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ENGINEERING CHANGE NOTICE

Page 1 of 2

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THIS REVISION 5 TO THE SINGLE-SHELL TANK LEAK EMERGENCY RESPONSE GUIDE, REVISION 4, INCORPORATES ADDITIONAL INFORMATION, AND CHANGES, AS FOLLOWS:

- 1) NEW REFERENCES TO PROCEDURES AND DRAWINGS.
- 2) A NEW REQUIREMENTS MATRIX IS ADDED.
- 3) AN OVERGROUND TRANSFER SYSTEM DRAWING LIST AND INSTALLATION INSTRUCTION IS ADDED.

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THIS REVISION IS INTENDED TO MEET THE REQUIREMENTS OF MILESTONE CONTROL NO. TWJ-94-538 TO DETERMINE AND DESCRIBE "WHAT IS REQUIRED TO PROVIDE EMERGENCY PUMPING IF THESE TANKS."... THESE CHANGES ARE ADMINISTRATIVE IN NATURE.

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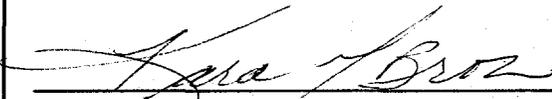
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7. Abstract

This document provides general information on all Single-Shell Tank Farms about readiness and special concerns for Emergency Pumping and identifies the required actions when a Single-Shell tank is identified as a leaking tank. Tank Transfer Routes are described, possible heat trace circuits are outlined, and tank riser status and obstructions are documented. Locations of existing saltwell systems and spares, information on emergency pumping equipment, watch list tank status, and transfer line integrity assessments are all included. A matrix of required actions to emergency pump individual tanks, and lists of useful drawings, procedures, work procedure outlines, and references are also provided.

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**SINGLE-SHELL TANK LEAK  
EMERGENCY PUMPING GUIDE**

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Prepared for the United States Department of Energy

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## I. GENERAL INFORMATION

### A. Background and Purpose

Westinghouse Hanford Company (WHC) operates high-level nuclear liquid waste storage facilities, consisting of large underground storage tanks, in behalf of the U.S. Department of Energy at the Hanford Site. There are 177 of these tanks, along with related structures, systems and equipment, located within the 200-East and 200-West areas of the site. 149 of the tanks are aging single-shell tanks (SST's) which pose an environmental threat due to the potential for leakage.

The Single-Shell Tank Stabilization Group within WHC Waste Tank Plant Engineering is responsible for a pro-active program of reducing the volume of drainable liquids within these tanks, to mitigate the potential for environmental releases prior to full-scale retrieval of tank wastes. Over 100 of these have been "interim stabilized" to date. However, because of the age and condition of the remaining tanks, the possibility exists that any one of them may begin to leak, even before this interim stabilization is completed. Therefore, an additional responsibility of the Stabilization Group is to maintain such plans and equipment necessary to address such a tank leak contingency; this guide is a key element of that effort.

The purpose of this document is to identify the actions to be taken when a single-shell tank has been identified as an assumed leaking tank ("leaker"). Washington State environmental regulations require notifications and initiation of response actions within a specified time frame after a tank leak is discovered. WHC's goal is to commence removal of pumpable liquid as soon as safely possible. This guide provides a preliminary plan of action, and serves as a ready source of detailed information required to fully plan and carry out the response to a leak situation. Revision 5 of this guide updates Revision 4, incorporating new information on equipment fabrication, field verification efforts, and results of recent stabilization activities.

### B. Information Summary

This guide contains much of the general information necessary to plan for and carry out an expeditious response to a leaking tank. Also, detailed information about each of the non-stabilized tanks, related transfer routes and other systems are set forth in the appendices. These include:

#### Appendix A:

- proposed primary and alternate transfer routes
- proposed receiving double shell tank
- leak detection systems
- riser status (including obstructions)
- piping heat trace circuits available

Appendix B: contains a listing of applicable drawings, procedures, and an inventory of emergency pumping equipment available on stand-by.

Appendix C: lists references on Watch List Tanks.

Appendix D: contains an inventory of the jet pumps intended for each tank in storage at 275-AW, Convenience Storage.

Appendix E: Consists of a tank-by-tank matrix summarizing specific actions to be completed to prepare for emergency pumping.

### C. Watch-List Tanks

Several categories of special safety risk have been identified in conjunction with some of the tanks at the site. These tanks are listed on four separate "watch lists" which categorize the tanks according to the unreviewed safety question (USQ) associated with each list. Operating Specifications Document (OSD) OSD-T-151-00030 "Operating Specifications for Watch List Tanks," addresses the requirements for safely operating the watch-listed single-shell tanks. Many of these specifications also apply to preparations that may be required prior to emergency pumping of a watch list tank.

As outlined in OSD-T-151-00030, the Watch List Tanks fall into 4 categories:

1. Hydrogen/Flammable Gas Tanks
2. Ferrocyanide Tanks
3. Organic Salt Tanks
4. High Heat Tanks

Because the Watchlist safety issues are a subject of current research, the criteria for managing these tanks will continue to evolve. Therefore, a thorough evaluation of applicable requirements will need to be done at the time a leaker is identified. Appendix C provides a listing of current references on watchlist tanks. Of particular interest will be WHC-SD-WM-TI-656, "Safety Evaluation of Interim Stabilization of Non-Stabilized Single-Shell Watchlist Tanks."

## II. EQUIPMENT DESCRIPTION

The heart of the emergency pumping preparation effort is an inventory of dedicated equipment, designed to meet the needs of a quick response to a leaking tank, which is maintained ready-to-roll in storage near the tank farms. Many of the existing tank farm systems, including utilities, instrumentation, and pump and transfer equipment, are obsolete and in poor condition. These emergency systems will eliminate the need for lengthy repairs and upgrades at the time a leaker is identified.

### A. Jet Pump and Jet Pump Jumper Assemblies

The jet pump is assembled according to Drawing H-2-73990 (assembly 2). The pump length will be modified to the necessary length for pumping the tank in question.

The jet pump jumper is modified according to Drawing H-2-78320. The interlocks that will be used include Limit Switch (LS) LS-1, Pressure Switch (PS) PS-1, PS-2; and the Pump Pit Leak Detector. These alarms are wired between the jet pump jumper intended for use, and the emergency pumping relay and instrumentation cabinet on the emergency trailer or emergency skid. If activated, these alarms will shut down the jet pump, so that operations personnel can evaluate the cause of the alarm. It also is possible to connect the emergency control relays to a Master Shutdown System in the tank farm.

Appendix D shows the status of jet pumps and jumpers fabricated for each specific tank for interim stabilization. Emergency pumping efforts will use equipment available in the emergency pumping trailer inventory.

Two Operability Test Procedures (OTP) are required to ensure that the jet pump, jet pump jumper, and support trailer operate properly. Procedure WM-OTP-027 shall be completed to verify that the jumper valving will stand up to the pressure requirements; WM-OTP-087 shall be completed after WM-OTP-027 to test the jet pump and jumper combination in concert with the interlocks and the Weight Factor Instrument Enclosure in simulated operational conditions. This OTP has already been completed on the emergency equipment in the shop prior to storage in the trailer, assuring operational readiness.

#### B. Submersible Pump

Submersible pumps have been fabricated to Drawing H-2-68521. Several of the various assemblies on this drawing can be used, depending upon the head requirements of the pump and whether rigid pipe or flexible hose is to be used. The pump length will be modified as necessary to fit the tank in question.

See Appendix B for a complete listing of submersible pumps available for single-shell tank emergency pumping.

#### C. Support Systems

##### 1. Emergency Pumping Equipment Storage Trailer (HO-64-05192)

A 45-foot semi-trailer is equipped to provide storage space and service facilities for emergency pumping equipment. This consists of two dedicated jet pump jumpers and two jet pumps, piping and dip tubes for each, two submersible pumps and attached piping, and a skid-mounted Weight Factor Instrument Enclosure (WFIE) with an air compressor and electronic recording instruments. The skid also contains a power control station for the pumps, pump pit leak detection, and instrumentation. A rack for over-ground double-contained piping is also in the trailer. A roll-off roof on the trailer facilitates equipment removal by crane. Drawings H-2-82557 through H-2-82564, and H-2-99136 describe this equipment.

##### 2. Wheeled Utility Trailer (H.O.-64-5482) and Non-Wheeled Emergency Skid

A utility-sized trailer (Drawings H-2-99136, H-2-99137, H-2-99139 and H-2-99142) has been equipped to provide the required support services to the emergency jet pump, or a submersible pump. It is equipped with a Weight Factor Instrument Enclosure (WFIE) and associated electronic instrumentation, air compressor, pump motor controls, electrical utility components and a reel holding 500 feet of power supply cord. A more detailed equipment listing is found in Appendix B.

The skid-mounted control system stored in the larger tractor-type emergency pumping trailer contains the same components, except that it has no wheels. The skid is equipped with lights for night-time operation; the trailer is not. Each of these systems provides all of the necessary instruments for monitoring one pumping operation, which includes a strip-chart recorder, flow totalizer, and a pump pit leak detector/alarm.

The trailer and skid units have completed all operational readiness procedures, and are fully field-ready for use at any time. See SD-WM-OTP-087, "Emergency Jet-Pump Control Operability Test Procedure," for a description of this testing.

A pump pit leak detection induction relay (to boost capability to detect liquid within a single-shell tank pump pit), and a saltwell jet-pump heat trace control cabinet (to increase capabilities for jumper heating) exist on the Emergency Pumping Skid. A quick connection system for all power and control wire interfaces will speed all wiring connections in the field (spare wiring and connectors are available).

