Appendix I Average-, early-, and late-stage HCT chemistry data used in modeling

Averaged Data		base	early	late	base	early	late	base	early	late	base	early	late	base	early	late	base	early	late
Geologic-Geochemical Material Types		Silica Quartz Porphyry			Potassic Quartz Porphyry			Potassic Quartz Porphyry (PAG)			Phyllic Quartz Porphyry			Phyllic Quartz Porphyry (PAG)			Argillic Quartz Porphyry		
HCT tests		HCT 26			HCT 30			HCT 7,29			HCT 15			HCT 14			HCT 2, 17		
pH	su	6.8	6.4	6.9	5.7	6.7	5.5	4.637	5.9	4.1	6.8	6.8	6.4	3.7	4.4	3.2	6.7	7.2	6.7
Alkalinity as $CaCO_3$	mg/L	10	5.5	9	4.3	13	0	4.2	6.6	0	27	56	12	0	0	0	39	36	64
Aluminum	mg/L	0	0.035	0	1.8	0.064	1.6	5.1	0.97	6.8	0	0	0	4	7.7	4.7	0.043	0.033	0.054
Antimony	mg/L	0	0	0	0	0.0016	0	0.0011	0.0014	0	0	0	0	0	0.0023	0	0	0	0
Arsenic	mg/L	0.01	0.004	0.0068	0.0028	0.0039	0	0.014	0.0014	0.048	0.0033	0	0	0.0059	0.0058	0.0053	0.0076	0.013	0.0077
Barium	mg/L	0.012	0.016	0.017	0.011	0.01	0.0093	0.024	0.019	0.026	0	0	0	0.021	0.024	0.029	0.02	0.0069	0.058
Beryllium	mg/L	0	0	0	0.0011	0	0	0.00052	0	0.00065	0	0	0	0	0.00075	0	0	0	0
Bismuth	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0.17	0.15	0.16	0	0	0
Boron	mg/L	0.49	0.36	0.41	0.091	0.19	0	0.034	0.071	0	0.094	0.12	0.063	0.061	0.11	0	0.044	0.078	0.079
Cadmium	mg/L	0	0	0	0.0019	0.0007	0.002	0.034	0.0031	0.075	0.016	0.021	0.021	25	40	27	0.0017	0.0016	0.0025
Calcium	mg/L	3.2	8.9	1.6	9.1	13	6.3	17	21	17	5.8	13	3.2	3.8	12	0.54	13	13	19
Chloride	mg/L	1.3	4.4	0	1.5	5.6	0	1.3	4.9	0	1.4	5.2	0	1.7	6.3	0	1.7	6.6	0
Chromium	mg/L	0	0	0	0	0	0	0	0	0.0038	0	0	0	0.0044	0.0039	0.011	0	0	0
Cobalt	mg/L	0	0	0	0.0066	0	0	0.015	0.018	0.0079	0	0	0	0.04	0.13	0	0	0	0
Copper	mg/L	0	0	0	0	0	0	0.89	0	2.6	0	0	0	61	69	45	0	0.042	0
Fluoride	mg/L	0.79	1.4	0.33	7.1	7	6.5	12	5.6	15	0.66	2.5	0.11	1.2	3.6	0.37	3.3	4.3	2.8
Gallium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Iron	mg/L	0.066	0.27	0.022	0.0098	0.011	0.008	0.28	0.16	0.76	0.0077	0	0.019	10	24	11	0.0069	0.0058	0.018
Lead	mg/L	0	0	0	0	0	0	0.27	0	0.72	0	0	0	0.74	1.1	0.32	0	0	0
Lithium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.058	0
Magnesium	mg/L	0.8	1.7	0.5	1.7	3.6	0.5	2.7	5.8	2.7	1.1	2.9	0.5	1.2	3.6	0.5	2.8	3.3	3.8
Manganese	mg/L	0.034	0.14	0.011	0.56	0.42	0.44	1.1	0.7	2.3	0.14	0.68	0.0083	0.5	1.4	0.21	0.61	0.8	1.3
Mercury	mg/L	0.00014	0.00013	0	0.0001	0.00018	0	0.0001	0.00015	0.000095	0.00011	0.00026	0	0.00016	0.000095	0	0.00011	0.00009	0.00012
Molybdenum	mg/L	0	0	0	0.66	3.2	0	0.0095	0.025	0	0.012	0.022	0	0	0	0	0.063	0.16	0.02
Nickel	mg/L	0	0	0	0.014	0.0068	0.0063	0.034	0.023	0.03	0	0	0	0.05	0.13	0.017	0	0	0
Nitrate	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrite	mg/L	0	0	0	0	0.007	0	0.011	0.019	0	0.014	0.05	0	0	0	0.025	0.035	0.063	0.011
Potassium	mg/L	4.5	16	1.2	9.6	34	1.5	9.1	32	2.4	3.3	6.2	1.1	5.9	20	1.1	3.4	6.1	1.4
Scandium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selenium	mg/L	0.0029	0.0044	0	0	0	0	0.0015	0	0	0	0	0	0.005	0.0077	0.0059	0	0	0
Silver	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	5.9	12	3.4	2.2	8.4	0	1.9	8.2	0.29	4.6	19	0.86	1.4	5.4	0.34	4	17	0.68
Strontium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	17	60	5.4	39	68	20	87	120	110	7.2	32	1.3	280	450	320	11	36	4
Thallium	mg/L	0	0	0	0	0	0	0.00034	0.0006	0.00093	0	0	0	0.0012	0	0	0	0	0
Tin	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Titanium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0063	0
Zinc	mg/L	0.011	0.034	0.007	0.97	0.06	0.67	2.5	0.95	3.2	0.17	0.2	0.27	8.3	11	15	0.044	0.14	0.049

Values not detected at the analytical detection limit (non-detects) were set to zero for modeling.

Appendix I Average-, eary-, and late-stage HCT chemistry data used in modeling

Averaged Data		base	early	late	base	early	late	base	early	late	base	early	late	base	early	late	base	early	late	base	early	late
Geologic-Geochemical Material Types		Biotite Quartz Porphyry			Silica Quartz Aplite Porphyry			Potassic Quartz Aplite Porphyry			Biotite Quartz Aplite Porphyry			Potassic Rhyolite			Potassic Rhyolite (PAG)			Phyllic Rhyolite		
HCT tests		HCT 30			HCT 13, 22			HCT 23			HCT 23			HCT 25			HCT 28			HCT 25		
pH	su	5.7	6.7	5.5	5.5	6.3	5.5	5.8	6.0	5.9	5.8	6.0	5.9	5.6	5.8	5.1	5.2	5.0	5.2	5.6	5.8	5.1
Alkalinity as $CaCO_3$	mg/L	4.3	13	0	2.8	8.8	0.88	1.5	5	1.3	1.5	5	1.3	2.4	4	1.3	2.1	3	0.88	2.4	4	1.3
Aluminum	mg/L	1.8	0.064	1.6	4.1	0.63	4.6	1.3	1.6	0.63	1.3	1.6	0.63	1.8	6.3	0.25	0.53	2.1	0	1.8	6.3	0.25
Antimony	mg/L	0	0.0016	0	0	0.002	0	0	0	0	0	0	0	0	0.0013	0.0013	0	0	0	0	0.0013	0.0013
Arsenic	mg/L	0.0028	0.0039	0	0.0023	0.0038	0	0.0089	0.025	0.0032	0.0089	0.025	0.0032	0	0.0025	0.0025	0.0028	0.004	0	0	0.0025	0.0025
Barium	mg/L	0.011	0.01	0.0093	0.012	0.0086	0.022	0.0057	0.0085	0	0.0057	0.0085	0	0	0.005	0.005	0.025	0.048	0.025	0	0.005	0.005
Beryllium	mg/L	0.0011	0	0	0	0	0	0.00065	0.00078	0	0.00065	0.00078	0	0.0012	0.0033	0.0005	0.00065	0.0014	0	0.0012	0.0033	0.0005
Bismuth	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0	0	0	0.05	0.05
Boron	mg/L	0.091	0.19	0	0.028	0.073	0	0	0.07	0	0	0.07	0	0.06	0.098	0.05	0	0.073	0	0.06	0.098	0.05
Cadmium	mg/L	0.0019	0.0007	0.002	0.017	0.0098	0.021	0.002	0.0031	0.0013	0.002	0.0031	0.0013	0.0014	0.003	0.0005	0.031	0.11	0	0.0014	0.003	0.0005
Calcium	mg/L	9.1	13	6.3	11	18	8.3	8.4	21	3.8	8.4	21	3.8	6	12	4.4	16	43	6.4	6	12	4.4
Chloride	mg/L	1.5	5.6	0	1.5	5.7	0	1.2	4.1	0	1.2	4.1	0	0.78	1.9	0.5	1.3	4.4	0	0.78	1.9	0.5
Chromium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0025	0.0025	0.0037	0	0	0	0.0025	0.0025
Cobalt	mg/L	0.0066	0	0	0.019	0.036	0	0.0095	0.022	0	0.0095	0.022	0	0	0.005	0.005	0.11	0.39	0.016	0	0.005	0.005
Copper	mg/L	0	0	0	0.27	0.03	0	0	0.049	0	0	0.049	0	0	0.025	0.025	0.14	0.34	0	0	0.025	0.025
Fluoride	mg/L	7.1	7	6.5	12	4.6	14	4.9	5.2	3.8	4.9	5.2	3.8	8.1	14	6.7	0.72	2.9	0.14	8.1	14	6.7
Gallium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0	0	0	0.05	0.05
Iron	mg/L	0.0098	0.011	0.008	0.083	0.22	0.041	0.066	0.25	0.018	0.066	0.25	0.018	0.019	0.058	0.019	0.097	0.22	0.032	0.019	0.058	0.019
Lead	mg/L	0	0	0	0.013	0	0.029	0	0	0	0	0	0	0	0.005	0.005	0.012	0.02	0	0	0.005	0.005
Lithium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0.085	0	0	0.05	0.05
Magnesium	mg/L	1.7	3.6	0.5	1.3	3.2	0.63	1.3	3.7	0.5	1.3	3.7	0.5	0.48	0.82	0.5	6.4	15	3.3	0.48	0.82	0.5
Manganese	mg/L	0.56	0.42	0.44	0.44	0.81	0.22	0.72	1.4	0.42	0.72	1.4	0.42	4.3	7.1	3.8	51	45	35	4.3	7.1	3.8
Mercury	mg/L	0.0001	0.00018	0	0.00011	0.00023	0	0.000067	0.000063	0	0.000067	0.000063	0	0.000071	0.00008	0.00005	0.00016	0.00053	0	7.1E-05	0.00008	0.00005
Molybdenum	mg/L	0.66	3.2	0	0.0062	0.028	0	0	0	0	0	0	0	0	0.005	0.005	0	0	0	0	0.005	0.005
Nickel	mg/L	0.014	0.0068	0.0063	0.027	0.029	0.0065	0.012	0.017	0	0.012	0.017	0	0	0.005	0.005	0.11	0.31	0.018	0	0.005	0.005
Nitrate	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0	0	0	0	0.5	0.5
Nitrite	mg/L	0	0.007	0	0	0	0	0	0.0068	0	0	0.0068	0	0	0.0075	0.005	0	0	0	0	0.0075	0.005
Potassium	mg/L	9.6	34	1.5	2.3	7.5	0.54	4.6	16	0.76	4.6	16	0.76	6	10	2.7	16	71	1.5	6	10	2.7
Scandium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0	0	0	0.05	0.05
Selenium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0025	0.0025	0.011	0.023	0.004	0	0.0025	0.0025
Silver	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0025	0.0025	0.0035	0	0	0	0.0025	0.0025
Sodium	mg/L	2.2	8.4	0	1.5	5.8	0.39	1.4	5.6	0	1.4	5.6	0	2	8.5	0.25	1.8	6.9	0	2	8.5	0.25
Strontium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0.1	0	0	0.05	0.05
Sulfate	mg/L	39	68	20	43	68	27	34	100	8.5	34	100	8.5	30	82	11	250	470	130	30	82	11
Thallium	mg/L	0	0	0	0.00048	0.00073	0.00058	0	0	0	0	0	0	0.0015	0.0019	0.00093	0.0012	0.0035	0	0.0015	0.0019	0.00093
Tin	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0	0	0	0.05	0.05
Titanium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0	0	0	0.05	0.05
Vanadium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.005	0.005	0.0073	0.011	0	0	0.005	0.005
Zinc	mg/L	0.97	0.06	0.87	4.6	3.3	2.7	1.4	2.5	0.71	1.4	2.5	0.71	2.3	4.4	1.5	23	38	13	2.3	4.4	1.5

Values not detected at the analytical detection limit (non-detects) were set to zero for modeling.

Appendix I Average-, early-, and late-stage HCT chemistry data used in modeling

Averaged Data		base	early	late	base	early	late	base	early	late	base	early	late	base	early	late	base	early	late	base	early	late
Geologic-Geochemical Material Types		Biotite Quartz Porphyry			Silica Quartz Aplite Porphyry			Potassic Quartz Aplite Porphyry			Biotite Quartz Aplite Porphyry			Potassic Rhyolite			Potassic Rhyolite (PAG)			Phyllic Rhyolite		
HCT tests		HCT 30			HCT 13, 22			HCT 23			HCT 23			HCT 25			HCT 28			HCT 25		
pH	su	5.7	6.7	5.5	5.5	6.3	5.5	5.8	6.0	5.9	5.8	6.0	5.9	5.6	5.8	5.1	5.2	5.0	5.2	5.6	5.8	5.1
Alkalinity as $CaCO_3$	mg/L	4.3	13	0	2.8	8.8	0.88	1.5	5	1.3	1.5	5	1.3	2.4	4	1.3	2.1	3	0.88	2.4	4	1.3
Aluminum	mg/L	1.8	0.064	1.6	4.1	0.63	4.6	1.3	1.6	0.63	1.3	1.6	0.63	1.8	6.3	0.25	0.53	2.1	0	1.8	6.3	0.25
Antimony	mg/L	0	0.0016	0	0	0.002	0	0	0	0	0	0	0	0	0.0013	0.0013	0	0	0	0	0.0013	0.0013
Arsenic	mg/L	0.0028	0.0039	0	0.0023	0.0038	0	0.0089	0.025	0.0032	0.0089	0.025	0.0032	0	0.0025	0.0025	0.0028	0.004	0	0	0.0025	0.0025
Barium	mg/L	0.011	0.01	0.0093	0.012	0.0086	0.022	0.0057	0.0085	0	0.0057	0.0085	0	0	0.005	0.005	0.025	0.048	0.025	0	0.005	0.005
Beryllium	mg/L	0.0011	0	0	0	0	0	0.00065	0.00078	0	0.00065	0.00078	0	0.0012	0.0033	0.0005	0.00085	0.0014	0	0.0012	0.0033	0.0005
Bismuth	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0	0	0	0.05	0.05
Boron	mg/L	0.091	0.19	0	0.028	0.073	0	0	0.07	0	0	0.07	0	0.06	0.098	0.05	0	0.073	0	0.06	0.098	0.05
Cadmium	mg/L	0.0019	0.0007	0.002	0.017	0.0098	0.021	0.002	0.0031	0.0013	0.002	0.0031	0.0013	0.0014	0.003	0.0005	0.031	0.11	0	0.0014	0.003	0.0005
Calcium	mg/L	9.1	13	6.3	11	18	8.3	8.4	21	3.8	8.4	21	3.8	6	12	4.4	16	43	6.4	6	12	4.4
Chloride	mg/L	1.5	5.6	0	1.5	5.7	0	1.2	4.1	0	1.2	4.1	0	0.78	1.9	0.5	1.3	4.4	0	0.78	1.9	0.5
Chromium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0025	0.0025	0.0037	0	0	0	0.0025	0.0025
Cobalt	mg/L	0.0066	0	0	0.019	0.036	0	0.0095	0.022	0	0.0095	0.022	0	0	0.005	0.005	0.11	0.39	0.018	0	0.005	0.005
Copper	mg/L	0	0	0	0.27	0.03	0	0	0.049	0	0	0.049	0	0	0.025	0.025	0.14	0.34	0	0	0.025	0.025
Fluoride	mg/L	7.1	7	6.5	12	4.6	14	4.9	5.2	3.8	4.9	5.2	3.8	8.1	14	6.7	0.72	2.9	0.14	8.1	14	6.7
Gallium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0	0	0	0.05	0.05
Iron	mg/L	0.0098	0.011	0.008	0.083	0.22	0.041	0.066	0.25	0.018	0.066	0.25	0.018	0.019	0.058	0.019	0.097	0.22	0.032	0.019	0.058	0.019
Lead	mg/L	0	0	0	0.013	0	0.029	0	0	0	0	0	0	0	0.005	0.005	0.012	0.02	0	0	0.005	0.005
Lithium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0.085	0	0	0.05	0.05
Magnesium	mg/L	1.7	3.6	0.5	1.3	3.2	0.63	1.3	3.7	0.5	1.3	3.7	0.5	0.48	0.82	0.5	6.4	15	3.3	0.48	0.82	0.5
Manganese	mg/L	0.56	0.42	0.44	0.44	0.81	0.22	0.72	1.4	0.42	0.72	1.4	0.42	4.3	7.1	3.8	51	45	35	4.3	7.1	3.8
Mercury	mg/L	0.0001	0.00018	0	0.00011	0.00023	0	0.000067	0.000063	0	0.000067	0.000063	0	0.000071	0.00008	0.00005	0.00016	0.00053	0	7.1E-05	0.00008	0.00005
Molybdenum	mg/L	0.66	3.2	0	0.0062	0.028	0	0	0	0	0	0	0	0	0.005	0.005	0	0	0	0	0.005	0.005
Nickel	mg/L	0.014	0.0068	0.0063	0.027	0.029	0.0065	0.012	0.017	0	0.012	0.017	0	0	0.005	0.005	0.11	0.31	0.018	0	0.005	0.005
Nitrate	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0.5	0	0	0	0	0.5	0.5
Nitrite	mg/L	0	0.007	0	0	0	0	0	0.0068	0	0	0.0068	0	0	0.0075	0.005	0	0	0	0	0.0075	0.005
Potassium	mg/L	9.6	34	1.5	2.3	7.5	0.54	4.6	16	0.76	4.6	16	0.76	6	10	2.7	16	71	1.5	6	10	2.7
Scandium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0	0	0	0.05	0.05
Selenium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0025	0.0025	0.011	0.023	0.004	0	0.0025	0.0025
Silver	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0025	0.0025	0.0036	0	0	0	0.0025	0.0025
Sodium	mg/L	2.2	8.4	0	1.5	5.8	0.39	1.4	5.6	0	1.4	5.6	0	2	8.5	0.25	1.6	6.9	0	2	8.5	0.25
Strontium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0.1	0	0	0.05	0.05
Sulfate	mg/L	39	68	20	43	68	27	34	100	8.5	34	100	8.5	30	82	11	250	470	130	30	82	11
Thallium	mg/L	0	0	0	0.00048	0.00073	0.00058	0	0	0	0	0	0	0.0015	0.0019	0.00093	0.0012	0.0035	0	0.0015	0.0019	0.00093
Tin	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0	0	0	0.05	0.05
Titanium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0.05	0	0	0	0	0.05	0.05
Vanadium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.005	0.005	0.0073	0.011	0	0	0.005	0.005
Zinc	mg/L	0.97	0.06	0.87	4.6	3.3	2.7	1.4	2.5	0.71	1.4	2.5	0.71	2.3	4.4	1.5	23	38	13	2.3	4.4	1.5

Values not detected at the analytical detection limit (non-detects) were set to zero for modeling.

Appendix I Average-, early-, and late-stage HCT chemistry data used in modeling

Averaged Data		base	early	late	base	early	late	base	early	late	base	early	late	base	early	late	base	early	late	base	early	late
Geologic-Geochemical Material Types		Argillic Rhyolite			Argillic Rhyolite (PAG)			Silica Vinini			Potassic Vinini			Potassic Vinini (PAG)			Phyllic Vinini			Phyllic Vinini (PAG)		
HCT tests		HCT 1, 8			HCT 3, 4, 27			HCT 12			HCT 5			HCT 6			HCT 19			HCT 24		
pH	su	6.7	7.3	6.4	3.6	3.7	3.2	7.6	7.6	7.6	7.5	7.5	7.3	3.0	4.0	2.5	7.6	7.5	7.6	3.1	4.9	2.5
Alkalinity as $CaCO_3$	mg/L	11	23	3.8	0	0	0	38	46	29	27	31	25	0	0	0	30	39	25	0	0	0
Aluminum	mg/L	0.068	0.037	0.1	27	88	20	0.029	0.038	0	0	0.039	0	3.5	0.17	8.9	0.026	0	0	43	2.5	100
Antimony	mg/L	0	0	0	0	0	0	0.0032	0.0045	0	0.0038	0.0042	0.0024	0.0061	0.0031	0.019	0	0	0	0	0	0
Arsenic	mg/L	0.009	0.012	0.01	0.17	0.44	0.3	0.29	0.35	0.11	0.014	0.012	0.011	0.22	0.034	0.79	0	0	0	0	0	0
Barium	mg/L	0	0	0	0.0078	0.061	0.016	0.0062	0.0063	0.02	0.0096	0.018	0	0.012	0.025	0.0088	0.019	0.018	0.025	0.015	0.0045	0.046
Beryllium	mg/L	0	0	0	0.0083	0.024	0.0033	0	0	0	0	0	0	0.0092	0.016	0.0078	0	0	0	0.031	0.028	0.017
Bismuth	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.023	0.0079	0.014
Boron	mg/L	0.031	0.083	0	0	0	0	0.67	0.56	0.56	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium	mg/L	0.0014	0.0008	0.0029	0.95	1.2	1.6	0	0	0	0.00088	0.0016	0.00065	0.012	0.0056	0.016	0.0016	0.0052	0.53	0.097	0.22	0
Calcium	mg/L	3.9	8	2.7	17	46	8.1	8.6	17	3.5	14	36	9.3	180	200	110	21	59	0	0.031	0.022	0.017
Chloride	mg/L	4.2	22	0	2	7.1	1.5	1.8	8.8	0	1.4	5	0	6.3	30	1.4	1.6	6	10	36	92	16
Chromium	mg/L	0	0	0	0.0067	0	0.0051	0	0	0	0	0	0	0.051	0	0.18	0	0	0	1.6	2.6	0
Cobalt	mg/L	0	0	0	0.1	0.45	0.02	0	0	0	0	0	0	0.069	0.056	0.12	0	0	0	0.016	0	0.05
Copper	mg/L	0	0	0	0.62	1.4	0.89	0	0	0	0	0	0	4.6	2.7	10	0	0	0	0.21	0.14	0.2
Fluoride	mg/L	8.1	4.3	2	6.7	13	4.7	0.8	1.5	0.42	1.1	1.3	0.8	1.3	0.34	3.4	0	0	0	3.6	0.68	2.3
Gallium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.08	0	0.76	0.88	0.54	2.1	2.5	1.6
Iron	mg/L	0.069	0.033	0.048	70	210	65	0.016	0	0.018	0	0.006	0	170	99	560	0	0	0	0	0	0
Lead	mg/L	0	0	0	0.056	0.16	0.023	0	0	0	0	0	0	0.19	0.14	0.7	0.013	0	0.023	62	3.7	280
Lithium	mg/L	0	0	0	0.066	0.68	0	0	0	0	0	0	0	0	0	0	0	0	0	0.083	0.011	0.082
Magnesium	mg/L	1.9	4.4	1.1	8.9	28	2.9	1.5	2.4	1.1	2.9	8	1.2	7.4	20	3.4	3.7	11	1.1	0.19	0.12	0.32
Manganese	mg/L	0.058	0.03	0.065	32	97	16	0.012	0.037	0.043	0.067	0.083	0.0031	4	4.4	2.4	0.069	0.28	0.026	36	44	47
Mercury	mg/L	0.00013	8.4E-05	0.0002	0.000083	0.000093	0.000065	0.00014	0.00037	0	0.0001	0.0001	0.00015	0.00015	0.00021	0.00017	7.7E-05	0.00009	0	4.1	4.9	1.2
Molybdenum	mg/L	0.026	0.062	0	0	0	0	0.0092	0.024	0	0.46	0.13	0.89	0	0.019	0	0	0	0	0.0001	0.00017	0
Nickel	mg/L	0	0	0	0.14	0.58	0.02	0	0.011	0	0	0	0	0.097	0.082	0.15	0	0.014	0	0	0	0
Nitrate	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2	1	1
Nitrite	mg/L	0.039	0.034	0.012	0.027	0.017	0.021	0.0076	0.0065	0	0.054	0.048	0	0	0.051	0	0	0	0	0	0	0
Potassium	mg/L	2.8	6.6	0.94	8.1	26	1.6	3.1	7.4	1.1	5.4	16	1.1	4.1	14	0	4.6	14	1.1	0	0	0
Scandium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	31	0.84
Selenium	mg/L	0	0	0	0.013	0.033	0.0072	0.0046	0.0093	0	0.0037	0.0092	0	0.0033	0	0.0049	0.0052	0.016	0	0	0	0
Silver	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.019	0.049	0.0067
Sodium	mg/L	7.9	37	0.28	3.7	16	0	7.6	14	1.6	3.7	20	0	1	4.3	0.34	7.9	17	4.4	0	0	0
Strontium	mg/L	0	0	0	0.048	0.59	0	0	0	0	0.064	0.13	0	0.095	0.15	0	0.06	0.1	0	8.9	42	0
Sulfate	mg/L	22	72	10	900	2400	1000	9.9	32	1.8	37	160	6.1	1300	990	3300	61	210	17	0.099	0.15	0.14
Thallium	mg/L	0	0	0	0.002	0.0065	0	0	0	0	0	0	0	0.012	0.0068	0.019	0	0	0	1300	640	3600
Tin	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.063	0	0	0	0	0	0
Titanium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium	mg/L	0.003	0.006	0	0.0087	0.063	0	0	0.0068	0	0	0	0	0.0075	0.0095	0.011	0.0079	0.018	0	0.018	0.018	0.021
Zinc	mg/L	0.073	0.02	0.18	79	160	91	0.0065	0.0095	0	0.057	0.081	0.0083	1.4	1	1.8	0.015	0.043	0	4.8	2.6	2.7

