PR-SUKUNKA 77(4)A.

PETROGRAPHIC ANALYSIS

REFLECTANCE FOR MACERALS.

DATA.

BRITISH COLUMBIA

BOOK 3 OF 3

GEOLOGICAL BRANCH
ASSESSMENT REPORT

00663

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ASSESSMENT REPORT

00663

PR-SUKUNKA 77(4) A.

CASCADE COAL PETROGRAPHY LIMITED

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~~CONFIDENTIAL~~

PETROGRAPHIC ANALYSIS

OF

BP # DDH SAMPLES

Cascade Coal Petrography Ltd.

November 1977

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SAMPLE DESIGNATION

BP#	SEAM IDENTIFICATION		CASCADE COAL NO.
#2	Chamberlain		CCP 190-206
#3A	Chamberlain (lower)		CCP 191-207
#4	Chamberlain		CCP 192-208
#8	Bird		CCP 193-209
#17	Bird (upper)	380-391	CCP 194-195
#16	Bird	479-482	CCP 196-197
#24	Chamberlain	483-488	CCP 198-199
#24	Chamberlain	489-499	CCP 200-201
#28	Chamberlain	518-523	CCP 210-211
#18	Bird	524-531	CCP 212-213
#26	Chamberlain	568-574	CCP 214-215
#26	Bird	575-583	CCP 216-217
#20	Bird	601-611	CCP 218-219
#21	Chamberlain	664-674	CCP 220-221
#30	Chamberlain	683-689	CCP 222-223
#37	Chamberlain (upper)	812-817	CCP 224-225
#37	Chamberlain (lower)	818-827	CCP 226-227

SAMPLE RECEPTION

All samples arrived in glass bottled and are listed on page 1.

SAMPLE PREPARATION

All samples arrived at +28 mesh size fraction. The samples were crushed to -20 mesh, coned and quartered till approximately 8 Grams was obtained. The sample was then remixed and coned and quartered till an additional 8 Grams was obtained. The two splits were made into two pellets representing one sample.

The pellets were then polished using 320 and 600 grit for the coarse polishing, and Texmet and silk for the medium and fine polishing respectively.

METHOD OF ANALYSIS

On each of the two pellets representing one sample, fifty (50) reflectance readings and five hundred (500) maceral readings were obtained, for a total of one hundred (100) reflectance and one thousand (1000) maceral points.

This data, in conjunction with ash and sulpher data, was used in the Schapiro and Grey method to obtain the Calculated Coke Stability Factor.

Using the Compositional Balance Index and Strength Index, in conjunction with Miyazu's chart, the approximate JIS Drum Index was obtained.

REFLECTANCE DATA.

BRITISH PETROLEUM #	CASCADE COAL #	MEAN MAXIMUM REFLECTANCE	VM % (from Ro)	V-TYPES						ASH	SULPHUR
				V11	V12	V13	V14	V15	V16		
#2	190-206	1.4428	21	-	-	23	58	18	1	6.6	0.39
#3A	191-207	1.4804	20	-	1	11	42	44	2	18.6	0.58
#4	192-208	1.4295	21	-	2	19	65	14	-	5.2	0.35
#8	193-209	1.4484	21	-	-	18	59	22	1	9.4	3.09
#17	194-195	1.3061	24	3	39	53	5	-	-	8.4	2.20
#16	196-197	1.3021	24	1	47	45	6	1	-	8.1	2.09
#24	198-199	1.4486	21	1	2	12	61	24	-	9.7	0.49
#24	200-201	1.4801	20	-	-	9	48	39	4	9.1	0.35
#28	210-211	1.4190	21	-	5	36	41	17	1	6.4	0.39
#18	212-213	1.3814	23	-	7	54	37	21	-	8.6	1.92
#26	214-215	1.4129	22	-	4	32	58	5	1	6.5	0.37
#26	216-217	1.3551	23	-	14	70	16	-	-	8.7	1.60
#20	218-219	1.3688	23	-	5	67	27	1	-	8.0	2.47
#21	220-221	1.4248	21	-	3	28	60	9	-	6.1	0.48
#30	222-223	1.4267	21	1	3	25	60	11	-	5.8	0.37
#37	224-225	1.4306	21	1	2	31	46	18	2	7.2	0.43
#37	226-227	1.4337	21	-	5	25	51	19	-	5.7	0.30

MACERAL DATA

CCP #.	VITRINITE	EXINITE	SEMIFUSINITE	MACRINITE	MICRINITE	FUSINITE	MINERAL MATTER	TOTAL REACTIVES %	TOTAL INERTS %	COMPOSITIONAL BALANCE INDEX	STRENGTH INDEX	CALCULATED COKE STABILITY FACTOR	APPROXIMATE JIS DRUM INDEX
190-206	53.63	-	23.93	7.48	4.06	9.04	1.49	60.42	39.58	3.35	5.22	44	90
191-207	54.17	-	16.99	6.69	2.26	7.21	12.67	61.55	38.45	3.54	6.56	53	90
192-208	56.36	-	22.89	7.32	3.46	8.04	1.93	63.36	36.64	2.9	6.47	55	90
193-209	45.09	-	27.78	8.71	3.64	11.25	3.53	53.02	46.98	4.64	6.18	40	90
194-195	50.73	-	19.09	8.29	5.39	10.06	6.43	57.89	42.11	2.64	5.09	48	90
196-197	50.33	-	21.81	6.70	4.72	10.57	5.85	58.18	41.82	2.60	5.05	48	90
198-199	47.89	-	26.69	6.67	2.25	11.08	5.39	56.84	43.16	3.97	6.32	47	90
200-201	42.60	-	28.19	9.19	2.60	12.17	5.21	52.15	47.85	5.25	6.28	38	90
210-211	52.16	-	25.03	6.69	1.73	11.02	3.34	60.40	39.60	3.12	6.12	53	90
212-213	49.42	-	19.09	11.48	4.12	10.06	5.80	56.19	43.81	3.37	5.75	49	90
214-215	40.49	-	28.82	12.24	5.47	10.23	2.74	49.66	50.34	4.78	5.80	37	90
216-217	54.10	-	17.29	8.21	3.38	11.30	5.70	60.25	39.75	2.64	5.58	52	90
218-219	47.64	-	21.86	9.44	4.37	12.54	4.14	54.55	45.55	3.53	5.61	46	90
220-221	40.52	-	29.56	11.64	3.65	12.33	2.28	49.81	50.19	4.93	5.75	35	90
222-223	50.36	-	21.78	8.79	3.46	11.73	3.87	58.01	41.99	3.51	6.22	51	90
224-225	39.39	-	27.82	12.76	4.22	13.22	2.57	48.28	51.52	5.27	5.77	37	90
226-227	52.89	-	21.08	9.04	3.97	10.00	3.01	60.20	39.80	3.30	6.15	52	90

CHAMBERLAIN SEAM.

		MACERALS									STABILITY DATA						
CIRN DRILL HOLE #	CCP #	VITRINITE	EXINITE	SEMIFUSINITE	MACRINITE	MICRINITE	FUSINITE	MINERAL MATTER	TOTAL REACTIVES %	TOTAL INERTS %	COMPOSITIONAL BALANCE INDEX	STRENGTH INDEX	CALCULATED COKE STABILITY FACTOR	MEAN MAXIMUM REFLECTANCE	ASH	SULPHUR
463 #2	190-206	53.63	-	23.93	7.48	4.06	9.24	1.49	60.42	39.58	3.35	5.22	44	1.4428	6.6	0.39
467 #3A	191-207	54.17	-	16.99	6.69	2.26	7.21	12.67	61.55	38.45	3.54	6.56	53	1.4804	18.6	0.58
466 #4	192-208	56.36	-	22.89	7.32	3.46	8.04	1.93	63.36	36.64	2.90	6.47	55	1.4295	5.2	0.35
460 #21	220-221	40.52	-	29.56	11.64	3.65	12.33	2.28	49.81	50.19	4.93	5.75	35	1.4248	6.1	0.48
453 #24	198-199	47.87	-	26.69	6.67	2.25	11.08	5.39	56.84	43.16	3.97	6.32	47	1.4486	9.7	0.49
454 #24	200-201	42.60	-	28.19	9.19	2.60	12.17	5.21	52.15	47.85	5.25	6.28	38	1.4801	9.1	0.35
461 #26	214-215	40.49	-	28.82	12.24	5.47	10.23	2.75	49.66	50.34	4.78	5.80	37	1.4129	6.5	0.37
455 #28	210-211	52.16	-	25.03	6.69	1.73	11.02	3.34	60.40	39.60	3.12	6.12	53	1.4190	6.4	0.39
56 #30	222-223	50.36	-	21.78	8.79	3.46	11.73	3.87	58.01	41.99	3.51	6.22	51	1.4267	5.8	0.37
457 #37	224-225	39.39	-	27.82	12.76	4.22	13.22	2.57	48.28	51.52	5.27	5.77	37	1.4306	7.2	0.43
456 #37	226-227	52.89	-	21.08	9.04	3.97	10.00	3.01	60.20	39.80	3.30	6.15	52	1.4337	5.7	0.30

CHAMBERLAIN SEAM REFLECTANCE AND MACERALS.

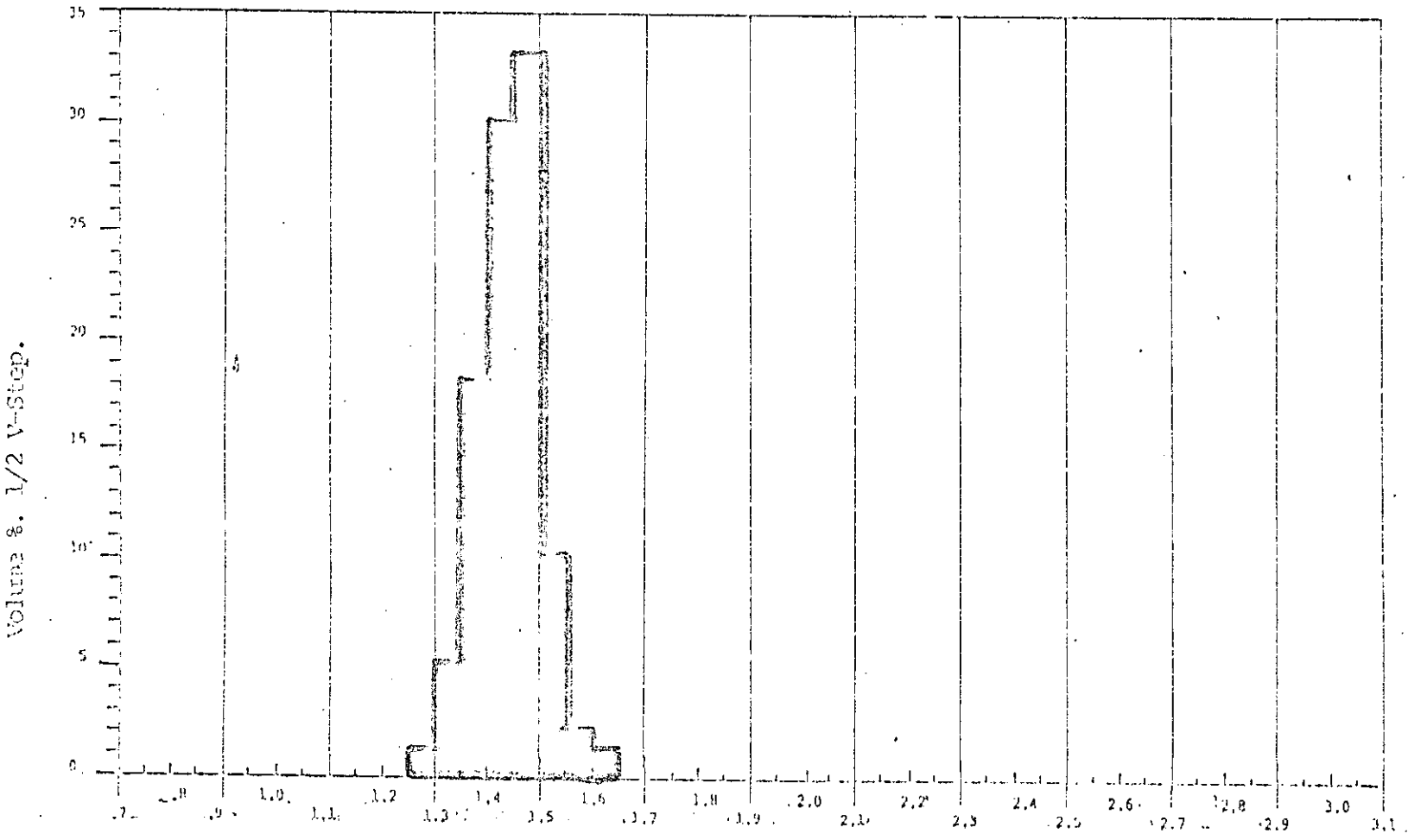
MACERAL STABILITY DATA

DRILL HOLE # CCP #.	VITRINITE	EXINITE	SEMIFUSINITE	MACRINITE	MICRINITE	FUSINITE	MINERAL MATTER	TOTAL REACTIVES %	TOTAL INERTS %	COMPOSITIONAL BALANCE INDEX	STRENGTH INDEX	CALCULATED COKE STABILITY FACTOR	MEAN MAXIMUM REFLECTANCE	ASH	SULPHUR
469 # 8 193-209	45.09	-	27.78	8.71	3.64	11.25	3.53	53.02	46.98	4.64	6.18	40.0	1.4484	9.4	3.09
450 #16 196-197	50.33	-	21.81	6.70	4.72	10.57	5.85	58.18	41.82	2.60	5.05	48	1.3021	8.1	2.09
451 #17 194-195	50.73	-	14.09	8.29	5.39	10.06	6.43	57.89	42.11	2.64	5.09	48	1.3061	8.4	2.20
452 #18 212-213	49.42	-	19.09	11.48	4.12	10.06	5.80	56.19	43.81	3.37	5.75	49	1.3814	8.6	1.92
459 #20 218-219	47.64	-	21.86	9.44	4.37	12.54	4.14	54.45	45.55	3.53	5.61	46	1.3688	8.0	2.47
462 #26 216-217	54.10	-	17.29	8.21	3.38	11.30	5.70	60.25	39.75	2.64	5.58	52	1.3551	8.7	1.60

BIRD SEAM.....REFLECTANCE AND MACERALS

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 190-206

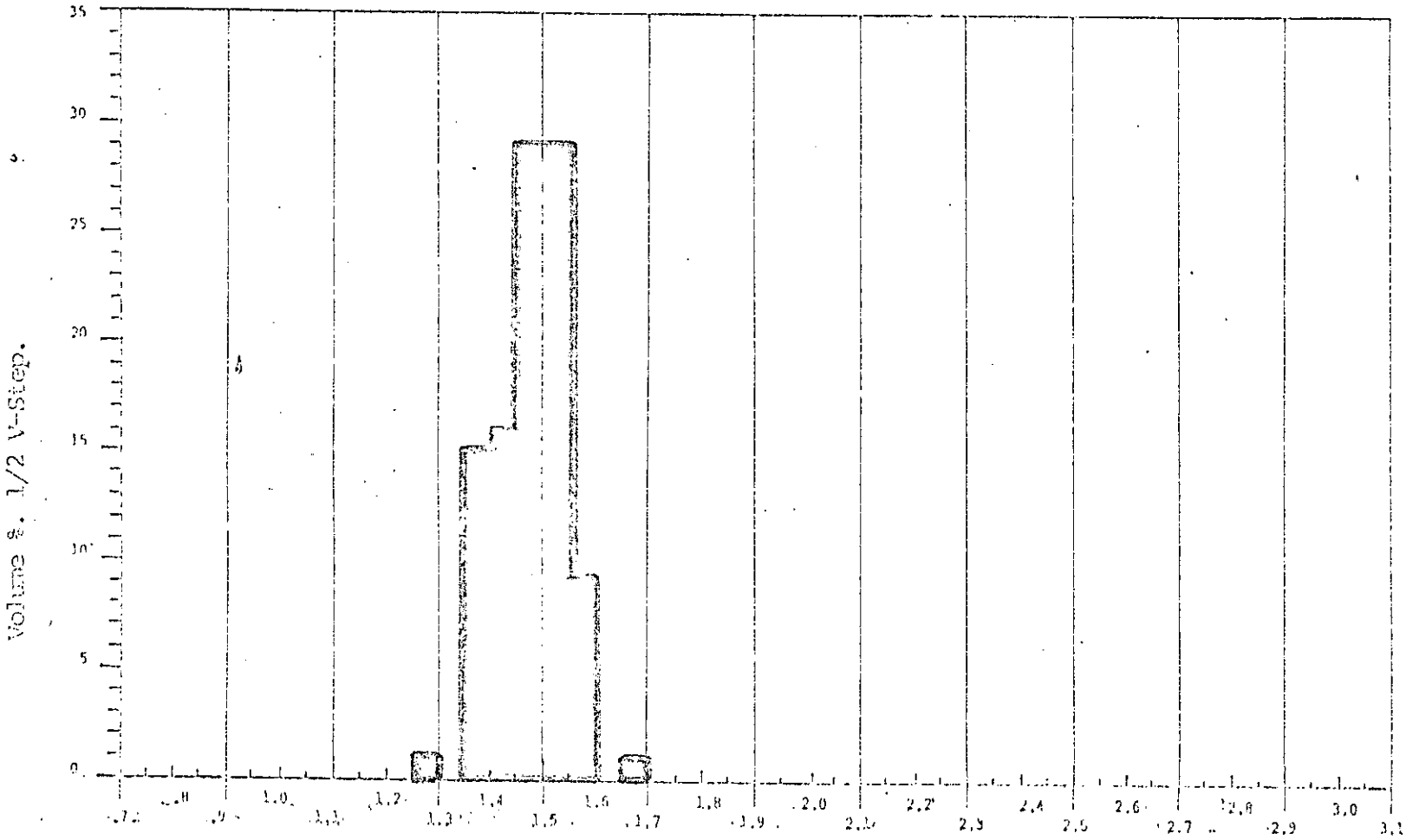


REFLECTANCE 0.05 % INCREMENTS.

BP #2 Chamberlain

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM. PELLET No:- CCP- 191 & 207

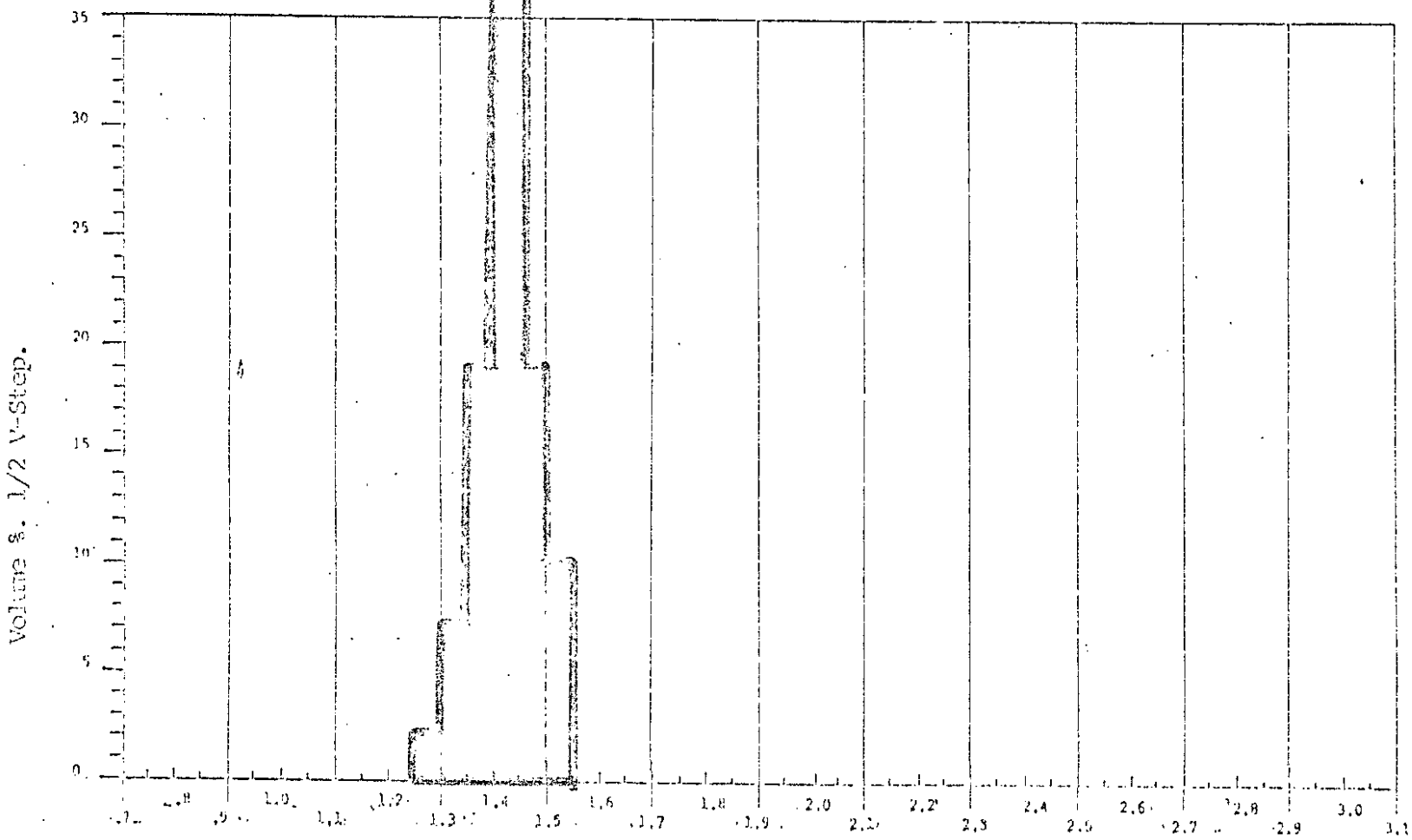


REFLECTANCE 0.05 % INCREMENTS.

BP #3A Chamberlain Lower

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM. PELLET No:- CCP- 192 & 208

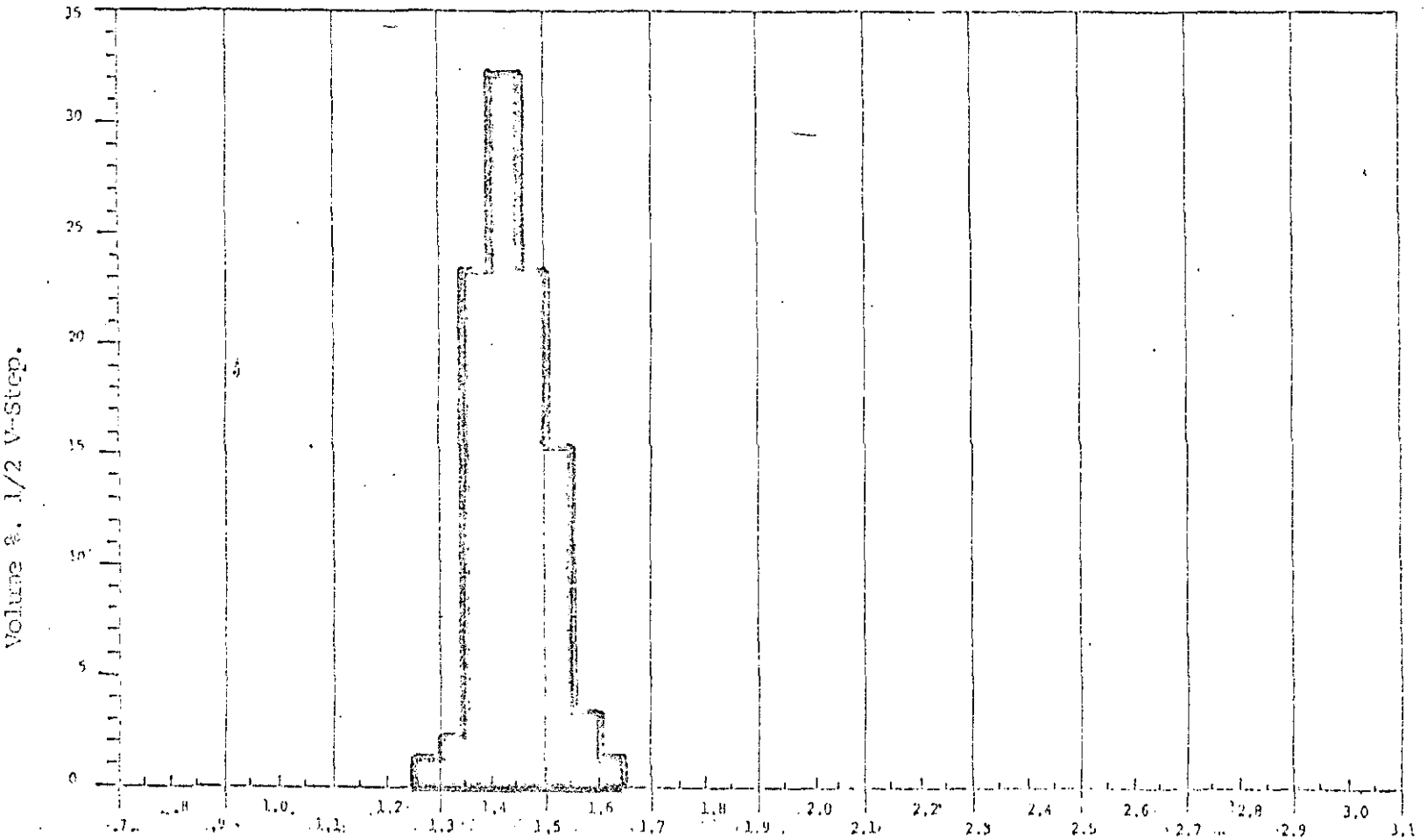


REFLECTANCE 0.05 % INCREMENTS.

BP #4 Chamberlain Lower

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM. PELLET No:- CCP- 193 & 209



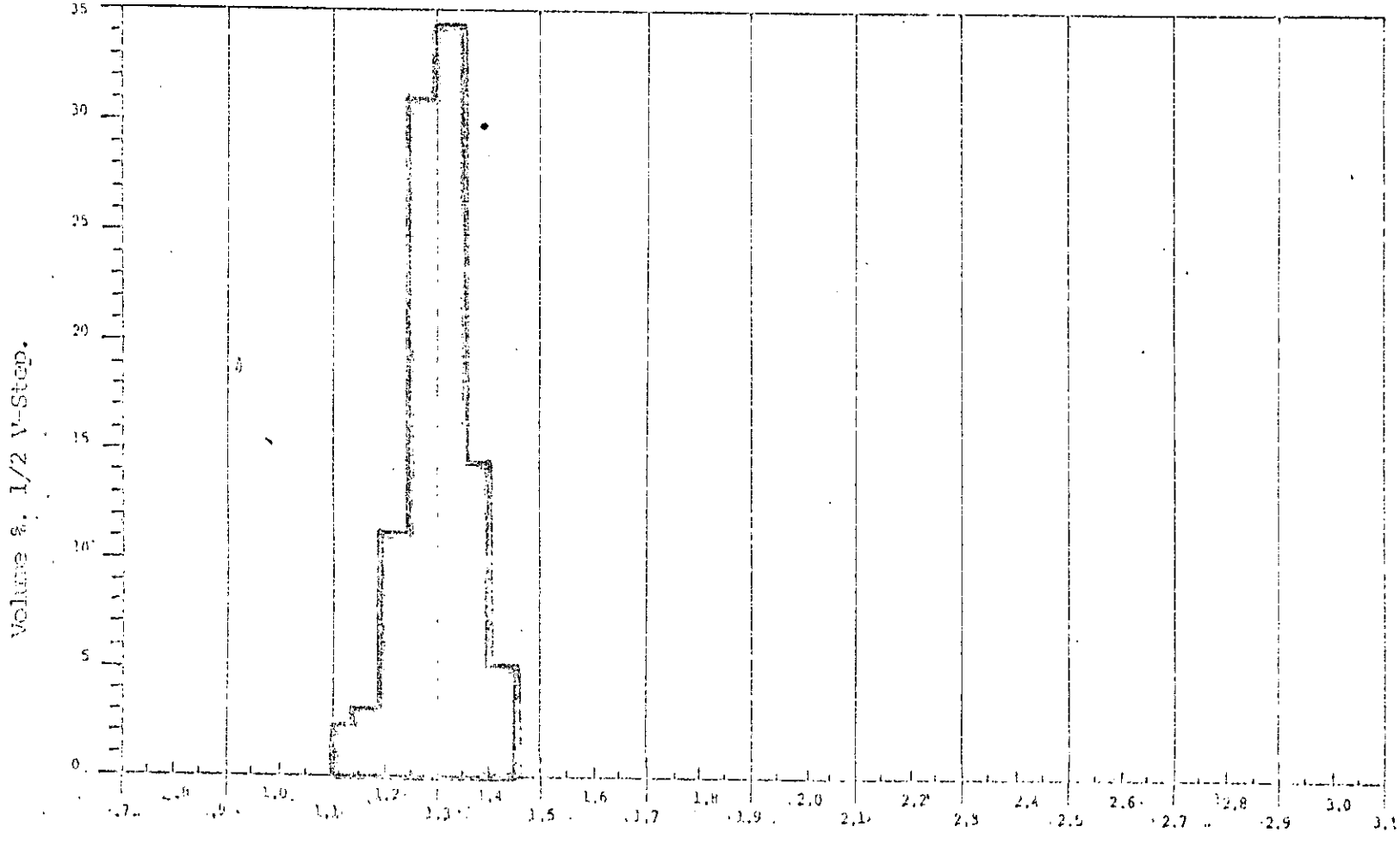
REFLECTANCE 0.05 % INCREMENTS.

BP #8 Bird Seam

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 194 & 195

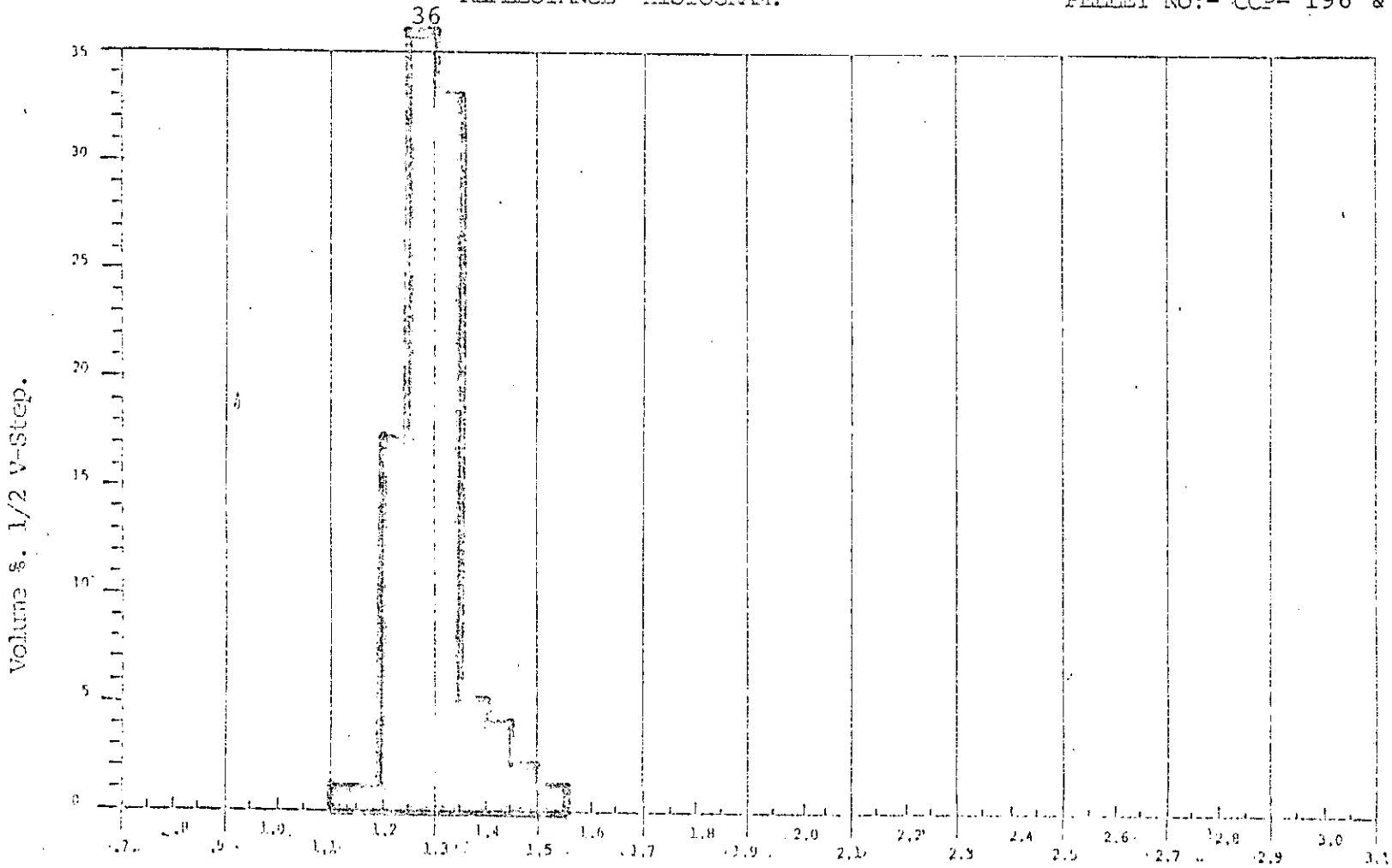


REFLECTANCE 0.05 % INCREMENTS.

BP #17 Bird Seam

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM. PELLET No:- CCP- 196 & 197.



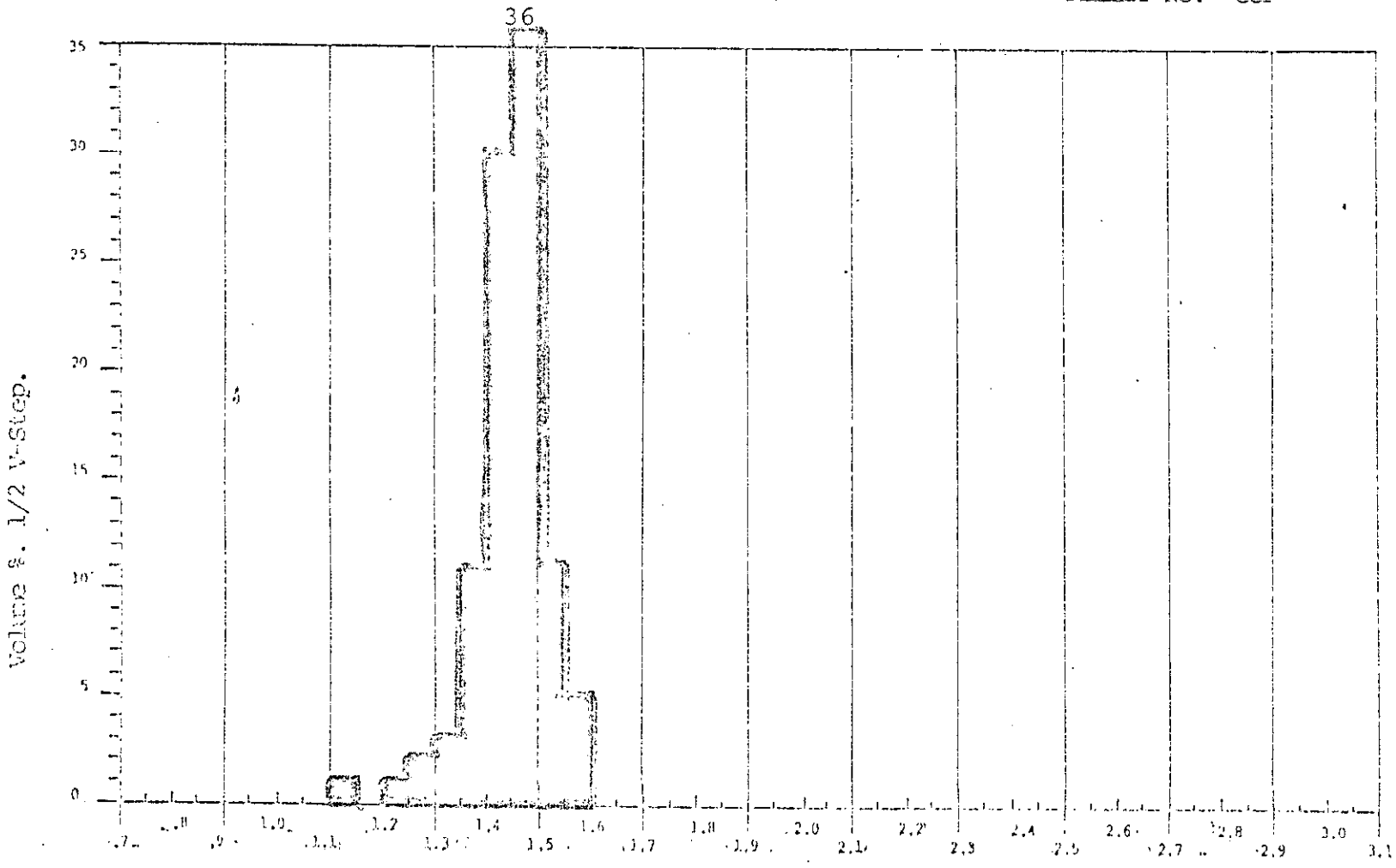
REFLECTANCE 0.05 % INCREMENTS.

'BP # 16' Bird Seam

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 198 & 199



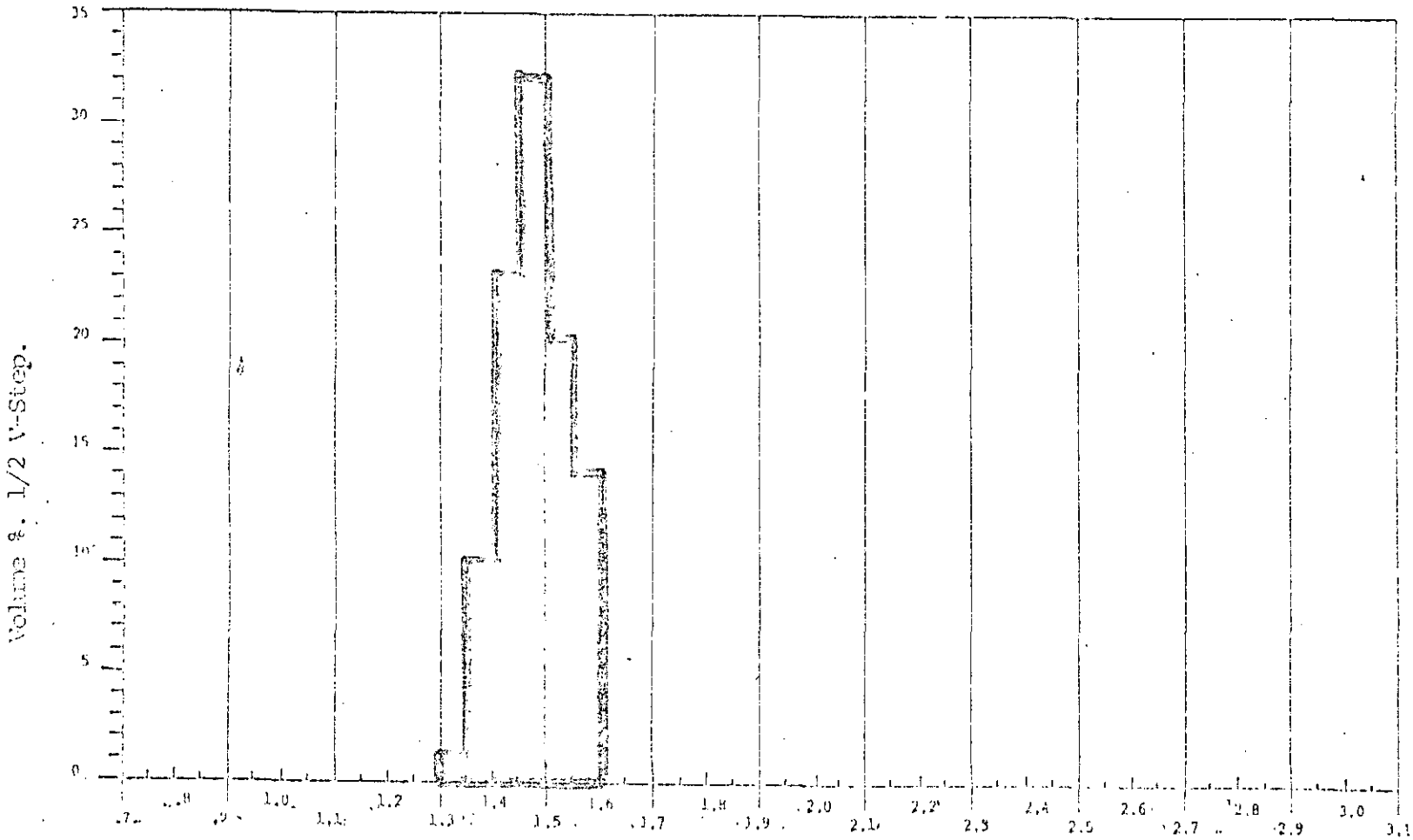
REFLECTANCE 0.05 % INCREMENTS.

BP# 24 Chamberlain

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP-200&201



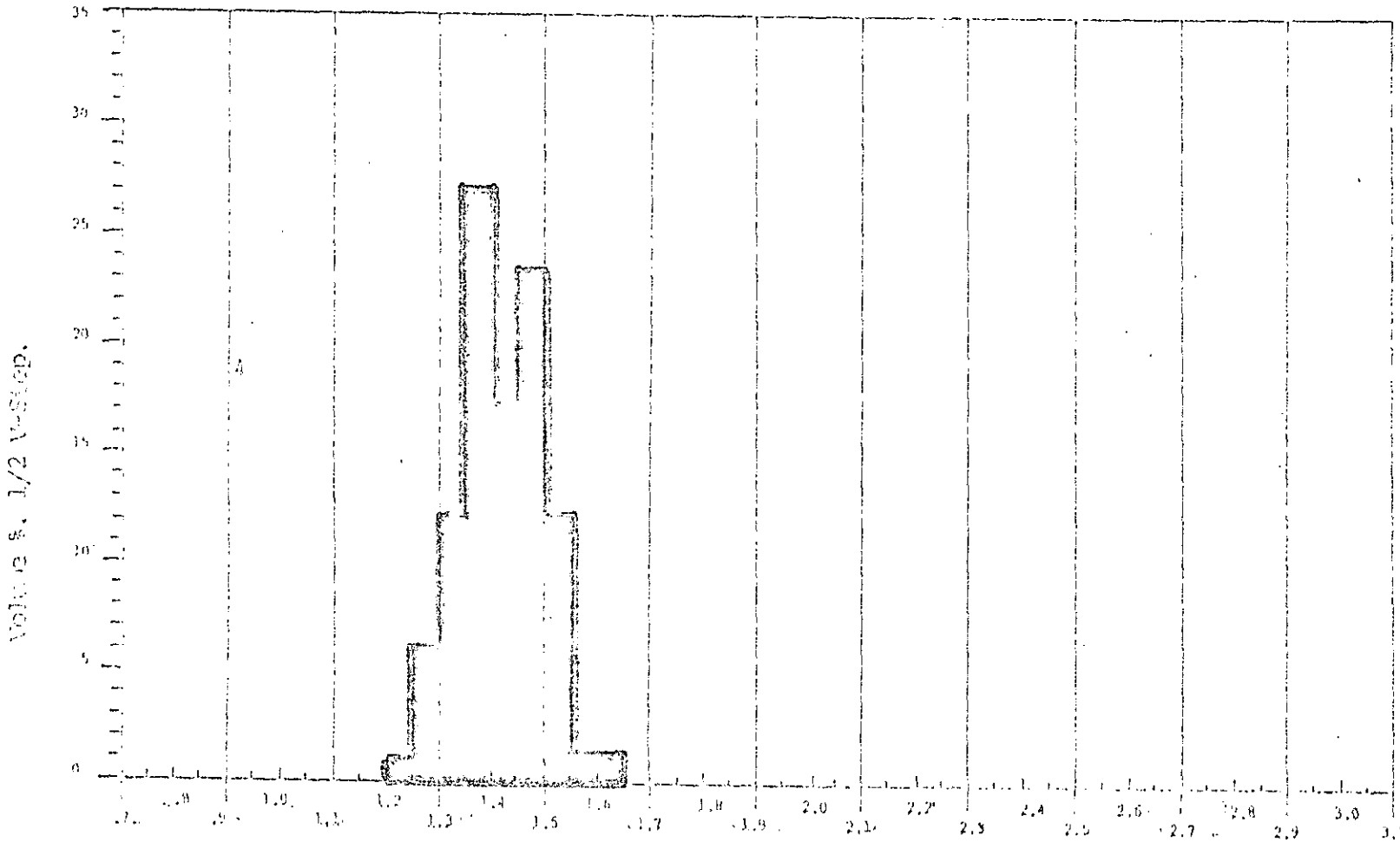
REFLECTANCE 0.05 % INCREMENTS.

BP # 24 Chamberlain

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 210 & 211



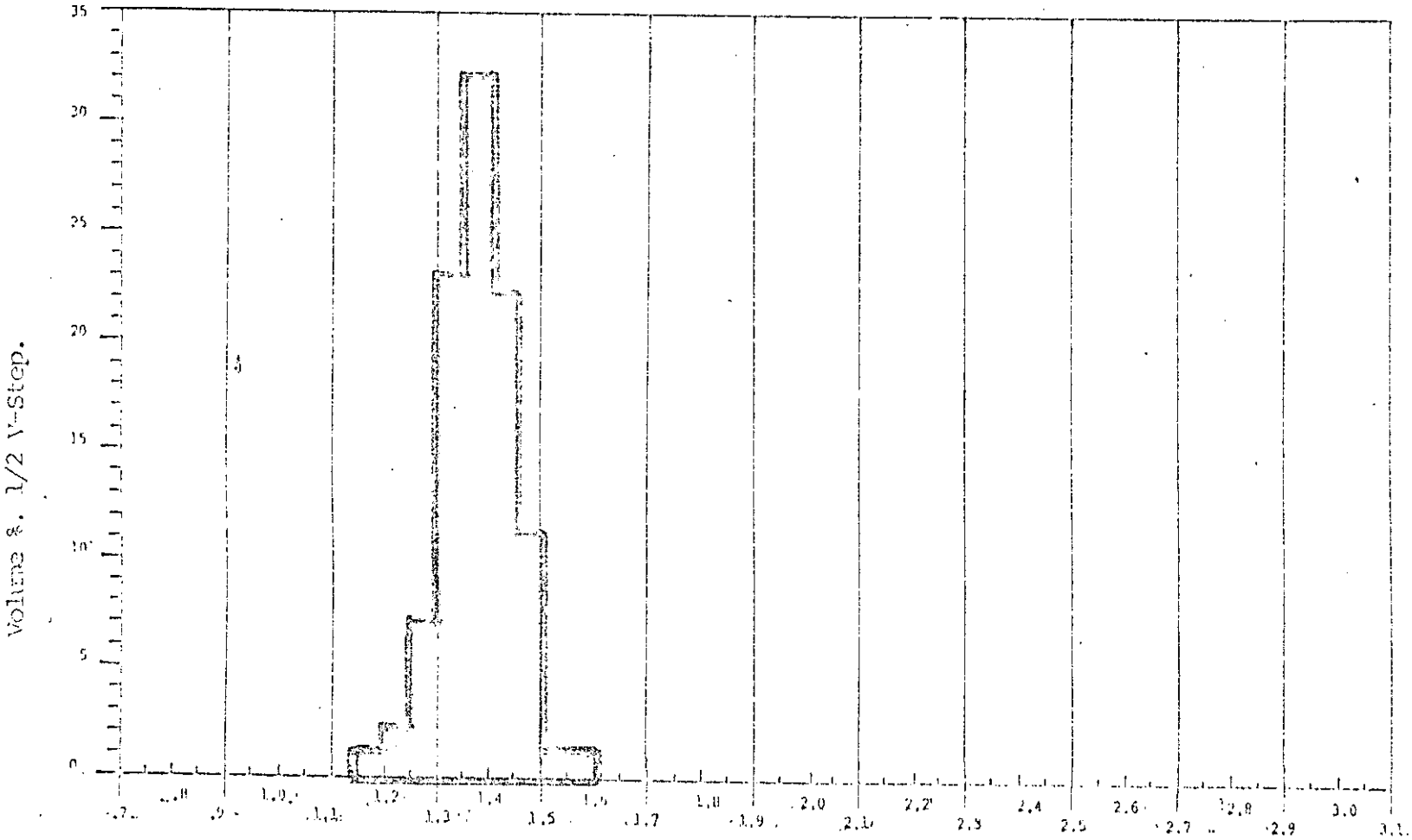
REFLECTANCE 0.05 % INCREMENTS.

BP # 28 Chamberlain

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 212 & 213

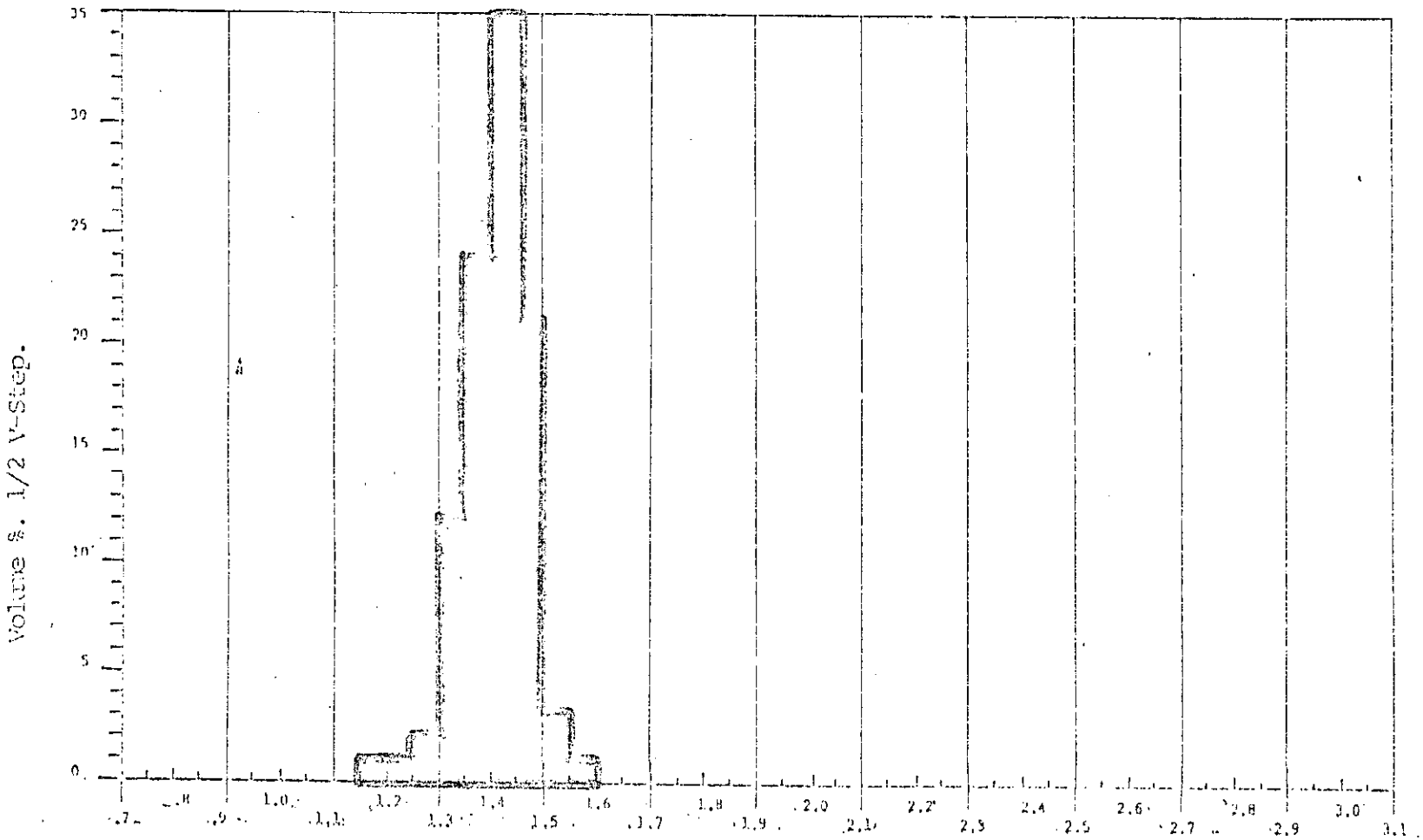


REFLECTANCE 0.05 % INCREMENTS.

BP# 18 Bird

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM. PELLET No:- CCP- 214 & 215



REFLECTANCE 0.05 % INCREMENTS.

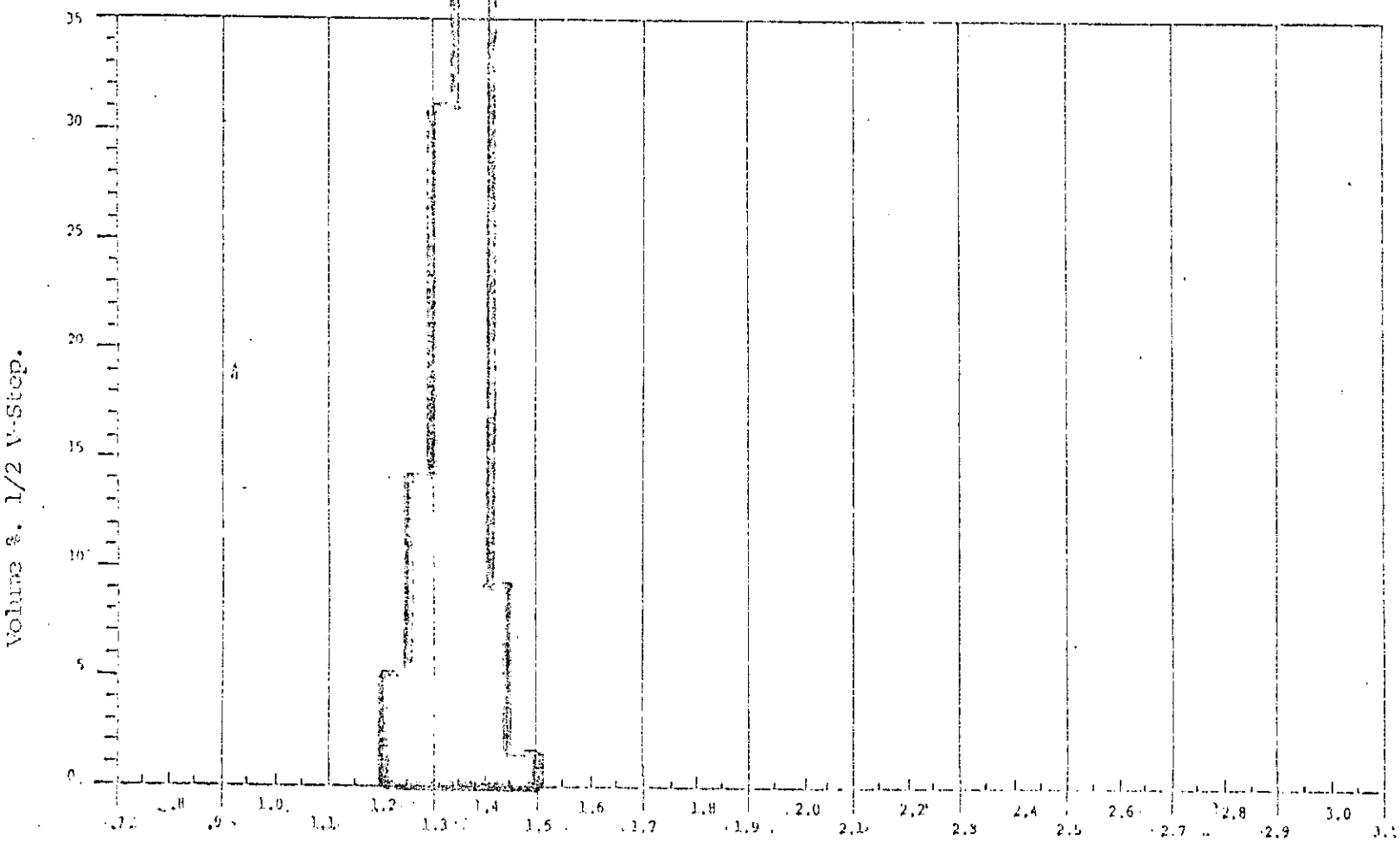
BP # 26 Chamberlain

Cascade Coal Petrography Limited.

40

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 216 & 217



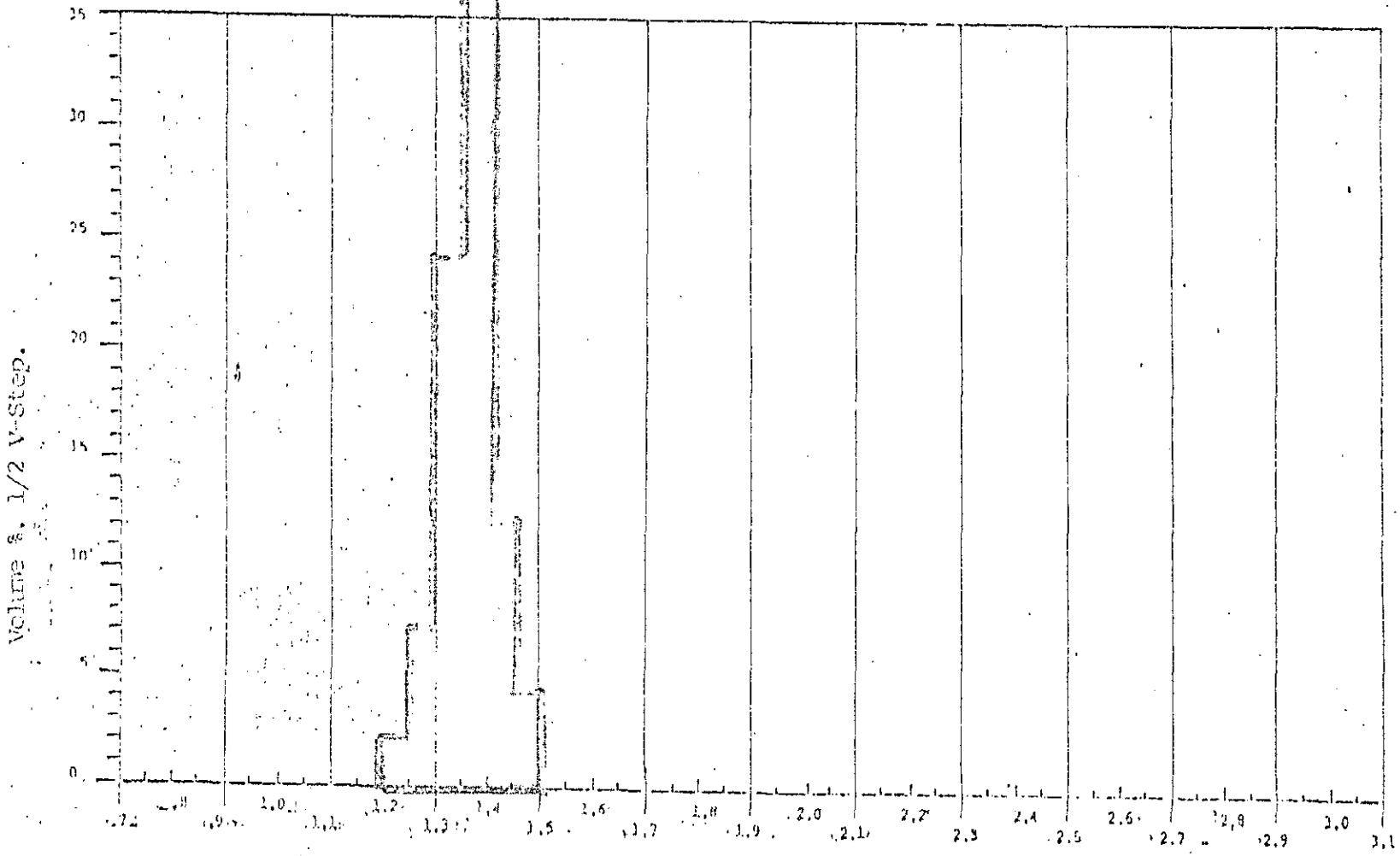
REFLECTANCE 0.05 % INCREMENTS.

BP # 26 Bird Seam

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 218 & 219



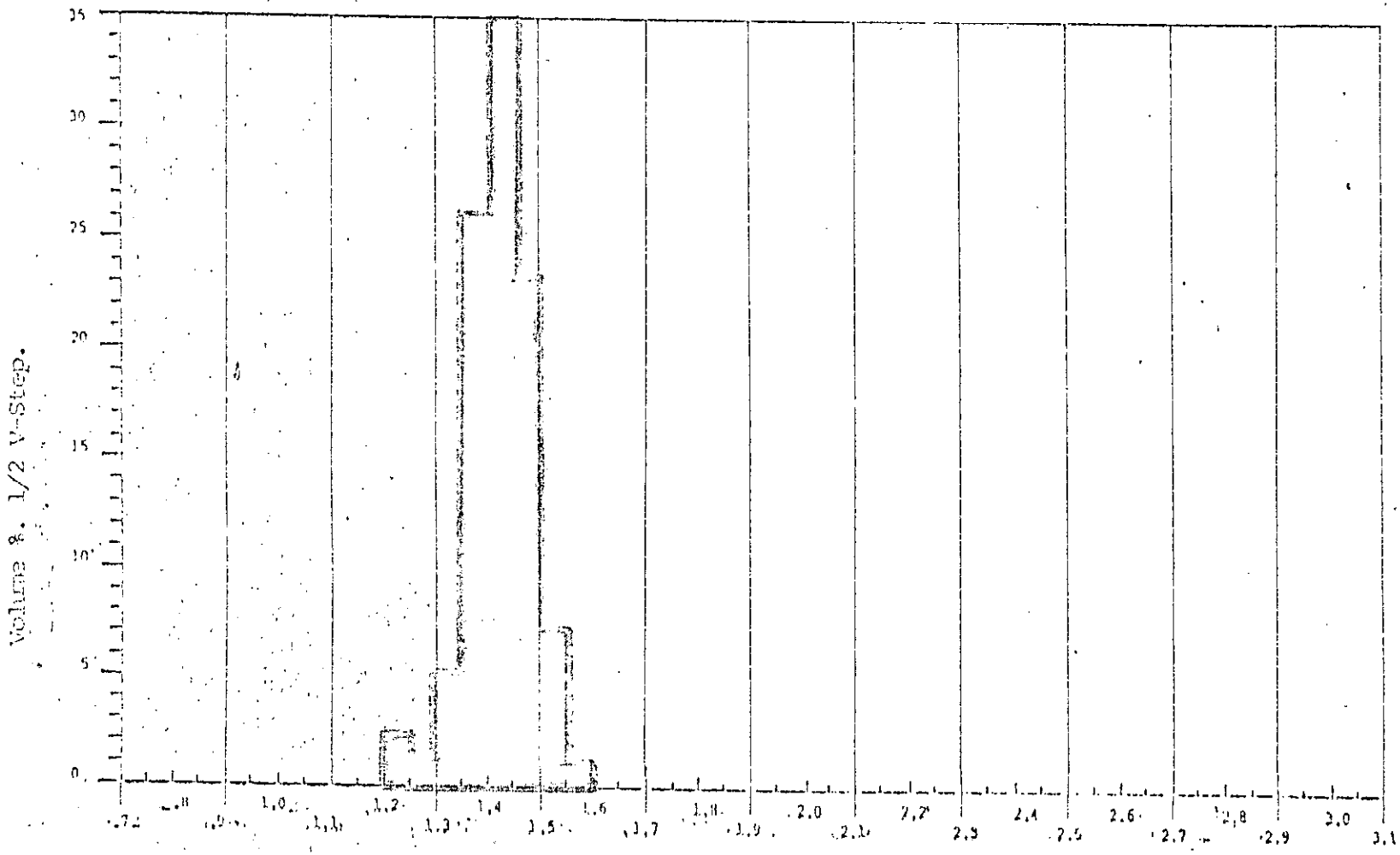
REFLECTANCE 0.05 % INCREMENTS.

BP # 20 Bird Seam

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 220 - 221



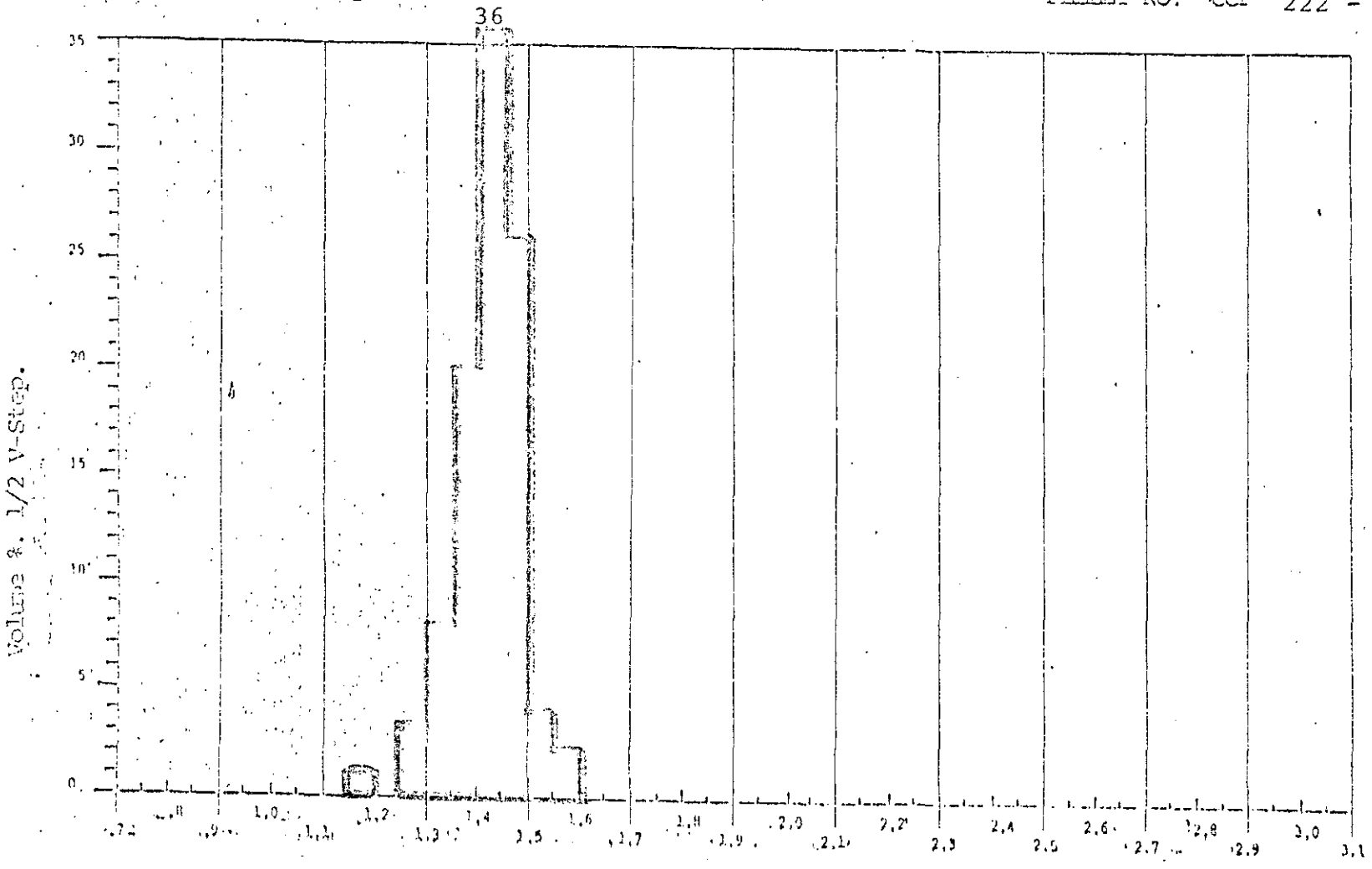
REFLECTANCE 0.05 % INCREMENTS.