#### D. Over-Ground Transfer Piping

WHC is currently in the process of assembling the equipment and procedures to provide an emergency over-ground transfer capability. When this system is available, a full description and installation instructions will be included as an appendix to this guide. Drawings describing this system are listed in Appendix B. A storage rack for the double-contained over-ground piping is provided within the Emergency Pumping Equipment Storage Trailer.

### III. PLAN OF ACTION

#### A. The Situation

When an assumed leaker is identified, pumping should begin as soon as safely possible under the circumstances at that time. The steps to be accomplished and the length of time required will vary somewhat by tank, but two general scenarios are anticipated:

Scenario 1: The tank contains a large volume of supernate, standing above any solids residing in the tank bottom. A submersible pumping operation will remove the greatest volume of liquid in the shortest time. This can be followed by jet pumping for further stabilization.

Scenario 2: Tank wastes are primarily solids, with only interstitial liquid to be removed. Jet pumping is the only option, as the liquid cannot be pumped any faster than it will drain into the saltwell by percolation from the surrounding solids.

There is not a significant difference in time required to prepare for one pumping method or the other. A list of preparation activities follows, to act as a guide. The first steps in each case will be to define the actual site conditions and develop a detailed plan and schedule to initiate pumping. The purpose of this guide is to streamline the planning process.

## B. Responsibilities

Coordination of activities will be essential to achieve a timely pumping response. Stabilization Engineering bears primary responsibility to prepare for the pumping effort, with operational support from Characterization Sampling and Support Operations (CSSO). East/West Tank Farm Operations, East/West Systems Engineering, and TWRS Emergency, Safety, and Quality Support will all be required to assist in the issuance of engineering documentation associated with the effort to pump a tank.

Also, because a leaking tank constitutes both a safety issue and an environmental issue, the emergency response must be planned in cooperation with the facility owner--DOE--and the state regulatory agencies--Washington State Department of Ecology and Washington State Department of Health.

After pumping is initiated, East/West Tank Farm Operations becomes responsible to operate the pumping system on an on-going basis until stabilization is achieved.

## C. Action Items

This section contains general groupings of activities, including explanation of what is to be done, why it is important, and how it relates to the overall situation. Understanding of these relationships is important to properly assign responsibility and to establish the sequence of events in planning. See Appendix E for a tank-by-tank matrix summarizing specific actions to be completed to prepare for pumping.

### 1. Pre-Processing

- Hold a kick-off meeting to bring together all required participants to assign responsibilities to initiate pumping.
- Determine facility status: Initiate a field walk-down; identify needed repairs, or scheduled maintenance that may need to be accelerated. Determine whether operating procedures are current. Emergency operating/

transfer procedures have been prepared for each farm. These are listed in Appendix B.

- Verify operator availability and training.
- Develop a detailed plan of action, schedule, and budget for the preparation activities and pumping operation.
- Form an Operational Readiness Review Board, if required, to track pumping readiness and approve start-up.
- Initiate procurement/fabrication for necessary equipment not available in inventory.

## 2. Waste Characterization

In preparation for final waste retrieval, there is an ongoing program within TWRS to fully document the chemical and physical characteristics of the waste stored in each tank. However, if a single shell tank begins to leak prior to full characterization, some preliminary sampling and analysis will be required to prepare for emergency pumping. These data are needed primarily to assure that potential safety issues have been properly addressed, and to confirm waste compatibility with the Double-Shell tank designated to receive the waste.

A liquid process sample shall be used for determining a compatible double-shell tank. Core sample data from the assumed leaker may also be available. The sample results from both the sending and the receiving tank, after comparison to the "Tank Farm Waste Compatibility Program," WHC-SD-WM-OCD-015, must indicate that there will not be a compatibility problem.

One notable complication that may arise in the 200 West Area is the limited number of available double-shell tanks. If sample analysis determines that an assumed leaker in 200 West contains complexed waste, a compatible receiver tank in that area may not be available. This becomes a problem in that the cross-site transfer system is not currently operable.

## 3. Safety Documentation

Initiate preparation of safety documentation, as required by status of declared leaker. If the leaker is a watch list tank, special start-up approval may be required before any work can proceed. This may involve approval from DOE HQ.

All provisions of Hanford Site Tank Farm Facilities Interim Safety Basis, WHC-SD-WM-ISB-001, as they apply to Single-Shell Tanks pumping activities, must be met during emergency pumping activities. This includes meeting all requirements of the Nuclear Criticality JCO, WHC-SD-WM-JCO-001, which provides information relating to activities permitted and restricted for tank farm facilities. Refer

to that document for specific details as they apply to Single-Shell Tank emergency pumping preparations and tank pumping activities.

Provisions of Industrial Safety Manual, WHC-CM-4-3, Vol. 1 and 2, Radiation Protection Manual, WHC-CM-1-6, and Tank Farm Health and Safety Plan, WHC-SD-WM-HSP-002, apply to all work performed as appropriate. Waste Tank Safety and Operational Health Physics shall be notified when emergency response is initiated. They shall assist in issuing special Radiation Work Permits as needed to safely perform the tasks required to pump the SST.

Refer to OSD-T-151-00030 if work is to be performed on a watch list tank, and assure that activities will be performed accordingly.

#### 4. Facility Operations

- Submersible Pumping (For Large Quantities of Easily Pumped Liquids): These pumps are capable of pumping 10 to 30 gallons per minute (GPM), which will reduce the driving force behind the leak and should minimize the impact of liquid leaking into the environment. Move the portable motor control center for the submersible pump to the tank farm in question. The jet pump trailer (or skid, depending on which unit is used), will need to be monitored regularly during pumping operations to monitor tank waste levels and to control pumping rates.
- Jet Pumping: Jet pumping removes the interstitial liquid and is a more complicated operation than submersible pumping. These pumps are capable of pumping between 0.05 and 4.0 GPM.
- Risers: Selection of a location for the pump shall be based on the availability of a saltwell screen and, in the case of submersible pumping, the areas where supernate is present (as determined from photographs). A recommended riser is identified in Appendix A based on the current equipment status. Remove any obstructions (equipment) not needed in the riser selected for the pump. Install a saltwell screen if one has not previously been installed.
- Transfer Routing: Select transfer route based on the pump riser used, destination of the waste, heat trace operability, and pressure testing required. A suggested transfer route for each tank (and alternate when available) is identified in Appendix A. For additional information on transfer routes, see WHC-SD-WM-ES-259, Single-Shell Tank Saltwell Transfer Piping Evaluation.
- Jumpers: Obtain and install necessary jumpers in valve pits. These jumpers may be rigid or flexible, depending on availability. Appendix A identifies the drawings for rigid jumpers that were built as part of the interim stabilization program; many of these jumpers are in place, or in storage. Appendix B lists flexible jumpers available.

- Leak detection: Verify that leak detection equipment for the transfer route is operational. If capability for automatic pump shut down interlock from all transfer route leak detectors is lacking, regular monitoring of the route will be required. Portable leak detector stations are available if needed. See H-2-85196, sheets 1-5, for a description.

#### D. Estimated Time To Start Pumping Tanks

Currently, the capability does not exist to begin pumping immediately. The pumps and portable control systems required have been fabricated, and up-to-date Operability Test Procedures have been completed and performed on the hardware. The two dedicated jet pumps and jet pump jumpers, and the skid-mounted WFIE, that are stored in the trailer are ready, as are two submersible pumps, and a maintenance plan is in place for this equipment (WHC-SP-1137).

Pumping methods will be evaluated on a tank-by-tank basis. The status of pumping support utilities varies from one tank farm to another; this leads to uncertainties in the estimates of time to pump candidate single-shell tanks. For a non-watchlist tank, the preparation activities may be accomplished within two or three months. For watchlist tanks, greater safety precautions, documentation and approvals require considerably longer.

A summary list of activities required before pumping the remaining unstabilized single-shell tanks is the basis for the matrix shown in Appendix E.

**APPENDIX A**  
**PROPOSED TRANSFER ROUTES**

APPENDIX A: PROPOSED TRANSFER ROUTES

241-A TANK FARM

The 241-A Tank Farm consists of six 1,000,000 gallon tanks. Tanks A-102, A-103, A-104, A-105, and A-106 are declared interim-stabilized. Tank A-101 has liquid that remains to be pumped.

Heat Trace details for the tank farm are set forth by drawing H-2-69157.  
Leak Detection details for the tank farm are set forth by drawing H-2-71825.

A-101 WATCH LIST TANK (Organic/Flammable Gas)

Route: Distributor pit 01H Riser 4 to Nozzle U-1 (SL-107)  
SL-107 to A-A Valve Pit  
SL-104 from A-A Valve Pit to A-B Valve Pit  
SL-100 from A-B Valve Pit to AX-B Valve Pit  
SN-247 from AX-B Valve Pit to AN-101 Pit 01E

Jumpers: Nozzle L-5 to Nozzle L-18 in A-A Pit (H-2-73765)  
Nozzle R-18 to Nozzle R-9 in A-B Pit (H-2-73766)  
Nozzle R-3 to Nozzle R-11A in AX-B Pit (H-2-73767)  
Nozzle R-11A to Nozzle R-11 in AX-B Pit (H-2-73768)

Alt. Route: Pump Pit 01B Riser 21 to Nozzle U-2 (SN-207)  
SN-207 to A-A Valve Pit  
Flexible Jumper to Nozzle L-18 in A-A  
Continue preferred route

Receiver DST: AN-101

Installed Equipment: Saltwell Screen in Riser 4  
Obstruction: Saltwell Screen and P-10 Pump in Riser 13

Exhauster: Attach portable exhauster at Riser 10  
(If Required)

241-AX TANK FARM

The 241-AX Tank Farm consists of four 1,000,000 gallon tanks. Tanks AX-102, AX-103, and AX-104 have been declared interim stabilized. Tank AX-101 has liquid that remains to be pumped.

