Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LWRTRT-Pipe	Retort Water	RT-1	Upper Manhole	Retort Water	RW-1	RW-2	Retort Water	Retort Water	Retort Water	LW-RETORT
SampleDate		2/16/2000	10/26/2000	10/26/2000	10/26/2000	10/2/2002	10/2/2002	10/2/2002	10/3/2006	10/11/2007	3/19/2008	10/30/2008
Parameters	Units											
General Chemistry												
Alkalinity, Bicarbonate (as CaCO3)	mg/L	---	426	439	---	471	474	487	---	439	436	497
Alkalinity, Carbonate (as CaCO3)	mg/L	---	12.9	5 U	---	43.1	43	72	---	57.1	69.6	5 U
Alkalinity, Total (As CaCO3)	mg/L	---	439	439	---	515	517	559	521	496	506	497
Ammonia	mg/L	26 D	0.8 U	4 U	1.9	11.1	10.7	5.3	7 J	3.5	4.9 J	0.33 U J
Bromide	mg/L	---	240	---	---	0.2	0.2	0.22	---	240	0.24	0.23
Chemical Oxygen Demand (COD)	mg/L	---	135	---	---	167	94.3	67.2	---	142	171	16.7
Chloride	mg/L	---	75.9	---	---	72.7	72.1	77.6	87.8	94.6	86.1	94.2
Specific Conductivity	umhos/cm	1800	---	---	---	6870	6930	8370	---	7750	11200	10800
Cyanide (free)	mg/L	---	---	---	---	---	---	---	---	---	---	---
Fluoride	mg/L	3.5	13.7	14.8	---	---	---	---	8	---	---	---
Fluoride (dissolved)	mg/L	---	11.6	---	---	9.2	9.9	11	---	11.5	10.1	10
Hardness	mg/L	---	279	---	---	224	228	193	---	300	340	310
Nitrate (as N)	mg/L	---	0.8	0.74	---	0.05 U	0.05 U	0.05 U	U	0.05 U	0.05 U	0.05 U
Nitrite (as N)	mg/L	---	0.01 U	0.01 U	---	0.05 U	0.05 U	0.05 U	---	0.05 U	0.05 U	0.05 U
Oil and Grease, Total	mg/L	---	14.5	---	---	---	---	---	---	---	---	---
Oil and grease (HEM), polar	mg/L	---	---	---	---	---	---	---	---	---	---	---
Oil and grease (HEM), total	mg/L	---	---	---	---	4.9 U	---	4.9 U	15.8	4.8 U	11.4	4.7 U
pH	s.u.	8.3	---	---	---	8.7	8.8	8.8	---	8.6 J	8.6	8.4 J
Phenolics (Total)	mg/L	---	50 U	---	---	0.034	---	---	93 J	0.046	0.058 J	0.065
Phosphorus as P, total	mg/L	---	0.15	---	---	0.1 U	0.1 U	0.1 U	---	0.1 U	0.1 U	0.081 J
Silica	mg/L	---	20700	---	---	---	---	---	---	---	11200	---
Sulfate	mg/L	---	3920	---	1810	3110	2770	3740	3790	4060	3650	3680
Sulfide	mg/L	---	---	---	---	---	---	---	---	---	---	23.4
Sulfite	mg/L	---	2 U	---	---	---	---	---	---	---	---	---
Thiocyanate	mg/L	---	1 U	---	---	---	---	---	---	---	---	---
Thiosulfate	mg/L	---	1 U	---	---	---	---	---	---	---	---	---
Total Dissolved Solids (TDS)	mg/L	---	6660	---	---	5350	5290	6380	6180	1470	5990	5730
Nitrogen, Total Kjeldahl	mg/L	---	---	---	---	---	---	---	---	5.8	4.5	10.1
Total Organic Carbon (TOC)	mg/L	---	---	---	---	22.8	---	---	---	---	35.5	24.3
Total Suspended Solids (TSS)	mg/L	---	179	---	---	---	---	---	---	4 U	4.8	2.4 J
Dissolved Organic Carbon (DOC)	mg/L	---	40 U	---	---	23.8	---	---	---	1.4	35.7	24.4

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LWRTRT-Pipe	Retort Water	RT-1	Upper Manhole	Retort Water	RW-1	RW-2	Retort Water	Retort Water	Retort Water	LW-RETORT
SampleDate		2/16/2000	10/26/2000	10/26/2000	10/26/2000	10/2/2002	10/2/2002	10/2/2002	10/3/2006	10/11/2007	3/19/2008	10/30/2008
Parameters	Units											
Metals												
Arsenic	ug/L	20	75.2	314	---	28.9	24.9	47.7	---	---	---	33.6
Arsenic (Dissolved)	ug/L	---	128	---	---	---	---	---	25.2	24.9	34.7	---
Boron	ug/L	6700	12900 E	13600 E	---	---	---	---	129000	---	---	---
Boron (Dissolved)	ug/L	---	13500 E	---	---	12800 J	12500 J	13600 J	---	10400	12600	9620
Cadmium	ug/L	2 U	2.4	3.9	---	---	---	---	---	---	---	---
Cadmium (Dissolved)	ug/L	---	2.3	---	---	0.75	0.68	0.64	---	1 U	1 U	0.68 J
Calcium	ug/L	---	---	---	---	---	---	---	61500 J	---	---	---
Calcium (Dissolved)	ug/L	---	68400	---	---	37300	37100	37100	---	51100	60100	49900
Chromium	ug/L	---	0.6 U	0.6 U	---	---	---	---	---	2 U	---	0.38 J
Chromium (Dissolved)	ug/L	---	1.1	---	---	18.6	15.4	19.5	---	0.36 J	0.26	0.67 J
Chromium III	ug/L	---	10 U	---	---	---	---	---	---	---	---	---
Chromium VI	ug/L	---	0.05 U	---	---	10 U	10 U	10 U	---	---	---	---
Copper	ug/L	---	3	16.9	---	---	---	---	---	---	---	---
Copper (Dissolved)	ug/L	---	3.1	---	---	13.5	14	16.4	---	12.1	2.1	5.9
Iron	ug/L	---	13900 E	54800 E	---	741 J	922 J	206 U	---	403	604	110
Iron (Dissolved)	ug/L	---	16800 E	---	---	---	---	---	---	280	114	235
Lead	ug/L	---	1.3	3.6	---	---	---	---	---	---	---	---
Lead (Dissolved)	ug/L	---	1.6	---	---	1 U	1 U	0.12	---	0.63 J	0.089 J	1 U
Lithium	ug/L	---	491 J	407 J	---	---	---	---	---	---	---	---
Lithium (Dissolved)	ug/L	---	582 J	---	---	355	349	367	---	435	489	503
Magnesium	ug/L	---	26700 E	28300 E	---	---	---	---	47200 J	---	---	---
Magnesium (Dissolved)	ug/L	---	26300 E	---	---	30700 J	30100 J	22200 J	---	34100	43300	36300
Manganese	ug/L	---	38	62.1	---	---	---	---	---	---	---	---
Manganese (Dissolved)	ug/L	---	42.1	---	---	70.5	83	13.9	---	19.4	15.4	14.8
Mercury	ug/L	---	0.12 U	0.12 U	---	0.2 U	0.2 U	0.2 U	---	---	---	---
Mercury (Dissolved)	ug/L	---	0.12 U	---	---	---	---	---	---	0.2 U	0.2 U	0.2 U
Molybdenum (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Nickel	ug/L	---	3.7	6.4	---	---	---	---	---	---	---	---
Nickel (Dissolved)	ug/L	---	3.9	---	---	0.37	0.29	0.17	---	---	---	---
Potassium	ug/L	---	167000 E	1160000 E	---	---	---	---	559000 J	---	---	---
Potassium (Dissolved)	ug/L	---	858000 E	---	---	754000	743000	917000	---	978000	711000	943000
Selenium	ug/L	---	15.1	57.7	---	---	---	---	3.1 B	---	---	---
Selenium (Dissolved)	ug/L	---	11.8	---	---	14.2 J	14 J	18.6 J	---	3.9 J	5.4	4.6 J

