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ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 604807

2. To: (Receiving Organization) Distribution		3. From: (Originating Organization) Waste Management Engineering		4. Related EDT No.: n/a	
5. Proj./Prog./Dept./Div.: Project W-417		6. Design Authority/ Design Agent/Cog. Engr.: N.K. Myers		7. Purchase Order No.: n/a	
8. Originator Remarks: Attached is an approved copy of the Operating Test Report (OTR) for Project W-417 "T Plant Steam Removal Upgrade" Waste Transfer Portion.				9. Equip./Component No.: n/a	
11. Receiver Remarks: This transmission is for Waste Management Federal Services of Hanford formal release of the OTR for Project W-417 "T Plant Steam Removal Upgrade" Waste Transfer portion.				10. System/Bldg./Facility: Waste Transfer/221-T/T Plant	
				12. Major Assm. Dwg. No.: n/a	
				13. Permit/Permit Application No.: n/a	
14. Required Response Date: None					

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	HNF-SD-W417-OTR-001		0	Operating Test Report for Project W-417 "T Plant Steam Removal Upgrade" Waste Transfer Portion	n/a	2	1	1

16. KEY				
Approval Designator (F)	Reason for Transmittal (G)		Disposition (H) & (I)	
E, S, Q, D or N/A (see WHC-CM-3-5, Sec. 12.7)	1. Approval 2. Release 3. Information	4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment	4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
		Design Authority									
		Design Agent									
2	1	Cog. Eng.	N.K. Myers	10-2-97	732						
2	1	Cog. Mgr.	R.M. Irwin	10/4/97	74-03						
		QA									
		Safety									
		Env.									

18. N.K. Myers Signature of EDT Originator		19. W.S. Ayers Authorized Representative Date for Receiving Organization		20. R.M. Irwin Design Authority/Cognizant Manager		21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments	
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Operating Test Report for Project W417 " T Plant Steam Removal Upgrade" Waste Transfer Portion

N.K. Myers

Waste Management Hanford, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

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Key Words: W-417 Waste Transfer System Upgrade

Abstract: This Operating Test Report (OTR) documents the performance results of the Operating Test Procedure HNF-SD-W417-OTP-001 that provides steps to test the waste transfer system installed in the 221-T Canyon under project W-417.

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Release Approval

10/21/97
Date

Release Stamp

Approved for Public Release

HNF-SD-W417-OTR-001

Rev ⁰₂ *mm*

Operational Test Procedure for Project W-417 "T Plant Steam Removal Upgrade" Waste Transfer Portion

200 W Area, Building 221-T Canyon

W-417

T Plant Steam Removal Upgrade

Prepared By

N.K. Myers

For

Waste Management Hanford

OPERATING TEST PROCEDURE: HNF-SD-W417-OTR-001 REV 2 ⁰ _{2/10/97}

TEST TITLE: Operational Test Procedure for Project W-417 "T Plant Steam Removal Upgrade"
Waste Transfer Portion.

PROJECT NUMBER: W-417

PROJECT TITLE: T PLANT STEAM REMOVAL UPGRADE

PROCEDURE APPROVAL:

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 Originator

9-10-97
 Date

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 Engineering Manager

9/10/97
 Date

R. Booden
 Operations

9/10/97
 Date

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 Operations Manager

9/10/97
 Date

Ang Fawett
 Environmental

9/10/97
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Bobby Baber
 Safety

9/10/97
 Date

N/A ME 9/10
 Quality Assurance

9/10/97
 Date

JR Ellis
 Radiological Control

9/10/97
 Date

EXECUTION AND TEST APPROVAL

Executed By:

[Signature] / TPLW OPS 9/15/97
 Test Director/Organization Date

[Signature] / T PLANT OPS 9/15/97
 Test Operator/Organization Date

N/A
 Test Operator/Organization Date

N/A
 Test Operator/Organization Date

[Signature] TPLW OPS 9/15/97
 Recorder/Organization Date

Add to signature block if additional operators/recorders are needed or N/A if not needed.

Approved and Accepted by:

Without exceptions _____ With exceptions ☒ With exceptions outstanding _____

Nick Myers 9-15-97 [Signature] 9/19/97
 Cognitive Engineer Date Engineering Manager Date

M.F. Buckley 9-22-97 [Signature] 10/1/97
 Quality Assurance Date Facility Manager Date

[Signature] 9/24/97
 Operations Manager Date

ECN Record (As Required): _____

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OPERATING TEST PROCEDURE FOR PROJECT W-417 " T PLANT STEAM REMOVAL UPGRADE" TRANSFER SYSTEM PORTION

I. TEST PLAN

Recent modifications have been performed on the T Plant Rail Car Waste Transfer System. This Operating Test Procedure (OTP) will document the satisfactory operation of the 221-T Rail Car Waste Transfer System modified by project W-417. Project W-417 installed a pump in Tank 5-7 to replace the steam jets used for transferring liquid waste.

This testing is required to verify that operational requirements of the modified transfer system have been met. Figure 2 and 3 shows the new and existing system to be tested. The scope of this testing includes the submersible air driven pump operation in Tank 5-7, liquid waste transfer operation from Tank 5-7 to rail car (HO-10H-3663 or HO-10H-3664), associated line flushing, and the operation of the flow meter. This testing is designed to demonstrate the satisfactory operation of the transfer line at normal operating conditions and proper functioning of instruments. Favorable results will support continued use of this system for liquid waste transfer.

The Functional Design Criteria for this system requires a transfer flow rate of 40 gallons per minute (GPM). To establish these conditions the pump will be supplied up to 90 psi air pressure from the existing air system routed in the canyon. An air regulator valve will regulate the air pressure. Tank capacity and operating ranges are the following:

Tank No.	Capacity (gal)	Operating Range (gal)
5-7	10,046	0 - 8040 (80%)
Rail car(HO-10H-3663 HO-10H-3664)	19,157	

Existing Tank level instrumentation, rail car level detection, and pressure indicators will be utilized for acceptance/rejection criteria.

The flow meter will be verified for accuracy against the Tank 5-7 level indicator. The level indicator is accurate to within 2.2 %. This will be for information only purposes.

The following acceptance/rejection criteria must be met for continued operation of the modified transfer system:

- The flow rate is above or equal to 40 gallons per minute.
- Air supply pressure to the pump in tank 5-7 will not exceed 90 psi.
- No visible leaks are observed.
- At least 300 gallons of liquid is transferred at or above the minimum flow rate of 40 gallons per minute.
- The flow meter provides indication of flow rate and total transferred.

II. REFERENCES

H-2-79851 Rail Car Waste Transfer System Piping Plan, Sect, & Details (Sht 1/Rev 3
Sht 2/Rev 3, Sht 3/Rev 2, Sht 4/Rev 2)

Engineering change notice 640184

III. RESPONSIBILITIES

Organizations involved in the test and their responsibilities include the following:

1. Test Operator
 - a. Confirms that all equipment required for performing the test will be available at the start of testing.
 - b. Performs test under direction of the Test Director.
 - c. Signs the Execution and Test Approval page when the test has been performed.
 - e. Stops any test which, in his or her judgement, may cause damage to the system until the problem has been resolved.
2. Test Director
 - a. Schedules and conducts a prejob kickoff meeting with all necessary test participants.
 - b. Confirms that all prerequisites have been completed.
 - c. Coordinates and directs test.
 - d. Ensures that required environmental conditions are maintained.
 - e. If the test is to be suspended for a period of time, the test director ensures that the system is in a safe mode.
 - f. Before restarting the suspended test, the test director reverifies the test prerequisites.
 - g. Reviews recorded data, and exceptions.
2. Recorder(s)
 - a. Prepares a field copy from the OTP Master
 - b. Records names of all designated personnel on Field copy of OTP prior to start of testing.
 - c. Records calibration expiration dates of instruments as applicable.
 - d. Signs execution and test approval page when test has been performed.

