S

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 659060

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersedure ☐ Cancel/Void ☐	D. F. Smith, Project Definition, R3-73, 373-0861	☐ Yes ☒ No	04/7/00
	6. Project Title/No./Work Order No. Performance Requirements for the Double-Shell Tank System: Phase 1	7. Bldg./Sys./Fac. No. N/A	8. Approval Designator N/A
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) HNF-2168, Rev. 0	10. Related ECN No(s).	11. Related PO No. N/A

12a. Modification Work	12b. Work Package No.	12c. Modification Work Completed	12d. Restored to Original Condition (Temp. or Standby ECNs only)
☐ Yes (fill out Blk. 12b) ☒ No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

13b. Design Baseline Document? ☐ Yes ☒ No

Complete revision of document.

14a. Justification (mark one)	14b. Justification Details
Criteria Change ☒ Design Improvement ☐ Environmental ☐ Facility Deactivation ☐ As-Found ☐ Facilitate Const. ☐ Const. Error/Omission ☐ Design Error/Omission ☐	The following criteria or requirement documents have changed dictating a need for a revision. BNFL Privatization Contract RL Planning Guidance Program Baselines

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

Distribution sheet is attached.

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DATE: APR 20 2000 HANFORD RELEASE STA: 4 ID: 2

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1. ECN (use no. from pg. 1): 659060

16. Design Verification Required	17. Cost Impact		18. Schedule Impact (days)
	ENGINEERING	CONSTRUCTION	
☐ Yes	Additional ☐ $ _____	Additional ☐ $ _____	Improvement ☐ _____
☒ No	Savings ☐ $ _____	Savings ☐ $ _____	Delay ☐ _____

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	☐	Seismic/Stress Analysis	☐	Tank Calibration Manual	☐
Functional Design Criteria	☐	Stress/Design Report	☐	Health Physics Procedure	☐
Operating Specification	☐	Interface Control Drawing	☐	Spares Multiple Unit Listing	☐
Criticality Specification	☐	Calibration Procedure	☐	Test Procedures/Specification	☐
Conceptual Design Report	☐	Installation Procedure	☐	Component Index	☐
Equipment Spec.	☐	Maintenance Procedure	☐	ASME Coded Item	☐
Const. Spec.	☐	Engineering Procedure	☐	Human Factor Consideration	☐
Procurement Spec.	☐	Operating Instruction	☐	Computer Software	☐
Vendor Information	☐	Operating Procedure	☐	Electric Circuit Schedule	☐
OM Manual	☐	Operational Safety Requirement	☐	ICRS Procedure	☐
FSAR/SAR	☐	IEFD Drawing	☐	Process Control Manual/Plan	☐
Safety Equipment List	☐	Cell Arrangement Drawing	☐	Process Flow Chart	☐
Radiation Work Permit	☐	Essential Material Specification	☐	Purchase Requisition	☐
Environmental Impact Statement	☐	Fac. Proc. Samp. Schedule	☐	Tickler File	☐
Environmental Report	☐	Inspection Plan	☐	_____	☐
Environmental Permit	☐	Inventory Adjustment Request	☐	_____	☐

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision

21. Approvals

	Signature	Date		Signature	Date
Design Authority	R. S. Popielarczyk	4/17/00	Design Agent		
Cog. Eng.	D. F. Smith	4/12/00	PE		
Cog. Mgr.	T. J. Conrad	4/13/00	QA		
QA			Safety		
Safety			Design		
Environ.			Environ.		
Other			Other		
D. G. Baide		4-13-00			
J. F. Bores		4/14/2000			
G. C. DeWeese		4-13-00	DEPARTMENT OF ENERGY		
G. P. Duncan		4-17-00	Signature or a Control Number that tracks the Approval Signature		
T. G. Goetz		4/13/00			
C. E. Grenard		4/12/00	ADDITIONAL		
J. W. Hunt		4/13/00			
R. A. Kirkbride		4/13/00			
T. C. Oten		4/13/00			

HNF-2168
Revision 1

Performance Requirements for the Double-Shell Tank System: Phase 1

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

CH2MHILL
Hanford Group, Inc.

Richland, Washington

Contractor for the U.S. Department of Energy
Office of River Protection under Contract DE-AC06-99RL14047

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PERFORMANCE REQUIREMENTS FOR THE DOUBLE-SHELL TANK SYSTEM: PHASE 1

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U.S. Department of Energy Contract DE-AC06-99RL-14047

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Key Words: requirements, DST System, functions

Abstract:

This document describes the performance requirements for the Double-Shell Tank (DST) System. These requirements reflect the Case 3, Project Planning Case from the Tank Waste Remediation System Operation and Utilization Plan, Revision 1. These requirements, in turn, will be incorporated into a specification for the DST System.

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Revision 1

Performance Requirements for the Double-Shell Tank System: Phase 1

D. F. Smith

Date Published
April 2000

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Office of River Protection under Contract DE-AC06-99RL14047

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TERMS

BNFL	BNFL Inc.
day	24-hour period
DOE	U.S. Department of Energy
DST	double-shell tank
HLW	high-level waste
ICD	interface control document
LAW	low-activity waste
month	calendar month or 30 days, depending on context
OWVP	operational waste volume projection
PFP	Plutonium Finishing Plant
PHMC	Project Hanford Management Contract
RPP	River Protection Project
SST	single-shell tank
TBD	to be determined
TBR	to be refined
TWRS	Tank Waste Remediation System
year	calendar year from January 1 through December 31

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PERFORMANCE REQUIREMENTS FOR THE DOUBLE-SHELL TANK SYSTEM: PHASE 1

1.0 PURPOSE AND SCOPE

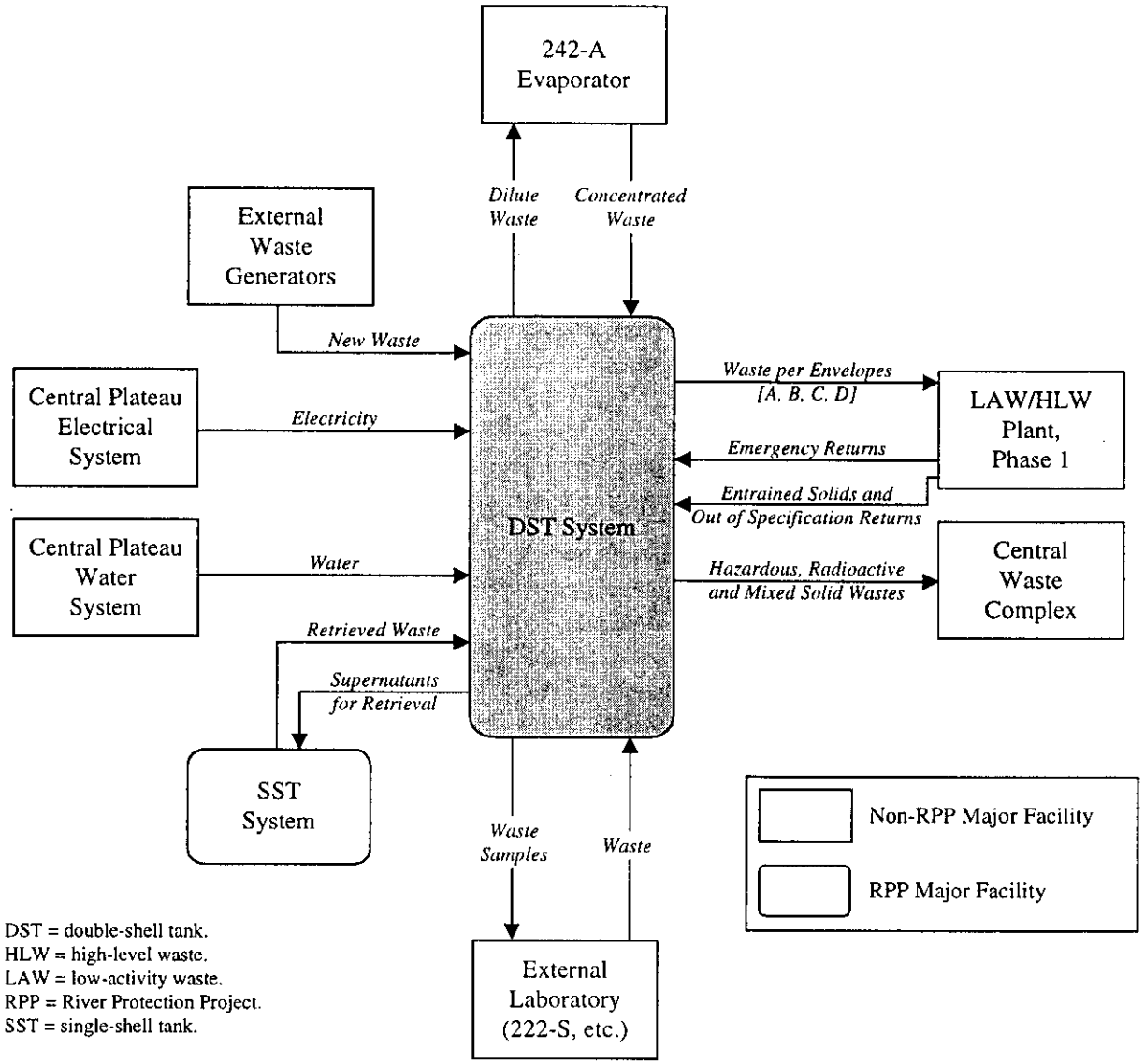
1.1 PURPOSE

This document establishes the performance requirements for the Double-Shell Tank (DST) System. These requirements, in turn, will be incorporated into a specification for the DST System.

1.2 SCOPE

This document describes the performance requirements applicable to the DST System in support of Phase 1 of the River Protection Project (RPP). Specifically, this document supports Phase 1 activities by the RPP Team including activities to safely store waste, receive new waste, move waste feed to staging tanks, adjust feed as necessary to meet specifications, and deliver the feed to the Privatization Contractor (BNFL Inc. [BNFL]). Figure 1 identifies the DST System in relation to other major Hanford Site facilities and the items that pass across the interfaces. Figure 2 identifies the upper-level DST functions and shows the relationship between these functions. The relationship among the subordinate functions is diagrammed in Figure 3 to illustrate the DST System functional flow. The bases for the functions shown in Figure 3 and their relationships are developed herein and in HNF-5136, *Functional Analysis for Double-Shell Tank Subsystems*. Note that Figures 2 and 3 show *what* the DST System must do, while the performance requirements derived herein serve to bound *how well* the system must perform.

Figure 1. Double-Shell Tank System Interface Diagram.



DST = double-shell tank.
HLW = high-level waste.
LAW = low-activity waste.
RPP = River Protection Project.
SST = single-shell tank.

Figure 2. Double-Shell Tank System Operations and Maintenance Flow, Phase I.

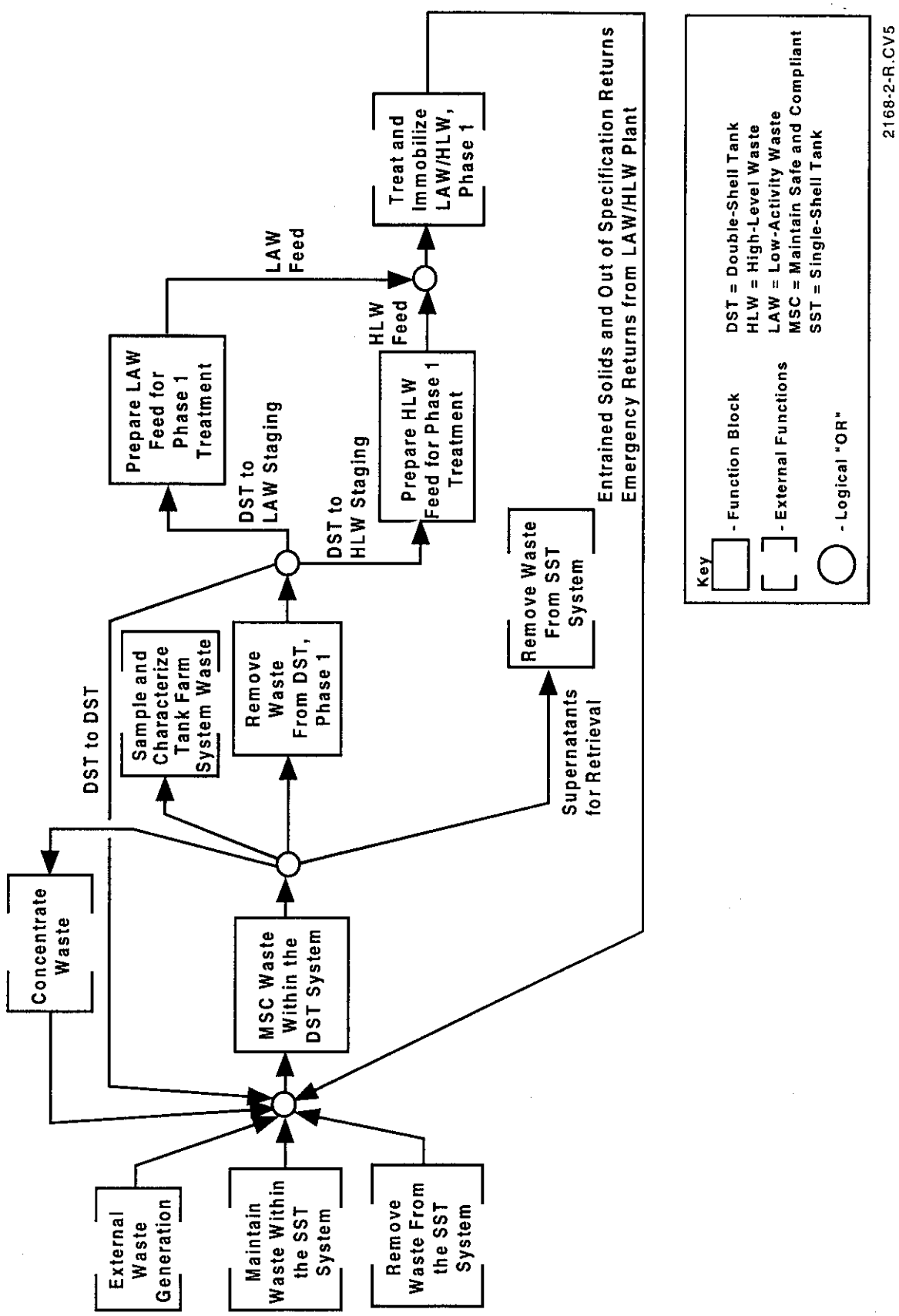


Figure 3. Double-Shell Tank System Functional Flow Block Diagram. (Sheet 1 of 2)

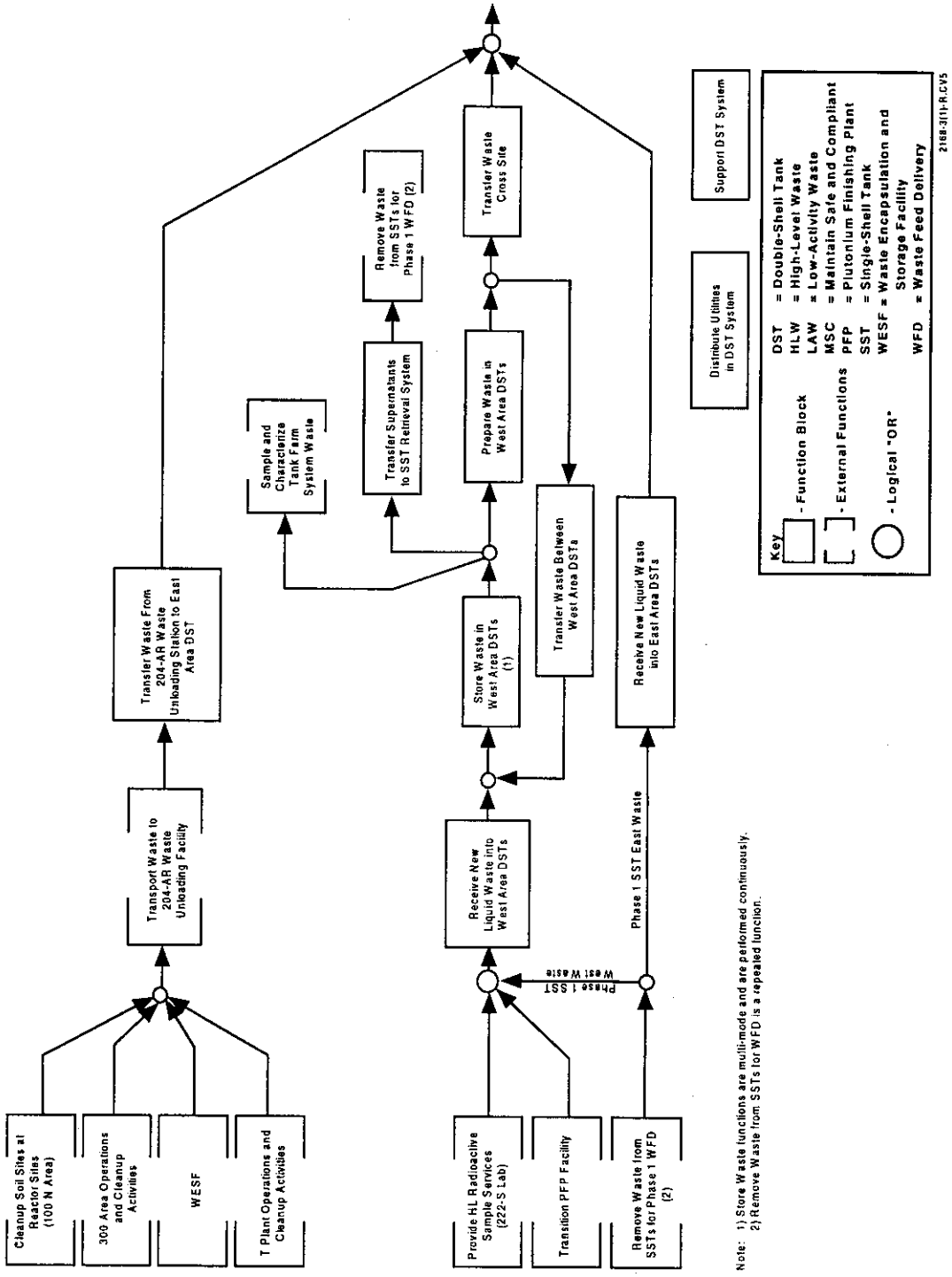
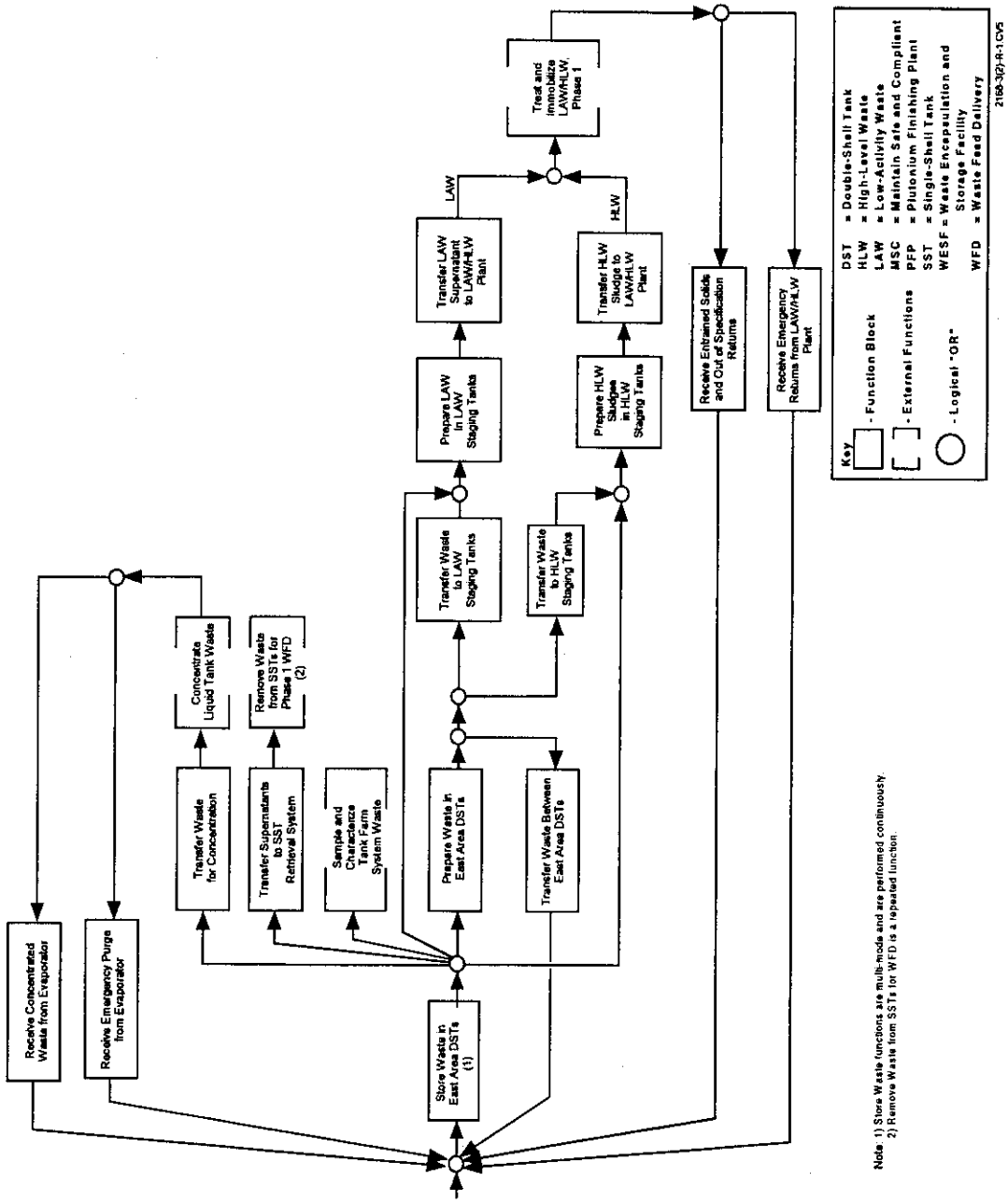


Figure 3. Double-Shell Tank System Functional Flow Block Diagram. (Sheet 2 of 2)



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2.0 APPROACH

Many of the performance requirements listed in this document were derived by an analysis of Appendix H, Table H-3 of HNF-SD-WM-SP-012. Case 3 is the Project Planning Case, in accordance with letter 99-AMPD-006, "Contract DE-AC06-96RL13200 - Planning Guidance Revision for Development of Contract Deliverables Required by Performance Agreement TWR1.3.5." Case 3 meets the guidance for moving waste as needed to support the required low-activity waste (LAW) and high-level waste (HLW) feeds to BNFL of a specified composition and various batch-transfer volumes and rates to support BNFL's production of vitrified LAW waste and HLW canisters. Interface control documents (ICD) BNFL-5193-ID-19, *Interface Control Document Between DOE and BNFL Inc. for Low-Activity Waste Feed,* and BNFL-5193-ID-20, *Interface Control Document Between DOE and BNFL Inc. for High-Level Waste Feed,* were used to identify waste feed envelopes and the envelope-delivery sequence for LAW. The proposed draft Case 3S6D has been reviewed and impacts to the requirements stated herein are expected to change as the source document used to provide bases (HNF-SD-WM-SP-012, Rev. 1) is revised to reflect the proposed change from the current planning case, Case 3. These changes are expected to include changes to bound the requirements related to waste batch volumes, durations, transfer sequences, and staging tank designations. In addition, references to entrained solids returned from BNFL will be deleted as no longer necessary for Case 3S6D. This document will need to be revised in the future to reflect changes from the Case 3 planning referenced herein. Fiscal year 2001 planning includes conducting sensitivity analyses that will serve to refine performance requirements stated herein.

