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Retention: Permanent

SRR Operations Performance Fiscal Year 2015 Summary

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Acronyms

AIV	A utomatic I solation V alve	SCDHEC	S outh C arolina D epartment of H ealth and E nvironmental C ontrol
ARP	A ctinide R emoval P rocess		
BFV	B ack F lush V alve		
BWRE	B ulk W aste R emoval E fforts	SDF	S altstone D isposal F acility
CSSX	C austic S ide S olvent E xtraction	SDU	S altstone D isposal U nit
DOE-SR	D eartment of E nergy – S avannah R iver O perations O ffice	SMP	S ubmersible M ixing P ump
DSS	D econtaminated S alt S olution	SPF	S altstone P roduction F acility
DSSHT	D econtaminated S alt S olution H old T ank	SRNL	S avannah R iver N ational L aboratory
DWPF	D efense W aste P rocessing F acility	SRR	S avannah R iver R emediation L LC
EPA	E nvironmental P rotection A gency	SRS	S avannah R iver S ite
ER	E nvironmental R estoration	STP	S ubmersible T ransfer P ump
ETF	E ffluent T reatment F acility	SWPF	S alt W aste P rocessing F acility
FFA	F ederal F acilities A greement	TCLP	T oxicity C haracteristic L eaching P rocedure
FMC	F our M ile C reek	TTJ	T elescoping T ransfer J et
FTF	F - T ank F arm	TTP	T elescoping T ransfer P ump
FW	F lush W ater	UTRC	U pper T hree R uns C reek
FY	F iscal Y ear	WD	W aste D etermination
GDL	G ravity D rain L ine	WW	W ell W ater
GP	H - C anyon G eneral P urpose E vaporator		
HDB	H - 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		
IAL	I nter- a rea L ine		
IW	I nhibited W ater		
kgal	thousand g allons		
LLW	L ow L evel W aste		
LPPP	L ow P oint P ump P it		
LTAD	L ow T emperature A luminum D issolution		
LW	L iquid W aste		
MCU	M odular C SSX U nit		
MFT	M elter F eed T ank		
SB	S ludge B atch		

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1.0 Executive Summary

This report summarizes the performance of Savannah River Remediation LLC (SRR) facilities at the Savannah River Site (SRS) during Fiscal Year (FY) 2015. SRR seeks to maximize utilization of the SRR facilities, including Tank Farms, Evaporators, Defense Waste Processing Facility (DWPF), Saltstone Production Facility (SPF) / Saltstone Disposal Facility (SDF), Actinide Removal Process & Modular CSSX Unit (ARP/MCU), and Effluent Treatment Facility (ETF), to meet company objectives.

Tank Farms Waste Storage

The total volume of the Tank Farms, , decreased 430 thousand gallons (kgal) to 36,040 kgal at the end of FY15 from 36,470 kgal at the end of FY14. The maximum for FY15 was 37,160 kgal on May 27 and the minimum was 35,980 kgal on September 20.

Tank Farms Type III Tank Usable Space

The volume of Type III Tank usable space, , decreased 95 kgal to 1,743 kgal at the end of FY15 from 1,838 kgal at the end of FY14. Usable 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 minus 1,300 kgal reserved for contingency space. Processing Tanks 40 (DWPF Sludge Feed Tank), 48 (Precipitate Storage Tank), and 50 (SPF Feed Tank) are excluded from Type III Tank usable space.

Tank Farms Waste Transfers

During FY15, the Tank Farms performed 87 tank-to-tank (15,367 kgal) transfers. Of these transfers, 48 (7,351 kgal) supported space management and 39 (8,016 kgal) were recycle transfers supporting evaporator operation.

Tank Closure

On September 23, 2015, Tank 16 was operationally closed and grouting was complete.

Evaporators

During FY15, the 2H and 3H Evaporator Systems recovered 2,711 kgal. This performance allowed H-Canyon to meet its objectives, tank closure activities to remain on schedule, DWPF to maintain canister production, and Sludge Batch (SB) preparations to proceed as scheduled.

Actinide Removal Process & Modular CSSX Unit (ARP/MCU)

The ARP/MCU processed 753 kgal of Tank 49 salt feed, , in FY15 for a total 5,378 kgals since startup. ARP/MCU completed Salt Batch #7 (696 kgal of Tank 49 salt solution in FY15) and began processing Salt Batch #8.

Defense Waste Processing Facility (DWPF)

In FY15, DWPF poured and leak checked 93 canisters, containing both salt waste from ARP/MCU and sludge waste from SB #8. At the end of FY15, the total since DWPF began operations was 3,970 canisters.



Saltstone Production Facility/Saltstone Disposal Facility (SPF/SDF)

The SPF processed 828 kgal, of Tank 50 material in FY15. The Tank 50 material includes low-level waste from H-Canyon, ETF Evaporator bottoms, and Decontaminated Salt Solution (DSS) from ARP/MCU.



Effluent Treatment Facility (ETF)

In FY15, ETF received:

- 1,341 kgal from H-Canyon
- 3,450 kgal from H-Tank Farm evaporators
- 148 kgal from F-Canyon and Central Laboratory
- 11 kgal via truck from: Savannah River National Laboratory (SRNL) and Environmental Restoration (ER).

ETF effluents include:

- 47,357 kgal of basin water released to Four-Mile Creek (FMC) without having to be processed in the facility proper
- 7,607 kgal of treated water released to Upper Three-Runs Creek (UTRC)
- 44 kgal of Low Level Waste (LLW) Concentrate transferred to Tank 50 for disposition at SPF.

2.0 Introduction

This report summarizes SRR facilities performance during FY15. The System Planning group goal is to maximize utilization of the SRR facilities, including Tank Farms, Evaporators, DWPF, SPF/SDF, ARP/MCU, and ETF 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.

Programmatic Objectives

Maintaining evaporator tank space and transfer system health and operations of the major SRR facilities supports the major programmatic and contract objectives for SRR. These objectives, as outlined in the *Liquid Waste (LW) System Plan — Revision 19*¹, are:

- Continue storing liquid radioactive wastes in a safe and environmentally sound manner
- Optimize program life cycle cost and schedule to minimize extension of the remaining time-at-risk associated with legacy high level waste storage in aging tanks
- 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, the *Section 3116 Determination for Closure of F-Tank Farm at the Savannah River Site*⁴, the *Basis for Section 3116 Determination for Closure of F-Tank Farm at the Savannah River Site*⁵, and future Waste Determination (WD) and Basis documents for H-Tank Farm
- Comply with applicable permits and consent orders, including the Modified Class 3 Landfill Permit for the SRS Z-Area Saltstone Disposal Facility (permit ID 025500-1603) and State-approved area-specific General Closure Plans
- Provide tank space to support staging of salt solution adequate to feed ARP/MCU and Salt Waste Processing Facility (SWPF)
- Sustain sludge vitrification in the DWPF
- 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 *Basis for Section 3116 Determination for Salt Waste Disposal at the Savannah River Site*³ and *Savannah River Site – Liquid Waste Disposition Processing Strategy*⁶, as amended by letter from the South Carolina Department of Health and Environmental Control (SCDHEC) to Department of Energy – Savannah River Operations Office (DOE-SR)⁷
- Support continued nuclear material stabilization of legacy materials in H-Canyon.

Major Activities

Tank Farms

- **Tank Closure**
 - Completed grouting of Tank 16
 - Completed field activities for grout preparations per Federal Facility Agreement (FFA) milestone of 9/30/2015 for Tank 12.
- **Evaporation**
 - Completed mechanical cleaning on the 2H Evaporator
- **DWPF Recycle Receipts**
 - Managed tank space in Tank 22 to support DWPF recycle receipt
- **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 LLW receipts)
- **Sludge Batch Preparation**
 - Continued preparation of SB #9
- **Salt Batch Preparation**
 - Completed qualification of Salt Batch #8
 - Initiated preparation of Salt Batch #9
 - Managed tank space in Tank 49 to support processing of Salt Batch #7 and #8
 - Managed tank space in Tank 50 to support successful DSS processing in SPF.

ARP/MCU

- Completed processing of Salt Batch #7
- Initiated processing of Salt Batch #8
- Resolved concerns with unanticipated mercury (Hg) levels detected in Saltstone.

DWPF

- Continued processing of SB #8
- Poured and leak checked 93 canisters of salt and sludge waste.
- Resolved flammability concerns with the use of anti-foam.

SPF/SDF

- Continued filling of SDU-5
- Physical construction of SDU-6 is complete (project is 77% complete)
- Clean cap two (2) Vault 4 cells
- After processing 3.2 Mgal of salt solution since the mixer was replaced as part of the ELAWD project, mixer paddles were replaced and reconfigured for improved operation.

3.0 Overall Performance

3.1 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 FY15, the total volume within the tanks decreased to 36,044 kgal from 36,466 kgal.

Table 3-1 — *Total Tank Farm Volume*

(thousands of gallons)

Total Tank Farm Volume: September 30, 2014	36,466
Space Recovery & Effluents	
2H Evaporator Space Recovery	1,531
3H Evaporator Space Recovery	1,180
Tank 49→ARP/MCU	753
Tank 40→DWPF	131
Tank 50→SPF	828
Tank 41, 45, 46, & 47 Reel Tape Adjustment	43
Total Space Recovery & Effluents	4,466
Influents & Waste Receipts	
H-Canyon Receipts to Tank 39	22
H-Canyon Receipts to Tank 50	12
H-Canyon Receipts to Tank 51	-
299-H Receipts to Tank 39	3
DWPF Recycle Receipts	796
ETF Receipts to Tank 50	45
DSS Receipts to Tank 50 from ARP/MCU	919
512-S Cleaning to Tank 50	18
Waste Removal Additions	858
Misc. Adds (Type I, II, & IV)	127
Misc. Adds (Processing Tanks – 40, 48, & 50)	35
Misc. Adds (Type III not incl. processing tanks)	116
Tank 22 & 47 Reel Tape Adjustment	21
Jet Dilution	854
Total Influents & Waste Receipts	3,826
Salt dissolution effects, specific gravity fluctuations, reel tape fluctuation, etc.	(1,062)
Total Tank Farm Volume: September 30, 2015	36,044

Table 3-2 — *Type III Usable Space* shows the Usable Type III Tank Space in the Tank Farms. During FY15, the total usable space within the tanks decreased to 1,743 kgal from 1,838 kgal.

Table 3-2 — *Type III Usable Space*

(thousands of gallons)

Total Usable Space: September 30, 2014	1,838
Space Recovery & Effluents	
2H Evaporator Space Recovery	1,531
3H Evaporator Space Recovery	1,180
Tank 35→21	201
Tank 37→23	737
Tank 41→21	117
Tank 43→21	37
Tank 51→13	176
Tank 49→ARP/MCU	753
Total Space Recovery & Effluents	4,732
Influents & Waste Receipts	
H-Canyon Receipts to Tank 39	22
H-Canyon Receipts to Tank 51	-
299-H Receipts to Tank 39	3
Tank 13→30	219
Tank 13→37	254
Tank 21→49	1,053
Tank 22→38	478
Tank 22→43	750
Misc. Adds (Type III not incl. processing tanks)	116
Lowering HLLCP (Tank 51)	140
Jet Dilution	855
Total Space Influents & Waste Receipts	3,890
Salt dissolution effects, specific gravity fluctuations, reel tape fluctuation, etc.	(937)
Total Usable Space: September 30, 2015	1,743

3.2 Waste Transfers

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

<i>(Volume in thousands of gallons)</i>		
Area	Number	Volume
F-Area Tank-to-Tank	-	-
H-Area Tank-to-Tank	47	7,084
Inter-Area Line	1	267
2H Recycles	16	3,247
3H Recycles	23	4,769
Total	87	15,367

A detailed listing of the transfers is shown in Table 3-4 — *Transfers*.

During FY15, there were no F-Tank Farm (FTF) tank-to-tank transfers.

During FY15, there were forty-seven (47) H-Tank Farm (HTF) tank-to-tank transfers totaling 7,084 kgal:

- **Eight (8)** transfers (four Tank 22 to Tank 43 and four Tank 22 to Tank 38) provided 1,228 kgal of feed for the 2H Evaporator and supported continuing DWPF operations
- **Twenty-six (36)** transfers to supported the 3H Evaporator
 - Three (3) Tank 51 to 32 transfers provided 583 kgal of feed
 - Two (2) Tank 51 to 30 transfers provided 155 kgal of feed
 - Three (3) Tank 13 to Tank 30 totaling 37 kgal provided chemistry adjustments supporting recycle transfers via an alternate route due to HDB-6 maintenance
 - Seventeen (17) transfers supported salt dissolution from Tank 37
 - Three (3) Tank 13 to Tank 37 transfers totaling 254 kgal
 - Four (4) Tank 37 to Tank 30 transfers totaling 417 kgal
 - Five (5) Tank 37 to Tank 35 transfers totaling 590 kgal
 - Five (5) Tank 37 to Tank 23 transfers totaling 737 kgal
 - One (1) 223-kgal deliquor transfer from Tank 30 to Tank 42
- **Five (5)** transfers, four from Tank 51 to Tanks 13, 30, 37, and 38 and one from Tank 13 to Tank 30, totaling 792 kgal supporting Sludge Batch #9 preparation
- **Seven (7)** transfers supported the preparation of ARP/MCU salt batches:
 - Two (2) Tank 21 to Tank 49 transfers totaling 1,053 kgal to provide Salt Batch #8 to ARP/MCU
 - Five (5) transfers from Tanks 23, 35, 41, and 43 to Tank 21 totaling 915 kgal supporting Salt Batch #9 preparation
- **One (1)** Tank 39 to Tank 32 transfer of 100 kgal for Tank 39 level relief.

During FY15, there was one (1) inter-area line (IAL) transfer of 267 kgal from Tank 26 to Tank 32 to provide 3H Evaporator feed and Tank 26 level relief.

During FY15, there were thirty-nine (39) recycle transfers totaling 8,016 kgal supporting evaporator operations:

- **Sixteen (16)** Tank 38 to Tank 43 transfers totaling 3,247 kgal for the 2H Evaporator
- **Twenty-three (23)** Tank 30 to Tank 32 transfers totaling 4,769 kgal for the 3H Evaporator

Table 3-4 — *Transfers*

HTF Transfers				HTF Transfers (continued)				3H Recycle Transfers											
Date	Tank		Volume (gallons)	Date	Tank		Volume (gallons)	Date	Tank		Volume (gallons)								
	From	To			From	To			From	To									
Oct 4, 2014	51	32	219,656	Aug 15, 2015	41	21	116,970	Dec 3, 2014	30	32	60,099								
Nov 25, 2014	22	43	246,848	Aug 16, 2015	51	37	172,060	Dec 31, 2014	30	32	93,757								
Dec 11, 2014	22	43	163,027	Aug 20, 2015	35	21	94,945	Jan 5, 2015	30	32	227,147								
Dec 15, 2014	37	30	145,656	Aug 22, 2015	43	21	37,281	Jan 23, 2015	30	32	197,626								
Dec 19, 2014	51	32	215,374	Aug 25, 2015	35	21	106,470	Jan 27, 2015	30	32	152,478								
Dec 21, 2014	13	37	58,450	Aug 30, 2015	22	38	182,027	Feb 2, 2015	30	32	281,747								
Dec 25, 2014	30	42	222,932	Sep 3, 2015	51	30	133,942	Feb 10, 2015	30	32	143,373								
Dec 29, 2014	37	30	59,198	Sep 20, 2015	51	38	127,975	Feb 16, 2015	30	32	236,321								
Jan 2, 2015	13	37	117,600	Total: 7,083,547				Mar 4, 2015	30	32	309,550								
Jan 3, 2015	37	30	74,959	Inter-Area Line (IAL) Transfers								Mar 9, 2015	30	32	158,027				
Jan 9, 2015	13	37	78,050									2H Recycle Transfers				May 23, 2015	30	32	181,056
Jan 10, 2015	37	30	137,547													2H Recycle Transfers			
Jan 31, 2015	37	35	56,947									2H Recycle Transfers							
Feb 5, 2015	37	35	65,605													2H Recycle Transfers			
Feb 8, 2015	51	32	147,947									2H Recycle Transfers							
Feb 12, 2015	37	35	18,967													2H Recycle Transfers			
Feb 15, 2015	37	35	42,759									2H Recycle Transfers							
Feb 23, 2015	37	35	406,057													2H Recycle Transfers			
Mar 7, 2015	51	30	124,956									2H Recycle Transfers							
Mar 11, 2015	37	23	12,975	2H Recycle Transfers				Aug 29, 2015	30	32	332,938								
Mar 20, 2015	37	23	142,024					2H Recycle Transfers				Sep 4, 2015	30	32	161,753				
Mar 30, 2015	22	43	247,163	2H Recycle Transfers								Sep 12, 2015	30	32	167,640				
Apr 22, 2015	22	43	92,784					2H Recycle Transfers				Sep 16, 2015	30	32	296,274				
Apr 24, 2015	37	23	318,752	2H Recycle Transfers								Total: 4,768,804							
May 14, 2015	37	23	137,991					2H Recycle Transfers											
May 25, 2015	37	23	124,962	2H Recycle Transfers															
May 29, 2015	39	32	99,894					2H Recycle Transfers											
Jun 3, 2015	22	38	100,961	2H Recycle Transfers															
Jun 4, 2015	21	49	99,566					2H Recycle Transfers											
Jun 11, 2015	22	38	105,740	2H Recycle Transfers															
Jun 25, 2015	51	30	29,590					2H Recycle Transfers											
Jul 10, 2015	22	38	89,633	2H Recycle Transfers															
Jul 11, 2015	51	13	176,097					2H Recycle Transfers											
Jul 15, 2015	21	49	953,075	2H Recycle Transfers															
Jul 25, 2015	13	30	182,350					2H Recycle Transfers											
Jul 31, 2015	23	21	558,860	2H Recycle Transfers															
Jul 31, 2015	13	30	19,950					2H Recycle Transfers											
Aug 8, 2015	13	30	13,125	2H Recycle Transfers															
Aug 14, 2015	13	30	3,850					2H Recycle Transfers											
				Total: 3,247,466															

3.3 Tank Influent and Effluents

The total influents and effluents from the Tank Farms are depicted in Table 3-5 — *Tank Farm Influent and Effluents*.

The major influents into the Tank Farms totaled 1,814 kgal:

- 21.8 kgal of H-Canyon HLW to Tank 39 for storage and future processing
- 11.9 kgal of H-Canyon LLW (General Purpose (GP) Evaporator bottoms) to Tank 50 to feed SPF
- 2.9 kgal of 299-H to Tank 39 for storage and future processing
- 45 kgal of ETF evaporator bottoms to Tank 50 to feed SPF
- 919 kgal of ARP/MCU DSS from the DSS Hold Tank (DSSHT) to Tank 50 to feed SPF
- 18 kgal of ARP filter flush from 512-S to Tank 50 to feed SPF
- 796 kgal of DWPF recycle to Tank 22.

The major effluents from the Tank Farms totaled 5,162 kgal:

- 3,450 kgal of evaporator overheads to ETF
- 828 kgal of LLW from Tank 50 to feed SPF
- 753 kgal of salt waste material from Tank 49 to feed ARP/MCU
- 131 kgal of sludge waste material from Tank 40 to the Low Point Pump Pit (LPPP) to feed DWPF.

Table 3-5 — Tank Farm Influent and Effluents

Date	Receipts to Tank Farms (thousands of gallons)						DWP/Recycle		Total
	H-Canyon		299-H to Tank 39	ETF to Tank 50	ARP/MCU to Tank 50		to Tank 41	to Tank 22	
	to Tank 39 (HAW & LAW)	to Tank 50 (GP Evap)			512-5	DSSHT			
Oct-14	2.4	1.2	-	-	4.6	29	-	61	98
Nov-14	2.1	0.6	-	-	-	37	-	123	163
Dec-14	-	0.6	-	-	4.6	127	-	106	238
Jan-15	-	0.7	-	-	-	216	-	141	358
Feb-15	0.9	0.7	-	-	4.6	232	-	111	349
Mar-15	3.4	1.9	0.5	-	4.6	204	-	102	317
Apr-15	2.5	1.9	-	-	-	-	-	16	20
May-15	5.5	0.5	0.8	22.8	-	2	-	-	31
Jun-15	-	0.7	0.6	-	-	61	-	21	83
Jul-15	4.4	1.1	0.9	-	-	6	-	21	33
Aug-15	-	0.6	-	-	-	-	-	14	15
Sep-15	0.6	1.3	-	21.7	-	5	-	79	108
FY15 Sub-Total	21.8	11.9	2.9	45	18	919	-	796	1,814
FY15 Total	34		2.9	45	937		796		

Date	Effluents from Tank Farms (thousands of gallons)						Total
	Overheads to ETF		Tank 50 to SPF	Tank 49 to ARP/MCU	Tank 40 to LPPP (DWP/)	Total	
	2H	3H					
Oct-14	24	-	-	28	14	66	
Nov-14	202	-	-	40	21	263	
Dec-14	241	73	-	99	19	433	
Jan-15	-	195	19	179	29	423	
Feb-15	-	271	35	190	17	512	
Mar-15	134	159	-	151	14	458	
Apr-15	220	-	-	1	-	221	
May-15	148	83	-	8	-	239	
Jun-15	173	232	224	57	-	686	
Jul-15	183	249	73	-	-	505	
Aug-15	139	326	477	-	-	942	
Sep-15	153	247	-	-	16	416	
FY15 Sub-Total	1,616	1,834	828	753	131	5,162	
FY15 Total	3,450		828	753	131	5,162	

3.4 Evaporator Performance

The evaporators generally support specific missions and their operations are planned around these missions. The 2H Evaporator primary mission is to recover space from DWPF Recycle receipts. The 3H Evaporator primary mission is to recover space from Sludge Batch (SB) decants, Tank Closure washing campaigns, and H-Canyon receipts.

During the period of October 1, 2014 through September 30, 2015, the 2H and 3H Evaporator Systems recovered 2,711 kgal (as compared with 1,346 kgal in FY14) with a combined total average utility of 41% vs. 26% in FY14. This performance allowed H-Canyon to meet its objectives, Tank Closure activities to remain on schedule, DWPF to maintain canister production, and SB preparations to proceed as scheduled. Table 3-6 — *Evaporator Space Recovery* and Table 3-7 — *Evaporator Average Utility* summarize quarterly evaporator performance for FY15.

Table 3-6 — *Evaporator Space Recovery*

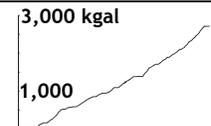
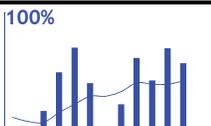
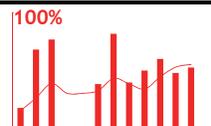
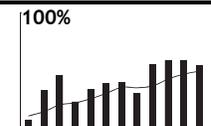
FY15	Space Recovery (kgal)		
	3H	2H	Total
Q1	61	478	539
Q2	399	139	538
Q3	198	490	688
Q4	522	424	946
Total	1,180	1,531	2,711
Cumulative Daily Space Gain			

Table 3-7 — *Evaporator Average Utility*

FY15	Average Utility		
	3H	2H	Cumulative
Q1	6%	55%	31%
Q2	54%	14%	34%
Q3	28%	58%	43%
Q4	57%	55%	56%
Average	36%	45%	41%
12-month utility (with 6 month moving average)			

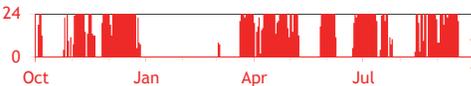
2H Evaporator

In the first three days of FY15, the 2H Evaporator (building 242-16H) completed an outage to repair a sagging overheads line. After two days of operation, the Evaporator was shut down for the annual site-wide steam outage. Upon startup, problems with a steam flow transmitter delayed full operations until November. In late November, troubleshooting the backflush valve caused a week of downtime. In late December, problems with lift and Gravity Drain Line (GDL) pluggage led to a Mechanical Cleaning outage. The Evaporator resumed operations in mid-March. Various minor issues interrupted operations in April, including concerns with Personal Protection Equipment associated with mercury concerns, tube bundle backpressure valve concerns and a tornado warning. In May the Evaporator was down for three weeks for Mechanical Cleaning. After two weeks of operation, the feed pump failed resulting in a two week replacement outage. In late July, there was another two-week Mechanical Cleaning outage followed by a week to repair the Automatic Isolation Valve (AIV) on the steam supply to the tube bundle. After returning to operation for a month the Evaporator entered a routine pot inspection outage for the balance of the year.

Figure 3-1 — *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. The salt level in Tank 38 at the end of the year was 230".

Space Recovered: 1,531 kgal

Utility: 45%

Downtime: 4,764 hours (**Uptime in hr/day:** 

- Unscheduled maintenance = 26%
(e.g., steam repairs, feed pump failure, etc.)
- Mechanical Cleaning = 14%
- Scheduled maintenance = 11%
(e.g., site steam outage, pot inspection, etc.)

Material Processed: Tank 22 — DWPF Recycle (1,228 kgal),
 Sludge Batch #9 decant (128 kgal)

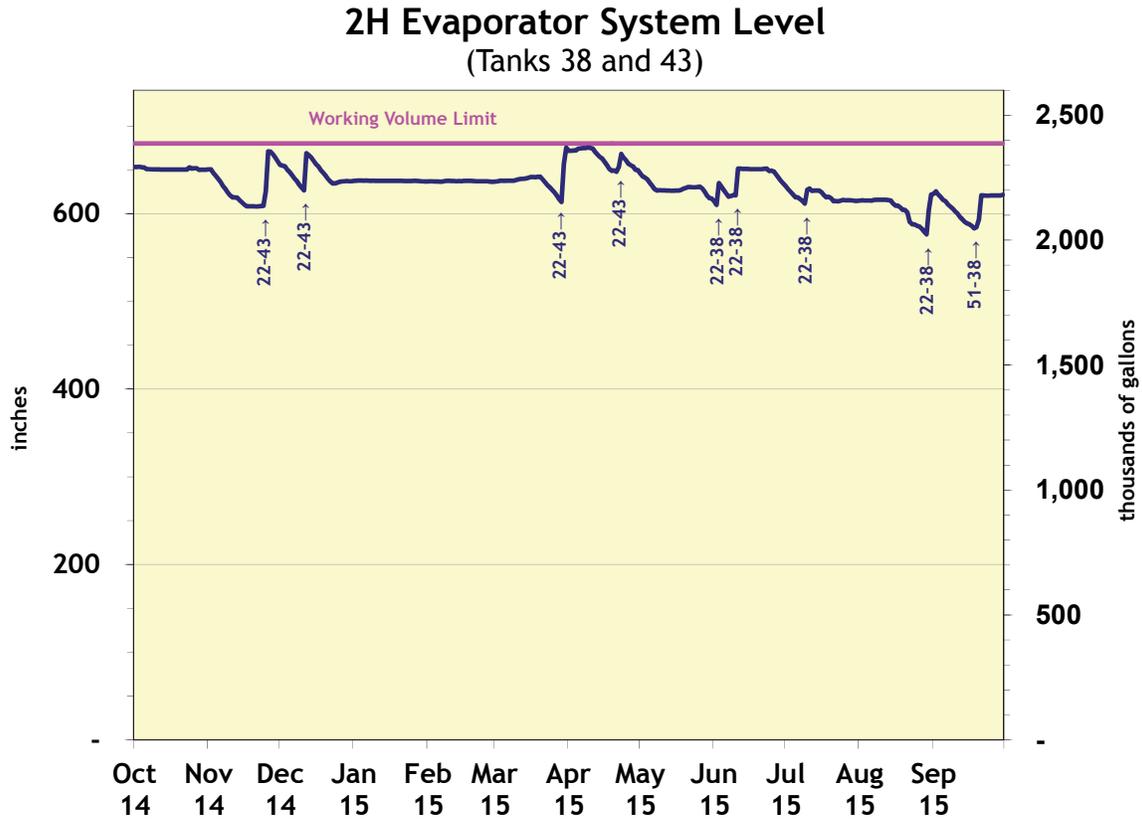
Key Event Timeline:

- 9/28/14–10/3/14 **Outage** to repair a sagging overheads line
- 10/4/14–10/5/14 **Operation**
- 10/6/14–10/24/14 **Planned Site Steam Outage**
- 10/25/14–11/17/14 **Operations**

Between October 25 and November 17, the 2H Evaporator operated at 83% utility while achieving ~158 kgal of space gain. This included intermittent trouble shooting of the steam flow transmitter and of the tube bundle backpressure valve.

11/18/14–11/24/14	Unplanned Outage A lifting malfunction lead to troubleshooting the Backflush Valve (BFV).
11/25/14–12/24/14	Operations Between November 25 and December 24, the 2H Evaporator operated at 94% utility while achieving ~325 kgal of space gain.
12/25/14–3/20/15	Unplanned Outage for Mechanical Cleaning The evaporator began experiencing GDL and Lift pluggage beginning December 25. A pot inspection was initiated January 4 and in January 7, the GDL failed a helium leak test. Mechanical Cleaning was initiation on February 7, after the GDL leak test was resolved. Steam repairs were initiated on February 13 and Mechanical Cleaning resumed March 4 through March 20.
3/21/15–5/8/15	Operations Between March 21 and May 8, the 2H Evaporator operated at 89% utility while achieving ~425 kgal of space gain.
5/9/15–5/26/15	Unplanned Outage for Mechanical Cleaning
5/27/15–6/7/15	Operations Between May 27 and June 7, the 2H Evaporator operated at 100% utility while achieving ~141 kgal of space gain.
6/8/15–6/23/15	Unplanned Outage to replace failed feed pump
6/24/15–7/21/15	Operations Between June 24 and July 21, the 2H Evaporator operated at 98% utility while achieving ~221 kgal of space gain. This excluded, however, a three-day outage to resolve a failed steam flow transmitter
7/22/15–8/13/15	Unplanned Outage for Mechanical Cleaning, including repair of the AIV
8/14/15–9/18/15	Operations Between August 14 and September 18, the 2H Evaporator operated at 90% utility while achieving ~260 kgal of space gain.
9/18/14–10/3/14	Planned Outage for pot inspection

Figure 3-1 — 2H Evaporator System Level



3H Evaporator

The 3H Evaporator (building 242-25H) processes H-Canyon and Tank Closure material in addition to SB decants. One Evaporator Concentrate Receipt Tank, Tank 30, has damaged cooling coils that limit the amount of cooling available. The other Concentrate Receipt Tank, Tank 37, has a high level of salt limiting its availability. The 3H Evaporator began the year in an outage while troubleshooting the plugged Tank 37 Telescoping Transfer Jet (TTJ). The Evaporator continued in an outage due to Tank 32 reaching its temperature limit. After operating for a couple of days in mid-December the facility entered an outage to support several transfers. After those transfers were complete, a dip tube flush limited operations for three days. After a three-day run, the Evaporator had to be shut down for a tornado watch and remained down while potential mercury issues were being resolved. The Evaporator resumed operations in mid-January and operated until mid-March with a one-week outage due to freeze damage to the feed pump bearing water system. In mid-March, an H-Diversion Box 4 (HDB-4) jumper valve failure during a Tank 30 to Tank 32 recycle transfer caused a minor inadvertent transfer. The Evaporator was shut down and a pot inspection was performed during the failure analysis. After the jumper repair, operations resumed in late May and continued for about a month until the Tank 30 operating limit was reached. It resumed operations in late July for about a month. It resumed operations for about a week with Tank 37 as the drop tank until the Tank 37 fill limit was reached. After completion of a Tank 30 to Tank 32 recycle transfer, the evaporator operated for another week until the Tank 32 temperature limit

was reached. The Evaporator was down for a week and then operated for about two weeks in mid-October until it entered a planned outage for pot inspection for the balance of the year.

