



January 31, 2008

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Revision 0

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### **Evaluation of DDA Batch 3 Material in Tank 50 for Transfer to Saltstone**

#### **Summary**

Tank 50 has been characterized for DDA Batch 3 for transfers to Saltstone. Using the volumes and characterizations of the incoming streams, Tank 50 has been found to meet the requirements of the Saltstone Waste Acceptance Criteria Limits and Targets with the exception of sodium concentration. A deviation has been approved to accept the lower sodium levels.

Transfers of Tank 50 to Saltstone, planned to start under 'supernate only', are limited to a minimum level of 50 inches in Tank 50 to meet IDP requirements.

#### **Introduction**

Tank 50 serves as the primary storage tank for aqueous waste before it is transferred to Saltstone. The waste that comprises the current contents of Tank 50 is primarily from transfers of Tank 23 and Tank 49. Additional small volumes were transferred from ETP, GPE, and the cold chemical runs of Actinide Removal Process and the Modular Caustic Side Solvent Extraction Unit (ARP/MCU). Material sent from Tank 50 for processing at Saltstone must be evaluated against the Saltstone's WAC (Ref. 1). This document serves as the evaluation for DDA Batch 3.

## Discussion

The Saltstone WAC (Ref. 1) requires that Tank Farm Engineering shall adequately demonstrate compliance with the WAC requirements prior to the transfer of waste to the Saltstone Facility for treatment and disposal. The waste stream sent to Saltstone must be characterized by sampling and analysis or process knowledge. This discussion below uses a combination of both analytical results and process knowledge to show how the existing material in Tank 50 (DDA Batch 3) meets the compliance requirement of the Saltstone WAC.

The waste that comprises the current contents of Tank 50 is primarily from transfers of Tank 23 and Tank 49. Additional small volumes were transferred from ETP, GPE, and the cold chemical runs of Actinide Removal Process and the Modular Caustic Side Solvent Extraction Unit (ARP/MCU). Finally there has been some in-leakage from the Tank 50 pump bearing water system. This combination of these streams is currently being sampled and therefore analytical results are unavailable. However, both of the primary input streams have been assessed (Ref. 4 & 5) and the minor streams have been previously baselined (Ref. 9 & 10). Using this information a characterization of the current contents of Tank 50 has been determined and shown in the Material Balance in Table 3. As shown in the table, the projected content of Tank 50 meets the requirements of the Saltstone WAC with the exception of sodium concentration. The sodium level is projected to be less than the Saltstone lower limit of 3.5 molar. A deviation to this requirement has been approved (see below).

Methanol is reported as 2 mg/L which is well below the Saltstone Target value. There is no available method for methanol analysis. An engineering assessment has conservatively estimated MeOH to be <2mg/L. Table 3 does not report a result for Ni-93m which is a Saltstone Target. There is no unequivocal way to determine Ni-93m from the available sample data. The analysis performed is inductively coupled plasma-mass spectroscopy which gives a result for atomic mass 93. The results for mass 93 can be related to the Zr-93 concentration which has no Target or Limit. Reference 11 provides the relative expected abundance of Ni-93m based on Ni-94. Based on the type of material processed and stored as waste at SRS and the quantity of Ni-94 detected, Ni-93m is expected to be well below the Saltstone Target value.

### Material Balance

The material balance for Tank 50 was updated in Table 3 through 1/29/08. This table includes the routine additions from ETP and GPE. In addition there are some cold chemical transfers from 512-S as part of start-up testing of the Actinide Removal Process and the Modular Caustic Side Solvent Extraction Unit. Bearing water in-leakage is accounted for as a water addition. Transfers from Tanks 23 and Tank 49 are based on the estimations in References 4 and 5.

### Tank 50 Sodium Deviation

The contents of DDA Batch 3 in Tank 50 are estimated to be outside the Saltstone WAC lower limit of 3.5 molar for sodium concentration and projected to be as low as 2.86 M (Ref. 5). A deviation to this requirement has been requested and approved in the latest revision of the Tank 50 to Saltstone Waste Compliance Plan (Ref. 2) to permit a sodium level as low as 2.5 molar.

### Tank 50 IDP Impact

Saltstone is expected to initiate processing of DDA Batch 3 on a supernate-only campaign. In the supernate-only mode the solids phase would be concentrated as the liquid was removed from Tank 50. The majority of the radioactive content on Tank 50 is contained in three isotopes: Cs-137, Sr-90, and Pu-238 (Ref. 4 & 5). For this assessment, the entire inventory radioactivity is assumed to be in these three isotopes. Cs-137 is a gamma emitter and the Sr-90 and Pu-238 are a beta emitter and an alpha emitter respectively. These three isotopes represent the largest contributors to current Tank 50 hydrogen generation and IDP. Just using these three isotopes would slightly underestimate the impact of the total radioactivity of the tank on the IDP. To compensate for this the reported total alpha value is used and assumed to be Pu-238. Reference 4 shows that the bulk of the alpha content of Tank 50 is Pu-238. In addition Pu-238 has a large dose conversion factor. This maximizes the impact of the isotope when calculating the inhalation dose potential.