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LWRTRT-Pipe	Retort Water	RT-1	Upper Manhole	Retort Water	RW-1	RW-2	Retort Water	Retort Water	Retort Water	LW-RETORT
SampleDate		2/16/2000	10/26/2000	10/26/2000	10/26/2000	10/2/2002	10/2/2002	10/2/2002	10/3/2006	10/11/2007	3/19/2008	10/30/2008
Parameters	Units											
Metals												
Silicon	ug/L											
Silicon (Dissolved)	ug/L	---	---	---	---	11700 J	11400 J	12800 J	---	---	12200	10100
Silver	ug/L	5 U	0.05 U	0.05 U	---	---	---	---	---	---	---	---
Silver (Dissolved)	ug/L	---	0.03 U	---	---	0.049 J	0.028 J	1 U	---	---	---	---
Sodium	ug/L	---	---	---	---	---	---	---	1450000 J	---	---	---
Sodium (Dissolved)	ug/L	---	1070000	---	---	1160000	1140000	1320000	---	740000	1430000	1320000
Strontium	ug/L	---	1300 J	2150 J	---	---	---	---	---	---	---	---
Strontium (Dissolved)	ug/L	---	998 J	---	---	1450	1440	1480	---	1700	1970	1700
Uranium (Dissolved)	ug/L	---	---	---	---	1.6 J	1.5 J	1.7 J	---	---	---	---
Zinc	ug/L	---	4.9	18 U	---	---	---	---	---	---	---	---
Zinc (Dissolved)	ug/L	---	10.6	---	---	1.9	1.8	2.3	---	5.9	4.5 B	14.8 U
Volatile Organic Compounds - BTEX												
Benzene	ug/L	47 D	0.52 J	0.51 J	0.52 J	5.3	5.5	0.47 J	3.0	2.6	1.5	3.5
Ethylbenzene	ug/L	11 D	0.37 J	0.36 J	0.35 J	1.5	1.6	0.23 J	1.2	1.2	0.59 J	1.8
Toluene	ug/L	2 U	0.33 J	0.33 J	0.37 J	0.36 J	0.38 J	0.24 J	3.0	1.4	0.6 J	2.6
Xylenes, Total	ug/L	46 D	0.94 J	0.91 J	1 J	6.3	6.6	0.64 J	7.9	8.2	3.4	12
Petroleum Products												
Diesel fuel	mg/L	---	---	---	---	---	---	---	---	---	---	---
TPH - Extractable	mg/L	---	---	---	---	4.9	---	5.1	7.3	0.36	---	5
TPH (non-polar)	mg/L	---	---	---	---	4.9	---	5.1	7.3	0.36	26	5
TPH (C21 - C28)	mg/L	---	16	---	---	---	---	---	---	---	---	---
Radiology												
Gross Alpha Analytes	pci/l	---	180 + or - 95	---	---	---	---	---	---	---	---	---
Gross Beta Analytes	pci/l	---	650 + or - 80	---	---	---	---	---	---	---	---	---
Field Parameters												
Specific Conductivity, field	uS/cm	---	---	---	---	---	---	---	---	---	---	---
Dissolved oxygen (DO), field	mg/L	---	---	---	---	---	---	---	---	---	---	---
Oxidation reduction potential (ORP), field	millivolts	---	---	---	---	---	---	---	---	---	---	---
pH, field	s.u.	---	---	---	---	---	---	---	---	---	---	---
Temperature, ambient	Deg F	---	---	---	---	---	---	---	---	---	---	---
Temperature, field	Deg C	---	---	---	---	---	---	---	---	---	---	---
Turbidity, field	NTU	---	---	---	---	---	---	---	---	---	---	---

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-RETORT	LW-RETORT	Settling Pond	LW-005	LW-RETORT	LW-RETORT	LW-RETORT	LW-RETORT	LW-RETORT	LW-RETORT	LW-RETORT
SampleDate		6/3/2009	11/5/2009	11/5/2009	6/2/2010	6/2/2010	11/22/2010	5/11/2011	10/19/2011	6/14/2012	10/24/2012	5/28/2013
Parameters	Units											
General Chemistry												
Alkalinity, Bicarbonate (as CaCO3)	mg/L	557	470	435	474	485	457	515	440	470	410 J	420
Alkalinity, Carbonate (as CaCO3)	mg/L	34.4	46.1	30.5	58.7	58.9	67.8	33.3	70	46	61 J	59
Alkalinity, Total (As CaCO3)	mg/L	592	516	465	532	543	525	572	510	520	470 J	480
Ammonia	mg/L	5.7	5.9	2.3	7.9	5.4	3.5	3.8	3.1	3.6	2.8 J	2.8
Bromide	mg/L	0.2 U	0.2 U J	0.2 U J	2 U	2 U	0.2 U	1 U	2 U	1 U	2.5 U	2.5 U
Chemical Oxygen Demand (COD)	mg/L	138	106	73.4	128	112	267	150	120	110	120 J	100
Chloride	mg/L	73.2	87.9	97	59.5	58.9	65.8	87.3	68	85	75	80
Specific Conductivity	umhos/cm	12500	11300	11500	10500	10300	11000	10000	12000	11000	13000 J	9900
Cyanide (free)	mg/L	---	---	---	---	---	---	---	---	---	---	---
Fluoride	mg/L	---	---	---	---	---	---	---	---	---	---	---
Fluoride (dissolved)	mg/L	13.4	12.6	12.3	9.4	9.3	10.1	12	10	9.9	10	9.7
Hardness	mg/L	352	300	340	320	310	300	400	300	330	330	320
Nitrate (as N)	mg/L	0.05 U	0.05 U	0.98	0.5 U	0.5 U	0.05 U	0.25 U	0.5 U	0.25 U	1 U J	0.5 U
Nitrite (as N)	mg/L	0.031 J	2.5 U J	2.5 U J	0.5 U	0.5 U	0.46	2.5 U	0.5 U	0.25 U	0.25 U J	0.25 U
Oil and Grease, Total	mg/L	---	---	---	---	---	---	---	---	---	---	---
Oil and grease (HEM), polar	mg/L	---	---	---	---	---	---	---	22	10	5 J	4.7 U
Oil and grease (HEM), total	mg/L	4.7 U	11.5	4.8 U	48.8 J	6.8 J	38.5	558	---	---	---	---
pH	s.u.	8.5 J	8.6 J	8.5 J	8.7 J	8.6 J	8.6 J	8.5 J	8.26 J	8.53 J	8.76 J	8.16 J
Phenolics (Total)	mg/L	0.1	0.069	0.018	0.071 J	0.07 J	0.072	0.1	0.06	0.066	0.071 J	0.044
Phosphorus as P, total	mg/L	0.1 U	0.045 J	0.07 J	0.1 U	0.1 U	0.1 U	0.031 J	0.1 U	0.045 J	0.038 J	0.058 J
Silica	mg/L	---	---	---	---	---	---	---	---	---	---	---
Sulfate	mg/L	3930	4150	4140	3980	4210	3310	3820	3600	3700	3600 J	3900
Sulfide	mg/L	5.8	5	2.4 J	5.5	6.4	14.3	18.5	46	20	20 J	46
Sulfite	mg/L	---	---	---	---	---	---	---	---	---	---	---
Thiocyanate	mg/L	---	---	---	---	---	---	---	---	---	---	---
Thiosulfate	mg/L	---	---	---	---	---	---	---	---	---	---	---
Total Dissolved Solids (TDS)	mg/L	6930	5360	7200	7010	6690	6580	1520	6900	6500	6000 J	6100
Nitrogen, Total Kjeldahl	mg/L	11.2	10.4	7.1	7.9	7.3	7.2	11.5	4.6 J	5.6	5.0 J	5.1
Total Organic Carbon (TOC)	mg/L	27.5	31.7	23.9	70.6	240	45.7	21.7	20	20	17 J	13
Total Suspended Solids (TSS)	mg/L	8.8	4 U	2.8 J	11.6 J	5.2 J	100	4 U	16	4 U	4 U J	2 U
Dissolved Organic Carbon (DOC)	mg/L	22	23.3 J	24.2 J	20.9	20.9	21.3	20.6	19	17	17 J	17

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-RETORT	LW-RETORT	Settling Pond	LW-005	LW-RETORT	LW-RETORT	LW-RETORT	LW-RETORT	LW-RETORT	LW-RETORT	LW-RETORT
SampleDate		6/3/2009	11/5/2009	11/5/2009	6/2/2010	6/2/2010	11/22/2010	5/11/2011	10/19/2011	6/14/2012	10/24/2012	5/28/2013
Parameters	Units											
Metals												
Arsenic	ug/L	34.6	39.6 J	35.9	26.5	30.4	31.3	19.2	25	39	37	28
Arsenic (Dissolved)	ug/L	29.2	29.2	37.1 J	28.6	25.7	12.1	29.5	31	36	32	36 J
Boron	ug/L	---	---	---	---	---	---	---	---	---	---	---
Boron (Dissolved)	ug/L	11800	11500 J	---	10700	11100	11000	10600	11000	11000	9500	13000 J
Cadmium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Cadmium (Dissolved)	ug/L	1 U	0.23 J	11500 J	1 U	0.2 J	1 U	0.28 J	1 U	0.2 J	0.12 J	0.64 J
Calcium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Calcium (Dissolved)	ug/L	52100	50600 J	54600 J	49600	51500	49500	48100	52000	57000	50000	68000 J
Chromium	ug/L	0.41 J	2 U	2 U J	2 U	0.19 J	2 U	0.24 J	0.91 J	0.18 J	2 U	10 U
Chromium (Dissolved)	ug/L	0.46 J	2 U J	2 U J	0.26 J	0.25 J	0.27 J	0.2 J	2 U	2 U	2 U	10 U J
Chromium III	ug/L	---	---	---	---	---	---	---	---	---	---	---
Chromium VI	ug/L	---	---	---	---	---	---	---	---	---	---	---
Copper	ug/L	---	---	---	---	---	---	---	---	---	---	---
Copper (Dissolved)	ug/L	0.89 J	1.2 J	---	0.42 J	0.46 J	0.1 J	0.54 J	0.41 J	1.5 J	0.89 J	3.6 J
Iron	ug/L	154	112	174	273	70.9	206 J	132	150	130	80	110 J
Iron (Dissolved)	ug/L	75.3	5.1 J	33.1 J	50 U	50 U	3.9 J	50 U	46 J	37 J	15 J	250 U J
Lead	ug/L	---	---	---	---	---	---	---	---	---	---	---
Lead (Dissolved)	ug/L	0.065 J	1 U J	1 U J	0.025 J	0.02 J	1 U	1 U	1 U	1 U	1 U	5 U J
Lithium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Lithium (Dissolved)	ug/L	498	492 J	483 J	519	533	536	472	470	520	450	480 J
Magnesium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Magnesium (Dissolved)	ug/L	43600	42400 J	48700 J	36700	37700	46800	43400	41000	45000	37000	48000 J
Manganese	ug/L	---	---	---	---	---	---	---	---	---	---	---
Manganese (Dissolved)	ug/L	16.2	13.3 J	17 J	11.5	11.7	11.2	11.4	13	11	7.8	9.1 J
Mercury	ug/L	---	---	---	---	---	---	---	---	---	---	---
Mercury (Dissolved)	ug/L	0.2 U	0.2 U J	0.2 U J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U J
Molybdenum (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Nickel	ug/L	---	---	---	---	---	---	---	---	---	---	---
Nickel (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Potassium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Potassium (Dissolved)	ug/L	939000	960000 J	950000 J	906000	904000	1050000	865000	950000	930000	890000	1100000 J
Selenium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Selenium (Dissolved)	ug/L	2.6 J	4.3 J	4.4 J	2.2 J	2.1 J	4.4 J	3.7 J	2.2 J	1.8 J	5 U	25 U J

