MOUNT KLAPPAN ANTHRACITE PROJECT

LOST - FOX AREA

GEOLOGICAL REPORT

1986

APPENDIX IV

DIAMOND DRILL HOLE DATA

VOLUME I

KPNLRDDH 86001

TO

KPNLRDDH 86009

APPENDIX IV

LOST-FOX AREA

1986 DIAMOND DRILL HOLE DATA

CONFIDENTIAL

DATA SOURCE SUMMARY

GULF CANADA CORPORATION - COAL DIVISION

03/MAR/87 PROJECT DATA SOURCE SUMMARY PAGE 1

DATA SOURCE	LOCATION NORTHING	EASTING	ELEVATION	LENGTH	ANGLE	AZIMUTH	LOG TYPE
KPNLRDDH86001	6344069.9	505992.1	1797.3	81.1	90.0		
							TSCC.UU*
KPNLRDDH86002	6343591.6	506123.1	1715.8	100.6	90.0		
							TSCC.UU*
KPNLRDDH86003	6345041.6	505846.4	1606.6	98.1	75.0	25.0	
							TSCC.UU*
KPNLRDDH86004	6344684.1	507152.4	1632.5	206.4	75.0	350.0	
							TSCC.UU*
KPNLRDDH86005	6344884.2	506166.9	1623.3	102.7	80.0	360.0	
							TSCC.UU*
KPNLRDDH86006	6344957.1	506566.3	1592.6	91.7	80.0	355.0	
							TSCC.UU*
KPNLRDDH86007	6344780.3	507445.5	1568.9	168.6	90.0		
							TSCC.UU*
KPNLRDDH86008	6344918.7	507081.0	1614.4	136.3	77.0	350.0	
							TSCC.UU*
KPNLRDDH86009	6344517.0	507379.7	1595.7	209.4	78.0	78.0	
							TSCC.UU*
KPNLRDDH86010	6344713.7	507615.8	1547.1	182.0	90.0		
KPNLRDDH86011	6344537.9	507835.5	1534.4	66.1	90.0		
							TSCC.UU*
KPNLRDDH86012	6344327.2	507019.1	1717.9	144.8	90.0		
							TSCC.UU*
KPNLRDDH86013	6344244.2	507847.0	1537.4	182.0	90.0		
							TSCC.UU*
KPNLRDDH86014	6344042.5	506891.7	1705.9	163.7	90.0		
							TSCC.UU*
KPNLRDDH86015	6344290.2	507601.8	1562.5	105.9	90.0		
							TSCC.UU*
KPNLRDDH86016	6343292.9	506636.3	1647.1	189.5	90.0		
							TSCC.UU*

GULF CANADA CORPORATION - COAL DIVISION

03/MAR/87 PROJECT DATA SOURCE SUMMARY PAGE 2

DATA SOURCE	LOCATION NORTHING	LOCATION EASTING	ELEVATION	LENGTH	ANGLE	AZIMUTH	LOG TYPE
KPNLRDDH86017	6343722.6	506526.6	1702.7	126.8	90.0		TSCC.UU*
KPNLRDDH86018	6343398.2	506220.3	1696.3	127.1	90.0		TSCC.UU*
KPNLRDDH86019	6343215.2	506835.3	1622.2	199.9	90.0		TSCC.UU*
KPNLRDDH86020	6345278.6	504613.6	1434.6	139.3	60.0	290.0	TSCC.UU*
KPNLRDDH86021	6343068.2	506427.9	1642.7	118.0	90.0		TSCC.UU*
KPNLRDDH86022	6343008.2	506732.9	1634.9	201.8	90.0		TSCC.UU*
KPNLRDDH86023	6345300.7	503627.3	1396.7	108.8	90.0		TSCC.UU*
KPNLRDDH86024	6344707.4	503600.2	1438.9	121.9	90.0		TSCC.UU*
KPNLRDDH86025	6342860.0	506215.0	1656.9	230.7	90.0		TSCC.UU*
KPNLRDDH86026	6343948.1	502857.7	1400.1	155.8	90.0		
KPNLRDDH86027	6343060.6	505969.1	1672.2	172.8	90.0		TSCC.UU*
KPNLRDDH86028	6346990.1	506187.5	1366.5	179.2	90.0		TSCC.UU*
KPNLRDDH86029	6343175.8	505751.6	1690.9	156.4	70.0	300.0	TSCC.UU*
KPNLRDDH86030	6344803.8	507888.2	1531.2	157.6	90.0		TSCC.UU*
KPNLRDDH86031	6343071.9	505509.5	1699.8	150.6	90.0		TSCC.UU*
KPNLRDDH86032	6345039.2	507804.5	1519.3	72.2	90.0		TSCC.UU*

GULF CANADA CORPORATION - COAL DIVISION

03/MAR/87 PROJECT DATA SOURCE SUMMARY

DATA SOURCE	LOCATION NORTHING	LOCATION EASTING	ELEVATION	LENGTH	ANGLE	AZIMUTH	LOG TYPE
KPNLRDDH86033	6344323.8	508088.9	1523.5	169.7	90.0		TSCC.UU*
KPNLRDDH86034	6344599.8	508167.4	1503.6	158.5	90.0		TSCC.UU*
KPNLRDDH86035	6344512.4	508451.6	1502.5	212.5	90.0		TSCC.UU*
KPNLRDDH86036	6344851.7	508346.9	1507.5	148.4	90.0		TSCC.UU*
KPNLRDDH86037	6342290.8	506750.4	1641.6	160.6	90.0		TSCC.UU*
KPNLRDDH86038	6346177.3	505424.8	1389.0	122.5	90.0		TSCC.UU*

SIMPLE SAMPLE SUMMARY

GULF CANADA CORPORATION - COAL DIVISION

13/MAR/87 SIMPLE SAMPLE SUMMARY PAGE 1

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH86001										
	I	4451	25.65	29.20	46.20	1.367	0.270	1.909		3.276- 0.270
		4452	25.16	25.65	79.59		0.390		0.100	0.000- 0.490
		4453	29.20	29.45	100.00		0.249			0.000- 0.249
		4454	68.01	68.24	100.00		0.230			0.000- 0.230
	H	4455	68.24	71.08	65.14	1.680	0.170	0.490	0.500	2.170- 0.670
		4456	71.08	71.26	100.00		0.180			0.000- 0.180
DDH86002										
		4457	38.21	39.33	100.00		0.955			0.000- 0.955
	H PART	4458	39.33	40.21	100.00	0.759				0.759- 0.000
		4459	40.21	41.29	100.00		0.939			0.000- 0.939
		4460	56.29	56.74	100.00		0.395			0.000- 0.395
	H	4461	56.74	59.42	57.84	0.867	0.518	0.845	0.160	1.712- 0.678
	H	4462	59.42	62.11	75.84	1.616	0.249	0.445	0.146	2.061- 0.395
		4463	62.11	63.69	100.00		1.467			0.000- 1.467
DDH86003										
		4464	39.58	40.08	100.00		0.500			0.000- 0.500
	I	4465	40.08	45.16	32.87	1.369	0.300	3.258	0.150	4.627- 0.450
	I	4466	45.16	47.34	28.44	0.618		1.556		2.174- 0.000
		4467	47.34	48.78	100.00		1.434			0.000- 1.434
		4468	87.18	88.03	100.00		0.810			0.000- 0.810
	H	4469	88.03	90.22	64.38	1.099	0.202	0.428	0.291	1.527- 0.493
	H	4470	90.22	91.73	62.25	0.556	0.274	0.319	0.177	0.875- 0.451
		4471	91.73	93.07	100.00		1.123			0.000- 1.123
DDH86004										
	K/L?	4496	16.46	16.57	100.00		0.108			0.000- 0.108
	K/L?	4497	16.57	17.79	72.95	0.749	0.129	0.059	0.265	0.808- 0.394
		4498	17.79	18.36	100.00		0.561			0.000- 0.561
		4499	37.69	39.38	88.76		1.449		0.184	0.000- 1.633

GULF CANADA CORPORATION - COAL DIVISION

13/MAR/87 SIMPLE SAMPLE SUMMARY

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
	K/L?	4500	39.38	41.47	65.07	0.992	0.332	0.653	0.059	1.645- 0.391
		5404	41.47	41.94	100.00		0.460			0.000- 0.460
		5405	53.00	53.20	100.00		0.200			0.000- 0.200
	K?	5406	53.20	56.64	75.00	1.940	0.640	0.670	0.190	2.610- 0.830
		5407	56.64	56.99	100.00	0.350				0.350- 0.000
		5408	88.81	89.27	100.00		0.437			0.000- 0.437
	K	5409	89.27	91.56	73.36	1.587		0.574		2.161- 0.000
	K	5410	91.56	93.83	92.07	1.924	0.085		0.171	1.924- 0.256
	K	5411	93.83	95.00	100.00	0.793	0.340			0.793- 0.340
		5412	95.00	95.25	100.00		0.233			0.000- 0.233
		5413	134.28	135.44	100.00		1.154			0.000- 1.154
	I	5414	135.44	137.12	90.48	1.450	0.060	0.159		1.609- 0.060
	I	5415	137.12	138.82	77.06	1.080	0.219	0.327	0.060	1.407- 0.279
	I	5416	138.82	140.76	100.00	1.918				1.918- 0.000
		5417	140.76	142.67	100.00		1.881			0.000- 1.881
		5418	190.69	191.50	100.00		0.780			0.000- 0.780
	H	5419	191.50	196.63	86.16	3.489	0.721	0.370	0.305	3.859- 1.026
	H	5420	196.63	199.00	77.64	1.658	0.065	0.430	0.065	2.088- 0.130
		5421	199.00	199.56	100.00		0.520			0.000- 0.520
DDH86005										
		4472	40.04	41.00	100.00		0.857			0.000- 0.857
	I	4473	41.00	44.46	48.27	1.289	0.206	1.555	0.045	2.844- 0.251
	I	4474	44.46	46.35	60.32	1.021		0.671		1.692- 0.000
		4475	46.35	46.56	100.00		0.188			0.000- 0.188
		4476	89.54	90.45	100.00		0.853			0.000- 0.853
	H	4477	90.45	92.23	79.21	0.931	0.408	0.349		1.280- 0.408
	H	4478	92.23	93.53	100.00	1.210	0.038			1.210- 0.038
		4479	93.53	95.41	100.00		1.827			0.000- 1.827

GULF CANADA CORPORATION - COAL DIVISION

13/MAR/87 SIMPLE SAMPLE SUMMARY PAGE 3

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH86006										
		4489	27.24	28.44	100.00		0.849			0.000- 0.849
	I	4490	28.44	42.43	27.81	3.070	0.349	8.080	0.559	11.150- 0.908
		4491	42.43	43.83	100.00		1.360			0.000- 1.360
		4492	77.16	78.50	100.00		1.112			0.000- 1.112
	H	4493	78.50	82.69	100.00	3.148	0.591			3.148- 0.591
	H	4494	82.69	84.95	85.84	1.665	0.182	0.226	0.075	1.891- 0.257
		4495	84.95	86.27	100.00		1.284			0.000- 1.284
DDH86007										
		4480	97.85	98.96	100.00		1.006			0.000- 1.006
	I	4481	98.96	100.72	83.52	1.270	0.063	0.263		1.533- 0.063
	I	4482	100.72	102.61	100.00	1.522	0.190			1.522- 0.190
	I	4483	102.61	105.11	95.20	2.157		0.109		2.266- 0.000
		4484	105.11	105.41	100.00		0.272			0.000- 0.272
		4485	156.88	157.89	100.00		0.902			0.000- 0.902
	H	4486	157.89	159.30	85.11	0.973	0.119	0.091	0.100	1.064- 0.219
	H	4487	159.30	161.84	95.67	2.100	0.169	0.104		2.204- 0.169
		4488	161.84	162.53	100.00		0.657			0.000- 0.657
DDH86008										
		5422	47.69	48.74	100.00		0.909			0.000- 0.909
	I REP	5423	48.74	50.66	59.90	0.997		0.468	0.199	1.465- 0.199
	I REP	5424	50.66	52.63	79.19	1.074	0.277		0.355	1.074- 0.632
	I REP	5425	52.63	54.35	100.00	1.489				1.489- 0.000
		5426	54.35	56.10	100.00		1.516			0.000- 1.516
		5427	92.69	93.65	100.00		0.914			0.000- 0.914
	H	5428	93.65	94.50	90.59	0.728		0.076		0.804- 0.000
	H	5429	94.50	95.26	100.00	0.047	0.669			0.047- 0.669
	H	5430	95.26	97.08	90.66	1.279	0.260	0.158		1.437- 0.260
	H	5431	97.08	100.01	84.30	2.024	0.237	0.417		2.441- 0.237

GULF CANADA CORPORATION - COAL DIVISION

13/MAR/87 SIMPLE SAMPLE SUMMARY PAGE 4

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
		5432	100.01	100.53	100.00		0.468			0.000- 0.468
		5433	123.39	124.33	100.00		0.908			0.000- 0.908
	PH	5434	124.33	125.13	100.00	0.772				0.772- 0.000
	PH	5435	125.13	125.49	100.00		0.348			0.000- 0.348
	PH	5436	125.49	127.04	85.81	1.189	0.097	0.213		1.402- 0.097
	PH	5437	127.04	129.17	98.59	1.942	0.087	0.029		1.971- 0.087
		5438	129.17	129.39	100.00		0.213			0.000- 0.213
		5439	20.12	20.92	100.00		0.769			0.000- 0.769
	I	5440	20.92	21.96	53.85	0.442	0.096	0.461		0.903- 0.096
	I	5441	21.96	24.56	48.46	1.019	0.193	1.182	0.106	2.201- 0.299
		5442	24.56	24.69	100.00		0.125			0.000- 0.125
DDH86009										
	H	5268	193.71	196.08	100.00	2.250	0.079			2.250- 0.079
	H	5269	196.08	201.52	95.04	4.327	0.770	0.267		4.594- 0.770
		5270	201.52	202.44	100.00		0.910			0.000- 0.910
		5443	68.54	70.29	100.00		1.686			0.000- 1.686
	K	5444	70.29	74.78	83.96	3.591	0.107	0.707		4.298- 0.107
	K	5445	74.78	74.90	100.00		0.119			0.000- 0.119
	K	5446	74.90	76.20	100.00	0.785	0.507			0.785- 0.507
		5447	76.20	76.82	100.00		0.618			0.000- 0.618
		5448	188.53	189.15	100.00		0.606			0.000- 0.606
	H	5449	189.15	190.50	100.00	1.320				1.320- 0.000
	H	5450	190.50	193.71	100.00	0.813	2.333			0.813- 2.333
DDH86010										
		5280	55.04	55.21	100.00		0.161			0.000- 0.161
	K	5281	55.21	61.45	55.13	3.175	0.114	2.688		5.863- 0.114
	K	5282	61.45	62.52	100.00		1.041			0.000- 1.041
	K	5283	62.52	65.10	67.44	1.644	0.058	0.825		2.469- 0.058
	K	5284	65.10	66.29	100.00		1.172			0.000- 1.172

GULF CANADA CORPORATION - COAL DIVISION

13/MAR/87 SIMPLE SAMPLE SUMMARY PAGE 5

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
	K	5285	66.29	67.03	100.00	0.730				0.730- 0.000
	K	5286	67.03	67.69	100.00		0.653			0.000- 0.653
	K	5287	67.69	69.99	75.65	1.725		0.556		2.281- 0.000
		5288	69.99	70.50	100.00		0.507			0.000- 0.507
		5289	94.36	94.72	100.00		0.348			0.000- 0.348
	J	5290	94.72	95.83	79.28	0.765	0.076	0.221		0.986- 0.076
		5291	95.83	96.79	100.00		0.900			0.000- 0.900
		5292	134.12	134.68	100.00		0.541			0.000- 0.541
	I	5293	134.68	136.75	77.78	1.179	0.377	0.444		1.623- 0.377
	I	5294	136.75	140.01	89.88	2.830		0.319		3.149- 0.000
		5295	140.01	140.49	100.00		0.464			0.000- 0.464
		5296	170.23	171.65	100.00		1.398			0.000- 1.398
	H	5297	171.65	173.90	80.89	1.488	0.306	0.227	0.197	1.715- 0.503
	H	5298	173.90	175.62	86.63	1.200	0.266	0.227		1.427- 0.266
		5299	175.62	176.21	100.00		0.581			0.000- 0.581
DDH86011										
		5271	23.69	25.44	100.00		1.586			0.000- 1.586
	L7	5272	25.44	30.95	50.64	2.241	0.249	1.500	0.922	3.741- 1.171
		5273	30.95	31.20	100.00		0.220			0.000- 0.220
		5274	55.85	56.91	100.00		0.960			0.000- 0.960
	K/L7	5275	56.91	58.76	72.43	1.035	0.193	0.394	0.074	1.429- 0.267
		5276	58.76	59.31	100.00		0.509			0.000- 0.509
DDH86012										
	O OVT	5154	20.10	22.99	92.39	0.861	0.084	0.038	0.039	0.899- 0.123
		5155	23.75	25.09	100.00		0.491			0.000- 0.491
		5156	82.41	82.67	100.00		0.238			0.000- 0.238
	O	5157	82.67	84.26	55.97	0.782	0.037	0.394	0.248	1.176- 0.285
		5158	84.26	86.31	100.00		1.900			0.000- 1.900
		5159	112.74	113.42	100.00		0.592			0.000- 0.592

GULF CANADA CORPORATION - COAL DIVISION

13/MAR/87 SIMPLE SAMPLE SUMMARY

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
	N	5160	113.42	115.06	100.00	1.233	0.191			1.233- 0.191
		5161	115.06	115.94	100.00		0.763			0.000- 0.763
	O OVT	5190	22.99	23.75	76.32	0.069	0.140	0.065		0.134- 0.140
		5300	19.33	20.10	100.00		0.265			0.000- 0.265
DDH86013										
		5173	52.74	53.56	100.00		0.757			0.000- 0.757
	K	5174	53.56	54.98	96.48	1.287		0.047		1.334- 0.000
	K	5175	54.98	57.35	78.90	1.660	0.134	0.386	0.097	2.046- 0.231
	K	5176	57.35	57.92	100.00		0.556			0.000- 0.556
	K	5177	57.92	58.53	81.97	0.490		0.108		0.598- 0.000
		5178	58.67	59.31	100.00		0.631			0.000- 0.631
		5179	88.74	89.14	100.00		0.395			0.000- 0.395
	J	5180	89.14	89.76	80.65	0.434	0.059	0.089	0.030	0.523- 0.089
		5181	89.76	89.94	100.00		0.178			0.000- 0.178
		5182	111.49	112.92	100.00		1.011			0.000- 1.011
	I	5183	112.92	115.58	83.46	1.430	0.234	0.189	0.141	1.619- 0.375
	I	5184	115.58	118.45	87.11	1.865	0.143	0.103	0.191	1.968- 0.334
	I	5185	118.45	121.60	75.56	2.000	0.034	0.561	0.092	2.561- 0.126
		5186	121.60	122.10	100.00		0.440			0.000- 0.440
		5187	158.14	159.00	100.00		0.633			0.000- 0.633
	I OVT	5188	159.00	176.64	93.71	13.780	0.058	0.810	0.167	14.590- 0.225
		5189	176.64	177.27	100.00		0.583			0.000- 0.583
DDH86014										
		10017	105.15	105.59	100.00		0.311			0.000- 0.311
	L OVT	10018	105.59	106.83	100.00	0.848	0.028			0.848- 0.028
	L OVT	10019	106.83	108.25	90.14	0.748	0.156	0.099		0.847- 0.156
	L OVT	10020	108.25	109.91	83.73	0.969	0.014	0.149	0.042	1.118- 0.056
		10021	109.91	110.34	100.00		0.304			0.000- 0.304
		10022	154.08	154.29	100.00		0.203			0.000- 0.203

GULF CANADA CORPORATION - COAL DIVISION

13/MAR/87 SIMPLE SAMPLE SUMMARY

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
	K	10023	154.29	155.64	84.44	0.944	0.165	0.058	0.146	1.002- 0.311
	K	10024	155.64	156.94	100.00	1.271				1.271- 0.000
		10025	156.94	157.77	100.00		0.814			0.000- 0.814
DDH86015										
		5162	28.77	29.21	100.00		0.425			0.000- 0.425
	L	5163	29.21	30.51	57.69	0.637	0.076	0.527		1.164- 0.076
		5164	30.51	30.99	100.00		0.451			0.000- 0.451
		5165	41.23	42.68	100.00		1.401			0.000- 1.401
	K/L	5166	42.68	43.19	94.12	0.468		0.029		0.497- 0.000
		5167	43.19	43.70	100.00		0.501			0.000- 0.501
		5168	85.13	86.55	100.00		1.413			0.000- 1.413
	K?	5169	86.55	87.50	100.00	0.945				0.945- 0.000
	K?	5170	87.50	90.04	77.56	1.918	0.040	0.418	0.149	2.336- 0.189
	K?	5171	90.04	90.55	100.00	0.436	0.070			0.436- 0.070
		5172	90.55	91.18	100.00		0.625			0.000- 0.625
DDH86016										
		10026	75.13	75.66	100.00		0.459			0.000- 0.459
	L	10027	75.66	78.30	89.77	2.052		0.234		2.286- 0.000
		10028	78.30	79.20	100.00		0.779			0.000- 0.779
		10029	143.81	144.00	100.00		0.189			0.000- 0.189
	K/L	10030	144.00	145.47	53.74	0.733	0.050	0.675		1.408- 0.050
	K/L	10031	145.47	146.77	92.31	0.908	0.276	0.099		1.007- 0.276
		10032	146.77	148.18	100.00		1.387			0.000- 1.387
		10033	156.00	157.12	100.00		1.092			0.000- 1.092
	K	10034	157.12	158.65	64.71	0.948	0.020	0.527		1.475- 0.020
	K	10035	158.65	159.80	90.43	0.732	0.283	0.107		0.839- 0.283
		10036	159.80	160.44	100.00		0.626			0.000- 0.626
DDH86017										
		10006	60.30	60.71	100.00		0.397			0.000- 0.397

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TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
	I	10007	60.71	62.28	83.44	1.158	0.117	0.252		1.410- 0.117
	I	10008	62.28	63.57	97.67	1.097	0.138		0.029	1.097- 0.167
	I	10009	63.57	65.97	97.08	2.299		0.069		2.368- 0.000
		10010	65.97	66.39	100.00		0.416			0.000- 0.416
	H PART	10011	110.00	113.00	76.00	1.278	0.789	0.661		1.939- 0.789
		10012	113.87	114.28	100.00		0.356			0.000- 0.356
	H	10013	114.35	115.97	100.00	1.374				1.374- 0.000
	H	10014	115.97	117.19	62.30	0.353	0.271	0.375		0.728- 0.271
	H	10015	117.19	119.86	86.52	1.711	0.083	0.079	0.204	1.790- 0.287
		10016	119.86	120.91	100.00		0.772			0.000- 0.772
		10112	114.28	114.35	0.00				0.060	0.000- 0.060
DDH86018										
		5277	102.10	103.00	100.00		0.707			0.000- 0.707
	H	5278	103.00	104.11	100.00	0.575	0.250			0.575- 0.250
		5279	104.11	105.47	100.00		0.933			0.000- 0.933
DDH86019										
		5191	68.86	69.31	100.00		0.331			0.000- 0.331
	M/N?	5192	69.31	70.84	71.24	0.777	0.053	0.337		1.114- 0.053
		5193	70.84	71.05	100.00		0.165			0.000- 0.165
		5194	81.10	82.70	100.00		1.541			0.000- 1.541
	M	5195	82.70	83.40	90.00	0.503	0.106	0.068		0.571- 0.106
		5196	83.40	84.12	100.00		0.668			0.000- 0.668
		5197	99.46	100.07	100.00		0.599			0.000- 0.599
	L	5198	100.07	101.96	88.89	1.483	0.167	0.206		1.689- 0.167
		5199	102.31	102.68	100.00		0.364			0.000- 0.364
		5200	119.93	120.18	100.00		0.246			0.000- 0.246
	K/L	10041	120.18	121.95	96.05	1.640	0.029		0.069	1.640- 0.098
	K/L	10042	121.95	124.70	85.09	2.107	0.187	0.215	0.186	2.322- 0.373
		10043	124.70	124.97	100.00		0.264			0.000- 0.264

GULF CANADA CORPORATION - COAL DIVISION

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TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
		10044	138.64	139.68	100.00		1.005			0.000- 1.005
	K	10045	139.68	141.29	82.61	1.286		0.270		1.556- 0.000
	K	10046	141.29	142.03	89.19	0.541	0.097	0.077		0.618- 0.097
	K	10047	142.03	143.13	68.18	0.492	0.232	0.290	0.048	0.782- 0.280
		10048	143.13	144.31	100.00		1.140			0.000- 1.140
		10049	184.87	185.15	100.00		0.269			0.000- 0.269
	I	10050	185.15	186.87	100.00	1.461	0.192			1.461- 0.192
	I	10051	186.87	190.11	69.44	1.914	0.250	0.951		2.865- 0.250
	I	10052	190.11	192.38	100.00	2.182				2.182- 0.000
		10053	192.38	193.33	100.00		0.913			0.000- 0.913
DDH86020										
		10037	66.98	67.77	100.00		0.716			0.000- 0.716
	A PART	10038	67.77	68.68	59.34	0.458		0.324		0.782- 0.000
	A PART	10039	68.68	71.29	71.26	1.023	0.653	0.469	0.177	1.492- 0.830
		10040	71.29	71.64	100.00		0.316			0.000- 0.316
DDH86021										
		10001	106.13	106.79	100.00		0.622			0.000- 0.622
	I REP	10002	106.79	107.94	86.09	0.872	0.056	0.075	0.075	0.947- 0.131
	I REP	10003	107.94	109.97	78.33	1.252	0.224	0.287	0.120	1.539- 0.344
	I REP	10004	109.97	111.76	100.00	1.637				1.637- 0.000
		10005	111.76	112.36	100.00		0.544			0.000- 0.544
		10054	23.07	23.82	100.00		0.728			0.000- 0.728
	I	10055	23.82	28.55	37.00	1.477	0.203	2.617	0.249	4.094- 0.452
		10056	28.55	29.17	100.00		0.590			0.000- 0.590
		10057	42.64	42.80	100.00		0.132			0.000- 0.132
	K	10058	42.80	44.20	30.71	0.321	0.033	0.675	0.124	0.996- 0.157
		10059	44.20	44.88	100.00		0.556			0.000- 0.556
DDH86022										
		5351	35.40	36.20	100.00		0.443			0.000- 0.443

GULF CANADA CORPORATION - COAL DIVISION

13/MAR/87 SIMPLE SAMPLE SUMMARY

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
	M	5352	36.20	38.80	28.08	0.208	0.222	0.870	0.218	1.078- 0.440
		5353	38.80	39.84	100.00		0.639			0.000- 0.639
		5354	64.23	64.78	100.00		0.360			0.000- 0.360
	L	5355	64.78	66.57	55.31	0.670		0.440	0.100	1.110- 0.100
	L	5356	66.57	68.24	77.25	0.761	0.147	0.133	0.135	0.894- 0.282
		5357	68.24	68.71	100.00		0.339			0.000- 0.339
		5358	87.28	88.20	100.00		0.744			0.000- 0.744
	K/L	5359	88.20	89.88	94.05	1.254			0.080	1.254- 0.080
	K/L	5360	89.88	91.75	53.48	0.693	0.077	0.510	0.164	1.203- 0.241
	K/L	5361	91.75	93.80	70.73	0.912	0.172	0.179	0.271	1.091- 0.443
		5362	93.80	95.43	100.00		1.179			0.000- 1.179
		5363	103.69	104.90	100.00		1.203			0.000- 1.203
	K	5364	104.90	106.87	32.99	0.314	0.321	1.157	0.127	1.471- 0.448
		5365	106.87	108.49	100.00		1.515			0.000- 1.515
		5366	138.83	140.41	100.00		1.541			0.000- 1.541
	I	5367	140.41	141.56	88.70	1.009		0.129		1.138- 0.000
		5368	141.56	142.05	100.00		0.488			0.000- 0.488
		5369	175.80	175.95	100.00		0.130			0.000- 0.130
	I OVT	5370	175.95	179.80	74.03	2.214		0.551	0.084	2.765- 0.084
	I OVT	5371	179.80	182.50	46.67	0.456	0.149	0.611	0.051	1.067- 0.200
	I OVT	5372	182.50	184.17	100.00	0.422				0.422- 0.000
		5373	184.17	184.63	100.00		0.065			0.000- 0.065
DDH86023										
		5382	23.85	24.44	91.53		0.205		0.019	0.000- 0.224
	A	5383	24.44	26.34	100.00	0.535	0.129			0.535- 0.129
	A	5384	26.34	27.87	100.00	0.472				0.472- 0.000
		5385	27.87	28.30	100.00		0.122			0.000- 0.122
		5386	40.37	40.82	100.00		0.136			0.000- 0.136
	A.	5387	40.82	41.96	96.49	0.352		0.012		0.364- 0.000

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
		5388	41.96	42.24	100.00		0.094			0.000- 0.094
		5389	55.13	55.60	100.00	0.043	0.211			0.043- 0.211
	A	5390	55.60	57.28	88.69	0.827		0.108		0.935- 0.000
	A	5391	57.28	60.11	94.70	0.714	0.626	0.087		0.801- 0.626
	A	5392	60.11	61.36	92.80	0.372			0.030	0.372- 0.030
		5393	61.36	62.85	100.00		0.436			0.000- 0.436
DDH86024										
		5374	45.41	46.25	100.00		0.733			0.000- 0.733
	A-4	5375	46.25	49.76	76.64	2.043	0.347	0.335	0.388	2.378- 0.735
		5376	49.76	50.14	100.00		0.342			0.000- 0.342
		5377	98.75	98.96	100.00		0.182			0.000- 0.182
	A-5	5378	98.96	100.52	90.38	1.222		0.130		1.352- 0.000
	A-5	5379	100.52	102.27	100.00	0.268	1.247			0.268- 1.247
	A-5	5380	102.27	104.38	95.26	1.741		0.087		1.828- 0.000
		5381	104.38	104.71	100.00		0.286			0.000- 0.286
DDH86025										
		10102	61.97	62.22	100.00		0.236			0.000- 0.236
	O	10103	62.22	64.16	66.49	1.196	0.038	0.257	0.361	1.453- 0.399
		10104	64.16	65.21	100.00		1.014			0.000- 1.014
		10105	93.30	93.61	100.00		0.296			0.000- 0.296
	N	10106	93.61	94.72	82.88	0.665	0.208	0.180		0.845- 0.208
		10107	94.72	95.76	100.00		0.977			0.000- 0.977
		10108	130.04	131.20	100.00		1.061			0.000- 1.061
	I	10109	131.20	132.97	77.40	1.136	0.119	0.367		1.503- 0.119
	I	10110	132.97	134.36	100.00	1.275				1.275- 0.000
		10111	134.36	135.71	100.00		1.241			0.000- 1.241
		10112	183.36	183.47	100.00		0.103			0.000- 0.103
	J REP	10113	183.47	183.96	65.31	0.299		0.159		0.458- 0.000
		10114	183.96	184.53	100.00		0.528			0.000- 0.528

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TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
		10115	215.12	216.24	100.00		0.956			0.000- 0.956
	I REP	10116	216.24	217.87	69.94	0.979		0.318	0.103	1.297- 0.103
	I REP	10117	217.87	219.45	93.04	1.141	0.129	0.078	0.017	1.219- 0.146
	I REP	10118	219.45	221.72	81.06	1.602		0.373		1.975- 0.000
		10119	221.72	223.07	100.00		1.182			0.000- 1.182
DDH86026										
		5394	36.32	36.63	100.00		0.286			0.000- 0.286
	A-2	5395	36.63	37.74	84.68	0.699	0.165	0.155		0.854- 0.165
		5396	37.74	38.71	100.00		0.882			0.000- 0.882
		5397	71.01	71.33	100.00	0.045	0.221			0.045- 0.221
	A-3	5398	71.33	73.64	58.87	1.097	0.136	0.861		1.958- 0.136
	A-3	5399	73.64	74.73	100.00	0.993				0.993- 0.000
	A-3	5400	74.73	76.79	100.00	1.095	0.798			1.095- 0.798
		10101	76.79	77.34	100.00		0.510			0.000- 0.510
DDH86027										
	C	10060	9.36	9.61	100.00		0.217			0.000- 0.217
	D	10061	9.61	12.00	30.54	0.485	0.147	1.290	0.147	1.775- 0.294
		10062	12.00	12.38	100.00		0.329			0.000- 0.329
		10063	26.08	26.53	100.00		0.414			0.000- 0.414
	N	10064	26.53	28.48	55.38	0.936	0.065	0.584	0.222	1.520- 0.287
		10065	28.48	28.91	100.00		0.401			0.000- 0.401
		10066	72.21	73.59	100.00		1.297			0.000- 1.297
	K/L	10067	73.59	76.55	75.00	1.965	0.122	0.696		2.661- 0.122
	K/L	10068	76.55	77.72	92.31	0.949	0.066		0.085	0.949- 0.151
	K/L	10069	77.72	79.76	88.73	1.466	0.235	0.197	0.019	1.663- 0.254
		10070	79.76	80.06	100.00	0.066	0.216			0.066- 0.216
		10071	95.17	95.95	100.00		0.732			0.000- 0.732
	K	10072	95.95	98.95	86.00	2.257	0.119	0.261	0.128	2.518- 0.247
		10073	98.95	99.17	100.00		0.199			0.000- 0.199

GULF CANADA CORPORATION - COAL DIVISION

13/MAR/87 SIMPLE SAMPLE SUMMARY

TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
DDH86028										
		10074	35.26	35.88	100.00		0.606			0.000- 0.606
	D	10075	35.88	38.87	80.60	1.849	0.448	0.484	0.066	2.333- 0.514
		10076	38.87	39.05	100.00		0.166			0.000- 0.166
		10077	59.60	60.32	100.00		0.573			0.000- 0.573
	C	10078	60.32	61.48	87.93	0.181	0.589	0.108		0.289- 0.589
		10079	61.48	61.99	100.00		0.368			0.000- 0.368
		10080	145.20	145.64	100.00		0.437			0.000- 0.437
	A	10081	145.64	147.32	98.21	1.593	0.029	0.030		1.623- 0.029
		10082	147.32	147.65	100.00	0.039	0.282			0.039- 0.282
DDH86029										
		10083	7.59	8.03	100.00		0.438			0.000- 0.438
	K	10084	8.03	11.00	36.70	0.969	0.120	1.495	0.378	2.464- 0.498
		10085	11.00	11.93	55.91		0.518		0.408	0.000- 0.926
		10086	50.04	50.99	100.00		0.914			0.000- 0.914
	I	10087	50.99	53.23	62.05	1.142	0.227	0.709	0.128	1.851- 0.355
	I	10088	53.23	55.48	70.22	1.556		0.660		2.216- 0.000
		10089	55.48	56.13	100.00		0.640			0.000- 0.640
DDH86030										
		10090	63.01	63.15	100.00		0.120			0.000- 0.120
	I	10091	63.15	64.82	76.05	1.091		0.343		1.434- 0.000
	I	10092	64.82	67.33	77.69	1.609	0.069	0.310	0.172	1.919- 0.241
	I	10093	67.33	69.65	100.00	2.001				2.001- 0.000
		10094	69.65	71.10	100.00		1.253			0.000- 1.253
		10095	121.31	122.64	100.00		1.311			0.000- 1.311
	H	10096	122.64	125.68	91.78	2.498	0.235	0.187	0.059	2.685- 0.294
		10097	125.68	126.66	100.00		0.954			0.000- 0.954
		10098	144.07	145.01	100.00		0.876			0.000- 0.876
	PH	10099	145.01	145.48	100.00	0.439				0.439- 0.000

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KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
		10100	145.48	145.90	100.00		0.392			0.000- 0.392
DDH86031										
		10151	40.19	40.72	100.00		0.513			0.000- 0.513
	I	10152	40.72	45.36	38.15	1.376	0.338	2.597	0.184	3.973- 0.522
		10153	45.36	46.56	100.00		1.165			0.000- 1.165
		10154	81.76	83.44	100.00		1.632			0.000- 1.632
	H	10155	83.44	87.61	84.17	2.398	0.994	0.521	0.116	2.919- 1.110
	H	10156	87.61	90.27	65.04	1.515	0.143	0.804	0.086	2.319- 0.229
		10157	90.27	90.64	100.00		0.353			0.000- 0.353
		10158	117.63	117.90	100.00		0.247			0.000- 0.247
	PH	10159	117.90	120.47	80.54	1.579	0.289	0.298	0.154	1.877- 0.443
		10160	120.47	120.93	100.00		0.310			0.000- 0.310
		10161	123.63	124.00	100.00		0.324			0.000- 0.324
	K/L?	10162	124.00	125.56	85.90	1.182		0.194		1.376- 0.000
	K/L?	10163	125.56	127.16	100.00	0.990	0.438			0.990- 0.438
	K/L?	10164	127.16	130.65	90.54	2.862		0.110	0.192	2.972- 0.192
	K/L?	10165	130.65	134.51	95.08	1.496	1.905	0.176		1.672- 1.905
		10166	134.51	135.02	100.00		0.478			0.000- 0.478
DDH86032										
	I	10120	8.15	9.29	77.19	0.764	0.110	0.158	0.099	0.922- 0.209
	I	10121	9.29	11.33	87.25	1.766		0.258		2.024- 0.000
		10122	11.33	12.37	100.00		1.032			0.000- 1.032
		10123	61.66	62.12	100.00		0.417			0.000- 0.417
	H	10124	62.12	64.65	58.89	1.051	0.299	0.851	0.090	1.902- 0.389
	H	10125	64.65	67.55	78.28	1.476	0.580	0.571		2.047- 0.580
		10126	67.55	67.93	100.00		0.344			0.000- 0.344
DDH86033										
		10215	47.38	48.80	100.00		0.558			0.000- 0.558
	M	10216	48.80	52.77	64.23	0.438	0.194	0.593		1.031- 0.194

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TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
	M	10217	52.77	55.11	88.89		0.970		0.087	0.000- 1.057
	M	10218	55.11	56.51	100.00	0.596	0.041			0.596- 0.041
	M	10219	56.51	57.45	72.34		0.305		0.116	0.000- 0.421
	M	10220	57.45	62.51	83.40	1.665	0.400	0.424		2.089- 0.400
		10221	62.51	63.07	100.00		0.426			0.000- 0.426
		10222	86.52	87.42	100.00		0.828			0.000- 0.828
	L	10223	87.42	90.06	84.85	1.758	0.316	0.298	0.074	2.056- 0.390
		10224	90.06	90.47	100.00		0.382			0.000- 0.382
		10225	114.92	115.07	100.00		0.141			0.000- 0.141
	K/L	10226	115.07	117.31	94.64	1.697	0.302	0.113		1.810- 0.302
		10227	117.31	117.92	67.21	0.161	0.227	0.066	0.123	0.227- 0.350
		10228	147.13	147.47	100.00		0.326			0.000- 0.326
	K	10229	147.47	151.21	67.65	2.276	0.134	0.899	0.258	3.175- 0.392
	K	10230	151.21	152.76	87.74	0.747	0.540	0.133	0.047	0.880- 0.587
		10231	152.76	153.47	100.00		0.670			0.000- 0.670
DDH86034										
		10167	19.72	20.03	100.00		0.294			0.000- 0.294
	K/L	10168	20.03	24.02	34.84	1.070	0.271	2.183	0.319	3.253- 0.590
		10169	24.02	24.52	100.00		0.487			0.000- 0.487
		10170	48.36	48.80	100.00		0.395			0.000- 0.395
	K	10171	48.80	50.94	70.56	1.101	0.251	0.341	0.225	1.442- 0.476
	K	10172	50.94	53.22	97.37	1.931	0.044	0.054		1.985- 0.044
	K	10173	53.22	56.10	81.60	1.032	1.045	0.469		1.501- 1.045
		10174	56.10	56.45	100.00		0.308			0.000- 0.308
		10175	80.71	81.88	100.00		1.133			0.000- 1.133
	J	10176	81.88	82.68	100.00	0.609	0.140			0.609- 0.140
		10177	82.68	83.11	100.00		0.391			0.000- 0.391
		10178	118.63	119.66	100.00		0.933			0.000- 0.933
	I	10179	119.66	121.34	71.43	1.044	0.055	0.442		1.486- 0.055

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TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
	I	10180	121.34	123.34	62.00	1.045	0.111	0.595	0.111	1.640- 0.222
	I	10181	123.34	125.13	100.00	1.690				1.690- 0.000
		10182	125.13	126.53	100.00		1.335			0.000- 1.335
DDH86035										
	L	10183	50.78	54.40	38.95	0.819	0.494	1.712	0.322	2.531- 0.816
		10184	54.40	54.66	100.00		0.233			0.000- 0.233
		10201	90.05	90.73	100.00		0.671			0.000- 0.671
	K	10202	90.73	93.96	59.75	1.893		0.754	0.517	2.647- 0.517
	K	10203	93.96	97.29	69.37	2.051	0.174	0.980		3.031- 0.174
	K	10204	97.29	99.39	74.29	0.745	0.730	0.254	0.255	0.999- 0.985
		10205	99.39	100.22	100.00		0.776			0.000- 0.776
		10206	156.89	157.51	100.00		0.573			0.000- 0.573
	I	10207	157.51	158.82	95.42	1.176		0.056		1.232- 0.000
		10208	158.82	159.15	100.00		0.314			0.000- 0.314
		10209	180.25	180.33	100.00		0.070			0.000- 0.070
	H/I	10210	180.33	181.21	55.68	0.316	0.114	0.342		0.658- 0.114
		10211	181.21	181.93	100.00		0.628			0.000- 0.628
		10212	197.09	197.19	100.00		0.088			0.000- 0.088
	H	10213	197.19	198.51	71.97	0.808	0.026	0.177	0.150	0.985- 0.176
		10214	198.51	198.73	100.00		0.195			0.000- 0.195
DDH86036										
		10127	32.10	32.84	100.00		0.721			0.000- 0.721
	J	10128	32.84	33.87	72.82	0.701	0.019	0.267		0.968- 0.019
		10129	33.87	34.31	100.00		0.415			0.000- 0.415
		10130	78.49	78.56	100.00		0.066			0.000- 0.066
	I	10131	78.56	80.85	100.00	2.075	0.075			2.075- 0.075
	I	10132	80.85	82.03	100.00	0.938	0.168			0.938- 0.168
	I	10133	82.03	84.06	97.04	1.846		0.056		1.902- 0.000
		10134	84.06	85.91	100.00		1.733			0.000- 1.733

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TRUE THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	SAMPLE ID	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL - ROCK
		10135	138.98	139.56	100.00		0.546			0.000- 0.546
	H	10136	139.56	140.67	90.99	0.360	0.595	0.095		0.455- 0.595
	H	10137	140.67	141.85	100.00	1.084	0.038			1.084- 0.038
		10138	141.85	142.08	100.00		0.219			0.000- 0.219
DDH86037										
		10139	16.78	17.48	100.00		0.692			0.000- 0.692
	O	10140	17.48	20.03	83.92	1.351	0.745	0.403		1.754- 0.745
		10141	20.03	20.33	100.00		0.291			0.000- 0.291
		10142	70.46	70.98	100.00		0.516			0.000- 0.516
	M	10143	70.98	73.12	85.05	0.473	1.298	0.236	0.079	0.709- 1.377
	M	10144	73.12	75.57	88.98	1.536	0.489	0.246		1.782- 0.489
	M	10145	75.57	78.44	94.43	1.062	1.234	0.129		1.191- 1.234
		10146	78.44	80.04	100.00		1.207			0.000- 1.207
		10147	147.78	148.02	100.00		0.227			0.000- 0.227
	L	10148	148.02	150.48	86.99	1.306	0.733	0.305		1.611- 0.733
		10149	150.48	151.96	100.00		1.423			0.000- 1.423
	K/L	10150	153.27	153.95	100.00	0.661				0.661- 0.000

GULF CANADA CORPORATION - COAL DIVISION

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APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH86001												
DDH86002												
DDH86003												
DDH86004												
	K	1	5409	5409	89.27	91.56	73.36	1.68	0.00	0.61	0.00	2.29- 0.00
	K	2	5410	5410	91.56	93.83	92.07	2.00	0.09	0.00	0.18	2.00- 0.27
	K	3	5411	5411	93.83	95.00	100.00	0.82	0.35	0.00	0.00	0.82- 0.35
	I	4	5414	5414	135.44	137.12	90.47	1.46	0.06	0.16	0.00	1.62- 0.06
	I	5	5415	5415	137.12	138.82	77.05	1.09	0.22	0.33	0.06	1.42- 0.28
	I	6	5416	5416	138.82	140.76	100.00	1.94	0.00	0.00	0.00	1.94- 0.00
	H	7	5419	5419	191.50	196.63	86.15	3.66	0.76	0.39	0.32	4.05- 1.08
	H	8	5420	5420	196.63	199.00	77.63	1.77	0.07	0.46	0.07	2.23- 0.14
	K	200	5409	5411	89.27	95.00	86.21	4.50	0.44	0.61	0.18	5.11- 0.62
	I	201	5414	5415	135.44	138.82	83.72	2.55	0.28	0.49	0.06	3.04- 0.34
	I	202	5416	5416	138.82	140.76	100.00	1.94	0.00	0.00	0.00	1.94- 0.00
	H	203	5419	5420	191.50	199.00	83.46	5.43	0.83	0.85	0.39	6.28- 1.22
	K	300	5409	5411	89.27	95.00	86.21	4.50	0.44	0.61	0.18	5.11- 0.62
	I	301	5414	5416	135.44	140.76	89.66	4.49	0.28	0.49	0.06	4.98- 0.34
	H	303	5419	5420	191.50	199.00	83.46	5.43	0.83	0.85	0.39	6.28- 1.22
DDH86005												
	H	9	4477	4477	90.45	92.23	79.21	0.98	0.43	0.37	0.00	1.35- 0.43
	H	10	4478	4478	92.23	93.53	100.00	1.26	0.04	0.00	0.00	1.26- 0.04
	H	204	4477	4478	90.45	93.53	87.98	2.24	0.47	0.37	0.00	2.61- 0.47
	H	304	4477	4478	90.45	93.53	87.98	2.24	0.47	0.37	0.00	2.61- 0.47
DDH86006												
	H	11	4493	4493	78.50	82.69	100.00	3.53	0.66	0.00	0.00	3.53- 0.66
	H	12	4494	4494	82.69	84.95	85.84	1.75	0.19	0.24	0.08	1.99- 0.27
	H	205	4493	4494	78.50	84.95	95.03	5.28	0.85	0.24	0.08	5.52- 0.93
	H	305	4493	4494	78.50	84.95	95.03	5.28	0.85	0.24	0.08	5.52- 0.93

GULF CANADA CORPORATION - COAL DIVISION

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APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH86007												
	I	13	4481	4481	98.96	100.72	83.52	1.40	0.07	0.29	0.00	1.69- 0.07
	I	14	4482	4482	100.72	102.61	100.00	1.68	0.21	0.00	0.00	1.68- 0.21
	I	15	4483	4483	102.61	105.11	95.20	2.38	0.00	0.12	0.00	2.50- 0.00
	H	16	4486	4486	157.89	159.30	85.10	1.07	0.13	0.10	0.11	1.17- 0.24
	H	17	4487	4487	159.30	161.84	95.66	2.25	0.18	0.11	0.00	2.36- 0.18
	I	206	4481	4482	98.96	102.61	92.05	3.08	0.28	0.29	0.00	3.37- 0.28
	I	207	4483	4483	102.61	105.11	95.20	2.38	0.00	0.12	0.00	2.50- 0.00
	H	208	4486	4487	157.89	161.84	91.89	3.32	0.31	0.21	0.11	3.53- 0.42
	I	306	4481	4483	98.96	105.11	93.33	5.46	0.28	0.41	0.00	5.87- 0.28
	H	308	4486	4487	157.89	161.84	91.89	3.32	0.31	0.21	0.11	3.53- 0.42
DDH86008												
	I	18	5423	5424	48.74	52.63	69.66	2.39	0.32	0.54	0.64	2.93- 0.96
	I	19	5425	5425	52.63	54.35	100.00	1.72	0.00	0.00	0.00	1.72- 0.00
	H	20	5428	5430	93.65	97.08	92.71	2.19	0.99	0.25	0.00	2.44- 0.99
	H	21	5431	5431	97.08	100.01	84.30	2.21	0.26	0.46	0.00	2.67- 0.26
	PH	22	5434	5435	124.33	125.49	100.00	0.80	0.36	0.00	0.00	0.80- 0.36
	PH	23	5436	5436	125.49	127.04	85.80	1.23	0.10	0.22	0.00	1.45- 0.10
	PH	24	5437	5437	127.04	129.17	98.59	2.01	0.09	0.03	0.00	2.04- 0.09
	I	209	5423	5424	48.74	52.63	69.66	2.39	0.32	0.54	0.64	2.93- 0.96
	I	210	5425	5425	52.63	54.35	100.00	1.72	0.00	0.00	0.00	1.72- 0.00
	H	211	5428	5431	93.65	100.01	88.83	4.40	1.25	0.71	0.00	5.11- 1.25
	H REP	212	5434	5437	124.33	129.17	94.83	4.04	0.55	0.25	0.00	4.29- 0.55
	I	309	5423	5425	48.74	54.35	78.96	4.11	0.32	0.54	0.64	4.65- 0.96
	H	311	5428	5431	93.65	100.01	88.83	4.40	1.25	0.71	0.00	5.11- 1.25
	H REP	312	5434	5437	124.33	129.17	94.83	4.04	0.55	0.25	0.00	4.29- 0.55
DDH86009												
	K	25	5444	5444	70.29	74.78	83.96	3.66	0.11	0.72	0.00	4.38- 0.11
	K	26	5445	5446	74.78	76.20	100.00	0.79	0.63	0.00	0.00	0.79- 0.63

GULF CANADA CORPORATION - COAL DIVISION

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APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
	H	27	5450	5450	190.50	193.71	100.00	0.83	2.38	0.00	0.00	0.83- 2.38
	H	28	5268	5268	193.71	196.08	100.00	2.29	0.08	0.00	0.00	2.29- 0.08
	H	29	5269	5269	196.08	201.52	95.03	4.39	0.78	0.27	0.00	4.66- 0.78
	H	30	5449	5449	189.15	190.50	100.00	1.35	0.00	0.00	0.00	1.35- 0.00
	K	213	5444	5446	70.29	76.20	87.81	4.45	0.74	0.72	0.00	5.17- 0.74
	H	214	5268	5449	189.15	201.52	97.05	8.03	0.86	0.27	0.00	8.30- 0.86
	K	313	5444	5446	70.29	76.20	87.81	4.45	0.74	0.72	0.00	5.17- 0.74
	H	314	5268	5449	189.15	201.52	97.05	8.03	0.86	0.27	0.00	8.30- 0.86
DDH86010												
	I	31	5293	5293	134.68	136.75	77.77	1.22	0.39	0.46	0.00	1.68- 0.39
	I	32	5294	5294	136.75	140.01	89.87	2.93	0.00	0.33	0.00	3.26- 0.00
	H	33	5297	5297	171.65	173.90	80.88	1.51	0.31	0.23	0.20	1.74- 0.51
	H	34	5298	5298	173.90	175.62	86.62	1.22	0.27	0.23	0.00	1.45- 0.27
	I	215	5293	5293	134.68	136.75	77.77	1.22	0.39	0.46	0.00	1.68- 0.39
	I	216	5294	5294	136.75	140.01	89.87	2.93	0.00	0.33	0.00	3.26- 0.00
	H	217	5297	5298	171.65	175.62	83.37	2.73	0.58	0.46	0.20	3.19- 0.78
	I	315	5293	5293	134.68	136.75	77.77	1.22	0.39	0.46	0.00	1.68- 0.39
	H	317	5297	5298	171.65	175.62	83.37	2.73	0.58	0.46	0.20	3.19- 0.78
DDH86011												
	K/L?	35	5275	5275	56.91	58.76	72.43	1.13	0.21	0.43	0.08	1.56- 0.29
	K/L	218	5275	5275	56.91	58.76	72.43	1.13	0.21	0.43	0.08	1.56- 0.29
	K/L	318	5275	5275	56.91	58.76	72.43	1.13	0.21	0.43	0.08	1.56- 0.29
DDH86012												
	N	36	5160	5160	113.42	115.06	100.00	1.42	0.22	0.00	0.00	1.42- 0.22
	N	219	5160	5160	113.42	115.06	100.00	1.42	0.22	0.00	0.00	1.42- 0.22
	N	319	5160	5160	113.42	115.06	100.00	1.42	0.22	0.00	0.00	1.42- 0.22
DDH86013												
	K	37	5174	5174	53.56	54.98	96.47	1.37	0.00	0.05	0.00	1.42- 0.00
	K	38	5175	5175	54.98	57.35	78.90	1.73	0.14	0.40	0.10	2.13- 0.24

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KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL	TOTAL ROCK
	K	39	5176	5177	57.35	58.53	90.67	0.50	0.57	0.11	0.00	0.61	0.57
	I	40	5183	5183	112.92	115.58	83.45	1.91	0.31	0.25	0.19	2.16	0.50
	I	41	5184	5184	115.58	118.45	87.10	2.32	0.18	0.13	0.24	2.45	0.42
	I	42	5185	5185	118.45	121.60	75.55	2.34	0.04	0.66	0.11	3.00	0.15
	I OVT	43	5188	5188	159.00	176.64	93.70	16.46	0.07	0.92	0.19	17.38	0.26
	K	220	5174	5177	53.56	58.53	86.72	3.60	0.71	0.56	0.10	4.16	0.81
	I	221	5183	5184	112.92	118.45	85.35	4.23	0.49	0.38	0.43	4.61	0.92
	I	222	5185	5185	118.45	121.60	75.55	2.34	0.04	0.66	0.11	3.00	0.15
	I	223	5188	5188	159.00	176.64	93.70	16.46	0.07	0.92	0.19	17.38	0.26
	K	320	5174	5177	53.56	58.53	86.72	3.60	0.71	0.56	0.10	4.16	0.81
	I	321	5183	5185	112.92	121.60	81.79	6.57	0.53	1.04	0.54	7.61	1.07
	I	323	5188	5188	159.00	176.64	93.70	16.46	0.07	0.92	0.19	17.38	0.26
DDH86014													
	L OVT	44	10018	10020	105.59	109.91	90.50	3.63	0.28	0.35	0.06	3.98	0.34
	K	45	10023	10024	154.29	156.94	92.07	2.27	0.17	0.06	0.15	2.33	0.32
	L	224	10018	10020	105.59	109.91	90.50	3.63	0.28	0.35	0.06	3.98	0.34
	K	225	10024	10025	155.64	157.77	100.00	1.30	0.83	0.00	0.00	1.30	0.83
	L	324	10018	10020	105.59	109.91	90.50	3.63	0.28	0.35	0.06	3.98	0.34
	K	325	10024	10025	155.64	157.77	100.00	1.30	0.83	0.00	0.00	1.30	0.83
DDH86015													
	K	46	5169	5171	86.55	90.55	85.75	3.32	0.11	0.42	0.15	3.74	0.26
	K	226	5169	5171	86.55	90.55	85.75	3.32	0.11	0.42	0.15	3.74	0.26
	K	326	5169	5171	86.55	90.55	85.75	3.32	0.11	0.42	0.15	3.74	0.26
DDH86016													
	L	47	10027	10027	75.66	78.30	89.77	2.37	0.00	0.27	0.00	2.64	0.00
	K/L	48	10030	10031	144.00	146.77	71.84	1.66	0.33	0.78	0.00	2.44	0.33
	K	49	10034	10035	157.12	159.80	75.74	1.72	0.31	0.65	0.00	2.37	0.31
	L	227	10027	10027	75.66	78.30	89.77	2.37	0.00	0.27	0.00	2.64	0.00
	L	327	10027	10027	75.66	78.30	89.77	2.37	0.00	0.27	0.00	2.64	0.00

GULF CANADA CORPORATION - COAL DIVISION

02/APR/87 COMPOSITE SAMPLE SUMMARY

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH86017												
	I	50	10007	10007	60.71	62.28	83.43	1.19	0.12	0.26	0.00	1.45- 0.12
	I	51	10008	10008	62.28	63.57	97.67	1.12	0.14	0.00	0.03	1.12- 0.17
	I	52	10009	10009	63.57	65.97	97.08	2.33	0.00	0.07	0.00	2.40- 0.00
	H PART	53	10011	10011	110.00	113.00	76.00	1.41	0.87	0.72	0.00	2.13- 0.87
	H	54	10013	10015	114.35	119.86	85.11	4.25	0.44	0.56	0.26	4.81- 0.70
	I	228	10007	10008	60.71	63.57	89.86	2.31	0.26	0.26	0.03	2.57- 0.29
	I	229	10009	10009	63.57	65.97	97.08	2.33	0.00	0.07	0.00	2.40- 0.00
	H	230	10013	10015	114.35	119.86	85.11	4.25	0.44	0.56	0.26	4.81- 0.70
	I	328	10007	10009	60.71	65.97	93.15	4.64	0.26	0.33	0.03	4.97- 0.29
	H	330	10013	10015	114.35	119.86	85.11	4.25	0.44	0.56	0.26	4.81- 0.70
DDH86018												
DDH86019												
	M/N	55	5192	5192	69.31	70.84	71.24	1.02	0.07	0.44	0.00	1.46- 0.07
	L	56	5198	5198	100.07	101.96	88.88	1.51	0.17	0.21	0.00	1.72- 0.17
	K/L	57	10041	10042	120.18	124.70	89.38	3.82	0.22	0.22	0.26	4.04- 0.48
	K	58	10045	10045	139.68	141.29	82.60	1.33	0.00	0.28	0.00	1.61- 0.00
	K	59	10046	10046	141.29	142.03	89.18	0.56	0.10	0.08	0.00	0.64- 0.10
	K	60	10047	10047	142.03	143.13	68.18	0.51	0.24	0.30	0.05	0.81- 0.29
	I	61	10050	10050	185.15	186.87	100.00	1.52	0.20	0.00	0.00	1.52- 0.20
	I	62	10051	10051	186.87	190.11	69.44	1.99	0.26	0.99	0.00	2.98- 0.26
	I	63	10052	10052	190.11	192.38	100.00	2.27	0.00	0.00	0.00	2.27- 0.00
	M/N	231	5192	5192	69.31	70.84	71.24	1.02	0.07	0.44	0.00	1.46- 0.07
	L	232	5198	5198	100.07	101.96	88.88	1.51	0.17	0.21	0.00	1.72- 0.17
	K/L	233	10041	10042	120.18	124.70	89.38	3.82	0.22	0.22	0.26	4.04- 0.48
	K	234	10045	10047	139.68	143.13	79.42	2.40	0.34	0.66	0.05	3.06- 0.39
	I	235	10050	10051	185.15	190.11	80.04	3.51	0.46	0.99	0.00	4.50- 0.46
	I	236	10052	10052	190.11	192.38	100.00	2.27	0.00	0.00	0.00	2.27- 0.00
	M/N	331	5192	5192	69.31	70.84	71.24	1.02	0.07	0.44	0.00	1.46- 0.07

GULF CANADA CORPORATION - COAL DIVISION

02/APR/87 COMPOSITE SAMPLE SUMMARY PAGE 6

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
	L	332	5198	5198	100.07	101.96	88.88	1.51	0.17	0.21	0.00	1.72- 0.17
	K/L	333	10041	10042	120.18	124.70	89.38	3.82	0.22	0.22	0.26	4.04- 0.48
	K	334	10045	10047	139.68	143.13	79.42	2.40	0.34	0.66	0.05	3.06- 0.39
	I	335	10050	10052	185.15	192.38	86.30	5.78	0.46	0.99	0.00	6.77- 0.46
DDH86020												
DDH86021												
	I REP	64	10002	10002	106.79	107.94	86.08	0.93	0.06	0.08	0.08	1.01- 0.14
	I REP	65	10003	10003	107.94	109.97	78.32	1.35	0.24	0.31	0.13	1.66- 0.37
	I REP	66	10004	10004	109.97	111.76	100.00	1.79	0.00	0.00	0.00	1.79- 0.00
	I	138	10004	10004	109.97	111.76	100.00	1.79	0.00	0.00	0.00	1.79- 0.00
	I	237	10002	10003	106.79	109.97	81.13	2.28	0.30	0.39	0.21	2.67- 0.51
	I	238	10004	10004	109.97	111.76	100.00	1.79	0.00	0.00	0.00	1.79- 0.00
	I	337	10002	10004	106.79	111.76	87.92	4.07	0.30	0.39	0.21	4.46- 0.51
DDH86022												
	L	67	5355	5356	64.78	68.24	65.89	2.07	0.21	0.84	0.34	2.91- 0.55
	L	239	5355	5356	64.78	68.24	65.89	2.07	0.21	0.84	0.34	2.91- 0.55
	L	339	5355	5356	64.78	68.24	65.89	2.07	0.21	0.84	0.34	2.91- 0.55
DDH86023												
DDH86024												
DDH86025												
	I	68	10109	10110	131.20	134.36	87.34	2.63	0.13	0.40	0.00	3.03- 0.13
	I REP	69	10116	10116	216.24	217.87	69.93	1.14	0.00	0.37	0.12	1.51- 0.12
	I REP	70	10117	10117	217.87	219.45	93.03	1.32	0.15	0.09	0.02	1.41- 0.17
	I REP	71	10118	10118	219.45	221.72	81.05	1.84	0.00	0.43	0.00	2.27- 0.00
	I	240	10109	10110	131.20	134.36	87.34	2.63	0.13	0.40	0.00	3.03- 0.13
	I	241	10116	10117	216.24	219.45	81.30	2.46	0.15	0.46	0.14	2.92- 0.29
	I	242	10118	10118	219.45	221.72	81.05	1.84	0.00	0.43	0.00	2.27- 0.00
	I	340	10109	10110	131.20	134.36	87.34	2.63	0.13	0.40	0.00	3.03- 0.13
	I	341	10116	10118	216.24	221.72	81.20	4.30	0.15	0.89	0.14	5.19- 0.29

GULF CANADA CORPORATION - COAL DIVISION

02/APR/87 COMPOSITE SAMPLE SUMMARY PAGE 7

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
DDH86026												
DDH86027												
	K/L	72	10067	10067	73.59	76.55	75.00	2.09	0.13	0.74	0.00	2.83- 0.13
	K/L	73	10068	10068	76.55	77.72	92.30	1.01	0.07	0.00	0.09	1.01- 0.16
	K/L	74	10069	10069	77.72	79.76	88.72	1.56	0.25	0.21	0.02	1.77- 0.27
	K	75	10072	10072	95.95	98.95	86.00	2.45	0.13	0.28	0.14	2.73- 0.27
	K/L	243	10067	10069	73.59	79.76	82.82	4.66	0.45	0.95	0.11	5.61- 0.56
	K	244	10072	10072	95.95	98.95	86.00	2.45	0.13	0.28	0.14	2.73- 0.27
	K/L	343	10067	10069	73.59	79.76	82.82	4.66	0.45	0.95	0.11	5.61- 0.56
	K	344	10072	10072	95.95	98.95	86.00	2.45	0.13	0.28	0.14	2.73- 0.27
DDH86028												
DDH86029												
	I	76	10087	10088	50.99	55.48	66.14	2.74	0.23	1.39	0.13	4.13- 0.36
	I	245	10087	10088	50.99	55.48	66.14	2.74	0.23	1.39	0.13	4.13- 0.36
	I	345	10087	10088	50.99	55.48	66.14	2.74	0.23	1.39	0.13	4.13- 0.36
DDH86030												
	I	77	10091	10091	63.15	64.82	76.04	1.27	0.00	0.40	0.00	1.67- 0.00
	I	78	10092	10092	64.82	67.33	77.68	1.87	0.08	0.36	0.20	2.23- 0.28
	I	79	10093	10093	67.33	69.65	100.00	2.32	0.00	0.00	0.00	2.32- 0.00
	H	80	10096	10096	122.64	125.68	91.77	2.55	0.24	0.19	0.06	2.74- 0.30
	I	246	10091	10092	63.15	67.33	77.03	3.14	0.08	0.76	0.20	3.90- 0.28
	I	247	10093	10093	67.33	69.65	100.00	2.32	0.00	0.00	0.00	2.32- 0.00
	H	248	10096	10096	122.64	125.68	91.77	2.55	0.24	0.19	0.06	2.74- 0.30
	I	346	10091	10093	63.15	69.65	85.23	5.46	0.08	0.76	0.20	6.22- 0.28
	H	348	10096	10096	122.64	125.68	91.77	2.55	0.24	0.19	0.06	2.74- 0.30
DDH86031												
	H	81	10155	10156	83.44	90.27	76.72	4.06	1.18	1.38	0.21	5.44- 1.39
	PH	82	10159	10159	117.90	120.47	80.54	1.75	0.32	0.33	0.17	2.08- 0.49
	K/L	83	10162	10164	124.00	130.65	91.72	5.61	0.49	0.34	0.21	5.95- 0.70

GULF CANADA CORPORATION - COAL DIVISION

02/APR/87 COMPOSITE SAMPLE SUMMARY PAGE 8

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL-ROCK
	K/L	84	10165	10165	130.65	134.51	95.07	1.61	2.06	0.19	0.00	1.80- 2.06
	H	249	10155	10156	83.44	90.27	76.72	4.06	1.18	1.38	0.21	5.44- 1.39
	PH	250	10159	10159	117.90	120.47	80.54	1.75	0.32	0.33	0.17	2.08- 0.49
	K/L	251	10162	10165	124.00	134.51	92.95	7.22	2.55	0.53	0.21	7.75- 2.76
	H	349	10155	10156	83.44	90.27	76.72	4.06	1.18	1.38	0.21	5.44- 1.39
	PH	350	10159	10159	117.90	120.47	80.54	1.75	0.32	0.33	0.17	2.08- 0.49
	K/L	351	10162	10165	124.00	134.51	92.95	7.22	2.55	0.53	0.21	7.75- 2.76
DDH86032												
	I	85	10120	10121	8.15	11.33	86.16	2.55	0.19	0.34	0.10	2.89- 0.29
	H	86	10124	10125	62.12	67.55	69.24	2.79	0.97	1.57	0.10	4.36- 1.07
	I	252	10120	10121	8.15	11.33	86.16	2.55	0.19	0.34	0.10	2.89- 0.29
	H	253	10124	10125	62.12	67.55	69.24	2.79	0.97	1.57	0.10	4.36- 1.07
	I	352	10120	10121	8.15	11.33	86.16	2.55	0.19	0.34	0.10	2.89- 0.29
	H	353	10124	10125	62.12	67.55	69.24	2.79	0.97	1.57	0.10	4.36- 1.07
DDH86033												
	L	87	10223	10223	87.42	90.06	84.84	1.90	0.34	0.32	0.08	2.22- 0.42
	K/L	88	10226	10226	115.07	117.31	94.64	1.80	0.32	0.12	0.00	1.92- 0.32
	K	89	10229	10230	147.47	152.76	73.53	3.18	0.71	1.08	0.32	4.26- 1.03
	L	254	10223	10223	87.42	90.06	84.84	1.90	0.34	0.32	0.08	2.22- 0.42
	K	256	10229	10230	147.47	152.76	73.53	3.18	0.71	1.08	0.32	4.26- 1.03
	L	354	10223	10223	87.42	90.06	84.84	1.90	0.34	0.32	0.08	2.22- 0.42
	K/L	355	10226	10226	115.07	117.31	94.64	1.80	0.32	0.12	0.00	1.92- 0.32
	K	356	10229	10230	147.47	152.76	73.53	3.18	0.71	1.08	0.32	4.26- 1.03
DDH86034												
	K	90	10171	10172	48.80	53.22	84.38	3.40	0.33	0.44	0.25	3.84- 0.58
	K	91	10173	10173	53.22	56.10	81.59	1.17	1.18	0.53	0.00	1.70- 1.18
	I	92	10179	10181	119.66	125.13	77.33	4.05	0.18	1.12	0.12	5.17- 0.30
	K	257	10171	10173	48.80	56.10	83.28	4.57	1.51	0.97	0.25	5.54- 1.76
	I	258	10179	10181	119.66	125.13	77.33	4.05	0.18	1.12	0.12	5.17- 0.30

GULF CANADA CORPORATION - COAL DIVISION

02/APR/87 COMPOSITE SAMPLE SUMMARY PAGE 9

APPARENT THICKNESS

KLAPPAN PROJECT

DATA SOURCE	SEAM	COMP ID	SAMPLE FROM	SAMPLE TO	DEPTH FROM	DEPTH TO	PERCENT REC	RECOVERED COAL	RECOVERED ROCK	MISSING COAL	MISSING ROCK	TOTAL COAL	TOTAL ROCK
	K	357	10171	10173	48.80	56.10	83.28	4.57	1.51	0.97	0.25	5.54-	1.76
	I	358	10179	10181	119.66	125.13	77.33	4.05	0.18	1.12	0.12	5.17-	0.30
DDH86035													
	K	93	10202	10203	90.73	97.29	64.63	4.06	0.18	1.79	0.53	5.85-	0.71
	K	94	10204	10204	97.29	99.39	74.28	0.79	0.77	0.27	0.27	1.06-	1.04
	K	259	10202	10204	90.73	99.39	66.97	4.85	0.95	2.06	0.80	6.91-	1.75
	K	359	10202	10204	90.73	99.39	66.97	4.85	0.95	2.06	0.80	6.91-	1.75
DDH86036													
	I	95	10131	10131	78.56	80.85	100.00	2.21	0.08	0.00	0.00	2.21-	0.08
	I	96	10132	10132	80.85	82.03	100.00	1.00	0.18	0.00	0.00	1.00-	0.18
	I	97	10133	10133	82.03	84.06	97.04	1.97	0.00	0.06	0.00	2.03-	0.00
	H	98	10136	10137	139.56	141.85	95.63	1.52	0.67	0.10	0.00	1.62-	0.67
	I	260	10131	10132	78.56	82.03	100.00	3.21	0.26	0.00	0.00	3.21-	0.26
	I	261	10133	10133	82.03	84.06	97.04	1.97	0.00	0.06	0.00	2.03-	0.00
	H	262	10136	10137	139.56	141.85	95.63	1.52	0.67	0.10	0.00	1.62-	0.67
	I	360	10131	10133	78.56	84.06	98.90	5.18	0.26	0.06	0.00	5.24-	0.26
	H	363	10136	10137	139.56	141.85	95.63	1.52	0.67	0.10	0.00	1.62-	0.67
DDH86037													

KPNLRDDH86001

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH86001 DATE - 02/13/87

- H I S T O R Y -

START DATE - 18/08/86
END DATE - 20/08/86

CONTRACTOR - J.T. THOMAS
GEOLOGIST - BARKER
OPERATOR - G.C.C.
SURVEYOR - TRONNES

REMARKS - SEAM I AND H WERE INTERSECTED.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1797.32
ZONE - 9
NORTHING - 6344069.00
EASTING - 505992.12

LICENCE/LEASE NUMBER -

LATITUDE - 571430
LONGITUDE - 1285403

- O R I E N T A T I O N -

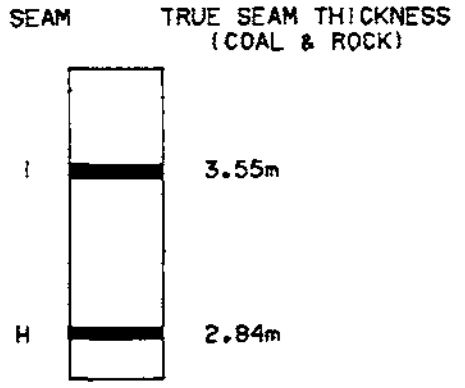
LENGTH - 81.07
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ - N

CASING DEPTH(M) - 12.19
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE



NOTE:

SCHEMATIC PROFILE.
NO THICKNESSES SHOWN
FOR SEAMS CONTAINING
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

FIGURE

MOUNT KLAPPAN ANTHRACITE PROJECT

1986 DIAMOND DRILL HOLES
DDH86001

GULF CANADA CORPORATION
11/03/87
KLAP:[2050571870063001.LOG

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	12.19	12.19	75			OVERBURDEN	CASING.
1	12.19	12.76	0.57	*75			SILTSTONE	LT.GY.VTHNB.XBDG.BRKN WISPY BLACK. CROSS BEDDED LAMINAE THROU GHOUT. CORE THIST OFF AT APPROX. 0.17 M . TOPS UP.
1	12.76	13.01	0.25	76			SILTSTONE	LT.GY.LAM.XBDG.VBRKN LITHOLOGY AS ABOVE, BUT MORE INTENSELY CROSS BEDDED WITH WISPY DARK ORGANIC - RICH LAMINAE.
1	13.01	13.11	0.10	77			BENTONITE	LI.GY.MAS.VBRKN V. SOFT. LIKE PLASTICENE. SOME FE STAIN ING ON MORESOLIDIFIED TUFFITE LAYERS. T YPICAL BENTONITE & TUFFITE MARKER ABOVE I SEAM.
1	13.11	14.26	1.15	79			ROCK LOSS	
1	14.26	14.64	0.38	81			SILTSTONE	SSY.DK.GY.LAM.XBDG.VBRKN PARTLY WEATHERED. OCCASIONAL BANDS OF F E STAINING ALONG FRACTURES. FG SAND LAM INAE THROUGHOUT.

