Table D5-1 - Overburden Analysis
Black Hills Bentonite, L.L.C.
BLM Plan of Operation Associated with
Permit to Mine No. 339C - North Fork Amendment

Overburden Analysis for Permit to Mine No. 339C Mayoworth - North Fork Amendment (Collected 9-25-07)

			Suitable Overburden Marginal Overburden Unsuitable Overburden			0-8 8-12 >12	25-80 <25 >80 n/a	5.5-8.5 5.0-5.5 <5				0-10 10-12 / 10-15 >12 >15				>-5 <-5				C, SiC, S
Location	Sample Identification	Formation	Bentonite Layer	Sample Upper Depth (feet)	Sample Lower Depth (feet)	EC @ 25° C	Saturation percent	pH s.u.	Calcium meq/L	Magnesium meq/L	Sodium meq/L	(SAR) Sodium Absorption Ratio	Carbonates percent	(NP) Neutralization Potential t/1000t	(AP) Acid Potential t/1000t	(AB) Acid/Base Potential t/1000t	Sand %	Silt %	Clay %	Texture** ----------
T45N R83W NENE Sec. 26	07-708A	Frontier	2nd Upper	0'	2'	2.42	22.5	5.7	580	18	42	0.47	1.0	10	2	7	23	33	44	C
North Fork Amendment	07-708A	Frontier	2nd Upper	2'	4'	2.78	121	5.6	590	82	54	0.55	1.1	11	6	5	29	29	42	C
	07-708A	Frontier	2nd Upper	4'	6'	3.20	127	6.4	580	160	81	0.77	1.9	19	8	11	21	25	54	C
	07-708A	Frontier	2nd Upper	6'	8'	3.87	122	6.9	530	310	110	0.96	2.4	24	2	22	19	31	50	C
	07-708A	Frontier	2nd Upper	8'	10'	3.90	120	7.0	500	340	120	1.00	1.8	18	0	17	18	28	54	C
	07-708A	Frontier	2nd Upper	10'	15'	4.13	135	7.1	500	360	160	1.30	1.7	17	1	16	37	27	36	CL
	07-708A	Frontier	2nd Upper	15'	20'	4.02	110	7.1	500	310	180	1.57	2.0	20	3	17	21	35	44	C
	07-708A	Frontier	2nd Upper	20'	25'	2.70	130	8.0	240	160	220	2.68	3.4	34	10	23	17	47	36	SiCL
	07-708A	Frontier	2nd Upper	25'	30'	2.31	187	8.5	120	74	320	5.72	3.4	34	10	24	19	37	44	C
T45N R83W NENE Sec. 22	07-709A	Frontier	Frontier	0'	2'	2.72	87.9	7.4	510	120	30	0.31	8.6	86	2	84	30	22	48	C
North Fork Amendment	07-709A	Frontier	Frontier	2'	4'	2.82	68.6	7.7	600	84	43	0.43	12.2	122	16	113	33	29	38	CL
	07-709A	Frontier	Frontier	4'	6'	3.24	82.1	7.8	570	180	53	0.49	5.6	56	14	42	31	35	34	CL
	07-709A	Frontier	Frontier	6'	8'	4.36	117	7.8	500	430	120	0.93	3.5	35	7	28	23	41	36	CL
	07-709A	Frontier	Frontier	8'	10'	4.81	109	7.8	460	460	210	1.64	2.4	24	2	22	17	37	46	C
	07-709A	Frontier	Frontier	10'	15'	5.11	163	7.8	470	500	280	2.17	3.4	34	4	30	29	36	35	CL
	07-709A	Frontier	Frontier	15'	20'	5.24	92.7	7.7	480	470	330	2.54	2.8	28	1	27	35	23	42	C
	07-709A	Frontier	Frontier	20'	25'	5.30	114	7.6	480	400	400	3.26	3.4	34	3	31	34	26	40	C - CL
	07-709A	Frontier	Frontier	25'	30'	6.11	92.8	8.0	450	340	710	6.18	3.5	35	8	27	31	35	34	CL
	07-709A	Frontier	Frontier	30'	35'	2.56	603	8.7	62	50	420	9.62	3.9	39	11	28	37	30	33	CL
	07-709A	Frontier	Frontier	35'	40'	2.02	688	9.8	7.1	3.6	300	22.7	4.6	46	24	22	19	43	38	SiCL
	07-709A	Frontier	Frontier	40'	45'	1.50	550	9.7	6.8	6.3	460	30.4	3.7	37	19	18	31	33	36	CL
T45N R83W SWSE Sec. 23	07-710A	Frontier	Frontier	0'	2'	6.13	829	8.2	230	67	1200	17.9	2.3	23	2	21	43	19	38	CL
Amendment No.2	07-710A	Frontier	Frontier	2'	4'	3.76	3540	9.0	34	21	790	26.2	3.6	36	1	35	27	17	56	C
	07-710A	Frontier	Frontier	4'	6'	3.59	1580	8.4	18	18	740	29.8	2.8	28	2	26	43	11	46	C
	07-710A	Frontier	Frontier	6'	8'	4.14	1690	8.1	33	27	870	27.0	2.5	25	1	24	23	24	53	C
	07-710A	Frontier	Frontier	8'	10'	6.02	622	8.1	220	100	1100	16.0	1.9	19	2	17	25	31	44	C
	07-710A	Frontier	Frontier	10'	15'	11.4	323	8.0	390	350	2400	21.5	1.9	19	2	17	24	31	45	C
	07-710A	Frontier	Frontier	15'	20'	13.3	301	7.8	430	480	2900	22.5	1.6	16	2	14	23	31	46	C
	07-710A	Frontier	Frontier	20'	25'	11.8	181	7.6	430	380	2500	21.0	1.0	10	3	7	34	29	37	CL
	07-710A	Frontier	Frontier	25'	30'	7.43	505	8.1	310	130	1500	18.1	1.8	18	10	8	37	29	34	CL
	07-710A	Frontier	Frontier	30'	35'	0.58	689	9.3	6.5	2.3	470	40.4	2.1	21	15	6	40	27	33	CL

Abreviations Key*

EC	Electrical Conductivity
pH	Percent Hydrogen
meq/l	Miliequivalents per liter
SAR	Sodium Adsorption Ratio
AP	Acid Potential
t/1000t	tons CaCO3 required per 1000 tons material
NP	Neutralization Potentential
t/1000t	Tons CaCO3 present per 1000 tons material
AB	Acid Base Potential
t/1000t	Tons CaCO3 per 1000 tons material

** Abreviations Used in the Texture Column

S	Sand
Si	Silt
C	Clay
CL	Clay Loam
L	Loam
SiC	Silty Clay
SiCL	Silty Clay Loaam

* Refer to Wyoming Department of Environmental Quality/Land Qality Division Guideline 1 - Topsoil and Overburden Appendix I, Parameters, Analytical Procedures and Suitability Criteria for Topsil and Overburden Analyses and Evaluation