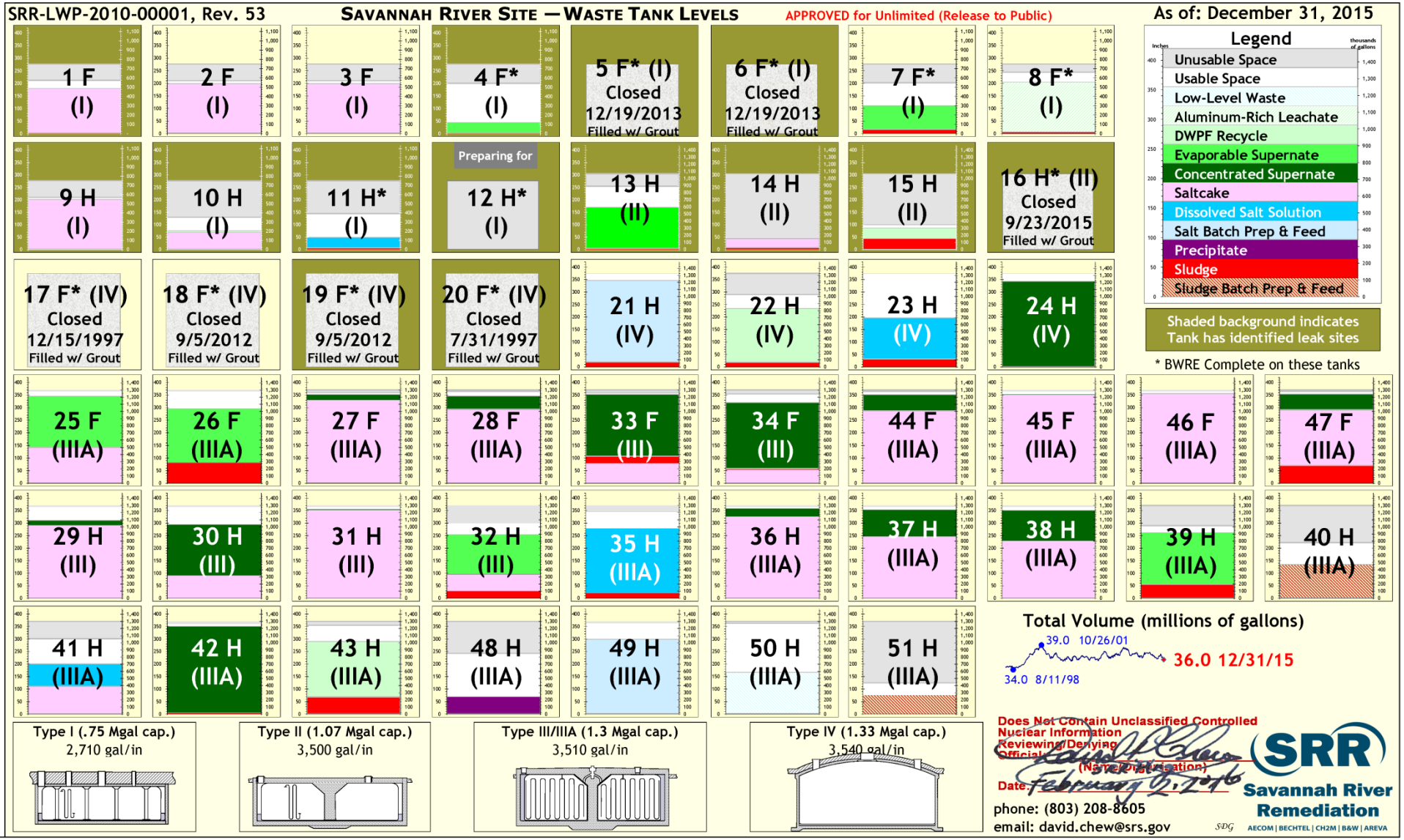
Total Tank Volume — All Waste Tanks

10/1/1997 - 12/31/2015

Waste Tank Levels



Waste Tank Levels — by System

SRR-LWP-2010-00001, Rev. 53 | TANKS BY SYSTEM / FUNCTION | APPROVED for Unlimited (Release to Public) | As of: December 31, 2015

3H (25H) Evaporator System

221-H / 299-H; Sludge Decants

- 39 — Canyon Receipt Tank
- 32 — Feed Tank
- 3H Evap
- 37 — Alternate Drop Tank
- 30 — Drop Tank
- 29 — Vent Tank

Supernate

2H (16H) Evaporator System

DWPF Recycle

- 43 — Feed / Vent Tank
- 2H Evap
- 38 — Drop Tank
- 22 — DWPF Recycle Receipt Tank

Salt Batch Prep & Feed

DWPF Recycle; Dissolved Salt; to ARP/MCU

- 41
- 23 — Dissolved Salt Hub
- 35 — Dissolved Salt Hub
- 21 — Salt Batch 9 Preparation
- 49 — Salt Batch 8 Feed

for On-Site Disposition

ETF Concentrate; H-Canyon LLW; ARP/MCU DSS; to SPF

- 50

Sludge Batch Prep & Feed

Sludge Batch 10; Sludge Batch 10 221-H; to DWPF

- 15
- 26
- 51 — Sludge Batch 9 Preparation
- 40 — Sludge Batch 8 Feed

ARP/MCU

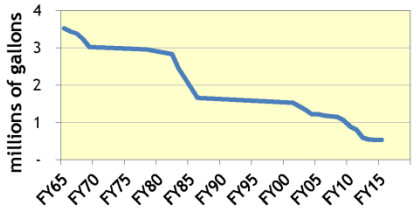
- 241-96H: MST, MST — ARP MST Strike Tanks
- 512-S: Filter Feed Tank; Filter — ARP MST Sludge Filtration
- Filtrate
- 278-H — MCU Cesium Removal

MST and Sludge Solids to DWPF; Cs Strip Effluent (SE) to DWPF; Decontaminated Salt Solution (DSS) to SPF

References

- Tank Levels: LWDP Electronic Morning Report — 2015-12-31
- Salt & Sludge Levels: SRR-LWP-2016-00004, 12/31/15 - December 2015 WCS Curie and Volume Inventory Report, February 2016
- Usable Space: N-ESR-G-00001, R754, December 2015

Sludge in Type I, II, & IV Tanks



Volume

Grout	8 Mgal	
Unusable	11 Mgal	
Usable	4 Mgal	
Supernate	17 Mgal	49%
Saltcake	16 Mgal	44%
Sludge	3 Mgal	7%
	33 Mgal	93%
	36 Mgal	