Cs-137 is a gamma emitter and the Sr-90 and Pu-238 are a beta emitter and an alpha emitter respectively. Prior evaluation have shown that Sr-90 and Pu-238 are mainly found in the Tank 50 solids while the Cs-137 is primarily soluble and found in the liquid phase (Ref. 6 & 7). For this evaluation the Cs-137 is assumed to be removed as the Tank 50 liquid is processed at Saltstone in a supernate only campaign. The Sr-90 and Pu-238 are assumed to remain in Tank 50 during the supernate transfers. The inhalation dose potential is then calculated assuming the remaining material is well mixed.

From the Tank Farm Morning Report the current level of the tank is 276.3 inches or 969813 gallons. The results for Cs-137, Sr-90, and total Alpha (as Pu-238) are taken from the Material Balance in Table 3 and listed in Table 1. In addition the dose conversion factor for each isotope is also listed in Table 1 (Ref. 8).

Isotope	Concentration (pCi/ml)	Dose Conv. Factor (Rem/Ci)
Cs-137	3.72E+07	1.90E+04
Sr-90	6.90E+04	8.90E+04
Total Alpha as Pu-238	3.77E+04	1.70E+08

**Table 1 Tank 50 Data**

The total curies of each of the three isotopes for a series of different levels are listed in Table 2. Also included in the table are the REM totals for each isotope and finally the inhalation dose potential. The total REM for an isotope is found by multiplying the total curies by the specific activity. The last column in Table 2 lists the IDP. This value is found by the summation REM of the three isotopes and dividing the total by the Tank 50 volume. The IDP calculation assumes that the tank contents are well mixed.

Level	Volume	Cs-137	Sr-90	Pu-238	Cs-137	Sr-90	Pu-238	IDP
in	gal	Total Ci	Total Ci	Total Ci	Total Rem	Total Rem	Total Rem	Rem/gal
276.3	969813	1.36E+05	2.53E+02	1.38E+02	2.59E+09	2.25E+07	2.35E+10	2.70E+04
100	351000	4.94E+04	2.53E+02	1.38E+02	9.38E+08	2.25E+07	2.35E+10	6.98E+04
95	333450	4.69E+04	2.53E+02	1.38E+02	8.91E+08	2.25E+07	2.35E+10	7.33E+04
90	315900	4.44E+04	2.53E+02	1.38E+02	8.44E+08	2.25E+07	2.35E+10	7.72E+04
85	298350	4.20E+04	2.53E+02	1.38E+02	7.98E+08	2.25E+07	2.35E+10	8.16E+04
80	280800	3.95E+04	2.53E+02	1.38E+02	7.51E+08	2.25E+07	2.35E+10	8.66E+04
75	263250	3.70E+04	2.53E+02	1.38E+02	7.04E+08	2.25E+07	2.35E+10	9.22E+04
70	245700	3.46E+04	2.53E+02	1.38E+02	6.57E+08	2.25E+07	2.35E+10	9.86E+04
65	228150	3.21E+04	2.53E+02	1.38E+02	6.10E+08	2.25E+07	2.35E+10	1.06E+05
60	210600	2.96E+04	2.53E+02	1.38E+02	5.63E+08	2.25E+07	2.35E+10	1.15E+05
55	193050	2.72E+04	2.53E+02	1.38E+02	5.16E+08	2.25E+07	2.35E+10	1.25E+05
50	175500	2.47E+04	2.53E+02	1.38E+02	4.69E+08	2.25E+07	2.35E+10	1.37E+05
45	157950	2.22E+04	2.53E+02	1.38E+02	4.22E+08	2.25E+07	2.35E+10	1.52E+05
40	140400	1.98E+04	2.53E+02	1.38E+02	3.75E+08	2.25E+07	2.35E+10	1.70E+05
39	136890	1.93E+04	2.53E+02	1.38E+02	3.66E+08	2.25E+07	2.35E+10	1.75E+05
38	133380	1.88E+04	2.53E+02	1.38E+02	3.57E+08	2.25E+07	2.35E+10	1.79E+05
37	129870	1.83E+04	2.53E+02	1.38E+02	3.47E+08	2.25E+07	2.35E+10	1.84E+05
36	126360	1.78E+04	2.53E+02	1.38E+02	3.38E+08	2.25E+07	2.35E+10	1.89E+05
35	122850	1.73E+04	2.53E+02	1.38E+02	3.28E+08	2.25E+07	2.35E+10	1.94E+05
34	119340	1.68E+04	2.53E+02	1.38E+02	3.19E+08	2.25E+07	2.35E+10	2.00E+05
33	115830	1.63E+04	2.53E+02	1.38E+02	3.10E+08	2.25E+07	2.35E+10	2.06E+05
32	112320	1.58E+04	2.53E+02	1.38E+02	3.00E+08	2.25E+07	2.35E+10	2.12E+05
31	108810	1.53E+04	2.53E+02	1.38E+02	2.91E+08	2.25E+07	2.35E+10	2.19E+05
30	105300	1.48E+04	2.53E+02	1.38E+02	2.81E+08	2.25E+07	2.35E+10	2.26E+05

**Table 2 Tank 50 Estimated IDP at Different Levels**

The inhalation dose potential for Tank 50 is also calculated and shown in Table 2. As seen in the table, the IDP could exceed the Saltstone WAC (Ref. 1) mandated value of 2.09E+05 Rem/Ci if the tank level drops below 33 inches. It should be noted that this analysis is based on the current level in Tank 50 of 276.3 inches as of 1/29/2008 (Ref. 3). Transfers of material from ETP and GPE are expected to occur after this report is issued and while processing occurs at Saltstone. While the additional volume will have an impact to the values presented in this report, this impact is expected to be slight. The volumes from ETP and GPE are small and each stream has already been characterized in the Tank 50 Material Balance section of this report. The added radiological content from these streams will not have a negative impact to the IDP conclusions of this report.