Heat Trace details for the tank farm are set forth by H-2-69157.  
Leak Detection details are set forth by H-2-71825.

AX-101 WATCH LIST TANK (Flammable Gas)

Route: Distribution pit 01A Riser 5B to Nozzle A (SL-108)  
SL-108 to AX-A Valve Pit  
SL-110 from AX-A Valve Pit to AX-B Valve Pit  
SN-247 from AX-B Valve Pit to AN-101 Pit 01E

Jumpers: Nozzle L-9 to Nozzle L-18 in AX-A Pit (H-2-73768)  
Nozzle R-18 to Nozzle R-11A in AX-B Pit (H-2-73767)  
Nozzle R-11A to Nozzle R-11 in AX-B Pit (H-2-73778)

Alt. Route: Pump pit 01B Riser 1B to Nozzle A (SN-208)  
SN-208 to AX-A Valve Pit  
Flexible jumper to nozzle L-18 in AX-B Pit  
Continue with preferred route

Receiver DST: AN-101

Obstructions: Sluicer in riser 1B; Saltwell screen and P-10 pump in riser 5B

Exhauster: Attach portable exhauster at Riser 9D  
(If Required)

**241-B TANK FARM**

The 241-B Tank Farm consists of twelve 500,000 gallon tanks. All twelve of the B farm tanks have been declared interim stabilized. However, several of the tanks (B-104, B-107, B-110, and B-111) do not meet current interim stabilization criteria and future pumping of these tanks is possible.

Heat Trace details for the tank farm are set forth in H-2-73612.

**B-104**

Route: Saltwell Pump Pit, Riser 9 to Nozzle A (SN-232)  
SN-232 to SN-231  
SN-231 to 244-BX DCRT (Connection F)

Jumpers: Pump Jumper Only

Alt. Route: Overland Transfer to Tank B-107 Saltwell Pit  
SN-233 to SN-231  
Continue with preferred route

Receiver DST: AN-101

Installed Equipment: Saltwell Screen Riser 9

Obstruction: Old Jet Pump installed in screen

Exhauster: Attach portable exhauster to Riser 2  
(If Required)

**B-107**

Route: Saltwell Pump Pit, Riser 11 to Nozzle A (SN-233)  
SN-233 to SN-231  
SN-231 to 244-BX DCRT (Connection F)

Jumpers: Pump Jumper Only

Alt. Route: Overland Transfer to Tank B-110 Saltwell Pit  
SN-234 to SN-231  
Continue with preferred route

Receiver DST: AN-101

Installed Equipment: Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 2 (If Required)

B-110

Route: Saltwell Pump Pit, Riser 11 to Nozzle A (SN-234)  
SN-234 to SN-231  
SN-231 to 244-BX DCRT (Connection F)

Jumpers: Pump Jumper Only

Alt. Route: Overland Transfer to Tank B-107 Saltwell Pit  
SN-233 to SN-231  
Continue with preferred route

Receiver DST: AN-101

Installed Equipment: Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 3  
(If Required)

B-111

Route: Saltwell Pump Pit, Riser 13 to Nozzle A (SN-228)  
SN-228 to SN-227  
SN-227 to 244-BX DCRT (Connection G)

Jumpers: Pump Jumper Only

Alt. Route: Overland Transfer to Tank B-108 Saltwell Pit  
SN-227 to 244-BX DCRT (Connection G)

Receiver DST: AN-101

Installed Equipment: Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 3  
(If Required)

**241-BX TANK FARM**

The 241-BX Tank Farm consists of twelve 500,000 gallon tanks. Tanks BX-101, BX-102, BX-103, BX-104, BX-105, BX-107, BX-108, BX-109, BX-110, BX-111 and BX-112, have been declared interim stabilized. Tank BX-106 has liquid remaining to be pumped.

(Tank BX-110 did not meet new interim stabilization criteria, so further pumping was initiated in 1993; BX-111 was declared a leaker in 1993 and emergency pumping took place. Both of these tanks are now being evaluated for final status.)

Heat Trace details for the tank farm are set forth in H-2-73612.

**BX-106**

Route: Overland Transfer from BX-106 Riser 13 to Tank BX-109 Saltwell  
Pit Nozzle A  
SN-213 to SN-215  
SN-215 to 244-BX DCRT (Connection A)

Jumpers: Pump Jumper Only

Alt. Route: Different Overland Transfer

Receiver DST: AN-101

Obstructions: No Saltwell Screen Installed: Heel Jet in Riser 13  
(Note: Heel jet may need to be removed and disposed of.)

Exhauster: Attach portable exhauster to Riser 2  
(If Required)

BX-110

Route: Saltwell Pump Pit, Riser 13 to Nozzle A  
SN-216 to 244-BX DCRT (Connection E)

Jumpers: Pump Jumper Only

Alt. Route: Overland Transfer to Tank BX-107 Saltwell Pit  
SN-217 to SN-216  
SN-216 to 244-BX DCRT (Connection E)

Receiver DST: AN-101

Installed Equipment: Saltwell Screen and Jet-Pump in Riser 13.

Exhauster: Attach portable exhauster to Riser 3  
(If Required)

BX-111

Route: Saltwell Pump Pit, Riser 13 to Nozzle A  
SN-215 to 244-BX DCRT (Connection A)

Jumpers: Pump Jumper Only

Alt. Route: Overland Transfer to Tank BX-112 Saltwell Pit  
SN-214 to SN-215  
SN-215 to 244-BX DCRT (Connection A)

Receiver DST: AN-101

Obstructions: Submersible pump in Riser 13  
Installed Equipment: Saltwell Screen and Jet-Pump (2 sets of piping) installed  
in Riser 13

Exhauster: Attach portable exhauster to Riser 3  
(If Required)

**241-BY TANK FARM**

The 241-BY Tank Farm consists of twelve 750,000 gallon tanks. Tanks BY-101, BY-104, BY-107, BY-108, BY-110, BY-111, and BY-112 have been declared interim stabilized. Tanks BY-103, BY-105, and BY-106 have liquid remaining to be pumped. BY-102 and BY-109 are currently being pumped for interim stabilization.

Heat Trace details for the tank farm are set forth in H-2-73612.

**BY-102** (Now Pumping)

Route: Pump Pit 02A, Riser 7 to Nozzle A  
SN-200 to 244-BX DCRT (Connection C)

Jumpers: Pump Jumper Only

Alt. Route: Overland Transfer to Tank BY-105 Pump Pit 05A  
SN-202 to SN-200  
SN-200 to 244-BX DCRT (Connection C)

Receiver DST: AN-101

Obstructions: Jet Pump In Saltwell Screen  
Installed Equipment: Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 4  
(If Required)

**BY-103 WATCH LIST TANK (Ferrocyanide)**

Route: Pump Pit 03A, Riser 7 to Nozzle U-2  
SN-201 to SN-200  
SN-200 to 244-BX DCRT

Jumpers: Pump Jumper Only

Alt. Route: Overland Transfer to Tank BY-102 Pit 02A  
SN-200 to 244-BX DCRT

Receiver DST: AN-101

Obstructions: Jet Pump In Saltwell Screen  
Installed Equipment: Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 10B  
(If Required)

BY-105 WATCH LIST TANK (Ferrocyanide)

Route: Pump Pit 05A, Riser 7 to Nozzle A  
SN-202 to SN-200  
SN-200 to 244-BX DCRT (Connection C)

Jumpers: Pump Jumper Only

Alt. Route: Overland Transfer to Tank BY-106 Pit 06A  
SN-203 to SN-200  
SN-200 to 244-BX DCRT (Connection C)

Receiver DST: AN-101

Installed Equipment: Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 4  
(If Required)

BY-106 WATCH LIST TANK (Ferrocyanide)

Route: Pump Pit 06A, Riser 7 to Nozzle A  
SN-203 to SN-200  
SN-200 to 244-BX DCRT (Connection C)

Jumpers: Pump Jumper Only

Alt. Route: Overland Transfer to Tank BY-105 Pit 05A  
SN-202 to SN-200  
SN-200 to 244-BX DCRT (Connection C)

Receiver DST: AN-101

Installed Equipment: Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 4  
(If Required)

BY-109 (Now Pumping)

Route: Pump Pit 09A, Riser 6 to Nozzle A  
SN-205 to SN-207  
SN-207 to 244-BX DCRT (Connection D)

Jumpers: Pump Jumper Only

Alt. Route: Overland Transfer to Tank BY-108 Pit 08A  
SN-204 to SN-207  
SN-207 to 244-BX DCRT (Connection D)

Receiver DST: AN-101

Installed Equipment: Saltwell Screen Installed, Jet Pump Installed

Exhauster: Attach portable exhauster to Riser 10B  
(If Required)

**241-C TANK FARM**

The 241-C Tank Farm consists of twelve 500,000 gallon tanks. Tanks C-101, C-104, C-108, C-109, C-111, and C-112 have been declared interim stabilized. Tanks C-102, C-107, and C-110 are currently pumping for interim stabilization. Tanks C-103, C-105, and C-106 have liquid remaining to be pumped.