III. RESPONSIBILITIES (cont)

- e. After test is finished, assigns alpha numeric page numbers to any added data sheets. Records page numbers in the Table of Contents.
- f. Transfers field copy entries for each step to the OTP Master in ink or type, signs and dates. Transmits the completed Master to the Cognitive Engineer for approval signature routing and file retention.

3. Cognizant Engineer

- a. Designates the Test Director, Test Operator, Recorder, and any support organizations which must participate in the testing. Note, the cognizant engineer may designate one individual for multiple tasks.(e.g, the Cog Engineer and Recorder can be the same individual, etc..)
- b. Provide an approved Operating Test Procedure for this test which shall establish test parameters and acceptance criteria.
- c. Initiates ECNs to document required changes to OTP.
- d. Reviews recorded data and evaluates results of testing.
- e. Takes necessary action to clear exceptions to the test.
- f. Signs Execution and Test Approval page when test has been completed.
- g. Obtains required signatures on the OTP Master.
- h. Provides a distribution list for the approved and accepted OTP.

4. Radiological Control

- a. Provide radiation work permit.
- b. Perform surveys of personnel and equipment as required.
- c. Supply radiation monitoring equipment, and Radiological control personnel.

5. Quality Assurance

- a. Verify the prerequisite requirements have been met.
- b. Signs Execution and Test Approval page when test has been performed.

IV. CHANGE CONTROL

Required changes to this OTP must be processed on ECNs in accordance with WHC-CM-5-36 SWD Internal Requirements, Chapter 6-1, EP 2.2. If a need for change is discovered in the course of running the test, the test shall be stopped until the ECN is initiated and approved or otherwise directed by the Test Director. However, this does not prevent the running of another portion of the test unaffected by the change.

IV. CHANGE CONTROL (cont.)

If field work (i.e. work in a radiological zone) is underway, the nature of the change shall be determined by the cognizant engineer. The cognizant engineer shall authorize work to proceed and instruct the test director regarding the steps necessary to implement the change. The change and the authorization shall be documented on the OTP field copy to reflect forthcoming ECN information. Before completing the work a change ECN shall be prepared immediately by the cognizant engineer who obtains the required approvals in accordance with EP 2.2 and releases the ECN within 24 hours.

Administrative or editorial changes required during testing are considered exceptions. They will be controlled by writing the exception on the Exception form, entering the change, and obtaining signatures from Engineering and quality assurance.

Prior to final test approval, the cognizant engineer shall enter ECNs written against this OTP on the Execution and Test Approval page.

V. SAFETY

Warning - Radiological Control personnel (RCT) shall be present during performance of this procedure. Increased radiation dose rates may be encountered during transfer activities.

Warning - Avoid contact with any liquid which has leaked or spilled from the transfer system.

Warning - The maximum shipping capacity for the rail car is 19,157 gallons. This amount will NOT be exceeded, under ANY circumstances, as this could release radioactive liquid to the environment and possibly contaminate personnel.

Warning - The rail car is no longer fissile exempt, and may contain quantities of fissile material up to the limits contained in WHC-SD-TP-SARP-015.

Warning - Avoid walking on plastic cover for cupola, as it is a slipping hazard.

Warning - Personnel should avoid standing in front of the chain opening on the cupola, as this is not an adequate fall protection device.

Warning - Personnel should watch their footing while in the rail tunnel, due to the height variation between the rails.

Warning - If leaks develop at any time in the transfer line or its connection points, the test shall be stopped until the test director has approved appropriate remedial action. T Plant Operations Management shall also be informed for determination of possible occurrence reporting.

Warning - The waste transfer line contains process water from previous testing. When verifying valves closed do not reopen for verification.

Warning - Caution must be used around pressurized hoses.

Warning - Watch for hoses on floor, they are a tripping hazard.

Caution - The air supply pressure to the pump is set at 50 psi, however may reach up to 90 psi without damaging the pump.

2
4/98
11/98

V. SAFETY (Cont.)

Warning -The ultrasonic level monitor contains exposed wires near the ON/OFF switch. Do not touch this area when energized.

NOTE- The hose should be placed on the canyon floor with minimum bends and elevation changes.

Management Information - The Safety Analysis Report for Packaging (WHC-SD-TP-SARP-015) limits the quantity of fissile material in a rail car. 221-T canyon is considered a limited control facility. The quantity of fissile material must be considered in T-Plant fissile material inventory.

Applicable Safety Documents: Provisions of Hanford Site Radiological Control Manual, HSRCM-1; applicable job specific Radiological Work Permits specified by RCO; Solid Waste Disposal Administrative Manual, WHC-CM-5-34, Section 1.14, "ALARA PROGRAM"; Safety Analysis for Packaging (SARP) WHC-SD-TP-SARP-015; T Plant Interim Safety Basis (ISB), SD-WM-ISB-006; T Plant Interim Operational Safety Requirements (IOSR), SD-WM-TSR-003; and the following chapters in the SWD S/RIDS Implementation Manual, WHC-CM-5-36: Safety Manual, Chapter 1-10; Industrial Hygiene Manual, Chapter 4-40; apply to all work performed under this procedure.

VI. TOOLS AND EQUIPMENT

Personal Protective Clothing in accordance with RWP and JHA
Hand tools, wrenches, pipe wrenches and connecting tools
3 Two Way Radios wrapped with plastic
Plastic Bags and Green Tape
Vent and drain assembly
2" 200 psi Waste Water Service Pump Discharge Flex hose
3/4" 200 psi Air Discharge hose
2" 200 psi Process Water Flex hose
Stop Watch/Clock
55 gallon drum
1-inch tygon tubing with 3-inch adapter for vent line
Absorbent cloth/material
hand pump w/ garden hose
DO-100-012, "Package RMW in Boxes and Drums"

VII. PREREQUISITES

The cognizant engineer has verified that the certification of the rail car to be used is current.

The following instruments are currently calibrated:

1. Pressure indicators 0-160 psi on transfer line.
 - Instrument No. T-LW-C-05-297 Calibration Expiration Date 4/98
 - Instrument No. T-LW-C-11-298 Calibration Expiration Date 4/98
 - Instrument No. P-LW-C-15-107 Calibration Expiration Date 4/98
2. Pressure indicator on air line at section 5
 - Instrument No. A-HP-C-05-311 Calibration Expiration Date 4/98

VII. PREREQUISITES (Cont.)

3. Tank 5-7 level indication currently calibrated.
Calibration Expiration Date 9/97 (Data 1/20/96)
4. Flowmeter and flowmeter display is configured.
5. Ultrasonic rail car level detector currently calibrated
Instrument Serial #64-6 Calibration expiration Date 10/97

Procedure approval page has been completed.

System has been inspected for compliance with construction documents. Reference documents have been verified for latest rev number and outstanding ecns.

Mark Myers 9-11-97
Engineering Date

Power is available to flowmeter at section 5.

The Acceptance Test Procedure (ATP) has been performed and is accepted as complete.

