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Evaporator Performance, Tank Space Management, and Liquid Waste Transfers: Fiscal Year 2009 Summary

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Acronyms

ARP	**A**ctinide **R**emoval **P**rocess
BFV	**B**ack**f**lush **V**alve
CSSX	**C**austic **S**ide **S**olvent E**x**traction
DDA	**D**eliquification, **D**issolution, and **A**djustment
DSS	**D**econtaminated **S**alt **S**olution
DWPF	**D**efense **W**aste **P**rocessing **F**acility
ETP	**E**ffluent **T**reatment **P**roject
FFA	**F**ederal **F**acilities **A**greement
FTF	**F**-**T**ank **F**arm
FW	**F**lush **W**ater
GDL	**G**ravity **D**rain **L**ine
GP	H-Canyon **G**eneral **P**urpose Evaporator
HDB	**H**-Area **D**iversion **B**ox
HLLCP	**H**igh **L**iquid **L**evel **C**onductivity **P**robe
HLW	**H**igh **L**evel **W**aste
HTF	**H**-**T**ank **F**arm
ISDP	**I**nterim **S**alt **D**isposition **P**roject
IW	**I**nhibited **W**ater
kgal	thousand **gal**lons
LLW	**L**ow **L**evel **W**aste
LPPP	**L**ow **P**oint **P**ump **P**it
LW	**L**iquid **W**aste
MCU	**M**odular **C**SSX **U**nit
SB	**S**ludge **B**atch
SMP	**S**ubmersible **M**ixing **P**ump
SPF	**S**altstone **P**roduction **F**acility
SRR	**S**avannah **R**iver **R**emediation LLC
SRS	**S**avannah **R**iver **S**ite
STP	**S**ubmersible **T**ransfer **P**ump
SWPF	**S**alt **W**aste **P**rocessing **F**acility
TPB	**T**etra**p**henyl**b**orate
TTJ	**T**elescoping **T**ransfer **J**et
TTP	**T**elescoping **T**ransfer **P**ump
WD	**W**aste **D**etermination
WW	**W**ell **W**ater

1.0 Executive Summary

Programmatic Objectives

During FY09, maintaining Evaporator tank space and Transfer System health supported the major programmatic and contract objectives for Savannah River Remediation LLC (SRR) at Savannah River Site (SRS) These objectives, as outlined in the *Liquid Waste (LW) System Plan — Revision 15*[1], are:

- Continue storing liquid radioactive wastes in a safe and environmentally sound manner
- Meet tank closure regulatory milestones in the currently-approved FFA
- Meet the waste treatment goals identified in the STP
- Conduct operations consistent with the *Section 3116 Determination for Salt Waste Disposal at the Savannah River Site*[2], the *Basis for Section 3116 Determination for Salt Waste Disposal at the Savannah River Site*[3], and future waste determination (WD) and bases documents for F- and H-Areas
- Comply with applicable permits and consent orders, including the Landfill Permit for the SRS Z Area Saltstone Disposal Facility (SDF) and the Consent Order for Dismissal in Natural Resources Defense Council, et al. v. South Carolina Department of Health and Environmental Control, et al. (South Carolina Administrative Law Court, August 7, 2007)
- Provide tank space to support staging of salt solution adequate to feed the SWPF at system capacity
- Sustain sludge vitrification in the DWPF
- Remove the tetraphenylborate (TPB) laden waste from Tank 48 and recover Tank 50 so these tanks are available to support DWPF feed batch preparation, tank closures, and SWPF feed batch preparation; treat and destroy the TPB in the waste
- Minimize the quantity of radionuclides (as measured in curies) dispositioned in the SDF, keeping the total curies at or below the amount identified in the *Savannah River Site – Liquid Waste Disposition Processing Strategy*[4] (SRS LW Strategy) and the *Basis for Section 3116 Determination for Salt Waste Disposal at the Savannah River Site*
- Support continued nuclear material stabilization of legacy materials in H-Canyon through at least 2019.

Major activities included:

DWPF Recycle Receipts

- Management of recycle receipt space during 2H Evaporator outages for mechanical and chemical cleaning.

H-Canyon Receipts

- Supported H-Canyon stabilization of nuclear materials by
  - — managing receipt space in Tank 39 (for High Level Waste (HLW) receipts)
  - — managing receipt space in Tank 50 (for Low Level Waste (LLW) receipts)
  - — supporting Pu disposition into sludge batches via Tank 51.

Sludge Batch Preparation

- Supported the preparation of Sludge Batch (SB) 5

- Supported the preparation of SB 6
- Supported heel removal from Tanks 5 and 6.

Salt Processing

- Deliquification, Dissolution, and Adjustment (DDA) waste continued
- Managed tank space in Tank 49 and Tank 50 to support successful initiation of Tank 41 DDA (Batches 1 & 2) processing in the Saltstone Production Facility (SPF)
- Supported Salt Batch #2 of the Interim Salt Disposition Project (ISDP —Actinide Removal Process and the Modular CSSX Unit [ARP/MCU]).
- Supported preparation of Salt Batch #3 of ISDP

Evaporator Performance

The evaporators support specific missions and their operation is planned around these missions. The 2F Evaporator serves to recover space from Tank Closure and H-Canyon missions as well as volume reducing Sludge Batch decants. The 2H Evaporator primarily recovers space from DWPF Recycle receipts. The 3H Evaporator primarily recovers space from sludge batch processing. Less emphasis is given to utility for the 2F and 3H Evaporators due to the timing of available feed streams

During the period of October 1, 2008 through September 30, 2009, the 2F, 2H, and 3H Evaporator Systems recovered 3,120 thousand gallons (kgal) — as compared with 2,348 in FY08 — with a combined total average utility of 33% — vs. 34% in FY08. This performance allowed H-Canyon to meet its objectives, tank closure activities to remain on schedule, DWPF to maintain canister production, ISDP to continue increasing its throughput and sludge batch preparations to proceed as scheduled. Table 1-1 — *Evaporator Space Recovery* and Table 1-2 — *Evaporator Average Utility* summarize quarterly evaporator performance for FY09.

Table 1-1 — *Evaporator Space Recovery*

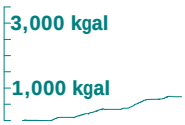
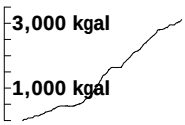
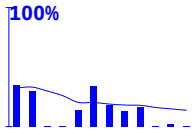
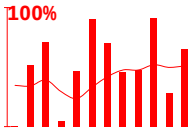
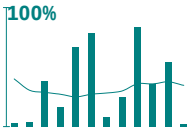
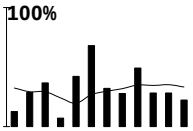
	Space Recovery (kgal)			
FY09	**3H**	**2H**	**2F**	**Total**
Q1	219	133	96	**448**
Q2	139	483	254	**876**
Q3	106	614	222	**942**
Q4	(20)	716	158	**854**
Total	**444**	**1,946**	**730**	**3,120**
Cumulative Daily Space Gain				

Table 1-2 — *Evaporator Average Utility*

	Average Utility			
FY09	**3H**	**2H**	**2F**	**Cumulative**
Q1	21%	41%	15%	**26%**
Q2	16%	48%	54%	**39%**
Q3	16%	54%	39%	**36%**
Q4	1%	61%	31%	**31%**
Average	**14%**	**51%**	**35%**	**33%**
12-month utility (with 6 month moving average)				

Total Volume of Stored Waste

The total volume of the tank farms, , declined 540 kgal from the beginning of the year to the end of the year. FY08 ended with a total volume of 37,121 kgal. The maximum for FY09 was 37,720 kgal on January 26, 2009 and the minimum was 36,290 kgal on September 6, 2009. The total volume at the end of FY09 was 36,580 kgal.

Waste Transfers

During FY09, the Tank Farms performed 144 tank-to-tank (17,739 kgal) transfers. Of these transfers, 75 (10,825 kgal) supported space management, including ten inter-area line transfers (2,048 kgal), and 69 (6,915 kgal) were recycles supporting evaporator operation.

Type III Tank Useable Space

The volume of Type III Tank useable space, , increased 813 kgal to 2,308 kgal at the end of FY09 from 1,494 kgal at the end of FY08. Useable space is the High Liquid Level Conductivity Probe (HLLCP) set-point minus the tank waste levels in Tanks 25–39, 41–47, 49, and 51. This useable space does not include the 1,300 kgal of space reserved for contingency space. Processing Tanks 40 (DWPF Sludge Feed Tank), 48 (Precipitate Storage Tank), and 50 (SPF Feed Tank) are not included in Type III Tank useable space.

2.0 Introduction

This report summarizes the waste tank space management and evaporator performance activities during FY09. The System Planning group goal is to maximize utilization of the Tank Farm space to meet the programmatic and contractual objectives of SRR. This requires an accurate assessment of the tank space remaining, potential space available for recovery, and influents and effluents, all of which are important for efficacious allocation of Type III tank space for various missions and projects.

This update for Fiscal Year 2009 summarizes the following:

- Evaporator performance
- Space recovery
- Utility
- Tank inventory
- Sludge
- Salt
- Supernate
- Available space
- Tank-to-tank transfers
- Type III useable tank space

Levels and volumes are as of September 30, 2009. *High Level Waste Emergency Response Data and Waste Tank Data, Revision 447*[5] documents the HLLCP heights and *9/30/09 – September 2009 WCS Curie and Volume Inventory Report*[6] documents salt levels and sludge levels. Prime mover levels are documented in the *Waste Tank Equipment Manual*[7]. The Working Volume is determined from the Reel Tape high alarm setting which may be found in: *241-2H Tanks 29-32, 35-37 and Outside Areas Surveillance Operator Rounds*[8]; *82H 4-Pack, Stby N2, Cold Feeds, and 49H Surveillance Operator Shift Rounds*[9]; *241-18F Surveillance Operator (Tks 25-28 And 44-47) Shift Rounds*[10]; or *242-F Surveillance Operator (Tks 1-8, 33 & 34) Shift Rounds*[11].

3.0 Overall Performance

3.1 Yearly Space Recovery and Utility

2F Evaporator

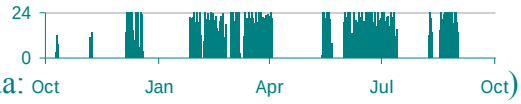
The 2F Evaporator (building 242-16F) began the year in an unplanned outage to replace the feed pump that failed September 19, 2008. The 2F Evaporator resumed operations on December 6, 2008, however, it began experiencing gravity drain line (GDL) pluggage on December 19. The evaporator was down until January 26, hydro-lancing of the evaporator pot being performed on January 23. The evaporator operated sporadically, experiencing diptube pluggage through April 3, 2009. On April 4, a pot evacuation attempt was made and on April 5, a chromate leak was detected. Trouble-shooting to determine the exact location of the chromate leak continued through May 11. During this time, a pot inspection was completed satisfactorily and F-Area experienced a scheduled steam outage. Upon startup on May 13, flushing was scheduled every 48 hours to minimize diptube pluggage. The evaporator shut down between May 21 and May 31 and again from July 13 through August 16 to repair a leak in the overheads line. The evaporator ended the year being shut down due to a salt mound in the Evaporator Concentrate Receipt Tank (Tank 47) impeding the reel tape.

There were small transfers to the evaporator from Tanks 27, 44, 45, and 46 for level control.

Figure 3–1 — *2F Evaporator System Level* shows the combined levels of Tank 26 (Evaporator Feed Tank) and Tank 47 (Evaporator Concentrate Receipt Tanks) through the year. It should be noted that, at times, it is appropriate to fill the system past the 30″ working volume limit to maximize feed and support other tank farm priorities. The salt level in Tank 47 is at ~291″. A salt mound at 350″ impeded 2F Evaporator operation.

Space Recovered: 730 kgal

Utility: 35%



Downtime: 5,735 hours (Uptime in hr/da:)

Feed Pump	= 25%
Pluggage	= 18%
Miscellaneous Repairs and Steam Outage	= 39%

Material Processed: Tank 7 (20 kgal), Tank 8 (380 kgal), Tank 27 (35 kgal), Tank 44 (21 kgal), Tank 45 (20 kgal), Tank 46 (31 kgal), Tank 39 (97 kgal)

Key Event Timeline:

9/21/08–12/5/08 **Feed Pump Outage**

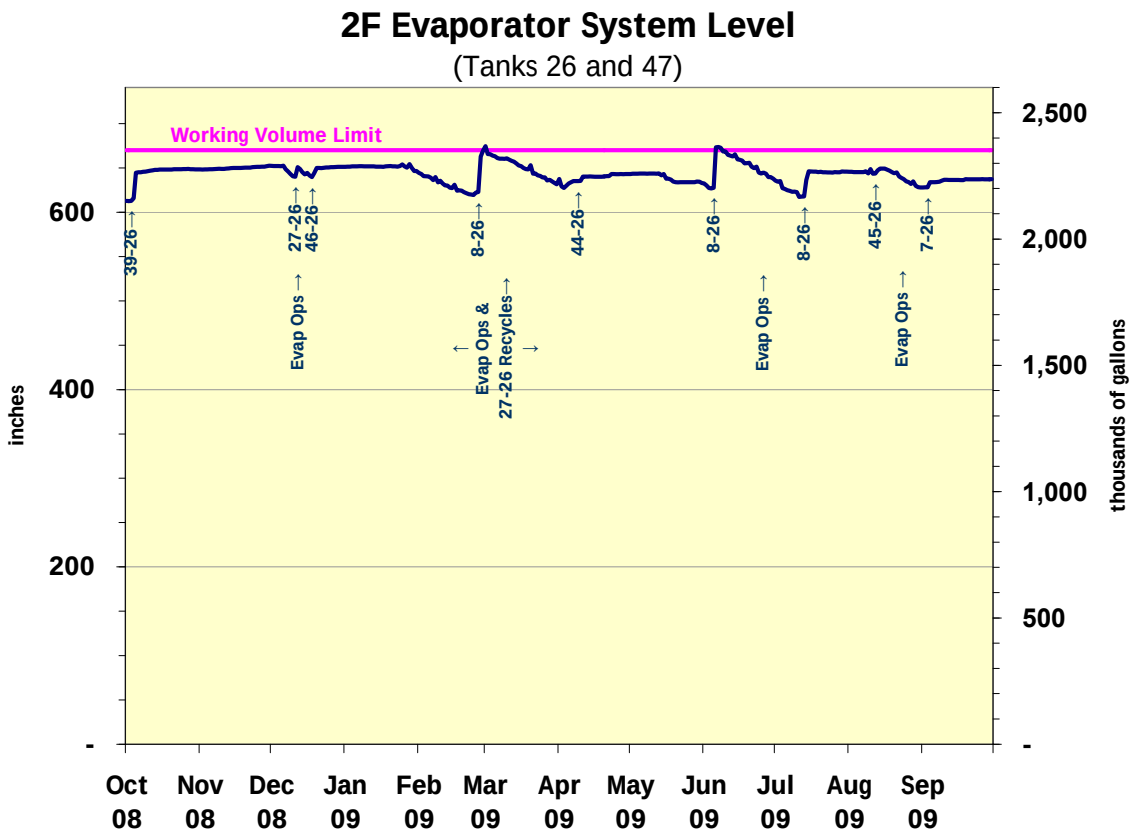
From September 21 to December 5 the evaporator was in an un-planned outage to replace evaporator feed pump.

12/6/08–12/19/08	**2F Evaporator Operation**
	The 2F Evaporator restarted on December 6 and operated until December 19. During this period it operated at 86% utility while achieving ~83 kgal of space gain from Tanks 26/47.
12/19/09–1/27/09	**Outage due to GDL Pluggage**
	From December 19 to January 27, the evaporator was in an un-planned outage to resolve GDL pluggage, including hydro-lancing the 2F Evaporator pot.
1/27/09–4/3/09	**2F Evaporator Operation**
	The 2F Evaporator restarted on January 27 and operated until April 3. During this period it operated at 74% utility while achieving ~266 kgal of space gain from Tanks 26/47.
4/4/09–5/13/09	**Planned and Unplanned Outages**
	On April 4, a pot evacuation attempt failed. Resolution of the failed pot evacuation took 18 days and the outage continued due to a chromate leak (39 days). This outage coincided with a planned area steam outage (21 days).
5/1409–5/20/09	**2F Evaporator Operation**
	The 2F Evaporator restarted on May 14 but shut down on May 21 due to an overheads line leak.
5/21/09–5/31/09	**Unplanned Outage due to Overheads Line Leak**
	A leak was discovered in the overheads line to the Effluent Treatment Project (ETP) on May 21.
5/31/09–7/12/09	**2F Evaporator Operation**
	The 2F Evaporator restarted on May 31 and operated until July 12. During this period it operated at 84% utility while achieving ~269 kgal of space gain from Tanks 26/47.
7/13/09–8/16/09	**Unplanned Outage due to Overheads Line Leak**
	A leak was discovered in the overheads line to ETP on July 13. After operating the evaporator for two days beginning August 9, it was discovered that an incorrect gasket was used in repairing the overheads line. The gasket was replaced before operation resumed on August 17.
8/17/09–8/31/09	**2F Evaporator Operation**
	The 2F Evaporator restarted on August 18 and operated fifteen days before a salt mound in Tank 47 impeded the operation of the reel tape.

9/1/09–10/24/09 **Unplanned Outage due to Tank 47 Reel Tape**

The 2F Evaporator ended the year in an unplanned outage due to the salt mound in Tank 47 impeding the operation of the reel tape.

Figure 3–1 — ***2F Evaporator System Level***



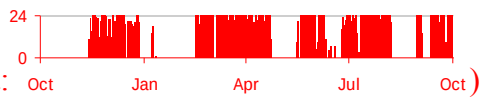
2H Evaporator

The 2H Evaporator (building 242-16H) entered the first quarter of FY09 in a planned outage for a 12-week chemical/mechanical cleaning campaign that began on July 4, 2008. Upon restart in early November, it experienced several minor operating problems and began experiencing GDL pluggage problems, hindering operations through the end of January. The evaporator was deliquored with a transfer of concentrated supernate from the feed tank, Tank 38, to Tank 24 beginning on January 10, 2009. GDL and diptube pluggage continued until, on January 29, the Tank 38 backflush valve (BFV) was repaired. The evaporator restarted on February 15. Performance of the evaporator improved from a space gain and operability standpoint once the deliquoring was completed. The evaporator was in a planned outage from August 8 to August 29 for a planned camera inspection and mechanical cleaning.

Figure 3–2 — *2H Evaporator System Level* shows the combined levels of Tank 43 (Evaporator Feed Tank) and Tank 38 (Evaporator Concentrate Receipt Tank) through the year. It should be noted that, at times, it is appropriate to fill the system past the 30″ working volume limit to maximize feed and support other tank farm priorities.

Space Recovered: 1,946 kgal

Utility: 51%



Downtime: 4,295 hours (Uptime in hr/da:)

Mechanical (1) and chemical cleaning (1)	= 33%
Steam Outage and repairs	= 28%
Flushing	= 19%

Material Processed: Tank 22 — DWP Recycle (2,113 kgal)

Key Event Timeline:

7/4/08–11/6/08 **Mechanical and Chemical Cleaning Outage**

Between August 18 and September 17, five acid strikes of the 2H Evaporator were completed. After each strike, the pot temperature was heated to ~85ºC and maintained for ~32 hours. Next, the 2H pot contents were cooled to ~40ºC and neutralized with sodium hydroxide. Afterwards, the 2H pot was pumped to Tank 38, re-filled with water, and emptied again. On September 19, a camera inspection of the 2H Evaporator pot was completed which indicated exposed surface areas were relatively clean. Between August 18 and September 17, Tank 38 received ~30 kgal of material associated with the acid strikes.

	Acid Added	Neutralized Acid Emptied	Water Added	Water Emptied
Acid Strike #1	8/18	8/30	8/30	8/30
Acid Strike #2	8/31	9/3	9/4	9/4
Acid Strike #3	9/10	9/11	9/11	9/11
Acid Strike #4	9/11	9/14	9/14	9/14
Acid Strike #5	9/16	9/17	9/17	9/17

Between July 4 and November 6, Tank 21 received ~ 590 kgal of DWPF recycle waste.

11/7/08–12/27/08 **2H Evaporator Operation**

After the chemical cleaning campaign was complete, the evaporator experienced problems with the Tank 43 Reel Tape and the Tank 38 Purge Fan. It began operation on November 13, but experienced downtime due to flushing the GDL and the diptubes. Between November 13 and December 26, the 2H Evaporator operated at 84% utility while achieving ~130 kgal of space gain from Tanks 38/43. During this same period, Tanks 21 and 22 received a total of ~228 kgal of DWPF recycle waste.

12/27/08–2/14/09 **2H Evaporator Outage**

The evaporator was shut down to prepare for a pot inspection and to troubleshoot the GDL plugging problems. The evaporator was deliquored with a Tank 38 to Tank 24 transfer from January 11 through January 14. The Tank 38 BFV was repaired beginning January 29.

2/15/09–4/22/09 **2H Evaporator Operation**

The 2H Evaporator restarted on February 15 after completion of the BFV repair. Between February 15 and April 22, the 2H Evaporator operated at 92% utility while achieving ~748 kgal of space gain from Tanks 38/43. During this same period, Tanks 21 and 22 received a total of ~341 kgal of DWPF recycle waste.

4/23/09–5/16/09 **2H Evaporator Planned Outage**

The evaporator was shut down from April 23 to May 16 for the planned area steam outage.

5/17/09–8/7/09 **2H Evaporator Operation**

The 2H Evaporator restarted on February 19 after the steam outage. It experienced an outage from June 10 to June 28 to resolve a steam flow transmitter problem. Between May 19 and August 7 (excluding June 10 to June 28), the 2H Evaporator operated at 92% utility while achieving ~744 kgal of space gain from Tanks 38/43. From May 19 to August 7, Tank 22 received ~389 kgal of DWPF recycle waste.

8/8/09–8/29/09 **Mechanical Cleaning Campaign**

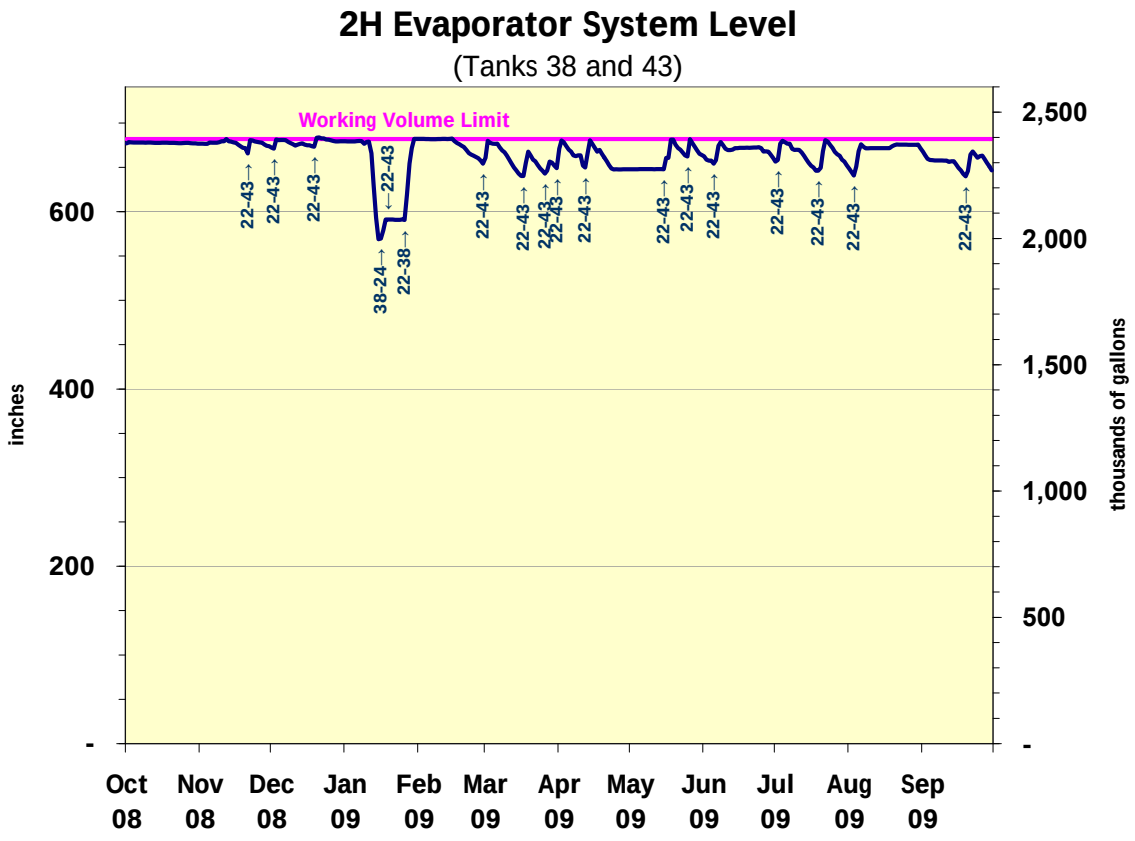
Between August 8 and August 29, the mechanical cleaning campaign added ~11 kgal of material to Tanks 38/43.

8/30/09–9/30/09 **2H Evaporator Operation**

On August 30, the 2H Evaporator restarted after completion of the mechanical cleaning outage. It experienced an outage from

September 3 to September 10 to resolve a Tank 38 purge fan vibration problem. Between August 30 and September 30 (excluding September 3 to September 10), the 2H Evaporator operated at 87% utility while achieving ~249 kgal of space gain from Tanks 38/43. From May 19 to August 7, Tank 22 received ~179 kgal of DWPF recycle waste.