Although Table 2 shows the IDP of the Tank 50 material is within Saltstone WAC requirements down to a level of 33 inches, it is not recommended to process to this level before transitioning to a slurried operation. Table 2 used only three isotopes to simplify the calculation and therefore slightly under represent the total radiological impact of DDA Batch 3. Additionally, the Material Balance in Table 3 is based on the transfer projections of References 4 and 5 and not on a sample of the mixed Tank 50 contents. In order to compensate for these uncertainties transfers on a supernate-only campaign should be limited to no lower than 50 inches. This lower limit can be refined when sample information for Tank 50 contents becomes available.

Table 3 Tank 50 Characterization From November 2007 to January 2008

X-SD-Z-00001 Acceptance Criteria Limits for Chemical Contaminants

NH4	CO3	Cl	F	OH	NO3	NO2	C2O4	PO4	SO4	As	Ba
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
7.13E+03	1.45E+05	9.68E+03	4.94E+03	1.91E+05	5.29E+05	2.59E+05	3.30E+04	3.56E+04	6.89E+04	7.50E+02	7.50E+02
100	1200	414	20	19380	227000	100	339	65	253	0.2101	11.3
157	220	0.02	54	20000	392000	100	54	76.7	63.3	0.055	1.9
1	1800	50	50	18000	219000	51	1580	24.7	5380	5	5
683	21800	137	150	20400	323000	17700	389	2030	22300	0.178	2.97
10	2710	4	2	3130	2440	9010	10.5	10	92.5	0.028	0.227
	33	0.8	0.33	110	507	82	0.99	2.47	19.6	0.43	
				323000							

Stream Name	Designation
ETP	E
HEU - HCAN	H
GPE - HCAN	G
Tank 49	A
Tank 23	B
Transfer Out	X
Tank 39	T
Caustic	C

Latest Baseline Sample	
Date	Volume of Tank
10/13/2004	309231
6/1/2006	707265
9/1/2006	810459
2/1/2007	778167
4/1/2007	623727
6/26/2007	639522
7/1/2007	641277

NH4	CO3	Cl	F	OH	NO3	NO2	C2O4	PO4	SO4	As	Ba
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
100	5030	354	20	17900	158000	386	1380	100	326	0.08	0.71
1.00E+02	3.78E+03	2.10E+02	2.00E+01	1.94E+04	1.86E+05	1.00E+02	1.39E+03	1.00E+02	2.54E+02	8.31E-01	1.83E-01
1.00E+02	8.68E+03	2.56E+02	2.00E+01	2.23E+04	2.35E+05	1.56E+02	8.52E+02	1.20E-01	3.18E+02	8.45E-01	2.28E+00
1.00E+02	3.10E+02	2.59E+02	2.00E+01	3.20E+04	2.30E+05	1.76E+02	9.51E+02	1.00E+02	3.19E+02	7.15E-01	1.07E+01
1.00E+02	3.55E+03	2.71E+02	1.90E+01	2.00E+04	2.44E+05	2.48E+02	8.27E+02	2.85E-02	4.78E+02	6.08E-02	1.56E+00
1.04E+02	3.30E+03	2.06E+02	2.43E+01	1.93E+04	2.06E+05	2.73E+02	1.18E+03	1.04E-02	5.59E+02	1.09E+00	2.01E+00

Activity Log			
Date of Activity	Transfer Code	Transfer Volume	New Volume
11/30/2007	X	-315877.8	310977.84
11/30/2007	E	842	311819.84
11/30/2007	G	792	312611.84
11/30/2007	S	7824.5	320436.34
12/31/2007	X	-252019	68417.34
12/31/2007	E	8389	76806.34
12/31/2007	G	1574	78380.34
12/31/2007	S	4703	83083.34
12/31/2007	B	389294	472377.34
12/31/2007	W	33486	505863.34
1/29/2008	E	10355	516218.34
1/29/2008	G	3714	519932.34
1/29/2008	W	11627	531559.34
1/29/2008	N	418672	950231.34
1/29/2008	S	14626	964857.34