Values not detected at the analytical detection limit (non-detects) were set to zero for modeling

Appendix I Average-, early-, and late-stage HCT chemistry data used in modeling

Averaged Data		base	early	late	base	early	late	base	early	late	base	early	late	base	early	late	base	early	late	base	early	late
Geologic-Geochemical Material Types		Argillic Rhyolite			Argillic Rhyolite (PAG)			Silica Vinini			Potassic Vinini			Potassic Vinini (PAG)			Phyllic Vinini			Phyllic Vinini (PAG)		
HCT tests		HCT 1, 8			HCT 3, 4, 27			HCT 12			HCT 5			HCT 6			HCT 19			HCT 24		
pH	su	6.7	7.3	6.4	3.6	3.7	3.2	7.6	7.6	7.6	7.5	7.5	7.3	3.0	4.0	2.5	7.6	7.5	7.6	3.1	4.9	2.5
Alkalinity as $CaCO_3$	mg/L	11	23	3.8	0	0	0	38	48	29	27	31	25	0	0	0	30	39	25	0	0	0
Aluminum	mg/L	0.068	0.037	0.1	27	88	20	0.029	0.038	0	0	0.039	0	3.5	0.17	8.9	0.026	0	0	43	2.5	100
Antimony	mg/L	0	0	0	0	0	0	0.0032	0.0045	0	0.0038	0.0042	0.0024	0.0061	0.0031	0.019	0	0	0	0	0	0
Arsenic	mg/L	0.009	0.012	0.01	0.17	0.44	0.3	0.29	0.35	0.11	0.014	0.012	0.011	0.22	0.034	0.79	0	0	0	0.015	0.0045	0.046
Barium	mg/L	0	0	0	0.0078	0.061	0.016	0.0062	0.0063	0.02	0.0096	0.018	0	0.012	0.025	0.0068	0.019	0.018	0.025	0.031	0.028	0.017
Beryllium	mg/L	0	0	0	0.0063	0.024	0.0033	0	0	0	0	0	0	0.0092	0.016	0.0078	0	0	0	0.023	0.0079	0.014
Bismuth	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boron	mg/L	0.031	0.063	0	0	0	0	0.67	0.56	0.56	0	0	0	0	0	0	0.62	0.45	0.53	0.097	0.22	0
Cadmium	mg/L	0.0014	0.0008	0.0029	0.95	1.2	1.6	0	0	0	0.00068	0.0016	0.00065	0.012	0.0056	0.016	0.0016	0.0052	0	0.031	0.022	0.017
Calcium	mg/L	3.9	8	2.7	17	46	8.1	8.6	17	3.5	14	36	9.3	180	200	110	21	59	10	36	92	16
Chloride	mg/L	4.2	22	0	2	7.1	1.5	1.8	8.8	0	1.4	5	0	6.3	30	1.4	1.6	6	0	1.6	2.6	0
Chromium	mg/L	0	0	0	0.0067	0	0.0051	0	0	0	0	0	0	0.051	0	0.18	0	0	0	0.016	0	0.05
Cobalt	mg/L	0	0	0	0.1	0.45	0.02	0	0	0	0	0	0	0.069	0.056	0.12	0	0	0	0.21	0.14	0.2
Copper	mg/L	0	0	0	0.62	1.4	0.89	0	0	0	0	0	0	4.6	2.7	10	0	0	0	3.6	0.68	2.3
Fluoride	mg/L	6.1	4.3	2	6.7	13	4.7	0.8	1.5	0.42	1.1	1.3	0.8	1.3	0.34	3.4	0.76	0.88	0.54	2.1	2.5	1.6
Gallium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0.08	0	0	0	0	0	0	0
Iron	mg/L	0.069	0.033	0.048	70	210	65	0.016	0	0.018	0	0.006	0	170	99	560	0.013	0	0.023	62	3.7	290
Lead	mg/L	0	0	0	0.056	0.16	0.023	0	0	0	0	0	0	0.19	0.14	0.7	0	0	0	0.083	0.011	0.082
Lithium	mg/L	0	0	0	0.066	0.68	0	0	0	0	0	0	0	0	0	0	0	0	0	0.19	0.12	0.32
Magnesium	mg/L	1.9	4.4	1.1	8.9	28	2.9	1.5	2.4	1.1	2.9	6	1.2	7.4	20	3.4	3.7	11	1.1	36	44	47
Manganese	mg/L	0.058	0.03	0.065	32	97	16	0.012	0.037	0.0043	0.067	0.083	0.0031	4	4.4	2.4	0.069	0.28	0.026	4.1	4.9	1.2
Mercury	mg/L	0.00013	8.4E-05	0.0002	0.000083	0.000093	0.000065	0.00014	0.00037	0	0.0001	0.0001	0.00015	0.00015	0.00021	0.00017	7.7E-05	0.00009	0	0.0001	0.00017	0
Molybdenum	mg/L	0.026	0.062	0	0	0	0	0.0092	0.024	0	0.46	0.13	0.89	0	0.019	0	0	0	0	0	0	0
Nickel	mg/L	0	0	0	0.14	0.56	0.02	0	0.011	0	0	0	0	0.097	0.082	0.15	0	0.014	0	1.2	1	1
Nitrate	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrite	mg/L	0.039	0.034	0.012	0.027	0.017	0.021	0.0076	0.0065	0	0.054	0.048	0	0	0.051	0	0	0	0	0	0	0
Potassium	mg/L	2.8	6.8	0.94	6.1	26	1.6	3.1	7.4	1.1	5.4	16	1.1	4.1	14	0	4.6	14	1.1	11	31	0.84
Scandium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selenium	mg/L	0	0	0	0.013	0.033	0.0072	0.0046	0.0093	0	0.0037	0.0092	0	0.0033	0	0.0049	0.0052	0.015	0	0.019	0.049	0.0067
Silver	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	7.9	37	0.28	3.7	16	0	7.6	14	1.6	3.7	20	0	1	4.3	0.34	7.9	17	4.4	8.9	42	0
Strontium	mg/L	0	0	0	0.048	0.59	0	0	0	0	0.064	0.13	0	0.095	0.15	0	0.06	0.1	0	0.099	0.15	0.14
Sulfate	mg/L	22	72	10	900	2400	1000	9.9	32	3.8	37	160	6.1	1300	990	3300	61	210	17	1300	640	3600
Thallium	mg/L	0	0	0	0.002	0.0065	0	0	0	0	0	0	0	0.012	0.0068	0.019	0	0	0	0	0	0
Tin	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.063	0	0	0	0	0	0
Titanium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium	mg/L	0.003	0.006	0	0.0087	0.063	0	0	0.0068	0	0	0	0	0.0075	0.0095	0.011	0.0079	0.018	0	0.018	0.018	0.021
Zinc	mg/L	0.073	0.02	0.18	79	160	91	0.0065	0.0095	0	0.057	0.081	0.0083	1.4	1	1.8	0.015	0.043	0	4.8	2.6	2.7

Values not detected at the analytical detection limit (non-detects) were set to zero for modeling.

Appendix I Average-, early-, and late-stage HCT chemistry data used in modeling

Averaged Data		base	early	late	base	early	late	base	early	late	base	early	late	base	early	late	base	early	late
Geologic-Geochemical Material Types		Argillic Vinini			Argillic Vinini (PAG)			Biotite Vinini			Biotite Vinini (PAG)			Hornfels Vinini			Hornfels Vinini (PAG)		
HCT tests		HCT 15, 9			HCT 31			HCT 5			HCT 6			HCT 19			HCT 24		
pH	su	5.2	7.5	7.6	3.3	5.9	3	7.5	7.5	7.3	3.0	4.0	2.5	7.6	7.5	7.6	3.1	4.9	2.5
Alkalinity as $CaCO_3$	mg/L	20	45	27	0	0	0	27	31	25	0	0	0	30	39	25	0	0	0
Aluminum	mg/L	0.77	0	0	21	2.8	13	0	0.039	0	3.5	0.17	8.9	0.026	0	0	43	2.5	100
Antimony	mg/L	0	0	0	0.0073	0.031	0	0.0036	0.0042	0.0024	0.0061	0.0031	0.019	0	0	0	0	0	0
Arsenic	mg/L	0.0033	0	0	0.043	0.044	0.0069	0.014	0.012	0.011	0.22	0.034	0.79	0	0	0	0.015	0.0045	0.046
Barium	mg/L	0.014	0.021	0.018	0.015	0.029	0.011	0.0096	0.018	0	0.012	0.025	0.0068	0.019	0.018	0.025	0.031	0.028	0.017
Beryllium	mg/L	0	0	0	0.0022	0	0.00083	0	0	0	0.0092	0.016	0.0078	0	0	0	0.023	0.0079	0.014
Bismuth	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boron	mg/L	0.3	0.48	0.53	0.099	0.24	0	0	0	0	0	0	0	0.62	0.45	0.53	0.097	0.22	0
Cadmium	mg/L	0.011	0.0035	0.00069	0.25	0.32	0.0041	0.00086	0.0016	0.00065	0.012	0.0056	0.016	0.0016	0.0052	0	0.031	0.022	0.017
Calcium	mg/L	45	62	12	15	31	6.4	14	36	9.3	180	200	110	21	59	10	36	92	16
Chloride	mg/L	1.6	7.3	0	0.71	1.6	0	1.4	5	0	6.3	30	1.4	1.6	6	0	1.6	2.6	0
Chromium	mg/L	0.0019	0	0	0.012	0	0.011	0	0	0	0.061	0	0.18	0	0	0	0.016	0	0.05
Cobalt	mg/L	0.079	0	0	0.22	0.17	0.038	0	0	0	0.069	0.056	0.12	0	0	0	0.21	0.14	0.2
Copper	mg/L	0.1	0	0	2.2	0.036	1	0	0	0	4.6	2.7	10	0	0	0	3.6	0.68	2.3
Fluoride	mg/L	0.53	0.89	0.57	3.6	6.9	1.2	1.1	1.3	0.8	1.3	0.34	3.4	0.76	0.88	0.54	2.1	2.5	1.6
Gallium	mg/L	0	0	0	0	0	0	0	0	0	0	0.08	0	0	0	0	0	0	0
Iron	mg/L	28	0.016	0.013	23	0.011	13	0	0.006	0	170	99	560	0.013	0	0.023	62	3.7	280
Lead	mg/L	0.04	0	0	0.019	0	0.022	0	0	0	0.19	0.14	0.7	0	0	0	0.083	0.011	0.082
Lithium	mg/L	0.039	0	0	0.068	0	0	0	0	0	0	0	0	0	0	0	0.19	0.12	0.32
Magnesium	mg/L	14	12	1.3	17	22	15	2.9	8	1.2	7.4	20	3.4	3.7	11	1.1	36	44	47
Manganese	mg/L	68	0.31	0.018	1	0.72	1	0.067	0.083	0.0031	4	4.4	2.4	0.069	0.28	0.026	4.1	4.9	1.2
Mercury	mg/L	0.00012	0.00013	0	9.3E-05	0.00015	0	0.0001	0.0001	0.00015	0.00015	0.00021	0.00017	7.7E-05	0.00009	0	0.0001	0.00017	0
Molybdenum	mg/L	0	0	0.0059	0	0	0	0.46	0.13	0.89	0	0.019	0	0	0	0	0	0	0
Nickel	mg/L	0.14	0.013	0	0.69	0.4	0.13	0	0	0	0.097	0.062	0.15	0	0.014	0	1.2	1	1
Nitrate	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrite	mg/L	0.014	0	0	0.009	0	0	0.054	0.048	0	0	0.051	0	0	0	0	0	0	0
Potassium	mg/L	4	16	1.2	16	53	0.7	5.4	16	1.1	4.1	14	0	4.6	14	1.1	11	31	0.84
Scandium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selenium	mg/L	0.011	0.015	0	0.0047	0.0056	0	0.0037	0.0092	0	0.0033	0	0.0049	0.0052	0.016	0	0.019	0.049	0.0067
Silver	mg/L	0.0041	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	mg/L	5.7	21	4.3	2.3	9.3	0	3.7	20	0	1	4.3	0.34	7.9	17	4.4	8.9	42	0
Strontium	mg/L	0.079	0.11	0	0	0	0	0.064	0.13	0	0.095	0.15	0	0.06	0.1	0	0.099	0.15	0.14
Sulfate	mg/L	480	220	21	630	250	440	37	160	6.1	1300	990	3300	61	210	17	1300	640	3600
Thallium	mg/L	0.0022	0	0	0.0016	0.0022	0	0	0	0	0.012	0.0068	0.019	0	0	0	0	0	0
Tin	mg/L	0	0	0	0	0	0	0	0	0	0	0	0.063	0	0	0	0	0	0
Titanium	mg/L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium	mg/L	0.017	0.022	0	0.0091	0.0085	0.0068	0	0	0	0.0075	0.0095	0.011	0.0079	0.018	0	0.018	0.018	0.021
Zinc	mg/L	26	0.03	0.0079	1.3	0.27	0.2	0.057	0.081	0.0083	1.4	1	1.8	0.015	0.043	0	4.8	2.6	2.7

Values not detected at the analytical detection limit (non-detects) were set to zero for modeling.

Appendix J
Base case and sensitivity pit lake modeling results

Base case and sensitivity modeling results tables

Table J-1 Mt. Hope Project - Pit Lake predicted chemistry
(Base Case Scenario - 1 Pore Volume Pit Wall & 10 Pore Volume Submergence Flushing)
Groundwater: Mix of PDT-1, PDT-2, PDT-3, and 231P Based on Water Balance

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Base Case)	Pit Lake (Time 10 yr) (Base Case)	Pit Lake (Time 20 yr) (Base Case)	Pit Lake (Time 50 yr) (Base Case)	Pit Lake (Time 100 yr) (Base Case)	Pit Lake (Time 150 yr) (Base Case)	Pit Lake (Time 200 yr) (Base Case)
pH, std units	6.5 - 8.5*	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Major Ions								
Alkalinity, as $CaCO_3$	ns	55	55	55	56	57	58	59
Chloride	400*	8.2	8.3	8.4	8.8	9.5	10.1	10.8
Fluoride	4.0 (2.0*)	3.1	3.0	3.0	3.0	3.2	3.4	3.7
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as SO_4^{2-}	500*	134	136	142	155	175	194	214
Calcium	ns	46	46	47	50	54	58	62
Magnesium	150*	7.3	7.4	7.6	8.1	8.9	9.6	10.4
Potassium	ns	4.5	4.6	4.7	5.1	5.7	6.3	6.8
Sodium	ns	26	27	28	30	34	38	42
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0056	0.0057	0.0058	0.0062	0.0067	0.0072	0.0076
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.013	0.012	0.011	0.011	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.053	0.059	0.065
Cadmium	0.005	0.033	0.034	0.037	0.043	0.051	0.059	0.067
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.009	0.009	0.010	0.011	0.013	0.014	0.016
Copper	1.0* (1.3**)	0.015	0.0149	0.016	0.016	0.018	0.018	0.018
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00045	0.00043	0.00045	0.00048	0.00051	0.00052	0.00053
Lithium	ns	0.0042	0.0045	0.0048	0.0057	0.0069	0.0079	0.0090
Manganese	0.10*	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.074	0.078	0.083	0.094	0.11	0.12	0.13
Nickel	0.1	0.023	0.023	0.025	0.028	0.034	0.038	0.043
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.22	0.22	0.22	0.23	0.24	0.26	0.28
Thallium	0.002	0.00055	0.00056	0.00058	0.00063	0.00069	0.00075	0.00083
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.7	2.7	2.9	3.3	3.5	3.5	3.5

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< Analyte concentration result is below typical analytical detection limits. Value shown is the detection limit.
ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0)
pe fixed at 4.5 V; pCO2 fixed at 10^{-3}

Table J-2 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Runoff coefficient, high stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Runoff, high)	Pit Lake (Time 10 yr) (Runoff, high)	Pit Lake (Time 20 yr) (Runoff, high)	Pit Lake (Time 50 yr) (Runoff, high)	Pit Lake (Time 100 yr) (Runoff, high)	Pit Lake (Time 150 yr) (Runoff, high)	Pit Lake (Time 200 yr) (Runoff, high)
pH, std units	6.5 - 8.5*	7.6	7.6	7.6	7.6	7.6	7.6	7.6
Major Ions								
Alkalinity, as $CaCO_3$	ns	45	45	44	44	43	43	43
Chloride	400*	7.4	7.4	7.5	7.8	8.3	8.8	9.3
Fluoride	4.0 (2.0*)	3.1	3.0	2.9	3.0	3.2	3.4	3.7
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	134	137	142	156	175	194	213
Calcium	ns	41	42	42	44	48	51	54
Magnesium	150*	6.8	6.9	7.0	7.5	8.1	8.8	9.5
Potassium	ns	4.5	4.6	4.7	5.1	5.6	6.2	6.7
Sodium	ns	26	27	28	31	34	38	42
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0050	0.0050	0.0051	0.0054	0.0058	0.0061	0.0065
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.013	0.013	0.013	0.012	0.011	0.010	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	0.053	0.060	0.067	0.073
Cadmium	0.005	0.038	0.040	0.043	0.050	0.059	0.068	0.076
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.010	0.010	0.011	0.012	0.014	0.016	0.018
Copper	1.0* (1.3**)	0.0140	0.0135	0.014	0.014	0.016	0.017	0.018
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00042	0.00040	0.00042	0.00044	0.00049	0.00054	0.00058
Lithium	ns	0.0050	0.0052	0.0057	0.0066	0.0079	0.0091	0.0103
Manganese	0.10*	2.02	2.04	2.13	2.22	2.34	2.43	2.54
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.081	0.085	0.091	0.102	0.12	0.13	0.14
Nickel	0.1	0.026	0.027	0.029	0.033	0.039	0.044	0.050
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.20	0.20	0.20	0.20	0.21	0.22	0.24
Thallium	0.002	0.00053	0.00053	0.00055	0.00059	0.00065	0.00071	0.00077
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	3.1	3.2	3.4	3.8	4.5	5.1	5.7

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< Analyte concentration result is below typical analytical detection limits. Value shown is the detection limit.
ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0)
pe fixed at 4.5 V, pCO2 fixed at 10^{-3}

Table J-3 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Runoff Coefficient, low stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Runoff, low)	Pit Lake (Time 10 yr) (Runoff, low)	Pit Lake (Time 20 yr) (Runoff, low)	Pit Lake (Time 50 yr) (Runoff, low)	Pit Lake (Time 100 yr) (Runoff, low)	Pit Lake (Time 150 yr) (Runoff, low)	Pit Lake (Time 200 yr) (Runoff, low)
pH, std units	6.5 - 8.5*	7.8	7.8	7.8	7.8	7.9	7.9	7.9
Major Ions								
Alkalinity, as $CaCO_3$	ns	68	69	70	73	77	81	85
Chloride	400*	9.3	9.4	9.7	10.2	11.2	12.1	13.0
Fluoride	4.0 (2.0*)	3.1	3.0	3.0	3.0	3.2	3.4	3.7
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2}$	500*	133	136	142	155	175	194	214
Calcium	ns	51	52	53	57	62	68	74
Magnesium	150*	7.9	8.1	8.3	8.9	9.9	10.8	11.8
Potassium	ns	4.6	4.6	4.8	5.2	5.8	6.4	7.0
Sodium	ns	26	27	28	30	34	38	42
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0063	0.0064	0.0066	0.0071	0.0078	0.0085	0.0092
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.014	0.013	0.012	0.011	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.053
Cadmium	0.005	0.025	0.026	0.029	0.034	0.040	0.047	0.053
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.007	0.007	0.008	0.009	0.010	0.011	0.013
Copper	1.0* (1.3**)	0.0161	0.0154	0.017	0.016	0.016	0.017	0.018
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00046	0.00043	0.00046	0.00044	0.00044	0.00044	0.00044
Lithium	ns	0.0033	0.0034	0.0038	0.0045	0.0054	0.0063	0.0072
Manganese	0.10*	0.91	0.89	0.88	0.83	0.77	0.72	0.67
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.064	0.068	0.073	0.083	0.10	0.11	0.12
Nickel	0.1	0.018	0.018	0.020	0.022	0.026	0.030	0.034
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.25	0.26	0.26	0.27	0.29	0.32	0.34
Thallium	0.002	0.00059	0.00059	0.00062	0.00066	0.00074	0.00081	0.00089
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.2	2.2	2.3	2.2	2.1	1.9	1.8

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ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4.5 V; pCO2 fixed at 10^{-3}

Table J-4 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Lake evaporation rate, high stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Evap, high)	Pit Lake (Time 10 yr) (Evap, high)	Pit Lake (Time 20 yr) (Evap, high)	Pit Lake (Time 50 yr) (Evap, high)	Pit Lake (Time 100 yr) (Evap, high)	Pit Lake (Time 150 yr) (Evap, high)	Pit Lake (Time 200 yr) (Evap, high)
pH, std units	6.5 - 8.5*	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Major Ions								
Alkalinity, as $CaCO_3$	ns	54	54	53	53	53	53	53
Chloride	400*	8.1	8.1	8.1	8.3	8.7	9.0	9.4
Fluoride	4.0 (2.0*)	3.1	2.9	2.9	2.8	2.9	3.1	3.2
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^2$	500*	132	134	138	147	161	173	186
Calcium	ns	45	45	46	47	49	52	54
Magnesium	150*	7.2	7.2	7.3	7.7	8.1	8.6	9.0
Potassium	ns	4.5	4.5	4.6	4.8	5.2	5.6	6.0
Sodium	ns	26	26	27	29	31	34	36
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0055	0.0055	0.0056	0.0058	0.0061	0.0063	0.0066
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.014	0.013	0.012	0.011	0.011
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	<0.05	0.053	0.057
Cadmium	0.005	0.032	0.033	0.036	0.041	0.047	0.053	0.059
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.009	0.009	0.009	0.010	0.012	0.013	0.014
Copper	1.0* (1.3**)	0.0150	0.0144	0.015	0.015	0.016	0.018	0.018
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00044	0.00041	0.00043	0.00044	0.00048	0.00053	0.00054
Lithium	ns	0.0042	0.0044	0.0047	0.0054	0.0063	0.0071	0.0079
Manganese	0.10*	1.4	1.4	1.5	1.5	1.5	1.6	1.6
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.073	0.076	0.081	0.089	0.10	0.11	0.12
Nickel	0.1	0.022	0.023	0.024	0.027	0.031	0.035	0.038
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.22	0.22	0.22	0.22	0.22	0.23	0.24
Thallium	0.002	0.00054	0.00055	0.00056	0.00059	0.00063	0.00067	0.00072
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.7	2.7	2.8	3.1	3.6	4.0	4.1

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< Analyte concentration result is below typical analytical detection limits. Value shown is the detection limit.
ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4.5 V; pCO2 fixed at 10^{-3}

Table J-5 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Lake evaporation rate, low stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Evap, low)	Pit Lake (Time 10 yr) (Evap, low)	Pit Lake (Time 20 yr) (Evap, low)	Pit Lake (Time 50 yr) (Evap, low)	Pit Lake (Time 100 yr) (Evap, low)	Pit Lake (Time 150 yr) (Evap, low)	Pit Lake (Time 200 yr) (Evap, low)
pH, std units	6.5 - 8.5*	7.7	7.7	7.7	7.7	7.7	7.8	7.8
Major Ions								
Alkalinity, as $CaCO_3$	ns	55	56	56	58	60	62	64
Chloride	400*	8.3	8.4	8.6	9.2	10.1	11.1	12.0
Fluoride	4.0 (2.0*)	3.1	3.0	3.0	3.1	3.4	3.7	4.1
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^2$	500*	135	138	146	162	186	210	234
Calcium	ns	46	47	48	52	57	63	69
Magnesium	150*	7.3	7.5	7.7	8.4	9.4	10.5	11.5
Potassium	ns	4.6	4.7	4.8	5.3	6.0	6.8	7.5
Sodium	ns	26	27	29	32	37	41	46
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0056	0.0057	0.0059	0.0064	0.0071	0.0078	0.0085
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.013	0.012	0.011	0.010	0.009
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.056	0.063	0.071
Cadmium	0.005	0.033	0.035	0.038	0.045	0.054	0.063	0.073
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.009	0.009	0.010	0.011	0.013	0.015	0.018
Copper	1.0* (1.3**)	0.0156	0.0152	0.016	0.017	0.018	0.018	0.019
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00045	0.00044	0.00047	0.00050	0.00051	0.00051	0.00052
Lithium	ns	0.0043	0.0045	0.0049	0.0059	0.0073	0.0085	0.0098
Manganese	0.10*	1.4	1.3	1.4	1.3	1.3	1.2	1.2
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.074	0.079	0.085	0.098	0.11	0.13	0.15
Nickel	0.1	0.023	0.024	0.025	0.029	0.035	0.041	0.047
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.22	0.23	0.23	0.24	0.26	0.29	0.31
Thallium	0.002	0.00056	0.00056	0.00059	0.00065	0.00073	0.00082	0.00090
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.7	2.8	3.0	3.3	3.3	3.2	3.1

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All concentrations are in milligrams per liter, unless otherwise noted.
< Analyte concentration result is below typical analytical detection limits. Value shown is the detection limit.
ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4.5 V; pCO2 fixed at 10^{-3}