BP # 21 Chamberlain

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 222 - 223



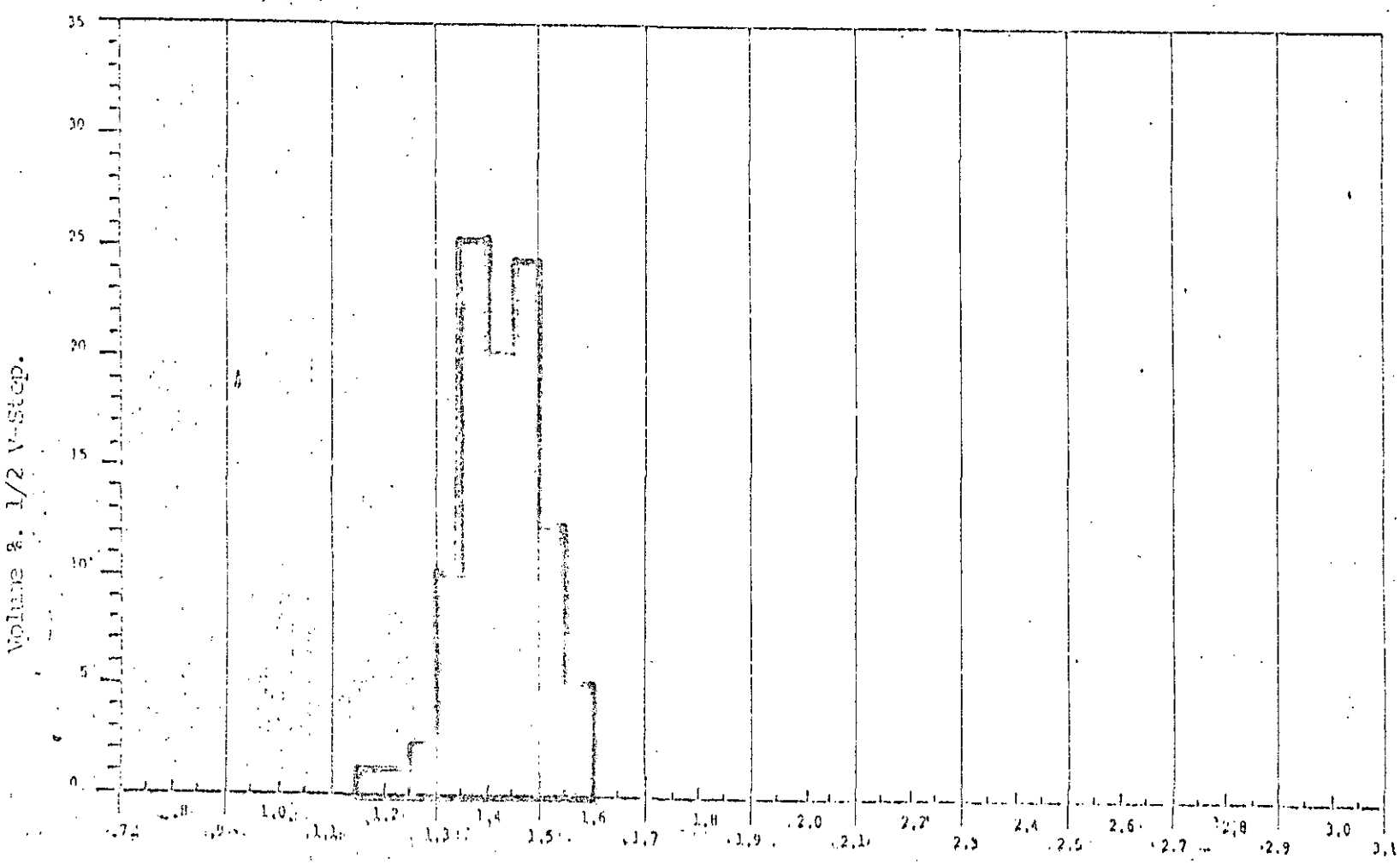
REFLECTANCE 0.05 % INCREMENTS.

BP # 30 Chamberlain

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

PELLET No:- CCP- 224-225



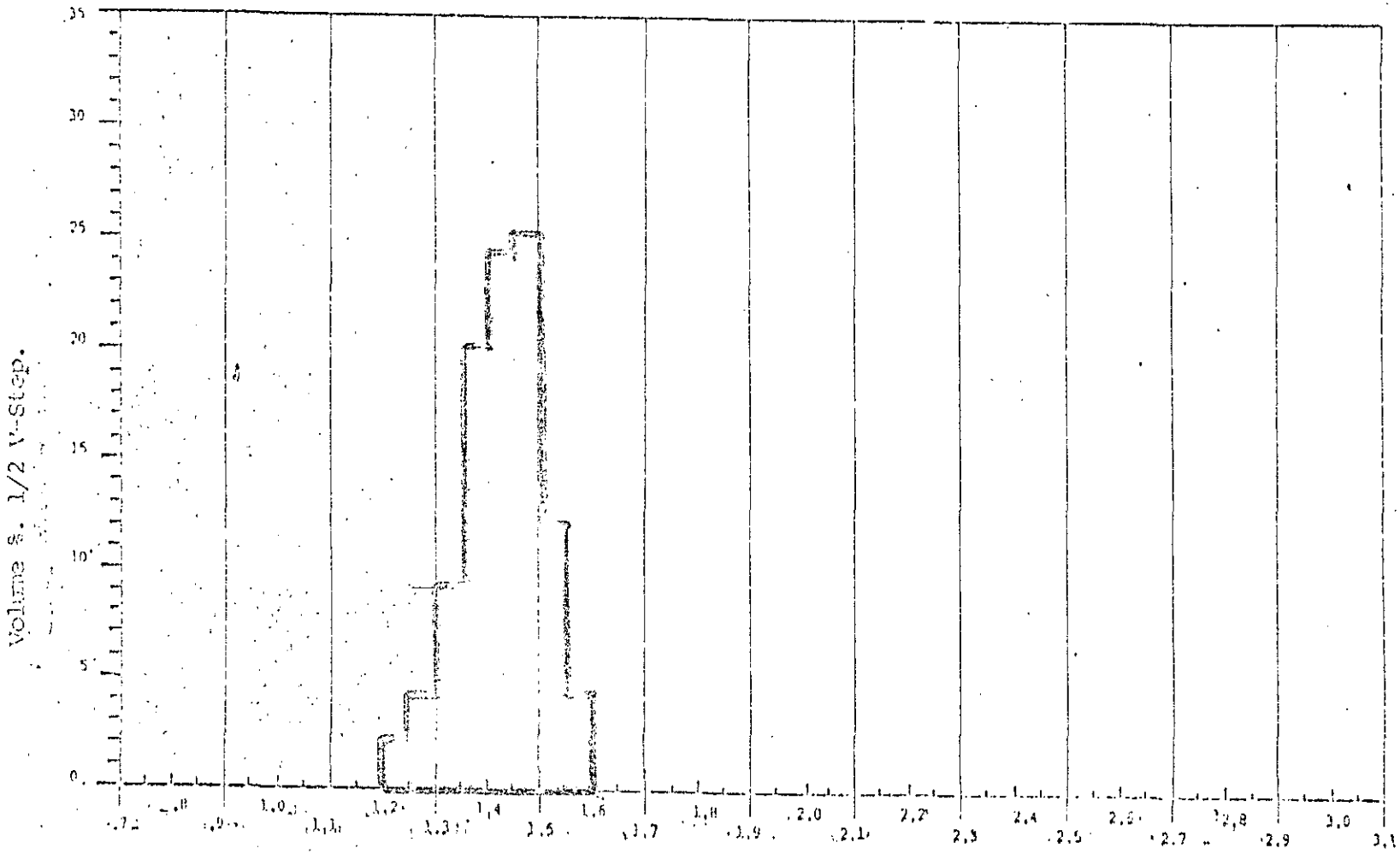
REFLECTANCE 0.05 % INCREMENTS.

BP # 37 Chamberlain

Cascade Coal Petrography Limited.

REFLECTANCE HISTOGRAM.

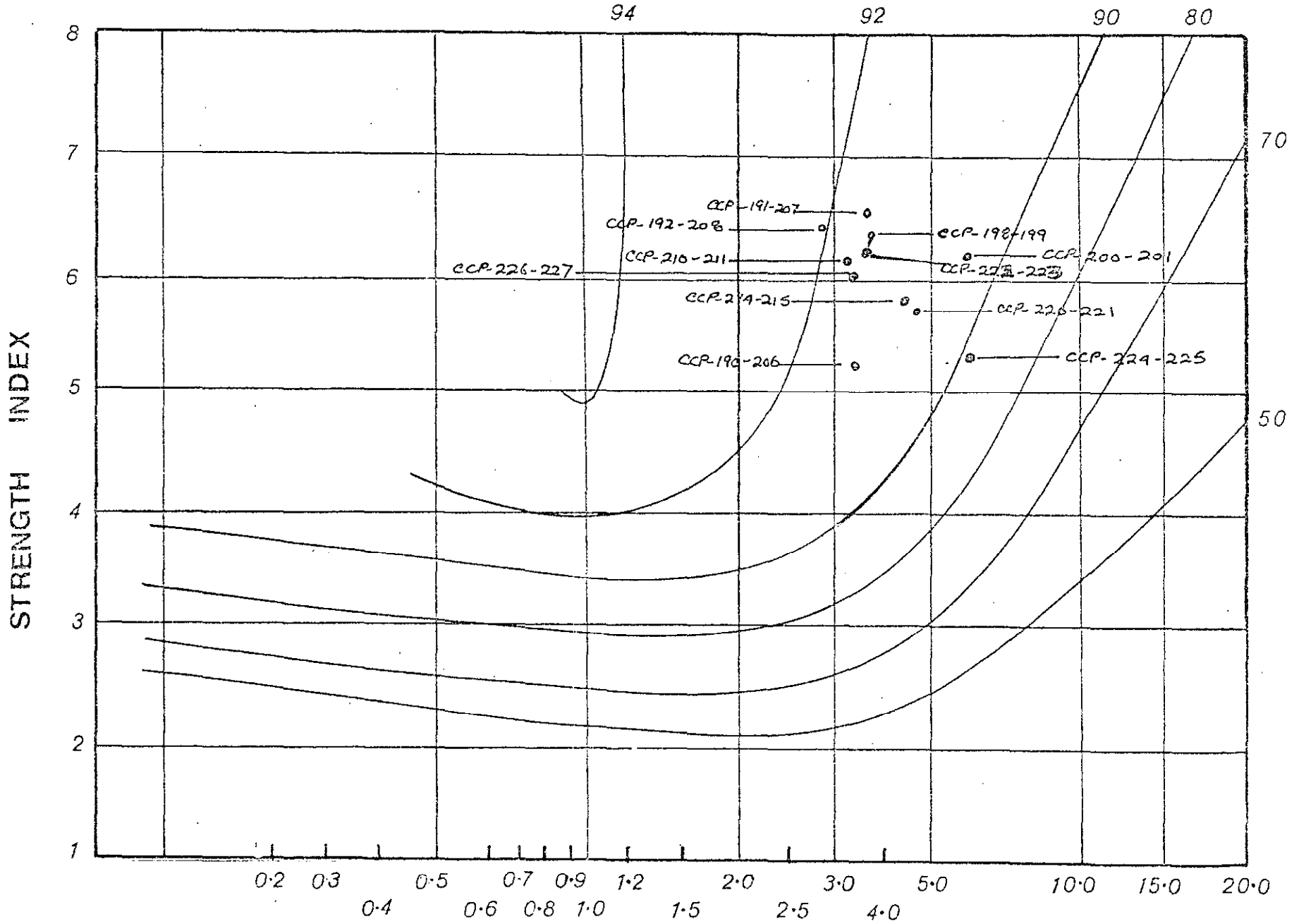
PELLET No:- CCP- 226-227



REFLECTANCE 0.05 % INCREMENTS.

BP #37 Chamberlain

Cascade Coal Petrography Limited.


94
92
90
80
70
50
8
7
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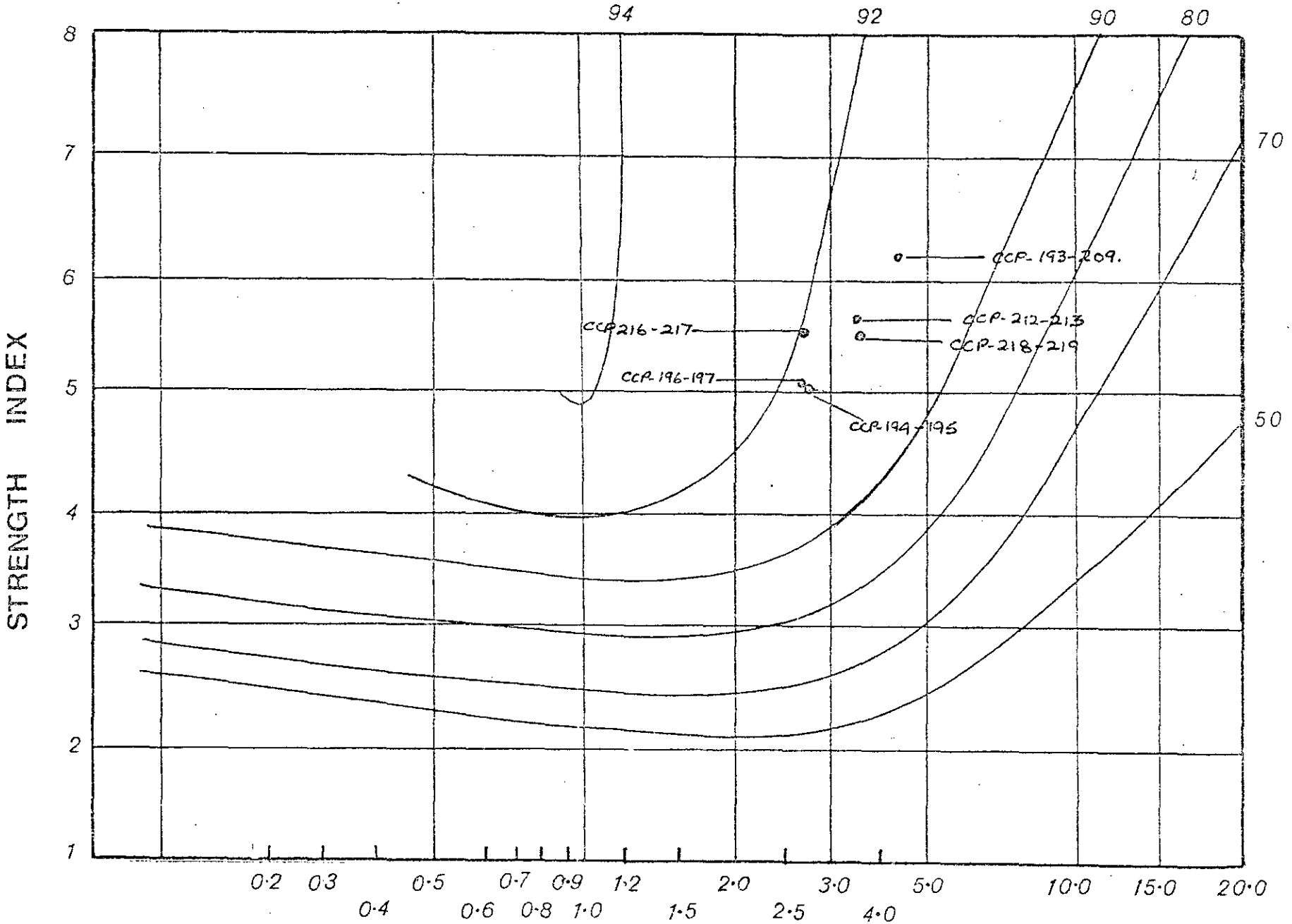
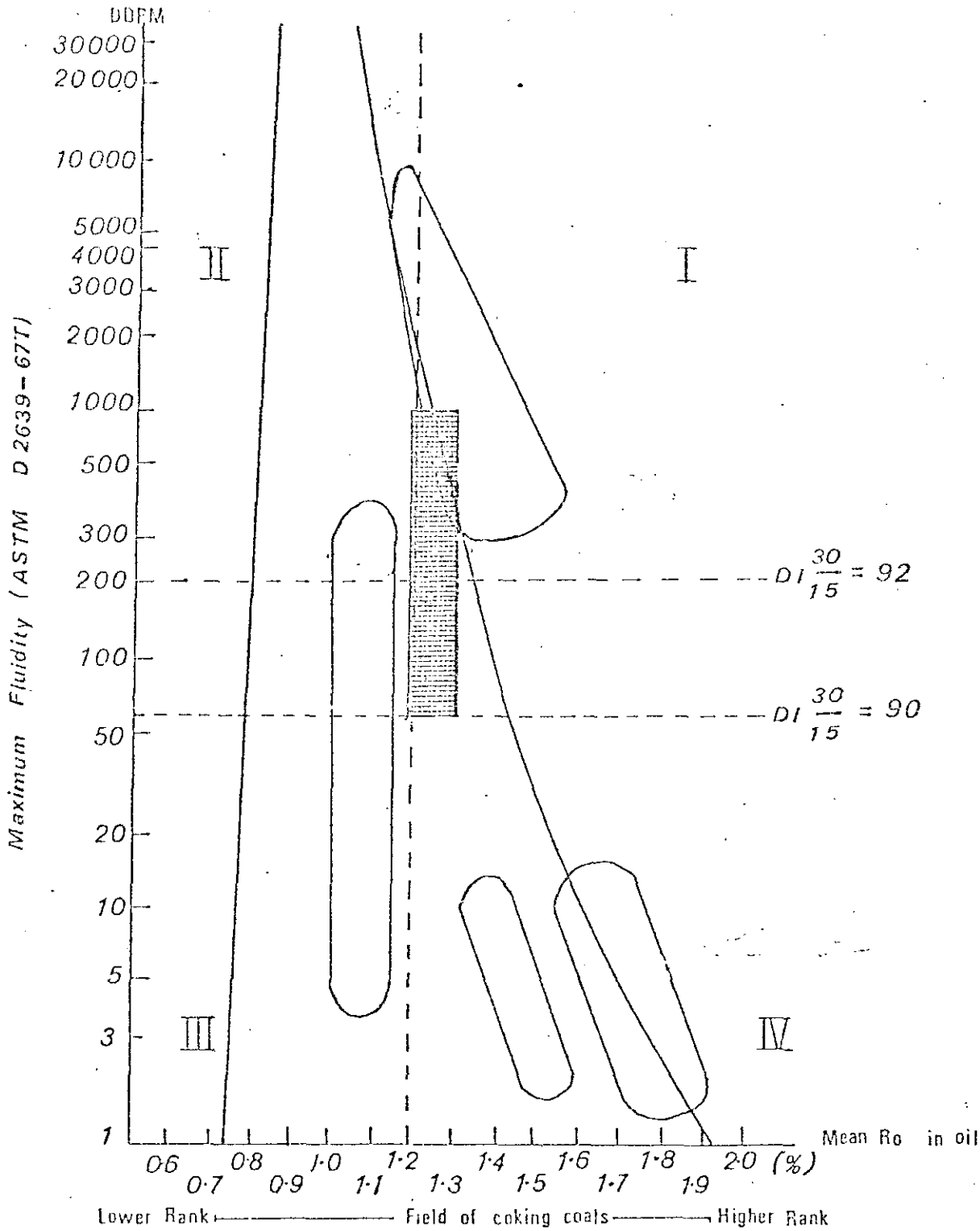
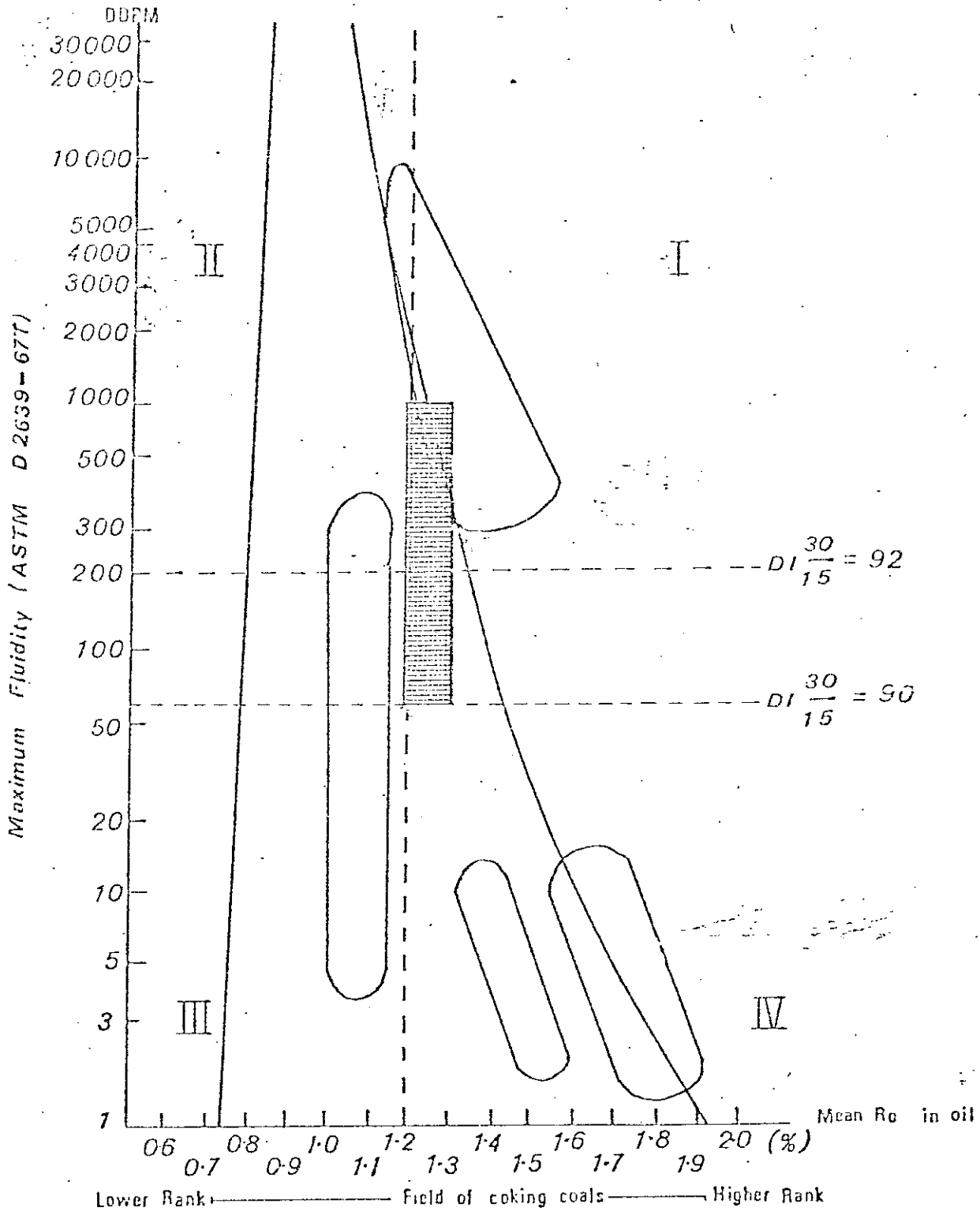
5
4
3
2
1
STRENGTH INDEX
CCP-191-207
CCP-192-208
CCP-210-211
CCP-226-227
CCP-214-215
CCP-196-206
CCP-198-199
CCP-200-201
CCP-222-223
CCP-220-221
CCP-224-225
0·2
0·3
0·4
0·5
0·6
0·7
0·8
0·9
1·0
1·2
1·5
2·0
2·5
3·0
4·0
5·0
10·0
15·0
20·0
COMPOSITION BALANCE INDEX
CHAMBERLAIN SEAM


94
92
90
80
70
50
8
7
6
5
4
3
2
1
CCP-193-209.
CCP-212-213
CCP-218-219
CCP216-217
CCP-196-197
CCP-194-195
0·2
0·3
0·4
0·5
0·6
0·7
0·8
0·9
1·0
1·2
1·5
2·0
2·5
3·0
4·0
5·0
10·0
15·0
20·0
STRENGTH INDEX
COMPOSITION BALANCE INDEX

BIRD SEAM



Relation between Maximum Fluidity and Rank of coals.



Relation between Maximum Fluidity and Rank of coals.

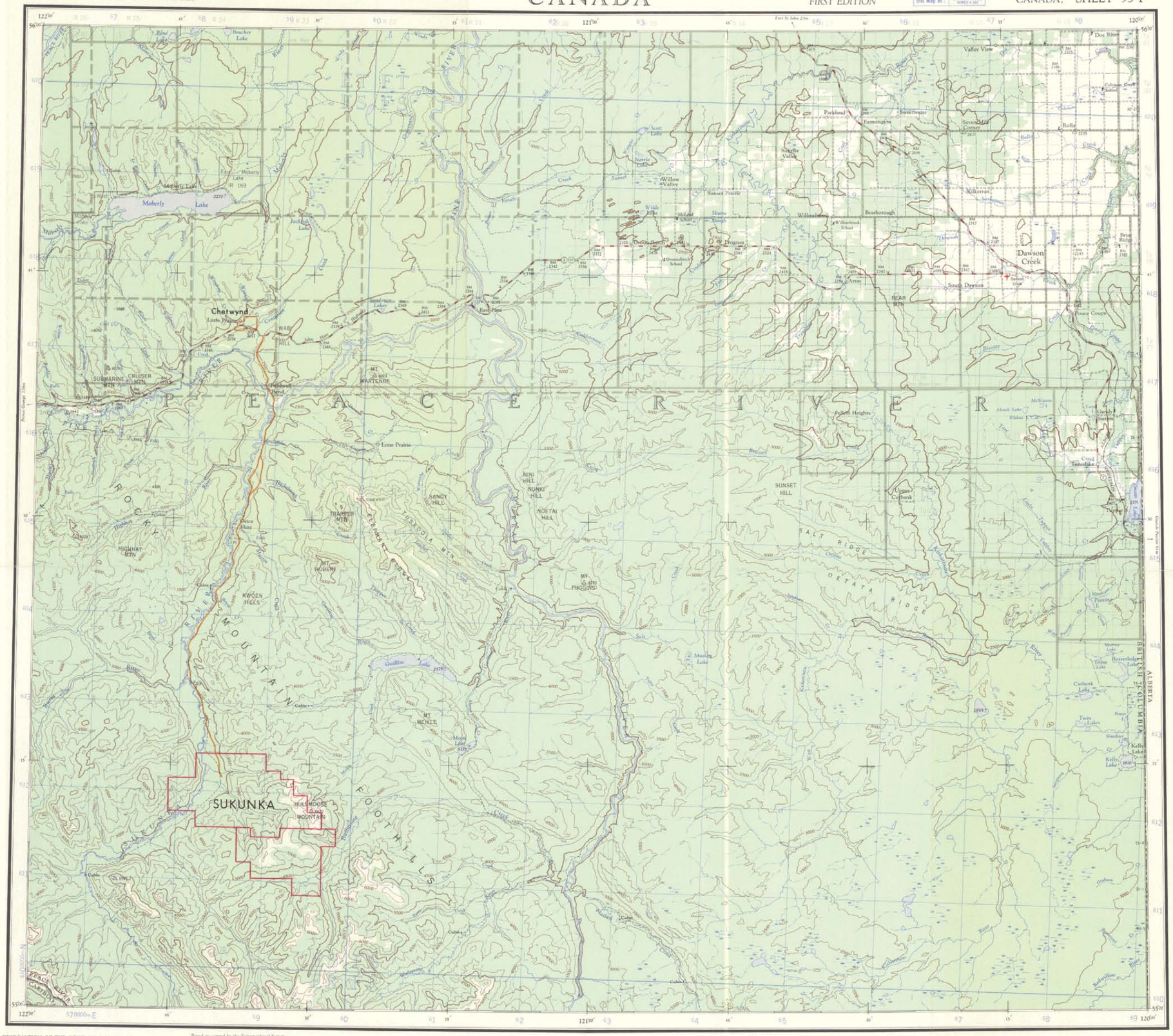
NATIONAL TOPOGRAPHIC SERIES

CANADA

FIRST EDITION

Refer to this Map as: 93 P EDITION 1 ASE

CANADA, SHEET 93 P



THE DECLINATION OF THE COMPASS NEEDLE, 1954

The declination of the compass needle at any place along a red line is the declination given on that red line. At other places the declination in between those given on the neighbouring red lines stays at the place marked A, the declination is between N.20°30'E. and N.19°30'E. The westerly declinations of the compass needle are decreasing 4·5 minutes annually.

Based on control by the Topographical Survey, Dept. of Mines and Technical Surveys, and the Army Survey Est., R.C.E., Dept. of National Defence 1947-50
Compiled, drawn and printed by the A.S.E. 1951-55.
Aerial photography by the R.C.A.F. 1945-49.

Universal Transverse Mercator Projection.

REFERENCE

	More than 2 Lanes	Road No. 2 Lanes
Road, Hard Surface, All Weather		
" Loose Surface, All Weather	2 Lanes Wide or More	
" " Less than 2 Lanes	All Weather	Dry Weather
Cart Track, Trail	Cart Track	Trail
Railway, Multiple Track		
" Single Track		
Boundary, International		
" Province or State		Marshall
" County or District		
" Reservations, Indian, Military, etc.		

DAWSON CREEK

BRITISH COLUMBIA

Scale 1 : 250,000

1 Inch to 4 Miles Approximately

Miles 0 5 10 15 20 Miles

Kilometres 0 5 10 15 20 25 Kilometres

Copies may be obtained from The Map Distribution Office, Dept. of Mines and Technical Surveys, Ottawa.

Contour Interval 500 Feet
All Elevations in Feet above Mean Sea Level.

North American Datum 1927

REFERENCE

Horizontal Control Point
Contours, Dimension 4500 5000
" Depression 4500
" Approximate
Church, School
Stream, Impermanent
Dam, Falls
Airfield, on Land
Power Transmission Line
Spot Elevation, as for 124
Forest, undefined
Swamp or Marsh
W.L.125
Ferry
Lighthouse
Mud
Sand
Water
Landing Ground
Anchorage

NOTE: On the above index the sheets published are shown tinted green

BP Exploration Canada Limited

(COAL DIVISION)

INDEX MAP #1

GRID ZONE DESIGNATION 10U	TO GIVE A STANDARD REFERENCE ON THIS SHEET TO NEAREST 1000 METRES
100,000 m. SQUARE IDENTIFICATION	SAMPLE POINT: HORIZONTAL CONTROL POINT
ET FT / ES FS / ER FR / EQ	1. Read letters identifying 100,000 metre square in which the point lies. 2. Locate foot HORIZONTAL grid line to LEFT of point and read LARGE figures labelling the line either at the top or bottom margin, or on the line itself. Estimate tenths from grid line to point. 3. Locate foot HORIZONTAL grid line BELOW point and read LARGE figures labelling the line either in the left or right margin, or on the line itself. Estimate tenths from grid line to point.
IGNORE the SMALLER figures of any grid number, these are for finding the full coordinates. Use ONLY the LARGER figures of the grid number, example 570000	SAMPLE REFERENCE: ES9618
	If reporting beyond 100 m. in any direction prefix Grid Zone Designation as: 10UES9618

TEN THOUSAND METRE
UNIVERSAL TRANSVERSE MERCATOR GRID
ZONE 10

CARTER MAPPING LIMITED
610 - 5 Street S.W., Calgary, Alberta
T2P 1V6 264-1230

PR-SUKUNKA 77(2) A

663

DAWSON CREEK
WEST OF 6TH MERIDIAN
SHEET 93 P
FIRST EDITION

121°28'30"
55°12'

55°10'

55°08'
121°36'

121°33'

121°30'

SADDLE CREEK

CAMP SITE

BP/TECK BOREHOLE

BP/TECK BOREHOLE

663 AR-SUKUNKA 77 (2) A

LEGEND

Improved road
Secondary road
Track or trail
Cut line
Tree area
Adit
Trench

River
Stream
Intermittent stream
Swamp
Contours
Spot elevation
Photo point
Drill hole

METRES 500 0 200 400 600 800 METRES
FEET 400 0 400 800 1200 1600 2000 2400 2800 FEET

CONTOUR INTERVAL 5 METRES
DATE OF PHOTOGRAPHS: SEPT. 1, 1977
DATE OF MAPPING: OCT. 1977

- Boreholes drilled as per original program
- Boreholes dropped from original progam
- Additional boreholes
- Old boreholes (logged)
- Adits
- Trenches

BP Exploration Canada Limited
COAL DIVISION

Sukunka / Bullmoose Coal Mining Project
N. E. British Columbia

SUKUNKA 1977 EXPLORATION PROGRAM
(Proposed / Actual)

MAP-3

AUTHOR :	DATE : JAN. 1978
REVISED :	REPORT :
SCALE : 1:10000	DRAWING No. :

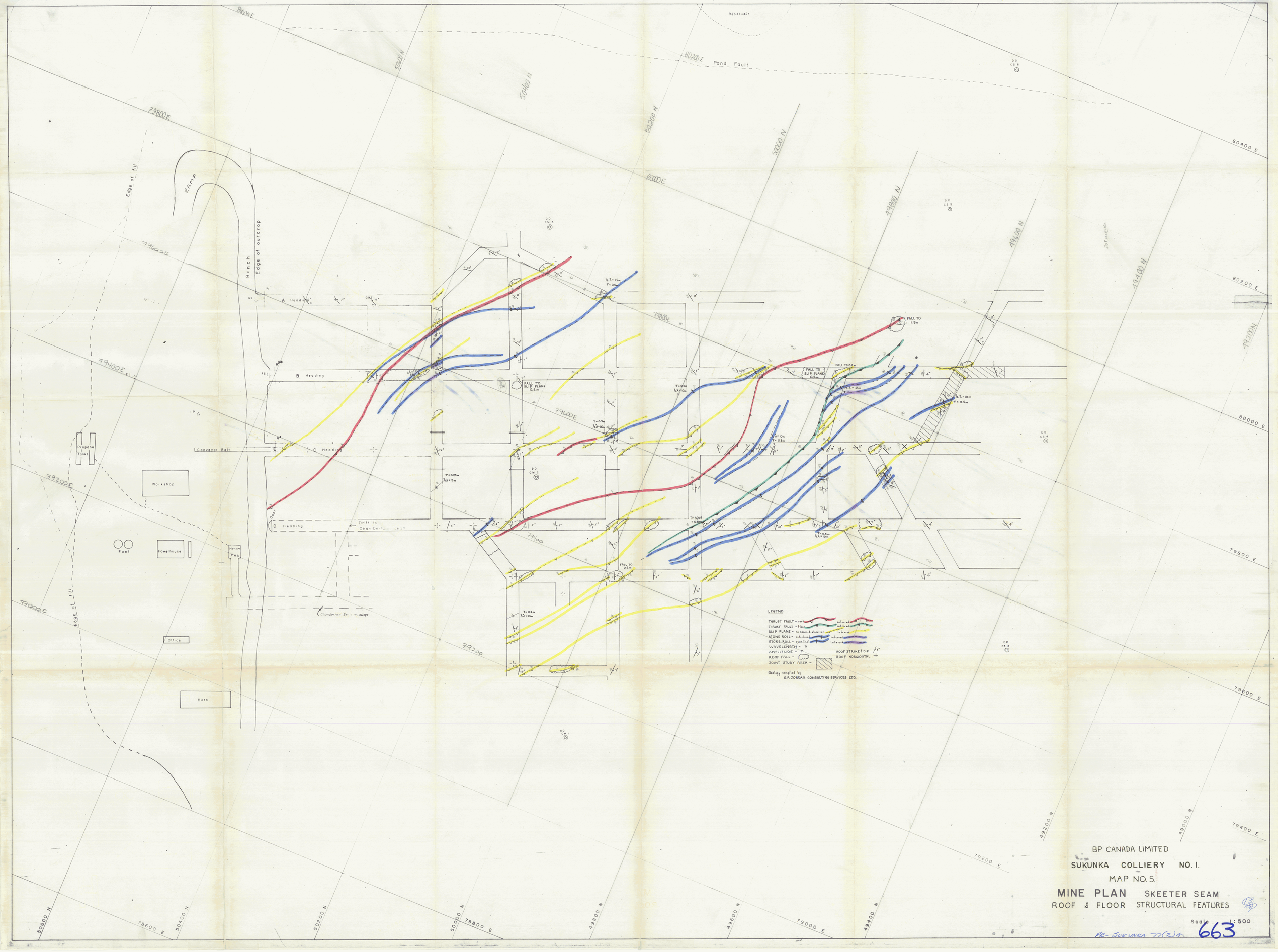
SHEET 3 — BULLMOOSE CR. — HASLER CR.

Y. ADIT
T. TRENCH
BORE HOLE
ROADWAY (Used by BP)
POSITION OF M. of M. & P. R. ROADWAY INACCURATE THROUGH PROSPECT

Scale 1: 50,000

BP SUKUNKA 1977 EXPLORATION PROGRAM
MINISTRY OF MINES & PETROLEUM RESOURCES, 1977.

PR-SUKUNKA 77 (2) B
MAP 2.



BP CANADA LIMITED

SUKUNKA COLLIERY NO. 1.

MAP NO. 5.

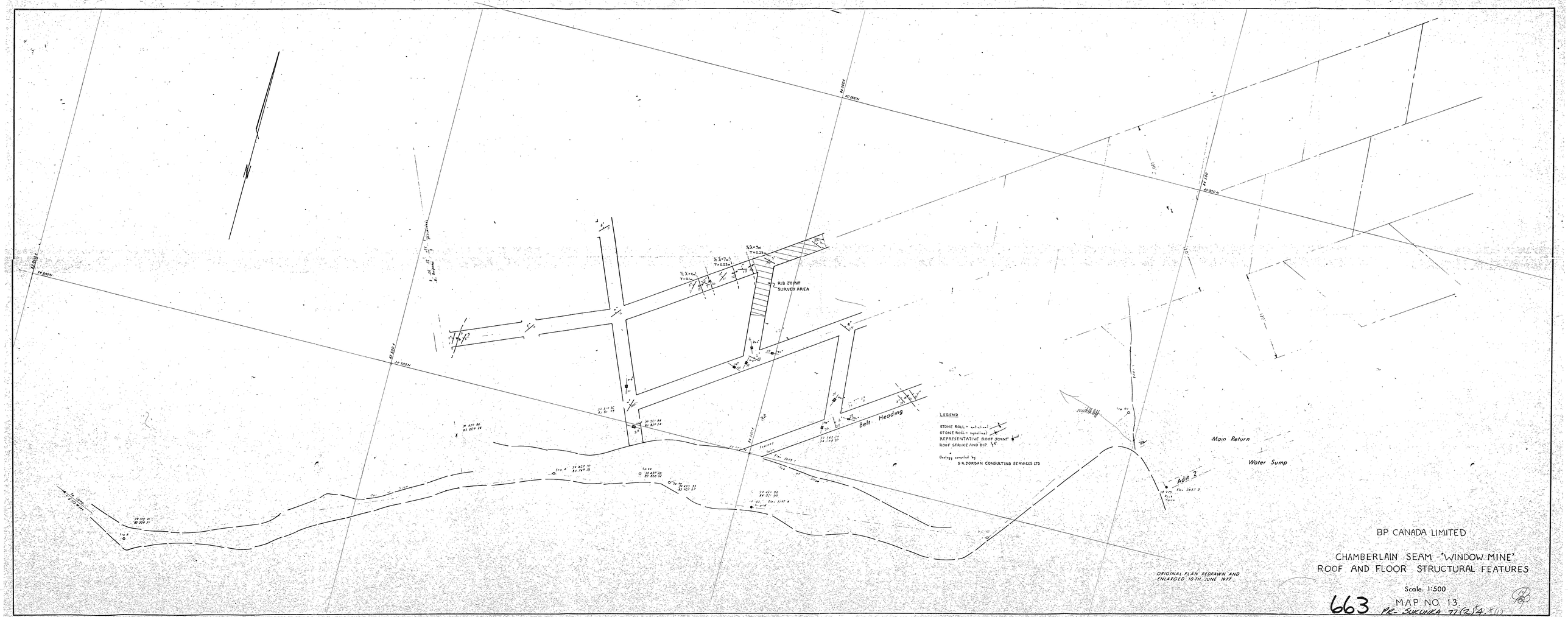
MINE PLAN SKEETER SEAM

ROOF & FLOOR STRUCTURAL FEATURES

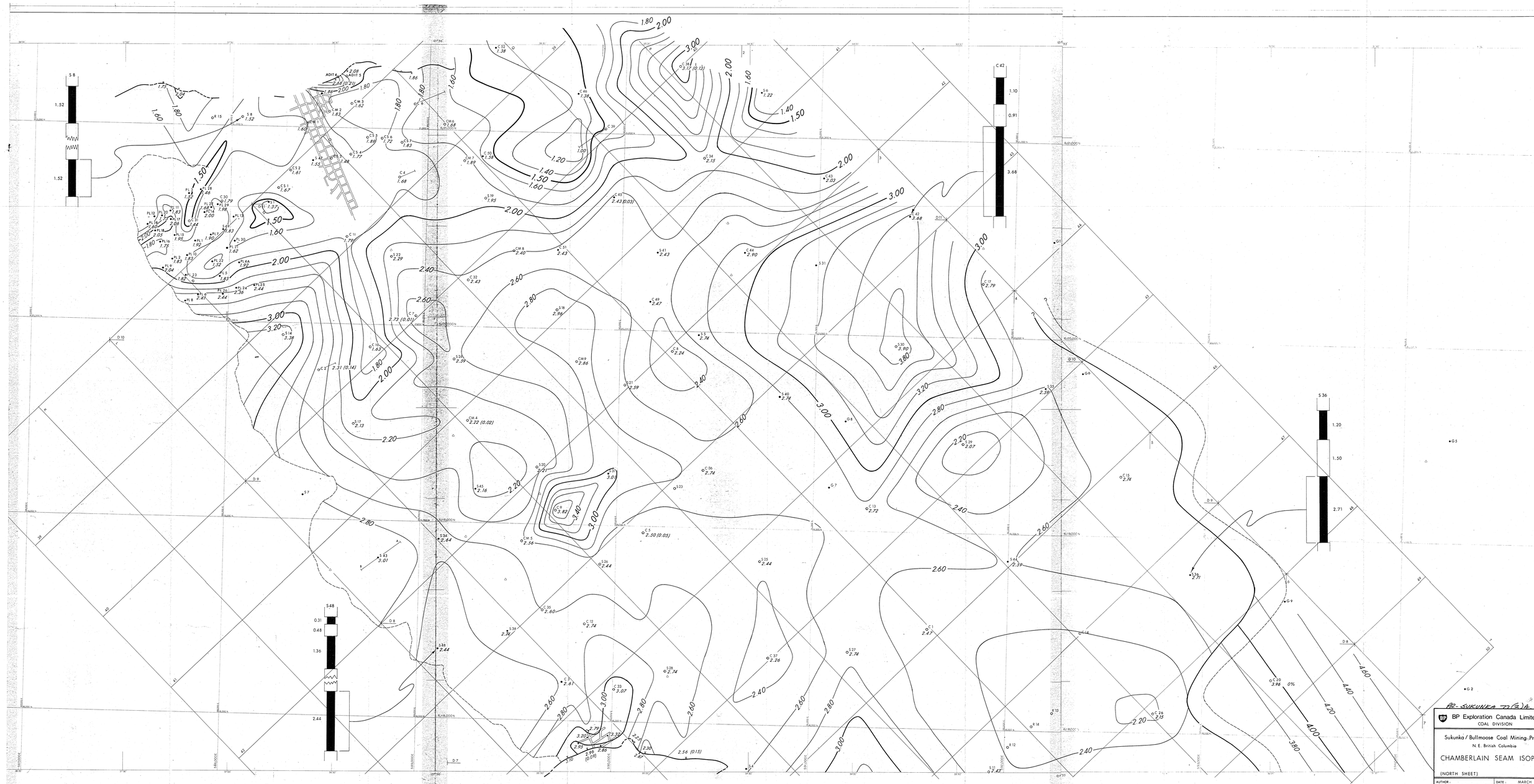
Scale 1:500

PR- SUKUNKA 77(2)A

663



RIB JOINT SURVEY AREA
Belt Heading
Main Return
Water Sump
Adit 2
LEGEND
STONE ROLL - anticlinal
STONE ROLL - synclinal
REPRESENTATIVE ROOF JOINT
ROOF STRIKE AND DIP
Geology compiled by
G.R. JORDAN CONSULTING SERVICES LTD
ORIGINAL PLAN REDRAWN AND ENLARGED 10TH JUNE 1977
BP CANADA LIMITED
CHAMBERLAIN SEAM - 'WINDOW MINE'
ROOF AND FLOOR STRUCTURAL FEATURES
Scale: 1:500
MAP NO. 13.
663
PR- SUKUNKA 77(2)4.*(1)


1.80
2.00
3.00
2.00
1.80
1.60
1.40
1.50
1.20
2.00
3.00
1.60
1.50
2.00
3.00
2.40
2.60
2.80
3.20
3.00
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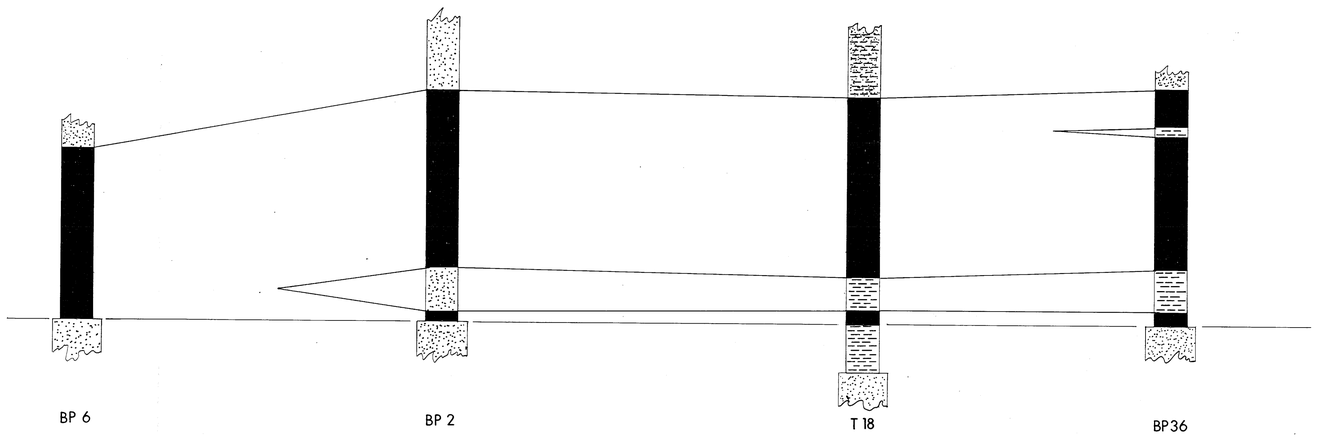
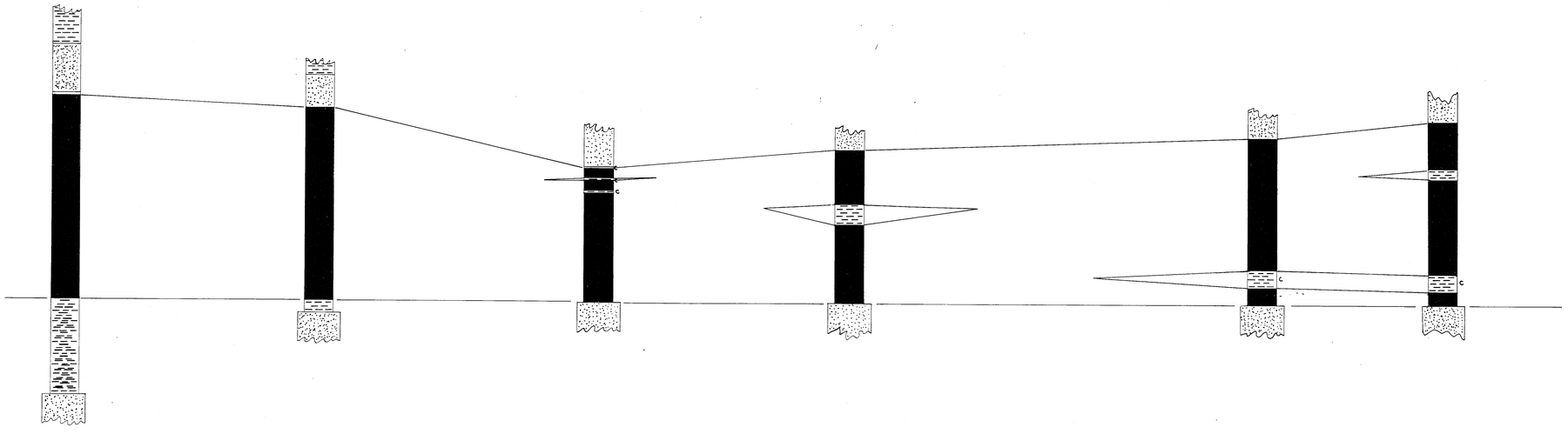
3.00





PR-SUKUNKA 77(2)A.

BP Exploration Canada Limited
COAL DIVISION

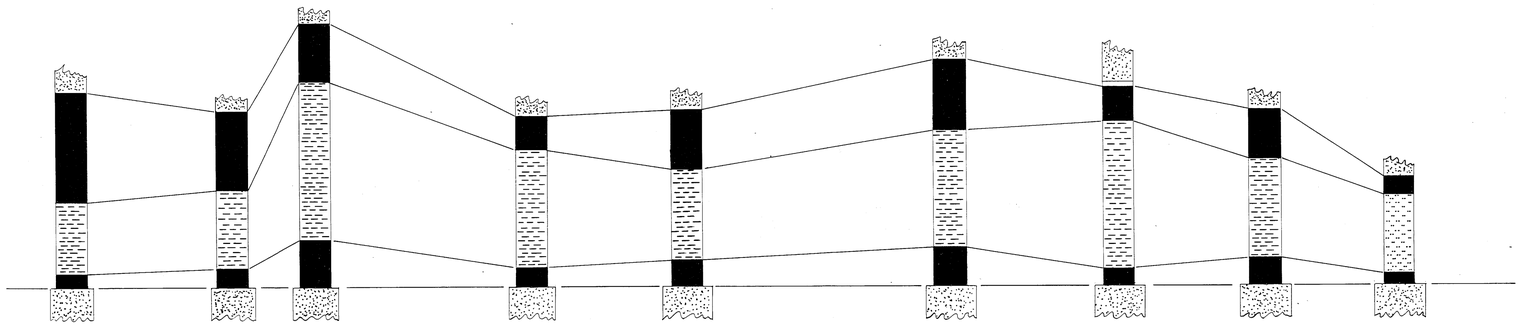
Sukunka / Bullmoose Coal Mining Project
N. E. British Columbia

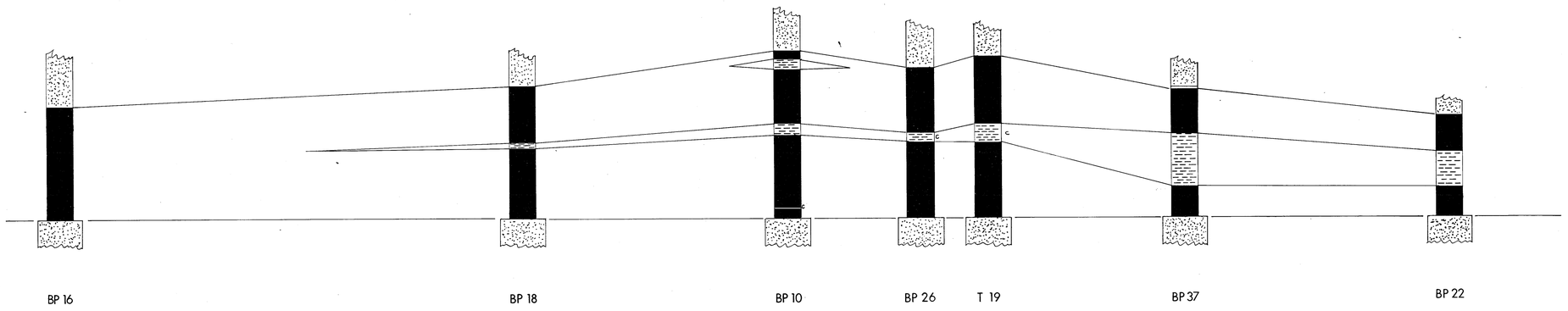
BIRD

COAL SEAM SECTION

AUTHOR : K. KIM	DATE : FEB. 1978
REVISED :	REPORT :
SCALE : VERTICAL 1 : 40 HORIZONTAL 1 : 500	DRAWING No. : 78/02/1

663





PR- SUKUNKA 77 (2) A.

BP Exploration Canada Limited
COAL DIVISION

Sukunka / Bullmoose Coal Mining Project
N. E. British Columbia

BIRD

COAL SEAM SECTION

AUTHOR : K. KIM	DATE : FEB. 1978
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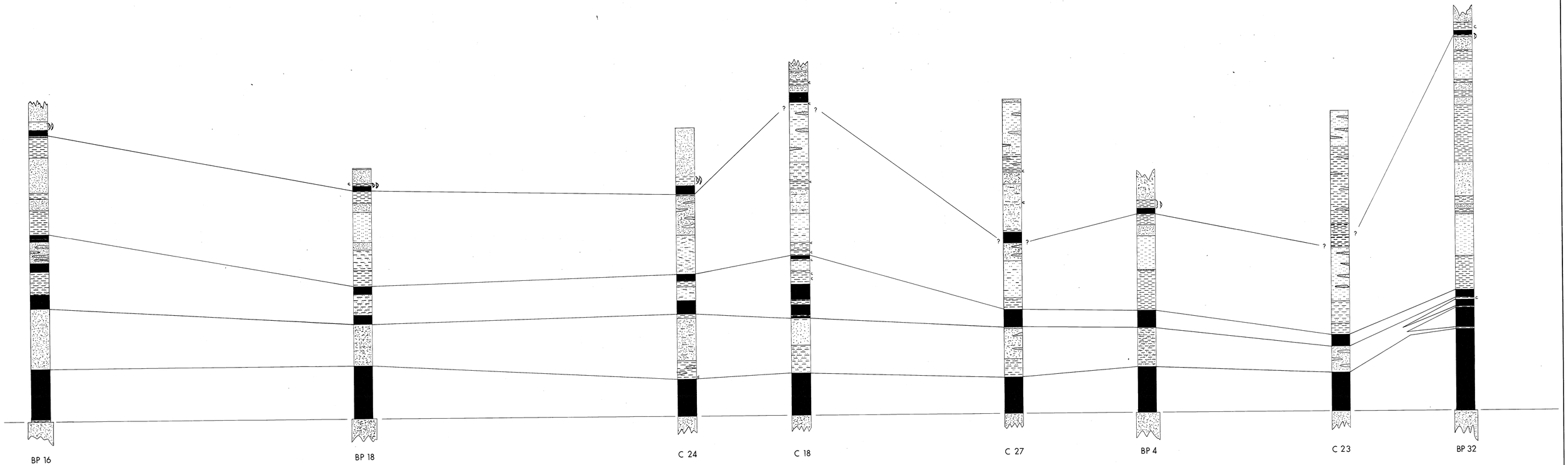
SCALE : VERTICAL 1 : 40 HORIZONTAL 1 : 500	DRAWING No. : 78/02/1

663



AR-SUKUNKA 77(2)A

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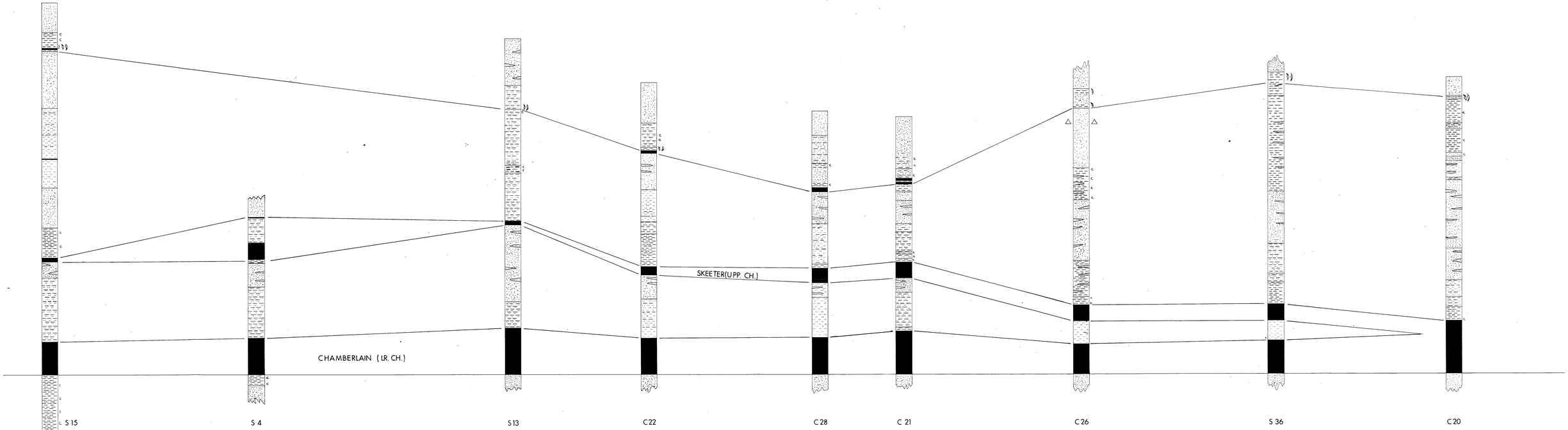
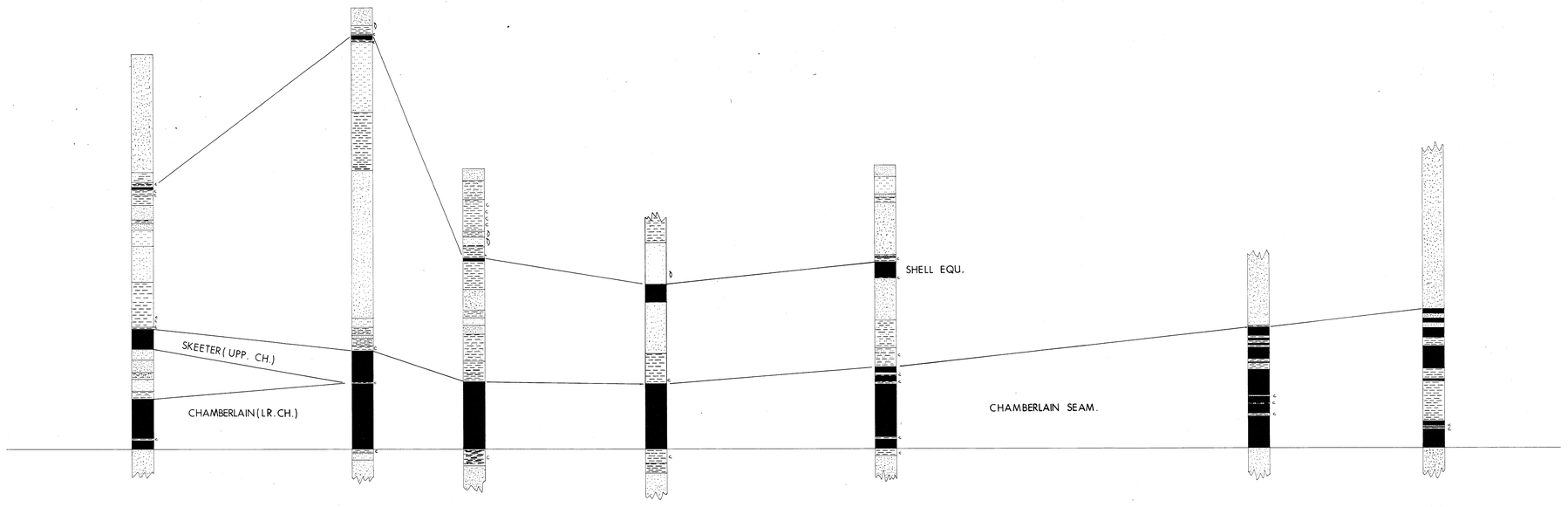
COAL DIVISION

Sukunka / Bullmoose Coal Mining Project
N. E. British Columbia
CHAMBERLAIN SKEETER
STRATIGRAPHIC SECTION NO. 6

AUTHOR : A. CHOWDRY	DATE : MARCH 1978
REVISED :	REPORT :
SCALE : VERTICAL 1:100 HORIZONTAL 1:5000	DRAWING No. : 78/03/1

663





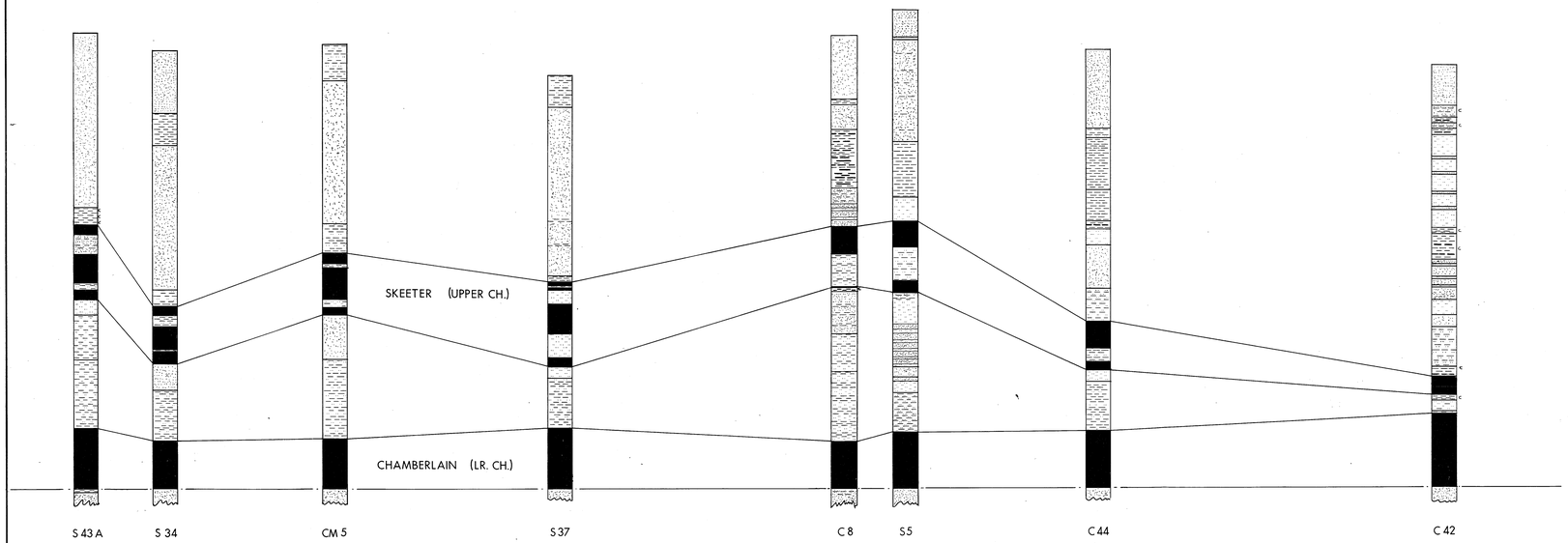
PR-SUKUNKA 77(2)A

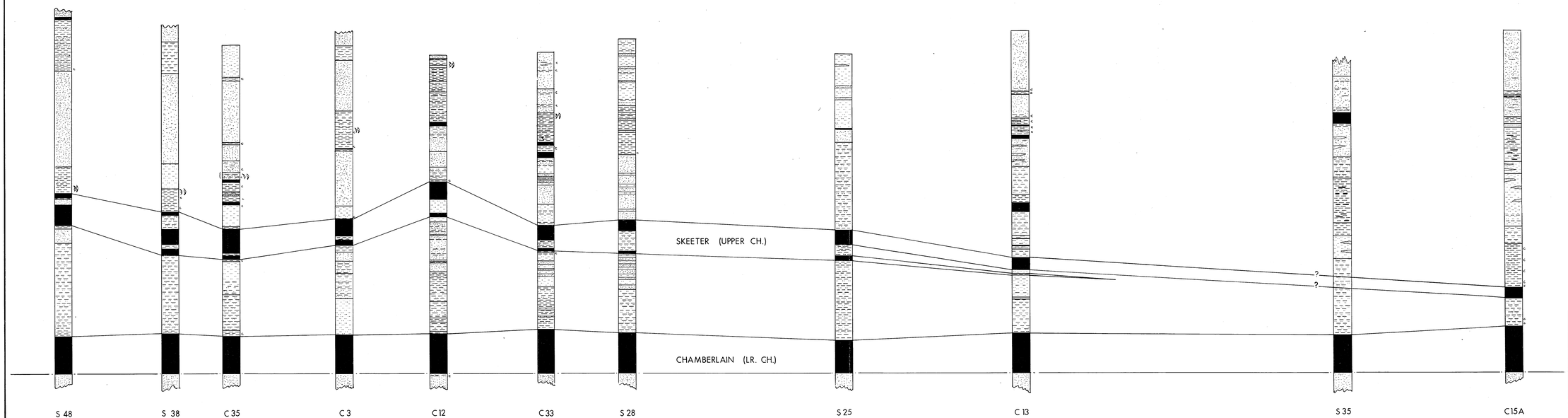
BP Exploration Canada Limited
COAL DIVISION

Sukunka / Bullmoose Coal Mining Project
N. E. British Columbia
CHAMBERLAIN - SKEETER
STRATIGRAPHIC SECTION NOS. 5&7

AUTHOR : A. CHOWDRY	DATE : MARCH 1978
REVISED :	REPORT :
SCALE : VERTICAL 1:100 HORIZONTAL 1:5000	DRAWING No. : 78/03/1

663





PR-SUKUNKA 77 (2) A.