* DENOTES MEASURED BCA

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
1	14.64	15.38	0.74	83			ROCK LOSS	
1	15.38	15.60	0.22	84			SILTSTONE	SSY.DK.GY.LAM.XBDG.VBRKN LITHOLOGY AS ABOVE. CORE TWIST OFF.
2	15.60	15.86	0.26	*85			SILTSTONE	SSY.DK.GY.LAM.XBDG.VBRKN LITHOLOGY AS ABOVE. FE STAINING. TYPICA L DARK LAM INATED SILTSTONE. LITHOLOGY BETWEEN BENTONITE AND I - SEAM.
2	15.86	16.60	0.74	86			ROCK LOSS	
2	16.60	17.41	0.81	*88			SILTSTONE	SSY.DK.GY.LAM.XBDG.VBRKN LITH. AS ABOVE WITH SLIGHTLY MORE FG SA ND. OCC. H ORIZ. WRMBURS 2 - 3 MM. ACRO SS & XBDG SHOW TOPS UP. FE STAINING ON FRACTURE SURFACES.
2	17.41	17.57	0.16	87			SILTSTONE	SSY.DK.GY.LAM.XBDG.VBRKN LITHOLOGY AS ABOVE.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	17.57	18.73	1.16	*85			MUDSTONE	SLTY.DK.GY.LAM.VBRKN OVERALL GRAIN SIZE DECREASING. PREDOMIN ANTLY DARK MUDST WITH VERY FINE LIGHTER SILT LAMINAE. OCCASIONAL BANDS OF FE S TAINING AS WELL AS ON FRACTURE SURFACES .
4	18.73	19.36	0.63	82			MUDSTONE	SLTY.DK.GY.LAM.VBRKN LITHOLOGY AS ABOVE.
4	19.36	20.00	0.64	*80			MUDSTONE	DK.GY.LAM.VBRKN LESS SILT THAN ABOVE.MUCH MORE UNIFORM GRAIN SIZE.VERY FINE LIGHTER GREY LAMIN AE ARE LESS COMMON TH AN ABOVE.
5	20.00	21.38	1.38	80			MUDSTONE	DK.GY.LAM.VBRKN LITH. AS ABOVE EXCEPT WITH EVEN FEWER L AMINAE. ALMOST MASSIVE.
5	21.38	21.61	0.23	*80			MUDSTONE	DK.GY.LAM.VBRKN LITH. AS ABOVE. FINE LIGHT GREY LAMINAE MORE COMMON THAN ABOVE. FE STAINING ON FRACTURES.
6	21.61	22.64	1.03	79			MUDSTONE	DK.GY.LAM.XBDG.BRKN LITH. AS ABOVE. V UNIFORM GRAINSIZE,BUT FINE LT GYLAMINAE V COMMON. OCC. LARGE VERTICAL WRMB 1-1.5 CM IN DIAMETER.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
6	22.64	22.79	0.15	78			ROCK LOSS	
6	22.79	23.43	0.64	*78			MUDSTONE	DK.GY.LAM.VBRKN LITH. AS ABOVE. NO WRM BURROWS.
7	23.43	24.47	1.04	84			MUDSTONE	DK.GY.LAM.WRMBU.VBRKN LITHOLOGY AS ABOVE.VERY UNIFORM GRAINSI ZE. 7MM WIDE BAND OF HELMINTHOPSIS. FE STAINING ON FRACTURES.
7	24.47	24.62	0.15	88			ROCK LOSS	
7	24.62	25.16	0.54	*90			MUDSTONE	DK.GY.LAM.BRKN LITH. AS ABOVE. NO BURROWS. NUMEROUS PL ANT FOSSILS.
8	25.16	25.47	0.31	90	04452		MUDSTONE	CARB.BLK.BRKN AS ABOVE, MINOR COALY LENSES IN LOWER 1 0 CM.
8	25.47	25.57	0.10	89	04452		ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
8	25.57	25.65	0.08	89	04452		MUDSTONE	CARB.BLK CONTAINS BROKEN UP C-2 COAL THROUGHOUT. APPEARS ASSPOIL. WEATHERED. SOFT.
8	25.65	25.76	0.11	89	04451	I	COAL	C-2.VBRKN VERY FRIABLE, SOFT & WEATHERED. MINOR F E STAIN, MINOR QTZ-CARB STRINGERS.
8	25.76	26.92	1.16	88	04451	I	COAL LOSS	
8	26.92	27.07	0.15	88	04451	I	MUDSTONE	CARB.BLK.BRKN CONTAIN ABUNDANT DISSEMINATED COAL FLEC KS (SPOIL APPEARANCE).CONTAINS MINOR 3 MM VITRINITE BANDS.SOFT.
8	27.07	27.27	0.20	87	04451	I	COAL	C-3.PWRD VERY HARD TO TELL QUALITY DUE TO POWDER ED NATURE.
8	27.27	27.84	0.57	87	04451	I	COAL LOSS	
8	27.84	27.87	0.03	87	04451	I	MUDSTONE	CARB.BLK.SHRD COALY TROUGHOUT (SPOILY APPEARANCE).

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
8	27.87	28.12	0.25	87	04451	I	COAL	C-3.BLK.PWRD APPEARS SHEARED. CONTAINS MINOR MUDST B UT UNABLE TO PLACE OR GET THICKNESS.DIF FICULT TO TELL GRADE.
8	28.12	28.17	0.05	86	04451	I	MUDSTONE	CARB.BLK.BRKN SOFT.MUDDY.SHEARED.CONTAINS MINOR COALY FLECKS.
8	28.17	28.20	0.03	86	04451	I	COAL	C-3.BLK.BRKN THINLY BANDED & DULL BANDS.
8	28.20	28.24	0.04	86	04451	I	MUDSTONE	CARB.BLK.BRKN CONTAINS MINOR COALY FLECKS THROUGHOUT. SOFT.MUDDY.
8	28.24	28.42	0.18	86	04451	I	COAL LOSS	
8	28.42	28.46	0.04	86	04451	I	COAL	C-3.SLD
8	28.46	28.49	0.03	86	04451	I	COAL	C-2.SLD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
8	28.49	28.78	0.29	86	04451	I	COAL	C-3.PWRD SOLID C-2 & C-3 PIECES AMONGST HIGHLY P ORDERED COAL.
8	28.78	29.00	0.22	86	04451	I	COAL	C-2.SLD LOCALLY APPROACHING C-1 QUALITY.
9	29.00	29.20	0.20	85	04451	I	COAL	C-2.VBRKN SAME AS ABOVE.
9	29.20	29.23	0.03	85	04453		MUDSTONE	CARB.DK.GY.VTHNB.BRKN CRUSHED CORE. MUDST WITH 5 - 7 MM. WIDE COAL BANDS. ANKERITE THROUGHOUT THESE BANDS ALSO.
9	29.23	29.45	0.22	*85	04453		SILTSTONE	SSY.DK.GY.LAM.VBRKN FINE LAMINAE RANGES FROM DARK MUD TO LI GHTER GY FGSS. FE STAINING ON FRAC. SUR FACES.
9	29.45	29.49	0.04	85			COAL	C-1.BLK.VBRKN
9	29.49	30.09	0.60	84			SILTSTONE	SSY.DK.GY.LAM.VBRKN FINE LAM RANGE FROM FINE DARK MUD TO FG SS. SAND CONTENT INCREASES DOWNWARD. F E STAINING ON FRACS.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
9	30.09	30.59	0.50	82			ROCK LOSS	
9	30.59	31.11	0.52	*80			SANDSTONE	SLTY.FG.PR.M.GY.LAM.XBDG.BRKN INTER LAMINATED FG SAND AND DARK SILT. MINOR RIPUPCLASTS. SAND CONTENT INCREAS ES DOWNWARD. START OF THE " UPPER SAND" IN THE H-I INTERSEAM. RIP UP CLASTS.
10	31.11	32.87	1.76	*83			SANDSTONE	SLTY.FG.PR.M.GY.LAM.XBDG.VBRKN INTER LAMINATED FG SAND AND SILT AS ABO VE, BUT RESPECTIVE LAYERS ARE THICKER T HAN ABOVE AND HAVE SHARP CONTACTS. " SI LTY BANDED SS " MARKER. SAND CONTENT IN CREASES DOWNWARD. VERTICAL WRMB 1-2 MM IN DIAMETER. MUCH FE STAINING. RIP UPS.
11	32.87	34.36	1.49	86			SANDSTONE	FG.MOD.M.GY.MAS.BRKN RARE DARK SILT STRINGERS 2 MM WIDE. FE STAINING ONFRACS.
11	34.36	34.78	0.42	*87			SANDSTONE	SLTY.FG.MOD.M.GY.VTHNB.VBRKN INTERLAYERED SAND AND SILT. SHARP CONTA CTS. LAYERS5-15 MM WIDE. TYPICAL SILTY BANDED SANDSTONE. SCO URS.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
12	34.78	34.97	0.19	87			SANDSTONE	SLTY.FG.M.GY.VTHNB.XBDG.SLD AS ABOVE: SILTY BANDED SS. RIP UPS. SCOURS.
12	34.97	36.51	1.54	87			SANDSTONE	SLTY.FG.M.GY.VTHNB.XBDG.SLD AS ABOVE: SLTY BANDED SS. SILT CONTENT INCREASES DOWNWARD. MUCH FE STAINING THROUGHOUT. RIP UPS. SCOURS.
13	36.51	37.31	0.80	86			SILTSTONE	SSY.DK.GY.LAM.XBDG.BRKN OCC. FINE SANDY LAMINAE. SAND CONTENT INCREASES DOWNWARD.
13	37.31	38.38	1.07	86			MUDSTONE	SLTY.DK.GY.MAS.MRMBU.VBRKN MUCH LESS SILT THAN ABOVE. RARE SILTY LAMINAE. HELMINTHOPSIS THROUGHOUT. PYRITE BLEB 2 1/2 CM LONG, 3 MM WIDE. NO PLANTS, NO BIVALVES.
13	38.38	38.59	0.21	85			ROCK LOSS	
14	38.59	38.95	0.36	85			MUDSTONE	DK.GY.MAS.VBRKN LITHOLOGY AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
14	38.95	40.31	1.36	*85			SANDSTONE	FG.VPR.M.GY.VTHNB.VBRKN OCC. SILTST LAYERS LESS THAN 1 CM WIDE. FE STAINING. TWO POORLY CONSOLIDATED SAND LAYERS 1-2 CM WIDE.
15	40.31	41.24	0.93	84			SANDSTONE	SLTY.FG.VPR.M.GY.VTHNB.VBRKN LITH. AS ABOVE EXCEPT WITH MORE FREQUENT SILT LAYERS. VERY WEATHERED CORE! EXTREME FE STAINING. SIMILAR IN APPEARANCE TO OVERBURDEN. MANY FRACS. PARALLEL TO CORE. CORE CRUMBLED.
15	41.24	41.48	0.24	84			ROCK LOSS	
15	41.48	41.81	0.33	83			SANDSTONE	SLTY.FG.VPR.M.GY.VTHNB.VBRKN AS ABOVE.
15	41.81	42.41	0.60	83			ROCK LOSS	
16	42.41	43.34	0.93	83			SANDSTONE	SLTY.FG.VPR.M.GY.VTHNB.VBRKN LITH. AS ABOVE.
16	43.34	43.92	0.58	*82			SANDSTONE	SLTY.FG.VPR.M.GY.VTHNB.VBRKN LITH. AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
17	43.92	44.74	0.82	84			SILTSTONE	SSY.M.GY.LAM.XBDG.BRKN LAMINAE GRADING FROM FINE MUD TO FG SS. SAND CONTENT DECREASES DOWNWARD. WRMB.
17	44.74	44.85	0.11	85			ROCK LOSS	
17	44.85	45.90	1.05	*87			SILTSTONE	SSY.DK.GY.LAM.VBRKN PREDOMINANTLY DARK SILTST WITH OCC. FIN E WISPY FG SS STRINGERS,SOME MINOR BIOG ENIC ACTIVITY - IRREGULAR BURROWS.
18	45.90	46.84	0.94	87			SILTSTONE	DK.GY.LAM.BRKN SAME AS ABOVE. MUCH LESS SAND. OCC. WIS PY SAND STRINGERS.
18	46.84	47.68	0.84	87			SILTSTONE	DK.GY.LAM.BRKN SAME AS ABOVE. GRADING TO MASSIVE MUDST AT BASE. NO BIVALVES OR PLANTS.
19	47.68	48.43	0.75	87			MUDSTONE	SLTY.DK.GY.LAM.VBRKN DARK MUDST GRADING INTO OCC. SILTY LAYE RS.
19	48.43	49.03	0.60	87			MUDSTONE	SLTY.DK.GY.LAM.VBRKN LITH. AS ABOVE. HELMINTHOPSIS.
19	49.03	49.35	0.32	87			ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
20	49.35	50.15	0.80	87			MUDSTONE	DK.GY.MAS.BRKN MASSIVE UNIFORM MUDSTONE. SOFT SLUMPED MATERIAL ATTOP OF BOX. MINOR PLANT HASH . ONE BIVALVE PIECE 5 MM WIDE. SILT CON TENT INCREASES DOWNWARD.
20	50.15	51.08	0.93	87			MUDSTONE	SLTY.DK.GY.MAS.BRKN AS ABOVE, BUT SILTIER OVERALL THAN ABOV E. PLANT HASH. PYRITE SPECKS. SLIGHTLY SANDIER DOWNWARD.
21	51.08	52.36	1.28	87			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.XBDG.VBRKN MUD LAYERS GRADE TO FINE & MG SAND, LAY ERS FROM 1 MM WISPS TO 2 CM WIDE. " LOW ER SAND UNIT " IN H - I INTERSEAM.
21	52.36	53.20	0.84	87			ROCK LOSS	
21	53.20	53.44	0.24	87			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.BRKN AS ABOVE, WITH MINOR PLANT MATERIAL IN MUD LAYERS.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
22	53.44	54.32	0.88	88			SANDSTONE	SLTY.MG.VPR.M.GY.LAM.BIOTR.VBRKN FINE DARK SILT THROUGHOUT. MUCH BIOTURB ATION. MRH BURROWS 1-3 CM IN DIAMETER (BIVALVE ESCAPE STRUCTURES) CROSS BEDDIN G.
22	54.32	54.81	0.49	88			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.BIOTR.VBRKN. AS ABOVE.
23	54.81	56.69	1.88	88			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.BIOTR.BRKN AS ABOVE. BUT SAND CONTENT DECREASES DO WNWARD.
24	56.69	57.35	0.66	88			MUDSTONE	SLTY.VPR.DK.GY.VTHNB.WRMBU.VBRKN OVERALL MUCH FINER THAN ABOVE. MUD GRAD ES TO SILT AND VFG SS IN FAINT BANDS. H ELMINTHOPSIS. 3 MM WIDE ANKERITE BAND.
24	57.35	58.37	1.02	88			MUDSTONE	SLTY.VPR.DK.GY.VTHNB.WRMBU.VBRKN AS ABOVE. HELMINTHOPSIS. ONE 1 MM WIDE COALY STRINGER. PLANT HASH IN MUD.
24	58.37	58.53	0.16	88			ROCK LOSS	
25	58.53	60.39	1.86	88			MUDSTONE	SLTY.VPR.DK.GY.VTHNB.WRMBU.VBRKN AS ABOVE. PLANT HASH.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	60.39	62.37	1.98	*88			MUDSTONE	DK.GY.MAS.BRKN UNIFORM DARK MUDST. MUCH LESS SILT THAN ABOVE, NO SAND. V. FAINT BEDDING. MUCH FOSSILIZED PLANT MATERIAL.
27	62.37	63.34	0.97	88			MUDSTONE	DK.GY.MAS.BRKN AS ABOVE. PLANT HASH.
27	63.34	63.44	0.10	88			ROCK LOSS	
27	63.44	63.50	0.06	88			MUDSTONE	DK.GY.MAS.VBRKN AS ABOVE. PLANT HASH.
28	63.50	64.19	0.69	88			MUDSTONE	DK.GY.MAS.VBRKN CRUSHED CORE. LITH. AS ABOVE.
28	64.19	65.58	1.39	88			ROCK LOSS	
28	65.58	65.97	0.39	89			MUDSTONE	DK.GY.MAS.VBRKN LITH. AS ABOVE.
29	65.97	66.67	0.70	89			MUDSTONE	DK.GY.MAS.VBRKN LITH. AS ABOVE.
29	66.67	68.01	1.34	89			ROCK LOSS	
29	68.01	68.17	0.16	89	04454		MUDSTONE	PR.LT.BN.SLD POORLY CONSOLIDATED.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
29	68.17	68.24	0.07	89	04454		MUDSTONE	CARB.BLK.VBRKN MIXTURE OF SOLID MUD & UNCONSOLIDATED M UD.
29	68.24	68.67	0.43	89	04455	H	COAL LOSS	
29	68.67	68.71	0.04	89	04455	H	COAL	C-5.BRKN .5 CM VITRINITE BAND AT BASE.
29	68.71	68.79	0.08	89	04455	H	MUDSTONE	PR.LT.BN.SLD POORLY CONSOLIDATED.
29	68.79	69.06	0.27	89	04455	H	ROCK LOSS	
29	69.06	69.12	0.06	89	04455	H	COAL LOSS	
29	69.12	69.16	0.04	89	04455	H	COAL	C-4
29	69.16	69.19	0.03	89	04455	H	MUDSTONE	CARB.BLK SOFT.
29	69.19	69.23	0.04	89	04455	H	COAL	C-3
30	69.23	69.25	0.02	89	04455	H	COAL	C-3

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
30	69.25	69.26	0.01	89	04455	H	COAL	C-4
30	69.26	69.47	0.21	89	04455	H	COAL	C-2.BRKN
30	69.47	69.56	0.09	89	04455	H	COAL	C-4.PWRD VERY SOFT & WEATHERED.
30	69.56	70.01	0.45	89	04455	H	COAL	C-2.BRKN
30	70.01	70.03	0.02	89	04455	H	COAL	C-3.SLD SOFT, WEATHERED. CONTAINS MM MUDSTONE B ANDS.
30	70.03	70.46	0.43	89	04455	H	COAL	C-2.BRKN
30	70.46	70.60	0.14	89	04455	H	ROCK LOSS	
30	70.60	70.65	0.05	89	04455	H	MUDSTONE	CARB.BLK POORLY CONSOLIDATED.
30	70.65	70.74	0.09	89	04455	H	ROCK LOSS	
30	70.74	70.90	0.16	89	04455	H	COAL	C-2

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
30	70.90	70.91	0.01	89	04455	H	MUDSTONE	CLYY.M.GY
30	70.91	71.08	0.17	89	04455	H	COAL	C-2.VBRKN MINOR QTZ AT BASE.
30	71.08	71.26	0.18	89	04456		MUDSTONE	CARB COALY STRINGERS NEAR TOP. LESS CARBONACEOUS & MORESLTY TOWARDS BASE.
31	71.26	71.64	0.38	89			MUDSTONE	DK.GY.MAS.BRKN UNIFORM DARK MUDST. ONE 2 CM WIDE COAL BAND.MINOR PLANT MASH.
31	71.64	73.00	1.36	89			MUDSTONE	SLTY.DK.GY.MAS.BRKN DISSEMINATED PYRITE THROUGHOUT. SILT AND VFG SAND THROUGHOUT. MINOR COAL STRINGERS 1 MM WIDE. 1-2 CMWIDE ANKERITE BAND AT BASE. POLISHED SLIPPAGE SUR FACES.
32	73.00	74.40	1.40	90			MUDSTONE	DK.GY.MAS.BRKN LESS SILT THAN ABOVE. BLEBS & DISSEMINATED PYRITE THROUGHOUT. MINOR COALY STRINGERS & LENSES.
32	74.40	75.00	0.60	90			MUDSTONE	DK.GY.MAS.BRKN AS ABOVE, BUT LESS PYRITE. MINOR PLANT MASH.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86001

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
33	75.00	76.05	1.05	90			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.BIOTR.VBRKN INTERLAMINATED SILTY MUD AND FINE GRAIN SAND. SHARP CONTACTS ON LAYERS. MUCH BIOTURBATION. SILT LAYERS ARE FEWER DOWNWARD.
33	76.05	76.96	0.91	*90			SANDSTONE	FG.VPR.M.GY.MAS.SLD OVERALL MASSIVE, WITH RARE SILTY MUD BANDS 1-3 CM WIDE. MINOR RIPUP CLASTS.
34	76.96	77.31	0.35	90			SANDSTONE	FG.VPR.LT.GY.MAS.SLD UNIFORM,MASSIVE WITH V. MINOR 1 MM WIDE , SILT WISPS THROUGHOUT.
34	77.31	78.65	1.34	90			SANDSTONE	CG.VPR.LT.GY.MAS.VBRKN PREDOMINANTLY MASSIVE MIXTURE OF FG TO COARSE GRAINED SS WITH SOME VCGR CLASTS , MINOR 1 CM WIDE MUDST RIP UP CLASTS.
35	78.65	79.69	1.04	90			SANDSTONE	SLTY.MG.VPR.M.GY.VTHNB.XBDG.BRKN SILTY MUD LAYERS NOW PRESENT IN FINE MEDIUM GRAINED SAND. 1-3 CM RIP UP CLASTS . SAND FINES TO SILT AT BASE.
35	79.69	80.21	0.52	90			SILTSTONE	VPR.DK.GY.LAM.XBDG.VBRKN FINE BEDDED SILT.

* DENOTES MEASURED BCA
NEWPAGE

GULF CANADA CORPORATION

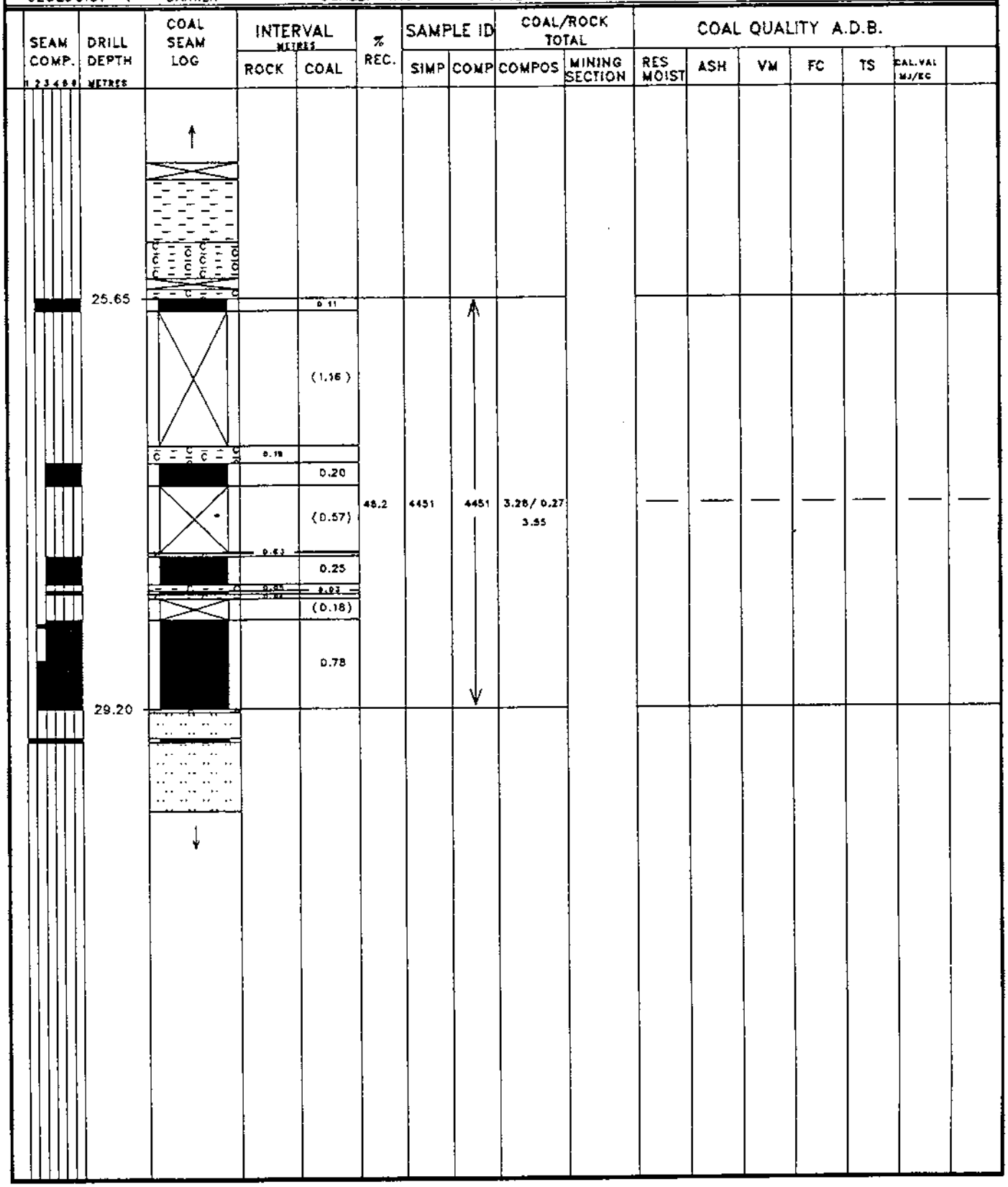
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86001 SEAM : 1 INTERVAL(M) : 25.65 - 29.20 ELEVATION(M) : 1797.3

GEOLOGIST : BARKER SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	25.65			0.11												
				(1.16)												
			0.18													
				0.20												
				(0.57)	48.2	4451	4451	3.28/ 0.27		—	—	—	—	—	—	—
			0.63					3.55								
				0.25												
			0.35	0.03												
				(0.18)												
				0.78												
	29.20															

GULF CANADA CORPORATION

SEAM DETAIL

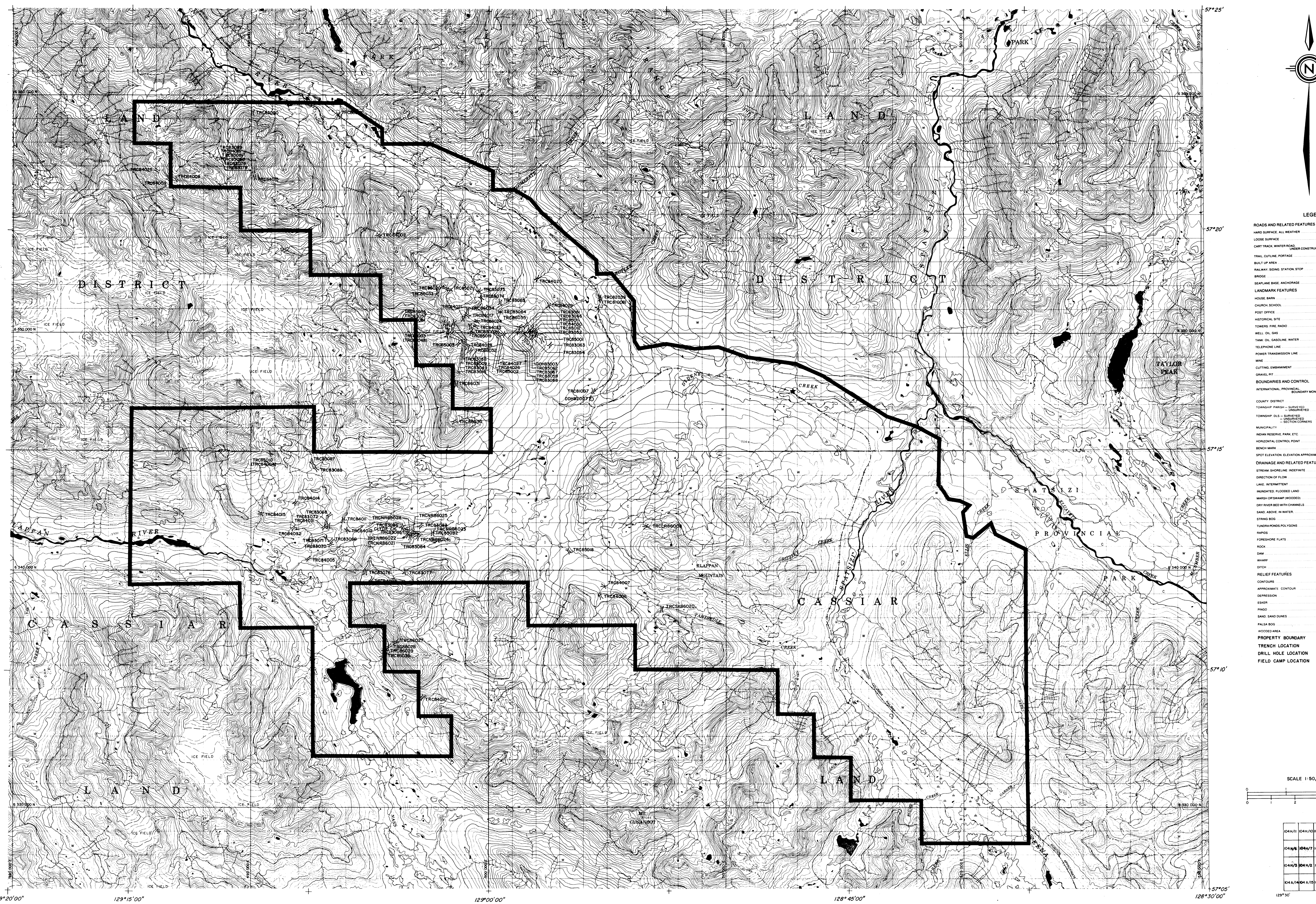
COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86001 SEAM : H INTERVAL(M) : 68.24 – 71.08 ELEVATION(M) : 1797.3

GEOLOGIST : BARKER SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	68.24			(0.43)												
			0.06													
			(0.27)													
			0.02	0.04												
				1.27	65.1	4455	4456	2.17 / 0.67 2.84		—	—	—	—	—	—	—
			(0.14)													
			0.04													
			(0.09)													
				0.18												
			0.01	0.17												
	71.08															



LEGEND

ROADS AND RELATED FEATURES
- HARD SURFACE, ALL WEATHER
- LOOSE SURFACE
- CART TRACK, WINTER ROAD, UNDER CONSTRUCTION
- TRAIL, CUTLINE, PORTAGE
- BUILT UP AREA
- RAILWAY, SIDING, STATION, STOP
- BRIDGE
- SEAPLANE BASE, ANCHORAGE

LANDMARK FEATURES
- HOUSE, BARN
- CHURCH, SCHOOL
- POST OFFICE
- HISTORICAL SITE
- TOWERS: FIRE, RADIO
- WELL: OIL, GAS
- TANK: OIL, GASOLINE, WATER
- TELEPHONE LINE
- POWER TRANSMISSION LINE
- MINE
- CUTTING, EMBANKMENT
- GRAVEL PIT — GP

BOUNDARIES AND CONTROL
- INTERNATIONAL, PROVINCIAL, BOUNDARY MONUMENT
- COUNTY, DISTRICT
- TOWNSHIP, PARISH — SURVEYED — UNSURVEYED
- TOWNSHIP, DLS — SURVEYED — UNSURVEYED — SECTION CORNERS
- MUNICIPALITY
- INDIAN RESERVE, PARK, ETC.
- HORIZONTAL CONTROL POINT
- BENCH MARK — BM 965
- SPOT ELEVATION, ELEVATION APPROXIMATE — ·390 ·721

DRAINAGE AND RELATED FEATURES
- STREAM, SHORELINE: INDEFINITE
- DIRECTION OF FLOW
- LAKE: INTERMITTENT
- INUNDATED, FLOODED LAND
- MARSH OR SWAMP (WOODED)
- DRY RIVER BED WITH CHANNELS
- SAND, ABOVE, IN WATER
- STRING BOG — SB
- TUNDRA PONDS, POLYGONS — TP, PG
- RAPIDS
- FORESHORE FLATS — FF
- ROCK
- DAM
- WHARF
- DITCH

RELIEF FEATURES
- CONTOURS — 500, 350
- APPROXIMATE CONTOUR — 125, 100
- DEPRESSION — 25
- ESKER
- PINGO — 125
- SAND, SAND DUNES — SAND
- PALSA BOG — PB
- WOODED AREA — W, C

PROPERTY BOUNDARY
TRENCH LOCATION
DRILL HOLE LOCATION
FIELD CAMP LOCATION

SCALE 1:50,000

0 1 2 3 MILES

0 1 2 3 4 5 KILOMETERS

104H/11	104H/10	104H/9
104H/6	104H/7	104H/8
104H/3	104H/2	104H/1
104A/14	104A/15	104A/16

57°45' 56°45' 129°30' 128°00'

723

GULF CANADA CORPORATION
Coal Division
CALGARY ALBERTA
Gulf

MT. KLAPPAN COAL PROPERTY

1981 - 1986 TRENCH AND DRILL HOLE LOCATION MAP

PREPARED BY: S. MACLEOD
APPROVED BY: E. SWANBERGSON DATE: MAR. 1987
DRAWING No. KPN86001

GULF CANADA CORPORATION
COAL DIVISION
KLAPPAN PROJECT
STRATIGRAPHIC LOG
KPN LR DDH86001

723

GEOLOGIST : BARKER	DATE : MAR 09/87	DRAWING NO. :

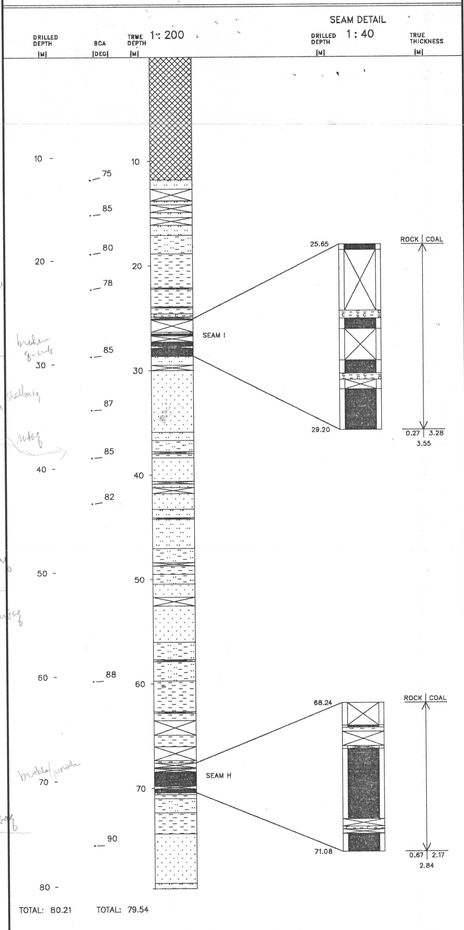
SCALE : 1:200 1:40

NORTHING: 6344089.0 N
EASTING: 505992.1 E

INCLINATION: 90.0°

LITHOLOGIC SYMBOLS

	SANDSTONE		BENTONITE
	SILTSTONE		BRECCIA
	COAL	C C C	CARBONACEOUS
	OVERBURDEN	Q Q Q	QUARTZ
	MUDSTONE,CLAYSTONE	P P P	PYRITE
	TUFF	FE FE FE	FERRUGINOUS
	LIMESTONE	○ ○ ○	CONGLOMERATE
	CORE LOSS		FOSSIL BED



Gulf Canada Corporation
Coal Division
Geophysical Log

723

Datasource:	KPNLRDDH86001	Province:	BC	Northing: 6344070.00	Lat: 571430
Log Date:	86-08-20	Zone:	9	Easting: 505992.00	Long: 1285403
Company:	CENTURY	Measuring Point:			Elevation: 1797.3
Geologist:	BARKER				

Scale: 1 to 100.0

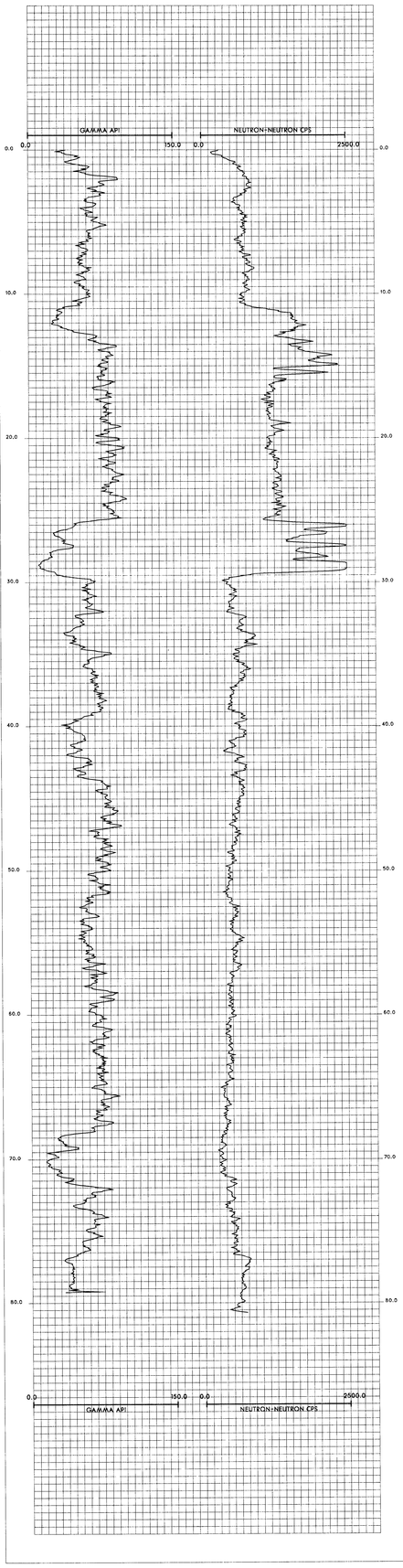
Depth Range: 0.0 to 86.0

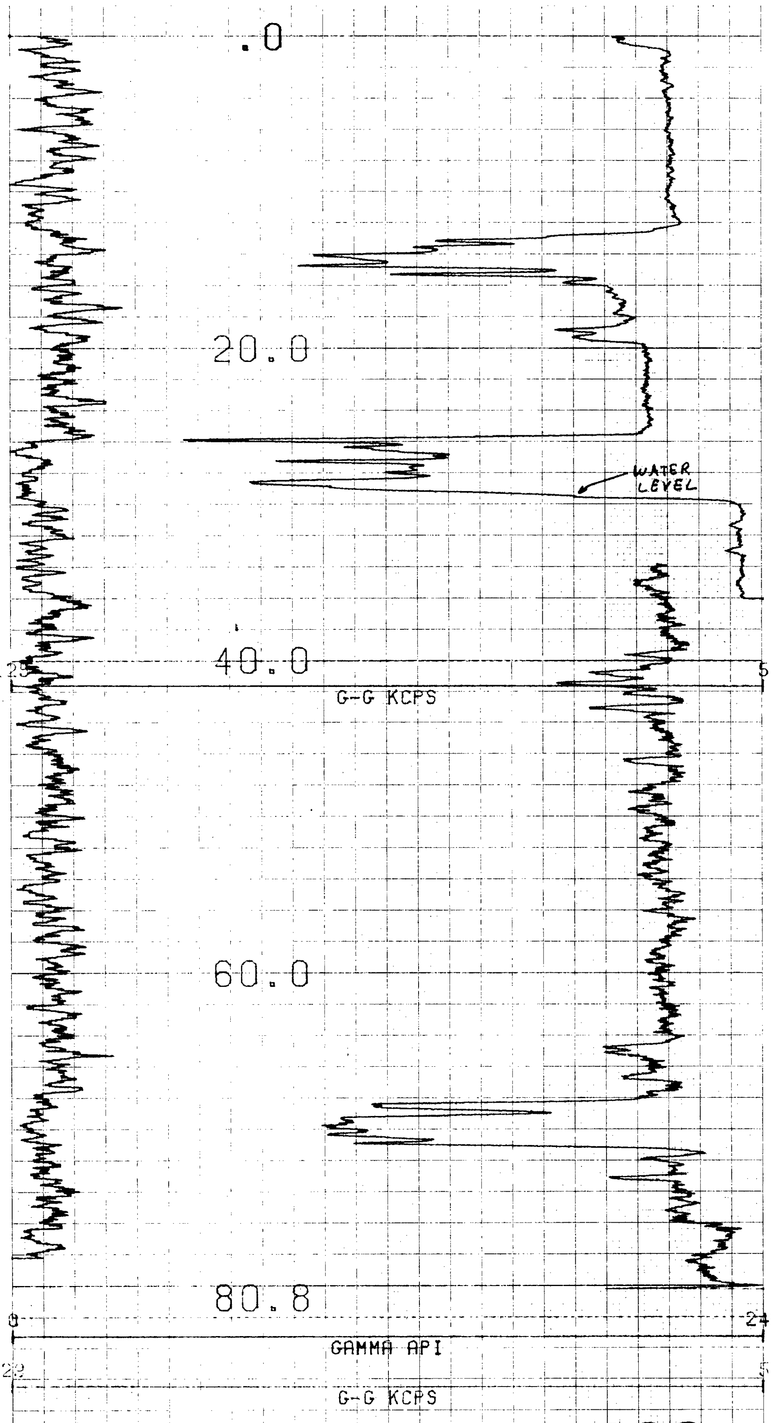
True Thickness: NO

Comments:
1.
2.

Logs Plotted:

Description	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9055A	IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE





723

COMPU-LOG V8L2 PLOT 08-20-86

DDH-86-01

GULF CANADA

MT. KLAPPAN

SCALE 1:200

HOLE DIAMETER : 08.5

PROBE # 9068 - 643

SENSOR #2 CAL STD CPS = 2283

SENSOR #2 CAL RUN CPS = 5977

SENSOR #2 CAL BIAS = 0

DATA V8L2#A TRUCK # P811

S. FORSTER APPL.#3705L1

LOGGED THRU RODS

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040

KPNLRDDH86002

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH86002 DATE - 02/13/87

- H I S T O R Y -

START DATE - 21/08/86
END DATE - 22/08/86

CONTRACTOR - J.T. THOMAS
GEOLOGIST - SAVOIE
OPERATOR - G.C.C.
SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1715.83
ZONE - 9
NORTHING - 6343591.00
EASTING - 506123.12

LICENCE/LEASE NUMBER -

LATITUDE - 571414
LONGITUDE - 1285355

- O R I E N T A T I O N -

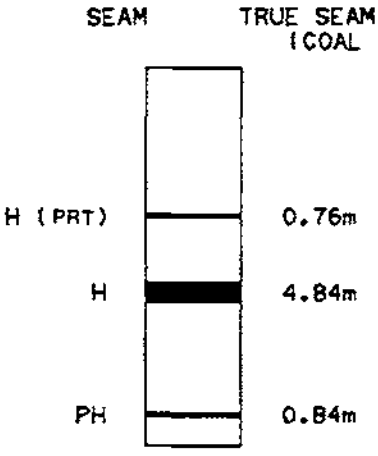
LENGTH - 100.58
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ - N

CASING DEPTH (M) - 12.19
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE



NOTE:

SCHEMATIC PROFILE.
NO THICKNESSES SHOWN
FOR SEAMS CONTAINING
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

FIGURE

MOUNT KLAPPAN ANTHRACITE PROJECT

1986 DIAMOND DRILL HOLES
DDH86002

GULF CANADA CORPORATION
11/03/87
KLAP:12050571870063002.LOG

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	12.19	12.19	25			OVERBURDEN	CASING
1	12.19	13.75	1.56	25			SANDSTONE	FG.MOD.LT-M.GY.MAS.VBRKN A FEW MINOR SLTST BANDS (<.5 CM). BCA'S APPEAR TOBE 15-25. MINOR ANGULAR MUDDY SLST (<1 CM) IN A 10 CM ZONE AT BOTTOM OF INTERVAL.
2	13.75	13.87	0.12	25			SANDSTONE	FG.MOD.M.GY.MAS.VBRKN
2	13.87	13.93	0.06	25			ROCK LOSS	
2	13.93	15.13	1.20	*25			SANDSTONE	FG.MOD.M.GY.MAS.VBRKN RARE MUDDY SLTST LAM (<1 CM). SLIGHTLY COARSER SAND FOR A 30 CM INTERVAL IN THE CENTER. MINOR QTZ STRINGERS. NUMEROUS LISTRIC FAULT SURFACES.
2	15.13	15.37	0.24	27			SANDSTONE	FG.MOD.M.GY.MAS.BRKN MINOR MUDDY SLST BAND (.5 CM) DISPLACED BY QTZ FILLED FRACTURES. (<.5 CM).

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	15.37	16.77	1.40	*30			SANDSTONE	FG.PR.M.GY.LAM.VBRKN INTERLAMINATED SLST AND SS. SMALL FLAME STRUCTURESINDICATE TOPS UP. SLST CONCENTRATES INTO THICKER BANDS TOWARD BASE OF UNIT.
4	16.77	17.02	0.25	35			SANDSTONE	SLTY.FG.PR.M-DK.GY.MAS.BRKN
4	17.02	18.47	1.45	*40			SANDSTONE	FG.PR.LT-M.GY.MAS.BRKN FREQUENT MUDDY SLST BANDS (<1.5 CM). ONE .5 CM QTZVEIN PARALLEL TO BEDDING.
5	18.47	18.68	0.21	40			SANDSTONE	FG.PR.LT-M.GY.MAS.BRKN RARE SLTST BANDS (<.5 CM).
5	18.68	19.22	0.54	*40			SANDSTONE	FG.PR.LT-M.GY.MAS.BRKN
5	19.22	19.82	0.60	41			SANDSTONE	SLTY.FG.PR.M.GY.LAM.VBRKN CORE IS SHEARED.
5	19.82	20.10	0.28	41			SANDSTONE	FG.PR.LT.GY.MAS.VBRKN QTZ VEINING WITH CLAY MATERIAL ALONG A FAULT OR FRACTURE SURFACE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
6	20.10	20.50	0.40	41			SANDSTONE	MG.PR.M.GY.MAS.BRKN MINOR QTZ VEINING PARALLEL TO CORE. MG.
6	20.50	21.28	0.78	42			SANDSTONE	MG.PR.M.GY.MAS.VBRKN ABUNDANT QTZ PRODUCING 2 BRECCIATED ZONES (10-20 CM). FAULT SURFACES ARE ABUNDANT.
6	21.28	21.33	0.05	42			COAL	C-S.SHRD VERY SHEARED. CONTAINS QTZ PARTICLES. SMALL SEAM FAULTED? MANY LISTRIC SURFACES.
6	21.33	21.42	0.09	42			MUDSTONE	CARB.LT-M.BLK.MAS.BRKN COALY FLECKS. LISTRIC SURFACES.
6	21.42	21.54	0.12	42			MUDSTONE	SLTY.LT.BLK.BRKN VERY BRECCIATED. ABUNDANT QTZ AND LISTRIC SURFACES. CLAY ALONG FAULT / FRACTURE.
7	21.54	22.09	0.55	43			SILTSTONE	CLYY.LT.BLK.MAS.BRKN BRECCIATED. IRREGULAR QTZ VEINING. NUMEROUS LISTRIC SURFACES.
7	22.09	23.06	0.97	43			SANDSTONE	MG.PR.M.GY.VBRKN AS ABOVE. FINER GRAINED TOWARD BASE. CLAY ALONG FRACTURE SURFACES.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
8	23.06	23.29	0.23	44			MUDSTONE	CARB.M.BLK.BRKN MANY LISTRIC SURFACES. CORE TWISTED OFF. GOOD PLACE FOR CORE LOSS (APPROX 1 M).
8	23.29	24.33	1.04	45			MUDSTONE	M.BLK.VBRKN MANY LISTRIC SURFACES. SOME QTZ. CARB. IN PLACES. VERY SOFT.
8	24.33	24.38	0.05	45			ROCK LOSS	
8	24.38	24.51	0.13	45			SILTSTONE	CLYY.LT.BLK.BRKN HARDER UNIT.
8	24.51	24.76	0.25	45			MUDSTONE	M.BLK.BRKN VERY SOFT.
9	24.76	26.03	1.27	46			MUDSTONE	SLTY.M.BLK.MAS.VBRKN ABUNDANT LISTRIC SURFACES. WEATHERS EASILY.
9	26.03	26.66	0.63	47			MUDSTONE	M.BLK.MAS.VBRKN AS ABOVE.
10	26.66	28.45	1.79	48			MUDSTONE	M-DK.BLK.MAS.VBRKN AS ABOVE.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
11	28.45	28.79	0.34	49			MUDSTONE	M-DK.BLK.MAS.SHRD ABUNDANT LISTRIC SURFACES.
11	28.79	30.35	1.56	50			MUDSTONE	M-DK.BLK.MAS.BRKN AS ABOVE.
12	30.35	31.89	1.54	51			MUDSTONE	SLTY.M-DK.BLK.MAS.BRKN AS ABOVE. ONE 1-2 CM QTZ VEIN AT BASE O F INTERVAL.
12	31.89	32.08	0.19	52			MUDSTONE	M-DK.BLK.MAS.BRKN ABUNDANT LISTRIC SURFACES. CLAY AND A G REENISH TALC ON FAULT SURFACES.
13	32.08	34.15	2.07	53			MUDSTONE	CARB.M-DK.BLK.MAS.BRKN AS ABOVE.
14	34.15	34.91	0.76	55			MUDSTONE	CARB.M-DK.BLK.MAS.BRKN AS ABOVE.
14	34.91	36.01	1.10	55			MUDSTONE	CARB.M-DK.BLK.MAS.VBRKN AS ABOVE.
15	36.01	38.21	2.20	57			MUDSTONE	CARB.DK.BLK.MAS.VBRKN AS ABOVE. MORE CARB TOWARD BASE OF INTE RVAL.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
16	38.21	39.33	1.12	59	04457		MUDSTONE	CARB.DK.BLK.BRKN DISTORTED PYRITE BLEBS 50 CM INTO THE U NIT.LISTRICSURFACES THROUGHOUT. COALY S TRINGERS NEAR BASE OF UNIT. PERIODIC CL AY MINERAL OCCURENCES.LOWER 25 CMSAMPLE D.
16	39.33	39.50	0.17	59	04458 H PART		COAL	C-3.SHRD HIGHLY CONTORTED AND INTERMIXED WITH PY RITE AND QTZ CARB VEINLETS. ABUNDANT LI STRIC SURFACES.
16	39.50	39.94	0.44	59	04458 H PART		COAL	C-2.SHRD HIGHLY SHEARED AND POWDERED. LISTRIC.
16	39.94	40.17	0.23	60	04458 H PART		COAL	C-2.SHRD AS ABOVE.
17	40.17	40.21	0.04	60	04458 H PART		COAL	C-2.SHRD AS ABOVE.
17	40.21	40.30	0.09	60	04459		MUDSTONE	CARB.M-DK.GY.SLD POORLY CONSOLIDATED. 5 CM QTZ VEIN AT B ASE OF MUDST.
17	40.30	41.29	0.99	60	04459		MUDSTONE	CARB.M-DK.GY.MAS.BRKN MINOR COALY STRINGERS NEAR TOP OF UNIT. BECOMES LESS CARB WITH DISTANCE FROM S EAM. QTZ - CARB INCLUSIONS.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
17	41.29	42.14	0.85	61			MUDSTONE	SLTY.M-DK.GY.MAS.BRKN GRADATIONAL FROM ABOVE.
18	42.14	44.19	2.05	63			MUDSTONE	SLTY.M-DK.GY.MAS.BRKN MINOR IRREGULAR QTZ VEINING. ABUNDANT L ISTRIC SURFACES.
19	44.19	44.34	0.15	64			MUDSTONE	SLTY.M-DK.GY.MAS.VBRKN LISTRIC SURFACES.
19	44.34	45.89	1.55	64			MUDSTONE	SLTY.M.GY.MAS.BRKN IRREGULAR QTZ VEINING. ABUNDANT LISTRIC SURFACES.
20	45.89	46.09	0.20	65			MUDSTONE	SLTY.M.GY.MAS.BRKN MINOR LISTRIC SURFACES.
20	46.09	46.17	0.08	65			ROCK LOSS	
20	46.17	47.97	1.80	66			MUDSTONE	SLTY.M.GY.MAS.BRKN SILTIER TOWARD BASE OF INTERVAL.
21	47.97	48.97	1.00	68			MUDSTONE	SLTY.M-DK.GY.MAS.VBRKN LISTRIC SURFACES. PLANT FRAGMENTS.
21	48.97	49.42	0.45	68			ROCK LOSS	
21	49.42	50.14	0.72	69			MUDSTONE	M-DK.GY.MAS.VBRKN LISTRIC SURFACES.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
22	50.14	52.04	1.90	*70			MUDSTONE	M-DK.GY.MAS.BRKN MINOR LISTRIC SURFACES. WELL COMPACTED. HARD.
23	52.04	52.36	0.32	67			MUDSTONE	M-DK.GY.MAS.BRKN AS ABOVE.
23	52.36	52.77	0.41	66			ROCK LOSS	
23	52.77	54.45	1.68	64			MUDSTONE	M-DK.GY.MAS.BRKN AS ABOVE. RARE, <.5 CM IRREGULAR QTZ ST RINGERS. SLIGHTLY CARB TOWARD BASE.
24	54.45	55.90	1.45	*60			MUDSTONE	CARB.M.BLK.MAS.BRKN MINOR LISTRIC SURFACES. CARBONACEOUS TO HARD BASE. DISSEMINATED, PYRITE IN BOTT OM 30 CM.
24	55.90	56.02	0.12	61			MUDSTONE	PYR.M.BLK.SLD ALMOST COMPLETELY PYRITIZED. VERY HARD. RARE QTZ.
24	56.02	56.22	0.20	61			MUDSTONE	CARB.M.BLK.MAS.VBRKN LISTRIC SURFACES.
24	56.22	56.29	0.07	61			ROCK LOSS	
25	56.29	56.74	0.45	61	04460		MUDSTONE	CARB.M.BLK.MAS.BRKN LISTRIC SURFACES.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
25	56.74	57.24	0.50	62	04461	H	COAL LOSS	
25	57.24	57.34	0.10	62	04461	H	COAL	C-3.VBRKN CONTAINS SOME QUARTZ STRINGERS. SHEARED THROUGHOUT.
25	57.34	57.42	0.08	62	04461	H	MUDSTONE	CARB.DK.GY.SHRD LISTRIC SURFACES.
25	57.42	57.60	0.18	62	04461	H	ROCK LOSS	
25	57.60	57.62	0.02	63	04461	H	COAL	C-2.SHRD
25	57.62	57.79	0.17	63	04461	H	COAL	C-3.SHRD ABUNDANT LISTRIC SURFACES. (ONE THISTE D OFF).
25	57.79	57.81	0.02	63	04461	H	MUDSTONE	CARB.DK.GY.VBRKN COALY SPECS WITHIN.
25	57.81	57.91	0.10	63	04461	H	COAL	C-3.VBRKN
25	57.91	57.98	0.07	63	04461	H	MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS WITHIN (MM SCALE).
25	57.98	58.00	0.02	63	04461	H	COAL	C-3.SLD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
25	58.00	58.21	0.21	63	04461	H	COAL	C-4.SHRD DIFFICULT TO DETERMINE GRADE.
25	58.21	58.27	0.06	63	04461	H	COAL	C-3.SHRD
25	58.27	58.59	0.32	63	04461	H	MUDSTONE	CARB.DK.GY.SHRD HAS THIN BANDS OF SHEARED COAL RUNNING PARALLEL TOCORE.LLISTRIC SURFACES. SOFT
25	58.59	59.04	0.45	64	04461	H	COAL LOSS	
25	59.04	59.06	0.02	64	04461	H	COAL	C-3.SLD HARD.
25	59.06	59.26	0.20	64	04461	H	COAL	C-6.VSHRD MIXTURE OF HIGHLY SHEARED COAL & COAL.P ROPER GRADENOT DETERMINABLE.
26	59.26	59.28	0.02	64	04461	H	COAL	C-3.PHRD
26	59.28	59.33	0.05	64	04461	H	COAL	C-6.SLD HARD MUDST WITH COALY STRINGERS THROUGH OUT.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	59.33	59.42	0.09	64	04461	H	MUDSTONE	CARB.DK.GY.SLD
26	59.42	59.46	0.04	65	04462	H	ROCK LOSS	
26	59.46	59.84	0.38	65	04462	H	COAL LOSS	
26	59.84	59.96	0.12	65	04462	H	COAL	C-3.BRKN HARD.
26	59.96	59.99	0.03	65	04462	H	MUDSTONE	CARB.SLD HARD. LISTRIC. CONTAINS COALY STRINGERS
26	59.99	60.26	0.27	65	04462	H	COAL	C-5.SLD VITRINITE STRINGERS THROUGHOUT. MUDDY B ANDS WITHIN.
26	60.26	60.46	0.20	66	04462	H	COAL	C-2.BRKN
26	60.46	60.93	0.47	66	04462	H	COAL	C-2.SHRD SOFT AND CRUMBLY.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	60.93	60.96	0.03	66	04462	H	COAL	C-2.SLD
26	60.96	61.00	0.04	66	04462	H	COAL	C-3.5HRD
26	61.00	61.22	0.22	66	04462	H	COAL	C-2.SLD
26	61.22	61.24	0.02	66	04462	H	COAL	C-6.SLD HARD ROCK WITH COAL STRINGERS.
26	61.24	61.29	0.05	66	04462	H	COAL	C-1 TWISTED OFF BY DRILL. ROUND CHUNK.
26	61.29	61.40	0.11	67	04462	H	COAL LOSS	
26	61.40	61.52	0.12	67	04462	H	ROCK LOSS	
26	61.52	61.67	0.15	67	04462	H	MUDSTONE	CARB.DK.GY.BRKN LISTRIC SURFACES.
26	61.67	61.71	0.04	67	04462	H	COAL	C-2.SLD
26	61.71	61.74	0.03	67	04462	H	MUDSTONE	CARB.DK.GY.SLD HARD.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	61.74	61.76	0.02	67	04462	H	COAL	C-2.SLD.
27	61.76	61.91	0.15	67	04462	H	COAL	C-2.BRKN
27	61.91	61.94	0.03	67	04462	H	MUDSTONE	CARB.DK.GY.SLD CONTAINS 0.5 CM VITRINITE BANDS WITHIN.
27	61.94	62.05	0.11	67	04462	H	COAL	C-2.SLD QTZ-CARB VEINS WITHIN.
27	62.05	62.08	0.03	67	04462	H	MUDSTONE	CARB.DK.GY.BRKN MINOR VITRINITE BANDS WITHIN.
27	62.08	62.11	0.03	67	04462	H	COAL	C-3.DK.GY.SLD MUDDY BANDS WITHIN.
27	62.11	63.69	1.58	68	04463		MUDSTONE	CARB.M-DK.GY.MAS.BRKN PYRITE BANDS WITHIN.LESS CARB WITH DEPT H.UPPER 25 CM SAMPLED.
28	63.69	64.31	0.62	69			MUDSTONE	M.GY.MAS.BRKN CARBONACEOUS AT TOP. PROGRESSIVELY SILT IER TOWARD BASE OF INTERVAL.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
28	64.31	64.68	0.37	70			SANDSTONE	SLTY.FG.VPR.LT-M.GY.MAS.BRKN WISPS OF MUDST. GRADATIONALLY SANDIER T OWARDS BASEOF INTERVAL.
28	64.68	65.18	0.50	70			SANDSTONE	MG.VPR.LT-M.GY.MAS.BRKN QTZ VEINING.
28	65.18	65.52	0.34	71			SANDSTONE	MG.VPR.LT-M.GY.MAS.SLD IRREGULAR QTZ VEINING.
29	65.52	67.32	1.80	*72			SANDSTONE	MG.MOD.LT-M.GY.MAS.SLD RARE QTZ VEINING (<.2 CM).MODERATELY RO UNDED SLTST RIPUP CLASTS.
29	67.32	67.38	0.06	61			SANDSTONE	MG.VPR.M-DK.GY.MAS.SLD BAND OF TIGHTLY PACKED, MOD WELL ROUNDE D SLTST RIPUP CLASTS (< 2 CM). MINOR QT Z STRINGER VEINING.
29	67.38	67.51	0.13	60			SANDSTONE	MG.VPR.LT-M.GY.MAS.SLD VERY MINOR SLTST RIP UP CLASTS.
30	67.51	67.81	0.30	57			SANDSTONE	CG.VPR.LT-M.GY.MAS.SLD IRREGULAR SHAPED SLTST RIPUP CLASTS
30	67.81	68.14	0.33	53			SANDSTONE	PBLY.CG.PR.LT-M.GY.MAS.SLD RARE WISPS OF SLTST.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
30	68.14	69.17	1.03	*45			SANDSTONE	MG.VPR.M.GY.MAS.BRKN AS ABOVE. ONE 4 CM BAND OF MOD WELL ROU NDED SLST CLASTS. ONE LISTRIC SURFACE.
30	69.17	69.41	0.24	47			SANDSTONE	GRAN.VPR.LT.GY.MAS.SLD RARE SMALL RIP UP CLASTS. FAIRLY POROUS (15-20%).
31	69.41	70.41	1.00	48			SANDSTONE	VCG.VPR.LT-DK.GY.MAS.BRKN NUMEROUS BANDS OF SLTST. RIP UP CLASTS (2-3 CM). MINOR QTZ VEINING (<.3CM) SHA RP LOWER CONTACT.
31	70.41	70.89	0.48	50			SILTSTONE	CLYY.PR.DK.GY.LAM.BRKN INTERLAMINATED CARB MUDST. CARBONACEOUS PLANT HASHON BDG PLANE.
31	70.89	71.34	0.45	51			SILTSTONE	CLYY.PR.M.GY.MAS.SLD SLIGHTLY CARBONACEOUS PLANT.
32	71.34	72.01	0.67	53			SANDSTONE	MG.PR.LT-M.GY.MAS.BRKN SLST LAM TOWARD BASE OF INTERVAL.
32	72.01	73.29	1.28	*55			SANDSTONE	SLTY.FG.PR.LT-DK.GY.LAM.BIOTR.BRKN SSD. INTERLAMINATED SILTY MUDST. TOPS U P (LOAD STRUCTURE). ABUNDANT HELMINTHOP SIS.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
33	73.29	73.90	0.61	59			SANDSTONE	FG.PR.M.GY.LAM INDISTINCT SLTST/MUDST LAM.
33	73.90	75.26	1.36	*64			SANDSTONE	SLTY.FG.PR.M.GY.SSD.SLD INTERLAMINATED SILTY MUDST. MINOR PYRIT E (DISSEMINATED 1 CM BAND).
34	75.26	76.42	1.16	62			SILTSTONE	PR.M-DK.GY.LAM.BIOTR.BRKN TOPS UP (ESCAPE BURROWS) HELMINTHOPSIS. INTERLAMINATED AND DEFORMED MUDST.
34	76.42	76.73	0.31	61			SILTSTONE	CLYY.PR.M-DK.GY ABUNDANT IRREGULAR QTZ VEINING, PLANT F RAGMENTS.
34	76.73	77.15	0.42	*60			SILTSTONE	CLYY.M.GY.LAM.SSD.SLD INTERLAMINATED WISPS OF MUDST. TOPS UP (LOAD CAST).
35	77.15	79.17	2.02	*71			SILTSTONE	CLYY.M.GY.SSD.BRKN SWIRLED BDG. LARGE AMOUNT OF HELMINTHOP SIS. SOME COALY PLANT FRAGMENTS.
36	79.17	79.69	0.52	71			MUDSTONE	M-DK.GY.MAS.SLD SLIGHTLY CARBONACEOUS. COALY PLANT FRAG MENTS.
36	79.69	81.21	1.52	71			MUDSTONE	M-DK.GY.MAS.SLD PLANT FRAGMENTS. VERY MONOTONOUS MUD.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
37	81.21	82.11	0.90	70			MUDSTONE	M-DK.GY.MAS.BRKN SILTIER TOWARD BASE.
37	82.11	83.22	1.11	70			MUDSTONE	SLTY.DK.GY.MAS.SLD
38	83.22	83.84	0.62	70			MUDSTONE	SLTY.M-DK.GY.MAS.SLD MINOR LISTRIC SURFACES.
38	83.84	84.24	0.40	70			SANDSTONE	SLTY.FG.VPR.LT-M.GY.MAS.BRKN 1 MM COAL MAT. RARE QTZ VEINING. SANDIE R TOWARD BASE OF INTERVAL.
38	84.24	84.30	0.06	70			ROCK LOSS	
38	84.30	85.03	0.73	*70			SANDSTONE	FG.PR.LT-M.GY.MAS.SLD MINOR WISPS OF MUDDY SLTST. ONE 3 CM BA ND OF MG SS.
39	85.03	85.71	0.68	68			SANDSTONE	FG.VPR.LT-M.GY.MAS.SLD MINOR WISPS OF MUDDY SLTST.
39	85.71	86.90	1.19	*66			SANDSTONE	MG.VPR.LT.GY.MAS.SLD AS ABOVE. RARE COAL FRAGMENTS. ONE THIN QTZ VEIN PERPENDICULAR TO BEDDING AT B ASE (3 CM).

