

Taproot Rockies Midstream
Hale Produced Water Release #2
Spill/Release Point ID 480563
Briggsdale, Colorado

Table 1. Summary of Analytical Results

Station Name	CAS Number	Units	Protection of Groundwater Soil Screening Level	Residential Soil Screening Level Concentrations	FS-01	BS2	SS1	SS2	SS3	SS4	SW-01	SW-02
Sample Date					8/20/2021	5/18/2022	9/24/2021	9/24/2021	9/24/2021	9/24/2021	8/20/2021	8/20/2021
Sample Depth					5 - 5.5 ft	2-2.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	2 - 2.5 ft	2 - 2.5 ft
Metals												
ARSENIC	7440-38-2	mg/kg	0.29	0.68	2.42	NS	3.52	3.2	2.41	3.13	2.82	2.45
BARIUM	7440-39-3	mg/kg	82	15,000	230	NS	315	301	184	247	180	200
CADMIUM	7440-43-9	mg/kg	0.38	71	0.127	NS	0.257	0.301	0.33	0.282	0.138	0.198
COPPER	7440-50-8	mg/kg	46	3,100	12.7	NS	11.3	12.5	12.5	12.5	12.7	12
CHROMIUM (VI)	18540-29-9	mg/kg	0.00067	0.3	<1	NS	<1	<1	<1	<1	<1	<1
LEAD	7439-92-1	mg/kg	14	400	8.96	NS	11.5	10.6	10.1	19.2	9.4	9.87
NICKEL	7440-02-0	mg/kg	26	1,500	10.8	NS	10.1	11.6	11.2	11.4	10.6	10.2
SELENIUM	7782-49-2	mg/kg	0.26	390	1.54	NS	<2	<2	<2	<2	1.51	1.45
SILVER	7440-22-4	mg/kg	0.8	390	<1	NS	<1	<1	<1	<1	<1	<1
ZINC	7440-66-6	mg/kg	370	23,000	45	NS	38.7	43.3	44	43	47.1	43.8
VOCs												
BENZENE	71-43-2	mg/kg	0.0026	1.2	<0.001	NS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
ETHYLBENZENE	100-41-4	mg/kg	0.78	5.8	<0.0025	NS	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
TOLUENE	108-88-3	mg/kg	0.69	490	<0.005	NS	<0.005	<0.005	<0.005	<0.005	<0.005	0.00155
XYLENES, TOTAL	1330-20-7	mg/kg	9.9	58	0.00103	NS	<0.0065	<0.0065	<0.0065	<0.0065	0.00123	0.0137
1,2,4-TRIMETHYLBENZENE	95-63-6	mg/kg	0.0081	30	0.00188	NS	<0.005	<0.005	<0.005	<0.005	0.00178	<0.005
1,3,5-TRIMETHYLBENZENE	108-67-8	mg/kg	0.0087	27	<0.005	NS	<0.005	<0.005	<0.005	<0.005	<0.005	0.0093
Semi-VOCs												
1-METHYLNAPHTHALENE	90-12-0	mg/kg	0.006	18	0.0336	NS	<0.02	<0.02	<0.02	<0.02	0.0755	0.133
2-CHLORONAPHTHALENE	91-58-7	mg/kg	--	--	<0.02	NS	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
2-METHYLNAPHTHALENE	91-57-6	mg/kg	0.019	24	0.0284	NS	<0.02	<0.02	<0.02	<0.02	0.0535	0.0589
ACENAPHTHENE	83-32-9	mg/kg	0.55	360	<0.006	NS	<0.006	<0.006	<0.006	<0.006	0.00361	0.0101
ACENAPHTHYLENE	208-96-8	mg/kg	--	--	<0.006	NS	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
ANTHRACENE	120-12-7	mg/kg	5.8	1,800	<0.006	NS	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
BENZO(A)ANTHRACENE	56-55-3	mg/kg	0.011	1.1	<0.006	NS	<0.006	<0.006	<0.006	<0.006	0.00254	<0.006
BENZO(A)PYRENE	50-32-8	mg/kg	0.24	0.11	<0.006	NS	<0.006	<0.006	<0.006	<0.006	0.003	<0.006
BENZO(B)FLUORANTHENE	205-99-2	mg/kg	0.3	1.1	<0.006	NS	<0.006	<0.006	<0.006	<0.006	0.00637	0.0028
BENZO(G,H,I)PERYLENE	191-24-2	mg/kg	--	--	<0.006	NS	<0.006	<0.006	<0.006	<0.006	0.00213	<0.006
BENZO(K)FLUORANTHENE	207-08-9	mg/kg	2.9	11	<0.006	NS	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
CHRYSENE	218-01-9	mg/kg	9	110	<0.006	NS	<0.006	<0.006	<0.006	<0.006	0.00436	0.0107
DIBENZ(A,H)ANTHRACENE	53-70-3	mg/kg	0.096	0.11	<0.006	NS	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
FLUORANTHENE	206-44-0	mg/kg	8.9	240	<0.006	NS	<0.006	<0.006	<0.006	<0.006	0.00389	0.0049
FLUORENE	86-73-7	mg/kg	0.54	240	0.00495	NS	<0.006	<0.006	<0.006	<0.006	0.0138	0.0451
INDENO(1,2,3-CD)PYRENE	193-39-5	mg/kg	0.98	1.1	<0.006	NS	<0.006	<0.006	<0.006	<0.006	0.00226	<0.006
NAPHTHALENE	91-20-3	mg/kg	0.0038	2	<0.0125	NS	<0.02	<0.02	<0.02	<0.02	0.00895	0.0104
PHENANTHRENE	85-01-8	mg/kg	--	--	0.012	NS	<0.006	<0.006	<0.006	<0.006	0.0311	0.112
PYRENE	129-00-0	mg/kg	1.3	180	<0.006	NS	<0.006	<0.006	<0.006	<0.006	0.0062	0.00908
TPH**												
TPH (GC/FID) LOW FRACTION	8006-61-9	mg/kg	--	500	0.0725	NS	<0.1	<0.1	<0.1	<0.1	0.781	2.18
C10-C28 DIESEL RANGE	NA	mg/kg	--	500	6.42	NS	8.62	4.01	4.24	4.22	43.1	166
C28-C36 MOTOR OIL RANGE	NA	mg/kg	--	500	5.75	NS	18	14.9	16.4	10.6	32	111

