

Table 1. Summary of Analytical Results

Station Name	CAS Number	Units	Protection of Groundwater Soil Screening Level	Residential Soil Screening Level Concentrations	BS1	BS2	FS1	FS2	SS1	SS2	SS3	SS4
Sample Date					9/8/2022	9/8/2022	9/12/2022	9/12/2022	9/8/2022	9/8/2022	9/8/2022	9/8/2022
Sample Depth					0 - 0.5 ft	0 - 0.5 ft	9 - 9.5 ft	7.5 - 8 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
<b>Metals</b>												
ARSENIC	7440-38-2	mg/kg	0.29	0.68	8.41	6.45	6.15	8.69	1.91	2.51	2.89	2.69
BARIUM	7440-39-3	mg/kg	82	15,000	463	596	227	63.2	72.7	161	61.8	81.5
CADMIUM	7440-43-9	mg/kg	0.38	71	0.356	0.392	0.293	0.611	<0.0878	0.0985	<0.0869	0.129
CHROMIUM	7440-47-3	mg/kg	0.00067	0.3	<0.511	<0.50	<0.50	<0.506	<0.50	<0.50	<0.50	<0.50
COPPER	7440-50-8	mg/kg	46	3,100	16.7	17.5	10.7	11.3	<8.78	<8.64	<8.69	<9.31
LEAD	7439-92-1	mg/kg	14	400	17.3	20.2	11.7	11.3	<8.78	<8.64	<8.69	<9.31
NICKEL	7440-02-0	mg/kg	26	1,500	14.7	15.7	10.3	<8.90	<8.78	<8.64	<8.69	<9.31
SELENIUM	7782-49-2	mg/kg	0.26	390	0.301	0.234	0.264	0.544	<0.0878	<0.0864	<0.0869	0.16
SILVER	7440-22-4	mg/kg	0.8	390	<0.0940	<0.0940	<0.0917	<0.0890	<0.0878	<0.0864	<0.0869	<0.0931
ZINC	7440-66-6	mg/kg	370	23,000	<94.0	<94.0	<91.7	<89.0	<87.8	<86.4	<86.9	<93.1
<b>VOCs</b>												
BENZENE	71-43-2	mg/kg	0.0026	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
ETHYLBENZENE	100-41-4	mg/kg	0.78	5.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
TOLUENE	108-88-3	mg/kg	0.69	490	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
XYLENES, TOTAL	1330-20-7	mg/kg	9.9	58	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1,2,4-TRIMETHYLBENZENE	95-63-6	mg/kg	0.0081	30	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1,3,5-TRIMETHYLBENZENE	108-67-8	mg/kg	0.0087	27	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
<b>Semi-VOCs</b>												
1-METHYLNAPHTHALENE	90-12-0	mg/kg	0.006	18	<0.00067	<0.00335	0.271	0.000652	<0.00067	0.00161	<0.00067	0.000858
2-METHYLNAPHTHALENE	91-57-6	mg/kg	0.019	24	<0.00067	<0.00335	0.149	<0.00067	<0.00067	0.00108	<0.00067	0.000671
ACENAPHTHENE	83-32-9	mg/kg	0.55	360	<0.00067	<0.00335	0.0126	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
ANTHRACENE	120-12-7	mg/kg	5.8	1,800	<0.00067	<0.00335	0.0049	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
BENZO(A)ANTHRACENE	56-55-3	mg/kg	0.011	1.1	<0.00067	<0.00335	0.00258	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
BENZO(A)PYRENE	50-32-8	mg/kg	0.24	0.11	<0.00067	<0.00335	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
BENZO(B)FLUORANTHENE	205-99-2	mg/kg	0.3	1.1	<0.00067	<0.00335	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
BENZO(K)FLUORANTHENE	207-08-9	mg/kg	2.9	11	<0.00067	<0.00335	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
CHRYSENE	218-01-9	mg/kg	9	110	<0.00067	<0.00335	0.0158	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
DIBENZ(A,H)ANTHRACENE	53-70-3	mg/kg	0.096	0.11	<0.00067	<0.00335	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
FLUORANTHENE	206-44-0	mg/kg	8.9	240	<0.00067	<0.00335	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
FLUORENE	86-73-7	mg/kg	0.54	240	<0.00067	<0.00335	0.0478	<0.00067	<0.00067	0.000413	<0.00067	<0.00067
INDENO(1,2,3-CD)PYRENE	193-39-5	mg/kg	0.98	1.1	<0.00067	<0.00335	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
NAPHTHALENE	91-20-3	mg/kg	0.0038	2	<0.00067	<0.00335	0.0143	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
PYRENE	129-00-0	mg/kg	1.3	180	<0.00067	<0.00335	0.00735	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
<b>TPH**</b>												
TPH (low fraction)	8006-61-9	mg/kg	--	500	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
C10-C28 DIESEL RANGE	NA	mg/kg	--	500	<25	<25	205	<25	<25	<25	<25	<25
C28-C40 RESIDUAL RANGE ORGANICS	NA	mg/kg	--	500	<100	<100	<100	<100	<100	<100	<100	<100
<b>Soil Suitability for Reclamation**</b>												
BORON	7440-42-8	mg/l	--	2	0.453	0.487	0.708	1.29	0.482	0.617	0.502	0.66
PH	NA	s.u.	--	6 - 8.3	8.2	8.21	7.92	7.87	8.27	8.07	7.99	8.02
SODIUM ADSORPTION RATIO	NA	Unknown	--	6	0.0793	0.0957	6.48	9.69	3.22	1.9	1.78	3.28
SPECIFIC CONDUCTANCE	NA	mmhos/cm	--	4	0.264	0.270	3.97	6.21	0.424	0.779	0.942	1.15

