GEOLOGICAL SURVEY

INFORMATION CIRCULAR 45

XRD ANALYSIS AND PETROLEUM POTENTIAL OF THE EAGLE MILLS FORMATION AND PALEOZOIC ROCKS IN THE SUBSURFACE, SOUTH ARKANSAS

Appendix 1

X-ray Diffraction, Total Organic Carbon and Rock-Eval Pyrolysis Raw Data

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North Little Rock, Arkansas
2021

WEIGHT PERCENT

Raw Data **NORMALIZED** to sum to 100%

WELL NAME	Georgia Pacific #1											
SAMPLE ID	1	2	3	4	5	6	7	8	9	10	11	12
SAMPLE DEPTH	7700-7710	7800-7810	7890-7900	8000-8010	8100-8110	8200-8210	8320-8330	8390-8400	8500-8510	8550-8560	8600-8610	8670-8680
NON-CLAY FRACTION												
Quartz	0.0	19.0	32.2	26.3	21.1	47.3	51.9	64.4	3.5	19.1	35.0	18.9
K-Feldspar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plagioclase	0.0	3.0	5.2	4.5	3.4	1.7	1.6	0.5	0.0	0.0	0.7	4.3
Organic Carbon (TOC)	0.0	0.3	0.3	0.2	0.2	0.3	0.4	0.4	0.1	0.3	0.5	0.5
Apatite	0.0	0.0	0.6	0.5	0.6	0.6	0.4	0.3	0.0	0.0	0.0	0.0
Pyrite	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0
Anatase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calcite	0.0	15.3	2.6	7.2	10.3	13.5	4.7	2.8	1.0	57.0	40.7	22.8
Dolomite	0.0	5.2	11.8	10.8	12.9	11.2	12.1	11.0	2.6	3.1	2.3	15.8
Siderite	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7
Aragonite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Halite	98.0	0.6	0.0	0.0	0.0	0.0	0.7	0.1	87.0	0.1	0.1	0.0
Vaterite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2
Hematite	0.0	2.1	2.5	2.7	2.3	1.9	1.0	0.2	0.0	1.9	1.8	1.7
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Anhydrite	2.0	25.3	5.3	1.0	0.4	0.0	0.0	0.0	2.1	0.0	0.0	0.0
Barite	0.0	0.0	0.0	0.0	0.0	1.2	0.7	0.5	0.5	0.3	0.6	1.5
TOTAL	100.0	70.8	60.7	53.4	51.4	77.7	73.8	80.3	96.8	81.9	81.8	76.5
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	0.0	3.6	4.4	9.8	10.2	4.4	5.9	3.1	0.0	3.5	4.3	4.9
Illite+Mica	0.0	19.8	26.7	28.3	35.9	16.1	14.2	10.8	2.3	13.3	12.1	14.8
Chlorite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kaolinite	0.0	5.7	8.2	8.5	2.5	1.8	6.2	5.8	0.9	1.4	1.8	3.8
TOTAL	0.0	29.2	39.3	46.6	48.6	22.3	26.2	19.7	3.2	18.1	18.2	23.5
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	n/a	20.4	14.9	15.6	16.0	12.4	14.0	18.2	n/a	12.6	12.4	18.3
% I/S to Illite in <1.0um Fraction	0.0	16.4	14.6	26.5	22.7	21.8	30.4	23.1	0.0	23.3	27.7	26.2
% Expandable I/S Layers in sample	n/a	0.74	0.66	1.53	1.63	0.54	0.83	0.57	n/a	0.44	0.53	0.90
% Fe in Dolomite/Ankerite	-	26.9	35.1	43.9	44.6	47.8	64.0	55.8	45.6	65.3	65.5	30.2

WELL NAME												
SAMPLE ID	13	14	15	16	17	18	19	20	21	22	23	24
SAMPLE DEPTH	8800-8810	8900-8910	9010-9020	9100-9110	9250-9260	9300-9310	9360-9370	9390-9400	9440-9450	9500-9510	9560-9570	9600-9610
NON-CLAY FRACTION												
Quartz	25.9	25.2	24.8	25.4	25.4	25.3	26.3	24.7	26.0	26.3	24.4	29.0
K-Feldspar	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1
Plagioclase	4.6	5.9	5.5	6.1	6.1	6.3	6.5	5.0	5.8	7.0	6.6	6.4
Organic Carbon (TOC)	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.3
Apatite	0.7	0.6	0.6	0.6	0.5	0.5	0.7	0.5	0.6	0.6	0.6	0.5
Pyrite	0.1	0.0	0.0	0.0	0.1	0.1	0.3	0.1	0.1	0.2	0.4	0.2
Anatase	0.4	0.5	0.5	0.5	0.3	0.4	0.5	0.6	0.5	0.5	0.5	0.4
Calcite	1.2	0.1	1.2	2.7	5.8	3.3	13.3	2.6	4.4	3.9	3.3	4.0
Dolomite	12.7	8.1	7.0	7.1	9.2	4.6	7.4	4.2	11.9	5.3	7.3	10.5
Siderite	0.2	0.2	0.2	0.3	0.2	0.2	0.4	0.3	0.0	0.3	0.5	0.2
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aragonite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Halite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vaterite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	3.3	2.9	3.1	2.6	2.5	2.7	2.2	3.1	2.4	2.5	1.9	1.7
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	49.3	43.7	43.0	45.5	50.3	43.7	57.8	41.2	52.1	47.0	45.7	53.4
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	9.2	11.6	12.0	12.0	13.0	16.4	10.6	13.8	12.8	13.3	14.1	11.1
Illite+Mica	31.0	36.1	34.9	32.2	27.4	29.9	21.8	31.3	26.0	28.9	29.9	26.3
Chlorite	1.0	1.8	1.9	3.2	3.2	4.4	4.3	5.5	4.6	4.8	4.8	4.2
Kaolinite	9.5	6.9	8.1	7.1	6.0	5.6	5.5	8.2	4.5	5.9	5.5	5.0
TOTAL	50.7	56.3	57.0	54.5	49.7	56.3	42.2	58.8	47.9	53.0	54.3	46.6
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	20.2	22.6	20.5	20.8	22.7	23.7	22.3	22.2	23.1	23.8	23.7	22.9
% I/S to Illite in <1.0um Fraction	23.1	24.9	26.2	27.6	32.7	36.0	33.7	32.5	33.8	32.3	32.8	30.4
% Expandable I/S Layers in sample	1.87	2.63	2.46	2.49	2.96	3.90	2.38	3.07	2.96	3.19	3.36	2.55
% Fe in Dolomite/Ankerite	47.8	47.6	43.6	48.1	55.1	49.1	59.5	48.1	51.3	50.1	48.1	57.6

WELL NAME													
SAMPLE ID	25	26	27	28	29	30	31	32	33	34	35	36	37
SAMPLE DEPTH	9650-9660	9700-9710	9750-9760	9800-9810	9850-9860	9900-9910	9950-9960	10000-10010	10050-10060	10100-10110	10150-10160	10200-10210	10250-10260
NON-CLAY FRACTION													
Quartz	27.5	26.1	25.2	27.5	22.5	31.2	24.8	18.9	24.1	22.7	26.1	24.8	25.2
K-Feldspar	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Plagioclase	6.7	7.0	7.1	7.1	6.4	7.2	6.4	6.2	6.9	6.1	6.6	6.8	6.9
Organic Carbon (TOC)	0.3	0.2	0.3	0.5	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.6	0.5
Apatite	0.6	0.5	0.6	0.7	0.5	0.6	0.7	0.8	0.6	0.6	0.8	0.7	0.7
Pyrite	0.5	0.5	0.4	0.8	0.7	0.7	0.5	1.5	0.8	0.5	0.8	1.0	1.4
Anatase	0.6	0.5	0.6	0.5	0.4	0.5	0.5	0.2	0.4	0.5	0.5	0.6	0.5
Calcite	4.5	4.0	4.5	4.2	8.4	5.2	5.1	11.0	9.8	17.4	8.1	5.0	9.1
Dolomite	7.9	7.8	4.6	5.4	6.6	5.8	6.2	22.0	11.3	5.8	5.5	4.2	7.4
Siderite	0.3	0.2	0.3	0.3	0.2	0.5	0.4	0.3	0.3	0.3	0.4	0.4	0.3
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aragonite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Halite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vaterite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	1.2	1.6	1.6	0.5	1.5	0.2	1.3	0.5	1.1	1.0	0.8	0.0	0.0
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	50.3	48.4	45.4	47.5	47.7	52.5	46.4	61.8	55.5	55.6	50.0	44.3	52.1
CLAY FRACTION													
Mixed-Layer ILLITE/SMECTITE (Includes R3)	10.4	11.6	11.7	13.3	12.2	10.5	13.9	10.8	10.5	10.5	12.6	12.7	11.9
Illite+Mica	28.0	31.6	31.8	29.9	30.8	27.8	29.8	20.5	24.2	23.8	29.2	32.9	26.6
Chlorite	5.5	3.6	5.8	5.1	4.6	5.7	5.2	4.0	5.2	6.2	4.9	7.0	6.0
Kaolinite	5.8	4.8	5.2	4.1	4.8	3.4	4.6	2.9	4.6	3.9	3.3	3.1	3.3
TOTAL	49.7	51.6	54.6	52.5	52.3	47.5	53.6	38.2	44.5	44.4	50.0	55.7	47.9
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	22.4	21.6	21.3	22.7	22.0	23.0	23.3	22.4	22.9	21.7	21.8	22.0	21.8
% I/S to Illite in <1.0um Fraction	28.2	27.7	27.6	31.6	29.4	28.8	32.7	35.8	32.1	34.1	30.9	29.8	32.3
% Expandable I/S Layers in sample	2.33	2.51	2.50	3.04	2.69	2.42	3.24	2.44	2.41	2.30	2.76	2.82	2.61
% Fe in Dolomite/Ankerite	52.3	58.1	59.0	57.1	53.6	63.5	56.8	70.0	66.0	61.3	58.1	61.8	64.3

WELL NAME												
SAMPLE ID	38	39	40	41	42	43	44	45	46	47	48	49
SAMPLE DEPTH	10310-10320	10350-10360	10400-10410	10450-10460	10500-10510	10550-10560	10600-10610	10650-10660	10700-10710	10750-10760	10800-10810	10850-10860
NON-CLAY FRACTION												
Quartz	20.3	23.1	24.4	20.7	21.2	22.1	25.5	21.9	20.8	24.3	23.9	23.6
K-Feldspar	0.2	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1
Plagioclase	5.4	6.3	7.2	6.0	5.5	5.9	6.1	6.0	5.4	6.4	6.5	6.1
Organic Carbon (TOC)	0.4	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4
Apatite	0.4	1.0	0.8	0.8	0.6	0.6	0.2	0.4	0.7	0.8	1.1	0.3
Pyrite	0.7	1.2	1.2	0.9	1.8	0.8	0.8	0.5	1.7	0.9	0.5	1.3
Anatase	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.6	0.6	0.7	0.7	0.6
Calcite	16.4	14.2	10.3	18.7	14.0	10.2	7.7	14.4	20.5	7.8	9.0	12.0
Dolomite	8.5	6.6	5.0	6.1	4.7	3.2	2.6	3.5	5.1	2.4	3.0	3.8
Siderite	0.5	0.4	0.5	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.5	0.4
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aragonite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Halite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vaterite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	53.1	54.0	50.4	54.5	49.4	44.5	44.7	48.4	55.5	44.1	45.9	48.6
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	10.5	9.0	9.1	8.6	8.6	9.5	10.3	8.7	8.5	8.1	7.6	9.8
Illite+Mica	27.4	25.9	28.6	27.3	31.7	34.2	33.8	31.1	24.2	34.4	33.2	29.1
Chlorite	7.1	8.6	8.6	7.2	8.9	9.3	10.1	10.8	10.3	10.8	11.0	9.5
Kaolinite	1.9	2.5	3.3	2.5	1.4	2.5	1.1	1.1	1.5	2.6	2.3	3.0
TOTAL	46.9	46.0	49.6	45.5	50.6	55.5	55.3	51.6	44.5	55.9	54.1	51.4
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	22.0	21.4	18.9	20.6	20.6	18.7	17.5	18.3	16.4	17.3	19.4	16.5
% I/S to Illite in <1.0um Fraction	30.9	27.8	25.8	26.3	24.3	23.9	27.3	26.2	29.4	21.5	21.0	28.1
% Expandable I/S Layers in sample	2.33	1.94	1.74	1.77	1.78	1.78	1.80	1.59	1.39	1.41	1.48	1.62
% Fe in Dolomite/Ankerite	63.8	60.8	60.8	61.8	58.8	60.8	57.1	56.3	61.5	60.3	53.6	49.1

WELL NAME	Georgia Pacific #1											
SAMPLE ID	50	51	52	53	54	55	56	57	58	59	60	61
SAMPLE DEPTH	10900-10910	10950-10960	10990-11000	11050-11060	11100-11110	11150-11160	11200-11210	11250-11260	11300-11310	11350-11360	11410-11420	11420-11430
NON-CLAY FRACTION												
Quartz	23.2	21.9	25.0	29.9	16.8	23.3	23.9	23.8	31.2	25.3	19.0	20.7
K-Feldspar	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Plagioclase	6.9	5.7	5.9	6.5	4.2	5.9	5.4	5.6	6.2	6.0	4.8	4.9
Organic Carbon (TOC)	0.5	0.4	0.4	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3
Apatite	0.6	0.7	0.3	0.4	0.7	0.4	0.4	0.4	0.7	0.5	0.5	0.4
Pyrite	0.5	0.9	0.6	0.5	0.8	0.6	0.6	0.5	0.6	0.5	0.6	0.8
Anatase	0.7	0.7	0.7	0.7	0.5	0.9	0.9	1.0	0.9	0.9	0.6	0.6
Calcite	8.0	12.6	9.8	8.1	30.4	6.5	8.6	7.5	6.6	7.8	22.8	25.7
Dolomite	3.0	3.5	2.6	2.5	4.3	1.9	1.7	2.0	1.4	2.3	3.1	3.3
Siderite	0.3	0.3	0.4	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.2
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aragonite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Halite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vaterite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	43.8	46.8	45.9	49.3	58.3	40.4	42.3	41.6	48.2	44.1	52.0	57.1
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	9.1	8.1	7.3	7.0	7.8	10.0	8.7	9.8	7.7	8.2	7.9	7.6
Illite+Mica	34.7	32.5	34.6	30.5	23.8	37.2	36.2	36.0	28.6	34.6	28.0	25.0
Chlorite	11.0	11.2	11.2	10.9	7.8	11.1	12.0	11.1	13.5	11.8	9.6	9.6
Kaolinite	1.4	1.4	1.1	2.4	2.2	1.3	0.8	1.6	2.0	1.3	2.5	0.8
TOTAL	56.2	53.2	54.1	50.7	41.7	59.6	57.7	58.4	51.8	55.9	48.0	42.9
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	18.4	17.6	18.4	18.1	11.7	16.6	16.2	16.5	17.1	15.7	15.5	15.7
% I/S to Illite in <1.0um Fraction	23.9	22.7	21.0	20.0	26.7	23.6	24.7	23.5	24.2	23.5	25.2	29.1
% Expandable I/S Layers in sample	1.68	1.42	1.36	1.27	0.92	1.66	1.41	1.63	1.32	1.29	1.23	1.19
% Fe in Dolomite/Ankerite	54.3	61.8	46.6	62.0	53.6	60.0	58.1	57.8	67.0	56.3	52.6	53.6