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
40	86.90	87.29	0.39	69			SILTSTONE	SSY.VPR.LT-M.GY.MAS.BRKN MINOR COAL FRAGMENTS. SILTIER TOWARD BA SE.
40	87.29	87.79	0.50	*70			SILTSTONE	CLYY.M.GY.MAS.VBRKN LISTRIC SURFACES.
40	87.79	88.67	0.88	70			MUDSTONE	SLTY.M.GY.MAS.BRKN PLANT FRAGS. RARE LISTRIC SURFACES. MIN OR COALY STRINGERS.
41	88.67	90.59	1.92	*70			MUDSTONE	DK.GY.MAS.BRKN LISTRIC SURFACES. INDISTINCT SILTY LAMI NAE. COALY STRINGERS. COLOR IS BLK TOWA RD BASE.
42	90.59	90.87	0.28	69			MUDSTONE	CARB.M.BLK.SLD COALY STRINGERS THROUGHOUT.
42	90.87	91.57	0.70	69			MUDSTONE	CARB.M.BLK.SLD COALY STRINGERS THROUGHOUT.
42	91.57	91.67	0.10	69			MUDSTONE	CLYY.DK.GY.BRKN
42	91.67	92.07	0.40	69			MUDSTONE	CARB.M.BLK.BRKN COALY STRINGERS & THIN BANDS THROUGHOUT

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
42	92.07	92.10	0.03	69			MUDSTONE	CLYY.DK.GY.SLD
42	92.10	92.14	0.04	69		PH	COAL	C-6.SLD
42	92.14	92.87	0.73	69		PH	COAL LOSS	
42	92.87	92.91	0.04	68		PH	COAL	C-2.SLD MUDDY BANDS WITHIN. QTZ WITHIN.
42	92.91	93.00	0.09	68		PH	COAL	C-6.SLD
42	93.00	93.92	0.92	68			MUDSTONE	CARB.MAS.SLD COALY CARB LENSES & STRINGERS THROUGHOU T.
43	93.92	95.42	1.50	68			MUDSTONE	M-DK.GY.LAM.SSD.BRKN ABUNDANT COALY STRINGERS. QTZ ASSOCIATE D WITH COALSTRINGERS. ABUNDANT COALIFIE D PLANT FRAGMENTS.
43	95.42	95.75	0.33	67			MUDSTONE	M.GY.MAS.BRKN ABUNDANT PLANT FRAGMENTS.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86002

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
44	95.75	97.87	2.12	67			MUDSTONE	M.GY.MAS.SLD AS ABOVE. PLANT FOSSIL NILSSONIA TENUIC AULIS PRESENT. RARE COALY FRAGMENTS. BC A'S APPROX. 70.
45	97.87	98.63	0.76	66			MUDSTONE	M.GY.MAS.SLD AS ABOVE. SILTIER TOWARD BASE.
45	98.63	99.73	1.10	66			MUDSTONE	SLTY.M.GY.MAS.SSD.BRKN PROGRESSIVELY SILTIER. PLANT FRAGMENTS DISAPPEAR TOWARD BASE. ABUNDANT IRREGUL AR QTZ VEINING AND LISTRIC SURFACES IN THE BOTTOM 40 CM.
46	99.73	100.83	1.10	*65			SILTSTONE	CLYY.LT-M.GY.LAM.BRKN INTERLAMINATED MUDST. TOPS UP (LOAD CAS T). LISTRICSURFACES. TOTAL DEPTH DRILLE D.

* DENOTES MEASURED BCA
NEWPAGE

GULF CANADA CORPORATION

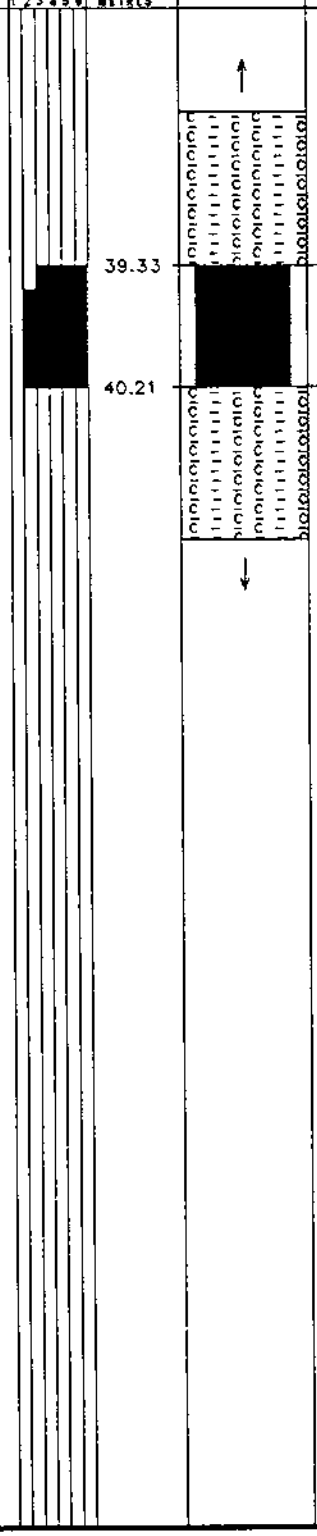
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86002 SEAM : H PART INTERVAL(M) : 39.33 - 40.21 ELEVATION(M) : 1715.8

GEOLOGIST : SAVOIE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :



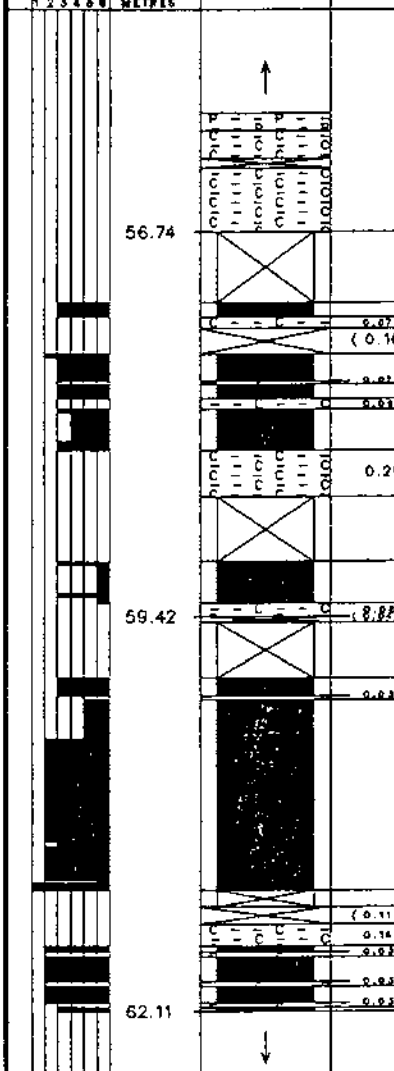
SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	39.33			0.75	100.0	4458	4458	0.75 / 0.00 0.75		—	—	—	—	—	—	—
	40.21															

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH86002 SEAM : H INTERVAL(M) : 56.74 - 62.11 ELEVATION(M) : 1715.8

GEOLOGIST : SAVOIE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	56.74				57.8	4461	4461	1.71 / 0.68 2.39		—	—	—	—	—	—	—
	59.42				75.8	4462	4462	2.06 / 0.40 2.46		—	—	—	—	—	—	—
	62.11															

GULF CANADA CORPORATION

COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH86002 SEAM : PH INTERVAL(M) : 92.10 – 93.00 ELEVATION(M) : 1715.8

GEOLOGIST : SAVOIE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	92.10			(0.68)	18.0	99999	99999	0.84/ 0.00 0.84		—	—	—	—	—	—	—
	93.00															

GULF CANADA CORPORATION
COAL DIVISION
KLAPPAN PROJECT
STRATIGRAPHIC LOG
KPN LR DDH86002

723

GEOLOGIST : SAVOIE	DATE : MAR 09/87	DRAWING NO. :

SCALE : 1:200 1:40

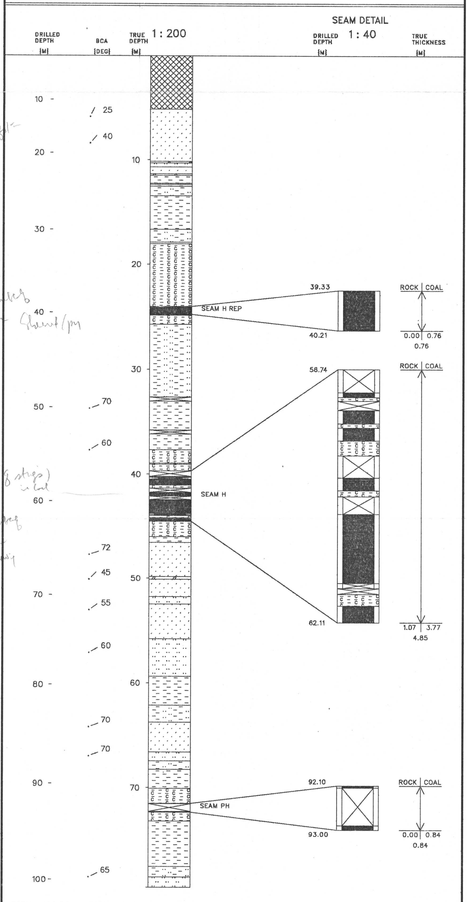
0 5 [M] 0 .5 1 [M]

NORTHING: 6343591.0 N
EASTING: 506123.1 E

INCLINATION: 90.0°

LITHOLOGIC SYMBOLS

SANDSTONE		BENTONITE	
SILTSTONE		BRECCIA	
COAL	C C C	CARBONACEOUS	
OVERBURDEN	Q Q Q	QUARTZ	
MUDSTONE,CLAYSTONE	P P P	PYRITE	
TUFF	FE FE FE	FERRUGINOUS	
LIMESTONE		CONGLOMERATE	
CORE LOSS	F	FOSSIL BED	



Gulf Canada Corporation
Coal Division
Geophysical Log

723

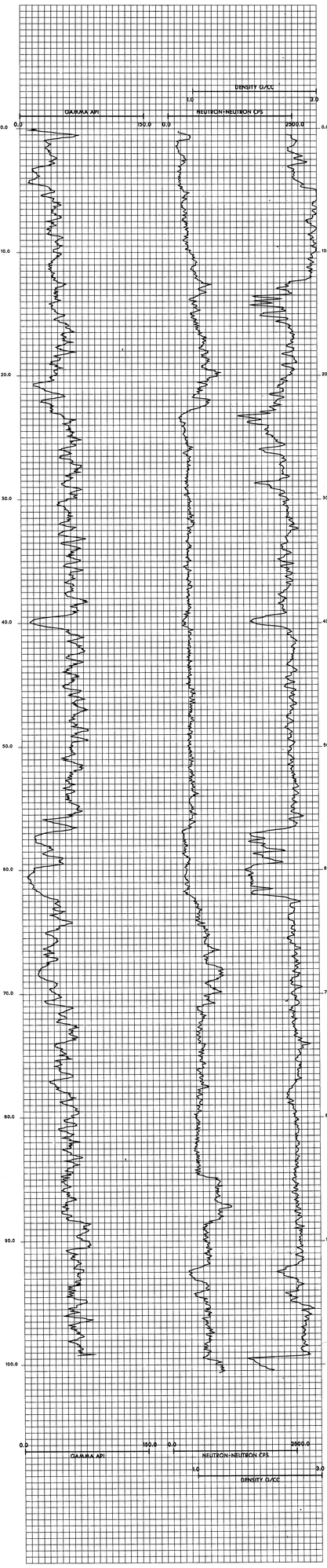
Datasource: KPNLRDDH86002	Province: BC	Northing: 6343590.00	Lat: 571414
Log Date: 86-08-22	Zone: 9	Easting: 506123.00	Long: 1285355
Company: CENTURY	Measuring Point:		Elevation: 1715.8
Geologist: SAVOIE			

Scale: 1 to 100.0
Depth Range: 0.0 to 106.0
True Thickness: NO

Comments:
1. LOGGED THROUGH THE RODS
2.

Logs Plotted:

Description	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1 .GAMMA API	0.0 to 150.0	10.0	31	9055A	IN PIPE
2 .NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3 .DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE



KPNLRDDH86003

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH86003 DATE - 02/13/87

- H I S T O R Y -

START DATE - 22/08/86
END DATE - 23/08/86

CONTRACTOR - J.T. THOMAS
GEOLOGIST - LOVE
OPERATOR - G.C.C.
SURVEYOR - TRONNES

REMARKS -

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1606.64
ZONE - 9
NORTHING - 6345041.00
EASTING - 505846.31

LICENCE/LEASE NUMBER -

LATITUDE - 571501
LONGITUDE - 1285411

- O R I E N T A T I O N -

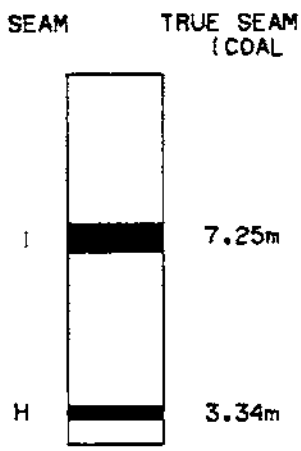
LENGTH - 98.10
INCLINATION - 75.0
AZIMUTH - 25.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ - N

CASING DEPTH(M) - 3.30
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE



NOTE:

SCHEMATIC PROFILE.
NO THICKNESSES SHOWN
FOR SEAMS CONTAINING
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

FIGURE

MOUNT KLAPPAN ANTHRACITE PROJECT

1986 DIAMOND DRILL HOLES
DDH86003

GULF CANADA CORPORATION
11/03/87
KLAP:[205057]870063003.LOG

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	3.05	3.05	70			OVERBURDEN	CASING.
1	3.05	4.89	1.84	*70			SANDSTONE	FER.FG.PR.M.BN.MB.WRMBU.VBRKN IRON STAINED. THIN SLTST INTERBEDS AND LAMINATIONSTHAT ARE MORE IRON STAINED. TOPS UP. SSD.
2	4.89	6.59	1.70	*80			SANDSTONE	FER.FG.PR.BN.MB.BIOTR.BRKN BECOMES GREY DOWNHOLE. SAME AS ABOVE. S ILTY INTERBEDS ARE BIOTURBATED, SSD IND ICATE TOPS UP. BECOMES COARSER GRAINED TOWARDS BASE.
2	6.59	7.04	0.45	88			SANDSTONE	SLTY.FG.PR.M.GY.VTHNB.SSD.SLD INTERLAMINATED GY SS AND DK GY SLST. MM TO CM SCALE LAMINATIONS AND THIN BEDS.
3	7.04	7.23	0.19	*90			SANDSTONE	SLTY.FG.PR.M.GY.VTHNB.SSD.SLD AS ABOVE.
3	7.23	7.57	0.34	90			SANDSTONE	FG.PR.M.GY.MAS.SLD V. RARE V. THIN SILTY WISPS.
3	7.57	7.95	0.38	89			SANDSTONE	SLTY.FG.PR.M.GY.VTHNB.SSD.SLD INTERLAMINATED GY SS AND DK GY SLST WIT H MM TO CM SCALE LAMINATIONS AND THIN B EDS.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	7.95	8.06	0.11	88			SANDSTONE	SLTY.FG.PR.M.GY.VTHNB.SSD.SLD SAME AS ABOVE. ONE LARGE SCOUR INDICATE S TOPS UP. ONE QTZ & CARBONATE FILLED F RACTURE A FEW MM THICK.
3	8.06	9.16	1.10	87			SANDSTONE	FG.MOD.M.GY.MAS.VBRKN MASSIVE, FEATURELESS SANDSTONE, IRREGUL ARLY IRON-STAINED. ONE THIN QTZ. CARB. -FILLED FRACTURE SUB- PARALLEL TO CORE.
4	9.16	10.86	1.70	85			SANDSTONE	FG.MOD.M.GY.MAS.VBRKN SAME AS ABOVE. VERY RARE SMALL (<1 CM) DK GY SLTSTRIPUP CLASTS.
4	10.86	11.18	0.32	83			SANDSTONE	FG.MOD.M.GY.MAS.VBRKN SAME AS ABOVE.
5	11.18	13.28	2.10	81			SANDSTONE	FG.MOD.M.GY.MAS.BRKN SAME AS ABOVE. FEW THIN QTZ CARB FILLED FRACTURES.
6	13.28	13.88	0.60	79			SANDSTONE	FG.MOD.M.GY.MAS.VBRKN SAME ROCK TYPE AS ABOVE.
6	13.88	15.22	1.34	77			SANDSTONE	FG.MOD.M.GY.MAS.BRKN SAME ROCK TYPE AS ABOVE. LOWEST 30 CM H AS SEVERAL QTZ CARB VEINS UP TO 4 CM WI DE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
7	15.22	16.92	1.70	74			SANDSTONE	FG.M.GY.MB.SSD.BRKN INTERBEDDED M-CG. SS AND DK GY SLTST. B EDS UP TO 20 CM THICK. SSD = FLAME AND LOAD STRUCTURES INDICATE TOPS UP. FEW V THIN QTZ. CARB FILLED FRACTURES. IRR EGULARLY RUST STAINED ESPECIALLY IN SLT ST.
8	16.92	17.62	0.70	72			SANDSTONE	FG.VPR.M-DK.GY.MB.SSD.BRKN SAME ROCK TYPE AS ABOVE.
8	17.62	19.07	1.45	*70			SANDSTONE	SLTY.FG.VPR.M-DK.GY.LAM.SSD.BRKN INTERLAMINATED M. GY. SS AND DK GY SLTS T. WITH MM TO CM SCALE LAMINATIONS AND INTERBEDS. SSD INDICATE TOPS UP. SAME A S BOTTOM OF BOX 2. BUT SOME SLTSTBEDS A RE RUSTY STAINED.
9	19.07	20.07	1.00	*80			SANDSTONE	SLTY.FG.VPR.GY.VTHNB.BIOTR.BRKN INTERBEDDED SS AND DK GY MUDST BED SEVE RAL CM THICK. MUDSTS ARE BIOTURBATED AN D RUSTY STAINED. TOPS UP, SSD.
9	20.07	20.48	0.41	80			SANDSTONE	SLTY.FG.VPR.GY.VTHNB.BIOTR.BRKN SAME AS ABOVE. SSD.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
9	20.48	20.98	0.50	81			SANDSTONE	FG.MOD.M.GY.MAS.BIOTR.BRKN RARE DK GY MUDST BEDS 1-2 CM THICK ARE BIOTURBATED. RARE SLTST WISPS.
10	20.98	21.21	0.23	81			SANDSTONE	FG.MOD.M.GY.MAS.BIOTR.BRKN SAME AS ABOVE.
10	21.21	21.93	0.72	81			SANDSTONE	SLTY.FG.VPR.GY.VTHNB.SSD.BRKN INTERLAMINATED M GY SS AND DK GY SLTST WITH MM TO CM SCALE LAMINATIONS AND INT ERBEDS.SSD INDICATES TOPS UP. SOME RUST STAINS NEAR FRACTURES AND IN SLST BEDS
10	21.93	23.10	1.17	81			SANDSTONE	VFG.PR.LT.GY.VTHNB.XBDG.BRKN LT AND M GY BANDED SANDSTONE.XBDG INDIC ATES TOPS UP.TYPICAL OF SS ABOVE TUFFIT E. MINOR LT RUSTY STAIN. SSD.
11	23.10	23.12	0.02	82			SANDSTONE	VFG.PR.LT.GY.VTHNB.XBDG.SLD AS ABOVE. SSD.
11	23.12	24.78	1.66	82			SANDSTONE	VFG.PR.LT.GY.VTHNB.XBDG.BRKN SAME AS ABOVE. SSD.
12	24.78	25.09	0.31	83			SANDSTONE	VFG.PR.LT.GY.VTHNB.XBDG.BRKN SAME AS ABOVE. SSD.

* DENOTES MEASURED BCA

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 5

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
12	25.09	26.04	0.95	83			SANDSTONE	VFG.PR.LT.GY.VTHNB.XBDG.BRKN FEW WISPY M GY SLTST LAYERS LESS COMMON XBDG THAN ABOVE. TUFFITE.
12	26.04	26.49	0.45	83			SANDSTONE	VFG.PR.LT.GY.VTHNB.XBDG.BRKN SAME AS ABOVE.
12	26.49	26.58	0.09	83			BENTONITE	DK.MH.LAM.SLD VERY LIGHT GREY.THINLY LAMINATED WITH M GY SLST BEDS 1-3 MM THICK.SOFT.KAOLINITIC.
12	26.58	26.77	0.19	83			SILTSTONE	M-DK.GY.LAM.XBDG.SLD
12	26.77	26.82	0.05	83			BENTONITE	DK.MH.LAM.BRKN SOFT. INTERLAMINATED WITH 1-3 MM SLST BEDS. RUST STAINED. VERY LIGHT GREY BENTONITE.
12	26.82	26.94	0.12	83			SILTSTONE	M-DK.GY.LAM.BRKN

* DENOTES MEASURED BCA

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 6

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
13	26.94	28.89	1.95	84			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN LAMINATED TO V. THIN BEDDED. OCCASIONALLY SLIGHTLYTO MOD. BIOTURBATED. MUDSTONE LAMINATED WITH SLST.RARE RUSTY STAIN ALONG FRACTURES. BOTTOM 60 CM VERY BRKN. SSD.
14	28.89	29.09	0.20	84			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN SAME AS ABOVE. IRON STAINED BANDING. TIGER STRIPED. SSD.
14	29.09	29.24	0.15	85			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.VBRKN SAME ROCK TYPE AS ABOVE. SSD.
14	29.24	29.91	0.67	85			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.SLD SAME ROCK TYPE AS ABOVE. SSD.
14	29.91	30.37	0.46	*85			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. LESS IRON STAINING. SSD.
15	30.37	32.07	1.70	*80			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE.SSD INDICATE TOPS UP. SSD.
15	32.07	32.55	0.48	82			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. SSD.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
16	32.55	34.65	2.10	*85			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. SLIGHTLY LESS SILTY WITH DEPTH. SSD.
17	34.65	36.80	2.15	*80			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. SSD.
18	36.80	38.07	1.27	*90			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. SSD.
18	38.07	38.53	0.46	90			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. SSD.
19	38.53	39.58	1.05	*90			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. SSD.
19	39.58	40.08	0.50	90	04464		MUDSTONE	SLTY.DK.GY.LAM.BIOTR.VBRKN SAME ROCK TYPE AS ABOVE.VERY BROKEN WIT H COAL PIECES MIXED IN WITH MUDSTONE PI ECES. LOWER 25 CM SAMPLED. SSD.
19	40.08	41.00	0.92	89	04465	I	COAL LOSS	
19	41.00	41.02	0.02	89	04465	I	COAL	C-2.SLD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
19	41.02	41.05	0.03	89	04465	I	MUDSTONE	CARB.M.BLK.SLD UNCONSOLIDATED (DRILLERS MUD?).
19	41.05	41.08	0.03	89	04465	I	COAL	C-3
19	41.08	41.11	0.03	89	04465	I	MUDSTONE	DK.GY.SLD VERY HARD PYRITE TRACE.
19	41.11	41.32	0.21	89	04465	I	COAL	C-2.VBRKN FIRST HALF HIGHLY SHEARED.
20	41.32	41.56	0.24	89	04465	I	COAL	C-2.BRKN
20	41.56	41.68	0.12	89	04465	I	MUDSTONE	CLYY.M.GY.SLD
20	41.68	41.73	0.05	89	04465	I	ROCK LOSS	
20	41.73	41.87	0.14	88	04465	I	COAL	C-2.VBRKN
20	41.87	41.94	0.07	88	04465	I	MUDSTONE	CARB.M.BLK.SLD CORE TWISTED OFF.
20	41.94	42.02	0.08	88	04465	I	ROCK LOSS	
20	42.02	44.36	2.34	88	04465	I	COAL LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
20	44.36	44.55	0.19		87 04465	I	COAL	C-3.VBRKN
20	44.55	45.07	0.52		87 04465	I	COAL	C-2.SHRD HIGHLY SHEARED WITH ABUNDANT LISTRIC SU RFACES.PARTIAL MIXING OF DRILLERS MUD.
20	45.07	45.09	0.02		87 04465	I	COAL	C-3.SLD
20	45.09	45.14	0.05		87 04465	I	MUDSTONE	CARB.M.BLK.SLD FIRST 2 CM SOFT.
20	45.14	45.16	0.02		87 04465	I	ROCK LOSS	
20	45.16	46.12	0.96		86 04466	I	COAL LOSS	
20	46.12	46.19	0.07		86 04466	I	COAL	C-2.SLD
20	46.19	46.43	0.24		86 04466	I	COAL	C-1.SLD
21	46.43	46.58	0.15		86 04466	I	COAL	C-1.SLD
21	46.58	47.18	0.60		86 04466	I	COAL LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
21	47.18	47.34	0.16		85 04466	I	COAL	C-1.VBRKN CORE LOSS.
21	47.34	48.78	1.44		85 04467		MUDSTONE	SLTY.DK.GY.LAM.SSD.BRKN SSD INDICATE TOPS UP.SIMILAR TO ROCK TY PE ABOVE COAL SEAM. INTERLAMINATED M GY SLST AND DK GY MUDST.UPPER 25 CM SAMPL ED.
22	48.78	48.91	0.13		84		MUDSTONE	SLTY.DK.GY.LAM.BIOTR.SLD COARSE SILST INTERLAM WITH MUDST. SIMIL AR TO ABOVEROCK TYPE BUT COARSER. SSD.
22	48.91	50.41	1.50		*84		SANDSTONE	SLTY.FG.VPR.M.GY.LAM.SSD.BRKN WISPS. LAMINAE AND RIP UP CLASTS OF MUD STONE AND/ OR SLTST. TOPS UP.
22	50.41	50.69	0.28		85		SANDSTONE	SLTY.FG.VPR.M.GY.LAM.SSD.BRKN SAME ROCK TYPE AS ABOVE.
23	50.69	52.71	2.02		*87		SANDSTONE	SLTY.MG.PR.LT-M.GY.LAM.SSD.BRKN SAME ROCK TYPE AS ABOVE.
23	52.71	52.80	0.09		89		MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN SILTY LAMINAE IN MUDST. SSD.
24	52.80	53.53	0.73		89		MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN SAME AS ABOVE ROCK TYPE. SSD INDICATE T OPS UP. SSD.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
24	53.53	54.02	0.49	*90			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. SSD.
24	54.02	54.91	0.89	89			MUDSTONE	DK.GY.LAM.BIOTR.BRKN SIMILAR TO ABOVE BUT NO LONGER SILTY. S SD.
25	54.91	55.50	0.59	89			MUDSTONE	DK.GY.MAS.BRKN GRADATIONAL OVER 10 CM INTO SS BELOW.
25	55.50	56.49	0.99	*88			SANDSTONE	FG.VPR.LT-M.GY.MAS.BRKN V. RARE WISPS OF DK GY SLTST.
25	56.49	56.99	0.50	87			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.SSD.BRKN INTERLAMINATED M GY SS AND DK GY MUDST. BOTTOM 5 CM IS VERY, VERY BROKEN.
26	56.99	57.36	0.37	86			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.SSD.BRKN SAME ROCK TYPE AS ABOVE.
26	57.36	59.12	1.76	*85			MUDSTONE	SLTY.DK.GY.LAM.SSD.BRKN TOPS UP.MOSTLY LAMINATED MUDST WITH FEW SILTY LAMINAE.
27	59.12	59.30	0.18	85			MUDSTONE	SLTY.DK.GY.LAM.SSD.BRKN SAME ROCK TYPE AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
27	59.30	61.15	1.85	*85			MUDSTONE	SLTY.DK.GY.LAM.SSD.BRKN TOPS UP. SIMILAR TO ABOVE AND WITH MORE SILTY LAMINAE.
28	61.15	61.56	0.41	82			SANDSTONE	SLTY.FG.M.GY.LAM.SSD.BRKN TOPS UP. 1-10 MM DK GY MUDST. LAMINAE I N SS.
28	61.56	62.37	0.81	*80			MUDSTONE	SLTY.DK.GY.LAM.SSD.BRKN SILTY & VFG SANDY LAM IN MUDST BECOME R ARE WITH DEPTH.GRADUALLY BECOMES LAM. M UDST.
28	62.37	62.55	0.18	81			MUDSTONE	DK.GY.LAM.SSD.BRKN SAME AS ABOVE ROCK TYPE.
28	62.55	63.17	0.62	82			SANDSTONE	SLTY.MG.M.GY.VTHNB.SSD.BRKN MG SS WITH VERY FEW 1-3 CM SILTY LAM.
29	63.17	63.39	0.22	83			SANDSTONE	SLTY.MG.VPR.M.GY.VTHNB.SSD.BRKN SAME ROCK TYPE AS ABOVE.
29	63.39	63.69	0.30	83			SANDSTONE	PBLY.CG.VPR.LT.GY.SLD CG TO GRAIN SAND W RIP UP CLASTS & RARE SILST. MISP "STORM DEPOSIT BED" SUB-RO UNDED RIP UP CLASTS U P TO 3 CM.
29	63.69	64.79	1.10	*85			MUDSTONE	DK.GY.LAM.SSD.BRKN FEW GRANULES & RIP UP CLASTS AT TOP.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
29	64.79	65.24	0.45	83			SANDSTONE	SLTY.FG.M.GY.LAM.SSD.VBRKN FEW QTZ CARB WISPY VEINLETS.DIRTY SANDS TONE WITH SLST LAM. VBRKN TO SHEARED. F EW LISTRIC SURFACES. CONSIDERABLE SSD.
29	65.24	65.41	0.17	82			ROCK LOSS	
30	65.41	65.84	0.43	82			SANDSTONE	SLTY.FG,M.GY,LAM.BRKN SS WITH DK GY SILTY LAMINAE.
30	65.84	66.64	0.80	*80			SANDSTONE	SLTY.FG.M.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE.TOPS UP. SSD.
30	66.64	67.19	0.55	82			SANDSTONE	MG.PR.LT-M.GY.THKB.SLD RARE RIP UP CLASTS UP TO 3 CM.FEW QTZ S TRINGERS.
30	67.19	67.44	0.25	82			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.BIOTR.SLD SS WITH DK GY SILTY LAM. SLICKENSIDES O N BOTTOM P IECE.
31	67.44	67.87	0.43	83			SANDSTONE	MG.PR.M.GY.THKB.SLD RARE RIP UP CLASTS UP TO 3 CM.SLICKENSI DES ON TOP OF PIECE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
31	67.87	68.91	1.04	*85			SANDSTONE	SLTY.VFG.VPR.M-DK.GY.LAM.BIOTR.BRKN INTERLAMINATED SS AND DK GY MUDST BEDS 1 MM TO 15 MM WIDE,OCCASIONALLY VERY BI OTURBATED. SSD.
31	68.91	69.44	0.53	*85			SANDSTONE	SLTY.VFG.VPR.M-DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. SSD.
32	69.44	71.59	2.15	*87			SANDSTONE	SLTY.FG.VPR.M.GY.VTHNB.BIOTR.BRKN VARIES FROM LAMINATED TO THIN- BEDDED S S AND MUDST. LOCALLY VERY BIOTURBATED. TOPS UP. MUDST AND SS BEDS BECOME THICK ER DOWN HOLE. SSD.
33	71.59	71.97	0.38	86			SANDSTONE	SLTY.FG.PR.M.GY.LAM.BIOTR.SLD SILTY BANDED SANDSTONE.TOPS UP. SHARP C ONTACTS BETWEEN BEDS OF DK GY MUDST AND M GY SS. MUDST LAMINAE 2-15 MM THICK. SSD.
33	71.97	73.59	1.62	*86			SANDSTONE	SLTY.VFG.VPR.M-DK.GY.LAM.BIOTR.BRKN LOCALLY MODERATELY BIOTURBATED. TOPS UP . LAMINATEDDK GY MUDST AND M DK GY VFG SS. SOME GRADATIONAL CONTACTS. BANDING IS NOT AS HIGH CONTRAST AS IN THE UNIT ABOVE. SSD.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
34	73.59	75.10	1.51	*88			SILTSTONE	VPR.M-DK.GY.LAM.BIOTR.BRKN SANDY SILTSTONE. SIMILAR TO ROCK TYPE A BOVE BUT MORE SILT THAN SAND WITH DEPTH . TOPS UP. SSD.
34	75.10	75.62	0.52	86			SILTSTONE	VPR.M-DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. SSD.
35	75.62	77.74	2.12	*84			SILTSTONE	VPR.M-DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE.BECOMING MUDDIE R AND DARKER GY WITH DEPTH. SSD.
36	77.74	78.09	0.35	*86			MUDSTONE	SLTY.DK.GY.LAM.SSD.SLD SIMILAR TO ROCK TYPE ABOVE BUT MUDDIER.
36	78.09	79.64	1.55	*75			MUDSTONE	SLTY.DK.GY.LAM.SSD.BRKN SIMILAR TO ROCK TYPE ABOVE. FEW SANDY L AMINAE NEARBOTTOM. MINOR PYRITE BLEBS. TOPS UP.
37	79.64	81.04	1.40	*55			MUDSTONE	SLTY.DK.GY.LAM.SSD.SHRD SHEARED TO VERY SHEARED CORE.SIMILAR RO CK TYPE AS ABOVE.FEW SANDY LAMINAE.
37	81.04	81.34	0.30	*45			MUDSTONE	SLTY.DK.GY.LAM.SSD.SHRD SAME AS ABOVE.
37	81.34	81.42	0.08	53			SANDSTONE	FG.M.GY.SLD MASSIVE SANDSTONE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
38	81.42	81.73	0.31	*62			SANDSTONE	SLTY.FG.VPR.M-DK.GY.LAM.SSD.VBRKN FG M GY SS INTERLAMINATED W DK GY MUDST .
38	81.73	82.86	1.13	*86			SANDSTONE	SLTY.FG.VPR.M-DK.GY.LAM.SSD.BRKN SAME AS ROCK TYPE ABOVE.LAMINATED TO VT HNB.
38	82.86	83.36	0.50	85			MUDSTONE	SLTY.DK.GY.LAM.SSD LESS SILTY WITH DEPTH.
39	83.36	84.06	0.70	84			MUDSTONE	SLTY.DK.GY.LAM.SSD.VBRKN VERY SLIGHTLY SILTY.SIMILAR TO ROCK TYP E ABOVE.
39	84.06	85.16	1.10	*82			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN TOP 10 CM IS VERY BROKEN. FEW LAMINAE A RE VFG SS AND SOME ARE SILTY BUT MOST A RE MUDST. SSD.
40	85.16	86.00	0.84	79			MUDSTONE	SLTY.DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE.TOPS UP. QUITE BIOTURBATEDLOCALLY. SSD.
40	86.00	86.75	0.75	76			MUDSTONE	DK.GY.MAS.BRKN BOTTOM 10 CM V.V. BROKEN.
40	86.75	87.18	0.43	74			MUDSTONE	DK.GY.MAS.BRKN SAME ROCK TYPE AS ABOVE..

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
41	87.18	88.03	0.85	72	04468		MUDSTONE	DK.GY.MAS.VBRKN SIMILAR ROCK TYPE TO ABOVE WITH 1-10 MM PYRITE LAYERS IN BOTTOM 5 CM. THEN COAL SEAM. LOWER 25 CM SAMPLED.
41	88.03	88.26	0.23	71	04469	H	COAL	C-2.VBRKN
41	88.26	88.30	0.04	70	04469	H	COAL	C-3.SHRD
41	88.30	88.41	0.11	70	04469	H	COAL	C-3.SHRD
41	88.41	88.74	0.33	69	04469	H	COAL LOSS	
41	88.74	88.84	0.10	69	04469	H	ROCK LOSS	
41	88.84	88.91	0.07	68	04469	H	COAL LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
41	88.91	88.93	0.02	68	04469	H	MUDSTONE	CARB.DK.GY.SHRD
41	88.93	89.06	0.13	68	04469	H	COAL	C-2.BRKN
41	89.06	89.12	0.06	68	04469	H	MUDSTONE	CARB.DK.GY.SLD SOFT ALMOST SPOIL APPEARANCE.
41	89.12	89.22	0.10	67	04469	H	COAL	C-2.VBRKN SHEARED, LISTRIC.
42	89.22	89.33	0.11	67	04469	H	COAL	C-3.SHRD LISTRIC SURFACES.
42	89.33	89.38	0.05	67	04469	H	MUDSTONE	CARB.DK.GY.VBRKN LISTRIC SURFACES.
42	89.38	89.61	0.23	66	04469	H	COAL	C-2.SHRD
42	89.61	89.66	0.05	66	04469	H	MUDSTONE	CARB.BLK.SLD SOFT.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
42	89.66	89.72	0.06	66	04469	H	COAL	C-2.SLD
42	89.72	89.76	0.04	65	04469	H	MUDSTONE	CARB.DK.GY.VBRKN
42	89.76	89.78	0.02	65	04469	H	COAL	C-6.SLD
42	89.78	89.81	0.03	65	04469	H	COAL	C-2.PWRD SLUSH.
42	89.81	89.83	0.02	65	04469	H	COAL	C-3.PWRD SLUSH.
42	89.83	89.88	0.05	65	04469	H	COAL	C-6.BRKN
42	89.88	89.94	0.06	65	04469	H	COAL	C-3.BRKN
42	89.94	90.00	0.06	65	04469	H	COAL LOSS	
42	90.00	90.22	0.22	64	04469	H	ROCK LOSS	
42	90.22	90.32	0.10	64	04470	H	MUDSTONE	CARB.DK.GY.SLD LOWER 6 CM VERY SOFT.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
42	90.32	90.59	0.27	63	04470	H	COAL	C-2.SHRD VERY SHEARED WITH LISTRIC SURFACES.
42	90.59	90.64	0.05	63	04470	H	COAL	C-5.SHRD LISTRIC.
42	90.64	90.67	0.03	63	04470	H	COAL	C-3.SLD
42	90.67	90.87	0.20	62	04470	H	ROCK LOSS	
42	90.87	90.95	0.08	62	04470	H	MUDSTONE	CARB.DK.GY.SLD
42	90.95	91.01	0.06	62	04470	H	MUDSTONE	CLYY.M.BN.SLD SOFT.
42	91.01	91.08	0.07	61	04470	H	MUDSTONE	CARB.DK.GY.SLD
42	91.08	91.27	0.19	61	04470	H	COAL	C-2.VBRKN SOUPY.
43	91.27	91.36	0.09	60	04470	H	COAL	C-3.BRKN SHEARED SLIGHTLY.
43	91.36	91.73	0.37	60	04470	H	COAL LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
43	91.73	93.07	1.34	57	04471		MUDSTONE	CARB.M.GY.LAM.BRKN LISTRIC SURFACES THROUGHOUT. BECOMES SI LTIER WITH DISTANCE FROM SEAM. QTZ 90 C M DOWN SECTION.UPPER 25 CM SAMPLED.
43	93.07	93.57	0.50	54			MUDSTONE	SLTY.M.GY.LAM.SLD GRADATIONAL FROM ABOVE.
44	93.57	95.54	1.97	*50			MUDSTONE	DK.GY.MAS.VBRKN VBRKN TO SHEARED.SIMILAR TO ROCK TYPE I MMEDIATELY ABOVE THE COAL SEAM.BECOMES LAMINATED IN BOTTOM 10CM. FEW QTZ CARB FILLED FRACTURES.
44	95.54	95.60	0.06	57			SANDSTONE	FG.M.GY.MAS.SLD
45	95.60	96.18	0.58	59			SANDSTONE	FG.M.GY.MAS.BRKN RARE MUDDY DK GY WISPS.FEW DISCONTIUOUS QTZ VEINS.
45	96.18	96.74	0.56	62			SANDSTONE	FG.M.GY.MAS.BRKN SAME ROCK TYPE AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86003

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
45	96.74	97.01	0.27	*65			SANDSTONE	SLTY.VFG.VPR.M.GY.VTHNB.SSD.SLD 1-2 CM MUDST BEDS IN FG SS.
46	97.01	97.27	0.26	65			MUDSTONE	SLTY.DK.GY.LAM.SSD SILTY TO VFG SS LAMINAE IN DK GY MUDST. END OF HOLE DRILLERS MARK, TD = 98.15 M.

* DENOTES MEASURED BCA
NEWPAGE

GULF CANADA CORPORATION

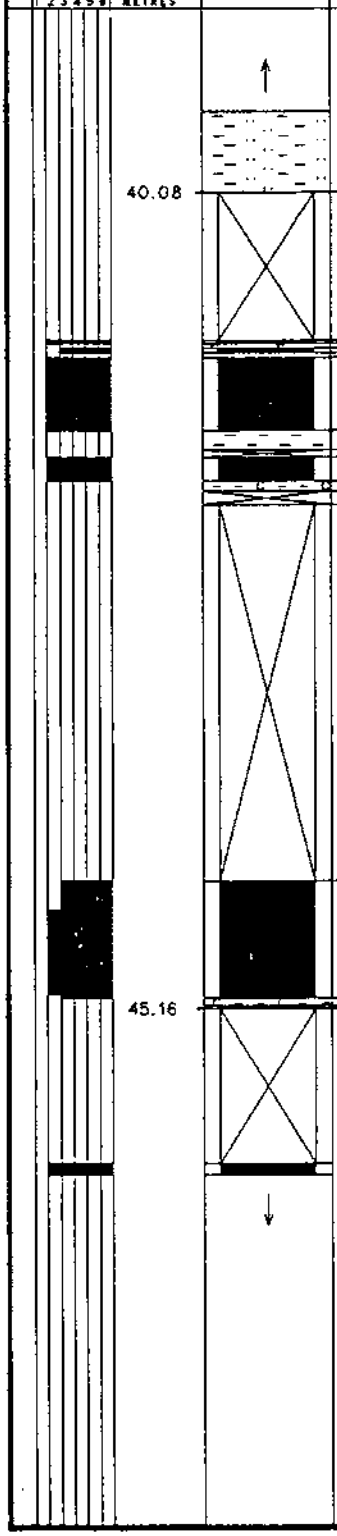
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86003 SEAM : 1 INTERVAL(M) : 40.08 - 45.18 ELEVATION(M) : 1606.6

GEOLOGIST : LOVE SCALE: 1:40 DATE : MAR 09/87 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	40.08			(0.92)												
				0.45												
				(2.34)	32.9	4485	4485	4.83 / 0.45 5.08		—	—	—	—	—	—	—
				0.73												
	45.16															

GULF CANADA CORPORATION

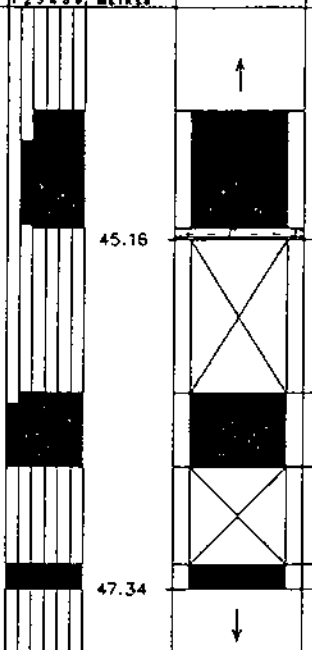
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDHB6003 SEAM : 1 INTERVAL(M) : 45.16 – 47.34 ELEVATION(M) : 1606.6

GEOLOGIST : LOVE SCALE: 1:40 DATE : MAR 09/87 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	45.16			(0.96)	28.4	4468	4468	2.17 / 0.00 2.17		—	—	—	—	—	—	—
				0.46												
				(0.60)												
	47.34			0.15												

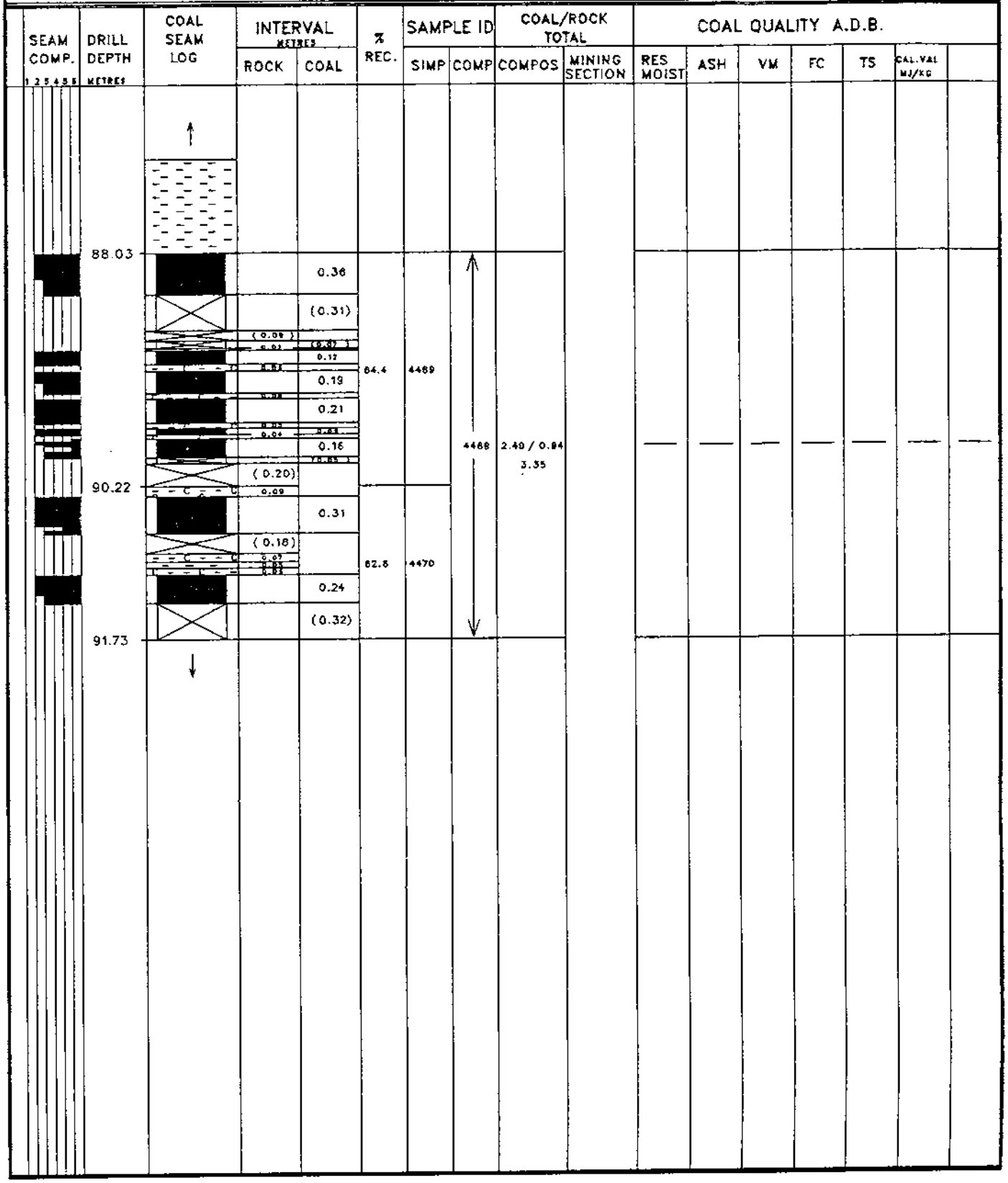
GULF CANADA CORPORATION

COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH86003 SEAM : H INTERVAL(M) : 88.03 - 91.73 ELEVATION(M) : 1606.6

GEOLOGIST : LOVE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :



GULF CANADA CORPORATION
COAL DIVISION
KLAPPAN PROJECT
STRATIGRAPHIC LOG
KPN LR DDH86003

723

GEOLOGIST : LOVE	DATE : MAR 09/87	DRAWING NO. :

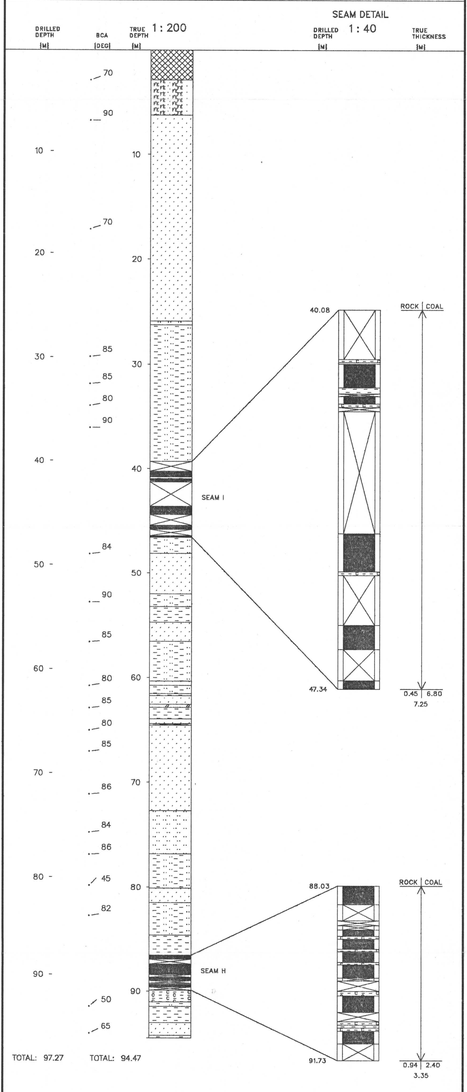
SCALE : 1:200 1:40

NORTHING: 6345041.0 N
EASTING: 505844.3 E

INCLINATION: 75.0°
BEARING: 25.0 °

LITHOLOGIC SYMBOLS

	SANDSTONE		BENTONITE
	SILTSTONE		BRECCIA
	COAL	C C C	CARBONACEOUS
	OVERBURDEN	Q Q Q	QUARTZ
	MUDSTONE,CLAYSTONE	P P P	PYRITE
	TUFF	FE FE FE	FERRUGINOUS
	LIMESTONE	○ ○ ○	CONGLOMERATE
	CORE LOSS	F	FOSSIL BED



Gulf Canada Corporation
Coal Division
Geophysical Log

723

Datasource: KPNLRDDH86003	Province: BC	Northing: 6345040.00	Lat: 571501
Log Date: 86-08-23	Zone: 9	Easting: 505846.00	Long: 1285411
Company: CENTURY	Measuring Point:		Elevation: 1606.6
Geologist: LOVE			

Scale: 1 to 100.0 '

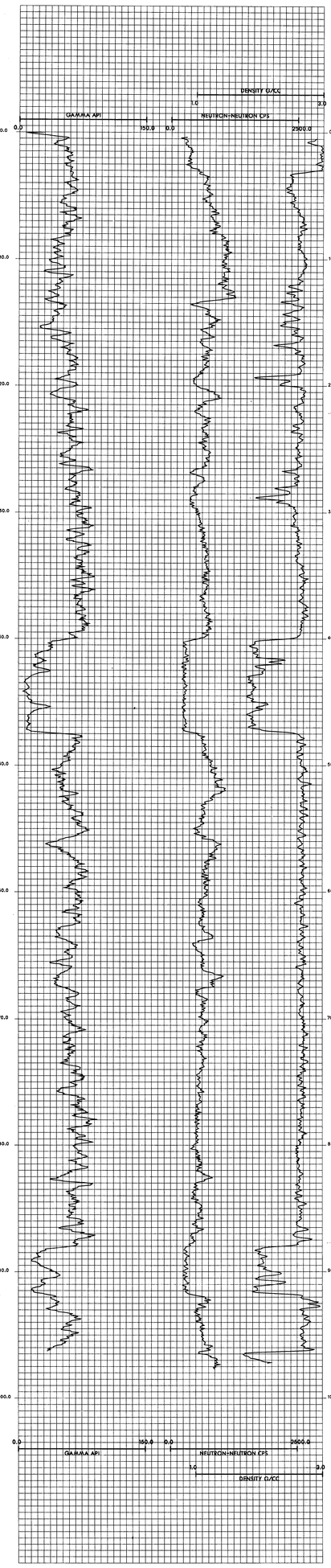
Depth Range: 0.0 to 103.0

True Thickness: NO

Comments:
1. LOGGED THROUGH THE RODS
2.

Logs Plotted:

Description	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9055A	IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE



KPNLRDDH86004

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH86004 DATE - 02/13/87

- H I S T O R Y -

START DATE - 22/08/86
END DATE - 25/08/86

CONTRACTOR - J.T. THOMAS
GEOLOGIST - BARKER
OPERATOR - G.C.C.
SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE. PIEZ AT 30 M.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1632.52
ZONE - 9
NORTHING - 6344684.00
EASTING - 507152.37

LICENCE/LEASE NUMBER -

LATITUDE - 571449
LONGITUDE - 1285253

- O R I E N T A T I O N -

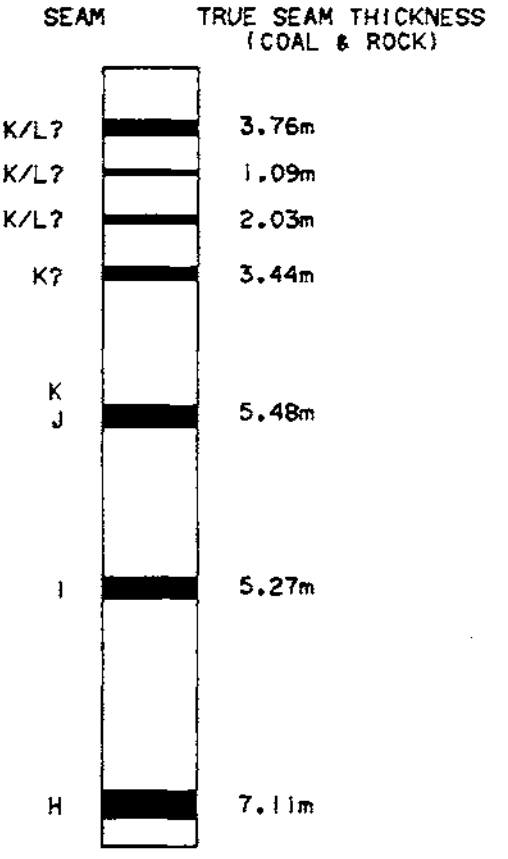
LENGTH - 206.35
INCLINATION - 75.0
AZIMUTH - 350.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ - Y

CASING DEPTH(M) - 16.46
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE



NOTE:

SCHEMATIC PROFILE.
NO THICKNESSES SHOWN
FOR SEAMS CONTAINING
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

FIGURE

MOUNT KLAPPAN ANTHRACITE PROJECT

1986 DIAMOND DRILL HOLES
DDH86004

GULF CANADA CORPORATION
11/03/87
KLAP:[205057]870063004.LOG

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	13.97	13.97	80			OVERBURDEN	CASING
	13.97	16.46	2.49	80		K/L?	COAL LOSS	CASING (LOST COAL).
1	16.46	16.53	0.07	80	04496	K/L?	SILTSTONE	DK.BN.VBRKN
1	16.53	16.57	0.04	80	04496	K/L?	MUDSTONE	CARB.BLK.MAS.BRKN POORLY CONSOLIDATED WITH SOME PEBBLES M IXED IN FROM ABOVE. V. SOFT. MUSHY.
1	16.57	16.66	0.09	80	04497	K/L?	COAL	C-2.BRKN MINOR QTZ WITHIN.
1	16.66	16.72	0.06	80	04497	K/L?	COAL LOSS	
1	16.72	16.89	0.17	80	04497	K/L?	ROCK LOSS	
1	16.89	16.93	0.04	80	04497	K/L?	MUDSTONE	CARB.DK.GY.SLD SOFT. MINOR COALY STRINGERS WITHIN.
1	16.93	17.04	0.11	80	04497	K/L?	COAL	C-3.SHRD LISTRIC SURFACES.
1	17.04	17.14	0.10	80	04497	K/L?	ROCK LOSS	
1	17.14	17.17	0.03	80	04497	K/L?	MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS WITHIN.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
1	17.17	17.19	0.02	80	04497	K/L?	COAL	C-2.SLD
1	17.19	17.20	0.01	80	04497	K/L?	MUDSTONE	CARB.DK.GY.SLD
1	17.20	17.22	0.02	80	04497	K/L?	COAL	C-2.SLD
1	17.22	17.28	0.06	80	04497	K/L?	COAL	C-3.BRKN MUDDY BANDS WITHIN.
1	17.28	17.30	0.02	80	04497	K/L?	MUDSTONE	CARB.DK.GY.SLD SOFT. COALY.
1	17.30	17.47	0.17	80	04497	K/L?	COAL	C-3.VBRKN
1	17.47	17.58	0.11	80	04497	K/L?	COAL	C-4.VBRKN ABUNDANT MUDDY BANDS MIXED WITH VITRINI TE.
1	17.58	17.61	0.03	80	04497	K/L?	COAL	C-3.SLD
1	17.61	17.64	0.03	80	04497	K/L?	MUDSTONE	CARB.DK.GY.SLD COALY.

* DENOTES MEASURED BCA

FORM 4091

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
1	17.64	17.67	0.03	80	04497	K/L?	COAL	C-2.SLD
1	17.67	17.75	0.08	80	04497	K/L?	COAL	C-4.BRKN THIN MUDDY BANDS THROUGHOUT.
1	17.75	17.79	0.04	80	04497	K/L?	COAL	C-3.SLD
1	17.79	17.84	0.05	80	04498		MUDSTONE	CARB.DK.GY.BRKN COALY.
1	17.84	18.36	0.52	80	04498		MUDSTONE	SLTY.M.GY GRADATIONAL FROM BELOW. PYRITE WITHIN.C ORE TWISTEDOFF AT TOP. UPPER 20 CM SAMP LED.
2	18.36	18.49	0.13	80			MUDSTONE	SLTY.DK.GY.MAS.VSHRD V. POORLY CONSOLIDATED DUE TO INTENSE S HEARING.LISTRIC SURFACES WITH TALC.
2	18.49	18.58	0.09	80			CLAYSTONE	SLTY.M.GY.MAS.VSHRD EXTREMELY SOFT CLAY, LIKE PLASTICENE. S OME GRITTY HARDER PIECES WITH LISTRIC S URFACES.
2	18.58	18.67	0.09	80			MUDSTONE	DK.GY.MAS.BIOTR.SLD PYRITE BLEB 1 CM IN DIAMETER. MINOR BIO TURBATION.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
2	18.67	19.43	0.76	80			SILTSTONE	CLYY.M.GY.MAS.VSHRD SOFT, POORLY CONSOLIDATED DUE INTENSE S HEARING.SOME V. MUSHY AREAS FROM GOUGE OR FRACTURE FILLING CLAYS. MINOR QTZ VE INING.
2	19.43	19.62	0.19	80			ROCK LOSS	
2	19.62	20.11	0.49	80			MUDSTONE	BLK.MAS.VBRKN MASSIVE,UNIFORM, 0.12 M OF PLASTICENE-L IKE CLAYEY FRACTURE FILL. POLISHED SLIP PAGE SURFACES.PLANT HASH THROUGHOUT, SO ME COALIFIED.
2	20.11	20.36	0.25	80			ROCK LOSS	
3	20.36	22.39	2.03	80			SILTSTONE	DK.GY.MAS.VSHRD ENTIRE BOX IS MASSIVE, POORLY CONSOLIDA TED DUE TO INTENSE SHEARING. LISTRIC SU RFACES THROUGHOUT. OCCFRACS FILLED BY G RITTY CLAY. FAULT GOUGE?

