Saltstone Production and Disposal Facility
Website Data - Fourth Quarter, Calendar Year 2011

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	Comments
B.5 a)	Cumulative process volume of salt waste disposed to date	Not Applicable	6,279 kgals Vault 4	Updated value reflects increase of 1 kgal from that previously reported due to typo in transcription of process run data.
b)	Process volume of saltstone grout disposed and vault location (cell identity) for the reporting period	Not Applicable	1.4×10^3 kgals Vault 4, Cells B	
c)	Cumulative process volume of saltstone grout disposed to date	Not Applicable	1.1×10^4 kgals Vault 4	
d)	Remaining vault volume	Not Applicable	9.3×10^2 kgals Vault 4	
e)	Curies disposed and vault location for the reporting period	13 kCi Vault 4, Cell B	13 kCi Vault 4, Cell B	
f)	Cumulative inventory of curies disposed to date	569 kCi Vault 4, Cells B, D, E, F, H, J, K, L	570 kCi Vault 4, Cells B, D, E, F, H, J, K, L	Updated value shown with two significant digits.
g)	Curies of highly radioactive radionuclides disposed and vault location for the reporting period	13 kCi Vault 4, Cell B	13 kCi Vault 4, Cell B	
h)	Cumulative inventory of highly radioactive radionuclides disposed to date	567 kCi Vault 4, Cells B, D, E, F, H, J, K, L	570 kCi Vault 4, Cells B, D, E, F, H, J, K, L	Updated value shown with two significant digits.

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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_2O]	8.95E+05	8.95E+05
Solvated Ions		
Aluminate [$Al(OH)_4$]	1.09E+04	1.09E+04
Carbonate [CO_3^{2-}]	8.32E+03	8.32E+03
Chloride [Cl^-]	2.15E+02	2.15E+02
Fluoride [F^-]	<1.00E+02	<1.00E+02
Hydroxide [OH^-]	2.92E+04	2.92E+04
Nitrate [NO_3^-]	1.48E+05	1.48E+05
Nitrite [NO_2^-]	2.35E+04	2.35E+04
Sulfate [SO_4^{2-}]	5.06E+03	5.06E+03
RCRA Hazardous Metals		
Arsenic [As]	<9.65E-02	<9.65E-02
Barium [Ba]	<4.56E-01	<4.56E-01
Cadmium [Cd]	<6.13E-01	<6.13E-01
Chromium [Cr]	4.39E+01	4.39E+01
Lead [Pb]	9.54E-02	9.54E-02
Mercury [Hg]	2.15E+01	2.15E+01
Selenium [Se]	<1.93E-01	<1.93E-01
Silver [Ag]	<1.28E+00	<1.28E+00
Other Metals		
Aluminum [Al]	3.09E+03	3.09E+03
Boron [B]	1.04E+02	1.04E+02
Cobalt [Co]	<7.45E-01	<7.45E-01
Copper [Cu]	<5.53E-01	<5.53E-01
Iron [Fe]	7.95E+00	7.95E+00
Lithium [Li]	1.11E+01	1.11E+01
Manganese [Mg]	2.67E+00	2.67E+00
Molybdenum [Mo]	1.56E+01	1.56E+01
Nickel [Ni]	<1.41E+00	<1.41E+00
Sodium [Na]	1.03E+05	1.03E+05
Strontium [Sr]	<4.39E-02	<4.39E-02
Zinc [Zn]	5.55E+00	5.55E+00
Organic Compounds		
Tetraphenylborate [$B(C_6H_5)^{4-}$]	<5.00E+00	<5.00E+00
Total Organic Carbon	3.18E+02	3.18E+02
Total Insoluble Solids		
Total Insoluble Solids	1.32E+03	1.32E+03

Saltstone Production and Disposal Facility
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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	3.97E+02	3.97E+02
C-14	2.64E+02	2.64E+02
Co-60	3.98E-01	3.98E-01
Ni-59	<2.35E+00	<2.35E+00
Ni-63	<7.25E+00	<7.25E+00
Se-79	1.76E+01	1.76E+01
Sr-90	4.74E+03	4.74E+03
Y-90	4.74E+03	4.74E+03
Tc-99	3.51E+04	3.51E+04
Ru-106	<1.90E+00	<1.90E+00
Rh-106	<1.90E+00	<1.90E+00
Sb-125	7.36E+02	7.36E+02
Te-125m	7.36E+02	7.36E+02
I-129	5.96E+00	5.96E+00
Cs-134	<9.37E+01	<9.37E+01
Cs-137	2.12E+06	2.12E+06
Ba-137m	2.01E+06	2.01E+06
Ce-144	<1.34E+00	<1.34E+00
Pr-144	<1.34E+00	<1.34E+00
Pm-147	<1.78E+03	<1.78E+03
Eu-154	4.26E+00	4.26E+00
Np-237 (α) ($t_{1/2}$) > 5 yr	<1.73E+01	<1.73E+01
Pu-238 (α) ($t_{1/2}$) > 5 yr	1.09E+03	1.09E+03
Pu-239 (α) ($t_{1/2}$) > 5 yr	1.38E+02	1.38E+02
Pu-240 (α) ($t_{1/2}$) > 5 yr	1.38E+02	1.38E+02
Pu-241	<2.75E+02	<2.75E+02
Pu-242 (α) ($t_{1/2}$) > 5 yr	<2.68E+01	<2.68E+01
Am-241 (α) ($t_{1/2}$) > 5 yr	1.41E+01	1.41E+01
Am-242m	<4.37E-02	<4.37E-02
Cm-242 (α)	<3.62E-02	<3.62E-02
Cm-244 (α) ($t_{1/2}$) > 5 yr	3.41E+01	3.41E+01
Cm-245 (α) ($t_{1/2}$) > 5 yr	<2.17E+00	<2.17E+00
Total Transuranic Alpha Emitters with ($t_{1/2}$) > 5 years	<6.22E+02	<6.22E+02

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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
The water to premix ratio reflects the pounds of free water added to the process for each pound of dry premix fed to the saltstone mixer averaged for the quarter.