Curies

Supernate	110 MCi	44%
Saltcake	12 MCi	5%
	122 MCi	49%
Sludge	128 MCi	51%
	250 MCi	

SRR Liquid Waste Program
(with current status)

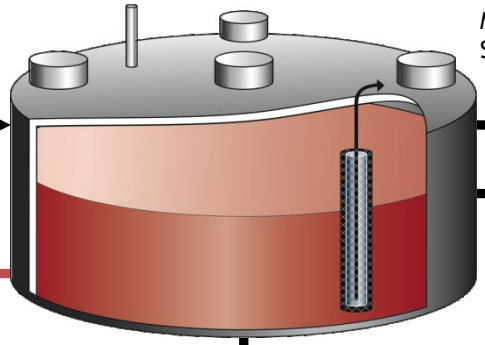
Legend:

ARP	Actinide Removal Process
BWRE	Bulk Waste Removal Efforts
DWPF	Defense Waste Processing Facility
MCU	Modular Caustic Side Solvent Extraction Unit
SWPF	Salt Waste Processing Facility

Operational Goals
- ✓Radionuclides to glass
- ✓Chemicals to Saltstone
- ✓Tanks cleaned and operationally closed

Legacy Liquid Waste

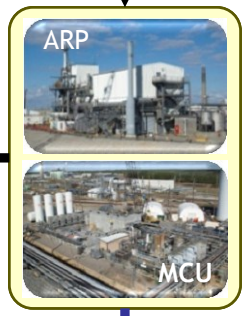
43 tanks
36 Mgal
250 MCi



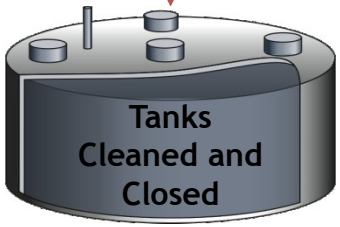
Salt waste
8.3 Mgal treated

Sludge waste
4.0 Mgal treated

Salt Processing



SWPF
(under construction)



<1% radionuclides remain in tanks

Radionuclides

Solid (not hazardous) waste

Most radionuclides to glass

Poured 4,000 cans of projected 8,582
57 million curies immobilized in glass

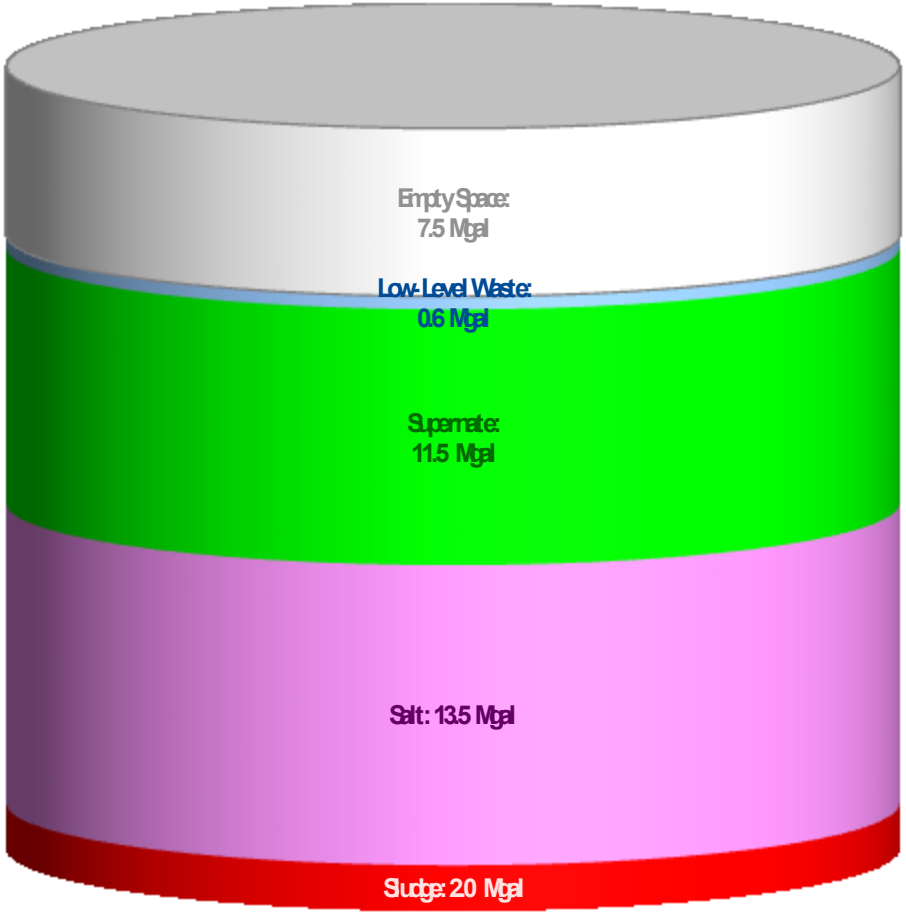
<<1% radionuclides to saltstone

18.3 Mgal grout dispositioned containing 459 kCi

51 Tanks
- 7 grouted & operationally closed
- 1 heel removal complete
- 6 BWRE complete
- 64% empty (old style)
- 21% empty (new style)