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
4	22.39	22.45	0.06	80			SILTSTONE	DK.GY.MAS.VSHRD AS ABOVE.
4	22.45	22.53	0.08	80			SILTSTONE	LT.GY.MAS.BIOTR.SLD MOTTLED APPEARANCE OF INFILLED FEEDING TRAILS (?).VERY HARD. "TYNDAL MOTTLES".
4	22.53	22.72	0.19	80			SILTSTONE	DK.GY.MAS.BIOTR.SLD MINOR BIOTURBATION.
4	22.72	22.78	0.06	*80			BENTONITE	LT.GY.MAS.SLD VERY SOFT BENTONITE (?) CLAY. SHARP CONTACTS. SHELLS WHEN WET.
4	22.78	24.08	1.30	82			SILTSTONE	DK.GY.MAS.BIOTR.VBRKN MASSIVE WITH MINOR BIOTURBATION. SOME VERY SOFT POORLY CONSOLIDATED AREAS FROM INTENSE SHEARING. PLANT HASH.
5	24.08	25.04	0.96	*85			MUDSTONE	CARB.DK.GY.MAS.VSHRD 1MM WIDE COALY STRINGERS THROUGHOUT. OCC. VERY SHEARED POORLY CONSOLIDATED AREAS.
5	25.04	25.29	0.25	84			ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
5	25.29	25.47	0.18	84			MUDSTONE	CARB.DK.GY.MAS.VSHRD V. SOFT AND MUSHY.
6	25.47	26.04	0.57	84			MUDSTONE	DK.GY.MAS.VSHRD LESS CARB THAN ABOVE. ONLY ONE 1 MM WIDE COALY STRINGER. ENTIRE INTERVAL EXTREMELY SOFT & SHEARED.
6	26.04	26.29	0.25	83			SILTSTONE	M.GY.MAS.BRKN LISTRIC SURFACES THROUGHOUT. SLIGHTLY COARSER THANABOVE.
6	26.29	27.02	0.73	83			MUDSTONE	CARB.DK.GY.MAS.VSHRD INCREASINGLY CARBONACEOUS DOWNWARD. POWDERED CORE AT BASE.
7	27.02	27.14	0.12	82			MUDSTONE	CARB.DK.GY.SLD THIN COALY BANDS WITHIN.
7	27.14	27.31	0.17	82		K/L?.	COAL LOSS	
7	27.31	27.68	0.37	82		K/L?.	COAL	C-3.PWRD SHEARED AND SOFT.
7	27.68	27.74	0.06	82		K/L?.	COAL	C-6.SLD VITRAIN STRINGERS WITHIN MUDST.
7	27.74	27.88	0.14	82		K/L?.	MUDSTONE	CARB.DK.GY.SLD MINOR COALY STRINGERS WITHIN.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
7	27.88	28.11	0.23	82		K/L?.	ROCK LOSS	
7	28.11	28.18	0.07	81		K/L?.	COAL	C-3.VBRKN
7	28.18	28.21	0.03	81		K/L?.	COAL	C-6.SLD
7	28.21	28.24	0.03	81		K/L?.	COAL	C-3.SLD
7	28.24	28.53	0.29	81			MUDSTONE	CARB.DK.GY COALY STRINGERS WITHIN COALIFIED PLANT FRAGMENTS.
7	28.53	28.57	0.04	81			COAL	C-4.BRKN
7	28.57	28.96	0.39	81			MUDSTONE	CARB.DK.GY.BRKN SOFT IN PLACES. COALY SPECKS. STRINGERS AND PLANT FRAGS WITH IN.
7	28.96	29.01	0.05	81			MUDSTONE	CARB.DK.GY.BRKN AS ABOVE.
7	29.01	29.06	0.05	80			COAL	C-4.VBRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
7	29.06	29.14	0.08	80			MUDSTONE	CARB.DK.GY.BRKN COALY STRINGERS WITHIN.
8	29.14	29.28	0.14	80			SILTSTONE	CLYY.DK.GY.MAS.VSHRD VERY SOFT-PLASTICENE LIKE. LISTRIC SURFACES ON HARDER PIECES.
8	29.28	29.75	0.47	*80			MUDSTONE	CARB.DK.GY.VTHNB.BRKN COALIFIED PLANT MAT'L THROUGHOUT. FAINT BEDDING. OCC 1 MM WIDE COAL STRINGERS.
8	29.75	30.95	1.20	*70			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.XBDG.BRKN VFG SANDY AND SILTY LAMINAE THROUGHOUT. LISTRIC SURFACES.
8	30.95	31.15	0.20	74			ROCK LOSS	
9	31.15	31.29	0.14	75			SILTSTONE	LT.GY.LAM.BIOTR.BRKN DARK WISPY BIOTURBATED LAMINAE THROUGHOUT. MOTTLEDAPPEARANCE.
9	31.29	32.96	1.67	*80			SANDSTONE	SLTY.FG-.VPR.M.GY.LAM.XBDG.SHRD WISPY SILTY LAMS THROUGHOUT. GRAINSIZE INCREASES DOWNWARD. SLICKENSIDES & LISTRIC SURFACES THROUGHOUT. QTZ VEINING TO CORE. CLAY FRACTURE FILL. FG-VFG.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
10	32.96	34.09	1.13	78			SANDSTONE	FG.MOD.LT.GY.MAS.XBDG.VBRKN PREDOMINANTLY MASSIVE. VERY FAINT SILT WISPS. POSSIBLY LARGE SCALE CROSS BEDDI NG. MODERATE QTZ VEINING.
10	34.09	34.64	0.55	76			ROCK LOSS	
10	34.64	35.27	0.63	*75			SANDSTONE	FG.PR.LT.GY.MAS.XBDG.BRKN LITH AS ABOVE.GRAINSIZE INCREASES SLIGH TLY DOWNHARD.
11	35.27	36.62	1.35	*78			SANDSTONE	VPR.LT.GY.VTHNB.XBDG.BRKN SLIGHTLY COARSER GRAINED THAN ABOVE. FA INT SILTY BANDS MORE COMMON. IRREGULAR QTZ VEINS THROUGHOUT. FG-MG.
11	36.62	37.25	0.63	77			MUDSTONE	SLTY.DK.GY.LAM.XBDG.SHRD SHARP UPPER CONTACT. V. SOFT CORE FROM SHEARING. BREAKS WHEN HANDLED.
12	37.25	37.40	0.15	76			MUDSTONE	DK.GY.LAM.VSHRD LESS SILTY THAN ABOVE. LISTRIC SURFACES THROUGHOUT.
12	37.40	37.69	0.29	76			ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
12	37.69	39.07	1.38	*75	04499		MUDSTONE	DK.GY.LAM.VSHRD LITH AS ABOVE. LISTRIC SURFACES AS ABOV E. BREAKS EASILY. ONE 4 CM WIDE QTZ VEI N PARALLEL TO BEDDING.LOWER 13 CM SAMPL ED.
12	39.07	39.26	0.19	76	04499		ROCK LOSS	
12	39.26	39.38	0.12	76	04499		MUDSTONE	CARB.BLK.MAS.VSHRD VERY CARBONACEOUS AND ALMOST POWDERED C ORE.
13	39.38	39.65	0.27	76	04500	K/L?	COAL	C-3.PHRD SHEARED.
13	39.65	39.84	0.19	76	04500	K/L?	COAL LOSS	
13	39.84	39.92	0.08	76	04500	K/L?	MUDSTONE	CARB.DK.GY.BRKN SOFT. COALY.
13	39.92	40.37	0.45	77	04500	K/L?	COAL	C-3.PHRD SHEARED.
13	40.37	40.85	0.48	77	04500	K/L?	COAL LOSS	
13	40.85	40.91	0.06	77	04500	K/L?	ROCK LOSS	

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
13	40.91	41.00	0.09	77	04500	K/L?	MUDSTONE	CARB.DK.GY.VBRKN MINOR COALY STRINGERS WITHIN.
13	41.00	41.07	0.07	77	04500	K/L?	COAL	C-3.VBRKN
13	41.07	41.15	0.08	77	04500	K/L?	MUDSTONE	CARB.DK.GY.VBRKN
13	41.15	41.18	0.03	77	04500	K/L?	COAL	C-3.SLD
13	41.18	41.23	0.05	77	04500	K/L?	MUDSTONE	CARB.DK.GY.BRKN
13	41.23	41.27	0.04	77	04500	K/L?	COAL	C-4.SLD
13	41.27	41.40	0.13	78	04500	K/L?	COAL	C-3.BRKN
13	41.40	41.44	0.04	78	04500	K/L?	MUDSTONE	CARB.DK.GY.BRKN
13	41.44	41.47	0.03	78	04500	K/L?	COAL	C-3.PHRD
13	41.47	41.60	0.13	78	05404		MUDSTONE	CARB.DK.GY.BRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
13	41.60	41.94	0.34	78	05404		SANDSTONE	CLYY.FG.PR.LT-M.GY.LAM.BRKN MUDDY AT TOP OF UNIT.UPPER 12 CM SAMPLE D.
14	41.94	43.68	1.74	79			SANDSTONE	SLTY.FG-.VPR.M.GY.LAM.XBDG.VBRKN WISPY SILT LAMS THROUGHOUT. GRAIN SIZE VARIES FROMFINE TO MEDIUM SAND. CLAY FR ACTURE FILL OR FAULT GOUGE (?) SOME POO RLY CONSOLIDATED AREAS.FG-MG.
14	43.68	45.35	1.67	80			ROCK LOSS	
15	45.35	45.53	0.18	81			SILTSTONE	CLYY.M.GY.MAS.SLD V. SOFT LIKE GRITTY PLASTICENE. FAULT G OUGE?
15	45.53	45.66	0.13	81			SILTSTONE	LT.GY.MAS.BIOTR.SLD V. HARD. MOTTLED TEXTURE FROM BIOTURBAT ION. TYNDAL-LIKE MOTTLES.
15	45.66	47.07	1.41	82			MUDSTONE	CARB.DK.GY.MAS.VSHRD VERY SOFT. EASILY BROKEN CORE. FINE COA LY STRINGERS THROUGHOUT MORE SOLID AREA S. K/L ZONE?

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
16	47.07	47.87	0.80	83			SILTSTONE	CLYY.M.GY.LAM.SHRD POORLY CONSOLIDATED. LISTRIC SURFACES. 2 MM WIDE COALY STRINGER AT TOP. GRAINS IZE INCREASES DOWNWARD.
16	47.87	47.91	0.04	83			CLAYSTONE	LT.GY.MAS.SLD GREY-BROWN IN COLOUR. SOFT.
16	47.91	47.95	0.04	83			SILTSTONE	SSY.M.GY.LAM.SLD
16	47.95	48.08	0.13	83			ROCK LOSS	
16	48.08	48.99	0.91	84			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.XBDG.BRKN WISPY SILT LAMS THROUGHOUT. APPEARS TO BE USUAL K/L INTERSEAM LITHOLOGY.SOME M OTTLING FROM BIOTURBATION.
17	48.99	50.73	1.74	*85			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.XBDG.VBRKN POORLY CONSOLIDATED SILTY SANDST AS ABO VE. K/L INTERSEAM. OCC COALY WISPS 1 MM WIDE. VERY SOFT CLAY FILLED FRACTURES.
17	50.73	50.98	0.25	86			ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
18	50.98	51.25	0.27	87			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.VBRKN LITH AS ABOVE, BUT LESS SAND THAN ABOVE .
18	51.25	52.60	1.35	*88			SILTSTONE	M.GY.VTHNB.BRKN FAINT BEDDING. UNIFORM GRAIN SIZE. OCC PIECES OF COALIFIED PLANT MATERIAL.
18	52.60	53.00	0.40	88			ROCK LOSS	
19	53.00	53.20	0.20	88	05405		MUDSTONE	CARB.DK.GY.VBRKN COALY STRINGERS THROUGHOUT.
19	53.20	53.35	0.15	88	05406	K?	COAL	C-4.BRKN POORLY CONSOLIDATED LISTRIC SURFACES.
19	53.35	53.38	0.03	88	05406	K?	MUDSTONE	CLYY.M.BN.SLD
19	53.38	53.42	0.04	88	05406	K?	COAL	C-4.SLD
19	53.42	53.43	0.01	88	05406	K?	COAL	C-2.SLD
19	53.43	53.45	0.02	88	05406	K?	COAL	C-6.SLD BONE COAL.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
19	53.45	53.47	0.02	88	05406	K?	COAL	C-2.SLD
19	53.47	53.49	0.02	88	05406	K?	COAL	C-6.SLD BONE COAL.
19	53.49	53.87	0.38	88	05406	K?	COAL	C-3.BRKN LISTRIC SURFACES.
19	53.87	53.92	0.05	89	05406	K?	MUDSTONE	SLTY.M.GY.SLD HARD.
19	53.92	54.33	0.41	89	05406	K?	COAL LOSS	
19	54.33	54.37	0.04	89	05406	K?	COAL	C-2.SLD
19	54.37	54.45	0.08	89	05406	K?	COAL	C-3.SLD
19	54.45	54.53	0.08	89	05406	K?	COAL	C-2.VBRKN
19	54.53	54.55	0.02	89	05406	K?	MUDSTONE	CARB.DK.GY.SLD LISTRIC.
19	54.55	54.66	0.11	89	05406	K?	ROCK LOSS	
19	54.66	54.77	0.11	89	05406	K?	COAL LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
19	54.77	55.13	0.36	89	05406	K?	COAL	C-3.VBRKN MINOR MUDST PARTS (1 CM).
20	55.13	55.30	0.17	89	05406	K?	COAL	C-3.VBRKN
20	55.30	55.39	0.09	89	05406	K?	MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS THROUGHOUT.
20	55.39	55.41	0.02	89	05406	K?	COAL	C-3.SLD
20	55.41	55.53	0.12	89	05406	K?	MUDSTONE	CARB.DK.GY.BRKN COALY BAND AND STRINGERS THROUGHOUT.
20	55.53	55.61	0.08	89	05406	K?	ROCK LOSS	
20	55.61	55.70	0.09	89	05406	K?	COAL LOSS	
20	55.70	55.80	0.10	89	05406	K?	COAL	C-2.SLD
20	55.80	56.02	0.22	89	05406	K?	MUDSTONE	CARB.DK.GY.VBRKN VERY COALY & CARBONACEOUS.
20	56.02	56.09	0.07	89	05406	K?	COAL	C-4.BRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
20	56.09	56.15	0.06	89	05406	K?	MUDSTONE	CARB.DK.GY.SLD
20	56.15	56.21	0.06	89	05406	K?	COAL LOSS	
20	56.21	56.51	0.30	89	05406	K?	COAL	C-5.BRKN LISTRIC SURFACES.
20	56.51	56.56	0.05	89	05406	K?	MUDSTONE	CARB.DK.GY.SLD LISTRIC.
20	56.56	56.64	0.08	89	05406	K?	COAL	C-2.VBRKN
20	56.64	56.99	0.35	89	05407		COAL	C-6.BRKN VERY CARB. STRINGERS OF VITRINITE THROU GHOUT.
20	56.99	57.07	0.08	89			MUDSTONE	CARB.DK.GY.SLD COALY.
21	57.07	57.51	0.44	89			MUDSTONE	CARB.BLK.BRKN ABUNDANT THIN BANDS & STRINGERS OF COAL THROUGHOUT.
21	57.51	57.53	0.02	89			COAL	C-2.SLD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
21	57.53	57.60	0.07	89			COAL	C-4.BRKN
21	57.60	58.72	1.12	90			MUDSTONE	CARB.BLK.BRKN ABUNDANT THIN BANDS & STRINGERS THROUGH OUT.VERY CARBONACEOUS.
22	58.72	60.23	1.51	*90			SILTSTONE	SSY.LT.GY.LAM.VBRKN SOME VERY SOFT, POORLY CONSOLIDATED ARE AS DUE TO SHEARING. LISTRIC SURFACES. 0 CC DARK WISPY SILT LAYERS. FINER & MORE UNIFORM DOWNWARD.
23	60.23	60.35	0.12	90			MUDSTONE	CARB.DK.GY.MAS.BRKN 1-2 MM WIDE COAL STRINGERS THROUGHOUT.
23	60.35	60.64	0.29	89			MUDSTONE	CARB.DK.GY.MAS.BRKN 1-10 MM WIDE COAL STRINGERS THROUGHOUT. SOME V. SOFT CLAYEY AREAS.
23	60.64	61.52	0.88	89			MUDSTONE	DK.GY.MAS.BRKN LESS CARB THAN ABOVE. UPPERMOST 38 CM I S V. SOFT-LIKE PLASTICENE. COALIFIED PL ANT HASH THROUGHOUT.
23	61.52	61.85	0.33	89			MUDSTONE	SLTY.M.GY.MAS.BIOTR.BRKN MOTTLED TEXTURE FROM BIOTURBATION (?)

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
24	61.85	62.21	0.36	89			MUDSTONE	DK.GY.MAS.VSHRD MASSIVE, UNIFORM TEXTURE. SOFT & POORLY CONSOLIDATED AT TOP.
24	62.21	63.04	0.83	88			MUDSTONE	DK.GY.MAS.SHRD MASSIVE,UNIFORM MUDST. V. HARD.
24	63.04	63.90	0.86	88			MUDSTONE	DK.GY.MAS.SHRD LITH AS ABOVE. V. HARD. SLICKENSIDES.
25	63.90	65.80	1.90	*87			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE.PREDOMINANTLY MASSIVE. MINOR SILTY BEDS. ONE BIVALVE PIECE.
26	65.80	65.82	0.02	85			CLAYSTONE	DK.MH.BRKN MUSHY TOOTHPASTE-LIKE CLAY. FRACTURE FILL (?)
26	65.82	66.03	0.21	*85			MUDSTONE	CLYY.M.GY.XBDG,SLD GRADES DOWNWARD INTO BENTONITE. IRREGULAR QTZ VEINWITH PYRITE WITHIN THE MUDST TO BENTONITE CONTACT (4 CM).
26	66.03	66.12	0.09	85			BENTONITE	LT.GY.LAM.SLD V LIGHT GREY, V SMOOTH WITH CONCHOIDAL FRACTURE. SHARP LOWER CONTACT.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	66.12	67.40	1.28	84			MUDSTONE	DK.GY.LAM.VBRKN BECOMES MORE MASSIVE DOWNWARD. V. FAINT MUD LAMINAE.
27	67.40	68.69	1.29	84			MUDSTONE	DK.GY.MAS.BRKN V. UNIFORM FEATURELESS MUDST. RARE COALIFIED PLANTMATERIAL.
27	68.69	69.27	0.58	83			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE. RARE PLANT MATERIAL. HARD CORE.
28	69.27	71.23	1.96	82			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE. LARGE NILSSONIA TENUICAULIS PLANT FOSSIL. PLANT MATERIAL INCREASES DOWNWARD.
29	71.23	71.62	0.39	82			MUDSTONE	DK.GY.MAS.SLD DARK FEATURELESS MUDST AS ABOVE.
29	71.62	73.28	1.66	81			MUDSTONE	DK.GY.MAS.SLD LITH AS ABOVE. SLIGHTLY MORE PLANT FOSSILS THAN ABOVE.
30	73.28	74.57	1.29	*80			MUDSTONE	DK.GY.MAS.SLD LITH AS ABOVE. V. FAINT BEDDING IS RARE

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
30	74.57	75.33	0.76	79			MUDSTONE	DK.GY.MAS.SLD LITH AS ABOVE.
31	75.33	77.27	1.94	79			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE.
32	77.27	77.50	0.23	78			MUDSTONE	DK.GY.MAS.BRKN AS ABOVE.
32	77.50	79.10	1.60	78			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE. MUCH SHEARING & QTZ VEIN ING AT BOTTOM OF BOX.
33	79.10	80.08	0.98	77			MUDSTONE	DK.GY.MAS.VBRKN LITH AS ABOVE BUT MORE SHEARING & FEWER PLANTS.
33	80.08	80.63	0.55	76			MUDSTONE	DK.GY.MAS.VBRKN AS ABOVE.
34	80.63	82.81	2.18	76			MUDSTONE	SLTY.DK.GY.MAS.SLD HIGHER SILT CONTENT THAN ABOVE. MUCH LE SS PLANT MATERIAL.
35	82.81	83.20	0.39	75			MUDSTONE	SLTY.DK.GY.MAS.BRKN AS ABOVE. V. RARE PLANT MATERIAL.
35	83.20	84.71	1.51	74			MUDSTONE	SLTY.DK.GY.MAS.BRKN AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
36	84.71	86.33	1.62	74			MUDSTONE	DK.GY.MAS.BRKN AS ABOVE.
36	86.33	86.84	0.51	73			MUDSTONE	DK.GY.MAS.SLD V. RARE PLANT MATERIAL.
37	86.84	88.81	1.97	72			MUDSTONE	CARB.DK.GY.MAS.SLD MUCH FINER & MORE CARB THAN ABOVE. NUME ROUS 2-4 MMWIDE COAL BANDS AT BASE. PLA NT MATERIAL MORE COMMON.
38	88.81	89.09	0.28	72	05408		MUDSTONE	CARB.BRKN VERY CARBONACEOUS, COALY.LOWER 7 CM SAM PLED.
38	89.09	89.27	0.18	71	05408		MUDSTONE	CARB.DK.GY.VBRKN VERY CARBONACEOUS AND COALY.
38	89.27	90.16	0.89	71	05409	K	COAL	C-2.VBRKN PONDERED IN PLACES WITH LISTRIC SURFACE S.
38	90.16	90.18	0.02	71	05409	K	COAL	C-5.SLD
38	90.18	90.71	0.53	71	05409	K	COAL	C-2.BRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
38	90.71	90.74	0.03	71	05409	K	COAL	C-3.SLD
39	90.74	90.95	0.21	71	05409	K	COAL	C-2.BRKN
39	90.95	91.56	0.61	70	05409	K	COAL LOSS	
39	91.56	91.66	0.10	70	05410	K	ROCK LOSS	
39	91.66	91.75	0.09	70	05410	K	MUDSTONE	CARB.DK.GY.SLD
39	91.75	91.87	0.12	*70	05410	K	COAL	C-3.SLD
39	91.87	92.73	0.86	72	05410	K	COAL	C-2.BRKN
39	92.73	92.81	0.08	74	05410	K	ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
39	92.81	92.97	0.16	75	05410	K	COAL	C-2.BRKN
39	92.97	92.99	0.02	75	05410	K	COAL	C-6.SLD
39	92.99	93.49	0.50	76	05410	K	COAL	C-2.BRKN
40	93.49	93.83	0.34	78	05410	K	COAL	C-2.BRKN
40	93.83	93.91	0.08	79	05411	K	MUDSTONE	CARB.DK.GY.SLD
40	93.91	94.14	0.23	*80	05411	K	COAL	C-3.BRKN
40	94.14	94.22	0.08	78	05411	K	MUDSTONE	CARB.DK.GY.SLD
40	94.22	94.25	0.03	78	05411	K	COAL	C-3.SLD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
40	94.25	94.29	0.04	78	05411	K	MUDSTONE	CLYY.M.GY.SLD
40	94.29	94.55	0.26	76	05411	K	COAL	C-3.PWRD
40	94.55	94.70	0.15	74	05411	K	MUDSTONE	CLYY.M.GY.SLD
40	94.70	95.00	0.30	72	05411	K	COAL	C-3.PWRD
40	95.00	95.25	0.25	69	05412		SANDSTONE	SLTY.VFG.LT-M.GY.VBRKN FLOOR APPEARS TO BE THE SS.
41	95.25	95.63	0.38	66			SANDSTONE	PR.M.GY.MAS.VBRKN SHARP CONTACT BTWN BASE OF COAL SEAM AN D START OF SS IN BOX 40. NUMEROUS ANGUL AR PIECES IN SANDY MATRIX AT CONTACT. F AULT (?)
41	95.63	96.91	1.28	57			SANDSTONE	SLTY.VFG.VPR.M.GY.LAM.XBDG.BRKN WISPY SILT LAMINAE THROUGHOUT.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
42	96.91	97.49	0.58	*48			SANDSTONE	SLTY.VFG.VPR.M.GY.LAM.XBDG.VBRKN GRAINSIZE DECREASES DOWNWARD.
42	97.49	97.83	0.34	51			SILTSTONE	M.GY.LAM.VBRKN APPROACHING COASTER LITHOLOGY.
42	97.83	98.44	0.61	*55			SILTSTONE	CLYY.M.GY.LAM.VBRKN START OF COASTER ZONE. UNIFORM LAMINAE PART ALONG BEDDING PLANES.
43	98.44	98.64	0.20	56			SILTSTONE	CLYY.M.GY.LAM.VBRKN COASTER ZONE AS ABOVE.
43	98.64	99.09	0.45	56			ROCK LOSS	
43	99.09	100.40	1.31	*58			SILTSTONE	CLYY.M.GY.LAM.VBRKN AS ABOVE. COASTER ZONE.
44	100.40	100.98	0.58	*60			SILTSTONE	CLYY.M.GY.LAM.VBRKN AS ABOVE. COASTER ZONE.
44	100.98	101.27	0.29	62			ROCK LOSS	
44	101.27	101.74	0.47	64			SILTSTONE	CLYY.M.GY.LAM.VBRKN AS ABOVE. COASTER ZONE.
45	101.74	102.32	0.58	67			SILTSTONE	CLYY.M.GY.LAM.VBRKN AS ABOVE. BUT SLIGHTLY MORE CARB INCREA SING DOWNWARD.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
45	102.32	102.84	0.52	70			ROCK LOSS	
45	102.84	103.19	0.35	73			SILTSTONE	CLYY.M.GY.LAM.VBRKN AS ABOVE, BUT MORE CARB. V. POORLY CONS OLIDATED FAULT ZONE (?) ANGULAR PIECES IN A COARSE COARSER ZONE MATRIX.
46	103.19	103.70	0.51	*75			SILTSTONE	CLYY.M.GY.LAM.VBRKN V. SHEARED CARBONACEOUS COASTER ZONE.
46	103.70	104.39	0.69	75		J	SILTSTONE	CLYY.VBRKN ZONE OF POORLY CONSOLIDATED MUSH (J SEA M ?).
46	104.39	105.01	0.62	75			ROCK LOSS	
46	105.01	105.08	0.07	75			SILTSTONE	CLYY.M.GY.LAM.VBRKN COASTER ZONE.
47	105.08	105.83	0.75	*75			SILTSTONE	CLYY.M.GY.LAM.VBRKN COASTER ZONE WITH FRACTURE ZONE & SANDY MATRIX. END OF COASTER ZONE.
47	105.83	106.28	0.45	*38			SILTSTONE	CLYY.M.GY.VTHNB.VBRKN MUCH LOWER BCA'S ON THIS SIDE OF FRACTU RE ZONE. SANDY AT BOTTOM OF BOX.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
48	106.28	106.81	0.53	43			MUDSTONE	CARB.DK.GY.MAS.VSHRD POORLY CONSOLIDATED & V. SHEARED THROUG HOUT EXCEPT FOR ONE SOLID M GY, VERY HA RD LAYER 13 CM WIDE.
48	106.81	107.25	0.44	47			SANDSTONE	FG.VPR.M.GY.MAS.VBRKN FRACTURE ZONE, LARGE ANGULAR PIECES IN FG SANDY MATRIX. MINOR QTZ VEINING.
48	107.25	108.17	0.92	53			ROCK LOSS	
48	108.17	108.73	0.56	*60			SANDSTONE	FG.MOD.LT.GY.MAS.BRKN MASSIVE UNIFORM SAND WITH ONE SILTY LAM INAE. MANY FRACTURES NEAR PARALLEL TO C ORE. SLIGHTLY COARSER DOWNHARD.
49	108.73	110.65	1.92	69			SANDSTONE	FG-.MOD.LT.GY.MAS.VBRKN PREDOMINANTLY MASSIVE SANDSTONE WITH MI NOR WISPY SILT LAMINAE. HIGH ANGLE FRAC TURING AS ABOVE. FG-MG.
50	110.65	110.91	0.26	77			SANDSTONE	FG-.VPR.LT.GY.MAS.BRKN AS ABOVE. FG-MG.
50	110.91	112.46	1.55	*84			SANDSTONE	SLTY.FG-.LT.GY.LAM.WRMBU.BRKN SILT LAMINAE MORE COMMON THAN ABOVE. MO RIZ WRMBURS1 CM ACROSS. FG-MG.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
51	112.46	113.22	0.76	85			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.WRMBU.VBRKN FINELY LAMINATED THROUGHOUT. MANY HORIZ & VERT WORM BURROWS 1-15 MM IN DIAMETE R. GRAIN SIZE INCREASES DOWNWARD.
51	113.22	114.13	0.91	*85			SANDSTONE	SLTY.VFG.VPR.M.GY.LAM.WRMBU.BRKN LITH AS ABOVE, BUT FINER GRAINED.
52	114.13	116.15	2.02	*80			SILTSTONE	M.GY.LAM.SLD V. FAINT FINE LAMINAE THROUGHOUT.NO BIO TURBATION.
53	116.15	117.99	1.84	81			SILTSTONE	SSY.M.GY.LAM.XBDG.SLD SLIGHTLY HIGHER SAND CONTENT THAN ABOVE
53	117.99	118.01	0.02	81			SILTSTONE	M.GY.MAS.SLD FINER GRAINED & MORE UNIFORM THAN ABOVE
54	118.01	120.03	2.02	81			SILTSTONE	M.GY.VTHNB.SLD V. FAINT BEDDING. FAIRLY UNIFORM GRAINS IZE. 1 1/2 CM QTZ VEIN.
55	120.03	120.18	0.15	82			SILTSTONE	M.GY.LAM.BRKN LITH AS ABOVE BUT FINER LAMINATIONS.
55	120.18	121.98	1.80	*82			SILTSTONE	M.GY.LAM.XBDG.BRKN FINELY LAMINATED SILTST.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
56	121.98	123.20	1.22	81			SILTSTONE	M.GY.LAM.XBDG.SLD LITH AS ABOVE.
56	123.20	124.03	0.83	*81			SILTSTONE	M.GY.LAM.XBDG.SLD LITH AS ABOVE.
57	124.03	126.17	2.14	*80			SILTSTONE	M.GY.LAM.XBDG.SLD LITH AS ABOVE.
58	126.17	126.21	0.04	83			SILTSTONE	M.GY.LAM.XBDG.SLD LITH AS ABOVE BUT SLIGHTLY COARSER.
58	126.21	128.25	2.04	86			SILTSTONE	SSY.M.GY.LAM.XBDG.BRKN AS ABOVE.
59	128.25	129.00	0.75	*90			SILTSTONE	SSY.M.GY.LAM.XBDG.SLD FINE LAMINAE THROUGHOUT. ABUNDANT CROSS BEDDING.
59	129.00	130.29	1.29	89			SILTSTONE	SSY.M.GY.LAM.XBDG.SLD LITH AS ABOVE. ABUNDANT CROSS BEDDING.
60	130.29	131.73	1.44	88			SILTSTONE	SSY.M.GY.LAM.XBDG.SLD LITH AS ABOVE BUT SLIGHTLY COARSER DOWN HARD.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
60	131.73	132.29	0.56	87			SANDSTONE	SLTY.FG.VPR.LT.GY.LAM.XBDG.SLD FINELY LAMINATED WITH MUCH XBDG. LOOKS LIKE IT WOULD GRADE DOWN INTO TUFFITE A BOVE I SEAM.
61	132.29	132.55	0.26	86			SANDSTONE	SLTY.FG.VPR.LT.GY.LAM.XBDG.VBRKN AS ABOVE. GRADES DOWN INTO CLAYST BELOW
61	132.55	132.90	0.35	86			ROCK LOSS	
61	132.90	133.55	0.65	86			CLAYSTONE	LT.GY.MAS.BRKN V. FINE CLAYSTONE. SWIRLED TEXTURE. SLU MPED (?)
61	133.55	133.58	0.03	85			BENTONITE	LT.GY.MAS.BRKN SOFT. VERY UNIFORM.
61	133.58	133.62	0.04	85			CLAYSTONE	LT.GY.MAS.BRKN HARDER. SOME SILT MIXED IN.
61	133.62	133.67	0.05	85			BENTONITE	LT.GY.MAS.BRKN SOFT. LIGHTER GREY DOWNWARD.
61	133.67	134.28	0.61	*85			CLAYSTONE	LT.GY.LAM.SLD V. FINELY LAM'D. RHYTHMITES. GRADED BED DING. TOPS UP. BREAKS ALONG BEDDING PLA NES, BUT IS NOT FISSILE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
62	134.28	135.34	1.06	84	05413		SILTSTONE	CLYY.M.GY.LAM.SLD GRADES FROM RHYTHMIC CLAYSTONE AS ABOVE , DOWN TO COARSER LAM'D SILTST. LOWER 1 5 CM SAMPLED.
62	135.34	135.44	0.10	84	05413		MUDSTONE	CARB.DK.GY.SLD ANKERITE VEINING AT BASE. SHARP CONTACT WITH COAL BELOW.
62	135.44	135.57	0.13	84	05414 I		COAL	C-2.BRKN
62	135.57	135.61	0.04	84	05414 I		MUDSTONE	CARB.DK.GY.BRKN PLANT FRAGS WITHIN.
62	135.61	135.70	0.09	84	05414 I		COAL	C-2.SLD
62	135.70	135.72	0.02	84	05414 I		MUDSTONE	CARB.DK.GY.SLD
62	135.72	135.88	0.16	84	05414 I		COAL LOSS	
62	135.88	136.27	0.39	84	05414 I		COAL	C-2.BRKN
62	136.27	136.31	0.04	84	05414 I		COAL	C-6.SLD BONE COAL.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
62	136.31	136.42	0.11	83	05414	I	COAL	C-2.BRKN
63	136.42	136.55	0.13	83	05414	I	COAL	C-3.BRKN
63	136.55	137.09	0.54	83	05414	I	COAL	C-2.BRKN
63	137.09	137.12	0.03	83	05414	I	COAL	C-2.SLD
63	137.12	137.26	0.14	83	05415	I	MUDSTONE	SLTY.M-DK.GY.SLD
63	137.26	137.41	0.15	83	05415	I	COAL	C-2.SLD
63	137.41	137.47	0.06	83	05415	I	SILTSTONE	CLYY.M.GY.SLD
63	137.47	137.53	0.06	83	05415	I	ROCK LOSS	
63	137.53	137.86	0.33	83	05415	1	COAL LOSS	
63	137.86	138.39	0.53	82	05415	I	COAL	C-1.BRKN PARTIALLY SHEARED.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
63	138.39	138.72	0.33	82	05415	I	COAL	C-2.PWRD SHEARED. DIFFICULTY TO DETERMINE GRADE.
64	138.72	138.80	0.08	82	05415	I	COAL	C-2.BRKN
64	138.80	138.82	0.02	82	05415	I	MUDSTONE	CARB.DK.GY.BRKN
64	138.82	138.96	0.14	82	05416	I	COAL	C-2.YBRKN
64	138.96	140.76	1.80	81	05416	I	COAL	C-1.BRKN C-1 OR C-2 IN QUALITY.
65	140.76	142.67	1.91	*80	05417		MUDSTONE	SLTY.DK.GY.LAM.YBRKN 1 MM WIDE COAL STRINGERS AT TOP. SILT L AMINAE BECOME COMMON AT BASE.POLISHED S LIPPAGE SURFACES. SLIGHTLY COARSER DOWN HARD. UPPER 25CM SAMPLED.
66	142.67	143.57	0.90	80			SANDSTONE	SLTY.FG-.M.GY.YTHNB.YBRKN FRACTURE ZONE : BRECCIATION OF SANDSTON E. FG-MG.
66	143.57	144.11	0.54	80			ROCK LOSS	

* DENOTES MEASURED BCA

FORM 4091

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
66	144.11	144.48	0.37	80			SANDSTONE	SLTY.FG-.VPR.M.GY.VTHNB.VBRKN LITH AS ABOVE. FG-MG.
67	144.48	144.58	0.10	80			SANDSTONE	MG.VPR.M.GY.MAS.PWRD TOTALLY PULVERIZED CORE.
67	144.58	145.63	1.05	80			ROCK LOSS	
67	145.63	146.66	1.03	80			SANDSTONE	SLTY.MG.VPR.M.GY.LAM.VBRKN FRAC. ZONE OF MIXED SANDSTONE AND SILTY BANDED SAND PIECES IN SILTY MATRIX.
67	146.66	147.29	0.63	80			SILTSTONE	M.GY.LAM.BRKN FINELY LAMINATED.
68	147.29	147.41	0.12	80			SILTSTONE	DK.GY.MAS.VBRKN SILTSTONE BRECCIA.
68	147.41	147.77	0.36	80			ROCK LOSS	
68	147.77	149.68	1.91	80			MUDSTONE	DK.GY.LAM.VBRKN FAINT SILTY LAMINAE THROUGHOUT. BECOMES MORE MASSIVE DOWNWARD. SLICKENSIDES.
69	149.68	150.73	1.05	80			MUDSTONE	DK.GY.MAS.VBRKN FEATURELESS. POLISHED SLIPPAGE SURFACES

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
69	150.73	150.82	0.09	80			ROCK LOSS	
69	150.82	151.44	0.62	80			SILTSTONE	DK.GY.LAM.NRMBU.BRKN LAMINAE GRADE FROM FINE DARK MUD TO FG SS.
70	151.44	153.53	2.09	*80			MUDSTONE	DK.GY.LAM OCC FINE WISPY SILT LAMS. MORE MASSIVE DOWNWARD.
70	153.53	153.87	0.34	80			ROCK LOSS	
71	153.87	155.82	1.95	80			SILTSTONE	DK.GY.LAM.SSD.BRKN FINELY LAM'D SILTST AS ABOVE. SLIGHTLY COARSER DO WNWARD.
72	155.82	156.85	1.03	80			SANDSTONE	SLTY.FG.VPR.DK.GY.LAM.BIOTR.BRKN COARSER THAN ABOVE.FINE SILT LAMINAE TH ROUGHOUT FGSS. CORE LOSS AT BOTTOM OF B OX?
73	156.85	157.13	0.28	80			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.XBDG.VBRKN SILT LAMINAE THROUGHOUT.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
73	157.13	158.72	1.59	80			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.WRMBU.SLD INTERLAMINATED SILT AND SAND. TYPICAL H -1 INTERSEAM LITHOLOGY. SILTY BANDED SA ND AT BASE. 3 CM WIDE STORMY LAYER.
74	158.72	160.10	1.38	80			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.WRMBU.SLD LITH AS ABOVE WITH SILTY BANDED SS THRO UGHOUT. LARGE VERTICAL WORM BURROWS 1 1 /2 CM IN DIAMETER THROUGHOUT.
74	160.10	160.75	0.65	80			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.WRMBU.SLD LITH AS ABOVE.
75	160.75	162.58	1.83	80			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.WRMBU.SLD LITH AS ABOVE.
76	162.58	163.01	0.43	80			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.WRMBU.VBRKN LITH AS ABOVE. FRACTURE ZONE VERY SHEAR ED IN PLACES. BRECCIA.
76	163.01	164.04	1.03	80			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.WRMBU.VBRKN LITHOLOGY & BRECCIA ZONE AS ABOVE.
77	164.04	165.82	1.78	80			SANDSTONE	SLTY.FG-.VPR.M.GY.LAM.WRMBU.VBRKN LITHOLOGY & FRAC ZONE AS ABOVE. SILTY B ANDED SANDSTONE AT BASE. WHITE TOOTHPAS TE-LIKE FRACTURE FILL.MUCH QTZ VEINING. SSD. FG-MG.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
77	165.82	166.06	0.24	80			ROCK LOSS	
78	166.06	168.12	2.06	80			SANDSTONE	SLTY.FG-.M.GY.LAM.WRMBU.BRKN SILTY BANDED SANDSTONE THROUGHOUT. LARG E ZONE OF MEDIUM GRAINED SS. FG-MG.
79	168.12	169.02	0.90	80			SANDSTONE	SLTY.FG-.M.GY.LAM.WRMBU.BRKN LITH AS ABOVE-SILTY BANDED SAND AS ABOV E. FG-MG.
79	169.02	169.11	0.09	80			ROCK LOSS	
79	169.11	170.24	1.13	*80			SANDSTONE	SLTY.FG-.M.GY.LAM.WRMBU.BRKN LITH AS ABOVE-SILTY BANDED SAND AS ABOV E. FG-MG.
80	170.24	170.79	0.55	81			SILTSTONE	SSY.DK.GY.LAM.BIOTR.SLD FINELY LAM'D. SILT CONTENT & LAMINATION S DECREASE DOWNWARD.
80	170.79	171.68	0.89	82			MUDSTONE	DK.GY.MAS.SLD SLICKENSIDES WITH TALC. PYRITE BLEBS.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
80	171.68	172.33	0.65	82			MUDSTONE	DK.GY.MAS.SLD AS ABOVE. MINOR COALIFIED PLANT MATERIAL.
81	172.33	174.39	2.06	84			MUDSTONE	DK.GY.MAS.VBRKN LITH AS ABOVE. RARE COALIFIED PLANT MATERIAL.
81	174.39	174.87	0.48	85			ROCK LOSS	
82	174.87	175.20	0.33	85			MUDSTONE	DK.GY.MAS.VBRKN DARK FEATURELESS MUDST.
82	175.20	176.67	1.47	86			MUDSTONE	DK.GY.MAS.BRKN AS ABOVE. PLANT FOSSILS THROUGHOUT.
83	176.67	178.15	1.48	88			MUDSTONE	DK.GY.MAS
83	178.15	178.63	0.48	89			MUDSTONE	DK.GY.MAS.BRKN AS ABOVE WITH 1 BIVALVE, PYRITE BLEB, & PLANT HASH.
84	178.63	180.76	2.13	*90			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE. FAINT LAMINAE AT TOP OF BOX. MASSIVE OVERALL. SLICKENSIDES WITH TALC.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
85	180.76	181.24	0.48	87			MUDSTONE	DK.GY.MAS.SLD MASSIVE FEATURELESS MUDST. AS ABOVE.MINOR PLANT HASH.
85	181.24	182.76	1.52	84			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE WITH PYRITE BLEBS. MINOR QTZ VEINS. NUMEROUS PLANT FOSSILS THROUGHOUT.
86	182.76	184.25	1.49	*80			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE WITH MINOR COALIFIED PLANT FOSSILS. FAINT LIGHTER GREY BEDS AT TOP.
86	184.25	184.74	0.49	79			MUDSTONE	DK.GY.MAS.SHRD LITH AS ABOVE WITH MUCH SHEARING ALONG HIGH ANGLE FRACTURES. NUMEROUS PLANT FOSSILS THROUGHOUT.
87	184.74	186.63	1.89	78			MUDSTONE	DK.GY.MAS.SHRD LITH AS ABOVE. POLISHED SLIPPAGE SURFACES THROUGHOUT. MINOR SILTY LAMINAE AT BASE.
88	186.63	186.80	0.17	78			MUDSTONE	DK.GY.MAS.BRKN MASSIVE DARK MUDST AS ABOVE.
88	186.80	186.95	0.15	77			ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
88	186.95	188.78	1.83	77			MUDSTONE	DK.GY.MAS.VBRKN AS ABOVE WITH POLISHED SLIPPAGE SURFACE S & QTZ VEINING. MINOR COALY STRINGERS 1 MM WIDE.
89	188.78	189.95	1.17	76			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE. SLICKENSIDES WITH TALC & CHLORITE.
89	189.95	190.69	0.74	75			MUDSTONE	DK.GY.MAS.SHRD LITH AS ABOVE. QTZ VEINING & SLICKENSID ES.
90	190.69	191.50	0.81	74	05418		MUDSTONE	CARB.M-DK.GY.MAS.BRKN BECOMES VERY CARB AND COALY NEAR BASE O F UNIT.LOWER 25 CM SAMPLED.
90	191.50	191.64	0.14	74	05419	H	COAL	C-4.BRKN
90	191.64	192.32	0.68	74	05419	H	COAL	C-3.BRKN
90	192.32	192.38	0.06	73	05419	H	COAL	C-2.SLD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
90	192.38	192.54	0.16	73	05419	H	COAL	C-3.BRKN
91	192.54	192.59	0.05	73	05419	H	COAL	C-3.BRKN
91	192.59	192.69	0.10	73	05419	H	COAL LOSS	
91	192.69	192.78	0.09	73	05419	H	ROCK LOSS	
91	192.78	192.90	0.12	73	05419	H	MUDSTONE	SHRD LISTRIC SURFACES.
91	192.90	192.97	0.07	73	05419	H	COAL	C-3.BRKN
91	192.97	193.31	0.34	73	05419	H	COAL	C-2.BRKN
91	193.31	193.48	0.17	73	05419	H	COAL	C-3.BRKN HIGHLY SHEARED.
91	193.48	193.52	0.04	73	05419	H	MUDSTONE	CARB.DK.GY.SLD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
91	193.52	193.61	0.09	73	05419	H	COAL	C-3.SHRD
91	193.61	193.65	0.04	72	05419	H	COAL	C-6.SLD BONE COAL.
91	193.65	193.86	0.21	72	05419	H	COAL	C-3.VBRKN
91	193.86	194.00	0.14	72	05419	H	COAL	C-4.BRKN
91	194.00	194.13	0.13	72	05419	H	ROCK LOSS	
91	194.13	194.18	0.05	72	05419	H	MUDSTONE	CLYY.M.GY.SLD
91	194.18	194.30	0.12	72	05419	H	COAL	C-3.BRKN
91	194.30	194.40	0.10	72	05419	H	MUDSTONE	CLYY.M.GY.SLD
91	194.40	194.61	0.21	72	05419	H	COAL	C-3.BRKN
92	194.61	194.85	0.24	72	05419	H	COAL	C-3.VBRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
92	194.85	194.89	0.04	72	05419	H	MUDSTONE	CARB.DK.GY.VBRKN
92	194.89	195.11	0.22	71	05419	H	COAL	C-3.SHRD LISTRIC SURFACES.
92	195.11	195.21	0.10	71	05419	H	ROCK LOSS	
92	195.21	195.31	0.10	71	05419	H	MUDSTONE	CARB.DK.GY.SHRD COALY.
92	195.31	195.60	0.29	71	05419	H	COAL LOSS	
92	195.60	195.77	0.17	71	05419	H	COAL	C-3.SHRD LISTRIC SURFACES.
92	195.77	195.79	0.02	71	05419	H	MUDSTONE	CARB.M-DK.GY.BRKN
92	195.79	195.88	0.09	71	05419	H	COAL	C-3.BRKN
92	195.88	195.95	0.07	71	05419	H	MUDSTONE	CLYY.DK.GY ABUNDANT LISTRIC SURFACES.
92	195.95	196.41	0.46	71	05419	H	COAL	C-3.VBRKN MUDDY BANDS WITHIN.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
92	196.41	196.63	0.22	70	05419	H	MUDSTONE	CARB.DK.GY.VBRKN VERY SHEARED & LISTRIC.
93	196.63	197.18	0.55	70	05420	H	COAL	C-3.BRKN CARB MUDST & QTZ SWIRLED THROUGHOUT ZON E.
93	197.18	197.41	0.23	70	05420	H	COAL	C-2.BRKN
93	197.41	197.59	0.18	70	05420	H	COAL	C-3.BRKN
93	197.59	197.79	0.20	69	05420	H	COAL	C-2.BRKN
93	197.79	198.03	0.24	69	05420	H	COAL	C-3.BRKN
93	198.03	198.37	0.34	69	05420	H	COAL LOSS	
93	198.37	198.44	0.07	69	05420	H	ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
93	198.44	198.51	0.07	69	05420	H	MUDSTONE	CARB.M-DK.GY.BRKN
93	198.51	198.64	0.13	69	05420	H	COAL	C-2.BRKN
93	198.64	198.67	0.03	69	05420	H	COAL	C-3.BRKN
94	198.67	198.79	0.12	69	05420	H	COAL LOSS	
94	198.79	198.84	0.05	69	05420	H	COAL	C-2.SLD
94	198.84	199.00	0.16	69	05420	H	COAL	C-3.VBRKN
94	199.00	199.56	0.56	68	05421		MUDSTONE	CARB.DK.GY COALY STRINGERS AND PYRITE WITHIN.
94	199.56	199.61	0.05	68			COAL	C-3.SLD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: ER DATA SOURCE: DDHB6004

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
94	199.61	200.71	1.10	68			MUDSTONE	SLTY.M.GY.BRKN CARB NEAR TOP,BECOMING SILTY NEAR BASE.
94	200.71	200.83	0.12	67			SANDSTONE	FG.LT.GY.SLD
95	200.83	200.95	0.12	67			SANDSTONE	FG.MOD.LT.GY.MAS.VBRKN POLISHED SLIPPAGE SURFACES.
95	200.95	202.73	1.78	66			SANDSTONE	MG.MOD.LT.GY.MAS.VBRKN INTENSE QTZ VEINING & FRACTURING. FG.
96	202.73	202.92	0.19	66			SANDSTONE	MG.MOD.LT.GY.MAS.VBRKN AS ABOVE. FG.
96	202.92	204.41	1.49	*65			SANDSTONE	FG.PR.LT.GY.THNB.VBRKN MINOR SILT LAMINAE. MUDSTONE RIPUP CLAS TS 1 CM IN DIAMETER. MG.
97	204.41	204.61	0.20	47			SANDSTONE	FG.PR.LT.GY.MAS.SLD AS ABOVE. MUDST RIPUP CLASTS. SHARP LOW ER CONTACT.MG.
97	204.61	205.11	0.50	*40			MUDSTONE	SLTY.DK.GY.LAM.BRKN SILTY LAMINAE THROUGHOUT. 206.35 T.D. D RILLER'S MARKER.

* DENOTES MEASURED BCA
NEWPAGE

FORM 4001

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH86004 SEAM : K/L? INTERVAL(M) : 13.97 - 17.79 ELEVATION(M) : 1632.5

GEOLOGIST : BARKER SCALE: 1:40 DATE : MAR 12/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	13.97			(2.45)	0.0	99999	99999	2.45 / 0.00								
								2.45								
	16.46		0.81		100.0	4496	4496	0.00/ 0.11								
	16.57			0.01												
			(0.17)					0.11								
				0.11												
			(0.15)													
					73.0	4497	4497	0.81/ 0.39								
				0.31				1.20								
	17.79															

GULF CANADA CORPORATION

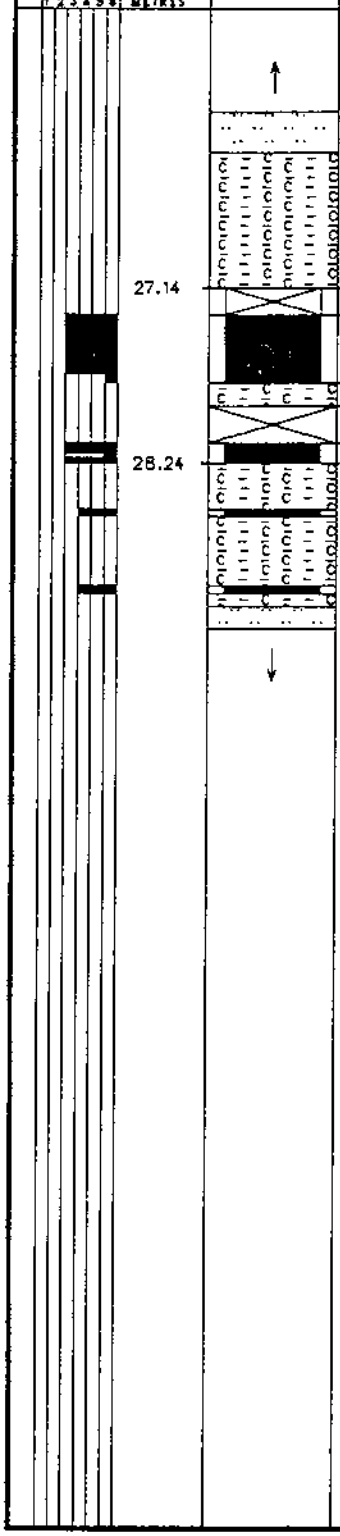
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86004 SEAM : K/L? INTERVAL(M) : 27.14 – 28.24 ELEVATION(M) : 1632.5

GEOLOGIST : BARKER SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	27.14			(0.17)											
				0.43	83.7	99998	99999	0.72 / 0.37		—	—	—	—	—	—
			0.14					1.09							
				(0.23)											
	28.24			0.13											

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86004 SEAM : K/L? INTERVAL(M) : 39.38 – 41.47 ELEVATION(M) : 1632.5

GEOLOGIST : BARKER SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	39.38			0.26												
				(0.19)												
			0.05													
				0.44												
				(0.47)	85.0	4500	4500	1.65 / 0.39 2.04		—	—	—	—	—	—	—
			(0.05) 0.09													
				0.07												
			0.03	0.03												
			0.05													
				0.17												
	41.47		0.04	0.03												

GULF CANADA CORPORATION

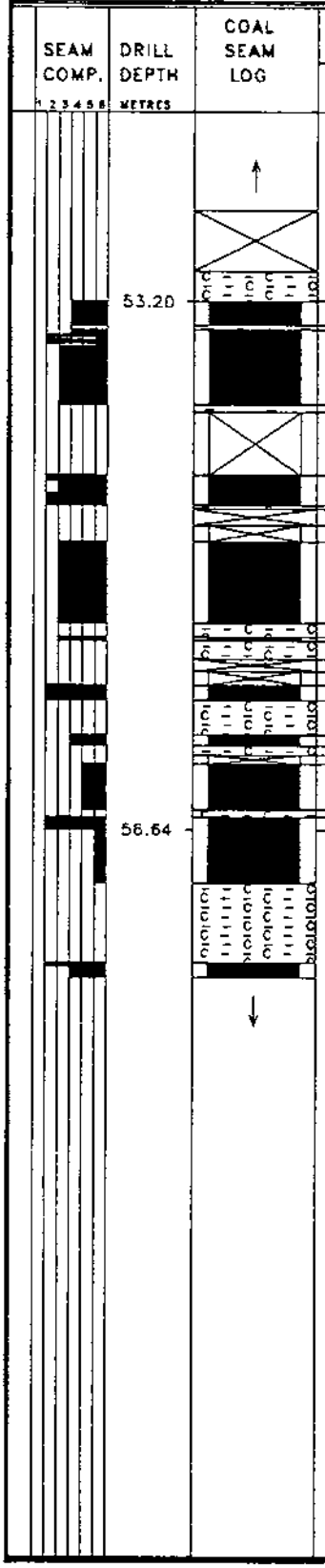
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86004 SEAM : K? INTERVAL(M) : 53.20 - 56.64 ELEVATION(M) : 1632.5

GEOLOGIST : BARKER SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :



SAMPLE ID		COAL/ROCK TOTAL		COAL QUALITY A.D.B.						
SIMP	COMP	COMPOS	MINING SECTION	RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
5408	5406	2.81 / 0.83 3.44		—	—	—	—	—	—	—

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86004 SEAM : K INTERVAL(M) : 89.27 – 95.00 ELEVATION(M) : 1632.5

GEOLOGIST : BARKER SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	89.27			1.59	73.4	5409	1	2.16 / 0.00 2.16		0.89	19.40	7.47	72.24	0.49	27.46	
				(0.57)												
	91.56		(0.09) 0.09													
				0.93	92.2	5410	2	1.92 / 0.26 2.18		0.98	21.39	7.28	70.35	0.50	26.75	
			(0.09)													
				0.99												
	93.83		0.08													
				0.23												
			0.08 0.01	0.03												
				0.25	100.0	5411	3	0.79 / 0.34 1.13		1.11	51.46	8.42	39.01	0.33	14.29	
			0.14													
				0.29												
	95.00															

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86004 SEAM : 1 INTERVAL(M) : 135.44 - 140.76 ELEVATION(M) : 1632.5

GEOLOGIST : BARKER SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :

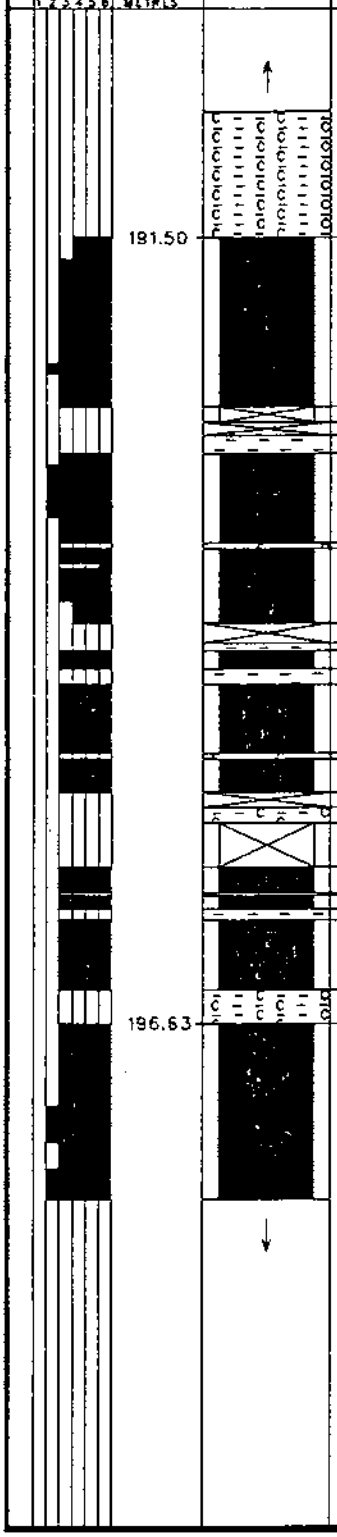
SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	135.44			0.13												
			0.06	0.06												
			0.03	(0.16)												
				1.23	90.5	5414	4	1.61 / 0.06 1.67		1.27	21.54	6.62	70.57	0.42	26.92	—
	137.12		0.16													
				0.18												
				(0.33)												
				0.93	77.0	5415	5	1.41 / 0.28 1.69		1.31	32.34	7.31	59.04	0.38	21.71	—
	138.82		0.82													
				1.92	100.0	5416	6	1.82 / 0.00 1.92		1.02	11.30	6.81	80.87	0.48	30.80	—
	140.76															

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH86004 SEAM : H INTERVAL(M) : 181.50 – 196.63 ELEVATION(M) : 1632.5

GEOLOGIST : BARKER SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	181.50			1.05											
				(0.10)											
			(0.09)												
			0.12												
				0.55											
			0.04												
				0.46											
			(0.12)		86.2	5419	7	3.86/ 1.03		0.81	43.85	8.27	47.27	0.41	17.52
			0.88					4.88							
				0.11											
			0.10												
				0.43											
			0.04												
				0.21											
			(0.10)												
			0.10												
				(0.27)											
				0.16											
			0.05	0.09											
			0.02												
				0.43											
			0.21												
	196.63														

GULF CANADA CORPORATION

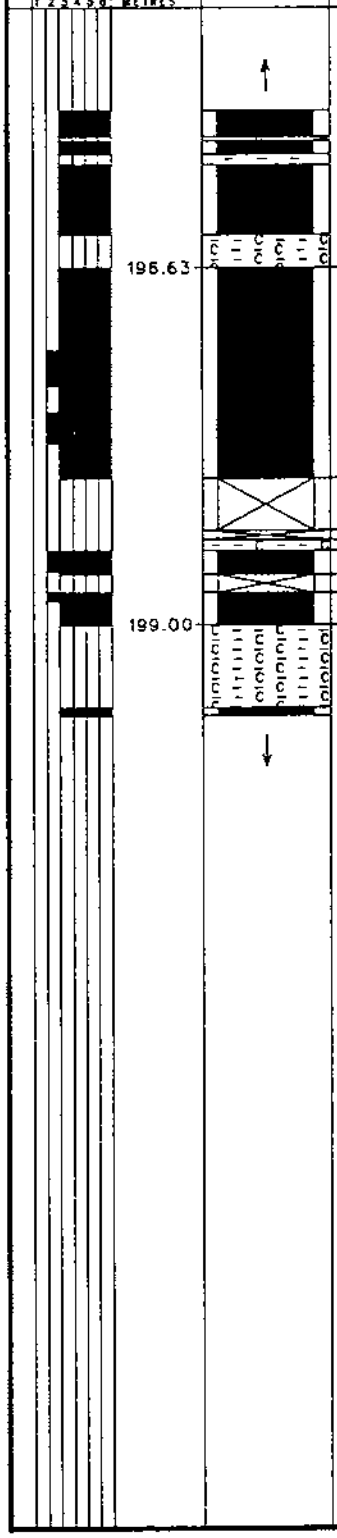
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86004 SEAM : H INTERVAL(M) : 196.63 – 199.00 ELEVATION(M) : 1532.5

GEOLOGIST : BARKER SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :



SEAM COMP.	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
1 2 3 4 5 6																
	196.63			1.31	77.7	5420	8	2.09 / 0.13 2.22		0.81	30.69	8.67	59.83	0.42	22.46	—
				(0.32)												
				0.15												
				(0.11)												
				0.20												
	199.00															

GULF CANADA CORPORATION
COAL DIVISION
KLAPPAN PROJECT
STRATIGRAPHIC LOG
KPN LR DDH86004

723

GEOLOGIST : BARKER | DATE : MAR 09/87 | DRAWING NO. :

SCALE : 1:200 1:40

NORTHING: 6344684.0 N
EASTING: 507165.5 E

INCLINATION: 75.9°
BEARING: 350.6°

LITHOLOGIC SYMBOLS

	SANDSTONE		BENTONITE
	SILTSTONE	S S S	BRECCIA
	COAL	C C C	CARBONACEOUS
	OVERBURDEN	Q. Q. Q.	QUARTZ
	MUDSTONE/CLAYSTONE	P. P. P.	PYRITE
	TUFF	FE. FE. FE.	FERRUGINOUS
	LIMESTONE		CONGLOMERATE
	CORE LOSS	F	FOSSIL BED

SEAM DETAIL

DRILLED DEPTH (m)	ROA (mm)	TRUE DEPTH (m)	1 : 200	DRILLED DEPTH (m)	1 : 40	TRUE THICKNESS (m)
10	80	10	SEAM K/L?	13.97 / 17.79		ROCK | COAL 0.50 | 3.35 3.76
20	80	20		27.16 / 28.24		ROCK | COAL 0.37 | 0.72 1.09
30	75	30	SEAM K/L?	39.38 / 41.47		ROCK | COAL 0.39 | 1.65 2.04
40	75	40	SEAM K/L?	53.20 / 56.64		ROCK | COAL 0.83 | 2.61 3.44
50	85	50		89.27 / 95.03		ROCK | COAL 0.60 | 4.87 5.47
60	88	60	SEAM K.	135.44 / 140.38		ROCK | COAL 0.34 | 4.93 5.27
70	90	70		191.80 / 199.50		ROCK | COAL 1.16 | 5.95 7.10
80	67	80				
90	80	90	SEAM K			
100	70	100				
110	80	110	SEAM I			
120	48	120				
130	60	130				
140	75	140				
150	38	150				
160	84	160				
170	85	170				
180	82	180	SEAM H			
190	81	190				
200	90	200				
	80					
	90					
	80					
	80					
	65					

TOTAL: 205.11 TOTAL: 199.31

Gulf Canada Corporation
Coal Division

723

Geophysical Log

Datasource:	KPNLRDDH86004	Province: BC	Northing: 6344680.00	Lat:	571449
Log Date:	86-08-25	Zone: 9	Easting: 507152.00	Long:	1285253
Company:	CENTURY	Measuring Point:		Elevation:	1632.5
Geologist:	BARKER				

Scale: 1 to 100.0

Depth Range: 0.0 to 210.0

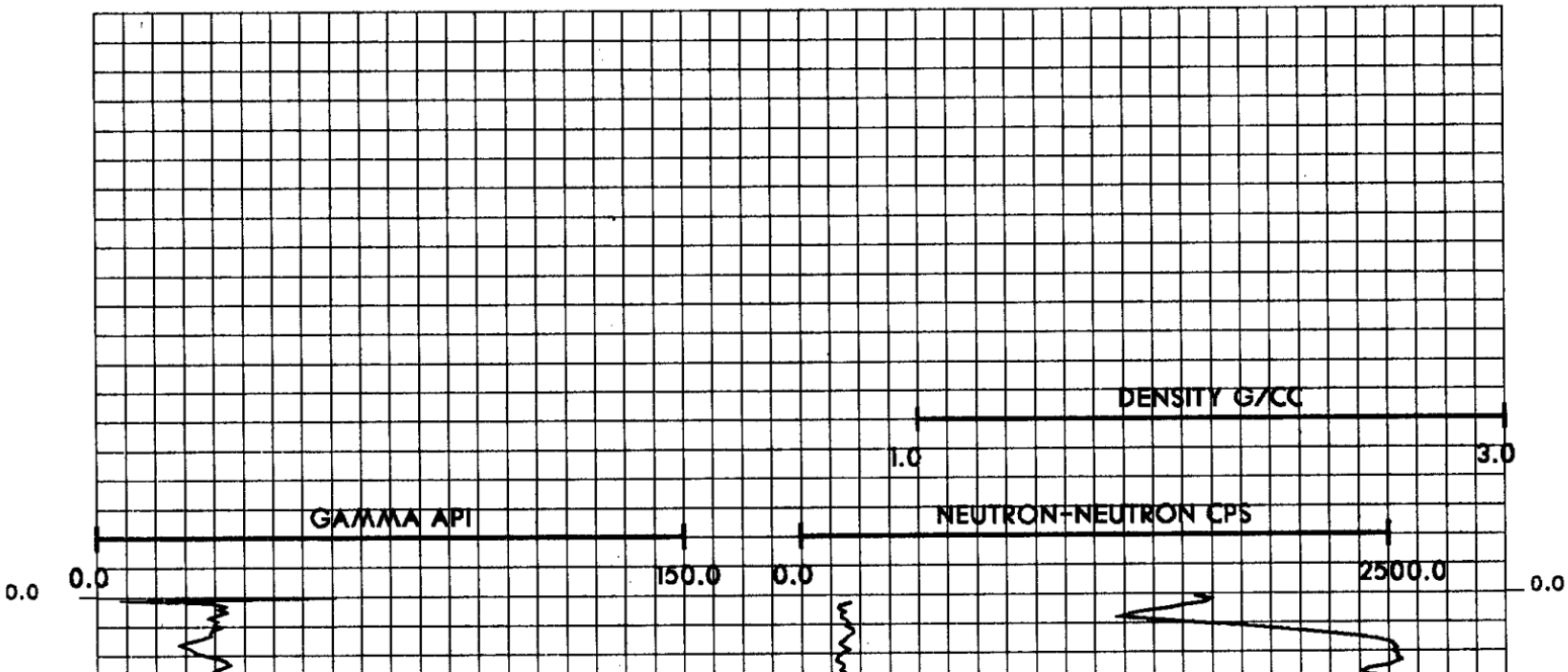
True Thickness: NO

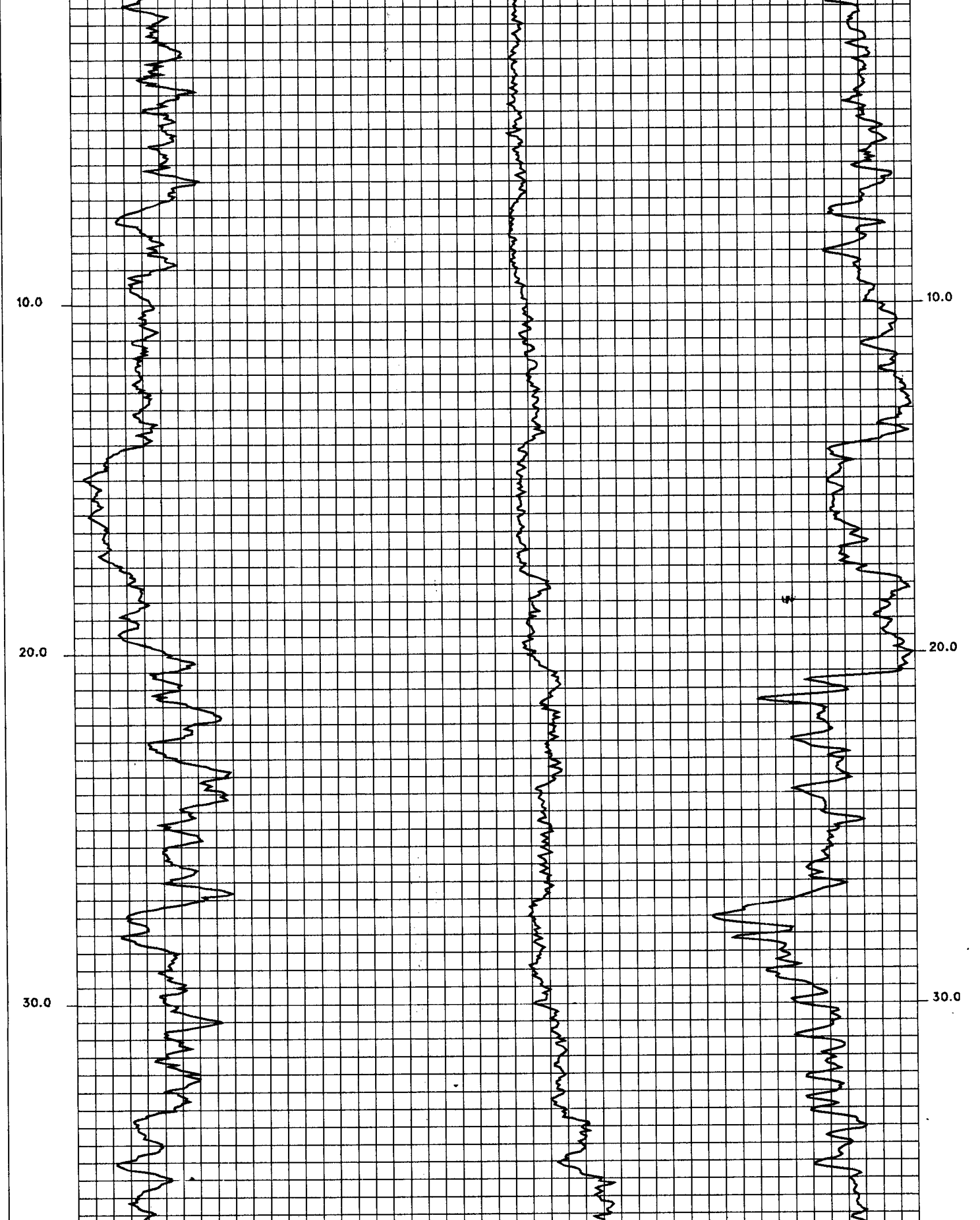
Comments:

1. LOGGED THROUGH THE RODS
2.

Logs Plotted:

Description	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1 .GAMMA API	0.0 to 150.0	10.0	31	9055A	IN PIPE
2.NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3.DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE

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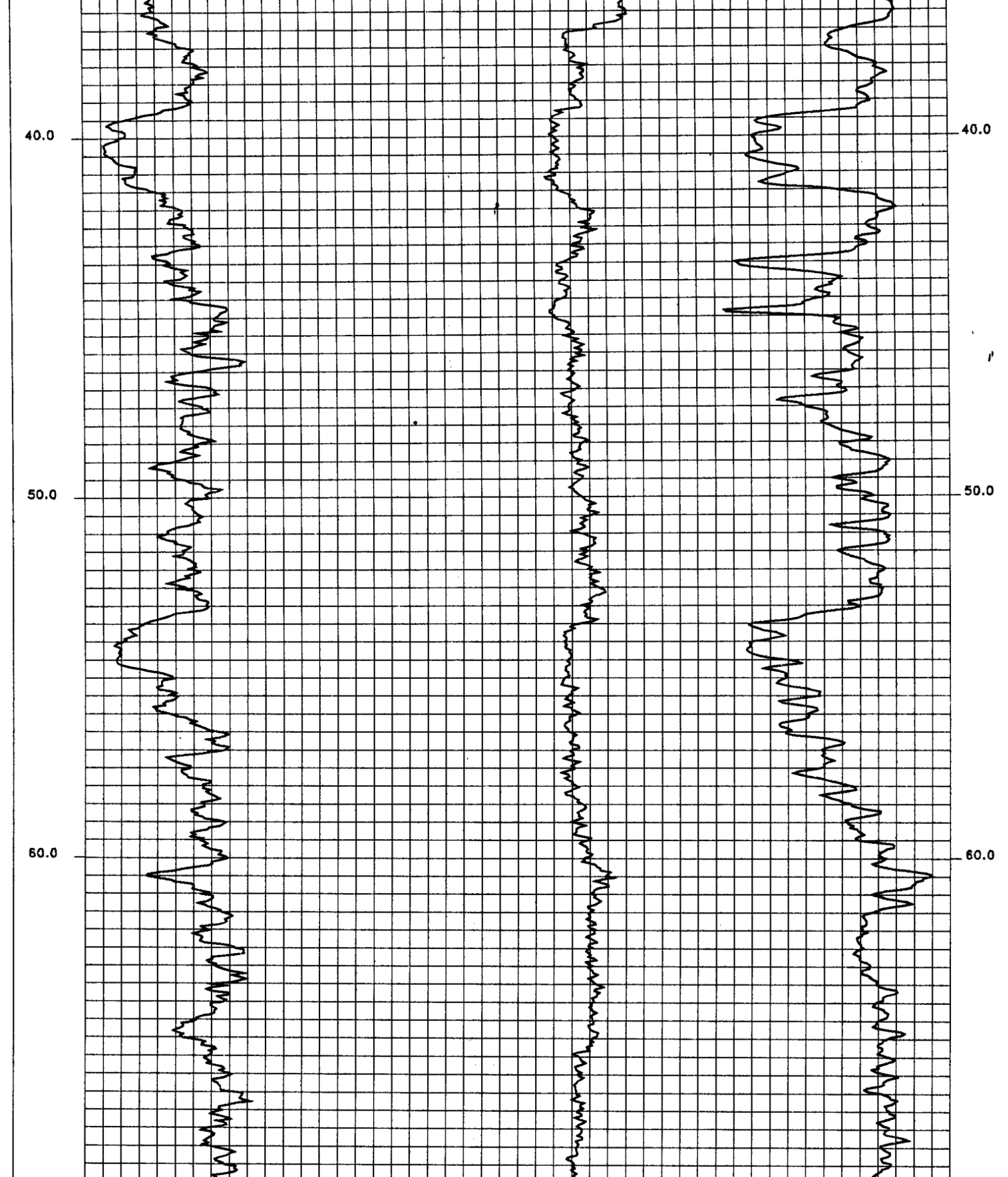
30.0
10.0
20.0
30.0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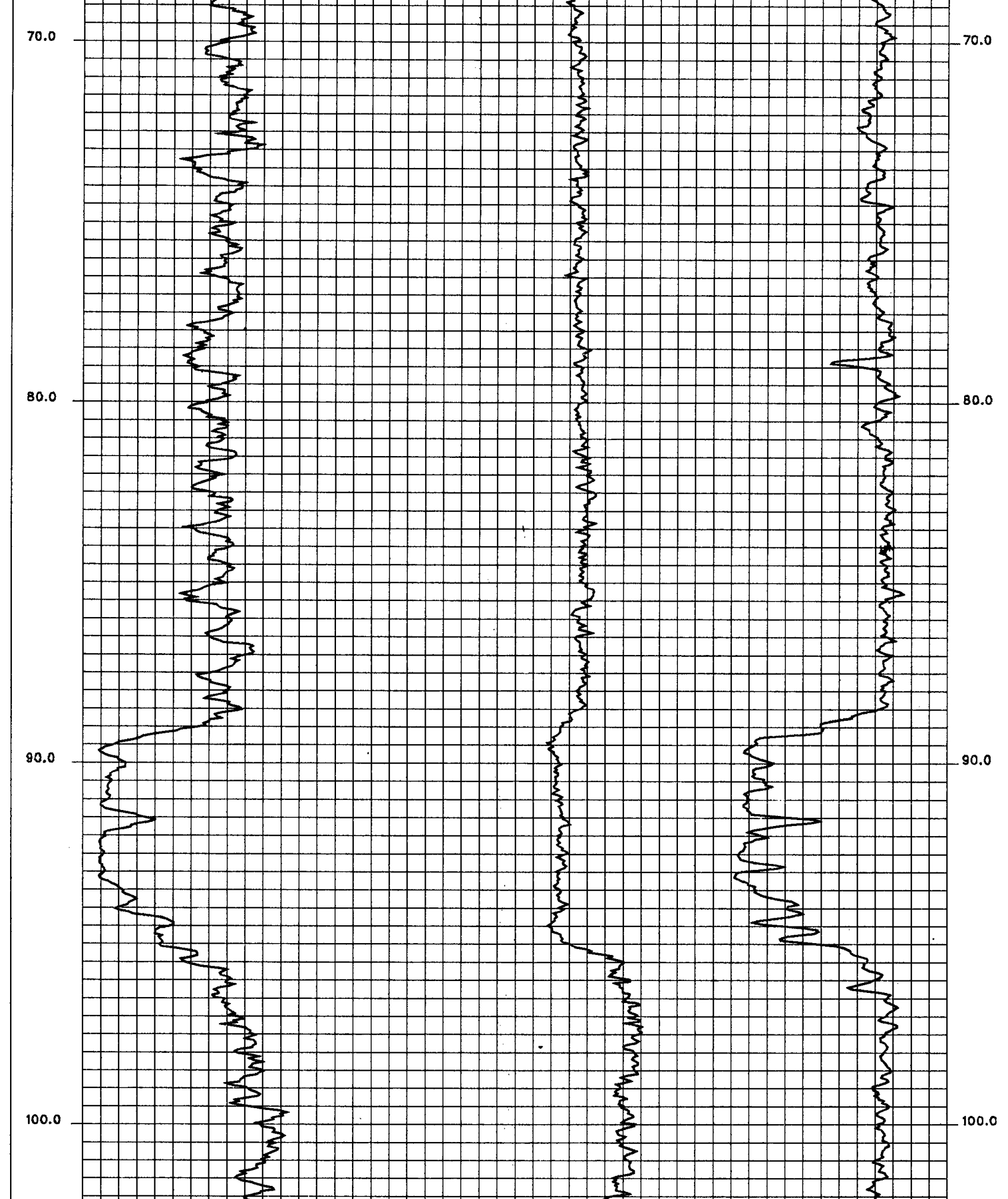
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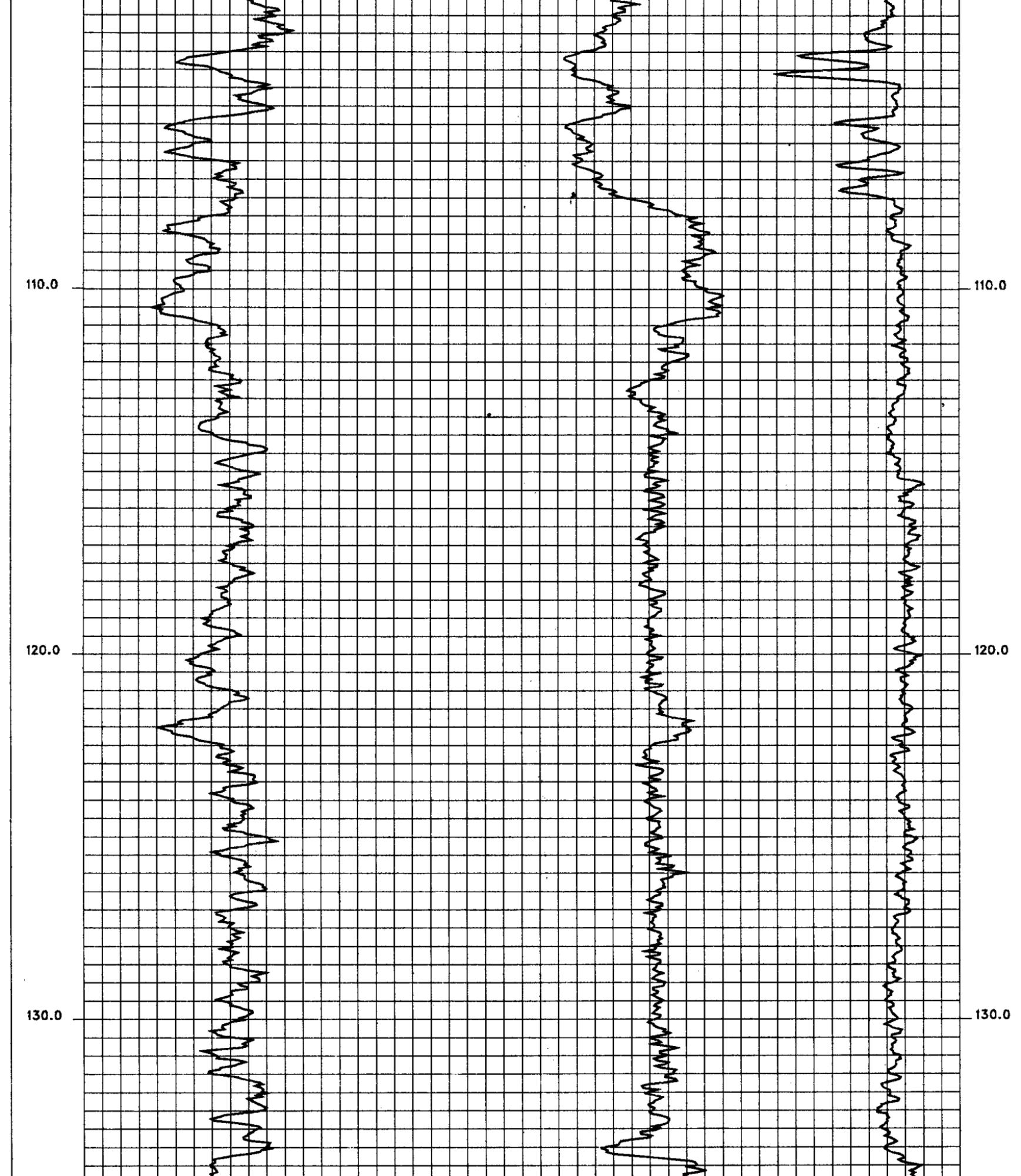
80.0
90.0
100.0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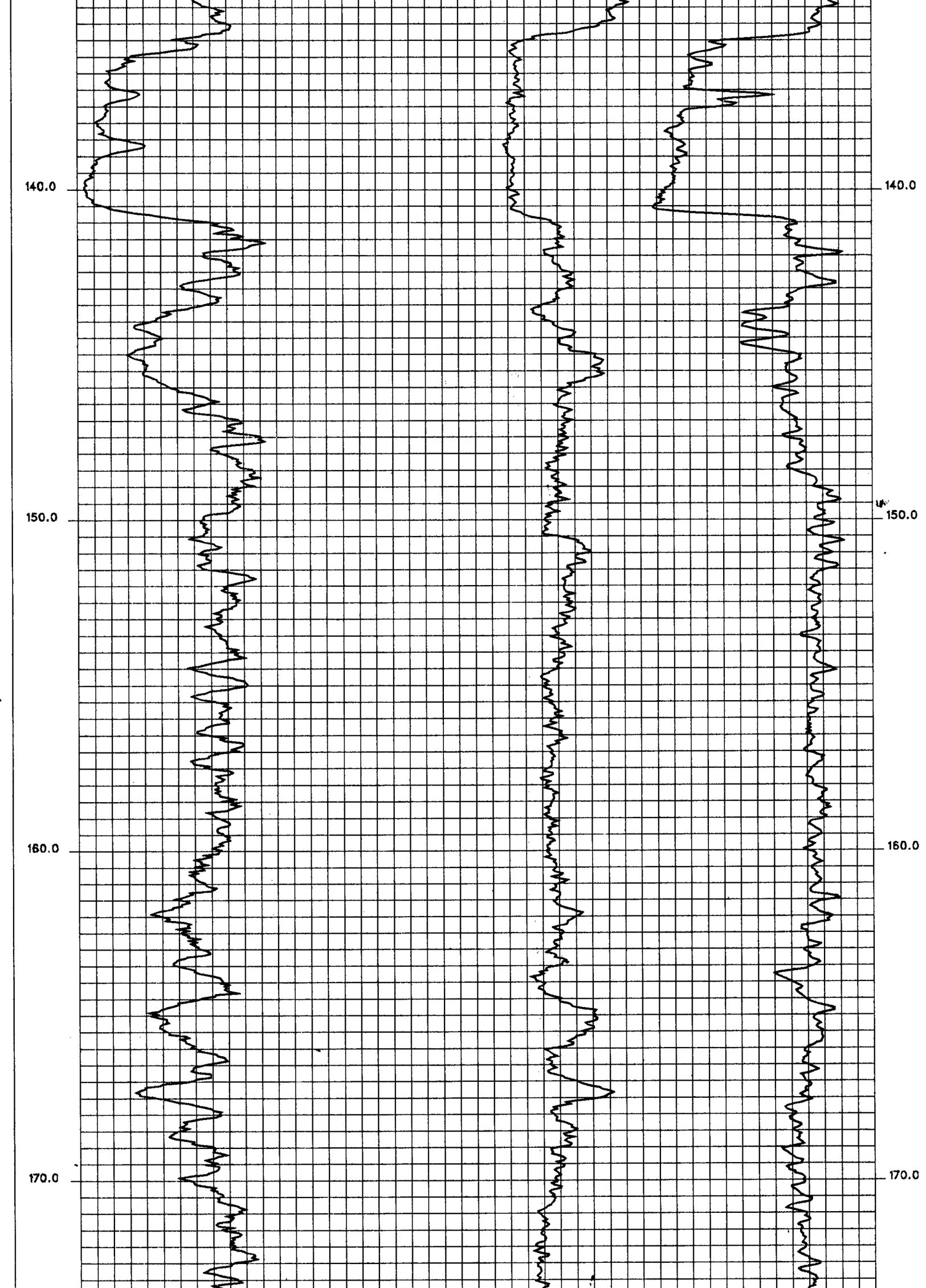
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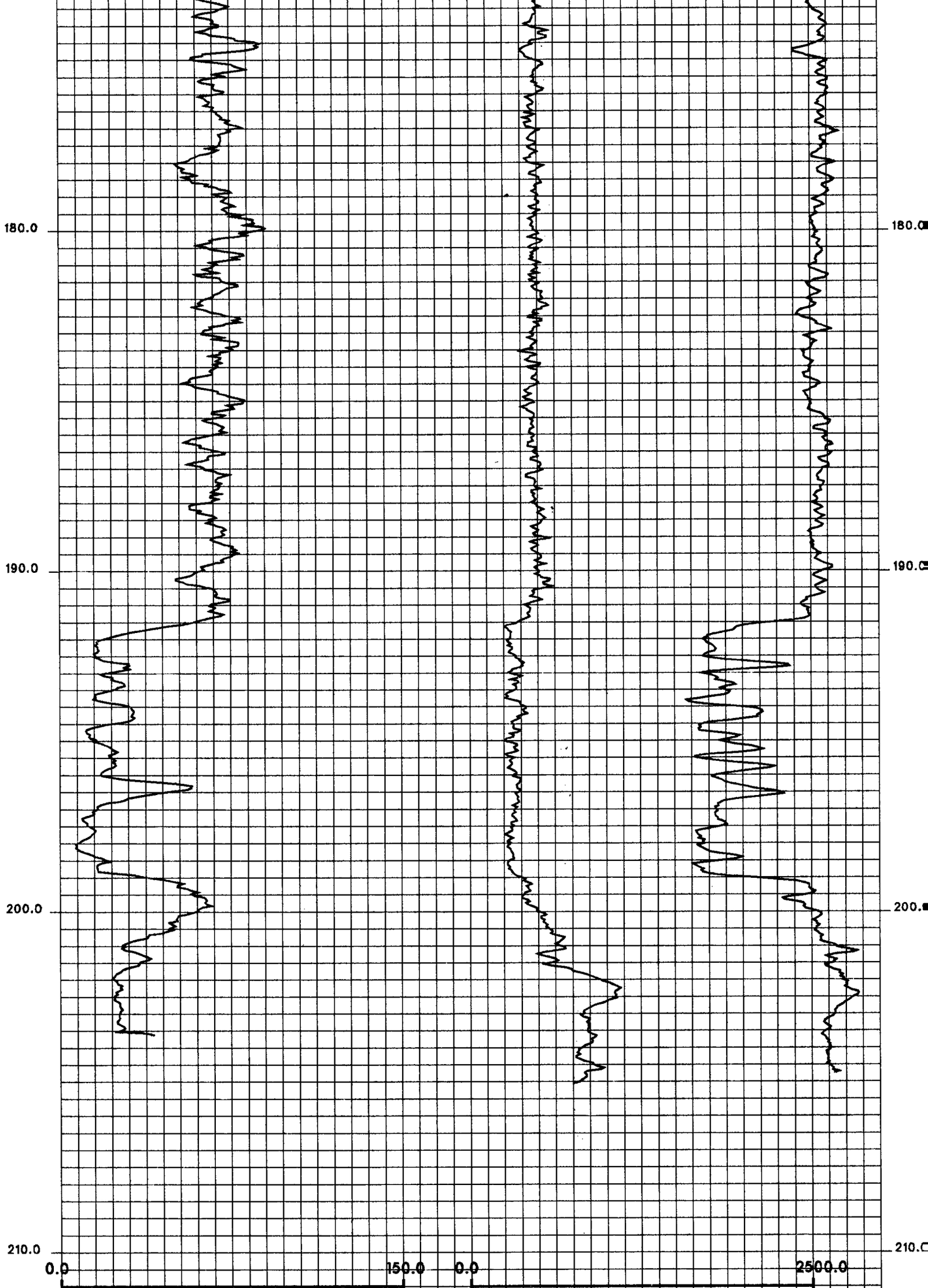
170.0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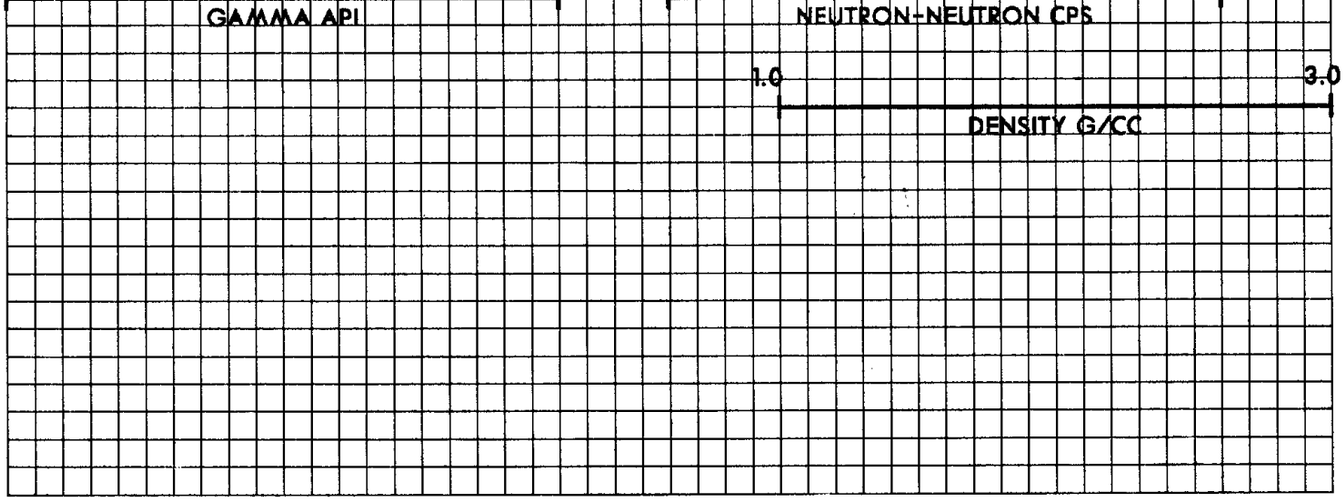

GAMMA API
NEUTRON-NEUTRON CPS
1.0
3.0
DENSITY G/CC

KPNLRDDH86005

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH86005 DATE - 02/13/87

- H I S T O R Y -

START DATE - 24/08/86
END DATE - 25/08/86

CONTRACTOR - J.T. THOMAS
GEOLOGIST - SAVOIE
OPERATOR - G.C.C.
SURVEYOR - TRONNES

REMARKS - SEAMS J,I,H WERE INTERSECTED. SITE B. UPRIGHT. COA
L LOGGED BY BRAD VANDENBUSSCHE.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1623.33
ZONE - 9
NORTHING - 6344884.00
EASTING - 506166.87

LICENCE/LEASE NUMBER -

LATITUDE - 571456
LONGITUDE - 1285352

- O R I E N T A T I O N -

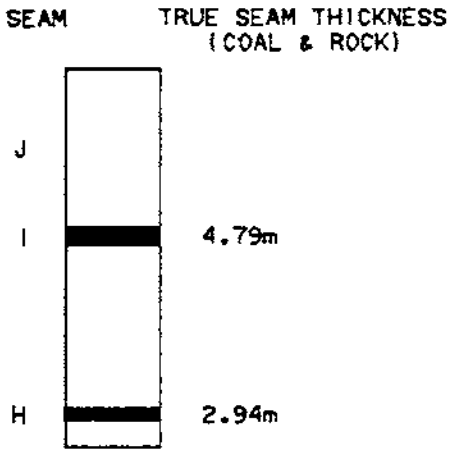
LENGTH - 102.72
INCLINATION - 80.0
AZIMUTH - 360.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ - N

CASING DEPTH (M) - 12.19
AQUIFER DEPTHS (M) - 0.00
0.00
LOST CIRC. DEPTHS (M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE



NOTE:

SCHEMATIC PROFILE.
NO THICKNESSES SHOWN
FOR SEAMS CONTAINING
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

FIGURE

MOUNT KLAPPAN ANTHRACITE PROJECT

1986 DIAMOND DRILL HOLES
DDH86005

GULF CANADA CORPORATION
11/03/87
KLAP:[2050571870063005.LOG

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	12.19	12.19	58			OVERBURDEN	CASING.
1	12.19	12.91	0.72	58			SANDSTONE	FER.MG.VPR.LT-M.GY.MAS.VBRKN WEATHERED. FE STAINED.
1	12.91	14.14	1.23	58			ROCK LOSS	
1	14.14	14.87	0.73	58			SANDSTONE	SLTY.FG.LT-M.GY.MAS.VBRKN FE STAINED. SILTIER TOWARD BASE.
1	14.87	15.36	0.49	58			ROCK LOSS	
2	15.36	15.51	0.15	58			SANDSTONE	SLTY.FG.M.GY.MAS.VBRKN RUBBLE.
2	15.51	15.71	0.20	*58			SILTSTONE	M.GY.LAM.VBRKN INTERLAMINATED MUDST. RYTHMITES (COASTE RS).
2	15.71	16.27	0.56	58			ROCK LOSS	
2	16.27	16.83	0.56	58			SILTSTONE	M.GY.LAM.VBRKN AS ABOVE.
2	16.83	17.13	0.30	58			MUDSTONE	M.GY.LAM.SHRD MINOR SILTY LAMINATIONS.
2	17.13	17.49	0.36	59			ROCK LOSS	

* DENOTES MEASURED BCA

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
2	17.49	17.68	0.19	59			MUDSTONE	CARB.M-DK.GY.LAM.VBRKN AS ABOVE.
3	17.68	17.90	0.22	59			MUDSTONE	CARB.DK.GY.MAS.VBRKN HARD.
3	17.90	18.57	0.67	59			ROCK LOSS	
3	18.57	19.20	0.63	59			MUDSTONE	CARB.DK.GY.MAS.BRKN SOFT & MUDDY, LISTRIC SURFACES. MINOR C OALY STRINGERS IN PLACES.
3	19.20	19.22	0.02	59		J	COAL	C-3.SLD QTZ MIXED WITHIN.
3	19.22	19.36	0.14	59		J	MUDSTONE	CARB.DK.GY.MAS.SLD
3	19.36	19.58	0.22	59		J	MUDSTONE	CARB.DK.GY.MAS.SLD
3	19.58	20.23	0.65	59		J	ROCK LOSS	
3	20.23	20.30	0.07	59		J	MUDSTONE	CARB.DK.GY.MAS.SLD
3	20.30	20.46	0.16	59			SILTSTONE	SSY.M.GY.LAM.SLD TWISTED OFF CORE.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	20.46	20.72	0.26	60			MUDSTONE	SLTY.M-DK.GY.VBRKN
4	20.72	21.31	0.59	60			MUDSTONE	SLTY.M.GY.MAS.BRKN QTZ VEINING (<1 CM).
4	21.31	22.55	1.24	60			SILTSTONE	CLYY.M.GY.LAM.SSD.SLD SILTIER TOWARD BASE. ONE QTZ VEIN (< 2 CM).
5	22.55	22.66	0.11	60			SILTSTONE	M.GY.MAS.VBRKN
5	22.66	24.20	1.54	60			SILTSTONE	SSY.LT-M.GY.LAM.SSD.BRKN TOPS UP (LOAD CASTS). INTERBEDDED FG SS . MINOR LISTRIC SURFACE.
6	24.20	24.88	0.68	61			SILTSTONE	SSY.LT-M.GY.LAM.SSD.BRKN INTERBEDDED FG SS.
6	24.88	24.96	0.08	61			MUDSTONE	M.GY.MAS.SLD
6	24.96	25.53	0.57	*61			SILTSTONE	SSY.LT-M.GY.LAM.SSD.BRKN INTERLAMINATED MUDST.
6	25.53	25.83	0.30	61			ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
6	25.83	26.45	0.62	61			SILTSTONE	CLYY.M.GY.LAM.SSD.BRKN AS ABOVE. MINOR HAIR LINE QTZ FILLED FR ACTURES PERPENDICULLAR TO BDG.
7	26.45	28.25	1.80	60			SILTSTONE	SSY.M.GY.LAM.SSD.BRKN INTERLAMINATED MUDST. TWO MAJOR 5 CM ZO NES OF QTZ VEINING.
8	28.25	28.92	0.67	60			SANDSTONE	SLTY.VFG.PR.LT-M.GY.LAM.SSD.SLD TOPS UP (LOAD STRUCTURE). BIOTURBATED. MINOR QTZ VEINING.
8	28.92	30.30	1.38	59			SANDSTONE	SLTY.VFG.PR.LT-M.GY.LAM.SSD.SLD AS ABOVE.
9	30.30	31.82	1.52	59			SANDSTONE	SLTY.VFG.VPR.LT-M.GY.SSD.BRKN INTERLAMINATED MUDST. LISTRIC SURFACE A ND QTZ VEINING NEAR BASE OF INTERVAL. T OPS UP (LOAD CAST).
9	31.82	31.96	0.14	59			SANDSTONE	SLTY.VFG.VPR.LT-M.GY.VBRKN
10	31.96	33.72	1.76	58			SANDSTONE	SLTY.FG.VPR.LT-M.GY.BRKN MINOR MUDST LAMINAE. TOPS UP (LOAD STRU CTURE). MINOR QTZ VEINING.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
11	33.72	34.18	0.46	*58			SILTSTONE	M.GY.LAM.VBRKN INTERLAMINATED MUDST.
11	34.18	35.09	0.91	59			ROCK LOSS	
11	35.09	35.73	0.64	60			SANDSTONE	CLYY.FG.PR.LT-M.GY.MAS.VBRKN MINOR MUDST LAMINAE. QTZ VEINING.
12	35.73	36.05	0.32	60			SANDSTONE	CLYY.FG.PR.LT.GY.MAS.VBRKN MINOR QTZ VEINING. MINOR INDISTINCT MUD ST LAMINAE.CLAY ENRICHED.
12	36.05	36.62	0.57	61			ROCK LOSS	
12	36.62	37.47	0.85	61			SANDSTONE	CLYY.FG.VFR.LT.GY.MAS.VBRKN AS ABOVE.
12	37.47	37.50	0.03	62			BENTONITE	LT.GY DEFORMED.
12	37.50	37.54	0.04	62			SILTSTONE	M.GY.LAM.BRKN INTERLAMINATED MUDST.
13	37.54	37.64	0.10	62			ROCK LOSS	
13	37.64	37.69	0.05	62			BENTONITE	LT.GY PROBABLY BELONGS WITH THE FIRST OCCUREN CE OF BENT.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
13	37.69	39.49	1.80	*63			MUDSTONE	SLTY.M-DK.GY.LAM.BRKN MINOR QTZ VEINING.
14	39.49	40.01	0.52	63			MUDSTONE	SLTY.M-DK.GY.LAM.BRKN INTERLAMINATED SLTST & MUDST.
14	40.01	40.04	0.03	63			MUDSTONE	SLTY.M.GY.BRKN SOFT. MUDDY.
14	40.04	40.97	0.93	63	04472		MUDSTONE	SLTY.M.GY.LAM.VBRKN LOWER 22 CM SAMPLED.
14	40.97	41.00	0.03	63	04472		MUDSTONE	CARB.DK.GY.BRKN
14	41.00	41.03	0.03	63	04473	I	COAL	C-2.SLD
14	41.03	41.37	0.34	63	04473	I	COAL LOSS	
14	41.37	41.51	0.14	63	04473	I	MUDSTONE	CARB.SLD SOFT. CLAYEY.
15	41.51	41.55	0.04	63	04473	I	COAL	C-2.SLD
15	41.55	42.95	1.40	63	04473	I	COAL LOSS	
15	42.95	43.00	0.05	63	04473	I	ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
15	43.00	43.06	0.06	63	04473	I	MUDSTONE	CARB.DK.GY.VBRKN HARD. MINOR VITRAIN STRINGERS THROUGHOU T.
15	43.06	43.24	0.18	63	04473	I	COAL	C-2.VBRKN
15	43.24	43.27	0.03	63	04473	I	COAL	C-2.BRKN
15	43.27	43.29	0.02	63	04473	I	MUDSTONE	CARB.DK.GY.SLD
15	43.29	43.46	0.17	63	04473	I	COAL	C-2.VBRKN
15	43.46	44.29	0.83	63	04473	I	COAL	C-3.PWRD SHEARED POWDERED MESS.
15	44.29	44.30	0.01	64	04473	I	MUDSTONE	CARB.DK.GY.SLD
15	44.30	44.42	0.12	64	04473	I	COAL	C-3.PWRD SHEARED POWDERED MESS, SOUPY.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
16	44.42	44.46	0.04	64	04473	I	COAL	C-3.SHRD AS ABOVE.
16	44.46	45.21	0.75	64	04474	I	COAL LOSS	
16	45.21	46.11	0.90	64	04474	I	COAL	C-1.SHRD HIGHLY SHEARED AND POWDERED.
16	46.11	46.31	0.20	64	04474	I	COAL	C-2.SHRD AS ABOVE.
16	46.31	46.35	0.04	64	04474	I	COAL	C-4.BRKN
16	46.35	46.56	0.21	64	04475		MUDSTONE	CARB.DK.GY.BRKN
16	46.56	47.14	0.58	64			MUDSTONE	SLTY.M-DK.GY.BRKN MORE CARB NEAR SEAM.
17	47.14	48.34	1.20	64			MUDSTONE	SLTY.M-DK.GY.VBRKN MINOR QTZ.
17	48.34	49.01	0.67	64			SILTSTONE	SSY.LT-M.GY.BRKN MINOR INTERLAMINATED MUDST.
18	49.01	49.78	0.77	64			SILTSTONE	SSY.M.GY.BRKN AS ABOVE. RARE QTZ.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
18	49.78	49.85	0.07	64			SANDSTONE	MG.VPR.LT-M.GY.MAS.SLD
18	49.85	50.00	0.15	*64			SILTSTONE	SSY.M.GY.SLD INTERLAMINATED MUDST.
18	50.00	50.10	0.10	64			SANDSTONE	FG.VPR.LT-M.GY.MAS.SLD
18	50.10	50.98	0.88	65			MUDSTONE	SLTY.M.GY.BRKN INTERBEDDED SLTST.
18	50.98	51.15	0.17	65			ROCK LOSS	
19	51.15	51.39	0.24	65			MUDSTONE	SLTY.M.GY.BRKN AS ABOVE.
19	51.39	53.16	1.77	66			MUDSTONE	M-DK.GY MONOTONOUS, FEATURELESS MUD. SOME LISTR IC SURFACES.
20	53.16	54.57	1.41	68			SILTSTONE	LT-M.GY.LAM.SSD,VBRKN INTERLAMINATED MUDST. MINOR QTZ VEINING (<.5 CM). DISTURBED BDG.
20	54.57	54.81	0.24	68			SILTSTONE	SSY.LT-M.GY.VBRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
21	54.81	55.21	0.40	69			MUDSTONE	SLTY.M.GY.SHRD MINOR INDISTINCT SLTST LAMINAE.
21	55.21	55.79	0.58	69			ROCK LOSS	
21	55.79	56.59	0.80	70			MUDSTONE	SLTY.M.GY.SHRD AS ABOVE. LOWER HALF OF INTERVAL IS RUB BLE. PLANT FRAGMENT FOUND.
22	56.59	56.80	0.21	70			ROCK LOSS	
22	56.80	58.56	1.76	*71			MUDSTONE	SLTY.M.GY.LAM.BRKN INDISTINCT SLTST LAMINAE.
23	58.56	58.81	0.25	71			MUDSTONE	SLTY.M.GY.BRKN
23	58.81	59.61	0.80	71			MUDSTONE	SLTY.M.GY.BRKN INTERLAMINATED SLTST.
23	59.61	59.87	0.26	71			SANDSTONE	SLTY,FG.VPR.LT-M.GY.BRKN MINOR INTERLAMINATED MUDST.
23	59.87	60.05	0.18	71			MUDSTONE	SLTY.M.GY.SLD PYRITE BLEB ON CRACKED SURFACE (<.3 CM)

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
24	60.05	60.43	0.38	71			ROCK LOSS	
24	60.43	60.78	0.35	71			MUDSTONE	M.GY.VBRKN CORE REDUCED TO ROUNDED RUBBLE. DISCONT INUOUS BANDOF GRANULAR SAND AT BASE OF INTERVAL.
24	60.78	61.00	0.22	71			MUDSTONE	DK.GY.MAS.BRKN GRANULAR TEXTURE.
24	61.00	62.10	1.10	*71			SILTSTONE	M.GY.SSD.SLD TOPS UP (LOAD STRUCTURE). INTERLAMINATE D MUDST.
25	62.10	63.32	1.22	70			SILTSTONE	M.GY.SSD.SLD SWIRLED BEDDING. MIXED SEDIMENT.
25	63.32	63.58	0.26	70			ROCK LOSS	
25	63.58	63.80	0.22	70			MUDSTONE	DK.GY.MAS.BRKN GRANULAR TEXTURE.
25	63.80	64.30	0.50	69			SANDSTONE	SLTY.FG.VPR.LT-M.GY.THNB.SSD.BRKN INTERBEDDED WITH SILTY MUDST.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	64.30	66.15	1.85	68			SANDSTONE	SLTY.FG.VPR.LT-M.GY.THNB.SSD.BRKN AS ABOVE. MINOR BIOTURB AND LISTRIC SUR FACES. ONE 2 CM ZONE OF QTZ VEINING. TO PS UP (LOAD STRUCTURE).
27	66.15	66.53	0.38	68			SANDSTONE	FG.VPR.LT-M.GY.MAS.SSD.SLD MINOR, DISTORTED SLTST/MUDST LAMINAE. B IOTURBATION.
27	66.53	66.71	0.18	67			ROCK LOSS	
27	66.71	67.99	1.28	67			SANDSTONE	FG.VPR.LT-M.GY.MAS.SSD.BRKN AS ABOVE. LISTRIC SURFACES.
27	67.99	68.23	0.24	66			ROCK LOSS	
27	68.23	68.43	0.20	66			SANDSTONE	MG.VPR.LT-M.GY.MAS.SSD.SLD MINOR DISTORTED SLTST LAMINAE. BIOTURBA TED.
28	68.43	69.37	0.94	66			SANDSTONE	MG.VPR.LT-M.GY.MAS.SSD.SLD AS ABOVE.
28	69.37	69.42	0.05	66			SANDSTONE	SLTY.VFG.VPR.LT-M.GY.LAM.SLD DISPERSED QTZ ALONG BDG PLANES.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
28	69.42	69.98	0.56	65			SANDSTONE	CG.VPR.S-P.GY.MAS.SLD MINOR MUDST RIP UP CLASTS.FINER GRAINED TOWARD BASE.GRADATIONAL CONTACTS.
28	69.98	70.31	0.33	65			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.SSD.SLD
29	70.31	71.21	0.90	65			SANDSTONE	MG.VPR.M.GY.SSD.BRKN MINOR SLTST/MUDST LAMINAE.
29	71.21	71.65	0.44	64			SILTSTONE	SSY.M.GY.BRKN GRADATIONAL CONTACTS.
29	71.65	72.21	0.56	64			SANDSTONE	FG.VPR.M.GY.LAM.SSD.BRKN BIOTURBATED, LISTRIC SURFACES.
30	72.21	74.04	1.83	*63			SANDSTONE	FG.VPR.M.GY.LAM.SSD.BRKN AS ABOVE, SLTST AND MUDST LAMINAE.
30	74.04	74.26	0.22	67			ROCK LOSS	
30	74.26	74.49	0.23	68			SANDSTONE	MG.LT-M.GY.LAM.SSD.SLD INTERLAMINATED MUDST.
31	74.49	76.59	2.10	*72			SANDSTONE	MG.LT-DK.GY.LAM.SSD.SLD BIOTURBATED,BURROWED,INTERLAMINATED MUDST. TOPSUP.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
32	76.59	77.31	0.72	71			SANDSTONE	MG.M.GY.MAS.SLD LISTRIC SURFACES. RARE MUDST LAMINAE.
32	77.31	78.71	1.40	71			SANDSTONE	MG.LT-DK.GY.LAM.SSD.SLD BIOTURBATION. INTERLAMINATED MUDST. TOPS UP. FINERGRAINED TOWARD BASE.
33	78.71	79.77	1.06	*70			SANDSTONE	SLTY.FG.LT-M.GY.LAM.SLD NUMEROUS MUDST LAMINAE. PYRITE BLEB (<1 .5 CM).COALLY PLANT FRAGMENTS ON MUDST BDG PLANES.
33	79.77	80.20	0.43	70			MUDSTONE	SLTY.M.GY.LAM.SLD INTERLAMINATED SLST. PLANT FRAGMENTS.
33	80.20	80.36	0.16	70			ROCK LOSS	
33	80.36	80.49	0.13	69			MUDSTONE	SLTY.M.GY.LAM.SLD AS ABOVE.
33	80.49	80.89	0.40	69			SANDSTONE	FG.LT-M.GY.MAS.BRKN MINOR MUDST LAMINAE.
34	80.89	83.01	2.12	69			SILTSTONE	M.GY.LAM.SSD.SLD INTERLAMINATED MUDST. MINOR FG SS. COALIFIED PLANTFRAGS.
35	83.01	83.44	0.43	68			MUDSTONE	M.GY.BRKN MINOR INTERLAMINATED SLTST.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
35	83.44	84.87	1.43	68			MUDSTONE	SLTY.LT-M.GY.LAM.BIOTR.BRKN INTERLAMINATED SLTST. COALIFIED PLANT F RAGMENTS. TOPS UP (BURROW).
36	84.87	86.39	1.52	67			MUDSTONE	SLTY.M.GY.LAM.BRKN AS ABOVE.
36	86.39	86.49	0.10	67			ROCK LOSS	
36	86.49	86.97	0.48	66			MUDSTONE	SLTY.M.GY.BRKN AS ABOVE.
37	86.97	88.34	1.37	*66			MUDSTONE	SLTY.M-DK.GY.BRKN INTERLAMINATED SLTST. PYRITE BLEB.
37	88.34	89.04	0.70	68			MUDSTONE	CARB.DK.GY.SLD ABUNDANT PLANT FRAGMENTS.
38	89.04	89.37	0.33	68			MUDSTONE	CARB.DK.GY.MAS.BRKN PYRITE NODULES AND COALY PLANT FRAGS WI THIN.
38	89.37	89.54	0.17	69			ROCK LOSS	
38	89.54	90.45	0.91	70	04476		MUDSTONE	CARB.DK.GY.MAS.BRKN LOWER 25 CM SAMPLED.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
38	90.45	90.50	0.05	70	04477	H	COAL	C-2.BRKN CORE TWISTED OFF.
38	90.50	90.64	0.14	70	04477	H	COAL LOSS	
38	90.64	90.76	0.12	71	04477	H	MUDSTONE	CARB.DK.GY.MAS.SLD COALY STRINGERS THROUGHOUT.
38	90.76	90.99	0.23	71	04477	H	COAL LOSS	
38	90.99	91.22	0.23	71	04477	H	COAL	C-3.BRKN
38	91.22	91.24	0.02	71	04477	H	COAL	C-2.SLD
38	91.24	91.38	0.14	72	04477	H	MUDSTONE	CARB.DK.GY.MAS.SLD
38	91.38	91.49	0.11	72	04477	H	COAL	C-2.SLD
39	91.49	91.51	0.02	72	04477	H	MUDSTONE	CARB.DK.GY
39	91.51	91.77	0.26	72	04477	H	COAL	C-2.VBRKN SHEARED IN PLACES.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
39	91.77	91.78	0.01	72	04477	H	COAL	C-6.SLD
39	91.78	92.08	0.30	73	04477	H	COAL	C-2.BRKN
39	92.08	92.23	0.15	73	04477	H	MUDSTONE	CARB.DK.GY.MAS.BRKN LISTRIC SURFACES.
39	92.23	92.29	0.06	73	04478	H	COAL	C-4.SLD
39	92.29	92.35	0.06	73	04478	H	COAL	C-2.SLD
39	92.35	92.94	0.59	74	04478	H	COAL	C-2.BRKN SHEARED IN PLACES.
39	92.94	92.98	0.04	74	04478	H	MUDSTONE	SOFT. QTZ AT BASE.
39	92.98	93.30	0.32	74	04478	H	COAL	C-2.BRKN
39	93.30	93.46	0.16	75	04478	H	COAL	C-1.BRKN
40	93.46	93.53	0.07	75	04478	H	COAL	C-1.BRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86005

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
40	93.53	95.41	1.88	76	04479		MUDSTONE	SLTY.M-DK.GY.LAM CARB NEAR COAL SEAM. PYRITE WITHIN. INT ERBEDDED MUDST LAMINAE. UPPER 25 CM SAM PLED.
40	95.41	95.63	0.22	78			SILTSTONE	CLYY.M.GY.LAM.SLD GRADATIONAL FROM ABOVE.
41	95.63	97.25	1.62	79			MUDSTONE	CARB.M-DK.GY.MAS.BRKN SILTIER TOWARD BASE OF INTERVAL. COALIF IED PLANT FRAGMENTS AT TOP OF INTERVAL.
41	97.25	97.68	0.43	*81			SANDSTONE	SLTY.FG.VPR.LT-M.GY.MAS.SLD MINOR MUDST LAMINAE.
42	97.68	98.33	0.65	81			SANDSTONE	FG.VPR.LT-M.GY.MAS.SLD AS ABOVE.
42	98.33	99.64	1.31	81			SANDSTONE	MG.VPR.LT-M.GY.MAS.SLD AS ABOVE.
43	99.64	101.20	1.56	81			SANDSTONE	CG.VPR.LT-M.GY.MAS.SLD AS ABOVE. SOME SECTIONS ARE VERY COARSE TO GRANULAR. TD = 102.72 M.

* DENOTES MEASURED BCA
NEWPAGE

GULF CANADA CORPORATION

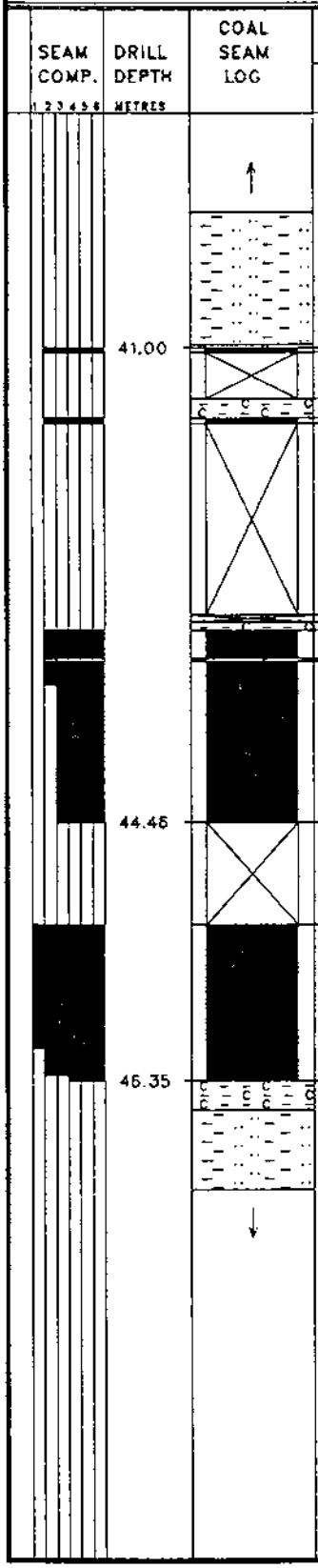
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86005 SEAM : 1 INTERVAL(M) : 41.00 - 46.35 ELEVATION(M) : 1623.3

GEOLOGIST : SAVOIE SCALE: 1:40 DATE : MAR 09/87 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	41.00			(0.30)												
				(1.25)	48.3	4473	4473	2.84 / 0.25 3.10		—	—	—	—	—	—	—
				0.19												
				1.05												
	44.46			(0.87)												
				1.02	80.3	4474	4474	1.69 / 0.00 1.69		—	—	—	—	—	—	—
	46.35															

GULF CANADA CORPORATION

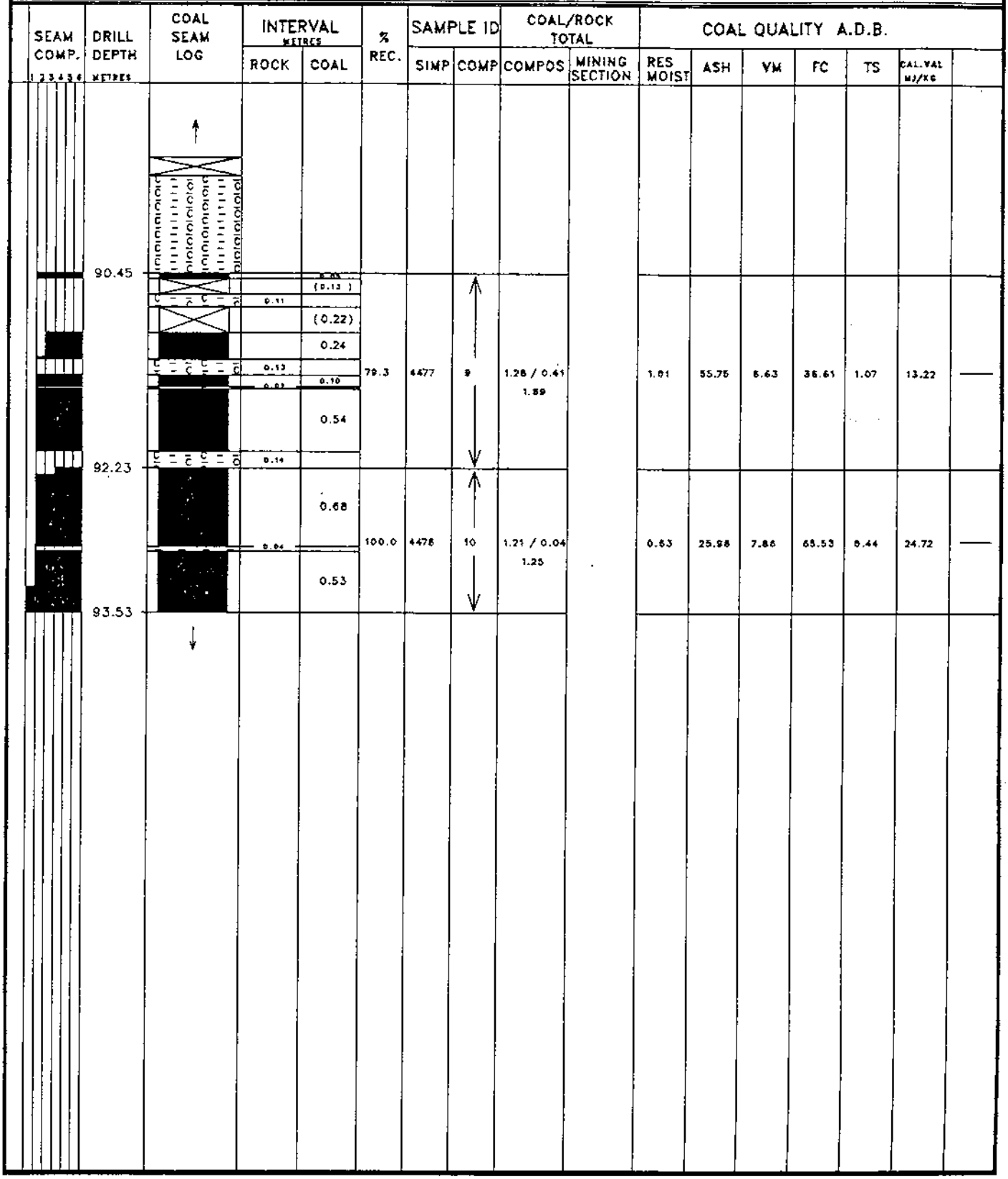
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86005 SEAM : H INTERVAL(M) : 90.45 - 93.53 ELEVATION(M) : 1623.3

GEOLOGIST : SAVOIE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	90.45			(0.13)												
			0.11	(0.22)												
				0.24												
			0.13	0.10	79.3	4477	9	1.28 / 0.41 1.89		1.01	55.75	6.63	36.61	1.07	13.22	—
				0.54												
	92.23		0.14													
				0.68												
			0.04		100.0	4478	10	1.21 / 0.04 1.25		0.63	25.98	7.86	65.53	0.44	24.72	—
				0.53												
	93.53															

GULF CANADA CORPORATION
COAL DIVISION
KLAPPAN PROJECT
STRATIGRAPHIC LOG
KPN LR DDH86005

723

GEOLOGIST : SAVOIE	DATE : MAR 09/87	DRAWING NO. :

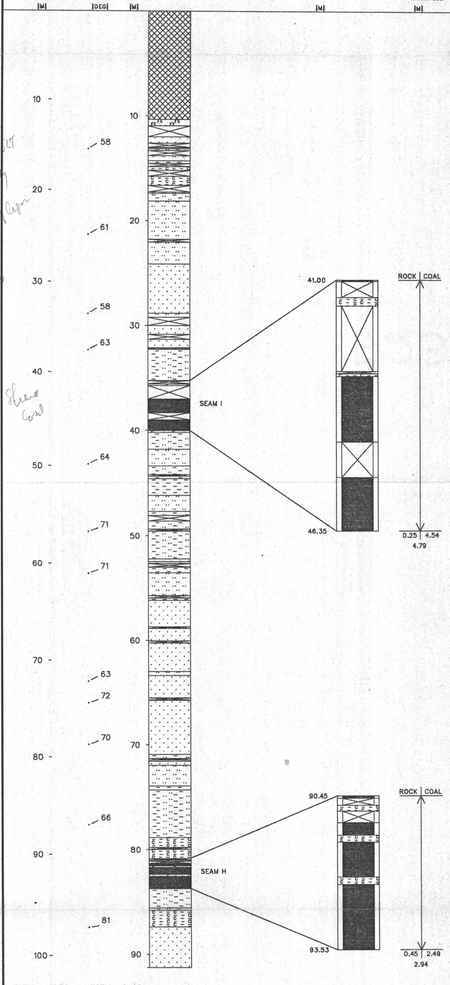
SCALE : 1:200 1:40

NORTHING: 6344884.0 N
EASTING: 506166.8 E

INCLINATION: 80.0°
BEARING: 360.0°

LITHOLOGIC SYMBOLS

	SANDSTONE		BENTONITE
	SILTSTONE	2 2 2	BRECCIA
	COAL	C C C	CARBONACEOUS
	OVERBURDEN	Q Q Q	QUARTZ
	MUDSTONE, CLAYSTONE	P P P	PYRITE
	TUFF	FE FE FE	FERRUGINOUS
	LIMESTONE	o o o	CONGLOMERATE
	CORE LOSS	f	FOSSIL BED



Gulf Canada Corporation
Coal Division
Geophysical Log

723

Datasource: **KPNLRDDH86005**	Province: BC	Northing: 6344880.00	Lat: 571456
Log Date: 86-08-25	Zone: 9	Easting: 506167.00	Long: 1285352
Company: CENTURY	Measuring Point:		Elevation: 1623.3
Geologist: SAVOIE			

Scale: 1 to 100.0

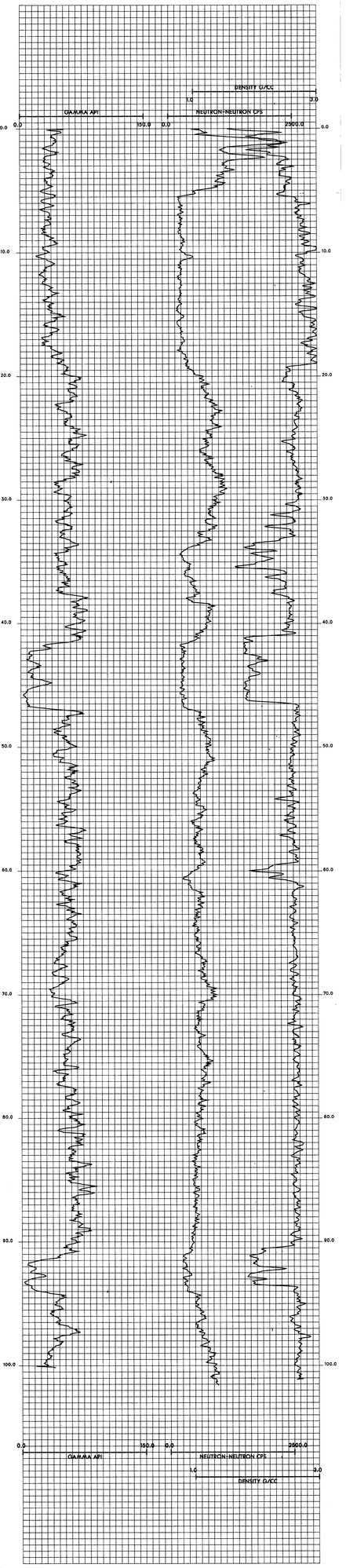
Depth Range: 0.0 to 106.0

True Thickness: NO

Comments:
1. LOGGED THROUGH THE RODS
2.

Logs Plotted:

Description	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9055A	IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE



KPNLRDDH86006

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH86006 DATE - 02/13/87

- H I S T O R Y -

START DATE - 25/08/86
END DATE - 26/08/86

CONTRACTOR - J.T. THOMAS
GEOLOGIST - LOVE
OPERATOR - G.C.C.
SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1592.60
ZONE - 9
NORTHING - 6344957.00
EASTING - 506566.25

LICENCE/LEASE NUMBER -

LATITUDE - 571458
LONGITUDE - 1285328

- O R I E N T A T I O N -

LENGTH - 91.74
INCLINATION - 80.0
AZIMUTH - 355.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ - N

CASING DEPTH(M) - 21.34
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE

SEAM	TRUE SEAM THICKNESS (COAL & ROCK)
I	12.06m
H	5.89m

NOTE:

SCHEMATIC PROFILE.
NO THICKNESSES SHOWN
FOR SEAMS CONTAINING
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

FIGURE

MOUNT KLAPPAN ANTHRACITE PROJECT

1986 DIAMOND DRILL HOLES
DDH86006

GULF CANADA CORPORATION
11/03/87
KLAP:(205057)870063006.LOG

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	21.34	21.34	45			OVERBURDEN	CASING.
1	21.34	22.44	1.10	45			SANDSTONE	FG.M.GY.SHRD VERY SHEARED CORE. GRAVEL IN A CORE BOX .
1	22.44	23.29	0.85	45			SANDSTONE	FG.M.GY.MAS.VBRKN
1	23.29	23.34	0.05	45			ROCK LOSS	
2	23.34	24.34	1.00	*45			SANDSTONE	FG.M.GY.MAS.VBRKN FEW DK GY SILTY LAMINAE.
2	24.34	25.19	0.85	40			SANDSTONE	FG.M.GY.MAS.VBRKN SAME ROCK TYPE AS ABOVE WITH RARE QTZ C ARB VEINS UP TO 2 CM WIDE.
2	25.19	25.24	0.05	38			ROCK LOSS	
3	25.24	26.14	0.90	*35			SANDSTONE	FG.M.GY.LAM.VBRKN SIMILAR TO ROCK TYPE AS ABOVE BUT WITH MORE VERY SILTY LAMINAE (< 1-3 MM WIDE) .

* DENOTES MEASURED BCA

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	26.14	26.19	0.05	38			ROCK LOSS	
3	26.19	27.04	0.85	*40			SANDSTONE	VFG.LT-M.GY.LAM.VBRKN OFTEN SHEARED. LISTRIC SURFACES AND SLI CKENSIDES COMMON. VFG TO SLTY. GETS LIG HTER GREY WITH DEPTH. SOFT IN PLACES AD JACENT TO FRACTURES. FEW QTZ VEINS. MAY BE SAND IMMEDIATELY ABOVE TUFFITE.
3	27.04	27.19	0.15	42			MUDSTONE	M-DK.GY.LAM.VBRKN
3	27.19	27.24	0.05	42			ROCK LOSS	
4	27.24	28.44	1.20	*45	04489		MUDSTONE	M-DK.GY.LAM.VBRKN VERY BROKEN TO SHEARED.LOWER 25 CM SAMP LED.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
4	28.44	28.47	0.03	46	04490	I	COAL	C-2.SLD
4	28.47	28.50	0.03	46	04490	I	MUDSTONE	CARB.DK.GY.SLD SPOIL APPEARANCE.
4	28.50	28.73	0.23	47	04490	I	COAL	C-2.BRKN
4	28.73	30.40	1.67	49	04490	I	COAL LOSS	
4	30.40	30.54	0.14	50	04490	I	MUDSTONE	CARB.DK.GY.SLD SPOIL APPEARANCE.COALY.
4	30.54	30.66	0.12	51	04490	I	COAL	C-4.BRKN HARD PIECES & POWDER.
4	30.66	32.92	2.26	53	04490	I	COAL LOSS	
5	32.92	33.21	0.29	56	04490	I	COAL	C-2.VBRKN POWDERED IN PLACES.
5	33.21	33.47	0.26	56	04490	I	COAL	C-2.PWRD
5	33.47	33.52	0.05	57	04490	I	COAL	C-3.SLD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
5	33.52	33.64	0.12	57	04490	I	MUDSTONE	SLTY.M.GY.SLD FAIRLY SOFT.
5	33.64	33.70	0.06	57	04490	I	COAL	C-3.BRKN
5	33.70	34.05	0.35	57	04490	I	COAL LOSS	
5	34.05	34.19	0.14	58	04490	I	MUDSTONE	CARB.M-DK.GY.SLD
5	34.19	34.27	0.08	58	04490	I	COAL	C-2.PWRD
5	34.27	34.39	0.12	58	04490	I	COAL	C-2.VBRKN
5	34.39	34.47	0.08	58	04490	I	COAL	C-3.PWRD SPOIL APPEARANCE.
5	34.47	34.49	0.02	59	04490	I	COAL	C-3.PWRD SPOIL APPEARANCE.
5	34.49	34.62	0.13	59	04490	I	COAL	C-2.VBRKN POWDERED IN PLACES.
5	34.62	37.90	3.28	62	04490	I	COAL LOSS	
6	37.90	38.08	0.18	66	04490	I	COAL	C-2.VBRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
6	38.08	38.11	0.03	66	04490	I	COAL	C-6 BONE COAL.
6	38.11	38.15	0.04	66	04490	I	COAL	C-2.BRKN
6	38.15	38.55	0.40	66	04490	I	COAL	C-2.VBRKN SHEARED IN PLACES. DIFFICULT TO DETERMINE GRADE.
6	38.55	39.71	1.16	68	04490	I	COAL LOSS	
6	39.71	39.87	0.16	69	04490	I	ROCK LOSS	
6	39.87	40.01	0.14	70	04490	I	COAL LOSS	
6	40.01	40.09	0.08	70	04490	I	ROCK LOSS	
6	40.09	40.22	0.13	70	04490	I	COAL	C-2.SHRD
6	40.22	40.38	0.16	70	04490	I	COAL	C-2.PWRD SHEARED. DIFFICULT TO DETERMINE GRADE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
6	40.38	40.44	0.06	71	04490	I	COAL	C-4.PWRD DIFFICULT TO DETERMINE GRADE.
6	40.44	40.54	0.10	71	04490	I	COAL	C-2.BRKN DIFFICULT TO DETERMINE GRADE.
6	40.54	40.74	0.20	71	04490	I	COAL LOSS	
6	40.74	40.92	0.18	72	04490	I	ROCK LOSS	
6	40.92	41.27	0.35	72	04490	I	COAL LOSS	
6	41.27	41.50	0.23	73	04490	I	COAL	C-2.PWRD DIFFICULT TO DETERMINE GRADE.
6	41.50	41.60	0.10	73	04490	I	COAL LOSS	
6	41.60	41.77	0.17	73	04490	I	ROCK LOSS	
7	41.77	42.43	0.66	74	04490	I	COAL	C-2.PWRD DIFFICULT TO DETERMINE GRADE.
7	42.43	43.83	1.40	76	04491		MUDSTONE	DK.GY.LAM.BRKN SLIGHTLY COALY. ABUNDANT PLANT FOSSILS DECREASE INABUNDANCE DOWNWARD, NEAR BLACK. VERY RARE COALY LENSES. UPPER 25 CM SAMPLED.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
8	43.83	44.14	0.31	78			MUDSTONE	SLTY,DK.GY,LAM,BRKN FEW PLANT FOSSILS.GRADATIONAL FROM ABOV E.BECOMES SILTIER WITH DEPTH.
8	44.14	45.77	1.63	*80			SILTSTONE	SSY,M-DK.GY,LAM,BIOTR,BRKN GRADATIONAL FROM ABOVE. SANDY AND SILTI ER. MORE DISTINCTLY LAMINATED,LESS MUD WITH DEPTH.INTERVAL BETWEEN MUD LAMINAE INCREASES IN WIDTH WITH DEPTH. SSD.
9	45.77	47.22	1.45	*85			SANDSTONE	SLTY,FG,M,GY,LAM,BIOTR,BRKN FEW DK GY MUDST LAMINAE ARE BIOTURBATED , TOPS UP. BECOMING MG WITH DEPTH. SSD.
9	47.22	47.74	0.52	*75			SANDSTONE	MG,M,GY,VTHNB,SSD,BRKN RARE V THIN MUDST BEDS.
10	47.74	49.69	1.95	*78			SANDSTONE	SLTY,M,GY,VTHNB,SSD,VBRKN SIMILAR TO ROCK TYPE ABOVE BUT MORE V T HIN MUD BEDS AND LENSES WITH DEPTH.
11	49.69	49.78	0.09	77			SANDSTONE	SLTY,M,GY,VTHNB,SSD,VBRKN SAME AS ROCK TYPE ABOVE.
11	49.78	50.28	0.50	*77			MUDSTONE	SLTY,DK,GY,LAM,SSD,BRKN M-DK GY SLTST LAMINAE IN DK GY SLTY MUD ST.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
11	50.28	51.61	1.33	78			MUDSTONE	SLTY,DK.GY,LAM,BRKN SIMILAR TO ABOVE ROCK TYPE.MORE MASSIVE WITH DEPTHAND FEWER SILTY LAMINAE ONE. 3 CM ZONE OF QTZ CARB VEINS PARALLEL TO BEDDING.
12	51.61	52.80	1.19	*80			MUDSTONE	DK.GY,LAM,SSD,VBRKN RARE SILTY LAMINAE.BECOMES ALMOST MASSI VE WITH DEPTH.RARE PLANT FOSSILS IN MAS SIVE PART.20 CM ABOVE BASE IS A VSHRD P ART 25 CM WIDE.
12	52.80	53.02	0.22	81			SANDSTONE	SLTY,FG,M-DK.GY,LAM,SSD GRADATIONAL UPPER CONTACT OVER 10 CM BE TWEEN INTERBEDDED SS AND MDST. BECOMES MORE MASSIVE WITH DEPTH.
12	53.02	53.33	0.31	82			ROCK LOSS	
12	53.33	53.80	0.47	82			SANDSTONE	FG,M,GY,VTHNB,BIOTR FEW BIOTURBATED V THIN SILTY BEDS.
13	53.80	54.74	0.94	83			SANDSTONE	FG,M,GY,VTHNB,BIOTR,VBRKN SAME AS ABOVE ROCK TYPE. APPROX 0.45 M IN MIDDLE IS VERY SHEARED.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
13	54.74	55.77	1.03	*85			MUDSTONE	SSY.M-DK.GY.LAM.BIOTR.BRKN FEW FG SANDY OR SILTY LAMINAE IN DK GY MUDST. MINOR PLANT FRAGMENTS. SSD.
13	55.77	56.41	0.64	80			MUDSTONE	SLTY.M-DK.GY.LAM.BIOTR.BRKN SIMILAR TO ABOVE ROCK TYPE BUT LAMINAE ARE MORE SILTY AND LESS SANDY. SSD.
13	56.41	57.71	1.30	*75			MUDSTONE	SLTY.M-DK.GY.LAM.BIOTR.BRKN SAME AS ROCK TYPE ABOVE. SSD.
15	57.71	59.51	1.80	82			MUDSTONE	SLTY.M-DK.GY.LAM.BIOTR.VBRKN VBRKN TO OCCASIONALLY SHEARED. FEW QTZ CARB VEINS.SSD.
15	59.51	59.64	0.13	86			SANDSTONE	CG.LT-M.GY.MAS.SLD
16	59.64	60.19	0.55	*87			SANDSTONE	SLTY.CG.VPR.LT-M.GY.VTHNB.BIOTR.SLD CG SS WITH RARE MUD INTERBEDS. FINER GR AINED IN MIDDLE 0.15M. SHARP LOWER CONT ACT.
16	60.19	60.89	0.70	*87			SANDSTONE	SLTY.MG.VPR.M.GY.VTHNB.SSD.SLD MOSTLY MG SS, FEW MUDST INTERBEDS, AND CG SS INTERBEDS.V RARE ROUNDED MUDST RI P UP CLASTS (1-2 CM).