Table J-6 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Lake conductance, high stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Lake Cond, high)	Pit Lake (Time 10 yr) (Lake Cond, high)	Pit Lake (Time 20 yr) (Lake Cond, high)	Pit Lake (Time 50 yr) (Lake Cond, high)	Pit Lake (Time 100 yr) (Lake Cond, high)	Pit Lake (Time 150 yr) (Lake Cond, high)	Pit Lake (Time 200 yr) (Lake Cond, high)
pH, std units	6.5 - 8.5*	7.8	7.8	7.8	7.8	7.8	7.8	7.8
Major Ions								
Alkalinity, as $CaCO_3$	ns	62	61	60	60	61	62	63
Chloride	400*	8.6	8.6	8.7	9.1	9.7	10.4	11.1
Fluoride	4.0 (2.0*)	3.0	2.9	2.9	2.9	3.1	3.4	3.7
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^2$	500*	132	135	140	154	173	192	212
Calcium	ns	48	48	49	51	55	59	64
Magnesium	150*	7.6	7.6	7.8	8.3	9.0	9.8	10.6
Potassium	ns	4.5	4.6	4.7	5.1	5.7	6.2	6.8
Sodium	ns	26	26	28	30	34	38	41
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0060	0.0060	0.0061	0.0064	0.0069	0.0074	0.0079
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.014	0.013	0.012	0.011	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.051	0.057	0.062
Cadmium	0.005	0.029	0.031	0.034	0.041	0.049	0.056	0.064
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.008	0.008	0.009	0.010	0.012	0.014	0.016
Copper	1.0* (1.3**)	0.0157	0.0153	0.016	0.017	0.017	0.018	0.018
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00045	0.00043	0.00046	0.00049	0.00049	0.00050	0.00051
Lithium	ns	0.0038	0.0041	0.0045	0.0054	0.0065	0.0076	0.0086
Manganese	0.10*	1.1	1.1	1.2	1.2	1.2	1.2	1.2
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.069	0.074	0.080	0.091	0.11	0.12	0.13
Nickel	0.1	0.020	0.021	0.023	0.027	0.032	0.037	0.041
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.22	0.22	0.22	0.23	0.24	0.26	0.28
Thallium	0.002	0.00056	0.00057	0.00058	0.00063	0.00069	0.00075	0.00082
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.4	2.5	2.7	3.1	3.1	3.1	3.1

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ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0)
pe fixed at 4.5 V; *pCO2 fixed at 10^{-3}*

Table J-7 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Lake conductance, low stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Lake Cond, low)	Pit Lake (Time 10 yr) (Lake Cond, low)	Pit Lake (Time 20 yr) (Lake Cond, low)	Pit Lake (Time 50 yr) (Lake Cond, low)	Pit Lake (Time 100 yr) (Lake Cond, low)	Pit Lake (Time 150 yr) (Lake Cond, low)	Pit Lake (Time 200 yr) (Lake Cond, low)
pH, std units	6.5 - 8.5*	7.6	7.6	7.6	7.6	7.6	7.6	7.6
Major Ions								
Alkalinity, as $CaCO_3$	ns	38	40	40	42	43	44	45
Chloride	400*	7.0	7.2	7.4	7.9	8.6	9.2	9.9
Fluoride	4.0 (2.0*)	3.5	3.2	3.2	3.2	3.3	3.6	3.9
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2}$	500*	138	140	147	160	181	201	221
Calcium	ns	39	40	42	45	49	53	57
Magnesium	150*	6.6	6.7	7.0	7.5	8.4	9.1	9.9
Potassium	ns	4.7	4.7	4.8	5.2	5.8	6.4	7.0
Sodium	ns	27	28	29	32	36	39	43
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0045	0.0047	0.0049	0.0053	0.0058	0.0063	0.0068
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.013	0.013	0.013	0.012	0.011	0.010	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	0.056	0.063	0.069	0.075
Cadmium	0.005	0.042	0.043	0.046	0.052	0.061	0.069	0.078
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.012	0.012	0.012	0.013	0.015	0.017	0.019
Copper	1.0* (1.3**)	0.0136	0.0130	0.014	0.014	0.016	0.017	0.019
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00043	0.00040	0.00042	0.00044	0.00050	0.00056	0.00061
Lithium	ns	0.0055	0.0057	0.0060	0.0069	0.0081	0.0093	0.0104
Manganese	0.10*	2.6	2.6	2.6	2.4	2.4	2.3	2.3
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.086	0.090	0.095	0.106	0.12	0.13	0.15
Nickel	0.1	0.029	0.030	0.031	0.034	0.040	0.045	0.051
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.19	0.20	0.20	0.21	0.23	0.25	0.27
Thallium	0.002	0.00052	0.00053	0.00055	0.00060	0.00067	0.00074	0.00081
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	3.5	3.5	3.6	4.0	4.6	5.2	5.7

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ns – No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0)
pe fixed at 4.5 V; pCO2 fixed at 10^{-3}

Table J-8 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Specific Yield, high stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Sp.Yield, high)	Pit Lake (Time 10 yr) (Sp.Yield, high)	Pit Lake (Time 20 yr) (Sp.Yield, high)	Pit Lake (Time 50 yr) (Sp.Yield, high)	Pit Lake (Time 100 yr) (Sp.Yield, high)	Pit Lake (Time 150 yr) (Sp.Yield, high)	Pit Lake (Time 200 yr) (Sp.Yield, high)
pH, std units	6.5 - 8.5*	7.7	7.7	7.7	7.7	7.7	7.8	7.8
Major Ions								
Alkalinity, as $CaCO_3$	ns	58	58	58	59	60	61	61
Chloride	400*	8.4	8.4	8.6	9.0	9.7	10.4	11.0
Fluoride	4.0 (2.0*)	3.0	2.9	2.9	2.9	3.1	3.4	3.7
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2}$	500*	133	135	141	154	174	194	213
Calcium	ns	47	47	48	51	55	59	63
Magnesium	150*	7.4	7.5	7.7	8.2	9.0	9.8	10.5
Potassium	ns	4.5	4.6	4.7	5.1	5.7	6.2	6.8
Sodium	ns	26	26	28	30	34	38	42
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0058	0.0059	0.0060	0.0063	0.0068	0.0073	0.0078
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.014	0.013	0.012	0.011	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.051	0.057	0.063
Cadmium	0.005	0.031	0.032	0.035	0.041	0.049	0.057	0.065
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.009	0.009	0.009	0.010	0.012	0.014	0.016
Copper	1.0* (1.3**)	0.0154	0.0149	0.016	0.017	0.017	0.018	0.018
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00045	0.00043	0.00045	0.00048	0.00050	0.00051	0.00052
Lithium	ns	0.0040	0.0042	0.0046	0.0054	0.0066	0.0077	0.0088
Manganese	0.10*	1.2	1.2	1.2	1.2	1.3	1.3	1.3
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.071	0.075	0.080	0.091	0.11	0.12	0.13
Nickel	0.1	0.021	0.022	0.023	0.027	0.032	0.037	0.042
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.22	0.22	0.23	0.24	0.25	0.27	0.29
Thallium	0.002	0.00057	0.00057	0.00059	0.00063	0.00069	0.00076	0.00083
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.5	2.6	2.7	3.1	3.2	3.2	3.3

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< Analyte concentration result is below typical analytical detection limits. Value shown is the detection limit
ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4.5 V; pCO2 fixed at 10^{-3}

Table J-9 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Specific Yield, low stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Sp.Yield, low)	Pit Lake (Time 10 yr) (Sp.Yield, low)	Pit Lake (Time 20 yr) (Sp.Yield, low)	Pit Lake (Time 50 yr) (Sp.Yield, low)	Pit Lake (Time 100 yr) (Sp.Yield, low)	Pit Lake (Time 150 yr) (Sp.Yield, low)	Pit Lake (Time 200 yr) (Sp.Yield, low)
pH, std units	6.5 - 8.5*	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Major Ions								
Alkalinity, as $CaCO_3$	ns	53	53	53	55	56	57	58
Chloride	400*	8.1	8.2	8.3	8.7	9.4	10.1	10.8
Fluoride	4.0 (2.0*)	3.1	3.0	3.0	3.0	3.2	3.4	3.7
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^2$	500*	134	137	143	156	175	194	214
Calcium	ns	45	45	46	49	54	58	62
Magnesium	150*	7.2	7.3	7.5	8.0	8.8	9.6	10.4
Potassium	ns	4.5	4.6	4.7	5.1	5.7	6.3	6.8
Sodium	ns	26	27	28	31	34	38	42
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0054	0.0055	0.0057	0.0061	0.0066	0.0071	0.0076
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.013	0.012	0.011	0.011	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.054	0.059	0.065
Cadmium	0.005	0.034	0.035	0.038	0.044	0.052	0.059	0.067
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.009	0.009	0.010	0.011	0.013	0.014	0.016
Copper	1.0* (1.3**)	0.0153	0.0148	0.015	0.016	0.018	0.018	0.018
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00045	0.00043	0.00045	0.00048	0.00051	0.00052	0.00053
Lithium	ns	0.0044	0.0046	0.0050	0.0058	0.0069	0.0080	0.0090
Manganese	0.10*	1.5	1.5	1.5	1.4	1.4	1.4	1.4
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.075	0.079	0.085	0.095	0.11	0.12	0.13
Nickel	0.1	0.023	0.024	0.026	0.029	0.034	0.039	0.043
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.22	0.22	0.22	0.23	0.24	0.26	0.28
Thallium	0.002	0.00055	0.00055	0.00058	0.00062	0.00069	0.00075	0.00082
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.8	2.8	3.0	3.4	3.6	3.6	3.5

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ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0)
pe fixed at 4.5 V; pCO2 fixed at 10^{-3}

Table J-10 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Precipitation rate, high stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Multi-, high)	Pit Lake (Time 10 yr) (Multi-, high)	Pit Lake (Time 20 yr) (Multi-, high)	Pit Lake (Time 50 yr) (Multi-, high)	Pit Lake (Time 100 yr) (Multi-, high)	Pit Lake (Time 150 yr) (Multi-, high)	Pit Lake (Time 200 yr) (Multi-, high)
pH, std units	6.5 - 8.5*	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Major Ions								
Alkalinity, as $CaCO_3$	ns	50	50	49	49	49	49	49
Chloride	400*	7.8	7.8	7.9	8.2	8.6	9.1	9.6
Fluoride	4.0 (2.0*)	3.1	2.9	2.9	2.9	3.1	3.3	3.5
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	133	136	141	153	170	187	204
Calcium	ns	43	44	44	46	49	53	56
Magnesium	150*	7.0	7.1	7.2	7.7	8.3	8.9	9.5
Potassium	ns	4.5	4.5	4.7	5.0	5.5	6.0	6.5
Sodium	ns	26	27	28	30	33	37	40
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0052	0.0053	0.0054	0.0057	0.0060	0.0064	0.0068
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.013	0.012	0.012	0.011	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.055	0.061	0.066
Cadmium	0.005	0.035	0.037	0.039	0.045	0.054	0.061	0.069
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.010	0.010	0.010	0.011	0.013	0.015	0.017
Copper	1.0* (1.3**)	0.0147	0.0141	0.015	0.015	0.017	0.018	0.019
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00043	0.00041	0.00043	0.00045	0.00050	0.00055	0.00058
Lithium	ns	0.0046	0.0048	0.0052	0.0060	0.0072	0.0082	0.0092
Manganese	0.10*	1.7	1.7	1.7	1.8	1.8	1.8	1.9
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.077	0.081	0.086	0.096	0.11	0.12	0.13
Nickel	0.1	0.024	0.025	0.026	0.030	0.035	0.040	0.045
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.21	0.21	0.21	0.21	0.22	0.23	0.25
Thallium	0.002	0.00054	0.00054	0.00056	0.00060	0.00065	0.00071	0.00077
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.9	2.9	3.1	3.5	4.0	4.6	4.8

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< Analyte concentration result is below typical analytical detection limits. Value shown is the detection limit
ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4.5 V; *pCO_2 fixed at 10^{-3}*

Table J-11 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Precipitation rate, low stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Multi-, high)	Pit Lake (Time 10 yr) (Multi-, high)	Pit Lake (Time 20 yr) (Multi-, high)	Pit Lake (Time 50 yr) (Multi-, high)	Pit Lake (Time 100 yr) (Multi-, high)	Pit Lake (Time 150 yr) (Multi-, high)	Pit Lake (Time 200 yr) (Multi-, high)
pH, std units	6.5 - 8.5*	7.8	7.8	7.8	7.8	7.8	7.8	7.8
Major Ions								
Alkalinity, as $CaCO_3$	ns	60	61	62	64	67	70	72
Chloride	400*	8.7	8.8	9.0	9.6	10.5	11.4	12.3
Fluoride	4.0 (2.0*)	3.1	3.0	3.0	3.0	3.3	3.6	3.9
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^2$	500*	134	137	144	158	180	202	224
Calcium	ns	48	49	50	54	59	65	70
Magnesium	150*	7.6	7.7	8.0	8.6	9.6	10.5	11.5
Potassium	ns	4.6	4.6	4.8	5.2	5.9	6.5	7.2
Sodium	ns	26	27	28	31	35	40	44
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0059	0.0060	0.0062	0.0067	0.0074	0.0080	0.0087
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.013	0.013	0.011	0.011	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.050	0.057	0.063
Cadmium	0.005	0.030	0.031	0.034	0.040	0.048	0.056	0.064
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.008	0.009	0.009	0.010	0.012	0.014	0.015
Copper	1.0* (1.3**)	0.0160	0.0154	0.016	0.017	0.017	0.018	0.018
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00046	0.00044	0.00047	0.00048	0.00048	0.00048	0.00048
Lithium	ns	0.0038	0.0041	0.0044	0.0053	0.0065	0.0075	0.0086
Manganese	0.10*	1.1	1.1	1.1	1.1	1.0	1.0	0.93
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.070	0.074	0.080	0.091	0.11	0.12	0.13
Nickel	0.1	0.021	0.021	0.023	0.026	0.031	0.036	0.041
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.23	0.24	0.24	0.25	0.27	0.30	0.32
Thallium	0.002	0.00057	0.00057	0.00060	0.00065	0.00073	0.00081	0.00089
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.5	2.5	2.7	2.8	2.7	2.6	2.5

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ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4.5 V; *pCO2 fixed at 10^{-3}*

Table J-12 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Multi-variable, high stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Multi-, high)	Pit Lake (Time 10 yr) (Multi-, high)	Pit Lake (Time 20 yr) (Multi-, high)	Pit Lake (Time 50 yr) (Multi-, high)	Pit Lake (Time 100 yr) (Multi-, high)	Pit Lake (Time 150 yr) (Multi-, high)	Pit Lake (Time 200 yr) (Multi-, high)
pH, std units	6.5 - 8.5*	7.7	7.7	7.6	7.6	7.6	7.5	7.5
Major Ions								
Alkalinity, as $CaCO_3$	ns	51	49	46	43	39	37	34
Chloride	400*	7.5	7.4	7.2	7.2	7.3	7.3	7.4
Fluoride	4.0 (2.0*)	2.8	2.7	2.7	2.7	2.8	2.9	3.1
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2}$	500*	129	131	135	143	156	167	178
Calcium	ns	43	42	42	42	42	43	44
Magnesium	150*	6.9	6.9	6.8	7.0	7.2	7.5	7.7
Potassium	ns	4.4	4.4	4.5	4.7	5.0	5.3	5.6
Sodium	ns	25	26	26	28	31	33	35
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0053	0.0052	0.0051	0.0051	0.0051	0.0052	0.0052
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.013	0.013	0.013	0.013	0.012	0.011	0.011
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.054	0.058	0.063
Cadmium	0.005	0.034	0.036	0.039	0.045	0.053	0.060	0.066
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.009	0.010	0.010	0.011	0.013	0.014	0.016
Copper	1.0* (1.3**)	0.0141	0.0136	0.014	0.013	0.013	0.013	0.014
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00041	0.00040	0.00040	0.00040	0.00042	0.00043	0.00044
Lithium	ns	0.0045	0.0048	0.0052	0.0060	0.0071	0.0080	0.0089
Manganese	0.10*	1.6	1.7	1.9	2.2	2.7	3.2	3.7
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.075	0.079	0.084	0.093	0.10	0.11	0.12
Nickel	0.1	0.023	0.024	0.026	0.030	0.035	0.039	0.043
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.19	0.18	0.18	0.18	0.18	0.18	0.19
Thallium	0.002	0.00054	0.00053	0.00054	0.00054	0.00057	0.00061	0.00065
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.7	2.9	3.1	3.5	4.0	4.5	4.9

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ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4.5 V; pCO2 fixed at 10^{-3}

Table J-13 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Multi-variable, low stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Multi-, low)	Pit Lake (Time 10 yr) (Multi-, low)	Pit Lake (Time 20 yr) (Multi-, low)	Pit Lake (Time 50 yr) (Multi-, low)	Pit Lake (Time 100 yr) (Multi-, low)	Pit Lake (Time 150 yr) (Multi-, low)	Pit Lake (Time 200 yr) (Multi-, low)
pH, std units	6.5 - 8.5*	7.7	7.7	7.8	7.8	7.9	7.9	7.9
Major Ions								
Alkalinity, as $CaCO_3$	ns	56	59	62	69	77	84	92
Chloride	400*	8.8	9.1	9.6	10.6	12.2	13.8	15.4
Fluoride	4.0 (2.0*)	3.7	3.5	3.5	3.5	3.8	4.2	4.6
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2}$	500*	141	145	154	172	203	232	263
Calcium	ns	48	50	53	59	68	77	86
Magnesium	150*	7.6	7.9	8.4	9.4	10.9	12.4	13.9
Potassium	ns	4.9	4.9	5.1	5.7	6.6	7.6	8.5
Sodium	ns	28	29	30	34	40	46	52
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0057	0.0059	0.0064	0.0072	0.0084	0.0095	0.0106
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.013	0.013	0.012	0.011	0.010	0.009
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.055	0.062	0.069
Cadmium	0.005	0.033	0.034	0.036	0.042	0.051	0.059	0.068
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.010	0.010	0.010	0.011	0.013	0.015	0.017
Copper	1.0* (1.3**)	0.0180	0.0168	0.018	0.017	0.017	0.018	0.018
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00053	0.00049	0.00052	0.00047	0.00046	0.00045	0.00045
Lithium	ns	0.0042	0.0044	0.0047	0.0055	0.0068	0.0080	0.0093
Manganese	0.10*	1.3	1.2	1.1	1.0	0.81	0.71	0.62
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0
Molybdenum	ns	0.075	0.080	0.086	0.098	0.12	0.13	0.15
Nickel	0.1	0.024	0.024	0.025	0.028	0.033	0.038	0.043
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.25	0.26	0.27	0.29	0.34	0.38	0.42
Thallium	0.002	0.00057	0.00059	0.00064	0.00071	0.00083	0.00095	0.00107
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.9	2.8	2.9	2.5	2.2	1.9	1.7

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ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4.5 V; pCO2 fixed at 10^{-3}

Table J-14 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Groundwater inflow rate, high stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (GW Inflow, high)	Pit Lake (Time 10 yr) (GW Inflow, high)	Pit Lake (Time 20 yr) (GW Inflow, high)	Pit Lake (Time 50 yr) (GW Inflow, high)	Pit Lake (Time 100 yr) (GW Inflow, high)	Pit Lake (Time 150 yr) (GW Inflow, high)	Pit Lake (Time 200 yr) (GW Inflow, high)
pH, std units	6.5 - 8.5*	7.9	7.9	7.9	8.0	8.0	8.0	8.0
Major Ions								
Alkalinity, as $CaCO_3$	ns	93	93	94	98	103	107	109
Chloride	400*	11	11	11.3	11.7	12.5	13.1	13.4
Fluoride	4.0 (2.0*)	2.3	2.3	2.3	2.4	2.6	2.7	2.8
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	125	127	131	140	154	164	170
Calcium	ns	59	59	61	64	68	72	74
Magnesium	150*	8.7	8.8	9.0	9.5	10.2	10.8	11.1
Potassium	ns	4.1	4.2	4.3	4.6	5.1	5.4	5.6
Sodium	ns	25	25	26	28	30	32	33
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0073	0.0074	0.0076	0.0081	0.0087	0.0091	0.0094
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.016	0.016	0.015	0.015	0.014	0.013	0.013
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	0.005	0.010	0.010	0.012	0.014	0.018	0.021	0.022
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.003	0.003	0.003	0.004	0.004	0.005	0.005
Copper	1.0* (1.3**)	0.0064	0.0068	0.008	0.009	0.012	0.013	0.013
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00018	0.00019	0.00022	0.00026	0.00032	0.00033	0.00034
Lithium	ns	0.0013	0.0014	0.0015	0.0019	0.0024	0.0028	0.0030
Manganese	0.10*	0.50	0.50	0.49	0.46	0.43	0.41	0.40
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.041	0.043	0.046	0.051	0.059	0.065	0.068
Nickel	0.1	<0.01	<0.01	<0.01	<0.01	0.012	0.013	0.014
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.32	0.32	0.32	0.33	0.35	0.37	0.37
Thallium	0.002	0.00059	0.00060	0.00062	0.00067	0.00074	0.00078	0.00081
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	0.81	0.85	0.93	1.1	1.3	1.2	1.2

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ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4 .5 V; *pCO2 fixed at 10^{-3}*

Table J-15 Mt. Hope Project - Pit Lake predicted chemistry
(Hydrologic Sensitivity Analysis - Groundwater inflow rate, low stage)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (GW Inflow, low)	Pit Lake (Time 10 yr) (GW Inflow, low)	Pit Lake (Time 20 yr) (GW Inflow, low)	Pit Lake (Time 50 yr) (GW Inflow, low)	Pit Lake (Time 100 yr) (GW Inflow, low)	Pit Lake (Time 150 yr) (GW Inflow, low)	Pit Lake (Time 200 yr) (GW Inflow, low)
pH, std units	6.5 - 8.5*	7.5	7.5	7.5	7.5	7.5	7.5	7.4
Major Ions								
Alkalinity, as $CaCO_3$	ns	31	31	31	30	31	30	30
Chloride	400*	6.4	6.5	6.6	6.9	7.5	8.0	8.6
Fluoride	4.0 (2.0*)	3.4	3.3	3.3	3.3	3.5	3.8	4.1
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	138	141	148	164	187	209	231
Calcium	ns	36	37	38	40	43	47	51
Magnesium	150*	6.2	6.3	6.5	7.0	7.8	8.6	9.3
Potassium	ns	4.6	4.7	4.9	5.3	6.0	6.6	7.2
Sodium	ns	27	28	29	32	37	41	45
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0041	0.0042	0.0043	0.0046	0.0051	0.0055	0.0058
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.013	0.013	0.012	0.011	0.010	0.010	0.009
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	0.053	0.055	0.065	0.074	0.082	0.089
Cadmium	0.005	0.046	0.048	0.052	0.060	0.072	0.082	0.092
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.013	0.013	0.014	0.015	0.018	0.020	0.022
Copper	1.0* (1.3**)	0.0118	0.0115	0.012	0.012	0.013	0.014	0.014
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00038	0.00037	0.00039	0.00040	0.00044	0.00049	0.00052
Lithium	ns	0.0060	0.0063	0.0068	0.0080	0.0096	0.0110	0.0124
Manganese	0.10*	3.0	3.1	3.3	3.9	4.6	5.0	5.3
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.091	0.096	0.103	0.117	0.13	0.15	0.16
Nickel	0.1	0.032	0.033	0.035	0.040	0.047	0.054	0.060
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.17	0.18	0.18	0.19	0.20	0.21	0.23
Thallium	0.002	0.00050	0.00051	0.00054	0.00058	0.00065	0.00072	0.00079
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	3.8	3.9	4.1	4.7	5.4	6.2	6.9

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ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4 .5 V; *pCO2 fixed at 10^{-3}*

Table J-16 Mt. Hope Project - Pit Lake predicted chemistry
(Sensitivity Analysis - Pit Wall Runoff/Submergence Chemistry - unscaled data)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Unscaled)	Pit Lake (Time 10 yr) (Unscaled)	Pit Lake (Time 20 yr) (Unscaled)	Pit Lake (Time 50 yr) (Unscaled)	Pit Lake (Time 100 yr) (Unscaled)	Pit Lake (Time 150 yr) (Unscaled)	Pit Lake (Time 200 yr) (Unscaled)
pH, std units	6.5 - 8.5*	7.7	7.7	7.6	7.6	7.6	7.6	7.6
Major Ions								
Alkalinity, as $CaCO_3$	ns	48	48	47	47	46	46	45
Chloride	400*	8.6	8.6	8.8	9.2	9.9	10.6	11
Fluoride	4.0 (2.0*)	4.1	3.9	3.8	3.8	4.1	4.4	4.8
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	164	168	176	194	221	247	273
Calcium	ns	48	49	50	53	57	62	67
Magnesium	150*	8.0	8.1	8.4	9.0	9.9	11	12
Potassium	ns	5.6	5.6	5.8	6.4	7.1	7.8	8.6
Sodium	ns	32	33	35	39	44	49	54
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0057	0.0058	0.0060	0.0064	0.0069	0.0074	0.0079
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.012	0.012	0.011	0.010	0.010	0.009	0.008
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	0.052	0.056	0.059	0.069	0.080	0.089	0.098
Cadmium	0.005	0.050	0.052	0.056	0.066	0.078	0.090	0.10
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.014	0.014	0.015	0.016	0.019	0.022	0.024
Copper	1.0* (1.3**)	0.0182	0.0173	0.018	0.018	0.019	0.019	0.019
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.0006	0.0005	0.0006	0.001	0.001	0.001	0.001
Lithium	ns	0.0064	0.0067	0.0073	0.0086	0.0103	0.0119	0.0135
Manganese	0.10*	1.9	1.9	2.0	2.1	2.2	2.3	2.5
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.10	0.11	0.12	0.13	0.15	0.17	0.19
Nickel	0.1	0.033	0.034	0.037	0.042	0.050	0.057	0.064
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.22	0.23	0.23	0.24	0.25	0.27	0.29
Thallium	0.002	0.00063	0.00064	0.00068	0.00074	0.00081	0.00089	0.00098
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	4.1	4.2	4.4	5.0	5.5	5.8	6.2