NH4	CO3	Cl	F	OH	NO3	NO2	C2O4	PO4	SO4	As	Ba
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
8.32E+01	3.19E+03	2.29E+02	1.63E+01	2.20E+04	2.01E+05	1.46E+03	6.69E+02	2.24E+02	4.40E+02	1.04E-01	1.80E+00
8.32E+01	3.18E+03	2.30E+02	1.63E+01	2.20E+04	2.01E+05	1.46E+03	6.68E+02	2.24E+02	4.39E+02	1.05E-01	1.83E+00
8.30E+01	3.18E+03	2.29E+02	1.64E+01	2.19E+04	2.01E+05	1.45E+03	6.70E+02	2.24E+02	4.52E+02	1.17E-01	1.83E+00
8.10E+01	3.10E+03	2.24E+02	1.60E+01	2.14E+04	1.96E+05	1.42E+03	6.54E+02	2.18E+02	4.41E+02	1.14E-01	1.79E+00
8.10E+01	3.10E+03	2.24E+02	1.60E+01	2.14E+04	1.96E+05	1.42E+03	6.54E+02	2.18E+02	4.41E+02	1.14E-01	1.79E+00
8.30E+01	2.90E+03	2.44E+02	1.64E+01	2.12E+04	1.99E+05	1.28E+03	6.19E+02	2.01E+02	4.20E+02	1.25E-01	2.83E+00
8.14E+01	2.87E+03	2.40E+02	1.71E+01	2.11E+04	2.00E+05	1.25E+03	6.39E+02	1.98E+02	5.20E+02	2.23E-01	2.87E+00
7.68E+01	2.71E+03	2.27E+02	1.61E+01	1.99E+04	1.89E+05	1.18E+03	6.02E+02	1.87E+02	4.90E+02	2.10E-01	2.71E+00
2.17E+01	2.71E+03	4.32E+01	4.49E+00	6.08E+03	3.52E+04	7.63E+03	1.15E+02	4.11E+01	1.62E+02	6.00E-02	6.63E-01
2.03E+01	2.53E+03	4.03E+01	4.19E+00	5.68E+03	3.28E+04	7.13E+03	1.07E+02	3.83E-01	1.52E+02	5.60E-02	6.20E-01
2.19E+01	2.30E+03	4.78E+01	4.51E+00	5.96E+03	3.67E+04	6.99E+03	1.12E+02	3.88E+01	1.54E+02	5.91E-02	8.34E-01
2.13E+01	2.50E+03	4.78E+01	4.83E+00	6.04E+03	3.80E+04	6.94E+03	1.22E+02	3.79E+01	1.91E+02	9.44E-02	8.64E-01
2.18E+01	2.44E+03	4.68E+01	4.72E+00	5.91E+03	3.72E+04	6.79E+03	1.19E+02	3.88E+01	1.87E+02	9.23E-02	8.45E-01
2.00E+02	7.78E+03	6.43E+01	4.40E+01	9.41E+03	1.10E+05	1.01E+04	1.75E+02	5.78E+02	6.22E+03	1.05E-01	1.32E+00
1.97E+02	7.67E+03	6.34E+01	4.34E+01	9.27E+03	1.08E+05	9.99E+03	1.72E+02	5.70E+02	6.13E+03	1.03E-01	1.30E+00

X-SD-Z-00001 Acceptance Criteria Limits for Chemical Contaminants

Cr	Pb	Hg	Se	Ag	AI	TOC	TPB	Na	Total Insoluble Solids	Butanol / Isobutanol (C4H9OH)	Isopropanol (C3H7OH)	Phenol (C6H5OH)
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	M	mg/L	mg/L	mg/L	mg/L
1.50E+03	7.50E+02	3.25E+02	4.50E+02	7.50E+02	1.41E+05	5.00E+03	3.00E+01	3.5<Na<7.0	1.88E+05	2.25E+03	2.25E+03	7.50E+02
2.44	2.46	70.2	0.025	0.15	2370	1550	10	5.26	28730	0.25	0.25	0.25
16	335	200	0.055	0.08	10200	143	10	5.51	130000	1.43E+02	1.43E+02	1.43E+02
2	5	0.5	5	5	29.7	882	10	5.48	59400	0.25	0.25	1
116	98.3	10.2	0.355	1.6	37200	847	5	10	684.5	0.5	0.5	1
4.05	0.298	10.2	0.066	0.00431	11.1	20	0.23	0	255	0.5	0.5	1
2.08		0.42	2.58	0.00064	25.6			0.024				
								19				

Stream Name	Designation
Limit	
ETP	E
HEU - HCAN	H
GPE - HCAN	G
Tank 49	A
Tank 23	B
Transfer Out	X
Tank 39	T
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Latest Baseline Sample

Date	Volume of Tank
10/13/2004	309231
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2/1/2007	778167
4/1/2007	623721
6/26/2007	639322
7/1/2007	641277

Cr	Pb	Hg	Se	Ag	AI	TOC	TPB	Na	Total Insoluble Solids	Butanol / Isobutanol (C4H9OH)	Isopropanol (C3H7OH)	Phenol (C6H5OH)
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	M	mg/L	mg/L	mg/L	mg/L
2.14	5.29	0.11	0.09	0.39	1365	747	10	3.74	1000	2.50E-02	2.50E-02	1.00E+00
8.75E-01	4.66E+00	4.27E+01	1.67E+00	3.42E-01	8.85E+01	1.15E+03	5.00E+00	4.56E+00	1.00E+03	2.50E-01	2.50E-01	1.00E+00
1.09E+01	5.82E+01	1.07E+01	1.53E+00	4.27E+00	8.94E+03	1.74E+03	5.00E-01	5.01E+00	7.44E+04	1.00E+00	1.00E+00	1.00E+00
2.04E+01	2.53E+02	7.11E+00	1.43E+00	8.70E+00	8.54E+03	7.16E+01	5.00E+00	5.01E+00	1.25E+02	1.00E+00	1.00E+00	1.00E+00
1.53E+01	1.44E+00	6.83E+01	1.22E-01	7.19E-01	8.50E+03	4.39E+02	1.00E+00	4.80E+00	7.53E+03	2.50E-01	2.50E-01	1.00E-01
3.78E+00	3.84E+01	7.09E+01	1.91E+00	6.10E-01	1.67E+03	1.40E+03	7.70E+00	4.76E+00	1.98E+04	1.10E+01	1.10E+01	1.20E+01