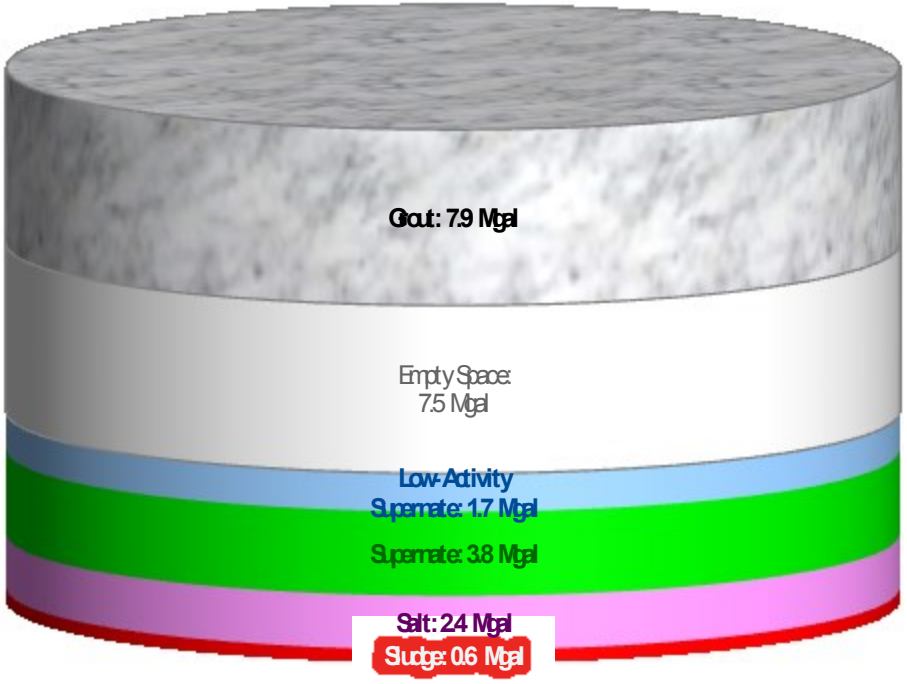
Tank Contents

New-Style Tanks

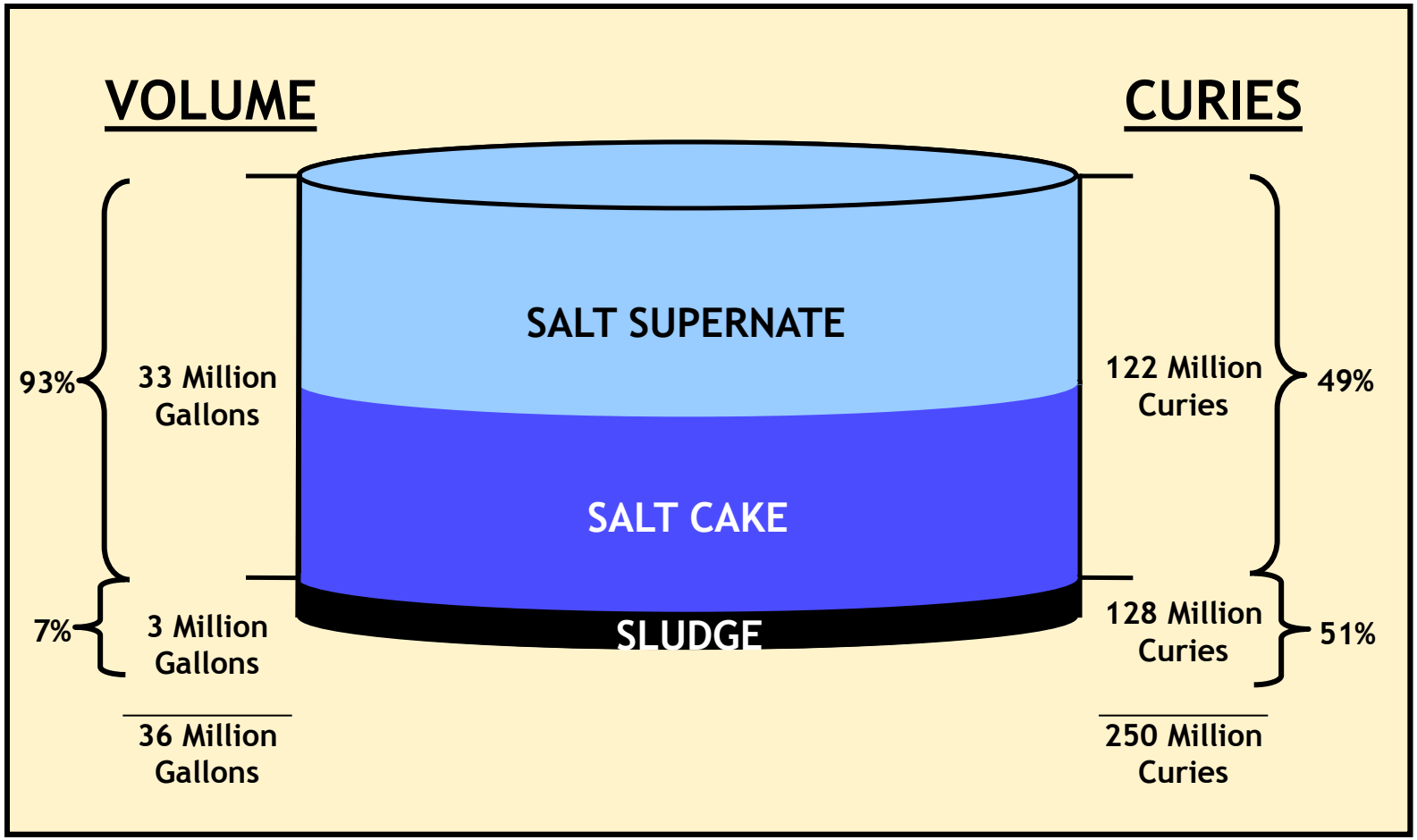


Old-Style Tanks

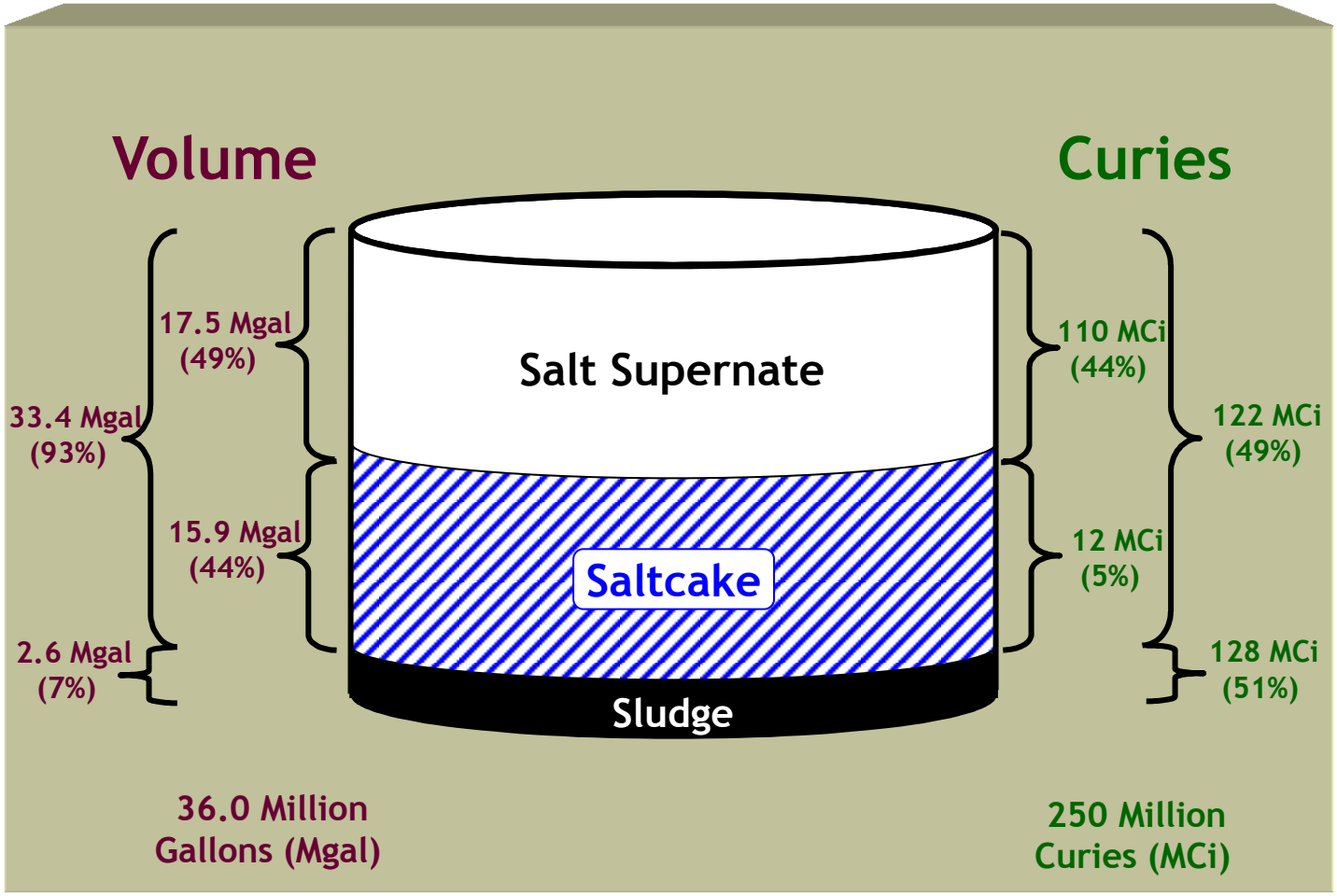
- 24 old-style tanks at SRS with 64% of space empty or grouted
- 7 grouted and closed (5,6,16-20)
- 1 being grouted(12)
- 4 with bulk waste removal complete (~90% radioactive inventory removed) (4,7,8,11)