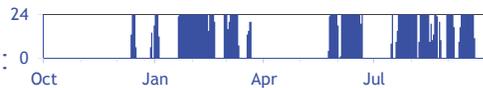
In addition to normal Evaporator operations, Tank 37 initiated a salt removal campaign in mid-December. In December and January 254 kgal was transferred from Tank 13 to supply salt dissolution material. Each transfer was followed by a transfer of the higher-curie interstitial waste to Tank 30. In January through April Tank 37 received well water (WW) and IW for salt dissolution. Tank 37 transferred dissolved salt solution to Tank 35 in January and February and to Tank 23 in March through May, completing the salt dissolution campaign. The final salt level in Tank 37 was 247" as compared to the FY14 level of 326".

Figure 3–2 — *3H Evaporator System Level* shows the combined levels of Tank 32 (Evaporator Feed Tank) and Tanks 30 and 37 (Evaporator Concentrate Receipt Tanks) through the year. At the end of the year, the salt level in Tank 30 increased five inches to ~ 96.8" and the Tank 37 salt level increased 9½" to 325.9".

Space Recovered: 1,180 kgal

Utility: 36%

Downtime: 5,594 hours (Uptime in hr/day:



Planned outage = 33%
 (e.g., HDB-4 jumper repair, pot inspection, preventive maintenance, transfers, etc.)
 Cooling = 20%

Material Processed: Tank 13 (219 kgal), Tank 26 (267 kgal), Tank 39 (100 kgal), and Tank 51 (871 kgal)

Key Event Timeline:

- 8/16/14–1/19/15 **Outage**
 The Tank 32 feed tank temperature was elevated. Operations resumed December 12, however, only for three days before a planned outage to support transfers. It operated for four days beginning December 31 before being shut down for a tornado watch, a recycle transfer, and resolution of the mercury concern.
- 1/20/15–3/10/15 **Operation**
 Between January 20 and March 10, the 3H Evaporator operated at 97% utility while achieving ~356 kgal of space gain. During that time it was down from February 20 through February 26 to repair freeze damage to the feed pump bearing water system.
- 3/11/15–5/24/15 **Outage**
 The Evaporator shut down for repair of a failed HDB-4 jumper valve. During the repair outage a pot inspection was completed.
- 5/25/15–6/20/15 **Operation**

Between May 25 and June 20, the 3H Evaporator operated at 94% utility while achieving ~190 kgal of space gain.

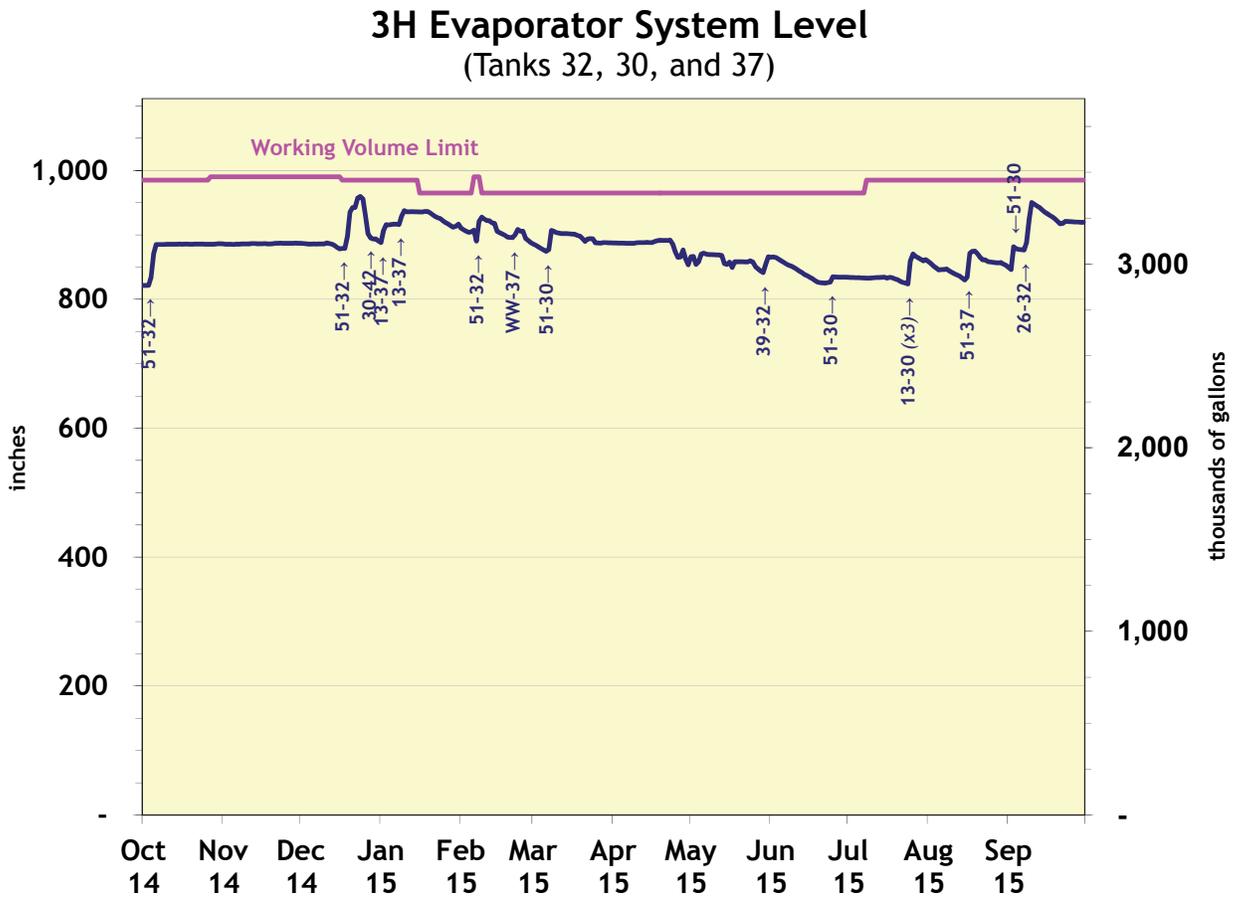
6/21/15–7/19/15 **Planned Outage** for miscellaneous repairs

7/20/15–9/21/15 **Operation**

Between July 20 and September 21, the 3H Evaporator operated at 90% utility while achieving ~501 kgal of space gain.

9/22/15–11/15/15 **Outage** for pot inspection and for FY16 site-wide steam outage.

Figure 3–2 — 3H Evaporator System Level



3.5 Actinide Removal Process & Modular CSSX Unit (ARP/MCU)

The Actinide Removal Process (ARP) operates in buildings 512-S and 241-96H, and a Caustic Side Solvent Extraction (CSSX) process operates in the Modular CSSX Unit (MCU) located in building 241-278H. The primary goal of ARP/MCU is to treat salt solution prior to the start of SWPF. This will disposition less than 200,000 curies of cesium to Saltstone while providing operational experience to the SWPF project.

The APR/MCU entered an outage at the beginning of FY15 for the scheduled site-wide steam outage. After returning to operations in late October, a vacuum breaker leak was discovered and ARP/MCU was down for repair for much of November. Operations continued in late November until a scheduled ARP filter cleaning outage in mid-December. Operations resumed in mid-January through the end of March. During this time, the process set production records, including 30, 60, and 90 day records, and achieved an average decontamination factor (df) of greater than 40,000. At the end of March, Saltstone TCLP analysis results indicated higher than anticipated levels of mercury in SPF feed. The SPF and ARP/MCU processes were suspended until a multi-facility team was assembled to resolve the concern. During review of the unanticipated mercury in the saltstone feed, an unanalyzed breakdown of antifoam in the DWPF process was identified, causing a cessation of DWPF operations with a commensurate interruption of Strip Effluent (SE) receipt capability. ARP/MCU operations resumed in June, but were unable to continue due to depletion of SE storage capacity at DWPF. Prior to ceased operations, MCU began processing Salt Batch #8 in June.

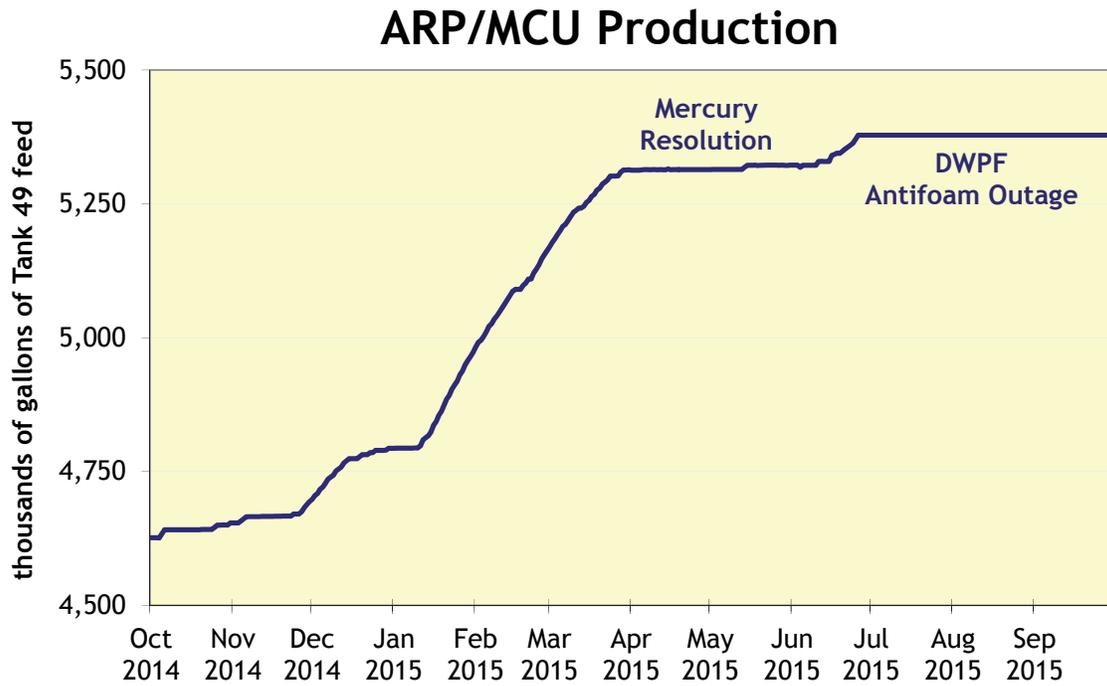
In FY15, ARP/MCU processed 696 kgal of Salt Batch #7 material and 56.5 kgal of Salt Batch #8 material for a total of 753 kgal of Tank 49 feed. Since the beginning of operations in April 2008, ARP/MCU has processed 5,378 kgal of Tank 49 material.

Figure 3–3 — *ARP/MCU Production* depicts the production of ARP/MCU.

Key Event Timeline:

10/1/14–10/6/15	Operations
10/7/14–10/24/14	Scheduled Outage for the sitewide steam outage
10/25/14–11/6/14	Operations
11/7/14–11/23/14	Unplanned Outage due to vacuum breaker leak
11/24/14–12/30/14	Operations
12/31/14–1/10/15	Scheduled Outage for 512-S filter cleaning
1/11/15–3/29/15	Operations
3/30/15–5/13/15	Unplanned Outage to resolve mercury concerns
5/14/15–5/15/15	Operations
5/16/15–6/10/15	Continued Unplanned Outage to resolve mercury concerns
6/11/15–6/26/15	Operations including transition to Salt Batch #8
6/27/15–9/30/15	Unplanned Outage due to lack of SE receipt space in DWPF

Figure 3-3 — ARP/MCU Production



3.6 Defense Waste Processing Facility (DWPF)

The DWPF entered FY15 in a bubbler replacement outage. Two canisters were poured in early October prior to entering the planned site-wide steam outage. The facility returned to operations in late October and operated until mid-November when it shut down for a week to clean the melter bellows. During this time a Potential Inadequacy in Safety Analysis (PISA) was declared for operation of the melter bubblers. Operations resumed without the use of the bubblers. Operations continued until early April whereupon the facility entered a planned outage to modify the purge system. Before the facility returned to service from the planned outage, a review of the unanticipated methyl mercury in the saltstone feed revealed an unanalyzed degradation of antifoam in the DWPF process. A PISA was declared and the facility remained down until the end of the year. Modification of the use of antifoam allowed DWPF to return to operations in late September for a few days. At the end of September, DWPF again was forced into an outage for plugged bellows.

Melter attainment (time feeding melter): 37.8%

Downtime: 5,452 hours

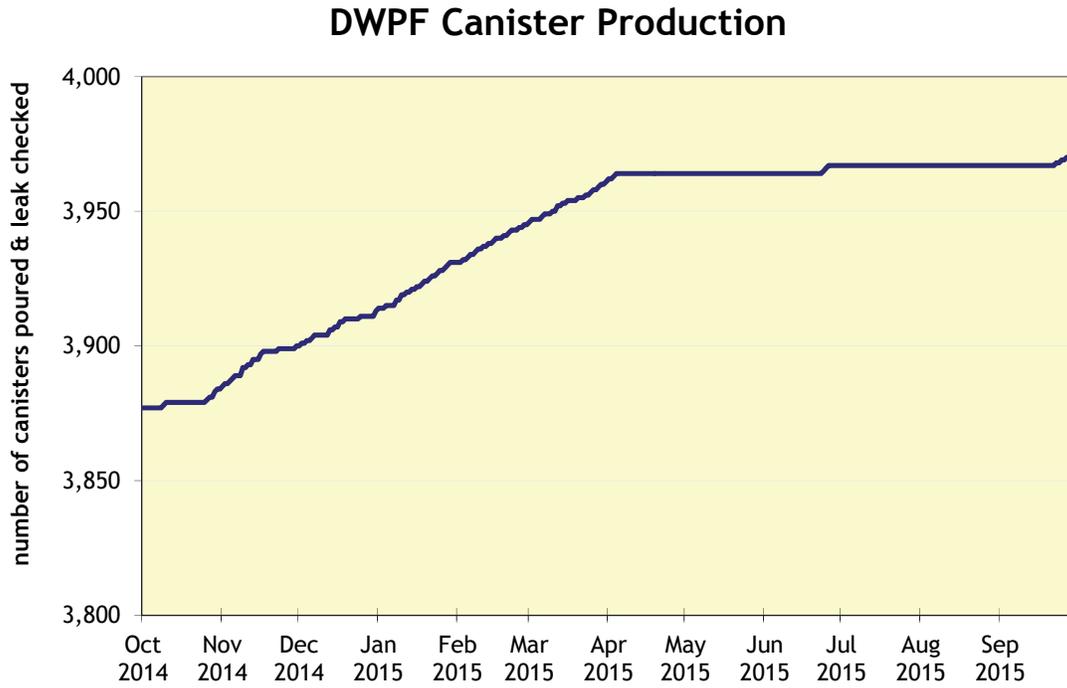
PISA PI-2015-0009 (Antifoam degradation):	37.4%
Planned Outage (including Purge Mod Outage):	18.6%
Waiting on feed material to Melter Feed Tank (MFT):	14.9%
PISA PI-2015-0007 (Higher than anticipated methyl Hg):	14.5%
Site steam outage:	7.1%
Process upset and equipment failures:	5.0%

Canisters produced: 93 canisters poured and leak checked in FY15; 3,970 total.

Key Event Timeline:

9/22/14–10/7/14	Planned Outage for bubbler replacement
10/8/14–10/9/14	Operations
10/10/14–10/25/14	Planned Outage for site-wide steam outage
10/26/14–11/17/14	Operations
11/18/14–11/23/14	Unplanned Outage to clean the bellows
11/23/14–4/4/15	Operations without bubblers
4/5/15–5/10/15	Planned Outage to install purge modifications
5/11/15–9/21/15	Unplanned Outage to resolve antifoam and methyl Hg PISAs
9/22/15–9/27/15	Operations
9/28/15–10/3/15	Unplanned Outage to clean the bellows

Figure 3-4 — DWPF Production



3.7 Effluent Treatment Facility (ETF)

In FY15, addition of a floating cover of 12-sided plastic "rhombo" block in the H Retention and F Moderate Cooling Water Basins was completed. The floating covers block sunlight and help control algae in the basin to control the water pH. In previous year algae activity during the late spring and summer months has driven the pH in the basins well above the 8.5 limit required for discharge to site streams. Since addition of the blocks, the pH levels in the two basins has stayed below 7, well within limits.



ETF operations were normal with no significant issues or occurrences. The ETF Basins operated without interruption through the year.

Figure 3-5 — *ETF Influent*s depicts the monthly receipts into ETF. The bulk of the receipts are from H-Canyon (1,341 kgal for the year) and the Tank Farm Evaporators (3,450 kgal). F-Canyon, being shut down, contributes little to ETF (148 kgal), mainly rainwater from exterior sumps and basins and Low Activity Lab Waste from the 772-F Central Laboratory. Additional material arrives via truck (11.0 kgal), either tanker trucks from SRNL or ER or Water Buffaloes from ER.

Figure 3-5 — *ETF Influent*s

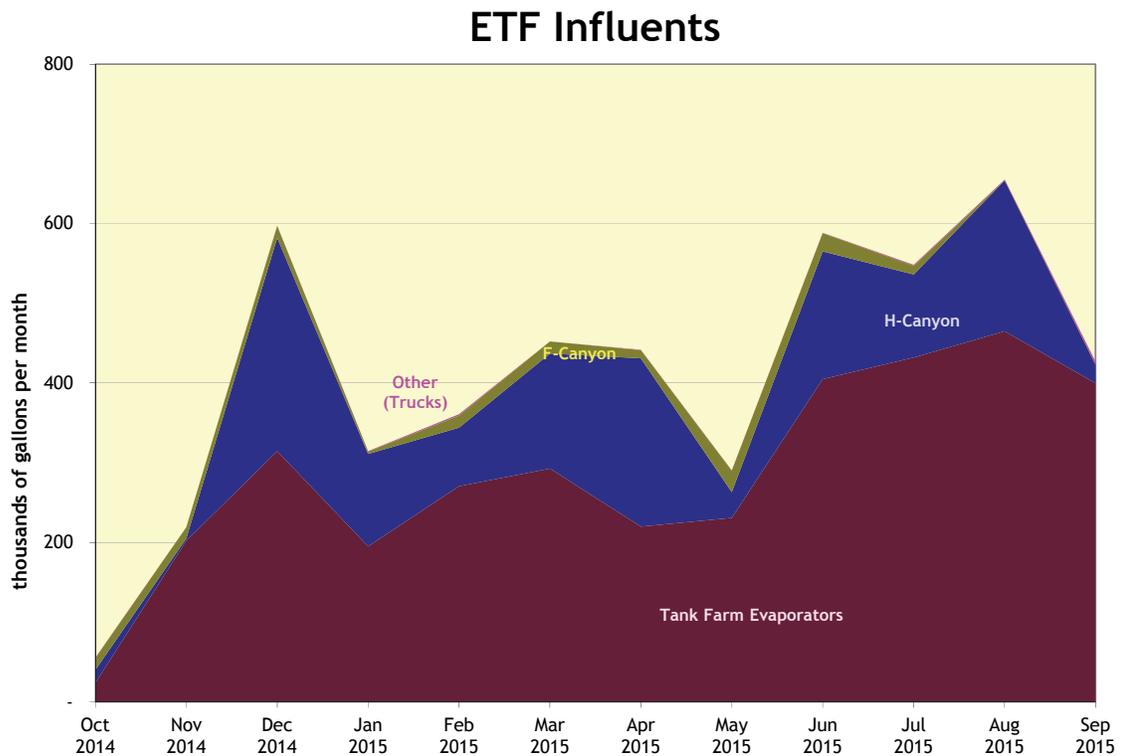
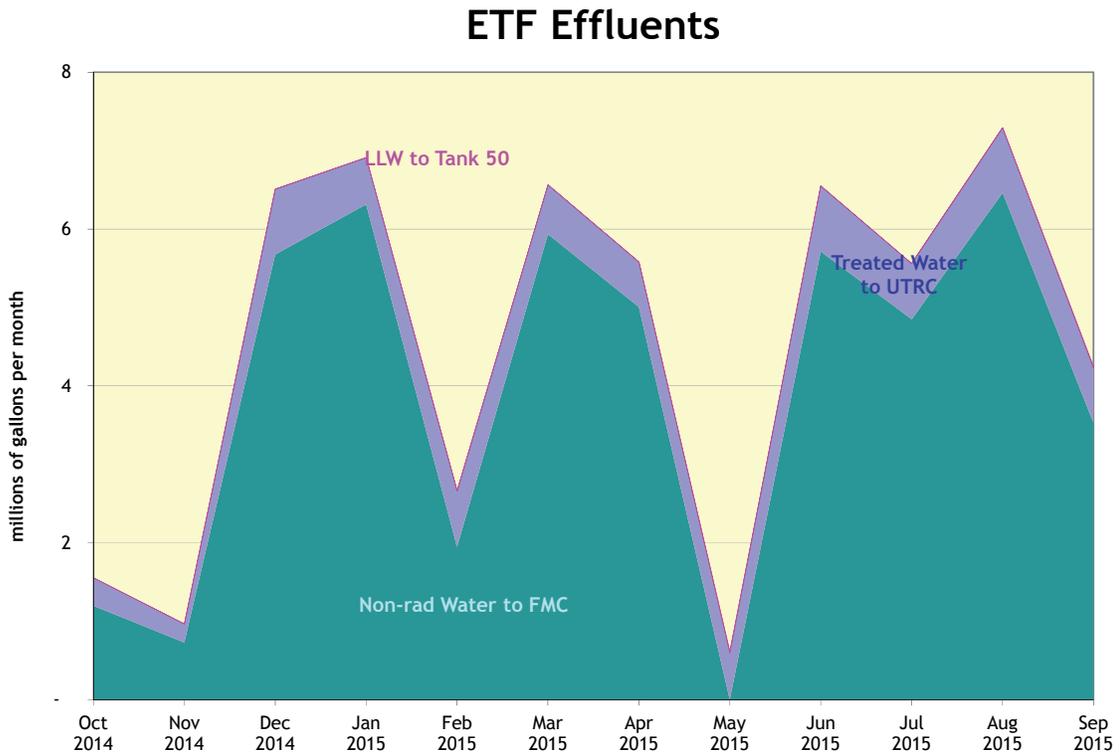


Figure 3–6 — *ETF Effluents* depicts effluents from ETF, including untreated basin water (47,357 kgal) released to Four-Mile Creek (FMC), treated water (7,607 kgal) released to Upper Three-Runs Creek (UTRC), and LLW Concentrate (44 kgal) which is dispositioned in SPF via Tank 50.

Figure 3–6 — *ETF Effluents*



3.8 Saltstone Production Facility (SPF)

The SPF processed 828 kgal of Tank 50 material in FY15. The year began in an outage pending feed availability from Tank 50. Soon after initiation of processing in late January, Toxicity Characteristic Leaching Procedure (TCLP) analysis results indicated higher than anticipated levels of methyl mercury in the SPF feed. After approximately seven months, SPF resumed operations on June 24, pumping grout to SDU-5B. After two weeks of operations the grout pump failed. Operations resumed after a month and SPF completed its planned operations by the end of August and ceased operation for the year.

Support activities included initiation of construction of the 30,000-kgal capacity SDU-6 and clean capping two Vault 4 cells.

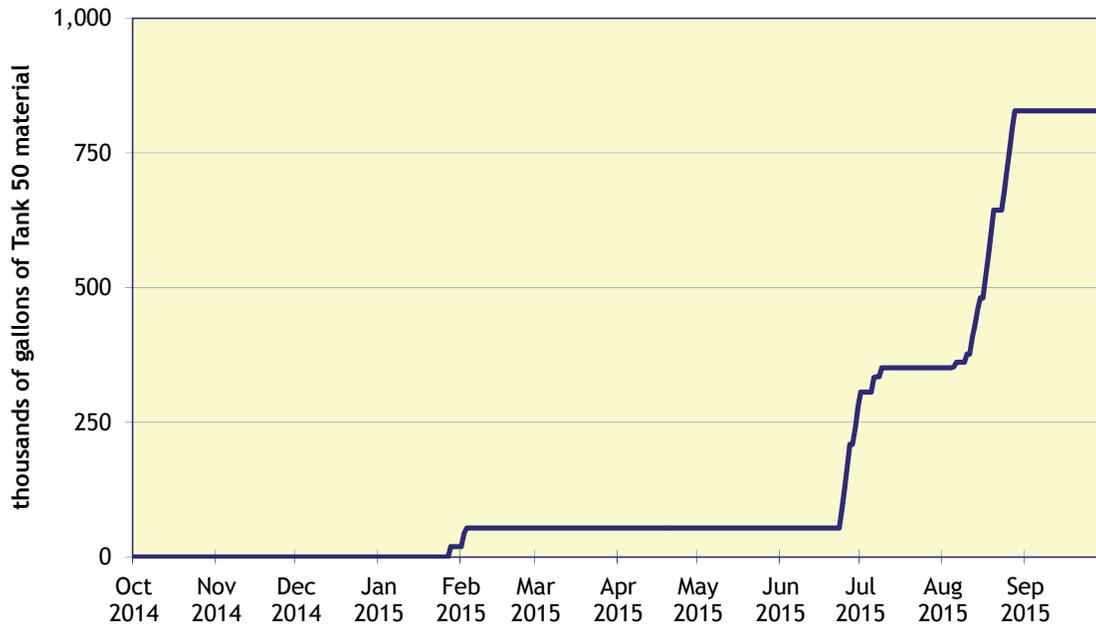
Figure 3-7 — *SPF Production* depicts SPF production for FY15.

Key Event Timeline:

10/1/14–1/27/15	Outage due to feed availability; replaced mixer paddles
1/28/15–2/3/15	Processing to SDU-5B
2/4/15–6/23/15	Outage to resolve higher than anticipated mercury levels
6/24/15–7/9/15	Processing to SDU-5B
7/10/15–8/4/15	Outage to recover from grout pump failure
8/5/15–8/28/15	Processing to SDU-5B
8/29/15–9/30/15	Planned Outage pending feed availability

Figure 3-7 — *SPF Production*

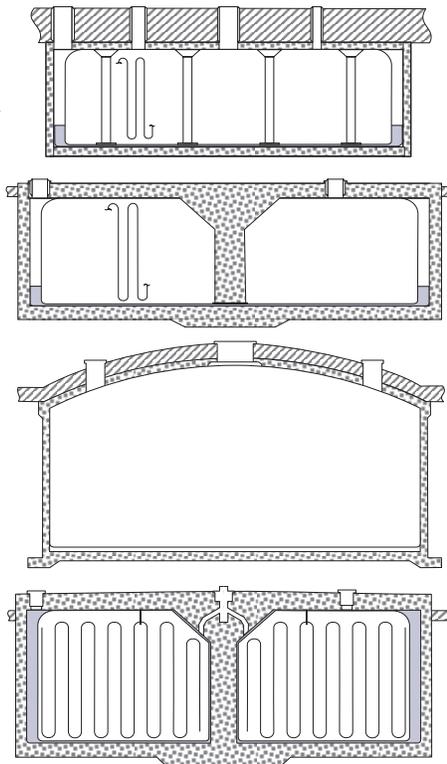
SPF Production



4.0 Tank Status

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

- **Type I:** Tanks 1–8 in FTF (including Tanks 5 & 6, which are closed) and Tanks 9–12 in HTF, each with a nominal capacity of 750 kgal
- **Type II:** Tanks 13–16 (including Tank 16, which is closed) in HTF (there are no Type II waste tanks in FTF), each with a nominal capacity of 1,070 kgal
- **Type IV:** Tanks 17–20 in FTF (which are closed) and Tanks 21–24 in HTF, each with a nominal capacity of 1,300 kgal
- **Type III/Type IIIA:** Tanks 25–28, 33–34, and 44–47 in FTF and Tanks 29–32, 35–43, and 48–51 in HTF, each with a nominal capacity of 1,300 kgal.



Each tank status is given in the following sections, grouped by the four different tank types. 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, 2015. Specific data sources are:

- *High Level Waste Emergency Response Data and Waste Tank Data*⁸ documents the HLLCP heights
- *9/30/2015– September 2015 Curie and Volume Inventory Report*⁹ documents salt levels and sludge levels
- *Waste Tank Equipment Manual*¹⁰ documents prime mover levels
- *F/H Tank Farms Tank Mixing Pump Elevations Data Sheet*¹¹ documents mixing pumps
- *241-2H Tanks 29-32, 35-37 and Outside Areas Surveillance Operator Rounds*¹²; *82H 4-Pack, Stby N2, Cold Feeds, and 49H Surveillance Operator Shift Rounds*¹³; *241-18F Surveillance Operator (Tks 25-28 And 44-47) Shift Rounds*¹⁴; *242-F Surveillance Operator (Tks 1-8, 33 & 34) Shift Rounds*¹⁵; *242-1H Tanks 9-16, 21-24, and Outside Areas Surveillance Operator Shift Rounds*¹⁶; *HDB-8, Tanks 21-24 & Support Surveillance Operator Shift Rounds*¹⁷; or *241-28H 6-PAC, 16H Evap, and Outside Areas Surveillance Operator Shift Rounds*¹⁸ determine a tank's "working volume" from the Reel Tape high alarm setting
- *SRS High Level Waste Tank Leaksite Information*¹⁹ and *Annual Radioactive Waste Tank Inspection Program — 2014*²⁰ documents leakage information.

Additionally, the individual tanks are visually represented by two graphs, a working volume chart and a level graph.

- The working volume chart depicts the levels of materials (sludge, salt, supernate, etc. with “Available” and “Unusable” space – see **Legend** at right) within the individual waste tanks as of the end of FY15. The dark green background in the working volume charts indicates tanks that have a leakage history.
- The **Level** graph depicts the daily tank level (dark blue line) and HLLCP setpoint (pink line) for the year, noting transfers into and out of the tank.