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ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4.5 V; *pCO2 fixed at 10^{-3}*

Table J-17 Mt. Hope Project - Pit Lake predicted chemistry
(Sensitivity Analysis - Scaled Pit Wall Runoff/Submergence Chemistry - 1 order of magnitude decrease)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Scaled -10x)	Pit Lake (Time 10 yr) (Scaled -10x)	Pit Lake (Time 20 yr) (Scaled -10x)	Pit Lake (Time 50 yr) (Scaled -10x)	Pit Lake (Time 100 yr) (Scaled -10x)	Pit Lake (Time 150 yr) (Scaled -10x)	Pit Lake (Time 200 yr) (Scaled -10x)
pH, std units	6.5 - 8.5*	7.8	7.8	7.8	7.8	7.9	7.9	7.9
Major Ions								
Alkalinity, as $CaCO_3$	ns	67	67	68	71	77	82	86
Chloride	400*	7.7	7.8	7.9	8.2	8.8	9.4	10.0
Fluoride	4.0 (2.0*)	1.5	1.5	1.5	1.5	1.6	1.8	1.9
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	84	85	87	92	100	108	117
Calcium	ns	42	42	43	45	49	52	56
Magnesium	150*	6.1	6.2	6.3	6.6	7.2	7.7	8.2
Potassium	ns	2.8	2.9	2.9	3.1	3.4	3.6	3.9
Sodium	ns	16	16	16	17	19	20	21
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0053	0.0054	0.0055	0.0059	0.0063	0.0068	0.0072
Arsenic	0.01	0.0016	0.0014	0.0009	0.001	<0.0005	<0.0005	<0.0005
Barium	2	0.011	0.011	0.011	0.012	0.013	0.014	0.015
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	0.005	0.0049	0.0052	0.0056	0.0065	0.0078	0.0090	0.010
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.0014	0.0014	0.0014	0.0016	0.0019	0.0022	0.0024
Copper	1.0* (1.3**)	<0.003	<0.003	<0.003	<0.003	0.0037	0.0045	0.0053
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	<0.0001	<0.0001	<0.0001	<0.0001	0.00010	0.00012	0.00015
Lithium	ns	<0.001	<0.001	<0.001	<0.001	0.0010	0.0012	0.0013
Manganese	0.10*	0.48	0.50	0.53	0.60	0.68	0.61	0.56
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.025	0.026	0.027	0.030	0.033	0.036	0.039
Nickel	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.21	0.21	0.21	0.22	0.23	0.25	0.27
Thallium	0.002	0.00042	0.00042	0.00044	0.00047	0.00051	0.00054	0.00059
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	0.42	0.43	0.46	0.52	0.61	0.70	0.79

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ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4 .5 V; pCO2 fixed at 10^{-3}

Table J-18 Mt. Hope Project - Pit Lake predicted chemistry
(Sensitivity Analysis - Scaled Pit Wall Runoff/Submergence Chemistry - 5 pore volumes submergence flushing)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (5 PVs flushing)	Pit Lake (Time 10 yr) (5 PVs flushing)	Pit Lake (Time 20 yr) (5 PVs flushing)	Pit Lake (Time 50 yr) (5 PVs flushing)	Pit Lake (Time 100 yr) (5 PVs flushing)	Pit Lake (Time 150 yr) (5 PVs flushing)	Pit Lake (Time 200 yr) (5 PVs flushing)
pH, std units	6.5 - 8.5*	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Major Ions								
Alkalinity, as $CaCO_3$	ns	55	55	55	56	57	58	59
Chloride	400*	8.2	8.2	8.4	8.8	9.4	10.1	10.8
Fluoride	4.0 (2.0*)	2.7	2.7	2.7	2.8	3.1	3.3	3.6
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	132	135	141	155	174	193	213
Calcium	ns	45	46	47	49	54	58	62
Magnesium	150*	7.2	7.3	7.5	8.1	8.9	9.6	10.4
Potassium	ns	4.4	4.5	4.6	5.1	5.6	6.2	6.8
Sodium	ns	26	27	28	30	34	38	42
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0056	0.0056	0.0058	0.0061	0.0067	0.0071	0.0076
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.013	0.013	0.012	0.011	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.051	0.057	0.063
Cadmium	0.005	0.032	0.034	0.037	0.043	0.051	0.059	0.067
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.008	0.009	0.009	0.011	0.012	0.014	0.016
Copper	1.0* (1.3**)	0.0141	0.0141	0.015	0.016	0.017	0.018	0.018
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.00041	0.00040	0.00043	0.00047	0.00051	0.00052	0.00052
Lithium	ns	0.0042	0.0045	0.0048	0.0057	0.0069	0.0079	0.0090
Manganese	0.10*	1.3	1.3	1.4	1.4	1.4	1.4	1.4
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.073	0.077	0.082	0.093	0.11	0.12	0.13
Nickel	0.1	0.022	0.023	0.024	0.028	0.033	0.038	0.043
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.22	0.22	0.22	0.23	0.24	0.26	0.28
Thallium	0.002	0.00054	0.00055	0.00057	0.00063	0.00069	0.00075	0.00083
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.6	2.6	2.8	3.2	3.5	3.5	3.5

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< Analyte concentration result is below typical analytical detection limits. Value shown is the detection limit.
ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4.5 V; pCO2 fixed at 10^{-3}

Table J-19 Mt. Hope Project - Pit Lake predicted chemistry
(Sensitivity Analysis - Scaled Pit Wall Runoff/Submergence Chemistry - 20 pore volumes submergence flushing)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (20 PVs flushing)	Pit Lake (Time 10 yr) (20 PVs flushing)	Pit Lake (Time 20 yr) (20 PVs flushing)	Pit Lake (Time 50 yr) (20 PVs flushing)	Pit Lake (Time 100 yr) (20 PVs flushing)	Pit Lake (Time 150 yr) (20 PVs flushing)	Pit Lake (Time 200 yr) (20 PVs flushing)
pH, std units	6.5 - 8.5*	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Major Ions								
Alkalinity, as $CaCO_3$	ns	54	54	54	56	57	58	59
Chloride	400*	8.4	8.4	8.5	8.9	9.5	10.2	10.8
Fluoride	4.0 (2.0*)	3.9	3.6	3.5	3.3	3.4	3.6	3.9
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	137	139	145	157	176	195	215
Calcium	ns	47	47	48	50	54	58	63
Magnesium	150*	7.4	7.5	7.7	8.2	8.9	9.7	10.5
Potassium	ns	4.9	4.9	4.9	5.3	5.8	6.4	7.0
Sodium	ns	27	27	28	31	35	38	42
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0056	0.0057	0.0058	0.0062	0.0067	0.0072	0.0077
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.013	0.012	0.011	0.011	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.057	0.063	0.069
Cadmium	0.005	0.033	0.035	0.037	0.043	0.052	0.059	0.067
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.010	0.010	0.011	0.011	0.013	0.015	0.016
Copper	1.0* (1.3**)	0.0182	0.0164	0.017	0.017	0.018	0.018	0.018
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.0005	0.0005	0.0005	0.001	0.001	0.001	0.001
Lithium	ns	0.0042	0.0045	0.0048	0.0057	0.0069	0.0079	0.0090
Manganese	0.10*	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.074	0.080	0.086	0.097	0.111	0.124	0.138
Nickel	0.1	0.024	0.024	0.026	0.029	0.034	0.039	0.044
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.22	0.22	0.22	0.23	0.24	0.26	0.28
Thallium	0.002	0.00057	0.00058	0.00060	0.00065	0.00070	0.00076	0.00084
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	3.0	2.9	3.1	3.4	3.5	3.5	3.5

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< Analyte concentration result is below typical analytical detection limits. Value shown is the detection limit.
ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4.5 V; *pCO2 fixed at 10^{-3}*

Table J-20 Mt. Hope Project - Pit Lake predicted chemistry
(Sensitivity Analysis - Early time HCT concentration data - weeks 0 - 4)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Early HCT data)	Pit Lake (Time 10 yr) (Early HCT data)	Pit Lake (Time 20 yr) (Early HCT data)	Pit Lake (Time 50 yr) (Early HCT data)	Pit Lake (Time 100 yr) (Early HCT data)	Pit Lake (Time 150 yr) (Early HCT data)	Pit Lake (Time 200 yr) (Early HCT data)
pH, std units	6.5 - 8.5*	7.7	7.6	7.6	7.6	7.6	7.6	7.6
Major Ions								
Alkalinity, as $CaCO_3$	ns	48	47	47	45	44	44	42
Chloride	400*	9.9	10.0	10.2	10.7	12	13	14
Fluoride	4.0 (2.0*)	3.0	2.9	3.0	3.2	3.5	3.9	4.2
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	179	184	192	213	242	270	299
Calcium	ns	51	51	53	56	61	66	71
Magnesium	150*	8.8	8.9	9.2	9.9	10.9	12	13
Potassium	ns	9.0	9.1	9.4	10	12	13	14
Sodium	ns	33	34	35	39	44	49	54
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0059	0.0060	0.0062	0.0066	0.0071	0.0077	0.0082
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.011	0.011	0.011	0.010	0.0090	0.0083	0.0078
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	0.057	0.065	0.073	0.080
Cadmium	0.005	0.041	0.043	0.047	0.055	0.065	0.075	0.085
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.018	0.018	0.019	0.021	0.025	0.028	0.031
Copper	1.0* (1.3**)	0.0063	0.0063	0.0065	0.0067	0.0072	0.0074	0.0075
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.0003	0.00032	0.00033	0.00036	0.00040	0.00042	0.00044
Lithium	ns	0.020	0.021	0.022	0.026	0.032	0.037	0.042
Manganese	0.10*	1.9	2.0	2.1	2.3	2.5	2.7	2.9
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.18	0.19	0.20	0.24	0.28	0.32	0.35
Nickel	0.1	0.029	0.030	0.032	0.037	0.044	0.050	0.056
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.24	0.24	0.25	0.26	0.28	0.30	0.32
Thallium	0.002	0.00066	0.00067	0.00070	0.00077	0.00085	0.00094	0.00103
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	4.2	4.4	4.7	5.4	6.1	6.6	7.2

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< Analyte concentration result is below typical analytical detection limits. Value shown is the detection limit.
ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4 .5 V; pCO2 fixed at 10^{-3}

Table J-21 Mt. Hope Project - Pit Lake predicted chemistry
(Sensitivity Analysis - Late time HCT concentration data - final 10 weeks)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Late HCT data)	Pit Lake (Time 10 yr) (Late HCT data)	Pit Lake (Time 20 yr) (Late HCT data)	Pit Lake (Time 50 yr) (Late HCT data)	Pit Lake (Time 100 yr) (Late HCT data)	Pit Lake (Time 150 yr) (Late HCT data)	Pit Lake (Time 200 yr) (Late HCT data)
pH, std units	6.5 - 8.5*	7.6	7.6	7.6	7.6	7.6	7.6	7.6
Major Ions								
Alkalinity, as $CaCO_3$	ns	46	46	44	44	44	45	44
Chloride	400*	7.7	7.7	7.9	8.2	8.8	9.4	10.0
Fluoride	4.0 (2.0*)	3.0	2.9	2.8	2.8	3.0	3.2	3.4
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	146	150	158	174	198	221	245
Calcium	ns	44	44	45	47	51	55	59
Magnesium	150*	6.7	6.8	7.0	7.4	8.1	8.7	9.4
Potassium	ns	2.9	3.0	3.0	3.2	3.5	3.8	4.1
Sodium	ns	17	17	18	18	20	21	23
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0055	0.0055	0.0057	0.0060	0.0065	0.0070	0.0075
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.013	0.012	0.012	0.011	0.010	0.009	0.009
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	0.005	0.047	0.049	0.053	0.062	0.075	0.086	0.10
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.003	0.003	0.003	0.004	0.004	0.005	0.006
Copper	1.0* (1.3**)	0.0081	0.0072	0.0073	0.0071	0.008	0.008	0.009
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.0003	0.00024	0.00025	0.00024	0.00026	0.00028	0.00031
Lithium	ns	0.0034	0.0036	0.0039	0.0046	0.0055	0.0064	0.0073
Manganese	0.10*	0.79	0.81	0.86	1.0	1.2	1.3	1.5
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.061	0.066	0.070	0.078	0.09	0.09	0.10
Nickel	0.1	0.011	0.011	0.012	0.014	0.017	0.019	0.021
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.21	0.21	0.22	0.22	0.23	0.25	0.27
Thallium	0.002	0.0005	0.0005	0.0005	0.0005	0.0006	0.0006	0.0007
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.3	2.4	2.5	2.9	3.4	3.9	4.4

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ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4.5 V; pCO2 fixed at 10^{-3}

Table J-22 Mt. Hope Project - Pit Lake predicted chemistry
(Sensitivity Analysis - Groundwater chemistry - Average groundwater chemistry)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (Avg GW chemistry)	Pit Lake (Time 10 yr) (Avg GW chemistry)	Pit Lake (Time 20 yr) (Avg GW chemistry)	Pit Lake (Time 50 yr) (Avg GW chemistry)	Pit Lake (Time 100 yr) (Avg GW chemistry)	Pit Lake (Time 150 yr) (Avg GW chemistry)	Pit Lake (Time 200 yr) (Avg GW chemistry)
pH, std units	6.5 - 8.5*	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Major Ions								
Alkalinity, as $CaCO_3$	ns	54	54	54	55	56	57	58
Chloride	400*	8.5	8.6	8.7	9.2	9.9	10.6	11.4
Fluoride	4.0 (2.0*)	3.1	3.0	3.0	3.0	3.2	3.5	3.8
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	135	137	143	157	177	196	216
Calcium	ns	46	46	47	49	53	58	62
Magnesium	150*	7.3	7.4	7.6	8.1	8.9	9.7	10.5
Potassium	ns	4.6	4.6	4.7	5.1	5.7	6.2	6.8
Sodium	ns	27	27	29	31	35	39	43
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0056	0.0056	0.0057	0.0060	0.0065	0.0070	0.0075
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.013	0.012	0.011	0.011	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.053	0.059	0.065
Cadmium	0.005	0.033	0.034	0.037	0.043	0.051	0.059	0.067
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.009	0.009	0.010	0.011	0.013	0.014	0.016
Copper	1.0* (1.3**)	0.0153	0.0147	0.0154	0.0162	0.018	0.018	0.019
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.0004	0.00042	0.00045	0.00047	0.00052	0.00053	0.00054
Lithium	ns	0.0042	0.0045	0.0048	0.0057	0.0069	0.0079	0.0090
Manganese	0.10*	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.074	0.078	0.084	0.095	0.11	0.12	0.13
Nickel	0.1	0.023	0.023	0.025	0.028	0.034	0.038	0.043
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.23	0.24	0.24	0.25	0.28	0.30	0.32
Thallium	0.002	0.0006	0.0006	0.0006	0.0006	0.0007	0.0007	0.0008
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.7	2.7	2.9	3.3	3.6	3.6	3.6

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ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information.
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4 .5 V; pCO2 fixed at 10^{-3}

Table J-23 Mt. Hope Project - Pit Lake predicted chemistry
(Sensitivity Analysis - Groundwater chemistry - High TDS groundwater)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (High TDS GW)	Pit Lake (Time 10 yr) (High TDS GW)	Pit Lake (Time 20 yr) (High TDS GW)	Pit Lake (Time 50 yr) (High TDS GW)	Pit Lake (Time 100 yr) (High TDS GW)	Pit Lake (Time 150 yr) (High TDS GW)	Pit Lake (Time 200 yr) (High TDS GW)
pH, std units	6.5 - 8.5*	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Major Ions								
Alkalinity, as $CaCO_3$	ns	54	54	54	55	56	57	58
Chloride	400*	8.3	8.3	8.5	8.9	9.6	10.4	11.1
Fluoride	4.0 (2.0*)	3.3	3.2	3.2	3.2	3.4	3.7	4.0
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	141	144	150	164	184	204	224
Calcium	ns	51	51	52	55	60	64	69
Magnesium	150*	7.5	7.6	7.8	8.3	9.1	9.9	10.7
Potassium	ns	7.4	7.5	7.6	8.1	8.9	9.7	10.5
Sodium	ns	22	23	24	26	30	33	37
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.010	0.010	0.010	0.011	0.012	0.012	0.013
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.013	0.013	0.012	0.011	0.010	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.053	0.059	0.065
Cadmium	0.005	0.032	0.034	0.037	0.043	0.051	0.059	0.067
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.009	0.009	0.010	0.011	0.013	0.014	0.016
Copper	1.0* (1.3**)	0.0131	0.0126	0.0134	0.0143	0.016	0.017	0.017
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.0004	0.00037	0.00039	0.00042	0.00048	0.00050	0.00050
Lithium	ns	0.0042	0.0045	0.0048	0.0057	0.0069	0.0079	0.0090
Manganese	0.10*	1.4	1.4	1.5	1.5	1.4	1.4	1.4
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	0.0	0.0	0.0
Molybdenum	ns	0.067	0.071	0.077	0.087	0.10	0.11	0.13
Nickel	0.1	0.022	0.023	0.025	0.028	0.033	0.038	0.043
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.12	0.12	0.13	0.13	0.15	0.16	0.17
Thallium	0.002	0.0018	0.0018	0.0018	0.0019	0.0021	0.0022	0.0024
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.6	2.7	2.8	3.2	3.7	3.7	3.7

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< Analyte concentration result is below typical analytical detection limits. Value shown is the detection limit.
ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Fernhydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4 .5 V; pCO2 fixed at 10^{-3}

Table J-24 Mt. Hope Project - Pit Lake predicted chemistry
(Sensitivity Analysis - Atmospheric gas equilibrium - Atmospheric $pCO_2 = 10^{-3.5}$ atm)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (pCO_2 $10^{-3.5}$)	Pit Lake (Time 10 yr) (pCO_2 $10^{-3.5}$)	Pit Lake (Time 20 yr) (pCO_2 $10^{-3.5}$)	Pit Lake (Time 50 yr) (pCO_2 $10^{-3.5}$)	Pit Lake (Time 100 yr) (pCO_2 $10^{-3.5}$)	Pit Lake (Time 150 yr) (pCO_2 $10^{-3.5}$)	Pit Lake (Time 200 yr) (pCO_2 $10^{-3.5}$)
pH, std units	6.5 - 8.5*	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Major Ions								
Alkalinity, as $CaCO_3$	ns	51	52	51	52	53	54	54
Chloride	400*	8.2	8.3	8.4	8.8	9.5	10.1	10.8
Fluoride	4.0 (2.0*)	3.1	3.0	3.0	3.0	3.2	3.4	3.7
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	134	136	142	156	175	194	214
Calcium	ns	46	46	47	50	54	58	62
Magnesium	150*	7.3	7.4	7.6	8.1	8.9	9.6	10.4
Potassium	ns	4.5	4.6	4.7	5.1	5.7	6.3	6.8
Sodium	ns	26	27	28	30	34	38	42
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0056	0.0057	0.0058	0.0062	0.0067	0.0072	0.0078
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.013	0.012	0.011	0.011	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.053	0.059	0.065
Cadmium	0.005	0.032	0.033	0.036	0.042	0.050	0.057	0.065
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.009	0.009	0.010	0.011	0.012	0.014	0.016
Copper	1.0* (1.3**)	0.0180	0.0172	0.0177	0.0172	0.018	0.018	0.019
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.0005	0.00046	0.00047	0.00045	0.00045	0.00046	0.00047
Lithium	ns	0.0042	0.0045	0.0048	0.0057	0.0069	0.0079	0.0090
Manganese	0.10*	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.075	0.079	0.085	0.096	0.11	0.12	0.14
Nickel	0.1	0.022	0.022	0.024	0.027	0.032	0.036	0.041
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.22	0.22	0.22	0.23	0.24	0.26	0.28
Thallium	0.002	0.0006	0.0006	0.0006	0.0006	0.0007	0.0008	0.0008
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	1.5	1.5	1.5	1.5	1.5	1.5	1.5

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All concentrations are in milligrams per liter, unless otherwise noted.
< Analyte concentration result is below typical analytical detection limits. Value shown is the detection limit.
ns = No standard
Exceedences of the Nevada State MCL standards are highlighted for reference.

Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4 .5 V;

Table J-25 Mt. Hope Project - Pit Lake predicted chemistry
(Sensitivity Analysis - Atmospheric gas equilibrium - Oversaturated $pCO_2 = 10^{-2.5}$ atm)

Parameter/ Analyte	Nevada Reference Standards	Pit Lake (Time 5 yr) (pCO_2 $10^{-2.5}$)	Pit Lake (Time 10 yr) (pCO_2 $10^{-2.5}$)	Pit Lake (Time 20 yr) (pCO_2 $10^{-2.5}$)	Pit Lake (Time 50 yr) (pCO_2 $10^{-2.5}$)	Pit Lake (Time 100 yr) (pCO_2 $10^{-2.5}$)	Pit Lake (Time 150 yr) (pCO_2 $10^{-2.5}$)	Pit Lake (Time 200 yr) (pCO_2 $10^{-2.5}$)
pH, std units	6.5 - 8.5*	7.2	7.2	7.2	7.2	7.3	7.3	7.3
Major Ions								
Alkalinity, as $CaCO_3$	ns	57	57	57	59	62	64	65
Chloride	400*	8.2	8.3	8.4	8.8	9.5	10.1	10.8
Fluoride	4.0 (2.0*)	3.1	3.0	3.0	3.0	3.2	3.4	3.7
Nitrate, as N	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phosphorus	ns	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfate, as $SO4^{2-}$	500*	134	136	142	155	175	194	214
Calcium	ns	46	46	47	50	54	58	62
Magnesium	150*	7.3	7.4	7.6	8.1	8.9	9.6	10.4
Potassium	ns	4.5	4.6	4.7	5.1	5.7	6.3	6.8
Sodium	ns	26	27	28	30	34	38	42
Metals/Metaloids								
Aluminum	0.2*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	0.006	0.0056	0.0057	0.0058	0.0062	0.0067	0.0072	0.0076
Arsenic	0.01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Barium	2	0.014	0.014	0.013	0.013	0.012	0.011	0.010
Beryllium	0.004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Bismuth	ns	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	ns	<0.05	<0.05	<0.05	<0.05	0.053	0.059	0.065
Cadmium	0.005	0.033	0.034	0.037	0.043	0.052	0.059	0.067
Chromium	0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	ns	0.009	0.009	0.010	0.011	0.013	0.014	0.016
Copper	1.0* (1.3**)	0.0110	0.0105	0.0110	0.0113	0.013	0.014	0.015
Iron	0.6*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.015**	0.0003	0.00029	0.00031	0.00033	0.00038	0.00043	0.00048
Lithium	ns	0.0042	0.0045	0.0048	0.0057	0.0069	0.0079	0.0090
Manganese	0.10*	2.2	2.3	2.5	2.9	3.4	3.5	3.5
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	ns	0.073	0.077	0.083	0.094	0.11	0.12	0.13
Nickel	0.1	0.023	0.023	0.025	0.029	0.034	0.039	0.044
Selenium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.1*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ns	0.22	0.22	0.22	0.23	0.24	0.26	0.28
Thallium	0.002	0.0006	0.0006	0.0006	0.0006	0.0007	0.0008	0.0008
Vanadium	ns	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	5.0*	2.8	2.8	3.0	3.4	4.0	4.6	5.1