**C-102** (Now Pumping)

Route: Pump Pit 02B, Riser 13 to Nozzle U3  
SN-255 to C Valve Pit  
SN-275 from C Valve Pit to Tank 244-CR-003

Jumpers: Nozzle L-1 to Nozzle U-1 in C Pit (H-2-73881)

Alt. Route: Overland Transfer to C Valve Pit (SN-275)  
Continue preferred route

Receiver DST: AY-101

Installed Equipment: Saltwell Screen Installed, Jet Pump installed

Exhauster: Attach portable exhauster to Riser 8  
(If Required)

**C-103 WATCH LIST TANK (Organic)**

Route: Pump Pit 03B, Riser 13 to Nozzle U-6 (SN-250)  
SN-250 to C Valve Pit  
SN-275 from C Valve Pit to Tank 244-CR-003

Jumpers: Nozzle L-6 to Nozzle U-6 in C Pit (H-2-73881)

Alt. Route: Overland Transfer to C Valve Pit  
Continue preferred route

Receiver DST: AY-101

Installed Equipment: Saltwell Screen Installed in Pump Pit

Exhauster: Attach portable exhauster to Riser 7  
(If Required)

C-105

Route: Pump Pit 05B, Riser 13 Overland Transfer to  
C Valve Pit Nozzle L-3  
SN-275 from C Valve Pit to Tank 244-CR-003

Jumpers: Nozzle L-1 to Nozzle U-1 in C Pit (H-2-73881)

Alt. Route: Overland Transfer to C-102 Pump Pit 02B Nozzle U-1  
SN-255 to C Valve Pit  
Continue preferred route

Receiver DST: AN-106

Installed Equipment: No Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 11  
(If Required)

C-106 WATCH LIST TANK (High Heat)

Route: Pump Pit 06B, Riser 13 Overland Transfer to  
C Valve Pit Nozzle L-3  
SN-275 from C Valve Pit to Tank 244-CR-003

Jumpers: Nozzle L-1 to Nozzle U-1 in C Pit (H-2-73881)

Alt. Route: Overland Transfer to C-102 Pump Pit 02B Nozzle U-1  
SN-255 to C Valve Pit  
Continue preferred route  
C-106 (continued)

Receiver DST: AN-106

Installed Equipment: No Saltwell Screen Installed

Exhauster: Permanently installed on this tank for routine ventilation

WHC is preparing a special leak response plan for this tank. Contact Process Engineering prior to any pumping plan preparation.

C-107 (Now Pumping)

Route: Saltwell Pump Pit, Riser 13 to Nozzle U1  
SN-253 to C Valve Pit  
SN-275 from C Valve Pit to Tank 244-CR-003

Jumpers: Nozzle L-3 to Nozzle U-3 in C Pit (H-2-73881)

Alt. Route: Overland Transfer to C Valve Pit  
Continue preferred route

Receiver DST: AY-101

Installed Equipment: Saltwell Screen Installed, Jet Pump installed

Exhauster: Attach portable exhauster to Riser 3  
(If Required)

C-110 (Now Pumping)

Route: Saltwell Pump Pit, Riser 13 to Nozzle U-1  
SN-252 to C Valve Pit  
SN-275 from C Valve Pit to Tank 244-CR-003

Jumpers: Nozzle L-4 to Nozzle U-4 in C Pit (H-2-73881)

Alt. Route: Overland Transfer to C Valve Pit  
Continue preferred route

Receiver DST: AY-101 (Core Sampled in April, 1992)

Installed Equipment: Saltwell Screen Installed, Jet Pump installed

Exhauster: Attach portable exhauster to Riser 2  
(If Required)

## 241-S TANK FARM

The 241-S Tank Farm consists of twelve 750,000 gallon tanks. Tanks S-104 and S-105 have been declared interim stabilized. All of the remaining tanks in S-Farm have liquid that is to be pumped.

For important information on transfer piping in S-Farm, see WHC-SD-WM-ES-259, "Single-Shell Tank Saltwell Transfer Piping Evaluation." Tanks S-101, S-103, S-106, S-107, S-108, S-109 and S-110 are scheduled for interim stabilization to begin January 1996 per TPA Milestone M-41-09. The saltwell lines for these tanks have recently been tested, and many failures have resulted in plans for over-ground transfers. These routes are included below.

Heat Trace details for the tank farm are set forth in H-2-46159.

### S-101

Route: Pump Pit 01A, Riser 5 to Nozzle B (SL-121)  
SL-121 to S-B Valve Pit  
Overground to S-D Valve Pit  
SN-249 from S-D Valve Pit to 244-S DCRT

**Jumpers:** A new custom-built jumper will connect at Nozzle R-5 and Nozzle R-18 in the S-B valve pit, connecting them to the OGT line; the OGT line connects by flange to Nozzle R-2 in S-D Pit (H-2-70606/1-A).

Receiver DST: SY-102 (liquid sample data available)

Installed Equipment: Saltwell Screen in Riser 5

Exhauster: Attach portable exhauster to Riser 4 (if required)

S-102 WATCH LIST TANK (Organic/Flammable Gas)

Route: Distribution Pit 02B, Riser 13 to Nozzle (SL-140)  
SL-140 to S-A Valve Pit; SL-134 from S-A Valve Pit to S-B Valve Pit

Note: SN-216 from S-B Valve Pit to S-D Valve Pit failed Leak/Pressure testing in 1992. OGT will be necessary to reach S-D Valve-Pit

SN-246 from S-D Valve Pit to 244-S DCRT

Jumpers: Nozzle L-5 to Nozzle L-18 in S-A Pit (H-2-73770)  
Nozzle R-18 to Nozzle TBD in S-B Pit (H-2-73771/73774)  
Nozzle TBD to Nozzle R-2 in S-D Pit (H-2-70606/1-A)

Alt. Route: Pump Pit 02A Riser R-8 to Nozzle G; SN-242 to S-A Valve Pit  
Flexible jumper to Nozzle L-18 in S-A Pit; Continue with new or overland route

Receiver DST: SY-102

Obstructions: Jet Pump in Riser 13  
Installed Equipment: Saltwell Screen in Riser 13  
No Saltwell Screen in Riser 8 (pump pit)

Exhauster: Attach portable exhauster to Riser 6 (If Required)

S-103

Route: Pump Pit 03A, Riser 5 to Nozzle A (SN-219)  
SN-219 to S-A Valve Pit; SL-134 from S-A Valve Pit to S-B Valve Pit;  
OGT to S-D Valve Pit; SN-246 from S-D Valve Pit to 244-S DCRT

Jumpers: Nozzle L-15 to Nozzle L-18 in S-A Pit (H-2-73770);  
Custom-built jumper Nozzle R-18 to OGT in S-B Pit;  
OGT to Nozzle R-2 in S-D Pit (H-2-70606/1-A)

Receiver DST: SY-102 (Liquid sample data available)

Installed Equipment: Saltwell Screen in Riser 5

Exhauster: Attach portable exhauster to Riser 7 (if required)

S-106

Route: OGT to 241-S-103 pump pit; then follow as above for S-103.

Jumpers: Custom-built jumper in S-103 pump pit, to Nozzle A;  
Nozzle L-15 to Nozzle L-18 in S-A Pit;  
Nozzle R-18 to OGT in S-B Pit;  
OGT to Nozzle R-2 in S-D Pit (H-2-70606/1-A)

Receiver DST: SY-102 (Liquid sample data available)

Obstructions: Pump in Riser 5

Installed Equipment: Saltwell Screen in Riser 5

Exhauster: Attach portable exhauster to Riser 7  
(If Required)

S-107

Route: Pump Pit 07A, Riser 5 to Nozzle B ( 2" Encasement)  
1" SN-246 to (# 17) 244-S DCRT

Alternate

Route: Pump Pit 07A, Riser 5 to Nozzle A (3" SN-226)  
SN-226 to S-D Valve Pit  
SN-247 from S-D Valve Pit to 244-S DCRT

Jumpers: Nozzle R-14 to Nozzle R-2 in S-D Valve Pit (Flexible)  
(for alternate route only)

Receiver DST: SY-102 (Liquid sample data available)

Installed Equipment: Saltwell Screen in Riser 5

Exhauster: Attach portable exhauster to Riser 7  
(If Required)

S-108

Route: Pump Pit 08A, Riser 5 to Nozzle B (SL-124)  
SL-124 to S-C Valve Pit  
SL-135 from S-C Valve Pit to S-D Valve Pit  
SN-249 from S-D Valve Pit to 244-S DCRT via 241-S-107 pump pit

Jumpers: Nozzle L-5 to Nozzle L-18 in S-C Pit (Flexible)  
Nozzle R-18 to Nozzle R-2 in S-D Pit (H-2-70606/2-D)

Alt. Route: Pump Pit 08A, Riser 5 to Nozzle A (SN-224)  
SN-224 to S-C Valve Pit  
Flexible jumper to Nozzle L-18 in S-C Pit  
Continue preferred route

Receiver DST: SY-102 (Liquid sample data available)

Installed Equipment: Saltwell Screen in Riser 5

Obstruction: Jet Pump in Riser 5

Exhauster: Attach portable exhauster to Riser 7  
(If Required)

S-109

Route: Pump Pit 09A, Riser 5 to Nozzle B (SL-123)  
SL-123 to S-C Valve Pit  
SL-135 from S-C Valve Pit to S-D Valve Pit  
SN-249 from S-D Valve Pit to 244-S DCRT

Jumpers: Nozzle L-7 to Nozzle L-18 in S-C Pit (Flexible)  
Nozzle R-18 to Nozzle R-2 in S-D Pit (H-2-70606/2-D)

Alt. Route: Pump Pit 09A, Riser 5 to Nozzle A (SN-223)  
SN-223 to S-C Valve Pit  
Flexible jumper to Nozzle L-18 in S-C Pit  
Continue preferred route

Receiver DST: SY-102 (Liquid sample data available)