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-RETORT	LW-RETORT	Settling Pond	LW-005	LW-RETORT	LW-RETORT	LW-RETORT	LW-RETORT	LW-RETORT	LW-RETORT	LW-RETORT
SampleDate		6/3/2009	11/5/2009	11/5/2009	6/2/2010	6/2/2010	11/22/2010	5/11/2011	10/19/2011	6/14/2012	10/24/2012	5/28/2013
Parameters	Units											
Metals												
Silicon	ug/L	---	---	---	---	---	---	---	---	---	---	---
Silicon (Dissolved)	ug/L	11800	10600 J	11200 J	9130	9270	12600	9590	9600	11000	9100	12000 J
Silver	ug/L	---	---	---	---	---	---	---	---	---	---	---
Silver (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Sodium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Sodium (Dissolved)	ug/L	1350000	1320000 J	1780 J	1310000	1310000	1460000	1250000	1300000	1400000	1300000	1700000 J
Strontium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Strontium (Dissolved)	ug/L	1790	1730 J	3.5 J	1690	1730	2170	1780	1800	2300	1900	2400 J
Uranium (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Zinc	ug/L	---	---	---	---	---	---	---	---	---	---	---
Zinc (Dissolved)	ug/L	4 J	2.3 J	3.5 J	1.6 J	1 J	2.6 J	2 J	5 U	5.4 U	5 U	25 U J
Volatile Organic Compounds - BTEX												
Benzene	ug/L	5.1	4.3	1 U	3.7	3.8	3.2	4.1	2.5	2.5	2.4 J	2.1
Ethylbenzene	ug/L	1.5	1.6	1 U	1.3	1.7	1.4	1.9	1.6	1.6	1.1 J	1.1
Toluene	ug/L	3.2	2.3	1 U	1.8	1.9	2.3	3.1	1.4	1.8	1 J	1.1
Xylenes, Total	ug/L	9.5	11	3 U	8.4	12	11	12	9.6	11	5.7 J	8.6
Petroleum Products												
Diesel fuel	mg/L	---	---	---	---	---	---	---	---	---	7.3 J	6.3
TPH - Extractable	mg/L	28	7.6	2.9	16 J	7.1 J	47	110	4.5	6.9	---	---
TPH (non-polar)	mg/L	28	7.6	2.9	16 J	7.1 J	47	110	4.5	6.9	---	---
TPH (C21 - C28)	mg/L	---	---	---	---	---	---	---	---	---	---	---
Radiology												
Gross Alpha Analytes	pci/l	---	---	---	---	---	---	---	---	---	---	---
Gross Beta Analytes	pci/l	---	---	---	---	---	---	---	---	---	---	---
Field Parameters												
Specific Conductivity, field	uS/cm	---	---	---	---	---	---	---	5590	5480	6008	8850
Dissolved oxygen (DO), field	mg/L	---	---	---	---	---	---	---	0.58	1.41	0.83	0.37
Oxidation reduction potential (ORP), field	millivolts	---	---	---	---	---	---	---	-182.9	-298	-256	-192.8
pH, field	s.u.	---	---	---	---	---	---	---	8.8	8.92	8.79	8.78
Temperature, ambient	Deg F	---	---	---	---	---	---	---	22	34	8.2	32
Temperature, field	Deg C	---	---	---	---	---	---	---	14.7	15	14.2	14.1
Turbidity, field	NTU	---	---	---	---	---	---	---	1.43	3.34	1.48	1.48

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-003 (DUP)	LW-RETORT	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)
SampleDate		5/28/2013	10/24/2013	5/21/2014	5/21/2014	10/22/2014	5/12/2015	5/12/2015	10/14/2015	10/14/2015	5/23/2016	5/23/2016
Parameters	Units											
General Chemistry												
Alkalinity, Bicarbonate (as CaCO3)	mg/L	460 J	540	690	680	580 B	410	500	370 B	277 B	354	372
Alkalinity, Carbonate (as CaCO3)	mg/L	410 J	45	120	610	5 U	100	390	76	390 B	21.5	26.9
Alkalinity, Total (As CaCO3)	mg/L	49 J	590	810	69	580 B	520	110	440 B	---	375	399
Ammonia	mg/L	3.9 J	4.8	5.7	6	3.2	2.8	3.2	2.6	2.8	1.7	1.69
Bromide	mg/L	2.5 U J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5 U	5 U	0.08 U	0.08 U
Chemical Oxygen Demand (COD)	mg/L	97 J	190	380	100	750	50	83	81	81	114	87.5
Chloride	mg/L	80 J	94	98	91	96	84	83	67	68	76.8	77.3
Specific Conductivity	umhos/cm	---	8800	8300	8400	8700	8500	8600	8700	---	85700	85100
Cyanide (free)	mg/L	---	---	---	---	---	---	---	---	---	---	---
Fluoride	mg/L	---	---	---	---	---	---	---	---	---	9.5	9.72
Fluoride (dissolved)	mg/L	9.6 J	10	14	8.7	10	10	10	8.7	8.9	---	---
Hardness	mg/L	330 J	370	410	390	400	330	310	340	340	332	336
Nitrate (as N)	mg/L	0.5 U J	0.5 U	0.5 U	0.5 U	0.035 J	0.64	0.5 U	1 U	1 U	0.023 U	0.023 U
Nitrite (as N)	mg/L	0.25 U J	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.5 U	0.5 U	0.028 U	0.028 U
Oil and Grease, Total	mg/L	---	---	---	---	560	---	---	---	---	---	---
Oil and grease (HEM), polar	mg/L	4.7 U J	20	14	4.7 U	---	3.4 J	2.9 J	1.6 J	4.1 U	---	---
Oil and grease (HEM), total	mg/L	---	---	---	---	---	---	---	---	---	1.38 J	1.74 J
pH	s.u.	0.00834 J	8.48 J	8.46 J	8.5 J	8.62 HF	8.44 J	8.58 J	8.74 HF	8.76 H F	8.25 J	7.36
Phenolics (Total)	mg/L	0.047 J	0.18	0.25	0.091	0.11	0.033	0.02065 U	0.058	0.031 U	0.014 U	0.046 U
Phosphorus as P, total	mg/L	0.062 J	0.075 J	0.11	0.067 J	1.2	0.056 J	0.087 J	0.077 J	0.059 J	0.064 J	0.054 J
Silica	mg/L	---	---	---	---	---	---	---	---	---	19.7	19.6
Sulfate	mg/L	4000 J	4000	3300	3800	4100	4200	4200	3500	3700	4120	4160
Sulfide	mg/L	38 J	58	110	55	3 U	46	45	46	50	0.34 J	1.32 J
Sulfite	mg/L	---	---	---	---	---	---	---	---	---	---	---
Thiocyanate	mg/L	---	---	---	---	---	---	---	---	---	---	---
Thiosulfate	mg/L	---	---	---	---	---	---	---	---	---	---	---
Total Dissolved Solids (TDS)	mg/L	6300 J	5800	5800	5700	6500	7100	7200	7100	7000	6740	6810
Nitrogen, Total Kjeldahl	mg/L	---	6.8	12	---	15	4.9 J	4.4 J	3.9 J	4.5 J	2.75	2.68
Total Organic Carbon (TOC)	mg/L	13 J	24	27	17	2.6	19	---	19	19	686	166
Total Suspended Solids (TSS)	mg/L	2 U J	7.2	22	2 U	1500	---	---	---	---	---	---
Dissolved Organic Carbon (DOC)	mg/L	13 J	24	25	23	19	20	20	19	18	118	74.8