WELL NAME													
SAMPLE ID	62	63	64	65	66	67	68	69	70	71	72	73	74
SAMPLE DEPTH	11450-11460	11500-11510	11540-11550	11550-11560	11600-11610	11650-11660	11700-11710	11750-11760	11790-11800	11850-11860	11900-11910	11950-11960	12000-12010
NON-CLAY FRACTION													
Quartz	22.6	24.1	23.5	20.5	24.3	23.3	25.8	19.9	22.8	24.7	26.6	28.0	25.7
K-Feldspar	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.2	0.3	0.2
Plagioclase	5.8	6.1	5.5	4.9	6.6	5.8	6.1	5.2	5.8	5.1	5.8	5.8	5.8
Organic Carbon (TOC)	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.2	0.3	0.3	0.4	0.5	0.4
Apatite	0.6	0.7	0.5	0.7	0.5	0.5	0.5	0.7	0.6	0.5	0.5	0.6	0.4
Pyrite	0.6	0.6	0.4	0.8	0.6	0.5	0.5	0.8	0.8	0.6	0.7	0.7	0.7
Anatase	0.8	0.9	0.9	0.7	0.8	0.8	1.0	0.7	0.8	1.1	1.0	1.1	0.9
Calcite	16.0	9.3	14.0	23.6	12.2	13.1	11.7	28.2	24.4	14.1	12.8	7.4	13.2
Dolomite	2.2	1.7	1.4	2.3	2.4	1.7	1.8	2.7	1.7	2.1	2.0	1.6	2.0
Siderite	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.4	0.2	0.2	0.2
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aragonite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Halite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vaterite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	49.3	43.9	47.0	54.0	47.9	46.5	48.0	58.8	57.4	49.1	50.3	46.2	49.5
CLAY FRACTION													
Mixed-Layer ILLITE/SMECTITE (Includes R3)	7.5	7.5	8.4	8.4	9.1	9.0	7.2	8.8	6.6	7.4	6.2	8.5	7.0
Illite+Mica	29.4	33.9	30.9	26.2	29.8	31.1	33.8	24.3	25.6	31.1	33.1	35.8	33.3
Chlorite	11.6	11.8	12.2	9.9	11.4	12.1	9.5	6.1	8.4	10.6	8.5	7.7	7.8
Kaolinite	2.2	2.9	1.5	1.5	1.8	1.3	1.5	1.9	2.0	1.8	1.9	1.8	2.4
TOTAL	50.7	56.1	53.0	46.0	52.1	53.5	52.0	41.2	42.6	50.9	49.7	53.8	50.5
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	16.4	16.3	15.8	14.5	16.3	15.5	16.4	15.6	15.4	14.7	14.8	15.4	15.8
% I/S to Illite in <1.0um Fraction	23.7	21.4	25.1	27.8	26.6	27.8	22.0	31.6	25.6	24.4	19.9	21.7	20.8
% Expandable I/S Layers in sample	1.24	1.23	1.33	1.22	1.50	1.41	1.18	1.38	1.02	1.09	0.92	1.32	1.11
% Fe in Dolomite/Ankerite	53.6	56.8	-	59.0	78.7	67.3	58.6	57.8	58.1	50.1	56.6	-	56.8

WELL NAME												
SAMPLE ID	75	76	77	78	79	80	81	82	83	84	85	86
SAMPLE DEPTH	12040-12050	12100-12110	12150-12160	12200-12210	12250-12260	12300-12310	12350-12360	12400-12410	12450-12460	12500-12510	12550-12560	12600-12610
NON-CLAY FRACTION												
Quartz	25.9	17.1	24.9	28.1	26.3	23.5	29.1	22.9	24.3	24.5	28.4	25.4
K-Feldspar	0.7	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.2	0.1
Plagioclase	6.4	3.6	6.0	6.8	6.7	6.3	7.5	8.5	8.3	6.8	6.7	6.6
Organic Carbon (TOC)	0.4	0.2	0.3	0.3	0.3	0.5	0.3	0.3	0.4	0.3	0.3	0.3
Apatite	0.5	0.7	0.5	0.5	0.7	0.6	0.5	0.6	0.6	0.4	0.7	0.6
Pyrite	0.7	0.6	0.6	0.5	0.6	0.8	0.6	0.4	0.7	0.4	0.5	0.5
Anatase	0.9	0.8	0.9	1.1	0.9	0.9	1.0	1.0	1.1	1.1	0.9	1.3
Calcite	5.5	34.4	10.1	9.2	10.5	11.8	9.5	9.3	7.0	7.2	7.5	6.7
Dolomite	1.4	2.5	3.0	1.9	1.5	2.2	1.6	2.4	1.7	1.6	1.7	1.9
Siderite	0.3	0.3	0.2	0.2	0.3	0.2	0.7	0.5	1.0	0.4	0.4	0.5
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aragonite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Halite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vaterite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	42.6	60.3	46.8	48.8	48.0	47.0	50.9	45.9	45.3	43.0	47.4	43.9
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	8.2	5.5	9.0	6.6	6.1	6.7	5.5	5.0	6.0	4.5	5.9	6.1
Illite+Mica	37.8	24.1	34.9	34.1	34.5	34.4	31.9	31.5	34.2	38.8	35.5	36.6
Chlorite	9.6	9.2	5.4	8.7	9.4	10.0	9.3	15.3	11.5	11.6	8.0	11.2
Kaolinite	1.7	1.0	3.8	1.9	2.0	2.0	2.5	2.4	3.0	2.1	3.3	2.3
TOTAL	57.4	39.7	53.2	51.2	52.0	53.0	49.1	54.1	54.7	57.0	52.6	56.1
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	15.8	13.5	16.6	14.2	14.4	13.1	13.6	12.4	13.8	13.4	14.6	13.2
% I/S to Illite in <1.0um Fraction	22.8	24.0	21.5	18.8	18.4	20.9	17.5	17.3	18.5	13.8	16.5	18.3
% Expandable I/S Layers in sample	1.30	0.74	1.50	0.94	0.88	0.87	0.75	0.62	0.84	0.61	0.87	0.81
% Fe in Dolomite/Ankerite	-	54.1	52.1	65.5	77.0	53.8	60.5	63.0	56.1	62.8	57.8	70.7

WELL NAME												
SAMPLE ID	87	88	89	90	91	92	93	94	95	96	97	98
SAMPLE DEPTH	12630-12640	12650-12660	12700-12710	12750-12760	12800-12810	12850-12860	12900-12910	12950-12960	13000-13010	13050-13060	13100-13110	13120-13130
NON-CLAY FRACTION												
Quartz	27.2	28.0	26.7	30.0	24.8	26.1	27.8	27.5	26.0	28.0	26.4	24.4
K-Feldspar	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.5
Plagioclase	6.4	6.3	6.6	7.5	7.2	6.9	6.4	8.0	7.5	6.8	6.0	5.5
Organic Carbon (TOC)	0.4	0.4	0.2	0.3	0.4	0.4	0.4	0.3	0.2	0.3	0.3	0.3
Apatite	0.4	0.4	0.6	0.6	1.2	0.7	0.8	0.5	0.3	0.5	0.6	0.5
Pyrite	0.4	0.5	0.3	0.4	0.6	0.8	0.5	0.6	0.2	0.7	0.8	0.3
Anatase	1.2	1.2	1.0	1.1	1.1	1.0	1.1	0.8	1.7	1.0	1.1	1.2
Calcite	8.3	5.7	4.8	5.8	6.6	5.9	2.7	2.3	3.0	3.4	4.1	4.4
Dolomite	2.0	1.1	1.6	1.5	2.8	6.0	2.1	3.0	1.4	2.6	2.2	1.0
Siderite	0.4	0.3	0.6	0.3	1.3	0.3	0.6	0.3	0.6	0.3	0.5	0.4
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aragonite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Halite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vaterite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	46.8	44.2	42.8	47.6	46.2	48.3	42.4	43.5	41.0	43.9	42.2	38.6
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	7.7	6.2	6.8	7.2	7.9	7.2	7.6	7.0	7.4	7.7	5.1	6.0
Illite+Mica	33.0	35.9	34.6	31.4	31.3	33.3	37.0	36.6	35.0	37.0	38.9	43.1
Chlorite	11.0	11.1	12.9	10.3	10.7	7.4	9.9	9.0	14.4	7.6	9.9	10.6
Kaolinite	1.5	2.7	2.9	3.5	3.8	3.8	3.2	3.9	2.2	3.8	3.9	1.7
TOTAL	53.2	55.8	57.2	52.4	53.8	51.7	57.6	56.5	59.0	56.1	57.8	61.4
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	14.2	15.2	14.7	16.3	15.5	19.7	19.8	18.6	14.5	17.9	17.6	15.6
% I/S to Illite in <1.0um Fraction	25.2	18.7	18.7	22.1	24.0	19.2	19.6	17.8	23.7	18.6	16.9	19.4
% Expandable I/S Layers in sample	1.11	0.95	1.00	1.17	1.24	1.42	1.51	1.30	1.07	1.39	0.90	0.93
% Fe in Dolomite/Ankerite	68.5	-	57.1	53.3	46.1	50.3	56.3	50.6	-	63.0	51.8	-

WELL NAME	Georgia Pacific #1											
SAMPLE ID	99	100	101	102	103	104	105	106	107	108	109	110
SAMPLE DEPTH	13150-13160	13160-13170	13190-13200	13250-13260	13300-13310	13350-13360	13390-13400	13450-13460	13500-13510	13550-13560	13600-13610	13650-13660
NON-CLAY FRACTION												
Quartz	23.6	26.5	26.9	26.1	20.8	27.2	25.7	23.0	24.1	23.9	28.4	27.1
K-Feldspar	0.7	0.2	0.2	0.3	0.4	0.1	0.4	0.5	0.9	0.6	0.4	0.6
Plagioclase	6.2	6.1	5.4	4.5	6.2	8.8	6.5	6.9	4.7	4.3	3.6	5.0
Organic Carbon (TOC)	0.3	0.3	0.3	0.4	0.3	0.5	0.4	0.6	0.5	0.5	0.4	0.3
Apatite	0.5	0.8	0.5	0.2	0.4	0.4	0.3	0.8	0.3	0.5	0.2	0.5
Pyrite	0.2	0.3	0.2	0.1	0.2	0.2	0.1	0.4	0.1	0.1	0.3	0.2
Anatase	1.1	1.2	1.2	1.2	1.8	1.5	1.3	1.0	1.3	1.5	1.7	0.9
Calcite	4.3	3.7	1.4	1.3	1.6	1.6	0.6	0.8	1.0	1.1	0.3	1.1
Dolomite	3.0	1.4	1.1	1.4	1.0	3.2	0.4	1.5	0.2	0.5	0.3	1.2
Siderite	0.4	0.7	0.6	1.8	2.3	0.5	1.5	1.4	1.3	0.4	1.1	0.4
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aragonite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Halite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vaterite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.3	41.3	37.8	37.3	35.0	43.9	37.3	36.9	34.5	33.5	36.7	37.3
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	5.4	4.1	4.4	5.2	5.1	4.4	4.3	3.2	4.7	5.8	6.1	6.3
Illite+Mica	40.1	42.0	44.0	43.3	43.4	34.7	39.0	29.1	46.5	48.0	46.1	46.5
Chlorite	11.5	9.6	11.7	9.4	12.6	14.5	15.7	27.2	11.3	11.0	9.4	7.3
Kaolinite	2.6	3.0	2.1	4.9	3.8	2.5	3.8	3.6	3.0	1.7	1.7	2.6
TOTAL	59.7	58.7	62.2	62.7	65.0	56.1	62.7	63.1	65.5	66.5	63.3	62.7
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	14.1	12.9	12.8	12.3	12.4	13.3	13.1	13.9	12.6	12.0	12.1	16.6
% I/S to Illite in <1.0um Fraction	18.8	14.3	14.8	18.4	18.0	18.0	16.0	15.7	15.2	17.8	19.4	18.1
% Expandable I/S Layers in sample	0.77	0.53	0.56	0.64	0.64	0.59	0.56	0.45	0.60	0.70	0.73	1.04
% Fe in Dolomite/Ankerite	61.8	54.1	-	68.5	-	62.3	-	43.1	-	-	-	-

WELL NAME												
SAMPLE ID	111	112	113	114	115	116	117	118	119	120	121	122
SAMPLE DEPTH	13700-13710	13750-13760	13800-13810	13940-13950	14000-14010	14210-14220	14290-14300	14500-14510	14700-14710	14900-14910	14940-14950	14990-15000
NON-CLAY FRACTION												
Quartz	26.0	32.0	32.1	26.7	32.0	29.8	43.5	42.3	39.7	36.6	38.8	35.1
K-Feldspar	0.7	0.5	0.9	1.2	0.2	0.4	0.2	0.3	0.3	0.1	0.1	0.3
Plagioclase	4.8	3.8	3.8	3.9	5.7	2.8	3.4	4.0	3.3	2.3	2.3	2.7
Organic Carbon (TOC)	0.4	0.3	0.3	1.1	0.3	0.4	0.4	0.5	0.4	0.5	0.4	0.5
Apatite	0.1	0.2	0.5	0.5	0.6	0.3	0.5	0.4	0.4	0.3	0.4	0.4
Pyrite	0.1	0.0	0.1	0.2	0.4	0.2	0.3	0.3	0.5	0.4	0.1	0.2
Anatase	1.1	1.3	1.1	1.4	1.8	1.0	1.7	1.3	1.2	1.4	1.2	1.4
Calcite	0.3	0.4	0.7	0.8	1.2	0.8	0.5	1.0	0.8	0.6	0.6	1.9
Dolomite	0.5	0.3	0.5	0.4	0.6	0.8	0.7	1.3	0.7	0.3	0.7	0.7
Siderite	1.1	0.6	0.7	0.3	0.3	0.2	1.1	0.3	0.0	0.0	0.0	0.0
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.8	0.8
Aragonite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Halite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vaterite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	35.3	39.7	40.8	36.6	43.0	36.6	52.3	51.7	47.2	43.4	45.5	43.9
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	5.8	3.9	4.4	5.3	3.6	4.7	3.1	4.3	3.8	4.1	3.8	3.1
Illite+Mica	47.9	44.9	42.6	48.1	38.3	45.3	33.0	34.6	37.0	39.0	38.6	41.2
Chlorite	8.5	9.2	9.2	7.5	11.5	13.4	8.3	7.5	9.5	13.5	12.2	11.8
Kaolinite	2.5	2.3	3.0	2.5	3.6	0.0	3.3	1.8	2.5	0.0	0.0	0.0
TOTAL	64.7	60.3	59.2	63.4	57.0	63.4	47.7	48.3	52.8	56.6	54.5	56.1
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	12.3	13.3	13.3	14.9	14.1	12.7	14.9	14.4	13.8	12.9	12.2	13.8
% I/S to Illite in <1.0um Fraction	16.8	13.1	15.1	16.0	13.7	16.0	14.6	20.0	16.8	18.3	17.9	13.9
% Expandable I/S Layers in sample	0.72	0.52	0.59	0.80	0.51	0.60	0.47	0.63	0.53	0.53	0.46	0.43
% Fe in Dolomite/Ankerite	-	-	-	-	-	-	-	46.9	-	-	-	-