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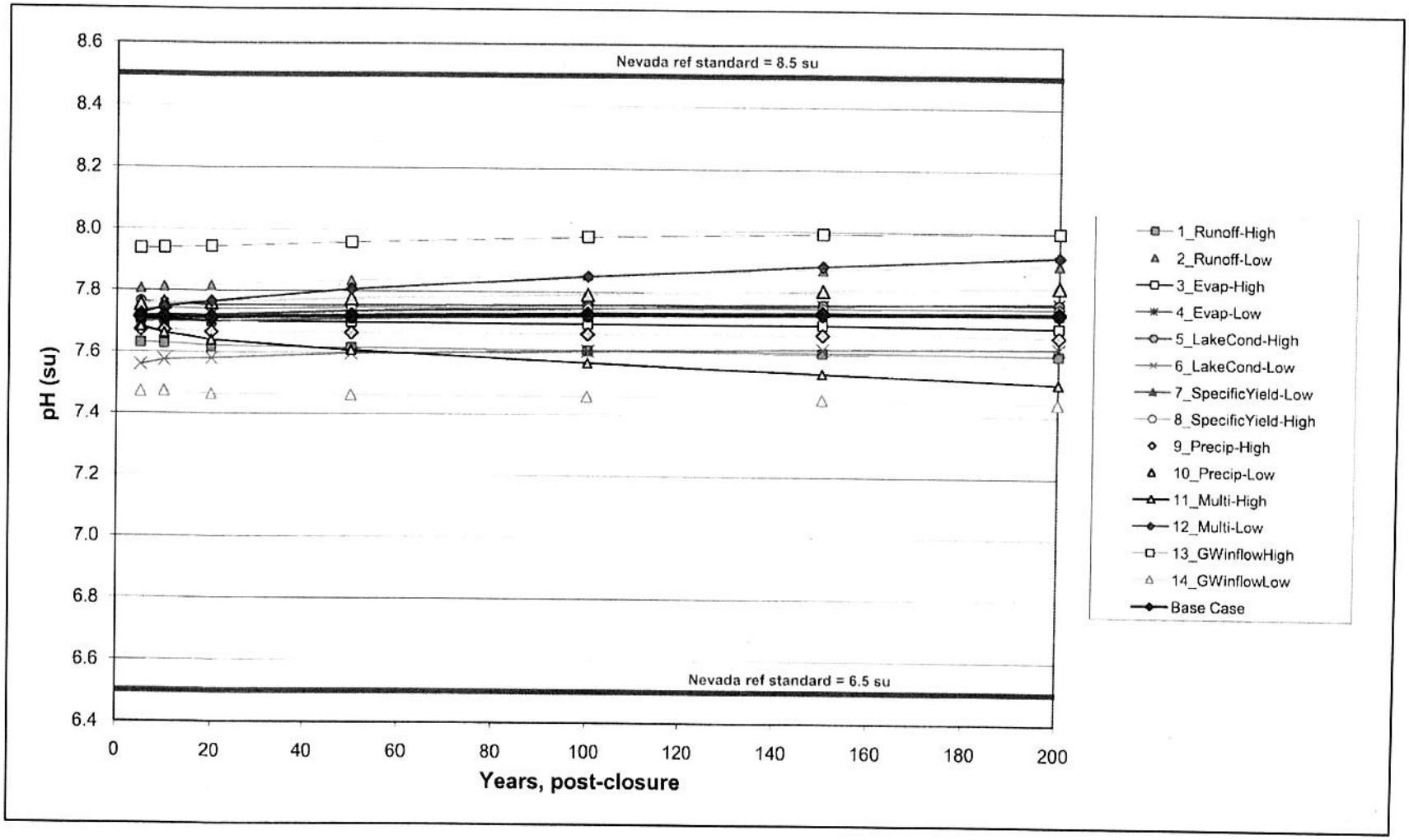
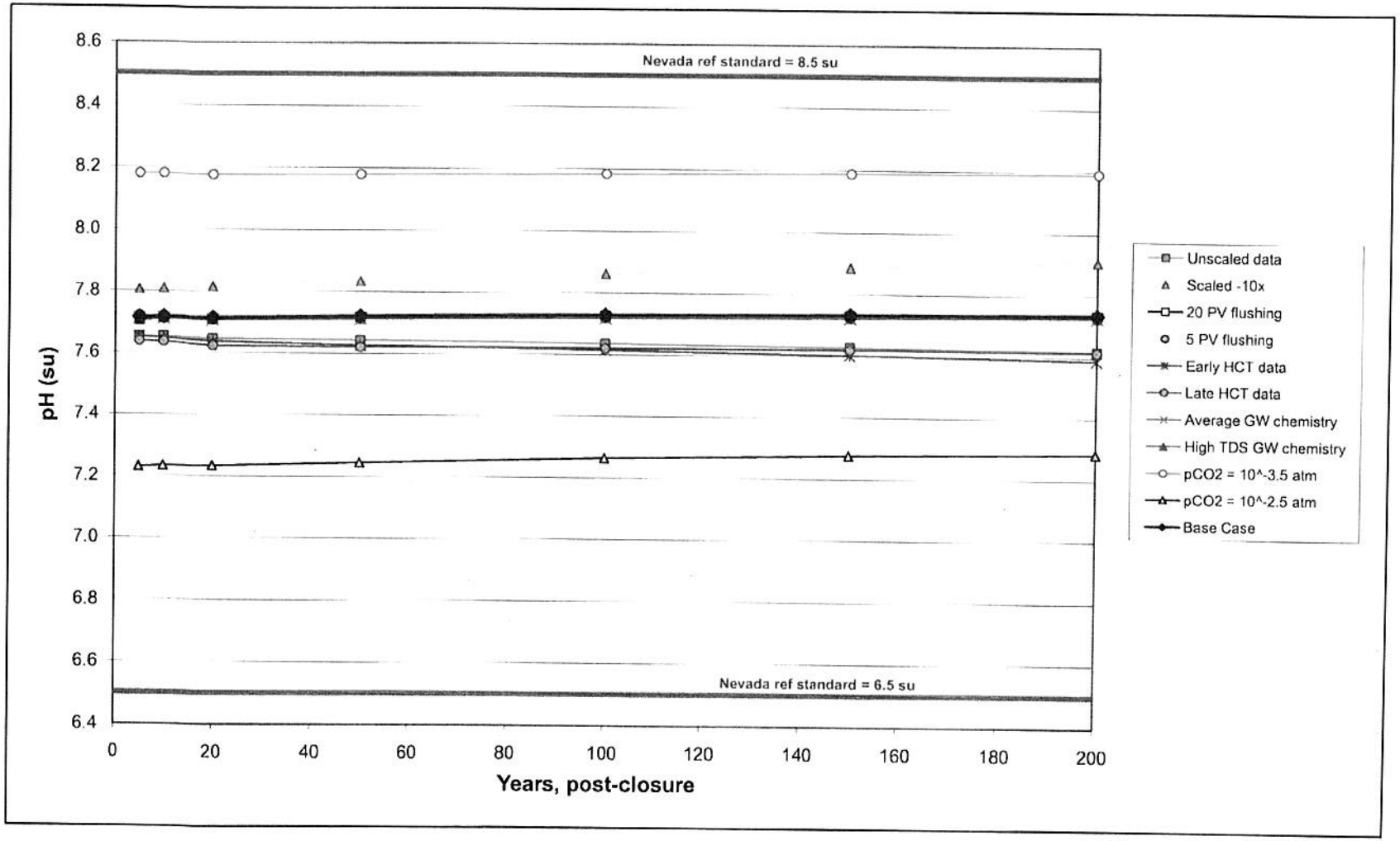
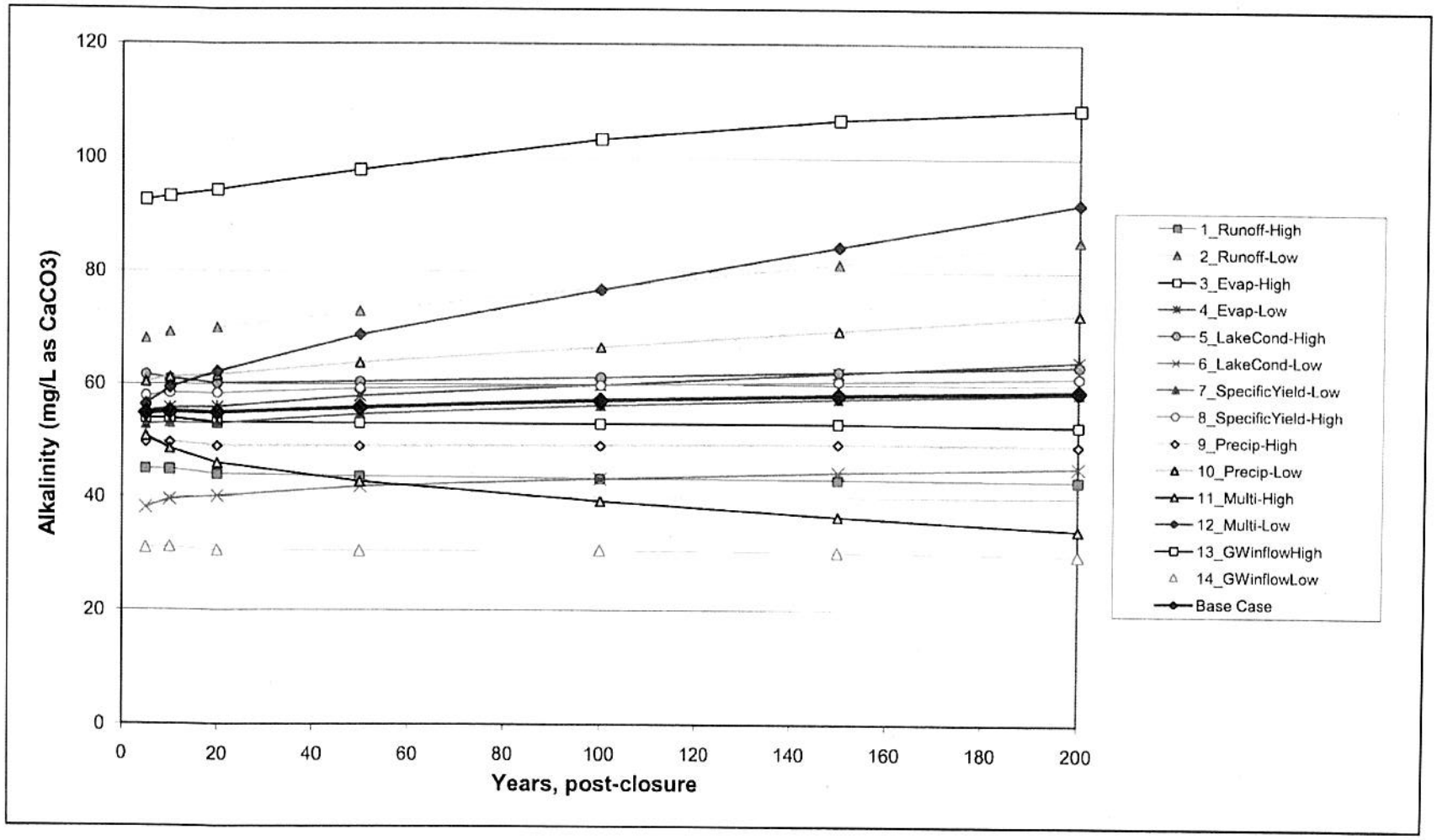
Modeling Information:
Phases: Ferrihydrite (Fe(OH)3), Gypsum (CaSO4), Barite (BaSO4), and Gibbsite (Al(OH)3) allowed to precipitate from the pit lake under equilibrium conditions (SI = 0).
pe fixed at 4.5 V;

Base case and sensitivity modeling results – graphs of selected constituents

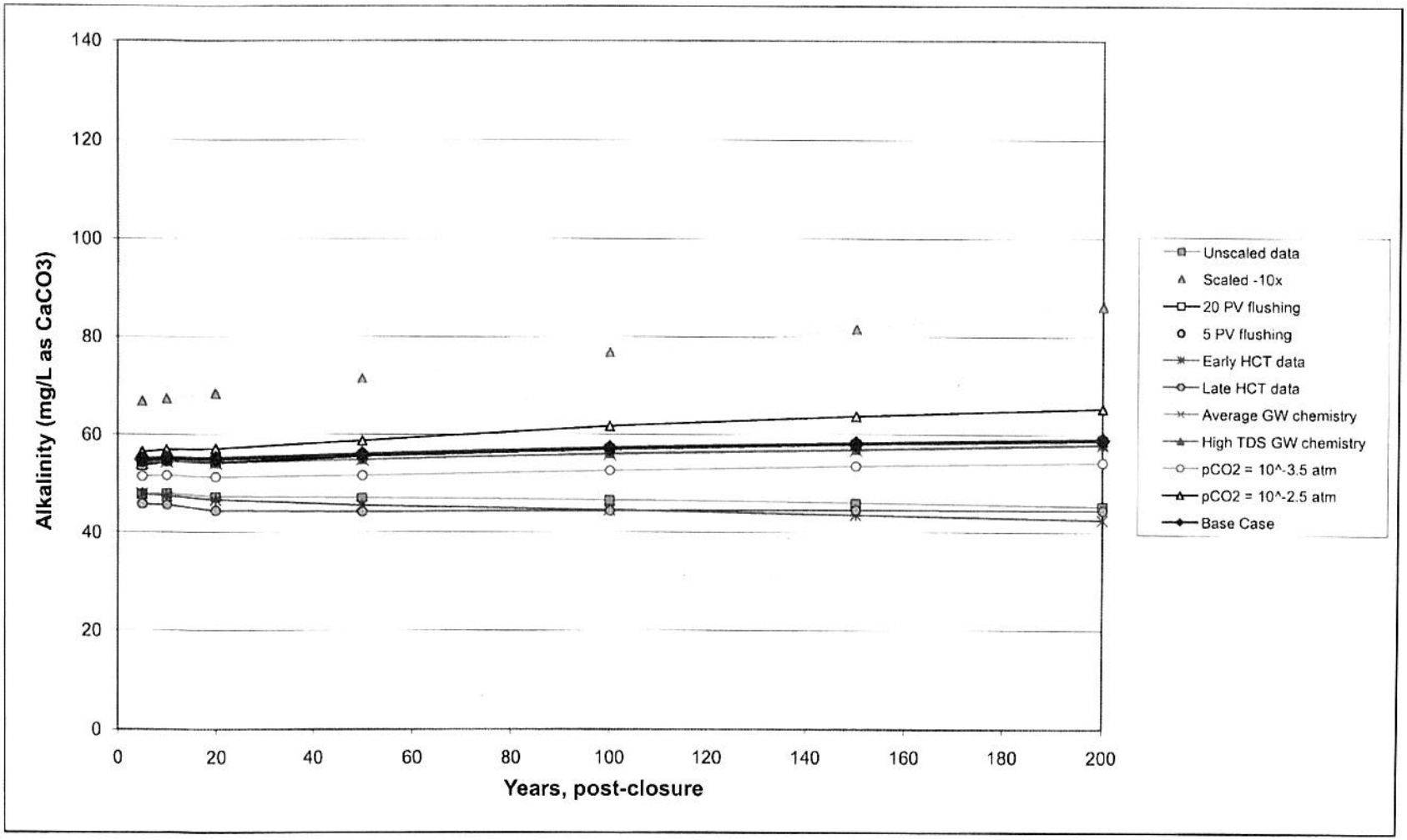

Nevada ref standard = 8.5 su
Nevada ref standard = 6.5 su
pH (su)
8.6
8.4
8.2
8.0
7.8
7.6
7.4
7.2
7.0
6.8
6.6
6.4
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
1_Runoff-High
2_Runoff-Low
3_Evap-High
4_Evap-Low
5_LakeCond-High
6_LakeCond-Low
7_SpecificYield-Low
8_SpecificYield-High
9_Precip-High
10_Precip-Low
11_Multi-High
12_Multi-Low
13_GWinflowHigh
14_GWinflowLow
Base Case

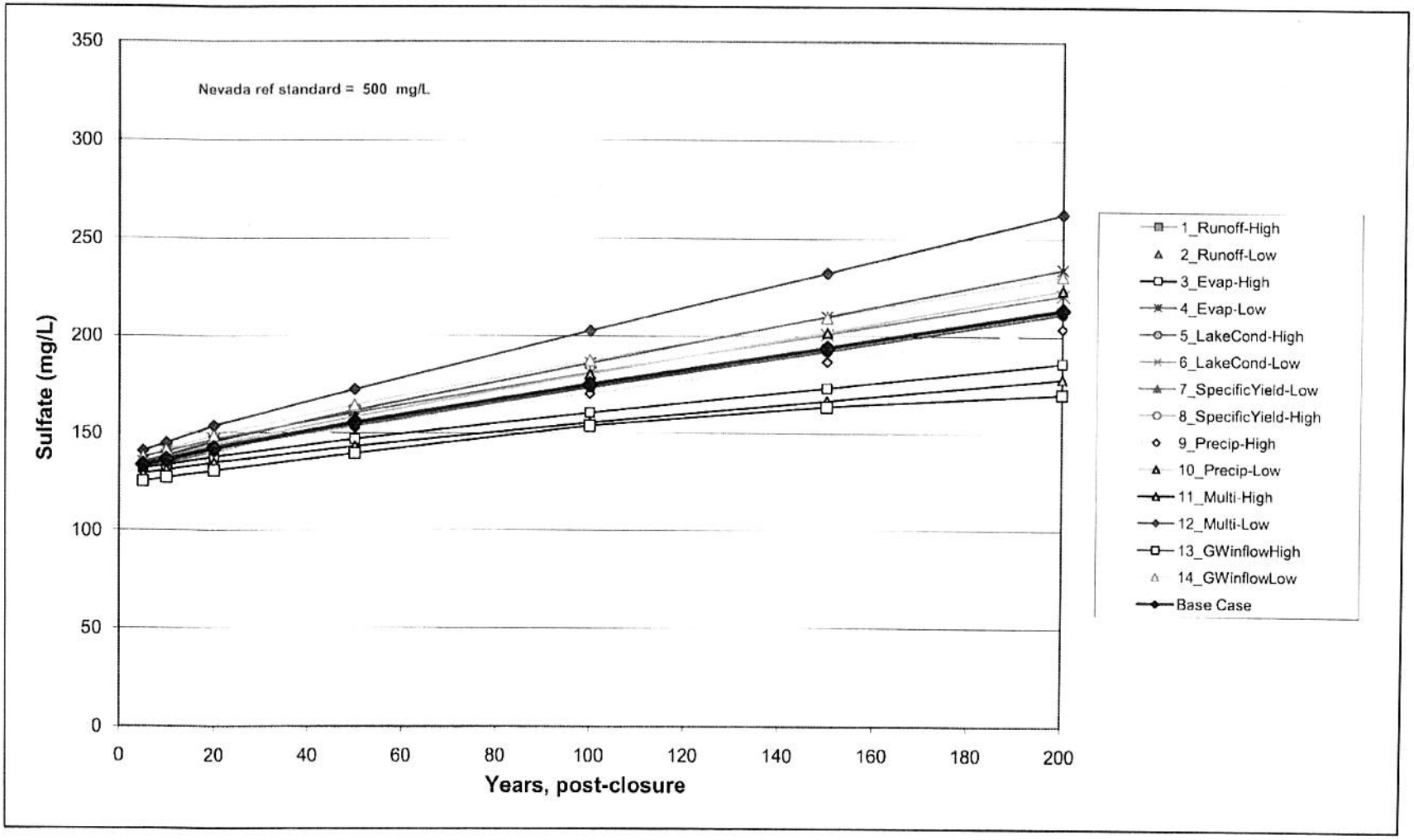
Appendix J.
Geochemical Model Sensitivity Results



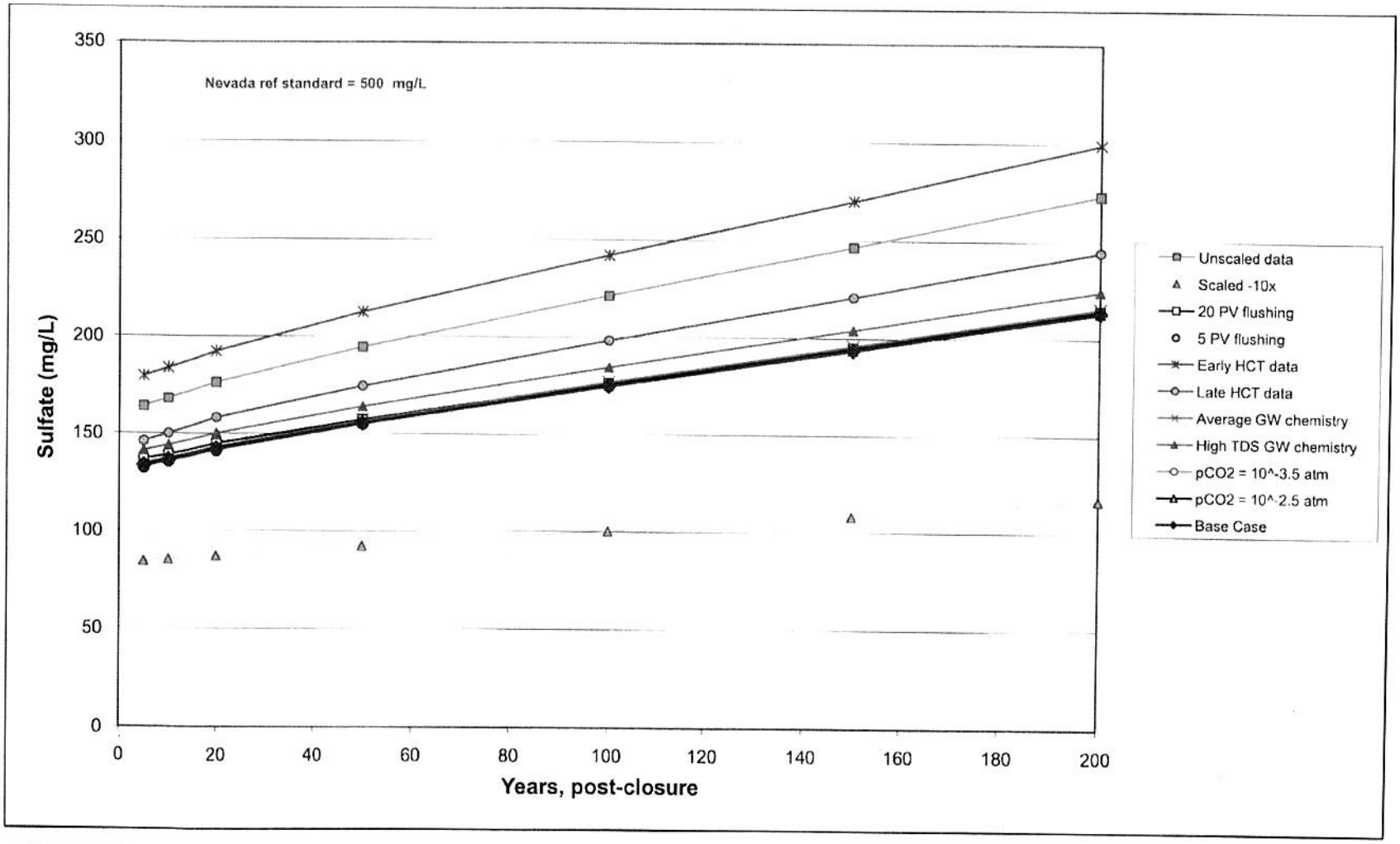

Alkalinity (mg/L as CaCO3)
120
100
80
60
40
20
0
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
1_Runoff-High
2_Runoff-Low
3_Evap-High
4_Evap-Low
5_LakeCond-High
6_LakeCond-Low
7_SpecificYield-Low
8_SpecificYield-High
9_Precip-High
10_Precip-Low
11_Multi-High
12_Multi-Low
13_GWinflowHigh
14_GWinflowLow
Base Case

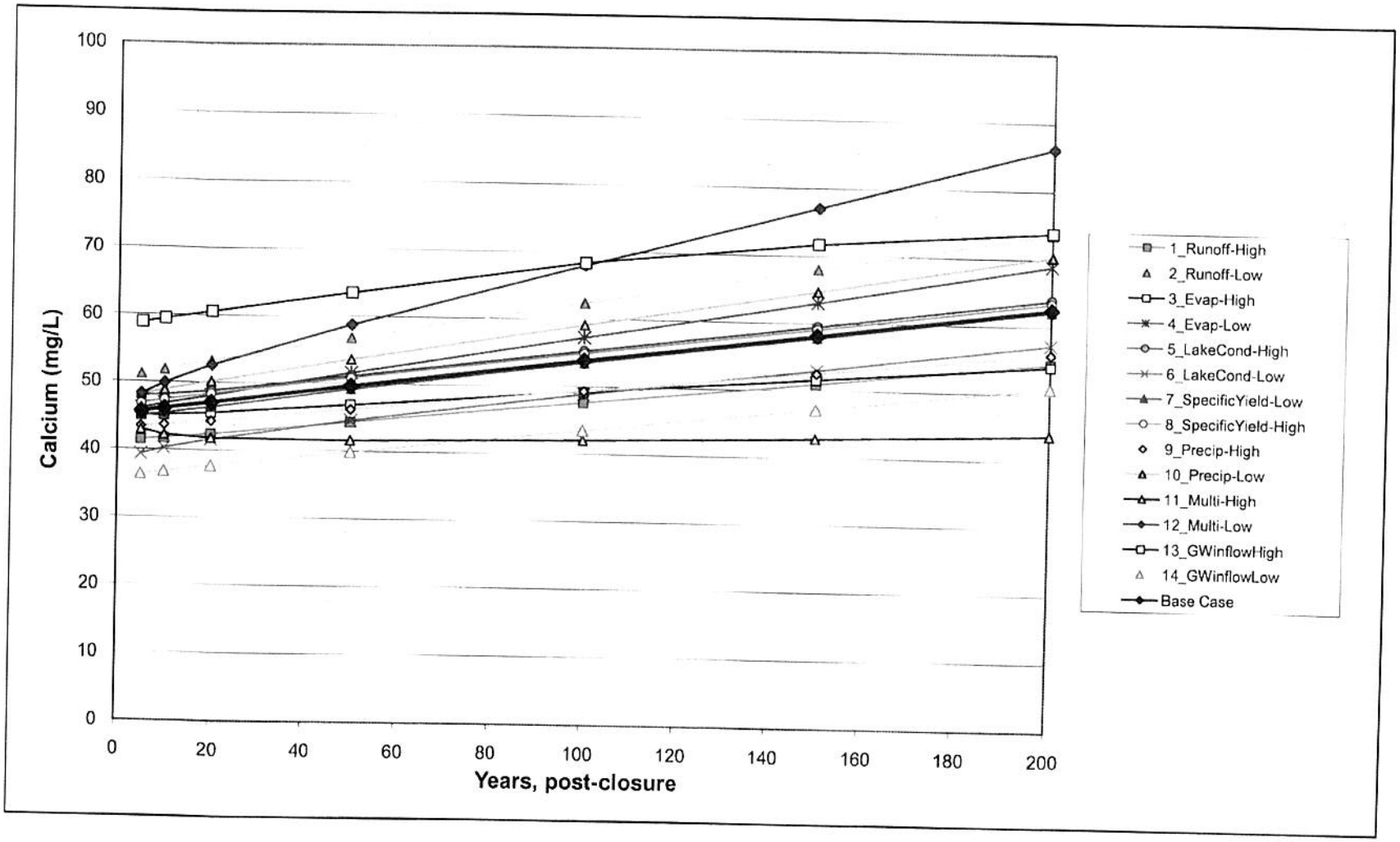
Appendix J.
Geochemical Model Sensitivity Results



