

Denison Mines-UT DRC Groundwater Study

Sample Event 7/18/2007-7/26/2007

Anion Analysis

Site	Date Collected	Sample Level	NO2+NO3, N (mg/L)	Sulfate (mg/L)
MW-1	7/20/2007		0.35	644
MW-1B	7/21/2007		0.25	708
MW-2	7/19/2007		<0.1	1780
MW-3	7/26/2007		0.19	2960
MW-3A	7/26/2007		1.07	3070
MW-5	7/25/2007		<0.1	980
MW-11	7/25/2007		<0.1	947
MW-14	7/24/2007	shallow	<0.1	2120
MW-14	7/24/2007	deep	<0.1	2050
MW-15	7/24/2007		0.13	2200
MW-18	7/21/2007	shallow	0.36	1690
MW-18	7/21/2007	deep	<0.1	1810
MW-19	7/22/2007	shallow	2.62	556
MW-19	7/22/2007	deep	2.69	581
MW-22	7/26/2007	shallow	3.36	5060
MW-22	7/26/2007	deep	3.24	5100
MW-27	7/20/2007		5.46	52.1
MW-29	7/22/2007		0.79	2830
MW-30	7/25/2007		15.5	859
MW-31	7/25/2007		24.6	598
TC1	7/19/2007		113	2500000
Slimes Drain	7/19/2007		5.19	666000
TC3	7/19/2007		19.6	1070000
WP2	7/18/2007		<0.1	39.9
WP3	7/18/2007		<0.1	33.1

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 Trace Metal Analysis

Site	Date Collected	Sample Level	Selenium (µg/L)	Manganese (µg/L)	Uranium-238 (µg/L)
MW-1	7/20/2007		<2	78.8	<1
MW-1B	7/21/2007		<2	115	<1
MW-2	7/19/2007		8.7	<10	10.5
MW-3	7/26/2007		10.2	2460	35.9
MW-3A	7/26/2007		74.2	1360	19.9
MW-5	7/25/2007		2.42	190	<1
MW-11	7/25/2007		<2	64.7	<1
MW-14	7/24/2007	shallow	<2	2080	59.4
MW-14	7/24/2007	deep	<2	2020	59.4
MW-15	7/24/2007		96.4	<10	42.9
MW-18	7/21/2007	shallow	2.5	84	41.2
MW-18	7/21/2007	deep	2.3	202	33.3
MW-19	7/22/2007	shallow	10.4	<10	6.94
MW-19	7/22/2007	deep	10.4	<10	7.68
MW-22	7/26/2007	shallow	15.2	32900	38.8
MW-22b	7/26/2007	deep	15.3	35500	39.7
MW-22	7/26/2007	deep	15.3	35500	39.7
MW-27	7/20/2007		10.1	<10	29.5
MW-29	7/22/2007		3.35	5100	10.2
MW-30	7/25/2007		32.6	<10	6.31
MW-31	7/25/2007		58.7	<10	7.01
TC1	7/19/2007		16200	869000	581000
Slimes Drain	7/19/2007		400	139000	23700
TC3	7/19/2007		1550	248000	68100
WP2	7/18/2007		<2	17	9.92
WP3	7/18/2007		<2	16.2	<1

