

Sheet 4

5

AUG 18 2003

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1	1	Design Authority GP Janicek	<i>[Signature]</i>	8/14/03	57-12	1	1	DS Rewinkel	<i>[Signature]</i>	8/10/03	57-63
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RPP-12051, Rev. 0

## 244-AR Vault Interim Stabilization Completion Report

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CH2M HILL Hanford Group  
Richland, WA 99352  
U.S. Department of Energy Contract DE-AC27-99RL14047

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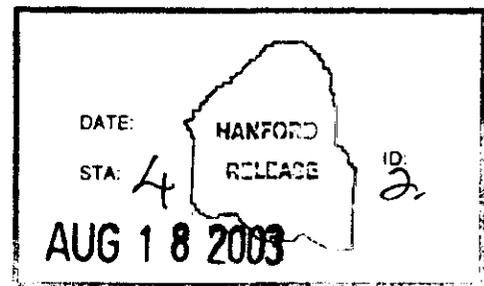
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**Abstract:** This report documents the work completed in order to meet the requirements of TPA Interim Milestone M-45-11 for interim stabilization of 244-AR vault as laid out in the 244-AR Vault Interim Stabilization Project Plan, RPP-5635, Rev. 0.

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## EXECUTIVE SUMMARY

The 244-AR vault facility is a "canyon" type facility housing four waste processing tanks in three below grade concrete cells. The facility was originally constructed between 1966 and 1968 to provide lag storage and treatment for the Plutonium Uranium Extraction Facility (PUREX). The last process transfers were made in support of that mission in the late 1970s. Modifications to the facility were initiated in 1984 to provide support for the vitrification program and the separation of the neutralized current acid waste (NCAW) into transuranic (TRU) and non-transuranic waste streams. The mission was cancelled in 1988, before the modifications were completed. The last transfer within the vault occurred in 1992.

In November 1999, the interim stabilization of the 244-AR vault facility was defined and the pending action was moved from the Hanford Federal Facility Agreement and Consent Order (TPA) Milestone M-32-00, "Complete Identified Dangerous Waste Tank Corrective Actions," to Milestone M-45-00, "Complete Closure of all Single-Shell Tanks." Two interim milestones were created within Milestone M-45-00. Interim Milestone M-45-11A required submittal by April 30, 2000, of a 244-AR vault interim stabilization project plan to the Washington State Department of Ecology (Ecology) for approval. Interim Milestone M-45-11 required completing the 244-AR vault interim stabilization by September 30, 2003.

The *244-AR Vault Interim Stabilization Project Plan*, RPP-5635, (CHG 2000) was issued in March 2000 to meet the requirement of Interim Milestone M-45-11A. RPP-5635 provided the path forward for interim stabilization of the 244-AR vault to meet the requirement set forth in TPA Interim Milestone M-45-11. Ecology concurred with the project scope and approved the document (Ecology 2000).

This Completion Report documents the completion of the Interim Stabilization effort for the 244-AR vault and the six activities required under the milestones M-45-11A and M-45-11. The areas addressed are:

1. Removal of the pumpable liquids from the 244-AR Vault tanks
2. Removal of the pumpable liquids from the 244-AR Vault sumps
3. Isolation of the 244-AR Vault
4. Provision for the removal of liquids that may accumulate in the future
5. Installation of intrusion prevention mechanisms as necessary
6. Establish liquid level monitoring to detect future intrusions.

An estimated 17,000 gallons of pumpable liquid was removed from the 244-AR Vault Facility tanks and sumps in the interim stabilization effort. With the inclusion of flush water, 17,600 gallons were added to the receiver tank, 241-AY-102. Access to the tanks and sumps was obtained by utilizing existing penetrations in the cover blocks and open nozzles in the tanks where possible. In cases where no existing openings were available, the concrete cover blocks were core-bored and the tanks were cut using a plasma-arc cutting process. Using a manifold configuration, an air driven diaphragm pump was used to pump the liquids using an eductor located in the pump leg to each tank or sump. The liquids were removed through the manifold within the facility and a flexible hose-in-hose line connecting the facility to the tie-in with the

Double Shell Tank (DST) transfer system at the AR-151 transfer pit. Liquids were consolidated within the facility tank 244-AR-TK-001 prior to sampling for compatibility with the DST receiver tank. Transfer to the DST receiver tank was then made in a single transfer. Pumping was used to remove the liquid in the four tanks and in sump 3. No pumpable liquid was present in sump 1 or sump 2. Due to the placement of the pump leg in cell 3, normal evaporation was used to remove the final gallons on the cell floor. Target volumes of liquid to remain, outlined in the Project Plan RPP-5635, Appendix A, were met or exceeded in each of the tanks and sumps.

All transfer and process lines penetrating the vault facility were isolated, or confirmed that isolation was in place. All other openings in the vault were reviewed, and modified as required, to prevent any future intrusion of liquid into the facility.

The transfer system has been flushed and left in place to provide for the removal of pumpable liquids from a future intrusion as may be necessary. Portable and temporary equipment will be removed within the guidelines outlined in the approved Project Plan.

Liquid level monitoring systems are in place with the period for monitoring revised to reflect the conditions of the facility and in line with the approved Functions and Requirements Documentation.

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## 1.0 INTRODUCTION

The 244-AR vault facility, constructed between 1966 and 1968, was designed to provide lag storage and treatment for the PUREX tank farm sludges. Tank farm personnel transferred the waste from the 244-AR vault facility to B Plant for recovery of cesium and strontium. B Plant personnel then transferred the treatment residuals back to the tank farms for storage of the sludge and liquids. The last process operations, which transferred waste supporting the cesium/strontium recovery mission, occurred in April 1978.

After the final transfer in 1978, the 244-AR facility underwent a cleanout. However, 2,271 L (600 gal) of sludge were left in tank 004AR from an earlier transfer from tank 241-AX-104. When the cleanout was completed, the facility was placed in a standby status. (The sludge had been transferred to tank 244-AR-TK-004 to support Pacific Northwest National Laboratory [PNNL] vitrification work. Documentation of waste transfers suggests that a portion of the sludge was moved from tank 244-AR-TK-004 to tank 244-AR-TK-002 in preparation for transfer back to the AX Tank Farm; however, quantities of the sludge that were moved to tank 244-AR-TK-002 from that transfer are only estimated.)

Beginning in 1984, the chemical processing contractor, Rockwell Hanford Company, began to modify the 244-AR vault facility for a new mission. It was to be used as a transfer, storage, and treatment facility for moving NCAW from the aging-waste tank farms (241-AY/AZ) to B Plant. B Plant was to be modified to separate the NCAW into TRU and non-TRU waste streams. The TRU waste stream then was to be returned to the tank farms for transfer to a vitrification facility and ultimately to geologic disposal. The non-TRU waste stream was to be transferred to the Grout Facility for solidification and onsite disposal. Modification of the 244-AR facility was initiated, but then was suspended before the modifications were completed, as a result of the abandonment of the NCAW mission in 1988. During this period, operations logs and facility records show that the sumps were jetted to the tanks multiple times. Liquids accumulating during this time were assumed to be from intrusions of precipitation and snowmelt through vault covers, roof leaks, floor drains, and drain lines. Some water also came from construction activities during the new mission modifications to the facility.

In November 1999, the interim stabilization of the 244-AR vault facility was defined and the pending action was moved from the TPA Milestone M-32-00, "Complete Identified Dangerous Waste Tank Corrective Actions," to Milestone M-45-00, "Complete Closure of all Single-Shell Tanks." Two interim milestones were created within Milestone M-45-00. Interim Milestone M-45-11A required submittal by April 30, 2000, of a 244-AR vault interim stabilization project plan to the Washington State Department of Ecology (Ecology) for approval. Interim Milestone M-45-11 required completing the 244-AR vault interim stabilization by September 30, 2003.

The *244-AR Vault Interim Stabilization Project Plan*, RPP-5635, (CHG 2000) was issued in March 2000 to meet the requirement of Interim Milestone M-45-11A. RPP-5635 provided the path forward for interim stabilization of the 244-AR vault to meet the requirement set forth in TPA Interim Milestone M-45-11. Ecology concurred with the project scope and approved the document (Ecology 2000) with a single stated issue regarding sampling of the waste in

accordance with the data quality objectives identified in *Data Quality Objectives For Tank Farms Waste Compatibility Programs*, HNF-SD-WM-DQO-001 (LMHC 1999).

## 1.1 PURPOSE

The purpose of this report is to document the work completed in order to meet the requirements of Interim Milestone M-45-11 for interim stabilization of 244-AR vault as laid out in the *244-AR Vault Interim Stabilization Project Plan* (CHG 2000).

In addition to describing the activities performed to meet the requirements of the milestone, this document describes the facility configuration upon completion and discusses planned surveillance and maintenance.

## 1.2 END POINT CRITERIA

The U. S. Department of Energy (DOE) Office of River Protection Program (ORP) and Ecology have agreed on the inclusion of the 244-AR Vault Interim Stabilization effort under the TPA major milestone series M-45-00, "Complete Closure of all Single-Shell Tanks." The agreement to include the 244-AR Interim Stabilization work within the M-45 milestone series, as M-45-11 and M-45-11A, was approved in TPA Change Number M-45-99-02 dated November 5, 1999. A copy of the Hanford Federal Facility Agreement and Consent Order Change Control Form M-45-99-02, containing TPA Interim Milestones M-45-11 and M-45-11A, is provided in Figure 1-1. Interim Milestone M-45-11 addresses the interim stabilization of the facility. There are six activities addressed within Interim Milestone M-45-11 scheduled for completion by September 30, 2003:

1. The removal of pumpable liquids from the 244-AR vault tanks
2. The removal of pumpable liquids from the vault itself and its associated sumps
3. Isolation of the 244-AR vault
4. Provisions for the removal of pumpable liquids, which may accumulate in the future
5. Installation of intrusion prevention mechanisms as may be necessary
6. Establishment of periodic liquid level monitoring systems for the detection of accumulating liquids prior to final closure.

In general terms, the final stabilized facility configuration described in Section 2.5.4 of the Project Plan states,

The 244-AR Facility will be isolated and all pumpable liquids removed from the sumps and tanks. The facility will be physically disconnected from all transfer and liquid support systems. All known intrusion pathways for precipitation and snowmelt will be corrected. Periodic sump level monitoring will be in place to detect any future intrusion into the vault. The transfer system will be flushed and left in place should any liquid

accumulation require removal in the future.

Appendix A of the *244-AR Vault Interim Stabilization Project Plan*, RPP-5635, (CHG 2000) contains the detailed endpoint criteria for the interim stabilization of the 244-AR vault. These endpoint criteria are included as Table 1-1. These target requirements were established to provide quantified endpoint criteria for Interim Milestone M-45-11. The column in Table 1-1 titled "Action to Meet the Requirement" contains a brief summary of the action and the measurable requirement for the action. The column entitled "Deliverable" contains the documentation that was anticipated, at the time the Project Plan was issued, to verify the performance of the action.

Figure 1-1. TPA Change Control Form M-45-99-02, Containing TPA Interim Milestone M-45-11 and M-45-11a (Page 1 of 2)

0052148

Change Number M-45-99-02	Federal Facility Agreement and Consent Order Change Control Form <small>Do not use blue ink. Type or print using black ink.</small>	Date November 5, 1999
Originator <b>G.H. Sanders</b> Phone <b>(509) 376-6888</b>		
Class of Change <input type="checkbox"/> I - Signatories <input checked="" type="checkbox"/> II - Executive Manager <input type="checkbox"/> III - Project Manager		
Change Title Interim Stabilization of the 244-AR Vault. Deletion of obsolete interim milestone and target dates M-32-06 and M-32-06-T01. Corresponding addition of new Tri Party Agreement Interim Milestones M-45-11 and M-45-11A.		
Description/Justification of Change The 244-AR Vault consists of a two-level, multi-cell, reinforced concrete structure that houses two single-walled 43,000-gallon tanks (TK-001 and TK-002) and two 4785-gallon tanks (TK-003 and TK-004). No waste transfers to the 244-AR Vault have been made since 1978 (estimated).  The four tanks contain a total of some 16,000 gallons of high-level radioactive mixed waste and are arranged within three cells. All three cells have experienced liquid accumulations believed to be from snowmelt/rainwater intrusion. Currently, there is no liquid in Sump #1 or Sump #2. Sump # 3 currently contains some 2800 gallons of liquid of unknown character. The 244-AR vault is regulated as a storage facility subject to RCRA, Washington's Hazardous Waste Management Act (HWMA), and their implementing regulations. The vault and its tanks are not in compliance with interim status standards including requirements for double containment, assessment of containment integrity, and the timely characterization and removal of liquids discovered within the containment system.  Earlier planning regarding the 244-AR vault were based on the assumption that vault waste transfer operations would eventually be restarted. The Parties have since agreed that the vault will not be utilized as an active waste transfer facility, does not require an operating permit, and should eventually undergo final closure under the Agreement's M-45-00 milestone series. This Change Form establishes commitments between the Parties governing the interim stabilization of the vault prior to final closure. These modifications are made in partial response to concerns raised by Ecology within its August 19, 1999 letter to DOE (Reference 1). (cont.)		
Impact of Change This change establishes appropriate milestones and associated compliance commitments governing interim stabilization of the 244-AR Vault prior to final closure under M-45-00.		
Affected Documents Hanford Federal Facility Agreement and Consent Order, Appendix D, as amended. DOE's annual Land Disposal Restrictions Report, and Hanford site internal planning, management, and budget documents (e.g., DOE and DOE contractor Baseline Change Control documents; Multi Year Work Plans; sitewide systems engineering control documents, Project Management Plans; and the Hanford Site Integrated Priority List (IPL)).		
Approvals <u>S.H. Sanders</u> <u>11/8/99</u> <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved DOE Date  <u>N/A</u> <u>_____</u> <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved EPA Date <u>M.L. Galt</u> <u>11/10/99</u> <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved Ecology Date		

**Figure 1-1. TPA Change Control Form M-45-99-02, Containing TPA Interim Milestone M-45-11 and M-45-11a (Page 2 of 2)**

Hanford Federal Facility Agreement and Consent Order  
Change Control Form M-45-99-02  
November 5, 1999  
Page 2 of 2

**Description/Justification of Change (cont.)**

Approval of this Change Form constitutes resolution of Dispute in this matter as noted within DOE's July 12, 1999 correspondence to Ecology (99-EAP-398), its subsequent August 11, 1999 correspondence elevating this dispute to the Parties Inter Agency Management Integration Team (IAMIT) (99-EAP-436), and associated documentation.

Agreement Interim Milestone and Target Date deleted on approval of this M-45-99-02 Change Form are as follows:

M-32-06	COMPLETE 244-AR VAULT INTERIM STATUS TANK ACTIONS	PRIOR TO RESTART
M-32-06-T01	COMPLETE AND SUBMIT INTEGRITY ASSESSMENT REPORT AND IDENTIFIED UPGRADES FOR 244-AR VAULT INTERIM STATUS TANK SYSTEM (EXCEPT THAT DST TRANSFER LINES THAT PENETRATE THE 244-AR VAULT WILL CONTINUE TO BE USED). PROVIDE A SCHEDULE TO ADDRESS ANY DEFICIENCIES DESCRIBED IN THE REPORT RELATED TO TANK SYSTEM COMPLIANCE.	PRIOR TO RESTART

Agreement Interim Milestones established on approval of this M-45-99-02 Change Form are as follows:

M-45-11	COMPLETE 244-AR VAULT INTERIM STABILIZATION.	09-30-03
M-45-11A	SUBMIT 244-AR VAULT INTERIM STABILIZATION PROJECT PLAN FOR ECOLOGY APPROVAL.  INTERIM STABILIZATION ACTIVITY ENDPOINT CRITERIA WILL BE ESTABLISHED ON APPROVAL OF THE STABILIZATION PROJECT PLAN. AT MINIMUM THE PLAN SHALL ESTABLISH CRITERIA FOR, AND SCHEDULE INTERIM STABILIZATION ACTIVITIES INCLUDING: THE REMOVAL OF PUMPABLE LIQUIDS FROM 244-AR VAULT TANKS; THE REMOVAL OF PUMPABLE LIQUIDS FROM THE VAULT ITSELF AND ITS ASSOCIATED SUMPS; ISOLATION OF THE 244-AR VAULT; PROVISIONS FOR THE REMOVAL OF PUMPABLE LIQUIDS WHICH MAY ACCUMULATE IN THE FUTURE; INSTALLATION OF INTRUSION PREVENTION MECHANISMS AS MAY BE NECESSARY; AND ESTABLISHMENT OF PERIODIC LIQUID LEVEL MONITORING SYSTEMS FOR THE DETECTION OF ACCUMULATING LIQUIDS PRIOR TO FINAL CLOSURE.  THE 244-AR VAULT INTERIM STABILIZATION PROJECT PLAN WILL BE ESTABLISHED AND MANAGED AS A PRIMARY DOCUMENT PURSUANT TO AGREEMENT ACTION PLAN 9.2.	04-30-00

Note: The M-45-11 "Complete 244-AR Vault Interim Stabilization" due date has been established prior to finalization of the planning basis for vault stabilization activities. Should new information affect completion of interim stabilization activities, appropriate modifications shall be made by agreement of the Parties pursuant to Agreement Action Plan, Section 12.0.

Reference: 1) Letter, A. Valero, Ecology, to G. Sanders, RL, "Re: 244-AR Vault System Change Control Request to Delete Tri-Party Agreement (TPA) Milestones M-32-06 and M-32-06-T01," dated August 19, 1999.

**Table 1-1. 244-AR Vault Interim Stabilization End Point Criteria**

Requirement	Source	Action to Meet the Requirement	Deliverable
Remove pumpable liquids from 244-AR vault tanks	M-45-11	Tanks 001AR, 002AR – Reduce liquid to a level equivalent to 0.064 m (2.5 in.) of tank volume. Estimated at 1,834 L (485 gal.).	Transfer summary sheet with level detector readings.
		Tanks 003AR, 004AR – Remove liquid to the depth volume equivalent to 1 in. at the high side of the sloped bottom of the tank. Estimated at 458 L (121 gal.).	Transfer summary sheet with level detector readings.
Remove pumpable liquids from the vault itself and its associated sumps	M-45-11	Remove liquids, if necessary, to a volume less than the capacity of the sump and drain trench (This volume would include any backflush water for flushing the pump.) Sump 3 = 110 L (29 gal.) Sump 1, 2 = 140 L (35 gal.)	Transfer summary sheet with level detector readings.
Isolate 244-AR vault	M-45-11	For all process liquids and waste transfer lines connecting to the facility, place a mechanical isolation in/on the line at the supply end and/or on the 244-AR vault end of the piping segment entering the vault.	Matrix listing lines, type and location of isolation, with closed-out work packages verifying installations.
Provide for the removal of pumpable liquids that may accumulate in the future	M-45-11	Leave pumping system in place and connected with exception of the temporary equipment (e.g., air supply, water supply, portable exhausters)	Issuance and approval of procedure and specification for reconnection and preparation for operation of the system.
Install intrusion prevention mechanisms as necessary	M-45-11	Mechanically seal or block all identified intrusion routes. Methods may include vault covers, foam, grout cement, process blank, etc. For some components, such as buried vaults and concrete piping encasements, a white paper may be created for specific concerns such as seepage.	Matrix listing all identified intrusion paths, listing type and location of intrusion prevention or evaluation document number with closed-out work packages verifying installation.
Establish periodic liquid level monitoring systems for intrusion detection before final closure	M-45-11	Provide instrumentation to detect a liquid intrusion in each of the three sumps, capable of detecting any intrusion that would exceed the capacity of the sumps, with quarterly readings.	Verify that monitoring is in place in the three sumps and is operational (calibrated).

## 2.0 PROJECT EXECUTION

At the start of the 244-AR Interim Stabilization Project, it was estimated that 19,050 gallons of liquid waste was present in the facility. When TPA Milestone M-45-11 was written to address the 244-AR facility, a task team was assembled to determine the best method of implementing the required actions described in the milestone. A facility assessment was performed to determine if and what existing facility systems could be used to support a transfer. The team concluded the facility, in its condition at the time, would not support project implementation without performing a substantial number of repairs, refurbishments, and upgrades. The following is a list of the significant facility limitations found during the assessment:

- No operable ventilation system (this consisted of failed exhaust fans, failed HEPA filters, and no operable effluent monitoring system).
- No steam (the last steam generated transfer took place in 1992).
- The steam transfer system was in a questionable operating condition.
- Can't consolidate the waste (some of the needed jumpers weren't installed).
- Inoperable crane (used to remove cover blocks and install jumpers).
- No water (required to flush the transfer line).

To facilitate implementation and completion of TPA Milestone M-45-11, the project was subdivided into four discrete groups of activity. These groups were as follows and summarized below:

- Remove pumpable liquid from tanks and cells
- Prevent pumpable liquid from entering the facility through isolation and intrusion prevention
- Maintain future pumping capability
- Monitor the facility for liquid intrusions

The approach for performing the work in these four discrete groups of activity was documented in the *244-AR Vault Interim Stabilization Project Plan*, RPP-5635, (CHG 2000). The execution of the approach differed in certain aspects from the described strategy provided in CHG 2000 but resulted in the same successful outcome.

### 2.1 REMOVE PUMPABLE LIQUID

The waste consolidation and transfer system is comprised of a number of components and subassemblies. Major components, subassemblies, and support systems include the following:

- Consolidation manifold and pumping system
- Drop legs with eductors
- Transfer line external to 244-AR vault
- Sampling capability
- Instrumentation and control
- Ventilation

- Chemical adjustment capability.

In general, the waste consolidation and transfer system uses commercial, off-the-shelf components including motor-operated ball valves, stainless steel pipe, hoses, miscellaneous pipe fittings, monitoring instruments, eductors, air driven pumps, and programmable logic controller with a compatible personal computer as a control station. A brief description of the waste consolidation and transfer system is provided below. See RPP-8617, *Process Control Plan for 244-AR Vault Interim Stabilization* (CHG 2003a) for specific details of the components that comprise the waste consolidation and transfer system.

### **2.1.1 Consolidation Manifold and Pumping System**

This subassembly, consisting of common piping headers and a main pumping system, connects to the drop legs with eductors, flush water connection, and the transfer line running external to the 244-AR vault to the 241-AR-151 diversion box. The common piping headers consist of single-wall pipes with in-line couplings to facilitate handling and entry into the 244-AR vault. Couplings are contained within boots that drain to leak detection. The common piping headers are a supply header and a return header. The supply header provides motive fluid to the eductors installed with each drop leg. The return header connects the return line from each of the eductors to the main pumping system. The piping headers contain motor-operated valves at each of the drop legs and the ends of the headers where connections are made external to the facility for the transfer line external to the 244-AR vault at one end and water and chemical addition at the other end.

Two air-operated, double-diaphragm pumps, operated independently or together, are used to provide the motive fluid to the eductors. A surge tank, on the suction side of the pumps, provides the liquid to the air-operated, double-diaphragm pumps. The pumps discharges are connected to the supply header providing the motive fluid to the drop legs with eductors. The return header discharges into the surge tank. As liquid is pumped from the sump or tanks a portion of the liquid flows through a control valve and is directed to 244-AR-TK-001 during consolidation and/or recirculation, or the liquid is directed to double-shell tank 241-AY-102 during the waste transfer from 244-AR vault.

Through pump operation and valve configuration, waste is consolidated from sump to tank and tank-to-tank. After completing the consolidation activity and final transfer, the lines are flushed. To facilitate this activity, a coupling is provided on the return header, with routing via a flexible hose and a vault wall penetration, to permit connection to a water truck to flush the system. The supply and return headers include connections that can be used to install additional drop legs with eductors into sumps 1 and 2 and the failed equipment storage tubes if necessary. These areas do not contain liquid, but the connections are included to meet the interim stabilization requirements specified in Section 3.2.5 of CHG 2000.

### **2.1.2 Drop Legs with Eductors**

Two drop legs, a motive supply to eductor leg and eductor discharge line, are used for each tank and the cell 3 sump. All the drop legs are connected to the consolidation manifold with a quick-disconnect coupling and an isolation valve above the cover blocks. The motive supply drop leg

is connected to the supply header above the cover blocks and connects to the eductor that is located below the cover blocks. The eductor has a suction leg that is inserted into the cell 3 sump and tanks. The eductor discharge leg is connected to the discharge of the eductor and comes up through the cover block to connect with the return header. The drop legs are inserted into the cell 3 sump through an existing access port in the cover block. The drop legs for each of the tanks are inserted through the cover blocks via holes that are core drilled through the cover blocks. The holes created in the cover blocks above tanks 244-AR-TK-002, TK-003, and TK-004 are 8 inches in diameter. The hole created in the cover block above tank 244-AR-TK-001 for the drop legs is 10 inches in diameter. The suction legs for the eductors associated with tanks 244-AR-TK-002, TK-003, and TK-004 are inserted through existing nozzles on top of the tanks. The suction leg and eductor associated with tank 244-AR-TK-001 is inserted through a hole cut into the top of the tank using a remotely operated plasma arc cutter. The hole created in the top of tank 244-AR-TK-001 for the suction leg and eductor is 10 inches in diameter.

A return pipe, referred to as a 4" riser, is also provided from the consolidation manifold and pumping system to tank 244-AR-TK-001. The primary purpose of this 4" riser is to provide an inflow path to consolidate tank and sump waste. Its secondary purpose is to provide a circulation path for mixing the waste and/or chemicals as necessary after chemical adjustment and before sampling. This 4" riser also acts as an access point for sampling the consolidated waste. The hole created in the cover block above tank 244-AR-TK-001 for the return leg is 8 inches in diameter. The return leg associated with tank 244-AR-TK-001 is inserted through a hole cut into the top of the tank using a remotely operated plasma arc cutter. The hole created in the top of tank 244-AR-TK-001 for the return leg is 10 inches in diameter.

### **2.1.3 Transfer Line External to 244-AR Vault**

This transfer line subassembly connects the consolidation manifold and pumping system within the 244-AR vault to the wall nozzle in the 241-AR-151 diversion box of the double-shell tank transfer system. The transfer line is a hose-in-hose transfer line similar to hose-in-hose transfer lines used to make overground transfers throughout the tank farms facilities. The portion of this subassembly within the 244-AR vault consists of an extended length of the 2" inner hose of the hose-in-hose transfer line that connects to a set of two, motor-operated, isolation valves between the hose and the rest of the consolidation manifold and pumping system. The 2" single-wall hose passes through a 10" hole core drilled through the wall of the facility. The hole core drilled through the wall contains a secondary containment pipe. This secondary containment pipe connects on the outside of the facility to the secondary containment of the hose-in-hose transfer line. The hose-in-hose transfer line is routed just below grade for approximately 100 feet between 244-AR vault and the 241-AR-151 diversion box. The below grade portions of the hose-in-hose transfer line is shielded with steel plating at grade. Where the hose-in-hose transfer line comes out of 244-AR vault and into 241-AR-151 diversion box above grade, steel shield boxes are used. A support assembly directs the hose-in-hose transfer line into the 241-AR-151 diversion box. The end of the inner hose is connected to a flexible jumper that is connected to nozzle 4 in 241-AR-151 diversion box. Nozzle 4 is part of an existing transfer line, 3"NHV-720, that terminates in 241-AY-02D pit at nozzle U5. A flexible jumper was connected from nozzle U5 to a nozzle on the installed pump to complete the route into tank 241-AY-102.

#### **2.1.4 Sampling Capability**

The sampling system consists of the standard grab sampling system used throughout tank farms for collecting waste samples from tanks. Samples are collected through a 4" pipe that protrudes down through the top of tank 244-AR-TK-001 (see section 2.1.2). Sampling consists of collecting representative samples in 120 milliliter bottles, packaging the bottles for shipping, and shipping the bottles to 222-S laboratory for analysis. The sampling system uses existing equipment and nothing specifically unique for 244-AR vault is required. The sampling and analysis is described in RPP-11952, *244-AR Vault Tank Sampling and Analysis Plan* (CHG 2003b).

#### **2.1.5 Instrumentation and Control**

The instrumentation and control system allows for remote monitoring and operation of the waste consolidation and transfer system. Valve position indication, pump supply air pressure, pump discharge pressure, system discharge flow rate, tank and sump level indication, and leak detector status are monitored and used to control operation during consolidation and transfer operations. The instrumentation outputs are displayed on a computer screen of a human-machine interface. Operational control of the system is performed from this human-machine interface located in the 244-AR lunch room/change room. Instrumentation signals are routed between the instruments and programmable logic controllers. The operator uses instrumentation outputs to the programmable logic controller to monitor the progress of operations and to make operational control decisions by transmitting signals from the human-machine interface through the programmable logic controller to the instrumentation.

#### **2.1.6 Ventilation**

A temporary ventilation system operates during the interim stabilization pumping activities or during certain activities requiring personnel access to ensure adequate containment of airborne radioactive materials and prevent releases to the environment. The system consists of portable ventilation equipment in conjunction with a containment tent installed within the 244-AR canyon where personnel can work. Air flow is maintained from areas of least contamination (i.e., containment tent) toward progressively more contaminated areas (canyon, cells, and tanks).

A skid-mounted supply ventilation unit provides fresh air to the canyon containment tent and to maintain the interior of the tent at a slightly positive pressure relative to the canyon/cell atmospheres. The skid has a nominal capacity of 1000 cfm, and includes a heat pump, electric heater, flow controller, and appropriate climate controls for worker comfort. Two portable exhauster skids, each with a rated capacity of 500 cfm each, provide exhaust ventilation for the 244-AR canyon/cells and process tanks during the interim stabilization activities. The exhausters operate in parallel to achieve the required flow rate necessary for the minimum pressure differential requirements. The supply ventilation unit is interlocked with the exhaust systems so that, if pressure differential between the tent and canyon or between tent and cells are outside the acceptable operating ranges, the system will alarm and if necessary shut down.

### **2.1.7 Chemical Adjustment**

Following the initial pH measurement and estimating the quantity and type of chemicals required for compatibility with the receiving tank, chemical adjustment of the waste was made using sodium hydroxide and sodium nitrite. The chemicals are pumped directly from 55-gallon storage drums through the 4" riser (see section 2.1.2) into the consolidation tank (i.e., 244-AR-TK-001). The waste from the remaining 244-AR tanks and sump in cell 3 were transferred into the consolidation tank on top of the added chemicals. After the tank and sump waste was consolidated, the tank contents were circulated by means of the transfer system to mix the chemicals into solution.

### **2.2 PREVENT PUMPABLE LIQUID FROM ENTERING THE FACILITY**

In addition to removing all pumpable liquid from the facility, actions were taken to prevent a pumpable quantity of liquid from entering the facility in the future. To accomplish this, all possible intrusion paths are identified and assessed. The assessment determines whether possible intrusion paths were already configured to eliminate future intrusion or if additional actions are required. A certain subset of intrusion points requiring additional actions was identified and appropriate engineering controls are implemented to remove the possible intrusion path. A summary of the identification, assessment and actions taken to prevent a pumpable quantity of liquid from entering the facility is provided in Section 4.0.

### **2.3 MAINTAIN FUTURE PUMPING CAPABILITY**

In addition to removing all existing pumpable liquid from the facility, it is necessary to maintain future pumping capability in the event a pumpable quantity of liquid enters the facility in the future.

The transfer system used to remove the initial pumpable liquid is laid up in the facility and is available to provide future pumping capability to each of the tanks and sumps. Although not installed, the pumping supply and return headers include connections for pump leg assemblies into sump 1, sump 2, or any of the failed-equipment storage tubes if necessary in the future. Temporary services will require re-connection if future pumping is required. A description of the lay up configuration of the interim stabilization systems is provided in Section 7.0. The description of what is required for reconnection and preparation for operation of the system is provided in Section 5.0.

### **2.4 MONITOR THE FACILITY FOR LIQUID INTRUSIONS**

Having removed the pumpable liquid from the facility, the individual tanks and/or sumps are monitored on a routine basis to determine if there is any sign of liquid intrusion into the facility. Section 6.0 summarizes the method selected for monitoring the facility for liquid intrusions.

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### 3.0 REMOVAL OF PUMPABLE LIQUID

The endpoint criteria for removal of "pumpable" liquid identified in table 1-1 are specific to each of the four tanks and the three process cell sumps. The deliverables to verify that the endpoint criteria have been met are transfer summary sheets with level detector readings. The sections below provide the information demonstrating the endpoint criteria for removal of pumpable liquid have been met.

#### 3.1 REMOVAL OF PUMPABLE LIQUID FROM 244-AR VAULT TANKS

The endpoint criteria for removal of pumpable liquid from the 244-AR vault tanks are specific to the individual tanks. For tanks 244-AR-TK-001 and 244-AR-TK-002 it is required to reduce liquid to a level equivalent to 0.064 m (2.5 in.) of tank volume. This level in these two tanks is estimated at 1,834 L (485 gal.). For tanks 244-AR-003 and 244-AR-004 it is required to remove liquid to the tank volume equivalent to 1 in. at the high side of the sloped bottom of the tank. This level in these two tanks is estimated at 458 L (121 gal.).

##### 3.1.1 Tank 244-AR-TK-001

Following the consolidation of waste into 244-AR-TK-001 from tanks -002, -003, -004 and the Cell 3 sump, the external transfer from 244-AR vault tank 244-AR-TK-001 to 241-AY-102 was started on June 9, 2003 and completed on June 12, 2003 following procedure TO-260-080, *External Transfer from 244-AR Tank TK-001 to 241-AY-102*. Data sheet 1 from TO-260-080, Start/Stop Material Balance Data Sheet provides the starting and ending tank levels for 244-AR-TK-001 and 241-AY-102. The levels are in "DST inches" meaning the recorded level values for 244-AR-TK-001 are converted to an equivalent level for the larger 241-AY-102 double-shell tank. For example 14 inches of liquid in 244-AR-TK-001 is equivalent to 1.0 inches in 241-AY-102 or 2750 gallons. The 244-AR-TK-001 level was converted to "DST inches" in order to perform material balance calculations necessary during transfers. TO-260-080 only records level detector readings in converted DST inches, but a table is provided in the procedure to convert 244-AR-TK-001 inches to DST inches and vice versa. However, it is simpler to refer to the *244-AR Vault Rounds* procedure, TF-OR-EF-244AR, which daily recorded the tank and sump levels in 244-AR during the time of the external transfer. The recorded level in tank 244-AR-TK-001 on June 9, 2003 prior to the start of pumping was 94.60 inches. The average recorded level in tank 244-AR-TK-001 during the week after pumping (June 16-22, 2003) was 2.40 inches. The material balance data sheets for 244-AR-TK-001 transfer and the surveillance data sheets showing liquid levels for tank 244-AR-TK-001 during the weeks starting June 9 and June 16, 2003 are provided in Appendix A. A plot of the liquid level history is provided in Appendix C.

For tank 244-AR-TK-001 it is required to reduce liquid to a level equivalent to 2.5 inches of tank volume. This level in tank 244-AR-TK-001 is estimated at 485 gallons. The weight factor dip tube assembly in tank 244-AR-TK-001 is installed with the low dip tube leg 1 inch off the bottom of the tank. Therefore, a reading of 2.4 inches would be equivalent to a level in the tank of 3.4 inches.

The pumping from tank 244-AR-TK-001 can be broken down into two distinct regions and modes of operation. The first part of the pumping was at a relatively rapid rate of pumping at

nominally 20-30 gallons per minute. During this time, the valve (AR244-WT-MOV-203) that allowed the waste to transfer to 241-AY-102 was open. (Note: Refer to CHG 2003a for a more complete description and diagrams of the transfer system.) This relatively rapid rate of pumping is indicative of free liquid being pumped out of the tank. The second part of the pumping was at a relatively slow rate of pumping at nominally 0.5 gallons per minute. During the second part of pumping, valve AR244-WT-MOV-203 was closed allowing surge tank AR244-WT-TK-200 to accumulate any liquid pumped out of 244-AR-TK-001 and provide for a more accurate measurement of liquid removed. Approximately 5 gallons of liquid was pumped from tank 244-AR-TK-001 during the last 11 minutes of pumping. This slower rate of pumping of liquid is indicative of a solid phase with interstitial liquid. Using the assumption that the current weight factor level is equal to the sludge level of the tank, there is estimated to be 3.4 inches, or 660 gallons of sludge remaining.

The pump suction leg is installed in contact with the bottom of the tank. The pump suction has a 1 inch chamfer to avoid plugging. This chamfer limits the removal of liquid as the eductor will not pump once there is a break through in the suction leg. Pumpable liquid was removed to the level of breakthrough, 1 inch from the bottom of the tank. Using the conservative assumption that that bottom inch of volume is all liquid, 194 gallons of pumpable liquid could remain. This is less than the required limit of no more than 485 gallons of liquid.

### 3.1.2 Tank 244-AR-TK-002

The transfer from 244-AR vault tank 244-AR-TK-002 to 244-AR-TK-001 was started on April 16, 2003 and completed on April 30, 2003 following procedure TO-280-050, *Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to 244-AR-TK-001*. The main transfer was completed on April 18, 2003. A second short transfer was performed on April 30 after the suction leg had been verified to be in contact with the bottom of tank 244-AR-TK-002. Data sheet 1 from TO-280-050, Liquid Level Monitoring, provides the starting and ending tank levels for 244-AR-TK-002 and 244-AR-TK-001. The recorded level in tank 244-AR-TK-002 on April 16, 2003 prior to the start of pumping was 62.8 inches. The average recorded level in tank 244-AR-TK-002 during the week after final pumping (May 5-11, 2003) was 0.075 inches. The reason the recorded value for the weight factor reading is 0.075 rather than exactly 0.0 is most likely due to the inherent accuracy of the differential pressure indicating instrument. The material balance data sheets for the 244-AR-TK-002 transfer and the surveillance data sheet showing liquid levels for tank 244-AR-TK-002 during the week starting May 5, 2003 are provided in Appendix A. A plot of the liquid level history is provided in Appendix C.

