

Table 1. Summary of Analytical Results

Station Name	CAS Number	Units	Protection of Groundwater Soil Screening Level	Residential Soil Screening Level Concentrations	BS1	BS2	BS3	FS1	FS1	FS2	FS2	SS1	SS2	SS3	SS4
Sample Date					9/8/22	9/8/22	11/10/22	9/12/22	11/11/22	9/12/22	11/10/22	9/8/22	9/8/22	9/8/22	9/8/22
Sample Depth					0 - 0.5 ft	0 - 0.5 ft	6 - 6.5 ft	9 - 9.5 ft	10 ft	7.5 - 8 ft	9 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	3.03	6.15	1.56	8.69	3.17	1.91	2.51	2.89	2.69
BARIUM	7440-39-3	mg/kg	82	15,000	463	596	90.9	227	82.1	63.2	46.4	72.7	161	61.8	81.5
CADMIUM	7440-43-9	mg/kg	0.38	71	0.356	0.392	0.334	0.293	0.395	0.611	0.182	<0.0878	0.0985	<0.0869	0.129
CHROMIUM	7440-47-3	mg/kg	0.00067	0.3	<0.511	<0.50	<0.244	<0.50	<0.244	<0.506	<0.252	<0.50	<0.50	<0.50	<0.50
COPPER	7440-50-8	mg/kg	46	3,100	16.7	17.5	9.96	10.7	9.16	11.3	10.3	<8.78	<8.64	<8.69	<9.31
LEAD	7439-92-1	mg/kg	14	400	17.3	20.2	11.7	11.7	12.0	11.3	14.7	<8.78	<8.64	<8.69	<9.31
NICKEL	7440-02-0	mg/kg	26	1,500	14.7	15.7	<9.67	10.3	<9.05	<8.90	<9.51	<8.78	<8.64	<8.69	<9.31
SELENIUM	7782-49-2	mg/kg	0.26	390	0.301	0.234	0.195	0.264	0.095	0.544	0.186	<0.0878	<0.0864	<0.0869	0.16
SILVER	7440-22-4	mg/kg	0.8	390	<0.0940	<0.0940	<0.0967	<0.0917	<0.0905	<0.0890	<0.0951	<0.0878	<0.0864	<0.0869	<0.0931
ZINC	7440-66-6	mg/kg	370	23,000	<94.0	<94.0	<96.7	<91.7	<90.5	<89.0	<95.1	<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	NS	<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	NS	<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	NS	<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	NS	<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	NS	<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	NS	<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	0.00141	0.271	<0.00109	0.000652	NS	<0.00067	0.00161	<0.00067	0.000858
2-METHYLNAPHTHALENE	91-57-6	mg/kg	0.019	24	<0.00067	<0.00335	0.00234	0.149	<0.00194	<0.00067	NS	<0.00067	0.00108	<0.00067	0.000671
ACENAPHTHENE	83-32-9	mg/kg	0.55	360	<0.00067	<0.00335	<0.000304	0.0126	<0.000304	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067
ANTHRACENE	120-12-7	mg/kg	5.8	1,800	<0.00067	<0.00335	<0.000334	0.0049	<0.000334	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067
BENZO(A)ANTHRACENE	56-55-3	mg/kg	0.011	1.1	<0.00067	<0.00335	<0.000493	0.00258	<0.000493	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067
BENZO(A)PYRENE	50-32-8	mg/kg	0.24	0.11	<0.00067	<0.00335	<0.000468	<0.00067	<0.000468	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067
BENZO(B)FLUORANTHENE	205-99-2	mg/kg	0.3	1.1	<0.00067	<0.00335	<0.000585	<0.00067	<0.000585	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067
BENZO(K)FLUORANTHENE	207-08-9	mg/kg	2.9	11	<0.00067	<0.00335	<0.000437	<0.00067	<0.000437	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067