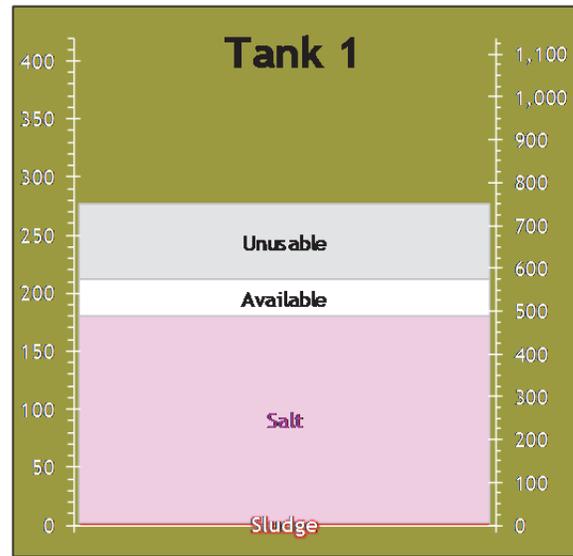
4.1 Type I Tanks

Tank 1:

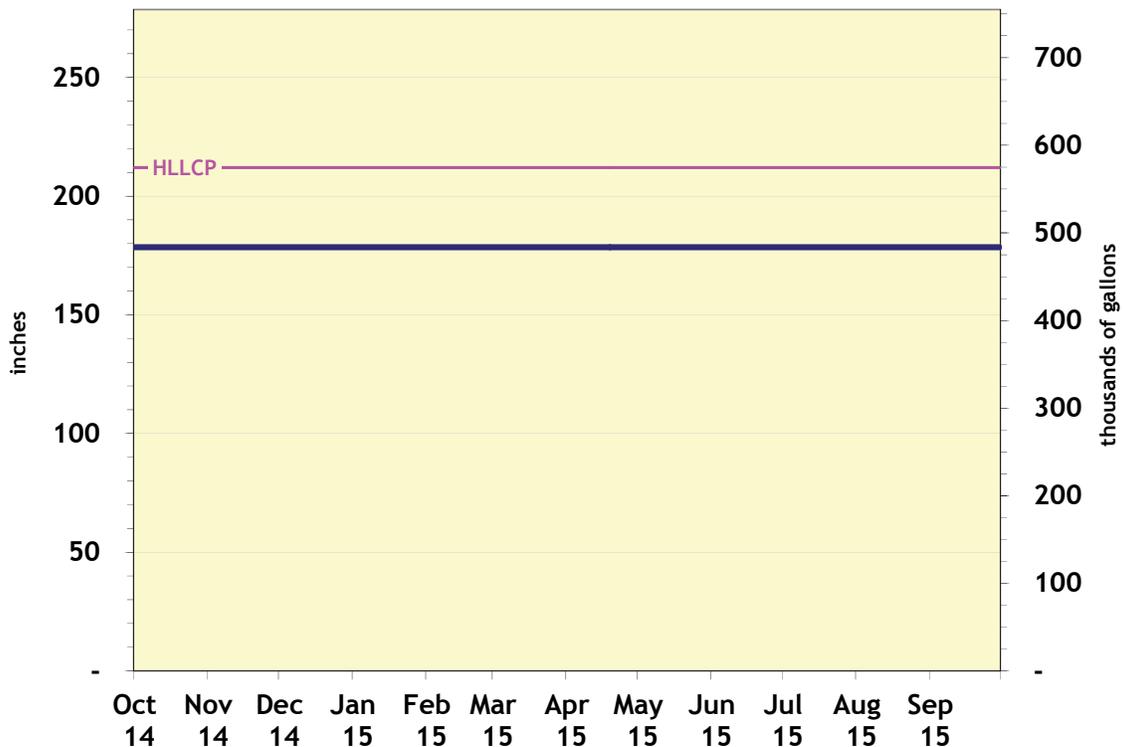
Area: F-Area
 Service: Inactive Waste Tank
 Type: I
 Maximum Volume: 574,500 gallons
 Working Volume: 561,000 gallons
 Waste Volume: 487,000 gallons
 Leak Sites: A small amount of dry waste was observed in 1969. Visual examinations have not revealed the location of the leak(s).
 Prime Movers: Fixed Length Jet in Riser 3 (156")

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 1 during FY15. The salt level in Tank 1 is ~177".

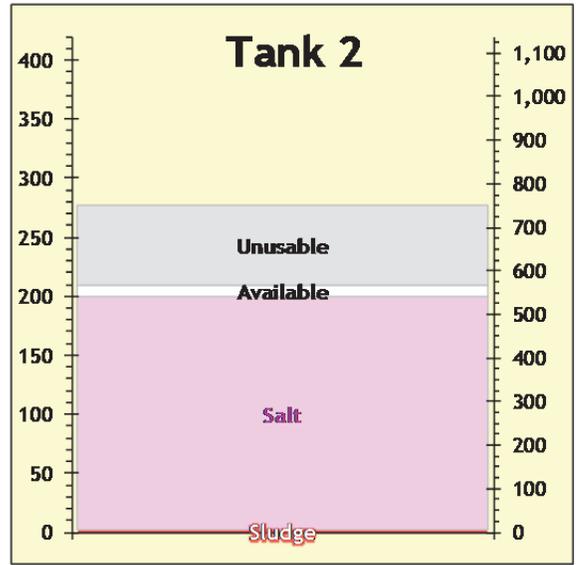


Tank 1 Level

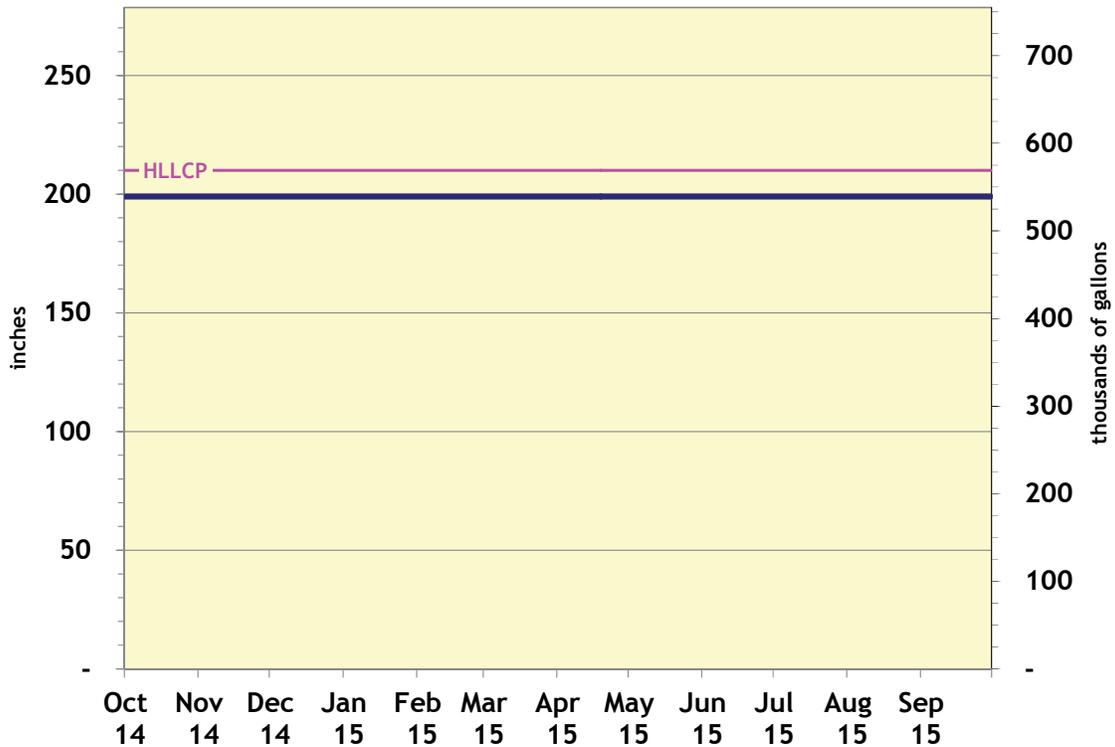


Tank 2:

Area: F Area
 Service: Inactive Waste Tank
 Type: I
 Maximum Volume: 569,100 gallons
 Working Volume: 555,600 gallons
 Waste Volume: 540,100 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 FY15. The salt level in Tank 2 is ~198".

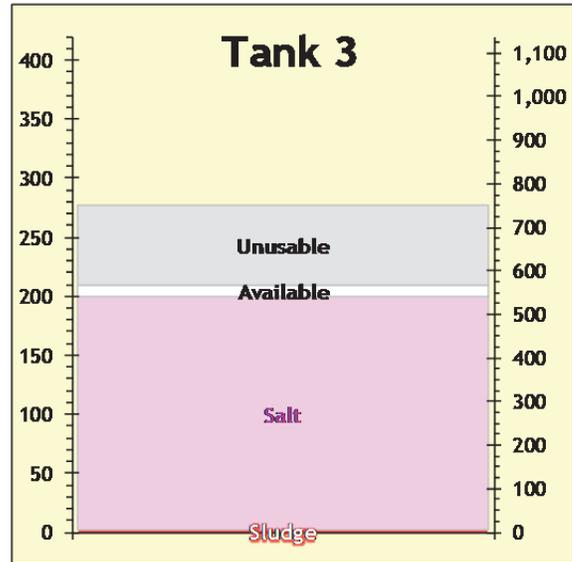


Tank 2 Level

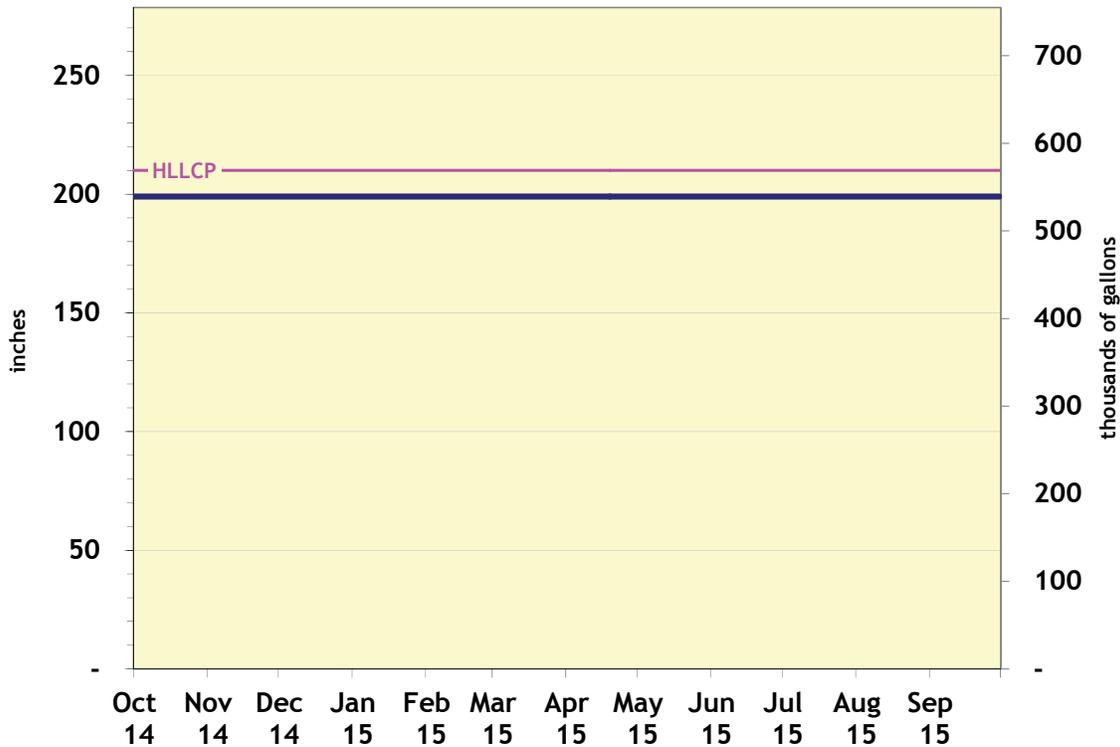


Tank 3:

Area: F-Area
 Service: Inactive Waste Tank
 Type: I
 Maximum Volume: 569,100 gallons
 Working Volume: 555,600 gallons
 Waste Volume: 540,100 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 FY15. The salt level in Tank 3 is ~198".



Tank 3 Level



Tank 4:

Area: F-Area

Service: Tank Closure

Type: I

Maximum Volume: 542,000 gallons

Working Volume: 528,500 gallons

Waste Volume: 371,000 gallons

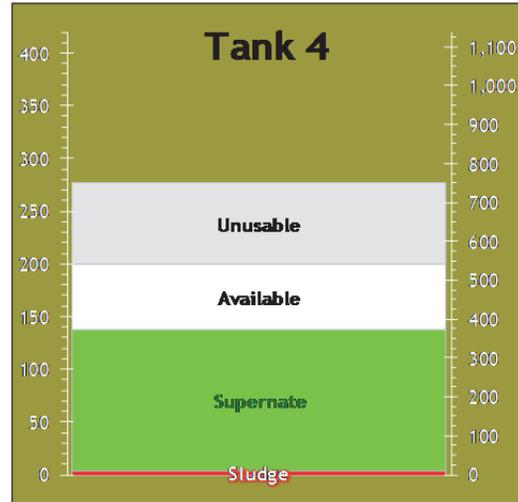
Leak Sites: A small crack was discovered in July 2011 at 234".

Prime Movers: Submersible Transfer Pump (STP) in Riser 6 (19")

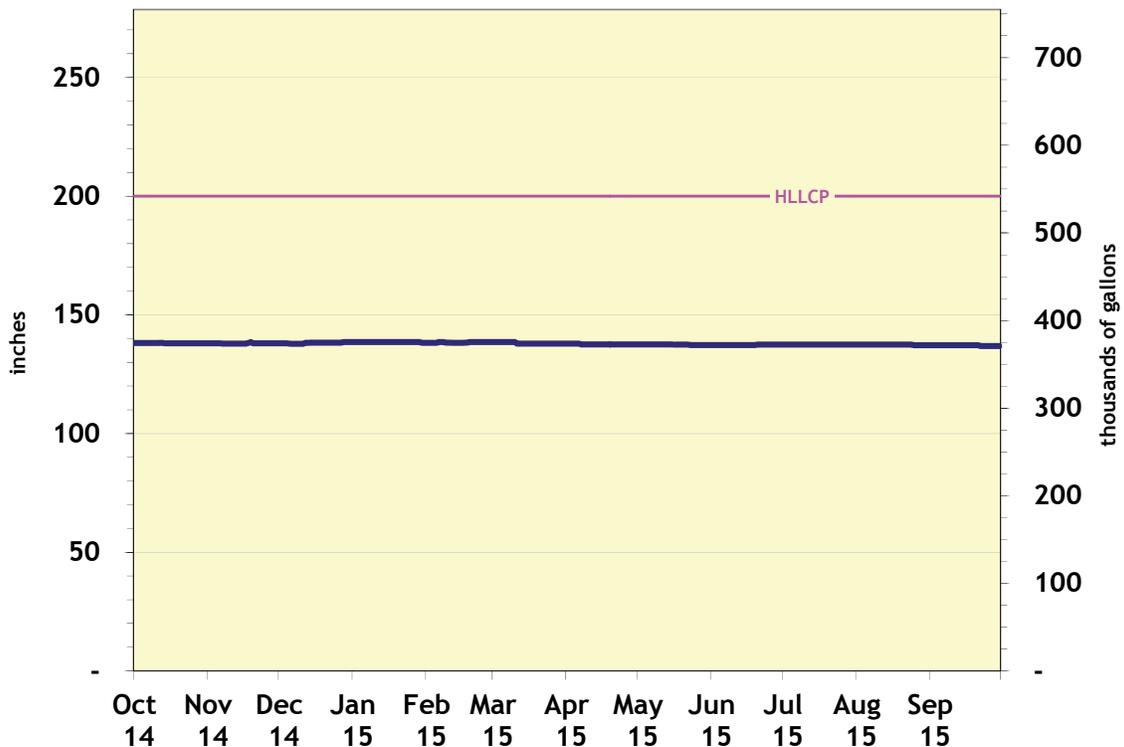
Mixing pumps: Three (3) Submersible Mixing pumps (SMP) in Risers 1, 3, and 8

Discussion: There were no transfers into or out of Tank 4 during FY15.

Comment: SCDHEC and Environmental Protection Agency (EPA) concurred that Bulk Waste Removal Efforts (BWRE) were complete and that additional supernate may be added to keep the sludge material hydrated.



Tank 4 Level



Tank 5:

Area: F-Area

Service: Closed / Stabilized with Grout

Type: I

Leak Sites: Nineteen leak sites were identified with one new site found and four sites reactivated during mechanical cleaning in FY08. An additional 25 leaksites were discovered during tank cleaning in FY09 and FY10.

Discussion: Tank 5 was emptied and de-activated as a waste tank. It was filled with grout and operationally closed on December 19, 2013.



Tank 6:

Area: F-Area

Service: Closed / Stabilized with Grout

Type: I

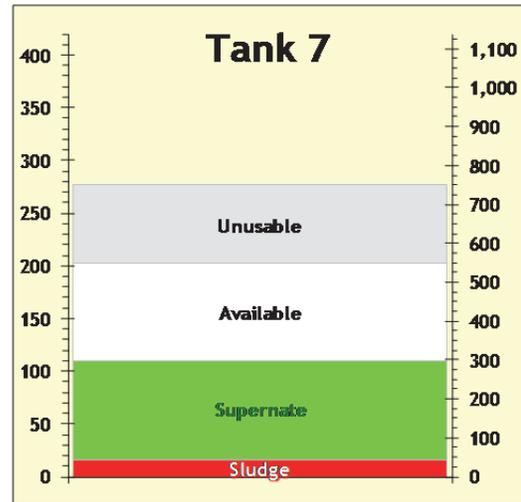
Leak Sites: Approximately 92 gallons was detected on the annulus floor after liquid was added to the tank in 2001. An additional five leaksites were discovered during tank cleaning in FY09 and FY10.

Discussion: Tank 6 was emptied and de-activated as a waste tank. It was filled with grout and operationally closed on December 19, 2013.



Tank 7:

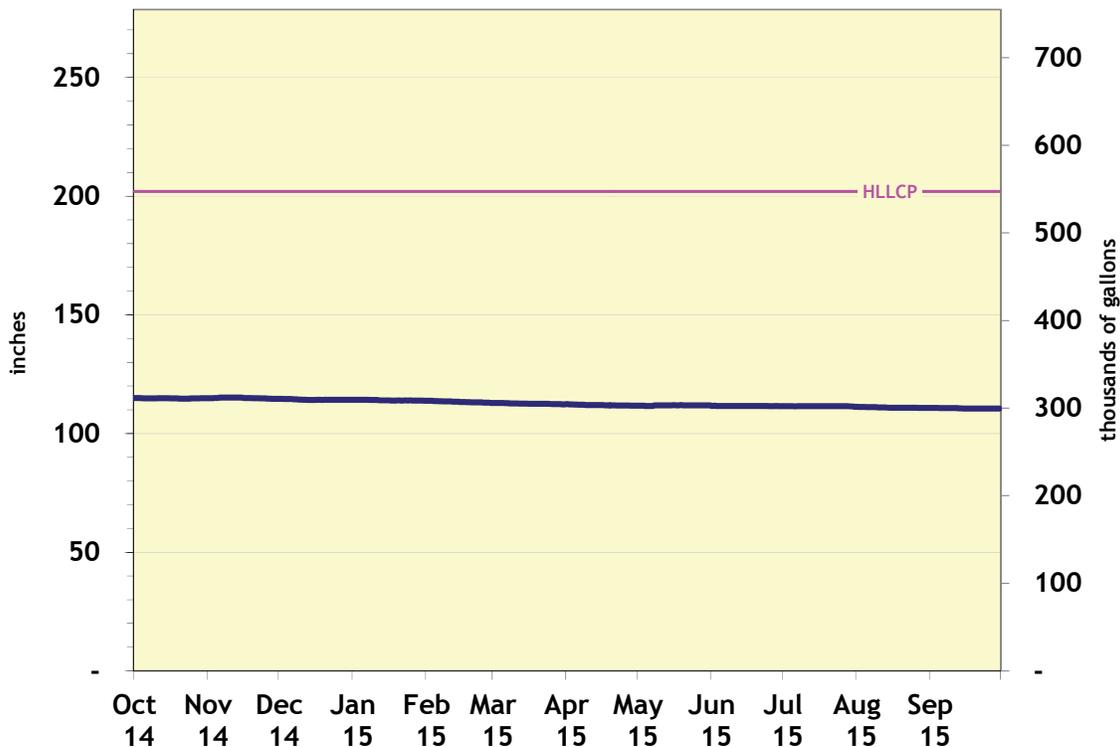
Area: F-Area
 Service: Storage Tank
 Type: I
 Maximum Volume: 547,400 gallons
 Working Volume: 533,900 gallons
 Waste Volume: 299,500 gallons
 Leak Sites: None
 Prime Movers: Telescoping Transfer Pump
 (TTP) in Riser 4 (12")
 Mixing pumps: Four (4) Lawrence slurry
 pumps in Risers 1, 3, 5, and 8



Discussion: There were no transfers into or out of Tank 7 during FY15.

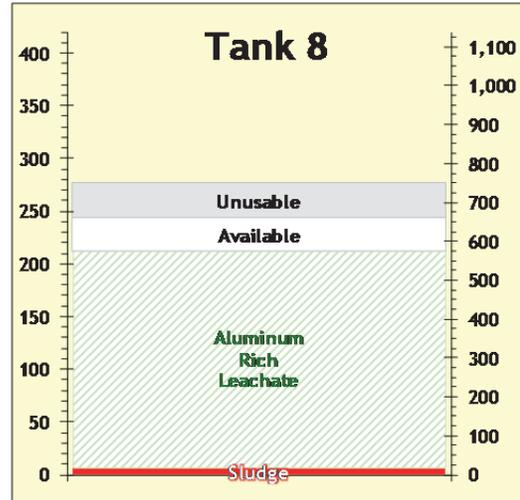
Comments: Tank 7 will continue to be a transfer tank for sludge batch preparation. SCDHEC and EPA concurred that BWRE were complete and that additional supernate may be added to keep the sludge material hydrated.

Tank 7 Level



Tank 8:

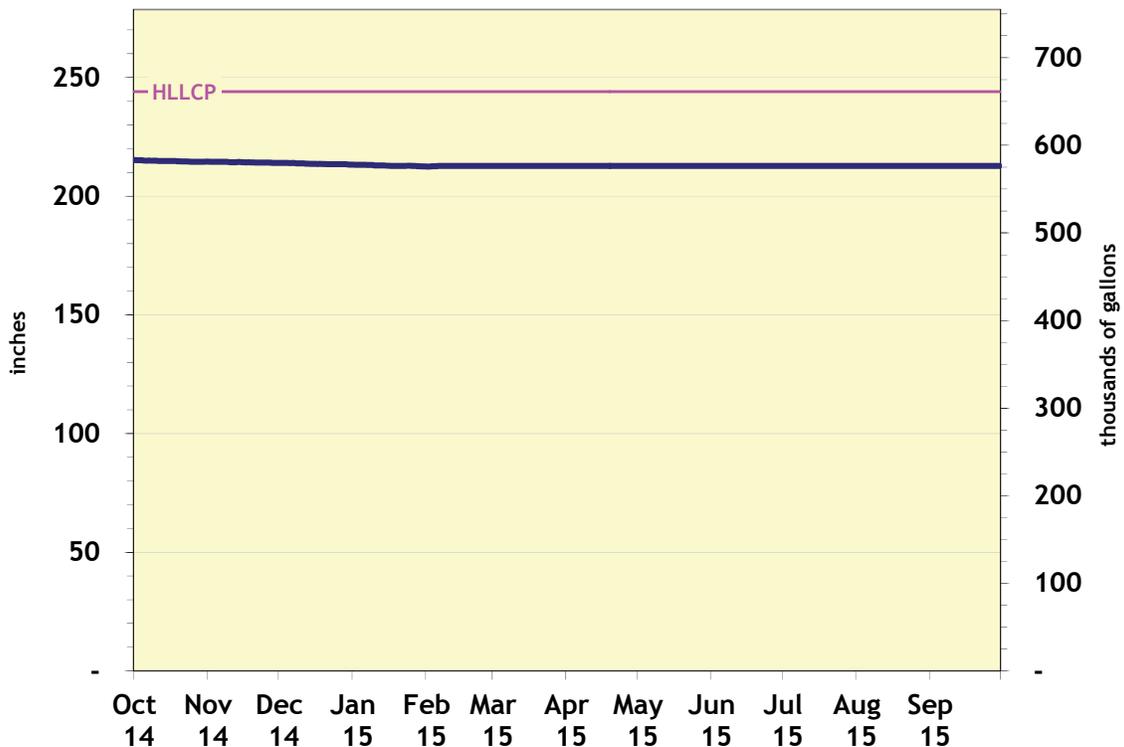
Area: F-Area
 Service: Storage Tank
 Type: I
 Maximum Volume: 661,200 gallons
 Working Volume: 647,700 gallons
 Waste Volume: 576,400 gallons
 Leak Sites: None
 Prime Movers: TTP in Riser 6 (2")
 Mixing pumps: None



Discussion: There were no transfers into or out of Tank 8 during FY15.

Comments: Tank 8 currently stores aluminum-rich leachate removed from sludge using Low Temperature Aluminum Dissolution (LTAD). The aluminum-rich leachate will remain in Tank 8 pending transfer to salt batches. SCDHEC and EPA concurred that BWRE were complete and that Tank 8 could continue to store aluminum rich supernate.

Tank 8 Level



Tank 9:

Area: H-Area (East Hill)
 Service: Inactive Waste Tank
 Type: I

Maximum Volume: 569,100 gallons

Working Volume: 555,600 gallons

Waste Volume: 550,100 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.

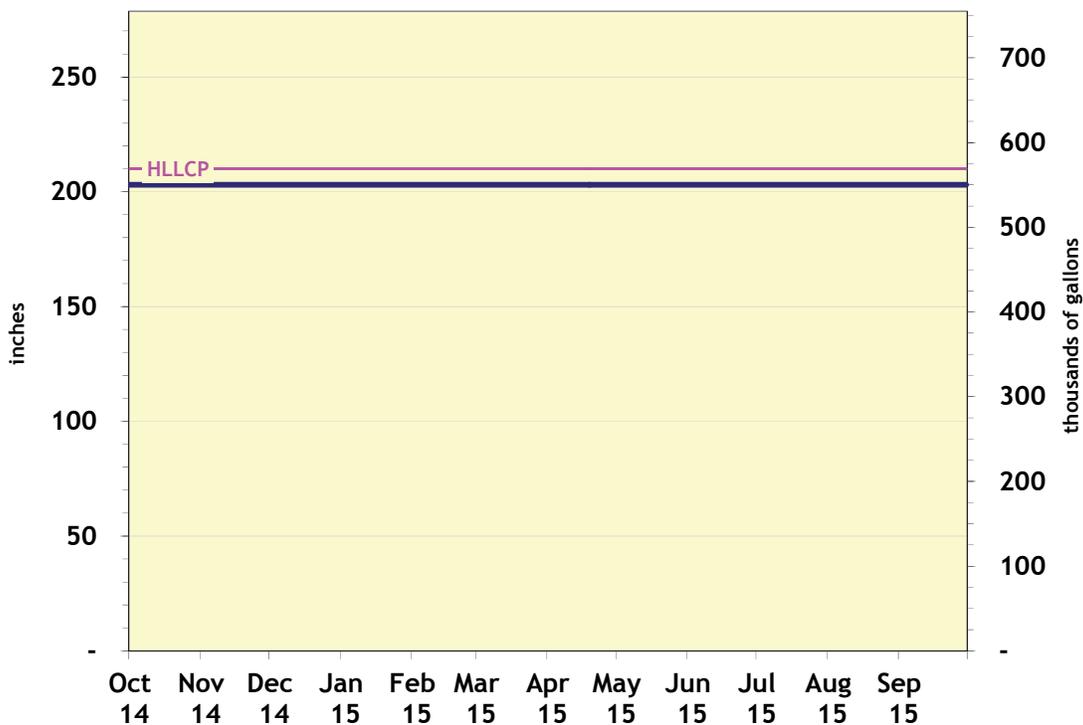
Prime Movers: TTJ in Riser 3 (unknown height)

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 9 during FY15. The salt level in Tank 9 is ~ 197".



Tank 9 Level



Tank 10:

Area: H-Area (East Hill)
 Service: Salt Removal Tank
 Type: I

Maximum Volume: 352,300 gallons

Working Volume: 338,800 gallons

Waste Volume: 201,400 gallons

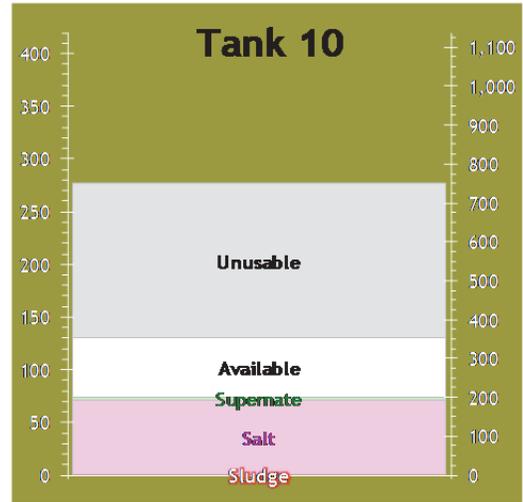
Leak Sites: Tank 10 was placed in service in 1955. Dry waste was discovered in the annulus pan during a visual inspection in 1959. Currently the annulus pan contains 2"-3" of salt deposits. Visual examinations have not revealed the location of the leak.

Prime Movers: STP in center riser (78")

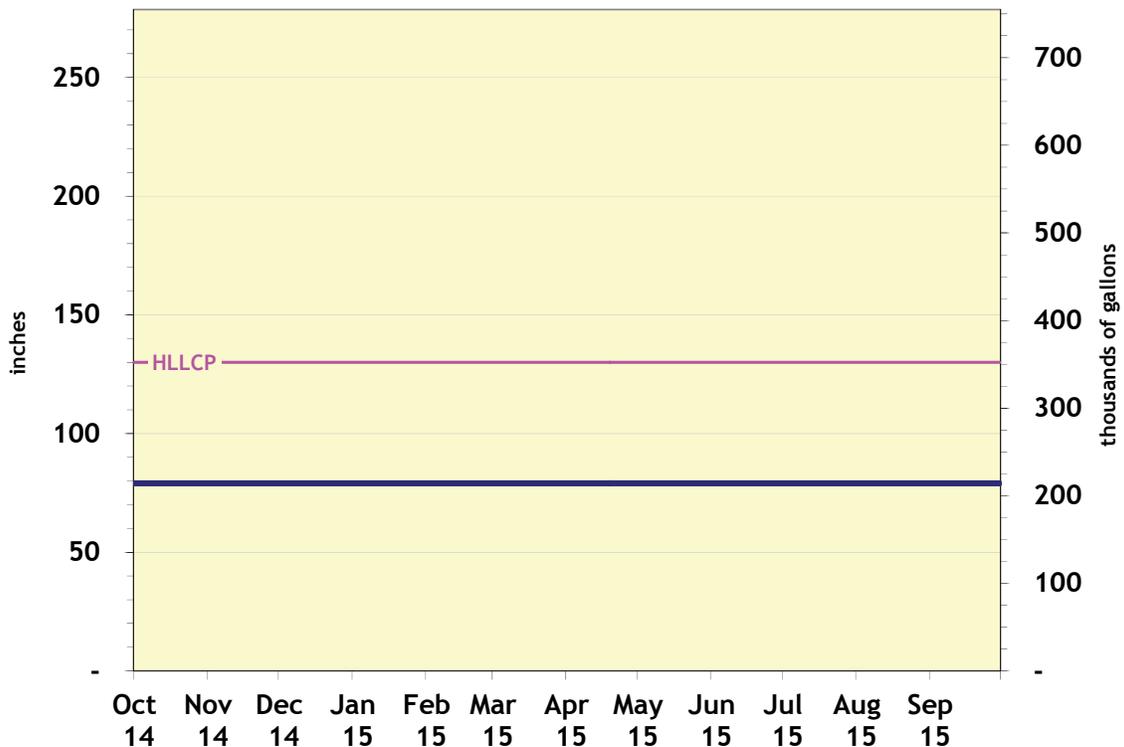
Fixed Length Jet in Riser 2 (36")

Mixing pumps: Three low volume mixing jets in Risers 1, 4, and 8

Discussion: There were no transfers into or out of Tank 10 during FY15. The salt level in Tank 10 is ~ 71".