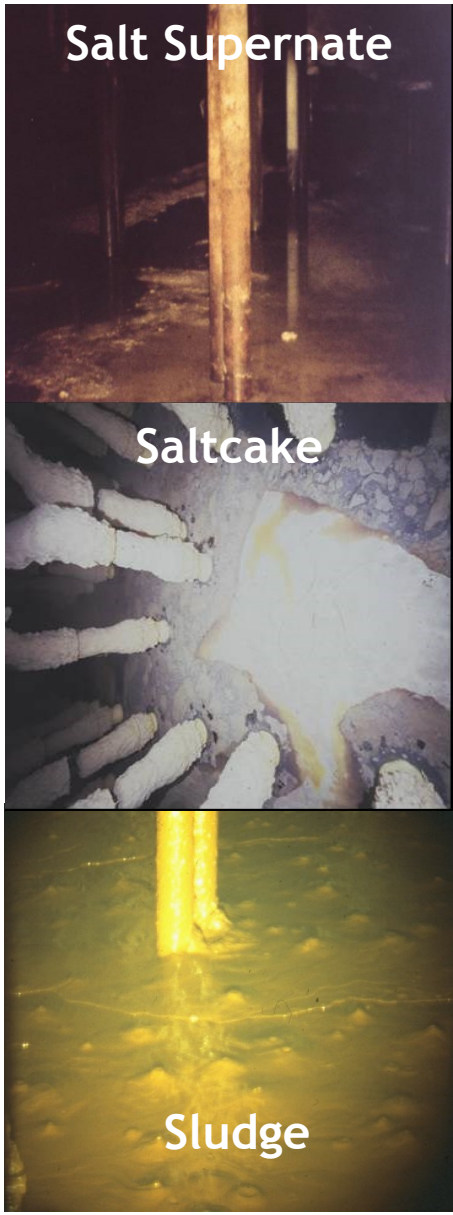
Waste Inventory



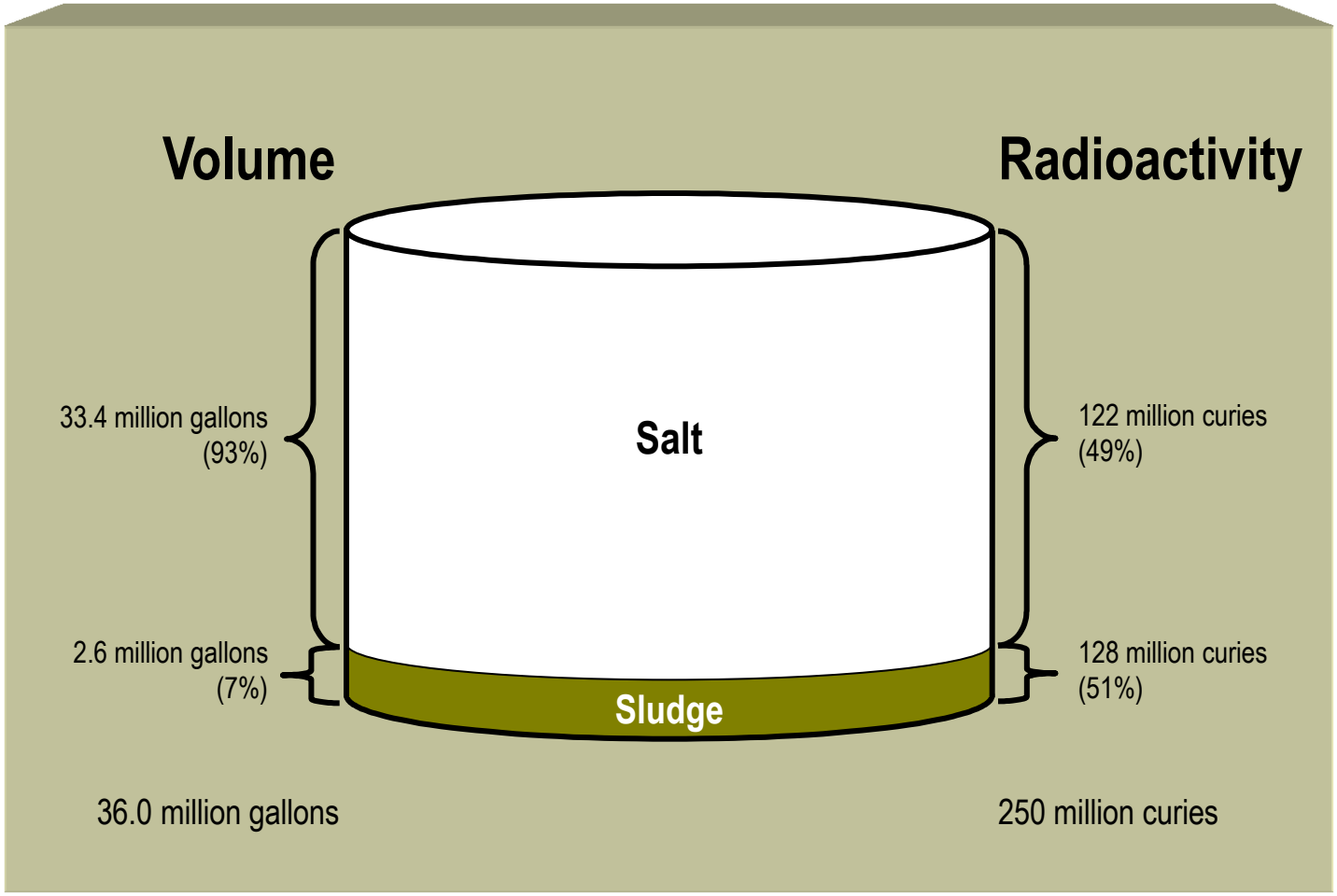
SRS Composite Inventory



Inventory values as of 2015-12-31



SRS Composite Inventory

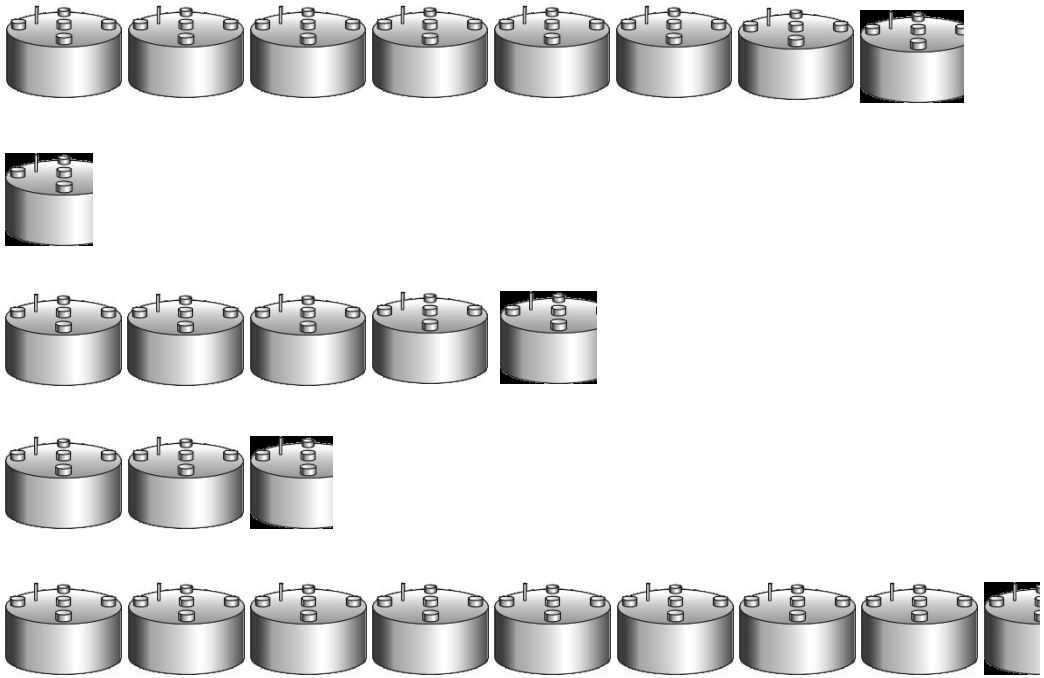


Inventory values as of 2015-12-31

Of 24 Non-compliant Tanks…

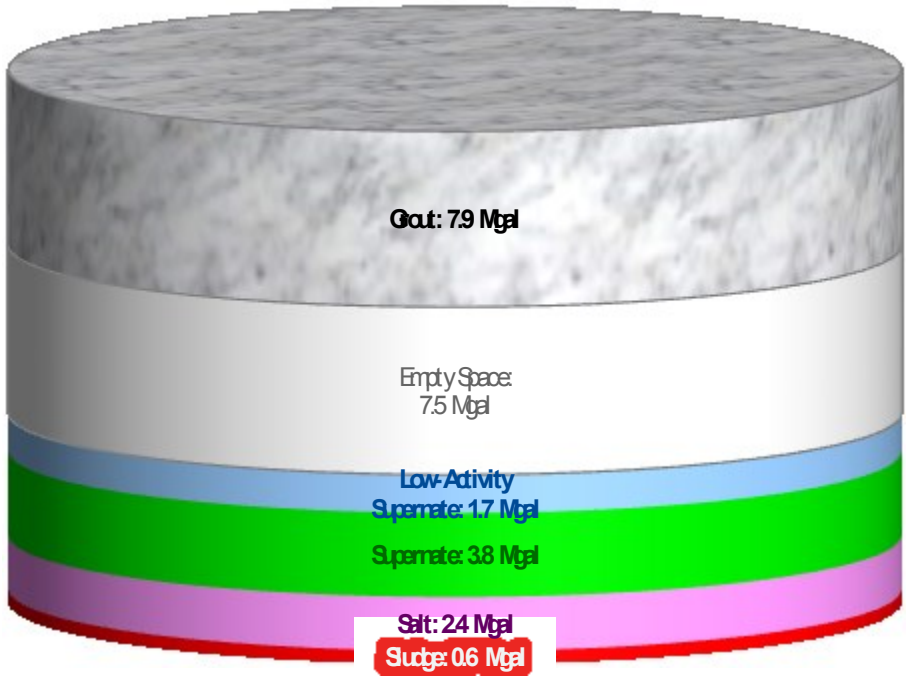
If one considers that the average tank volume (averaged across Type I, II, and IV tanks):

- 7.9 equivalent tanks are operationally closed
- 0.75 are in the process of grouting (Tank 12H)
- 4.8 are out of service (vapor space above HLLCP)
- 2.7 are empty (available vapor space below HLLCP)
- 8.5 are in continued use