Figure 3–2 — ***2H Evaporator System Level***



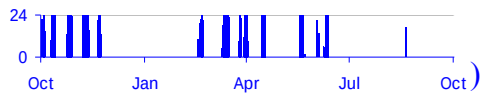
3H Evaporator

The primary purpose of the 3H Evaporator (building 242-25H) is to process Sludge Batch decants. The 3H Evaporator began the year shutdown after reaching the Tank 30 temperature restriction. On August 14, 2008, one of two operable Tank 30 cooling coils failed resulting in operations being constrained by Tank 30 temperature elevation. Typical operation in FY09 continues to be two-to-three days of operation followed by eight-to-eleven days down to allow for cooling of Tank 30. Operation of the 3H Evaporator were as planned with a scheduled outage for pot inspection from November 26, 2008 through February 17, 2009 and a schedule outage for the area steam outage from April 23 through May 14. A scheduled infrastructure outage began Jun 15 to repair the failed cooling coil and deliquor the evaporator. The Sludge Batch preparation process did not require the operation of the 3H Evaporator for much of the year.

Figure 3–3 — *3H Evaporator System Level* shows the combined levels of Tank 32 (Evaporator Feed Tank) and Tank 30 (Evaporator Concentrate Receipt Tank) through the year. It should be noted that, at times, it is appropriate to fill the system past the 30″ working volume limit to maximize feed and support other tank farm priorities.

Space Recovered: 444 kgal

Utility: 14%

Downtime: 7,574 hours (Uptime in hr/da: 

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Planned outage (lack of feed)	= 42%
Scheduled Maintenance	= 33%
Tank 30 maximum temperature	= 22%

Material Processed: Tank 51 (135 kgal — Sludge Batch #5 decants), Tank 40 (97 kgal — Tank 40 bearing water leakage) Tank 37 (25 kgal for level relief), Tank 8 (168 kgal to free up space for Sludge Batch #6 aluminum rich leachate storage)

Key Event Timeline:

10/1/08–11/25/08 **3H Evaporator Operation**

Between October 1 and November 25, the 2H Evaporator operated at 35% utility while achieving ~217 kgal of space gain from Tanks 30/32.

11/26/08–2/17/09 **Pot Inspection Outage**

From November 26 to February 17, the evaporator was in a scheduled evaporator pot inspection outage.

2/17/09–4/22/09 **3H Evaporator Operation**

The evaporator resumed operations on February 17 and operated for four days until it was shut down pending receipt of feed. After receipt of material from Tank 8 from March 7 to March 10, the evaporator resumed operations. Between March 11 and April 17,

the 2H Evaporator operated at 42% utility while achieving ~172 kgal of space gain from Tanks 30/32.

4/23/09–5/17/09 **Planned Area Steam Outage**

From April 23 to May 14, the evaporator was down due to the area steam outage.

5/18/09–6/14/09 **3H Evaporator Operation**

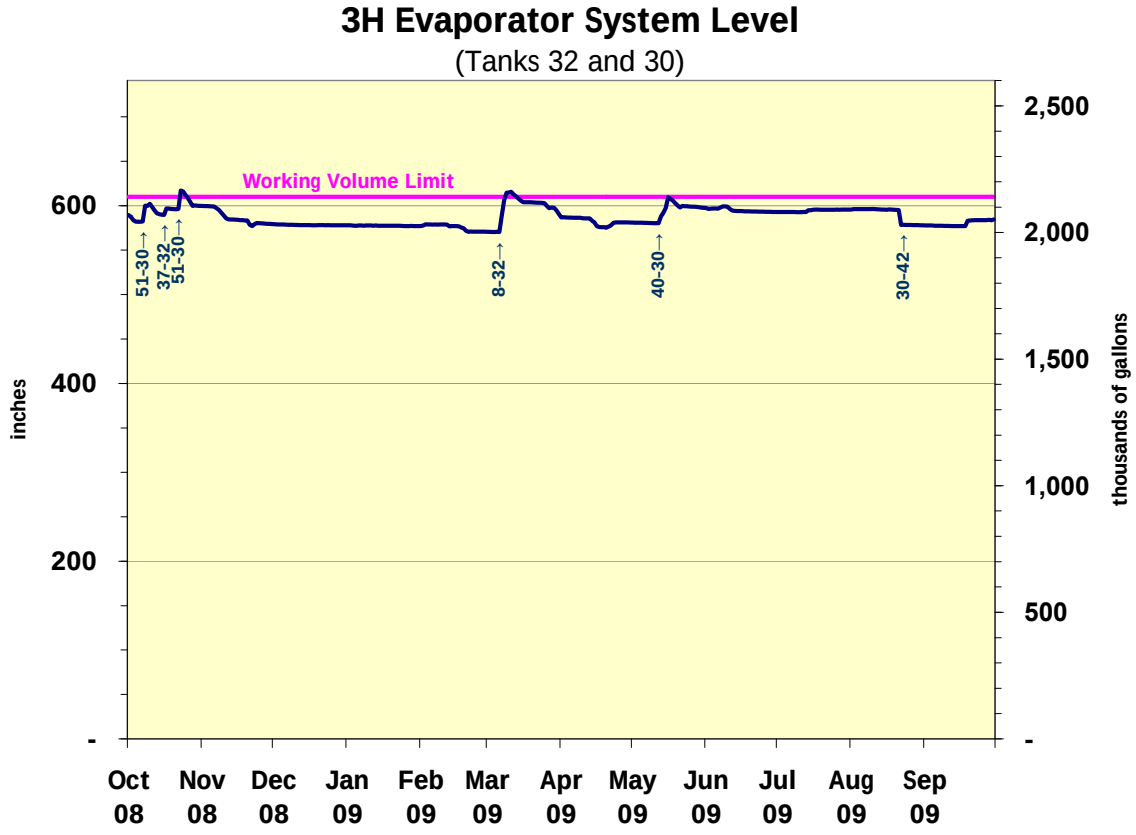
Between May 18 and June 14, the 2H Evaporator operated at 32% utility while achieving ~46 kgal of space gain from Tanks 30/32. This completed the processing necessary to reach a system concentration for deliquoring and to prepare the system for an infrastructure upgrade outage.

6/15/09–9/30/09 **Planned Infrastructure Outage**

The evaporator entered a feed outage on June 15 and then, on June 17 began infrastructure upgrades including:

- Cargo Deployment — this stop-leak product was introduced into the leaking cooling coil in Tank 30 to return it to service
- West Pumphouse heat exchanger replacement
- A Tank 30–Tank 42 system deliquoring.

Figure 3–3 — *3H Evaporator System Level*



3.2 Waste Storage

Table 3-1 — *Total Tank Farm Volume* shows the volume in the tank farms. Note that additions, influents, and effluents — including inhibited water (IW), well water (WW) and flush water (FW) — are not additive due to mixing and dissolving. During FY09, the total volume within the tanks decreased to 36,580 kgal from 37,121 kgal.

Table 3-1 — *Total Tank Farm Volume*

(thousands of gallons)

Total Tank Farm Volume (9/30/08)		**37,121**
Space Recovery & Effluents		
2F Evaporator Space Recovery	730	
2H Evaporator Space Recovery	1,946	
3H Evaporator Space Recovery	444	
Tank 49→ISDP	560	
Tank 40→DWPF	227	
Tank 50→SPF	1,556	
Reel Tape Standardization (Tank 1 — 2009-05-18, Tank 36 — 2009-07-27)	34	
Raising HLLCP (Tanks 12 & 51)	276	
Total Space Recovery & Effluents	**5,773**	
Influents & Waste Receipts	-	
Canyon Receipts to Tank 39	64	
Canyon Receipts to Tank 51	14	
Canyon Receipts to Tank 50	121	
ETP Receipts to Tank 50	113	
ISDP Receipts to Tank 50	718	
DWPF Recycle Receipts	1,503	
Waste Removal Addtions (Type I,II,&IV)	640	
Waste Removal Addtions (Type III)	450	
Misc. Adds (Type I,II, & IV)	138	
Misc. Adds (Processing Tanks — 40, 48, & 50)	116	
Misc. Adds (Type III not incl. processing)	379	
Replace Reel Tape (Tank 12 — 2009-05-23)	31	
Lowering HLLCP (Tanks 4 & 40)	292	
Jet Dilution	988	
Total Influents & Additions	**5,568**	
Salt dissolution effects, specific gravity fluctuations, reel tape fluctuation, etc.	(336)	
Total Tank Farm Volume (9/30/08)		**36,580**

Table 3-2 — *Tank-to-Tank Transfer Summary* shows a summary of transfers that occurred in each area, as well as the recycle transfers that occurred at each evaporator.

Table 3-2 — *Tank-to-Tank Transfer Summary*

(Volume in thousands of gallons)

Area	Number	Volume
F-Area Tank-to-Tank	23	2,423
H-Area Tank-to-Tank	42	6,353
Inter-Area Line	10	2,048
2F Recycles	29	2,321
2H Recycles	22	2,719
3H Recycles	18	1,875
Total	**144**	**17,739**

A detailed listing of the transfers is shown in Table 4-1 — *Tank-to-Tank Transfers* and Table 4-2 — *Recycle Transfers* on pages 70 and 71.

Table 3-3 — *Type III Useable Space* shows the Useable Type III Tank Space in the tank farms. During FY09, the total useable space within the tanks increased to 2,308 kgal from 1,494 kgal.

Table 3-3 — *Type III Useable Space*

(thousands of gallons)

Total Useable Space (9/30/08)		**1,494**
Space Recovery & Effluents		
2F Evaporator Space Recovery	730	
2H Evaporator Space Recovery	1,946	
3H Evaporator Space Recovery	444	
Tank 33→7	371	
Tank 51→8	428	
Tank 38→24	397	
Tank 51→12	73	
Tank 51→40	326	
Tank 41→23	567	
Tank 49→ISDP	560	
Reel Tape Correction (Tank 36)	18	
Raising HLLCP (Tank 51)	176	
Total Space Recovery & Effluents	**6,036**	
Influents & Waste Receipts		
Canyon Receipts to Tank 39	64	
Canyon Receipts to Tank 51	14	
Tank 4→51	135	
Tank 7→26	20	
Tank 8→26	380	
Tank 8→32	168	
Tank 12→51	551	
Tank 22→43	1,782	
Tank 22→49	197	
Tank 22→38	331	
Waste Removal Additions (Type III)	450	
Misc. Adds (Type III not incl. processing)	379	
Jet Dilution (Useable Space only)	738	
Total Space Influents & Waste Receipts	**5,209**	
Salt dissolution effects, specific gravity fluctuations, reel tape fluctuation, etc.	(14)	
Total Useable Space (9/30/09)		**2,308**

4.0 Tank Status

The LW tanks at SRS consist of four different types of tanks:

- **Type I:** Tanks 1–8 in F-Tank Farm (FTF) and Tanks 9–12 in H-Tank Farm (HTF)
- **Type II:** Tanks 13–16 in HTF. There are no Type II waste tanks in FTF
- **Type IV:** Tanks 17–20 in FTF and Tanks 21–24 in HTF.
  Tanks 1 through 24 are designated as "non-compliant" because they have leaked or do not have full secondary containment.
- **Type III/Type IIIA:** Tanks 25–28, 33–34, 44–47 in FTF and Tanks 29–32, 35–43, 48–51 in HTF
  Tanks 25 through 51 are designated as "compliant," because no leaks have been detected and they comply with secondary containment requirements.

The following sections describe in detail the use of the waste tanks.

The major characteristics of each tank (service, type, maximum volume, working volume, total waste volume, prime movers, mixing pumps, etc.) are described as of September 30, 2009. The working volume is generally five inches below the HLLCP, however, it may vary from tank to tank. The plans for each tank are noted, where appropriate.

A **Level** graph depicts the daily tank levels and HLLCP setpoint for the past fiscal year, noting major transfers into and out of the tanks.

A working volume chart depicts the final levels of materials (sludge, salt, supernate, freeboard, and HLLCP levels — noted by the transition point between "Available" and "Unuseable") within the individual waste tanks as of the end of FY09. The darker the shade of green for supernate, the more it is concentrated. Several of the non-compliant tanks experienced leakage in the past. None of the Type III (compliant) tanks has had any leakage detected. The information presented concerning the leakage summarizes *SRS High Level Waste Tank Leaksite Information*[12] and *Annual Radioactive Waste Tank Inspection Program — 2008*[13]. The dark green background in the working volume charts indicates tanks that have a leakage history.

4.1 Type I Tanks

Tank 1:

Area: F-Area

Service: Inactive Waste Tank

Type: I

Maximum Volume: 569,100 gallons

Working Volume: 555,550 gallons

Waste Volume: 487,800 gallons

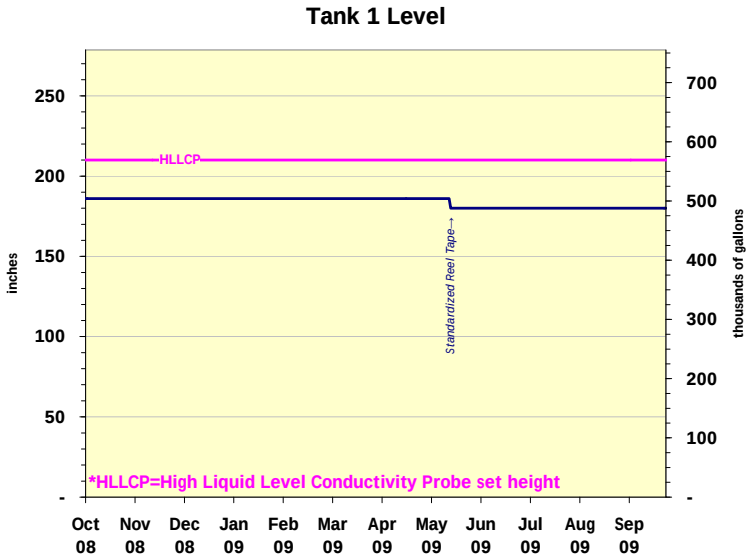
Leak Sites: A small amount of dry waste was observed in 1969. Visual examinations have not revealed the location of the leak(s).

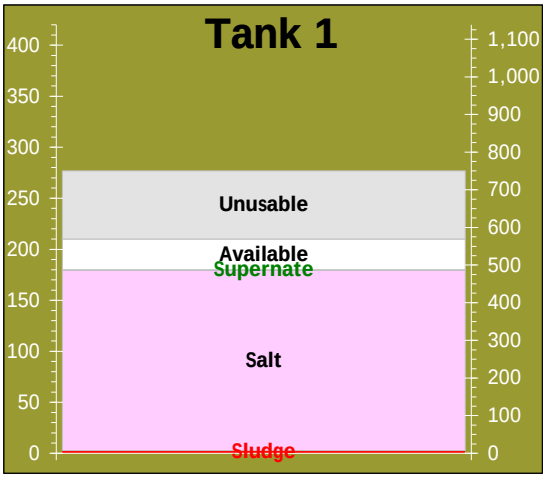
Prime Movers: Fixed Length Jet in Riser 3 (156″)

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 1 during FY09.

Comments: Tank 1 will be a future salt removal tank.





Tank 2:

Area: F Area

Service: Inactive Waste Tank

Type: I

Maximum Volume: 569,100 gallons

Working Volume: 555,550 gallons

Waste Volume: 538,480 gallons

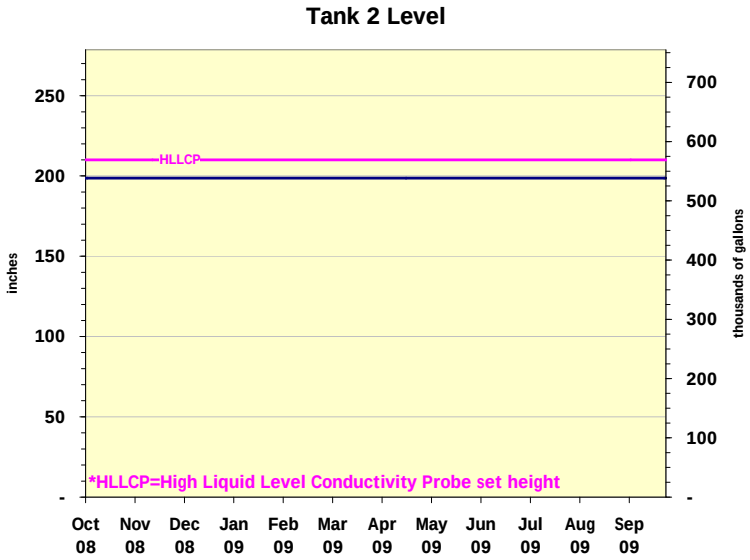
Leak Sites: None

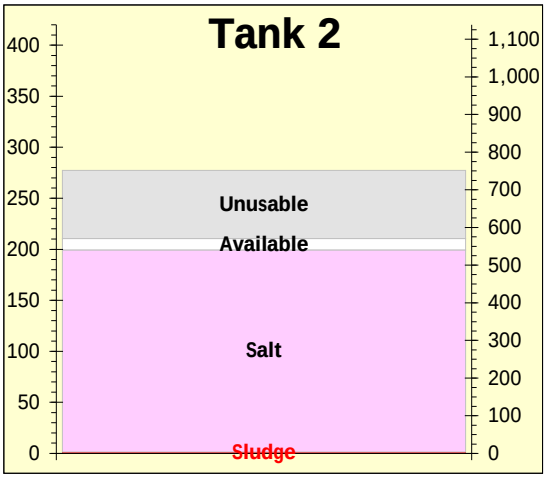
Prime Movers: Fixed Length Jet in Riser 3 (193″)

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 2 during FY09.

Comments: Tank 2 will be a future salt removal tank.





Tank 3:

Area: F-Area

Service: Inactive Waste Tank

Type: I

Maximum Volume: 569,100 gallons

Working Volume: 555,550 gallons

Waste Volume: 539,290 gallons

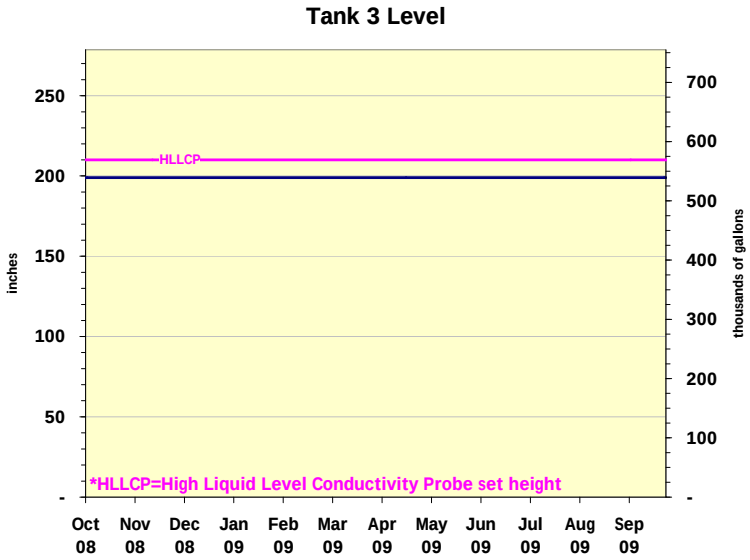
Leak Sites: None

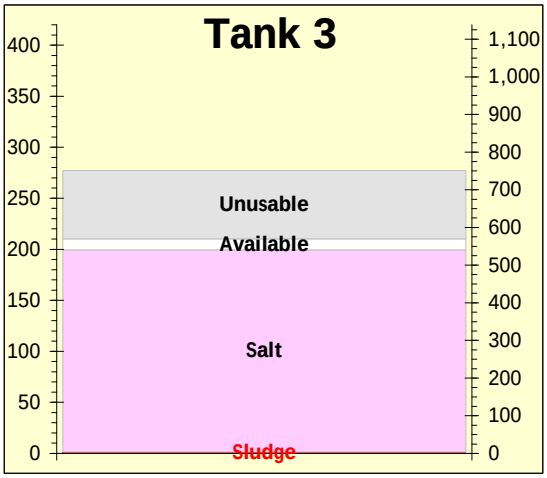
Prime Movers: Fixed Length Pump in Riser 5 (29″)

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 3 during FY09.

Comments: Tank 3 will be a future salt removal tank.





Tank 4:

Area: F-Area

Service: Sludge Removal Tank

Type: I

Maximum Volume: 474,250 gallons

Working Volume: 460,700 gallons

Waste Volume: 366,930 gallons

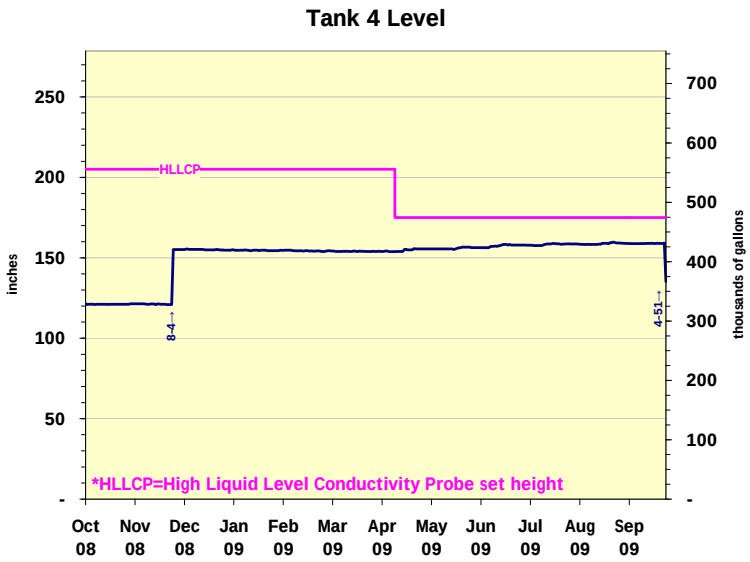
Leak Sites: None

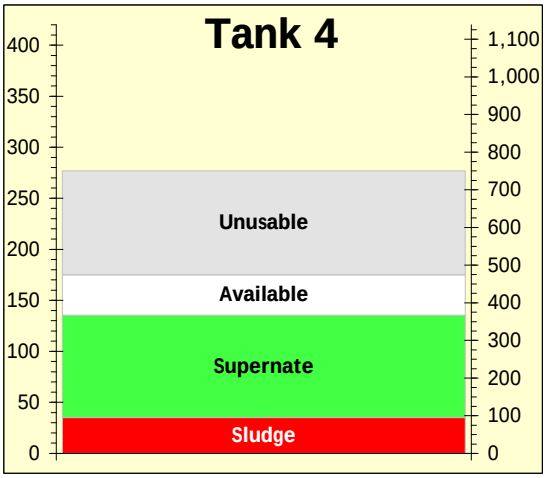
Prime Movers: Submersible Transfer Pump (STP) in Riser 6 (42″)

Mixing pumps: (2) Submersible Mixing pumps (SMP)

Discussion: In November, a Tank 8 to Tank 4 transfer of 93 kgal of supernate made room for Tank 5 heel removal activities. The initial volume in Tank 4 was 328 kgal. A Tank 4–Tank 51 sludge removal transfer was initiated at the end of the year that totaled 136 kgal.

Comments: Tank 4 is a SB 6 and future SB 7 sludge tank.





Tank 5:

Area: F-Area

Service: Tank Closure

Type: I

Maximum Volume: 428,180 gallons

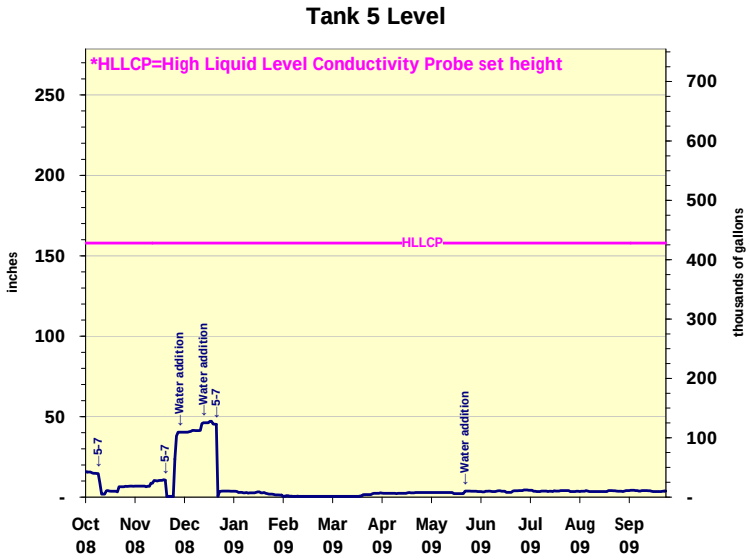
Working Volume: 414,630 gallons

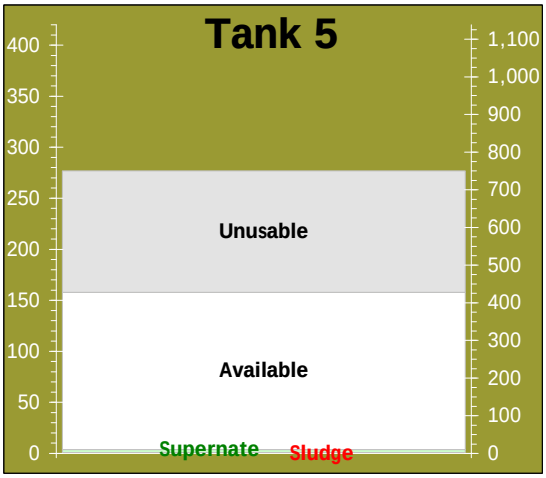
Waste Volume: 10,298 gallons

Leak Sites: A total of 19 leak sites have been identified with one new site found and four sites reactivated during mechanical cleaning in FY08. A small quantity of waste (less than 15 gallons) is on the annulus floor. Dried salt nodules and deposits have formed on the tank wall.

Prime Movers: STP in Riser 6 (1″)

Mixing pumps: None





Discussion: Chemical cleaning in Tank 5 continued with the completion of the third acid strike/spray wash and the water spray wash. Additionally, failed cooling coil flushing and the final water wash were completed in Tank 5. All water wash material has been removed from Tank 5. Remaining solids volumes have remained constant during the last two acid washes, which is attributed to oxalate formation. Process samples were analyzed to determine the effectiveness of the oxalic cleaning and extent of oxalate formation.

Comments: Plans are being made to complete one last mechanical heel removal of Tank 5 to remove oxalates (formed during chemical cleaning) and as much sludge as possible. Tank 5 will be grouted when the *Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005* (Public Law 108-375) §3116 regulatory process is completed, forecast for completion in FY12.