Installed Equipment: Saltwell Screen in Riser 5

Obstruction: Jet Pump in Riser 5

Exhauster: Attach portable exhauster to Riser 7  
(If Required)

S-110

Route: Pump Pit 10A, Riser 5 to Nozzle B (St-127)  
SL-127 to S-D Valve Pit  
SN-249 from S-D Valve Pit to 244-S DCRT

Jumpers: Nozzle R-7 to Nozzle R-2 in S-D Pit (H-2-70606/3-E)

Alt. Route: Pump Pit 10A, Riser 5 to Nozzle A (SN-227)  
SN-227 to S-D Valve Pit  
Flexible jumper to Nozzle R-2 in S-D Pit  
Continue preferred route

Receiver DST: SY-102

Installed Equipment: Saltwell Screen in Riser 5  
Obstruction: Jet Pump in Riser 5

Exhauster: Attach portable exhauster to Riser 7

S-111 WATCH LIST TANK (Organic/Flammable Gas)

Route: Pump Pit 11A, Riser 5 to Nozzle A (SN-228)  
SN-228 to S-D Valve Pit  
SN-247 from S-D Valve Pit to 244-S DCRT

Jumpers: Nozzle R-16 to Nozzle R-2 in S-D Pit (H-2-70606/6-D)

Alt. Route: Pump Pit 11A, Riser 5 to Nozzle B (SL-128)  
SL-128 to S-D Valve Pit  
Flexible jumper to Nozzle R-2 in S-D Pit  
Continue preferred route

Receiver DST: SY-102

Installed Equipment: Saltwell Screen in Riser 5  
Obstruction: Jet Pump in Riser 5

Exhauster: Attach portable exhauster to Riser 8  
(If Required)

S-112 WATCH LIST TANK (Flammable Gas)

Route: Pump Pit 12A, Riser 5 to Nozzle B (SL-124)  
SL-125 to S-C Valve Pit  
SL-135 from S-C Valve Pit to S-D Valve Pit  
SN-245 from S-D Valve Pit to 244-S DCRT

Jumpers: Nozzle L-9 to Nozzle L-18 in S-C Pit (Flexible)  
Nozzle R-18 to Nozzle R-2 in S-D Pit (H-2-70606/2-D)

Alt. Route: Pump Pit 12A, Riser 5 to Nozzle A (SN-225)  
SN-225 to S-C Valve Pit  
Flexible jumper to Nozzle L-18 in S-C Pit  
Continue preferred route

Receiver DST: SY-102

Installed Equipment: Saltwell Screen in Riser 5  
Obstruction: Jet Pump in Riser 5

Exhauster: Attach portable exhauster to Riser 7  
(If Required)

**241-SX TANK FARM**

The 241-SX Tank Farm consists of fifteen 1,000,000 gallon tanks. Tanks SX-107 through SX-115 have been declared interim stabilized. Tanks SX-101 through SX-106 have liquid remaining to be pumped.

Heat Trace details for the tank farm are set forth in H-2-46159.  
Leak Detection details are set forth in H-2-34965 and H-2-46477.

**SX-101 WATCH LIST TANK (Flammable Gas)**

Route: Pump Pit 01A, Riser 9 to Nozzle B (SL-137)  
SL-137 to SX-B Valve Pit; SL-118 from SX-B Valve Pit to S-D Valve Pit  
SN-249 from S-D Valve Pit to 244-S DCRT

Jumpers: Nozzle R-7 to Nozzle R-3 in SX-B Pit (H-2-70606)  
Nozzle R-10 to Nozzle R-2 in S-D Pit (H-2-93653/2-D)

Alt. Route: Pump Pit 01A, Riser 9 to Nozzle A (SN-241)  
SN-241 to SX-B Valve Pit; Flexible Jumper to Nozzle R-3 in SX-B Pit  
Continue preferred route

Receiver DST: SY-102

**SX-102 WATCH LIST TANK (Flammable Gas)**

Route: Pump Pit 02B, Riser 9 to Nozzle B (SL-130)  
SL-130 to SX-A Valve Pit  
SL-117 from SX-A Valve Pit to S-C Valve Pit  
SL-135 from S-C Valve Pit to S-D Valve Pit  
SN-245 from S-D Valve Pit to 244-S DCRT

Jumpers: Nozzle L-5 to Nozzle L-3 in SX-A Pit (H-2-70606)  
Nozzle L-10 to Nozzle L-18 in S-C Pit (H-2-93653/5-E)  
Nozzle R-18 to Nozzle R-2 in S-D Pit (H-2-93653/2-B)

Alt. Route: Pump Pit 02B, Riser 9 to Nozzle A (SN-230)  
SN-230 to SX-A Valve Pit  
Flexible Jumper to Nozzle L-3 in SX-A Pit  
Continue preferred route

Receiver DST: SY-102

Obstructions: P-10 Pump in Riser 9  
Installed Equipment: Saltwell Screen in Riser 9

SX-103 WATCH LIST TANK (Organic/Flammable Gas)

Route: Pump Pit 03B, Riser 9 to Nozzle B (SL-129)

SL-129 to SX-A Valve Pit

SL-117 from SX-A Valve Pit to S-C Valve Pit

SL-135 from S-C Valve Pit to S-D Valve Pit

SN-245 from S-D Valve Pit to 244-S DCRT

Jumpers: Nozzle L-7 to Nozzle L-3 in SX-A Pit (H-2-70606)

Nozzle L-10 to Nozzle L-18 in S-C Pit (H-2-93653/5-E)

Nozzle R-18 to Nozzle R-2 in S-D Pit (H-2-93653/2-B)

Alt. Route: Pump Pit 03B, Riser 9 to Nozzle A (SN-229)

SN-229 to SX-A Valve Pit

Flexible Jumper to Nozzle L-3 in SX-A Pit

Continue preferred route

Receiver DST: SY-102

Installed Equipment: Saltwell Screen in Riser 9

SX-104 WATCH LIST TANK (Flammable Gas)

Route: Pump Pit 04A, Riser 5 to Nozzle A

SN-233 to 241-SX-B Valve Pit

SL-118 from 241-SX-B Valve Pit to 241-S-D Valve Pit

6" Encased Pipe from 241-S-D Valve Pit to TK 241-S-107  
Valve Pit

SN-249 from TK 241-S-107 Valve Pit to 244-S DCRT

Jumpers: Nozzle R-15 to Nozzle R-3

Nozzle R-10 to Nozzle R-2

Alt. Route: Overground transfer to 241-SX-B Valve Pit

SL-118 from 241-SX-B Valve Pit to 241-S-D Valve Pit

6" Encased Pipe from 241-S-D Valve Pit to TK 241-S-107 Valve Pit

SN-249 from TK 241-S-107 Valve Pit to 244-S DCRT

Receiver DST: SY-102

Obstructions: Submersible pump on hose in Riser 5

Installed Equipment: Saltwell Screen in Riser 5

Exhauster: Attach a portable exhauster to Riser 7  
(If Required)

SX-105 WATCH LIST TANK (Flammable Gas)

Route: Pump Pit 05A, Riser 5 to Nozzle A (SN-232)  
SN-232 to SX-B Valve Pit  
SL-118 from SX-8 Valve Pit to S-D Valve Pit  
SN-249 from S-D Valve Pit to 244-S DCRT

Jumpers: Nozzle R-16 to Nozzle R-3 in SX-B Pit (H-2-70606)  
Nozzle R-10 to Nozzle R-2 in S-D Pit (H-2-93653/2-D)

Alt. Route: Pump Pit 05B, Riser 13 to Nozzle B (SL-132)  
SL-132 to SX-B Valve Pit  
Flexible Jumper to Nozzle R-3 in SX-B Pit  
Continue preferred route

Receiver DST: SY-102

Obstructions: Submersible pump in Riser 5  
Installed Equipment: Saltwell Screen in Riser 5

SX-106 WATCH LIST TANK (Organic/Flammable Gas)

Route: Pump Pit 06A, Riser 5 to Nozzle B (SL-131)  
SL-131 to SX-A Valve Pit  
SL-117 from SX-A Valve Pit to S-C Valve Pit  
SL-135 from S-C Valve Pit to S-D Valve Pit  
SN-245 from S-D Valve Pit to 244-S DCRT

Jumpers: Nozzle L-9 to Nozzle L-3 in SX-A Pit (H-2-70606)  
Nozzle L-10 to Nozzle L-18 in S-C Pit (H-2-93653/5-E)  
Nozzle R-18 to Nozzle R-2 in S-D Pit (H-2-93653/2-B)

Alt. Route: Pump Pit 06A, Riser 5 to Nozzle A (SN-231)  
SN-231 to SX-A Valve Pit  
Flexible jumper to Nozzle L-3 in SX-A Pit  
Continue preferred route

Receiver DST: SY-102

Obstructions: Submersible pump in Riser 5

Installed Equipment: Saltwell Screen in Riser 5

**241-T TANK FARM**

The 241-T Tank Farm consists of twelve 500,000 gallon tanks. Tanks T-101, T-102, T-103, T-105, T-106, T-108, T-109, and T-112 have been declared interim stabilized. Tanks T-102 and T-112 do not meet the current interim stabilization criteria, however, and future pumping of these tanks is possible. Tanks T-104, T-107, and T-110 have liquid remaining to be pumped. Tank T-111 was declared a leaker in 1994 and emergency pumping is in progress.