A "process" sample of Tank 5-7 liquid contents has been taken, and the results of the sample analyses have been received prior to transferring liquid waste from Tank 5-7 to the rail car.

The canyon ventilation system is operating.

The total quantity of liquid (gallons) in the rail car has been established using the Radioactive Shipment Record (RSR).

A Waste Stream Profile Sheet has been approved by Tank Farms prior to shipping waste to Tank Farms via a rail car.

A radiological Work Permit (RWP), Alara Management Worksheet (AMW) if required, and Job Hazard Analysis (JHA) has been prepared, reviewed, and signed off prior to job start and will be discussed at the pre-job meeting.

A pre-job safety meeting has been held to discuss the following items:

- The steps of this procedure.
- Radiological hazards involved with the performance of this procedure and the protective measures to be used in mitigating these hazards.
- Industrial safety hazards involved in the performance of this procedure and the protective measures to be used in mitigating these hazards.
- The placement of a step to assist personnel access to the first step on the rail car.
- The existing scaffolding steps in the tunnel should not be used to access the rail car platform.
- Unless authorized by the Operations Manager, there should not be more than 10 personnel working in the rail tunnel at a time, to allow for quick and safe egress from the tunnel.

0
2
10/1/97VII. PREREQUISITES (Cont.)

- Recovery actions to be taken in the event of a systems failure, leak and/or loss of containment.
- Results of the meeting to be documented by the Test Director on a Pre-Job Safety Briefing Form.

Quality Assurance verifies that the prerequisites listed above have been met.

Quality Assurance M.F. Briskey R. Date 9-22-97

IX. TEST STEPS

NOTE (1) - Administrative hold steps are identified by initials in parenthesis at the left margin of the procedure step. The direction given in the procedure step must be satisfied before work continues.

(S) - The T Plant Management shall approve continued operation.

(R) - Radiological Control personnel shall complete surveys or agree to permit continued operation.

A. PREPARE TO TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR

NOTE- Independent Verifier and Operator initials shall be signed on attached DATA SHEET when step states "Perform independent verification". Steps that do not require independent verification but require initials of person performing the work shall be initialed on DATA SHEET.

Perform Preliminary Activities

1. **VERIFY** that the Prerequisite Conditions have been met.

WARNING

USE CARE WHEN REMOVING CUPOLA LID TO AVOID PINCHING HANDS OR FINGERS BETWEEN THE LID AND THE CUPOLA.

2. **REMOVE** cupola lid.

- a. **LOOSEN** T-bolts.
- b. **RAISE** lid using hand crank.
- (R) c. **REQUEST** RCT to **OBTAIN** dose rate on platform w/cupola OPEN.
- d. **SWING** lid to the side of the cupola.
- e. **ROTATE** lid to verticle position and **MOVE** to the side railing.
- (R) f. **REQUEST** RCT to **OBTAIN** contamination surveys inside cupola.

A. PREPARE TO TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR(Cont.)

WARNING

The ultrasonic level monitor contains exposed wires near the ON/OFF switch. Do not touch this area when energized.

3. VERIFY that the ON/OFF switch on the ultrasonic level monitor is ON.
 4. CONNECT the two ultrasonic level detector probes to the monitor.
 5. PLUG-IN ultrasonic level monitor to 110-Volt outlet.
 6. CALCULATE and RECORD the following information on TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR WORKSHEET:
 - a. "Initial Gallons" in Tank 5-7,
 - b. Amount to be transferred (Gallons) from Tank 5-7.
 - c. ENTER Initial Volume (Gallons) in Rail Car (use Table 1 to determine volume).
 - d. Available Volume (Gallons) in Rail Car.
 - (S) e. IF amount to be transferred from Tank 5-7 exceeds available rail car volume, NOTIFY Management.
 - (R) 7. OBTAIN dose rate information from Radiological Control, for measurements conducted during receipt survey, and INITIAL TANK 5-7 TO RAIL CAR WASTE TRANSFER DATA SHEET.
 8. INSTALL plastic sheet inside cupola and around the vent and fill risers, and TAPE to risers below flange level. RECORD initials on DATA SHEET.
- NOTE - *This plastic provides contamination control for riser cap from potential drips.*
- (R) 9. REQUEST RCT to establish working dose rate prior to and after removal of 4-inch riser cap.
 - a. REMOVE the 4-inch fill riser cap and 3-inch vent valve cap. (See Figure 1)
 10. SWIVEL the 2-inch flex hose to a position OVER the four inch fill riser on top of the rail car. (See Figures 1 and 3)
 11. CONNECT the swivel transfer line to the 4-inch fill riser via the SNAP TITE quick disconnect coupling.

A. PREPARE TO TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR(Cont.)

NOTE - The Operator must verify flow direction on the 4-inch fill riser valve by observing the flow direction arrow on the valve operator stem. Do NOT rely solely on the position of the handle.

12. CLOSE the 4-inch fill riser valve below quick disconnect on rail car 4 inch riser and **PERFORM** Independent Verification.
13. **CONNECT** the quick disconnect adapter with 1-inch hose to the 3-inch vent riser. (See Figure 1)
14. **ROUTE** 1-inch hose connected to vent riser into 55 gallon drum.
15. **OPEN** 3-inch vent valve below quick disconnect on rail car riser and **PERFORM** Independent Verification.

WARNING

The waste transfer line contains process water from previous testing. When verifying valves closed do not reopen for verification.

16. **VERIFY** that the following valves are **CLOSED**, and **PERFORM** "Independent Verification". (See Figure 2)

T-LW-C-05-269	T-LW-C-11-281	P-LW-C-15-106
T-LW-C-05-272	T-LW-C-11-286	P-LW-C-15-002
T-LW-C-05-275	T-LW-C-11-287	P-LW-C-15-001
T-LW-C-05-271	T-LW-C-11-284	W-PW-C-16-001
T-LW-C-05-276	T-LW-C-11-288	W-PW-C-16-002
T-LW-C-05-279	T-LW-C-11-283	W-PW-C-16-003
A-HP-C-05-310	T-LW-C-11-291	P-LW-C-15-102
T-LW-C-05-294	T-LW-C-11-290	
	A-HP-C-11-312	

17. **OPEN/VERIFY OPEN** the following valves are **OPEN**, and **PERFORM** "Independent Verification".

T-LW-C-05-277	T-LW-C-11-289	P-LW-C-15-105
T-LW-C-05-270	T-LW-C-11-280	P-LW-C-15-003
T-LW-C-05-268	T-LW-C-11-282	P-LW-C-02-001
T-LW-C-05-274		
T-LW-C-05-278		

18. **INSPECT** the transfer line from the rail tunnel to Tank 5-7 for damage and/or deteriorated conditions.

- IF damage is found; **NOTIFY** Management immediately.

19. **OBTAIN** 2" pump discharge flex hose from storage.

20. **REQUEST** RCT to establish radiological conditions during cap removal.

- a. **REMOVE** the dust caps from the 2" pump discharge pipe (located near tank 5-7 hand rail) and the rigid transfer pipe between valve T-LW-C-05-278 and T-LW-C-05-294.