For tank 244-AR-TK-002 it is required to reduce liquid to a level equivalent to 2.5 inches of tank volume. This level in tank 244-AR-TK-002 is estimated at 485 gallons. The weight factor dip tube assembly in tank 244-AR-TK-002 is installed with the low dip tube leg 12 inches off the bottom of the tank. Therefore, a reading of 0.075 inches would be equivalent to a level in the tank of 12.075 inches or 2,342 gallons.

A review of the data from final pumping of 244-AR-TK-002 on April 18 shows that the 244-AR-TK-001 level continued to increase after the 244-AR-TK-002 level equalized at nominally 0.08 inches. When the 244-AR-TK-002 level first read 0.08 inches the 244-AR-TK-001 level was 88.74 inches and when the transfer pumps were stopped the level in 244-AR-TK-001 was 89.94 inches. This is equal to an increase of 224 gallons. During the same time an additional 14.46

inches of liquid, or 28 gallons, was pumped into surge tank AR244-WT-TK-200. Based on the level changes in 244-AR-TK-001 and AR244-WT-TK-200, an additional 252 gallons of liquid was pumped out of 244-AR-TK-002 after there was virtually no change to the tank's level reading of .08 inches. The additional 252 gallons is roughly 1.4 inches of level in 244-AR-TK-002. Therefore, removing an additional 252 gallons would be equivalent to a level in the tank of 10.7 inches at the end of pumping on April 18.

Similar to the final pumping of 244-AR-TK-001, the last hour of pumping from tank 244-AR-TK-002 on April 18 can be broken down into two distinct regions. The first part of the pumping was at a relatively rapid rate of pumping at nominally 7 gallons per minute. During this time, the valve (AR244-WT-MOV-203) that allowed the waste to transfer to 244-AR-TK-001 was open. This relatively rapid rate of pumping is indicative of free liquid being pumped out of the tank. During the second part of pumping, valve AR244-WT-MOV-203 was closed allowing surge tank AR244-WT-TK-200 to accumulate any liquid pumped out of 244-AR-TK-002. Approximately 2 gallons of liquid was pumped from tank 244-AR-TK-002 during the last 20 minutes of pumping on April 18. This slower rate of pumping of liquid is indicative of a solid phase with interstitial liquid. Using the conservative assumption that the current weight factor level is equal to the sludge level of the tank, there could be an estimated 12.075 inches, or 2,342 gallons of sludge remaining. Using the assumption that pumpable liquid was removed down to 10.7 inches, there could be 2,080 gallons of sludge remaining.

The eductor suction legs in the 244-AR vault tanks and cell 3 sump were verified to be in contact with the tank/cell bottom after the primary consolidation of waste into 244-AR-TK-001. On April 30, 2003 operations were performed to remove any residual pumpable liquid from 244-AR-TK-002. Pumping was performed for approximately 30 minutes. The first 20 minutes of pumping was at a relatively rapid rate of pumping at nominally 4 gallons per minute. During the last ten minutes of pumping, valve AR244-WT-MOV-203 was closed allowing surge tank AR244-WT-TK-200 to accumulate any liquid pumped out of 244-AR-TK-002. Approximately four gallons of waste was pumped out of 244-AR-TK-002 during the last ten minutes of pumping. The total estimated volume pumped from 244-AR-TK-002 on April 30, 2003 is approximately 70 gallons or 0.38 inches of level in 244-AR-TK-002.

The pump suction leg is installed in contact with the bottom of the tank. The pump suction has a 1 inch chamfer to avoid plugging the suction leg. This chamfer limits the removal of liquid as the eductor will not pump once there is a break through in the suction leg. Pumpable liquid was removed to the level of breakthrough, 1 inch from the bottom of the tank. Using the conservative assumption that that bottom inch of volume is all liquid, 194 gallons of pumpable liquid could remain. This is less than the required limit of no more than 485 gallons of liquid.

### **3.1.3 Tank 244-AR-TK-003**

The transfer of waste from 244-AR vault tank 244-AR-TK-003 to 244-AR-TK-001 was started April 16, 2003, also performed April 21, and completed April 30, 2003 following procedure TO-280-050, *Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to 244-AR-TK-001*. The main transfer was completed on April 16, 2003. A second transfer was performed on April 21 to try and reduce the liquid level remaining in 244-AR-TK-003 to below the liquid level indicator. A third short transfer was performed on April 30 after the suction leg had been verified to be in contact with the bottom of tank 244-AR-TK-003. Data sheet 1 from

TO-280-050, Liquid Level Monitoring, provides the starting and ending tank levels for 244-AR-TK-003 and 244-AR-TK-001. The recorded level in tank 244-AR-TK-003 on April 16, 2003 prior to the start of pumping was 44.7 inches. The average recorded level in tank 244-AR-TK-003 during the week after final pumping (May 5-11, 2003) was 0.00 inches. The material balance data sheets for the 244-AR-TK-003 transfer and the surveillance data sheet showing liquid levels for tank 244-AR-TK-003 during the week starting May 5, 2003 are provided in Appendix A. A plot of the liquid level history is provided in Appendix C.

For tank 244-AR-TK-003 it is required to remove liquid to the depth volume equivalent to 1 in. above the high side of the sloped bottom of the tank. This level in 244-AR-TK-003 is estimated at 121 gallons. The weight factor dip tube assembly in tank 244-AR-TK-003 is installed with the low dip tube leg 1 inch off the bottom of the high side of the sloped bottom of the tank. Therefore, a reading of 0.00 inches would be equivalent to a level in the tank of 121 gallons.

A review of the data from pumping of 244-AR-TK-003 on April 16 shows a final level reading of 0.5 inches. However, the level reading on the following day taken during operator rounds via procedure TF-OR-EF-244AR showed a level reading of 0.01 inches without any additional pumping occurring. It is expected that the actual level was actually at or below the level indicator when it was reading 0.5 inches.

Examining the data from pumping of 244-AR-TK-003 on April 16 shows that the 244-AR-TK-001 level continued to increase after the 244-AR-TK-003 level equalized at between 0.07 and 0.05 inches. When the 244-AR-TK-003 level first read 0.07 inches the 244-AR-TK-001 level was 25.95 inches; later when the transfer pump was stopped the level in 244-AR-TK-001 was 26.18 inches. This is equal to an increase of 42 gallons. During the same time frame the level in surge tank AR244-WT-TK-200 increased only two inches or four gallons. Based on the level changes in 244-AR-TK-001 and AR244-WT-TK-200, an additional 46 gallons of liquid was pumped out of 244-AR-TK-003 on April 16 after there was virtually no change to the tank's level reading. This left an estimated 75 gallons present in 244-AR-TK-003 on April 16.

On April 21, additional pumping of 244-AR-TK-003 to 244-AR-TK-001 was performed. Initially a backflush was performed for the eductor installed for 244-AR-TK-003. This backflushing activity added approximately 18 gallons back into 244-AR-TK-003. After backflushing, a transfer from 244-AR-TK-003 to 244-AR-TK-001 was performed with valve AR244-WT-MOV-203 closed allowing surge tank AR244-WT-TK-200 to accumulate any liquid pumped out of 244-AR-TK-003. (Note: Refer to CHG 2003a for a more complete description and diagrams of the transfer system.) In addition to recovering the 18 gallons added to 244-AR-TK-003 during backflush, approximately 21 more gallons of liquid were pumped from tank 244-AR-TK-003. This left an estimated 54 gallons present in 244-AR-TK-003 on April 21.

On April 22, two flushes of the transfer system were performed prior to recirculating the waste in 244-AR-TK-001. The flushes of the system went through the eductor in tank 244-AR-TK-003 with the majority of the flush water being transferred into 244-AR-TK-001. The first flush consisted of 106 gallons of water with 94 gallons going to 244-AR-TK-001 and the remaining 12 gallons going to 244-AR-TK-003. The second flush consisted of 84 gallons of water with 65 gallons going to 244-AR-TK-001 and the remaining 19 gallons going to 244-AR-TK-003. After the flushes on April 22, the estimated volume of waste in 244-AR-TK-003 was 85 gallons.

The eductor suction legs in the 244-AR vault tanks and cell 3 sump were verified to be in contact with the tank/cell bottom after the primary consolidation of waste into 244-AR-TK-001. On April 30, 2003 operations were performed to remove any residual pumpable liquid from 244-AR-TK-003. Pumping was performed for approximately 15 minutes. During that time it is calculated, based on 244-AR-TK-001 and AR244-WT-TK-200 level changes, that 39 gallons were pumped from 244-AR-TK-003 to 244-AR-TK-001. This left an estimated 46 gallons present in 244-AR-TK-003 on April 30. This is less than the required limit of no more than 121 gallons of liquid. The amount of sludge, if any, remaining in tank 244-AR-244-TK-003 is not known, but is estimated at less than 50 gallons.

#### 3.1.4 Tank 244-AR-TK-004

The transfer of waste from 244-AR vault tank 244-AR-TK-004 to 244-AR-TK-001 was started April 16, 2003, and completed April 30, 2003 following procedure TO-280-050, *Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to 244-AR-TK-001*. The main transfer was completed on April 16, 2003. A second transfer was performed on April 30 after the suction leg had been verified to be in contact with the bottom of tank 244-AR-TK-004. Data sheet 1 from TO-280-050, Liquid Level Monitoring, provides the starting and ending tank levels for 244-AR-TK-004 and 244-AR-TK-001. The recorded level in tank 244-AR-TK-004 on April 16, 2003 prior to the start of pumping was 1.9 inches. The average recorded level in tank 244-AR-TK-004 during the week after final pumping (May 5-11, 2003) was 0.09 inches. The material balance data sheets for the 244-AR-TK-004 transfer and the surveillance data sheet showing liquid levels for tank 244-AR-TK-004 during the week starting May 5, 2003 are provided in Appendix A. A plot of the liquid level history is provided in Appendix C.

For tank 244-AR-TK-004 it is required to remove liquid to the depth volume equivalent to 1 in. at the high side of the sloped bottom of the tank. This level in 244-AR-TK-004 is estimated at 121 gallons. The weight factor dip tube assembly in tank 244-AR-TK-004 is installed with the low dip tube leg 1 inch off the bottom of the high side of the sloped bottom of the tank. Therefore, a reading of 0.00 inches would be equivalent to a level in the tank of 121 gallons.

A review of the data from pumping of 244-AR-TK-004 on April 16 shows a final level reading of 0.0 inches. Examining the data from pumping of 244-AR-TK-004 on April 16 shows that the 244-AR-TK-001 level increased 0.71 inches and the AR244-WT-TK-200 level increased 12.35 inches during the time frame that 244-AR-TK-004 was pumped. The increase in 244-AR-TK-001 is equivalent to 132 gallons while the increase in AR244-WT-TK-200 is equivalent to 24 gallons. The initial level in 244-AR-TK-004 of 1.9 inches is equivalent to 200 gallons. Removing 156 gallons would result in a remaining 44 gallons of waste left in 244-AR-TK-004 on April 16.

The eductor suction legs in the 244-AR vault tanks and cell 3 sump were verified to be in contact with the tank/cell bottom after the primary consolidation of waste into 244-AR-TK-001. On April 30, 2003 operations were performed to remove any residual pumpable liquid from 244-AR-TK-004. Pumping was performed for approximately 10 minutes. During that time, the transfer from 244-AR-TK-004 to 244-AR-TK-001 was performed with valve AR244-WT-MOV-203 closed allowing surge tank AR244-WT-TK-200 to accumulate any liquid pumped out of 244-AR-TK-004. (Note: Refer to CHG 2003a for a more complete description and diagrams of the transfer system.) The level in AR244-WT-TK-200 only increased 0.14 inches or less than

one gallon. This left an estimated 44 gallons present in 244-AR-TK-004 on April 30. This is less than the required limit of no more than 121 gallons of liquid. The amount of sludge, if any, remaining in tank 244-AR-TK-004 is not known but is estimated at less than 50 gallons.

### **3.2 REMOVAL OF PUMPABLE LIQUID FROM 244-AR VAULT CELLS AND ASSOCIATED SUMPS**

The endpoint criteria for removal of pumpable liquid from the 244-AR vault cells and associated sumps are specific to the individual cells. For cells 1, 2 and 3 it is required to remove liquids, if necessary, to a volume less than the capacity of the sump and drain trench. This volume includes any backflush water for flushing the pump. The volume of cell 1 and cell 2 sump and drain trench is estimated at 140 L (35 gal.). This volume of the cell 3 sump and trench is estimated at 110 L (29 gal.).

#### **3.2.1 244-AR Vault Cell 1 and Associated Sump**

Based on the liquid level measurement data for the 244-AR vault cell 1 sump, there is no liquid present within the cell and associated sump. No liquid intrusion into the cell 1 sump has been detected over the past several years and it is expected that the sump is completely dry. The collected surveillance data for May 2003, which is typical, shows that the average liquid level measurement during that month was 0.12 inches. The surveillance data sheets showing liquid level for 244-AR vault cell 1 sump during the months of May and June 2003 are provided in Appendix A. A plot of the liquid level history is provided in Appendix C.

For 244-AR vault cell 1 it is required to remove liquids, if necessary, to a volume less than the capacity of the sump and drain trench. This volume includes any backflush water for flushing the pump. This level in 244-AR vault cell 1 is estimated as 35 gallons. The weight factor dip tube assembly in the 244-AR vault cell 1 sump is installed with the low dip tube leg 1 inch off the bottom of the sump. Therefore, a reading of 0.12 inches, the average during May 2003, would be equivalent to a volume in the sump of 2 gallons. This is less than the required limit of no more than 35 gallons of liquid.

#### **3.2.2 244-AR Vault Cell 2 and Associated Sump**

Based on the liquid level measurement data for the 244-AR vault cell 2 sump, there is no pumpable liquid present within the cell and associated sump. No liquid intrusion into the cell 2 sump has been detected over the past several years and it is expected that the sump is completely dry. The collected surveillance data for May 2003, which is typical, shows that the average liquid level measurement during that month was 0.05 inches. The surveillance data sheets showing liquid level for 244-AR vault cell 2 sump during the months of May and June 2003 are provided in Appendix A. A plot of the liquid level history is provided in Appendix C.

For 244-AR vault cell 2 it is required to remove liquids, if necessary, to a volume less than the capacity of the sump and drain trench. This volume includes any backflush water for flushing the pump. This level in 244-AR vault cell 2 is estimated as 35 gallons. The weight factor dip tube assembly in the 244-AR vault cell 2 sump is installed with the low dip tube leg 1 inch off

the bottom of the sump. Therefore, a reading of 0.05 inches, the average during May 2003, would be equivalent to a volume in the sump of 2 gallons. This is less than the required limit of no more than 35 gallons of liquid.

### 3.2.3 244-AR Vault Cell 3 and Associated Sump

The transfer of waste from 244-AR vault cell 3 sump was started April 8, 2003, also performed April 10, April 18, April 30, and completed June 2, 2003 following procedure TO-280-050, *Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to 244-AR-TK-001*. Because of instrumentation problems, the transfer on April 8 only lasted 7 minutes and no appreciable quantity of waste was transferred from the cell 3 sump. The main transfer was completed on April 10, 2003. A third transfer was performed on April 21 to try and reduce the liquid level remaining in 244-AR vault cell 3 sump to at or below a liquid level equal to the height of the sump and trench. Another transfer was performed on April 30 after attempting to move the suction leg. A final transfer was performed on June 2 after performing a video inspection of the cell floor and moving the pump suction leg to within the trench associated with the cell 3 sump. Data sheet 1 from TO-280-050, Liquid Level Monitoring, providing the starting and ending levels for 244-AR vault cell 3 and 244-AR-TK-001 for each of these pumping evolutions is provided in Appendix A. The recorded level in 244-AR vault cell 3 sump on April 8, 2003 prior to the start of pumping was 27.1 inches.

For 244-AR vault cell 3 it is required to remove liquids, if necessary, to a volume less than the capacity of the sump and drain trench. This volume includes any backflush water for flushing the pump. The volume at this level in 244-AR vault cell 3 is calculated as 29 gallons. The weight factor dip tube assembly in 244-AR vault cell 3 is installed with the low dip tube leg 1 inch off the bottom of the sump. The sump is 17.5 inches deep; therefore, a reading of 16.5 inches would be equivalent to a volume in the sump and trench of 29 gallons.

The pumping of 244-AR vault cell 3 sump performed on April 10 resulted in a final sump level reading of 18.4 inches. Because this reading was greater than the required limit another attempt to pump the sump was made on April 18. In the days between April 10 and 18, the liquid level in the sump had gone down by 0.2 inches, indicating continued normal evaporation of the water in the 244-AR vault cell 3 sump was occurring. Pumping of the 244-AR vault cell 3 sump on April 18 resulted in a final sump level reading of 17.9 inches. However, since this level was greater than 16.5 inches it indicated the presence of some water on the cell floor outside the sump and trench. It was anticipated that the suction leg had not been placed within the trench and therefore could not remove any more liquid. The depth of the trench at the location of the pump leg is  $\frac{3}{4}$  inches. An attempt to move the suction leg was made on April 29 and then pumping was again performed on April 30. In the days between April 18 and 30, the liquid level in the sump had gone down by 0.2 inches, indicating evaporation of the water in the 244-AR vault cell 3 sump was occurring. Pumping on April 30 resulted in a recorded liquid level of 17.6.

Because the liquid level was still greater than the required minimum level a video inspection was performed to determine whether the suction leg was indeed within the sump trench or on the cell floor adjacent to the trench. The video inspection performed on May 15, 2003 did identify that the suction leg was not within the trench. The video inspection also found significant quantities of dirt on the floor, and in the drain trench of cell 3. The suction leg was successfully moved into the trench in order to attempt to remove additional liquid from 244-AR vault cell 3. The

final pumping of the 244-AR vault cell 3 occurred on June 2, 2003. The liquid level in the 244-AR vault cell 3 on June 2, prior to backflushing the eductor, had dropped to 16.9 inches. Due to continued evaporation, the liquid level had dropped 0.7 inches since the previous pumping event. At the start of pumping on June 2, water drained back through the eductor initially increasing the liquid level in the cell 3 sump. The transfer from 244-AR vault cell 3 to 244-AR-TK-001 was performed with valve AR244-WT-MOV-203 closed allowing surge tank AR244-WT-TK-200 to accumulate any liquid pumped out of 244-AR vault cell 3. Pumping continued for approximately 5 minutes without any increase in the liquid level in surge tank AR244-WT-TK-200. The recorded liquid level in the 244-AR vault cell 3 at the end of pumping was 17.5 inches. From the May 15, 2003 video, it is projected that the dirt buildup on the floor and in the trench between the location of the pump leg and the sump, where the level indication is taken, could be isolated from each other slightly above the level of the lip of the sump.

A review of the May 2003, 244-AR vault cell 3 sump liquid level data was performed to determine how long it would take to evaporate to a level no more than 16.5 inches at the current rate of evaporation. The data from May 2003 indicated that evaporation to the required level would be reached by the end of July 2003 or sooner, assuming the evaporation curve would continue to be linear. The sump liquid level was decreasing steadily due to normal evaporation and was projected to be at or below the required level well before the Interim Milestone M-45-11 completion date of September 30, 2003. Due to the small quantity of liquid involved and the difficulty of modifying the pump leg, the decision was made to not make any additional attempts to pump liquid from the 244-AR vault cell 3 sump.

To confirm that the loss of liquid was due to normal evaporation, a liquid level plot was run from November 2001 to just prior to pumping. It was confirmed that the loss of liquid remained nearly constant, even after the bulk of the liquid was removed. The collected surveillance data for June 2 through July 2003 for the 244-AR vault cell 3 sump, shows the continued decrease in the liquid level measurement during that time period. The surveillance data sheets show that on July 2, 2003 the level dropped below the level of 16.5 inches or 29 gallons, thus meeting the required limit of no more than 29 gallons of liquid. The evaporation rate dropped off when the surface area of the liquid was limited to the sump only. A plot of the liquid levels depicting the evaporation rate in sump 3 is included as Appendix D. As of August 12, 2003 the sump level was 15.15 inches or 25 gallons. The surveillance data sheets are provided in Appendix A. A plot of the liquid level history for each of the sumps and tanks is provided in Appendix C.

#### **4.0 244-AR VAULT ISOLATION AND INTRUSION PREVENTION**

To satisfy the TPA Interim Milestone M-45-11, it is necessary to "isolate" the 244-AR vault and install "intrusion prevention" mechanisms as necessary. To isolate the 244-AR vault, the piping now connected to the 244-AR vault needs to be mechanically blocked to prevent the reintroduction of liquids to the vault. For intrusion prevention, the known paths for the intrusion of precipitation/snow melt are to be blocked to prevent future intrusions to the 244-AR vault.

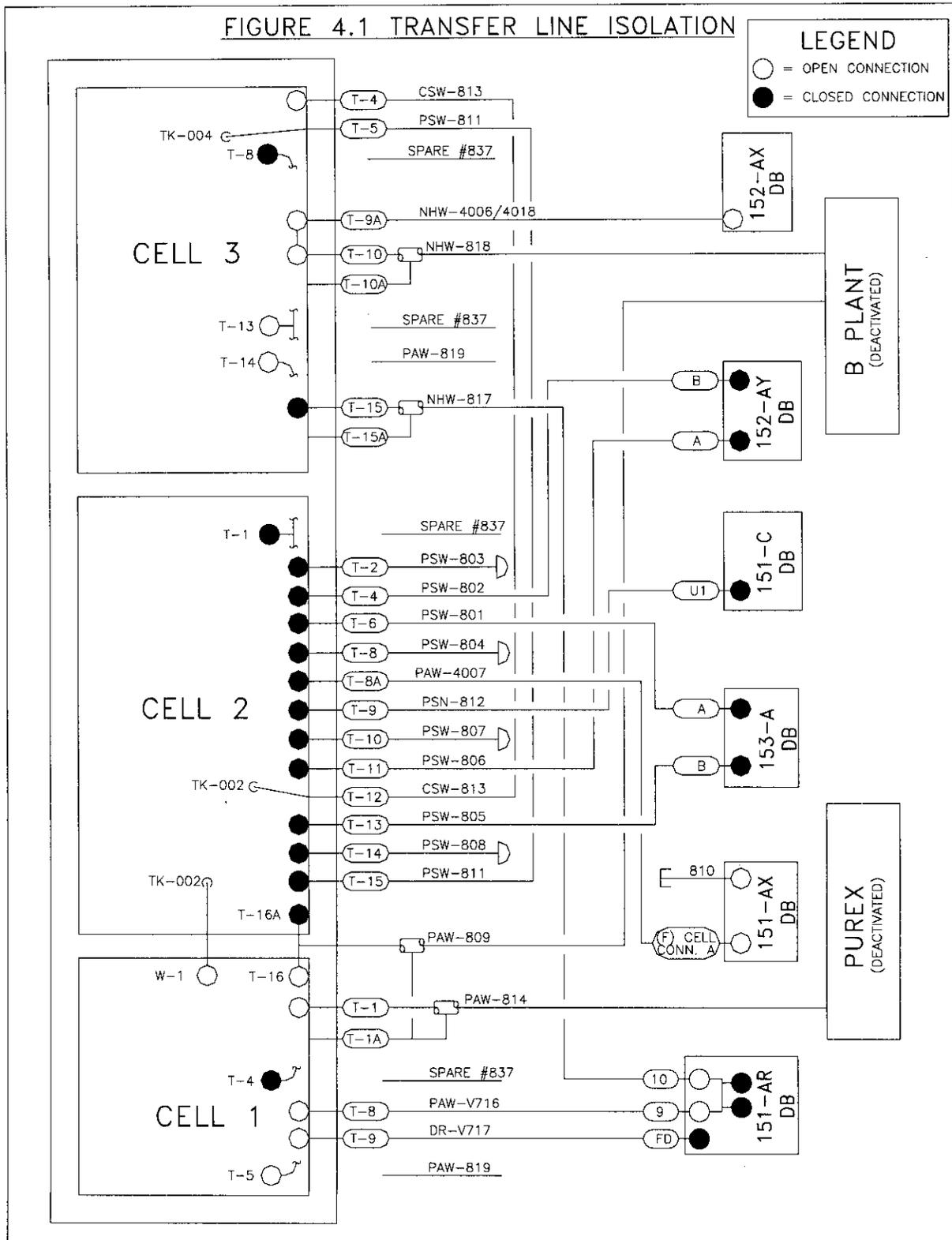
The majority of penetrations into the 244-AR vault are the connection points or "nozzles" (i.e., piping nozzles (for use with removable jumpers), rigid piping, electrical, instrumentation, etc.) identified by an alphanumeric code. The connection points on the north side of the 244-AR vault are designated with an alphanumeric code that begins with the letter T, connection points on the south side of the 244-AR vault are designated with an alphanumeric code that begins with the letter G, while inter-cell connection points are designated with an alphanumeric code that begins with either the letter T or W.

#### **4.1 244-AR VAULT ISOLATION**

For all process liquids and waste transfer lines connecting to the facility, the required action is to place a mechanical isolation in/on the line at the supply end and/or on the 244-AR vault end of the piping segment entering the vault. The required deliverable to demonstrate this action has been taken is a matrix listing lines, type and location of isolation, with closed-out work packages verifying installations. Because some of the isolation work was performed several years ago rather than as part of the current interim stabilization effort, existing drawings and/or engineering change notices are used to verify installations rather than closed-out work packages. The project plan, CHG 2000, states that the transfer lines will be isolated at the north wall nozzle, inside 244-AR vault, or at the other end of the line segment, within the terminating facility. The project plan, CHG 2000, goes on to state that this activity will not require that transfer lines be blocked at both ends. Where lines are isolated at both ends, this is noted.

##### **4.1.1 Transfer Line Isolation**

Two types of transfer lines are discussed in CHG 2000 as being used at the 244-AR vault. One type is used to make intra-facility transfers between facility tanks or from sumps to tanks; and the other type is used to transfer waste to or from outside facilities such as SSTs, DSTs, PUREX, or B Plant. Transfer line connection points (i.e., nozzles) at 244-AR vault are generally designated with an alphanumeric code that begins with the letter T. An exception to this is that some intra-facility transfer lines are designated with an alphanumeric code that begins with the letter W. However, not all "T" designated nozzles are transfer lines. Non-transfer line "T" designated nozzles are discussed as part of either process line isolation or intrusion prevention, as appropriate. A graphical representation of the isolation status of the transfer line nozzles is presented in Figure 4.1. A nozzle by nozzle listing of the connecting lines is given in Table 4-1.



Because the intra-facility sump-to-tank and tank-to-tank transfer lines begin and end within the physical footprint of the facility boundary, they do not have a source of liquid, and isolation is not required. However, they are included in this report for completeness. There are a total of eleven intra-facility sump-to-tank and tank-to-tank transfer lines. Within Cell 1, nozzles T-4, T-5, and W-1 are intra-facility connections. Within Cell 2, nozzles T-1, T-12 and T-15 are intra-facility connections. Within Cell 3, nozzles T-4, T-5, T-8, T-13, and T-14 are intra-facility connections. The status of each of these nozzles is documented in Table 4-1.

Waste transfer lines that leave the building are required to have a mechanical isolation in order to meet the TPA Interim Milestone requirement for line isolation. The mechanical isolation can be placed in/on the line at the supply end and/or on the 244-AR vault end of the piping segment entering the vault. There are a total of 18 waste transfer line connections that leave the 244-AR vault. Within Cell 1, nozzles T-1, T-8, T-9, and T-16 are external waste transfer line connections. Within Cell 2, nozzles T-2, T-4, T-6, T-8, T-8A, T-9, T-10, T-11, T-13, T-14, and T-16A are external transfer line connections. Within Cell 3, nozzles T-9A, T-10, and T-15 are external transfer line connections. Table 4-1 lists each of these nozzle connection points, the associated line, type and location of isolation, with either reference drawings and/or engineering change notices or closed-out work package verifying each installation.

There are also four transfer lines with encasement drains that penetrate the vault at three locations. The encasement drain penetrations are designated Cell 1, nozzle T-1A, and Cell 3, nozzles T-10A and T-15A. These encasement drains penetrate the encasements on the exterior of the vault wall and penetrate the vault wall directly below the penetration of the encased pipe. The encasement drain for line 814 (cell 1, nozzle T-1) enters the vault at Cell 1, nozzle T-1A. The encasement drain for line 809 (Cell 1, nozzle T-16 and Cell 2, nozzle T-16A) ties into the drain line for line 814 external to the vault. Line 818 (Cell 3, nozzle T-10) encasement drain enters the vault at Cell 3, nozzle 10A. Line 817 (Cell 3, nozzle T-15) encasement drain enters the vault at Cell 3, nozzle 15A. The encasement drain penetrations do not have a "nozzle" connection on the inside of the vault, but are open embedded pipe.

Cell 1, nozzle T-1 contains a jumper connected to nozzle A on tank 244-AR-TK-001. This waste transfer line is a direct line (i.e., no intermediate pits or diversion boxes) connection to PUREX. The transfer line is isolated at PUREX via completion of the PUREX facility deactivation.

Cell 1, nozzle T-1A is the encasement drain for transfer lines 814 and 819, routed to Cell 1, nozzle T-1. Line 814 is out of service and isolated by the deactivation of the PUREX facility. Line 819 is out of service and isolated by the deactivation of B Plant. This is an open pipe inside the 244-AR vault and drains to the cell. Because the transfer lines are inactive and isolated, the encasement drain is also considered isolated.

Cell 1, nozzle T-8 contains a jumper connection to nozzle C on tank 244-AR-TK-001. This transfer line is isolated via existing configuration. The Cell 1, nozzle T-8, via line V716, terminates outside 244-AR vault at nozzle 9 of the 241-AR-151 diversion box which is connected via a rigid jumper to nozzle 10 of 241-AR-151 diversion box. All other connection points on this rigid jumper in the 241-AR-151 diversion box have process blanks installed. Nozzle 10 of 241-AR-151 diversion box is connected to 244-AR vault Cell 3, nozzle T-15.

Cell 1, nozzle T-9 contains a jumper connected to nozzle N on tank 244-AR-TK-001. The Cell 1, nozzle T-9 is isolated via closing the 241-AR-151 diversion box floor drain under work package 2E-03-0834.

Cell 1, nozzle T-16 either contains a jumper connected to nozzle CC on tank 244-AR-TK-001 or a blank may be installed. The existing configuration documentation is not clear. However, the configuration of this nozzle is not critical to isolation of the facility. This waste transfer line is a direct line (i.e., no intermediate pits or diversion boxes) connection to B Plant. The transfer line is isolated at B Plant via completion of the B Plant facility deactivation.

Cell 2, nozzle T-2 is a capped spare with a process blank installed on the nozzle. Because the line terminates at a cap a few feet outside the building and it contains a process blank, this nozzle is isolated.

Cell 2, nozzle T-4 contains a process blank installed on the nozzle. This nozzle connects to diversion box 241-AY-152, connection B. Diversion box 241-AY-152, connection B contains an isolation blank and the diversion box is weather sealed. This waste transfer line is isolated on both ends.

Cell 2, nozzle T-6 contains a process blank installed on the nozzle. This nozzle connects to diversion box 241-A-153, connection A. Diversion box 241-A-153, connection A contains a process blank and the diversion box is weather sealed. This waste transfer line is isolated on both ends.

Cell 2, nozzle T-8 is a capped spare with a process blank installed on the nozzle. Because the line terminates at a cap a few feet outside the building and it contains a process blank this nozzle is isolated.

Cell 2, nozzle T-8A contains a process blank installed on the nozzle. This nozzle connects to the diverter station 241-AX-151, F Cell diverter tank. The line from cell 2, nozzle T-8A is designated as line 4007 at the diverter station. Line 4007 empties into the top of a nominally 50-gallon receiver tank. A moveable spout on the bottom of the receiver tank directs the flow to any one of several exit pipe funnels. Each routing funnel represents a direct transfer line to a specific receiver tank. Because line 4007 enters near the top of the receiver tank and the receiver tank empties out near the bottom, there is a vapor gap within the receiver tank. This vapor gap serves as a physical disconnect and isolation for line 4007 from waste transfers as well as intrusions. Diversion box 241-AX-151 is also weather sealed. This waste transfer line is therefore isolated at both ends.

Cell 2, nozzle T-9 contains a process blank installed on the nozzle. This nozzle connects to diversion box 241-C-151, nozzle U1. Diversion box 241-C-151, nozzle U1 contains a process blank and the diversion box is weather sealed. This waste transfer line is isolated on both ends.

Cell 2, nozzle T-10 is a capped spare with a process blank installed on the nozzle. Because the line terminates at a cap a few feet outside the building and it contains a process blank this nozzle is isolated.

Cell 2, nozzle T-11 contains a process blank installed on the nozzle. This nozzle connects to diversion box 241-AY-152, connection A. Diversion box 241-AY-152, connection A contains a process blank and the diversion box is weather sealed. This waste transfer line is isolated on both ends.

Cell 2, nozzle T-13 contains a process blank installed on the nozzle. This nozzle connects to diversion box 241-A-153, connection B. Diversion box 241-A-153, connection B contains an isolation blank and the diversion box is weather sealed. This waste transfer line is isolated on both ends.

Cell 2, nozzle T-14 is a capped spare with a process blank installed on the nozzle. Because the line terminates at a cap a few feet outside the building and it contains a process blank this nozzle is isolated.

Cell 2, nozzle T-16A is a tee with cell 1, nozzle T-16 (i.e., Cell 1, nozzle T-16 and Cell 2, nozzle T-16A share the same external transfer line). This nozzle contains a process blank. This waste transfer line is a direct line (i.e., no intermediate pits or diversion boxes) connection to B Plant. The transfer line is isolated at B Plant via completion of the B Plant facility deactivation. This waste transfer line is isolated on both ends.

Cell 3, nozzle T-9A contains a jumper connected to Cell 3, nozzle T-10. The waste transfer line from Cell 3, nozzle T-9A is a direct line (i.e., no intermediate pits or diversion boxes) connection to the 241-AX-152 diverter station. The 241-AX-152 diverter station is currently the only active diverter station in the 200 Areas. The line from cell 3, nozzle T-9A is designated as line 4018 at the diverter station. Line 4018 empties into the top of a nominally 50-gallon receiver tank. A moveable spout on the bottom of the receiver tank directs the flow to any one of several exit pipe funnels. Each routing funnel represents a direct transfer line to a specific receiver tank. Because line 4018 enters near the top of the receiver tank and the receiver tank empties out the bottom, there is a vapor gap within the receiver tank. This vapor gap serves as a physical disconnect and isolation for 4018 from waste transfers as well as intrusions.

Cell 3, nozzle T-10 contains a jumper connected to Cell 3, nozzle T-9A. The waste transfer line from Cell 3, nozzle T-10 is a direct line (i.e., no intermediate pits or diversion boxes) connection to B Plant. The transfer line is isolated at B Plant via completion of the B Plant facility deactivation.

Cell 3, nozzle T-10A is the encasement drain for transfer line 818, routed to Cell 3, nozzle T-10. Line 818 is out of service and isolated by the deactivation of B Plant. This is an open pipe inside the 244-AR vault and drains to the cell. Because the transfer line is inactive and isolated, the encasement drain is also considered isolated.

Cell 3, nozzle T-15 is isolated via existing configuration. Cell 3, nozzle T-15 contains a process blank installed on the nozzle. This nozzle connects via line 3"NHW-817/4019/(V718), to nozzle 10 of 241-AR-151 diversion box which is connected via a rigid jumper to nozzle 9 of 241-AR-151 diversion box. All other connection points on this rigid jumper have process blanks installed. Nozzle 9 of 241-AR-151 diversion box is connected to 244-AR vault Cell 1, nozzle T-8.

Cell 3, nozzle T-15A is the encasement drain for transfer line 817, routed to Cell 3, nozzle T-15. Line 817 is isolated at the 241-AR-151 by a jumper installed to nozzle 9. This is an open pipe inside the 244-AR vault and drains to the cell. Because the transfer line is inactive and isolated, the encasement drain is also considered isolated.

#### 4.1.2 Process Line Isolation

Process lines are lines that potentially carry liquids and supply various services to the 244-AR vault. These lines typically enter from the south side of the vault. The process line connection points (i.e., nozzles) at 244-AR vault are generally designated with an alphanumeric code that begins with the letter G. An exception to this is that some cooling water discharge lines are on the north side of the 244-AR vault and thus have an alphanumeric code that begins with the letter T. However, not all "G" or "T" designated nozzles are process lines. Non-process line "G" and "T" designated nozzles are discussed as part of either transfer line isolation or intrusion prevention, as appropriate. For the purpose of process line isolation, CHG 2000 (see Section 3.2.2.2 of CHG 2000) identified the process lines to be isolated as either water lines or steam lines. This completion report also considers chemical addition lines as process lines because of the potential for addition of liquid into the 244-AR vault via these lines. A graphical representation of the process line isolation status within 244-AR vault is presented in Figure 4.2. A nozzle by nozzle listing of the connecting lines is given in Table 4-1.