**T-102**

Route: Over-ground Transfer from T-102 Riser 10 to Tank T-101 Saltwell Pit  
Nozzle U-3  
2" Line from Tank T-101 to SN-6012  
SN-6012 to 244-TX DCRT (Connection H)

Jumpers: Pump Jumper Only

Alt. Route: Over-ground Transfer to Tank T-104 Saltwell Pit  
SN-252 to SN-6012  
SN-6012 to 244-TX DCRT (Connection H)

Receiver DST: SY-102

Installed Equipment: No Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 2 (If Required)

**T-104**

Route: Saltwell Pit, Riser 13 to Nozzle U-3  
SN-252 to SN-6012  
SN-6012 to 244-TX DCRT (Connection H)

Jumpers: Pump Jumper Only

Alt. Route: Over-ground Transfer to Tank T-101 Saltwell Pit  
2" Line from Tank T-101 to SN-6012  
SN-6012 to 244-TX DCRT (Connection H)

Receiver DST: SY-102

Installed Equipment: Saltwell Screen Installed in Riser 13

Exhauster: Attach portable exhauster to Riser 3 (If Required)

T-107

Route: Saltwell Pit, Riser 13 to Nozzle U-3  
2" Line from Tank T-107 to SN-7624  
SN-7624 to 244-TX DCRT (Connection I)

Jumpers: Pump Jumper Only

Alt. Route: Over-ground Transfer to Tank T-110 Saltwell Pit  
2" Line from Tank T-110 to SN-7624  
SN-7624 to 244-TX DCRT (Connection I)

Receiver DST: SY-102 (Core sampled in Sept. 1992)

Obstructions: Submersible Pump in Riser 13  
Installed Equipment: Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 2  
(If Required)

T-110 WATCH LIST TANK (Flammable Gas)

Route: Saltwell Pit, Riser 13 to Nozzle U-3  
2" Line from Tank T-110 to SN-7624  
SN-7624 to 244-TX DCRT (Connection I)

Jumpers: Pump Jumper Only

Alt. Route: Over-ground Transfer to Tank T-107 Saltwell Pit  
2" Line From Tank T-107 to SN-7624  
SN-7624 to 244-TX DCRT (Connection I)

Receiver DST: SY-102

Installed Equipment: Saltwell Screen Installed in Riser 13

Exhauster: Attach portable exhauster to Riser 2

T-111 WATCH LIST TANK (Organic)

Route: Saltwell Fit, Riser 13 to Nozzle U-3  
2" Line from Tank T-111 to SN-7624  
SN-7624 to 244-TX DCRT (Connection I)

Jumpers: Pump Jumper Only

Alt. Route: Over-ground Transfer to Tank T-110 Saltwell Pit  
2" Line from Tank T-110 to SN-7624  
SN-7624 to 244-TX DCRT (Connection I)

Receiver DST: SY-102 (Core Sampled in Nov. 1991)

Installed Equipment: Saltwell Screen Installed in Riser 13

Exhauster: Attach portable exhauster to Riser 2  
(If Required)

T-112

Route: Over-ground Transfer from T-112 Riser 13 to T-111 Saltwell Pit  
Nozzle U-3  
2" Line from Tank T-111 to SN-7624  
SN-7624 to 244-TX DCRT (Connection I)

Jumpers: Pump Jumper Only

Alt. Route: Over-ground Transfer to Tank T-109 Saltwell Pit  
2" Line From Tank T-109 to SN-7624  
SN-7624 to 244-TX DCRT (Connection I)

Receiver DST: SY-102

Installed Equipment: No Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 2  
(If Required)

244-U TANK FARM

The 241-U Tank Farm consists of twelve 500,000 gallon tanks. Tanks U-101, U-104, U-110 and U-112 have been declared interim stabilized. Tanks U-102, U-103, U-105, U-106 through U-109, and U-111 have liquid remaining to be pumped.

Tank U-110 does not meet present interim stabilization criteria and future pumping of this tank is possible.

Heat Trace details for the farm are set forth in H-2-37326.

U-102

Route: Pump pit 02B, Riser 13 to Nozzle A (SL-111)  
SL-111 to U-B Valve Pit  
SL-103 from U-B Valve Pit to U-D Valve Pit  
SN-264 from U-D Valve Pit to 244-U DCRT

Jumpers: Nozzle R-7 to Nozzle R-3 in U-B Pit (H-2-73718)  
Nozzle R-10 to Nozzle R-5 in U-D Pit (H-2-73707)

Alt. Route: Overland Transfer to U-B Valve Pit

Receiver DST: SY-102

Obstructions: Distributor Jet in Riser 13  
Installed Equipment: No Saltwell Screen

Exhauster: Attach portable exhauster to Riser 7  
(If Required)

U-103 WATCH LIST TANK (Organic/Flammable Gas)

Route: Pump pit 03B, Riser 13 to Nozzle A (SL-109)  
SL-109 to U-B Valve Pit  
SL-103 from U-B Valve Pit to U-D Valve Pit  
SN-264 from U-D Valve Pit to 244-U DCRT

Jumpers: Nozzle R-9 to Nozzle R-3 in U-B Pit (H-2-73718)  
Nozzle R-10 to Nozzle R-5 in U-D Pit (H-2-73707)

Alt. Route: Overland transfer to U-B Valve Pit

Receiver DST: SY-102

Installed Equipment: No Saltwell Screen

Exhauster: Attach portable exhauster to Riser 2 (If Required)

U-105 WATCH LIST TANK (Organic/Flammable Gas)

Route: Pump Pit 05B, Riser 13 to Nozzle A (SL-112)  
SL-112 to U-A Valve Pit  
SL-102 from U-A Valve Pit to U-C Valve Pit  
SL-113 from U-C Valve Pit to U-D Valve Pit  
SN-265 from U-D Valve Pit to 244-U DCRT

Jumpers: Nozzle L-7 to Nozzle L-3 in U-A Pit (H-2-73719)  
Nozzle L-10 to Nozzle L-18 in U-C Pit (H-2-73714)  
Nozzle R-18 to Nozzle R-4 in U-D Pit (H-2-73715)

Alt. Route: Overland Transfer to U-A Valve Pit

Receiver DST: SY-102

Installed Equipment: No Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 7  
(If Required)

U-106 WATCH LIST TANK (Organic)

Route: Pump Pit 06B, Riser 13 to Nozzle A (SL-110)  
SL-110 to U-A Valve Pit  
SL-102 from U-A Valve Pit to U-C Valve Pit  
SL-113 from U-C Valve Pit to U-D Valve Pit  
SN-265 from U-D Valve Pit to 244-U DCRT

Jumpers: Nozzle L-9 to Nozzle L-3 in U-A Pit (H-2-73719)  
Nozzle L-10 to Nozzle A in U-C Pit (H-2-73713)  
Nozzle A to Nozzle L-18 in U-C Pit (H-2-73714)  
Nozzle R-18 to Nozzle R-4 in U-D Pit (H-2-73715)

Alt. Route: Overland Transfer to U-A Valve Pit

Receiver DST: SY-102

Installed Equipment: No Saltwell Screen Installed  
Exhauster: Attach portable exhauster to Riser 7

U-107 WATCH LIST TANK (Organic/Flammable Gas)

Route: Pump Pit 07B, Riser 13 to Nozzle A (SL-106)  
SL-106 to U-D Valve Pit  
SN-266 from U-D Valve Pit to 244-U DCRT

Jumpers: Nozzle R-9 to Nozzle B in U-D Pit (H-2-73708)  
Nozzle B to Nozzle R-22 in U-D Pit (H-2-73716)

Alt. Route: Overland Transfer to U-D Valve Pit

Receiver DST: SY-102

Obstructions: Distributor Jet in Riser 13  
Installed Equipment: No Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 7  
(If Required)

U-108 WATCH LIST TANK (Flammable Gas)

Route: Pump Pit 08B, Riser 13 to Nozzle A (SL-105)  
SL-105 to U-C Valve Pit  
SL-113 from U-C Valve Pit to U-D Valve Pit  
SN-265 from U-D Valve Pit to 244-U DCRT

Jumpers: Nozzle L-9 to Nozzle A in U-C Pit (H-2-73713) Nozzle A to Nozzle L-18  
in U-C Pit (H-2-73714)  
Nozzle R-18 to Nozzle R-4 in U-D Pit (H-2-73715)

Alt. Route: Overland Transfer to U-C Valve Pit

Receiver DST: SY-102

Obstructions: Distributor Jet in Riser 13  
Installed Equipment: No Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 7  
(If Required)

U-109 WATCH LIST TANK (Flammable Gas)

Route: Pump Pit 09B, Riser 13 to Nozzle A (SL-104)  
SL-104 to U-C Valve Pit  
SL-113 from U-C Valve Pit to U-D Valve Pit  
SN-265 from U-D Valve Pit to 244-U DCRT

Jumpers: Nozzle L-7 to Nozzle A in U-C Pit (H-2-73713)  
Nozzle A to Nozzle L-18 in U-C Pit (H-2-73714)  
Nozzle R-18 to Nozzle R-4 in U-D Pit (H-2-73715)

Alt. Route: Overland Transfer to U-C Valve Pit

Receiver DST: SY-102

Obstructions: Distributor Jet in Riser 13  
Installed Equipment: No Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 7  
(If Required)

U-110

Route: Pump Pit 10B, Riser 13 to Nozzle A (SL-108)  
SL-108 to 241-U-D Valve Pit  
SN-264 to 244-U DCRT

Jumpers: Nozzle R-7 to Nozzle R-5 in 241-U-D Valve Pit

Alt. Route: Overground transfer to 241-U-D Valve Pit

Receiver DST: SY-102

Installed Equipment: Saltwell Screen in Riser 13

Exhauster: Attach a portable exhauster to Riser 2  
(If Required)

U-111 WATCH LIST TANK (Organic)