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

Overall Grout Composition

(Due to rounding, numbers may not add to 100%)

Component	Weight %
Salt Waste	44
Type II Portland cement	6
Grade 120/100 slag	25
Class F flyash	25

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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_2O]	5.60E+05	5.60E+05
Portland (II) Cement	9.49E+04	9.49E+04
Class F Flyash	4.27E+05	4.27E+05
Grade 100/120 Slag	4.27E+05	4.27E+05
Solvated Ions		
Aluminate [$Al(OH)_4$]	6.81E+03	6.81E+03
Carbonate [CO_3^{2-}]	5.21E+03	5.21E+03
Chloride [Cl^-]	1.35E+02	1.35E+02
Fluoride [F^-]	<6.26E+01	<6.26E+01
Hydroxide [OH^-]	1.83E+04	1.83E+04
Nitrate [NO_3^-]	9.26E+04	9.26E+04
Nitrite [NO_2^-]	1.47E+04	1.47E+04
Sulfate [SO_4^{2-}]	3.17E+03	3.17E+03
RCRA Hazardous Metals		
Arsenic [As]	<6.04E-02	<6.04E-02
Barium [Ba]	<2.85E-01	<2.85E-01
Cadmium [Cd]	<3.84E-01	<3.84E-01
Chromium [Cr]	2.75E+01	2.75E+01
Lead [Pb]	5.97E-02	5.97E-02
Mercury [Hg]	1.35E+01	1.35E+01
Selenium [Se]	<1.21E-01	<1.21E-01
Silver [Ag]	<8.01E-01	<8.01E-01
Other Metals		
Aluminum [Al]	1.93E+03	1.93E+03
Boron [B]	6.51E+01	6.51E+01
Cobalt [Co]	<4.66E-01	<4.66E-01
Copper [Cu]	<3.46E-01	<3.46E-01
Iron [Fe]	4.97E+00	4.97E+00
Lithium [Li]	6.95E+00	6.95E+00
Manganese [Mg]	1.67E+00	1.67E+00
Molybdenum [Mo]	9.76E+00	9.76E+00
Nickel [Ni]	<8.82E-01	<8.82E-01
Sodium [Na]	6.45E+04	6.45E+04
Strontium [Sr]	<2.75E-02	<2.75E-02
Zinc [Zn]	3.47E+00	3.47E+00
Organic Compounds		
Tetraphenylborate [$B(C_6H_5)^{4-}$]	<3.13E+00	<3.13E+00
Total Organic Carbon	1.99E+02	1.99E+02
Total Insoluble Solids		
Total Insoluble Solids	8.26E+02	8.26E+02

Saltstone Production and Disposal Facility
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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	2.48E+02	2.48E+02
C-14	1.65E+02	1.65E+02
Co-60	2.49E-01	2.49E-01
Ni-59	<1.47E+00	<1.47E+00
Ni-63	<4.54E+00	<4.54E+00
Se-79	1.10E+01	1.10E+01
Sr-90	2.97E+03	2.97E+03
Y-90	2.97E+03	2.97E+03
Tc-99	2.20E+04	2.20E+04
Ru-106	<1.19E+00	<1.19E+00
Rh-106	<1.19E+00	<1.19E+00
Sb-125	4.61E+02	4.61E+02
Te-125m	4.61E+02	4.61E+02
I-129	3.73E+00	3.73E+00
Cs-134	<5.86E+01	<5.86E+01
Cs-137	1.33E+06	1.33E+06
Ba-137m	1.25E+06	1.25E+06
Ce-144	<8.39E-01	<8.39E-01
Pr-144	<8.39E-01	<8.39E-01
Pm-147	<1.11E+03	<1.11E+03
Eu-154	2.67E+00	2.67E+00
Np-237 (α) $(t_{1/2})$ > 5 yr	<1.08E+01	<1.08E+01
Pu-238 (α) $(t_{1/2})$ > 5 yr	6.82E+02	6.82E+02
Pu-239 (α) $(t_{1/2})$ > 5 yr	8.64E+01	8.64E+01
Pu-240 (α) $(t_{1/2})$ > 5 yr	8.64E+01	8.64E+01
Pu-241	<1.72E+02	<1.72E+02
Pu-242 (α) $(t_{1/2})$ > 5 yr	<1.68E+01	<1.68E+01
Am-241 (α) $(t_{1/2})$ > 5 yr	8.82E+00	8.82E+00
Am-242m	<2.73E-02	<2.73E-02
Cm-242 (α)	<2.27E-02	<2.27E-02
Cm-244 (α) $(t_{1/2})$ > 5 yr	2.13E+01	2.13E+01
Cm-245 (α) $(t_{1/2})$ > 5 yr	<1.36E+00	<1.36E+00
Total Transuranic Alpha Emitters with $(t_{1/2})$ > 5 years	<3.89E+02	<3.89E+02