There are a total of 27 process line connections that either introduce raw water or cooling water or discharge cooling water from the 244-AR vault. Within Cell 1, nozzles T-2 (Note: this is a capped line), T-3, and T-11 are cooling water discharge/return lines; nozzles G-3, G-11, G-16, and GS-1 are raw water addition lines; and nozzles G-7 and G-15 are cooling water supply lines. Within Cell 2, nozzles T-3 and T-5 are cooling water discharge/return lines; nozzles G-1, G-9, G-13, G-14, and GS-2 are raw water addition lines; and nozzles G-15, G-17 are cooling water supply lines. Within Cell 3, nozzles T-3, T-6, and T-11 are cooling water discharge/return lines; nozzle T-9 was reutilized to dump cooling water to the sump in the closed loop cooling system (ref. H-2-79949); nozzles G-9, G-23, and GS-3 are raw water supply lines; and nozzles G-13 and G-27 are cooling water supply lines. The water to 244-AR vault has been isolated as shown in engineering change control document ECN-664735. The work to isolate water to the 244-AR facility was completed under work package 2E-01-0566.

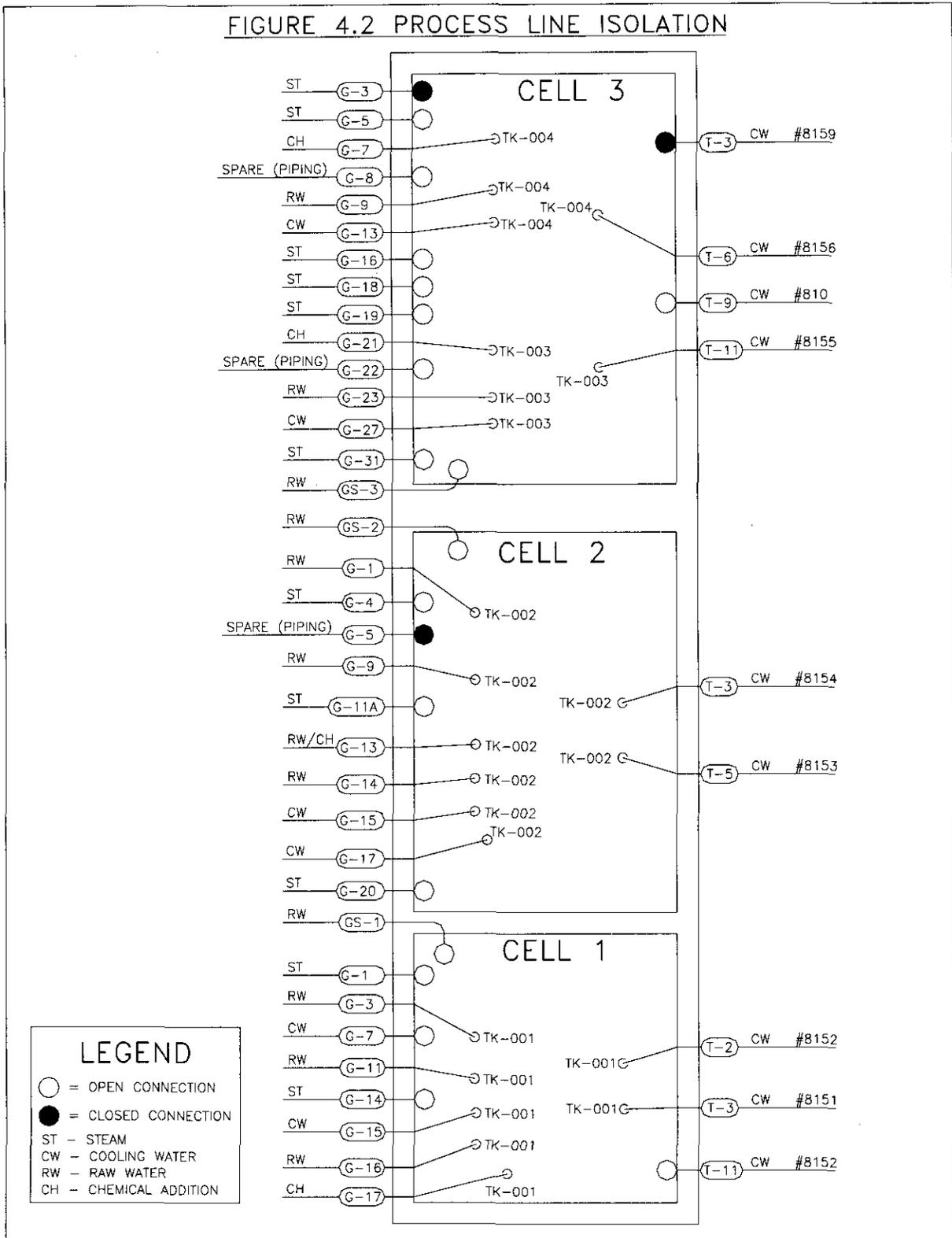
There are a total of 11 process line connections that introduce steam to the 244-AR vault. Within Cell 1, nozzles G-1 and G-14 are steam supply lines. Within Cell 2, nozzles G-4, G-11A, and G-20 are steam supply lines. Within Cell 3, nozzles G-3, G-5, G-16, G-18, G-19, and G-31 are steam supply lines. The steam to 244-AR vault has been isolated as shown in engineering change control documents ECN-668802 and ECN-668812. The work to isolate steam to the 244-AR facility was completed under work package 2E-01-0626.

There are a total of 4 process line connections that are used for chemical addition to the tanks within 244-AR vault. Cell 1, nozzle G-17; Cell 2, nozzle G-13; Cell 3, nozzle G-7; and Cell 3, nozzle G-21 are chemical addition lines. Cell 2, nozzle G-13 is also used for raw water addition and has been described above in this section. The chemical addition system to 244-AR vault has been isolated as shown in engineering drawing H-2-79949, Sheet 8 which shows a blind flange on the external chemical addition line truck hose connection and a blind flange on the chemical

addition line in the Service Building. The work to isolate chemical addition lines to the 244-AR facility was completed several years ago prior to the 244-AR interim stabilization effort.

There are 3 spare process line connections that were never used: Cell 2, nozzle G-5; Cell 3, nozzle G-8; and Cell 3, nozzle G-22. Each of these connection points contains a globe valve in the 244-AR Service Building with a blank on the globe valve, thus isolating the connections from the 244-AR vault. This configuration is depicted on H-2-79949, Sheet 12 for Cell 2, nozzle G-5 and is depicted on H-2-79949, Sheet 10 for Cell 3, nozzles G-8 and G-22. The isolation of these spare lines to the 244-AR vault was completed several years ago prior to the 244-AR interim stabilization effort.

FIGURE 4.2 PROCESS LINE ISOLATION



## 4.2 244-AR VAULT INTRUSION PREVENTION

For all intrusion paths into the 244-AR vault, the required action to meet the TPA Interim Milestone requirement is to mechanically seal or block each identified intrusion route. Methods identified in Appendix A of CHG 2000 may include vault covers, foam, cement, grout, process blanks, etc. Appendix A of CHG 2000 also states that for some components, such as buried vaults and concrete piping encasements, a white paper may be created for specific concerns such as seepage. The deliverable to meet the milestone requirement is a matrix listing all identified intrusion paths, listing type and location of intrusion prevention or evaluation document number with closed-out work packages verifying installation.

### 4.2.1 Alpha-numerically Designated Penetrations

There are 13 designated electrical connections and 17 designated instrumentation connections into the 244-AR vault. The 13 electrical connections consist of: in Cell 1, nozzles G-4, G-10, and G-12; in Cell 2, nozzles G-2, G-8, G-10, G-16, and G-18; and in Cell 3, nozzles G-2, G-10, G-14, G-24, and G-28. The 13 instrumentation connections consist of: in Cell 1, nozzles G-2, G-5, G-6, and G-13; in Cell 2, nozzles G-3, G-11, G-12, G-19, and G-21; and in Cell 3, nozzles G-1, G-4, G-6, G-12, G-17, G-20, G-26, and G-30. Electrical and instrumentation lines have been evaluated as potential intrusion paths into the 244-AR vault and although these connections penetrate the 244-AR vault it has been determined that the electrical and instrumentation lines are not feasible intrusion paths. All electrical and instrumentation lines penetrating the 244-AR vault terminate within the 244-AR Service Building. These electrical connections within the 244-AR Service Building terminate within motor control centers that are located on raised concrete pads a minimum of 4 inches above the floor. The conduit for these electrical connections is stubbed above the tops of these pads on which the motor control centers are placed. Similarly, the instrumentation line connections within the 244-AR Service Building terminate within instrument panels that are located on raised concrete pads a minimum of 4 inches above the floor. The instrument lines are stubbed above the tops of these pads a minimum of 4 inches. The 244-AR Service Building contains floor drains that would drain any water leakage into the building before covering the pads on which the motor control centers and instrument control panels are placed. The status of each of these nozzles is documented in Table 4-1.

There are 8 designated penetrations into 244-AR vault associated with the vessel ventilation system. Six of the penetrations are tank or equipment related ventilation lines: Cell 1, nozzle T-6; Cell 2, nozzle T-7; and Cell 3, nozzles T-1, T-2, T-7, and T-12. These six vessel ventilation lines manifold together and the only external opening is from Cell 3, nozzle T-1. The vessel ventilation line from Cell 3, nozzle T-1, 8"VV-8166, previously was normally routed through a fiberglass prefilter, the 292-AR vessel ventilation filter vault vault, and then on to the vessel ventilation fan and stack. Valving to the fiberglass prefilter has been closed to isolate the prefilter from the ventilation line. The 292-AR vessel ventilation filter vault has been isolated via weather sealing according to engineering change notice ECN-662911. The vessel ventilation fan and stack have been isolated via ECN-650611. The only active connection to the vessel ventilation system is valve IV-K4-1, an above grade valve, used to connect the temporary ventilation system to the 244-AR vault vessel ventilation line for use during interim stabilization. This connection will remain in place, but the valve is in the closed position when the ventilation system is not operated. The seventh penetration, designated as Cell 3, nozzle T-1A, is a high

pressure sensing line for the vessel ventilation differential pressure measurement. This connection is a ¼" sensing line that terminates at the differential pressure gauge five feet above grade. Since this line extends five feet above grade and is connected to an instrument, it is not considered an intrusion path. The eighth penetration, designated as Cell 3, T-1B is an out of service seal loop associated with the vessel vent system. This connection is a 1 ½" line that is capped outside the 244-AR vault. The status of each of these nozzles is documented in Table 4-1.

There are four designated penetrations into 244-AR vault that are sampling points for each of the four tanks. The sampling points are designated Cell 1, nozzle G-8; Cell 2, nozzle G-6; and Cell 3, nozzles G-15 and G-29. Sampling lines through each of these designated connections is connected to one of four sampling pits within the sample room of the 244-AR facility's Service Building. The sampling pits have been foamed over to prevent any intrusion of water into the sampling pits and ultimately into the 244-AR vault. The foaming of the pits is as shown in engineering change control document ECN-720561 R-0. The work to foam over the pits was completed under work package 2E-03-0742. This status is documented in Table 4-1.

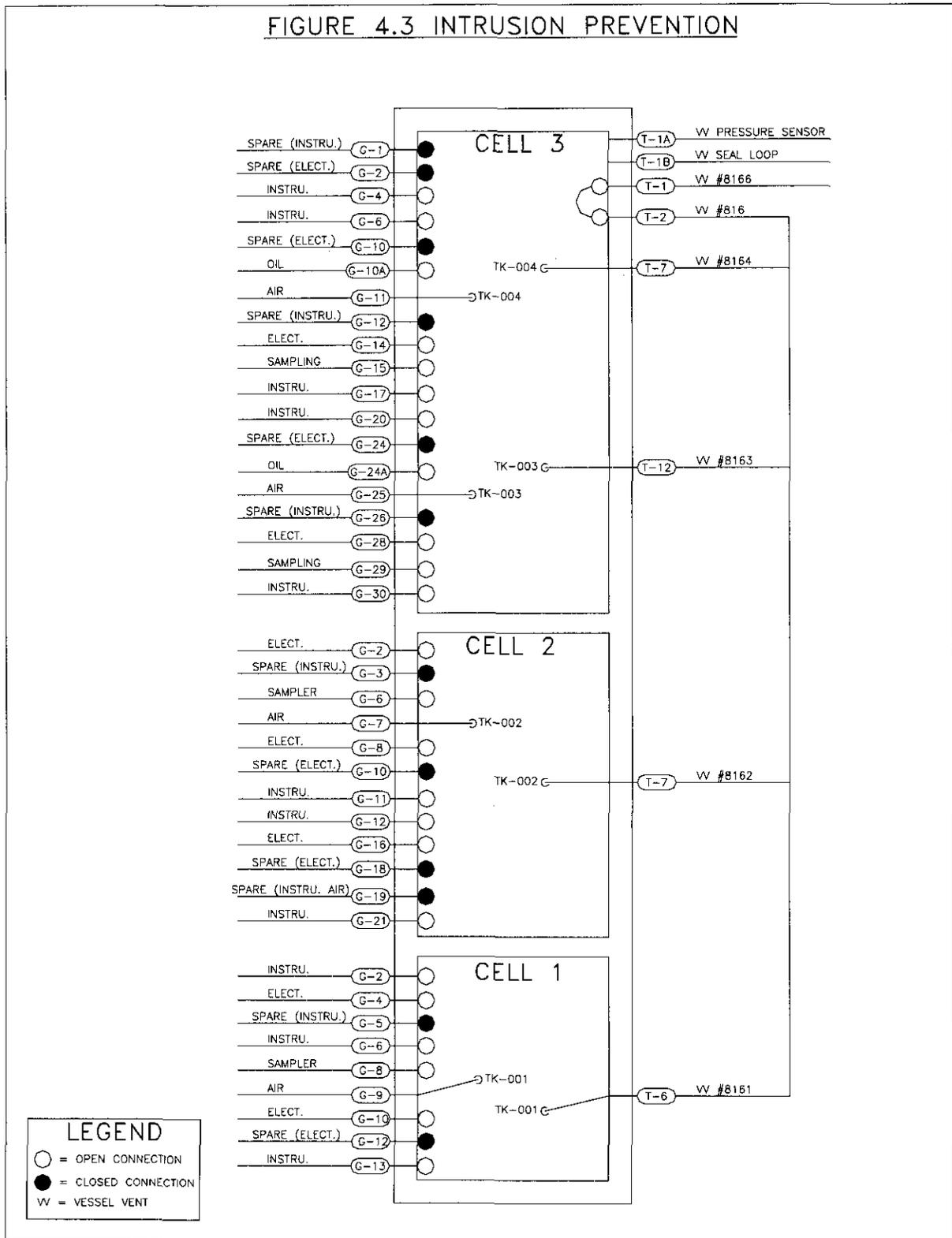
There are four designated process air/purge air connections into the 244-AR vault. These four connections consist of: Cell 1, nozzle G-9; Cell 2, nozzle G-7; and Cell 3, nozzles G-11 and G-25. Process/purge air lines have been evaluated as potential intrusion paths into the 244-AR vault and although these connections penetrate the 244-AR vault it has been determined that the process air lines are not feasible intrusion paths. Drawing H-2-79949, Sheet 15 shows the process/purge air system instrument air header as being capped, thus closing off the path for liquid intrusion. All process/purge air lines within the 244-AR Service Building are hard piped and are not intrusion paths. Since the air system is already isolated, no additional work has been done as part of the interim stabilization effort to prevent intrusion through the process air/purge air connections. The status of each of these nozzles is documented in Table 4-1.

There are two designated oil lubrication lines into the 244-AR vault. These two connections are nozzles G-10A and G-24A in Cell 3. These oil lubrication lines have been evaluated as potential intrusion paths into the 244-AR vault and although these connections penetrate the 244-AR vault it has been determined that the oil lubrication lines are not feasible intrusion paths. Drawing H-2-62066 shows the two oil lubrication lines coming up into the 244-AR Service Building. Drawing H-2-79949, Sheet 9 shows a gate valve with a blank installed for the oil line going to nozzle G-10A while drawing H-2-79949, Sheet 10 shows the exact same configuration for the oil line going to nozzle G-24A. This effectively closes off the oil lubrication lines and they are not potential intrusion paths. Because the oil lubrication lines are already isolated, no additional work has been done as part of the interim stabilization effort to prevent intrusion through these oil lubrication lines. The status of each of these nozzles is documented in Table 4-1.

Spare nozzles, penetrations, and lines are included with the transfer lines, process lines or the intrusion prevention lines and are defined in Table 4-1. Piping spares, which are capped outside the vault are included with the intrusion prevention penetrations.

Figure 4.3 is a graphical representation of the alphanumerically designated penetrations that are potential intrusion paths.

FIGURE 4.3 INTRUSION PREVENTION



#### 4.2.2 241-AR-151 Diversion Box Intrusion Prevention

The external transfer path put in place to support 244-AR interim stabilization is isolated at the 241-AY-02D pit, nozzle 5. This maintains the external transfer path intact to the degree possible for the pumping of any future intrusions to the facility while isolating the transfer path from 244-AR. Transfer pit AR-151 has been isolated and covered. Pit configuration is documented in Table 4-2.

#### 4.2.3 Miscellaneous Penetrations into the 244-AR Vault

All other openings in the vault boundary, categorized as miscellaneous penetrations, were evaluated as potential intrusion paths. These potential paths included personnel and equipment doors, ventilation openings, miscellaneous vents and drains, miscellaneous conduits, openings created during the 244-AR interim stabilization activity, seal pot overflow, and connecting openings from the 244-AR Service Building. A status and listing of these miscellaneous penetrations is provided in Table 4-3.

There are six penetrations into 244-AR vault that are associated with the sample room of the 244-AR facility's Service Building. Each of the four sampling pits in the sample room have a pit drain. Each of these four drains goes to a common drain line that drains to cell 3 of the 244-AR vault. As discussed above (see Section 4.2.1), the four sampling pits have been foamed over with the pit configuration shown on ECN-720561 R-0 and the work performed under work package 2E-03-0742. The other two penetrations into 244-AR vault from the sample room are a floor drain and a sink drain. The floor drain has been foamed over to eliminate it as an intrusion path. The sink drain is above the floor level. The sink has been removed and the sink drain line has been rotated so the opening in the drain line is facing downward so the sink drain line now has an air gap which serves as the intrusion prevention mechanism. The documented configuration of the floor drain and sink drain is also provided on ECN-720561 R-0 and the work was also performed under work package 2E-03-0742. The remainder of the Service Building roof and floor drains do not penetrate the vault.

The canyon entrance rain gutter discharge, discussed in CHG 2000, though shown on reference drawings, was found through photos and field walkdowns to have never been installed.

Two encasement drain lines (one each) are associated with transfer line 3"PAW-V716 (refer to Cell 1, nozzle T-8 in table 4-1) and the 241-AR-151 pit floor drain line 3"DR-V717. Neither of these penetrations has an alphanumeric designation like other encasement drain lines discussed in section 4.1. Both lines are connected between the 244-AR vault (Cell 1) and the 241-AR-151 pit. The 241-AR-151 pit floor drain is isolated by closing floor drain assembly (work package 2E-03-00834) and the pit has been weather sealed, providing intrusion prevention, by installing a pre-fabricated weather cover per ECN-720547 R0 and work package 2E-03-00222. The connection at the vault is located a minimum of 9 feet below grade.

The Cell 2 penetration from 1"JV-85110-M2 attached to DPI-K3A (canyon differential pressure indicator) was evaluated and determined it isn't an intrusion path. The instrumentation is hard piped between the canyon and the Service Building with the Service Building end located a minimum of 12 inches above the floor.

Water intrusion via the canyon ventilation system can arise from either the inlet or discharge ducting. To eliminate these intrusion paths, the following activities were performed or verified as being completed: the canyon stack, 296-A-13, was capped under ECN-668801 and work package 2E-01-0627; the canyon discharge ducting was repaired and isolated under ECN-668803 and work package 2E-01-0649; the canyon inlet ducting, located on top of the canyon roof, was encapsulated and the flashing repaired under work package 2E-01-00609; and the canyon filter building, having been foamed over years ago, was verified to be complete and intact.

Water intrusion from the Vessel Ventilation system can arise from either the primary ventilation ducting or the accumulation of drain water into the seal pot that overflows into cell 3. To eliminate this intrusion path, the following activities were performed: The primary ventilation ducting was isolated under ECN-650611 and work package 2E-99-0679, the seal pot was isolated under ECN-662908 and work package 2E-00-01669, the Vessel Vent Filter Building was isolated under ECN-662911 and work package 2E-00-01669, and the stack drain line was isolated under ECN-668809 and work package 2E-01-0648.

#### **4.2.4 Inspection of Failed Equipment Storage Tubes**

To support intrusion prevention to the vault, a video inspection was done on each of the three failed equipment storage tubes. Access was obtained by core-boring a 2" diameter inspection holes in each tubes cover block. All three tubes were found to be empty of equipment and did not contain any liquid.