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Station Name	CAS Number	Units	Protection of Groundwater Soil Screening Level	Residential Soil Screening Level Concentrations	FS-01	BS2	SS1	SS2	SS3	SS4	SW-01	SW-02
Sample Date					8/20/2021	5/18/2022	9/24/2021	9/24/2021	9/24/2021	9/24/2021	8/20/2021	8/20/2021
Sample Depth					5 - 5.5 ft	2-2.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	0.5 - 0.5 ft	2 - 2.5 ft	2 - 2.5 ft
Soil Suitability for Reclamation**												
HOT WATER SOL. BORON	7440-42-8	mg/l	--	2	1.41	0.239	0.511	0.332	0.139	0.133	0.514	0.953
PH	NA	s.u.	--	6 - 8.3	8.06	8.03	8.13	8.03	7.97	7.79	7.81	7.62
SODIUM ADSORPTION RATIO	NA	Na/(Ca+Mg)	--	6	5.21	1.59	3.2	3.29	0.517	1.08	2.65	7.15
SPECIFIC CONDUCTANCE	Specific Conductance	mmhos/cm	--	4	1.75	0.250	0.575	1.1	0.25	1.6	0.983	3.06

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 a nearby unaffected area.
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.

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Station Name	SW-03	SW-04	SW-05	SW-06	SW-07	SW-08	SW-09	SW-10	SW-11	SW-12	SW-13	SW-14	SW-15
Sample Date	8/20/2021	8/20/2021	8/20/2021	8/20/2021	8/20/2021	8/20/2021	9/24/2021	5/18/2022	5/18/2022	5/18/2022	5/18/2022	5/18/2022	5/18/2022
Sample Depth	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft
Metals													
ARSENIC	3.05	2.66	3.24	2.72	2.84	2.46	3.5	NS	NS	NS	NS	NS	NS
BARIUM	192	424	446	200	245	196	147	NS	NS	NS	NS	NS	NS
CADMIUM	0.175	0.113	0.143	0.145	0.21	0.146	0.309	NS	NS	NS	NS	NS	NS
COPPER	12.6	12.1	15.8	13.1	13.3	12.2	12.3	NS	NS	NS	NS	NS	NS
CHROMIUM (VI)	<1	<1	<1	<1	<1	<1	<1	NS	NS	NS	NS	NS	NS
LEAD	10.2	8.81	10.5	8.92	9.78	9.79	9.65	NS	NS	NS	NS	NS	NS
NICKEL	11.4	10.4	13.1	11	11.4	10.3	11.7	NS	NS	NS	NS	NS	NS
SELENIUM	2.08	1.49	2.23	1.67	1.82	2.25	<2	NS	NS	NS	NS	NS	NS
SILVER	<1	<1	<1	<1	<1	<1	<1	NS	NS	NS	NS	NS	NS
ZINC	43.2	44.8	56.1	47.1	47.3	44.4	41.3	NS	NS	NS	NS	NS	NS
VOCs													
BENZENE	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NS	NS	NS	NS	NS	NS
ETHYLBENZENE	<0.0025	<0.0025	<0.0025	0.0028	<0.0025	<0.0025	<0.0025	NS	NS	NS	NS	NS	NS
TOLUENE	<0.005	<0.005	<0.005	0.0029	<0.005	<0.005	<0.005	NS	NS	NS	NS	NS	NS
XYLENES, TOTAL	<0.0065	0.00425	<0.0065	0.00926	<0.0065	<0.0065	<0.0065	NS	NS	NS	NS	NS	NS
1,2,4-TRIMETHYLBENZENE	<0.005	<0.005	<0.005	0.0051	<0.005	<0.005	<0.005	NS	NS	NS	NS	NS	NS
1,3,5-TRIMETHYLBENZENE	<0.005	0.00298	<0.005	<0.005	<0.005	<0.005	<0.005	NS	NS	NS	NS	NS	NS
Semi-VOCs													
1-METHYLNAPHTHALENE	<0.02	0.00627	0.0052	0.0388	0.0303	0.0788	<0.02	NS	NS	NS	NS	NS	NS
