

ROCK EVALUATION : SAMPLING IDENTIFIER No : 12544

Introduction :

The purpose was to submit eleven wells (Table 1) from the GSC Core Sample Repository to Petro-Canada Geochemical Laboratory for Rock Eval 6 analysis, and one well Canyon Creek 1 (G-51) to Core Laboratories for core analysis, Petro-Canada for petrographic analysis and Calgary Rock and Mineral Services for X-Ray Diffraction on the shales. The resulting data is used to determine if there is sufficient source rock for generation of hydrocarbons and reservoir quality at any one location.

Procedures:

Company:

Petro-Canada: Rock Eval/Petrography
PO Box 2844
Calgary AB T2P 3E3
1.403.296.5000

Core Laboratories: Core Analysis
2810 - 12th Street N.E.
Calgary, Alberta T2E 7P7
Canada
1.403.250.4000

Calgary Rock and Mineral Analysis: XRD
#3, 3610-29th St NE
Calgary AB
1.403.735.5050

Project Coordinator :

Rock Eval: Carolle Lafleur

Carolle has been the lead for Petro-Canada rock evaluation for over 20 years.

Rock Eval: Sample Preparation Services:

Sample grinding and homogenization for 60 mesh grain size (<2 grams)
Sample cleaning (if necessary on contaminated samples), grinding and homogenization for 60 mesh grain size (<2 grams)
Sample picking to obtain contaminate free samples (when necessary)
Sample cleaning, grinding and homogenization for 20 mesh grain size (> 2 grams)

Rock-Eval 6

Total Organic Carbon (TOC) from Rock-Eval (includes sample prep)

Rock-Eval Analysis S1,S2,S3 and Tmax (includes sample prep)

Results: See Appendix I

Petrography: John Gordon

John has been the lead for Petro-Canada petrographic evaluation for over 5 years. Thin sections prepared, photographed and described for SP 1-29, Canyon Creek G-51 Core. See appendix 2 for descriptions.

Results: See Appendix II

Core Analysis: Lou Monahan

Lou has been lead for Core Laboratories core analysis for over 15 years

Procedure: Slab core, photograph, Spectral Gamma Ray, drill 29 plugs for porosity and permeability, profile permeability, NOB permeability and porosity on shale drill plugs.

Results: See Appendix III

X-Ray Diffraction: Raymond Strom

Procedures/Results: See Appendix IV

Table 1) Sampled Wells (all wells measured in feet converted to meters)

Well Name	Top Depth (m)	Bottom Depth (m)	Type of Sample
Nogha B-23	1340	1420	Unwashed cuttings
Behdzia Youh O-52	1375	1450	Unwashed cuttings
Belot Hills M-63	954	1067	Unwashed cuttings
Belot Hills M-63	1240	1280	Unwashed cuttings
Lac Maunoir D-45 (Colville D-45)	880	884	Unwashed cuttings
Lac Maunoir D-45 (Colville D-45)	996	1174	Unwashed cuttings
Colville E-15	1529	1828	Core
Tedji Lake K-24	1176	1214	Unwashed cuttings
Mirror Lake N-33	300	1100	Unwashed cuttings
Little Bear M-39	750	1550	Unwashed cuttings
Slater River A-67	128	1067	Unwashed cuttings
Deh Cho-2 B-14	200	798	Unwashed cuttings
Deh Cho-1 B-25	225	785	Unwashed cuttings
Canyon Creek #1	376	416	Core
Canyon Creek #1	423	427	Core
Canyon Creek #1	566	571	Core
Canyon Creek #1	617	630	Core

Appendix 1

Well Name	Depth	S1	S2	S3	TMax Raw	TMax	TOC	OI	HI	PI
Nogha B-23	1350 m	19.64	5.93	0.55	432	432	2.91	19	204	0.77
Nogha B-23	1355 m	0.30	5.45	0.46	415	415	1.22	38	447	0.05
Nogha B-23	1360 m	0.20	5.87	0.56	425	425	1.22	46	481	0.03
Nogha B-23	1365 m	0.05	2.28	0.28	436	436	1.09	26	209	0.02
Nogha B-23	1370 m	0.17	4.99	0.74	443	443	1.28	58	390	0.03
Nogha B-23	1375 m	0.05	2.09	0.27	444	444	1.14	24	183	0.02
Nogha B-23	1380 m	0.10	4.02	0.37	436	436	1.26	29	319	0.02
Nogha B-23	1385 m	0.83	6.42	0.59	443	443	2.06	29	312	0.11
Nogha B-23	1392 m	0.02	0.78	0.11	452	452	0.99	11	79	
Nogha B-23	1395 m	0.15	4.43	0.79	442	442	2.33	34	190	0.03
Nogha B-23	1400 m	0.04	1.65	0.40	439	439	1.21	33	136	
Nogha B-23	1405 m	0.21	3.08	0.28	437	437	1.32	21	233	0.06
Nogha B-23	1415 m	0.08	2.06	0.16	452	452	1.59	10	130	0.04
Nogha B-23	1420 m	0.01	0.03	0.21	567		0.66	32	5	

Well Name	Well #	Depth m	S1	S2	S3	TMax Raw	Tmax	TOC	OI	HI
Behdzia Youh	O-52	1375.0	0.08	0.52	0.30	422		0.84	36	62
Behdzia Youh	O-52	1380.0	0.17	0.72	0.69	435		0.78	88	92
Behdzia Youh	O-52	1385.0	0.36	1.79	0.41	446	446	1.33	31	135
Behdzia Youh	O-52	1385.0	0.06	1.66	0.36	443	443	1.48	24	112
Behdzia Youh	O-52	1390.0	0.20	1.41	0.54	437	437	0.76	71	186
Behdzia Youh	O-52	1390.0	0.14	1.08	0.44	436	436	0.77	57	140
Behdzia Youh	O-52	1395.0	0.21	0.88	0.38	442	442	0.80	48	110
Behdzia Youh	O-52	1395.0	0.19	0.85	0.32	443	443	0.82	39	104
Behdzia Youh	O-52	1400.0	0.01	0.45	0.31	436		0.77	40	58
Behdzia Youh	O-52	1405.0	0.04	0.22	0.31	438		0.22		
Behdzia Youh	O-52	1405.0	0.05	0.24	0.19	368		0.28		
Behdzia Youh	O-52	1410.0	0.04	0.19	0.38	415		0.29		
Behdzia Youh	O-52	1410.0	0.06	0.20	0.20	341		0.34		
Behdzia Youh	O-52	1415.0	0.01	1.43	1.04	416	416	1.04	100	138
Behdzia Youh	O-52	1420.0	0.06	0.39	0.27	421		0.98	28	40
Behdzia Youh	O-52	1425.0	0.66	1.58	2.11	412	412	1.32	160	120
Behdzia Youh	O-52	1425.0	0.64	1.55	1.95	421	421	1.39	140	112
Behdzia Youh	O-52	1430.0	0.18	0.61	0.55	413		0.94	59	65
Behdzia Youh	O-52	1435.0	0.24	1.05	1.19	411	411	0.99	120	106
Behdzia Youh	O-52	1435.0	0.20	1.01	1.04	420	420	1.08	96	94
Behdzia Youh	O-52	1440.0	0.04	0.57	0.66	403	403	0.57	116	100
Behdzia Youh	O-52	1445.0	0.29	0.57	0.36	349	349	0.77	47	74
Behdzia Youh	O-52	1450.0	0.30	0.84	0.85	420	420	1.08	79	78
Behdzia Youh	O-52	1450.0	0.19	0.64	0.89	401		1.24	72	52
Behdzia Youh	O-52	1455.0	0.19	0.53	1.01	445	445	0.77	131	69
Behdzia Youh	O-52	1455.0	0.11	0.39	0.97	402		0.92	105	42
Behdzia Youh	O-52	1464.0	0.22	0.87	1.02	411	411	1.21	84	72

Well Name	Depth (m)	Depth (ft)	S1	S2	S3	Tmax	TOC	OI	HI	PI
Belot Hills M-63	971.4	3187								
Belot Hills M-63	984.5	3230								
Belot Hills M-63	986.3	3236								
Belot Hills M-63	986.3	3236								
Belot Hills M-63	1024.1	3360	0.89	1.46	0.09	325	0.55	16	265	0.38
Belot Hills M-63	1030.2	3380	0.71	0.70	0.09		0.38			
Belot Hills M-63	1033.3	3390	0.27	0.41	0.09		0.29			
Belot Hills M-63	1036.3	3400	0.45	0.45	0.08		0.35			
Belot Hills M-63	1039.4	3410	0.05	0.57	0.10		0.43			
Belot Hills M-63	1042.4	3420	0.54	0.85	0.12	359	0.60	20	142	
Belot Hills M-63	1045.5	3430	0.91	0.98	0.11	326	0.53	21	185	
Belot Hills M-63	1048.5	3440	0.45	0.47	0.07		0.32			
Belot Hills M-63	1051.6	3450	1.11	1.00	0.08		0.48			0.53
Belot Hills M-63	1054.6	3460	0.07	0.54	0.05		0.30			
Belot Hills M-63	1057.7	3470	0.12	1.19	0.07		0.41			
Belot Hills M-63	1060.7	3480	0.46	0.59	0.08		0.35			
Belot Hills M-63	1063.8	3490	0.36	0.48	0.12		0.41			
Belot Hills M-63	1066.8	3500	0.04	0.40	0.09		0.31			
Belot Hills M-63	1240.5	4070	0.03	0.65	0.02	459	1.06	2	61	
Belot Hills M-63	1243.6	4080	0.03	0.69	0.04	465	1.09	4	63	
Belot Hills M-63	1246.6	4090	0.01	0.48	0.04	469	0.77	5	62	
Belot Hills M-63	1252.7	4110	0.03	1.51	0.04	462	1.84	2	82	
Belot Hills M-63	1255.8	4120	0.05	1.03	0.05	467	1.60	3	64	
Belot Hills M-63	1258.8	4130	0.43	1.15	0.15	465	1.84	8	63	
Belot Hills M-63	1261.9	4140	0.24	0.66	0.05	448	1.13	4	58	
Belot Hills M-63	1264.9	4150	0.04	1.43	0.04	461	1.68	2	85	
Belot Hills M-63	1268.0	4160	0.06	1.19	0.03	470	1.70	2	70	
Belot Hills M-63	1271.0	4170	0.01	1.07	0.03	465	1.54	2	69	
Belot Hills M-63	1274.1	4180	0.02	0.68	0.03	465	1.10	3	62	
Belot Hills M-63	1277.1	4190	0.11	0.44	0.04	454	0.66	6	67	
Belot Hills M-63	1280.2	4200	0.02	0.56	0.06	462	0.83	7	67	

Well Name	Depth	S1	S2	S3	TMax	TOC	OI	HI	PI
Lac Maunoir D-45	2890 ft	0.04	9.15	0.11	441	2.66	4	344	0.00
Lac Maunoir D-45	2890 ft repeat	0.04	9.83	0.11	442	2.40	5	410	0.00
Lac Maunoir D-45	2900 ft	0.29	2.40	0.07	445	0.93	8	258	0.11
Lac Maunoir D-45	3270 ft	1.04	1.14	0.04		0.49			0.48
Lac Maunoir D-45	3280 ft	0.28	0.61	0.13		0.33			
Lac Maunoir D-45	3290 ft	0.08	0.77	0.06		0.34			
Lac Maunoir D-45	3310 ft	0.33	0.55	0.04		0.32			
Lac Maunoir D-45	3320 ft	0.25	0.48	0.07		0.27			
Lac Maunoir D-45	3330 ft	0.19	0.45	0.05		0.29			
Lac Maunoir D-45	3340 ft	0.14	0.35	0.16		0.25			
Lac Maunoir D-45	3350 ft	0.05	0.70	0.08		0.44			
Lac Maunoir D-45	3360 ft	0.18	0.55	0.19		0.46			
Lac Maunoir D-45	3780 ft	0.15	0.33	0.13		0.33			
Lac Maunoir D-45	3780 ft repeat	0.19	0.32	0.08		0.25			
Lac Maunoir D-45	3790 ft	0.06	0.43	0.05		0.24			
Lac Maunoir D-45	3810 ft	0.03	0.49	0.10		0.29			
Lac Maunoir D-45	3820 ft	0.19	0.32	0.10		0.25			
Lac Maunoir D-45	3830 ft	0.16	0.39	0.08		0.41			
Lac Maunoir D-45	3830 ft repeat	0.02	0.41	0.10		0.33			
Lac Maunoir D-45	3840 ft	0.02	0.68	0.11		0.41			
Lac Maunoir D-45	3850 ft	0.06	0.63	0.08		0.31			

Well Name	Well #	Top Depth (ft)	Sample Type	S1	S2	S3	Tmax	TOC	OI	HI
Colville	E-15	5018	Core	0.31	0.33	0.08	317	0.60	13	55
Colville	E-15	5200	Core	0.08	0.13	0.02		0.62	3	21
Colville	E-15	5400	Core	0.41	0.49	0.07	318	0.90	8	54
Colville	E-15	5600	Core	0.24	0.32	0.02		0.15		
Colville	E-15	5700	Core	0.22	0.31	0.05		0.20		
Colville	E-15	5850	Core	0.26	0.33	0.04		0.20		

Well Name	Depth (m)	Depth (ft)	S1	S2	S3	TMax Raw	Tmax	TOC	OI	HI	PI
Tedji Lake K-24	1176.53	3860	0.49	0.71	0.40	339	339	0.90	44	79	0.41
Tedji Lake K-24	1176.53	3860	0.09	0.27	0.33	393		0.37			
Tedji Lake K-24	1176.53	3860	0.49	0.71	0.40	339	339	0.90	44	79	
Tedji Lake K-24	1179.58	3870	0.01	0.23	0.18	401		0.33			
Tedji Lake K-24	1182.62	3880	0.01	0.31	0.30	317		0.66	45	47	
Tedji Lake K-24	1185.67	3890	0.30	1.18	0.69	304	304	1.38	50	86	
Tedji Lake K-24	1188.72	3900	0.01	0.43	0.52	419	419	0.84	62	51	
Tedji Lake K-24	1191.77	3910	0.02	0.24	0.22	333		1.44	15	17	
Tedji Lake K-24	1194.82	3920	0.01	0.33	0.32	395		1.33	24	25	
Tedji Lake K-24	1197.86	3930	0.03	0.40	0.32	364		0.94	34	43	
Tedji Lake K-24	1200.91	3940	0.02	0.34	0.20	353		0.69	29	49	
Tedji Lake K-24	1203.96	3950	0.01	0.03	0.18	488		0.28			
Tedji Lake K-24	1207.01	3960	0.01	0.27	0.21	349		0.67	31	40	
Tedji Lake K-24	1210.06	3970	0.01	0.37	0.41	396		0.83	49	45	
Tedji Lake K-24	1213.10	3980	0.01	0.36	0.35			0.73	48	49	

Well Name	Depth	S1	S2	S3	TMax Raw	TMax	TOC	OI	HI	PI
Mirror Lake N-33	300 m	0.05	0.31	0.10	446		0.88	11	35	
Mirror Lake N-33	305 m	0.06	0.29	0.08	450		0.88	9	33	
Mirror Lake N-33	310 m	0.08	0.41	0.15	440		0.96	16	43	
Mirror Lake N-33	315 m	0.06	0.26	0.07	437		0.94	7	28	
Mirror Lake N-33	320 m	0.06	0.31	0.06	442		1.03	6	30	
Mirror Lake N-33	325 m	0.04	0.32	0.17	441		1.04	16	31	
Mirror Lake N-33	330 m	0.06	0.29	0.04	440		0.97	4	30	
Mirror Lake N-33	335 m	0.06	0.28	0.01	447		0.96	1	29	
Mirror Lake N-33	340 m	0.08	0.29	0.03	445		0.98	3	30	
Mirror Lake N-33	345 m	0.07	0.34	0.14	444		1.04	13	33	
Mirror Lake N-33	350 m	0.05	0.21	0.06	448		0.87	7	24	
Mirror Lake N-33	355 m	0.05	0.21	0.07	453		0.89	8	24	
Mirror Lake N-33	360 m	0.05	0.21	0.00	445		0.87		24	
Mirror Lake N-33	365 m	0.08	0.26	0.04	443		0.85	5	31	
Mirror Lake N-33	370 m	0.05	0.29	0.12	450		0.84	14	35	
Mirror Lake N-33	375 m	0.10	0.33	0.10	441		1.09	9	30	
Mirror Lake N-33	380 m	0.16	0.47	0.02	443		1.06	2	44	
Mirror Lake N-33	385 m	0.12	0.39	0.00	447		1.38		28	
Mirror Lake N-33	390 m	0.11	0.57	0.02	439		1.86	1	31	
Mirror Lake N-33	395 m	0.11	0.47	0.00	444		1.72		27	
Mirror Lake N-33	400 m	0.18	0.54	0.00	445		1.44		38	
Mirror Lake N-33	405 m	0.16	0.39	0.00	447		1.49		26	
Mirror Lake N-33	410 m	0.07	0.22	0.01	458		0.84	1	26	
Mirror Lake N-33	415 m	0.16	0.35	0.07	321		0.95	7	37	
Mirror Lake N-33	420 m	0.13	0.31	0.07	311		0.93	8	33	
Mirror Lake N-33	425 m	0.13	0.36	0.29	343		1.37	21	26	
Mirror Lake N-33	430 m	0.15	0.39	0.13	442		0.90	14	43	
Mirror Lake N-33	435 m	0.10	0.26	0.10	316		0.74	14	35	
Mirror Lake N-33	440 m	0.07	0.28	0.11	450		0.96	11	29	
Mirror Lake N-33	445 m	0.08	0.33	0.14	432		1.00	14	33	
Mirror Lake N-33	450 m	0.08	0.19	0.12	447		0.80	15	24	
Mirror Lake N-33	455 m	0.11	0.24	0.10	450		0.98	10	24	
Mirror Lake N-33	460 m	0.09	0.31	0.06	451		0.99	6	31	
Mirror Lake N-33	465 m	0.16	0.29	0.04	341		1.16	3	25	
Mirror Lake N-33	470 m	0.09	0.34	0.03	441		1.37	2	25	
Mirror Lake N-33	475 m	0.08	0.23	0.08	449		0.92	9	25	
Mirror Lake N-33	480 m	0.07	0.18	0.03	455		0.77	4	23	
Mirror Lake N-33	485 m	0.10	0.24	0.01	311		0.77	1	31	
Mirror Lake N-33	490 m	0.06	0.19	0.00	446		0.79		24	
Mirror Lake N-33	495 m	0.14	0.24	0.00	338		0.82		29	

Mirror Lake N-33	500 m	0.15	0.25	0.01	450		0.89	1	28	
Mirror Lake N-33	505 m	0.07	0.31	0.03	447		1.00	3	31	
Mirror Lake N-33	510 m	0.08	0.34	0.00	449		1.16		29	
Mirror Lake N-33	515 m	0.08	0.35	0.04	453		1.14	4	31	
Mirror Lake N-33	520 m	0.15	0.33	0.02	451		0.99	2	33	
Mirror Lake N-33	525 m	0.06	0.23	0.04	450		0.97	4	24	
Mirror Lake N-33	530 m	0.05	0.29	0.14	445		1.06	13	27	
Mirror Lake N-33	535 m	0.09	0.21	0.05	447		0.86	6	24	
Mirror Lake N-33	540 m	0.09	0.23	0.08	452		0.94	9	24	
Mirror Lake N-33	545 m	0.08	0.20	0.03	446		0.88	3	23	
Mirror Lake N-33	550 m	0.07	0.61	0.12	452		1.43	8	43	
Mirror Lake N-33	555 m	0.09	0.67	0.40	452		1.53	26	44	
Mirror Lake N-33	560 m	0.20	0.92	0.62	443	443	1.48	42	62	
Mirror Lake N-33	565 m	0.24	1.05	0.59	451	451	1.45	41	72	
Mirror Lake N-33	570 m	0.17	0.49	0.92	305		1.24	74	40	
Mirror Lake N-33	575 m	0.16	0.46	1.12	303		1.13	99	41	
Mirror Lake N-33	580 m	0.14	0.45	0.62	450		1.21	51	37	
Mirror Lake N-33	585 m	0.12	0.41	0.49	445		1.20	41	34	
Mirror Lake N-33	590 m	0.08	0.32	0.56	450		1.23	46	26	
Mirror Lake N-33	595 m	0.11	0.41	0.63	453		1.26	50	33	
Mirror Lake N-33	600 m	0.09	0.30	0.85	449		1.11	77	27	
Mirror Lake N-33	605 m	0.13	0.46	0.45	448		1.19	38	39	
Mirror Lake N-33	610 m	0.09	0.41	0.65	440		1.26	52	33	
Mirror Lake N-33	615 m	0.08	0.28	0.83	443		1.16	72	24	
Mirror Lake N-33	620 m	0.16	0.52	0.56	444		1.22	46	43	
Mirror Lake N-33	625 m	0.10	0.44	0.51	448		1.18	43	37	
Mirror Lake N-33	630 m	0.10	0.39	0.45	447		1.15	39	34	
Mirror Lake N-33	635 m	0.07	0.26	0.65	453		1.11	59	23	
Mirror Lake N-33	640 m	0.05	0.22	1.21	455		1.28	95	17	
Mirror Lake N-33	645 m	0.05	0.23	0.54	456		1.15	47	20	
Mirror Lake N-33	650 m	0.04	0.26	0.32	462		1.13	28	23	
Mirror Lake N-33	655 m	0.03	0.21	0.40	464		1.17	34	18	
Mirror Lake N-33	660 m	0.06	0.59	1.66	461		1.29	129	46	
Mirror Lake N-33	665 m	0.06	0.39	0.28	457		1.35	21	29	
Mirror Lake N-33	670 m	0.06	0.40	0.67	456		1.37	49	29	
Mirror Lake N-33	675 m	0.04	0.25	0.91	457		1.34	68	19	
Mirror Lake N-33	680 m	0.05	0.36	0.29	459		1.36	21	26	
Mirror Lake N-33	685 m	0.06	0.43	0.37	458		1.37	27	31	
Mirror Lake N-33	690 m	0.05	0.21	0.99	464		1.25	79	17	
Mirror Lake N-33	700 m	0.05	0.23	0.80	458		1.27	63	18	
Mirror Lake N-33	705 m	0.09	0.45	0.27	459		1.39	19	32	
Mirror Lake N-33	710 m	0.10	0.57	1.54	457		1.54	100	37	
Mirror Lake N-33	715 m	0.08	0.47	0.36	458		1.62	22	29	
Mirror Lake N-33	720 m	0.06	0.35	0.46	460		1.45	32	24	
Mirror Lake N-33	725 m	0.08	0.41	1.00	457		1.59	63	26	
Mirror Lake N-33	730 m	0.06	0.31	1.20	461		1.57	76	20	
Mirror Lake N-33	735 m	0.07	0.36	0.95	460		1.56	61	23	
Mirror Lake N-33	740 m	0.06	0.30	1.05	459		1.60	66	19	
Mirror Lake N-33	745 m	0.10	0.55	1.07	461		2.02	53	27	

Mirror Lake N-33	750 m	0.06	0.29	1.31	462		1.64	80	18	
Mirror Lake N-33	755 m	0.06	0.33	0.78	460		1.62	48	20	
Mirror Lake N-33	760 m	0.07	0.36	0.29	457		1.61	18	22	
Mirror Lake N-33	765 m	0.06	0.33	0.39	463		1.46	27	23	
Mirror Lake N-33	770 m	0.05	0.30	0.47	460		1.39	34	22	
Mirror Lake N-33	775 m	0.05	0.28	0.31	457		1.22	25	23	
Mirror Lake N-33	780 m	0.04	0.21	0.21	468		1.16	18	18	
Mirror Lake N-33	785 m	0.04	0.23	0.26	464		1.15	23	20	
Mirror Lake N-33	790 m	0.04	0.20	0.27	463		1.13	24	18	
Mirror Lake N-33	795 m	0.04	0.19	0.26	463		1.12	23	17	
Mirror Lake N-33	800 m	0.03	0.20	0.28	468		1.14	25	18	
Mirror Lake N-33	805 m	0.04	0.21	0.16	465		1.17	14	18	
Mirror Lake N-33	810 m	0.04	0.26	0.16	464		1.21	13	21	
Mirror Lake N-33	815 m	0.06	0.31	0.20	487		1.13	18	27	
Mirror Lake N-33	820 m	0.06	0.32	0.20	461		1.18	17	27	
Mirror Lake N-33	825 m	0.06	0.30	0.16	464		1.10	15	27	
Mirror Lake N-33	830 m	0.05	0.27	0.14	465		1.02	14	26	
Mirror Lake N-33	835 m	0.06	0.38	0.23	464		1.07	21	36	
Mirror Lake N-33	840 m	0.06	0.33	0.17	463		1.07	16	31	
Mirror Lake N-33	845 m	0.06	0.33	0.21	458		1.16	18	28	
Mirror Lake N-33	850 m	0.05	0.25	0.22	461		1.07	21	23	
Mirror Lake N-33	855 m	0.08	0.33	0.08	462		1.13	7	29	
Mirror Lake N-33	865 m	0.12	0.46	0.05	456		1.20	4	38	
Mirror Lake N-33	870	0.26	0.88	0.05	457	457	1.51	3	58	
Mirror Lake N-33	875	0.35	1.59	0.06	458	458	2.19	3	73	
Mirror Lake N-33	880	0.19	1.02	0.10	458	458	1.75	6	58	
Mirror Lake N-33	885	0.28	1.44	0.19	459	459	1.89	10	76	
Mirror Lake N-33	890	0.32	1.47	0.05	458	458	1.84	3	80	
Mirror Lake N-33	895	0.29	1.28	0.04	457	457	2.09	2	61	
Mirror Lake N-33	900	0.25	1.13	0.05	456	456	2.00	3	57	
Mirror Lake N-33	905	0.32	1.64	0.08	460	460	2.46	3	67	
Mirror Lake N-33	910	0.52	2.23	0.00	458	458	2.51		89	0.19
Mirror Lake N-33	915	0.47	2.24	0.07	462	462	2.61	3	86	0.17
Mirror Lake N-33	920	0.51	2.16	0.01	463	463	2.48	0	87	0.19
Mirror Lake N-33	925	0.54	2.45	0.07	462	462	2.89	2	85	0.18
Mirror Lake N-33	930	0.56	2.59	0.05	461	461	2.90	2	89	0.18
Mirror Lake N-33	935	0.31	2.08	0.19	465	465	2.99	6	70	0.13
Mirror Lake N-33	940	0.20	1.56	0.06	463	463	2.55	2	61	
Mirror Lake N-33	945	0.14	0.79	0.17	464		1.83	9	43	
Mirror Lake N-33	950	0.17	1.04	0.20	468	468	1.95	10	53	
Mirror Lake N-33	955	0.18	1.02	0.25	470		2.11	12	48	
Mirror Lake N-33	960	0.19	1.23	0.29	468	468	2.45	12	50	
Mirror Lake N-33	965	0.22	1.16	0.18	467	467	2.22	8	52	
Mirror Lake N-33	970	0.19	1.11	0.18	465	465	2.14	8	52	
Mirror Lake N-33	975	0.25	1.23	0.11	463	463	2.32	5	53	
Mirror Lake N-33	980	0.25	1.44	0.08	462	462	2.39	3	60	
Mirror Lake N-33	985	0.30	1.18	0.05	468	468	2.15	2	55	
Mirror Lake N-33	990	0.41	1.46	0.07	459	459	2.22	3	66	
Mirror Lake N-33	995	0.34	1.50	0.10	456	456	2.27	4	66	

Mirror Lake N-33	1000	0.18	0.84	0.02	464		1.94	1	43	
Mirror Lake N-33	1005	0.19	1.18	0.06	468	468	2.15	3	55	
Mirror Lake N-33	1010	0.13	0.63	0.12	466		1.70	7	37	
Mirror Lake N-33	1015	0.22	0.97	0.04	459	459	1.92	2	51	
Mirror Lake N-33	1020	0.12	0.64	0.07	466		1.53	5	42	
Mirror Lake N-33	1025	0.15	0.81	0.01	470		1.70	1	48	
Mirror Lake N-33	1030	0.13	0.65	0.11	463		1.59	7	41	
Mirror Lake N-33	1035	0.12	0.60	0.12	464		1.53	8	39	
Mirror Lake N-33	1040	0.11	0.54	0.14	466		1.53	9	35	
Mirror Lake N-33	1045	0.14	0.95	0.09	465		1.95	5	49	
Mirror Lake N-33	1050	0.12	0.60	0.07	465		1.57	4	38	
Mirror Lake N-33	1055	0.15	0.61	0.10	467		1.67	6	37	
Mirror Lake N-33	1060	0.17	0.71	0.10	455		1.61	6	44	
Mirror Lake N-33	1065	0.15	0.67	0.09	465		1.62	6	41	
Mirror Lake N-33	1070	0.11	0.51	0.14	463		1.57	9	32	
Mirror Lake N-33	1075	0.16	0.84	0.20	464		1.89	11	44	
Mirror Lake N-33	1080	0.14	0.70	0.19	467		1.73	11	40	
Mirror Lake N-33	1085	0.14	0.75	0.11	466		1.76	6	43	
Mirror Lake N-33	1090	0.11	0.56	0.21	466		1.45	14	39	
Mirror Lake N-33	1095	0.10	0.51	0.23	467		1.47	16	35	
Mirror Lake N-33	1100	0.14	0.79	0.26	466		1.78	15	44	

Well Name	Depth	S1	S2	S3	TMax Raw	TMax	TOC	OI	HI	PI
Little Bear M-39	750	0.01	1.24	0.26	430	430	2.21	12	56	
Little Bear M-39	755	0.00	1.07	0.08	431		2.28	4	47	
Little Bear M-39	760	0.00	1.09	0.10	431	431	2.04	5	53	
Little Bear M-39	765	0.00	1.47	0.08	435	435	2.46	3	60	
Little Bear M-39	770	0.00	2.47	0.19	428	428	2.66	7	93	
Little Bear M-39	775	0.00	1.58	0.08	431	431	2.59	3	61	
Little Bear M-39	780	0.00	3.12	0.10	430	430	2.74	4	114	
Little Bear M-39	785	0.01	1.63	0.22	436	436	1.86	12	88	
Little Bear M-39	790	0.10	1.52	0.15	432	432	2.12	7	72	
Little Bear M-39	795	0.00	1.86	0.44	431	431	2.27	19	82	
Little Bear M-39	800	0.33	1.72	0.27	433	433	1.90	14	91	0.16
Little Bear M-39	805	0.00	4.62	0.12	428	428	3.15	4	147	
Little Bear M-39	810	0.00	2.01	0.07	434	434	2.50	3	80	
Little Bear M-39	815	0.01	0.44	0.07	439		1.05	7	42	
Little Bear M-39	825	0.00	1.37	0.17	435	435	2.18	8	63	
Little Bear M-39	830	0.00	0.74	0.08	436		1.94	4	38	
Little Bear M-39	835	0.00	0.33	0.10	440		1.24	8	27	
Little Bear M-39	840	0.01	0.33	0.07	440		0.91	8	36	
Little Bear M-39	845	0.00	1.99	0.07	428	428	2.26	3	88	
Little Bear M-39	850	0.06	0.47	0.16	445		1.18	14	40	
Little Bear M-39	855	0.01	0.51	0.06	435		1.59	4	32	
Little Bear M-39	860	0.00	0.35	0.03	440		1.11	3	32	
Little Bear M-39	865	0.01	1.56	0.14	429	429	2.10	7	74	
Little Bear M-39	870	0.08	0.80	0.16	434		1.82	9	44	
Little Bear M-39	875	0.00	0.59	0.14	432		1.79	8	33	
Little Bear M-39	880	0.04	0.39	0.09	434		1.22	7	32	
Little Bear M-39	885	0.00	1.89	0.07	439	439	2.01	3	94	
Little Bear M-39	890	0.00	0.51	0.02	445		1.62	1	31	
Little Bear M-39	895	0.00	0.61	0.07	440		1.75	4	35	
Little Bear M-39	900	0.00	0.61	0.06	445		1.74	3	35	
Little Bear M-39	905	0.00	0.77	0.04	441		1.82	2	42	
Little Bear M-39	915	0.26	1.16	0.16	437	437	1.53	10	76	
Little Bear M-39	920	0.01	0.37	0.29	439		0.86	34	43	
Little Bear M-39	925	0.00	1.12	0.29	446		2.63	11	43	
Little Bear M-39	930	0.01	0.05	0.03	530		1.06	3	5	
Little Bear M-39	935	0.01	0.31	0.04	440		1.06	4	29	
Little Bear M-39	940	0.01	0.04	0.07	568		1.79	4	2	
Little Bear M-39	945	0.01	0.91	0.11	436	436	1.47	7	62	
Little Bear M-39	950	0.01	0.04	0.05	389		0.82	6	5	
Little Bear M-39	955	0.01	0.33	0.03	442		1.09	3	30	
Little Bear M-39	960	0.01	2.40	0.03	444	444	1.95	2	123	0.00
Little Bear M-39	965	0.01	0.37	0.06	333		0.75	8	49	
Little Bear M-39	970	0.00	0.66	0.05	435		1.86	3	35	
Little Bear M-39	975	0.03	0.21	0.12	439		0.75	16	28	
Little Bear M-39	980	0.01	0.31	0.20	437		1.23	16	25	
Little Bear M-39	985	0.00	0.15	0.06	445		0.86	7	17	
Little Bear M-39	990	0.01	0.34	0.10	439		1.22	8	28	
Little Bear M-39	995	0.01	0.26	0.10	442		0.95	11	27	

Little Bear M-39	1000	0.01	0.15	0.02	437		0.52	4	29	
Little Bear M-39	1005	0.02	1.00	0.03	434	434	1.07	3	93	
Little Bear M-39	1010	0.01	0.41	0.05	434		1.16	4	35	
Little Bear M-39	1015	0.01	0.14	0.05	451		0.56	9	25	
Little Bear M-39	1020	0.02	0.20	0.09	443		0.78	12	26	
Little Bear M-39	1025	0.01	0.29	0.03	437		0.72	4	40	
Little Bear M-39	1030	0.01	0.04	0.06	449		1.03	6	4	
Little Bear M-39	1035	0.01	0.22	0.03	446		0.89	3	25	
Little Bear M-39	1040	0.10	0.55	0.09	441		1.37	7	40	
Little Bear M-39	1045	0.01	0.43	0.09	443		1.54	6	28	
Little Bear M-39	1050	0.01	0.28	0.06	439		1.11	5	25	
Little Bear M-39	1055	0.01	0.19	0.04	444		0.68	6	28	
Little Bear M-39	1060	0.00	0.14	0.04	445		0.78	5	18	
Little Bear M-39	1065	0.00	0.18	0.02	439		0.79	3	23	
Little Bear M-39	1070 m	0.00	0.29	0.05	433		1.02	5	28	
Little Bear M-39	1075 m	0.00	0.21	0.05	441		0.82	6	26	
Little Bear M-39	1080 m	0.00	0.84	0.07	438	438	1.37	5	61	
Little Bear M-39	1085 m	0.00	0.97	0.10	434	434	1.76	6	55	
Little Bear M-39	1090 m	0.00	0.17	0.02	444		0.72	3	24	
Little Bear M-39	1095 m	0.00	0.37	0.02	439		1.00	2	37	
Little Bear M-39	1100 m	0.00	0.21	0.03	441		0.83	4	25	
Little Bear M-39	1105 m	0.00	0.10	0.00	450		0.55		18	
Little Bear M-39	1110 m	0.00	0.13	0.00	451		0.67		19	
Little Bear M-39	1115 m	0.00	0.67	0.02	445		1.68	1	40	
Little Bear M-39	1120 m	0.07	0.47	0.19	437	437	0.65	29	72	
Little Bear M-39	1125 m	0.00	0.53	0.05	445		1.34	4	40	
Little Bear M-39	1130 m	0.00	0.16	0.02	442		0.70	3	23	
Little Bear M-39	1135 m	0.00	0.24	0.02	441		0.75	3	32	
Little Bear M-39	1140 m	0.00	0.34	0.05	437		1.56	3	22	
Little Bear M-39	1145 m	0.14	0.76	0.20	416	416	1.09	18	70	
Little Bear M-39	1150 m	0.00	0.10	0.01	450		0.53	2	19	
Little Bear M-39	1155 m	0.01	0.50	0.02	440		1.14	2	44	
Little Bear M-39	1160 m	0.00	0.26	0.05	436		1.13	4	23	
Little Bear M-39	1165 m	0.00	0.24	0.01	440		1.07	1	22	
Little Bear M-39	1170 m	0.00	0.29	0.06	435		0.85	7	34	
Little Bear M-39	1175 m	0.00	1.19	0.10	430	430	2.18	5	55	
Little Bear M-39	1180 m	0.00	1.15	0.01	437	437	1.41	1	82	
Little Bear M-39	1185 m	0.01	0.60	0.01	439	439	0.98	1	61	
Little Bear M-39	1190 m	0.00	0.54	0.02	446		1.17	2	46	
Little Bear M-39	1195 m	0.00	0.53	0.05	450		1.07	5	50	
Little Bear M-39	1200 m	0.00	0.43	0.03	439		1.34	2	32	
Little Bear M-39	1205 m	0.00	0.44	0.08	432		1.42	6	31	
Little Bear M-39	1210 m	0.00	0.44	0.03	444	444	0.85	4	52	
Little Bear M-39	1215 m	0.00	0.22	0.00	438		0.85		26	
Little Bear M-39	1220 m	0.00	0.29	0.01	444		1.10	1	26	
Little Bear M-39	1225 m	0.00	0.19	0.03	454		0.63	5	30	
Little Bear M-39	1230 m	0.00	0.55	0.05	437		1.12	4	49	
Little Bear M-39	1235 m	0.00	0.41	0.04	441		1.04	4	39	
Little Bear M-39	1240 m	0.00	0.00	0.04	536		1.21	3		
Little Bear M-39	1245 m	0.00	0.45	0.08	435		1.49	5	30	
Little Bear M-39	1250 m	0.00	0.81	0.09	441	441	1.16	8	70	
Little Bear M-39	1255 m	0.00	0.30	0.05	439		1.00	5	30	
Little Bear M-39	1260 m	0.00	0.35	0.02	445		1.47	1	24	
Little Bear M-39	1265 m	0.00	0.26	0.07	445		0.88	8	30	
Little Bear M-39	1270 m	0.00	0.42	0.05	447	447	0.73	7	58	
Little Bear M-39	1275 m	0.00	0.00	0.08	569		1.26	6		
Little Bear M-39	1280 m	0.01	0.45	0.09	436		1.33	7	34	
Little Bear M-39	1285 m	0.01	0.41	0.06	436		1.19	5	34	
Little Bear M-39	1290 m	0.00	0.37	0.05	439		1.33	4	28	
Little Bear M-39	1295 m	0.00	0.17	0.06	454		0.69	9	25	

Well Name	Depth	S1	S2	S3	TMax Raw	TMax	TOC	OI	HI	Member
Slater River A-37	420 ft	0.14	2.11	0.69	421	421	2.98	23	71	
Slater River A-37	430 ft	0.13	2.56	0.70	420	420	3.09	23	83	
Slater River A-37	440 ft	0.10	1.47	0.77	423	423	2.72	28	54	
Slater River A-37	450 ft	0.14	2.06	0.76	421	421	2.97	26	69	
Slater River A-37	460 ft	0.13	1.73	0.70	421	421	2.75	25	63	
Slater River A-37	470 ft	0.09	1.31	0.59	421		2.69	22	49	
Slater River A-37	480 ft	0.08	1.50	0.60	422	422	2.79	22	54	
Slater River A-37	490 ft	0.10	1.47	0.64	422	422	2.55	25	58	
Slater River A-37	500 ft	0.07	1.47	0.64	423	423	2.69	24	55	
Slater River A-37	510 ft	0.09	1.55	0.60	423	423	2.73	22	57	
Slater River A-37	520 ft	0.08	1.46	0.53	422	422	2.66	20	55	
Slater River A-37	540 ft	0.08	1.41	0.62	424		2.89	21	49	
Slater River A-37	550 ft	0.10	1.58	0.66	423	423	2.81	23	56	
Slater River A-37	560 ft	0.19	0.67	0.25	435	435	1.05	24	64	
Slater River A-37	570 ft	0.35	0.46	0.24	440	440	0.86	28	53	
Slater River A-37	580 ft	0.30	0.46	0.28	427		0.98	29	47	
Slater River A-37	590 ft	0.29	0.42	0.17	432		0.92	18	46	
Slater River A-37	600 ft	0.17	0.44	0.22	430		1.08	20	41	
Slater River A-37	610 ft	0.31	0.60	0.11	438	438	1.20	9	50	
Slater River A-37	620 ft	0.23	0.54	0.15	437		1.22	12	44	
Slater River A-37	630 ft	0.15	0.36	0.12	444		1.08	11	33	
Slater River A-37	640 ft	0.16	0.38	0.14	443		1.13	12	34	
Slater River A-37	650 ft	0.22	0.55	0.10	438		1.18	8	47	
Slater River A-37	660 ft	0.12	0.33	0.12	442		1.05	11	31	
Slater River A-37	670 ft	0.13	0.39	0.15	440		1.16	13	34	
Slater River A-37	680 ft	0.27	0.43	0.26	432		1.26	21	34	
Slater River A-37	690 ft	0.09	0.34	0.26	439		1.28	20	27	
Slater River A-37	700 ft	0.11	0.31	0.32	431		1.17	27	26	
Slater River A-37	710 ft	0.06	0.89	0.41	423		2.00	21	45	
Slater River A-37	720 ft	0.20	0.50	0.24	427		1.22	20	41	
Slater River A-37	730 ft	0.24	0.93	0.09	439	439	1.20	8	78	
Slater River A-37	740 ft	0.24	0.68	0.10	438	438	1.07	9	64	
Slater River A-37	750 ft	0.17	0.58	0.11	441		1.30	8	45	
Slater River A-37	760 ft	0.10	0.35	0.15	439		1.20	13	29	
Slater River A-37	770 ft	0.11	0.39	0.10	439		1.19	8	33	
Slater River A-37	780 ft	0.12	0.43	0.11	440		1.16	9	37	
Slater River A-37	790 ft	0.13	0.32	0.11	441		1.10	10	29	
Slater River A-37	800 ft	0.14	0.39	0.17	442		1.11	15	35	
Slater River A-37	810 ft	0.12	0.28	0.09	437		0.94	10	30	
Slater River A-37	820 ft	0.19	0.48	0.40	439		1.15	35	42	
Slater River A-37	830 ft	0.21	0.63	0.45	440	440	1.16	39	54	
Slater River A-37	840 ft	0.14	0.42	0.31	444		1.19	26	35	
Slater River A-37	850 ft	0.14	0.56	0.34	435		1.33	26	42	
Slater River A-37	860 ft	0.17	0.51	0.23	445		1.29	18	40	
Slater River A-37	870 ft	0.13	0.41	0.21	442		1.22	17	34	
Slater River A-37	880 ft	0.14	0.55	0.25	440		1.30	19	42	
Slater River A-37	890 ft	0.11	0.30	0.16	442		1.01	16	30	
Slater River A-37	900 ft	0.11	0.26	0.12	437		0.93	13	28	
Slater River A-37	910 ft	0.14	0.38	0.10	441		1.12	9	34	
Slater River A-37	920 ft	0.23	0.83	0.22	437	437	1.28	17	65	
Slater River A-37	930 ft	0.16	0.63	0.35	439	439	1.22	29	52	
Slater River A-37	940 ft	0.15	0.55	0.18	440		1.21	15	45	
Slater River A-37	950 ft	0.14	0.54	0.47	439		1.27	37	43	
Slater River A-37	960 ft	0.09	0.59	0.25	425		1.71	15	35	
Slater River A-37	970 ft	0.14	0.67	0.45	442		1.42	32	47	
Slater River A-37	980 ft	0.12	0.61	0.56	440		1.42	39	43	
Slater River A-37	990 ft	0.10	0.45	0.30	443		1.20	25	38	