NOTES:

Boldface type indicates the analyte was detected above the reporting limit.

Highlighted text indicates an exceedance of either the protection of groundwater soil screening level or residential soil screening level.

\*\* Where RSSL or protection of groundwater screening level is not present, Table 915-1 Cleanup Concentrations are used.

-- No standard established.

NA Not applicable.

NS Not sampled.

BS indicates a background sample collected from unaffected soil nearby.

FS indicates a sample collected from the floor of an excavation.

SS indicates a surface sample collected from the area of shallow excavation with limited impact from produced water.

SW indicates a sample collected from the sidewall of an excavation.

Taproot Rockies Midstream  
Big Mountain Viper Produced Water Release  
Spill/Release Point ID 482854  
Briggsdale, Colorado

Station Name	Protection of Groundwater Soil Screening Level	Residential Soil Screening Level Concentrations	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SW1	SW2	SW3	SW4	SW5	SW6
Sample Date			9/8/2022	9/8/2022	9/8/2022	9/8/2022	9/8/2022	9/12/2022	9/12/2022	9/12/2022	9/12/2022	9/12/2022	9/12/2022	9/12/2022	9/12/2022
Sample Depth			0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	6 - 6.5 ft	6 - 6.5 ft	6 - 6.5 ft	7.5 - 8 ft	6 - 6.5 ft	6 - 6.5 ft
<b>Metals</b>															
ARSENIC	0.29	0.68	5.86	4.98	4.71	5.52	2.35	4.98	5.08	3.6	2.8	4.17	1.99	2.33	2.24
BARIUM	82	15,000	529	551	377	528	48.1	343	366	211	223	264	137	102	110
CADMIUM	0.38	71	0.328	0.29	0.268	0.269	0.0938	0.399	0.276	0.249	0.599	0.289	0.211	0.216	0.461
CHROMIUM	0.00067	0.3	<0.50	<0.50	<0.514	<0.50	<0.52	<2.51	<2.54	<0.51	<0.515	<0.502	<0.513	<0.503	<0.51
COPPER	46	3,100	13.9	13.7	12.6	11.3	<9.29	13.5	13.3	<9.51	<9.39	10.9	10.9	9.47	9.34
LEAD	14	400	22.4	13.1	11.1	10.6	<9.29	12.4	15.4	17.8	12.2	12.6	12	12.7	13
NICKEL	26	1,500	11	10.5	11	9.58	<9.29	11.1	11.7	<9.51	<9.39	10.3	13.1	<8.83	<8.66
SELENIUM	0.26	390	0.3	0.243	0.23	0.252	<0.0929	0.207	0.32	0.235	0.181	0.146	0.136	0.173	0.221
SILVER	0.8	390	<0.0961	<0.0763	<0.0897	<0.0926	<0.0929	0.156	<0.0898	<0.0951	<0.0939	<0.0801	<0.0867	<0.0883	<0.0866
ZINC	370	23,000	<96.1	<76.3	<89.7	<92.6	<92.9	<93.9	<89.8	<95.1	<93.9	<80.1	<86.7	<88.3	<86.6
<b>VOCs</b>															
BENZENE	0.0026	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
ETHYLBENZENE	0.78	5.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
TOLUENE	0.69	490	<0.002	0.00232	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
