

**Saltstone Production and Disposal Facility
Website Data - Second Quarter, Calendar Year 2009**

**Consent Order of Dismissal, Section III.7
Z-Area Saltstone Disposal Facility Permit
General Condition B.5.a-h Information**

Permit Condition	Requirement	Estimated Value	Updated Value
B.5 a)	Cumulative process volume of salt waste disposed to date	Not Applicable	2,619 kgals Vault 4
b)	Process volume of saltstone grout disposed and vault location (cell identity) for the reporting period	Not Applicable	1,365 kgals Vault 4, Cell K
c)	Cumulative process volume of saltstone grout disposed to date	Not Applicable	4,622 kgals Vault 4
d)	Remaining vault volume;	Not Applicable	8.005 x 10 ³ kgals Vault 4
e)	Curies disposed and vault location for the reporting period	149 kCi Vault 4, Cell K	152 kCi Vault 4, Cell K
f)	Cumulative inventory of curies disposed to date	344 kCi Vault 4, Cells D, E, F, L, K	347 kCi Vault 4, Cells D, E, F, L, K
g)	Curies of highly radioactive radionuclides disposed and vault location for the reporting period	149 kCi Vault 4, Cell K	151 kCi Vault 4, Cell K
h)	Cumulative inventory of highly radioactive radionuclides disposed to date	343 kCi Vault 4, Cells D, E, F, L, K	345 kCi Vault 4, Cells D, E, F, L, K

Saltstone Production and Disposal Facility Website Data - Second Quarter, Calendar Year 2009

Consent Order of Dismissal, Section III.7 (1) Chemical and Radiological Composition of Salt Waste

Chemical Name	Estimated Concentration (mg/L)	Updated Concentration (mg/L)
Major Constituent		
Water [H ₂ O]	8.06E+05	7.84E+05
Solvated Ions		
Aluminate [Al(OH) ₄]	1.39E+04	1.37E+04
Carbonate [CO ₃ ²⁻]	6.74E+03	8.80E+03
Chloride [Cl]	3.12E+02	3.03E+02
Fluoride [F]	2.98E+02	2.93E+02
Hydroxide [OH]	1.85E+04	1.95E+04
Nitrate [NO ₃ ⁻]	1.24E+05	1.42E+05
Nitrite [NO ₂ ⁻]	6.13E+03	7.56E+03
Sulfate [SO ₄ ²⁻]	6.81E+03	7.75E+03
RCRA Hazardous Metals		
Arsenic [As]	7.97E-01	6.60E-01
Barium [Ba]	2.75E+00	2.15E+00
Cadmium [Cd]	1.33E+00	1.13E+00
Chromium [Cr]	4.89E+01	4.75E+01
Lead [Pb]	1.70E+01	1.30E+01
Mercury [Hg]	1.65E+01	1.73E+01
Selenium [Se]	1.53E+00	1.28E+00
Silver [Ag]	6.44E+00	5.15E+00
Other Metals		
Aluminum [Al]	3.95E+03	3.91E+03
Boron [B]	5.12E+00	5.12E+00
Cobalt [Co]	8.17E-02	8.17E-02
Copper [Cu]	<1.15E+00	<1.15E+00
Iron [Fe]	1.80E+02	1.80E+02
Lithium [Li]	1.26E+00	<1.26E+00
Manganese [Mg]	1.15E+02	1.15E+02
Molybdenum [Mo]	5.94E+01	5.94E+01
Nickel [Ni]	1.59E+01	<1.59E+01
Sodium [Na]	9.24E+04	9.12E+04
Strontium [Sr]	5.31E-01	<5.31E-01
Zinc [Zn]	1.03E+01	1.03E+01
Organic Compounds		
Tetraphenylborate [B(C ₆ H ₅) ₄ ⁻]	4.97E+00	4.95E+00
Total Organic Carbon	8.02E+02	7.06E+02
Total Insoluble Solids		
Total Insoluble Solids	2.70E+03	2.85E+03

Saltstone Production and Disposal Facility Website Data - Second Quarter, Calendar Year 2009

Consent Order of Dismissal, Section III.7 (1) Chemical and Radiological Composition of Salt Waste (continued)

