

Thompson, Pamela J.

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Case Number: 08-2024-CV-00694
Case Style: Casey Voigt, et al. vs. North Dakota Public Service Commission, et al.



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Court	Burleigh County
Case Number	08-2024-CV-00694
Case Style	Casey Voigt, et al. vs. North Dakota Public Service Commission, et al.
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Casey and Julie Voigt v. Coyote Creek Mining Company, LLC

Case No. RC-23-348

COY-034 OB Sample Analyses Spreadsheet

[Placeholder] - Excel workbook in electronic format

Voigt Exhibit 5

COY-034OB Sample Analyses	Average Overburden SAR*
<u>CC12084C</u>	30.48
<u>CC12086C</u>	21.56
<u>CC12088C</u>	33.04
<u>CC12090C</u>	28.59
<u>CC12091C</u>	28.84
<u>CC12093C</u>	32.88
<u>CC12094C</u>	21.55
<u>CC12095C</u>	34.65
<u>CC12096C</u>	23.08
<u>CC12099C</u>	16.13
<u>CC12100C</u>	26.00
<u>CC12102C</u>	37.38
<u>CC12103C</u>	27.95
<u>CC12104C</u>	29.91
Total Average	28.00

*Average for values from surface to top of coal seam

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>	
14378431	49336	0-5	2.68	9.79	3.2	5.7	17.3	8.20	8.40	CLAY LOAM	40	25	35	55.2	8.20
14378432	49337	5-10	6.15	15.86	25.4	27.6	44.5	8.65	8.22	CLAY LOAM	38	23	39	60.7	8.65
14378433	49338	10-15	6.72	18.58	28.6	31.7	64.5	11.75	7.84	CLAY	20	39	41	85.6	11.75
14378434	49339	15-20	8.14	14.72	22.6	33.6	63.5	11.98	8.09	CLAY LOAM	36	33	31	76.7	11.98
14378435	49340	20-25	8.39	14.94	19.0	26.9	79.5	16.58	8.33	LOAM	36	39	25	61.2	16.58
14378436	49341	25-30	5.11	18.40	16.4	17.2	60.4	14.73	8.25	CLAY	22	37	41	129.5	14.73
14378437	49342	30-35	7.07	12.74	12.7	12.0	65.4	18.58	8.21	CLAY LOAM	44	25	31	122.0	18.58
14378438	49343	35-40	2.67	10.25	0.8	0.9	25.7	27.86	8.97	CLAY	6	31	63	225.5	27.86
14378439	49344	40-45	3.30	11.23	1.3	1.1	34.6	31.56	8.61	CLAY	10	19	71	172.3	31.56
14378440	49345	45-50	4.33	11.32	1.9	1.6	45.5	34.22	7.83	CLAY	16	33	51	98.9	34.22
14378441	49346	50-55	2.70	10.28	0.7	0.5	26.6	34.44	8.42	CLAY	6	17	77	129.5	34.44
14378442	49347	55-60	3.09	8.97	0.6	0.5	26.6	35.36	8.44	CLAY	8	19	73	150.9	35.36
14378443	49348	60-65	3.92	11.66	1.1	0.9	43.7	43.97	8.04	CLAY LOAM	26	37	37	94.9	43.97
14378444	49349	65-70	2.50	10.99	0.4	0.3	26.7	42.47	8.94	CLAY LOAM	30	41	29	119.2	22.91
14378445	49350	70-75	2.33	11.07	0.4	0.3	25.0	40.90	9.11	LOAM	42	33	25	105.7	
14378446	49351	75-80	2.96	8.87	0.4	0.3	25.6	44.24	9.16	LOAM	34	45	21	96.1	
14378447	49352	80-85	2.14	11.02	0.4	0.3	22.9	39.58	9.17	SANDY CLAY LOAM	50	27	23	105.4	
14378448	49353	85-90	2.00	11.19	0.6	0.5	21.3	29.09	9.14	SANDY CLAY LOAM	58	19	23	100.5	
14378449	49354	90-95	2.23	10.52	0.8	0.7	21.9	25.21	8.98	CLAY LOAM	38	33	29	101.6	
14378450	49355	95-100	5.47	13.42	4.3	3.0	66.1	34.55	8.42	SANDY CLAY LOAM	60	19	21	47.2	
14378451	49356	100-105	2.59	11.02	0.7	0.5	27.3	35.32	8.79	CLAY	8	21	71	138.1	
14378452	49357	105-110	2.59	11.02	0.5	0.3	27.7	43.29	8.83	SILTY CLAY	10	41	49	125.8	
14378453	49358	110-115	2.45	11.29	0.5	0.3	26.9	42.16	8.71	CLAY	18	35	47	121.3	
14378454	49359	115-120	2.21	9.40	0.6	0.6	19.6	25.55	8.91	CLAY	12	39	49	161.5	
14378455	49360	120-125	1.77	10.93	0.5	0.3	18.6	29.85	9.05	CLAY LOAM	26	41	33	126.5	
14378456	49361	125-130	1.99	10.14	0.3	0.3	19.5	34.98	8.97	CLAY	14	31	55	133.0	
14378457	49362	130-135	2.19	11.48	0.5	0.3	24.4	40.02	8.80	CLAY	18	39	43	114.1	
14378458	49363	135-140	2.19	11.05	0.6	0.5	23.0	30.23	8.70	SILTY CLAY	10	43	47	123.9	
14378459	49364	140-145	2.38	11.44	0.5	0.4	26.3	39.03	8.92	SILTY CLAY LOAM	18	45	37	119.0	
14378460	49365	145-148.9	2.75	10.20	0.6	0.4	27.1	40.10	8.83	SILTY CLAY	8	41	51	109.0	
14378461	49366	159-164	1.45	11.63	0.9	0.4	15.6	19.17	9.11	LOAM	34	39	27	62.0	