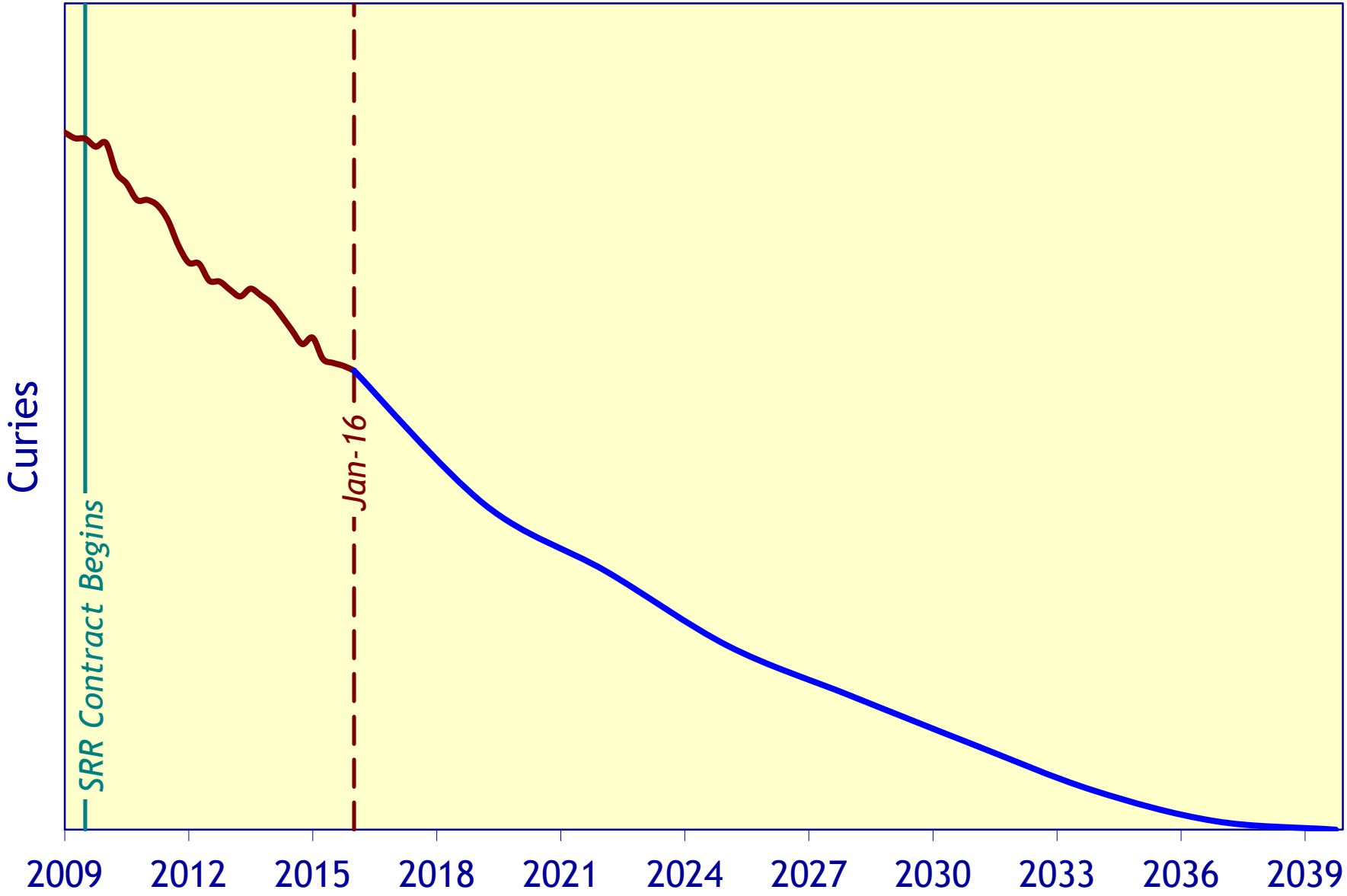


Of 24 Non-compliant Tanks…

- 24 old-style tanks at SRS with 64% of space empty or grouted
- 7 grouted and closed (5,6,16–20)
- 1 being grouted (12)
- 4 with bulk waste removal complete (~90% radioactive inventory removed) (4,7,8,11)



Curies Remaining in the SRS HLW Tanks



Evaporator Space Recovery

(kgals)	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16 (2016-12)
2F	872	905	987	779	263	522	730	326	658	95	OOS	OOS	OOS	OOS
2H	1,059	1,195	2,156	1,701	1,576	1,111	1,946	2,179	1,115	1,851	1,141	879	1,531	3.6
3H	1,788	1,041	260	648	69	715	444	707	708	376	973	467	1,180	355
Total	**3,719**	**3,141**	**3,403**	**3,128**	**1,908**	**2,349**	**3,120**	**3,212**	**2,481**	**2,322**	**2,115**	**1,346**	**2,711**	**358**

Per SW11.1-WTE-7.2 Rev 91 IPC-2 — 12/28/15 &
SRR-LWP-2016-00004 12/31/2015 — December 2015 WCS Curie and Volume Inventory Report, January 2016