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COAL DIVISION

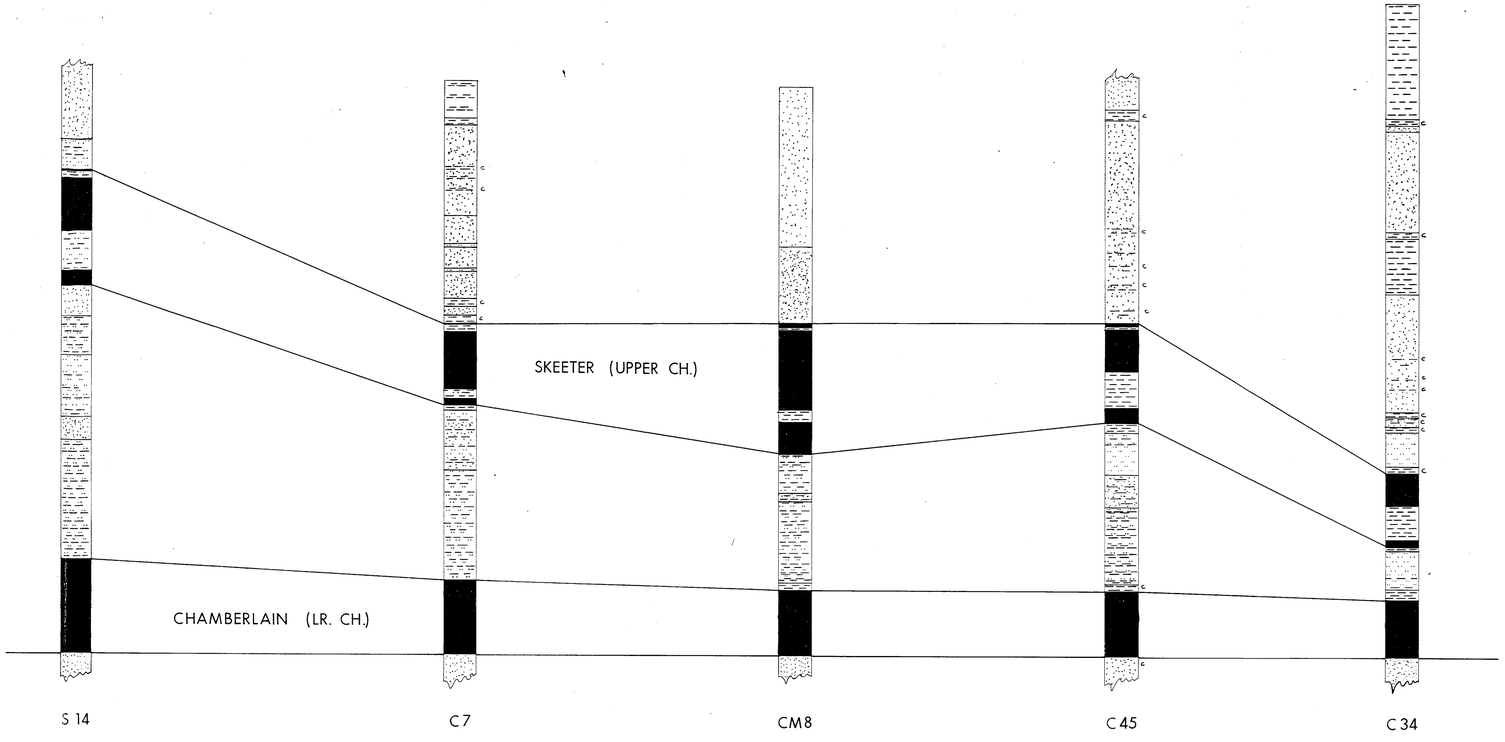
Sukunka / Bullmoose Coal Mining Project
N. E. British Columbia

CHAMBERLAIN - SKEETER

STRATIGRAPHIC SECTION NOS. 3&4

AUTHOR: A. CHOWDRY	DATE: MARCH 1978
REVISED	REPORT:
SCALE VERTICAL 1:100 HORIZONTAL 1:5000	DRAWING No. 78/03/1

663



PR- SUKUNKA 77(2)A.

BP Exploration Canada Limited
COAL DIVISION

Sukunka / Bullmoose Coal Mining Project
N. E. British Columbia
CHAMBERLAIN - SKEETER
STRATIGRAPHIC SECTION NO. 2

AUTHOR : A. CHOWDRY	DATE : MARCH 1978
REVISED :	REPORT :
SCALE : VERTICAL 1:100 HORIZONTAL 1:5000	DRAWING No. : 78/03/1

663

PR- SUKUNKA 77(2)A.

663

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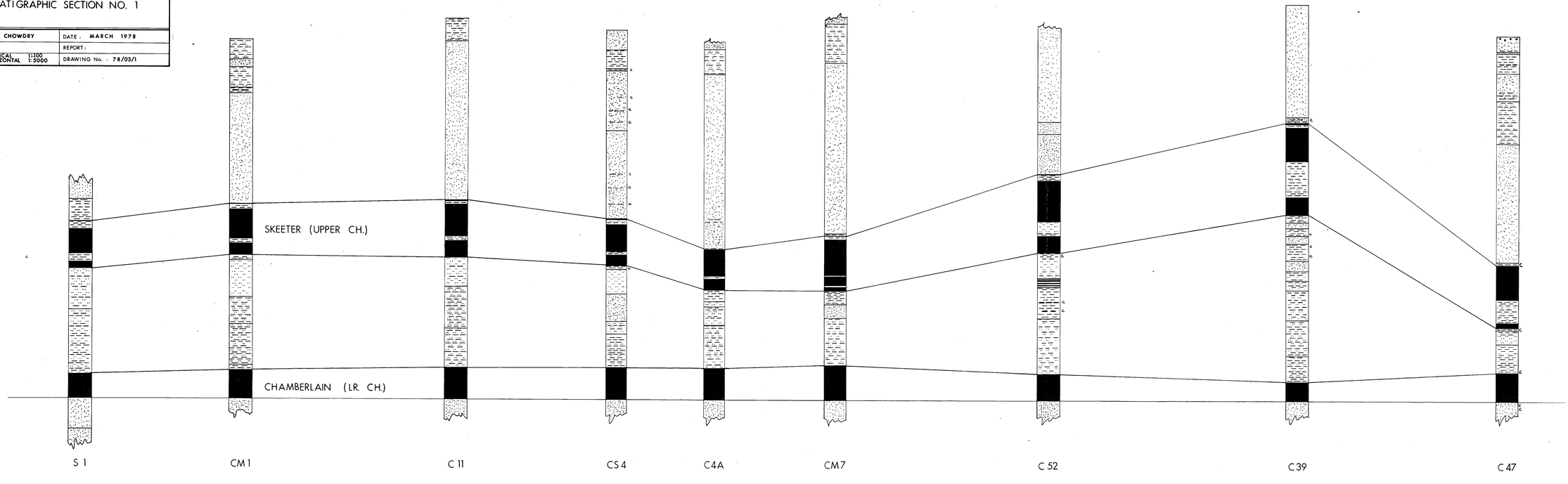
COAL DIVISION

Sukunka / Bullmoose Coal Mining Project
N. E. British Columbia
CHAMBERLAIN - SKEETER
STRATIGRAPHIC SECTION NO. 1

AUTHOR : A. CHOWDRY	DATE : MARCH 1978
REVISED :	REPORT :
SCALE : VERTICAL 1:100 HORIZONTAL 1:5000	DRAWING No. : 78/03/1



IRON MAIDEN SYSTEMS — CALGARY, ALBERTA, CANADA

0.50 m MIDDLE DIRT

0.00 m MIDDLE DIRT

0.00 m LOWER DIRT

0.00 m UPPER DIRT

0.50 m LOWER DIRT

OUTCROP OF BIRD SEAM

TRENCH 1 · TRENCH 2 · TRENCH 3 · TRENCH 7 · TRENCH 13

CHAMBERLAIN ADIT · BIRD ADIT

NOTE

T1	FAULTED SEAM (NO DETAIL INFORMATION)
T7	UNRELIABLE INFORMATION (POOR COAL RECOVERY)
T11	FRAGMENTED SEAM
T16	TEXTONICALLY OVER THICKENED
CC6	SURVEY POINT
*0.35	INTERPRETATION VALUE

INCLUDES ALL COAL LEAVES AND DIRT PARTINGS WHERE THE LATTER ARE LESS THAN 0.50m THICK. WHEN DIRT PARTINGS ARE IN EXCESS OF 0.50m THE MAIN COAL LEAF HAS BEEN MAPPED.

663 RE: SUKUNKA 77(2)A.

BP Exploration Canada Limited
COAL DIVISION

Sukunka / Bullmoose Coal Mining Project
N. E. British Columbia

BIRD SEAM ISOPACH

AUTHOR :	DATE : FEB. '78
REVISED : K. KIM	REPORT :
SCALE : -	DRAWING No. :

IRON MAIDEN SYSTEM

IRON MAIDEN

ADIT A ADIT 5

2.50 3.50 3.00 2.50 2.00 3.00 3.00 3.00 2.00 2.00 2.00 0.50 2.00 2.00 3.00 1.50 0.50 2.00 2.00 2.00 3.50 2.50 3.00 2.50 2.00 2.50 0.50 2.00 2.00 2.50 0.50 2.00 2.00 1.50 1.50 1.40 1.60 1.50 1.20 1.00 1.50 1.00 2.00

C 32 2.69 (0.36)
C 38 2.16 (0.00) R RP
C 46
C 36 2.16 (1.40)
C 34 1.22 (0.00) R RP
C 43
C 45 1.72 (0.12)
C 42
C 39 2.64 (2.40)
C 30 2.18 (0.25)
C 31 1.11 (0.38)
S 49 1.86 (0.30)
C 11 3.23 (0.47)
C 8 2.29 (0.47)
C 51 2.19 (0.05)
S 41 1.67 (0.44)
C 44 1.24 (0.00) R RP
S 22 1.83 (0.15)
C 12 2.68 (0.42)
S 18 2.27 (0.10)
C 49 2.17 (0.31)
S 5 1.22
C 9 2.37
S 14 2.38 (0.32)
C 10
C 7 2.91 (0.49)
C 21 1.33 (0.18)
S 26 2.36 (0.34)
CM 9 2.10 (0.16)
S 32 2.23 (0.18)
S 40 0.91 (0.00) R RP
S 17 2.43 (0.34)
CM 8 2.32 (0.11) LL
S 45 2.33 (0.29) LL
C 6 2.07 (0.36)
S 38 2.38 (0.21)
CM 3 2.86 (0.55)
CM 4 2.81 (0.59)
C 3 2.16 (1.40)
S 37 1.49
C 4 1.85 (0.48)
S 29
S 20
S 7
C 13
S 39 0.97 (0.00) R RP
S 36 1.02 (0.00) R RP
C 5
S 44
S 25 0.98 (0.03) R RP
C 1
S 27
S 28 0.70 (0.00) R RP
C 37 0.91 (0.00) R RP
S 35 1.04 (0.05) R RP
C 41 2.26 (0.37) R RP
C 12 1.20 (0.05) R RP
S 48
C 40 1.73 (0.40) R RP
S 24 2.24 (0.29) R RP
C 28 2.28 (0.06) R RP
S 43
C 15 2.36 (0.38)
S 26 0.61 (0.00) R RP
S 13
S 14
S 12
S 11
S 4
S 31
C 17
S 30
S 35
G 8
G 1
S 8
R 15
C 35 2.69 (0.36)
S 33 2.54 (0.44)
S 34 2.60 (0.55)
S 47 3.35
S 52 2.71 (0.31)
S 53 3.06 (0.23)
S 50 2.24 (0.33)
S 51 2.74 (0.61)
S 52 3.26 (0.83)
S 53 2.75 (0.76)
S 54 2.54 (0.83)
S 55 2.37 (0.48)
CS 6
CS 5
CS 4
CS 3
CS 2
CS 1
PL 1 PL 2 PL 3 PL 4A PL 5 PL 6 PL 7 PL 8 PL 9 PL 10 PL 11 PL 12 PL 13 PL 15 PL 16 PL 17 PL 18 PL 19 PL 20 PL 21 PL 22 PL 23 PL 24 PL 25 PL 26 PL 27 PL 28 PL 29 PL 30

D 7 D 8 D 9 D 10 D 11

LEGEND

Improved road
Secondary road
Track or trail
Cut line
Tree zone
Adit
Trench
River
Stream
Intermittent stream
Swamp
Contours
Spot elevation
Photo point
Drill hole

NOTE: DRILL HOLE LOCATIONS SHOWN THUS ARE APPROXIMATE

SCALE 1:5000

METRES 100 0 200 400 600 800 METRES
FEET 400 0 800 1600 2000 2800 3600 FEET

CONTOUR INTERVAL: 5 METRES
DATE OF PHOTOGRAPHY: SEPT. 1, 1977
DATE OF MAPPING: OCT. 1977

SURVEY NOTE

The Horizontal and Vertical Co-ordinates were established by Burnett Resource Surveys Ltd. under the supervision of Mr. J. Davidson, P.Eng., B.C.L.S., using CA1000 Tellurometers, Hewlett Packard Distance Meter and Wild T2 Theodolites. Horizontal control was established from Trig. Station 2498 Lat. 55° 09' 30.9450" Long. 121° 34' 42.2850" and Trig. Station 2350 Lat. 55° 12' 09.1870" Long. 121° 29' 36.5450". Elevations are above mean sea level and derived from Trig. Station 2498, elev. = 1915.058m and where established by trig. levelling, vertical angles being read simultaneously at both ends of each course. The field survey was executed in 1977.

SCALE 1:5000

METRES 100 0 200 400 600 800 METRES
FEET 400 0 800 1600 2000 2800 3600 FEET

CONTOUR INTERVAL: 5 METRES
DATE OF PHOTOGRAPHY: SEPT. 1, 1977
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SURVEY NOTE

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RIDER
RIDER PARTING
UPPER LEAF
SKEETER PARTING
LOWER LEAF

KEY MAP

MAP SCALE 1 0 1 2 3 4 5 6 KM

INCLUDES ALL COAL LEAVES AND DIRT PARTINGS WHERE THE LATTER ARE LESS THAN 0.50m. THICK. WHEN DIRT PARTINGS ARE IN EXCESS OF 0.50m THE MAIN COAL LEAF HAS BEEN MAPPED.

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RE. SUKUNKA 77/82.

BP Exploration Canada Limited
COAL DIVISION

Sukunka / Bullmoose Coal Mining Project
N E British Columbia

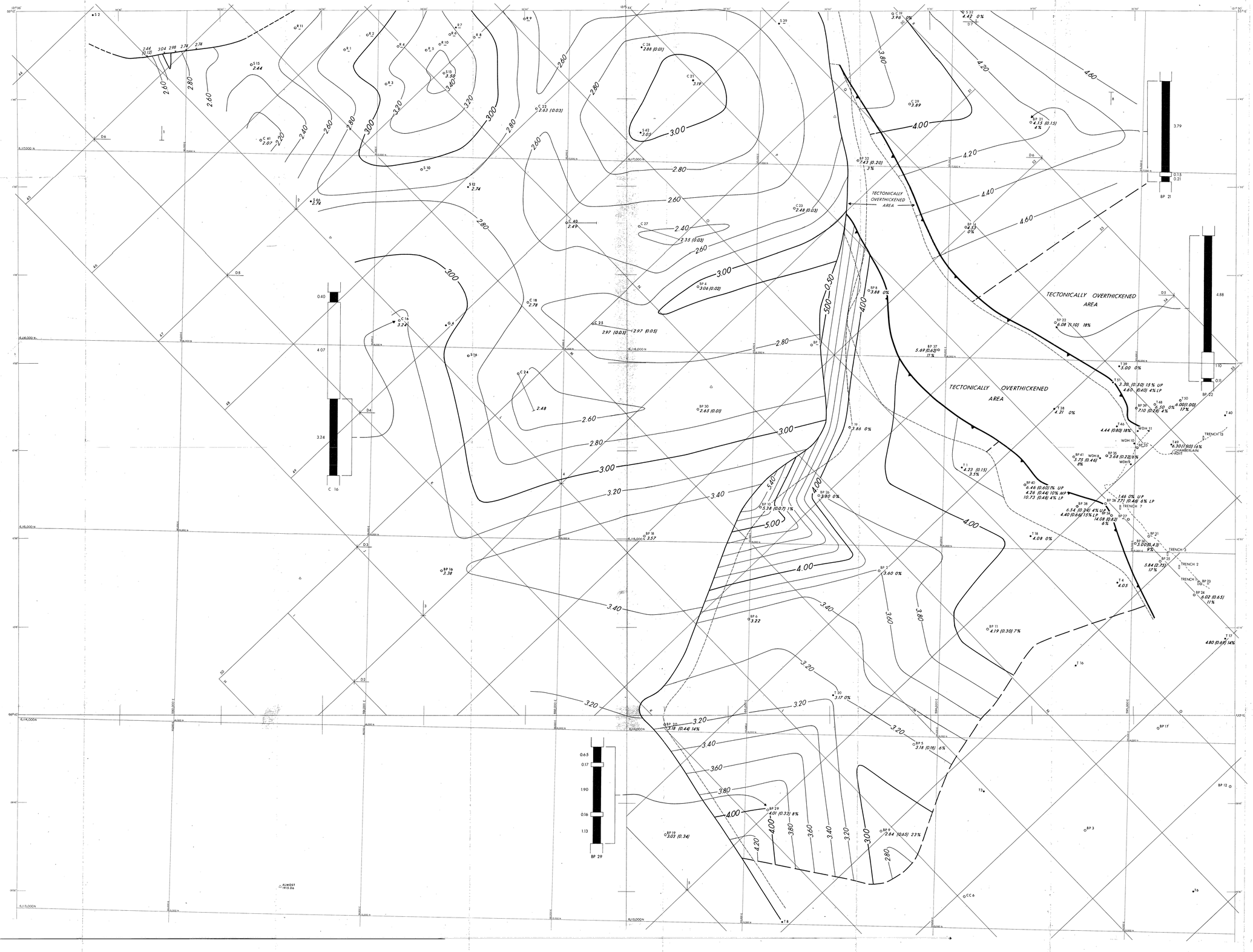
SKEETER SEAM ISOPACH

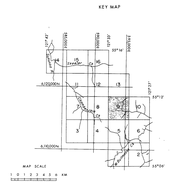
PLATE 2 AREA

DRAWN BY:	DATE: FEB. 1978	SCALE: 1:5,000
PREPARED BY:	DATE:	REVISED:
APPROVED BY:	DRAWING No:	

MAP NO. 12

APPROXIMATE MEAN DECLINATION 1965
Annual change decreasing 6.7'





PR- SUKUNKA 72(2)A. 663

BP Exploration Canada Limited
COAL DIVISION

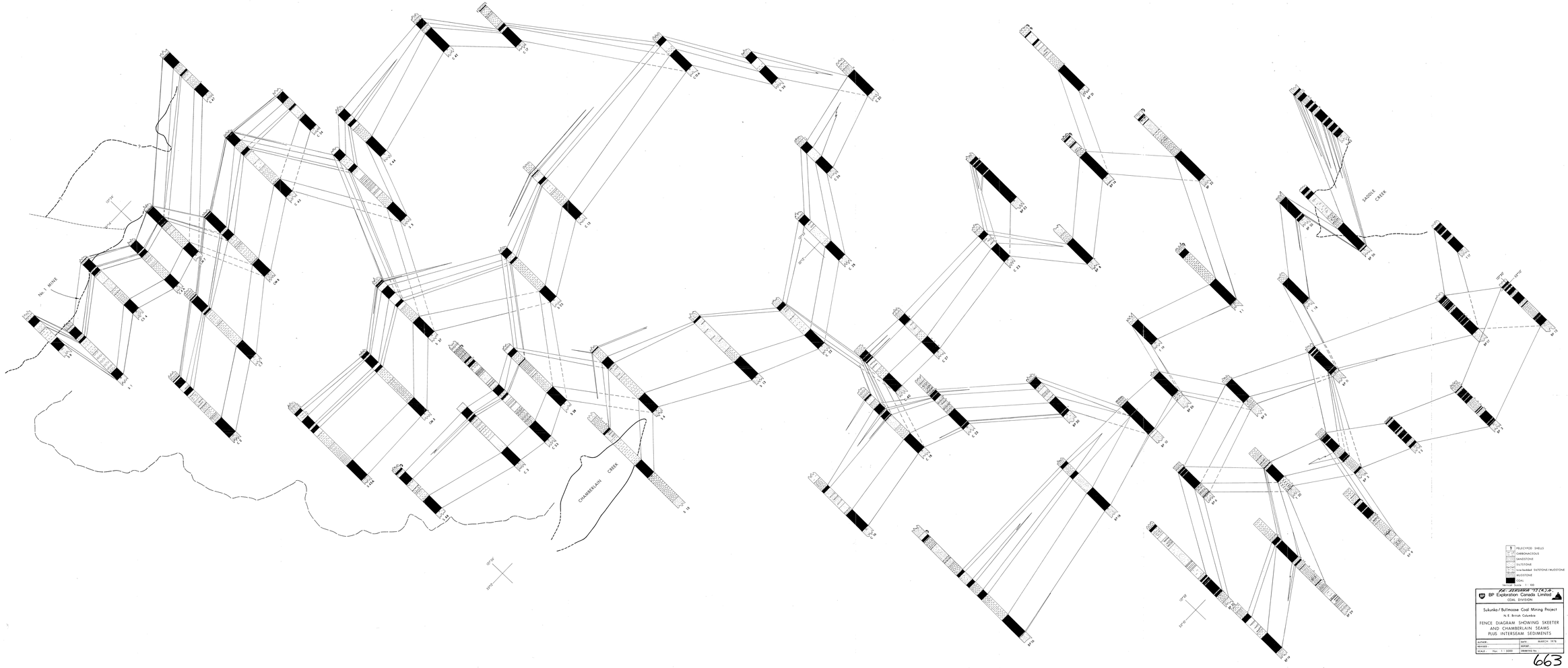
Sukunka / Bullmoose Coal Mining Project
N.E. British Columbia

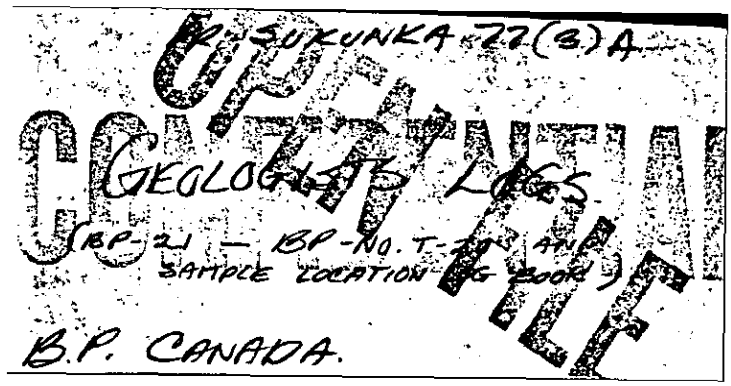
CHAMBERLAIN SEAM ISOPACH

CENTRAL SHEET

AUTHOR :	DATE : MARCH 1978
REVISED :	REPORT :
SCALE : 1 : 5000	DRAWING No. :

INCLUDES ALL COAL LEAVES AND DIRT PARTINGS WHERE THE LATTER ARE LESS THAN 0.50 m THICK. WHEN DIRT PARTINGS ARE IN EXCESS OF 0.50 m THE MAIN COAL LEAF HAS BEEN MAPPED.


No. 1 MINE
CHAMBERLAIN CREEK
SADDLE CREEK
UPPER
SKEENA
SEAM
SEAM
SEAM



663

Geologist	Depth
Peter Raymond	285.29-285.54
Andy Newson	673.75-707.44

GEOLOGICAL BRANCH
ASSESSMENT REPORT

00 663

Sperry-Sun Survey

Date: 17th September 1977

Borehole: BP 21 Sukunka 77

Compass: 20° Maximum to Magnetic North

BPB Operator: P. J. Waters

Measured Depth	Tilt	Tilt Direction
700m	8° -	N 50° E
650m	7° 45'	N 49° E
600m	7° 30'	N 44° E
550m	7° 15'	N 37° E
500m	7° -	N 37° E
450m	6° 30'	N 34° E
400m	6° -	N 27° E
350m	3° 45'	N 25° E
300m	2° 15'	N 23° E
250m	1° 45'	N 22° E
200m	1° 30'	N 23° E
150m	1° 30'	N 20° E
100m	1° 45'	N 18° W
50m	1° 45'	N 49° W

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			SANDSTONE; broken up, weathered.
			SANDSTONE/MUDSTONE, silty, light-grey, very fine-grained sandstone, well sorted throughout, finely laminated to cross-bedded, occasionaly burrowed and slumped, occurs as thin interbeds (0.02-0.15m thick) and irregularly shaped pods and lenses with dark-grey silty mudstone, burrowed (small).
	14.02	2.75	SANDSTONE (35%)/MUDSTONE (65%):silty.
	14.87	0.85	SANDSTONE (35%)/MUDSTONE (65%):silty.
	15.36	0.49	SANDSTONE; as above, core broken up in all directions, but prominently lengthwise.
	16.86	1.50	SANDSTONE (20%)/MUDSTONE(80%) silty.
	16.91	0.05	SANDSTONE; as above, is grounded up
	17.06	0.15	MUDSTONE, silty.
	20.01	2.95	SANDSTONE/MUDSTONE:silty, mixed sandstone, mudstone, light-grey, fine-grained sandstone, moderately well-sorted, laminated, occasionally cross-bedded (low angle) and massive, very occasionally by burrowed, occurs as thin sharply contrasted interbeds, medium-grey silty mudstone, heavily burrowed (mostly small ones); mixed sandstone, silty mudstone churned intimately together, heavily bioturbated burrowed, slumped, shell debris often found scattered.
	20.11	0.10	SANDSTONE (5%)/MUDSTONE (75%): (SILTY/MIXED SAND AND MUD) (20%).
	23.16	3.05	SANDSTONE; same as above.
	26.21	3.05	SANDSTONE (20%)/MUDSTONE (40%) (SILTY/MIXED SAND AND MUD) (40%).
	29.26	3.05	SANDSTONE (20%)/MUDSTONE (20%)/(SILTY/MIXED SAND AND MUD) (60%):heavily burrowed.
	32.30	3.04	SANDSTONE (5%)/MUDSTONE (40%) (SILTY/MIXED SAND AND MUD) (55%).
	35.35	3.05	SANDSTONE (10%)/MUDSTONE (20%) (SILTY/MIXED SAND AND MUD) (70%).
	37.20	1.85	SANDSTONE (10%)/MUDSTONE (30%) (SILTY/MIXED SAND AND MUD) (60%).

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	38.40	1.20	SANDSTONE,: core broken up and weathered, few slickensided features and calcite veining.
	40.51	2.11	SANDSTONE (5%)/MUDSTONE (20%) (SILTY/MIXED SAND AND MUD) (75%), core highly broken up, numerous listric and slickenside features, abundant calcite veins (Possible fault).
	41.45	0.94	SANDSTONE (10%)/MUDSTONE (15%) (SILTY/MIXED SAND AND MUD) (75%).
	44.50	3.05	SANDSTONE (5%)/MUDSTONE (45%) (SILTY/MIXED SAND AND MUD) (50%).
	47.54	3.04	SANDSTONE (5%)/MUDSTONE (45%) (SILTY/MIXED SAND AND MUD) (50%),, very heavily burrowed section.
	50.59	3.05	SANDSTONE (15%)/MUDSTONE (25%) (SILTY/MIXED SAND AND MUD) (60%):, sandstone becomes more abundant to base.
	53.64	3.05	SANDSTONE (10%)/MUDSTONE (20%) (SILTY/MIXED SAND AND MUD) (70%).
	56.07	2.43	SANDSTONE (15%)/MUDSTONE (20%) (SILTY/MIXED SAND AND MUD) (65%), medium-grey, fine-medium-grained sandstone, moderately well sorted, finely laminated with few low angle cross-beds to massive, moderately well-sorted, to poorly-sorted characteristically burrowed (large size); interbeds of black massive mudstone sometimes silty.
	56.69	0.62	SANDSTONE (95%) massive burrowed/MUDSTONE (5%).
	57.54	0.85	SANDSTONE;: massive, heavily burrowed.
	58.13	0.59	SANDSTONE;: finely laminated.
	59.04	0.91	SANDSTONE (95%):, massive, moderately burrowed/MUDSTONE (5%).
	59.74	0.70	SANDSTONE: finely laminated.
	60.69	0.95	SANDSTONE,: finely laminated with locally abundant large scale burrows.
	62.79	2.10	SANDSTONE (85%),: finely laminated/MUDSTONE (15%).
	65.83	3.04	SANDSTONE (85%):, finely laminated/MUDSTONE (15%):: occasional burrows (large size).
	68.58	2.75	SANDSTONE (75%): finely laminated/MUDSTONE (25%): moderately burrowed.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	71.62	3.04	SANDSTONE (50%) finely laminated/MUDSTONE (50%), occasionally 2 lithologies are mixed together, sandstone interbeds are becoming much thinner and often appear as wisps of structural sand.
	74.67	3.05	SANDSTONE (45%)/MUDSTONE (55%).
	77.72	3.05	SANDSTONE (45%)/MUDSTONE (55%).
	79.85	2.13	SANDSTONE (45%)/MUDSTONE (55%).
	81.07	1.22	No more laminated SANDSTONE present just wisps and irregularly shaped lenses and MUDSTONE becomes silty.
	84.12	3.05	SANDSTONE (30%)/MUDSTONE (70%).
	87.17	3.05	SANDSTONE (25%)/MUDSTONE (75%).
	88.86	1.69	SANDSTONE (25%)/MUDSTONE (75%) silty.
	90.04	1.18	Zone of heavily bioturbated MUDSTONE.
	90.22	0.18	SANDSTONE (25%)/MUDSTONE (75%): silty.
	93.26	3.04	SANDSTONE (20%)/MUDSTONE (80%): silty.
	96.31	3.05	SANDSTONE (20%)/MUDSTONE (80%): silty.
	99.36	3.05	SANDSTONE (15%)/MUDSTONE (85%): silty.
	102.41	3.05	SANDSTONE (15%)/MUDSTONE (85%): silty.
	105.46	3.05	SANDSTONE (10%)/MUDSTONE (90%): silty, scattered distribution of pyritic nodules.
	106.50	1.04	SANDSTONE (10%)/MUDSTONE (90%): silty, core broken lengthwise.
	106.60	0.10	SANDSTONE (10%)/MUDSTONE (90%): silty, core broken lengthwise.
	108.50	1.90	SANDSTONE (10%)/MUDSTONE (90%): silty, core broken lengthwise.
	111.55	3.05	SANDSTONE (20%)/MUDSTONE (80%): silty.
	114.60	3.05	SANDSTONE (15%)/MUDSTONE (85%): silty.
	115.51	0.91	SANDSTONE (20%)/MUDSTONE (80%): silty.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	117.50	1.99	Zone of broken up core predominantly lengthwise, with occasional listric and slickenside surfaces.
	118.15	0.65	Lithological same as above, core broken up in short sticks 0.10-0.12m long.
	118.65	0.50	Core badly broken up in many small pieces.
	120.47	1.82	SANDSTONE (10%)/MUDSTONE (90%).
	123.52	3.05	SANDSTONE (5%)/MUDSTONE (95%).
	124.25	0.73	SANDSTONE (10%)/MUDSTONE (90%).
	124.82	0.57	Core broken up lengthwise.
	126.40	1.58	SANDSTONE (10%)/MUDSTONE (90%).
	126.93	0.53	SANDSTONE (5%)/MUDSTONE (95%), mudstone is locally burrowed (dark, small scale) zones of up to 0.10m thick.
	128.28	1.35	Zone of broken up core in short sticks, 11 slickenside and listric surfaces 0.03-0.10m apart.
	128.36	0.08	Brecciated zone with calcite infillings.
	129.05	0.69	Zone of broken up core in short sticks, 8 surfaces show slickenside and listric features.
	129.37	0.32	Zone of broken up core in short sticks, 9 surfaces show slickenside and listric features.
	131.85	2.48	SANDSTONE (2%)/MUDSTONE (98%), mudstone still shows local areas of burrowing. SUKUNKA / MOOSEBAR
	132.00	0.15	MUDSTONE: silty mudstone interval, calcareous calcite veining and 1 slickenside surface.
	132.20	0.20	MUDSTONE; black, massive.
	135.31	3.11	MUDSTONE; black, massive.
	135.76	0.45	BLACK MUDSTONE
	136.31	0.55	MUDSTONE, zone of broken up core with small thin brecciated zones 0.005-0.1m thick.
	138.55	2.24	BLACK MUDSTONE
	141.76	3.21	BLACK MUDSTONE

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	145.02	3.26	BLACK MUDSTONE
	148.13	3.11	BLACK MUDSTONE
	151.18	3.05	BLACK MUDSTONE
	154.20	3.02	BLACK MUDSTONE
	157.25	3.05	BLACK MUDSTONE
	160.30	3.05	BLACK MUDSTONE
	163.35	3.05	BLACK MUDSTONE
	166.32	2.97	BLACK MUDSTONE
	169.16	2.84	BLACK MUDSTONE
	171.26	2.10	BLACK MUDSTONE; one slickenside.
	172.16	0.90	BLACK MUDSTONE
	173.34	1.18	BLACK MUDSTONE; one slickenside.
	175.02	1.68	BLACK MUDSTONE; one slickenside.
	177.25	2.23	BLACK MUDSTONE
	178.06	0.81	MUDSTONE; core badly broken up and calcite veining.
	178.41	035	BLACK MUDSTONE
	178.57	0.16	Burrowed bentonite bed.
	179.29	0.72	BLACK MUDSTONE
	179.39	0.10	MUDSTONE,: calcite veining.
	180.39	1.00	MUDSTONE,: black.
	180.44	0.05	MUDSTONE,: two slickensides 0.05m apart.
	180.94	0.50	MUDSTONE,: black.
	181.82	0.88	MUDSTONE, black.
	181.87	0.05	Ground up bentonite.
	183.97	2.10	MUDSTONE, black, as above.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	185.11	1.14	MUDSTONE: black, one slickenside.
	186.31	1.20	MUDSTONE: black
	186.33	0.02	MUDSTONE: bentonite bed.
	186.80	0.47	MUDSTONE, black.
	189.81	3.01	MUDSTONE, black.
	191.38	1.57	MUDSTONE: as above, 0.06m impure reworked bentonitic zone 0.55 from top, two sizeable bentonite bands within 0.25m of base, one of these with worm burrows, abrupt with sand below; bentonite badly swelling.
	191.64	0.26	SANDSTONE: dark-grey, fine-to medium-grained, much carbonized plant debris; basal 0.04 essentially pyrite band. Patches of glauconitic sandstone, abrupt below.
			MOOSEBAR GETHING BIRD SEAM
	192.10	0.46	CORE LOSS-COAL
	192.16	0.06	COAL SEAM: top and bottom fragmented, two pieces only of coal.
	192.42	0.26	MUDSTONE: dark-grey, top 0.09m richly pyritized, rest with abundant carbonized plant debris, silty and gradual below.
	192.91	0.49	SILTSTONE: medium-grey, argillaceous, few intercalations of very fine-grained sandstone, irregular lamination, plant debris, gradual.
	193.57	0.66	SANDSTONE: medium grey, very fine-grained, argillaceous laminae, bottom 0.12m silty mudstone, contact with coal below is broken.
	193.61	0.04	CORE LOSS-ROCK
	193.65	0.04	COAL: finely pulverized and sheared.
	193.85	0.20	COAL: finely broken, pulverized and sheared, appears dull
	194.06	0.21	COAL: finely fragmented and thoroughly sheared, abrupt at base

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	194.32	0.26	SANDSTONE: medium-grey, fine/medium-grained, top 0.025m richly carbonaceous, rest distinctly mottled with many small burrows, non-calcareous.
	195.88	1.56	SANDSTONE: identical to above. Many pronounced burrows in basal 0.05m, bedding totally obliterated.
	196.09	0.21	SANDSTONE: same as above, rare abundance of small burrows.
	196.52	0.43	SANDSTONE: as above, abundance of burrows.
	199.23	2.71	SANDSTONE: medium-grey, medium-grained, clean and well sorted, predominently mottled (discrete burrows not discernible), widely spaced isolated current structures concomitant with silty carbonaceous streaks; bottom 0.80m with much cross-bedding and enbodies a 0.25m zone of large burrows.
	202.19	2.96	SANDSTONE: light-medium grey, medium-grained, generally clean and sorted, frequently corss-stratified, abundance of well developed large burrows, locally briefly bioturbated, calcareous
	205.23	3.04	SANDSTONE: similar to above, fewer large burrows, less prominently cross-bedded, calcareous.
	206.41	1.18	SANDSTONE: medium-grey, dominantly medium-grained, brief zones of medium-to coarse-grained sandstone, cross-bedded units, generally clean and well-sorted, some intervals (especially medium/coarse-grained ones strongly clacareous, no large burrows, abrupt below.
	202.28	1.87	SANDSTONE: medium-grey, medium-grained, 0.40m sand zone with large burrows, strongly calcareous throughout, cross-laminated units.
	211.33	3.05	SANDSTONE: medium-grey, uniformly medium-grained, low-angle, large-scale cross-bedded units, very clean and well-sorted, strongly calcareous.
	214.38	3.05	SANDSTONE: identical to the above, calcareous.
	216.23	1.85	SANDSTONE: similar to above, very clean and uniform.
	217.42	1.19	SANDSTONE: light/medium-grey, fine-grained, very clean and well sorted, vaguely cross laminated, top 0.23m with drill circles and a slickenside surface, non-calcareous, abrupt basal contact.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	218.90	1.48	SANDSTONE: light/medium grey, fine-grained, very clean and well sorted, vabuely cross laminated, top 0.23m with drill circles and a slickenside surface, non-calcareous, abrupt basal contact.
	219.95	1.05	SANDSTONE/MUDSTONE: sandstone fine to very fine-grained slightly argillaceous, interbedded (broadly) with dark-grey silty mudstone, highly pvritiferous, many burrows invariably pyrite impregnated; sandstone may have erosional contact with mudstone or may be transitional (through silty zones); strongly calcareous throughout erosional at base.
	220.19	0.24	SANDSTONE: medium-grey, top half medium-grained, rest fine-grained, calcareous, gradational below.
	220.73	9.54	SILTSTONE/MUDSTONE: top half silty gradually passing to fine siltstone and silty mudstone, calcareous.
	221.75	1.02	SANDSTONE/SILTSTONE: medium-grey, top sequence dominantly siltstone with lenticles and ripples of very fine-grained sandstone, sporadic burrowing, sporadic lamination; bottom 0.37m dominantly finely sandy, argillaceous, few burrows, calcareous, passage below by interbedding.
	223.31	0.56	SANDSTONE: light-grey, top half fine/medium-grained, laminated, rest very fine grained, argillaceous with small-scale cross-lamination, also lower half exhibits brief gradational interval from sandstone to mudstone, calcareous 0.06m zone with a large (3cm-9cm) burrow.
	223.78	1.47	SANDSTONE: medium-grey, top medium-grained, bottom fine-grained and silty muddy layers, numerous burrows, calcareous throughout, dip 5°, abrupt bottom.
	224.24	0.46	SANDSTONE: fine-medium grained, thin silty partings, burrows, strongly calcareous.
	224.64	0.40	SANDSTONE: very fine-grained, argillaceous intercalations calcareous, slightly carbonaceous, gradational bottom.
	226.47	1.83	SILTSTONE: medium-grey, fine sandstone intercalations, laminated, locally argillaceous, stronly to weakly, calcareous.
	226.65	0.18	MUDSTONE: dark-grey, silty layers, shells at base.
	226.87	0.22	MUDSTONE: dark-grey, gradational base.
	228.15	1.28	MUDSTONE/SILTSTONE: dominantly silty, .20 of fine sandstone at top; shelly horizons, patchy calcareous, abrupt contact with COAL.

BH Nos. 21

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			SKEETER SEAM (Upper Leaf)
	228.33	0.18	COAL: dull and bright banded, fragment (drill circles at base).
	229.64	1.31	SILTSTONE: argillaceous, with thin lentricles of fine laminated sands, medium-dark grey, bottom 0.07 has pyrite streaks.
	229.68	0.04	MUDSTONE: black , canneloid.
			SKEETER SEAM (lower leaf)
	229.97	0.29	COAL: dull lustrous, sheared in middle, listric surfaces at base.
	230.23	0.26	SANDSTONE: very fine-grained, medium-grey, slightly argillaceous, weakly calcareous.
	230.38	0.15	SANDSTONE: very fine-grained, light medium-grey, small-scale cross-lamination, strongly calcareous, irregular base.
	230.91	0.53	SILTSTONE: very fine-grained, strongly calcareous, erosional at base.
	232.24	1.33	SANDSTONE: light-grey, fine-grained, widely spaced, silty laminated, micro-gradation units, strongly calcareous interbedded below.
	232.64	0.40	SILTSTONE: dark-grey; very fine-grained, regular thin argillaceous layers, laminated, calcareous.
	234.83	2.19	MUDSTONE: silty, medium to dark-grey, wisps of fine silt, weakly calcareous, laminated (occasionally), basal .10 homogeneosly carbonaceous, occasional listric surfaces in basal 0.78
			CHAMBERLAIN SEAM
	234.98	0.15	COAL: bright banded, stick, top 0.005 calcite filled.
	235.035	.055	COAL: bright banded, cleat 11° to axis, 0.055 stick.
	235.085	0.05	COAL: same as above, cleat 10° to axis 0.05 stick.
	235.115	0.03	COAL: dull (possibly out of position - drill circles at base, also core catcher marks on core).
	235.17	0.055	COAL: dull, fragmented small pieces, pulverised.
	235.26	0.09	CORE LOSS-COAL
	235.30	0.04	COAL: dull banded.
	235.34	0.04	COAL: dull and bright.

BH Nos. 21

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	235.46	0.12	COAL: dull, with widely spaced thin 0.12 bright streaks, fracture planes at 25° from core axis.
	235.54	0.08	COAL: dull, with finely disseminated vitrinite.
	235.60	0.06	COAL: dull and bright.
	235.645	0.045	COAL: dull.
	235,655	0.01	COAL: bright.
	235,695	0.04	COAL: dull, with irregular bright streaks.
	235.75	0.055	COAL: dull banded, listric surface at base (45°), slightly calcareous.
	235.82	0.07	COAL: bright banded.
	235,85	0.03	COAL: dull and bright, fine streaks of vitrinite.
	235.895	0.045	COAL: bright.
	235.945	0.05	COAL: dull with streaks of bright near base.
	236.005	0.06	COAL: dull sub-lustrous.
	236.05	0.045	COAL: dull lustrous, clear 20° off core axis.
	236.105	0.055	COAL: dull lustrous, with cleats parallel to core axis.
	236.165	0.06	COAL: dull banded.
	236.265	0.10	COAL: dull banded, highly sheared, fragment listricated.
	236.295	0.03	COAL dull with few bright streaks, listricated.
	236.335	0.04	COAL: bright
	236.355	0.02	COAL: dull with bright streaks.
	236.41	0.055	COAL: dull banded.
	236.44	0.03	COAL: dull banded, sheared cleat 20° core axis.
	236.54	0.10	COAL: bright banded, cleat 60° core axis.
	236.61	0.07	COAL: dull banded.
	236.64	0.03	COAL: dull
	236.66	0.02	COAL: bright
	236.705	0.045	COAL: dull, minor bright streaks.
	236.735	0.03	COAL: dull banded, widely spaced cleats parallel to core axis

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	236.775	0.015	COAL: dull
	236.80	0.025	COAL: dull and bright.
	236.81	0.01	COAL: dull.
	236.865	.055	COAL: dull and bright, broadly banded.
	236.90	.035	COAL: bright banded.
	236.97	0.07	COAL: dull banded.
	237.015	.045	COAL: dull, minor bright streaks.
	237.065	0.05	COAL: dull banded, cleat sub-parallel to core axis.
	237.08	0.015	COAL: dull, minor bright streaks, cleat as above.
	237.09	0.01	COAL: bright.
	237.17	0.08	COAL: dull banded.
	237.21	0.04	COAL: dull with wide bright bands.
	237.255	0.045	COAL: bright.
	237.335	0.08	COAL: dull, minor bright streak.
	237.37	0.035	COAL: bright.
	237.395	0.025	COAL: dull with bright bands.
	237.405	.01	COAL: bright, listric surface at base.
	237.430	0.025	COAL: dull banded.
	237.445	0.015	COAL: bright.
	237.475	0.03	COAL: dull with 0.01 bright band.
	237.535	0.06	COAL: bright banded.
	237.565	0.03	COAL: dull bright.
	237.645	0.08	COAL: dull banded with two major bright layers 3-4mm.
	237.74	.095	COAL: dull banded, lustrous, cleated 30° off core axis.
	237.77	0.03	COAL: bright
	237.860	0.09	COAL: dull bright.
	237.895	.035	COAL: dull banded.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	237.925	0.03	COAL: bright, cleated.
	237.975	0.05	COAL: dull, bright.
	237.985	0.01	COAL: bright.
	238.085	0.10	COAL: dull, bright.
	238.185	0.10	COAL: dull, lustrous.
	238.345	0.16	COAL: sheared, dull, bright, slickensided throughout.
	238.405	0.06	COAL: highly sheared
	238.625	0.22	CORE LOSS-COAL
	238.695	0.07	MUDSTONE: listric surfaces, medium-grey, carbonaceous.
	238.755	0.06	CORE LOSS-ROCK
	238.795	0.04	COAL: dull with minor bright bands.
	238.830	0.035	COAL: bright banded.
	238.855	0.025	COAL: dull banded.
	238.875	0.02	COAL: bright.
	238.90	0.025	COAL: dull, bright with finely disseminated silt.
	238.98	0.08	CORE LOSS-COAL
	240.49	1.51	SANDSTONE: fractured top, medium-grey, medium-grained, mottled appearance.
	242.62	2.13	SANDSTONE: as above, laminated intervals.
	244.12	1.50	SANDSTONE: as above, bottom .70 weakly calcareous, well cross-bedded.
	245.67	1.55	SANDSTONE: dark-grey, fine to medium-grained, alternating bands of fine-grained sand and fine to medium-grained sand, cross-bedded, one thin muddy layer, strongly calcareous.
	248.72	3.05	SANDSTONE: medium-grey, fine/medium-grained, very homogeneous and uniform, massive, well washed and and very clean, barely discernible cross-stratifaction, very strongly calcareous.

BH Nos. 21

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	251.76	3.04	SANDSTONE: slightly darker in hue, otherwise similar, very strongly calcareous.
	254.81	3.05	SANDSTONE: identical to above, very strongly calcareous, bottom 0.37m fine-grained with few silty intraclasts.
	256.71	1.90	MUDSTONE/SILTSTONE: with subordinate lenticles and layers of very fine-grained sandstone. Mudstone dark-grey, slightly dominant over silts, many pin burrows and larger burrows, micro-erosional features, strongly calcareous throughout, interbedded at base.
	257.54	0.83	SANDSTONE: broad interbedding of fine-to very fine-grained sandstone, muddy intervals and medium-to coarse-grained sandstone. Many large burrows funneling sand in muddy matrix and muddy lithology in sandstone matrix. Seems to reflect rapidly fluctuating energy levels. Burrows responding to shifting substrate/pronounced shallowing, strongly calcareous throughout.
	257.63	0.09	SANDSTONE: coarse conglomeratic horizon, some large rounded pebbles, stick.
	257.86	0.23	SANDSTONE: medium-grained, calcareous, grey, with lamae one large burrow, stick.
	259.64	1.78	SANDSTONE: as above, some cross-bedding, stick with few breaks.
	260.91	1.27	SANDSTONE: medium-grey, top 0.39m fine/medium-grained, rest fine-grained, cross-laminated throughout, 0.08m burrowed zones associated with silty, muddy lithology, rest very clean and well sorted; very strongly calcareous.
	263.96	3.05	SANDSTONE: similar to above, very strongly calcareous.
	267.00	3.04	SANDSTONE: identical to above, very strongly calcareous.
	270.05	3.05	SANDSTONE: light/medium-grey, very fine-grained, clean, sorted; 0.10m muddy band in middle, regularly laminated throughout, very strongly calcareous throughout.
	273.10	3.05	SANDSTONE: similar to above, bottom 0.62m with numerous muddy layers; 0.08m fine/medium-grained sand intraclasts, strongly calcareous.
	276.15	3.05	SANDSTONE: medium to light-grey, very fine-grained, very uniform and clean, thin intraclastic zones (of mudstone), cross-laminated throughout, very strongly calcareous, 0.07m muddy/silty zones toward top.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	276.23	0.08	SANDSTONE: similar to above, abrupt basal contact.
	276.45	0.22	SANDSTONE: dark-grey, silty, tiny muddy cleats within thin sandstone layers, calcareous, gradual.
	277.13	0.68	SANDSTONE: light-grey, very fine grained, clean, tiny Pelecypod impression; well laminated, very strongly calcareous, erosional below.
	277.91	0.78	SILTSTONE/SANDSTONE: medium to dark-grey, rapidly interbedded sequence some large burrows (Pelecypod size), intertidal zone, many pin burrows, strongly calcareous, erosional base.
	279.20	1.29	SANDSTONE: light grey, clean, fine-grained; three muddy layers totalling 0.25 m; cross-laminated, very strongly calcareous, large pyrite nodule (sample taken).
	282.24	3.04	MUDSTONE/SANDSTONE: Interbeds of mudstone (dark-grey, silty), and very fine grained sandstone. Top 1.32 dominantly muddy/silty, large and small burrows, has erosional boundaries with sandstone. Rest dominantly sandy, very strongly calcareous, sandstone irregularly laminated, cross-laminated.
	283.44	1.20	MUDSTONE/SANDSTONE: identical to above.
	285.29	1.85	SANDSTONE/SILTSTONE: interbedded fine sandstone and siltstone, grey, calcareous, fine laminations within units, units range from 0.01 to 0.15, broken stick.
	285.54	0.25	SANDSTONE/SILTSTONE: as above, broken stick.
	288.34	2.80	SILTSTONE: dark-grey, richly argillaceous, micromicaceous, occasional laminae, totally sandy, (very fine-grained), very strongly calcareous, few burrows in lower half.
	290.76	2.42	SILTSTONE/MUDSTONE: dark-grey, intergrading siltstone and mudstone with sporadic but variable sizes of sandstone (very fine-grained) units. Most sand well laminated. Abundance of small and large burrows, also pin burrows Whole sequence reminiscent of Sukunka lithology, Thin some richly zones carbonaceous, very strongly calcareous.
	291.08	0.32	SILTSTONE: as above, subordinate muddy layers. Many fractures in lower half, very strong calcareous.
	291.43	0.35	SILTSTONE: as above. Highly broken, sheared and listricated fragments. A faulted interval.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	293.06	1.63	SANDSTONE: very fine-grained, entire interval extremely sheared and distorted; in fact, a fault breccia, Extensive mineralization. Some areas gouged, calcareous.
	294.43	1.37	SANDSTONE: light/medium-grey, fine-grained, very clean, well sorted; some large (Gates type) burrows, calcareous, laminated (vaguely), numerous tension fractures (mineralized).
	297.48	3.05	SANDSTONE: somewhat similar to above, thin tension fractures in upper half, well cross-bedded, very clean, well-sorted, very strongly calcareous.
	300.53	3.05	SANDSTONE: as above, very strongly calcareous. No fractures, fine-grained.
	300.99	0.46	SANDSTONE: identical to above, steep fracture (70° from horizontal) in basal 0.10m.
	301.75	0.76	SANDSTONE: as above, fine-grained. Basal 0.10m fragmented, a 70° fracture (from horizontal) in 0.18m sand.
	302.40	0.65	SANDSTONE: medium-grey, fine-grained, clean, well sorted 0.03 argillaceous silty band, very strongly calcareous.
	302.94	0.54	MUDSTONE/SANDSTONE: very fine-grained, dark-grey sand, intimately associated with silty sandstone, whole unit fragments, strongly calcareous.
	303.58	0.64	MUDSTONE; dark-grey, richly silty (some lenticular silt) strongly calcareous, small burrows.
	306.20	2.62	SILTSTONE/MUDSTONE: with variable amounts of very fine grained, well-laminated sandstones, sharp micro-erosional boundaries. Numerous burrows, some pin pricks reminiscent of Sukunka, few small fractures (along bedding) very strongly calcareous.
	306.63	0.43	SANDSTONE: top and bottom sandstone very fine-grained, 0.10m sand in middle, medium-grained (poorly sorted), thick mudstone band with large sand infilled burrows (in muddy matrix). Whole sequence sheared and mineralized, strongly calcareous.
	307.84	1.21	SANDSTONE: medium-grey, fine-grained, intercalations of dark-grey mudstone. Whole interval badly fragmented, sheared, listricated, high angle shear planes. A fault zone. Lithologically thin shear zone and overlaying 3.70m can be closely equated with lithology errors at 254.82m level. (Check on Geophysical log for repeat).

PR-SUKUNKA 77(3)A

BP COAL CANADA

OPEN FILE

AREA SUKUNKA B. H. No. BP 21

Contractor: Tonto

Commenced: Aug 26, 1977

Completed: Sept 17, 1977

Co-ordinates: 6,117,247.11 N
594,414.48 E
Surface Elevation: 1,653.35 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } See detail page 1a
Hole Azimuth: }

Geologist
Mike DeMestre
Logged by: Ali Chowdry

Depth
14.02-189.81
191.38-233.31
245.67-257.54
260.91-283.44
288.34-673.50
223.78-244.12

(SEE OVER)

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka	131.85	131.85	1,521.50
Moosebar	191.64	59.79	1,461.71
U. Gething	238.98	47.34	1,414.37

GEOLOGICAL BRANCH
ASSESSMENT REPORT
00 663

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD	194.06			1,459.29
CHAMBERLAIN	238.98			1,414.37

F.PO.	128.28-129.37	Fractured, Slickensdied & brecciated
F.PO.	307.84-313.03	Fractured & sheared & brecciated
F.E.	414.53	Breccia
F.PO.	624-638.08	sheared & slickensided

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	309.98	2.14	SANDSTONE: light-grey, fine/medium-grained, very clean, sorted, cross-bedded, abundant mineralized tension fractures, very strongly calcareous.
	313.03	3.05	SANDSTONE: light/medium-grey, fine/medium-grained, (some medium-grained zones), very clean, sorted, with many small pebbles, laminated throughout; much fracturing, whole interval steeply inclined, very strongly calcareous, one brecciated zone (0.03m) fractures along bedding, also across at 45°.
	316.08	3.05	SANDSTONE: very similar to above interval, well cross-stratified throughout, core locally fragmented, some wormy, parallel lamination, very strongly calcareous.
	319.13	3.05	SANDSTONE: medium-grey, medium-grained, clean, well-sorted, cross-stratified throughout, 0.14m. large burrows (Gates Type), very strongly calcareous, one fracture along bedding, basal 0.10m fragmented.
	322.17	3.04	SANDSTONE: identical to above, very strongly calcareous.
	325.22	3.05	SANDSTONE: same as above, very clean, uniform, cross-bedded, very strongly calcareous, 0.05 fractured mineralized zone.
	328.27	3.05	SANDSTONE: as above, 0.10m silty/muddy zone, very strongly calcareous, fine/medium-grained.
	329.91	1.64	SANDSTONE: very clean, fine-grained; laminated, very strongly calcareous.
	330.14	0.23	SANDSTONE: as above; sheared, mineralized zone, highly listricated, slickensided surfaces.
	330.22	0.08	SANDSTONE: fine-grained, laminated, listricated, as above.
	331.02	0.80	SANDSTONE: light-grey, fine-grained, clean, laminated, very strongly calcareous.
	332.22	1.20	SANDSTONE: similar to above, near-vertical fracture in basal 0.30m .
	334.06	1.84	SANDSTONE: light-grey, fine-grained, very clean, laminated, tiny dark grey silty clasts 0.93m zone with a continuous near vertical fracture, very strongly calcareous.
	337.11	3.05	SANDSTONE: as above, basal 0.85 much fragmented and with mineralized fractures at 55° - 60° from horizontal, strongly calcareous.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	337.51	0.40	SANDSTONE: similar to above, highly fractured, sheared, mineralized, very strongly calcareous.
	340.16	2.65	MUDSTONE/SANDSTONE: dark-grey to medium-grey, upper half dominantly muddy, rest dominantly sandy (very fine grained), interbedded, mudstone with pin burrows, erosional boundaries. The whole interval highly sheared, listricated, crushed, very strongly calcareous, locally carbonized plant debris.
	343.20	3.04	SANDSTONE/MUDSTONE: Sandstone fine-grained, well-laminated, clean, interlayered with dark-grey mudstone, many muddy intraclasts; erosional features, burrowing, some pin pricks, typically intertidal look, very strongly calcareous, thin band of finely broken, carbonized plant debris.
	346.25	3.05	SANDSTONE/MUDSTONE: similar with all attendant features, very strongly calcareous, carbonized plant debris.
	349.30	3.05	MUDSTONE/SILTSTONE/SANDSTONE: dark-grey interbeds, erosional boundaries, abundant burrows, intraclasts, well-laminated and cross-laminated sandstone, very strongly calcareous. Bottom 0.68m essentially sandy/silty with some bioturbation. Mudstone - 50%; Siltstone - 30% and Sandstone - 20%.
	352.35	3.05	MUDSTONE/SILTSTONE: Predominance of mudstone, dark-grey, interbedded with siltstone. Abundantly bioturbated, minor sandy layers, one sandy unit 0.12m thick, very strongly calcareous.
	352.86	0.51	MUDSTONE/SILTSTONE: identical to above, very strongly calcareous.
	354.29	1.43	SILSTONE (60%)/SANDSTONE (30%)/MUDSTONE (10%): interbeds, well laminated, very fine-grained sand, much burrowing, pin burrows, very strongly calcareous, gradual.
	355.40	1.11	SILTSTONE/MUDSTONE: dominance of mudstone, minor very fine sand, locally slightly carbonaceous, very strongly calcareous.
	358.44	3.04	SILTSTONE (80%)/MUDSTONE (20%): closely associated, no lamination, burrows, strongly calcareous.
	361.49	3.05	SILTSTONE/SANDSTONE/MUDSTONE: Top 0.50m silty mudstone, rest predominantly very fine sand, some siltstone, very strongly calcareous.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	364.54	3.05	SILTSTONE/MUDSTONE/SANDSTONE: similar to above, 0.06m large intraclastic zone 7 cm from base.
	367.59	3.05	SILTSTONE/SANDSTONE/MUDSTONE: overall dominance of very fine sand, rest similar, very strongly calcareous, few fractures 60° from horizontal, large pyrite nodule.
	370.64	3.05	SANDSTONE/MUDSTONE: Top 0.25m very fine grained laminated sands, rest dominantly silty mudstone with all attendant features.
	373.68	30.4	MUDSTONE: dark-grey, richly silty, minor sandy intraclasts, disseminated pyrite, many small and large burrows, very strongly calcareous.
	376.42	2.74	MUDSTONE: as above, very strongly calcareous.
	379.48	3.06	MUDSTONE: homogeneously silty, strongly calcareous.
	380.27	0.79	MUDSTONE: dark-grey, as above, non-calcareous, pyritic sandy intracalations toward base.
	381.67	1.40	SANDSTONE: dark-grey, top 0.37m essentially dark-grey mud with sprinkling of sand grains (fine/medium-grained, Pyritic, intensive burrowing (Therefore, mud/sand association due to bioturbation). Rest dark-grey, medium-grained sand, abundant large vertical tubes and other burrows. Bedding completely obliterated due to biochurning, some greenish species of glauconite. Pyrite species throughout. Non-calcareous, abrupt below. Few emaciated Pelecypod shells.
	382.03	0.36	MUDSTONE: dark-grey to medium-grey, very silty, laminated, distinct slump structures, fine sandy layers, strongly calcareous, erosional at base.
	382.52	0.49	SANDSTONE: light-grey, very fine-grained, laminated, silty/muddy layers; few fractures 45° to bedding, very strongly calcareous, micro-erosional features.
	384.26	1.74	SANDSTONE (60%)/MUDSTONE (40%): frequently interbedded, typical intertidal look, very strongly calcareous; abrupt below.
	385.57	1.31	SANDSTONE: light-grey, fine/medium-grained, very clean, well-sorted, two silty intraclastic zones; extensive criss-cross fracturing (mineralized), strongly calcareous erosional band contact.
	385.88	0.31	SANDSTONE: medium-grey, fine-to very fine-grained, structureless, strongly calcareous, fractures calcite-infilled.
	386.36	0.48	SANDSTONE: medium-grey, fine-to very fine-grained, lower half very argillaceous, several low-angle tension fractures, strongly calcareous, erosional below.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	388.25	1.89	MUDSTONE/SILTSTONE: mostly structureless, strongly calcareous, abrupt.
	388.92	0.67	SILSTONE/SANDSTONE: Top half very fine-grained sandstone, rest argillaceous siltstone; slumping in sand, strongly calcareous.
	390.95	2.03	SILTSTONE : medium-grey, argillaceous, mostly devoid of lamination; 0.20m zone of large, angular to rounded intraclasts of siltstone with very fine sandy matrix, (soft pebble conglomerate), some coarse grained silt, very strongly calcareous; abrupt below.
	391.17	0.22	SANDSTONE: light-grey, very fine-grained, near vertical lamine due to syndepositional disturbance., very strongly calcareous, sharp basal contacts.
	392.73	1.56	MUDSTONE (70%)/SANDSTONE (30%): interbeds, lenticular to thin bands of very fine-grained sandstone, locally very silty, sharp micro-boundaries, burrows, strongly calcareous.
	395.02	2.29	MUDSTONE (65%)/SANDSTONE (35%): interbeds, intertidal look, locally abundant carbonized plant debris (finely broken) very strongly calcareous, very fine sandstone.
	398.07	3.05	MUDSTONE (65%)/SANDSTONE (35%): interbeds, as above, very strongly calcareous, very fine sand.
	398.49	0.42	MUDSTONE/SANDSTONE: as above, highly fragmented zone, many listricated surfaces; very strongly calcareous.
20°	401.11	2.62	MUDSTONE (55%)/SANDSTONE (45%): dark-grey, more regularly alternating bands of very fine-grained sandstone and silty mudstones, delicately sharp boundaries; abundant large and small burrowing, very strongly calcareous.
	402.91	1.80	MUDSTONE/SANDSTONE: similar to above.
	404.16	1.25	MUDSTONE: dark-grey, richly silty, remnants of lamination, abundant small burrows, very strongly calcareous.
	407.21	3.05	MUDSTONE: similar to above, slightly higher silty content two ferruginous band, pyritic,calcareous, small burrows.
	407.62	0.41	MUDSTONE/SILTSTONE: Top half dominantly muddy, rest silty very finely sandy, burrowed, abundant erosional features, very strongly calcareous.
	410.26	2.64	MUDSTONE (75%)/SANDSTONE: interbeds, very fine-grained, laminated, richly silty, usual features, very strongly calcareous.

BH Nos. 21

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	411.84	1.58	MUDSTONE: dark-grey, richly silty, very strongly calcareous, abrupt below.
	412.09	0.25	CONGLOMERATE: fine quartz-chert pebbles in sandstone matrix.
	412.91	0.82	MUDSTONE: dark-grey to black; interval entirely fragmented, fragments highly listricated; bottom 0.18 richly carbonaceous, black sandstone.
	413.31	0.40	SANDSTONE: medium-grey, fine-to very fine-grained, numerous fractures, argillaceous, non-calcareous.
	413.96	0.65	SANDSTONE: as above, many listricated and striated surfaces, numerous fractures, non-calcareous.
	414.11	0.15	SANDSTONE: dark-grey, very silty, carbonaceous, fragmented and listricated, non-calcareous.
	414.53	0.42	SANDSTONE: light-grey, fine-grained, This zone a fault breccia, intensely sheared, distorted and extensively mineralized.
50°	415.44	0.91	SANDSTONE: as above; extensively fragmented , striated and listricated surfaces; abundantly mineralized.
30°	416.65	1.21	SANDSTONE: as above, similarly disturbed, sand calcareous.
20°	418.49	1.84	SANDSTONE/MUDSTONE: top half dominantly sandstone fine-grained, clean, cross-laminated; rest interbeds of very fine sand and mudstone, small burrows, clean micro-contact, some large burrows, very strongly calcareous undisturbed zone.
	421.54	3.05	SANDSTONE (70%)/MUDSTONE (30%): interbeds with attendant features, very strongly calcareous.
	424.59	3.05	MUDSTONE (65%)/SANDSTONE (35%): interbed, as above in sedimentary features; a fracture 50° from horizontal, very strongly calcareous.
	425.50	0.91	MUDSTONE/SANDSTONE: very similar to above.
	426.27	0.77	SANDSTONE (70%)/MUDSTONE (30%): interbeds, very strongly calcareous, gradual.
	428.55	2.28	MUDSTONE: dark-grey, richly silty (homogeneously), devoid of lamination, one 50° fracture from horizontal, very strongly calcareous.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	431.60	3.05	MUDSTONE (75%)/SILTSTONE(25%): interbeds, dark-grey, extensive burrowing, small and large, differentiated silty layers in lower 0.75m, very strongly calcareous.
	434.64	3.04	SANDSTONE (35%)/MUDSTONE (65%): interbeds, two discrete very fine-grained sand units, each 0.16cm, laminated, very strongly calcareous.
	437.70	3.06	SANDSTONE (30%)/MUDSTONE (70%): very similar to above, very strongly calcareous.
	438.43	0.73	SANDSTONE (70%)/MUDSTONE (30%): interbeds, basal 0.12m fragmented.
	439.43	1.00	SANDSTONE (35%)/MUDSTONE (65%): interbeds, very strongly calcareous.
	440.74	1.31	MUDSTONE: dark-grey, wisps of very fine siltstone, abundant pin burrows, very strongly calcareous.
	443.79	3.05	MUDSTONE: dark-grey, mostly structureless, homogeneously silty, occasional vague lamination, strongly calcareous.
	446.84	3.05	MUDSTONE: identical to above, no discernible boundaries, very strongly calcareous.
	449.88	3.04	MUDSTONE: dark-grey, locally very silty (homogeneously), totally devoid of lamination; basal 0.70m non-calcareous, rest calcareous.
	450.43	0.55	MUDSTONE: dark-grey, the unit is characterized by sprinkling of fine/medium-grained sand grains in mudstone matrix, totally lacking lamination, bottomward sandy content increasing gradually, non-calcareous.
	452.16	1.73	SANDSTONE: (Predominently dark-grey; top 0.50m have abundant muddy matrix; rest medium-grained sands; many large burrows; bedding almost completely blotted out due largely to presumed bioturbation. Greenish specks might be glauconitic, few tiny muddy clasts; non-calcareous, abrupt below. NOTE: This whole sandstone unit and the overlying mudstone are reminiscent of Mud/Sandstone zone between 379.48 - 382.52, (Repetition due to thrusting).
	452.93	0.77	SANDSTONE: light-grey, fine-grained, clean, well-sorted, 0.08m intraclastic zone, (both rounded and elongate). Also scattered cherts throughout, strongly calcareous throughout; numerous calcite-filled fractures.