(R)

A. PREPARE TO TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR(Cont.)

- b. REMOVE the dust caps from the 3/4" rigid air supply line to the pump in 5-7 (located near tank 5-7 hand rail) and the 3/4" rigid air pipe at section 5.
21. INSTALL the 2" pump discharge flex hose by attaching to the 2" pump discharge pipe and the rigid transfer pipe at section 5 and **LOCKING** the quick disconnect locks down, **AND PERFORM** Independent Verification.
22. INSTALL the 3/4" air hose by attaching to the rigid air supply line to the pump in tank 5-7 and the 3/4" rigid air pipe at section 5 and **LOCKING** the quick disconnect locks down and **PERFORM** Independent Verification.
23. **PRESS** the (RESET) key on the flow meter keyboard at section 5 to reset count to 0.
24. REMOVE cap from the line end at valve P-LW-C-15-002.
25. INSTALL process water flex line between valve P-LW-C-16-002 and Valve P-LW-C-15-002 securing tightly.
 - **PERFORM** Independent Verification
26. INSTALL the discharge pump flex hose by attaching to the pump discharge pipe at section 15 and the rigid transfer pipe at section 15 and locking down quick disconnects.(See Figure 2)
 - **PERFORM** Independent Verification
27. PLACE Vent line at Section 15 in 55 gallon drum.
28. POSITION operators for the leak/transfer process as follows:
 - "Tank Level Monitor Operator", with radio, at the Five (5) board in 221-T Operating Gallery to monitor and report changes in Tank 5-7 liquid level.
 - "Rail Car Operator", with radio, at the rail car to monitor the flex connection, vent, and hose and swivel and rail car ultrasonic level detector.
 - "Pump Operator" at section 5 to monitor pressure, flow, and control pump.
 - "Pressure Monitor Operator" at section 11 to monitor pressure.
 - "Pressure Monitor/Valve Operator" at section 15 to monitor pressure and manipulate valves.
 - RCT to survey transfer line during pumping
 - RCT at rail car to monitor radiation dose levels

Perform Leak Test of Rail Car Transfer Hose

29. OPEN Valve P-LW-C-15-001 and PERFORM "Independent Verification".
30. OPEN Valve W-PW-C-16-002, and PERFORM "Independent Verification".
31. VERIFY that process water connection is tight.
32. NOTIFY all personnel that transfer system leak test preparations have begun.
33. FULLY OPEN Valve P-LW-C-15-002 and NOTIFY all personnel that Leak Test has commenced, and PERFORM "Independent Verification".
34. OBTAIN transfer line pressure reading (Gauge # P-LW-C-15-107) and RECORD on DATA SHEET.

NOTE - *Pressure shall be maintained on the transfer line for 3 minutes.*

35. All personnel MONITOR transfer system for leakage.
 - (S) • IF ANY transfer line leakage is observed, CLOSE Valve W-PW-C-16-002, and NOTIFY Operations Management IMMEDIATELY.
36. UPON completion of 3 minute leak test,
 - CLOSE Valve W-PW-C-16-002,
 - OPEN Valves P-LW-C-15-102, and P-LW-C-15-106.
 - OPEN 4" Fill Riser Valve below quick disconnect on rail car.
 - RECORD Leak Test results on DATA SHEET.
37. "Pressure Monitor/Valve Operator" NOTIFY personnel when transfer system pressure is 0 psi at gauge P-LW-C-15-107.
38. ALLOW 15 min for drainage. WHEN drainage is complete, CLOSE the following valves:
 - P-LW-C-15-002
 - P-LW-C-15-106
 - P-LW-C-15-102
 - P-LW-C-15-003
 - P-LW-C-15-001
 - T-LW-C-05-268
 - PERFORM "Independent Verification".
39. UNCOUPLE and DISCONNECT Process Water Flex Line from Valve P-LW-C-15-002 pipe end.
40. REINSTALL and TIGHTEN cap on Valve P-LW-C-15-002 pipe end.
41. OBTAIN volume in rail car prior to leak test(use ultrasonic level indicator and Table 1 to determine volume.) AND RECORD rail car Volume on DATA SHEET.

Perform Leak Test of Rail Car Transfer Hose(Continued)

42. **CALCULATE** Rail Car Available Capacity prior to leak test AND **RECORD** on WORK SHEET:
 Rail Car Available capacity after leak test = 19,157 - Rail Car Volume after leak test(step A.42)
- a. IF amount to be transferred from Tank 5-7 exceeds available rail car volume after leak test, **NOTIFY**

Management.

43. **NOTIFY** all personnel to standby for transfer operations.

B. TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR

- (R) 1. **REQUEST** RCTs survey line during the transfer to **DETERMINE** the transfer dose rate, and **RECORD** the highest dose rate on DATA SHEET.
2. **OPEN** valve T-LW-C-05-269 and **PERFORM** Independent Verification.

CAUTION

Exceeding 90 psi air supply pressure to the pump may cause damage to the pump.

NOTE 2- Quick, short pulses of the pump indicate no flow, longer, slower pulses indicate liquid movement.

3. **SLOWLY OPEN** air supply valve A-HP-C-05-310 **FULLY OPEN** and **VERIFY** liquid movement

AND

NOTIFY the " Rail car Operator", "Pressure Monitor Operator" , and "Tank Level Monitor Operator" via radio, that the pump has been activated.

4. **MONITOR** pressure gauges on transfer line at sections 5 (T-LW-C-05-297 and A-HP-C-05-311) 11 (T-LW-C-11-298) and 15 (P-LW-C-15-107).
- a. IF pressure exceeds 90 psi on pressure gauge A-HP-C-05-311, **CLOSE** valve A-HP-C-05-310 and notify Operations Management immediately. This will end testing until further evaluation of system has been made.
- b. IF pressure reading exceeds 10 psi on gauge T-LW-C-11-298 or P-LW-C-15-107 or is less than 10 psi on gauge T-LW-C-05-297, **NOTIFY** Test Director. **RECHECK** valve lineup and **CHECK** for leaks.
5. "Pump Operator" **NOTIFY** all that the transfer is underway.
- a. **RECORD** the "Start of Transfer" time on DATA SHEET.

NOTE- The discharge pressure reading (gauge T-LW-C-05-297) should be less than air supply pressure (gauge A-HP-C-05-311) which is set at 50 psi. IF the pump discharge pressure equals or exceeds the air supply pressure the pump will stop.

8
2
10/1/17**B. TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR (Cont.)**

6. When system stabilizes in pressure (about 30 seconds) **RECORD** pressure readings at the following gauges on DATA SHEET:
- T-LW-C-05-297 at section 5 • A-HP-C-05-311 at section 5
 - T-LW-C-11-298 at section 11 • P-LW-C-15-107 at section 15
7. **DURING** the transfer operation operators shall surveil their respective areas for leaks at hose connections, hose valve flange joints, or rupture conditions and **RECORD** on DATA SHEET.
- a. **IF ANY** leaks are observed, the "Pump Operator" shall be notified immediately,

AND

(S)(R)

CLOSE valve A-HP-C-05-310 to stop the pump and **NOTIFY** Management and RCT immediately that corrective repairs and investigative surveys are required.