CHRYSENE	218-01-9	mg/kg	9	110	<0.00067	<0.00335	<0.000624	0.0158	<0.000624	<0.00067	NS	<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	<0.000614	<0.00067	<0.000614	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067
FLUORANTHENE	206-44-0	mg/kg	8.9	240	<0.00067	<0.00335	<0.000394	<0.00067	<0.000394	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067
FLUORENE	86-73-7	mg/kg	0.54	240	<0.00067	<0.00335	0.00152	0.0478	<0.000286	<0.00067	NS	<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	<0.000627	<0.00067	<0.000627	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067
NAPHTHALENE	91-20-3	mg/kg	0.0038	2	<0.00067	<0.00335	<0.00145	0.0143	<0.00145	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067
PYRENE	129-00-0	mg/kg	1.3	180	<0.00067	<0.00335	<0.000643	0.00735	<0.000643	<0.00067	NS	<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	NS	<0.2	<0.2	<0.2	<0.2
C10-C28 DIESEL RANGE	NA	mg/kg	--	500	<25	<25	<25	205	<25	<25	NS	<25	<25	<25	<25
C28-C40 RESIDUAL RANGE ORGANICS	NA	mg/kg	--	500	<100	<100	<100	<100	<100	<100	NS	<100	<100	<100	<100
<b>Soil Suitability for Reclamation**</b>															
BORON	7440-42-8	mg/l	--	2	0.453	0.487	1.37	0.708	0.241	1.29	0.618	0.482	0.617	0.502	0.66
PH	NA	s.u.	--	6 - 8.3	8.2	8.21	8.15	7.92	8.00	7.87	7.96	8.27	8.07	7.99	8.02
SODIUM ADSORPTION RATIO	NA	NA	--	6	0.0793	0.0957	5.35	6.48	5.74	9.69	5.21	3.22	1.9	1.78	3.28
SPECIFIC CONDUCTANCE	NA	mmhos/cm	--	4	0.264	0.270	1.75	3.97	2.12	6.21	2.12	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	SS6	SS7	SS7	SS8	SS9	SS10	SS10	SS11	SS11	SW1	SW2	SW3	SW4	SW5	SW6
Sample Date			9/8/22	9/8/22	11/10/22	9/8/22	11/10/22	9/8/22	9/8/22	9/12/22	11/10/22	9/12/22	11/10/22	9/12/22	9/12/22	9/12/22	9/12/22	9/12/22	9/12/22
Sample Depth			0 - 0.5 ft	0 - 0.5 ft	1 ft	0 - 0.5 ft	1 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	2 ft	0 - 0.5 ft	2 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
Metals																			
ARSENIC	0.29	0.68	5.86	4.98	4.45	4.71	4.72	5.52	2.35	4.98	6.14	5.08	5.74	3.6	2.8	4.17	1.99	2.33	2.24
BARIUM	82	15,000	529	551	522	377	334	528	48.1	343	512	366	510	211	223	264	137	102	110
CADMIUM	0.38	71	0.328	0.29	0.283	0.268	0.306	0.269	0.0938	0.399	0.251	0.276	0.252	0.249	0.599	0.289	0.211	0.216	0.461
CHROMIUM	0.00067	0.3	<0.50	<0.50	<1.22	<0.514	<1.26	<0.50	<0.52	<2.51	<0.246	<2.54	<0.488	<0.51	<0.515	<0.502	<0.513	<0.503	<0.51
COPPER	46	3,100	13.9	13.7	13.8	12.6	14.1	11.3	<9.29	13.5	12.8	13.3	12.2	<9.51	<9.39	10.9	10.9	9.47	9.34
LEAD	14	400	22.4	13.1	28.9	11.1	13.4	10.6	<9.29	12.4	18.4	15.4	13.1	17.8	12.2	12.6	12	12.7	13
NICKEL	26	1,500	11	10.5	11.4	11	11.8	9.58	<9.29	11.1	11.6	11.7	10.9	<9.51	<9.39	10.3	13.1	<8.83	<8.66
SELENIUM	0.26	390	0.3	0.243	0.274	0.23	0.335	0.252	<0.0929	0.207	0.298	0.32	0.296	0.235	0.181	0.146	0.136	0.173	0.221
SILVER	0.8	390	<0.0961	<0.0763	<0.0947	<0.0897	<0.0921	<0.0926	<0.0929	0.156	<0.0964	<0.0898	<0.0974	<0.0951	<0.0939	<0.0801	<0.0867	<0.0883	<0.0866