BH Nos. 21

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	453.65	0.72	SANDSTONE: identical to above; erosional at base; few steep calcite filled fractures.
	454.18	0.53	SANDSTONE: dark-grey, very fine-grained, calcareous, fractured, distinct slumping, some silty zones, gradual.
	455.27	1.09	SANDSTONE: light-grey, fine-grained, clean, well-sorted, laminated, cross-laminated, some slumping and burrowing, abundant fracturing along and across bedding at about 40°-50°; mineralized, very strongly calcareous.
	455.99	0.72	SANDSTONE (85%)/MUDSTONE (15%): interbeds, very fine sand, very strongly calcareous.
	456.60	0.61	SANDSTONE/SILTSTONE: medium to dark-grey, sandstone very fine-grained, interbedded with argillaceous siltstone, large truncated slump structures, somewhat muddy, very strongly calcareous; abrupt below.
	457.93	1.33	SANDSTONE: light/medium-grey, fine/medium-grained, very clean, well-sorted, devoid of lamination, extremely scattered fine clasts, very strongly calcareous.
	458.42	0.49	SANDSTONE: light/medium-grey, fine-grained, well laminated silty laminae, few intraclasts; sequence characterized by extensive fracturing, striation and listricated surfaces; abundant mineralization, very strongly calcareous.
	460.83	2.41	SANDSTONE (85%)/MUDSTONE (15%): sandstone fine-to very-fine-grained, well laminated, some gradational units; mudstone dark-grey, silty and interbedded with sand, sharp to erosional boundaries; sequence characterized by extensive shearing and fracturing. Extensive calcite veining; basal 0.15m brecciated, whole zone representing faulted area; very strongly calcareous.
	461.20	0.37	SANDSTONE (50%)/MUDSTONE (50%): interbeds, very fine sand.
	461.47	0.27	SANDSTONE: fine-grained, well-laminated, some fine/medium toward base; silty/muddy laminae at top, very strongly calcareous.
	464.13	2.66	SANDSTONE: light-grey, fine/medium-grained, some local graded intervals, laminated throughout; several distinct intraclastic zones; generally clean and sorted, top 0.25 extensively fractured and mineralized; bottom 0.35m with two fractures at 45° and slickensided.
	464.51	0.38	SILTSTONE: dark-grey, richly argillaceous and sandy, structureless, very strongly calcareous.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	467.56	3.05	SILTSTONE: as above, basal 0.53m dominantly muddy with subordinate, very fine sand interbeds, very strongly calcareous.
	470.61	3.05	SANDSTONE (35%)/MUDSTONE (65%): interbeds, regularly interbedded subtle micro-contacts, large and small burrows, sand very fine-grained, laminated, intertidal look, very strongly calcareous, locally thin films of carbonized plant debris (finely broken).
	473.66	3.05	SANDSTONE (60%)/MUDSTONE (40%): interbeds. Three distinct sandy units (apart from minor ones), aggregating 0.52m sand, very clean, well laminated, very fine-grained usual sedimentary features; very strongly calcareous.
	475.49	1.83	SANDSTONE (40%)/MUDSTONE (60%): typical interbeds, very strongly calcareous.
	477.32	1.83	SILTSTONE (25%)/MUDSTONE (75%): interbeds, minor, very fine sand; very strongly calcareous.
	478.91	1.59	SANDSTONE (20%)/MUDSTONE (80%): interbeds, very strongly calcareous.
	480.36	1.45	MUDSTONE: dark-grey, richly silty (homogeneously); very strongly calcareous.
	483.41	3.05	MUDSTONE: dark-grey, homogeneously silty, very strongly calcareous.
	485.09	1.68	SANDSTONE (15%)/MUDSTONE (85%): interbeds, very strongly calcareous.
	486.46	1.37	MUDSTONE: dark-grey, very silty homogeneously; very strongly calcareous.
	488.29	1.83	MUDSTONE: dark-grey, locally slightly carbonaceous, locally highly silty; 0.16m ferruginous band, basal 0.12 black, carbonaceous (carbonized plant detritus), very hard sandy matrix with few well rounded chert/quartz pebbles.
	488.45	0.16	MUDSTONE: black, richly carbonaceous, hard with listricated surfaces, (abundant carbonized plant debris).
	490.66	2.21	SANDSTONE: medium-to dark-grey, fine-grained, ubiquitous small-scale cross-lamination; some parallel lamination, abundant finely macerated carbonaceous matter emphasising laminae (throughout) non-calcareous throughout; transitional below.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	491.38	0.72	SANDSTONE: light-grey; fine/medium-grained, fairly clean, sorted, cross-bedded, calcareous.
	493.69	2.31	SANDSTONE: identical to above; strongly calcareous.
	493.82	0.13	MUDSTONE (70%)/SANDSTONE (30%): interbedded, fragmented, gradual.
	494.38	0.56	SANDSTONE: similar to zone after 491.38, strongly calcareous.
	495.15	0.77	SANDSTONE: light-grey, very fine-grained, relatively clean, very strongly calcareous; barely discernible cross lamination; few tension fractures, abrupt below.
	497.43	2.28	MUDSTONE (80%)/SANDSTONE (20%): interbedded, very strongly calcareous.
	500.33	2.90	MUDSTONE (80%)/SILTSTONE (20%): dark-grey, interbeds, few zones with pin burrows, variously calcareous.
	501.09	0.76	COAL/MUDSTONE: interbedded; mudstone black, carbonaceous.
	502.66	1.57	COAL/MUDSTONE: top 0.04m essentially fragments of coal, dull, some dull and bright, dark-grey carbonaceous muds (enormous Core Loss indicated).
	502.91	0.25	MUDSTONE: dark-grey, carbonaceous, few bands of muddy coal, mostly splitting along bedding, listricated surfaces.
	503.30	0.39	MUDSTONE: top half incorporating substantial sand intracalations; rest homogeneously silty.
	504.22	0.92	SILTSTONE/SANDSTONE: medium-grey, top 0.62m very fine-grained sands and siltstones (argillaceous and with carbonaceous plant debris), rest fine-grained, laminated sands with graded units, micro-erosional features, few burrows; strongly calcareous, abrupt below.
	506.37	2.15	MUDSTONE: dark-grey, o.25m very carbonaceous near top; rest somewhat ferruginous, homogeneously silty, partially calcareous.
	507.66	1.29	MUDSTONE: medium/dark-grey, silty, non-calcareous, 2cm coaly lens.
	508.03	0.37	SILTSTONE: medium-grey, muddy, vaguely laminated, strongly calcareous, basal contact very transitional.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	508.77	0.74	SANDSTONE/SILTSTONE: medium-grey, top half very fine sand with muddy/silty layers; very small scale cross-lamination, rest at base argillaceous siltstone, strongly calcareous throughout.
	509.42	0.65	MUDSTONE: medium-grey, richly silty, occasional vague silty laminae; abundant carbonized plant debris, calcareous.
	509.72	0.30	MUDSTONE: as above, much siltier, calcareous, gradual.
	510.35	0.63	SANDSTONE: medium-grey, very fine-grained, silty intraclasts, laminated, few tension fractures, strongly calcareous, slickensided at base.
	510.71	0.36	SANDSTONE: light-grey, fine to very fine-grained; many tiny silty/muddy clasts, one 3cm across toward base; basal contact highly erosional, very strongly calcareous.
	512.13	1.42	MUDSTONE: top 0.24m medium-grey, richly silty, strongly calcareous, rest black; rich in carbonized plant debris, listricated surfaces, non-calcareous.
	512.78	0.65	MUDSTONE: top 0.35m black, locally very carbonaceous and some dirty dull coal, rest richly silty mudstone and very calcareous; transitional at base.
	514.20	1.42	SANDSTONE/MUDSTONE: medium/dark-grey, broadly interbedded very fine sandstone and silty mudstone, sand/mud have erosional contacts, locally tiny clasts; bottom 0.16m fine-grained sand with tiny burrows, strongly calcareous, gradual at base.
	515.24	1.04	MUDSTONE: medium-grey, homogeneously silty, strongly calcareous.
	518.22	2.98	MUDSTONE: bottom 0.90m richly silty (homogeneously), rest dark-grey, abundant carbonized plant debris.
	518.92	0.70	SANDSTONE: dark-grey to black, fine grained, characterized by its richly argillaceous, carbonaceous matrix (20% black muddy matrix), non calcareous, vague lamination.
	519.68	0.76	MUDSTONE: dark-grey, silty, structureless, non calcareous.
	520.60	0.92	SILTSTONE/MUDSTONE: dark-grey, dominance of muds, 0.05 sand at base, muds very carbonaceous.
	521.29	0.69	MUDSTONE, dark grey, carbonized plant debris, silty, non-calcareous.
	522.81	1.52	MUDSTONE, identical to above, basal 0.15m fragmented with striated, listricated surfaces.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	523.13	0.32	MUDSTONE: as above, near vertical fractures, totally fragmented.
	523.64	0.51	MUDSTONE: dark-grey, identical to above and similarly fragmented.
	524.16	0.52	SANDSTONE: light/medium-grey, fine/medium-grained, very hard, siliceous, numerous intraclasts, coaly inclusions, erosional at base.
	524.88	0.72	SANDSTONE: light-grey; very fine-grained, brief silty intervals, laminated, basal 0.15m fine-grained and with one steep fracture, slightly argillaceous, non-calcareous, gradual.
	525.61	0.73	SANDSTONE: light-grey, fine/medium-grained, generally clean and sorted, laminated, cross-laminated, few silty cherts, very strongly calcareous. Numerous, high angle, mineralized tension fractures.
	527.06	1.45	SANDSTONE: light-grey, top 0.58m fine/medium-grained, rest medium-grained; cross-stratified; 2cm deep stylolite 0.23m from base, well washed, top 0.58m calcareous, broken at base.
	528.18	1.12	MUDSTONE: black, richly carbonaceous, locally coaly, fragmented interval throughout.
	529.16	0.98	MUDSTONE: medium-grey, silty, carbonaceous in lower section, partially calcareous, 0.15m at base richly carbonaceous, and with coaly intraclasts; fragmented.
	529.73	0.57	COAL: badly fragmented, fragments dull lustrous and some bright bands; listricated surfaces.
	530.20	0.47	COAL: highly fragmented, listricated, same as above.
	530.72	0.52	MUDSTONE: dark-grey, carbonaceous, fragmented.
	531.12	0.40	COAL: finely broken and pulverized, type indistinquishable.
	531.76	0.64	MUDSTONE: dark-grey, rich in carbonized plant debris, highly silty (homogeneously), structureless, non-calcareous.
	531.89	0.13	MUDSTONE: as above.
	534.81	2.92	MUDSTONE: as above; 0.07m sandstone, very fine argillaceous, otherwise structureless; rest non-calcareous.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	537.55	2.74	MUDSTONE: medium/dark-grey, locally very carbonaceous, especially in top half), lower half very silty and vague (occasional) lamination of silts, calcareous partially Much of section with broken stick.
	538.01	0.46	MUDSTONE: medium-grey, silty, fragmented and gradual.
	538.38	0.37	SILTSTONE: medium-grey, argillaceous; steep fractures, some plant debris, non-calcareous.
	539.12	0.74	MUDSTONE: medium-grey, richly silty, non-calcareous.
	539.92	0.80	SILTSTONE: medium-grey, rootlets argillaceous, strongly calcareous.
	540.60	0.68	MUDSTONE: grey, very highly silty, strongly calcareous.
	542.59	1.99	MUDSTONE: medium/dark-grey, very highly silty, strongly calcareous.
	543.65	1.06	SANDSTONE: medium-grey, very fine grained, richly argillaceous, silty, laminated, sporadic burrowing, strongly calcareous.
	546.59	2.94	SANDSTONE: similar to above, slightly richer in argillaceous and silty content. Strongly calcareous throughout.
	547.52	0.93	MUDSTONE: medium-grey, richly silty (homogeneously), strongly calcareous.
	548.90	1.38	SANDSTONE (60%)/SILTSTONE (25%)/MUDSTONE (15%): alternating sequence of sands, (very fine-grained, laminated, cross-laminated and argillaceous), strongly calcareous throughout.
	549.64	0.74	MUDSTONE: dark-grey, carbonized plant debris, homogeneously silty, very strongly calcareous, bottom 0.07m sandy.
	550.44	0.80	MUDSTONE: dark-grey, carbonized plant debris, silty; top 0.14m, very fine sand, strongly calcareous, erosional base.
	550.81	0.37	SANDSTONE: light-grey, very fine-grained, very strongly calcareous, small scale cross-bedding throughout, erosional.
	552.30	1.49	MUDSTONE (70%)/SILTSTONE (30%): strongly calcareous, very gradual.
	552.44	0.14	SANDSTONE: light grey, very fine-grained, strongly calcareous, erosional.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	552.71	0.27	MUDSTONE: black, richly silty, abundant carbonaceous plant debris, very strongly calcareous.
	553.15	0.44	SILTSTONE: dark-grey, very muddy, well preserved plant impressions, locally finely sandy, laminated, strongly calcareous.
	553.94	0.79	MUDSTONE: black, silty, richly carbonaceous, fragments, non-calcareous.
	554.16	0.22	MUDSTONE: hard, dense, somewhat ferruginous, locally carbonaceous, non-calcareous, a steep fracture.
	554.76	0.60	COAL: fragmented, pulverized with carbonaceous mudstone.
	555.76	1.00	MUDSTONE: medium-grey, richly silty (30%), somewhat ferruginous, numerous listricated surfaces, non-calcareous.
	556.77	1.01	MUDSTONE: black, very carbonaceous, much of section fragmented, with highly listricated surfaces.
	557.58	0.31	SANDSTONE: light/medium-grey, fine-to very fine-grained, some silty laminae; zone highly fractured and extensively mineralized, sheared and recemented zones (faulted zone), strongly calcareous.
	558.86	1.28	SANDSTONE (40%)/SILTSTONE (60%): medium to dark-grey, sand very fine-grained, very argillaceous, sporadically laminated and few burrows, strongly calcareous.
	560.69	1.83	SANDSTONE: medium-grey, very fine-grained, argillaceous, locally silty layers, bottom 0.37m very silty/argillaceous micro-erosional features, 1cm thick calcite filled fracture in middle; very strongly calcareous, gradual at base.
	561.09	0.40	SILTSTONE: medium-grey, richly argillaceous, strongly calcareous.
	561.91	0.82	MUDSTONE: medium-grey, richly silty, sandy at base, strongly calcareous.
	564.96	3.05	MUDSTONE: as above, two discrete very fine sand units, aggregating 0.26m, strongly calcareous throughout.
	566.37	1.41	MUDSTONE: richly silty, fragmented, strongly calcareous.
	568.01	1.64	SANDSTONE: medium-grey, very fine-grained, argillaceous, numerous large burrows, locally silty, abundant carbonaceous plant debris, some disturbed lamination, strongly calcareous, numerous calcite filled fractures.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	569.99	1.98	SANDSTONE: light/medium-grey, fine-grained, relatively clean, abundant small-scale cross-lamination, very strongly calcareous; scoured base; few fractures.
	571.56	1.57	MUDSTONE: black, richly carbonaceous, non-calcareous, very uniform look, structureless.
	572.10	0.54	COAL: entire interval, fragmented to small pieces and pulverized appears to be low ash, light coal.
	572.64	0.54	COAL: as above, similar physical condition.
	573.08	0.44	MUDSTONE: black, richly carbonaceous, coaly stringer, fragmented.
	573.69	0.61	MUDSTONE: as above, slightly silty; 0.06m coal, fragmented
	574.91	1.22	MUDSTONE: Top 0.35 black and lustrous, followed by 0.17m muddy coal; rest at base carbonaceous mudstone with coaly intercalations, fragmented.
	575.52	0.61	MUDSTONE: black, slightly carbonaceous, fragmented.
	577.65	2.13	MUDSTONE: dark-grey to black, many coaly/carbonaceous zones (these particularly fragmented and listricated) 0.12m siltstone layer, structureless throughout.
	579.91	2.26	MUDSTONE: identical to above, locally fragmented,
	580.09	0.18	COAL: top half dirty; rest bright, fragmented.
	583.14	3.05	MUDSTONE/COAL: black, carbonaceous, core locally badly broken, many coaly zones, lightly broken and pulverized, mud fragments listricated.
	584.36	1.22	MUDSTONE: medium-grey, richly silty, carbonaceous plant debris, carbonaceous and coaly base. (pulverized 0.06m at base).
	585.85	1.49	MUDSTONE: black, locally very carbonaceous.
	586.42	0.57	MUDSTONE (50%)/SILTSTONE (50%): Upper half mudstone, rest siltstone, laminated, gradual at base.
	587.34	0.92	MUDSTONE: dark-grey to black, somewhat canneloid, carbonaceous.
	589.05	1.71	MUDSTONE/SILTSTONE: equally represented, intimately associated, structureless, carbonaceous plant debris; bottom 0.24m very coarse-grained silt, with very fine sand intercalation at base.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	589.37	0.32	COAL/MUDSTONE: top half carbonaceous mudstone; rest muddy coal.
	589.47	0.10	MUDSTONE: medium-grey, silty, structureless, non-calcareous.
	589.84	0.37	SILTSTONE: medium-grey, richly muddy, structureless, non-calcareous.
	590.69	0.85	SANDSTONE: medium-grey, very fine-grained, laminated, regular silty laminæ and layers, non-calcareous.
	591.41	0.72	SANDSTONE/MUDSTONE: medium-grey, very fine sand, laminated, aberrant burrows, interbedded with dark-grey mudstone, a steeply inclined mineralized fracture. (70%-Sandstone; 30% - Mudstone).
	592.16	0.75	MUDSTONE (65%)/SANDSTONE (35%): Broadly alternately sequence of very fine grained sandstone/or coarse silts and mudstone.
	593.35	1.19	MUDSTONE: black to dark-grey, richly silty (especially lower half), non-calcareous, very transitional at base.
	593.74	0.39	SANDSTONE: medium-grey, very fine-grained, argillaceous, silty, laminated broadly, non-calcareous.
	595.57	1.83	SANDSTONE: light/medium-grey, fine to very fine-grained, (dominantly fine-grained), ubiquitous small scale cross-lamination (ripple-drift), very clean, large deep burrow (35mm x 10cm deep) 0.30m from base, siliceous. Few muddy intercalations towards base.
	597.68	2.11	SANDSTONE: medium-grey, fine/medium-grained, sequence characterized by ubiquity of coaly inclusion, tiny intraclasts, laminated, cross-laminated (small-scale) siliceous, some silty intercalations, erosional at base.
	598.20	0.52	SANDSTONE: medium-grey, very fine-grained, some silts, non -calcareous, abrupt at base.
	598.62	0.42	MUDSTONE: dark-grey, slightly carbonaceous, structureless
	599.22	0.60	SILTSTONE: medium-grey, coarse-grained, top 0.07m muddy, non-calcareous.
	599.59	0.37	SILTSTONE: identical to above, very gradational at base.
	601.66	2.07	SANDSTONE: medium-grey, very fine-grained, argillaceous, totally lacking lamination, non-calcareous.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	602.79	1.13	SANDSTONE: similar to above.
	603.14	0.35	SANDSTONE: medium-grey, generally fine-grained with scattering of medium/coarse grains abundant coaly inclusions, erosional at base.
	604.10	0.96	MUDSTONE/SILTSTONE: top 0.35 dark-grey mudstone, rest argillaceous siltstone, numerous tiny tension fractures.
	604.71	0.61	SILTSTONE: medium-grey, coarse-grained, argillaceous, calcareous.
	605.49	0.78	SILTSTONE (65%)/SANDSTONE (35%): muddy siltstone at top, very fine sandstone, laminated, calcareous throughout, gradual at base.
	606.85	1.36	MUDSTONE: dark-grey, silty; 0.14m very carbonaceous coal zone, non-calcareous.
	608.37	1.52	MUDSTONE: as above (minus coal Zone).
	610.81	2.44	MUDSTONE: dark-grey to black, 0.30m carbonaceous and coal zone, structureless, non-calcareous.
	613.86	3.05	MUDSTONE: dark-grey to black, locally very carbonaceous, basal 0.67m very fragmented with high angle listricated surfaces; some shearing.
	615.68	1.82	MUDSTONE: as above, many shear plane 45°-50° to horizontal.
	616.60	0.92	MUDSTONE: dark-grey to black, silty; numerous low angle fractures.
	616.74	0.14	MUDSTONE: as above; sheared and mineralization at base.
	617.40	0.66	MUDSTONE: medium-grey, highly silty, laminated, calcareous whole interval steeply inclined.
	619.95	2.55	MUDSTONE: dark-grey, carbonaceous, structureless, non-calcareous, many listricated surfaces, very carbonaceous towards base. NOTE: Coal indicated between Geophysical depths: 619.44-620.56 m.
	621.47	1.52	MUDSTONE: medium-grey, carbonaceous, silty, few strongly listricated zones; non-calcareous.
	622.11	0.64	MUDSTONE: medium-grey, richly silty, listricated, non-calcareous.
	623.00	0.89	SANDSTONE: medium-grey, very fine-grained, fractured with mineralization, laminated, non-calcareous.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	623.16	0.16	SILTSTONE: medium-grey, argillaceous, gradual at base.
	624.24	1.08	SANDSTONE: medium-grey, very fine-grained, laminated, many silty intercalations; several mineralized fracture zones; non-calcareous. Much listrication.
	624.80	0.56	MUDSTONE: dark-grey, bottom one-third richly silty and laminated.
	625.74	0.94	SANDSTONE: medium-grey, very fine-grained; frequently interlayered with silty/muddy layers, wavy, rippled lamination throughout. Bottom 0.30 very muddy with listricated surfaces and mineralized fractures.
	627.49	1.75	SANDSTONE/SILTSTONE: medium-grey, very fine-grained sands, laminated, very argillaceous; 0.19 muddy zone, non-calcareous, fractured at base.
	628.18	0.69	MUDSTONE: dark-grey, fragmented, heavily listricated.
	629.15	0.97	MUDSTONE: dark-grey, carbonaceous, very silty (homogeneous), gradational.
	629.45	0.30	SILTSTONE: medium-grey, well-laminated, coarse-grained, non-calcareous, very gradational at base.
	630.32	0.87	MUDSTONE: dark-grey, carbonaceous, fragmented, listricated.
	632.45	2.13	MUDSTONE (80%)/SILTSTONE (20%): dark-grey mudstone and sporadically slightly carbonaceous, much slickensiding and listricated surfaces; silts locally laminated, non-calcareous throughout.
	633.99	1.54	SANDSTONE/SILTSTONE: top 0.62m siltstone, argillaceous, stick but rest of interval badly fragmented, extensively listricated, and fractured. Some large fragments of carbonaceous mudstone.
	634.58	0.59	MUDSTONE: dark-grey, carbonaceous, listricated, fragmented base.
	637.31	2.73	MUDSTONE: dark-grey; 0.29m siltstone at top, laminated, much listrication Bottom 0.11m argillaceous siltstone.
	638.54	1.23	MUDSTONE: dark-grey, very similar to above zone.
	638.88	0.34	MUDSTONE: dark-grey, richly silty, fractured and mineralized, highly sheared zone. A faulted zone somewhat ferruginous.
	641.44	2.56	CORE LOSS-COAL

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	642.39	0.95	MUDSTONE: dark-grey, sheared, much plant debris, very silty in basal 0.15m, very transitional.
	642.96	0.57	SANDSTONE: dark-grey at top and richly argillaceous, carbonaceous, rest medium-grey, very fine-grained, laminated.
	643.64	0.68	SANDSTONE: medium-grey, fine-to very fine-grained, laminated, 0.15m intensely fractured and mineralized zone. Bottom 0.45m extremely muddy (finely particulate carbonaceous matter), very fine-grained, laminated, near vertical slickensided surfaces, fragmented.
	644.49	0.85	MUDSTONE: dark-grey, top 0.25m highly sandy, bottom 0.13m highly fragmented, small pieces of very carbonaceous mudstone.
	644.79	0.30	SANDSTONE: dark-grey/black, silty (homogeneously), carbonaceous, fragmented, listricated, non-calcareous.
	645.36	0.57	SILTSTONE: dark-grey, well-laminated, (wavy parallel) some argillaceous laminae, 0.08m very fine sandstone, silts have carbonized plant debris.
	646.04	0.68	SANDSTONE: medium-grey, very fine-grained, silty, well-laminated (laminated as above), very gradational at base.
	647.41	1.37	MUDSTONE: medium-grey, richly silty (laminae and layers) broadly laminated, strongly calcareous, abrupt below.
	649.62	2.21	SANDSTONE: medium-grey, very fine-grained, regularly intercalated by silty layers, ubiquitous wavy parallel lamination, micro-erosional features, 0.13m muddy band, numerous calcite-lined fractures perpendicular to bedding, intraclastic zone, strongly calcareous throughout.
	650.89	1.27	SILTSTONE: dark-grey, coarse-grained, richly argillaceous, ubiquitous lamination (wavey, parallel), brief intercalations of very fine sand, strongly calcareous, numerous tension fractures, calcite-filled.
	652.11	1.22	MUDSTONE: top 0.45m richly silty, sporadically laminated, calcareous, rest black, very carbonaceous, fragmented with many listric surfaces, structureless, non-calcareous
	653.93	1.82	MUDSTONE: dark-grey, richly silty, bottom one-third sheared, fragmented, extensively mineralized and very silty.
	654.39	0.46	MUDSTONE: similar to above, sheared, listricated, some laminated siltstone (calcareous).

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	654.85	0.46	MUDSTONE: dark-grey, somewhat laminated, silty, fragmented listricated and striated surfaces, calcareous.
	656.22	1.37	MUDSTONE: dark-grey/black carbonaceous, fragmented, listricated, vaguely discernible silty laminae (calcareous).
	657.30	1.08	MUDSTONE: dark-grey, carbonaceous, structureless, non-calcareous.
	657.90	0.60	MUDSTONE: black, whole interval badly fragmented, intensely listricated, pulverized coal here and there.
	658.45	0.55	MUDSTONE: badly fragmented, listricated, as above.
	659.43	0.98	MUDSTONE: dark-grey, top 0.50m argillaceous siltstone, widely laminated, rest black, slightly carbonaceous mud-stone, some fractures and polished surfaces.
	660.32	0.89	SANDSTONE: medium-grey, top half very fine-grained, sporadically laminated, feebly calcareous, rest sand, fine-grained, clean, well-sorted, similarly laminated, abrupt basal contact.
	660.95	0.63	MUDSTONE: dark-grey to black, carbonaceous, fragmented.
	662.77	1.82	MUDSTONE: dark-grey, fragmented, listricated, basal 0.15m very carbonaceous, non-calcareous, structureless.
	663.56	0.79	SILSTONE (40%)/MUDSTONE (60%): much plant debris, slightly carbonaceous.
	664.19	0.63	SANDSTONE: medium-grey, very fine-grained, laminated throughout, two calcite-filled fractures, non-calcareous.
	664.63	0.44	MUDSTONE/SILTSTONE: dark-grey, slight dominance of mud-stone, interbedded, laminated, micro-erosional boundaries, non-calcareous, abrupt below.
	665.82	1.19	SANDSTONE: medium-grey, very fine-grained, ubiquitous silty laminae, layers, erosional features, wavy lenti-cular bedding, abundant carbonized plant debris; some isolated cross-beds, sporadic tiny silty intraclasts; calcareous.
	666.00	0.18	SANDSTONE: identical to above, erosional at base.
	666.78	0.78	SANDSTONE: medium-grey, very fine-grained, highly argilla-ceous, sporadically laminated, 0.13m silty mudstone to-wards base, strongly calcareous, transitional at base.
	667.54	0.76	SILTSTONE/MUDSTONE: medium dark-grey, laminated wavy,

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			slight dominance of mudstone, non-calcareous, gradual.
	668.87	1.33	MUDSTONE: dark-grey, top half sparingly silty, rest richly silty, abundant carbonized plant debris, large near-vertical fracture; structureless.
	670.70	1.83	MUDSTONE: as above, 0.45m with abundant silty content and chaotic lamination and incorporates abundant finely broken plant debris, non-calcareous throughout.
	672.98	2.28	MUDSTONE: dark-grey, much silty content (homogeneously dispersed), abundant carbonized plant debris, locally very carbonaceous and locally fragmented. No apparent lamination; listricated surface, 35° to base.
	673.28	0.30	MUDSTONE/SILTSTONE: dominantly muddy, top 0.08m silty with some very fine sandy layers, erosional at base.
	673.50	0.22	SANDSTONE: light-grey, very fine-grained, clean, fairly well-sorted, siliceous, near-vertical large fracture, vaguely and partially calcite encrusted.
	673.75	0.25	SANDSTONE: fine to medium-grained, very carbonaceous, with numerous coaly stringers, well developed bedding and cross-bedding. Numerous calcite-filled fractures 80°-85° from horizontal, abrupt below.
	675.08	1.33	SANDSTONE: as above
	677.38	2.30	MUDSTONE: carbonaceous, numerous coaly stringers, listric surfaces and slickensides throughout, transitional below. Broken stick. Shear at 676.66m plane 80° from horizontal, slickensides 10° of core axis.
	678.30	0.92	MUDSTONE: as above
	678.75	0.45	SANDSTONE: well bedded, some carbonaceous partings, numerous calcite-filled fractures at 75°-80° cm.B.C.A. broken stick, transitional below.
	679.22	0.47	MUDSTONE: sandy 50:50, poorly-bedded showing some disturbance, abrupt below, numerous well developed calcite-filled joints. 75° from horizontal.
	680.12	0.90	MUDSTONE: carbonaceous, very broken with numerous slickensides and listric surfaces.
	680.65	0.53	MUDSTONE: as above.
	681.85	1.20	SANDSTONE: medium-grained, carbonaceous, poorly bedded, numerous rootlets, abrupt below, calcite filled joints

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			at 45° from horizontal.
	682.87	1.02	SANDSTONE: medium to coarse-grained, very carbonaceous, numerous coaly stringers; calcite filled cracks. Numerous listric surfaces.
	684.08	1.21	MUDSTONE: carbonaceous and coaly, broken, listric surfaces common with no preferred orientation.
	686.78	2.70	SILTSTONE: very carbonaceous, poorly bedded showing some disturbance, a lot of planty material. Listric surfaces common.
	687.12	0.34	MUDSTONE: very carbonaceous and coaly, numerous plant fragments.
	687.13	0.01	SANDSTONE: fine-grained, argillaceous, zones of coarse sands, poorly developed bedding, some disturbance by slumping and load structures. Minor calcite fractures horizontal, transitional below.
	689.33	2.20	SANDSTONE: as above
	690.18	0.85	MUDSTONE: carbonaceous, broken stick, broken numerous listric surfaces, transitional below.
	690.81	0.63	MUDSTONE: as above.
	691.75	0.94	SANDSTONE: fine-grained, carbonaceous, rootlets, poorly bedded and disturbed, minor calcite filled cracks, slickensides on 45° surface, slickensides parallel to core axis, transitional below.
	691.95	0.20	MUDSTONE: carbonaceous, relatively homogeneous, abrupt below.
	692.05	0.10	COAL: dull, sheared.
	692.20	0.15	MUDSTONE: carbonaceous, sheared.
	692.50	0.30	COAL/MUDSTONE: broken fragments, coal dull, sheared.
	692.57	0.07	COAL/MUDSTONE: powder.
	692.68	0.11	MUDSTONE: very carbonaceous, listric surfaces, transitional below.
	693.11	0.43	SANDSTONE: fine-grained, rootlets and coaly fragments, slickenside on 45° - com.B.C.A., surface with slickenside at 30° to core axis, poorly developed bedding and cross-bedding.

BH Nos. 21

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	693.86	0.75	SANDSTONE: as above
	696.16	2.30	MUDSTONE: sandy in places, poorly developed, bedding, transitional below, minor carbonaceous fragments.
	697.04	0.88	MUDSTONE: as above.
	701.01	3.97	SANDSTONE: medium-grained, bioturbated, very poorly-bedded, calcite fractures at 50° from horizontal becoming finer below. Transitional below.
	702.56	1.55	SANDSTONE: medium to coarse-grained, very carbonaceous, disturbed - bioturbated, minor mudstone interbeds, some listric surfaces and minor calcite filled joints, 80° from horizontal becoming very carbonaceous to base. Occasional stylolytes.
	705.64	3.08	SANDSTONE: as above.
	706.74	1.10	SANDSTONE: very dirty, numerous carbonaceous fragments, intraclasts and conglomeratic pebbles, poorly bedded, disturbed, listric surfaces and some shearing. Minor calcite filled cracks.
	707.26	0.52	MUDSTONE: homogeneous becoming sandy to base, numerous listric surfaces, abrupt below.
	707.44	0.18	SANDSTONE: carbonaceous stringers, intraclasts and pebbles, bedding poorly developed.

* * * * *

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 22

Contractor: Tonto

Commenced: Aug 28, 1977
Completed: Aug 30, 1977

Co-ordinates: 6,116,196.82 N
594,567.39 E
Surface Elevation: 1,512.81 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Geologist	Depth
Mike DeMestre	19.50-72.06
Logged by: Geoff Jordan	72.09-135.77

Final Depth: 135.77

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar	72.51 79.66	72.51 7.15	1,440.30 1,433.15
U. Gething	130.43	50.77	1,382.38

SEAMS		DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD	UP	73.37			1,439.44
	LP	81.52			1,431.29
CHAMBERLAIN		130.43			1,382.38

F.PO. 20.11-67.59
F.E. 73.37
F.PR. 121.86

Slickensided, fractured in coal- Bird Breccia (?Sigmoidal structure)

BH Nos. 22

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			Hole spudded in Moosebar
			MUDSTONE, black, massive with occasional pyritic nodules and ferruginous bands
	19.50	3.66	MUDSTONE, core badly broken up with few intervals not broken (up to 0.30m)
	20.11	0.61	MUDSTONE, black, core badly broken up, no slickensided or listric surfaces
	23.16	3.05	MUDSTONE, black, 1.56-1.85 core badly broken up, 1.85-3.01 core slightly broken
	26.21	3.05	MUDSTONE, black, core badly broken up 0.10m, .76-1.20, 1.63-2.01
	29.26	3.05	MUDSTONE, black, 2.67-3.03 core badly broken up
	32.30	3.04	MUDSTONE, black, core slightly broken up, bottom 0.70m badly shattered
	35.35	3.05	MUDSTONE, black, core slightly broken in sticks 0.05-0.35m thick
	38.40	3.05	MUDSTONE, black, 1.56-1.90 core broken, shattered
	41.45	3.05	MUDSTONE, black
	44.50	3.05	MUDSTONE, black, 0-0.50 three slickensides at high angles 0.05-0.25m apart, 1.55m-2.00m fractures, high angle, no evidence for movement
	47.50	3.00	MUDSTONE, black, 2.36-2.46 core slightly broken up
	50.59	3.09	MUDSTONE, black, 0-0.69m five listric surfaces poorly defined 0.05-0.21m apart, 2.10m-2.25m two listric surfaces
	53.64	3.05	MUDSTONE, black, 0-0.30m core badly broken up with occasional listric surfaces, 0.30m-1.75m core slightly broken up, one slickenside @ 1.03m (high angle)
	59.74	6.10	MUDSTONE, black, 0.34-0.45 core slightly broken up, 0.84 core sheared up, @1.45-3.05 six slickenside at high angles 0.07-0.35m apart
	62.18	2.44	MUDSTONE, black, 0.11-0.20 two high angle slickensides, 0.96m thin sheared up bentonite bed (0.14m thick), 0.96-1.74m four high angle slickensides, 1.74-2.15m highly broken up core with calcite mineralization
	65.83	3.65	MUDSTONE, black, 0.50m core with calcite, core slightly broken, usually high angle but no sign of movement, 1.19m bentonite bed 0.05m thick, 1.61m-1.81m two high angle slickensides
	67.59	1.76	MUDSTONE, black, 0-0.45m core shattered and broken lengthwise, 1.46m-2.05m core shattered, 2.05m-2.30m core broken lengthwise
	68.59	1.00	MUDSTONE, black, 0-0.33m core broken lengthwise

BH Nos. 22

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	70.59	2.00	MUDSTONE, black
	71.59	1.00	MUDSTONE, black, bentonite 1.78-1.83
	72.06	0.47	MUDSTONE, black, bentonite 0-13,0.29-0.47
	72.09	0.03	CLAYSTONE, grey/white, soft "bentonitic" Moosebar formation
	72.51	0.42	SANDSTONE, dark grey/green, glauconitic, pyritic worm burrows, bioturbation
	72.53	0.02	COAL, dull and bright, stick, pyritic band
	72.59	0.06	COAL, dull, stick
	72.67	0.08	COAL, dull banded, stick
	72.75	0.08	COAL, dull and bright, stick
	72.77	0.02	COAL, bright, large pieces
	72.80	0.03	CLAYSTONE, carbonaceous
	72.84	0.04	COAL, dull, sheared, small pieces
	72.87	0.03	CLAYSTONE, carbonaceous
	72.90	0.03	COAL, dull, stick
	72.96	0.06	COAL, dull and bright, stick
	73.07	0.11	COAL, dull, stick
	73.13	0.06	COAL, dull and bright, stick
	73.20	0.07	COAL, dull banded, stick, sheared
	73.26	0.06	COAL, dull and bright, stick
	73.29	0.03	COAL, dull, stick
	73.34	0.05	COAL, dull and bright, small pieces
	73.35	0.01	CLAYSTONE, carbonaceous
	73.37	0.02	COAL, dull banded, stick
	74.37	1.00	MUDSTONE, dark grey, calcite veins in top 0.50m, bedding not developed, Moosebar formation
	75.90	1.53	MUDSTONE, as above
	75.92	0.02	MUDSTONE, as above
	78.28	2.36	MUDSTONE, as above
	78.31	0.03	CLAYSTONE, light grey/white, soft, "bentonitic"
	78.56	0.25	MUDSTONE, dark grey, pyritic worm burrows, no bedding apparent, Moosebar formation
	78.66	0.10	CLAYSTONE, as above
	78.96	0.30	MUDSTONE, as above

BH Nos. 22

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	79.23	0.27	CLAYSTONE, as above
	79.66	0.43	SANDSTONE, dark grey/green, glauconitic, pyritic worm burrows, fine-grained, bedding obliterated by bioturbation
	79.68	0.02	PYRITE, one band
	79.97	0.29	CORE LOSS
	80.01	0.04	COAL, dull, large pieces
	80.13	0.12	COAL, dull, stick
	80.15	0.02	COAL, dull, pyrite inclusions
	80.32	0.17	COAL, dull, stick
	80.36	0.04	CORE LOSS
	80.86	0.50	CLAYSTONE, carbonaceous, black, coal bands at top
	80.99	0.13	CLAYSTONE, as above
	81.06	0.07	COAL, dull, core fragmented
	81.16	0.10	COAL, dull banded, core fragmented
	81.52	0.36	CORE LOSS
	83.29	1.77	SANDSTONE, medium to coarse-grained, light grey, carbonaceous at top with large coaly inclusions from 9.0m to 10.0m from top
	85.43	2.14	SANDSTONE, as above
	86.82	1.39	SANDSTONE, as above
	87.82	1.00	SANDSTONE, as above
	89.92	2.10	SANDSTONE, as above
	92.97	3.05	SANDSTONE, as above
	96.01	3.04	SANDSTONE, as above
15°	96.99	0.98	SANDSTONE, medium-grained, light grey, scattered interbeds of carbonaceous mudstone with large light colored worm tubes, occasional calcite filled fractures normal to bedding
	100.04	3.05	SANDSTONE, as above
	101.32	1.28	SANDSTONE, as above
	103.50	2.18	SANDSTONE, fine-grained, light grey, very clean
	105.64	2.14	SANDSTONE, as above
	106.43	0.79	SANDSTONE, as above
	107.04	0.61	SILTSTONE, grey-dark grey mudstone interbeds, plant rootlets, pyritic worm burrows at top
	107.58	0.54	SANDSTONE, fine-grained, light grey, small-scale cross-bedding

BH Nos. 22

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	107.73	0.15	SANDSTONE, coarse-grained, light grey, occasional coaly inclusions
	108.72	0.99	SANDSTONE, as above
	109.05	0.33	SILTSTONE, grey, plant rootlets, massive
	109.71	0.66	SILTSTONE, as above
17°	109.87	0.16	SANDSTONE/MUDSTONE INTERBEDDED, thin bedded mudstone and light grey, fine-grained sandstone
	111.88	2.01	SANDSTONE/MUDSTONE INTERBEDDED, as above
	113.94	2.06	SANDSTONE/MUDSTONE INTERBEDDED, as above
	114.54	0.60	SANDSTONE, medium-grained, light grey, very clean
	115.18	0.64	SANDSTONE & MUDSTONE INTERBEDDED, light grey sandstone and carbonaceous mudstone, worm burrows, bioturbation, coaly inclusions at base
	115.93	0.75	SANDSTONE & MUDSTONE INTERBEDDED, as above
	116.02	0.09	SANDSTONE, dark grey, medium-grained, abundant shelly fossils, coaly inclusions
	116.66	0.64	SANDSTONE, as above
	116.72	0.06	COAL, dull and bright, stick
	116.76	0.04	COAL, dull banded, stick
	116.81	0.05	COAL, dull and bright, stick
	116.88	0.07	COAL, dull, stick
	116.93	0.05	COAL, dull banded, stick
	116.98	0.05	COAL, dull and bright, stick
	117.22	0.24	CLAYSTONE, carbonaceous, black, bright coal bands
	117.79	0.57	SANDSTONE & CLAYSTONE INTERBEDDED, carbonaceous mudstone and fine-grained sandstone, worm burrow and bioturbation
	117.85	0.06	COAL, dull banded
	118.11	0.26	SANDSTONE, light grey, fine-grained, cross-bedded
	119.98	1.87	SANDSTONE, as above
	120.26	0.28	LAMINITE, interbedded dark grey claystone and grey siltstone, regular-bedded
	120.71	0.45	LAMINITE, as above
	121.41	0.70	LAMINITE, as above
	121.81	0.40	MUDSTONE, dark grey, carbonaceous at base
	121.86	0.05	BRECCIA, mudstone fragments, rotated in calcite matrix, fault zone, repeat of laminite below
	122.18	0.32	SANDSTONE, fine-grained, light grey, small-scale cross-bedding

BH Nos. 22

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
19°	123.14	0.96	LAMINITE, thin bedded, regular-bedded, dark grey mudstone, grey siltstone
	123.87	0.73	LAMINITE, as above
	124.43	0.56	MUDSTONE, dark grey, carbonaceous at base
	124.46	0.03	COAL, dull and bright, stick
	124.47	0.01	COAL, bright, stick
	124.54	0.07	COAL, dull and bright, stick
	124.60	0.06	COAL, dull banded, stick
	124.67	0.07	COAL, bright banded, sheared, small pieces
	124.71	0.04	COAL, dull, small pieces
	125.09	0.38	CORE LOSS
	125.15	0.06	COAL, dull and bright, sheared, stick
	125.23	0.08	COAL, dull banded, sheared, stick
	125.26	0.03	COAL, dull, sheared, stick
	125.28	0.02	COAL, dull and bright, sheared, stick
	125.31	0.03	COAL, bright, small pieces
	125.36	0.05	COAL, dull banded, small pieces
	125.43	0.07	COAL, dull and bright, small pieces
	125.62	0.19	CORE LOSS
	125.63	0.01	COAL, bright, stick
	125.67	0.04	COAL, dull banded, stick
	125.73	0.06	COAL, dull, stick
	125.79	0.06	COAL, dull and bright, stick
	125.85	0.06	COAL, dull banded, stick
	125.92	0.07	COAL, dull, stick
	126.25	0.33	CORE LOSS
	126.29	0.04	COAL, dull, large pieces
	126.44	0.15	COAL, dull banded, large pieces
	126.45	0.01	CLAYSTONE, carbonaceous
	126.49	0.04	COAL, dull and bright, stick
	126.53	0.04	COAL, dull, stick
	126.61	0.08	COAL, dull, stick
	126.66	0.05	COAL, dull and bright, stick
	126.69	0.03	COAL, dull, stick
	126.83	0.14	CORE LOSS

BH Nos. 22

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	126.86	0.03	COAL, dull banded, large pieces
	126.99	0.13	CORE LOSS
	127.02	0.03	COAL, bright banded, large pieces
	127.15	0.13	CORE LOSS
	127.21	0.06	COAL, dull, large pieces
	127.34	0.13	CORE LOSS
	127.40	0.06	COAL, dull banded, large pieces
	127.47	0.07	COAL, dull and bright, stick
	127.55	0.08	COAL, dull, stick
	127.61	0.06	COAL, dull banded, stick
	127.65	0.04	COAL, dull and bright, stick
	127.69	0.04	COAL, bright, stick
	127.84	0.15	COAL, dull, stick
	127.88	0.04	COAL, dull banded, stick
	127.97	0.09	COAL, dull, stick
	128.00	0.03	COAL, dull banded, stick
	128.06	0.06	COAL, dull, stick
	128.10	0.04	COAL, dull and bright, stick, sheared
	128.26	0.16	COAL, dull, stick, sheared
	128.33	0.07	COAL, dull and bright, stick, sheared
	128.39	0.06	COAL, dull, stick
	128.43	0.04	COAL, dull banded, stick
	128.46	0.03	COAL, bright banded, sheared, large pieces
	128.59	0.13	CORE LOSS
	128.63	0.04	COAL, bright, sheared, large pieces
	128.66	0.03	COAL, dull and bright, sheared, stick
	128.71	0.05	COAL, bright banded, sheared, stick
	128.74	0.03	COAL, dull and bright, sheared, stick
	128.83	0.09	COAL, dull, stick
	128.85	0.02	COAL, bright banded
	128.90	0.05	COAL, dull, stick
	128.97	0.07	COAL, bright banded, sheared, small pieces
	129.06	0.09	COAL, dull, sheared, stick
	129.13	0.07	COAL, dull and bright, sheared, stick
	129.19	0.06	COAL, dull and bright, sheared, stick

BH Nos. 22

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	129.25	0.06	COAL, bright banded, sheared, stick
	129.33	0.08	COAL, dull and bright, sheared, small pieces
	129.35	0.02	COAL, bright, stick
	129.39	0.04	COAL, dull banded, stick
	129.62	0.23	CORE LOSS
	130.41	0.79	SANDSTONE, medium-grained, light grey, massive, carbonaceous at top with large bright coal inclusions
	130.43	0.02	COAL, dull and bright, fragments
22°	131.51	1.08	SANDSTONE, as above
	131.89	0.38	SANDSTONE, as above
	131.94	0.05	COAL, dull banded, fragments
	132.59	0.65	SANDSTONE, as above
	133.61	1.02	SANDSTONE, as above
	135.77	2.16	SANDSTONE, as above

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 23

Contractor: Connors

Commenced:

Completed:

Co-ordinates: 6,114,839.39 N
595,359.50 E
Surface Elevation: 1,458.28 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by:

Geologist	Depth
Geoff Jordan	1.83-19.81
Graham Wallis	22.86-28.34

Final Depth: 28.34

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar			
U. Gething			

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD				
CHAMBERLAIN				

NB collared beneath Chamberlain

F.PO. 21.333-26.0 highly fractured/steep dips

BH Nos. 23

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	1.83	1.83	TRICONED, rock rolled to 1.83m.
15°	3.05	1.22	SANDSTONE, medium-grained, light grey, carbonaceous at top, scattered interbeds of dark grey siltstone, phases of broken and weathered core, occasional irregular calcite filled fractures.
	3.96	0.91	AS ABOVE
	5.49	1.53	AS ABOVE
	6.10	0.61	AS ABOVE
	7.62	1.52	AS ABOVE
	9.14	1.52	AS ABOVE
	10.67	1.53	AS ABOVE
	12.19	1.52	AS ABOVE
25°	13.72	1.53	AS ABOVE
	15.24	1.52	AS ABOVE
	15.44	0.20	AS ABOVE
	15.85	0.41	SANDSTONE, as above with frequent interbeds of dark grey mudstone, clasts of sedimentary breccia at top, bedding disturbed by bioturbation.
	17.07	1.22	AS ABOVE
	17.57	0.50	AS ABOVE
	18.20	0.63	SANDSTONE, coarse-grained, fine-grained at top, light grey, occasional grey chert pebbles.
	18.89	0.69	AS ABOVE
25°	19.19	0.30	MUDSTONE, dark grey with sandstone phases and siltstone interbeds.
	19.81	0.62	SANDSTONE, coarse-grained, light grey, large bright coal inclusions, frequent pebbles and beds of conglomerate.
	21.33	1.52	SANDSTONE AS ABOVE
	22.86	1.53	SANDSTONE, medium-to coarse-grained, grading to fine-grained in basal 5m., finely cross-bedded throughout, medium grey, tending to light grey toward basal section. Mudstone partings throughout on bedding planes. Core fractured in upper 2.5m with calcite filled joints at

BH Nos. 23

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			25° to core axis, unit dipping at 35° at 22m., 25° at 24m., flat at 25m., 0.30m. zone of fractures with badly fractured at 26m.
35°	24.38	1.52	AS ABOVE
25°	25.90	1.52	AS ABOVE
	27.43	1.53	AS ABOVE
	28.34	0.91	AS ABOVE

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 24

Contractor: Connors

Commenced:

Completed:

Co-ordinates: 6,114,780.01 N
595,327.34 E
Surface Elevation: 1,475.79 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by:

Geologist	Depth
Andy Newson	12.19-38.10
	48.77-56.39
Geoff Jordan	38.40-47.03

Final Depth: 56.39

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar			
U. Gething	46.44		1,429.35

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD				
CHAMBERLAIN	46.44			1,429.35

BH Nos. 24

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	12.19	12.19	CASING
35°	13.72	1.53	SANDSTONE, coarse grained, light-medium grey, minor calcite filled joints, bedding faintly developed, carbonaceous intraclasts, top 3 m. broken & weathered.
	15.24	1.52	AS ABOVE.
	16.76	1.52	AS ABOVE
	18.29	1.53	AS ABOVE
	19.81	1.52	AS ABOVE
30°	21.34	1.53	SANDSTONE, medium grained, bedding and cross-bedding fairly well developed, numerous large worm burrows.
	22.86	1.52	SANDSTONE, medium-fine grained, medium grey, bedding poorly developed, becoming finer grained at base.
	24.38	1.52	AS ABOVE
	26.97	2.59	AS ABOVE
	28.38	1.41	AS ABOVE
	30.24	1.86	AS ABOVE
	31.88	1.64	AS ABOVE, calcite filled fracture with slick surfaces at 60° COM. B.C.A.
	33.25	1.37	AS ABOVE
	35.05	1.80	AS ABOVE
	36.58	1.53	AS ABOVE
	38.10	1.52	AS ABOVE
32°	38.40	0.30	SANDSTONE, fine grained, light grey, very clean
	39.92	1.52	AS ABOVE
	40.02	0.10	AS ABOVE
	40.05	0.03	COAL, dull banded, large piece, pyrite band at base
	40.06	0.01	COAL, bright, stick
	40.08	0.02	COAL, dull, stick, pyritic inclusions.

BH Nos. 24

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	40.11	0.03	COAL, dull, small pieces.
1	40.24	0.13	SANDSTONE, dark grey, fine grained, carbonaceous, silty.
			ROOF OF CHAMBERLAIN SEAM
	40.29	0.05	COAL, bright, core pulverized.
	40.35	0.06	COAL, dull and bright, pulverized.
	40.40	0.05	COAL, dull banded, pulverized.
	40.45	0.05	COAL, dull and bright, pulverized
	40.50	0.05	COAL, bright, core pulverized.
	40.52	0.02	COAL, bright,stick
	40.57	0.05	COAL, dull, stick
	40.59	0.02	COAL, bright, stick
	40.62	0.03	COAL, bright banded, stick
	40.67	0.05	COAL, bright,stick
	40.74	0.07	COAL, dull and bright, stick, sheared
	40.79	0.05	COAL, bright, stick, sheared
	40.83	0.04	COAL, dull and bright, stick, sheared
	40.88	0.05	COAL, dull banded, stick, sheared
	40.94	0.06	COAL, dull and bright, small pieces, sheared.
	40.97	0.03	COAL, dull and bright, stick, sheared.
	41.00	0.03	COAL, bright, stick, sheared.
	41.04	0.04	COAL, dull and bright, stick, sheared
	41.07	0.03	COAL, bright, stick, sheared.
	41.13	0.06	COAL, dull and bright, core pulverized, sheared.

BH Nos. 24

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	41.17	0.04	COAL, dull banded, pulverized, sheared.
	41.30	0.13	COAL, dull and bright, pulverized, sheared.
	41.39	0.09	COAL, dull banded, core pulverized, sheared.
	41.44	0.05	COAL, dull and bright, pulverized, sheared.
	41.48	0.04	COAL, dull, sheared, stick
	41.50	0.02	CLAYSTONE, carbonaceous, stick
	41.53	0.03	COAL, dull, sheared, stick
	41.58	0.05	COAL, dull and bright, sheared, core pulverized
	41.63	0.05	COAL, dull, sheared, core pulverized.
	41.73	0.10	COAL, dull, sheared, stick
	41.81	0.08	COAL, dull banded, sheared, stick
	41.90	0.09	COAL, dull, sheared, stick
	41.95	0.05	COAL, dull banded, sheared, stick
	42.01	0.06	COAL, dull and bright, sheared, stick
	42.05	0.04	COAL, dull banded, sheared, stick
	42.11	0.06	COAL, dull and bright, sheared, stick
	48.14	0.03	COAL, dull banded, sheared, stick
	42.16	0.02	COAL, bright, sheared, small pieces.
	42.19	0.03	COAL, dull banded, sheared, stick
	42.25	0.06	COAL, dull, sheared, stick
	42.27	0.02	COAL, bright, sheared, stick
	42.31	0.04	COAL, dull and bright, sheared, stick
	42.34	0.03	COAL, dull, sheared, stick
	42.36	0.02	COAL, bright, sheared, stick.
	42.64	0.28	CORE LOSS - COAL

BH Nos. 24

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	42.69	0.05	COAL, dull and bright, sheared, stick
	42.73	0.04	COAL, dull, sheared, stick
	42.76	0.03	COAL, bright, sheared, stick
	42.86	0.10	COAL, dull, sheared, stick
	42.93	0.07	COAL, dull banded, sheared, stick
	42.95	0.02	COAL, dull, sheared,stick
	43.03	0.08	COAL, dull banded, sheared, stick
	43.08	0.05	COAL, dull and bright, sheared stick
	43.13	0.05	COAL, dull banded, sheared, stick
	43.17	0.04	CLAYSTONE, carbonaceous
	43.24	0.07	COAL, dull and bright, sheared, stick
	43.28	0.04	COAL, bright, sheared, stick
	43.34	0.06	COAL, dull and bright, sheared, stick
	43.38	0.04	COAL, dull banded, sheared, stick
	43.41	0.03	COAL, bright, sheared,
	43.45	0.04	COAL, dull, sheared,
	43.48	0.03	COAL, dull and bright, sheared,
	43.58	0.10	COAL, dull and bright, sheared, core pulverized
	43.61	0.03	COAL, dull banded, sheared, large pieces.
	43.63	0.02	CLAYSTONE, carbonaceous, sheared.
	43.69	0.06	COAL, dull, sheared, large pieces.
	43.73	0.04	COAL, dull, sheared, stick
	43.81	0.08	COAL, dull banded, stick

BH Nos. 24

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	43.86	0.05	COAL, dull and bright, stick
	43.93	0.07	COAL, dull banded, stick
	44.01	0.08	COAL, dull, stick
	44.07	0.06	COAL, dull banded, stick
	44.09	0.02	CLAYSTONE, carbonaceous
	44.12	0.03	COAL, dull, stick
	44.13	0.01	COAL, dull and bright, stick
	44.17	0.04	COAL, dull and bright, stick
	44.20	0.03	CLAYSTONE, carbonaceous
	44.25	0.05	COAL, dull banded, large pieces, sheared
	44.35	0.10	COAL, dull and bright, large pieces, sheared.
	44.38	0.03	COAL, dull, large pieces, sheared.
	44.41	0.03	COAL, bright, sheared, stick
	44.45	0.04	CLAYSTONE, carbonaceous
	44.52	0.07	COAL, dull, stick
	44.55	0.03	COAL, dull and bright, stick
	44.57	0.02	COAL, dull, stick
	44.59	0.02	COAL, bright, stick
	44.66	0.07	COAL, dull banded, stick
	44.70	0.04	COAL, dull, stick
	44.76	0.06	COAL, dull and bright, stick
	44.81	0.05	COAL, dull banded, stick
	44.89	0.08	COAL, dull, stick
	44.90	0.01	COAL, bright, stick
	44.92	0.02	COAL, dull, stick

BH Nos. 24

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	44.94	0.02	COAL, dull and bright, stick
	44.96	0.02	COAL, bright, stick
	45.04	0.08	COAL, dull and bright, stick
	45.12	0.08	COAL, dull and bright, stick,
	45.14	0.02	CLAYSTONE, carbonaceous, small pieces
	45.17	0.03	COAL, dull and bright, core pulverized, sheared
	45.21	0.04	COAL, dull banded, stick
	45.25	0.04	COAL, dull and bright, stick
	45.34	0.09	COAL, dull banded, stick
	45.37	0.03	COAL, bright, stick
	45.40	0.03	COAL, bright banded, stick
	45.44	0.04	COAL, dull and bright, stick
	45.51	0.07	COAL, dull, large pieces.
	45.54	0.03	COAL, bright, pulverized
	45.56	0.02	COAL, dull and bright, pulverized
	45.58	0.02	COAL, bright, stick
	45.61	0.03	COAL, dull banded, stick
	45.63	0.02	COAL, bright, stick
	45.68	0.05	COAL, dull and bright, stick
	45.70	0.02	COAL, dull banded, stick
	45.84	0.14	COAL, dull and bright, stick
	45.89	0.05	COAL, bright banded, stick
	45.98	0.09	COAL, dull and bright
	46.01	0.03	COAL, bright, stick
	46.06	0.05	COAL, dull and bright, stick

BH Nos. 24

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	46.14	0.08	COAL, dull banded, stick
	46.17	0.03	COAL, dull and bright, stick
	46.21	0.04	COAL, dull, stick
	46.31	0.10	COAL, dull and bright, stick
	46.34	0.03	COAL, dull banded, stick
	46.36	0.02	COAL, bright, stick
	46.44	0.08	COAL, dull & bright, stick
			FLOOR OF CHAMBERLAIN SEAM
	47.03	0.59	SANDSTONE, medium grained, light grey, carbonaceous at top, coaly inclusions at top, very competent.
25°	48.77	1.74	SANDSTONE, coarse grained, dark grey- black, carbonaceous bedding fairly well developed, micaseous on bedding plane surface, transitional below.
	50.29	1.52	AS ABOVE
	51.82	1.53	AS ABOVE
	51.88	0.06	SANDSTONE, medium grained, dark grey, bioturbated, large worm burrows.
25°	52.18	0.30	SANDSTONE, medium-coarse grained, dark grey- black, carbonaceous, mica on bedding surfaces, pyritic especially on joint surfaces, bedding faintly developed.
	53.34	1.16	AS ABOVE
	54.86	1.52	AS ABOVE
	56.39	1.53	AS ABOVE

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 25A

Contractor: Connors

Commenced:

Completed:

Co-ordinates: 6,114,952.96 N
595,144.19 E
Surface Elevation: 1,446.88 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by:

Geologist	Depth
Geoff Jordan	8.12-15.24
	44.16-53.64
Andy Newson	17.24-44.20
	54.64-59.44

Final Depth: 59.44

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar	10.06		1,436.82
U. Gething	52.63		1,394.23

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD	14.82			1,432.06
CHAMBERLAIN	52.63			1,394.23
F.PO.	25.91	Fractured & slickensided		

BH Nos. 25A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	8.12	8.12	TRICONED
	8.23	0.11	SANDSTONE, medium-grained, iron stained, boulder
	9.20	0.97	MUDSTONE, dark grey, no bedding observed, pyritic worm burrows, Moosebar formation, weathered
	9.26	0.06	CLAYSTONE, grey/white, soft, weathered, bentonitic
	9.47	0.21	MUDSTONE, as above
	9.53	0.06	CLAYSTONE, as above
	10.06	0.53	SANDSTONE, dark green, glauconitic, pyritic worm burrows, bedding distrubed by bioturbation Moosebar
	11.07	1.01	CORE LOSS-COAL U. Gething
	11.23	0.16	COAL, dull banded, fragments
	11.40	0.17	COAL, dull, small pieces
	11.50	0.10	COAL, dull, fragments
	11.59	0.09	COAL, dull, small pieces
	11.71	0.12	COAL, dull, weathered, stick
	11.89	0.18	COAL, dull, fragmented, earthy, weathered
	12.00	0.11	COAL, dull banded, pulverized
	12.04	0.04	COAL, bright, pulverized
	12.12	0.08	COAL, dull and bright, pulverized
	12.19	0.07	COAL, dull, pulverized
	12.21	0.02	COAL, dull and bright, pulverized
	12.25	0.04	CLAYSTONE, carbonaceous
	12.34	0.09	COAL, dull and bright, pulverized
	12.40	0.06	COAL, bright, pulverized
	12.43	0.03	COAL, dull, pulverized
	12.48	0.05	COAL, bright, pulverized
	12.54	0.06	COAL, dull, pulverized
	12.61	0.07	COAL, dull and bright, pulverized
	12.63	0.02	COAL, bright, pulverized
	12.74	0.11	COAL, dull and bright, pulverized
	13.20	0.46	CLAYSTONE, carbonaceous, weathered
	14.48	1.28	MUDSTONE, dark grey, carbonaceous phases and bright coal bands, badly weathered
	14.52	0.04	COAL, dull and bright, fragments
	14.55	0.03	COAL, bright, fragments, sheared

BH Nos. 25A

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	14.58	0.03	COAL, dull and bright, fragments, sheared
	14.64	0.06	COAL, bright banded, fragments, sheared
	14.65	0.01	PYRITE
	14.69	0.04	COAL, bright, sheared, powdered
	14.72	0.03	COAL, dull and bright, sheared, powdered
	14.82	0.10	CLAYSTONE, carbonaceous, core fragmented at top, small pieces at base, bright coal bands and fragments
	15.24	0.42	SANDSTONE, medium-grained, light grey, carbonaceous at top
	17.24	2.00	SANDSTONE, coarse/medium-grained, dark grey/black, carbonaceous, mottled with small worm burrows, bedding faint-poorly developed, minor calcite filled joints
	18.29	1.05	SANDSTONE, as above
	19.81	1.52	SANDSTONE, as above
	20.71	0.90	SANDSTONE, as above
40°	21.34	0.63	SANDSTONE, coarse/medium-grained, medium-dark grey, bedding distinct, minor mudstone bands, minor calcite filled cracks
	22.86	1.52	SANDSTONE, as above
	24.38	1.52	SANDSTONE, as above
	24.91	0.53	SANDSTONE, light-dark grey, bioturbated-large burrows, bedding indistinct, coarse/medium-grained,
	25.91	1.00	SANDSTONE, medium-grained, light grey, bedding distinct, numerous calcite filled fractures with slicks, fault breccia 0.08m thick at top, (joints 25° to strike 70° dip, joints 65° strike 53° dip, slicks and movement on bedding plane parallel to dip)
	27.43	1.52	SANDSTONE, as above
	28.96	1.53	SANDSTONE, as above
45°	30.48	1.52	SANDSTONE, as above
	31.00	0.52	SANDSTONE, as above
	32.00	1.00	SANDSTONE, medium-grained, light/medium grey, bedding faint, broken and slicked
	33.53	1.53	SANDSTONE, as above
	35.05	1.52	SANDSTONE, as above
	36.58	1.53	SANDSTONE, as above
	37.38	0.80	SANDSTONE, as above
	38.10	0.72	SANDSTONE, medium-fine-grained, light/medium grey, clean

BH Nos. 25A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			bedding faint, minor calcite filled fractures
	39.62	1.52	SANDSTONE, as above
	41.15	1.53	SANDSTONE, as above
	42.67	1.52	SANDSTONE, as above
35°	43.21	0.54	SANDSTONE, as above
	44.16	0.95	SANDSTONE, fine-grained, light grey, very clean, competent
	44.18	0.02	SANDSTONE, as above
	44.99	0.81	SILTSTONE, grey with phases of sandstone at top, carbonaceous inclusions towards base
	45.05	0.06	COAL, dull banded, large pieces
	45.10	0.05	COAL, dull and bright, stick
	45.16	0.06	COAL, bright banded, stick
	45.21	0.05	COAL, dull and bright, stick
	45.24	0.03	COAL, dull and bright, small pieces
	45.29	0.05	COAL, dull, stick
	45.32	0.03	COAL, dull and bright, stick
	45.35	0.03	COAL, bright, large pieces
	45.41	0.06	COAL, dull and bright, large pieces
	45.44	0.03	COAL, bright banded, large pieces
	45.48	0.04	COAL, dull, large pieces
	45.60	0.12	CLAYSTONE, carbonaceous, black
38°	46.00	0.40	SILTSTONE, dark grey with frequent interbeds of dark grey claystone and phases of light grey sandstone, large coaly inclusions towards base
	46.10	0.10	COAL, dull, sheared, stick
	46.14	0.04	COAL, bright, sheared, stick
	46.18	0.04	COAL, dull and bright, sheared, stick
	46.28	0.10	COAL, dull, sheared, stick
	46.33	0.05	COAL, dull banded, sheared, stick
	46.40	0.07	COAL, dull, sheared, stick
	46.88	0.48	CLAYSTONE, dark grey, carbonaceous at top, appears weathered
	48.60	1.72	SANDSTONE, medium-grained, light grey, claystone clasts in top 0.30m
35°	49.48	0.88	LAMINITE, thin-bedded, regular-bedded, light grey siltstone with dark grey claystone, core broken at base

BH Nos. 25A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	49.52	0.04	COAL, dull and bright, sheared, fragments
	49.60	0.08	CORE LOSS-COAL
	49.69	0.09	COAL, dull, sheared, stick
	49.73	0.04	COAL, dull and bright, sheared, stick
	49.76	0.03	COAL, bright, sheared, stick
	49.79	0.03	COAL, dull banded, sheared, stick
	49.82	0.03	COAL, bright, sheared, large pieces
	49.84	0.02	COAL, dull, sheared, stick
	49.86	0.02	COAL, dull and bright
	49.92	0.06	CORE LOSS-COAL
	49.98	0.06	COAL, dull and bright, sheared, large pieces
	50.03	0.05	COAL, bright banded, sheared stick
	50.06	0.03	COAL, dull and bright, sheared, stick
	50.17	0.11	COAL, dull, sheared, stick
	50.24	0.07	COAL, dull and bright, sheared, stick
	50.27	0.03	COAL, dull banded, sheared, large pieces
	50.30	0.03	COAL, dull and bright, sheared, fragments
	50.32	0.02	CLAYSTONE, carbonaceous
	50.36	0.04	COAL, dull banded, sheared, fragments
	50.39	0.03	COAL, bright banded, sheared, stick
	50.42	0.03	COAL, dull, sheared, stick
	50.44	0.02	COAL, bright, sheared, stick
	50.50	0.06	COAL, dull and bright, sheared, stick
	50.55	0.05	COAL, bright, sheared, stick
	50.62	0.07	COAL, dull, sheared, stick
	50.68	0.06	COAL, dull banded, sheared, stick
	50.70	0.02	COAL, bright, sheared, stick
	50.78	0.08	COAL, dull and bright, sheared, stick
	50.81	0.03	CLAYSTONE, carbonaceous, coal bands
	50.89	0.08	COAL, dull banded, sheared, stick
	50.94	0.05	COAL, dull banded, sheared, stick
	50.98	0.04	COAL, dull and bright, sheared, stick
	51.02	0.04	COAL, dull, sheared, stick

BH Nos. 25A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	51.13	0.11	COAL, dull and bright, sheared, stick
	51.20	0.07	COAL, dull, sheared, stick
	51.22	0.02	COAL, dull and bright, sheared, stick
	51.26	0.04	COAL, dull and bright, sheared, large pieces
	51.31	0.05	COAL, bright banded, sheared, stick
	51.33	0.02	COAL, dull and bright, sheared, stick
	51.39	0.06	COAL, bright banded, sheared, large pieces
	51.42	0.03	COAL, dull and bright, sheared, large pieces
	51.47	0.05	COAL, dull banded, sheared, stick
	51.52	0.05	COAL, dull and bright, sheared, stick
	51.60	0.08	COAL, dull, sheared, stick
	52.14	0.54	CORE LOSS-COAL
	52.18	0.04	COAL, dull and bright, sheared, fragments
	52.24	0.06	COAL, bright, sheared, fragments
	52.32	0.08	COAL, dull banded, sheared, stick
	52.39	0.07	COAL, bright banded, sheared, stick
	52.42	0.03	COAL, dull banded, sheared, stick
	52.45	0.03	COAL, bright, sheared, stick
	52.51	0.06	COAL, dull banded, sheared, stick
	52.57	0.06	COAL, dull, sheared, stick
	52.61	0.04	COAL, dull and bright, sheared, stick
	52.63	0.02	COAL, bright, sheared, stick
	52.67	0.04	SANDSTONE, medium-grained, light grey, carbonaceous at top, scattered fine interbeds of carbonaceous mudstone
	53.64	0.97	SANDSTONE, as above
45°	54.64	1.00	SANDSTONE, coarse/medium-grained, dark grey/black, well-bedded, mica on bedding planes, becoming finer and cleaner towards the base, 0.20 of large burrows at 58.60m, broken and slicks at 57.51-58.60
	55.04	0.40	SANDSTONE, as above
	56.39	1.35	SANDSTONE, as above
	57.91	1.52	SANDSTONE, as above
	59.44	1.53	SANDSTONE; as above

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 26

Contractor: Tonto

Commenced: Aug 31, 1977

Completed: Sept 12, 1977

Co-ordinates: 6,115,267.46 N
593,351.47 E
Surface Elevation: 1,710.94 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } See detail page 1a
Hole Azimuth: }

Logged by:

Geologist	Depth
Bill Nyland	16.46-232.40
Mike DeMestre	236.52-438.19
Geoff Jordan	438.94-483.62

Final Depth: 483.62

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross	31.60	31.60	1,679.34
Gates	232.40	200.8	1,478.54
Sukunka	361.90	129.50	1,349.04
Moosebar	440.23	78.33	1,270.71
U. Gething	480.75	40.52	1,230.19

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD	442.90			1,268.04
CHAMBERLAIN	480.75			1,230.19

F.P.O. 331.01 Fractured, slickensided & brecciated

Sperry-Sun Survey

Date: 13th September 1977

Borehole: BP 26 Sukunka 77

Compass: 20° Maximum to magnetic North

BPB Operator: P. J. Waters

Measured Depth	Tilt	Tilt Direction
480m	0° 30'	N 35° W
450m	0° 45'	N 76° W
400m	0° 30'	N 76° W
350m	1° -	N 84° W
300m	1° -	- W -
250m	1° 15'	S 80° W
200m	1° 30	S 77° W
150m	2° 15'	S 74° W
100m	2° 30'	S 75° W
50m	3° 30'	S 83° W

P.S. Peculiar results

BH Nos. 26

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	16.46	16.46	Triconed, no Core.
	17.07	0.61	SANDSTONE/SILTSTONE: broken, highly weathered to extremly weathered, iron stained. Clay in various quantities.
	20.12	3.05	SANDSTONE/SILTSTONE: as above
	23.16	3.04	SANDSTONE/SILTSTONE: as above
	23.93	0.77	SANDSTONE/SILTSTONE: Clay, as above.
	26.21	2.28	SANDSTONE/SILTSTONE: thinly laminated sandstone, very fine grained, grey, argillaceous, siltstone dark-grey to black, highly weathered, numerous iron stained joints and fractures, in part broken.
	29.26	3.05	SANDSTONE/SILTSTONE: as above.
	31.60	2.34	SANDSTONE/SILTSTONE: as above, moderately weathered.
			HULCROSS GATES
	31.63	0.03	PEBBLE BAND: varicoloured, well rounded chert and quartzite.
	32.41	0.78	SILTSTONE: muddy, dark grey to black, numerous carbonaceous partings, numerous pyritic blebs and bands.
	32.67	0.26	SAND BAND: unconsolidated medium-grained sand, iron stained, angular to sub-angular.
	33.71	1.04	SILTSTONE: muddy, dark grey to black, numerous carbonaceous bands and pyritic blebs and bands, gradational contact with sandstone below.
	34.02	0.31	SANDSTONE: very fine-grained, dark grey, argillaceous pyritic blebs and disseminations, calcareous.
	34.35	0.33	SANDSTONE: fine to very fine-grained, grey, in part thinly laminated, calcareous.
	34.73	0.38	SANDSTONE: very fine-grained, dark-grey, argillaceous, carbonaceous and bright bands, numerous rootlets at top of sections.
	35.36	0.63	SANDSTONE/SILTSTONE: dark-grey, laminated, argillaceous, small bioturbated bands and ferruginous bands.
	38.19	2.83	SANDSTONE/SILTSTONE: as above
	38.40	0.21	SILTSTONE: muddy, dark-grey to black, numerous carbonaceous partings.