Tank 6:

Area: F-Area

Service: Tank Closure

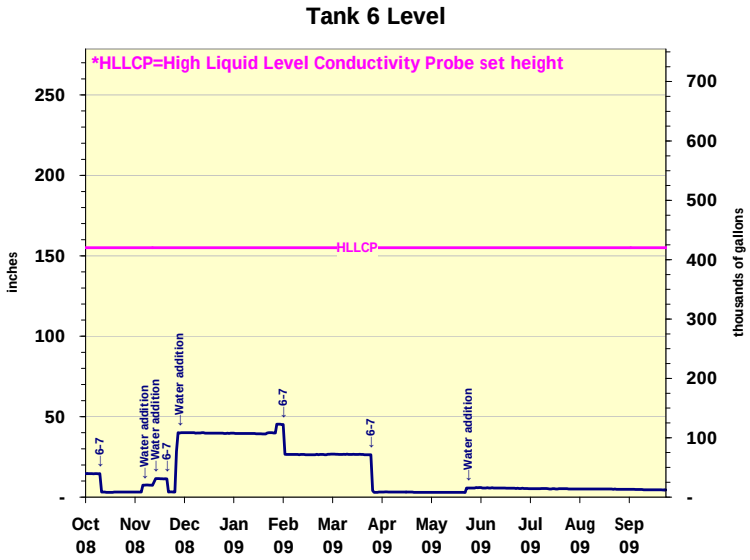
Type: I

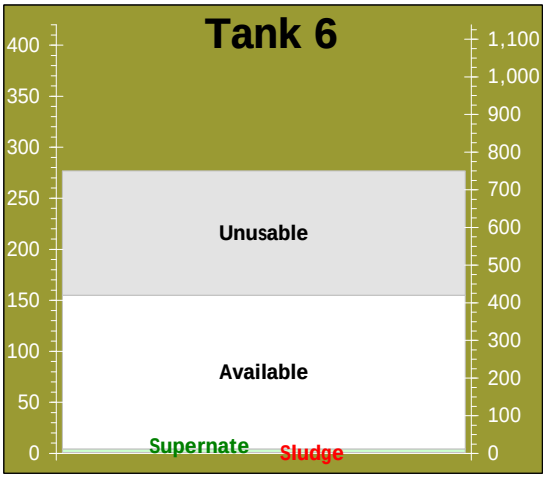
Maximum Volume: 420,050 gallons

Working Volume: 406,500 gallons

Waste Volume: 11,924 gallons

Leak Sites: In 2001 liquid was added to the tank to support tank closure activities. Approximately 92 gallons was subsequently detected on the annulus floor. Visual inspections have documented six known leaksites, the lowest of which is 129″ from the bottom of the tank.





Prime Movers: STP in Riser 6 (1″)

Mixing pumps: (2) SMP

Discussion: Chemical cleaning in Tank 6 continued with the completion of the third acid strike/spray wash and the water spray wash. The cooling coil flush and final water wash for Tank 6 was completed. All water wash material has been removed from Tank 6. Remaining solids volumes have remained constant during the last two acid washes, which is attributed to oxalate formation. Process samples for Tank 6 were analyzed to determine the effectiveness of the oxalic cleaning and extent of oxalate formation.

Comments: Plans are being made to complete one last mechanical heel removal of Tank 6 to remove oxalates (formed during chemical cleaning) and as much sludge as possible. Tank 6 will be grouted when the *Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005* (Public Law 108-375) §3116 regulatory process is completed, forecast for completion in FY13.

Tank 7:

Area: F-Area

Service: Sludge Batch 6/7 Preparation Tank

Type: I

Maximum Volume: 547,420 gallons

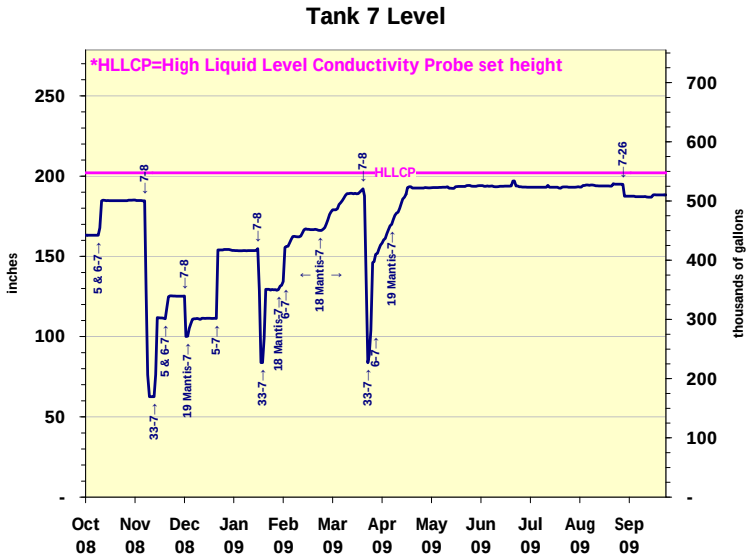
Working Volume: 533,870 gallons

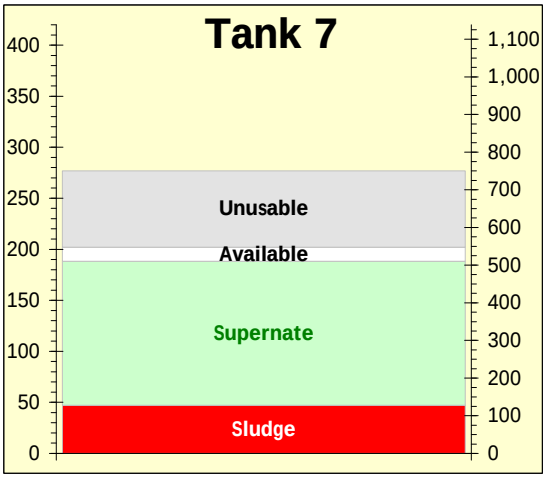
Waste Volume: 510,290 gallons

Leak Sites: None

Prime Movers: Telescoping Transfer Pump (TTP) in Riser 4 (82″)

Mixing pumps: (4) Lawrence slurry pumps





Discussion: Tank 7 was used extensively to support heel removal and chemical cleaning of Tanks 5 and 6 and Sand Mantis mechanical cleaning of Tanks 18 and 19. It initially received three transfers from Tank 33, totaling 371 kgal, to neutralize the oxalic acid to be received from chemical cleaning. Then a series of Tank 7–Tanks 5 & 6 and Tanks 5 & 6–Tank 7 waste transfers were made interspersed with receipts from Sand Mantis cleaning of Tanks 18 and 19. Several Tank 7–Tank 8 transfers (331 kgal in November, 69 kgal in December, 194 kgal in January, and 456 kgal in March) allowed Tank 7 to continue to support Tanks 5, 6, 18, and 19 closures. A small (20 kgal) transfer to the 2F Evaporator Feed Tank (Tank 26) was completed in September.

Comments: Tank 7F has been designated as a hub tank to receive and stage radioactive waste for further processing. Tank 7 is currently playing a key role in the chemical cleaning campaigns for Tank 5, 6, 18, and 19. It will be a transfer tank for sludge for SB 6 and 7.

Tank 8:

Area: F-Area

Service: Aluminum-rich Leachate Storage Tank

Type: I

Maximum Volume: 569,100 gallons

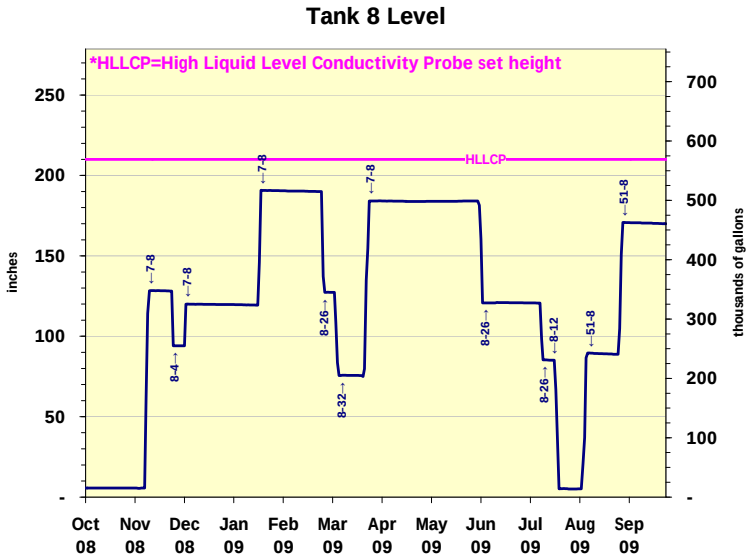
Working Volume: 555,550 gallons

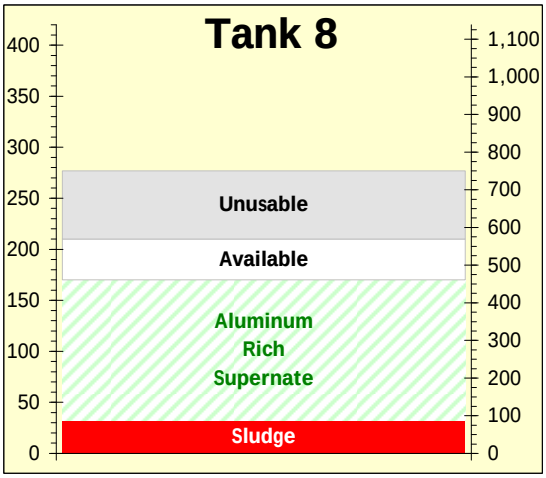
Waste Volume: 460,590 gallons

Leak Sites: None

Prime Movers: TTP in Riser 6 (2″)

Mixing pumps: (4) Lawrence slurry pumps





Discussion: Several Tank 7–Tank 8 transfers (331 kgal in November, 69 kgal in December, 194 kgal in January, and 456 kgal in March) allowed Tank 7 to support Tanks 5, 6, 18, and 19 closures. A Tank 8–Tank 4 transfer of 93 kgal in November supplied sludge removal slurry material. Three Tank 8–Tank 26 (170 kgal in February, 114 kgal in June and 96 kgal in July) and one Tank 8–Tank 32 (168 kgal in March) provided feed for the 2F and 3H Evaporators. A Tank 8–Tank 12 kgal transfer of 238 kgal in July emptied Tank 8 to enable it to receive aluminum-rich leachate from low-temperature aluminum dissolution of SB 6. It also provided liquid for slurrying Tank 12 in support of bulk sludge removal for SB 7. In August, the aluminum-rich leachate was transferred via two Tank 51–Tank 8 transfers totaling 428 kgal.

Comments: The aluminum-rich leachate will remain in Tank 8 until it is processed in the SWPF.

Tank 9:

Area: H-Area (East Hill)

Service: Inactive Waste Tank

Type: I

Maximum Volume: 569,100 gallons

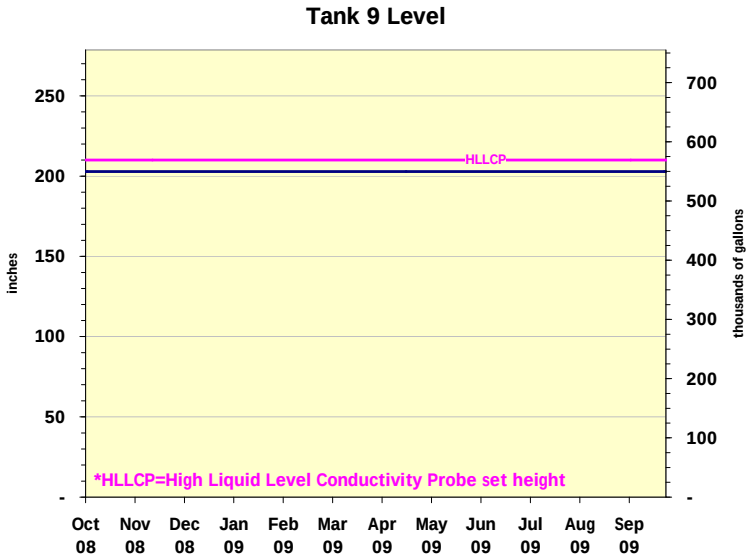
Working Volume: 555,550 gallons

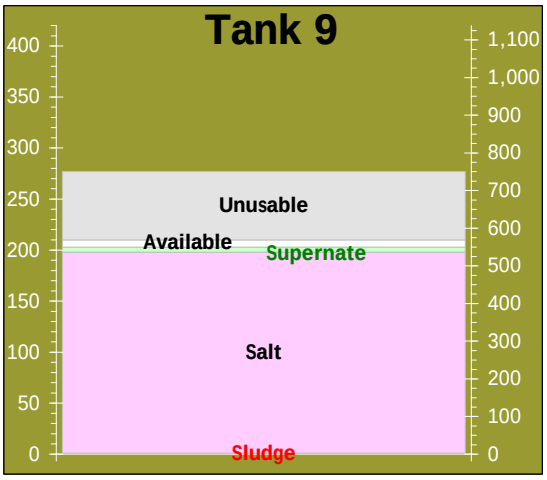
Waste Volume: 549,590 gallons

Leak Sites: After being placed into service in 1955, liquid waste was observed in the annulus pan in 1957. Currently the annulus pan contains 8″–10″ of salt deposits. Visual inspections have identified three known leaksites, the lowest of which is 269″ from the bottom of the tank. No waste from these leaksites has reached to the annulus floor. The annulus pan contains 8-10 inches of waste from unknown leak site(s).

Prime Movers: Telescoping Transfer Jet (TTJ) in Riser 3 (unknown height)

Mixing pumps: None





Discussion: There were no transfers into or out of Tank 9 during FY09.

Tank 10:

Area: H-Area (East Hill)

Service: Inactive Waste Tank

Type: I

Maximum Volume: 569,100 gallons

Working Volume: 555,550 gallons

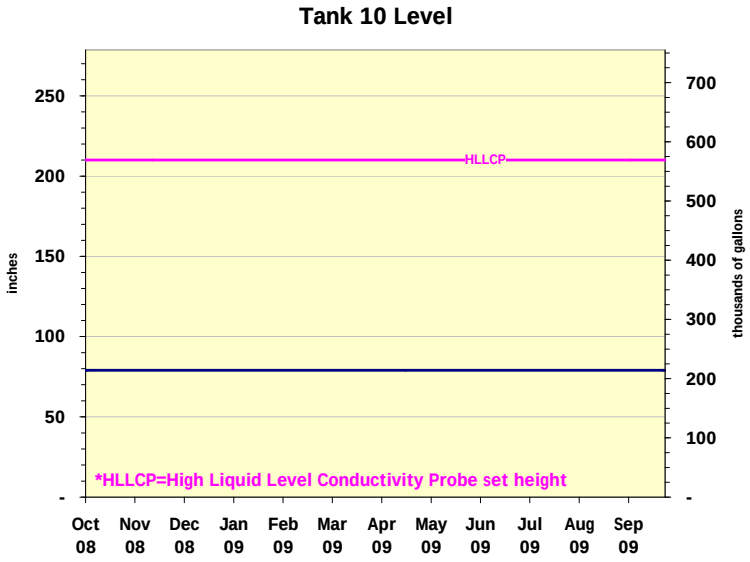
Waste Volume: 214,090 gallons

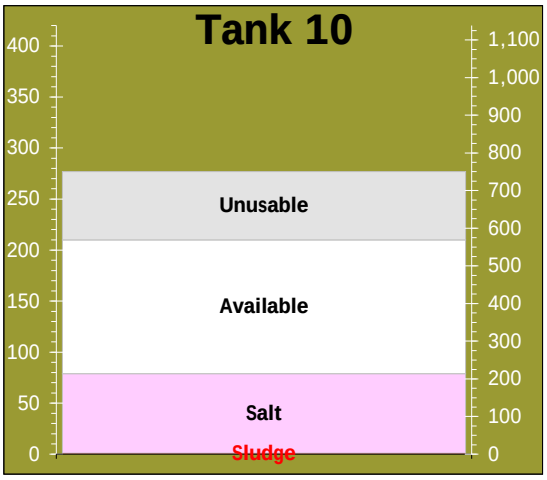
Leak Sites: Tank 10 was placed in service in 1955. Dry waste was discovered in the annulus pan during a visual inspection in 1959. Currently the annulus pan contains 2″–3″ of salt deposits. Visual examinations have not revealed the location of the leak.

Prime Movers: Fixed Length Jet in Riser 2 (36″)

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 10 during FY09.





Tank 11:

Area: H-Area (East Hill)

Service: Sludge Removal Tank

Type: I

Maximum Volume: 392,950 gallons

Working Volume: 379,400 gallons

Waste Volume: 355,690 gallons

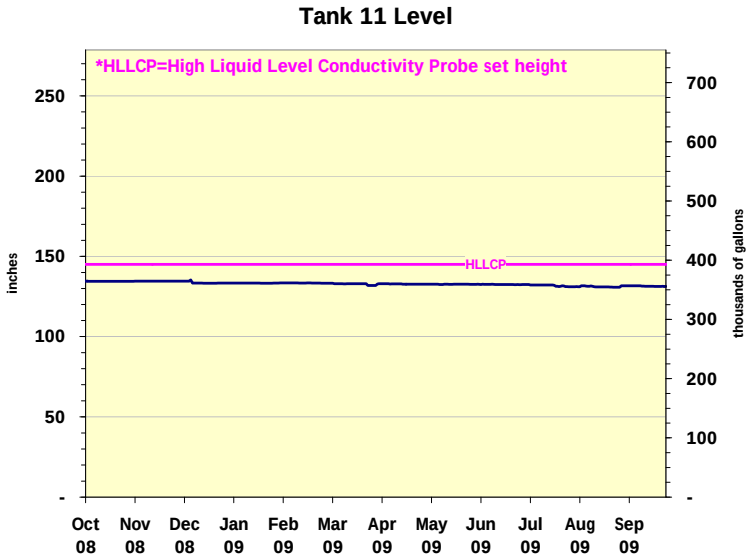
Leak Sites: Inspections in 1974 revealed two leaksites, the lowest of which is 189″ from the bottom of the tank. Only trace amounts of waste reached the annulus pans.

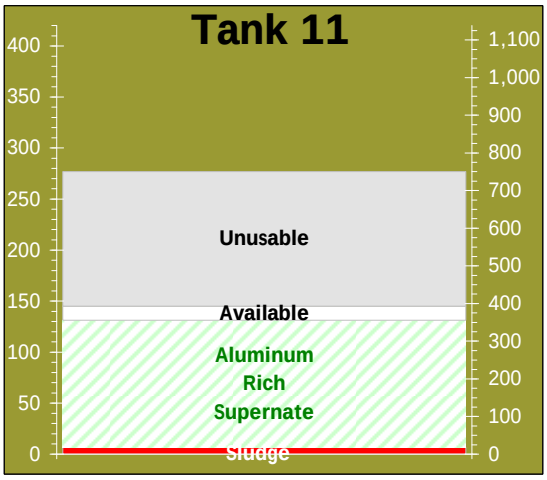
Prime Movers: Variable Depth Submersible Transfer Pump (STP) in Riser 6 (~144″ with a range of 144″–2″)

Transfer Jet in Riser 7 — abandoned in place

Mixing pumps: None

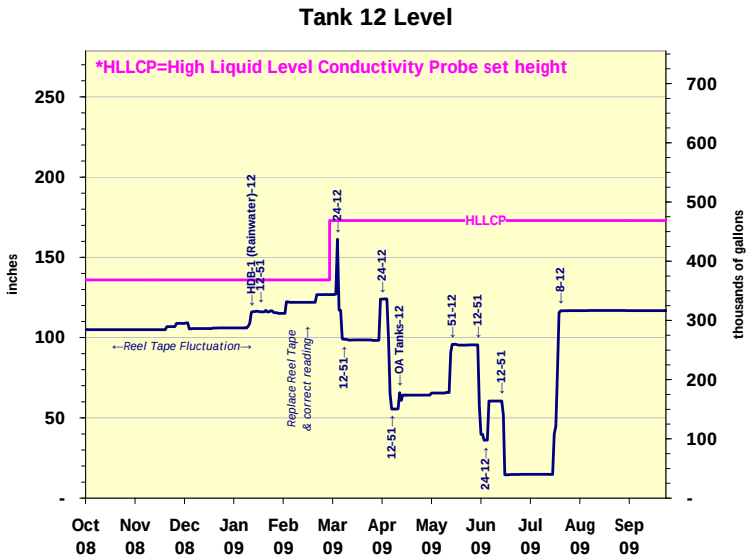
Discussion: Tank 11 is currently a supernate storage location for the aluminum-rich leachate removed from Tank 51 sludge using the Low Temperature Aluminum Dissolution process.

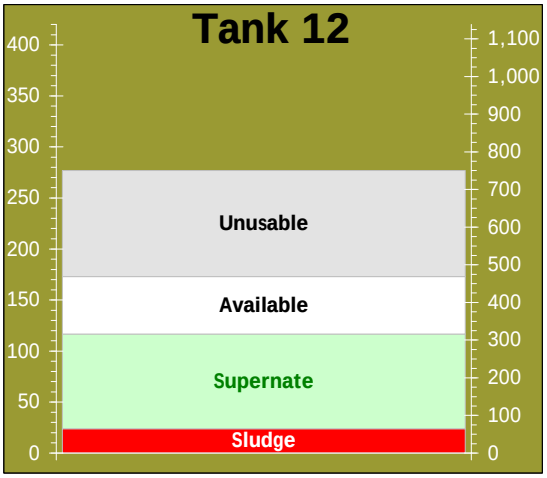




Comments: The aluminum-rich leachate will remain in Tank 11 until it is processed in the SWPF.

Tank 12:





Area: H-Area (East Hill)

Service: Sludge Removal Tank

Type: I

Maximum Volume: 468,830 gallons

Working Volume: 460,700 gallons

Waste Volume: 316,370 gallons

Leak Sites: Visual inspections have identified five leaksites, the lowest of which is 70″ from the bottom of the tank. A sixth leaksite was confirmed during mechanical cleaning in FY09 when leaked waste was observed in the annulus pan from an unknown source.

Prime Movers: Fixed Length Jet in Riser 6 (92″) — abandoned in place

Variable depth STP in Riser 7 (144″ with a range of 144″–2″)

Mixing pumps: (4) Lawrence slurry pumps

Discussion: The addition in January of 34 kgal of rainwater from H-Diversion Box #1 (HDB-1) provided material for movement of sludge for the preparation of SB 6. The initial attempt to transfer sludge from Tank 12 to Tank 51 in January, however, only moved 950 gallons. Additional material was added from Tank 24 (101 kgal in March) and 164 kgal of sludge slurry was subsequently transferred to Tank 51. An additional 70 kgal was added from Tank 24 in April prior to another 95 kgal sludge removal to Tank 51. Rainwater in the oxalic acid tanks was emptied into Tank 12 (31 kgal in April) and supernate was transferred from Tank 51 to Tank 12 (73 kgal in May). Two final Tank 12–Tank 51 sludge removal transfers (167 kgal and 125 kgal in June) were made, interspersed with a 50 kgal Tank 24–Tank 12 transfer. Finally, 283 kgal were transferred in July from Tank 8 to provide space in Tank 8 for SB 6 aluminum-rich leachate and to provide material for slurry of Tank 12 sludge removal for SB 7 preparation.

Comments: Tank 12 is a future SB 7 sludge tank.

4.2 Type II Tanks

Tank 13:

Area: H-Area (East Hill)

Service: Active Waste Tank

Type: II

Maximum Volume: 927,500 gallons

Working Volume: 892,500 gallons

Waste Volume: 798,700 gallons

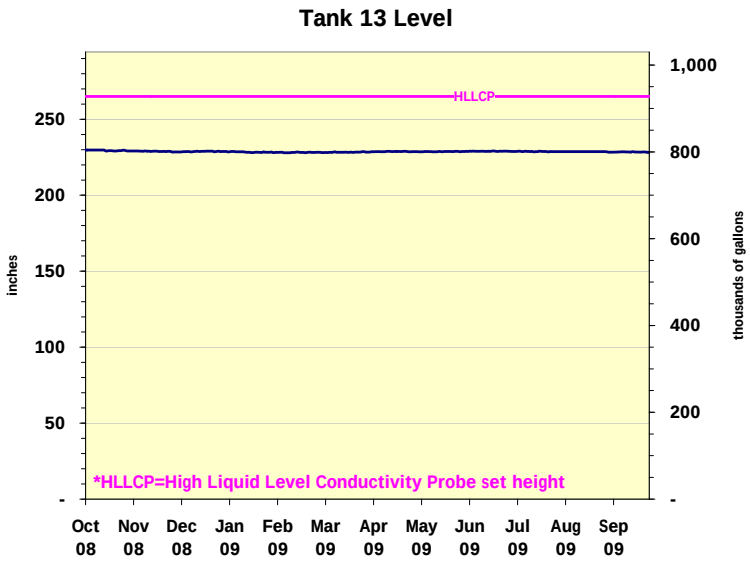
Leak Sites: Inspections in 1977 revealed the first of two known leaksites, the lowest of which is 269″ from the bottom of the tank. Only trace amounts of waste reached the annulus pans.

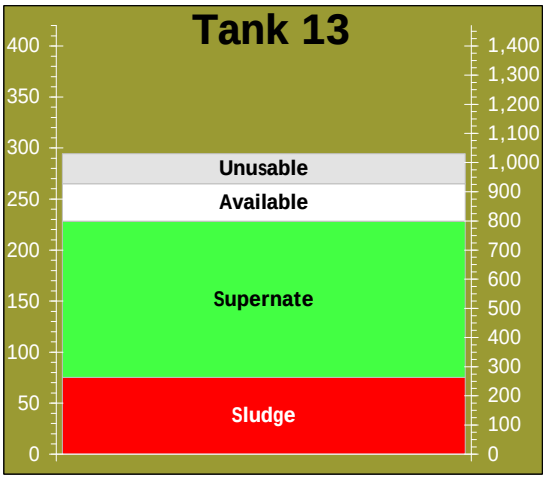
Prime Movers: Fixed Length Jet in Riser 7 (137″)

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 13 during FY09.