Activity Log

Date of Activity	Transfer Code	Transfer Volume	New Volume
11/30/2007	X	-315877.8	310977.84
11/30/2007	E	842	311819.84
11/30/2007	G	792	312611.84
11/30/2007	S	7824.5	320436.34
12/31/2007	X	-252019	68417.34
12/31/2007	E	8389	76806.34
12/31/2007	G	1574	78380.34
12/31/2007	S	4703	83083.34
12/31/2007	B	389294	472377.34
12/31/2007	W	33486	505863.34
1/29/2008	E	10355	516218.34
1/29/2008	G	3714	519932.34
1/29/2008	W	11627	531559.34
1/29/2008	N	418672	950231.34
1/29/2008	S	14626	964857.34

Cr	Pb	Hg	Se	Ag	AI	TOC	TPB	Na	Total Insoluble Solids	Butanol / Isobutanol (C4H9OH)	Isopropanol (C3H7OH)	Phenol (C6H5OH)
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	M	mg/L	mg/L	mg/L	mg/L
1.25E+01	1.31E+00	5.74E+01	1.53E-01	6.05E-01	6.67E+03	4.21E+02	1.35E+00	4.47E+00	7.68E+03	2.07E-01	2.07E-01	9.77E-02
1.25E+01	1.31E+00	5.74E+01	1.53E-01	6.04E-01	6.66E+03	4.24E+02	1.37E+00	4.47E+00	7.73E+03	2.07E-01	2.07E-01	9.77E-02
1.25E+01	1.32E+00	5.72E+01	1.65E-01	6.15E-01	6.64E+03	4.25E+02	1.40E+00	4.47E+00	7.86E+03	2.07E-01	2.07E-01	9.99E-02
1.21E+01	1.29E+00	5.59E+01	1.61E-01	6.00E-01	6.48E+03	4.14E+02	1.36E+00	4.52E+00	7.67E+03	2.02E-01	2.02E-01	9.75E-02
1.21E+01	1.29E+00	5.59E+01	1.61E-01	6.00E-01	6.48E+03	4.14E+02	1.36E+00	4.52E+00	7.67E+03	2.02E-01	2.02E-01	9.75E-02
1.11E+01	1.42E+00	5.74E+01	1.46E-01	5.51E-01	6.03E+03	5.38E+02	2.31E+00	4.60E+00	9.97E+03	2.07E-01	2.07E-01	1.14E-01
1.09E+01	1.49E+00	5.63E+01	2.43E-01	6.40E-01	5.91E+03	5.45E+02	2.46E+00	4.62E+00	1.10E+04	2.08E-01	2.08E-01	1.32E-01
1.03E+01	1.40E+00	5.31E+01	2.30E-01	6.04E-01	5.57E+03	5.14E+02	2.32E+00	4.72E+00	1.03E+04	1.96E-01	1.96E-01	1.24E-01
5.15E+00	4.93E-01	1.77E+01	9.48E-02	1.10E-01	9.89E+02	1.07E+02	5.98E-01	4.72E+00	2.03E+03	3.45E-02	3.45E-02	2.19E-02
4.81E+00	4.60E-01	1.66E+01	8.85E-02	1.02E-01	9.24E+02	9.99E+01	5.58E-01	4.72E+00	1.90E+03	3.22E-02	3.22E-02	2.04E-02
4.76E+00	5.00E-01	1.76E+01	8.72E-02	1.03E-01	9.53E+02	1.29E+02	7.48E-01	4.72E+00	2.43E+03	3.66E-02	3.66E-02	2.50E-02
4.74E+00	5.32E-01	1.75E+01	1.22E-01	1.38E-01	9.46E+02	1.34E+02	8.14E-01	4.72E+00	2.84E+03	3.81E-02	3.81E-02	3.20E-02
4.64E+00	5.21E-01	1.71E+01	1.20E-01	1.35E-01	9.26E+02	1.31E+02	7.96E-01	4.72E+00	2.78E+03	3.73E-02	3.73E-02	3.13E-02
3.47E+01	2.70E+01	1.40E+01	1.74E-01	5.10E-01	1.06E+04	3.06E+02	1.84E+00	4.72E+00	1.78E+03	2.08E-02	2.08E-02	1.85E+01
3.41E+01	2.66E+01	1.38E+01	1.71E-01	5.02E-01	1.04E+04	3.02E+02	1.81E+00	4.72E+00	1.75E+03	2.05E-02	2.05E-02	1.82E+01