Slater River A-37	1000 ft	0.11	0.43	0.36	435		1.33	27	32	
Slater River A-37	1010 ft	0.18	0.56	0.09	437		1.24	7	45	
Slater River A-37	1020 ft	0.16	0.57	0.14	433	433	1.08	13	53	
Slater River A-37	1030 ft	0.07	0.75	0.29	425		1.86	16	40	
Slater River A-37	1040 ft	0.08	0.44	0.31	432		1.51	21	29	
Slater River A-37	1060 ft	0.11	0.32	0.14	433		1.07	13	30	
Slater River A-37	1070 ft	0.05	0.20	0.17	428		1.14	15	18	
Slater River A-37	1080 ft	0.08	0.31	0.11	437		1.14	10	27	
Slater River A-37	1090 ft	0.10	0.55	0.16	443		1.43	11	38	
Slater River A-37	1100 ft	0.08	0.51	0.22	438		1.49	15	34	
Slater River A-37	1110 ft	0.09	0.50	0.24	439		1.43	17	35	
Slater River A-37	1120 ft	0.10	0.42	0.29	440		1.39	21	30	
Slater River A-37	1130 ft	0.16	0.67	0.39	439		1.67	23	40	
Slater River A-37	1140 ft	0.06	0.36	0.21	444		1.42	15	25	
Slater River A-37	1150 ft	0.07	0.49	0.21	433		1.58	13	31	
Slater River A-37	1160 ft	0.07	0.48	0.18	440		1.65	11	29	
Slater River A-37	1180 ft	0.07	0.42	0.12	443		1.46	8	29	
Slater River A-37	1190 ft	0.05	0.40	0.22	442		1.43	15	28	
Slater River A-37	1200 ft	0.08	0.45	0.27	441		1.53	18	29	
Slater River A-37	1210 ft	0.09	0.50	0.15	439		1.47	10	34	
Slater River A-37	1220 ft	0.06	0.40	0.18	442		1.45	12	28	
Slater River A-37	1230 ft	0.07	0.53	0.22	441		1.60	14	33	
Slater River A-37	1240 ft	0.06	0.48	0.25	444		1.45	17	33	
Slater River A-37	1250 ft	0.08	0.53	0.20	447		1.57	13	34	
Slater River A-37	1260 ft	0.06	0.45	0.22	444		1.53	14	29	
Slater River A-37	1270 ft	0.08	0.51	0.24	442		1.50	16	34	
Slater River A-37	1280 ft	0.06	0.32	0.19	447		1.40	14	23	
Slater River A-37	1290 ft	0.06	0.37	0.21	447		1.46	14	25	
Slater River A-37	1300 ft	0.08	0.39	0.15	448		1.44	10	27	
Slater River A-37	1310 ft	0.09	0.49	0.20	443		1.51	13	32	
Slater River A-37	1320 ft	0.06	0.41	0.18	444		1.46	12	28	
Slater River A-37	1330 ft	0.10	0.57	0.44	440		1.58	28	36	
Slater River A-37	1340 ft	0.09	0.52	0.15	446		1.54	10	34	
Slater River A-37	1350 ft	0.09	0.48	0.18	445		1.51	12	32	
Slater River A-37	1360 ft	0.11	0.48	0.23	447		1.56	15	31	
Slater River A-37	1370 ft	0.07	0.37	0.15	445		1.39	11	27	
Slater River A-37	1380 ft	0.03	0.29	0.10	444		1.31	8	22	
Slater River A-37	1390 ft	0.04	0.29	0.13	445		1.29	10	22	
Slater River A-37	1400 ft	0.10	0.42	0.11	447		1.31	8	32	
Slater River A-37	1410 ft	0.05	0.30	0.13	446		1.29	10	23	
Slater River A-37	1420 ft	0.06	0.40	0.19	443		1.37	14	29	
Slater River A-37	1430 ft	0.09	0.41	0.12	443		1.38	9	30	
Slater River A-37	1440 ft	0.06	0.37	0.15	444		1.40	11	26	
Slater River A-37	1450 ft	0.07	0.42	0.14	444		1.43	10	29	
Slater River A-37	1460 ft	0.07	0.42	0.17	444		1.45	12	29	
Slater River A-37	1470 ft	0.09	0.45	0.27	443		1.48	18	30	
Slater River A-37	1480 ft	0.08	0.46	0.22	448		1.47	15	31	
Slater River A-37	1490 ft	0.10	0.52	0.24	443		1.50	16	35	

Slater River A-37	1500 ft	0.12	0.46	0.25	447		1.45	17	32	
Slater River A-37	1510 ft	0.17	0.61	0.25	447		1.49	17	41	
Slater River A-37	1520 ft	0.09	0.44	0.23	446		1.50	15	29	
Slater River A-37	1530 ft	0.15	0.60	0.13	445		1.48	9	41	
Slater River A-37	1540 ft	0.05	0.38	0.21	446		1.48	14	26	
Slater River A-37	1550 ft	0.04	0.35	0.22	449		1.49	15	23	
Slater River A-37	1560 ft	0.05	0.37	0.23	447		1.44	16	26	
Slater River A-37	1570 ft	0.06	0.39	0.22	447		1.48	15	26	
Slater River A-37	1580 ft	0.06	0.39	0.24	446		1.47	16	27	
Slater River A-37	1590 ft	0.06	0.39	0.32	446		1.47	22	27	
Slater River A-37	1600 ft	0.06	0.37	0.32	447		1.47	22	25	
Slater River A-37	1610 ft	0.05	0.36	0.20	445		1.46	14	25	
Slater River A-37	1620 ft	0.05	0.36	0.24	445		1.49	16	24	
Slater River A-37	1630 ft	0.06	0.38	0.25	446		1.47	17	26	
Slater River A-37	1640 ft	0.04	0.33	0.17	447		1.44	12	23	
Slater River A-37	1650 ft	0.09	0.48	0.18	448		1.50	12	32	
Slater River A-37	1660 ft	0.08	0.46	0.18	446		1.52	12	30	
Slater River A-37	1670 ft	0.05	0.41	0.22	446		1.55	14	26	
Slater River A-37	1680 ft	0.05	0.41	0.19	447		1.57	12	26	
Slater River A-37	1690 ft	0.06	0.41	0.21	449		1.48	14	28	
Slater River A-37	1700 ft	0.05	0.39	0.11	445		1.46	8	27	
Slater River A-37	1710 ft	0.07	0.38	0.19	447		1.42	13	27	
Slater River A-37	1720 ft	0.07	0.39	0.17	446		1.27	13	31	
Slater River A-37	1730 ft	0.06	0.31	0.18	446		1.43	13	22	
Slater River A-37	1740 ft	0.06	0.30	0.24	450		1.38	17	22	
Slater River A-37	1750 ft	0.09	0.35	0.19	450		1.45	13	24	
Slater River A-37	1760 ft	0.07	0.35	0.19	448		1.44	13	24	
Slater River A-37	1770 ft	0.12	0.44	0.16	449		1.23	13	36	
Slater River A-37	1780 ft	0.12	0.48	0.15	442		1.26	12	38	
Slater River A-37	1790 ft	0.07	0.36	0.19	447		1.23	15	29	
Slater River A-37	1800 ft	0.09	0.38	0.20	454		1.25	16	30	
Slater River A-37	1810 ft	0.08	0.37	0.19	454		1.23	15	30	
Slater River A-37	1820 ft	0.16	0.58	0.19	450	450	1.14	17	51	
Slater River A-37	1830 ft	0.16	0.59	0.22	451	451	1.13	19	52	
Slater River A-37	1840 ft	0.12	0.49	0.14	450		1.15	12	43	
Slater River A-37	1850 ft	0.09	0.38	0.16	438		1.36	12	28	
Slater River A-37	1860 ft	0.13	0.49	0.10	450		1.23	8	40	
Slater River A-37	1870 ft	0.10	0.48	0.21	449		1.24	17	39	
Slater River A-37	1880 ft	0.14	0.56	0.13	443		1.30	10	43	
Slater River A-37	1890 ft	0.09	0.47	0.15	444		1.31	11	36	
Slater River A-37	1900 ft	0.13	0.59	0.27	450		1.37	20	43	
Slater River A-37	1910 ft	0.11	0.51	0.18	447		1.34	13	38	
Slater River A-37	1920 ft	0.10	0.56	0.17	450		1.36	13	41	
Slater River A-37	1930 ft	0.11	0.58	0.11	452		1.45	8	40	
Slater River A-37	1940 ft	0.15	0.65	0.18	448		1.42	13	46	
Slater River A-37	1950 ft	0.13	0.67	0.15	451		1.47	10	46	
Slater River A-37	1960 ft	0.12	0.63	0.16	451		1.49	11	42	
Slater River A-37	1970 ft	0.13	0.65	0.21	450		1.59	13	41	
Slater River A-37	1980 ft	0.09	0.56	0.28	449		1.46	19	38	
Slater River A-37	1990 ft	0.11	0.65	0.23	449		1.59	14	41	

Slater River A-37	2000 ft	0.09	0.61	0.30	450		1.58	19	39	
Slater River A-37	2010 ft	0.12	0.70	0.20	450		1.65	12	42	
Slater River A-37	2020 ft	0.13	0.73	0.17	450		1.66	10	44	
Slater River A-37	2030 ft	0.12	0.57	0.13	448		1.46	9	39	
Slater River A-37	2040 ft	0.12	0.67	0.26	450		1.49	17	45	
Slater River A-37	2050 ft	0.23	1.03	0.17	442	442	1.60	11	64	
Slater River A-37	2060 ft	0.19	0.85	0.22	446	446	1.51	15	56	
Slater River A-37	2070 ft	0.16	0.87	0.18	447	447	1.64	11	53	
Slater River A-37	2080 ft	0.36	2.59	0.13	445	445	2.12	6	122	0.12
Slater River A-37	2090 ft	0.41	2.93	0.14	446	446	2.25	6	130	0.12
Slater River A-37	2100 ft	0.43	2.91	0.11	445	445	2.22	5	131	0.13
Slater River A-37	2110 ft	0.54	3.69	0.04	446	446	2.94	1	126	0.13
Slater River A-37	2120 ft	0.71	5.00	0.08	448	448	3.14	3	159	0.12
Slater River A-37	2130 ft	0.35	2.22	0.08	448	448	2.45	3	91	0.14
Slater River A-37	2140 ft	0.17	0.86	0.11	444	444	1.72	6	50	
Slater River A-37	2150 ft	0.20	0.98	0.12	448	448	1.68	7	58	
Slater River A-37	2160 ft	0.26	1.17	0.14	445	445	1.78	8	66	
Slater River A-37	2170 ft	0.40	2.25	0.09	446	446	2.22	4	101	0.15
Slater River A-37	2180 ft	0.56	3.17	0.02	447	447	2.88	1	110	0.15
Slater River A-37	2190 ft	0.67	4.13	0.05	448	448	2.72	2	152	0.14
Slater River A-37	2200 ft	0.67	3.75	0.00	447	447	3.16		119	0.15
Slater River A-37	2210 ft	0.72	3.96	0.00	446	446	3.27		121	0.15
Slater River A-37	2220 ft	0.46	2.54	0.00	447	447	2.58		98	0.15
Slater River A-37	2230 ft	0.62	3.45	0.03	448	448	2.58	1	134	0.15
Slater River A-37	2240 ft	0.82	4.11	0.00	448	448	2.99		137	0.17
Slater River A-37	2250 ft	0.92	4.37	0.00	447	447	3.26		134	0.17
Slater River A-37	2260 ft	0.96	5.90	0.02	449	449	3.30	1	179	0.14
Slater River A-37	2270 ft	1.07	6.44	0.00	448	448	3.72		173	0.14
Slater River A-37	2280 ft	1.28	7.81	0.02	447	447	3.89	1	201	0.14
Slater River A-37	2290 ft	1.20	7.03	0.03	449	449	4.01	1	175	0.15
Slater River A-37	2300 ft	0.81	4.25	0.00	448	448	3.31		128	0.16
Slater River A-37	2310 ft	0.52	2.97	0.00	447	447	2.62		113	0.15
Slater River A-37	2320 ft	0.43	2.38	0.00	449	449	2.63		90	0.15
Slater River A-37	2330 ft	0.39	1.98	0.00	447	447	2.37		84	0.16
Slater River A-37	2340 ft	0.33	1.73	0.02	448	448	2.21	1	78	0.16
Slater River A-37	2350 ft	0.48	2.83	0.06	449	449	2.66	2	106	0.15
Slater River A-37	2360 ft	0.47	3.09	0.04	448	448	2.99	1	103	0.13
Slater River A-37	2370 ft	0.39	2.05	0.05	450	450	2.25	2	91	0.16
Slater River A-37	2380 ft	0.39	1.84	0.00	447	447	2.42		76	0.17
Slater River A-37	2390 ft	0.60	2.58	0.00	448	448	2.75		94	0.19
Slater River A-37	2400 ft	0.65	3.18	0.00	450	450	3.05		104	0.17
Slater River A-37	2410 ft	0.93	4.71	0.01	451	451	3.19	0	148	0.16
Slater River A-37	2420 ft	1.23	6.96	0.00	453	453	4.75		147	0.15
Slater River A-37	2430 ft	1.39	7.25	0.00	450	450	6.01		121	0.16
Slater River A-37	2440 ft	1.78	8.78	0.00	449	449	5.91		149	0.17
Slater River A-37	2450 ft	1.93	9.41	0.00	446	446	5.78		163	0.17
Slater River A-37	2470 ft	2.34	12.25	0.00	445	445	6.41		191	0.16
Slater River A-37	2480 ft	2.09	10.51	0.00	450	450	7.09		148	0.17
Slater River A-37	2490 ft	1.58	7.67	0.00	449	449	6.28		122	0.17

Slater River A-37	2500 ft	2.41	11.69	0.00	445	445	6.09		192	0.17
Slater River A-37	2510 ft	2.89	10.75	0.00	440	440	5.58		193	0.21
Slater River A-37	2520 ft	2.01	6.97	0.00	444	444	4.47		156	0.22
Slater River A-37	2530 ft	1.54	4.68	0.01	443	443	3.27	0	143	0.25
Slater River A-37	2540 ft	1.25	5.48	0.00	448	448	4.86		113	0.19
Slater River A-37	2550 ft	1.78	8.48	0.00	448	448	6.24		136	0.17
Slater River A-37	2560 ft	1.45	7.50	0.00	447	447	6.26		120	0.16
Slater River A-37	2570 ft	1.74	10.01	0.00	449	449	8.01		125	0.15
Slater River A-37	2580 ft	1.84	9.58	0.00	449	449	8.46		113	0.16
Slater River A-37	2590 ft	1.67	10.34	0.00	449	449	7.82		132	0.14
Slater River A-37	2600 ft	2.61	11.70	0.00	443	443	7.65		153	0.18
Slater River A-37	2610 ft	2.15	9.89	0.00	448	448	8.03		123	0.18
Slater River A-37	2630 ft	3.10	15.75	0.00	440	440	8.25		191	0.16
Slater River A-37	2640 ft	2.57	13.89	0.18	446	446	8.17	2	170	0.16
Slater River A-37	2650 ft	2.57	14.90	0.18	444	444	8.50	2	175	0.15
Slater River A-37	2670 ft	2.30	12.18	0.16	450	450	9.04	2	135	0.16
Slater River A-37	2680 ft	2.65	12.50	0.06	444	444	7.34	1	170	0.17
Slater River A-37	2690 ft	2.98	10.55	0.05	443	443	7.13	1	148	0.22
Slater River A-37	2700 ft	2.54	10.06	0.04	448	448	6.80	1	148	0.20
Slater River A-37	2710 ft	2.03	8.53	0.00	450	450	7.71		111	0.19
Slater River A-37	2720 ft	1.86	8.73	0.00	453	453	7.04		124	0.18
Slater River A-37	2730 ft	1.80	9.13	0.00	450	450	7.39		124	0.16
Slater River A-37	2740 ft	1.12	5.71	0.00	454	454	6.34		90	0.16
Slater River A-37	2750 ft	1.21	5.74	0.00	452	452	7.15		80	0.17
Slater River A-37	2760 ft	1.11	5.03	0.00	451	451	5.78		87	0.18
Slater River A-37	2770 ft	1.16	4.34	0.00	453	453	6.10		71	0.21
Slater River A-37	2780 ft	1.63	9.88	0.00	450	450	9.30		106	0.14
Slater River A-37	2790 ft	1.25	8.37	0.00	449	449	7.32		114	0.13
Slater River A-37	2800 ft	1.23	6.84	0.00	454	454	7.53		91	0.15
Slater River A-37	2810 ft	1.36	8.54	0.00	449	449	7.21		118	0.14
Slater River A-37	2820 ft	1.22	7.01	0.00	451	451	6.47		108	0.15
Slater River A-37	2830 ft	1.01	5.65	0.00	455	455	6.99		81	0.15
Slater River A-37	2840 ft	1.07	5.21	0.00	453	453	7.35		71	0.17
Slater River A-37	2850 ft	0.27	0.98	0.03	452	452	1.96	2	50	
Slater River A-37	2860 ft	0.31	0.80	0.06	455		1.61	4	50	
Slater River A-37	2870 ft	0.25	0.71	0.06	461		1.64	4	43	
Slater River A-37	2880 ft	0.39	0.95	0.13	449	449	1.54	8	62	
Slater River A-37	2890 ft	0.39	0.94	0.15	439	439	1.63	9	58	
Slater River A-37	2900 ft	0.12	0.27	0.05	445		1.23	4	22	
Slater River A-37	2910 ft	0.26	0.41	0.07	452		1.19	6	34	
Slater River A-37	2920 ft	0.09	0.19	0.04	452		0.94	4	20	
Slater River A-37	2930 ft	0.16	0.28	0.08	462		1.04	8	27	
Slater River A-37	2940 ft	0.15	0.39	0.06	456		1.20	5	33	
Slater River A-37	2950 ft	0.31	0.69	0.07	461		1.44	5	48	
Slater River A-37	2960 ft	0.67	1.03	0.10	448	448	1.59	6	65	
Slater River A-37	2970 ft	1.07	1.31	0.05	315	315	1.44	3	91	0.45
Slater River A-37	2980 ft	0.13	0.27	0.06	448		1.38	4	20	
Slater River A-37	2990 ft	0.10	0.23	0.05	462		1.02	5	23	

Slater River A-37	3000 ft	0.42	0.84	0.08	443		1.75	5	48	
Slater River A-37	3010 ft	0.39	0.87	0.11	445	445	1.68	7	52	
Slater River A-37	3020 ft	0.10	0.20	0.03	447		1.06	3	19	
Slater River A-37	3030 ft	0.08	0.19	0.08	432		1.04	8	18	
Slater River A-37	3040 ft	0.11	0.33	0.06	450		1.16	5	28	
Slater River A-37	3050 ft	0.20	0.76	0.11	448	448	1.51	7	50	
Slater River A-37	3060 ft	0.21	0.86	0.09	447		1.77	5	49	
Slater River A-37	3070 ft	0.10	0.25	0.07	437		1.09	6	23	
Slater River A-37	3080 ft	0.12	0.32	0.09	445		1.18	8	27	
Slater River A-37	3090 ft	0.08	0.21	0.04	443		1.10	4	19	
Slater River A-37	3100 ft	0.11	0.22	0.06	353		0.97	6	23	
Slater River A-37	3110 ft	0.06	0.11	0.05	447		1.00	5	11	
Slater River A-37	3120 ft	0.05	0.11	0.08	354		0.97	8	11	
Slater River A-37	3130 ft	0.10	0.27	0.12	465		1.21	10	22	
Slater River A-37	3140 ft	0.19	0.55	0.13	438		1.52	9	36	
Slater River A-37	3150 ft	0.14	0.34	0.14	445		1.18	12	29	
Slater River A-37	3160 ft	0.14	0.31	0.10	447		1.16	9	27	
Slater River A-37	3170 ft	0.11	0.20	0.06	350		0.97	6	21	
Slater River A-37	3180 ft	0.08	0.21	0.13	346		1.06	12	20	
Slater River A-37	3190 ft	0.09	0.18	0.09	453		1.00	9	18	
Slater River A-37	3200 ft	0.06	0.14	0.07	449		0.95	7	15	
Slater River A-37	3210 ft	0.08	0.25	0.15	458		1.14	13	22	
Slater River A-37	3220 ft	0.13	0.30	0.08	447		1.17	7	26	
Slater River A-37	3230 ft	0.20	0.50	0.17	352		1.30	13	38	
Slater River A-37	3240 ft	0.09	0.19	0.08	346		1.01	8	19	
Slater River A-37	3250 ft	0.15	0.31	0.13	341		1.11	12	28	
Slater River A-37	3260 ft	0.13	0.30	0.05	353		1.08	5	28	
Slater River A-37	3270 ft	0.10	0.23	0.08	438		1.09	7	21	
Slater River A-37	3280 ft	0.11	0.22	0.08	358		1.07	7	21	
Slater River A-37	3290 ft	0.07	0.14	0.06	440		0.94	6	15	
Slater River A-37	3300 ft	0.08	0.15	0.04	436		0.97	4	15	
Slater River A-37	3310 ft	0.11	0.25	0.22	438		1.13	19	22	
Slater River A-37	3320 ft	0.09	0.30	0.14	438		1.24	11	24	
Slater River A-37	3330 ft	0.13	0.37	0.12	446		1.29	9	29	
Slater River A-37	3340 ft	0.09	0.32	0.06	443		1.32	5	24	
Slater River A-37	3350 ft	0.08	0.21	0.06	348		1.16	5	18	
Slater River A-37	3360 ft	0.11	0.25	0.10	441		1.18	8	21	
Slater River A-37	3370 ft	0.07	0.16	0.06	435		1.16	5	14	
Slater River A-37	3380 ft	0.07	0.17	0.04	434		1.17	3	15	
Slater River A-37	3390 ft	0.08	0.20	0.08	432		1.26	6	16	
Slater River A-37	3400 ft	0.13	0.25	0.05	430		1.19	4	21	
Slater River A-37	3410 ft	0.08	0.32	0.19	346		1.20	16	27	
Slater River A-37	3420 ft	0.12	0.22	0.05	442		1.16	4	19	
Slater River A-37	3430 ft	0.09	0.19	0.10	378		0.65	15	29	
Slater River A-37	3450 ft	0.60	0.99	0.15	435	435	1.34	11	74	
Slater River A-37	3460 ft	0.07	0.09	0.09	331		0.68	13	13	
Slater River A-37	3470 ft	0.10	0.10	0.11	334		0.91	12	11	
Slater River A-37	3480 ft	0.52	0.74	0.12	439	439	1.29	9	57	
Slater River A-37	3490 ft	0.59	1.35	0.14	432	432	1.51	9	89	
Slater River A-37	3500 ft	0.58	1.12	0.14	427	427	1.50	9	75	

Well Name	Depth (m)	Depth	S1	S2	S3	TMax Raw	TMax	TOC	OI	HI	PI
Deh Cho 2B-14	210	210 m	0.26	0.93	0.08	438	438	1.59	5	58	
Deh Cho 2B-14	215	215 m	0.04	0.27	0.03	444		1.03	3	26	
Deh Cho 2B-14	220	220 m	0.04	0.27	0.16	447		1.25	13	22	
Deh Cho 2B-14	225	225 m	0.05	0.31	0.15	444		1.17	13	26	
Deh Cho 2B-14	230	230 m	0.05	0.44	0.09	442		1.30	7	34	
Deh Cho 2B-14	235	235 m	0.06	0.48	0.07	443		1.30	5	37	
Deh Cho 2B-14	240	240 m	0.04	0.23	0.09	448		1.13	8	20	
Deh Cho 2B-14	245	245 m	0.06	0.32	0.17	441		1.13	15	28	
Deh Cho 2B-14	250	250 m	0.08	0.47	0.00	442		1.17		40	
Deh Cho 2B-14	255	255 m	0.06	0.44	0.02	442		1.48	1	30	
Deh Cho 2B-14	260	260 m	0.07	0.51	0.02	442		1.51	1	34	
Deh Cho 2B-14	265	265 m	0.05	0.50	0.00	441		1.22		41	
Deh Cho 2B-14	270	270 m	0.05	0.36	0.05	446		1.10	5	33	
Deh Cho 2B-14	275	275 m	0.06	0.40	0.10	438		1.11	9	36	
Deh Cho 2B-14	280	280 m	0.15	0.63	0.11	435	435	1.20	9	53	
Deh Cho 2B-14	285	285 m	1.27	1.24	0.01	439	439	1.46	1	85	0.51
Deh Cho 2B-14	290	290 m	0.06	0.51	0.16	442		1.29	12	40	
Deh Cho 2B-14	295	295 m	0.05	0.42	0.14	442		1.24	11	34	
Deh Cho 2B-14	300	300 m	0.40	0.84	0.00	439	439	1.51		56	
Deh Cho 2B-14	305	305 m	0.15	0.79	0.01	440	440	1.42	1	56	
Deh Cho 2B-14	310	310 m	0.08	0.55	0.15	443		1.41	11	39	
Deh Cho 2B-14	315	315 m	0.09	0.74	0.26	441		1.49	17	50	
Deh Cho 2B-14	320	320 m	0.13	1.10	0.36	441	441	1.59	23	69	
Deh Cho 2B-14	325	325 m	0.11	0.67	0.03	441		1.54	2	44	
Deh Cho 2B-14	330	330 m	0.13	0.69	0.30	440		1.43	21	48	
Deh Cho 2B-14	335	335 m	0.08	0.66	0.09	439	439	1.29	7	51	
Deh Cho 2B-14	340	340 m	0.70	1.76	0.27	437	437	1.50	18	117	0.28
Deh Cho 2B-14	345	345 m	0.92	4.12	1.46	328	328	2.38	61	173	0.18
Deh Cho 2B-14	350	350 m	0.13	0.84	0.26	442	442	1.24	21	68	
Deh Cho 2B-14	355	355 m	0.11	0.82	0.44	439	439	1.22	36	67	
Deh Cho 2B-14	360	360 m	0.21	1.37	0.31	442	442	1.55	20	88	
Deh Cho 2B-14	365	365 m	0.15	1.14	0.21	439	439	1.45	14	79	
Deh Cho 2B-14	370	370 m	0.13	0.84	0.22	442	442	1.23	18	68	
Deh Cho 2B-14	375	375 m	0.15	1.35	0.33	440	440	1.56	21	87	
Deh Cho 2B-14	380	380 m	0.30	1.23	0.24	440	440	1.60	15	77	
Deh Cho 2B-14	385	385 m	0.37	2.80	0.23	442	442	2.08	11	135	0.12
Deh Cho 2B-14	390	390 m	1.06	4.56	0.36	438	438	2.43	15	188	0.19
Deh Cho 2B-14	395	395 m	1.25	2.11	0.11	433	433	1.45	8	146	0.37
Deh Cho 2B-14	400	400 m	0.23	1.39	0.15	440	440	1.38	11	101	
Deh Cho 2B-14	405	405 m	0.52	3.26	0.24	436	436	1.68	14	194	0.14
Deh Cho 2B-14	410	410 m	0.49	2.00	0.17	430	430	1.23	14	163	0.20
Deh Cho 2B-14	415	415 m	0.80	5.01	0.18	443	443	2.36	8	212	0.14
Deh Cho 2B-14	420	420 m	0.21	1.56	0.14	440	440	1.37	10	114	
Deh Cho 2B-14	425	425 m	0.13	0.81	0.05	439	439	1.14	4	71	
Deh Cho 2B-14	430	430 m	0.63	5.90	0.23	443	443	2.51	9	235	0.10
Deh Cho 2B-14	435	435 m	0.80	8.47	0.20	444	444	3.12	6	271	0.09
Deh Cho 2B-14	440	440 m	0.82	9.86	0.31	452	452	2.66	12	371	0.08
Deh Cho 2B-14	445	445 m	0.99	9.76	0.09	443	443	3.99	2	245	0.09
Deh Cho 2B-14	450	450 m	0.75	4.55	0.21	443	443	2.17	10	210	0.14
Deh Cho 2B-14	455	455 m	0.58	4.96	0.25	441	441	1.76	14	282	0.10
Deh Cho 2B-14	455	455 m R	0.58	4.83	0.14	442	442	2.14	7	226	0.11
Deh Cho 2B-14	460	460 m	0.38	3.22	0.00	442	442	2.00		161	0.11
Deh Cho 2B-14	465	465 m	0.44	3.43	0.11	442	442	1.36	8	252	0.11
Deh Cho 2B-14	470	470 m	0.42	3.92	0.10	449	449	1.60	6	245	0.10
Deh Cho 2B-14	475	475 m	0.39	4.19	0.14	438	438	1.64	9	255	0.09
Deh Cho 2B-14	480	480 m	0.78	7.51	0.15	442	442	2.51	6	299	0.09
Deh Cho 2B-14	485	485 m	0.92	9.21	0.10	448	448	3.21	3	287	0.09
Deh Cho 2B-14	490	490 m	0.83	12.03	0.17	438	438	6.13	3	196	0.06
Deh Cho 2B-14	495	495 m	2.28	23.96	0.05	442	442	7.31	1	328	0.09

Deh Cho 2B-14	500	500 m	0.98	15.02	0.04	444	444	5.83	1	258	0.06
Deh Cho 2B-14	505	505 m	2.05	23.22	0.01	441	441	8.15	0	285	0.08
Deh Cho 2B-14	510	510 m	2.47	26.47	0.04	440	440	6.45	1	410	0.09
Deh Cho 2B-14	515	515 m	1.54	16.41	0.00	438	438	7.12		230	0.09
Deh Cho 2B-14	520	520 m	3.45	22.77	0.00	439	439	6.23		365	0.13
Deh Cho 2B-14	525	525 m	2.95	21.41	0.00	438	438	6.62		323	0.12
Deh Cho 2B-14	530	530 m	2.44	24.86	0.00	437	437	9.02		276	0.09
Deh Cho 2B-14	535	535 m	2.71	24.05	0.00	443	443	8.05		299	0.10
Deh Cho 2B-14	540	540 m	2.35	17.55	0.17	443	443	4.53	4	387	0.12
Deh Cho 2B-14	545	545 m	3.01	13.34	0.05	440	440	4.27	1	312	0.18
Deh Cho 2B-14	550	550 m	2.02	12.83	0.07	437	437	4.02	2	319	0.14
Deh Cho 2B-14	550	550 m R	2.54	12.94	0.11	442	442	4.51	2	287	0.16
Deh Cho 2B-14	555	555 m	2.42	17.67	0.33	440	440	6.20	5	285	0.12
Deh Cho 2B-14	560	560 m	2.80	17.62	0.04	437	437	4.91	1	359	0.14
Deh Cho 2B-14	565	565 m	2.16	27.02	0.05	444	444	6.42	1	421	0.07
Deh Cho 2B-14	570	570 m	1.11	14.34	0.11	444	444	7.50	1	191	0.07
Deh Cho 2B-14	575	575 m	2.05	24.19	0.11	444	444	6.16	2	393	0.08
Deh Cho 2B-14	580	580 m	2.66	19.05	0.03	443	443	4.93	1	386	0.12
Deh Cho 2B-14	585	585 m	3.81	22.12	0.09	441	441	6.90	1	321	0.15
Deh Cho 2B-14	590	590 m	2.16	21.32	0.00	445	445	7.63		279	0.09
Deh Cho 2B-14	595	595 m	0.82	7.29	0.00	449	449	2.80		260	0.10
Deh Cho 2B-14	600	600 m	1.42	6.65	1.07	450	450	3.00	36	222	0.18
Deh Cho 2B-14	605	605 m	0.61	3.58	0.09	449	449	1.79	5	200	0.15
Deh Cho 2B-14	610	610 m	0.44	1.99	0.00	447	447	1.45		137	0.18
Deh Cho 2B-14	615	615 m	0.66	3.83	0.15	447	447	1.86	8	206	0.15
Deh Cho 2B-14	620	620 m	6.14	92.48	0.12	441	441	24.99	0	370	0.06
Deh Cho 2B-14	625	625 m	1.47	13.00	0.28	446	446	4.49	6	290	0.10
Deh Cho 2B-14	630	630 m	1.19	10.64	0.15	441	441	3.90	4	273	0.10
Deh Cho 2B-14	635	635 m	1.53	16.42	0.08	443	443	6.41	1	256	0.09
Deh Cho 2B-14	640	640 m	0.53	3.15	0.10	446	446	1.79	6	176	0.14
Deh Cho 2B-14	645	645 m	0.69	2.66	0.13	451	451	0.84	15	317	0.21
Deh Cho 2B-14	650	650 m	0.57	2.35	0.31	444	444	0.70	44	336	0.20
Deh Cho 2B-14	655	655 m	0.29	0.84	0.07	449	449	0.68	10	124	
Deh Cho 2B-14	660	660 m	0.26	0.54	0.28	452	452	0.67	42	81	
Deh Cho 2B-14	665	665 m	0.33	1.36	0.03	453	453	0.71	4	192	
Deh Cho 2B-14	670	670 m	0.11	0.42	0.14	453		0.45			
Deh Cho 2B-14	675	675 m	0.16	0.61	0.07	452	452	0.61	11	100	
Deh Cho 2B-14	680	680 m	0.11	0.51	0.23	327	327	0.77	30	66	
Deh Cho 2B-14	685	685 m	0.06	0.10	0.04	452		0.51	8	20	
Deh Cho 2B-14	690	690 m	0.33	1.88	0.12	569	569	0.53	23	355	0.15
Deh Cho 2B-14	695	695 m	0.35	1.88	0.10	565	565	0.52	19	362	0.16
Deh Cho 2B-14	700	700 m	0.01	0.15	0.15	443		0.34			
Deh Cho 2B-14	700	700 m R	0.04	0.15	0.12	449		0.53	23	28	
Deh Cho 2B-14	705	705 m	0.13	0.77	0.03	447	447	1.18	3	65	
Deh Cho 2B-14	710	710 m	0.07	0.23	0.09	437		0.60	15	38	
Deh Cho 2B-14	715	715 m	0.09	0.35	0.10	445	445	0.55	18	64	
Deh Cho 2B-14	720	720 m	0.06	0.17	0.13	432		0.47			
Deh Cho 2B-14	725	725 m	0.12	0.40	0.02	444	444	0.56	4	71	
Deh Cho 2B-14	730	730 m	0.17	0.41	0.05	351	351	0.55	9	75	
Deh Cho 2B-14	735	735 m	0.10	0.36	0.16	359	359	0.63	25	57	
Deh Cho 2B-14	740	740 m	0.14	0.53	0.14	442	442	0.59	24	90	
Deh Cho 2B-14	745	745 m	0.14	0.38	0.09	438	438	0.54	17	70	

Deh Cho 2B-14	750	750 m	0.13	0.41	0.08	436	436	0.62	13	66	
Deh Cho 2B-14	755	755 m	0.17	0.44	0.17	442	442	0.82	21	54	
Deh Cho 2B-14	760	760 m	0.18	0.39	0.10	437	437	0.64	16	61	
Deh Cho 2B-14	765	765 m	0.08	0.19	0.13	446		0.66	20	29	
Deh Cho 2B-14	770	770 m	0.09	0.21	0.20	448		0.89	22	24	
Deh Cho 2B-14	775	775 m	0.07	0.16	0.08	440		0.69	12	23	
Deh Cho 2B-14	780	780 m	0.12	0.34	0.14	437		0.75	19	45	
Deh Cho 2B-14	785	785 m	0.11	0.15	0.10	430		0.51	20	29	
Deh Cho 2B-14	790	790 m	0.11	0.20	0.03	318		0.43			
Deh Cho 2B-14	795	795 m	0.08	0.22	0.01	339		0.41			
Deh Cho 2B-14	798	798 m	0.10	0.37	0.08	442		0.44			

Well Name	Well #	Depth (ft)	S1	S2	S3	TMax	TOC	OI	HI	PI
Canyon Creek	G-51	0								
Canyon Creek	G-51	164	0.07	14.10	0.14	447	5.63	2	250	0.00
Canyon Creek	G-51	1231								
Canyon Creek	G-51	1236								
Canyon Creek	G-51	1244	0.02	3.14	0.12	441	1.48	8	212	0.01
Canyon Creek	G-51	1258	0.03	1.90	0.08		6.34	1	30	
Canyon Creek	G-51	1267	0.28	3.92	0.33	434	2.14	15	183	0.07
Canyon Creek	G-51	1267	0.28	3.92	0.33	434	2.14	15	183	0.07
Canyon Creek	G-51	1276								
Canyon Creek	G-51	1301	0.01	7.50	0.16	442	2.47	6	304	0.00
Canyon Creek	G-51	1306	0.02	6.76	0.09	443	2.34	4	289	0.00
Canyon Creek	G-51	1311	0.02	6.99	0.10	444	2.11	5	331	0.00
Canyon Creek	G-51	1321								
Canyon Creek	G-51	1328								
Canyon Creek	G-51	1391	0.01	7.96	0.17	442	2.55	7	312	0.00
Canyon Creek	G-51	1397	0.01	9.70	0.12	446	2.86	4	339	0.00
Canyon Creek	G-51	1585								
Canyon Creek	G-51	1861	0.02	21.21	0.15	449	7.38	2	287	0.00
Canyon Creek	G-51	1862	0.02	14.67	0.15	445	4.68	3	313	0.00
Canyon Creek	G-51	1866	0.02	21.97	0.14	449	7.20	2	305	0.00
Canyon Creek	G-51	2052								

Well Name	Depth	S1	S2	S3	TMax Raw	TMax	TOC	OI	HI
Deh Cho 1B-25	225 m	0.07	0.55	0.40	440	440	1.04	38	53
Deh Cho 1B-25	230 m	0.07	0.50	0.56	443		1.06	53	47
Deh Cho 1B-25	235 m	0.06	0.44	0.35	443		1.06	33	42
Deh Cho 1B-25	240 m	0.10	0.58	0.18	442	442	1.09	17	53
Deh Cho 1B-25	245 m	0.06	0.40	0.31	440		1.03	30	39
Deh Cho 1B-25	250 m	0.06	0.47	0.46	442		1.07	43	44
Deh Cho 1B-25	255 m	0.07	0.46	0.26	437		1.05	25	44
Deh Cho 1B-25	260 m	0.06	0.54	0.32	444		1.13	28	48
Deh Cho 1B-25	265 m	0.07	0.51	0.17	443		1.11	15	46
Deh Cho 1B-25	270 m	0.07	0.48	0.20	442		1.12	18	43
Deh Cho 1B-25	275 m	0.08	0.48	0.23	442		1.10	21	44
Deh Cho 1B-25	280 m	0.10	0.64	0.42	439	439	1.21	35	53
Deh Cho 1B-25	285 m	0.10	0.70	0.26	443	443	1.25	21	56
Deh Cho 1B-25	290 m	0.09	0.47	0.32	444		1.09	29	43
Deh Cho 1B-25	295 m	0.09	0.54	0.31	439		1.15	27	47
Deh Cho 1B-25	305 m	0.11	0.70	0.26	441	441	1.28	20	55
Deh Cho 1B-25	310 m	0.13	0.68	0.36	440	440	1.20	30	57
Deh Cho 1B-25	320 m	0.13	0.58	0.42	439	439	1.13	37	51
Deh Cho 1B-25	335 m	0.10	0.63	0.37	439	439	1.24	30	51
Deh Cho 1B-25	340 m	0.14	1.01	0.71	441	441	1.42	50	71
Deh Cho 1B-25	345 m	0.16	1.03	0.82	439	439	1.49	55	69
Deh Cho 1B-25	350 m	0.10	1.04	0.35	439	439	1.63	21	64
Deh Cho 1B-25	355 m	0.33	4.13	0.29	439	439	2.23	13	185
Deh Cho 1B-25	360 m	0.10	2.19	0.24	438	438	1.83	13	120
Deh Cho 1B-25	365 m	0.18	4.34	0.19	436	436	2.44	8	178
Deh Cho 1B-25	370 m	0.42	4.54	0.09	439	439	2.12	4	214
Deh Cho 1B-25	375 m	0.67	1.93	0.18	431	431	1.21	15	160
Deh Cho 1B-25	380 m	0.85	5.89	0.54	433	433	2.34	23	252
Deh Cho 1B-25	385 m	0.45	2.50	0.74	428	428	1.48	50	169
Deh Cho 1B-25	390 m	0.57	5.32	0.26	438	438	2.15	12	247
Deh Cho 1B-25	395 m	0.94	10.73	0.16	439	439	3.21	5	334
Deh Cho 1B-25	400 m	0.83	8.39	0.17	441	441	2.91	6	288
Deh Cho 1B-25	405 m	0.47	3.60	0.17	440	440	1.98	9	182
Deh Cho 1B-25	410 m	0.28	2.41	0.23	442	442	1.80	13	134
Deh Cho 1B-25	415 m	0.38	2.66	0.15	440	440	1.76	9	151
Deh Cho 1B-25	420 m	0.38	2.96	0.24	441	441	1.81	13	164
Deh Cho 1B-25	425 m	0.45	3.56	0.21	442	442	1.92	11	185
Deh Cho 1B-25	430 m	0.71	5.85	0.28	441	441	3.05	9	192
Deh Cho 1B-25	435 m	0.53	4.90	0.21	441	441	2.64	8	186
Deh Cho 1B-25	440 m	1.14	8.62	0.42	442	442	3.64	12	237
Deh Cho 1B-25	445 m	1.40	11.50	0.37	441	441	4.01	9	287
Deh Cho 1B-25	455 m	1.79	12.90	0.25	437	437	4.10	6	315
Deh Cho 1B-25	465 m	1.53	22.06	0.15	443	443	5.57	3	396
Deh Cho 1B-25	470 m	2.83	18.34	0.15	435	435	4.70	3	390
Deh Cho 1B-25	475 m	2.76	19.09	0.10	437	437	4.66	2	410
Deh Cho 1B-25	480 m	2.59	16.73	0.17	433	433	4.73	4	354
Deh Cho 1B-25	485 m	2.92	25.03	0.28	439	439	6.04	5	414
Deh Cho 1B-25	490 m	2.02	15.68	0.17	440	440	4.36	4	360
Deh Cho 1B-25	495 m	2.07	13.52	0.19	440	440	4.26	4	317

Appendix II



Canyon Creek No. 1 G-51 SP1



A. Moderately well sorted, silt to lower fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51

SP2



- A. Moderately well sorted, silt to lower very fine grained argillaceous litharenite.