Comments: Tank 13 will be a sludge removal tank for SB 8 and future sludge batches.





Tank 14:

Area: H-Area (East Hill)

Service: Inactive Waste Tank

Type: II

Maximum Volume: 350,000 gallons

Working Volume: 332,500 gallons

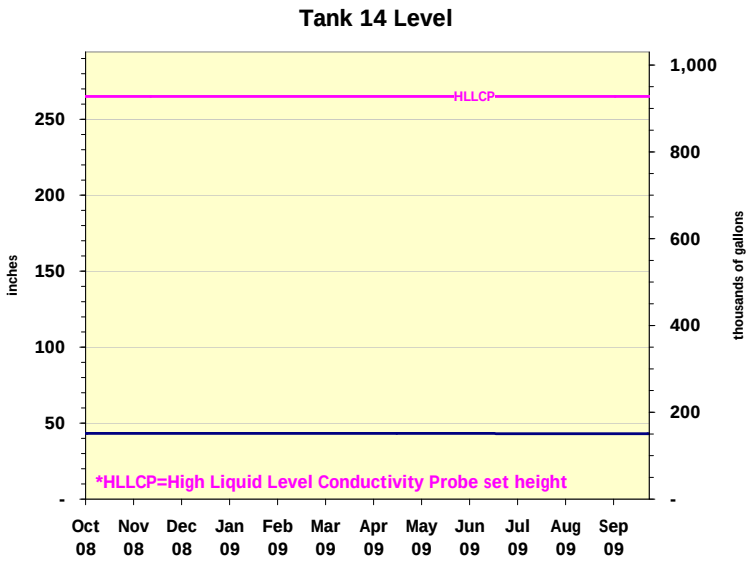
Waste Volume: 150,850 gallons

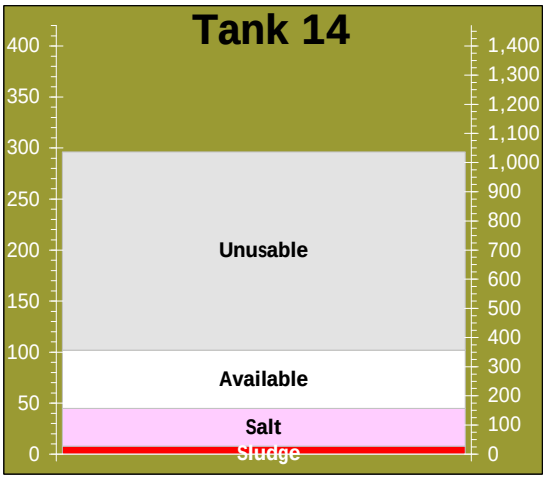
Leak Sites: Tank 14 was placed in service in 1957. Dry waste was discovered in the annulus pan during a visual inspection in 1959. Currently the annulus pan contains 12″–13″ of salt deposits. Approximately 50 leaksites have been visually confirmed, most of which are near the bottom circumferential weld at 2½′ above the bottom of the tank. The lowest is 16″ above the bottom of the tank.

Prime Movers: Fixed Length Jet in Riser 2 (68″)

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 14 during FY06.





Comments: Tank 14 will be a sludge removal tank for SB 9.

Tank 15:

Area: H-Area (East Hill)

Service: Inactive Waste Tank

Type: II

Maximum Volume: 350,000 gallons

Working Volume: 332,500 gallons

Waste Volume: 149,800 gallons

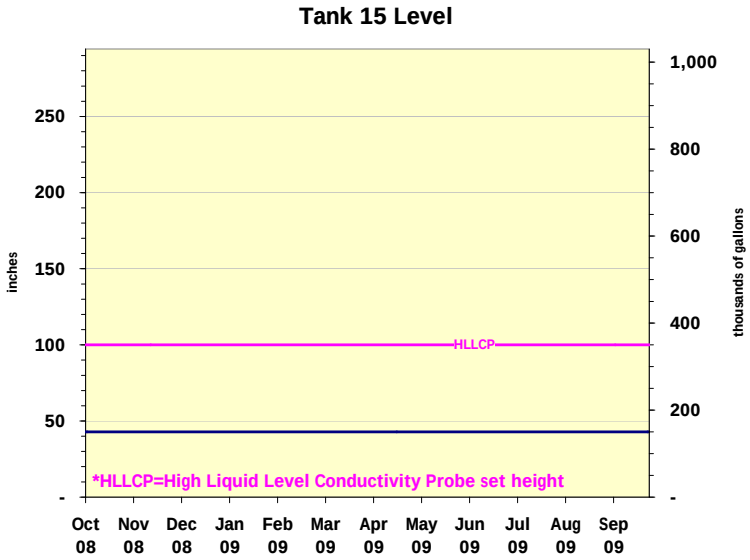
Leak Sites: Inspections in 1972 revealed the first two of 20 known leaksites, most of which are near the bottom circumferential weld at 2½′ above the bottom of the tank. The lowest are 30″ above the bottom of the tank. Only trace amounts of waste have been observed in the annulus pans.

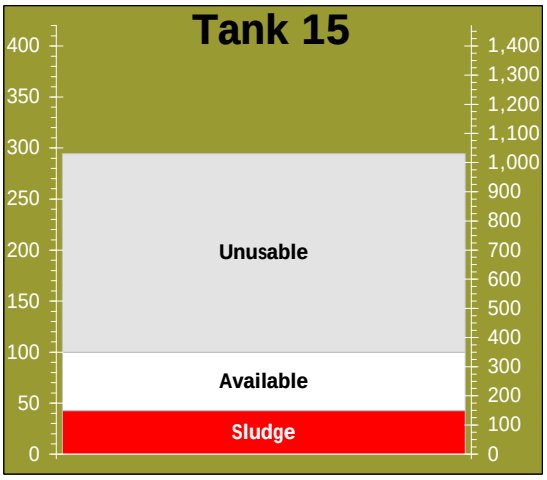
Prime Movers: TTP in Riser 7 (20″)

Mixing pumps: None

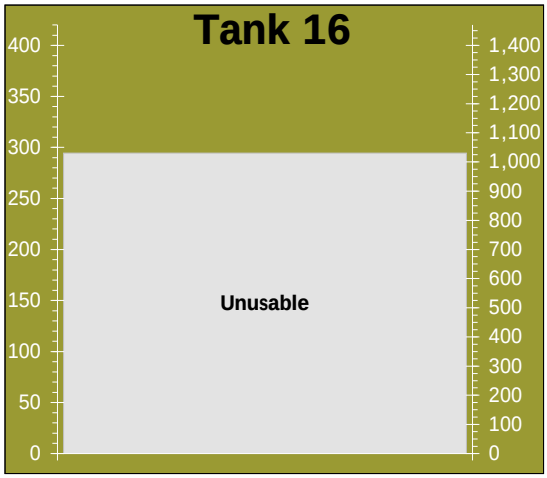
Discussion: There were no transfers into or out of Tank 15 during FY09.

Comments: Tank 15 will be a sludge removal tank for SB 9.





Tank 16:



Area: H-Area (East Hill)

Service: Removed From Service

Type: II

Maximum Volume: N/A

Working Volume: N/A

Leak Sites: Tank 16 was placed in service in 1959 with liquid waste detected in the annulus pan that same year. Seventy percent of the waste was removed from the annulus pan leaving approximately 11″–12″ (4,760 gallons) of waste containing approximately 30,000 curies of Cs-137 in the annulus pan. Approximately 300–350 leaksites have been visually confirmed.

Discussion: Tank 16 was emptied and removed from service due to leakage of primary containment. The tank has yet to be closed due to residual waste inside the annulus.

4.3 Type IV Tanks

Tank 17:

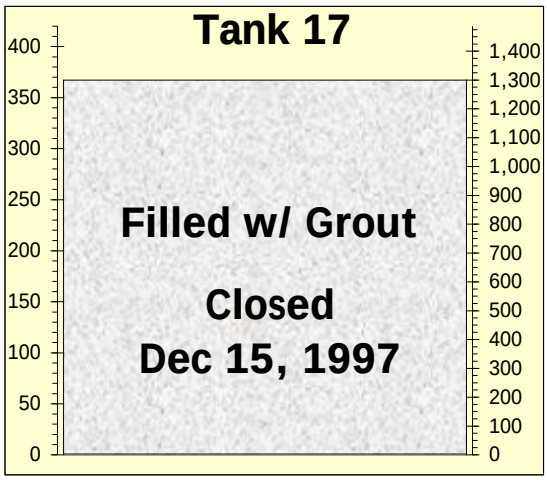
Area: F-Area

Service: Closed / Filled with Grout

Type: IV

Leak Sites: None

Discussion: Tank 17 was emptied and de-activated as a waste tank. Tank 17 was filled with grout and formally closed on December 15, 1997



Tank 18:

Area: F-Area

Service: Tank Closure / Removed From Service

Type: IV

Maximum Volume: N/A

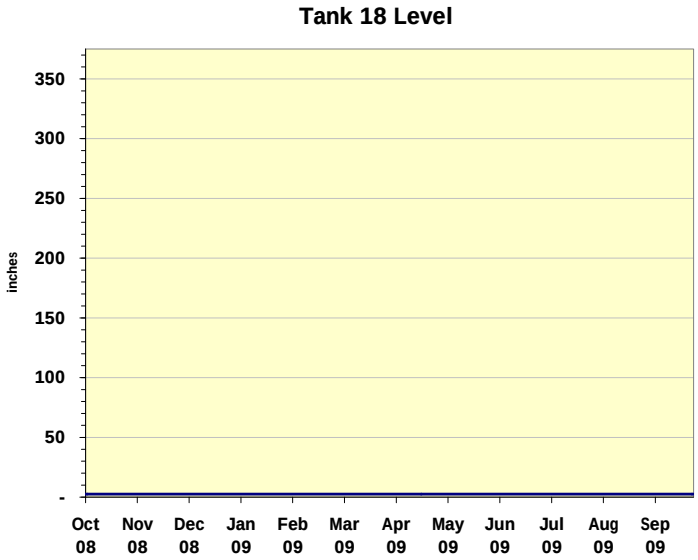
Working Volume: N/A

Waste Volume: 2,655 gallons

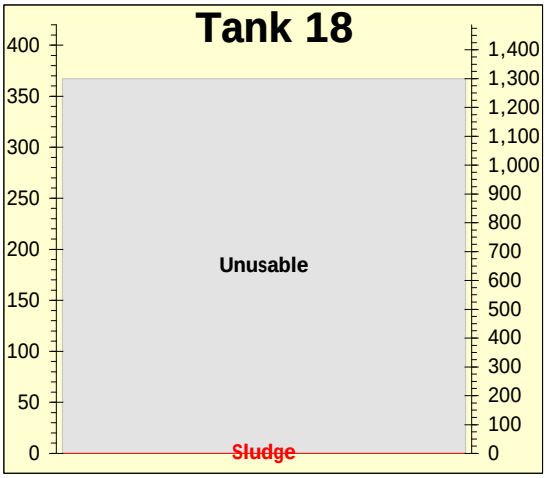
Leak Sites: None

Prime Movers: None

Mixing pumps: None

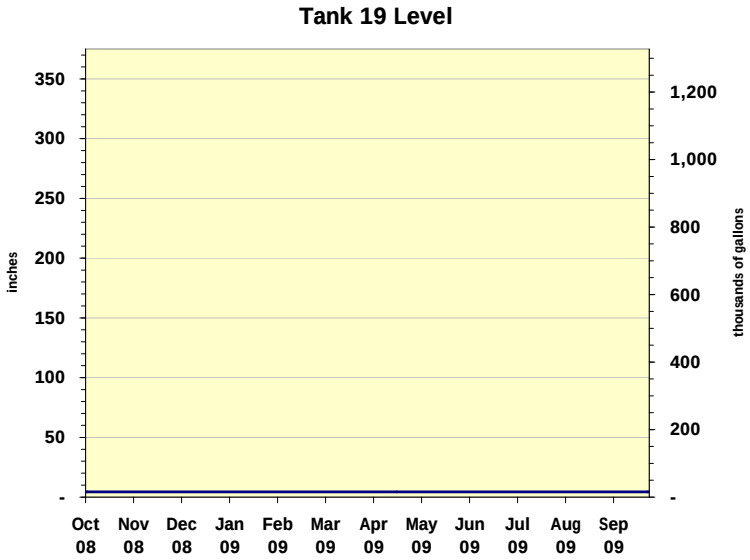


Discussion: In March 2009, mechanical cleaning of Tank 18 with a Sand Mantis was completed. Efforts yielded approximately 85% removal of the waste from the tank. Tank 18 cessation of waste removal discussions were completed with DOE, SCDHEC, and the EPA. All three agencies have verbally agreed to cease waste removal operations and begin Waste Determination (WD) sampling.



Comments: Upon completion of all regulatory requirements, Tank 18 will begin grouting with completion planned for FY11.

Tank 19:



Area: F-Area

Service: Tank Closure / Removed From Service

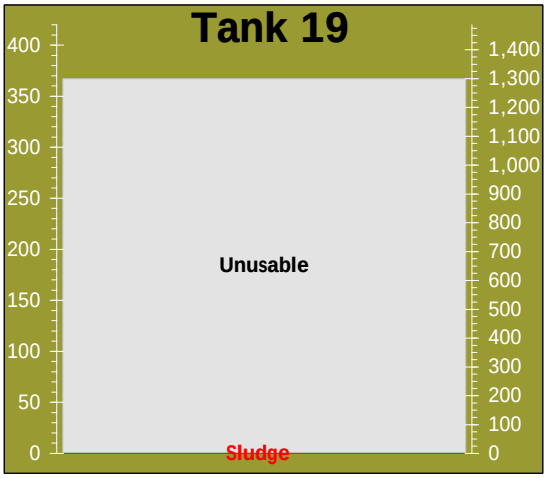
Type: IV

Maximum Volume: N/A

Working Volume: N/A

Waste Volume: 2,655 gallons

Leak Sites: Visual examination of the tank revealed inleakage into the tank identifying two leaksites at 317″ and 330″. No waste has been detected leaking from the tank.



Prime Movers: None

Mixing pumps: None

Discussion: Mechanical cleaning of Tank 19 was completed in April 2009 with a Sand Mantis. Efforts yielded approximately 90% removal of the remaining waste from the tank. Tank 19 cessation of waste removal discussions were completed with DOE, SCDHEC, and the EPA. All three agencies have verbally agreed to cease waste removal operations and begin WD sampling.

Comments: Upon completion of all regulatory requirements, Tank 19 will begin grouting with completion planned for FY11.

Tank 20:

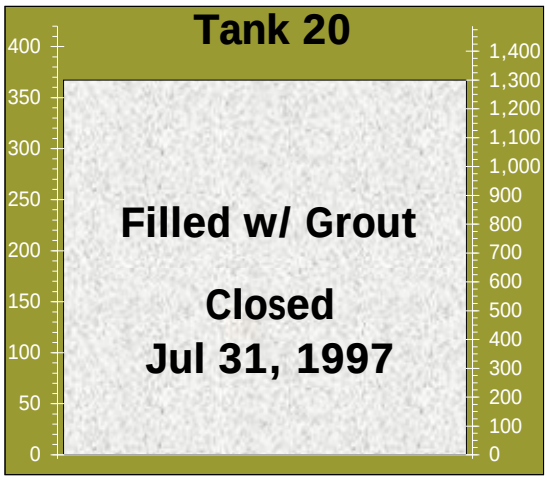
Area: F-Area

Service: Closed / Filled with Grout

Type: IV

Leak Sites: Visual examinations in 1983 revealed four failure sites, the lowest of which was 264″ above the bottom of the tank. As the tank is closed and filled with grout, inspections are discontinued.

Discussion: Tank 20 was emptied and de-activated as a waste tank. Tank 20 was filled with grout and formally closed on July 31, 1997



Tank 21:

Area: H-Area (East Hill)

Service: Receipt Tank for DWPF Recycle

Type: IV

Maximum Volume: 1,327,500 gallons

Working Volume: 1,316,880 gallons

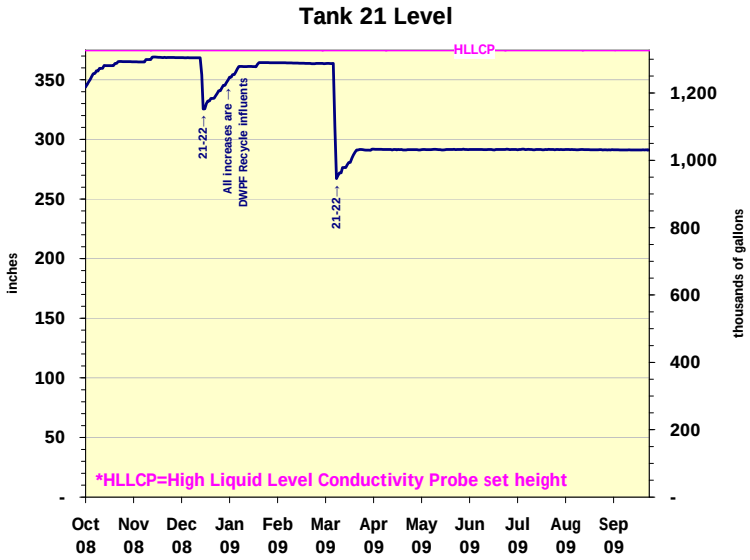
Waste Volume: 1,030,700 gallons

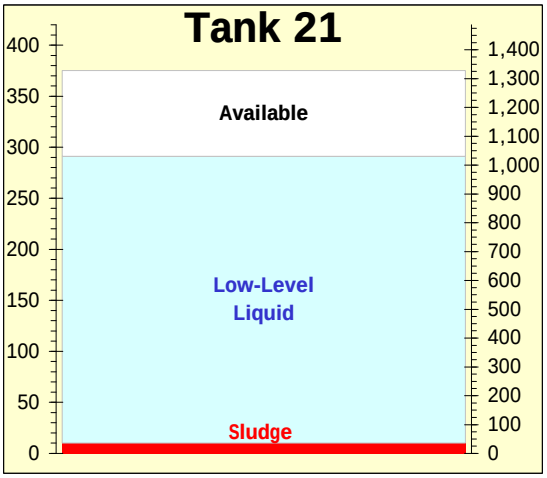
Leak Sites: None

Prime Movers: TTP (Hazelton) in the south riser (62″)

Mixing pumps: (3) 2x15 Sulzer slurry pumps. Note: only the pumps in the southeast and southwest riser are operable.

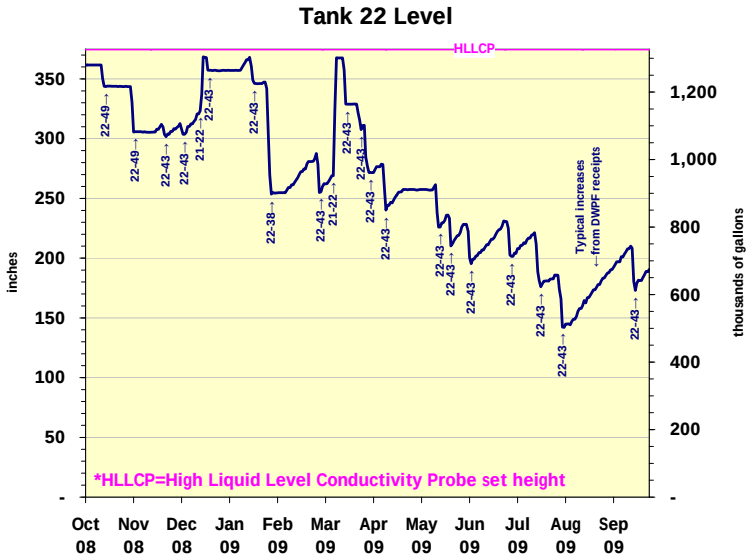
Discussion: During FY09, two Tank 21–Tank 22 transfers (501 kgal) provided room to support DWPF recycle receipts. Tank 21 received 316 kgal of DWPF recycle during FY09. The initial volume in the tank was 1,217 kgal, the final volume was 1,031 kgal, and the average volume for the year was 1,139 kgal.





Comments: Tank 21 will be a salt batch preparation tank beginning in FY10.

Tank 22:



Area: H-Area (East Hill)

Service: Storage Tank for DWPF Recycle

Type: IV

Maximum Volume: 1,327,500 gallons

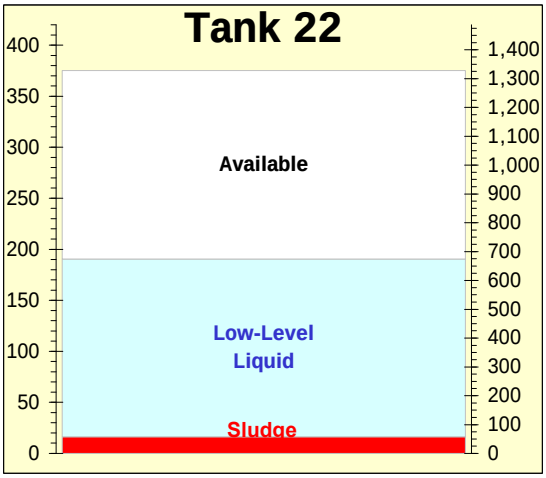
Working Volume: 1,316,880 gallons

Waste Volume: 674,370 gallons

Leak Sites: None

Prime Movers: TTP in the south riser (62″)

Mixing pumps: (3) 2x15 Sulzer slurry pumps. Note: only the pumps in the southeast and southwest riser are operable.



Discussion: During FY09, two Tank 21–Tank 22 transfers (501 kgal total) provided room to support DWPF recycle receipts. Subsequent settling time in Tank 22 minimizes silica in the 2H Evaporator System and ETP. Tank 22 received 1,187 kgal of DWPF recycle directly in the third quarter of FY09. Sixteen Tank 22–Tank 43 transfers (1,782 kgal total) and a Tank 22–Tank 38 (331 kgal) provided feed for the 2H Evaporator. Two Tank 22–Tank 49 transfer (197 kgal) provided feed for ISDP. The initial volume in Tank 22 was 1,280 kgal and the final volume was 674 kgal; the average was 940 kgal for the year.

Comments: Tank 22 will continue to store DWPF recycle receipts.

Tank 23:

Area: H-Area (East Hill)

Service: Aggregate Supply Tank/Salt Solution Hold Tank

Type: IV

Maximum Volume: 1,327,500 gallons

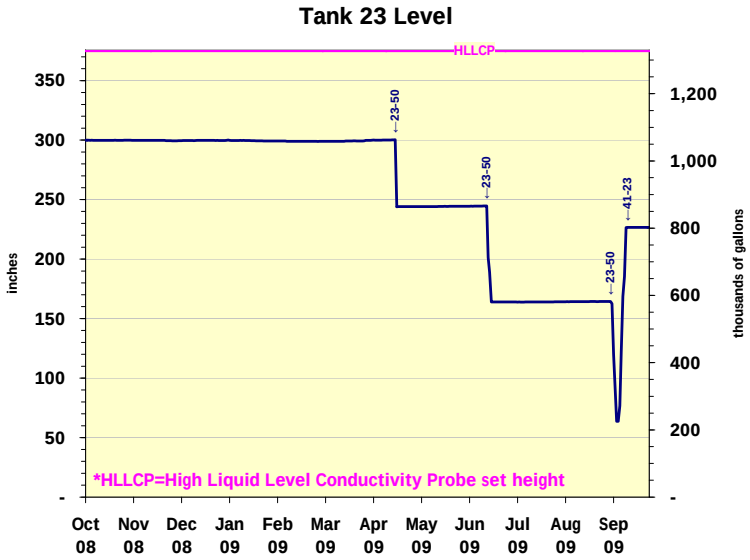
Working Volume: 1,313,340 gallons

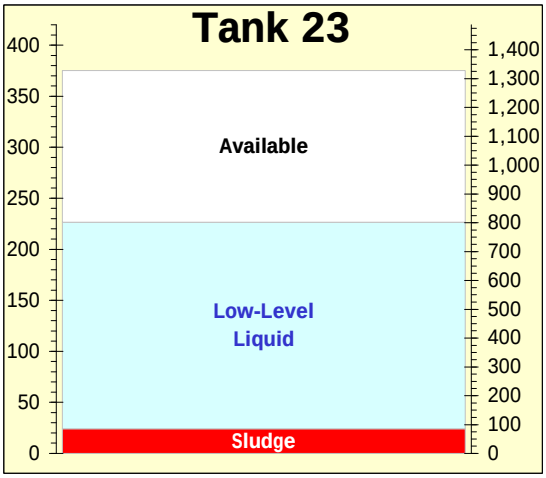
Waste Volume: 802,340 gallons

Leak Sites: None

Prime Movers: STP in the north riser (60″)

Mixing pumps: None





Discussion: Three Tank 23–Tank 50 transfers totaling 967 kgal provided salt feed to SPF. A Tank 41–Tank 23 transfer of 567 kgal in September provided for preparation of ISDP Salt Batch #3. The initial volume in Tank 23 was 1,062 kgal and the final volume was 802 kgal; the average was 897 kgal for the year.

Comments: The material in Tank 23 provided aggregation and molarity adjustment material to Tank 50 for DDA salt processing. Tank 23 material is preferable because the actinide level is lower than typical DWPF recycle.