Route: Pump Pit 11B, Riser 13 to Nozzle A (SL-107)  
SL-107 to U-C Valve Pit  
SL-217 from U-C Valve Pit to U-D Valve Pit  
SN-266 from U-D Valve Pit to 244-U DCRT

Jumpers: Nozzle L-5 to Nozzle L-19 in U-C Pit (H-2-73712)  
Nozzle R-19 to Nozzle R-22 in U-D Pit (H-2-73716)

Alt. Route: Overland Transfer to U-C Valve Pit

Receiver DST: SY-102

Installed Equipment: No Saltwell Screen Installed

Exhauster: Attach portable exhauster to Riser 7  
(If Required)

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**APPENDIX B**

**INFORMATIONAL LISTING OF PROCEDURES,  
EQUIPMENT, AND DRAWINGS**

APPENDIX B: INFORMATIONAL LISTING OF PROCEDURES, EQUIPMENT, AND DRAWINGS

PROCEDURES / DOCUMENTS:

A. General Procedures / Other Documents

TO-020-044 Lock and Tag Control Procedure  
 TO-020-070 Swab Radiation Readings in Pipeline Encasement Risers, Leak  
 Detection Risers and In-Tank LOWs  
 TO-020-140 In-Tank Photography  
 TO-020-190 East Area Pit Leak Detector Alarm System  
 TO-020-200 East Area Tank Farm Surface Radiation Alarm System  
 TO-020-210 West Area Pit Leak Detector Alarm System  
 TO-020-220 West Area Tank Farm Surface Radiation Alarm System  
 TO-020-270 Equipment Removal of Installation at Diversion Boxes and Pits  
 TO-020-345 Tank Farm Saltwell Screen Flushing  
 TO-020-350 Saltwell Screen or Liquid Level Well and Dip  
 Tube Installation  
 TO-020-390 Breaking Flanged Joints on Equipment Containing Radioactive Solution  
 or Materials  
 TO-020-700 East Area Saltwell Trouble Shooting Guide  
 TO-020-705 Perform Jet Pump, Foot Valve, DOV, and Transfer Line Flushing  
 TO-025-001 General Transfer Procedure  
 TO-025-030 Overground Transfers of Tank Farm Solutions  
 TO-040-540 Raw Water Surveillance and Usage  
 TO-140-010 Leak Checking Waste Transfer Lines  
 TO-140-170 Pressure Testing of Process Pipelines and Pipe-in-Pipe Encasements  
 WHC-CM-5-7 Section 3.9 Equipment Lock and Tag  
 WM-OTP-027 OTP of Jet Pump Jumper Pressure Test for Tank Farms  
 WM-OTP-087 OTP of Emergency Jet Pump and Jumpers  
 OSD-T-151-00030 Watch List Tanks

B. Specific Tank Farm Procedures (Some may be currently inactive. Inactive  
 procedures need revision, but are good references for new procedure  
 preparation.)

1. B/BX/BY Farms

TO-220-023 Transfer Routing for 244-BX to 101-AN Via Supernate Lines  
 TO-220-025 Transfer Routing for 244-BX to 101-AN  
 TO-220-026 Transfer Routing 244-BX Via Slurry Lines to 102-AN  
 TO-305-450 Tank 244-BX Exhauster Operation  
 TO-305-460 244-BX Sump Pump Operation  
 TO-321-700 Transfer Procedure for 244-BX Receiver Vessel  
 TO-321-710 Transfer From 241-BX SST to 244-BX DCRT : Saltwell Jet-Pump  
 TO-020-700 Respond to Alarms at 244-BX and 254-BY

2. C Farms

TO-350-010 Transfer Liquid from 241-C to 244-CR-003 Tank - Saltwell Jet Pump  
TO-350-110 Sump Jet Operation - 244-CR VAULT  
TO-350-200 Water Additions to TK-105-C & TK-106-C

3. S/SX Farms

TO-410-856 Transfer Liquid from TK-101-SX to 244-S DCRT Saltwell Jet Pump  
TO-410-857 Transfer Liquid from TK-101-SX to 244-S DCRT  
TO-410-858 Supernate Pump Liquid from 104-SX to 244-S DCRT  
TO-410-859 Jet Pump Liquid from 104-SX to 244-S DCRT

4. T Farms

TO-450-045 Saltwell Pumping 241-TX Tank Farm  
TO-450-050 Tank 244-TX Dip Tube Operation  
TO-450-055 244-TX Sump Pumping  
TO-450-160 TX Farm Saltwell Screen Flushing  
TO-450-200 Flushing of TX Farm Process Pipelines  
TO-460-500 Saltwell Transfers from 102, 104, 105, 107, 109, 110, 111, 201, 202, 203, and 204 to TK-101-T  
TO-480-200 Transfer Procedure TK-101-TY Saltwell to TK-102-TY  
TO-480-220 Saltwell Pumping, TK-103-TY to TK-102-TY(void)  
TO-480-240 Saltwell Pumping, TK-105-TY to TK-102-TY

5. U Farm

TO-505-010 Start-up 241-U Jet Pumps  
TO-505-020 Transfer Procedure for 244-U Receiver Vessel  
TO-505-030 Tank 244-U Exhauster Operation  
TO-505-040 244-U Sump Pump Operation

## 6. Emergency Pumping Procedures

TANK FARM	PROCEDURE NUMBER	PROCEDURE TITLE
S-Farm	TO-001-025	Perform S-Tank Farm Emergency Pumping Procedure for Tanks 241-S-101 through 241-S-103 and 241-S-106 through 241-S-112
S-Farm	TO-020-800	Troubleshoot and Respond to S-Farm (241-S-101 through 241-S-103 and 241-S-106 through 241-S-112) Emergency Saltwell Jet Pump Out-of-Limits/Alarm Conditions
U-Farm	TO-001-090	Perform U-Tank Farm Emergency Pumping Procedure for Tanks 241-U-102 and 241-U-103, 241-U-105 through 241-U-109 and 241-U-111
U-Farm	TO-020-805	Troubleshoot and Respond to U-Farm (241-U-102, 241-U-103, 241-U-105 through 241-U-109 and 241-U-111) Emergency Saltwell Jet Pump Out-of-Limits/Alarm Conditions
T-Farm	TO-001-340	Perform T-Tank Farm Emergency Pumping Procedure for Tanks 241-T-104 and 241-T-107, 241-T-110
T-Farm	TO-020-840	Troubleshoot and Respond to T-Farm (241-T-104, 241-U-107, 241-U-110) Emergency Saltwell Jet Pump Out-of-Limits/Alarm Conditions
BY-Farm	TO-001-350	Perform BY-Tank Farm Emergency Pumping Procedure for Tanks 241-BY-103 and 241-BY-105, 241-BY-106
BY-Farm	TO-020-850	Troubleshoot and Respond to BY-Farm (241-BY-103, 241-BY-105, 241-BY-106) Emergency Saltwell Jet Pump Out-of-Limits/Alarm Conditions
BX-Farm	TO-001-360	Perform BX-Tank Farm Emergency Pumping Procedure for Tank 241-BX-106
BX-Farm	TO-020-860	Troubleshoot and Respond to BX-Farm (241-BX-106) Emergency Submersible Out-of-Limits/Alarm Conditions
SX-Farm	TO-001-370	Perform SX-Tank Farm Emergency Pumping Procedure for Tanks 241-SX-101 through 241-SX-106
SX-Farm	TO-020-870	Troubleshoot and Respond to SX-Farm (241-SX-101 through 241-SX-106) Emergency Saltwell Jet Pump Out-of-Limits/Alarm Conditions
AX-Farm	TO-001-380	Perform AX-Tank Farm Emergency Pumping Procedure for Tank 241-AX-101

TANK FARM	PROCEDURE NUMBER	PROCEDURE TITLE
AX-Farm	TO-020-880	Troubleshoot and Respond to AX-Farm (241-AX-101) Emergency Saltwell Jet Pump Out-of-Limits/Alarm Conditions
A-Farm	TO-001-390	Perform A-Tank Farm Emergency Pumping Procedure for Tank 241-A-101
A-Farm	TO-020-890	Troubleshoot and Respond to A-Farm (241-A-101) Emergency Saltwell Jet Pump Out-of-Limits/Alarm Conditions
C-Farm	TO-001-400	Perform C-Tank Farm Emergency Pumping Procedure for Tank 241-C-103
C-Farm	TO-020-900	Troubleshoot and Respond to C-Farm (241-C-103) Emergency Submersible Out-of-Limits/Alarm Conditions

Emergency Pumping Skid, and Wheeled Trailer

The pump control station contains power and instrumentation for the jet-pump (and any submersible pump) that will be used to pump a tank. The 480-volt, three phase AC power required is supplied via the cable reel from a tank farm welding receptacle. This power is controlled and apportioned by an on-board transformer, switchgear, fuses, and safety features.

Power at 110 V AC (converted to 24 V DC) is supplied to the Weight Factor Instrument Enclosure and the self-contained instrumentation within, including:

- specific gravity transmitter
- weight factor transmitter
- electro/pneumatic converter
- programmable flowrate/totalizer computer
- three-color pen recorder for specific gravity, weight factor, flow rate
- elapsed time indicator
- circuits for leak detector and pump pressure alarms and strobes
- heater to allow for cold weather operation
- indicating lights are mounted on the exterior of the cabinet to aid operators.

Power is also supplied to the portable air compressor, and to a lighting system to allow night operation. Power receptacles are also available for tools. The power supply to the pumps will be protected by fuses sized according to the pump used. Switchgear is available to shut down the complete system, or the pump, the transformer, the compressor, or AC power separately.

