Black Hills Plateau Production
Whittaker Flats D-17 Cuttings Remediation
Analytical Results

						Lift 1							Lift 2									Lift 3								
			Pad Surface Baseline	Cuttings Stockpile (Starting Baseline)	Lift 1 Cuttings Baseline (Treatment Start) (Bioremediation Prod. Conditioners, & Nitrogen)	Monitoring (Soil Cond. Nitrogen & Gypsum)	Monitoring (Round 2 Bioremediation Product Inj.)	Monitoring (Nitrogen & Soil Conditioners Inj.)	Monitoring (Round 1 of gypsum - Slurry)	Monitoring (Nitrogen & Soil Conditioners)	Monitoring (Aeration)	Lift 2 Baseline (Treatment Start)	Monitoring (Soil Conditioners)	Monitoring (Nitrogen & Soil Conditioners)	Monitoring (Bioremediation Product Applied)	Monitoring (Lots of Water)	Monitoring (Round 1 of gypsum)	Monitoring (Aeration)	Monitoring (Aeration)	Monitoring (Round 2 of gypsum & low pH additives)	Monitoring (Aeration)	Lift 3 Baseline (Treatment Start)	Monitoring (Post Gypsum - Pre Water)	Monitoring (Post Gypsum - Post Water)	Monitoring (Bioremediation Product)	Monitoring (Round 2 of gypsum, low pH solution, & nitrogen)	Monitoring (soil conditioner & nitrogen)	Background 1	Background 2	Background 3
COGCC Table 910-1 Analytical Suite	**Table 910-1 Standard**	**Units**			**L822919**	**L827946**	**L979488**	**L983930**	**L988355**	**L993071**	**L995932**	**L870762**	**L898439**	**L903371**	**L907105**	**L920013**	**L936988**	**L983935**	**L986719**	**L986744**	**L995937**	**L979484**	**L983926**	**L983913**	**L986762**	**L991152**	**L993068**			
Sample Date			**3/8/2016**	**10/27/2015**	**3/10/2016**	**5/24/2016**	**3/21/2018**	**4/5/2018**	**4/23/2018**	**5/10/2018**	**5/21/2018**	**11/1/2016**	**3/21/2017**	**4/18/2017**	**5/2/2017**	**6/30/2017**	**9/26/2017**	**4/5/2018**	**4/16/2018**	**4/16/2018**	**6/6/2018**	**3/21/2018**	**4/5/2018**		**4/26/2018**	**5/3/2018**	**5/10/2018**	**5/24/2016**	**5/24/2016**	**5/24/2016**
																		Organics												
TEPH (DRO)	**500**	**mg/kg**	33.700	3680.000	1260.000	216.000	-	-	-	-	-	1320	1210	NA - but still exceeds	1010	470	-	-	-	-	-	2200	not tested	not tested	1140	790	338	NA	NA	NA
TVPH (GRO)	**500**	**mg/kg**	ND	ND	7.220	2.330	-	-	-	-	-	0.421	0.158	-	0.269	0.248	-	-	-	-	-	0.501	not tested	not tested	ND	-	-	NA	NA	NA
TPH	**500**	**mg/kg**	33.700	3680.000	1267.220	218.330	-	-	-	-	-	1320.421	1210.2	NA - but still exceeds	1010	470.2	-	-	-	-	-	2200.5	-	-	1140	790	338	NA	NA	NA
BENZENE	**0.17**	**mg/kg**	ND	ND	0.024	-	-	-	-	-	-	0.00149	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA
TOLUENE	**85**	**mg/kg**	ND	ND	0.199	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA
ETHYLBENZENE	**100**	**mg/kg**	ND	ND	0.050	-	-	-	-	-	-	0.00114	-	-	-	-	-	-	-	-	-	constituents did not exceed original stockpile baseline	-	-	-	-	-	NA	NA	NA
XYLENE TOTAL	**175**	**mg/kg**	ND	ND	0.562	-	-	-	-	-	-	0.00675	-	-	-	-	-	-	-	-	-		-	-	-	-	-	NA	NA	NA
ACENAPHTHENE	**1,000**	**mg/kg**	ND	0.033	0.166	-	-	-	-	-	-	0.0326	-	-	-	-	-	-	-	-	-		-	-	-	-	-	NA	NA	NA
ANTHRACENE	**1,000**	**mg/kg**	ND	0.132	0.058	-	-	-	-	-	-	0.0247	-	-	-	-	-	-	-	-	-		-	-	-	-	-	NA	NA	NA