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
16	60.89	61.46	0.57	84			SANDSTONE	CG.LT-M.GY.VBRKN ONE 3CM MUDSTONE INTERBED.NUMEROUS ANGU LAR RIP UP CLASTS. MANY QTZ CARB VEINLE TS.
16	61.46	61.66	0.20	*82			MUDSTONE	SLTY.DK.GY.LAM.BRKN RARE SLTY M GY LAMINAE IN DK GREY MUDST ONE.
17	61.66	62.35	0.69	82			MUDSTONE	SLTY.DK.GY.LAM.BRKN SAME ROCK TYPE AS ABOVE. SILTY LAMINAE AND LENSES AND RARE PLANT FRAGS.
17	62.35	62.75	0.40	*82			SANDSTONE	MG.LT-M.GY.THNB.SLD MANY BIVALVES (1/2 SHELLS RANDOMLY ORIE NTED).
17	62.75	62.78	0.03	*82			SANDSTONE	SLTY.VFG.M.GY.LAM.SSD.SLD FEW DK GY SLTST LAMINAE. TOPS UP.
17	62.78	62.88	0.10	82			SANDSTONE	SLTY.VFG.M.GY.LAM.SLD SAME ROCK TYPE AS ABOVE.
17	62.88	62.98	0.10	82			SANDSTONE	CG.LT.GY.THNB.SLD COARSER DOWN HOLE. SHARP UPPER AND LOWE R CONTACTS.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
17	62.98	63.32	0.34	82			SANDSTONE	SLTY.VFG.M-DK.GY.LAM.SSD.BRKN INTERLAMINATED VFG SS AND MUDSTONE.
17	63.32	63.60	0.28	82			SANDSTONE	SLTY.CG.VPR.LT.GY.VTHN8.BRKN THINLY INTERBEDDED DK GY MUDSTONE IN CG SS.
17	63.60	63.67	0.07	82			SANDSTONE	SLTY.VFG.VPR.M-DK.GY.LAM.SLD
18	63.67	64.38	0.71	82			SANDSTONE	SLTY.VFG.VPR.M-DK.GY.LAM.SSD.BRKN TOPS UP. V. FEW QTZ CARB VEINS MOSTLY P ARALLEL TO BEDDING.
18	64.38	65.63	1.25	83			SANDSTONE	FG.PR.M.GY.VTHNB.BIOTR.SLD FAIRLY MASSIVE. V. FEW SILTY INTERBEDS, SOME OF WHICH ARE VERY BIOTURBATED.
19	65.63	65.75	0.12	83			SANDSTONE	FG.PR.M.GY.VTHNB.BIOTR.BRKN SAME ROCK TYPE AS ABOVE.
19	65.75	66.49	0.74	83			SANDSTONE	SLTY.VFG.VPR.M-DK.GY.LAM.BIOTR.BRKN TOPS UP. SSD.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
19	66.49	67.70	1.21	*83			SANDSTONE	SLTY.FG.M.GY.THNB.BIOTR.BRKN INTERBEDDED DK GY MUDST (6-22 CM) AND M -LT GY FG SS. IN SOME PLACES SS IS BIOT URBATED. SHARP CONTACTS BETWEEN SS AND MUDST.
19	67.70	67.88	0.18	78			ROCK LOSS	
20	67.88	68.80	0.92	73			SANDSTONE	SLTY.FG.M.GY.LAM.BIOTR.SLD SSD.
20	68.80	68.92	0.12	69			SANDSTONE	SLTY.FG.M.GY.LAM.BIOTR.SLD SAME ROCK TYPE AS ABOVE.LOWER CONTACT I S SHEARED. SSD.
20	68.92	69.07	0.15	68			SANDSTONE	CG.LT-M.GY.VTHNB.SHRD LOWER CONTACT IS 5 CM BRECCIA ZONE.
20	69.07	69.29	0.22	67			SANDSTONE	SLTY.FG.M.GY.LAM.SSD LOWER CONTACT SLICKENSIDED.
20	69.29	69.77	0.48	64			SANDSTONE	MG.VPR.M.GY.VTHNB.SHRD V RARE DK GY MUDST LAMINAE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
21	69.77	70.38	0.61	*60			SANDSTONE	MG.VPR.M.GY.VTHNB.BRKN SAME AS ABOVE ROCK TYPE BUT FEWER SHEAR ED SURFACES.
21	70.38	70.55	0.17	59			ROCK LOSS	
21	70.55	71.36	0.81	58			SANDSTONE	SLTY.FG.M.GY.VTHNB.SSD.BRKN VTHNB TO LAM SILTY INTERBEDDED SANDSTON E WITH SHARP BEDDING CONTACTS. HIGH CON TRAST BANDING.
21	71.36	71.85	0.49	57			SILTSTONE	SSY.M-DK.GY.LAM.BIOTR.SLD SANDY SILTSTONE. QUITE BIOTURBATED. BEC OMES SANDIER AND LIGHTER GY WITH DEPTH.
22	71.85	72.03	0.18	57			SANDSTONE	SLTY.LT-M.GY.LAM.SSD.SLD GRADATIONAL FROM ROCK TYPE ABOVE.SHARP LOWER CONTACT.
22	72.03	72.21	0.18	56			MUDSTONE	SLTY.DK.GY.LAM.SLD
22	72.21	72.57	0.36	56			ROCK LOSS	
22	72.57	72.99	0.42	55			SANDSTONE	SLTY.M.GY.VSHRD SS BRECCIA.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
22	72.99	73.87	0.88	54			SANDSTONE	SLTY.DK.GY.LAM.SLD V FEW SILTY LAM IN DK GY MUDST. PLANT F OSSILS: NILSSONIA TENUICAULIS AND A VAR IETY OF CLADOPHLEBIS (?).
22	73.87	74.24	0.37	*53			SANDSTONE	SLTY.VFG.M-DK.GY.LAM.BIOTR.SLD GRADES RAPIDLY FROM ROCK TYPE ABOVE.MAN Y SANDY LENSES. SSD.
23	74.24	74.52	0.28	*47			SANDSTONE	SLTY.VFG.M.GY.LAM.BIOTR.SLD VERY BIOTURBATED.SAME ROCK TYPE AS ABOV E.
23	74.52	74.91	0.39	48			MUDSTONE	DK.GY.LAM.SLD PLANT FRAGMENTS ONLY.FAINTLY LAMINATED.
23	74.91	75.11	0.20	49			MUDSTONE	SLTY.M-DK.GY.LAM.SLD DISTINCTLY LAMINATED.PLANT FRAGMENTS.
23	75.11	76.13	1.02	50			MUDSTONE	DK.GY.LAM.BRKN TOP IS VBRKN. FEW TWIST OFFS. FAINTLY L AMINATED. INATED. PLANT FRAGMENTS ON BE DDING PLANES.
23	76.13	76.46	0.33	52			ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
24	76.46	77.16	0.70	53			MUDSTONE	DK.GY.MAS.BRKN LOCALLY SHEARED. SIMILAR TO ROCK TYPE A BOVE BUT MASSIVE. VERY DK GY.
24	77.16	78.50	1.34	56	04492		MUDSTONE	DK.GY.MAS.BRKN SIMILAR TO ROCK TYPE ABOVE. BECOMES COA LY WITH DEPTH. SEVERAL COALY LENSES 1-5 MM. PLANT FRAGS ABUNDANT. BOXES 25-28 CONTAIN COAL. H SEAM. LOWER 25 CMSAMPLE D.
25	78.50	78.61	0.11	58	04493	H	COAL	C-4.SLD MIXTURE OF BONE COAL & YITRAIN BANDS.
25	78.61	78.76	0.15	58	04493	H	COAL	C-3.SLD
25	78.76	78.88	0.12	59	04493	H	MUDSTONE	CARB.M-DK.GY.SLD LISTRIC.
25	78.88	79.80	0.92	60	04493	H	COAL	C-2.BRKN
25	79.80	79.97	0.17	62	04493	H	MUDSTONE	CARB.M-DK.GY.BRKN
25	79.97	80.03	0.06	62	04493	H	COAL	C-6.SLD BONE COAL.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
25	80.03	80.33	0.30	62	04493	H	COAL	C-2.BRKN
26	80.33	80.51	0.18	63	04493	H	COAL	C-2.BRKN
26	80.51	80.56	0.05	63	04493	H	MUDSTONE	CARB.DK.GY.SLD COALY.
26	80.56	80.70	0.14	63	04493	H	COAL	C-3.BRKN
26	80.70	80.77	0.07	64	04493	H	MUDSTONE	CARB.DK.GY.SHRD LISTRIC SURFACES.
26	80.77	82.02	1.25	65	04493	H	COAL	C-3.VBRKN MUCH OF SECTION POWDERED AND HIGHLY SHE ARED. DIFFICULT TO DETERMINE GRADE.
26	82.02	82.13	0.11	67	04493	H	MUDSTONE	CARB.DK.GY.VBRKN COALY STRINGERS THROUGHOUT.
27	82.13	82.34	0.21	68	04493	H	COAL	C-3.BRKN
27	82.34	82.55	0.21	68	04493	H	COAL	C-2.BRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
27	82.55	82.69	0.14	69	04493	H	MUDSTONE	SLTY.M.GY.SLD
27	82.69	82.78	0.09	69	04494	H	COAL	C-4.SLD
27	82.78	83.03	0.25	69	04494	H	COAL	C-2.BRKN
27	83.03	83.07	0.04	70	04494	H	COAL	C-2.BRKN
27	83.07	83.25	0.18	70	04494	H	COAL LOSS	
27	83.25	83.33	0.08	70	04494	H	ROCK LOSS	
27	83.33	83.40	0.07	71	04494	H	MUDSTONE	SLTY.M.GY.BRKN
27	83.40	83.48	0.08	71	04494	H	COAL	C-3.SLD
27	83.48	83.54	0.06	71	04494	H	COAL LOSS	
27	83.54	84.01	0.47	72	04494	H	COAL	C-2.BRKN
27	84.01	84.02	0.01	72	04494	H	MUDSTONE	SLTY.M.GY.SLD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
27	84.02	84.29	0.27	73	04494	H	COAL	C-2.BRKN
28	84.29	84.46	0.17	73	04494	H	COAL	C-2.SLD
28	84.46	84.57	0.11	74	04494	H	MUDSTONE	CARB.M-DK.GY.BRKN
28	84.57	84.95	0.38	74	04494	H	COAL	C-2.BRKN
28	84.95	86.27	1.32	77	04495		MUDSTONE	SLTY.M-DK.GY.LAM.BRKN GRADATIONAL FROM CARB. AT TOP TO SILTY AT BASE.PYRITE ABOUT 1 METER INTO UNIT. COALY PLANT FRAGS IN PLACES.UPPER 25 CM SAMPLED.
28	86.27	87.52	1.25	*80			MUDSTONE	SLTY.DK.GY.LAM.BRKN TOP 0.62 M OF BOX 28 IS COAL. VERY DARK GREY,COALY,PYRITIC MUDSTONE WITH FEW S ILTY LAMINAE. LOWEST .25 CM IS VERY BRO KEN TO SHEARED. 7 CM PYRITE IN MIDDLE. MANY COALY LAYERS .1-2 CM. AT TOP AND F EWERWITH DEPTH.
29	87.52	87.61	0.09	70			SILTSTONE	M-DK.GY.SLD FEW COALY LENSES.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86006

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
29	87.61	88.29	0.68	*65			MUDSTONE	SLTY.M-DK.GY.LAM.BRKN GRADATIONAL UPPER & LOWER CONTACTS, RAR E V. SMALL PLANT FRAGMENTS AND COALY BI TS.
29	88.29	89.55	1.26	65			MUDSTONE	DK.GY.LAM.BRKN FEW COALY LENSES,1-3 MM, RARE SHEARED S URFACE.FAIRLY LAMINATED AT THE TOP AND BECOMING MASSIVE AT DEPTH.
30	89.55	90.20	0.65	65			MUDSTONE	DK.GY.LAM.BRKN SAME ROCK TYPE AS ABOVE.
30	90.20	90.54	0.34	65			SANDSTONE	FG.LT.GY.LAM.SLD FEW SILTY LAMINAE.
30	90.54	91.52	0.98	65			SANDSTONE	FG.LT.GY.LAM.SLD SAME ROCK TYPE AS ABOVE.
31	91.52	92.40	0.88	65			SANDSTONE	FG.LT.GY.LAM.SLD SAME ROCK TYPE AS ABOVE.12 CM ZONE OF A BUNDANT RIPUP CLASTS IN MIDDLE.TOTAL DE PTH = 91.74 (DRILLER'SMARKER).

* DENOTES MEASURED BCA
NEWPAGE

FORM 4001

GULF CANADA CORPORATION

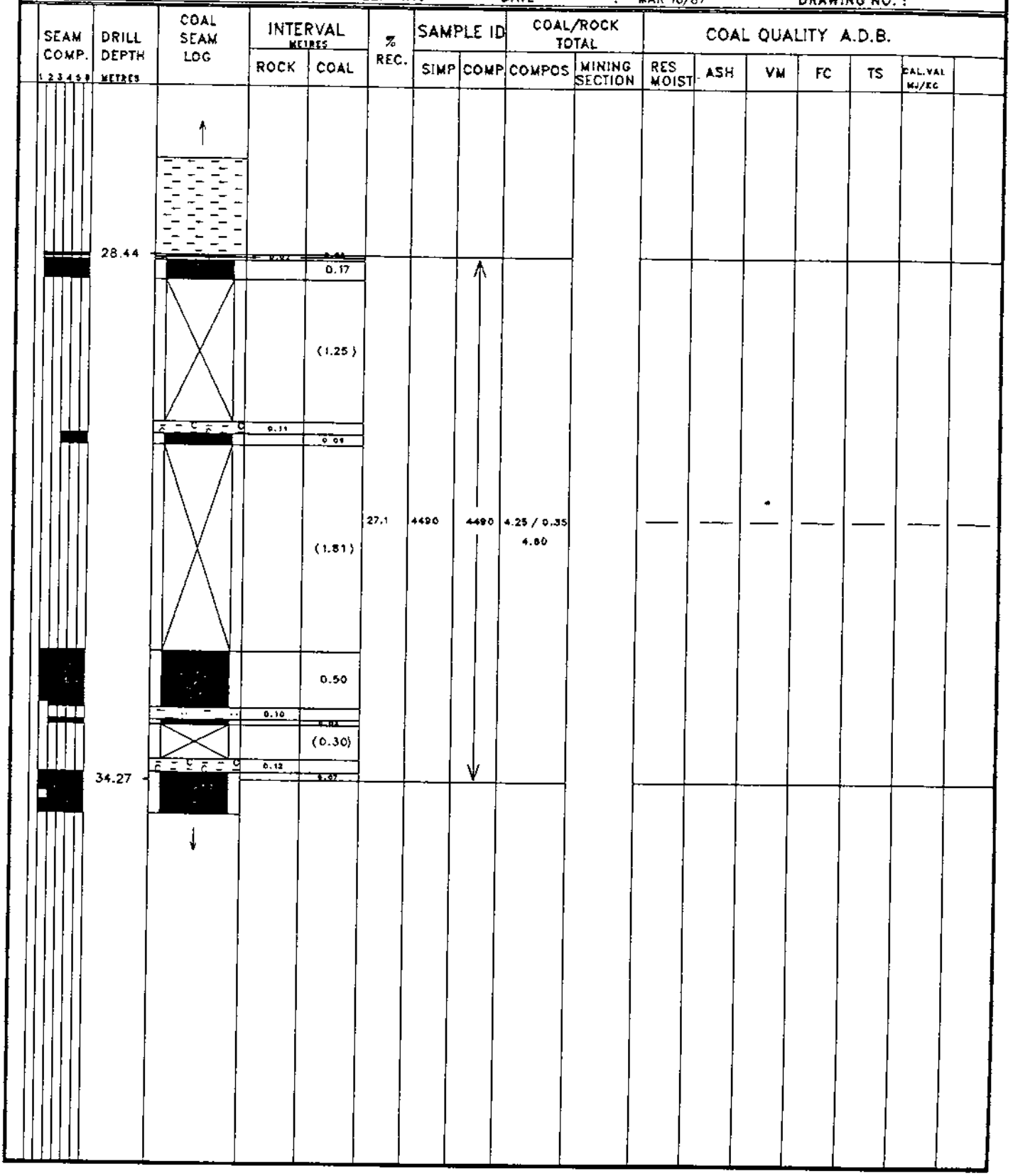
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86006 SEAM : 1 INTERVAL(M) : 28.44 – 34.27 ELEVATION(M) : 1592.6

GEOLOGIST : LOVE SCALE: 1:40 DATE : MAR 10/87 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	28.44			0.17											
				(1.25)											
			0.11	0.04											
				(1.81)	27.1	4490	4490	4.25 / 0.35 4.60		—	—	—	—	—	—
				0.50											
			0.10												
				(0.30)											
	34.27		0.13												

GULF CANADA CORPORATION

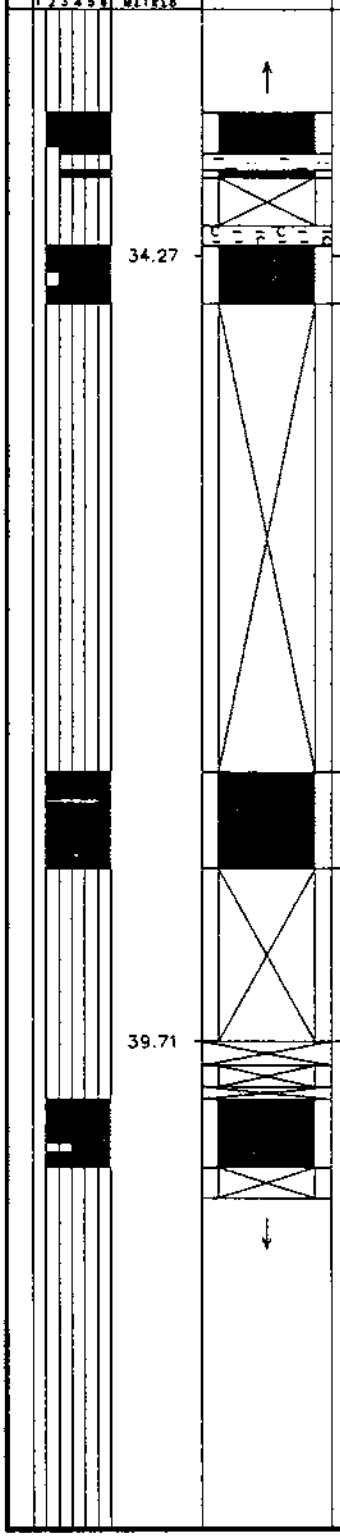
SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86006 SEAM : 1 INTERVAL(M) : 34.27 - 39.71 ELEVATION(M) : 1592.6

GEOLOGIST : LOVE SCALE: 1:40 DATE : MAR 10/87 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	34.27			0.30											
				(2.80)											
					18.5	4480	4490	4.87 / 0.00		—	—	—	—	—	—
								4.87							
				0.60											
				(1.08)											
	39.71														

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86006 SEAM : 1 INTERVAL(M) : 39.71 - 42.43 ELEVATION(M) : 1582.6

GEOLOGIST : LOVE SCALE: 1:40 DATE : MAR 10/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	39.71		(0.18)													
				(0.13)												
			(0.06)													
				0.42												
				(0.19)												
			(0.17)													
				(0.33)	49.4	4490	4490	2.03/0.55		—	—	—	—	—	—	—
								2.58								
				0.22												
				(0.18)												
			(0.16)													
				0.64												
	42.43															

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86006 SEAM : H INTERVAL(M) : 78.50 – 84.95 ELEVATION(M) : 1592.6

GEOLOGIST : LOVE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	78.50			0.22												
			0.10													
				0.80												
			0.18													
				0.48												
			0.15		100.0	4493	11	3.15 / 0.59		0.60	40.98	6.08	50.14	0.34	18.92	—
			0.83					3.74								
				1.14												
			0.10													
				0.39												
	82.69		0.13													
				0.36												
				(0.17)												
			0.03													
			0.87													
				0.09												
				(0.03)												
				0.45	88.0	4494	12	1.89 / 0.26		0.87	32.80	8.19	58.34	0.36	21.98	—
			0.41					2.15								
				0.42												
			0.11													
				0.37												
	84.95															

GULF CANADA CORPORATION
COAL DIVISION
KLAPPAN PROJECT
STRATIGRAPHIC LOG
KPN LR DDH86006

723

GEOLOGIST : LOVE	DATE : MAR 11/87	DRAWING NO. :

SCALE : 1:200 1:40

NORTHING: 6244657.0 N
EASTING: 506566.2 E

INCLINATION: 80.0°
BEARING: 355.0°

LITHOLOGIC SYMBOLS

SANDSTONE	BENTONITE
SILTSTONE	BRECCIA
COAL	CARBONACEOUS
OVERBURDEN	QUARTZ
MUDSTONE, CLAYSTONE	PYRITE
TUFF	FERRUGINOUS
LIMESTONE	CONGLOMERATE
CORE LOSS	FOSSIL BED

SEAM DETAIL

DRILLED DEPTH [M]	BCA [DEG]	TRUE DEPTH [M] 1 : 200
10		10
20	45	20
	45	
30		
		SEAM I
40		30
	80	
	75	
50	77	40
	85	
60	87	50
	82	
	83	
70	60	60
	53	
80		
		SEAM H
	80	70
90		

TOTAL: 92.40 TOTAL: 78.70

DRILLED DEPTH [M] 1 : 40	ROCK	COAL	TRUE THICKNESS [M]
28.44			
42.43	0.91	11.15	12.06
78.50			
84.95	0.85	5.04	5.89

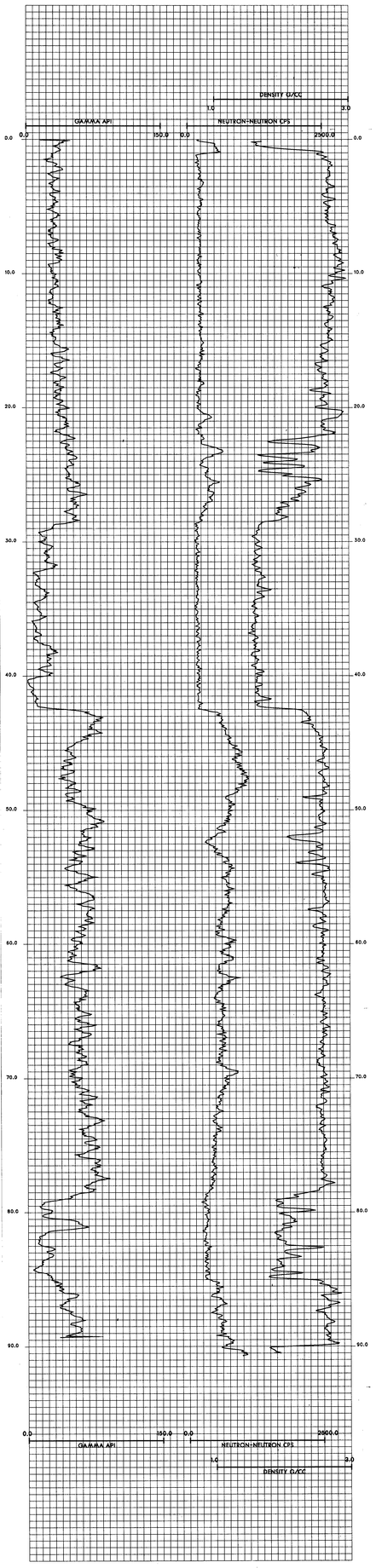
Gulf Canada Corporation
Coal Division
Geophysical Log

723

Datasource: KPNLRDDH86006	Province: BC Northing: 6344960.00 Lat: 571458
Log Date: 86-08-26	Zone: 9 Easting: 506566.00 Long: 1285328
Company: CENTURY	Measuring Point: Elevation: 1592.6
Geologist: LOVE	
Scale: 1 to 100.0	Comments: 1. LOGGED THROUGH THE RODS 2.
Depth Range: 0.0 to 96.0	
True Thickness: NO	

Logs Plotted:

Description	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9055A	IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE



KPNLRDDH86007

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH86007 DATE - 02/13/87

- H I S T O R Y -

START DATE - 26/08/86
END DATE - 27/08/86

CONTRACTOR - J.T. THOMAS
GEOLOGIST - BARKER
OPERATOR - G.C.C.
SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE. THERMISTOR AT 7 5 M.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1568.88
ZONE - 9
NORTHING - 6344780.00
EASTING - 507445.50

LICENCE/LEASE NUMBER -

LATITUDE - 571453
LONGITUDE - 1285236

- O R I E N T A T I O N -

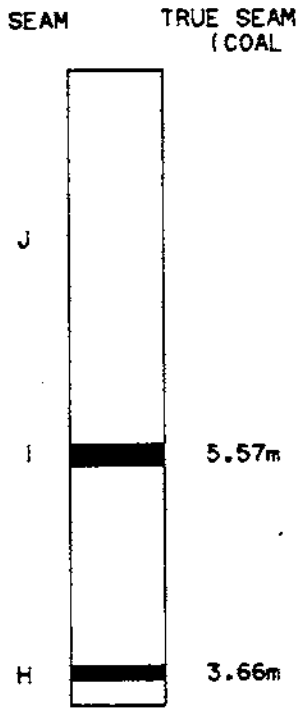
LENGTH - 168.55
INCLINATION - 90.0
AZIMUTH - 0.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ - N

CASING DEPTH(M) - 16.76
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE



NOTE:

SCHEMATIC PROFILE.
NO THICKNESSES SHOWN
FOR SEAMS CONTAINING
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

FIGURE

MOUNT KLAPPAN ANTHRACITE PROJECT

1986 DIAMOND DRILL HOLES
DDHB6007

GULF CANADA CORPORATION
11/03/87
KLAP:[205057]870063007.LOG

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	16.76	16.76	77			OVERBURDEN	CASING.
1	16.76	18.80	2.04	*77			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.XBDG.BRKN FINELY LAMINATED SS.
2	18.80	19.62	0.82	77			SANDSTONE	FG.PR.LT.GY.VTHNB.WRMBU.BRKN LESS SILT THAN ABOVE. WRMBURS 3MM ACROS S IN SILT LAYERS.
2	19.62	20.42	0.80	76			ROCK LOSS	
2	20.42	21.11	0.69	76			SANDSTONE	FG.PR.LT.GY.VTHNB.VBRKN LITH AS ABOVE WITH LESS SILT.
3	21.11	22.78	1.67	76			SANDSTONE	FG.MOD.LT.GY.MAS.VBRKN MASSIVE CLEAN SANDSTONE SUCH AS IS ABOV E COASTER ZONE.
4	22.78	22.98	0.20	76			SANDSTONE	FG.MOD.LT.GY.MAS.VBRKN AS ABOVE.
4	22.98	23.47	0.49	75			ROCK LOSS	
4	23.47	24.98	1.51	75			SANDSTONE	FG.MOD.LT.GY.MAS.VBRKN AS ABOVE.
5	24.98	26.10	1.12	75			SANDSTONE	FG.MOD.LT.GY.MAS.BRKN AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
5	26.10	26.23	0.13	75			ROCK LOSS	
5	26.23	26.97	0.74	74			SANDSTONE	FG.MOD.LT.GY.MAS.BRKN AS ABOVE. SLIGHTLY FINER DOWNWARD.
6	26.97	27.16	0.19	74			SANDSTONE	FG.LT.GY.MAS.SLD AS ABOVE. SHARP LOWER CONTACT.
6	27.16	28.82	1.66	*74			SILTSTONE	SSY.M.GY.LAM.BRKN FINELY LAMINATED SILST. LAYERS GRADE FR OM FINE MUDTO FG SS.
7	28.82	30.70	1.88	74			SILTSTONE	SSY.M.GY.LAM.SLD LITH AS ABOVE.
8	30.70	31.75	1.05	75			SILTSTONE	M.GY.LAM.BRKN FINER GRAINED THAN ABOVE. NO SAND.APPRO ACHING COASTER LITHOLOGY.
8	31.75	31.83	0.08	*75			SILTSTONE	LT.GY.LAM.BRKN AS ABOVE. ALMOST COASTER LITH, BUT NOT FISSILE.
9	31.83	32.71	0.88	75			SILTSTONE	M.GY.LAM.BRKN AS ABOVE.
9	32.71	33.72	1.01	74			SILTSTONE	M.GY.LAM.BRKN AS ABOVE BUT SLIGHTLY FINER GRAINED.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
9	33.72	34.47	0.75	74			ROCK LOSS	
10	34.47	35.40	0.93	74			MUDSTONE	DK.GY.LAM.VBRKN COASTER LITHOLOGY AS ABOVE BUT FINER GR AINED. CLEAVAGE IS ALMOST PERPENDICULAR TO BEDDING.
10	35.40	36.23	0.83	74			MUDSTONE	DK.GY.LAM.VBRKN AS ABOVE.
11	36.23	38.09	1.86	*73			MUDSTONE	DK.GY.LAM.VBRKN AS ABOVE. COASTER LITHOLOGY BUT FAINTER LAMINAE. MORE MASSIVE DOWNWARD.
12	38.09	38.32	0.23	71			MUDSTONE	DK.GY.MAS.SLD V. FINE GRAINED, NOT LAMINATED.
12	38.32	40.03	1.71	*70			MUDSTONE	SLTY.DK.GY.VTHNB.BRKN GRADED SILT & MUD BANDS THROUGHOUT. SIM ILAR TO COASTERS,BUT WIDER LAMINAE.
13	40.03	41.25	1.22	63			MUDSTONE	DK.GY.LAM.SLD FINER THAN ABOVE. MORE LIKE COASTER LIT HOLOGY.
13	41.25	41.90	0.65	58			MUDSTONE	DK.GY.LAM.SLD LITH AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
14	41.90	43.17	1.27	*53			MUDSTONE	DK.GY.LAM.VBRKN SIMILAR TO COASTER LITHOLOGY, BUT LAMIN AE ARE VERYFAINT AND FARTHER APART.CLEA VAGE ALMOST PERPENDIC ULAR TO BEDDING.
14	43.17	43.55	0.38	54			MUDSTONE	DK.GY.LAM.VBRKN LITH AS ABOVE.
15	43.55	43.80	0.25	55			ROCK LOSS	
15	43.80	44.18	0.38	56			MUDSTONE	DK.GY.LAM.VBRKN LITH AS ABOVE. DOMINANT CLEAVAGE IS NOW PARALLEL TO BEDDING. COASTER ZONE.
15	44.18	44.72	0.54	56			MUDSTONE	CARB.BLK.MAS.VBRKN POORLY CONSOLIDATED,MASSIVE,SOFT,CARB M UDST.
15	44.72	45.39	0.67	57	J		MUDSTONE	CARB.BLK.MAS.VBRKN VERY CARB WITH SHEARED COALY BITS.
16	45.39	46.86	1.47	59			MUDSTONE	CARB.BLK.MAS.VBRKN MASSIVE MUDST. 1 - 2 MM COAL STRINGERS THROUGHOUT.
16	46.86	46.99	0.13	61			MUDSTONE	CARB.BLK.MAS.VBRKN AS ABOVE.
16	46.99	47.30	0.31	61			ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
17	47.30	48.96	1.66	63			MUDSTONE	SLTY.DK.GY.VTHNB.VBRKN BANDS RANGING FROM MUD TO VFG SAND. QTZ VEINING THROUGHOUT. SLICKENSIDES. VERY FINELY LAMINATED AT BASE.
18	48.96	49.91	0.95	*65			MUDSTONE	SLTY.DK.GY.LAM.SSD.SLD VERY FAINT BEDDING. FAIRLY UNIFORM GRAIN SIZE THROUGHOUT.
18	49.91	50.96	1.05	63			MUDSTONE	SLTY.DK.GY.LAM.SSD.SLD LITH AS ABOVE.
19	50.96	52.22	1.26	60			MUDSTONE	SLTY.DK.GY.MAS.VBRKN UNIFORM. MASSIVE SLICKENSIDES.
17	52.22	52.35	0.13	59			ROCK LOSS	
19	52.35	52.75	0.40	58			SILTSTONE	CLYY.DK.GY.MAS.SLD SLIGHTLY COARSER THAN ABOVE WITH A SLIGHTLY MOTTLED TEXTURE.
20	52.75	54.57	1.82	*56			SILTSTONE	SSY.DK.GY.LAM.BRKN MOTTLED TEXTURE THROUGHOUT. VFG SAND MIXED IN.
21	54.57	54.68	0.11	51			MUDSTONE	DK.GY.MAS.SLD FRACTURE FILL - CROSS CUTS BEDDING. INDURATED CLAY.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
21	54.68	55.27	0.59	50			SANDSTONE	SLTY.M.GY.LAM.VBRKN SILTY LAMINAE THROUGHOUT.
21	55.27	55.50	0.23	48			ROCK LOSS	
21	55.50	56.45	0.95	*45			SANDSTONE	SLTY.M.GY.LAM.SSD.VBRKN AS ABOVE. QTZ VEINING. SOME BRECCIATION (FRACTURE ZONE ?) SLICKENSIDES.
22	56.45	58.40	1.95	*71			SANDSTONE	FG.MOD.LT.GY.MAS.XBDG.SLD OCC WISPY SILT LAMINAE, DECREASING DOWNWARD. MASSIVE OVERALL.
23	58.40	58.71	0.31	70			SANDSTONE	FG.WEL.LT.GY.MAS.SLD MODERATE QTZ VEINING.
23	58.71	60.41	1.70	69			SANDSTONE	FG.WEL.LT.GY.MAS.XBDG.SLD CLEAN SANDSTONE AS ABOVE, WITH RARE WISPY SILT STRINGERS. INTENSE QTZ VEINING - VEINS 2-10 CM WIDE.
24	60.41	61.83	1.42	68			SANDSTONE	FG.WEL.LT.GY.MAS.VBRKN AS ABOVE WITH INTENSE QTZ VEINING - VEINS 2-5 CM WIDE.
24	61.83	62.25	0.42	67			SANDSTONE	FG.WEL.LT.GY.MAS.SLD AS ABOVE. NO QTZ.

* DENOTES MEASURED BCA

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 7

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
25	62.25	63.72	1.47	67			SANDSTONE	FG.MEL.LT.GY.MAS.SLD AS ABOVE - NO QTZ. RARE ANGULAR SILTST RIPUP CLASTS. SHARP LOWER CONTACT.
25	63.72	64.10	0.38	66			SILTSTONE	M.GY.LAM.SHRD FINELY LAMINATED. INTENSE QTZ VEINING - VEINS 3-8 CM WIDE.
26	64.10	64.58	0.48	66			SILTSTONE	M.GY.LAM.VBRKN LITH AS ABOVE. INTENSE QTZ VEINING.
26	64.58	64.88	0.30	65			ROCK LOSS	
26	64.88	66.15	1.27	65			SILTSTONE	M.GY.LAM.SSD.BRKN LITH AS ABOVE. INTENSE QTZ VEINING.
27	66.15	67.86	1.71	63			SILTSTONE	M.GY.LAM.WRMBU.BRKN LITH AS ABOVE.INTENSE QTZ VEINING. 1 CM DIAMETER VERTICAL WORM BURROWS.
28	67.86	69.64	1.78	*62			SILTSTONE	M.GY.LAM.WRMBU.VBRKN LITH AS ABOVE. VERY FINELY LAM'D. QTZ V EINS THROUGHOUT.SLICKENSIDES. SHRD AT B OTTOM OF BOX. TOPS UP.
29	69.64	70.34	0.70	*10			SILTSTONE	M.GY.LAM.VSHRD VERY CONTORTED DUE TO INTENSE SHEARING. FAULT ZONEIN THIS BOX (?)

* DENOTES MEASURED BCA

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 8

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
29	70.34	70.56	0.22	31			ROCK LOSS	
29	70.56	71.42	0.86	*55			SILTSTONE	M.GY.LAM.VSHRD AS ABOVE - INTENSE SHEARING, & VERY CON TORTED. BCA'S 0-55 DEGREES. QTZ VEINING THROUGHOUT BOX.
30	71.42	72.04	0.62	*68			SILTSTONE	M.GY.LAM.VSHRD AS ABOVE. SHARP LOWER CONTACT.
30	72.04	73.46	1.42	67			SANDSTONE	FG.MEL.LT.GY.MAS.BRKN V. UNIFORM MASSIVE SAND.
31	73.46	73.67	0.21	67			SANDSTONE	FG.MEL.LT.GY.MAS.BRKN AS ABOVE.
31	73.67	73.80	0.13	67			SANDSTONE	FG.MEL.LT.GY.MAS.BRKN AS ABOVE. SHARP LOWER CONTACT.
31	73.80	74.69	0.89	66			SANDSTONE	SLTY.VFG.VPR.LT.GY.LAM.BRKN V. FINE SILTY LAMS THROUGHOUT.
31	74.69	74.89	0.20	66			ROCK LOSS	
31	74.89	75.20	0.31	66			SANDSTONE	SLTY.VFG.VPR.LT.GY.LAM.BRKN AS ABOVE.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
32	75.20	77.20	2.00	*65			SANDSTONE	SLTY.VFG.VPR.LT.GY.LAM.WRMBU.SLD AS ABOVE. VERTICAL WRMBURS 5-10 MM IN D IAMETER. TOPS UP.
33	77.20	77.47	0.27	68			SILTSTONE	SSY.M.GY.LAM.WRMBU.SLD MUCH MORE SILT LAMINAE THAN ABOVE.
33	77.47	79.15	1.68	71			SILTSTONE	SSY.M.GY.LAM.WRMBU.SLD AS ABOVE. THOROUGHLY LAMINATED. NUMEROU S WORM BURROWS.
34	79.15	80.49	1.34	*76			SILTSTONE	SSY.M.GY.LAM.WRMBU.SLD LITH AS ABOVE.
34	80.49	81.20	0.71	74			SILTSTONE	SSY.M.GY.LAM.WRMBU.BRKN LITH AS ABOVE.
35	81.20	83.11	1.91	*72			SILTSTONE	M.GY.LAM.WRMBU.SLD LITH AS ABOVE. EXCEPT SLIGHTLY FINER DO WNWARD & LESS BIOTURBATION.
36	83.11	83.29	0.18	73			SILTSTONE	M.GY.LAM.XBDG.SLD LESS BIOTURB THAN ABOVE. XBDG MORE PREV ALENT.
36	83.29	84.97	1.68	74			SILTSTONE	M.GY.LAM.XBDG.SLD AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
37	84.97	86.32	1.35	75			SILTSTONE	M.GY.LAM.BRKN UNIFORM GRADED BEDS THROUGHOUT.
37	86.32	87.03	0.71	*76			SILTSTONE	M.GY.LAM.SLD AS ABOVE. GRADED BEDS.
38	87.03	89.02	1.99	73			SILTSTONE	M.GY.VTHNB.BRKN LAYERING IS FAINTER AND FARTHER APART T HAN ABOVE GRADED BEDS.
39	89.02	89.37	0.35	70			SILTSTONE	M.GY.VTHNB.BRKN LITH AS ABOVE.
39	89.37	91.00	1.63	*68			SILTSTONE	M.GY.LAM.XBDG.BRKN FINER LAMINAE DOWNWARD. XBDG AT BASE.
40	91.00	91.20	0.20	68			SILTSTONE	M.GY.LAM.XBDG.VBRKN FINE MUDDY LAMINAE THROUGHOUT. MUCH XBD G.TOPS UP.
40	91.20	91.70	0.50	67			ROCK LOSS	
40	91.70	93.36	1.66	67			SILTSTONE	M.GY.LAM.XBDG.VBRKN LITH AS ABOVE. XBDG AND GRADED BEDDING THROUGHOUT.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
41	93.36	94.55	1.19	66			SILTSTONE	LT.GY.MAS.XBDG.BRKN EXCELLENT EXAMPLES OF XBDG THROUGHOUT. TYPICAL SILTST ABOVE TUFFITE.
41	94.55	95.39	0.84	66			SILTSTONE	LT.GY.MAS.XBDG.SLD LITH AS ABOVE, GRADING INTO TUFFITE AT BASE.
42	95.39	96.69	1.30	*65			SILTSTONE	CLYY.LT.GY.LAM.XBDG.SLD TUFFITE AS ABOVE. LAMINAE BECOMES UNIFO RM WITH NO XBDG AND BECOMES LESS SILTY DOWNWARD.
42	96.69	96.81	0.12	65			CLAYSTONE	LT.GY.MAS.SLD VERY LIGHT GREY. HARD.
42	96.81	96.97	0.16	65			BENTONITE	LT.GY.MAS.BRKN SOFT BENTONITE CLAY.TYPICAL MARKER ABOV E I SEAM.
42	96.97	97.33	0.36	65			SILTSTONE	CLYY.LT.GY.LAM.SLD SHARP UPPER CONTACT. FINE UNIFORM LAMIN AE.
43	97.33	97.85	0.52	65			SILTSTONE	CLYY.LT-M.GY.LAM.SLD BECOMES MUDDIER NEAR BASE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
43	97.85	98.96	1.11	65	04480		MUDSTONE	CARB.M-DK.GY.LAM.BRKN GRADATIONAL FROM ABOVE. COALY BANDS AND STRINGERS THROUGHOUT. LOWER 25 CM SAMP LED.
43	98.96	99.04	0.08	65	04481	I	COAL	C-6 THIN C-2 BANDS WITHIN.
43	99.04	99.22	0.18	65	04481	I	COAL	C-2.SLD
43	99.22	99.25	0.03	65	04481	I	COAL	C-3.SLD
43	99.25	99.30	0.05	65	04481	I	MUDSTONE	CARB.DK.GY COALY IN PLACES.
43	99.30	99.39	0.09	65	04481	I	COAL LOSS	
43	99.39	99.51	0.12	65	04481	I	COAL	C-2.VBRKN
44	99.51	99.77	0.26	65	04481	I	COAL	C-3.VBRKN SHEARED LISTRIC SURFACES.
44	99.77	99.79	0.02	65	04481	I	MUDSTONE	SLTY.M-DK.GY.SLD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
44	99.79	100.07	0.28	65	04481	I	COAL	C-2.PHRD
44	100.07	100.26	0.19	65	04481	I	COAL	C-2.BRKN
44	100.26	100.37	0.11	65	04481	I	COAL	C-6.SLD BONE COAL.
44	100.37	100.57	0.20	65	04481	I	COAL LOSS	
44	100.57	100.72	0.15	65	04481	I	COAL	C-2.BRKN
44	100.72	100.85	0.13	65	04482	I	MUDSTONE	SLTY.M.GY.SLD
44	100.85	100.89	0.04	65	04482	I	MUDSTONE	CARB.DK.GY.SLD
44	100.89	100.94	0.05	65	04482	I	COAL	C-4.BRKN
44	100.94	101.59	0.65	65	04482	I	COAL	C-2.BRKN
45	101.59	102.57	0.98	65	04482	I	COAL	C-2.VBRKN LISTRIC SURFACES THROUGHOUT.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
45	102.57	102.61	0.04	65	04482	I	MUDSTONE	CARB.DK.GY.SLD COALY.
45	102.61	103.11	0.50	65	04483	I	COAL	C-2.VBRKN LISTRIC SURFACES,ESPECIALLY NEAR BASE O F UNIT.
45	103.11	103.43	0.32	65	04483	I	COAL	C-1
46	103.43	104.87	1.44	65	04483	I	COAL	C-1.BRKN POSSIBLY SOME C-2.
46	104.87	104.99	0.12	65	04483	I	COAL LOSS	
46	104.99	105.11	0.12	65	04483	I	COAL	C-3.SLD SOFT. LOWER 4 CM CONTAINS QTZ.
46	105.11	105.41	0.30	65	04484		MUDSTONE	CARB.DK.GY.SLD ABUNDANT PLANT FRAGMENTS. SOME COALIFIE D.
47	105.41	107.23	1.82	65			MUDSTONE	DK.GY.MAS.BRKN PLANT FOSSILS THROUGHOUT, SOME COALIFIE D.
48	107.23	107.47	0.24	65			MUDSTONE	DK.GY.MAS.VBRKN CRUSHED CORE. LITH AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
48	107.47	108.58	1.11	65			SANDSTONE	FG.MOD.LT.GY.MAS.VBRKN MASSIVE SS. BRECCIATED IN PLACES. MUDST ONE AND SS PIECES IN A SHEARED MATRIX. MINOR QTZ VEINS.
49	108.58	109.38	0.80	65			SANDSTONE	MG.MOD.LT.GY.MAS.VBRKN CRUSHED CORE, ONE 5 CM WIDE QTZ VEIN.
49	109.38	109.90	0.52	65			ROCK LOSS	
49	109.90	110.56	0.66	65			SANDSTONE	MG.MOD.LT.GY.MAS.VBRKN AS ABOVE, ONE 11 CM WIDE QTZ VEIN.
50	110.56	111.57	1.01	65			SANDSTONE	PBLY.MG.PR.LT.GY.MAS.VBRKN SUBROUNDED MUDST & CHERT CLASTS 2-10 MM IN DIAMETER THROUGHOUT.
50	111.57	111.73	0.16	65			ROCK LOSS	
50	111.73	112.38	0.65	65			SANDSTONE	PBLY.MG.VPR.LT.GY.MAS.BRKN LITH AS ABOVE, 0.17 CM WIDE INTENSE CONCENTRATION OF RIPPED UP MUD STRINGERS AT BASE.
51	112.38	113.46	1.08	65			SANDSTONE	FG.MOD.LT.GY.MAS.BRKN MUDST RIPUP CLASTS 2-30 MM IN DIA AT BASE. SHEARED.POORLY CONSOLIDATED.SHARP CONTACT AT BASE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
51	113.46	113.99	0.53	65			ROCK LOSS	
51	113.99	114.17	0.18	65			MUDSTONE	SLTY.DK.GY.LAM.SSD.SLD VERY FINE SILTY SANDY LAMINAE THROUGHOUT. TOPS UP.
51	114.17	114.85	0.68	*65			MUDSTONE	SLTY.DK.GY.LAM.SSD.SLD LITH AS ABOVE. HORIZ WRMBURS 2 MM ACROSS.
52	114.85	116.65	1.80	64			MUDSTONE	DK.GY.LAM.BRKN LESS SILT THAN ABOVE, AND DECREASING DOWNWARD. BEDDING IS FAINTER & MORE UNIFORM. HELMINTHOPSIS.
53	116.65	117.13	0.48	63			MUDSTONE	DK.GY.MAS.SLD DARK, FEATURELESS, MASSIVE.
53	117.13	118.69	1.56	62			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE, BECOMING QUITE SANDY WITH MUDST RIPUP CLASTS AT BOTTOM OF BOX. VERY MUDDY & DARK OVERENTIRE INTERVAL.
54	118.69	118.78	0.09	61			ROCK LOSS	

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
54	118.78	120.27	1.49	*60			MUDSTONE	SLTY.DK.GY.LAM.SSD.BRKN FINE SILTY SANDY LAMINAE THROUGHOUT AS IN BOX 51. SSD & SMALL HORIZONTAL WRMBU RS ARE COMMON.
54	120.27	120.74	0.47	*50			MUDSTONE	SLTY.DK.GY.LAM.WRMBU.SLD LITH AS ABOVE.
55	120.74	122.76	2.02	*40			MUDSTONE	SLTY.DK.GY.LAM.WRMBU.SLD SLIGHTLY LESS SILT THAN ABOVE, HELMINTH OPSIS & HORIZONTAL WRMBUR 1-10 MM WIDE THROUGHOUT.
56	122.76	123.36	0.60	*40			MUDSTONE	SLTY.DK.GY.LAM.WRMBU.SLD LITH AS ABOVE.
56	123.36	124.83	1.47	40			MUDSTONE	SLTY.DK.GY.LAM.WRMBU.SLD LITH AS ABOVE.
57	124.83	125.26	0.43	*40			MUDSTONE	SLTY.DK.GY.LAM.WRMBU.BRKN LITH AS ABOVE. SHARP BOTTOM CONTACT.
57	125.26	126.34	1.08	37			SANDSTONE	SLTY.VPR.M.GY.VTHNB.WRMBU.SHRD GRAIN SIZE RANGE FROM FG SS TO GRANULE SIZED QTZ CLASTS. DARK SILT LAM WITH 5-10 MM WIDE VERT BURROWS.ONE COALY QUART Z RIP UP CLAST 1-5 CM IN DIAMETER.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
57	126.34	126.50	0.16	34			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.WRMBU.BRKN DARK SILT LAYERS ARE NUMEROUS. ONE LONG VERT. BURROW 1 CM IN DIAMETER .
58	126.50	127.91	1.41	*30			SANDSTONE	SLTY.FG.M.GY.LAM.WRMBU.SHRD LITH AS ABOVE. MUDST RIP UP CLASTS. BCA 'S 8-32 DEGREES, MUD TO MG SS LAYERS.
58	127.91	128.20	0.29	33			MUDSTONE	DK.GY.MAS.SHRD MOD QTZ VEINS THROUGHOUT. DISSEMINATED PYRITE IN LAYERS. POORLY CONSOLIDATED A T BASE. SHARP UPPER CONTACT.
59	128.20	129.03	0.83	35			MUDSTONE	DK.GY.MAS.SHRD MASSIVE MUDST AS ABOVE. INTENSE QTZ VEI NING, COAL STRINGERS 1-10 MM WIDE.
59	129.03	129.39	0.36	37			ROCK LOSS	
59	129.39	130.15	0.76	39			MUDSTONE	DK.GY.MAS.VSHRD FEWER COAL STRINGERS & QTZ VEINS THAN A BOVE.
60	130.15	131.73	1.58	42			MUDSTONE	SLTY.DK.GY.LAM.VBRKN VERY FAINT SILTY LAMINAE.
61	131.73	131.92	0.19	45			MUDSTONE	DK.GY.MAS.SLD LITH AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
61	131.92	132.44	0.52	47			ROCK LOSS	
61	132.44	134.00	1.56	*50			MUDSTONE	DK.GY.MAS.VBRKN LITH AS ABOVE. PREDOMINANTLY MASSIVE.
62	134.00	135.23	1.23	58			MUDSTONE	DK.GY.MAS.VSHRD LITH AS ABOVE. LESS SILT.
62	135.23	135.49	0.26	63			ROCK LOSS	
62	135.49	135.70	0.21	64			MUDSTONE	DK.GY.MAS.BRKN LITH AS ABOVE.
63	135.70	137.43	1.73	*70			MUDSTONE	SLTY.DK.GY.VTHNB.VBRKN VERY FAINT BANDS 3-5 CM WIDE CONTAINING SLIGHTLY HIGHER AMTS OF SILT. SLICKENSIDES WITH TALC.
64	137.43	139.32	1.89	*70			MUDSTONE	SLTY.DK.GY.VTHNB.VBRKN BANDING AS ABOVE. SLIGHTLY MORE SILT OVERALL.
65	139.32	141.18	1.86	75			MUDSTONE	SLTY.DK.GY.VTHNB.SHRD FAINT BANDING AS ABOVE. FRACTURES PARALLEL TO CORE. SLICKENSIDES & TALC.
66	141.18	141.58	0.40	79			MUDSTONE	SLTY.DK.GY.LAM.WRMBU.BRKN MORE SILT THAN ABOVE IN FINE WISPY STRINGERS. VERTWRMBURS 5 MM WIDE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
66	141.58	142.94	1.36	81			MUDSTONE	SLTY.DK.GY.LAM.WRMBU.VBRKN FINE FAINT SILTY STRINGERS AS ABOVE.
67	142.94	144.38	1.44	*85			MUDSTONE	SLTY.DK.GY.LAM.WRMBU.VBRKN LITH AS ABOVE.
68	144.38	146.09	1.71	*50			MUDSTONE	SLTY.DK.GY.LAM.VBRKN LITH AS ABOVE.
69	146.09	146.85	0.76	58			MUDSTONE	SLTY.VPR.DK.GY.LAM.VBRKN SLICKENSIDES WITH TALC. WISPY SILT LAMS AS ABOVE.
69	146.85	147.68	0.83	64			ROCK LOSS	
69	147.68	148.65	0.97	*70			MUDSTONE	SLTY.VPR.DK.GY.LAM.VBRKN FAINT BANDS 1-3 CM WIDE OF SILTIER,LESS CONSOLIDATED MUDST.
70	148.65	150.24	1.59	*60			MUDSTONE	SLTY.VPR.DK.GY.VTHNB.VBRKN FAINT 1-3 CM BANDS OF SILTIER MUDST,AS ABOVE.SLICKENSIDES OF TALC.
71	150.24	150.32	0.08	67			MUDSTONE	SLTY.VPR.DK.GY.VTHNB.SLD AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
71	150.32	152.05	1.73	*75			MUDSTONE	SLTY.VPR.DK.GY.VTHNB.VBRKN LITH AS ABOVE. BCA'S RANGE FROM 8-75 DE GREES. LESSCONSOLIDATED.
71	152.05	152.46	0.41	72			ROCK LOSS	
72	152.46	153.58	1.12	*70			MUDSTONE	SLTY.VPR.DK.GY.VTHNB.BRKN LITH AS ABOVE. POORLY CONSOLIDATED. CRU MBLES EASILY.
72	153.58	154.43	0.85	66			MUDSTONE	SLTY.VPR.DK.GY.VTHNB.BRKN AS ABOVE.
72	154.43	154.63	0.20	64			ROCK LOSS	
73	154.63	156.56	1.93	*60			MUDSTONE	SLTY.VPR.DK.GY.VTHNB.BRKN LITH AS ABOVE. MUCH SHEARING WITH CLAY FRACTURE FILL AT BASE.
74	156.56	156.69	0.13	62			MUDSTONE	SLTY.M-DK.GY.BRKN CARB TOWARDS BASE.
74	156.69	156.88	0.19	62			ROCK LOSS	
74	156.88	157.89	1.01	63	04485		MUDSTONE	CARB.DK.GY.BRKN GRADATIONAL FROM ABOVE.LISTRIC SURFACES .LOWER 25 CM SAMPLED.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
74	157.89	158.29	0.40	65	04486	H	COAL	C-2.VBRKN
74	158.29	158.31	0.02	65	04486	H	COAL	C-6.SLD
74	158.31	158.40	0.09	65	04486	H	MUDSTONE	CLYY.M-DK.GY.BRKN SOFT. LISTRIC SURFACES.
74	158.40	158.51	0.11	65	04486	H	ROCK LOSS	
74	158.51	158.61	0.10	65	04486	H	COAL LOSS	
75	158.61	158.69	0.08	66	04486	H	COAL	C-4.SLD
75	158.69	159.07	0.38	66	04486	H	COAL	C-3.SHRD VERY SHEARED. LISTRIC SURFACES.
75	159.07	159.11	0.04	66	04486	H	MUDSTONE	CLYY.M-DK.GY.SLD
75	159.11	159.25	0.14	67	04486	H	COAL	C-4.SHRD LISTRIC SURFACES.
75	159.25	159.30	0.05	67	04486	H	COAL	C-6.SLD BONE COAL.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
75	159.30	159.86	0.56	67	04487	H	COAL	C-3.VBRKN
75	159.86	159.92	0.06	68	04487	H	COAL	C-4.BRKN
75	159.92	160.45	0.53	68	04487	H	COAL	C-2.VBRKN POWDERED IN PLACES.
76	160.45	161.07	0.62	70	04487	H	COAL	C-2.BRKN
76	161.07	161.25	0.18	70	04487	H	MUDSTONE	CARB.DK.GY.BRKN ABUNDANT PLANT FRAGMENTS THROUGHOUT.
76	161.25	161.42	0.17	71	04487	H	COAL	C-2.BRKN
76	161.42	161.48	0.06	71	04487	H	COAL	C-3.BRKN
76	161.48	161.73	0.25	71	04487	H	COAL	C-3.
76	161.73	161.84	0.11	71	04487	H	COAL LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86007

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
76	161.84	162.53	0.69	72	04488		MUDSTONE	CARB.DK.GY.LAM.BRKN COALIFIED PLANT FRAGS NEAR SEAM, GRADES TO SILTY LAMINAE NEAR BASE. UPPER 25 C M SAMPLED.
77	162.53	164.48	1.95	75			MUDSTONE	CARB.DK.GY.MAS.BRKN COAL STRINGERS 1-3 MM WIDE, DISSEMINATE D PYRITE INONE 2 CM WIDE BAND. 5 CM BAN D C-2 AT CORE SPIN OF F.
78	164.48	164.81	0.33	77			MUDSTONE	SLTY.DK.GY.MAS.BRKN SLIGHTLY SILTIER & HARDER THAN ABOVE. U NIFORM, MASSIVE.
78	164.81	166.34	1.53	78			MUDSTONE	SLTY.DK.GY.MAS.BRKN AS ABOVE.
78	166.34	166.56	0.22	*80			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.SSD.SLD
79	166.56	167.71	1.15	*80			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.SSD.BRKN V. POORLY SORTED. GRAINSIZE RANGES FROM MUD TO MGSS. MUDST RIP UP CLASTS 4 MM IN DIA @ BASE. T.D. = 168.55 M, DRILLER 'S MARKER.

* DENOTES MEASURED BCA

NEWPAGE

FORM 4001

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86007 SEAM : 1 INTERVAL(M) : 98.96 - 105.11 ELEVATION(M) : 1568.9

GEOLOGIST : BARKER SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/Kg	
	98.96			0.26												
				(0.09)												
				0.35												
			0.63		63.5	4451	13	1.53 / 0.08		1.18	27.94	7.56	63.34	0.36	24.27	—
				0.53				1.60								
				(0.18)												
	100.72		0.14													
			0.12 0.84													
				1.52	100.0	4452	14	1.52 / 0.19		1.30	28.65	7.46	62.59	0.39	23.99	—
								1.71								
	102.61		0.04													
				2.05	85.2	4453	15	2.27 / 0.00		1.36	12.84	6.91	78.80	0.46	29.86	—
								2.27								
				(0.11)												
	105.11			0.11												

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86007 SEAM : H INTERVAL(M) : 157.89 - 161.84 ELEVATION(M) : 1566.9

GEOLOGIST : BARKER SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	157.89			0.38											
			0.08												
			(0.10)												
				(0.08)	85.1	4486	16	1.08/0.22		0.67	38.08	7.58	53.67	0.33	20.76
				0.42				1.28							
			0.04												
	159.30			1.82											
					95.6	4487	17	2.20/0.17		0.65	28.69	6.82	61.84	0.39	23.30
								2.37							
			0.17												
				0.45											
				(0.10)											
	161.84														

GULF CANADA CORPORATION
COAL DIVISION
KLAPPAN PROJECT
STRATIGRAPHIC LOG
KPN LR DDH86007

723

GEOLOGIST : BARKER	DATE : FEB 26/87	DRAWING NO. :

SCALE : 1:200 1:40

NORTHING: 8344780.0 N
EASTING: 507445.5 E

INCLINATION: 90.0°

LITHOLOGIC SYMBOLS

SANDSTONE	BENTONITE
SILTSTONE	BRECCIA
COAL	CARBONACEOUS
OVERBURDEN	QUARTZ
MUDSTONE, CLAYSTONE	PYRITE
TUFF	FERRUGINOUS
LIMESTONE	CONGLOMERATE
CORE LOSS	FOSSIL BED

DRILLED DEPTH [M] | BCA [DEG] | TRUE DEPTH [M] 1 : 200

10 - 77
20 - 74
30 - 75
73
70
40 - 53
65
50 - 56
45
60 -
62
70 - 68
65
80 - 76
76
68
90 - 65
100 -
110 - 65
60
120 - 40
30
130 - 50
70
140 -
85
130 70
150 - 75
70
60
140
160 -
80
150

TOTAL: 167.71 TOTAL: 150.49

SEAM DETAIL 1 : 40

DRILLED DEPTH [M] | TRUE THICKNESS [M]

SEAM I
98.96
105.11
ROCK | COAL
0.25 | 5.32
5.57

SEAM H
157.89
161.84
ROCK | COAL
0.39 | 3.27
3.66

Gulf Canada Corporation
Coal Division

723

Geophysical Log

Datasource: KPNLRDDH86007	Province: BC	Northing: 6344780.00	Lat: 57.463
Log Date: 86-08-28	Zone: 9	Easting: 509446.00	Long: 121.852.36
Company: CENTURY	Measuring Point:		Elevation: 1568.8
Geologist: BARKER			

Scale: 1 to 100.0

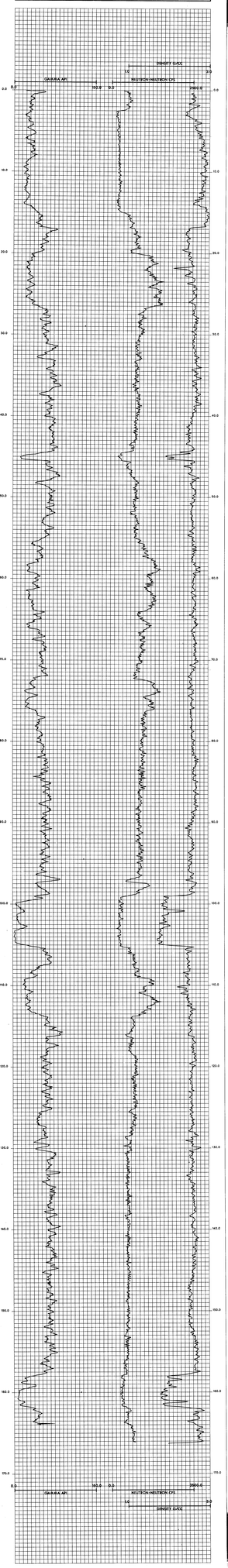
Depth Range: 0.0 to 171.0

True Thickness: NO

Comments:
1. LOGGED THROUGH THE RODS
2.