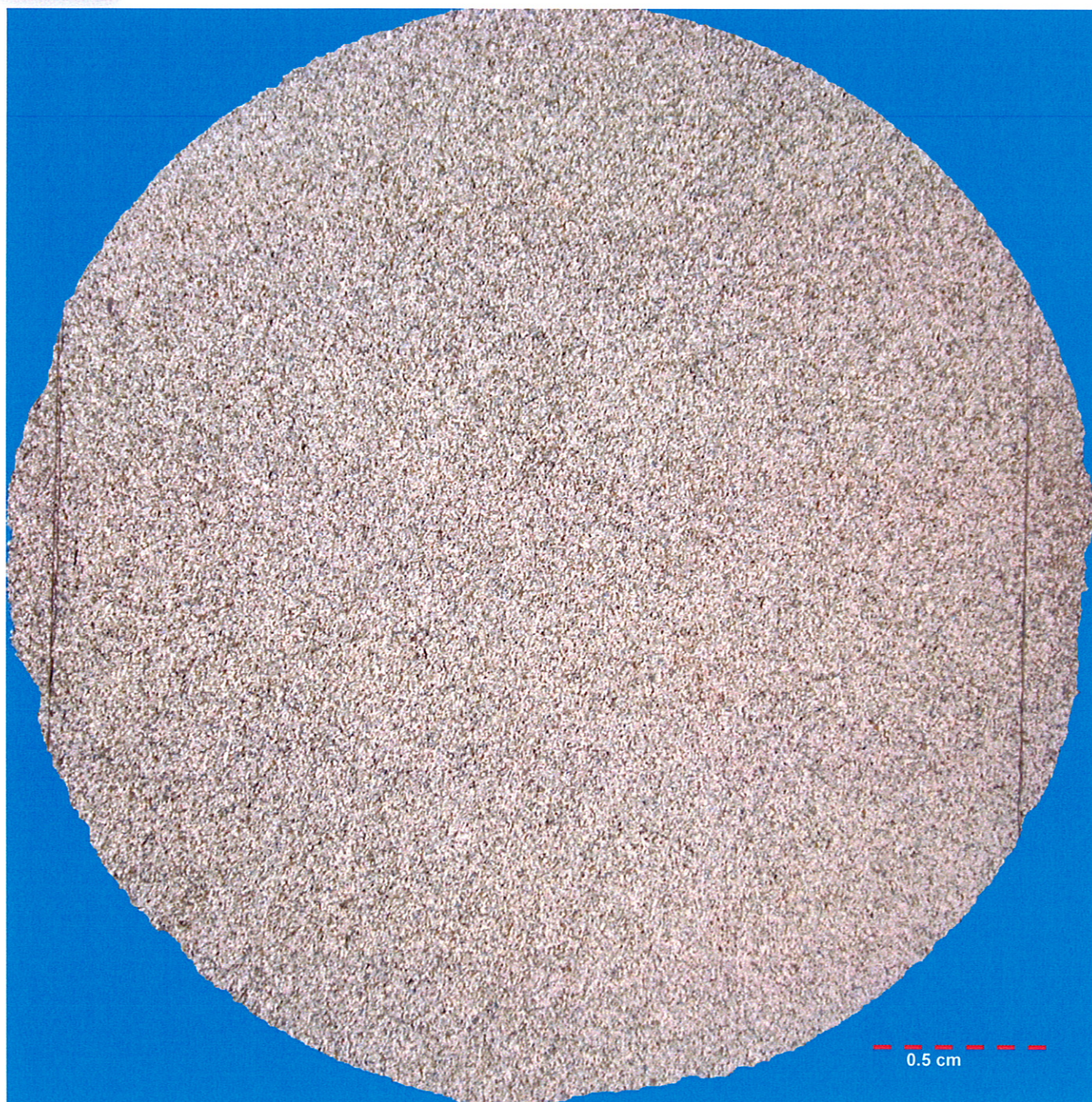
Canyon Creek No. 1 G-51 SP3



- A. Moderately well sorted, but locally poorly sorted silt to lower fine grained argillaceous litharenite. Some quartz grains are locally coarser grained (red arrows).



Canyon Creek No. 1 G-51 SP4



A. Moderately well sorted, silt to mid-fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP5



A. Well sorted, argillaceous laminated siltstone.



Canyon Creek No. 1 G-51 SP6



A. Moderately well sorted, silt to mid-very fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP7



- A. Moderately well sorted, silt to mid-very fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP8



- A. Moderately well sorted, silt to mid-very fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP9



- A. Moderately well sorted, silt to lower fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP10



- A. Moderately well sorted, silt to lower very fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP11



- A. Moderately well sorted, silt to lower very fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP12



- A. Moderately well sorted, silt to lower fine grained argillaceous litharenite.



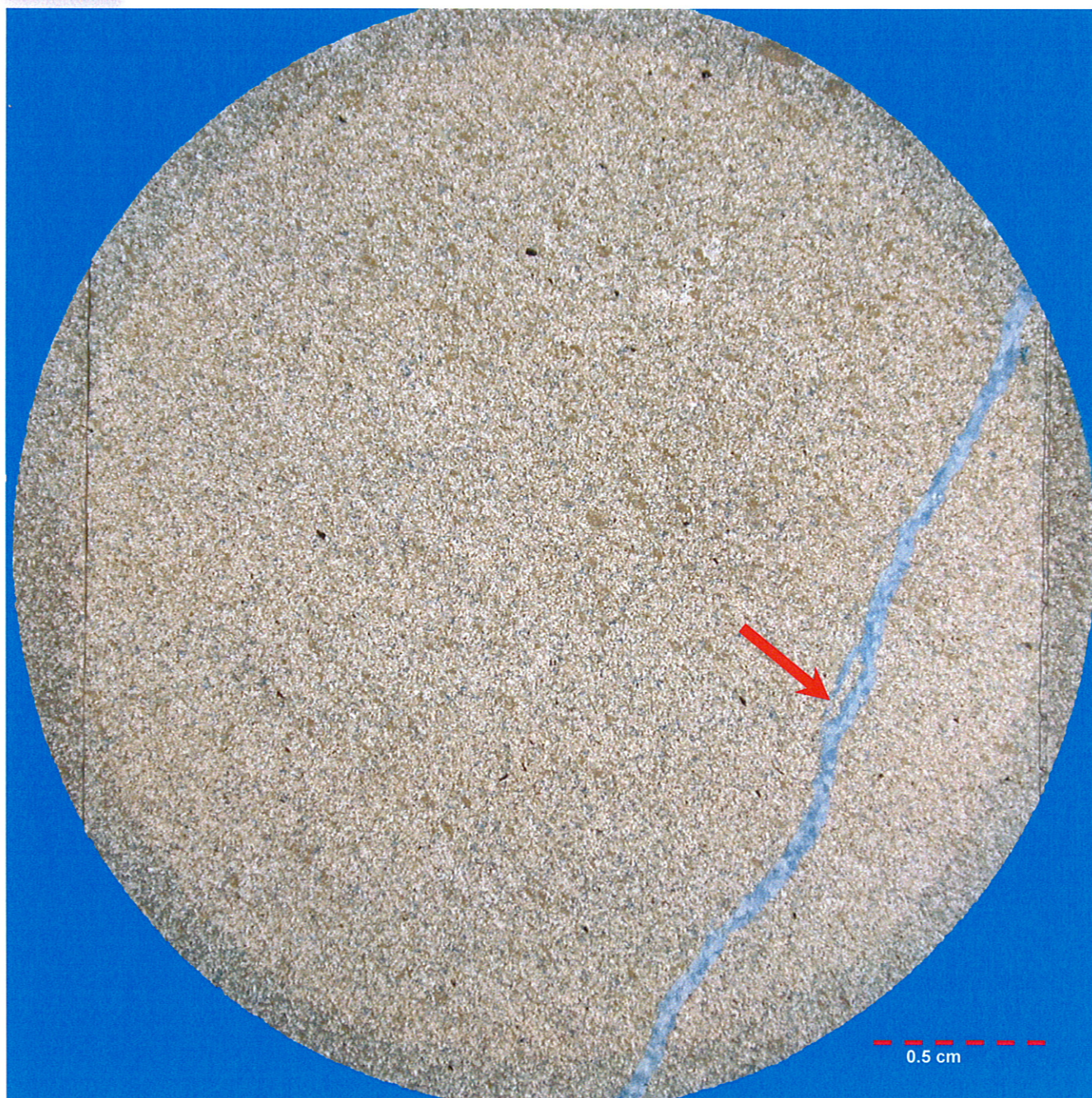
Canyon Creek No. 1 G-51 SP13



A. Moderately well sorted, silt to lower fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP14



- A. Moderately well sorted, silt to lower very fine grained argillaceous litharenite. Note ferroan carbonate healed microfracture (red arrow).



Canyon Creek No. 1 G-51

SP15



- A. Moderately well sorted, silt to lower fine grained argillaceous litharenite. Abundant siderite and ferroan carbonate cement severely reduce reservoir quality.



Canyon Creek No. 1 G-51 SP16



- A. Moderately well sorted, silt to mid-very fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP17



A. Moderately well sorted, silt to lower fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP18



A. Moderately well sorted, silt to mid-very fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP19



A. Moderately well sorted, silt to lower fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP20



A. Moderately well sorted, silt to lower very fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP21



A. Well sorted, argillaceous siltstone.



Canyon Creek No. 1 G-51 SP22



A. Moderately well sorted, silt to mid-very fine grained argillaceous litharenite



Canyon Creek No. 1 G-51 SP23



- A. Moderately well sorted, silt to upper very fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP24



A. Moderately well sorted, silt to mid-very fine grained argillaceous litharenite.



Canyon Creek No. 1 G-51 SP25



- A. Moderately well sorted, silt to lower very fine grained argillaceous litharenite.



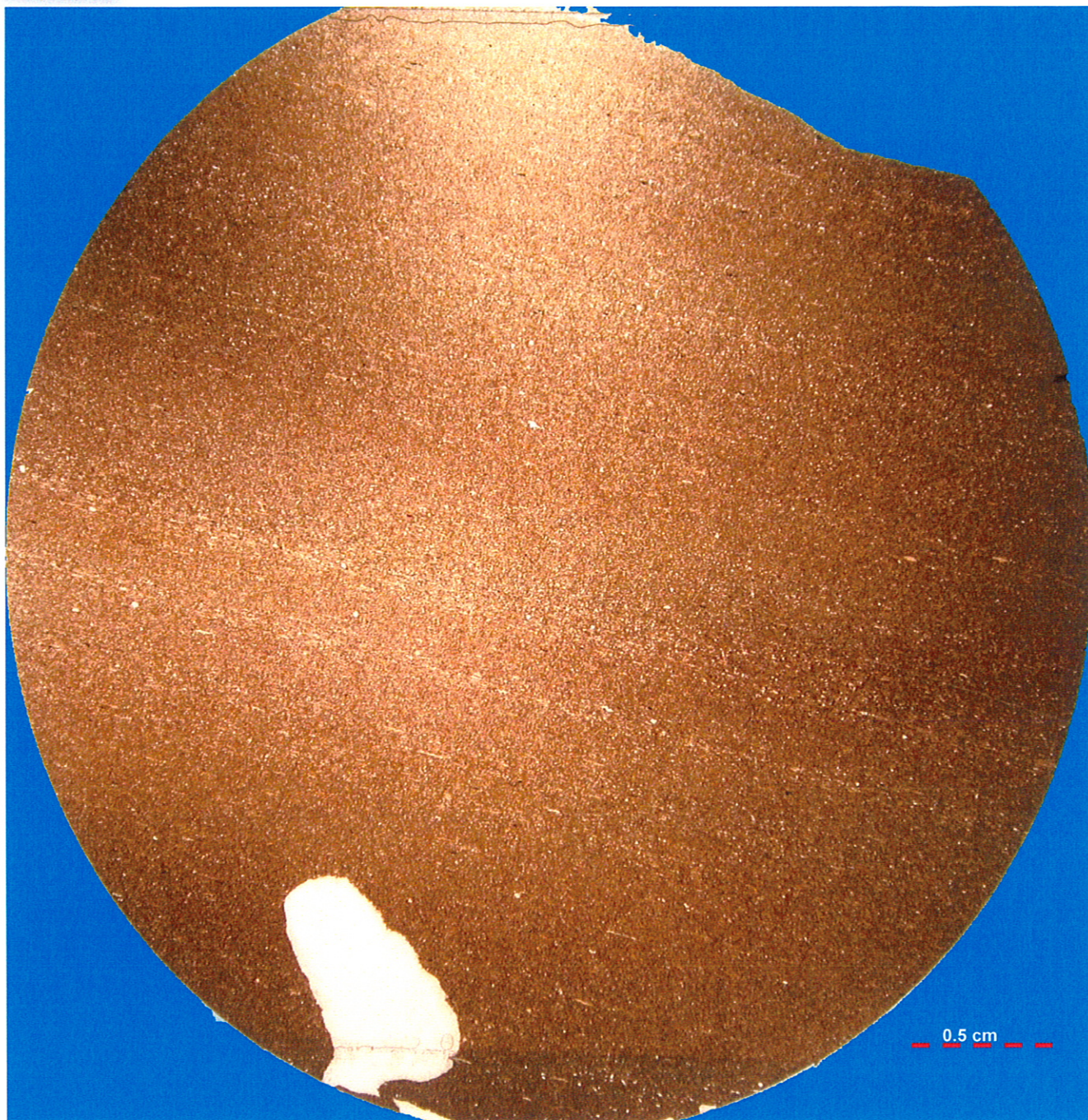
Canyon Creek No. 1 G-51 SP26



A. Moderately well sorted, silt to lower very fine grained argillaceous litharenite.



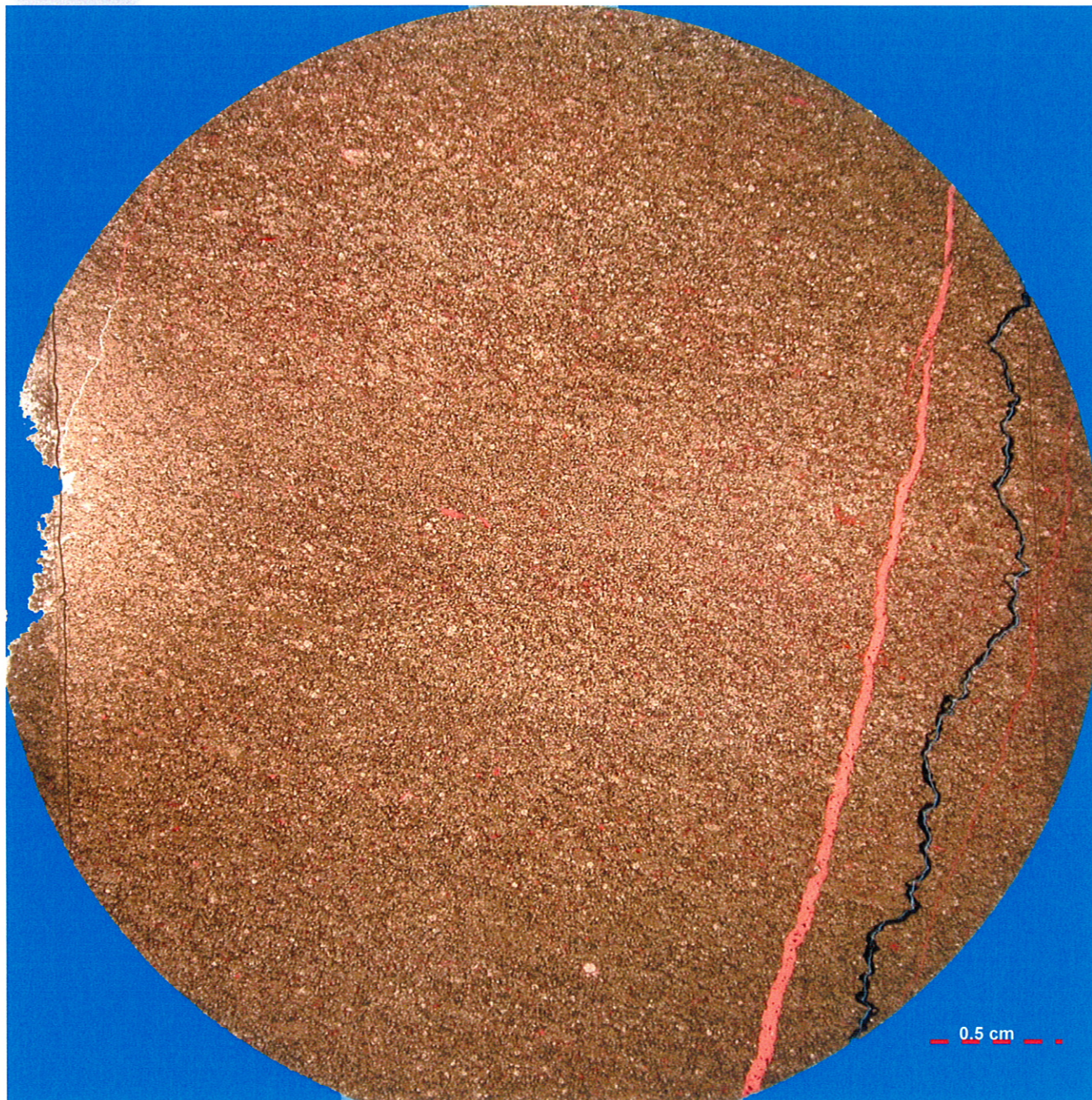
Canyon Creek No. 1 G-51 SP27



A. Vaguely laminated silty shale.



Canyon Creek No. 1 G-51 SP28



A. Very finely crystalline dolostone. Note stylolite and calcite healed microfracture.



Canyon Creek No. 1 G-51 SP29



A. Very finely crystalline dolostone.

Appendix III

PETRO-CANADA OIL AND GAS
IMP CANYON #1
Core #1

52139-08-4615-F01
Nov. 04, 2008

Top 1236.0 ft

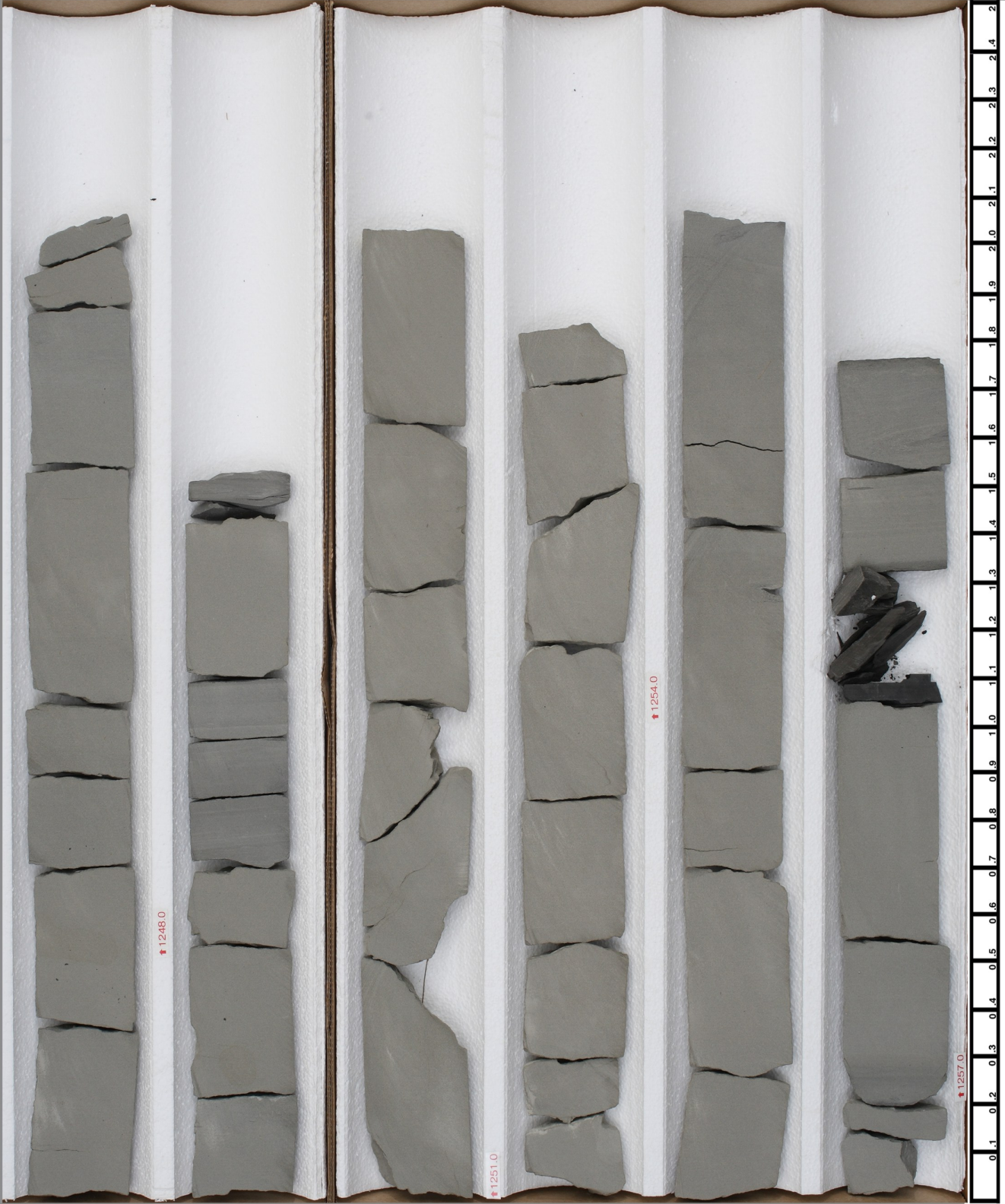
Bottom 1247.5 ft



PETRO-CANADA OIL AND GAS
IMP CANYON #1
Core #1

52139-08-4615-F02
Nov. 04, 2008

Top 1247.5 ft



Bottom 1258.6 ft

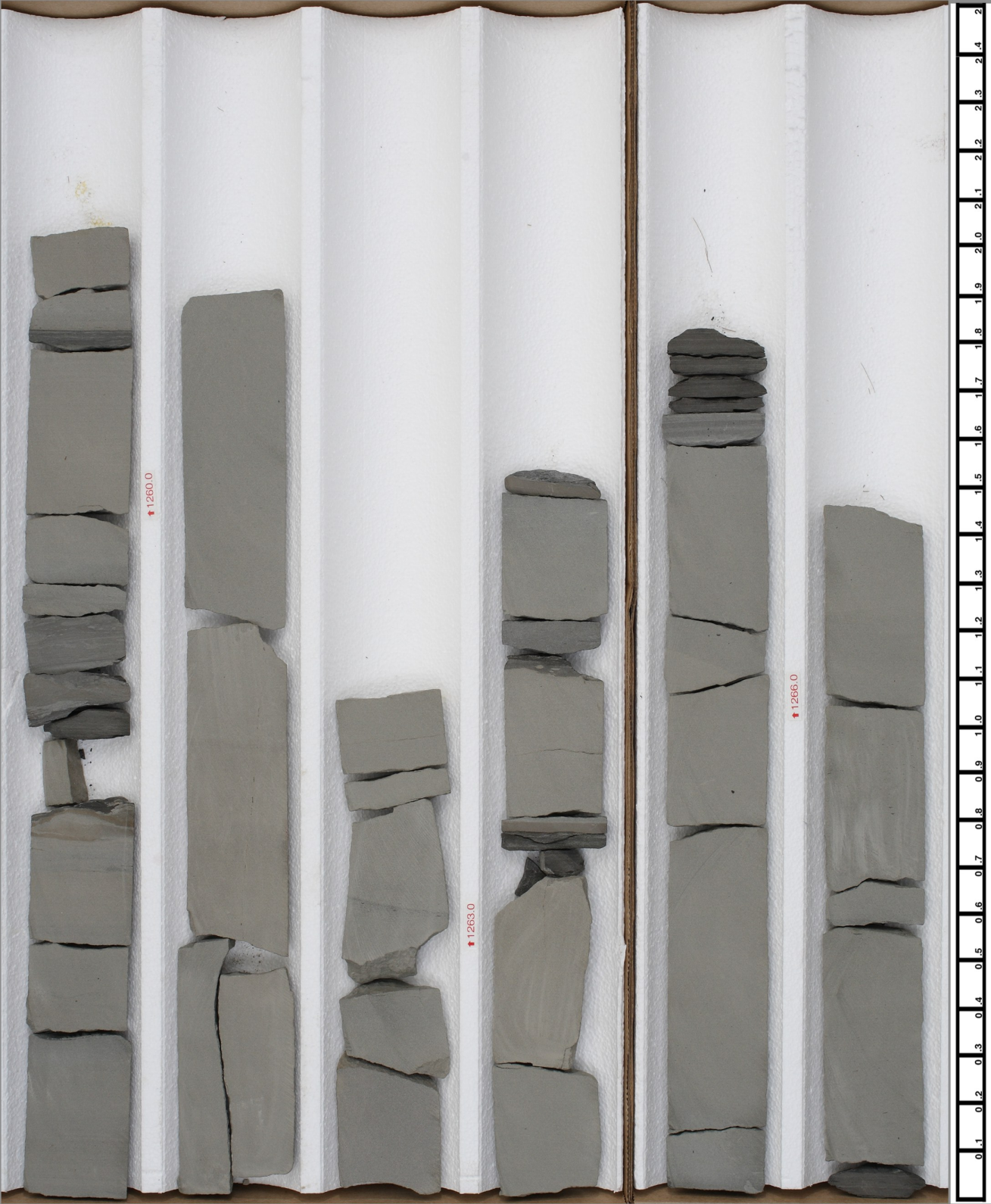


PETRO-CANADA OIL AND GAS
IMP CANYON #1
Core #1

52139-08-4615-F03
Nov. 04, 2008

Top 1258.6 ft

Bottom 1268.2 ft



PETRO-CANADA OIL AND GAS
IMP CANYON #1
Core #1

52139-08-4615-F04
Nov. 04, 2008

Top 1268.2 ft

Bottom 1279.6 ft



PETRO-CANADA OIL AND GAS
IMP CANYON #1
Core #1

52139-08-4615-F05
Nov. 04, 2008

Top 1279.6 ft

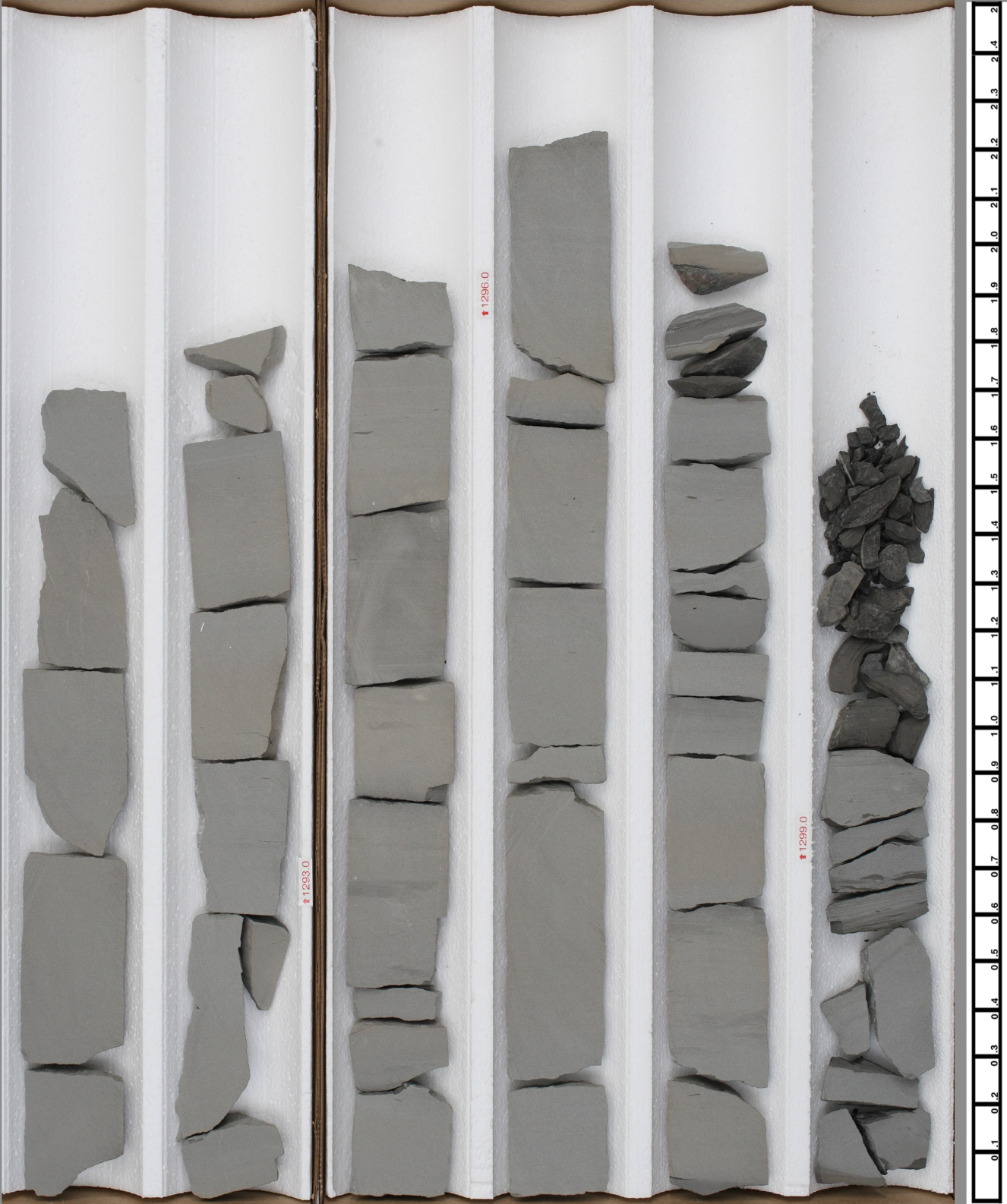
Bottom 1290.8 ft



PETRO-CANADA OIL AND GAS
IMP CANYON #1
Core #1

52139-08-4615-F06
Nov. 04, 2008

Top 1290.8 ft



Bottom 1301.7 ft



PETRO-CANADA OIL AND GAS
IMP CANYON #1
Core #1

52139-08-4615-F07
Nov. 04, 2008

Top 1301.7 ft



Bottom 1311.4 ft

PETRO-CANADA OIL AND GAS
IMP CANYON #1
Core #1

52139-08-4615-F08
Nov. 04, 2008

Top 1311.4 ft

Bottom 1317.5 ft



PETRO-CANADA OIL AND GAS
IMP CANYON #1
Core #2

52139-08-4615-F09
Nov. 04, 2008

Top 1390.0 ft



Bottom 1397.5 ft



PETRO-CANADA OIL AND GAS
IMP CANYON #1
Core #3

52139-08-4615-F10
Nov. 04, 2008

Top 1860.0 ft



Bottom 1867.5 ft



PETRO-CANADA OIL AND GAS
IMP CANYON #1
Core #4

52139-08-4615-F11
Nov. 04, 2008

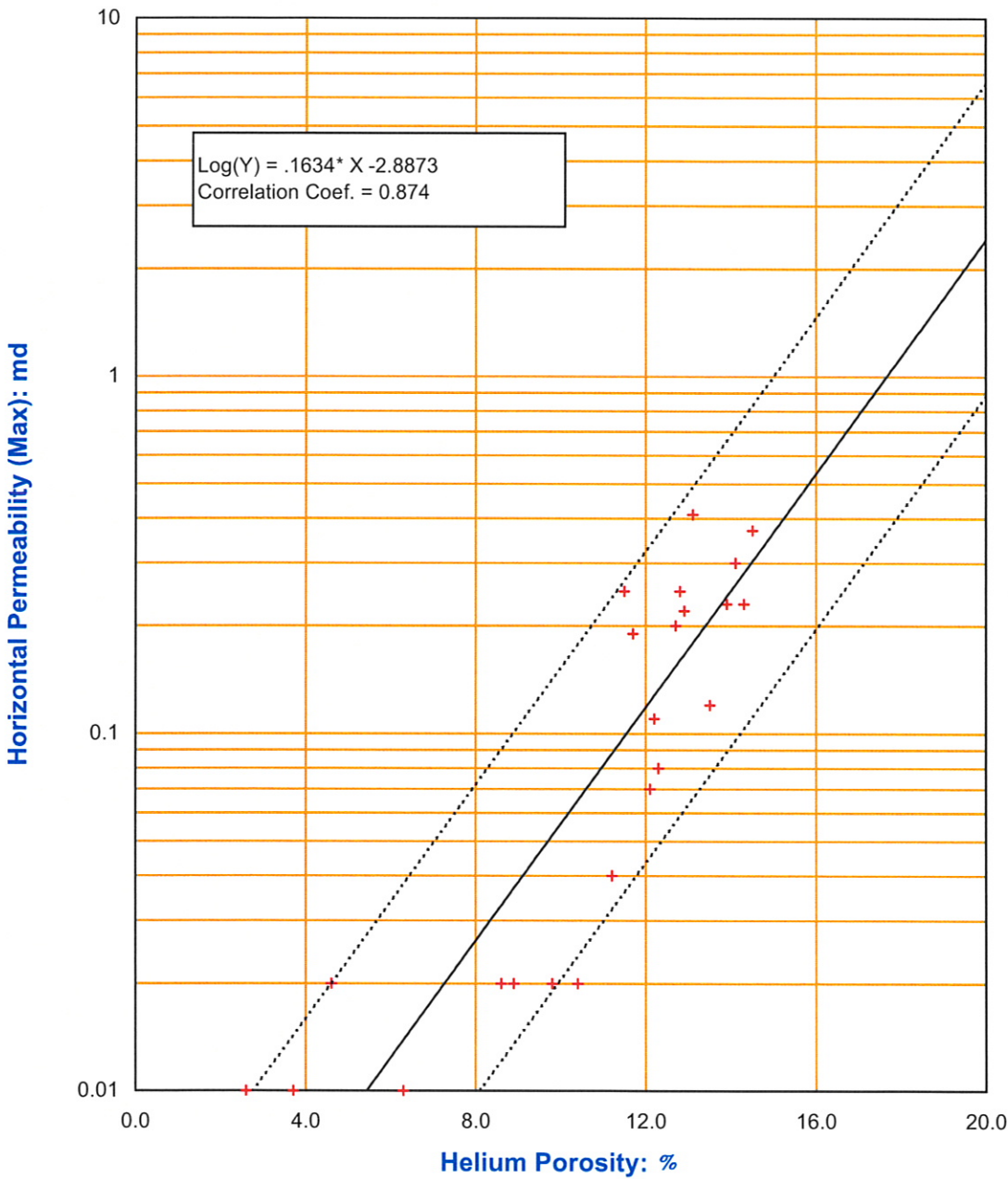
Top 2027.0 ft



Bottom 2034.0 ft



Permeability vs Porosity



PETRO CANADA OIL AND GAS

IMP CANYON #1

CANYON

DEVONIAN (1236.0 - 2066.0 ft)

Core Laboratories Canada Ltd.

- LEGEND -

CORE LABORATORIES

Company : PETRO CANADA OIL AND GAS
 Well : IMP CANYON #1
 Location :
 Province : NORTHWEST TERRITORIES

Field : CANYON
 Formation : DEVONIAN
 Coring Equip : DIAMOND
 Coring Fluid : WATER BASE MUD
 File No. : 52131-08-0284
 Date : 2008-10-28
 Analysts : DJB
 Core Dia : 2.8 inches

CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH ft	INTVL REP ft	PERMEABILITY (MAXIMUM) Kair md	CAPACITY (MAXIMUM) Kair md-ft	POROSITY (HELIUM) %	CAPACITY (HELIUM) ø-ft	BULK DENSITY gm/cc	GRAIN DENSITY gm/cc	DESCRIPTION
CORE NO.1 1236.0 - 1363.0 ft (CORE RECEIVED 81.5 ft) (24 BOXES)									
NA	1236.0- 1236.6	0.6							ss slty
SP 1	1236.6- 1237.0	0.4	0.23	0.09	14.3	5.7	2.32	2.71	ss vf f dol sid
NA	1237.0- 1240.9	3.9							ss slty
SP 2	1240.9- 1241.2	0.3	0.22	0.07	12.9	3.9	2.36	2.71	ss vf f dol sid
NA	1241.2- 1242.1	0.9							ss slty
SP 3	1242.1- 1242.5	0.4	0.20	0.08	12.7	5.1	2.37	2.72	ss vf f dol sid
NA	1242.5- 1244.9	2.4							ss slty
SP 4	1244.9- 1245.4	0.5	0.37	0.19	14.5	7.3	2.31	2.70	ss vf f dol sid
NA	1245.4- 1246.9	1.5							ss slty
SP 5	1246.9- 1247.5	0.6	0.25	0.15	11.5	6.9	2.38	2.69	ss vf f dol
NA	1247.5- 1250.2	2.7							ss slty
SP 6	1250.2- 1250.6	0.4	0.41	0.16	13.1	5.2	2.35	2.70	ss vf f dol
NA	1250.6- 1253.6	3.0							ss slty
SP 7	1253.6- 1254.2	0.6	0.30	0.18	14.1	8.5	2.33	2.71	ss vf f dol sid
NA	1254.2- 1258.1	3.9							ss slty
SP 8	1258.1- 1258.6	0.5	0.12	0.06	13.5	6.8	2.33	2.69	ss vf f dol sid
NA	1258.6- 1261.8	3.2							ss slty
SP 9	1261.8- 1262.5	0.7	0.25	0.17	12.8	9.0	2.36	2.71	ss vf f dol sid
NA	1262.5- 1265.0	2.5							ss slty

CORE LABORATORIES

Company : PETRO CANADA OIL AND GAS
 Well : IMP CANYON #1
 Location :
 Province : NORTHWEST TERRITORIES

Field : CANYON
 Formation : DEVONIAN
 Coring Equip : DIAMOND
 Coring Fluid : WATER BASE MUD
 File No. : 52131-08-0284
 Date : 2008-10-28
 Analysts : DJB
 Core Dia : 2.8 inches

CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH ft	INTVL REP ft	PERMEABILITY (MAXIMUM) Kair md	CAPACITY (MAXIMUM) Kair md-ft	POROSITY (HELIUM) %	CAPACITY (HELIUM) ø-ft	BULK DENSITY gm/cc	GRAIN DENSITY gm/cc	DESCRIPTION
SP 10	1265.0- 1265.8	0.8	0.23	0.18	13.9	11.1	2.32	2.70	ss vf f dol sid
NA	1265.8- 1268.2	2.4							ss slty
SP 11	1268.2- 1268.8	0.6	0.02	0.01	10.4	6.2	2.55	2.85	ss vf f dol sid
NA	1268.8- 1271.7	2.9							ss slty
SP 12	1271.7- 1272.7	1.0	0.11	0.11	12.2	12.2	2.41	2.75	ss vf f dol sid
NA	1272.7- 1275.9	3.2							ss slty
SP 13	1275.9- 1276.6	0.7	0.19	0.13	11.7	8.2	2.40	2.72	ss vf f dol sid
NA	1276.6- 1279.6	3.0							ss slty
SP 14	1279.6- 1280.3	0.7	0.02	0.01	8.9	6.2	2.67	2.93	ss vf f dol sid lam
NA	1280.3- 1283.8	3.5							ss slty
SP 15	1283.8- 1284.2	0.4	0.08	0.03	12.3	4.9	2.37	2.70	ss vf f dol sid
NA	1284.2- 1288.1	3.9							ss slty
SP 16	1288.1- 1288.7	0.6	0.07	0.04	12.1	7.3	2.37	2.69	ss vf f dol sid
NA	1288.7- 1290.8	2.1							ss slty
SP 17	1290.8- 1291.5	0.7	0.04	0.03	11.2	7.8	2.40	2.70	ss vf f dol sid
NA	1291.5- 1293.8	2.3							ss slty
SP 18	1293.8- 1294.2	0.4	<0.01		8.6	3.4	2.56	2.80	ss vf f dol sid
NA	1294.2- 1296.4	2.2							ss slty
SP 19	1296.4- 1297.0	0.6	0.02	0.01	9.8	5.9	2.48	2.75	ss vf f dol sid
NA	1297.0- 1300.2	3.2							ss slty
SP 20	1300.2- 1300.7	0.5	0.02	0.01	8.6	4.3	2.46	2.69	ss vf f dol sid

CORE LABORATORIES

Company : PETRO CANADA OIL AND GAS
Well : IMP CANYON #1
Location :
Province : NORTHWEST TERRITORIES

Field : CANYON
Formation : DEVONIAN
Coring Equip : DIAMOND
Coring Fluid : WATER BASE MUD
Core Dia : 2.8 inches

File No. : 52131-08-0284

Date : 2008-10-28

Analysts : DJB

CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH ft	INTVL REP ft	PERMEABILITY (MAXIMUM) Kair md	CAPACITY (MAXIMUM) Kair md-ft	POROSITY (HELIUM) %	CAPACITY (HELIUM) ø-ft	BULK DENSITY gm/cc	GRAIN DENSITY gm/cc	DESCRIPTION
NA	1300.7- 1302.7	2.0							ss slty
SP	21 1302.7- 1303.4	0.7	0.01	0.01	6.3	4.4	2.51	2.68	ss vf f dol sid
-	1303.4- 1308.8	5.4							sh ssdy
SP	22 1308.8- 1309.1	0.3	0.02	0.01	4.6	1.4	2.60	2.72	ss vf f dol sid
-	1309.1- 1313.0	3.9							sh
SP	23 1313.0- 1313.4	0.4	0.01	0.00	3.7	1.5	2.66	2.76	ss vf f dol sid
NA	1313.4- 1315.3	1.9							ss slty
SP	24 1315.3- 1315.7	0.4	<0.01		2.1	0.8	2.74	2.80	ss vf f dol sid
NA	1315.7- 1317.0	1.3							ss slty
SP	25 1317.0- 1317.5	0.5	<0.01		2.5	1.3	2.78	2.85	ss vf f dol sid
LC	1317.5- 1363.0	45.5							Lost core
DR	1363.0- 1390.0	27.0							Drilled Interval
CORE NO.2 1390.0 - 1400.0 ft (CORE RECEIVED 7.5 ft) (2 BOXES)									
-	1390.0- 1393.9	3.9							sh
SP	26 1393.9- 1394.3	0.4	0.01	0.00	2.6	1.0	2.70	2.77	ss vf f dol sid
-	1394.3- 1397.5	3.2							sh
LC	1397.5- 1400.0	2.5							Lost core
DR	1400.0- 1860.0	460.0							Drilled Interval

CORE LABORATORIES

Company : PETRO CANADA OIL AND GAS
 Well : IMP CANYON #1
 Location :
 Province : NORTHWEST TERRITORIES

Field : CANYON
 Formation : DEVONIAN
 Coring Equip : DIAMOND
 Coring Fluid : WATER BASE MUD
 File No. : 52131-08-0284
 Date : 2008-10-28
 Analysts : DJB
 Core Dia : 2.8 inches

CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH ft	INTVL REP ft	PERMEABILITY (MAXIMUM) Kair md	CAPACITY (MAXIMUM) Kair md-ft	POROSITY (HELIUM) %	CAPACITY (HELIUM) ø-ft	BULK DENSITY gm/cc	GRAIN DENSITY gm/cc	DESCRIPTION
CORE NO.3 1860.0 - 1874.0 ft (CORE RECEIVED 8.0 ft) (3 BOXES)									
SP	27	1860.0- 1860.6	0.6	<0.01	0.2	0.1	2.45	2.45	sh carb
NA		1860.6- 1864.5	3.9						sh
SP	28	1864.5- 1865.2	0.7	<0.01	1.5	1.0	2.68	2.72	ss vf f calc dol lam
SP	29	1865.2- 1865.8	0.6	<0.01	0.4	0.2	2.57	2.58	ss vf shy calc
-		1865.8- 1868.0	2.2						sh
LC		1868.0- 1874.0	6.0						Lost core
DR		1874.0- 2027.0	153.0						Drilled Interval
CORE NO.4 2027.0 - 2066.0 ft (CORE RECEIVED 7.0 ft) (2 BOXES)									
-		2027.0- 2034.0	7.0						Is shy
LC		2034.0- 2066.0	32.0						Lost core

CORE SPECTRAL GAMMA

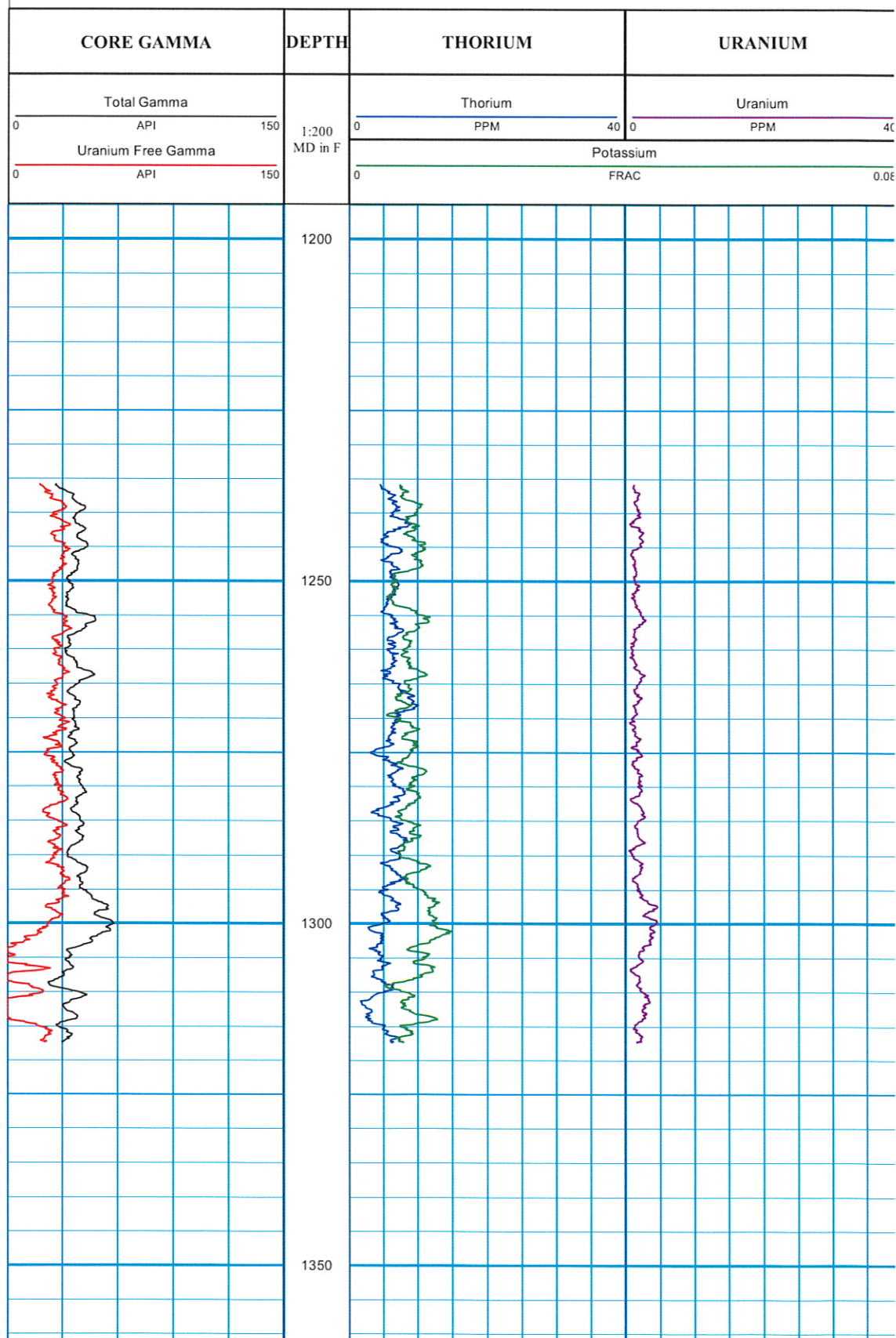
PETRO CANADA OIL AND GAS

IMP CANYON # 1

DEVONIAN (1236.0 - 2066.0 ft)

6 inch - 100 feet

Core Laboratories Canada Ltd.