Overburden (Rows 2-31) average SAR: 30.48

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>	
14378111	49367	0-5	1.00	10.65	2.2	2.9	5.5	3.44	7.80	CLAY LOAM	44	23	33	48.3	3.44
14378112	49368	5-10	5.10	18.07	23.8	35.1	33.3	6.13	7.90	CLAY LOAM	41	24	35	62.2	6.13
14378113	49369	10-15	5.43	14.39	16.7	24.2	37.3	8.26	7.90	CLAY LOAM	37	24	39	68.0	8.26
14378114	49370	15-20	3.44	12.11	7.1	9.0	25.5	8.99	7.90	CLAY	16	17	67	99.3	8.99
14378115	49371	20-25	4.36	12.59	8.1	13.2	33.6	10.29	7.30	CLAY	24	31	45	75.2	10.29
14378116	49372	25-30	7.40	15.34	23.5	33.8	56.3	10.51	6.80	CLAY	16	35	49	80.0	10.51
14378117	49373	30-35	3.88	10.87	2.3	5.0	34.9	18.26	8.20	CLAY	18	39	43	108.8	18.26
14378118	49374	35-40	4.05	10.67	1.8	3.5	37.9	23.33	8.57	SILTY CLAY LOAM	14	47	39	101.0	9.41
14378119	49375	40-45	2.91	11.27	1.2	1.8	29.8	24.17	8.40	CLAY LOAM	23	44	33	102.0	
14378120	49376	45-50	3.26	10.51	1.7	2.2	30.4	21.77	8.40	LOAM	35	38	27	81.4	
14378121	49377	50-55	1.57	10.25	0.4	0.4	15.2	22.98	8.70	CLAY LOAM	27	44	29	112.0	
14378122	49378	55-60	1.78	10.50	0.6	0.4	17.7	24.48	9.00	CLAY	12	37	51	129.5	
14378123	49379	60-65	2.11	9.37	0.4	0.4	19.0	31.64	8.86	CLAY LOAM	21	42	37	101.3	
14378124	49380	65-70	2.12	10.51	0.5	0.4	21.4	32.49	8.40	SILTY CLAY LOAM	19	44	37	119.8	
14378125	49381	70-75	1.74	8.93	0.3	0.2	15.1	33.16	8.80	CLAY	27	32	41	110.9	
14378126	49382	75-80	0.96	10.61	0.2	0.2	9.7	19.84	9.40	CLAY LOAM	25	40	35	143.8	
14378127	49383	80-85	1.18	10.16	0.3	0.2	11.5	24.17	9.11	CLAY LOAM	20	49	31	128.4	
14378128	49384	85-90	1.20	10.54	0.3	0.2	12.2	24.80	8.80	SILTY CLAY LOAM	19	46	35	135.1	
14378129	49385	90-95	1.27	10.73	0.3	0.2	13.1	26.79	8.80	SILTY CLAY LOAM	17	48	35	133.1	
14378130	49386	95-100	1.30	9.19	0.1	0.1	11.7	33.18	9.31	CLAY LOAM	26	41	33	146.3	
14378131	49387	100-105	1.38	10.99	0.3	0.3	14.6	26.73	9.05	SILTY CLAY LOAM	17	46	37	123.2	
14378132	49388	105-110	1.48	9.21	0.3	0.2	13.1	25.98	8.70	SILTY CLAY	7	50	43	122.9	
14378133	49389	110-115	1.43	11.07	0.4	0.3	15.2	26.09	8.72	CLAY	5	20	75	128.8	
14378134	49390	115-119.15	1.87	11.08	0.5	0.4	19.9	30.06	7.89	CLAY	35	12	53	106.8	
14378135	49391	129.3-134.3	3.68	11.84	1.0	0.8	41.7	43.11	8.50	CLAY	31	28	41	117.4	

Overburden (Rows 2-25) average SAR: 21.56

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>
14378421	49392	0-5	11.65	13.47	18.4	29.9	108.6	22.07	8.20	CLAY LOAM	40	23	37	98.78
14378422	49393	5-10	4.45	10.58	0.9	1.5	44.7	41.01	8.96	CLAY	2	33	65	149.6
14378423	49394	10-15	3.96	9.14	0.8	0.7	34.7	39.80	8.70	CLAY	16	29	55	146.2
14378424	49395	15-20	2.50	10.65	0.6	0.5	25.5	33.73	8.86	SILTY CLAY LOAM	12	49	39	124.2
14378425	49396	20-25	1.74	10.87	0.4	0.4	18.1	28.99	8.99	SILTY CLAY SILTY	6	51	43	125.0
14378426	49397	25-30	1.59	10.15	0.4	0.4	15.4	24.52	9.09	CLAY	9	47	44	127.4
14378427	49398	30-35	1.54	11.46	0.2	0.2	17.2	36.91	8.73	CLAY	14	21	65	131.6
14378428	49399	35-39.1	2.13	11.74	0.5	0.3	24.2	37.30	7.75	CLAY	24	11	65	119.4
14378429	49400	50-55	1.27	10.26	0.3	0.1	12.6	28.73	9.00	CLAY	15	36	49	115.8