Tank 24:

Area: H-Area (East Hill)

Service: Concentrated DWPF Recycle Storage Tank

Type: IV

Maximum Volume: 1,327,500 gallons

Working Volume: 1,309,800 gallons

Waste Volume: 1,032,300 gallons

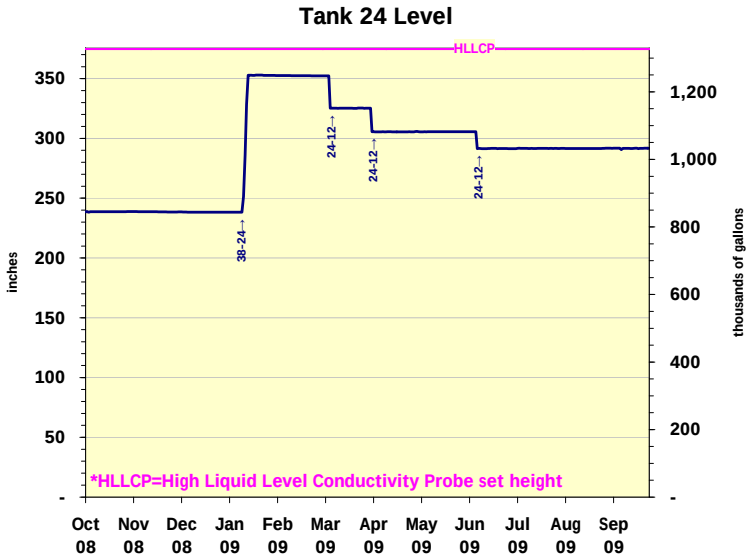
Leak Sites: None

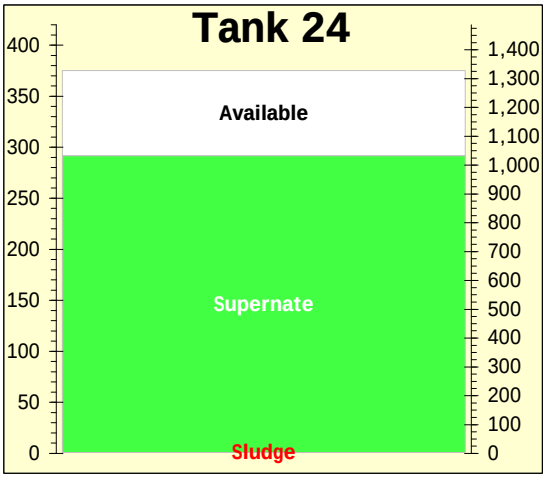
Prime Movers: Fixed Length Pump in the north riser (5″)

Mixing pumps: None

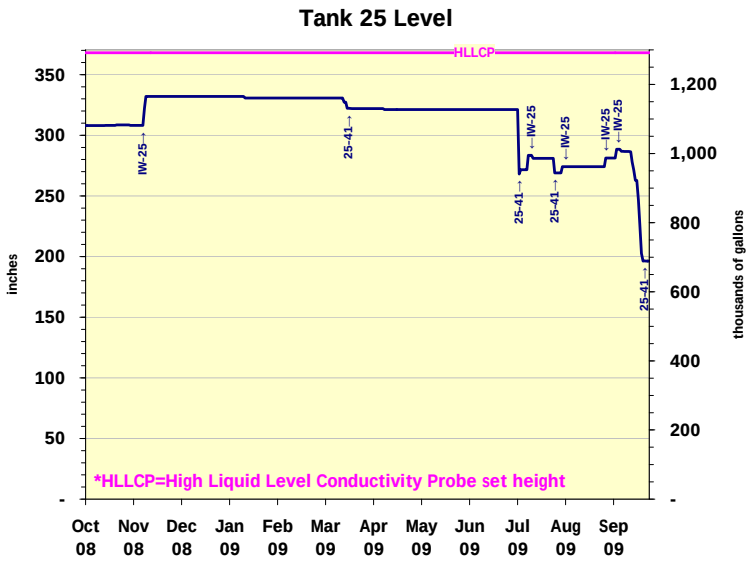
Discussion: Tank 24 received 397 kgal of concentrated supernate when the 2H Evaporator Feed Tank, Tank 38, was deliquored in January. Tank 24 also provided slurry material (101 kgal in March, 70 kgal in April, and 50 kgal in June) for bulk sludge removal from Tank 12.

Comments: Tank 24 stores waste from de-liquoring the 2H Evaporator System.





4.4 Type III Tanks



Tank 25:

Area: F-Area

Service: Salt Removal Tank

Type: IIIA

Maximum Volume: 1,291,680 gallons

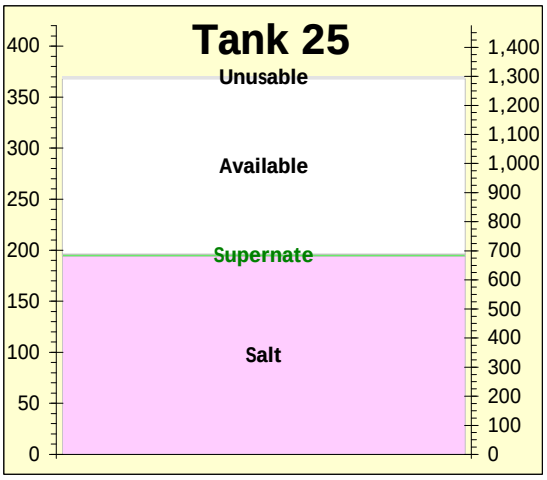
Working Volume: 1,274,130 gallons

Waste Volume: 688,730 gallons

Prime Movers: Salt Pump in the C1 Riser (0″)

Mixing pumps: None

Discussion: Four Tank 25–Tank 41 transfers (40 kgal in March, 346 kgal in May, 102 kgal in July and 449 in September) constituted the bulk of a salt dissolution campaign. Completion of the Tank 25 salt dissolution campaign is planned for FY10. The initial volume in Tank 25 was 1,081 kgal and the final volume was 689 kgal; the average was 1,094 kgal for the year.



Comments: After completion of the salt dissolution campaign, modifications will be made to return Tank 25 to service as the 2F Evaporator Concentrate Receipt Tank.

Tank 26

Area: F-Area

Service: 2F Evaporator Feed Tank

Type: IIIA

Maximum Volume: 1,221,480 gallons

Working Volume: 1,203,930 gallons

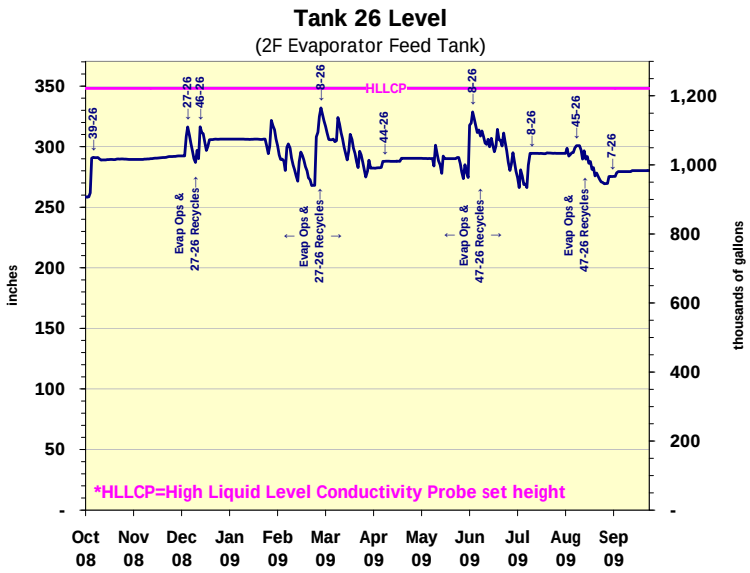
Waste Volume: 983,470 gallons

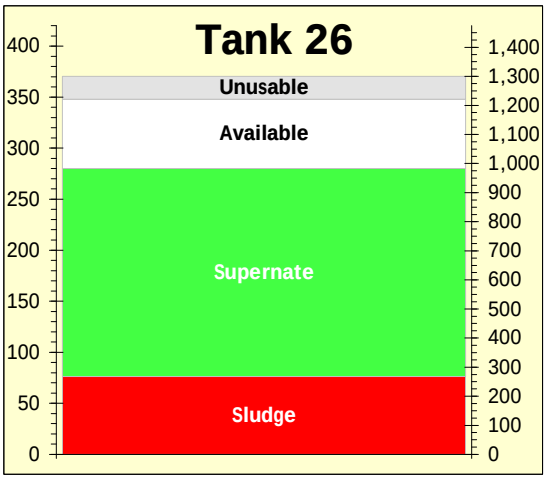
Prime Movers: Fixed Length Jet in the C1 Riser (108″)

Fixed Length Evaporator Feed Pump in the R2 Riser (161″)

Mixing pumps: None

Discussion: Tank 26 is the 2F Evaporator Feed Tank. It received fresh feed from Tank 39 (97 kgal) and Tank 8 (three transfers totaling 380 kgal). Tank 26 also received five transfers to relieve the tank levels in Tanks 7 (20 kgal), 27 (35 kgal), 44 (21 kgal), 45 (20 kgal), and 46 (31 kgal). Twenty-nine Tank 47–Tank 26 recycle transfers totaling 2,321 kgal were made during the year. The average volume of Tank 26 was 1,028 kgal.





Tank 27

Area: F-Area

Service: 2F Evaporator Vent Tank

Type: IIIA

Maximum Volume: 1,263,600 gallons

Working Volume: 1,253,070 gallons

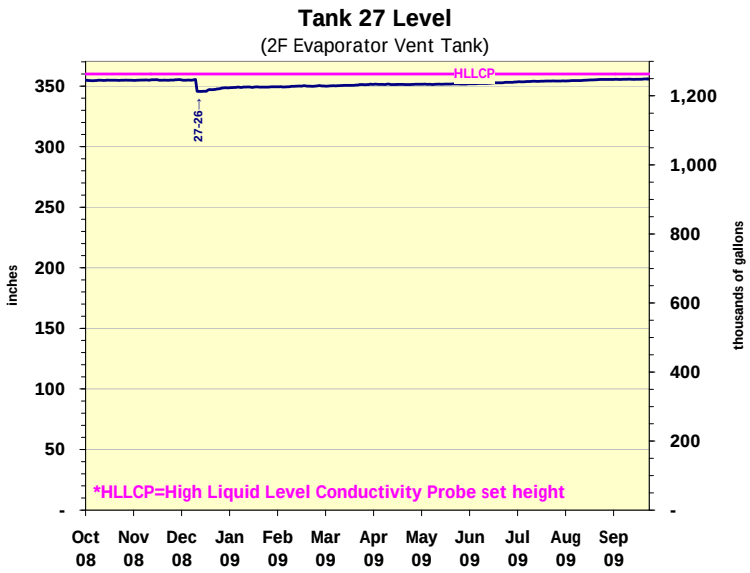
Waste Volume: 1,248,600 gallons

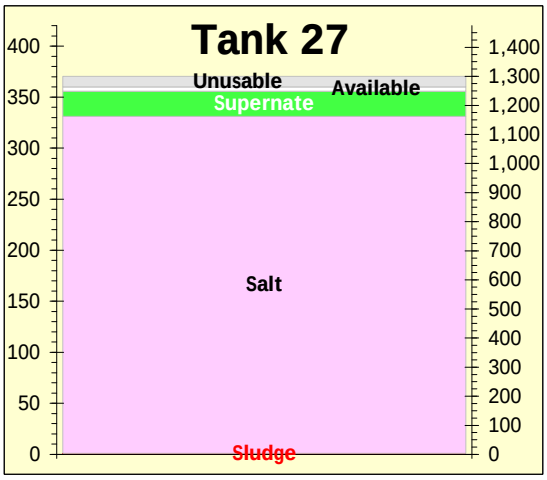
Prime Movers: TTJ in the C1 Riser (267″ with a range of 155.5″–267″)

Mixing pumps: None

Discussion: Tank 27 is the 2F Evaporator Vent Tank. There was a single Tank 27–Tank 26 transfer of 35 kgal for level relief in December. The salt level in Tank 27 is ~330″.

Comments: Upon conversion of Tank 25 to 2F Evaporator Concentrate Receipt service, Tank 27 will become inactive pending a salt dissolution campaign subsequent to SWPF start-up.





Tank 28:

Area: F-Area

Service: Inactive Waste Tank

Type: IIIA

Maximum Volume: 1,288,170 gallons

Working Volume: 1,270,620 gallons

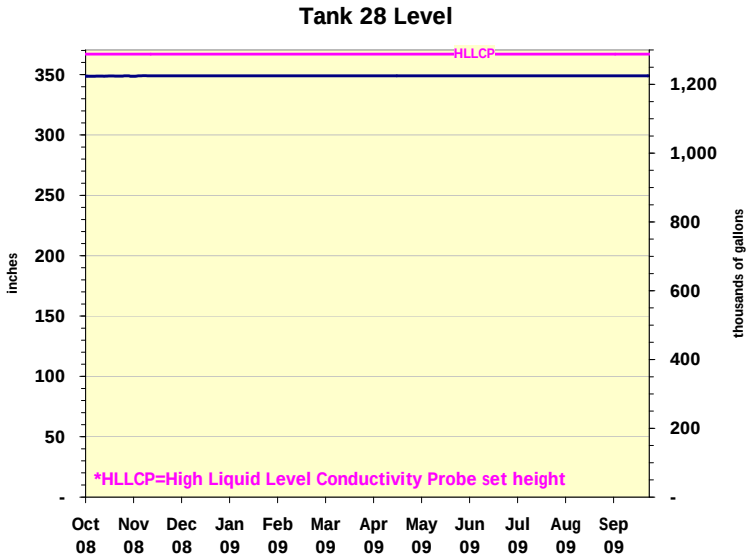
Waste Volume: 1,225,000 gallons

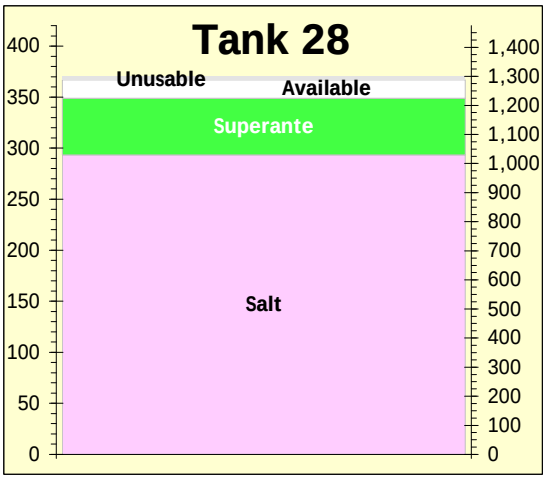
Prime Movers: TTJ in the C1 Riser (unknown height)

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 28 during FY09.

Comments: Tank 28 will be a future salt removal tank and will be used as the F-Area hub tank during salt batch preparation activities.





Tank 29:

Area: H-Area (East Hill)

Service: 3H Evaporator Vent Tank

Type: III

Maximum Volume: 1,288,170 gallons

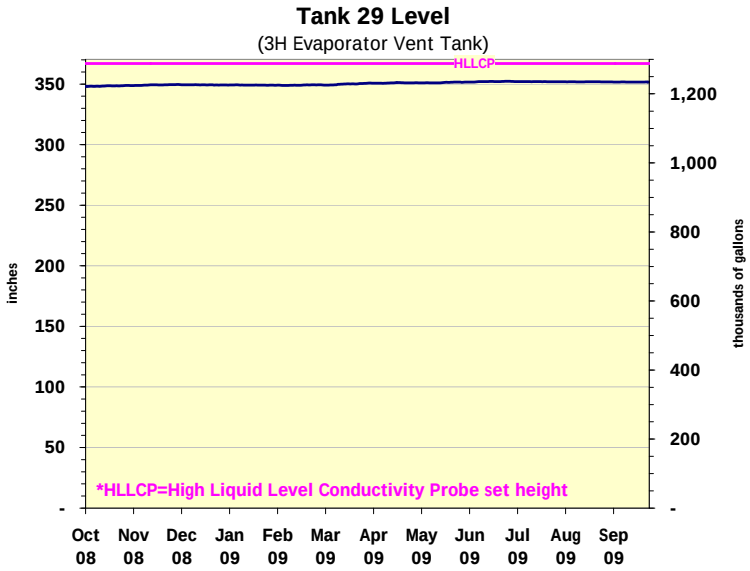
Working Volume: 1,270,620 gallons

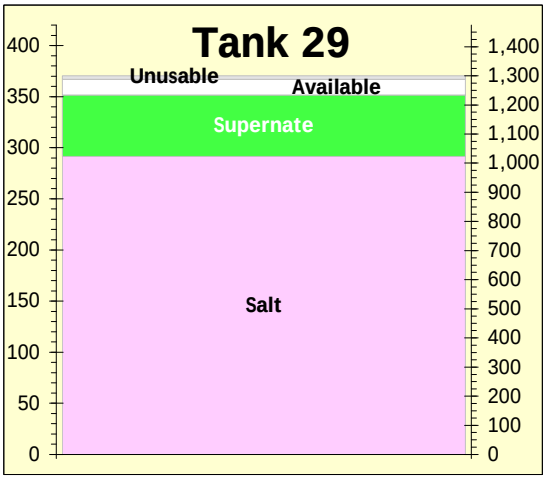
Waste Volume: 1,234,400 gallons

Prime Movers: Fixed Length Jet in Riser C1 (292″)*

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 29 during FY09.





* SW11.1-WTE, Sec 7.2, Rev 44 states an unknown height for this prime mover. The last known recorded height was 292″ (SW11.1-WTE, Sec 7.2, Rev 9).

Tank 30:

Area: H-Area (East Hill)

Service: 3H Evaporator Concentrate Receipt Tank

Type: III

Maximum Volume: 1,295,190 gallons

Working Volume: 1,277,640 gallons

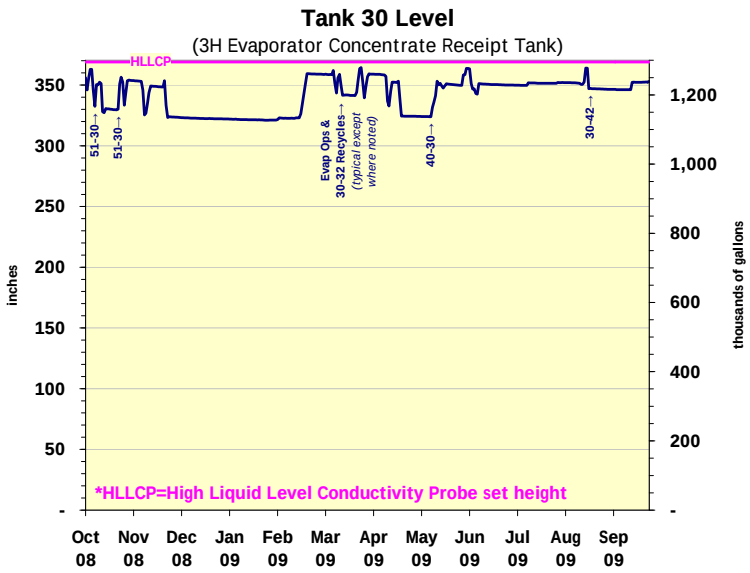
Waste Volume: 1,239,300 gallons

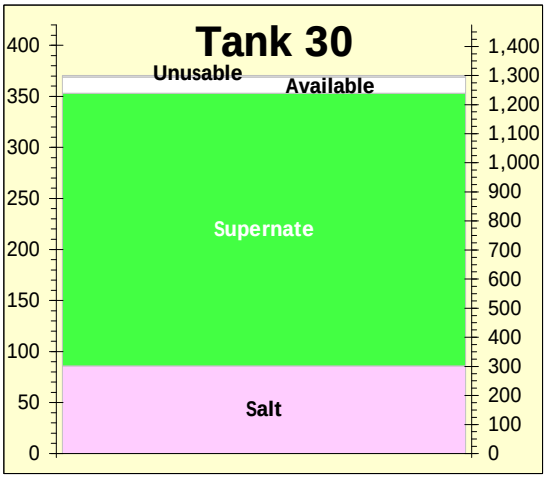
Prime Movers: TTJ in Riser C1 (229.5″ — with a range of 155.5″–263″)

Mixing pumps: None

Discussion: Tank 30 received two SB 6 decants in October totaling 73 kgal. It received 97 kgal from Tank 40 to dewater Tank 40. A Tank 30–Tank 42 3H Evaporator deliquoring transfer of 59 kgal was performed in August. Eighteen Tank 30–Tank 32 recycle transfers totaling 1,875 kgal were made during the year. The average volume in Tank 30 was 1,200.

Comments: Tank 30 will be the 3H Evaporator Concentrate Receipt Tank during the processing of SB 6 decants.





Tank 31:

Area: H-Area (East Hill)

Service: Inactive Waste Tank

Type: III

Maximum Volume: 1,288,170 gallons

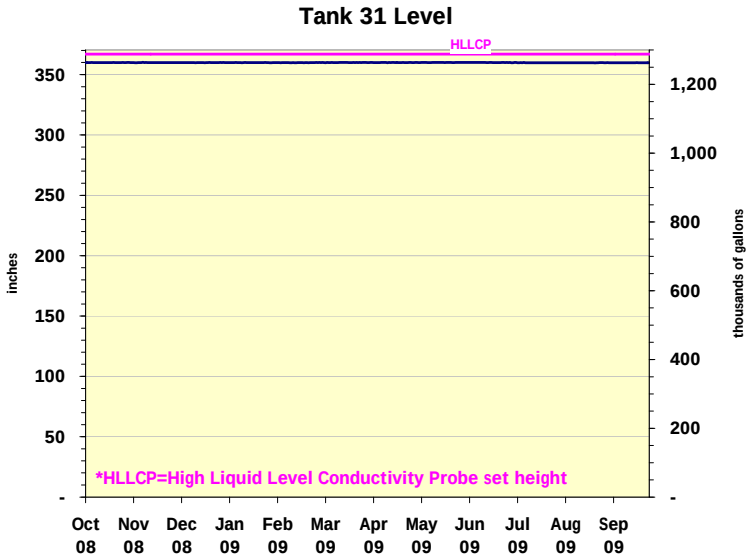
Working Volume: 1,270,620 gallons

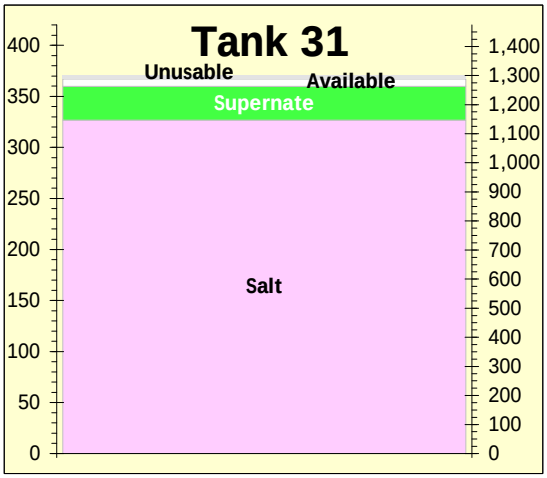
Waste Volume: 1,263,100 gallons

Prime Movers: Fixed Length Jet in Riser C1 (268″)*

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 31 during FY09.





* SW11.1-WTE, Sec 7.2, Rev 44 states an unknown height for this prime mover. The last known recorded height was 268″ (SW11.1-WTE, Sec 7.2, Rev 9).

Tank 32:

Area: H-Area (East Hill)

Service: 3H Evaporator Feed Tank

Type: IIIA

Maximum Volume: 986,310 gallons

Working Volume: 968,760 gallons

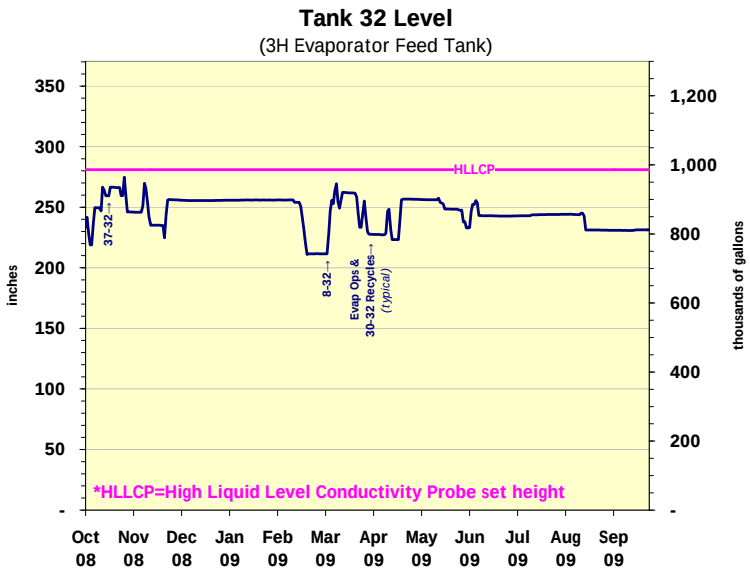
Waste Volume: 811,930 gallons

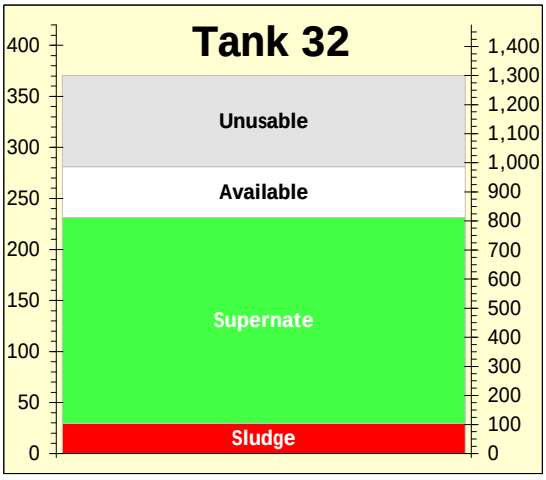
Prime Movers: Fixed Length Jet in the C1 Riser (60″)*

Fixed Length Evaporator Feed Pump in the C2 Riser (89″)

Mixing pumps: None

Discussion: Tank 32 is the 3H Evaporator Feed Tank. A Tank 37–Tank 32 transfer of 25 kgal was made in October. Tank 32 also received feed from Tank 8 (168 kgal) in February. Eighteen Tank 30–Tank 32 recycle transfers totaling 1,875 kgal were made during the year. The average volume in Tank 32 was 861 kgal.





* SW11.1-WTE, Sec 7.2, Rev 44 states an unknown height for this prime mover. The last known recorded height was 60″ (SW11.1-WTE, Sec 7.2, Rev 9).