WELL NAME												
SAMPLE ID	123	124	125	126	127	128	129	130	131	132	133	134
SAMPLE DEPTH	15000-15010	15050-15060	15100-15110	15150-15160	15200-15210	15250-15260	15290-15300	15350-15360	15400-15410	15440-15450	15500-15510	15550-15560
NON-CLAY FRACTION												
Quartz	33.8	35.4	44.2	38.7	36.3	39.0	43.9	31.6	35.2	29.2	33.1	37.3
K-Feldspar	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Plagioclase	2.3	2.7	2.6	1.7	3.3	3.0	3.8	4.4	4.4	5.3	4.4	3.6
Organic Carbon (TOC)	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.7	0.5	0.6	0.6	0.5
Apatite	0.3	0.2	0.1	0.4	0.2	0.3	0.2	0.4	0.4	0.3	0.3	0.3
Pyrite	0.4	0.3	0.3	0.1	0.3	0.3	0.5	0.2	0.1	0.2	0.3	0.4
Anatase	1.2	1.2	1.2	1.1	1.1	0.8	0.6	0.5	0.8	0.5	0.8	0.6
Calcite	1.4	2.1	1.2	0.8	0.9	1.1	0.0	0.5	0.2	0.0	1.4	0.8
Dolomite	0.6	0.7	0.4	0.5	0.4	0.7	0.2	0.4	0.3	0.2	0.6	0.4
Siderite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Magnesite	1.0	1.0	1.0	1.4	1.1	1.2	1.1	1.3	1.1	1.8	1.0	0.7
Aragonite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Halite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vaterite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	2.6	0.7	0.5	0.5	0.3	0.0	0.0	0.0	0.0	0.3	0.4
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	41.7	47.0	52.1	45.8	44.6	47.3	51.2	40.0	43.1	38.2	43.0	45.2
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	2.8	3.3	2.3	2.2	2.4	2.3	1.1	1.6	1.2	0.7	1.7	1.5
Illite+Mica	41.8	36.8	33.6	41.8	41.7	41.0	39.1	44.4	45.0	50.4	42.8	40.9
Chlorite	13.7	12.8	11.9	10.2	11.2	9.4	8.6	13.9	10.8	10.8	12.5	12.4
Kaolinite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	58.3	53.0	47.9	54.2	55.4	52.7	48.8	60.0	56.9	61.8	57.0	54.8
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	14.3	11.9	12.3	11.5	10.3	17.9	7.8	9.1	9.0	10.8	12.9	9.9
% I/S to Illite in <1.0um Fraction	12.8	15.5	17.0	13.1	13.4	15.3	9.1	10.1	9.5	5.5	10.2	10.5
% Expandable I/S Layers in sample	0.41	0.40	0.28	0.26	0.25	0.42	0.09	0.15	0.10	0.07	0.22	0.15
% Fe in Dolomite/Ankerite	-	-	-	-	-	-	-	-	-	-	-	-

WELL NAME												
SAMPLE ID	135	136	137	138	139	140	141	142	143	144	145	146
SAMPLE DEPTH	15600-15610	15700-15710	15790-15800	15900-15910	15950-15960	16000-16010	16100-16110	16200-16210	16300-16310	16400-16410	16500-16510	16600-16610
NON-CLAY FRACTION												
Quartz	53.8	38.5	42.0	45.0	36.4	36.8	25.9	30.7	34.6	32.5	28.3	24.2
K-Feldspar	0.1	0.1	0.2	0.2	0.0	0.1	0.0	0.1	0.0	0.0	0.0	1.3
Plagioclase	4.2	8.0	6.2	8.6	10.2	15.9	24.2	11.9	9.1	11.6	27.3	10.7
Organic Carbon (TOC)	0.3	0.5	0.5	0.3	0.5	0.3	0.5	0.3	0.3	0.3	0.3	0.2
Apatite	0.2	0.3	0.3	0.4	0.3	0.6	0.6	0.4	0.4	0.3	0.5	0.8
Pyrite	0.4	0.2	0.1	0.3	0.3	0.2	0.2	0.1	0.2	0.4	0.2	0.4
Anatase	0.3	0.4	0.4	0.5	0.4	0.4	0.9	0.7	0.6	0.5	0.6	0.3
Calcite	0.8	1.4	0.6	0.7	0.9	0.4	0.5	0.7	0.1	0.7	0.8	24.1
Dolomite	1.0	0.2	0.4	0.3	0.5	1.6	2.2	0.8	0.3	0.4	2.8	2.0
Siderite	0.7	0.0	0.2	0.1	0.0	0.5	1.6	0.2	0.0	0.0	0.6	0.0
Magnesite	0.4	0.5	0.9	0.6	0.7	0.5	0.3	0.6	0.6	0.9	0.3	0.8
Aragonite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Halite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vaterite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	0.2	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.3
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	62.2	50.5	51.8	56.9	50.5	57.3	56.8	46.4	46.2	47.6	61.7	65.2
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	0.7	1.0	1.0	1.4	1.5	1.2	1.6	1.8	1.1	1.0	2.1	3.4
Illite+Mica	31.2	39.5	39.5	34.7	41.2	36.9	36.3	44.3	44.9	42.4	31.2	26.2
Chlorite	6.0	9.0	7.7	7.0	6.9	4.6	5.3	7.5	7.9	9.0	5.0	5.2
Kaolinite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	37.8	49.5	48.2	43.1	49.5	42.7	43.2	53.6	53.8	52.4	38.3	34.8
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	11.5	10.4	11.6	14.3	13.2	16.1	13.7	13.2	12.1	13.9	13.1	11.9
% I/S to Illite in <1.0um Fraction	8.7	9.7	10.5	12.0	10.2	9.2	11.7	10.7	8.7	8.0	15.1	20.8
% Expandable I/S Layers in sample	0.08	0.11	0.12	0.20	0.19	0.20	0.23	0.23	0.13	0.14	0.27	0.40
% Fe in Dolomite/Ankerite	-	-	-	-	-	51.1	54.3	-	-	-	48.3	35.1

Comments

Sample #12 (8670-8680ft): Quantitative analysis for the sample was conducted using a merged method of using Rietveld refinement with our traditional FULLPAT analyses since we don't have standard for the Vaterite (CaCo3).

Carbonates of the solid solution between Siderite (Fe2+ = 0.92Å) and Magnesite (Mg2+ = 0.86Å) are present in some samples.

WEIGHT PERCENT	*Raw Data* ***NORMALIZED*** *to sum to 100%*					
WELL NAME	**Georgia Pacific #5**					
SAMPLE ID	1	2	3	4	5	6
SAMPLE DEPTH	9750-9760	9800-9810	9850-9860	9900-9910	10100-10110	10420-10430
NON-CLAY FRACTION						
Quartz	53.9	39.8	44.2	36.4	20.5	38.6
K-Feldspar	0.1	0.1	0.1	0.1	0.0	0.0
Plagioclase	11.6	17.7	12.6	19.6	28.3	12.4
Organic Carbon (TOC)	0.0	0.1	0.1	0.0	0.1	0.1
Apatite	0.6	0.9	0.7	1.0	1.5	0.7
Pyrite	0.1	0.0	0.1	0.2	0.5	0.0
Calcite	2.0	3.3	2.4	3.3	3.3	1.7
Dolomite	8.4	5.9	4.9	6.9	9.1	7.1
Siderite	0.5	0.6	0.4	0.5	0.8	0.3
Analcime	0.0	0.0	0.0	0.0	0.6	0.3
Hematite	1.2	1.9	2.1	1.7	1.3	2.6
Anatase	0.3	0.5	0.4	0.5	0.5	0.4
Augite	0.0	0.0	0.0	0.0	4.2	1.1
TOTAL	78.8	70.7	67.9	70.2	70.7	65.4
CLAY FRACTION						
Mixed-Layer ILLITE/SMECTITE (Includes R3)	3.7	4.3	4.2	7.0	8.7	7.0
Illite+Mica	14.9	21.3	24.4	18.6	15.2	25.1
Chlorite	1.1	1.3	1.2	1.5	2.2	0.8
Kaolinite	1.6	2.4	2.2	2.7	3.2	1.7
TOTAL	21.2	29.3	32.1	29.8	29.3	34.6
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	10.2	14.9	15.4	13.3	13.7	16.8
% I/S to Illite in <1.0um Fraction	21.3	17.2	16.1	28.1	37.5	22.9
% Expandable I/S Layers in sample	0.38	0.64	0.65	0.92	1.20	1.18
% Fe in 1st/primary Dolomite/Ankerite	59.0	61.0	29.7	59.8	64.8	57.6
% Fe in 2nd Dolomite/Ankerite			62.0			

Comments

Some samples are believed to contain Augite but unconfirmed by independent means

WEIGHT PERCENT

Raw Data ***NORMALIZED*** *to sum to 100%*

WELL NAME	Mary Curie #1	
SAMPLE ID	1	2
SAMPLE DEPTH	4890-4900	5460-5470
NON-CLAY FRACTION		
Quartz	16.2	5.3
K-Feldspar	0.0	0.0
Plagioclase	0.0	46.2
Organic Carbon (TOC)	0.2	0.1
Apatite	0.0	1.1
Pyrite	0.7	0.9
Marcasite	0.7	0.0
Calcite	65.8	0.0
Dolomite	9.1	2.4
Siderite	0.3	6.6
Magnesite	0.0	4.4
Hematite	0.0	1.4
Augite	0.0	7.6
TOTAL	92.9	76.0
CLAY FRACTION		
Mixed-Layer ILLITE/SMECTITE (Includes R3)	0.0	15.0
Illite+Mica	3.7	8.3
Chlorite	0.0	0.0
Kaolinite	3.4	0.7
TOTAL	7.1	24.0
GRAND TOTAL	100.0	100.0
% Expandable Layers in I/S	n/a	62.2
% I/S to Illite in <1.0um Fraction	0.0	66.6
% Expandable I/S Layers in sample	n/a	9.33
% Fe in Dolomite/Ankerite	65.0	53.1

Comments

Carbonates of the solid solution between Siderite (Fe2+ = 0.92Å) and
Magnesite (Mg2+ = 0.86Å) are present in Sample #2 (5460-5470ft).
Some samples are believed to contain Augite but unconfirmed by independent means

WEIGHT PERCENT

Raw Data ***NORMALIZED*** *to sum to 100%*

WELL NAME	Brine Supply Well #1
SAMPLE ID	1
SAMPLE DEPTH	10740-10745

NON-CLAY FRACTION	
Quartz	1.5
K-Feldspar	1.8
Plagioclase	0.9
Apatite	1.7
Dolomite	1.4
Halite	1.7
Anhydrite	91.1
TOTAL	100.0

CLAY FRACTION	
Mixed-Layer ILLITE/SMECTITE (Includes R3)	0.0
Illite+Mica	0.0
Chlorite	0.0
Kaolinite	0.0
TOTAL	0.0

GRAND TOTAL	100.0
% Expandable Layers in I/S	n/a
% I/S to Illite in <1.0um Fraction	0.0
% Expandable I/S Layers in sample	n/a

% Fe in Dolomite/Ankerite	23.0

Comments

No TOC analysis was requested for the sample.

WEIGHT PERCENT	*Raw Data* ***NORMALIZED*** *to sum to 100%*

WELL NAME	**James A. Williams #1**														
SAMPLE ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
SAMPLE DEPTH	5820-5850	6510-6540	6750-6780	6870-6900	6960-6990	7050-7080	7140-7170	7230-7260	7440-7470	7463.75	7480.50	7489.60	7491.00	7500-7530	7530-7560
NON-CLAY FRACTION															
Quartz	13.2	23.9	21.4	20.9	26.0	20.4	34.3	21.2	22.0	1.9	3.3	3.6	1.4	16.8	17.6
K-Feldspar	0.8	0.7	0.6	0.6	0.7	0.6	0.8	0.5	0.4	0.2	0.2	0.1	0.2	0.2	0.2
Plagioclase	1.3	5.4	5.3	4.8	3.6	5.5	3.2	4.9	4.0	0.3	0.2	0.3	0.3	8.0	7.9
Organic Carbon (TOC)	1.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.0	0.0	0.2	0.2
Apatite	0.4	0.7	0.5	0.8	0.8	0.7	0.6	0.6	0.6	0.7	0.3	0.6	1.0	1.1	1.0
Pyrite	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	1.1	0.1	0.2	0.3	0.1
Calcite	1.7	0.7	0.1	0.6	2.4	0.1	1.2	3.3	4.7	90.3	66.5	82.5	92.0	26.1	28.3
Dolomite	4.2	4.6	7.5	4.5	7.8	5.9	5.1	6.5	5.7	0.4	4.9	0.5	3.4	5.2	5.0
Siderite	0.3	0.2	0.0	0.0	0.5	0.3	1.0	0.3	0.5	0.4	0.1	0.4	0.0	0.9	0.9
Magnesite	0.0	0.8	0.9	0.6	1.2	0.6	0.3	0.5	0.4	0.0	0.0	0.0	0.0	0.6	0.0
Gypsum	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Analcime	0.0	2.5	1.1	1.6	1.9	2.8	1.6	1.7	1.1	0.0	0.0	0.0	0.0	0.7	0.8
Anatase	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.3	0.0	0.2	0.0	0.0	0.1	0.1
Anhydrite	51.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	1.0	3.1	2.7	2.6	2.1	2.7	2.0	2.3	2.3	0.0	0.0	0.0	0.0	0.8	0.6
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Augite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	80.9	43.1	40.6	37.6	47.6	40.0	50.5	42.3	42.5	94.3	76.9	88.1	98.4	61.0	62.7
CLAY FRACTION															
Mixed-Layer ILLITE/SMECTITE (Includes R3)	1.5	8.1	7.0	10.5	7.2	8.0	8.9	9.4	8.2	1.0	3.4	2.1	0.3	3.9	6.0
Illite+Mica	12.2	42.8	48.2	47.7	41.7	48.9	38.6	46.1	47.3	4.7	19.2	9.8	1.2	33.0	29.7
Chlorite	0.2	1.0	1.1	1.0	0.6	0.6	0.4	0.5	0.5	0.0	0.0	0.0	0.0	0.9	0.2
Kaolinite	5.2	4.9	3.2	3.3	2.9	2.5	1.6	1.7	1.5	0.0	0.6	0.0	0.0	1.2	1.4
Talc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	19.1	56.9	59.4	62.4	52.4	60.0	49.5	57.7	57.5	5.7	23.1	11.9	1.6	39.0	37.3
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	15.4	14.9	15.4	16.5	15.9	13.3	17.2	15.3	14.1	15.4	14.0	15.4	15.4	17.1	19.1
% I/S to Illite in <1.0um Fraction	22.5	19.3	16.7	22.6	18.1	16.6	23.8	21.2	18.0	22.5	22.6	22.5	22.5	14.4	22.3
% Expandable I/S Layers in sample	0.23	1.21	1.07	1.72	1.14	1.07	1.53	1.43	1.17	0.15	0.48	0.33	0.05	0.67	1.14
% Fe in 1st/primary Dolomite/Ankerite	17.2	25.4	29.4	31.9	32.7	24.9	40.6	28.2	26.9		46.6		57.8	54.1	40.4
% Fe in 2nd Dolomite/Ankerite															