8. **MONITOR** the level indication for Tank 5-7 from the 5 board periodically throughout the transfer.
- a. **IF** tank 5-7 % digital reading does not decrease after 15 minutes, **CLOSE** valve A-HP-C-05-310 and **NOTIFY** supervision.
9. **MONITOR** the reading from the ultrasonic level indicator periodically throughout the transfer.
- a. **IF** ultrasonic level indicator does not increase during the transfer, **CLOSE** valve A-HP-C-05-310 and **NOTIFY** supervision.
10. After 10 minutes from start of transfer **RECORD** time **AND** % digital reading for Tank 5-7 on DATA SHEET.
11. After 15 minutes from start of transfer **PRESS** (rate) on the flow meter display (T-LW-C-05-273) and **RECORD** on DATA SHEET.
12. After 20 minutes from start of transfer **RECORD** time **AND** % digital reading for Tank 5-7 on DATA SHEET.
13. **DETERMINE** volumes for Tank 5-7 in 10 minutes and 20 minutes and **RECORD** on WORKSHEET.
14. **CALCULATE** Gallons transferred from Tank 5-7 in 10 minutes and **RECORD** on WORKSHEET:
15. **CALCULATE** flow rate using gallons sent from tank 5-7 and time and **RECORD** on WORKSHEET:
- NOTE- The key on the bottom of the regulator is pushed in to adjust the setting. When pulled out the adjusting knob spins freely.*
16. **IF** flow rate calculated in step B.15 is less than 40 gallons/minute (GPM) **ADJUST** air pressure regulator to a higher setting as determined by Test Director; however not to exceed 90 psi on gauge A-HP-C-05-311; and **RECORD** on DATA SHEET. **IF** flow rate is 40 gallons/minute or greater **N/A** this step.

PERFORM the following steps until flow rate is at least 40 GPM. **IF** flow rate does not reach 40 gallons/minute after changing setting, **CLOSE** valve A-HP-C-05-310 and **NOTIFY** Operations management immediately. This will end testing until further evaluation of system has been made.

B. TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR(Cont.)

- a. **RECORD** time **AND** % digital reading for Tank 5-7 and **RECORD** on DATA SHEET.
- b. After 10 minutes **RECORD** time **AND** % digital reading for Tank 5-7 and **RECORD** on DATA SHEET.
- c. **DETERMINE** volume for Tank 5-7 and **RECORD** on WORKSHEET.
- d. **CALCULATE** Gallons transferred from tank 5-7 in 10 minutes and **RECORD** on WORK SHEET:
- e. **CALCULATE** flow rate and **RECORD** on WORKSHEET:

NOTE 1- When tank 5-7 is empty, flowmeter T-LW-C-05-273 no longer indicates flow, the pump gets louder and % digital reading for tank 5-7 indicates 0 to .1%.

17. **CONTINUE** transfer until tank 5-7 is empty, or until the amount indicated on the WORK SHEET (step A.6.b) has been transferred from Tank 5-7. **THEN**, **CLOSE** valve A-HP-C-05-310 to **STOP** the pump.
18. **RECORD** the "End of Transfer" time on DATA SHEET.
19. **PRESS** (Total) on the flow meter at section 5 (T-LW-C-05-273) and **RECORD** reading on DATA SHEET.
20. **OBTAIN** ending % digital reading for Tank 5-7 and ending ultrasonic level reading **AND RECORD** on DATA SHEET.
21. **DETERMINE** ending volume for Tank 5-7 and rail car and **RECORD** on WORKSHEET.

B. TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR(Cont.)

22. OPEN the following valves:

T-LW-C-05-268
P-LW-C-15-106
T-LW-C-05-294

- PERFORM "Independent Verification
 - ALLOW transfer system to drain for 15 minutes.
23. UPON completion of post transfer draining, CLOSE valve P-LW-C-15-106.
- PERFORM "Independent Verification
24. COMPUTE total gallons transferred from Tank 5-7, gallons received into the rail car and transfer differential and RECORD on WORKSHEET.
- a. IF transfer differential between Tank 5-7 level change and the rail car level change is greater than 100 gallons, NOTIFY Management.
25. CALCULATE flow rate using gallons sent from tank 5-7 and time and RECORD on WORKSHEET:
26. COMPUTE Flow Rate Differential, Total Differential and % Difference and RECORD on WORKSHEET.

C. FLUSH TANK 5-7 TO RAIL CAR WASTE TRANSFER SYSTEM

1. REMOVE the cap from the line end at valve P-LW-C-15-002.
2. INSTALL process water flex line between valve P-LW-C-16-002 and P-LW-C-15-002 SECURING tightly.
 - PERFORM "Independent Verification".
3. CLOSE valve T-LW-C-05-270 and PERFORM Independent verification.
4. VERIFY the following valves are CLOSED AND RECORD on DATA SHEET:
T-LW-C-05-276
T-LW-C-05-271
P-LW-C-15-001
5. OPEN the following valves and PERFORM Independent Verification:
T-LW-C-05-272
T-LW-C-05-275
P-LW-C-15-003

CAUTION

Opening valve T-LW-C-05-278 more than 1/8 turn may result in over pressurization of the pump seals during flushing of transfer system, possibly damaging the pump.

6. CLOSE valve T-LW-C-05-278 in the fully CLOSED position. THEN REOPEN 1/8 of ONE TURN only and PERFORM Independent Verification.

C. FLUSH TANK 5-7 TO RAIL CAR WASTE TRANSFER SYSTEM(Cont)

7. VERIFY the "Rail Car Operator" and "Pump Operator" and "Pressure Monitor Operator" are in position.
8. REPOSITION the "Pressure Monitor Operator" at the flushing line connection at section 15. This person shall now be designated as the "Flush Operator".
9. REPOSITION the "Pump Operator" at valve T-LW-C-05-278. This person shall be designated as the "Pump Flush Operator".
10. VERIFY that radio communications are acceptable.
11. "Flush Operator" OPEN valve W-PW-C-16-002.
 - PERFORM "Independent Verification".
12. VERIFY that the process water connection is tight and that NO leakage is observed.
13. OBTAIN "start of flush" reading from process water flow totalizer at section 15 and RECORD reading on DATA SHEET.
14. "Flush Operator" NOTIFY all personnel that flushing of the transfer system is about to begin.

NOTE - *Flush time for normal operations shall be one minute.*

15. "Flush Operator" FULLY OPEN valve P-LW-C-15-002 and NOTIFY all personnel that flushing has commenced.
16. ALL personnel shall OBSERVE their respective areas for leaks and/or ruptures.

IF any leakage or venting of liquid is observed at the rail car,

- a. NOTIFY the Flush Operator immediately.
- b. Flush Operator shall CLOSE valve P-LW-C-15-002 and water supply valve.

(S)(R)

- c. NOTIFY Management and RCT that corrective repairs and investigative surveys are necessary.
17. 1 minute into the flushing operation, "Flush Operator" shall,
 - a. CLOSE valve P-LW-C-15-002 and PERFORM Independent Verification.
 - b. NOTIFY personnel that flushing has been completed and to STAND BY.
 18. CALCULATE amount of flush.
 - a. OBTAIN "end of flush" reading from flow totalizer on process water line at section 15.
 - b. SUBTRACT the "start of flush" reading determined in Step C.13 from the "end of flush" reading.
 - c. RECORD the amount of flush in gallons on the WORKSHEET.
 19. VERIFY valve T-LW-C-05-294 is OPEN.

C. FLUSH TANK 5-7 TO RAIL CAR WASTE TRANSFER SYSTEM (Cont.)

20. FULLY OPEN the following valves AND PERFORM "Independent Verification":

T-LW-C-05-278
P-LW-C-15-106

- NOTIFY personnel that draining of the system has commenced.

NOTE - Draining times shall be directed by Test Director.

- (R) 21. REQUEST RCTs survey the transfer line to determine ending dose rates and RECORD highest dose rate on the data sheet and NOTIFY Management of the rates recorded PRIOR to continuing.