BH Nos. 26

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	39.62	1.22	SILTSTONE: as above, very carbonaceous toward bottom of section, numerous associated bright bands.
	40.26	0.64	COAL: dull, lustrous, cubic type cleavage.
	41.15	0.89	SILTSTONE: muddy, black, carbonaceous.
	41.96	0.81	SANDSTONE: fine to very fine-grained, argillaceous minor silty laminae, minor small slump structures.
	42.09	0.13	SILTSTONE: muddy, black carbonaceous, minor bright bands and pyrite along fractures.
	42.47	0.38	COAL: dull, lustrous with bright band fissile.
	42.53	0.06	MUDSTONE: black, carbonaceous, bright banded.
	43.26	0.73	SILTSTONE: dark-grey, to black muddy, minor carbonaceous fragments.
	43.54	0.28	SANDSTONE: very fine-grained, argillaceous.
	43.69	0.15	MUDSTONE: black with bright coal stringers.
	44.20	0.51	SANDSTONE: fine-grained, argillaceous, bioturbated by pin burrows.
	44.36	0.16	SANDSTONE: as above.
	45.47	1.11	MUDSTONE: black, carbonaceous, listricated, broken, numerous bright bands grading into sandstone below.
	45.77	0.30	SANDSTONE: medium-grained, light-grey, with darker cross-beds, weakly calcareous.
	47.02	1.25	SANDSTONE: fine to very fine-grained, grey with small worm burrows and slump structures, minor inter-laminations of siltstone.
	47.43	0.41	SILTSTONE: muddy, black, carbonaceous, minor bright bands.
	47.48	0.05	SILTSTONE: as above, grading into sandstone/siltstone below.
	48.27	0.79	SANDSTONE/SILTSTONE: laminated sandstone, medium- to very fine-grained, argillaceous, slumped and burrowed. Siltstone black, similar structure as that of sandstone. Minor bright, carbonaceous fragments, strongly calcareous.
	48.47	0.20	SILTSTONE: black, muddy, minor carbonaceous inclusions.

BH Nos. 26

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	50.60	2.13	SANDSTONE/SILTSTONE: dark-grey to black, argillaceous, a very fine-grained to silty sandstone.
	52.43	1.83	SANDSTONE/SILTSTONE: grading from above to interbedded fine-grained sandstone and black siltstone, slumped and mixed.
	53.34	0.91	SANDSTONE: grey, medium to fine-grained, minor slump structures with associated siltstone bands, moderately calcareous.
	56.39	3.05	SANDSTONE: as above
	56.43	0.04	SANDSTONE: as above
	58.80	2.37	SANDSTONE/SILTSTONE: interlaminated sandstone, very fine-grained, grey to light-grey, strongly calcareous with siltstone dark-grey to black, numerous small slump structures, minor worm burrows, very carbonaceous at top of section.
	59.74	0.94	SANDSTONE: as above, fine-grained, argillaceous, bioturbated. FOSSIL ZONE: Pelecypods from 59.24m to 60.24m
	60.64	0.90	SANDSTONE: as above
	61.14	0.50	SANDSTONE: fine-grained, frey, uniform gradation contact with below.
	62.04	0.90	SANDSTONE/SILTSTONE: laminated, fine-grained, grey with dark-grey to black siltstone, slumped and small worm burrowed miniscus structures, siltier toward bottom of section.
	62.79	0.75	SANDSTONE: fine to very fine-grained, grey, argillaceous with minor light-grey bands, minor cross-beds.
	63.04	0.25	SANDSTONE: as above.
	65.84	2.80	SANDSTONE: fine-grained, argillaceous, very large slump structures, listric surfaces between 65.94m and 66.14m (a) angles from 22° to 30°
	68.78	1.06	SANDSTONE: fine to very fine-grained, thinly laminated, carbonaceous material, cross-laminated.
	68.88	0.10	SANDSTONE: medium to fine-grained, grey, poorly sorted, subangular to subrounded, strongly calcareous.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	71.93	3.05	SANDSTONE: as above, minor bands of granule sized mud clasts.
	72.95	1.02	SANDSTONE: as above
	73.85	0.90	SANDSTONE: as above but medium to coarse-grained.
	74.98	1.13	SANDSTONE: very fine-grained, dark-grey, argillaceous, minor slump structures.
	75.78	0.80	SANDSTONE/SILTSTONE: laminated sandstone, very fine-grain, grey, argillaceous in part, minor burrows and ferruginous bands.
	76.78	1.00	SANDSTONE: medium-grained, grey, subrounded, moderated calcareous, minor dark-grey to black siltstone bands.
	78.03	1.25	SANDSTONE/SILTSTONE: fine-grained, laminated, grey to bands of dark-grey to black, slightly calcareous, minor bands of mud clasts.
	78.13	0.10	SANDSTONE/SILTSTONE: as above.
	78.93	0.80	SANDSTONE: medium to fine-grained , grey, subangular to sub rounded, poorly sorted.
	79.40	0.47	SANDSTONE/SILTSTONE: laminated sandstone, fine to very fine-grained.
	81.08	1.68	SANDSTONE: medium to fine-grained, grey, subangular to sub-rounded, poorly-sorted, strongly calcareous.
	81.11	0.03	SANDSTONE: as above.
	82.07	0.96	SANDSTONE: medium to fine-grained, grey, subangular to sub-rounded, poorly-sorted, numerous large and small slump structures with associated siltstones, minor siltstone bands throughout section, minor small burrows also present.
	82.47	0.40	SANDSTONE: as above.
	82.78	0.31	SANDSTONE/SILTSTONE: laminated sandstone, very fine-grained, grey, siltstone dark-grey to black.
	82.83	0.05	CONGLOMERATE: granule size in fine sand matrix, angular to subrounded varicolour chert and quartzite pebbles.
	83.03	0.20	SANDSTONE: fine-grained, grey, argillaceous, burrows.
	83.16	0.13	SILTSTONE: dark-grey, minor sandy lenses.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	83.51	0.35	CONGLOMERATE: pebbles, poorly-sorted sub-to well-rounded varicoloured chert and quartzite pebbles, medium to fine sand matrix.
	84.12	0.61	SANDSTONE: medium to fine-grained , dark-grey.
	86.42	2.30	SANDSTONE: as above
	87.17	0.75	SANDSTONE/SILTSTONE: laminated, sandstone very fine-grained in part, argillaceous with siltstone dark-grey to black, minor ferruginous bands, minor horizontal pin burrows at bottom of section.
	90.22	3.05	SILTSTONE: sandy, very fine-grained , argillaceous, dark-grey,minor light-grey, calcareous bands, numerous randomly oriented pin burrows, minor ferruginous bands.
	90.72	0.50	SILTSTONE: sandy, as above.
	93.27	2.55	SANDSTONE/SILTSTONE: laminated sandstone, fine-grained grey, argillaceous with large bands of siltstone, dark-grey to black, numerous small worm burrows throughout siltstone and sandstone. Minor light grey bands weakly calcareous, bioturbated at top of section.
	93.88	0.61	SANDSTONE/SILTSTONE: as above, numerous long small burrows at bottom of section exhibiting miniscus structures, grading into sandstone below.
	94.08	0.20	SANDSTONE: fine-grained, grey, uniform.
	94.58	0.50	SANDSTONE: fine-grained, argillaceous with banded siltstone pin burrows in middle of section.
	95.30	0.72	SANDSTONE: fine-grained, grey, uniform.
	96.32	1.02	SANDSTONE: as above, with numerous mud clasts, slumps and worm burrowed zones, argillaceous, bioturbated, minor silty bands.
	100.26	3.94	SANDSTONE: as above.
	101.36	1.10	MUDSTONE: silty black, minor bright bands, grading into laminated sandstone below.
	102.41	1.05	SANDSTONE: very fine-grained,with argillaceous bands, laminated, cross-laminated and slumped, moderately calcareous.
	103.45	1.04	SILTSTONE: muddy, dark-grey to black, minor ferruginous band, gradational contact with sandstone below.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	103.86	0.41	SANDSTONE: very fine-grained, grey to light-grey, cross-laminated and minor small slumps structures, strongly calcareous.
	105.46	1.60	SILSTONE/SANDSTONE: argillaceouslaminated sandstone, very fine-grained dark-grey with laminated, black muddy siltstone.
	105.54	0.08	SILTSTONE/SANDSTONE: as above.
	107.94	2.40	SANDSTONE: very fine-grained, grey to light-grey, cross-laminated with minor slump structures, strongly calcareous, grading into siltstone below, minor siltstone bands throughout section.
	108.24	0.30	SILTSTONE: dark-grey to black, sandy, small light-grey bands, numerous black small horizontal burrows, minor ferruginous band.
	110.04	1.80	SILTSTONE: as above, grading into siltstone below.
	110.52	0.48	SILTSTONE: sandy, very fine-grained, grey, argillaceous, laminated, cross-laminated and slumped, grading into silty mudstone below.
	110.82	0.30	MUDSTONE: silty black, minor bright bands.
	111.62	0.80	MUDSTONE: as above, carbonaceous toward bottom of section, minor listrication at 45°.
	112.19	0.57	COAL SEAM "E" ZONE: Coal - dull, lustrous with bright bands, listricated, stick, 0.23m. Coal - dull with minor bright bands, stick, 0.05m Coal - dull, heavy, numerous bright bands (high ash) 0.14m.
	113.48	1.29	MUDSTONE: black, carbonaceous, numerous fossil plant fragments, listricated in part, minor bright bands.
	113.58	0.10	COAL: dull, heavy, numerous bright bands (high ash).
	113.64	0.06	COAL: as above.
	113.82	0.18	MUDSTONE: carbonaceous, black, minor bright stringers.
	113.99	0.17	COAL: bright and dull banded, heavy, high ash, stick.
	114.36	0.37	COAL: dull, heavy, minor bright bands, heavy ash, stick.
	114.40	0.04	COAL: bright and dull banded.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	114.44	0.04	COAL: bright with dull bands.
	114.51	0.07	MUDSTONE: carbonaceous, dark-brown, silty.
	114.69	0.18	COAL: bright and dull banded, listricated at 50°.
	115.29	0.60	MUDSTONE: black, carbonaceous, numerous fossil plant fragments.
	115.39	0.10	COAL: bright with dull bands, strongly calcareous.
	115.75	0.36	MUDSTONE: black, carbonaceous, listricated in random orientation.
	115.83	0.08	COAL: dull, lustrous with very dull fragments.
	116.05	0.22	COAL: bright and dull banded with small mudstone lenses, listricated in part.
	116.18	0.13	COAL: dull with minor bright bands, heavy (high ash).
	116.26	0.08	SILTSTONE: muddy, dark-grey, minor carbonaceous partings.
	116.42	0.16	COAL: dull, lustrous with minor very small bright partings.
	116.76	0.34	COAL: dull, lustrous with bright bands fractured at 60°.
	116.85	0.09	COAL: bright and dull banded.
	116.92	0.07	COAL: dull with bright bands, horizontal, listricated, surfaces.
	116.98	0.06	SILTSTONE: grey, sandy with bright bands.
	117.44	0.46	MUDSTONE: black, carbonaceous with numerous bright bands and fossil plant fragments.
	117.60	0.16	COAL: dull, lustrous with bright bands, listricated at 20° and near perpendicular.
	118.41	0.81	SANDSTONE: dark-grey, very fine-grained, carbonaceous, argillaceous, numerous rootlets at top of section, gradational lower contact.
	119.87	1.46	SANDSTONE: medium-to fine-grained, laminated, minor slump structures and cross-laminations, mildly calcareous. minor argillaceous bands.
	122.01	2.14	SANDSTONE: grey, fine-grained, argillaceous with minor siltstone bands towards bottom of section, mildly calcareous.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	122.51	0.50	SILTSTONE: dark-grey to black, sandy bands, carbonaceous towards bottom of section.
	122.93	0.42	COAL SEAM "D" HORIZON: Coal - dull with bright bands, heavy, high ash, 0.05m. Coal - bright and dull banded, bedding at 30°, listricated at bottom of section, 0.17m. Coal - as above, but fissile, sheared 0.03m.
	123.05	0.12	MUDSTONE: silty, black, carbonaceous, grading into below
	123.38	0.33	SANDSTONE: very fine-grained, argillaceous, laminated siltstone.
	124.75	1.37	SILTSTONE: muddy, dark-grey to black, minor sandy lenses grading into sandstone at bottom of section.
	125.90	1.15	SANDSTONE: very fine-grained, grey, argillaceous, numerous small slump structures, strongly calcareous.
	126.68	0.78	SANDSTONE: as above.
	128.62	1.94	SANDSTONE/SILTSTONE: laminated, fine to very fine-grain light-grey siltstone, dark-grey sandstone, more siltstone towards bottom of section, slump structure, minor listrication, strongly calcareous.
	129.16	0.54	SILTSTONE/SANDSTONE: as above, grading into muddy siltstone.
	131.84	2.68	SILTSTONE: muddy, black, minor sandy areas, minor bright stringers, numerous fossil plant fragments on bedding planes, numerous ferruginous bands.
	132.26	0.42	SILTSTONE: as above, carbonaceous towards bottom of section.
	132.97	0.71	COAL SEAM "D" HORIZON: Coal - bright and dull banded, 0.14m Coal - bright and dull bands, 0.31m Coal - dull, lustrous with minor bright bands, 0.05m Coal - dull, lustrous with numerous thin bright bands, 0.23m.
	133.20	0.23	SILTSTONE: muddy, carbonaceous, dark-grey to black, numerous bright bands.
	133.25	0.05	COAL: dull, heavy, minor bright bands (high ash).
	133.32	0.07	COAL: bright and dull banded.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	133.42	0.10	COAL: dull with numerous thin bright bands.
	133.50	0.08	COAL: dull, heavy, minor bright bands (high ash).
	133.73	0.23	COAL: dull and bright banded, bright bands very thin listrified.
	133.83	0.10	MUDSTONE: dark-brown, silty.
	134.04	0.21	COAL: dull with bright bands, broken with mudstone fragments.
	134.16	0.12	MUDSTONE: carbonaceous, minor bright stringers.
	134.19	0.03	COAL: dull, lustrous with bright bands.
	134.26	0.07	MUDSTONE: carbonaceous with bright stringers.
	134.33	0.07	COAL: dull, with bright bands, heavy, high ash.
	134.71	0.38	SILTSTONE: sandy, dark-grey, minor bright bands, grading into sandstone.
	134.95	0.24	SANDSTONE: fine-grained, grey, laminated, slightly calcareous.
	135.05	0.10	SANDSTONE; very fine-grained to silty argillaceous.
	135.36	0.31	SANDSTONE: as above
	136.00	0.64	SANDSTONE: fine-grained, grey, laminated, weakly calcareous.
	136.97	0.97	SILTSTONE: dark grey to black, minor ferruginous bands.
	137.05	0.08	COAL: dull, heavy, minor bright bands, high ash.
	137.14	0.09	MUDSTONE: silty, carbonaceous, black.
	137.19	0.05	COAL: dull, heavy, minor bright bands, high ash
	137.30	0.11	SANDSTONE: very fine-grained, argillaceous, numerous rootlets, grading into siltstone.
	137.96	0.66	SILTSTONE: dark-grey to black, sandy, minor carbonaceous partings.
	138.76	0.80	SANDSTONE: very fine-grained, argillaceous, minor silty bands.
	139.06	0.30	SANDSTONE: light-grey, fine-grained, laminated, strongly calcareous.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	139.76	0.70	SANDSTONE: very fine-grained, laminated, bioturbated at bottom of section, grading into muddy siltstone.
	140.98	1.22	SILTSTONE: muddy, dark-grey to black, numerous ferruginous bands, grading to mudstone.
	141.01	0.03	MUDSTONE: black, silty, fractured.
	143.14	2.13	MUDSTONE: as above.
	143.53	0.39	SILTSTONE: sandy, dark-grey, grading into very fine-grain sandstone.
	143.92	0.39	SANDSTONE: very fine-grained, cross-bedded argillaceous
	144.29	0.37	MUDSTONE: black, minor sandy partings.
	144.62	0.33	MUDSTONE: as above, carbonaceous towards bottom with listrications.
	145.20	0.58	COAL SEAM "C" ZONE: Coal - dull with bright bands, stick 0.08m. Coal - section broken and sheared indication of bright and dull, dull lustrous with bright bands and dull type coals-0.37m.
	145.26	0.06	SANDSTONE: fine-grained, black, carbonaceous.
	145.90	0.64	SANDSTONE: fine-grained, grey uniform, minor rootlets top of section.
	147.45	1.55	SANDSTONE: fine-grained, grey, uniform, bioturbated and small worm burrowed.
	147.50	0.05	SANDSTONE: very coarse-grained to granular poorly sorted sub-rounded.
	147.55	0.05	SANDSTONE: fine-grained, grey, minor pebbles throughout occassional mudstone bands.
	150.39	2.84	SANDSTONE: as above.
	150.47	0.08	PEBBLE BAND: poorly-sorted subrounded, fine to medium sand matrix.
	150.67	0.20	SANDSTONE: medium to fine-grained, light-grey, scattered pebbles and pebble bands throughout, cross-bedded.
	152.28	1.61	SANDSTONE: as above.
	153.78	1.50	SANDSTONE: fine-grained, light-grey, minor siltstone bands. numerous large horizontal burrows.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	154.38	0.60	SANDSTONE: as above.
	156.87	2.49	SANDSTONE: fine to very fine-grained, light-grey, minor laminations, minor granulite size mud-clast bands, moderately calcareous.
	159.95	3.08	SANDSTONE: as above.
	163.04	3.09	SANDSTONE: as above.
	166.13	3.09	SANDSTONE: as above.
	166.68	0.55	SANDSTONE: as above.
	166.91	0.23	SANDSTONE/SILTSTONE: interbedded sandstone, very fine-grained, argillaceous siltstone, dark-grey to black, slump structur
	167.89	0.98	SANDSTONE: fine to very fine-grained. light-grey, minor laminations, minor granule sized mud-clast bands, weakly calcareous.
	167.98	0.09	SILTSTONE: dark-grey to black.
	169.30	1.32	SANDSTONE: as two above.
	169.50	0.20	SANDSTONE/SILTSTONE: interbedded sandstone, fine-grained argillaceous siltstone, muddy-black.
	169.85	0.35	SILTSTONE: muddy-black.
	172.51	2.66	SANDSTONE: fine to very fine-grained, light-grey, minor laminations, weakly calcareous.
	174.61	2.10	SANDSTONE: as above.
	175.59	0.98	SANDSTONE: as above with banded argillaceous material.
	176.02	0.43	SANDSTONE: as above with minor bright stringers.
	176.18	0.16	SANDSTONE: very fine-grained, grey, siltstone, blackinterbedded.
	177.16	0.98	SANDSTONE: fine to very fine-grained, laminated, grey, cross-bedded.
	177.39	0.23	SANDSTONE/SILTSTONE: interbedded.
	177.48	0.09	CONGLOMERATE: varicolored, well-rounded chert and quartzite pebbles in very fine sandstone matrix.
	177.58	0.10	SANDSTONE/SILTSTONE: laminated.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	177.69	0.11	CONGLOMERATE: poorly-sorted, sub-rounded, varicolored chert and quartzite pebbles, in a very fine sand matrix.
	178.03	0.34	COAL SEAM "B" HORIZON: Coal - bright and dull banded with a small sandstone lens, 0.06m. Coal - bright and dull, 0.20m.
	178.18	0.15	SANDSTONE: very fine-grained, argillaceous, grading into siltstone.
	179.42	1.24	SILTSTONE: dark-grey to black, sandy.
	180.68	1.26	SANDSTONE: fine-to very fine-grained, grey, slightly argillaceous with minor siltstone bands.
	181.06	0.38	SILTSTONE: sandy, black, grading into sandstone below.
	181.66	0.60	SANDSTONE: very fine-grained, grey, argillaceous, cross-laminated with slump structures.
			COAL SEAM "A" HORIZON.
	181.81	0.15	COAL: bright and dull banded broken.
	181.87	0.06	CONGLOMERATE: carbonaceous, granular listricated, angular, well-sorted chert and quartzite granules.
	182.90	1.03	SILTSTONE: mud, carbonaceous, black, bright stringers, ferruginous bands.
	183.43	0.53	SANDSTONE/SILTSTONE: laminated, argillaceous, fine-grained, sandstone grey, siltstone, black.
	184.71	1.28	CONGLOMERATE: granular poorly-sorted, sub-rounded to rounded, varicolored chert and quartzite pebbles.
	185.01	0.30	CONGLOMERATE: as above
	185.23	0.22	SANDSTONE: grey, fine-grained, argillaceous, minor carbonaceous partings.
	186.10	0.87	CONGLOMERATE: granular, as two above.
	187.76	1.66	CONGLOMERATE: pebbles, poorly-sorted, sub-to well-rounded varicolored chert and quartzite pebbles.
	189.46	1.70	CONGLOMERATE: as above, with larger pebbles in a very coarse sandstone matrix.
	190.80	1.34	CONGLOMERATE: granular with some pebbles, poorly-sorted, sub-to well-rounded varicolored chert and quartzite pebbles.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	191.84	1.04	CONGLOMERATE: as above.
	192.81	0.97	SANDSTONE: coarse to medium-grained, poorly-sorted, angular to sub-angular pebble band at 172.10 12cm thick.
	192.94	0.13	SANDSTONE: very fine-grained, argillaceous with carbonaceous material on bedding planes.
	193.14	0.20	CONGLOMERATE: granular , poorly-sorted, sub-angular to sub-rounded, varicolored chert and quartzite granuls.
	193.85	0.71	SANDSTONE: very coarse-grained to granular, sub-angular to sub-rounded chert and quartzite.
	194.31	0.46	SANDSTONE: as above.
	196.29	1.98	SANDSTONE: fine-to very fine-grain, light-grey, minor coarse-grain bands, several stylol at 195.45 m to 195.70 m
	199.95	3.66	SANDSTONE: as above.
	203.00	3.05	SANDSTONE: as above, minor weathered zones at 201.m and at 201.6 m
	206.04	3.04	SANDSTONE: as above, minor carbonaceous siltstone bands at 205.57m 2cm thick.
	209.09	3.05	SANDSTONE: as above, minor carbonaceous siltstone bands at 207.04m, 2cm thick; at 207.43m, 1cm thick; at 209.09m, 4cm thick.
	210.49	1.40	SANDSTONE: as above, minor bioturbated zone at 209.32m, 22cm thick, by large burrows.
	212.14	1.65	SILTSTONE/SANDSTONE: laminated, sandstone, light-grey to argillaceous, medium-to fine-grain burrowed, bioturbated and slumped in different areas. Siltstone, dark-grey to black, with structures identical to the sandstone. Numerous pyritic bands; granular bands at 213.14m, 2cm. weakly calcareous band at 213.34m, 2cm at 213.54m, 4cm.
	213.91	1.77	SILTSTONE/SANDSTONE: as above.
	215.62	1.71	CONGLOMERATE: granular to pebbly, sub-angular to well-rounded, poorly-sorted with very fine sandstone matrix towards bottom of section, size also increases toward bottom.

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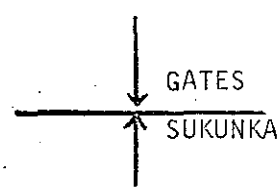
Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	215.97	0.35	SANDSTONE: fine-to very fine-grain, faintly laminated, light grey, minor siltstone bands at 216.35m, 9cm thick, and at 218.09m, 4cm thick.
	218.24	2.27	SANDSTONE: as above.
	221.28	3.04	SANDSTONE: as above.
	224.33	3.05	SANDSTONE: as above, silty bands at 224.93m.
	224.98	0.65	SANDSTONE: as above.
	226.43	1.45	SANDSTONE/SILTSTONE: laminated 30/70, sandstone, light-grey to argillaceous burrowed, siltstone, dark-grey to black, burrowed.
20°	227.38	0.95	SANDSTONE: light-grey, fine-grain, laminated, minor siltstone bands at 227.10m, 3cm thick and at 227.38m, 7cm thick.
	230.43	3.05	SANDSTONE: as above, minor siltstone bands at: 227.48m, 2cm thick 227.58m, 1cm thick 228.62m, 3cm thick 228.68m, 8cm thick.
	232.40	1.97	SANDSTONE: as above, siltstone at 230.98m, 18 cm thick.
			
	236.52	4.12	SANDSTONE (50%)/MUDSTONE (30%)/MIXED (20%).
	239.57	3.05	SANDSTONE (30%)/MUDSTONE (50%)/MIXED (20%): at this level the mudstone becomes slightly silty.
	242.62	3.05	SANDSTONE (30%)/SILTY MUDSTONE (50%)/MIXED (20%): 0.81-1.36m 3 slickensided surfaces 0.12-0.30m apart.
	245.66	3.04	SANDSTONE (20%)/SILTY MUDSTONE (40%)/MIXED (40%): slickensided surfaces at 0.65-1.13m.
	248.71	3.05	SANDSTONE (20%)/SILTY MUDSTONE (40%)/MIXED (40%).
	251.76	3.05	SANDSTONE (20%)/SILTY MUDSTONE (50%)/MIXED (30%).
	254.81	3.05	SANDSTONE (20%)/SILTY MUDSTONE (60%)/MIXED (20%).

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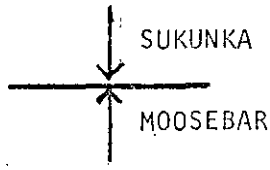
Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	257.55	2.74	SANDSTONE (15%)/MUDSTONE (85%): silty, core broken at 0.89-1.13m and 1.29-1.58m.
	260.06	2.51	SANDSTONE (15%)/MUDSTONE (85%): silty and heavily bioturbated.
	263.65	3.59	SANDSTONE (15%)/MUDSTONE (55%)/MIXED (30%): around this level the black mudstone becomes progressively sandy, white small fossils found scattered throughout, gradual.
	266.70	3.05	SANDSTONE (20%)/MUDSTONE (80%): sandy, mixed, churned, slickensided surfaces at 0.96m.
	269.90	3.20	SANDSTONE (30%)/MUDSTONE (10%)/MIXED (60%): 1 slickensided surface at 3.00m, gradational below.
	273.10	3.20	SANDSTONE (10%)/MUDSTONE (60%)/MIXED (30%): mudstone heavily burrowed, loses its sandy character back to silty.
	276.14	3.04	SANDSTONE (15%)/MUDSTONE (40%)/MIXED (45%): slickensided surfaces at 1.01m, 1.03m, and 1.30m.
	279.19	3.05	SANDSTONE (15%)/MUDSTONE (20%)/MIXED (65%).
	282.24	3.05	SANDSTONE (5%)/MUDSTONE (20%)/MIXED (75%).
	285.29	3.05	SANDSTONE/MUDSTONE (20%)/MIXED (80%): gradational below.
	288.34	3.05	SANDSTONE/MUDSTONE (40%)/MIXED (60%): one slickensided surface at 1.33m.
	291.38	3.04	SANDSTONE (25%)/MUDSTONE (70%)/MIXED (5%)
	294.43	3.05	SANDSTONE (15%)/MUDSTONE (80%)/MIXED (5%): salt and pepper, coarse-grain sandstone, poorly-sorted, massive 1.73-1.78m, sandstone sprinkled throughout.
	296.46	2.03	SANDSTONE (15%)/MUDSTONE (85%): mixed.
	297.48	1.02	SANDSTONE (80%)/MUDSTONE (20%): light-grey, very fine-grained sandstone, well-sorted, finely laminated with low-angle cross-bedding, sharp lower contacts, upper contacts often sharp as well, black muddy intraclastic layers and inclusions, occasional few burrows with black mudstone interbeds often burrowed and bioturbated.
	300.53	3.05	SANDSTONE (80%)/MUDSTONE (20%): gradual decrease in sand content, sand bed becomes thinner.
	303.58	3.05	SANDSTONE (75%)/MUDSTONE (25%): as above.

BH Nos. 26

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	306.62	3.04	SANDSTONE (60%)/MUDSTONE (40%).
	309.67	3.05	SANDSTONE (60%)/MUDSTONE (40%).
	312.72	3.05	SANDSTONE (50%)/MUDSTONE (50%): intimately mixed sandstone and mudstone lithology appears again.
	315.77	3.05	SANDSTONE (30%)/MUDSTONE (65%)/MIXED (5%).
	318.82	3.05	SANDSTONE (25%)/MUDSTONE (70%)/MIXED (5%): between 1.73m-2.01m, core broken lengthwise.
	321.86	3.04	SANDSTONE (25%)/MUDSTONE (60%)/MIXED (15%).
	324.91	3.05	SANDSTONE:present mostly as thin stringers.
	331.01	6.10	SANDSTONE (35%)/SILTY MUDSTONE (65%): light-grey, very fine-grain sandstone, well-sorted, laminated low angle cross-beds between 0.-0.30m, sandstone and mudstone between 0.53-1.29m, core broken up, especially lengthwise. Also locally shattered, slickensided surfaces between 2.24-2.71m same as above, 2.71m-3.05m core shattered, locally brecciated with calcite in slickensided surfaces.
	334.06	3.05	SANDSTONE (15%)/SILTY MUDSTONE (85%): between 0.-0.27m same as above, at 1.01, 1.27, 1.50, 1.73, 1.84, 2.01 and 2.52m, slickensided surfaces, low angles.
	337.10	3.04	SANDSTONE (10%)/SILTY MUDSTONE (90%): slickensided surfaces at 0.31 and 0.95m.
	340.15	3.05	SANDSTONE (10%)/MUDSTONE (90%): silty.
	343.20	3.05	SANDSTONE (5%)/MUDSTONE (95%): silty.
	346.25	3.05	SANDSTONE (5%)/MUDSTONE (95%): slickensided surfaces at 0.14, 0.91, 1.05 and 1.31m.
	349.30	3.05	SANDSTONE (5%)/MUDSTONE (95%): slickensided surfaces at 0.40, 0.80, 1.19, 1.63, 1.73 and 1.82m.
	352.34	3.04	SANDSTONE (5%)/MUDSTONE (95%): slickensided surfaces at 0.18, 0.48 and 1.03m.
	355.87	3.53	SANDSTONE (4%)/MUDSTONE (96%): between 0-0.43m core broken up with slickensided and listric surfaces. Core broken in sticks between 0.15-0.30m long with occasional poorly-developed listric surfaces.
	360.75	4.88	SANDSTONE (2%)/SILTY MUDSTONE (98%): core shattered between 2.95 and 3.05m.

BH Nos. 26

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	361.90	1.15	SANDSTONE (2%)/SILTY MUDSTONE (98%): listric at 1.05m. 
	362.54	0.64	MUDSTONE: black, massive, with occasional pyrite and ferruginous nodules.
	364.54	2.00	MUDSTONE: black, core broken up between 1.55-1.67m with poorly developed listric surfaces at 2.05 and 2.06m, high angle fractures at 2.30m and core broken up between 2.80 and 3.03m.
	367.58	3.04	MUDSTONE: black.
	370.63	3.05	MUDSTONE: black.
	373.68	3.05	MUDSTONE: black.
	376.73	3.05	MUDSTONE: black, slickensided at 0.11m.
	379.78	3.05	MUDSTONE, black, core broken in small sticks but no evidence of movement.
	382.83	3.05	MUDSTONE: black.
	385.88	3.05	MUDSTONE: black.
	388.93	3.05	MUDSTONE: black.
	391.97	3.04	MUDSTONE: black.
	395.02	3.05	MUDSTONE: black.
	398.06	3.04	MUDSTONE: black.
	401.11	3.05	MUDSTONE: black.
	404.16	3.05	MUDSTONE: black.
	407.21	3.05	MUDSTONE: black.
	410.26	3.05	MUDSTONE: black.
	413.30	3.04	MUDSTONE: black, one slickensided surface at 2.40m.
	416.35	3.05	MUDSTONE: black.

BH Nos. 26

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	419.40	3.05	MUDSTONE: black, core broken up between 0-0.42m, some calcite veining, slickensided surfaces at 1.28, 2.06 and 2.16m.
	422.45	3.05	MUDSTONE: black, one slickensided surface at 0.30, burrowed bentonite bed between 0.99 and 1.10m, two slickensided surfaces (high-angle) between 1.99 and 2.10m plus breccia.
	425.50	3.05	MUDSTONE: black, sheared up bentonite between 0.91 and 0.96m.
	428.54	3.04	MUDSTONE: black, slickensided surface at 1.90, 1.97 and 1.99m.
	431.59	3.05	MUDSTONE: black
	434.64	3.05	MUDSTONE: black, core broken up lengthwise between 0-0.47 m and between 1.05 and 1.20m.
	438.19	3.55	MUDSTONE: black.
	438.94	0.75	MUDSTONE: dark-grey, pyritic worm burrows, no bedding developed.
	439.03	0.09	CLAYSTONE: light-grey, white, hard "bentonitic".
	439.19	0.16	MUDSTONE: dark-grey, as above.
	439.27	0.08	CLAYSTONE: as above.
	440.23	0.96	SANDSTONE: dark-grey-green, glauconitic, pyritic worm burrows, bedding obliterated by bioturbation.
			MOOSEBAR GETHING
			BIRD COAL SEAM
	440.27	0.04	COAL: bright banded, stick.
	440.32	0.05	COAL: dull banded, stick.
	440.37	0.05	COAL: dull, stick.
	440.45	0.08	COAL: dull and bright, stick.
	440.51	0.06	COAL: bright banded, stick.
	440.55	0.04	COAL: bright, stick.

BH Nos. 26

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	440.59	0.04	COAL: bright banded, stick.
	440.70	0.11	COAL: dull, stick.
	440.78	0.08	COAL: dull banded, stick.
	440.79	0.01	COAL: bright, stick.
	440.84	0.05	COAL: dull banded, stick.
	440.91	0.07	COAL: dull and bright, stick.
	441.01	0.10	COAL: dull and bright, core fragmented.
	441.09	0.08	CORE LOSS-COAL
	441.11	0.02	COAL: dull, large pieces.
	441.13	0.02	COAL: bright, stick.
	441.21	0.08	COAL: dull and bright, stick.
	441.29	0.08	COAL: dull, sheared, stick.
	441.34	0.05	COAL: dull, stick.
	441.39	0.05	COAL: dull banded, stick.
	441.44	0.05	COAL: dull, fragmented.
	441.49	0.05	CLAYSTONE: carbonaceous.
	441.56	0.07	COAL: dull, sheared, stick.
	441.64	0.08	COAL: dull, stick.
	441.69	0.05	COAL: dull banded, stick.
	441.73	0.04	COAL: dull banded, stick.
	441.75	0.02	COAL: bright, stick.
	441.77	0.02	COAL: dull banded, stick.
	441.80	0.03	COAL: bright banded, stick.
	441.83	0.03	COAL: bright, stick.
	441.91	0.08	COAL: dull and bright, pyritic inclusions, stick.
	441.97	0.06	COAL: dull banded, stick.

BH Nos. 26

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	442.0	0.03	COAL: stoney, pyrite, stick.
	442.05	0.05	COAL: dull banded, stick.
	442.08	0.03	COAL: dull banded, stick.
	442.10	0.02	COAL: dull and bright, stick.
	442.14	0.04	COAL: bright, stick.
	442.18	0.04	COAL: bright banded, stick.
	442.23	0.05	COAL: bright, stick.
	442.30	0.07	COAL: dull and bright, stick.
	442.33	0.03	COAL: dull banded, stick.
	442.39	0.06	COAL: dull, stick.
	442.45	0.06	COAL: dull and bright, stick.
	442.47	0.02	COAL: bright, stick.
	442.52	0.05	COAL: dull and bright, stick.
	442.53	0.01	COAL: bright, stick.
	442.58	0.05	COAL: dull and bright, stick.
	442.64	0.06	COAL: dull banded, stick.
	442.66	0.02	COAL: bright, stick.
	442.74	0.08	COAL: dull and bright, stick.
	442.76	0.02	COAL: dull, stick.
	442.80	0.04	COAL: bright banded, stick.
	442.84	0.04	COAL: dull, stick.
	442.90	0.06	COAL: dull banded, stick.
	443.20	0.30	SANDSTONE: medium-grained, light-grey, carbonaceous at top with coaly inclusions, mottling by small light coloured worm burrows from 1.22 to 2.02m from top.
	444.42	1.22	SANDSTONE: as above.
	446.50	2.08	SANDSTONE: as above.

BH Nos. 26

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	447.10	0.60	SANDSTONE: light-grey, medium-grained, scattered very fine interbeds of carbonaceous mudstone with large light colored worm burrows.
	448.63	1.53	SANDSTONE: as above.
	450.51	1.88	SANDSTONE: as above.
	450.80	0.29	SANDSTONE: light-grey, fine-grained, very clean.
	452.41	1.61	SANDSTONE: as above.
	452.90	0.49	SANDSTONE: as above.
	455.05	2.15	SANDSTONE: as above.
	455.53	0.48	SANDSTONE: as above.
	457.21	1.68	SANDSTONE: as above.
	458.61	1.40	SANDSTONE: as above.
	459.32	0.71	SANDSTONE: as above.
	460.04	0.72	SANDSTONE: as above.
	460.13	0.09	COAL: dull and bright, calcite veins, stick.
	460.24	0.11	CLAYSTONE: carbonaceous.
	461.01	0.77	MUDSTONE: dark-grey with interbeds of grey siltstone, pyritic worm burrows at base.
	461.68	0.67	SILTSTONE: grey, indistinct bedding.
	461.78	0.10	SANDSTONE: medium-grained, light-grey.
	461.91	0.13	SANDSTONE: as above
	462.41	0.50	SILTSTONE/MUDSTONE: interbedded, grey siltstone, dark-grey mudstone.
	462.71	0.30	SANDSTONE: as above
	463.19	0.48	SILTSTONE/MUDSTONE: interbedded, as above, slumping at base.
	463.64	0.45	SANDSTONE: as above, small scale cross-bedding.
	463.74	0.10	SILTSTONE/MUDSTONE: interbedded, as above.
	464.14	0.40	SILTSTONE/MUDSTONE: as above.

BH Nos. 26

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	464.32	0.18	SANDSTONE: as above
	464.79	0.47	SANDSTONE: as above
	465.87	1.08	SANDSTONE/MUDSTONE: interbedded, light-grey, fine-grained sandstone.
	467.46	1.59	MUDSTONE: black, carbonaceous, minor bioturbation.
	467.66	0.20	MUDSTONE: as above.
	467.98	0.32	SANDSTONE/MUDSTONE: interbedded, as above with abundant shelly fossils.
	468.48	0.50	SILTSTONE: dark-grey, carbonaceous with abundant shelly fossils, coal bands at base.
	468.73	0.25	CLAYSTONE: carbonaceous, black, frequent bright coal bands.
	469.02	0.29	STONE: coaly bright bands.
	469.09	0.07	STONE: as above.
	469.18	0.09	COAL: dull and bright, stick.
	469.24	0.06	COAL: dull banded, stick.
	469.28	0.04	COAL: dull, stick.
	469.38	0.10	CLAYSTONE: carbonaceous, black, frequent bright coal bands.
	470.12	0.74	CLAYSTONE: as above.
	470.82	0.70	CLAYSTONE: as above.
	470.84	0.02	CLAYSTONE: as above.
	472.02	1.18	SANDSTONE: light-grey, fine-grained, small scale cross-bedding, phases of siltstone at top and centre.
	472.27	0.25	LAMINITE: thin, regular bedded interbeds of dark-grey mudstone and grey siltstone.
	472.45	0.18	LAMINITE: as above.
	472.86	0.41	SILTSTONE: grey, minor sandstone phases, bedding indistinct.
	473.37	0.51	SANDSTONE: fine-grained, light-grey, small scale cross-bedding.
	473.86	0.49	LAMINITE: thin, regular interbeds of dark-grey mudstone

BH Nos. 26

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			and grey siltstone.
	474.36	0.50	LAMINITE: as above.
	474.88	0.52	LAMINITE: as above.
	475.57	0.69	MUDSTONE: dark-grey, carbonaceous at base.
	475.74	0.17	MUDSTONE: as above, slickensided 20° to horizontal fractures at top; at base tectonic disturbance, possible sigmoidal laminite type structure.
	476.03	0.29	MUDSTONE: undisturbed, as above.
			TOP OF CHAMBERLAIN SEAM
	476.09	0.06	COAL: dull banded, stick.
	476.15	0.06	COAL: dull and bright, stick.
	476.16	0.01	COAL: bright, small fragments.
	476.32	0.16	COAL: dull, stick.
	576.37	0.05	COAL: dull banded, stick.
	476.42	0.05	COAL: dull and bright, stick.
	476.45	0.03	COAL: dull banded, stick.
	476.46	0.01	COAL: bright, stick.
	476.55	0.09	COAL: dull banded, stick.
	476.60	0.05	COAL: dull and bright, stick.
	476.64	0.04	COAL: dull, stick.
	476.66	0.02	COAL: dull banded, stick.
	476.71	0.05	COAL: dull and bright, bright banded, stick.
	476.74	0.03	COAL: bright, stick.
	476.76	0.02	COAL: dull and bright, stick.
	476.78	0.02	COAL: dull, stick.
	476.86	0.08	COAL: dull and bright, stick.
	476.97	0.11	COAL: dull, stick.

BH Nos. 26

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	477.04	0.07	COAL: dull and bright, stick.
	477.06	0.02	COAL: bright, stick.
	477.11	0.05	COAL: dull and bright, stick.
	477.17	0.06	COAL: dull, stick.
	477.22	0.05	COAL: bony stick.
	477.31	0.09	COAL: dull, stick.
	477.36	0.05	COAL: dull banded, large pieces.
	477.64	0.28	CORE LOSS -COAL
	477.68	0.04	COAL: dull, stick.
	477.71	0.03	COAL: dull and bright, stick.
	477.76	0.05	COAL: dull, stick.
	477.77	0.01	COAL: bright, stick.
	477.80	0.03	COAL: dull and bright, stick.
	477.87	0.07	COAL: dull, stick.
	477.96	0.09	COAL: dull and bright, stick.
	478.02	0.06	COAL: dull banded, stick.
	478.07	0.05	COAL: dull and bright, stick.
	478.11	0.04	COAL: bright, stick.
	478.14	0.03	COAL: dull, stick.
	478.16	0.02	COAL: bright, stick.
	478.22	0.06	COAL: bright banded, stick.
	478.28	0.06	COAL: dull and bright, stick.
	478.34	0.06	COAL: dull banded, stick.
	478.41	0.07	COAL: dull, stick.
	478.44	0.03	COAL: bright, stick.
	478.49	0.05	COAL: dull banded, stick.

BH Nos. 26

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	478.52	0.03	COAL: bright, stick.
	478.58	0.06	COAL: dull, stick.
	478.59	0.01	COAL: bright, stick.
	478.62	0.03	COAL: dull and bright, stick.
	478.64	0.02	COAL: bright, stick.
	478.69	0.05	COAL: dull banded, stick.
	478.72	0.03	COAL: dull and bright, stick.
	478.74	0.02	COAL: dull, stick.
	478.83	0.09	COAL: dull and bright, stick.
	478.88	0.05	COAL: bright, stick.
	478.89	0.01	COAL: dull, stick.
	478.91	0.02	COAL: bright, stick.
	478.93	0.02	COAL: dull, stick.
	478.96	0.03	COAL: bright, stick.
	479.01	0.05	COAL: dull, stick.
	479.06	0.05	COAL: bright, stick.
	479.13	0.07	COAL: dull banded, stick.
	479.21	0.08	COAL: dull, stick.
	479.28	0.07	COAL: dull and bright, stick.
	479.35	0.07	COAL: dull, stick.
	479.41	0.06	COAL: dull and bright, stick.
	479.46	0.05	COAL: bright banded, stick.
	479.48	0.02	COAL: bright, stick.
	479.53	0.05	COAL: dull and bright, stick.
	479.57	0.04	COAL: dull, stick.
	479.64	0.07	COAL: dull and bright, stick.

BH Nos. 26

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	479.71	0.07	COAL: dull, stick.
	479.74	0.03	COAL: dull and bright, stick.
	479.77	0.03	COAL: dull, stick.
	479.79	0.02	COAL: bright banded, stick.
	479.84	0.05	COAL: bright, stick.
	480.75	0.91	MUDSTONE: carbonaceous, bright coal bands.
	480.92	0.17	SANDSTONE: medium-grained, light-grey, massive carbonaceous and coal inclusions at top.
	482.88	1.96	SANDSTONE: as above.
	483.02	0.14	SANDSTONE: as above.
	483.62	0.60	SANDSTONE: as above.

* * * * *

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 27

Contractor: Connors

Commenced:

Completed:

Co-ordinates: 6,115,168.27 N
594,973.28 E
Surface Elevation: 1,423.72 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by:

Geologist	Depth
Andy Newson	10.97-45.60

Final Depth: 45.60

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar			
U. Gething			

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD				
CHAMBERLAIN				+1397

Possibly collared in Upper Gething and Chamberlain seam not intersected

BH Nos. 27

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	10.97	10.97	CASING
20°	12.19	1.22	SANDSTONE, medium/fine-grained, medium-dark grey, bedding faintly developed, regular, generally broken with clay infilling and iron staining due to weathering, abrupt below.
	13.41	1.22	SANDSTONE, as above.
	14.33	0.92	SANDSTONE, as above.
	15.24	0.91	SANDSTONE, as above.
	16.76	1.52	SANDSTONE, as above.
	17.54	0.78	SANDSTONE, as above.
	18.14	0.60	MUDSTONE/SANDY, 80:20, pyritic worm burrows, carbonaceous to base, abrupt below.
	18.44	0.30	MUDSTONE, as above.
	19.14	0.70	SANDSTONE, medium-grained, dark grey-black, carbonaceous, poorly-bedded, cross-bedded.
	19.81	0.67	MUDSTONE, carbonaceous and coaly, very broken and muddy (core-loss?)
	20.61	0.80	MUDSTONE, carbonaceous, sheared and broken.
45°	21.34	0.73	SANDSTONE, medium/fine-grained, medium grey, broken with calcite filled cracks, minor interbedded zones of mudstone are sandy.
	22.86	1.52	SANDSTONE, as above, very broken and sheared.
	23.06	0.20	SANDSTONE, as above.
	23.19	0.13	MUDSTONE, carbonaceous and coaly, very broken, core loss
			FAULTED CHAMBERLAIN?
	23.82	0.63	COAL, dull, sheared and broken.
40°	24.31	0.49	MUDSTONE, sandy, very carbonaceous and dirty, faintly bedded.
	24.38	0.07	COAL, broken, dull, metallic lustre.
	24.70	0.32	COAL, bright, sheared surfaces.
	24.96	0.26	COAL, bright, very broken.
	25.56	0.60	MUDSTONE WITH SANDY LAYERS, 90:10, light grey-medium grey, bedding poorly developed showing some disturbence.
	26.50	0.94	SANDSTONE WITH MUDSTONE INTERBEDS, 80:20, coarse/medium-grained, bedding fairly well developed, some cross-bedding in cleaner units, fractures with calcite filling, broken, some slickensides.
	27.43	0.93	SANDSTONE WITH MUDSTONE INTERBEDS, as above.
	27.56	0.13	COAL, bright, broken shaley.

BH Nos. 27

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
35°	28.96	1.40	SANDSTONE, coarse/medium-grained, light-medium grey, carbonaceous; micaceous on bedding planes, occasional minor mudstone interbeds, bedding poorly developed, occasional calcite filled joints, transitional below.
	30.48	1.52	SANDSTONE, as above.
	32.00	1.52	SANDSTONE, as above.
	33.53	1.53	SANDSTONE, as above.
	35.05	1.52	SANDSTONE, as above, bioturbated with large worm burrows.
	36.58	1.53	SANDSTONE, as above, no burrows.
	38.10	1.52	SANDSTONE, as above.
	39.62	1.52	SANDSTONE, as above.
	39.82	0.20	SANDSTONE, as above.
	40.23	0.41	MUDSTONE AND INTERBEDDED SANDS, 50:50, sharp boundaries some rolling and disturbance occasional worm burrows, transitional below.
	41.76	1.53	MUDSTONE AND INTERBEDDED SANDS, as above.
	42.67	0.91	MUDSTONE AND INTERBEDDED SANDS, as above.
	43.37	0.70	MUDSTONE AND INTERBEDDED SANDS, as above.
40°	44.20	0.83	SANDSTONE AND INTERBEDDED MUDSTONES, 50:50, carbonaceous stringers, some bioturbation, 0.06 of conglomerate at 44.0m.
	45.60	1.40	SANDSTONE, light-medium grey, medium-grained, slightly carbonaceous, minor calcite filled fractures.

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 28

Contractor: Connors

Commenced:

Completed:

Co-ordinates: 6,115,247.47 N
594,851.33 E
Surface Elevation: 1,421.05 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by:

Geologist	Depth
Andy Newson	10.97-38.44
	54.55-59.13
Geoff Jordan	38.60-53.73

Final Depth: 59.13

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar			
U. Gething	53.44		1,367.61

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD	±11.37			
CHAMBERLAIN	53.44			
F.PO.	41.80		Sheared & slickensided	

BH Nos. 28

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	10.97	10.97	CASING
	11.37	0.40	SANDSTONE & COAL, broken and mixed (Bird remains)
	11.52	0.15	SANDSTONE, dark grey, coarse-grained, mottled, numerous small worm burrows, carbonaceous stringers, abrupt below, becoming finer towards base
	12.19	0.67	SANDSTONE, as above
	13.41	1.22	SANDSTONE, as above
	14.91	1.50	SANDSTONE, as above
23°	16.46	1.55	SANDSTONE, as above
	18.06	1.60	SANDSTONE, as above
	18.70	0.64	SANDSTONE, as above
	19.64	0.94	SANDSTONE, fine-grained, medium/light grey, poorly-bedded, fining down, abrupt below
	21.24	1.60	SANDSTONE, as above
	22.86	1.62	SANDSTONE, as above
	24.38	1.52	SANDSTONE, as above, some minor slicks
	25.91	1.53	SANDSTONE, as above
	27.43	1.52	SANDSTONE, as above
	30.48	3.05	SANDSTONE, as above
	31.13	0.65	SANDSTONE, as above
	31.18	0.05	SANDSTONE, coarse/medium-grained, dark grey/black, carbonaceous stringers, abrupt, poorly-bedded
	33.53	2.35	SANDSTONE, as above
	33.58	0.05	SANDSTONE, as above
	35.05	1.47	SANDSTONE WITH INTERBEDDED MUDSTONE, 60:40, carbonaceous and coaly, poorly-bedded (core-loss?)
	35.19	0.14	SANDSTONE WITH INTERBEDDED MUDSTONE, as above
	35.48	0.29	SANDSTONE & INTERBEDDED MUDSTONES, 80:20, poorly-defined bedding, disturbed
	38.33	2.85	SANDSTONE & INTERBEDDED MUDSTONES, as above
	38.44	0.11	SANDSTONE & INTERBEDDED MUDSTONES, as above
9°	38.60	0.16	SANDSTONE, medium-grained, light grey, clean, slumped
	39.75	1.15	LAMINITE, thin bedded, dark grey, claystone and grey siltstone
	39.81	0.06	COAL, dull, sheared, stick
	39.90	0.09	COAL, dull banded, sheared, stick

BH Nos. 28

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	40.01	0.11	COAL, dull, sheared, stick
	40.08	0.07	COAL, dull and bright, sheared, stick
	40.15	0.07	COAL, dull, sheared, stick
	40.85	0.70	CORE LOSS-COAL
	40.91	0.06	COAL, dull banded, sheared, large pieces
	40.94	0.03	COAL, dull and bright, sheared, large pieces
	41.02	0.08	COAL, dull, sheared, stick
	41.09	0.07	COAL, dull banded, sheared, stick
	41.20	0.11	COAL, dull, sheared, stick
	41.80	0.60	CLAYSTONE, core badly sheared. slickensided and broken, calcite veins, fault zone, Chamberlain above and below
	43.09	1.29	SANDSTONE, light grey, fine-grained with phases of dark grey siltstone
	43.30	0.21	CLAYSTONE, dark grey
	43.45	0.15	CLAYSTONE, as above
	44.12	0.67	SANDSTONE, fine-grained, light grey with frequent interbeds of dark grey siltstone
	44.82	0.70	SANDSTONE, as above
	45.28	0.46	LAMINITE, dark grey claystone,well-bedded with grey siltstone, carbonaceous at base
	45.72	0.44	LAMINITE, as above
	46.28	0.56	LAMINITE, as above
	46.35	0.07	COAL, dull, stick
	46.38	0.03	COAL, dull banded, stick
	46.66	0.28	CORE LOSS-COAL
	46.75	0.09	COAL, dull banded, stick
	46.79	0.04	COAL, dull and bright, stick
	46.85	0.06	COAL, dull, stick
	46.89	0.04	COAL, dull and bright, stick
	46.91	0.02	COAL, bright, stick
	46.95	0.04	COAL, dull and bright, stick
	47.01	0.06	COAL, dull, stick
	47.02	0.01	COAL, bright, stick
	47.07	0.05	COAL, dull banded, stick
	47.11	0.04	COAL, dull banded, stick

BH Nos. 28

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	47.13	0.02	COAL, bright, stick
	47.15	0.02	COAL, dull and bright, stick
	47.19	0.04	COAL, bright, stick
	47.29	0.10	COAL, dull and bright
	47.34	0.05	COAL, dull banded, stick
	47.42	0.08	COAL, dull and bright, stick
	47.43	0.01	COAL, bright, stick
	47.58	0.15	COAL, dull, stick
	47.62	0.04	COAL, dull banded, stick
	47.65	0.03	COAL, dull, stick, sheared
	47.68	0.03	COAL, dull and bright, stick, sheared
	47.74	0.06	COAL, dull, stick, sheared
	47.80	0.06	COAL, dull and bright, stick, sheared
	47.86	0.06	COAL, dull banded, stick, sheared
	47.90	0.04	CLAYSTONE, carbonaceous
	47.95	0.05	COAL, dull, stick
	48.03	0.08	COAL, dull banded, stick
	48.05	0.02	COAL, dull, stick
	48.13	0.08	COAL, dull and bright, small pieces
	48.19	0.06	COAL, dull banded, stick
	48.22	0.03	COAL, stony, stick
	48.25	0.03	COAL, dull, sheared, stick
	48.29	0.04	COAL, dull banded, stick, small fragments
	48.33	0.04	COAL, dull banded, stick
	48.39	0.06	COAL, dull, stick
	48.43	0.04	COAL, dull banded, stick
	48.52	0.09	COAL, dull, stick
	48.55	0.03	COAL, dull and bright, stick
	48.63	0.08	COAL, dull, stick
	48.64	0.01	COAL, bright, stick
	48.71	0.07	COAL, dull, stick
	48.74	0.03	COAL, dull banded
	48.81	0.07	COAL, dull, stick
	48.85	0.04	COAL, dull banded, stick

BH Nos. 28

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	48.93	0.08	COAL, dull, stick
	48.96	0.03	COAL, bright, stick
	49.00	0.04	COAL, dull and bright, stick
	49.02	0.02	COAL, stony, stick
	49.05	0.03	COAL, dull and bright, stick
	49.10	0.05	COAL, bright, stick
	49.11	0.01	COAL, dull, stick
	49.15	0.04	COAL, bright, stick
	49.21	0.06	COAL, bright banded, stick
	49.23	0.02	COAL, dull, stick
	49.26	0.03	COAL, dull banded, stick, sheared
	49.32	0.06	COAL, dull and bright, stick, sheared
	49.40	0.08	COAL, dull, stick, sheared
	49.43	0.03	COAL, dull banded, stick, sheared
	49.49	0.06	COAL, dull, stick, sheared
	49.58	0.09	COAL, dull and bright, pulverized, sheared
	49.62	0.04	COAL, dull, pulverized, sheared
	49.70	0.08	COAL, dull and bright, pulverized, sheared
	49.78	0.08	COAL, dull banded, pulverized, sheared
	50.10	0.32	CORE LOSS-COAL
	50.14	0.04	COAL, dull, stick
	50.17	0.03	COAL, dull and bright, stick
	50.19	0.02	COAL, bright, stick
	50.25	0.06	COAL, bright banded, sheared, stick
	50.28	0.03	COAL, dull and bright, sheared, stick
	50.31	0.03	COAL, bright, sheared, stick
	50.35	0.04	COAL, dull and bright, sheared, stick
	50.42	0.07	COAL, dull banded, sheared, stick
	50.49	0.07	COAL, dull, stick
	50.54	0.05	COAL, dull and bright, sheared, large pieces
	50.60	0.06	COAL, dull banded, sheared, stick
	50.67	0.07	COAL, dull, stick
	50.78	0.11	COAL, dull banded, sheared, stick

BH Nos. 28

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	50.86	0.08	COAL, dull, sheared, stick
	50.89	0.03	COAL, dull and bright, stick
	50.95	0.06	COAL, dull banded, stick
	50.97	0.02	COAL, dull and bright, stick
	51.00	0.03	COAL, bright, stick
	51.02	0.02	COAL, dull banded, stick
	51.04	0.02	COAL, bright, stick
	51.10	0.06	COAL, dull banded, stick
	51.21	0.11	COAL, dull, stick
	51.23	0.02	COAL, bright, stick
	51.27	0.04	COAL, dull banded, stick
	51.35	0.08	COAL, dull and bright, stick
	51.40	0.05	COAL, dull, stick
	51.44	0.04	COAL, dull banded, stick
	51.50	0.06	COAL, bright, stick
	51.53	0.03	COAL, dull and bright
	51.61	0.08	COAL, bony, stick
	51.65	0.04	COAL, dull and bright, stick
	51.71	0.06	COAL, dull, stick
	51.76	0.05	COAL, bright banded, stick
	51.80	0.04	COAL, dull and bright, stick
	51.83	0.03	COAL, bright, stick
	51.87	0.04	COAL, dull and bright, stick
	51.94	0.07	COAL, bright, stick
	51.96	0.02	COAL, dull and bright, stick
	52.00	0.04	COAL, dull and bright, sheared, pulverized
	52.07	0.07	COAL, dull, sheared, small pieces
	52.14	0.07	CORE LOSS - COAL
	52.20	0.06	COAL, dull banded, sheared, small pieces
	52.30	0.10	COAL, dull and bright, sheared, small pieces
	52.35	0.05	COAL, dull banded, sheared, small pieces
	52.38	0.03	COAL, dull and bright, sheared, stick
	52.40	0.02	COAL, dull
	52.43	0.03	COAL, bright, stick
	52.50	0.07	COAL, dull and bright, stick

BH Nos. 28

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	52.56	0.06	COAL, bright banded, stick
	52.62	0.06	COAL, dull and bright, stick
	52.65	0.03	COAL, bright, stick
	52.70	0.05	COAL, bright, pulverized
	52.88	0.18	CORE LOSS-COAL
	52.95	0.07	CLAYSTONE, dark grey, carbonaceous phases, sub-fissile
	53.30	0.35	CLAYSTONE, as above
	53.39	0.09	COAL, dull and bright, stick
	53.44	0.05	CLAYSTONE, as above, bright coal bands
	53.73	0.29	SANDSTONE, medium-grained, light grey, carbonaceous at top, large coal inclusions at top
5°	54.55	0.82	SANDSTONE, coarse-grained, carbonaceous, minor mudstone interbeds, bedding fairly well defined, some calcite fractures with slicks
	56.08	1.53	SANDSTONE, as above
	57.60	1.52	SANDSTONE, as above
	59.13	1.53	SANDSTONE, as above, with slickensided and fault zone

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 29

Contractor: Tonto

Commenced: Sept 6, 1977

Completed: Sept 21, 1977

Co-ordinates: 6,113,599.29 N
593,120.56 E
Surface Elevation: 1,609.30 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } See detail page 1a
Hole Azimuth: }

Logged by:

Geologist	Depth
Mike DeMestre	21.36-507.49
Peter Raymond	507.74-526.93
	583.07-589.79
	610.21-619.66
	628.73-640.88
Ali Chowdry	528.52-582.85
	592.84-609.69
Peter Caine	620.07-628.60

Final Depth: 640.88

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross	101.26	101.26	1,508.04
Gates	310.86	209.60	1,298.44
Sukunka	439.88	129.02	1,169.42
Moosebar	529.28	89.4	1,080.02
U. Gething	UP 588.27 LP 631.87	58.99 43.6	1,021.03 977.43

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD	532.67			1,076.63
CHAMBERLAIN	UP 588.27			1,021.03
	LP 631.87*			1,977.43

F.PO.	96.01-101.26	Slickensided
F.PO.	498.34-507.49	Slickensided
F.PO.	560.74	Brecciated & Fractured
F.PR.	560-583	Very steep dips, fracturing
F.E.	605	Broken & pulverized coal

* extensive zone of carbonaceous mst. in basal ±10m of Chamberlain seam zone

Sperry-Sun Survey

Date: 22nd September 1977

Borehole: BP 29 Sukunka 77

Compass: 20° Maximum to Magnetic North

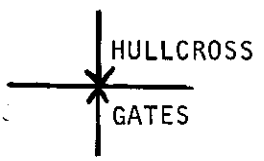
BPB Operator: R. Bishop

Measured Depth	Tilt	Tilt Direction
640m	3° 30'	N 25° E
600m	3° 45'	N 23° E
550m	3° 45'	N 22° E
500m	3° 30'	N 28° E
450m	3° -	N 25° E
400m	2° 45'	N 28° E
350m	2° -	N 29° E
300m	1° 45'	N 30° E
250m	1° 30'	N 33° E
200m	1° -	N 50° E
150m	0° 45'	S 85° E
100m	1° -	S 52° E
50m	5° -	N 3° E

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	21.36	21.36	TRICONED, NO CORE HULLCROSS: MUDSTONE/SANDSTONE: light-grey, very fine-grained sandstone, moderately well-sorted, ripple cross-laminae, thin (less than 5cm thick), not very well defined, contact can be sharp or diffuse with interbedded black mudstone with occasional burrows.
	22.86	1.50	MUDSTONE (50%)/SANDSTONE (50%): core badly shattered and weathered.
	24.23	1.37	MUDSTONE (50%)/SANDSTONE (50%): core badly shattered and weathered.
	25.90	1.67	SANDSTONE (50%)/MUDSTONE (50%): core badly shattered and weathered.
	26.82	0.92	MUDSTONE (50%)/SANDSTONE (50%): core badly shattered and weathered.
	30.48	3.66	MUDSTONE (50%)/SANDSTONE (50%): core badly shattered and weathered.
	31.88	1.40	MUDSTONE (50%)/SANDSTONE (50%): core broken up between 0-0.51m
	33.68	1.80	MUDSTONE (50%)/SANDSTONE (50%): clay band between 0-0.35m
	35.05	1.37	MUDSTONE (60%)/SANDSTONE (40%).
	38.10	3.05	MUDSTONE/SANDSTONE: clay band between 0.05-0.35m; slickensided surface at 1.18m; core broken up lengthwise 1.55-3.00m.
	41.14	3.04	SANDSTONE/MUDSTONE: 50:50
	44.19	3.05	SANDSTONE (40%)/MUDSTONE (60%).
	47.24	3.05	SANDSTONE (55%)/MUDSTONE (45%).
	50.29	3.05	SANDSTONE (60%)/MUDSTONE (40%).
	53.34	3.05	SANDSTONE (60%)/MUDSTONE (40%): clay band between 2.41-2.71m.
	56.38	3.04	SANDSTONE (60%)/MUDSTONE (40%).
	59.43	3.05	SANDSTONE (60%)/MUDSTONE (40%).
	62.48	3.05	SANDSTONE (65%)/MUDSTONE (35%).
	65.53	3.05	SANDSTONE (60%)/MUDSTONE (40%).