As noted in HNF-SD-WM-SP-012, Phase 1 waste transfers to support waste feed delivery for Case 3 are broken into the following feed projections:

- <u>HLW, Phase 1B (minimum order quantities, 600 canisters)</u>
  (100 canisters per year, for 2 years, and 120 canisters per year through year 13)
  - Initial batch, Batch 1, delivered in October 2004
  - Last batch, Batch 25, delivered in December 2010
  - Contingency feed, Batches 26 through 32, delivered from April 2011 through March 2014
- <u>HLW Phase 1B-Prime (1B')</u>
  (480 canisters per year, in year 13 and on through the end of Phase 1)
  - Initial batch, Batch 33, delivered in June 2014
  - Final batch, Batch 50, delivered in January 2018
  - Contingency feed, Batches 51-59, delivered from June 2018 through April 2020

- LAW Phase 1
  (800 units per year for 3 years, then 1,100 units per year through the end of Phase 1)
  - Initial batch, Batch 1, delivered in October 2005
  - Last batch, Batch 21, delivered in November 2017.

For waste transfers from non-RPP facilities (such as new waste received from the 222-S Laboratory and 300 Area), volumes were derived from two sources. The first source was the *Operational Waste Volume Projections* (OWVP), HNF-SD-WM-ER-029. The second source was the ICDs between the RPP and non-RPP facilities. Both documents define annual transfer volumes; however, an approved and released ICD took precedence over the OWVP data. Otherwise, the OWVP data were used.

The *Tank Waste Remediation System Mission Analysis Report* (HNF-SD-WM-MAR-008, Rev. 3) was used to provide the basis for the DST functions.

As noted above, the following documents were used as the primary sources for defining DST System planning and bounding the associated requirements:

- HNF-SD-WM-SP-012, *Tank Waste Remediation System Operation and Utilization Plan to Support Waste Feed Delivery*, Rev. 1
- BNFL-5193-ID-19, *Interface Control Document Between DOE and BNFL Inc. for Low-Activity Waste Feed*, Rev. 4, and BNFL-5193-ID-20, *Interface Control Document Between DOE and BNFL Inc. for High-Level Waste Feed*, Rev. 4
- 99-AMPD-006, "Contract DE-AC06-96RL13200 - Planning Guidance Revision for Development of Contract Deliverables Required by Performance Agreement TWR1.3.5"
- HNF-SD-WM-ER-029, *Operational Waste Volume Projection*, Rev. 25
- HNF-4500, *Tank Farm System Interface Summary*, Rev. 0
- HNF-SD-WM-MAR-008, *Tank Waste Remediation System Mission Analysis Report*, Rev. 3.

As noted herein, some requirements reference source documents containing the actual applicable requirement or set of requirements. As such, these source documents are intended to bound the DST System in accordance with the version identified in the References section.

3.0 PERFORMANCE REQUIREMENTS FOR THE DOUBLE-SHELL TANK SYSTEM

The performance requirements for the DST System are listed in this section according to function.

3.1 MAINTAIN SAFE AND COMPLIANT WASTE WITHIN THE DOUBLE-SHELL TANK SYSTEM

The DST System shall (a) store existing tank waste and waste received from the Single-Shell Tank (SST) System and onsite waste generators in DSTs and (b) transfer waste to the 242-A Evaporator during evaporator campaigns.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for storing existing tank waste, accepting and storing additional waste received, and "sending" waste to the evaporator.

3.1.a Double-Shell Tank System Storage Capacity, Phase 1. The DST System shall provide at least 118,060 m^3 (31,170,000 gal) of storage capacity through Phase 1.

Basis: Total DST System capacity was provided by Figure 3.1-5 of HNF-SD-WM-SP-012.

3.1.1 Store Waste in West Area Double-Shell Tanks

The DST System shall store existing waste and waste received from the SSTs and waste generators in the 200 West Area.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for storing existing tank waste and for accepting and storing waste transferred from SSTs to the DST System.

3.1.1.a West Area Double-Shell Tank System Storage Capacity, Phase 1. The DST System shall provide at least 11,363 m^3 (3,000,000 gal) of storage capacity in the 200 West Area DSTs.

Basis: As given in WHC-MR-0132, A History of the 200 Area Tank Farms, *for the SY Tank Farm three tanks at 3,788 m^3 (1,000,000 gal).*

3.1.2 Store Waste in East Area Double-Shell Tanks

The DST System shall store existing waste in the 200 East Area DSTs and waste received from the SSTs, the 200 West Area DSTs, the 200 East Area waste generators, and other waste generators that use the 204-AR Waste Unloading Facility.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for storing existing tank waste and for accepting and storing waste transferred from SSTs to the DST System.

3.1.2.a East Area Double-Shell Tank System Storage Capacity, Phase 1. The DST System shall provide at least 106,887 m^3 (28,220,000 gal) of storage capacity in the 200 East Area DSTs.

Basis: As given by FDM-T-200-00002, 241-AN Tank Farm Facilities Description Manual, *seven tanks at 4,318 m^3 (1,140,000 gal) maximum, FDM-T-200-00003,* Aging-Waste Tank Facility Description Manual, *four tanks at 3,901 m^3 (1,030,000 gal) maximum, FDM-T-270-00001,* 241-AP Tank Farm Facility Description Manual, *eight tanks at 4,394 m^3 (1,160,000 gal) maximum, and FDM-T-200-00001,* 241-AW Tank Farm Facility Description Manual, *six tanks at 4,318 m^3 (1,140,000 gal).*

3.1.3 Transfer Waste From the 204-AR Waste Unloading Facility to East Area Double-Shell Tanks

The DST System shall remove waste from tanker trucks and the LR-56 Cask System at the 204-AR Waste Unloading Facility and transfer that waste to 200 East Area DSTs for storage, in accordance with the requirements of Section 4.1.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for accepting and storing additional waste from other DSTs and from other waste generators.

3.1.4 Receive New Liquid Waste Into West Area Double-Shell Tanks

The DST System shall receive waste from 200 West Area waste generators and shall route that waste to a 200 West Area DST.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for accepting and storing additional waste from other DSTs and from other waste generators.

3.1.4.a West Area Liquid Waste Annual Capacity. The DST System shall receive a maximum of 17,040 m^3 (4,499,000 gal) of liquid waste per year into West Area DSTs from 200 West Area waste generators through Phase 1.

Basis: Based on the maximum yearly quantity of waste transferred to the West Area DSTs for Phase 1 as listed in HNF-SD-WM-SP-012, Rev 1, Appendix H, Table H-3. Waste inputs to the West Area DSTs would be a sum of the following:

1. *222-S Laboratory (45 m^3 [12,000 gal/yr] per HNF-4483,* Interface Control Document for the Tank Farm System and 222-S Laboratory, *Section 3.1.1, into the 244-S Double-Contained Receiver Tank and Tank 241-SY-102)*

2. *SST retrieval (16,870 m^3 [4,454,000 gal] over the period from 02/08/11 to 08/17/11)*

3. *Plutonium Finishing Plant (125 m^3 [33,000 gal/yr] per HNF-4486,* Interface Control Document for the Double-Shell Tank System and the Plutonium Finishing Plant, *Section 3.1.1, into the 244-TX Double-Contained Receiver Tank and subsequently into Tank 241-SY-102).*

(See Appendix, Data Supporting 3.1.4.a)

3.1.4.b Waste Volumes Received –West Area. The DST System shall receive up to 2,913 m^3 (769,000 gal) of waste within 5 days into a West Area DST from 200 West Area waste generators.

Basis: Based on maximum waste transfers into a West Area DST during Phase 1, as listed in HNF-SD-WM-SP-012, Rev 1, Appendix H, Table H-3. Transfers into Tank 241-SY-102 are no greater than 2,193 m^3 (769,000 gal) of waste as identified in the series of transfers projected for the period 7/9/14 through 7/13/14 (see Appendix, Data Supporting 3.1.4.b).

3.1.5 Receive New Liquid Waste into East Area Double-Shell Tanks

The DST System shall receive waste from 200 East Area waste generators and shall route that waste to a 200 East Area DST.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for accepting and storing additional waste from other DSTs and from other waste generators.

3.1.5.a East Area Liquid Waste Annual Capacity. The DST System shall receive up to 7,189 m^3 (1,898,000 gal) of liquid waste per year through Phase 1 into East Area DSTs, excluding waste transferred into East Area DSTs via cross-site transfers.

Basis: Based on the maximum yearly quantity of waste transferred to the East Area DSTs from retrieved SSTs. This maximum occurs in year 2016 (see Appendix, Data Supporting 3.1.5.a).

3.1.5.b Waste Volumes Received–East Area. The DST System shall receive up to 2,560 m^3 (676,000 gal) of waste within 4 days into East Area DSTs, excluding waste transferred into East Area DSTs via cross-site transfers.

Basis: Based on the maximum quantity of waste transferred continuously to the East Area DSTs from retrieved SSTs.

Based on maximum transfers into an East Area DST during Phase 1, as listed in HNF-SD-WM-SP-012, Rev. 1, Appendix H, Table H-3. Transfers into DST 241-AP-101 are 2,560 m^3 (676,000 gal) over a 4 day period (see Appendix, Data Supporting 3.1.5.b.

3.1.6 Receive Concentrated Waste from Evaporator

The DST System shall route concentrated waste from the 242-A Evaporator to a 200 East Area DSTs for storage.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for accepting and storing additional waste from the 242-A Evaporator.

3.1.6.a Annual Volume of Concentrated Waste. The DST System shall receive up to 3765 m^3 (994,000 gal) of waste per year through Phase 1 from the 242-A Evaporator.

Basis: Based on the maximum yearly quantity of waste transferred from the evaporator during Phase 1, as listed in HNF-SD-WM-SP-012, Rev. 1, Appendix H, Table H-3. (See Appendix, Data Supporting 3.1.6.a, for details regarding waste received during year 2012.)

3.1.6.b Concentrated Waste Receipt Rate. The DST System shall be capable of continuously receiving evaporator slurry at a nominal 0.00189 to 0.00442 m^3/s (30 to 70 gal/min).

Basis: Based on requirements presented in Section 6.1.2.1 of HNF-SD-WM-SAR-023, 242-A Evaporator Safety Analysis Report.

3.1.7 Receive Emergency Purge from Evaporator

The DST System shall receive waste from the 242-A Evaporator during an emergency purge event, as specified in Section 4.5.c.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for accepting and storing additional waste from the 242-A Evaporator.

3.1.8 Receive Emergency Returns from Low-Activity Waste/High-Level Waste Plant

The DST System shall receive waste returns from the LAW/HLW Plant on an emergency basis, as specified in Section 4.6.a.

Basis: Per 99-AMDP-006, Attachment item 6, the DST System shall provide the capability to receive BNFL waste returns on an emergency basis.

3.1.9 Receive Entrained Solids and Out-of-Specification Returns from Low-Activity Waste/High-Level Waste Plant

The DST System shall receive entrained solids and out-of-specification waste feed returned from the LAW/HLW Plant as specified in Section 4.6.b.

Basis: Per 99-AMDP-006, Attachment item 25, the DST System shall install the capability (piping, valving, etc.) to accept back entrained solids and out-of-specification waste feed.

3.1.10 Transfer Waste for Concentration

The DST System shall transfer waste from the 242-A Evaporator feed tank (241-AW-102) to the 242-A Evaporator for concentration.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for removing waste from DSTs for evaporation.

3.1.10.a Evaporator Feed Annual Volume. The DST System shall provide the capability to deliver up to 9,090 m^3 (2,400,000 gal) of waste per year for transfer from a DST to the 242-A Evaporator through the end of Phase 1.

Basis: Based on the average yearly quantity of waste transferred to the evaporator for Phase 1 (7,575 m^3 [2,000,000 gal] is the total of 2 items in the table for the period 10/2004 through 11/2004) as listed in HNF-SD-WM-ER-029, Rev 25, Table 14. An additional 1,515 m^3 (400,000 gal) was added to conservatively bound the projection.

3.1.10.b Evaporator Feed Rate. The DST System shall provide the capability to transfer waste to the evaporator within a range of 0.00442 m^3/s (70 gal/min) to 0.00757 m^3/s (120 gal/min) for 2 months.

Basis: Based on requirements presented in Section 6.1.2.1 of HNF-SD-WM-SAR-023, Rev 3.

3.1.10.c Evaporator Feed Requirements. The DST System shall provide evaporator feed that satisfies the requirements in WHC-SD-WM-DQO-014, *242-A Evaporator Data Quality Objectives*. In addition, the DST System shall provide evaporator feed from a DST that satisfies the following requirements:

(1) No significant exotherm at a temperature below 168 °C (335 °F) or the exotherm/exotherm ratio less than or equal to 1

(2) No total concentration in excess of the $NaNO_3/NaNO_2$ precipitation boundary.

Basis: WHC-SD-WM-DQO-014, Rev. 2, provides guidance for successful operations involving a candidate feed tank for the 242-A Evaporator. HNF-SD-WM-EV-060, Rev. 6, 242-A Evaporator Waste Analysis Plan, Section 5.1.1, addresses exothermic reactions in discussing candidate feed tanks.

3.2 REMOVE WASTE FROM DOUBLE-SHELL TANKS, PHASE 1

The DST System shall remove waste from a DST and send it to another DST to support waste staging operations and for space management.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for removing waste from one DST and sending that waste to another DST for storage or treatment.

3.2.a Low-Activity Waste Staging Quantity, Phase 1. The DST System shall transfer a minimum of 43,891 m^3 (11,588,000 gal) of LAW for Phase 1 to support LAW staging operations.

Basis: These quantities were obtained using Table 3.1-2(summary feed staging for LAW) of HNF-SD-WM-SP-012, Rev 1 to identify source and staging tanks. (See Appendix, Data Supporting 3.2.a)

3.2.b High-Level Waste Staging Quantity, Phase 1. The DST System shall stage up to 30,350 m^3 of waste slurry containing 2,913 metric tons of solids.

Basis: These quantities were obtained from Table 2.4-1 (projected feed staging for HLW) of HNF-SD-WM-SP-012, Rev 1. Note: Phase 1 quantities include contingency waste.

3.2.c **Waste Properties.** The DST System shall remove waste from the DSTs that has the following properties:

Supernatant

Density:	1-1.57 g/mL
pH:	8 to 14+
Sodium Molarity:	Up to 14 Molar

Soluble Waste

Solubility:	Soluble waste dissolves within 48 hours using the dissolution kinetics test as described in HNF-SD-WM-DTR-046, *Results of Dilution Studies with Waste from Tank 241-AN-105.*
Shear Strength:	6.9 Pa at 300 s^{-1} (undiluted settled solids, 45 °C)
	3.0 Pa at 300 s^{-1} (undiluted whole tank composite, 45 °C)
Apparent Viscosity:	10,000 to 10,000,000 cP (in situ, unmixed)
Yield Stress:	<500 Pa (in situ, unmixed)

Insoluble Waste

Solubility:	Insoluble waste does not dissolve within 48 hours using the dissolution kinetics test as described in HNF-SD-WM-DTR-046.
Shear Strength:	210 to 5,360 Pa

Basis: Per HNF-SD-WM-DTR-046, Rev. 0, and TWR-2244, Rev. 0-A, Retrieved Waste Properties and High-Level Waste Critical Component Ratios for Privatization Waste Feed Delivery. *Note: These values bound the waste forms within the tanks. Actual application of these values will vary by tank.*

3.2.1 Prepare Waste in West Area Double-Shell Tanks

The DST System shall prepare waste stored in the 200 West Area DSTs for transfer to another 200 West Area DST or cross-site to an East Area DST.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for removing waste from one DST and sending that waste to another DST for storage or treatment. Given that scenario, preparing the waste for transfer to another DST is a logical extension.

3.2.1.a **Supernatant Preparation – West Area.** The DST System shall adjust up to 4,231 m^3 (1,117,000 gal) of supernatant to meet the transfer requirements of HNF-SD-WM-DQO-001, Rev. 3 and HNF-SD-WM-OCD-015, Rev. 2. In addition, the DST System may adjust the supernatant to achieve the waste characteristics identified in RPP-5346, *Waste Feed Delivery Transfer System Analysis* <TBR>, Appendix D.

Basis: The volume is captured by the cross-site transfers from 241-SY-101 to 241-AN-104 in 2015 (see Appendix, Data Supporting 3.2.3.a). RPP-5346 defines the waste critical velocities, flow rates, and characteristics for supporting DST-to-DST, and DST-to-BNFL waste transfers. RPP-5346 currently is a Rev. 0 Draft version; thus, the term "TBR" is noted for this document.

3.2.1.b **Soluble Waste Preparation – West Area.** The DST System shall transform a selected quantity of soluble waste to satisfy the transfer requirements of HNF-SD-WM-DQO-001, Rev. 3 and HNF-SD-WM-OCD-015, Rev. 2. In addition, the DST System may adjust the waste to achieve the waste characteristics as identified in RPP-5346 <TBR>, Appendix D. Soluble waste preparation of the selected quantity shall be completed within 82 days.

Basis: To satisfy the requirements of DE-AC06-96RL13308, TWRS Privatization Contract, *Specification 7, "Low Activity Waste Envelopes Definition," Section 7.2.2.1.*

The duration of 82 days is taken from the schedule in HNF-1946 and does not include the time required to transfer. RPP-5346 currently is a Rev. 0 Draft version; thus, the term "TBR" is noted for this document.

3.2.1.c **Insoluble Waste Preparation – West Area.** The DST System shall mobilize a selected quantity of insoluble waste and shall transform that waste to satisfy the transfer requirements of HNF-SD-WM-DQO-001 and HNF-SD-WM-OCD-015, Rev. 2. In addition, the system shall adjust the selected waste to achieve the waste characteristics as identified in RPP-5346 <TBR>, Appendix D, within 14 days.

Basis: A reasonable minimum duration for waste preparation is defined by the rationale for assumption C in Section 4.1 of WHC-SD-WM-CBA-001, Life-Cycle Cost Analysis of the Advanced Design Mixer Pump. *The adjustments are required to ensure waste compatibility and to support meeting the waste critical velocities*

analyzed as needed for transfer. RPP-5346 currently is a Rev. 0 Draft version; thus, the term "TBR" is noted for this document.