Overburden (Rows 2-9) Average SAR: 33.04

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>
14378381	49487	0-5	2.71	10.97	1.9	4.3	23.6	13.40	8.30	CLAY	29	24	47	90.6
14378382	49488	5-10	7.89	16.28	21.4	28.0	79.0	15.90	6.50	CLAY	17	22	61	77.6
14378383	49489	10-15	5.28	9.49	3.5	5.4	41.3	19.65	8.00	CLAY	14	31	55	101.7
14378384	49490	15-20	3.64	11.02	2.0	3.2	34.9	21.53	8.10	CLAY	14	33	53	127.5
14378385	49491	20-25	2.78	10.08	1.0	1.6	25.5	22.55	8.61	CLAY LOAM	35	33	32	127.0
14378386	49492	25-30	2.27	10.34	0.4	0.7	22.3	29.54	8.70	SANDY CLAY LOAM	58	17	25	92.3
14378387	49493	30-35	2.38	8.44	0.3	0.4	19.3	31.36	9.10	LOAM	41	37	22	99.1
14378388	49494	35-40	2.36	9.81	0.3	0.3	22.6	41.97	9.47	SANDY CLAY LOAM	57	21	22	95.8
14378389	49495	40-45	2.01	8.93	0.3	0.1	17.5	38.51	9.30	SANDY CLAY LOAM	65	14	21	85.2
14378390	49496	45-50	1.73	10.15	0.3	0.2	17.1	35.95	9.00	CLAY LOAM	25	38	37	114.8
14378391	49497	50-55	1.59	10.22	0.2	0.1	15.9	38.49	9.10	SILTY CLAY	15	42	43	125.7
14378392	49498	55-60	1.73	10.39	0.2	0.2	17.5	36.65	8.60	CLAY	15	14	71	126.5
14378393	49499	60-61.9	1.54	10.92	0.4	0.3	16.1	26.21	7.50	CLAY	24	11	65	118.5
14378394	49500	73-78	4.37	9.38	2.5	2.8	35.6	21.77	6.70	CLAY	26	19	55	85.4

Overburden (Rows 2-14) Average SAR: 28.59

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>
14378351	49501	0-5	2.58	12.14	1.6	5.7	24.0	12.55	8.4	CLAY LOAM	44	23	33	64.6
14378352	49502	5-10	8.20	17.29	24.7	47.1	70.1	11.70	8.1	CLAY LOAM	35	26	39	84.4
14378353	49503	10-15	5.15	13.89	9.6	15.6	46.4	13.09	8.1	CLAY	30	29	41	79.8
14378354	49504	15-20	2.70	11.93	3.2	3.4	25.6	14.01	8.2	CLAY	28	29	43	88.6
14378355	49505	20-25	3.53	12.04	6.4	6.1	30.0	12.01	8.1	CLAY	20	29	51	86.1
14378356	49506	25-30	2.37	10.47	2.8	2.8	19.2	11.51	8.2	CLAY	8	31	61	113.9
14378357	49507	30-35	2.46	10.05	1.9	1.6	21.3	16.21	8.5	CLAY	8	35	57	114.2
14378358	49508	35-40	2.35	10.26	1.3	1.0	21.8	20.40	8.4	CLAY	6	35	59	105.0
14378359	49509	40-45	2.32	9.94	0.7	0.6	21.8	27.35	8.3	CLAY	4	11	85	129.2
14378360	49510	45-50	2.81	11.00	1.2	1.0	28.8	27.89	7.6	CLAY	8	33	59	83.4
14378361	49511	50-55	2.55	10.08	0.6	0.4	24.8	36.47	8.4	CLAY	2	17	81	105.8
14378362	49512	55-60	2.34	10.38	0.4	0.3	23.6	39.91	8.5	CLAY	0	19	81	113.5
14378363	49513	60-65	2.27	10.07	0.4	0.2	22.3	41.42	8.8	SILTY CLAY	8	41	51	133.0
14378364	49514	65-70	2.82	10.48	0.6	0.4	28.5	40.43	8.7	LOAM	42	33	25	68.8
14378365	49515	70-75	2.70	11.27	0.5	0.4	29.6	44.54	8.4	CLAY	4	33	63	110.5
14378366	49516	75-80	2.04	10.68	0.3	0.3	21.3	41.14	8.7	SILTY CLAY	14	41	45	121.1
14378367	49517	80-85	1.88	11.44	0.6	0.5	20.4	27.39	8.5	CLAY	6	35	59	111.8
14378368	49518	85-90	1.74	11.23	0.5	0.3	18.7	29.39	8.4	SILTY CLAY	10	47	43	108.8
14378369	49519	90-95	1.87	9.55	0.6	0.5	16.7	22.19	8.6	SILTY CLAY	6	47	47	115.2
14378370	49520	95-100	1.97	9.65	0.7	0.4	17.9	24.62	8.5	SILTY CLAY	10	47	43	122.5
14378371	49521	100-105	1.46	11.20	0.4	0.4	15.6	24.53	8.8	SILTY CLAY LOAM	14	49	37	130.1
14378372	49522	105-110	1.85	10.26	0.2	0.2	18.6	43.22	8.9	CLAY	11	34	55	123.6
14378373	49523	110-115	1.88	10.49	0.3	0.2	19.3	41.15	8.9	CLAY	8	37	55	141.3
14378374	49524	115-120	2.27	9.06	0.2	0.2	20.2	44.20	8.9	CLAY	10	29	61	144.7
14378375	49525	120-125	2.17	11.6	0.3	0.2	24.6	47.45	8.6	SILTY CLAY	8	47	45	128.6
14378376	49526	125-130	1.48	11.15	0.3	0.2	16.0	31.32	8.8	SILTY CLAY	8	47	45	138.1
14378377	49527	130-135	1.78	10.55	0.4	0.4	18.1	29.92	8.6	CLAY	4	35	61	122.3
14378378	49528	135-136.2	2.34	12.25	0.9	0.6	27.2	31.56	7.6	CLAY	34	19	47	93.2
14378379	49529	147.95-152.95	1.85	10.03	0.5	0.4	17.6	25.85	7.5	CLAY	14	17	69	122.4