Logs Plotted

Description	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9033A	- IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2000.0	10.0	9	9005A	- IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	- IN PIPE



KPNLRDDH86008

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH86008 DATE - 02/13/87

- H I S T O R Y -

START DATE - 27/08/86
END DATE - 29/08/86

CONTRACTOR - J.T. THOMAS
GEOLOGIST - SAVOIE
OPERATOR - G.C.C.
SURVEYOR - TRONNES

REMARKS - SITE D. COAL LOGGED BY BRAD VANDENBUSSCHE. PIEZ AT 110 M, STAND PIPE (1.5") AT 88 M.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1614.37
ZONE - 9
NORTHING - 6344918.00
EASTING - 507080.94

LICENCE/LEASE NUMBER -

LATITUDE - 571457
LONGITUDE - 1285258

- O R I E N T A T I O N -

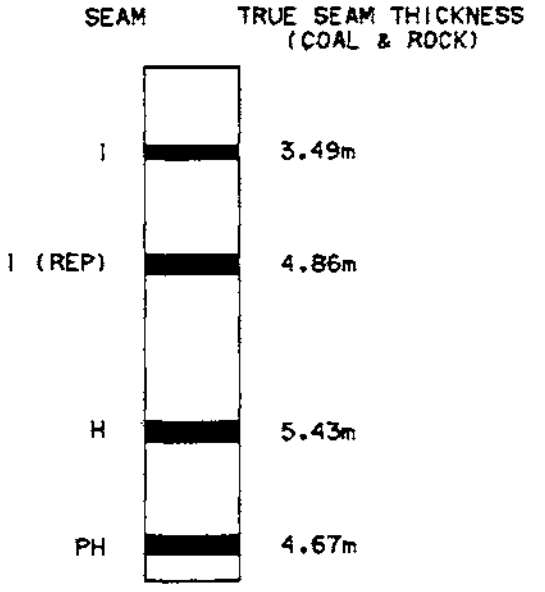
LENGTH - 136.25
INCLINATION - 77.0
AZIMUTH - 350.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ - Y

CASING DEPTH(M) - 19.81
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE



NOTE:

SCHEMATIC PROFILE.
NO THICKNESSES SHOWN
FOR SEAMS CONTAINING
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

FIGURE

MOUNT KLAPPAN ANTHRACITE PROJECT

1986 DIAMOND DRILL HOLES
DDH8600B

GULF CANADA CORPORATION
11/03/87
KLAP:[205057]870063008.LOG

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	19.81	19.81	74			OVERBURDEN	CASING.
1	19.81	20.09	0.28	74			MUDSTONE	CLYY.M.GY.BRKN SLIGHTLY CARB IN PLACES.
1	20.09	20.12	0.03	74			ROCK LOSS	
1	20.12	20.92	0.80	74	05439		MUDSTONE	SLTY.M.GY.BRKN LOWER 25 CM SAMPLED.
1	20.92	21.00	0.08	74	05440	I	COAL	C-3.PWRD
1	21.00	21.25	0.25	74	05440	I	COAL LOSS	
1	21.25	21.35	0.10	74	05440	I	MUDSTONE	CARB.DK.GY.SLD POORLY CONSOLIDATED.
1	21.35	21.43	0.08	74	05440	I	COAL	C-3.SHRD POWDERED & DIFFICULT TO TELL GRADE.
1	21.43	21.73	0.30	74	05440	I	COAL	C-2.SHRD HIGHLY SHEARED AND POWDERED.
1	21.73	21.96	0.23	74	05440	I	COAL LOSS	
1	21.96	22.07	0.11	74	05441	I	ROCK LOSS	
1	22.07	22.16	0.09	74	05441	I	COAL LOSS	

* DENOTES MEASURED BCA

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
1	22.16	22.27	0.11	74	05441	I	MUDSTONE	CARB.DK.GY MINOR COALY STRINGERS WITHIN.
2	22.27	23.12	0.85	74	05441	I	COAL	C-2.VBRKN POWDERED IN PLACES.
2	23.12	23.15	0.03	74	05441	I	MUDSTONE	CARB.DK.GY.BRKN
2	23.15	23.24	0.09	74	05441	I	COAL	C-3.SHRD
2	23.24	23.28	0.04	74	05441	I	COAL LOSS	
2	23.28	23.34	0.06	74	05441	I	MUDSTONE	CARB.DK.GY.SHRD SOFT.
2	23.34	23.46	0.12	74	05441	I	COAL	C-3.PWRD HIGHLY SHEARED.
2	23.46	24.56	1.10	74	05441	I	COAL LOSS	
2	24.56	24.69	0.13	74	05442		MUDSTONE	CARB.DK.GY.SHRD
2	24.69	25.19	0.50	74			MUDSTONE	SLTY.M.GY.LAM.VBRKN COASTER APPEARANCE.RYTHMIC CYCLES.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH8600B

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
3	25.19	25.29	0.10	74			MUDSTONE	CLYY.DK.GY.VBRKN SOFT. SEMI-CONSOL. QTZ AT START OF INTE RVAL.
3	25.29	26.22	0.93	74			ROCK LOSS	
3	26.22	27.04	0.82	74			MUDSTONE	CARB.DK.GY.VSHRD LISTRIC SURFACES. COAL STRINGERS.
3	27.04	27.74	0.70	74			ROCK LOSS	
3	27.74	28.16	0.42	74			MUDSTONE	CARB.DK.GY.BRKN ABUNDANT COAL STRINGERS. 2 CM BAND OF C -2 COAL.
4	28.16	28.46	0.30	74			MUDSTONE	CARB.DK.GY.SHRD MINOR COAL STRINGERS.
4	28.46	28.76	0.30	*74			MUDSTONE	SLTY.M-DK.GY.SHRD SLTST LAMINAE.
4	28.76	29.27	0.51	74			ROCK LOSS	
4	29.27	29.97	0.70	73			SILTSTONE	M.GY.LAM.BIOTR.VBRKN INTERLAMINATED MUDST. LISTRIC SURFACES. QTZ VEINING (<.2 CM)

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH8600B

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
5	29.97	30.35	0.38	73			SILTSTONE	M.GY.LAM.BIOTR.BRKN INTERLAMINATED MUDST.
5	30.35	31.09	0.74	72			ROCK LOSS	
5	31.09	32.69	1.60	*71			SILTSTONE	M.GY.LAM.BIOTR.BRKN AS ABOVE. MINOR QTZ VEINING. BURROW 2.5 CM LONG .5 CM WIDE.
6	32.69	33.10	0.41	63			ROCK LOSS	
6	33.10	34.86	1.76	*54			SILTSTONE	M.GY.BRKN INTERLAMINATED MUDST. VERY MINOR BIOTRB . QTZ VEIN (<2.5 CM WIDE). SANDIER TOWA RD BASE.
7	34.86	35.36	0.50	53			SANDSTONE	SLTY.FG.LT-M.GY.MAS.SLD SPARSE INTERLAMINATED MUDST/SLTST STRIN GERS. QTZ VEIN.
7	35.36	35.66	0.30	*53			SANDSTONE	SLTY.FG.LT-M.GY.MAS.SLD AS ABOVE.
7	35.66	36.46	0.80	55			SILTSTONE	M.GY.LAM.VBRKN INTERLAMINATED MUDST. MINOR BIOTRB.
7	36.46	36.74	0.28	58			ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
8	36.74	37.19	0.45	59			SILTSTONE	M.GY.LAM.VBRKN AS ABOVE.
8	37.19	37.53	0.34	*61			SILTSTONE	M.GY.LAM.SLD AS ABOVE. MINOR IRREGULAR QTZ VEINING.
8	37.53	37.93	0.40	61			BRECCIA	M.GY.BRKN LITHOLOGY AS ABOVE EXCEPT IT IS BROKEN UP AND CONSUMED IN QTZ.
8	37.93	38.33	0.40	*61			SILTSTONE	M.GY.LAM.BRKN INTERLAMINATED MUDST.
8	38.33	38.58	0.25	59			ROCK LOSS	
9	38.58	40.41	1.83	*54			SILTSTONE	SSY.M.GY.LAM.BRKN INTERLAMINATED MUDST.
10	40.41	41.46	1.05	*58			SILTSTONE	SSY.M.GY.LAM.BIOTR.SLD AS ABOVE.
10	41.46	41.96	0.50	*55			SILTSTONE	SSY.M.GY.LAM.BRKN AS ABOVE. 2 CM ZONE OF FG SS. MINOR QTZ .
10	41.96	42.07	0.11	56			ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
10	42.07	42.38	0.31	*56			SILTSTONE	SSY.M.GY.LAM.SLD
11	42.38	44.30	1.92	*55			SILTSTONE	SSY.M.GY.LAM.BRKN INTERLAMINATED MUDST. IRREGULAR QTZ VEI NING (<.3 CM) IN BOTTOM HALF OF INTERVA L. MINOR LISTRIC SURFACES.
12	44.30	44.56	0.26	57			SILTSTONE	SSY.M.GY.SLD MINOR BRECCIATION. IRREGULAR QTZ VEININ G.
12	44.56	45.54	0.98	58			SANDSTONE	SLTY.VFG.LT-M.GY.MAS.BRKN SPARSE INTERLAMINATED SLTST AND MUDST.
12	45.54	46.11	0.57	*60			SANDSTONE	SLTY.FG.LT-M.GY.LAM.BRKN INTERLAMINATED SLTST AND MUDST. QTZ VEI NING PERPENDICULAR TO BEDDING (<.3 CM) . MINOR DISPLACEMENT ALONG FRACTURES.
13	46.11	46.57	0.46	60			SILTSTONE	SSY.LT.GY.LAM.VBRKN INTERLAMINATED MUDST. COASTER LIKE LITH O. SAMPLED.
13	46.57	46.89	0.32	60			SANDSTONE	SLTY.LT.GY.MAS.SLD BENTONITIC.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
13	46.89	46.93	0.04	60			BENTONITE	LT.GY.BRKN TYPICAL ABOVE I SEAM.
13	46.93	47.09	0.16	60			ROCK LOSS	
13	47.09	47.22	0.13	60			SILTSTONE	M.GY.LAM.BRKN INTERLAMINATED MUDST.
13	47.22	47.34	0.12	60			SILTSTONE	M.GY.LAM.SLD AS ABOVE, RYTHMITES, SAMPLED.
13	47.34	47.69	0.35	60			MUDSTONE	M-DK.GY.LAM.VBRKN MINOR INTERLAMINATED SLTST, LARGE QTZ V EIN NEAR BASE OF INTERVAL (APPROX 1 CM WIDE).
14	47.69	48.74	1.05	*60	05422		MUDSTONE	SLTY.M.GY.LAM.SLD BECOMES CARB AND CONTAINS COALY STRINGE RS NEAR BASE, LOWER 25 CM SAMPLED.
14	48.74	48.99	0.25	60	05423 I REP		COAL	C-1.BRKN
14	48.99	49.11	0.12	60	05423 I REP		ROCK LOSS	
14	49.11	49.29	0.18	60	05423 I REP		COAL LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
14	49.29	49.40	0.11	60	05423 I REP		ROCK LOSS	
14	49.40	49.76	0.36	60	05423 I REP		COAL LOSS	
14	49.76	50.24	0.48	60	05423 I REP		COAL	C-2.BRKN APPROACHING C-1 IN PLACES.
15	50.24	50.56	0.32	60	05423 I REP		COAL	C-2.BRKN APPROACHING C-1 IN PLACES.
15	50.56	50.66	0.10	60	05423 I REP		COAL	C-2.BRKN APPROACHING C-1 IN PLACES.
15	50.66	50.81	0.15	60	05424 I REP		MUDSTONE	SLTY.M-DK.GY.SLD
15	50.81	50.99	0.18	60	05424 I REP		COAL	C-2.SLD
15	50.99	51.08	0.09	60	05424 I REP		MUDSTONE	CARB.DK.GY.SLD COALY PLANT FRAGS WITHIN.
15	51.08	51.22	0.14	60	05424 I REP		ROCK LOSS	
15	51.22	51.47	0.25	60	05424 I REP		COAL	C-2.SHRD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
15	51.47	51.60	0.13	60	05424	I REP	ROCK LOSS	
15	51.60	52.20	0.60	60	05424	I REP	COAL	C-2.SHRD
15	52.20	52.22	0.02	60	05424	I REP	MUDSTONE	CARB.DK.GY.SLD
16	52.22	52.30	0.08	60	05424	I REP	COAL	C-2.SLD
16	52.30	52.35	0.05	60	05424	I REP	COAL	C-6.SLD
16	52.35	52.43	0.08	60	05424	I REP	COAL	C-1.BRKN
16	52.43	52.49	0.06	60	05424	I REP	MUDSTONE	CARB.DK.GY.BRKN
16	52.49	52.63	0.14	60	05424	I REP	ROCK LOSS	
16	52.63	52.83	0.20	60	05425	I REP	COAL	C-3.SHRD VERY SHEARED & LISTRIC.
16	52.83	53.82	0.99	60	05425	I REP	COAL	C-1.VBRKN POWDERED IN PLACES.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
16	53.82	54.12	0.30	60	05425	I REP	COAL	C-1.VBRKN POWDERED IN PLACES.
17	54.12	54.35	0.23	60	05425	I REP	COAL	C-1.BRKN
17	54.35	56.10	1.75	60	05426		MUDSTONE	CARB.DK.GY.SLD ABUNDANT COALIFIED PLANT FRAGS ESPECIAL LY NEAR SEAM. UPPER 25 CM SAMPLED.
18	56.10	56.44	0.34	60			MUDSTONE	SLTY.M.GY.LAM.SLD INTERLAMINATED SLTST.
18	56.44	57.18	0.74	*60			SILTSTONE	M.GY.LAM.SLD INTERLAMINATED MUDST.
18	57.18	58.07	0.89	62			SANDSTONE	SLTY.FG.PR.LT-M.GY.LAM.SLD INTERLAMINATED MUDST/SLTST. LAMINATIONS DECREASE TOWARD BASE. GRADATIONAL CONT ACTS.
19	58.07	59.15	1.08	*65			SANDSTONE	MG.PR.LT.GY.MAS.SLD MINOR ZONES OF MUDST/SLTST LAMINAE. LIS TRIC SURFACE.
19	59.15	59.30	0.15	65			CONGLOMERATE	PR.LT-M.GY.MAS.SLD SUBROUNDED CHERT CLASTS (<1 CM). MATRIX SUPPORTED CHANNEL? SHARP UPPER CONTACT

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
19	59.30	59.50	0.20	65			SANDSTONE	MG.VPR.LT.GY.MAS.VBRKN GRANULAR TEXTURE.
19	59.50	59.87	0.37	65			SANDSTONE	MG.PR.LT.GY.MAS.VBRKN MINOR QTZ VEINING. GRANULAR TEXTURE.
20	59.87	60.01	0.14	65			SANDSTONE	MG.PR.LT.GY.MAS.BRKN VERY SHARP LOWER CONTACT.
20	60.01	60.73	0.72	65			SILTSTONE	M.GY.LAM.BRKN INTERLAMINATED MUDST.
20	60.73	61.41	0.68	65			MUDSTONE	M-DK.GY.MAS.BRKN VERY VERY MINOR PLANT FRAGMENTS.
20	61.41	62.17	0.76	65			ROCK LOSS	
21	62.17	62.29	0.12	65			MUDSTONE	M-DK.GY.MAS.VBRKN
21	62.29	64.17	1.88	*65			SILTSTONE	M-DK.GY.LAM.BIOTR.SLD MINOR SSD. TOPS UP (BURROW). INTERLAMIN ATED MUDST. MINOR BAND OF HELMINTHOPSIS BURROWS.
22	64.17	65.41	1.24	*65			MUDSTONE	SLTY.M-DK.GY.LAM.SLD INTERLAMINATED SLTST WITH MINOR SS LAMI NAE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
22	65.41	65.98	0.57	65			MUDSTONE	SLTY.M-DK.GY.LAM.SLD INDISTINCT INTERLAMINATED SLTST.
23	65.98	67.02	1.04	65			MUDSTONE	SLTY.M-DK.GY.LAM.SLD AS ABOVE.
23	67.02	68.07	1.05	*65			SILTSTONE	SSY.M.GY.LAM.BIOTR.SLD INTERLAMINATED MUDST. HELMINTHOPSIS BUR ROWS. BOTTOM 1/4 BECOMES SSY AND CONTAI NS NUMEROUS BURROWS DOWN INTO SEDIMENT. TOPS UP.
24	68.07	68.53	0.46	65			SANDSTONE	SLTY.FG.PR.M.GY.LAM.SSD.SLD ABUNDANT MUDST LAMINAE.
24	68.53	69.68	1.15	65			SANDSTONE	SLTY.MG.PR.LT-M.GY.MAS.SSD.BRKN SPARSE MUDST LAMINAE. TOPS UP (LOAD STR UCTURES). ONE LISTRIC SURFACE.
24	69.68	69.79	0.11	*65			MUDSTONE	SLTY.M-DK.GY.MAS.SLD
24	69.79	69.86	0.07	65			SANDSTONE	MG.PR.LT-M.GY.MAS.SLD

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
24	69.86	69.91	0.05	65			MUDSTONE	SLTY.M-DK.GY.MAS.SLD
24	69.91	69.96	0.05	65			SANDSTONE	SLTY.MG.PR.LT-M.GY.MAS.SLD MINOR MUDST LAMINAE.
25	69.96	70.03	0.07	65			SANDSTONE	SLTY.MG.PR.LT-M.GY.MAS.SLD AS ABOVE.
25	70.03	70.32	0.29	65			SANDSTONE	GRAN.VPR.LT-M.GY.MAS.SLD TWO ZONES OF SLTY MUDST BANDS.
25	70.32	71.63	1.31	*65			SANDSTONE	MG.PR.LT-M.GY.MAS.BIOTR.SLD ZONES OF INTERLAMINATED SLTST AND MUDST , TOPS UP (BURROWS).
25	71.63	71.97	0.34	68			SANDSTONE	MG.PR.LT-M.GY.MAS.SLD ZONES OF INTERLAMINATED SLTST AND MUDST
26	71.97	73.13	1.16	*70			SANDSTONE	MG.VPR.LT-M.GY.LAM.SLD INTERLAMINATED SLTST AND MUDST.
26	73.13	73.30	0.17	69			SANDSTONE	MG.LT-M.GY.MAS.SLD MINOR MUDST LAMINAE. STRANGE BURROW (?) (8 CM LONG, VARYING WIDTHS) CROSS CUTT ING BEDDING.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	73.30	73.83	0.53	68			SANDSTONE	MG.LT-DK.GY.LAM.BIOTR.SLD TOPS UP. (BURROWS). ABUNDANT INTERLAMIN ATED MUDST/SLTST.
26	73.83	73.88	0.05	67			SANDSTONE	GRAN.VPR.SLD RELATIVELY SHARP BASAL CONTACT, GRADATI ONAL UPWARDS. FAIRLY POROUS. WHITE GRAN ULES APPEAR TO BE QTZ.
26	73.88	74.10	0.22	67			SANDSTONE	MG.PR.LT-M.GY.MAS.BRKN MINOR MUDST LAMINAE.
26	74.10	74.37	0.27	66			ROCK LOSS	
27	74.37	74.52	0.15	66			SANDSTONE	MG.PR.M.GY.MAS.VBRKN MINOR LISTRIC SURFACES.
27	74.52	74.57	0.05	66			SANDSTONE	GRAN.VPR.S-P.GY.SLD SIMILAR TO PREVIOUS UNIT WITH SAME DESC RIPTIONS. SHARP BASAL CONTACT, GRADATIO NAL UPWARDS.
27	74.57	75.04	0.47	65			SANDSTONE	FG.PR.LT-M.GY.MAS.SLD SPARSE BLEBS OF MUDST.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
27	75.04	76.24	1.20	63			SANDSTONE	FG.PR.LT-M.GY.MAS.BIOTR.BRKN MINOR INDISTINCT MUDST LAMINAE. TOPS UP (BURROW). 2 VERY DISTINCT LISTRIC SURF ACES.
28	76.24	78.04	1.80	*60			SANDSTONE	MG.PR.LT-M.GY.MAS.BIOTR.BRKN MINOR MUDST LAMINAE, QUESTIONABLE BURRO W. MINOR DISPLACEMENT (<1 CM) ALONG FRA CTURES. ABUNDANT CLAY COATED LISTRIC SU RFACES.
28	78.04	78.20	0.16	61			SANDSTONE	MG.PR.LT-M.GY.MAS.SLD MINOR QTZ VEINING (<.2 CM) RUNNING ALMO ST PARALLEL TO CORE. UNEXPLAINED MUDST "CHUNKS".
29	78.20	78.83	0.63	62			SANDSTONE	MG.PR.LT-M.GY.MAS.SLD ONE 1 CM BAND OF MUDST NEAR THE TOP OF INTERVAL. MINOR SILTY LAMINAE WITHIN BO TTOM 20 CM OF INTERVAL. SHARP BASAL CON TACT.
29	78.83	79.09	0.26	63			MUDSTONE	DK.GY.MAS.BRKN NUMEROUS LARGE BIVALVE (?) IMPRINTS WIT HIN CORE BUT NO REPLACEMENT BY SILICA. THEY WERE HERE BUT THEY WEREN'T REPLACE D FOR SOME REASON UNKNOWN AT THIS TIME.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
29	79.09	80.12	1.03	64			MUDSTONE	DK.GY.MAS.SLD BIVALVE HEAVEN. OVER ABUNDANCE OF QTZ R EPLACED BIVALVIA WHICH HAVE BEEN COMPAC TED INTO BIZZARE SHAPES. MINOR FLECKS O F PYRITE AS WELL AS ONE MJ BLEB OF PYRI TE (<2 CM). EXCITING STUFF.
30	80.12	80.36	0.24	64			MUDSTONE	DK.GY.MAS.SLD AS ABOVE EXCEPT THERE IS ONLY A FEW OF THE CRITTERS.
30	80.36	82.06	1.70	66			MUDSTONE	DK.GY.MAS.BRKN LISTRIC SURFACES. MONOTONOUS MUD. VERY MINOR COALY STRINGERS.
31	82.06	83.46	1.40	68			MUDSTONE	DK.GY.MAS.BRKN AS ABOVE. QTZ VEINING (MINIMAL). PLANT FRAGMENTS.
31	83.46	84.08	0.62	70			MUDSTONE	CARB ABUNDANT PLANT FRAGMENTS (NILSSONIA TEN UICAULIS). COAL STRINGERS.
32	84.08	85.93	1.85	71			MUDSTONE	CARB.DK.GY.MAS.BRKN AS ABOVE. LISTRIC SURFACES.
33	85.93	86.34	0.41	*73			MUDSTONE	CARB.DK.GY.MAS.BRKN AS ABOVE. BCA TAKEN OFF PLANT BDG PLANE

* DENOTES MEASURED BCA

PROJECT: KPW BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
33	86.34	87.90	1.56	74			MUDSTONE	CARB.DK.GY.BRKN AS ABOVE.
33	87.90	88.12	0.22	76			ROCK LOSS	
34	88.12	89.59	1.47	*77			MUDSTONE	CARB.DK.GY.BRKN AS ABOVE. HILSSONIA CANADENSIS.
34	89.59	90.14	0.55	76			MUDSTONE	CARB.DK.GY.BRKN AS ABOVE. EXCEPTIONAL PLANT FOSSILS. LI STRIC SURFACES.
34	90.14	90.34	0.20	75			ROCK LOSS	
35	90.34	92.34	2.00	74			MUDSTONE	CARB.DK.GY.BRKN AS ABOVE. RARE QTZ STRINGER.
36	92.34	92.69	0.35	73			MUDSTONE	CARB.DK.GY.SLD COALIFIED PLANT FRAGS THROUGHOUT.
36	92.69	93.65	0.96	72	05427		MUDSTONE	CARB.DK.GY.SLD LOWER 25 CM SAMPLED.
36	93.65	94.16	0.51	71	05428	H	COAL	C-2.BRKN MINOR PYRITE WITHIN C-1 IN PLACES.
37	94.16	94.37	0.21	71	05428	H	COAL	C-2.BRKN

* DENOTES MEASURED BCA

PROJECT: KPW BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
37	94.37	94.42	0.05	71	05428	H	COAL	C-5.SHRD
37	94.42	94.50	0.08	71	05428	H	COAL LOSS	
37	94.50	94.99	0.49	70	05429		MUDSTONE	CARB.DK.GY.BRKN COALY STRINGERS THROUGHOUT.
37	94.99	95.04	0.05	70	05429	H	COAL	C-5.SLD
37	95.04	95.26	0.22	70	05429	H	MUDSTONE	CARB.DK.GY.SLD COALY STRINGERS THROUGHOUT. QTZ AT TOP.
37	95.26	95.43	0.17	70	05430	H	COAL	C-3.BRKN
37	95.43	95.64	0.21	70	05430	H	COAL	C-5.VBRKN SHEARED.
37	95.64	96.08	0.44	69	05430	H	COAL	C-2.BRKN
37	96.08	96.14	0.06	69	05430	H	MUDSTONE	CARB.DK.GY.SHRD LISTRIC SURFACES.
38	96.14	96.69	0.55	69	05430	H	COAL	C-4.BRKN ABUNDANT MUDDY BANDS WITHIN.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
38	96.69	96.86	0.17	68	05430	H	COAL LOSS	
38	96.86	97.08	0.22	68	05430	H	MUDSTONE	SLTY.M.GY.SLD
38	97.08	97.90	0.82	67	05431	H	COAL	C-4.BRKN ABUNDANT MUDDY BANDS WITHIN.
38	97.90	98.02	0.12	67	05431	H	MUDSTONE	SLTY.M.GY.SLD
38	98.02	98.23	0.21	67	05431	H	COAL	C-2.PWRD SHEARED.
39	98.23	99.03	0.80	66	05431	H	COAL	C-2.VBRKN SHEARED.
39	99.03	99.41	0.38	65	05431	H	COAL LOSS	
39	99.41	99.51	0.10	65	05431	H	MUDSTONE	CARB.DK.GY.SHRD
39	99.51	99.58	0.07	65	05431	H	COAL	C-3.SHRD
39	99.58	99.62	0.04	65	05431	H	MUDSTONE	CARB.DK.GY.SLD COALY BITS THROUGHOUT.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
39	99.62	99.93	0.31	65	05431	H	COAL	C-2.SLD
39	99.93	100.01	0.08	65	05431	H	COAL LOSS	
39	100.01	100.53	0.52	64	05432		MUDSTONE	CARB.DK.GY.BRKN COALIFIED PLANT FRAGS MINOR PYRITE. UPPER 25 CM SAMPLED.
40	100.53	101.70	1.17	63			MUDSTONE	DK.GY.BRKN LISTRIC SURFACES. VERY MINOR PLANT FRAGMENTS. PYRITE BLEB AND 3 CM BAND OF DISSEMINATED PYRITE NEAR BASE OF INTERVAL. MINOR QTZ VEIN.
40	101.70	101.78	0.08	63			ROCK LOSS	
40	101.78	102.38	0.60	62			MUDSTONE	SLTY.M.GY.MAS.VBRKN RARE PLANT IMPRINTS. LISTRIC SURFACE.
41	102.38	103.08	0.70	61			MUDSTONE	SLTY.M.GY.MAS.SLD
41	103.08	103.58	0.50	61			SILTSTONE	SSY.M.GY.LAM.BIOTR.SLD INTERLAMINATED MUDST/SLTST.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
41	103.58	104.43	0.85	*60			SANDSTONE	FG.LT-M.GY.MAS.SLD MINOR SLTST LAMINAE.
42	104.43	104.75	0.32	58			SANDSTONE	FG.LT-M.GY.MAS.SLD AS ABOVE.
42	104.75	105.35	0.60	56			SANDSTONE	MG.LT-M.GY.MAS.SLD VERY MINOR MUDST/SLTST LAMINAE THAT APP EAR IN A BOUDINAGE FORM. 3 MUDST RIPUP CLASTS. MINOR QTZ VEINING.
42	105.35	105.39	0.04	*55			MUDSTONE	SLTY.DK.GY.MAS.SLD
42	105.39	105.42	0.03	55			SANDSTONE	MG.LT-M.GY.MAS.SLD
42	105.42	105.45	0.03	55			MUDSTONE	SLTY.DK.GY.MAS.SLD
42	105.45	105.65	0.20	54			SANDSTONE	MG.LT-M.GY.MAS.VBRKN MUDST/SLTST LAMINAE. <1 CM QTZ VEINING.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
42	105.65	106.03	0.38	52			ROCK LOSS	
42	106.03	106.70	0.67	48			SANDSTONE	MG.PR.LT-M.GY.MAS.BRKN MINOR INDISTINCT SLTST LAMINAE. 1 CM BA ND OF QTZ AT BASE. BLADED CRYSTAL ALONG FRACTURE.
43	106.70	108.15	1.45	*40			SANDSTONE	MG.PR.LT.GY.MAS.SLD MINOR INDISTINCT SLTST LAMINAE. 5 QTZ F ILLED FRACTURES (FROM <1 CM TO 3 CM THI CK).
43	108.15	108.48	0.33	36			SANDSTONE	MG.VPR.LT.GY.MAS.SLD LISTRIC SURFACE AT BASE.
44	108.48	110.43	1.95	*30			SANDSTONE	MG.VPR.LT.GY.MAS.BRKN MINOR SLTST/MUDST LAMINAE. ABUNDANT LIS TRIC SURFACES TOWARD BASE SUB PARALLEL TO CORE LENGTH. QTZ VEINING (<.5 CM).
44	110.43	110.53	0.10	28			ROCK LOSS	
45	110.53	111.29	0.76	27			SANDSTONE	CG.VPR.LT-M.GY.MAS.BRKN LISTRIC SURFACES AND QTZ VEINING (<2 CM) THAT IS OFF SET ALONG SECONDARY FRACT URES.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
45	111.29	112.43	1.14	25			SANDSTONE	CG.VPR.LT-M.GY.MAS AS ABOVE. INCREASE IN MUDST RIPUP CLAST S THRD BASE. SOME FRACTURE FILLS CONTAI N BLADED WHITE CRYSTALS THAT HAVE A WEA K HCL REACTION.
46	112.43	112.52	0.09	23			SANDSTONE	MG.VPR.LT-M.GY.MAS.SLD SILTY MUDST RIPUP CLASTS. (2-3 CM). MIN OR QTZ.
46	112.52	113.55	1.03	22			SANDSTONE	MG.VPR.LT-M.GY.MAS.SLD MINOR VERY INDISTINCT SLTST LAMINAE. QT Z VEINS (3 CM).
46	113.55	113.80	0.25	21			SANDSTONE	MG.VPR.LT-DK.GY.MAS.SLD SUB-WELL ROUNDED RIPUP CLASTS (3-4 CM I N LENGTH). 6 CM QTZ VEIN CONTAINING A F EW RIPUPS. SHARP BASAL CONTACT.
46	113.80	114.15	0.35	*20			SILTSTONE	SSY.M.GY.LAM.BRKN INTERLAMINATED MUDST. MINOR QTZ VEINING
46	114.15	114.41	0.26	18			ROCK LOSS	
46	114.41	114.49	0.08	17			SILTSTONE	SSY.M.GY.LAM.VBRKN AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
47	114.49	115.19	0.70	*15			SILTSTONE	M.GY.LAM.BRKN AS ABOVE. MINOR HELMINTHOPSIS BURROWS.
47	115.19	115.44	0.25	14			ROCK LOSS	
47	115.44	116.69	1.25	13			MUDSTONE	SLTY.M-DK.GY.BRKN QTZ VEINING.
48	116.69	117.51	0.82	12			MUDSTONE	SLTY.DK.GY.MAS.SLD HELMINTHOPSIS BURROWS.
48	117.51	118.74	1.23	*10			MUDSTONE	SLTY.DK.GY.MAS.SLD AS ABOVE. 3 QTZ VEINS (<1 CM). BCA IS A N APPROXIMATE GUESS. SECTION DOES NOT A PPEAR TO BE OVERTURNED.
49	118.74	120.26	1.52	10			MUDSTONE	SLTY.DK.GY.MAS.SLD HELMINTHOPSIS BURROWS.
49	120.26	120.66	0.40	10			MUDSTONE	SLTY.DK.GY.MAS.SLD AS ABOVE.
50	120.66	121.21	0.55	*10			MUDSTONE	SLTY.DK.GY.MAS.SLD AS ABOVE. LARGE QTZ VEIN AT BASE OF INT ERVAL (3 CM) WITH A LISTRIC SURFACE AT THE BASE.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
50	121.21	122.11	0.90	*31			SILTSTONE	M-DK.GY.LAM.BRKN LISTRIC SURFACES. INTERLAMINATED MUDST. QTZ VEINING. SHARP BASAL CONTACT.
50	122.11	122.21	0.10	58			ROCK LOSS	
50	122.21	122.75	0.54	*75			SANDSTONE	MG.PR.LT.GY.MAS.BRKN IRREGULAR QTZ VEINING.
51	122.75	123.39	0.64	75			SANDSTONE	FG.LT.GY.MAS.SLD QTZ VEINS WITHIN.
51	123.39	124.33	0.94	75	05433		SANDSTONE	FG.LT.GY.MAS.BRKN AS ABOVE WITH MUDDY LAMINAE WITHIN LOWE R HALF, LOWER 25 CM SAMPLED.
51	124.33	124.70	0.37	75	05434	PH	COAL	C-2.VBRKN
52	124.70	125.10	0.40	75	05434	PH	COAL	C-4.SHRD LISTRIC.
52	125.10	125.13	0.03	75	05434	PH	COAL	C-6.SLD
52	125.13	125.49	0.36	75	05435	PH	MUDSTONE	SLTY.M.GY.BRKN QTZ AT BASE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
52	125.49	125.71	0.22	75	05436	PH	COAL	C-5.BRKN QTZ WITHIN.
52	125.71	125.85	0.14	75	05436	PH	COAL	C-3.VBRKN SHEARED.
52	125.85	126.51	0.66	75	05436	PH	COAL	C-2.VBRKN MUDDY BANDS WITHIN (MINOR).
52	126.51	126.55	0.04	75	05436	PH	COAL	C-2.VBRKN
53	126.55	126.72	0.17	75	05436	PH	COAL	C-2.BRKN
53	126.72	126.94	0.22	75	05436	PH	COAL LOSS	
53	126.94	127.04	0.10	75	05436	PH	MUDSTONE	CARB.DK.GY.BRKN COALY.
53	127.04	127.07	0.03	75	05437	PH	COAL LOSS	
53	127.07	127.14	0.07	75	05437	PH	COAL	C-4.SLD SOFT.
53	127.14	127.47	0.33	75	05437	PH	COAL	C-2.BRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
53	127.47	127.71	0.24	75	05437	PH	COAL	C-3.BRKN CORE TWISTED OFF AT TOP.
53	127.71	127.80	0.09	75	05437	PH	MUDSTONE	CARB.SLD POORLY CONSOLIDATED.
53	127.80	128.65	0.85	75	05437	PH	COAL	C-2.BRKN MINOR MUDDY BANDS THROUGHOUT.
54	128.65	128.67	0.02	75	05437	PH	COAL	C-6.SLD BONE COAL.
54	128.67	129.17	0.50	75	05437	PH	COAL	C-2.VBRKN POSSIBLY LOWER GRADE.
54	129.17	129.39	0.22	75	05438		MUDSTONE	CARB.DK.GY.SHRD COALY IN PLACES.
54	129.39	130.46	1.07	*75			MUDSTONE	M-DK.GY.BRKN CARB AT TOP SILTY AT BASE.
55	130.46	131.02	0.56	70			MUDSTONE	SLTY.M.GY.MAS.VSHRD ABUNDANT LISTRIC SURFACES.
55	131.02	132.02	1.00	65			SANDSTONE	MG.LT-DK.GY.MAS.SHRD VERY DISTURBED SECTION OF CORE. HEAVILY FRACTURED, ABUNDANT QTZ. MINOR INTERLAMINATED MUDST.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86008

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
55	132.02	132.12	0.10	62			MUDSTONE	SLTY.M-DK.GY.MAS.VSHRD
56	132.12	132.27	0.15	61			MUDSTONE	SLTY.M-DK.GY.MAS.VSHRD
56	132.27	133.59	1.32	57			SILTSTONE	SSY.VSHRD ABUNDANT LISTRIC SURFACES. MINOR IRREGULAR QTZ VEINING.
56	133.59	133.74	0.15	52			SANDSTONE	MG.PR.LT-M.GY.MAS.SLD MINOR QTZ VEINING. DEFINITE IRREGULAR UPPER CONTACT. LISTRIC SURFACE.
57	133.74	135.05	1.31	*48			SANDSTONE	MG.PR.LT-M.GY.MAS.BRKN LISTRIC SURFACES. QTZ VEINING (<2 CM). ONE 2 CM SILTY BAND. TOTAL DEPTH = 136.25 M.

* DENOTES MEASURED BCA

NEWPAGE

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86008 SEAM : 1 INTERVAL(M) : 20.92 - 24.56 ELEVATION(M) : 1614.4

GEOLOGIST : SAVOIE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	20.92			0.08												
				(0.24)												
			0.10													
				0.37	53.8	5440	5440	0.90/ 0.10		—	—	—	—	—	—	—
								1.00								
				(0.22)												
	21.96		(0.11)													
				(0.08)												
			0.11													
				0.82												
			0.63													
				(0.87)	48.5	5441	5441	2.20 / 0.30		—	—	—	—	—	—	—
			0.04					2.50								
			0.12													
				(1.06)												
	24.56															

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDHB60DB | SEAM : 1 REP | INTERVAL(M) : 48.74 – 54.35 | ELEVATION(M) : 1614.4

GEOLOGIST : SAVOIE | SCALE: 1:40 | DATE : MAR 04/87 | DRAWING NO. :

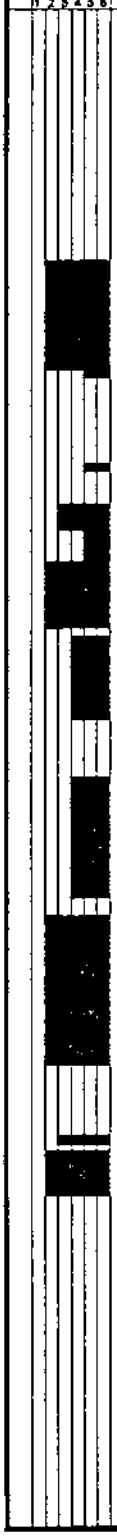
SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	48.74			0.22												
			(0.10)													
			(0.10)	(0.10)												
			(0.10)													
				(0.31)	59.8	5423										
				0.78												
	50.66		0.13													
				0.19												
			0.08													
			(0.12)													
				0.22												
			(0.11)													
				0.52	78.2	5424	18	2.54 / 0.83		1.60	27.95	7.19	83.36	0.44	24.47	—
			0.03					3.37								
				0.18												
			0.03													
	52.63		(0.12)													
				1.49	100.0	5425	19	1.49 / 0.00		1.18	11.17	8.79	80.86	—	30.69	—
								1.49								
	54.35															

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH86008 SEAM : H INTERVAL(M) : 93.65 – 100.01 ELEVATION(M) : 1614.4

GEOLOGIST : SAVOIE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	93.65			0.73	90.5	5428										
	94.50		0.46		100.0	5429										
			0.21													
	95.26			0.77			20	2.28 / 0.83 3.22		0.55	55.28	9.09	35.08	0.38	12.82	—
				0.51	90.7	5430										
			0.20	(0.14)												
	97.08			0.76												
			0.11													
				0.92	84.4	5431	21	2.44 / 0.24 2.88		0.47	35.06	8.68	55.79	0.40	21.13	—
				(0.35)												
			0.09													
			0.04	0.03												
				0.28												
	100.01			(0.07)												

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86008 SEAM : PH INTERVAL(M) : 124.33 - 129.17 ELEVATION(M) : 1614.4

GEOLOGIST : SAVOIE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	124.33			0.77	100.0	5434	22	0.77 / 0.35 1.12		0.81	60.35	11.35	37.69	0.28	14.43	—
	125.13		0.35		100.0	5435										
	125.49			1.19	85.8	5436	23	1.40 / 0.10 1.50		0.99	26.78	8.23	64.02	0.37	23.85	—
				(0.21)												
	127.04		0.10	(0.03)												
				0.62												
			0.08													
				1.32	88.6	5437	24	1.87 / 0.09 2.06		1.84	28.56	7.88	62.72	0.37	24.06	—
	129.17	COAL														

GULF CANADA CORPORATION
COAL DIVISION
KLAPPAN PROJECT
STRATIGRAPHIC LOG
KPN LR DDH86008

723

GEOLOGIST : SAVOIE	DATE : FEB 26/87	DRAWING NO. :

SCALE : 1:200 1:40

NORTHING: 6344618.0 N
EASTING: 507080.9 E

INCLINATION: 77.0°
BEARING: 350.0°

LITHOLOGIC SYMBOLS

SANDSTONE	BENTONITE
SILTSTONE	BRECCIA
COAL	CARBONACEOUS
OVERBURDEN	QUARTZ
MUDSTONE,CLAYSTONE	PYRITE
TUFF	FERRUGINOUS
LIMESTONE	CONGLOMERATE
CORE LOSS	FOSSIL BED

SEAM DETAIL

DRILLED DEPTH (M)	BCA (DCC)	TRUE DEPTH (M) 1 : 200	DRILLED DEPTH (M) 1 : 40	TRUE THICKNESS (M)
10		10		
20		20	20.92	ROCK | COAL
			SEAM I	
	74			
30	71	30	24.56	0.40 | 3.10
	53			3.50
	61			
40	58	40	48.74	ROCK | COAL
	60			
50			SEAM I REP	
	60	50		
60	65		54.35	0.83 | 4.03
	65	60		4.86
70	65			
	70	70		
	60			
80			93.65	ROCK | COAL
	73			
	77	80		
90			SEAM H	
		90		
100	60			
	40			
110	20	100	100.01	1.17 | 4.73
120	75			5.89
			124.33	ROCK | COAL
130	75	110		
	48			
			SEAM PH	
			129.17	0.53 | 4.14
				4.68

TOTAL: 135.05 TOTAL: 114.71

Gulf Canada Corporation
Coal Division
Geophysical Log

723

Datasource: KPNLRDDH86008	**Province:** BC	**Northing:** 6344920.00	**Lat:** 571457
Log Date: 86-08-29	**Zone:** 9	**Easting:** 507081.00	**Long:** 1285258
Company: CENTURY	**Measuring Point:**		**Elevation:** 1614.3
Geologist: SAVOIE			

Scale: 1 to 100.0

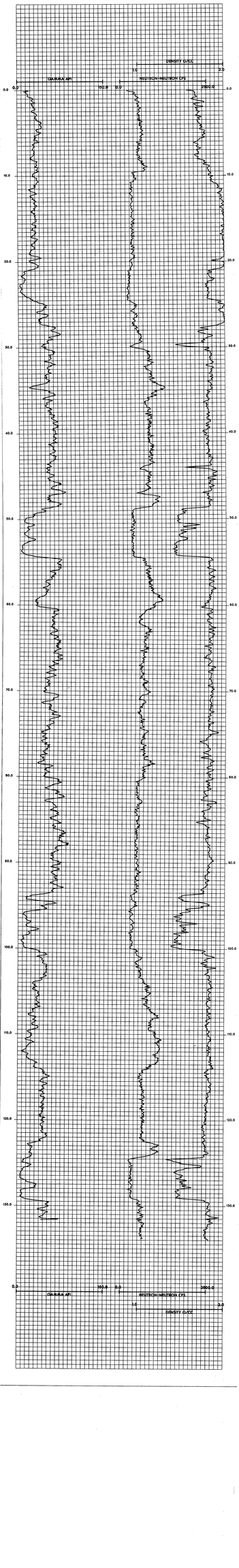
Depth Range: 0.0 to 139.0

True Thickness: NO

Comments:
1. LOGGED THROUGH THE RODS
2.

Logs Plotted:

Description	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1. GAMMA API	0.0 to 150.0	10.0	31	9030A	IN PIPE
2. NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3. DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE



KPNLRDDH86009

GULF CANADA CORPORATION

- D A T A S O U R C E S U M M A R Y -

DATA SOURCE - KPNLRDDH86009 DATE - 02/13/87

- H I S T O R Y -

START DATE - 28/08/86
END DATE - 01/09/86

CONTRACTOR - J.T. THOMAS
GEOLOGIST - LOVE
OPERATOR - G.C.C.
SURVEYOR - TRONNES

REMARKS - COAL LOGGED BY BRAD VANDENBUSSCHE. TWO STAND PIPES (1") AT 201 M, (1") AT 128 M.

- L O C A T I O N -

PROVINCE - BC
ELEVATION - 1595.68
ZONE - 9
NORTHING - 6344517.00
EASTING - 507379.69

LICENCE/LEASE NUMBER -

LATITUDE - 571444
LONGITUDE - 1285240

- O R I E N T A T I O N -

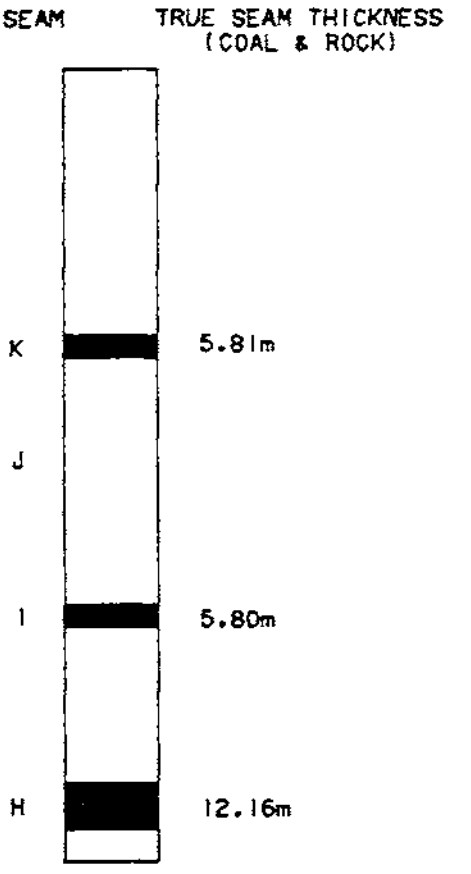
LENGTH - 209.40
INCLINATION - 78.0
AZIMUTH - 78.0

CORE SIZE - 0.0

CEMENT - N
PLUG - N
PIEZ - N

CASING DEPTH(M) - 18.29
AQUIFER DEPTHS(M) - 0.00
0.00
LOST CIRC. DEPTHS(M) - 0.00
0.00

*** NOTE *** 0 INDICATES NO VALUE



NOTE:

SCHEMATIC PROFILE.
NO THICKNESSES SHOWN
FOR SEAMS CONTAINING
LESS THAN 50cm ANTHRACITE.

SCALE 1:2000

FIGURE

MOUNT KLAPPAN ANTHRACITE PROJECT

1986 DIAMOND DRILL HOLES
DDH86009

GULF CANADA CORPORATION
11/03/87
KLAP:[205057]870063009.LOG

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 1

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
	0.00	18.29	18.29	45			OVERBURDEN	CASING.
1	18.29	19.69	1.40	*45			SANDSTONE	FG.MOD.LT-M.GY.LAM.VBRKN M VERY VERY BROKEN CORE.V. RARE DK GY S ILTY LAM.
1	19.69	20.06	0.37	47			ROCK LOSS	
2	20.06	20.70	0.64	48			SANDSTONE	FG.LT-M.GY.LAM.VBRKN SAME AS ABOVE. MOSTLY VERY VERY BROKEN.
2	20.70	20.98	0.28	49			MUDSTONE	DK.GY.MAS UPPER 5-10 CM IS VERY VERY BROKEN.
3	20.98	21.78	0.80	51			MUDSTONE	DK.GY.MAS.VBRKN SOFT, FINELY BRECCIATED IN SOFT ROCK PO WDER MATRIX. RUSTY AT .55 TO .60 M.BOTT OM 10 CM IS SLIGHTLY COALY.
3	21.78	22.24	0.46	*52			MUDSTONE	SLTY.DK.GY.LAM.VBRKN MOSTLY FINELY BRECCIATED AND V SOFT. IR REGULAR M GY SILTY LENSES AND LAMINAE I N MUDST.
4	22.24	22.32	0.08	52			MUDSTONE	DK.GY.VBRKN GRAVEL IN A CORE BOX.
4	22.32	23.61	1.29	54			ROCK LOSS	

* DENOTES MEASURED BCA

87/02/13 GULF CANADA CORPORATION - COAL DIVISION - DESCRIPTIVE LOG PAGE 2

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
4	23.61	24.21	0.60	55			MUDSTONE	DK.GY.VBRKN MOSTLY GRAVEL GRADING DOWN INTO SOFT BR ECCIATED ROCK.
4	24.21	24.88	0.67	56			MUDSTONE	DK.GY.MAS.SLD MONOTONOUS MASSIVE MUDSTONE. RARE BIVAL VE FOSSILS.
4	24.88	26.66	1.78	58			ROCK LOSS	
4	26.66	26.74	0.08	59			MUDSTONE	DK.GY.VBRKN SOFT, BRECCIATED WITH SOFT ROCK POWDER MATRIX.
5	26.74	27.44	0.70	60			MUDSTONE	DK.GY.MAS.VBRKN V. RARE SHELL FRAGMENTS.CORE STATE VARI ES FROM GRAVEL WITH A FEW PIECES 10 - 2 0 CM LONG THAT ARE SOFT AND BRECCIATED.
5	27.44	29.71	2.27	62			ROCK LOSS	
5	29.71	30.33	0.62	65			MUDSTONE	DK.GY.VBRKN SOFT, BRECCIATED WITH VERY SOFT ROCK PO WDER MATRIX.

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
6	30.33	31.23	0.90	66			MUDSTONE	DK.GY.MAS.VBRKN UPPER 25 CM IS BROKEN.THE REST IS GRAVE L TO SOFT AND BRECCIATED.
6	31.23	32.75	1.52	68			ROCK LOSS	
6	32.75	33.15	0.40	69			MUDSTONE	DK.GY.VBRKN COALY.MANY PLANT FRAGS. NUMEROUS LISTRI C SURFACES.VERY BROKEN TO SHEARED.
7	33.15	33.50	0.35	70			MUDSTONE	DK.GY.VBRKN DARK GY TO MED. BLK.VERY COALY. NUMEROU S PLANT FRAGS. OFTEN SHEARED. MANY LIST RIC SURFACES.
7	33.50	35.80	2.30	72			ROCK LOSS	
7	35.80	36.75	0.95	75			MUDSTONE	DK.GY.VBRKN SAME ROCK TYPE AS ABOVE WITH FEW THIN (1 CM) COAL LAYERS.
7	36.75	37.75	1.00	76			ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
8	37.75	38.85	1.10	*78			MUDSTONE	M-DK.GY.LAM.VBRKN V. FEW SILTY LAM.FEW COALY LENSES.MANY PLANT FRAGMENTS.LOWER 50 CM IS VERY VER Y BROKEN.
8	38.85	39.39	0.54	*65			MUDSTONE	M.BLK.SLD VERY COALY.MANY PLANT FRAGMENTS.FEW COA LY LENSES.
9	39.39	40.19	0.80	67			MUDSTONE	DK.GY.LAM.VBRKN MANY PLANT FRAGMENTS.FEW COALY PIECES. VERY DARK GREY. 10 CM SILTY LAMINATED P IECE NEAR TOP. MOSTLY VBRKN.SOME PARTS ARE SOFT AND BRECCIATED WITH VERY SOFT MATRIX.RARELY SHEARED.
9	40.19	41.14	0.95	69			MUDSTONE	DK.GY.LAM.VBRKN SAME ROCK TYPE AS ABOVE.
10	41.14	41.67	0.53	71			MUDSTONE	DK.GY.LAM.VBRKN SIMILAR TO ABOVE. SLIGHTLY LESS PLANT F RAGMENTS. PART HAS 1-2% PYRITE DISSEMIN ATED.
10	41.67	42.02	0.35	72			ROCK LOSS	

* DENOTES MEASURED BCA

FORM 4001

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
10	42.02	43.09	1.07	74			MUDSTONE	DK.GY.MAS.VBRKN SECTIONS ARE SOFT AND VSHRD.
11	43.09	44.84	1.75	*77			MUDSTONE	DK.GY.LAM.BRKN FAINTLY LAMINATED. SOME SECTIONS VSHRD.
11	44.84	45.06	0.22	77			ROCK LOSS	
11	45.06	45.09	0.03	77			MUDSTONE	DK.GY.LAM.BRKN SAME AS ABOVE.
12	45.09	46.85	1.76	77			MUDSTONE	DK.GY.LAM.BRKN SAME AS ABOVE.
12	46.85	47.39	0.54	76			ROCK LOSS	
13	47.39	48.10	0.71	76			MUDSTONE	DK.GY.MAS.SLD V. RARELY FAINTLY LAMINATED.
13	48.10	49.32	1.22	76			MUDSTONE	DK.GY.MAS.SLD SAME AS ABOVE.
14	49.32	50.73	1.41	76			MUDSTONE	DK.GY.MAS.SLD V RARELY FAINTLY LAMINATED.
14	50.73	51.28	0.55	75			MUDSTONE	DK.GY.MAS.SLD SAME AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
15	51.28	53.35	2.07	*75			MUDSTONE	DK.GY.LAM.SLD VERY FAINTLY LAMINATED.
16	53.35	53.43	0.08	72			MUDSTONE	DK.GY.LAM.SLD SAME AS ABOVE.
16	53.43	54.98	1.55	70			MUDSTONE	DK.GY.LAM.SLD SAME AS ABOVE.
17	54.98	56.33	1.35	67			MUDSTONE	DK.GY.LAM.SLD SAME AS ABOVE.
17	56.33	56.72	0.39	65			MUDSTONE	DK.GY.LAM.BRKN SAME AS ABOVE.
18	56.72	58.66	1.94	*62			MUDSTONE	DK.GY.LAM.SLD SAME AS ABOVE. FEW LISTRIC SURFACES.
19	58.66	59.21	0.55	62			MUDSTONE	DK.GY.LAM.BRKN SAME AS ABOVE.
19	59.21	59.62	0.41	62			ROCK LOSS	
19	59.62	60.92	1.30	63			MUDSTONE	DK.GY.LAM.BRKN SAME AS ABOVE. FEW LISTRIC SURFACES.
20	60.92	62.42	1.50	*63			MUDSTONE	DK.GY.LAM.BRKN SAME AS ABOVE. FEW LISTRIC SURFACES.VBR KR AT BOTTOM OF INTERVAL.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
20	62.42	62.66	0.24	64			MUDSTONE	DK.GY.LAM.BRKN SAME AS ABOVE.
21	62.66	64.41	1.75	66			MUDSTONE	DK.GY.LAM.VBRKN SAME ROCK TYPE AS ABOVE. MANY LISTRIC S URFACES.
21	64.41	64.72	0.31	67			ROCK LOSS	
22	64.72	65.49	0.77	68			MUDSTONE	DK.GY.LAM.BRKN SAME ROCK TYPE AS ABOVE.
22	65.49	66.54	1.05	69			MUDSTONE	DK.GY.LAM.SLD SAME ROCK TYPE AS ABOVE.
23	66.54	68.54	2.00	72			MUDSTONE	DK.GY.MAS.SLD V FAINTLY LAMINATED.
24	68.54	70.29	1.75	74	05443		MUDSTONE	DK.GY.MAS.SLD SAME AS ABOVE.BREAKS ON ABUNDANT LISTRI C SURFACES.LOWER 25 CM SAMPLED.
24	70.29	70.35	0.06	76	05444	K	COAL	C-3.BRKN LISTRIC SURFACES.
25	70.35	70.82	0.47	76	05444	K	COAL	C-2.SHRD SHEARED IN PLACES.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
25	70.82	71.12	0.30	77	05444	K	COAL LOSS	
25	71.12	71.16	0.04	77	05444	K	COAL	C-6 BONE COAL.
25	71.16	71.18	0.02	77	05444	K	COAL	C-2
25	71.18	71.25	0.07	77	05444	K	MUDSTONE	CARB.DK.GY.SLD COALY PLANT FRAGS WITHIN.
25	71.25	71.45	0.20	77	05444	K	COAL	C-3.SHRD MINOR MUDDY BANDS WITHIN.
25	71.45	72.60	1.15	78	05444	K	COAL	C-2.SHRD MINOR MUDDY BANDS WITHIN.
26	72.60	73.10	0.50	80	05444	K	COAL	C-2.SHRD MINOR MUDDY BANDS WITHIN.
26	73.10	73.55	0.45	80	05444	K	COAL	C-3.SHRD
26	73.55	73.65	0.10	81	05444	K	COAL LOSS	
26	73.65	73.67	0.02	81	05444	K	COAL	C-6.SLD BONE COAL.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
26	73.67	73.71	0.04	81	05444	K	MUDSTONE	CARB.DK.GY.SLD ABUNDANT COALY PLANT FRAGS THROUGHOUT.
26	73.71	73.76	0.05	81	05444	K	COAL	C-3.BRKN
26	73.76	73.86	0.10	81	05444	K	COAL	C-5.SLD POORLY CONSOLIDATED AND MUDDY.
26	73.86	74.18	0.32	81	05444	K	COAL LOSS	
26	74.18	74.24	0.06	82	05444	K	COAL	C-4.SLD
26	74.24	74.73	0.49	82	05444	K	COAL	C-2.BRKN SHEARED IN PLACES.
27	74.73	74.78	0.05	82	05444	K	COAL	C-6.SLD BONE COAL.
27	74.78	74.90	0.12	83	05445	K	MUDSTONE	CARB.DK.GY.VBRKN COALY STRINGERS THROUGHOUT.
27	74.90	75.33	0.43	83	05446	K	MUDSTONE	CARB.DK.GY.BRKN COALY STRINGERS THROUGHOUT.
27	75.33	76.00	0.67	84	05446	K	COAL	C-3.BRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
27	76.00	76.08	0.08	84	05446	K	MUDSTONE	SLTY.M.GY.SLD
27	76.08	76.20	0.12	84	05446	K	COAL	C-3.SHRD
27	76.20	76.82	0.62	*85	05447		MUDSTONE	DK.GY.LAM.SLD ABUNDANT PLANT FOSSILS AND FRAGMENTS IN BOTTOM 62 CM. 2.5 CM M-DK GY CLAY BAND AT 25 CM. UPPER 25 CMSAMPLED.
28	76.82	77.06	0.24	83			MUDSTONE	DK.GY.MAS.SLD MODERATELY ABUNDANT PLANT BITS.
28	77.06	77.64	0.58	81			MUDSTONE	DK.GY.MAS.SLD
28	77.64	78.14	0.50	*78			SANDSTONE	FG.LT-M.GY.LAM.SLD FEW SILTY LAMINAE.
28	78.14	78.82	0.68	78			SILTSTONE	M.GY.LAM.XBDG.SLD SANDY LAMINATED SILTSTONE. SSD.
29	78.82	79.54	0.72	78			SILTSTONE	M.GY.LAM.SSD.SLD ONLY SLIGHTLY SANDY, LESS THAN ROCK TYPE ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
29	79.54	80.64	1.10	78			SANDSTONE	SLTY.FG.LT-M.GY.LAM.XBDG.SLD WISPY SILTY LAMINATED SANDSTONE.VARIABL E CORE ANGLES DUE TO XBDG.
30	80.64	80.97	0.33	78			SANDSTONE	SLTY.FG.M.GY.LAM.XBDG.SLD SAME AS ABOVE.
30	80.97	81.47	0.50	78			SANDSTONE	MG.LT-M.GY.MAS.SLD
30	81.47	82.22	0.75	78			SANDSTONE	MG.M.GY.MAS.VBRKN OCCASIONALLY SHEARED. FEW QTZ CARB VEIN LETS.
30	82.22	82.42	0.20	78			ROCK LOSS	
30	82.42	82.52	0.10	78			SANDSTONE	FG.LT-M.GY.MAS.VBRKN
31	82.52	83.74	1.22	78			SANDSTONE	FG.LT-M.GY.LAM.SLD TOP IS VBRKN. MOST IS SOLID.RARE SILTY LAMINAE, SLIGHTLY WISPY. FEW QTZ CARB V EINLETS.V RARE SMALL (<1 CM) RIPUP CLAS T.
31	83.74	84.36	0.62	78			SANDSTONE	FG.LT-M.GY.LAM.SLD BECOMING COARSER GRAINED DOWN-HOLE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
32	84.36	85.99	1.63	78			SANDSTONE	MG.LT-M.GY.MAS.VBRKN GRADATIONAL FROM ABOVE ROCK TYPE.
33	85.99	86.89	0.90	78			SANDSTONE	MG.LT-M.GY.MAS.VBRKN SAME ROCK TYPE AS ABOVE.
33	86.89	87.44	0.55	78			SANDSTONE	MG.LT-M.GY.MAS.VBRKN SAME ROCK TYPE AS ABOVE.
34	87.44	87.52	0.08	78			SANDSTONE	MG.LT-M.GY.MAS.VBRKN SAME ROCK TYPE AS ABOVE.
34	87.52	87.66	0.14	78			ROCK LOSS	
34	87.66	88.22	0.56	78			SILTSTONE	M-DK.GY.MAS.VSHRD
34	88.22	89.08	0.86	*78			MUDSTONE	SLTY.M-DK.GY.LAM.BRKN OCCASIONALLY SHEARED, BREAKS ON LISTRIC SURFACES. FAINTLY LAMINATED.
35	89.08	89.72	0.64	*85			SANDSTONE	SLTY.M.GY.LAM.BRKN WISPY SILTY LAMINATED SANDSTONE BECOMIN G FINER-GRAINED DOWNWARD.
35	89.72	90.84	1.12	85			MUDSTONE	SLTY.M-DK.GY.LAM.VBRKN FEW SANDY LAMINAE NEAR TOP. LOCALLY SHE ARED. FEW QTZ CARB VEINLETS.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
35	90.84	91.27	0.43	85			ROCK LOSS	
36	91.27	92.38	1.11	84			MUDSTONE	DK.GY.LAM.VBRKN LOCALLY EXTREMELY BROKEN. FAINTLY LAMIN ATED.
36	92.38	92.49	0.11	84			ROCK LOSS	
36	92.49	92.96	0.47	*84			MUDSTONE	DK.GY.LAM.BRKN SAME ROCK TYPE AS ABOVE.
37	92.96	93.81	0.85	*83			MUDSTONE	SLTY.DK.GY.LAM.VBRKN LOCALLY FISSILE. EVENLY LAMINATED RHYTH MITE. BEGINNING OF COASTER ZONE.
37	93.81	94.36	0.55	83			ROCK LOSS	
37	94.36	95.31	0.95	84			MUDSTONE	SLTY.DK.GY.LAM.VBRKN SAME AS ABOVE. COASTER ZONE.
37	95.31	95.77	0.46	84			ROCK LOSS	
38	95.77	97.41	1.64	85			MUDSTONE	SLTY.DK.GY.LAM.SLD SAME ROCK TYPE AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
38	97.41	97.83	0.42	85			MUDSTONE	SLTY.DK.GY.LAM.SSD.SLD SAME ROCK TYPE AS ABOVE.
39	97.83	99.79	1.96	*86			MUDSTONE	SLTY.DK.GY.LAM.BRKN SAME ROCK TYPE AS ABOVE.
40	99.79	100.34	0.55	87			MUDSTONE	SLTY.DK.GY.LAM.BRKN SAME ROCK TYPE AS ABOVE.
40	100.34	100.61	0.27	87			ROCK LOSS	
40	100.61	101.81	1.20	*87			MUDSTONE	SLTY.DK.GY.LAM.BRKN SAME ROCK TYPE AS ABOVE.
41	101.81	101.84	0.03	86			MUDSTONE	SLTY.DK.GY.LAM.SLD SAME ROCK TYPE AS ABOVE.
41	101.84	103.39	1.55	85			MUDSTONE	SLTY.DK.GY.LAM.BRKN SAME ROCK TYPE AS ABOVE.
41	103.39	103.54	0.15	84			MUDSTONE	SLTY.DK.GY.LAM.BRKN COALY ON BEDDING PLANES.SEVERAL QTZ CAR B VEINS WITH MOST PARALLEL TO BEDDING.
42	103.54	104.13	0.59	83			MUDSTONE	SLTY.DK.GY.LAM.BRKN SAME ROCK TYPE AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
42	104.13	104.55	0.42	83			MUDSTONE	SLTY.DK.GY.LAM.BRKN VERY COALY. SEVERAL V THIN COAL LAYERS AND LENSES.J SEAM.
42	104.55	105.00	0.45	82		J	COAL LOSS	
42	105.00	105.72	0.72	81			MUDSTONE	SLTY.DK.GY.LAM.BRKN SAME AS ABOVE. LOCALLY VBRKN.
43	105.72	106.00	0.28	81			MUDSTONE	SLTY.DK.GY.LAM.BRKN COALY ON BEDDING PLANES. FEW V THIN COAL LAYERS AND LENSES.
43	106.00	106.25	0.25	80			MUDSTONE	DK.GY.MAS.BRKN SLIGHTLY COALY. MANY PLANT FRAGS. FEW LISTRIC SURFACES.
43	106.25	107.53	1.28	79			SANDSTONE	SLTY.FG.VPR.M.GY.VTHNB.BIOTR.BRKN FEW SILTY BEDS ARE VERY BIOTURBATED. V. THIN SILTYBEDS.
43	107.53	108.04	0.51	78			ROCK LOSS	
43	108.04	108.06	0.02	78			SANDSTONE	SLTY.FG.VPR.M.GY.VTHNB.BIOTR.BRKN SAME AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
44	108.06	108.82	0.76	*77			SANDSTONE	SLTY.MG.VPR.M.GY.LAM.SSD.BRKN FEW SILTY LAMINAE TO VERY THIN BEDS. MOSTLY MG SS.
44	108.82	109.93	1.11	79			MUDSTONE	DK.GY.LAM.BIOTR.SLD IRREGULARLY LAMINATED. SSD.
45	109.93	111.15	1.22	*81			MUDSTONE	DK.GY.LAM.BIOTR.SLD SAME AS ABOVE. LOCALLY BROKEN. SSD.
45	111.15	111.87	0.72	71			MUDSTONE	DK.GY.LAM.BIOTR.SLD SAME ROCK TYPE AS ABOVE. SSD.
46	111.87	113.57	1.70	*59			MUDSTONE	DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE.LOCALLY SHEARED .MANY LISTRIC SURFACES.LOCALLY BRECCIATED. SSD.
47	113.57	113.77	0.20	66			MUDSTONE	DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE.
47	113.77	114.20	0.43	69			ROCK LOSS	
47	114.20	114.56	0.36	72			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.VBRKN MANY LISTRIC SURFACES.
47	114.56	115.26	0.70	76			SANDSTONE	MG.LT-M.GY.LAM.SLD WISPY WITH DISCONTINOUS SILTY LAYERS 1-3 MM THICK.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
47	115.26	115.63	0.37	*80			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.SLD
47	115.63	115.85	0.22	81			SANDSTONE	MG.LT-M.GY.VTHNB.SSD.SLD ONLY ONE VERY THIN SILT BED.
48	115.85	117.13	1.28	*85			SANDSTONE	MG.LT-M.GY.MAS.SSD.BRKN V. RARE SILTY BEDS WITH SSD. FEW SILTY WISPS. MOSTLY MASSIVE.
48	117.13	117.25	0.12	88			ROCK LOSS	
48	117.25	117.86	0.61	*90			SANDSTONE	MG.LT-M.GY.MAS.BRKN SEVERAL OPEN FRACTURES.
49	117.86	119.48	1.62	89			SANDSTONE	MG.LT-M.GY.MAS.VBRKN MANY OPEN FRACTURES.CORE IS VERY VERY BROKEN.FEW SILTY WISPS. MOSTLY MASSIVE.
50	119.48	120.23	0.75	87			SANDSTONE	MG.LT-M.GY.MAS.SSD.VBRKN SAME AS ABOVE, LOCALLY SO BROKEN IT IS JUST GRAVEL.
50	120.23	120.68	0.45	87			SANDSTONE	MG.LT-M.GY.MAS.SSD.VBRKN SAME ROCK TYPE AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
50	120.68	120.93	0.25	86			SILTSTONE	SSY.M-DK.GY.LAM.SSD.VBRKN SANDY SILTSTONE WITH VFG SAND WISPS, LENSES AND LAMINAE.
50	120.93	121.35	0.42	86			ROCK LOSS	
51	121.35	122.06	0.71	85			SILTSTONE	SSY.M-DK.GY.LAM.SSD.VBRKN SAME ROCK TYPE AS ABOVE.
51	122.06	123.07	1.01	84			MUDSTONE	SSY.M-DK.GY.LAM.BIOTR.BRKN LOCALLY BIOTURBATED. TOPS UP. SSD.
52	123.07	123.52	0.45	83			MUDSTONE	SSY.M-DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. SSD.
52	123.52	125.05	1.53	*82			MUDSTONE	SSY.M-DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. SSD.
53	125.05	126.50	1.45	81			MUDSTONE	SSY.M-DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. SSD.
53	126.50	126.96	0.46	80			MUDSTONE	SSY.M-DK.GY.LAM.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. SSD.
54	126.96	128.89	1.93	78			SILTSTONE	SSY.M.GY.LAM.BIOTR.BRKN LOCALLY VBRKN. SIMILAR TO ROCK TYPE ABOVE, WITH LOW ANGLE XBDG, GRADUALLY BECOMING LIGHTER GY DOWN-HOLE. XBDG. SSD.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
55	128.89	129.56	0.67	77			SANDSTONE	SLTY.VFG.PR.LT-M.GY.LAM.BIOTR.SLD GRADATIONAL FROM ABOVE. SSD. XBDG.
55	129.56	130.82	1.26	76			SANDSTONE	SLTY.VFG.PR.LT-M.GY.LAM.BIOTR.SLD SAME ROCK TYPE AS ABOVE. SSD. XBDG.
56	130.82	132.12	1.30	*75			SANDSTONE	SLTY.VFG.PR.LT-M.GY.LAM.BIOTR.SLD SAME ROCK TYPE AS ABOVE. SSD. XBDG.
56	132.12	132.43	0.31	76			SANDSTONE	SLTY.VFG.PR.LT-M.GY.LAM.BIOTR.VBRKN SAME ROCK TYPE AS ABOVE. XBDG. SSD.
56	132.43	133.47	1.04	77			ROCK LOSS	
57	133.47	134.26	0.79	78			SANDSTONE	SLTY.VFG.PR.LT-M.GY.LAM.BIOTR.VBRKN SAME ROCK TYPE AS ABOVE, SSD. XBDG.
57	134.26	135.10	0.84	79			SANDSTONE	SLTY.VFG.PR.LT-M.GY.LAM.XBDG.SLD SIMILAR ROCK TYPE AS ABOVE WITH QTZ CAR B FILLED CLOSED FRACTURES. SSD.
58	135.10	137.15	2.05	80			SANDSTONE	SLTY.VFG.PR.LT.GY.LAM.XBDG.SLD GRADATIONAL FROM ABOVE. BOTTOM 20 CM IS VBRKN.
59	137.15	137.25	0.10	81			SANDSTONE	SLTY.VFG.PR.LT.GY.LAM.XBDG.BRKN SAME ROCK TYPE AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
59	137.25	138.95	1.70	82			SANDSTONE	SLTY.VFG.PR.LT.GY.LAM.XBDG.VBRKN SAME ROCK TYPE AS ABOVE.
59	138.95	139.05	0.10	83			ROCK LOSS	
60	139.05	139.40	0.35	84			SILTSTONE	LT.GY.LAM.VBRKN FISSILE LAMINATED TUFFITE WITH CLAY BET WEEN SOME LAMINAE.
60	139.40	139.70	0.30	84			SILTSTONE	LT.GY.VTHNB.BRKN BANDED TUFFITE.
60	139.70	139.95	0.25	84			SILTSTONE	LT.GY.MAS.VBRKN MASSIVE TUFFITE.
60	139.95	140.02	0.07	84			ROCK LOSS	
60	140.02	140.07	0.05	84			BENTONITE	DK.WH.VBRKN SOFT.SHARP CONTACTS.
60	140.07	140.10	0.03	84			SILTSTONE	M.GY.BRKN
60	140.10	140.14	0.04	85			BENTONITE	DK.WH.BRKN SOFT, SHARP CONTACTS.
60	140.14	140.97	0.83	*85			MUDSTONE	SLTY.M-DK.GY.LAM.SLD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
61	140.97	141.18	0.21	84			MUDSTONE	DK.GY.LAM.BRKN FAINTLY LAMINATED.
61	141.18	141.61	0.43	83			MUDSTONE	DK.GY.MAS.BRKN MANY PLANT FRAGMENTS.
61	141.61	142.13	0.52	82			ROCK LOSS	
61	142.13	142.29	0.16	81		I	COAL LOSS	
61	142.29	142.51	0.22	81		I	ROCK LOSS	
61	142.51	144.00	1.49	79		I	COAL LOSS	
61	144.00	144.21	0.21	77		I	ROCK LOSS	
61	144.21	144.41	0.20	77		I	COAL LOSS	
61	144.41	144.58	0.17	77		I	ROCK LOSS	
61	144.58	148.14	3.56	73		I	COAL LOSS	
61	148.14	148.79	0.65	*68			MUDSTONE	DK.GY.MAS.VBRKN SAME ROCK TYPE AS ABOVE. ENTIRE I SEAM MISSING DUETO CORE LOSS.
61	148.79	148.89	0.10	67			SANDSTONE	FG.M.GY.VBRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
61	148.89	149.12	0.23	66			ROCK LOSS	
62	149.12	149.92	0.80	*65			MUDSTONE	DK.GY.MAS.VBRKN FAINTLY LAMINATED IN PLACES.
62	149.92	150.56	0.64	66			SANDSTONE	MG.PR.LT-M.GY.MAS.VBRKN QTZ CARB FILLED FRACTURES.
62	150.56	150.85	0.29	67			ROCK LOSS	
62	150.85	151.11	0.26	67			SANDSTONE	MG.PR.LT-M.GY.MAS.VBRKN SAME ROCK TYPE AS ABOVE.
63	151.11	151.29	0.18	68			SANDSTONE	MG.PR.LT-M.GY.MAS.BRKN SAME ROCK TYPE AS ABOVE.
63	151.29	152.84	1.55	69			CONGLOMERATE	PBL.VPR.LT-M.GY.THNB.VBRKN LOCALLY JUST MG SS WITHOUT PEBBLES. POL YMICTIC PARACONGLOMERATE.
63	152.84	152.99	0.15	71			ROCK LOSS	
64	152.99	153.49	0.50	71			CONGLOMERATE	PBL.VPR.LT-M.GY.THNB.VBRKN SAME ROCK TYPE AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
64	153.49	154.54	1.05	73			SANDSTONE	PBLY.MG.VPR.LT-M.GY.THNB.VBRKN LOCALLY PEBBLY. SIMILAR TO ROCK TYPE AB OVE BUT WITH FEWER PEBBLES.
64	154.54	154.72	0.18	74			ROCK LOSS	
65	154.72	154.90	0.18	74			SANDSTONE	PBLY.MG.VPR.LT-M.GY.THNB.VBRKN SAME ROCK TYPE AS ABOVE.
65	154.90	156.07	1.17	75			SANDSTONE	PBLY.MG.VPR.LT-M.GY.THNB.VBRKN OCCASIONAL PEBBLY LAYER UP TP 10 CM THI CK.
65	156.07	156.29	0.22	76			ROCK LOSS	
66	156.29	157.19	0.90	77			SANDSTONE	MG.VPR.LT-M.GY.THNB.VBRKN BECOMES DARKER AND SLIGHTLY SILTIER WIT H DEPTH. SHARP LOWER CONTACT.
66	157.19	157.31	0.12	*78			MUDSTONE	SLTY.VPR.M-DK.GY.LAM.XBDG.BRKN SSD.
66	157.31	158.02	0.71	77			MUDSTONE	SLTY.VPR.M-DK.GY.LAM.XBDG.BRKN SAME ROCK TYPE AS ABOVE. TOPS UP. SSD.
66	158.02	158.36	0.34	76			ROCK LOSS	