3.2.2 Transfer Waste Between West Area Double-Shell Tanks

The DST System shall transfer waste between West Area DSTs for storage.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for removing DST waste and relocating that waste to another DST for storage or treatment. Available feed in Table 14 (LAW) and Table 16 (HLW) identify source and staging tanks.

3.2.2.a 200 West Area Waste Batch Transfer. The DST System shall transfer selected batches of up to 1727 m^3 (456,000 gal) of prepared waste from a 200 West Area DST to another 200 West Area DST within 3 days.

Basis: Based on the maximum and minimum waste transfers to the West Area DSTs during Phase 1, as listed in HNF-SD-WM-SP-012, Rev 1, Appendix H, Table H-3. (See Appendix, Data Supporting 3.2.2.a, for basis details regarding quantities.

3.2.2.b Waste Pumpability. The DST System shall adjust the selected waste as required to maintain the waste critical velocities as identified in RPP-5346 <TBR>, Appendix D.

Basis: RPP-5346 defines the waste critical velocities, flow rates, and characteristics for supporting DST-to-DST, and DST-to-BNFL waste transfers. RPP-5346 currently is a Rev. 0 Draft version; thus, the term "TBR" is noted for this document.

3.2.3 Transfer Waste Cross-Site

The DST System shall transfer waste from the West Area DSTs to the East Area DSTs.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 8.2, identifies a cross-site transfer system to facilitate regulatory-compliant transfers from the 200 West Area to the 200 East Area.

3.2.3.a Cross-Site Transfer Annual Capacity. The DST System shall transfer up to 11,344 m^3 (2,995,000 gal) of prepared waste annually from the 200 West Area to a 200 East Area DST.

Basis: Based on the maximum transfers from West Area DSTs to Tank 241-AN-104 in year 2011 (see Appendix, Data Supporting 3.2.3.a).

3.2.3.b Cross-Site Waste Transfer Volume. The DST System shall transfer selected batches of up to 4,231 m^3 (1,117,000 gal) of prepared waste from 200 West Area to a 200 East Area DST in 6 days.

Basis: Based on the maximum quantity of waste planned for transfer from West Area DSTs to Tank 241-AN-104 in 2015 (see Appendix, Data Supporting 3.2.3.a).

3.2.3.c Waste Pumpability. The DST System shall adjust waste to meet the waste pumpability requirements of WHC-SD-W058-DRD-001, Rev. 0, *Preliminary Design Requirement Document for Project W-058 Replacement of the Cross-Site Transfer System.*

Basis: WHC-SD-W058-DRD-001 identifies the waste physical properties that the Cross-Site Transfer System must handle. The Cross-Site Transfer System put in place by Project W-058 is assumed to be adequate for Phase 1 Waste Feed Delivery activities. RPP-5346, used to define the waste critical velocities, flow rates, and characteristics for supporting waste transfers between DSTs and DST-to-BNFL, does not specifically address supporting cross-site transfers.

3.2.4 Prepare Waste In East Area Double-Shell Tanks

The DST System shall prepare waste stored in the 200 East Area DSTs for transfer to another East Area DST.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for removing waste from one DST and sending that waste to another DST for storage or treatment. Given that scenario, preparing the waste for transfer to another DST is a logical extension.

3.2.4.a Supernatant Preparation – East Area. The DST System shall adjust up to 6,575 m^3 (1,736,000 gal) of supernatant to meet the transfer requirements of HNF-SD-WM-DQO-001, Rev. 3 and HNF-SD-WM-OCD-015, Rev. 2. In addition, the DST System may adjust the supernatant to achieve the waste characteristics identified in RPP-5346 <TBR>, Appendix D.

Basis: Tanks 241-AN-102 and 241-AN-107 are identified in HNF-SD-WM-SP-012, Section 3.4.3.2, as the tanks containing supernatant that will be adjusted in line during transfer to provide Envelope C feed (Phase 1 Low-Activity Waste). Based on quantity of waste transferred between these tanks as listed in HNF-SD-WM-SP-012, Rev 1, Appendix H, Table H-3, the maximum annual volume noted was 6,575 m^3 (1,736,000 gal) transferred from Tank 241-AN-102 and Tank 241-AN-107 from 09/02/05 through 12/13/05. (See Appendix, Data Supporting 3.2.4.a.)

RPP-5346 defines the waste critical velocities, flow rates, and characteristics for supporting DST-to-DST and DST-to-BNFL waste transfers. RPP-5346 currently is a Rev. 0 Draft version; thus, the term "TBR" is noted for this document.

3.2.4.b **Soluble Waste Preparation – East Area.** The DST System shall transform a selected quantity of soluble waste to satisfy the transfer requirements of HNF-SD-WM-DQO-001, Rev. 3 and HNF-SD-WM-OCD-015, Rev. 2. In addition, the DST System shall adjust the waste to achieve the waste characteristics identified in RPP-5346 <TBR>, Appendix D. Soluble waste preparation of the selected quantity shall be completed within 117 days.

Basis: To satisfy the requirements of DE-AC06-96RL13308, Specification 7, Section 7.2.2.1. The duration of 117 days is taken from the schedule in HNF-1946, and does not include the time required to degas or transfer. RPP-5346 currently is a Rev. 0 Draft version; thus, the term "TBR" is noted for this document.

3.2.4.c **Insoluble Waste Preparation--East Area.** The DST System shall mobilize a selected quantity of insoluble waste and shall transform that waste to satisfy the transfer requirements of HNF-SD-WM-DQO-001 and HNF-SD-WM-OCD-015, Rev. 2, and may adjust the waste to achieve the waste characteristics identified in RPP-5346 <TBR>, Appendix D. The selected waste preparation shall be completed within 14 days.

Basis: A reasonable minimum duration for waste preparation is defined by the rationale for assumption 'C' in Section 4.1 of WHC-SD-WM-CBA-001. The adjustments are required to ensure waste compatibility and to support meeting the waste critical velocities analyzed as needed for transfer. RPP-5346 currently is a Rev. 0 Draft version; thus, the term "TBR" is noted for this document.

3.2.5 Transfer Waste Between East Area Double-Shell Tanks

The DST System shall transfer waste between East Area DSTs.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for removing DST waste and relocating that waste to another DST for storage or treatment. Available feed data in Table 14 (LAW) and Table 16 (HLW) identify source and staging tanks.

3.2.5.a **200 East Area Waste Batch Transfer.** The DST System shall transfer selected batches of up to 3,916 m^3 (1,034,000 gal) of prepared waste from a 200 East Area DST to another 200 East Area DST within 9 days.

Basis: Based on quantity of waste transferred between East Area DSTs for Phase 1 as listed in HNF-SD-WM-SP-012, Rev 1, Appendix H, Table H-3. The maximum noted was 3,916 m^3 (1,034,000 gal) transferred to Tank 241-AN-104 and Tank 241-AP-105 over a 9-day period from 07/02/14 to 07/10/14. (See Appendix, Data Supporting 3.2.5.a.)

3.2.5.b Waste Pumpability. The DST System shall satisfy the waste pumpability requirements of Section 3.2.2.b.

3.2.6 Transfer Waste to Low-Activity Waste Staging Tanks

The DST System shall transfer operator-selected waste from the 200 East Area DSTs to the LAW staging tanks.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Table 17, identifies the DST LAW transfer function in terms of removing DST waste and relocating the waste to another DST for storage or treatment.

3.2.6.a Low-Activity Waste Staging Batch Volumes. The DST System shall transfer 1,587 m^3 (419,000 gal) to 3,785 m^3 (995,000 gal) of prepared waste from East Area DSTs to the LAW feed staging tank in 3 to 6 days.

Basis: Based on the minimum and maximum quantity of waste transferred between East Area DSTs for Phase 1 as listed in HNF-SD-WM-SP-012, Rev 1, Appendix H, Table H-3, i.e., waste transferred to staging tanks 241-AN-101 and 241-AN-106 (see Appendix, Data Supporting 3.2.6.a).

3.2.6.b Waste Pumpability. The DST System shall satisfy the waste pumpability requirements of Section 3.2.2.b.

3.2.7 Transfer Waste to High-Level Waste Staging Tanks

The DST System shall transfer operator-selected waste from the 200 East Area DSTs to the HLW staging tanks.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Table 17, identifies the DST HLW transfer function in terms of removing DST waste and relocating the waste to another DST for storage or treatment.

3.2.7.a High-Level Waste Staging Batch Volumes. The DST System shall transfer up to 1,905 m^3 (503,000 gal) of prepared waste from East Area DSTs to the HLW feed staging tank in 4 days.

Basis: Based on the maximum quantity of waste transferred between East Area DSTs for Phase 1 as listed in HNF-SD-WM-SP-012, Rev 1, Appendix H, Table H-3, i.e., waste transferred to HLW staging tanks 241-AZ-101, 242-AZ-102, 241-AY-101, and 241-AY-102. See Appendix, Data Supporting 3.2.7.a, which shows the largest projected batch received into tank 241-AZ-101 over 4 days. (See Appendix, Data Supporting 3.2.7.a.)

3.2.8 Transfer Supernatant to Single-Shell Tank Retrieval System

The DST System shall transfer supernatant to the SST Retrieval System.

Basis: HNF-3339, Interface Control Document for the Double-Shell Tank System and the Single-Shell Tank System, *Rev. 0, Section 2, item 4, supernatant from DSTs intended to support SST retrieval is passed across an interface between the DST System and the SST System.*

3.2.8.a Supernatant Volume for Phase 1 Single-Shell Tank Waste Feed Delivery Retrieval. The DST System shall deliver supernatant from the DST System source tank to the SST System as specified below:

Supernatant Source Tank (DST)	Available Volume (m^3)	SST Requiring Supernatant
TBD	TBD	241-C-104
TBD	TBD	241-C-102

Basis: No data is currently available to bound the volume or source tank (DST). The two SSTs were identified in the SST Retrieval Sequence described in HNF-SD-WM-SP-012, Section 3.3 and Section 11.9 along with identification of an issue that "there are several licensing issues that must be addressed prior to initiation of retrieval of SSTs beyond 241-C-106." This issue is assumed to include the assumption in HNF-3912, System Specification for the Single-Shell Tank System, *Rev. 0, Section 6.2, that states "The Wyden Bill (Public Law 101-510) does not prohibit the addition of fluids to the SSTs for the purpose of waste retrieval."*

3.2.8.b Supernatant Volume for Phase 1 Single-Shell Tank Retrieval Concurrent with Phase 1. The DST System shall deliver supernatant from the DST System at the source tank to the SST System as specified below:

Supernatant Source Tank (DST)	Available Volume (m^3)	SST Requiring Supernatant
TBD	TBD	TBD

Basis: No data is currently available to bound the tank designations or volumes. See basis noted in Section 3.2.8.a.

3.2.8.c Supernatant Properties. The DST System shall adjust supernatant properties in accordance with **TBD**.

Basis: No data is currently available to bound the supernatant properties. See basis noted in Section 3.2.8.a.

3.3 PREPARE LOW-ACTIVITY WASTE FEED FOR PHASE 1 TREATMENT

The DST System shall prepare and certify waste in the staging tanks as LAW feed and shall transfer that LAW feed to the LAW/HLW Plant.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Table 17, identifies the DST LAW feed preparation function.

3.3.a Low-Activity Waste Feed Composition, Phase 1. The DST System shall prepare independent batches of LAW feed, satisfying envelope A, B, or C. Envelopes A, B, and C compositions shall be as defined in Tables 1 and 2.

Basis: Per DE-AC06-96RL13308, Specification 7, Section 7.2.2.1.

Table 1. LAW Chemical Composition, Soluble Fraction Only.

Chemical Analyte	Maximum Ration, analyte (mole) to sodium (mole)		
	Envelope A	Envelope B	Envelope C
Al	2.5 E-01	2.5 E-01	2.5 E-01
Ba	1.0 E-04	1.0 E-04	1.0 E-04
Ca	4.0 E-02	4.0 E-02	4.0 E-02
Cd	4.0 E-03	4.0 E-03	4.0 E-03
Cl	3.7 E-02	8.9 E-02	3.7 E-02
Cr	6.9 E-03	2.0 E-02	6.9 E-03
F	9.1 E-02	2.0 E-01	9.1 E-02
Fe	1.0 E-02	1.0 E-02	1.0 E-02
Hg	1.4 E-05	1.4 E-05	1.4 E-05
K	1.8 E-01	1.8 E-01	1.8 E-01
La	8.3 E-05	8.3 E-05	8.3 E-05
Ni	3.0 E-03	3.0 E-03	3.0 E-03
NO_2	3.8 E-01	3.8 E-01	3.8 E-01
NO_3	8.0 E-01	8.0 E-01	8.0 E-01
Pb	6.8 E-04	6.8 E-04	6.8 E-04
PO_4	3.8 E-02	1.3 E-01	3.8 E-02
SO_4	1.0 E-02	7.0 E-02	2.0 E-02
TIC[1]	3.0 E-01	3.0 E-01	3.0 E-01

Table 1. LAW Chemical Composition, Soluble Fraction Only.

Chemical Analyte	Maximum Ration, analyte (mole) to sodium (mole)		
	Envelope A	Envelope B	Envelope C
TOC[2]	5.0 E-01	5.0 E-01	5.0 E-01
U	1.2 E-03	1.2 E-03	1.2 E-03

Notes:
[1]Mole of inorganic carbon atoms/mole sodium.
[2]Mole of organic carbon atoms/mole sodium.

Table 2. LAW Radionuclide Content, Soluble Fraction Only.

Maximum Ratio, radionuclide (Bq) to sodium (mole)			
Radionuclide	Envelope A	Envelope B	Envelope C
TRU*	4.8 E+05	4.8 E+05	3.0 E+06
^{137}Cs	4.3 E+09	2.0 E+10	4.3 E+09
^{90}Sr	4.4 E+07	4.4 E+07	8.0 E+08
^{99}Tc	7.1 E+06	7.1 E+06	7.1 E+06
^{60}Co	6.1 E+04	6.1 E+04	3.7 E+05
^{154}Eu plus ^{155}Eu	1.2 E+06	1.2 E+06	4.3 E+06

*Note: TRU is defined in accordance with 10 CFR Part 61.55.

3.3.b **Low-Activity Waste Feed Solids Concentration.** The LAW feed solids concentration shall be no more than 2 weight percent solids (dry basis).

Basis: Per DE-AC06-96RL13308, Specification 7, Section 7.2.2.2.

3.3.c **Low-Activity Waste Feed Sodium Concentration.** The sodium concentration in the LAW feed shall be between 4 M and 10 M sodium, except for feed from Tanks 241-AZ-101 and 241-AZ-102, where the allowable range shall be between 2 M and 5 M sodium.

Basis: Per DE-AC06-96RL13308, Specification 7, Section 7.2.2.2. The sodium concentration was changed per 99-AMPD-006, Attachment 1, item 32, to denote sodium concentration from 4 M to 10 M, with an exception for Tanks 241-AZ-101 and 241-AZ-102 as noted above.

3.3.d **Low-Activity Waste Feed Cesium Concentration.** The ^{137}Cs concentration in the LAW feed shall be less than 4 Ci/L.

Basis: Per DE-AC06-96RL13308, Specification 7, Section 7.2.2.2. The cesium concentration was changed per 99-AMPD-006, Attachment 1, item 32, to denote concentrations changed from the previous 6 Ci/L to 4 Ci/L.

3.3.e **Low-Activity Waste Feed Visible Separate Organic Phase.** The DST System shall prepare LAW feed to contain no visible separate organic phase.

Basis: Per DE-AC06-96RL13308, Specification 7, Section 7.2.2.2.

3.3.f **Low-Activity Waste Feed, Production Quantities, Phase 1.** The DST System shall prepare and deliver at least 6,000 units of LAW (Envelopes A, B, and C). The quantity of Envelope C shall not exceed 2100 units. Units are defined in DE-AC06-96RL13308, Specification 7, *Low-Activity Waste Envelopes Definition,* for each envelope.

Basis: The waste feed delivery "minimum order quantity" is defined in DE-AC06-96RL-13308, Section H.9.a(1), to be 6000 units, and the sequencing of waste envelope delivery is noted in H.9.f.2.e. The sequence and production quantities are further defined in BNFL-5193-ID-19, Rev 2C, Section 4.1.1.

3.3.g **Minimum Annual Low-Activity Waste Feed Delivery.** The DST System shall prepare and deliver a minimum of 800 units of LAW feed per year for the first 3 years, after which the rate will increase to 1100 units of LAW per year through Phase 1.

Basis: The waste feed production quantities are defined in the TWRS Privatization Contract, Section H.9.a(1), and the delivery sequence is stated in BNFL-5193-ID-19, Rev 2C, Section 4.1.1 (Schedule). 99-AMDP-006, Attachment 1, item 10, identifies the change in rate after the first 3 years.

3.3.h **Low-Level Waste Feed Certification.** The DST System shall support LAW feed certification at least 30 days before batch transfer in accordance with BNFL-5193-ID-19 before transfer in a batch to the LAW/HLW Plant.

Basis: Per DOE/RL, 99-AMDP-006, Attachment item 30, the LAW feed certification will be as specified in BNFL-5193-ID-19. BNFL-5193-ID-19 identifies the 30-day time period.

3.3.1 Prepare Low-Activity Waste in Low-Activity Waste Staging Tanks

The DST System shall prepare and certify waste in the LAW staging tanks as LAW feed to the LAW/HLW Plant.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Table 15, identifies processes for LAW feed preparation, including functions for mixing tank waste.

3.3.1.a Low-Activity Waste Staging Batch Size, Phase 1. The DST System shall prepare and certify batches of LAW feed with a minimum of 306 units up to a maximum of 701 units within 114 days.

Basis: The minimum and maximum number of units is based on projections in Table 2.3-2, HNF-SD-WM-SP-012, Rev 1.

Per HNF-SP-WM-SP-012, Rev. 1, Section 3.1.1.1, the allocation between completion of delivery of one feed batch and the waste transfer date for the next feed batch is 114 days and includes the following:

- *25 days for setting up the transfer and correcting problems, such as failed pumps, jumpers, and other equipment*
- *5 days to retrieve and transfer feed to the intermediate feed staging tanks*
- *14 days to mix the feed and take and analyze process control samples*
- *5 days to take feed qualification and contractor samples and transport the samples to the laboratory*
- *60 days to analyze samples and report results*
- *5 days to interpret and evaluate results (establish official composition and envelope classification).*

3.3.2 Transfer Low-Activity Waste Supernatant to Low-Activity Waste/High-Level Waste Plant

The DST System shall transfer certified LAW feed from LAW staging tanks to the LAW/HLW Plant feed tank.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Table 17, identifies the function for preparing and sending the prepared LAW feed to the immobilization system.

3.3.2.a Low-Activity Waste Feed Batches, Phase 1. The DST System shall transfer LAW feed from LAW staging tanks to the LAW/HLW Plant in batches of up to 3,030 m^3 (800,000 gal) without interruption

Basis: 99-AMPD-006, Attachment 1, item 13 and 14 bound the batch size.

3.3.2.b Waste Pumpability. The DST System shall satisfy the waste pumpability requirements of Section 3.2.2.b.

3.4 PREPARE HIGH-LEVEL WASTE FEED FOR PHASE 1 TREATMENT

The DST System shall prepare and certify waste in the staging tanks as HLW feed and shall transfer that HLW feed to the LAW/HLW Plant.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Table 17, identifies the DST HLW feed preparation, function which involves separation of HLW from tank wastes.

3.4.a High-Level Waste Feed Composition, Phase 1. The DST System shall prepare HLW feed that may contain a mixture of liquids (Envelopes A, B, or C) and solids (Envelope D). The compositional range of the Envelope D solids is defined in Tables 3, 4, 5, and 6. The compositional range of the liquid fraction is defined in Section 3.3.

NOTE: Waste composition limits are defined in terms of elemental or anion concentrations and radionuclide activities per 100 grams of equivalent nonvolatile waste oxides. The nonvolatile waste oxides include sodium oxide and silicon oxide.

Basis: The HLW feed must conform to BNFL DE-AC06-96RL13308, Specification 8.

Table 3. High-Level Waste Feed Composition (grams per 100 grams nonvolatile waste oxides).

Nonvolatile Element	Maximum (grams/100 grams waste oxide)	Nonvolatile Element	Maximum (grams/100 grams waste oxide)
As	0.16	Pu	0.054
B	1.3	Rb	0.19
Be	0.065	Sb	0.84
Ce	0.81	Se	0.52
Co	0.45	Sr	0.52
Cs	0.58	Ta	0.03
Cu	0.48	Tc	0.26
Hg	0.1	Te	0.13
La	2.6	Th	0.52
Li	0.14	Tl	0.45
Mn	6.5	V	0.032
Mo	0.65	W	0.24
Nd	1.7	Y	0.16
Pr	0.35	Zn	0.42

Table 4. High-Level Waste Feed Unwashed Solids Maximum Volatile Component Composition (grams per 100 grams non-volatile waste oxide).