Overburden (Rows 2-29) Average SAR: 28.84

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>	
14378471	49463	0-5	4.83	14.03	9.3	17.6	40.9	11.15	8.44	CLAY LOAM	38	23	39	55.7	11.15
14378472	49464	5-10	6.25	13.28	12.6	19.6	50.9	12.68	8.45	CLAY	30	29	41	73.9	12.68
14378473	49465	10-15	7.57	17.29	25.7	34.9	70.3	12.77	8.13	CLAY	20	29	51	80.9	12.77
14378474	49466	15-20	6.42	16.02	19.5	21.9	61.4	13.50	8.09	CLAY	6	25	69	98.0	13.50
14378475	49467	20-25	2.07	10.91	0.8	1.3	20.5	20.08	8.76	CLAY	2	21	77	155.2	20.08
14378476	49468	25-30	2.29	10.68	0.8	1.1	22.6	23.15	8.62	CLAY	2	25	73	160.2	23.15
14378477	49469	30-35	2.80	11.63	1.0	1.2	30.4	28.97	8.45	CLAY	12	33	55	142.5	15.56
14378478	49470	35-40	1.77	10.82	0.5	0.4	18.3	28.54	9.08	CLAY	10	35	55	185.8	
14378479	49471	40-45	1.91	10.98	0.5	0.3	20.1	31.34	9.09	SILTY CLAY LOAM	12	55	33	118.0	
14378480	49472	45-50	1.92	11.39	0.4	0.3	21.2	35.95	8.83	CLAY	10	33	57	119.3	
14378481	49473	50-55	2.40	9.63	1.0	0.5	21.6	25.09	8.77	CLAY	8	37	55	114.8	
14378482	49474	55-60	2.41	11.18	0.5	0.5	26.0	36.95	8.86	SILTY CLAY	4	49	47	122.1	
14378483	49475	60-65	2.39	10.95	0.7	0.5	25.0	32.13	8.50	SILTY CLAY	10	47	43	108.2	
14378484	49476	65-70	2.63	10.70	0.4	0.3	27.4	44.32	8.41	SILTY CLAY	12	43	45	113.1	
14378485	49477	70-75	2.22	10.98	0.3	0.3	23.8	45.46	8.64	CLAY	6	37	57	108.1	
14378486	49478	75-80	2.58	10.60	0.6	0.4	26.4	38.78	8.24	CLAY	12	31	57	131.0	
14378487	49479	80-85	2.27	10.74	0.3	0.3	23.8	43.76	8.73	CLAY	20	31	49	107.1	
14378488	49480	85-90	2.52	10.42	0.3	0.3	25.6	46.47	8.48	CLAY	14	25	61	111.9	
14378489	49481	90-95	1.86	10.71	0.2	0.2	19.5	43.93	8.97	CLAY	12	37	51	146.0	
14378490	49482	95-100	2.09	10.96	0.3	0.2	22.4	46.85	9.06	CLAY LOAM	32	35	33	112.4	
14378491	49483	100-105	1.86	9.23	0.1	0.1	16.9	46.98	9.33	LOAM	40	33	27	117.5	
14378492	49484	105-110	1.83	10.62	0.2	0.2	19.1	46.30	9.13	CLAY LOAM	26	43	31	110.4	
14378493	49485	110-114.5	2.09	11.34	0.4	0.3	23.1	41.08	8.26	CLAY	32	13	55	110.1	
14378494	49486	125.3-130.3	1.62	10.65	0.4	0.2	16.6	29.59	9.10	LOAM	38	37	25	76.4	

