Saltstone Production Facility and Saltstone Disposal Facility
Website Data – First Quarter 2019

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

Permit Condition	Requirement	Estimated Value	Updated Value	Comments
B.5 a)	Cumulative process volume of salt waste disposed to date	Not Applicable	13,400.44 kgal SDU 4, Cells B, D, E, F, H, J, K, L SDU 2, Cells A and B SDU 5, Cells A and B SDU 3, Cell A SDU 6	
b)	Process volume of saltstone grout disposed and vault/disposal unit location (including cell identity) for the reporting period	Not Applicable	753.8 kgal SDU 6	This value was updated based on updated run time data.
c)	Cumulative process volume of saltstone grout disposed-to-date	Not Applicable	22,982.8 kgal SDU 4, Cells B, D, E, F, H, J, K, L SDU 2, Cells A and B SDU 5, Cells A and B SDU 3, Cell A SDU 6	This value was updated based on updated run time data.
d)	Remaining vault/disposal unit volume	Not Applicable	4,917.6 kgal SDU 3, Cells A and B 31,665.2 kgal SDU 6	The remaining vault/disposal unit volume shown for SDU 3 is based on a fill height of 21.5 feet and SDU 6 is based on 41 feet. Currently, due to Saltstone Safety Basis assumptions, the fill height of SDUs 3 and 6 are restricted to less than these heights.
e)	Curies disposed and vault/disposal unit location for the reporting period	6.631 kCi SDU 6	2.630 kCi SDU 6	
f)	Cumulative inventory of curies disposed-to-date	479.3 kCi SDU 4, Cells B, D, E, F, H, J, K, L SDU 2, Cells A and B SDU 5, Cells A and B SDU 3, Cell A SDU 6	475.3 kCi SDU 4, Cells B, D, E, F, H, J, K, L SDU 2, Cells A and B SDU 5, Cells A and B SDU 3, Cell A SDU 6	
g)	Curies of highly radioactive radionuclides disposed and vault/disposal unit location for the reporting period	6.572 kCi SDU 6	2.573 kCi SDU 6	
h)	Cumulative inventory of highly radioactive radionuclides disposed-to-date	479.0 kCi SDU 4, Cells B, D, E, F, H, J, K, L SDU 2, Cells A and B SDU 5, Cells A and B SDU 3, Cell A SDU 6	475.0 kCi SDU 4, Cells B, D, E, F, H, J, K, L SDU 2, Cells A and B SDU 5, Cells A and B SDU 3, Cell A SDU 6	

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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]	9.04E+05	9.02E+05
Solvated Ions		
Aluminate [$Al(OH)_4$]	2.03E+04	1.68E+04
Carbonate [CO_3^{2-}]	1.56E+04	1.44E+04
Chloride [Cl^-]	5.83E+02	4.72E+02
Fluoride [F^-]	9.73E+01	1.00E+02
Hydroxide [OH^-]	3.92E+04	3.19E+04
Nitrate [NO_3^-]	1.04E+05	1.13E+05
Nitrite [NO_2^-]	2.81E+04	2.25E+04
Sulfate [SO_4^{2-}]	4.27E+03	3.84E+03
RCRA Hazardous Metals		
Arsenic [As]	2.35E-01	1.96E-01
Barium [Ba]	9.88E-01	7.00E+00
Cadmium [Cd]	1.03E+00	1.48E+00
Chromium [Cr]	5.05E+01	4.90E+01
Lead [Pb]	1.16E+01	3.83E-01
Mercury [Hg]	9.20E+01	5.98E+01
Selenium [Se]	2.63E-01	1.96E-01
Silver [Ag]	1.14E-00	2.12E+00
Other Metals		
Aluminum [Al]	5.77E+03	4.78E+03
Boron [B]	4.95E+01	4.49E+01
Cobalt [Co]	3.99E-02	2.94E-02
Copper [Cu]	3.36E+00	8.12E-01
Iron [Fe]	5.65E+00	2.86E+01
Lithium [Li]	8.88E+00	9.61E+00
Manganese [Mn]	6.74E-01	3.28E+00
Molybdenum [Mo]	1.80E+01	2.21E+01
Nickel [Ni]	4.90E+00	4.11E+00
Sodium [Na]	5.67 M	5.38 M
Strontium [Sr]	1.32E-01	4.07E-01
Zinc [Zn]	6.61E+00	1.26E+01
Organic Compounds		
Tetraphenylborate [$B(C_6H_5)^{4-}$]	5.21E+00	5.00E+00
Total Organic Carbon	3.02E+02	1.96E+02
Total Insoluble Solids		
Total Insoluble Solids	1.81E+03	0.00E+00

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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	1.67E+03	1.16E+03
C-14	1.33E+03	3.47E+02
Ni-59	4.72E-01	1.42E-01
Co-60	3.49E+00	1.42E-01
Ni-63	2.36E+01	7.12E+00
Se-79	2.77E+01	2.15E+01
Sr-90	2.25E+05	2.91E+04
Y-90	2.21E+05	2.91E+04
Tc-99	4.19E+04	4.29E+04
Rh-106	5.61E+01	1.68E+00
Ru-106	5.84E+01	1.68E+00
Sb-125	1.35E+02	7.24E+00
Te-125m	1.34E+02	7.24E+00
I-129	2.81E+01	2.75E+01
Cs-134	6.57E-02	6.57E-02
Cs-137	1.61E+06	6.68E+05
Ba-137m	1.52E+06	6.32E+05
Ce-144	2.37E-04	2.37E-04
Pr-144	2.37E-04	2.37E-04
Pm-147	8.47E+01	3.52E+01
Eu-154	1.11E+01	4.43E-01
Np-237 (α) $(t_{1/2}) > 5$ yr	4.94E+00	1.38E+01
Pu-238 (α) $(t_{1/2}) > 5$ yr	2.28E+04	2.49E+04
Pu-239 (α) $(t_{1/2}) > 5$ yr	6.59E+02	6.44E+02
Pu-240 (α) $(t_{1/2}) > 5$ yr	4.13E+02	6.44E+02
Pu-241	7.11E+03	7.94E+03
Pu-242 (α) $(t_{1/2}) > 5$ yr	1.43E+01	7.94E+01
Am-241 (α) $(t_{1/2}) > 5$ yr	9.25E+00	3.05E+00
Am-242m	3.13E-02	1.20E-02
Cm-242 (α)	1.82E+00	9.95E-03
Cm-244 (α) $(t_{1/2}) > 5$ yr	6.66E+00	1.70E+01
Cm-245 (α) $(t_{1/2}) > 5$ yr	4.58E+00	3.10E-01
Total Transuranic Alpha Emitters with $(t_{1/2}) > 5$ years	2.17E+04	2.14E+04