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	68.59	3.06	SANDSTONE (60%)/MUDSTONE (40%): slickensided surfaces at 0.91, 0.92, 1.40 and 1.66m
	71.68	3.09	MUDSTONE (40%)/SILTSTONE (60%): slickensided surfaces at 0.16, 0.23, and 2.34m
	74.67	2.99	MUDSTONE (40%)/SILTSTONE (60%).
	77.72	3.05	MUDSTONE (40%)/SILTSTONE (60%): slickensided surface at 2.62m
	80.77	3.05	MUDSTONE (45%)/SILTSTONE (55%): slickensided surfaces at 0.33, 0.83, 0.91m.
	83.83	3.06	MUDSTONE/SILTSTONE: clay band between 0-0.43m, one slickensided surface between 0.97 and 1.27m, core broken lengthwise, slickensided surfaces at 1.79 and 1.96m.
	86.86	3.03	SANDSTONE (45%)/MUDSTONE (55%): one slickensided surface at 0.90m
	89.91	3.05	SANDSTONE (40%)/MUDSTONE (60%): slickensided surfaces at 0.98, 2.82, 2.95 and 2.99m
	92.96	3.05	SANDSTONE (40%)/MUDSTONE (60%): slickensided surfaces at 0.13, 0.40, 0.42, 0.55, 0.69, 2.64 and 2.74m
	96.01	3.05	SANDSTONE (60%)/MUDSTONE (40%): slickensided surface at 0.46m
	99.06	3.05	SANDSTONE (60%)/MUDSTONE (40%): slickensided surfaces at 0.93, 0.99, 1.01, 1.03, 1.13 and 1.42m
	101.26	2.20	SANDSTONE (60%)/MUDSTONE (40%): slickensided surfaces at 0.87, 1.00 and 1.31m, core broken up between 1.70-1.75m, and between 1.80-2.20m 
	101.40	0.14	CONGLOMERATE: varicolored pebbles, average pebble size 12-13 mm, sub-rounded, chert predominant, matrix of medium-grained, poorly sorted sandstone.
	102.10	0.70	SANDSTONE: light/medium-grey, very fine-to fine-grained sandstone, calcareous, moderately well-sorted, massive with numerous argillaceous partings, locally slightly convoluted, occasional small burrows and carbonaceous inclusions, several erosional surfaces within unit.

BH Nos.

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	104.66	2.56	SANDSTONE: as above, listric surface at 0.92, 1.25, 1.48 and 1.55m, core broken up between 1.75-2.36m lengthwise.
	105.15	0.49	COAL: core heavily fragmented and powdered, very finely sheared, some listrication, mostly dull coal and dull lustrous.
	106.07	0.92	SILTSTONE/MUDSTONE, SILTY: medium-grey siltstone, silty mudstone, massive, churned, rooted with thin stringers of light-grey very fine-grained sandstone scattered irregularly. Core shattered between 0.0.80m with listric surfaces. Gradational change to: MUDSTONE/SILTY/SAND-STONE: silty mudstone as above, dark-grey with numerous poorly defined interbeds of light-grey, fine-to-medium-grained sandstone, calcareous, mudstone well-sorted, often with argillaceous partings and very occasional rootlets, occasional ferruginous bands and nodules.
	108.20	2.13	MUDSTONE, SILTY (40%)/SANDSTONE (60%): slickensided surfaces between 2.49-2.52m, shattered at 2.64, 2.71, 2.85m, between 2.85-3.00m core broken.
	109.46	1.26	MUDSTONE, SILTY (40%)/SANDSTONE (60%): with occasional rootlets, ferruginous band at 0.14m, slickensided surfaces at 0.09, 0.20, 0.32 and 0.82. Gradual change.
	111.25	1.79	SANDSTONE: light/medium-grey, very fine-to-medium-grained sandstone, highly calcareous, moderately well-sorted with numerous calcareous and some carbonaceous partings, locally convoluted and churned, occasionally burrowed, oc occurs as grossly interbedded poorly defined units of different grain size. Slickensided surfaces at 1.79 and 1.86m.
	112.24	0.99	SANDSTONE: as above, gradual downwards.
	112.97	0.73	SANDSTONE (30%)/MUDSTONE (70%): as above, interbedded with dark-grey mudstone, calcareous.
	114.30	1.33	SANDSTONE: dark-grey silty, muddy, very fine-grained sandstone, calcareous, highly carbonaceous, finely laminated with carbonaceous and argillaceous partings, interbedded with light-grey fine-to-medium-grained sandstone, calcareous, slightly argillaceous, grossly laminated. Contact between these two sharp, erosional.
	115.46	1.16	SANDSTONE: same as above, medium-grained interbeds more numerous and coarser-grained (medium-to-coarse-grained bottom 0.47m), sharp lower contact, erosional.
	115.51	0.05	COAL: very broken stock to fragmented, dull banded, dense, stick.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	115.61	0.10	COAL: dull lustrous, lightly fragmented, listricated slightly.
	115.72	0.11	COAL: dull lustrous, broken stick, listricated near bottom
	115.75	0.03	COAL: bright and dull, stick
	115.91	0.16	COAL: carbonaceous mudstone.
	117.34	1.43	MUDSTONE: dark-grey/black, highly carbonaceous near top 0.10-0.15m with carbonaceous inclusions and numerous ferruginous bands (0.05m thick), slickensided surfaces at 1.46,1.72,1.77,1.81,1.98,2.23 and 2.35m.
	118.09	0.75	MUDSTONE: same as above, gradational below.
	118.37	0.28	MUDSTONE: extremely carbonaceous.
	118.43	0.06	COAL: bright, pyritic, stick
	118.80	0.37	BONE:
	118.93	0.13	COAL: dull lustrous, with few thin discontinuous bright bands, bottom 0.02m listricated, very broken stick.
	118.95	0.02	COAL: bright and dull, fragmented.
	119.16	0.21	COAL: dull lustrous, with thin discontinuous bright bands, fragmented, small pieces.
	119.23	0.07	COAL: dull lustrous, banded, stick
	119.68	0.45	COAL: dull lustrous and bright, broken stick.
	119.84	0.16	BONE: carbonaceous mudstone, listric surfaces and small slickensided surfaces at 0.39, 0.50, 0.70, 0.72 and 0.76m
	120.78	0.94	MUDSTONE: dark grey with carbonaceous inclusions and root lets, ferruginous bands, locally coaly.
	120.83	0.05	COAL: fragments, dull, lustrous, banded.
	122.98	2.15	MUDSTONE: same as above, slickensided surfaces at 0.03 and 0.97m, core broken up between 0.97-1.55m.
	123.61	0.63	MUDSTONE/SANDSTONE: 70:30, mudstone, same as above, but sometimes locally silty, light-grey, very fine to medium-grained sandstone, highly calcareous, poorly sorted, massive, found interbedded with mudstone or as thin wisps, contacts poorly defined. Mudstone is also fossiliferous and has ferruginous bands.

BH Nos.

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	124.65	1.04	MUDSTONE: fossiliferous, slightly silty, (fossil bed at 0.91 m).
	126.03	1.38	MUDSTONE: same as above, slickensided surfaces at 0.23, 0.43, 0.75, 0.80, and 0.92m, core broken up between 2.10-2.52m, and 2.76-2.86m.
	127.79	1.76	MUDSTONE (60%)/SANDSTONE (40%): same as above.
	129.08	1.29	MUDSTONE: same as above, locally ferruginous and locally abundant ferruginous bands. Thin fossil beds slickensided surfaces at 0.60, 0.65, 0.80, 1.10, 1.26, 1.99 and 2.00m. Core sheared between 1.26-1.29m.
	129.39	0.31	MUDSTONE: same as above.
	129.43	0.04	COAL: pulverized, numerous listrications.
	129.93	0.50	SILTSTONE/MUDSTONE: quickly grades down into a SILTSTONE, medium-grey, smassive, highly calcareous with think interbeds of very fine-grained sandstone, gradational below.
	130.92	0.99	SANDSTONE: light-grey, fine-to-medium-grained, calcareous, poorly sorted, massive, calcareous partings and black muddy inclusions, coarser at bottom of unit. Upper contact gradational, lower contact shartp, erosional.
	131.80	0.88	MUDSTONE: slightly silty, medium-grey, massive with occasional ferruginous nodules.
	132.28	0.48	MUDSTONE/SANDSTONE: 50:50, same as above, with thin interbeds of light-grey, very fine-to-fine-grained sandstone, calcareous, poorly-sorted to moderately well-sorted, usually massive and slumped but also finely laminated, slickensided surfaces at 0.73, 1.20, 1.29, 1.31, 1.47, 1.61 and 1.83m, core broken between 1.47-1.61m, gradational below.
	133.08	0.80	SANDSTONE (80%)/MUDSTONE((20%): mudstone and sandstone lithologically same as above, but highly churned, often the two lithologies are intimately mixed, locally argillaceous (thin partings), gradational below.
	135.33	2.25	SANDSTONE (30%)/MUDSTONE((70%): lithologically similar to above, but sand is present as thinkwasps and think poorly defined interbeds, fossil bed at 2.83m, slickensided surface at 2.12m and core shattered, slickensided surface between 2.32-3.05m, gradational below.
	135.93	0.60	MUDSTONE: black massive mudstone, locally coaly and sandy, gradational to SANDSTONE/MUDSTONE, light-grey, fine-grained sandstone, very slightly calcareous, massive moderately, well-sorted, interbedded with dark-grey slightly silty mudstone.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	136.09	0.16	SANDSTONE (80%)/MUDSTONE (20%).
	136.32	0.23	SANDSTONE: sharp contact, erosional
	136.53	0.21	SANDSTONE (30%)/MUDSTONE (70%).
	138.22	1.69	SANDSTONE (85%)/MUDSTONE (15%): sandstone, fining down to very fine-grained.
	138.53	0.31	SANDSTONE: same as above, fine-to medium-grained.
	138.63	0.10	SANDSTONE: same as above, sharp contact.
	141.57	2.94	SANDSTONE: light-grey, very fine-to medium grained (0.10-0.30m), sandstone, non-calcareous 0.10-0.50, calcareous from 0.50 onwards, massive, moderately well-sorted, thin argillaceous partings 0.10-0.38m with a very occasional thinn black muddy intraclastic bed at 0.60m., slickensided surfaces at 0.25, 0.89, 1.08, 1.17, 1.47 and 1.55m.
	142.01	0.44	SANDSTONE: as above, gradational below
	142.35	0.34	SANDSTONE: light-grey, coarse-grained, slightly calcareous, massive, moderately well-sorted with numerous black carbonaceous partings and muddy inclusions, sharp contact.
	143.04	0.69	SANDSTONE (90%)/MUDSTONE (10%): light-grey, fine-grained sandstone, non-calcareous, moderately well-sorted to well-sorted, massive with thin mudstone interbeds in the upper part, upper part also slumped, slumping common.
	144.62	1.58	SANDSTONE: light-grey, very fine-to fine-grained sandstone, moderately well-sorted, massive with thin interbeds of dark mudstone (partings of black mudstone as well), characterized by slump features between 0.52-1.20m, also occasional ferruginous bands and nodules.
	146.17	1.55	SANDSTONE (95%)/MUDSTONE (5%).
	147.13	0.96	SANDSTONE (80%)/MUDSTONE (20%): same lithology as above, but very fine-grained.
	147.67	0.54	SANDSTONE: light-grey, fine-to-medium-grained sandstone, non-calcareous, moderately well-sorted, with occasional thin argillaceous partings, massive in discreet 'bands' of different grain size, hard to distinguish because they blend into one another.
	149.18	1.51	SANDSTONE: same as above.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	150.87	1.69	SANDSTONE: same lithology as above but becoming highly calcareous and coarsening down from very fine-to medium-grained with occasional zone with small black argillaceous inclusions between 1.38-1.40m, slickensided surfaces at 0.94, 1.60, 1.68 and 1.72m.
	152.76	1.89	SANDSTONE: same as above, but with argillaceous partings from 0.44 onward, plus the sandstone is mostly fine-to medium-grained.
	153.92	1.16	SANDSTONE (65%)/MUDSTONE (35%): medium-grey, very fine-to medium-grained, moderately well-sorted in discreet bands each consisting of sandstone of one size, black thin mudstone interbeds (<0.3cm thick) and argillaceous partings are common, bedding sometimes slightly convoluted. Sandstone, gradational to very fine-to fine-grained.
	154.71	0.79	SANDSTONE (70%)/MUDSTONE (30%): very fine-to fine-grained with few intervals medium-grained, at 1.20m, first appearance of very thin beds of silty brown intraclasts.
	157.05	2.34	SANDSTONE (80%)/MUDSTONE (20%): mostly medium-grained, slickended surface between 1.02-2.89m.
	160.02	2.97	SANDSTONE (75%)/MUDSTONE (25%): medium/fine-grained, one thin calcareous interval with carbonaceous inclusions between 0.25-0.28m.
	161.52	1.50	SANDSTONE (80%)/MUDSTONE (20%): medium/fine-grained, same as above.
	163.06	1.54	SANDSTONE/SILTSTONE (40%)/MUDSTONE (60%): mudstone interbeds become thicker and more frequent, also at this level locally burrowed, bioturbated zones (=5cm thick). Sandstone lithologically similar to that described above, but finer to very-fine-grained. Pyrite and ferruginous nodules are found scattered throughout. The sandstone/siltstone interbeds have sharp lower contacts, but upper contacts usually gradational to mudstone.
	166.11	3.05	SANDSTONE/SILTSTONE (20%)/MUDSTONE (70%)/FERRUGINOUS BAND (10%): very fine-grained sandstone, sandstone/siltstone gradational to (80%)m bottom 0.59m. Heavily bioturbated zones between 2.30-2.55m and 2.68-2.93m.
	167.54	1.43	SANDSTONE/SILTSTONE (95%)/MUDSTONE (5%): very fine-grained sandstone/siltstone, heavily bioturbated between 0-1.24m.
	168.70	1.16	SANDSTONE/SILTSTONE: light-grey siltstone to fine-grained sandstone, massive, poorly to moderately well-sorted, zone interval laminated between 1.42-1.60m) but usually

CLIENT: BP EXPLORATION CANADA LTD. TABLE 102

SAMPLE: 3 - CH BULK SAMPLE

LAB. NO.: 9587 October, 1977

HEAD RAW ANALYSIS

ADL%	RM.%	ASH%	VM.%	FC.%	S%	F.S.I.	REMARKS
2.8	0.6	11.0	20.5	67.9	0.58	7 1/2	air dried basis
	3.4	10.7	19.9	66.0	0.56	--	as rec'd basis
		11.1	20.6	68.3	0.58	--	dry basis

SIZE & RAW ANALYSES

SIZE FRACTION	WT.%	RM.%	ASH%	VM.%	FC.%	S%	F.S.I.	CUMULATIVE WT.%	CUMULATIVE ASH%	CUMULATIVE S%	REMARKS
4" x 2"	12.0	0.7	18.8	17.8	62.7	0.73	4	12.0	18.8	0.73	WT% AND ANALYSES ARE ON AN A.D.B. BASIS. AMT. OF +4" FRACTION CRUSHED TO PASS 4"= 5.7% OF TOTAL
2"x1 1/2"	3.8	0.7	18.7	17.8	62.8	0.63	4	15.8	18.8	0.71	
1 1/2"x1"	6.2	1.1	14.8	19.8	64.3	0.57	5	22.0	17.7	0.67	
1"x1/2"	11.1	0.9	13.1	19.3	66.7	0.58	5 1/2	33.1	16.1	0.64	
1/2"x1/4"	12.1	0.9	12.3	20.7	66.1	0.64	6 1/2	45.2	15.1	0.64	
1/4"x1/8"	10.9	1.0	10.0	20.6	68.4	0.58	7 1/2	56.1	14.1	0.63	
1/8"x10M	13.1	0.6	7.6	21.5	70.3	0.57	8 1/2	69.2	12.9	0.62	
10Mx28M	16.6	1.1	6.5	22.2	70.2	0.59	8 1/2	85.8	11.6	0.61	
28Mx100M	9.4	0.9	6.4	21.8	70.9	0.58	8 1/2	95.2	11.1	0.61	
100Mx0	4.8	1.1	6.9	22.7	69.3	0.57	9	100.0	10.9	0.61	

SIZE (WET SCREEN) & RAW ANALYSES: 28M x 0

SIZE FRACTION	WT.%	RM.%	ASH%	VM.%	FC.%	S%	F.S.I.	CUMULATIVE WT.%	CUMULATIVE ASH%	CUMULATIVE S%	REMARKS
28Mx65M	46.6	0.6	5.3	22.0	72.1	0.54	8 1/2	46.6	5.3	0.54	A.D.B. WT.% OF -28M = 14.2% OF TOTAL
65Mx100M	11.1	0.6	5.6	22.1	71.7	0.56	8 1/2	57.7	5.4	0.54	
100Mx200M	18.1	0.6	5.9	22.6	70.9	0.60	8 1/2	75.8	5.5	0.56	
200Mx325M	8.0	0.6	6.8	22.4	70.2	0.65	8 1/2	83.8	5.6	0.57	
325Mx0	16.2	0.7	13.3	21.6	64.4	0.69	7	100.0	6.9	0.59	
28Mx0	100.0	1.2	6.5	22.1	70.2	0.57	8 1/2				

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			GATES 'E' SEAM
	176.69	0.03	COAL: bright banded stick
	176.82	0.13	COALY/MUDSTONE: carbonaceous.
	176.84	0.02	COAL: dull, stick
	176.92	0.08	COAL: dull, pyritic, stick with listrication bottom 0.05m
	176.94	0.02	COAL: pyrite, bright, stick
	177.00	0.06	COAL: bright, pyritic, fragmented in small pieces and pulverized.
	177.05	0.05	COAL: bright, pyritic, broken stick, heavily listricated
	177.12	0.07	COAL: dull, lustrous, heavily pyritized, whole stick, heavily listricated.
	177.18	0.06	COAL: mostly dull, pulverized, heavily listricated.
	177.23	0.05	COAL: mostly dull, few bright bands, fragmented, loose pieces.
	178.30	1.07	MUDSTONE: black, carbonaceous, coaly with frequent slickensided surfaces.
	178.72	0.42	MUDSTONE: carbonaceous, gradational
	179.11	0.39	SILTSTONE: light-grey, massive, gradational
	180.49	1.38	SANDSTONE: whitish-grey, fine-to medium-grained, slightly calcareous, well-sorted, banded dark and light. Lower part churned up with argillaceous inclusions, gradational
	180.59	0.10	MUDSTONE: dark-grey, with many small size rootlets, silty in upper part, interbedded with fine-to medium-grained sandstone lower part, ferruginous bands and nodules are common. Slickensided surfaces at 0, 0.10, 0.17, 0.21, 0.35, 0.59, 0.91, 1.46, 1.67 and 2.05m. Core shattered between: 0.17-0.28m, 0.98-1.13m and 1.86-2.00m.
	182.21	1.62	MUDSTONE: as described above.
	182.78	0.57	MUDSTONE (60%)/SANDSTONE (40%): as described above.
	184.03	1.25	MUDSTONE: slickensided surfaces at 0.07, 0.12, 0.24, 0.28 0.99 and 2.48m.
	185.78	1.75	MUDSTONE: as described above, but increasingly carbonaceous.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	185.88	0.10	MUDSTONE: carbonaceous with thin coaly layers.
	185.92	0.04	COAL: dull banded, stick
	186.13	0.21	MUDSTONE: coaly.
	186.15	0.02	COAL: bright, listricated
	186.19	0.04	MUDSTONE: coaly, interbedded with thin coal band
	186.25	0.06	COAL: dull, lustrous with thin irregular bright bands, one bright band at top (.1cm).
	186.28	0.03	MUDSTONE: carbonaceous.
	186.31	0.03	COAL: bright banded, stick
	186.32	0.01	MUDSTONE: carbonaceous.
	186.35	0.03	COAL: bright banded, stick
	186.37	0.02	MUDSTONE: partings
	186.38	0.01	COAL: bright
	186.41	0.03	MUDSTONE: parting
	186.42	0.01	COAL: bright
	186.59	0.17	MUDSTONE: parting
	186.61	0.02	COAL: bright, broken stick
	186.63	0.02	COAL: dull, lustrous, stick
	186.67	0.04	COAL: bright stick
	186.69	0.02	COAL: bright banded, stick
	186.70	0.01	COAL: dull banded
	187.07	0.37	MUDSTONE:
	187.40	0.33	MUDSTONE.
	187.55	0.15	COAL: heavily sheared in all directions, possibly dull, lustrous, whole stick.
	187.60	0.05	COAL: sheared, listricated, whole stick
	187.71	0.11	COAL: dull lustrous, with thin irregular bright bands, whole stick, dense.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	187.76	0.05	COAL: sheared, possibly bright, whole stick
	187.81	0.05	COAL: dull and bright, whole stick
	187.99	0.18	MUDSTONE: coaly
	188.01	0.02	COAL: bright banded, whole stick
	188.04	0.03	COAL: dull, whole stick
	188.06	0.02	COAL: bright band, whole stick
	188.13	0.07	COAL: dull, (slightly lustrous), banded, whole stick.
	188.19	0.06	COAL: bright banded, whole stick
	188.24	0.05	COAL: dull with irregular thin bright bands, whole stick
	188.28	0.04	COAL: dull, lustrous, banded
	188.38	0.10	COAL: very broken stick, heavily listricated, possibly mostly bright.
	188.51	0.13	COAL: dull banded, whole stick
	188.57	0.06	MUDSTONE: coal bright, interbedded thinly with mudstone, sheared, broken stick.
	188.59	0.02	MUDSTONE
	188.61	0.02	COAL: bright
	188.69	0.08	MUDSTONE:
	188.71	0.02	COAL: pulverized, sheared possibly bright.
	188.73	0.02	MUDSTONE
	188.75	0.02	COAL: pulverized, sheared, possibly bright
	189.25	0.50	MUDSTONE: dark, rooted with occasional ferruginous nodules
	189.34	0.09	COAL: heavily sheared, broken stick, numerous listrications, possibly mostly dull
	190.04	0.70	MUDSTONE: dark-grey, massive, slightly silty with rootlets scattered throughout, also ferruginous bands. Slickensided surfaces at 1.62m and through the coal, gradational
	193.15	3.11	SILTSTONE (60%)/SANDSTONE (40%): light-grey siltstone, massive, interbedded with light-grey, very fine to fine

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			grained sandstone, slightly calcareous, moderately well-sorted, massive, sandstone interbeds are often irregularly shaped and poorly defined. The two lithologies are sometimes mixed intimately, black, argillaceous and carbonaceous inclusions are found scattered throughout, occasional ferruginous nodules. Slickensided surfaces at 1.74 and 1.84m
	193.45	0.30	SILTSTONE/SANDSTONE: same as above, gradational
	194.35	0.90	SILTSTONE (20%)/MUDSTONE (60%).
	194.40	0.05	MUDSTONE: black
	194.53	0.13	MUDSTONE: carbonaceous.
			GATES 'D' COAL SEAM
	194.61	0.08	COAL: dull lustrous, heavily sheared, fragmented.
	194.71	0.10	COAL: dull lustrous, whole stick, occasionally listricated and sheared.
	194.75	0.04	COAL: dull lustrous, with occasional thin bright bands, sheared.
	194.87	0.12	COAL: dull, sub lustrous, with ankerite, whole stick
	194.94	0.07	COAL: dull sub lustrous, with thin bright bands, whole stick
	194.98	0.04	COAL: dull, sub-lustrous, whole stick
	195.06	0.08	COAL: heavily sheared, whole stick, possibly dull, lustrous
	195.09	0.03	MUDSTONE: carbonaceous, interbedded with thin bright coal.
	195.63	0.54	MUDSTONE: coaly
	196.09	0.46	MUDSTONE: black carbonaceous with few rootlets.
	196.29	0.20	MUDSTONE: same as above
	197.47	1.18	MUDSTONE: same as above, gradational to MUDSTONE/SANDSTONE: mudstone as above plus light grey, very fine to fine-grained sandstone, calcareous, moderately well-sorted, massive with argillaceous partings, possibly slightly burrowed, the sandstone interbeds are discreet, gradational, irregularly shaped and sometimes intimately mixed with mudstone.
	197.90	0.43	MUDSTONE (60%)/SANDSTONE (40%).

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	198.90	1.00	MUDSTONE (40%)/SANDSTONE (60%): gradational
	199.30	0.40	MUDSTONE (70%)/SANDSTONE (30%): very fine-grained sandstone, slickensided surfaces at 0.30, 0.50, 0.62,0.66, 1.24m, core broken, shattered between 0.57-1.02m and 1.42-1.47m.
	199.61	0.31	MUDSTONE/SANDSTONE: as above, gradational, mudstone black with occasional rootlets.
	202.01	2.40	MUDSTONE/SANDSTONE: as above interbedded, lithologically similar to 197.47 but sandstone is fine-to medium-grained.
	202.23	0.22	MUDSTONE (20%)/SANDSTONE (80%).
	202.45	0.22	MUDSTONE (30%)/SANDSTONE (70%): same as above.
	202.68	0.23	MUDSTONE: black, core sheared between 0.15-0.28m, slickensided surfaces.
	202.78	0.10	COAL: dull, sub-lustrous, with thin irregular bright bands, slightly broken stick
	202.81	0.03	COAL: dull, sub-lustrous, banded, broken stick.
	202.91	0.10	COAL: dull, sub-lustrous, broken stick.
	202.92	0.01	COAL: bright
	203.01	0.12	COAL: dull, sub-lustrous, with thin irregular bright bands, fragmented large pieces.
	203.04	0.03	COAL: bright banded, broken stick
	203.17	0.13	MUDSTONE: carbonaceous
	203.29	0.12	MUDSTONE: coaly interbedded with thin coals, heavily sheared, slickensided surfaces.
	203.34	0.05	COAL: dull, muddy with thin bright bands, sheared.
	203.40	0.06	COAL: pulverized, possibly dull,sub=lustrous.
	203.45	0.05	COAL: dull banded, dense, sheared, very broken stick
	203.48	0.03	COAL: same as above, but whole stick
	203.55	0.07	COAL: interbedded with mudstone.
	203.57	0.02	COAL: dull with thin bright bands, heavily sheared
	203.60	0.03	COAL: dull banded, very broken stick

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	203.63	0.03	COAL: dull banded, pulverized, broken, small pieces.
	203.77	0.14	COAL: bright interbedded with mudstone.
	204.02	0.25	COAL: dull with thin bright bands interbedded with Coaly mudstone, pulverized.
	204.82	0.80	MUDSTONE: Coaly, pulverized.
	205.74	0.92	MUDSTONE (60%)/SANDSTONE (40%): mudstone, black carbonaceous, with few rootlets, plus light-grey, very fine-to fine-grained sandstone, calcareous, moderately well-sorted, massive with argillaceous partings, possibly slightly burrowed, the sandstone interbeds are discreet, gradational, irregularly shaped and sometimes intimately mixed with mudstone.
	206.27	0.53	MUDSTONE (60%)/SANDSTONE (40%): as above.
	206.42	0.15	MUDSTONE
	206.51	0.09	COAL: mostly bright, few dull bands, broken stick
	206.53	0.02	COAL: dull, whole stick
	206.55	0.02	COAL: bright, whole stick
	206.57	0.02	COAL: dull, with thin bright band.
	207.67	1.10	MUDSTONE: dark
			SANDSTONE/MUDSTONE: light-grey, fine-grained sandstone, moderately well-sorted, massive, slightly calcareous with argillaceous partings and occasional ferruginous bands, interbedded with black mudstone, contacts sandstone/mudstone gradational and often mixed intimately together.
	208.78	1.11	SANDSTONE (85%)/MUDSTONE (15%).
	210.61	1.83	SANDSTONE (85%)/MUDSTONE (15%): gradational to mudstone (80%)/sandstone (20%).
	211.83	1.22	MUDSTONE: dark-grey, massive with numerous ferruginous bands and nodules.
	212.97	1.14	MUDSTONE: dark-grey to black, core shattered between 1.12 and 1.38m, slickensided surface.
	214.15	1.18	MUDSTONE (80%)/SANDSTONE (20%): dark-grey mudstone with thin interbeds of fine-grained, light-grey sandstone, discreet interbeds, core shattered or badly broken up

BH Nos.

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			between 1.12-1.38m and 1.97-2.30m.
	215.24	1.09	MUDSTONE (95%)/SANDSTONE((5%): same as above, sharp contact. CONGLOMERATE: varicolered, well sorted, pebbles sub-rounded to rounded, chert and quartz predominant. RRock tightly packed, no matrix, in layers of equal size pebbles, occasional layers of coarse-grained sand-stone (1cm).
	217.01	1.77	CONGLOMERATE: average size 5-6mm some layers a bit coarser.
	217.77	0.76	CONGLOMERATE: as above, average size 5-6mm.
	217.93	0.16	CONGLOMERATE: as above, average size 10-12mm.
	220.98	3.05	CONGLOMERATE: as above, average size 10mm top-0.05m average size 5-6mm 0.05-0.51m average size 9-10mm 0.51m-0.60m average size 8mm 2.00-2.50m
	224.02	3.04	CONGLOMERATE: as above, average size 6mm 0.-0.80m average size 8mm 0.80-1.42m average size 5mm 1.42-2.11m average size 10mm 2.11-2.13m matrix is medium-coarse-grained salt and pepper sandstone.
	227.07	3.05	CONGLOMERATE: less well-sorted but lithologically similar to above, matrix medium-grained salt and pepper sandstone (size 3mm-10mm).
	229.25	2.18	CONGLOMERATE: as above
	230.21	0.96	CONGLOMERATE (90%)/SANDSTONE (10%): conglomerate same as above, interbedded with salt and pepper medium-grained sandstone, moderately well-sorted with floating pebbles, contacts are gradational, diffuse, sand interbeds usually .02-.03m but occasionally up to 0.10m.
	233.17	2.96	CONGLOMERATE (70%)/SANDSTONE (30%): same as above, one bed of conglomerate has average size 10mm @ 1.88m-2.15m.
	235.23	2.06	CONGLOMERATE: as above but coarser with pebbles up to 2cm.
	235.29	0.06	SANDSTONE: varicolered, very coarse-grained, well-sorted.
	236.82	1.53	SANDSTONE: medium-grey, very fine-to-fine-grained, non-calcareous well-sorted to moderately well-sorted, usually massive but can be finely laminated, occasional carbon-aceous inclusions and partings, locally burrowed (large size), burrowed between 0.50-0.66m; laminated between 0.73-1.20m.

BH Nos. 32A

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	7.92	1.82	CONGLOMERATE, grading to sandstone, coarse-grained, poorly sorted, angular to sub-rounded, pebbles 25 mm. to coarse-grained moderately weathered.
	8.55	0.63	CONGLOMERATE, pebbles banded with sandstone, coarse grained.
	10.97	2.42	SANDSTONE, medium-to fine-grained cross-bedded, minor pebble bands, moderately weathered, numerous iron stained bands. High-angle fractures ~80°.
	14.02	3.05	SANDSTONE, as above
	17.07	3.05	SANDSTONE, as above, extremely weathered and broken towards bottom of section.
	20.12	3.05	SANDSTONE, as above, highly weathered and broken towards top of section, minor bioturbated zones, weathered and broken toward bottom of section.
	20.32	0.20	SANDSTONE, as above, minor bioturbated zones.
	20.63	0.31	SANDSTONE/SILTSTONE, heavily bioturbated, dark grey.
			BOULDER CREEK / HULLCROSS
	22.56	1.93	SANDSTONE, SILTSTONE, dominantly silty, gradational at base.
	25.60	3.04	SANDSTONE, SILTSTONE, as above
	26.21	0.61	SANDSTONE, SILTSTONE, as above
	29.26	3.05	SANDSTONE, SILTSTONE, as above
	32.31	3.05	SANDSTONE, SILTSTONE, fine-to very fine-grained, inter-bedded, cross-laminated, bioturbated zones, minor slump structures.
	35.36	3.05	SANDSTONE, SILTSTONE, as above, 50/50, high angle iron stained fractures at 80° to 90°.
	38.40	3.04	SANDSTONE, SILTSTONE, as above, 50/50

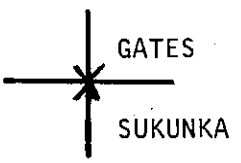
BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	254.90	0.30	CONGLOMERATE: same as above
			GATES 'B' COAL SEAM
	255.00	0.10	COAL: dull, lustrous, broken stick
	255.04	0.04	COAL: dull, lustrous with occasional very thin bright bands
	255.13	0.09	COAL: dull, semi-lustrous, broken stick
	255.19	0.06	COAL: dull, lustrous, very broken stick
	255.31	0.12	COAL: dull, semi-lustrous, stick
	255.45	0.14	COAL: dull, lustrous, stick
	255.50	0.05	MUDSTONE: dark-grey, grades rapidly downward
	256.68	1.18	SANDSTONE: very fine-grained, light-grey, moderately well sorted, massive with numerous argillaceous and carbonaceous partings, locally between 0-0.65 m, some sandstone between 0.65-0.98m, but coarsening to fine-grained downward.
	257.35	0.67	SILTSTONE/MUDSTONE, SILTY: medium-grey with numerous thin argillaceous partings.
	257.55	0.20	SILTSTONE/MUDSTONE, SILTY/SANDSTONE: silty mudstone as above, sandstone light-grey, very fine-to fine-grained (coarsening down), moderately well-sorted to poorly sorted, irregularly banded, light-grey/medium-grey, numerous very thin argillaceous partings. Interbedded with siltstone mostly as very gradational units where thin, where thicker lower contact of the sand is sharper, and upper gradational.
	258.50	0.95	SILTSTONE/SANDSTONE: as above.
			GATES 'A' SEAM
	258.65	0.15	MUDSTONE: black with thin coal interbeds, <5mm thick, bright, sheared.
	260.60	1.95	MUDSTONE: dark-grey, with thin very fine-grained sandy intervals, also ferruginous bands, bottom 0.50m broken up with occasional listric surfaces.
	263.65	3.05	CONGLOMERATES: varicolered, pebbles of varying size, but well-to moderately well-sorted, sub-rounded pebbles, rock usually tightly packed, no matrix, usually medium/coarse-grained, salt and pepper sandstone. Quartz, chert most frequent rock particles. Average size 4mm.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	266.40	2.75	CONGLOMERATE: as above
	266.70	0.30	CONGLOMERATE: moderately well-sorted, matrix very coarse-grained sand, size 6mm to 30mm.
	269.30	2.60	CONGLOMERATE: same as above
	269.62	0.32	CONGLOMERATE: same as above, sandstone varicolered very coarse-grained, moderately well-sorted contacts gradational, pebbles floating in sand.
	271.32	1.70	CONGLOMERATE/SANDSTONE: fining downward to very coarse-grained sandstone, gradational, size 6mm-30mm to 1mm. SANDSTONE/CONGLOMERATE: varicolered, very coarse-grained sandstone as above, interbedded with medium-grey, fine-to medium-grained sandstone, non-calcareous, massive, often with floating very coarse-grained darker grains scattered throughout along with pebbles. Contacts are generally sharp.
	272.67	1.35	SANDSTONE (95%)/CONGLOMERATE (5%): sandstone is 60% very coarse-grained, 35% fine-to medium-grained.
	275.72	3.05	SANDSTONE (90%)/CONGLOMERATE (10%): sandstone is 20% very coarse-grained, 70% fine-grained.
	278.73	3.01	SANDSTONE (95%)/CONGLOMERATE (5%): sandstone is 40% very coarse-grained and 55% fine-grained.
	281.65	2.92	SANDSTONE (70%)/CONGLOMERATE (30%): very coarse-grained sandstone (40%) varicolored, fine-grained, medium-grey sandstone (30%).
	281.78	0.13	CONGLOMERATE: varicolered, moderately well-sorted, large pebbles floating in a matrix of smaller ones, sub-rounded, 3mm-20mm pebble size.
	282.51	0.73	CONGLOMERATE: as above.
	282.78	0.27	SANDSTONE: medium-grey, fine-grained, as above, sharp contact.
	282.93	0.15	CONGLOMERATE: moderately well-sorted, average size 2mm.
	283.20	0.27	SANDSTONE: medium-grey, fine-grained type as above.
	284.44	1.24	CONGLOMERATE: varicolered, poorly-sorted, very coarse pebbles in a matrix of smaller ones, size 3mm-12mm, sub-angular clasts.
	284.75	0.31	SANDSTONE: medium-grey, fine-grained type.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	284.82	0.07	CONGLOMERATE.
	284.89	0.07	SANDSTONE: medium-grey, fine-grained type.
	286.19	1.30	SANDSTONE: medium-grey, fine-grained type, with occasional argillaceous inclusions.
	286.34	0.15	CONGLOMERATE: average size 4mm.
	287.93	1.59	SANDSTONE: medium-grey, fine-grained, finely laminated, argillaceous partings and burrowed (large size) in upper part. Burrowed between 1.41-2.24m, Sandstone becomes coarse-grained (2.77-2.98m) and a few pebbles are floating in matrix of coarse-grained sandstone.
	287.97	0.04	CONGLOMERATE: average size 2mm.
	288.07	0.10	CONGLOMERATE: as above
	291.08	3.01	SANDSTONE: medium-grained, fine-grained, laminated alternating bands: light/medium-grey (2cm/few cm thick).
	299.92	8.84	SANDSTONE: same as above
	303.06	3.14	SANDSTONE: same as above with minor carbonaceous inclusions.
	309.06	6.00	SANDSTONE: same as above
	310.86	1.80	SANDSTONE: same as above with black argillaceous interbeds <1cm thick, near base of unit.
			
	312.11	1.25	SANDSTONE/MUDSTONE: mixed, same description as follows.
	315.16	3.05	SANDSTONE/MUDSTONE: mixed, light-grey, very fine- to fine-grained sandstone, moderately well- to well-sorted, finely laminated with few low-angle cross-beds, sharp (erosional) lower contact, upper contact usually gradational to mudstone and is also sharp. Sandstone occurs as massive interbeds burrowed, bioturbated, slumped with black massive mudstone interbeds, often burrowed (small size). The two lithologies mudstone/sandstone occur intimately mixed together. Slickensides at 0.15 and 0.75 m.
	318.21	3.05	SANDSTONE (50%)/MUDSTONE (30%)/MIXED (20%): core broken lengthwise between 2.30-2.63m.

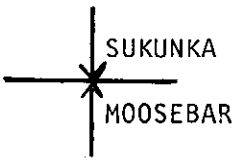
BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	321.25	3.04	SANDSTONE (30%)/MUDSTONE (30%)/MIXED (40%): core broken lengthwise between 0.84-1.27m
	324.30	3.05	SANDSTONE (35%)/MUDSTONE (20%)/MIXED (45%): slickensided surfaces at 2.37, 2.38 and 2.71m
	327.66	3.36	SANDSTONE (30%)/MUDSTONE (20%)/MIXED (50%): slickensided surfaces at 1.22 and 2.89m
	330.70	3.04	SANDSTONE (30%)/MUDSTONE (40%)/MIXED (30%): slickensided surfaces at 0.12m
	333.75	3.05	SANDSTONE (30%)/MUDSTONE (40%)/MIXED (30%):
	336.80	3.05	SANDSTONE (35%)/MUDSTONE (40%)/MIXED (25%): core broken lengthwise between 1.67-1.90m and 2.63-3.05m.
	342.90	6.10	SANDSTONE (30%)/MUDSTONE (45%)/MIXED (25%): core ground up, sheared, slickensided between 1.44-1.49m.
	344.72	1.82	SANDSTONE (55%)/MUDSTONE (10%)/MIXED (35%).
	347.77	3.05	SANDSTONE (55%)/MUDSTONE (10%)/MIXED (35%), slickensided surfaces at 0.10, 0.17 and 1.03m.
	350.82	3.05	SANDSTONE (70%)/MUDSTONE MIXED (30%): slickensided surfaces at 0.07, 0.41,0.49, 0.55, 1.07, 1.29 and 1.74m
	353.87	3.05	SANDSTONE (60%)/MUDSTONE (10%)/MIXED (30%): sandstone is lithologically similar to above (315.16 - p.20), but massive, moderately well-sorted and locally burrowed (large scale), slickensided surfaces at 0.30, 0.37, 0.57 and 1.07m
	356.92	3.05	SANDSTONE (60%)/MUDSTONE (15%)/MIXED (25%): slickensided surfaces at 0.39, 1.18, and 1.25m.
	359.96	3.04	SANDSTONE (60%)/MUDSTONE (5%)/MIXED (35%): gradational
	364.23	4.27	SANDSTONE (40%)/MIXED (60%).
	367.28	3.05	SANDSTONE (30%)/MUDSTONE (10%)/MIXED (60%).
5°	370.33	3.05	SANDSTONE (40%)/MUDSTONE (20%)/MIXED (40%): slickensided surfaces at 0.73, 0.78 and 0.93m
	373.38	3.05	SANDSTONE (40%)/MUDSTONE (10%)/MIXED (50%): slickensided surfaces at 0.75, 1.31, 1.32m.
	376.42	3.04	SANDSTONE/MUDSTONE: light-grey, very fine-to fine-grained sandstone, moderately calcareous, moderately well-to well

BH Nos. 29

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			sorted, finely laminated, occasionally cross-bedded (low-angle), also massive, large size burrows locally abundant, occasional black muddy intraclastic beds and muddy inclusions (black) scattered throughout with interbeds of black mudstone, sometimes silty. Sandstone (85%)/Mudstone (15%), between 1.30-3.00m.
	379.47	3.05	SANDSTONE (80%)/MUDSTONE (20%): burrowed zone between 0.37-0.45m, slickensided surface at 0.71m
	382.52	3.05	SANDSTONE (70%)/MUDSTONE (30%):
	385.57	3.05	SANDSTONE/MUDSTONE: mixed intimately [illegible]
	388.82	3.25	SANDSTONE (60%)/MUDSTONE (30%)/MIXED (10%): sandstone interbeds thick (to 0.55m)
	391.66	2.84	SANDSTONE (65%)/MUDSTONE (25%)/MIXED (10%).
	394.71	3.05	SANDSTONE/MUDSTONE/MIXED: sandstone interbeds are much thinner from now on (<0.18m) still mostly laminated, lithologically similar to above, slickensided surface at 0.69m
	397.76	3.05	SANDSTONE (40%)/MUDSTONE (30%)/MIXED (30%).
	400.81	3.05	SANDSTONE (40%)/MUDSTONE (30%)/MIXED (30%).
	403.86	3.05	SANDSTONE/MUDSTONE/MIXED: sandstone interbeds ever decreasing in size <0.08m with many thin wisps.
	406.90	3.04	SANDSTONE (30%)/MUDSTONE (40%)/MIXED (30%).
	409.95	3.05	SANDSTONE (20%)/MUDSTONE (50%)/MIXED (30%): mudstone getting silty.
	413.00	3.05	SANDSTONE (15%)/MUDSTONE (60%)/MIXED (25%).
	416.05	3.05	SANDSTONE (15%)/MUDSTONE (75%)/MIXED (10%): sandstone interbeds are mostly wisps and irregularly shaped lenses. Mudstone is dark-grey silty and locally heavily burrowed (medium-size).
	419.10	3.05	SANDSTONE (15%)/MUDSTONE (85%).
	422.14	3.04	SANDSTONE (45%)/MUDSTONE (55%).
	425.19	3.05	SANDSTONE (40%)/MUDSTONE (60%).
	428.24	3.05	SANDSTONE (35%)/MUDSTONE (65%).
	431.29	3.05	SANDSTONE (35%)/MUDSTONE (65%).

BH Nos.29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	434.34	3.05	SANDSTONE (25%)/MUDSTONE (75%): core broken lengthwise between 1.81-2.00m.
	437.38	3.04	SANDSTONE (15%)/MUDSTONE (85%).
	439.88	2.50	SANDSTONE (5%)/MUDSTONE (95%): gradational.
			
	440.43	0.55	MUDSTONE: dark, with occasional pyrite nodules and ferruginous bands.
	443.48	3.05	MUDSTONE: black, core broken up
	446.53	3.05	MUDSTONE: black, core broken up, mostly lengthwise.
	452.62	6.09	MUDSTONE: black
	455.37	2.75	MUDSTONE: black, well developed slickensided surfaces at 0.33, 0.40, 0.47, 0.52, 0.66, 0.80, 0.87, 0.99, 2.28 and between 2.50-2.58m.
	483.10	27.73	MUDSTONE: black
	486.15	3.05	MUDSTONE: black, slickensided surface at 2.48m
	495.30	9.15	MUDSTONE: black
	498.34	3.04	MUDSTONE: black, slickensided surfaces at 1.16, 1.20, 1.61, 1.70, and between 2.53-2.58m
	501.39	3.05	MUDSTONE: black, slickensided surfaces between 1.10-1.18m en echelon fractures at 1.67, 2.20, 2.33, and 2.95m.
	504.44	3.05	MUDSTONE: black, slickensided surface at 0.33m
	507.49	3.05	MUDSTONE: black, slickensided surfaces at 0.60, 0.67m at a high angle.
	507.74	0.25	MUDSTONE: grey, silty, small pyritic specks, stick with few breaks.
	508.47	0.73	MUDSTONE: grey, silty, pyrite, stick with few breaks.
	510.54	2.07	CORE-LOSS

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	512.01	1.47	MUDSTONE: as above, one horizontal striated plane passing through core 0.26m above base, stick.
	512.55	0.54	MUDSTONE: dark-buff , dense, ferruginous, mineralized fractures, broken stick
	513.58	1.03	MUDSTONE: grey, silty, pyrite, stick
	515.74	2.16	MUDSTONE: grey, silty, pyrite, stick with few breaks.
	516.64	0.90	MUDSTONE: as above, broken stick
	517.08	0.44	MUDSTONE: as above.
	517.17	0.09	MUDSTONE: ferruginous, calcitic fractures, 60° striated plane at top, low-angle striated plane at base, stick.
	517.60	0.43	MUDSTONE: grey, silty, pyrite, broken stick
	517.65	0.05	MUDSTONE: ferruginous, calcitic fractures, striated planes top and bottom, broken stick
	518.48	0.83	MUDSTONE: grey, silty, pyrite, stick with few breaks.
	519.69	1.21	MUDSTONE: as above, ferruginous band 0.23 to 0.26m from base, stick.
	520.56	0.87	MUDSTONE: as above, stick with few breaks.
	522.74	2.18	MUDSTONE: as above, pyrite content increasing, bentonitic horizon 0.26-0.29m from top, stick with few breaks.
	524.90	2.16	MUDSTONE: as above, stick
	525.79	0.89	MUDSTONE: as above, stick
	526.93	1.14	MUDSTONE: as above, stick with few breaks.
	528.52	1.59	MUDSTONE: medium-grey, highly silty, structureless, thin bentonitic bands (12-15mm thick), pyrite blobs, some of these pyritized burrows.
	528.62	0.10	BENTONITIC BAND: light-grey, pin and large burrows.
	528.75	0.13	MUDSTONE: medium-grey, irregular base.
	528.83	0.08	BENTONITE BAND: same as above minus burrows
	529.16	0.33	SANDSTONE: glauconitic, fine-grained at top, medium to base, no fractures.
	529.28	0.12	SANDSTONE: medium-grained, glauconitic, pyritized, carbon-

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			aceous, slickensided irregular base. MOOSEBAR / UPPER GETHING
			BIRD COAL SEAM
	529.305	0.025	COAL: dull and bright, strong cleat parallel to core axis.
	529.345	0.04	COAL: bright banded, strong cleat parallel to core axis.
	529.375	0.03	COAL: dull and bright, strong cleat parallel to core axis.
	529.455	0.08	COAL: dull banded, strong cleat parallel to core axis.
	529.51	0.055	COAL: dull and bright, very strong cleat.
	529.540	0.03	COAL: dull banded.
	529.575	0.035	COAL: dull with occasional bright streaks.
	529.585	0.01	COAL: bright.
	529.615	0.03	COAL: dull with .004M bright band in middle
	529.665	0.05	COAL: dull band with shear planes and strong cleat parallel to core axis.
	529.715	0.05	COAL: dull banded with numerous bright streaks near base.
	529.815	0.10	COAL: dull banded.
	529.875	0.06	COAL: dull and bright, finely disseminated bright streaks, fragmented.
	529.985	0.11	CORE LOSS-COAL.
	530.025	0.04	COAL: bright banded.
	530.135	0.11	COAL: dull and bright, fragmented.
	530.245	0.11	CORE LOSS-COAL.
	530.315	0.07	COAL: dull lustrous.
	530.345	0.03	COAL: bright banded.
	530.365	0.02	COAL: dull banded.
	530.395	0.03	COAL: dull.
	530.415	0.02	COAL: bright.
	530.435	0.02	COAL: dull banded.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	530.545	0.11	COAL: bright banded, cleat 70°
	530.565	0.02	COAL: dull and bright.
	530.615	0.05	COAL: bright banded.
	530.845	0.23	COAL: dull, brownish streak, with irregular vitrain near middle and fine diss. vitrain specks near base (probably high-ash), calcareous.
	530.975	0.13	COAL: bright, sheared, pulverized middle .06 M is dull. banded.
	530.995	0.02	PYRITE: with coal streaks.
	531.035	0.04	COAL: dull banded.
	531.11	0.075	COAL: bright banded.
	531.21	0.10	COAL: dull, weakly calcareous, (see .13 above), possibly high ash.
	531.24	0.03	COAL: dull and bright, cleated (.003-.004 apart).
	531.30	0.06	COAL: bright banded, with ankerite mineralization.
	531.32	0.02	COAL: dull and bright.
	531.37	0.05	COAL: bright.
	531.42	0.05	COAL: bright banded.
	531.49	0.07	COAL: dull and bright, listricated.
	531.51	0.02	COAL: bright.
	531.565	0.055	COAL: dull and bright, listricated, ankerite.
	531.575	0.01	COAL: dull and lustrous.
	531.595	0.02	COAL: dull banded.
	531.64	0.045	COAL: bright banded.
	531.70	0.06	COAL: lustrous, highly cleated, small fragments.
	531.86	0.16	CORE LOSS-COAL
	531.98	0.12	COAL: dull lustrous, bright banding, slightly sheared.
	532.04	0.06	COAL: same as above, but highly cleated.

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	532.14	0.10	COAL: dull banded sheared.
	532.22	0.08	COAL: bright.
	532.235	0.015	COAL: dull banded.
	532.24	0.005	MUDSTONE: carbonaceous, slickensided.
	532.315	0.075	COAL: bright banded.
	532.355	0.04	COAL: dull and bright bands, finely broken, listric surfaces.
	532.365	0.01	COAL: dull.
	532.39	0.025	COAL: bright.
	532.45	0.06	COAL: some bright, highly pulverized, possible core loss, abrupt floor contact.
	532.58	0.13	CORE LOSS-COAL.
	532.67	0.09	MUDSTONE: black, carbonaceous, silty near top, listric near base - 20°.
	533.35	0.68	SANDSTONE: medium-grey, medium-grained, quartz, mottled, small burrows, occasional lamination at 10°.
	533.74	0.39	SANDSTONE: as above.
	534.92	1.18	SANDSTONE: medium/dark-grey, medium-grained, infested with small burrows, two minor calcite fractures, typical Bird floor sands.
	537.97	3.05	SANDSTONE: as above, much mottling due to intensive bioturbation, occasional relicts of primary lamination; 0.13m fine sand, 0.26m from base; generally clean and sorted, non-calcareous.
5°	541.02	3.05	SANDSTONE: top 1.24m medium-grained, rest fine/medium-grained, regularly cross-bedded throughout, bottom 1.02m with numerous large burrows, unit characterized by reoccurence of fine carbonaceous matter within laminae (these locally emphasising cross-sets); weakly calcareous.
	544.07	3.05	SANDSTONE: as above, bottom 1.25m almost massive, devoid of lamination, strongly calcareous throughout.
	547.11	3.04	SANDSTONE: medium-grey, fine/medium-grained, very uniform well sorted and washed, massive, no indication of sedimentary lamination, strongly calcareous throughout.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	550.16	3.05	SANDSTONE: identical to the above, strongly calcareous.
	550.61	0.45	SANDSTONE: as above, basal contact erosional with mud.
	550.69	0.08	MUDSTONE/SANDSTONE: sandstone fine-grained, interlayed with dark-grey muds, mutual boundaries erosional, typical 'intertidal' look.
	550.95	0.26	MUDSTONE: black, carbonaceous, somewhat coaly, abrupt below.
	551.30	0.35	SILTSTONE/SANDSTONE: medium-grey, ferruginous, slightly laminated, sands very fine-grained; sequence fairly calcareous, abrupt below.
	551.43	0.13	MUDSTONE: black, very sandy, carbonaceous, ferruginous band, non-calcareous, abrupt below.
	551.94	0.51	SANDSTONE: medium-grey, very fine-grained, very argillaceous, silty/muddy laminae and thin layers, small gradational units, micro-erosional fractures, calcareous, erosional at base.
	552.14	0.20	MUDSTONE: black to dark-grey, abundant admixture of very fine sandstone in matrix; bottom 0.06m fine-grained argillaceous sandstone, non-calcareous, structureless.
	552.62	0.48	SANDSTONE: medium-grey, very fine-grained, argillaceous, silty intercalations, occasional lamination, non-calcareous, gradual at base.
	553.21	0.59	SANDSTONE: light/medium-grey, fine-grained, devoid of lamination, (some suggestion of 'flowage' and/or bioturbation).
	555.06	1.85	SANDSTONE: identical to above, abrupt below with coal, some zones exhibit lamination.
	555.19	0.13	COAL: finely fragmented and all jumbled up. Many fragments of dull type Coal, highly listricated surfaces.
	555.63	0.44	COAL: very similar to above (physically).
	555.95	0.32	MUDSTONE: dark-grey to black, slightly sheared and listricated, homogeneously carbonaceous.
	556.41	0.46	MUDSTONE: dark-grey to black, locally very carbonaceous and banded mudstone; abundantly listricated, fragmented, gradual at base.
	556.60	0.19	SILTSTONE: dark-grey, argillaceous, coarse-grained, finely sandy and laminated bottomward; erosional.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	556.77	0.17	SANDSTONE: medium-grey, fine-grained, silty argillaceous layers, slumped within sand, strongly calcareous, scoured basal contact.
10°	558.00	1.23	SANDSTONE/SILTSTONE: top 0.45m essentially very fine-grained sand, argillaceous; sparsely laminated, rest richly muddy (30%) siltstone, slightly ferruginous, strongly calcareous.
	559.09	1.09	SANDSTONE: medium-grey, very fine-grained, laminated, argillaceous, much syndepositional disturbance, micro-graded units, few burrows, strongly calcareous, throughout.
	559.38	0.29	SANDSTONE: light/medium-grey, very fine-grained, relatively clean, sparingly laminated, strongly calcareous, sharp basal contact.
	559.54	0.16	SILTSTONE: dark-grey, argillaceous, calcareous, gradual.
10°	560.28	0.74	SANDSTONE/SILTSTONE: top 0.15m very fine-grained sand, laminated, rest argillaceous siltstone with sporadic intercalations of very fine-grained sands, calcareous, basal contact brecciated.
55°	560.74	0.46	SANDSTONE: top 0.26m very fine sands, laminated, in this zone an intensely mineralized fractured (now healed), rest argillaceous siltstones, equally sheared, basal 0.06m same as at top.
	560.97	0.23	MUDSTONE: dark-grey/black, top half fragmented and small pieces with abundant listric surfaces, carbonaceous, abundant plant debris, abrupt basal contact.
	561.52	0.55	SANDSTONE: light/medium-grey, fine- to very fine-grained, 10 cm muddy siltstone, tiny 'rooty' matter, calcareous, abrupt at base.
	561.75	0.23	MUDSTONE: dark-grey, silty (homogeneously) structureless, erosional at base.
15°	561.99	0.24	SANDSTONE: medium-grey, very fine-grained, argillaceous, small-scale cross-bedding, lower half has parallel, wavy to crinkly lamination, strongly calcareous, broken at base.
	562.17	0.18	MUDSTONE: medium-grey, somewhat sheared, strongly calcareous, silty intercalations, laminated.
	562.93	0.76	SILTSTONE: medium-grey, very argillaceous, sporadic lamination and highly distorted due to slumping, strongly calcareous, gradational at base.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	563.39	0.46	SANDSTONE: light/medium grey, fine-to very fine-grained, small-scale cross-lamination, two fractures, strongly calcareous, fractured at base.
	563.57	0.18	MUDSTONE/SILTSTONE: medium-grey, top 2/3 silty mudstone, rest coarse-grained siltstone with micro-cross-lamination, calcareous.
	564.47	0.90	SANDSTONE: medium grey, fine-grained, ubiquitous small-scale cross-lamination, much of laminae enhanced due to entombment of finely particulate carbonaceous matter; strongly calcareous, erosional at base.
25°	565.40	0.93	SILTSTONE/MUDSTONE: top 0.30 silts with layers and lenticles of very fine-grained laminated sands, rest highly silty (homogeneously), medium grey siltstones, some differentiated silty laminae, calcareous throughout.
	566.31	0.91	MUDSTONE: top 0.80 highly silty (30%), silts as laminae and thin layers, strongly calcareous, rest homogeneously silty.
	566.93	0.62	MUDSTONE: medium-to dark grey, slightly ferruginous, locally silty laminae, strongly calcareous.
	568.30	1.37	MUDSTONE: as above, locally fragmented, top 0.69m silty and calcareous, rest devoid of silts and non-calcareous.
	568.48	0.18	MUDSTONE: very similar to above (non-calcareous type).
	568.76	0.28	MUDSTONE: dark grey/black as above, silty, structureless.
25°	569.67	0.91	SILTSTONE: medium grey, top 0.24m fractured, listricated, mineralized, 0.10m very fine-grained sandstone zone, laminated, strongly calcareous.
	570.63	0.96	SILTSTONE (60%)/MUDSTONE (40%): dark grey, very muddy, occasional laminae, calcareous.
	571.50	0.87	MUDSTONE: medium grey, silty, hard breaking with concoidal fracture, calcareous, fragmented toward base and with one near-vertical fracture.
	571.94	0.44	MUDSTONE: medium grey, as above, some rootlets, strongly calcareous, very transitional at base.
	573.27	1.33	SILTSTONE: medium grey, argillaceous, bottom half coarse-grained silts, vaguely laminated, two fractures crossing core at 45° with 1cm thick calcite encrustation, strongly calcareous, gradual.
20°	574.54	1.27	SANDSTONE: medium/dark grey, very fine-grained, highly argillaceous (finely disseminated), much wavy parallel lamination, slumping and compactional features, sporadic burrowing, many zones grading into siltstone, very

BH Nos. 29

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			strongly calcareous throughout, some calcite filled fractures in bottom 0.40m.
40°	576.52	1.98	SANDSTONE: as above, basal 0.40m less argillaceous, much fracturing at various angles to core axis, strongly calcareous, very fractured at base.
50°	577.59	1.07	SANDSTONE: medium-grey, fine-grained, small-scale, cross-lamination; abundant fractures, paralleling bedding planes, calcite encrusted; strongly calcareous, 4cm very fine-grained sand at base.
65°	578.58	0.99	SANDSTONE: top 0.20 very fine-grained sands, laminated containing fine carbonaceous matter within laminae, rest a mixture of very fine sands and richly argillaceous siltstone, numerous healed fractures, gradual at base, calcareous throughout, some fractures at 40° from horizontal and cutting across bedding.
60°	579.88	1.30	MUDSTONE: dark-grey, laminated, abundant listric surfaces mostly along bedding. Typical "Laminite Roof:.
62°	580.61	0.0.73	MUDSTONE: dark-grey, laminated, same as above "Laminite".
	580.76	0.15	MUDSTONE: medium-grey/dark-grey, silty, all fragments, some listricated surfaces.
68°	581.32	0.56	MUDSTONE: dark-grey, highly silty and well-laminated, listricated surfaces along bedding (slippage along laminae), some calcite lining of these listric surfaces, very weakly calcareous.
62°	582.23	0.91	MUDSTONE: similar to above, listricated surfaces along bedding planes (rock showing six discrete listric zones) fragmented toward the base, very weakly calcareous.
	582.44	0.21	MUDSTONE: as above, listricated, steeply inclined.
40°	582.85	0.41	MUDSTONE: dark-grey, carbonized plant debris, 6cm zone toward base with intensive hairline calcite infilling.
	583.07	0.22	MUDSTONE: dark-grey, silty, becoming carbonaceous to base, thinly bedded 45° fracture plane 0.08 from top, filled with calcite, some plant remains at base, broken stick.
	583.09	0.02	FRAGMENTS: large coaly mudstone and small fragments coal. frequently listricated.
	583.36	0.27	CORE:LOSS-COAL
	583.46	0.10	COAL: dull, dense, listric surfaces, hard, large pieces.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	583.50	0.04	COAL: highly sheared, fragmented, type indistinguishable.
	583.52	0.02	COAL: dull, lustrous with occasional bright bands, highly sheared, broken, friable.
	583.63	0.11	CORE LOSS COAL
	583.68	0.05	COAL: dull, lustrous, sheared, fragmented to small pieces.
	583.76	0.08	COAL: highly listricated, dull, lustrous with occasional bright bands, very broken stick.
	583.78	0.02	COAL: dull, lustrous, fragmented
	583.92	0.14	COAL: dull, lustrous, highly listricated and sheared, slickensides passing through core at 60° to horizontal and 2nd direction normal to that direction. Broken stick.
	584.14	0.22	COAL: dull with some bright bands, highly sheared, broken stick.
	584.33	0.19	COAL: dull with occassional bright bands, sheared (less than above) some large striated planes passing through core at 60°, very broken stick.
	584.50	0.17	COAL: dull, with occassional bright bands, highly sheared, broken stick.
	584.52	0.02	COAL: dull, dense, sheared, harder than above, broken stick.
	584.66	0.14	COAL: as before, lightly sheared, broken stick.
	584.76	0.10	CORE LOSS COAL
	584.80	0.04	COAL: fragmented, dull with probable high % bright indicated by high % powdered and pulverised Coal.
	584.81	0.01	COAL: mostly bright, small fragments.
	584.84	0.03	COAL: mostly bright, listricated, broken stick.
	584.88	0.04	COAL: dull, lustrous, some listric surfaces, one large listric surface at 60° passing through core, broken stick.
	584.94	0.06	COAL: dull some bright bands, highly sheared, broken stick.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	585.07	0.13	COAL: dull and bright, hard, large listric surfaces passing through core at 30°.
	585.12	0.05	COAL: bright with dull bands, listicated, broken stick.
	585.13	0.01	COAL: bright, moderate cleat, stick.
	585.16	0.03	COAL: as before, broken stick.
	585.23	0.07	COAL: dull/bright, banding at 60°, listricated at 60° parallel to banding, hard, stick broken.
	585.30	0.07	COAL: dull, lustrous with occasional bright bands.
	585.48	0.18	COAL: bright banded, with occasional large bright bands, listricated at 30° and horizontal.
	585.51	0.03	COAL: bright, listricated at 30° at top and base, cleat developed normal to listric surfaces.
	585.56	0.05	COAL: dull and bright, cleated at 60°, listricated at 30°.
	585.61	0.05	COAL: lustrous, with occasional thin bright bands.
	585.66	0.05	COAL: bright.
	585.72	0.06	COAL: dull and bright.
	585.75	0.03	COAL: as above.
	585.83	0.08	COAL: as above but highly sheared, broken stick.
	585.87	0.04	COAL: dull, broken highly sheared.
	585.93	0.06	CORE LOSS COAL
	585.99	0.06	COAL: dull banded, sheared less than above.
	586.04	0.05	COAL: dull with some bright bands, fragments, listric surfaces.
	586.79	0.75	CORE LOSS COAL
	586.94	0.15	COAL: pulverised and powdered.
	586.99	0.05	COAL: dull with some bright, highly listricated, stick.
	587.07	0.08	COAL: fragmented, bright with dull, powdered.

BH Nos. 29

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	588.07	1.00	CORE LOSS COAL
	588.27	0.20	MUDSTONE: dark grey, silty, fragments, highly listricated, calcitized fractures.
	588.58	0.31	SANDSTONE: medium-grained, dark grey, slightly carbonaceous, mottled, 45° polished surfaces with calcite passing through core.
	589.79	1.21	SANDSTONE: dark grey, medium-grained, thinly bedded, with dark carbonaceous laminae, large worm burrows 0.14 from base.
	592.84	3.05	SANDSTONE: light/medium-grey, fine/medium-grained generally clean and well-sorted, many intervals embodying large burrows. Calcite encrusted fracture; Top half well cross-bedded, lower half with poor cross-bedding to absent, calcareous.
	595.88	3.04	SANDSTONE: similar to above, very strongly calcareous; much of interval poorly laminated.
	598.93	3.05	SANDSTONE: identical to above, strongly calcareous.
	599.93	1.00	SANDSTONE: light grey, fine-grained to medium-grained, very well-washed, sorted, uniform looking, cross-bedded, strongly calcareous, basal contact very abrupt (sharp).
	600.60	0.67	MUDSTONE (60%)/SILTSTONE (40%): interbedded sequence of, some very fine-grained laminated sands. Mud/Sand boundaries erosional. Bottom 0.25m fragmented as is top 0.15m, calcareous throughout. Abrupt at base.
7°	600.81	0.21	SANDSTONE: dark-grey, medium-grained, abundance of carbonaceous matter (finely macerated) in matrix, sporatic lamination, non-calcareous.
	601.98	1.17	SANDSTONE: medium grey, fine medium-grained, laminated, cross-laminated, some silty laminae in bottom 0.45m, few small burrows.
	602.73	0.75	SANDSTONE: as above, abrupt basal contact.
	603.48	0.75	COAL/MUDSTONE: highly broken up and much pulverized zone. Mixture of carbonaceous mudstone and coal.
	605.48	2.00	MUDSTONE: dark-grey, carbonized plant debris, locally slightly coaly, fragmented interval.
	605.68	0.20	COAL: badly fragmented, most coal dull, some pyrite interbedded with carbonaceous mudstone.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	605.83	0.15	MUDSTONE: black, carbonaceous, sticky, coal/clayey mixture, 0.03m zone at top. Fragmented.
	606.83	1.00	SILTSTONE (70%)/SANDSTONE (30%): sandstone very fine grained, argillaceous, laminated, interbedded with silts. Much of sequence exhibiting slumping (distortion of lamination) silts very muddy in bottom 0.55m strongly calcareous throughout. Some rootlets in top 0.30m.
	607.05	0.22	SANDSTONE: medium-grey, fine to very fine grained argillaceous, silty laminae, micro-erosional surfaces, very small scale cross-laminae, few burrows, strongly calcareous, abrupt at base.
	607.16	0.11	SILTSTONE/MUDSTONE: medium-grey, slight dominance of mudstone, sporatic lamination, strongly calcareous, fragmented at base.
12°/15°	609.70	2.54	MUDSTONE: medium-grey, highly silty (as wisps and tiny lenticles of silts), sporadically laminated, strongly calcareous throughout, fairly competent roof.
	610.21	0.51	MUDSTONE: dark-grey, silty, slight carbonaceous in places, broken stick.
	610.41	0.20	MUDSTONE: as above, broken stick.
	610.61	0.20	COAL: dull, lustrous with bright bands, broken.
	611.87	1.26	SILTSTONE: grey-brown, muddy, occassional plant fragments, sandy horizon 0.30M to 0.50M from base, broken stick.
	613.41	1.54	SILTSTONE: as above, with muddy horizons, broken stick.
	614.01	0.60	SILTSTONE: as above, coarsening to fine sandstone in places, stick with few breaks.
	614.93	0.92	SILTSTONE: as above, weakly calcareous, stick with few breaks.
	616.27	1.34	SANDSTONE, dark-grey, fine, muddy horizons, (interbedded) stick with few breaks.
	616.46	0.19	SILTSTONE/MUDSTONE: interbedded, grey, plant remains, stick.
	619.66	3.20	SILTSTONE/MUDSTONE: as above, stick with few breaks.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			MUDSTONE: dark grey/black, silty, carbonized plant remains scattered throughout.
	620.07	0.41	MUDSTONE: dark grey/black as above becoming carbonaceous to base, basal contact irregular.
			CHAMBERLAIN SEAM LOWER PLATE
	620.12	0.05	COAL: bright/dull, thinly banded, predominantly bright.
	620.20	0.08	COAL: dull, slightly lustrous.
	620.25	0.05	COAL: dull with bright streaks, granular texture.
	620.27	0.02	COAL: bright, listric surface at 20° at base.
	620.36	0.09	COAL: dull, with numerous bright bands, numerous listric surfaces throughout; 30° listric surface at base.
	620.46	0.10	COAL: bright and dull banded, closely packed cleats on bright coal, occassional ankerite. 10mm bright coal at base.
	620.48	0.02	COAL dull to lustrous, closely cleated, core ground at base.
	620.72	0.24	CORE LOSS-COAL.
	620.83	0.11	CORE LOSS-ROCK.
	620.89	0.06	MUDSTONE: grey/brown, carbonaceous at margins with coal streaks throughout.
	621.06	0.17	COAL: pulverized with fragments of dull and bright coal.
	621.11	0.05	COAL: dull, slightly lustrous.
	621.16	0.05	COAL: bright/dull, core broken.
	621.25	0.09	COAL: dull, highly sheared, stick, shearing almost vertical.
	621.32	0.07	COAL: pulverized, fragments of bright, lustrous coal.
	621.37	0.05	CORE LOSS COAL
	621.46	0.09	COAL: dull to lustrous, with thin bright bands.
	621.57	0.11	COAL: pulverized, small fragments of sheared coal.