Overburden (Rows 2-24) Average SAR: 32.88

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>
14378141	49297	0-5	1.00	10.45	3.6	2.1	4.8	2.86	7.84	SANDY LOAM	75	14	11	26.3
14378142	49298	5-10	0.82	10.07	1.7	1.9	4.7	3.53	8.10	SANDY CLAY LOAM	61	18	21	35.5
14378143	49299	10-15	0.80	10.31	1.3	1.6	5.4	4.45	8.11	SANDY CLAY LOAM	47	24	29	48.3
14378144	49300	15-20	0.76	10.08	0.8	0.9	5.9	6.38	8.15	CLAY LOAM	37	28	35	61.7
14378145	49301	20-25	1.36	9.87	1.2	0.9	11.3	11.01	8.11	CLAY	19	26	55	85.3
14378146	49302	25-30	1.48	9.92	0.6	0.4	13.6	18.90	8.27	CLAY.	37	14	49	68.8
14378147	49303	30-35	1.34	8.85	0.3	0.2	11.3	21.94	8.67	SILTY CLAY	17	42	41	89.0
14378148	49304	35-40	1.81	10.72	0.4	0.3	18.7	30.61	8.28	CLAY	29	30	41	75.9
14378149	49305	40-45	1.09	9.95	0.2	0.1	10.5	25.48	9.06	CLAY	15	38	47	121.0
14378150	49306	45-50	1.45	10.39	0.3	0.2	14.6	31.31	8.56	CLAY	17	32	51	97.1
14378151	49307	50-55	2.00	10.97	0.4	0.3	21.2	35.63	8.86	CLAY	29	22	49	106.2
14378152	49308	55-60	1.00	10.39	0.2	0.1	10.1	24.47	9.10	SILTY CLAY LOAM	19	44	37	120.9
14378153	49309	60-65	0.88	9.38	0.2	0.1	7.9	19.03	9.28	CLAY LOAM	21	44	35	140.1
14378154	49310	65-70	1.23	10.50	0.2	0.2	12.5	28.32	8.87	CLAY	17	40	43	132.9
14378155	49311	70-75	1.39	10.65	0.4	0.4	14.0	21.63	8.83	CLAY	21	38	41	133.9
14378156	49312	75-80	1.52	10.70	0.3	0.3	15.7	28.98	8.93	SILTY CLAY LOAM	19	46	35	118.7
14378157	49313	80-85	1.21	8.78	0.2	0.1	10.4	29.15	9.23	SANDY CLAY LOAM	63	16	21	115.5
14378158	49314	85-90	1.19	10.50	0.3	0.2	12.0	23.60	9.02	CLAY LOAM	39	32	29	101.1
14378159	49315	90-95	1.36	9.99	0.3	0.2	13.2	28.84	8.86	CLAY	23	36	41	118.7
14378160	49316	95-100.2	2.49	9.69	0.5	0.4	23.3	34.95	7.69	CLAY LOAM	43	18	39	91.2
14378161	49317	111-116	1.76	10.33	0.3	0.3	17.6	32.81	8.39	CLAY LOAM	27	34	39	124.5

Overburden (Rows 2-21) Average SAR: 21.55

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>
14378581	49318	0-5	7.32	14.28	15.6	16.0	73.0	18.36	8.22	SILTY CLAY	13	44	43	206.5
14378582	49319	5-10	4.04	10.58	1.4	2.0	39.3	30.23	8.53	CLAY	13	26	61	184.2
14378583	49320	10-15	3.82	8.98	0.7	0.6	33.0	40.12	8.77	SILTY CLAY	11	42	47	139.6
14378584	49321	15-20	3.28	9.36	0.7	0.6	29.5	37.22	8.90	LOAM	36	43	21	101.4
14378585	49322	20-25	3.82	11.18	0.8	0.6	41.3	49.38	8.70	SILTY CLAY	10	47	43	130.8
14378586	49323	25-30	3.06	10.10	0.8	0.5	29.6	36.26	8.60	SILTY CLAY LOAM	14	47	39	118.1
14378587	49324	30-35	3.44	11.18	1.4	1.0	36.1	33.07	7.30	CLAY LOAM	26	35	39	103.5
14378588	49325	35-40	2.79	9.64	0.7	0.5	25.7	33.33	8.00	CLAY	19	28	53	112.2
14378589	49326	40-45	2.29	10.41	0.4	0.3	23.2	39.94	8.49	CLAY	11	28	61	126.2
14378590	49327	45-50	1.99	8.16	0.2	0.2	15.8	35.50	9.00	CLAY	16	39	45	143.8
14378591	49328	50-55	1.75	11.27	0.4	0.3	19.1	33.01	8.70	CLAY LOAM	32	33	39	124.8
14378592	49329	55-60	1.86	9.33	0.3	0.2	16.9	34.78	8.90	CLAY LOAM	28	41	31	124.8
14378593	49330	60-65	4.14	3.75	0.3	0.2	15.0	30.11	9.00	LOAM	44	33	23	107.4
14378594	49331	65-70	1.87	10.15	0.3	0.2	18.5	38.43	9.00	LOAM	36	41	23	102.1
14378595	49332	70-75	1.87	10.62	0.5	0.3	19.1	31.74	8.70	CLAY LOAM	34	37	29	103.7
14378596	49333	75-80	1.64	10.69	0.3	0.2	17.0	32.40	8.86	CLAY LOAM	33	32	35	116.7
14378597	49334	80-85	2.09	11.17	0.5	0.3	22.5	35.24	7.68	CLAY	39	14	47	112.6
14378598	49335	95.45-100.45	1.58	10.26	0.4	0.3	15.5	25.73	8.83	CLAY	21	36	43	109.9