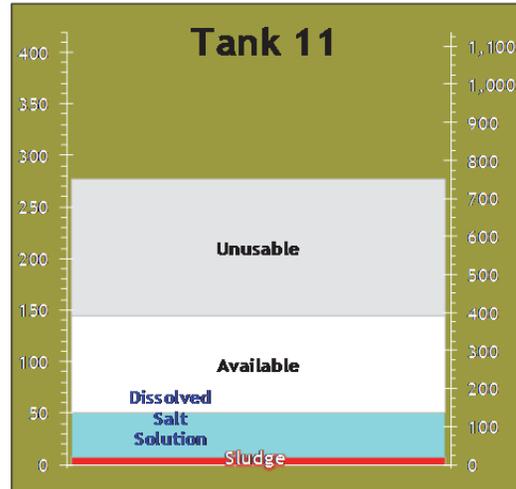


Tank 10 Level



Tank 11:

Area: H-Area (East Hill)
 Service: Salt Solution Storage Tank
 Type: I
 Maximum Volume: 393,000 gallons
 Working Volume: 379,400 gallons
 Waste Volume: 135,200 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 STP in Riser 6 (12" with a range of 2"-144")

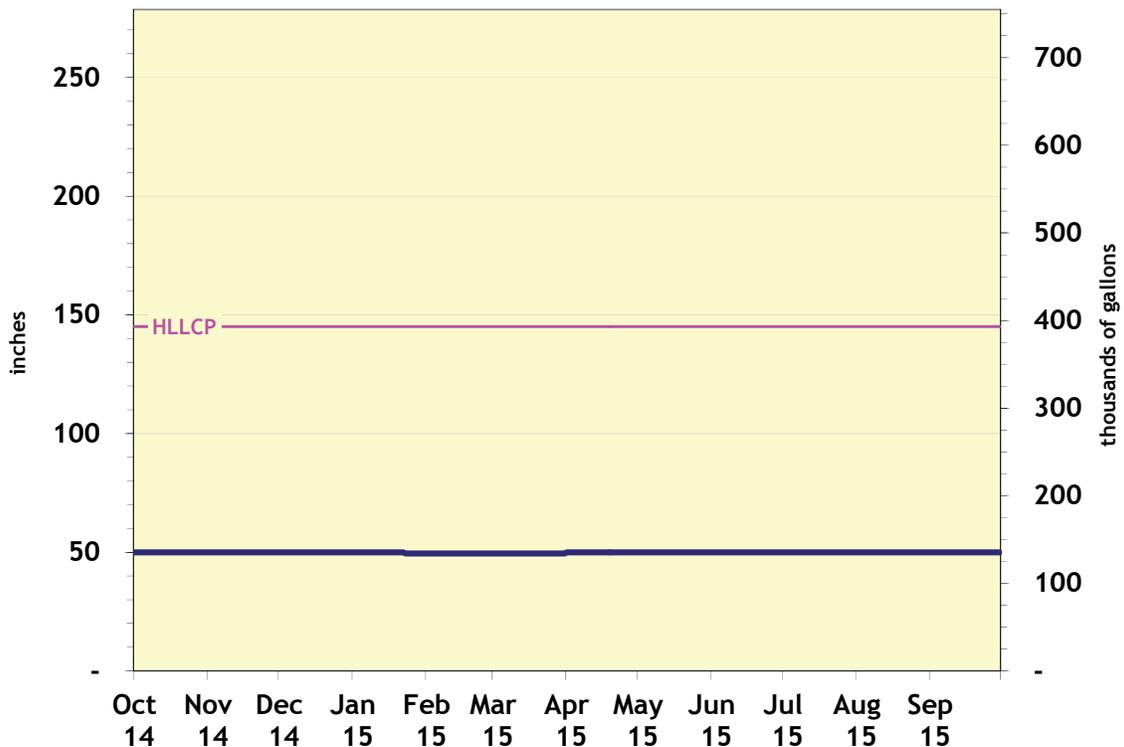
Transfer Jet in Riser 7 — abandoned in place

Mixing pumps: An SMP in Riser 8 (not electrically connected)

Discussion: There were no transfers into or out of Tank 11 during FY15.

Comments: SCDHEC and EPA concurred that BWRE were complete. Tank 11 will be used to transfer dissolved salt and cleaning materials from Tank 10.

Tank 11 Level



Tank 12:

Area: H-Area (East Hill)

Service: Tank Closure

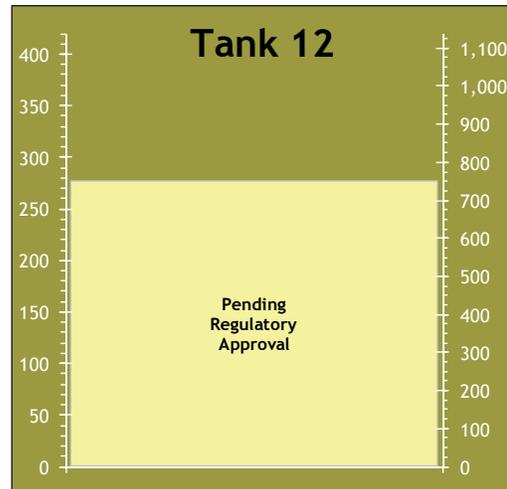
Type: I

Maximum Volume: N/A

Working Volume: N/A

Waste Volume: 5,000 gallons^a

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 (11" with a range of 2"–144")

Dewatering Pump in the center riser suspended at approximately 120"

Mixing pumps: Three (3) Lawrence slurry pumps in Risers 1, 3, and 5

Discussion: Completed field activities for grout preparations per FFA milestone of 9/30/2015. Grout is forecast to be complete in FY16.

^a Clark, J. L., *Tank 12 Final Volume Determination and Uncertainty Estimate*, U-ESR-H-00125, Rev. 0, October 09, 2014

4.2 Type II Tanks

Tank 13:

Area: H-Area (East Hill)

Service: Sludge Prep Hub Tank

Type: II

Maximum Volume: 892,500 gallons

Working Volume: 875,000 gallons

Waste Volume: 601,000 gallons

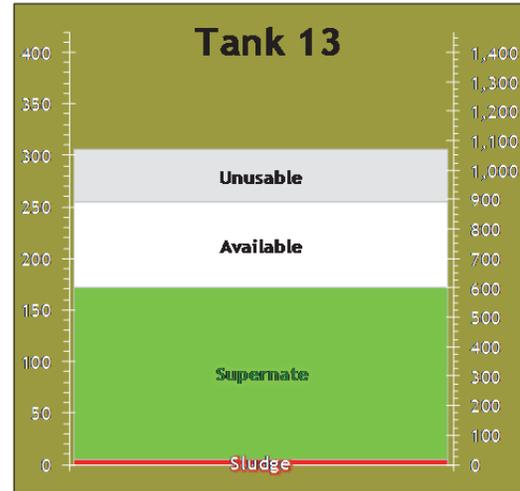
Leak Sites: Inspections in 1977 revealed the first of two known leaksites, the lowest of which is 269" from the bottom of the tank. Only trace amounts of waste reached the annulus pans.

Prime Movers: STP in Riser 5 (48")

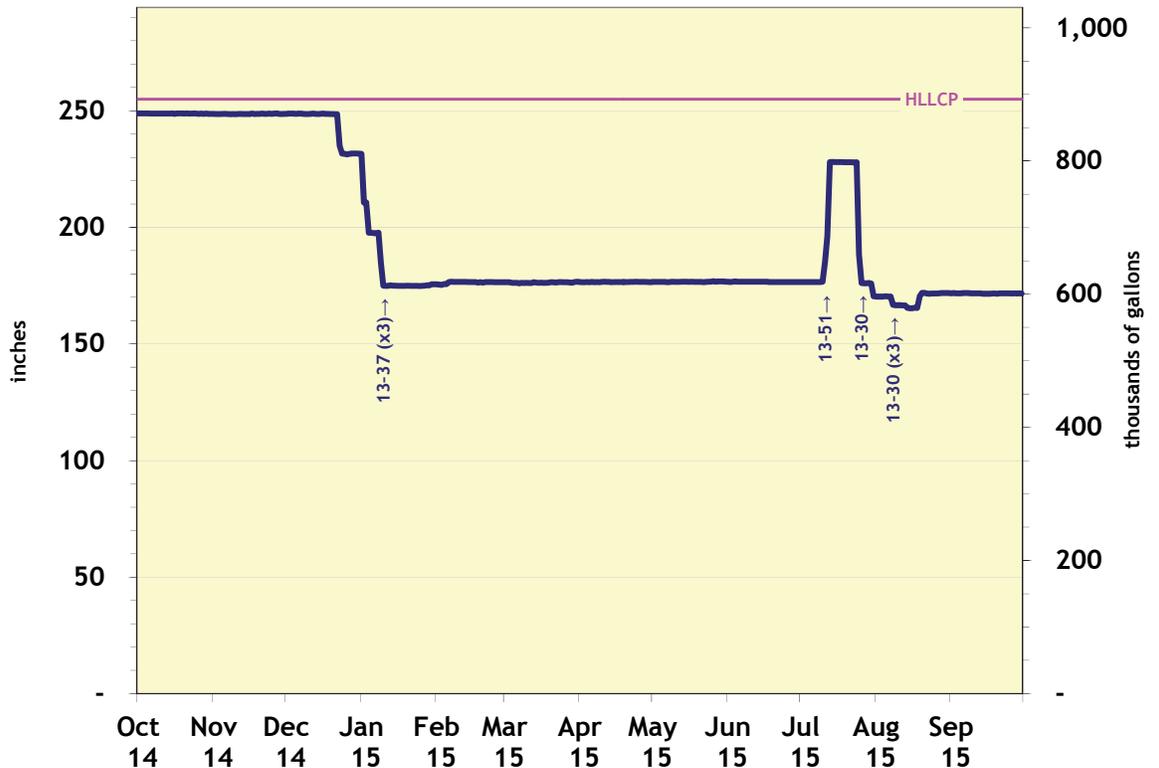
Adjustable reel type Jet in Riser 7 (137") — abandoned in place.

Mixing pumps: Three (3) SMPs in Risers 2A, 4, and 8

Discussion: Three Tank 13 transfers in December and January (totaling 254 kgal) supplied material to Tank 37 for salt dissolution. To support SB #9 preparation, 176 kgal was received in July from Tank 51 and 182 kgal was transferred to Tank 30 in July. An additional 37 kgal was transferred to Tank 30 in three transfers in July and August to inhibit the low point in an alternate 3H Evaporator recycle transfer path during the repair of a jumper in HDB-6.



Tank 13 Level



Tank 14:

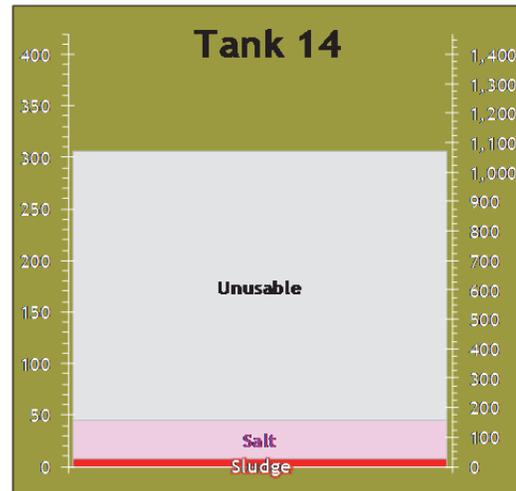
Area: H-Area (East Hill)
 Service: Inactive Waste Tank
 Type: II

Maximum Volume: 350,000 gallons

Working Volume: 332,500 gallons

Waste Volume: 157,500 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.

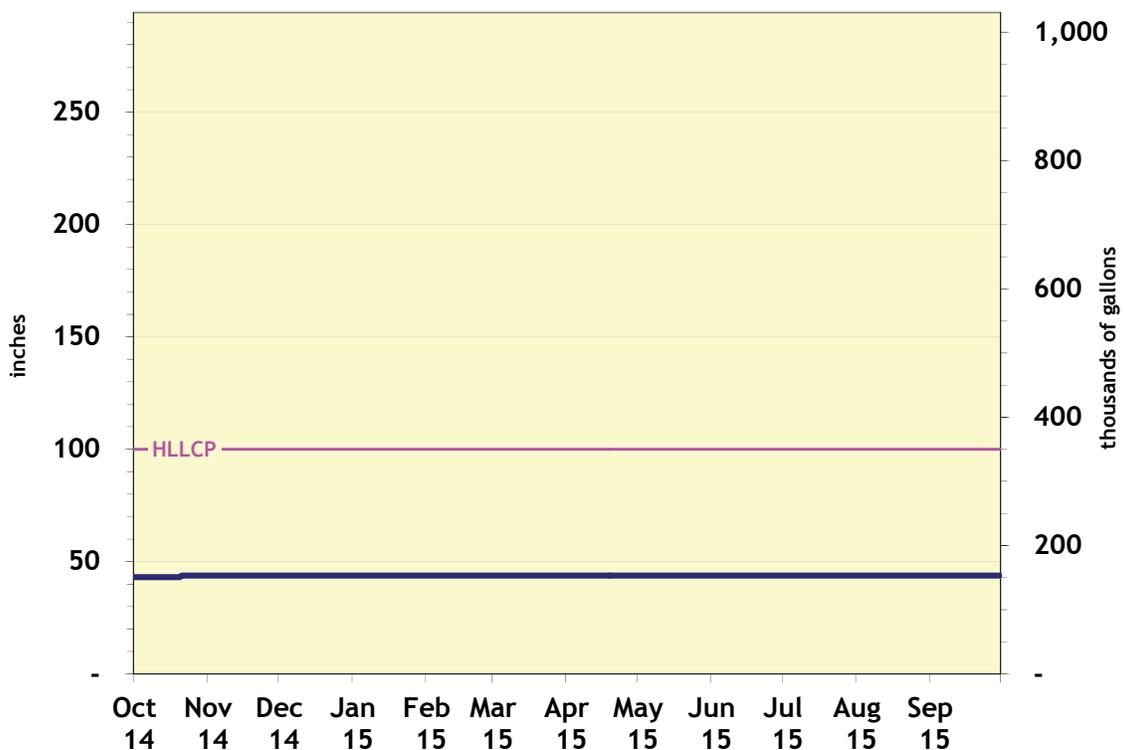


Prime Movers: Fixed Length Jet in Riser 2 (68")

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 14 during FY15. The salt level in Tank 14 is ~ 37".

Tank 14 Level



Tank 15:

Area: H-Area (East Hill)
 Service: Inactive Waste Tank
 Type: II

Maximum Volume: 350,000 gallons

Working Volume: 332,500 gallons

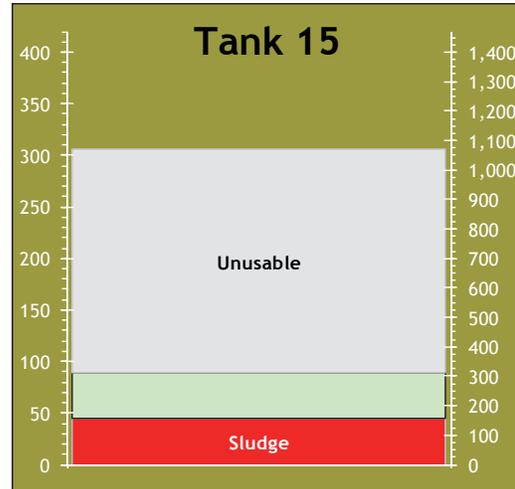
Waste Volume: 311,900 gallons

Leak Sites: Inspections in 1972 revealed the first two of twenty 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.

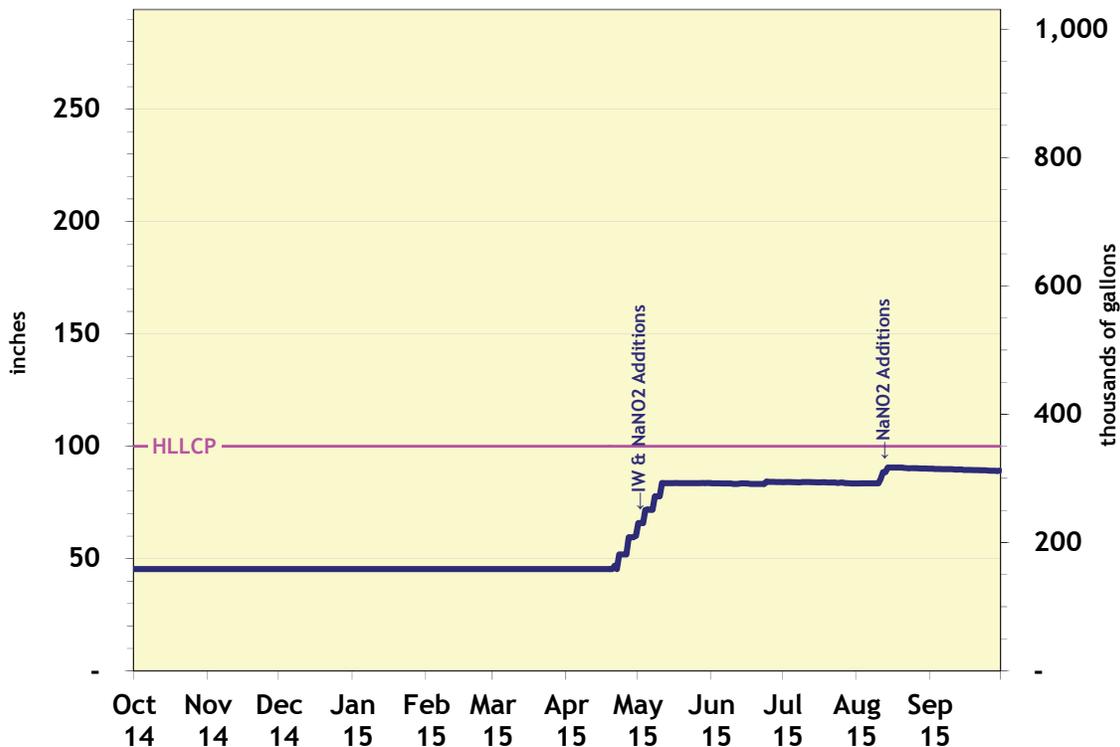
Prime Movers: TTP in Riser 7 (20")

Mixing pumps: None

Discussion: The addition of 126 kgal Inhibited Water (IW) and 13 kgal sodium nitrite (NaNO₂) in April and May wet the sludge in preparation for removal of the sludge into SB #10. In June, 4 kgal and in August 25 kgal of caustic (sodium hydroxide – NaOH) was added to the tank.



Tank 15 Level



Tank 16:

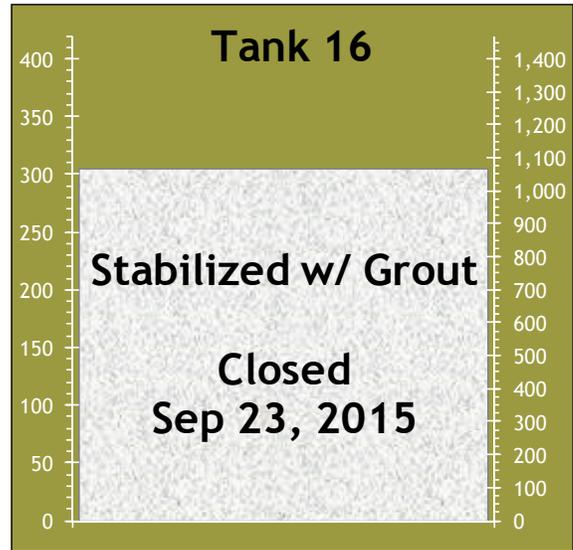
Area: H-Area (East Hill)

Service: Closed / Stabilized with Grout

Type: II

Leak Sites: Tank 16 was placed in service in 1959 with liquid waste detected in the annulus pan that same year. Approximately 300–350 leaksites were visually confirmed.

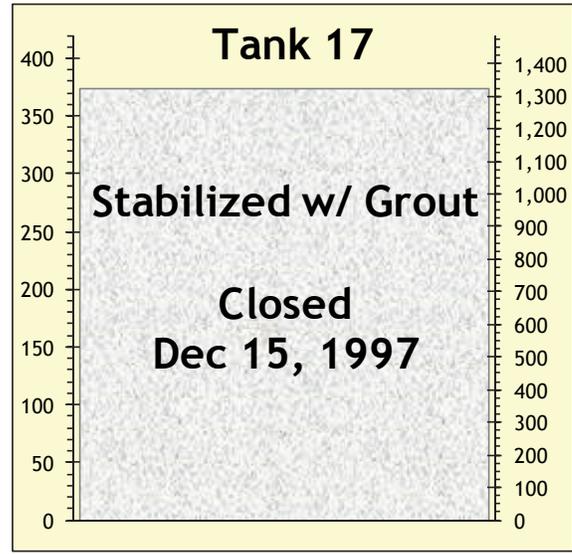
Discussion: Tank 16 was emptied and deactivated as a waste tank. It was filled with grout and operationally closed on September 23, 2015.



4.3 Type IV Tanks

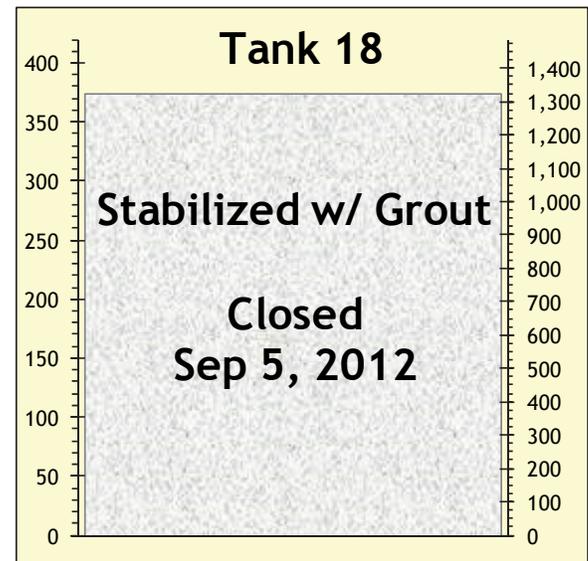
Tank 17:

Area: F-Area
Service: Closed / Stabilized with Grout
Type: IV
Leak Sites: None
Discussion: Tank 17 was emptied and de-activated as a waste tank. It was filled with grout and operationally closed on December 15, 1997.



Tank 18:

Area: F-Area
Service: Closed / Stabilized with Grout
Type: IV
Leak Sites: None
Discussion: Tank 18 was emptied and de-activated as a waste tank. It was filled with grout and operationally closed on September 5, 2012.



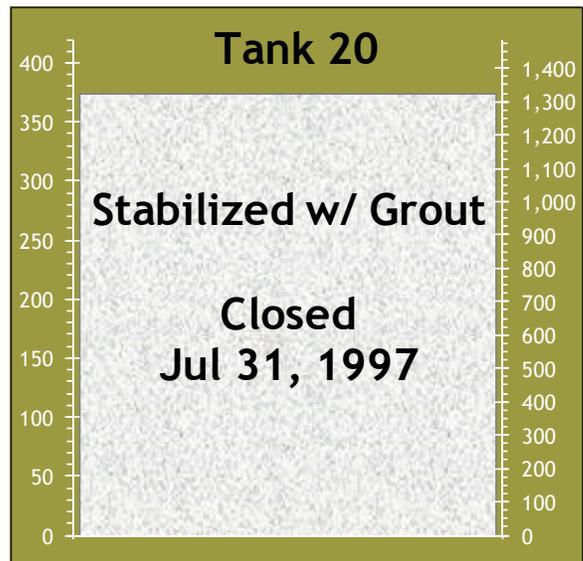
Tank 19:

Area: F-Area
Service: Closed / Stabilized with Grout
Type: IV
Leak Sites: Visual examination of the tank identified two leaksites at 317" and 330". Two other leaksites were identified during tank cleaning in FY09 at 28". No waste was detected leaking from the tank.
Discussion: Tank 19 was emptied and de-activated as a waste tank. It was filled with grout and operationally closed on September 5, 2012.



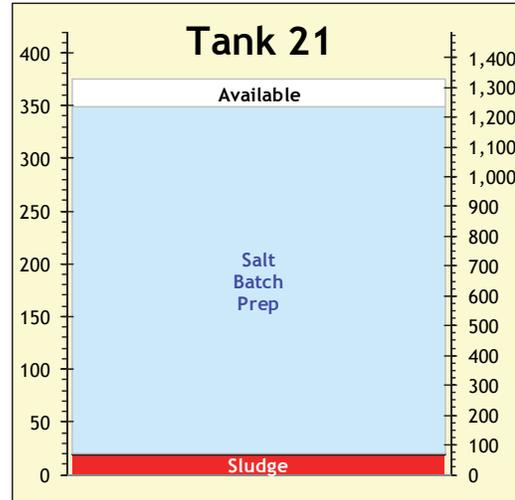
Tank 20:

Area: F-Area
Service: Closed / Stabilized 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. Past inspections of the steel liner revealed no leakage from the tank.
Discussion: Tank 20 was emptied and de-activated as a waste tank. It was filled with grout and operationally closed on July 31, 1997.



Tank 21:

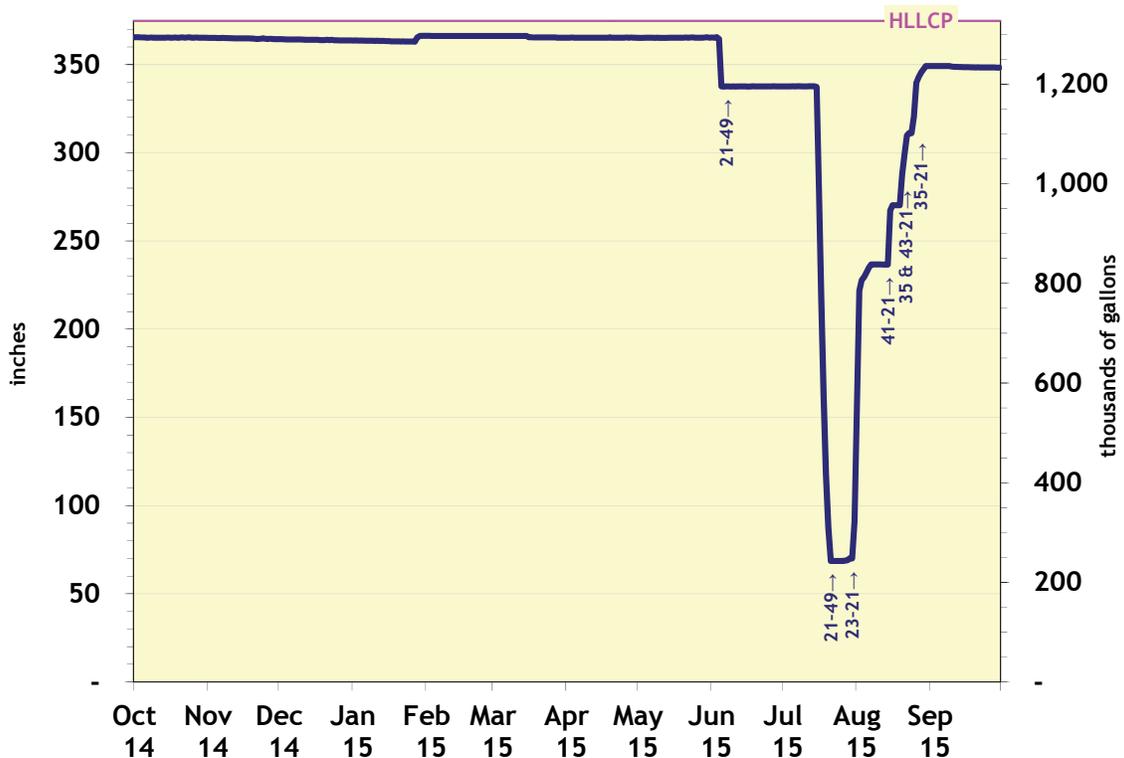
Area: H-Area (East Hill)
 Service: ARP/MCU Salt Batch Blend Tank
 Type: IV
 Maximum Volume: 1,327,500 gallons
 Working Volume: 1,309,800 gallons
 Waste Volume: 1,232,600 gallons
 Leak Sites: None
 Prime Movers: TTP (Hazelton) in the south riser (62")



Mixing pumps: Two (2) operable 2x15 Sulzer slurry pumps in the southeast and southwest risers
 One (1) inoperable 2x15 Sulzer slurry pump — abandoned in place.

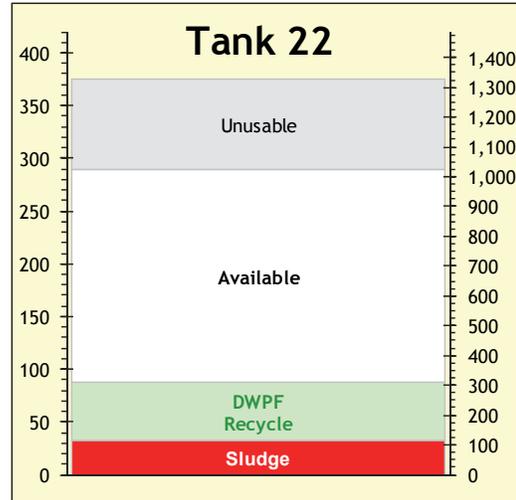
Discussion: Salt Batch #8 was delivered into Tank 49 in June (100 kgal) and July (953 kgal). Salt Batch #9 preparation consisted of five transfers: 559 kgal from Tank 23 in July, 117 kgal from Tank 41, 95 kgal from Tank 35, 37 kgal from Tank 43, and another 106 kgal from Tank 35, all in August.

Tank 21 Level



Tank 22:

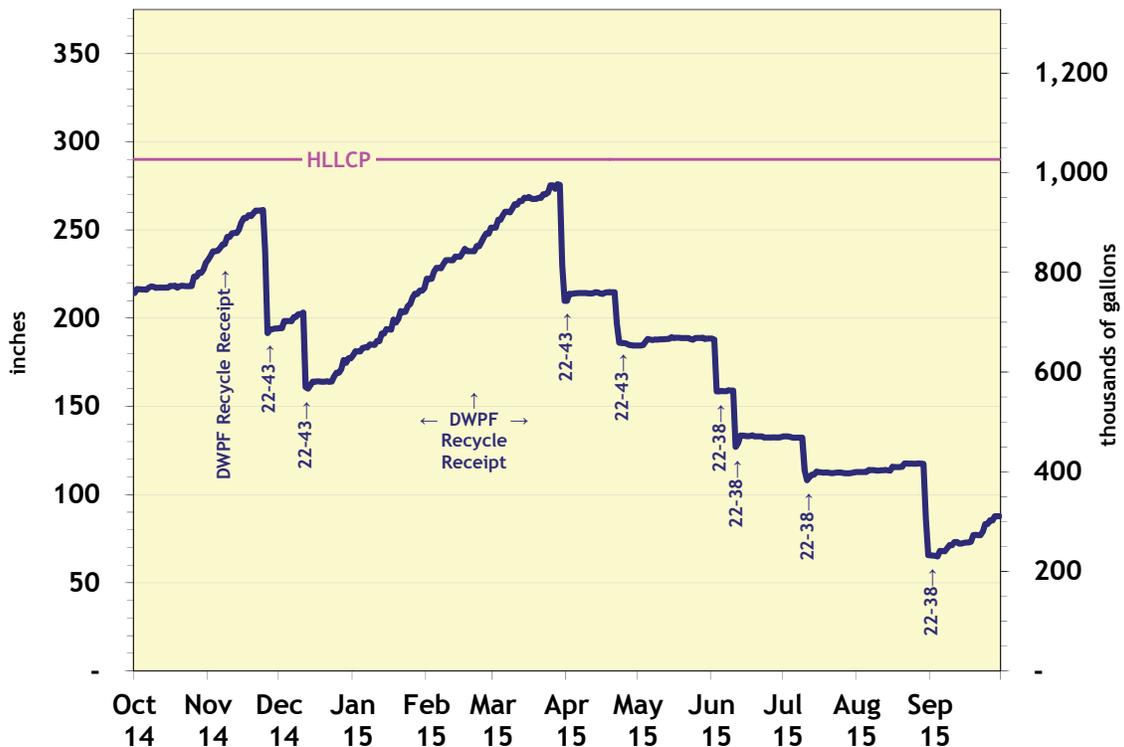
Area: H-Area (East Hill)
 Service: Storage Tank for DWPF Recycle
 Type: IV
 Maximum Volume: 1,026,600 gallons
 Working Volume: 1,008,900 gallons
 Waste Volume: 310,500 gallons
 Leak Sites: None
 Prime Movers: TTP in the south riser (62")
 Mixing pumps: Two (2) operable 2x15 Sulzer slurry pumps in the southeast and southwest risers



One (1) inoperable 2x15 Sulzer slurry pump — abandoned in place.