NOTE - If the dose rate for end of flushing is determined by operations Management as being too high, additional flushing may be directed by Management as being required, if sufficient rail car capacity exists.

22. AFTER system has drained, CLOSE valve T-LW-C-05-294 and P-LW-C-15-106 and PERFORM Independent Verification.
23. "Flush Operator" NOTIFY all personnel that system has been drained, and DIRECT that the system be restored to its stand by condition.
24. THE following listed valves shall be CLOSED and/or REVERIFIED as closed.

T-LW-C-05-270	T-LW-C-11-282	P-LW-C-15-106
T-LW-C-05-268	T-LW-C-11-280	P-LW-C-02-001
T-LW-C-05-269	T-LW-C-11-281	P-LW-C-15-002
T-LW-C-05-274	T-LW-C-11-286	P-LW-C-15-001
T-LW-C-05-272	T-LW-C-11-287	P-LW-C-15-003
T-LW-C-05-275	T-LW-C-11-284	W-PW-C-16-001
T-LW-C-05-271	T-LW-C-11-288	W-PW-C-16-002
T-LW-C-05-276	T-LW-C-11-283	W-PW-C-16-003
T-LW-C-05-279	T-LW-C-11-291	P-LW-C-15-102
T-LW-C-05-294	T-LW-C-11-290	
T-LW-C-05-278	A-HP-C-11-312	
A-HP-C-05-310		
4-inch Rail Car Fill Riser Valve		
3-inch Rail Car Vent Riser Valve		

- PERFORM "Independent Verification"

D. RESTORE TANK 5-7 TO RAIL CAR TRANSFER SYSTEM TO STANDBY CONDITION

1. DISCONNECT the process water flex line at Valve P-LW-C-15-002, and CAP and BAG flex line end.
2. STORE process water flex line in the adjacent hose rack.
3. REPLACE caps on open valve ends P-LW-C-15-002.
 - PERFORM "Independent Verification".

D. RESTORE TANK 5-7 TO RAIL CAR TRANSFER SYSTEM TO STANDBY
CONDITION (Cont.)

- (R) 4. REQUEST RCT to SURVEY 5-7 pump flex line prior to capping and bagging line ends.
- a. UNCOUPLE the 5-7 pump discharge flex line and CAP and BAG flex line ends.
5. STORE pump discharge flex line in an area out of normal foot traffic lanes.
6. DISCONNECT the air flex line at Valve A-HP-C-05-311 and to tank 5-7 pump at the handrail.
7. REPLACE caps on open ends at valve A-HP-C-05-311 and to tank 5-7 pump at the handrail.
- PERFORM Independent Verification.
- (R) 8. REQUEST RCT to establish radiological conditions of openings prior to capping pipe ends.
- a. REPLACE caps on open pipe ends between valve T-LW-C-05-278 and T-LW-C-05-294, and PERFORM "Independent Verification".

TABLE 1 - RAIL CAR LIQUID LEVEL CONVERSION TABLE

Display Reading (Inches)	Actual Liquid Level in Tank (inches)	Volume (Gallons)	Display Reading (Inches)	Actual Liquid Level in Tank (inches)	Volume (Gallons)
-	0	0	19	25.5	2960
-	0.5	1	20	26.5	3146
-	1.5	8	21	27.5	3336
-	2.5	27	22	28.5	3528
-	3.5	60	23	29.5	3722
-	4.5	109	24	30.5	3920
-	5.5	174	25	31.5	4120
0	6.5	251	26	32.5	4322
1	7.5	338	27	33.5	4527
2	8.5	434	28	34.5	4733
3	9.5	538	29	35.5	4942
4	10.5	650	30	36.5	5153
5	11.5	768	31	37.5	5366
6	12.5	892	32	38.5	5581
7	13.5	1023	33	39.5	5797
8	14.5	1160	34	40.5	6015
9	15.5	1301	35	41.5	6234
10	16.5	1448	36	42.5	6455
11	17.5	1599	37	43.5	6678
12	18.5	1756	38	44.5	6901
13	19.5	1916	39	45.5	7126
14	20.5	2081	40	46.5	7351
15	21.5	2250	41	47.5	7578
16	22.5	2422	42	48.5	7805
17	23.5	2598	43	49.5	8034
18	24.5	2778	44	50.5	8263

TABLE 1 - (Cont.)

Display Reading (Inches)	Actual Liquid Level in Tank (inches)	Volume (Gallons)	Display Reading (Inches)	Actual Liquid Level in Tank (inches)	Volume (Gallons)
45	51.5	8492	70	76.5	14200
46	52.5	8722	71	77.5	14417
47	53.5	8953	72	78.5	14633
48	54.5	9184	73	79.5	14847
49	55.5	9415	74	80.5	15059
50	56.5	9647	75	81.5	15269
51	57.5	9878	76	82.5	15478
52	58.5	10110	77	83.5	15684
53	59.5	10342	78	84.5	15887
54	60.5	10574	79	85.5	16088
55	61.5	10805	80	86.5	16287
56	62.5	11037	81	87.5	16484
57	63.5	11267	82	88.5	16677
58	64.5	11498	83	89.5	16868
59	65.5	11728	84	90.5	17056
60	66.5	11957	85	91.5	17241
61	67.5	12186	86	92.5	17422
62	68.5	12414	87	93.5	17601
63	69.5	12641	88	94.5	17776
64	70.5	12867	89	95.5	17947
65	71.5	13092	90	96.5	18114
66	72.5	13316	91	97.5	18277
67	73.5	13539	92	98.5	18435
68	74.5	13760	93	99.5	18589
69	75.5	13981	94	100.5	18739

TABLE - 1 (Cont.)

Display Reading (Inches)	Actual Liquid Level in Tank (inches)	Volume (Gallons)	Display Reading (Inches)	Actual Liquid Level in Tank (inches)	Volume (Gallons)
95	101.5	18884	-	105.5	19407
96	102.5	19023	-	106.5	19522
97	103.5	19157	-	107.5	19630
-	104.5	19286			

TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR WORKSHEET

Step A.6.a

$$\begin{aligned}
 &(\text{Digital \% Reading}) \times (100.5) = \text{Initial Tank 5-7 Gallons} \\
 &\underline{72.4 \text{ (9/12)}} \times (100.5) = \underline{7276 \text{ (9/12)}} \text{ Gallons} \\
 &\underline{72.2 \text{ (9/12)}} \times (100.5) = \underline{7256.1 \text{ (9/12)}}
 \end{aligned}$$

Step A.6.b

$$\text{Amount to be Transferred} = (\underline{7276 \text{ (9/12)}} - \underline{7256.1 \text{ (9/12)}}) \text{ Gallons}$$

Step A.6.c

$$\begin{aligned}
 &(\text{Ultrasonic level Reading}) = \text{Initial Rail car Gallons (From Table 1)} \\
 &\underline{25'} = \underline{25'} \text{ Gallons}
 \end{aligned}$$

Step A.6.d

$$\begin{aligned}
 &19,157 - \text{Initial Rail car Volume} = \text{Rail car Available Volume} \\
 &19,157 - \underline{25'} \text{ Gallons} = \underline{18,906} \text{ Gallons}
 \end{aligned}$$

Step A.6.e

Is Amount to be transferred from Tank 5-7 LESS THAN available Rail car volume? YES ☒ NO ☐

IF NO, NOTIFY supervision.