Overburden (Rows 2-18) Average SAR: 34.65

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>
14378401	49530	0-5	1.45	10.56	0.5	2.0	12.8	11.41	8.78	SILTY CLAY LOAM	17	49	34	83.8
14378402	49531	5-10	1.33	10.38	0.4	1.1	12.4	14.54	8.95	SILTY CLAY LOAM	15	49	36	97.2
14378403	49532	10-15	1.90	9.80	0.7	1.7	16.3	14.92	8.75	SILTY CLAY LOAM	17	43	40	101.2
14378404	49533	15-20	1.29	10.02	0.5	0.9	11.5	13.65	8.50	SILTY CLAY LOAM	17	44	39	99.5
14378405	49534	20-25	1.52	10.07	1.5	1.7	12.2	9.75	8.10	SILTY CLAY	10	45	45	93.0
14378406	49535	25-30	1.73	10.80	3.1	2.7	12.9	7.56	8.27	CLAY LOAM	20	45	35	65.2
14378407	49536	30-35	2.09	10.69	4.3	4.3	13.8	6.68	7.40	CLAY	20	29	51	64.2
14378408	49537	35-40	2.45	11.27	3.9	3.7	20.0	10.29	7.10	CLAY LOAM	26	41	33	69.7
14378409	49538	40-45	1.87	10.99	0.6	0.4	19.5	27.07	8.44	CLAY	31	28	41	88.0
14378410	49539	45-50	1.81	11.42	0.3	0.2	20.2	39.53	8.55	CLAY	13	40	47	129.7
14378411	49540	50-55	1.87	10.16	0.3	0.2	18.5	36.07	8.94	CLAY	3	29	68	132.0
14378412	49541	55-60	2.10	8.35	0.3	0.2	17.0	33.71	9.27	SILTY CLAY LOAM	17	49	34	124.3
14378413	49542	60-65	1.81	10.54	0.3	0.2	18.5	34.97	9.14	CLAY LOAM	23	45	32	121.8
14378414	49543	65-70	1.65	10.73	0.4	0.3	17.0	28.72	9.07	CLAY LOAM	20	43	37	104.2
14378415	49544	70-75	1.51	9.49	0.2	0.2	13.9	30.08	9.39	LOAM	38	35	27	110.9
14378416	49545	75-80	2.49	9.90	0.3	0.2	24.2	48.65	8.68	SILTY CLAY	10	41	49	118.0
14378417	49546	80-83.85	1.64	10.84	0.7	0.3	16.9	24.74	8.30	CLAY	16	25	59	127.1
14378418	49547	95-100	1.93	10.66	0.2	0.2	20.1	41.73	7.90	CLAY LOAM	25	36	39	85.3

Overburden (Rows 2-18) Average SAR: 23.08

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>
14378101	49548	0-5	2.23	11.28	5.0	4.3	15.8	7.34	6.90	SANDY CLAY LOAM	54	23	23	43.8
14378102	49549	5-10	3.83	12.04	4.9	8.5	32.8	12.68	8.00	CLAY	32	27	41	70.6
14378103	49550	10-15	1.11	10.07	0.6	0.8	9.8	11.63	8.20	SILTY CLAY LOAM	14	47	39	96.4
14378104	49551	15-20	1.22	9.73	0.6	0.7	10.6	13.39	8.40	CLAY LOAM	32	33	35	103.7
14378105	49552	20-25	1.87	9.00	0.6	0.6	15.6	20.11	8.50	SILTY CLAY LOAM	16	45	39	118.2
14378106	49553	25-30	2.18	10.19	0.9	0.7	20.7	23.63	8.40	SILTY CLAY	8	43	49	116.5
14378107	49554	30-35.3	3.50	11.08	2.0	2.1	34.7	24.16	7.10	CLAY	28	15	57	104.5
14378108	49555	47.4-52.4	1.31	10.02	0.9	0.7	11.5	12.85	7.90	CLAY	12	31	57	73.6