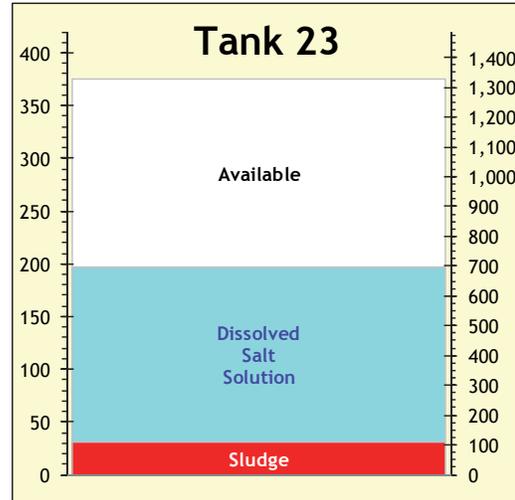
Discussion: Tank 22 received 796 kgal of DWPF Recycle in FY15. Four Tank 22 to Tank 43 transfers, totaling 750 kgal and four Tank 22 to Tank 38 transfers, totaling 478 kgal, provided feed for the 2H Evaporator. For FY15, the initial volume in Tank 22 was 759 kgal and the final volume was 310 kgal; the average was 640 kgal for the year.

Tank 22 Level



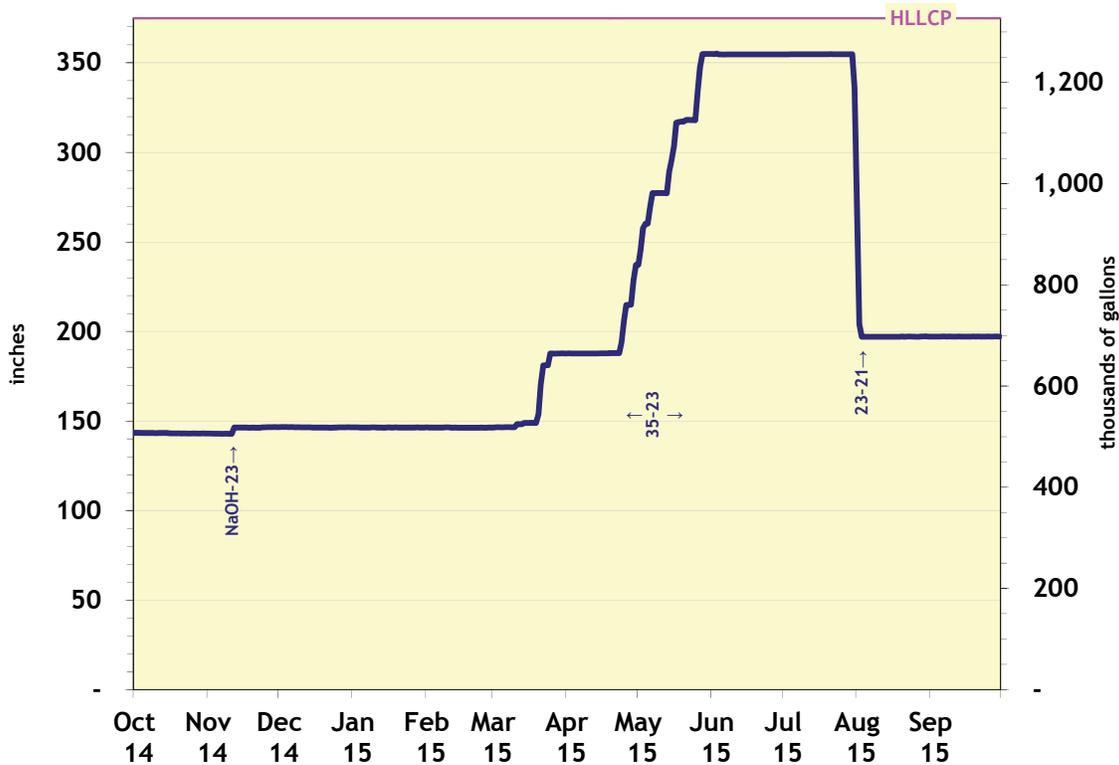
Tank 23:

Area: H-Area (East Hill)
 Service: Salt Solution Hold Tank
 Type: IV
 Maximum Volume: 1,327,500 gallons
 Working Volume: 1,309,800 gallons
 Waste Volume: 697,700 gallons
 Leak Sites: None
 Prime Movers: STP in the north riser (60")
 Mixing pumps: None



Discussion: In November, 13 kgal of NaOH was added to precondition Tank 23 to receive dissolved salt from Tank 37. Tank 23 received five transfers in March through May from Tank 37 salt dissolution totaling 737 kgal. A transfer of 559 kgal from Tank 23 to Tank 21 in July provided material for Salt Batch #9 preparation.

Tank 23 Level



Tank 24:

Area: H-Area (East Hill)

Service: Storage Tank

Type: IV

Maximum Volume: 1,327,500 gallons

Working Volume: 1,309,800 gallons

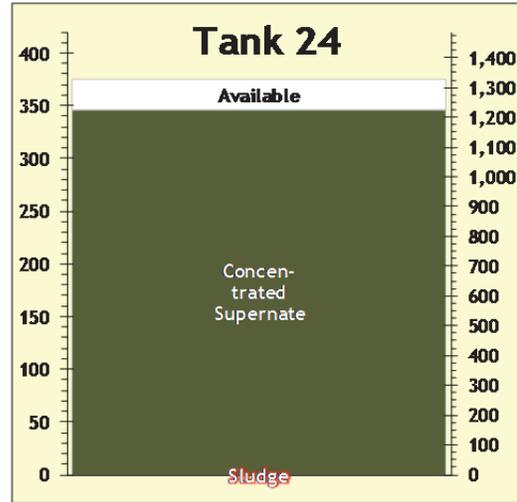
Waste Volume: 1,225,900 gallons

Leak Sites: None

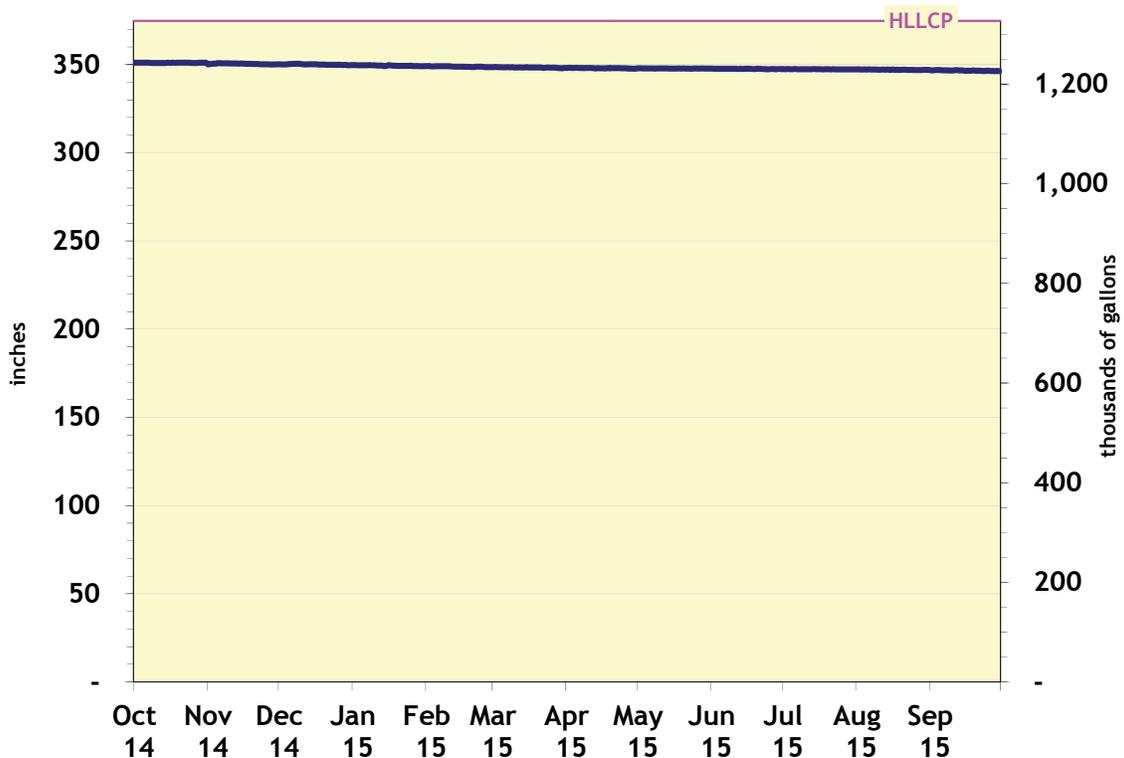
Prime Movers: STP in the north riser (5")

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 24 during FY15.



Tank 24 Level



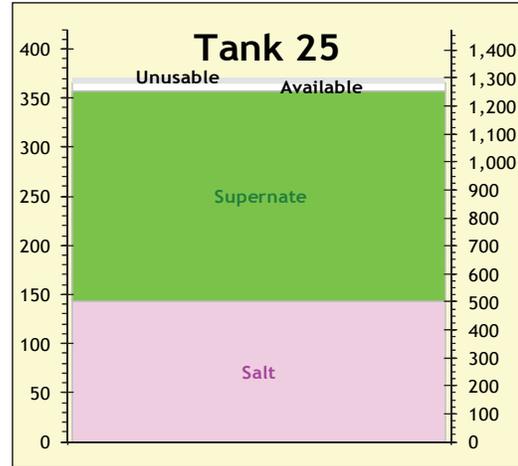
4.4 Type III Tanks

Tank 25:

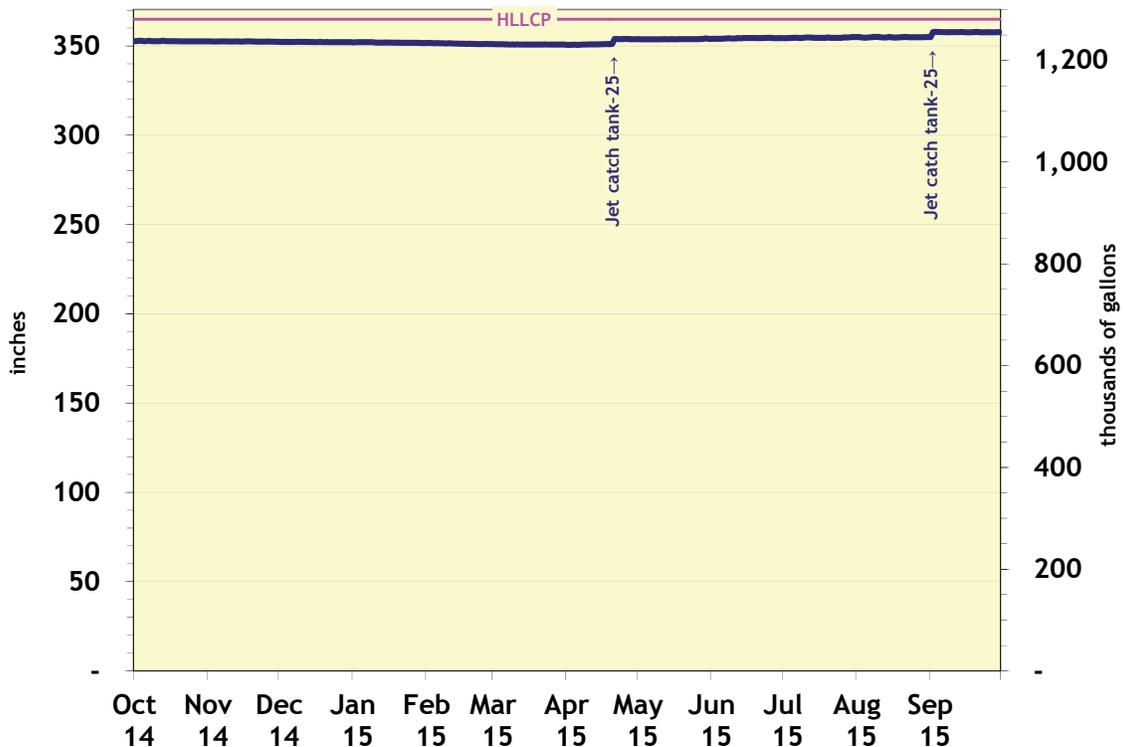
Area: F-Area
 Service: Active Waste Tank
 Type: IIIA
 Maximum Volume: 1,281,200 gallons
 Working Volume: 1,263,600 gallons
 Waste Volume: 1,255,500 gallons
 Prime Movers: Fixed Length Jet in the C1
 Riser (270")

Mixing pumps: None

Discussion: Tank 25 received 10 kgal of rainwater from the catch tank in April and again in September. The salt level in Tank 25 is ~143".

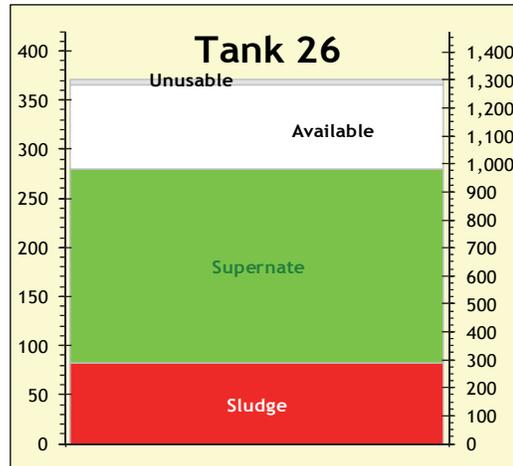


Tank 25 Level



Tank 26

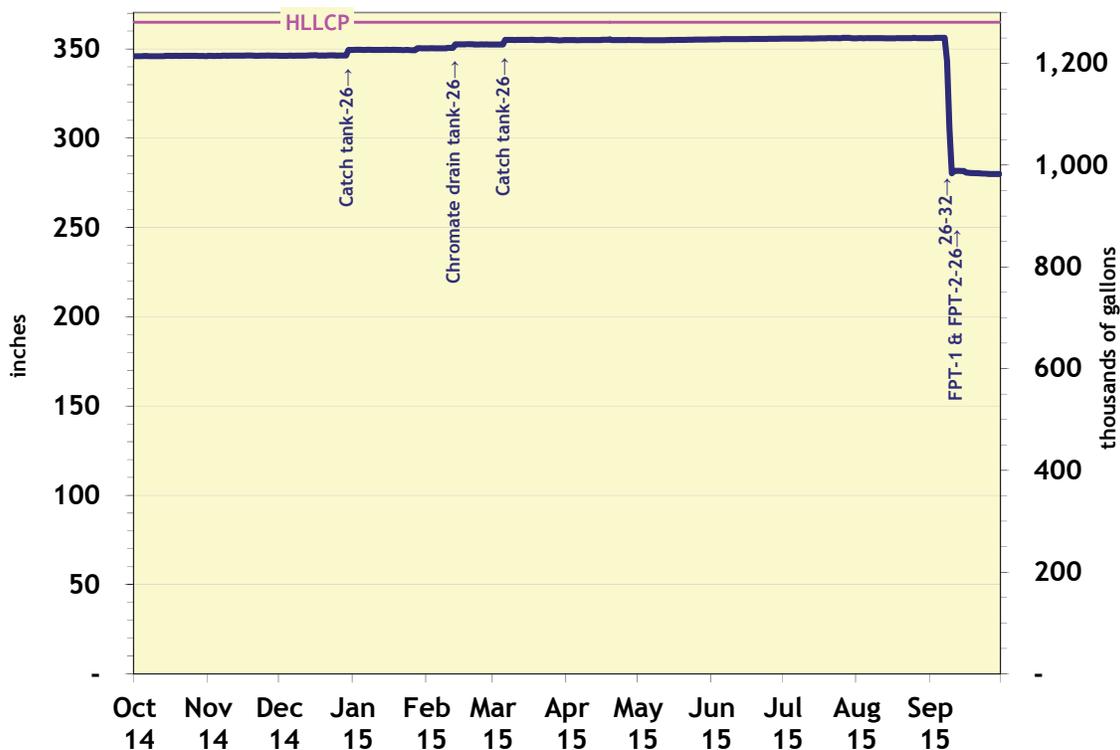
Area: F-Area
 Service: Active Waste Tank
 Type: IIIA
 Maximum Volume: 1,281,200 gallons
 Working Volume: 1,263,600 gallons
 Waste Volume: 982,500 gallons
 Prime Movers: Fixed Length Jet in the C1 Riser (108")
 Fixed Length Evaporator Feed Pump in the R2 Riser (161")



Mixing pumps: None

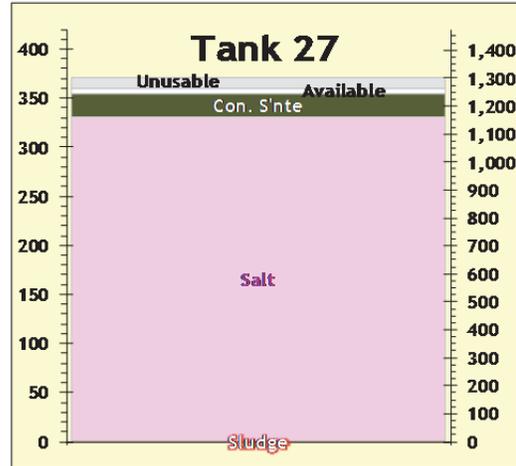
Discussion: Tank 26 received rainwater from several sources in FY15: 9 kgal from the Chromate drain tank, 32 kgal from the catch tank, and 6 kgal from FPT-1 and FPT-2 plus a few smaller amounts from various sources. In September, a 267-kgal Inter-area Line (IAL) transfer to Tank 32 provided feed for the 3H Evaporator and level relief for Tank 26.

Tank 26 Level



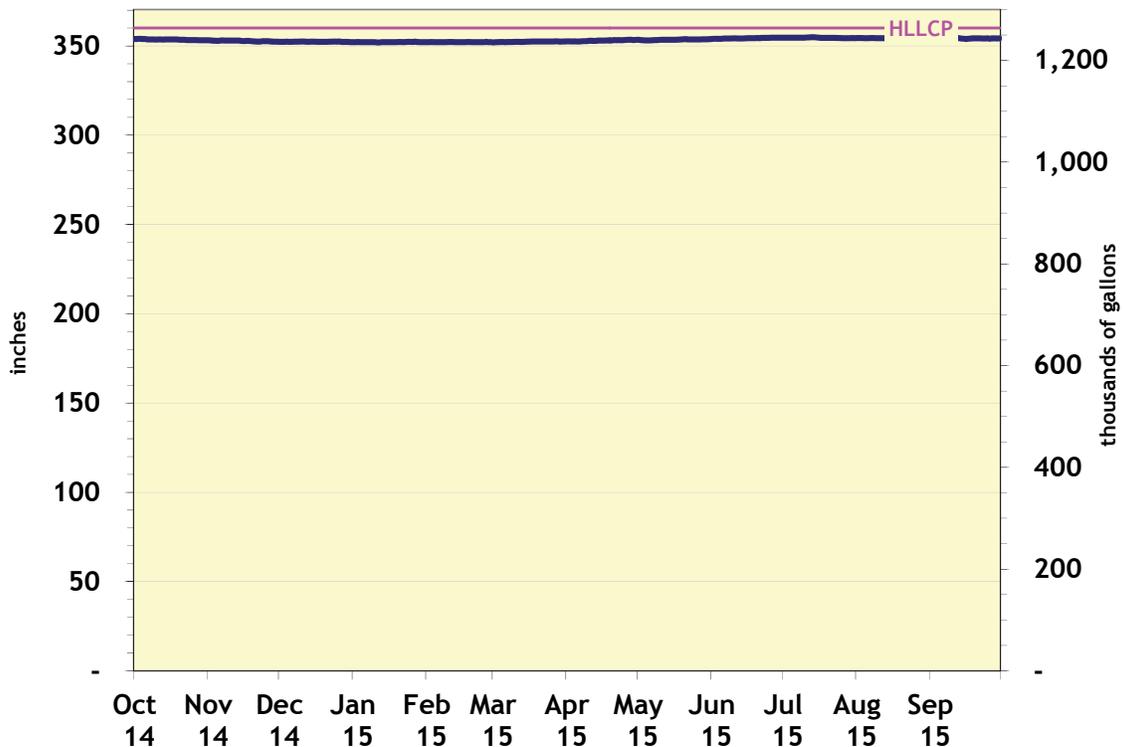
Tank 27

Area: F-Area
 Service: Inactive Waste Tank
 Type: IIIA
 Maximum Volume: 1,263,600 gallons
 Working Volume: 1,246,100 gallons
 Waste Volume: 1,243,200 gallons
 Prime Movers: TTJ in the C1 Riser (267" with a range of 155.5"-267")
 Mixing pumps: None



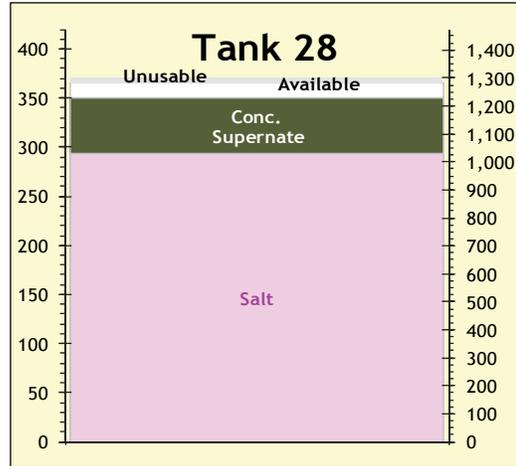
Discussion: There were no transfers into or out of Tank 27 during FY15. The salt level in Tank 27 is ~330".

Tank 27 Level



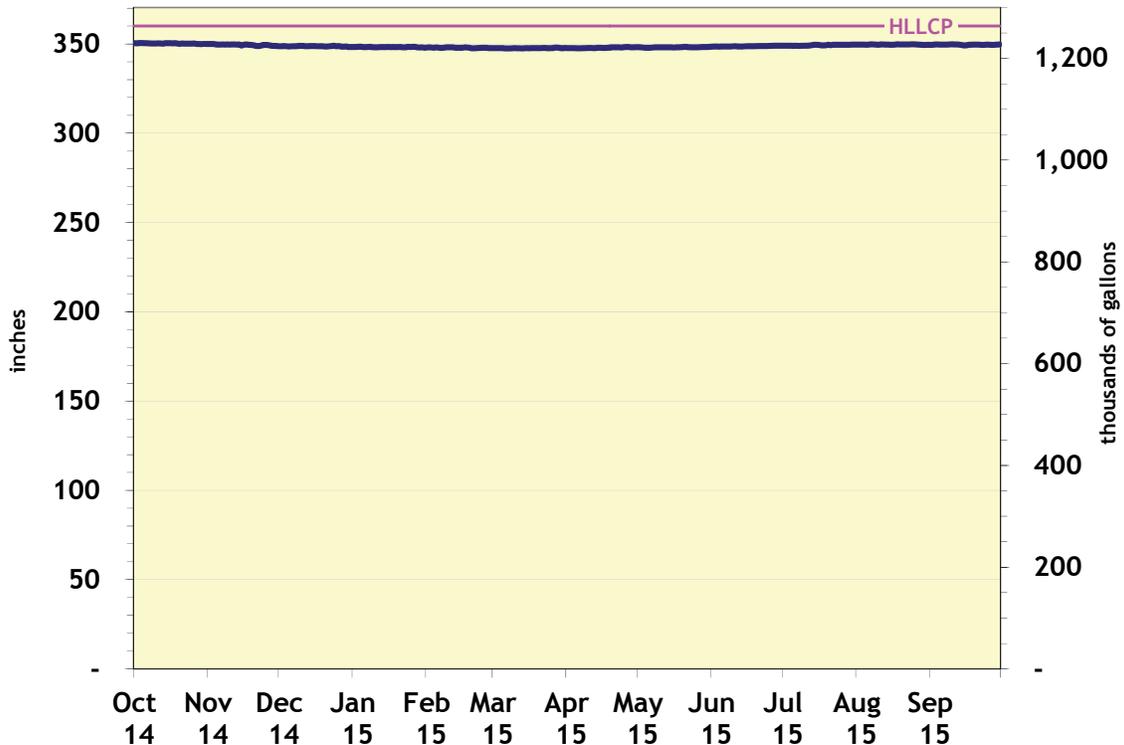
Tank 28:

Area: F-Area
 Service: Inactive Waste Tank
 Type: IIIA
 Maximum Volume: 1,281,200 gallons
 Working Volume: 1,263,600 gallons
 Waste Volume: 1,227,400 gallons
 Prime Movers: TTJ in the C1 Riser (unknown height)
 Mixing pumps: None



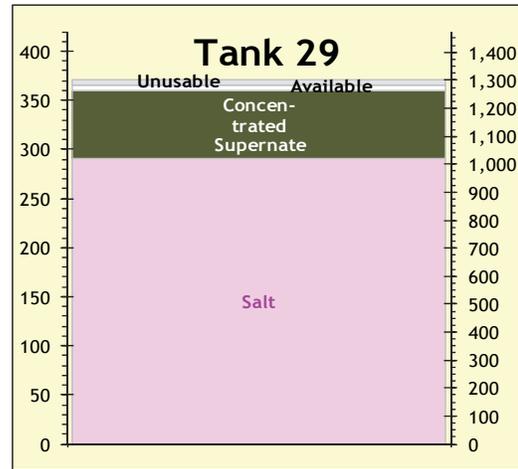
Discussion: There were no transfers into or out of Tank 28 during FY15. The salt level in Tank 28 is ~293”.

Tank 28 Level

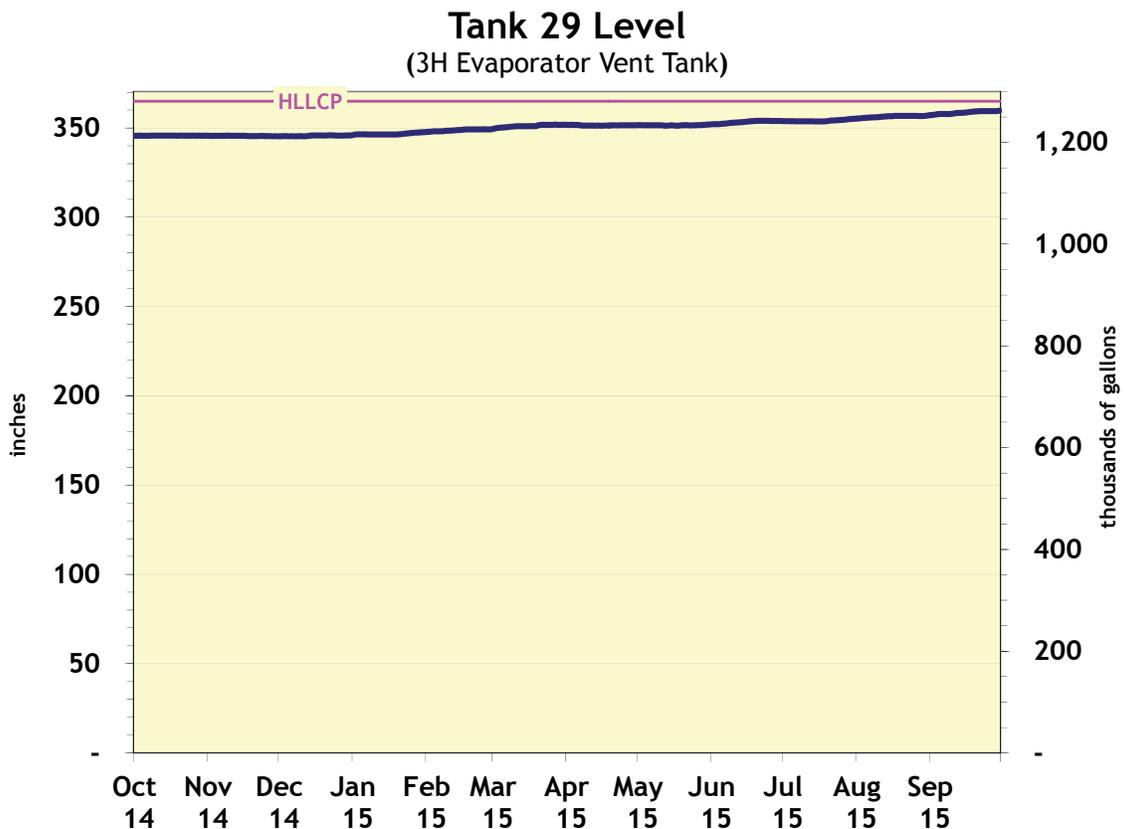


Tank 29:

Area: H-Area (East Hill)
 Service: 3H Evaporator Vent Tank
 Type: III
 Maximum Volume: 1,281,200 gallons
 Working Volume: 1,263,600 gallons
 Waste Volume: 1,262,200 gallons
 Prime Movers: Fixed Length Jet in Riser C1 (292")
 Mixing pumps: None

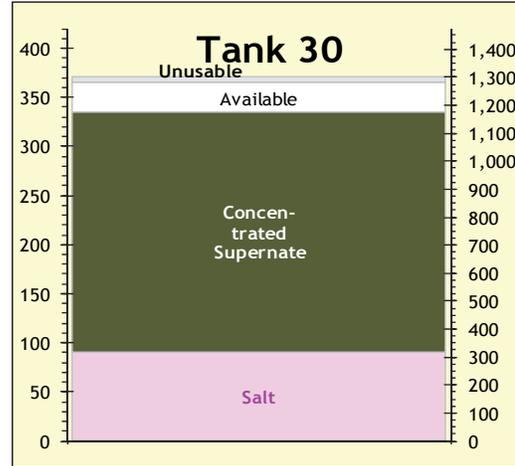


Discussion: There were no transfers into or out of Tank 29 during FY15. The salt level in Tank 29 is ~292".



Tank 30:

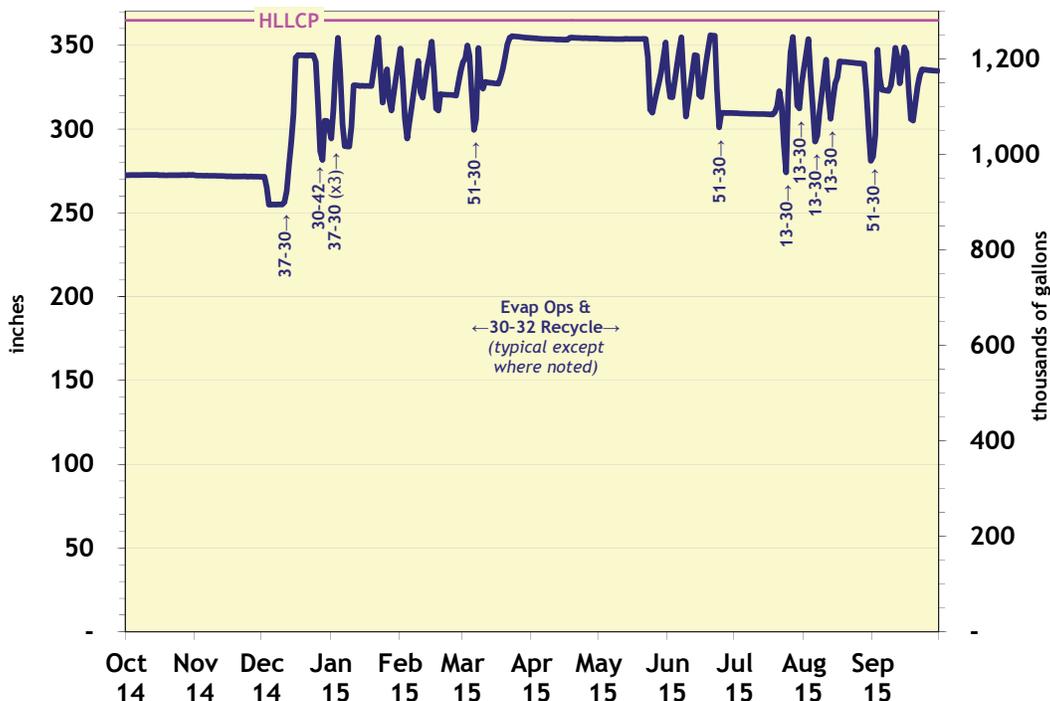
Area: H-Area (East Hill)
 Service: 3H Evaporator Concentrate Receipt Tank
 Type: III
 Maximum Volume: 1,281,200 gallons
 Working Volume: 1,263,600 gallons
 Waste Volume: 1,174,800 gallons
 Prime Movers: TTJ in Riser C1 (150" — with a range of 89.5"–197")
 Mixing pumps: None



Discussion: Tank 30 is a 3H Evaporator Concentrate Receipt tank. Twenty-three Tank 30 to Tank 32 recycle transfers totaling 4,769 kgal supported operation of the 3H Evaporator. In December, Tank 30 received a 146-kgal supernate transfer from Tank 37 to initiate salt dissolution in Tank 37 followed by a 223-kgal Tank 30 to Tank 42 deliquor transfer. Tank 30 then received three higher-curie interstitial transfers from Tank 37, totaling 272 kgal. Two Tank 51 to Tank 30 transfers provided 155 kgal of feed for the 3H Evaporator. A 182-kgal receipt from Tank 13 supported preparation of SB#9. Three additional Tank 13 to Tank 30 transfers in August, totaling 37 kgal, adjusted the chemistry in the low point of an alternative transfer route for Tank 30 to Tank 32 recycle transfers as an HDB-6 jumper was being repaired. For FY15, the initial volume in Tank 30 was 956 kgal and the final volume was 1,175 kgal; the average was 1,119 kgal for the year. A final Tank 51 to Tank 30 transfer of 134 kgal supported SB#9 preparation.