Volatile Components	Maximum (grams/100 grams waste oxide)
Cl	0.33
CO_3^{-2}	30

NO_2	36 (Total NO_2/NO_3)
NO_3	
TOC	11
CN	1.6
NH_3	1.6

Table 5. High-Level Waste Feed Unwashed Solids Maximum Radionuclide Composition (curies per 100 grams nonvolatile waste oxide).

Isotope	Maximum (Ci/100 grams waste oxides)	Isotope	Maximum (Ci/100 grams waste oxides)	Isotope	Maximum (Ci/100 grams waste oxides)
^{3}H	6.5 E-05	^{129}I	2.9 E-07	^{237}Np	7.4 E-05
^{14}C	6.5 E-06	^{137}Cs	1.0 E+01	^{238}Pu	3.5 E-04
^{60}Co	1.0 E-02	^{152}Eu	4.8 E-04	^{239}Pu	3.1 E-03
^{90}Sr	1.0 E+01	^{154}Eu	5.2 E-02	^{241}Pu	2.2 E-02
^{99}Tc	1.5 E-02	^{155}Eu	2.9 E-02	^{241}Am	9.0 E-02
^{125}Sb	3.2 E-02	^{233}U	9.0 E-07	$^{243+244}Cm$	3.0 E-03
^{126}Sn	1.5 E-04	^{235}U	2.5 E-07		

Table 6. Additional High-Level Waste Feed Composition for Nonvolatile Components (grams per 100 grams nonvolatile waste oxide).

Nonvolatile Element	Maximum (grams/100 grams waste oxide)	Nonvolatile Element	Maximum (grams/100 grams waste oxide)
Ag	0.55	Ni	2.4
Al	14	P	1.7
Ba	4.5	Pb	1.1
Bi	2.8	Pd	0.13
Ca	7.1	Rh	0.13
Cd	4.5	Ru	0.35
Cr	0.68	S	0.65
F	3.5	Si	19
Fe	29	Ti	1.3
K	1.3	U	14
Mg	2.1	Zr	15
Na	19		

3.4.b **High-Level Waste Feed Solids Concentration.** The HLW feed solids concentration shall be 10 (minimum) to 200 (maximum) grams of unwashed solids per liter, except for HLW feed from Tanks 241-AZ-101 and 241-AZ-102.

Basis: Per 99-AMDP-006, Attachment 1, item 32, the specification (Specification 8, DE-AC06-96RL13308) was changed to eliminate the solids concentration requirement for the 2 tanks noted above.

3.4.c **High-Level Waste Feed Sodium Concentration.** The sodium concentration in the liquid fraction of the HLW slurry shall be between 0.1 M and 10 M sodium.

Basis: Per 99-AMDP-006, Attachment item 32, the HLW sodium concentration is limited as noted above for HLW feed.

3.4.d **High-Level Waste Feed Visible Separate Organic Phase.** The DST System shall prepare the HLW feed to contain no visible separate organic phase.

Basis: Per BNFL DE-AC06-96RL13308 (High Level Waste Envelope Definition) Specification 8, Section 8.2.2.2.

3.4.e **High-Level Waste Feed, Production Quantities, Phase 1.** The DST System shall prepare HLW feed for delivery in quantities as needed to support the Privatization Contractor filling a minimum of 600 canisters of HLW glass. The HLW glass is defined by DE-AC06-96RL13308, Specification 12 and Specification 8 during Phase 1.

Basis: As defined in DE-AC06-96RL13308, Section H.9, Paragraph b.2. Per 99-AMPD-006, Attachment 1, item 18, the Pacific Northwest National Laboratory glass properties model should be used to simulate the waste loading in the glass, and the contractor solids washing factors should be used to simulate the effects of BNFL's high-temperature caustic washing.

3.4.f **Maximum Annual High-Level Waste Feed Delivery.** The DST System shall prepare HLW feed for delivery in quantities as needed to support the Privatization Contractor filling a minimum of 100 canisters per year for the first 2 years of HLW feed delivery, after which the rate increases to 120 canisters per year of HLW glass (as defined in Section 3.4.1.e) during Phase 1.

Basis: As defined in DE-AC06-96RL13308, Section H.9, Paragraph b2 for annual amount. Per 99-AMPD-006, Attachment 1, item 10, the slurry delivery rate is delineated.

3.4.g **High-Level Waste Feed Certification.** The DST System shall support HLW feed certification at least 30 days before batch transfer in accordance with BNFL-5193-ID-20, before transferring a batch to the LAW/HLW Plant.

Basis: Per 99-AMDP-006, Attachment item 30, the HLW feed pre-certification will be as specified in BNFL-5193-ID-20. BNFL-5193-ID-20 identifies the 30-day time period.

3.4.1 Prepare High-Level Waste Sludges in High-Level Waste Staging Tanks

The DST System shall prepare and certify waste in the staging tanks as HLW feed to the LAW/HLW Plant.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Table 17, identifies the DST HLW feed preparation function, which involves separation of HLW from tank wastes.

3.4.1.a High-Level Waste Feed Batch Size, Phase 1. The DST System shall prepare a batch of HLW feed with a volume of up to 600,000 L for transfer within a minimum of 11 days.

Basis: This batch volume is bounded by the minimum and maximum volumes in HNF-SD-WM-SP-012, Rev. 1, Table 3.2-2. The duration is the minimum duration between delivery dates in Table 3.2-2, denoting the minimum time allotted for preparation between designated batches. From this table the minimum duration is 11 days to prepare 326,000 L over the period from 08/12/2006 to 08/23/2006. The 11 days represents the time allowed between starting delivery of one batch and the start of delivery of the next batch.

3.4.1.b High-Level Waste Feed Preparation, Phase 1. The DST System shall prepare and certify a batch group of HLW feed within a staging tank with a volume of between 2,749,000 L and 4,053,000 L within 83 days.

Basis: This batch group volume is bounded by the minimum and maximum volumes in HNF-SD-WM-SP-012, Rev. 1, Table 3.2-2, for the batch group of Table 3.2-1. The minimum group volume is 2,749,000 L for group 6, and the maximum is 4,053,000 L for group 4. The duration is the minimum duration of delivery dates within a batch group (see Table 3.2-1) denoting the minimum time allotted for preparation of a batch group within the staging tank. From this table the minimum duration is 83 days to prepare 3,200,000 L over the period from 06/01/2006 to 08/23/2006.

3.4.2 Transfer High-Level Waste Sludge to Low-Activity Waste/High-Level Waste Plant

The DST System shall transfer HLW feed from HLW staging tanks to the LAW/HLW Plant.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Table 17, identifies the DST HLW transfer function, which involves sending the HLW "to the immobilization system."

3.4.2.a **High-Level Waste Feed Batch Transfer Volume.** The DST System shall transfer multiple batches of HLW feed, with each batch volume consisting of between 200,000 and 600,000 L, from HLW staging tanks to the LAW/HLW Plant through Phase 1.

Basis: DE-AC06-96RL13308, Mod No. M010, Section H.9.f.1(a) and (b) bound the initial batch at 600,000 L and subsequent waste feed quantities of between 200,000 and 600,000 L per batch, including flush volume.

3.4.2.b **High-Level Waste Transfer Rate**: The DST System shall transfer up to 600,000 L of HLW feed per month from HLW staging tanks to the LAW/HLW Plant during Phase 1.

Basis: DE-AC06-96RL13308, Mod No. M010, Section H.9.f.1(c), bounds the maximum monthly rate before LAW Commissioning, with the target date in Section F of the Contract set for January 2008. In addition, per 99-AMPD-006, Attachment 1, item 20, states that U.S. Department of Energy (DOE)/contractor will have 30 days to complete an HLW feed batch transfer.

3.4.2.c **High-Level Waste Feed Batch Transfer Frequency.** The DST System shall complete HLW transfers between HLW staging tanks and the LAW/HLW Plant within 30 days following notification by DOE.

Basis: Per 99-AMDP-066, Attachment item 20, the HLW feed batch transfer will have 30 days for completion.

3.4.2.d **Waste Pumpability**: The DST System shall adjust the HLW feed to satisfy the waste pumpability requirements of Section 3.2.2.b.

Basis: See basis for Section 3.2.2.b.

4.0 EXTERNAL INTERFACE REQUIREMENTS

The following sections identify current and planned interfaces with the DST System. Per HNF-4500, *Tank Farm System Interface Summary*, a number of major facilities on the Hanford Site no longer have an interface with the DST System, including the Plutonium-Uranium Extraction Plant (PUREX), B Plant, U Plant, Reduction-Oxidation (REDOX), 105F, 105H, Grout, and the reactors (e.g., B Reactor). Per HNF-4500, K Basin sludge originally slated for shipment to the tank farms will instead be packaged and stored at T Plant.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 4.3, identifies primary onsite interfaces as the Canister Storage Building, the 242-A Evaporator, the Treated Effluent Disposal Facility, the Effluent Treatment Facility, the Waste Encapsulation and Storage Facility, the 100 Area facilities, the 200 Area facilities (not related to RPP), the 300 Area facilities, the 400 Area facilities, the Analytical Laboratories, the Solid Waste Disposal facilities, and the 90-day hazardous waste storage facility. Per HNF-SD-WM-MAR-008, Rev. 3, Section 6.1, radioactive liquid wastes are received from interim storage into the DST System by truck, rail car, or transfer lines from external sources such as B Plant, the Plutonium Finishing Plant, and the 222-S Laboratory.

4.1 EXTERNAL WASTE GENERATORS USING SURFACE TRANSPORT

The DST System shall accept new liquid waste transported by truck and the LR-56 cask system from onsite external waste generators (e.g., T Plant and the 100 and 300 Areas) at the 204-AR Waste Unloading Facility.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 5.2.5, identifies RPP facilities supporting storage and transfer of tank waste. One of these facilities is the 204-AR Waste Unloading Facility.

4.1.a **204-AR Waste Unloading Facility Annual Capacity.** The DST System shall have the capacity to transfer up to 277 m^3 (73,200 gal) of waste annually through Phase 1 from the 204-AR Waste Unloading Facility to East Area DSTs.

Basis: Based on the maximum yearly quantity of waste transferred to the 204-AR Waste Unloading Facility for Phase 1 from the sources noted below:

300 Area to 204-AR	*11 m^3/yr (3,000 gal/yr) (per HNF-3404,* Interface Control Document for the Double-Shell Tank System and Building 325*) with waste moved by the LR-56 Cask System.*
	379 m^3/12 years (100,000 gal/12 years) (per HNF-4489, Interface Control Document for the

	Double-Shell Tank System and Building) *for the period between 1999 and July 2011.*
	(HNF-4490 for the 327 Building unavailable) Total for 300 Area per HNF-SD-WM-ER-029, Rev. 25, Table 9, is 13 m^3/mo (3,400 gal/mo) or 155 m^3/yr (40,800 gal/yr).
100 N to 204-AR	*(HNF-4488 for 100 N unavailable) 0 per HNF-SD-WM-ER-029, Rev. 25, Table 9.*
T Plant to 204-AR	*123 m^3 (32,400 gal/yr) (10 m^3 [2,700 gal/mo] per HNF-3394,* Interface Control Document Between the Double-Shell Tank (DST) System and T Plant, *Section 3.1.1, waste moved using MC312 tank trailers).*

4.1.b **204-AR Waste Unloading Facility Batch Transfer.** The DST System shall be capable of unloading batches of up to 19 m^3 (5,000 gal) within 1 day at the 204-AR Waste Unloading Facility.

Basis: This is the typical batch size and duration for waste unloaded at the 204-AR Waste Unloading Facility.

4.1.c **204-AR Waste Unloading Facility Waste Receipt Properties.** Waste received at the 204-AR Waste Unloading Facility shall meet the acceptance requirements contained in the HNF-SD-WM-EV-053, *Double-Shell Tank Waste Analysis Plan* and OSD-T-151-00008, *Operating Specifications for the 204-AR Waste Unloading Facility.*

Basis: The T Plant waste acceptance is addressed in HNF-3394, Section 3.1.2, which identifies acceptance requirements.

300 Area waste acceptance is addressed in HNF-3404; Section 3.1.2, per the waste analysis plan (HNF-SD-WM-EV-053).

4.2 PLUTONIUM FINISHING PLANT (PFP)

The DST System shall accept new liquid waste from the PFP.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for accepting and storing additional waste from the PFP. HNF-4500, Rev. 0, Section 3.1.7, identifies the Plutonium Finishing Plant interface with the Tank Farm System and references HNF-4486.

4.2.a **Plutonium Finishing Plant Waste Annual Volume.** The DST System shall accept up to 125 m^3 (33,000 gal) of liquid waste per year from 1999 through 2012 from the PFP.

Basis: HNF-4486, Rev. 0, Section 3.1.1, provides the quantities and time period specified.

4.2.b **Waste Properties.** The PFP waste shall meet the chemical composition, radionuclide composition, and transfer requirements contained in OSD-Z-184-00010, Rev. H-0, 241-Z *Waste Facility.*

Basis: HNF-4486, Rev. 0, Section 3.1.2, provides the noted reference to the waste acceptance criteria.

4.3 222-S LABORATORY

The DST System shall accept new liquid waste from the 222-S Laboratory.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for accepting and storing additional waste from the 222-S Laboratory.

4.3.a **222-S Laboratory Waste Annual Volume.** The DST System shall accept up to 45 m^3 (12,000 gal) of liquid waste per year from the 222-S Laboratory.

Basis: HNF-4483, Rev. 0, Section 3.1.1, provides the quantities and time period specified.

4.3.b **Waste Properties.** The DST System shall accept waste satisfying the requirements of HNF-SD-WM-DQO-001 and HNF-SD-WM-OCD-015, Rev. 2.

Basis: The DQO and OCD contain the full set of waste compatibility requirements for accepting waste into the DST System.

4.4 SINGLE-SHELL TANK SYSTEM

The DST System shall accept liquid waste from the SST System.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the function set (Table 17), which includes functions for removing wastes from the SSTs and transferring that waste to the DST System.

4.4.a **Single-Shell Tank Waste Retrieval Volume, Phase 1.** The DST System shall accept at least 37,107 m^3 (9,797,000 gal) of SST waste from the SST System through the end of Phase 1.

Basis: Based on the maximum yearly quantity of waste transferred from SSTs to the West Area DSTs for Phase 1, as listed in HNF-SD-WM-SP-012, Rev 1, Appendix H, Table H-3. The totals for SST Retrieval were 31,782 m^3 (8,391,000 gal) for West Area DSTs and 5,329 m^3 (1,407,000 gal) for East Area DSTs through the end of Phase 1. The former includes SST waste that will constitute Phase 2 feed. (See Appendix, Data Supporting 4.4.a.)

4.5 EVAPORATOR

The DST System shall accept waste from the evaporator.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 10.3.3, identifies the DST function set (Table 17), which includes functions for accepting and storing additional waste from the 242-A Evaporator.

4.5.a **Concentrated Waste Receipt Rate.** The DST System shall be capable of continuously receiving evaporator slurry at a nominal 0.00189 to 0.00442 m^3/s (30 to 70 gal/min).

Basis: See basis for Section 3.1.6.b.

4.5.b **Concentrated Waste Composition.** The DST System shall accept waste that meets the flammable gas controls specified in Section 3.1 of HNF-SD-WM-OCD-015, Rev. 2.

Basis: The flammable gas generation/retention requirements of HNF-SD-WM-OCD-015, Section 3.1.1 identify the maximum specific gravity for commingled waste.

4.5.c **Evaporator Purge Batch Size.** The DST System shall be capable of accepting an emergency transfer of less than or equal to 98 m^3 (26,000 gal) of waste in approximately 12 minutes from the 242-A Evaporator.

Basis: Section 6.1.2.4.1 of HNF-SD-WM-SAR-023 identifies the maximum normal operating capacity of the evaporator vessel tank (C-A-1) as 98 m^3 (26,000 gal). Section 6.1.3.3.3 indicates that an emergency purge happens "in a few minutes," defined as approximately 12 minutes, when analyzing the effects of the emergency purge on the Tank 241-AW-102 ventilation system.

4.6 PHASE 1 LOW-ACTIVITY WASTE/HIGH-LEVEL WASTE PLANT

The system shall accept emergency returns and shall have the capability to accept entrained solids and out-of-specification feed returns as specified below.

Basis: Per 99-AMDP-006, the PHMC shall receive emergency returns (Attachment item 6), and shall have the capability to accept entrained solids and out-of-specification feed returns (Attachment item 25).

4.6.a **Emergency Return Volume.** The DST System shall accept an emergency transfer of up to 3,788 m^3 (1,000,000 gal) of waste returned from the LAW/HLW Plant on an emergency basis during Phase 1.

Basis: Per 99-AMDP-006, Attachment item 6, the contractor shall provide the capability to receive the noted returns on an emergency basis.

4.6.b **Entrained Solids and Out-of-Specification Return Volume.** The DST System shall accept up to **TBD** m^3 of entrained solids and out-of-specification feed returned from the LAW/HLW Plant during Phase 1.

Basis: Per 99-AMDP-006, Attachment item 25, however, the volume is left unspecified.

4.7 CENTRAL PLATEAU ELECTRICAL SYSTEM

The DST System shall obtain electricity from the Central Plateau Electrical System and distribute that electricity throughout the DST System.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 4.3, identifies the basis DST infrastructure interfaces, which include electrical facilities.

4.7.a **Double-Shell Tank System Electrical Power for Safe Storage and Waste Feed Delivery.** The DST System shall distributing 480/277 V ac to support the electrical load characteristics for each DST farm as specified in Table 7.

Table 7. 480 Volt Alternating Current Electrical Load Requirements.

Tank Farm	Demand (kVA)	Projected (kVA)
AN	152.5	854 <TBR>
AP	208.8	924 <TBR>
AW	104	893 <TBR>
AY	319.9	1075.5 <TBR>
AZ	40.25	883.3 <TBR>
SY	1291.2	2864 <TBR>

Basis: RPP-5228, Rev. 0, Assessment of the Electrical Power Requirements for Continued Safe Storage and Waste Feed Delivery Phase One, *identifies the loads per tank farm as noted in the table. The values are "TBR" due to assumptions not yet validated (e.g., 2 300-bp mixer pumps operating simultaneously per tank farm).*

4.8 CENTRAL PLATEAU WATER SYSTEM

The DST System shall obtain water from the Central Plateau Water System and distribute that water throughout the DST System.

Basis: HNF-SD-WM-MAR-008, Rev. 3, Section 4.3, identifies the basis DST infrastructure interfaces, which include water facilities.

4.8.a Double-Shell Tank System Waste Feed Delivery Raw Water. The DST System shall receive up to 3,445 L/min (910 gal/min) of raw water to support Waste Feed Delivery Phase 1 activities.

Basis: Per Table 2 of RPP-5227, Rev 0., Waste Feed Delivery Raw Water, Potable Water, and Compressed Air Capacity Evaluation.

4.9 CENTRAL WASTE COMPLEX

The DST System shall provide solid waste to the Central Waste Complex.

Basis: Per HNF-SD-WM-MAR-008, Rev. 3, Section 4.3, one of the primary onsite interfaces for the RPP is the solid waste disposal facilities.

4.9.a Central Waste Complex Waste Acceptance Criteria. The DST System-generated solid waste provided by the DST System to the Central Waste Complex shall meet the waste acceptance criteria defined in HNF-EP-0063, *Hanford Site Solid Waste Acceptance Criteria.*

Basis: Per HNF-4482, Section 3.1.1. Currently, HNF-EP-0063, Rev. 5 is referenced.

5.0 CONSTRAINT

5.1 DOUBLE-SHELL TANK DANGEROUS WASTE RESTRICTIONS

The DST System shall not accept wastes other than those identified in the *Hanford Facility Dangerous Waste Part A Permit Application* (DOE/RL-88-21).

Basis: The land disposal restriction numbers identifying the dangerous wastes that may be stored in the DST System are identified in the referenced permit. The DST System cannot accept waste with land disposal restriction numbers other than those identified in the permit per HNF-SD-WM-EV-053, Rev. 5.