SAMPLE ID	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
SAMPLE DEPTH	7560-7590	7590-7620	7620-7650	7650-7680	7680-7710	7710-7740	7740-7770	7770-7800	7800-7830	7830-7860	7860-7890	7890-7920	7920-7950	7950-7980	7980-8010
NON-CLAY FRACTION															
Quartz	24.3	18.0	16.7	27.2	18.1	10.8	13.6	10.5	8.1	10.1	7.2	15.5	18.6	58.8	37.6
K-Feldspar	0.4	0.2	0.4	0.2	0.2	0.2	1.1	1.2	0.5	0.6	0.0	0.2	0.9	0.4	0.6
Plagioclase	6.6	7.2	7.7	14.7	26.3	32.1	34.4	37.1	37.0	35.5	44.8	4.8	12.6	2.8	24.8
Organic Carbon (TOC)	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1
Apatite	0.9	0.8	0.9	1.2	0.6	0.3	0.6	0.1	0.2	0.3	0.1	0.5	1.3	0.9	0.6
Pyrite	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.3	0.1	0.0
Calcite	14.4	17.6	17.4	11.7	6.2	4.2	2.5	1.9	4.9	1.2	2.4	53.7	32.0	10.6	6.6
Dolomite	4.2	5.7	3.5	4.1	3.9	4.3	4.6	7.0	4.3	5.1	3.8	10.7	5.9	2.8	6.3
Siderite	1.2	0.9	1.2	1.2	0.4	0.2	0.6	0.2	0.3	0.3	0.4	0.3	0.4	0.8	1.2
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gypsum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Analcime	0.7	1.1	1.1	0.6	0.5	0.2	0.2	0.2	0.3	0.2	0.0	0.8	0.0	0.8	0.1
Anatase	0.2	0.2	0.3	0.2	0.1	0.1	0.2	0.0	0.0	0.1	0.0	0.4	0.0	0.3	0.0
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	1.3	1.5	1.6	0.6	0.9	0.7	0.4	1.1	0.9	0.9	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	0.0	0.0	0.2	0.5	0.3	0.3	0.2	0.2	0.2	0.1	0.0	0.4	0.0	0.6
Augite	0.0	0.0	0.0	0.0	5.1	11.1	13.4	9.2	7.4	9.7	15.7	0.7	5.2	1.0	8.9
TOTAL	54.5	53.4	50.7	62.0	62.8	64.6	72.0	68.6	64.2	64.4	74.8	87.8	77.6	79.3	87.3
CLAY FRACTION															
Mixed-Layer ILLITE/SMECTITE (Includes R3)	7.6	6.8	6.9	7.9	4.0	5.5	4.7	2.3	3.6	5.1	3.4	2.7	4.0	3.0	1.7
Illite+Mica	35.6	36.6	39.3	28.8	26.0	23.7	20.1	24.4	26.4	25.2	16.6	9.3	15.0	10.5	6.4
Chlorite	0.4	0.6	0.6	0.1	2.2	2.6	1.4	1.5	1.6	1.7	1.5	0.1	1.3	0.0	0.9
Kaolinite	2.0	2.6	2.5	1.2	4.2	2.5	1.2	1.6	2.8	2.7	2.1	0.1	2.1	7.1	3.8
Talc	0.0	0.0	0.0	0.0	0.8	1.1	0.5	1.6	1.3	0.8	1.6	0.0	0.0	0.0	0.0
TOTAL	45.5	46.6	49.3	38.0	37.2	35.4	28.0	31.4	35.8	35.6	25.2	12.2	22.4	20.7	12.7
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	15.1	14.2	14.7	15.0	13.9	12.3	15.4	8.8	12.5	15.6	15.4	15.4	15.4	15.4	15.4
% I/S to Illite in <1.0um Fraction	23.3	21.1	19.2	26.1	16.8	20.6	22.5	10.8	15.8	21.4	22.5	22.5	22.5	22.5	22.5
% Expandable I/S Layers in sample	1.15	0.97	1.02	1.18	0.56	0.68	0.73	0.20	0.45	0.80	0.52	0.41	0.61	0.47	0.26
% Fe in 1st/primary Dolomite/Ankerite	32.7	30.4	30.7	23.9	45.6	37.9	41.1	36.9	36.4	36.9	45.1	43.1	50.8	23.0	58.6
% Fe in 2nd Dolomite/Ankerite															

SAMPLE ID	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
SAMPLE DEPTH	8010-8040	8040-8070	8070-8100	8100-8130	8130-8160	8160-8190	8190-8220	8220-8250	8250-8280	8280-8310	8310-8340	8340-8370	8370-8400	8400-8430	8430-8460
NON-CLAY FRACTION															
Quartz	35.8	22.1	25.4	33.0	10.8	6.3	10.4	5.0	4.7	6.5	8.9	6.2	7.5	3.5	4.6
K-Feldspar	0.5	0.1	0.1	0.3	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Plagioclase	25.0	35.0	28.7	28.1	37.1	34.6	11.1	7.2	8.4	5.5	5.5	5.2	6.2	0.9	1.6
Organic Carbon (TOC)	0.1	0.2	0.2	0.6	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Apatite	0.6	0.8	0.5	0.8	0.5	0.5	0.7	1.2	0.4	0.7	0.6	1.1	0.7	1.5	1.6
Pyrite	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1
Calcite	3.9	3.2	1.7	1.7	3.0	11.9	47.2	67.1	64.1	65.1	61.5	64.5	57.9	80.8	76.0
Dolomite	4.2	5.8	3.8	4.5	6.3	4.0	2.4	2.8	1.8	3.4	3.5	6.1	2.9	0.9	3.3
Siderite	1.2	1.5	1.5	2.8	0.7	0.5	0.8	0.5	0.2	0.5	0.9	1.1	1.6	0.5	0.5
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gypsum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Analcime	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Anatase	0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Augite	5.8	2.6	0.9	0.0	10.2	9.2	2.6	2.8	3.1	1.0	1.5	2.0	2.1	1.0	1.7
TOTAL	77.9	71.8	63.0	72.5	69.2	67.7	75.9	87.1	83.7	83.2	82.9	86.5	79.2	89.3	89.5
CLAY FRACTION															
Mixed-Layer ILLITE/SMECTITE (Includes R3)	2.2	4.2	5.2	3.9	4.9	5.9	5.1	2.3	2.9	2.9	2.7	2.5	2.9	2.3	2.0
Illite+Mica	9.2	17.7	27.6	17.5	21.2	19.5	17.6	9.5	12.6	13.3	13.7	10.9	17.0	8.4	8.5
Chlorite	0.8	0.8	0.6	0.5	1.3	3.1	0.0	0.4	0.4	0.0	0.0	0.0	0.1	0.0	0.0
Kaolinite	9.1	4.8	3.0	5.2	2.4	2.3	1.4	0.7	0.4	0.5	0.6	0.0	0.5	0.0	0.0
Talc	0.9	0.6	0.7	0.4	1.0	1.5	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0
TOTAL	22.1	28.2	37.0	27.5	30.8	32.3	24.1	12.9	16.3	16.8	17.1	13.5	20.8	10.7	10.5
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	15.4	15.4	15.3	15.7	12.5	5.4	14.3	15.4	11.5	12.6	13.8	11.8	10.3	15.4	15.4
% I/S to Illite in <1.0um Fraction	22.5	22.5	21.4	21.3	23.2	26.8	28.3	22.5	22.1	21.6	20.1	22.0	18.1	22.5	22.5
% Expandable I/S Layers in sample	0.33	0.65	0.79	0.62	0.61	0.32	0.73	0.36	0.34	0.37	0.38	0.30	0.30	0.35	0.31
% Fe in 1st/primary Dolomite/Ankerite	65.5	52.8	46.6	50.8	44.6	44.4	23.9	14.5	31.7	58.3	43.6	64.3	50.6		79.7
% Fe in 2nd Dolomite/Ankerite							61.3	63.5					80.5		

WELL NAME	**James A. Williams #1**														
SAMPLE ID	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
SAMPLE DEPTH	8460-8490	8490-8520	8520-8550	8550-8580	8580-8610	8610-8640	8640-8670	8670-8700	8700-8730	8713.10	8715.25	8730-8760	8760-8790	8790-8820	8820-8850
NON-CLAY FRACTION															
Quartz	2.1	5.9	3.6	6.8	9.8	8.8	8.0	6.0	6.5	24.6	10.7	7.0	10.2	25.5	31.1
K-Feldspar	0.0	0.1	0.1	0.2	0.1	0.2	0.2	0.3	0.5	0.2	0.1	1.5	0.3	0.3	0.3
Plagioclase	1.5	3.1	1.5	0.6	3.2	1.4	0.6	3.6	9.5	0.4	0.4	18.0	11.6	7.7	3.5
Organic Carbon (TOC)	0.0	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.3	1.0
Apatite	0.6	0.8	0.4	0.6	0.5	0.8	0.8	0.7	0.5	1.4	0.9	1.4	0.6	0.9	1.4
Pyrite	0.2	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.9	0.2
Calcite	87.6	73.8	83.8	78.6	66.7	74.4	78.0	74.8	59.6	52.2	78.5	32.9	42.5	13.9	7.7
Dolomite	0.7	1.4	1.7	1.0	1.0	1.2	1.6	1.5	2.7	0.4	0.2	3.3	7.5	12.3	8.1
Siderite	0.0	0.2	0.3	0.4	0.3	0.6	0.2	0.4	1.1	1.4	0.0	1.8	0.7	1.0	3.0
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gypsum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Analcime	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.6	0.4
Anatase	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.2
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Augite	1.5	1.3	0.7	0.0	1.6	1.7	0.8	2.2	1.8	0.0	0.8	5.6	2.8	1.7	1.4
TOTAL	94.2	87.1	92.2	88.4	83.6	89.3	90.4	89.8	82.5	80.9	91.7	72.2	77.2	65.3	58.3
CLAY FRACTION															
Mixed-Layer ILLITE/SMECTITE (Includes R3)	1.3	3.5	1.8	2.7	2.9	1.8	1.9	2.2	2.8	2.2	1.5	3.1	3.8	9.2	8.1
Illite+Mica	4.5	9.1	6.1	8.6	13.2	8.6	7.8	8.0	12.6	17.0	6.8	18.7	16.7	23.2	29.2
Chlorite	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	2.7	0.5	0.3	0.2
Kaolinite	0.0	0.2	0.0	0.3	0.3	0.3	0.0	0.0	1.1	0.0	0.0	2.3	1.4	1.8	3.9
Talc	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	1.0	0.4	0.2	0.2
TOTAL	5.8	12.9	7.8	11.6	16.4	10.7	9.6	10.2	17.5	19.1	8.3	27.8	22.8	34.7	41.7
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	15.4	18.4	15.4	11.9	14.2	12.3	15.4	15.4	15.4	8.6	15.4	13.9	15.4	15.6	16.2
% I/S to Illite in <1.0um Fraction	22.5	27.8	22.5	25.4	20.2	17.7	22.5	22.5	21.9	15.4	22.5	17.2	22.6	34.3	26.9
% Expandable I/S Layers in sample	0.20	0.64	0.27	0.32	0.42	0.22	0.29	0.33	0.44	0.19	0.24	0.43	0.59	1.44	1.33
% Fe in 1st/primary Dolomite/Ankerite		31.7	15.5	49.3	44.6	29.2	7.8	29.7	47.6			39.9	8.3	32.7	55.8
% Fe in 2nd Dolomite/Ankerite			53.3				46.6						57.1	66.8	

SAMPLE ID	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
SAMPLE DEPTH	8850-8880	8880-8910	8910-8940	8950-8980	8980-9010	9010-9040	9040-9070	9070-9100	9100-9130	9130-9160	9160-9190	9190-9220	9220-9240	9240-9270	9270-9300
NON-CLAY FRACTION															
Quartz	23.9	20.0	17.9	24.7	22.5	22.5	25.2	19.4	23.2	20.9	23.2	23.8	18.5	23.5	19.9
K-Feldspar	0.5	0.4	0.2	1.5	1.8	1.8	0.7	0.5	1.3	1.0	1.1	1.1	0.3	0.8	0.6
Plagioclase	8.3	8.1	11.4	6.3	3.4	4.7	3.4	39.4	6.3	5.6	3.7	6.6	9.8	5.7	3.1
Organic Carbon (TOC)	2.1	0.6	0.5	0.8	0.9	0.8	0.5	0.2	0.7	0.4	0.5	0.6	0.5	0.7	0.5
Apatite	0.7	2.6	0.9	0.5	0.7	0.6	1.0	1.2	1.1	1.1	1.1	1.0	0.8	0.8	0.5
Pyrite	0.1	0.1	0.0	0.1	0.3	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.3	0.1
Calcite	2.4	3.0	12.9	0.1	0.1	1.1	15.9	6.4	1.7	18.3	15.5	6.6	16.6	15.0	26.9
Dolomite	8.9	5.1	5.4	2.0	1.1	1.7	1.3	1.8	2.1	1.6	2.0	2.1	5.4	1.8	2.2
Siderite	4.0	4.9	3.9	4.1	5.2	5.3	3.5	1.7	4.1	3.9	4.6	4.7	3.0	4.2	3.5
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gypsum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Analcime	0.0	0.3	0.0	0.1	0.0	0.0	0.4	0.4	0.4	0.3	0.3	0.0	0.0	0.2	0.0
Anatase	0.0	0.2	0.1	0.2	0.3	0.2	0.2	0.1	0.3	0.1	0.2	0.2	0.1	0.2	0.1
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Augite	1.8	2.4	2.1	1.6	0.0	1.2	1.6	0.7	1.4	1.4	1.2	1.4	2.0	0.8	0.7
TOTAL	52.7	47.7	55.4	41.8	36.3	40.0	54.4	72.1	42.7	54.8	53.6	48.2	57.1	53.9	58.1
CLAY FRACTION															
Mixed-Layer ILLITE/SMECTITE (Includes R3)	8.6	8.6	8.2	7.7	7.5	9.4	6.4	4.1	7.4	7.7	8.3	8.5	6.7	8.2	8.0
Illite+Mica	35.9	39.8	34.0	48.0	53.7	48.8	37.2	22.3	48.0	35.7	36.0	40.3	33.1	35.0	32.0
Chlorite	0.3	0.0	0.4	0.1	0.5	0.4	0.5	0.1	0.3	0.7	0.4	0.7	0.6	0.4	0.3
Kaolinite	2.2	3.6	1.6	2.2	1.9	1.4	1.4	1.4	1.6	1.1	1.8	2.4	2.0	2.5	1.6
Talc	0.4	0.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0
TOTAL	47.3	52.3	44.6	58.2	63.7	60.0	45.6	27.9	57.3	45.2	46.4	51.8	42.9	46.1	41.9
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	14.8	17.2	21.3	16.2	18.9	16.2	17.3	17.1	16.3	14.5	15.2	15.0	16.8	15.9	14.1
% I/S to Illite in <1.0um Fraction	23.2	21.6	23.6	18.7	17.4	22.3	18.9	20.6	19.3	23.9	24.3	24.2	22.0	26.2	26.3
% Expandable I/S Layers in sample	1.30	1.49	1.75	1.26	1.44	1.54	1.12	0.71	1.22	1.11	1.26	1.28	1.14	1.32	1.14
% Fe in 1st/primary Dolomite/Ankerite	58.1	56.8	48.6	42.4	42.1	47.1	39.1	50.3	48.6	57.3	55.8	62.0	40.6	40.6	54.6
% Fe in 2nd Dolomite/Ankerite															