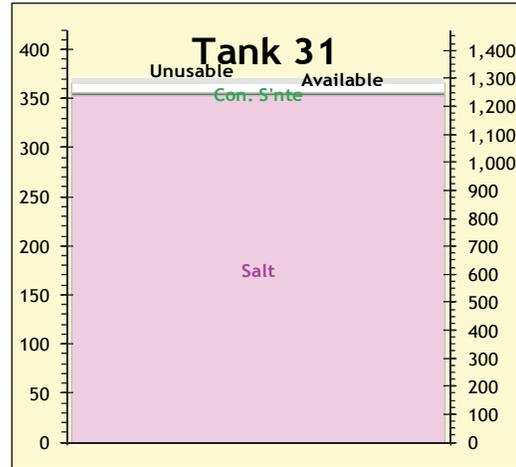
Tank 30 Level

(3H Evaporator Concentrate Receipt Tank)

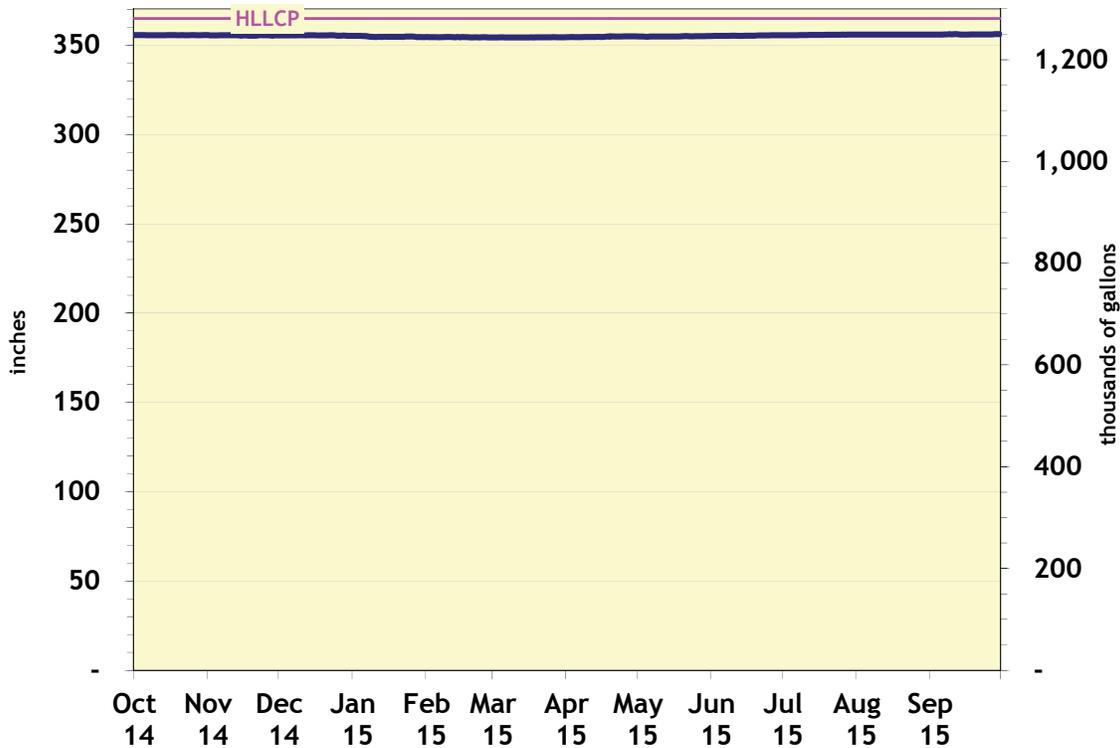


Tank 31:

Area: H-Area (East Hill)
 Service: Inactive Waste Tank
 Type: III
 Maximum Volume: 1,281,200 gallons
 Working Volume: 1,263,600 gallons
 Waste Volume: 1,250,300 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 FY15. The salt
 level in Tank 31 is ~ 353".



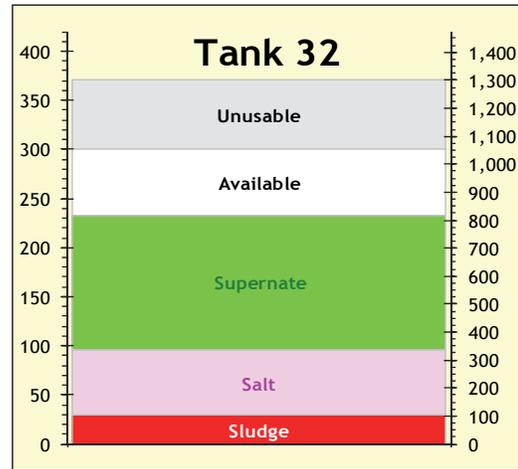
Tank 31 Level



* SW11.1-WTE, Sec 7.2, Rev 83-IPC1 states an unknown height for this prime mover. The last recorded height was 268" (SW11.1-WTE, Sec 7.2, Rev 9).

Tank 32:

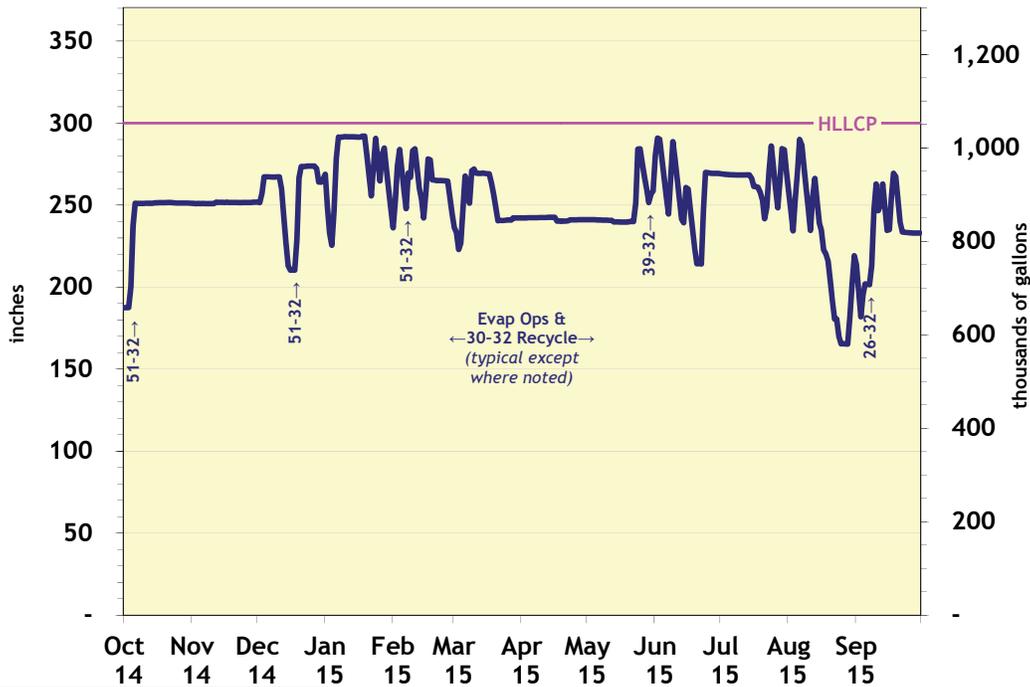
Area: H-Area (East Hill)
 Service: 3H Evaporator Feed Tank
 Type: IIIA
 Maximum Volume: 1,053,000 gallons
 Working Volume: 1,035,500 gallons
 Waste Volume: 817,800 gallons
 Prime Movers: Fixed Length Jet in the C1 Riser (60")*
 Fixed Length Evaporator Feed Pump in the C2 Riser (89")



Mixing pumps: None

Discussion: Tank 32 is the 3H Evaporator Feed Tank. Twenty-three Tank 30 to Tank 32 recycle transfers totaling 4,769 kgal supported operation of the 3H Evaporator. Three Tank 51 Evaporator feed transfers, totaling 583 kgal, were received in October, December, and February. Tank 32 received 100 kgal from Tank 39 in May to support continued H-Canyon receipt capacity. In September, a Tank 26 to Tank 32 IAL transfer supplied 267 kgal of feed and provided level relief for F-Area. For FY15, the initial volume in Tank 32 was 658 kgal and the final volume was 818 kgal; the average was 881 kgal for the year. Approximately 66" of salt (up from 53" in FY14) cover ~30" of sludge.

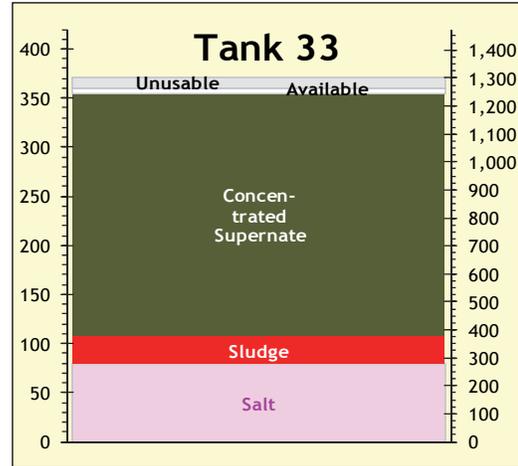
Tank 32 Level
 (3H Evaporator Feed Tank)



* SW11.1-WTE, Sec 7.2, Rev 83-IPC1 states an unknown height for this prime mover. The last recorded height was 60" (SW11.1-WTE, Sec 7.2, Rev 9).

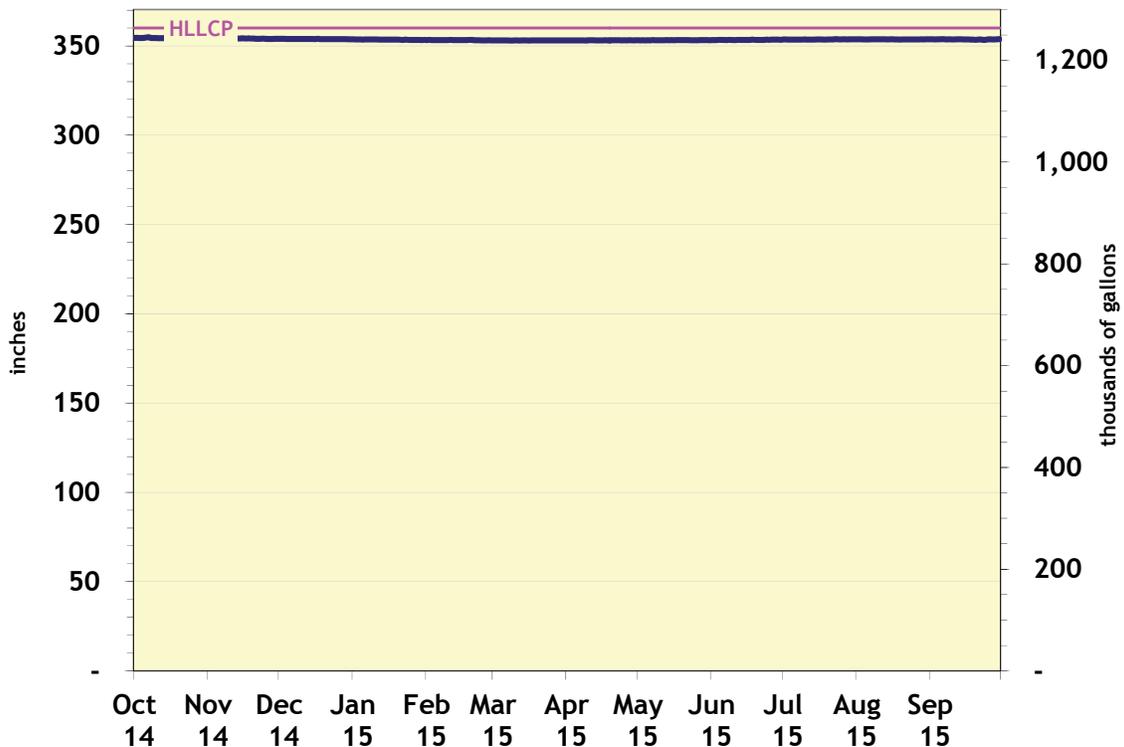
Tank 33:

Area: F-Area
 Service: Active Storage Tank
 Type: III
 Maximum Volume: 1,263,600 gallons
 Working Volume: 1,246,100 gallons
 Waste Volume: 1,241,800 gallons
 Prime Movers: TTJ in the C1 Riser (145" with a range of 89.5"–197")
 Mixing pumps: None



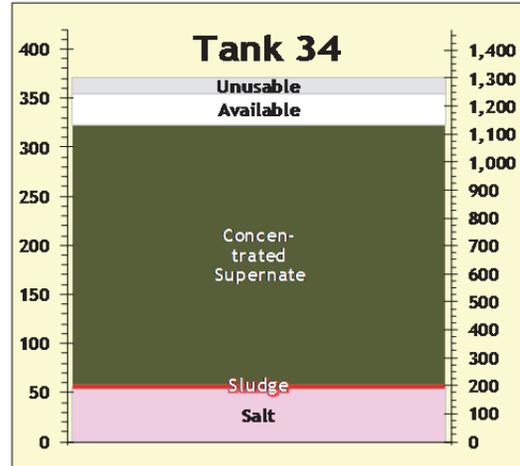
Discussion: There were no transfers into or out of Tank 33 during FY15. The salt level in Tank 33 is ~80".

Tank 33 Level



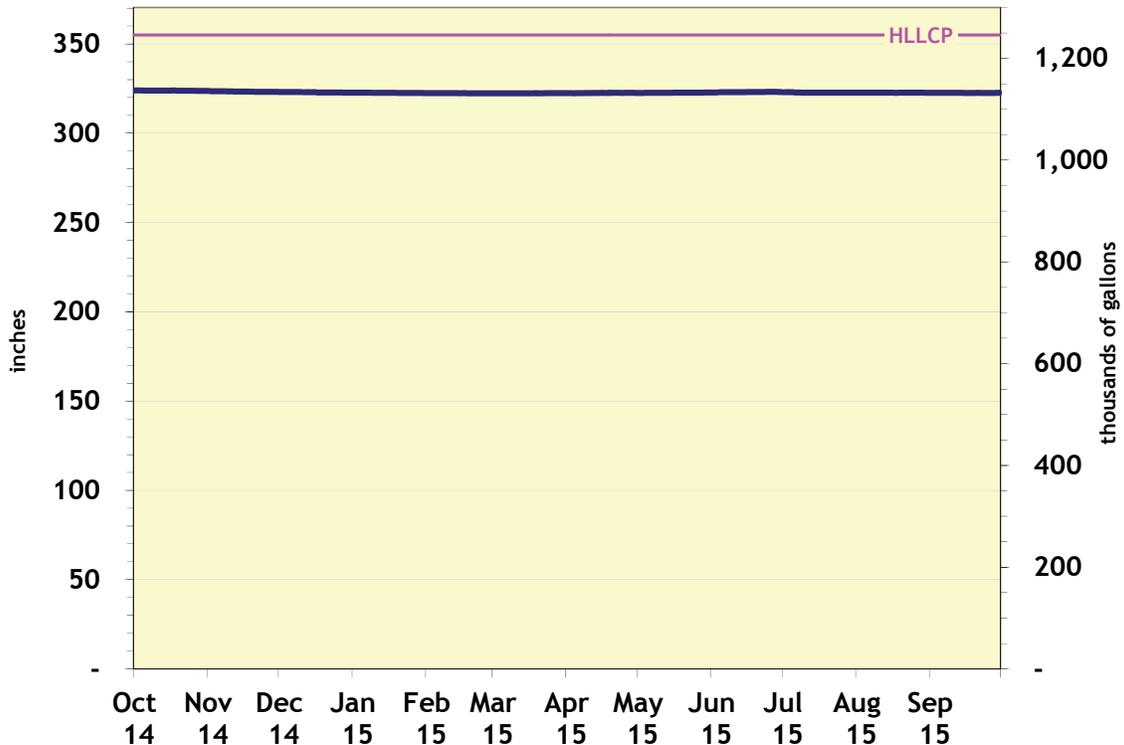
Tank 34:

Area: F-Area
 Service: Active Storage Tank
 Type: III
 Maximum Volume: 1,246,100 gallons
 Working Volume: 1,228,500 gallons
 Waste Volume: 1,132,300 gallons
 Prime Movers: Fixed Length Jet in the C1 Riser (100.5")
 Mixing pumps: None



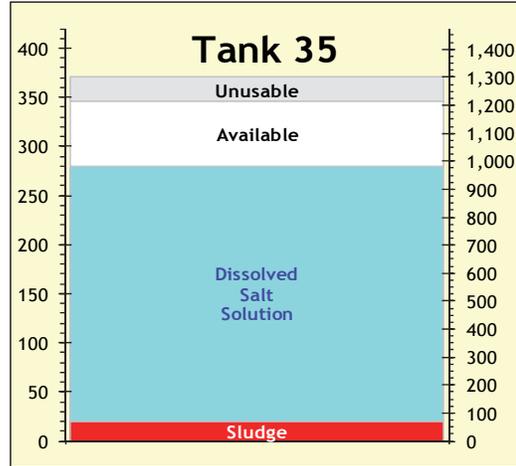
Discussion: There were no transfers into or out of Tank 34 during FY15. The salt level in Tank 34 is ~55".

Tank 34 Level



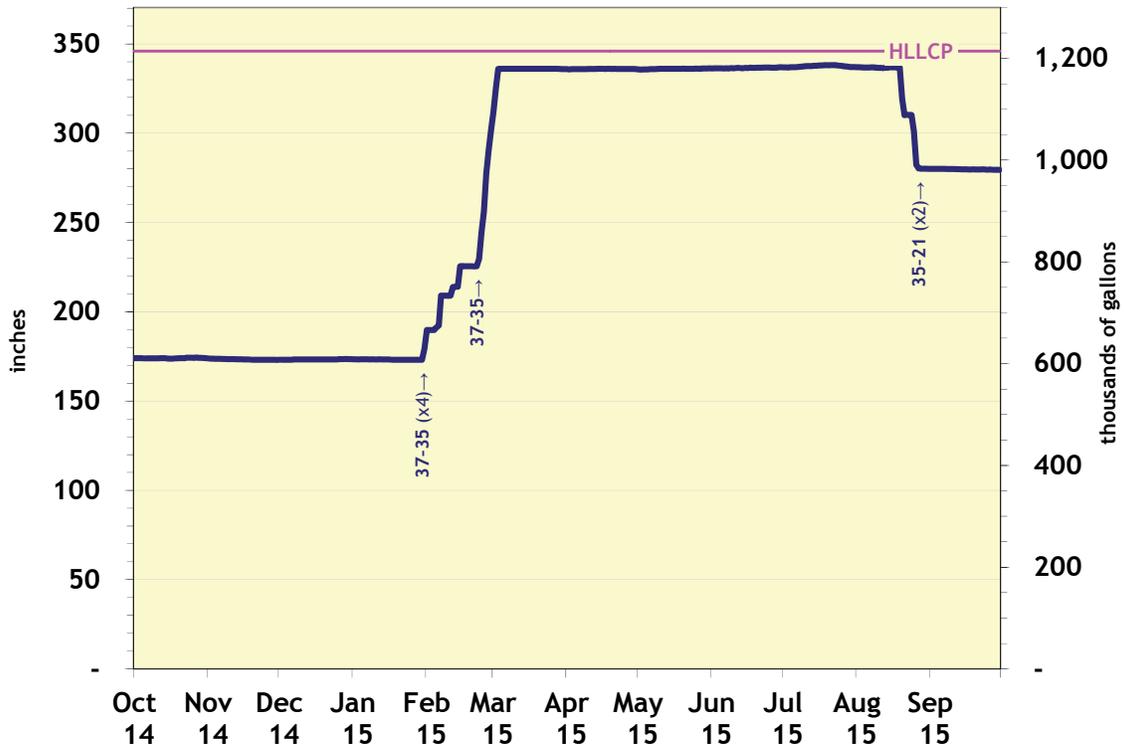
Tank 35:

Area: H-Area (East Hill)
 Service: Dissolved Salt Storage
 Type: IIIA
 Maximum Volume: 1,214,500 gallons
 Working Volume: 1,196,900 gallons
 Waste Volume: 981,100 gallons
 Prime Movers: TTJ in the C1 Riser (130" with a range of 0"-206.5")
 Mixing pumps: None



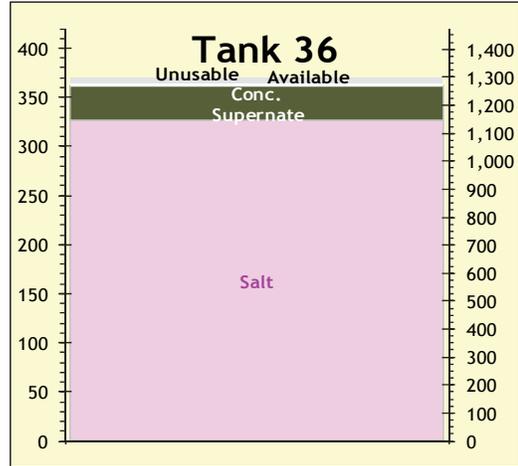
Discussion: Tank 35 received 590 kgal from the Tank 37 salt dissolution campaign in February. In August, two transfers totaling 201 kgal contributed material for Salt Batch #9 preparation.

Tank 35 Level



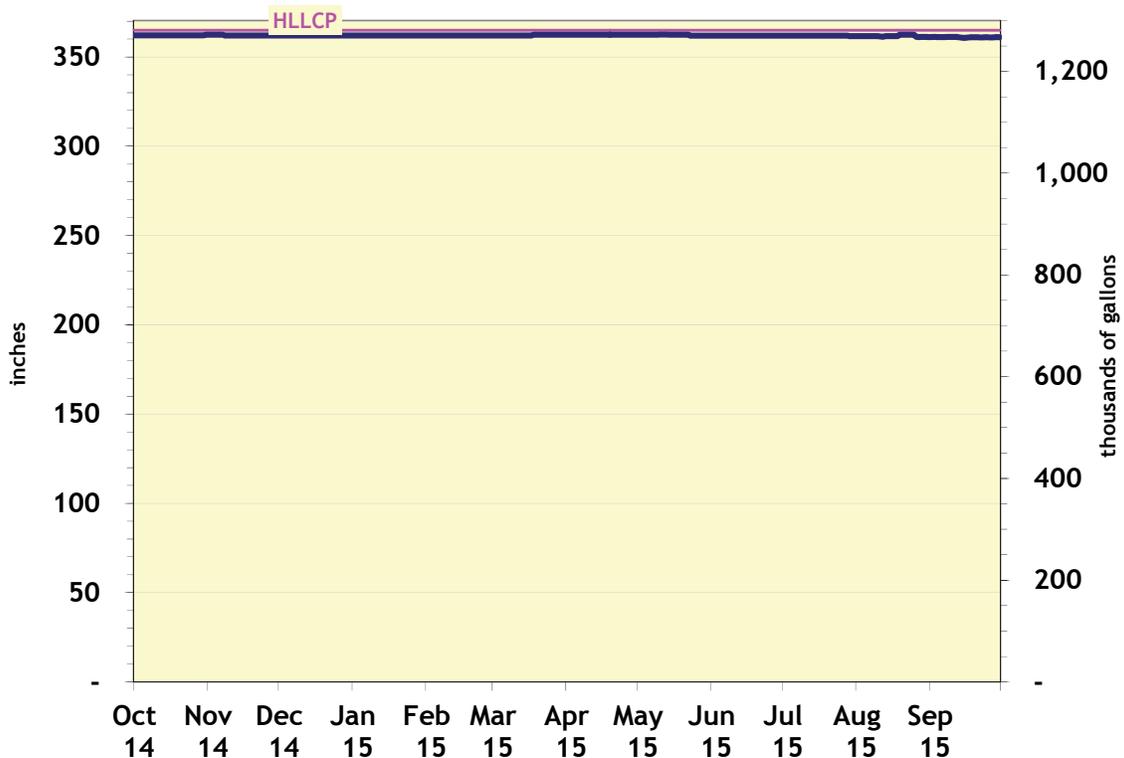
Tank 36:

Area: H-Area (East Hill)
 Service: Inactive Waste Tank
 Type: IIIA
 Maximum Volume: 1,281,200 gallons
 Working Volume: 1,263,600 gallons
 Waste Volume: 1,267,100 gallons
 Prime Movers: Fixed Length Jet in the C1
 Riser (201")
 Mixing pumps: None



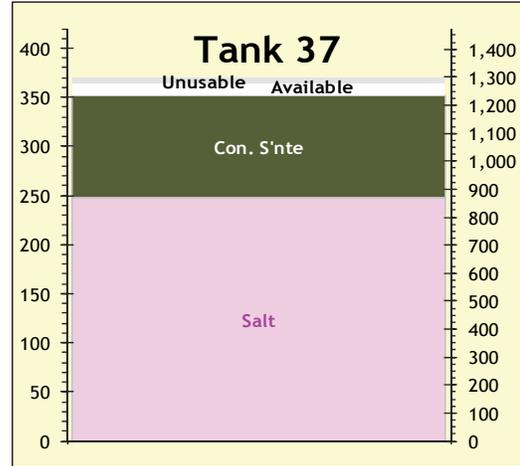
Discussion: There were no transfers into or out of Tank 36 during FY15. The salt level in Tank 36 is ~ 327".

Tank 36 Level

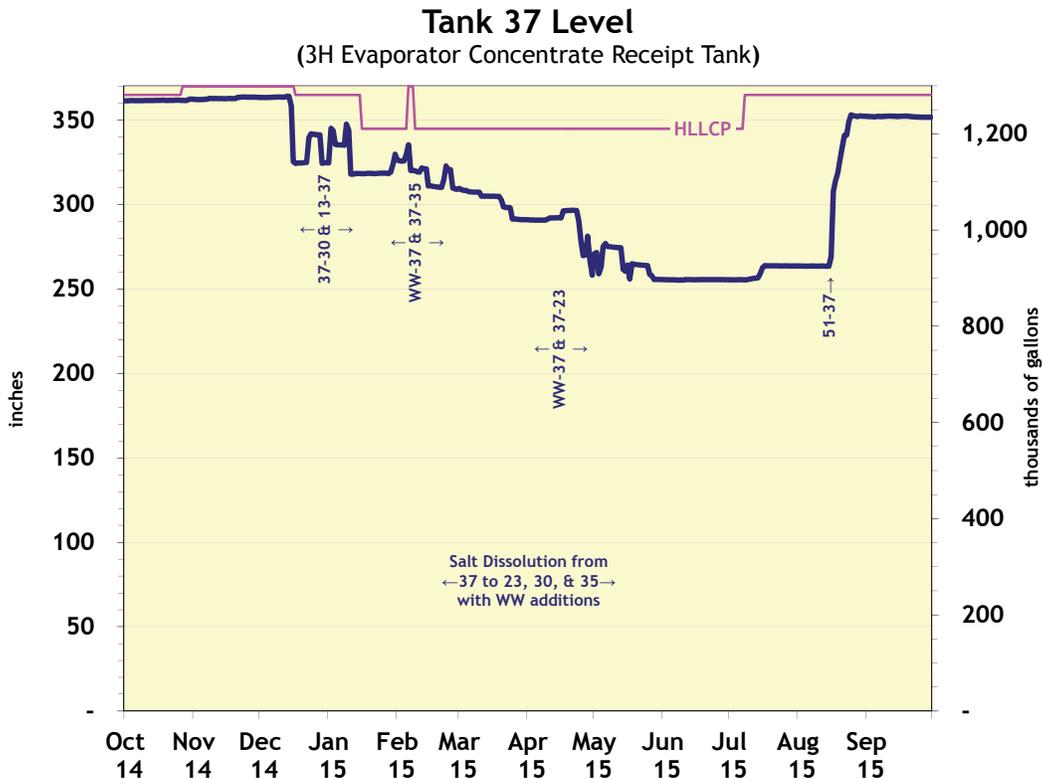


Tank 37:

Area: H-Area (East Hill)
 Service: 3H Evaporator Concentrate Receipt Tank
 Type: IIIA
 Maximum Volume: 1,281,200 gallons
 Working Volume: 1,270,600 gallons
 Waste Volume: 1,234,800 gallons
 Prime Movers: TTJ in C1 Riser (206" with a range of 155.5"-267")
 Mixing pumps: Three low volume mixing jets in Risers B1, B3, and B5

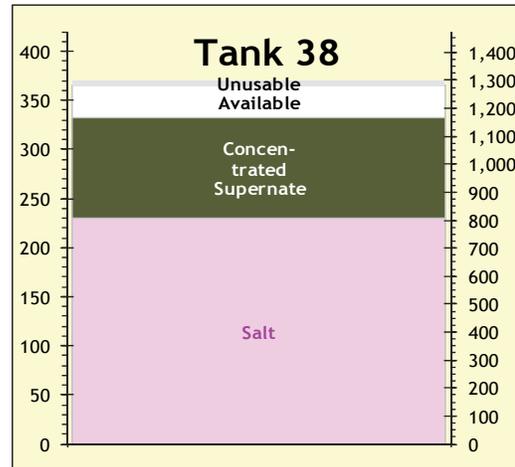


Discussion: Tank 37 is one of two 3H Evaporator Concentrate Receipt tanks. The TTJ became plugged in August of FY14, however, and Tank 37 only received concentrate for about four days in FY15. In mid-December, Tank 37 initiated a salt removal campaign with a 146-kgal supernate transfer to Tank 30. Three Tank 13 to Tank 37 transfers in December and January (totaling 254 kgal) supplied material for salt dissolution, each followed by a transfer of the higher-curie interstitial waste to Tank 30 (totaling 272 kgal). In January through April Tank 37 received 617 kgal of WW and 17 kgal of IW for salt dissolution. Tank 37 transferred 590 kgal to Tank 35 in five transfers in January and February and 737 kgal to Tank 23 in five transfers in March through May, completing the salt dissolution campaign. The final salt level in Tank 37 was 247" as compared to the FY14 level of 326".