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	621.64	0.07	COAL: dull/bright, thinly banded, core badly broken.
	621.74	0.10	CORE LOSS-COAL
	621.75	0.01	COAL: dull/bright and thinly banded, fragments.
	621.76	0.01	COAL: dull, stony, heavy, fragments.
	622.01	0.25	CORE LOSS-COAL.
	622.08	0.07	COAL: dull to lustrous with bright bands. - fragments.
	622.09	0.01	COAL: bright banded, fragments.
	622.30	0.21	CORE LOSS COAL
	622.38	0.08	COAL: pulverized with small fragments of dull coal with bright bands.
	622.63	0.25	CORE LOSS COAL
	622.71	0.08	COAL: lustrous with numerous bright bands, many listric surfaces, 10° to horizontal, broken stick.
	622.74	0.03	COAL: dull with bright bands, 2mm inferior coal bands at top and base.
	622.75	0.01	COAL: bright, highly cleated.
	622.78	0.03	COAL: bright, thinly banded.
	622.80	0.02	COAL: dull with bright bands, listric surface at base
	622.81	0.01	COAL: lustrous, with submicroscopic banding. 2mm bright band at base, listricated at top and base.
	622.83	0.02	SILTSTONE: black, very coaly, calcareous, highly slickensided.
	622.92	0.09	COAL: dull with bright bands, core badly fragmented and pulverized, fragments show listrication.
	623.68	0.76	CORE LOSS COAL
	623.69	0.01	COAL: bright.
	623.73	0.04	COAL: bright/dull, thinly banded, core broken by 30° listric surface, stick, basal listric surface at 10°.
	623.83	0.10	COAL: bright, highly listricated to sheared at base, core fragmented.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	623.95	0.12	CORE LOSS COAL.
	623.97	0.02	COAL: dull sheared.
	623.98	0.01	COAL: dull, intermixed with calcite.
	624.08	0.10	COAL: dull, highly pulverized, no fragments.
	624.43	0.35	MUDSTONE: black, carbonaceous with coal streaks. top 250 mm slickensideddand listricated at ± 10°. becoming coaly in basal 0.06.
	624.59	0.16	MUDSTONE: black, as above.
	624.60	0.01	COAL: bright.
	624.73	0.13	COAL: dull, inferior, with bright coal streaks throughout, horizontal to subhorizontal slickensides, stick.
	624.77	0.04	COAL: dull, pulverized, sheared.
	624.82	0.05	COAL: dull, inferior with bright streaks, 1 mm calcite streak at 15 mm from base and at base.
	624.84	0.02	MUDSTONE: black, carbonaceous to coaly with bright coal streaks.
	625.13	0.29	MUDSTONE: as above.
	625.60	0.47	MUDSTONE: dark grey/black, carbonaceous, becoming coaly to base with numerous coal streaks, broken stick.
	625.63	0.03	COAL: dull, pulverized.
	625.66	0.03	MUDSTONE: black, carbonaceous, highly listricated.
	626.07	0.41	MUDSTONE: black, pulverized and fragmented, highly sheared and listricated.
	626.09	0.02	MUDSTONE: as above, highly sheared.
	626.47	0.38	MUDSTONE: black, very carbonaceous, slightly silty at top, abundant plant debris throughout.
	628.60	2.13	MUDSTONE: black as above; with a coaly phase, 0.70 m from base.
	628.73	0.13	MUDSTONE: grey, brown-streak, carbonaceous, abundant plant-fragments, listric surfaces, broken stick.
	628.75	0.02	MUDSTONE: carbonaceous, very highly listricated and sheared, broken.

BH Nos. 29

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	628.8	0.05	COAL: dull, dense with thin coal bands, listricated, broken.
	629.5	0.70	MUDSTONE: carbonaceous, plant fragments, listric surfaces, silty to base, broken stick.
	629.70	0.20	MUDSTONE: silty, slighty carbonaceous, small plant remains some listric surfaces, stick.
	630.50	0.80	SANDSTONE/SILTSTONE: fine-grained, grey sandstone interbedded with slightly carbonaceous siltstone, some sedimentary structures at interfaces, plant remains in silty horizons, stick with few breaks.
	631.65	1.15	SILTSTONE: dark grey, muddy, plant fragments, sticks with few breaks.
	631.84	0.19	SILTSTONE: as above, broken stick.
	631.87	0.03	COAL: small fragments.
	632.64	0.77	SILTSTONE: grey, interbedded with fine sandstone, plant fragments, stick.
	634.04	1.40	INTERBEDDED FINE SAND/SILTSTONE: units from 0.001 to 0.05 thick, some grading downwards of units, sharp structures compactional sedimentary structures, stick with few breaks.
	634.80	0.76	SANDSTONE: grey, fine to medium grained occasional thin mudstone laminae, no structural disturbance, stick.
	636.88	2.08	SANDSTONE: as above, occasional large worm burrows, some small-scale cross-bedding, stick with few breaks.
	637.85	0.97	SANDSTONE: as above, large worm burrows 0.33 to 0.47 from top, stick.
	639.00	1.15	SANDSTONE: as above, no worm burrows, stick.
	640.88	1.88	SANDSTONE: as above, no signs of structural disturbance, stick with few breaks.

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BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 30

Contractor: Longyear

Commenced: Sept 6, 1977

Completed: Sept 21, 1977

Co-ordinates: 6,115,698.11 N
592,708.50 E
Surface Elevation: 1,855.28 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by:

Geologist	Depth
Mike DeMestre	24.65-619.41
Ali Chowdry	621.55-695.24

Final Depth: 695.24

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek	121.11	121.11	1,734.17
Hulcross	221.50	100.39	1,633.78
Gates	422.81	201.31	1,432.47
Sukunka	552.16	129.35	1,303.12
Moosebar	626.61	74.45	1,228.67
U. Gething	680.08	53.47	1,175.20

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD	628.88			1,226.40
CHAMBERLAIN	680.08			1,175.20
F.PO.	651.77		Breccia	
F.PR	655.32		Fracturing and Steep dips	

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	24.65	1.79	SANDSTONE, medium grey, fine grained sandstone, slightly calcareous, mud, well sorted, banded appearance because of bands & lenses of darker sand also local bands of black carbonaceous inclusions.
	25.90	1.25	SANDSTONE, medium grey, fine grained to medium grained sandstone, slightly calcareous, well sorted, massive with occasional zones of hairthin calcareous bands and also very occasional dark mudstone interbed.
	28.95	3.05	SANDSTONE, as above
	29.30	0.35	SANDSTONE, as above
	30.54	1.24	SANDSTONE, same as above but with numerous black thin carbonaceous partings.
	32.04	1.50	SANDSTONE, as above, getting coarser down section, fine to medium grained, bottom 0.25 m. broken up.
	32.29	0.25	SANDSTONE, as above, with a slightcoarsening down, medium grained, highly broken up.
	32.41	0.12	SILTSTONE, black, thinly interbedded with mudstone
	33.01	0.60	CONGLOMERATIC MUDSTONE/SILTSTONE with clasts up to several cm. across and bimodal, well rounded clasts and sub angular, rip up clasts of siltstone, matrix light grey, medium grained to coarse grained sandstone, well sorted, contactsare usually erosional with interbedded siltstone, very fine grained sandstone units, light grey to brown, banded with numerous carbonaceous inclusions and partings.
	33.55	0.54	CONGLOMERATIC SANDSTONE (corebroken up)
	33.84	0.29	SILTSTONE, dark grey, with leaf imprint (corebroken up)
	34.05	0.21	SANDSTONE, conglomerate (broken up)
	35.05	0.00	SILTSTONE, dark grey, broken up
	35.92	0.87	SILTSTONE,very fine grained sandstone, dark grey siltstone interbedded with very fine grained, light grey sandstone, numerous carbonaceous partings present, convolute bedding and interbedding of units common.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	36.01	0.09	CONGLOMERATIC SANDSTONE, very fine-grained sandstone matrix, clasts .5-3 cm.
	36.73	0.72	SILTSTONE, dark grey
	37.80	1.07	SILTSTONE, very fine-grained sandstone interbeds 1-2 cm. thick.
	38.00	0.20	SILTSTONE, very fine grained sandstone interbeds .5-2 cm. thick
	38.42	0.42	CONGLOMERATIC SANDSTONE/mudstone interbeds, matrix sandstone, fine-grained to-coarse grained, well sorted clasts sub angular to rounded and 2-6cm.
	38.44	0.02	SANDSTONE, salt and pepper, medium-grained to coarse-grained sandstone, mod.well sorted to well sorted usually massive but can be coarsely laminated. Locally has a conglomeratic appearance with scattered clasts 0.5-4 cm. sub angular and silty.
	38.99	0.55	SANDSTONE, pebbly
	39.11	0.12	SILTSTONE, light grey
	39.80	0.69	SANDSTONE
	40.40	0.60	SANDSTONE, pebbly
	40.84	0.44	SANDSTONE, core broken up near 0.20 m.
	43.04	2.20	SANDSTONE, as above, with occasional carbonaceous partings
	43.79	0.75	SANDSTONE, fine to medium-grained, as above, with 4 carbonaceous interbeds 0.5-1 cm. thick
	43.90	0.11	SANDSTONE, pebbly
	44.81	0.91	MUDSTONE, dark with carbonaceous remains indicative of the former presence of roots, core ground 0.15 - 0.20.
	46.56	1.75	MUDSTONE, as above, but lighter coloured

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	47.24	0.68	SILTSTONE, gradational change from the above mudstone to a light grey massive siltstone with thin very fine grained sandstone stringers in its lower part.
	48.47	1.23	SANDSTONE, coarsening down cycle, medium grey, very fine grained to fine grained sandstone, moderatelywell sorted, massive,banded (dark, light sandstone), grades down into a medium-grained to coarse grained salt & pepper sandstone,
			massive, moderately, well sorted with occasional dark mudstone inclusions.
	50.29	1.82	SANDSTONE, medium grained to coarse grained.
	52.15	1.86	SANDSTONE, coarse grained.
	52.81	0.66	SANDSTONE, very coarse grained.
	53.14	0.33	SANDSTONE, fine grained to medium grained.
	53.34	0.20	SANDSTONE, medium grained.
	55.04	1.70	SANDSTONE, coarse grained to very coarse grained.
	55.26	0.22	SANDSTONE, salt & pepper, medium grained with pebbly band, sandstone lower contact erosional.
	55.36	0.10	MUDSTONE, dark grey with black muddy inclusions.
	56.21	0.85	SANDSTONE, medium grained - PEBBLE CONGLOMERATE varicolored,0.5-1.0cm clasts, sharp lower contact.
	56.39	0.18	SANDSTONE, salt & pepper, medium grained sandstone with bands of coarser grained sandstone and pebble bands.
	57.54	1.15	SANDSTONE, same as above.
	58.71	1.17	CONGLOMERATE, varicolored mod. well sorted, clasts sub angular, to sub rounded, average .6 cm. at top to .9 cm. at bottom.
	59.14	0.43	CONGLOMERATE, same as above but numerous coaly inclusions veining the core.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	59.44	0.30	CONGLOMERATE
	59.56	0.12	CONGLOMERATE (lower contact is erosional)
	60.41	0.85	SANDSTONE, dark grey, medium grained to very coarse grained sandstone, poorly sorted massive with thin carbonaceous partings banded in bands of different size grains 2 - 10cm. thick, gradational.
	61.75	1.34	SANDSTONE, salt & pepper, medium grained sandstone, moderately well sorted, massive with very occasional carbonaceous partings, very gradational.
	62.48	0.73	SANDSTONE, same as above but coarse grained.
	62.80	0.32	SANDSTONE, coarse grained.
	63.30	0.50	SANDSTONE, becomes very coarse grained, poorly sorted and pebbly.
	64.53	1.23	CONGLOMERATE, varicolored, poorly sorted getting coarser downward, sub-angular to sub-rounded clasts .3cm.-.8cm. -in size.
	64.85	0.32	SANDSTONE, upper contacts erosional, medium grained, light grey, gets pebbly downward.
	65.53	0.68	SANDY CONGLOMERATE, light, varicolored, highly unsorted, pebbles sub-angular to sub-rounded Ø, .5 - 1.2cm., coarse grained salt & pepper sandstone intervals.
	67.27	1.74	SANDY CONGLOMERATE, with sandstone intervals.
	67.99	0.72	CONGLOMERATE, varicolored, coarse, .8-1.5cm. sized clasts sub-rounded, moderately well sorted.
	68.13	0.14	SILTSTONE, with numerous carbonaceous inclusions
	68.38	0.25	SILTSTONE, core badly broken up
	68.58	0.20	SANDY CONGLOMERATE
	69.05	0.47	PEBBLY SANDSTONE, dark grey, very coarse sandstone with floating pebbles throughout, moderately well sorted core broken up.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	69.35	0.30	SANDSTONE, (coarsening downward cycle), medium grey, fine-grained sandstone with pebbly bands grading to medium gray coarse-grained sandstone, massive to banded with occasional black muddy inclusions and occasional floating pebbles.
	69.62	0.27	SANDSTONE, coarse grained with pebbly bands.
	71.62	2.00	SANDSTONE, medium grained to coarse grained.
	72.25	0.63	SANDSTONE, coarse grained, gradational
	74.67	2.42	CONGLOMERATE, varicolored, coarse texture, well sorted pebbles are sub angular - sub rounded, (avg. gram size 0.7cm(to 1.3 cm. (bottom)
	74.88	0.21	CONGLOMERATE, as above, lower contact erosional
	74.97	0.09	COAL, dull, sub-metallic lustre
	75.01	0.04	COAL, bright
	75.04	0.03	COAL, bright banded
	75.12	0.08	COAL, bone
	75.56	0.44	MUDSTONE, silty, with thin black carbonaceous inclusions (roots), core broken up, lengthwise, light grey mudstone, with roots and rootlets, (core broken lengthwise over 0.2cm.).
	76.41	0.85	MUDSTONE, with rootlets, core broken up in small sticks (4.7 cm.) and locally shattered.
	77.72	1.31	MUDSTONE, as above
	78.56	0.84	MUDSTONE, core badly broken up, lengthwise and weathered surfaces.
	79.05	0.49	SILTY MUDSTONE, medium grey siltstone with very fine grained light grey sandstone interbeds, also convolute bedding and inclusions of black mudstone.

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	79.93	0.88	SILTY MUDSTONE, as above, core broken up, 5 listric, slickensided surfaces 0.09-0.23 m.apart, core shattered lower 0.12 m.
	80.52	0.59	SILTSTONE, as above
	80.77	0.25	SANDSTONE, core badly shattered
	81.77	1.00	core badly shattered
	82.89	1.12	SILTSTONE with convolute bedding and black mudstone partings.
	83.82	0.93	SILTSTONE, medium grey with thin very fine-grained sandstone interbeds as thin wisps and beds.
	84.80	0.98	SILTSTONE, medium grey (same as above).
	86.21	1.41	SANDSTONE/MUDSTONE, light grey, very fine-grained sandstone, 60:40, finely laminated with numerous black argillaceous and carbonaceous partings, occasional convoluted bedding, interbedded with dark grey mudstone, sometimes slightly silty.
	86.86	0.65	MUDSTONE, locally silty, light brown to black with occasional roots & rootlets.
	88.10	1.24	MUDSTONE, as above, core broken lengthwise, weathered.
	89.30	1.20	MUDSTONE, light brown with rootlets, core badly shattered.
	89.80	0.50	MUDSTONE, same as above, core extremely shattered with occasional remnants of listric surfaces, broken up.
	90.21	0.41	MUDSTONE, black, carbonaceous with many very thin coaly streaks (0.1 cm. - 0.2 cm.) core still badly broken up.
	90.99	0.78	MUDSTONE, black - medium grey, with coaly inclusions core badly broken up.
	91.36	0.37	MUDSTONE, light brown,
	91.94	0.58	MUDSTONE, 1 slickenside and badly broken up core.
	92.35	0.41	MUDSTONE, silty, light grey.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	92.85	0.50	MUDSTONE, silty, light grey
	93.35	0.50	MUDSTONE, core broken lengthwise, weathered surface.
	94.79	1.44	MUDSTONE, dark grey with roots & rootlets, core badly broken up.
	95.69	0.90	MUDSTONE, with rootlets and core badly broken up.
	95.94	0.25	MUDSTONE, coaly, with thin coal bed 0.02 m. thick, core still broken up.
	96.41	0.47	BLACK, mudstone with numerous coaly shears, core broken up.
	96.49	0.08	COAL, bone
	96.55	0.06	COAL, dull banded, stick
	96.56	0.01	COAL, bright
	96.60	0.04	COAL, bone with thin bright coaly streaks (0.005 m.thick)
	96.67	0.07	COAL, dull
	96.74	0.07	COAL, dull banded
	97.84	1.10	MUDSTONE, medium grey with carbonaceous inclusions and rootlets, core broken up in small sticks with occasional listric surfaces.
	97.94	0.10	MUDSTONE, medium grey with rootlets, core shattered top 0.15 m.
	98.89	0.95	MUDSTONE, core also locally broken up with occasional poorly developed listric surfaces.
	99.06	0.17	MUDSTONE, slightly silty, medium grey with very fine grained light grey sandstone "sprinkled" throughout and as thin wisps, with very occasional black muddy inclusions.
	101.60	2.54	MUDSTONE/SANDSTONE, silty, same as above

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	102.10	0.50	MUDSTONE, core broken lengthwise, weathered.
	103.18	1.08	MUDSTONE/SANDSTONE, silty, sandstone becomes more abundant, sharp lower contact.
	103.78	0.60	SANDSTONE coarsening downward cycle, white to very light grey, medium grained to very coarse grained sandstone, mod. well to poorly sorted, banded (light/dark), coaly interbeds very numerous locally occasional pebbly bands.
	103.80	0.02	COGLOMERATE, pebbly, coaly bands.
	105.15	1.35	SANDSTONE, goes from medium-grained to coarse-grained to medium-grained.
	105.83	0.68	SANDSTONE, medium grained,
	106.52	0.69	SANDSTONE, very coarse grained, varicolored , coaly bands,
	107.12	0.60	CONGLOMERATE, coarsening down, varicolored , medium well sorted, sub rounded pebbles (.5 - 1.2 cm. in size with occasional lenses of medium grained sandstone described above, also occasional coaly band
	108.20	1.08	SANDSTONE, medium grey - whitish, medium-grained to fine-grained sandstone, mod. well sorted, banded light/dark with numerous inclusions of black and brown mudstones, also partings of the same material.
	110.36	2.16	SANDSTONE, same as above but lowest 1.00 m. with numerous black mudstone inclusions & partings
	111.25	0.89	SANDSTONE, very fine-grained to fine grained, medium grey sandstone, finely laminated to low angle cross bedded with occasional iron concretions (small $\leq$ 2 cm.) and bands to cm. thick.
	112.47	1.22	SANDSTONE (same as above)
	113.09	0.62	SANDSTONE, as above but interbedded with dark mudstone interbeds and partings, laminated, 3 listric surfaces 0.18 - 0.24 m apart .

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	114.30	1.21	SANDSTONE, as above
	115.78	1.48	SANDSTONE, as above with occasional black carbonaceous partings.
	115.91	0.13	Core broken and heavy calcite mineralization.
	117.34	1.43	SANDSTONE, as above, with black carbonaceous partings.
	119.21	1.87	SANDSTONE, as above, occasional large scale burrows, black muddy intervals become frequent, (sandstone/mud 30:20), 6 listric surfaces 0.06-0.30 m. apart, core locally broken, weathered.
	120.39	1.18	SANDSTONE/MUDSTONE, 80:20
	121.11	0.72	SANDSTONE/MUDSTONE, 80:20
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	123.44	2.33	SANDSTONE/MUDSTONE/MIXED, light grey, very fine grained to fine grained sandstone, mod. well sorted, finely laminated and low angle & bedded to massive, occurs as thin beds and lenses usually with a sharp basal contact and gradational upper contact with interbedded, black, massive mudstone, burrowed, these 2 lithologies also occur mixed intimately together, burrowed and slumped.
	126.49	3.05	SANDSTONE/MUDSTONE/MIXED, 20/20/60
	129.54	3.05	SANDSTONE/MUDSTONE/MIXED, 15/20/65
	130.26	0.72	SANDSTONE/MUDSTONE/MIXED, 25/20/55, core broken lengthwise and weathered.
	132.58	2.32	SANDSTONE/MUDSTONE/MIXED, 20/10/70
	135.63	3.05	SANDSTONE/MUDSTONE/MIXED, 20/10/70
	136.85	1.22	SANDSTONE/MUDSTONE/MIXED, 20/20/60

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	138.68	1.83	SANDSTONE/MUDSTONE, light grey, very fine-grained to fine-grained sandstone, well sorted, finely laminated cross-bedded (low angle small scale) also massive, they occur as thin beds (0.5-3 cm.) often trough shaped and are sharply defined at their base & top. Sometimes they are slumped and mixed intimately with the mudstone, black mudstone massivesoften burrowed (small scale)
	139.44	0.76	SANDSTONE/MUDSTONE, 60/40
	139.71	0.27	SANDSTONE/MUDSTONE, 60/40, core broken lengthwise, weathered.
	141.73	2.02	SANDSTONE/MUDSTONE, 60/40
	144.78	3.05	SANDSTONE/MUDSTONE, 50/50
	145.50	0.72	SANDSTONE/MUDSTONE
	147.14	1.64	SANDSTONE/MUDSTONE, core broken up lengthwise.
	147.82	0.68	SANDSTONE/MUDSTONE, 50/50
	149.70	1.88	SANDSTONE/MUDSTONE
	149.84	0.14	SANDSTONE/MUDSTONE, core badly shattered
	150.87	1.03	SANDSTONE/MUDSTONE, 55/45
	151.50	0.63	SANDSTONE/MUDSTONE
	153.92	2.42	SANDSTONE/MUDSTONE, core badly shattered in all directions, no listric or slickenside
	154.23	0.31	CLAY, band
	154.59	0.36	SANDSTONE/MUDSTONE
	155.48	0.89	SANDSTONE/MUDSTONE, 40/60, core broken up lengthwise.
	156.47	0.99	SANDSTONE/MUDSTONE, 40/60, core shattered
	156.97	0.50	SANDSTONE/MUDSTONE, 40/60

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	160.02	3.05	SANDSTONE/MUDSTONE, 40/60
	166.11	6.09	SANDSTONE/MUDSTONE, 35/65
	167.62	1.51	SANDSTONE/MUDSTONE, 35/65
	168.64	1.02	SANDSTONE/MUDSTONE, core broken lengthwise.
	169.16	0.52	SANDSTONE/MUDSTONE, 35/65
	172.21	3.05	AS ABOVE, some intimately mixed zones of sandstone and mudstone, sandstone/mudstone/mixed, 35/40/25.
	173.32	1.11	SANDSTONE/MUDSTONE/MIXED, 35/40/25
	173.99	0.67	AS ABOVE, 2 listric surfaces 0.30 m. apart calcite veining and coating.
	175.26	1.27	AS ABOVE
	178.30	3.04	SANDSTONE/MUDSTONE/MIXED, 20/40/40
	181.35	3.05	SANDSTONE/MUDSTONE/MIXED, 40/50/10
	184.40	3.05	SANDSTONE/MUDSTONE/MIXED, 20/20/60, SANDSTONE/MUDSTONE, 50/50
	187.45	3.05	SANDSTONE/MUDSTONE, 65/35
	190.65	3.20	SANDSTONE/MUDSTONE, 40/60
	190.90	0.25	SANDSTONE/MUDSTONE, 40/60
	191.40	0.50	SANDSTONE/MUDSTONE/MIXED
	193.54	2.14	SANDSTONE/MUDSTONE, 40/60
	196.59	3.05	SANDSTONE/MUDSTONE, 45/55
	199.64	3.05	SANDSTONE/MUDSTONE, 45/55
	201.86	2.22	SANDSTONE/MUDSTONE, 35/65
	202.20	0.34	CLAY, band
	202.69	0.49	SANDSTONE/MUDSTONE, 35/65

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	205.74	3.05	SANDSTONE/MUDSTONE, 35/65
	208.01	2.27	SANDSTONE/MUDSTONE, 35/65
	208.09	0.08	CLAY
	208.78	0.69	SANDSTONE/MUDSTONE, 35/65
	211.73	2.95	SANDSTONE/MUDSTONE, 35/65
	214.73	3.00	SANDSTONE/MUDSTONE, 35/65, to SANDSTONE/MUDSTONE 50/50
	215.43	0.70	SANDSTONE/MUDSTONE, 60/40, 4 poorly developed listric surfaces 0.7 - 0.22 m. apart.
	217.63	2.20	SANDSTONE/MUDSTONE, 55/45
	220.58	2.95	SANDSTONE/MUDSTONE, 55/45
	220.73	0.15	SANDSTONE/MUDSTONE, 60/40
	220.75	0.02	AS ABOVE, 4 listric surfaces with minor amount of carbonaceous material .02 - .41 m. apart.
	221.50	0.75	AS ABOVE
	221.74	0.24	CONGLOMERATE, varicolored conglomerate, moderately well sorted, coarsening down, avg. grain size 4mm. to 25mm. chert predominant, sub-rounded to rounded particles with sandstone matrix.
	223:14	1.40	SANDSTONE, salt & pepper, coarse-grained sandstone moderately well sorted, coarsley layered, dark/light,
	223.87	0.73	SANDSTONE, same as above but massive and medium-grained, sharp lower contact.
	224.02	0.15	MUDSTONE, black, with occasional pyritic nodules.

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BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	224.12	0.10	MUDSTONE, black, gradual
	224.36	0.24	SANDSTONE, white, medium-grained to coarse-grained sandstone, slightly calcareous, poorly sorted, massive, sharp lower contact.
	224.60	0.24	MUDSTONE, black, with occasional thin sandstone stringers, scattered.
	224.99	0.39	SANDSTONE, (same as white sandstone described above) also cross-bedded.
	225.75	0.76	MUDSTONE, black with thin sandstone stringers scattered throughout and often intimately mixed with the mudstone.
	225.99	0.24	SANDSTONE, (same as above), sharp contact.
	226.26	0.27	MUDSTONE, black, same as above.
	226.38	0.12	COAL, dull, lustrous, fragmented, large piece with listrications.
	227.07	0.69	MUDSTONE, with thin stringers of sandstone, siltstone and carbonaceous inclusions, core badly broken.
	227.96	0.89	MUDSTONE/SILTSTONE, dark mudstone, intimately mixed with light grey siltstone with occasional ferruginous bands and carbonaceous inclusions.
	228.13	0.17	MUDSTONE, black carbonaceous.
	228.21	0.08	COAL, heavily sheared, pulverized
	228.54	0.33	COAL, pulverized, mostly dull semi-lustrous with occasional thin bright band.
	230.12	1.58	MUDSTONE, dark grey, massive, rooted in its upper part, 0.30 mm. with ferruginous nodules and carbonaceous inclusions.
	230.98	0.86	MUDSTONE, (same as above), sharp contact
	231.38	0.40	SILTSTONE, medium grey, massive, with occasional carbonaceous inclusions.
	233.17	1.79	SILTSTONE/SANDSTONE, siltstone same as above, mixed and churned together with a light grey fine grained sandstone, poorly sorted with numerous carbonaceous and argillaceous inclusions, pyrite & ferruginous nodules scattered throughout.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	233.33	0.16	SANDSTONE/SILTSTONE (same as above), gradational contact.
	233.46	0.13	MUDSTONE, black with thin argillaceous partings.
	235.08	1.62	SILTSTONE/MUDSTONE, very fine-grained sands, 80/20, light grey siltstone, very fine grained sandstone, moderately well sorted with numerous argillaceous partings. The 2 lithologies occur closely interbedded, finely laminated near the top of the unit, intimately mixed together, slumped or as thin massive interbeds for the rest of the unit with black mudstone interbeds 2 - 3 cm. thick.
	236.14	1.06	SANDSTONE, light grey, fine-grained to medium-grained sandstone, slightly calcareous, moderately well-sorted, massive with black argillaceous partings.
	236.28	0.14	COAL, finely sheared, dull lustrous
	236.42	0.14	COAL, dull lustrous, whole stick.
	236.68	0.26	COAL, dull lustrous, broken stick with some listrications.
	236.74	0.06	COAL, dull, lustrous, heavily sheared, listricated
	237.91	1.17	MUDSTONE, dark grey, massive with numerous rootlets scattered throughout.
	239.26	1.35	SILTSTONE, SANDSTONE, medium grey, massive siltstone, light grey sandstone, slightly calcareous, both lithologies bioturbated together.
	240.68	1.42	SILTSTONE, SANDSTONE, (same as above)
	242.31	1.63	SANDSTONE, whitish grey, medium-grained sandstone, highly calcareous, heavily bioturbated near the top massive interbedded with thin siltstone beds for the rest of the unit, sometimes convoluted, slickensided @ 2.55, 2.82.
	242.47	0.16	SANDSTONE, as above

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	242.73	0.26	SANDSTONE, white ,very fine-grained to medium-grained sandstone (coarsening downward), highly calcareous, thinly interbedded with siltstone (top 9 cm.), massive, sharp contact.
	243.17	0.44	MUDSTONE, black, massive.
	243.64	0.47	SILTSTONE, light grey siltstone with occasional argillaceous interbeds and pyrite nodules, gradational
	244.71	1.07	SANDSTONE, SILTSTONE, 70/30, siltstone, same as above, sandstone light grey, very fine-grained to fine-grained sandstone, highly calcareous. Both lithologies are interbedded but the parallel nature of the interbeds is often disturbed by bioturbation and slumping, gradational.
	245.36	0.65	SANDSTONE/MUDSTONE, 30/70, sandstone same as above in interbeds 2.5 cm. thick, siltstone is gradually being replaced by mudstone (black, massive).
	246.31	0.95	SANDSTONE/MUDSTONE, same as above, 20/80
	246.52	0.21	SANDSTONE, light grey ,medium-grained sandstone, calcareous, massive, moderately well-sorted.
	248.41	1.89	MUDSTONE, dark grey with occasional discreet interbeds of medium grey siltstone. Few ferruginous nodules scattered, 1.24 - 1.75 core broken lengthwise.
	249.22	0.81	MUDSTONE, same as above, gradational
	250.14	0.92	MUDSTONE, silty, the mudstone described above becomes increasingly silty downsection (to siltstone) and has numerous argillaceous inclusions and partings, gradational.
	250.75	0.61	SANDY/SILTSTONE, the siltstone described above becomes sandy and is bioturbated and slumped.
	251.46	0.71	SANDSTONE, white, fine-grained sandstone, highly calcareous, moderately well sorted, massive with numerous argillaceous partings (top 0.25 cm.). Next 0.40 mm. is cross-troughed or laminated with thin mudstone interbeds. Slickensided @ 0.37, 0.74, 0.82, 0.97, 0.99, 1.12, 1.13, 1.25 - 1.50, core heavily broken, slickensided.

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	251.95	0.49	SANDSTONE, same as above, laminated and cross troughed gradational.
	252.67	0.72	SANDSTONE/SILTY MUDSTONE - (60/40) SANDSTONE/SILTY MUDSTONE (20/80)sandstone same as above, silty mudstone interbeds become more frequent, rock still laminated and a few burrows are found scattered throughout.
	253.09	0.42	SILTY MUDSTONE/SANDSTONE, 70/30, same silty mudstone as above, but sandstone is white-grey, fine grained to medium-grained, , slightly calcareous, found in irregularly shaped pods and stringers scattered in the silty mudstone, Heavily bioturbated, also loaded with fossils, over 0.31 m.
	254.50	1.41	SANDSTONE, light grey, fine-grained to medium-grained sandstone, slightly calcareous, well sorted, massive with occasional argillaceous partings and inclusions.
	254.80	0.30	SANDSTONE, as above
	255.99	1.19	SANDSTONE, same as above with increasing number of argillaceous partingsand the coming in of silty mudstone interbeds (< 1.5 cm. thick). Also the whole section is heavily bioturbated.
	256.41	0.42	SANDSTONE/SILTY MUDSTONE, 50/50, same lithology as above but sandstone interbeds are thinner (1-3 cm. thick) and horizontally layered with mudstone interbeds of same thickness.
	256.92	0.51	SILTY/MUDSTONE
	257.13	0.21	SANDSTONE/SILTY MUDSTONE, 20/80, silty mudstone same as above, sandstone (described below) in irregularly shaped interbeds 2-3 cm. thick.
	257.55	0.42	SANDSTONE, light grey, fine-grained to medium-grained sandstone (coarsening down), slightly calcareous, moderately well sorted, massive with occasional muddy interbed 3-4 mm thick, slickensided @ 1.66, 1.76, 1.86, 2.40.
	259.08	1.53	SANDSTONE, same as above, sharp contact

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	259.98	0.90	MUDSTONE/SANDSTONE, silty, dark grey silty mudstone, interbedded (horizontally) with very fine-grained light grey sandstone, gradational contact.
	260.60	0.62	SANDSTONE, light grey very fine-grained to fine-grained sandstone (coarsening down), well sorted, clean with many argillaceous partings and thin interbeds, slightly convolute bedding.
	260.76	0.16	SANDSTONE, same as above
	263.65	2.89	SANDSTONE, light grey, fine-grained to medium-grained sandstone, moderately well-sorted, faintly laminated and thin brown silty intraclastic beds (1 - 2 mm. thick)
	263.88	0.23	SANDSTONE, lithologically similar to that above with a thin bed of black muddy intraclasts.
	264.46	0.58	SANDSTONE, same as above but finer grained and with numerous very thin carbonaceous partings, black mudstone interbeds 1 to 5 cm. thick.
	265.22	0.76	SANDSTONE/MUDSTONE, 65/35, large burrows @ 0.75 - 0.80, 0.99 - 1.54, 2.72 - 2.75.
	266.70	1.48	SANDSTONE, same as above but mudstone interbeds not present.
	266.74	0.04	MUDSTONE, black, sharp contact.
	269.74	3.00	SANDSTONE, medium grey, very fine-grained to fine-grained mudstone, well sorted, clean, finely laminated to cross-bedded with occasional black mudstone interbeds 1-2 cm. and numerous very thin argillaceous partings, occasionally burrowed (large size).
	272.18	2.44	SANDSTONE/MUDSTONE, same as above, mudstone interbeds thicker and more numerous, also characterized at this level by slump features, sharp contact.
	272.79	0.61	SANDSTONE, light grey, fine-grained to medium-grained sandstone, massive, moderately well-sorted with thin beds of black muddy intraclasts.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	275.84	3.05	SANDSTONE, same as above, but no intraclastic bed only very thin argillaceous partings ,the sandstone which was non calcareous up to now becomes very calcareous @ 0.50. Near the bottom, mudstone intervals become frequent (2.50 - 2.99), slickensided @ 0.43, 0.49, 1.08, 1.18, 1.25.
	278.89	3.05	SANDSTONE, MUDSTONE, 60/40, same as above, fine-to medium-grained, 2.80-3.05 sandstone becomes coarser. Also noted were a few ferruginous bands.
	279.53	0.64	SANDSTONE, MUDSTONE, 35/65, Sandstone medium grained.
	280.74	1.21	SANDSTONE, SILTY MUDSTONE, SILTSTONE, FERRUGINOUS BANDS, 70/20/5same as above but the mudstone becomes silty and the lithologies are mixed, churned together, ferruginous bands common, gradational.
	281.86	1.12	MUDSTONE, SANDSTONE, black massive mudstone, intermixed with thin irregularly shaped pods of sandstone (because of bioturbation?)
	281.94	0.08	SANDSTONE, SILTSTONE, very fine-grained, medium grey sandstone, siltstone highly calcareous, massive, slickensided @ 2.45, 2.77
	282.96	1.02	SANDSTONE, SILTSTONE, very fine grained, as above
	283.93	0.97	MUDSTONE, SILTSTONE, dark massive mudstone interbedded with thin discreet beds of light grey siltstone.
	284.98	1.05	MUDSTONE, SILTSTONE (as above), heavily bioturbated, small to medium size burrows, also thin very fine-grained sandstone, laminated beds, slumped. Sukunkoid Marker
	286.11	1.13	MUDSTONE, SANDSTONE, (same as above)but siltstone is replaced by a fine-grained to medium-grained sandstone intimately mixed with the mudstone and heavily burrowed, sandstone progressively becomes bedded horizontally.
	287.87	1.76	SANDSTONE, MUDSTONE, 80/20, medium grey, very fine-grained to fine grained sandstone, non calcareous , well-sorted, fairly clean, finely laminated with a few thin burrowed mudstone interbeds and occasionally a ferruginous band.

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	289.77	1.90	SANDSTONE, same as above but locally massive, churned. burrowed (5-10 cm. bands) and coarsening downward, fine-to medium-grained, gradational contact.
	290.08	0.31	CONGLOMERATE (Marker), light coloured conglomerate, poorly sorted, clasts are sub rounded, avg. grain size 28 mm.
	290.80	0.72	SILTSTONE, SANDSTONE, , medium grey siltstone, very fine grained sandstone, slightly bioturbated
	292.28	1.48	SILTSTONE, SANDSTONE , 70/30, same as above but gets interbedded (very discreet interbeds blend into each other)
	293.77	1.49	MUDSTONE, silty, black, massive with occasional carbonaceous inclusions, slickensided @ 0.05, 0.10, 0.94.
	296.05	2.28	MUDSTONE, silty, becomes increasingly carbonaceous downsection with an increase in carbonaceous inclusions.
	296.58	0.53	MUDSTONE, black, carbonaceous, coaly (thin layers .5-1 cm) slightly rooted
	297.94	1.36	MUDSTONE, same as above but no more coaly layers
	298.15	0.21	FERRUGINOUS BAND
	298.76	0.61	MUDSTONE, coaly, rooted
	299.30	0.54	COAL, pulverized, highly sheared, possibly dull, lustrous with occasional thin bright bands, broken up core 1.18 - 1.41, slickensided 1.63 - 2.30
	301.07	1.77	MUDSTONE, black, rooted
	301.12	0.05	COAL, sheared, pulverized, dull & bright
	301.22	0.10	COAL, dull, dense with thin irregular bright streaks, wholte stick
	301.41	0.19	MUDSTONE, carbonaceous.
	301.46	0.05	COAL, dull & bright, whole stick

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	301.48	0.02	MUDSTONE, coaly
	301.52	0.04	COAL, dull banded, whole stick.
	301.62	0.10	COAL, dull & bright, whole stick
	301.65	0.03	COAL, dull with irregular bright bands, whole stick
	301.75	0.10	COAL, bright banded
	301.77	0.02	COAL, dull
	301.83	0.06	COAL, bright banded
	301.93	0.10	MUDSTONE, coaly, heavily slickensided
	302.06	0.13	MUDSTONE, carbonaceous
	302.93	0.87	MUDSTONE, dark grey, rooted, becomes coaly bottom 0.20 m.
	302.98	0.05	COAL, sheared, dull semi-lustrous, whole stick, coaly mudstone.
	303.07	0.09	COAL, sheared, very broken stick, possibly dull, lustrous.
	303.13	0.06	COAL, dull with irregular bright bands, whole stick
	303.23	0.10	COAL, bright banded, whole stick
	303.25	0.02	COAL, sheared, dull, broken.
	303.28	0.03	MUDSTONE,
	303.41	0.13	COAL, heavily sheared, cleats running in all direction possibly dull lustrous.
	303.89	0.48	MUDSTONE, coaly
	303.98	0.09	COAL, sheared, dull lustrous with occasional bright band, broken stick
	303.99	0.01	COAL, bright

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	304.08	0.09	COAL, dull lustrous with occasional irregular bright bands.
	304.10	0.02	COAL, dull & bright.
	304.36	0.26	MUDSTONE, coaly.
	304.44	0.08	COAL, dull, whole stick
	304.47	0.03	COAL, dull semi-lustrous, broken stick, sheared
	304.57	0.10	COAL, dull & bright, badly broken stick, sheared
	304.66	0.09	COAL, dull, semi-lustrous
	304.95	0.29	COALY MUDSTONE.
	305.30	0.35	MUDSTONE, rooted
	305.77	0.47	MUDSTONE, silty, rooted
	307.22	1.45	MUDSTONE, silty, churned, occasionally rooted.
	309.22	2.00	MUDSTONE, SILTSTONE, intimately mixed & occasional ferruginous band
	309.27	0.05	SANDY
	309.81	0.54	SANDSTONE, light grey very fine grained sandstone calcareous, moderately well sorted with numerous black carbonaceous inclusions.
	312.08	2.27	MUDSTONE, SILTSTONE, black mudstone, slightly silty, discreetly interbedded with siltstone interbeds, slightly convoluted bedding, massive when bioturbated Also occasional ironstone bands.
	312.20	0.12	MUDSTONE, black,carbonaceous.
	312.32	0.12	COAL, dull banded, broken stick, sheared, listricated
	312.41	0.09	MUDSTONE, black coaly
	312.51	0.10	COAL, dull semi=lustrous fragmented, small pieces

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	314.62	2.11	MUDSTONE, black, massive, carbonaceous, rootlets common, also found are ferruginous concretions. slickensided @ 0.22, 0.34, 0.85, 1.11, 1.24, 1.98
	317.12	2.50	MUDSTONE, same as above
	317.22	0.10	CORE LOSS - Coal COAL SEAM "D" ZONE
	317.30	0.08	COAL, pulverized, dull lustrous, sheared
	317.45	0.15	COAL, dull, semi-lustrous with occasional thin bright bands, whole stick
	317.55	0.10	Core Loss - Coal
	317.75	0.20	COAL, pulverized, mostly dull lustrous
	317.84	0.09	COAL, whole stick, dull banded.
	318.70	0.86	MUDSTONE, black, carbonaceous.
	319.69	0.99	MUDSTONE, silty, dark grey
	321.56	1.87	MUDSTONE, SANDSTONE, 60/40, mudstone slightly silty as above, interbedded with very fine-grained sandstone, laminated to massive, biotubated.
	322.26	0.70	MUDSTONE, SANDSTONE, same as above but strictly massive.
	324.26	2.00	MUDSTONE, SANDSTONE, 20/80, sandstone coarser, fine-grained, often laminated with occasional black muddy intraclastic beds to 3 cm. thick. SANDSTONE, CONGLOMERATE, salt & pepper, medium to coarse-grained sandstone, non-calcareous, moderately well sorted, massive, often with "floating" pebbles and occasionaly with black carbonaceous inclusions conglomerate. Thinly bedded at top (1.44m) more massive for the rest of the section, varicolored clasts are sub-angular to sub-rounded, moderately well-sorted loosely packed with the above sandstone for matrix.
	324.61	0.35	SANDSTONE, medium-grained/CONGLOMERATE, avg. grain size 8 - 9 mm, 70/30

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	325.84	1.23	SANDSTONE, CONGLOMERATE, 70/30, medium-grained, coarsening downward, 8-9 mm. - 12 mm sized grains
	327.66	1.82	SANDSTONE, CONGLOMERATE, 35/65, medium-grained more thinly bedded, + some coarse-grained bands. 10 mm. - 35 mm. sized grains
	329.28	1.62	SANDSTONE/CONGLOMERATE, 10/90, 6-7 mm., sized grains poorly sorted
	329.82	0.54	SANDSTONE, medium-grained with floating pebbles, sharp contact.
	330.71	0.89	MUDSTONE, black, carbonaceous with occasional thin coaly layers.
	331.02	0.31	MUDSTONE/SILTSTONE, interbedded
	332.11	1.09	MUDSTONE, SANDSTONE, 10/90, sandstone is light grey fine-grained, calcareous, massive with carbonaceous inclusions.
	332.68	0.57	MUDSTONE, SANDSTONE, silty mudstone,
	333.24	0.56	MUDSTONE, black, carbonaceous with thin coaly partings.
	333.39	0.15	MUDSTONE, sheared, coaly.
	334.00	0.61	MUDSTONE, as above
	334.49	0.49	MUDSTONE, SANDSTONE, light grey, very fine-to medium-grained, laminated.
	335.15	0.66	MUDSTONE, dark grey, massive with occasional ferruginous nodules.
	336.98	1.83	MUDSTONE, as above, slickensided at 1.37 m
	338.59	1.61	MUDSTONE, as above
	339.02	0.43	MUDSTONE, SILTSTONE, very fine grained sandstone, mudstone as above, discreetly interbedded with thin siltstone, very fine grained sandstone 5 cm. thick. Extremely calcareous (Marker)

BH Nos. 30

Dip°	DEPTH m	THICKNESS m	DESCRIPTION
	339.46	0.44	CORE LOSS - Coal
	339.53	0.07	COAL, fragmented, small pieces and pulverized, mostly dull lustrous.
	339.62	0.09	COAL, whole stick, dull, lustrous.
	339.64	0.02	MUDSTONE
	339.86	0.22	COAL, whole stick, dull semi-lustrous, listricated
	339.94	0.08	COAL, stick, bright banded, listricated, sharp contact.
	342.60	2.66	SANDSTONE, salt & pepper, medium-grained sandstone, non-calcareous, moderately well-sorted, laminated to coarsely cross-bedded, with carbonaceous inclusions near the top 30 cm., heavily burrowed (small ones) from 1.74 - 2.98.
	345.58	2.98	SANDSTONE, same as above, burrowed 0-0.10 m., finning to fine-grained sandstone near the next marker, occasional dark grey mudstone inclusions.
	348.55	2.97	SANDSTONE, as above, fine-grained with occasional thin bands of muddy intraclasts and pebbles to 1 cm. thick. 1.91-2.30 zone of large burrows.
	351.55	3.00	SANDSTONE, same as above but fine grained to very fine-grained, and thinly laminated with occasional pebble bandsand locally black argillaceous partings.
	354.58	3.03	SANDSTONE, medium grey, very fine grained to fine grained sandstone, well-sorted, clean, massive to laminated.
	357.58	3.00	SANDSTONE, as above.
	360.56	2.98	SANDSTONE, as above.
	362.22	1.66	SANDSTONE, as above, occasional mudstone bed, 80/20.
	362.39	0.17	SANDSTONE, light grey to medium grey, massive.
	363.57	1.18	SANDSTONE, MUDSTONE, 80/20
	365.08	1.51	SANDSTONE, MUDSTONE, 70/30, 1 mudstone interbed is slightly coaly.

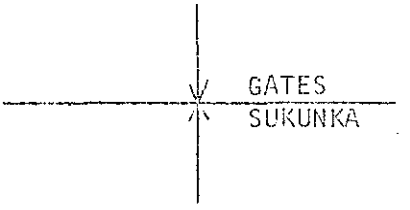
BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	367.43	2.35	SANDSTONE, same as above
	367.79	0.36	SANDSTONE/MUDSTONE, 80/20
	369.44	1.65	SANDSTONE, MUDSTONE, 40/60
	370.10	0.66	SANDSTONE, MUDSTONE, sandstone is medium grained, light grey.
	370.50	0.40	COAL SEAM 'B' Horizon , gradational
	372.70	2.20	SILTSTONE/MUDSTONE, 40/60, mudstone is black, slightly carbonaceous, siltstone, medium grey as thin discreet interbeds.
	373.87	1.17	MUDSTONE/SANDSTONE, medium grained ,light grey, finely laminated, 50/50.
	376.06	2.19	MUDSTONE/SANDSTONE as above, grading to sandstone/ mud 10/90
	377.20	1.14	MUDSTONE, black, massive coaly.
	377.30	0.10	COAL, dull banded, broken in small pieces & pulverized.
	377.45	0.15	CORE LOSS - Coal
	377.50	0.05	COAL, bright, broken up small pieces, conglomerate, varicolor, conglomerate, well-sorted to moderately well-sorted, tightly packed (no matrix) clasts sub-rounded, size variable, chert predominant.
	379.54	2.04	CONGLOMERATE (grain size 4-6 mm.)
	380.52	0.98	CONGLOMERATE(avg. grain size 8mm.) now the conglomerate more loosely packed and has a matrix of medium grained to coarse grained, salt & pepper sandstone.
	382.00	1.48	CONGLOMERATE, (avg. grain size 9mm.)
	383.30	1.30	CONGLOMERATE/SANDSTONE, fine grained medium grey laminated, avg. grain size 6mm 80/20
	384.51	1.21	SANDSTONE, medium grey, fine-grained sandstone, well sorted, clean, finely laminated with an occasional "floating" pebble and thin mudstone band.

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	387.56	3.05	SANDSTONE, as above
	390.60	3.04	SANDSTONE, as above but becoming massive.
	393.65	3.05	SANDSTONE, as above.
	396.70	3.05	SANDSTONE, as above
	399.75	3.05	SANDSTONE, as above
	402.80	3.05	SANDSTONE/MUDSTONE, 90/10, slickensided, broken up bottom 0.20 m.
	403.07	0.27	SANDSTONE/MUDSTONE, 80/20
	405.69	2.62	SANDSTONE/MUDSTONE, 60/40, sandstone is light grey, fine-to medium-grained, moderately well sorted, laminated, massive & bioturbated, also a few large burrows are present, also locally slumped into the mudstone.
	405.84	0.15	CONGLOMERATE, varicolor conglomerate, poorly sorted, clasts sub-angular to sub-rounded, avg.grain size-5mm. slickensided @ 0.10, 0.49, 0.55, 0.70, 1.57, 1.90.
	406.36	0.52	CONGLOMERATE, sharp contact.
	409.86	3.50	SANDSTONE, medium grey, very fine grained, sandstone slightly calcareous, well-sorted, clean, locally laminated, massive.
	412.96	3.10	SANDSTONE, as above.
	414.91	1.95	SANDSTONE, as above but gradually getting coarser to fine-grained, with 2 thin black muddy interbeds.
	416.15	1.24	MUDSTONE/SANDSTONE, 70/30, sandstone as above, mudstone is black and intermixed with irregular shaped lenses and beds of the above sandstone. Heavily bioturbated, burrowed (med. size)
	419.38	3.23	MUDSTONE/SANDSTONE, 70/60
	420.06	0.68	MUDSTONE/SANDSTONE, 60/40

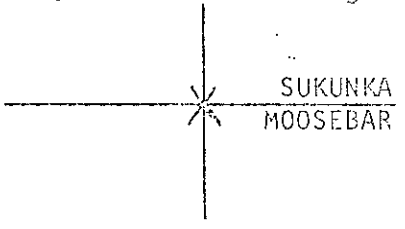
BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	421.72	1.66	SANDSTONE, light grey decribed above.
	422.81	1.09	SANDSTONE, as above and thin black mudstone interbeds.
			
	424.89	2.08	SANDSTONE, light grey, very fine- to fine-grained, well-sorted to moderately well-sorted, finely laminated with few low-angle cross beds, lower contact sharp, upper contact gradational to mudstone or sharp, sandstone also massive, bioturbated, slumped with black mudstone, often burrowed. The 2 lithologies are also found intimately mixed together.
	427.93	3.04	SANDSTONE/MUDSTONE, MIXED, 30/50/20
	430.98	3.05	SANDSTONE/MUDSTONE, MIXED, 30/50/20, core broken up 0-0.40 mm. slickensided @ 2.30-2.34 m.
	434.03	3.05	SANDSTONE/MUDSTONE, MIXED, 30/60/10, 1.95,-2.35 m. core broken lengthwise.
	437.38	3.35	SANDSTONE/MUDSTONE, MIXED, 90/50/10
	440.43	3.05	SANDSTONE/MUDSTONE, MIXED, 30/30/40
	443.48	3.05	SANDSTONE/MUDSTONE, MIXED, 30/40/30
	446.53	3.05	SANDSTONE/MUDSTONE, MIXED, 30/40/30, slickensided @ 2.07
	449.58	3.05	SANDSTONE/MUDSTONE, MIXED, 35/30/35,
	452.62	3.04	SANDSTONE/MUDSTONE, MIXED, 20/50/30, 0.38-0.39 clay band.
	455.67	3.05	SANDSTONE/MUDSTONE/MIXED, 15/45/40
	458.72	3.05	SANDSTONE/MUDSTONE, MIXED,, 10/30/60
	461.77	3.05	SANDSTONE/MUDSTONE, MIXED , 20/15/65
	464.82	3.05	SANDSTONE/MUDSTONE/MIXED, 25/10/65, slickensided at 0.25, 1.59, 1.76, 1.78, 1.49, 1.62
	467.86	3.04	SANDSTONE/MUDSTONE/MIXED, 1 slick at 1.40

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	470.91	3.05	SANDSTONE/MUDSTONE/MIXED, 20/10/70
	473.96	3.05	SANDSTONE/MUDSTONE/MIXED, 20/0/80
	477.01	3.05	SANDSTONE/MUDSTONE/MIXED, 30/5/65
	480.06	3.05	SANDSTONE/MUDSTONE/MIXED, 30/10/60
	483.10	3.04	SANDSTONE/MUDSTONE/MIXED, 30/10/60, this section is heavily bioturbated, slickensided @ 0.56 m., 0.99 m.
	486.15	3.05	SANDSTONE/MUDSTONE/MIXED, 30/20/50, at 0.70 m., salt & pepper, medium grained sandstone, appears laminated throughout the mudstone, & mixed lithologies, it culminates in a thin bed of medium-grained to coarse-grained sandstone at its base 1.79-2.05 m.
	489.20	3.05	SANDSTONE, light grey, very fine-to fine grained, calcareous, well-sorted, finely laminated to cross bedded (low angle), lower contact sharp upper sharp or gradational, also occasionally massive with large size burrows, slumped, occasional thin intra-clastic beds of black mudstone with black mudstone (sometimes silty) interbeds, burrowed, 2 lithologies occasionally mixed together (intimately). 2.04 - 3.04 m. - sandstone / mudstone / mixed, 60/35/5
	492.25	3.05	SANDSTONE/MUDSTONE, 80/20, 0.28 - 0.38 heavily burrowed @ 1.61 - 1 slickenside.
	495.30	3.05	SANDSTONE/MUDSTONE, 75/25.
	498.34	3.04	SANDSTONE/MUDSTONE/MIXED, 60/25/15
	501.39	3.05	SANDSTONE/MUDSTONE/MIXED, 60/25/15
	504.44	3.05	SANDSTONE/MUDSTONE/MIXED, 50/30/20, with occasional pyrite nodules.
	510.54	6.10	SANDSTONE/MUDSTONE/MIXED, 35/35/30
	513.58	3.04	SANDSTONE, lithologically similar to that above but now appears only occasionally as thin bedded sand and mostly thin beds (<3 cm) and wisps of sand.

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	516.63	3.05	SANDSTONE/MUDSTONE/MIXED, 30/60/10, the mudstone is locally heavily burrowed and gets silty, grading to SANDSTONE/MUDSTONE, 40/60
	519.68	3.05	SANDSTONE/MUDSTONE, 30/70
	522.73	3.05	SANDSTONE/MUDSTONE, 25/75
	525.78	3.05	SANDSTONE/MUDSTONE, 35/65
	528.82	3.04	SANDSTONE/MUDSTONE, 25/75
	531.87	3.05	SANDSTONE/MUDSTONE, 15/85
	534.92	3.05	SANDSTONE/MUDSTONE. 15/85, core shattered 0.21-0.26.
	537.97	3.05	SANDSTONE/MUDSTONE, 10/90
	541.02	3.05	SANDSTONE/MUDSTONE, 8/92
	544.06	3.04	SANDSTONE/MUDSTONE, 5/95
	547.11	3.05	SANDSTONE/MUDSTONE, with occasional pyrite nodules.
	550.16	3.05	SANDSTONE/MUDSTONE, 2/98
	552.16	2.00	SANDSTONE/MUDSTONE, 2/98, 0-1.34 m. core broken lenthwise in sticks - 0.10 m. 1.34 m - 1.98 core broken lengthwise & shattered. 
	553.21	1.05	MUDSTONE, black, massive with occasional pyrite nodules & ferruginous bands scattered throughout.
	555.04	1.83	MUDSTONE, black, 0-0.41 m. core broken lengthwise, 1.06-1.24 m. core broken up.
	558.08	3.04	MUDSTONE, black with occasional high angle fractures (3), no slickensides.

BH Nos. 30

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	561.13	3.05	MUDSTONE, black
	562.35	1.22	MUDSTONE, black
	565.40	3.05	MUDSTONE, black
	568.45	3.05	MUDSTONE, black
	571.50	3.05	MUDSTONE, black
	574.54	3.04	MUDSTONE, black
	577.59	3.05	MUDSTONE, black
	580.64	3.05	MUDSTONE, black
	583.69	3.05	MUDSTONE, black
	585.52	1.83	MUDSTONE, black
	586.74	1.22	MUDSTONE, black, broken in small sticks 0.10 - 0.15 m. long.
	589.78	3.04	MUDSTONE, black
	592.83	3.05	MUDSTONE, black, 1 slickenside @ 2.67
	595.88	3.05	MUDSTONE, black
	598.10	2.22	MUDSTONE, black
	601.06	2.96	MUDSTONE, black, slickensided @ 2.80, 2.91 + calcite filling.
	601.98	0.92	MUDSTONE, black, with ferruginous bands, slickensided @ 0.24, 0.24-0.40 core shattered with occasional listric surfaces.
	603.80	1.82	MUDSTONE, black, slightly broken up
	606.85	3.05	MUDSTONE, black
	609.90	3.05	MUDSTONE, black, broken up in small sticks (0.08-0.15 m.)

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	612.95	3.05	MUDSTONE, black, 0.18-0.32 m. burrowed bentonite, slickenside @ 0.41, 0.51 m., 2.80, 2.25 m.
	616.00	3.05	MUDSTONE, black, 0.80-0.88 sheared bentonite.
	619.04	3.04	MUDSTONE, black, core broken up in very thin sticks 0.02 - 0.10 m. thick.
	619.41	0.37	MUDSTONE, black, badly broken up rubble.
	621.55	2.14	MUDSTONE, dark grey, very homogeneous, structureless 5 mm. bentonitic band toward base, top 0.32 m. fragments
	624.90	3.35	MUDSTONE, identical to above.
	625.48	0.58	MUDSTONE, similar to above, 0.05 m. bentonitic mudstone,
	625.59	0.11	BENTONITE, grey, top half with tiny burrows, abrupt.
	625.72	0.13	MUDSTONE, dark grey, structureless, abrupt at base
	625.80	0.08	BENTONITE, light grey, similar to above, few burrows
	626.43	0.63	SANDSTONE, dark grey, medium-grained, glauconitic, somewhat mottled appearance, argillaceous, and finely particulate carbonaceous matrix.
	626.61	0.18	SANDSTONE, similar to above, a smaller coaly intercalation in lower half. Basal 4 cm. richly pyritiferous.
			COAL SEAM - 'BIRD'
	627.13	0.52	Core loss - coal
	627.28	0.15	COAL SEAM - Bird, mostly fragmented - mostly 2-3 cm. across, all jumbled up, appears to be dull predominately
	628.06	0.78	MUDSTONE, dark grey, locally with abundant carbonized plant debris, carbonaceous, very competent.
	628.35	0.29	MUDSTONES, dark grey, carbonaceous, 2 cm. coal 8 cm., from base, listric contact with coal below.
	628.44	0.09	COAL, mostly as large pieces

BH Nos.

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	628.51	0.07	COAL, dull lustrous, pieces with listric surfaces.
	628.59	0.08	COAL, dull banded, disseminated pyrite, large pieces 0.08.
	628.67	0.08	COAL, dull and bright, sporatic large pyrite blobs 0.08.
	628.73	0.06	COAL, bright banded, stick
	628.84	0.11	COAL, dull and bright, large pieces
	628.88	0.04	Core Loss - coal
	629.06	0.18	SANDSTONE, top 5 cm. black, richly carbonaceous, rest medium grey, medium grained, mottling due to burrowing, many discreet small burrows.
	629.44	0.38	SANDSTONE, medium grey, medium-grained, similar to above
	629.59	0.15	SANDSTONE, medium grey, medium-grained, as above.
	631.44	1.85	SANDSTONE, as above, top 0.93 m. with abundant burrows.
	632.82	1.38	SANDSTONE, as above, little or no burrowing
5°	634.24	1.42	SANDSTONE, as above, brief fine/medium-grained intervals occasional dense carbonaceous laminae , locally somewhat mottled, clean, well-sorted, listric basal surface.
	634.29	0.05	COAL, finely powdered, bright coal mixed with dark grey, sand fragments highly impregnated with pyrite. Base and top of coal not defined (Anomalous occurrance)
	634.90	0.61	SANDSTONE, medium grey, medium-grained, non-calcareous,
	636.10	1.20	SANDSTONE, similar to above, abundant small burrows.
	636.42	0.32	SANDSTONE, identical to above
	637.94	1.52	SANDSTONE, medium grey, medium-grained, brief gradational zones of fine/medium grained sands, top 0.16 m. have some burrows, locally cross-bedded, generally clean, weakly calcareous.
	639.47	1.53	SANDSTONE, light/medium grey, generally grading from fine-to medium-grained (some brief zones slightly coarser) frequently cross-bedded, widely spaced, silty laminae

BH Nos. 30

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			continued from page 33 weakly calcareous, clean, micaceous.
	639.99	0.52	SANDSTONE, top 9 cm. and middle 8 cm. very fine-grained, rest fine-grained, laminated, clean, sporatic large burrows, strongly calcareous.
	640.99	1.00	SANDSTONE, medium grey, medium-grained, middle 0.15 m. riddled with large burrows, many cross bedded units, clean and well-sorted, strongly calcareous, fragmented at base.
	642.67	1.68	SANDSTONE, as above, minus burrows.
	644.35	1.68	SANDSTONE, medium grey, uniformly medium-grained, very clean and well-sorted, frequently cross-bedded, calcareous.
5°	645.87	1.52	SANDSTONE, identical to above.
5°	647.70	1.83	SANDSTONE, fine/medium-grained, strongly calcareous, clean, well-sorted, cross-bedded throughout.
	648.45	0.75	SANDSTONE, identical to above, fine/medium-grained
	649.22	0.77	SANDSTONE, similar to above.
	650.11	0.89	SANDSTONE, as above, very abrupt at base.
	650.75	0.64	SANDSTONE, dark grey/black, abundant carbonized plant debris, extensive listric surfaces, carbonaceous, abrupt basal contact.
	651.77	1.02	SANDSTONE, medium grey, fine/medium-grained, near vertical fracture in top 0.40 m., rest with numerous calcite fractures more or less along the bedding; bottom 0.07 m. a structural breccia, highly polished basal contact with mudstone
	652.27	0.50	MUDSTONE, dark grey, carbonaceous, highly polished surfaces, 45° to core axis.
	652.46	0.19	MUDSTONE, similar to above, erosional at base

BH Nos. 30

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
50°	653.80	1.34	SANDSTONE, medium grey, fine-grained, locally very fine grained, bottom 0.60 m. exhibits much fracturing 40° to core axis, calcite encrusted.
	654.08	0.28	SILTSTONE, medium grey, structureless, calcareous, erosional at base.
50°	655.32	1.24	SANDSTONE, medium grey, fine/medium-grained, thin intervals of siltstone and silty mudstone (erosional contacts), slickensided surfaces, one large fracture abundantly calcite infilled, bottom 0.30 m. of sand well cross-bedded, strongly calcareous, sorted and washed.
	656.84	1.52	SANDSTONE, light/medium grey, medium-grained, clean and sorted, strongly cross-stratified, numerous calcite filled fractures, strongly calcareous throughout.
	658.37	1.53	SANDSTONE, as above, bottom 0.36 m. fine/medium-grained, numerous calcite filled fractures.
	659.89	1.52	SANDSTONE, light/medium grey, medium-grained, very well washed and sorted, cross-bedded, some fractures along bedding.
	661.42	1.53	SANDSTONE, medium grey, medium-grained, middle 0.70 m. sparsely cross-bedded, top 0.35 with small calcite filled fractures, strongly calcareous throughout.
	663.24	1.82	SANDSTONE, as above, strongly calcareous.
	663.32	0.08	SANDSTONE, as above, erosional at base.
8°	664.77	1.45	SANDSTONE, dark grey, very fine-grained, ubiquitous, silty layers and some dark grey sandstone; sands very argillaceous, abundant finely particulate carbonaceous matter, ubiquitous wavy/parallel lamination, some ripples, numerous small fractures, few zones show micro-faulting, slickensided surfaces, patchily calcareous.
	665.30	0.53	MUDSTONE/SILTSTONE, dark grey/black, laminated, numerous slickensided surfaces, bottom 2 cm. richly pyritiferous and directly in contact with coal below.