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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 (cement, thermally beneficiated flyash, and 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 %
Cement	10
Thermally Beneficiated Flyash	45
Slag	45

Water to Premix Ratio (by weight) – 0.632
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

Component	Weight %
Salt Waste	45.1
Cement	5.49
Slag	24.7
Thermally Beneficiated Flyash	24.7

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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]	5.71E+05	5.70E+05
Cement	9.51E+04	9.50E+04
Thermally Beneficiated Flyash	4.28E+05	4.28E+05
Slag	4.28E+05	4.28E+05
Solvated Ions		
Aluminate [$Al(OH)_4$]	1.28E+42	1.06E+04
Carbonate [CO_3^{2-}]	9.85E+03	9.10E+03
Chloride [Cl^-]	3.68E+02	2.98E+02
Fluoride [F^-]	6.14E+01	6.32E+01
Hydroxide [OH^-]	2.48E+04	2.02E+04
Nitrate [NO_3^-]	6.57E+04	7.14E+04
Nitrite [NO_2^-]	1.77E+04	1.42E+04
Sulfate [SO_4^{2-}]	2.70E+03	2.43E+03
RCRA Hazardous Metals		
Arsenic [As]	1.48E-01	1.24E-01
Barium [Ba]	6.24E-01	4.42E+00
Cadmium [Cd]	6.50E-01	9.35E-01
Chromium [Cr]	3.19E+01	3.10E+01
Lead [Pb]	7.33E+00	2.42E-01
Mercury [Hg]	5.81E+01	3.78E+01
Selenium [Se]	1.66E-01	1.24E-01
Silver [Ag]	7.20E-01	1.34E+00
Other Metals		
Aluminum [Al]	3.64E+01	3.02E+03
Boron [B]	3.13E-02	2.84E+01
Cobalt [Co]	2.52E+00	1.86E-02
Copper [Cu]	2.12E+00	5.13E-01
Iron [Fe]	3.57E+00	1.81E+01
Lithium [Li]	5.61E+00	6.07E+00
Manganese [Mn]	4.26E-01	2.07E+00
Molybdenum [Mo]	1.14E+01	1.40E+01
Nickel [Ni]	3.09E+00	2.60E+00
Sodium [Na]	8.23E+04	7.82E+04
Strontium [Sr]	8.34E-02	2.57E-01
Zinc [Zn]	4.17E+00	7.96E+00
Organic Compounds		
Tetraphenylborate [$B(C_6H_5)^{4-}$]	3.29E+00	3.16E+00
Total Organic Carbon	1.91E+02	1.21E+02
Total Insoluble Solids		
Total Insoluble Solids	0.00E+00	0.00E+00

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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	1.05E+03	7.33E+02
C-14	8.40E+02	2.19E+02
Ni-59	2.98E-01	9.00E-02
Co-60	2.20E+00	8.97E-02
Ni-63	1.49E+01	4.50E+00
Se-79	1.75E+01	1.36E+01
Sr-90	1.42E+05	1.84E+04
Y-90	1.40E+05	1.84E+04
Tc-99	2.65E+04	2.71E+04
Rh-106	3.54E+01	1.06E+00
Ru-106	3.69E+01	1.06E+00
Sb-125	8.53E+01	4.58E+00
Te-125m	8.46E+01	4.58E+00
I-129	1.77E+01	1.74E+01
Cs-134	4.15E-02	4.15E-02
Cs-137	1.02E+06	4.22E+05
Ba-137m	9.62E+05	3.99E+05
Ce-144	1.49E-04	1.50E-04
Pr-144	1.49E-04	1.50E-04
Pm-147	5.35E+01	2.22E+01
Eu-154	7.01E+00	2.80E-01
Np-237 (α) $(t_{1/2}) > 5$ yr	3.12E+00	8.72E+00
Pu-238 (α) $(t_{1/2}) > 5$ yr	1.44E+04	1.57E+04
Pu-239 (α) $(t_{1/2}) > 5$ yr	4.16E+02	4.07E+02
Pu-240 (α) $(t_{1/2}) > 5$ yr	2.61E+02	4.07E+02
Pu-241	4.49E+03	5.02E+03
Pu-242 (α) $(t_{1/2}) > 5$ yr	1.98E+01	4.73E+01
Am-241 (α) $(t_{1/2}) > 5$ yr	5.84E+00	1.93E+00
Am-242m	1.98E-02	7.58E-03
Cm-242 (α)	1.15E+00	6.29E-03
Cm-244 (α) $(t_{1/2}) > 5$ yr	4.21E+00	1.07E+01
Cm-245 (α) $(t_{1/2}) > 5$ yr	2.89E+00	1.96E-01
Total Transuranic Alpha Emitters with $(t_{1/2}) > 5$ years	1.37E+04	1.35E+04