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-003 (DUP)	LW-RETORT	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)
SampleDate		5/28/2013	10/24/2013	5/21/2014	5/21/2014	10/22/2014	5/12/2015	5/12/2015	10/14/2015	10/14/2015	5/23/2016	5/23/2016
Parameters	Units											
Metals												
Arsenic	ug/L	28	21	40	34	630	9.5 J	12 J	14	17	32.9	34.3
Arsenic (Dissolved)	ug/L	33 J	19	38	32	39	21 J	23 J	26	30	28.7	26.2
Boron	ug/L	---	---	---	---	---	---	---	---	---	---	---
Boron (Dissolved)	ug/L	12000 J	12000	13000	12000	10000 B	10000	11000	11000	11000	10800	11200
Cadmium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Cadmium (Dissolved)	ug/L	0.61 J	5 U	1 U	1 U	10 U	1 U	1 U	1.9 J	2.2 J	0.52 J	0.568 J
Calcium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Calcium (Dissolved)	ug/L	63000 J	65000	60000	60000	53000 B	53000	53000	58000 B	59000 B	65400	64700
Chromium	ug/L	10 U	2 U	0.77 J	0.79 J	4 J	2 U	2 U	20 U	20 U	0.32 U	0.320 U
Chromium (Dissolved)	ug/L	10 U J	10 U	0.79 J	0.57 J	20 U	2 U	2 U	20 U	20 U	0.32 U	0.320 U
Chromium III	ug/L	---	---	---	---	---	---	---	---	---	---	---
Chromium VI	ug/L	---	---	---	---	---	---	---	---	---	---	---
Copper	ug/L	---	---	---	---	---	---	---	---	---	---	---
Copper (Dissolved)	ug/L	3.6 J	6 J	0.55 J	0.63 J	20 U	1.4 J	1.4 J	7.3 J	7.3 J	16.2	0.412 J
Iron	ug/L	340	820	2900	180	200000	180	120	340 J	210 J	462	123
Iron (Dissolved)	ug/L	250 U J	250 U	50 U	50 U	500 U	9.1 J	12 J	500 U	500 U	227	15 U
Lead	ug/L	---	---	---	---	---	---	---	---	---	---	---
Lead (Dissolved)	ug/L	5 U J	5 U	1 U	1 U	10 U	1 U	1 U	10 U	10 U	1.63	0.26 U
Lithium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Lithium (Dissolved)	ug/L	490 J	520	520	530	530	500	500	550	540	518	513
Magnesium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Magnesium (Dissolved)	ug/L	44000 J	47000	70000	67000	39000 B	36000	37000	41000 B	41000 B	39300	39200
Manganese	ug/L	---	---	---	---	---	---	---	---	---	---	---
Manganese (Dissolved)	ug/L	8.7 J	13 J	1.2	12	12 JB	13	13	15 J	16 J	10.4	9.77
Mercury	ug/L	---	---	---	---	---	---	---	---	---	---	---
Mercury (Dissolved)	ug/L	0.2 U J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.037 JB	0.04 J B	0.049 U	0.0490 U
Molybdenum (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Nickel	ug/L	---	---	---	---	---	---	---	---	---	---	---
Nickel (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Potassium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Potassium (Dissolved)	ug/L	1100000 J	920000	760000	780000	870000	930000	920000	910000	940000	968000	994000
Selenium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Selenium (Dissolved)	ug/L	25 U J	6.6 J	2.9 J	3.2 J	50 U	4.5 J	4.1 J	3.6 J	4.8 J	3.18	2.75

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID SampleDate Parameters	Units	LW-003 (DUP) 5/28/2013	LW-RETORT 10/24/2013	LW-RETORT 5/21/2014	LW-003 (DUP) 5/21/2014	LW-RETORT 10/22/2014	LW-RETORT 5/12/2015	LW-003 (DUP) 5/12/2015	LW-RETORT 10/14/2015	LW-003 (DUP) 10/14/2015	LW-RETORT 5/23/2016	LW-003 (DUP) 5/23/2016
Metals												
Silicon	ug/L	---	---	---	---	---	---	---	---	---	9220	9160
Silicon (Dissolved)	ug/L	11000 J	8900	11000	11000	8100	7900	8400	8500	8800	---	---
Silver	ug/L	---	---	---	---	---	---	---	---	---	---	---
Silver (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Sodium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Sodium (Dissolved)	ug/L	1500000 J	1500000	1400000	1400000	1200000	1500000	1600000	1300000	1300000	1370000	1400000
Strontium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Strontium (Dissolved)	ug/L	2200 J	2600	2400	2300	1900	1600	1600	1900	2000	2100	2140
Uranium (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Zinc	ug/L	---	---	---	---	---	---	---	---	---	---	---
Zinc (Dissolved)	ug/L	25 U J	25 U	5 U	5 U	25 JB	1.1 J	1.5 J	15 JB	14 J B	163	2.39 U
Volatile Organic Compounds - BTEX												
Benzene	ug/L	2.1 J	6.7	10	3.5	0.75 J	4.9 J	3.6 J	5 U	5 U	1.22	1.21
Ethylbenzene	ug/L	1.4 J	1.9	3	2	1 U	3.6 J	3.1 J	5 U	5 U	0.85 J	0.825 J
Toluene	ug/L	1.2 J	7.6	12	3.7	1 U	5 U	5 U	5 U	5 U	0.78 U	0.780 U
Xylenes, Total	ug/L	9 J	16	21	14	1.2 J	24	19	10	9.7 J	4.38	4.14
Petroleum Products												
Diesel fuel	mg/L	5.2 J	15	39	5	1400	5.2	5.4	7.3	7	6.8	7.34
TPH - Extractable	mg/L	---	---	---	---	---	---	---	---	---	---	---
TPH (non-polar)	mg/L	---	---	---	---	---	---	---	---	---	---	---
TPH (C21 - C28)	mg/L	---	---	---	---	---	---	---	---	---	---	---
Radiology												
Gross Alpha Analytes	pci/l	---	---	---	---	---	---	---	---	---	---	---
Gross Beta Analytes	pci/l	---	---	---	---	---	---	---	---	---	---	---
Field Parameters												
Specific Conductivity, field	uS/cm	---	5690	9230	9500	9600	9730	9660	9670	9670	9550	9520
Dissolved oxygen (DO), field	mg/L	---	0.17	---	---	1.09	0.85	1.44	5.24	5.24	11.7	5.9
Oxidation reduction potential (ORP), field	millivolts	---	-281	-267	-190.1	-266	-226	-259	---	---	-256	-275
pH, field	s.u.	---	8.64	8.16	8.77	8.61	8.92	8.92	8.88	8.77	8.75	8.79
Temperature, ambient	Deg F	---	32	---	---	---	18	65	24	---	---	---
Temperature, field	Deg C	---	14	13.4	14.8	13.7	11.8	12.2	25	14.1	13.2	13.7
Turbidity, field	NTU	---	12.98	10.92	---	---	2.27	1.7	1.93	1.93	3.36	2.73

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT
SampleDate		10/4/2016	10/4/2016	5/1/2017	5/1/2017	10/3/2017	10/3/2017	5/29/2018	5/29/2018	10/22/2018	10/22/2018	05/22/2019
Parameters	Units											
General Chemistry												
Alkalinity, Bicarbonate (as CaCO3)	mg/L	352	334	307	309	324	348	337	353	346	347	351
Alkalinity, Carbonate (as CaCO3)	mg/L	61.6	64.7	54.8	55.2	79.3	34.2	36.3	14.3 J	10.9 J	11.6 J	2.71 U
Alkalinity, Total (As CaCO3)	mg/L	413 J	399 J	362	364	403	382	373	367	357	359	351
Ammonia	mg/L	2.65	1.85	1 U	1.49	1.52	1.5	0.798	0.802	1.24	1.22	1.02
Bromide	mg/L	R	R	7.9 U	7.9 U	0.079 U	0.079 U	1 U	1 U	3.95 U	3.95 U	990
Chemical Oxygen Demand (COD)	mg/L	102	12.9	173	78.2	75.3	89.4	162	125	53.8	3 U	156
Chloride	mg/L	80.4	80.5	79.1	83.5	84.5	84.4	83.2	83.3	79.7	80.1	79
Specific Conductivity	umhos/cm	8310	8260	8780	8800	9080	9040	9290	9280	9050	8990	9100
Cyanide (free)	mg/L	---	---	---	---	---	---	---	---	---	---	---
Fluoride	mg/L	8.87	8.9	8.53	8.73	8.37	8.49	9.57	9.62	9.95	9.99	---
Fluoride (dissolved)	mg/L	---	---	---	---	---	---	---	---	---	---	9.68
Hardness	mg/L	327	320	520	527	525 0	374	374	378	332	357	329
Nitrate (as N)	mg/L	0.023 U	0.023 U	2.27 UJ	2.27 UJ	0.0227 U	0.0227 U	0.1 U	0.1 U	0.0227 U	0.0227 U	0.0227 U
Nitrite (as N)	mg/L	0.028 U	0.028 U	0.0277 U	0.0277 U	0.0277 U	0.0277 U	0.1 U	0.1 U	0.0277 U	0.0277 U	0.0277 U
Oil and Grease, Total	mg/L	---	---	---	---	---	---	---	---	---	---	88.8
Oil and grease (HEM), polar	mg/L	---	---	---	---	---	---	---	---	---	---	---
Oil and grease (HEM), total	mg/L	3.58 J	1.160 U	157	12.5	25.3	3.51 J	54.5	434	589	327	---
pH	s.u.	8.43 J	8.73 J	8.60 J	8.61 J	8.48 J	8.69 J	8.77 T8	8.74 T8	8.68 J	8.65 J	8.75 J
Phenolics (Total)	mg/L	0.039 UJ	0.188 J	0.0309 J	0.0291 J	0.0137 U	0.0148 U	0.0387 J	0.033 J	0.0356 U	0.0352 U	0.0145 U
Phosphorus as P, total	mg/L	0.059 J	0.058 J	0.109	0.0744 J	0.0526 U	0.0686 U	0.0447 J	0.0414 J	0.344	0.314	0.0499 J
Silica	mg/L	19.6	19.6	15.6	15.8	15.7	16.3	15.9	15.5	15.2	14.4	16.4
Sulfate	mg/L	4010	3930	4090	4980	4400	4460	4570	4760	4660	4640	4840
Sulfide	mg/L	1.77	1.84	0.274	1.12	0.091	0.079	0.043 J	0.027 J	0.019 J	0.007 J	0.07
Sulfite	mg/L	---	---	---	---	---	---	---	---	---	---	---
Thiocyanate	mg/L	---	---	---	---	---	---	---	---	---	---	---
Thiosulfate	mg/L	---	---	---	---	---	---	---	---	---	---	---
Total Dissolved Solids (TDS)	mg/L	6250	6330	6280	6870	6890	5970	7080	6860	6950	7010	7360
Nitrogen, Total Kjeldahl	mg/L	2.98	2.99	3.81	2.85	2.46	2.38	2.18	2.51	3.64	5.28	3.03
Total Organic Carbon (TOC)	mg/L	25.4	16.9	17.7	16.2	19.7	18.1	25	25.1	20.7	20.1	16.6
Total Suspended Solids (TSS)	mg/L	---	---	---	---	---	---	---	---	---	---	---
Dissolved Organic Carbon (DOC)	mg/L	21.1	21.7	17.2	20.3	33.9	18.8	16.7	16.3	17.7	17.8	17.1