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APPENDIX

CALCULATION SHEETS

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APPENDIX

CALCULATION SHEETS

The data in these calculation sheets are provided as support for derivation of quantities in the following sections:

Section 3.1.4.a A-3
Section 3.1.4.b A-7
Section 3.1.5.a A-11
Section 3.1.5.b A-19
Section 3.1.6.a A-23
Section 3.2.a A-27
Section 3.2.2.a A-31
Section 3.2.3.a A-35
Section 3.2.4.a A-39
Section 3.2.5.a A-43
Section 3.2.6.a A-51
Section 3.2.7.a A-55
Section 4.4.a. A-59

Performed by: D. F. Smith 4/12/00
Date

Checked by: Dexter L Penwell 4/12/2000
Dexter Penwell Date

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DATA SUPPORTING 3.1.4.a

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DATA SUPPORTING 3.1.4.a (2 Sheets)

New Liquid Waste Received into West Area DSTs

(1st filter)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
	SY-101					
	SY-102					
	SY-103					
		>10/01/2003	*<01/01/2020*			

(Initial sort to identify waste coming into these 3 West Area DSTs)

(2nd filter)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
SY-101	SY-102	02/13/2010	02/15/2010	4.51 E+05	3901.492	

(This item was removed to only look at waste coming into the 3 DSTs and reject volumes representing waste passed between West Area DSTs)

(3rd filter)

Remove waste received from S-102 ("West Area DST to DST Transferred Waste")
Remove waste received from S-103 ("West Area DST to DST Transferred Waste")

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Annual Maximum	Product
TA-4	SY-102	2/8/11	2/9/11	147,300	2,595		Retrieved SST Waste, Phase 2
TA-2	SY-102	2/9/11	2/10/11	147,000	2,939		Retrieved SST Waste, Phase 2
TA-5	SY-102	2/19/11	2/19/11	146,300	3,638		Retrieved SST Waste, Phase 2
TA-1	SY-102	3/11/11	3/12/11	149,200	692		Retrieved SST Waste, Phase 2
TA-6	SY-102	3/12/11	3/12/11	144,000	5,914		Retrieved SST Waste, Phase 2
TA-4	SY-102	3/20/11	3/20/11	147,000	2,938		Retrieved SST Waste, Phase 2
TA-2	SY-102	3/20/11	3/21/11	53,322	939		Retrieved SST Waste, Phase 2
TA-2	SY-102	3/25/11	3/25/11	93,983	1,656		Retrieved SST Waste, Phase 2
TA-3	SY-102	3/29/11	3/30/11	145,000	4,928		Retrieved SST Waste, Phase 2
TA-5	SY-102	4/9/11	4/10/11	146,300	3,638		Retrieved SST Waste, Phase 2
TA-3	SY-102	4/11/11	4/11/11	25,924	678		Retrieved SST Waste, Phase 2
TA-6	SY-102	4/12/11	4/12/11	71,818	309		Retrieved SST Waste, Phase 2
TA-4	SY-102	4/28/11	4/28/11	147,300	2,595		Retrieved SST Waste, Phase 2
TA-2	SY-102	5/3/11	5/4/11	147,000	2,938		Retrieved SST Waste, Phase 2
TA-5	SY-102	5/13/11	5/13/11	106,600	2,502		Retrieved SST Waste, Phase 2
TA-3	SY-102	5/16/11	5/17/11	93,173	1,983		Retrieved SST Waste, Phase 2
TA-3	SY-102	5/21/11	5/21/11	53,603	1,141		Retrieved SST Waste, Phase 2
TA-1	SY-102	5/21/11	5/22/11	144,000	5,911		Retrieved SST Waste, Phase 2
TA-6	SY-102	5/24/11	5/25/11	145,100	4,809		Retrieved SST Waste, Phase 2
TA-4	SY-102	6/6/11	6/6/11	147,300	2,595		Retrieved SST Waste, Phase 2
TA-5	SY-102	6/11/11	6/12/11	147,100	2,842		Retrieved SST Waste, Phase 2
TA-2	SY-102	6/12/11	6/13/11	147,000	2,939		Retrieved SST Waste, Phase 2
TA-1	SY-102	6/26/11	6/26/11	146,800	3,126		Retrieved SST Waste, Phase 2
S-102	SY-101	6/27/11	7/14/11	74,157	206		West Area DST to DST Transferred Waste
TA-5	SY-102	6/27/11	6/28/11	43,270	786		Retrieved SST Waste, Phase 2
LERF	SY-102-PUMP	6/28/11	7/2/11	0	0		Water for in-line dilution
TA-5	SY-102	7/2/11	7/2/11	22,591	411		Retrieved SST Waste, Phase 2
TA-6	SY-102	7/6/11	7/7/11	145,100	4,812		Retrieved SST Waste, Phase 2
TA-2	SY-102	7/11/11	7/12/11	147,100	2,841		Retrieved SST Waste, Phase 2
S-112	SY-101	4/12/11	7/14/11	428,200	2,595		Retrieved SST Waste, Phase 2
TA-4	SY-102	7/15/11	7/15/11	147,300	2,595		Retrieved SST Waste, Phase 2
TA-3	SY-102	7/30/11	7/30/11	144,000	5,912		Retrieved SST Waste, Phase 2
TA-1	SY-102	7/31/11	8/1/11	146,800	3,124		Retrieved SST Waste, Phase 2
TA-6	SY-102	8/8/11	8/9/11	147,100	2,843		Retrieved SST Waste, Phase 2

DATA SUPPORTING 3.1.4.a (2 Sheets)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Annual Maximum	Product
TA-5	SY-102	8/17/11	8/17/11	73,366	2,433		Retrieved SST Waste, Phase 2
						4,453,907	
S-112	SY-101	11/1/12	3/4/13	566,200	3,430		Retrieved SST Waste, Phase 2
						569,630	
TA-5	SY-102	7/9/14	7/9/14	71,723	2,378		Retrieved SST Waste, Phase 2
TA-2	SY-102	7/9/14	7/10/14	147,300	2,595		Retrieved SST Waste, Phase 2
TA-3	SY-102	7/10/14	7/10/14	146,800	3,126		Retrieved SST Waste, Phase 2
TA-1	SY-102	7/10/14	7/11/14	147,100	2,842		Retrieved SST Waste, Phase 2
TA-4	SY-102	7/11/14	7/12/14	90,795	3,481		Retrieved SST Waste, Phase 2
TA-6	SY-102	7/12/14	7/13/14	145,100	4,811		Retrieved SST Waste, Phase 2
TA-2	SY-102	8/7/14	8/8/14	147,100	2,841		Retrieved SST Waste, Phase 2
TA-3	SY-102	8/14/14	8/15/14	78,649	1,674		Retrieved SST Waste, Phase 2
						998,314	
S-112	SY-101	6/9/15	9/13/15	443,300	2,686		Retrieved SST Waste, Phase 2
						445,986	
TA-3	SY-102	12/13/16	12/14/16	68,127	1,450		Retrieved SST Waste, Phase 2
TA-1	SY-102	12/14/16	12/14/16	147,300	2,595		Retrieved SST Waste, Phase 2
TA-5	SY-102	12/14/16	12/15/16	145,100	4,812		Retrieved SST Waste, Phase 2
TA-2	SY-102	12/15/16	12/16/16	72,451	1,171		Retrieved SST Waste, Phase 2
TA-4	SY-102	12/16/16	12/16/16	147,100	2,843		Retrieved SST Waste, Phase 2
TA-6	SY-102	12/16/16	12/17/16	146,800	3,125		Retrieved SST Waste, Phase 2
						742,874	
TA-5	SY-102	1/6/17	1/6/17	81,688	2,511		Retrieved SST Waste, Phase 2
TA-1	SY-102	1/12/17	1/13/17	147,100	2,841		Retrieved SST Waste, Phase 2
TA-3	SY-102	1/17/17	1/18/17	20,859	444		Retrieved SST Waste, Phase 2
						255,442	
TA-3	SY-102	5/11/18	5/12/18	125,900	2,680		Retrieved SST Waste, Phase 2
TA-5	SY-102	5/12/18	5/12/18	12,936	149		Retrieved SST Waste, Phase 2
TA-2	SY-102	5/12/18	5/13/18	147,100	2,841		Retrieved SST Waste, Phase 2
TA-4	SY-102	5/13/18	5/13/18	147,100	2,841		Retrieved SST Waste, Phase 2
TA-6	SY-102	5/13/18	5/14/18	147,100	2,842		Retrieved SST Waste, Phase 2
TA-1	SY-102	5/14/18	5/15/18	147,100	2,841		Retrieved SST Waste, Phase 2
TA-3	SY-102	6/9/18	6/10/18	147,100	2,842		Retrieved SST Waste, Phase 2
TA-5	SY-102	7/7/18	7/8/18	105,000	2,028		Retrieved SST Waste, Phase 2
						998,400	

Other liquid waste received by West Area DSTs comes from the following:

Source:	Liquid Vol. per year:	Basis:
222-S Lab	**12,000 gal/yr**	HNF-4483, section 3.1.1
PFP	**33,000 gal/yr**	HNF-4486, section 3.1.1
SST Retrieval	**4,454,000**	2011 Retrieved SST Waste
Totals:	**4,499,000**	

DATA SUPPORTING 3.1.4.b

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DATA SUPPORTING 3.1.4.b (2 Sheets)

Waste Volumes Received - West Area

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Annual Maximum
	SY-101					
	SY-102					
	SY-103					

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Total Volumes	Days
TA-4	SY-102	2/8/11	2/9/11	147,300	2,595		
TA-2	SY-102	2/9/11	2/10/11	147,000	2,939	299,833	3
TA-5	SY-102	2/19/11	2/19/11	146,300	3,638		
TA-1	SY-102	3/11/11	3/12/11	149,200	692		
TA-6	SY-102	3/12/11	3/12/11	144,000	5,914	299,806	2
TA-4	SY-102	3/20/11	3/20/11	147,000	2,938		
TA-2	SY-102	3/20/11	3/21/11	53,322	939	204,200	2
TA-2	SY-102	3/25/11	3/25/11	93,983	1,656		
TA-3	SY-102	3/29/11	3/30/11	145,000	4,928		
TA-5	SY-102	4/9/11	4/10/11	146,300	3,638		
TA-3	SY-102	4/11/11	4/11/11	25,924	678		
TA-6	SY-102	4/12/11	4/12/11	71,818	309	248,667	4
TA-4	SY-102	4/28/11	4/28/11	147,300	2,595		
TA-2	SY-102	5/3/11	5/4/11	147,000	2,938		
TA-5	SY-102	5/13/11	5/13/11	106,600	2,502		
TA-3	SY-102	5/16/11	5/17/11	93,173	1,983		
TA-3	SY-102	5/21/11	5/21/11	53,603	1,141		
TA-1	SY-102	5/21/11	5/22/11	144,000	5,911	204,654	2
TA-6	SY-102	5/24/11	5/25/11	145,100	4,809		
TA-4	SY-102	6/6/11	6/6/11	147,300	2,595		
TA-5	SY-102	6/11/11	6/12/11	147,100	2,842		
TA-2	SY-102	6/12/11	6/13/11	147,000	2,939	299,880	3
TA-1	SY-102	6/26/11	6/26/11	146,800	3,126		
TA-5	SY-102	6/27/11	6/28/11	43,270	786		
LERF	SY-102-PUMP	6/28/11	7/2/11	0	0		
TA-5	SY-102	7/2/11	7/2/11	22,591	411		
TA-6	SY-102	7/6/11	7/7/11	145,100	4,812		
TA-2	SY-102	7/11/11	7/12/11	147,100	2,841		
S-102	SY-101	6/27/11	7/14/11	74,157	206		
S-112	SY-101	4/12/11	7/14/11	428,200	2,595	430,795	94
TA-4	SY-102	7/15/11	7/15/11	147,300	2,595		
TA-3	SY-102	7/30/11	7/30/11	144,000	5,912		
TA-1	SY-102	7/31/11	8/1/11	146,800	3,124		
TA-6	SY-102	8/8/11	8/9/11	147,100	2,843		

DATA SUPPORTING 3.1.4.b (2 Sheets)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Total Volumes	Days
TA-5	SY-102	8/17/11	8/17/11	73,366	2,433		
S-102	SY-101	11/1/12	3/4/13	545,400	1,514	546,914	124
S-112	SY-101	11/1/12	3/4/13	566,200	3,430	569,630	124
TA-5	SY-102	7/9/14	7/9/14	71,723	2,378		
TA-2	SY-102	7/9/14	7/10/14	147,300	2,595		
TA-3	SY-102	7/10/14	7/10/14	146,800	3,126		
TA-1	SY-102	7/10/14	7/11/14	147,100	2,842		
TA-4	SY-102	7/11/14	7/12/14	90,795	3,481		
TA-6	SY-102	7/12/14	7/13/14	145,100	4,811	**768,050**	5
TA-2	SY-102	8/7/14	8/8/14	147,100	2,841		
TA-3	SY-102	8/14/14	8/15/14	78,649	1,674		
S-112	SY-101	6/9/15	9/13/15	443,300	2,686		
S-102	SY-101	6/9/15	9/13/15	427,200	1,186	874,372	97
TA-3	SY-102	12/13/16	12/14/16	68,127	1,450		
TA-1	SY-102	12/14/16	12/14/16	147,300	2,595		
TA-5	SY-102	12/14/16	12/15/16	145,100	4,812		
TA-2	SY-102	12/15/16	12/16/16	72,451	1,171		
TA-4	SY-102	12/16/16	12/16/16	147,100	2,843		
TA-6	SY-102	12/16/16	12/17/16	146,800	3,125	742,874	5
TA-5	SY-102	1/6/17	1/6/17	81,688	2,511	84,198	1
TA-1	SY-102	1/12/17	1/13/17	147,100	2,841	149,941	8
TA-3	SY-102	1/17/17	1/18/17	20,859	444	234,140	7
S-102	SY-101	6/28/17	9/25/17	392,000	1,088		
S-103	SY-101	6/28/17	9/25/17	320,000	3,820	716,908	90
TA-3	SY-102	5/11/18	5/12/18	125,900	2,680		
TA-5	SY-102	5/12/18	5/12/18	12,936	149		
TA-2	SY-102	5/12/18	5/13/18	147,100	2,841		
TA-4	SY-102	5/13/18	5/13/18	147,100	2,841		
TA-6	SY-102	5/13/18	5/14/18	147,100	2,842		
TA-1	SY-102	5/14/18	5/15/18	147,100	2,841	741,430	5
TA-3	SY-102	6/9/18	6/10/18	147,100	2,842	149,942	2
TA-5	SY-102	7/7/18	7/8/18	105,000	2,028		

768,050 is the largest volume transferred within the fewest number of days (5). This number is rounded up to 769,000 gallons.

DATA SUPPORTING 3.1.5.a

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DATA SUPPORTING 3.1.5.a (5 Sheets)

New Liquid Waste Received into East Area DSTs
- annual volume received by East Area DSTs from 200 East Area waste generators.

1st filter isolates waste streams coming into the East Area DSTs as follows:

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
	AN-101					
	AN-102					
	AN-103					
	AN-104					
	AN-105					
	AN-106					
	AN-107					
	AP-101					
	AP-102					
	AP-103					
	AP-104					
	AP-105					
	AP-106					
	AP-107					
	AP-108					
	AW-101					
	AW-102					
	AW-103					
	AW-104					
	AW-105					
	AW-106					
	AY-101					
	AY-102					
	AZ-101					
	AZ-102					

(1st filter results)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	Product
AW-106	AP-108	2/23/05	2/26/05	636,300	1		East Area DST to DST Transferred Waste
AN-106	AP-107	9/1/05	9/2/05	220,000	0		
LERF	AN-107-PUMP	9/2/05	9/5/05	446	0		Water for in-line dilution
AN-107	AN-106	9/2/05	9/5/05	478,400	1,045		
LERF	AN-107-PUMP	9/5/05	9/7/05	253	0		Water for in-line dilution
AN-107	AN-106	9/5/05	9/7/05	474,500	1,036		
AP-107	AW-102	9/7/05	9/7/05	5,818	0		East Area DST to DST Transferred Waste
AN-101	AN-107	9/8/05	9/9/05	140,000	0		East Area DST to DST Transferred Waste
242-A	AW-106	9/7/05	9/11/05	632,100	0		Concentrated Waste transferred to AW-106
LERF	AN-104-PUMP	9/9/05	9/13/05	4,024	0		Water for in-line dilution
AN-104	AN-101	9/9/05	9/13/05	894,700	1,303		
AP-107	AW-102	9/11/05	9/13/05	459,800	0		East Area DST to DST Transferred Waste
AW-106	AP-107	9/13/05	9/17/05	821,100	1		East Area DST to DST Transferred Waste
LERF	AN-102-PUMP	12/9/05	12/13/05	3,764	0		Water for in-line dilution
AN-102	AN-106	12/9/05	12/13/05	779,200	1,215		East Area DST to DST Transferred Waste
AW-103	AY-102	10/1/06	10/2/06	215,900	11,276		
AY-101	AN-107	3/1/07	3/2/07	350,000	15		
AW-103	AY-101	6/1/07	6/2/07	323,800	16,914		
LERF	AN-101-PUMP	1/3/08	1/7/08	0	0		Water for in-line dilution
AN-101	AN-107	1/8/08	1/9/08	140,000	32		East Area DST to DST Transferred Waste
LERF	AN-102-PUMP	1/9/08	1/13/08	3,287	0		Water for in-line dilution
AN-102	AN-101	1/9/08	1/13/08	778,200	1,213		East Area DST to DST Transferred Waste
SY-102	AN-104	9/12/08	9/13/08	279,600	6,621		West DST Waste Transferred Cross-Site
AN-104	AZ-101	9/13/08	9/14/08	280,000	6,158		
AN-104	AN-107	9/15/08	9/16/08	139,500	495		
LERF	AN-105-PUMP	9/16/08	9/20/08	1,470	0		Water for in-line dilution
AN-105	AN-104	9/16/08	9/20/08	874,900	1,043		
AN-106	AN-107	6/3/09	6/3/09	140,000	37		

DATA SUPPORTING 3.1.5.a (5 Sheets)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	Product
AP-106	AN-106	6/3/09	6/7/09	721,800	0		
C-104	AY-102	9/23/09	12/11/09	320,400	25,406		Retrieved SST Waste, Phase 1 WFD
AW-103	AZ-101	1/1/10	1/3/10	431,700	22,552		
SY-102	AN-101	2/15/10	2/17/10	410,600	8,729		
C-104	AZ-102	12/11/09	3/7/10	351,200	27,845		
LERF	AN-103-PUMP	2/16/11	2/20/11	4,309	0		Water for in-line dilution
AN-103	AN-105	2/16/11	2/20/11	894,500	1,192		East Area DST to DST Transferred Waste
SY-102	AN-104	3/21/11	3/25/11	974,700	23,544		West DST Waste Transferred Cross-Site
AN-104	AP-102	3/25/11	3/25/11	47,355	1,114		LAW Waste in LAW Feed Tanks
AN-104	AP-106	3/25/11	3/30/11	928,900	21,833		
SY-102	AN-104	5/17/11	5/21/11	976,900	21,289		West DST Waste Transferred Cross-Site
AN-104	AP-106	5/21/11	5/22/11	162,200	3,541		
AN-104	AW-103	5/22/11	5/26/11	815,600	17,792		
SY-102	AN-104	6/28/11	7/2/11	974,100	24,072		West DST Waste Transferred Cross-Site
AN-104	AW-103	7/2/11	7/3/11	165,400	4,073		
AN-106	AN-107	8/16/11	8/16/11	50,442	0		
AN-107	AW-102	8/16/11	8/18/11	262,600	177		LAW Waste in LAW Feed Tanks
AN-106	AN-107	8/18/11	8/18/11	89,558	0		
LERF	AW-101-PUMP	8/18/11	8/23/11	4,215	0		Water for in-line dilution
AW-101	AN-106	8/18/11	8/23/11	863,000	1,256		
242-A	AW-106	8/18/11	8/23/11	659,500	0		Concentrated Waste transferred to AW-106
AN-101	AN-107	1/5/12	1/6/12	140,000	2		East Area DST to DST Transferred Waste
LERF	AW-101-PUMP	1/6/12	1/10/12	0	0		Water for in-line dilution
AW-101	AN-101	1/6/12	1/10/12	867,200	1,256		
AN-105	AN-107	4/19/12	4/19/12	33,007	7		
AN-107	AW-102	4/19/12	4/24/12	953,000	660		LAW Waste in LAW Feed Tanks
AN-105	AN-107	4/24/12	4/24/12	107,000	23		
242-A	AW-106	4/24/12	4/25/12	162,000	0		Concentrated Waste transferred to AW-106
AW-106	AW-102	4/25/12	4/27/12	324,900	1		East Area DST to DST Transferred Waste
LERF	AW-104-PUMP	4/24/12	4/28/12	3,912	0		Water for in-line dilution
AW-104	AN-105	4/24/12	4/28/12	695,700	1,114		
242-A	AW-106	4/27/12	4/29/12	324,000	0		Concentrated Waste transferred to AW-106
AW-106	AW-102	4/29/12	5/2/12	504,000	1		East Area DST to DST Transferred Waste
242-A	AW-106	5/2/12	5/6/12	507,600	0		Concentrated Waste transferred to AW-106
AW-106	AP-107	5/6/12	5/7/12	295,200	1		East Area DST to DST Transferred Waste
AW-104	AY-102	7/15/12	7/16/12	281,800	8,817		
AN-104	AN-103	10/24/12	10/28/12	809,800	19,926		
BA-1	AN-103	10/28/12	10/29/12	145,800	4,082		
BA-2	AN-103	10/29/12	10/29/12	133,200	3,728		Retrieved SST Waste, Phase 2
SY-101	AN-104	10/28/12	11/1/12	1,052,000	64,283		
AN-106	AN-107	6/19/13	6/20/13	140,000	32		
LERF	AP-105-PUMP	6/20/13	6/24/13	592	0		Water for in-line dilution
AP-105	AN-106	6/20/13	6/24/13	839,800	1,351		
AW-104	AZ-102	6/19/14	6/21/14	281,800	8,817		
BA-2	AW-104	6/21/14	6/21/14	20,151	355		Retrieved SST Waste, Phase 2
BA-3	AW-104	6/21/14	6/22/14	145,800	4,082		Retrieved SST Waste, Phase 2
BA-4	AW-104	6/22/14	6/22/14	145,800	4,082		Retrieved SST Waste, Phase 2
BA-5	AW-104	6/22/14	6/23/14	145,800	4,082		Retrieved SST Waste, Phase 2
BA-6	AW-104	6/23/14	6/24/14	145,800	4,082		Retrieved SST Waste, Phase 2
AN-104	AW-104	6/24/14	6/26/14	407,300	24,514		
AN-101	AN-107	6/27/14	6/27/14	140,000	32		East Area DST to DST Transferred Waste
LERF	AP-105-PUMP	6/27/14	7/2/14	586	0		Water for in-line dilution
AP-105	AN-101	6/27/14	7/2/14	839,800	1,351		
AN-104	AP-105	7/2/14	7/5/14	646,300	38,869		
BA-1	AP-105	7/5/14	7/5/14	80,030	2,031		Retrieved SST Waste, Phase 2
SY-102	AN-104	7/5/14	7/9/14	973,300	24,946		West DST Waste Transferred Cross-Site
AN-104	AP-105	7/9/14	7/10/14	339,800	9,009		
C-102	AY-101	9/15/14	12/6/14	327,300	13,451		
LERF	AP-104-PUMP	12/18/14	12/21/14	1,749	0		Water for in-line dilution
AP-104	AN-105	12/18/14	12/21/14	711,900	0		East Area DST to DST Transferred Waste
C-102	AZ-101	12/15/14	3/7/15	327,400	13,455		