BENZO(A)ANTHRACENE	**0.22**	**mg/kg**	ND	0.336	0.183	0.311	0.131	-	-	-	-	0.1099	-	-	-	-	-	-	-	-	-	0.0205	-	-	-	-	-	NA	NA	NA
BENZO(A)PYRENE	**0.022**	**mg/kg**	ND	0.099	0.066	0.090	0.050	0.114	0.050	0.077	ND	0.0356	0.0590	not analyzed	not analyzed	0.062	0.00682	-	-	-	-	0.01420	-	-	-	-	-	NA	NA	NA
BENZO(B)FLUORANTHENE	**0.22**	**mg/kg**	ND	0.475	0.267	0.365	0.216	-	0.240	0.338	0.009	0.1530	-	-	-	-	-	-	-	-	-	0.030	-	-	-	-	-	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	**0.022**	**mg/kg**	ND	0.074	0.046	ND	0.040	0.088	0.047	0.060	ND	0.0382	0.0530	not analyzed	not analyzed	0.044	ND	-	-	-	-	0.006	-	-	-	-	-	NA	NA	NA
																		Metals												
MERCURY	**23**	**mg/kg**	ND	0.085	-	-	-	-	-	-	-	0.048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA
ARSENIC	**0.39**	**mg/kg**	3.940	ND	-	-	-	-	-	-	-	5.58	-	-	-	-	-	-	-	-	-	4.51	-	-	-	-	-	3.230	2.760	2.850
BARIUM	**15,000**	**mg/kg**	1340.000	9060	-	-	-	-	-	-	-	24400	34200	11200	12500	-	-	-	-	-	-	12900	-	-	-	-	-	NA	NA	NA
CADMIUM	**70**	**mg/kg**	ND	ND	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-		-	-	-	-	-	NA	NA	NA
CHROMIUM (III)	**120,000**	**mg/kg**	6.110	13.900	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-		-	-	-	-	-	NA	NA	NA
CHROMIUM (VI)	**23**	**mg/kg**	3.960	ND	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-		-	-	-	-	-	NA	NA	NA
COPPER	**3,100**	**mg/kg**	8.740	82.400	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	constituents did not exceed original stockpile baseline	-	-	-	-	-	NA	NA	NA
LEAD	**400**	**mg/kg**	8.310	11.000	-	-	-	-	-	-	-	11.1	-	-	-	-	-	-	-	-	-		-	-	-	-	-	NA	NA	NA
NICKEL	**1,600**	**mg/kg**	8.870	20.200	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-		-	-	-	-	-	NA	NA	NA
SELENIUM	**390**	**mg/kg**	ND	ND	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-		-	-	-	-	-	NA	NA	NA
SILVER	**390**	**mg/kg**	ND	ND	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-		-	-	-	-	-	NA	NA	NA
ZINC	**23,000**	**mg/kg**	24.300	58.100	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-		-	-	-	-	-	NA	NA	NA
																		Inorganics												
Sodium Absorption Ratio	**<12**	**unitless**	9.880	29.4	15	25	30	26	20	16	11.5	33	14	not analyzed	22	NA - but still exceeds	32	19	16	14	6	29	24	21	18	19	12	0.205	0.255	0.141
Electric Conductivity	**<4mmhos/cm or 2x background**	**mmhos/cm**	0.029	5.120	2.260	4	4.600	3.100	-	-	-	3.090	-	-	-	-	-	-	-	-	-	2.750	-	-	-	-	-	0.086	0.014	0.033
pH	**6 to 9**	**SU**	9.100	7.550	8.440	8.710	-	-	-	-	-	8.26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.990	7.870	7.500

Notes:
highlight indicates reading above COGCC Table 910-1 standards
ND - non detect
- not analyzed
SU - standard unit
mg/kg - milligram per kilogram
mmhos/cm - millimhos per centimeter
TEPH - total petroleum hydrocarbons - Diesel range organics
TVPH - total petroleum hydrocarbons - gasoline range organics
TPH - total petroleum hydrocarbons (TEPH and TVPH combined)
COGCC - Colorado Oil and Gas Conservation Commission