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT
SampleDate		10/4/2016	10/4/2016	5/1/2017	5/1/2017	10/3/2017	10/3/2017	5/29/2018	5/29/2018	10/22/2018	10/22/2018	05/22/2019
Parameters	Units											
Metals												
Arsenic	ug/L	45.6	50.8	34.1	23.7	36.3	38.2	32.1	30.5	73.5	49.4	44.6
Arsenic (Dissolved)	ug/L	32.2	43.0	35.0	37.8	34.9	28.1	29.1	29.4	63.3	60	38.3
Boron	ug/L	---	---	---	---	---	---	---	---	---	---	---
Boron (Dissolved)	ug/L	10800	11500	13600	11900	10100	9470	10500	10900	10600	10400	10000
Cadmium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Cadmium (Dissolved)	ug/L	0.26 J	0.335 J	0.230 J	0.220 U	4.4 U	4.4 U	0.318 J	0.393 J	0.220 U	0.220 U	0.391 J
Calcium	ug/L	---	---			---	---	---	---	---	---	---
Calcium (Dissolved)	ug/L	48600	70300	109000	112000	77200	78800	81200	80800	68300	68200	72900
Chromium	ug/L	0.32 U	0.320 U	0.320 U	0.320 U	0.32 U	0.32 U	1.00 U	1.00 U	1.72	0.744 J	0.406 J
Chromium (Dissolved)	ug/L	0.38 U	0.650 U	0.320 U	0.455 J	6.4 U	6.4 U	0.390 J	1.00 U	0.320 U	0.320 U	0.614 J
Chromium III	ug/L	---	---	---	---	---	---	---	---	---	---	---
Chromium VI	ug/L	---	---	---	---	---	---	---	---	---	---	---
Copper	ug/L	---	---	---	---	---	---	---	---	---	---	---
Copper (Dissolved)	ug/L	0.29 J	0.66 J	13.0	15.1	18.1 J	16.7 J	15.9	16.1	0.749 J	1.52	0.503 J
Iron	ug/L	250	228	1380	1030	19.1 J	2480	19.9 J	19.8 J	42700	1020	6440
Iron (Dissolved)	ug/L	15 U	22.1 J	20.6 J	36.4 J	300 U	300 U	21.0 B J	16.8 B J	157	89.2 J	15.0 U
Lead	ug/L	---	---	---	---	---	---	---	---	---	---	---
Lead (Dissolved)	ug/L	0.26 U	0.260 U	0.260 U	0.260 U	5.2 U	5.2 U	1.00 U	1.00 U	0.260 U	0.260 U	0.260 U
Lithium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Lithium (Dissolved)	ug/L	528	524	584	569	475	460	438	463	448	463	476
Magnesium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Magnesium (Dissolved)	ug/L	28200	39300	44400	45100	40900	40200	47100	46000	39300	38800	46500
Manganese	ug/L	---	---	---	---	---	---	---	---	---	---	---
Manganese (Dissolved)	ug/L	14.1	20.5	46.5	47.6	27.4 J	24.9 J	39.9	38.7	24	23.5	15.3
Mercury	ug/L	---	---	---	---	---	---	---	---	---	---	---
Mercury (Dissolved)	ug/L	0.049 U	0.0490 U	0.0490 U	0.0490 U	0.049 U	0.049 U	0.0673 B J	0.0636 B J	0.0490 U	0.0490 U	0.345
Molybdenum (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Nickel	ug/L	---	---	---	---	---	---	---	---	---	---	---
Nickel (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Potassium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Potassium (Dissolved)	ug/L	670000	963000	1270000	1130000	997000	984000	1100000	1070000	952000	933000	1150000
Selenium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Selenium (Dissolved)	ug/L	2.38	3.07	4.94	5.20	6.4 U	6.4 U	4.24	3.96	4.99	4.88	4.52

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT	LW-003 (DUP)	LW-RETORT
SampleDate		10/4/2016	10/4/2016	5/1/2017	5/1/2017	10/3/2017	10/3/2017	5/29/2018	5/29/2018	10/22/2018	10/22/2018	05/22/2019
Parameters	Units											
Metals												
Silicon	ug/L	9170	9170	7310	7360	7310	7630	7420	7220	7100	6720	7660
Silicon (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Silver	ug/L	---	---	---	---	---	---	---	---	---	---	---
Silver (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Sodium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Sodium (Dissolved)	ug/L	1560000	1370000	1770000	1570000	1330000	1310000	1520000	1480000	1440000	1390000	1610000
Strontium	ug/L	---	---	---	---	---	---	---	---	---	---	---
Strontium (Dissolved)	ug/L	1530	2400	2790	2900	2070	2080	2430	2560	2200	2250	2380
Uranium (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---
Zinc	ug/L	---	---	---	---	---	---	---	---	---	---	---
Zinc (Dissolved)	ug/L	4.24 J	15.6 J	2.39 J	3.67 J	38.2 U	38.2 U	10.0 U	10.0 U	2.89 J	3.46 J	2.38 J
Volatile Organic Compounds - BTEX												
Benzene	ug/L	1.9	1.85	1.44	1.47	1.59	1.67	1.15	1.17	1.23	1.16	1.78
Ethylbenzene	ug/L	0.92 J	0.845 J	0.857 J	0.807 J	0.732 J	0.743 J	0.484 J	0.501 J	0.427 J	0.436 J	0.448 J
Toluene	ug/L	0.78 U	0.780 U	0.419 J	0.432 J	0.425 J	0.417 J	1.00 U	1.00 U	0.412 U	0.412 U	0.412 U
Xylenes, Total	ug/L	4.86	4.56	4.56	4.38	3.21	3.24	1.57 J	1.55 J	1.37 J	1.38 J	1.35 J
Petroleum Products												
Diesel fuel	mg/L	5.2	4.34	5.9	9.55	5.11	5.7	24.3	3.41	9.55	6.9	5.64
TPH - Extractable	mg/L	---	---	---	---	---	---	---	---	---	---	---
TPH (non-polar)	mg/L	---	---	---	---	---	---	---	---	---	---	---
TPH (C21 - C28)	mg/L	---	---	---	---	---	---	---	---	---	---	---
Radiology												
Gross Alpha Analytes	pci/l	---	---	---	---	---	---	---	---	---	---	---
Gross Beta Analytes	pci/l	---	---	---	---	---	---	---	---	---	---	---
Field Parameters												
Specific Conductivity, field	uS/cm	8740	8870	8840	8730	9200	9130	8847	8791	8556	8577	9018
Dissolved oxygen (DO), field	mg/L	1.26	1.14	--	6	27.0	28.6	NM	NM	1.46	2.58	1.05
Oxidation reduction potential (ORP), field	millivolts	-220	-249	-166.4	-199.6	-240	-242	-208.9	-241.9	-228.1	-232.5	-256.6
pH, field	s.u.	8.75	8.87	8.67	8.8	8.55	8.65	7.6	7.58	8.53	8.3	9.42
Temperature, ambient	Deg F	---	---	60	60	12.8	12.8	---	---	---	---	60
Temperature, field	Deg C	13.8	13.4	13.4	12.8	12.9	12.9	14.1	14.1	14.1	14.4	11.1
Turbidity, field	NTU	3.17	3.29	11.75	7.31	7.97	7.01	0.79	15.65	6.4	60.5	19.41

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-003 (Dup)	LW-RETORT	LW-RETORT	LW-003 (Dup)	LW-RETORT	LW-003 (Dup)	LW-RETORT	LW-RETORT	LW-003 (Dup)	LW-003 (Dup)
SampleDate		05/22/2019	10/09/2019	5/26/2020	5/26/2020	10/7/2020	10/7/2020	5/5/2021	10/20/2021	5/5/2021	10/20/2021
Parameters	Units										
General Chemistry											
Alkalinity, Bicarbonate (as CaCO3)	mg/L	353	408	362	371	385	398	367	353	382	380
Alkalinity, Carbonate (as CaCO3)	mg/L	2.71 U	2.71 U	21.8 P1	11.4 J	31.7	8.45 U	56.4	81.2	29.7	68.1
Alkalinity, Total (As CaCO3)	mg/L	353	409	384	382	417	402	423	434	412	448
Ammonia	mg/L	0.997	1.91	1.05	1.09	2.09	2.02	1.22	1.43	1.18	1.64
Bromide	mg/L	923	7.45 J	17.6 U	17.6 U	17.6 U	17.6 U	3.53 U	3.53 U	3.53 U	3.53 U
Chemical Oxygen Demand (COD)	mg/L	102	---	---	---						
Chloride	mg/L	79.3	87.9	82.6	82.6	91.1	91.4	82.2	93.2	83.7	93.7
Specific Conductivity	umhos/cm	9140	7940	9170	9300	9200	9180	9400	9470	9560	9450
Cyanide (free)	mg/L	---	---	---	---						
Fluoride	mg/L	---	---	---	---						
Fluoride (dissolved)	mg/L	9.71	9.65	9.13	9.09	9.93	9.95	9.67	11.5	9.85	11.4
Hardness	mg/L	338	332 B	316	343	332	335	315		305	
Nitrate (as N)	mg/L	0.0227 U	0.0227 U	0.048 U	0.048 U	0.048 U	0.048U	0.48 U	0.48 U	0.48 U	0.48 U
Nitrite (as N)	mg/L	0.0704 J	0.0277 U	0.042 U	0.042 U	0.042 U	0.042U	0.42 U	0.42 U	0.42 U	0.42 U
Oil and Grease, Total	mg/L	16.9	2.56 J	2.07 J	3.82 J						
Oil and grease (HEM), polar	mg/L	---	---	---	---						
Oil and grease (HEM), total	mg/L	---	---	---	---						
pH	s.u.	8.92 J	8.76 T8	8.43 T8	8.4 T8	8.72 T8	8.75 T8	8.65	8.43	8.74	8.48
Phenolics (Total)	mg/L	0.0425 U	0.0385 B	0.011 B,J	0.0146 B,J	0.0636	0.061 B	0.0229	0.00902	0.0083 U	18.7
Phosphorus as P, total	mg/L	0.054 J	0.035 U	0.286 B	0.0483 B,J	0.04	0.0539 J	0.035 U	0.0479	0.035 U	0.0549
Silica	mg/L	18.1	16.1	16.4	15.6	15.5	14.7	19.2	20	19.6	19.8
Sulfate	mg/L	4620	4730	4540	4530	4110	4110	4660	4670	4820	4570
Sulfide	mg/L	0.059	0.026 J	0.722	0.775	0.056	0.058	0.025 U	0.025 U	0.025 U	0.025 U
Sulfite	mg/L	---	---	---	---						
Thiocyanate	mg/L	---	---	---	---						
Thiosulfate	mg/L	---	---	---	---						
Total Dissolved Solids (TDS)	mg/L	7400	7290	5800	5720	7440	7360	7340	7200	7300	7140
Nitrogen, Total Kjeldahl	mg/L	2.85	---	---	---						
Total Organic Carbon (TOC)	mg/L	16	17.4	17.6	17.6	15.7	15.8	13.8	14.1	15.5	14.5
Total Suspended Solids (TSS)	mg/L	---	1.4 J	10.8	43	14.5	3.2 J	3.47	2.5 U	5.85	2.5 U
Dissolved Organic Carbon (DOC)	mg/L	16.9	---	---	---						

