*	Decontamination Tank	No	No	Yes
241-Z-8*	Settling Tank	Plutonium Finishing Plant	No	No

*Not SST component – added for completeness (see Section 1.2.2).
**This component is close to WMA boundary and may be closed under WMA barrier

DCRT = double-contained receiver tank
IMUST = inactive miscellaneous underground storage tank
HFFACO = *Hanford Federal Facility Agreement and Consent Order*
SST = single-shell tank
TSD = treatment, storage, or disposal

Side slopes can occupy from 15 to 75% of the total surface area of an above-grade barrier and therefore have the potential to generate a significant amount of drainage. Yet there is no consistent design standard or practice for protective side slopes. The length of the side slope and the associated land surface it covers is dependent on the grade of the side slope and ground surface topography. Side slopes can range from a steep 2:1 slope, which would minimize the overall barrier size, to a gentle 10:1 slope, which would occupy a larger area.

Final component closure strategies will be determined on a case-by-case basis as WMA closure plans and past practice evaluations are developed. Closure strategies may change from those presented in this plan due to a variety of reasons including but not limited to the following:

a. Changes of an SST component from designation as a TSD or past practice component.

b. Changes in assumed closure end states (e.g., capping versus removal).

c. Changes in assumed cap footprints.

d. WMA or OU schedule changes which may prompt more advantageous timing for component closure actions via another decision process.

e. Direction from the regulatory agencies to pursue a different process.

4.2.2 Pipeline Single-Shell Tank Components

The majority of the SST System pipeline segments are identified in the SST System Part A Permit Application. However, this listing is not considered to be complete and on-going efforts are underway to identify additional pipelines that are part of the SST System. As indicated in the cover letter from ORP that accompanied Revision 12 of SST System Part A [Letter 10-ESQ-131, "Submittal of Proposed Revision to the Single-Shell Tank (SST) System Dangerous Waste Permit (DWP) Application Part A Form"], further refinement of pipeline listings will be made as part of the closure plan submittals for the individual WMAs. Efforts are also underway as part of the current development of the 200-IS-1 Remedial Investigation/Feasibility Study Work Plan to refine the lists of SST System pipelines that are outside or transect the WMAs.

Waste transfer pipelines are located either entirely inside or entirely outside the WMA fenceline, or transect it. Their location will influence how they are closed. For the majority of pipelines that reside entirely within the WMAs, closure decisions will be consistent with each WMA closure. Approximately 270 pipelines have been identified that reside entirely outside of the WMAs and will be closed in a manner that is consistent with the cleanup strategy for the Central Plateau Inner Area. Approximately 180 pipelines transect the WMA fencelines. The pipelines outside of the WMAs as well as the portion of the pipelines transecting the WMA are currently expected to be closed as part of the 200-IS-1 OU. The boundary between the WMA and the 200-IS-1 OU will be delineated following an agreed-to decision logic developed between ORP and Ecology. The decision logic may include isolation of the pipeline at the effective edge of the WMA engineered surface barrier as defined by the approved final design (surface area and slope) of the WMA barrier.

The DOE's cleanup strategy for the Central Plateau Inner Area is to develop a comprehensive approach to address the closure of pipelines outside WMA boundaries. This approach will consider the proximity of pipelines to barriers and to waste site and facility remedial actions. Closure strategies for individual pipeline segments have not been identified as many segments transect WMA boundaries as well as other facilities that may have barriers constructed as part of their cleanup remedy. The logic for determining component closure strategies presented in Section 4.2 can be used to determine which pipeline portion will be closed as part of the WMA or as part of a past practice geographic area/OU.

4.3 SCHEDULE FOR WASTE MANAGEMENT AREA AND PAST PRACTICE CLOSURE ACTIONS

Currently only WMA C has had a specific closure date scheduled in the HFFACO. Waste Management Area C closure plans are due to Ecology by September 30, 2015 (HFFACO Milestone M-045-82), however it is anticipated that closure plans will be submitted earlier in order to ensure closure of WMA C by June 30, 2019 (M-045-83). In addition, the HFFACO Milestones M-045-84 and M-045-85 will require selection and schedules for submittal of WMA closure plans and risk assessments for the second and remaining WMAs by January 31, 2017 and January 31, 2021, respectively.

Appendix D of the HFFACO (M-16-00) requires SST components that will be closed in association with past practice actions to be closed by September 30, 2024 (M-16-00). Proposed milestone dates for OUs associated with SST components (Tables 4-3 and 4-4) are as follows:

200-IS-1 Work Plan	June 2011
200-IS-1/200-EA-1 Feasibility Study/Proposed Plan	June 2014
B Plant Work Plan	December 2011
PUREX Work Plan	September 2015
REDOX Work Plan	December 2017

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