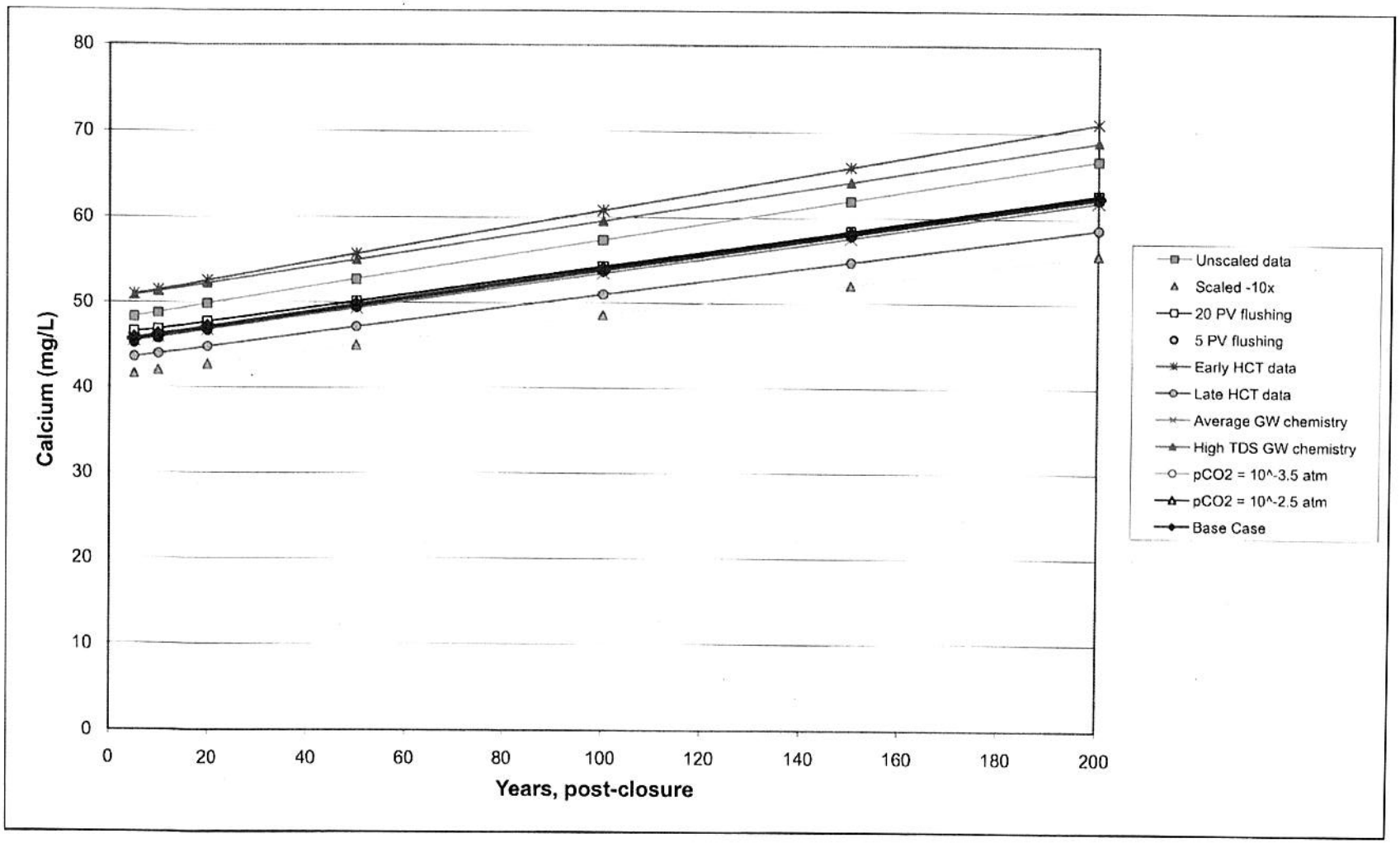

Nevada ref standard = 500 mg/L
Sulfate (mg/L)
350
300
250
200
150
100
50
0
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
1_Runoff-High
2_Runoff-Low
3_Evap-High
4_Evap-Low
5_LakeCond-High
6_LakeCond-Low
7_SpecificYield-Low
8_SpecificYield-High
9_Precip-High
10_Precip-Low
11_Multi-High
12_Multi-Low
13_GWinflowHigh
14_GWinflowLow
Base Case

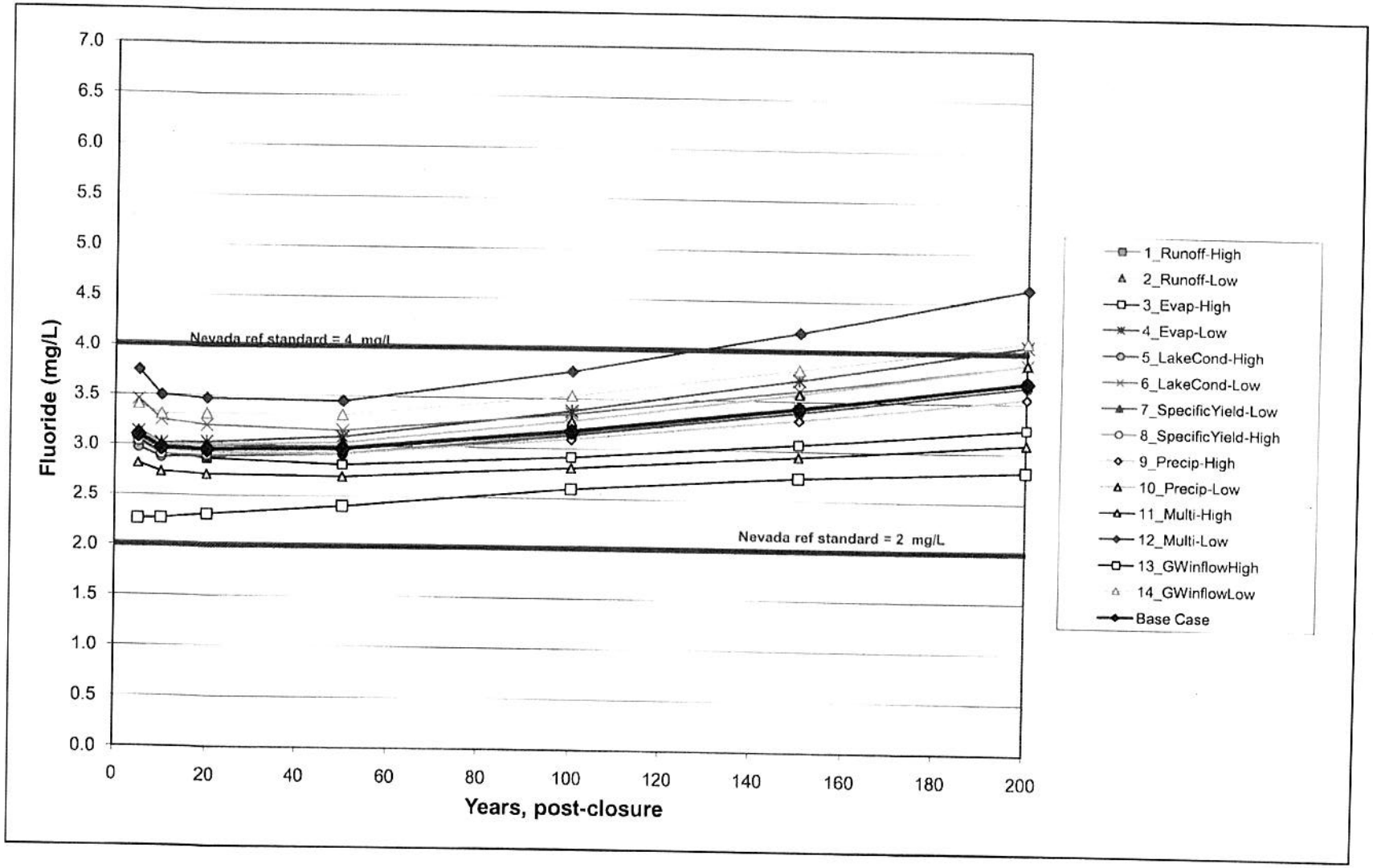
Appendix J.
Geochemical Model Sensitivity Results



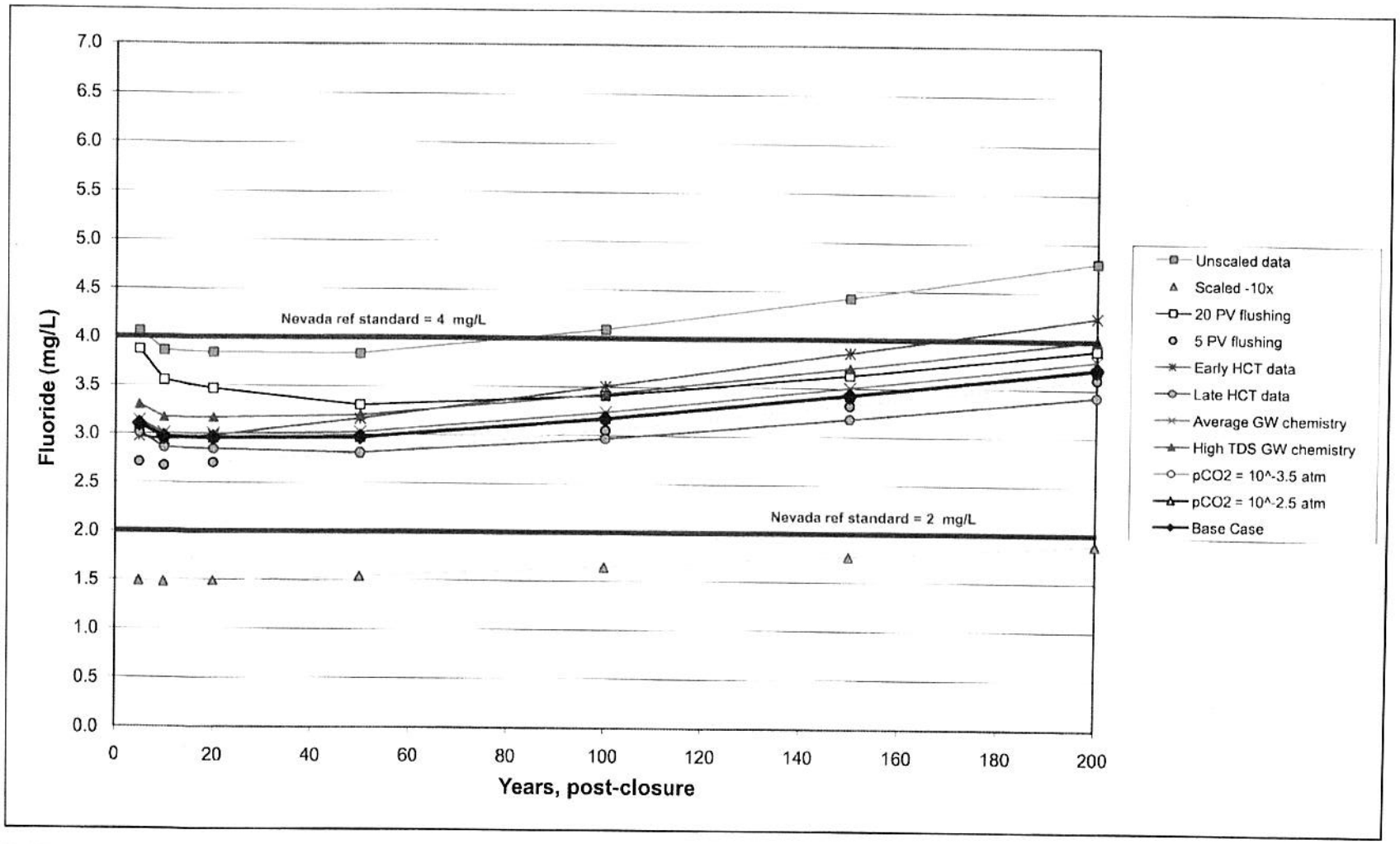

Calcium (mg/L)
100
90
80
70
60
50
40
30
20
10
0
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
1_Runoff-High
2_Runoff-Low
3_Evap-High
4_Evap-Low
5_LakeCond-High
6_LakeCond-Low
7_SpecificYield-Low
8_SpecificYield-High
9_Precip-High
10_Precip-Low
11_Multi-High
12_Multi-Low
13_GWinflowHigh
14_GWinflowLow
Base Case

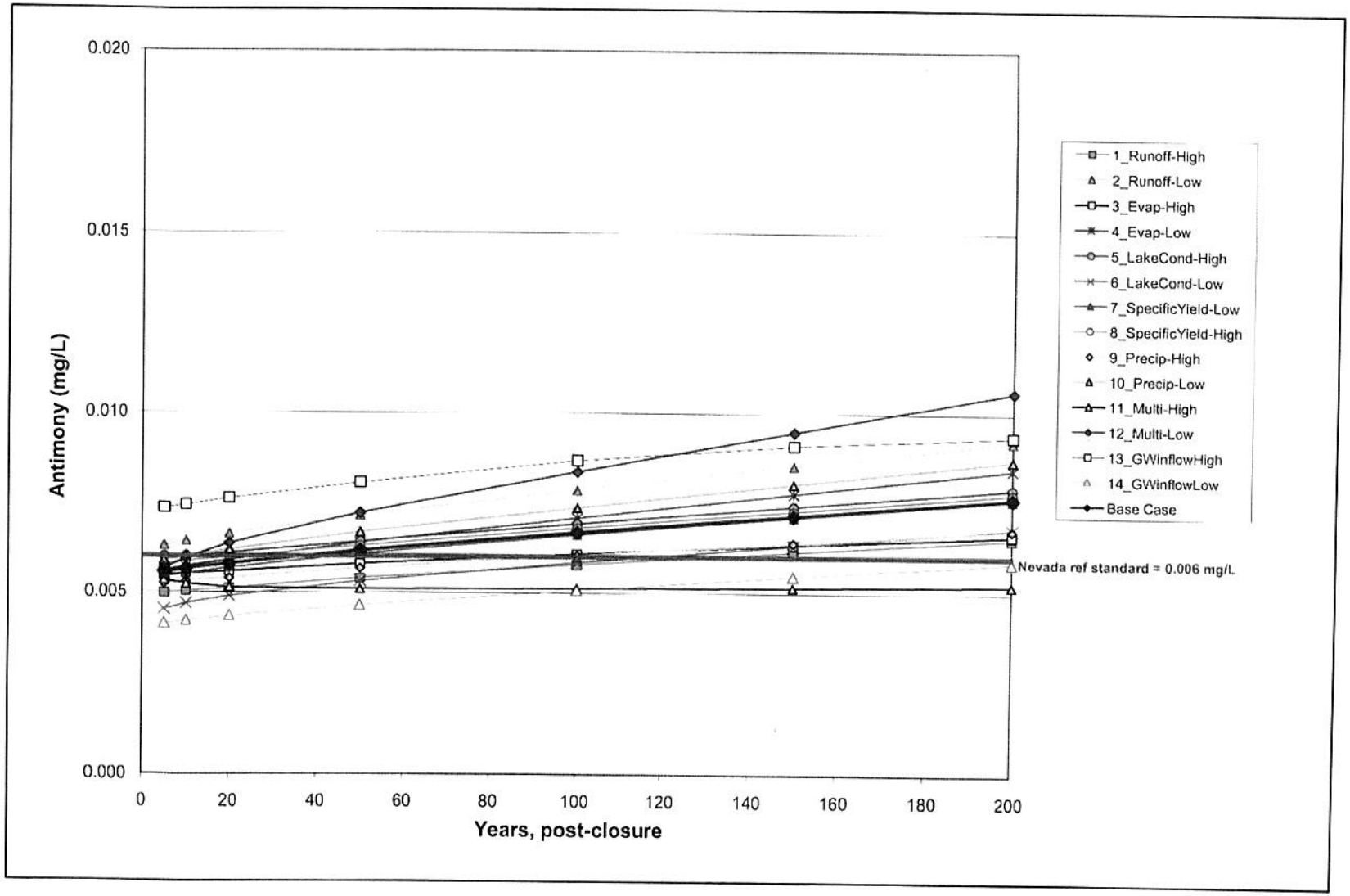
Appendix J.
Geochemical Model Sensitivity Results



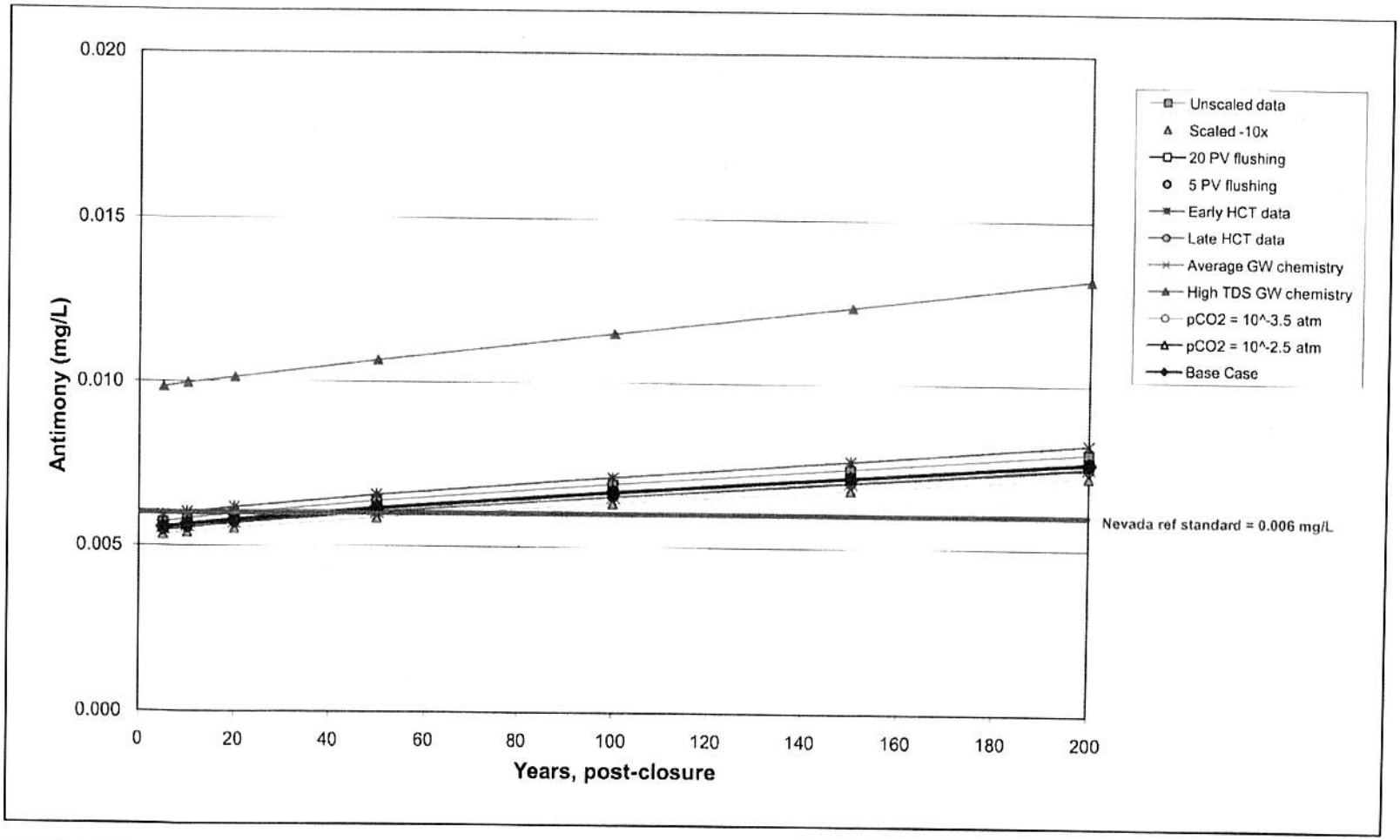

7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Fluoride (mg/L)
Nevada ref standard = 4 mg/L
Nevada ref standard = 2 mg/L
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
1_Runoff-High
2_Runoff-Low
3_Evap-High
4_Evap-Low
5_LakeCond-High
6_LakeCond-Low
7_SpecificYield-Low
8_SpecificYield-High
9_Precip-High
10_Precip-Low
11_Multi-High
12_Multi-Low
13_GWinflowHigh
14_GWinflowLow
Base Case

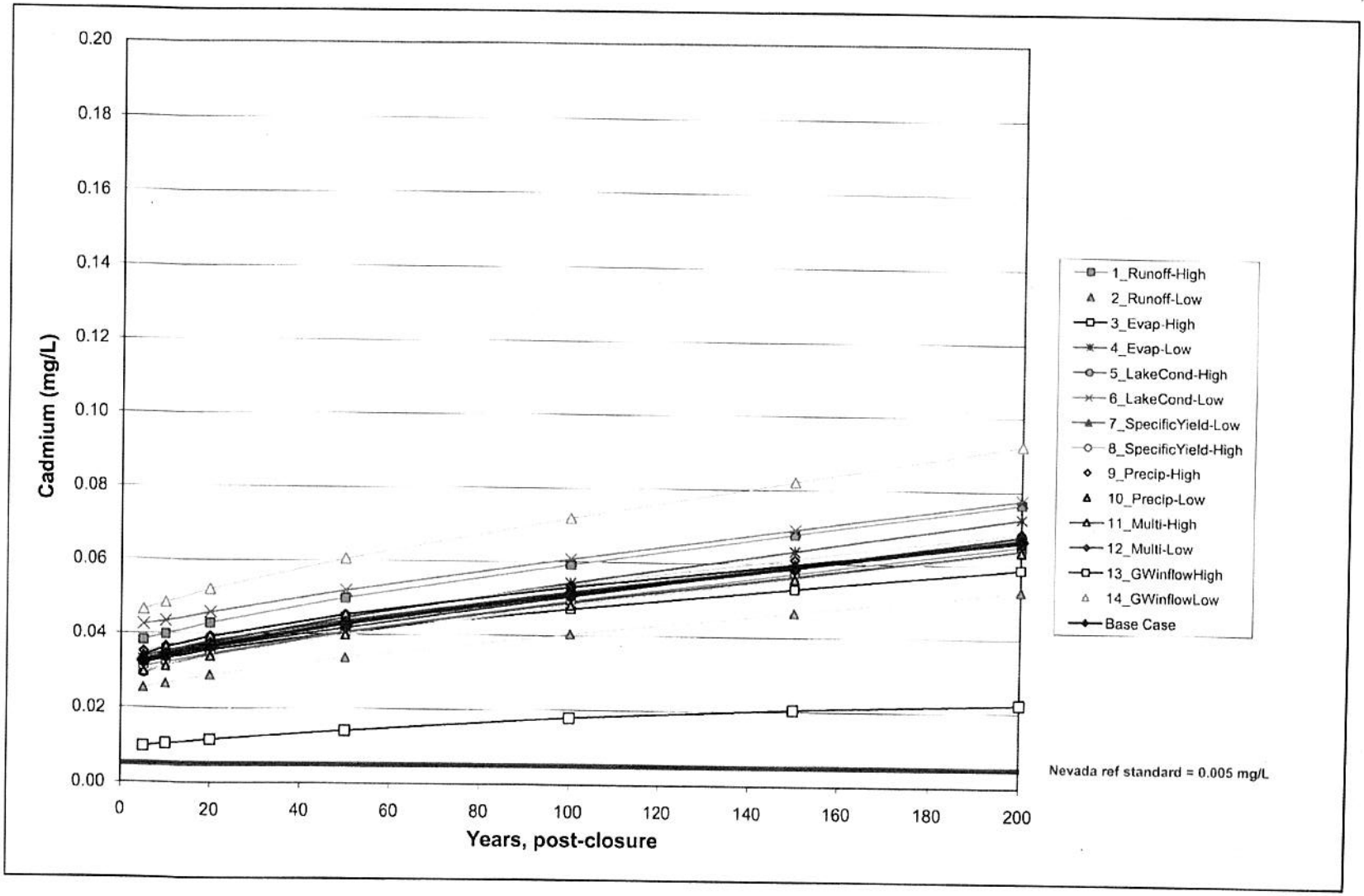
Appendix J.
Geochemical Model Sensitivity Results



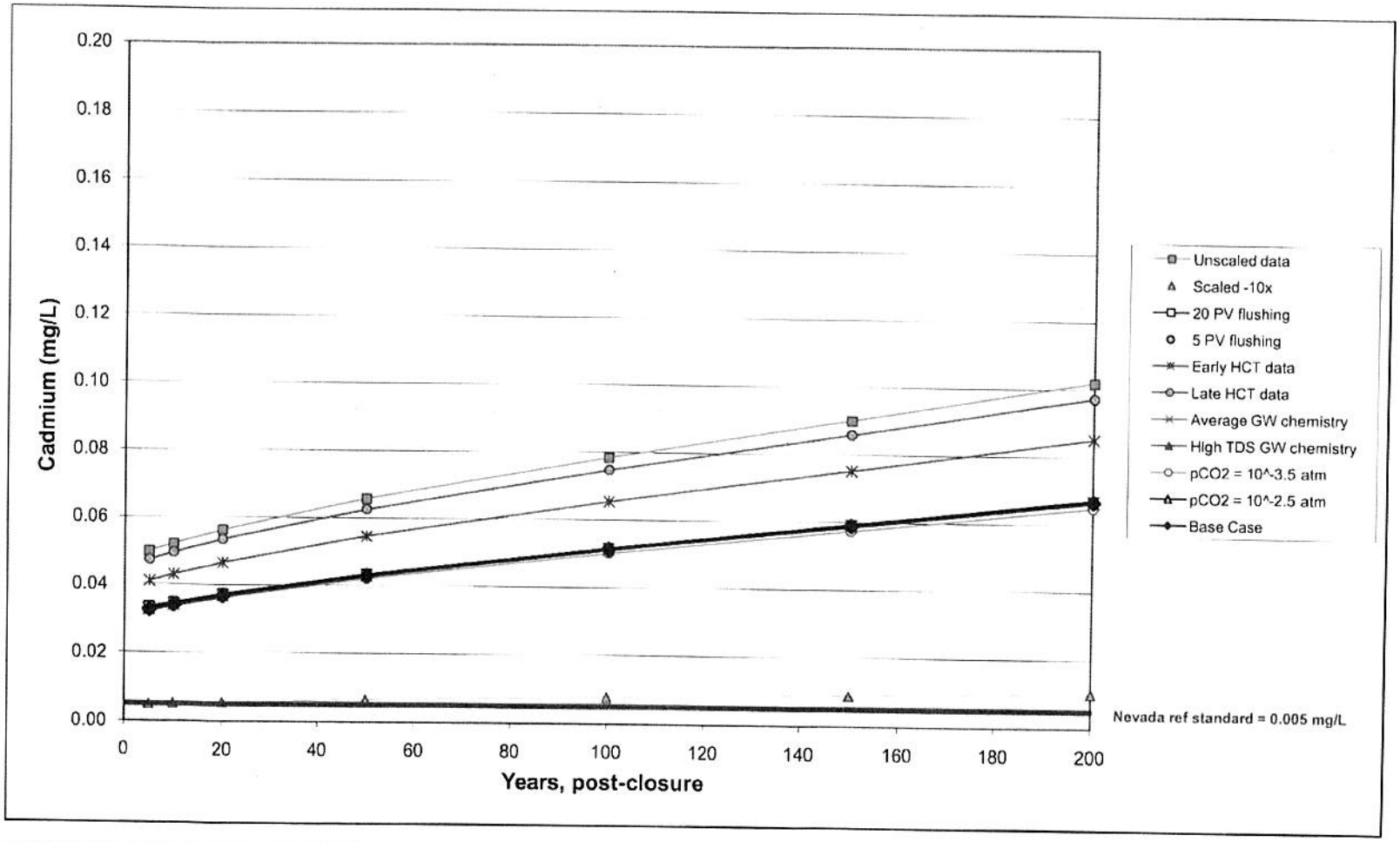

0.020
0.015
0.010
0.005
0.000
Antimony (mg/L)
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
1_Runoff-High
2_Runoff-Low
3_Evap-High
4_Evap-Low
5_LakeCond-High
6_LakeCond-Low
7_SpecificYield-Low
8_SpecificYield-High
9_Precip-High
10_Precip-Low
11_Multi-High
12_Multi-Low
13_GWinflowHigh
14_GWinflowLow
Base Case
Nevada ref standard = 0.006 mg/L