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 1 T-1	TK-001, Conn. A Jumper Installed	3"PAW-814 Waste Transfer	PUREX, 4028/G026 & 4002/T031 PUREX Deactivated	Yes	The PUREX facility has been deactivated; the line is isolated due to PUREX deactivation. 3" PAW-814 slopes downward toward 244-AR. [H-2-61971; H-2-62062; H-2-62077; H-2-79949, Sh 13]
Cell 1 T-1A	Hard piped to cell Open Pipe	3"PAW-809 & 3"PAW-814 Encasement Drain 2 <sup>nd</sup> ry Containment	Pipe Encasement Open/Line Inactive	No	Not considered an intrusion path because: transfer line is inactive, encasement is located approximately 16 feet below grade. [H-2-61973; H-2-62098, Sh 2; H-2-79949, Sh 13]
Cell 1 T-2	TK-001, Conn. B Hard Pipe Connection	4"CWD-8152 Cooling Water Discharge	Pipe is Capped Water Isolated	Yes	Raw water isolated by ECN 664735. Pipe is capped outside of facility. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3 & 13]
Cell 1 T-3	TK-001, Conn. D Hard Pipe Connection	4"CWD-8151 Cooling Water Discharge	Valve Box 1, PRV-001-1 Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3 & 13]
Cell 1 T-4	None Process Blank Installed	3"SP- 837/4"SP-837 Internal Spare, Not Used	Cell to Cell Connection Process Blank Installed	Yes	This is a spare line internal to 244-AR sharing Cell 2, nozzle T-1 and Cell 3, nozzles T-8 and T-13. Line is 3" in Cell 3 and 4" in Cells 1 & 2. No isolation action required. [H-2-62064]
Cell 1 T-5	None Open Nozzle	3"PAW-819 Internal Waste Transfer	Cell to Cell Connection (Other end terminates at Cell 3 T-14)	No	This is a transfer line internal to 244-AR sharing Cell 3, nozzle T-14. No isolation action required. [H-2-62064]
Cell 1 T-6	TK-001, Conn. E Hard Pipe Connection	6"VV-8161 Tank Ventilation	Internal Connection Cell 3, Nozzle T-2	No	This is the vessel ventilation line from TK-001 that connects to a common header that terminates at Cell 3, nozzle T-2. No isolation action required. [H-2-62055, H-2-79949, Sh 9&13]
Cell 1 T-8	TK-001, Conn. C Jumper Installed	3"PAW-V716 Waste Transfer	241-AR-151, Nozzle 9 Jumper Installed to 244-AR-151, Nozzle 10	Yes	Rigid jumper in 241-AR-151 connected between nozzles 9 and 10. This rigid jumper has two nozzle connection points that have process blanks installed. The process line slopes toward 244-AR vault [H-2-62055]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 1 T-9	TK-001, Conn. N Jumper Installed	3"DR-V717 Drain Line	241-AR-151 Floor Drain Drain is Closed	Yes	241-AR-151 floor drain closed and pit covered per work packages 2E-03-0834 and 2E-03-0222, respectively. ECN for pit cover is ECN-720547-R0. The drain slopes from 241-AR-151 to 244-AR-TK-001 [H-2-79949, Sh 13; H-2-93629]
Cell 1 T-11	None Open Nozzle	4"CWR Cooling Water Discharge	Valve Box 1, PRV-001-2 Raw water isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3 & 13]
Cell 1 T-16	Indeterminate Jumper or blank may be installed or open nozzle	3"PAW-809 Waste Transfer	221-B-Plant Cell 11/202 B-Plant Deactivated	Yes	This is a single line with shared nozzle T-16A in Cell 2. B-Plant has been deactivated; the line is isolated due to B-Plant deactivation. 3" PAW-809 slopes downward toward 244-AR. [H-2-44507, Sh 3; H-2-61970; H-2-62055; H-2-79949, Sh 12]
Cell 1 W-1	Indeterminate Jumper or blank may be installed or open nozzle	3"SP-8141 Inter cell Transfer	Internal Connection Hard Pipe to TK-002, Conn. G	No	This is a transfer line internal to 244-AR between TK-001 and TK-002. No isolation action required. [H-2-62055; H-2-62056]
Cell 1 G-1	Cell 1 Sump Jumper Installed	2"STM-8486 Steam to Sump 1 Jet	6"STM-844 Line Steam Isolated	Yes	Steam isolated by ECNs 668802 & 668812 [H-2-2525; H-2-34506; H-2-61963; H-2-61976; H-2-63940; H-2-63942; H-2-77154; H-2-79949, Sh 4]
Cell 1 G-2	Cell 1 Sump Jumper Installed	2", (1/2")WF-001 Instrument tubing for sump level detection	Service Building Hard pipe above floor	No	Connection is hard piped above the floor of Service Building. [H-2-62063; H-2-79949 Sh 13]
Cell 1 G-3	TK-001, Conn. S Hard Pipe Connection	2"RW-84910 Tank Spray Ring	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3, 12 & 13]
Cell 1 G-4	TK-001, Conn. BB Jumper Installed	XY-0011-7PT Electrical for P-001	Service Building Hard pipe above floor	No	Connection is hard piped above the floor of Service Building. [H-2-62013; H-2-62017; H-2-79949 Sh 12]
Cell 1 G-5	None (Spare) Blank Installed	2", 3-way Instrument Spare	Service Building Hard pipe above floor	No	Spare. Connection is hard piped above the floor of Service Building. Blank installed. [H-2-62055; H-2-62063; H-2-79949 Sh 13]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 1 G-6	TK-001, Conn. P Jumper Installed	XY-0012-7PT TK-001 Temperature Instrument	Service Building Hard pipe above floor	No	Connection is hard piped above floor of Service Building. [H-2-62063; H-2-79949 Sh 13]
Cell 1 G-7	None Open Nozzle	4"CWS-001 Cooling Water In	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949, Sh 3 & 13]
Cell 1 G-8	TK-001, Conn. M Jumper Installed	SPL-001 TK-001 Sampling	Sample Room Sample Pit Sealed	Yes	Sampling system is inactive and the sample pit and floor drains are sealed per 2E-03-0742. [H-2-79949, Sh 13]
Cell 1 G-9	TK-001, Conn. L Hard Pipe Connection	2"PA-8463 Purge Air	2707-AR Hard pipe above floor	No	Purge Air system is inoperable and hard piped above grade. [H-2-62063; H-2-62066; H-2-62068; H-2-79949, Sh 13]
Cell 1 G-10	TK-001, Conn. AA Jumper Installed	XY-0010-7PT Electrical for A-001	Service Building Hard pipe above floor	No	Connection is hard piped above the floor of Service Building. [H-2-62013; H-2-62017; H-2-79949 Sh 13]
Cell 1 G-11	TK-001, Conn. K Hard Pipe Connection	2"RW-8499 Tank Spray Ring	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949, Sh 3 & 13]
Cell 1 G-12	None (Spare) Blank Installed	N/A Electrical Spare	Service Building Hard pipe above floor	No	Connection is hard piped above the floor of Service Building. Blank installed. [H-2-62013; H-2-62017; H-2-79949 Sh 13]
Cell 1 G-13	TK-001, Conn. J Jumper to tank	YA-001 TK-001 Level & Specific Gravity Instrument	Service Building Hard pipe above floor	No	Connection is hard piped above floor of Service Building. [H-2-62063; H-2-79949 Sh 13]
Cell 1 G-14	TK-001, Conn. EE Jumper installed	2"STM-8486 Steam to jet J-001	6"STM-844 Line Steam Isolated	Yes	Steam isolated by ECNs 668802 & 668812. [H-2-2525; H-2-34506; H-2-61963; H-2-61976; H-2-63940; H-2-63942; H-2-77154; H-2-79949, Sh 4]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 1 G-15	TK-001, Conn. G Hard Pipe Connection	4"RW-8491 Cooling Water In	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949, Sh 3 & 13]
Cell 1 G-16	TK-001, Conn. H Hard Pipe Connection	4"RW-8492 Cooling Water In	715-AR Raw Water Isolated	Yes	4"RW-8492 blanked off in Service Building. Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949, Sh 3 & 13]
Cell 1 G-17	TK-001, Conn. F Hard Pipe Connection	1 ½"CA-8301 Chemical Addition	Service Building Terminates Above Floor	Yes	Connection is hard piped above the floor of Service Building and is disconnected.
Cell 1 GS-1	Cell 1 Wall Hard Piped to Cell	2"RW-84935 Cell Spray	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949, Sh 3]
Cell 2 T-1	None Process Blank Installed	3"SP- 837/4"SP-837 Internal Spare, Not Used	Cell to Cell Connection Process Blank Installed	Yes	This line is internal to 244-AR sharing Cell 1, nozzle T-4 and Cell 3, nozzles T-8 and T-13. Line is 3" in Cell 3 and 4" in Cells 1 & 2. No isolation action required. [H-2-62064]
Cell 2 T-2	None Process Blank Installed	6"PSW-803 Spare, Not Used	No Destination Unused Capped Spare	Yes	Blank installed at 244-AR. Pipe is stubbed out approximately 11 feet from exterior of 244-AR vault. Stubbed pipe has a welded cap installed. [H-2-62062; H-2-79949, Sh 11]
Cell 2 T-3	TK-002, Conn. B Hard Pipe Connection	4"CWD-8154 Cooling Water Discharge	Valve Box 2, PRV-002-2 Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3 & 11]
Cell 2 T-4	None Process Blank Installed	6"PSW-802 Waste Transfer	241-AY-152, Nozzle B Isolation Blank Installed	Yes	Process blank installed at Cell 2, nozzle T-4. AY-152 is weather sealed and isolated. Nozzle B where 6"PSW-802 terminates is isolated. Line 6"PSW-802 slopes downward toward 244-AR vault. [H-2-61978; H-2-62062; H-2-79949, Sh 11]
Cell 2 T-5	TK-002, Conn. C Hard Pipe Connection	4"CWR-8153 Cooling Water Discharge	Valve Box 2, PRV-002-1 Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3 & 11]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 2 T-6	None Process Blank Installed	6"PSW-801 Waste Transfer	241-A-153, Nozzle.A Process Blank Installed	Yes	Process blank installed at Cell 2, nozzle T-6. 241-A-153 is weather sealed and isolated. Nozzle A where 6"PSW-801 terminates is isolated. Line 6"PSW-801 slopes downward toward 244-AR vault. [H-2-61978; H-2-62062; H-2-79949, Sh 11]
Cell 2 T-7	TK-002, Conn. D Hard Pipe Connection	6"VV-8162 Tank Ventilation	Internal Connection Cell 3, Nozzle T-2	No	This is the vessel ventilation line from TK-002 that connects to a common header that terminates at Cell 3, nozzle T-2. No isolation action required. [H-2-62055, H-2-79949, Sh 9&11]
Cell 2 T-8	None Process Blank Installed	6"PSW-804 Spare, Not Used	No Destination Unused Capped Spare	Yes	Blank installed at 244-AR. Pipe is stubbed out approximately 11 feet from exterior of 244-AR vault. Stubbed pipe has a welded cap installed. [H-2-62062; H-2-79949, Sh 11]
Cell 2 T-8A	None Process Blank Installed	3"PAW-4007 Waste Transfer	241-AX-151, F Cell Diverter Tank Weather Sealed Isolated	Yes	Blank installed at 244-AR. Vapor gap at 241-AX-151, F Cell diverter tank. Line 3"PAW-4007 slopes downward toward 244-AR vault. [H-2-36647; H-2-47791; H-2-79949, Sh 11].
Cell 2 T-9	None Process Blank Installed	3"PSN-812 (V108) Waste Transfer	241-C-151, Nozzle U-1 Weather Sealed, Isolated, Process Blank on U-1	Yes	Both ends of the transfer line are isolated. Line 3"PSN-812 is referred to as V108 at 241-C-151. The line slopes downward toward 241-C-151. [H-2-61967; H-2-62062; H-2-79949, Sh 11]
Cell 2 T-10	None Process Blank Installed	6"PSW-807 Spare, Not Used	No Destination Unused Capped Spare	Yes	Blank installed at 244-AR. Pipe is stubbed out approximately 11 feet from exterior of 244-AR vault. Stubbed pipe has a welded cap installed. [H-2-62062; H-2-79949, Sh 11]
Cell 2 T-11	None Process Blank Installed	6"PSW-806 Waste Transfer	241-AY-152, Nozzle A Process Blank Installed	Yes	Process blank installed at Cell 2, nozzle T-11. AY-152 is weather sealed and isolated. Nozzle A where 6"PSW-806 terminates is isolated. Line 6"PSW-806 slopes downward toward 244-AR vault. [H-2-61978; H-2-62062; H-2-79949, Sh 11]
Cell 2 T-12	TK-002, Conn. E Hard Pipe Connection	3"CSW-813 Internal Waste Transfer	Cell to Cell Connection (Other end terminates at Cell 3 T-4)	No	This is a transfer line internal to 244-AR sharing Cell 3, nozzle T-4. No isolation action required. [H-2-62062; H-2-62064; H-2-79949, Sh 9 & 11]]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 2 T-13	None Process Blank Installed	6"PSW-805 Waste Transfer	241-A-153, Nozzle.B Isolation Blank Installed	Yes	Process blank installed at Cell 2, nozzle T-13. 241-A-153 is weather sealed and isolated. Nozzle B where 6"PSW-805 terminates is isolated. Line 6"PSW-805 slopes downward toward 244-AR vault. [H-2-61978; H-2-62062; H-2-79949, Sh 11]
Cell 2 T-14	None Process Blank Installed	6"PSW-808 Spare, Not Used	No Destination Unused Capped Spare	Yes	Blank installed at 244-AR. Pipe is stubbed out approximately 11 feet from exterior of 244-AR vault. Stubbed pipe has a welded cap installed. [H-2-62062; H-2-79949, Sh 11]
Cell 2 T-15	None Process Blank Installed	2"PSW-811 Internal Waste Transfer	Cell to Cell Connection (Other End Terminates at Cell 3 T-5)	No	This is a transfer line connecting TK-002 and TK-004. No isolation action required. [H-2-62062; H-2-62064; H-2-79949, Sh 9 & 11]
Cell 2 T-16A	None Process Blank Installed	3"PAW-809 Waste Transfer	221-B-Plant Cell 11/202 B-Plant Deactivated	Yes	This is a single line with shared nozzle T-16A in Cell 2. B-Plant has been deactivated; the line is isolated due to B-Plant deactivation. 3" PAW-809 slopes downward toward 244-AR. [H-2-44507, Sh 3; H-2-61970; H-2-62055; H-2-79949, Sh 12]
Cell 2 G-1	TK-002, Conn. V Hard Pipe Connection	2"RW-84913 Tank Spray Ring	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3, 11 & 12]
Cell 2 G-2	TK-002, Conn. GG Jumper Installed	XY-0023-13PT Electrical P-002-1	Service Building Hard pipe above floor	No	Connection is hard piped above the floor of Service Building. [H-2-62013; H-2-62017; H-2-79949 Sh 11]
Cell 2 G-3	None (Spare) Blank Installed	2", 3-way Instrument Spare	Service Building Hard pipe above floor	No	Spare. Connection is hard piped above the floor of Service Building. Blank installed. [H-2-62055; H-2-62063; H-2-79949 Sh 11]
Cell 2 G-4	TK-002, Conn. EE Jumper installed	2"STM-8488 Steam to jet J-002	6"STM-844 Line Steam Isolated	Yes	Steam isolated by ECNs 668802 & 668812. [H-2-2525; H-2-34506; H-2-61963; H-2-61976; H-2-63940; H-2-63942; H-2-77154; H-2-79949, Sh 4]
Cell 2 G-5	None (Spare) Open Nozzle	3"SP-002 Piping Spare	Service Building Piping Spare Isolated	No	Blank installed on globe valve in Service Building [H-2-79949 Sh 12]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 2 G-6	TK-002, Conn. S Jumper Installed	SPL-002 TK-002 Sampling	Sample Room Sample Pit Sealed	Yes	Sampling system is inactive and the sample pit and floor drains are sealed per 2E-03-0742. [H-2-79949, Sh 11 & 12]
Cell 2 G-7	TK-002, Conn. R Hard Pipe Connection	2"PA-8464 Purge Air	2707-AR Hard pipe above floor	No	Purge Air system is inoperable and hard piped above grade. [H-2-62063; H-2-62066; H-2-62068; H-2-79949, Sh 11 & 12]
Cell 2 G-8	TK-002, Conn. AA Jumper Installed	XY-0024-7PT Electrical for A-002	Service Building Hard pipe above floor	No	Connection is hard piped above the floor of Service Building. [H-2-62013; H-2-62017; H-2-79949 Sh 11]
Cell 2 G-9	TK-002, Conn. Q Hard Pipe Connection	2"RW-84911 Tank Spray Ring	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3 & 11]
Cell 2 G-10	None (Spare) Blank Installed	N/A Electrical Spare	Service Building Hard pipe above floor	No	Connection is hard piped above the floor of Service Building. Blank installed. [H-2-62013; H-2-62017; H-2-79949 Sh 11]
Cell 2 G-11	TK-002, Conn. P Jumper to tank	YA-002 TK-002 Level & Specific Gravity Instrument	Service Building Hard pipe above floor	No	Connection is hard piped above floor of Service Building. [H-2-62063; H-2-79949 Sh 11]
Cell 2 G-11A	Hard piped to cell Open Vent Pipe	1"JV-851 Jet Vent	6"STM-844 Line Steam Isolated	No	Jetting system is inoperable and hard piped above grade. Steam isolated by ECNs 668802 & 668812. [H-2-2525; H-2-34506; H-2-61963; H-2-61976; H-2-63940; H-2-63942; H-2-77154; H-2-79949, Sh 4]
Cell 2 G-12	TK-002, Conn. N Jumper Installed	XY-0021-7PT TK-002 Temperature Instrument	Service Building Hard pipe above floor	No	Connection is hard piped above floor of Service Building. [H-2-62063; H-2-79949 Sh 11 & 12]
Cell 2 G-13	TK-002, Conn. M Hard Pipe Connection	3"RW-8494 Water & Chemical Addition	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3 & 11]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 2 G-14	TK-002, Conn. L Hard Pipe Connection	2"RW-84912 Tank Spray Ring	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3 & 11]
Cell 2 G-15	TK-002, Conn. K Hard Pipe Connection	4"CWS-8482 Cooling water supply	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949, Sh 3, 11 & 12]
Cell 2 G-16	TK-002, Conn. BB Jumper Installed	XY-0022-7PT Electrical P-002-2	Service Building Hard pipe above floor	No	Connection is hard piped above the floor of Service Building. [H-2-62013; H-2-62017; H-2-79949 Sh 11 & 12]
Cell 2 G-17	TK-002, Conn. J Hard Pipe Connection	4"CWS-8483 Cooling water supply	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949, Sh 3, 11 & 12]
Cell 2 G-18	None (Spare) Open Nozzle	N/A Electrical Spare	Service Building Hard pipe above floor	No	Connection is hard piped above the floor of Service Building. [H-2-62013; H-2-62017; H-2-79949 Sh 12]
Cell 2 G-19	None (Spare) Blank Installed	2", 3-way Instrument Spare	Service Building Hard pipe above floor	No	Spare. Connection is hard piped above the floor of Service Building. Blank installed. [H-2-62055; H-2-62063; H-2-79949 Sh 12]
Cell 2 G-20	Cell 2 Sump Jumper Installed	2"STM-84813 Steam to Sump 2 Jet	6"STM-844 Line Steam Isolated	Yes	Steam isolated by ECNs 668802 & 668812. [H-2-2525; H-2-34506; H-2-61963; H-2-61976; H-2-63940; H-2-63942; H-2-77154; H-2-79949, Sh 4]
Cell 2 G-21	Cell 2 Sump Jumper Installed	2", (1/2")WF-002 Instrument tubing for sump level detection	Service Building Hard pipe above floor	No	Connection is hard piped above the floor of Service Building. [H-2-62063; H-2-79949 Sh 12]
Cell 2 GS-2	Cell 2 Wall Hard piped to cell	2"RW-84936 Cell Spray	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949, Sh 3]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 3 T-1	Cell 3, Nozzle T-2 Jumper Installed	6"VV-8166 Tank Ventilation	Vessel Vent System Isolated with Exception of valve IV-K4-1	Yes	This is the vessel ventilation line to the vessel ventilation that passes through the vessel vent filter vault, fan and stack. The vessel vent filter vault is weather sealed via ECN-662911. The vessel vent fan and stack are isolated via ECN-650611. Valve IV-K4-1 is an above grade valve used as connection point to temporary ventilation system for interim stabilization. Terminates above grade so no isolation required. [H-2-62098, Sh 3; H-2-63939; H-2-63940; H-2-63942, H-2-79949, Sh 9]
Cell 3 T-1A	None Open to Cell	¼"-M9 HI Pressure Sensing Leg for Vent System	Differential Pressure Gage Hard pipe above grade	No	Connection is hard piped above grade outside the canyon wall to a differential pressure gage 5 feet above grade. [H-2-36499; H-2-62062; H-2-79949, Sh 9]
Cell 3 T-1B	None Open to Cell	1 ½"-M9 (Seal) Out of Service Seal Loop Drain	Seal Pot 1 ½" Line is Capped	No	Pipe is capped outside facility below grade. [H-2-36499; H-2-62062; H-2-79949, Sh 9]
Cell 3 T-2	Cell 3, Nozzle T-1 Jumper Installed	8"VV-816 Tank Ventilation	Cell to Cell Connection Hard piped to tanks TK-001 through -004	No	This is the vessel ventilation line from tanks TK-001 through -004 that connects to a common header that terminates at Cell 3, nozzle T-2. No isolation action required. [H-2-62055, H-2-79949, Sh 9&11]
Cell 3 T-3	Not Connected Process Blank Installed	2"CWD-8159 Cooling water discharge	Valve Box 3 Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949, Sh 3]
Cell 3 T-4	TK-004, Conn. CC Jumper Installed	3"CSW-813 Internal Waste Transfer	Cell to Cell Connection (Other end terminates at Cell 2 T-12)	No	This is a transfer line internal to 244-AR sharing Cell 3, nozzle T-4. No isolation action required. [H-2-62062; H-2-62064; H-2-79949, Sh 9 & 11]
Cell 3 T-5	TK-004, Conn. C Hard Pipe Connection	2"PSW-811 Internal Waste Transfer	Cell to Cell Connection (Other End Terminates at Cell 2 T-15)	No	This is a transfer line connecting TK-002 and TK-004. No isolation action required. [H-2-62062; H-2-62064; H-2-79949, Sh 9 & 11]]
Cell 3 T-6	TK-004, Conn. D Hard Pipe Connection	3"CWR-8156 Cooling water discharge	Valve Box 3, PRV-004-1 Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3, 9 & 10]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 3 T-7	TK-004, Conn. E Hard Pipe Connection	4"VV-8164 Tank Ventilation	Internal Connection Cell 3, Nozzle T-2	No	This is the vessel ventilation line from TK-004 that connects to a common header that terminates at Cell 3, nozzle T-2. No isolation action required. [H-2-62058, H-2-79949, Sh 9]
Cell 3 T-8	None Process Blank Installed	3"SP- 837/4"SP-837 Internal Spare, Not Used	Cell to Cell Connection Process Blank Installed	Yes	This line is internal to 244-AR sharing Cell 2, nozzle T-1 and Cell 3, nozzles T-8 and T-13. Line is 3" in Cell 3 and 4" in Cells 1 & 2. No isolation action required. [H-2-62064]
Cell 3 T-9	None Open to Cell	4"DR Cooling Water Diversion on High Radiation	New Valve Box Water Isolated	Yes	Raw water isolated by ECN 664735. Control station that switches MOV to drain position is deenergized. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3, 4, 9 & 10]
Cell 3 T-9A	Cell 3, Nozzle T-10 Jumper Installed	3"NHW-818- 4006/4018 Waste Transfer	241-AX-152 Connection Isolated Via Air Gap	Yes	Vapor gap at 241-AX-152 diverter tank. Line 3"NHW-818-4006/4018 slopes downward toward 241-AX-152. [H-2-36647; H-2-44683; H-2-62058; H-2-79949, Sh 9].
Cell 3 T-10	Cell 3, Nozzle T-9A Jumper Installed	3"NHW-818 (8653)(V834) Waste Transfer	221-B-Plant Cell 25/206 B-Plant Deactivated	Yes	B-Plant has been deactivated; the line is isolated due to B-Plant deactivation. 3" NHW-818(8653)(V834) slopes downward toward 244-AR. [H-2-44507, Sh 3; H-2-61970; H-2-79949, Sh 10]
Cell 3 T-10A	Hard piped to cell Open Pipe	3"NHW-818 Encasement Drain 2 <sup>nd</sup> ry Containment	Pipe Encasement Open/Line Inactive	No	Not considered an intrusion path because: transfer line is inactive, encasement is located approximately 16 feet below grade. [H-2-61973, Sh 4; H-2-62062; H-2-62098, Sh 2]
Cell 3 T-11	TK-003, Conn. D Hard Pipe Connection	3"CWR-8155 Cooling Water	Valve Box 3, PRV-003-1 Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3 & 10]
Cell 3 T-12	TK-003, Conn. E Hard Pipe Connection	4"VV-8163 Tank Ventilation	Internal Connection Cell 3, Nozzle T-2	No	This is the vessel ventilation line from TK-003 that connects to a common header that terminates at Cell 3, nozzle T-2. No isolation action required. [H-2-62058, H-2-79949, Sh 9&10]
Cell 3 T-13	None Process Blank Installed	3"SP- 837/4"SP-837 Internal Spare, Not Used	Cell to Cell Connection	Yes	This line is internal to 244-AR sharing Cell 1, nozzle T-4, Cell 2, nozzle T-1 and Cell 3, nozzle T-8. Line is 3" in Cell 3 and 4" in Cells 1 & 2. No isolation action required. [H-2-62064]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 3 T-14	TK-003, Conn. F Open Nozzle	3"PAW-819 Internal Waste Transfer	Cell to Cell Connection (Other end terminates at Cell 1 T-5)	No	This is a transfer line internal to 244-AR sharing Cell 1, nozzle T-5. No isolation action required. [H-2-62064]
Cell 3 T-15	None Process Blank Installed	3"NHW-817 4019 (V718) Waste Transfer	241-AR-151, Nozzle 10 Jumper Installed to 244-AR-151, Nozzle 9	Yes	Rigid jumper in 241-AR-151 connected between nozzles 9 and 10. This rigid jumper has two nozzle connection points that have process blanks installed. Line 3"NHW-817 slopes downward toward 244-AR vault. [H-2-79949, Sh 10; H-2-90358; H-2-93629; H-2-93631]
Cell 3 T-15A	Hard piped to cell Open Pipe	3"NHW-817 Encasement Drain 2 <sup>nd</sup> Containment	Pipe Encasement Open/Line Inactive	No	Not considered an intrusion path because: transfer line is inactive, encasement is located approximately 13 feet below grade. Encasement slopes toward 244-AR vault [H-2-61971; H-2-61973; H-2-62098, Sh 2]
Cell 3 G-1	None (Spare) Blank Installed	2", 3-way Instrument Spare	Service Building Hard pipe above floor	No	Part of original vessel ventilation system that was removed. Spare. Connection is hard piped above the floor of Service Building. Blank installed. [H-2-62055; H-2-62063; H-2-79949 Sh 9]
Cell 3 G-2	None (Spare) Open Nozzle	N/A Electrical Spare	Service Building Hard pipe above floor	No	Part of original vessel ventilation system that was removed. Spare. Connection is hard piped above the floor of Service Building. [H-2-62013; H-2-62017; H-2-79949 Sh 9]
Cell 3 G-3	Vessel Vent Heater Open Nozzle	2"STM-84815 Steam to Vessel Vent Heater	6"STM-844 Line Steam Isolated	No	Steam isolated by ECNs 668802 & 668812. Heater was part of original vessel ventilation system that was removed. [H-2-2525; H-2-34506; H-2-61963; H-2-61976; H-2-63940; H-2-63942; H-2-77154; H-2-79949, Sh 4]
Cell 3 G-4	TK-004, Conn. T Jumper to tank	YA-004 TK-004 Level & Specific Gravity Instrument	Service Building Hard pipe above floor	No	Connection is hard piped above floor of Service Building. [H-2-62063; H-2-79949 Sh 9]
Cell 3 G-5	TK-004, Conn. BB Jumper Installed	2"STM-84811 Steam to Jet J-004-1	6"STM-844 Line Steam Isolated	Yes	Steam isolated by ECNs 668802 & 668812. [H-2-2525; H-2-34506; H-2-61963; H-2-61976; H-2-63940; H-2-63942; H-2-77154; H-2-79949, Sh 4]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 3 G-6	TK-004, Conn. R Jumper Installed	XY-0041-6PT TK-004 Temperature Instrument	Service Building Hard pipe above floor	No	Connection is hard piped above floor of Service Building. [H-2-62063; H-2-79949 Sh 13]
Cell 3 G-7	TK-004, Conn. Q Hard Pipe Connection	1 ½" CA-8304 Chemical Addition	Service Building Terminates Above Floor	Yes	Connection is hard piped above the floor of Service Building and is disconnected.
Cell 3 G-8	None (Spare) Open Nozzle	3"SP-004 Piping Spare	Service Building Piping Spare Isolated	No	Blank installed on globe valve in Service Building [H-2-79949 Sh 10]
Cell 3 G-9	TK-004, Conn. P Hard Pipe Connection	2"RW-84925 Tank Spray	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949 Sh 3 & 9]
Cell 3 G-10	None (Spare) Open Nozzle	N/A Electrical Spare	Service Building Hard pipe above floor	No	Spare. Connection is hard piped above the floor of Service Building. [H-2-62013; H-2-62017; H-2-79949 Sh 9]
Cell 3 G-10A	TK-004, Conn. U Hard Pipe Connection to Nozzle U, Jumper from Conn. U to DD	1"OIL-823 Lube oil to agitator	Service Building Oil Line Isolated	No	Blank installed on gate valve in Service Building [H-2-62066; H-2-79949 Sh 9]
Cell 3 G-11	TK-004, Conn. N Hard Pipe Connection	1"PA-8466 Purge Air	2707-AR Hard pipe above floor	No	Purge Air system is inoperable and hard piped above grade. [H-2-62063; H-2-62066; H-2-62068; H-2-79949, Sh 13]
Cell 3 G-12	None (Spare) Blank Installed	2", 3-way Instrument Spare	Service Building Hard pipe above floor	No	Spare. Connection is hard piped above the floor of Service Building. Blank installed. [H-2-62055; H-2-62063; H-2-79949 Sh 9]
Cell 3 G-13	TK-004, Conn. M Hard Pipe Connection	3"CWS-8496 Cooling water supply	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949, Sh 3 & 9]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 3 G-14	TK-004, Conn. AA Jumper Installed	XY-0040-6PT Electrical for A-004	Service Building Hard pipe above floor	No	Connection is hard piped above the floor of Service Building. [H-2-62013; H-2-62017; H-2-79949 Sh 9]
Cell 3 G-15	TK-004, Conn. K Jumper Installed	SPL-004 TK-004 Sampling	Sample Room Sample Pit Sealed	Yes	Sampling system is inactive and the sample pit and floor drains are sealed per 2E-03-0742. [H-2-79949, Sh 9]
Cell 3 G-16	TK-004, Conn. CC Jumper Installed	2"STM-84812 Steam to Jet J-004-2	6"STM-844 Line Steam Isolated	Yes	Steam isolated by ECNs 668802 & 668812. [H-2-2525; H-2-34506; H-2-61963; H-2-61976; H-2-63940; H-2-63942; H-2-77154; H-2-79949, Sh 4; H-2-79949, Sh 9]
Cell 3 G-17	Cell 3 Sump Jumper Installed	2", (1/2")WF-003 Instrument tubing for sump level detection	Service Building Hard pipe above floor	No	Connection is hard piped above the floor of Service Building. [H-2-62063; H-2-79949 Sh 10]
Cell 3 G-18	Cell 3 Sump Jumper Installed	2"STM-84814 Steam to Jet J-003-3	6"STM-844 Line Steam Isolated	Yes	Steam isolated by ECNs 668802 & 668812. [H-2-2525; H-2-34506; H-2-61963; H-2-61976; H-2-63940; H-2-63942; H-2-77154; H-2-79949, Sh 4; H-2-79949, Sh 10]
Cell 3 G-19	TK-003, Conn. CC Jumper Installed	2"STM-84810 Steam to Jet J-003-2	6"STM-844 Line Steam Isolated	Yes	Steam isolated by ECNs 668802 & 668812. [H-2-2525; H-2-34506; H-2-61963; H-2-61976; H-2-63940; H-2-63942; H-2-77154; H-2-79949, Sh 4; H-2-79949, Sh 10]
Cell 3 G-20	TK-003, Conn. R Jumper Installed	XY-0031-6PT TK-003 Temperature Instrument	Service Building Hard pipe above floor	No	Connection is hard piped above floor of Service Building. [H-2-62063; H-2-79949 Sh 13]
Cell 3 G-21	TK-003, Conn. Q Hard Pipe Connection	1 1/2"CA-8303 Chemical Addition	Service Building Terminates Above Floor	Yes	Connection is hard piped above the floor of Service Building and is disconnected.
Cell 3 G-22	None (Spare) Open Nozzle	3"SP-003 Piping Spare	Service Building Piping Spare Isolated	No	Blank installed on globe valve in Service Building [H-2-79949 Sh 10]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 3 G-23	TK-003, Conn. P Hard Pipe Connection	2"RW-84926 Tank spray	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H- 2-77158; H-2-79949 Sh 3 & 10]
Cell 3 G-24	None (Spare) Blank Installed	N/A Electrical Spare	Service Building Hard pipe above floor	No	Spare. Connection is hard piped above the floor of Service Building. Blank installed. [H-2-62013; H- 2-62017; H-2-79949 Sh 10]
Cell 3 G-24A	TK-003, Conn. U Hard Pipe Connection to Nozzle U, Jumper from Conn. U to DD	1"OIL-822 Lube oil to agitator	Service Building Oil Line Isolated	No	Blank installed on gate valve in Service Building [H-2-62066; H-2-79949 Sh 10]
Cell 3 G-25	TK-003, Conn. N Hard Pipe Connection	1"PA-8465 Purge Air	2707-AR Hard pipe above floor	No	Purge Air system is inoperable and hard piped above grade. [H-2-62063; H-2-62066; H-2-62068; H-2-79949, Sh 13]
Cell 3 G-26	None (Spare) Open Nozzle	2", 3-way Instrument Spare	Service Building Hard pipe above floor	No	Spare. Connection is hard piped above the floor of Service Building. [H-2-62055; H-2-62063; H-2- 79949 Sh 9]
Cell 3 G-27	TK-003, Conn. M Hard Pipe Connection	3"CWS-8495 Cooling water supply	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H- 2-77158; H-2-79949, Sh 3 & 10]
Cell 3 G-28	TK-003, Conn. AA Jumper Installed	XY-0030-6PT Electrical for A-003	Service Building Hard pipe above floor	No	Connection is hard piped above the floor of Service Building. [H-2-62013; H-2-62017; H-2-79949 Sh 10]
Cell 3 G-29	TK-003, Conn. K Jumper Installed	SPL-003 TK-003 Sampling	Sample Room Sample Pit Sealed	Yes	Sampling system is inactive and the sample pit and floor drains are sealed per 2E-03-0742. [H-2-79949, Sh 10]
Cell 3 G-30	TK-003, Conn. J Jumper to tank	YA-003 TK-003 Level & Specific Gravity Instrument	Service Building Hard pipe above floor	No	Connection is hard piped above floor of Service Building. [H-2-62063; H-2-79949 Sh 10]

Table 4-1. Matrix of Isolation/Intrusion Prevention for 244-AR Vault Nozzle Penetrations

244-AR Penetration Cell Wall Nozzle	244-AR Connection Connection Point Configuration/Status	External Line Line Number Line Use	External Connection Destination Configuration/Status	Intrusion Path	Isolation/Intrusion Prevention Status & Remarks [Reference Drawings]
Cell 3 G-31	None Open Nozzle	2"STM-8489 Steam to Jet J-003-1	6"STM-844 Line Steam Isolated	Yes	Steam isolated by ECNs 668802 & 668812. [H-2-2525; H-2-34506; H-2-61963; H-2-61976; H-2-63940; H-2-63942; H-2-77154; H-2-79949, Sh 4]
Cell 3 GS-3	Cell 3 Wall Hard piped to cell	2"RW-84937 Cell 3 Spray	715-AR Raw Water Isolated	Yes	Raw water isolated by ECN 664735. [H-2-34506; H-2-61963; H-2-61975; H-2-61976; H-2-77156; H-2-77158; H-2-79949, Sh 3]

Table 4-2. Matrix of Intrusion Prevention for 241-AR-151 Diversion Box

Wall Nozzle	Connected To Structure/Cell Wall Nozzle Elevation	Line No. or Purpose	Intrusion Prevention Action
1	241-AX-155 NOZZLE 10	3"NHW-V714	Blank installed on nozzle 1 in 241-AR-151
2	PUREX	3"NHW-V714	PUREX, 202A, F-16 Isolation Blank
3	V714 Enclosure	2"V714 Enclosure Drain, PUREX Line	Blank installed on nozzle 3 in 241-AR-151
4	241-AY-02D U-5	3"NHW-V720	Isolation Blank installed at nozzle U-5 in 241-AY-02D
5	Blanked	Spare	Capped on outside and blank installed
6	Blanked	Spare	Capped on outside and blank installed
7	Blanked	Spare	Capped on outside and blank installed
8	Blanked	Spare	Capped on outside and blank installed
9	244-AR CELL 1 T-8	3"PAW-V716	Blank installed on connections of rigid jumper between nozzles 9 and 10 in 241-AR-151
10	244-AR CELL 3 T-15	3"NHW-V718/817	Blank installed on connections of rigid jumper between nozzles 9 and 10 in 241-AR-151
Floor Drain	244-AR Cell 1 T-9	3"DR-V717	Floor drain closed per 2E-03-00834. Pit covered per 2E-03-0222

Table 4-3. Miscellaneous 244-AR Vault Intrusion Paths

Intrusion Path	Isolation Status
Northwest canyon core drill for installation of the supply air skid ventilation duct, raw water, and control cable insert.	Insert is grouted in place. Penetration is located approximately 1.5 feet above grade level. All pipes are sealed with installed components. ECN-710763 and W/P 2E-01-0735
Northeast canyon core drill for installation of the Hose-in-Hose, heat trace, compressed air, and electrical power insert.	Insert is grouted in place. Penetration is located approximately 1.5 feet above grade level. All pipes are sealed with installed components. ECN-710763 and W/P 2E-01-0735
Below grade cell ventilation duct connection to canyon filter vault.	Penetration is located approximately 13 feet below grade. The filter vault is weather sealed (foamed). The primary canyon stack and ventilation ducting is isolated from the filter vault. See section 4.2.3 for ECN and work package numbers.
Periscope Sleeve	Sleeve is grouted in place. Penetration is located approximately 5 feet above grade level. Periscope enters the crane control room, which has a non-leaking roof.
Failed Equipment Storage Tube Vents and Drains (3)	The FESTs were inspected and no liquid was observed. Work package 2E-01-00787
Sample room vent ducting or roof leak. Intrusion path is via either the abandoned sink drain line, floor drain, or sample pit drain lines.	Roof was inspected and cracks or leak paths were present. The exterior vent ducting is encapsulated with foam. The sample room floor drain and pit drains are isolated with foam. The sink drain line has an inverted connection and is located above the floor. Work package 2E-03-0742
Canyon roof vent penetration.	The penetration flashing was sealed and the vent ducting is encapsulated with foam.
244-AR Shield Door	Door is located inside the Wind Reduction Facility and is located above the floor level. Door is normally closed. A major water leak that occurred in 1996 (flooded the floor in front of the door) did not result in any water entering the canyon from this potential intrusion point.
244-AR Crane Platform Access Door	Door is normally closed and is located a minimum of 15 feet above grade level.
244-AR NW Air Lock Door	Door is normally closed. A major water leak that occurred in 1996 (flooded the north side of the building up to the door) did not result

Table 4-3. Miscellaneous 244-AR Vault Intrusion Paths

Intrusion Path	Isolation Status
	in any water entering the canyon from this potential intrusion point.
244-AR SE Air Lock Door	Door is normally closed. A major water leak that occurred in 1996 (flooded the below grade pit where the door is located) did not result in any water entering the canyon from this potential intrusion point.
Canyon Vacuum Breaker line	Line is hard piped and the canyon penetration is located a minimum of 10 feet above the Service Building Floor level.
Cell 3 Seal Pot Overflow Connection	Seal Pot isolated by ECN 662908
Miscellaneous Conduits	Miscellaneous conduit penetrations for vault lighting, camera cables, electrical power etc. are located above grade and are not a viable intrusion path.

## **5.0 PROVISIONS FOR FUTURE REMOVAL OF PUMPABLE LIQUIDS**

One of the six requirements of Interim Milestone M-45-11 is to provide for the removal of pumpable liquids that may accumulate in the future. In order to meet this requirement the action was taken is to leave the pumping system in place and connected with exception of the temporary equipment (e.g., air supply, water supply, portable ventilation, air compressor, power generator). Because significant effort would be required to restart the system (e.g., permitting, safety basis, equipment preparation, testing, training, readiness assessment), the time period for the removal of a future accumulation of pumpable liquid would be several months. The deliverable associated with this requirement is issuance and approval of procedure and specification for reconnection and preparation for operation of the system. This section has been prepared as the deliverable for identifying the procedure and specification for reconnection and preparation for operation of the system. A description of the lay-up of the transfer system and ventilation system is provided in section 7 of this document.

### **5.1 WASTE CONSOLIDATION AND TRANSFER SYSTEM**

The waste consolidation and transfer system (see section 2.1 for a description) is primarily installed within the 244-AR facility. The transfer line that is external to 244-AR vault and the human-machine interface computer control/monitoring station are the only portions of the system external to the facility. A description of the lay-up activities performed for the interior and external portions of the waste consolidation and transfer system is provided in section 7. The procedure and specifications for reconnection of the waste consolidation and transfer system is provided below.

#### **5.1.1 Interior System**

The consolidation manifold and pumping system (see Section 2.1.1 for a description) will be left intact with the exception of air and water connections. Prior to operation, a water source and air source will need to be connected to the system. The previous water source used during waste consolidation and transfer activities was a water tanker truck limited to 2,000 gallons of water. The quantity of water was limited to reduce the quantity of water that could inadvertently be added through the system into any of the tanks or sumps connected to the consolidation manifold and pumping system. The previous air source used to provide air to the air-operated double diaphragm pumps was a Sullair Corporation's Model 185H portable air compressor capable of delivering 185 cubic feet per minute of air at 150 psig.

Prior to operating the air-operated double diaphragm pumps, it will be necessary to re-torque bolts on the pumps per manufacturer's recommendation. During pumping, especially with both air-operated double diaphragm pumps operating, excessive impacting/vibration would result in fasteners loosening on equipment on the pumping skid. If long term use of the pump skid is foreseen, shock mounting the air-operated double diaphragm pumps should be considered. Torque values are documented in the manufacturer's literature that is maintained in vendor information file 50224. In addition to bolts on the pumps, bolts and fasteners on the pump skid equipment and support brackets should be inspected and tightened if necessary. Prior to

consolidation pumping during interim stabilization, the bolts on the pumps were re-torqued and bolts and fasteners on the remaining equipment on the pump skid were tightened. This work was performed under work package 2E-03-00768 and this work package would serve as a guide for preparation of a new work package to re-torque the pump bolts and tighten the other bolts and fasteners on the pump skid.

Depending on the amount of time that has passed, a number of the following activities may also need to be performed. It may be required to inspect the hoses for any signs of wear, abnormal conditions or evidence of separation of the hose from the end fittings. Because of the limited use of the hoses, it is not expected that the hoses will show any signs of wear or damage. After re-torquing the pump bolts, tightening the bolts and fasteners on the pump skid equipment, and inspecting the hoses (if performed), a low-pressure (less than 15 psig) leak test of the pumping system is recommended. A low-pressure leak test of the system was previously performed prior to operation of the system, under the operational test procedure of the transfer system. Section 5.3 of OTP-280-001, *Operational Test for the 244-AR Waste Transfer System*, contains the instructions for performing the low pressure leak test. At the time that the low-pressure leak test of the system is performed, the level switches and level transmitter associated with tank AR244-WT-TK-200 should also be tested to confirm that they are still working properly. A functional check of the four level switches AR244-WT-LSL-203, AR244-WT-LSH-203, AR244-WT-LSLL-207, and AR244-WT-LSHH-207 and the level transmitter AR244-WT-LT-208 was previously performed prior to operation of the system, under the operational test procedure of the transfer system. Section 5.3 of OTP-280-001, *Operational Test for the 244-AR Waste Transfer System*, contains the instructions for performing the check of the four level switches and the level transmitter.

Prior to any future pumping, it should be confirmed that the drop legs with eductors for the tanks and/or sumps requiring pumping are lowered to come in contact with the tank/cell floor bottom to remove the pumpable liquid. Though most of the pumping was performed with the drop legs slightly above the tank/cell floor bottom, the pump legs did work properly with the suction legs in contact with the floor. Actual placement of the drop legs will depend on the conditions present if removal of future liquid intrusion is required.

The computer and monitors of the human-machine interface will need to be powered up in the 244-AR lunch room/control room.

Instrumentation calibrations and equipment checks may be required prior to operation of the system. Any equipment or instrument beyond its calibration expiration date will require recalibration. The instrumentation and equipment associated directly with the transfer system requiring periodic calibrations and/or checks are:

- AR244-WT-PIT-209, pump discharge pressure indicating transmitter (see PM/S data sheet ET-07868),
- AR244-SA-PIT-303, pump supply air pressure indicating transmitter (see PM/S data sheet ET-07867),

- AR244-SA-PRV-301, pump supply air pressure relief valve (see PM/S data sheet ET-07873),
- AR244-WT-PNL-200, safety significant valve indication light panel and lights (see PM/S data sheet ET-08014)
- AR244-WT-LDE-503, pump skid leak detector element (see PM/S data sheet ET-08003).

In addition to the instruments listed above, the weight factor indicating transmitter for the tank or cell being pumped and for AR-244-TK-001 (i.e., WFIT-001-1) will also need to be within its periodic calibration prior to operation. This assumes the pumped liquid will be consolidated into AR-244-TK-001 and from there transferred to the double-shell tank system.

### **5.1.2 Transfer Line External to the 244-AR Vault**

The transfer line external to the 244-AR vault (see Section 2.1.3 for a description) is left intact with the exception of the flexible jumper being disconnected and left in the 241-AY-02D pit, 241-AY-02D pit nozzle U5 being outfitted with an isolation blank, and the 241-AR-151 diversion box drain being closed. If future pumping is routed to tank 241-AY-102, then prior to operation of the transfer line external to the 244-AR vault, the isolation blank installed on 241-AY-02D pit nozzle U5 will need to be removed and the flexible jumper installed between nozzle U5 and the installed pump in the 241-AY-02D pit. If future pumping is not routed to tank 241-AY-102 then an alternate transfer route will need to be determined and the appropriate system will need to be put in place. If the transfer goes through the 241-AR-151 diversion box, the 241-AR-151 leak detector will have to be tested and the diversion box drain may need to be opened. Any work inside the 241-AR-151 diversion box drain will require removing the weather cover installed on the diversion box. This cover should be reusable if the existing configuration remains the same. Any future pumping which utilizes the existing hose-in-hose transfer line installed between 244-AR vault and the 241-AR-151 diversion box will need to be performed before June 9, 2006. The hose-in-hose transfer line was put into service on June 9, 2003 and has a three year service life. Life extension on the hose may also be considered due to its limited use. Prior to use of the hose-in-hose transfer line between 244-AR vault and the 241-AR-151 diversion box, the heat trace on the inner hose should be meggered at 500V, 1000V and 2500 V according to the manufacturer's recommendations. As a guide, heat trace meggering has previously been performed under routine work request 2E-03-00254.

All leak detection circuits in the transfer path will need to be verified as being within current calibration prior to an external transfer from the 244-AR vault. Those leak detector circuits not within current calibration will require calibration.

### **5.1.3 Human-Machine Interface Computer**

The human-machine interface (HMI) computer control station and the HMI monitoring station will need to be electrically reconnected prior to operation. For proper communication between the local control panel inside the 244-AR vault and the remote control panel, it is necessary to first provide power to the local control panel, then to the remote control panel.

## 5.2 VENTILATION SYSTEM

The ventilation system is left intact with isolation valves between the supply skid and the 244-AR vault and between the 244-AR vault and the portable exhausters closed. Operation of the ventilation system in the current configuration would be performed under existing procedure TO-060-087, *Operate Ventilation System for 244-AR Waste Transfer*. Prior to operation, instrumentation calibrations and equipment checks may be required for the ventilation system. Any equipment or instrument beyond its calibration expiration or due date will require recalibration or check. The required periodic calibrations and/or checks for instrumentation and equipment associated directly with the portable exhausters POR05 and POR06 are:

- Perform a calibration on the ventilation stack Continuous Air Monitor (CAM) for portable exhausters POR05 and POR06 via procedure 6-RM-168 (see PM/S data sheets WT-06250 and WT-06573, respectively)
- Perform a functional test on the ventilation stack CAM interlock for portable exhausters POR05 and POR06 via procedures TF-FT-359-014 and TF-FT-359-015, respectively (see PM/S data sheets WT-06252 and WT-06596, respectively)
- Perform a source check of the ventilation stack CAM for portable exhausters POR05 and POR06 via procedure TF-OPS-018
- Ensure the following instrumentation is within current calibration for use of portable exhausters POR05 and POR06:

INSTRUMENT NUMBER	DESCRIPTION	PM/S DATA SHEET (POR05/POR06)
POR0*-VTP-PDI-170 (Where * is 5 or 6 for POR05 or POR06)	EXHAUSTER PLENUM INLET DP INDICATOR	(WT-06256 / WT-06577)
POR0*-VTP-PDI-171	GREEN HOUSE TO CELL DP INDICATOR	(WT-07542 / WT-07545)
POR0*-VTP-PDI-173	GREEN HOUSE TO CANYON DP INDICATOR	(WT-07544 / WT-07541)
POR0*-VTP-PDI-177	HEAT EXCHANGER 001 DP INDICATOR	(WT-06276 / WT-06576)
POR0*-VTP-PDI-178	PRE FILTER 001 DP INDICATOR	(WT-06277 / WT-06589)
POR0*-VTP-PDI-180	1ST HEPA FILTER 002 DP INDICATOR	(WT-06257 / WT-06590)
POR0*-VTP-PDI-182	2ND HEPA FILTER 003 DP INDICATOR	(WT-06259 / WT-06591)
POR0*-VTP-PDI-181	HEPA FILTERS 002 AND 003 TOTAL DP INDICATOR	(WT-06258 / WT-06592)
POR0*-VTP-FI-184	EXHAUST STACK FLOW INDICATOR	(WT-06253 / WT-06582)
POR0*-VTP-LI-205	GLYCOL EXPANSION TANK 001 LEVEL INDICATOR	(WT-06255 / WT-06581)
POR0*-VTP-LI-185	SEAL POT 001 LEVEL INDICATOR	(WT-06254 / WT-06579)
POR0*-VTP-TI-179	1ST HEPA FILTER 002 INLET TEMPERATURE INDICATOR	(WT-06261 / WT-06570)
POR0*-VTP-TI-176	HEAT EXCHANGER 001 INLET TEMPERATURE INDICATOR	(WT-06260 / WT-06569)
POR0*-VTP-TI-183	EXHAUST STACK INLET TEMPERATURE INDICATOR	(WT-06262 / WT-06571)
POR0*-VTP-PDT-170	EXHAUSTER PLENUM INLET DP XMTR	(WT-06268 / WT-06578)

INSTRUMENT NUMBER	DESCRIPTION	PM/S DATA SHEET (POR05/POR06)
POR0*-VTP-PDT-177	HEAT EXCHANGER 001 DP XMTR	(WT-06274 / WT-06575)
POR0*-VTP-PDT-178	PRE FILTER 001 DP XMTR	(WT-06275 / WT-06594)
POR0*-VTP-PDT-180	1ST HEPA FILTER 002 DP XMTR	(WT-06269 / WT-06568)
POR0*-VTP-PDT-182	2ND HEPA FILTER 003 DP XMTR	(WT-06271 / WT-06567)
POR0*-VTP-PDT-181	HEPA FILTER 002 AND 003 TOTAL DP XMTR	(WT-06270 / WT-06566)
POR0*-VTP-FT-184	EXHAUST STACK FLOW TRANSMITTER	(WT-06272 / WT-06587)
POR0*-VTP-LT-205	GLYCOL EXPANSION TANK 001 LEVEL TRANSMITTER	(WT-06279 / WT-06588)
POR0*-VTP-LT-185	SEAL POT 001 LEVEL TRANSMITTER	(WT-06278 / WT-06595)
POR0*-VTP-RE-301	EXHAUST STACK SAMPLE RADIATION ELEMENT	(WT-06250 / WT-06573)
POR0*-VTP-RA-301	EXHAUST STACK SAMPLE RADIATION TRANSMITTER	(WT-06252 / WT-06596)
POR0*-VTP-FCV-301	EXHAUST STACK RECORD SAMPLE LINE FLOW CONTROL VALVE	(WT-06243 / WT-06584)
POR0*-VTP-FCV-302	EXHAUST STACK CAM SAMPLE LINE FLOW CONTROL VALVE	(WT-06242 / WT-06583)

- Perform a radiation survey on the pre-filter housings and HEPA filter housings for portable exhausters POR05 and POR06.
- Perform a radiation survey on the ventilation ducting leading from 244-AR to the portable exhausters POR05 and POR06.
- Perform HEPA filter efficiency tests on the 1<sup>st</sup> and 2<sup>nd</sup> HEPA filters for both POR05 and POR06 (see PM/S data sheets WT-06387 for POR05/1st HEPA; WT-06388 for POR05/2nd HEPA; ET-07780 for POR06/1st HEPA; ET-07781 for POR06/2nd HEPA)
- Seal pot and glycol tank levels shall be verified to be within normal operating ranges. The seal pot typically operates between 38% and 72% full. The glycol tank operates above 50% full.