**X-SD-Z-00001 Acceptance Criteria Limits for Radioactive Contaminants**

H-3	C-14	Ni-63	Sr-90	Tc-99	I-129	Cs-137	U-233	U-235	Pu-241	Total Alpha	Total Gamma
pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml
5.63E+05	1.13E+05	1.13E+05	2.25E+07	4.22E+05	1.13E+03	4.75E+07	1.13E+04	1.13E+02	8.38E+05	2.50E+05	4.75E+07
3800	11	55	757	2.7	0.46	10800	42.6	0.192	94	18	13900
1020	141	210	92000	117000	523	106000	13.1	9.47	29600	19300	4070000
0.031	195	21.7	6.71	1	1.31	129	34.3	5	180	1450	1150
1640	4550	154	111000	62900	11.4	127000000	113	0.519	6810	108000	127000000
1030	41.1	37.5	320	67.1	0.579	53400	2.41	0.0213	19.3	662	53400
81.4				5620		651000		0.00264	4970	0	651000

Stream Name	Designation
HEU - HCAN	H
GPE - HCAN	G
Tank 49	A
Tank 23	B
Transfer Out	X
Tank 39	T
Cautic	C

**Latest Baseline Sample**

Date	Volume of Tank
10/13/2004	309231
6/1/2006	707265
9/1/2006	810459
2/1/2007	778167
4/1/2007	623727
6/26/2007	639522
7/1/2007	641277

H-3	C-14	Ni-63	Sr-90	Tc-99	I-129	Cs-137	U-233	U-235	Pu-241	Total Alpha	Total Gamma
pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml
3530	10.6	16.4	303	27.3	2.15	4040	0.68	0.07	18.4	179	4040
2.40E+03	2.52E+02	1.58E+03	4.87E+05	7.51E+03	1.45E+01	7.07E+04	7.24E+02	1.03E+00	1.92E+04	4.66E+04	1.15E+06
2.30E+03	3.81E+00	8.89E+02	5.25E+03	2.51E+02	6.43E+00	1.52E+04	1.43E+02	5.97E+01	3.06E+02	2.56E+03	6.13E+04
2.15E+03	5.27E+00	2.63E+00	1.47E+03	2.63E+02	4.17E+00	1.50E+04	5.01E+01	8.63E-01	1.32E+02	9.77E+02	6.80E+04
2.00E+03	1.79E+01	2.16E+02	6.85E+05	5.50E+02	3.64E+00	5.89E+05	2.14E+02	8.72E-01	2.66E+04	1.09E+05	6.93E+05
2.33E+03	3.13E+02	1.61E+03	4.97E+05	1.93E+04	6.53E+01	7.43E+05	7.33E+02	2.20E+00	2.21E+04	4.94E+04	7.43E+05

**Activity Log**

Date of Activity	Transfer Code	Transfer Volume	New Volume
10/31/2007	X	-184785	613137.39
10/31/2007	S	9880	623017.39
10/31/2007	G	1556.25	624573.64
10/31/2007	E	2282	626855.64
11/30/2007	X	-315877.8	310977.84
11/30/2007	E	842	311819.84
11/30/2007	G	792	312611.84
11/30/2007	S	7824.5	320436.34
12/31/2007	X	-252019	68417.34
12/31/2007	E	8389	76806.34
12/31/2007	G	1574	78380.34
12/31/2007	S	4703	83083.34
12/31/2007	B	389294	472377.34
12/31/2007	W	33486	505863.34
1/29/2008	E	10355	516218.34
1/29/2008	G	3714	519932.34
1/29/2008	W	11627	531559.34
1/29/2008	N	418672	950231.34
1/29/2008	S	14626	964857.34