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-003 (Dup)	LW-RETORT	LW-RETORT	LW-003 (Dup)	LW-RETORT	LW-003 (Dup)	LW-RETORT	LW-RETORT	LW-003 (Dup)	LW-003 (Dup)
SampleDate		05/22/2019	10/09/2019	5/26/2020	5/26/2020	10/7/2020	10/7/2020	5/5/2021	10/20/2021	5/5/2021	10/20/2021
Parameters	Units										
Metals											
Arsenic	ug/L	44.3	---	---	---						
Arsenic (Dissolved)	ug/L	35.4	29.5	35.7	33.1	1.21	1.24	35.2	3.2	37.3	2.13
Boron	ug/L	---	---	---	---						
Boron (Dissolved)	ug/L	11100	12000	11300	11200	12200	12200	11100	11600	10900	11600
Cadmium	ug/L	---	---	---	---						
Cadmium (Dissolved)	ug/L	0.396 J	63400	---	---						
Calcium	ug/L	---	---	55500	60100	53500	53900	54000		52100	
Calcium (Dissolved)	ug/L	69200	---	61100	61000	59000	58400	61000	55000	58500	54700
Chromium	ug/L	0.518 J	---	---	---						
Chromium (Dissolved)	ug/L	0.716 J	---	---	---						
Chromium III	ug/L	---	---	---	---						
Chromium VI	ug/L	---	---	---	---						
Copper	ug/L	---	---	---	---						
Copper (Dissolved)	ug/L	0.587 J	---	---	---						
Iron	ug/L	7310	---	---	---						
Iron (Dissolved)	ug/L	15.0 U	17.8 J	44.7 U	44.7 U	44.7 U	44.7 U	44.7 U	44.7 U	44.7 U	44.7 U
Lead	ug/L	---	---	---	---						
Lead (Dissolved)	ug/L	0.260 U	---	---	---						
Lithium	ug/L	---	---	---	---						
Lithium (Dissolved)	ug/L	471	---	---	---						
Magnesium	ug/L	---	---	43000	46900	48200	48700	43800		42600	
Magnesium (Dissolved)	ug/L	46000	44400	43700	44000	47400	46700	43700	39500	45100	40400
Manganese	ug/L	---	---	---	---						
Manganese (Dissolved)	ug/L	15.1	---	---	---						
Mercury	ug/L	---	---	---	---						
Mercury (Dissolved)	ug/L	0.397	---	---	---						
Molybdenum (Dissolved)	ug/L	---	---	---	---						
Nickel	ug/L	---	---	---	---						
Nickel (Dissolved)	ug/L	---	---	---	---						
Potassium	ug/L	---	---	---	---						
Potassium (Dissolved)	ug/L	1060000	941000	1040000	1010000	1020000	1020000	1090000	1070000	1070000	1030000
Selenium	ug/L	---	---	---	---						
Selenium (Dissolved)	ug/L	4.56	2.95	4.59	4.22	1.03 J	0.938 J	4.81	1.38	6.16	1.28

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-003 (Dup)	LW-RETORT	LW-RETORT	LW-003 (Dup)	LW-RETORT	LW-003 (Dup)	LW-RETORT	LW-RETORT	LW-003 (Dup)	LW-003 (Dup)
SampleDate		05/22/2019	10/09/2019	5/26/2020	5/26/2020	10/7/2020	10/7/2020	5/5/2021	10/20/2021	5/5/2021	10/20/2021
Parameters	Units										
Metals											
Silicon	ug/L	8480	7540	7670	7280	7250	6890	8990	9350	9160	9230
Silicon (Dissolved)	ug/L	---	---	---	---						
Silver	ug/L	---	---	---	---						
Silver (Dissolved)	ug/L	---	---	---	---						
Sodium	ug/L	---	---	---	---						
Sodium (Dissolved)	ug/L	1460000	1290000	1480000	1450000	1490000	1430000	1430000	1370000	1390000	1340000
Strontium	ug/L	---	---	---	---						
Strontium (Dissolved)	ug/L	2140	---	---	---						
Uranium (Dissolved)	ug/L	---	---	---	---						
Zinc	ug/L	---	---	---	---						
Zinc (Dissolved)	ug/L	3.13 J	---	---	---						
Volatile Organic Compounds - BTEX											
Benzene	ug/L	1.82	2.93	1.75	1.73	3.22	2.9	1.77	1.55	1.65	1.88
Ethylbenzene	ug/L	0.443 J	0.922 J	0.897 J	0.664 J	1.13	1.13	0.803	0.815	0.813	0.863
Toluene	ug/L	0.412 U	1.03	0.278 U	0.278 U	1.74	1.52	0.278 U	0.278 U	0.278 U	0.473
Xylenes, Total	ug/L	1.49 J	2.81 J	1.43 J	1.4 J	3.3	3.34	1.54	1.67	1.55	1.94
Petroleum Products											
Diesel fuel	mg/L	4.17	4.6	3.93	3.28	4.48	4.06	3.99	7.18	4.29	4.35
TPH - Extractable	mg/L	---	---	---	---						
TPH (non-polar)	mg/L	---	---	---	---						
TPH (C21 - C28)	mg/L	---	---	---	---						
Radiology											
Gross Alpha Analytes	pci/l	---	---	---	---						
Gross Beta Analytes	pci/l	---	---	---	---						
Field Parameters											
Specific Conductivity, field	uS/cm	9058	9387	9156	9108	9873	9841	8901	8901	9125	9886
Dissolved oxygen (DO), field	mg/L	1.03	0.42	0.99	0.87	1.78	0.81	1.14	1	1.46	1.05
Oxidation reduction potential (ORP), field	millivolts	-244.5	-229.8	-254.8	-227	-211.6	-291.3	-193.8	-110.7	-249.4	-114.9
pH, field	s.u.	9.37	8.62	8.75	8.77	8.75	8.61	8.77	8.59	8.81	8.49
Temperature, ambient	Deg F	60	60	60	60	60	60	60	45	60	45
Temperature, field	Deg C	10.3	14.1	13.2	13.6	14.1	13.6	11.9	12.1	11.7	13.3
Turbidity, field	NTU	22.04	3.99	5.07	7.26	5.94	5.84	5.78	3.2	6.48	2.8