The Emergency Pumping Skid and the Emergency Pumping Trailer will have their water needs supplied either by tank farm utilities, or by water truck. These units will each be moved by crane or pulled by truck to the leaker tank pump pit for the purpose of pump control. Instrumentation does not currently exist on the skid or trailer for automatic control of the jet pumps. Manual surveillance of instrumentation and control of the jet pump system will be necessary for tank farm use.

Emergency Pumping Support Systems:

EQUIPMENT DESCRIPTIONS	DRAWING NUMBER
Wheeled Utility-Type Trailer	Wiring Diagram Portable Jet Pump Station H-2-99142
Wheeled Utility-Type Trailer and Weight Factor Instrument Skid	Skid Mounted Portable Jet Pump Station H-2-99136 (12 sheets)
	Trailer Mounted Portable Jet Pump Station H-2-85187
	Instrument Enclosure H-2-99139
	Portable Jet Pump Station Weight Factor Enclosure H-2-70877
	Instrument & WT Factor Skid H-2-82561
Semi-Trailer	Pumping Trailer Assembly H-2-82557
	Electrical Installation H-2-82558
	Overground Piping Storage Rack H-2-82562
	Overground Piping Support Stand Storage Rack H-2-82563
	Equipment Arrangement H-2-82564
Jet Pump Jet Pump Jumper	Total of five sheets H-2-73990 Total of 3 sheets H-2-78320
Submersible Pumps	Universal Submersible Pump H-2-68521
Weight Factor Instrument Enclosure (WFIE) Cabinet	Total of 4 Sheets H-2-94182 Alternate Configuration For Enclosure H-2-70877
Saltwell Screens	Saltwell Screens H-2-38587 H-2-69757
Portable Leak Detector Assy	Saltwell Pump Pits H-2-85196

Over-Ground Transfer Lines:

Piping - Plan, Elevation and Detail	H-2-818279
Piping - Overground Transfer System Assemblies	H-2-818280
Piping - Overground Transfer System Support	H-2-818281 (2 Sheets)
Piping - Overground Transfer System Loop/Detail	H-2-818283
Procurement Specification for OGT	ER5313-P1

Instruction Manuals for Instrumentation:

Note: These documents can be found in the Tank Farms Vendor Information files directory under their manufacturer for future reference:

Brooks Instrument Brooks Wafer-Mag 7400 Electromagnetic Flowmeter with Complete Remote Electronics(CVT) Installation and Operating Instructions

Foxboro Instrument 823 DP Series Electronic d/p Cell Transmitters (WFT and SGT) in WFIE. WFT is 0-750 inches water; SGT is 0-20 inches water  
Installation, Maintenance, Operation Manual

Kessler-Ellis Products Flow Computer, Masstrol Mass Flow, MCF-A-BL, Installation and Operating Instructions

Yokogawa Electric Corp. YEW Three Pen Recorder, Model 4153  
(now Johnson-Yokogawa) (Part no. 4153-555-32/BU/AK-04/REM/S25N1  
Recorder with resistor, Instruction Manual

Spare Parts Inventory:

Saltwell Screen inventory is as follows:  
Stored a 272EA Piping Laydown yard (200 East Area)

241-U-102  
241-U-103  
241-U-105  
241-U-106  
241-U-107  
241-U-108  
241-U-109  
241-U-111  
241-S-101

Submersible pump inventory available for emergency use:

One Flygt Submersible pump, on rigid piping, modified according to H-2-68521, assembly 22. The Flygt pump itself is modified according to H-2-72507. The model no. is B-2060, and two controllers are on hand (Controller no. 4.802), along with 180 feet of the special Flygt cable (AWG # 12/3-2-1-GC). Use of these controllers and cable allows the full use of the Flygt safety features. These units are inside the emergency pumping storage trailer. An additional spare Flygt pump, modified according to the same drawing in a similar configuration (Assy 47), has been fabricated and stored.

One Peabody Flow Way 4 HOH Shrouded Submersible Turbine pump, on rigid piping, fabricated according to H-2-68521, Assembly 22, is stored within the emergency pumping trailer. This pump is acceptable for use within a saltwell screen.

Additional items:

Pump Pit Leak Detectors according to H-2-34965, sht 1, rev. 23.

Two Flushing Tees with valves (for submersible pumps) according to H-2-75254, Rev. 1, sheet 1, assembly 1, will be available for the emergency trailer storage.

Two inch diameter stainless steel flex hose lengths, with 2" SST flanges.

Two inch and three inch size PUREX connector heads with flanges.

Saltwell jet pump insulated stainless steel flex hose for 3" wall nozzles (PUREX) connector heads, quantity 2.

Stainless Steel braided, EPDM Flex hose, 400 feet, 1 inch, for double-contained piping fabrication.

Insulated, heat-traced 1 inch stainless steel flex jumpers for valve pits:

H-2-93653, Assembly 26, 14 ft. with 3" horiz. Purex connector and 2" vertical Purex connector

H-2-93653, Assembly 28, 14 ft. with 3" horiz. Purex connector and 2" horizontal Purex connector

H-2-93655, Rev. 1 (special 3-head flexible jumper)  
H-2-93653, Assembly 2, Length A (Insulated Flex Jumper)  
H-2-93653, Assembly 1, Length A (Insulated Flex Jumper)  
H-2-93653, Assembly 1, Length B (Insulated Flex Jumper)

Drawing indexes for each tank farm:

241-A, AX and S	H-2-73730
241-B, BX, and BY	H-2-70879
241-C, T and TY	H-2-73940
241-SX	H-2-93641
241-U	H-2-73670

APPENDIX C: WATCH LIST TANK REFERENCES

- 1) OSD-T-151-00030, "Watch List Tanks"
- 2) Letter 77130-92-D1-001, T. P. Moberg, "Transfer Routes and Drainbacks into Non-interim Stabilized Watchlist Single Shell Tanks"
- 3) WHC-EP-0182-XX, "Tank Farm Surveillance and Waste Status Summary Report" (see most recent revision)
- 4) WHC-SD-WM-OCD-015, "Tank Farm Waste Compatibility Program"
- 5) Letter, R. E. Gerton, DOE-RL to T. M. Anderson, WHC, "Emergency Pumping Program for Remaining Non-Stabilized Tanks at Hanford," 92-0B-084
- 6) WHC-SD-WM-ES-259, "Single-Shell Tank Saltwell Transfer Piping Evaluation"
- 7) Public Law 101-510, Section 3137, Subsection (c) (the "Wyden Bill"), discusses the potential for addition of high level waste to a watch list tank.
- 8) WHC-SD-WM-TI-656, "Safety Evaluation of Interim Stabilization of Non-Stabilized Single-Shell Watchlist Tanks"

**APPENDIX D**  
**EXISTING PUMP EQUIPMENT INVENTORY**

APPENDIX D: EXISTING PUMP EQUIPMENT INVENTORY

TANK #	Pump	Jumper(2)
A-101	Yes	Yes
AX-101	Yes	Yes
B-104	Yes (1)	Yes (3)(5)(B-106)
B-107	Yes	Yes
B-110	No	Yes (5)
B-111	Yes	Yes (4)(5)(B-109)
BX-106	(Submersible)	N/A
BX-110	Yes (B-106)	Yes (TY-103)
BX-111	Yes (B-108)	Yes (TY-105)
BY-103	Yes (AX-102)	Yes (5)(AX-103)
BY-105	Yes (C-104)	Yes (C-104)
BY-106	Yes (C-112)	Yes (C-112)
C-103	(Submersible)	N/A
C-105	Yes	Yes
C-106	Note: Contingency linked to Retrieval from C-106.	
S-101	Yes (7)	Yes (7)
S-102	Yes	Yes
S-103	Yes (7)	Yes (7)
S-106	Yes (7)	Yes (7)
S-107	Yes (7)	Yes (7)
S-108	Yes (7)	Yes (7)
S-109	Yes (7)	Yes (7)
S-110	Yes (7)	Yes (7)
S-111	Yes (7)	Yes (7)
S-112	Yes	Yes
SX-101	Yes	Yes
SX-102	Yes	Yes
SX-103	Yes	Yes
SX-104	Yes (T-109)	Yes (T-109)
SX-105	Yes	Yes
SX-106	Yes (T-105)	Yes (T-105)
T-101	Yes	Yes (tank submersible pumped)
T-102	(Submersible)	N/A
T-104	Yes	Yes
T-107	Yes	Yes
T-110	Yes	Yes
T-111	Yes	Yes
T-112	(Submersible)	N/A
U-102	Yes	Yes
U-103	Yes	Yes
U-105	Yes	Yes

EXISTING PUMP EQUIPMENT INVENTORY

TANK #	Pump	Jumper(2)
U-106	Yes	Yes
U-107	Yes	Yes (6)
U-108	Yes	Yes
U-109	Yes	Yes
U-110	Yes	Yes (6)
U-111	Yes	Yes
Emergency 1	Yes(7) in Emerg.Trlr, Yes (7) in Emerg. Trailer	
Emergency 2	Pump in fabrication; jumper in fabrication	
not allocated	B-105	
not allocated	B-109	
not allocated		TY-101

NOTES:

- (1) No canned rotor centrifugal pump on apparatus; spares available.
- (2) All funnels require modification, with the exception of 1992 fabrications (all (7) notations).
- (3) Flow meter is rotated 90 degrees. Pump is tagged BY-106.
- (4) Flow meter is rotated 90 degrees. Pump is tagged BY-109.
- (5) No funnels currently on the jumper.
- (6) Has a blue rework tag attached; rework may be needed prior to use
- (7) Completed by Fabrication Shops in 1992

APPENDIX E

ACTIONS REQUIRED TO INITIATE PUMPING