The required periodic calibrations and/or checks for instrumentation and equipment associated directly with the portable supply skid POR46 are:

- Perform a radiation survey on the HEPA filter housing for portable supply skid POR46.
- Perform HEPA filter efficiency tests on the HEPA filter for POR46 (see PM/S data sheet ET-07857).
- Perform calibration of HEPA filter differential pressure indicating switch, POR46-VT-PDIS-115 (see PM/S data sheet ET-07821)

- Perform calibration of pre-filter differential pressure indicator, POR46-VT-PDI-111 (see PM/S data sheet ET-07820)
- Perform calibration of relays POR46-VT-K-120 and POR46-VT-K-121 located within the containment tent inside 244-AR vault (see PM/S data sheets ET-07871 and ET-07872 respectively)

The required periodic calibrations and/or checks for ventilation instrumentation associated with the 244-AR vault, within the containment tent are:

- Perform calibration of tent to cell differential pressure transmitter, AR244-VT-PDT-171 (see PM/S data sheet ET-07859)
- Perform calibration of tent to canyon differential pressure transmitter, AR244-VT-PDT-173 (see PM/S data sheet ET-07860)

It is anticipated that the portable exhausters POR05 and POR06, portable supply skid POR46 or any other portable equipment may eventually be removed for use elsewhere within the tank farms system. If this occurs, then suitable replacement portable equipment will need to be acquired and proper calibration of the instrumentation and equipment will be required prior to use.

### **5.3 ELECTRICAL POWER**

During the interim stabilization pumping activities, the electrical power required to operate the waste consolidation and transfer system and the ventilation system was provided by three separate portable generators. If future pumping is required and building power has not been restored to the 244-AR facility, then portable generators will be required to operate the transfer and ventilation systems. During interim stabilization, the ventilation system supply skid, two portable exhausters and the majority of the waste consolidation and transfer system equipment were powered from a 110-kilowatt diesel generator. The human-machine interface, tank and sump level detection instruments, and leak detection circuits were powered from a 25-kilowatt diesel generator. The air compressors used to provide air to the tank and sump weight factor dip tubes were powered from a separate 25-kilowatt diesel generator.

### **5.4 OPERATING PROCEDURES**

Consolidation of waste from the various tanks and the cell 3 sump into tank 244-AR-TK-001 can be performed under existing operating procedure TO-280-050, *Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to 244-AR Tank TK-001*. Existing requirements (e.g., authorization basis, environmental), in place at the time, will need to be incorporated into the consolidation procedure as necessary. If pumping is required from either the cell 1 or cell 2 sump into tank 244-AR-TK-001, then the operating procedure will have to be updated to accommodate pumping from these locations.

Transfer of waste from tank 244-AR-TK-001 to tank 241-AY-102 can be performed under existing operating procedure TO-260-080, *External Transfer From 244-AR Tank 001 to 241-AY-*

102. Existing requirements (e.g., authorization basis, environmental) in place at the time of the will need to be incorporated into the consolidation procedure as necessary. If waste is to be transferred to a different double-shell tank a new procedure will be required.

Operation of the ventilation system is performed under operating procedure TO-060-087, *Operate Ventilation System for 244 AR Waste Transfer*. The operational aspects of running the ventilation system should require no changes to the existing procedure provided all existing components are left in place. However, existing requirements in place at the time of operation of the ventilation system will need to be incorporated into the procedure. If a change to the specific ventilation equipment used is made, then equipment specific changes will be required in the procedure.

## **5.5 SAFETY AND ENVIRONMENTAL DOCUMENTATION**

A new documented safety analysis is being prepared for the tank farms that does not discuss removal of pumpable liquid from 244-AR, because that work has been completed. Therefore, after the documented safety analysis is implemented, transfers from 244-AR are not permitted without the proper evaluations and/or modifications to the documented safety analysis.

The notice of construction (NOC) approved for interim stabilization activities at 244-AR would not be valid for any future pumping activities for removal of accumulated pumpable liquid. In order to allow pumping operations a new NOC permit application would have to be prepared and approval granted from the Washington State Department of Health and Ecology.

## 6.0 FACILITY SURVEILLANCE AND MAINTENANCE

One of the six requirements of Interim Milestone M-45-11 is to establish periodic level monitoring systems for intrusion detection before final closure. In order to meet this requirement the action to be taken is to provide instrumentation to detect a liquid intrusion in each of the three sumps, capable of detecting any intrusion that would exceed the capacity of the sumps, with quarterly readings. The deliverable associated with this requirement is to verify that monitoring is in place in the three sumps and is operational (calibrated). This section has been prepared to describe the action taken and document the deliverable associated with this requirement.

### 6.1 INTERIM MILESTONE M-45-11 RELATED SURVEILLANCE

Regarding the action to be taken to provide instrumentation to detect a liquid intrusion in each of the three sumps, the instrumentation consists of an existing installed weight factor and specific gravity dip tube jumper assembly (see H-2-62112). These weight factor and specific gravity dip tube assemblies measure a differential pressure between a tube open to atmosphere and a tube that is positioned a set distance above the tank or sump bottom to determine a weight factor reading. In each of the three cell sumps the weight factor tubes are installed 1" above the bottom of the sump. A separate tube terminates 10" above the weight factor reading tube. This tube and the weight factor reading tube can be used to measure the specific gravity of the liquid present in the sump, provided there is at least 11" inches of liquid in the sump. The specific gravity measurement is used to correct the weight factor reading based on the density of the liquid. Generally, the sump waste is water, which has a specific gravity of 1.0 and therefore, the weight factor reading is the actual measurement of the height of liquid within the sump. The weight factor and specific gravity tube jumper assembly itself consists of no moving parts or instrumentation requiring maintenance or calibration.

By measuring the liquid level using the weight factor and specific gravity dip tube assemblies and comparing the current reading to past reading, it can be determined whether a liquid intrusion into the vault has occurred. Because the weight factor tube is 1" above the bottom of the sump, the instrument is capable of measuring a liquid level before the level of the sump would be exceeded. The cell 1 and 2 sumps are 19.25 inches deep while the cell 3 sump is 17.5 inches deep. The instrument has no alarm capability and will rely on the comparison of current level data to previous level data to determine whether an intrusion has occurred.

To take a liquid level measurement, a small amount of air, supplied by an air compressor, is passed through the weight factor dip tubes to displace the liquid from the tube. The pressure of the air required to displace the liquid in the tube, relative to atmospheric pressure, is a measure of the liquid height of the waste present in the sump. Again, because the sump waste is water, the reading is generally not corrected for specific gravity of the liquid.

At the time of this report, sump level readings are taken daily via pressure-indicating transmitters WFIT-001-2 for the cell 1 sump, WFIT-002-2 for the cell 2 sump, and WFIT-004-2 for the cell 3 sump. These sump level readings are recorded on TF-OR-EF-244AR, *244-AR Vault Rounds*. These pressure-indicating transmitters have been most recently calibrated on March 21, 2003 (WFIT-001-2); and December 19, 2002 (WFIT-002-2 and WFIT-004-2). The frequency for

calibration of these instruments is every 330 days (with a 10% grace period). The instruments are next due to be calibrated on February 14, 2004 (WFIT-001-2); and November 14, 2003 (WFIT-002-2 and WFIT-004-2). A copy of the PM/S activity data sheet showing the last performed and next due calibration for these three instruments is provided in Appendix B.

The frequency for taking sump level readings will be annually rather than quarterly as originally described in CHG 2000. In accordance with Section 4.1.1.C of the *Single-Shell Tank System Leak Detection and Monitoring Functions and Requirements Document* (CHG 2003c), vessels and cells in miscellaneous structures (e.g., 244-AR vault) that are empty and that meet interim stabilization criteria shall not require leak detection monitoring. However, CHG 2000 does identify that monitoring will be performed quarterly for intrusion monitoring of the sumps at 244-AR vault. In line with CHG 2003c, the best management practice for single-shell tanks where leak detection monitoring is technically feasible and the tank is interim stabilized and is not of suspect integrity is to annually monitor for intrusion. For consistency with the CHG 2003c established single-shell tank leak detection and monitoring requirements (including for 244-AR vault) the sump level readings will be taken annually.

Because of the reduced frequency required for taking level readings, it may be more cost effective and operationally advantageous to measure the sump levels via alternate means to those described above. These alternate means could include hand-held, self-contained pressure calibration instruments with internal pressure generator and pressure measurement display or a simple water-filled manometer tube in which the pressure differential could be measured by visual means. Any measuring and test equipment used (e.g., pressure calibration instruments) to take level readings would be within current calibration prior to use.

## **6.2 GENERAL FACILITY SURVEILLANCE AND MAINTENANCE**

The current method of performing facility surveillance is via operator rounds procedure TF-OR-EF-244AR, *244-AR Vault Rounds*. This surveillance includes checking for abnormal conditions, including any spills or discharges, verifying doors are in working order and properly secured when not in use, and there is adequate lighting to allow visual observations.

While the 244-AR facility remains under the control and ownership of Operations, all required instrumentation and supporting systems or components will remain in operation. Since the required instruments and supporting components are currently maintained (calibrated and or cleaned and tested) using existing PM/S Datasheets, maintenance procedures, and operating procedures, this process will continue to be used. No new maintenance activities have been identified. Corrective maintenance activities will continue to be documented and worked via the JCS system (routine work requests or full work packages).

## 7.0 FACILITY LAY-UP ACTIVITIES

To satisfy the TPA Interim Milestone M-45-11, a transfer system must be available to remove any liquid that may intrude into the vault once the initial pumpable quantity of liquid has been removed. The transfer system used to remove the initial pumpable liquid is to be laid up in the facility and be available to provide future pumping capability to each of the tanks and sumps. Temporary services will require re-connection, as necessary, if future pumping is required.

The action required to meet the requirement associated with providing for removal of future accumulations of pumpable liquid is to "Leave (the) pumping system in place and connected with exception of the temporary equipment (e.g., air supply, water supply, portable exhausters)" (CHG 2000). This action has been taken. The lay-up configuration of the transfer system and ventilation system at the time of this report, at project completion, is provided below. The deliverable associated with this requirement is issuance and approval of procedure and specification for reconnection and preparation for operation of the system. A description of the procedure and specification for reconnection and preparation of the system is provided in section 5 of this document.

### 7.1 WASTE CONSOLIDATION AND TRANSFER SYSTEM

The waste consolidation and transfer system (see Section 2.1 for a description) is primarily installed within the 244-AR vault. The transfer line that is external to 244-AR vault and the human-machine interface computer are the only portions of the system external to the vault. A description of the lay-up activities performed for the interior and external portions of the waste consolidation and transfer system is provided below.

#### 7.1.1 Interior System

The consolidation manifold and pumping system (see Section 2.1.1 for a description) is left intact with two exceptions. The first temporary equipment disconnect is that the air delivery system to the air-operated double diaphragm pumps has been disconnected. The portable compressor used to drive the pumps has been removed from the 244-AR facility. The air delivery main shut-off valve, AR244-SA-V-301, is closed. The second temporary equipment disconnect is that the water delivery system to the consolidation manifold has been disconnected. The portable water truck used to supply water to the system has been removed from the 244-AR facility. The water delivery main shut-off valve, AR244-RW-V-101, is closed.

The drop legs with eductors (see Section 2.1.2) have been left intact with one exception. The drop legs in each of the tanks and the cell 3 sump will be raised approximately 12 inches above the tank/cell floor bottom to avoid plugging or deterioration of the suction legs with any residual sludge. This adjustment will not be made as part of the 244-AR interim stabilization project work to allow possible video survey work, which is performed through the same floor penetrations where the drop legs are installed.

The sampling system (see Section 2.1.4) consisted of portable equipment widely used throughout tank farms for grab sampling. No portions of this portable sampling system were left at the 244-AR facility. No lay-up activities were associated with the sampling system.

The instrumentation and control system (see Section 2.1.5) is left intact. No lay-up activities were associated with the instrumentation and control system.

The chemical adjustment system (see Section 2.1.4) consists of small portable equipment readily available within tank farms. Because the system consists of readily available equipment, no lay-up activities are associated with the chemical adjustment system, rather if chemical adjustment is required in the future, available equipment will be used to perform the chemical adjustment.

### **7.1.2 Transfer Line External to the 244-AR Vault**

The transfer line external to the 244-AR vault (see Section 2.1.3 for a description) is left intact with four exceptions. The first exception is that the flexible jumper between the 241-AY-02D pit nozzle U5 and the nozzle on the installed pump in that pit has been disconnected. The second exception is that an isolation blank has been installed on the 241-AY-02D pit nozzle U5. The third exception is that the drain valve for the 241-AR-151 diversion box has been closed. The final exception is that a weather cover has been installed over the 241-AR-151 diversion box to prevent any inadvertent water intrusion into the 241-AR-151 diversion box and ultimately into the 244-AR vault.

The existing final safety analysis report for tank farms (HNF-SD-WM-SAR-067, Rev. 3-L) states in section 2.4.7.5 "Post-Interim Stabilization," that "...*The hose-in-hose from the vault wall to 241-AR-151 diversion box will be removed...*". Therefore, leaving the transfer line "in-place" after the post-interim stabilization, does not agree with the statements in the FSAR. Unreviewed safety question (USQ) determination TF-03-3439-D, Rev. 0 has been performed to examine whether leaving the transfer line "in-place" constitutes an unreviewed safety question. The USQ determination identifies the temporary transfer system is isolated in the 241-AY-102 pit and by two Safety-Significant isolation valves, which provide physical disconnection from a misroute from the waste transfer system into the 244-AR Vault. Leaving the transfer pipeline used in the 244-AR Vault Interim Stabilization project "in-place" for possible future action to remove the "left-behind" sludge despite providing instructions not fully in the agreement with the FSAR, are within the bounds of the safety basis and the proposed activity does not constitute a USQ. The USQ determination identifies as an impact that the information in the safety basis is to be revised to document proposed life extension of the waste transfer line from 244-AR facility to 241-AY-102.

### **7.1.3 Human-Machine Interface Computer**

The HMI computer control station and monitoring station are electrically disconnected.

## **7.2 VENTILATION SYSTEM**

The ventilation system (see Section 2.1.6 for a description) is left intact. Isolation valve POR46-VT-V-104, between the supply skid and the containment tent, is closed. Isolation valve AR244-VTP-V-182 between the cell ventilation system and the ducting to the portable exhausters is closed. Isolation valve IV-K4-1, between the vessel ventilation system and the ducting to the portable exhausters, is closed. Isolation valves POR05-VTP-V-135 and POR06-VTP-V-135, between the ducting to the portable exhausters and portable exhausters POR05 and POR06 respectively, is closed.

The existing final safety analysis report for tank farms (HNF-SD-WM-SAR-067, Rev. 3-L) states in section 2.4.7.5 "Post-Interim Stabilization," that "...*The temporary ventilation systems will be partially dismantled. The supply blower skid will be isolated from the facility and the line will have a HEPA filter installed if it is not blanked off...*". Therefore, the proposed activity advocating leaving the ventilation system "in-place" after the post-interim stabilization, does not agree with the statements in the FSAR. Unreviewed safety question (USQ) determination TF-03-3439-D, Rev. 0 has been performed to examine whether leaving the ventilation system "in-place" constitutes an unreviewed safety question. Leaving the ventilation system used in the 244-AR Vault Interim Stabilization project "in-place" for possible future action to remove the "left-behind" sludge despite providing instructions not fully in the agreement with the FSAR, are within the bounds of the safety basis and the proposed activity does not constitute a USQ. The USQ determination identifies as an impact that the information in the safety basis is to be revised to document proposed life extension of the 244-AR ventilation system.

### 7.3 ELECTRICAL POWER

During the interim stabilization pumping activities, the electrical power required to operate the waste consolidation and transfer system and the ventilation system was provided by three separate portable generators. The ventilation system supply skid, two portable exhausters and the majority of the waste consolidation and transfer system equipment were powered from one generator. This generator will be removed after use of the ventilation system is no longer required. The human-machine interface, tank and sump level detection instruments, and leak detection circuits were powered from a second generator. A third generator powered the air compressors used to provide air to the tank and sump weight factor dip tubes. These second and third portable generators remain at the facility at the time of the preparation of this report, but if periodic liquid level measurements are made via a method other than the existing weight factor instruments or at a relatively long frequency, these generators may be removed.

## 8.0 REFERENCES

- CHG 2000, *244-AR Vault Interim Stabilization Project Plan*, RPP-5635, Rev. 0, CH2M HILL Hanford Group, Inc., Richland, Washington, March 2000.
- CHG 2003a, *Process Control Plan for 244-AR Vault Interim Stabilization*, RPP-8617, Rev. 1B, CH2M HILL Hanford Group, Inc., Richland, Washington, May 2003.
- CHG 2003b, *244-AR Vault Tank Sampling and Analysis Plan*, RPP-11952, Rev. 1, CH2M HILL Hanford Group, Inc., Richland, Washington, April 2003.
- CHG 2003c, *Single-Shell Tank System Leak Detection and Monitoring Functions and Requirements Document*, RPP-9937, Rev. B, CH2M HILL Hanford Group, Inc., Richland, Washington, June 2003.
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- ECN 668802, *Supp. Dwg Change to Isolate Steam Lines to Prevent Inadvertent Activation*
- ECN 668812, *Change ECN 668802 to Permit the Use of 1 or 2 Blind Flanges to Isolate Steam Lines*
- ECN 664735, *Supp. Dwg to Remove Backflow Preventers & Install Blind Flanges to Prevent Reactivation of Water System.*
- ECN 668801 *Supp. Dwg Change to Cover Top of Canyon Stack to Prevent Water Intrusion into Cell 3*
- ECN 662911, *Supp. Dwg Change Drawing to Indicate the Vessel Vent Filter Vault is Sealed*
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Drawing H-2-79949, *Sheet 5, Rev. 0, Sludge Removal and Waste Transfer Vault*  
Drawing H-2-79949, *Sheet 6, Rev. 5, Sludge Removal and Waste Transfer Vault*  
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Drawing H-2-62055, *Sheet 1, Rev. 10, Cell #1 Equipment Arrangement*  
Drawing H-2-62056, *Sheet 1, Rev. 13, Cell #2 Equipment Arrangement*  
Drawing H-2-62058, *Sheet 1, Rev. 11, Cell #3 Equipment Arrangement*  
Drawing H-2-93634, *Sheet 1, Rev. 1, Piping Equipment Arrangement 241-AR-151*  
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**APPENDIX A. TRANSFER SUMMARY SHEETS WITH LEVEL READINGS AND  
LIQUID LEVEL SURVEILLANCE DATA SHEETS**

**Appendix A.1. Transfer Summary Sheets with Level Readings and Liquid Level  
Surveillance Data Sheets for Tank 244-AR-TK-001**

6/12/03

6/11/03 2:49 PM	WORKING COPY	T S R Compliance
Tank Farm Operating Procedure		241-AY



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*Transfer log# 03-T-0037*

External Transfer from 244-AR Tank TK-001 to 241-AY-102
---

The original signatures are on file.

PCA Incorporated:	TF-2003-0585	
Procedure Signatures for:	TO-260-080 B-10	
Type of Change:	PCA	
Review Designator:	N/A	
USQ Screening Number:	TF-03-0648-D R4	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops	<u>V. Miller</u>	<u>05/20/2003</u>
Shift Manager	<u>J. Andrews</u>	<u>05/20/2003</u>
Engineering	<u>T. Laney</u>	<u>05/20/2003</u>
Rad Con		
Quality Assurance		
Environmental Engineering		
IH/Safety		
Technical Writer	<u>S. Burns</u>	<u>06/03/2003</u>
Approval Authority	<u>C. Wallgren</u>	<u>06/03/2003</u>
<b>Justification:</b>		
Operations Request		
<b>Summary of Changes:</b>		
Deleted liquid level steps due to redundancy, modified step to eliminate restrictive completion criteria and eliminated 15 and 30 minute shutdown criteria.		

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T S R Compliance

## Data Sheet 1 - Start/Stop Material Balance Data Sheet

		Sheet 1 of 3	
Instrumentation calibration complete (Checklist 4) (Initial)		Ventilation systems operating (Initial)	
ja		Yes	No
Shift Manager Approval to start transfer:			
ja			
	START	END	
Date:	6-12-03	6/12/03	
Time:	0155	1505	
Water Meter Reading	A <sub>S</sub> = 2157.6	A <sub>E</sub> = 2764.3	
Total Water Added (A <sub>E</sub> - A <sub>S</sub> )/2750	B = 0	B = .22	
*Tank 244-AR-TK001 Liquid Level (inches) Limit: ≤ 2 inches remaining at end of transfer	C = 3	C = .2	
241-AY-102 Liquid Level (inches) (Maximum 364")	D = 273.22	D = 276.14	
Material Balance (inches) (MB) = B + C + D	E = 276.22	G = 276.56	
Final Material Balance (inches) (FMBD) = G - E	N/A	FMBD = .34	
Operator Initials:	SY	VM	
MBD Review Shift Manager/OE Initials:	ja	ja	
Actual START: Time and Date:	02:05 6-12-03	Actual STOP Time and Date:	1050 6/12/03
NOTE - Allowable MBD during Transfer = ± .5 inches Allowable Final MBD = ± .5 inches * - Use Table 1 to convert to DST inches			
① transfer was restarted @ 1205 transfer completed @ 1235 HUSIP completed @ 1405			

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T S R Compliance

Data Sheet 2 - Intermediate Material Balance Data Sheet

							Sheet 2 of 3
	+ .5 hours	+ .5 hours	+ 1 hours	+ 1 hours	+ 1 hours	+ 1 hours	+ 1 hours
Date:	6-12-03	6-12-03	6-12-03	6-12-03	6-12-03	6-12-03	6/12/03 <sup>①</sup>
Time:	02:35	03:05	04:05	05:05	06:05	07:05	08:05
*Tank 244AR-WT-TK-001 Liquid Level (inches) Limit: ≤ 2 inches remaining at end of transfer	C = 2.8	C = 2.7	C = 2.2	C = 1.7	C = 1.3	C = .9	C = .6
241-AY-102 Liquid Level (max 364 inches)	D = 273.38	D = 273.57	D = 273.97	D = 274.35	D = 274.72	D = 275.12	D = 275.51
Material Balance (inches) = C + D	F = 276.18	F = 276.27	F = 276.17	F = 276.05	F = 276.02	F = 276.02	F = 276.11
MBD (inches) = F - E <small>(from previous page) E = 276.22</small>	MBD = .04	MBD = .05	MBD = -.05	MBD = -.17	MBD = -.20	MBD = -.20	MBD = -.11
Operator Initials:	<i>WJ</i>						
Shift Manager/OE Review (signature):	<i>J. Anderson</i>						
Note - Allowable MBD during Transfer = ± 0.5 DST inches * - Use Table 1 to convert to DST inches <i>Transfer shutdown @ 0805                      air compressor out of gas                      continuing with hourly readings</i>							
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Data Sheet 2 - Intermediate Material Balance Data Sheet

							Sheet 3 of 3
	+ 1 hours	+ 1 hours	+ 1 hours	+ 1 hours	+ hours	+ hours	+ hours
Date:	6/12/03 ①	6/12/03	6/12/03 ①	6/12/03			
Time:	0905	1005	1145	1205			
*Tank 244AR-WT-TK-001 Liquid Level (inches) Limit: ≤ 2 inches remaining at end of transfer	C = .6	C = .3	C = .3	C = .3	C =	C =	C =
241-AY-102 Liquid Level (max 364 inches)	D = 275.50	D = 275.77	D = 275.93	D = 275.94	D =	D =	D =
Material Balance (inches) = C + D	F = 276.10	F = 276.07	F = 276.23	F = 276.24	F =	F =	F =
MBD (inches) = F - E	MBD = -0.12	MBD = -0.15	MBD = 0.01	MBD = -0.02	MBD =	MBD =	MBD =
(from previous page) E = 276.22							
Operator Initials:	UM	UM	UM	UM			
Shift Manager/OE Review (signature):	Jander	Jander	Jander	Jander			
<p>Note - Allowable MBD during Transfer = ± 0.5 DST inches                      * - Use Table 1 to convert to DST inches                      ① transfer restarted @ 0918                      transfer stopped @ 1050                      transfer restarted @ 1205</p>							
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Signature Sheet 1

All persons participating in the performance of this Test shall enter their printed name, signature and initials below.

Name (Printed)	Signature	Initials
JE Andrews	<i>JE Andrews</i>	JA
T Deiger	<i>T Deiger</i>	TD
Steve Stampfer	<i>Steve Stampfer</i>	SS
DR Jones	<i>Donald R Jones</i>	DJ
C.R. Chrystal	<i>C.R. Chrystal</i>	CRC
Vicki Miller	<i>Vicki Miller</i>	VM
SR Joseph	<i>SR Joseph</i>	SJ
Ross Cole	<i>R Cole</i>	RC
TERANCE LANEY	<i>Terance Laney</i>	TL

6/9/03 → 6/10/03

6/4/03 7:53 AM	<b>WORKING COPY</b>	<b>T S R Compliance</b>
<b>Tank Farm Operating Procedure</b>		<b>241-AY</b>



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*Transfer log # 03-T-0022*

<b>External Transfer from 244-AR Tank TK-001 to 241-AY-102</b>
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The original signatures are on file.

PCA Incorporated:	TF-2003-0585	
Procedure Signatures for:	TO-260-080 B-10	
Type of Change:	PCA	
Review Designator:	N/A	
USQ Screening Number:	TF-03-0648-D R4	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops	<u>V. Miller</u>	<u>05/20/2003</u>
Shift Manager	<u>J. Andrews</u>	<u>05/20/2003</u>
Engineering	<u>T. Laney</u>	<u>05/20/2003</u>
Rad Con		
Quality Assurance		
Environmental Engineering		
IH/Safety		
Technical Writer	<u>S. Burns</u>	<u>06/03/2003</u>
Approval Authority	<u>C. Wallgren</u>	<u>06/03/2003</u>
<b>Justification:</b>		
Operations Request		
<b>Summary of Changes:</b>		
Deleted liquid level steps due to redundancy, modified step to eliminate restrictive completion criteria and eliminated 15 and 30 minute shutdown criteria.		

Next Periodic Review Due – 01/20/2005

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T S R Compliance

Data Sheet 1 - Start/Stop Material Balance Data Sheet

		Sheet 1 of 3	
Instrumentation calibration complete (Checklist 4) (Initial)		Ventilation systems operating (Initial)	
LM		Yes	No
Shift Manager Approval to start transfer:			
ja			
	START	END	
Date:	6/9/03	6/10/03	
Time:	0915	1520	
Water Meter Reading	A <sub>S</sub> = 2046.9	A <sub>E</sub> = 2157.6	
Total Water Added (A <sub>E</sub> - A <sub>S</sub> )/2750	B = 0	B = .04	
*Tank 244-AR-TK001 Liquid Level (inches) Limit: ≤ 2 inches remaining at end of transfer	C = 6.4	C = 2.9	
241-AY-102 Liquid Level (inches) (Maximum 364")	D = 264.09	D = 267.58	
Material Balance (inches) (MB) = B + C + D	E = 270.49	G = 270.52	
Final Material Balance (inches) (FMBD) = G - E	N/A	FMBD = .03	
Operator Initials:	LM	LM	
MBD Review Shift Manager/OE Initials:	ja	ja	
Actual START: Time and Date:	0915 6/9/03	Actual STOP Time and Date:	1520 6/10/03
NOTE - Allowable MBD during Transfer = ± .5 inches Allowable Final MBD = ± .5 inches * - Use Table 1 to convert to DST inches			

03 7:46 AM

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T S R Compliance

Data Sheet 1 - Start/Stop Material Balance Data Sheet

		Sheet		of	
Instrumentation calibration complete (Checklist 4) (Initial)			Ventilation systems operating (Initial)		
ja			Yes	ja	No
Shift Manager Approval to start transfer:		ja			
	Date:	START	END		
	Time:	6/5/03			
		1450			
Water Meter Reading	As =	2046.9	AE =	N/A	
Total Water Added (AE - AS)/2750	B =	0	B =	N/A	
*Tank 244-AR-TK001 Liquid Level (inches) Limit: ≤ 2 inches remaining at end of transfer	C =	6.4	C =	A	
241-AY-102 Liquid Level (inches) (Maximum 364")	D =	264.22	D =	ja	
Material Balance (inches) (MB) = B + C + D	E =	270.62	G =	started new sheet	
Final Material Balance (inches) (FMBD) = G - E		N/A	FMBD =		
	Operator Initials:	UM			
	MBD Review Shift Manager/OE Initials:	ja			
Actual START: Time and Date:			Actual STOP Time and Date:		
NOTE - Allowable MBD during Transfer = ± .5 inches Allowable Final MBD = ± .5 inches * - Use Table 1 to convert to DST inches					

03 7:50 AM

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Data Sheet 2 - Intermediate Material Balance Data Sheet

							Sheet 2 of 7
	+30 min hours	+1 hours	+1 hours	+1 hours	+1 hours	+1 hours	+1 hours ①
Date:	4/9/03	4/9/03	4/9/03	4/9/03	4/9/03	4/9/03	4/9/03
Time:	1005	1035	1135	1235	1335	1435	1535
*Tank 244AR-WT-TK-001 Liquid Level (inches) Limit: ≤ 2 inches remaining at end of transfer	C = 6.2	C = 6.0	C = 5.6	C = 5.1	C = 4.7	C = 4.3	C = 3.8
241-AY-102 Liquid Level (max 364 inches)	D = 264.27	D = 264.50 <del>265.14</del>	D = 264.92	D = 265.37	D = 265.80	D = 266.24	D = 266.65
Material Balance (inches) = C + D	F = 270.47	F = 270.50	F = 270.52	F = 270.47	F = 270.50	F = 270.54	F = 270.45
MBD  (inches) = F - E	MBD = -0.02	MBD = .01 <del>0.03</del>	MBD = .03	MBD = -0.02	MBD = .01 <del>0.03</del>	MBD = .05	MBD = -0.04
Operator Initials:	UM	UM	UM	UM	UM	UM	UM
Shift Manager/OE Review (signature):	<i>J. Anderson</i>	<i>J. Anderson</i>	<i>J. Anderson</i>	<i>J. Anderson</i>	<i>J. Anderson</i>	<i>J. Anderson</i>	<i>J. Anderson</i>
Note - Allowable MBD during Transfer = ± 0.5 DST inches * - Use Table 1 to convert to DST inches ① - transfer stopped @ 1545 4/9/03							
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T S R Compliance

Data Sheet 2 - Intermediate Material Balance Data Sheet

							Sheet 3 of 3
	+ 30 min hours	+ 60 min hours	+ 1 hours	+ hours	+ hours	+ hours	+ hours
Date:	6/10/03	6/10/03	6/10/03				
Time:	1350	1420	1520				
*Tank 244AR-WT-TK-001 Liquid Level (inches) Limit: ≤ 2 inches remaining at end of transfer	C = 3.5	C = 3.3	C = 2.9	C =	C =	C =	C =
241-AY-102 Liquid Level (max 364 inches)	D = 266.96	D = 267.16	D = 267.57	D =	D =	D =	D =
Material Balance (inches) = C + D	F = 270.46	F = 270.46	F = 240.47	F =	F =	F =	F =
MBD (inches) = F - E	MBD = -0.03	MBD = -0.03	MBD = -0.02	MBD =	MBD =	MBD =	MBD =
(from previous page) E = 270.49							
Operator Initials:	UM	UM	UM				
Shift Manager/OE Review (signature):	Jarden	Jarden	Jarden				
Note - Allowable MBD during Transfer = ± 0.5 DST inches * - Use Table 1 to convert to DST inches (I transfer restarted @ 0952 6/10/03 transfer shutdown @ 1055 6/10/03 transfer restarted @ 1320 6/10/03							
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6/4/03 7:53 AM      WORKING COPY      T S R Compliance

Signature Sheet 1

All persons participating in the performance of this Test shall enter their printed name, signature and initials below.

Name (Printed)	Signature	Initials
JE Andrews	<i>J Andrews</i>	JA
R FRIESZ	<i>R Friesz</i>	RF
Steve Stamp	<i>Steve Stamp</i>	SS
Charles W Kerke	<i>Charles W Kerke</i>	CWK
TERANCE LANEY	<i>Terance Laney</i>	TL
Rich Gutierrez	<i>R. Gutierrez</i>	RG
Vick. Miller	<i>Vick Miller</i>	VM
SR JOSEPH	<i>SR Joseph</i>	SJ
Ross Cole	<i>R Cole</i>	RC

6/5/03 9:07 AM

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DATE STARTING: JUN 9 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
<b>244-AR VAULT</b>									
<b>Instrument Panel</b>									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.60 <del>94.60</del> 6-13-03	IN 55.67 <sup>①</sup>	IN 42.65	IN 80.04 <sup>①</sup>	IN 2.160 <sup>②</sup>	IN 2.367 <sup>②</sup>	IN 2.405
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN .062 <del>138.50</del> 6-13-03	IN -.097	IN .064	IN -.065 <del>0.20</del> 6-13-03	IN -.095	IN .071	IN .076
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN .004	IN -.154	IN .004	IN -.148	IN -.163	IN .011	IN .015
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN .102	IN -.057	IN .101	IN -.051	IN -.056	IN .107	IN .113
<b>COMMENTS: NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .136	IN -.020	IN .137	IN -.016	IN -.020	IN .146	IN .150
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .055	IN -.101	IN .057	IN -.095	IN -.100	IN .065	IN .075
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.368	IN 17.178	IN 17.301	IN 17.122	IN 17.072	IN 17.206	IN 17.197
<b>NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

① TRANSFER TO 102.44 - WILL CONTINUE

② xfer completed

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RPP-12051 Rev. 0

A-16

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DATE STARTING: JUN 16 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 2.14	IN 2.42	IN 2.41	IN 2.460	IN 2.465	IN 2.48	IN 2.459
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN .060	IN .070	IN .065	IN .063	IN .070	IN .075	IN .071
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN .012	IN .013	IN .014	IN .006	IN .015	IN .011	IN .012
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN .109	IN .107	IN .108	IN .103	IN .111	IN .113	IN .112
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .145	IN .146	IN .144	IN .135	IN .141	IN .145	IN .146
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .064	IN .068	IN .061	IN .055	IN .057	IN .065	IN .067
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.39	IN 17.10	IN 17.07	IN 17.040	IN 17.017	IN 16.986	IN 17.009
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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**Appendix A.2. Transfer Summary Sheets with Level Readings and Liquid Level  
Surveillance Data Sheets for Tank 244-AR-TK-002**

Tank 2

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T S R Compliance

Tank Farm Operating Procedure

244-AR



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TRANSFER log 03-T-0021

Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to  
244-AR Tank TK-001

The original signatures are on file.

PCA Incorporated:	TF-2003-0397	
Procedure Signatures for:	TO-280-050 B5	
Type of Change:	PCA	
Review Designator:	NA	
USQ Screening Number:	TF-03-1590-AA, TF-03-1578-S	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops	<u>T. Berger</u>	<u>04/14/2003</u>
Shift Manager	<u>J. Andrews</u>	<u>04/14/2003</u>
Engineering	<u>T. Laney</u>	<u>04/15/2003</u>
Criticality Prevention		
Quality Assurance		
Environmental Engineering		
Safety		
RadCon		
Technical Writer	<u>S. Burns</u>	<u>04/15/2003</u>
Approval Authority	<u>S. Kelly</u>	<u>04/15/2003</u>
<b>Justification:</b>		
Operation Request		
<b>Summary of Changes:</b>		
Added new step and moved NOTE to reflect changed configuration and deleted part of note to maintain transfer control with OE.		