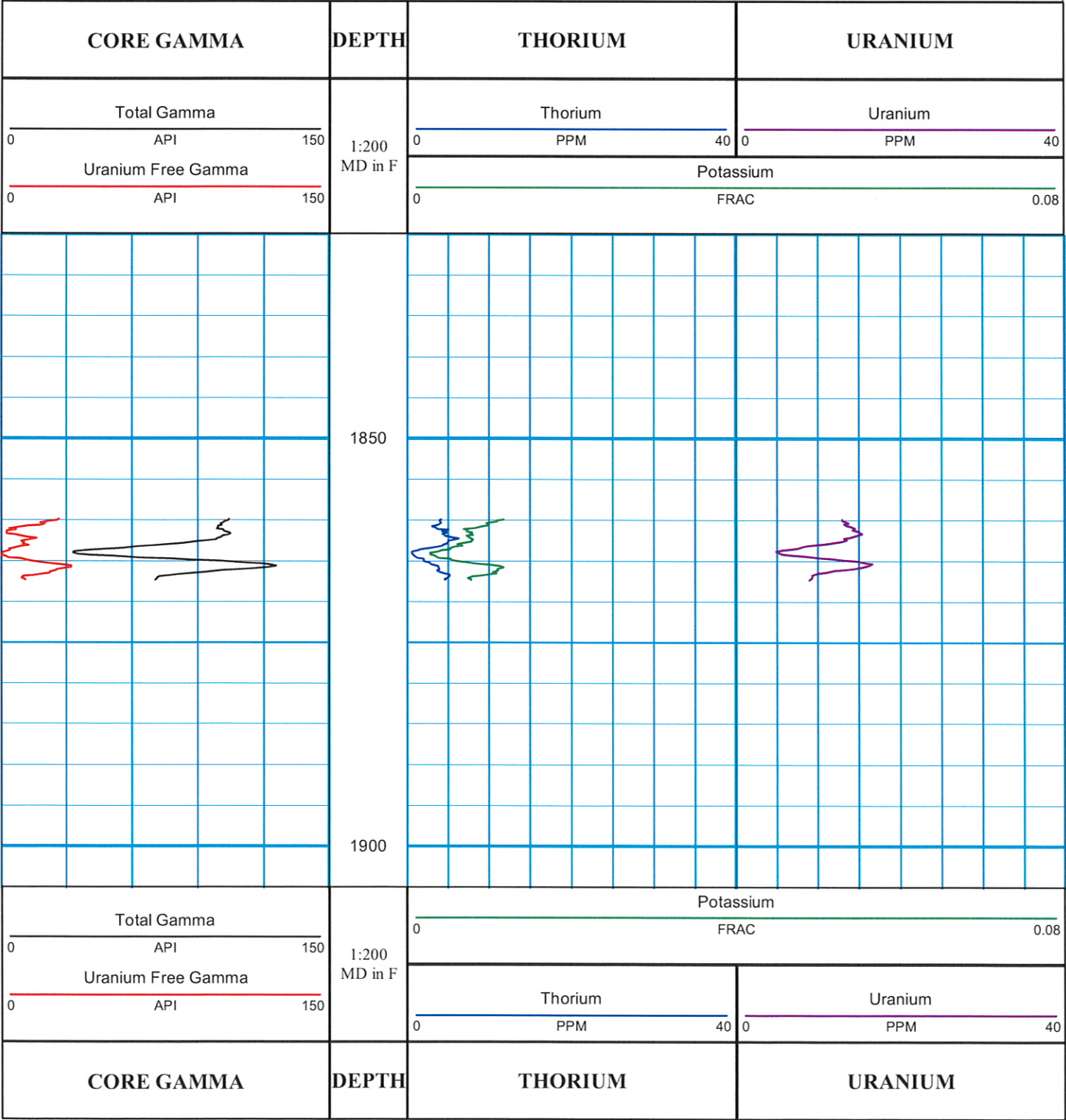
CORE SPECTRAL GAMMA

PETRO CANADA OIL AND GAS IMP CANYON # 1

DEVONIAN (1236.0 - 2066.0 ft)

6 inch - 100 feet

Core Laboratories Canada Ltd.



CORE SPECTRAL GAMMA

PETRO CANADA OIL AND GAS

IMP CANYON # 1

DEVONIAN (1236.0 - 2066.0 ft)

6 inch - 100 feet

Core Laboratories Canada Ltd.

CORE GAMMA	DEPTH	THORIUM	URANIUM
Total Gamma 0150 API Uranium Free Gamma 0150 API	1:200 MD in F	Thorium 040 PPM Potassium 00.08 FRAC	Uranium 040 PPM
	2000		
	2050		
Total Gamma 0150 API Uranium Free Gamma 0150 API	1:200 MD in F	Potassium 00.08 FRAC Thorium 040 PPM Uranium 040 PPM	
CORE GAMMA	DEPTH	THORIUM	URANIUM

Depth ft	Potassium frac	Uranium ppm	Thorium ppm	Total api	Uranium_free api
1236.00	0.0075	1.27	4.57	26.5	17.9
1236.13	0.0074	1.21	4.67	26.2	17.9
1236.27	0.0078	1.17	4.67	27.0	19.0
1236.40	0.0074	1.16	4.77	27.5	19.6
1236.53	0.0076	1.20	4.77	28.2	20.1
1236.66	0.0079	1.39	5.37	29.7	20.3
1236.80	0.0084	1.38	5.48	31.1	21.8
1236.93	0.0087	1.32	5.99	32.1	23.4
1237.06	0.0082	1.75	5.89	32.3	21.0
1237.19	0.0078	2.06	5.70	33.4	20.4
1237.33	0.0078	2.10	6.40	35.9	22.8
1237.46	0.0080	1.85	6.81	36.3	24.8
1237.59	0.0075	1.89	6.51	35.6	23.9
1237.72	0.0077	1.77	6.41	35.4	24.5
1237.86	0.0077	1.77	6.11	35.3	24.4
1237.99	0.0081	1.93	5.71	35.1	23.3
1238.12	0.0082	1.81	6.11	35.5	24.4
1238.25	0.0088	1.68	6.51	36.2	25.9
1238.39	0.0095	1.26	7.01	36.9	29.1
1238.52	0.0096	1.25	6.31	37.3	29.7
1238.65	0.0103	1.41	6.31	38.2	29.5
1238.78	0.0107	1.41	6.71	39.7	31.1
1238.92	0.0103	1.51	6.91	39.4	30.1
1239.05	0.0105	1.73	6.81	41.9	31.3
1239.18	0.0105	1.71	7.42	42.2	31.8
1239.31	0.0103	1.70	7.11	42.5	32.1
1239.45	0.0101	1.73	6.81	42.4	31.7
1239.58	0.0098	2.03	6.71	42.1	29.7
1239.71	0.0100	1.75	7.42	41.4	30.7
1239.84	0.0100	1.96	6.61	40.1	28.2
1239.98	0.0098	1.97	6.51	39.3	27.4
1240.11	0.0097	2.21	6.21	38.8	25.4
1240.24	0.0095	2.10	6.42	37.3	24.6
1240.37	0.0098	1.76	6.52	37.6	27.0
1240.51	0.0090	2.11	6.02	36.9	24.4
1240.64	0.0083	2.21	6.62	36.6	23.5
1240.77	0.0084	1.82	7.12	36.8	26.0
1240.90	0.0088	1.51	7.32	35.6	26.5
1241.04	0.0084	1.41	7.93	36.6	28.2
1241.17	0.0082	1.35	8.43	36.9	28.8
1241.30	0.0086	1.02	8.43	36.5	30.4
1241.43	0.0085	1.24	8.33	37.0	29.7
1241.57	0.0089	0.85	8.13	36.8	31.8
1241.70	0.0097	0.70	9.14	37.4	33.2
1241.83	0.0097	0.81	8.84	39.0	34.2
1241.96	0.0103	0.88	8.64	39.3	34.2
1242.10	0.0093	1.51	8.54	41.2	32.5
1242.23	0.0092	2.10	7.23	41.2	29.1
1242.36	0.0098	1.98	7.64	42.4	31.0
1242.49	0.0096	2.22	6.53	42.7	29.9

1242.63	0.0097	1.94	6.83	42.4	31.2
1242.76	0.0090	2.20	6.73	41.6	28.9
1242.89	0.0084	2.53	5.52	40.7	26.1
1243.02	0.0084	2.72	5.72	40.2	24.4
1243.16	0.0080	2.42	5.42	38.6	24.4
1243.29	0.0086	2.50	5.02	38.6	23.8
1243.42	0.0086	2.21	5.42	37.8	24.8
1243.55	0.0091	2.09	5.82	38.6	26.4
1243.69	0.0095	2.07	5.22	37.6	25.6
1243.82	0.0095	2.29	5.12	38.6	25.4
1243.95	0.0097	2.37	4.72	39.3	25.7
1244.08	0.0092	2.47	4.92	39.8	25.7
1244.22	0.0100	2.65	4.83	41.2	26.1
1244.35	0.0110	2.49	4.73	42.8	28.6
1244.48	0.0111	2.19	5.23	43.0	30.5
1244.61	0.0111	2.14	5.73	43.9	31.7
1244.75	0.0102	2.14	5.33	43.3	31.1
1244.88	0.0105	2.35	6.03	44.1	30.5
1245.01	0.0107	2.27	6.43	43.7	30.6
1245.14	0.0111	1.85	7.23	43.5	32.7
1245.28	0.0107	1.84	7.33	42.2	31.4
1245.41	0.0112	1.26	7.73	41.7	34.3
1245.54	0.0109	1.08	7.53	39.9	33.5
1245.67	0.0105	1.09	7.83	39.3	32.9
1245.81	0.0101	1.08	7.53	37.2	30.8
1245.94	0.0096	0.92	7.42	35.9	30.4
1246.07	0.0098	0.82	6.12	35.8	31.0
1246.20	0.0091	0.78	6.12	35.0	30.4
1246.34	0.0094	0.92	5.92	35.6	30.1
1246.47	0.0099	1.20	5.62	36.4	29.4
1246.60	0.0098	1.06	5.82	37.3	31.1
1246.73	0.0100	1.11	5.32	37.4	30.9
1246.87	0.0095	1.36	5.32	36.9	28.9
1247.00	0.0104	1.38	4.72	38.1	30.0
1247.13	0.0106	1.47	5.02	39.0	30.4
1247.26	0.0103	1.35	6.12	38.2	30.3
1247.40	0.0105	1.40	6.43	38.5	30.3
1247.53	0.0105	1.47	6.22	38.7	30.1
1247.66	0.0107	1.14	6.22	38.8	32.1
1247.79	0.0108	1.24	6.42	38.2	30.9
1247.93	0.0104	1.43	6.52	38.2	29.6
1248.06	0.0105	1.26	7.02	38.0	30.5
1248.19	0.0098	1.62	7.12	37.8	28.2
1248.32	0.0094	1.42	7.42	38.3	29.7
1248.46	0.0090	1.47	6.21	38.1	29.2
1248.59	0.0087	1.59	6.21	37.8	28.2
1248.72	0.0080	1.58	5.91	36.4	26.9
1248.85	0.0073	1.55	6.21	36.8	27.4
1248.99	0.0064	1.57	6.01	34.7	25.1
1249.12	0.0066	1.55	6.21	35.3	25.9
1249.25	0.0067	1.61	6.41	34.9	25.0
1249.38	0.0068	1.22	6.21	33.4	25.8

1249.52	0.0065	1.20	6.00	32.9	25.5
1249.65	0.0065	1.31	6.51	32.7	24.5
1249.78	0.0068	1.24	6.40	32.2	24.5
1249.91	0.0063	1.34	7.00	32.9	24.4
1250.05	0.0071	1.32	6.80	33.5	25.2
1250.18	0.0070	1.62	7.10	34.4	24.2
1250.31	0.0067	1.38	7.00	33.3	24.6
1250.44	0.0064	1.44	7.20	34.0	24.9
1250.58	0.0061	1.92	7.30	35.7	23.5
1250.71	0.0064	2.10	7.20	35.5	22.2
1250.84	0.0068	1.78	7.10	35.4	24.2
1250.97	0.0063	1.71	7.00	35.2	24.4
1251.11	0.0072	1.57	6.80	36.0	26.1
1251.24	0.0067	1.97	6.50	35.3	23.0
1251.37	0.0068	1.55	6.61	34.3	24.6
1251.50	0.0064	1.44	6.81	34.0	25.0
1251.64	0.0068	1.54	6.31	33.9	24.3
1251.77	0.0065	1.16	6.71	32.3	25.1
1251.90	0.0063	0.99	6.41	32.2	26.2
1252.03	0.0059	1.19	6.81	32.5	25.2
1252.17	0.0063	1.30	5.81	33.1	25.1
1252.30	0.0055	1.30	6.21	32.6	24.7
1252.43	0.0057	0.88	6.31	31.8	26.5
1252.57	0.0061	1.15	6.11	33.3	26.4
1252.70	0.0060	1.21	5.51	32.7	25.4
1252.83	0.0062	1.47	5.81	33.4	24.5
1252.96	0.0063	1.35	5.71	33.2	25.0
1253.10	0.0064	1.37	5.62	32.2	24.1
1253.23	0.0066	1.43	5.42	32.4	23.9
1253.36	0.0063	1.44	5.72	31.9	23.5
1253.49	0.0066	1.59	5.42	32.1	22.9
1253.63	0.0070	1.79	5.53	32.8	22.5
1253.76	0.0075	1.48	5.33	31.7	23.2
1253.89	0.0081	1.56	5.33	32.7	23.8
1254.02	0.0089	1.76	5.03	34.6	24.7
1254.16	0.0090	1.92	5.13	34.9	24.2
1254.29	0.0090	2.08	5.13	36.1	24.5
1254.42	0.0098	1.98	4.93	37.1	26.1
1254.55	0.0099	2.21	4.73	37.5	25.4
1254.69	0.0096	2.23	4.94	37.4	25.1
1254.82	0.0098	2.17	5.44	38.7	26.8
1254.95	0.0099	2.23	6.04	42.8	30.3
1255.08	0.0110	2.39	6.43	44.6	30.8
1255.22	0.0114	2.63	6.12	46.3	30.8
1255.35	0.0118	2.55	6.12	47.9	32.8
1255.48	0.0108	2.59	6.52	47.6	32.2
1255.61	0.0109	2.72	6.82	47.7	31.4
1255.75	0.0116	2.92	6.52	48.0	30.5
1255.88	0.0115	2.87	6.62	48.3	31.1
1256.01	0.0117	2.52	7.12	48.1	33.0
1256.14	0.0115	2.54	6.62	46.6	31.4
1256.28	0.0104	2.52	6.02	45.1	30.1

1256.41	0.0097	1.99	6.73	43.4	31.7
1256.54	0.0100	2.09	6.93	42.4	30.3
1256.67	0.0101	2.12	6.63	42.4	30.2
1256.81	0.0102	1.74	7.14	43.3	33.4
1256.94	0.0102	1.59	6.64	42.4	33.4
1257.07	0.0101	1.22	7.74	42.1	35.1
1257.20	0.0098	1.24	7.94	41.0	34.0
1257.34	0.0096	1.45	7.94	40.4	32.1
1257.47	0.0087	1.35	7.74	39.1	31.4
1257.60	0.0083	1.29	7.14	37.9	30.6
1257.73	0.0084	1.17	7.04	37.1	30.4
1257.87	0.0086	1.26	7.04	36.7	29.6
1258.00	0.0080	1.25	6.74	34.6	27.5
1258.13	0.0080	1.16	6.44	32.9	26.4
1258.26	0.0078	1.43	5.83	33.0	25.0
1258.40	0.0080	1.48	5.74	32.7	24.4
1258.53	0.0080	1.65	5.64	33.7	24.4
1258.66	0.0087	1.38	5.54	33.5	25.8
1258.79	0.0092	1.24	6.44	34.4	27.5
1258.93	0.0088	1.36	6.44	33.6	26.0
1259.06	0.0090	0.82	6.84	33.5	28.9
1259.19	0.0090	1.19	5.74	33.5	26.8
1259.32	0.0088	1.19	6.14	34.6	28.0
1259.46	0.0087	1.19	6.54	34.5	27.9
1259.59	0.0090	0.78	6.84	34.3	29.9
1259.72	0.0086	0.83	6.74	34.0	29.2
1259.85	0.0084	0.86	6.53	33.2	28.3
1259.99	0.0081	1.05	5.53	31.3	25.3
1260.12	0.0078	1.05	5.52	31.6	25.5
1260.25	0.0081	1.00	5.92	31.5	25.6
1260.38	0.0086	1.09	5.92	32.6	26.2
1260.52	0.0082	0.87	6.02	31.6	26.4
1260.65	0.0080	0.86	7.22	31.7	26.5
1260.78	0.0077	1.20	6.41	32.2	24.9
1260.91	0.0076	1.04	6.31	32.4	26.0
1261.05	0.0078	0.99	6.41	33.5	27.3
1261.18	0.0083	0.70	6.40	34.2	29.8
1261.31	0.0089	1.00	6.70	35.9	29.5
1261.44	0.0088	1.17	6.30	36.6	29.1
1261.58	0.0086	1.19	6.50	36.0	28.5
1261.71	0.0085	1.34	7.00	36.5	27.9
1261.84	0.0084	1.36	6.80	37.0	28.3
1261.97	0.0089	1.46	6.60	38.1	28.8
1262.11	0.0089	1.44	6.40	37.2	28.1
1262.24	0.0086	1.63	6.21	38.0	27.9
1262.37	0.0090	1.60	6.51	37.8	28.0
1262.50	0.0088	1.45	6.72	38.2	29.4
1262.64	0.0091	1.18	6.22	37.7	30.6
1262.77	0.0087	1.30	6.22	37.9	30.2
1262.90	0.0099	1.47	5.82	40.2	31.4
1263.03	0.0099	1.79	5.52	40.8	30.2
1263.17	0.0102	2.04	4.71	42.3	30.1

1263.30	0.0103	2.08	5.91	44.7	32.2
1263.43	0.0110	2.06	6.01	46.4	33.8
1263.56	0.0109	2.26	6.11	46.0	32.2
1263.70	0.0113	2.56	5.20	46.8	31.0
1263.83	0.0113	2.86	5.10	47.8	30.1
1263.96	0.0111	2.72	5.70	47.1	30.2
1264.09	0.0102	2.47	5.30	45.6	30.2
1264.23	0.0101	2.18	4.90	43.8	30.2
1264.36	0.0094	2.31	5.60	42.6	28.2
1264.49	0.0090	2.27	6.00	41.1	27.0
1264.62	0.0081	2.25	6.61	39.7	25.7
1264.76	0.0081	2.07	6.31	39.0	26.0
1264.89	0.0082	2.07	6.30	39.7	26.7
1265.02	0.0081	1.94	7.51	39.1	26.8
1265.15	0.0087	1.82	7.51	38.5	27.0
1265.29	0.0088	1.59	7.31	37.2	27.1
1265.42	0.0087	1.68	7.30	36.7	26.0
1265.55	0.0086	1.78	7.10	36.0	24.6
1265.68	0.0087	1.51	7.30	34.8	25.1
1265.82	0.0092	1.19	7.20	34.3	26.7
1265.95	0.0090	1.33	7.50	33.9	25.4
1266.08	0.0088	1.20	8.31	33.5	25.9
1266.21	0.0085	1.45	7.51	32.8	23.7
1266.35	0.0078	1.30	8.11	32.6	24.4
1266.48	0.0078	1.54	8.62	33.6	24.0
1266.61	0.0070	1.97	8.82	33.6	21.4
1266.74	0.0076	1.62	9.42	35.4	25.4
1266.88	0.0072	1.89	9.53	35.9	24.2
1267.01	0.0068	2.28	8.62	36.7	22.7
1267.14	0.0068	2.41	8.52	37.3	22.5
1267.27	0.0070	2.18	8.82	37.3	23.9
1267.41	0.0069	2.06	9.12	36.7	23.9
1267.54	0.0077	1.75	9.32	38.2	27.3
1267.67	0.0077	2.06	9.52	39.4	26.5
1267.80	0.0082	1.84	9.22	39.7	28.2
1267.94	0.0083	1.69	9.12	39.4	28.7
1268.07	0.0086	1.47	9.62	39.4	30.2
1268.20	0.0092	1.13	10.12	39.3	32.3
1268.33	0.0088	1.20	9.82	38.0	30.5
1268.47	0.0087	1.34	9.72	37.7	29.5
1268.60	0.0083	1.34	9.32	37.9	29.7
1268.73	0.0074	1.44	9.53	36.9	28.1
1268.87	0.0070	1.52	8.83	35.5	26.4
1269.00	0.0067	1.48	8.03	35.7	26.9
1269.13	0.0071	1.43	8.13	36.6	28.2
1269.26	0.0068	1.56	6.93	36.2	27.1
1269.40	0.0060	1.79	6.63	36.2	25.7
1269.53	0.0058	1.65	7.23	36.0	26.4
1269.66	0.0055	1.37	7.53	36.2	28.3
1269.79	0.0060	1.23	6.93	36.2	29.1
1269.93	0.0068	1.18	6.93	36.3	29.5
1270.06	0.0072	0.93	7.34	36.1	30.8

1270.19	0.0075	0.86	7.64	36.8	31.8
1270.32	0.0075	1.00	6.73	35.1	29.4
1270.46	0.0069	1.34	6.63	36.1	28.3
1270.59	0.0078	0.93	7.03	36.2	30.8
1270.72	0.0090	0.60	7.03	37.4	34.0
1270.85	0.0090	0.71	6.32	36.9	32.7
1270.99	0.0090	1.01	6.62	37.1	31.0
1271.12	0.0089	1.30	6.61	37.3	29.4
1271.25	0.0094	1.41	6.31	37.5	28.8
1271.38	0.0091	1.48	6.11	36.7	27.5
1271.52	0.0098	1.28	6.40	37.9	29.9
1271.65	0.0103	1.03	6.80	38.7	32.2
1271.78	0.0101	1.08	6.30	38.9	32.0
1271.91	0.0095	1.31	6.50	37.2	28.9
1272.05	0.0092	1.47	6.20	35.8	26.5
1272.18	0.0085	1.44	6.81	35.5	26.5
1272.31	0.0081	1.47	6.20	34.1	25.0
1272.44	0.0085	1.34	6.20	35.1	26.7
1272.58	0.0082	1.32	6.00	34.8	26.5
1272.71	0.0079	1.67	5.80	33.8	23.4
1272.84	0.0077	1.72	5.80	33.5	22.8
1272.97	0.0077	2.13	5.80	33.1	19.9
1273.11	0.0077	2.22	5.70	33.8	20.1
1273.24	0.0088	1.89	6.11	36.0	24.3
1273.37	0.0093	2.01	5.40	37.0	24.5
1273.50	0.0100	1.51	5.80	36.9	27.6
1273.64	0.0094	1.57	6.01	37.2	27.5
1273.77	0.0100	1.57	6.41	38.0	28.4
1273.90	0.0098	1.51	6.61	38.0	28.7
1274.03	0.0093	1.69	6.01	36.9	26.4
1274.17	0.0101	1.12	6.00	36.6	29.6
1274.30	0.0100	0.80	5.09	35.1	30.0
1274.43	0.0094	1.12	4.79	34.2	27.0
1274.56	0.0093	1.56	4.19	34.4	24.4
1274.70	0.0089	1.89	3.78	33.7	21.6
1274.83	0.0094	1.67	3.88	33.7	22.8
1274.96	0.0090	1.91	3.58	34.3	21.9
1275.09	0.0091	2.13	3.08	34.7	20.9
1275.23	0.0089	2.08	3.18	35.6	22.0
1275.36	0.0088	2.24	3.58	35.7	21.0
1275.49	0.0088	2.40	3.98	35.7	20.1
1275.62	0.0086	2.36	4.38	36.7	21.5
1275.76	0.0087	1.84	5.79	36.4	24.7
1275.89	0.0084	1.53	5.60	35.6	25.9
1276.02	0.0080	1.63	5.40	35.1	24.9
1276.15	0.0077	1.56	4.90	33.5	23.8
1276.29	0.0079	1.17	5.91	32.5	25.3
1276.42	0.0078	0.98	5.71	31.9	25.9
1276.55	0.0070	1.15	6.12	31.0	24.2
1276.68	0.0074	1.09	6.62	31.5	25.1
1276.82	0.0079	0.93	7.03	32.7	27.3
1276.95	0.0084	1.06	6.13	33.4	27.2

1277.08	0.0086	1.32	6.83	34.3	26.7
1277.21	0.0096	1.17	7.04	34.6	27.9
1277.35	0.0103	1.38	7.84	37.2	29.4
1277.48	0.0106	1.70	7.94	39.7	30.0
1277.61	0.0109	1.95	7.13	40.2	29.0
1277.74	0.0112	1.77	7.23	40.8	30.5
1277.88	0.0113	1.77	6.83	41.0	30.6
1278.01	0.0110	1.74	6.72	40.0	29.6
1278.14	0.0110	2.20	6.32	39.1	25.9
1278.27	0.0107	2.29	6.21	40.1	26.2
1278.41	0.0099	2.48	5.61	39.9	24.8
1278.54	0.0100	2.00	6.21	38.7	26.5
1278.67	0.0092	1.96	5.81	38.3	26.2
1278.80	0.0091	1.99	6.31	37.9	25.6
1278.94	0.0095	1.99	6.31	38.5	26.3
1279.07	0.0098	1.93	6.51	39.1	27.3
1279.20	0.0094	2.24	6.31	39.9	26.3
1279.33	0.0094	1.97	6.11	39.1	27.2
1279.47	0.0090	1.83	6.32	38.7	27.8
1279.60	0.0088	2.15	6.42	39.5	26.7
1279.73	0.0091	1.98	6.82	39.8	28.0
1279.86	0.0087	2.45	6.32	40.1	25.6
1280.00	0.0096	1.76	6.52	40.4	29.9
1280.13	0.0091	1.91	7.42	40.7	29.3
1280.26	0.0089	2.17	7.32	41.1	28.2
1280.39	0.0083	2.22	8.03	41.0	27.7
1280.53	0.0084	2.32	7.83	41.9	28.0
1280.66	0.0092	2.45	7.83	42.3	27.6
1280.79	0.0097	2.20	8.23	42.0	28.9
1280.92	0.0098	2.06	8.03	42.8	30.4
1281.06	0.0102	2.09	8.13	43.1	30.6
1281.19	0.0098	2.00	8.13	41.2	29.1
1281.32	0.0100	2.01	7.73	40.7	28.7
1281.45	0.0103	1.46	7.02	39.7	31.0
1281.59	0.0103	1.27	6.52	38.9	31.2
1281.72	0.0104	0.96	7.12	38.3	32.5
1281.85	0.0100	0.74	7.22	37.3	32.8
1281.98	0.0099	0.74	7.21	37.8	33.3
1282.12	0.0095	0.88	7.41	37.7	32.3
1282.25	0.0096	0.95	7.21	37.6	31.7
1282.38	0.0096	1.24	6.01	37.4	29.8
1282.51	0.0092	1.72	6.11	38.5	27.8
1282.65	0.0086	1.76	6.51	38.6	27.6
1282.78	0.0089	1.94	6.00	38.1	25.9
1282.91	0.0084	2.13	5.80	36.7	23.3
1283.04	0.0083	2.15	5.20	36.5	23.1
1283.18	0.0084	2.28	4.80	35.7	21.7
1283.31	0.0083	2.33	4.30	35.1	20.8
1283.44	0.0078	2.32	4.00	34.4	20.2
1283.57	0.0074	2.49	4.40	34.8	19.6
1283.71	0.0071	2.49	3.60	34.9	19.7
1283.84	0.0072	2.61	3.20	35.4	19.4

1283.97	0.0075	2.63	3.80	36.5	20.5
1284.10	0.0076	2.33	4.30	37.5	23.3
1284.24	0.0077	2.59	4.20	38.3	22.4
1284.37	0.0071	2.78	4.70	38.9	21.5
1284.50	0.0067	2.81	5.19	39.1	21.3
1284.63	0.0074	2.69	5.89	39.7	22.4
1284.77	0.0075	2.25	6.19	39.5	24.9
1284.90	0.0077	2.09	6.09	39.6	25.8
1285.03	0.0084	1.80	6.18	39.6	27.7
1285.17	0.0085	1.88	6.58	40.1	27.5
1285.30	0.0093	1.69	7.18	40.8	29.4
1285.43	0.0093	1.65	7.89	41.4	30.2
1285.56	0.0100	1.53	7.48	41.7	31.1
1285.70	0.0105	1.27	7.18	41.1	32.2
1285.83	0.0100	1.27	6.47	41.5	32.6
1285.96	0.0097	1.35	6.47	39.8	30.3
1286.09	0.0094	1.67	6.97	38.9	27.3
1286.23	0.0093	1.73	7.18	38.5	26.5
1286.36	0.0094	1.64	7.28	39.4	28.1
1286.49	0.0095	1.71	6.17	38.5	26.7
1286.62	0.0088	1.73	5.97	37.1	25.2
1286.76	0.0089	1.68	6.08	37.5	26.0
1286.89	0.0088	1.76	6.89	38.3	26.5
1287.02	0.0096	1.85	7.19	39.0	26.7
1287.15	0.0104	1.70	7.49	40.1	28.9
1287.29	0.0105	1.80	7.29	40.7	28.8
1287.42	0.0103	1.93	7.60	41.6	28.9
1287.55	0.0098	1.94	8.30	40.7	28.1
1287.68	0.0090	2.01	8.40	41.1	28.1
1287.82	0.0091	2.27	7.90	40.6	26.0
1287.95	0.0093	2.37	8.51	41.3	26.2
1288.08	0.0090	2.61	8.21	39.5	23.1
1288.21	0.0083	2.81	7.92	39.5	22.1
1288.35	0.0081	2.43	8.02	38.5	23.6
1288.48	0.0079	2.19	7.92	37.6	24.1
1288.61	0.0075	1.82	7.91	36.9	25.6
1288.74	0.0079	1.49	7.51	35.5	26.1
1288.88	0.0082	1.40	7.20	34.6	25.6
1289.01	0.0081	1.04	7.09	34.3	27.5
1289.14	0.0080	1.29	6.29	33.8	25.2
1289.27	0.0081	0.62	5.98	33.4	29.2
1289.41	0.0080	0.47	6.17	33.6	30.3
1289.54	0.0071	0.80	6.16	32.9	27.1
1289.67	0.0073	0.74	6.76	33.0	27.7
1289.80	0.0074	0.85	6.86	32.4	26.2
1289.94	0.0074	1.01	7.36	32.8	25.5
1290.07	0.0075	0.90	7.57	33.3	26.8
1290.20	0.0073	1.17	7.37	33.0	24.6
1290.33	0.0075	1.13	7.37	32.8	24.8
1290.47	0.0078	1.14	7.27	33.1	24.9
1290.60	0.0088	1.28	7.47	35.0	25.8
1290.73	0.0092	1.69	6.77	35.7	23.7

1290.86	0.0097	1.86	5.97	37.1	24.1
1291.00	0.0102	2.10	5.67	37.6	23.1
1291.13	0.0099	2.33	4.67	37.8	21.8
1291.26	0.0103	2.59	4.57	38.6	21.0
1291.39	0.0112	2.35	4.87	39.4	23.6
1291.53	0.0117	2.05	5.38	40.6	27.0
1291.66	0.0119	2.23	5.99	42.7	28.4
1291.79	0.0112	2.49	5.90	42.8	27.1
1291.92	0.0114	2.15	6.01	43.9	30.7
1292.06	0.0112	2.19	6.41	43.8	30.6
1292.19	0.0104	2.30	6.12	43.1	29.3
1292.32	0.0104	2.18	6.52	43.3	30.3
1292.45	0.0103	2.05	6.92	43.3	31.1
1292.59	0.0093	2.15	6.72	42.4	29.5
1292.72	0.0089	2.19	7.12	42.5	29.4
1292.85	0.0083	1.84	6.92	39.9	28.9
1292.98	0.0084	1.70	7.52	40.1	29.9
1293.12	0.0083	1.33	7.52	39.0	31.0
1293.25	0.0079	1.38	7.42	37.8	29.5
1293.38	0.0083	0.99	8.33	38.9	33.0
1293.51	0.0086	1.02	8.43	39.9	33.7
1293.65	0.0084	1.02	7.32	39.5	33.4
1293.78	0.0082	0.98	7.63	40.0	34.2
1293.91	0.0082	1.26	7.02	39.4	31.9
1294.04	0.0088	1.45	6.02	40.0	31.4
1294.18	0.0083	1.66	6.72	41.3	31.4
1294.31	0.0094	1.72	6.12	41.0	30.8
1294.44	0.0093	1.83	5.52	40.6	29.7
1294.57	0.0095	1.67	5.52	39.5	29.6
1294.71	0.0093	1.82	4.81	39.2	28.4
1294.84	0.0099	1.76	5.01	39.8	29.4
1294.97	0.0098	1.98	4.91	39.2	27.5
1295.10	0.0104	1.60	5.72	40.9	31.5
1295.24	0.0108	1.69	4.92	41.3	31.3
1295.37	0.0108	2.19	4.51	43.1	30.2
1295.50	0.0112	2.17	4.31	43.0	30.1
1295.63	0.0112	2.06	4.91	43.5	31.2
1295.77	0.0109	2.48	4.81	44.6	29.6
1295.90	0.0114	2.45	5.11	45.1	30.2
1296.03	0.0113	2.34	5.71	45.6	31.2
1296.16	0.0115	2.05	6.10	46.3	33.5
1296.30	0.0114	2.41	6.20	45.8	30.5
1296.43	0.0126	2.42	6.50	46.0	30.4
1296.56	0.0121	2.68	6.39	46.4	28.8
1296.69	0.0125	3.13	6.08	47.3	26.5
1296.83	0.0121	3.06	6.68	48.4	27.8
1296.96	0.0131	3.14	6.68	49.5	28.0
1297.09	0.0129	3.29	7.27	51.4	28.4
1297.22	0.0124	3.67	7.57	52.2	25.9
1297.36	0.0124	4.30	7.06	53.5	22.0
1297.49	0.0125	4.48	6.85	54.7	21.4
1297.62	0.0120	4.58	6.75	55.0	20.8

1297.75	0.0115	4.50	7.05	54.4	20.7
1297.89	0.0117	3.95	7.25	53.9	24.3
1298.02	0.0117	4.11	7.25	55.0	24.1
1298.15	0.0114	3.70	6.85	53.2	25.5
1298.28	0.0116	3.33	6.05	50.3	25.9
1298.42	0.0119	3.14	5.56	49.0	26.7
1298.55	0.0116	2.90	4.77	47.6	27.7
1298.68	0.0116	2.78	4.67	47.8	29.0
1298.81	0.0119	2.52	4.77	47.3	30.4
1298.95	0.0122	2.90	5.08	48.5	29.1
1299.08	0.0123	3.34	5.28	50.2	28.0
1299.21	0.0128	3.38	4.88	50.6	28.1
1299.34	0.0126	3.87	5.68	52.3	26.3
1299.48	0.0126	4.38	5.57	54.3	24.3
1299.61	0.0121	4.43	5.86	55.8	24.5
1299.74	0.0122	4.54	5.95	56.7	23.2
1299.87	0.0125	4.47	5.44	57.5	23.0
1300.01	0.0129	4.39	5.02	57.0	21.7
1300.14	0.0127	4.30	4.71	58.1	21.9
1300.27	0.0117	4.02	4.19	57.1	21.7
1300.40	0.0124	3.75	3.58	56.0	21.6
1300.54	0.0128	3.45	2.96	54.7	22.2
1300.67	0.0127	3.55	2.76	53.6	19.4
1300.80	0.0132	3.50	2.86	54.9	21.1
1300.93	0.0142	3.98	2.96	56.1	17.7
1301.07	0.0146	4.00	3.16	56.0	17.9
1301.20	0.0149	4.25	3.57	56.3	16.4
1301.33	0.0141	3.93	3.87	53.6	16.9
1301.47	0.0146	3.55	4.68	52.0	18.8
1301.60	0.0138	3.69	4.98	51.0	16.4
1301.73	0.0136	3.50	4.77	49.9	17.0
1301.86	0.0134	3.52	4.57	49.4	16.2
1302.00	0.0131	4.01	5.07	48.9	10.7
1302.13	0.0125	3.90	4.87	46.5	9.1
1302.26	0.0126	3.65	4.56	45.8	10.4
1302.39	0.0120	3.49	4.86	45.0	10.3
1302.53	0.0118	3.31	4.95	45.9	12.3
1302.66	0.0117	3.59	4.65	46.6	9.5
1302.79	0.0118	3.56	4.54	46.6	9.0
1302.92	0.0114	3.41	4.83	45.9	8.9
1303.06	0.0103	3.65	4.12	43.8	2.1
1303.19	0.0101	3.14	4.20	41.9	3.8
1303.32	0.0099	2.78	4.08	41.2	5.1
1303.45	0.0091	2.56	4.17	39.5	3.8
1303.59	0.0088	2.37	3.65	37.8	2.6
1303.72	0.0088	2.65	2.94	36.8	0.0
1303.85	0.0084	2.60	3.43	34.0	0.0
1303.98	0.0086	2.61	4.03	32.9	0.0
1304.12	0.0090	2.19	3.72	32.1	0.0
1304.25	0.0104	1.89	4.62	32.9	0.4
1304.38	0.0110	1.97	4.22	33.6	0.0
1304.51	0.0117	1.97	4.23	34.1	0.8

