

Soil Sampling Results  
Thomas Jaquez E #1  
BP America Production Co.

Parameter	North POC 11/4/18	South POC 11/4/18	SS01 11/5/18	SS02 11/5/18	SS03 11/13/18	SS04 11/14/18	SS05 11/14/18	SS06 11/14/18	SS07 11/14/18	SS08 11/14/18	SS09 11/14/18	SS10 11/14/18	SS11 11/15/18	COGCC Table 910	Units
Conductivity	0.695	1.150	1.130	0.382	0.829	0.613	0.860	0.755	0.838	0.877	0.938	0.650	1.020	<4 or 2x BG	mmhos/cm
pH	7.80	7.57	8.25	7.36	7.27	7.75	7.85	7.86	7.81	7.99	7.86	8.13	7.92	6-9	pH units
Sodium Adsorption Ratio	<b>12.7</b>	<b>13.0</b>	<b>14.5</b>	0.44	1.26	0.62	0.65	0.65	0.63	0.71	0.66	0.68	0.61	<12	NA
Calcium	19.9	28.2	27.7	78.7	128	89.9	136	112	132	130	148	89.5	166	NA	mg/L
Magnesium	1.89	2.32	3.39	8.03	12.7	14.7	20.2	18.1	19.2	20.4	22.2	14.3	24.4	NA	mg/L
Sodium	222	268	303	15.2	56.0	23.9	30.6	28.0	29.1	32.9	32.5	26.1	31.7	NA	mg/L
Barium	406	487	587	575	472	428	275	379	271	388	309	535	219	15,000	mg/kg
Cadmium	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	70	mg/kg
Chromium	<5.00	<5.00	5.40	7.03	<5.00	7.53	5.69	6.11	7.52	5.60	7.56	<5.00	7.02	23	mg/kg
Copper	13.0	16.6	17.0	16.8	23.9	19.3	21.8	27.0	24.3	22.9	19.8	15.7	26.6	3,100	mg/kg
Lead	12.0	21.1	14.0	18.2	19.1	43.2	45.0	61.2	52.7	60.1	37.6	13.5	52.4	400	mg/kg
Nickel	6.65	7.28	7.97	8.29	6.24	10.6	9.02	9.71	11.0	8.53	9.50	7.16	10.1	1,600	mg/kg
Selenium	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	390	mg/kg
Silver	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	390	mg/kg
Zinc	48.2	63.5	52.5	54.8	57.6	173	226	268	287	237	164	72.6	276	23,000	mg/kg
Arsenic	<b>1.21</b>	<b>2.57</b>	<b>2.05</b>	<b>2.15</b>	<b>1.98</b>	<b>3.13</b>	<b>3.94</b>	<b>4.79</b>	<b>5.31</b>	<b>4.79</b>	<b>4.30</b>	<b>2.21</b>	<b>3.71</b>	0.39	mg/kg
Mercury	<0.0525	<0.0531	<0.0533	<0.0453	<0.0602	<0.0569	<0.0598	<0.0567	<0.0622	<0.0547	<0.0587	<0.0559	<0.0609	23	mg/kg
Boron	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	2	mg/L
Benzene	<0.050	<0.050	<0.025	<0.025	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.17	mg/kg
Toluene	0.079	0.252	0.710	<0.025	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	85	mg/kg
Ethylbenzene	<0.050	0.109	0.170	<0.025	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	100	mg/kg
Total Xylenes	0.665	1.77	3.33	<0.075	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	175	mg/kg
Total BTEX	0.745	2.13	4.21	<0.150	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	NA	mg/kg
TPH (GRO)	<10.0	<10.0	35.3	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	NA	mg/kg
TPH (DRO)	54.8	41.0	1,450	22.6	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	10.1	<10.0	NA	mg/kg
TPH (EXT DRO)	<10.0	<10.0	359	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	NA	mg/kg
Total TPH	<74.8	<61.0	<b>1,844.3</b>	<42.6	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	<30.1	<30.0	500	mg/kg
Naphthalene	0.117	0.764	0.491	<0.014	<0.014	<0.014	<0.014	<0.014	<0.139	<0.014	<0.014	<0.014	<0.014	23	mg/kg
2-Methylnaphthalene	0.647	3.33	1.95	<0.008	<0.008	<0.008	<0.008	0.009	<0.075	<0.008	<0.008	0.010	<0.008	NA	mg/kg
1-Methylnaphthalene	0.339	1.66	1.16	<0.007	<0.007	<0.007	<0.007	0.007	<0.066	<0.007	0.007	<0.007	<0.007	NA	mg/kg
Acenaphthylene	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.062	<0.006	<0.006	<0.006	<0.006	NA	mg/kg
Acenaphthene	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.068	<0.007	<0.007	<0.007	<0.007	1,000	mg/kg
Fluorene	0.065	0.259	0.432	<0.006	<0.006	<0.006	<0.006	<0.006	<0.058	<0.006	<0.006	<0.006	<0.006	1,000	mg/kg
Phenanthrene	0.084	0.363	0.825	<0.007	<0.007	<0.007	0.009	0.011	<0.067	<0.007	<0.007	<0.007	0.010	NA	mg/kg
Anthracene	<0.008	<0.008	0.251	<0.008	<0.008	<0.008	<0.008	<0.008	<0.076	<0.008	<0.008	<0.008	<0.008	1,000	mg/kg
Carbazole	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.062	<0.006	<0.006	<0.006	<0.006	NA	mg/kg
Fluoranthene	<0.006	<0.006	0.083	<0.006	<0.006	<0.006	<0.006	<0.006	<0.057	<0.006	<0.006	<0.006	<0.006	1,000	mg/kg
Pyrene	0.015	0.056	0.178	<0.007	<0.007	<0.007	<0.007	<0.007	<0.068	<0.007	<0.007	<0.007	<0.007	1,000	mg/kg
Benzo(a)anthracene	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.083	<0.008	<0.008	<0.008	<0.008	0.22	mg/kg
Chrysene	<0.010	0.034	0.203	<0.010	<0.010	<0.010	<0.010	<0.010	<0.100	<0.010	<0.010	<0.010	<0.010	22	mg/kg
Benzo(b)fluoranthene	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.094	<0.009	<0.009	<0.009	<0.009	0.22	mg/kg
Benzo(k)fluoranthene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.096	<0.010	<0.010	<0.010	<0.010	2.2	mg/kg
Benzo(a)pyrene	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.068	<0.007	<0.007	<0.007	<0.007	0.022	mg/kg
Indeno(1,2,3-cd)pyrene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.103	<0.010	<0.010	<0.010	<0.010	0.22	mg/kg
Dibenz(a,h)anthracene	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.058	<0.006	<0.006	<0.006	<0.006	0.022	mg/kg
Benzo(g,h,i)perylene	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.057	<0.006	<0.006	<0.006	<0.006	NA	mg/kg