Next Periodic Review Due – 01/20/2005

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4/16/03 3:00 PM

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T S R Compliance

Data Sheet 1 – Liquid Level Monitoring

	Initial	+ .5 HOURS	+ 1.0 HOURS	+ 2.0 HOURS	+ 2 1/2 HOURS	<del>+ 3.0 HOURS</del>	<del>+ 3.5 HOURS</del>	<del>+ 4.0 HOURS</del>
DATE:	4-16-03	4-16-03	4-16-03	4-16-03	4-16-03			
TIME:	1912	1955	2055	2155	2215			
TK-001 Level (Limit 120")* (Limit 216")**	26.9"	28.3"	29.4"	32.4"	33.1"			
Sending Tank/Sump:	62.8"	61.3"	60.2	57.4"	56.5"			
Th002								
Operator Initials:	[Signature]	[Signature]	[Signature]	[Signature]	[Signature]			
Actual Start Date/Time	4-16-03 / 1955		Actual Stop Date/Time		22:15 4-16-03			
* Notify Shift Manager ** Stop Transfer								

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Data Sheet 1 - Liquid Level Monitoring

	Initial 16:00 4-21-03	+ .5 HOURS	+ .5 HOURS	+ 1.0 HOURS	+ 1.0 HOURS	+ 1 HOURS	+ 1 HOURS	+ 1 HOURS
DATE:	4-17-03	4-17-03	4-17-03	4-17-03	4-17-03	4/17/03	4-17-03	4-17-03
TIME:	0823 1912	0900	0930	10:30	11:30	12:30	13:30	14:30
TK-001 Level (Limit 120")* (Limit 216")**	26.9" <del>33.1"</del> 4-21-03	34.7"	35.8"	38.6"	41.1"	43.8"	46.7"	49.0
Sending Tank/Sump:	62.8" <del>56.5"</del> 4-21-03	55.3"	53.9"	51.2"	48.5"	45.9"	42.9"	40.6
TK002								
Operator Initials:	[Signature]	[Signature]	[Signature]	[Signature]	[Signature]	[Signature]	[Signature]	[Signature]
Actual Start Date/Time	4-17-03 / 0830		Actual Stop Date/Time		Continued			
* Notify Shift Manager ** Stop Transfer								

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4/17/03 11:24 AM

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T S R Compliance

Data Sheet 1 – Liquid Level Monitoring

	Initial 16 4-21-03	+ 1 HOURS	+ 1 HOURS	+ 1 HOURS	+ 1 HOURS	+ 1 HOURS	+ 1 HOURS	+ 1 HOURS
DATE:	4-17-03	4-17-03	4-17-03	4-17-03	4-17-03	4-17-03	4-17-03	4-17-03
TIME:	19:12 4-21-03 6823	15:30	16:30	17:30	18:30	19:30	20:30	21:30
TK-001 Level (Limit 120")* (Limit 216")**	26.1" 4-21-03 <del>35.1</del>	51.3	54.1	51.0	59.3	61.4	64.0	66.1
Sending Tank/Sump:	62.8"							
TK002	56.5 4-21-03	38.3	35.5	32.7	30.5	28.0	25.7	23.3
Operator Initials:	sj	sj	VM	VM	sj	VM	VM	VM
Actual Start Date/Time	4-17-03 / 0830		Actual Stop Date/Time		Continued			
* Notify Shift Manager ** Stop Transfer								

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4/17/03 11:24 AM

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T S R Compliance

Data Sheet 1 - Liquid Level Monitoring

	Initial 4-21-03	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS
DATE:	4/17/03	4/17/03						
TIME:	2230	2230						
TK-001 Level (Limit 120")* (Limit 216")**	26.9" 22.4 4-21-03	68.3						
Sending Tank/Sump:	62.8" TK002 4-21-03	21.2						
Operator Initials:	UM	UM						
Actual Start Date/Time	4/17/03	2230	Actual Stop Date/Time	4/17/03	2231			
* Notify Shift Manager ** Stop Transfer								

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#4

4/17/03 11:24 AM

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T S R Compliance

Data Sheet 1 - Liquid Level Monitoring

	Initial 16 of 4-18-03	+ .5 HOURS	+ .5 HOURS	+ 1.0 HOURS				
DATE:	4-18-03	4-18-03	4-18-03	4-18-03	4-18-03	4-18-03	4-18-03	4-18-03
TIME:	0730 <sup>1912</sup>	0900	0930	10:30	11:30	12:30	13:30	14:30
TK-001 Level (Limit 120")* (Limit 216")**	26.9" <del>58.4</del> 4-21-03	69.5"	70.7"	73.1"	75.7	77.9	80.3	82.5"
Sending Tank/Sump:	62.8" <del>21.2"</del>	20.0"	18.8"	16.4"	14.0	11.5	9.2	6.8"
TK 002	4-21-03							
Operator Initials:	JS	JS	JS	JS	JS	JS	JS	JS
Actual Start Date/Time	4-18-03 / 0830		Actual Stop Date/Time		Continued			
* Notify Shift Manager								
** Stop Transfer								

#5

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Data Sheet 1 - Liquid Level Monitoring

	Initial 16 of 4-21-03	+ 1 HOURS	+ 1 HOURS	+ 1 HOURS	+ 1 HOURS	+ 1 HOURS	+ 1 HOURS	+ 1 HOURS
DATE:	4-18-03	4-18-03	4/18/03	4/18/03	4/18/03	4/18/03	4/18/03	
TIME:	<del>6:55</del> 1912	1530	1630	1730	1830	1910	1920	
TK-001 Level (Limit 120")* (Limit 216")**	26.9"	84.8	87.9	89.2	N/A ①	90.0	90	
Sending Tank/Sump:								
FK 002	62.8"	4.0	2.0	.1	N/A ①	0.1	0.0	
Operator Initials:	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	①	<i>[Signature]</i>	<i>[Signature]</i>	
Actual Start Date/Time	Res. Transfer 4/18/03			Actual Stop Date/Time		4/18/03 1813		
* Notify Shift Manager	Final Shutdown 1920 4/18/03							
** Stop Transfer								

① System shutdown due to backflush.

#6

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4/16/03 3:00 PM

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T S R Compliance

## Transfer Information Record Sheet

Record information as applicable to transfer.		
Date/Time		Sheet <u>1</u> of <u>   </u>
4/16/03 / 1854	Completed pre-reqs in section 5.1	
1946	Started backflush	
1947	Completed Backflush	
1955	Started Tank 2 to Tank 1 Transfer	
2215	Secured Transfer	
4/17/03 / 0230	Started tank 2 to Tank 1 Transfer	
1345	Unable to obtain HPT for swing shift who had completed overview training and drills. Discussed with Ops/Startup Manager Ron Tucker and he approved use of HPT with Overview training only.	
1517	assumed duties of 244AR Transfer OE from J.E. ANDREWS. R. Gutierrez	
1520	Notified Shift Manager Rich Gutierrez is 244AR Transfer OE.	
1630	Process Engineering delivered an updated conversion <del>calculator</del> Table for TK-002.	
2231	Pumps P-001 + P-002 shutdown for tonite. IHT had 4 ppm reading on VOC inst. instrument could of possibly drifted.	

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4/16/03 10:02 AM

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T S R Compliance

## Transfer Information Record Sheet

Record information as applicable to transfer.		
Date/Time		Sheet <u>2</u> of <u>    </u>
4/16/03 / 0830	Started Transfer from Tank 2 to Tank 1	
1736	Generator # 3 temporarily shutdown due to plugged fuel filter. Restarted generator.	
Late Entry 1719	Tank 2 level beginning to fluctuate between 0.1 and 0.	
1750	Brought in portable compressor due to plugging problem with Generator # 3.	
1818	Shutdown transfer due to low flow condition. Will backflush to ensure eductor is clear.	
1854	Completed backflush.	
1910	Restarted Tank 2 to Tank 1 Transfer.	
1920	Tank 2 to Tank 1 Transfer Complete.	

Type <b>CONTINUOUS</b>	Document No. <b>TO-280-050</b>	Rev/Mod <b>B-5</b>	Release Date <b>04/15/2003</b>	Page <b>37 of 43</b>
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*Re pumping of Tank 2, 3, 4 and Cell 3 Sump, Receive, Flush*

4/29/03 3:52 PM

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T S R Compliance

Tank Farm Operating Procedure

244-AR



Double click to change COPY type

*Transfer log # 03-T-0030*

Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to  
244-AR Tank TK-001

The original signatures are on file.

PCA Incorporated:	TF-2003-0435	
Procedure Signatures for:	TO-280-050 B6	
Type of Change:	PCA	
Review Designator:	NA	
USQ Screening Number:	TF-03-0596-D	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops	<u>V. Miller</u>	<u>04/28/2003</u>
Shift Manager	<u>J. Andrews</u>	<u>04/28/2003</u>
	<u>S. Ringo</u>	<u>04/29/2003</u>
Engineering	<u>T. Laney</u>	<u>04/29/2003</u>
Criticality Prevention		
Quality Assurance		
Environmental Engineering		
Safety		
RadCon		
Technical Writer	<u>W. White</u>	<u>04/29/2003</u>
Approval Authority	<u>S. Ringo</u>	<u>04/29/2003</u>
<b>Justification:</b>		
Operation Request		
<b>Summary of Changes:</b>		
Deleted LCO 3.1.3. Made editorial changes. Deleted pre-transfer backflush. Modified wording to allow multiple transfers without shutting down between transfers. Deleted unused causes for shutdowns.		

Next Periodic Review Due – 01/20/2005

Type <b>CONTINUOUS</b>	Document No. <b>TO-280-050</b>	Rev/Mod <b>B-6</b>	Release Date <b>04/29/2003</b>	Page <b>1 of 43</b>
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Data Sheet 1 - Liquid Level Monitoring

	Initial	+ <u>0.5</u> HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS
DATE:	4/30/03	4/30/03						
TIME:	13:40	14:11						
TK-001 Level (Limit 120")* (Limit 216")**	91.8"	92.4						
Sending Tank/Sump:	.1"	.1						
TK-002								
Operator Initials:	ES	ES						
Actual Start Date/Time	13:41 / 4/30/03		Actual Stop Date/Time		14:12 / 4/30/03			
* Notify Shift Manager								
** Stop Transfer								

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200 3.8 4.0 4.1  
54.8 31.6 33.2

Data Sheet 1 – Liquid Level Monitoring

	Initial	+ .2 HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS
DATE:	4/30/03	4/30/03	4/30/03					
TIME:	14:44	14:58	14:58					
TK-001 Level (Limit 120")* (Limit 216")**	92.6	92.6						
Sending Tank/Sump:								
TK-004	- .0	- 0.0						
Operator Initials:	<i>JS</i>	<i>JS</i>						
Actual Start Date/Time	4/30/03 / 14:50		Actual Stop Date/Time		4/30/03 / 14:58			
* Notify Shift Manager								
** Stop Transfer								

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14:58 Start  
 TR-001 92.57  
 TR-004 -0.01  
 TR-200 30.15  
 15:10 End  
 TR-001 92.57  
 TR-004 -0.01  
 TR-200 30.29

Data Sheet 1 - Liquid Level Monitoring

	Initial	+ .28 HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS
DATE:	4/30/03	4/30/03						
TIME:	14:23	14:41						
TK-001 Level (Limit 120")* (Limit 216")**	92.4	92.4						
Sending Tank/Sump:								
TK-003	-0.0	- .1						
Operator Initials:	<i>SB</i>	<i>SB</i>						
Actual Start Date/Time	4/30/03 14:28		Actual Stop Date/Time		4/30/03 14:41			
* Notify Shift Manager								
** Stop Transfer								

TK-001 Shift End  
92.36 92.57 + 0.21 + 39  
TK-200 33.32 30.16 - 0.07 - 0.1  
= 39.00

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4/29/03 3:52 PM

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S R Compliance

Data Sheet 2 – Back Flush/Recirculation/Flush

Tanks Being Back Flushed (TK001, TK002, TK003, TK004, Cell 3 Sump)	Pumping Start		Pumping Stop		Total Pump Time (C=B-A)	AR244-WT-TK-200		Volume Pumped from AR244-WT-TK-200 (inches)
	Date	Time (24 Hr Clock) (A)	Date	Time (24 Hr Clock) (B)		Starting Level (inches)	Final Level (inches)	
TK-001	5-1-03	0100	5-1-03	0745	6.45	30.84	5.34	30.24.50
TK 003	5-1-03	0806	5-1-03	0809	00'03	58.32	2.79	55.53
TK 003	5-1-03	0825	5-1-03	0827	00'02	53.89	0.00	53.87
Total Volume transferred (Gal)								
*Notes:- Verify Start and Stop pumping dates are accounted for in total hours.								
Comments:								

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4/29/03 5:48 PM

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S R Compliance

Vidmar  
May 15

Data Sheet 1 - Liquid Level Monitoring

	Initial	+ <u>1.2</u> HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS
DATE:	4/30/03	4/30/03						
TIME:	15:01	15:21						
TK-001 Level (Limit 120")* (Limit 216")**	92.6	92.6						
Sending Tank/Sump:								
Cell Sump 3	17.7	17.6						
Operator Initials:	<i>[Signature]</i>	<i>[Signature]</i>						
Actual Start Date/Time	4/30/03 15:04		Actual Stop Date/Time		4/30/03 15:21			
* Notify Shift Manager								
** Stop Transfer								

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4/29/03 3:43 PM

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T S R Compliance

## Transfer Information Record Sheet

Record information as applicable to transfer.		
Date/Time		Sheet <u>1</u> of <u>   </u>
4/30/03 / 1217	Completed pre-reqs per section 5.1	
1317	Filled surge tank to 54.84"	
1341	Started Tank 2 to Tank 1 Transfer	
1412	Completed Tank 2 to Tank 1 Transfer	
1428	Started Tank 3 to Tank 1 Transfer	
1441	Completed Tank 3 to Tank 1 Transfer	
1450	Started Tank 4 to Tank 1 Transfer	
1458	Completed Tank 4 to Tank 1 Transfer	
1504	Started Cell 3 Sump to Tank 1 Transfer	
1521	Completed Cell 3 Sump to Tank 1 Transfer	
5/1/03 0100	started Recirc. of Tank 1	
0745	Completed Recirc. of Tank 1	
0827	Completed 2 flushes.	

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5/2/03 6:54 AM

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DATE STARTING: <b>MAY 05 2003</b>									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
<b>244-AR VAULT</b>									
<b>Instrument Panel</b>									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.05	IN 94.00	IN 94.05	IN 94.05	IN 94.07	IN 94.05	IN 94.05
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN .086	IN .095	IN .084	IN .082	IN .104	IN .084	IN .076
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN (-.006)	IN -.001	IN (-.008)	IN -.010	IN (.004)	IN (-.002)	IN (-.005)
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN .091	IN .091	IN .089	IN .084	IN .095	IN .093	IN .088
<b>COMMENTS: NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .131	IN .135	IN .126	IN .125	IN .138	IN .135	IN .130
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .060	IN .078	IN .069	IN .067	IN .079	IN .071	IN .067
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.59	IN 17.60	IN 17.590	IN 17.573	IN 17.572	IN 17.547	IN 17.527
<b>NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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⓪ Below normal range / Tanks pumps down and moved

**Appendix A.3. Transfer Summary Sheets with Level Readings and Liquid Level  
Surveillance Data Sheets for Tank 244-AR-TK-003**

Tank 3

4/16/03 9:31 AM	WORKING COPY	T S R Compliance
Tank Farm Operating Procedure		244-AR



Double click to change COPY type

Transfer log# 03-T-0019

Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to 244-AR Tank TK-001

The original signatures are on file.

PCA Incorporated:	TF-2003-0397	
Procedure Signatures for:	TO-280-050 B5	
Type of Change:	PCA	
Review Designator:	NA	
USQ Screening Number:	TF-03-1590-AA, TF-03-1578-S	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops	<u>T. Berger</u>	<u>04/14/2003</u>
Shift Manager	<u>J. Andrews</u>	<u>04/14/2003</u>
Engineering	<u>T. Laney</u>	<u>04/15/2003</u>
Criticality Prevention		
Quality Assurance		
Environmental Engineering		
Safety		
RadCon		
Technical Writer	<u>S. Burns</u>	<u>04/15/2003</u>
Approval Authority	<u>S. Kelly</u>	<u>04/15/2003</u>
<b>Justification:</b>		
Operation Request		
<b>Summary of Changes:</b>		
Added new step and moved NOTE to reflect changed configuration and deleted part of note to maintain transfer control with OE.		

Next Periodic Review Due - 01/20/2005

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Data Sheet 1 - Liquid Level Monitoring

	Initial	+ .5 HOURS	+ 1.0 HOURS	+ 2.0 HOURS	+ 3.0 HOURS	+ 3 <sup>1</sup> / <sub>2</sub> HOURS	+ _____ HOURS	+ _____ HOURS
DATE:	4-16-03	4-16-03	4-16-03	4-16-03	4-16-03			
TIME:	13:00	14:09	14:39	15:39	16:39	17:19		
TK-001 Level (Limit 120")* (Limit 216")**	16.31"	16.67"	17.9"	21.6	24.7"	26.2"		
Sending Tank/Sump:	44.2"	42.7	35.1"	20.1"	6.2"	.5"		
Tk 003								
Operator Initials:	LSY	LSY	LSY	LSY	LSY	LSY		
Actual Start Date/Time	13:39 4-16-03		Actual Stop Date/Time		4-16-03 1710			
* Notify Shift Manager ** Stop Transfer								

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4/16/03 9:31 AM

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T S R Compliance

## Transfer Information Record Sheet

Record information as applicable to transfer.		
Date/Time		Sheet 1 of 1
4/16/03/1000	started pre-regs. Manual valves in canyon were verified on 4/8/03 per step 5.1.8.	
	Step 5.1.9 was completed on 4/8/03	
4/16/03/1253	Pre-regs complete	
1324	started <del>4/16/03</del> Completed Backflush	
1339	started Transfer	
1350	Received LDE-503 Alarm. Transfer pump s/p p sump pump started LDE-503 cleared immediately	
1400	SOM gave permission to restart transfer.	
1410	Restarted transfer, LDE-503 Appears to be spurious alarm.	
1709	Completed Tank 3 to Tank 1 Transfer Will not perform flush until all transfers are complete.	

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Tank 3 2nd Try, Receive 10 hours

4/21/03 6:59 AM	<b>WORKING COPY</b>	<b>T S R Compliance</b>
Tank Farm Operating Procedure		244-AR



Double click to change COPY type *Transfer log 03-T-0027*

Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to 244-AR Tank TK-001
---

The original signatures are on file.

PCA Incorporated:	TF-2003-0397	
Procedure Signatures for:	TO-280-050 B5	
Type of Change:	PCA	
Review Designator:	NA	
USQ Screening Number:	TF-03-1590-AA, TF-03-1578-S	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops	<u>T. Berger</u>	<u>04/14/2003</u>
Shift Manager	<u>J. Andrews</u>	<u>04/14/2003</u>
Engineering	<u>T. Laney</u>	<u>04/15/2003</u>
Criticality Prevention		
Quality Assurance		
Environmental Engineering		
Safety		
RadCon		
Technical Writer	<u>S. Burns</u>	<u>04/15/2003</u>
Approval Authority	<u>S. Kelly</u>	<u>04/15/2003</u>
<b>Justification:</b>		
Operation Request		
<b>Summary of Changes:</b>		
Added new step and moved NOTE to reflect changed configuration and deleted part of note to maintain transfer control with OE.		

Next Periodic Review Due – 01/20/2005

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Data Sheet 1 - Liquid Level Monitoring

	Initial	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS
DATE:	4-21-03	4-21-03						
TIME:	11:10	11:49						
TK-001 Level (Limit 120")* (Limit 216")**	90.1"	90.1"						
Sending Tank/Sump:	-.2"	-.1"						
TK-003								
Operator Initials:	<i>[Signature]</i>	<i>[Signature]</i>						
Actual Start Date/Time	4-21-03 / 11:30 41		Actual Stop Date/Time			11 49 / 4/21/03		
* Notify Shift Manager ** Stop Transfer								

- ① • Tk-200 38.1" prior to backflush.
- MOV-203 closed manually during transfer.
- Tk-200 49.36" post transfer *[Signature]*

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*Repumping of Tank 2, 3, 4 and Cell 3 Sump, Receive, Flush*

4/29/03 3:52 PM	<b>WORKING COPY</b>	<b>T S R Compliance</b>
Tank Farm Operating Procedure		244-AR



Double click to change COPY type

*Transfer log # 03-T-0030*

Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to 244-AR Tank TK-001
--

The original signatures are on file.

PCA Incorporated:	TF-2003-0435	
Procedure Signatures for:	TO-280-050 B6	
Type of Change:	PCA	
Review Designator:	NA	
USQ Screening Number:	TF-03-0596-D	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops	<u>V. Miller</u>	<u>04/28/2003</u>
Shift Manager	<u>J. Andrews</u>	<u>04/28/2003</u>
	<u>S. Ringo</u>	<u>04/29/2003</u>
	<u>T. Laney</u>	<u>04/29/2003</u>
Engineering		
Criticality Prevention		
Quality Assurance		
Environmental Engineering		
Safety		
RadCon		
Technical Writer	<u>W. White</u>	<u>04/29/2003</u>
Approval Authority	<u>S. Ringo</u>	<u>04/29/2003</u>
<b>Justification:</b>		
Operation Request		
<b>Summary of Changes:</b>		
Deleted LCO 3.1.3. Made editorial changes. Deleted pre-transfer backflush. Modified wording to allow multiple transfers without shutting down between transfers. Deleted unused causes for shutdowns.		

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4/29/03 3:52 PM

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A S R Compliance

Data Sheet 1 - Liquid Level Monitoring

	Initial	+ <u>0.5</u> HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS
DATE:	4/30/03	4/30/03						
TIME:	13:40	14:11						
TK-001 Level (Limit 120")* (Limit 216")**	91.8"	92.4						
Sending Tank/Sump:	.1"	.1						
TK-002								
Operator Initials:	ES	ES						
Actual Start Date/Time	13:41 / 4/30/03		Actual Stop Date/Time		14:12 / 4/30/03			
* Notify Shift Manager								
** Stop Transfer								

31.2 4/30/03 14:12  
54.5 5/10/03 33.2

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Data Sheet 1 - Liquid Level Monitoring

	Initial	+ $\frac{.2}{\text{HOURS}}$	+ $\frac{\quad}{\text{HOURS}}$					
DATE:	4/30/03	4/30/03	<i>Stop</i>					
TIME:	14:44	14:58						
TK-001 Level (Limit 120")* (Limit 216")**	92.6	92.6						
Sending Tank/Sump:								
TK-004	-0.0	-0.0						
Operator Initials:	<i>JK</i>	<i>JK</i>						
Actual Start Date/Time	4/30/03 / 14:50		Actual Stop Date/Time	4/30/03 / 14:58				
* Notify Shift Manager								
** Stop Transfer								

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14:44 Start  
 15:10 End  
 TK-001 92.57  
 TK-004 -0.01  
 TK-200 30.15  
 TK-001 92.57  
 TK-004 -0.01  
 TK-200 30.29

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Data Sheet 1 - Liquid Level Monitoring

	Initial	+ .28 HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS
DATE:	4/30/03	4/30/03						
TIME:	14:23	14:41						
TK-001 Level (Limit 120")* (Limit 216")**	92.4	92.6						
Sending Tank/Sump:								
<del>TK-30</del> TK-003	-0.0	- .1						
Operator Initials:	<i>ES</i>	<i>ES</i>						
Actual Start Date/Time	4/30/03 14:28		Actual Stop Date/Time			4/30/03 14:41		
* Notify Shift Manager								
** Stop Transfer								

Shut  
 TK-001 92.36 92.57 + 0.21 + 39  
 TK-200 33.32 30.16 - 3.16  
 39

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S R Compliance

Data Sheet 2 - Back Flush/Recirculation/Flush

Tanks Being Back Flushed (TK001, TK002, TK003, TK004, Cell 3 Sump)	Pumping Start		Pumping Stop		Total Pump Time (C=B-A)	AR244-WT-TK-200		Volume Pumped from AR244-WT-TK-200 (inches)
	Date	Time (24 Hr Clock) (A)	Date	Time (24 Hr Clock) (B)		Starting Level (inches)	Final Level (inches)	
TK-001	5-1-03	0100	5-1-03	0745	6.45	30.84	5.34	30.24.50
TK 003	5-1-03	0806	5-1-03	0809	00'03	58.32	2.79	55.53
TK 003	5-1-03	0825	5-1-03	0827	00'02	53.99	0.00	53.87
Total Volume transferred (Gal)								
*Notes - Verify Start and Stop pumping dates are accounted for in total hours.								
Comments:								

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Vis. 100  
14.4/15

Data Sheet 1 - Liquid Level Monitoring

	Initial	+ <u>0.2</u> HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS
DATE:	4/30/03	4/30/03						
TIME:	15:01	15:21						
TK-001 Level (Limit 120")* (Limit 216")**	92.4	92.6						
Sending Tank/Sump:								
Cell Sump 3	17.7	17.6						
Operator Initials:	<i>TD</i>	<i>TD</i>						
Actual Start Date/Time	4/30/03 15:04		Actual Stop Date/Time			4/30/03 15:21		
* Notify Shift Manager								
** Stop Transfer								

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4/29/03 3:43 PM

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T S R Compliance

## Transfer Information Record Sheet

Record information as applicable to transfer.		
Date/Time		Sheet <u>1</u> of <u>    </u>
4/30/03	1217	Completed pre-regs per section 5.1
	1317	Filled surge tank to 54.84"
	1341	Started Tank 2 to Tank 1 Transfer
	1412	Completed Tank 2 to Tank 1 Transfer
	1425	Started Tank 3 to Tank 1 Transfer
	1441	Completed Tank 3 to Tank 1 Transfer
	1456	Started Tank 4 to Tank 1 Transfer
	1458	Completed Tank 4 to Tank 1 Transfer
	1504	Started Cell 3 Sump to Tank 1 Transfer
	1521	Completed Cell 3 Sump to Tank 1 Transfer
5/1/03	0100	started Recirc. of Tank 1
	0745	Completed Recirc. of Tank 1
	0827	Completed 2 flushes.

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5/2/03 6:54 AM

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DATE STARTING: <b>MAY 05 2003</b>									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
<b>244-AR VAULT</b>									
<b>Instrument Panel</b>									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.05	IN 94.06	IN 94.05	IN 94.05	IN 94.07	IN 94.05	IN 94.05
WFIT-002-1, TK-002 *	0-180 IN	208 IN OSD	IN .086	IN .095	IN .084	IN .082	IN .104	IN .084	IN .076
WFIT-003-1, TK-003 *	0-80 IN	106 IN OSD	IN (-.006)	IN -.001	IN (-.008)	IN -.010	IN (-.004)	IN (-.002)	IN (-.005)
WFIT-004-1, TK-004 *	0-80 IN	105 IN OSD	IN .091	IN .091	IN .089	IN .084	IN .095	IN .093	IN .088
<b>COMMENTS: NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .131	IN .135	IN .126	IN .125	IN .138	IN .135	IN .130
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .060	IN .078	IN .069	IN .067	IN .079	IN .071	IN .067
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.59	IN 17.60	IN 17.590	IN 17.573	IN 17.572	IN 17.547	IN 17.527
<b>NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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Ⓞ Below normal range / Tanks P-112's down and moved

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**Appendix A.4. Transfer Summary Sheets with Level Readings and Liquid Level  
Surveillance Data Sheets for Tank 244-AR-TK-004**

Tank 4

4/16/03 9:32 AM

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T S R Compliance

Tank Farm Operating Procedure

244-AR



Double click to change COPY type

TRANSFER log 03-T-0020

Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to  
244-AR Tank TK-001

The original signatures are on file.

PCA Incorporated:	TF-2003-0397	
Procedure Signatures for:	TO-280-050 B5	
Type of Change:	PCA	
Review Designator:	NA	
USQ Screening Number:	TF-03-1590-AA, TF-03-1578-S	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops	<u>T. Berger</u>	<u>04/14/2003</u>
Shift Manager	<u>J. Andrews</u>	<u>04/14/2003</u>
Engineering	<u>T. Laney</u>	<u>04/15/2003</u>
Criticality Prevention		
Quality Assurance		
Environmental Engineering		
Safety		
RadCon		
Technical Writer	<u>S. Burns</u>	<u>04/15/2003</u>
Approval Authority	<u>S. Kelly</u>	<u>04/15/2003</u>
<b>Justification:</b>		
Operation Request		
<b>Summary of Changes:</b>		
Added new step and moved NOTE to reflect changed configuration and deleted part of note to maintain transfer control with OE.		

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Data Sheet 1 - Liquid Level Monitoring

	Initial	+ .5 HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS
DATE:	4-16-03	4-16-03						
TIME:	1740	18:42						
TK-001 Level (Limit 120")* (Limit 216")**	26.2"	26.9"						
Sending Tank/Sump:	1.9"	0.0"						
TK004								
Operator Initials:	MS	MS						
Actual Start Date/Time	4-16-03 / 18:12			Actual Stop Date/Time	4-16-03 18:35			
* Notify Shift Manager ** Stop Transfer								

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18:05  
 Start 26.18 26.42 26.89 + 0.71" + 132 gall  
 TB-004 1.89 0.0 -0.01 + 12.35" + 24 gall  
 TB-200 36.77 55.25 49.12

2.05" =  
 1.89" =

time to p 81 gals.

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*Re pumping of Tank 2, 3, 4 and Cell 3 Sump, Recirc, Flush*

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Tank Farm Operating Procedure		244-AR

 Double click to change COPY type

*Transfer log# 03-T-0030*

Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to 244-AR Tank TK-001
---

The original signatures are on file.

PCA Incorporated:	TF-2003-0435	
Procedure Signatures for:	TO-280-050 B6	
Type of Change:	PCA	
Review Designator:	NA	
USQ Screening Number:	TF-03-0596-D	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops	<u>V. Miller</u>	<u>04/28/2003</u>
Shift Manager	<u>J. Andrews</u>	<u>04/28/2003</u>
	<u>S. Ringo</u>	<u>04/29/2003</u>
	<u>T. Laney</u>	<u>04/29/2003</u>
Engineering		
Criticality Prevention		
Quality Assurance		
Environmental Engineering		
Safety		
RadCon		
Technical Writer	<u>W. White</u>	<u>04/29/2003</u>
Approval Authority	<u>S. Ringo</u>	<u>04/29/2003</u>
<b>Justification:</b>		
Operation Request		
<b>Summary of Changes:</b>		
Deleted LCO 3.1.3. Made editorial changes. Deleted pre-transfer backflush. Modified wording to allow multiple transfers without shutting down between transfers. Deleted unused causes for shutdowns.		

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Data Sheet 1 - Liquid Level Monitoring

	Initial	+ <sup>0.5</sup> HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS
DATE:	4/30/03	4/30/03						
TIME:	13:40	14:11						
TK-001 Level (Limit 120")* (Limit 216")**	91.8"	92.4						
Sending Tank/Sump:	.1"	.1						
TK-002								
Operator Initials:	DB	DB						
Actual Start Date/Time	13:41 / 4/30/03		Actual Stop Date/Time		14:12 / 4/30/03			
* Notify Shift Manager ** Stop Transfer								

3:52 14:11 14:12  
91.8 92.4 93.2

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4/29/03 3:47 PM

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T S R Compliance

Data Sheet 1 - Liquid Level Monitoring

	Initial	+ .2 HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS
DATE:	4/30/03	4/30/03	4/30/03					
TIME:	14:44	14:58						
TK-001 Level (Limit 120")* (Limit 216")**	92.6	92.6						
Sending Tank/Sump:								
TK-004	-0.0	-0.0						
Operator Initials:	JS	JS						
Actual Start Date/Time	4/30/03 / 14:50		Actual Stop Date/Time	4/30/03 / 14:58				
* Notify Shift Manager								
** Stop Transfer								

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11:58  
 Start  
 TD-001 92.57  
 TD-004 -0.01  
 TD-200 30.15  
 15:10  
 End  
 92.57  
 -0.01  
 30.15

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Data Sheet 1 - Liquid Level Monitoring

	Initial	+ .28 HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS
DATE:	4/30/03	4/30/03						
TIME:	14:23	14:41						
TK-001 Level (Limit 120")* (Limit 216")**	92.4	92.6						
Sending Tank/Sump:								
<sup>4/30/03</sup> TK-301 Tk-003	-0.0	- .1						
Operator Initials:	<i>SB</i>	<i>SB</i>						
Actual Start Date/Time	4/30/03	14:28	Actual Stop Date/Time	4/30/03	14:41			
* Notify Shift Manager								
** Stop Transfer								

Start End  
 TK-001 92.26 92.57 + 39  
 TK-300 33.22 30.15 0.0  
 SB 4/30/03

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4/30/03  
15:21

Data Sheet 1 - Liquid Level Monitoring

	Initial	+ 0.2 HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS
DATE:	4/30/03	4/30/03						
TIME:	15:01	15:21						
TK-001 Level (Limit 120")* (Limit 216")**	92.6	92.6						
Sending Tank/Sump:								
Cull Sump 3	17.7	17.6						
Operator Initials:	<i>[Signature]</i>	<i>[Signature]</i>						
Actual Start Date/Time	4/30/03	15:04	Actual Stop Date/Time			4/30/03	15:21	
* Notify Shift Manager								
** Stop Transfer								

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4/29/03 3:43 PM

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T S R Compliance

## Transfer Information Record Sheet

Record information as applicable to transfer.	
Date/Time	Sheet <u>1</u> of <u>   </u>
4/30/03 / 1217	Completed pre-regs per section 5.1
1317	Filled surge tank to 54.84"
1341	Started Tank 2 to Tank 1 Transfer
1412	Completed Tank 2 to Tank 1 Transfer
1428	Started Tank 3 to Tank 1 Transfer
1441	Completed Tank 3 to Tank 1 Transfer
1450	Started Tank 4 to Tank 1 Transfer
1450	Completed Tank 4 to Tank 1 Transfer
1504	Started Cell 3 Sump to Tank 1 Transfer
1521	Completed Cell 3 Sump to Tank 1 Transfer
5/1/03 0100	started Recirc. of Tank 1
0745	Completed Recirc. of Tank 1
0827	Completed 2 flushes.