1304.65	0.0113	1.83	4.43	34.5	3.8
1304.78	0.0115	1.85	5.03	35.3	4.3
1304.91	0.0107	1.95	4.83	33.6	0.8
1305.04	0.0112	2.00	4.73	34.6	0.8
1305.18	0.0109	2.15	4.53	33.6	0.0
1305.31	0.0106	2.33	4.74	31.8	0.0
1305.44	0.0098	2.56	4.14	31.5	0.0
1305.57	0.0093	2.49	4.85	32.3	0.0
1305.71	0.0095	2.37	5.55	33.5	0.0
1305.84	0.0094	2.19	6.06	33.5	0.0
1305.97	0.0102	1.93	5.46	34.1	4.9
1306.10	0.0116	1.56	5.46	34.1	10.8
1306.24	0.0118	1.65	4.95	34.5	9.7
1306.37	0.0125	1.26	4.75	35.6	16.2
1306.50	0.0119	1.04	4.84	36.2	19.3
1306.63	0.0121	0.71	4.82	35.9	23.6
1306.77	0.0120	0.78	4.91	35.1	20.8
1306.90	0.0122	0.71	3.70	33.0	19.5
1307.03	0.0122	0.86	3.39	32.0	14.8
1307.16	0.0119	1.09	3.58	31.2	8.5
1307.30	0.0111	1.21	3.57	29.8	3.4
1307.43	0.0108	1.32	3.67	30.9	1.1
1307.56	0.0103	1.64	3.76	30.7	0.0
1307.69	0.0106	1.92	3.46	31.0	0.0
1307.83	0.0106	1.99	3.26	30.8	0.0
1307.96	0.0100	2.05	3.87	29.2	0.0
1308.09	0.0094	2.04	3.99	28.4	0.0
1308.22	0.0094	1.92	4.72	27.6	0.0
1308.36	0.0085	2.04	4.75	25.8	0.0
1308.49	0.0081	2.14	4.69	25.5	0.0
1308.62	0.0073	1.87	5.35	23.6	2.4
1308.75	0.0064	1.91	5.04	22.2	3.4
1308.89	0.0066	1.79	5.31	22.6	7.1
1309.02	0.0058	1.50	6.51	23.3	11.9
1309.15	0.0053	1.59	6.31	22.7	11.7
1309.28	0.0053	1.84	6.19	24.5	12.6
1309.42	0.0057	1.97	6.50	26.4	13.9
1309.55	0.0058	2.32	5.89	28.1	13.2
1309.68	0.0069	2.05	6.49	30.8	17.2
1309.81	0.0075	2.13	6.17	33.2	18.4
1309.95	0.0075	2.24	5.06	35.5	19.8
1310.08	0.0082	2.50	5.35	38.0	19.3
1310.21	0.0087	2.64	4.44	39.6	19.7
1310.34	0.0089	2.82	3.91	41.1	17.9
1310.48	0.0092	3.14	3.88	42.4	14.3
1310.61	0.0096	3.29	3.66	43.6	12.1
1310.74	0.0095	2.77	3.45	42.0	13.9
1310.87	0.0086	3.17	3.23	40.6	6.8
1311.01	0.0085	3.21	3.22	40.5	4.4
1311.14	0.0087	3.35	3.00	37.8	0.0
1311.27	0.0078	3.20	2.89	35.8	0.0
1311.40	0.0077	3.45	1.66	34.6	0.0

1311.54	0.0075	3.44	1.75	34.1	0.0
1311.67	0.0082	3.13	1.93	34.0	0.0
1311.80	0.0078	2.69	1.82	31.8	0.0
1311.93	0.0081	2.78	2.11	30.4	0.0
1312.07	0.0083	2.59	2.30	30.5	0.0
1312.20	0.0078	2.87	2.39	30.0	0.0
1312.33	0.0076	2.83	2.39	31.0	0.0
1312.46	0.0081	2.57	2.90	31.0	0.0
1312.60	0.0084	2.41	3.20	31.6	0.0
1312.73	0.0090	2.36	3.30	31.9	0.0
1312.86	0.0088	2.44	3.31	32.4	0.0
1312.99	0.0092	2.65	3.31	34.1	0.0
1313.13	0.0093	2.92	3.11	35.7	0.0
1313.26	0.0096	2.94	2.51	36.4	0.0
1313.39	0.0106	2.55	2.72	36.8	0.0
1313.52	0.0113	2.60	3.02	37.6	0.0
1313.66	0.0120	2.74	2.42	38.3	0.0
1313.79	0.0124	2.87	2.43	38.5	0.0
1313.92	0.0127	2.42	3.14	37.6	0.5
1314.05	0.0129	2.42	2.75	37.7	2.0
1314.19	0.0121	2.48	2.66	35.3	0.8
1314.32	0.0117	2.07	3.38	32.5	5.7
1314.45	0.0112	1.88	3.30	31.4	9.0
1314.58	0.0101	1.79	3.32	29.2	9.5
1314.72	0.0095	1.60	4.05	28.4	12.4
1314.85	0.0092	1.36	4.78	28.5	16.0
1314.98	0.0074	1.30	5.31	26.7	15.7
1315.11	0.0074	1.30	4.93	26.9	16.9
1315.25	0.0079	1.28	5.16	27.9	18.8
1315.38	0.0085	1.13	5.08	29.1	21.7
1315.51	0.0082	1.58	4.80	30.8	20.9
1315.64	0.0085	1.74	5.21	32.4	21.9
1315.78	0.0092	1.48	5.72	33.0	24.3
1315.91	0.0092	1.49	5.62	33.1	24.5
1316.04	0.0089	1.71	5.53	32.3	22.5
1316.17	0.0094	2.07	5.23	34.2	22.5
1316.31	0.0092	1.98	5.63	35.1	23.9
1316.44	0.0086	2.21	5.83	35.4	22.9
1316.57	0.0077	2.49	6.74	34.9	20.9
1316.70	0.0074	2.39	7.24	34.4	20.9
1316.84	0.0068	2.17	7.34	32.6	20.2
1316.97	0.0075	2.32	6.33	33.8	20.4
1317.10	0.0072	2.18	6.13	32.3	19.7
1317.23	0.0072	2.27	6.02	31.7	18.4
1317.37	0.0078	1.60	6.52	31.0	21.6
1317.50	0.0080	1.67	6.22	29.9	20.0
1390.00	0.0107	4.08	3.51	43.8	0.0
1390.21	0.0107	4.15	3.61	44.8	0.0
1390.42	0.0120	4.02	3.71	45.8	0.0
1390.63	0.0116	3.57	4.82	46.6	5.0
1390.83	0.0124	3.28	5.62	48.2	10.1
1391.04	0.0125	2.98	5.32	46.6	12.0

1391.25	0.0129	2.98	5.32	46.8	12.0
1391.46	0.0136	3.17	5.12	47.7	10.6
1391.67	0.0135	2.93	5.02	47.3	12.9
1391.87	0.0140	2.85	5.01	47.5	14.0
1392.08	0.0137	2.58	4.81	46.9	16.6
1392.29	0.0133	2.49	5.62	46.7	17.4
1392.50	0.0127	2.63	5.12	43.9	13.0
1392.71	0.0116	3.05	5.42	43.1	7.4
1392.92	0.0112	2.98	5.73	42.1	8.3
1393.12	0.0108	2.63	5.54	39.9	11.4
1393.33	0.0106	2.49	5.35	38.6	12.9
1393.54	0.0108	2.65	5.76	39.5	13.0
1393.75	0.0107	2.93	5.87	41.0	12.6
1393.96	0.0098	3.17	6.28	42.2	12.3
1394.17	0.0106	3.36	5.69	43.0	12.1
1394.37	0.0107	3.71	5.49	44.1	11.0
1394.58	0.0113	3.44	5.00	45.8	15.9
1394.79	0.0120	3.46	5.20	47.6	18.0
1395.00	0.0127	3.52	5.40	50.0	19.8
1395.21	0.0123	3.99	5.60	51.5	17.0
1395.42	0.0114	4.31	5.30	51.2	14.0
1395.62	0.0116	3.97	5.40	49.9	15.9
1395.83	0.0121	3.56	5.41	48.4	18.3
1396.04	0.0119	3.55	5.51	49.4	19.7
1396.25	0.0114	3.60	5.42	48.7	19.0
1396.46	0.0121	3.75	5.22	49.6	19.1
1396.67	0.0117	3.73	5.02	49.3	19.4
1396.87	0.0115	3.98	5.03	49.4	17.8
1397.08	0.0114	4.37	4.42	50.1	15.6
1397.29	0.0115	4.30	4.73	49.8	16.1
1397.50	0.0116	4.13	5.13	50.3	18.0
1860.00	0.0118	13.03	4.21	104.5	26.5
1860.15	0.0110	12.98	3.91	104.0	26.2
1860.29	0.0110	13.34	4.00	102.6	22.4
1860.44	0.0097	13.77	4.20	101.5	18.2
1860.59	0.0100	13.17	4.00	100.4	20.3
1860.74	0.0099	13.47	3.60	101.0	18.7
1860.88	0.0092	13.98	2.99	99.4	11.8
1861.03	0.0083	14.46	3.58	99.2	6.6
1861.18	0.0069	14.53	3.68	98.6	3.8
1861.32	0.0074	14.25	5.08	101.4	7.1
1861.47	0.0073	14.87	4.27	102.1	2.7
1861.62	0.0080	15.14	4.88	103.9	2.5
1861.76	0.0077	15.45	4.28	105.0	2.6
1861.91	0.0081	14.98	4.48	104.2	6.8
1862.06	0.0073	14.68	4.59	101.9	8.2
1862.21	0.0076	13.91	5.60	100.6	12.6
1862.35	0.0078	13.17	6.30	99.0	16.3
1862.50	0.0081	13.61	5.70	98.4	13.5
1862.65	0.0079	13.31	5.00	94.1	11.0
1862.79	0.0079	12.86	5.00	89.8	9.3
1862.94	0.0066	11.47	4.89	83.2	10.9

1863.09	0.0061	10.51	4.59	77.2	10.2
1863.24	0.0068	8.77	4.28	69.6	13.1
1863.38	0.0058	8.29	3.78	62.8	9.0
1863.53	0.0052	7.60	2.47	55.3	6.0
1863.68	0.0052	6.74	1.67	47.3	3.8
1863.82	0.0042	5.61	1.37	40.3	4.4
1863.97	0.0038	4.91	0.67	33.8	2.7
1864.12	0.0028	5.21	0.58	33.1	0.6
1864.26	0.0028	5.65	0.68	35.4	0.7
1864.41	0.0032	6.71	0.79	40.4	0.0
1864.56	0.0034	8.31	0.89	51.1	1.9
1864.71	0.0038	10.18	1.20	63.3	3.3
1864.85	0.0052	11.62	2.00	77.3	9.1
1865.00	0.0054	13.05	2.10	87.8	11.6
1865.15	0.0061	14.83	2.00	99.8	13.4
1865.29	0.0078	15.78	2.81	110.8	19.1
1865.44	0.0087	16.69	2.81	119.8	22.9
1865.59	0.0101	16.49	3.11	122.8	26.8
1865.74	0.0114	16.01	3.71	125.8	32.3
1865.88	0.0118	15.30	3.81	121.9	32.1
1866.03	0.0112	14.42	3.91	114.8	28.4
1866.18	0.0110	13.39	3.90	107.8	25.7
1866.32	0.0112	12.09	3.69	100.9	25.3
1866.47	0.0105	11.10	4.09	93.2	22.6
1866.62	0.0109	10.07	4.48	87.5	22.4
1866.76	0.0099	9.54	5.18	80.5	18.1
1866.91	0.0091	9.33	5.18	77.3	15.5
1867.06	0.0080	9.37	5.18	73.0	10.6
1867.21	0.0074	9.32	4.88	71.4	9.5
1867.35	0.0078	9.19	4.58	71.3	10.5
1867.50	0.0078	8.97	4.68	70.6	11.5
2027.00	0.0003	0.32	0.00	1.2	0.0
2027.18	0.0002	0.34	0.00	1.2	0.0
2027.35	0.0000	0.43	0.00	1.3	0.0
2027.53	0.0000	0.45	0.00	1.4	0.0
2027.70	0.0000	0.43	0.07	1.4	0.0
2027.88	0.0000	0.41	0.08	1.4	0.0
2028.05	0.0000	0.47	0.00	1.4	0.0
2028.23	0.0000	0.34	0.12	1.3	0.0
2028.40	0.0000	0.37	0.06	1.2	0.0
2028.58	0.0000	0.30	0.12	1.1	0.0
2028.75	0.0000	0.37	0.00	1.1	0.0
2028.92	0.0000	0.35	0.02	1.1	0.0
2029.10	0.0000	0.36	0.00	1.1	0.0
2029.27	0.0000	0.33	0.00	1.0	0.0
2029.45	0.0002	0.35	0.00	1.2	0.0
2029.62	0.0000	0.42	0.00	1.2	0.0
2029.80	0.0000	0.45	0.00	1.4	0.0
2029.97	0.0000	0.46	0.00	1.4	0.0
2030.15	0.0000	0.49	0.00	1.5	0.0
2030.32	0.0000	0.53	0.00	1.6	0.0
2030.50	0.0000	0.53	0.00	1.6	0.0

2030.67	0.0000	0.52	0.00	1.6	0.0
2030.85	0.0000	0.49	0.00	1.5	0.0
2031.02	0.0000	0.32	0.23	1.4	0.0
2031.20	0.0000	0.18	0.44	1.4	0.0
2031.37	0.0001	0.15	0.40	1.3	0.0
2031.55	0.0001	0.11	0.39	1.2	0.2
2031.72	0.0002	0.10	0.37	1.2	0.2
2031.90	0.0002	0.09	0.39	1.2	0.4
2032.07	0.0002	0.00	0.51	1.3	1.2
2032.25	0.0003	0.03	0.43	1.3	1.0
2032.42	0.0002	0.08	0.56	1.5	0.7
2032.60	0.0001	0.11	0.50	1.5	0.4
2032.77	0.0001	0.14	0.48	1.5	0.1
2032.95	0.0001	0.15	0.50	1.6	0.1
2033.12	0.0000	0.21	0.57	1.8	0.0
2033.30	0.0000	0.18	0.62	1.8	0.0
2033.47	0.0001	0.22	0.52	1.8	0.0
2033.65	0.0001	0.19	0.59	1.8	0.0
2033.82	0.0001	0.15	0.65	1.8	0.4
2034.00	0.0001	0.19	0.59	1.8	0.0

IMP CANYON # 1_PDPK.XLS

Point	Depth	Kair	Kliquid	Comment		
	(ft)	(mD)	(mD)			
1	1236.081	0.328	0.184			
2	1236.4152	0.368	0.216			
3	1236.7297	0.376	0.222			
4	1237.06	0.424	0.255			
5	1237.3911	0.302	0.172			
6	1237.7	0.0834	0.0354			
7	1237.8127	0.32	0.184			
8	1238.1369	0.124	0.058			
9	1238.4949	0.0164	0.00402			
10	1238.8168	0.148	0.0727			
11	1239.1316	0.234	0.126			
12	1239.4692	0.168	0.085			
13	1239.7986	0.254	0.14			
14	1240.1031	0.0266	0.00784			
15	1240.4503	0.0829	0.0351			
16	1240.7683	0.223	0.12			
17	1241.0982	0.234	0.126			
18	1241.432	0.21	0.111			
19	1241.7991	0.25	0.137			
20	1242.1261	0.16	0.0799			
21	1242.4561	0.393	0.233			
22	1242.7899	0.404	0.241			
23	1243.1017	0.189	0.0982			
24	1243.429	0.151	0.0744			
25	1243.7603	0.0472	0.0169			
26	1244.0813	0.0691	0.0277			
27	1244.4144	0.124	0.0584			
28	1244.6576	0.14	0.0679			
29	1244.9801	0.284	0.159			
30	1245.3027	0.14	0.0678			
31	1245.6171	0.213	0.113			
32	1245.9403	0.0497	0.0181			
33	1246.2668	0.0671	0.0268			
34	1246.5967	0.0722	0.0295			
35	1246.9205	0.0385	0.0129			
36	1247.3052	0.156	0.0774			
37	1247.6656	0.12	0.0562			
38	1247.9971	0.304	0.172			
39	1248.3149	0.111	0.0505			
40	1248.647	0.153	0.0759			
41	1248.9807	0.118	0.0547			
42	1249.3012	0.0817	0.0345			
43	1249.6331	0.0876	0.0377			
44	1249.9626	0.179	0.0915			
45	1250.2968	0.016	0.00388			
46	1250.6229	0.148	0.0726			
47	1250.9566	0.0178	0.00452			
48	1251.2733	0.278	0.155			
49	1251.6018	0.291	0.164			
50	1251.9184	0.181	0.093			

IMP CANYON # 1_PDPK.XLS

51	1252.2179	0.367	0.216			
52	1252.5436	0.409	0.244			
53	1252.888	0.223	0.119			
54	1253.2334	0.573	0.363			
55	1253.5724	0.243	0.132			
56	1253.9003	0.16	0.0797			
57	1254.2189	0.33	0.191			
58	1254.5431	0.193	0.1			
59	1254.8811	0.25	0.137			
60	1255.2158	0.201	0.106			
61	1255.5215	0.157	0.0781			
62	1255.8518	0.129	0.0612			
63	1256.1728	0.263	0.146			
64	1256.4941	0.171	0.0866			
65	1256.8071	0.0966	0.0427			
66	1257.1399	0.0912	0.0397			
67	1257.468	0.197	0.103			
68	1257.7845	0.148	0.0725			
69	1258.1108	0.0533	0.0199			
70	1258.4306	0.0742	0.0305			
71	1258.7509	0.0716	0.0291			
72	1259.085	0.0825	0.0349			
73	1259.3956	0.0452	0.016			
74	1259.7436	0.0234	0.00659			
75	1260.0715	0.165	0.0833			
76	1260.4354	0.0864	0.037			
77	1260.7609	0.23	0.124			
78	1261.0855	0.152	0.0753			
79	1261.4185	0.129	0.0614			
80	1261.7443	0.0752	0.031			
81	1262.0712	0.132	0.0629			
82	1262.3983	0.217	0.115			
83	1262.6513	0.0732	0.03			
84	1263.0086	0.092	0.0401			
85	1263.3365	0.133	0.0636			
86	1263.6555	0.237	0.129			
87	1263.9794	1.9	1.39			
88	1264.312	0.237	0.129			
89	1264.6636	0.0484	0.0175			
90	1265.0529	0.0399	0.0135			
91	1265.374	0.125	0.0588			
92	1265.6978	0.142	0.0689			
93	1266.0234	0.199	0.105			
94	1266.345	0.104	0.0466			
95	1266.6747	0.0504	0.0184			
96	1267.0029	0.191	0.0965			
97	1267.3273	0.288	0.163			
98	1267.6645	0.272	0.152			
99	1267.9928	0.301	0.172			
100	1268.332	0.159	0.0796			
101	1268.6504	0.0721	0.0295			
102	1268.9516	0.16	0.08			

IMP CANYON # 1_PDPK.XLS

103	1269.2719	0.257	0.142			
104	1269.5977	0.645	0.417			
105	1269.9243	0.328	0.19			
106	1270.2441	0.337	0.196			
107	1270.6326	0.164	0.0829			
108	1270.9698	0.04	0.0136			
109	1271.2785	0.147	0.0725			
110	1271.6049	0.113	0.0521			
111	1271.9324	0.078	0.0327			
112	1272.2602	0.31	0.177			
113	1272.5866	0.201	0.106			
114	1272.9014	0.246	0.135			
115	1273.227	0.289	0.164			
116	1273.5497	0.293	0.166			
117	1273.9109	0.393	0.235			
118	1274.2313	0.179	0.0917			
119	1274.547	0.0673	0.027			
120	1274.8663	0.441	0.269			
121	1275.1819	0.0809	0.0342			
122	1275.5101	0.152	0.0757			
123	1275.8789	0.134	0.0643			
124	1276.1724	0.209	0.111			
125	1276.5002	0.0856	0.0368			
126	1276.806	0.027	0.00804			
127	1277.1196	0.0882	0.0382			
128	1277.4445	0.0832	0.0355			
129	1277.7811	0.0713	0.0291			
130	1278.0451	0.152	0.0756			
131	1278.3735	0.0991	0.0442			
132	1278.7028	0.15	0.0739			
133	1279.024	0.156	0.0781			
134	1279.3539	0.0755	0.0313			
135	1279.6885	0.198	0.104			
136	1280.0133	0.08	0.0337			
137	1280.3549	0.0782	0.0327			
138	1280.6772	0.191	0.0994			
139	1281.0039	0.187	0.0971			
140	1281.3651	0.159	0.0798			
141	1281.6951	0.0416	0.0144			
142	1281.9515	0.175	0.0893			
143	1282.2825	0.15	0.0742			
144	1282.6088	0.0413	0.0142			
145	1282.9386	0.0357	0.0117			
146	1283.268	0.118	0.0552			
147	1283.5946	0.132	0.0633			
148	1283.949	0.059	0.0227			
149	1284.2789	0.117	0.0544			
150	1284.6044	0.149	0.0737			
151	1284.9292	0.117	0.0542			
152	1285.2574	0.0587	0.0226			
153	1285.5754	0.0701	0.0285			
154	1285.9425	0.0286	0.00867			

IMP CANYON # 1_PDPK.XLS

155	1286.2612	0.0661	0.0264			
156	1286.5819	0.0451	0.016			
157	1286.9145	0.0535	0.0201			
158	1287.2405	0.0516	0.0191			
159	1287.6526	0.114	0.0525			
160	1287.9824	0.0591	0.0228			
161	1288.3041	0.103	0.0464			
162	1288.6361	0.0669	0.0267			
163	1288.9719	0.0652	0.0259			
164	1289.3185	0.0363	0.012			
165	1289.6401	0.0585	0.0225			
166	1289.9828	0.0821	0.0348			
167	1290.3151	0.0617	0.0241			
168	1290.6481	0.0627	0.0246			
169	1290.9659	0.0646	0.0256			
170	1291.2979	0.0624	0.0245			
171	1291.624	0.0208	0.00562			
172	1291.957	0.037	0.0123			
173	1292.2995	0.0308	0.00963			
174	1292.6404	0.0809	0.0342			
175	1292.9772	0.0835	0.0356			
176	1293.2984	0.0792	0.0333			
177	1293.6164	0.0633	0.0249			
178	1293.9386	0.0348	0.0113			
179	1294.2762	0.0636	0.0251			
180	1294.6158	0.0521	0.0193			
181	1294.9446	0.0712	0.029			
182	1295.3048	0.082	0.0348			
183	1295.6063	0.0333	0.0107			
184	1295.9103	0.0423	0.0147			
185	1296.2329	0.0666	0.0267			
186	1296.5611	0.0242	0.00692			
187	1296.8897	0.105	0.0477			
188	1297.2203	0.0828	0.0352			
189	1297.5473	0.0939	0.0413			
190	1297.8765	0.0587	0.0226			
191	1298.208	0.0898	0.0391			
192	1298.5088	0.0781	0.0327			
193	1298.8325	0.0713	0.0291			
194	1299.1648	0.0808	0.0342			
195	1299.4897	0.0408	0.014			
196	1299.846	0.0828	0.0352			
197	1300.175	0.0575	0.022			
198	1300.448	0.121	0.057			
199	1300.7576	0.0473	0.017			
200	1301.0551	0.057	0.0218			
201	1301.8837	0.0411	0.014			
202	1302.3848	0.0115	0.00244			
203	1302.7086	0.0106	0.00215			
204	1303.0499	0.0271	0.00806			
205	1305.0619	0.013	0.0029			
206	1309.0135	0.0183	0.0047			

IMP CANYON # 1_PDPK.XLS

207	1313.0324	0.0227	0.00632		
208	1313.3328	0.0381	0.0128		
209	1313.6688	0.0379	0.0127		
210	1314.0111	0.0456	0.0162		
211	1314.3288	0.0813	0.0344		
212	1314.6702	0.0601	0.0233		
213	1315.005	0.0883	0.0382		
214	1315.3043	0.00923	0.00177	24	1315.30-1315
215	1315.6326	0.0101	0.00202		
216	1315.8479	0.0271	0.00803		
217	1316.1395	0.0666	0.0266		
218	1316.4758	0.0264	0.00778		
219	1316.8426	0.0581	0.0223		
220	1317.0836	0.0743	0.0306		
221	1317.409	0.0209	0.00565		1317.00-1317
222	1394.2305	0.058	0.0222		1393.90-1394
223	1394.6062	0.0306	0.0095		
224	1860.0507	0.0144	0.00333		
225	1860.3608	0.0306	0.00951		
226	1860.6688	0.00484	0.000687		
227	1860.9921	0.0166	0.00407		
228	1861.3585	0.0098	0.00193		
229	1861.7048	0.0125	0.00274		
230	1862.0366	0.013	0.00288		
231	1862.3799	0.00452	0.000622		
232	1862.7229	0.00217	0.000204		
233	1863.0959	0.0175	0.00441		
234	1863.4124	0.0204	0.00546		
235	1863.7773	0.0325	0.0103		
236	1864.0557	0.0087	0.00163		
237	1864.3102	0.0146	0.00342		
238	1864.6407	0.0188	0.00488		1864.50-1965.20
239	1864.962	0.0072	0.00123		
240	1865.2672	0.00336	0.000399		1865.20-1865.80
241	1865.5854	0.0283	0.00855		
242	1865.9298	0.0151	0.00358		
243	1866.2374	0.0174	0.00437		
244	1866.5791	0.0267	0.0079		
245	1866.9191	0.0233	0.00645		
246	1867.2836	0.024	0.00681		
247	2027.1232	0.0417	0.0144		
248	2027.4506	0.0314	0.00982		
249	2027.796	0.0207	0.00554		
250	2028.1688	0.0251	0.00724		
251	2028.5261	0.0537	0.0201		
252	2029.2624	0.0277	0.00828		
253	2029.7441	0.00567	0.000869		
254	2030.0592	0.00553	0.000838		
255	2030.2931	0.0284	0.00857		
256	2031.0436	0.0281	0.00846		
257	2031.3108	0.012	0.00258		
258	2031.686	0.0228	0.00634		

IMP CANYON # 1_PDPK.XLS

259	2033.0399	0.0348	0.0113			
260	2033.3659	0.0203	0.0054			

FILE:

52132-09-6021

COMPANY: Petro-Canada Oil & Gas

FORMATION:

Devonian

WELL: Imp Canyon #1

FIELD:

Canyon Creek

LOCATION:

PROVINCE:

Northwest Territories

AMBIENT POROSITY AND NET OVERBURDEN GAS PERMEABILITY DATA

SAMPLE	DEPTH, feet	AMBIENT POROSITY, fraction	PDP NITROGEN PERMEABILITY*, millidarcies
24	1315.30-1315.70	0.013	1.61E-04
25	1317.00-1317.50	0.024	1.06E-04
26	1393.90-1394.30	0.020	1.30E-04
28	1864.50-1965.20	0.010	7.57E-05
29	1865.20-1865.80	0.008	8.83E-05

* Net confining pressure: 3400 kPa.

Appendix IV

**X-Ray Diffraction
Report
Petro-Canada
Canyon Creek G-51**

18 February, 2009

This document contains information derived from possible multiple sources. Calgary Rock and Materials Services Inc. (CR), and its associates, through this report, provides exclusive proprietary rights to the recipient, with the benefit of the best judgement of CR. All interpretations are based on limited data and inferences, and CR cannot and does not guarantee the accuracy or correctness of any interpretation. CR will not accept liability for any loss, damages or expenses, whatsoever, that may be incurred or sustained by the client or its associates, partners or clients resulting from recommendations provided herein.



*Calgary Rock
and Materials
Services Inc.*

Technical Analysis

X-ray diffraction (XRD) analysis at Calgary Rock and Materials Services Inc. is completed by trained laboratory staff. The undersigned has interpreted the X-ray diffraction data for bulk and clay mineralogy.

Raymond Strom, Ch.T.
Calgary Rock and Materials Services Inc.



*Calgary Rock
and Materials
Services Inc.*

#3, 3610 – 29th Street N.E., Calgary, Alberta Canada (403) 735-5050

Table of Contents

Section 1

Introduction

Section 2

Tables and Plots



*Calgary Rock
and Materials
Services Inc.*

#3, 3610 – 29th Street N.E., Calgary, Alberta Canada (403) 735-5050

Section 1

Introduction



*Calgary Rock
and Materials
Services Inc.*

#3, 3610 – 29th Street N.E., Calgary, Alberta Canada (403) 735-5050

Calgary Rock and Materials Services Inc.
**X-RAY DIFFRACTOMETRY (XRD) EVALUATION -
AN INTRODUCTION**

Introduction

X-Ray Diffractometry (XRD) is a very useful tool to the geologist, in that it has the capability of positively identifying crystalline materials. XRD can be used as a stand-alone method, or used in conjunction with other tools to provide a comprehensive, integrated approach to petrologic evaluation. In the following we will outline the strengths and potential weaknesses of the XRD method.

XRD has been used in the oil and gas industry as a routine analysis technique since the early 1960s when cost effective commercial units were introduced to the marketplace. Use of the technique has become commonplace due to its low cost and availability.

Sample Preparation

Sample Homogeneity – Sample quality can vary considerably, depending on whether it is a whole rock sample, cuttings or corrosion sample. Homogeneity of the samples can vary considerably as well. A uniform, massive sandstone with well distributed clays and cements will present the least problem while partially cemented sandstones and variable lithology carbonates and cuttings samples represent the most challenging samples.

Sample Sizes

It is recommended that a minimum sample size be in the range of 5 to 10 grams. For normal sample preparation, a 1 gram sample is needed for bulk powder analysis, while 5 grams are needed for clay separates analysis.

Bulk Sample Prep. – Normal sampling of bulk samples is accomplished by drying the sample at 60 °C overnight, then fracturing a portion of the bulk rock for use in the pulverizing mill.

Samples are normally ground for 20 minutes in the mill until a homogenous powder is obtained. If specified by the client, samples can be crushed then quartered until a representative amount is obtained. This quartered sample is then pulverized until homogeneous. The powder is then packed in a powder mount, against glass, to provide a stable surface for analysis. Keep in mind that this will destroy the sample for analysis by most other testing techniques.

Special cases would include selection of specific parts of a rock for analysis, for example, mineral nodules of interest.

Cuttings can be analyzed as well. Usually a minimal amount of sample is available for analysis, and as a result, hand grinding and packing into a micro powder holder is required. As little as 1 or 2 cuttings can be analyzed in this fashion.

The bulk powder holder is then placed into the goniometer of the Rigaku Miniflex II and the sample is typically scanned from 4 to 60 degrees 2 θ (two theta) to produce the spectrum. A copper source tube is used to provide the incident beam of monochromatic X-rays.

Clay Sample Prep. – Generally, a 5 gram sample is required in order to get good results from the clay separates. Rock portions are first of all, disaggregated using an agate mortar and pestle with a calgon solution. Suspended clays, silt and sand are then transferred to a glass tube, topped up with calgon solution, agitated and then centrifuged for the appropriate amount of time at given centrifuge speeds to drop out the coarse fraction. The suspended portion is decanted into a clean centrifuge tube, and this is spun at high speed to settle the fine fraction of material. Calgary

Rock chooses to utilize the less than 5 micron fraction ($<5\mu$) for clay analysis, while others may utilize the $<2\mu$ or $<1\mu$ fraction. The reason for this is that significant amounts of kaolinite may be settled out of the clay suspension if other than the 5 micron fraction size is used. Kaolinite particles can typically have sizes of 10-20 microns. If other than the $<5\mu$ fraction is desired, clients should specify what value they want. After settling of the clays, the majority of the supernatant liquid is poured off, and the settled clays are homogenized. A small amount of the clay suspension is then smeared on to a glass slide, and allowed to air dry. The slide is then placed into the goniometer and run typically from 2 to 35 degrees 2θ . The slide will then be removed and placed in a container with glycol vapours at elevated temperature in order to expand sensitive clays. This provides a diagnostic for particular clay types as well as providing an indication of whether or not the clays will be fresh-water sensitive. Heating of samples, on occasion, may be necessary to delineate clay species. Sensitivity to ionic substitution (Na^+ , Mg^{++} , K^+ and Ca^{++}) can also be completed as a special analysis.

It should be noted that the term clay analysis in this case refers to sample particle size, and not necessarily mineralogy. As a result, clay results will include such minerals as quartz, feldspars, carbonates and potentially even heavy minerals such as pyrite. If true clay species alone are needed, then recalculation excluding non-clay species will be required. It should be kept in mind that size fractions of non-clay types may be important, particularly where microcrystalline minerals are present, or where dissolution of minerals is or has taken place. Often, these species will show up in the clay trace.

Data Interpretation

Raw data provided in a tabular form by the X-Ray computer is imported into X-Ray analysis software, where peak positions, shapes and

heights are recorded. The software then provides most likely matches of minerals for the spectrum generated. The latest version of Jade software is used for interpretation of spectra.

The Bragg Equation

The Bragg equation is used to determine the relationship between the 2θ angle of the incident beam of X-rays, and the spacings between ordered layers or sheets of atoms.

The Bragg equation is as follows:

$$n\lambda = 2d \sin\theta$$

Where:

n = order of the reflection. This number is an integer.

λ = wavelength of the incident beam of x-rays.

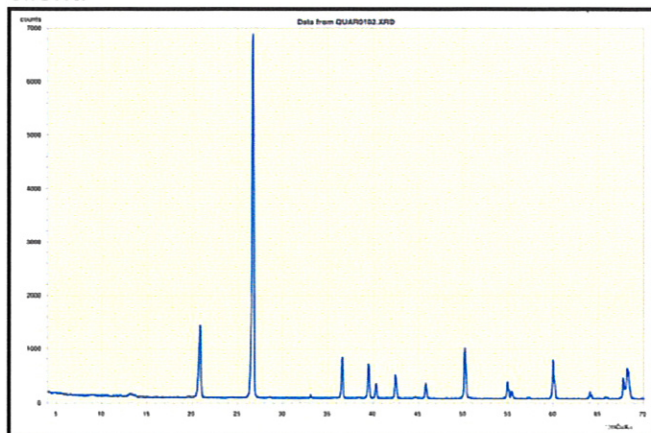
d = spacing of the layers or sheets of atoms in Angstroms.

θ = angle between the incident beam and the atomic planes of the layers or sheets.

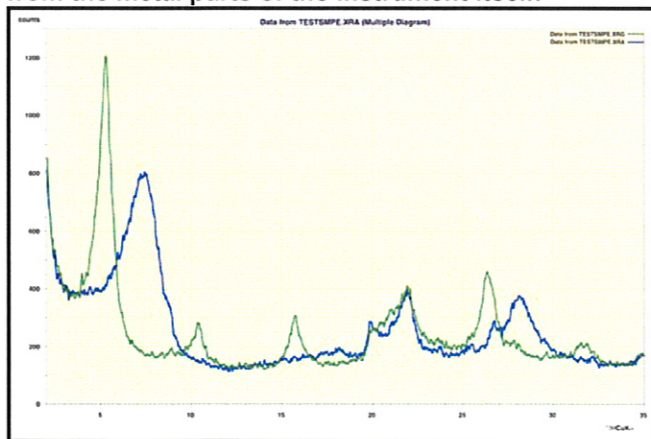
A copper tube emitting a beam of X-rays having a wavelength of $1.541874\text{\AA}$ is normally used for most analyses. Analysis of spectra is based on tables or standard spectra generated on standard samples of known minerals.

Peaks found on the spectra must have a high enough signal to be discriminated from the background noise. In addition, it is necessary to have secondary peaks that are used to confirm the primary peak as belonging to the particular mineral species in question. As a result, there are practical limitations to the minimum detectability of minerals in the sample. Some minerals may simply be reported as having trace amounts.

Printed spectra, digital spectra images as .pdf files, spreadsheets of tabular data and .pdf files of tabular data are provided on disk for the client.



The above spectrum shows a sample of quartz used as a standard. Virtually all of the peaks seen in the spectrum are attributed to the quartz. Exceptions include a peak at 33.1 degrees 2θ (pyrite) and one at 44.7 degrees 2θ (iron). The pyrite is part of the sample while the iron is from secondary emissions from the metal parts of the instrument itself.



The above spectra show the peak shifting that occurs in a sample containing abundant smectite. The blue spectrum is the air-dried run while the green spectrum is the glycolated run. Substitution of interlayer water molecules with larger radii glycol molecules expands the interlayer distances (d-spacing) causing the shift of peaks in those species which are susceptible to expansion. Note the shift of the main peak at about 7 degrees to just over 5 degrees 2θ. The fact that the peak at about 7 degrees (air-dried) is strongly broadened indicates multiple species of clays or disordering of clay layers. Illite-smectite layers are indicated. A very sharp peak and placement toward 6 degrees 2θ would indicate pure smectite.



Calgary Rock
and Materials
Services Inc.

SEMI QUANTITATIVE MINERALOGY BY XRD

COMPANY: Your Company
LOCN: 1-2-3-4W5
DEPTH: 1234.5 M.
FORM: CRDM

REQ BY:

BULK POWDER
00010505

	2 THETA	DENSITY	INTENSITY	FACTOR	WGHT FRACTION	VOL FRACTION
QUARTZ	20.9	2.65	6734	1.00	0.77	0.78
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	127	1.10	0.02	0.02
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	679	0.66	0.08	0.08
CALCITE	29.5	2.71	274	0.33	0.03	0.03
DOLOMITE	30.8	2.84	147	0.40	0.01	0.01
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	63	0.84	0.01	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	284	0.60	0.02	0.01
KAOLINITE	12.5	2.65	256	1.20	0.04	0.04
ILLITE	8.9	2.75	121	2.07	0.02	0.02
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	57	5.00	0.01	0.01
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00

1.00 1.00

CALCULATED GRAIN DENSITY = 2.71

Interpreted output tables are provided for the client's use. Pertinent data includes both weight fraction as well as volume fractions for mineral species. Note the calculated grain density at the bottom.

Important Reminders

Strengths

There are several reasons for using XRD as a semi-analytical tool. It can be used to positively identify mineral species contained in a sample. For example, on larger samples, relative amounts of clay types can be determined. In addition, the relative amounts of clays can be evaluated, both from a volumetric and mass perspective.

Differences between illite and mixed-layer clays are easily discernable using XRD analysis.

XRD analysis can be conducted on small amounts of sample. Qualitative analysis may provide critical input to completion decisions.

XRD analysis conducted on small samples can provide grain density of the rock in question. This can be helpful for calibrating logs.

Clay analyses can also be indicators of burial history. For example, shallow sediments often contain smectite, which will undergo transition through illite/smectite mixed layer clay, to a pure, end-member illite clay. If, for example, illite/smectite mixed-layer clay is found at around 300 metres depth, it could be an indication that the sediments have undergone a burial history of subsidence, then erosional uplift following that deeper burial. Similarly, smectite found at depth may indicate a situation of lower temperatures or compartmentalization of sediments with minimal diagenesis.

Limitations

X-ray analysis only measures what is there. One of the common errors in evaluation of XRD data is to compare it to petrographic analysis. For example, a petrologist will, in doing a point count and landing on a pore fill of kaolinite, count it as kaolinite. In fact, clusters of vermicular kaolinite are really only about 50% kaolinite, while the remainder is made up of microporosity. This is clearly seen in scanning electron microscopy analysis. As a result, the petrographer's results could be out by 100% with respect to the amount of kaolinite present! Chert dissolution can present a similar problem. Care must be taken in comparing XRD mineralogical analyses to standard petrographic techniques.

XRD analysis is limited with respect to the minimum fractions of mineral that it can detect. This can be related to the absolute amounts of material present, for example, if under one percent of a mineral is present, it may or may not be detectable. Response factors, interference by other minerals and signal to noise ratios may be influential on whether detection is possible. Peak overlap presents serious roadblocks to detectability when small

amounts of one mineral are dominated by large amounts of another.

Note that multiple angles are reported for the same minerals such as the feldspars and illite. Only one peak position will be used for any mineral, and where the typical peak position is interfered with by other minerals, the alternate position will be used for semi-quantitative analysis.



Calgary Rock's new "state-of-the-art" Rigaku Miniflex II X-ray diffractometer. Jade software with a database of over 100,000 compounds is used to evaluate mineralogy of unknown samples.

Q & A

Q: My amounts of clay (<5 μm) shown on the clay fraction table do not match the amounts shown if I add up the clay amounts from the bulk analysis spreadsheet.

A: It would, in fact, be unusual to have these two amounts match. There are several reasons for this. First of all, we are separating out the less than 5 micron fraction of the material by centrifugation methods. This means that materials that are not technically considered to be clays in a generic sense (illite, kaolinite, smectite and chlorite) like quartz and feldspars for example, may be of an appropriate size fraction to be separated using this standard method. Second, clay sizes are different, so minerals such as kaolinite, having particle sizes sometimes approaching 20 microns diameter, will get "spun out" of the "clay" fraction simply because they are large enough to settle rapidly. Other clays such as

illite may or may not disaggregate to the size necessary to do a quantitative analysis. This is partially why XRD is considered semi-quantitative. The nature of the minerals involved have a substantial influence on the end result. So, amounts that can be too little, or too great will be normal when using these techniques.

Q: Petrographically, the results do not match the amounts of minerals that are found using XRD analysis.

A: This too, is not unusual. Much depends on the homogeneity of the sample, and the method of deriving a sample from the raw rock piece provided. Cuttings can be very inhomogeneous, as can bulk rock samples from plugs, core or outcrop. As suggested in the preceding review, techniques can be used to minimize these effects, but they cannot be totally eliminated.

Q: Petrographically, I see a large amount of blue-stained "dolomite" but the XRD analysis shows calcite.

A: In unusual circumstances (mostly in shallow burial) the calcite takes on a very hard blue stain in the thin sections. It is unclear as to why this phenomenon occurs. If inspection is made on the thin section, it will be discovered that the stain (which is a thin film over the calcite or dolomite) has a "crazed" appearance. This is caused by aggressive evolution of CO₂ gas from underneath the layer of stain. This feature is enhanced when the sample is dried.

Q: A 5 micron fraction is used in the clay separates instead of 2 microns, 1 micron, 0.5 micron, 0.1 micron, etc. Why?

A: A variety of clay-separate sizes can be utilized. In fact, in research cases, a complete series of size fractions may be separated and analyzed in order to determine relationships between size and the constituent components of the clay material. CRMS utilizes a 5 micron

fraction for a variety of reasons. 1. CRMS' adopted a 30 year tradition of using a 5 micron fraction in order to provide some clients with backward compatibility with archived data. 2. The 5 micron fraction generally provides a better correlation with the actual clay amounts from the bulk sample analysis (see above comments). 3. Certain clay species' relative amounts will be reduced due to size fractionation in the centrifugation/separation process. Inclusion of as much of the clay fraction is desired in this case.