Tank 33:

Area: F-Area

Service: 2F Evaporator Liquor Storage Tank

Type: III

Maximum Volume: 1,228,500 gallons

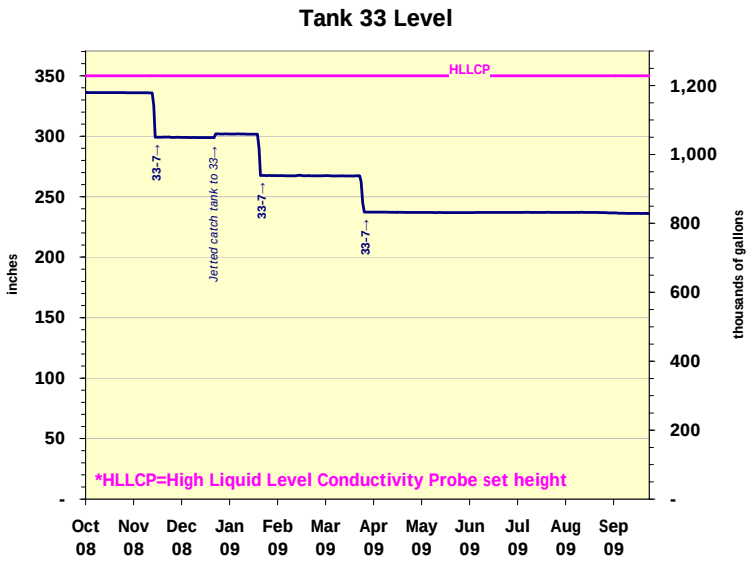
Working Volume: 1,210,950 gallons

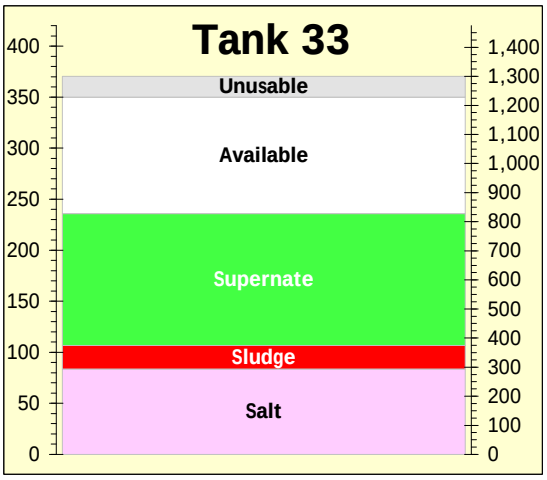
Waste Volume: 828,250 gallons

Prime Movers: TTJ in the C1 Riser (145″ with a range of 89.5″–197″)

Mixing pumps: None

Discussion: There were three transfers to Tank 7 (129 kgal in November, 120 kgal in January, and 123 in March) to provide caustic additions to neutralize the oxalic acid to have been received in Tank 7 from Tank 5 and 6 during chemical cleaning.





Tank 34:

Area: F-Area

Service: Liquor Storage Tank

Type: III

Maximum Volume: 1,140,750 gallons

Working Volume: 1,123,200 gallons

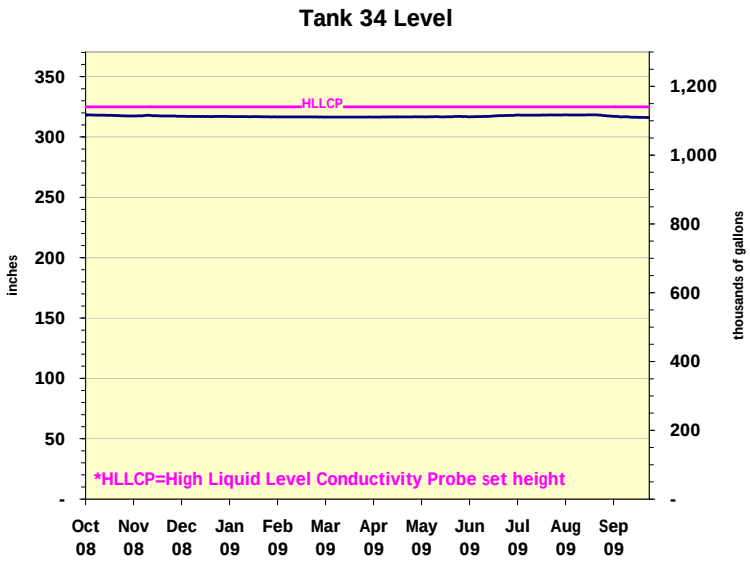
Waste Volume: 1,109,300 gallons

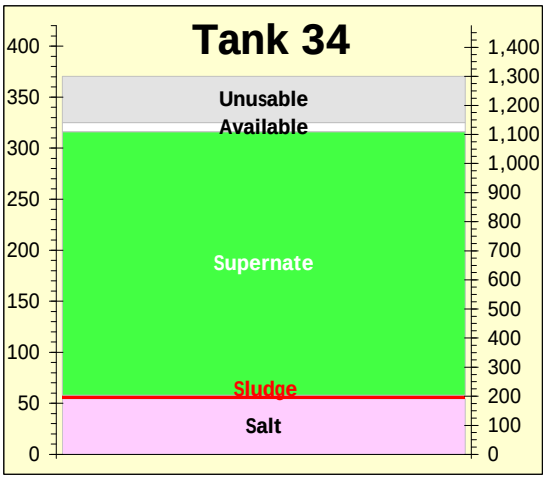
Prime Movers: Fixed Length Jet in the C1 Riser (100.5″)

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 34 during FY09.

Comments: Tank 34 Supernate may provide caustic additions to neutralize oxalic acid used in chemical cleaning.





Tank 35:

Area: H-Area (East Hill)

Service: Active Waste Tank

Type: IIIA

Maximum Volume: 1,214,460 gallons

Working Volume: 1,196,910 gallons

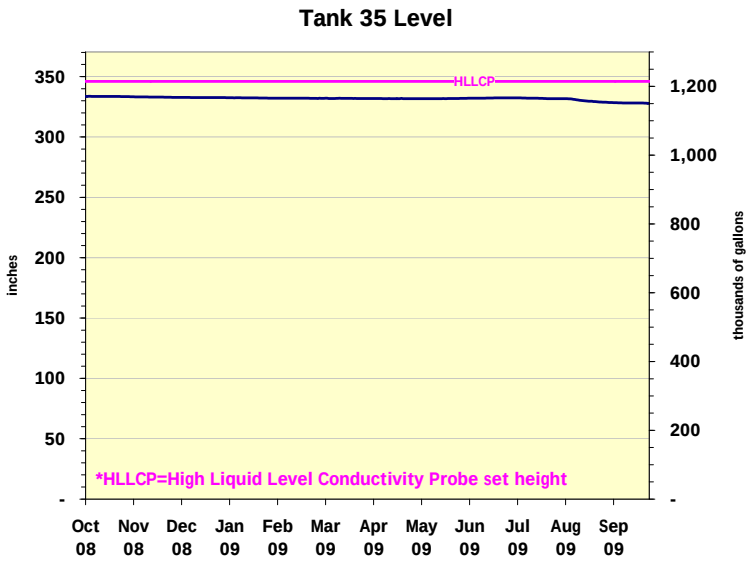
Waste Volume: 1,150,500 gallons

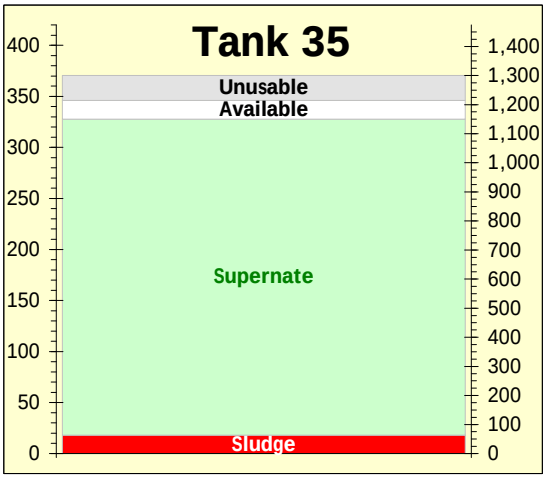
Prime Movers: TTJ in the C1 Riser (130″ with a range of 0″–206.5″)

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 35 in FY09. The volume consists mainly of salt solution from a previous Tank 37 salt removal campaign.

Comments: After conversion of Tank 25 to 2F Evaporator Concentrate Receipt Tank service, Tank 35 waste will be transferred to the 2F Evaporator for volume reduction. The space made available will provide for future Tank 37 salt removal.





Tank 36:

Area: H-Area (East Hill)

Service: Inactive Waste Tank

Type: IIIA

Maximum Volume: 1,288,170 gallons

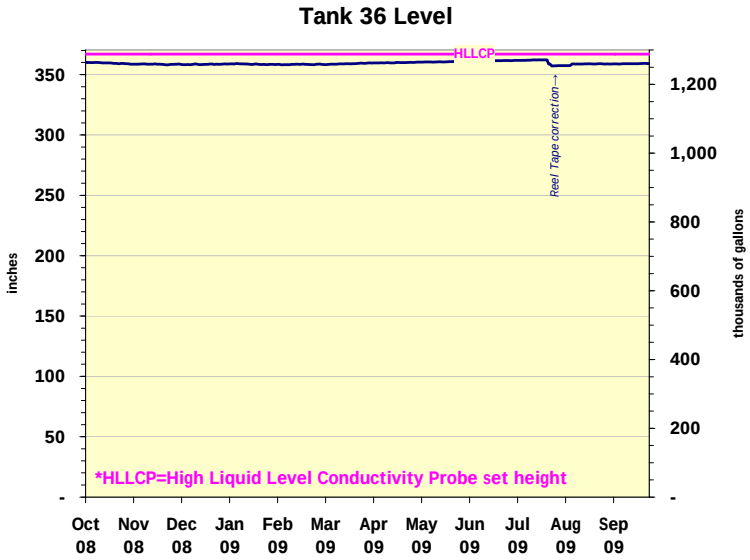
Working Volume: 1,270,620 gallons

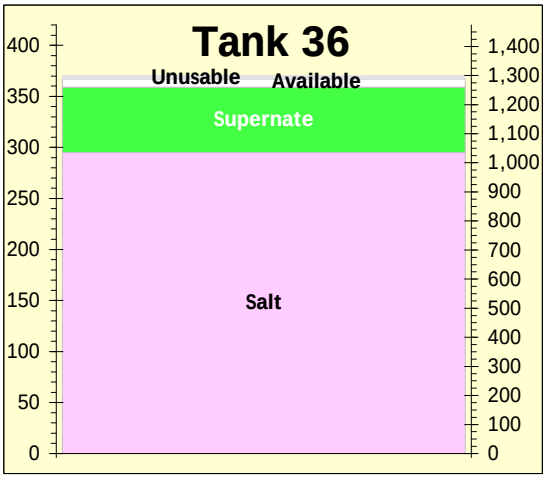
Waste Volume: 1,260,400 gallons

Prime Movers: Fixed Length Jet in the C1 Riser (201″)

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 36 during FY09. In late July a salt deposit affecting the reel tape was removed.





Tank 37:

Area: H-Area (East Hill)

Service: 3H Evaporator Alternate Concentrate Receipt Tank

Type: IIIA

Maximum Volume: 1,298,700 gallons

Working Volume: 1,281,150 gallons

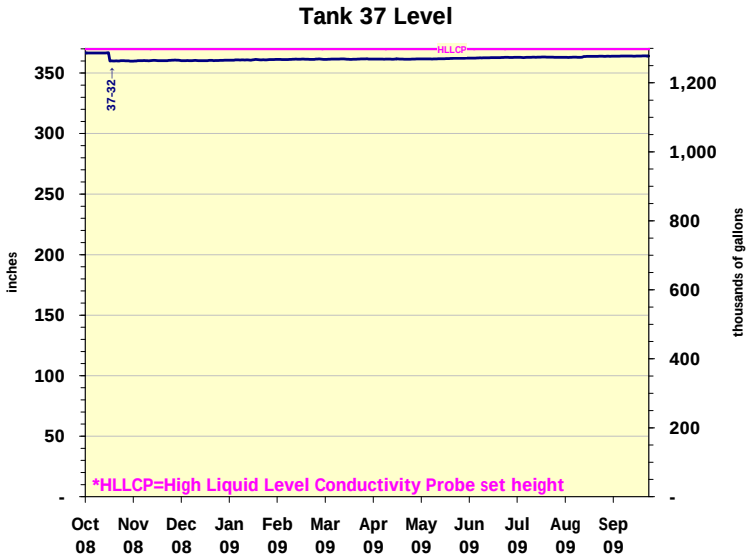
Waste Volume: 1,277,800 gallons

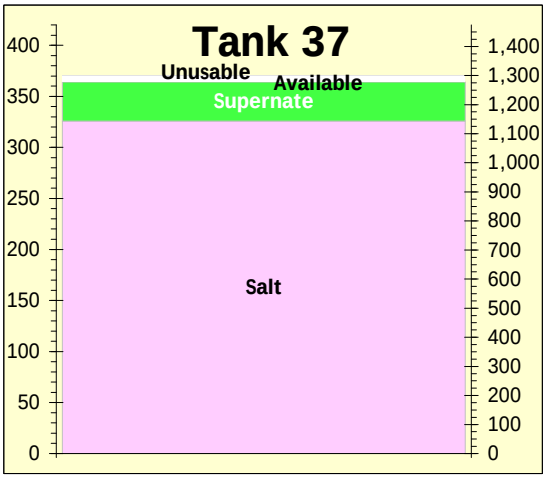
Prime Movers: TTJ in C1 Riser (206″ with a range of 155.5″–267″)

Mixing pumps: None

Discussion: A Tank 37–Tank 32 transfer of 25 kgal in October provided level relief in Tank 37.

Comments: Tank 37 will undergo a salt dissolution campaign to enable a return to Evaporator Concentrate Receipt tank service.





Tank 38:

Area: H-Area (West Hill)

Service: 2H Evaporator Concentrate Receipt Tank

Type: IIIA

Maximum Volume: 1,288,170 gallons

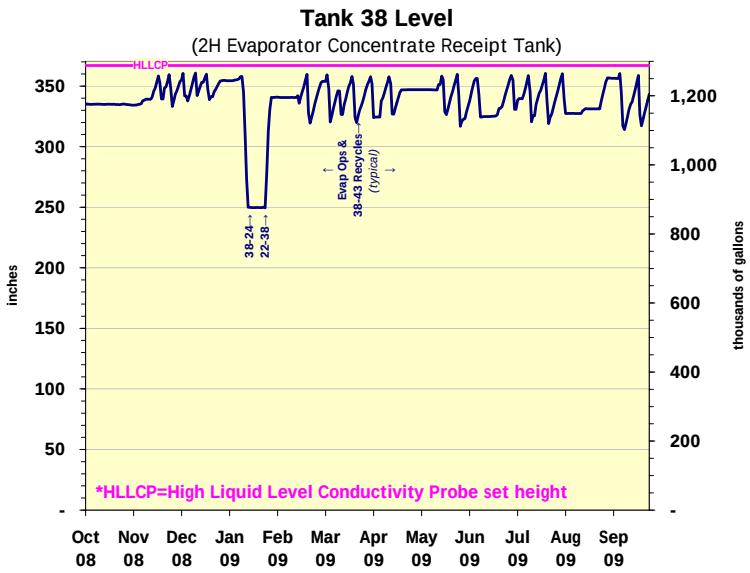
Working Volume: 1,270,620 gallons

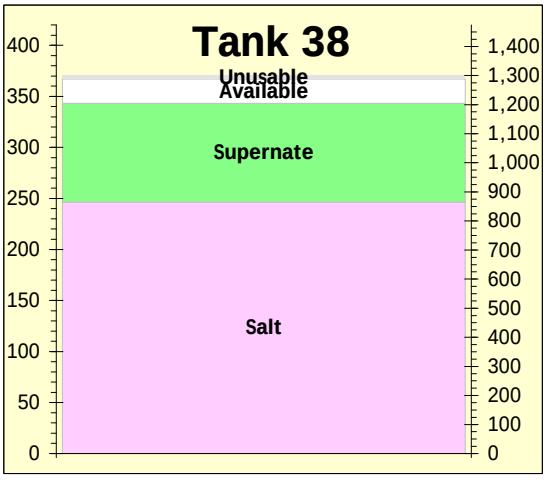
Waste Volume: 1,204,600 gallons

Prime Movers: Fixed Length Jet in C1 Riser (248″)

Mixing pumps: None

Discussion: Tank 38 is the 2H Evaporator Concentrate Receipt Tank with an average volume of 1,271 kgal. A 2H Evaporator deliquoring was performed with the Tank 38–Tank 24 transfer of 397 kgal in January. A Tank 22–Tank 38 transfer of 331 kgal provided feed for the 2H Evaporator. Twenty-two Tank 43–Tank 38 recycle transfers totaling 2,719 kgal were made during the year.





Tank 39:

Area: H-Area (West Hill)

Service: Receipt Tank for H-Canyon (221-H)

Type: IIIA

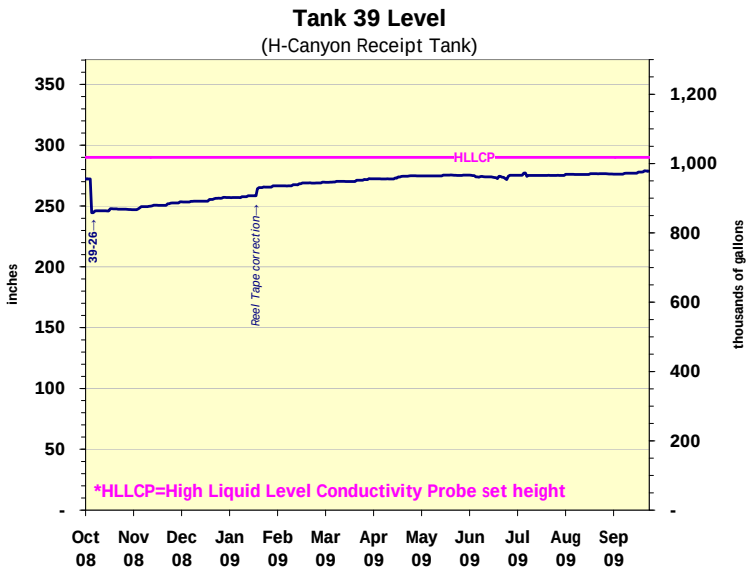
Maximum Volume: 1,017,900 gallons

Working Volume: 1,000,350 gallons

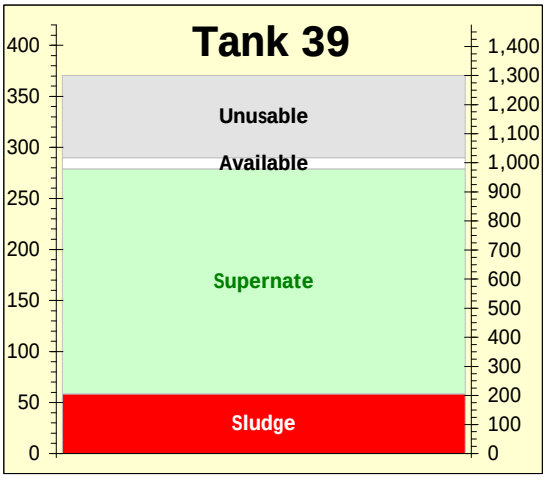
Waste Volume: 978,410 gallons

Prime Movers: Fixed Length Jet in the C1 Riser (75″)

Mixing pumps: None



Discussion: One Tank 39–Tank 26 waste transfer (97 kgal) in October provided feed to the 2F Evaporator System and provided additional H-Canyon receipt space. Tank 39 received approximately 64 kgal of H-Canyon waste and 1.2 kgal of 299-H waste in FY09. The initial volume was 956 kgal with an average volume of 937 kgal.



Comments: Tank 39 will continue to receive H-Canyon waste in the future. Currently H-Canyon forecasts waste transfers to HTF through FY22 in *H-Area Liquid Waste Forecast Through 2019*[14].

Tank 40:

Area: H-Area (West Hill)

Service: DWPF Sludge Feed Tank

Type: IIIA

Maximum Volume: 631,800 gallons

Working Volume: 614,250 gallons

Waste Volume: 373,960 gallons

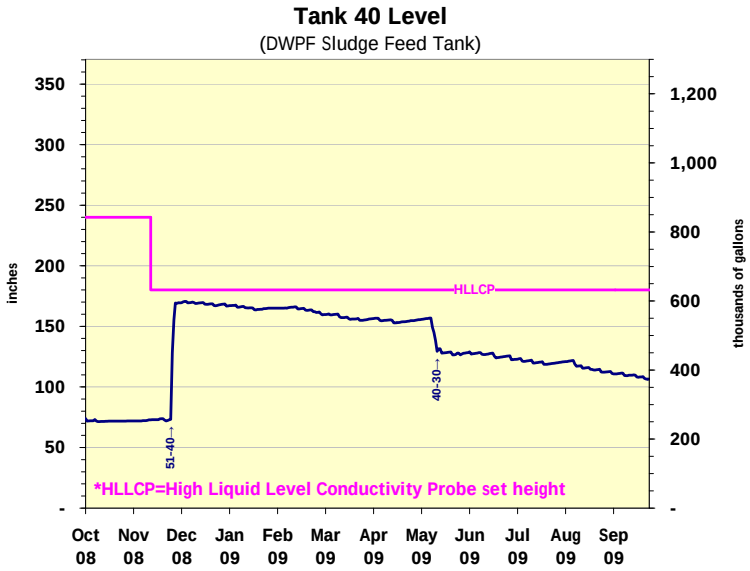
Prime Movers: TTJ in the C1 Riser (123″ with a range of 60″–255″)

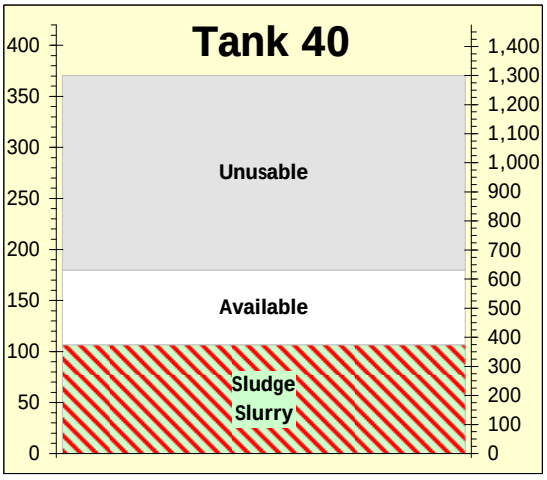
TTP in the B5 Riser (1″)

Mixing pumps: (4) quadvolute Sulzer slurry pumps

Discussion: Sludge Batch 5 (326 kgal) was transferred from Tank 51 to Tank 40 in November to begin processing in DWPF. To remove excess supernate from Tank 40 due to Bearing Water in-leakage, a decant was transferred to Tank 30 from Tank 40 totaling 97 kgal (total removed from Tank 40) in May.

During FY09, Tank 40 transferred 227 kgal of sludge to DWPF through the Low Point Pump Pit (LPPP).





Comments: SB 6 washing and qualification began in FY09.

Tank 41:

Area: H-Area (West Hill)

Service: Dry Salt Removal Tank

Type: IIIA

Maximum Volume: 1,288,170 gallons

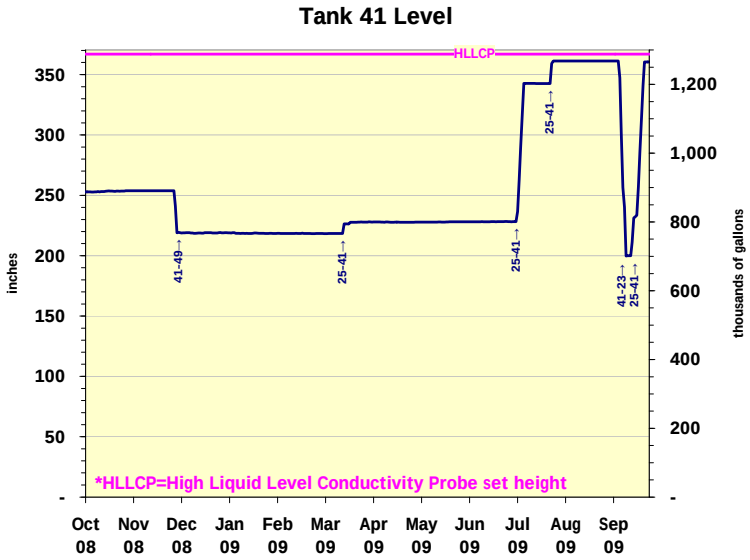
Working Volume: 1,270,620 gallons

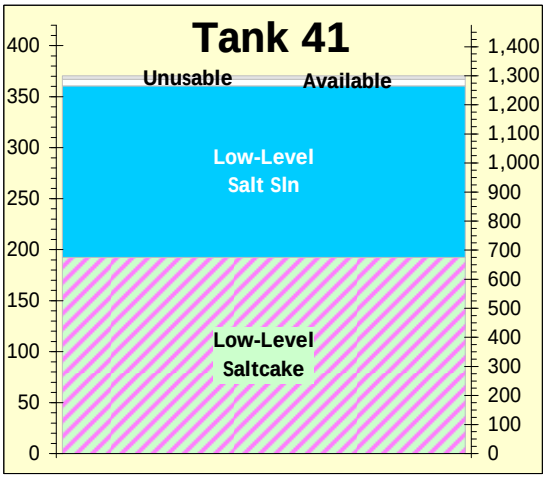
Waste Volume: 1,265,200 gallons

Prime Movers: Salt pump in Riser C1 (113.35″)

Air-diaphragm pump in Riser C3 (250″ — not connected)

Mixing pumps: (3) 2x15 Sulzer slurry pumps (Abandoned in place)





Discussion: Approximately 123 kgal was transferred from Tank 41 to Tank 49 to provide feed for ISDP. Four Tank 25–Tank 41 transfers (40 kgal in March, 346 kgal in May, 102 kgal in July, and 449 kgal in September) were made during the Tank 25 salt dissolution campaign. A Tank 41–Tank 23 transfer of 567 kgal in September provided material for preparation of ISDP Salt Batch #3.