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM
SampleDate		5/13/2015	10/14/2015	5/23/2016	10/4/2016	5/1/2017	10/3/2017	5/29/2018	10/22/2018	05/20/2019	10/09/2019	6/4/2020	10/7/2020
Parameters	Units												
General Chemistry													
Alkalinity, Bicarbonate (as CaCO3)	mg/L	490	410 B	391	391	342	374	348	350	350	363	363	3.82
Alkalinity, Carbonate (as CaCO3)	mg/L	5 U	5 U	2.71 U	2.71 U	2.71 U	7.7 J	20 U	2.71 U	2.71 U	14 J	8.45 U	8.45 U
Alkalinity, Total (As CaCO3)	mg/L	490	410 B	391	391 J	342	382	348	350	350	377	363	3.85
Ammonia	mg/L	0.1	0.1 U	0.038 U	0.038 U	0.05 U	0.0317 U	0.1 U	0.0317 U	0.0317 U	0.0317 U	0.117 U	.117 U
Bromide	mg/L	2.5 U	5 U	0.079 U	R	7.9 U	0.079 U	1 U	3.95 U	3.95 U	7.9 U	3.53 U	3.53 U
Chemical Oxygen Demand (COD)	mg/L	30	39	49.9	83.9	41.2	44.3	38.4	3 U	45.8	---	---	
Chloride	mg/L	80	66	78.8	82.4	81.8	86.4	82.9	80.4	79.7	84.6	81.3	87.2
Specific Conductivity	umhos/cm	8500	8700	86000	8300	8760	8920	9310	9000	27900	8480	9360	9210
Cyanide (free)	mg/L	---	---	---	---	---	---	---	---	---	---	---	
Fluoride	mg/L	---	---	9.6	8.95	8.81	8.57	9.55	9.99	---	---	---	
Fluoride (dissolved)	mg/L	10	8.7	---	---	---	---	---	---	9.78	9.79	8.48	10.2
Hardness	mg/L	350	330	351	325	526	376	396	330	364	303 B	326	318
Nitrate (as N)	mg/L	3	2.1	0.0227 U	0.0227 U	2.27 U	1.01	0.1 U	0.807	0.785	0.0227 U	0.048 U	1.01 U
Nitrite (as N)	mg/L	0.25 U	0.24 U	0.0277 U	0.0227 U	0.0277 U	0.0277 U	0.1 U	0.0277 U	0.0277 U	0.0277 U	0.0579 J	0.42 U
Oil and Grease, Total	mg/L	---		---	---	---	---	---	---	2.33 J	1.3 U	2.35 J	
Oil and grease (HEM), polar	mg/L	4.7 U		---	---	---	---	---	---	---	---	---	
Oil and grease (HEM), total	mg/L	---		1.86 J	1.16 U	1.16 U	1.16 U	5.56 U	1.16 U	---	---	---	
pH	s.u.	8.04 J	8.1	7.36 J	8.22 J	8.36 J	8.15 T8	7.75 T8	7.93 J	7.79 J	8.11 T8	8.1 T8	8.18 T8
Phenolics (Total)	mg/L	0.027	0.024	0.0188 U	0.0215 U	0.0142 J	0.0083 U	0.00934 J	0.012 U	0.0083 U	0.0101 B	0.0083 U	0.0154 BJ
Phosphorus as P, total	mg/L	0.055 J	0.071	0.0814 J	0.0541 J	0.0738 J	0.0737 B J	0.1 U	0.14 U	0.035 U	0.0564 J	0.0706 J	0.0903 J
Silica	mg/L	---		19.6	19.6	17.4	17.2	14.6	15	18.2	17	17.1	170
Sulfate	mg/L	4000	3600	4020	4100	4830	4580	4580	4330	4330	4950	4360	43300
Sulfide	mg/L	1.8 J	0.47 U	0.0065 U	0.0065 U	0.0065 U	0.0065 U	0.05 U	0.0065 U	0.0065 U	0.0065 U	0.025 U	0.025 J
Sulfite	mg/L	---		---	---	---	---	---	---	---	---	---	
Thiocyanate	mg/L	---		---	---	---	---	---	---	---	---	---	
Thiosulfate	mg/L	---		---	---	---	---	---	---	---	---	---	
Total Dissolved Solids (TDS)	mg/L	6900	7000	6770	6470	7460	5860	7040	6980	7260	7470000 4	7380	7380
Nitrogen, Total Kjeldahl	mg/L	3.3 J	1.7 J	1.21	1.1	1.16	1.26	0.979	1.22	1.03	---	---	
Total Organic Carbon (TOC)	mg/L	15	14	68.3	14	16.2	15.6	---	---	14.5	13.8	14.5	13.3
Total Suspended Solids (TSS)	mg/L	---	---	---	---	---	---	14.8	15.9	---	1.3 J	2.6	2.0 J
Dissolved Organic Carbon (DOC)	mg/L	15	24	20 J	17.2	15	15.6	13.9	15.1	13.6	---	---	

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM
SampleDate		5/13/2015	10/14/2015	5/23/2016	10/4/2016	5/1/2017	10/3/2017	5/29/2018	10/22/2018	05/20/2019	10/09/2019	6/4/2020	10/7/2020
Parameters	Units												
Metals													
Arsenic	ug/L	33	41	33.1	32.7	20.1	31.7	25.1	44.1	34.2	---	---	
Arsenic (Dissolved)	ug/L	33	39	34.7	29.5	20.5	28.1	25.8	41.3	44.6	40.8	50	12 J
Boron	ug/L	9600	11000	---	---	---	---	---	---	---	---	---	
Boron (Dissolved)	ug/L	---	---	11200	11200	11300	9690 V	11300	10900	8970	11400	11500	11900
Cadmium	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Cadmium (Dissolved)	ug/L	1 U	2.7 J	0.663 J	0.263 J	0.240 J	4.40 U	0.352 J	0.220 U	0.428 J	63700	---	
Calcium	ug/L	---	---	---	---	---	---	---	---	---	---	56600	51900
Calcium (Dissolved)	ug/L	55000	59000 B	74600	62600	107000	79800 V	82100	68000	70400	---	60300	14600 J
Chromium	ug/L	2 U	20 U	0.320 U	0.320 U	0.320 U	0.649 J	1.00 U	0.407 J	0.320 U	---	---	
Chromium (Dissolved)	ug/L	2 U	20 U	0.536 J	0.386 U	0.320 U	6.40 U	1.00 U	0.320 U	0.852 J	---	---	
Chromium III	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Chromium VI	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Copper	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Copper (Dissolved)	ug/L	1.6 J	6.8 J	1.02	0.270 U	14.4	19.5 J	16.2	0.631 J	0.467 J	---	---	
Iron	ug/L	61	81 J	67.5 J	105	46.3 J	67.9 J	19.1 J	89.2 J	31.6 J	---	---	
Iron (Dissolved)	ug/L	40 J	500 U	15.0 U	22.5 J	25.9 J	300 U	18.8 B J	55.2 J	27.8 U	27.9 J	263	2240 U
Lead	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Lead (Dissolved)	ug/L	1 U	10 U	0.260 U	0.260 U	1.01	5.20 U	1.00 U	0.260 U	0.260 U	---	---	
Lithium	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Lithium (Dissolved)	ug/L	480	530	510	525	607	469 O1	453 O1	455	462	---	---	
Magnesium	ug/L	---	---	---	---	---	---	---	---	---	---	44900	45800
Magnesium (Dissolved)	ug/L	38000	43000 B	46500	36500	46100	43300 V	46400	38100	47500	42400	43300	12300
Manganese	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Manganese (Dissolved)	ug/L	14	3.4 J	4.72 J	7.65	17.4	29.7 B J	18.7	37	18.4	---	---	
Mercury	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Mercury (Dissolved)	ug/L	0.2 U	0.034 JB	0.0490 U	0.0490 U	0.0490 U	0.0677 J	0.0605 B J	0.0490 U	0.0490 U	---	---	
Molybdenum (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Nickel	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Nickel (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Potassium	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Potassium (Dissolved)	ug/L	890000	950000	1030000	837000	1050000	994000 V	1110000	957000	1050000	992000	989000	268000
Selenium	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Selenium (Dissolved)	ug/L	4.4 J	6.3 J	4.48	4	7.81	6.40 U	10	6.34	8.84	6.39	7.45	21.8 U

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM	LW-LM
SampleDate		5/13/2015	10/14/2015	5/23/2016	10/4/2016	5/1/2017	10/3/2017	5/29/2018	10/22/2018	05/20/2019	10/09/2019	6/4/2020	10/7/2020
Parameters	**Units**												
Metals													
Silicon	ug/L	---	---	9150	9170	8150	8030	6840	7030	8500	7960	7990	
Silicon (Dissolved)	ug/L	7800	9000	---	---	---	---	---	---	---	---	---	
Silver	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Silver (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Sodium	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Sodium (Dissolved)	ug/L	1500000	1400000	1520000	1400000	1510000	1360000 V	1520000	1420000	1510000	1340000	1330000	394000
Strontium	ug/L	---	---			---	---	---	---	---	---	---	
Strontium (Dissolved)	ug/L	1900	2000	2510	2510	2790	2140 V	2580	2250	2210	---	---	
Uranium (Dissolved)	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Zinc	ug/L	---	---	---	---	---	---	---	---	---	---	---	
Zinc (Dissolved)	ug/L	2 J	14 JB	6.41 U	4.21 J	12	38.2 U	2.69 J	1.91 J	4.09 J	---	---	
Volatile Organic Compounds - BTEX													
Benzene	ug/L	5 U	5 U	0.331 U	0.331 U	0.331 U	0.331 U	1.00 U	0.331 U	0.331 U	0.331 U	0.0941 U	0.0941 U
Ethylbenzene	ug/L	5 U	5 U	0.384 U	0.384 U	0.384 U	0.384 U	1.00 U	0.384 U	0.384 U	0.384 U	0.137 U	0.137 U
Toluene	ug/L	5 U	5 U	0.780 U	0.780 U	0.412 U	0.412 U	1.00 U	0.412 U	0.412 U	0.412 U	0.278 U	0.278 U
Xylenes, Total	ug/L	10 U	10 U	1.06 U	1.06 U	1.06 U	1.06 U	3.00 U	1.06 U	1.06 U	1.06 U	0.174 U	0.174 U
Petroleum Products													
Diesel fuel	mg/L	2.2	3.2	3.41	2.24	3.24	2.67	1890	3340	1.91	2.06	1.91	1.73
TPH - Extractable	mg/L	---	---	---	---	---	---	---	---	---	---	---	
TPH (non-polar)	mg/L	---	---	---	---	---	---	---	---	---	---	---	
TPH (C21 - C28)	mg/L	---	---	---	---	---	---	---	---	---	---	---	
Radiology													
Gross Alpha Analytes	pci/l	---	---	---	---	---	---	---	---	---	---	---	
Gross Beta Analytes	pci/l	---	---	---	---	---	---	---	---	---	---	---	
Field Parameters													
Specific Conductivity, field	uS/cm	8866	8851	9730	8510	8980	8980	8783	8663	9100	9058	9460	10063
Dissolved oxygen (DO), field	mg/L	7.04	5.37	---	5.22	--	12.12	NM	5.39	--	5.1	8.21	6.74
Oxidation reduction potential (ORP), field	millivolts	-7.6	26.5	236	208	172.5	69.1	194.7	176.5	70.3	-83	6.4	25.1
pH, field	s.u.	7.91	7.98	7.52	8.04	7.74	7.26	7.9	7.74	7.15	7.99	6.46	8.44
Temperature, ambient	Deg F	21	24	---	---	60	---	---	---	60	60	60	60
Temperature, field	Deg C	11.25	16.8	12.8	15.6	12.2	17.9	12.8	16.6	10.9	17.1	12.9	17.2
Turbidity, field	NTU	1.07	1.43	1.32	4.29	3.21	0.73	4.46	1.98	3.7	1.03	7.61	1.26