ZINC	370	23,000	<96.1	<76.3	<94.7	<89.7	<92.1	<92.6	<92.9	<93.9	<96.4	<89.8	<97.4	<95.1	<93.9	<80.1	<86.7	<88.3	<86.6
VOCs																			
BENZENE	0.0026	1.2	<0.002	<0.002	NS	<0.002	NS	<0.002	<0.002	<0.002	NS	<0.002	NS	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
ETHYLBENZENE	0.78	5.8	<0.002	<0.002	NS	<0.002	NS	<0.002	<0.002	<0.002	NS	<0.002	NS	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
TOLUENE	0.69	490	<0.002	0.00232	NS	<0.002	NS	<0.002	<0.002	<0.002	NS	<0.002	NS	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
XYLENES, TOTAL	9.9	58	<0.002	<0.002	NS	<0.002	NS	<0.002	<0.002	<0.002	NS	<0.002	NS	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1,2,4-TRIMETHYLBENZENE	0.0081	30	<0.002	<0.002	NS	<0.002	NS	<0.002	<0.002	<0.002	NS	<0.002	NS	<0.002	<0.002	0.0187	<0.002	<0.002	<0.002
1,3,5-TRIMETHYLBENZENE	0.0087	27	<0.002	<0.002	NS	<0.002	NS	<0.002	<0.002	<0.002	NS	<0.002	NS	<0.002	<0.002	0.00434	<0.002	<0.002	<0.002
Semi-VOCs																			
1-METHYLNAPHTHALENE	0.006	18	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	0.00131	NS	<0.00067	NS	0.000631	<0.00067	1.56	0.000563	<0.00067	<0.00067
2-METHYLNAPHTHALENE	0.019	24	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	0.000707	<0.00067	0.455	<0.00067	<0.00067	<0.00067
ACENAPHTHENE	0.55	360	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	0.0454	<0.00067	<0.00067	<0.00067
ANTHRACENE	5.8	1,800	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	0.0191	<0.00067	<0.00067	<0.00067
BENZO(A)ANTHRACENE	0.011	1.1	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	0.0073	<0.00067	<0.00067	<0.00067
BENZO(A)PYRENE	0.24	0.11	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
BENZO(B)FLUORANTHENE	0.3	1.1	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	0.0081	<0.00067	<0.00067	<0.00067
BENZO(K)FLUORANTHENE	2.9	11	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
CHRYSENE	9	110	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	0.0873	<0.00067	<0.00067	<0.00067
DIBENZ(A,H)ANTHRACENE	0.096	0.11	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
FLUORANTHENE	8.9	240	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
FLUORENE	0.54	240	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	<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	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
NAPHTHALENE	0.0038	2	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	0.0703	<0.00067	<0.00067	<0.00067
PYRENE	1.3	180	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	<0.00067	NS	<0.00067	NS	<0.00067	<0.00067	0.0506	<0.00067	<0.00067	<0.00067
TPH**																			
TPH (low fraction)	--	500	<0.2	<0.2	NS	<0.2	NS	<0.2	<0.2	<0.2	NS	<0.2	NS	<0.2	<0.2	0.382	<0.2	<0.2	<0.2
C10-C28 DIESEL RANGE	--	500	<25	<25	NS	<25	NS	<25	<25	<25	NS	<25	NS	<25	<25	39.9	<25	<25	<25
C28-C40 RESIDUAL RANGE ORGANICS	--	500	<100	<100	NS	<100	NS	<100	<100	<100	NS	<100	NS	<100	<100	<100	<100	<100	<100