2-CHLORONAPHTHALENE	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	NS	NS	NS	NS	NS	NS
2-METHYLNAPHTHALENE	<0.02	<0.02	0.00445	0.0302	0.0215	0.058	<0.02	NS	NS	NS	NS	NS	NS
ACENAPHTHENE	<0.006	<0.006	<0.006	<0.006	<0.006	0.00513	<0.006	NS	NS	NS	NS	NS	NS
ACENAPHTHYLENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NS	NS	NS	NS	NS	NS
ANTHRACENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NS	NS	NS	NS	NS	NS
BENZO(A)ANTHRACENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NS	NS	NS	NS	NS	NS
BENZO(A)PYRENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NS	NS	NS	NS	NS	NS
BENZO(B)FLUORANTHENE	<0.006	<0.006	<0.006	<0.006	<0.006	0.00196	<0.006	NS	NS	NS	NS	NS	NS
BENZO(G,H,I)PERYLENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NS	NS	NS	NS	NS	NS
BENZO(K)FLUORANTHENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NS	NS	NS	NS	NS	NS
CHRYSENE	<0.006	<0.006	<0.006	<0.006	<0.006	0.00677	<0.006	NS	NS	NS	NS	NS	NS
DIBENZ(A,H)ANTHRACENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NS	NS	NS	NS	NS	NS
FLUORANTHENE	<0.006	<0.006	<0.006	<0.006	<0.006	0.00278	<0.006	NS	NS	NS	NS	NS	NS
FLUORENE	<0.006	<0.006	<0.006	0.00937	0.00899	0.0228	<0.006	NS	NS	NS	NS	NS	NS
INDENO(1,2,3-CD)PYRENE	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NS	NS	NS	NS	NS	NS
NAPHTHALENE	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.02	NS	NS	NS	NS	NS	NS
PHENANTHRENE	<0.006	<0.006	<0.006	0.0248	0.0259	0.0684	<0.006	NS	NS	NS	NS	NS	NS
PYRENE	<0.006	<0.006	<0.006	0.0021	0.00203	0.00591	<0.006	NS	NS	NS	NS	NS	NS
TPH**													
TPH (GC/FID) LOW FRACTION	<0.1	3.23	0.0247	0.496	0.0382	0.867	<0.1	NS	NS	NS	NS	NS	NS
C10-C28 DIESEL RANGE	<4	4.96	<4	2.57	4.38	49.5	2.53	NS	NS	NS	NS	NS	NS
C28-C36 MOTOR OIL RANGE	3.67	3.51	2.54	3.23	4.9	35.2	8.65	NS	NS	NS	NS	NS	NS

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Station Name	SW-03	SW-04	SW-05	SW-06	SW-07	SW-08	SW-09	SW-10	SW-11	SW-12	SW-13	SW-14	SW-15
Sample Date	8/20/2021	8/20/2021	8/20/2021	8/20/2021	8/20/2021	8/20/2021	9/24/2021	5/18/2022	5/18/2022	5/18/2022	5/18/2022	5/18/2022	5/18/2022
Sample Depth	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2.5 - 3 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft
Soil Suitability for Reclamation**													
HOT WATER SOL. BORON	0.407	2.04	0.744	0.674	0.733	0.999	0.235	0.332	0.285	0.211	0.308	0.261	0.236
PH	8.32	7.97	7.96	8.02	7.9	7.84	8.7	7.76	8.26	7.74	8.08	7.59	7.91
SODIUM ADSORPTION RATIO	1.52	10.5	2.73	3.68	3.51	9.8	1.64	1.32	1.32	1.16	1.37	1.38	1.09
SPECIFIC CONDUCTANCE	0.304	3.53	1.44	1.16	1.58	3.49	0.291	0.250	0.230	0.239	0.337	1.64	0.313