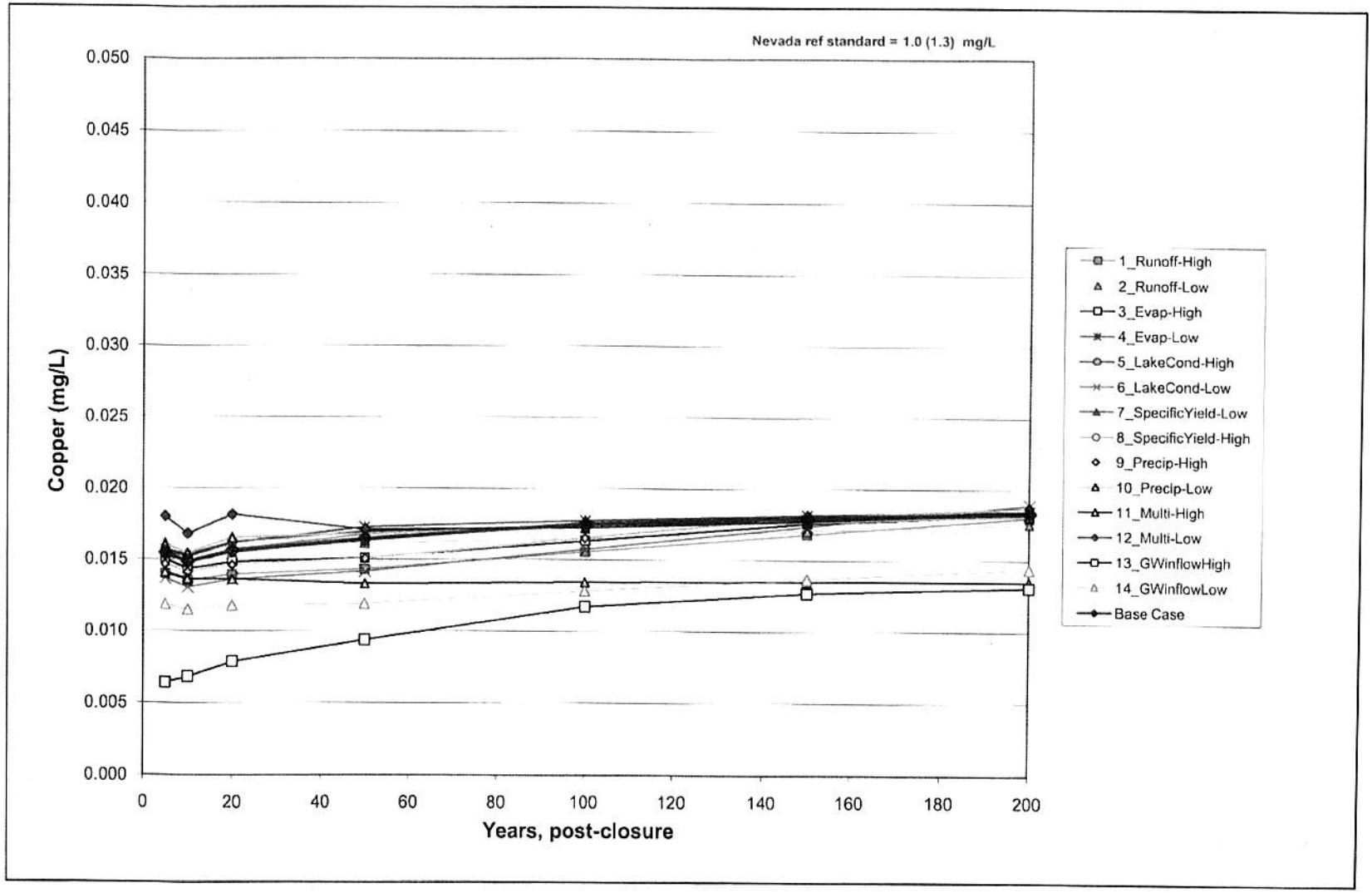
Appendix J. Geochemical Model Sensitvity Results



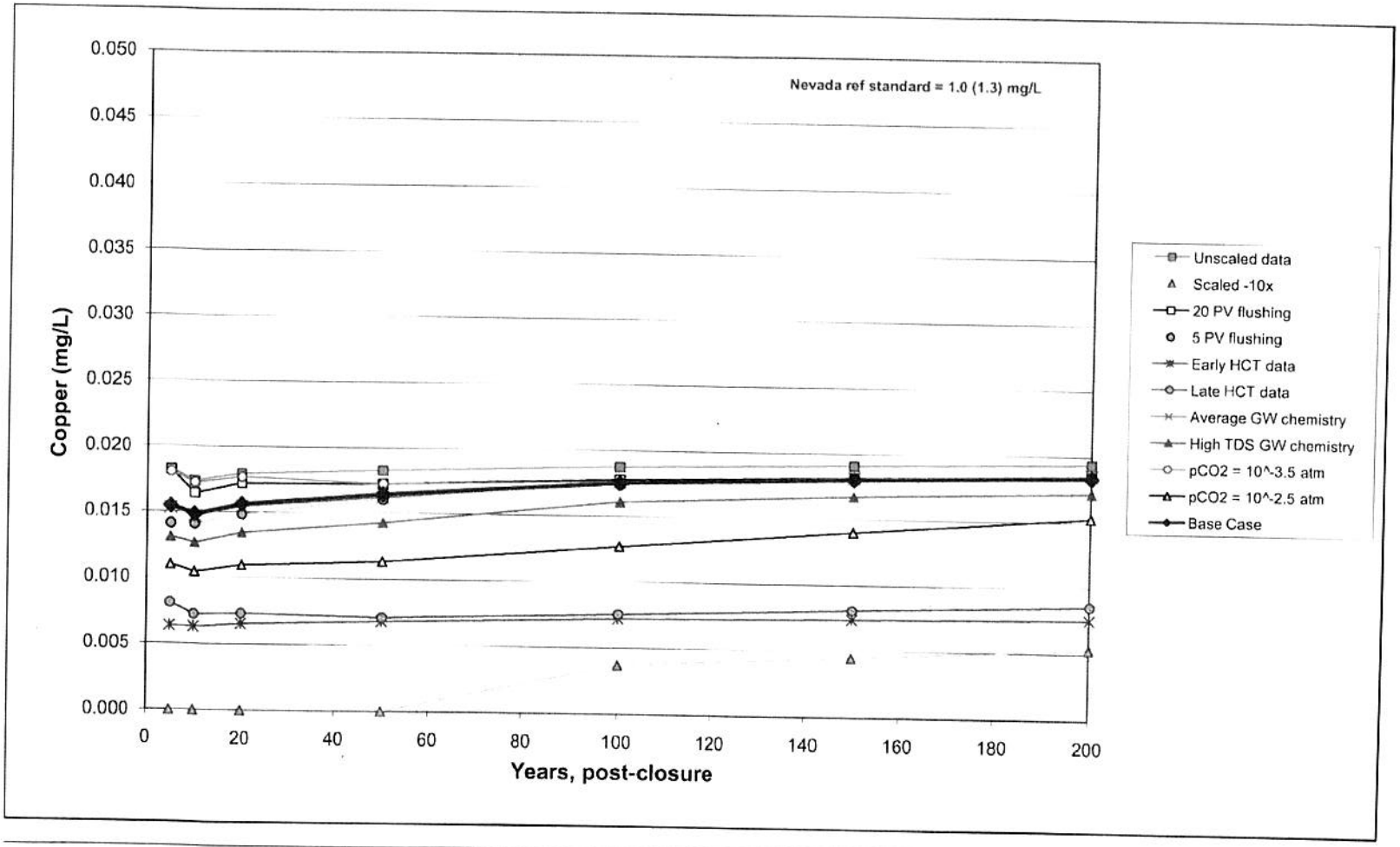

Cadmium (mg/L)
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
1_Runoff-High
2_Runoff-Low
3_Evap-High
4_Evap-Low
5_LakeCond-High
6_LakeCond-Low
7_SpecificYield-Low
8_SpecificYield-High
9_Precip-High
10_Precip-Low
11_Multi-High
12_Multi-Low
13_GWinflowHigh
14_GWinflowLow
Base Case
Nevada ref standard = 0.005 mg/L

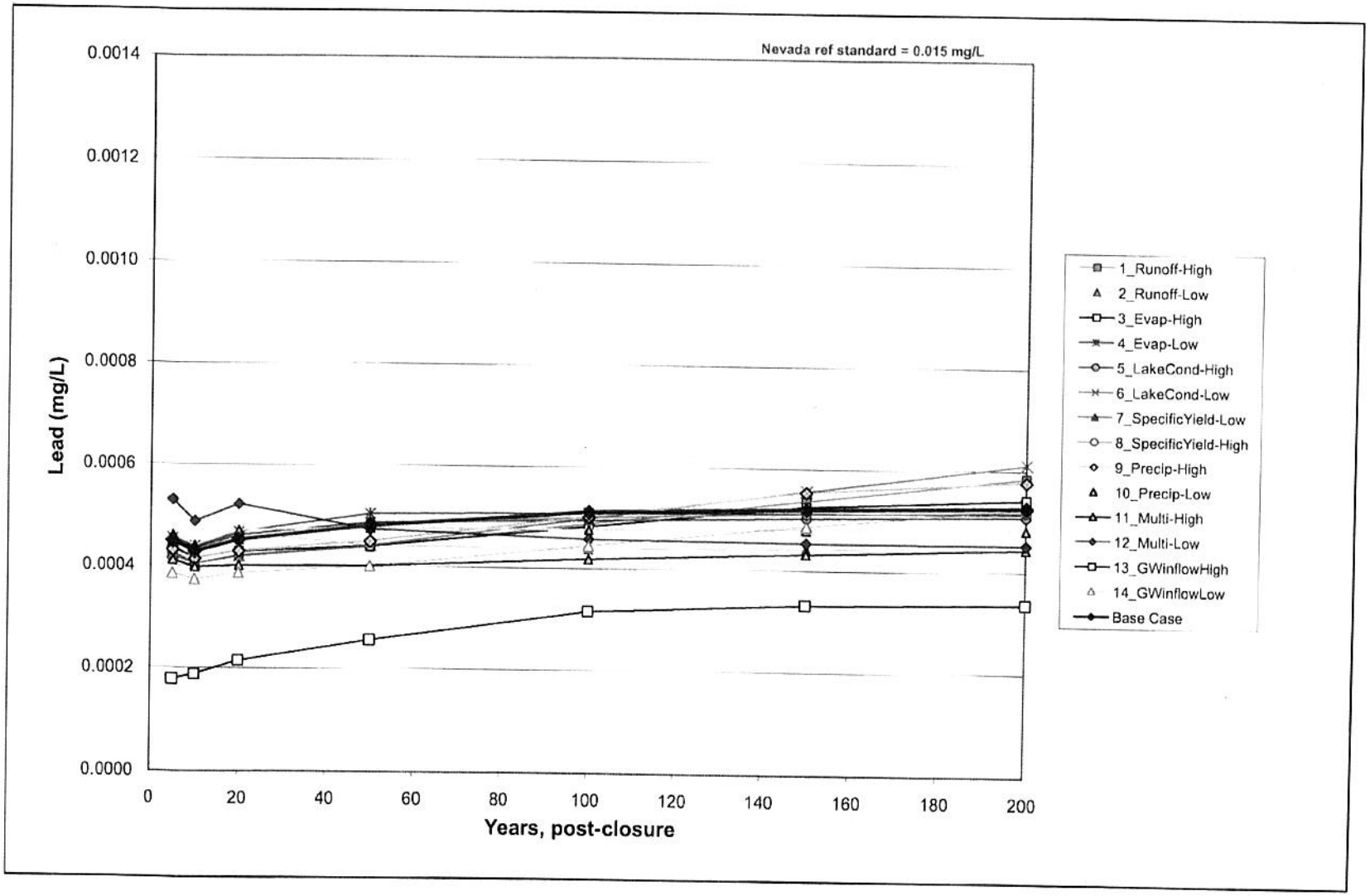
Appendix J. Geochemical Model Sensitvity Results



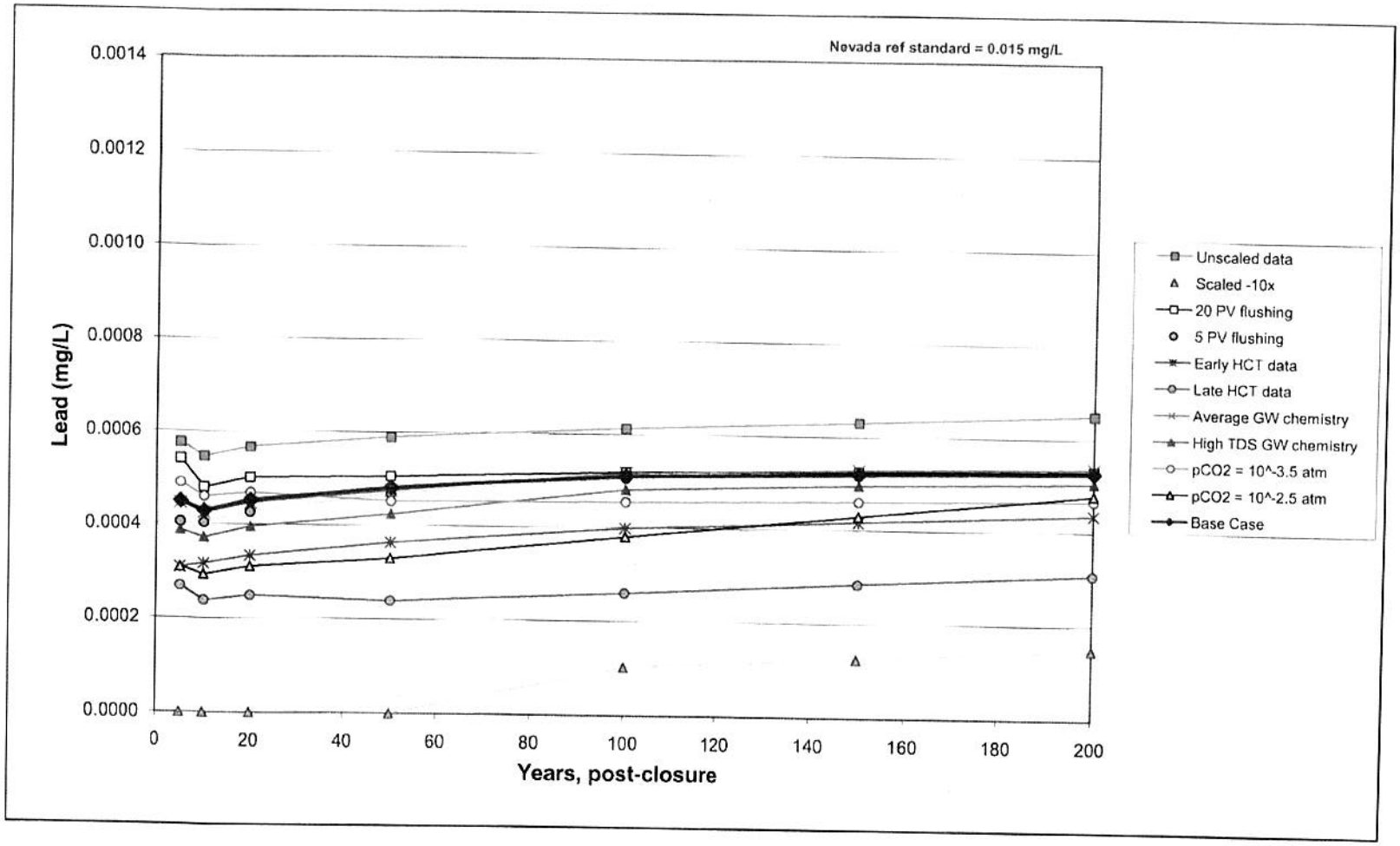

Nevada ref standard = 1.0 (1.3) mg/L
Copper (mg/L)
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
1_Runoff-High
2_Runoff-Low
3_Evap-High
4_Evap-Low
5_LakeCond-High
6_LakeCond-Low
7_SpecificYield-Low
8_SpecificYield-High
9_Precip-High
10_Precip-Low
11_Multi-High
12_Multi-Low
13_GWinflowHigh
14_GWinflowLow
Base Case

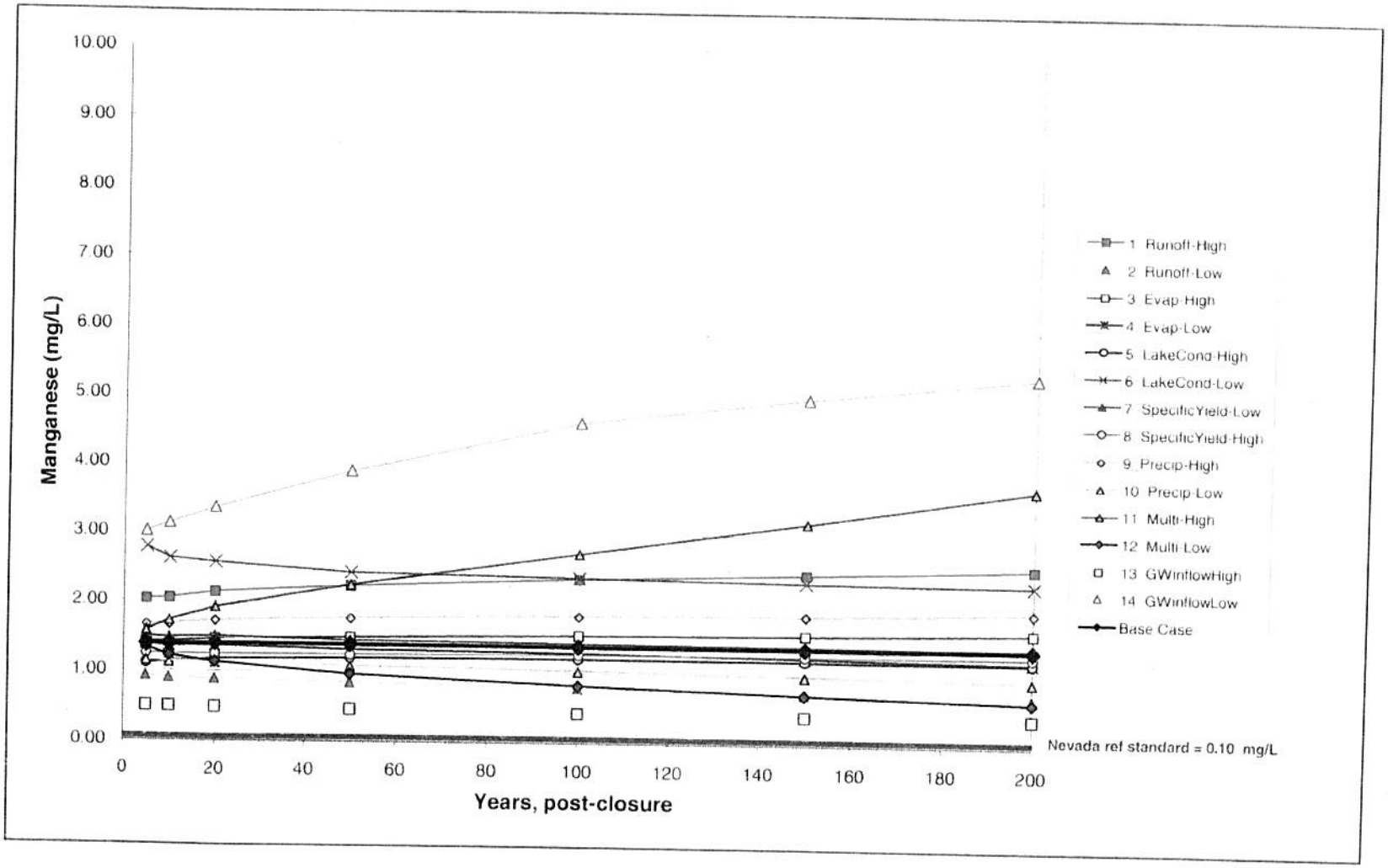
Appendix J. Geochemical Model Sensitvity Results