SAMPLE ID	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
SAMPLE DEPTH	9300-9330	9330-9360	9360-9390	9390-9420	9420-9450	9450-9480	9480-9510	9510-9540	9540-9570	9630-9660	9660-9690	9690-9720	9780-9810	9870-9900	9930-9948
NON-CLAY FRACTION															
Quartz	18.6	18.5	19.6	14.5	18.2	20.6	21.4	13.2	13.0	14.2	15.4	15.1	22.7	31.1	15.6
K-Feldspar	0.5	0.8	0.3	0.2	0.3	1.2	0.8	0.2	0.9	1.3	1.4	0.6	0.2	0.2	0.7
Plagioclase	7.7	8.4	3.6	14.9	10.4	7.3	9.3	22.6	27.7	28.4	23.2	19.7	29.4	30.8	24.3
Organic Carbon (TOC)	0.5	0.5	0.5	0.3	0.2	0.4	0.5	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2
Apatite	0.4	0.7	0.5	0.9	0.9	1.1	0.5	1.6	0.9	0.6	0.4	0.8	0.4	0.3	0.9
Pyrite	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.4	0.0	0.0	0.1	0.1	0.2
Calcite	16.8	14.9	16.9	20.2	20.8	12.7	6.4	11.1	5.8	9.8	14.4	14.7	1.3	4.9	3.5
Dolomite	3.8	2.4	3.3	2.3	3.6	1.5	1.9	2.3	2.0	3.1	3.1	1.9	1.6	2.8	3.6
Siderite	2.6	2.7	2.1	1.1	1.9	2.9	2.9	2.0	1.7	1.0	1.6	1.7	1.8	2.3	1.5
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gypsum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Analcime	0.1	0.4	0.1	0.1	0.2	0.2	0.1	0.3	0.0	0.1	0.0	0.0	0.1	0.0	0.0
Anatase	0.2	0.2	0.2	0.2	0.3	0.5	0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Anhydrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hematite	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hornblende	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.2	0.3	0.2	0.1	0.9	0.0	0.4
Augite	2.0	1.2	0.7	3.1	1.9	1.0	0.9	4.4	5.2	9.3	6.5	4.4	2.5	1.3	6.0
TOTAL	53.5	50.8	48.1	58.1	58.8	49.7	45.0	58.4	58.0	68.9	66.4	59.4	61.4	74.1	56.8
CLAY FRACTION															
Mixed-Layer ILLITE/SMECTITE (Includes R3)	8.2	7.6	7.4	7.5	7.7	5.1	8.4	6.8	7.8	6.6	6.3	7.0	9.2	4.9	8.5
Illite+Mica	34.7	35.6	38.5	27.6	25.0	34.1	42.7	26.8	28.1	20.0	24.2	30.2	23.4	20.0	25.4
Chlorite	1.8	4.2	4.1	4.7	6.1	8.7	2.6	3.6	2.3	2.0	0.8	0.7	2.3	0.1	4.8
Kaolinite	1.6	1.8	1.8	1.9	2.3	2.3	1.3	3.9	3.4	2.3	2.3	2.6	3.5	0.9	4.1
Talc	0.2	0.0	0.0	0.2	0.1	0.0	0.0	0.5	0.4	0.2	0.0	0.2	0.2	0.0	0.3
TOTAL	46.5	49.2	51.9	41.9	41.2	50.3	55.0	41.6	42.0	31.1	33.6	40.6	38.6	25.9	43.2
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	14.7	14.2	15.1	15.1	22.8	15.8	16.1	17.0	15.7	20.7	15.7	20.2	22.2	21.0	22.0
% I/S to Illite in <1.0um Fraction	24.9	23.0	22.7	26.8	30.5	17.2	22.2	28.2	27.7	30.9	28.2	24.5	35.3	24.6	33.0
% Expandable I/S Layers in sample	1.20	1.08	1.13	1.14	1.77	0.81	1.36	1.16	1.23	1.37	0.99	1.42	2.05	1.04	1.88
% Fe in 1st/primary Dolomite/Ankerite	40.6	50.1	49.1	49.6	49.6	52.8	53.6	51.1	49.8	38.4	43.6	40.4	44.4	39.4	43.6
% Fe in 2nd Dolomite/Ankerite	85.7														

Comments

Carbonates of the solid solution between Siderite (Fe2+ = 0.92Å) and Magnesite (Mg2+ = 0.86Å) are present in some samples.

Fair amount of pure Smectite (~100% Expandable) in some of the samples (especially Sample # 20-36)
This is possibly from residual drilling mud that was not washed off from the sample.

WEIGHT PERCENT

Raw Data ***NORMALIZED*** *to sum to 100%*

WELL NAME	Edith Mehrens et al. #1																
SAMPLE ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
SAMPLE DEPTH	7750-7760	7790-7800	7800-7810	7840-7850	7940-7950	7950-7960	8000-8010	8050-8060	8100-8110	8200-8210	8250-8260	8300-8310	8350-8360	8400-8410	8450-8460	8980-8990	9190-9200
NON-CLAY FRACTION																	
Quartz	8.1	3.6	3.5	18.9	78.3	73.0	68.7	56.8	53.9	64.3	63.1	46.5	48.3	22.5	16.3	49.5	48.6
K-Feldspar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.7	0.1	0.4	0.0	0.4	0.0	0.0	0.7	0.0
Plagioclase	7.6	4.4	3.2	5.8	1.9	2.5	2.5	2.9	5.4	2.9	4.3	11.0	18.2	30.2	32.3	12.0	11.6
Organic Carbon (TOC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.4	0.2	0.0	0.0	0.7	0.1
Apatite	2.2	2.7	2.5	3.1	0.4	0.3	0.4	0.5	0.7	0.3	0.3	0.3	0.4	0.6	0.8	1.0	0.5
Pyrite	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.3	0.5	0.1	0.1
Sodalite	2.4	3.1	2.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calcite	0.8	0.8	0.8	0.5	0.2	0.4	0.2	0.0	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.6	1.7
Dolomite	1.2	0.7	1.0	1.3	2.0	3.0	5.4	2.3	3.1	4.9	4.6	5.5	3.9	2.8	2.8	3.2	4.8
Siderite	0.0	0.0	0.0	0.0	0.2	0.3	0.7	0.6	0.4	0.2	0.2	0.2	0.4	0.4	0.0	0.8	0.2
Magnesite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Ewaldite	0.5	0.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trona	2.4	4.3	3.2	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nahcolite	3.2	0.8	1.2	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.6	0.0	0.0
Jarosite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.6	0.4	0.2
Analcime	9.7	3.8	2.9	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0
Hematite	1.9	1.2	1.1	18.4	0.7	0.9	1.1	2.9	2.3	1.3	1.3	1.3	1.1	0.6	0.0	0.4	1.8
Magnetite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.8	0.0	0.0
Scolecite	2.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Augite	28.6	62.1	64.2	13.4	3.3	2.9	3.7	1.7	3.4	3.1	2.2	4.5	2.4	8.4	12.8	3.3	3.3
TOTAL	71.1	88.3	86.3	72.9	87.2	83.3	82.7	68.4	70.0	77.6	76.5	70.0	75.5	72.0	72.7	72.7	74.0
CLAY FRACTION																	
Mixed-Layer ILLITE/SMECTITE (Includes R3)	2.7	0.6	0.5	2.6	0.8	1.1	0.8	1.9	1.4	0.6	0.6	1.2	0.9	2.0	1.8	1.4	1.9
Illite + Mica	17.1	6.1	5.8	20.4	10.7	12.9	12.5	26.6	25.0	17.7	17.3	25.1	19.9	24.0	24.0	16.5	20.5
Chlorite	4.1	2.1	1.9	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.8
Kaolinite	4.8	2.9	5.5	4.2	1.3	2.7	4.0	3.0	3.6	4.1	5.6	3.7	3.7	2.1	1.6	7.5	2.8
TOTAL	28.9	11.7	13.7	27.1	12.8	16.7	17.3	31.6	30.0	22.4	23.5	30.0	24.5	28.0	27.3	27.3	26.0
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	13.4	9.6	9.6	7.9	9.6	7.3	8.9	17.3	7.3	7.2	10.3	7.9	9.3	9.6	9.6	6.1	11.8
% I/S to Illite in <1.0um Fraction	13.8	8.2	8.2	11.2	8.2	9.9	8.3	9.1	7.4	4.6	5.0	6.1	6.2	8.2	8.2	8.4	9.0
% Expandable I/S Layers in sample	0.00	0.00	0.00	0.00	0.07	0.08	0.07	0.33	0.10	0.04	0.06	0.09	0.09	0.19	0.17	0.08	0.22
% Fe in 1st/primary Dolomite/Ankerite	48.1		42.9	39.6	38.4	36.1	35.6	31.9	29.9	34.7	34.4	35.6	35.9	47.8	49.8	53.3	44.4

Comments

Some samples did not have enough resolution with normal XRD runs to determine clay expandability. For these samples, approximate average was used (highlighted in orange).

WEIGHT PERCENT

Raw Data ***NORMALIZED*** *to sum to 100%*

WELL NAME G. D. Royston #1

SAMPLE ID	1	2	3	4	5	6	7	8	9	10	11	12	13
SAMPLE DEPTH	1740-1750	1930-1940	2190-2200	2390-2400	2590-2600	2790-2800	3000-3010	3200-3210	3400-3410	3600-3610	3800-3810	4000-4010	4200-4210
NON-CLAY FRACTION													
Quartz	72.2	31.1	27.8	22.9	23.3	37.4	24.7	26.0	29.5	26.8	25.2	30.2	31.9
K-Feldspar	1.2	0.8	1.1	0.5	0.5	0.7	1.0	1.0	1.1	0.7	0.6	0.7	0.5
Plagioclase	0.9	8.1	6.9	8.5	8.0	12.2	9.5	8.6	8.0	9.5	5.8	11.7	11.2
Organic Carbon (TOC)	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Apatite	0.5	0.6	0.6	0.8	0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.8	0.4
Pyrite	1.7	2.4	0.7	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Calcite	7.6	5.6	10.0	0.8	0.3	0.2	1.3	0.5	1.6	2.7	4.3	2.2	1.7
Dolomite	3.8	12.9	8.0	3.7	5.0	5.8	9.0	7.9	6.8	4.6	4.3	1.1	1.6
Siderite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Anatase	0.0	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.5	0.4
Hematite	0.0	0.8	1.3	1.6	1.6	1.2	1.7	1.6	1.6	1.7	1.7	1.9	1.7
TOTAL	87.9	62.9	56.7	39.2	39.6	58.3	48.3	46.5	49.4	46.8	42.6	49.2	49.6
CLAY FRACTION													
Mixed-Layer ILLITE/SMECTITE (Includes R3)	2.7	9.7	13.0	16.1	14.4	9.8	13.3	12.6	12.4	14.4	15.0	11.1	12.1
Illite+Mica	8.5	25.1	26.8	40.0	42.9	28.6	33.6	36.4	32.5	34.1	38.3	31.9	32.4
Chlorite	0.0	1.5	2.2	3.3	3.1	2.8	3.4	3.1	3.1	3.2	2.7	4.7	3.9
Kaolinite	0.9	0.9	1.3	1.3	0.0	0.5	1.4	1.3	2.5	1.6	1.4	3.1	1.9
TOTAL	12.1	37.1	43.3	60.8	60.4	41.7	51.7	53.5	50.6	53.2	57.4	50.8	50.4
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	17.6	21.6	23.1	20.9	20.4	19.9	21.1	19.5	19.6	19.6	20.4	22.0	21.9
% I/S to Illite in <1.0um Fraction	30.0	31.4	36.4	32.0	29.5	33.8	34.1	29.5	33.8	34.6	33.3	31.1	33.6
% Expandable I/S Layers in sample	0.48	2.10	3.01	3.37	2.93	1.95	2.80	2.46	2.44	2.82	3.06	2.43	2.65
% Fe in 1st/primary Dolomite/Ankerite	51.1	14.2	27.9	19.0	20.7	26.9	22.2	21.7	24.7	15.7	18.7	25.7	20.0
% Fe in 2nd Dolomite/Ankerite		42.1								57.1			

SAMPLE ID	14	15	16	17	18	19	20	21	22	23	24	25	26
SAMPLE DEPTH	4400-4410	4600-4610	4800-4810	5000-5010	5200-5210	5400-5410	5600-5610	5860-5870	5968	5990-6000	6300-6310	6396	6444
NON-CLAY FRACTION													
Quartz	32.4	32.3	35.9	35.7	28.9	28.9	30.6	37.3	27.8	31.3	37.1	91.7	52.2
K-Feldspar	0.6	0.5	0.7	0.5	0.2	0.8	0.5	0.3	0.5	0.5	0.2	0.8	0.5
Plagioclase	11.7	10.9	10.3	9.1	10.1	9.5	10.7	7.6	5.4	7.1	6.6	0.6	1.8
Organic Carbon (TOC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1
Apatite	0.5	0.4	0.5	0.5	0.7	0.6	0.5	0.5	0.5	0.5	0.6	0.0	0.0
Pyrite	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0
Calcite	4.2	2.4	1.9	2.2	1.1	1.9	2.3	2.5	0.1	2.1	1.2	0.0	0.5
Dolomite	1.0	0.6	1.0	0.7	0.3	0.9	1.2	1.1	0.3	0.8	0.6	3.0	35.9
Siderite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Anatase	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.1	0.0
Hematite	1.7	1.6	1.6	1.2	1.7	1.8	1.2	1.3	2.6	1.4	1.2	0.0	0.0
TOTAL	52.4	49.1	52.2	50.3	43.5	44.7	47.5	51.0	37.7	44.1	48.0	96.3	91.0
CLAY FRACTION													
Mixed-Layer ILLITE/SMECTITE (Includes R3)	10.3	11.6	10.6	12.3	12.7	14.2	10.1	11.7	12.3	13.5	12.0	0.6	2.2
Illite+Mica	32.3	34.0	32.5	32.1	38.7	35.5	37.2	32.9	45.5	35.6	33.6	1.4	5.2
Chlorite	3.2	3.4	3.3	3.7	3.8	4.0	4.5	3.4	2.7	3.8	3.4	0.0	0.0
Kaolinite	1.8	1.8	1.4	1.6	1.2	1.5	0.7	1.0	1.8	3.0	3.0	1.7	1.6
TOTAL	47.6	50.9	47.8	49.7	56.5	55.3	52.5	49.0	62.3	55.9	52.0	3.7	9.0
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	22.9	22.6	21.5	22.0	21.4	23.2	20.3	22.5	25.5	21.8	22.0	21.9	21.9
% I/S to Illite in <1.0um Fraction	30.9	31.1	28.5	33.4	26.8	33.8	24.8	30.3	22.9	31.9	30.0	30.3	30.3
% Expandable I/S Layers in sample	2.37	2.62	2.29	2.71	2.72	3.30	2.06	2.63	3.15	2.94	2.64	0.13	0.49
% Fe in 1st/primary Dolomite/Ankerite	30.4		21.5				11.0	64.0				47.6	62.5
% Fe in 2nd Dolomite/Ankerite													