Radionuclide	Estimated Concentration (pCi/mL)	Updated Concentration (pCi/mL)
H-3	8.67E+02	8.59E+02
C-14	1.39E+03	1.39E+03
Co-60	7.37E+00	7.37E+00
Ni-59	<1.80E+01	<1.80E+01
Ni-63	3.99E+02	3.97E+02
Se-79	2.67E+02	2.67E+02
Sr-90	1.30E+05	1.33E+05
Y-90	1.30E+05	1.33E+05
Tc-99	2.65E+04	2.71E+04
Ru-106	<1.58E+02	<1.58E+02
Rh-106	<1.58E+02	<1.58E+02
Sb-125	7.96E+03	7.96E+03
Te-125m	7.96E+03	7.96E+03
I-129	2.88E+01	2.89E+01
Cs-134	<5.45E+02	<5.45E+02
Cs-137	2.47E+07	2.51E+07
Ba-137m	2.33E+07	2.37E+07
Ce-144	<1.54E+02	<1.54E+02
Pr-144	<1.54E+02	<1.54E+02
Pm-147	<3.11E+03	<3.11E+03
Eu-154	2.13E+02	2.13E+02
Np-237 (α) (t _{1/2}) > 5 yr	1.09E+01	1.09E+01
Pu-238 (α) (t _{1/2}) > 5 yr	1.67E+04	1.67E+04
Pu-239 (α) (t _{1/2}) > 5 yr	5.77E+02	<5.77E+02
Pu-240 (α) (t _{1/2}) > 5 yr	5.77E+02	<5.77E+02
Pu-241	1.66E+04	1.56E+04
Pu-242 (α) (t _{1/2}) > 5 yr	3.00E-01	3.00E-01
Am-241 (α) (t _{1/2}) > 5 yr	7.96E+02	7.96E+02
Am-242m	<1.23E+00	1.23E+00
Cm-242 (α)	<1.01E+00	1.01E+00
Cm-244 (α) (t _{1/2}) > 5 yr	1.73E+03	1.73E+03
Cm-245 (α) (t _{1/2}) > 5 yr	1.77E-03	1.77E-03
Total Transuranic Alpha Emitters with (t _{1/2}) > 5 years	3.54E+04	3.58E+04

Saltstone Production and Disposal Facility Website Data - Second Quarter, Calendar Year 2009

Consent Order of Dismissal, Section III.7 (2) Formulation of Grout Used to Treat and Solidify the Salt Waste

The grout formulation is defined by the proportions of dry premix components (Type II Portland cement, Class F flyash, and Grade 120/100 slag) and the ratio of the water content in the salt waste to dry premix. Small quantities of admixtures are added as required for the purposes of set retardant and anti-foam. These have an insignificant effect on the overall grout composition (0.2 wt% of the overall grout composition).

The formulation used for the reporting period is shown below:

Saltstone Dry Premix Composition

Component	Weight %
Type II Portland cement	10
Class F flyash	45
Grade 120/100 slag	45

Water to Premix Ratio (by weight) – 0.60

Utilizing this grout formulation leads to an overall grout composition as shown below:

Overall Grout Composition

Component	Weight %
Salt Waste	40
Type II Portland cement	6
Grade 120/100 slag	27
Class F flyash	27

Saltstone Production and Disposal Facility Website Data - Second Quarter, Calendar Year 2009

Consent Order of Dismissal, Section III.7 (3) Chemical and Radiological Composition of Saltstone