Comments: Additional Tank 25 salt dissolutions into Tank 41 are planned in FY10 to allow Tank 25 to be used as a 2F Evaporator Concentrate Receipt tank.

Tank 42:

Area: H-Area (West Hill)

Service: Active Waste Tank

Type: IIIA

Maximum Volume: 1,263,600 gallons

Working Volume: 1,256,580 gallons

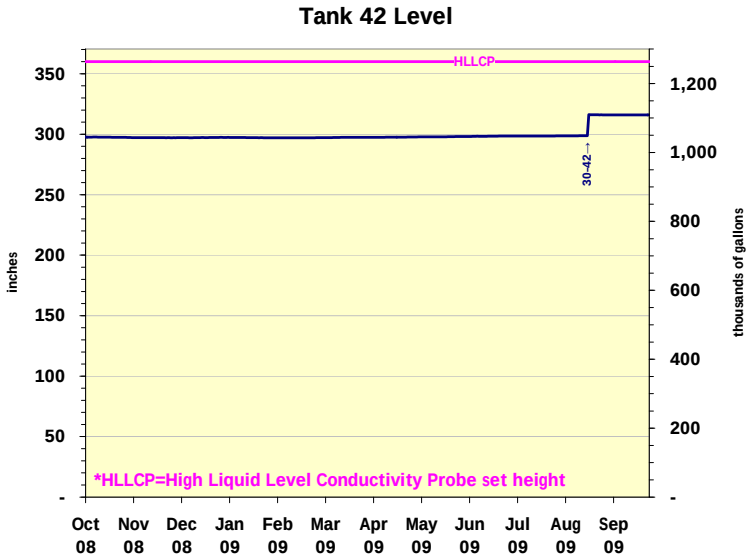
Waste Volume: 1,109,100 gallons

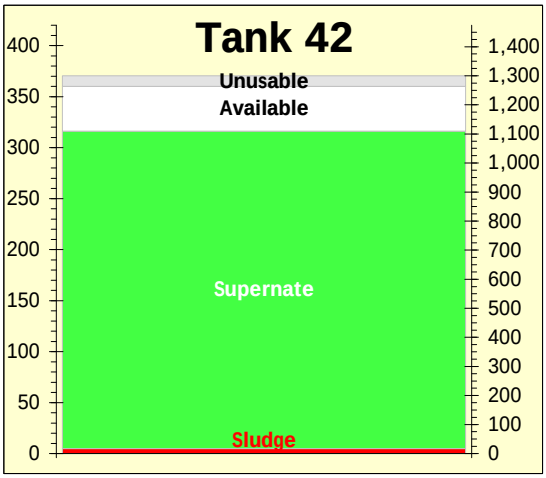
Prime Movers: TTJ in C1 Riser (75″ with a range of 65.5″–236.5″)

TTP in B3 Riser (1″)

Mixing pumps: (4) 2x15 Sulzer slurry pumps

Discussion: Tank 42 received a 59 kgal 3H Evaporator deliquor transfer from Tank 30 in August.





Tank 43:

Area: H-Area (West Hill)

Service: 2H Evaporator Feed Tank

Type: IIIA

Maximum Volume: 1,246,050 gallons

Working Volume: 1,228,500 gallons

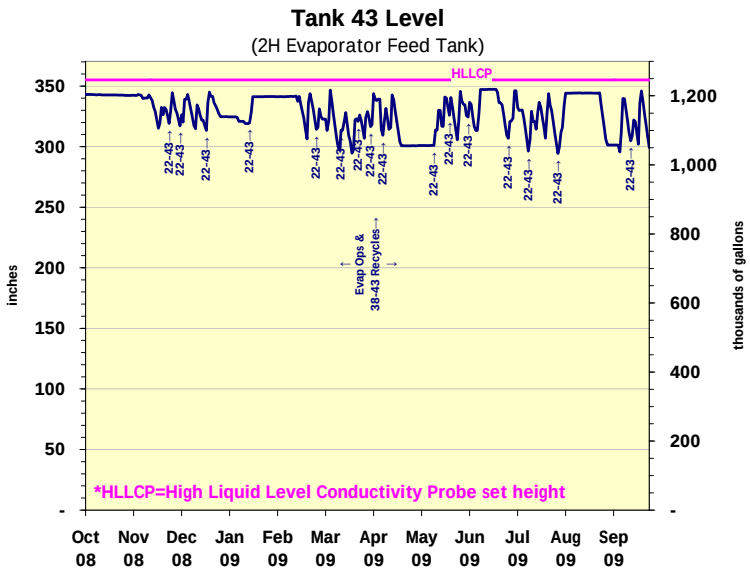
Waste Volume: 1,050,400 gallons

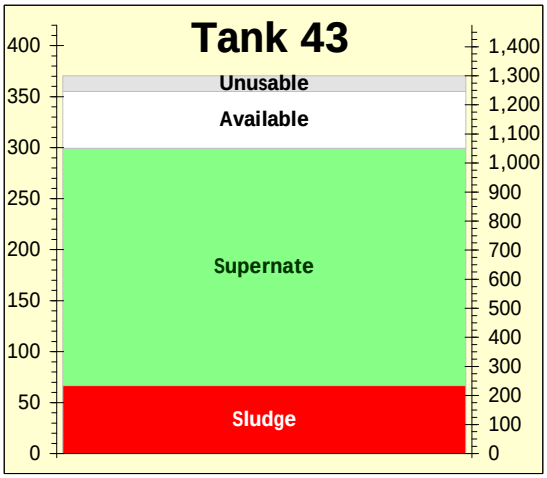
Prime Movers: Fixed Length Jet in Riser C1 (96″)

Fixed Length Evaporator Feed Pump in Riser R (161″)

Mixing pumps: None

Discussion: Tank 43 is the 2H Evaporator Feed Tank. Twenty-two Tank 38–Tank 43 recycle transfers totaling 2,719 kgal and sixteen Tank 22–Tank 43 evaporator feed transfers totaling 1,782 kgal were made during the year. Its average volume was 1,150 kgal for the year.





Tank 44:

Area: F-Area

Service: Inactive Waste Tank

Type: IIIA

Maximum Volume: 1,291,680 gallons

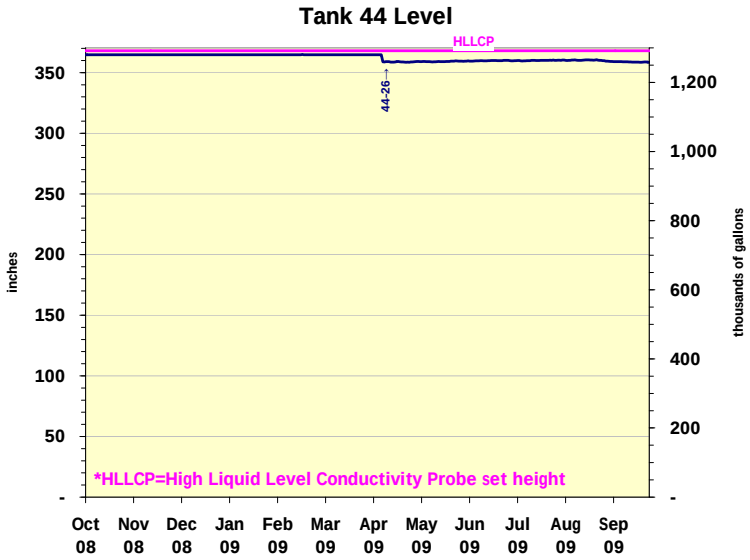
Working Volume: 1,281,150 gallons

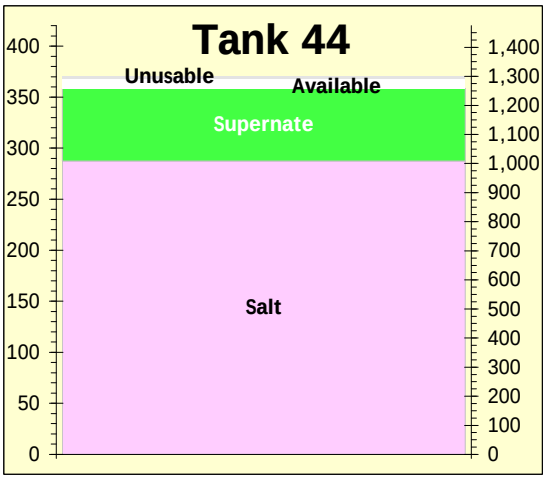
Waste Volume: 1,258,200 gallons

Prime Movers: Fixed Length Jet in Riser C1 (60″)

Mixing pumps: None

Discussion: A 21 kgal Tank 44–Tank 26 transfer in April provided level relief.





Tank 45:

Area: F-Area

Service: Inactive Waste Tank

Type: IIIA

Maximum Volume: 1,291,680 gallons

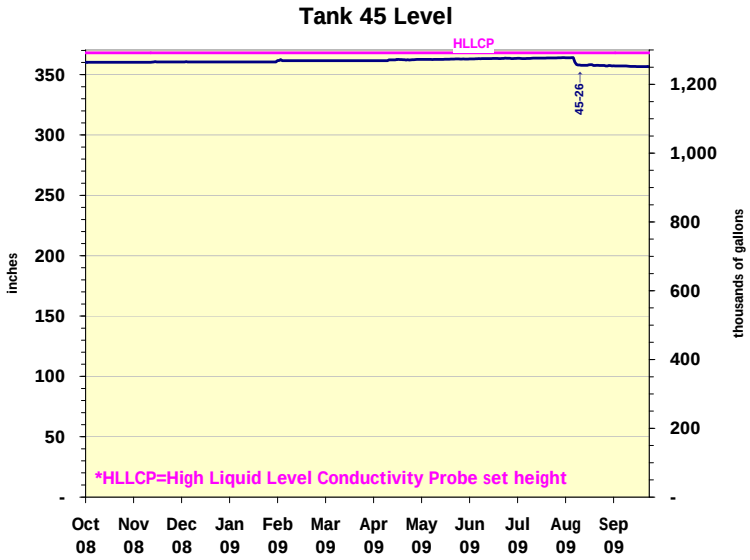
Working Volume: 1,274,130 gallons

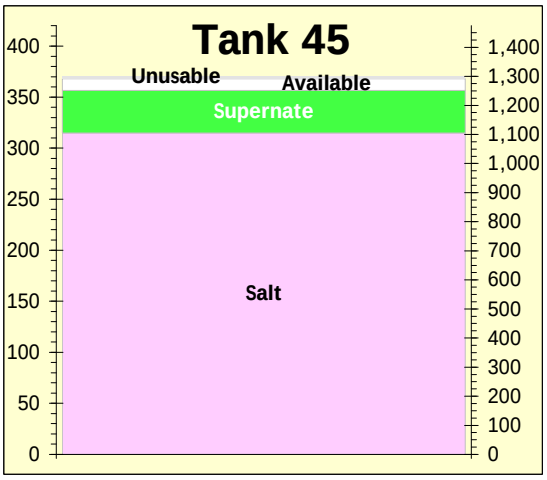
Waste Volume: 1,251,500 gallons

Prime Movers: Fixed Length Jet in Riser C1 (60″)

Mixing pumps: None

Discussion: A 20 kgal Tank 45–Tank 26 transfer in August provided level relief.





Tank 46:

Area: F-Area

Service: Active Waste Tank

Type: IIIA

Maximum Volume: 1,288,170 gallons

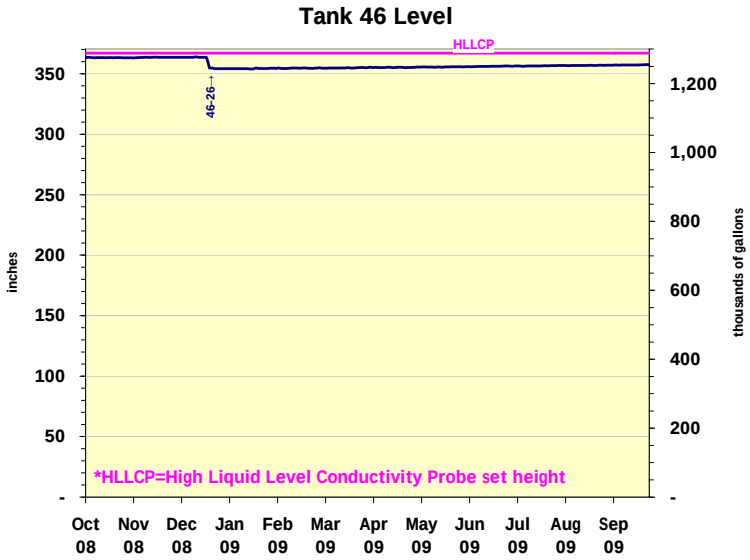
Working Volume: 1,277,640 gallons

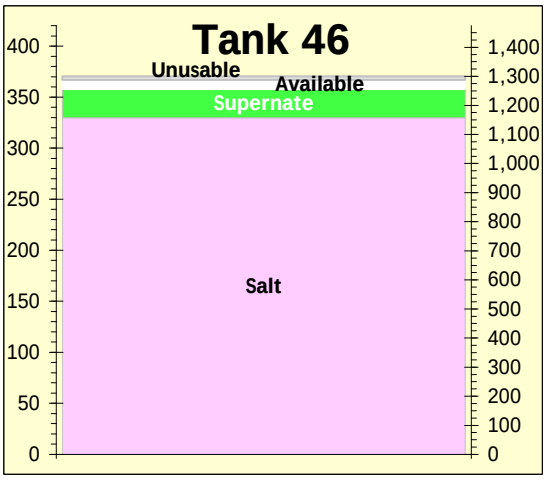
Waste Volume: 1,254,200 gallons

Prime Movers: Fixed Length Jet in Riser C1 (200″)

Mixing pumps: None

Discussion: A 31 kgal Tank 46–Tank 26 transfer in August provided level relief.





Tank 47:

Area: F-Area

Service: 2F Evaporator Concentrate Receipt Tank

Type: IIIA

Maximum Volume: 1,288,170 gallons

Working Volume: 1,270,620 gallons

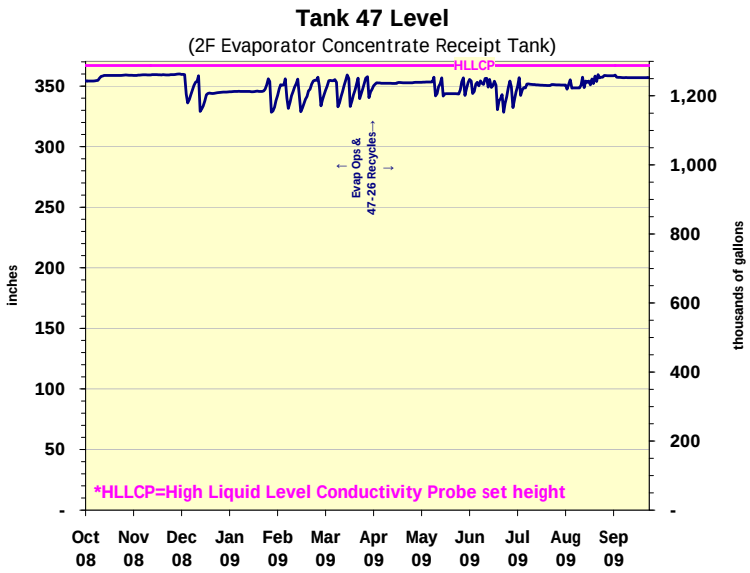
Waste Volume: 1,253,200 gallons

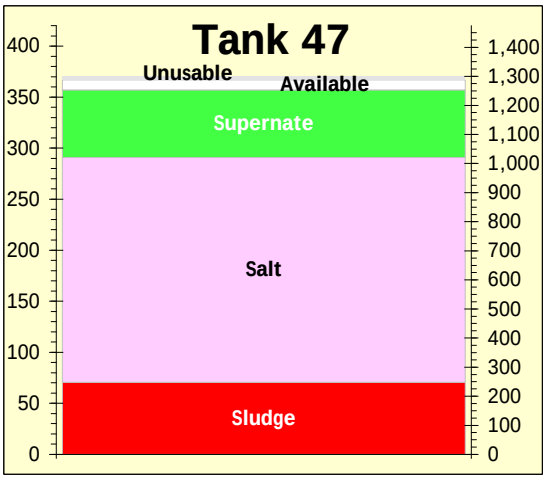
Prime Movers: Fixed Length Jet in Riser C1 (313″)

Mixing pumps: None

Discussion: Tank 47 returned to service as the Concentrate Receipt Tank. Twenty-nine Tank 47–Tank 26 recycle transfers totaling 2,321 kgal were made during the year. The average volume in Tank 47 was 1,231 kgal for FY09.

Comments: Tank 47 is to be replaced by Tank 25 as the 2F Evaporator Concentrate Receipt Tank in FY10. Although the salt level is 220″, salt mounding is impeding the effective operation of the reel tape, impacting evaporator operations.





Tank 48:

Area: H-Area (West Hill)

Service: Precipitate Storage Tank

Type: IIIA

Maximum Volume: 852,930 gallons

Working Volume: 333,450 gallons

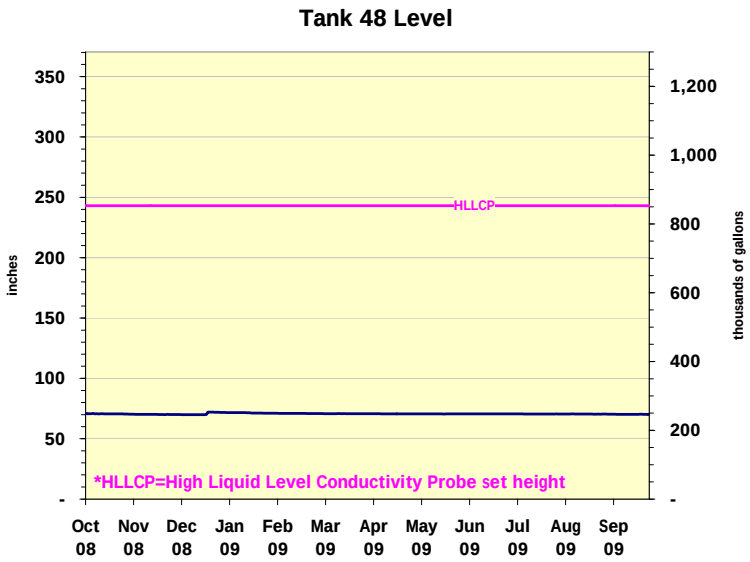
Waste Volume: 246,350 gallons

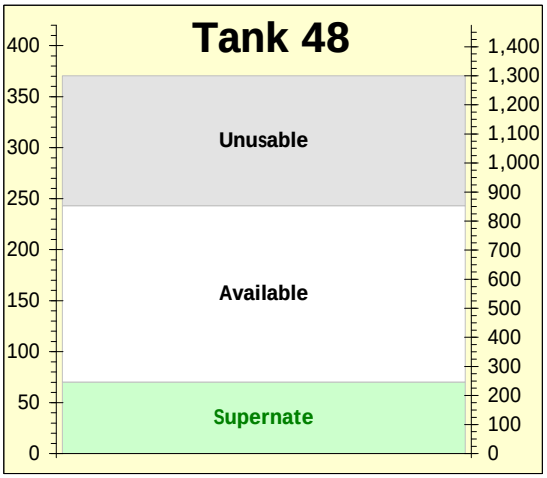
Prime Movers: TTP in Riser B5 (2″)

Mixing pumps: (4) quadvolute Sulzer slurry pumps

Discussion: There were no transfers into or out of Tank 48 during FY09.

Comments: The waste in Tank 48 currently contains sodium tetraphenylborate (NaTPB). An inert nitrogen blanket (N_2) is maintained in the tank vapor space to mitigate flammability hazards.





Tank 49:

Area: H-Area (West Hill)

Service: ARP/MCU Feed Tank

Type: IIIA

Maximum Volume: 1,288,170 gallons

Working Volume: 1,270,620 gallons

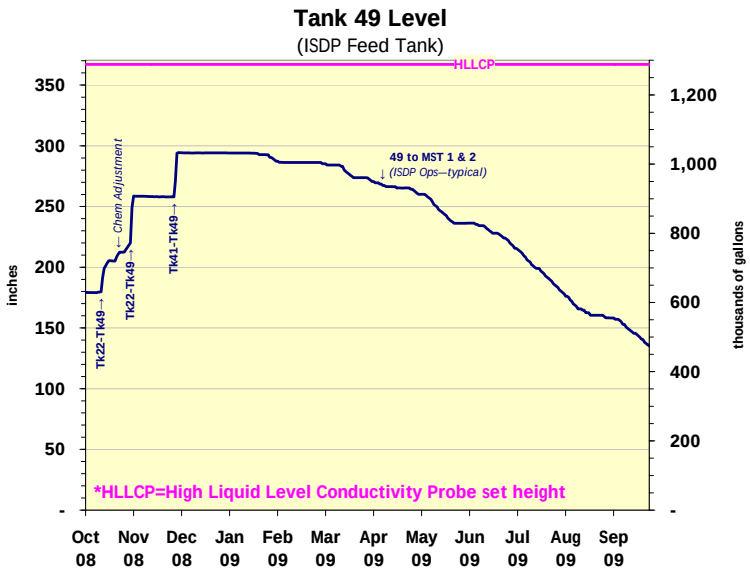
Waste Volume: 474,100 gallons

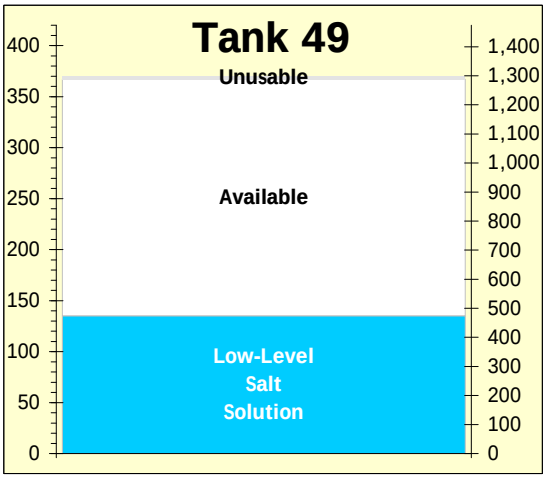
Prime Movers: TTP in Riser B3 (2″)
Fixed length TTP in Riser B5 (38″)

Mixing pumps: (1) quadvolute Sulzer slurry pump

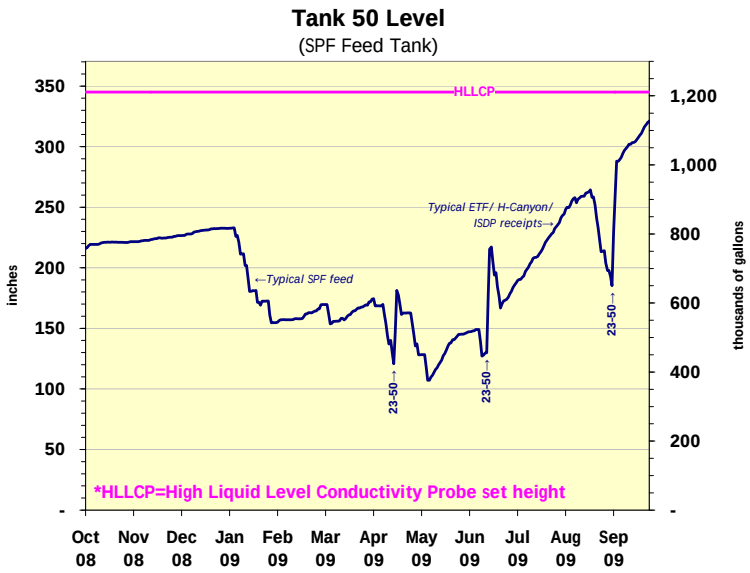
Discussion: Two Tank 22–Tank 49 transfers in October, totaling 197 kgal and a 123 kgal Tank 41–Tank 49 transfer provided ISDP Salt Batch #2 makeup. Tank 49 began transferring Salt Batch #2 materials to the ISDP facility on January 20, 2009. ISDP received 560 kgal from Tank 49 for the year.

Comments: Tank 49 will continue to provide feed for the ISDP facilities in FY10.





Tank 50:



Area: H-Area (West Hill)

Service: SPF Feed Tank (ETP concentrate receipt, ISDP DSS receipt, H-Canyon LLW receipt)

Type: IIIA

Maximum Volume: 1,210,950 gallons

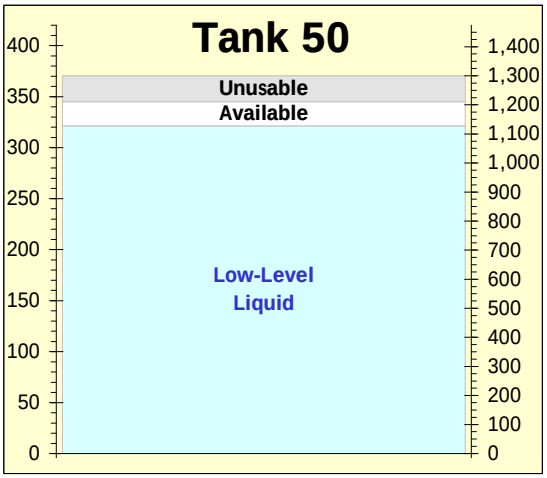
Working Volume: 1,193,400 gallons

Waste Volume: 1,127,300 gallons

Prime Movers: TTP in Riser B5 (3-5/8″)

Mixing pumps: (2) quadvolute Sulzer slurry pumps

(2) 2x15 Sulzer slurry pumps



Discussion: During FY09, the SPF operated necessitating feed transfers from Tank 50 totaling 1,556 kgal.

Tank 50 received DDA material from Tank 23 (199 kgal in April, 410 kgal in June, and 358 kgal in September). Additionally, Tank 50 received 113 kgal of low-level waste from ETP Evaporator bottoms, 121 kgal of H-Canyon LLW including General Purpose (GP) evaporator bottoms, and 718 kgal of Decontaminated Salt Solution (DSS) from ISDP.

Comments: Tank 50 will continue to feed SPF.