SAMPLE ID	27	28	29	30	31	32	33	34	35	36	37	38	39
SAMPLE DEPTH	6510-6520	6700-6710	6902-6907	6916	6950	7150-7160	7366	7420-7430	7600-7610	7810-7820	8000-8010	8200-8210	8400-8410
NON-CLAY FRACTION													
Quartz	65.7	42.3	42.2	41.6	49.2	39.0	36.3	44.7	50.4	42.0	46.4	43.1	40.6
K-Feldspar	0.6	0.7	0.5	0.2	0.5	0.4	0.9	0.5	0.5	0.6	0.5	0.5	0.5
Plagioclase	4.7	5.4	3.1	3.2	5.8	6.5	1.1	2.1	4.0	5.4	6.3	6.2	5.9
Organic Carbon (TOC)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
Apatite	0.4	0.5	0.5	1.0	0.0	0.5	0.7	0.4	0.5	0.4	0.3	0.4	0.7
Pyrite	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Calcite	1.3	6.4	1.0	3.8	0.1	3.0	0.1	0.1	0.6	0.3	0.6	3.5	2.0
Dolomite	4.0	4.0	3.5	13.6	0.1	1.7	0.4	2.3	3.1	2.6	2.3	2.8	4.1
Siderite	0.3	0.3	0.2	3.5	0.0	0.2	1.8	0.3	0.3	0.2	0.1	0.1	0.2
Anatase	0.2	0.3	0.4	0.3	0.4	0.3	0.7	0.4	0.3	0.4	0.3	0.3	0.4
Hematite	0.4	1.1	1.3	0.1	1.5	1.5	2.2	1.5	1.2	1.8	1.8	1.8	1.4
TOTAL	77.5	61.2	52.7	67.4	57.6	53.1	44.3	52.5	61.0	53.7	58.7	58.7	55.8
CLAY FRACTION													
Mixed-Layer ILLITE/SMECTITE (Includes R3)	4.5	9.2	8.2	7.1	5.9	9.3	5.8	0.0	8.0	8.0	8.0	8.6	14.6
Illite+Mica	13.4	23.3	30.6	20.5	32.5	30.6	43.0	39.3	25.0	30.6	27.3	26.1	23.7
Chlorite	1.7	3.2	3.2	1.2	1.3	3.3	0.0	1.7	1.6	2.7	2.6	3.0	2.7
Kaolinite	2.8	3.2	5.3	3.8	2.6	3.7	6.9	6.5	4.4	5.0	3.4	3.6	3.1
TOTAL	22.5	38.8	47.3	32.6	42.4	46.9	55.7	47.5	39.0	46.3	41.3	41.3	44.2
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	24.7	21.4	20.2	24.6	17.9	22.6	14.2	17.0	19.9	21.7	21.3	20.9	24.0
% I/S to Illite in <1.0um Fraction	28.1	33.3	25.5	27.4	18.0	26.5	14.3	0.1	26.8	25.4	27.4	29.5	43.8
% Expandable I/S Layers in sample	1.11	1.96	1.65	1.76	1.06	2.10	0.82	0.01	1.61	1.74	1.71	1.81	3.50
% Fe in 1st/primary Dolomite/Ankerite	62.0	59.3	66.0	41.9		59.5		63.5	64.0	36.9	57.3	62.5	36.9
% Fe in 2nd Dolomite/Ankerite				84.4						64.5			

SAMPLE ID	40	41	42	43	44	45	46	47	48	49	50	51	52
SAMPLE DEPTH	8626-8630	8670-8680	8720-8730	8730-8740	8790-8800	8810-8820	8940-8950	8950-8960	9000-9010	9100-9110	9250-9260	9300-9310	9350-9360
NON-CLAY FRACTION													
Quartz	36.8	38.1	32.8	41.1	31.7	32.5	40.5	41.8	39.9	37.6	22.3	34.7	34.8
K-Feldspar	0.6	0.2	0.3	0.3	0.6	0.3	0.7	0.2	0.6	0.6	0.1	0.4	0.5
Plagioclase	4.6	3.0	4.1	4.7	4.4	3.4	6.5	5.3	4.1	3.7	2.5	4.1	2.3
Organic Carbon (TOC)	0.1	0.1	0.1	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.3
Apatite	0.5	0.4	0.5	0.4	0.8	0.3	0.6	0.4	0.5	0.4	1.1	1.5	0.8
Pyrite	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.2	0.2
Calcite	0.9	1.0	4.3	2.5	1.2	21.0	4.0	1.9	5.6	2.5	31.0	8.8	4.1
Dolomite	7.1	17.0	5.5	5.1	3.5	1.2	2.2	1.2	4.2	0.8	4.1	3.6	11.7
Siderite	0.2	0.1	0.2	0.1	0.4	0.2	0.4	0.3	0.2	0.7	0.8	1.3	2.0
Anatase	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.1
Hematite	1.7	1.3	1.4	1.6	1.6	1.0	1.2	1.5	1.1	1.0	0.4	0.7	0.4
TOTAL	52.7	61.5	49.6	56.3	44.9	60.6	56.6	53.3	56.7	48.2	62.9	55.7	57.3
CLAY FRACTION													
Mixed-Layer ILLITE/SMECTITE (Includes R3)	14.0	13.0	13.5	13.6	14.5	10.6	7.7	9.6	10.5	9.1	8.2	13.4	8.1
Illite+Mica	28.5	20.4	28.4	24.3	31.4	22.6	30.8	30.5	25.2	33.5	23.2	23.2	26.8
Chlorite	2.1	2.4	2.6	2.6	2.4	2.4	2.5	2.5	2.4	2.2	1.2	2.7	1.8
Kaolinite	2.7	2.7	5.9	3.3	6.9	3.9	2.4	4.2	5.2	6.9	4.5	5.0	6.1
TOTAL	47.3	38.5	50.4	43.7	55.1	39.4	43.4	46.7	43.3	51.8	37.1	44.3	42.7
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	26.7	21.1	25.1	26.0	24.4	25.5	21.7	23.0	23.5	21.9	19.8	24.1	22.3
% I/S to Illite in <1.0um Fraction	36.2	40.4	36.3	40.8	34.8	37.0	23.1	27.0	34.2	26.8	29.9	41.2	28.0
% Expandable I/S Layers in sample	3.73	2.73	3.39	3.53	3.55	2.70	1.68	2.20	2.48	2.00	1.63	3.23	1.80
% Fe in 1st/primary Dolomite/Ankerite	52.3	45.4	35.9	48.8	59.5	49.8	56.8	59.5	63.3		62.5	45.4	46.4
% Fe in 2nd Dolomite/Ankerite			82.0										66.8

SAMPLE ID	53	54	55	56	57	58	59	60	61	62	63	64	65
SAMPLE DEPTH	9390-9400	9400-9410	9528-9530	9590-9600	9700-9710	9750-9760	9790-9800	9800-9810	9850-9860	9900-9910	10000-10010	10140-10150	10260-10270
NON-CLAY FRACTION													
Quartz	35.4	36.5	36.1	47.0	30.1	34.9	36.6	31.5	37.3	30.4	36.4	33.5	47.3
K-Feldspar	0.6	0.5	0.8	0.4	0.5	0.5	0.5	0.4	0.4	0.6	0.7	0.6	0.6
Plagioclase	3.3	4.2	4.5	3.1	3.3	4.5	3.6	4.2	3.6	2.9	6.3	4.8	6.5
Organic Carbon (TOC)	0.3	0.2	0.4	0.4	0.3	0.3	0.5	0.5	3.5	1.4	0.3	0.5	0.4
Apatite	0.5	0.3	0.4	0.5	0.4	0.6	0.5	0.4	0.1	0.6	0.5	0.4	0.4
Pyrite	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1
Calcite	8.4	3.6	4.5	5.3	10.5	6.5	1.7	4.9	1.0	1.4	3.4	0.5	0.5
Dolomite	3.3	2.4	3.7	2.2	6.4	1.8	2.1	4.6	2.7	11.6	4.0	1.4	2.2
Siderite	1.4	1.4	0.9	1.0	1.4	1.6	1.0	2.0	1.0	1.2	0.9	1.2	0.6
Anatase	0.4	0.4	0.4	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4
Hematite	0.7	1.0	1.2	0.8	0.8	1.0	1.0	0.8	0.7	0.5	1.0	0.5	0.4
TOTAL	54.5	50.7	52.9	61.0	54.0	52.0	47.9	49.9	50.9	51.0	53.9	43.9	59.3
CLAY FRACTION													
Mixed-Layer ILLITE/SMECTITE (Includes R3)	9.0	9.7	9.7	7.7	9.8	11.9	10.8	9.8	10.3	11.5	10.8	9.0	6.9
Illite+Mica	28.2	30.0	28.6	23.7	29.5	28.6	32.3	32.3	30.1	27.3	28.6	38.7	26.8
Chlorite	1.9	2.5	2.4	1.5	1.8	1.8	2.2	1.8	1.8	1.9	2.4	4.7	5.5
Kaolinite	6.5	7.1	6.4	6.1	5.0	5.6	6.9	6.2	6.9	8.3	4.2	3.7	1.6
TOTAL	45.5	49.3	47.1	39.0	46.0	48.0	52.1	50.1	49.1	49.0	46.1	56.1	40.7
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	24.4	22.8	21.8	25.3	23.9	22.0	22.8	22.5	20.6	24.5	23.1	19.7	18.6
% I/S to Illite in <1.0um Fraction	30.1	31.3	31.1	29.3	30.1	35.1	31.7	28.2	30.4	37.1	32.6	25.5	26.7
% Expandable I/S Layers in sample	2.20	2.21	2.13	1.95	2.35	2.63	2.47	2.21	2.20	2.86	2.52	1.78	1.28
% Fe in 1st/primary Dolomite/Ankerite	64.3	43.9	49.3	54.1	40.6	65.5	40.9	47.6	49.6	46.1	43.6	42.1	62.0
% Fe in 2nd Dolomite/Ankerite													

Comments

Some samples did not have enough resolution with normal XRD runs to determine clay expandability. For these samples, approximate average was used (highlighted in orange).

WEIGHT PERCENT

Raw Data ***NORMALIZED*** *to sum to 100%*

WELL NAME	J. H. Douglass et al. #1											
SAMPLE ID	1	2	3	4	5	6	7	8	9	10	11	12
SAMPLE DEPTH	10800-10805	10805-10810	11000-11005	11110-11115	11200-11205	11295-11300	11395-11400	11500-11505	11600-11605	11710-11715	11800-11810	11955-11960
NON-CLAY FRACTION												
Quartz	51.4	50.5	63.4	63.4	47.5	53.0	38.8	50.3	61.5	40.5	34.3	63.6
K-Feldspar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plagioclase	2.3	2.3	2.2	2.2	3.4	3.3	3.4	2.1	2.1	2.7	2.4	1.5
Organic Carbon (TOC)	0.0	0.1	0.1	0.1	0.2	0.4	1.1	0.8	0.5	1.1	0.7	0.4
Apatite	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.3	0.7	0.6	0.3
Pyrite	0.1	0.1	0.1	0.1	0.1	0.4	0.0	0.1	0.7	1.6	0.5	0.2
Calcite	0.0	0.0	0.1	0.1	0.1	0.1	2.6	0.0	0.1	1.8	0.5	0.4
Dolomite	6.4	5.1	4.3	4.3	2.8	2.9	2.6	0.7	1.8	1.8	19.3	1.5
Siderite	1.4	0.7	1.7	1.7	0.9	2.3	3.3	2.1	1.6	1.3	3.3	1.4
Anhydrite	0.2	0.3	2.5	2.5	0.5	0.4	0.7	0.6	0.3	0.7	0.3	0.3
Anatase	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.2	0.3	0.3	0.3
Diopside	1.1	1.2	0.9	0.9	1.3	0.9	0.5	0.9	0.8	1.2	0.0	0.8
Hematite	1.0	1.3	0.3	0.3	0.6	0.4	0.0	0.0	0.2	0.1	0.1	0.0
TOTAL	64.6	62.3	76.5	76.5	58.3	65.0	53.9	58.6	70.0	53.7	62.3	70.5
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	6.0	3.7	3.3	4.1	6.9	5.3	7.6	5.0	6.1	10.7	7.7	5.8
Illite+Mica	15.0	19.4	12.4	11.7	24.9	19.4	25.4	22.8	17.1	23.7	20.1	15.9
Chlorite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kaolinite	14.3	14.6	7.8	7.8	9.9	10.3	13.1	13.7	6.8	11.9	9.9	7.8
TOTAL	35.4	37.7	23.5	23.5	41.7	35.0	46.1	41.4	30.0	46.3	37.7	29.5
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	13.3	17.6	20.3	18.3	17.3	15.7	15.3	16.1	14.6	14.8	16.7	16.9
% I/S to Illite in <1.0um Fraction	30.2	17.3	21.8	26.7	23.1	22.7	27.2	20.2	26.7	32.5	30.9	29.2
% Expandable I/S Layers in sample	0.80	0.65	0.67	0.75	1.20	0.84	1.17	0.81	0.89	1.60	1.30	0.98
% Fe in Dolomite/Ankerite	41.4	38.1	25.9	39.1	44.1	51.8	55.1	35.9	35.9	53.3	25.7	32.2

Comments

WEIGHT PERCENT	*Raw Data **NORMALIZED** to sum to 100%*

WELL NAME	Cabe LD Co. Inc. et al. #1											
SAMPLE ID	1	2	3	4	5	6	7	8	9	10	11	12
SAMPLE DEPTH	9500-9510	9600-9610	9700-9710	9750-9760	9800-9810	9900-9910	10000-1001	10150-1016	10390-1040	10500-1051	10600-1061	10710-1072
NON-CLAY FRACTION												
Quartz	35.5	35.8	44.6	50.8	42.8	45.0	43.5	58.4	25.9	51.3	49.3	39.9
K-Feldspar	0.2	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2
Plagioclase	2.1	2.3	2.6	1.1	1.9	1.6	1.9	2.0	1.7	0.7	0.7	1.6
Organic Carbon (TOC)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3
Apatite	0.3	0.6	0.2	0.2	0.5	0.3	1.1	0.2	0.2	0.5	0.5	0.6
Pyrite	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.5	0.1	0.1	0.1	0.1
Calcite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.3
Dolomite	6.0	5.7	6.7	2.2	2.0	4.0	3.6	1.2	5.6	1.3	1.9	5.8
Siderite	1.6	5.3	2.6	2.1	2.4	3.3	2.6	0.5	3.4	3.1	6.4	4.9
Anatase	0.5	0.5	0.4	0.4	0.6	0.5	0.4	0.4	0.6	0.3	0.3	0.2
Hematite	2.1	0.9	1.3	0.9	1.2	1.3	1.5	0.8	1.3	0.3	0.0	0.0
Sphalerite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	48.3	51.8	58.9	58.2	52.1	56.5	55.2	64.4	39.0	58.0	60.2	55.9
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	5.2	4.4	4.3	3.6	3.3	3.1	4.0	2.4	4.8	2.9	3.9	5.4
Illite + Mica	27.6	28.8	23.8	18.6	29.7	26.6	26.1	19.9	38.7	21.4	22.4	24.8
Chlorite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kaolinite	19.0	15.0	13.0	19.6	14.9	13.8	14.7	13.3	17.4	17.7	13.6	13.9
Talc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	51.7	48.2	41.1	41.8	47.9	43.5	44.8	35.6	61.0	42.0	39.8	44.1
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	21.2	19.3	19.2	17.7	19.8	18.3	19.0	16.1	16.9	16.7	18.4	16.5
% I/S to Illite in <1.0um Fraction	19.9	16.3	19.8	21.3	13.1	13.3	16.8	12.9	14.4	15.0	18.7	23.1
% Expandable I/S Layers in sample	1.10	0.86	0.82	0.63	0.65	0.56	0.77	0.39	0.82	0.49	0.72	0.90
% Fe in 1st/primary Dolomite/Ankerite	27.9	40.4	38.6	42.9	37.1	40.1	51.6	32.9	45.6	38.1	36.9	71.7
% Fe in 2nd Dolomite/Ankerite												