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
67	158.36	159.90	1.54	*75			MUDSTONE	SLTY.VPR.M-DK.GY.LAM.XBDG.BRKN SIMILAR TO ROCK TYPE ABOVE BUT SLIGHTLY DARKER AN D LESS SILTY. SSD.
67	159.90	160.16	0.26	76			MUDSTONE	DK.GY.LAM.SLD VERY FAINTLY LAMINATED.
68	160.16	160.36	0.20	77			MUDSTONE	DK.GY.LAM.BRKN SAME ROCK TYPE AS ABOVE.
68	160.36	160.67	0.31	77			ROCK LOSS	
68	160.67	161.47	0.80	78			MUDSTONE	DK.GY.LAM.SLD SAME ROCK TYPE AS ABOVE.
68	161.47	161.66	0.19	79			SANDSTONE	SLTY.FG.VPR.M.GY.LAM.SLD INDISTINCT LAMINATIONS.
68	161.66	162.07	0.41	79			SILTSTONE	VPR.M.GY.LAM.BIOTR.SLD LOCALLY BIOTURBATED. UNEVENLY LAMINATED IN MANY LENSES.
68	162.07	162.31	0.24	*80			MUDSTONE	SLTY.VPR.DK.GY.LAM.SSD GRADATIONAL FROM ABOVE. UNEVENLY LAMINA TED WITH MANY LENSES.
69	162.31	163.41	1.10	*80			MUDSTONE	SLTY.VPR.DK.GY.LAM.SSD.SLD SAME ROCK TYPE AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
69	163.41	164.18	0.77	78			MUDSTONE	SLTY.VPR.DK.GY.LAM.SSD.SLD SAME AS ROCK TYPE ABOVE.
70	164.18	165.28	1.10	*77			MUDSTONE	SLTY.VPR.DK.GY.LAM.SSD.BRKN SHEARED NEAR BASE OF INTERVAL.
70	165.28	166.05	0.77	79			SANDSTONE	SLTY.MG.VPR.M.GY.VTHNB.BIOTR.SLD TOPS UP. SILTY BEDS ARE BIOTURBATED. ON E SANDY LAYER IS COARSE-GRAINED. SSD.
71	166.05	166.31	0.26	*80			SANDSTONE	SLTY.MG.VPR.M.GY.VTHNB.BIOTR.SLD SAME ROCK TYPE AS ABOVE. SILTY BANDED S AND. SSD.
71	166.31	166.43	0.12	80			SANDSTONE	VCG.VPR.LT-M.GY.THNB.SLD STORM UNIT.
71	166.43	166.57	0.14	81			SANDSTONE	SLTY.FG.VPR.M.GY.VTHNB.SSD.SLD MORE SILTY BANDED SAND.
71	166.57	167.07	0.50	82			SANDSTONE	SLTY.FG.VPR.M.GY.VTHNB.SSD.SLD LOCALLY LAMINATED. SAME ROCK TYPE AS AB OVE.
71	167.07	167.84	0.77	83			SANDSTONE	VFG.M.GY.LAM.XBDG.BRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
72	167.84	168.55	0.71	*85			SILTSTONE	M-DK.GY.LAM.SSD.SLD GRADATIONAL FROM ABOVE.
72	168.55	169.19	0.64	83			MUDSTONE	SLTY.M-DK.GY.MAS.SLD GRADATIONAL FROM ABOVE.
72	169.19	169.49	0.30	81			SANDSTONE	MG.M.GY.MAS.SLD
72	169.49	169.78	0.29	80			SANDSTONE	MG.M.GY.MAS.SLD BECOMING COARSER WITH DEPTH.
73	169.78	170.01	0.23	79			SANDSTONE	MG.M.GY.MAS.SLD SAME ROCK TYPE AS ABOVE.
73	170.01	170.58	0.57	78			SANDSTONE	MG.M.GY.VTHNB.SLD OCCASIONAL SILTY LAMINAE IN SS SIMILAR TO THAT ABOVE.
73	170.58	171.56	0.98	*75			SANDSTONE	SLTY.FG.M.GY.LAM.WRMBU.BRKN LOCALLY SHEARED AND/OR BRECCIATED. TOPS UP. MINOR QTZ CARB VEINING ACCOMPANIES BRECCIATION. BIOTRB.
74	171.56	172.11	0.55	70			SANDSTONE	SLTY.FG.M.GY.LAM.VBRKN SHEARED NEAR BASE. SIMILAR TO ROCK TYPE ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
74	172.11	172.31	0.20	68			SANDSTONE	SLTY.FG.M.GY.BIOTR.SLD MINOR BRECCIA AT TOP OF INTERVAL WITH Q TZ CARB MATRIX.
74	172.31	173.37	1.06	64			SANDSTONE	SLTY.FG.LT-M.GY.VTHNB.WRMBU.BRKN FEW THIN SILTY BEDS ARE BIOTURBATED. MO STLY MASSIVE SS. RARE SILTY LAMINAE. BI OTRB. .
75	173.37	175.11	1.74	*55			SANDSTONE	SLTY.FG.LT-M.GY.VTHNB.BIOTR.BRKN SAME ROCK TYPE AS ABOVE. WRMBUR.
76	175.11	176.19	1.08	60			SANDSTONE	SLTY.MG.LT-M.GY.THNB.VBRKN LOCALLY SHEARED AND OR BRECCIATED. FEW SILTY BEDS.LOCAL QTZ CARB VEINING.
76	176.19	176.86	0.67	63			SILTSTONE	SSY.M-DK.GY.LAM.VBRKN SANDY SILTSTONE. FEW LISTRIC SURFACES.F AINTLY LAMINATED.
76	176.86	177.16	0.30	65			ROCK LOSS	
77	177.16	178.16	1.00	68			SILTSTONE	M-DK.GY.LAM.VBRKN SAME AS ROCK TYPE ABOVE, BECOMING MUDDI ER AND LESSSANDY WITH DEPTH.
77	178.16	178.81	0.65	71			MUDSTONE	DK.GY.MAS.SHRD MASSIVE MONOTONOUS MUDSTONE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDHB6009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
78	178.81	180.46	1.65	*75			MUDSTONE	DK.GY.MAS.SHRD SAME AS ABOVE ROCK TYPE.LOCALLY VERY SH EARED,BECOMING QUITE SOFT. LOCALLY FAIN TLY LAMINATED.
79	180.46	180.79	0.33	75			MUDSTONE	DK.GY.MAS.SHRD SAME ROCK TYPE AS ABOVE.
79	180.79	181.14	0.35	75			ROCK LOSS	
79	181.14	182.63	1.49	76			MUDSTONE	DK.GY.MAS.SHRD SAME ROCK TYPE AS ABOVE.
80	182.63	184.19	1.56	76			MUDSTONE	DK.GY.MAS.SHRD SAME ROCK TYPE AS ABOVE WITH RARE VTHIN COAL LENS ES.
80	184.19	184.49	0.30	76			MUDSTONE	DK.GY.MAS.SHRD SAME ROCK TYPE AS ABOVE.
81	184.49	185.04	0.55	76			MUDSTONE	DK.GY.MAS.VSHRD SAME ROCK TYPE AS ABOVE.
81	185.04	186.36	1.32	77			MUDSTONE	DK.GY.MAS.BRKN SAME ROCK TYPE AS ABOVE. NO MORE COAL L ENSES.
82	186.36	187.03	0.67	77			MUDSTONE	DK.GY.MAS.BRKN SAME AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
82	187.03	187.24	0.21	77			ROCK LOSS	
82	187.24	188.25	1.01	77			MUDSTONE	CARB.DK.GY.MAS.SHRD LOCALLY VERY SHEARED. ABUNDANT COALY PL ANT FRAGMENTS. FEW COALY LENSES AND LAM INAE. BOXES 83-90 CONTAIN COAL, PROBABL Y H SEAM.
83	188.25	188.49	0.24	77			MUDSTONE	CARB.DK.GY.SHRD VERY LISTRIC.
83	188.49	188.53	0.04	78			COAL	C-3.PHRD
83	188.53	189.15	0.62	78	05448		MUDSTONE	CARB.DK.GY.SHRD VERY LISTRIC.LOWER 25 CM SAMPLED.
83	189.15	190.10	0.95	78	05449	H	COAL	C-3.SHRD HIGHLY SHEARED AND POWDERED.
84	190.10	190.50	0.40	78	05449	H	COAL	C-3.SHRD VERY SHEARED AND POWDERED.
84	190.50	190.88	0.38	78	05450	H	MUDSTONE	CARB.M-DK.GY.BRKN COALY PLANT FRAGS WITHIN. MINOR QTZ.
84	190.88	190.99	0.11	78	05450	H	MUDSTONE	CARB.M-DK.GY.BRKN COALY PLANT FRAGS WITHIN. MINOR QTZ.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
84	190.99	191.04	0.05	78	05450	H	COAL	C-3.PHRD
84	191.04	191.37	0.33	78	05450	H	MUDSTONE	CARB.DK.GY.BRKN COALY LENSES AND STRINGERS WITHIN.
84	191.37	191.65	0.28	78	05450	H	MUDSTONE	CARB.DK.GY.BRKN COALY LENSES AND STRINGERS WITHIN.
85	191.65	191.69	0.04	78	05450	H	COAL	C-3.PHRD
85	191.69	192.35	0.66	79	05450	H	MUDSTONE	CARB.DK.GY.BRKN COALY STRINGERS THROUGHOUT. PYRITE WITH IN.
85	192.35	192.48	0.13	79	05450	H	COAL	C-5.VBRKN SHEARED.
85	192.48	192.83	0.35	79	05450	H	COAL	C-3.BRKN SHEARED.
85	192.83	193.05	0.22	79	05450	H	COAL	C-4.SHRD
85	193.05	193.20	0.15	79	05450	H	MUDSTONE	CARB.DK.GY.SHRD LISTRIC.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
85	193.20	193.24	0.04	79	05450	H	COAL	C-3.SHRD
85	193.24	193.46	0.22	79	05450	H	MUDSTONE	CARB.DK.GY.SLD COALY.
86	193.46	193.64	0.18	79	05450	H	MUDSTONE	CARB.DK.GY.BRKN COALY.
86	193.64	193.71	0.07	79	05450	H	MUDSTONE	CARB.DK.GY.SLD COALY.
86	193.71	194.83	1.12	79	05268	H	COAL	C-2.SHRD VERY BROKEN AND SHEARED. DIFFICULT TO D ETERMINE GRADE.
86	194.83	194.88	0.05	79	05268	H	COAL	C-6.SLD MINOR PYRITE.
86	194.88	195.12	0.24	79	05268	H	COAL	C-2.SHRD HIGHLY SHEARED. DIFFICULT TO DETERMINE GRADE.
87	195.12	195.59	0.47	79	05268	H	COAL	C-2.VBRKN
87	195.59	195.72	0.13	80	05268	H	COAL	C-6.SLD BONE COAL.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
87	195.72	196.00	0.28	80	05268	H	COAL	C-3.BRKN
87	196.00	196.08	0.08	80	05268	H	MUDSTONE	CLYY.M-DK.GY.SLD
87	196.08	196.48	0.40	80	05269	H	COAL	C-3.SHRD VERY LISTRIC.
87	196.48	196.52	0.04	80	05269	H	MUDSTONE	CARB.DK.GY.SHRD LISTRIC.
87	196.52	196.76	0.24	80	05269	H	COAL	C-3.SHRD
88	196.76	197.27	0.51	80	05269	H	COAL	C-2.SLD APPROACHING C-1 IN PLACES.
88	197.27	197.42	0.15	80	05269	H	MUDSTONE	CARB.DK.GY.SLD
88	197.42	197.46	0.04	80	05269	H	COAL	C-4.SLD
88	197.46	197.72	0.26	80	05269	H	COAL	C-2.SLD
88	197.72	197.81	0.09	80	05269	H	MUDSTONE	CLYY.M-DK.GY.SLD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
88	197.81	197.84	0.03	80	05269	H	COAL	C-3.BRKN
88	197.84	197.85	0.01	80	05269	H	MUDSTONE	CLYY.M-DK.GY.SLD
88	197.85	198.47	0.62	80	05269	H	COAL	C-2.BRKN MINOR MUDDY BANDS WITHIN.
88	198.47	198.51	0.04	80	05269	H	MUDSTONE	CLYY.M-DK.GY.SLD
88	198.51	198.73	0.22	80	05269	H	COAL	C-3.BRKN
89	198.73	198.84	0.11	80	05269	H	COAL	C-3.BRKN
89	198.84	198.87	0.03	80	05269	H	MUDSTONE	CARB.M-DK.GY.SLD
89	198.87	198.96	0.09	80	05269	H	COAL	C-3.BRKN
89	198.96	198.98	0.02	80	05269	H	MUDSTONE	CLYY.M-DK.GY.SLD
89	198.98	199.14	0.16	81	05269	H	COAL	C-3.VBRKN

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
89	199.14	199.24	0.10	81	05269	H	COAL	C-4.SLD
89	199.24	199.36	0.12	81	05269	H	MUDSTONE	CARB.DK.GY.SHRD
89	199.36	199.40	0.04	81	05269	H	COAL	C-3.BRKN
89	199.40	199.47	0.07	81	05269	H	MUDSTONE	CARB.DK.GY.BRKN MINOR COALY STRINGERS WITHIN.
89	199.47	200.37	0.90	81	05269	H	COAL	C-2.SHRD SHEARED AND POWDERED. DIFFICULT TO DETE RMINE GRADE.
90	200.37	200.49	0.12	81	05269	H	COAL	C-3.SHRD
90	200.49	200.76	0.27	81	05269	H	COAL LOSS	
90	200.76	200.93	0.17	81	05269	H	MUDSTONE	SLTY.M.GY.SLD
90	200.93	201.08	0.15	81	05269	H	COAL	C-3.SHRD

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
90	201.08	201.12	0.04	81	05269	H	MUDSTONE	CARB.DK.GY.SHRD
90	201.12	201.52	0.40	81	05269	H	COAL	C-3.VBRKN MUDDY BANDS WITHIN.
90	201.52	202.44	0.92	81	05270		MUDSTONE	CARB.DK.GY.BRKN LISTRIC SURFACES THROUGHOUT. UPPER 25 C M SAMPLED.
91	202.44	203.16	0.72	82			MUDSTONE	CARB.M.BLK.VSHRD LOCALLY VERY COALY WITH FEW COAL LAM AN D LENSES,P YRITIC NEAR TOP OF INTERVAL. MANY LISTRIC SURFACES.
91	203.16	204.01	0.85	82			MUDSTONE	CARB.M.BLK.VSHRD SAME AS ABOVE.
92	204.01	205.31	1.30	82			MUDSTONE	CARB.DK.GY.VSHRD LESS COALY THAN ABOVE. NUMEROUS PLANT F RAGMENTS, MANY LISTRIC SURFACES.
92	205.31	205.63	0.32	82			SANDSTONE	SLTY.FG.M.GY.MAS.SHRD SOFT SHEARED CORE BUT NOT BROKEN UP.
92	205.63	205.74	0.11	82			SANDSTONE	SLTY.FG.M.GY.MAS.SHRD SAME AS ABOVE.

* DENOTES MEASURED BCA

PROJECT: KPN BLOCK: LR DATA SOURCE: DDH86009

BOX	DEPTH FROM	DEPTH TO	INTRVAL THICK.	BCA	SAMP. ID	SEAM ID	LITHOLOGY	DESCRIPTION
93	205.74	206.74	1.00	83			SANDSTONE	SLTY.FG.M.GY.MAS.SHRD SAME AS ABOVE.
93	206.74	207.28	0.54	83			SANDSTONE	SLTY.MG.M.GY.VTHNB.VBRKN OCCASIONAL VERY THIN DK GY SILTY BED.
94	207.28	207.60	0.32	83			SANDSTONE	SLTY.MG.M.GY.VTHNB.VBRKN SAME AS ABOVE.
94	207.60	208.06	0.46	*83			MUDSTONE	M-DK.GY,LAM.SHRD LOCALLY V FRACTURED TO BRECCIATED BUT W ITHOUT DISPLACEMENT OF BEDDING. MANY LI STRIC SURFACES. END OF HOLE TOTAL DEPTH = 209.40 M.

* DENOTES MEASURED BCA
NEWPAGE

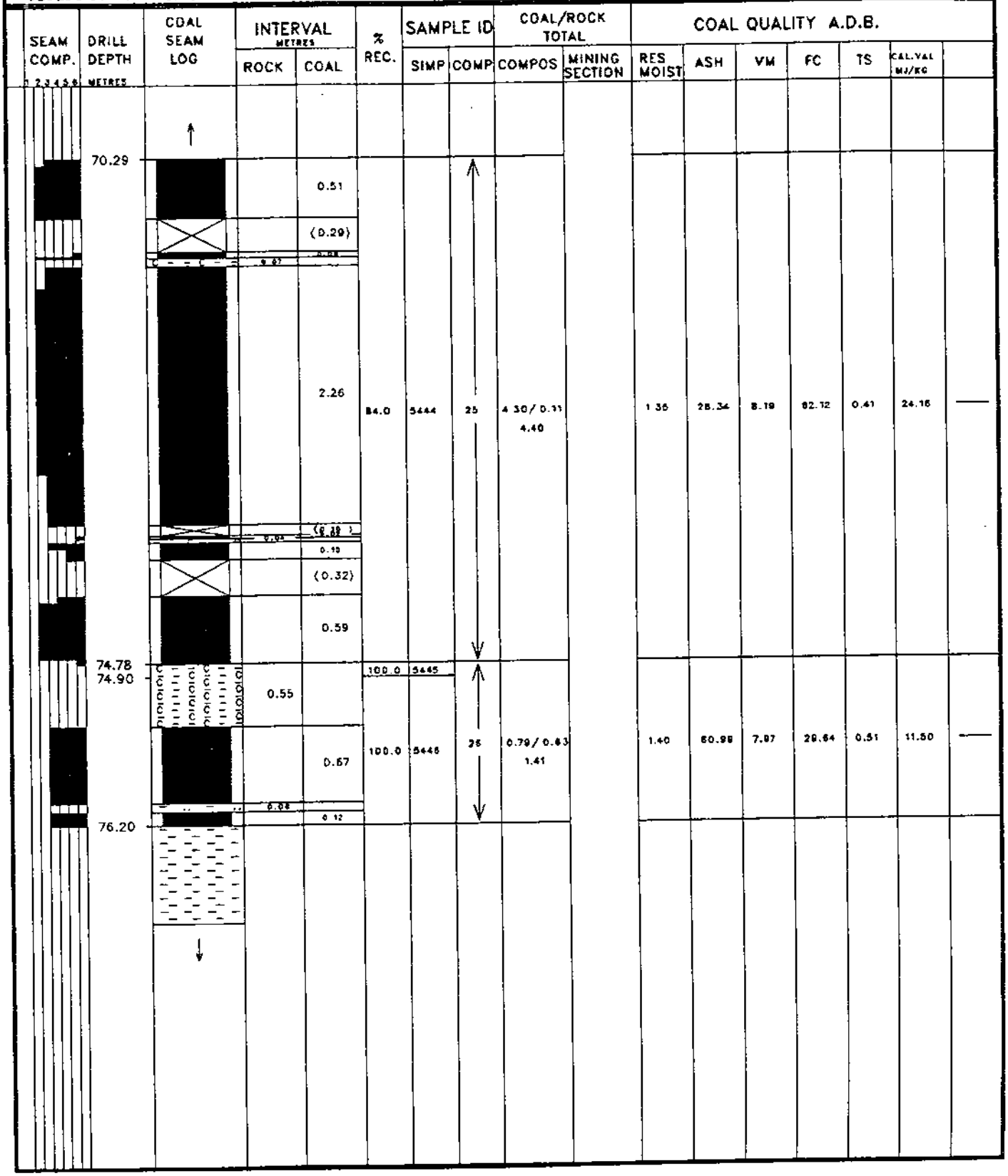
GULF CANADA CORPORATION

COAL DIVISION
MOUNT KLAPPAN PROJECT

SEAM DETAIL — TRUE THICKNESS

DATA SOURCE: KPN LR DDH86009 | SEAM : K | INTERVAL(M) : 70.29 - 76.20 | ELEVATION(M) : 1595.7

GEOLOGIST : LOVE | SCALE: 1:40 | DATE : MAR 04/87 | DRAWING NO. :



SEAM COMP. 1,2,3,4,5,6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	70.29			0.51											
				(0.29)											
				2.26	84.0	5444	25	4.30/0.11 4.40		1.35	28.34	8.19	62.12	0.41	24.16
				(0.32)											
				0.59											
	74.78				100.0	5445									
	74.90		0.55												
				0.67	100.0	5446	25	0.79/0.63 1.41		1.40	60.98	7.87	29.64	0.51	11.50
	76.20														

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86009 SEAM : J INTERVAL(M) : 104.55 – 105.00 ELEVATION(M) : 1595.7

GEOLOGIST : LOVE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	104.55			(0.45)	0.0	99098	99098	0.45 / 0.00	0.45	—	—	—	—	—	—	—
	105.00															

GULF CANADA CORPORATION

SEAM DETAIL

COAL DIVISION
MOUNT KLAPPAN PROJECT

TRUE THICKNESS

DATA SOURCE: KPN LR DDH86009 SEAM : 1 INTERVAL(M) : 142.13 – 148.14 ELEVATION(M) : 1595.7

GEOLOGIST : LOVE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :

SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG
	142.13			(0.16)											
			(0.22)												
				(1.46)											
			(0.21)												
				(0.20)											
			(0.17)												
					0.0	99999	99999	5.21 / 0.59 5.80		—	—	—	—	—	—
				(3.40)											
	148.14														

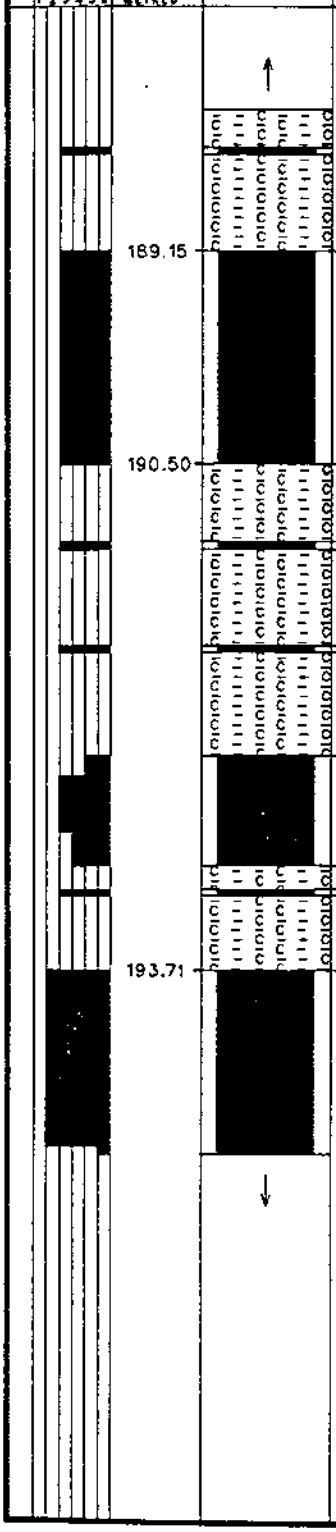
GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — TRUE THICKNESS

MOUNT KLAPPAN PROJECT

DATA SOURCE: KPN LR DDH86009 SEAM : H INTERVAL(M) : 189.15 - 193.71 ELEVATION(M) : 1595.7

GEOLOGIST : LOVE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :



COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
		1.32	100.0	5449	30	1.32 / 0.00 1.32		1.28	32.62	6.88	59.22	0.44	22.28	—
	0.48													
		0.04												
	0.60													
		0.04												
	0.65		100.0	5450	27	0.61 / 2.33 3.15		—	—	—	—	—	—	—
		0.69												
	0.15													
		0.01												
	0.46													

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — **TRUE THICKNESS**

DATA SOURCE: KPN LR DDH86009 SEAM : H INTERVAL(M) : 193.71 - 196.08 ELEVATION(M) : 1595.7

GEOLOGIST : LOVE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :

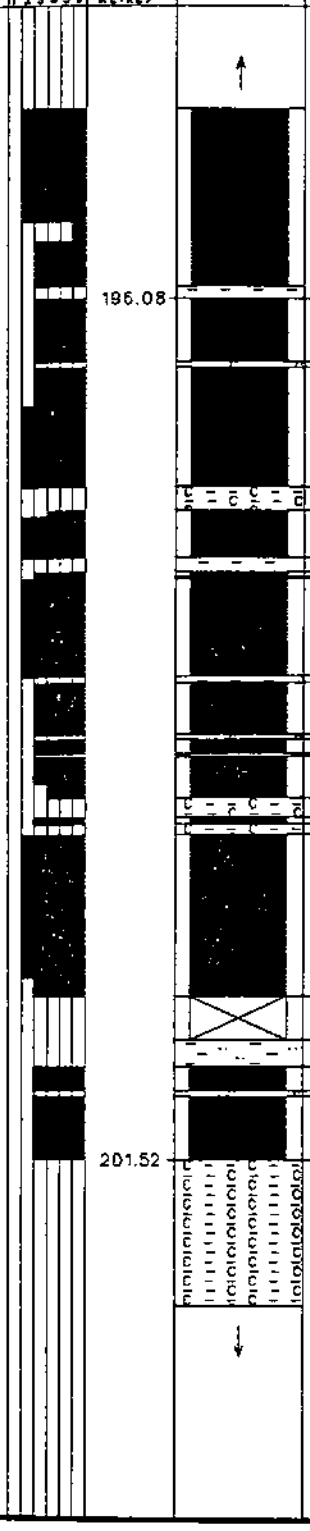
SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	193.71															
				2.25	100.0	5288	28	2.28 / 0.08 2.33		0.85	31.70	7.21	60.14	0.45	22.73	—
	196.08		0.08													

GULF CANADA CORPORATION

SEAM DETAIL — COAL DIVISION — MOUNT KLAPPAN PROJECT — TRUE THICKNESS

DATA SOURCE: KPN LR DDH86009 SEAM : H INTERVAL(M) : 196.08 – 201.52 ELEVATION(M) : 1595.7

GEOLOGIST : LOVE SCALE: 1:40 DATE : MAR 04/87 DRAWING NO. :



SEAM COMP. 1 2 3 4 5 6	DRILL DEPTH METRES	COAL SEAM LOG	INTERVAL METRES ROCK	INTERVAL METRES COAL	% REC.	SAMPLE ID SIMP	SAMPLE ID COMP	COAL/ROCK TOTAL COMPOS	COAL/ROCK TOTAL MINING SECTION	COAL QUALITY A.D.B. RES MOIST	ASH	VM	FC	TS	CAL.VAL MJ/KG	
	196.08			0.39												
			0.04	0.74												
			0.15													
				0.30												
			0.09	0.84												
				0.61												
			0.04													
				0.33												
			0.03	0.09	95.0	5269	29	4.59 / 0.77		1.05	38.45	7.33	55.17	0.38	20.84	
			0.01					5.36								
				0.26												
			0.12													
			0.07	0.44												
				1.01												
				(0.27)												
			0.17													
				0.18												
				0.40												
	201.52															

GULF CANADA CORPORATION
COAL DIVISION
KLAPPAN PROJECT
STRATIGRAPHIC LOG
KPN LR DDH86009

723

GEOLOGIST : LOVE | DATE : FEB 26/87 | DRAWING NO. :

LITHOLOGIC SYMBOLS

SANDSTONE, SILTSTONE, COAL, OVERBURDEN, MUDSTONE/CLAYSTONE, TUFF, LIMESTONE, CORE LOSS

BENTONITE, BRECCIA, CARBONACEOUS, QUARTZ, PYRITE, FERRUGINOUS, CONGLOMERATE, FOSSIL BED

SCALE : 1:200 1:40

NORTHING: 6544517.0 M
EASTING: 507378.6 E
INCLINATION: 78.0°
BEARING: 78.0 °

DRILLED DEPTH [m] | BCA [cc/g] | TRUE DEPTH [m] 1 : 200

SEAM DETAIL 1 : 40

DRILLED DEPTH [m] | TRUE THICKNESS [m]

SEAM K: 70.29 / 78.20 — ROCK 0.73 | COAL 5.08 — 5.82

SEAM J: 104.55 / 105.00 — ROCK 0.00 | COAL 0.45 — 0.45

SEAM I: 142.13 / 148.14 — ROCK 0.58 | COAL 5.21 — 5.80

SEAM H: 189.15 / 201.52 — ROCK 4.18 | COAL 8.98 — 12.16

TOTAL: 208.06 TOTAL: 194.45

Gulf Canada Corporation
Coal Division

Geophysical Log

723

Datasource:	**KPNLRDDH86009**	Province: BC	Northing: 6344520.00	Lat:	571444
Log Date:	86-09-01	Zone: 9	Easting: 507380.00	Long:	1285240
Company:	CENTURY	Measuring Point:		Elevation:	1595.6
Geologist:	LOVE				

Scale: 1 to 100.0

Depth Range: 0.0 to 212.0

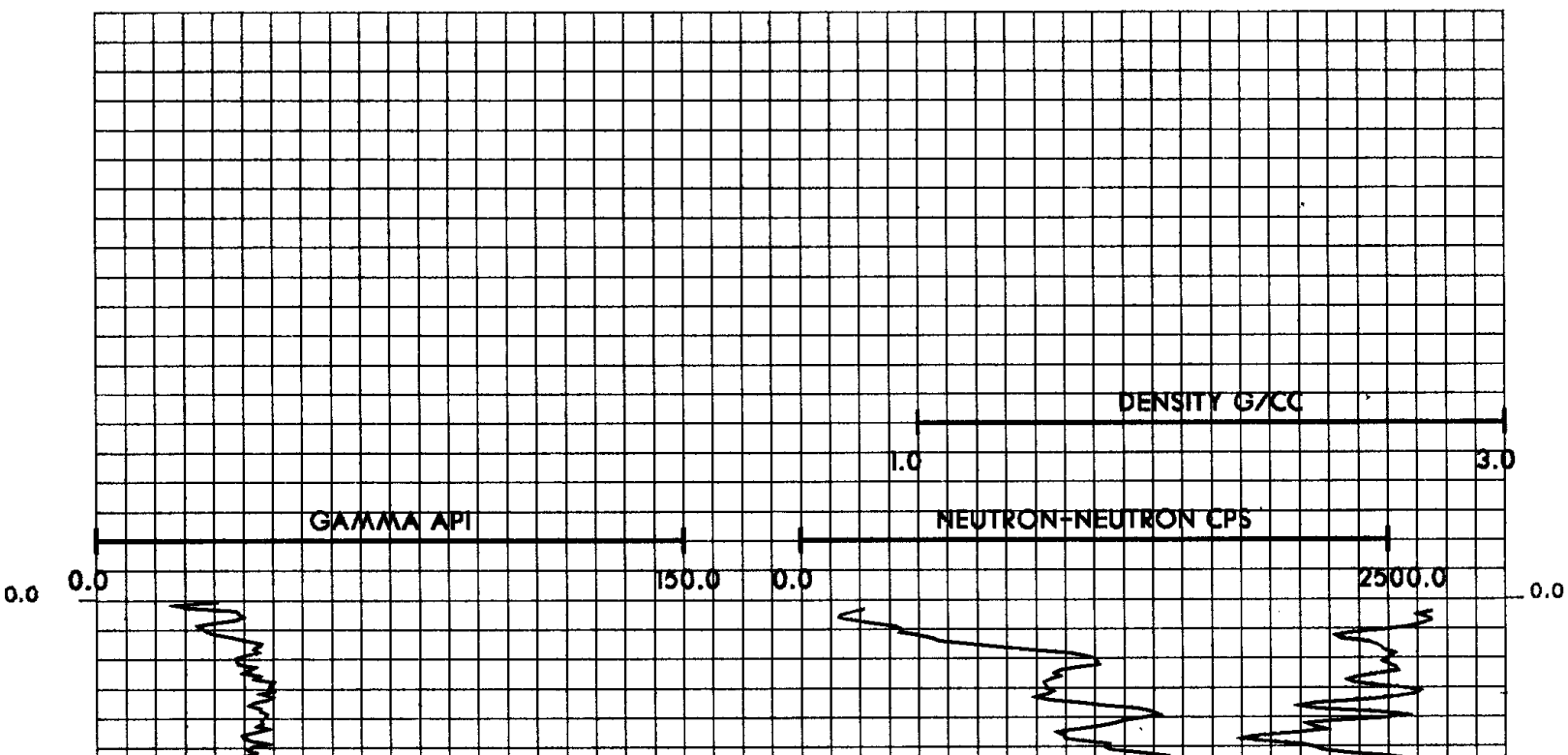
True Thickness: NO

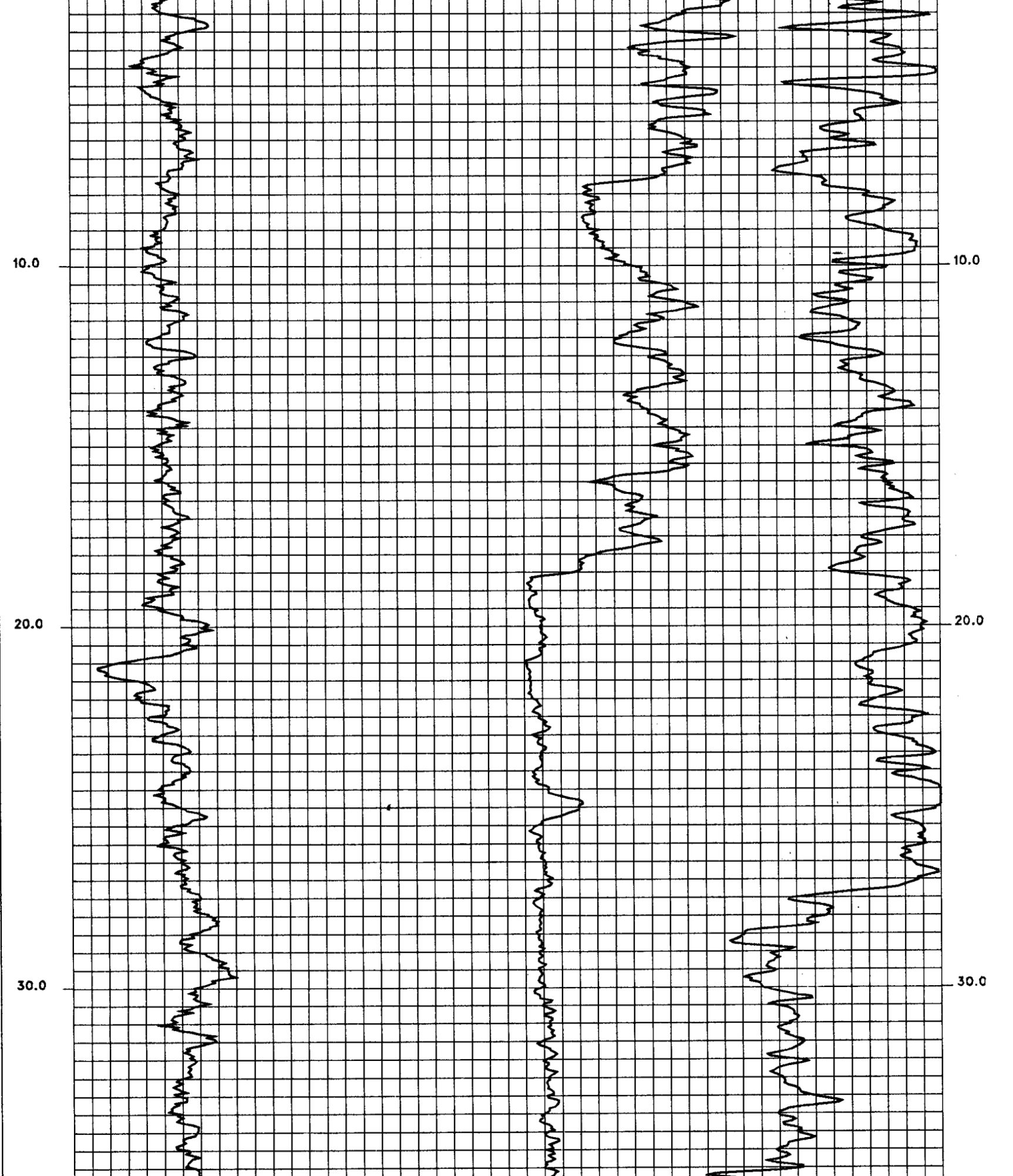
Comments:

1. LOGGED THROUGH THE RODS
2.

Logs Plotted:

Description	Axis Range	Axis Length	Smoothing Points	Tool	Comments
1 .GAMMA API	0.0 to 150.0	10.0	31	9055A	IN PIPE
2 .NEUTRON-NEUTRON CPS	0.0 to 2500.0	10.0	9	9055A	IN PIPE
3 .DENSITY G/CC	1.0 to 3.0	10.0	15	9030A	IN PIPE

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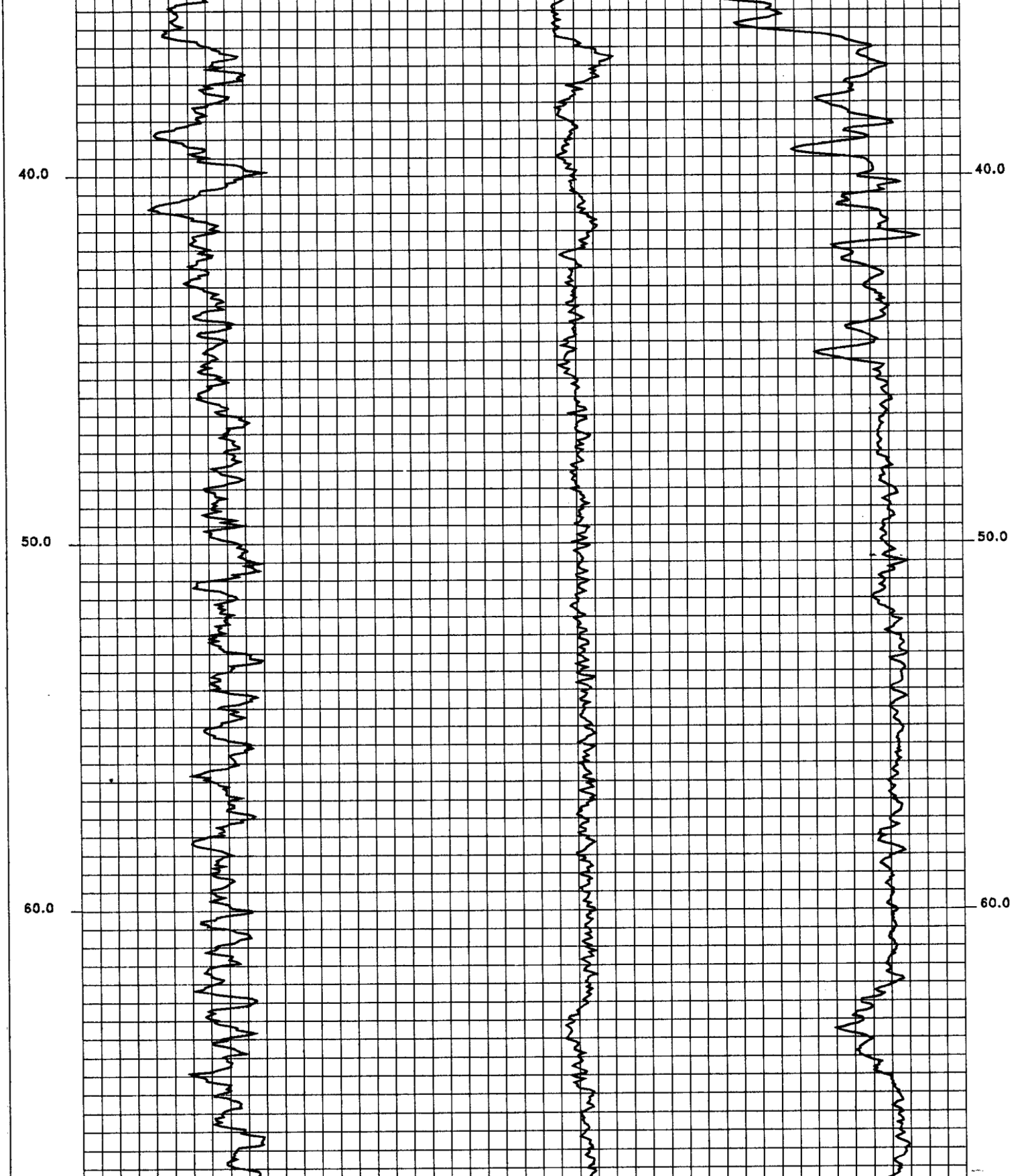
20.0
30.0
10.0
20.0
30.0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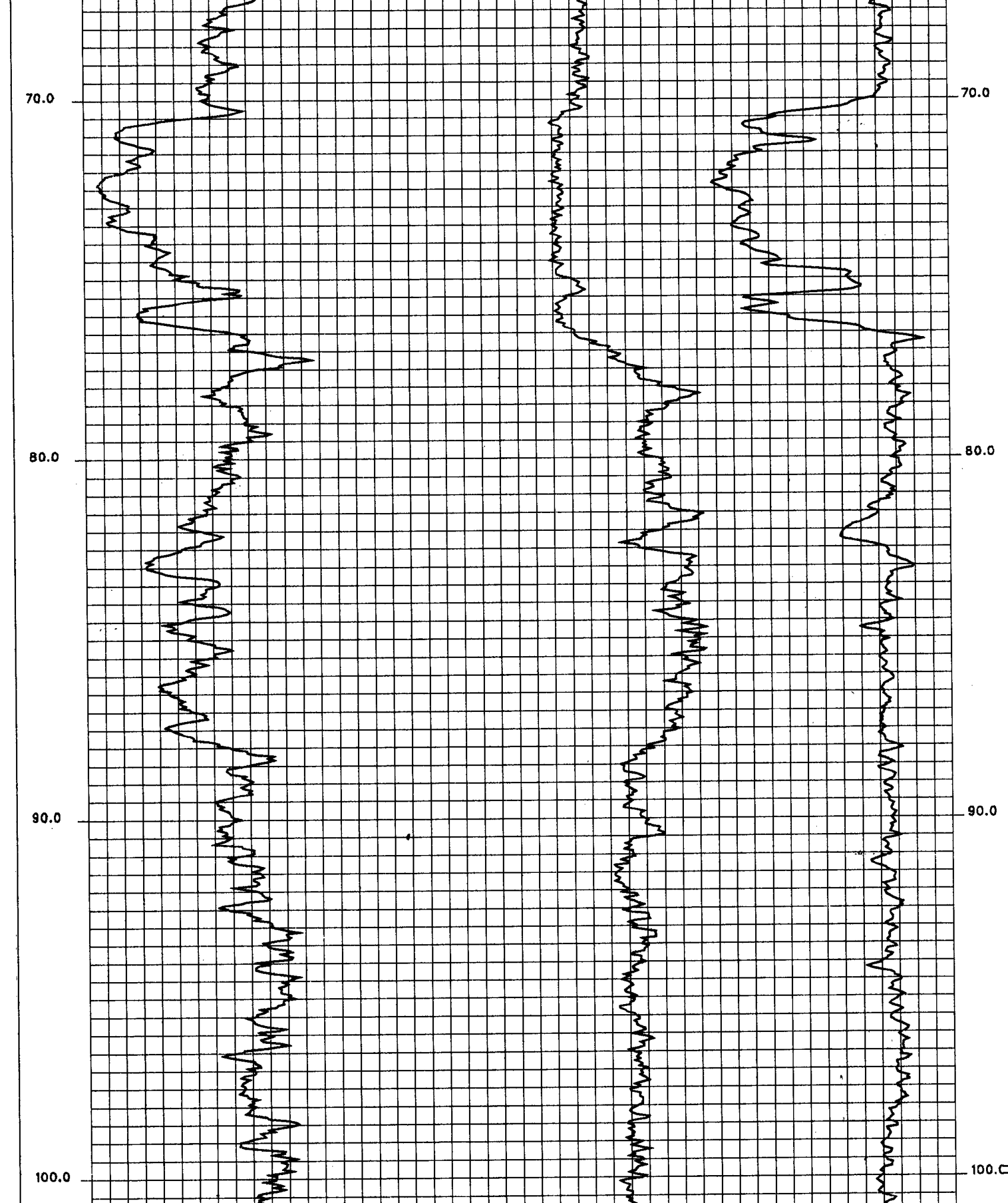
50.0
60.0
40.0
50.0
60.0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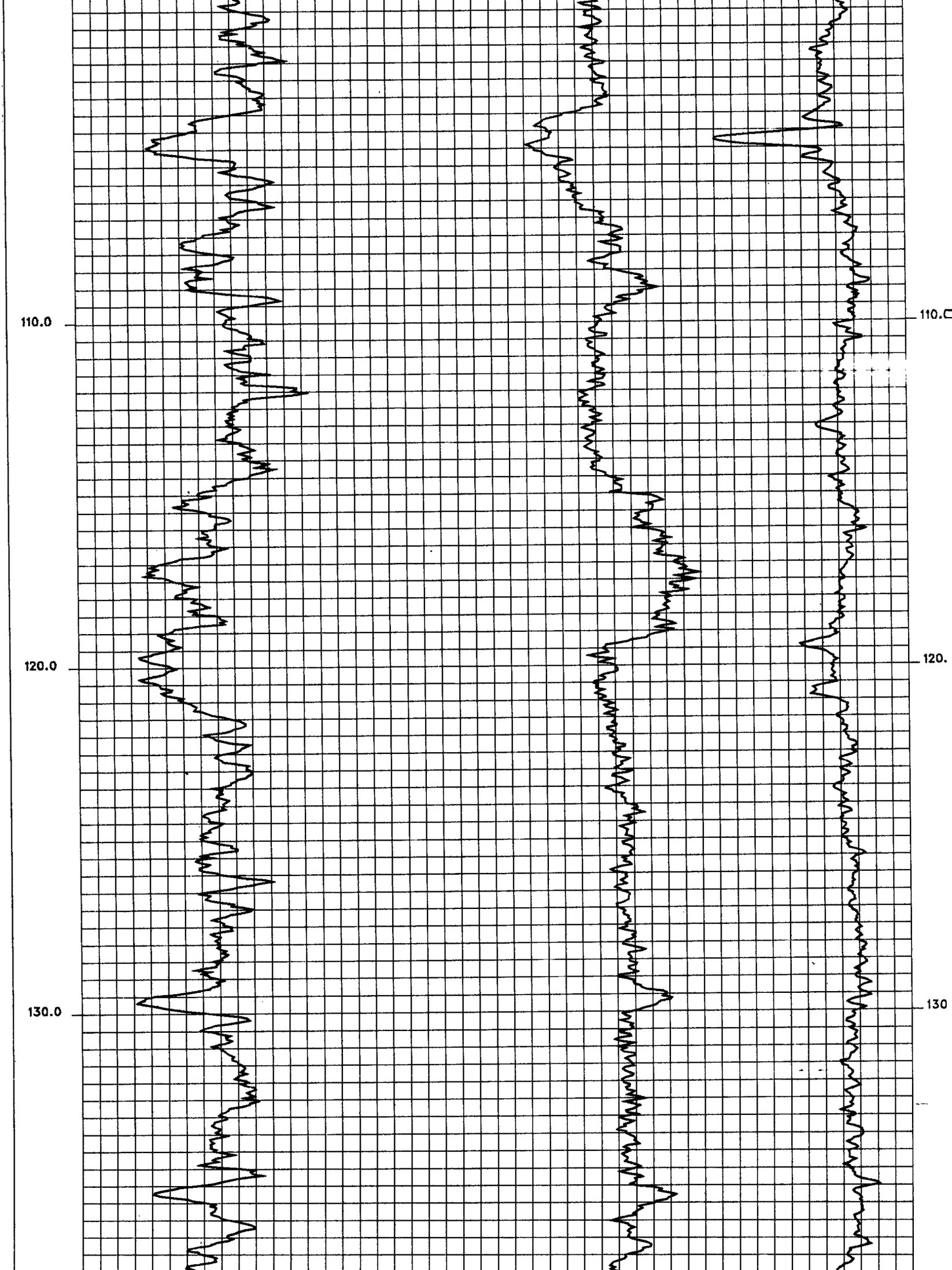
80.0
90.0
100.0
70.0
80.0
90.0
100.0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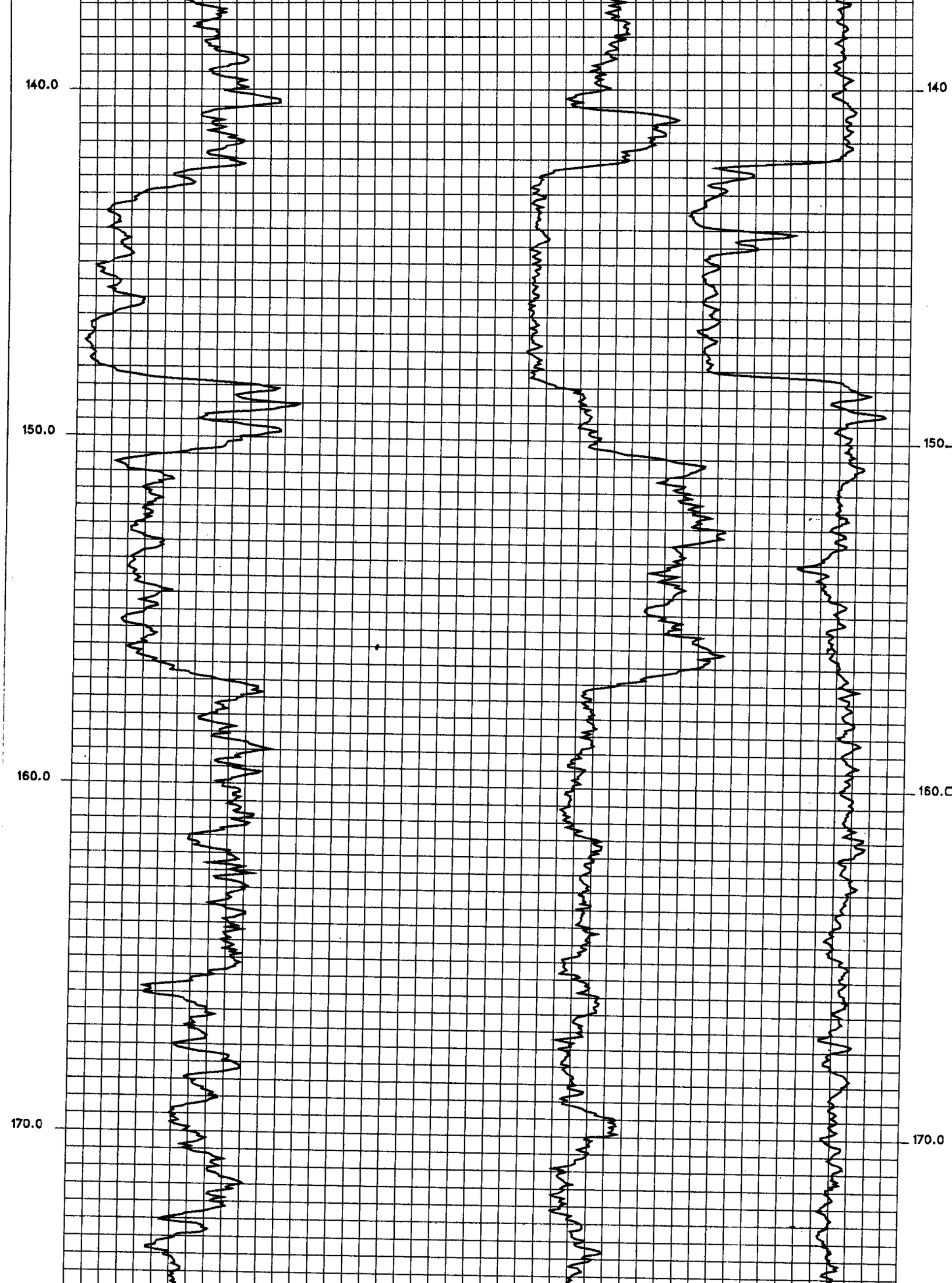
130.0
110.0
120.
130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170.0
140
150
160.0
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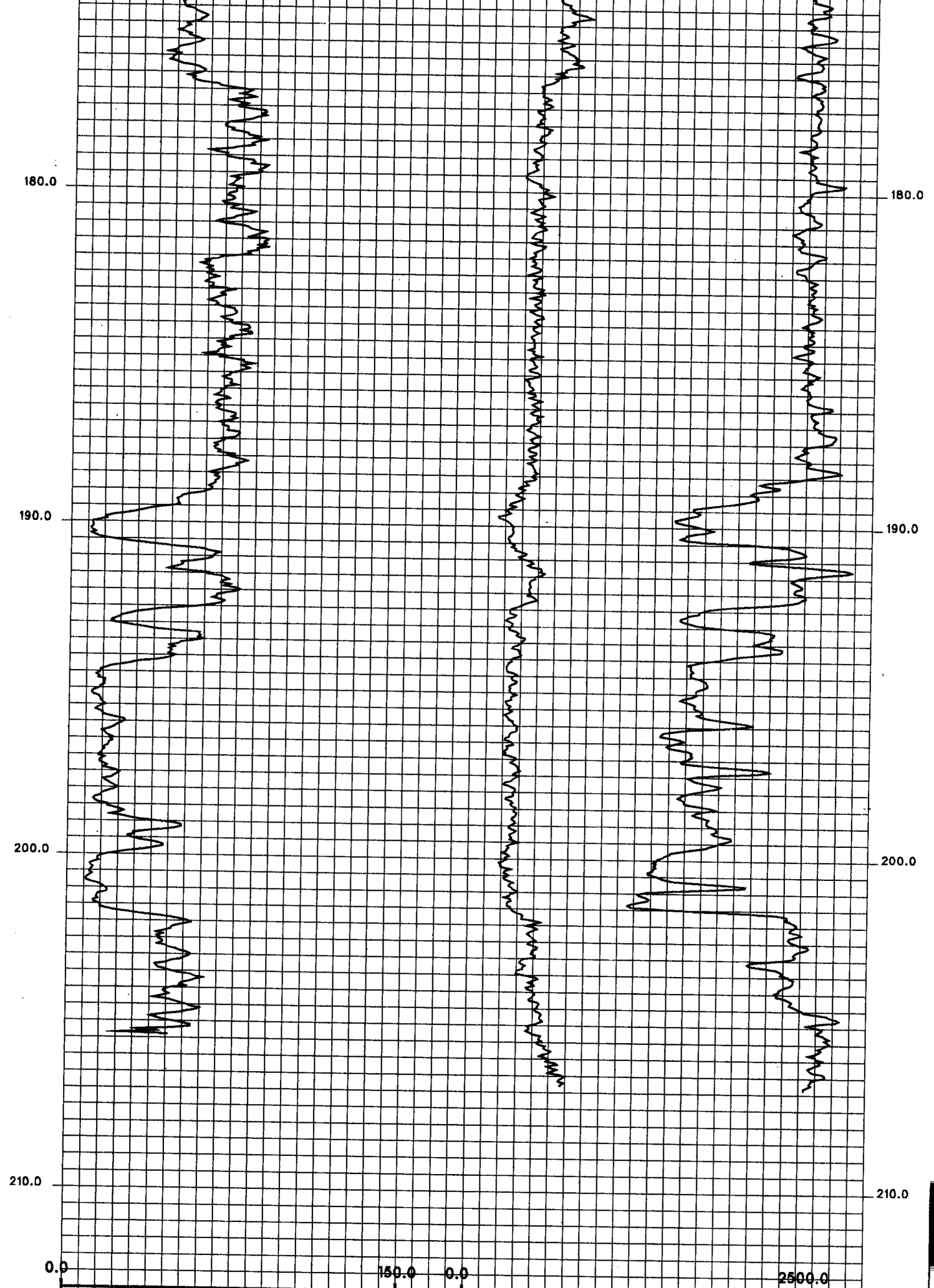
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180.0
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210.0
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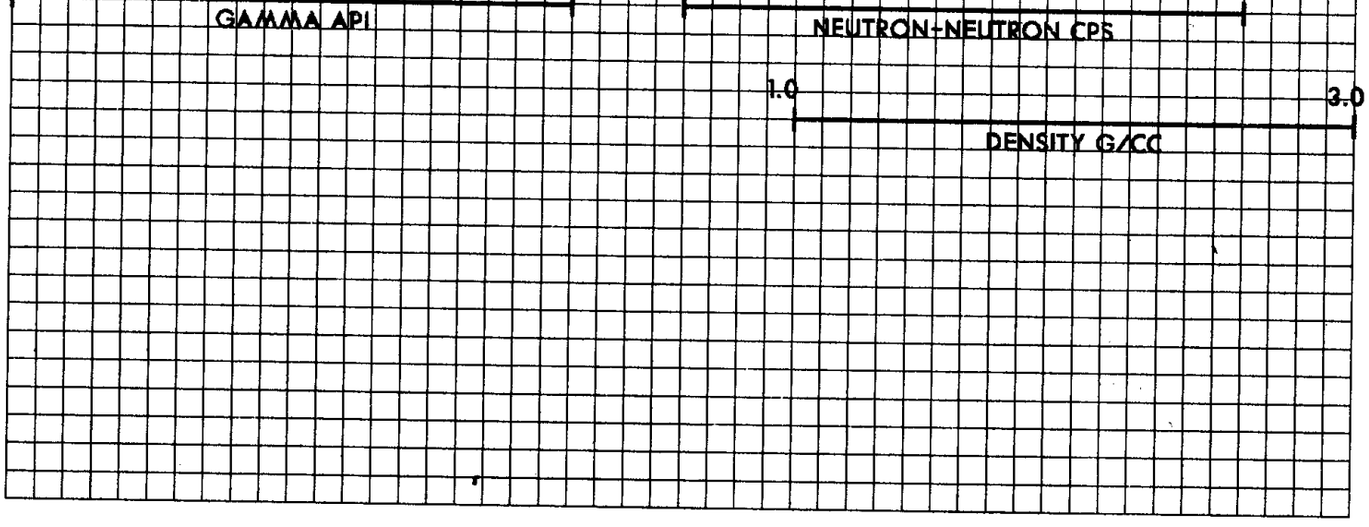
GAMMA API
NEUTRON-NEUTRON CPS
1.0
3.0
DENSITY G/CC