Tank 51:

Area: H-Area (West Hill)

Service: Sludge Preparation Tank

Type: IIIA

Maximum Volume: 789,750 gallons

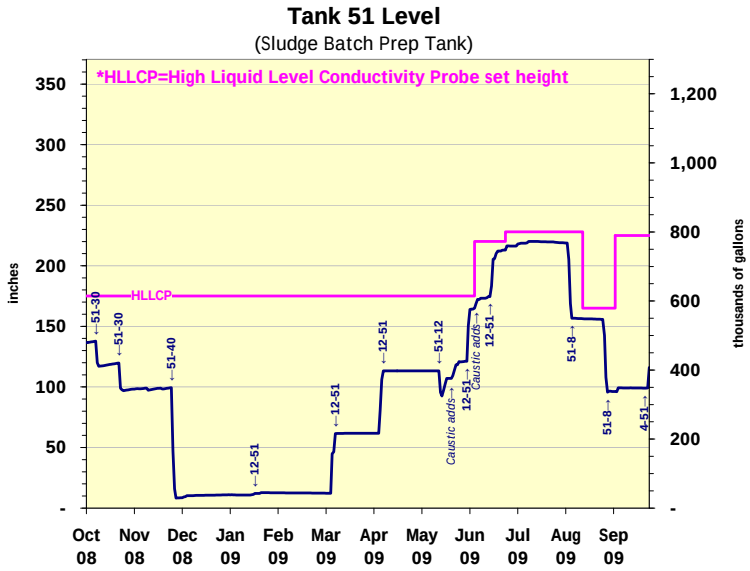
Working Volume: 772,200 gallons

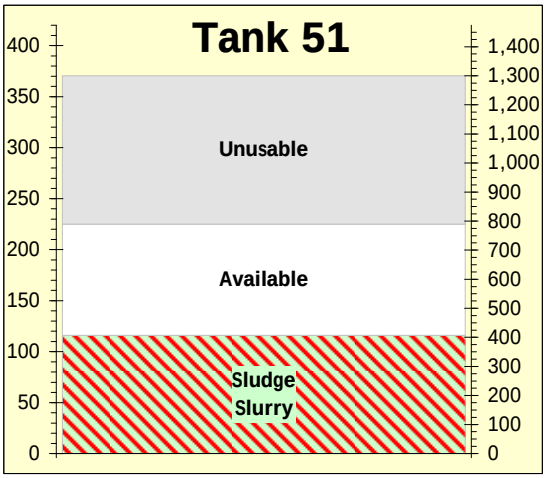
Waste Volume: 407,250 gallons

Prime Movers: TTP in riser B5 (1″)

TTJ in Riser C1 (94.0″ with a range of 60″–255″)

Mixing pumps: (4) quadvolute Sulzer slurry pumps





Discussion: Sludge washing for SB 5 was complete in October with two decants, totaling 135 kgal, to Tank 30 for processing in the 3H Evaporator. SB 5 was transferred to the DWPF Feed Tank, Tank 40 (326 kgal), in November. SB 6 processing began with the transfer of sludge from Tank 12 bulk sludge removal beginning in January. A total of 426 kgal was transferred from Tank 12 in four transfers. After transferring 73 kgal of supernate from Tank 51 back to Tank 12, caustic was added in May and June for aluminum dissolution. Two Tank 51–Tank 8 transfers totaling 428 kgal in August and September moved the aluminum-rich leachate to Tank 8 for storage pending startup of SWPF. Sludge from Tank 4 (136 kgal) was added in September.

Comments: Tank 51 will support preparation of SB 6 during FY10.

4.5 Waste Transfers

During FY09, there were 23 FTF tank-to-tank transfers totaling 2,423 kgal (see Table 4-1 — *Tank-to-Tank Transfers*):

- (14) transfers involving Tanks 5, 6, 7, 8, 26, and 33 totaling 1,824 kgal supported tank closure including heel removal in Tanks 5 and 6 and Sand Mantis operation in Tanks 18 and 19
- (5) transfers to Tank 26 from Tanks 7, 27, 44, 45, and 46, totaling 126 kgal for tank level relief
- (4) transfers from Tank 8 to Tanks 4 and 26, totaling 472 kgal to support Sludge Batch 6 preparation including providing space for aluminum-rich leachate storage in Tank 8.

During FY09, there were 42 HTF tank-to-tank transfers totaling 6,353 (see Table 4-1 — *Tank-to-Tank Transfers*):

- (16) Tank 22–Tank 43 transfers and a Tank 22–Tank 38 transfer provided 2,113 kgal of feed for the 2H Evaporator
- (2) Tank 21–Tank 22 transfers relocated 501 kgal of DWPF recycle to create receipt space in the preferred DWPF recycle receipt tank
- (2) Tank 51–Tank 30 decant transfers and a Tank 51–Tank 40 transfer, totaling 461 kgal, were required to finalize SB 5 and send it to the DWPF Feed Tank
- (9) Tank 12, 24, and 51 transfers totaling 845 kgal provided bulk sludge removal from Tank 12 to Tank 51 for initiation of SB 6 processing
- (2) evaporator deliquor transfers: 2H - Tank 38–Tank 24, 397 kgal; 3H - Tank 30–Tank 42, 59 kgal
- (7) transfers supported the preparation of ISDP material for SPF to process.
  - (3) Tank 23–Tank 50 transfers totaling 967 kgal for SPF feed
  - (2) Tank 22–Tank 49 transfers totaling 197 kgal for ISDP feed
  - a 567-kgal Tank 41–Tank 23 transfer, and
  - a 123-kgal Tank 41–Tank 49 transfer
- a 97 kgal Tank 40–Tank 30 transfer to dewater Tank 40
- a 25 kgal Tank 37–Tank 32 transfer for tank level relief.

During FY09, there were ten inter-area line (IAL) transfers totaling 2,048 kgal (see Table 4-1 — *Tank-to-Tank Transfers*):

- a 97 kgal Tank 39–Tank 26 transfer provided feed to the 2F Evaporator System and space in Tank 39 to support H-Canyon operations
- a 283-kgal Tank 8–Tank 12 and (2) Tank 51–Tank 8 transfers totaling 428 kgal provided for storage of aluminum-rich leachate in support of SB 5 preparation
- a 168-kgal Tank 4–Tank 51 sludge removal transfer in support of SB 5 preparation
- (4) Tank 25–Tank 41 transfers totaling 937 kgal (salt dissolution campaign)
- a 168-kgal Tank 8–Tank 32 transfer supporting tank closure activities

Sixty-nine recycle transfers totaling 6,915 kgal supporting evaporator operation (see Table 4-2 — *Recycle Transfers*):

- (29) Tank 47–Tank 26 transfers totaling 2,321 kgal for the 2F Evaporator
- (22) Tank 38–Tank 43 transfers totaling 2,719 kgal for the 2H Evaporator
- (18) Tank 30–Tank 32 transfers totaling 1,875 kgal for the 3H Evaporator

Table 4-1 — *Tank-to-Tank Transfers*

FTF Transfers

Date	Tank To	Tank From	Volume (gallons)
Oct 10, 2008	7	5	34,959
Oct 11, 2008	7	6	31,165
Nov 8, 2008	8	7	331,108
Nov 14, 2008	7	33	128,817
Nov 21, 2008	7	5	18,780
Nov 22, 2008	7	6	22,430
Nov 25, 2008	4	8	92,888
Dec 3, 2008	8	7	68,571
Dec 12, 2008	26	27	35,135
Dec 19, 2008	26	46	30,939
Dec 23, 2008	7	5	118,043
Jan 18, 2009	8	7	193,639
Jan 21, 2009	7	33	119,867
Feb 3, 2009	7	6	50,135
Feb 27, 2009	26	8	169,646
Mar 25, 2009	8	7	456,298
Mar 28, 2009	7	33	122,513
Mar 30, 2009	7	6	128,109
Apr 11, 2009	26	44	20,885
Jun 5, 2009	26	8	113,881
Jul 14, 2009	26	8	96,028
Aug 13, 2009	26	45	19,516
Sep 4, 2009	26	7	19,923
		Total:	**2,423,275**

Inter-Area Line (IAL) Transfers

Date	Tank To	Tank From	Volume (gallons)
Oct 4, 2008	26	39	97,157
Mar 7, 2009	32	8	167,804
Mar 17, 2009	41	25	39,548
Jul 7, 2009	41	25	345,868
Jul 22, 2009	12	8	283,045
Jul 28, 2009	41	25	101,994
Aug 9, 2009	8	51	217,164
Sep 1, 2009	8	51	210,880
Sep 19, 2009	41	25	449,105
Sep 30, 2009	51	4	135,500
		Total:	**2,048,065**

HTF Transfers

Date	Tank To	Tank From	Volume (gallons)
Oct 8, 2008	30	51	62,759
Oct 12, 2008	49	22	61,171
Oct 17, 2008	32	37	24,886
Oct 23, 2008	30	51	72,446
Oct 31, 2008	49	22	135,794
Nov 21, 2008	43	22	45,747
Nov 26, 2008	40	51	325,667
Nov 28, 2008	49	41	123,131
Dec 2, 2008	43	22	40,250
Dec 15, 2008	22	21	159,831
Dec 18, 2008	43	22	39,780
Jan 11, 2009	24	38	396,930
Jan 16, 2009	43	22	84,570
Jan 18, 2009	51	12	948
Jan 26, 2009	38	22	331,025
Feb 28, 2009	43	22	122,732
Mar 7, 2009	12	24	100,796
Mar 9, 2009	51	12	163,631
Mar 11, 2009	22	21	341,609
Mar 17, 2009	43	22	96,181
Mar 26, 2009	43	22	79,509
Mar 30, 2009	43	22	145,211
Apr 4, 2009	12	24	69,915
Apr 9, 2009	51	12	94,830
Apr 12, 2009	43	22	141,671
Apr 19, 2009	50	23	199,231
May 13, 2009	30	40	97,202
May 15, 2009	43	22	132,466
May 18, 2009	12	51	73,429
May 24, 2009	43	22	92,960
Jun 5, 2009	43	22	124,426
Jun 5, 2009	51	12	166,774
Jun 11, 2009	12	24	50,126
Jun 18, 2009	50	23	410,249
Jun 20, 2009	51	12	124,606
Jul 1, 2009	43	22	118,767
Jul 19, 2009	43	22	177,038
Aug 3, 2009	43	22	207,551
Aug 22, 2009	42	30	59,038
Sep 6, 2009	50	23	357,540
Sep 11, 2009	23	41	567,391
Sep 19, 2009	43	22	133,565
		Total:	**6,353,380**

Table 4-2 — *Recycle Transfers*

2F Recycle Transfers

Date	Tank To	Tank From	Volume (gallons)
Dec 6, 2008	26	47	109,041
Dec 15, 2008	26	47	123,565
Jan 29, 2009	26	47	267,661
Feb 9, 2009	26	47	116,647
Feb 18, 2009	26	47	40,515
Mar 2, 2009	26	47	62,472
Mar 13, 2009	26	47	100,829
Mar 21, 2009	26	47	106,518
Mar 27, 2009	26	47	77,813
Apr 2, 2009	26	47	82,935
May 16, 2009	26	47	82,834
May 21, 2009	26	47	70,250
Jun 4, 2009	26	47	67,610
Jun 8, 2009	26	47	95,728
Jun 13, 2009	26	47	38,047
Jun 15, 2009	26	47	46,917
Jun 19, 2009	26	47	44,391
Jun 21, 2009	26	47	59,616
Jun 24, 2009	26	47	114,111
Jun 29, 2009	26	47	17,388
Jul 4, 2009	26	47	168,558
Jul 10, 2009	26	47	95,928
Jul 13, 2009	26	47	25,114
Aug 11, 2009	26	47	44,805
Aug 20, 2009	26	47	50,821
Aug 22, 2009	26	47	71,360
Aug 26, 2009	26	47	33,131
Aug 28, 2009	26	47	96,715
Sep 10, 2009	26	47	9,512
		Total:	**2,320,832**

2H Recycle Transfers

Date	Tank To	Tank From	Volume (gallons)
Nov 19, 2008	43	38	83,693
Nov 26, 2008	43	38	125,653
Dec 5, 2008	43	38	116,494
Dec 13, 2008	43	38	96,034
Dec 20, 2008	43	38	98,431
Jan 26, 2009	43	38	2,597
Feb 16, 2009	43	38	52,778
Feb 22, 2009	43	38	176,583
Mar 8, 2009	43	38	171,259
Mar 15, 2009	43	38	115,619
Mar 24, 2009	43	38	189,080
Apr 5, 2009	43	38	169,878
Apr 17, 2009	43	38	148,435
May 21, 2009	43	38	120,795
May 31, 2009	43	38	182,623
Jun 13, 2009	43	38	112,460
Jul 6, 2009	43	38	100,307
Jul 16, 2009	43	38	63,585
Jul 27, 2009	43	38	181,496
Aug 8, 2009	43	38	60,577
Sep 15, 2009	43	38	194,254
Sep 25, 2009	43	38	156,546
		Total:	**2,719,177**

3H Recycle Transfers

Date	Tank To	Tank From	Volume (gallons)
Oct 2, 2008	32	30	61,080
Oct 7, 2008	32	30	106,423
Oct 12, 2008	32	30	230,309
Oct 18, 2008	32	30	24,886
Oct 26, 2008	32	30	143,638
Nov 8, 2008	32	30	226,388
Nov 22, 2008	32	30	208,648
Mar 11, 2009	32	30	98,840
Mar 15, 2009	32	30	170,362
Mar 30, 2009	32	30	122,759
Apr 14, 2009	32	30	149,750
Apr 23, 2009	32	30	104,036
May 18, 2009	32	30	23,400
May 21, 2009	32	30	55,793
Jun 5, 2009	32	30	4,507
Jun 8, 2009	32	30	65,156
Jun 11, 2009	32	30	73,861
Aug 18, 2009	32	30	4,739
		Total:	**1,874,575**

4.6 Tank Summary

A full listing of the tanks with their volumes as of September 30, 2009 in inches, gallons, and cubic meters is contained in Table 4-3 — *Waste Summary Chart — Sludge, Salt, Supernate, and HLLCP Setpoint Levels (Sep 30, 2009)*. Additionally, this chart lists the level in inches and gallons of sludge, salt, and supernate as well as the free space between the tank contents and the approved fill level. The HLLCP setpoint indicates the approved fill level and its equivalent volume.

Table 4-3 — *Waste Summary Chart — Sludge, Salt, Supernate, and HLLCP Setpoint Levels (Sep 30, 2009)*

	Tank Level			Sludge		Salt		Supernate		Freeboard		HLLCP		Working Height	
Tank #	(in)	(gallons)	(m^3)	(in)	(kgal)	(in)	(kgal)	(in)	(kgal)	(in)	(kgal)	(in)	(gallons)	(in)	(gallons)
1	180.0	487,800	1,846	2.6	7	177.1	480	0.3	1	30.0	81	210	569,100	205	555,550
2	198.7	538,480	2,038	1.5	4	197.8	536	-	-	11.3	31	210	569,100	205	555,550
3	199.0	539,290	2,041	1.5	4	197.8	536	-	-	11.0	30	210	569,100	205	555,550
4	135.4	366,930	1,389	35.0	95	-	-	100.4	272	39.6	107	175	474,250	170	460,700
5	3.8	10,298	39	1.0	3	-	-	2.8	8	154.2	418	158	428,180	153	414,630
6	4.4	11,924	45	0.9	2	-	-	3.5	10	150.6	408	155	420,050	150	406,500
7	188.3	510,290	1,932	47.3	128	-	-	141.1	382	13.7	37	202	547,420	197	533,870
8	170.0	460,590	1,743	32.6	88	-	-	137.4	372	40.0	109	210	569,100	205	555,550
9	202.8	549,590	2,080	1.0	3	197.0	534	4.8	13	7.2	20	210	569,100	205	555,550
10	79.0	214,090	810	1.0	3	78.0	211	-	-	131.0	355	210	569,100	205	555,550
11	131.3	355,690	1,346	6.7	18	-	-	124.6	338	13.8	37	145	392,950	140	379,400
12	116.7	316,370	1,197	24.1	65	-	-	92.7	251	56.3	152	173	468,830	170	460,700
13	228.2	798,700	3,023	75.2	263	-	-	153.0	535	36.8	129	265	927,500	255	892,500
14	43.1	150,850	571	8.0	28	37.0	130	-	-	56.9	199	100	350,000	95	332,500
15	42.8	149,800	567	42.8	150	-	-	-	-	57.2	200	100	350,000	95	332,500
16	-	-	-	-	-	-	-	-	-	-	-		-		-
17	-	-	-	-	-	-	-		-	-	-		-		-
18	0.8	2,655	10	0.8	3	-	-	-	-	-	-		-		-
19	0.8	2,655	10	0.8	3	-	-	-	-	-	-		-		-
20	-	-	-	-	-	-	-		-	-	-		-		-
21	291.2	1,030,700	3,901	10.1	36	-	-	281.1	995	83.8	297	375	1,327,500	372	1,316,900
22	190.5	674,370	2,553	16.2	57	-	-	174.3	617	184.5	653	375	1,327,500	372	1,316,900
23	226.6	802,340	3,037	24.3	86	-	-	202.4	716	148.4	525	375	1,327,500	371	1,313,300
24	291.6	1,032,300	3,907	1.0	4	-	-	290.6	1,029	83.4	295	375	1,327,500	370	1,309,800
25	196.2	688,730	2,607	-	-	194.1	681	2.1	7	171.8	603	368	1,291,700	363	1,274,100
26	280.2	983,470	3,722	76.1	267	-	-	204.1	716	67.8	238	348	1,221,500	343	1,203,900
27	355.7	1,248,600	4,726	1.1	4	330.1	1,159	24.5	86	4.3	15	360	1,263,600	357	1,253,100
28	349.0	1,225,000	4,637	-	-	293.4	1,030	55.6	195	18.0	63	367	1,288,200	362	1,270,600
29	351.7	1,234,400	4,672	-	-	291.5	1,023	60.2	211	15.3	54	367	1,288,200	362	1,270,600
30	353.1	1,239,300	4,691	-	-	85.8	301	267.3	938	15.9	56	369	1,295,200	364	1,277,600
31	359.9	1,263,100	4,781	-	-	326.7	1,147	33.2	116	7.1	25	367	1,288,200	362	1,270,600
32	231.3	811,930	3,073	29.6	104	-	-	201.8	708	49.7	174	281	986,310	276	968,760
33	236.0	828,250	3,135	22.8	80	83.7	294	129.4	454	114.0	400	350	1,228,500	345	1,211,000
34	316.0	1,109,300	4,199	3.6	13	54.5	191	257.9	905	9.0	31	325	1,140,800	320	1,123,200
35	327.8	1,150,500	4,355	18.0	63	-	-	309.8	1,087	18.2	64	346	1,214,500	341	1,196,900
36	359.1	1,260,400	4,771	-	-	295.0	1,036	64.1	225	7.9	28	367	1,288,200	362	1,270,600
37	364.0	1,277,800	4,836	-	-	325.6	1,143	38.4	135	6.0	21	370	1,298,700	365	1,281,200
38	343.2	1,204,600	4,560	-	-	246.5	865	96.7	339	23.8	84	367	1,288,200	362	1,270,600
39	278.8	978,410	3,703	58.5	205	-	-	220.3	773	11.3	39	290	1,017,900	285	1,000,400
40	106.5	373,960	1,416	106.5	374	-	-	-	-	73.5	258	180	631,800	175	614,250
41	360.5	1,265,200	4,789	-	-	192.3	675	168.2	590	6.5	23	367	1,288,200	362	1,270,600
42	316.0	1,109,100	4,198	5.0	18	-	-	311.0	1,092	44.0	154	360	1,263,600	358	1,256,600
43	299.3	1,050,400	3,976	66.8	234	-	-	232.5	816	55.8	196	355	1,246,100	350	1,228,500
44	358.5	1,258,200	4,762	-	-	287.5	1,009	71.0	249	9.5	33	368	1,291,700	365	1,281,200
45	356.6	1,251,500	4,737	-	-	314.8	1,105	41.8	147	11.4	40	368	1,291,700	363	1,274,100
46	357.3	1,254,200	4,747	-	-	329.8	1,157	27.6	97	9.7	34	367	1,288,200	364	1,277,600
47	357.0	1,253,200	4,743	70.7	248	220.4	773	66.0	232	10.0	35	367	1,288,200	362	1,270,600
48	70.2	246,350	932	-	-	-	-	70.2	246	172.8	607	243	852,930	95	333,450
49	135.1	474,100	1,795	-	-	0.1	0	135.0	474	231.9	814	367	1,288,200	362	1,270,600
50	321.2	1,127,300	4,267	-	-	-	-	321.2	1,127	23.8	84	345	1,211,000	340	1,193,400
51	116.0	407,250	1,541	116.0	407	-	-	-	-	109.0	383	225	789,750	220	772,200
Type I		4,361,342	16,508		420		2,297		1,646		1,785		**Non-Compliant**		
Type II		1,099,350	4,161		441		130		535		528				
Type IV		3,545,020	13,418		188		-		3,357		1,770				
Type III		27,574,550	104,371		2,017		13,590		11,968		4,556		**Compliant**		
FTF		14,031,362	53,109		949		8,952		4,134		2,714				
HTF		22,548,900	85,349		2,118		7,065		13,373		5,925				
Total		**36,580,262**	**138,458**		**3,067**		**16,016**		**17,507**		**8,639**				

4.7 Tank Influents and Effluents

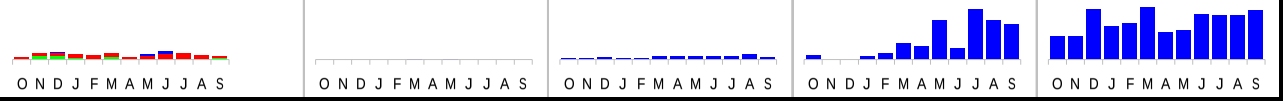
The major influents into the tank farms are H-Canyon Pu to Tank 51 for inclusion in sludge feed to DWPF; H-Canyon HLW and 299-H to Tank 39 for storage and future processing; H-Canyon LLW, ETP, and ISDP DSS to Tank 50 to feed SPF; and DWPF recycle to Tanks 21 and 22 for evaporation. The total waste received from these sources in FY09 was 2,535 kgal (see Table 4-4 — *Tank Farm Influents and Effluents — FY09*).

The major effluents from the tank farms are Evaporator overheads to ETP, Tank 50 to SPF, Tank 49 to ISDP, and Tank 40 to LPPP to feed DWPF. The waste exiting the tank farms from these sources totaled 6,170 kgal in FY09 (see Table 4-4 — *Tank Farm Influents and Effluents — FY09*).

Table 4-4 — *Tank Farm Influents and Effluents — FY09*

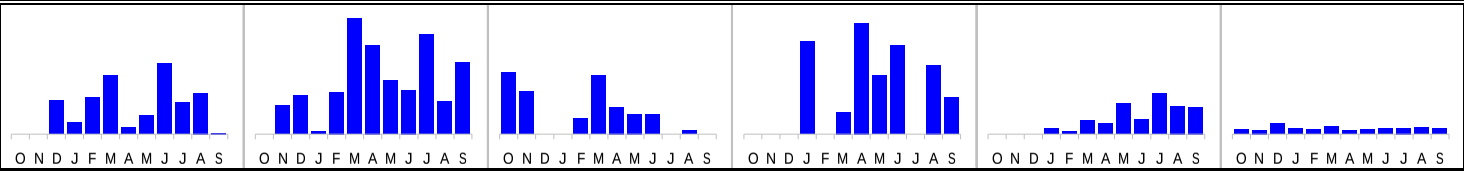
Receipts to Tank Farms (thousands of gallons)

Date	F-Canyon	H-Canyon to Tank 39 (HAW & LAW)	H-Canyon to Tank 50 (LLW/GP Evap)	H-Canyon to Tank 51 (Pu)	299-H to Tank 39	ETP to Tank 50	ISDP to Tank 50	DWPF Recycle to Tanks 21/22	Total
Oct-08	-	4.2	3.8	-	-	5.6	14.7	78	106
Nov-08	-	13.7	7.3	-	-	5.4	-	78	104
Dec-08	-	11.8	10.4	2.0	-	8.0	-	166	198
Jan-09	-	7.5	10.1	-	-	4.6	10.5	109	141
Feb-09	-	3.8	12.2	-	-	5.8	20.8	117	160
Mar-09	-	8.8	10.1	-	0.6	12.7	52.4	172	257
Apr-09	-	3.1	4.7	-	-	11.6	44.0	90	153
May-09	-	1.9	9.5	4.6	0.6	11.3	130.1	96	254
Jun-09	-	-	18.3	7.9	-	13.2	39.0	149	227
Jul-09	-	3.1	18.1	-	-	10.5	163.3	145	340
Aug-09	-	1.9	10.7	-	-	17.2	127.8	144	301
Sep-09	-	4.4	5.2	-	-	6.8	115.4	161	293
FY09 Total	**-**	**64.4**	**120.5**	**14.5**	**1.2**	**113**	**718**	**1,503**	**2,535**



Effluents from Tank Farms (thousands of gallons)

Date	Overheads to ETP 2F	Overheads to ETP 2H	Overheads to ETP 3H	Tank 50 to SPF	Tank 49 to ISDP	Tank 40 to LPPP (DWPF)	Total
Oct-08	-	-	200	-	-	16	216
Nov-08	-	93	139	-	-	14	246
Dec-08	109	125	-	-	-	34	268
Jan-09	38	8	-	301	18	18	383
Feb-09	119	136	51	-	7	16	330
Mar-09	190	377	191	72	44	25	899
Apr-09	20	290	87	361	33	12	804
May-09	61	175	66	190	99	15	606
Jun-09	230	144	63	289	47	18	790
Jul-09	103	323	-	-	132	20	577
Aug-09	134	106	12	225	91	22	591
Sep-09	4	232	-	119	88	19	462
FY09 Total	**1,007**	**2,011**	**809**	**1,556**	**560**	**227**	**6,170**



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