DATA SUPPORTING 3.1.5.a (5 Sheets)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	Product
LERF	AP-104-PUMP	5/29/15	6/2/15	1,749	0		Water for in-line dilution
AP-104	AN-106	5/29/15	6/2/15	711,900	0		
LERF	AN-104-PUMP	6/2/15	6/5/15	0	0		Water for in-line dilution
AN-104	AP-104	6/2/15	6/5/15	633,600	16,787		LAW Waste in LAW Feed Tanks
BA-2	AP-104	6/5/15	6/6/15	146,200	3,690		Retrieved SST Waste, Phase 2
BA-1	AP-104	6/6/15	6/6/15	146,200	3,691		Retrieved SST Waste, Phase 2
BA-3	AP-104	6/6/15	6/7/15	146,200	3,691		Retrieved SST Waste, Phase 2
BA-4	AP-104	6/7/15	6/7/15	15,986	404		Retrieved SST Waste, Phase 2
SY-101	AN-104	6/5/15	6/9/15	1,110,000	6,370		
AW-105	AY-101	12/3/15	12/6/15	492,500	9,919		
LERF	AP-101-PUMP	12/10/15	12/14/15	2,471	0		Water for in-line dilution
AP-101	AN-101	12/10/15	12/14/15	730,300	0		
LERF	AP-101-PUMP	6/21/16	6/25/16	2,471	0		Water for in-line dilution
AP-101	AN-105	6/21/16	6/25/16	730,300	0		
BA-4	AP-101	6/25/16	6/26/16	137,700	3,288		Retrieved SST Waste, Phase 2
BA-5	AP-101	6/26/16	6/26/16	146,600	3,307		Retrieved SST Waste, Phase 2
BA-6	AP-101	6/26/16	6/27/16	146,200	3,691		Retrieved SST Waste, Phase 2
AN-104	AP-101	6/27/16	7/1/16	671,500	4,182		
AN-104	AN-106	12/7/16	12/10/16	438,600	2,728		
BA-2	AN-106	12/10/16	12/10/16	146,200	3,691		Retrieved SST Waste, Phase 2
BA-1	AN-106	12/10/16	12/11/16	146,600	3,306		Retrieved SST Waste, Phase 2
BA-3	AN-106	12/11/16	12/12/16	146,200	3,691		Retrieved SST Waste, Phase 2
BA-4	AN-106	12/12/16	12/13/16	146,200	3,691		Retrieved SST Waste, Phase 2
BA-5	AN-106	12/13/16	12/13/16	73,923	1,667		Retrieved SST Waste, Phase 2
SY-102	AN-104	12/10/16	12/13/16	974,400	23,779		West DST Waste Transferred Cross-Site
AX-101	AY-102	1/6/17	2/14/17	167,700	129		East Area DST to DST Transferred Waste
A-101	AY-102	7/26/16	2/14/17	778,700	341		
BA-5	AN-101	5/26/17	5/26/17	80,171	1,639		Retrieved SST Waste, Phase 2
BA-6	AN-101	5/26/17	5/27/17	39,653	812		Retrieved SST Waste, Phase 2
AN-104	AN-101	5/27/17	6/1/17	971,000	23,203		
AW-105	AZ-101	6/22/17	6/25/17	492,500	9,919		
AN-104	AW-105	6/25/17	6/25/17	4,861	114		LAW Waste in LAW Feed Tanks
BA-2	AW-105	6/25/17	6/26/17	146,600	3,306		Retrieved SST Waste, Phase 2
BA-1	AW-105	6/26/17	6/26/17	146,600	3,306		Retrieved SST Waste, Phase 2
SY-101	AN-104	6/25/17	6/28/17	870,500	3,906		
AY-102	AW-105	6/26/17	6/30/17	698,700	1,385		East Area DST to DST Transferred Waste
AY-102	AN-105	11/16/17	11/17/17	246,800	488		East Area DST to DST Transferred Waste
BA-3	AN-105	11/17/17	11/18/17	146,600	3,306		Retrieved SST Waste, Phase 2
BA-4	AN-105	11/18/17	11/19/17	146,600	3,306		Retrieved SST Waste, Phase 2
BA-5	AN-105	11/19/17	11/19/17	146,600	3,306		Retrieved SST Waste, Phase 2
AN-104	AN-105	11/19/17	11/21/17	417,400	2,110		LAW Waste in LAW Feed Tanks
AX-101	AY-102	11/17/17	3/14/18	498,000	383		East Area DST to DST Transferred Waste
A-101	AY-102	11/17/17	3/14/18	448,300	196		
RETURN_2	AN-102	5/5/18	5/6/18	154,200	5,835		
BA-6	AW-102	5/5/18	5/6/18	146,600	3,306		Retrieved SST Waste, Phase 2
BA-2	AN-107	5/5/18	5/6/18	146,600	3,306		Retrieved SST Waste, Phase 2
BA-1	AW-102	5/6/18	5/6/18	58,360	1,147		Retrieved SST Waste, Phase 2
AN-104	AW-106	5/5/18	5/7/18	294,900	1,489		
AN-104	AW-102	5/7/18	5/7/18	159,300	802		
AY-102	AN-107	5/6/18	5/8/18	415,900	270		
AY-102	AW-102	5/8/18	5/10/18	419,800	273		East Area DST to DST Transferred Waste
AY-102	AN-102	5/10/18	5/11/18	111,500	72		
SY-102	AN-104	5/8/18	5/11/18	976,400	21,845		West DST Waste Transferred Cross-Site
AN-104	AN-102	5/11/18	5/15/18	788,400	17,258		
AX-101	AY-102	5/11/18	9/5/18	498,000	383		East Area DST to DST Transferred Waste
A-101	AY-102	5/11/18	9/5/18	448,300	196		

2nd Filter removes the following waste streams to isolate waste coming into the East Area DSTs

East Area DST to DST Transferred Waste
LAW Waste in LAW Feed Tanks
Waste from an East Area DST going to another East Area DST (i.e., from AN-106 to AP-107, etc.)
Waste from 242-A Evaporator
Waste from SY-101 and SY-102

DATA SUPPORTING 3.1.5.a (5 Sheets)

(2nd filter results)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	Product
LERF	AN-107-PUMP	9/2/05	9/5/05	446	0		Water for in-line dilution
LERF	AN-107-PUMP	9/5/05	9/7/05	253	0		Water for in-line dilution
LERF	AN-104-PUMP	9/9/05	9/13/05	4,024	0		Water for in-line dilution
LERF	AN-102-PUMP	12/9/05	12/13/05	3,764	0		Water for in-line dilution
						8,488	
LERF	AN-101-PUMP	1/3/08	1/7/08	0	0		Water for in-line dilution
LERF	AN-102-PUMP	1/9/08	1/13/08	3,287	0		Water for in-line dilution
LERF	AN-105-PUMP	9/16/08	9/20/08	1,470	0		Water for in-line dilution
						4,757	
C-104	AY-102	9/23/09	12/11/09	320,400	25,406		Retrieved SST Waste, Phase 1 WFD
						345,806	
C-104	AZ-102	12/11/09	3/7/10	351,200	27,845		
						379,045	
LERF	AN-103-PUMP	2/16/11	2/20/11	4,309	0		Water for in-line dilution
LERF	AW-101-PUMP	8/18/11	8/23/11	4,215	0		Water for in-line dilution
						8,524	
LERF	AW-101-PUMP	1/6/12	1/10/12	0	0		Water for in-line dilution
LERF	AW-104-PUMP	4/24/12	4/28/12	3,912	0		Water for in-line dilution
BA-1	AN-103	10/28/12	10/29/12	145,800	4,082		
BA-2	AN-103	10/29/12	10/29/12	133,200	3,728		Retrieved SST Waste, Phase 2
						290,722	
LERF	AP-105-PUMP	6/20/13	6/24/13	592	0		Water for in-line dilution
						592	
BA-2	AW-104	6/21/14	6/21/14	20,151	355		Retrieved SST Waste, Phase 2
BA-3	AW-104	6/21/14	6/22/14	145,800	4,082		Retrieved SST Waste, Phase 2
BA-4	AW-104	6/22/14	6/22/14	145,800	4,082		Retrieved SST Waste, Phase 2
BA-5	AW-104	6/22/14	6/23/14	145,800	4,082		Retrieved SST Waste, Phase 2
BA-6	AW-104	6/23/14	6/24/14	145,800	4,082		Retrieved SST Waste, Phase 2
LERF	AP-105-PUMP	6/27/14	7/2/14	586	0		Water for in-line dilution
BA-1	AP-105	7/5/14	7/5/14	80,030	2,031		Retrieved SST Waste, Phase 2
C-102	AY-101	9/15/14	12/6/14	327,300	13,451		
LERF	AP-104-PUMP	12/18/14	12/21/14	1,749	0		Water for in-line dilution
						1,045,180	
C-102	AZ-101	12/15/14	3/7/15	327,400	13,455		
LERF	AP-104-PUMP	5/29/15	6/2/15	1,749	0		Water for in-line dilution
LERF	AN-104-PUMP	6/2/15	6/5/15	0	0		Water for in-line dilution
BA-2	AP-104	6/5/15	6/6/15	146,200	3,690		Retrieved SST Waste, Phase 2
BA-1	AP-104	6/6/15	6/6/15	146,200	3,691		Retrieved SST Waste, Phase 2
BA-3	AP-104	6/6/15	6/7/15	146,200	3,691		Retrieved SST Waste, Phase 2
BA-4	AP-104	6/7/15	6/7/15	15,986	404		Retrieved SST Waste, Phase 2
LERF	AP-101-PUMP	12/10/15	12/14/15	2,471	0		Water for in-line dilution
						811,138	
LERF	AP-101-PUMP	6/21/16	6/25/16	2,471	0		Water for in-line dilution
BA-4	AP-101	6/25/16	6/26/16	137,700	3,288		Retrieved SST Waste, Phase 2
BA-5	AP-101	6/26/16	6/26/16	146,600	3,307		Retrieved SST Waste, Phase 2
BA-6	AP-101	6/26/16	6/27/16	146,200	3,691		Retrieved SST Waste, Phase 2
BA-2	AN-106	12/10/16	12/10/16	146,200	3,691		Retrieved SST Waste, Phase 2
BA-1	AN-106	12/10/16	12/11/16	146,600	3,306		Retrieved SST Waste, Phase 2
BA-3	AN-106	12/11/16	12/12/16	146,200	3,691		Retrieved SST Waste, Phase 2
BA-4	AN-106	12/12/16	12/13/16	146,200	3,691		Retrieved SST Waste, Phase 2
BA-5	AN-106	12/13/16	12/13/16	73,923	1,667		Retrieved SST Waste, Phase 2
A-101	AY-102	7/26/16	2/14/17	778,700	341		
						1,897,467	
BA-5	AN-101	5/26/17	5/26/17	80,171	1,639		Retrieved SST Waste, Phase 2
BA-6	AN-101	5/26/17	5/27/17	39,653	812		Retrieved SST Waste, Phase 2
BA-2	AW-105	6/25/17	6/26/17	146,600	3,306		Retrieved SST Waste, Phase 2
BA-1	AW-105	6/26/17	6/26/17	146,600	3,306		Retrieved SST Waste, Phase 2
BA-3	AN-105	11/17/17	11/18/17	146,600	3,306		Retrieved SST Waste, Phase 2
BA-4	AN-105	11/18/17	11/19/17	146,600	3,306		Retrieved SST Waste, Phase 2
BA-5	AN-105	11/19/17	11/19/17	146,600	3,306		Retrieved SST Waste, Phase 2
						871,807	

DATA SUPPORTING 3.1.5.a (5 Sheets)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	Product
A-101	AY-102	11/17/17	3/14/18	448,300	196		
RETURN_2	AN-102	5/5/18	5/6/18	154,200	5,835		
BA-6	AW-102	5/5/18	5/6/18	146,600	3,306		Retrieved SST Waste, Phase 2
BA-2	AN-107	5/5/18	5/6/18	146,600	3,306		Retrieved SST Waste, Phase 2
BA-1	AW-102	5/6/18	5/6/18	58,360	1,147		Retrieved SST Waste, Phase 2
						967,850	
							Note: year 2016, the largest constituents were
		Waste streams into East Area DSTs (max per year)				**1,897,467**	Retrieved SST Waste, Phase 2.
						1,898,000	(Rounding up to the nearest 1,000)

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DATA SUPPORTING 3.1.5.b

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DATA SUPPORTING 3.1.5.b (2 Sheets)

Waste Volumes Received-East Area
(start with data from 3.1.5.a)

Data from analysis supporting 3.1.5.a
Receive New Liquid Waste into East Area DSTs
- annual volume received by East Area DSTs from 200 East Area waste generators.

1st filter isolates waste streams coming into the East Area DSTs as follows:

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
	AN-101					
	AN-102					
	AN-103					
	AN-104					
	AN-105					
	AN-106					
	AN-107					
	AP-101					
	AP-102					
	AP-103					
	AP-104					
	AP-105					
	AP-106					
	AP-107					
	AP-108					
	AW-101					
	AW-102					
	AW-103					
	AW-104					
	AW-105					
	AW-106					
	AY-101					
	AY-102					
	AZ-101					
	AZ-102					

2nd Filter removes the following waste streams to isolate waste coming into the East Area DSTs

East Area DST to DST Transferred Waste
LAW Waste in LAW Feed Tanks
Waste from an East Area DST going to another East Area DST (i.e., from AN-106 to AP-107, etc.)
Waste from 242-A Evaporator
Waste from SY-101 and SY-102

(2nd filter results)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	Days	Product
LERF	AN-107-PUMP	9/2/05	9/5/05	446	0			Water for in-line dilution
LERF	AN-107-PUMP	9/5/05	9/7/05	253	0			Water for in-line dilution
LERF	AN-104-PUMP	9/9/05	9/13/05	4,024	0			Water for in-line dilution
LERF	AN-102-PUMP	12/9/05	12/13/05	3,764	0			Water for in-line dilution
LERF	AN-101-PUMP	1/3/08	1/7/08	0	0			Water for in-line dilution
LERF	AN-102-PUMP	1/9/08	1/13/08	3,287	0			Water for in-line dilution
LERF	AN-105-PUMP	9/16/08	9/20/08	1,470	0			Water for in-line dilution
C-104	AY-102	9/23/09	12/11/09	320,400	25,406	345,806	80	Retrieved SST Waste, Phase 1 WFD
C-104	AZ-102	12/11/09	3/7/10	351,200	27,845			
LERF	AN-103-PUMP	2/16/11	2/20/11	4,309	0			Water for in-line dilution
LERF	AW-101-PUMP	8/18/11	8/23/11	4,215	0			Water for in-line dilution
LERF	AW-101-PUMP	1/6/12	1/10/12	0	0			Water for in-line dilution
LERF	AW-104-PUMP	4/24/12	4/28/12	3,912	0			Water for in-line dilution
BA-1	AN-103	10/28/12	10/29/12	145,800	4,082			

DATA SUPPORTING 3.1.5.b (2 Sheets)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	Days	Product
BA-2	AN-103	10/29/12	10/29/12	133,200	3,728	286,809	2	Retrieved SST Waste, Phase 2
LERF	AP-105-PUMP	6/20/13	6/24/13	592	0			Water for in-line dilution
BA-2	AW-104	6/21/14	6/21/14	20,151	355			Retrieved SST Waste, Phase 2
BA-3	AW-104	6/21/14	6/22/14	145,800	4,082			Retrieved SST Waste, Phase 2
BA-4	AW-104	6/22/14	6/22/14	145,800	4,082			Retrieved SST Waste, Phase 2
BA-5	AW-104	6/22/14	6/23/14	145,800	4,082			Retrieved SST Waste, Phase 2
BA-6	AW-104	6/23/14	6/24/14	145,800	4,082	620,033	4	Retrieved SST Waste, Phase 2
LERF	AP-105-PUMP	6/27/14	7/2/14	586	0			Water for in-line dilution
BA-1	AP-105	7/5/14	7/5/14	80,030	2,031	82,060		Retrieved SST Waste, Phase 2
C-102	AY-101	9/15/14	12/6/14	327,300	13,451			
LERF	AP-104-PUMP	12/18/14	12/21/14	1,749	0			Water for in-line dilution
C-102	AZ-101	12/15/14	3/7/15	327,400	13,455			
LERF	AP-104-PUMP	5/29/15	6/2/15	1,749	0			Water for in-line dilution
LERF	AN-104-PUMP	6/2/15	6/5/15	0	0			Water for in-line dilution
BA-2	AP-104	6/5/15	6/6/15	146,200	3,690			Retrieved SST Waste, Phase 2
BA-1	AP-104	6/6/15	6/6/15	146,200	3,691			Retrieved SST Waste, Phase 2
BA-3	AP-104	6/6/15	6/7/15	146,200	3,691			Retrieved SST Waste, Phase 2
BA-4	AP-104	6/7/15	6/7/15	15,986	404	466,062	3	Retrieved SST Waste, Phase 2
LERF	AP-101-PUMP	12/10/15	12/14/15	2,471	0			Water for in-line dilution
LERF	AP-101-PUMP	6/21/16	6/25/16	2,471	0			Water for in-line dilution
BA-4	AP-101	6/25/16	6/26/16	137,700	3,288			Retrieved SST Waste, Phase 2
BA-5	AP-101	6/26/16	6/26/16	146,600	3,307			Retrieved SST Waste, Phase 2
BA-6	AP-101	6/26/16	6/27/16	146,200	3,691	440,786	3	Retrieved SST Waste, Phase 2
BA-2	AN-106	12/10/16	12/10/16	146,200	3,691			Retrieved SST Waste, Phase 2
BA-1	AN-106	12/10/16	12/11/16	146,600	3,306			Retrieved SST Waste, Phase 2
BA-3	AN-106	12/11/16	12/12/16	146,200	3,691			Retrieved SST Waste, Phase 2
BA-4	AN-106	12/12/16	12/13/16	146,200	3,691			Retrieved SST Waste, Phase 2
BA-5	AN-106	12/13/16	12/13/16	73,923	1,667	675,169	4	Retrieved SST Waste, Phase 2
A-101	AY-102	7/26/16	2/14/17	778,700	341			
BA-5	AN-101	5/26/17	5/26/17	80,171	1,639			Retrieved SST Waste, Phase 2
BA-6	AN-101	5/26/17	5/27/17	39,653	812	122,275	2	Retrieved SST Waste, Phase 2
BA-2	AW-105	6/25/17	6/26/17	146,600	3,306			Retrieved SST Waste, Phase 2
BA-1	AW-105	6/26/17	6/26/17	146,600	3,306	299,813	2	Retrieved SST Waste, Phase 2
BA-3	AN-105	11/17/17	11/18/17	146,600	3,306			Retrieved SST Waste, Phase 2
BA-4	AN-105	11/18/17	11/19/17	146,600	3,306			Retrieved SST Waste, Phase 2
BA-5	AN-105	11/19/17	11/19/17	146,600	3,306	449,719	3	Retrieved SST Waste, Phase 2
A-101	AY-102	11/17/17	3/14/18	448,300	196			
RETURN_2	AN-102	5/5/18	5/6/18	154,200	5,835			
BA-6	AW-102	5/5/18	5/6/18	146,600	3,306	149,906		Retrieved SST Waste, Phase 2
BA-2	AN-107	5/5/18	5/6/18	146,600	3,306	149,906		Retrieved SST Waste, Phase 2
BA-1	AW-102	5/6/18	5/6/18	58,360	1,147	299,812		Retrieved SST Waste, Phase 2
Waste streams into East Area DSTs (max per year)					12/13/16	**675,169**		