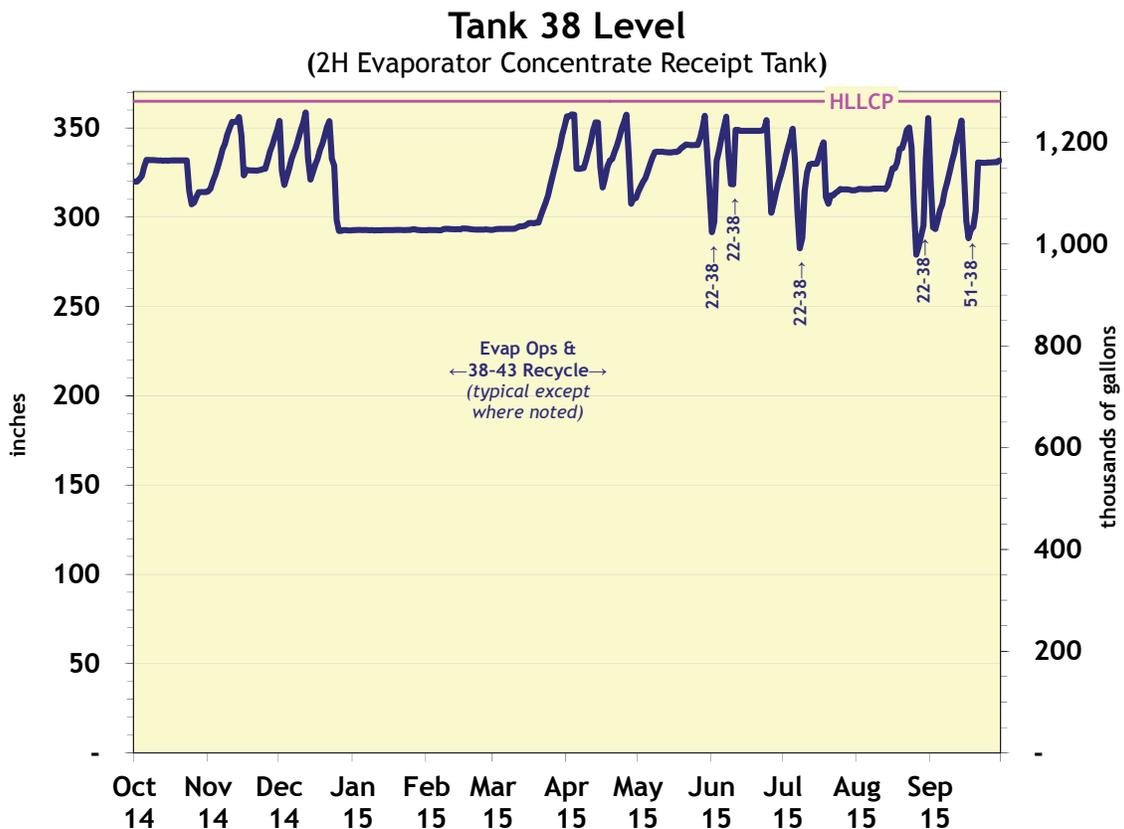
Tank 38:

Area: H-Area (West Hill)
 Service: 2H Evaporator Concentrate Receipt Tank
 Type: IIIA
 Maximum Volume: 1,281,200 gallons
 Working Volume: 1,263,600 gallons
 Waste Volume: 1,164,300 gallons
 Prime Movers: Fixed Length Jet in C1 Riser (248")



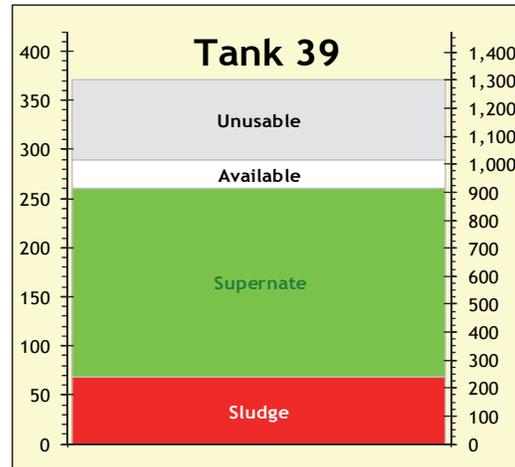
Mixing pumps: None

Discussion: Sixteen Tank 38 to Tank 43 recycle transfers, totaling 3,247 kgal, supported 2H Evaporator operations. Four Tank 22 to Tank 38 transfers provided 478 kgal of feed for the 2H Evaporator. In September, Tank 38 received a 128-kgal decant from Tank 51 supporting SB9 preparation. For FY15, the initial volume in Tank 38 was 1,123 kgal and the final volume was 1,164 kgal; the average was 1,126 kgal for the year. The salt level in Tank 38 is ~230".



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: 1,000,400 gallons
 Waste Volume: 914,400 gallons
 Prime Movers: Fixed Length Jet in the C1 Riser (75")

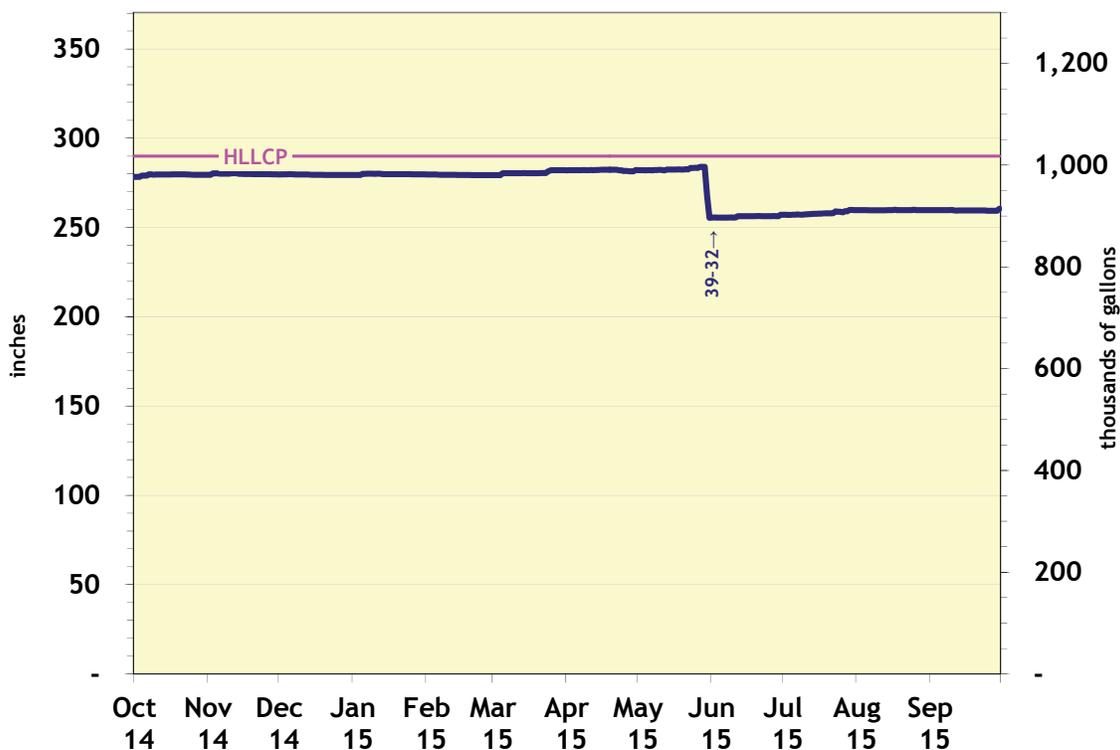


Mixing pumps: None

Discussion: Tank 39 received approximately 21.8 kgal of H-Canyon waste and 2.9 kgal of 299-H waste in FY15. In May, Tank 39 transferred 100 kgal to Tank 32 to support continued H-Canyon receipts. For FY15, the initial volume in Tank 39 was 977 kgal and the final volume was 914 kgal; the average was 958 kgal for the year.

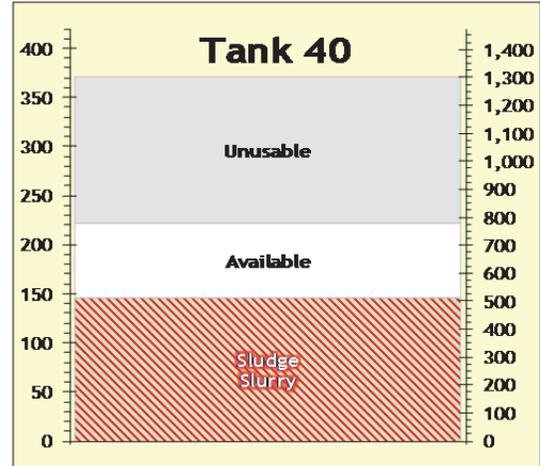
Comments: Tank 39 will continue to receive H-Canyon waste in the future. Currently H-Canyon forecasts waste transfers to HTF through FY25.

Tank 39 Level
 (H-Canyon Receipt Tank)



Tank 40:

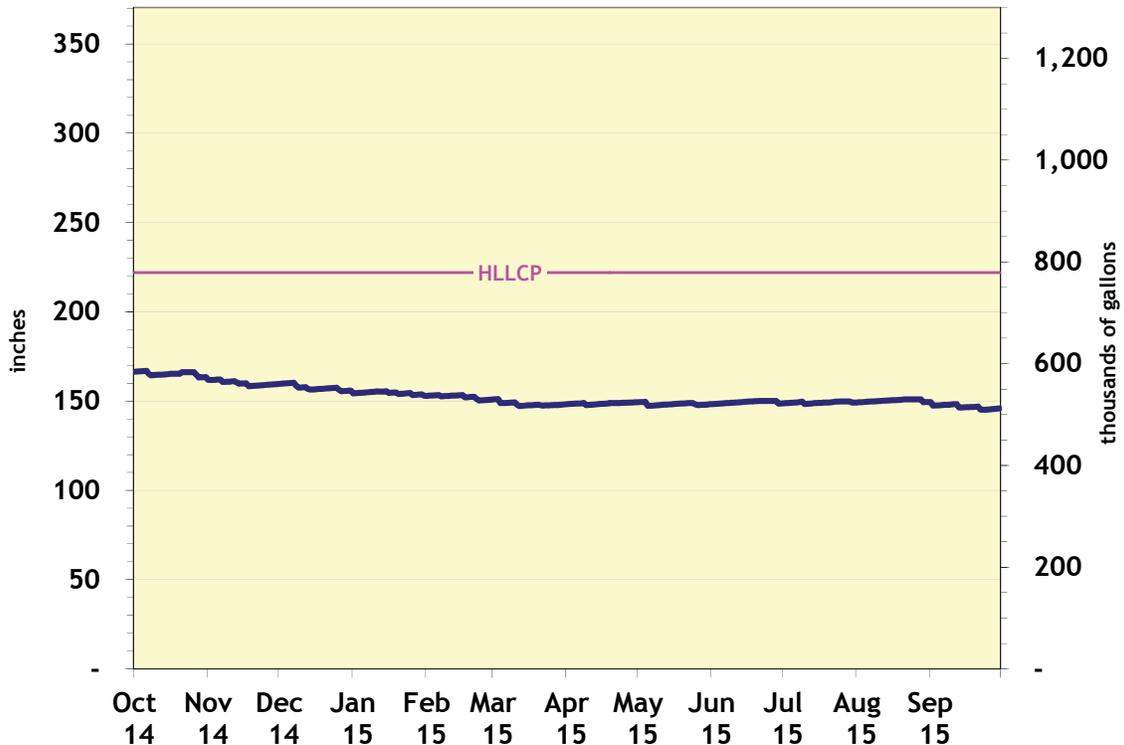
Area: H-Area (West Hill)
 Service: DWPF Sludge Feed Tank
 Type: IIIA
 Maximum Volume: 779,200 gallons
 Working Volume: 761,700 gallons
 Waste Volume: 512,100 gallons
 Prime Movers: TTJ in the C1 Riser (123" with a range of 60"-255")
 TTP in the B5 Riser (1")



Mixing pumps: Four (4) quadvolute Sulzer slurry pumps in Risers B2, B6, G, and H

Discussion: During FY15, Tank 40 supplied 131 kgal of sludge to DWPF through the Low Point Pump Pit (LPPP). For FY15, the initial volume in Tank 40 was 584 kgal and the final volume was 512 kgal; the average was 535 kgal for the year.

Tank 40 Level
 (DWPF Feed Tank)



Tank 41:

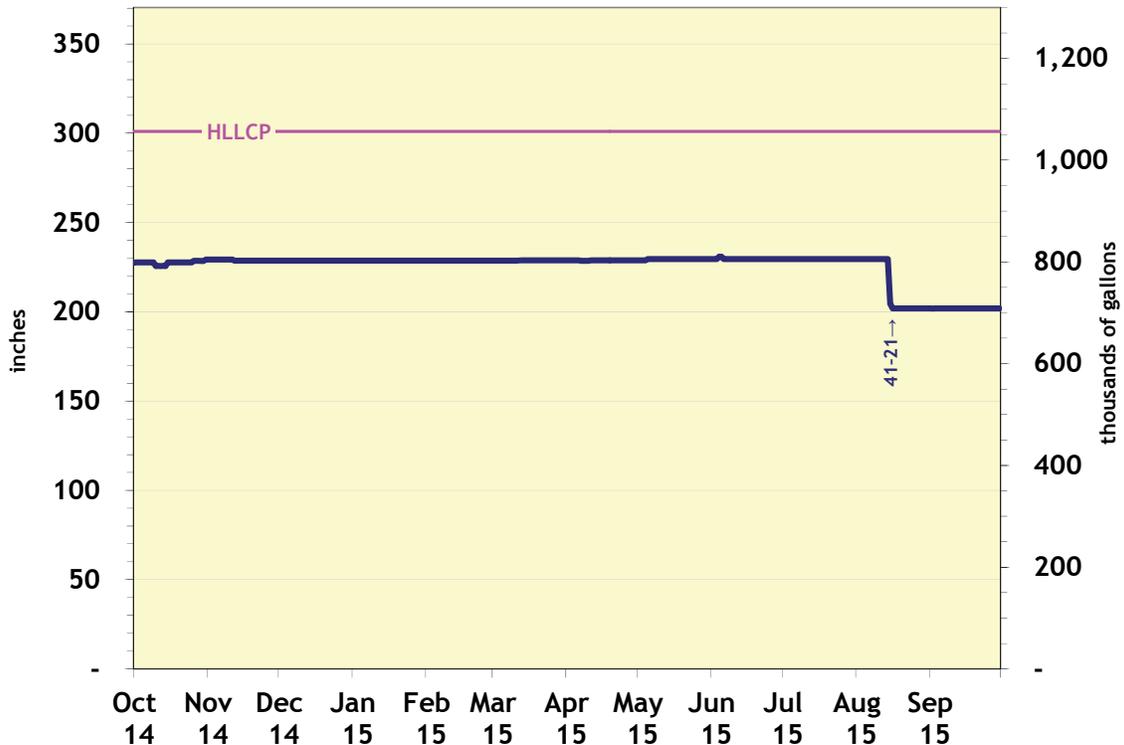
Area: H-Area (West Hill)
 Service: Salt Removal Tank
 Type: IIIA
 Maximum Volume: 1,056,500 gallons
 Working Volume: 1,039,000 gallons
 Waste Volume: 708,700 gallons
 Prime Movers: Salt pump in Riser C1 (6")
 Air-diaphragm pump in Riser C3 (250") — abandoned in place.



Mixing pumps: None

Discussion: One 117 kgal transfer of dissolved salt solution to Tank 21 provided material for Salt Batch #9. The salt level in Tank 41 is ~ 111".

Tank 41 Level



Tank 42:

Area: H-Area (West Hill)

Service: Active Waste Tank

Type: IIIA

Maximum Volume: 1,263,600 gallons

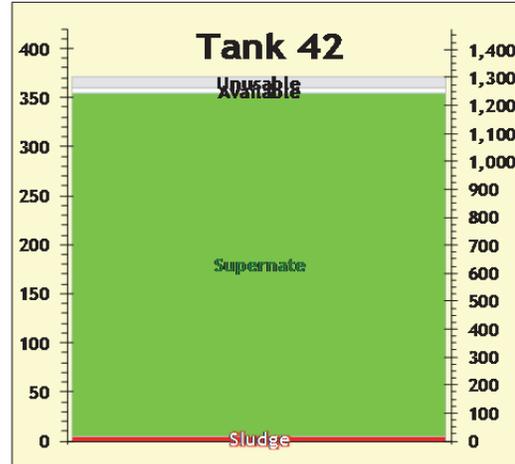
Working Volume: 1,246,100 gallons

Waste Volume: 1,244,300 gallons

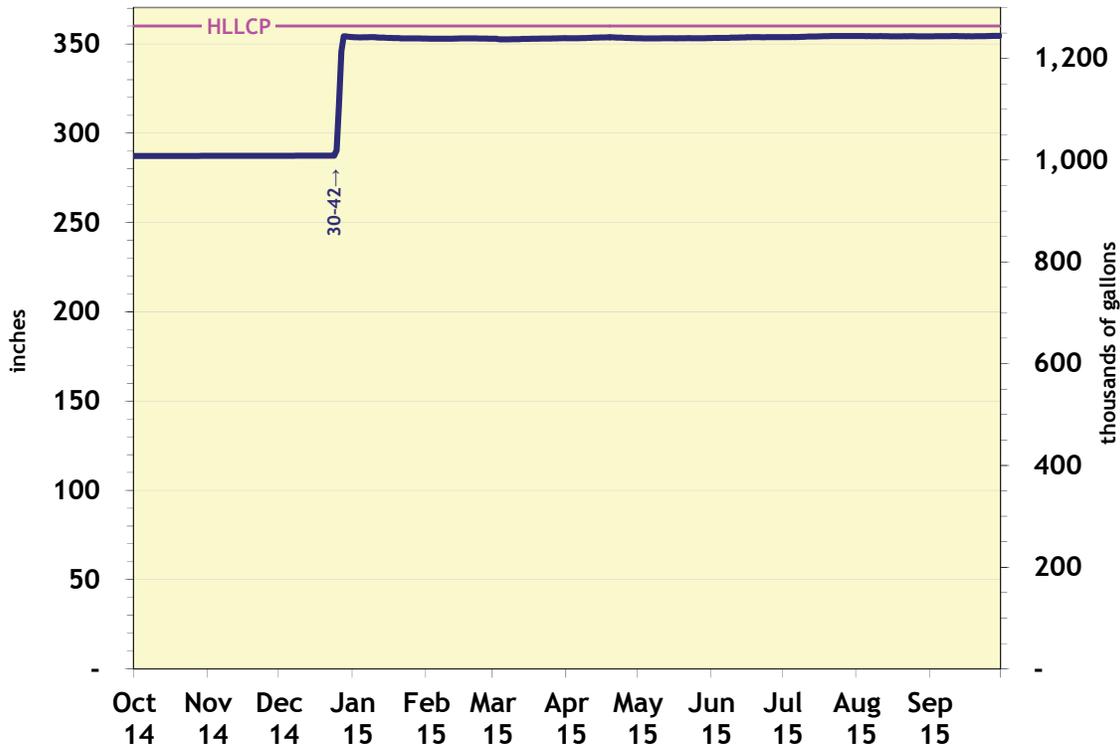
Prime Movers: TTJ in C1 Riser (110" with a range of 65.5"–236.5")
 TTP in B3 Riser (1")

Mixing pumps: Four (4) 2x15 Sulzer slurry pumps. There are currently no plans to operate these pumps.

Discussion: In December, Tank 42 received 223 gal of 3H Evaporator liquor from Tank 30.

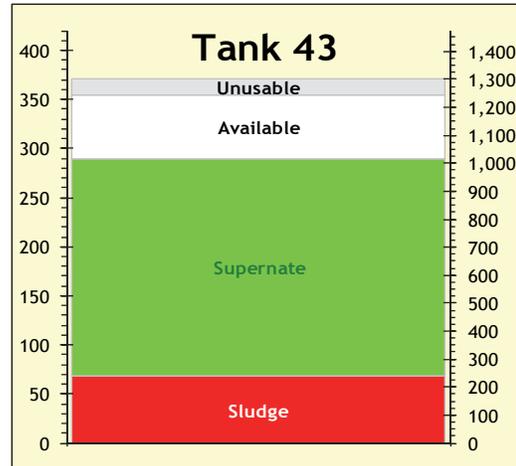


Tank 42 Level



Tank 43:

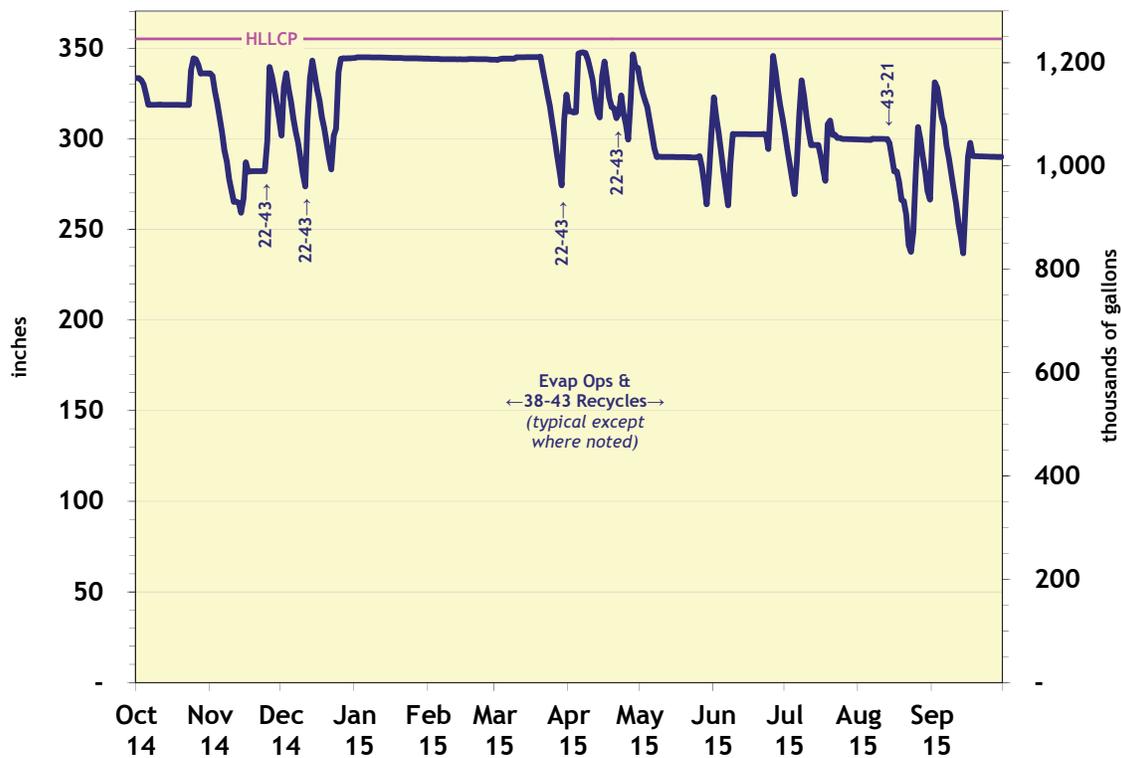
Area: H-Area (West Hill)
 Service: 2H Evaporator Feed Tank
 Type: IIIA
 Maximum Volume: 1,246,100 gallons
 Working Volume: 1,228,500 gallons
 Waste Volume: 1,017,500 gallons
 Prime Movers: Fixed Length Jet in Riser C1 (96")
 Fixed Length Evaporator Feed Pump in Riser R (161")



Mixing pumps: None

Discussion: Tank 43 is the 2H Evaporator Feed Tank. Sixteen Tank 38 to Tank 43 recycle transfers, totaling 3,247 kgal, supported 2H Evaporator operations. Four Tank 22 to Tank 43 transfers, totaling 750 kgal provided feed for the 2H Evaporator. In August, a 37-kgal transfer to Tank 21 provided material for Salt Batch #9. For FY15, the initial volume in Tank 43 was 1,170 kgal and the final volume was 1,018 kgal; the average was 1,098 kgal for the year.

Tank 43 Level
(2H Evaporator Feed Tank)



Tank 44:

Area: F-Area

Service: Active Waste Tank

Type: IIIA

Maximum Volume: 1,281,200 gallons

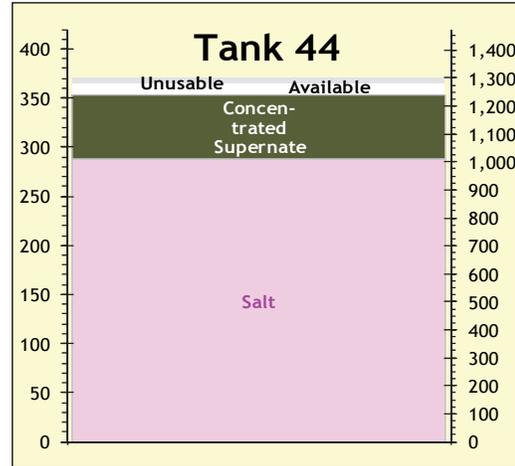
Working Volume: 1,263,600 gallons

Waste Volume: 1,239,700 gallons

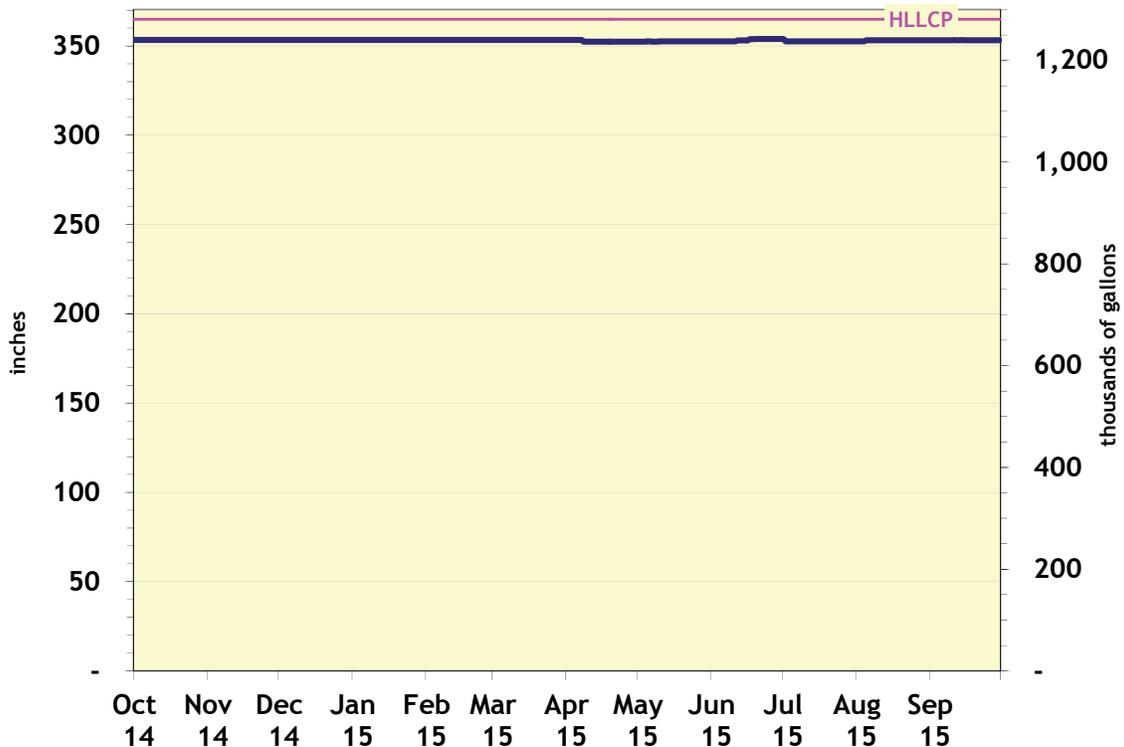
Prime Movers: Fixed Length Jet in Riser C1
 (60")

Mixing pumps: None

Discussion: There were no transfers into or out of Tank 44 during FY15. The salt level in Tank 44 is ~288".

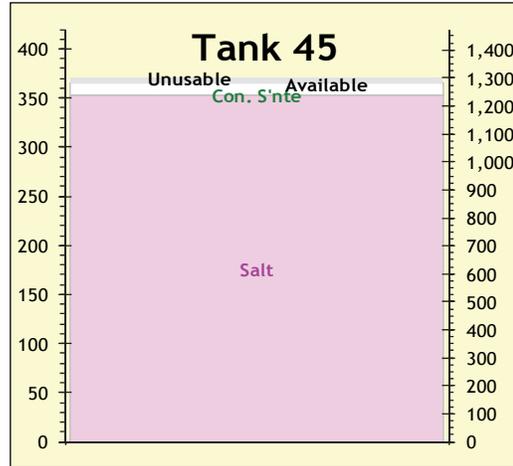


Tank 44 Level
 (2H Evaporator Vent Tank)



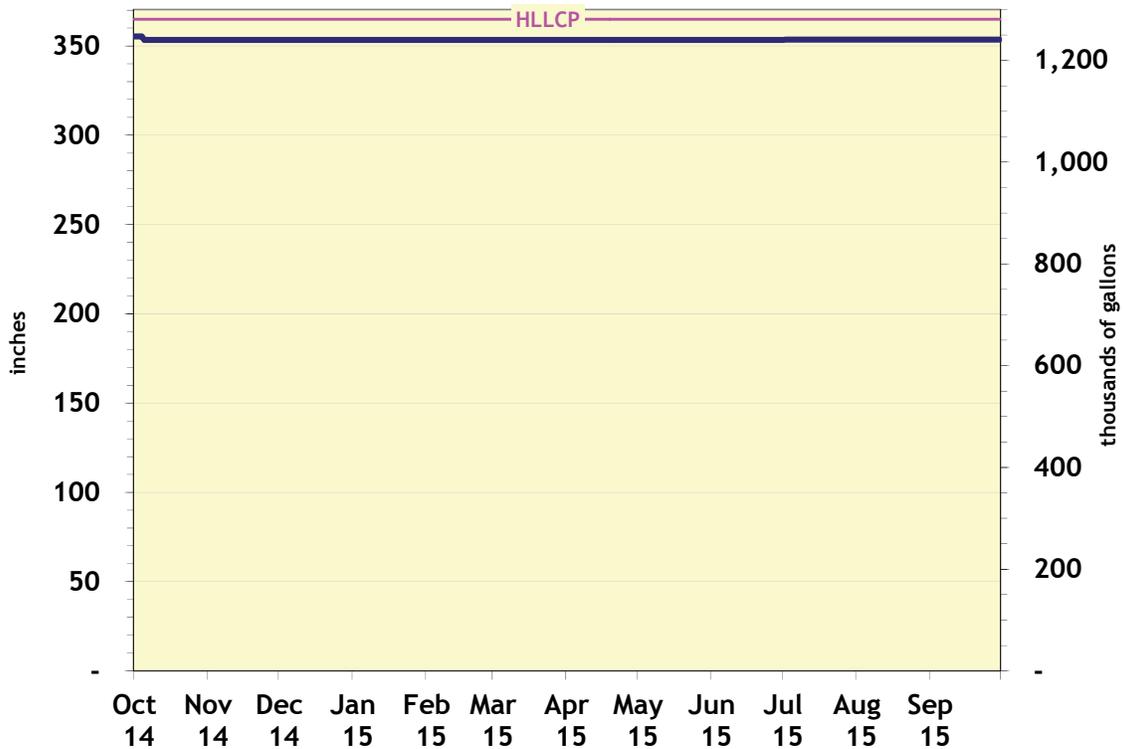
Tank 45:

Area: F-Area
 Service: Inactive Waste Tank
 Type: IIIA
 Maximum Volume: 1,281,200 gallons
 Working Volume: 1,263,600 gallons
 Waste Volume: 1,240,800 gallons
 Prime Movers: Fixed Length Jet in Riser C1
 (60")
 Mixing pumps: None



Discussion: There were no transfers into or out of Tank 45 during FY15. The salt level in Tank 45 is ~ 353".