Soil Suitability for Reclamation**																			
BORON	--	2	0.67	1.25	0.558	1.54	0.573	1.3	0.61	0.989	0.701	11.4	0.987	2.04	0.94	1.37	0.529	2.43	1.14
PH	--	6 - 8.3	7.8	7.99	7.74	7.77	7.80	8.07	8.1	7.71	8.37	8.12	8.16	7.96	7.94	7.9	7.96	7.9	7.91
SODIUM ADSORPTION RATIO	--	6	1.51	9.73	2.31	7.47	1.74	5.44	1.47	6.66	5.76	34.8	6.67	9.78	5.73	17.9	6.43	10.7	6.54
SPECIFIC CONDUCTANCE	--	4	2.09	5.73	4.60	6.12	3.78	2.01	0.647	8.28	0.806	10.5	1.98	4.39	3.26	8.34	2.84	6.98	5.83

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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	SW7	SW8	SW9	SW10	SW11	Backfill
Sample Date			11/10/22	11/10/22	11/10/22	11/10/22	11/11/22	11/10/2022
Sample Depth			6 ft	7.5 ft	6 ft	6 ft	6 ft	
<b>Metals</b>								
ARSENIC	0.29	0.68	3.13	4.36	3.26	1.89	3.75	6.18
BARIUM	82	15,000	386	237	160	117	229	573
CADMIUM	0.38	71	0.210	0.220	0.216	0.583	0.258	0.272
CHROMIUM	0.00067	0.3	<0.244	<0.467	<0.244	<0.249	<0.492	<0.488
COPPER	46	3,100	10.5	11.8	11.0	<9.50	11.1	14.1
LEAD	14	400	12.9	12.8	12.8	13.1	13.7	16.6
NICKEL	26	1,500	9.64	10.6	<9.35	<9.50	10.0	12.5
SELENIUM	0.26	390	0.311	0.260	0.196	0.106	0.217	0.294
SILVER	0.8	390	<0.0945	<0.0862	<0.0935	<0.095	<0.0962	<0.0941
ZINC	370	23,000	<94.5	<86.2	<93.5		<96.2	<94.1
<b>VOCs</b>								
BENZENE	0.0026	1.2	<0.002	NS	NS	NS	NS	<0.002
ETHYLBENZENE	0.78	5.8	<0.002	NS	NS	NS	NS	<0.002
TOLUENE	0.69	490	<0.002	NS	NS	NS	NS	<0.002
XYLENES, TOTAL	9.9	58	<0.002	NS	NS	NS	NS	<0.002
1,2,4-TRIMETHYLBENZENE	0.0081	30	<0.002	NS	NS	NS	NS	<0.002
1,3,5-TRIMETHYLBENZENE	0.0087	27	<0.002	NS	NS	NS	NS	<0.002
<b>Semi-VOCs</b>								
1-METHYLNAPHTHALENE	0.006	18	<0.00109	NS	NS	NS	NS	<0.00109
2-METHYLNAPHTHALENE	0.019	24	<0.00194	NS	NS	NS	NS	<0.00194
ACENAPHTHENE	0.55	360	<0.000304	NS	NS	NS	NS	<0.000304
ANTHRACENE	5.8	1,800	<0.000334	NS	NS	NS	NS	<0.000334
BENZO(A)ANTHRACENE	0.011	1.1	<0.000493	NS	NS	NS	NS	<0.000493
BENZO(A)PYRENE	0.24	0.11	<0.000468	NS	NS	NS	NS	<0.000468
BENZO(B)FLUORANTHENE	0.3	1.1	<0.000585	NS	NS	NS	NS	<0.000585
BENZO(K)FLUORANTHENE	2.9	11	<0.000437	NS	NS	NS	NS	<0.000437
CHRYSENE	9	110	<0.000624	NS	NS	NS	NS	<0.000624
DIBENZ(A,H)ANTHRACENE	0.096	0.11	<0.000614	NS	NS	NS	NS	<0.000614
FLUORANTHENE	8.9	240	<0.000394	NS	NS	NS	NS	<0.000394
FLUORENE	0.54	240	<0.000286	NS	NS	NS	NS	<0.000286
INDENO(1,2,3-CD)PYRENE	0.98	1.1	<0.000627	NS	NS	NS	NS	<0.000627
NAPHTHALENE	0.0038	2	<0.00145	NS	NS	NS	NS	<0.00145
PYRENE	1.3	180	<0.000643	NS	NS	NS	NS	<0.000643
<b>TPH**</b>								
TPH (low fraction)	--	500	<0.2	NS	NS	NS	NS	<0.2
C10-C28 DIESEL RANGE	--	500	<25	NS	NS	NS	NS	<25
C28-C40 RESIDUAL RANGE ORGANICS	--	500	<100	NS	NS	NS	NS	<100
<b>Soil Suitability for Reclamation**</b>								
BORON	--	2	0.909	4.09	5.40	0.812	1.96	0.856
PH	--	6 - 8.3	8.03	7.94	7.90	8.00	7.70	8.24
SODIUM ADSORPTION RATIO	--	6	5.65	15.8	17.8	8.65	8.03	3.69
SPECIFIC CONDUCTANCE	--	4	1.98	7.04	6.99	3.55	2.21	1.23