H-3	C-14	Ni-63	Sr-90	Tc-99	I-129	Cs-137	U-233	U-235	Pu-241	Total Alpha	Total Gamma
pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml
1.89E+03	2.17E+01	1.78E+02	5.40E+05	4.56E+02	2.98E+00	6.05E+05	1.71E+02	7.30E-01	2.10E+04	8.61E+04	6.05E+05
1.86E+03	2.14E+01	1.75E+02	5.32E+05	4.49E+02	2.93E+00	5.95E+05	1.68E+02	7.19E-01	2.07E+04	8.47E+04	5.95E+05
1.86E+03	2.18E+01	1.75E+02	5.30E+05	4.47E+02	2.93E+00	5.93E+05	1.68E+02	7.29E-01	2.06E+04	8.45E+04	5.94E+05
1.86E+03	2.18E+01	1.75E+02	5.28E+05	4.46E+02	2.92E+00	5.91E+05	1.68E+02	7.27E-01	2.05E+04	8.42E+04	5.91E+05
1.86E+03	2.18E+01	1.75E+02	5.28E+05	4.46E+02	2.92E+00	5.91E+05	1.68E+02	7.27E-01	2.05E+04	8.42E+04	5.91E+05
1.87E+03	2.17E+01	1.74E+02	5.27E+05	4.45E+02	2.91E+00	5.90E+05	1.67E+02	7.26E-01	2.05E+04	8.40E+04	5.90E+05
1.86E+03	2.22E+01	1.74E+02	5.26E+05	4.44E+02	2.91E+00	5.88E+05	1.67E+02	7.37E-01	2.04E+04	8.37E+04	5.88E+05
1.82E+03	2.16E+01	1.70E+02	5.13E+05	4.33E+02	2.84E+00	5.74E+05	1.63E+02	7.19E-01	1.99E+04	8.17E+04	5.74E+05
2.03E+03	2.05E+01	1.57E+02	4.57E+05	3.86E+02	2.58E+00	5.12E+05	1.50E+02	6.61E-01	1.78E+04	7.28E+04	5.13E+05
1.99E+03	2.40E+01	1.54E+02	4.48E+05	3.78E+02	2.55E+00	5.02E+05	1.47E+02	7.48E-01	1.74E+04	7.13E+04	5.03E+05
1.88E+03	2.26E+01	1.46E+02	4.22E+05	3.57E+02	2.41E+00	4.74E+05	1.39E+02	7.06E-01	1.64E+04	6.73E+04	4.74E+05
1.18E+03	3.78E+01	5.65E+01	7.46E+04	1.18E+02	9.01E-01	1.27E+05	2.65E+01	1.42E-01	2.90E+03	1.24E+04	1.27E+05
1.10E+03	3.53E+01	5.28E+01	6.96E+04	1.10E+02	8.41E-01	1.19E+05	2.47E+01	1.32E-01	2.71E+03	1.16E+04	1.19E+05
1.16E+03	3.49E+01	5.28E+01	6.82E+04	1.08E+02	8.34E-01	1.17E+05	2.51E+01	1.34E-01	2.66E+03	1.13E+04	1.17E+05
1.15E+03	3.60E+01	5.26E+01	6.78E+04	1.07E+02	8.37E-01	1.16E+05	2.51E+01	1.68E-01	2.64E+03	1.13E+04	1.16E+05
1.12E+03	3.52E+01	5.15E+01	6.63E+04	1.05E+02	8.19E-01	1.13E+05	2.46E+01	1.65E-01	2.58E+03	1.10E+04	1.13E+05
1.26E+03	1.38E+03	7.99E+01	7.00E+04	1.87E+04	3.92E+00	3.77E+07	4.76E+01	2.49E-01	3.47E+03	3.83E+04	3.77E+07
1.24E+03	1.35E+03	7.86E+01	6.90E+04	1.84E+04	3.86E+00	3.72E+07	4.69E+01	2.45E-01	3.42E+03	3.77E+04	3.72E+07

**X-SD-Z-0001 Acceptance Criteria Targets for Chemical Contaminants**

B	Co	Cu	Fe	K	Li	Mn	Mo	Ni	Si	Sr	Zn
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
9.00E+02	9.00E+02	9.00E+02	6.00E+03	3.67E+04	9.00E+02	9.00E+02	9.00E+02	9.00E+02	1.29E+04	9.00E+02	9.75E+02

B	Co	Cu	Fe	K	Li	Mn	Mo	Ni	Si	Sr	Zn
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
9.23	0.748	3.43	8.62	1.79E+02	4.82	5.31	3.14E+01	2.03E+01	7.32E+01	4.26	1.19E+01
77.024	0.17062	3.43	8.7544	2.99E+02	4.82	5.27	3.14E+01	2.03E+01	7.32E+01	4.26	1.19E+01
104.08	8.02E-02	2.2668	3.01	3.28E+02	3.57E+01	8.91E-01	1.05E+02	2.96E+01	1.78E+03	3.64E+01	1.54E+01
6.24E+01	2.99E-01	5.19	3.98E+02	2.71E+02	7.52E-01	2.92E+02	7.11E+00	4.33E+01	2.35E+02	2.10E+00	2.27E+01

Benzene (C6H6)	Methanol (CH3OH)	Toluene (C6H5CH3)	TBP [(C4H9)3PO]	EDTA
mg/L	mg/L	mg/L	mg/L	mg/L
3.75E+02	2.25E+02	3.75E+02	3.00E+02	3.75E+02

Benzene (C6H6)	Methanol (CH3OH)	Toluene (C6H5CH3)	TBP [(C4H9)3PO]	EDTA
mg/L	mg/L	mg/L	mg/L	mg/L
2.50E-01	2.00E+00	2.50E-02	2.50E-01	5.00E+01
2.50E-01	2.00E+00	2.50E-01	1.00E+00	1.00E+01
2.50E-01	2.00E+00	2.50E-01	1.00E+00	1.00E+01
2.50E-01	2.00E+00	2.50E-01	1.00E-01	5.00E+01

Target value:

Latest Baseline Sample	
Date	Volume of Tank
6/1/2006	707265
9/1/2006	810459
2/1/2007	778167
4/1/2007	623727

Target value:

Latest Baseline Sample	
Date	Volume of Tank
6/1/2006	707265
9/1/2006	810459
2/1/2007	778167
4/1/2007	623727