This amount rounds up to 676,000 gallons received over a period of 4 days

DATA SUPPORTING 3.1.6.a

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Waste Received from 242-A Evaporator

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
(Concentrated waste transferred to AW-106)						
242-A	SY-102	06/02/99	06/07/99	659,200	0	
242-A	SY-103	06/12/99	06/17/99	659,300	0	
242-A	AW-106	06/23/99	06/28/99	659,400	0	
242-A	AW-106	07/03/99	07/08/99	701,600	0	
242-A	AW-106	07/13/99	07/14/99	118,800	0	
242-A	AW-106	07/14/99	07/14/99	10,800	0	
242-A	AW-106	07/14/99	07/18/99	529,600	0	
242-A	AW-106	07/26/99	07/30/99	593,800	0	
242-A	AW-106	08/04/99	08/09/99	636,500	0	
242-A	AW-106	08/14/99	08/16/99	183,600	0	
242-A	AW-106	08/16/99	08/16/99	10,800	0	
242-A	AW-106	08/16/99	08/20/99	465,000	0	
						5,228,400
242-A	AW-106	09/08/00	09/12/00	464,400	0	
242-A	AW-106	09/15/00	09/21/00	659,500	0	
242-A	AW-106	09/26/00	09/26/00	63,108	0	
242-A	AW-106	09/26/00	09/26/00	15,777	0	
242-A	AW-106	09/26/00	10/01/00	884,600	0	
						2,087,386
242-A	AW-106	08/18/01	08/22/01	814,600	0	
242-A	AW-106	09/30/01	10/02/01	291,300	0	
242-A	AW-106	10/02/01	10/02/01	15,329	0	
242-A	AW-106	10/02/01	10/06/01	629,500	0	
242-A	AW-106	01/27/02	01/31/02	814,100	0	
242-A	AW-106	09/08/02	09/11/02	515,100	0	
						1,329,200
242-A	AW-106	05/13/03	05/13/03	4,922	0	
242-A	AW-106	05/13/03	05/13/03	174	0	
242-A	AW-106	05/13/03	05/13/03	6	0	
242-A	AW-106	05/13/03	05/13/03	0	0	
242-A	AW-106	05/13/03	05/13/03	0	0	
						5,102
242-A	AW-106	09/07/05	09/11/05	632,100	0	
						632,100
242-A	AW-106	08/18/11	08/23/11	659,500	0	
						659,500
242-A	AW-106	04/24/12	04/25/12	**162,000**	0	
242-A	AW-106	04/27/12	04/29/12	**324,000**	0	
242-A	AW-106	05/02/12	05/06/12	**507,600**	0	
						993,600

The largest annual volume received after the start of Phase 1 (2004) is 993,600 gal.
This quantity is rounded up to 994,000 gallons.

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DATA SUPPORTING 3.2.a

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LAW Staging Quantity, Phase 1
(1st filter is per Table 3.1-2, TWRS O&UP feed source tanks)

(1st filter)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
AN-107	AN-106					
AN-104	AN-101					
AN-102	AN-106					
AN-102	AN-101					
AN-105	AN-104					
AP-106	AN-106					
SY-102	AN-101					
AN-103	AN-105					
AW-101	AN-106					
AW-101	AN-101					
AW-104	AN-105					
AP-105	AN-106					
AP-105	AN-101					
AP-104	AN-105					
AP-104	AN-106					
AP-101	AN-101					
AP-101	AN-105					

(Initial sort to identify waste transfers per Table 3.1-2 of TWRS O&UP)
Remove data after Batch 21, ap-101 to an-105

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
AN-107	AN-106	9/2/05	9/5/05	478,400	1,045	
AN-107	AN-106	9/5/05	9/7/05	474,500	1,036	
AN-104	AN-101	9/9/05	9/13/05	894,700	1,303	
AN-102	AN-106	12/9/05	12/13/05	779,200	1,215	
AN-102	AN-101	1/9/08	1/13/08	778,200	1,213	
AN-105	AN-104	9/16/08	9/20/08	874,900	1,043	
AP-106	AN-106	06/03/09	6/7/09	7.22E+05	0	
SY-102	AN-101	02/15/10	2/17/10	4.11E+05	8728.942	
AN-103	AN-105	2/16/11	2/20/11	894,500	1,192	
AW-104	AN-105	4/24/12	4/28/12	695,700	1,114	
AP-105	AN-106	6/20/13	6/24/13	839,800	1,351	
AP-105	AN-101	6/27/14	7/2/14	839,800	1,351	
AP-104	AN-105	12/18/14	12/21/14	711,900	0	
AP-104	AN-106	5/29/15	6/2/15	711,900	0	
AP-101	AN-101	12/10/15	12/14/15	730,300	0	
AP-101	AN-105	6/21/16	6/25/16	730,300	0	
						11,587,093

11,587,093 is rounded to 11,588,000 gallons
This quantity represents the volume transferred to support LAW Staging

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DATA SUPPORTING 3.2.2.a

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DATA SUPPORTING 3.2.2.a

200 West Area DST to West Area DST Transfers

(Initial filter to isolate waste streams from West Area DSTs to West Area DSTs)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
SY-101	SY-102					
SY-101	SY-103					
SY-102	SY-101					
SY-102	SY-103					
SY-103	SY-101					
SY-103	SY-102					

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
SY-101	SY-102	02/13/10	02/15/10	451,300	3,901	455,201

The volume (455,201 gal.) is the transfer between West Area Tanks SY-101 and SY-102 over a 3-day period between 02/13/10 and 02/15/10.
This total volume was rounded up to 456,000 gallons.

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DATA SUPPORTING 3.2.3.a

Cross-Site Waste Transfer Volume

(Initial filter to isolate waste streams from West Area DST SY-102 to East Area DST receiver, AN-104)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
SY-101	AN-104					
SY-102	AN-104					
SY-103	AN-104					

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	Annual Vol
SY-102	AN-104	09/12/08	09/13/08	279,600	6,621	286,221	286,221
SY-102	AN-104	03/21/11	03/25/11	974,700	23,544	998,244	
SY-102	AN-104	05/17/11	05/21/11	976,900	21,289	998,189	
SY-102	AN-104	06/28/11	07/02/11	974,100	24,072	998,172	**2,994,604**
SY-101	AN-104	10/28/12	11/01/12	1,052,000	64,283	1,116,283	1,116,283
SY-102	AN-104	07/05/14	07/09/14	973,300	24,946	998,246	998,246
SY-101	AN-104	06/05/15	06/09/15	1,110,000	6,370	**1,116,370**	1,116,370
SY-102	AN-104	12/10/16	12/13/16	974400	23779.305	998,179	998,179
SY-101	AN-104	06/25/17	06/28/17	870500	3905.931	874,406	874,406
SY-102	AN-104	05/08/18	05/11/18	976400	21845.032	998,245	998,245

The volume transferred over the 5-day period from 6/5/15 to 6/9/15 is 1,284,465 gallons.
The volume is rounded up to 1,117,000 gallons.
The maximum annual volume is 2,994,604 transferred during 2011.
This is annual quantity is rounded up to 2,995,000.

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DATA SUPPORTING 3.2.4.a

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DATA SUPPORTING 3.2.4.a

Supernatant Preparation - East Area

(Initial filter to isolate waste streams from AN-107 and AN-102, East Area DSTs which represent Envelope C feed to be retrieved with in-line dilution (see HNF-SD-WM-SP-012, Section 3.4.3.2.)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
AN-107						
AN-102						

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
AN-107	AN-106	09/02/05	09/05/05	478,400	1,045	
AN-107	AN-106	09/05/05	09/07/05	474,500	1,036	
AN-102	AN-106	12/09/05	12/13/05	779,200	1,215	1,735,396
AN-102	AN-101	01/09/08	01/13/08	778,200	1,213	779,413
AN-107	AW-102	08/16/11	08/18/11	262,600	177	262,777
AN-107	AW-102	04/19/12	04/24/12	953,000	660	953,660
AN-102	OUT-OF-TANK-5	11/30/18	12/01/18	132,400	3,244	135,644
AN-102	OUT-OF-TANK-1	04/11/19	04/12/19	132,400	3,242	
AN-102	OUT-OF-TANK-6	05/14/19	05/15/19	158,600	3,880	
AN-107	OUT-OF-TANK-3	06/10/19	06/11/19	140,200	2,567	
AN-107	OUT-OF-TANK-3	09/10/19	09/11/19	196,300	3,591	
AN-102	OUT-OF-TANK-2	11/02/19	11/03/19	162,200	3,967	806,947
AN-107	OUT-OF-TANK-1	03/07/20	03/08/20	125,700	2,299	
AN-102	OUT-OF-TANK-2	06/26/20	06/27/20	195,100	4,768	
AN-107	OUT-OF-TANK-1	08/28/20	08/29/20	196,300	3,586	527,753

The maximum supernatant prepared in 1 year is therefore: 1,735,396
This volume is rounded up to 1,736,000 gal. representing the quantity of supernatant prepared over the period 09/02/05 to 12/13/05.

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DATA SUPPORTING 3.2.5.a

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DATA SUPPORTING 3.2.5.a (5 Sheets)

200 East Area Waste Batch Transfer

(Initial filter to isolate waste streams from an East Area DST)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
AN-101						
AN-102						
AN-103						
AN-104						
AN-105						
AN-106						
AN-107						
AP-101						
AP-102						
AP-103						
AP-104						
AP-105						
AP-106						
AP-107						
AP-108						
AW-101						
AW-102						
AW-103						
AW-104						
AW-105						
AW-106						
AY-101						
AY-102						
AZ-101						
AZ-102						
Also, remove streams after 2018						

(Result of 1st filter)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
AZ-101	OUT-TANK-WASH	09/01/04	10/16/04	156,800	1,672	
AW-106	AP-108	02/23/05	02/26/05	636,300	1	
AN-106	AP-107	09/01/05	09/02/05	220,000	0	
AN-107	AN-106	09/02/05	09/05/05	478,400	1,045	
AN-107	AN-106	09/05/05	09/07/05	474,500	1,036	
AP-107	AW-102	09/07/05	09/07/05	5,818	0	
AN-101	AN-107	09/08/05	09/09/05	140,000	0	
AN-104	AN-101	09/09/05	09/13/05	894,700	1,303	
AP-107	AW-102	09/11/05	09/13/05	459,800	0	
AW-106	AP-107	09/13/05	09/17/05	821,100	1	
AZ-101	OUT-TANK-WASH	10/20/05	12/04/05	156,800	1,672	
AN-106	SPARE-101	12/05/05	12/09/05	969,200	3,592	
AN-102	AN-106	12/09/05	12/13/05	779,200	1,215	
AZ-101	OUT-TANK-WASH	12/07/05	01/21/06	156,800	1,672	
AZ-101	OUT-TANK-WASH	01/25/06	03/11/06	156,800	1,672	
AZ-101	OUT-TANK-WASH	03/14/06	04/28/06	156,800	1,672	
AZ-101	OUT-TANK-WASH	05/02/06	05/14/06	126,600	1,350	
AZ-102	OUT-TANK-WASH	05/17/06	06/01/06	155,400	3,137	
AZ-102	OUT-TANK-WASH	06/04/06	06/19/06	155,400	3,137	
AZ-102	OUT-TANK-WASH	06/22/06	07/07/06	155,400	3,137	
AZ-102	OUT-TANK-WASH	07/10/06	07/25/06	155,400	3,137	
AZ-102	OUT-TANK-WASH	07/28/06	08/12/06	155,400	3,137	

DATA SUPPORTING 3.2.5.a (5 Sheets)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
AZ-102	OUT-TANK-WASH	08/15/06	08/23/06	84,552	1,707	
AW-103	AY-102	10/01/06	10/02/06	215,900	11,276	
AY-101	AN-107	03/01/07	03/02/07	350,000	15	
AY-102	OUT-TANK-WASH	03/19/07	04/01/07	133,200	5,000	
AW-103	AY-101	06/01/07	06/02/07	323,800	16,914	
AY-102	OUT-TANK-WASH	08/05/07	08/18/07	133,200	5,000	
AY-102	OUT-TANK-WASH	12/22/07	01/04/08	133,200	5,000	
AN-101	SPARE-101	01/03/08	01/07/08	898,700	1,265	
AN-101	AN-107	01/08/08	01/09/08	140,000	32	
AN-102	AN-101	01/09/08	01/13/08	778,200	1,213	
AY-102	OUT-TANK-WASH	05/09/08	05/22/08	133,200	5,000	
AN-104	SPARE-101	09/07/08	09/11/08	928,900	4,382	
AN-104	AZ-101	09/13/08	09/14/08	280,000	6,158	
AN-104	AN-107	09/15/08	09/16/08	139,500	495	
AY-102	OUT-TANK-WASH	09/05/08	09/18/08	133,200	5,000	
AN-105	AN-104	09/16/08	09/20/08	874,900	1,043	
AY-102	OUT-TANK-WASH	01/01/09	01/02/09	6,059	227	
AY-101	OUT-TANK-WASH	01/28/09	02/08/09	118,500	5,000	
AY-101	OUT-TANK-WASH	05/21/09	06/02/09	118,500	5,000	
AN-106	SPARE-101	05/29/09	06/02/09	782,900	1,272	
AN-106	AN-107	06/03/09	06/03/09	140,000	37	
AP-106	AN-106	06/03/09	06/07/09	721,800	0	
AY-101	OUT-TANK-WASH	09/11/09	09/23/09	118,500	5,000	
AW-103	AZ-101	01/01/10	01/03/10	431,700	22,552	
AY-101	OUT-TANK-WASH	01/03/10	01/14/10	118,500	5,000	
AN-101	SPARE-101	02/07/10	02/11/10	781,600	1,178	
AY-101	OUT-TANK-WASH	04/26/10	05/08/10	118,500	5,000	
AN-104	SPARE-101	08/18/10	08/23/10	876,400	1,106	
AY-101	OUT-TANK-WASH	08/18/10	08/29/10	118,500	5,000	
AY-101	OUT-TANK-WASH	12/09/10	12/21/10	118,500	5,000	
AN-105	SPARE-101	02/11/11	02/16/11	876,400	1,043	
AN-103	AN-105	02/16/11	02/20/11	894,500	1,192	
AN-104	AP-102	03/25/11	03/25/11	47,355	1,114	
AN-104	AP-106	03/25/11	03/30/11	928,900	21,833	
AY-101	OUT-TANK-WASH	04/02/11	04/10/11	83,192	3,511	
AN-104	AP-106	05/21/11	05/22/11	162,200	3,541	
AN-104	AW-103	05/22/11	05/26/11	815,600	17,792	
AN-104	AW-103	07/02/11	07/03/11	165,400	4,073	
AZ-101	OUT-TANK-WASH	06/21/11	07/04/11	127,400	5,000	
AN-106	SPARE-101	08/12/11	08/15/11	721,800	7	
AN-106	AN-107	08/16/11	08/16/11	50,442	0	
AN-107	AW-102	08/16/11	08/18/11	262,600	177	
AN-106	AN-107	08/18/11	08/18/11	89,558	0	
AW-101	AN-106	08/18/11	08/23/11	863,000	1,256	
AW-103	OUT-OF-TANK-1	10/01/11	10/02/11	194,900	5,044	
AP-106	OUT-OF-TANK-2	10/01/11	10/02/11	196,300	3,744	
AP-102	OUT-OF-TANK-3	10/01/11	10/02/11	199,800	165	
AP-103	OUT-OF-TANK-4	10/01/11	10/02/11	200,000	0	
AP-108	OUT-OF-TANK-5	10/01/11	10/02/11	200,000	0	
AW-103	OUT-OF-TANK-6	10/02/11	10/03/11	195,000	5,044	
AN-101	SPARE-101	01/02/12	01/04/12	410,600	39	
AN-101	AN-107	01/05/12	01/06/12	140,000	2	
AW-101	AN-101	01/06/12	01/10/12	867,200	1,256	
AZ-101	OUT-TANK-WASH	01/02/12	01/15/12	127,400	5,000	

DATA SUPPORTING 3.2.5.a (5 Sheets)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
AN-105	SPARE-101	04/14/12	04/18/12	898,800	1,189	
AN-105	AN-107	04/19/12	04/19/12	33,007	7	
AN-107	AW-102	04/19/12	04/24/12	953,000	660	
AN-105	AN-107	04/24/12	04/24/12	107,000	23	
AW-106	AW-102	04/25/12	04/27/12	324,900	1	
AW-104	AN-105	04/24/12	04/28/12	695,700	1,114	
AW-106	AW-102	04/29/12	05/02/12	504,000	1	
AW-106	AP-107	05/06/12	05/07/12	295,200	1	
AW-104	AY-102	07/15/12	07/16/12	281,800	8,817	
AZ-101	OUT-TANK-WASH	07/16/12	07/28/12	127,400	5,000	
AN-103	SPARE-101	10/18/12	10/24/12	1,061,000	5,710	
AN-104	AN-103	10/24/12	10/28/12	809,800	19,926	
AZ-101	OUT-TANK-WASH	01/27/13	02/09/13	127,400	5,000	
AN-106	SPARE-101	06/14/13	06/18/13	867,200	1,218	
AN-106	AN-107	06/19/13	06/20/13	140,000	32	
AP-105	AN-106	06/20/13	06/24/13	839,800	1,351	
AZ-101	OUT-TANK-WASH	08/11/13	08/24/13	127,400	5,000	
AZ-101	OUT-TANK-WASH	02/23/14	03/02/14	75,476	2,962	
AW-104	AZ-102	06/19/14	06/21/14	281,800	8,817	
AN-101	SPARE-101	06/21/14	06/26/14	867,200	1,218	
AN-104	AW-104	06/24/14	06/26/14	407,300	24,514	
AN-101	AN-107	06/27/14	06/27/14	140,000	32	
AY-102	OUT-TANK-WASH	06/19/14	06/28/14	89,253	5,000	
AP-105	AN-101	06/27/14	07/02/14	839,800	1,351	
AN-104	AP-105	07/02/14	07/05/14	646,300	38,869	
AN-104	AP-105	07/09/14	07/10/14	339,800	9,009	
AY-102	OUT-TANK-WASH	09/06/14	09/15/14	89,253	5,000	
AY-102	OUT-TANK-WASH	11/24/14	12/03/14	89,253	5,000	
AN-105	SPARE-101	12/14/14	12/18/14	699,600	1,078	
AP-104	AN-105	12/18/14	12/21/14	711,900	0	
AY-102	OUT-TANK-WASH	02/10/15	02/19/15	89,253	5,000	
AY-102	OUT-TANK-WASH	04/30/15	05/09/15	89,253	5,000	
AN-106	SPARE-101	05/25/15	05/29/15	840,400	1,314	
AP-104	AN-106	05/29/15	06/02/15	711,900	0	
AN-104	AP-104	06/02/15	06/05/15	633,600	16,787	
AY-102	OUT-TANK-WASH	07/18/15	07/27/15	89,253	5,000	
AY-102	OUT-TANK-WASH	10/05/15	10/12/15	67,094	3,759	
AW-105	AY-101	12/03/15	12/06/15	492,500	9,919	
AN-101	SPARE-101	12/06/15	12/10/15	840,400	1,314	
AZ-102	OUT-TANK-WASH	12/03/15	12/12/15	88,677	5,000	
AP-101	AN-101	12/10/15	12/14/15	730,300	0	
AZ-102	OUT-TANK-WASH	02/20/16	02/29/16	88,677	5,000	
AZ-102	OUT-TANK-WASH	05/09/16	05/18/16	88,677	5,000	
AN-105	SPARE-101	06/18/16	06/21/16	713,600	41	
AP-101	AN-105	06/21/16	06/25/16	730,300	0	
AN-104	AP-101	06/27/16	07/01/16	671,500	4,182	
AZ-102	OUT-TANK-WASH	07/26/16	08/04/16	88,677	5,000	
AZ-102	OUT-TANK-WASH	10/13/16	10/22/16	88,677	5,000	
AN-106	SPARE-101	12/04/16	12/07/16	713,600	41	
AN-104	AN-106	12/07/16	12/10/16	438,600	2,728	
AZ-102	OUT-TANK-WASH	12/31/16	01/09/17	88,677	5,000	
AZ-102	OUT-TANK-WASH	03/19/17	03/28/17	88,677	5,000	
AN-101	SPARE-101	05/22/17	05/26/17	732,700	41	
AN-104	AN-101	05/27/17	06/01/17	971,000	23,203	