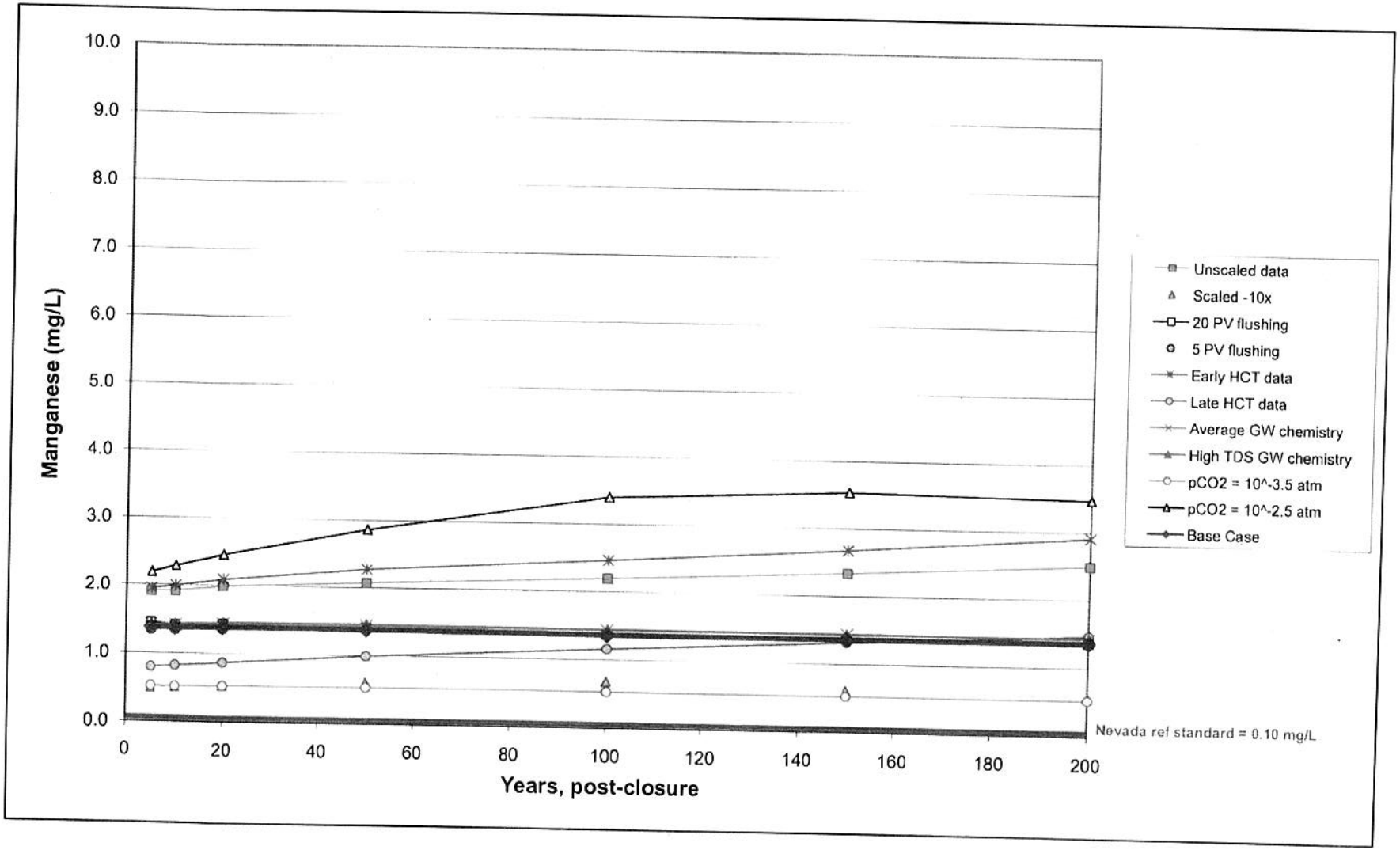


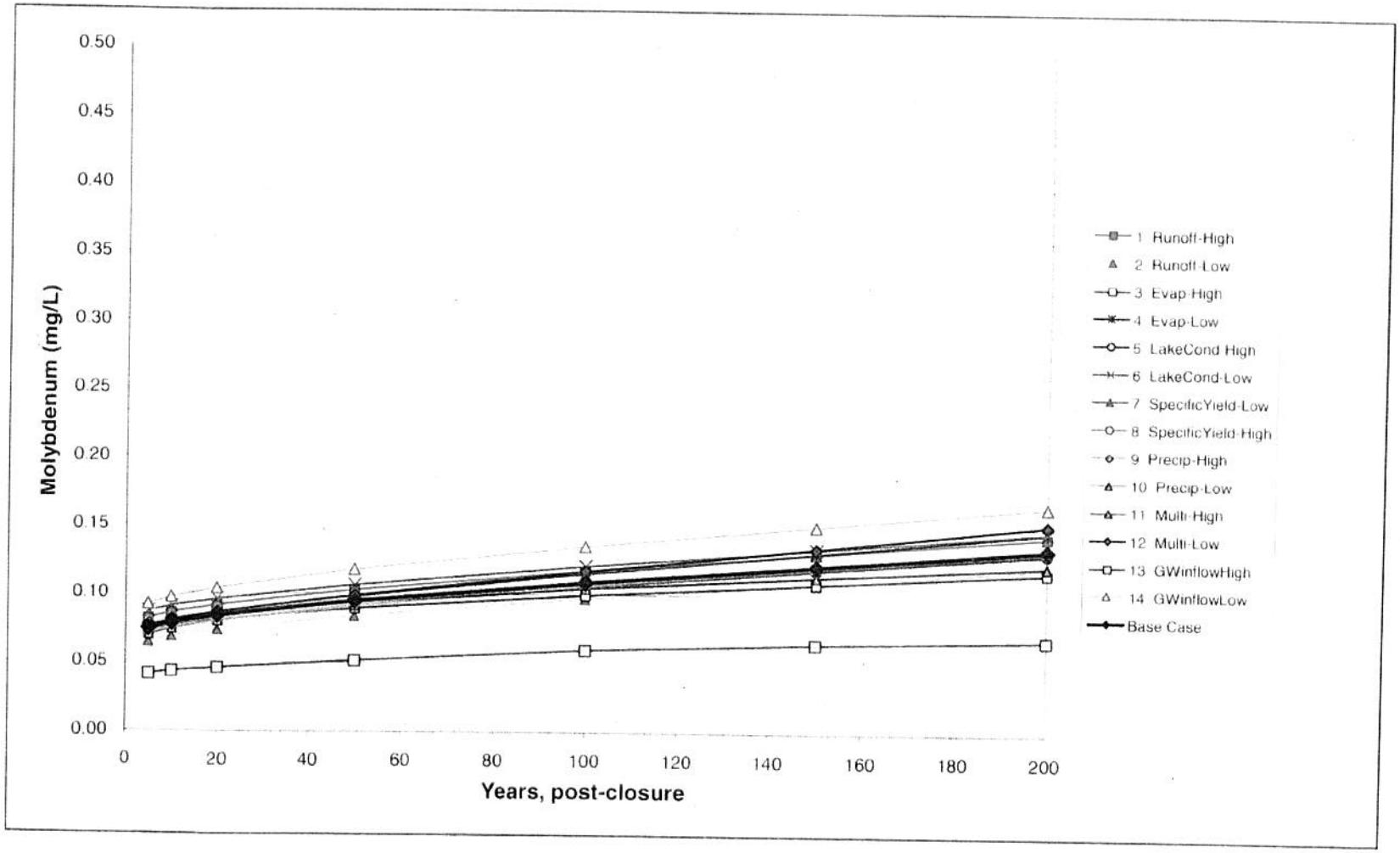

Nevada ref standard = 0.015 mg/L
Lead (mg/L)
0.0014
0.0012
0.0010
0.0008
0.0006
0.0004
0.0002
0.0000
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
1_Runoff-High
2_Runoff-Low
3_Evap-High
4_Evap-Low
5_LakeCond-High
6_LakeCond-Low
7_SpecificYield-Low
8_SpecificYield-High
9_Precip-High
10_Precip-Low
11_Multi-High
12_Multi-Low
13_GWinflowHigh
14_GWinflowLow
Base Case

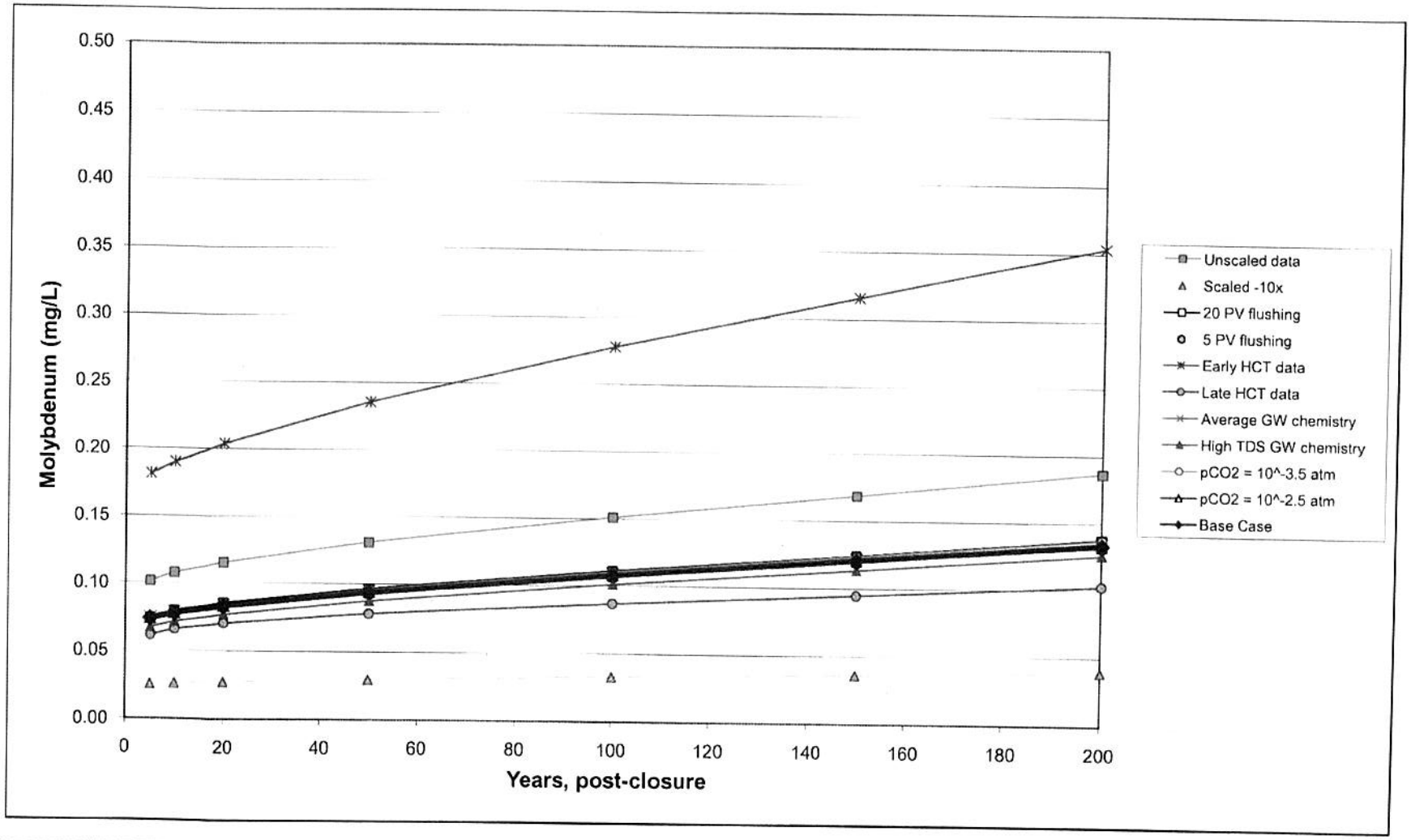
Appendix J. Geochemical Model Sensitvity Results

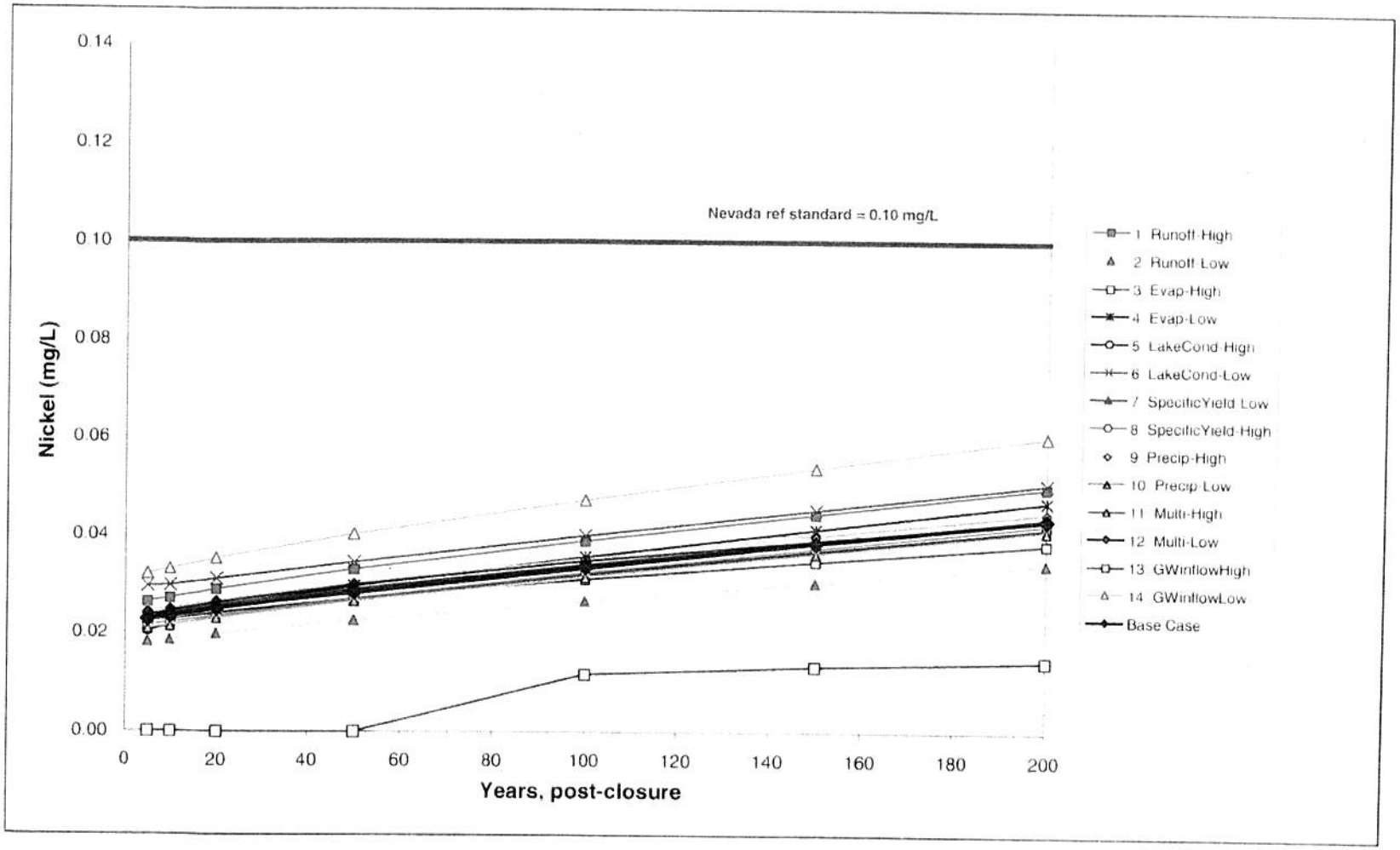


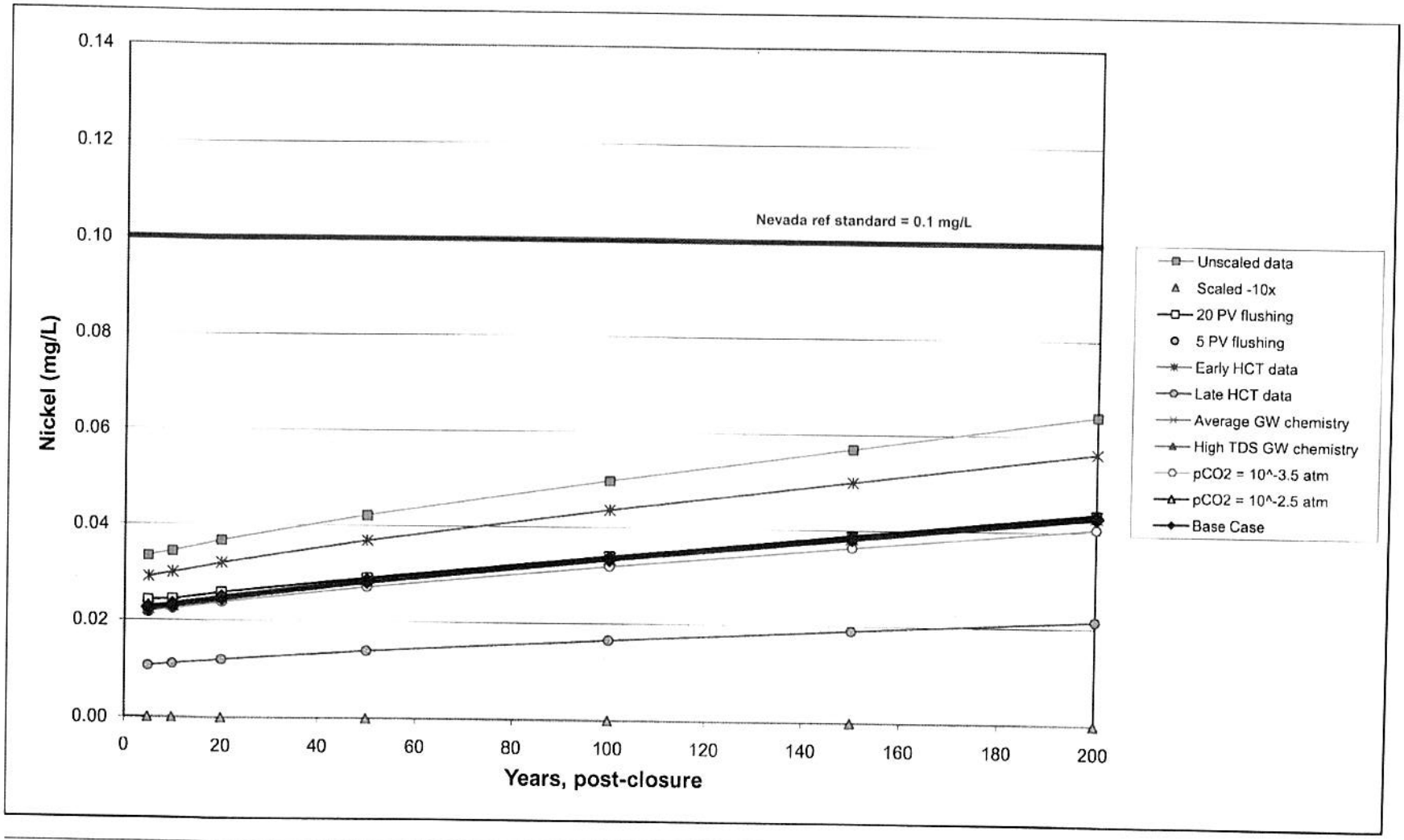

Manganese (mg/L)
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
1 Runoff-High
2 Runoff-Low
3 Evap-High
4 Evap-Low
5 LakeCond-High
6 LakeCond-Low
7 SpecificYield-Low
8 SpecificYield-High
9 Precip-High
10 Precip-Low
11 Multi-High
12 Multi-Low
13 GWinflowHigh
14 GWinflowLow
Base Case
Nevada ref standard = 0.10 mg/L

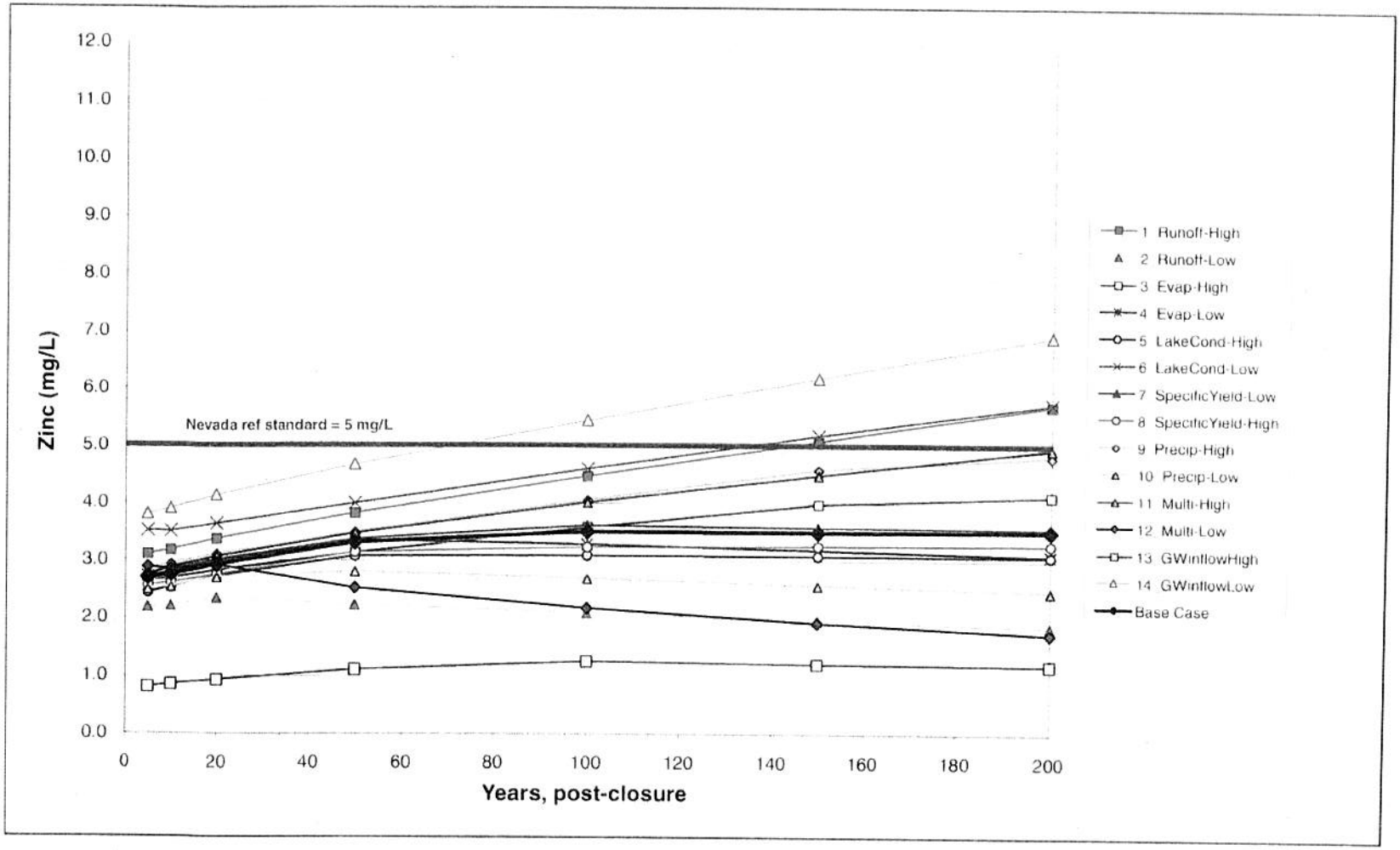

Manganese (mg/L)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
Unscaled data
Scaled -10x
20 PV flushing
5 PV flushing
Early HCT data
Late HCT data
Average GW chemistry
High TDS GW chemistry
pCO2 = 10^-3.5 atm
pCO2 = 10^-2.5 atm
Base Case
Nevada ref standard = 0.10 mg/L

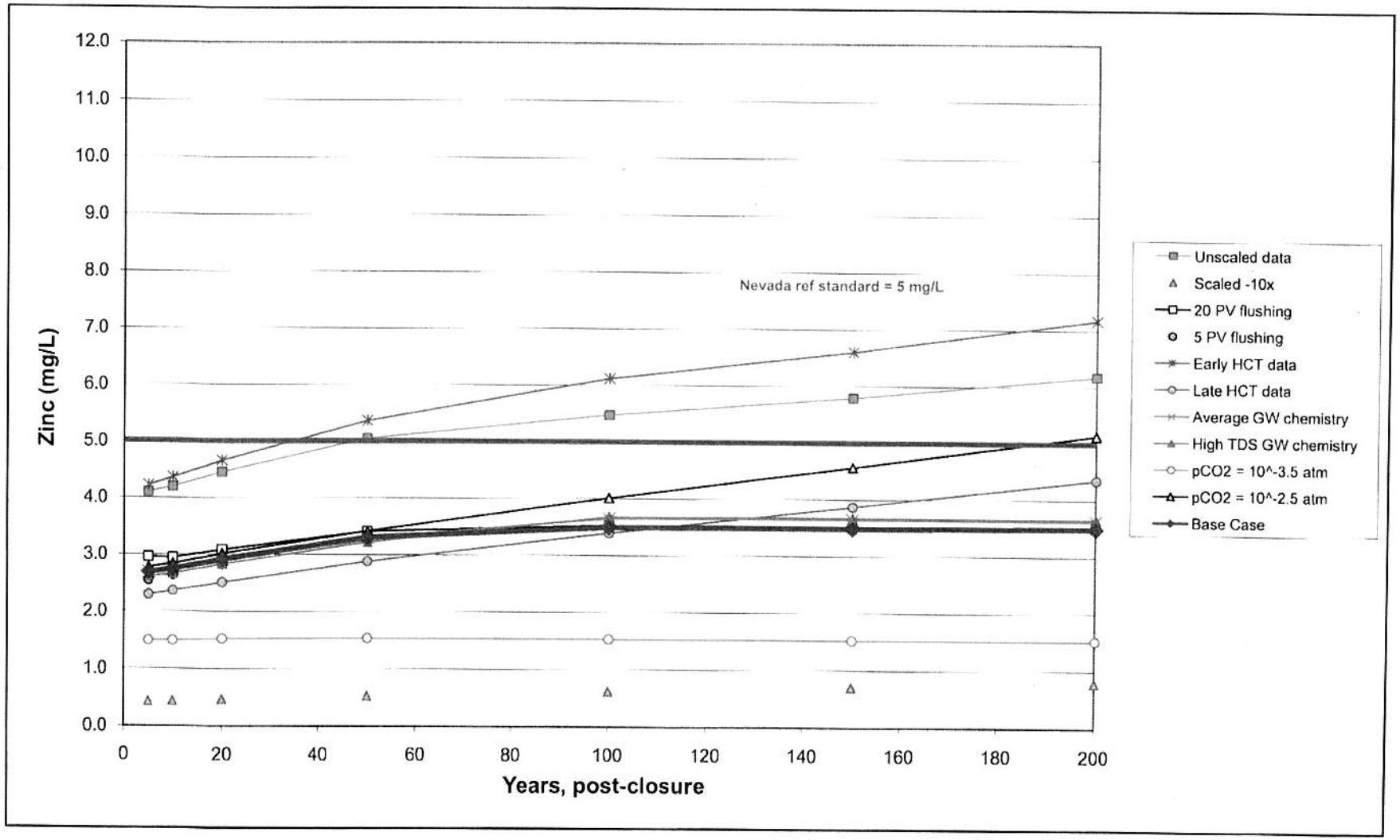

Molybdenum (mg/L)
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
1 Runoff-High
2 Runoff-Low
3 Evap-High
4 Evap-Low
5 LakeCond-High
6 LakeCond-Low
7 SpecificYield-Low
8 SpecificYield-High
9 Precip-High
10 Precip-Low
11 Multi-High
12 Multi-Low
13 GWinflowHigh
14 GWinflowLow
Base Case


Molybdenum (mg/L)
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
Unscaled data
Scaled -10x
20 PV flushing
5 PV flushing
Early HCT data
Late HCT data
Average GW chemistry
High TDS GW chemistry
pCO2 = 10^-3.5 atm
pCO2 = 10^-2.5 atm
Base Case


Nickel (mg/L)
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Nevada ref standard = 0.10 mg/L
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
1 Runoff-High
2 Runoff-Low
3 Evap-High
4 Evap-Low
5 LakeCond-High
6 LakeCond-Low
7 SpecificYield-Low
8 SpecificYield-High
9 Precip-High
10 Precip-Low
11 Multi-High
12 Multi-Low
13 GWinflowHigh
14 GWinflowLow
Base Case


0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Nickel (mg/L)
Nevada ref standard = 0.1 mg/L
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
Unscaled data
Scaled -10x
20 PV flushing
5 PV flushing
Early HCT data
Late HCT data
Average GW chemistry
High TDS GW chemistry
pCO2 = 10^-3.5 atm
pCO2 = 10^-2.5 atm
Base Case


Zinc (mg/L)
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Nevada ref standard = 5 mg/L
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
1 Runoff-High
2 Runoff-Low
3 Evap-High
4 Evap-Low
5 LakeCond-High
6 LakeCond-Low
7 SpecificYield-Low
8 SpecificYield-High
9 Precip-High
10 Precip-Low
11 Multi-High
12 Multi-Low
13 GWinflowHigh
14 GWinflowLow
Base Case


Zinc (mg/L)
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0
20
40
60
80
100
120
140
160
180
200
Years, post-closure
Nevada ref standard = 5 mg/L
Unscaled data
Scaled -10x
20 PV flushing
5 PV flushing
Early HCT data
Late HCT data
Average GW chemistry
High TDS GW chemistry
pCO2 = 10^-3.5 atm
pCO2 = 10^-2.5 atm
Base Case