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Dissolved Gas Analysis

Site	Sample Depth	N ₂	⁴⁰ Ar	⁸⁴ Kr	²⁰ Ne	⁴ He	¹²⁹ Xe
		Conc (ccSTP/g)	Conc (ccSTP/g)	Conc (ccSTP/g)	Conc (ccSTP/g)	Conc (ccSTP/g)	Conc (ccSTP/g)
MW-1	Shallow	1.69E-02	5.05E-04	6.37E-08	2.25E-07	6.12E-08	3.89E-09
MW-1	Deep	1.96E-02	5.66E-04	7.17E-08	2.53E-07	7.08E-08	4.57E-09
MW-2	Shallow	9.56E-03	2.64E-04	3.40E-08	1.28E-07	3.26E-08	2.25E-09
MW-2	Deep	1.19E-02	3.19E-04	4.20E-08	1.52E-07	4.15E-08	2.78E-09
MW-3		1.25E-02	3.35E-04	4.24E-08	1.56E-07	3.98E-08	3.10E-09
MW-3A	Shallow	1.26E-02	3.48E-04	4.45E-08	1.66E-07	4.31E-08	2.71E-09
MW-3A	Deep	1.38E-02	3.31E-04	3.88E-08	1.88E-07	4.96E-08	2.65E-09
MW-5	Shallow	1.68E-02	4.12E-04	5.27E-08	1.72E-07	4.80E-08	3.67E-09
MW-5	Deep	1.75E-02	3.99E-04	5.14E-08	1.81E-07	5.20E-08	3.43E-09
MW-11	Shallow	1.79E-02	4.67E-04	5.96E-08	2.27E-07	8.69E-08	3.63E-09
MW-11	Deep	2.05E-02	4.86E-04	6.05E-08	2.66E-07	1.05E-07	3.84E-09
MW-14	Shallow	1.41E-02	3.90E-04	4.93E-08	1.78E-07	4.34E-08	3.12E-09
MW-14	Deep	1.66E-02	4.40E-04	5.38E-08	2.18E-07	5.48E-08	3.36E-09
MW-15	Shallow	1.52E-02	4.06E-04	4.88E-08	1.92E-07	4.87E-08	2.86E-09
MW-15	Deep	1.63E-02	3.79E-04	4.40E-08	2.21E-07	6.58E-08	2.74E-09
MW-18	Shallow	1.81E-02	4.85E-04	5.92E-08	2.34E-07	6.96E-08	3.64E-09
MW-18	Deep	1.81E-02	5.32E-04	6.67E-08	2.28E-07	7.18E-08	3.95E-09
MW-19	Shallow	2.63E-02	7.16E-04	8.60E-08	3.56E-07	9.62E-08	4.70E-09
MW-19	Deep	2.72E-02	7.08E-04	8.42E-08	3.63E-07	9.44E-08	4.80E-09
MW-22	Shallow	1.20E-02	3.24E-04	4.01E-08	1.71E-07	4.89E-08	2.47E-09
MW-22b	Deep	1.19E-02	3.24E-04	4.02E-08	1.66E-07	4.91E-08	2.52E-09
MW-22	Deep	1.22E-02	3.26E-04	4.14E-08	1.84E-07	5.68E-08	2.41E-09
MW-27	Shallow	1.04E-02	3.58E-04	5.32E-08	1.30E-07	3.33E-08	3.39E-09
MW-27	Deep	1.10E-02	3.69E-04	5.38E-08	1.37E-07	3.42E-08	3.36E-09
MW-29	Shallow	1.75E-02	3.49E-04	4.20E-08	2.52E-07	6.34E-08	2.76E-09
MW-29	Deep	2.01E-02	3.93E-04	4.52E-08	3.02E-07	8.37E-08	2.84E-09
MW-30	Shallow	1.24E-02	3.62E-04	4.69E-08	1.55E-07	3.96E-08	2.94E-09
MW-30	Deep	1.35E-02	3.85E-04	4.94E-08	1.64E-07	4.11E-08	3.35E-09
MW-31	Shallow	1.48E-02	4.19E-04	5.60E-08	1.95E-07	6.16E-08	3.52E-09
MW-31	Deep	1.62E-02	4.48E-04	5.84E-08	2.12E-07	6.53E-08	3.85E-09
TC1		1.66E-02	4.19E-04	9.49E-08	6.70E-08	2.73E-08	8.31E-09
SD		1.31E-02	7.32E-04	1.57E-07	7.85E-08	9.00E-06	2.80E-09
TC3		4.72E-03	2.84E-04	5.13E-08	5.86E-08	1.85E-08	6.35E-09
WP2		1.45E-02	7.39E-04	1.50E-07	1.49E-07	3.46E-08	3.53E-08
WP3		7.50E-03	3.76E-04	7.05E-08	7.74E-08	1.70E-08	3.18E-08

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Tritium Analysis

Site	Date Collected	Sample Level	Tritium		Tritium - repeat	
			(TU)	(error ±)	(TU)	(error ±)
MW-1	7/20/2007		<0.3			
MW-1B	7/21/2007		<0.3			
MW-2	7/19/2007		<0.3			
MW-3	7/26/2007		<0.3			
MW-3A	7/26/2007		<0.3			
MW-5	7/25/2007		<0.3			
MW-11	7/25/2007		<0.3		0.16	0.05
MW-14	7/24/2007	shallow	<0.3		<0.3	
MW-14	7/24/2007	deep	<0.3			
MW-15	7/24/2007		0.64	-0.25	0.64	0.37
MW-18	7/21/2007	shallow	<0.3		<0.3	
MW-18	7/21/2007	deep	<0.3			
MW-19	7/22/2007	shallow	3.11	0.31		
MW-19	7/22/2007	deep	3.96	0.37		
MW-22	7/26/2007	shallow	<0.3			
MW-22	7/26/2007	deep	0.87	0.31	<0.3	
MW-27	7/20/2007		8.67	0.92		
MW-29	7/22/2007		<0.3		<0.3	
MW-30	7/25/2007		<0.3			
MW-31	7/25/2007		<0.3			
TC1	7/19/2007		n/a		n/a	
Slimes Drain	7/19/2007		0.93	0.68	1.04	0.13
TC3	7/19/2007		6.01	1.37	7.24	0.55
WP2	7/18/2007		5.98	0.39		
WP3	7/18/2007		5.94	0.40		