DATA SUPPORTING 3.2.5.a (5 Sheets)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	
AZ-102	OUT-TANK-WASH	06/06/17	06/07/17	13,096	738		
AW-105	AZ-101	06/22/17	06/25/17	492,500	9,919		
AN-104	AW-105	06/25/17	06/25/17	4,861	114		
AY-102	AW-105	06/26/17	06/30/17	698,700	1,385		
AY-101	OUT-TANK-WASH	06/22/17	07/07/17	154,000	4,457		
AY-101	OUT-TANK-WASH	09/27/17	10/12/17	154,000	4,457		
AN-105	SPARE-101	11/12/17	11/16/17	732,800	2		
AY-102	AN-105	11/16/17	11/17/17	246,800	488		
AN-104	AN-105	11/19/17	11/21/17	417,400	2,110		
AY-101	OUT-TANK-WASH	01/03/18	01/18/18	154,000	4,457		
AY-101	OUT-TANK-WASH	04/10/18	04/25/18	154,000	4,457		
AN-104	AW-106	05/05/18	05/07/18	294,900	1,489		
AN-104	AW-102	05/07/18	05/07/18	159,300	802		
AY-102	AN-107	05/06/18	05/08/18	415,900	270		
AY-102	AW-102	05/08/18	05/10/18	419,800	273		
AY-102	AN-102	05/10/18	05/11/18	111,500	72		
AN-104	AN-102	05/11/18	05/15/18	788,400	17,258		
(2nd filter is to isolate "Tank to" as 200 East Area DSTs)							
AW-106	AP-108	02/23/05	02/26/05	636,300	1		
AN-106	AP-107	09/01/05	09/02/05	220,000	0		
AN-107	AN-106	09/02/05	09/05/05	478,400	1,045		
AN-107	AN-106	09/05/05	09/07/05	474,500	1,036	954,981	6
AP-107	AW-102	09/07/05	09/07/05	5,818	0		
AN-101	AN-107	09/08/05	09/09/05	140,000	0		
AN-104	AN-101	09/09/05	09/13/05	894,700	1,303	896,003	5
AP-107	AW-102	09/11/05	09/13/05	459,800	0		
AW-106	AP-107	09/13/05	09/17/05	821,100	1		
AN-106	SPARE-101	12/05/05	12/09/05	969,200	3,592		
AN-102	AN-106	12/09/05	12/13/05	779,200	1,215	780,415	5
AW-103	AY-102	10/01/06	10/02/06	215,900	11,276		
AY-101	AN-107	03/01/07	03/02/07	350,000	15		
AW-103	AY-101	06/01/07	06/02/07	323,800	16,914		
AN-101	AN-107	01/08/08	01/09/08	140,000	32		
AN-102	AN-101	01/09/08	01/13/08	778,200	1,213		
AN-104	AZ-101	09/13/08	09/14/08	280,000	6,158		
AN-104	AN-107	09/15/08	09/16/08	139,500	495		
AN-105	AN-104	09/16/08	09/20/08	874,900	1,043		
AN-106	AN-107	06/03/09	06/03/09	140,000	37		
AP-106	AN-106	06/03/09	06/07/09	721,800	0		
AW-103	AZ-101	01/01/10	01/03/10	431,700	22,552		
AN-103	AN-105	02/16/11	02/20/11	894,500	1,192		
AN-104	AP-102	03/25/11	03/25/11	47,355	1,114		
AN-104	AP-106	03/25/11	03/30/11	928,900	21,833	950,733	6
AN-104	AP-106	05/21/11	05/22/11	162,200	3,541		
AN-104	AW-103	05/22/11	05/26/11	815,600	17,792		
AN-104	AW-103	07/02/11	07/03/11	165,400	4,073		
AN-106	AN-107	08/16/11	08/16/11	50,442	0		
AN-107	AW-102	08/16/11	08/18/11	262,600	177		
AN-106	AN-107	08/18/11	08/18/11	89,558	0		
AW-101	AN-106	08/18/11	08/23/11	863,000	1,256	864,256	6
AN-101	AN-107	01/05/12	01/06/12	140,000	2		
AW-101	AN-101	01/06/12	01/10/12	867,200	1,256	868,456	5

DATA SUPPORTING 3.2.5.a (5 Sheets)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	
AN-105	AN-107	04/19/12	04/19/12	33,007	7		
AN-107	AW-102	04/19/12	04/24/12	953,000	660	953,660	6
AN-105	AN-107	04/24/12	04/24/12	107,000	23		
AW-106	AW-102	04/25/12	04/27/12	324,900	1		
AW-104	AN-105	04/24/12	04/28/12	695,700	1,114		
AW-106	AW-102	04/29/12	05/02/12	504,000	1		
AW-106	AP-107	05/06/12	05/07/12	295,200	1		
AW-104	AY-102	07/15/12	07/16/12	281,800	8,817		
AN-104	AN-103	10/24/12	10/28/12	809,800	19,926	829,726	5
AN-106	AN-107	06/19/13	06/20/13	140,000	32		
AP-105	AN-106	06/20/13	06/24/13	839,800	1,351		
AW-104	AZ-102	06/19/14	06/21/14	281,800	8,817		
AN-104	AW-104	06/24/14	06/26/14	407,300	24,514		
AN-101	AN-107	06/27/14	06/27/14	140,000	32		
AP-105	AN-101	06/27/14	07/02/14	839,800	1,351	841,151	6
AN-104	AP-105	07/02/14	07/05/14	646,300	38,869		
AN-104	AP-105	07/09/14	07/10/14	339,800	9,009	**1,033,978**	**9**
AP-104	AN-105	12/18/14	12/21/14	711,900	0		
AP-104	AN-106	05/29/15	06/02/15	711,900	0		
AN-104	AP-104	06/02/15	06/05/15	633,600	16,787		
AW-105	AY-101	12/03/15	12/06/15	492,500	9,919		
AP-101	AN-101	12/10/15	12/14/15	730,300	0		
AP-101	AN-105	06/21/16	06/25/16	730,300	0		
AN-104	AP-101	06/27/16	07/01/16	671,500	4,182		
AN-104	AN-106	12/07/16	12/10/16	438,600	2,728		
AN-104	AN-101	05/27/17	06/01/17	971,000	23,203	994,203	6
AW-105	AZ-101	06/22/17	06/25/17	492,500	9,919		
AN-104	AW-105	06/25/17	06/25/17	4,861	114		
AY-102	AW-105	06/26/17	06/30/17	698,700	1,385		
AY-102	AN-105	11/16/17	11/17/17	246,800	488		
AN-104	AN-105	11/19/17	11/21/17	417,400	2,110		
AN-104	AW-106	05/05/18	05/07/18	294,900	1,489		
AN-104	AW-102	05/07/18	05/07/18	159,300	802		
AY-102	AN-107	05/06/18	05/08/18	415,900	270		
AY-102	AW-102	05/08/18	05/10/18	419,800	273		
AY-102	AN-102	05/10/18	05/11/18	111,500	72		
AN-104	AN-102	05/11/18	05/15/18	788,400	17,258	917,230	6

The system must be capable of transferring batches of up to 1,033,978 to a 200 East Area DST over a period of 9 days.
The volume of 1,033,978 is rounded to 1,034,000 gallons.

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DATA SUPPORTING 3.2.6.a

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DATA SUPPORTING 3.2.6.a

Low-Activity Waste Staging Batch Volumes
(Per HNF-SD-WM-SP-012, Section 3.1.1.5.2, the staging tanks are AN-101 and AN-106)
First filter is to isolate waste streams into AN-101 and AN-106

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	Days
	AN-101						
	AN-106						

Also, remove waste into from AN-106 and AN-101 from "BA-X" tanks as erroneous input.

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	Days
AN-107	AN-106	09/02/05	09/05/05	478,400	1,045		
AN-107	AN-106	09/05/05	09/07/05	474,500	1,036	954,981	4
AN-104	AN-101	09/09/05	09/13/05	894,700	1,303	896,003	5
AN-102	AN-106	12/09/05	12/13/05	779,200	1,215	780,415	5
LERF	AN-101-PUMP	01/03/08	01/07/08	0	0		5
AN-102	AN-101	01/09/08	01/13/08	778,200	1,213	779,413	5
AP-106	AN-106	06/03/09	06/07/09	721,800	0	721,800	5
SY-102	AN-101	02/15/10	02/17/10	410,600	8,729	**419,329**	3
AW-101	AN-106	08/18/11	08/23/11	863,000	1,256	864,256	6
AW-101	AN-101	01/06/12	01/10/12	867,200	1,256	868,456	5
AP-105	AN-106	06/20/13	06/24/13	839,800	1,351	841,151	5
AP-105	AN-101	06/27/14	07/02/14	839,800	1,351	841,151	5
AP-104	AN-106	05/29/15	06/02/15	711,900	0	711,900	5
AP-101	AN-101	12/10/15	12/14/15	730,300	0	730,300	5
AN-104	AN-106	12/07/16	12/10/16	438,600	2,728		
AN-104	AN-101	05/27/17	06/01/17	971,000	23,203	**994,203**	6

Therefore the system must be capable of transferring 419,329 to 994,203 gallons of LAW over a period of between 3 to 6 days.
The volumes are rounded to between 419,000 to 995,000 gallons.

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DATA SUPPORTING 3.2.7.a

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DATA SUPPORTING 3.2.7.a

High-Level Waste Staging Batch Volumes
(Per HNF-SD-WM-SP-012, Section 3.2, the staging tanks are AZ-101, AZ-102, AY-101, and AY-102)
First filter is to isolate waste streams into these 4 tanks.

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
	AZ-101					
	AZ-102					
	AY-101					
	AY-102					
	Delete data after year 2018					
	Delete "Return_x_x""					

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	Days
AW-103	AY-102	10/01/06	10/2/06	215,900	11,276	227,176	2
AW-103	AY-101	06/01/07	6/2/07	323,800	16,914	340,714	2
AN-104	AZ-101	09/13/08	9/14/08	280,000	6,158	567,890	2
C-104	AY-102	09/23/09	12/11/09	320,400	25,406	345,806	80
AW-103	AZ-101	01/01/10	1/3/10	431,700	22,552	454,252	3
C-104	AZ-102	12/11/09	3/7/10	351,200	27,845	800,058	87
AW-104	AY-102	07/15/12	7/16/12	281,800	8,817	290,617	2
AW-104	AZ-102	06/19/14	6/21/14	281,800	8,817	290,617	3
C-102	AY-101	09/15/14	12/6/14	327,300	13,451	581,234	83
C-102	AZ-101	12/15/14	3/7/15	327,400	13,455	340,855	83
AW-105	AY-101	12/03/15	12/6/15	492,500	9,919	502,419	4
AX-101	AY-102	01/06/17	2/14/17	167,700	129	167,829	40
A-101	AY-102	07/26/16	2/14/17	778,700	341	779,041	204
AW-105	AZ-101	06/22/17	6/25/17	492,500	9,919	**502,419**	**4**
AX-101	AY-102	11/17/17	3/14/18	498,000	383		
A-101	AY-102	11/17/17	3/14/18	448,300	196	946,879	118
AX-101	AY-102	05/11/18	9/5/18	498,000	383		
A-101	AY-102	05/11/18	9/5/18	448,300	196	946,879	118

The largest batch volume is 502,419 gallons transferred into AZ-101 over a 4-day period.
This volume is rounded to 503,000 gallons.

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DATA SUPPORTING 4.4.a

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DATA SUPPORTING 4.4.a (2 Sheets)

New Liquid Waste Received into West Area DSTs from SSTs

(1st filter)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
	SY-101					
	SY-102					
	SY-103					
		> 10/01/2003	*<01/01/2020*			

(Initial sort to identify waste coming into these 3 West Area DSTs)

(2nd filter)

Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
SY-101	SY-102	02/13/2010	02/15/2010	4.51E+05	3901.492	

(This item was removed to only look at waste coming into the 3 DSTs and reject volumes representing waste passed between West Area DSTs)

(3rd filter)

Remove waste received from S-102 ("West Area DST to DST Transferred Waste")
Remove waste received from S-103 ("West Area DST to DST Transferred Waste")

#Days	Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Annual Maximum	Product
2	TA-4	SY-102	2/8/11	2/9/11	147,300	2,595		Retrieved SST Waste, Phase 2
2	TA-2	SY-102	2/9/11	2/10/11	147,000	2,939		Retrieved SST Waste, Phase 2
1	TA-5	SY-102	2/19/11	2/19/11	146,300	3,638		Retrieved SST Waste, Phase 2
2	TA-1	SY-102	3/11/11	3/12/11	149,200	692		Retrieved SST Waste, Phase 2
1	TA-6	SY-102	3/12/11	3/12/11	144,000	5,914		Retrieved SST Waste, Phase 2
1	TA-4	SY-102	3/20/11	3/20/11	147,000	2,938		Retrieved SST Waste, Phase 2
2	TA-2	SY-102	3/20/11	3/21/11	53,322	939		Retrieved SST Waste, Phase 2
1	TA-2	SY-102	3/25/11	3/25/11	93,983	1,656		Retrieved SST Waste, Phase 2
2	TA-3	SY-102	3/29/11	3/30/11	145,000	4,928		Retrieved SST Waste, Phase 2
2	TA-5	SY-102	4/9/11	4/10/11	146,300	3,638		Retrieved SST Waste, Phase 2
1	TA-3	SY-102	4/11/11	4/11/11	25,924	678		Retrieved SST Waste, Phase 2
1	TA-6	SY-102	4/12/11	4/12/11	71,818	309		Retrieved SST Waste, Phase 2
1	TA-4	SY-102	4/28/11	4/28/11	147,300	2,595		Retrieved SST Waste, Phase 2
2	TA-2	SY-102	5/3/11	5/4/11	147,000	2,938		Retrieved SST Waste, Phase 2
1	TA-5	SY-102	5/13/11	5/13/11	106,600	2,502		Retrieved SST Waste, Phase 2
2	TA-3	SY-102	5/16/11	5/17/11	93,173	1,983		Retrieved SST Waste, Phase 2
1	TA-3	SY-102	5/21/11	5/21/11	53,603	1,141		Retrieved SST Waste, Phase 2
2	TA-1	SY-102	5/21/11	5/22/11	144,000	5,911		Retrieved SST Waste, Phase 2
2	TA-6	SY-102	5/24/11	5/25/11	145,100	4,809		Retrieved SST Waste, Phase 2
1	TA-4	SY-102	6/6/11	6/6/11	147,300	2,595		Retrieved SST Waste, Phase 2
2	TA-5	SY-102	6/11/11	6/12/11	147,100	2,842		Retrieved SST Waste, Phase 2
2	TA-2	SY-102	6/12/11	6/13/11	147,000	2,939		Retrieved SST Waste, Phase 2
1	TA-1	SY-102	6/26/11	6/26/11	146,800	3,126		Retrieved SST Waste, Phase 2
2	TA-5	SY-102	6/27/11	6/28/11	43,270	786		Retrieved SST Waste, Phase 2
5	LERF	SY-102-PUMP	6/28/11	7/2/11	0	0		Water for in-line dilution
1	TA-5	SY-102	7/2/11	7/2/11	22,591	411		Retrieved SST Waste, Phase 2
2	TA-6	SY-102	7/6/11	7/7/11	145,100	4,812		Retrieved SST Waste, Phase 2
2	TA-2	SY-102	7/11/11	7/12/11	147,100	2,841		Retrieved SST Waste, Phase 2
94	S-112	SY-101	4/12/11	7/14/11	428,200	2,595		Retrieved SST Waste, Phase 2
1	TA-4	SY-102	7/15/11	7/15/11	147,300	2,595		Retrieved SST Waste, Phase 2
1	TA-3	SY-102	7/30/11	7/30/11	144,000	5,912		Retrieved SST Waste, Phase 2
2	TA-1	SY-102	7/31/11	8/1/11	146,800	3,124		Retrieved SST Waste, Phase 2
2	TA-6	SY-102	8/8/11	8/9/11	147,100	2,843		Retrieved SST Waste, Phase 2
1	TA-5	SY-102	8/17/11	8/17/11	73,366	2,433		Retrieved SST Waste, Phase 2
							4,379,544	
124	S-112	SY-101	11/1/12	3/4/13	566,200	3,430		Retrieved SST Waste, Phase 2
							569,630	
1	TA-5	SY-102	7/9/14	7/9/14	71,723	2,378		Retrieved SST Waste, Phase 2
2	TA-2	SY-102	7/9/14	7/10/14	147,300	2,595		Retrieved SST Waste, Phase 2
1	TA-3	SY-102	7/10/14	7/10/14	146,800	3,126		Retrieved SST Waste, Phase 2
2	TA-1	SY-102	7/10/14	7/11/14	147,100	2,842		Retrieved SST Waste, Phase 2
2	TA-4	SY-102	7/11/14	7/12/14	90,795	3,481		Retrieved SST Waste, Phase 2

DATA SUPPORTING 4.4.a (2 Sheets)

#Days	Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Annual Maximum	Product
2	TA-6	SY-102	7/12/14	7/13/14	145,100	4,811		Retrieved SST Waste, Phase 2
2	TA-2	SY-102	8/7/14	8/8/14	147,100	2,841		Retrieved SST Waste, Phase 2
2	TA-3	SY-102	8/14/14	8/15/14	78,649	1,674		Retrieved SST Waste, Phase 2
							998,314	
97	S-112	SY-101	6/9/15	9/13/15	443,300	2,686		Retrieved SST Waste, Phase 2
							445,986	
2	TA-3	SY-102	12/13/16	12/14/16	68,127	1,450		Retrieved SST Waste, Phase 2
1	TA-1	SY-102	12/14/16	12/14/16	147,300	2,595		Retrieved SST Waste, Phase 2
2	TA-5	SY-102	12/14/16	12/15/16	145,100	4,812		Retrieved SST Waste, Phase 2
2	TA-2	SY-102	12/15/16	12/16/16	72,451	1,171		Retrieved SST Waste, Phase 2
1	TA-4	SY-102	12/16/16	12/16/16	147,100	2,843		Retrieved SST Waste, Phase 2
2	TA-6	SY-102	12/16/16	12/17/16	146,800	3,125		Retrieved SST Waste, Phase 2
							742,874	
1	TA-5	SY-102	1/6/17	1/6/17	81,688	2,511		Retrieved SST Waste, Phase 2
2	TA-1	SY-102	1/12/17	1/13/17	147,100	2,841		Retrieved SST Waste, Phase 2
2	TA-3	SY-102	1/17/17	1/18/17	20,859	444		Retrieved SST Waste, Phase 2
							255,442	
2	TA-3	SY-102	5/11/18	5/12/18	125,900	2,680		Retrieved SST Waste, Phase 2
1	TA-5	SY-102	5/12/18	5/12/18	12,936	149		Retrieved SST Waste, Phase 2
2	TA-2	SY-102	5/12/18	5/13/18	147,100	2,841		Retrieved SST Waste, Phase 2
1	TA-4	SY-102	5/13/18	5/13/18	147,100	2,841		Retrieved SST Waste, Phase 2
2	TA-6	SY-102	5/13/18	5/14/18	147,100	2,842		Retrieved SST Waste, Phase 2
2	TA-1	SY-102	5/14/18	5/15/18	147,100	2,841		Retrieved SST Waste, Phase 2
2	TA-3	SY-102	6/9/18	6/10/18	147,100	2,842		Retrieved SST Waste, Phase 2
2	TA-5	SY-102	7/7/18	7/8/18	105,000	2,028		Retrieved SST Waste, Phase 2
							998,400	

Liquid waste received by West Area DSTs from SSTs: Totals: **8,390,191**

8,390,191 gallons is rounded to 8,391,000 gallons.

New Liquid Waste Received into East Area DSTs from SSTs

(1st filter)	Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum
	c-102						
	c-104						

#Days	Tank From	Tank To	Begin Date	End Date	Liquid Vol (gal)	Solid Vol (gal)	Maximum	
80	C-104	AY-102	9/23/09	12/11/09	320,400	25,406	345,806	Retrieved SST Waste, Phase 1
87	C-104	AZ-102	12/11/09	3/7/10	351,200	27,845	379,045	
83	C-102	AY-101	9/15/14	12/6/14	327,300	13,451	724,850	
83	C-102	AZ-101	12/15/14	3/7/15	327,400	13,455	340,855	
							1,406,457	

Liquid waste received by East Area DSTs from SSTs:

1,406,457 gallons is rounded to 1,407,000 gallons.

The total transferred into both West Area and East Area DSTs is then given by the sum:

8,390,191
1,406,457
9,796,648

9,796,648 rounded up is 9,797,000 gallons.

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Project Title/Work Order:		EDT No.
Performance Requirements for the Double-Shell Tank (DST) System: Phase 1		ECN No. 659060

Name	MSIN	Text With All Attach.	Text Only	Attach. Appendix Only	EDT/ECN Only
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