A.42

$$\begin{aligned}
 &19,157 - (\text{Ultrasonic level reading after leak test}) = \text{Rail Car volume after leak test} \\
 &19,157 - \underline{311.7} \text{ Gallons} = \underline{18,845.1} \text{ Gallons}
 \end{aligned}$$

A.42.a. Is Amount to be transferred from tank 5-7 (see step A.6.b) LESS THAN available Rail car volume after leak test(see step A.42)? Yes ☒ No ☐ If No, Notify Management.

B.13

$$\begin{aligned}
 &(\text{Digital \% Reading in 10 minutes})(\text{step B.10}) \times (100.5) = \text{Tank 5-7 Gallons in 10 minutes} \\
 &\underline{65.3} \times (100.5) = \underline{6562.65} \text{ Gallons}
 \end{aligned}$$

$$\begin{aligned}
 &(\text{Digital \% Reading in 20 minutes})(\text{step B.12}) \times (100.5) = \text{Tank 5-7 Gallons in 20 minutes} \\
 &\underline{59.1} \times (100.5) = \underline{5939.6} \text{ Gallons}
 \end{aligned}$$

B.14

$$\begin{aligned}
 &(\text{Tank 5-7 Gallons in } \underline{10} \text{ minutes}) - (\text{Tank 5-7 Gallons in } \underline{20} \text{ minutes})(\text{step B.13}) = \text{Tank 5-7} \\
 &\text{Gallons Sent in 10 minutes} \\
 &(\underline{6562.65}) - (\underline{5939.6}) = (\underline{623.05} \text{ Gallons})
 \end{aligned}$$

B.15

$$\begin{aligned}
 &(\text{Tank 5-7 Gallons Sent in 10 minutes})(\text{step B.14}) / (\text{Time after 20 minutes from start of} \\
 &\text{transfer}(\text{step B.12}) - \text{Time after 10 minutes from start of transfer}(\text{step B.10}) = \text{Calculated} \\
 &\text{Flow rate } (\underline{623.05}) / ((\underline{20}) - (\underline{10})) \text{ minutes} = \\
 &(\underline{62.305} \text{ GPM})
 \end{aligned}$$

Note-GPM = gallons/minute

B.16

If flow rate calculated B.15 is 40 gallons/minute or greater N/A step B.16.a-e.

B.16.c

$$\begin{aligned}
 &(\text{Initial Digital \% Reading})(\text{step B.16.a}) \times (100.5) = \text{Tank 5-7 Initial Gallons} \quad \text{P/H} \\
 &\quad \quad \quad \times (100.5) = \quad \quad \quad \text{Gallons}
 \end{aligned}$$

TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR WORKSHEET (Cont.)

B.16c (continued)

(Digital % Reading in 10 minutes)(step B.16.b) x (100.5) = Tank 5-7 Gallons in 10 minutes
 _____ x (100.5) = NA Gallons

B.16.d

(Tank 5-7 Gallons in 10 minutes)(step B.16.c) - (Tank 5-7 Initial Gallons)(step B.16.c) =
 Tank 5-7 Gallons Sent in 10 minutes NA = (_____ Gallons)

B.16.e

(Tank 5-7 Gallons Sent in 10 minutes)(B.16.d)/(Time after 10 minutes(step B.16.b) -
 Initial Time(step B.16.a)) = Calculated Flow Rate in gallons/minute
 (_____) / ((_____) - (_____)) = _____ GPM

B.21.

(Ending Digital % Reading)(step B.20) x (100.5) = Tank 5-7 Gallons ending
8.8 x (100.5) = 884.4 Gallons

(Ending Ultrasonic Level Reading)(step B.20) = Final Rail Car Gallons (From Table 1)
31.4 50 444 = 6767.2 Gallons

Step B.24

(Tank 5-7 Initial Gallons)(step A.6.a) - (Tank 5-7 Final Gallons)(step B.21) = Tank 5-7
 Gallons Sent
 (7256.1) - (884.4) = (6371.7 Gallons)

Step B.24

(Final Rail Car Gallons)(step B.21) - (Rail Car Gallons after leak test)(step A.43) =
 Rail Car Gallons Received
 (6767.2) - (311.9) = (6455.3 Gallons)

Step B.24

(TK 5-7 Gallons Sent)(step B.24) - (Rail Car Gallons Received)(step B.24) = TK 5-7 to Rail
 Car XFER Differential
 (6371.7) - (6455.3) = (-83.6 Gallons)

* If this transfer differential is greater than 100 gallons, Notify Management.

B.25

(Tank 5-7 Gallons Sent)(step B.18)/(Final time) - (Initial time) = Calculated Flow rate (_____)
6371.7 / ((1125) - (0952)) minutes = (68.51)
 GPM)

Note-GPM = gallons/minute

Step B.26

(Flow Rate calculated)(step B.25) - (Flow rate indicated on flow meter)(step B.11) = Flow
 Rate Differential
 (68.51) - (0) = (68.51 GPM)

B.26

(Tank 5-7 Gallons sent)(step B.24) - (Total indicated on flow meter)(Step B.19) = Total
 Differential
 (6371.7) - (0) = (6371.7 Gallons)

TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR WORKSHEET (Cont.)

B.26

(Flow rate Differential/Flow rate calculated(step B.25)) x 100 = Flow rate % difference
 from 5-7 level indicator((68.51) / (68.51)) x 100 = (100.
 %)

B.26

((Total Differential/Tank 5-7 gallons sent (step B.24)) x 100 = Total % difference from
 5-7 level indicator((6371.7) / (6371.7)) x 100 = (100. %)

Step C.18

(Start of flush reading)(step C.13) - (end of flush reading)(step C.18.a) = Amount of
 Flush(14.4) - (14.5) = (-1) Gallons

5-7 INITIAL LEVEL

9.0' 904.5

5-7 FINAL LEVEL

10.4' = 1045.2

1045.2 - 904.5 = 140.7 FLUSH GALLONS

TANK 5-7 TO RAIL CAR WASTE TRANSFER DATA SHEET Date: 9/14/97

A. PERFORM PRELIMINARY ACTIVITIES

Step

A.7 Rail Car Dose Rate: 0.7 (RCT) Initials RSA.8 Plastic Sheetting in Cupola RS

A.12 4-inch Riser Valve CLOSED.

Operator JLH Verifier JD

A.15 3-inch Vent Valve OPEN

Operator JLH Verifier JD

A.16 Following Valves are CLOSED:

T-LW-C-05-269	T-LW-C-11-281	P-LW-C-15-106
T-LW-C-05-272	T-LW-C-11-286	P-LW-C-15-102
T-LW-C-05-275	T-LW-C-11-287	P-LW-C-15-002
T-LW-C-05-271	T-LW-C-11-284	P-LW-C-15-001
T-LW-C-05-276	T-LW-C-11-288	W-PW-C-16-001
A-HP-C-05-310	T-LW-C-11-283	W-PW-C-16-002
T-LW-C-05-279	T-LW-C-11-291	W-PW-C-16-003
T-LW-C-05-294	T-LW-C-11-290	

A-HP-C-11-312

Operator RS Verifier JLH

A.17 The following valves are OPEN:

T-LW-C-05-277	T-LW-C-11-289	T-LW-C-15-105
T-LW-C-05-270	T-LW-C-11-280	T-LW-C-15-003
T-LW-C-05-268	T-LW-C-11-282	
T-LW-C-05-274		
T-LW-C-05-278		
P-LW-C-02-001		

Operator RS Verifier RS

A.21 Pump Discharge Flex Hose at section 5 installed.