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5/2/03 6:54 AM

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DATE STARTING: <b>MAY 05 2003</b>									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
<b>244-AR VAULT</b>									
<b>Instrument Panel</b>									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.05	IN 94.00	IN 94.05	IN 94.05	IN 94.07	IN 94.05	IN 94.05
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN .086	IN .095	IN .084	IN .082	IN .104	IN .084	IN .076
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN (-.006)	IN -.001	IN (-.008)	IN -.010	IN (-.004)	IN (-.002)	IN (-.005)
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN .091	IN .091	IN .089	IN .084	IN .095	IN .093	IN .088
<b>COMMENTS: NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .131	IN .135	IN .126	IN .125	IN .138	IN .135	IN .130
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .060	IN .078	IN .069	IN .067	IN .079	IN .071	IN .067
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.59	IN 17.60	IN 17.590	IN 17.573	IN 17.572	IN 17.547	IN 17.527
<b>NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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⓪ Below normal range / Tanks pumped down and moved

**Appendix A.5. Liquid Level Surveillance Data Sheets for 244-AR Vault Cell 1 Sump**

4/24/03 7:43 AM

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DATE STARTING: APR 28 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	91.83	91.82	91.85	92.85	94.04	94.05	94.05
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	0.07	0.099	0.067	0.067	.082	.084	.082
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	0.081	0.092	0.071	0.161	0.01	0.003	0.017
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	0.078	0.105	0.069	0.066	.082	.098	.085
<b>COMMENTS: NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	0.035	0.068	0.025	0.027	0.122 ALL 15/5/03	.129	.120
WFIT-002-2, Sump-2* ER	0-22 IN	None	0.074	0.122	0.054	0.053	.066	.067	.065
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	17.750	17.667	17.691	17.531	17.65	17.625	17.606
<b>NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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Below Normal Range Tanks have been Pumped down & moved to WFIT-001 -1  
 28 4/30/03

5/2/03 6:54 AM

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DATE STARTING: <b>MAY 05 2003</b>									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
<b>244-AR VAULT</b>									
<b>Instrument Panel</b>									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.05	IN 94.06	IN 94.05	IN 94.05	IN 94.07	IN 94.05	IN 94.05
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN .086	IN .095	IN .084	IN .082	IN .104	IN .084	IN .076
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN (-.006)	IN (-.001)	IN (-.008)	IN (-.010)	IN (-.004)	IN (-.002)	IN (-.005)
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN .091	IN .091	IN .089	IN .084	IN .095	IN .093	IN .088
<b>COMMENTS: NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .131	IN .135	IN .126	IN .125	IN .138	IN .135	IN .130
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .060	IN .078	IN .069	IN .067	IN .079	IN .071	IN .067
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.59	IN 17.60	IN 17.590	IN 17.573	IN 17.572	IN 17.547	IN 17.527
<b>NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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Ⓞ Below normal range / Tanks pumped down and moved

5/8/03 9:53 AM

CONTROLLED COPY

DATE STARTING: MAY 12 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.05	IN 94.06	IN 94.06	IN 93.91	IN 94.05	IN 94.06	IN 94.06
WFIT-002-1, TK-002 *	0-180 IN	208 IN OSD	IN .072	IN .074	IN .073	IN -.079	IN .072	IN .079	IN 0.082
WFIT-003-1, TK-003 *	0-80 IN	106 IN OSD	IN -.009	IN -.012	IN -.005	IN -.150	IN -.008	IN -.002	IN 0.006
WFIT-004-1, TK-004 *	0-80 IN	105 IN OSD	IN .086	IN -.084	IN .089	IN -.061	IN .086	IN .090	IN 0.087
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .128	IN .123	IN .130	IN -.021	IN .126	IN .135	IN 0.131
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .058	IN .055	IN .061	IN -.079	IN .054	IN .065	IN 0.066
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.510	IN 17.492	IN 17.484	IN 17.302	IN 17.516	IN 17.420	IN 17.394
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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DATE STARTING: MAY 19 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
<b>244-AR VAULT</b>									
<b>Instrument Panel</b>									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.07	IN 94.06	IN 94.07	IN 94.06	IN 94.07	IN 94.07	IN 94.08
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN .081	IN .075	IN .070	IN .071	IN .073	IN .073	IN .072
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN Ⓢ -.006	IN Ⓢ -.010	IN Ⓢ -.010	IN Ⓢ -.006	IN Ⓢ -.005	IN Ⓢ -.007	IN Ⓢ .000
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN .088	IN .082	IN .083	IN .084	IN .088	IN .089	IN .092
<b>COMMENTS: NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .133	IN .126	IN .126	IN .124	IN .130	IN .131	IN .133
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .067	IN .059	IN .057	IN .056	IN .059	IN .058	IN .060
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.376	IN 17.352	IN 17.356	IN 17.307	IN 17.240	IN 17.30	IN 17.25
<b>NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

*Below Normal - no Action Required*

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DATE STARTING <b>MAY 26 2003</b>									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-I, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.08	IN 94.07	IN 94.16	IN 94.26	IN 94.26	IN 94.26	IN 94.27
WFIT-002-I, TK-002*	0-180 IN	208 IN OSD	IN .080	IN .078	IN -.086	IN .074	IN .075	IN -.074	IN .078
WFIT-003-I, TK-003*	0-80 IN	106 IN OSD	IN .010	IN .010	IN -.153	IN .005	IN .008	IN .009	IN .009
WFIT-004-I, TK-004*	0-80 IN	105 IN OSD	IN .103	IN .084	IN -.060	IN .102	IN .102	IN .106	IN .106
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .145	IN .143	IN -.020	IN .139	IN .142	IN .142	IN .147
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .070	IN .071	IN -.101	IN .062	IN .063	IN .062	IN .065
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.230	IN 17.209	IN 17.011	IN 17.144	IN 17.116	IN 3.614	IN 3.575
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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DATE STARTING: JUN 02 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.12	IN 94.67	IN 94.62	IN 94.46	IN 94.62	IN 94.62	IN 94.62
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN -.070	IN .070	IN .076	IN .081	IN .080	IN .087	IN .070
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN -.135	IN .004	IN .011	IN .146	IN .014	IN .022	IN .017
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN -.041	IN .099	IN .109	IN .048	IN .114	IN .120	IN .111
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN -.002	IN .143	IN .145	IN .015	IN .151	IN .154	IN .147
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN -.070	IN .066	IN .066	IN .093	IN .073	IN .080	IN .064
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.09	IN 17.47	IN 17.476	IN 17.286	IN 17.431	IN 17.414	IN 17.384
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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① SOM AWARE

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DATE STARTING: JUN 9 2003			MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
PARAMETER	NORMAL RANGE	OSD LIMIT							
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.60 <del>94.60</del> 06.03	IN ① 55.67	IN ① 42.65	IN ① 8.004	IN ② 2.160	IN ② 2.367	IN 2.405
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN .062 136.03 136.03	IN -.097	IN .064	IN -.065 <del>-.020</del> FILE ~	IN -.095 AT 6-13-03	IN .071	IN .076
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN .004	IN -.154	IN .004	IN -.148	IN -.163	IN .011	IN .015
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN .102	IN -.057	IN .101	IN -.051	IN -.054	IN .107	IN .113
<b>COMMENTS: NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .138	IN -.020	IN .137	IN -.016	IN -.020	IN .146	IN .150
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .055	IN -.101	IN .057	IN -.098	IN -.100	IN .065	IN .075
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.368	IN 17.178	IN 17.301	IN 17.122	IN 17.072	IN 17.206	IN 17.197
<b>NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

① TRANSFER TO 102-AY - WILL CONTINUE      ② xfer completed

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DATE STARTING: JUN 16 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 2.14	IN 2.42	IN 2.41	IN 2.460	IN 2.465	IN 2.48	IN 2.459
WFIT-002-1, TK-002 *	0-180 IN	208 IN OSD	IN .060	IN .070	IN .065	IN .063	IN .070	IN .075	IN .071
WFIT-003-1, TK-003 *	0-80 IN	106 IN OSD	IN .012	IN .013	IN .014	IN .006	IN .015	IN .011	IN .012
WFIT-004-1, TK-004 *	0-80 IN	105 IN OSD	IN .109	IN .107	IN .108	IN .103	IN .111	IN .113	IN .112
<b>COMMENTS: NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .145	IN .146	IN .144	IN .135	IN .141	IN .145	IN .146
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .064	IN .068	IN .061	IN .055	IN .057	IN .065	IN .067
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.39	IN 17.10	IN 17.07	IN 17.040	IN 17.017	IN 16.986	IN 17.009
<b>NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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DATE STARTING: JUN 23 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0 - 114 IN	216IN** OSD 120 IN*** AC 5.9	IN 2.472	IN 2.469	IN 2.482	IN 2.475	IN 2.474	IN 2.481	IN 2.472
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN .084	IN .063	IN .072	IN .069	IN .088	IN .079	IN .068
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN .011	IN .004 <del>0.011</del> TOL 1/2"	IN .010	IN .010	IN .004	IN .006	IN .010
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN .108	IN .092	IN .106	IN .109	IN .110	IN .111	IN .108
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .144	IN .129	IN .139	IN .136	IN .125	IN .121	IN .140
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .069	IN .052	IN .064	IN .060	IN .068	IN .059	IN .052
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 16.916	IN 16.870	IN 16.829	IN 16.778	IN 16.895	IN 16.799 <del>16.8</del>	IN 16.868
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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6/27/03 8:07 AM

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DATE STARTING: JUN 30 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 2.50	IN 2.499	IN 2.316 <del>2.43</del> 2.43	IN 2.406	IN 2.514	IN 2.505	IN 2.513
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN .076	IN .069	IN 0 -0.093	IN .061	IN .077	IN .065	IN .071
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN .016	IN .010	IN 0 -0.150	IN .010	IN .032	IN .005	IN .015
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN .118	IN .108	IN 0 -0.055	IN .098	IN .117	IN .108	IN .111
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .152	IN .143	IN 0 -0.020	IN .138	IN .150	IN .151	IN .143
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .066	IN .060	IN 0 -0.100	IN .059	IN .070	IN .060	IN .060
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 16.604	IN 16.539	IN 16.279	IN 16.234	IN 16.393	IN 16.231	IN 16.172
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

0 Below normal range NO ACTION Required 25 Jun 2003

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**Appendix A.6. Liquid Level Surveillance Data Sheets for 244-AR Vault Cell 2 Sump**

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DATE STARTING: APR 28 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 91.83	IN 91.82	IN 91.85	IN 92.85	IN 94.04	IN 94.05	IN 94.05
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN (-078)	IN (-099)	IN (-067)	IN (-067)	IN .082	IN .084	IN .082
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN (-081)	IN (-092)	IN (-071)	IN (-101)	IN -.01	IN (-.003)	IN (-.017)
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN (-078)	IN (-105)	IN (-069)	IN (-066)	IN .082	IN .098	IN .085
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN (-035)	IN (-068)	IN (-028)	IN (-027)	IN .122 ALL R/S 5/1/03	IN .124	IN .120
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN (-094)	IN (-122)	IN (-084)	IN (-083)	IN .066	IN .067	IN .065
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.750	IN 17.667	IN 17.691	IN 17.531	IN 17.65	IN 17.625	IN 17.606
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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*Below Normal Range Tanks have been Pumped down & moved to WFIT-001-1  
28 4/30/03*

5/2/03 6:54 AM

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DATE STARTING: <b>MAY 05 2003</b>									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
<b>244-AR VAULT</b>									
<b>Instrument Panel</b>									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.05	IN 94.00	IN 94.05	IN 94.05	IN 94.07	IN 94.05	IN 94.05
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN .086	IN .095	IN .084	IN .082	IN .104	IN .084	IN .076
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN (-.006)	IN -.001	IN (-.008)	IN -.010	IN (-.004)	IN (-.002)	IN (-.005)
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN .091	IN .091	IN .089	IN .084	IN .095	IN .093	IN .088
<b>COMMENTS: NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .131	IN .135	IN .126	IN .125	IN .138	IN .135	IN .130
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .060	IN .078	IN .069	IN .067	IN .079	IN .071	IN .067
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.59	IN 17.60 <sup>2</sup>	IN 17.590	IN 17.573	IN 17.572	IN 17.547	IN 17.527
<b>NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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Ⓞ Below normal range / Tanks pumped down and moved

5/8/03 9:53 AM

CONTROLLED COPY

DATE STARTING: MAY 12 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.05	IN 94.06	IN 94.06	IN 93.91	IN 94.05	IN 94.06	IN 94.06
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN .072	IN .074	IN .073	IN -.079	IN .072	IN .079	IN 0.082
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN -.009	IN -.012	IN -.005	IN -.150	IN -.008	IN -.002	IN 0.006
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN .086	IN -.087	IN .089	IN -.061	IN .086	IN .090	IN 0.087
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .128	IN .123	IN .130	IN -.021	IN .126	IN .135	IN 0.131
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .058	IN .055	IN .061	IN -.079	IN .054	IN .065	IN 0.066
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.510	IN 17.492	IN 17.484	IN 17.302	IN 17.516	IN 17.420	IN 17.394
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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DATE STARTING: <b>MAY 19 2003</b>									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
<b>244-AR VAULT</b>									
<b>Instrument Panel</b>									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.07	IN 94.06	IN 94.07	IN 94.06	IN 94.07	IN 94.07	IN 94.08
WFIT-002-1, TK-002 *	0-180 IN	208 IN OSD	IN -051	IN .075	IN .070	IN .071	IN .073	IN .073	IN .072
WFIT-003-1, TK-003 *	0-80 IN	106 IN OSD	IN (-.006)	IN (-.010)	IN (-.010)	IN (-.006)	IN (-.005)	IN (-.007)	IN .000
WFIT-004-1, TK-004 *	0-80 IN	105 IN OSD	IN -088	IN .082	IN .083	IN .084	IN .088	IN .089	IN .092
<b>COMMENTS: NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .133	IN .126	IN .126	IN .124	IN .130	IN .131	IN .133
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .067	IN .059	IN -057	IN 056	IN .059	IN .058	IN .060
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.376	IN 17.352	IN 17.356	IN 17.307	IN 17.240	IN 17.30	IN 17.25
<b>NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

*Below Normal" no action Required*

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DATE STARTING <b>MAY 26 2003</b>									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.08	IN 94.07	IN 94.10	IN 94.26	IN 94.26	IN 94.26	IN 94.27
WFIT-002-1, TK-002*	0-180 IN	208 IN OSD	IN .080	IN .078	IN -.086	IN .074	IN .075	IN -.074	IN .078
WFIT-003-1, TK-003*	0-80 IN	106 IN OSD	IN .010	IN .010	IN -.153	IN .005	IN .008	IN .009	IN .009
WFIT-004-1, TK-004*	0-80 IN	105 IN OSD	IN .103	IN .094	IN -.060	IN .102	IN .102	IN .106	IN .106
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .145	IN .143	IN -.020	IN .139	IN .142	IN .142	IN .147
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .070	IN .071	IN -.101	IN .062	IN .063	IN .062	IN .065
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.230	IN 17.209	IN 17.011	IN 17.144	IN 17.116	IN 3.614	IN 3.575
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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5/30/03 6:36 AM

WORKING COPY

DATE STARTING: JUN 02 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.12	IN 94.67	IN 94.62	IN 94.46	IN 94.62	IN 94.62	IN 94.62
WFIT-002-1, TK-002*	0-180 IN	208 IN OSD	IN -.070	IN .070	IN .076	IN .081	IN .080	IN .087	IN .070
WFIT-003-1, TK-003*	0-80 IN	106 IN OSD	IN -.135	IN .004	IN .011	IN .146	IN .014	IN .022	IN .017
WFIT-004-1, TK-004*	0-80 IN	105 IN OSD	IN -.041	IN .099	IN .109	IN .048	IN .114	IN .120	IN .111
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN -.002	IN .143	IN .145	IN .015	IN .151	IN .154	IN .147
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN -.070	IN .066	IN .066	IN .093	IN .073	IN .080	IN .064
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.09	IN 17.47	IN 17.476	IN 17.286	IN 17.431	IN 17.414	IN 17.384
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

① SOM ALWAYS

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6/5/03 9:07 AM

WORKING COPY

DATE STARTING: JUN 9 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 94.60 <del>94.60</del> 06/05/03	IN 55.67 <sup>①</sup>	IN 42.65 <sup>①</sup>	IN 80.04 <sup>①</sup>	IN 2.160 <sup>②</sup>	IN 2.367 <sup>②</sup>	IN 2.405
WFIT-002-1, TK-002 *	0-180 IN	208 IN OSD	IN .062 <del>138.03</del> 06/05/03	IN -.097	IN .064	IN -.065 <del>020</del> 06/05/03	IN -.095 <del>024</del> 06/13/03	IN .071	IN .076
WFIT-003-1, TK-003 *	0-80 IN	106 IN OSD	IN .004	IN -.154	IN .004	IN -.148	IN -.163	IN .011	IN .015
WFIT-004-1, TK-004 *	0-80 IN	105 IN OSD	IN .102	IN -.057	IN .101	IN -.051	IN -.054	IN .107	IN .113
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .138	IN -.020	IN .137	IN -.016	IN -.020	IN .146	IN .150
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .055	IN -.101	IN .057	IN -.095	IN -.100	IN .065	IN .075
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.368	IN 17.178	IN 17.301	IN 17.122	IN 17.072	IN 17.206	IN 17.197
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

① TRANSFER TO 102-AY - WILL CONTINUE

② xfer completed

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6/13/03 9:09 AM

WORKING COPY

DATE STARTING: JUN 16 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 2.14	IN 2.42	IN 2.41	IN 2.460	IN 2.465	IN 2.48	IN 2.459
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN .060	IN .070	IN .065	IN .063	IN .070	IN .075	IN .071
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN .012	IN .013	IN .014	IN .006	IN .015	IN .011	IN .012
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN .109	IN .107	IN .108	IN .103	IN .111	IN .113	IN .112
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .145	IN .146	IN .144	IN .135	IN .141	IN .145	IN .146
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .064	IN .068	IN .061	IN .055	IN .057	IN .065	IN .067
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 17.39	IN 17.10	IN 17.07	IN 17.040	IN 17.017	IN 16.986	IN 17.009
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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DATE STARTING: JUN 23 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 2.492	IN 2.469	IN 2.482	IN 2.475	IN 2.474	IN 2.481	IN 2.472
WFIT-002-1, TK-002 *	0-180 IN	208 IN OSD	IN .084	IN .063	IN .072	IN .069	IN .088	IN .079	IN .068
WFIT-003-1, TK-003 *	0-80 IN	106 IN OSD	IN .011	IN <del>.004</del> OTT 10.6.12	IN .010	IN .010	IN .004	IN .006	IN .010
WFIT-004-1, TK-004 *	0-80 IN	105 IN OSD	IN .108	IN .092	IN .106	IN .109	IN .110	IN .111	IN .108
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .144	IN .129	IN .139	IN .136	IN .125	IN .121	IN .140
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .069	IN .052	IN .064	IN .060	IN .068	IN .059	IN .052
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 16.916	IN 16.870	IN 16.829	IN 16.778	IN 16.845	IN 16.799 JMM	IN 16.868
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

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6/27/03 8:07 AM

WORKING COPY

DATE STARTING: JUN 30 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0 - 114 IN	216IN** OSD 120 IN*** AC 5.9	IN 2.50	IN 2.499	IN 2.316 <del>2.47</del> 2.47	IN 2.406	IN 2.514	IN 2.505	IN 2.513
WFIT-002-1, TK-002 *	0 - 180 IN	208 IN OSD	IN .076	IN .069	IN 0 -0.093	IN .061	IN .077	IN .065	IN .071
WFIT-003-1, TK-003 *	0 - 80 IN	106 IN OSD	IN .016	IN .010	IN 0 -0.150	IN .010	IN .032	IN .005	IN .015
WFIT-004-1, TK-004 *	0 - 80 IN	105 IN OSD	IN .118	IN .108	IN 0 -0.055	IN .098	IN .117	IN .108	IN .111
<b>COMMENTS: NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .152	IN .143	IN 0 -0.020	IN .138	IN .150	IN .151	IN .143
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .066	IN .060	IN 0 -0.100	IN .059	IN .070	IN .060	IN .060
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 16.604	IN 16.539	IN 16.279	IN 16.234	IN 16.293	IN 16.231	IN 16.172
<b>NOTE (information only):</b> * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

Ⓢ Below normal range NO ACTION Required RSM - 7/2/03

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**Appendix A.7. Transfer Summary Sheets with Level Readings and Liquid Level  
Surveillance Data Sheets for 244-AR Vault Cell 3 Sump**

4/8/03

4/8/03 8:43 AM	WORKING COPY	T S R Compliance
Tank Farm Operating Procedure		244-AR



Double click to change COPY type

Transfer log # 03-T-0018 (1 of 2)

Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to 244-AR Tank TK-001
--

The original signatures are on file.

PCA Incorporated:	TF-2003-0370	
Procedure Signatures for:	TO-280-050 B4	
Type of Change:	PCA	
Review Designator:	NA	
USQ Screening Number:	TF-03-0596-D R3	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops		
Shift Manager		
Engineering		
Criticality Prevention		
Quality Assurance		
Environmental Engineering		
Safety		
RadCon		
Technical Writer	<u>S. Burns</u>	<u>04/08/2003</u>
Approval Authority	<u>K. O. Smith</u>	<u>04/08/2003</u>
<b>Justification:</b>		
Administrative request		
<b>Summary of Changes:</b>		
Corrected misspelled words in Checklist 2.		

Next Periodic Review Due – 01/20/2005

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4/8/03 8:43 AM

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T S R Compliance

Data Sheet 1 – Liquid Level Monitoring

	Initial	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS
DATE:	4/8/03	4/8/03						
TIME:	1710	2047						
TK-001 Level (Limit 120")* (Limit 216")**	7.7	7.7						
Sending Tank/Sump:								
Cell 3 Sump	27.1	27.1						
Operator Initials:	UM	UM						
Actual Start Date/Time	4/8/03	2040	Actual Stop Date/Time	4/8/03	2047			
* Notify Shift Manager ** Stop Transfer								

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4/8/03 9:00 AM

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T S R Compliance

## Transfer Information Record Sheet

Record information as applicable to transfer.		
Date/Time		Sheet <u>1</u> of <u>    </u>
4/8/03	0945 <del>1045</del>	Completed Pre-job for Pre-reqs, Sect. 5.1, of Internal Transfer procedure.
1430		Completed Section 5.1 of procedure
1700		Completed pre-job. Obtained permission from Shift Manager to start transfer.
1715		Level indication for surge tank failed to register. Secured filling surge tank.
1925		Generated RWR to do controlled S/D.
1935		System S/D and restarted. Level indication returned
1937		Restarted tank 200 fill.
1945		Completed 200 fill
2025		Completed backflush
2040		Started Transfer
2045		Low Low Alarm came in. Verified pump 1 shutdown. Reinstalled Admin lock. Called Mark Dallas to come out and look at software.
2130		Mark Dallas looked at software. Appears to be Level instrument problem. Secured from transfer. No flush performed

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4/10/03

4/8/03 10:41 AM	WORKING COPY	T S R Compliance
Tank Farm Operating Procedure		244-AR



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Transfer log 03-T-0018 (2 of 2)

Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to 244-AR Tank TK-001
--

The original signatures are on file.

PCA Incorporated:	TF-2003-0370	
Procedure Signatures for:	TO-280-050 B4	
Type of Change:	PCA	
Review Designator:	NA	
USQ Screening Number:	TF-03-0596-D R3	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops		
Shift Manager		
Engineering		
Criticality Prevention		
Quality Assurance		
Environmental Engineering		
Safety		
RadCon		
Technical Writer	<u>S. Burns</u>	<u>04/08/2003</u>
Approval Authority	<u>K. O. Smith</u>	<u>04/08/2003</u>
<b>Justification:</b>		
Administrative request		
<b>Summary of Changes:</b>		
Corrected misspelled words in Checklist 2.		

Next Periodic Review Due - 01/20/2005

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T S R Compliance

Data Sheet 1 – Liquid Level Monitoring

	Initial	+ <sup>30min</sup> HOURS	+ <sup>1</sup> HOURS					
DATE:	4/10/03	4/10/03	4/10/03	4-10-03	4/10/03			
TIME:	1555	1905	1935	2035	2145			
TK-001 Level (Limit 120")* (Limit 216")**	9.4	11.1	12.4	15.7	16.3			
Sending Tank/Sump:								
cell 3 Sump	27.1	24.9	23.1	19.2	18.4			
Operator Initials:	UM	UM	UM	SP	UM			
Actual Start Date/Time	1626	4/10/03	①	Actual Stop Date/Time	4/10/03	1433	①	
* Notify Shift Manager								
** Stop Transfer								

① restarted @ 1835 4/10/03

① transfer complete @ 2043 4/10/03

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T S R Compliance

Data Sheet 2 – Back Flush/Recirculation/Flush

Tanks Being Back Flushed (TK001, TK002, TK003, TK004, Cell 3 Sump)	Pumping Start		Pumping Stop		Total Pump Time (C=B-A)	Volume Pumped from AR244-WT-TK-200 (inches)
	Date	Time (24 Hr Clock) (A)	Date	Time (24 Hr Clock) (B)		
Cell 3 Sump	4/10/03	1615	4/10/03	1616	1 min	49.59" - 40.32" = 9.27"
Cell 3 Sump	4/10/03	2115	4/10/03	2118	3 min	50.21" - 18.30" = 31.91"
Cell 3 Sump	4/10/03	2120 11 4/10	4/10/03	2125 11 4/10		
Total Volume transferred (Gal)						
*Notes - Verify Start and Stop pumping dates are accounted for in total hours.						
Comments: 2nd Flush not complete due to Hi Rad alarm on POR 06						

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4/8/03 12:09 PM

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T S R Compliance

## Transfer Information Record Sheet

Record information as applicable to transfer.		
Date/Time		Sheet <u>1</u> of <u>    </u>
4/10/03/1400	Conducted pre-job.	
1530	Completed pre-regs per section 5.1	
1545	Obtained permission from shift Manager to start transfer.	
1616	Completed back flush	
1626	Started transfer	
1639	Transfer shutdown due to Low Low level alarm	
1822	<del>4/10/03</del> Incorporated PCA into ARP-T-281-00002 which allows transfer to continue with Low Low alarm in.	
1935	Transfer started	
2049	Transfer secured. Only able to reach level of 18.1" in sump 3.	
<del>4/10/03</del> <sup>2126</sup> 2070	Completed 1/2 flushes. Received CAM Hi Rad Alarm on POR 06	
2130	Verified Exhauster shutdown automatically.	
2135	Shutdown portable exhauster system. HPT verified there was no activity on CAM filter paper.	

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Cell 3 Sump 4/18/03

4/18/03 6:56 AM	<b>WORKING COPY</b>	<b>T S R Compliance</b>
Tank Farm Operating Procedure		244-AR



Double click to change COPY type

*Transfer log 03-T-0026*

**Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to 244-AR Tank TK-001**

The original signatures are on file.

PCA Incorporated:	TF-2003-0397	
Procedure Signatures for:	TO-280-050 B5	
Type of Change:	PCA	
Review Designator:	NA	
USQ Screening Number:	TF-03-1590-AA, TF-03-1578-S	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops	<u>T. Berger</u>	<u>04/14/2003</u>
Shift Manager	<u>J. Andrews</u>	<u>04/14/2003</u>
Engineering	<u>T. Laney</u>	<u>04/15/2003</u>
Criticality Prevention		
Quality Assurance		
Environmental Engineering		
Safety		
RadCon		
Technical Writer	<u>S. Burns</u>	<u>04/15/2003</u>
Approval Authority	<u>S. Kelly</u>	<u>04/15/2003</u>
<b>Justification:</b>		
Operation Request		
<b>Summary of Changes:</b>		
Added new step and moved NOTE to reflect changed configuration and deleted part of note to maintain transfer control with OE.		

Next Periodic Review Due - 01/20/2005

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4/18/03 6:56 AM

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SR Compliance

Data Sheet 1 - Liquid Level Monitoring

	Initial	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS
DATE:	4/18/03	4/18/03						
TIME:	1816	<del>20</del> 2102						
TK-001 Level (Limit 120")* (Limit 216")**	90.0	90.0						
Sending Tank/Sump:	18.2	17.9						
Cell 3 Sump								
Operator Initials:	SPS	SPS						
Actual Start Date/Time	4-18-03 2045		Actual Stop Date/Time			4-18-03 2102		
* Notify Shift Manager ** Stop Transfer								

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*Re pumping of Tank 2, 3, 4 and Cell 3 Sump, Receive, Flush*

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<b>Tank Farm Operating Procedure</b>		<b>244-AR</b>



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*Transfer log # 03-T-0030*

<b>Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to 244-AR Tank TK-001</b>
--

The original signatures are on file.

PCA Incorporated:	TF-2003-0435	
Procedure Signatures for:	TO-280-050 B6	
Type of Change:	PCA	
Review Designator:	NA	
USQ Screening Number:	TF-03-0596-D	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops	<u>V. Miller</u>	<u>04/28/2003</u>
Shift Manager	<u>J. Andrews</u>	<u>04/28/2003</u>
	<u>S. Ringo</u>	<u>04/29/2003</u>
	<u>T. Laney</u>	<u>04/29/2003</u>
Engineering		
Criticality Prevention		
Quality Assurance		
Environmental Engineering		
Safety		
RadCon		
Technical Writer	<u>W. White</u>	<u>04/29/2003</u>
Approval Authority	<u>S. Ringo</u>	<u>04/29/2003</u>
<b>Justification:</b>		
Operation Request		
<b>Summary of Changes:</b>		
Deleted LCO 3.1.3. Made editorial changes. Deleted pre-transfer backflush. Modified wording to allow multiple transfers without shutting down between transfers. Deleted unused causes for shutdowns.		

Next Periodic Review Due – 01/20/2005

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Data Sheet 1 - Liquid Level Monitoring

	Initial	+ <u>2.5</u> HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS
DATE:	4/30/03	4/30/03						
TIME:	13:40	14:11						
TK-001 Level (Limit 120")* (Limit 216")**	91.8"	92.4						
Sending Tank/Sump:	.1"	.1						
TK-002								
Operator Initials:	JS	JS						
Actual Start Date/Time	13:41 / 4/30/03		Actual Stop Date/Time		14:12 / 4/30/03			
* Notify Shift Manager								
** Stop Transfer								

200 1400 100 21  
91.8 340 33.0

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4/29/03 3:47 PM

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f S R Compliance

Data Sheet 1 - Liquid Level Monitoring

	Initial	+ .2 HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS
DATE:	4/30/03	4/30/03						
TIME:	14:44	14:58						
TK-001 Level (Limit 120")* (Limit 216")**	92.6	92.6						
Sending Tank/Sump:								
TK-004	- .0	- 0.0						
Operator Initials:	<i>JS</i>	<i>JS</i>						
Actual Start Date/Time	4/30/03 / 14:50		Actual Stop Date/Time		4/30/03 / 14:58			
* Notify Shift Manager								
** Stop Transfer								

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11:55 Start  
 15:10 End  
 TO-001 92.57  
 TE-004 -0.01  
 T2-200 30.15  
 92.57  
 -0.01  
 30.29

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WORKING COPY

S R Compliance

Data Sheet 1 - Liquid Level Monitoring

	Initial	+ .28 HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS
DATE:	4/30/03	4/30/03						
TIME:	14:23	14:41						
TK-001 Level (Limit 120")* (Limit 216")**	92.4	92.6						
Sending Tank/Sump:								
<del>TK-001</del> TK-003	-0.0	- .1						
Operator Initials:	<i>ES</i>	<i>ES</i>						
Actual Start Date/Time	4/30/03 14:28		Actual Stop Date/Time		4/30/03 14:41			
* Notify Shift Manager								
** Stop Transfer								

Start End  
 TK-001 92.36 92.57 + 0.21 + 30  
 TK-003 33.32 30.16 - 3.16 - 10  
*ES*

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Type <b>CONTINUOUS</b>	Document No. <b>TO-280-050</b>	Rev/Mod <b>B-6</b>	Release Date <b>04/29/2003</b>	Page <b>35 of 43</b>
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4/29/03 3:52 PM

WORKING COPY

S R Compliance

Data Sheet 2 - Back Flush/Recirculation/Flush

Tanks Being Back Flushed (TK001, TK002, TK003, TK004, Cell 3 Sump)	Pumping Start		Pumping Stop		Total Pump Time (C=B-A)	AR244-WT-TK-200		Volume Pumped from AR244-WT-TK-200 (inches)
	Date	Time (24 Hr Clock) (A)	Date	Time (24 Hr Clock) (B)		Starting Level (inches)	Final Level (inches)	
TK-001	5-1-03	0100	5-1-03	0745	6.45	30.84	5.34	30. 24.50
TK 003	5-1-03	0806	5-1-03	0809	00'03	58.32	2.79	55.53
TK 003	5-1-03	0825	5-1-03	08:27	00'02	53.89	0.00	53.8
Total Volume transferred (Gal)								
*Notes - Verify Start and Stop pumping dates are accounted for in total hours.								
Comments:								

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V. J. J. J.  
11 Aug 15

Data Sheet 1 - Liquid Level Monitoring

	Initial	+ <u>12</u> HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS	+ _____ HOURS
DATE:	4/30/03	4/30/03						
TIME:	15:01	15:21						
TK-001 Level (Limit 120")* (Limit 216")**	92.6	92.6						
Sending Tank/Sump:								
Cell Sump 3	17.7	17.6						
Operator Initials:	<i>[Signature]</i>	<i>[Signature]</i>						
Actual Start Date/Time	4/30/03 15:04		Actual Stop Date/Time			4/30/03 15:21		
* Notify Shift Manager								
** Stop Transfer								

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4/29/03 3:43 PM

WORKING COPY

T S R Compliance

## Transfer Information Record Sheet

Record information as applicable to transfer.		
Date/Time		Sheet <u>1</u> of <u>    </u>
4/30/03/ 1217	Completed pre-regs per section 5.1	
1317	Filled surge tank to 54.84"	
1341	Started Tank 2 to Tank 1 Transfer	
1412	Completed Tank 2 to Tank 1 Transfer	
1428	Started Tank 3 to Tank 1 Transfer	
1441	Completed Tank 3 to Tank 1 Transfer	
1450	Started Tank 4 to Tank 1 Transfer	
1450	Completed Tank 4 to Tank 1 Transfer	
1504	Started Cell 3 Sump to Tank 1 Transfer	
1521	Completed Cell 3 Sump to Tank 1 Transfer	
5/1/03 0100	started Recirc. of Tank 1	
0745	Completed Recirc. of Tank 1	
0827	Completed 2 flushes.	

Type <b>CONTINUOUS</b>	Document No. <b>TO-280-050</b>	Rev/Mod <b>B-6</b>	Release Date <b>04/29/2003</b>	Page <b>37 of 43</b>
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5/27/2003 10:15 AM

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T S R Compliance

Tank Farm Operating Procedure

244-AR



Double click to change COPY type

*TRANSFER log 03-T-0033*Internal Transfer from 244-AR Tanks TK-002, TK-003, TK-004 or Cell 3 Sump to  
244-AR Tank TK-001

The original signatures are on file.

PCA Incorporated:	TF-2003-0435	
Procedure Signatures for:	TO-280-050 B6	
Type of Change:	PCA	
Review Designator:	NA	
USQ Screening Number:	TF-03-0596-D	
<b>POSITION/ORG</b>	<b>DELEGATE</b>	<b>DATE</b>
NCO/Ret Ops	<u>V. Miller</u>	<u>04/28/2003</u>
Shift Manager	<u>J. Andrews</u>	<u>04/28/2003</u>
	<u>S. Ringo</u>	<u>04/29/2003</u>
	<u>T. Laney</u>	<u>04/29/2003</u>
Engineering		
Criticality Prevention		
Quality Assurance		
Environmental Engineering		
Safety		
RadCon		
Technical Writer	<u>W. White</u>	<u>04/29/2003</u>
Approval Authority	<u>S. Ringo</u>	<u>04/29/2003</u>
<b>Justification:</b>		
Operation Request		
<b>Summary of Changes:</b>		
Deleted LCO 3.1.3. Made editorial changes. Deleted pre-transfer backflush. Modified wording to allow multiple transfers without shutting down between transfers. Deleted unused causes for shutdowns.		

Next Periodic Review Due – 01/20/2005

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S R Compliance

Data Sheet 1 - Liquid Level Monitoring

	Initial	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS	+ HOURS
DATE:	6/2/03	6/2/03						
TIME:	1030	1050						
TK-001 Level (Limit 120")* (Limit 216")**	94.0"	94.4						
Sending Tank/Sump:								
Cell 3 Sump	16.9"	17.5						
Operator Initials:	MM	MM						
Actual Start Date/Time	1030	6/2/03	Actual Stop Date/Time			1035	6/2/03	
* Notify Shift Manager ** Stop Transfer								

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6/27/03 8:07 AM

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DATE STARTING: JUN 30 2003									
PARAMETER	NORMAL RANGE	OSD LIMIT	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
244-AR VAULT									
Instrument Panel									
WFIT-001-1, TK-001*	0-114 IN	216IN** OSD 120 IN*** AC 5.9	IN 2.50	IN 2.499	IN 2.316 <del>2.47</del> 2.224	IN 2.406	IN 2.514	IN 2.505	IN 2.513
WFIT-002-1, TK-002 *	0-180 IN	208 IN OSD	IN .076	IN .069	IN <del>0.093</del>	IN .061	IN .077	IN .065	IN .071
WFIT-003-1, TK-003 *	0-80 IN	106 IN OSD	IN .016	IN .010	IN <del>0.150</del>	IN .010	IN .022	IN .005	IN .015
WFIT-004-1, TK-004 *	0-80 IN	105 IN OSD	IN .118	IN .108	IN <del>0.055</del>	IN .098	IN .117	IN .108	IN .111
COMMENTS: NOTE (information only): * Data may be taken by installed level Instruments or Manometer. ** OSD-T-151-00015 *** Shift manager must be notified immediately if liquid level reaches or exceeds 120 inches.									
WFIT-001-2, Sump-1* ER	0-22 IN	None	IN .152	IN .143	IN <del>0.020</del>	IN .138	IN .150	IN .151	IN .143
WFIT-002-2, Sump-2* ER	0-22 IN	None	IN .066	IN .060	IN <del>0.100</del>	IN .059	IN .070	IN .060	IN .060
WFIT-004-2, Sump-3* ER	0-18 IN	52 IN**** OSD	IN 16.604	IN 16.539	IN 16.279	IN 16.234	IN 16.293	IN 16.231	IN 16.172
NOTE (information only): * Data may be taken by installed level Instruments or Manometer. **** OSD-T-151-00015 Shift manager must be notified immediately if liquid level reaches 52 inches.									