Overburden (Rows 2-8) Average SAR: 16.13

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>
14378171	49556	0-5	2.01	12.46	5.4	8.8	10.9	4.12	7.87	SANDY CLAY LOAM	53	21	26	46.2
14378172	49557	5-10	4.88	14.99	21.3	33.1	18.7	3.58	7.78	SANDY CLAY LOAM	55	23	22	55.2
14378173	49558	10-15	6.44	17.63	25.3	59.8	28.4	4.36	7.66	LOAM	33	41	26	65.1
14378174	49559	15-20	6.39	17.73	25.0	60.8	27.5	4.21	7.45	LOAM	47	29	24	58.5
14378175	49560	20-25	5.44	15.39	21.7	45.6	16.4	2.84	7.51	LOAM	33	41	26	66.6
14378176	49561	25-30	5.45	15.54	24.5	44.9	15.3	2.60	6.50	CLAY	20	39	41	67.8
14378177	49562	30-35	5.30	17.41	23.5	46.1	22.7	3.85	4.10	CLAY LOAM	42	27	31	79.6
14378178	49563	35-40	4.13	13.40	15.1	15.7	24.5	6.25	6.60	CLAY	22	25	53	86.8
14378179	49564	40-45	3.36	11.68	8.3	6.0	24.9	9.30	7.70	CLAY	16	29	55	93.7
14378180	49565	45-50	4.88	13.26	17.9	14.0	32.9	8.25	7.40	CLAY	24	29	47	83.9
14378181	49566	50-55	3.13	9.50	1.7	1.0	26.9	22.85	8.30	CLAY	20	27	53	102.5
14378182	49567	55-60	2.55	10.29	0.8	0.5	25.0	31.36	8.41	CLAY	11	13	76	144.9
14378183	49568	60-65	3.18	11.08	0.9	0.8	33.5	35.70	7.91	CLAY	11	25	64	95.5
14378184	49569	65-70	2.75	10.92	0.6	0.5	28.9	38.96	8.37	CLAY	3	21	76	109.2
14378185	49570	70-75	2.87	9.75	0.5	0.4	27.1	40.75	8.43	CLAY	5	17	78	127.9
14378186	49571	75-80	2.73	10.71	0.6	0.4	28.3	40.25	8.32	CLAY LOAM	23	38	39	114.1
14378187	49572	80-85	1.64	9.89	0.4	0.3	15.5	26.03	9.04	SILTY CLAY	11	44	45	172.9
14378188	49573	85-90	1.91	9.74	0.3	0.2	18.1	34.48	8.98	CLAY	19	34	47	153.8
14380791	55311	90-95	1.45	10.52	0.2	0.2	14.8	31.77	9.03	CLAY	9	25	66	225.1
14380792	55321	95-100	2.30	8.11	0.4	0.5	17.8	26.71	8.65	CLAY	7	17	76	145.8
14380793	55322	100-105	2.21	11.13	0.3	0.2	24.1	47.89	8.49	CLAY	9	11	80	173.0
14380794	55323	105-107.2	2.45	10.84	0.5	0.5	25.6	37.15	8.05	CLAY	17	29	54	137.0
14380795	55327	109-115	1.57	10.39	0.4	0.2	15.7	28.24	8.71	CLAY	15	31	54	144.6
14380796	55329	115-120	2.55	11.35	0.4	0.3	28.2	46.60	8.23	CLAY	19	23	58	126.9
14380797	55330	120-125	3.25	8.67	0.5	0.4	27.3	40.00	8.57	CLAY	22	33	45	116.0
14380798	55331	125-130	2.33	10.22	0.4	0.3	23.1	37.94	8.82	CLAY	14	29	57	122.4
14380799	55332	130-135	2.52	10.21	0.3	0.2	25.2	48.62	8.36	CLAY	21	33	46	125.0
14380800	55333	135-140	2.97	10.82	0.7	0.6	30.9	39.46	8.23	CLAY	17	39	44	133.3
14380801	55334	140-145	1.48	11.37	0.3	0.3	16.1	27.42	8.73	SILTY CLAY	9	45	46	148.7
14380802	55335	145-151	2.48	10.50	0.3	0.3	25.5	48.45	8.59	CLAY	9	29	62	133.6
14380803	55336	162.95-167.95	1.50	10.72	0.5	0.3	15.3	24.34	8.04	SILTY CLAY	15	43	42	98.9

Overburden (Rows 2-31) Average SAR: 26.00

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>
14384101	55238	0-5	4.21	9.77	6.1	6.0	29.1	11.85	8.10	CLAY	29	29	42	80.3
14384102	55240	5-10	5.54	14.86	10.3	9.8	62.3	19.67	8.22	CLAY LOAM	33	31	36	106.3
14384103	55241	10-15	2.00	9.54	0.4	0.4	18.2	28.30	8.94	SILTY CLAY	13	41	46	181.9
14384104	55242	15-20	2.55	10.48	0.9	0.7	25.1	27.77	8.48	CLAY	11	11	78	135.1
14384105	55243	20-25	4.81	9.52	1.5	1.3	43.0	36.45	7.11	CLAY	32	13	55	126.1
14384106	55245	25-30	1.77	10.97	0.2	0.2	19.0	43.27	8.90	CLAY LOAM	40	27	33	123.4
14384107	55246	30-35	2.27	11.41	0.3	0.3	25.3	46.78	8.32	CLAY	12	25	6	123.2
14384108	55248	35-40	1.77	10.80	0.2	0.1	18.e	44.47	9.04	CLAY	20	35	4	123.6
14384109	55249	40-45	1.86	11.02	0.2	0.2	20.1	46.79	9.11	CLAY LOAM	20	47	33	129.7
14384110	55252	45-50	2.73	10.42	0.4	0.3	27.8	48.28	8.22	CLAY	16	37	47	116.6
14384111	55253	50-55	1.86	11.45	0.3	0.2	20.8	42.73	8.88	CLAY LOAM	20	41	39	142.5
14384112	55256	55-60	2.12	9.95	0.2	0.2	20.6	43.35	8.79	SILTY CLAY	14	41	45	126.8
14384113	55257	60-65	2.13	11.24	0.3	0.3	23.3	42.38	8.62	CLAY	12	29	59	119.9
14384114	55261	65-68.9	2.08	12.32	0.4	0.3	24.9	41.25	7.89	CLAY	16	15	69	118.2
14384115	55262	79.1-84.1	2.17	11.68	0.3	0.3	24.7	44.24	8.41	SILTY CLAY	14	43	43	132.5