Chemical Name	Estimated Concentration (mg/L)	Updated Concentration (mg/L)
Major Constituent		
Water [H ₂ O]	5.1E+05	5.0E+05
Portland (II) Cement	1.0E+05	1.0E+05
Class F Flyash	4.6E+05	4.6E+05
Grade 100/120 Slag	4.6E+05	4.6E+05
Solvated Ions		
Aluminate [Al(OH) ₄]	8.79E+03	8.69E+03
Carbonate [CO ₃ ²⁻]	4.27E+03	5.56E+03
Chloride [Cl]	1.97E+02	1.91E+02
Fluoride [F]	1.89E+02	1.85E+02
Hydroxide [OH]	1.17E+04	1.23E+04
Nitrate [NO ₃]	7.84E+04	8.97E+04
Nitrite [NO ₂]	3.88E+03	4.78E+03
Sulfate [SO ₄ ²⁻]	4.31E+03	4.90E+03
RCRA Hazardous Metals		
Arsenic [As]	5.04E-01	4.17E-01
Barium [Ba]	1.74E+00	1.36E+00
Cadmium [Cd]	8.38E-01	7.14E-01
Chromium [Cr]	3.09E+01	3.00E+01
Lead [Pb]	1.08E+01	8.20E+00
Mercury [Hg]	1.05E+01	1.09E+01
Selenium [Se]	9.66E-01	8.07E-01
Silver [Ag]	4.07E+00	3.26E+00
Other Metals		
Aluminum [Al]	2.50E+03	2.47E+03
Boron [B]	3.24E+00	3.24E+00
Cobalt [Co]	5.17E-02	5.17E-02
Copper [Cu]	<7.27E-01	<7.27E-01
Iron [Fe]	1.14E+02	1.14E+02
Lithium [Li]	7.97E-01	7.97E-01
Manganese [Mg]	7.27E+01	7.27E+01
Molybdenum [Mo]	3.76E+01	3.76E+01
Nickel [Ni]	1.01E+01	1.01E+01
Sodium [Na]	5.84E+04	5.77E+04
Strontium [Sr]	3.36E-01	3.36E-01
Zinc [Zn]	6.51E+00	6.51E+00
Organic Compounds		
Tetraphenylborate [B(C ₆ H ₅) ₄ ⁻]	3.14E+00	3.13E+00
Total Organic Carbon	5.07E+02	4.47E+02
Total Insoluble Solids		
Total Insoluble Solids	1.71E+03	1.80E+03

Saltstone Production and Disposal Facility Website Data - Second Quarter, Calendar Year 2009

Consent Order of Dismissal, Section III.7 (3) Chemical and Radiological Composition of Saltstone (continued)

Radionuclide	Estimated Concentration (pCi/mL)	Updated Concentration (pCi/mL)
H-3	5.48E+02	5.43E+02
C-14	8.79E+02	8.76E+02
Co-60	4.66E+00	4.66E+00
Ni-59	<1.14E+01	<1.14E+01
Ni-63	2.52E+02	2.51E+02
Se-79	1.69E+02	1.69E+02
Sr-90	8.21E+04	8.39E+04
Y-90	8.21E+04	8.39E+04
Tc-99	1.67E+04	1.71E+04
Ru-106	<9.99E+01	<9.99E+01
Rh-106	<9.99E+01	<9.99E+01
Sb-125	5.03E+03	5.03E+03
Te-125m	5.03E+03	5.03E+03
I-129	1.82E+01	1.83E+01
Cs-134	<3.45E+02	<3.45E+02
Cs-137	1.56E+07	1.59E+07
Ba-137m	1.48E+07	1.50E+07
Ce-144	<9.74E+01	<9.74E+01
Pr-144	<9.74E+01	<9.74E+01
Pm-147	<1.97E+03	<1.97E+03
Eu-154	1.35E+02	1.35E+02
Np-237 (α) ($t_{1/2}$) > 5 yr	6.89E+00	6.89E+00
Pu-238 (α) ($t_{1/2}$) > 5 yr	1.06E+04	1.06E+04
Pu-239 (α) ($t_{1/2}$) > 5 yr	3.65E+02	3.65E+02
Pu-240 (α) ($t_{1/2}$) > 5 yr	3.65E+02	3.65E+02
Pu-241	1.05E+04	9.84E+03
Pu-242 (α) ($t_{1/2}$) > 5 yr	1.89E-01	1.89E-01
Am-241 (α) ($t_{1/2}$) > 5 yr	5.03E+02	5.03E+02
Am-242m	<7.78E-01	<7.78E-01
Cm-242 (α)	<6.39E-01	<6.39E-01
Cm-244 (α) ($t_{1/2}$) > 5 yr	1.09E+03	1.09E+03
Cm-245 (α) ($t_{1/2}$) > 5 yr	1.12E-03	1.12E-03
Total Transuranic Alpha Emitters with ($t_{1/2}$) > 5 years	2.24E+04	2.27E+04