**X-SD-Z-00001 Acceptance Criteria Targets for Radioactive Contaminants**

Co-60	Ni-59	Se-79	Nb-93m	Nb-94	Mo-93	Ru-106	Sb-125	Sn-126	Cs-134	Cs-135	Ce-144	Pm-147	Sm-151	Eu-154	Eu-155	Ra-226	Th-229
pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml
1.13E+06	1.13E+05	1.90E+04	2.85E+06	1.53E+04	1.18E+07	1.13E+06	2.25E+06	1.80E+04	1.13E+06	1.13E+06	1.13E+04	5.63E+06	2.25E+04	2.25E+06	1.13E+04	7.97E+03	1.63E+05
Co-60	Ni-59	Se-79	Nb-93m	Nb-94	Mo-93	Ru-106	Sb-125	Sn-126	Cs-134	Cs-135 <td>Ce-144</td> <td>Pm-147</td> <td>Sm-151</td> <td>Eu-154</td> <td>Eu-155</td> <td>Ra-226</td> <td>Th-229</td>	Ce-144	Pm-147	Sm-151	Eu-154	Eu-155	Ra-226	Th-229
pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml
7.16E+01	9.20E+01	8.92E+03	3.44E+01	1.64E+05	3.92E+02	1.01E+05	2.50E+02	2.50E+02	4.42E+01	1.01E+02	6.55E+02	8.54E+03	7.59E+03	2.13E+03	1.72E+02	2.56E+03	1.98E+02
6.15E+00	3.32E+00	1.48E-03	5.96E+00	2.77E+05	1.65E+02	5.03E+04	6.76E+01	1.01E+01	1.70E+01	1.70E+01	2.60E+02	2.09E+01	1.17E+01	1.56E+01	1.07E+02	9.77E+02	3.15E+03
1.68E+00	1.33E+01	1.43E-03	2.62E+02	1.81E+00	1.15E+05	6.15E+01	3.52E+04	3.64E+00	3.96E+00	3.96E+00	8.94E+01	2.63E+01	1.07E+01	3.07E+00	3.68E+01	3.32E+02	1.10E+03
8.51E+01	1.35E+01	3.28E+03	5.77E+00	1.46E+05	4.86E+01	1.22E+05	3.89E+01	2.14E+01	1.04E+02	1.04E+02	1.00E+02	8.42E+03	4.18E+03	3.99E+03	7.79E+02	3.27E+02	3.30E+04

Target value:

Latest Baseline Sample	
Date	Volume of Tank
6/1/2006	707265
9/1/2006	810459
2/1/2007	778167
4/1/2007	623727

**X-SD-Z-00001 Acceptance Criteria Targets for Radioactive Contaminants**

Th-230	Th-232	U-232	U-234	U-236	U-238	Np-237	Pu-238	Pu-239	Pu-240	Pu-242	Pu-244	Am-241	Am-242m	Am-243	Am-242	Am-244	Am-245
pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml
6.26E+03	2.88E+03	1.71E+05	1.13E+04	1.13E+04	1.13E+04	2.50E+05	2.50E+05	2.50E+05	2.50E+05	2.50E+05	7.02E+04	2.50E+05	4.50E+05	2.50E+05	1.13E+04	2.50E+05	2.25E+05
Th-230	Th-232	U-232	U-234	U-236	U-238	Np-237	Pu-238	Pu-239	Pu-240	Pu-242	Pu-244	Am-241	Am-242m	Am-243	Am-242	Am-244	Am-245
pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml	pCi/ml
2.36E+03	8.75E-03	2.60E+01	1.17E+03	9.67	3.61	1.32E+02	4.61E+04	1.96E+03	4.89E+02	2.85E+02	1.99	1.08E+04	6.35	5.09E+01	5.27	1.20E+04	2.29E+02
3.12E+02	2.44E-03	3.21E-01	9.25E+01	8.6	1.99	1.57E-01	1.01E+03	4.15E+01	5.06E+03	8.48E+01	0.263	2.45E+02	0.0896	4.07E+00	0.0741	2.20E+01	1.05E+01
1.09E+02	7.10E-03	5.18E-01	5.02E-01	5.02E-01	1.85E+00	1.82E+02	4.14E+02	1.77E+03	1.77E+03	2.96E+01	9.18E-02	1.76E+02	2.85E-01	2.16E+00	2.36E-01	2.36E-01	6.89E+00
3.27E+03	1.70E-02	4.41E-01	1.38E+02	6.37E+00	3.19	1.56E+01	7.30E+04	4.67E+03	4.67E+03	8.45E+01	3.92E-01	9.44E+03	5.07E+00	1.35E+02	4.20E+00	2.25E+04	7.16E+01

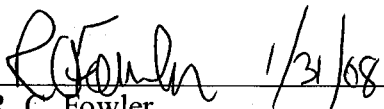
Target value:

Latest Baseline Sample	
Date	Volume of Tank
6/1/2006	707265
9/1/2006	810459
2/1/2007	778167
4/1/2007	623727

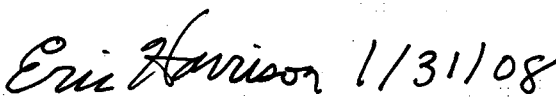
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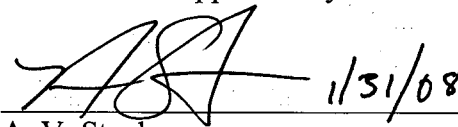
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