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Chlorofluorocarbon Analysis

Site	Date Collected	Sample Level	Mean CFC-11 (pmoles/kg)	Mean CFC-12 (pmoles/kg)	Mean CFC-113 (pmoles/kg)
MW-1	7/20/2007		2.620	1.857	0.089
MW-1B	7/21/2007		2.778	1.649	0.090
MW-2	7/19/2007		2.807	1.246	0.149
MW-3	7/26/2007		1.297	0.808	0.124
MW-3A	7/26/2007		2.788	1.847	0.218
MW-5	7/25/2007		0.700	0.278	0.000
MW-11	7/25/2007		0.181	0.088	0.000
MW-14	7/24/2007	shallow	0.308	0.116	0.000
MW-14	7/24/2007	deep	0.264	0.126	0.000
MW-15	7/24/2007		0.693	0.664	0.014
MW-18	7/21/2007	shallow	0.515	0.000	0.000
MW-18	7/21/2007	deep	1.440	0.136	0.024
MW-19	7/22/2007	shallow	1.518	0.954	0.027
MW-19	7/22/2007	deep	1.637	1.085	0.082
MW-22	7/26/2007	shallow	n/a	n/a	n/a
MW-22	7/26/2007	deep	n/a	n/a	n/a
MW-27	7/20/2007		1.988	5.430	0.301
MW-29	7/22/2007		0.516	0.346	0.000
MW-30	7/25/2007		n/a	n/a	n/a
MW-31	7/25/2007		0.855	0.962	0.000
TC1	7/19/2007		n/a	n/a	n/a
Slimes Drain	7/19/2007		n/a	n/a	n/a
TC3	7/19/2007		n/a	n/a	n/a
WP2	7/18/2007		0.000	0.831	0.010
WP3	7/18/2007		1.692	0.941	0.054

n/a -- indicates samples were not analyzed by the laboratory

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$d^{34}\text{S} - d^{18}\text{O}$ (of sulfate) Isotope Ratio Analysis

Site	Date Collected	Sample Level	$d^{18}\text{O} (\text{SO}_4)$ (‰)	$d^{34}\text{S} (\text{SO}_4)$ (‰)
MW-1	7/20/2007		-2.36	9.16
MW-1B	7/21/2007		-2.22	9.88
MW-2	7/19/2007		-8.59	12.13
MW-3	7/26/2007		-7.03	13.69
MW-3A	7/26/2007		-6.69	12.66
MW-5	7/25/2007		-3.93	9.55
MW-11	7/25/2007		-5.08	9.34
MW-14	7/24/2007	shallow	-2.69	9.63
MW-14	7/24/2007	deep	-1.81	9.86
MW-15	7/24/2007		-4.61	9.07
MW-18	7/21/2007	shallow	-4.02	5.05
MW-18	7/21/2007	deep	-3.63	5.23
MW-19	7/22/2007	shallow	-4.08	7.40
MW-19	7/22/2007	deep	-4.88	7.27
MW-22	7/26/2007	shallow	-9.99	-2.44
MW-22	7/26/2007	deep	-10.27	-3.07
MW-27	7/20/2007		2.02	-0.20
MW-29	7/22/2007		-5.58	9.73
MW-30	7/25/2007		-3.31	11.03
MW-31	7/25/2007		-2.18	6.39
TC1	7/19/2007		3.97	-0.89
Slimes Drain	7/19/2007		4.58	-0.93
TC3	7/19/2007		4.34	-1.04
WP2	7/18/2007		4.52	0.90
WP3	7/18/2007		3.15	0.19

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dD - d¹⁸O (of water) Isotope Ratio Analysis

Site	Date Collected	Sample Level	dD (‰)	dD stdev	d ¹⁸ O (‰)	d ¹⁸ O stdev
MW-1	7/20/2007		-113	1.6	-14.8	0.13
MW-1B	7/21/2007		-113	0.3	-14.3	0.02
MW-2	7/19/2007		-113	0.5	-14.2	0.01
MW-3	7/26/2007		-106	1.0	-13.2	0.16
MW-3A	7/26/2007		-107	1.4	-13.3	0.19
MW-5	7/25/2007		-112	2.3	-14.1	0.03
MW-11	7/25/2007		-115	0.3	-15.6	0.04
MW-14	7/24/2007	shallow	-110	0.0	-13.8	0.05
MW-14	7/24/2007	deep	-112	0.5	-13.9	0.03
MW-15	7/24/2007		-111	0.5	-14.0	0.09
MW-18	7/21/2007	shallow	-103	1.7	-13.7	0.05
MW-18	7/21/2007	deep	-107	2.1	-13.9	0.18
MW-19	7/22/2007	shallow	-81	1.5	-9.6	0.05
MW-19	7/22/2007	deep	-81	2.0	-9.5	0.04
MW-22	7/26/2007	shallow	-110	1.7	-13.5	0.23
MW-22	7/26/2007	deep	-107	0.2	-13.2	0.05
MW-27	7/20/2007		-83	0.5	-9.8	0.07
MW-29	7/22/2007		-107	2.0	-13.3	0.00
MW-30	7/25/2007		-95	0.3	-11.7	0.09
MW-31	7/25/2007		-95	1.1	-11.9	0.22
TC1	7/19/2007		n/a		n/a	
Slimes Drain	7/19/2007		n/a		n/a	
TC3	7/19/2007		-12	7.9	4.9	0.92
WP2	7/18/2007		-45	1.9	-1.3	0.15
WP3	7/18/2007		-60	0.3	-5.3	0.14

n/a -- indicates samples were not analyzed by contract laboratory