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-LM	LW-LM	LW-POND	LW-POND	LW-POND	LW-POND	LW-POND	LW-POND
SampleDate		5/5/2021	10/20/2021	05/20/2019	10/9/2019	5/26/2020	10/7/2020	5/5/2021	10/20/2021
Parameters	Units								
General Chemistry									
Alkalinity, Bicarbonate (as CaCO3)	mg/L	418	401	312	1150	2900	9880	942	369
Alkalinity, Carbonate (as CaCO3)	mg/L	8.45 U	8.45 U	64.3	1330	2340	18300	1350	838
Alkalinity, Total (As CaCO3)	mg/L	418	401	376	2470	5240	28100	2290	1210
Ammonia	mg/L	0.117 U	0.117 U	0.0317 U	0.143	0.215 J	1.17	0.117 U	0.117 U
Bromide	mg/L	3.53 U	3.53 U	3.95 U	7.9 U	353 U	35.3	3.53 U	3.53 U
Chemical Oxygen Demand (COD)	mg/L			48.7	---	---			
Chloride	mg/L	83.3	90.9	83.6	0.0519 U	1930	13500	904	952
Specific Conductivity	umhos/cm	9330	9190	27900	75100	105000	97000	68800	60200
Cyanide (free)	mg/L			---	---	---			
Fluoride	mg/L			---	---	---			
Fluoride (dissolved)	mg/L	9.39	11.2	10	7.28	187	583	74.8	19.9
Hardness	mg/L	318		368	1640	3730	19700	1380	
Nitrate (as N)	mg/L	0.919	2.06	0.764	0.0227 U	0.48 U	4.8	0.48 U	4.80 U
Nitrite (as N)	mg/L	0.42 U	0.42 U	0.0277 U	0.0277 U	0.42 U	4.2	0.42 U	4.20 U
Oil and Grease, Total	mg/L			2.16 J	1.35 U	4.19 J			
Oil and grease (HEM), polar	mg/L			---	---	---			
Oil and grease (HEM), total	mg/L			---	---	---			
pH	s.u.		8.23	8.88 J	9.05 T8	8.93 T8	9.17	9.23	9.13
Phenolics (Total)	mg/L	0.0083 U	0.0083 U	0.0083 U	0.015 B	0.0083 U	0.083	0.0083 U	0.0083 U
Phosphorus as P, total	mg/L	0.035 U	0.0083 U	0.035 U	0.359	0.162 B	1.76	0.035 U	0.0541
Silica	mg/L	19.3	19.7	14.2	31.8	73.4	238	6.61	7.66
Sulfate	mg/L	4540	4500	4300	58300	90400	784000	50900	43900
Sulfide	mg/L	0.025 U	0.025 U	0.0065 U	0.092	0.624	2.48	0.025 U	0.025 U
Sulfite	mg/L			---	---	---			
Thiocyanate	mg/L			---	---	---			
Thiosulfate	mg/L			---	---	---			
Total Dissolved Solids (TDS)	mg/L	6250	7320	7270	42300	138000 J4	1110000	75600	63400
Nitrogen, Total Kjeldahl	mg/L			1.3	---	---			
Total Organic Carbon (TOC)	mg/L	13.4	12.5	15.4	174	276	2430	118	122
Total Suspended Solids (TSS)	mg/L	2.6 U	2.5 U	---	36.8	219	6880	8.28	17.3
Dissolved Organic Carbon (DOC)	mg/L			13.8	---	---			

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-LM	LW-LM	LW-POND	LW-POND	LW-POND	LW-POND	LW-POND	LW-POND
SampleDate		5/5/2021	10/20/2021	05/20/2019	10/9/2019	5/26/2020	10/7/2020	5/5/2021	10/20/2021
Parameters	Units								
Metals									
Arsenic	ug/L			37.5	---	---			
Arsenic (Dissolved)	ug/L	40.4	36.9	47.7	490	446	369	284	214
Boron	ug/L			---	---	---			
Boron (Dissolved)	ug/L	11100	11500	11000	146000	255000	181000	116000	111000
Cadmium	ug/L			---	---	---			
Cadmium (Dissolved)	ug/L			0.444 J	153000	---			
Calcium	ug/L	52800		---	---	163000	91400	69200	
Calcium (Dissolved)	ug/L	55700	55000	74200	---	198000	91600	96000	28400
Chromium	ug/L			0.320 U	---	---			
Chromium (Dissolved)	ug/L			0.952 J	---	---			
Chromium III	ug/L			---	---	---			
Chromium VI	ug/L			---	---	---			
Copper	ug/L			---	---	---			
Copper (Dissolved)	ug/L			2.68	---	---			
Iron	ug/L			30.8 J	---	---			
Iron (Dissolved)	ug/L	44.8	44.7 U	15.0 U	19.0 J	2240 U	4470	44.7 U	44.7U
Lead	ug/L			---	---	---			
Lead (Dissolved)	ug/L			0.260 U	---	---			
Lithium	ug/L			---	---	---			
Lithium (Dissolved)	ug/L			488	---	---			
Magnesium	ug/L	45200	41900	---	---	807000	424000	294000	
Magnesium (Dissolved)	ug/L	44500		48200	371000	882000	359000	339000	105000
Manganese	ug/L			---	---	---			
Manganese (Dissolved)	ug/L			5.73	---	---			
Mercury	ug/L			---	---	---			
Mercury (Dissolved)	ug/L			0.0490 U	---	---			
Molybdenum (Dissolved)	ug/L			---	---	---			
Nickel	ug/L			---	---	---			
Nickel (Dissolved)	ug/L			---	---	---			
Potassium	ug/L			---	---	---			
Potassium (Dissolved)	ug/L	1000000	1070000	1030000	12800000	23900000	16400000	11400000	10700000
Selenium	ug/L			---	---	---			
Selenium (Dissolved)	ug/L	8.59	7.89	8.79	88.7	155	78.3	74.9	59.3

Table 10. Logan Wash Mine Retort Water Analytical Data

SampleID		LW-LM	LW-LM	LW-POND	LW-POND	LW-POND	LW-POND	LW-POND	LW-POND
SampleDate		5/5/2021	10/20/2021	05/20/2019	10/9/2019	5/26/2020	10/7/2020	5/5/2021	10/20/2021
Parameters	**Units**								
Metals									
Silicon	ug/L	9030	9190	6660	14900	34300	11100	3090	3580
Silicon (Dissolved)	ug/L			---	---	---			
Silver	ug/L			---	---	---			
Silver (Dissolved)	ug/L			---	---	---			
Sodium	ug/L			---	---	---			
Sodium (Dissolved)	ug/L	1340000	1380000	1560000	16900000	24900000	22600000	14800000	12700000
Strontium	ug/L			---	---	---			
Strontium (Dissolved)	ug/L			2190	---	---			
Uranium (Dissolved)	ug/L			---	---	---			
Zinc	ug/L			---	---	---			
Zinc (Dissolved)	ug/L			4.60 J	---	---			
Volatile Organic Compounds - BTEX									
Benzene	ug/L	0.0941 U	0.0941 U	0.331 U	0.331 U	0.0941 U	0.0941	0.0941U	0.0941 U
Ethylbenzene	ug/L	0.137 U	0.137 U	0.384 U	0.384 U	0.137 U	0.137	0.137U	0.137 U
Toluene	ug/L	0.278 U	0.278 U	0.412 U	0.412 U	0.278 U	0.278	0.278U	0.278 U
Xylenes, Total	ug/L	0.174 U	0.174 U	1.06 U	1.06 U	0.174 U	0.174	0.174U	0.174 U
Petroleum Products									
Diesel fuel	mg/L	2.1	1.91	0.973	3.66	5.33	3.26	2.97	3.2
TPH - Extractable	mg/L			---	---	---			
TPH (non-polar)	mg/L			---	---	---			
TPH (C21 - C28)	mg/L			---	---	---			
Radiology									
Gross Alpha Analytes	pci/l			---	---	---			
Gross Beta Analytes	pci/l			---	---	---			
Field Parameters									
Specific Conductivity, field	uS/cm	9007	9654	8998	79473	104962	113115	67430	69578
Dissolved oxygen (DO), field	mg/L	9.32	4.93	--	2.11	1.57	0.76	6.39	3.46
Oxidation reduction potential (ORP), field	millivolts	103.2	89.9	3.3	97.4	-37.8	-61.2	55.8	77.9
pH, field	s.u.	7.81	8.19	8.62	9.18	8.99	9.29	9.45	9.52
Temperature, ambient	Deg F	60	37	60	60	60	60	60	45
Temperature, field	Deg C	10.7	15.9	18.6	8.5	30.1	14.6	19.3	11.3
Turbidity, field	NTU	1.67	0.75	2.94	13.13	5.09	14.47	4.07	4.68