SAMPLE ID	13	14	15	16	17	18	19	20	21	22	23	24
SAMPLE DEPTH	10810-1082	10910-1092	11000-1101	11100-1111	11200-1121	11300-1131	11390-1140	11490-1150	11600-1161	11700-1171	11800-1181	11900-1191
NON-CLAY FRACTION												
Quartz	49.7	32.3	31.9	39.2	45.9	35.5	31.9	38.6	31.8	42.0	15.4	26.4
K-Feldspar	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3
Plagioclase	1.1	1.8	2.1	1.2	0.9	1.1	1.5	1.1	1.6	0.6	0.5	1.4
Organic Carbon (TOC)	0.3	0.6	0.4	0.5	0.4	0.5	0.5	0.7	0.5	0.3	0.2	0.4
Apatite	0.5	0.7	0.6	0.4	0.5	0.8	0.8	0.3	0.6	0.3	0.3	0.2
Pyrite	0.2	0.2	0.6	0.3	0.3	0.3	0.4	0.2	0.1	0.3	0.3	0.3
Calcite	2.2	7.6	5.1	0.8	5.1	1.3	0.2	0.2	0.2	36.2	53.9	10.0
Dolomite	5.7	6.5	8.1	3.2	5.2	3.9	1.0	4.1	2.6	1.9	6.5	20.1
Siderite	3.3	3.2	2.8	9.0	2.7	4.5	5.5	3.2	6.8	0.8	2.1	6.8
Anatase	0.2	0.3	0.4	0.3	0.3	0.4	0.5	0.4	0.5	0.2	0.4	0.3
Hematite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sphalerite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	63.5	53.4	52.2	55.1	61.5	48.6	42.5	49.0	45.1	82.8	79.7	66.1
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	5.2	6.4	6.9	5.9	4.6	6.0	5.9	5.6	6.1	1.9	2.4	2.4
Illite + Mica	21.4	30.2	29.9	24.8	24.9	32.8	39.3	35.5	36.8	12.1	15.0	23.9
Chlorite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1
Kaolinite	9.9	9.9	11.0	14.2	9.1	12.6	12.4	9.9	12.1	3.2	2.8	5.6
Talc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	36.5	46.6	47.8	44.9	38.5	51.4	57.5	51.0	54.9	17.2	20.3	33.9
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	19.4	18.2	15.6	21.3	18.8	17.9	16.4	18.2	17.2	15.0	10.7	17.9
% I/S to Illite in <1.0um Fraction	25.0	21.9	23.7	24.4	21.1	21.6	17.9	19.2	19.8	16.8	19.1	13.3
% Expandable I/S Layers in sample	1.01	1.18	1.09	1.26	0.87	1.07	0.97	1.02	1.05	0.29	0.26	0.43
% Fe in 1st/primary Dolomite/Ankerite	61.3	66.5	52.8	54.8	56.1	53.8	45.1	52.6	42.1	60.0	46.4	54.8
% Fe in 2nd Dolomite/Ankerite			93.2	91.4	93.7							

SAMPLE ID	25	26	27	28	29	30	31	32	33	34	35	36
SAMPLE DEPTH	12000-1201	12050-1206	12090-1210	12190-1220	12300-1231	12350-1236	12480-1249	12600-1261	12690-1270	12790-1280	12900-1291	13000-1301
NON-CLAY FRACTION												
Quartz	47.8	28.6	38.0	18.7	28.5	18.9	44.5	13.6	15.6	11.4	34.9	28.4
K-Feldspar	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2
Plagioclase	4.9	10.7	3.1	1.8	1.7	1.1	0.9	0.6	0.8	0.6	1.7	0.7
Organic Carbon (TOC)	0.4	0.4	0.4	0.5	0.4	0.3	0.4	0.2	0.5	0.4	0.3	0.3
Apatite	0.3	0.4	0.3	0.6	1.4	0.2	0.3	0.3	0.6	0.4	0.3	0.2
Pyrite	0.3	0.2	0.2	0.4	0.4	0.2	0.2	0.3	0.3	0.6	0.4	0.4
Calcite	4.5	4.2	0.5	20.6	10.3	42.8	14.6	53.3	9.2	51.6	6.9	30.1
Dolomite	5.9	12.9	7.8	3.1	4.3	3.6	5.2	3.3	14.3	6.5	5.2	11.6
Siderite	1.0	2.4	5.0	3.4	6.0	0.3	1.5	1.9	14.0	6.9	8.0	1.2
Anatase	0.4	0.4	0.4	0.5	0.5	0.3	0.4	0.3	0.3	0.3	0.3	0.2
Hematite	0.0	0.0	0.0	0.0	0.7	0.3	0.2	0.0	0.0	0.0	0.7	0.2
Sphalerite	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	65.7	60.2	55.9	49.9	55.1	68.4	68.4	74.1	56.0	78.9	59.1	73.7
CLAY FRACTION												
Mixed-Layer ILLITE/SMECTITE (Includes R3)	4.2	5.1	4.4	6.0	4.3	4.9	4.3	3.7	6.1	3.5	4.4	4.2
Illite + Mica	23.3	24.9	31.2	32.6	30.7	21.8	20.9	18.9	30.1	15.1	27.4	19.3
Chlorite	2.6	1.5	2.0	1.2	0.7	0.2	0.4	1.0	0.4	0.0	0.6	0.2
Kaolinite	3.8	7.6	6.5	10.4	9.1	4.7	5.8	2.4	7.4	2.6	8.7	2.6
Talc	0.5	0.7	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
TOTAL	34.3	39.8	44.1	50.1	44.9	31.6	31.6	25.9	44.0	21.1	40.9	26.3
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	15.0	14.9	19.7	17.1	18.6	15.4	15.8	15.5	12.5	13.5	20.1	17.0
% I/S to Illite in <1.0um Fraction	21.1	23.0	17.2	21.3	17.5	25.2	22.7	20.5	24.1	25.7	20.6	24.5
% Expandable I/S Layers in sample	0.63	0.77	0.87	1.02	0.81	0.75	0.68	0.57	0.77	0.47	0.88	0.72
% Fe in 1st/primary Dolomite/Ankerite	61.0	52.3	56.1	46.9	50.3	58.6	58.3	56.1	48.3	45.1	50.8	16.7
% Fe in 2nd Dolomite/Ankerite												64.0

SAMPLE ID	37	38	39	40	41	42	43	44	45	46	47	48	49
SAMPLE DEPTH	13040-1305	13060-1307	13200-1321	13300-1331	13390-1340	13490-1350	13600-1361	13700-1371	13810-1382	13900-1391	13940-1395	13990-1400	14020-14025
NON-CLAY FRACTION													
Quartz	31.3	36.5	22.3	40.1	38.5	28.2	41.7	36.4	40.0	28.8	41.0	47.9	67.4
K-Feldspar	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1
Plagioclase	0.6	0.7	0.9	2.0	1.0	0.9	1.5	1.2	2.0	2.0	2.5	1.6	2.1
Organic Carbon (TOC)	0.4	0.4	0.3	0.3	0.6	0.3	0.5	0.6	0.5	0.5	0.3	0.5	0.1
Apatite	0.2	0.2	0.2	0.4	0.3	0.4	0.6	0.2	0.5	0.3	0.3	0.5	0.4
Pyrite	0.4	0.2	0.3	0.2	0.4	0.7	1.4	0.7	0.7	0.3	0.3	0.5	0.3
Calcite	14.6	14.2	30.3	6.8	12.7	32.2	8.9	10.2	5.5	11.1	2.1	2.1	1.7
Dolomite	8.7	11.8	10.0	6.0	7.9	5.1	4.9	6.8	5.0	4.0	3.4	9.4	3.5
Siderite	3.1	2.0	3.6	2.9	3.0	1.3	1.8	3.4	1.4	1.3	1.9	0.9	0.7
Anatase	0.3	0.5	0.4	0.5	0.3	0.3	0.3	0.5	0.4	0.4	0.5	0.3	0.2
Hematite	0.2	0.3	0.2	0.7	0.2	0.3	0.4	0.2	0.6	0.8	1.2	0.2	0.4
Sphalerite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	60.1	67.0	68.7	60.1	65.3	69.9	62.3	60.3	56.9	49.9	53.9	64.1	77.0
CLAY FRACTION													
Mixed-Layer ILLITE/SMECTITE (Includes R3)	3.8	4.1	4.3	4.4	5.2	5.1	4.5	5.3	3.4	4.7	6.2	5.0	2.8
Illite + Mica	30.9	24.5	22.7	27.2	25.7	20.6	26.3	29.3	32.5	38.5	31.3	25.6	17.0
Chlorite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kaolinite	5.2	4.5	4.3	7.8	3.6	4.2	6.5	4.4	6.3	6.1	8.1	4.4	2.7
Talc	0.0	0.0	0.0	0.5	0.2	0.2	0.5	0.7	0.8	0.7	0.6	0.9	0.5
TOTAL	39.9	33.0	31.3	39.9	34.7	30.1	37.7	39.7	43.1	50.1	46.1	35.9	23.0
GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% Expandable Layers in I/S	17.0	17.2	20.4	19.6	28.7	17.6	23.6	16.6	20.1	18.7	23.1	18.0	16.4
% I/S to Illite in <1.0um Fraction	16.4	20.7	21.7	18.1	21.7	25.4	19.8	22.3	13.9	16.0	22.7	20.9	14.9
% Expandable I/S Layers in sample	0.65	0.71	0.89	0.86	1.50	0.89	1.06	0.89	0.70	0.88	1.43	0.90	0.46
% Fe in 1st/primary Dolomite/Ankerite	47.8	33.9	19.5	60.3	59.8	57.3	60.3	51.6	52.8	11.5	47.1	51.3	56.6
% Fe in 2nd Dolomite/Ankerite										50.6			

Comments

Sphalerite is believed to be present in Sample #29 (12300-12310ft) but unconfirmed by independent means

Well Name: Georgia Pacific #1
Sample Size: powder and 20/40 mesh
Instrumentation: LECO C230 & Rock-Eval 6

Depth Range	Ave. Depth	SAMPLE ID	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	Tmax (°C)	S1+S2	TOC (% wt)	HI	OI	PI	NOC
7700-7710	7705.00	1						0.01				
7800-7810	7805.00	2						0.32				
7890-7900	7895.00	3						0.29				
8000-8010	8005.00	4						0.25				
8100-8110	8105.00	5						0.24				
8200-8210	8205.00	6						0.28				
8320-8330	8325.00	7						0.36				
8390-8400	8395.00	8						0.36				
8500-8510	8505.00	9						0.06				
8550-8560	8555.00	10						0.34				
8600-8610	8605.00	11						0.51				
8670-8680	8675.00	12						0.53				
8800-8810	8805.00	13						0.07				
8900-8910	8905.00	14						0.08				
9010-9020	9015.00	15						0.06				
9100-9110	9105.00	16						0.13				
9250-9260	9255.00	17						0.11				
9300-9310	9305.00	18						0.18				
9360-9370	9365.00	19						0.13				
9390-9400	9395.00	20						0.12				
9440-9450	9445.00	21						0.15				
9500-9510	9505.00	22						0.22				
9560-9570	9565.00	23						0.24				
9600-9610	9605.00	24						0.25				
9650-9660	9655.00	25						0.31				
9700-9710	9705.00	26						0.25				
9750-9760	9755.00	27						0.33				
9800-9810	9805.00	28						0.47				
9850-9860	9855.00	29						0.32				
9900-9910	9905.00	30						0.42				
9950-9960	9955.00	31						0.36				
10000-10010	10005.00	32						0.43				
10050-10060	10055.00	33						0.35				
10100-10110	10105.00	34						0.39				
10150-10160	10155.00	35						0.40				
10200-10210	10205.00	36						0.58				
10250-10260	10255.00	37						0.51				
10310-10320	10315.00	38						0.40				
10350-10360	10355.00	39						0.47				
10400-10410	10405.00	40						0.47				
10450-10460	10455.00	41						0.47				
10500-10510	10505.00	42						0.61				
10550-10560	10555.00	43						0.52				
10600-10610	10605.00	44						0.55				
10650-10660	10655.00	45						0.46				
10700-10710	10705.00	46						0.41				
10750-10760	10755.00	47						0.43				

10800-10810	10805.00	48						0.44				
10850-10860	10855.00	49						0.39				
10900-10910	10905.00	50						0.46				
10950-10960	10955.00	51						0.39				
10990-11000	10995.00	52						0.42				
11050-11060	11055.00	53						0.33				
11100-11110	11105.00	54						0.29				
11150-11160	11155.00	55						0.37				
11200-11210	11205.00	56						0.34				
11250-11260	11255.00	57						0.35				
11300-11310	11305.00	58						0.30				
11350-11360	11355.00	59						0.35				
11410-11420	11415.00	60						0.32				
11420-11430	11425.00	61						0.32				
11450-11460	11455.00	62						0.31				
11500-11510	11505.00	63						0.36				
11540-11550	11545.00	64						0.31				
11550-11560	11555.00	65						0.27				
11600-11610	11605.00	66						0.27				
11650-11660	11655.00	67						0.37				
11700-11710	11705.00	68						0.40				
11750-11760	11755.00	69						0.25				
11790-11800	11795.00	70						0.34				
11850-11860	11855.00	71						0.35				
11900-11910	11905.00	72						0.36				
11950-11960	11955.00	73						0.47				
12000-12010	12005.00	74						0.36				
12040-12050	12045.00	75						0.39				
12100-12110	12105.00	76						0.24				
12150-12160	12155.00	77						0.34				
12200-12210	12205.00	78						0.31				
12250-12260	12255.00	79						0.34				
12300-12310	12305.00	80						0.51				
12350-12360	12355.00	81						0.34				
12400-12410	12405.00	82						0.28				
12450-12460	12455.00	83						0.38				
12500-12510	12505.00	84						0.35				
12550-12560	12555.00	85						0.31				
12600-12610	12605.00	86						0.35				
12630-12640	12635.00	87						0.37				
12650-12660	12655.00	88						0.35				
12700-12710	12705.00	89						0.25				
12750-12760	12755.00	90						0.33				
12800-12810	12805.00	91						0.40				
12850-12860	12855.00	92						0.44				
12900-12910	12905.00	93						0.43				
12950-12960	12955.00	94						0.33				
13000-13010	13005.00	95						0.23				
13050-13060	13055.00	96						0.30				
13100-13110	13105.00	97						0.30				
13120-13130	13125.00	98						0.30				
13150-13160	13155.00	99						0.33				