Notes: POC samples collected near area where flow intersected with Citizens Animas Ditch.

SS02 collected as a background sample

POC - Point of Contact

mg/kg - milligrams per kilogram

mg/L - milligrams per liter

mmhos/cm - millihos per centimeter

BTEX - Benzene, Toluene, Ethylbenzene, Total Xylenes

TPH - Total Petroleum Hydrocarbons

GRO - Gasoline Range Organics

DRO - Diesel Range Organics

EXT - Extended

BG - Background

NA - Not Applicable

COGCC - Colorado Oil & Gas Conservation Commission

**Bold** values exceed COGCC Table 910 Standard

Soil Sampling Results  
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Parameter	SS12 11/15/18	SS13 11/15/18	SS14 11/15/18	SS15 11/15/18	SS16 11/15/18	SS17 11/15/18	SS18 11/15/18	SS19 11/15/18	SS20 11/15/18	SS21 11/16/18	SS22 11/16/18	SS23 11/16/18	SS24 11/16/18	COGCC Table 910	Units
Conductivity	0.787	0.670	0.491	2.360	0.514	0.476	0.828	0.746	0.976	0.622	0.660	0.654	0.787	<4 or 2x BG	mmhos/cm
pH	7.66	7.22	7.72	7.45	7.77	7.86	7.93	7.90	7.98	7.72	7.94	7.83	7.90	6-9	pH units
Sodium Adsorption Ratio	0.58	0.62	0.68	0.51	0.77	0.74	0.66	0.69	2.98	2.43	1.07	0.68	0.80	<12	NA
Calcium	121	95.5	60.3	537	60.0	57.3	116	107	87.8	48.8	78.5	90.5	101	NA	mg/L
Magnesium	16.7	15.0	9.72	75.5	11.4	10.4	17.2	14.2	11.8	7.61	12.2	13.7	16.8	NA	mg/L
Sodium	25.5	24.5	21.5	47.3	24.8	23.2	28.9	28.6	112	69.1	38.6	26.2	33.0	NA	mg/L
Barium	271	277	385	422	321	586	315	360	569	765	880	552	926	15,000	mg/kg
Cadmium	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	70	mg/kg
Chromium	6.18	7.47	5.18	5.97	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	23	mg/kg
Copper	24.5	24.5	13.5	35.1	19.2	19.7	17.8	19.5	17.5	13.3	13.3	9.80	13.4	3,100	mg/kg
Lead	43.8	40.3	14.2	51.7	24.1	17.7	24.4	20.5	24.9	14.8	15.6	13.8	16.0	400	mg/kg
Nickel	8.31	9.48	7.97	9.78	8.01	7.35	7.30	7.83	8.02	5.63	5.72	6.14	<5.00	1,600	mg/kg
Selenium	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	390	mg/kg
Silver	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	390	mg/kg
Zinc	190	182	77.1	394	162	78.3	119	122	124	65.7	75.8	52.6	68.7	23,000	mg/kg
Arsenic	<b>4.26</b>	<b>4.73</b>	<b>1.76</b>	<b>4.81</b>	<b>2.60</b>	<b>1.49</b>	<b>1.99</b>	<b>2.07</b>	<b>2.55</b>	<b>1.89</b>	<b>1.53</b>	<b>2.52</b>	<b>2.04</b>	0.39	mg/kg
Mercury	<0.0556	<0.0617	<0.0540	<0.0593	<0.0555	<0.0546	<0.0584	<0.0588	<0.0567	<0.0546	<0.0563	<0.0476	<0.0512	23	mg/kg
Boron	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	<1.20	2	mg/L
Benzene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.17	mg/kg
Toluene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	85	mg/kg
Ethylbenzene	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	100	mg/kg
Total Xylenes	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	<0.150	175	mg/kg
Total BTEX	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	<0.300	NA	mg/kg
TPH (GRO)	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	NA	mg/kg