Operator RS Verifier RS

A.22 Air Flex hose at section 5 installed.

Operator RS Verifier RS

A.25 Process Water flex line at section 15 installed

Operator RS Verifier RS

A.26 Discharge pump flex hose at section 15 installed

Operator RS Verifier RS

A.29 Valve P-LW-C-15-001 OPEN.

Operator RS Verifier RSA.30 Valve W-PW-C-16-002 OPEN. Operator RS Verifier RS

A. PERFORM PRELIMINARY ACTIVITIES (CONTINUED)

A.33 Valve P-LW-C-15-002 FULLY OPEN. Operator JLH
Verifier RSA.34 Gauge P-LW-C-15-107 reading 60 psi

A.36 Valve P-LW-C-16-002 CLOSED AND the following valves are OPEN:

P-LW-C-15-102

P-LW-C-15-106

4" Fill riser Valve

Operator JLH Verifier RSLeakage yes ☒ no, if yes location _____

A.38 The following valves are CLOSED:

P-LW-C-15-002

P-LW-C-15-106

P-LW-C-15-102

P-LW-C-15-003

P-LW-C-15-001

T-LW-C-05-268

Operator JLH Verifier RSA.41 Ultrasonic level reading after leak test 311.9 gal ^{705/4}

B. TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR

B.1 Transfer Dose Rate (RCT) 1 hr

B.2 Valve T-LW-C-05-269 is OPEN:

Operator RS Verifier: RSB.5 "Start of Transfer" Time 0752

B.6 Pressure Gauge readings

T-LW-C-05-297 6 psiT-LW-C-05-298 6 psiA-HP-C-05-311 50 psiP-LW-C-15-107 0 psiB.7 Transfer System Leaks? YES ☐ NO ☒ Location _____B.10 "Time after ten minutes from transfer start" 0% digital reading 65.3B.11 Flow rate from flow meter (T-LW-C-05-273) 0 GPM

note: GPM = gallons/minute

B.12 "Time after 20 minutes from transfer start" 0% digital reading 59.1B.16 Flow rate 40 gallons/minute? ☒ yes ☐ no

* If no, Regulator adjusted however not to exceed 90

psi? ☒ yes ☐ no If yes new setting 60 psiB.16.a "Initial Time" NA% digital reading NA* INCREASE TO 60 PSIG FOR OPS CONFIRMATION T-LW-C-05-297

① INCREASE TO 65 PSIG T-LW-C-05-297 READS 25 PSIG

INCREASED TO 20 PSIG. NOW FLOW RATE: 67 GPM

B. TRANSFER LIQUID WASTE FROM TANK 5-7 TO RAIL CAR(COND)

- B.16.b "Time after 10 minutes from Initial time" NA
 % digital reading NA
- B.18 "End of Transfer" Time 1:25
- B.19 Total transferred reading from totalizer
 (T-LW-C-05-273) 0 gallons
- B.20 ending % digital reading for tank 5-7 8.8
 ending ultrasonic level reading 37.4
- B.22 The following valves are OPEN:
 P-LW-C-15-106
 T-LW-C-05-268
 T-LW-C-05-294
 Transfer line drained
 Operator RLC Verifier LLH
- B.23 Valve P-LW-C-15-106 CLOSED:
 Operator LLH Verifier RLC

C. FLUSH TANK 5-7 TO RAIL CAR WASTE TRANSFER SYSTEM

- Step Initials
- C.2 Process Water Flex Line at section 15 installed.
 Operator LLH Verifier RLC
- C.3 Valve T-LW-C-05-270 CLOSED. Operator RLC
 Verifier LLH
- C.4 The following valves are verified CLOSED:
 T-LW-C-05-276
 T-LW-C-05-271
 P-LW-C-15-001
 CRANTON
 KRAIFIL
NA
- C.5 The following valves OPENED:
 T-LW-C-05-272
 T-LW-C-05-275
 P-LW-C-15-003
 Operator RLC Verifier LLH
 Operator LLH Verifier RLC
- C.6 Valve T-LW-C-05-278 OPENED 1/8 of a turn
 Operator RLC Verifier LLH
 Operator LLH Verifier RLC
- C.11 Valve W-PW-C-16-002 OPENED.
 Operator LLH Verifier RLC
- C.13 "Start of Flush" Reading from Flow Totalizer at
 section 15. 14.4 gallons
- C.17 1 minute after flush Valve P-LW-C-15-002 CLOSED.
 Operator LLH Verifier RLC
- C.20 Valve T-LW-C-05-278 AND P-LW-C-15-106 OPENED
 Operator RLC Verifier LLH

Step No.

Initials

- C.21 Post-Flush Dose Rate (RCT) 1 M RE
- C.22 Valve T-LW-C-05-294 AND P-LW-C-15-106 CLOSED.
 Operator RLC Verifier LLH
- C.24 Following valves are CLOSED.
 T-LW-C-05-269 T-LW-C-11-282 P-LW-C-15-106
 T-LW-C-05-274 T-LW-C-11-280 P-LW-C-02-001
 T-LW-C-05-272 T-LW-C-11-281 P-LW-C-15-003
 T-LW-C-05-275 T-LW-C-11-286 P-LW-C-15-002
 T-LW-C-05-271 T-LW-C-11-287 PL-W-C-15-001
 T-LW-C-05-279 T-LW-C-11-284 W-PW-C-16-001
 A-HP-C-05-310 T-LW-C-11-288 W-PW-C-16-002
 T-LW-C-05-294 T-LW-C-11-291 W-PW-C-16-003
 T-LW-C-05-270 T-LW-C-11-290 P-LW-C-15-102
 T-LW-C-05-268 A-HP-C-11-312
 T-LW-C-05-278 T-LW-C-11-283
 4-inch rail car fill riser valve
 3-inch rail car vent riser valve
 Operator RLC Verifier by LLH

D. RESTORE TANK 5-7 TO RAIL CAR TRANSFER
 SYSTEM TO STANDBY CONDITION

- D.3 End Caps REPLACED for Valves P-LW-C-15-002
 Operator RLC Verifier LLH
- D.7 End Caps REPLACED on open pipe ends between
 valve A-HP-C-05-311 and to pump in 5-7 at the
 handrail.
 Operator RLC Verified by: LLH
- D.8 End Caps REPLACED on open pipe ends between
 Valves T-LW-C-05-278 & T-LW-C-05-294
 Operator RLC Verified by: LLH

Verifiers Name Don E. [unclear] / [unclear]
 Signature AE
 RCT's Name Don E. [unclear]
 Signature [unclear]
 Operator's Name E. P. [unclear]
 Signature [unclear]

Manager's Name RAY BOONE
 Signature [unclear]
 Date 7/1/01

FIGURE 1 - RAIL CAR AND CUPOLA

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0 10/2/97

Figure 3 - Tankcar Transfer Line

[illegible]

DISTRIBUTION SHEET

To Distribution	From Waste Management Engineering	Page 1 of 1
Project Title/Work Order		Date 10/2/97
		EDT No. 604807
		ECN No. n/a

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
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Project File	R1-29	x			
R.M. Irwin	T4-03				x
W.S. Ayers	T3-28				x
Record Center	T3-28	x			
N.K. Myers	T3-28	x			
F.D.N.W. C.D.C.	S2-53	x			