Tank #	Morn Rpt (in) 12/31/15 Tank Level	N-ESR-G-00001 R754 12/10/15 HLLCP	Chart Data (inches) Sludge (in)	Insoluble Solids	Salt (in)	Supernate (in)	Usable Space	Unusable Space	Freeboard	Grout	Nom Cap (in.)	gal./in.	HLLCP Capacity	Nom Cap (gal)	Tank Level (Rounded) (gal)	Tank Level	Chart Data (kgal) Sludge (kgal)	Insoluble Solids	Salt (kgal)	Supernate (kgal)	Usable Space	Unusable Space	Grout	Tank Level (m^3)	Curies MCi	Ci/gal
1	179.7	212	2.6		177.1	-	32.3	64.8	97.1		277	2,710	574,520	750,000	487,000	486,987	7	-	480	-	88	175	-	1,840	4.8	9.9
2	199.3	210	1.5		197.8	-	10.7	66.8	77.5		277	2,710	569,100	750,000	540,100	540,103	4	-	536	-	29	181	-	2,040	2	3.7
3	199.3	210	1.5		197.8	-	10.7	66.8	77.5		277	2,710	569,100	750,000	540,100	540,103	4	-	536	-	29	181	-	2,040	2	3.7
4	44.8	200	3.3		-	41.6	155.2	76.8	232.0		277	2,710	542,000	750,000	121,400	121,408	9	-	-	113	421	208	-	460	0.55	4.5
5							-			276.8	277	2,710		750,000			-	-	-		-	-	750	-		
6							-			276.8	277	2,710		750,000			-	-	-		-	-	750	-		
7	111.6	202	16.3		-	95.4	90.4	74.8	165.2		277	2,710	547,420	750,000	302,400	302,436	44	-	-	258	245	203	-	1,140	0.95	3.1
8	205.2	244	6.8		-	198.4	38.8	32.8	71.6		277	2,710	661,240	750,000	556,100	556,092	19	-	-	538	105	89	-	2,100	3.1	5.6
9	203.0	210	1.0		202.5	(0.5)	7.0	66.8	73.8		277	2,710	569,100	750,000	550,100	550,130	3	-	549	(1)	19	181	-	2,080	1.4	2.5
10	76.6	130	1.0		70.6	5.0	53.4	146.8	200.2		277	2,710	352,300	750,000	207,600	207,586	3	-	191	13	145	398	-	786	0.24	1.2
11	50.0	145	7.1		-	42.9	95.0	131.8	226.8		277	2,710	392,950	750,000	135,500	135,500	19	-	-	116	257	357	-	513	1.2	8.9
12	1.8		0.6		-	1.3	-	274.9	274.9		277	2,710		750,000	5,000	5,000	2	-	-	4	-	745	-	19	0.095	19
13	170.8	255	4.8		-	166.1	84.2	50.7	134.9		306	3,500	892,500	1,070,000	597,800	597,800	17	-	-	581	295	178	-	2,260	2.6	4.3
14	45.0	100	8.0		37.0	-	-	260.7	260.7		306	3,500	350,000	1,070,000	157,500	157,500	28	-	130	-	-	913	-	596	2.3	15
15	87.4	100	45.4		-	42.0	12.6	205.7	218.3		306	3,500	350,000	1,070,000	305,900	305,900	159	-	-	147	44	720	-	1,160	12	39
16							-	-		305.7	306	3,500		1,070,000	-	-	-	-	-	-	-	-	1,082	-		
17							-			375.0	375	3,540		1,327,500	-	-	-	-	-	-	-	-	1,328	-		
18							-			375.0	375	3,540		1,327,500	-	-	-	-	-	-	-	-	1,328	-		
19							-			375.0	375	3,540		1,327,500	-	-	-	-	-	-	-	-	1,328	-		
20							-			375.0	375	3,540		1,327,500	-	-	-	-	-	-	-	-	1,328	-		
21	347.3	375	18.9		1.0	327.5	27.7	-	27.7		375	3,540	1,327,500	1,327,500	1,229,000	1,229,442	67	-	4	1,159	98	-	-	4,650	5.5	4.5
22	233.9	290	18.7		-	215.2	56.1	85.0	141.1		375	3,540	1,026,600	1,327,500	828,000	828,006	66	-	-	762	199	301	-	3,130	3	3.6
23	197.2	375	31.7		-	165.5	177.8	-	177.8		375	3,540	1,327,500	1,327,500	698,100	698,088	112	-	-	586	629	-	-	2,640	1.2	1.7
24	344.4	375	1.0		-	343.4	30.6	-	30.6		375	3,540	1,327,500	1,327,500	1,219,000	1,219,176	4	-	-	1,216	108	-	-	4,610	14	11
25	346.0	365	-		143.3	202.8	19.0	5.4	24.4		370	3,510	1,281,150	1,300,000	1,214,000	1,214,460	-	-	503	712	67	19	-	4,600	2.6	2.1
26	296.2	365	82.0		-	214.2	68.8	5.4	74.2		370	3,510	1,281,150	1,300,000	1,040,000	1,039,662	288	-	-	752	241	19	-	3,940	2.5	2.4
27	352.8	360	1.1		330.1	21.6	7.2	10.4	17.6		370	3,510	1,263,600	1,300,000	1,238,000	1,238,328	4	-	1,159	76	25	36	-	4,690	3.9	3.1
28	348.0	365	-		293.4	54.6	17.0	5.4	22.4		370	3,510	1,281,150	1,300,000	1,221,000	1,221,480	-	-	1,030	192	60	19	-	4,620	4.5	3.7
29	311.0	365	-		291.5	19.5	54.0	5.4	59.4		370	3,510	1,281,150	1,300,000	1,092,000	1,091,610	-	-	1,023	68	190	19	-	4,130	1	0.92
30	294.7	365	0.2		90.8	203.7	70.3	5.4	75.7		370	3,510	1,281,150	1,300,000	1,034,000	1,034,397	1	-	319	715	247	19	-	3,920	6.9	6.7
31	355.5	365	-		353.0	2.5	9.5	5.4	14.9		370	3,510	1,281,150	1,300,000	1,248,000	1,247,805	-	-	1,239	9	33	19	-	4,720	7.1	5.7
32	254.6	300	29.6		66.0	159.1	45.4	70.4	115.8		370	3,510	1,053,000	1,300,000	893,600	893,646	104	-	232	558	159	247	-	3,380	24	27
33	353.7	360	28.0		79.7	246.0	6.3	10.4	16.7		370	3,510	1,263,600	1,300,000	1,241,000	1,241,487	98	-	280	863	22	36	-	4,700	20	16
34	321.7	355	3.6		54.5	263.6	33.3	15.4	48.7		370	3,510	1,246,050	1,300,000	1,129,000	1,129,167	13	-	191	925	117	54	-	4,270	21	19
35	279.0	346	20.4		-	258.6	67.0	24.4	91.4		370	3,510	1,214,460	1,300,000	979,300	979,290	72	-	-	908	235	86	-	3,710	19	19
36	358.4	365	0.1		326.6	31.7	6.6	5.4	12.0		370	3,510	1,281,150	1,300,000	1,258,000	1,257,984	0	-	1,146	111	23	19	-	4,760	13	10