13160-13170	13165.00	100						0.30				
13190-13200	13195.00	101						0.32				
13250-13260	13255.00	102						0.41				
13300-13310	13305.00	103						0.29				
13350-13360	13355.00	104						0.46				
13390-13400	13395.00	105						0.36				
13450-13460	13455.00	106						0.63				
13500-13510	13505.00	107						0.50				
13550-13560	13555.00	108						0.46				
13600-13610	13605.00	109						0.36				
13650-13660	13655.00	110						0.30				
13700-13710	13705.00	111						0.43				
13750-13760	13755.00	112						0.30				
13800-13810	13805.00	113						0.26				
13940-13950	13945.00	114	0.05	0.21	0.51	433.0	0.26	1.14	18.42	44.74	0.192	4.39
14000-14010	14005.00	115						0.33				
14210-14220	14215.00	116						0.36				
14290-14300	14295.00	117						0.35				
14500-14510	14505.00	118						0.46				
14700-14710	14705.00	119						0.43				
14900-14910	14905.00	120						0.45				
14940-14950	14945.00	121						0.45				
14990-15000	14995.00	122						0.46				
15000-15010	15005.00	123						0.56				
15050-15060	15055.00	124						0.59				
15100-15110	15105.00	125						0.47				
15150-15160	15155.00	126						0.52				
15200-15210	15205.00	127						0.53				
15250-15260	15255.00	128						0.48				
15290-15300	15295.00	129						0.56				
15350-15360	15355.00	130						0.66				
15400-15410	15405.00	131						0.49				
15440-15450	15445.00	132						0.56				
15500-15510	15505.00	133						0.61				
15550-15560	15555.00	134						0.50				
15600-15610	15605.00	135						0.31				
15700-15710	15705.00	136						0.54				
15790-15800	15795.00	137						0.54				
15900-15910	15905.00	138						0.35				
15950-15960	15955.00	139						0.53				
16000-16010	16005.00	140						0.29				
16100-16110	16105.00	141						0.49				
16200-16210	16205.00	142						0.31				
16300-16310	16305.00	143						0.32				
16400-16410	16405.00	144						0.25				
16500-16510	16505.00	145						0.28				
16600-16610	16605.00	146						0.19				

Average TOC	0.37
Average TOC Eagle Mills	0.25
Average TOC Paleozoic	0.39

Well Name: Georgia Pacific #5
Sample Size: powder
Instrumentation: LECO C230

Depth Range	Ave. Depth	SAMPLE ID	TOC (% wt)
9750-9760	9755.00	1	0.02
9800-9810	9805.00	2	0.06
9850-9860	9855.00	3	0.06
9900-9910	9905.00	4	0.03
10100-10110	10105.00	5	0.06
10420-10430	10425.00	6	0.07
		Average TOC	0.05

Well Name: Mary Curie #1
Sample Size: powder
Instrumentation: LECO C230

Depth Range	Ave. Depth	SAMPLE ID	TOC (% wt)
4890-4900	4895.00	1	0.16
5460-5470	5465.00	2	0.09

Well Name: Brine Supply Well #1
Sample Size: powder
Instrumentation: LECO C230

Depth Range	Ave. Depth	SAMPLE ID	TOC (% wt)
10740-10745	10742.50	1	0.12

Well Name: James A. Williams #1
Sample Size: powder and 20/40 mesh
Instrumentation: LECO C230 & Rock-Eval 6

Depth Range	Ave. Depth	SAMPLE ID	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	Tmax (°C)	S1+S2	TOC (% wt)	HI	OI	PI	NOC
5820-5850	5835.00	1	0.06	1.15	1.10	423.0	1.21	1.07	107.48	102.80	0.050	5.61
6510-6540	6525.00	2						0.08				
6750-6780	6765.00	3						0.06				
6870-6900	6885.00	4						0.15				
6960-6990	6975.00	5						0.05				
7050-7080	7065.00	6						0.05				
7140-7170	7155.00	7						0.09				
7230-7260	7245.00	8						0.10				
7440-7470	7455.00	9						0.23				
7463.75	7463.75	10						0.03				
7480.50	7480.50	11						0.13				
7489.60	7489.60	12						0.03				
7491.00	7491.00	13						0.04				
7500-7530	7515.00	14						0.24				
7530-7560	7545.00	15						0.22				
7560-7590	7575.00	16						0.21				
7590-7620	7605.00	17						0.14				
7620-7650	7635.00	18						0.13				
7650-7680	7665.00	19						0.08				
7680-7710	7695.00	20						0.06				
7710-7740	7725.00	21						0.09				
7740-7770	7755.00	22						0.08				
7770-7800	7785.00	23						0.03				
7800-7830	7815.00	24						0.06				
7830-7860	7845.00	25						0.08				
7860-7890	7875.00	26						0.02				
7890-7920	7905.00	27						0.08				
7920-7950	7935.00	28						0.04				
7950-7980	7965.00	29						0.06				
7980-8010	7995.00	30						0.06				
8010-8040	8025.00	31						0.13				
8040-8070	8055.00	32						0.24				
8070-8100	8085.00	33						0.24				
8100-8130	8115.00	34						0.64				
8130-8160	8145.00	35						0.32				
8160-8190	8175.00	36						0.11				
8190-8220	8205.00	37						0.15				
8220-8250	8235.00	38						0.09				
8250-8280	8265.00	39						0.08				
8280-8310	8295.00	40						0.12				
8310-8340	8325.00	41						0.15				
8340-8370	8355.00	42						0.05				
8370-8400	8385.00	43						0.09				
8400-8430	8415.00	44						0.04				
8430-8460	8445.00	45						0.07				
8460-8490	8475.00	46						0.05				

8490-8520	8505.00	47						0.08				
8520-8550	8535.00	48						0.18				
8550-8580	8565.00	49						0.02				
8580-8610	8595.00	50						0.10				
8610-8640	8625.00	51						0.06				
8640-8670	8655.00	52						0.08				
8670-8700	8685.00	53						0.05				
8700-8730	8715.00	54						0.14				
8713.10	8713.10	55						0.04				
8715.25	8715.25	56						0.02				
8730-8760	8745.00	57						0.13				
8760-8790	8775.00	58						0.22				
8790-8820	8805.00	59						0.31				
8820-8850	8835.00	60						0.97				
8850-8880	8865.00	61	0.04	0.20	0.63	412.0	0.24	2.13	9.39	29.58	0.167	1.88
8880-8910	8895.00	62						0.60				
8910-8940	8925.00	63						0.51				
8950-8980	8965.00	64						0.75				
8980-9010	8995.00	65						0.92				
9010-9040	9025.00	66						0.76				
9040-9070	9055.00	67						0.48				
9070-9100	9085.00	68						0.20				
9100-9130	9115.00	69						0.68				
9130-9160	9145.00	70						0.43				
9160-9190	9175.00	71						0.54				
9190-9220	9205.00	72						0.58				
9220-9240	9230.00	73						0.47				
9240-9270	9255.00	74						0.66				
9270-9300	9285.00	75						0.48				
9300-9330	9315.00	76						0.49				
9330-9360	9345.00	77						0.52				
9360-9390	9375.00	78						0.54				
9390-9420	9405.00	79						0.30				
9420-9450	9435.00	80						0.23				
9450-9480	9465.00	81						0.41				
9480-9510	9495.00	82						0.54				
9510-9540	9525.00	83						0.28				
9540-9570	9555.00	84						0.32				
9630-9660	9645.00	85						0.30				
9660-9690	9675.00	86						0.22				
9690-9720	9705.00	87						0.30				
9780-9810	9795.00	88						0.30				
9870-9900	9885.00	89						0.19				
9930-9948	9939.00	90						0.22				
7590-7620	7605.00	17 (dark portion)						0.63				
9070-9100	9085.00	68 (dark portion						0.72				

Average TOC	0.28
Average TOC Eagle Mills	0.13
Average TOC Paleozoic	0.31

Well Name: Edith Mehrens et al. #1
Sample Size: powder
Instrumentation: LECO C230

Depth Range	Ave. Depth	SAMPLE ID	TOC (% wt)
7750-7760	7755.00	1	0.02
7790-7800	7795.00	2	0.01
7800-7810	7805.00	3	0.00
7840-7850	7845.00	4	0.01
7940-7950	7945.00	5	0.01
7950-7960	7955.00	6	0.01
8000-8010	8005.00	7	0.02
8050-8060	8055.00	8	0.00
8100-8110	8105.00	9	0.01
8200-8210	8205.00	10	0.22
8250-8260	8255.00	11	0.09
8300-8310	8305.00	12	0.44
8350-8360	8355.00	13	0.18
8400-8410	8405.00	14	0.04
8450-8460	8455.00	15	0.00
8980-8990	8985.00	16	0.65
9190-9200	9195.00	17	0.12
7940-7950	7945.00	5 (dark pieces)	0.04
7950-7960	7955.00	6 (dark pieces)	0.02

Average TOC 0.10

Well Name: G. D. Royston #1
Sample Size: powder and 20/40 mesh
Instrumentation: LECO C230 & Rock-Eval 6

Depth Range	Ave. Depth	SAMPLE ID	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	Tmax (°C)	S1+S2	TOC (% wt)	HI	OI	PI	NOC
1740-1750	1745.00	1						0.12				
1930-1940	1935.00	2						0.18				
2190-2200	2195.00	3						0.09				
2390-2400	2395.00	4						0.07				
2590-2600	2595.00	5						0.09				
2790-2800	2795.00	6						0.03				
3000-3010	3005.00	7						0.05				
3200-3210	3205.00	8						0.06				
3400-3410	3405.00	9						0.04				
3600-3610	3605.00	10						0.03				
3800-3810	3805.00	11						0.05				
4000-4010	4005.00	12						0.03				
4200-4210	4205.00	13						0.03				
4400-4410	4405.00	14						0.04				
4600-4610	4605.00	15						0.02				
4800-4810	4805.00	16						0.02				
5000-5010	5005.00	17						0.02				
5200-5210	5205.00	18						0.04				
5400-5410	5405.00	19						0.03				
5600-5610	5605.00	20						0.04				
5860-5870	5865.00	21						0.02				
5968.00	5968.00	22						0.06				
5990-6000	5995.00	23						0.04				
6300-6310	6305.00	24						0.03				
6396.00	6396.00	25						0.12				
6444.00	6444.00	26						0.08				
6510-6520	6515.00	27						0.03				
6700-6710	6705.00	28						0.04				
6902-6907	6904.50	29						0.05				
6916.00	6916.00	30						0.10				
6950.00	6950.00	31						0.08				
7150-7160	7155.00	32						0.06				
7366.00	7366.00	33						0.07				
7420-7430	7425.00	34						0.04				
7600-7610	7605.00	35						0.04				
7810-7820	7815.00	36						0.04				
8000-8010	8005.00	37						0.07				
8200-8210	8205.00	38						0.07				
8400-8410	8405.00	39						0.07				
8626-8630	8628.00	40						0.11				
8670-8680	8675.00	41						0.06				
8720-8730	8725.00	42						0.06				

8730-8740	8735.00	43						0.04				
8790-8800	8795.00	44						0.21				
8810-8820	8815.00	45						0.12				
8940-8950	8945.00	46						0.09				
8950-8960	8955.00	47						0.10				
9000-9010	9005.00	48						0.12				
9100-9110	9105.00	49						0.22				
9250-9260	9255.00	50						0.13				
9300-9310	9305.00	51						0.16				
9350-9360	9355.00	52						0.33				
9390-9400	9395.00	53						0.29				
9400-9410	9405.00	54						0.25				
9528-9530	9529.00	55						0.37				
9590-9600	9595.00	56						0.40				
9700-9710	9705.00	57						0.25				
9750-9760	9755.00	58						0.28				
9790-9800	9795.00	59						0.52				
9800-9810	9805.00	60						0.49				
9850-9860	9855.00	61	0.06	0.53	0.36	570.0	0.59	3.52	15.06	10.23	0.102	1.70
9900-9910	9905.00	62	0.03	0.13	0.58	581.0	0.16	1.35	9.63	42.96	0.188	2.22
10000-10010	10005.00	63						0.34				
10140-10150	10145.00	64						0.53				
10260-10270	10265.00	65						0.39				

Average TOC	0.20
Average TOC Eagle Mills	0.06
Average TOC Paleozoic	0.49

Well Name: J. H. Douglass et al. #1
Sample Size: powder
Instrumentation: LECO C230 & Rock-Eval 6

Depth Range	Ave. Depth	SAMPLE ID	S1 (mg/g)	S2 (mg/g)	S3 (mg/g)	Tmax (°C)	S1+S2	TOC (% wt)	HI	OI	PI	NOC
10800-10805	10802.50	1						0.03				
10805-10810	10807.50	2						0.05				
11000-11005	11002.50	3						0.10				
11110-11115	11112.50	4						0.14				
11200-11205	11202.50	5						0.22				
11295-11300	11297.50	6						0.39				
11395-11400	11397.50	7	0.09	0.59	0.49	496.0	0.68	1.05	56.19	46.67	0.132	8.57
11500-11505	11502.50	8						0.79				
11600-11605	11602.50	9						0.46				
11710-11715	11712.50	10	0.10	0.40	0.38	495.0	0.50	1.10	36.36	34.55	0.200	9.09
11800-11810	11805.00	11						0.71				
11955-11960	11957.50	12						0.44				

Average TOC	0.46
Average TOC Eagle Mills	0.04
Average TOC Paleozoic	0.54

Well Name: Cabe LD Co. Inc. et al. #1
Sample Size: powder
Instrumentation: LECO C230

Depth Range	Ave. Depth	SAMPLE ID	TOC (% wt)
9500-9510	9505.00	1	0.05
9600-9610	9605.00	2	0.15
9700-9710	9705.00	3	0.08
9750-9760	9755.00	4	0.10
9800-9810	9805.00	5	0.12
9900-9910	9905.00	6	0.12
10000-10010	10005.00	7	0.08
10150-10160	10155.00	8	0.14
10390-10400	10395.00	9	0.11
10500-10510	10505.00	10	0.11
10600-10610	10605.00	11	0.24
10710-10720	10715.00	12	0.27
10810-10820	10815.00	13	0.29
10910-10920	10915.00	14	0.58
11000-11010	11005.00	15	0.37
11100-11110	11105.00	16	0.48
11200-11210	11205.00	17	0.42
11300-11310	11305.00	18	0.55
11390-11400	11395.00	19	0.50
11490-11500	11495.00	20	0.68
11600-11610	11605.00	21	0.53
11700-11710	11705.00	22	0.26
11800-11810	11805.00	23	0.24
11900-11910	11905.00	24	0.36
12000-12010	12005.00	25	0.40
12050-12060	12055.00	26	0.36
12090-12100	12095.00	27	0.39
12190-12200	12195.00	28	0.50
12300-12310	12305.00	29	0.44
12350-12360	12355.00	30	0.25
12480-12490	12485.00	31	0.42
12600-12610	12605.00	32	0.23
12690-12700	12695.00	33	0.46
12790-12800	12795.00	34	0.36
12900-12910	12905.00	35	0.33
13000-13010	13005.00	36	0.28
13040-13050	13045.00	37	0.44
13060-13070	13065.00	38	0.41
13200-13210	13205.00	39	0.32
13300-13310	13305.00	40	0.29
13390-13400	13395.00	41	0.65
13490-13500	13495.00	42	0.27
13600-13610	13605.00	43	0.49
13700-13710	13705.00	44	0.57
13810-13820	13815.00	45	0.46
13900-13910	13905.00	46	0.45
13940-13950	13945.00	47	0.31
13990-14000	13995.00	48	0.47
14020-14025	14022.50	49	0.15

Average TOC	0.34
Average TOC Eagle Mills	0.10
Average TOC Paleozoic	0.39