① Below normal range NO ACTION Required RSM 7/2/03

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CONTINUOUS	TF-OR-EF-244AR	D-15	02/13/2003	3 of 7

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**APPENDIX B. COMPLETED CALIBRATION DATA SHEETS FOR LIQUID LEVEL  
MONITORING INSTRUMENTS IN 244-AR VAULT CELLS 1, 2, AND 3 SUMPS**

## =====PM/S Activity (P200)=====

Page: 1

10:40:29 11 JUL 2003

1. PM/S Number ET-00930 2. Type 7 INSTRUMENT CALIBRATION PROGRAM  
 3. Title CELL 1 SUMP WEIGHT FACTOR

4. Requirements Document & Section WAC 173-303  
 5. Description

6. Component Number WFIT-001-2 Safety Class GS  
 Component Name SUMP 1 WEIGHT FACTOR  
 7. Procedure Number 6-PCD-373 Title YOKOGAWA DIFFERENTIAL PRESSURE  
 Procedure Type OVERCAL  
 8. Recall Basis 1 PERIODIC, CALENDAR DATE  
 9. Phase Designator ENVIR ENVIRONMENTAL  
 10. Next Due Date 02/14/04 11. Last Done Date 03/21/03  
 12. Frequency 330 Days 13. Grace Period 10 %  
 14. Next Due Calc 2 FREQUENCY + LAST DONE DATE  
 15. Fixed Due Dates  
 16. Group 44AR2 17. Mode N/A  
 18. Operations Rel. Req'd. Y  
 19. PM/S Authority LANEY, T  
 20. Associated Components

Number	Name
--------	------

21. Associated PM/S	Number	Title
---------------------	--------	-------

22. Reference Documents	Type
6-PCD-373	PROC
WAC 173-303	ENVI
TF-97-0283 R3	USQ
TF-02-0332	USQ

23. Resources Required	Res Code	Description	No.	Est Hrs
	18	Instrument Technician	2	4

24. Component Operating Parameters	Input Range Low	Input Range High	Input M&TE Tolerance	Output Range Low	Output Range High	Output M&TE Tolerance
	0	48	0.5 %	4	20	2.0 %
	IN H2O			MA		

25. Body Type F FREE FORM

26. Comments

## =====PM/S Activity (P200)=====

-----PM/S Activity (P200)-----

Page: 2

10:40:29 11 JUL 2003

1. PM/S Number ET-00930 2. Type 7 INSTRUMENT CALIBRATION PROGRAM  
 3. Title CELL 1 SUMP WEIGHT FACTOR

-----Freeform Body (P202)-----

TRANSMITTER: HART PROTOCOL

INPUT H20	DISPLAY IN H20			TOLERANCE		OUTPUT MA			TOLERANCE	
	AS FOUND	I/O	AS LEFT	LOW LIMIT	UP LIMIT	AS FOUND	I/O	AS LEFT	LOW LIMIT	UP LIMIT
0				-1	1				3.96	4.06
12				11	13				7.96	8.06
24				23	25				11.96	12.06
36				35	37				15.96	16.06
48				47	49				19.96	20.06

-----PM/S Activity (P200)-----

## =====PM/S Activity (P200)=====

Page: 1

10:41:15 11 JUL 2003

1. PM/S Number ET-00959 2. Type 7 INSTRUMENT CALIBRATION PROGRAM  
 3. Title SUMP NO. 2 WEIGHT FACTORS

4. Requirements Document & Section WAC 173-303  
 5. Description

6. Component Number WFIT-002-2 Safety Class GS  
 Component Name SUMP NO. 2 WEIGHT FACTORS  
 7. Procedure Number 6-PCD-373 Title YOKOGAWA DIFFERENTIAL PRESSURE  
 Procedure Type OVERCAL  
 8. Recall Basis 1 PERIODIC, CALENDAR DATE  
 9. Phase Designator ENVIR ENVIRONMENTAL  
 10. Next Due Date 11/14/03 11. Last Done Date 12/19/02  
 12. Frequency 330 Days 13. Grace Period 10 %  
 14. Next Due Calc 2 FREQUENCY + LAST DONE DATE  
 15. Fixed Due Dates  
 16. Group 44AR2 17. Mode N/A  
 18. Operations Rel. Req'd. Y  
 19. PM/S Authority LANEY, T  
 20. Associated Components

Number	Name
--------	------

21. Associated PM/S Number	Title
-------------------------------	-------

22. Reference Documents	Type
6-PCD-373	PROC
WAC 173-303	ENVI
SPECIAL RWP E-1001	RWP
TF-97-0283 R3	USQ
TF-02-0332	USQ

23. Resources Required		No.	Est Hrs
Res Code	Description		
18	Instrument Technician	2	4

24. Component Operating Parameters			
Input Range Low	0	Input Range High	48
Input Range Units	IN H2O	Input M&TE Tolerance	0.5 %
Output Range Low	4	Output Range High	20
Output Range Units	MA	Output M&TE Tolerance	2.0 %

25. Body Type F FREE FORM

26. Comments

## =====PM/S Activity (P200)=====

=====PM/S Activity (P200)=====

Page: 2

10:41:15 11 JUL 2003

1. PM/S Number ET-00959 2. Type 7 INSTRUMENT CALIBRATION PROGRAM  
 3. Title SUMP NO. 2 WEIGHT FACTORS

=====Freeform Body (P202)=====

TRANSMITTER: HART PROTOCOL

INPUT H20	DISPLAY IN H20			TOLERANCE		OUTPUT MA			TOLERANCE	
	AS FOUND	I/O	AS LEFT	LOW LIMIT	UP LIMIT	AS FOUND	I/O	AS LEFT	LOW LIMIT	UP LIMIT
0				-1	1				3.96	4.06
12				11	13				7.96	8.06
24				23	25				11.96	12.06
36				35	37				15.96	16.06
48				47	49				19.96	20.06

=====PM/S Activity (P200)=====

## =====PM/S Activity (P200)=====

Page: 1

10:41:50 11 JUL 2003

1. PM/S Number ET-00987 2. Type 7 INSTRUMENT CALIBRATION PROGRAM  
 3. Title SUMP NO. 3 WEIGHT FACTORS

4. Requirements Document & Section WAC 173-303  
 5. Description

6. Component Number WFIT-004-2 Safety Class GS  
 Component Name SUMP NO. 3 WEIGHT FACTORS  
 7. Procedure Number 6-PCD-373 Title YOKOGAWA DIFFERENTIAL PRESSURE  
 Procedure Type OVERCAL  
 8. Recall Basis 1 PERIODIC, CALENDAR DATE  
 9. Phase Designator ENVIR ENVIRONMENTAL  
 10. Next Due Date 11/14/03 11. Last Done Date 12/19/02  
 12. Frequency 330 Days 13. Grace Period 10 %  
 14. Next Due Calc 2 FREQUENCY + LAST DONE DATE  
 15. Fixed Due Dates  
 16. Group 44AR2 17. Mode N/A  
 18. Operations Rel. Req'd. Y  
 19. PM/S Authority LANEY,T  
 20. Associated Components

Number	Name
--------	------

21. Associated PM/S  
 Number Title

Reference Documents	Type
6-PCD-373	PROC
WAC 173-303	ENVI
SPECIAL RWP E-1001	RWP
TF-97-0283 R3	USQ
TF-02-0332	USQ

23. Resources Required

Res Code	Description	No.	Est Hrs
18	Instrument Technician	2	2

24. Component Operating Parameters

Input Range Low	0	Input Range High	48
Input Range Units	IN H2O	Input M&TE Tolerance	0.5 %
Output Range Low	4	Output Range High	20
Output Range Units	MA	Output M&TE Tolerance	2.0 %

25. Body Type F FREE FORM

26. Comments

## =====PM/S Activity (P200)=====

=====PM/S Activity (P200)=====

Page: 2

10:41:50 11 JUL 2003

1. PM/S Number ET-00987 2. Type 7 INSTRUMENT CALIBRATION PROGRAM  
 3. Title SUMP NO. 3 WEIGHT FACTORS

=====Freeform Body (P202)=====

TRANSMITTER: HART PROTOCOL

INPUT H20	DISPLAY IN H20			TOLERANCE		OUTPUT MA			TOLERANCE	
	AS FOUND	I/O	AS LEFT	LOW LIMIT	UP LIMIT	AS FOUND	I/O	AS LEFT	LOW LIMIT	UP LIMIT
0				-1	1				3.96	4.06
12				11	13				7.96	8.06
24				23	25				11.96	12.06
36				35	37				15.96	16.06
48				47	49				19.96	20.06

=====PM/S Activity (P200)=====

**APPENDIX C. LEVEL HISTORY SHEETS**  
**244-AR VAULT TANKS 001, 002, 003, 004, AND CELL 1, 2, AND 3 SUMPS**

Retrieval Date: 07/17/2003

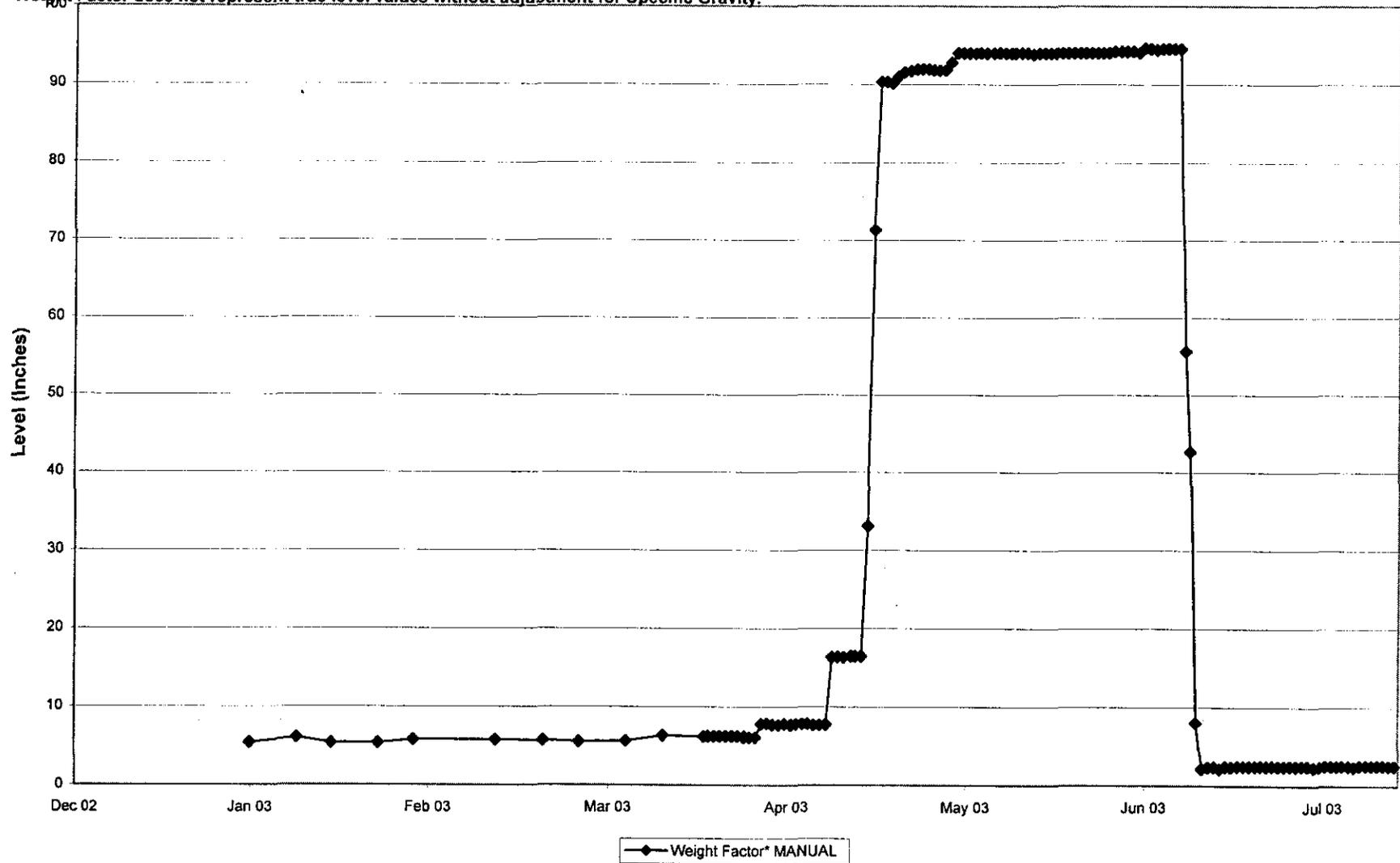
Start Date: 01/01/2003

End Date: 07/17/2003

Data Types: Good Transcribed

# Structure AR244-TK1

\*Weight Factor does not represent true level values without adjustment for Specific Gravity.



Retrieval Date: 07/17/2003

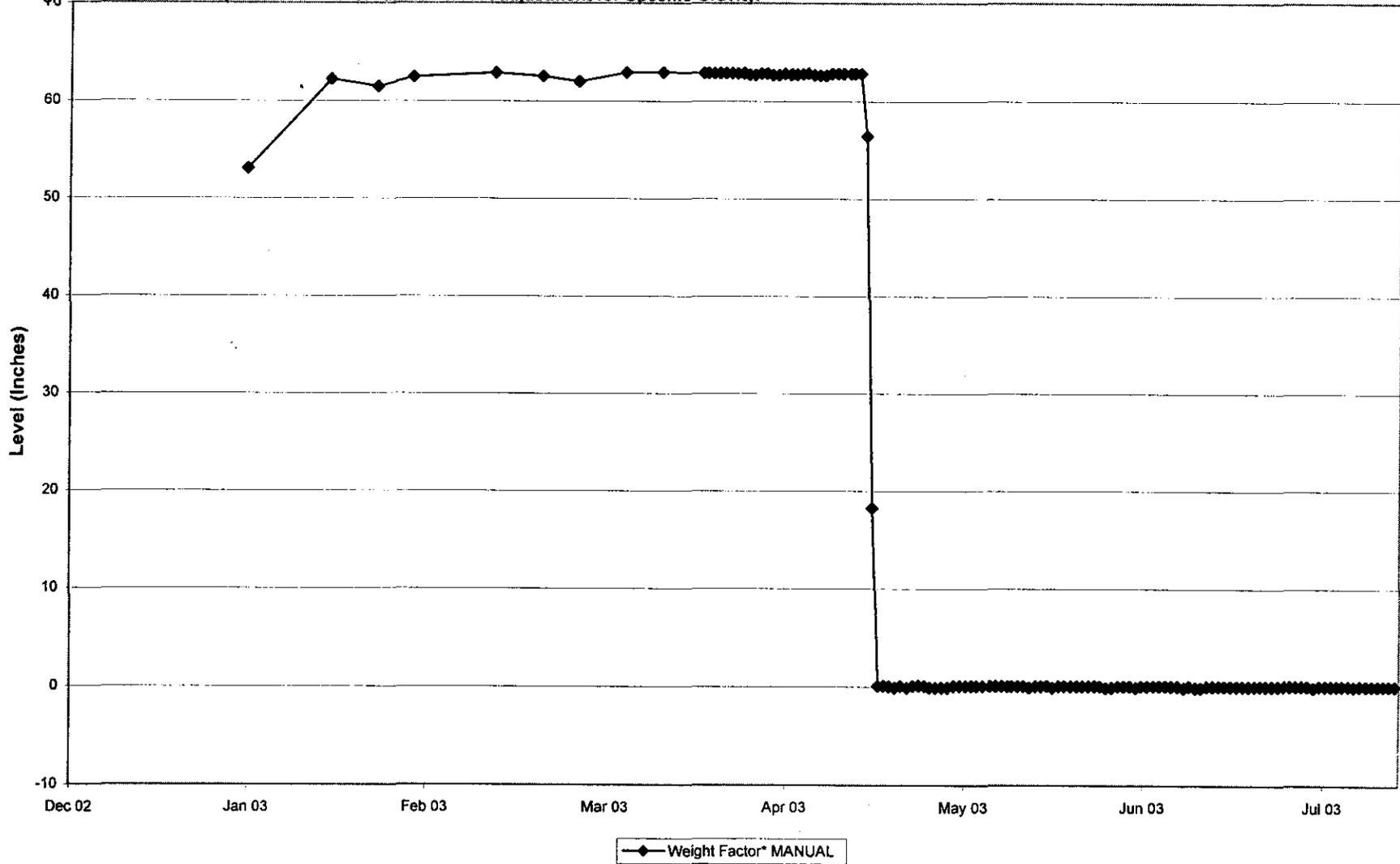
Start Date: 01/01/2003

End Date: 07/17/2003

Data Types: Good Transcribed

# Structure AR244-TK2

\*Weight Factor does not represent true level values without adjustment for Specific Gravity.



C-3

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Retrieval Date: 07/17/2003

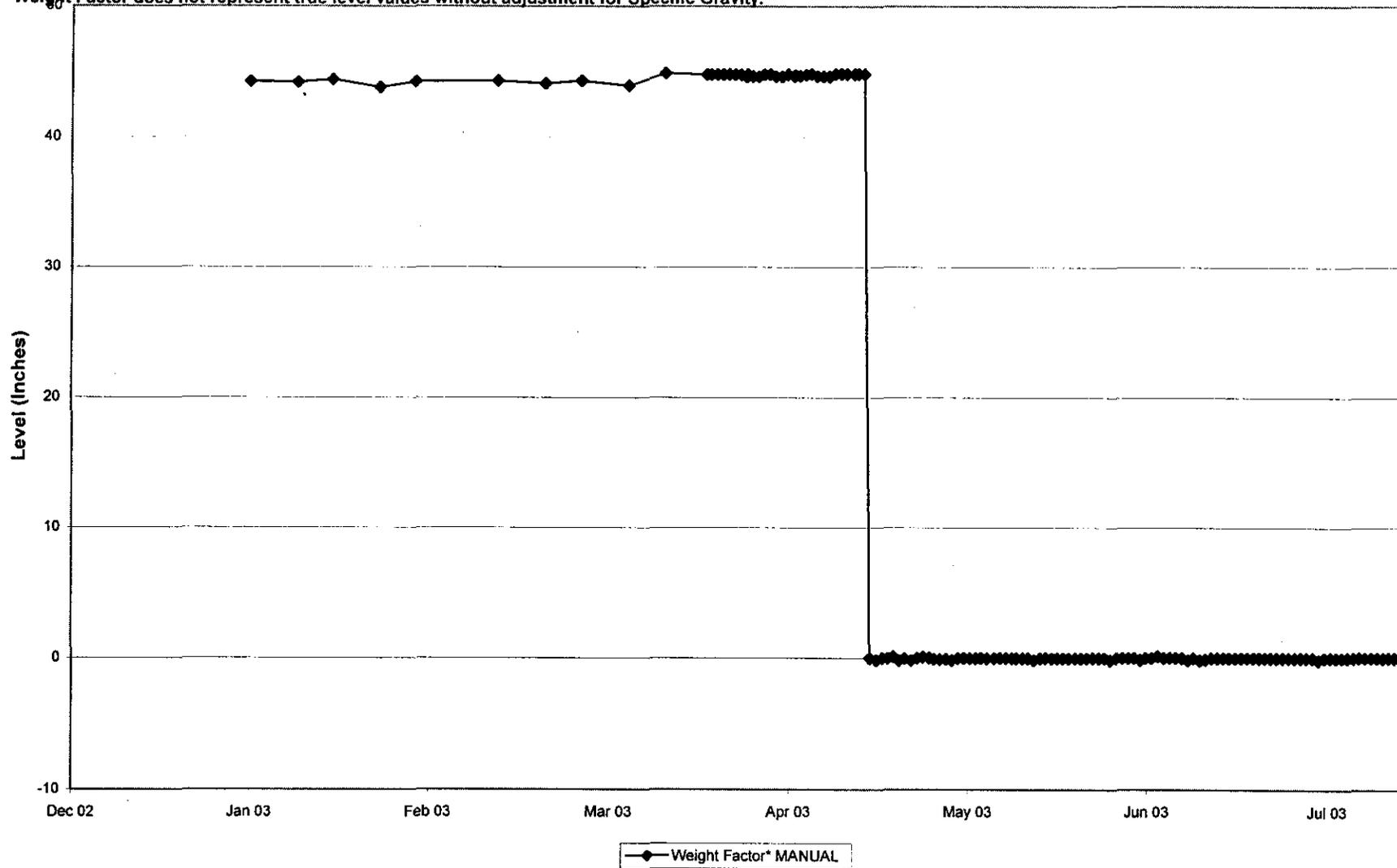
Start Date: 01/01/2003

End Date: 07/17/2003

# Structure AR244-TK3

Data Types: Good Transcribed

\*Weight Factor does not represent true level values without adjustment for Specific Gravity.



C-4

RPP-12051 Rev. 0

Retrieval Date: 07/17/2003

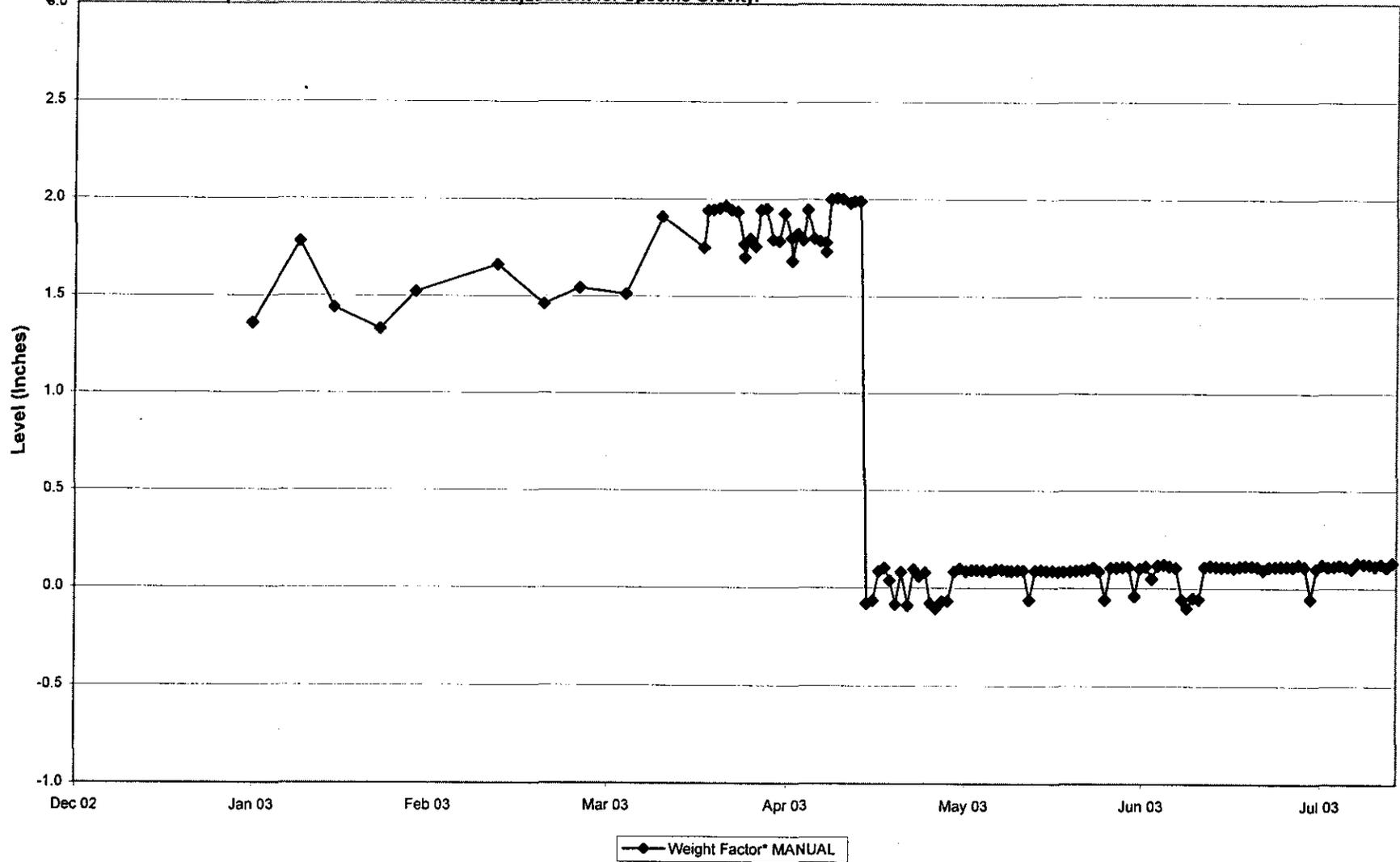
Start Date: 01/01/2003

End Date: 07/17/2003

# Structure AR244-TK4

Data Types: Good Transcribed

\*Weight Factor does not represent true level values without adjustment for Specific Gravity.



C-5

RPP-12051 Rev. 0

Retrieval Date: 07/17/2003

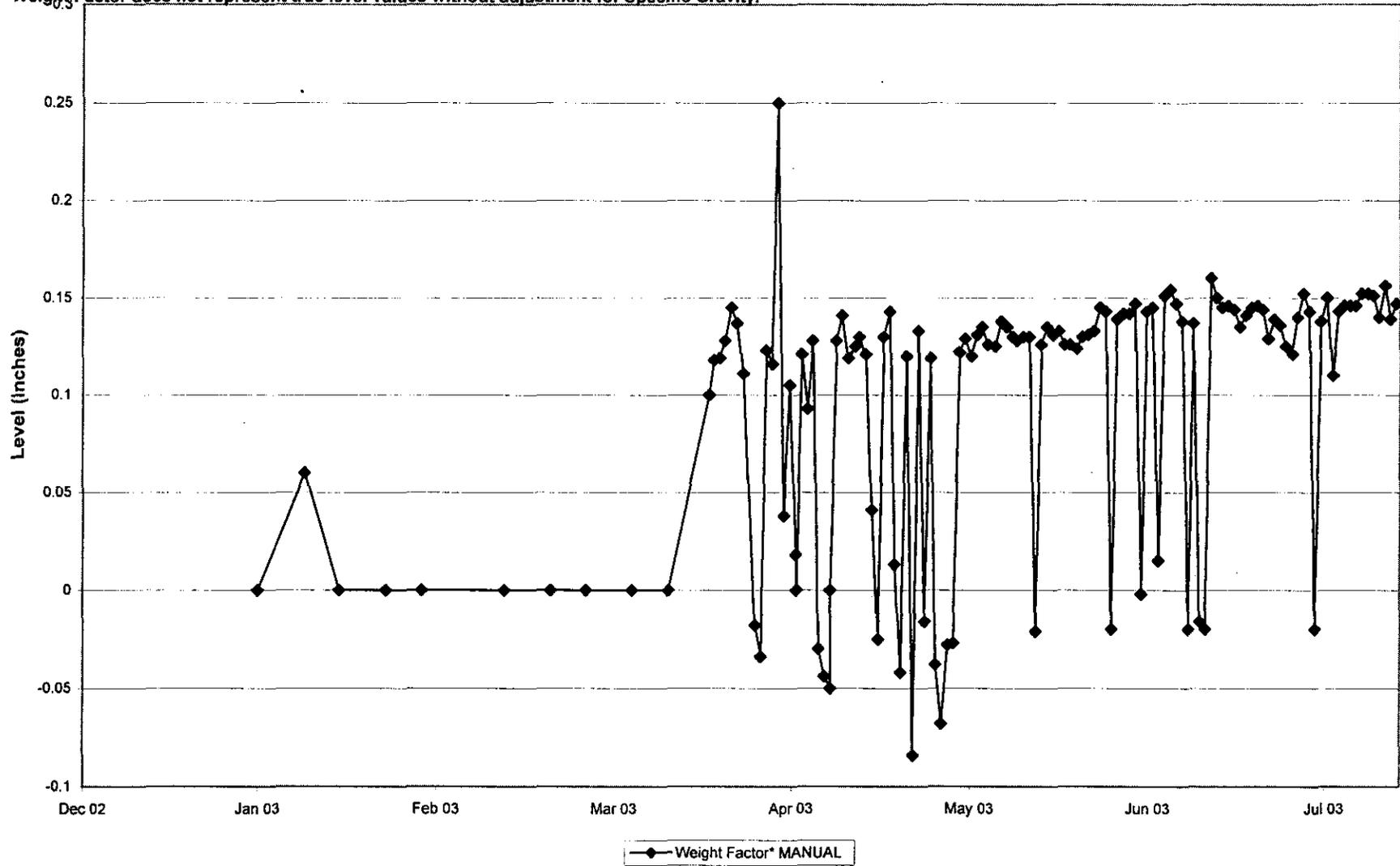
Start Date: 01/01/2003

End Date: 07/17/2003

# Structure AR244-SMP1

Data Types: Good Transcribed

\*Weight Factor does not represent true level values without adjustment for Specific Gravity.



C-6

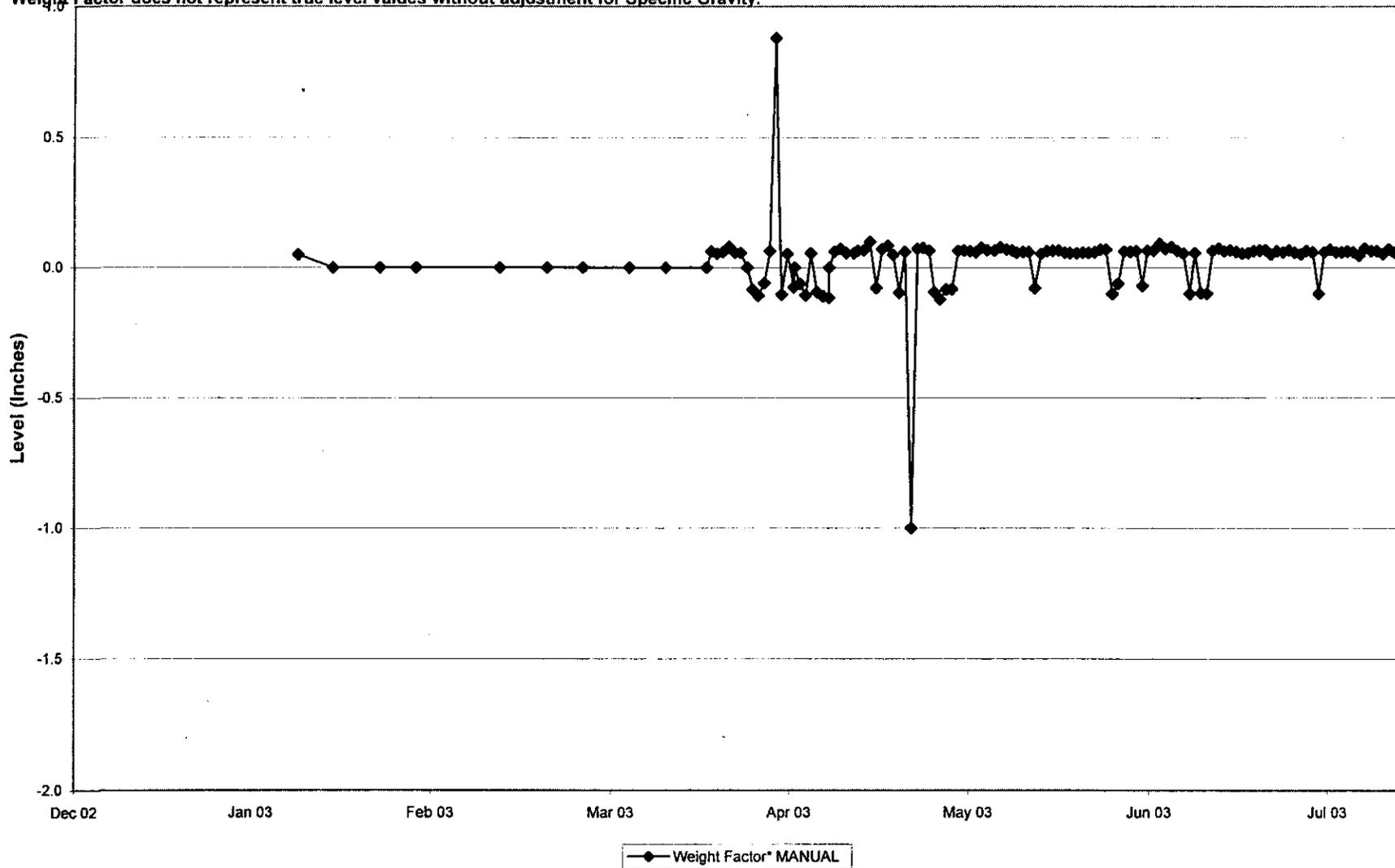
RPP-12051 Rev. 0

Retrieval Date: 07/17/2003  
Start Date: 01/01/2003  
End Date: 07/17/2003

# Structure AR244-SMP2

Data Types: Good Transcribed

\*Weight Factor does not represent true level values without adjustment for Specific Gravity.



C-7

RPP-12051 Rev. 0

Retrieval Date: 07/17/2003

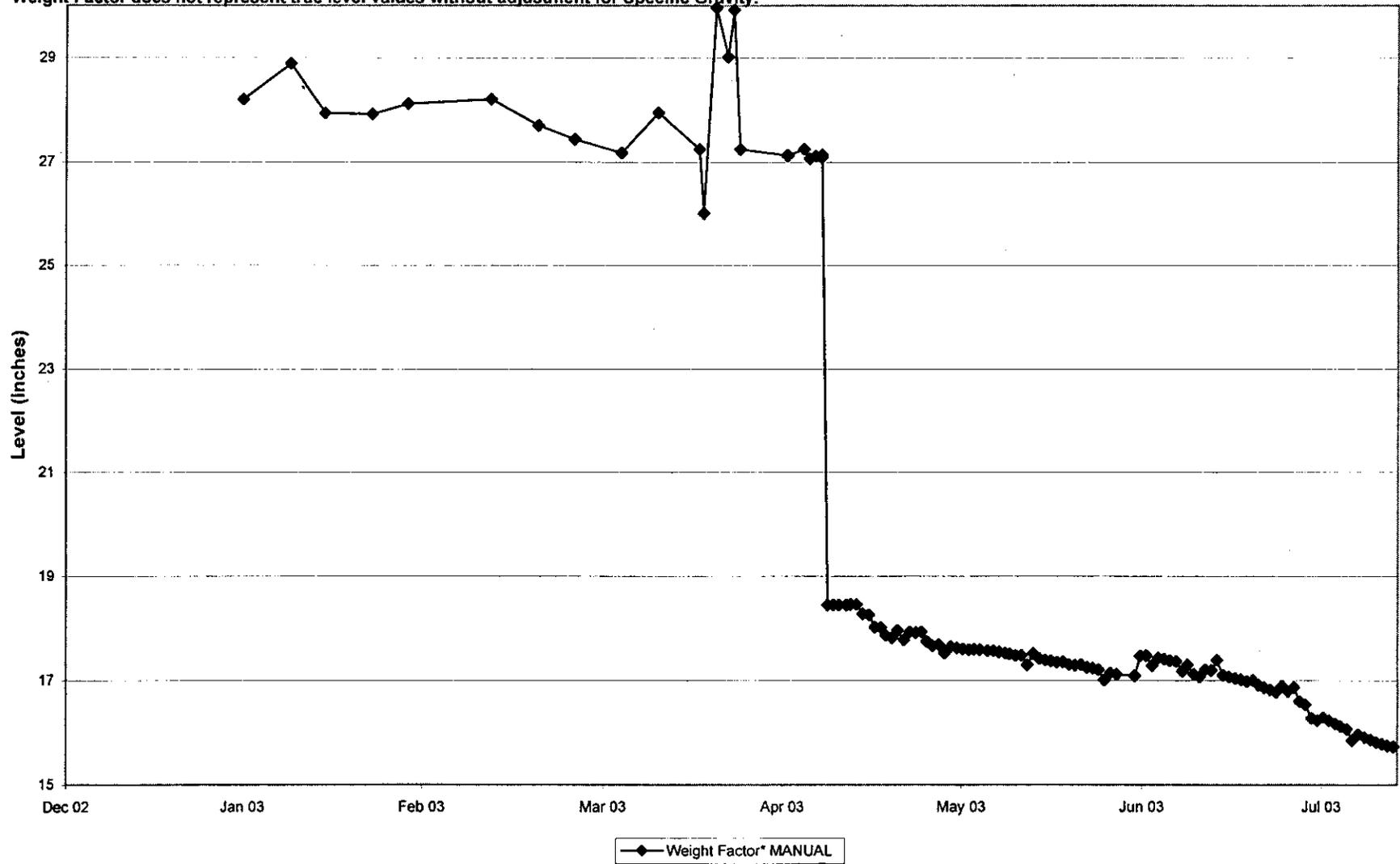
Start Date: 01/01/2003

End Date: 07/17/2003

# Structure AR244-SMP3

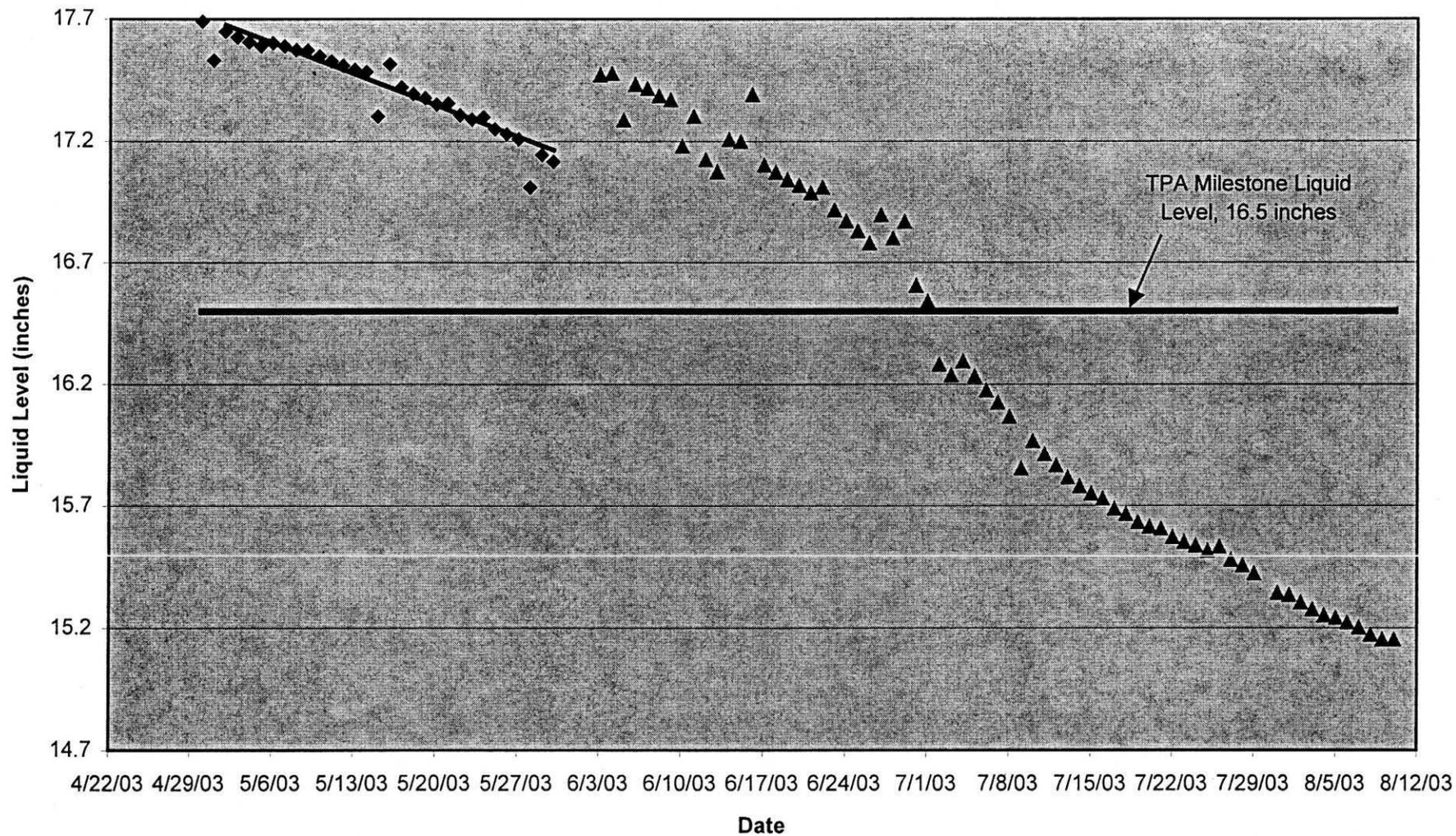
Data Types: Good Transcribed

\*Weight Factor does not represent true level values without adjustment for Specific Gravity.



**APPENDIX D. CELL 3 SUMP LEVEL READINGS**  
**APRIL 22, 2003 THROUGH AUGUST 12, 2003**  
**APRIL 2003 THROUGH JULY 2003**

Cell 3 Sump Level Since Consolidation Pumping and Estimated Time to a Sump Level of 29 Gallons based on a Linear Regression of Available Data



# Historic 244-AR Vault Cell 3 Sump Level