TPH (DRO)	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	NA	mg/kg
TPH (EXT DRO)	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	NA	mg/kg
Total TPH	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	<30.0	500	mg/kg
Naphthalene	<0.014	<0.014	<0.014	<0.139	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	23	mg/kg
2-Methylnaphthalene	<0.008	<0.008	<0.008	<0.075	<0.008	0.024	<0.008	0.016	0.013	<0.008	<0.008	<0.008	<0.008	NA	mg/kg
1-Methylnaphthalene	<0.007	<0.007	<0.007	<0.066	<0.007	0.019	<0.007	0.010	0.017	<0.007	<0.007	<0.007	<0.007	NA	mg/kg
Acenaphthylene	<0.006	<0.006	<0.006	<0.062	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NA	mg/kg
Acenaphthene	<0.007	<0.007	<0.007	<0.068	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	1,000	mg/kg
Fluorene	<0.006	<0.006	<0.006	<0.058	<0.006	0.009	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	1,000	mg/kg
Phenanthrene	0.009	0.010	<0.007	<0.067	<0.007	0.015	<0.007	0.009	0.011	<0.007	<0.007	<0.007	<0.007	NA	mg/kg
Anthracene	<0.008	<0.008	<0.008	<0.076	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	1,000	mg/kg
Carbazole	<0.006	<0.006	<0.006	<0.062	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NA	mg/kg
Fluoranthene	<0.006	<0.006	<0.006	<0.057	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	1,000	mg/kg
Pyrene	<0.007	<0.007	<0.007	<0.068	<0.007	0.009	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	1,000	mg/kg
Benzo(a)anthracene	<0.008	<0.008	<0.008	<0.083	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.22	mg/kg
Chrysene	<0.010	<0.010	<0.010	<0.100	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	22	mg/kg
Benzo(b)fluoranthene	<0.009	<0.009	<0.009	<0.094	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	0.22	mg/kg
Benzo(k)fluoranthene	<0.010	<0.010	<0.010	<0.096	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	2.2	mg/kg
Benzo(a)pyrene	<0.007	<0.007	<0.007	<0.068	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.022	mg/kg
Indeno(1,2,3-cd)pyrene	<0.010	<0.010	<0.010	<0.103	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.22	mg/kg
Dibenz(a,h)anthracene	<0.006	<0.006	<0.006	<0.058	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.022	mg/kg
Benzo(g,h,i)perylene	<0.006	<0.006	<0.006	<0.057	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	NA	mg/kg

Notes: POC samples collected near area where flow intersected with Citizens Animas Ditch.

SS02 collected as a background sample

POC - Point of Contact

mg/kg - milligrams per kilogram

mg/L - milligrams per liter

mmhos/cm - millihos per centimeter

BTEX - Benzene, Toluene, Ethylbenzene, Total Xylenes

TPH - Total Petroleum Hydrocarbons

GRO - Gasoline Range Organics

DRO - Diesel Range Organics

EXT - Extended

BG - Background

NA - Not Applicable

COGCC - Colorado Oil & Gas Conservation Commission

**Bold** values exceed COGCC Table 910 Standard