Hints on Manipulation of Tabular Data from an Adobe Acrobat® .pdf file.

1. Open the Acrobat .pdf file.
2. Click the Text Select tool on the menu bar.
3. Click and drag select the text you want to copy.
4. Use the Copy command or use the Ctrl+C keys to copy the text. This copies the text to your clipboard.
5. Open a word processor like Notepad, Wordpad, Word or some other.
6. Use the Paste command or use the Ctrl+V keys to paste the copied text to your page.
7. Save the file as a ASCII text file.
8. Start Microsoft Excel or another spreadsheet.
9. Open the file that you saved from your word processor.
10. Follow the instructions for delimiting the columnar data. Normally this will be a space delimited type.
11. Manipulate and chart your data.

An excellent resource for techniques used in XRD analysis is found at:

<http://pubs.usgs.gov/of/of01-041/html/docs/intro.htm>

References:

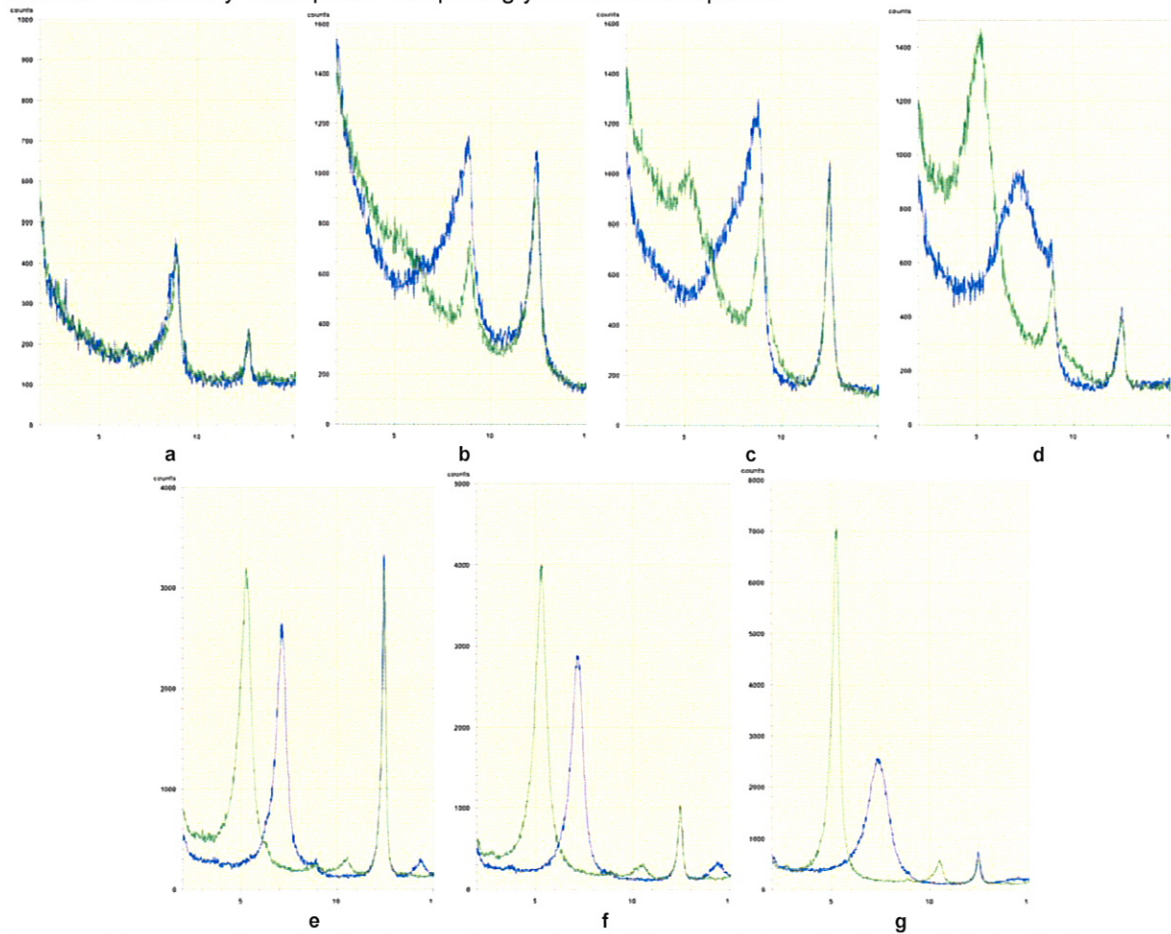
Moore, D.M. and Reynolds, R.C. Jr., *X-Ray Diffraction and the Identification and Analysis of Clay Minerals*. Oxford University Press, 1997.

Meunier, A., *Clays*, Springer-Verlag Berlin Heidelberg, 2005.

Meunier, A., and Velde, B., *Illite*, Springer-Verlag Berlin Heidelberg, 2004.

Some Additional Notes on Clay Analysis

The following real-world clay traces provide some examples of the variety of smectite and illite combinations that can be found. These may be helpful in interpreting your own XRD spectra.



The following provide explanations for the traces shown above. The x-axis is calibrated in 2-theta (θ) degrees while the y-axis denotes peak intensity. Air-dried traces are shown in blue while glycolated traces are shown in green.

a: A sample containing virtually no smectite or illite-smectite expandable clays. Illite is shown at peak position of about 8.9 degrees. Note also kaolinite at about 12.5 degrees and chlorite at about 6.3 degrees.

b: A sample containing pure end-member illite (8.9 degrees on the glycolated trace) and a highly disordered illite-smectite indicated by the broad leading edge of the illite peak in the air-dried trace (blue). When glycolated, this type of highly disordered illite-smectite gets generally "smeared" into the low-angle background rather than showing any distinct peak. Kaolinite is seen at about 12.5 degrees where peaks essentially overlap.

c: Sample showing a mixture of illite, illite-smectite and minor pure end-member smectite. Pure illite is discriminated in the glycolated trace at 8.9 degrees. The background is generally increased at the low angles indicating a disordered illite-smectite. Kaolinite is shown at about 12.5 degrees.

d: Sample showing a dominance of illite and illite-smectite. Large, broad peak at 5.2 degrees in the glycolated trace is ordered illite-smectite. Randomly-ordered illite-smectite can be indicated by a significant background increase at the low-angle region of the spectrum.

e: Sample of mainly ordered smectite (narrow, sharp peaks) with illite-smectite layers in small amounts. There are small amounts of pure, end-member illite and a trace of chlorite.

f: This sample has even less illite than e, but similar characteristics are seen otherwise.

g: Sample similar to previous two. Illite-smectite peak at 7 degrees is very broad, indicating more poorly ordered illite-smectite compared to previous samples. Pure smectite is also present. Care must be taken to evaluate the peak broadening characteristics of the sample, as well as higher angle responses of the traces. Very broad peaks are indicators of multiple species.

Section 2

Tables and Plots



*Calgary Rock
and Materials
Services Inc.*

#3, 3610 – 29th Street N.E., Calgary, Alberta Canada (403) 735-5050

Calgary Rock and Materials Services Inc. XRD Clay Fraction Table

Requestor: Carolle Lafleur

Company: PetroCanada

Date: 9 February, 2009

Sequence Number	Sample Number	Formation	Location	Depth	Total Sample Mass gm	Mass of Centrifuge Tube + >2 um - gm	Mass of Centrifuge Tube gm	Total Clay % <2 um by Mass	Sequence Number
1	07950109	N/A	Canyon Creek G-51	1244.7 ft	1.21	45.89	44.79	9.1	1
2	07960109	N/A	Canyon Creek G-51	1258.0 ft	1.26	46.25	45.01	1.6	2
3	07970109	N/A	Canyon Creek G-51	1267.0 ft	0.75	45.58	44.88	6.7	3
4	07980109	N/A	Canyon Creek G-51	1301.0 ft	1.33	46.06	44.88	11.3	4
5	07990109	N/A	Canyon Creek G-51	1306.0 ft	1.31	46.06	44.93	13.7	5
6	08000109	N/A	Canyon Creek G-51	1311.5 ft	1.31	45.08	43.98	16.0	6
7	08010109	N/A	Canyon Creek G-51	1391.0 ft	1.28	45.07	43.99	15.6	7
8	08020109	N/A	Canyon Creek G-51	1397.0 ft	1.27	44.85	43.77	15.0	8
9	08030109	N/A	Canyon Creek G-51	1861.0 ft	1.44	45.16	43.77	3.5	9
10	08040109	N/A	Canyon Creek G-51	1862.0 ft	1.35	45.94	44.66	5.2	10
11	08050109	N/A	Canyon Creek G-51	1866.0 ft	1.33	45.02	43.77	6.0	11
12									12
13									13
14									14
15									15
16									16
17									17
18									18
19									19
20									20
21									21
22									22
23									23
24									24
25									25
26									26
27									27
28									28
29									29
30									30



Calgary Rock
and Materials
Services Inc.

SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: PetroCanada

REQ BY: C. Lafleur

LOCN: Canyon Creek G-51

DEPTH: 1244.7 ft

BULK POWDER

FORM: N/A

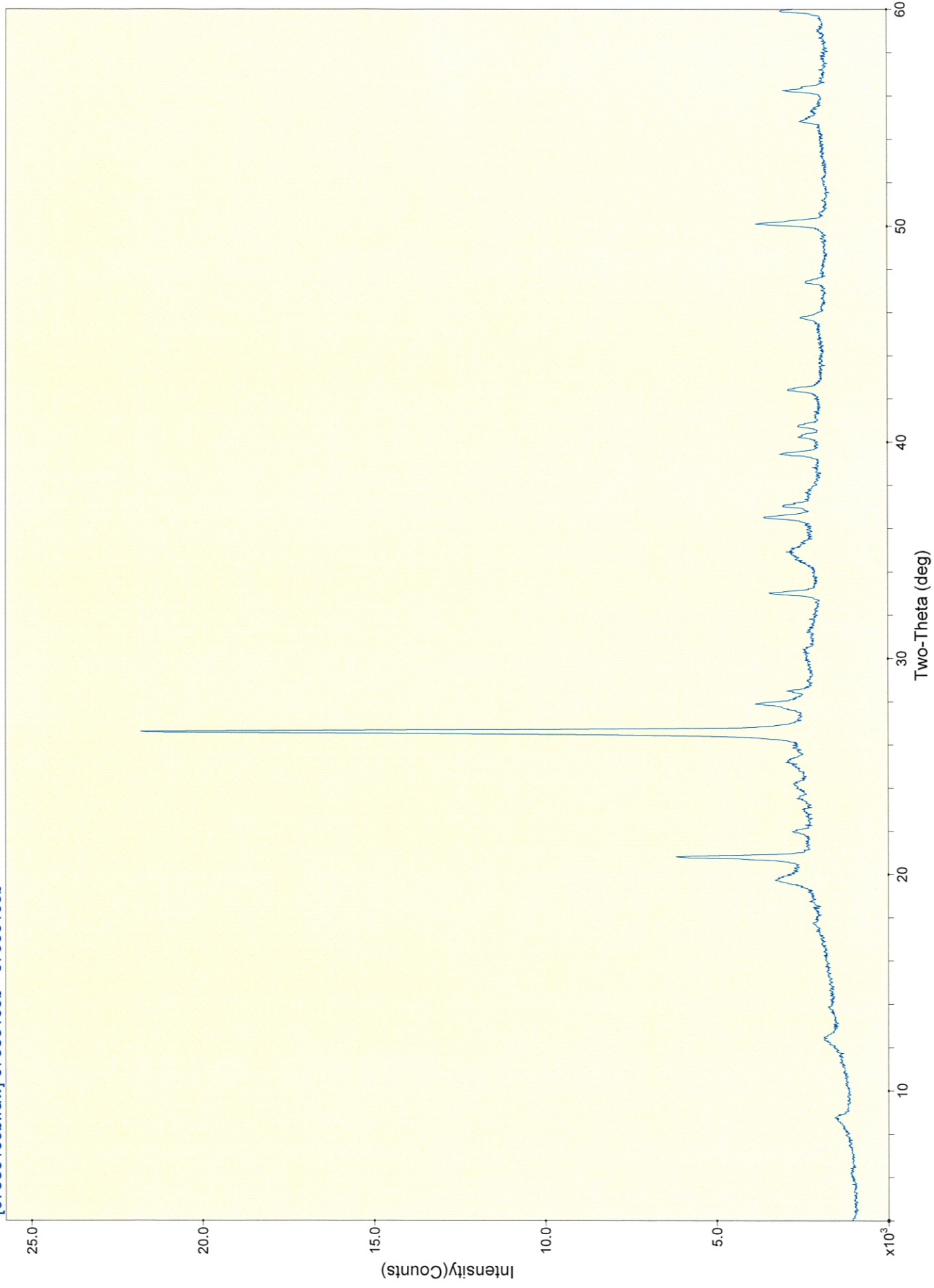
07950109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	2729	1.00	0.45	0.48
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	1.10	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	1141	0.98	0.18	0.20
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	377	1.88	0.12	0.10
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	1073	0.60	0.11	0.06
KAOLINITE	12.5	2.65	318	1.20	0.06	0.07
ILLITE	8.9	2.75	319	1.30	0.07	0.07
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	41	2.00	0.01	0.01
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					<u>1.00</u>	<u>1.00</u>

CALCULATED GRAIN DENSITY =

2.97

[07950109b.raw] 07950109b - 07950109b





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

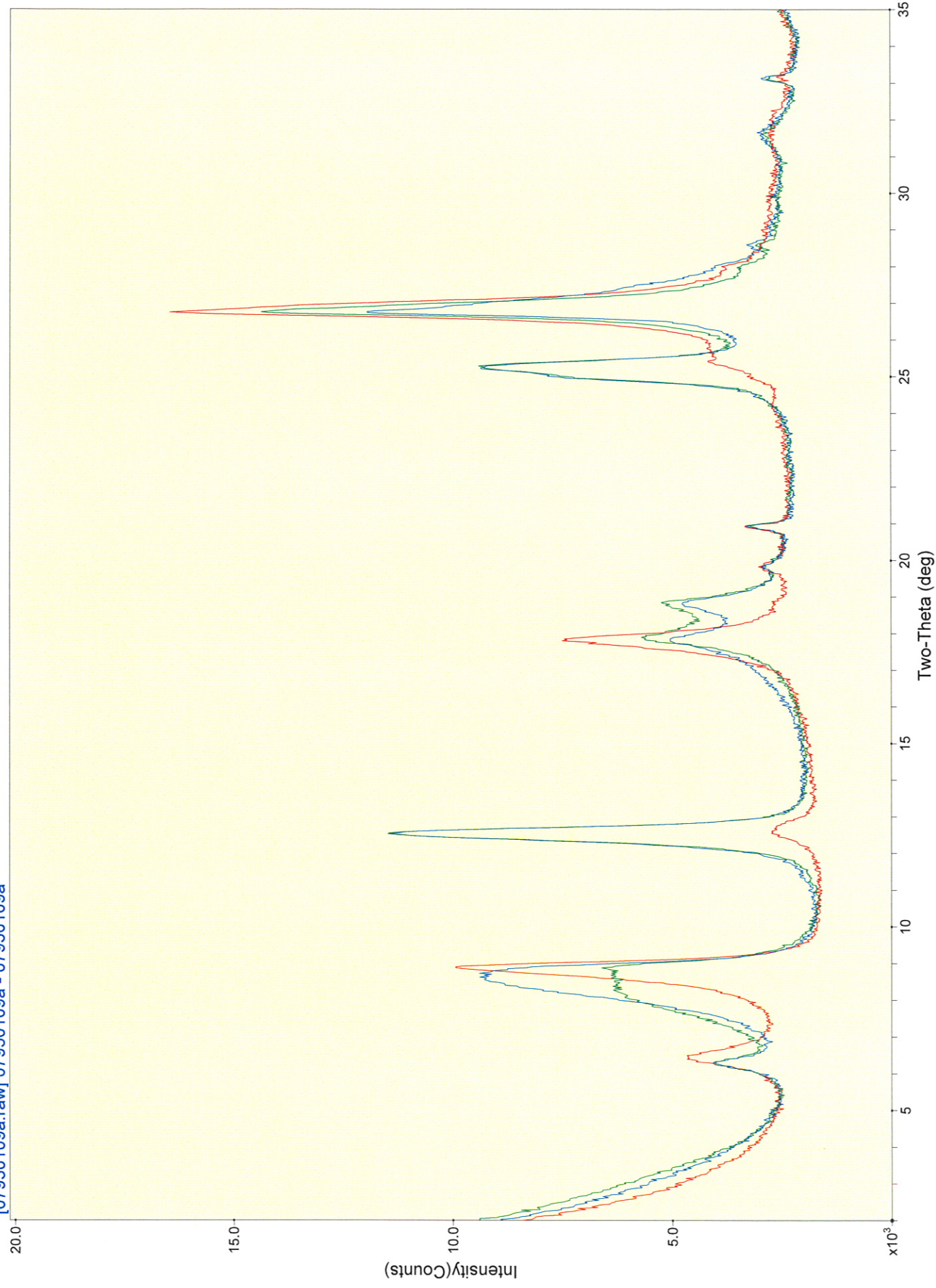
COMPANY: PetroCanada
 LOCN: Canyon Creek G-51
 DEPTH: 1244.7 ft
 FORM: N/A

REQ BY: C. Lafleur
 CLAY SMEAR < 2 um
 07950109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	705	1.00	0.02	0.02
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	0.62	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	580	0.66	0.01	0.01
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	523	0.60	0.01	0.00
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	6341	1.20	0.21	0.22
ILLITE	8.9	2.75	2915	7.20	0.58	0.58
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	979	5.00	0.14	0.12
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	1291	1.00	0.04	0.04
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
					1.00	1.00

CALCULATED GRAIN DENSITY = 2.77

[079501095.raw] 079501095 - 079501095
[A07950109g.raw] A07950109g - A07950109g
[07950109a.raw] 07950109a - 07950109a





Calgary Rock
and Materials
Services Inc.

SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: PetroCanada

REQ BY: C. Lafleur

LOCN: Canyon Creek G-51

DEPTH: 1258.0 ft

BULK POWDER

FORM: N/A

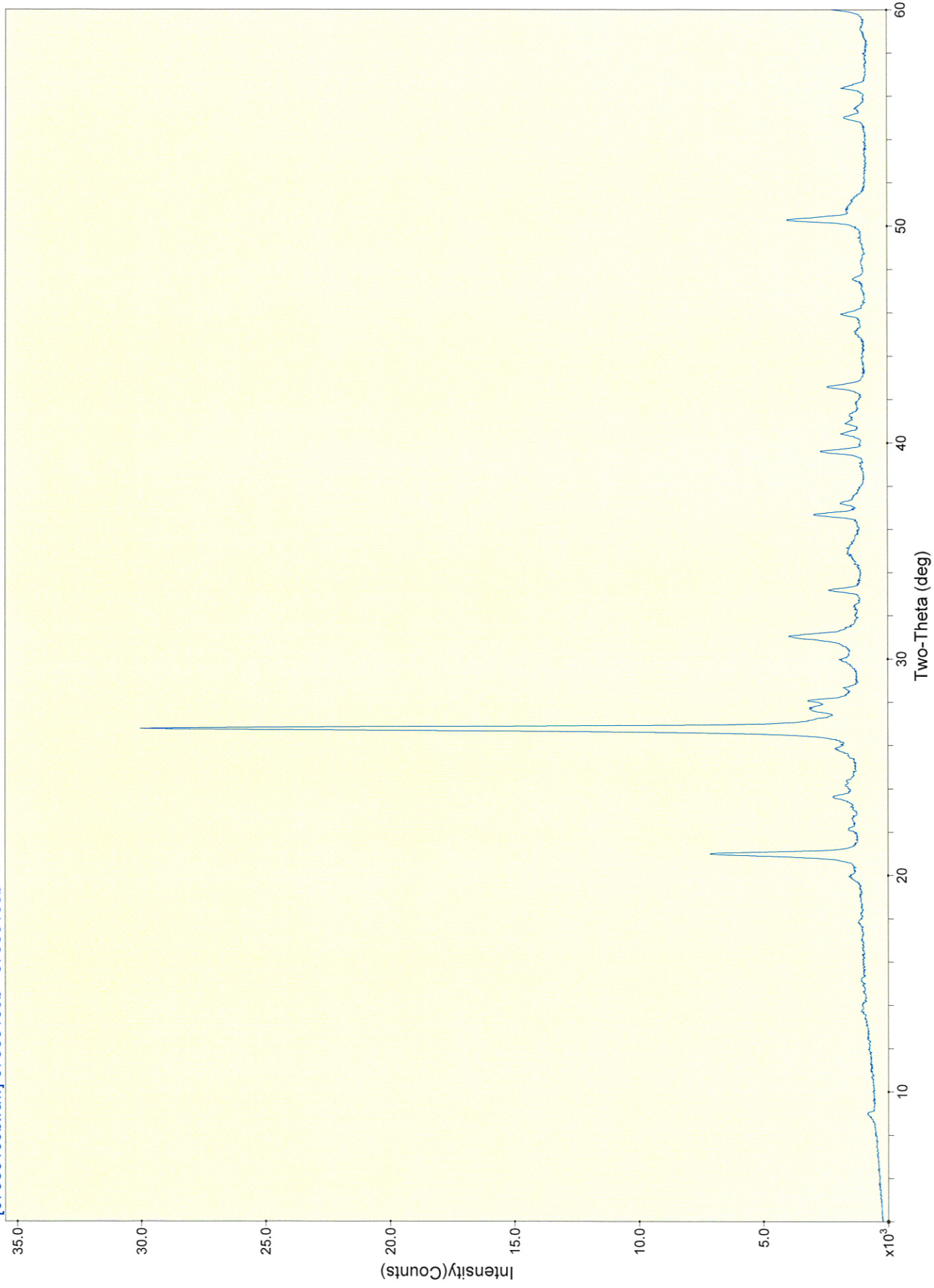
07960109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	4046	1.00	0.40	0.42
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	1128	1.10	0.12	0.13
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	1397	0.98	0.13	0.14
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	1854	0.96	0.18	0.17
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	488	1.88	0.09	0.08
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	927	0.60	0.05	0.03
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	192	1.30	0.02	0.02
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	2.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					<u>1.00</u>	<u>1.00</u>

CALCULATED GRAIN DENSITY =

2.85

[07960109b.raw] 07960109b - 07960109b





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: PetroCanada
 LOCN: Canyon Creek G-51
 DEPTH: 1258.0 ft
 FORM: N/A

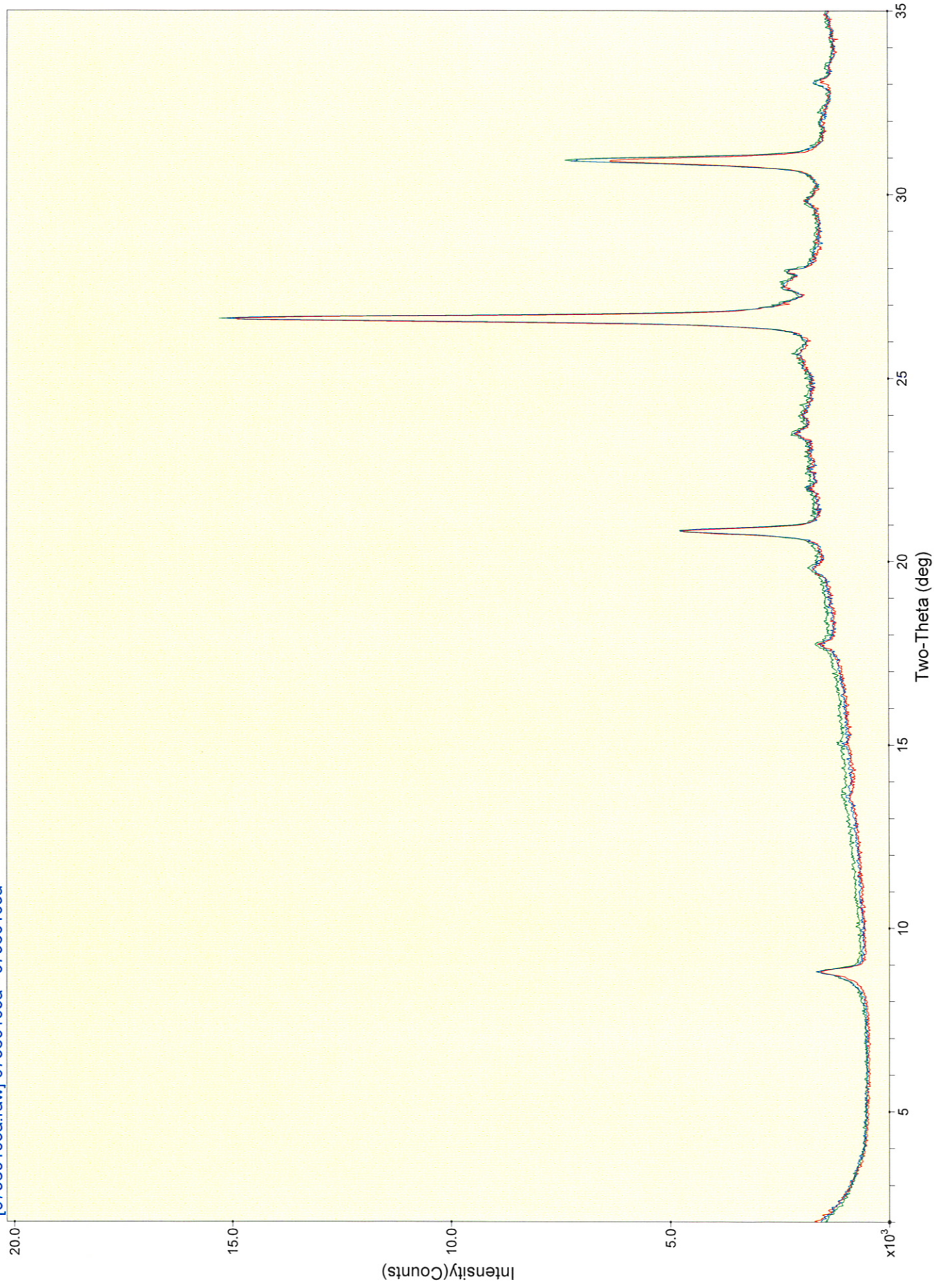
REQ BY: C. Lafleur
 CLAY SMEAR < 2 um
 07960109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	2159	1.00	0.18	0.19
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	535	0.62	0.03	0.03
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	482	0.66	0.03	0.03
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	4329	0.96	0.34	0.34
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	289	0.60	0.01	0.01
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	682	7.20	0.41	0.41
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	5.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
					1.00	1.00

CALCULATED GRAIN DENSITY =

2.79

[079601095.raw] 079601095 - 079601095
[07960109g.raw] 07960109g - 07960109g
[07960109a.raw] 07960109a - 07960109a





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: PetroCanada

REQ BY: C. Lafleur

LOCN: Canyon Creek G-51

DEPTH: 1267.0 ft

BULK POWDER

FORM: N/A

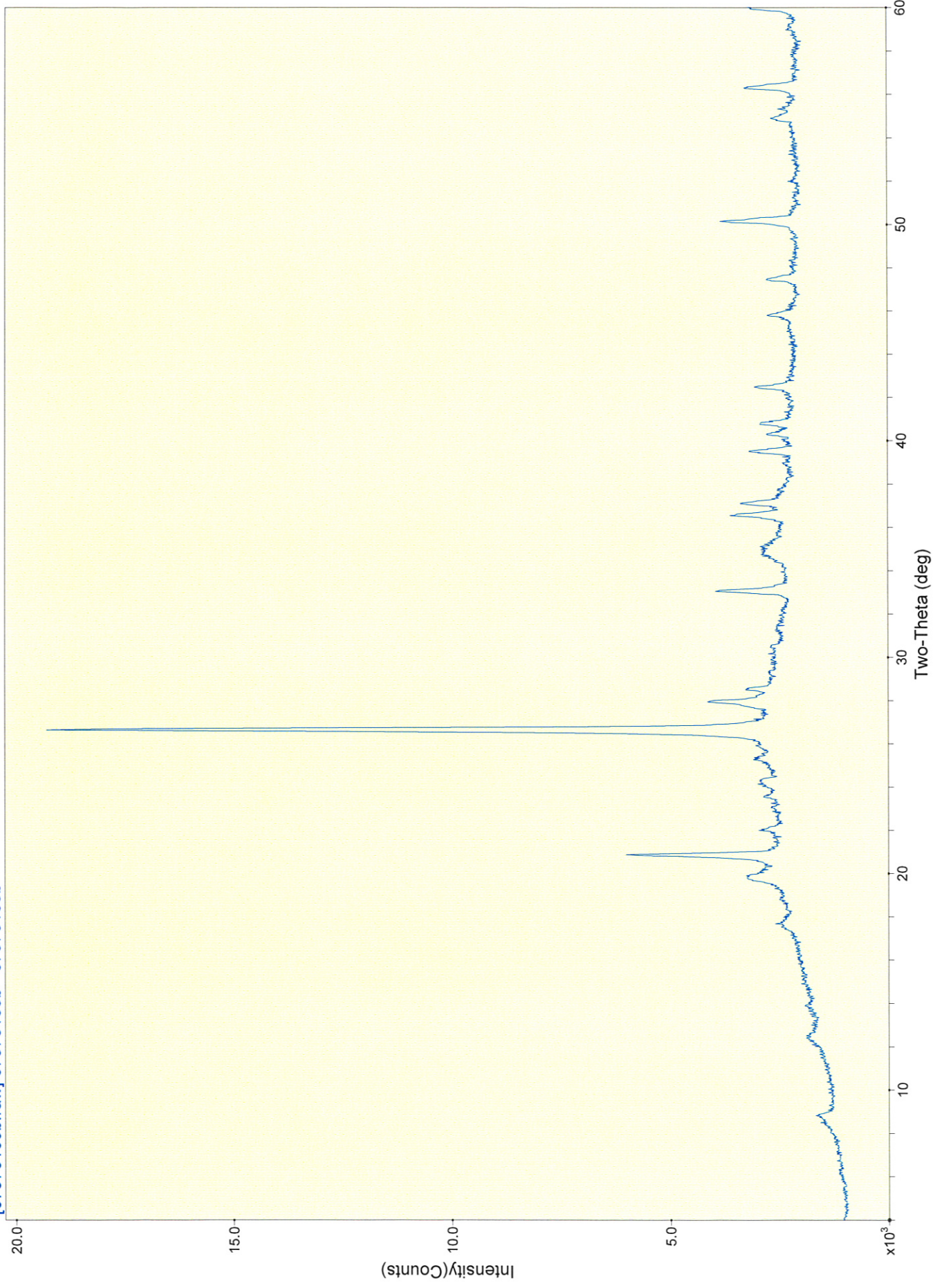
07970109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	2458	1.00	0.47	0.51
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	1.10	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	1100	0.98	0.20	0.22
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	218	1.88	0.08	0.07
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	1283	0.60	0.15	0.08
KAOLINITE	12.5	2.65	199	1.20	0.05	0.05
ILLITE	8.9	2.75	248	1.30	0.06	0.06
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	tr	2.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					<u>1.00</u>	<u>1.00</u>

CALCULATED GRAIN DENSITY =

3.04

[07970109b.raw] 07970109b - 07970109b





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

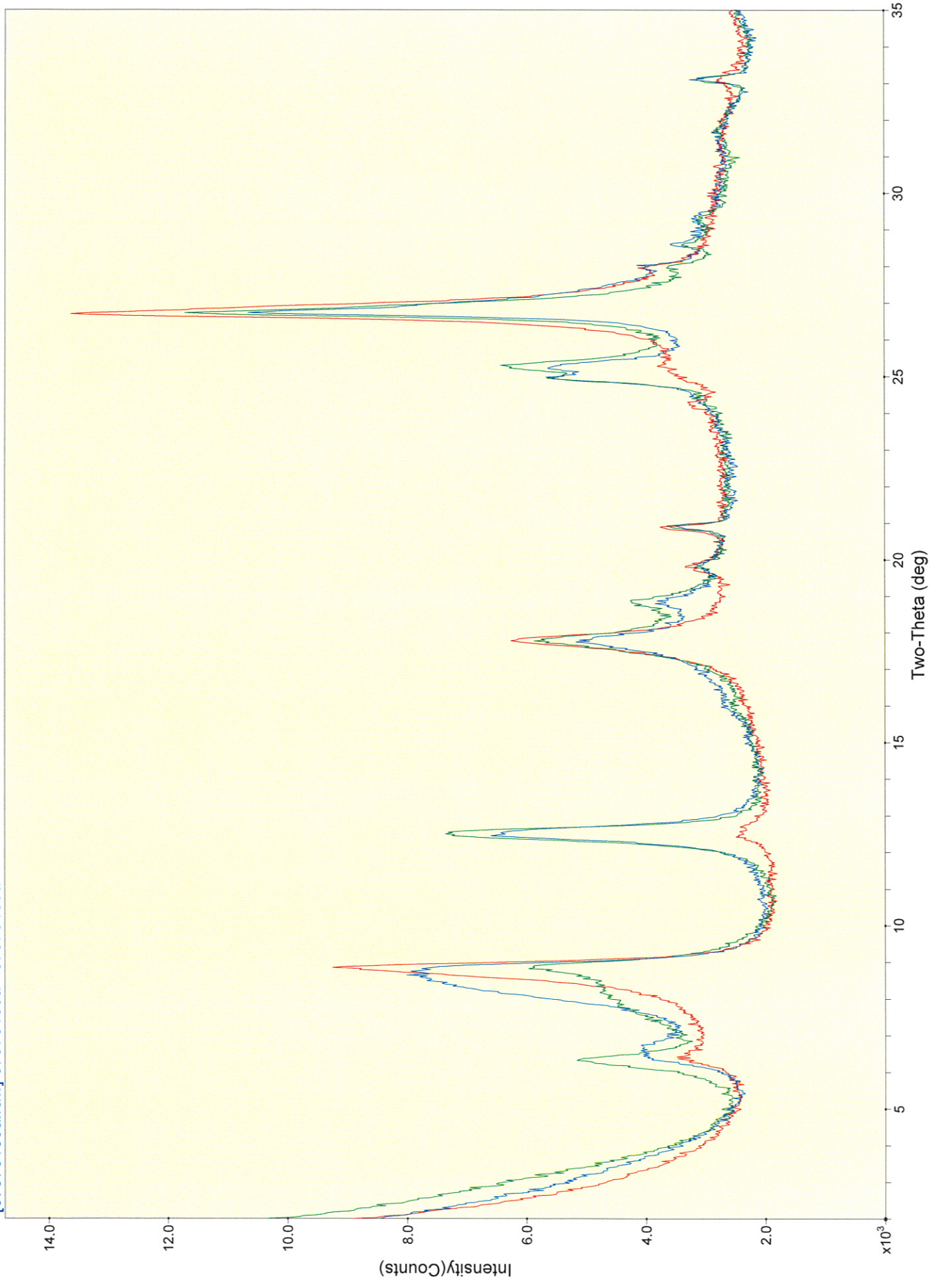
COMPANY: PetroCanada
 LOCN: Canyon Creek G-51
 DEPTH: 1267.0 ft
 FORM: N/A

REQ BY: C. Lafleur
 CLAY SMEAR < 2 um
 07970109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	660	1.00	0.02	0.02
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	0.62	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	499	0.66	0.01	0.01
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	595	0.60	0.01	0.01
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	3457	1.20	0.14	0.15
ILLITE	8.9	2.75	2356	7.20	0.58	0.58
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	1068	5.00	0.18	0.17
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	1616	1.00	0.05	0.06
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
					1.00	1.00

CALCULATED GRAIN DENSITY = 2.79

[079701095.raw] 079701095 - 079701095
[07970109g.raw] 07970109g - 07970109g
[07970109a.raw] 07970109a - 07970109a





Calgary Rock
and Materials
Services Inc.

SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: PetroCanada

REQ BY: C. Lafleur

LOCN: Canyon Creek G-51

DEPTH: 1301.0 ft

BULK POWDER

FORM: N/A

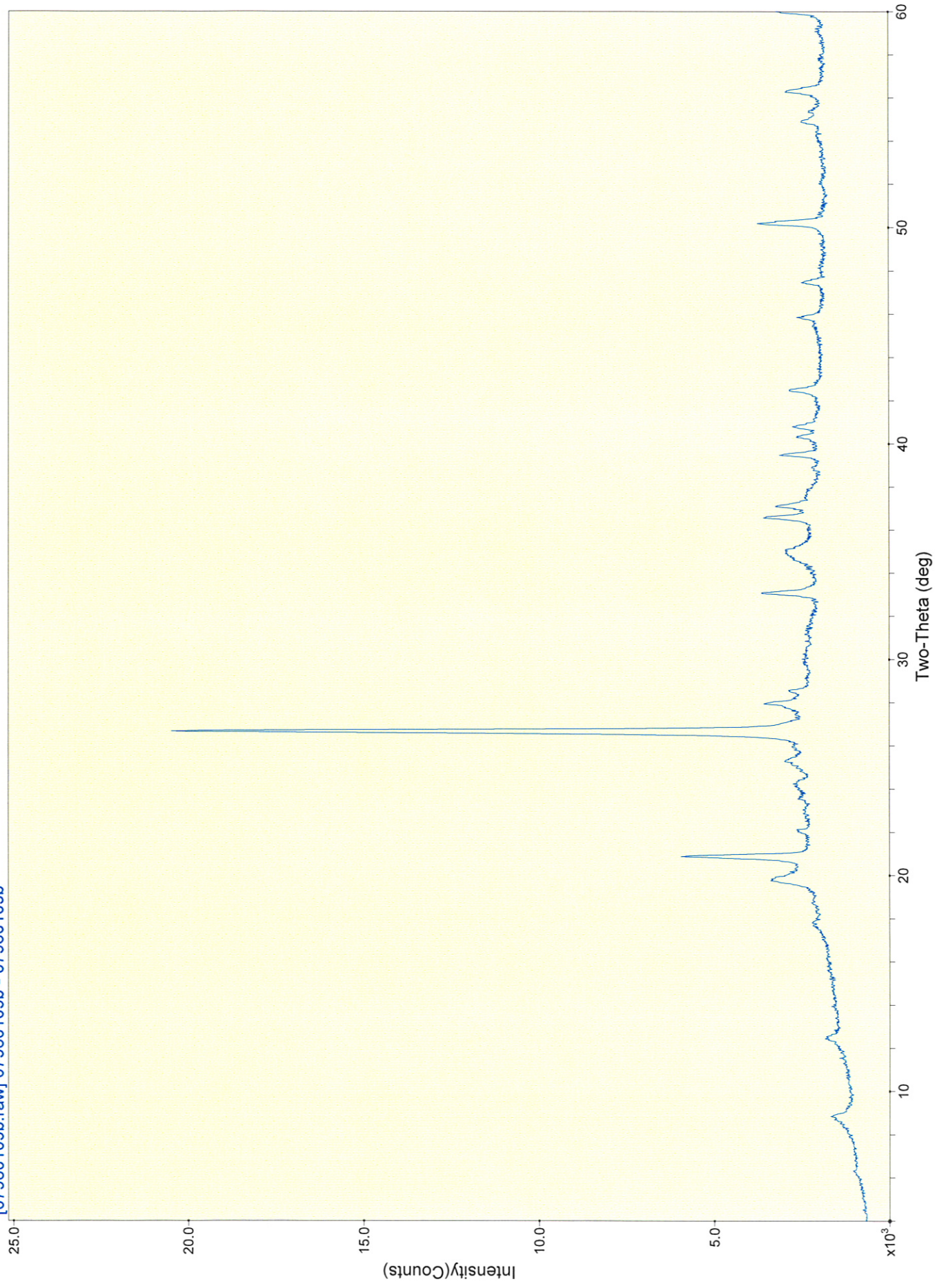
07980109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	2692	1.00	0.51	0.54
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	1.10	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	982	0.98	0.18	0.20
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	tr	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	1152	0.60	0.13	0.07
KAOLINITE	12.5	2.65	332	1.20	0.08	0.08
ILLITE	8.9	2.75	422	1.30	0.10	0.11
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	tr	2.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					<u>1.00</u>	<u>1.00</u>

CALCULATED GRAIN DENSITY =

2.96

[07980109b.raw] 07980109b - 07980109b





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

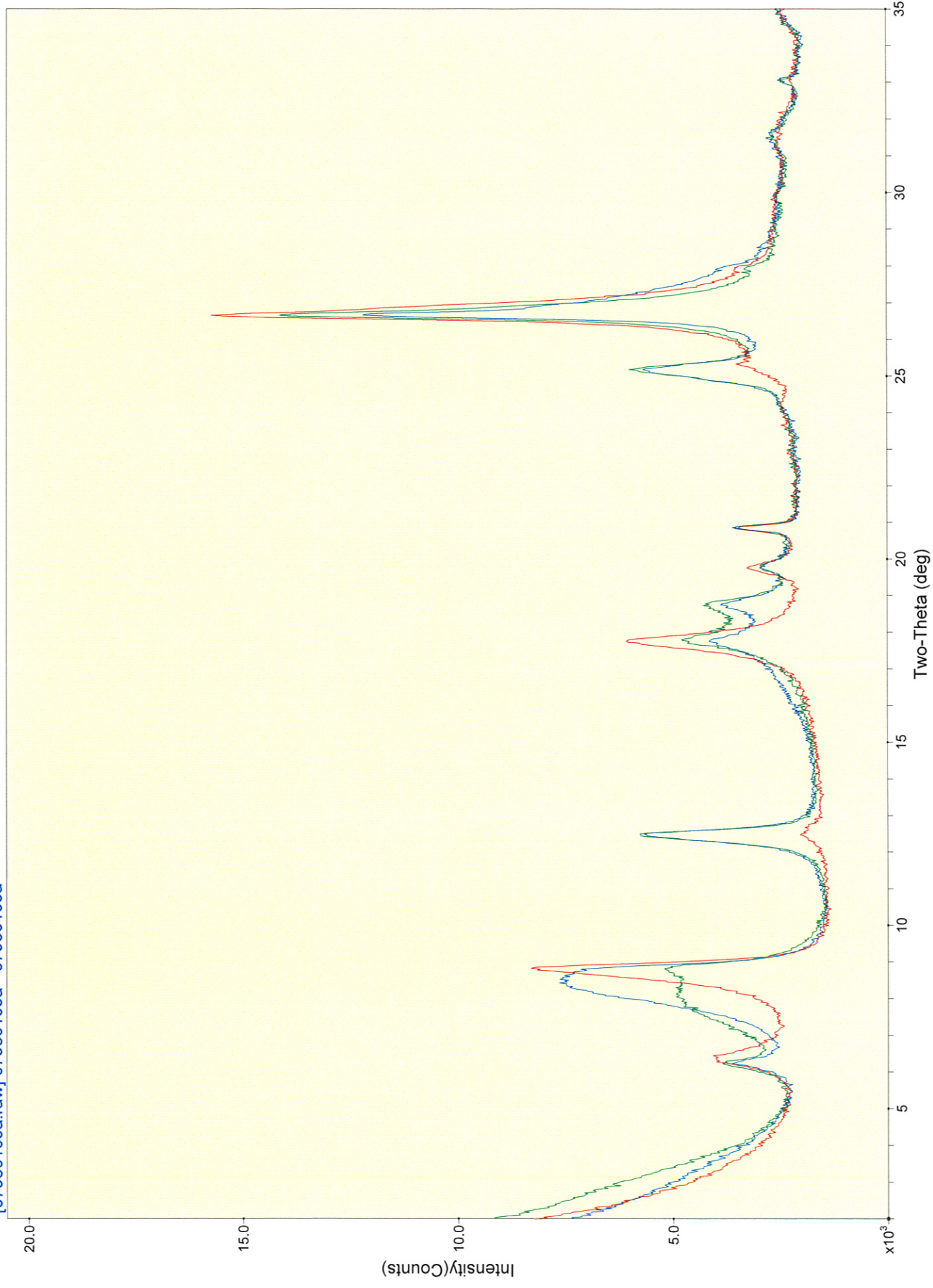
COMPANY: PetroCanada
 LOCN: Canyon Creek G-51
 DEPTH: 1301.0 ft
 FORM: N/A

REQ BY: C. Lafleur
 CLAY SMEAR < 2 um
 07980109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT</u> <u>FRACTION</u>	<u>VOL</u> <u>FRACTION</u>
QUARTZ	20.9	2.65	1086	1.00	0.04	0.04
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	0.62	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	604	0.66	0.02	0.02
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	280	0.60	0.01	0.00
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	2730	1.20	0.13	0.13
ILLITE	8.9	2.75	2083	7.20	0.58	0.58
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	891	5.00	0.17	0.16
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	1531	1.00	0.06	0.07
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
					1.00	1.00

CALCULATED GRAIN DENSITY = 2.77

[079801095.raw] 079801095 - 079801095
[07980109g.raw] 07980109g - 07980109g
[07980109a.raw] 07980109a - 07980109a





Calgary Rock
and Materials
Services Inc.

SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: PetroCanada

REQ BY: C. Lafleur

LOCN: Canyon Creek G-51

DEPTH: 1306.0 ft

BULK POWDER

FORM: N/A

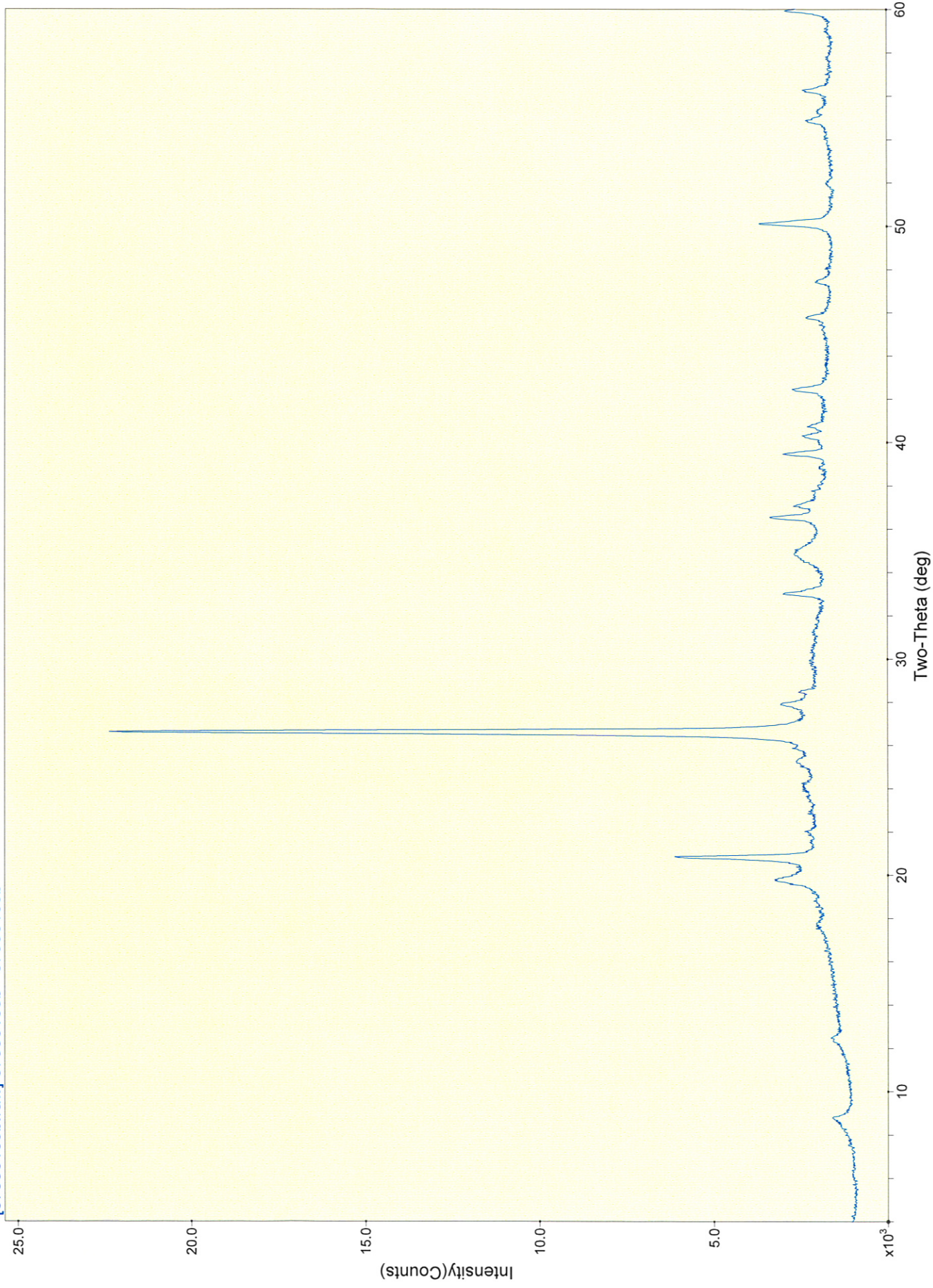
07990109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	2805	1.00	0.52	0.56
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	1.10	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	668	0.98	0.12	0.13
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	364	1.88	0.13	0.11
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	858	0.60	0.10	0.05
KAOLINITE	12.5	2.65	142	1.20	0.03	0.03
ILLITE	8.9	2.75	324	1.30	0.08	0.08
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	81	2.00	0.03	0.03
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					<u>1.00</u>	<u>1.00</u>

CALCULATED GRAIN DENSITY =

2.96

[07990109b.raw] 07990109b - 07990109b





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

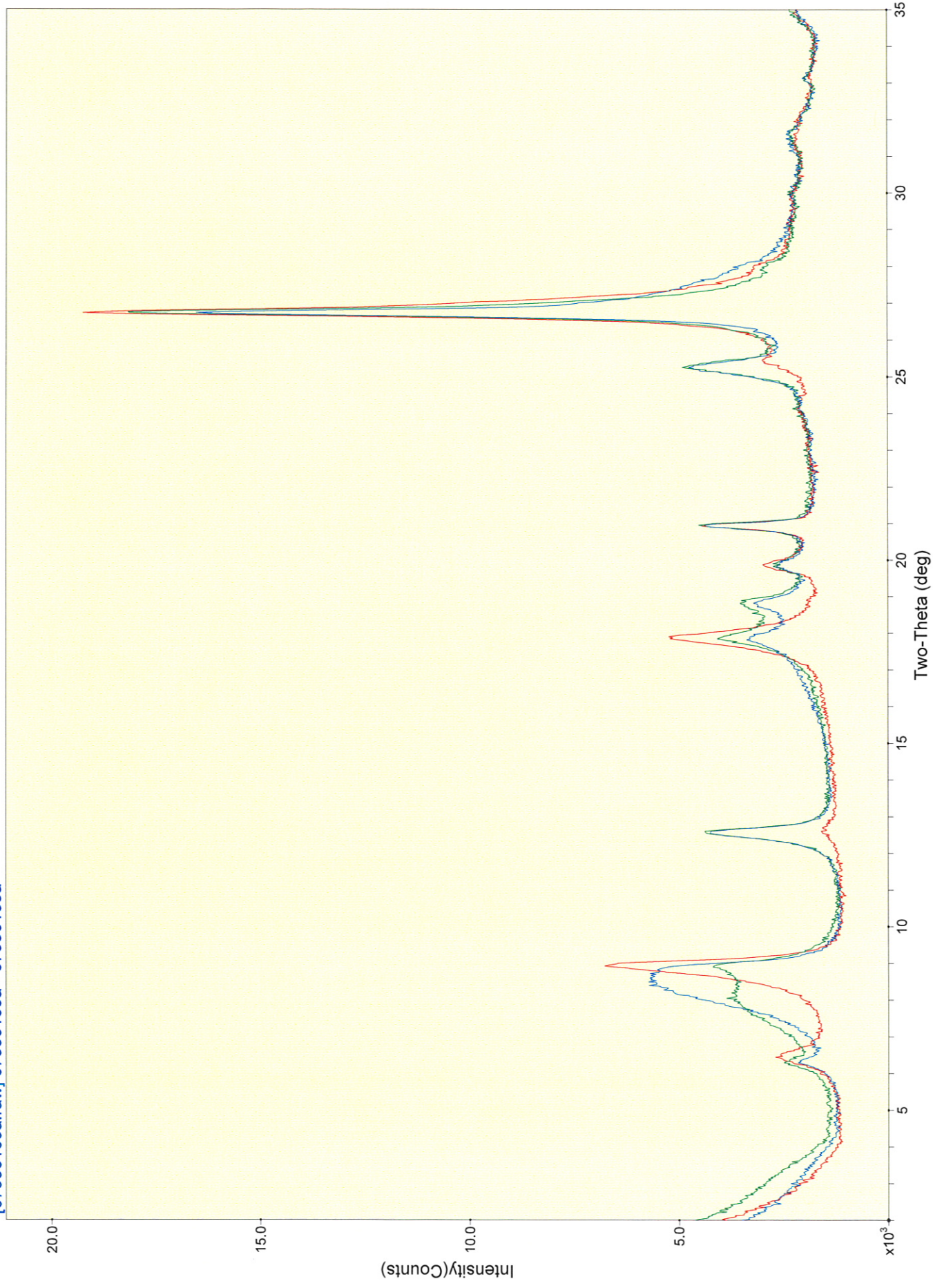
COMPANY: PetroCanada
 LOCN: Canyon Creek G-51
 DEPTH: 1306.0 ft
 FORM: N/A

REQ BY: C. Lafleur
 CLAY SMEAR < 2 um
 07990109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	1788	1.00	0.08	0.08
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	0.62	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	520	0.66	0.02	0.02
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	169	0.60	0.00	0.00
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	2043	1.20	0.11	0.11
ILLITE	8.9	2.75	1949	7.20	0.63	0.62
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	483	5.00	0.11	0.10
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	1275	1.00	0.06	0.06
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
					1.00	1.00

CALCULATED GRAIN DENSITY = 2.75

[079901095.raw] 079901095 - 079901095
[A07990109g.raw] A07990109g - A07990109g
[07990109a.raw] 07990109a - 07990109a





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: PetroCanada

REQ BY: C. Lafleur

LOCN: Canyon Creek G-51

DEPTH: 1311.5 ft

BULK POWDER

FORM: N/A

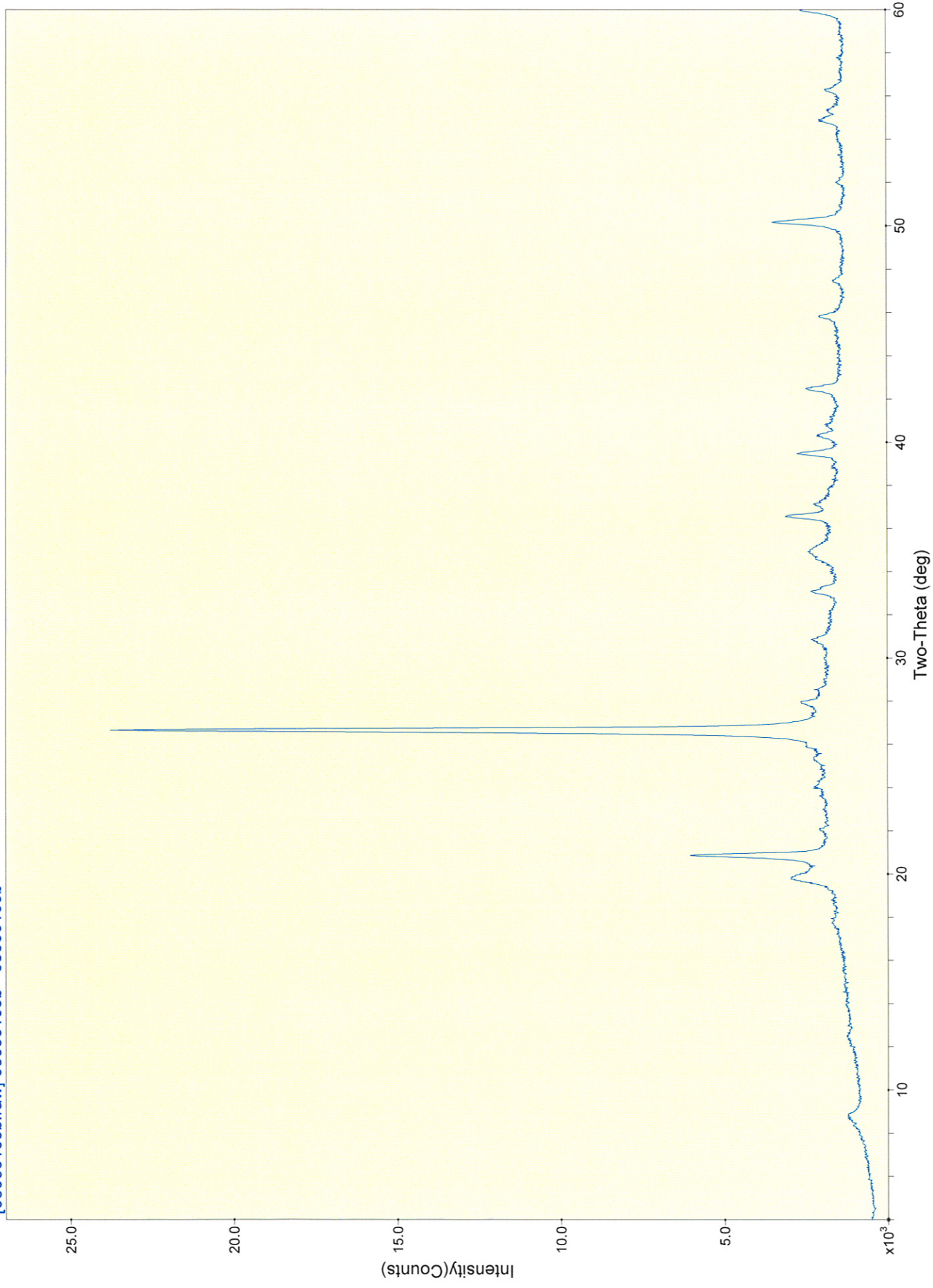
08000109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	3033	1.00	0.53	0.56
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	tr	1.10	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	535	0.98	0.09	0.10
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	437	0.96	0.07	0.07
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	484	1.88	0.16	0.14
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	516	0.60	0.05	0.03
KAOLINITE	12.5	2.65	155	1.20	0.03	0.03
ILLITE	8.9	2.75	296	1.30	0.07	0.07
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	2.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					<u>1.00</u>	<u>1.00</u>

CALCULATED GRAIN DENSITY =

2.88

[08000109b.raw] 08000109b - 08000109b





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

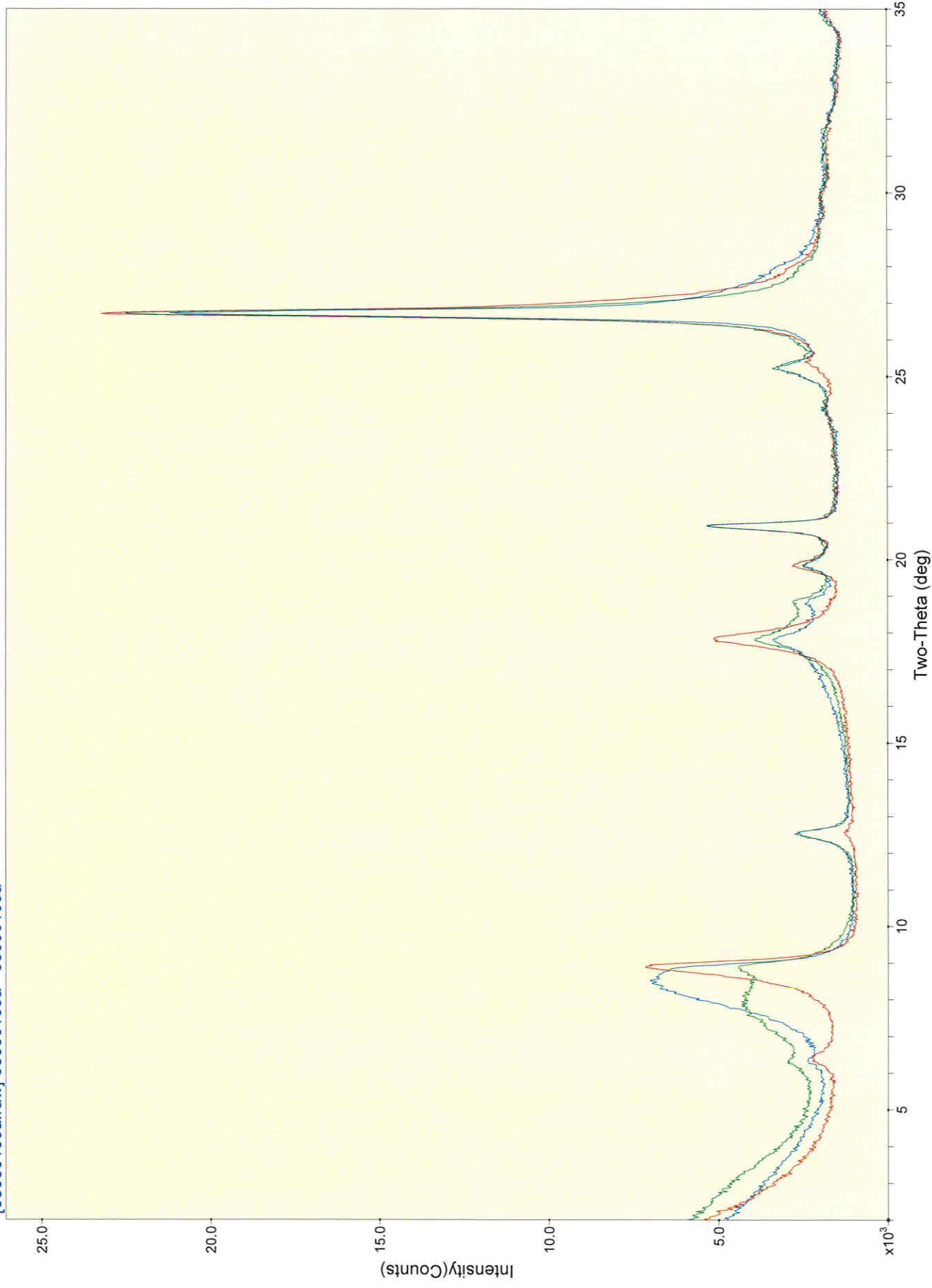
COMPANY: PetroCanada
 LOCN: Canyon Creek G-51
 DEPTH: 1311.5 ft
 FORM: N/A

REQ BY: C. Lafleur
 CLAY SMEAR < 2 um
 08000109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT</u> <u>FRACTION</u>	<u>VOL</u> <u>FRACTION</u>
QUARTZ	20.9	2.65	2598	1.00	0.13	0.13
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	0.62	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	332	0.66	0.01	0.01
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	114	0.60	0.00	0.00
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	1033	1.20	0.06	0.06
ILLITE	8.9	2.75	1667	7.20	0.59	0.59
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	446	5.00	0.11	0.10
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	1966	1.00	0.10	0.11
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
					1.00	1.00

CALCULATED GRAIN DENSITY = 2.74

[080001095.raw] 080001095 - 080001095
[08000109g.raw] 08000109g - 08000109g
[08000109a.raw] 08000109a - 08000109a





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: PetroCanada

REQ BY: C. Lafleur

LOCN: Canyon Creek G-51

DEPTH: 1391.0 ft

BULK POWDER

FORM: N/A

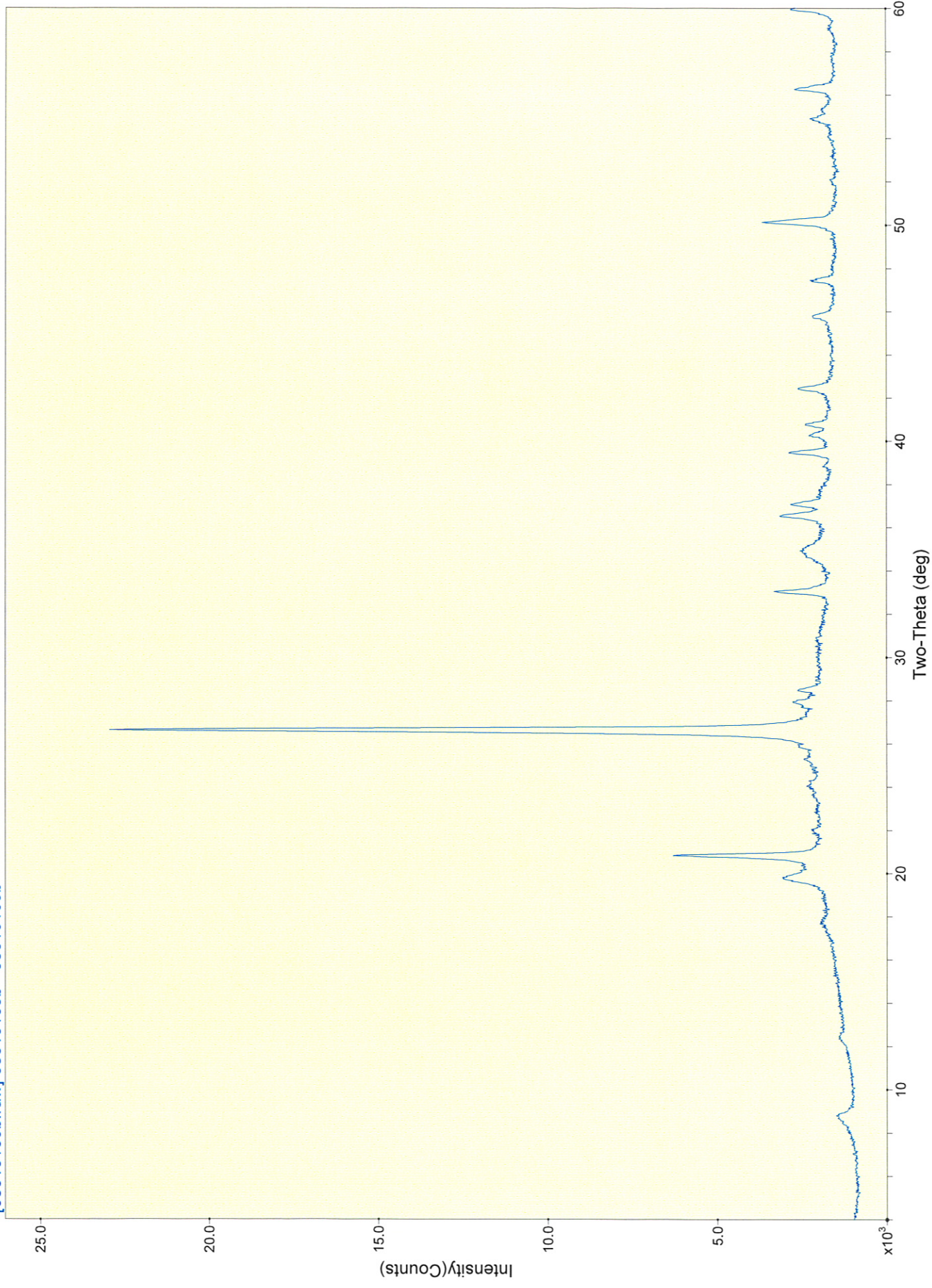
08010109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	2983	1.00	0.56	0.62
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	1.10	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	358	0.98	0.07	0.07
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	337	1.88	0.12	0.11
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	1174	0.60	0.13	0.08
KAOLINITE	12.5	2.65	142	1.20	0.03	0.04
ILLITE	8.9	2.75	342	1.30	0.08	0.09
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	2.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					<u>1.00</u>	<u>1.00</u>

CALCULATED GRAIN DENSITY =

3.04

[08010109b.raw] 08010109b - 08010109b





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

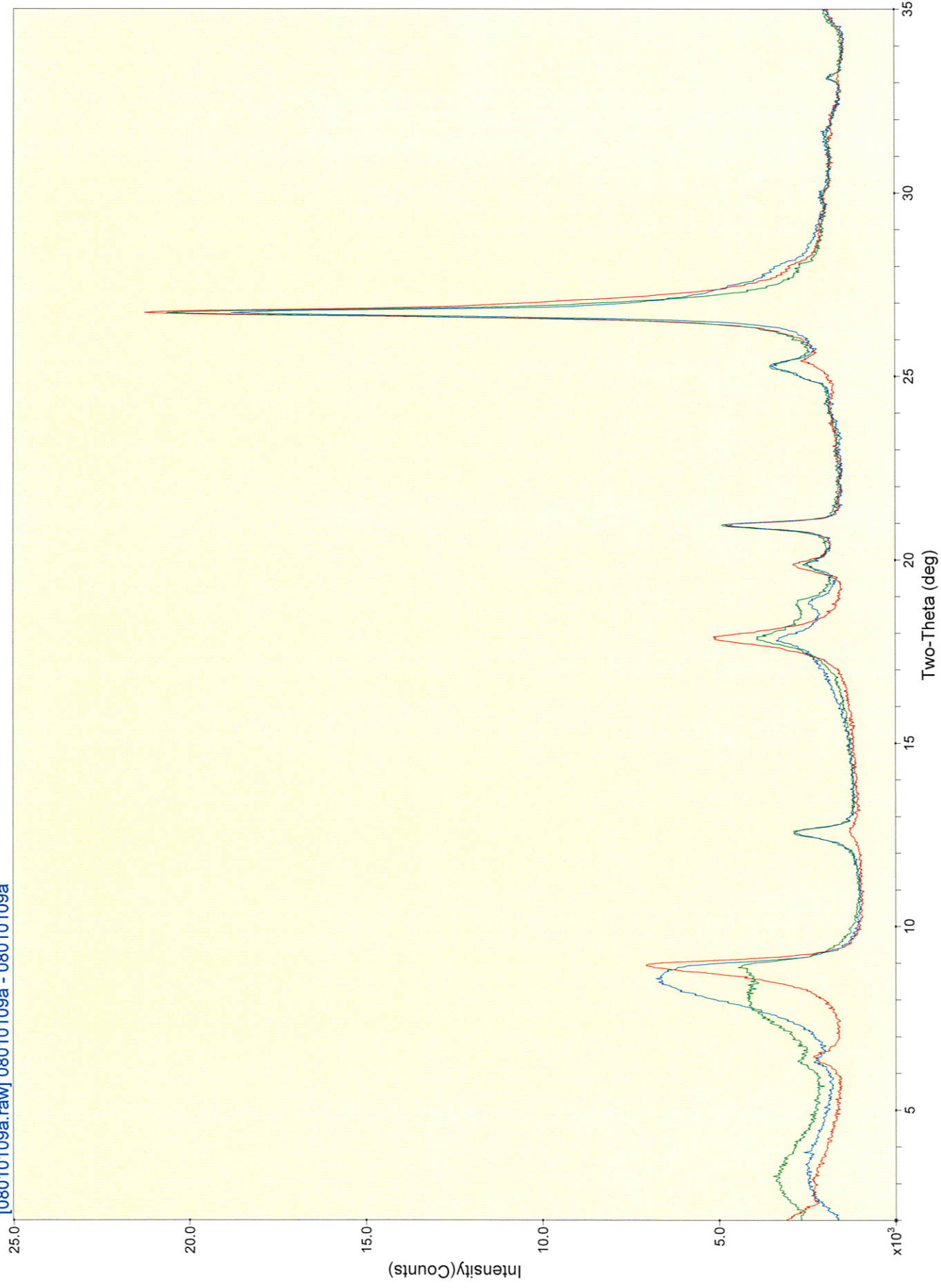
COMPANY: PetroCanada
 LOCN: Canyon Creek G-51
 DEPTH: 1391.0 ft
 FORM: N/A

REQ BY: C. Lafleur
 CLAY SMEAR < 2 um
 08010109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	2356	1.00	0.11	0.11
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	0.62	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	669	0.66	0.02	0.02
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	0	0.60	0.00	0.00
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	1168	1.20	0.06	0.07
ILLITE	8.9	2.75	1968	7.20	0.64	0.64
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	432	5.00	0.10	0.09
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	1637	1.00	0.07	0.08
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
					1.00	1.00

CALCULATED GRAIN DENSITY = 2.74

[080101095.raw] 080101095 - 080101095
[08010109g.raw] 08010109g - 08010109g
[08010109a.raw] 08010109a - 08010109a





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: PetroCanada

REQ BY: C. Lafleur

LOCN: Canyon Creek G-51

DEPTH: 1397.0 ft

BULK POWDER

FORM: N/A

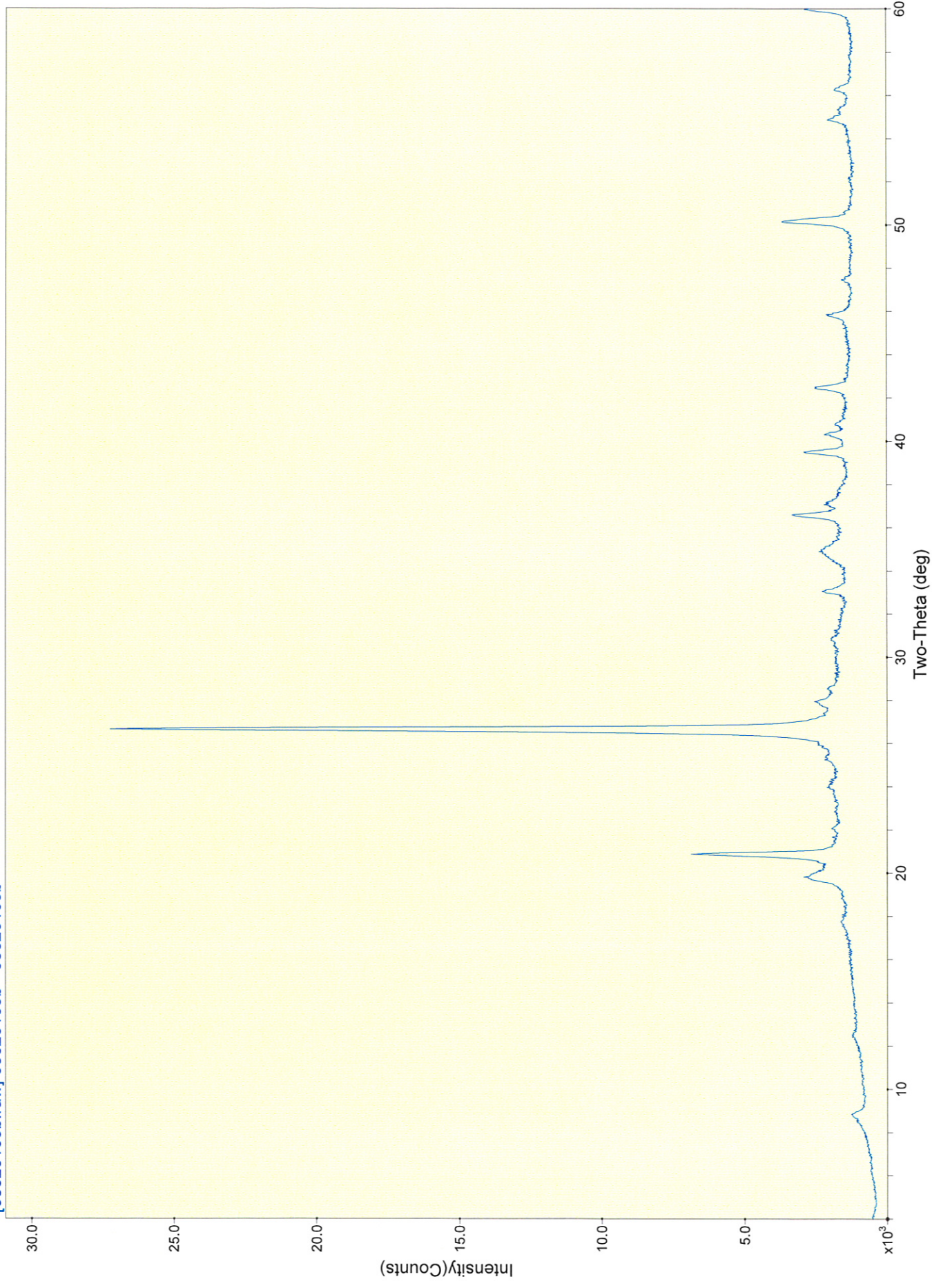
08020109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	3637	1.00	0.57	0.61
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	tr	1.10	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	538	0.98	0.08	0.09
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	286	0.96	0.04	0.04
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	472	1.88	0.14	0.12
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	624	0.60	0.06	0.03
KAOLINITE	12.5	2.65	173	1.20	0.03	0.03
ILLITE	8.9	2.75	332	1.30	0.07	0.07
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	2.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					<u>1.00</u>	<u>1.00</u>

CALCULATED GRAIN DENSITY =

2.88

[08020109b.raw] 08020109b - 08020109b





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

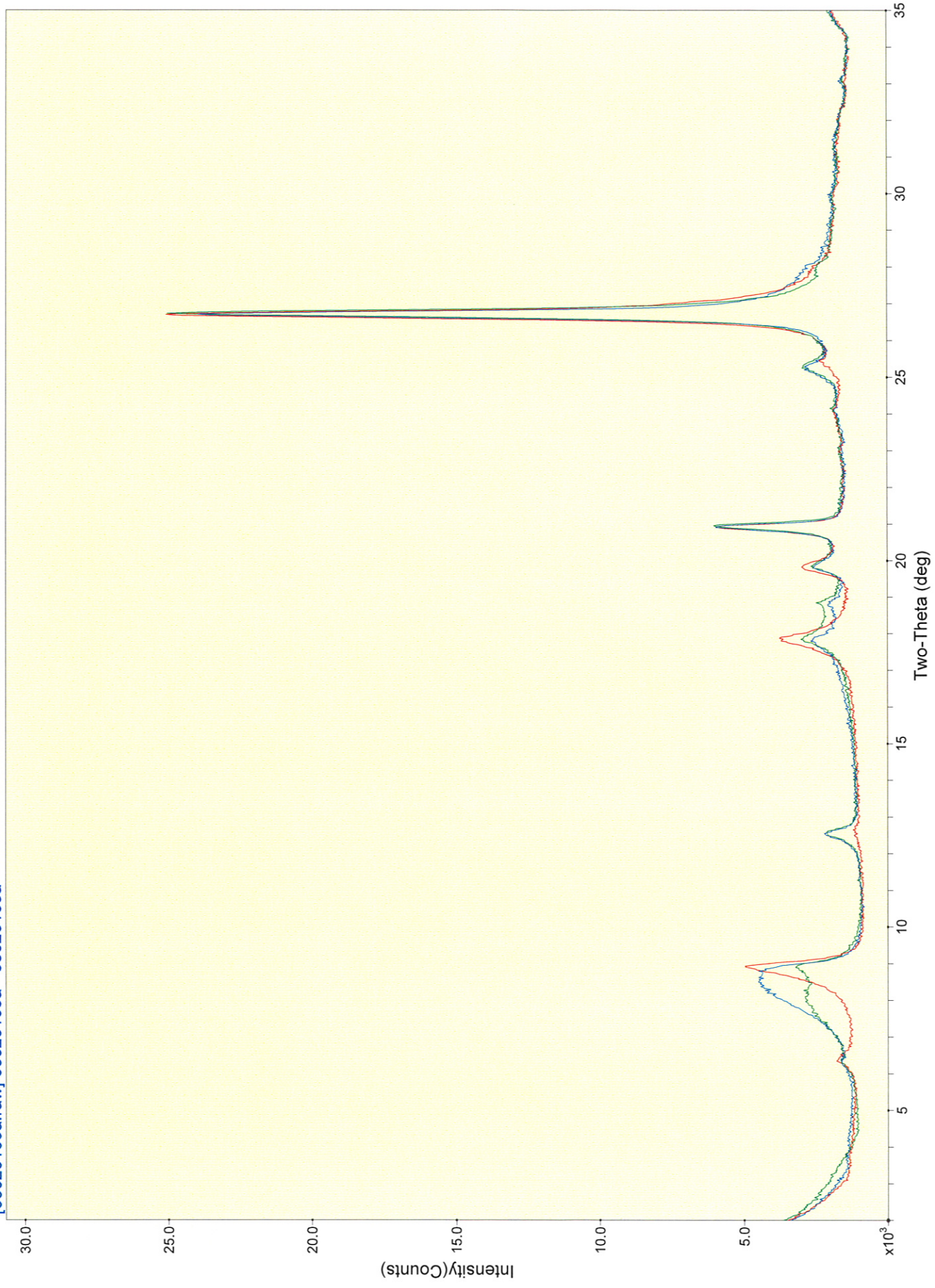
COMPANY: PetroCanada
 LOCN: Canyon Creek G-51
 DEPTH: 1397.0 ft
 FORM: N/A

REQ BY: C. Lafleur
 CLAY SMEAR < 2 um
 08020109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	2915	1.00	0.19	0.20
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	0.62	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	488	0.66	0.02	0.02
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	160	0.60	0.01	0.00
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	708	1.20	0.06	0.06
ILLITE	8.9	2.75	1251	7.20	0.59	0.58
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	202	5.00	0.07	0.06
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	1113	1.00	0.07	0.08
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
					1.00	1.00

CALCULATED GRAIN DENSITY = 2.74

[080201095.raw] 080201095 - 080201095
[08020109g.raw] 08020109g - 08020109g
[08020109a.raw] 08020109a - 08020109a





Calgary Rock
and Materials
Services Inc.

SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: PetroCanada

REQ BY: C. Lafleur

LOCN: Canyon Creek G-51

DEPTH: 1861.0 ft

BULK POWDER

FORM: N/A

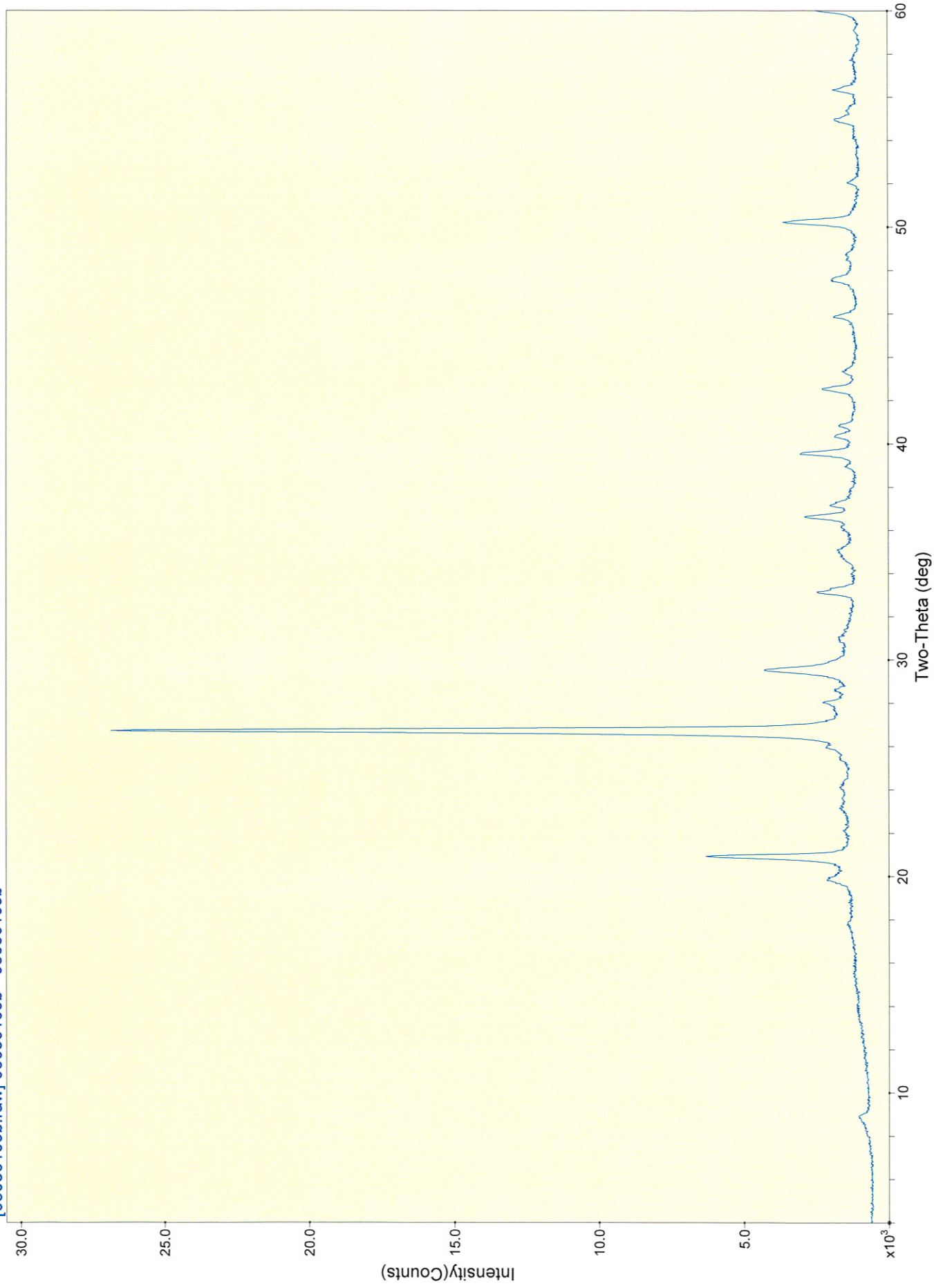
08030109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	3341	1.00	0.42	0.45
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	tr	1.10	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	732	0.98	0.09	0.10
CALCITE	29.5	2.71	2105	0.78	0.21	0.21
DOLOMITE	30.8	2.84	346	0.96	0.04	0.04
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	572	1.88	0.13	0.12
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	966	0.60	0.07	0.04
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	236	1.30	0.04	0.04
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	2.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					<u>1.00</u>	<u>1.00</u>

CALCULATED GRAIN DENSITY =

2.92

[08030109b.raw] 08030109b - 08030109b





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

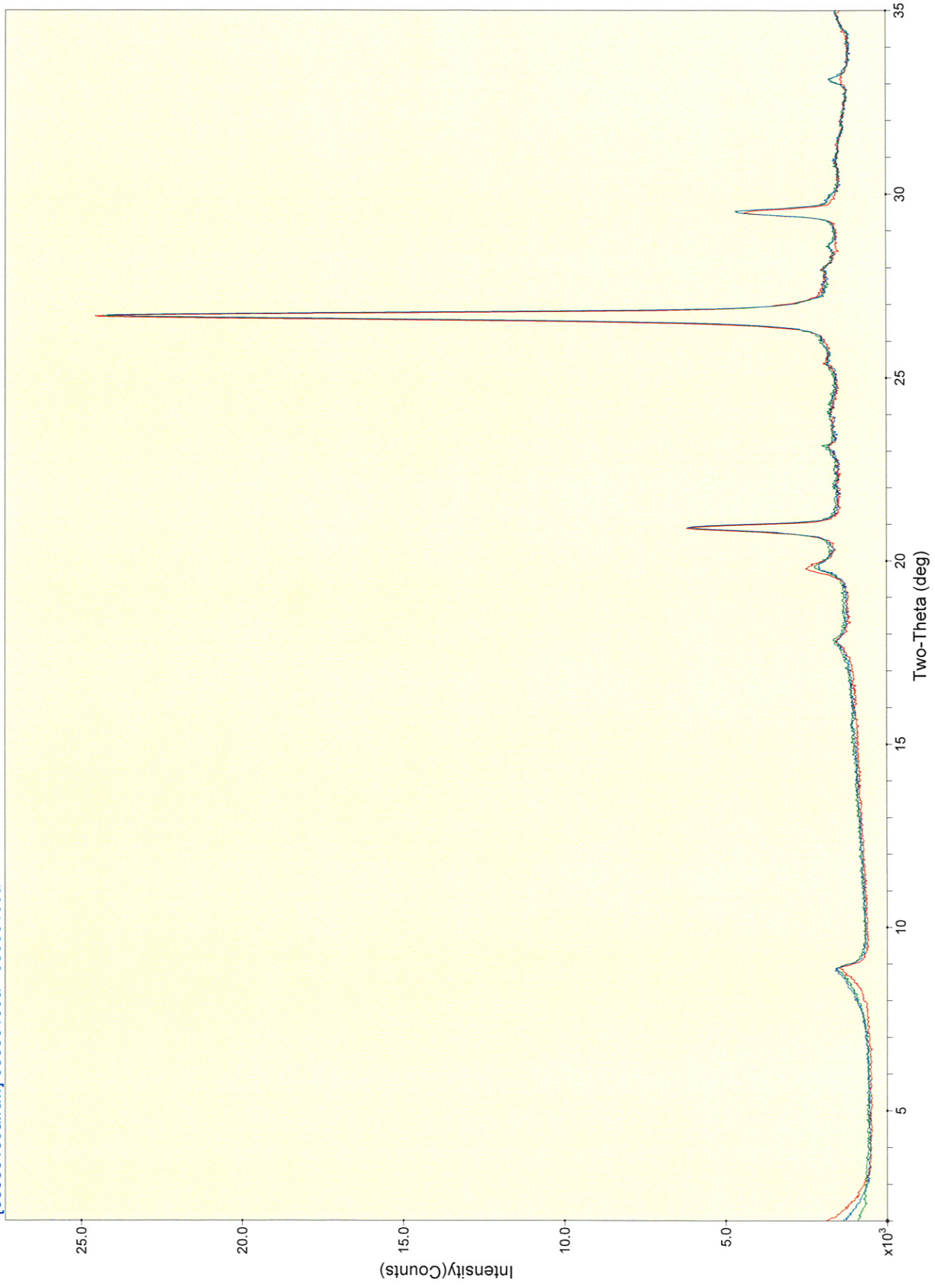
COMPANY: PetroCanada
 LOCN: Canyon Creek G-51
 DEPTH: 1861.0 ft
 FORM: N/A

REQ BY: C. Lafleur
 CLAY SMEAR < 2 um
 08030109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	3291	1.00	0.34	0.35
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	0.62	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	310	0.66	0.02	0.02
CALCITE	29.5	2.71	2334	0.78	0.19	0.19
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	203	0.60	0.01	0.01
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	595	7.20	0.44	0.44
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	5.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
					1.00	1.00

CALCULATED GRAIN DENSITY = 2.73

[080301095.raw] 080301095 - 080301095
[08030109g.raw] 08030109g - 08030109g
[08030109a.raw] 08030109a - 08030109a





Calgary Rock
and Materials
Services Inc.

SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: PetroCanada

REQ BY: C. Lafleur

LOCN: Canyon Creek G-51

DEPTH: 1862.0 ft

BULK POWDER

FORM: N/A

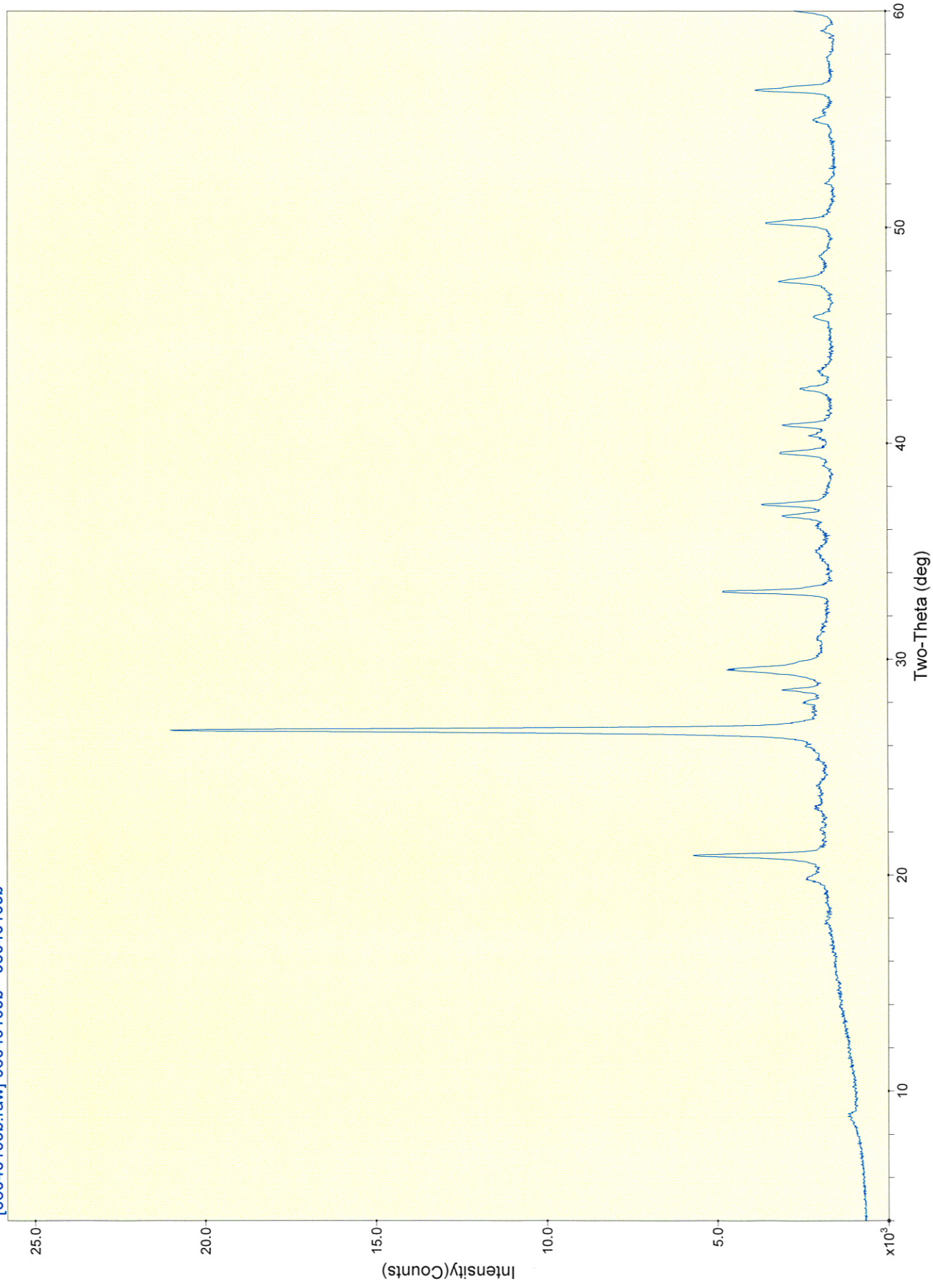
08040109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	2612	1.00	0.34	0.39
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	tr	1.10	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	560	0.98	0.07	0.08
CALCITE	29.5	2.71	2154	0.78	0.22	0.24
DOLOMITE	30.8	2.84	253	0.96	0.03	0.03
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	458	1.88	0.11	0.11
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	2405	0.60	0.19	0.11
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	186	1.30	0.03	0.03
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	2.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					<u>1.00</u>	<u>1.00</u>

CALCULATED GRAIN DENSITY =

3.18

[08040109b.raw] 08040109b - 08040109b





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

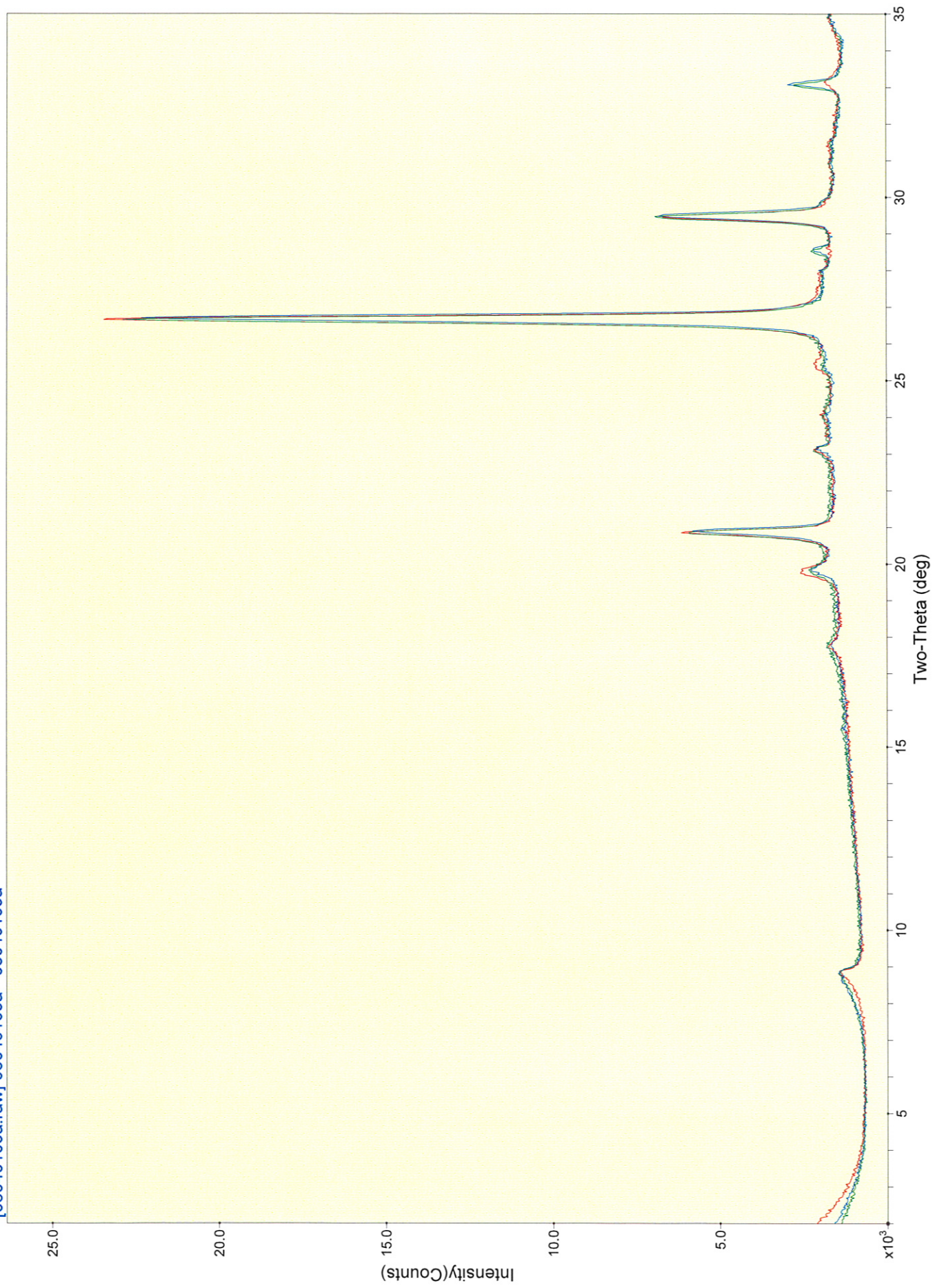
COMPANY: PetroCanada
 LOCN: Canyon Creek G-51
 DEPTH: 1862.0 ft
 FORM: N/A

REQ BY: C. Lafleur
 CLAY SMEAR < 2 um
 08040109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	3081	1.00	0.31	0.33
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	0.62	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	225	0.66	0.02	0.02
CALCITE	29.5	2.71	3740	0.78	0.30	0.31
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	0	1.88	0.00	0.00
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	1051	0.60	0.06	0.04
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	421	7.20	0.31	0.31
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	5.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
					1.00	1.00

CALCULATED GRAIN DENSITY = 2.85

[080401095.raw] 080401095 - 080401095
[08040109g.raw] 08040109g - 08040109g
[08040109a.raw] 08040109a - 08040109a





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

COMPANY: PetroCanada

REQ BY: C. Lafleur

LOCN: Canyon Creek G-51

DEPTH: 1866.0 ft

BULK POWDER

FORM: N/A

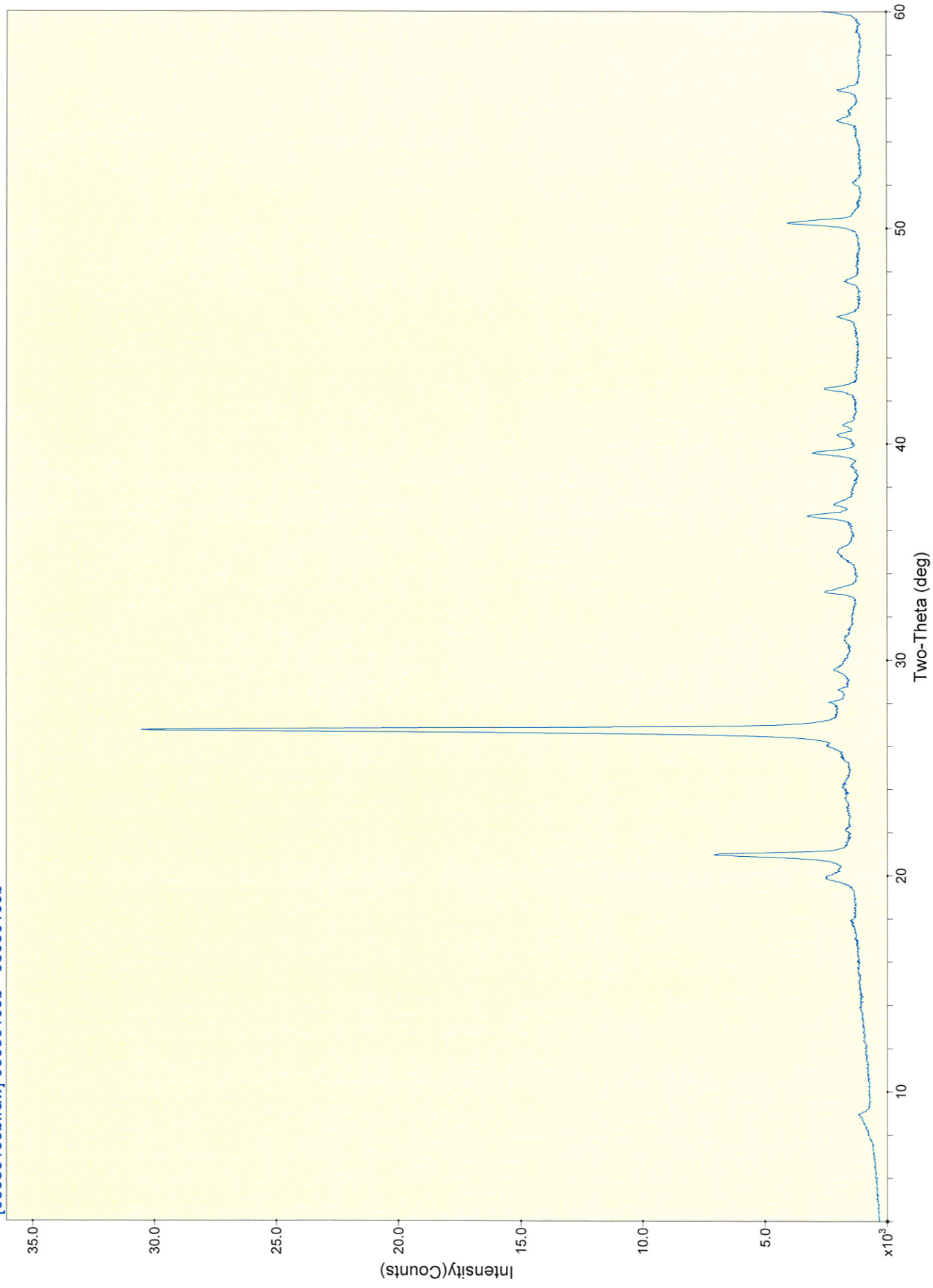
08050109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	3968	1.00	0.54	0.58
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	1.10	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	681	0.98	0.09	0.10
CALCITE	29.5	2.71	483	0.78	0.05	0.05
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	685	1.88	0.18	0.16
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	974	0.60	0.08	0.05
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	348	1.30	0.06	0.06
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	2.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	12.5	3.03	0	1.00	0.00	0.00
					<u>1.00</u>	<u>1.00</u>

CALCULATED GRAIN DENSITY =

2.94

[08050109b.raw] 08050109b - 08050109b





SEMI QUANTITATIVE MINERALOGY BY XRD

07/12/2007

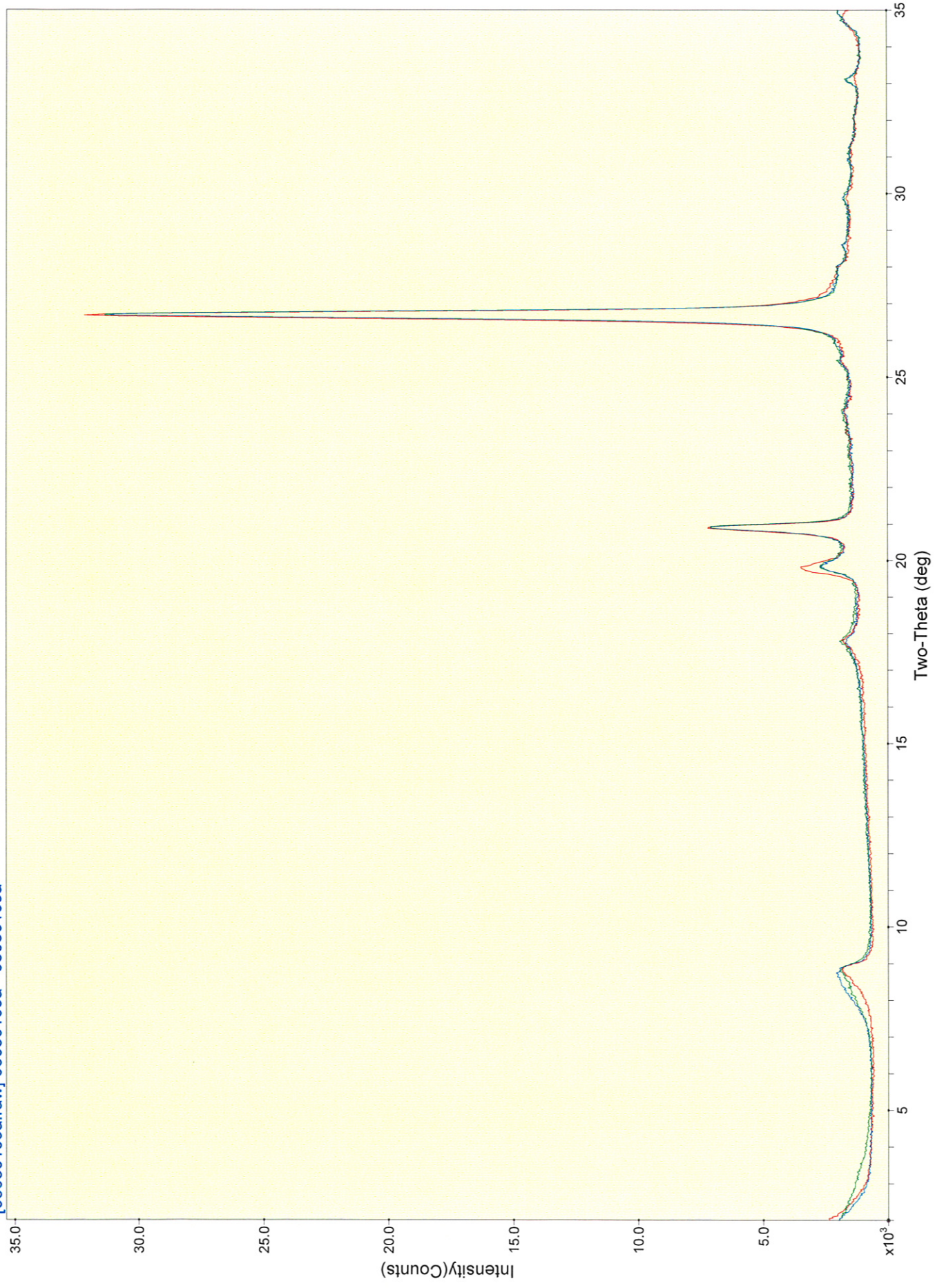
COMPANY: PetroCanada
 LOCN: Canyon Creek G-51
 DEPTH: 1866.0 ft
 FORM: N/A

REQ BY: C. Lafleur
 CLAY SMEAR < 2 um
 08050109

	<u>2 THETA</u>	<u>DENSITY</u>	<u>INTENSITY</u>	<u>FACTOR</u>	<u>WGHT FRACTION</u>	<u>VOL FRACTION</u>
QUARTZ	20.9	2.65	3933	1.00	0.35	0.36
K-FELDSPAR	25.8	2.58	0	3.12	0.00	0.00
K-FELDSPAR	27.5	2.58	0	0.62	0.00	0.00
PLAGIOCLASE	22.1	2.63	0	1.63	0.00	0.00
PLAGIOCLASE	28.0	2.63	378	0.66	0.02	0.02
CALCITE	29.5	2.71	0	0.78	0.00	0.00
DOLOMITE	30.8	2.84	0	0.96	0.00	0.00
ARAGONITE	26.2	2.93	0	1.80	0.00	0.00
SIDERITE	32.0	3.80	0	0.84	0.00	0.00
APATITE	25.9	3.20	328	1.88	0.06	0.05
ANHYDRITE	25.5	2.95	0	0.13	0.00	0.00
GYPSUM	11.7	2.33	0	0.85	0.00	0.00
BARITE	26.0	4.50	0	0.96	0.00	0.00
HALITE	31.7	2.16	0	0.25	0.00	0.00
PYRITE	33.1	5.00	392	0.60	0.02	0.01
HEMATITE	33.3	5.27	0	1.00	0.00	0.00
KAOLINITE	12.5	2.65	0	1.20	0.00	0.00
ILLITE	8.9	2.75	815	7.20	0.52	0.52
ILLITE	19.8	2.75	0	4.20	0.00	0.00
CHLORITE	6.2	3.00	0	5.00	0.00	0.00
SMECTITE	5.0	2.50	0	1.00	0.00	0.00
ILLITE/SMECTITE	5.2	2.50	293	1.00	0.03	0.03
MICA	8.9	2.75	0	1.00	0.00	0.00
BERTHIERINE	33.4	3.03	0	2.50	0.00	0.00
					1.00	1.00

CALCULATED GRAIN DENSITY = 2.78

[080501095.raw] 080501095 - 080501095
[08050109g.raw] 08050109g - 08050109g
[08050109a.raw] 08050109a - 08050109a



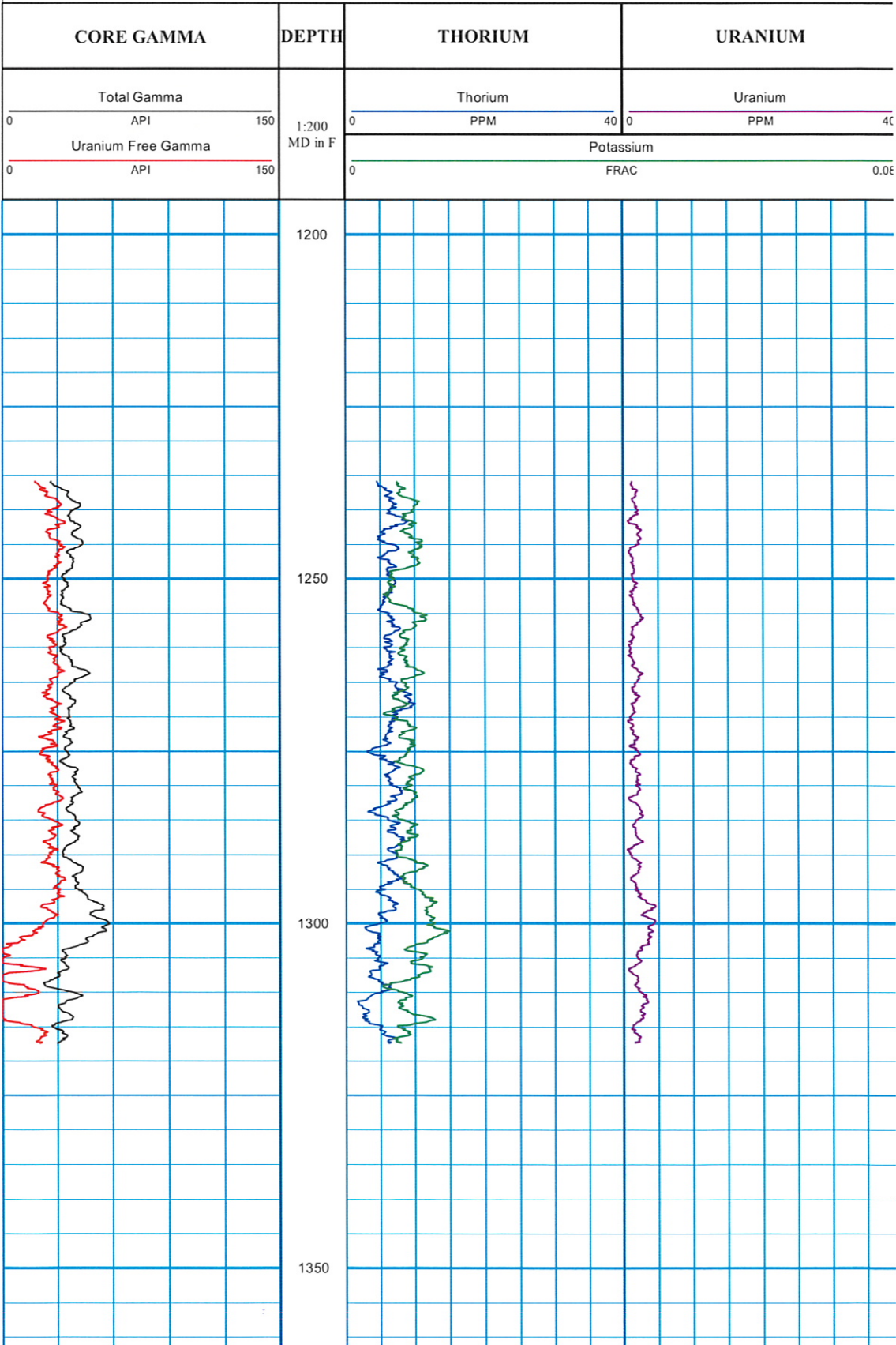
CORE SPECTRAL GAMMA

PETRO CANADA OIL AND GAS
IMP CANYON # 1

DEVONIAN (1236.0 - 2066.0 ft)

6 inch - 100 feet

Core Laboratories Canada Ltd.



CORE SPECTRAL GAMMA

PETRO CANADA OIL AND GAS

IMP CANYON # 1

DEVONIAN (1236.0 - 2066.0 ft)

6 inch - 100 feet

Core Laboratories Canada Ltd.

CORE GAMMA	DEPTH	THORIUM	URANIUM
Total Gamma 0 API 150 Uranium Free Gamma 0 API 150	1:200 MD in F	Thorium 0 PPM 40 Potassium 0 FRAC 0.08	Uranium 0 PPM 40
	1850 1900		
Total Gamma 0 API 150 Uranium Free Gamma 0 API 150	1:200 MD in F	Potassium 0 FRAC 0.08 Thorium 0 PPM 40 Uranium 0 PPM 40	
CORE GAMMA	DEPTH	THORIUM	URANIUM

CORE SPECTRAL GAMMA

PETRO CANADA OIL AND GAS

IMP CANYON # 1

DEVONIAN (1236.0 - 2066.0 ft)

6 inch - 100 feet

Core Laboratories Canada Ltd.

CORE GAMMA	DEPTH	THORIUM	URANIUM
Total Gamma 0150 API Uranium Free Gamma 0150 API	1:200 MD in F	Thorium 040 PPM Potassium 00.08 FRAC	Uranium 040 PPM
	2000 2050		
Total Gamma 0150 API Uranium Free Gamma 0150 API	1:200 MD in F	Potassium 00.08 FRAC Thorium 040 PPM Uranium 040 PPM	
CORE GAMMA	DEPTH	THORIUM	URANIUM

BULK DENSITY INDEX

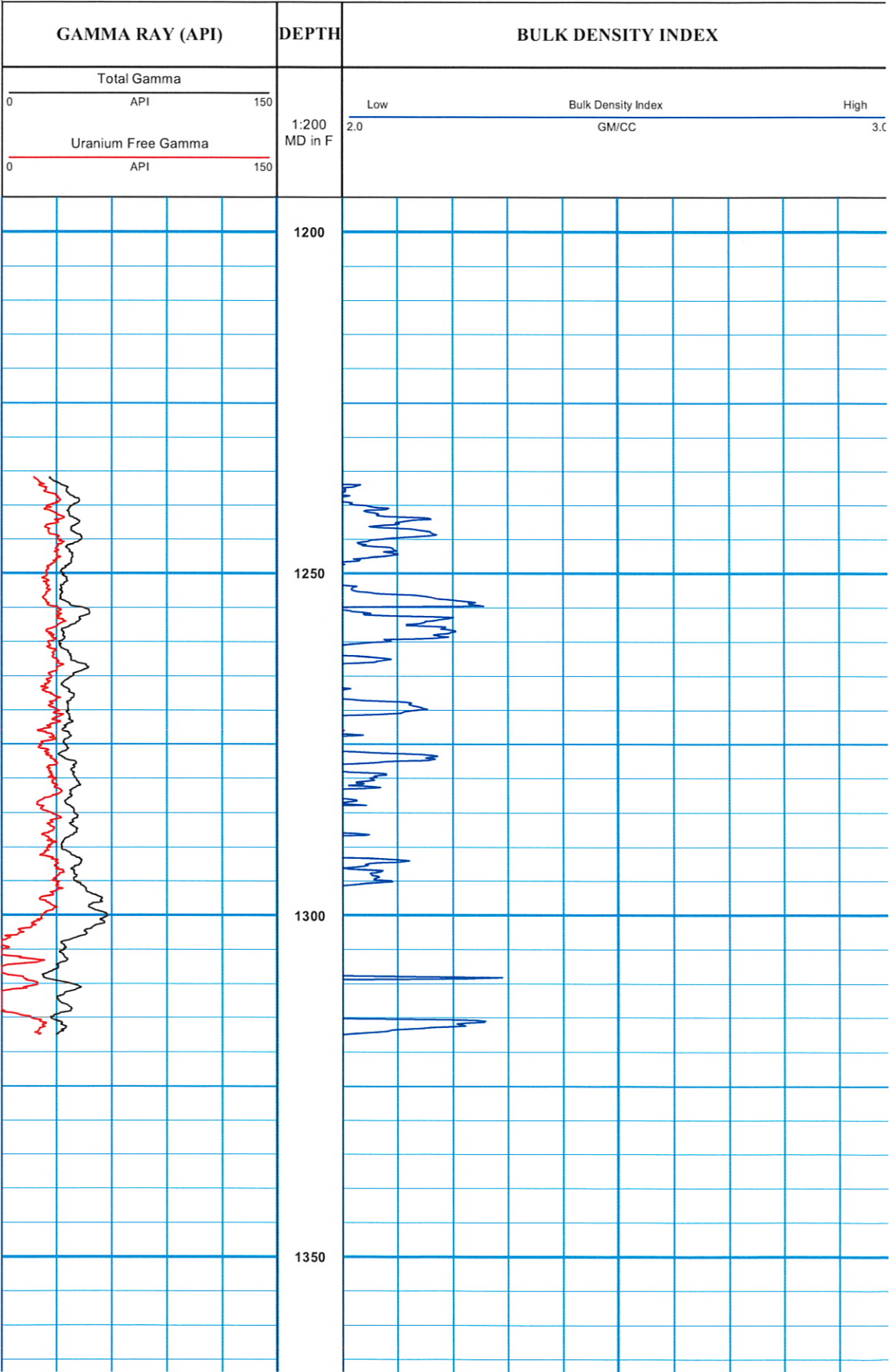
PETRO CANADA OIL AND GAS

IMP CANYON # 1

DEVONIAN (1236.00 - 2066.00 ft)

6 inch - 100 feet

Core Laboratories Canada Ltd.



BULK DENSITY INDEX

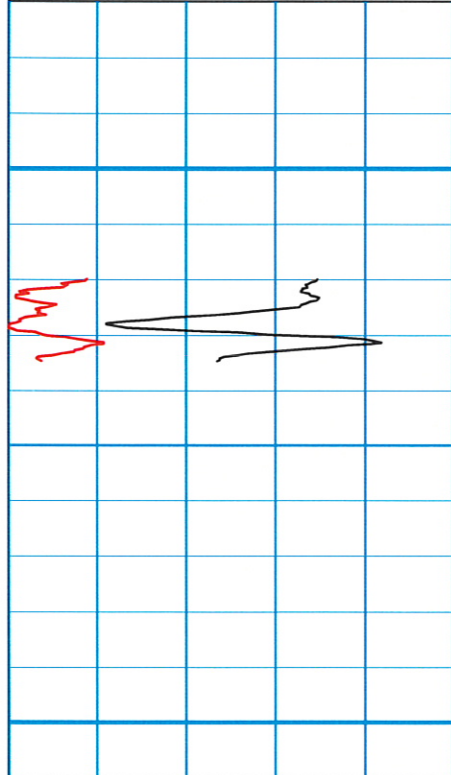
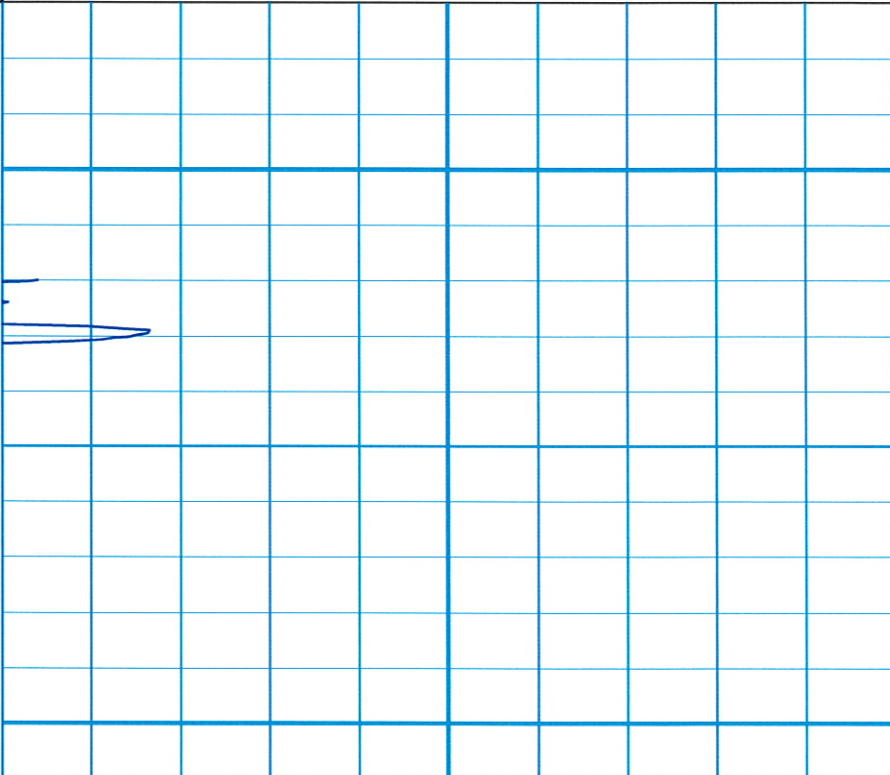
PETRO CANADA OIL AND GAS

IMP CANYON # 1

DEVONIAN (1236.00 - 2066.00 ft)

6 inch - 100 feet

Core Laboratories Canada Ltd.

GAMMA RAY (API)		DEPTH	BULK DENSITY INDEX	
Total Gamma 0 API 150 Uranium Free Gamma 0 API 150		1:200 MD in F	Low Bulk Density Index High 2.0 GM/CC 3.0	
		1850		
Total Gamma 0 API 150 Uranium Free Gamma 0 API 150		1:200 MD in F	Low Bulk Density Index High 2.0 GM/CC 3.0	
GAMMA RAY (API)		DEPTH	BULK DENSITY INDEX	

GAMMA RAY (API)	DEPTH	BULK DENSITY INDEX
-----------------	-------	--------------------

BULK DENSITY INDEX

PETRO CANADA OIL AND GAS

IMP CANYON # 1

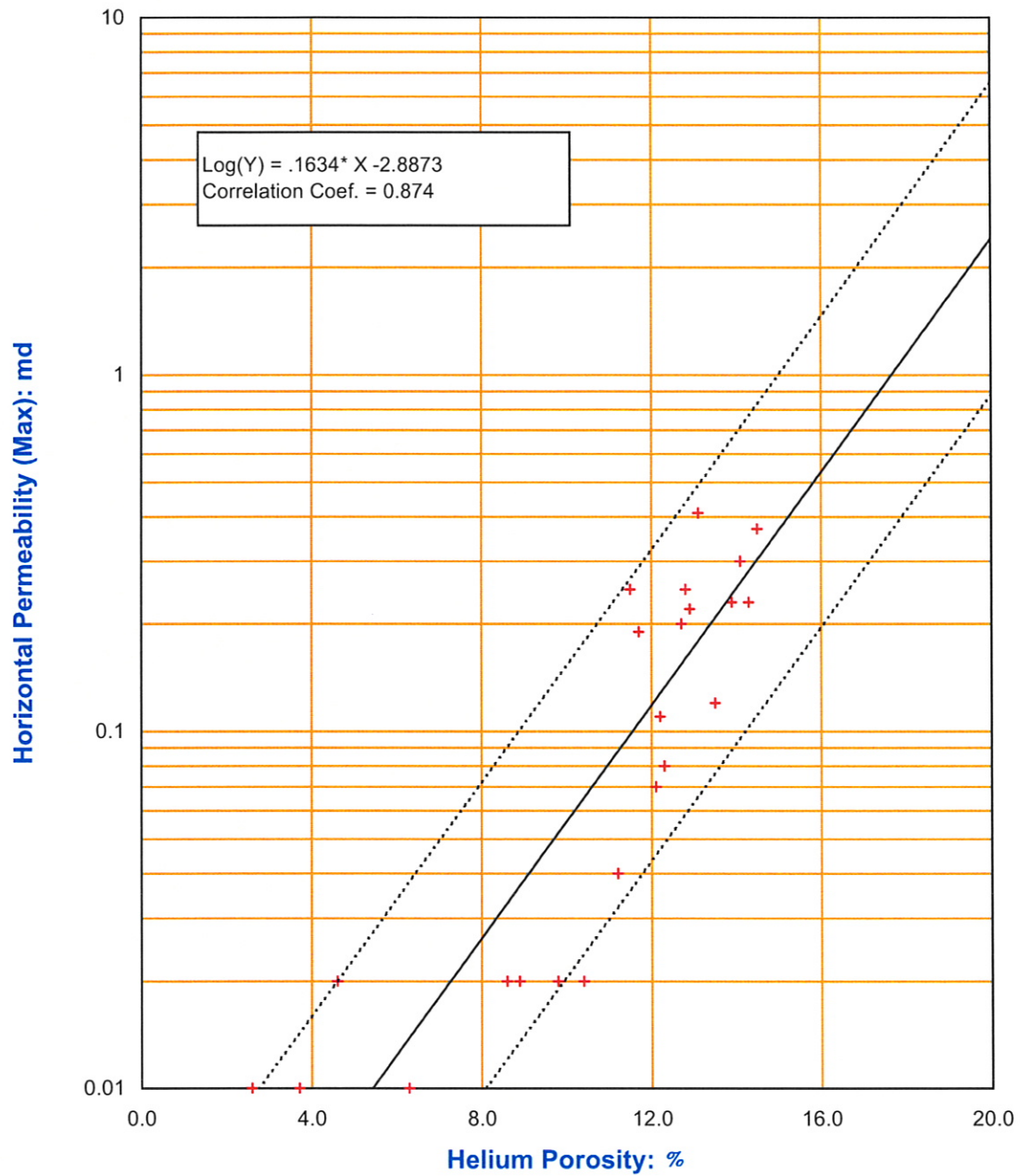
DEVONIAN (1236.00 - 2066.00 ft)

6 inch - 100 feet

Core Laboratories Canada Ltd.

GAMMA RAY (API)		DEPTH	BULK DENSITY INDEX	
Total Gamma 0 API 150 Uranium Free Gamma 0 API 150		1:200 MD in F	Low Bulk Density Index High 2.0 GM/CC 3.0	
		2000		
		2050		
Total Gamma 0 API 150 Uranium Free Gamma 0 API 150		1:200 MD in F	Low Bulk Density Index High 2.0 GM/CC 3.0	
GAMMA RAY (API)		DEPTH	BULK DENSITY INDEX	

Permeability vs Porosity



PETRO CANADA OIL AND GAS

IMP CANYON #1

CANYON

DEVONIAN (1236.0 - 2066.0 ft)

Core Laboratories Canada Ltd.

- LEGEND -