Overburden (Rows 2-15) Average SAR: 37.38

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>
14378251	55656	0-5	2.40	9.70	4.5	4.5	14.2	6.70	7.92	CLAY	24	33	43	72.7
14378252	55657	5-10	6.15	17.65	12.4	18.3	77.9	19.88	8.21	CLAY	24	25	51	94.1
14378253	55658	10-15	2.50	9.84	0.8	1.0	22.8	23.77	8.59	CLAY LOAM	20	45	35	132.8
14378254	55659	15-20	2.66	10.07	0.6	0.6	27.6	34.75	8-48	CLAY	0	17	83	135.2
14378255	55660	20-25	4.22	10.90	1.8	1.6	42.7	33.10	7.52	CLAY	18	35	47	100.6
14378256	55661	25-30	2.68	8.76	0.5	0.4	22.6	35.32	8.71	CLAY	20	39	41	110.3
14378257	55662	30-35	2.05	10.60	0.4	0.3	21.0	35.04	8.90	CLAY	6	39	55	117.8
14378258	55663	35-40	1.59	10.14	0.2	0.2	15.6	31.71	8.20	CLAY	20	31	49	130.7
14378259	55664	40-45	1.22	9.75	0.2	0.3	11.3	21.54	8.92	CLAY LOAM	26	39	35	165.3
14378260	55665	45-50	3.95	12.34	0.9	1.0	46.9	48.15	8.78	CLAY	10	37	53	147.1
14378261	55666	50-55	1.15	10.15	0.3	0.4	11.0	18.91	8.46	CLAY LOAM	30	41	29	145.2
14378262	55667	55-60	1.30	10.02	0.2	0.3	12.5	23.59	9.11	CLAY LOAM	24	43	33	144.3
14378263	55668	60-65	1.45	10.69	0.3	0.3	14.9	27.13	9.18	LOAM	38	35	27	130.3
14378264	55669	65-70	1.46	10.55	0.5	0.3	14.7	23.95	8.78	SILTY CLAY	12	47	41	143.4
J4378265	55670	70-75	1.85	8.21	0.4	0.3	14.5	24.08	8.91	SILTY CLAY	12	45	43	149.6
14378266	55671	75-80	1.92	9.74	0.3	0.3	18.1	33.39	8.66	CLAY	4	15	81	149.4
14378267	55672	80-82.3	1.95	11.66	0.5	0.4	21.9	34.06	8.00	CLAY	22	17	61	135.2
14378268	55673	94.2-99.2	3.04	9.89	0.7	0.5	28.8	36.83	7.27	CLAY	14	13	73	139.8

Overburden (Rows 2-18) Average SAR: 27.95

<u>Ref#</u>	<u>Lab#</u>	<u>Depth</u>	<u>EC</u>	<u>Cat/EC</u>	<u>Ca</u>	<u>Mg</u>	<u>Na</u>	<u>SAR</u>	<u>pH</u>	<u>Texture</u>	<u>Sand</u>	<u>Silt</u>	<u>Clay</u>	<u>Sat. Percent</u>
14380811	55285	0-5	4.19	10.68	3.8	8.3	32.7	13.30	7.61	SANDY LOAM	71	9	20	45.3
14380812	55286	5-10	9.67	17.94	23.8	56.7	93.0	14.66	8.10	CLAY	13	11	76	119.9
14380813	55287	10-15	5.27	12.70	4.0	11.5	51.4	18.44	8.18	CLAY	9	31	60	125.6
14380814	55288	15-20	2.45	9.62	1.0	2.3	20.3	15.85	8.24	CLAY	11	17	72	128.4
14380815	55289	20-25	1.82	10.21	0.8	1.2	16.6	16.67	8.52	CLAY	6	11	83	137.1
14380816	55292	25-30	2.29	10.82	0.9	0.8	23.1	25.21	8.45	CLAY	16	39	45	99.5
14380817	55293	30-35	1.84	9.88	0.5	0.5	17.2	24.65	8.86	CLAY	18	37	45	145.2
14380818	55294	35-40	3.77	9.80	1.1	1.0	34.9	34.44	8.60	LOAM	38	41	21	55.4
14380819	55295	40-45	1.92	10.25	0.4	0.3	19.0	32.16	9.02	SILTY CLAY	10	45	45	152.1
14380820	55296	45-50	1.82	11.06	0.4	0.3	19.5	34.01	9.06	CLAY	14	35	51	166.7
14380821	55297	50-55	1.45	10.48	0.3	0.2	14.7	28.80	9.21	CLAY LOAM	21	39	40	212.5
14380822	55298	55-60	1.91	10.00	0.4	0.3	18.5	32.22	8.78	SILTY CLAY LOAM	19	49	32	135.0
14380823	55299	60-65	1.93	8.52	0.3	0.3	15.8	28.93	8.93	CLAY LOAM	25	39	36	135.5
14380824	55300	65-70	1.91	10.15	0.4	0.3	18.8	33.40	8.83	CLAY	27	23	50	121.4
14380825	55301	70-75	5.33	15.80	3.0	2.1	79.1	49.31	7.21	SANDY CLAY LOAM	50	15	35	92.3
14380826	55302	75-80	1.62	9.94	0.6	0.4	15.1	21.78	9.41	LOAM	44	29	27	129.1
14380827	55303	80-85	2.41	9.87	0.4	0.3	23.1	38.68	8.84	CLAY	14	35	51	117.5
14380828	55304	85-90	3.55	11.42	0.8	0.6	39.2	47.48	8.11	CLAY	16	27	57	106.5
14380829	55305	90-95	2.71	9.19	0.4	0.3	24.2	42.14	8.88	CLAY	16	25	59	111.8
14380830	55306	95-100	2.36	9.03	0.2	0.2	20.9	47.55	8.81	CLAY LOAM	21	39	40	124.1
14380831	55307	100-105	1.46	10.62	0.4	0.6	14.6	21.04	8.72	CLAY LOAM	21	43	36	149.3
14380832	55308	105-110	1.50	10.77	0.3	0.3	15.6	28.38	8.90	CLAY LOAM	23	43	34	147.6
14380833	55309	110-113.95	2.55	10.04	0.5	0.4	24.8	38.88	8.08	CLAY	19	27	54	124.1
14380834	55310	124-129	2.65	7.86	0.4	0.3	20.0	32.08	7.92	CLAY	15	15	70	150.9

Overburden (Rows 2-24) Average SAR: 29.91