37	353.4	365	-		247.4	106.0	11.6	5.4	17.0		370	3,510	1,281,150	1,300,000	1,240,000	1,240,434	-	-	868	372	41	19	-	4,700	4	3.2
38	351.0	365	-		230.0	121.0	14.0	5.4	19.4		370	3,510	1,281,150	1,300,000	1,232,000	1,232,010	-	-	807	425	49	19	-	4,660	1.4	1.1
39	262.2	290	56.5		-	205.7	27.8	80.4	108.2		370	3,510	1,017,900	1,300,000	920,300	920,322	198	-	-	722	98	282	-	3,480	25	27
40	136.4	222	136.4		-	-	85.6	148.4	234.0		370	3,510	779,220	1,300,000	478,800	478,764	479	-	-	-	300	521	-	1,810	7.5	16
41	201.9	301	-		111.1	90.9	99.1	69.4	168.5		370	3,510	1,056,510	1,300,000	708,700	708,669	-	-	390	319	348	243	-	2,680	0.35	0.49
42	350.9	360	5.0		-	345.9	9.1	10.4	19.5		370	3,510	1,263,600	1,300,000	1,232,000	1,231,659	18	-	-	1,214	32	36	-	4,660	4	3.2
43	291.3	355	68.8		-	222.5	63.7	15.4	79.1		370	3,510	1,246,050	1,300,000	1,022,000	1,022,463	241	-	-	781	224	54	-	3,870	3.7	3.6
44	352.6	365	-		287.5	65.1	12.4	5.4	17.8		370	3,510	1,281,150	1,300,000	1,238,000	1,237,626	-	-	1,009	229	44	19	-	4,680	3.2	2.6
45	353.2	365	-		352.5	0.7	11.8	5.4	17.2		370	3,510	1,281,150	1,300,000	1,240,000	1,239,732	-	-	1,237	2	41	19	-	4,690	3.5	2.8
46	357.0	365	-		356.6	0.4	8.0	5.4	13.4		370	3,510	1,281,150	1,300,000	1,253,000	1,253,070	-	-	1,252	1	28	19	-	4,740	4.4	3.5
47	354.9	365	70.7		220.4	63.9	10.1	5.4	15.5		370	3,510	1,281,150	1,300,000	1,246,000	1,245,699	248	-	773	224	35	19	-	4,710	6	4.8
48	71.2	243	-		-	71.2	171.8	127.4	299.2		370	3,510	852,930	1,300,000	249,900	249,912	-	-	-	250	603	447	-	946	0.96	3.8
49	300.1	365	-		2.0	298.1	64.9	5.4	70.3		370	3,510	1,281,150	1,300,000	1,053,000	1,053,351	-	-	7	1,046	228	19	-	3,990	1.7	1.6
50	168.4	363	-	2.0	-	166.4	194.6	7.4	202.0		370	3,510	1,274,130	1,300,000	591,100	591,084	-	7	-	584	683	26	-	2,240	0.0023	0.0039
51	75.7	125	75.7		-	-	49.3	245.4	294.7		370	3,510	438,750	1,300,000	265,700	265,707	266	-	-	-	173	861	-	1,010	4.1	15
Volumes			% Total Waste			(kgal)→	Def in depth	Conting-ency	Working space	% Empty (incl closed)	Useable Space	Empty Space	43,285,230	59,000,000	36,039,000	36,041,075	2,594	7	15,890	17,550	2,760	←excluding processing)	7,892	136,370	252	7.0
Type I			9.6%				1,972		1,337	62%	*1,332,385*	4,054,655	4,777,730	9,000,000	3,445,300	3,445,345	113	-	2,292	1,040	1,337	2,717	1,500	13,018	16	4.6
Type II			2.9%				1,618		531	75%	*531,300*	2,148,800	1,592,500	4,280,000	1,061,200	1,061,200	203	-	130	728	339	1,810	1,082	4,016	17	16.0
Type III			76.47%				3,194	1,300	3,046	21%	*4,346,082*	7,540,182	31,905,900	35,100,000	27,558,400	27,559,818	2,028	7	13,465	12,059	4,346	3,194	-	104,306	195	7.1
Type IV			11.0%				301		733	63%	*1,034,388*	1,335,288	5,009,100	10,620,000	3,974,100	3,974,712	249	-	4	3,722	1,034	301	5,310	15,030	24	6.0
Total										39%	7,244,155	22,958,925	43,285,230	59,000,000	36,039,000	36,041,075	2,594	7	15,890	17,550	7,057	8,022	7,892	136,370	252	7.0
FTF			40.5%				1,295		1,597	40%	*1,596,840*	9,702,160	16,204,680	24,310,000	14,607,100	14,607,840	737	-	8,986	4,885	1,597	1,295	6,810	55,260	84	5.8
HTF			59.5%				5,789		5,652	38%	*5,647,315*	13,256,765	27,080,550	34,690,000	21,431,900	21,433,235	1,857	7	6,905	12,665	5,460	6,727	1,082	81,110	166	7.7
HTFE			*21.5%*				*2,509*		*2,737*	*40%*	*2,737,449*	*5,246,059*	*10,491,390*	*13,000,000*	*7,753,500*	*7,753,941*	*1,202*	*7*	*1,204*	*5,341*	*2,737*	*2,509*	-	*29,346*	*49*	*6.3*
HTFW			*38.0%*				*3,281*		*2,915*	*37%*	*2,909,866*	*8,010,706*	*16,589,160*	*21,690,000*	*13,678,400*	*13,679,294*	*655*	-	*5,700*	*7,324*	*2,722*	*4,218*	*1,082*	*51,764*	*119*	*8.7*
Total										39%	*7,244,155*	22,958,925	43,285,230	59,000,000	36,039,000	36,041,075	2,594	7	15,890	17,550	7,057	8,022	7,892	136,370	250	6.9
New Style			76.5%				3,194	1,300	3,046	21%	*4,346,082*	7,540,182	31,905,900	35,100,000	27,558,400	27,559,818	2,028	7	13,465	12,059	4,346	3,194	-	104,306	195	7.1
Old Style			23.5%				4,641		2,903	65%	*2,898,073*	7,538,743	11,379,330	23,900,000	8,480,600	8,481,257	565	-	2,425	5,491	2,711	4,828	7,892	32,064	57	6.7
New Style (Non-processing)			72.8%				2,200	1,300	1,460	16%	*2,759,562*	4,959,942	28,999,620	31,200,000	26,238,600	26,240,058	1,550	-	13,465	11,225	2,760	2,200	-	99,310	187	7.1
Processing			3.7%				994		1,587	66%	*1,586,520*	2,580,240	2,906,280	3,900,000	1,319,800	1,319,760	479	7	-	834	1,587	994	-	4,996	8	6.1
Total										39%	*7,244,155*	22,958,925	43,285,230	59,000,000	36,039,000	36,041,075	2,594	7	15,890	17,550	7,057	8,022	7,892	136,370	252	7.0