XYLENES, TOTAL	9.9	58	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1,2,4-TRIMETHYLBENZENE	0.0081	30	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0187	<0.002	<0.002	<0.002
1,3,5-TRIMETHYLBENZENE	0.0087	27	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.00434	<0.002	<0.002	<0.002
<b>Semi-VOCs</b>															
1-METHYLNAPHTHALENE	0.006	18	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	0.00131	<0.00067	0.000631	<0.00067	1.56	0.000563	<0.00067	<0.00067
2-METHYLNAPHTHALENE	0.019	24	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	0.000707	<0.00067	0.455	<0.00067	<0.00067	<0.00067
ACENAPHTHENE	0.55	360	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	0.0454	<0.00067	<0.00067	<0.00067
ANTHRACENE	5.8	1,800	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	0.0191	<0.00067	<0.00067	<0.00067
BENZO(A)ANTHRACENE	0.011	1.1	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	0.0073	<0.00067	<0.00067	<0.00067
BENZO(A)PYRENE	0.24	0.11	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
BENZO(B)FLUORANTHENE	0.3	1.1	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	0.0081	<0.00067	<0.00067	<0.00067
BENZO(K)FLUORANTHENE	2.9	11	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
CHRYSENE	9	110	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	0.0873	<0.00067	<0.00067	<0.00067
DIBENZ(A,H)ANTHRACENE	0.096	0.11	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
FLUORANTHENE	8.9	240	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
FLUORENE	0.54	240	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	0.217	<0.00067	<0.00067	<0.00067
INDENO(1,2,3-CD)PYRENE	0.98	1.1	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
NAPHTHALENE	0.0038	2	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	0.0703	<0.00067	<0.00067	<0.00067
PYRENE	1.3	180	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	0.0506	<0.00067	<0.00067	<0.00067
<b>TPH**</b>															
TPH (low fraction)	--	500	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.382	<0.2	<0.2	<0.2
C10-C28 DIESEL RANGE	--	500	<25	<25	<25	<25	<25	<25	<25	<25	<25	39.9	<25	<25	<25
C28-C40 RESIDUAL RANGE ORGANICS	--	500	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
<b>Soil Suitability for Reclamation**</b>															
BORON	--	2	0.67	1.25	1.54	1.3	0.61	0.989	11.4	2.04	0.94	1.37	0.529	2.43	1.14
PH	--	6 - 8.3	7.8	7.99	7.77	8.07	8.1	7.71	8.12	7.96	7.94	7.9	7.96	7.9	7.91
SODIUM ADSORPTION RATIO	--	6	1.51	9.73	7.47	5.44	1.47	6.66	34.8	9.78	5.73	17.9	6.43	10.7	6.54
SPECIFIC CONDUCTANCE	--	4	2.09	5.73	6.12	2.01	0.647	8.28	10.5	4.39	3.26	8.34	2.84	6.98	5.83

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