Tank 45 Level



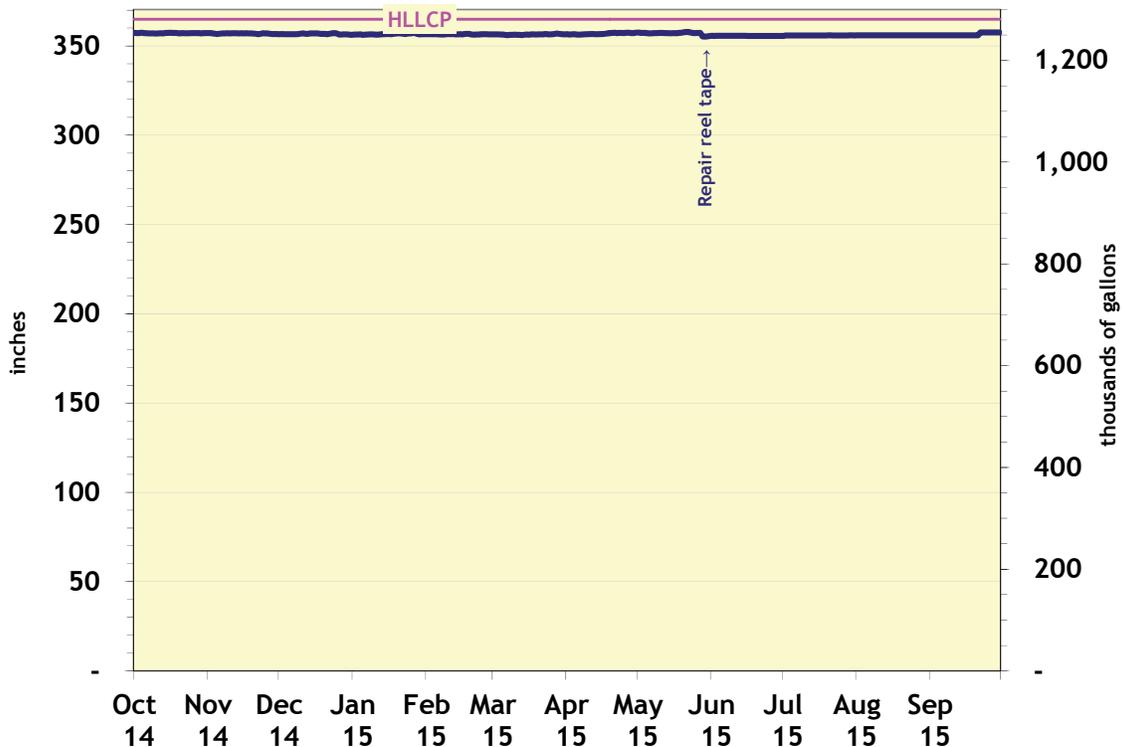
Tank 46:

Area: F-Area
 Service: Active Waste Tank
 Type: IIIA
 Maximum Volume: 1,281,200 gallons
 Working Volume: 1,263,600 gallons
 Waste Volume: 1,254,800 gallons
 Prime Movers: Fixed Length Jet in Riser C1
 (200")
 Mixing pumps: None



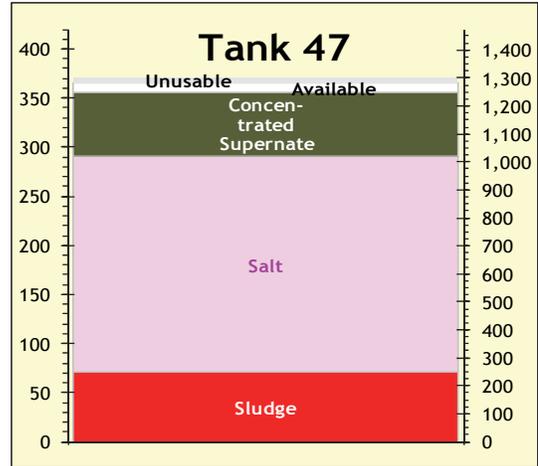
Discussion: There were no transfers into or out of Tank 46 during FY15. The salt level in Tank 46 is ~ 357".

Tank 46 Level



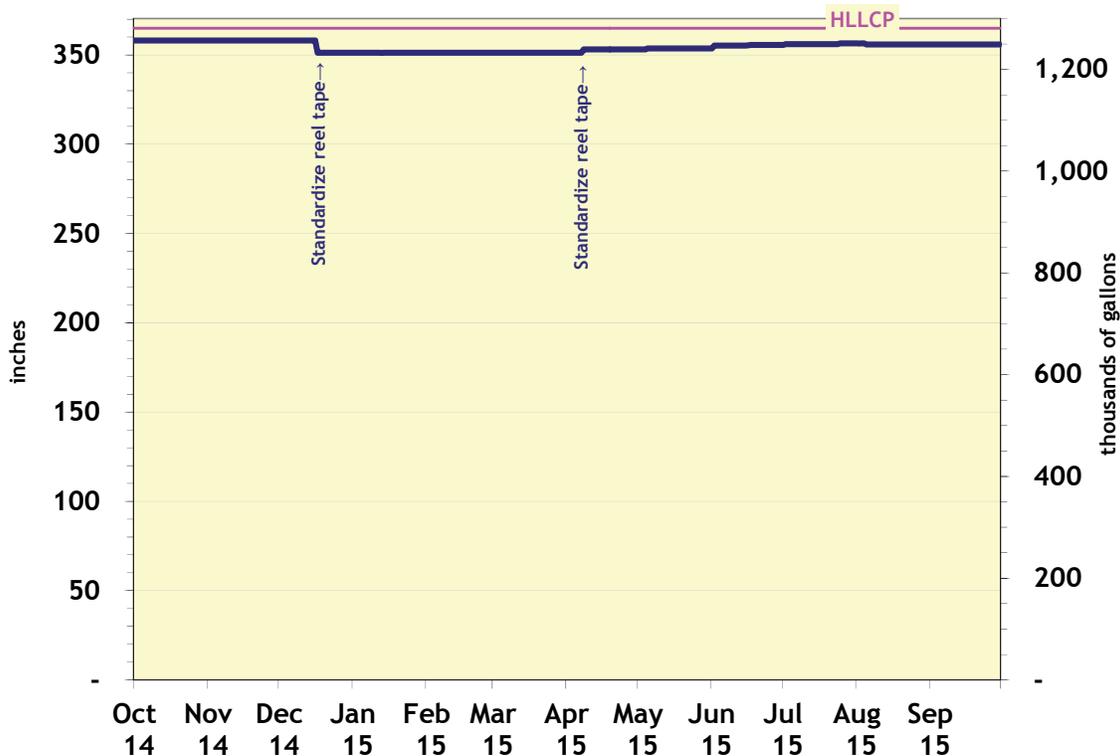
Tank 47:

Area: F-Area
 Service: Active Waste Tank
 Type: IIIA
 Maximum Volume: 1,281,200 gallons
 Working Volume: 1,263,600 gallons
 Waste Volume: 1,248,900 gallons
 Prime Movers: Fixed Length Jet in Riser C1 (313")
 Mixing pumps: None



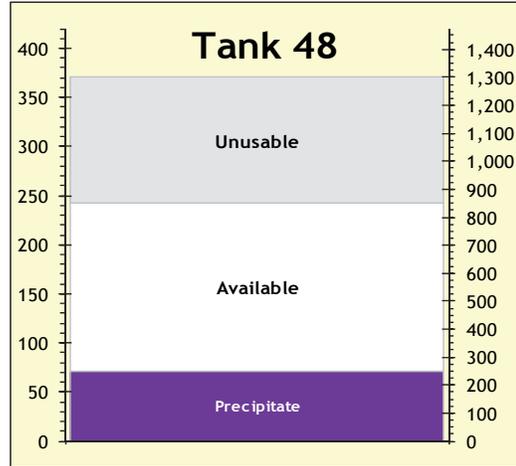
Discussion: There were no transfers into or out of Tank 47 during FY15. The salt level in Tank 47 is ~220".

Tank 47 Level



Tank 48:

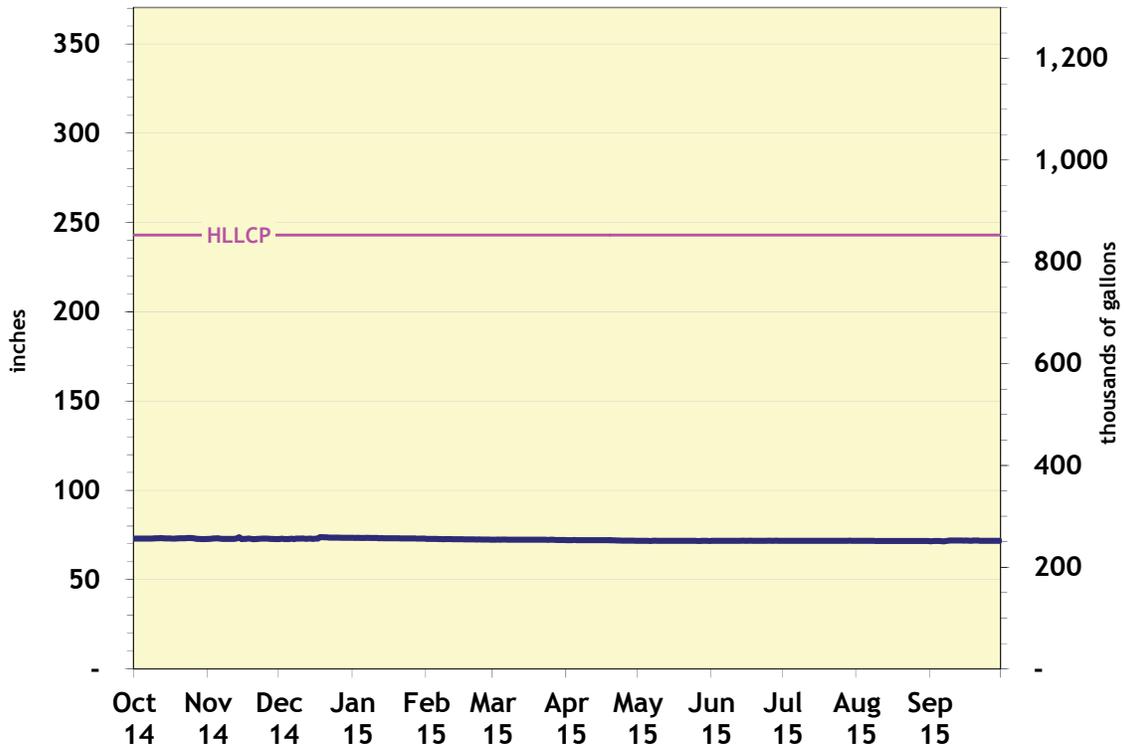
Area: H-Area (West Hill)
 Service: Precipitate Storage Tank
 Type: IIIA
 Maximum Volume: 852,900 gallons
 Working Volume: 333,500 gallons
 Waste Volume: 251,700 gallons
 Prime Movers: TTP in Riser B5 (2")
 Mixing pumps: Four (4) quadvolute Sulzer slurry pumps in Risers B1, B4, V1, and V2



Discussion: There were no transfers into or out of Tank 48 during FY15.

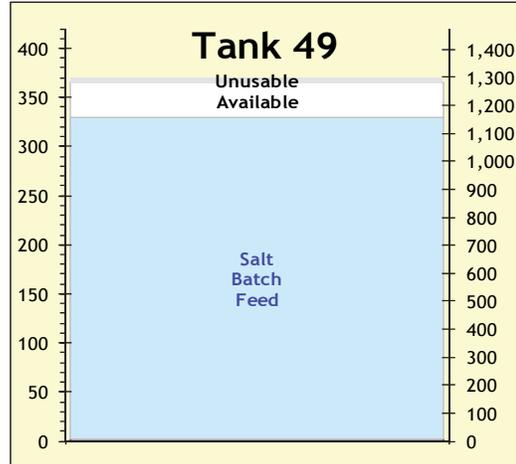
Comments: The waste in Tank 48 currently contains sodium tetraphenylborate. An inert nitrogen blanket (N₂) is maintained in the tank vapor space to mitigate flammability hazards.

Tank 48 Level



Tank 49:

Area: H-Area (West Hill)
 Service: ARP/MCU Feed Tank
 Type: IIIA
 Maximum Volume: 1,281,200 gallons
 Working Volume: 1,263,600 gallons
 Waste Volume: 1,156,500 gallons
 Prime Movers: TTP in Riser B3 (2")
 TTP in Riser B5 (38")
 Mixing pumps: None



Discussion: Tank 49 began the year feeding

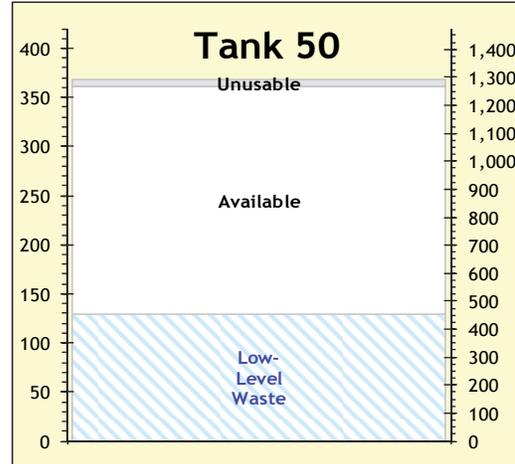
Salt Batch #7. Salt Batch #8 consisted of two transfers from Tank 21: 100 kgal in June and 953 kgal in July. In FY15, Tank 49 supplied 753 kgal of salt solution to ARP/MCU. For FY15, the initial volume in Tank 49 was 857 kgal and the final volume was 1,157 kgal; the average was 598 kgal for the year.

Tank 49 Level
 (ARP/MCU Feed Tank)



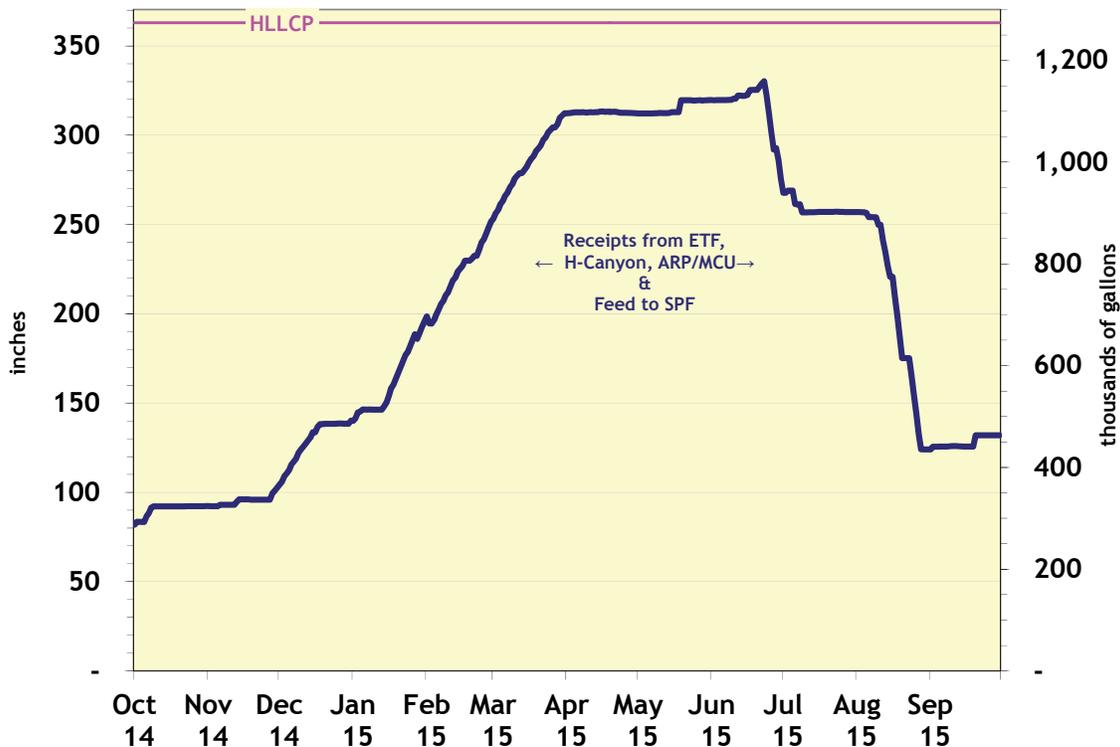
Tank 50:

Area: H-Area (West Hill)
 Service: SPF Feed Tank (ETF concentrate receipt, ARP/MCU DSS receipt, H-Canyon LLW receipt)
 Type: IIIA
 Maximum Volume: 1,274,100 gallons
 Working Volume: 1,256,600 gallons
 Waste Volume: 463,000 gallons
 Prime Movers: TTP in Riser B5 (3⁵/₈")
 Mixing pumps: Two (2) 2x15 Sulzer slurry pumps in Risers E1 and B3



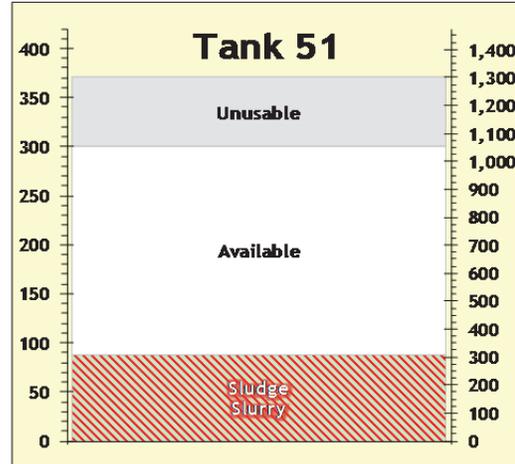
Discussion: During FY15, Tank 50 supplied 828 kgal of LLW to SPF. Tank 50 received 45 kgal of low-level waste from ETF Evaporator bottoms, 11.9 kgal of H-Canyon LLW (GP evaporator bottoms), 18 kgal of filter washes from ARP, and 919 kgal of DSS from MCU. For FY15, the initial volume in Tank 50 was 287 kgal and the final volume was 463 kgal; the average was 736 kgal for the year.

Tank 50 Level
 (SPF Feed Tank)



Tank 51:

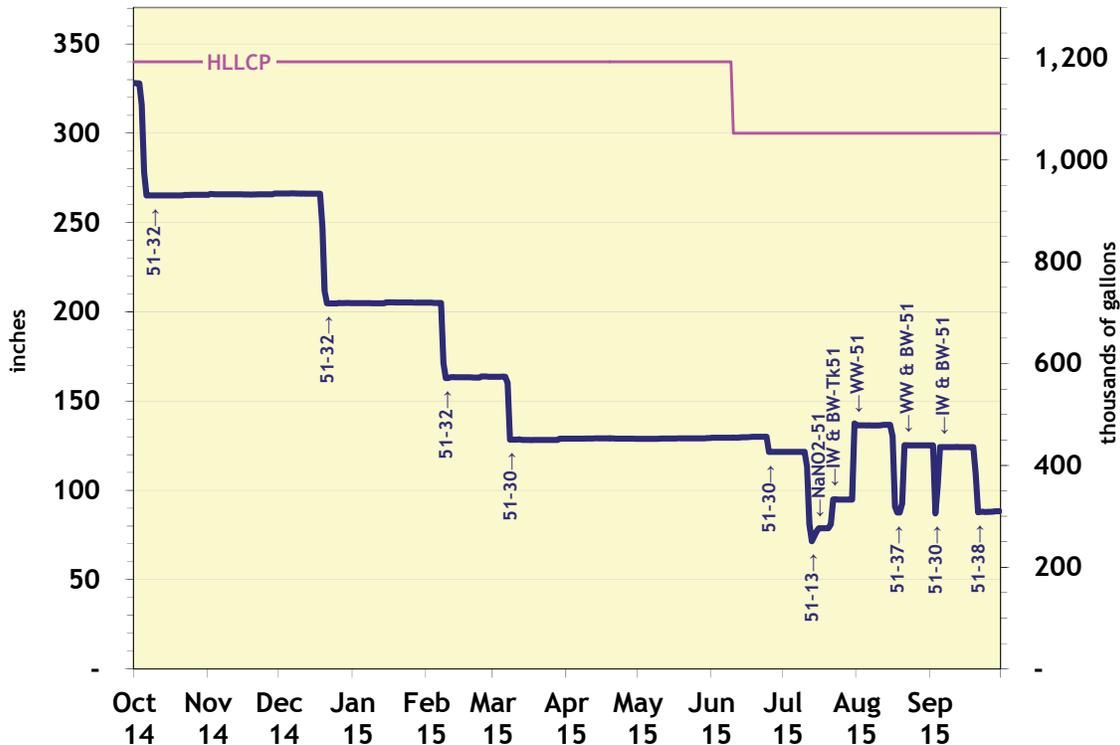
Area: H-Area (West Hill)
 Service: Sludge Preparation Tank
 Type: IIIA
 Maximum Volume: 1,193,400 gallons
 Working Volume: 1,175,900 gallons
 Waste Volume: 309,900 gallons
 Prime Movers: TTP in riser B5 (1")
 TTJ in Riser C1 (75.1" with a range of 60"-255")



Mixing pumps: Four (4) quadvolute Sulzer slurry pumps in Risers B1, B4, G, and H

Discussion: In October, December, and February, Tank 51 transferred 583 kgal to Tank 32 and in March and June, 288 kgal to Tank 30 to provide feed for the 3H Evaporator. Several Tank 51 transfers were required to wash SB9: 176 kgal in July to Tank 13, 172 kgal in August to Tank 37, 134 kgal in September to Tank 30, and 128 kgal in September to Tank 38.

Tank 51 Level
(Sludge Batch Prep Tank)



4.5 Tank Summary

A full listing of the tanks with their volumes as of September 30, 2015 in inches, gallons, and cubic meters is contained in Table 4-1 — *Tank Summary Chart* (note that the total gallons differs slightly from §3.1 due to rounding). 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 equivalent volume.

Table 4-1 — Tank Summary Chart

Tank #	Tank Level			Sludge		Salt		Supernate		Freeboard		HLLCP		Working Height	
	(in)	(gallons)	(m ³)	(in)	(kgal)	(in)	(kgal)	(in)	(kgal)	(in)	(kgal)	(in)	(gallons)	(in)	(gallons)
1	179.7	486,990	1,843	2.6	7	177.1	480	-	-	32.3	88	212	574,520	207	560,970
2	199.3	540,100	2,044	1.5	4	197.8	536	-	-	10.7	29	210	569,100	205	555,550
3	199.3	540,100	2,044	1.5	4	197.8	536	-	-	10.7	29	210	569,100	205	555,550
4	136.9	371,000	1,404	3.3	9	-	-	133.7	362	63.1	171	200	542,000	195	528,450
5	Filled with grout														
6	Filled with grout														
7	110.5	299,460	1,133	16.3	44	-	-	94.3	255	91.5	248	202	547,420	197	533,870
8	212.7	576,420	2,182	6.8	19	-	-	205.9	558	31.3	85	244	661,240	239	647,690
9	203.0	550,130	2,082	1.0	3	202.5	549	(0.5)	(1)	7.0	19	210	569,100	205	555,550
10	74.3	201,350	762	1.0	3	70.6	191	2.7	7	55.7	151	130	352,300	125	338,750
11	49.9	135,230	512	7.1	19	-	-	42.8	116	95.1	258	145	392,950	140	379,400
12	1.8	5,000	19	0.6	2	-	-	1.3	4	-	-				
13	171.7	600,950	2,275	4.8	17	-	-	167.0	584	83.3	292	255	892,500	250	875,000
14	45.0	157,500	596	8.0	28	37.0	130	-	-	55.0	193	100	350,000	95	332,500
15	89.1	311,850	1,180	45.4	159	-	-	43.7	153	10.9	38	100	350,000	95	332,500
16	Filled with grout														
17	Filled with grout														
18	Filled with grout														
19	Filled with grout														
20	Filled with grout														
21	348.2	1,232,600	4,666	18.9	67	1.0	4	328.4	1,162	26.8	95	375	1,327,500	370	1,309,800
22	87.7	310,460	1,175	32.2	114	-	-	55.5	196	202.3	716	290	1,026,600	285	1,008,900
23	197.1	697,730	2,641	31.7	112	-	-	165.4	586	177.9	630	375	1,327,500	370	1,309,800
24	346.3	1,225,900	4,640	1.0	4	-	-	345.3	1,222	28.7	102	375	1,327,500	370	1,309,800
25	357.7	1,255,500	4,752	-	-	143.3	503	214.5	753	7.3	26	365	1,281,200	360	1,263,600
26	279.9	982,450	3,719	82.0	288	-	-	197.9	695	85.1	299	365	1,281,200	360	1,263,600
27	354.2	1,243,200	4,706	1.1	4	330.1	1,159	23.0	81	5.8	20	360	1,263,600	355	1,246,100
28	349.7	1,227,400	4,646	-	-	293.4	1,030	56.3	198	15.3	54	365	1,281,200	360	1,263,600
29	359.6	1,262,200	4,777	-	-	291.5	1,023	68.1	239	5.4	19	365	1,281,200	360	1,263,600
30	334.7	1,174,800	4,447	0.2	1	90.8	319	243.7	855	30.3	106	365	1,281,200	360	1,263,600
31	356.2	1,250,300	4,732	-	-	353.0	1,239	3.2	11	8.8	31	365	1,281,200	360	1,263,600
32	233.0	817,830	3,096	29.6	104	66.0	232	137.5	482	67.0	235	300	1,053,000	295	1,035,500
33	353.8	1,241,800	4,700	28.0	98	79.7	280	246.1	864	6.2	22	360	1,263,600	355	1,246,100
34	322.6	1,132,300	4,286	3.6	13	54.5	191	264.5	928	32.4	114	355	1,246,100	350	1,228,500
35	279.5	981,050	3,713	20.4	72	-	-	259.1	909	66.5	233	346	1,214,500	341	1,196,900
36	361.0	1,267,100	4,796	0.1	0	326.6	1,146	34.3	121	4.0	14	365	1,281,200	363	1,274,100
37	351.8	1,234,800	4,674	-	-	247.4	868	104.4	366	13.2	46	365	1,281,200	360	1,263,600
38	331.7	1,164,300	4,407	-	-	230.0	807	101.7	357	33.3	117	365	1,281,200	360	1,263,600
39	260.5	914,360	3,461	68.0	239	-	-	192.5	676	29.5	104	290	1,017,900	285	1,000,400
40	145.9	512,110	1,938	145.9	512	-	-	-	-	76.1	267	222	779,220	217	761,670
41	201.9	708,670	2,682	-	-	111.1	390	90.9	319	99.1	348	301	1,056,500	296	1,039,000
42	354.5	1,244,300	4,710	5.0	18	-	-	349.5	1,227	5.5	19	360	1,263,600	355	1,246,100
43	289.9	1,017,500	3,851	68.8	241	-	-	221.1	776	65.1	229	355	1,246,100	350	1,228,500
44	353.2	1,239,700	4,692	-	-	287.5	1,009	65.7	231	11.8	41	365	1,281,200	360	1,263,600
45	353.5	1,240,800	4,696	-	-	352.5	1,237	1.0	4	11.5	40	365	1,281,200	360	1,263,600
46	357.5	1,254,800	4,750	-	-	356.6	1,252	0.9	3	7.5	26	365	1,281,200	360	1,263,600
47	355.8	1,248,900	4,727	70.7	248	220.4	773	64.8	227	9.2	32	365	1,281,200	360	1,263,600
48	71.7	251,670	953	-	-	-	-	71.7	252	171.3	601	243	852,930	95	333,450
49	329.5	1,156,500	4,378	-	-	2.0	7	327.5	1,150	35.5	125	365	1,281,200	360	1,263,600
50	131.9	462,970	1,752	-	-	-	-	129.9	456	231.1	811	363	1,274,100	358	1,256,600
51	88.3	309,930	1,173	88.3	310	-	-	-	-	211.7	743	300	1,053,000	295	1,035,500
Type I		3,705,780	14,026		113		2,292		1,301		1,077				
Type II		1,070,300	4,051		203		130		737		522				
Type IV		3,466,690	13,122		296		4		3,167		1,542				
Type III		27,797,240	105,213		2,146		13,465		12,179		4,723				
FTF		14,880,920	56,325		737		8,986		5,158		1,324				
HTF		21,159,090	80,087		2,022		6,905		12,226		6,541				
Total		36,040,010	136,412		2,759		15,891		17,384		7,864				

References

- ¹ Chew, D.P., & Hamm, B. A., SRR-LWP-2009-00001, *Liquid Waste System Plan*, Revision 19, May 2014
- ² Bodman, S.W., DOE-WD-2005-001, *Section 3116 Determination for Salt Waste Disposal at the Savannah River Site*, Revision 0, January 2006
- ³ DOE-WD-2005-001, *Basis for Section 3116 Determination for Salt Waste Disposal at the Savannah River Site*, Revision 0, January 2006
- ⁴ Chu, S, DOE-WD-2012-001, *Section 3116 Determination for Closure of F-Tank Farm at the Savannah River Site*, Revision 0, March 2012
- ⁵ DOE/SRS-WD-2012-001, *Basis for Section 3116 Determination for Closure of F-Tank Farm at the Savannah River Site*, Revision 0, March 2012
- ⁶ Thomas, S.A., LWO-PIT-2006-00017, *Savannah River Site – Liquid Waste Disposition Processing Strategy*, Revision 0, September 2006
- ⁷ Kent M. Coleman, P.G., to Dr. David C. Moody, *Savannah River Site Z-Area Saltstone Disposal Facility Permit Facility ID No. 02550-1603 Aiken County*, August 2011
- ⁸ Williams, F.L., N-ESR-G-00001, *High Level Waste Emergency Response Data And Waste Tank Data*, Revision 746, September 2015
- ⁹ Lynn, J., SRR-LWP-2015-00042, *9/30/2015– September 2015 Curie and Volume Inventory Report*, Revision 0, October 2015
- ¹⁰ Eubanks, L.W., SW11.1-WTE-7.2, *Waste Tank Equipment Manual*, Revision 90-IPC-8, September 2015
- ¹¹ Griffin, G.M., SW11.1-WTE-7.8, *F/H Tank Farms Tank Mixing Pump Elevations Data Sheet*, Revision 8, August 2015
- ¹² SW9.6-RS(2H)E-6-1, *241-2H Tanks 29-32, 35-37 and Outside Areas Surveillance Operator Rounds*, Revision 86, July 2015
- ¹³ SW9.6-RS(82H)E-2-1, *82H 4-Pack, Stby N2, Cold Feeds, and 49H Surveillance Operator Shift Rounds*, Revision 124, September 2015
- ¹⁴ SW10.6-RS(18F)E-5-1, *241-18F Surveillance Operator (Tks 25-28 and 44-47) Shift Rounds*, Revision 94, May 2015
- ¹⁵ SW10.6-RS(1F)E-1-1, *242-F Surveillance Operator (Tks 1-8, 33 & 34) Shift Rounds*, Revision 193, May 2015
- ¹⁶ SW9.6-RS(1H)E-1-1, *Tanks 9-15 and Support Surveillance Operator Shift Rounds*, Revision 143, June 2014
- ¹⁷ SW9.6-RS(1H)E-2-1, *HDB-8, Tanks 21-24 & Support Surveillance Operator Shift Rounds*, Revision 11, July 2015
- ¹⁸ SW9.6-RS(28H)E-5-1, *241-28H 6-PAC, 16H Evap, and Outside Areas Surveillance Operator Shift Rounds*, Revision 119, September 2015
- ¹⁹ Waltz, Jr., R.S., C-ESR-G-00003, *SRS High Level Waste Tank Leaksite Information*, Revision 12, August 2014
- ²⁰ Waltz, Jr., R.S. and West, W.R., SRR-STI-2015-00283, *Annual Radioactive Waste Tank Inspection Program - 2014*, June 2015