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	666.05	0.75	COAL/MUDSTONE, top 0.27 m. highly sheared coal, followed below by 0.12 m. black carbonaceous mudstone, rest at base, black carbonaceous mudstone, listricated surface.
	666.62	0.57	MUDSTONE, as above, basal 0.13 m. highly sheared coal, abrupt.
	667.44	0.82	SANDSTONE, top 0.12 m. siltstone, rest fine-grained, light grey, clean, well-sorted, cross-bedded, strongly calcareous, erosional at base.
	667.64	0.20	MUDSTONE, medium grey, richly silty, calcareous, gradational.
	668.04	0.40	SANDSTONE, light grey, well-sorted, washed, small scale cross-bedding, strongly calcareous, gradual
	668.96	0.92	SILTSTONE, medium grey, very argillaceous, bottom 0.28 m. very fine-grained cross-laminated sandstone, calcareous throughout. A large calcite filled fracture at base.
	670.03	1.07	SANDSTONE, light/medium grey, top 0.28 m. very fine-grained, rest fine-grained, small scale cross-laminations calcareous, few small fractures filled with calcite.
	670.48	0.45	SANDSTONE, light grey, fine grained, very clean and sorted, sporatic, tiny coaly inclusions, calcareous, faintly cross-bedded.
	670.98	0.50	SANDSTONE, as above, erosional at base.
5°	672.01	1.03	MUDSTONE, dark grey, wisps and tiny ripples of very fine silts, strongly calcareous, last 0.26 m. with listric surfaces.
	672.78	0.77	MUDSTONE, identical to above, "laminite", weakly calcareous.
	673.43	0.65	MUDSTONE, dark grey to black, slightly carbonaceous, listric surface throughout (at 3 to 5 cm. intervals) non-calcareous; listric with coal seam at base. Appears to constitute a weak roof.
			Coal Seam - CHAMBERLAIN upper split

BH Nos. 30

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	673.44	0.01	MUDSTONE, carbonaceous, coaly.
	673.49	0.05	COAL, dull banded, stick.
	673.55	0.06	COAL, dull with occasional bright streaks.
	673.60	0.05	COAL, dull banded, listricated, fragmented.
	673.66	0.06	CORE LOSS - COAL
	673.69	0.03	COAL, dull lustrous, small fragments.
	673.76	0.07	COAL, dull banded, large pieces.
	673.78	0.02	COAL, dull lustrous, some bright streaks, cleated.
	673.85	0.07	COAL, dull, widely spaced bright laminae, listric surfaces, large pieces.
	673.87	0.02	COAL, bright, strongly cleated.
	673.90	0.03	COAL, dull, sub-lustrous, large pieces.
	673.92	0.02	COAL, dull banded, listricated, large pieces.
	673.95	0.03	COAL, dull, minor bright streaks.
	674.07	0.12	COAL, dull banded, large pieces.
	674.17	0.10	COAL, dull lustrous, minor vitrinite streaks, fragmented 0.10
	674.28	0.11	COAL, dull lustrous, fragmented into small pieces.
	674.36	0.08	COAL, dull banded, sheared badly, small pieces
	674.53	0.17	COAL, dull, listricated, fragmented.
	674.58	0.05	CORE LOSS - COAL
	674.61	0.03	COAL, dull banded, highly listricated, sheared.
	675.21	0.60	SILTSTONE/SANDSTONE, top 8cm dark grey, silty mudstone followed by 0.32m argillaceous laminated silts with slump structure. Rest of base very fine-grained sand.

BH Nos. 30

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	675.93	0.72	SANDSTONE, medium grey, very fine-grained, ubiquitous, small-scale cross-lamination, few thin muddy lenses, weakly calcareous.
	676.33	0.40	SANDSTONE/SILTSTONE, medium grey, sand very fine-grained, numerous muddy layers, laminated & cross-laminated, weakly calcareous.
5°	676.99	0.66	SILTSTONE, medium grey, abundant muddy layers, streaks and ripples of very fine-grained sands, weakly calcareous, very transitional basal contact.
	677.43	0.44	MUDSTONE/SILTSTONE, medium grey, top half richly argillaceous, silts, structureless, rest silty mudstone, few very fine-grained sand layers. Basal 0.16 m. frequently listricated and slightly carbonaceous
			Coal, CHAMBERLAIN - continued
	677.48	0.05	COAL, bony, finely silty/sandy.
	677.53	0.05	COAL, bright, sheared.
	677.56	0.03	COAL, dull, large piece, cleated, sporatic bright streaks and laminae
	677.64	0.08	COAL, dull (very uniform), listric surfaces, fracture planes 10° from core axis.
	677.68	0.04	COAL, dull banded, large pieces.
	677.73	0.05	COAL, dull banded, lustrous, listric surfaces
	677.77	0.04	COAL, dull with occasional bright streaks.
	677.82	0.05	COAL, dull banded, large piece.
	677.88	0.06	COAL, dull and bright, stick
	677.94	0.06	COAL, dull lustrous, stick
	678.01	0.07	COAL, dull banded, large fragments
	678.10	0.09	Core Loss - Coal

BH Nos.

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	678.18	0.08	COAL, dull, lustrous, joints 45°
	678.26	0.08	COAL, dull banded, stick, listricated
	678.38	0.12	COAL, dull and bright, small fragments
	678.50	0.12	Core Loss - Coal
	678.54	0.04	COAL, dull, small fragments
	678.64	0.10	COAL, dull, lustrous, finely disseminated vitrain
	678.71	0.07	COAL, dull banded, stick
	678.80	0.09	COAL, bright, sheared, cleated
	678.83	0.03	COAL, dull, lustrous.
	678.88	0.05	COAL, dull with 5 mm. thick bright band in middle.
	678.90	0.02	COAL, bright, heavily cleated, stick
	678.98	0.08	COAL, dull banded with 15 mm. zone in middle of vitrinite stick.
	678.99	0.01	COAL, bright
	679.11	0.12	COAL, dull and bright, cleated, stick
	679.24	0.13	COAL, dull, stick, minor bright streaks in lower zone.
	679.35	0.11	COAL, dull banded, sometimes large vitrinitic layers
	679.47	0.12	COAL, dull and bright, fragmented
	679.57	0.10	COAL, dull, lustrous, cleated, listricated.
	679.58	0.01	COAL, dull, appears high ash.
	679.61	0.03	COAL, bright, cleated.

SUKUNKA PROJECT
BULK SAMPLING PROGRAM

Float-Sink Analysis

Seam: CHAMBERLAIN

Sample site: SUKUNKA MAIN MINE

Dates analyzed: October 14 - 20, 1977

Size Fraction: 1 1/2" x 1"

Wt. % of head sample: 6.2

Lab No.: 9587

Specific Gravity Fraction	Fractional Analysis							Cumulative Floats		Cumulative Sinks	
	Weight gm	Weight %	Moist. %	Ash %	V.M. %	Tot.S. %	F.S.I.	Weight %	Ash %	Weight %	Ash %
F @ 1.20	--	--	--	--	--	--	--	--	--	--	--
1.20 - 1.25	--	--	--	--	--	--	--	--	--	--	--
1.25 - 1.30	22839.1	21.1	0.7	2.3	22.1	0.52	8 1/2	21.1	2.3	78.9	18.9
1.30 - 1.35	41000.0	37.9	0.7	3.9	21.2	0.47	6	59.0	3.3	41.0	32.8
1.35 - 1.40	9739.0	9.0	0.7	9.8	19.8	0.48	2 1/2	68.0	4.2	32.0	39.2
1.40 - 1.45	4497.0	4.2	0.7	15.1	19.6	0.47	2 1/2	72.2	4.8	27.8	42.9
1.45 - 1.50	2947.7	2.7	0.8	20.2	19.2	0.41	1 1/2	74.9	5.4	25.1	45.2
1.50 - 1.55	3894.2	3.6	0.7	27.4	16.1	0.46	1	78.5	6.4	21.5	48.3
1.55 - 1.60	2396.5	2.2	0.7	31.9	15.6	0.48	1	80.7	7.1	19.3	50.1
1.60 - 1.65	1556.3	1.4	0.6	36.0	14.7	0.80	1	82.1	7.6	17.9	51.2
1.65 - 1.70	948.8	0.9	0.7	42.3	13.4	1.10	1	83.0	7.9	17.0	52.0
1.70 - 1.80	14076.0	13.0	0.7	45.6	13.4	1.63	1/2	96.0	13.0	4.0	73.0
1.80 - 1.90	1622.5	1.5	0.6	53.7	11.5	1.49	1/2	97.5	13.7	2.5	81.7
1.90 - 2.00	427.9	0.4	0.7	62.1	11.0	0.98	1/2	97.9	13.9	2.1	85.4
S @ 2.00	2202.0	2.1	0.8	86.7	5.7	0.39	N.A.	100.0	15.4	--	--
TOTAL	108147.0	100.0	0.7	15.4	19.1	0.66	5	--	--	--	--

REMARKS:

TABLE 107

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP-31

Contractor: Connors

Commenced:

Completed:

Co-ordinates: 6,115,080.93 N
595,082.14 E
Surface Elevation: 1,428.34 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by: Geologist Andy Newson Depth 18.29-59.44

Final Depth: 59.44

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar			
U. Gething			

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION

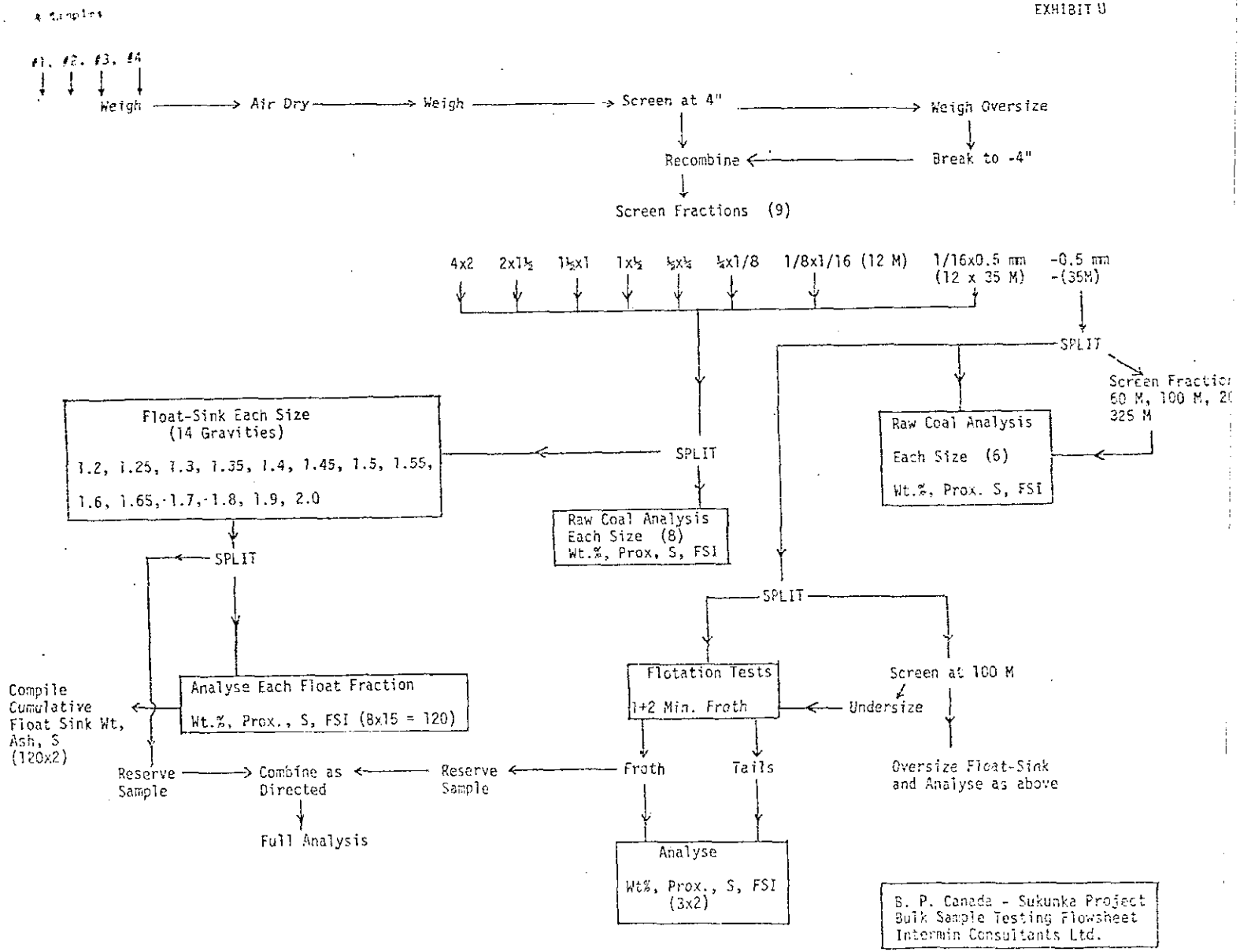
BIRD

CHAMBERLAIN

F.PO. 35 Steep dips

Collared below Chamberlain

EXHIBIT U


4 Samples
#1, #2, #3, #4
Weigh
Air Dry
Weigh
Screen at 4"
Weigh Oversize
Break to -4"
Recombine
Screen Fractions (9)
4x2
2x1½
1½x1
1x½
½x¼
¼x1/8
1/8x1/16 (12 M)
1/16x0.5 mm (12 x 35 M)
-0.5 mm -(35M)
SPLIT
Screen Fractio
60 M, 100 M, 2
325 M
Float-Sink Each Size (14 Gravities)
1.2, 1.25, 1.3, 1.35, 1.4, 1.45, 1.5, 1.55,
1.6, 1.65, 1.7, 1.8, 1.9, 2.0
SPLIT
Raw Coal Analysis Each Size (6) Wt.%, Prox. S, FSI
Raw Coal Analysis Each Size (8) Wt.%, Prox, S, FSI
SPLIT
SPLIT
Compile Cumulative Float Sink Wt, Ash, S (120x2)
Analyse Each Float Fraction
Wt.%, Prox., S, FSI (8x15 = 120)
Flotation Tests
1+2 Min. Froth
Undersize
Screen at 100 M
Reserve Sample
Combine as Directed
Reserve Sample
Froth
Tails
Oversize Float-Sink and Analyse as above
Full Analysis
Analyse
Wt%, Prox., S, FSI (3x2)
B. P. Canada - Sukunka Project
Bulk Sample Testing Flowsheet
Intermin Consultants Ltd.

BH Nos. 31

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	53.34	1.33	SANDSTONE & INTERBEDDED MUDSTONES; 50:50, sharp contacts, minor calcite filled fractures.
	54.86	1.52	SANDSTONE, as above.
	56.39	1.53	SANDSTONE, as above.
	57.91	1.52	SANDSTONE, as above.
	59.44	1.53	SANDSTONE, as above.

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 32A

Contractor: Tonto

Commenced: Sept 14, 1977

Completed: Oct. 1, 1977

Co-ordinates: 6,117,028.17 N
593,518.27 E
Surface Elevation: 1,874.15 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } See details page 1a
Hole Azimuth: }

Logged by:

Geologist	Depth
Bill Nyland	7.92-533.09
Ali Chowdry	533.69-631.99
Peter Raymond	632.76-639.20

Final Depth: 639.20

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek	20.63	20.63	1,853.52
Hulcross	128.98	108.35	1,745.17
Gates	307.41	178.43	1,566.74
Sukunka	457.02	149.61	1,417.13
Moosebar	535.48	78.46	1,338.67
U. Gething	596.72	61.24	1,277.43

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD	538.70			1,335.45
CHAMBERLAIN	596.72			1,277.43

F.PR.	50.29	Couge zone
F.PO.	361.49	Highly fractured and slickensided
F.PO.	449.88	Slickensided
F.PO.	495-498.35	Slickensided
F.PO.	631.99	Fracturing and mineralization

Sperry-Sun Survey

Date: 3rd October 1977

Borehole: BP 32 Sukuṅka 77

Compass: 20° Maximum to Magnetic North

BPB Operator: R. Bishop

Measured Depth	Tilt	Tilt Direction
638m	4° -	N 39° E
600m	3° 45'	N 38° E
550m	4° -	N 38° E
500m	3° 15'	N 36° E
450m	3° 15'	N 37° E
400m	3° -	N 35° E
350m	2° 45'	N 31° E
300m	2° 30'	N 31° E
250m	2° 30'	N 26° E
200m	2° 30'	N 22° E
150m	2° -	N 11° E
100m	2° -	N 8° W
50m	1° 45'	N 36° W

BH Nos. 32A

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	7.92	1.82	CONGLOMERATE, grading to sandstone, coarse-grained, poorly sorted, angular to sub-rounded, pebbles 25 mm. to coarse-grained moderately weathered.
	8.55	0.63	CONGLOMERATE, pebbles banded with sandstone, coarse grained.
	10.97	2.42	SANDSTONE, medium-to fine-grained cross-bedded, minor pebble bands, moderately weathered, numerous iron stained bands. High-angle fractures ~80°.
	14.02	3.05	SANDSTONE, as above
	17.07	3.05	SANDSTONE, as above, extremely weathered and broken towards bottom of section.
	20.12	3.05	SANDSTONE, as above, highly weathered and broken towards top of section, minor bioturbated zones, weathered and broken toward bottom of section.
	20.32	0.20	SANDSTONE, as above, minor bioturbated zones.
	20.63	0.31	SANDSTONE/SILTSTONE, heavily bioturbated, dark grey.
			BOULDER CREEK / HULLCROSS
	22.56	1.93	SANDSTONE, SILTSTONE, dominantly silty, gradational at base.
	25.60	3.04	SANDSTONE, SILTSTONE, as above
	26.21	0.61	SANDSTONE, SILTSTONE, as above
	29.26	3.05	SANDSTONE, SILTSTONE, as above
	32.31	3.05	SANDSTONE, SILTSTONE, fine-to very fine-grained, inter-bedded, cross-laminated, bioturbated zones, minor slump structures.
	35.36	3.05	SANDSTONE, SILTSTONE, as above, 50/50, high angle iron stained fractures at 89° to 90°.
	38.40	3.04	SANDSTONE, SILTSTONE, as above, 50/50

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	41.45	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	44.50	3.05	SANDSTONE, SILTSTONE, as above, high angle iron stained fractures at 80°.
	47.55	3.05	SANDSTONE, SILTSTONE, as above
	50.29	2.74	SANDSTONE, SILTSTONE, as above. minor fissile clay band @ 47.60 m 7 cm. thick, gouge zone from 49.45 to 49.65, highly weathered 75°.
	53.04	2.75	SANDSTONE, SILTSTONE, as above, very broken section
	56.08	3.04	SANDSTONE, SILTSTONE, as above
	58.83	2.75	SANDSTONE, SILTSTONE, as above, clay band @ 56.08 11 cm. thick.
	61.87	3.04	SANDSTONE, SILTSTONE, as above, clay band @ 58.83 12 cm. thick,
	62.79	0.92	SANDSTONE, SILTSTONE, as above, 50/50
	65.84	3.05	SANDSTONE, SILTSTONE, as above, 50/50, calcareous band at top of section.
	68.88	3.04	SANDSTONE, SILTSTONE, as above, 50/50.
	71.93	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	74.98	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	78.03	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	81.08	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	84.12	3.04	SANDSTONE, SILTSTONE, as above, 50/50
	87.17	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	90.22	3.05	SANDSTONE, SILTSTONE, as above, 40/60
	93.27	3.05	SANDSTONE, SILTSTONE, as above, 40/60
	96.32	3.05	SANDSTONE, SILTSTONE, as above 40/60, calcareous clay band at 95.12, 10 cm. thick.
	99.36	3.04	SANDSTONE, SILTSTONE, as above, 50/50

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	102.41	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	105.46	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	108.51	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	111.56	3.05	SANDSTONE, SILTSTONE, as above, 50/50 calcareous clay band @ 110.31, 13 cm. thick.
	114.60	3.04	SANDSTONE, SILTSTONE, as above, 50/50
	117.65	3.05	SANDSTONE, SILTSTONE, as above, 20/80
	120.70	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	123.75	3.05	SANDSTONE, SILTSTONE, as above, 60/40
	126.80	3.05	SANDSTONE, SILTSTONE, as above, 60/40
	128.57	1.77	SANDSTONE, SILTSTONE, as above, 60/40
	128.65	0.08	SANDSTONE, medium-grained, non-calcareous, light grey, bioturbated.
	128.98	0.33	SANDSTONE, fine grained, siltstone interbedded, slightly calcareous, bioturbated, siltier toward bottom
			HULLCROSS GATES
	129.03	0.05	CONGLOMERATE, varicoloured, poorly sorted, sub- to well rounded, fine sandstone matrix.
	129.72	0.69	SILTSTONE, bright, carbonaceous stringers, pyritic inclusions, ferruginous bands, sheared towards bottom of section
	129.76	0.04	COAL, dull minor bright bands small listric surfaces.
	129.84	0.08	SILTSTONE, muddy, bright, carbonaceous stringers, ferruginous bands, listric surfaces @ 25°.
	130.44	0.60	SILTSTONE, as above
	130.46	0.02	COAL, fissile, sheared and striated surfaces on dull minor bright bands.

Bll Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	130.53	0.07	COAL, lustrous, bright bands listric surfaces.
	130.55	0.02	COAL, dull, bright bands sheared.
	130.60	0.05	COAL, lustrous, bright bands, listric surfaces.
	130.62	0.02	COAL, dull bright bands, sheared.
	130.68	0.06	COAL, dull stick, finely sheared.
	130.71	0.03	COAL, lustrous, dull bands, sheared
—	131.46	0.75	COAL, lustrous, bright bands, listric surfaces @ 40° to 10°.
	131.98	0.52	SILSTONE, black listric surfaces, carbonaceous, stick marks on bedding planes.
	132.04	0.06	SILTSTONE, as above, sheared, possible grinding.
	132.38	0.34	COAL, dull, lustrous, sheared @ 60°, minor bright bands slightly calcareous.
	132.43	0.05	BONE, hard stick, bright stringers.
	132.82	0.39	SILTSTONE, muddy carbonaceous, bright coaly stringers.
	132.87	0.05	MUDSTONE, black, soft fissile,weathered.
	132.90	0.03	COAL, bright & dull banded stick.
	133.40	0.50	MUDSTONE, black, carbonaceous, bright stringers up to .015 M. thick.
	134.66	1.26	SANDSTONE, SILTSTONE, interbedded sandstone fine-to very fine-grained, well-sorted, grey to light grey, siltstone, dark grey, weakly calcareous, occasional bioturbated zones and slump structures. Carbonaceous stringers.
	135.94	1.28	SILTSTONE, dark grey minor very fine-grained sandstone bands and bright coaly stringers; cross-bedded, ferruginous nodules.
	136.16	0.22	SILTSTONE, as above, gradational contact with sandstone below.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	137.96	1.80	SANDSTONE, fine-to very fine-grained, grey to light grey, well sorted, sub-angular, thinly interbedded, siltstone bands, unit occasionally bioturbated on siltstone beds.
	138.83	0.87	SILTSTONE, dark grey to black, muddy coaly stringers ferruginous bands, minor calcareous sandstone bands, very fine-grained.
	138.89	0.06	COAL, dull, listric surface, broken, grinding indicated
	138.99	0.10	SILTSTONE, dark grey to black, carbonaceous at top of sections.
	140.29	1.30	SILTSTONE, as above, occasional pelecypod fossils.
	140.32	0.03	SANDY, SILTSTONE, carbonaceous, numerous bright stringers.
	140.75	0.43	SILTY, SANDSTONE, very fine-grained, dark grey, numerous small pelecypod fossils, bioturbated zone at bottom of section, moderately calcareous.
	141.37	0.62	SILTSTONE, black, carbonaceous numerous bright stringers, moderately calcareous, more carbonaceous towards top of section.
	141.89	0.52	SANDSTONE, SILTSTONE, interbedded sandstone, light grey, fine-to very fine-grained, calcareous (strongly), cross-bedded.
	142.04	0.15	SILTY MUDSTONE, light grey to black, very fine-grained sandstone bands near top of section, generally siltier toward bottom of section, occasional very hard ferruginous bands.
	144.48	2.44	SILTY MUDSTONE, as above, fossil band (pelecypods) at 143.13 20 cm. thick.
	145.31	0.83	SANDSTONE, very fine-grained, dark grey, argillaceous finely bedded, weakly calcareous.
	145.39	0.08	SANDSTONE, fine-to very fine grained, light grey, interbedded carbonaceous material, cross bedded.
	145.81	0.42	SILTY MUDSTONE, dark grey, minor calcareous ferruginous bands.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	146.11	0.30	SANDSTONE, fine-to very fine-grained. light to dark grey, finely interbedded carbonaceous material, argillaceous towards bottom of section.
	148.13	2.02	SANDY, SILTSTONE, grey to dark grey, weakly calcareous, minor listric surfaces along bedding plane, minor bright coal stringers, minor ferruginous bands, fossil band @ 146.75, 2 cm. thick.
	149.50	1.37	MUDSTONE, silty carbonaceous, grading from sandy siltstone above, bright stringers and rootlets towards bottom of section.
	150.41	0.91	SANDSTONE, SILTSTONE, interbedded and bioturbated sandstone, medium to very fine-grained, poorly sorted, minor bedded carbonaceous material, strongly calcareous, rootlets at top of section.
	150.50	0.09	SANDSTONE, light grey, medium-grained, poorly sorted, sub-angular to well-rounded, moderately calcareous.
	151.80	1.30	SANDSTONE, SILTSTONE, interbedded, fine-to very fine-grained, sandstone, light to dark grey, moderately calcareous, slump structures and cross-bedding.
	152.39	0.59	SILTSTONE, SANDY, black very fine sands, minor very fine sand beds, siltstone, black, numerous ferruginous bands, minor carbonaceous, bright bands, minor pelecypod fossils.
	154.23	1.84	SANDSTONE, light grey, fine to very fine grained, poorly sorted, angular to sub-angular, minor carbonaceous and calcareous inclusions, upper contact silty.
	154.90	0.67	SANDSTONE, as above with slightly more carbonaceous material.
	155.90	1.00	SANDSTONE, SILTSTONE, interbedded sandstone, very fine grained, light grey siltstone, dark grey sandstone and siltstone, bioturbated and cross-bedded. Fossil bands @ 155.06 3 cm. thick,(pelecypods) @ 155.70 m. 2.5 cm. thick(pelecypods) gradational contact to bottom of section.
	157.28	1.38	SILTSTONE, sandy, dark grey sandstone, very fine-grained thinly bedded, cross-bedded and moderately bioturbated.
	158.11	0.83	SILTSTONE, sandy as above, larger fine-grained sandstone bands at bottom of section.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	160.32	2.21	SANDSTONE, fine to very fine-grained, poorly sorted, sub-angular to sub-rounded, calcareous, very minor carbonaceous material, interbedded, light grey to grey.
	163.37	3.05	SANDSTONE, as above
	164.51	1.14	SANDSTONE, as above
	166.42	1.91	SANDSTONE, siltstone, thinly interbedded sandstone, grey, very fine grain, weakly to moderately calcareous, small areas of bioturbation noted.
	166.70	0.28	SANDSTONE, SILTSTONE, as above, mildly bioturbated gradational contact with sandstone below.
	167.39	0.69	SANDSTONE, fine to very fine-grained, same bedding, grey, mildly argillaceous.
	169.47	2.08	SANDSTONE, SILTSTONE, very argillaceous, very fine-grained thinly bedded in parts, some light grey, sandstone bands, numerous slump structures and bioturbated zones.
	171.64	2.17	SANDSTONE, as above
	172.52	0.88	SANDSTONE, fine-grained to very fine-grained, poorly sorted, angular to sub-angular, minor carbonaceous bedding, and pyrite blebs, sandstone light grey.
	173.40	0.88	SANDSTONE, as above, listric and slickensided surfaces @ 172.92 @ 15°, calcareous infilling.
	173.77	0.37	SANDSTONE, SILTSTONE, interbedded, sandstone very fine grained, argillaceous, siltstone dark grey to black, bioturbated.
	174.65	0.88	SANDSTONE, fine-grained grey, weakly calcareous, sub-angular to sub-rounded, minor carbonaceous stringers.
	175.56	0.91	SANDSTONE, SILTSTONE, sandstone very fine-grained, grey, siltstone dark grey to black, carbonaceous in part, numerous laminated carbonaceous bands and small slump structures, minor ferruginous bands.
	175.77	0.21	SANDSTONE, fine grained, grey, sub-rounded, moderately calcareous, gradational contact at bottom of section.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	176.15	0.38	SANDSTONE, as above with thinly bedded, carbonaceous material.
	179.65	3.50	SANDSTONE, fine-to very fine grained , argillaceous with siltstone thickly interbedded, also interbeds of light grey fine-grained sandstones, minor bioturbated areas and very large slump structures, generally weakly calcareous, minor ferruginous and pyritic bands.
	180.60	0.95	SANDSTONE, SILTSTONE, interbedded sandstone fine to very fine-grained, moderately calcareous. numerous thinly bedded carbonaceous bands, siltstone thickly bedded at top of section and nonexistent at bottom. Occasionally sand sized ferruginous banded mud clasts.
	181.66	1.06	SANDSTONE, very fine-grained, argillaceous, minor silty bands large slump structures, weakly calcareous, numerous carbonaceous bands and pin worm burrows.
	182.86	1.20	SANDSTONE, as above
	183.32	0.46	SANDSTONE, fine to very fine grained, large worm burrows with miniscus structures at top of section and tightly burrowed at bottom.
	184.42	1.10	SANDSTONE, very fine grained, very argillaceous, small light grey calcareous sandstone slump structures, unit strongly calcareous toward bottom. Occasional pin burrows.
	184.71	0.29	SANDSTONE, very fine-grained, and muddy, siltstone interbeds , siltstone thinly laminated and dark grey to black, numerous pin burrows in first 13 cm. of unit, minor ferruginous bands.
	186.51	1.80	SANDSTONE, SILTSTONE, as above,
	187.45	0.94	SILTSTONE, muddy dark grey to black, very thin, very fine-grained sandstone laminated, occasional pin burrows noted on bedding planes.
	188.00	0.55	SILTSTONE, as above
	188.12	0.12	SANDSTONE, very fine-grained, light grey, strongly calcareous, minor pin burrows at top of section.
	188.95	0.83	SILTSTONE, muddy. dark grey to black, very thinly bedded, very fine-grained sandstone.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	190.65	1.70	SANDSTONE, very fine-grained, silty, argillaceous, bioturbated, small worm burrows, small undisturbed zones of light grey sandstone, up to 6 cm. thick, highly calcareous.
	191.75	1.10	SANDSTONE, as above
	192.75	1.00	SANDSTONE, very fine-grained, light grey and argillaceous interbeds, cross-laminations noted, large pyrite nodules, weakly calcareous, gradational boundary with lower section.
	193.25	0.50	SANDSTONE, SILTSTONE, interbedded sandstone, very fine-grained argillaceous, cross-laminated, small worm burrows ferruginous nodules.
	193.48	0.23	SANDSTONE, very fine grained, grey, thinly laminated, argillaceous sandstone.
	193.70	0.22	SANDSTONE, argillaceous, dark grey, slumped minor siltstone, interlaminated, burrowed to bioturbated by small worms.
	194.32	0.62	SANDSTONE, as above
	194.42	0.10	SANDSTONE, coarse-to fine-grained, laminations, numerous mud clasts in coarse laminations, weakly calcareous.
	194.61	0.19	SANDSTONE, very fine-grained, grey, fine sand lenses, very thin carbonaceous laminations, cross-laminated.
	195.31	0.70	SANDSTONE, fine-to very fine-grained, small worm burrows, bioturbated, rootlets in last 17 cm. of section.
	195.84	0.53	CONGLOMERATE, pebbles 2 m. to 5 mm., well sorted except for occasional large pebbles 5 and 10 cm. in diameter. Calcareous matrix, varicoloured, chert and quartzite pebbles.
	196.75	0.91	SANDSTONE, very fine-grained, grey, interbedded, argillaceous sandstone, strongly calcareous, thinly laminated, large worm burrows; cross laminated.
	198.69	1.94	SANDSTONE, as above, fine-grained, cross laminated, strongly calcareous @ 197.17, 5 cm. thick @ 30°.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	199.80	1.11	SANDSTONE SILTSTONE, interbedded sandstone, very fine-grained grey with thinly laminated siltstone, cross-laminated with occasional small worm burrowed areas, minor slump structures and pyritic blebs. Occasional high angle fracture.
	200.50	0.70	SANDSTONE, SILTSTONE, as above.
50°	200.83	0.33	SANDSTONE, fine-grained, thinly laminated, argillaceous, fine grain sandstone, strongly calcareous.
	201.17	0.34	SANDSTONE, fine-grained, grey, bioturbated, strongly calcareous, gradational contact below.
	203.69	2.52	SANDSTONE, SILTSTONE, interbedded, very fine sandstones, light grey to argillaceous, strongly calcareous, minor burrowed areas, siltstone dark grey to black with ferruginous bands, large high angle fractures with small pyritic crystals.
	203.78	0.09	SANDSTONE, SILTSTONE, as above, only ferruginous with numerous calcareous filled fractures.
	203.90	0.12	MUDSTONE, SILTSTONE, carbonaceous with bright stringers, listricated.
	203.98	0.08	MUDSTONE, coaly, dull, hard, black, numerous bright stringers, black streaks, non-carbonaceous, (bone)
			GATES 'E' SEAM
	204.05	0.07	COAL, dull, sheared, minor bright stringers.
	204.24	0.19	COAL, dull and bright banded.
	204.36	0.12	COAL, as above, ground & pulverized.
	204.56	0.20	COAL, dull with bright bands broken, 50% mudstone fragments mixed.
	205.13	0.57	MUDSTONE, silty, black, carbonaceous, numerous rootlets and bright bands up to 2 cm. thick, non-calcareous.
	206.04	0.91	MUDSTONE, as above
	208.05	2.01	MUDSTONE, as above

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	208.19	0.14	COAL, dull and bright banded, minor very dull mudstone bands.
	208.22	0.03	SANDSTONE, fine-grained, calcareous, carbonaceous
	208.39	0.17	COAL, bright and dull banded, 90° cleats, strongly calcareous in first 0.7 m. of section.
	208.54	0.15	MUDSTONE, dull brown with bright bands.
	209.09	0.55	MUDSTONE, black, brown, numerous small listricated surfaces, minor bright bands.
	209.43	0.34	COAL, dull with minor bright bands, heavy probable high ash, silty.
	209.49	0.06	MUDSTONE, black, carbonaceous with bright bands.
	209.52	0.03	COAL, dull.
	209.59	0.07	COAL, dull with bright bands, strongly calcareous in upper and lower portions of section.
	209.61	0.02	COAL, dull with minor bright bands, weakly calcareous, minor iron staining.
	209.63	0.02	COAL, bright with minor dull bands
	209.69	0.06	COAL, dull, lustrous, minor bright bands.
	209.74	0.05	COAL, bright with dull bands, weakly calcareous.
	209.78	0.04	COAL, dull and lustrous.
	209.92	0.14	COAL, bright with dull bands, minor curved listrications.
	210.07	0.15	COAL, dull with bright bands, last 10 cm. broken.
	211.61	1.54	SANDSTONE, muddy, very fine grained, dark grey, very argillaceous, numerous rootlets, occasional bright coaly bands, numerous slump structures.
	212.14	0.53	SILTSTONE, dark grey, argillaceous, ferruginous bands.
	213.43	1.29	SANDSTONE, SILTSTONE, mixed dark grey, fine to very fine sandstone, argillaceous, weakly calcareous, high angle fracture pyrite coated.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	213.89	0.46	SANDSTONE, grey, fine-grained, cross laminated, minor siltstone laminations with associated ferruginous nodules, gradational contacts at top and bottom.
	214.42	0.53	SILTSTONE, dark grey to black, minor very fine-grained sandy lenses, numerous curved listric surfaces.
	214.47	0.05	SILTSTONE, as above
	214.74	0.27	SANDSTONE, very fine-grained to silty, argillaceous, small burrows, weakly calcareous.
	214.83	0.09	MUDSTONE, black, carbonaceous, numerous fossil plant fragments on bedding planes.
			GATES "D" COAL
	215.29	0.46	COAL, dull lustrous with very dull bands, weakly calcareous.
	216.23	0.94	MUDSTONE, silty dark grey, minor bright stringers and numerous fossil plant fragments.
	216.29	0.06	COAL, bright and dull bands.
	217.04	0.75	MUDSTONE, silty,dark grey,minor bright stringers and numerous fossil plant fragments, high angle fractures.
	218.41	1.37	MUDSTONE, as above.
	218.50	0.09	MUDSTONE, as above.
	218.81	0.31	SANDSTONE, SILTSTONE, interbedded sandstone, very fine-grained argillaceous, siltstone dark grey to black, thinly laminated with numerous slump structures.
	221.45	2.64	MUDSTONE, silty, black, bright coaly bands and numerous fossil plant fragments, listricated surfaces from 218.64 to 221.68 angles from 45° to 20°.
	222.17	0.72	MUDSTONE, black as above, listricated surfaces at 221.68, large pyrite blebs, listricated.
	222.25	0.08	COAL, dull, muddy, bright bands.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	222.36	0.11	COAL, dull, lustrous, with bright bands, weakly calcareous, stick.
	222.46	0.10	COAL, bright and dull banded, stick.
	222.50	0.04	COAL, dull lustrous
	222.53	0.03	COAL, bright and dull banded stick.
	222.60	0.07	COAL, as above
	224.33	1.73	CONGLOMERATE, granular , very coarse, sandstone matrix, varicoloured, quartzite and chert, weakly calcareous, upper 23 cm. carbonaceous.
	225.39	1.06	CONGLOMERATE, pebbles approximately 5 mm. in diameter, well sorted, varicoloured, sub-angular to sub-rounded.
	226.37	0.98	CONGLOMERATE, pebbles, 5 mm. to 25 mm., poorly sorted, varicoloured, sub-rounded to well-rounded, medium grained sandstone matrix.
	226.57	0.20	SANDSTONE, fine grain to granular with minor pebbles, poorly sorted, angular to rounded, light grey.
	226.96	0.39	CONGLOMERATE, granular to pebbley, approx. 30 mm. poorly sorted, sub-to well-rounded, fine-grained sandstone matrix. Varicoloured chert and quartzite.
	227.38	0.42	SANDSTONE, fine-grained to granular with minor pebble bands, light grey sandstone, poorly sorted, sub-angular to sub-rounded.
	227.57	0.19	CONGLOMERATE, grading from granular at top to pebbly at bottom of section, poorly sorted, varicoloured chert & quartzite, fine-grained sandstone matrix.
	228.67	1.10	SANDSTONE, fine-to medium-grained, light grey, poorly sorted, angular to sub-rounded, granular and pebble bands 1 cm. to 10 cm. thick, occasional scattered pebbles.
	228.89	0.22	MUDSTONE, carbonaceous, dark brown minor bright bands.
	229.02	0.13	COAL, bright and dull bands, dull bands are very muddy and silty, coal heavy & dense.
	229.21	0.19	MUDSTONE, carbonaceous, numerous bright bands, dark brown to black.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	229.44	0.23	MUDSTONE, as above
	230.43	0.99	MUDSTONE, dark brown, minor bright band, occasional rootlets.
	231.08	0.65	MUDSTONE, as above grading to siltstone.
	231.37	0.29	SILTSTONE, muddy, argillaceous, dark brown, grey, slumped.
	231.93	0.56	SANDSTONE, very fine-grained, dark grey, argillaceous, small burrows at top of section, cross-laminated.
	232.48	0.55	SANDSTONE, laminated, argillaceous, fine-grained and dark grey siltstone, grading into silty mudstone.
	233.53	1.05	MUDSOTNE, silty, dark brown to black, minor bright bands, minor listrications, numerous light brown ferruginous bands, mudstone grading into laminated sandstone and siltstone.
	234.37	0.84	SANDSTONE, laminated, very fine-grained and argillaceous, with siltstone, dark grey, numerous small slump structures and burrowed areas, minor ferruginous nodules, sandstoned siltstone grading into silty mudstone.
	235.61	1.24	SILTY, MUDSTONE, black, minor very fine-grained argillaceous sandstone lens, numerous ferruginous bands and nodules.
	239.05	3.44	MUDSTONE, silty, as above
	239.43	0.38	SANDSTONE, very fine-grained, very argillaceous, cross laminated gradational contact with muds above and below. Mudstone, black, silky texture homogenous.
			GATES "C" SEAM
	239.58	0.15	COAL, bright and dull bands, listricated, pyrite oxidation on cleavages, stick.
	240.37	0.79	COAL, broken fragments of sandy muds and bright and dull coal.
	240.72	0.35	SANDSTONE, fine-grained, carbonaceous, well sorted, weakly calcareous, angular to sub-rounded, some rootlets noted.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	241.71	0.99	SANDSTONE, fine-grained, light grey, well sorted, angular to sub-rounded, weakly to strongly calcareous, faintly cross-laminated.
	241.94	0.23	SANDSTONE, as above
	243.14	1.20	SANDSTONE, as above but small worm burrowed and bio-turbated.
	244.75	1.61	SANDSTONE, fine-grained, light grey, well sorted, angular to sub-rounded, moderately calcareous, minor silty lamine.
	247.25	2.50	SANDSTONE, as above, granular band @ 246.95 m 15 mm. thick.
	247.80	0.55	SANDSTONE, as above with large worm burrows, predominantly of the horizontal type.
	248.32	0.52	SANDSTONE, as above, worm burrowed.
	249.75	1.43	SANDSTONE, very fine-grained, light grey, moderately calcareous, well sorted, small and large worm burrowed area from 248.95 to 249.20 with small pebble band @ 249.20, 4 cm. thick.
	249.98	0.23	SANDSTONE, as above with large horizontal burrows.
	251.00	1.02	SANDSTONE, very fine-grained, light grey, moderately calcareous, well sorted, minor scattered pebbles.
	254.20	3.20	SANDSTONE, as above.
	257.25	3.05	SANDSTONE, as above
	260.45	3.20	SANDSTONE, as above
	263.50	3.05	SANDSTONE, minor mud clasts and pyrite blebs in middle of section.
	264.80	1.30	SANDSTONE, as above, thinly laminated siltstone in last third of section.
	265.28	0.48	SANDSTONE, very fine-grained, grey, in part argillaceous with thinly laminated siltstones.
	266.70	1.42	SANDSTONE, SILTSTONE, interlaminated sandstone, fine- to very fine-grained, grey, in part argillaceous, fine- to strongly calcareous, large worm burrows and bio-turbated zones. (cont'd on page 17)

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			Cont'd from page 16 - Siltstones are dark grey to black, thinly bedded compared to the sandstones, numerous small slump structures noted.
	269.75	3.05	SANDSTONE, SILTSTONE, as above, with a small very calcareous, poorly sorted conglomerate band @ 267.67, 4 cm. thick.
	271.06	1.31	SANDSTONE, SILTSTONE, as above, conglomerate unit @ 269.83, 5 cm. thick, poorly sorted, granular and pebbly, moderately calcareous.
	271.44	0.38	CONGLOMERATE, poorly sorted, pebbly cherts and quartzites, argillaceous, medium-grained, sandstone matrix slightly weathered.
	271.74	0.30	COAL, and pebbles mixed, coal bright and dull banded broken into cubic fragments.
	272.80	1.06	LAMINATED, very fine-grained, argillaceous sandstone with dark grey to black siltstones, cross-laminated with miniscus structures and rootlets in top of section.
	273.72	0.92	SANDSTONE, SILTSTONE, as above.
	274.03	0.31	SILTSTONE, muddy, black, numerous leaf imprints on bedding plain, gradational contact with sandstone below.
	274.89	0.86	SANDSTONE, very fine grained with thinly laminated, carbonaceous material, argillaceous, small slump structures, grades into siltstone below.
	275.0	0.11	SILTSTONE, black, carbonaceous, with bright stringers in middle of section, grading into sandstone below.
	275.47	0.47	SANDSTONE, very fine-grained with thinly laminated carbonaceous material, argillaceous, small burrowed areas and small slump structures.
	275.84	0.37	SILTSTONE, dark grey to black with very fine-grained sandstone lenses, small burrows and small slump structures, gradational contact with sandstone below.
	275.91	0.07	SILTSTONE, as above
	276.96	1.05	SANDSTONE, very fine-grained interbedded siltstone, argillaceous, numerous small slump structures, grading into muddy siltstone below.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	277.56	0.60	SILTSTONE, muddy, black, minor very fine-grained sandstone lenses, toward top of section, carbonaceous with bright bands towards bottom of section.
	279.04	1.48	SANDSTONE, medium-to fine-grained, grey, sub-angular to sub-rounded, laminated, weakly calcareous.
30°	282.24	3.20	SANDSTONE, as above with numerous cross-laminations.
	285.29	3.05	SANDSTONE, as above with grain size reduced to fine to very fine and lighter grey, occasional slump structures.
	287.92	2.63	SANDSTONE, as above, large worm burrows in very argillaceous, very fine-grained sandstone at 286.96m. 4 cm. thick, bioturbated zone @ 287.12, 17 cm. thick.
	288.07	0.15	SILTSTONE, sandy, dark grey, thinly laminated, carbonaceous material.
	288.34	0.27	SANDSTONE, as above
	291.39	3.05	SANDSTONE, as above, miniscus structures in silty sandstone @ 288.40 and @ 288.63. Large worm burrowed zone @ 290.79, 39 cm. thick.
	294.44	3.05	SANDSTONE, as above, bioturbated zone from 293.34 to 293.90.
	297.48	3.04	SANDSTONE, as above, with no cross-lamination apparent.
	298.39	0.91	SANDSTONE, as above
	298.64	0.25	SANDSTONE, SILTSTONE, interlaminated sandstone, very fine-grained argillaceous siltstone, black muddy.
	299.20	0.56	SANDSTONE, very fine-grained, laminated, argillaceous.
	300.53	1.33	SANDSTONE, very fine-grained, cross-laminated, argillaceous. Small sandstone, siltstone bands less than 10 cm. thick tending to be burrowed by small worms throughout the section.
	301.68	1.15	SANDSTONE, as above

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	303.58	1.90	SANDSTONE, SILTSTONE, inter-laminated, sandstone very fine-grained, light to dark grey, laminated, and cross-laminated, siltstone dark grey to black usually associated with burrowing which tends to carry into the sandstones. Small slump structures are also noted throughout section.
	306.49	2.91	SANDSTONE, SILTSTONE, as above.
	306.63	0.14	SANDSTONE, very fine-grained laminated, lighty grey, minor carbonaceous bands.
	307.41	0.78	SANDSTONE, as above
			GATES / SUKUNKA
	308.16	0.75	SANDSTONE, as above with minor siltstone bands and small worm burrows.
	309.68	1.52	SANDSTONE, SILTSTONE, interlaminated sandstone, very fine-grained, light to dark grey, laminated, cross-laminated and worm burrows with occasional associated miniscus structure, siltstone dark grey to black with associated worm burrowing and small bioturbated areas which tend to carry into the sandstone laminae Numerous small slump structures are found throughout the section, occasional broad bands of light grey medium-grained sandstone are found towards the top.
	312.72	3.04	SANDSTONE, SILTSTONE, as above, 70/30.
	315.77	3.05	SANDSTONE, SILTSTONE, as above, 30/70
	318.82	3.05	SANDSTONE, SILTSTONE, as above, 80/20, large sandstone bands - 30 cm. thick.
	321.87	3.05	SANDSTONE, SILTSTONE, as above, 40/60.
	324.92	3.05	SANDSTONE, SILTSTONE, as above, 60/40, with numerous horizontal large burrows.
	327.96	3.04	SANDSTONE, SILTSTONE, as above.

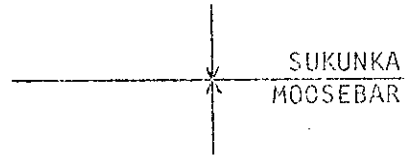
BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	331.01	3.05	SANDSTONE, SILTSTONE, as above.
	334.06	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	337.11	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	340.16	3.05	SANDSTONE, SILTSTONE, as above 50/50
	343.20	3.04	SANDSTONE, SILTSTONE, as above, 50/50
	346.25	3.05	SANDSTONE, SILTSTONE, as above, 50/50, clay band @ 343.72 4cm. , thick, is grey-beige and silky
	349.30	3.05	SANDSTONE,SILTSTONE, as above, 50/50
	352.35	3.05	SANDSTONE, SILTSTONE, as above, 60/40
	355.40	3.05	SANDSTONE, SILTSTONE, as above, 70/30
	358.44	3.04	SANDSTONE, SILTSTONE, as above, 70/30
	361.49	3.05	SANDSTONE, SILTSTONE, 60/40, highly fractured zone calcite filled, numerous slickensided and listric surfaces at random angles from 361.20 m to 362.99 m
	364.54	3.05	SANDSTONE, SILTSTONE, as above, 50/50.
	367.59	3.05	SANDSTONE, SILTSTONE, as above, 40/60
	370.64	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	373.68	3.04	SANDSTONE, SILTSTONE, as above, 50/50
	376.63	2.95	SANDSTONE, SILTSTONE, as above, 60/40
	379.78	3.15	SANDSTONE, SILTSTONE, as above, 50/50
	382.83	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	385.88	3.05	SANDSTONE, SILTSTONE, as above, 80/20
	388.92	3.04	SANDSTONE, SILTSTONE, as above, 70/30, sandstone strongly calcareous from this point on.
	391.97	3.05	SANDSTONE, SILTSTONE, as above, 70/30
	395.02	3.05	SANDSTONE, SILTSTONE, as above, 60/40

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	398.07	3.05	SANDSTONE, SILTSTONE, as above, 50/50.
	401.12	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	404.16	3.04	SANDSTONE, SILTSTONE, as above, 50/50
	407.21	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	410.26	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	413.31	3.05	SANDSTONE, SILTSTONE, as above, 50/50
	416.36	3.05	SANDSTONE, SILTSTONE, as above, 60/40
	419.40	3.04	SANDSTONE, SILTSTONE, as above, 40/60
	422.45	3.05	SANDSTONE, SILTSTONE, as above, 40/60
	425.50	3.05	SANDSTONE, SILTSTONE, as above, 30/70
	428.55	3.05	SANDSTONE, SILTSTONE, as above, 30/70
	431.60	3.05	SANDSTONE, SILTSTONE, as above, 40/60
	434.64	3.04	SANDSTONE, SILTSTONE, as above, 40/60
	437.69	3.05	SANDSTONE, SILTSTONE, as above, 40/60
	440.94	3.25	SANDSTONE, SILTSTONE, as above, 30/70
	443.79	2.85	SANDSTONE, SILTSTONE, as above 30/70
	446.23	2.44	SANDSTONE, SILTSTONE, as above with numerous high angle fractures, broken.
	447.14	0.91	SANDSTONE, SILTSTONE, as above, 20/80, gouge zone from 447.11 to 447.20.
	449.88	2.74	SANDSTONE, SILTSTONE, as above, 20/80, shear zone from 447.20 to 448.14, numerous listric and slickensided surfaces, angles very sheared and broken.
	452.93	3.05	SANDSTONE, SILTSTONE, as above, 20/80, high angle fractures towards top of section.
	455.98	3.05	SANDSTONE, SILTSTONE, as above, 10/90.

BH Nos.

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	457.02	1.04	SANDSTONE, muddy siltstone, 10/90  CONTACT OF UPPER AND LOWER MOOSEBAR
	459.03	2.01	MUDSTONE, black, numerous ferruginous bands, pyrite blebs and pin burrows, listric surfaces @ 459.03 at 20°.
	462.08	3.05	MUDSTONE, as above, listric surface @ 462.04 @ 15°.
	465.12	3.04	MUDSTONE, as above, shear zone from 462.04 to 462.38 numerous listricated and slickensided surfaces @ 15° to 70°, minor gouge along high angle shears.
	468.17	3.05	MUDSTONE, as above.
	471.22	3.05	MUDSTONE, as above.
	474.27	3.05	MUDSTONE, as above
	477.32	3.05	MUDSTONE, as above, numerous 45° fractures.
	480.36	3.04	MUDSTONE, as above, numerous 45° fractures.
	483.41	3.05	MUDSTONE, as above, numerous 45° fractures.
	486.16	2.75	MUDSTONE, as above.
	489.20	3.04	MUDSTONE, black, as above.
	492.25	3.05	MUDSTONE, black as above.
	495.30	3.05	MUDSTONE, as above
	498.35	3.05	MUDSTONE, as above, listricated and slickensided zones from 496 to 496.47 at 30° to 70°, from 496.77 to 497.12 at 30° and 80°, from 497.39 to 497.74 at 60° and 70°.

BH Nos. 32A

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	501.40	3.05	MUDSTONE, as above, listricated and slickensided zone from 498.40 to 498.75 at 50° & from 499.7 to 500.1 at 55°.
	504.75	3.35	MUDSTONE, as above.
	507.80	3.05	MUDSTONE, as above, high angle fractures.
	510.84	3.04	MUDSTONE, as above.
	513.89	3.05	MUDSTONE, as above.
	516.94	3.05	MUDSTONE, as above, numerous low angle fractures.
	519.99	3.05	MUDSTONE, as above, clay band @ 519.49 7 cm. thick beige mottled and has numerous mudstone inclusions (worm burrows?)
	523.04	3.05	MUDSTONE, as above
	526.08	3.04	MUDSTONE, as above, clay band @ 523.11 6 cm. thick dark beige mottled with fewer mudstone inclusions than in above clay band, fissile.
	529.13	3.05	MUDSTONE, as above, clay band at 528.6 is 4 cm. thick, beige, large mudstone inclusion in the middle of the band.
	532.18	3.05	MUDSTONE, as above, clay band at 530.40 - 2 cm. thick, beige with , large mudstone inclusions in centre of band, large calcite filled fracture (parallel to axis) at base.
	533.09	0.91	MUDSTONE, as above.
	533.69	0.60	MUDSTONE, dark grey, pyritic, small burrows, dense, traces of bentonite at base.
	534.44	0.75	MUDSTONE, as above, broken stick with thin bentonitic bands.
	534.64	0.20	MUDSTONE, as above, sharp contact with bentonitic layer.
	534.73	0.09	BENTONITE, buff grey, infested with burrows.
	534.84	0.11	MUDSTONE, as above
	534.96	0.12	BENTONITE, grey, buff, contact with mudstone sheared, and muds wedged in, core broken.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	535.16	0.20	SANDSTONE, dark grey, pyritic, glauconitic (blobs of), very hard, argillaceous.
	535.23	0.07	SANDSTONE, as before, gluaconitic sandstone.
	535.41	0.18	SANDSTONE, gluaconitic, numerous blobs of pyrite, band.
	535.48	0.07	SANDSTONE, 70/80% pyrite, very hard, bottom contact slickensided, coaly fragments at base. MOOSEBARD
	535.64	0.16	BIRD SEAM UPPER GETHING COAL, dull, heavily listricated, occasionally bright, stick.
	535.67	0.03	COAL, fragments, dull, lustrous.
	535.70	0.03	COAL, dull with occasional bright bands, fragmented.
	535.76	0.06	COAL, dull essentially with occasional bright streaks, broken stick.
	535.81	0.05	COAL, dull, very minor patches of bright patches, broken stick.
	535.82	0.01	MUDSTONE, black, very carbonaceous, coaly, broken
	535.86	0.04	COAL, dull, sheared, some occasional bright bands, broken.
	535.89	0.03	COAL, dull, highly sheared, broken.
	535.92	0.03	COAL, dull, highly sheared, as above, broken.
	535.98	0.06	MUDSTONE, black to dark grey, coaly, plant debris, broken stick.
	536.01	0.03	COAL, dull, dense, listricated, broken stick.
	536.20	0.19	CORE LOSS - COAL.
	536.65	0.45	MUDSTONE, dark grey, carbonaceous, highly listricated, abundant carbonized plant debris.
	537.36	0.71	MUDSTONE, similar to above, becoming less carbonaceous, silty at base, pyritic, few polished surfaces, one passing at 30° through the core.

BH Nos. 32-A

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	538.27	0.91	MUDSTONE, as above, silty, finely broken plant debris
	538.34	0.07	CORE LOSS-ROCK
	538.70	0.36	CORE LOSS-COAL
	539.00	0.30	SANDSTONE, dark grey, medium-grained, finely disseminated carbonaceous matter, very argillaceous, gradational
	541.38	2.38	SANDSTONE, light/medium grey, uniformly medium-grained, some intervals medium/coarse-grained, mottled look, generally clean, well-sorted, quartzitic, small burrows
	542.11	0.73	SANDSTONE, as above, very clean and well-sorted
	542.54	0.43	SANDSTONE, medium-grey, medium-grained, cherty, quartzose, cross-bedded, fracture at 60° from horizontal, fragmented at base
	544.37	1.83	SANDSTONE, as above, this interval highly fractured, sheared, abundant calcite encrustation, many brecciated zones definitely a faulted zone
5°	547.42	3.05	SANDSTONE, top 0.16m fragmented and sheared, rest light/medium grey, medium-grained, mostly cross-bedded, (some laminae of fine sands), several zones abound in large burrows, few minor calcite filled fractures, strongly calcareous throughout, broken stick
	550.47	3.05	SANDSTONE, light/medium grey, medium-grained, generally clean and well-sorted, much burrowing, some zones bioturbated, some intervals with cross-bedding, 0.45m zone in middle encompassing large near vertical fracture, bottom 0.40m with sporadic small burrows within an otherwise bioturbated zone, these burrows are thought to be collapsed large burrows, mostly strongly calcareous
	553.52	3.05	SANDSTONE, light grey, medium-grained, very uniform, clean, locally cross-bedded, sporadic discrete burrows, calcareous, near vertical calcite encrusted large fractures
	556.56	3.04	SANDSTONE, as above, 0.35m near vertical fracture zone 0.23m from top, rest very clean and uniform sandstone
	559.61	3.05	SANDSTONE, light grey, medium-grained, well-washed, well-sorted, cross-bedded, top 1.28 sporadically cross-bedded, several fractures at about 50°, calcareous throughout
	562.66	3.05	SANDSTONE, light/medium grey, sands as above, several fractures
	562.82	0.16	SANDSTONE, as above, erosional at base
	563.53	0.71	SILTSTONE, medium to dark grey, richly argillaceous, lenticles and minor ripples of very fine-grained sands throughout, irregularly laminated, strongly calcareous throughout, erosional at base

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	564.65	1.12	SANDSTONE, light/medium grey, very fine-grained, characteristic ripples and micro cross-lamination throughout, frequent laminae and layers of siltstones, sometimes graded zones of silts and sands, some compactional features sporadic burrows, strongly calcareous, gradational at base and brief argillaceous intervals
	564.72	0.07	MUDSTONE, dark grey, finely sandy/silty, abrupt basal contact
	564.95	0.23	SANDSTONE, medium-grained, 0.06m silty/muddy layer in upper half. calcareous, erosional at base
	565.17	0.22	SILTSTONE/MUDSTONE, medium grey, some lamination, listricated, bottom 0.05m fragmented, calcareous
	565.71	0.54	SANDSTONE, light grey, medium-grained, clean, sorted, few silty clasts, calcareous
	566.32	0.61	SANDSTONE, as above, strongly calcareous, scoured base
	567.11	0.79	SANDSTONE, light grey, fine-grained, small-scale cross-lamination, some wavy lamination, locally passing to very fine-grained sands, small and large vertical burrows, top 10cm very silty mudstone, strongly calcareous, gradual at base
	567.58	0.47	SANDSTONE, medium grey, very fine-grained, argillaceous, silty laminae and layers, ubiquitous small-scale cross-lamination, some parallel lamination, many vertical burrows, compactional features, strongly calcareous, silts/mud contact increasing downward
	568.76	1.18	SILTSTONE/MUDSTONE, top half dominantly silty, rest mudstones ripples and lenses of silts, laminated in top half, strongly calcareous throughout.
	569.20	0.44	MUDSTONE, dark grey, slightly ferruginous (locally), silty gradual
8°	571.24	2.04	SANDSTONE, medium grey, fine-to very fine-grained, small-scale cross-laminated zones to parallel wavy laminated zones, locally these embodying micro-graded units, much dark grey laminae (caused by ubiquity of finely macerated carbonaceous matter), much plant debris (carbonized), much silty/muddy interbedding, strongly calcareous, passing below by interbedding, sporadic small vertical burrowing
	571.80	0.56	MUDSTONE, dark grey to black, siltstone lenticles throughout, locally very carbonaceous, some canneloid muds, non calcareous, abrupt with coal below
	572.06	0.26	COAL SEAM, SKEETER SEAM, large pieces, entirely of dull coal, listricated surfaces

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	572.26	0.20	MUDSTONE, black, slightly carbonaceous, very silty in middle zone, fragmented pelecypod shells, gradual
	573.13	0.87	SANDSTONE, medium grey, very fine-grained, richly argillaceous, slightly distrubed, patchy lamination, strongly calcareous, transitional at base
	573.85	0.72	MUDSTONE, dark grey, locally slightly ferruginous, very silty homogeneously, top 0.25m strongly calcareous, rest mildlycalcareous, gradual at base, much carbonized plant debris
	574.85	1.00	SILTSTONE, dark grey, much finely broken carbonaceous debris, some large carbonized pieces, structureless, strongly calcareous
	575.08	0.23	SILTSTONE, identical to above, very gradual at base
	575.33	0.25	MUDSTONE, dark grey, carbonaceous debris, silty, gradual
	575.87	0.54	SANDSTONE, dark grey, very fine-grained, richly argillaceous, irregularly laminated, sporadic wavy lamination, strongly calcareous, some silty zones, gradual at base
	576.28	0.41	MUDSTONE, dark grey, homogeneously silty, abundant carbonized plant debris, strongly calcareous, structureless, gradual
	576.81	0.53	SANDSTONE, medium grey, very fine-grained, very argillaceous, silty, widely spaced lamination, strongly calcareous, very transitional at base
	577.91	1.10	MUDSTONE/SILTSTONE, dominance of mudstones, mostly structureless, patchily calcareous (weakly)
	580.41	2.50	MUDSTONE, medium to dark grey, locally richly silty and ferruginous, local zones of black mudstone rich in carbonized plant debris, 10cm zone vaguely laminated and strongly calcareous, rest non calcareous
	580.69	0.28	MUDSTONE, dark grey, very silty, slightly ferruginous, non calcareous
	580.94	0.25	SANDSTONE, top 0.12m coarse-grained siltstones, argillaceous gradually passing below to very fine-grained sands, vaguely laminated
	581.14	0.20	SANDSTONE, identical to above, very transitional at base
	582.94	1.80	SANDSTONE, light grey, top 0.64m fine-grained sands, rest very fine-grained, abundant small-scale cross-lamination, well-sorted, locally some very finely broken carbonaceous matter, strongly calcareous, abrupt basal contact
	583.47	0.53	MUDSTONE/SILTSTONE, top half medium grey mudstone, rest argillaceous siltstone, laminated (irregularly), strongly calcareous throughout, erosional base

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	583.79	0.32	SANDSTONE, light grey, very fine-grained, laminated, cross-laminated, strongly calcareous, erosional
	583.99	0.20	MUDSTONE, dark grey, silty wisps and lenticles, strongly calcareous, gradual at base
	584.17	0.18	SANDSTONE, light grey, very fine-grained, strongly calcareous, locally laminated, erosional at base
10°	586.98	2.81	SILTSTONE, light/medium grey, sequence characterized by ubiquitous occurrence of delicate lamination and ripples, lenticles of very fine-grained sands, muddy (discrete) zones, silts argillaceous throughout, locally abundant carbonized plant debris, few burrows and these exhibiting internal intricate crescenticstructures, few micro-slumped zones, some wavy irregularly laminated siltstone, micro-graded units, strongly calcareous throughout
	587.48	0.50	MUDSTONE, medium grey, top 0.25m very silty, and calcareous, rest regularly listricated at 6/7cm intervals, continuous below
	588.51	1.03	MUDSTONE, dark grey, the interval characterized by frequent listric and highly polished surfaces (26 separate core rings), bottom 0.14m broken up and some small fragments,highly incompetent zone
	589.16	0.65	MUDSTONE, dark grey, breaks with semi-conchoidal fracture, two listricated surfaces, totally devoid of silty intercalations
	589.20	0.04	MUDSTONE, dark grey, slightly carbonaceous, polished surfaces
	589.45	0.25	CORE LOSS-COAL
	589.65	0.20	COAL, fragments, some mudstone fragments, fragments of dull banded with minor bright streaks
	589.72	0.07	MUDSTONE, medium grey, carbonaceous, silty, one prominent polished surface passing through core, broken stick
	589.74	0.02	MUDSTONE, all fragmented, as above
	589.79	0.05	CORE LOSS-ROCK
	589.81	0.02	COAL, very broken, fragmented, listricated, probably dull banded
			CHAMBERLAIN SEAM
	590.01	0.20	COAL, dull lustrous, streaks and laminae of bright coal, cleated, major fracture parallel to core axis, broken stick
	590.14	0.13	COAL, dull, lustrous with occasional thin bright, broken, some vertical fractures, as above

BH Nos. 32A

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	590.21	0.07	COAL, dull lustrous with regular streaks of bright, very broken stick, fractures and cleats as above.
	590.26	0.05	COAL, fragments, essentially as above, dull lustrous.
	590.36	0.10	COAL, dull, lustrous with minor bright, highly sheared at least 3 directions of shearing, broken stick.
	590.41	0.05	COAL, fragments, two large fragments, dull lustrous, sheared with some small fragments having large amount of bright coal.
	590.45	0.04	COAL, fragmented, broken, highly sheared, type indistinguishable.
	590.54	0.09	COAL, highly sheared, as above, type indistinguishable, stick, broken at base.
	590.60	0.06	COAL, highly sheared, probably dull with minor bright band, broken stick.
	590.67	0.07	COAL, dull, highly sheared, broken stick.
	590.71	0.04	COAL, dull banded, sheared.
	590.82	0.11	COAL, dull, banded, with thin bright streak, two bright layers each 3 mm. thick, lustrous at base, 45°, striated surface at base, stick.
	590.86	0.04	COAL, dull, sheared, 45° striated planes passing through core, very broken stick.
	590.88	0.02	COAL, as above, very broken stick.
	591.04	0.16	COAL, dull, lustrous, banded, with streaks and bands of bright throughout. 0.04 to 0.07 from top zones with higher percentage of bright bands, relatively hard, stick, sharp contact with rock below.
	591.13	0.09	MUDSTONE, dark grey, coaly, carbonized plant remains, silty, stick.
	591.15	0.02	CORE LOSS - ROCK
	591.19	0.04	COAL, dull, dense, thin bright bands, bright band at base, very muddy, stick.
	591.28	0.09	COAL, dull and bright, sheared, 60° planes passing through core, stick.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	591.41	0.13	COAL, dull banded, lustrous, highly sheared, fracture stick.
	591.46	0.05	COAL, as above, sheared, dull banded, cleated
	591.55	0.09	COAL, highly sheared, less sheared at base, probably dull.
	591.69	0.14	COAL, dull, lustrous, banded, percentage of bright increasing through centre, bedding apparently 30°, with abundant striated planes parallel to bedding, stick, hard.
	591.72	0.03	COAL, highly sheared, probably dull, stick.
	591.88	0.16	COAL, all pieces, some large ones, some dull & bright, some dull banded, lustrous, jumbled up.
	591.94	0.06	COAL, highly sheared, probably dull banded, broken stick,
	592.01	0.07	COAL, highly sheared, probably dull banded, broken stick,
	592.04	0.03	COAL, broken, highly sheared, type indistinguishable.
	592.10	0.06	COAL, highly sheared, probably dull, broken stick,
	592.16	0.06	COAL, dull and bright, highly sheared, broken stick.
	592.22	0.06	COAL, bright banded, broken stick, high angle shear planes
	592.35	0.13	COAL, dull, sheared, broken stick, high angle shear planes.
	592.45	0.10	COAL, highly sheared, high angle fracture planes, probably dull banded, broken stick.
	592.49	0.04	COAL, bright, sheared and fractured, broken stick.
	592.53	0.04	COAL, heavily sheared, probably dull banded.
	592.56	0.03	COAL, sheared, dull banded, fragmented.
	592.58	0.02	COAL, highly pulverized, sheared, type indistinguishable
	592.65	0.07	COAL, dull banded, sheared, broken stick.
	592.69	0.04	COAL, sheared, dull banded, broken.

BH Nos. 32A :

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	592.69	0.05	COAL, sheared, dull banded, broken.
	592.74	0.05	COAL, dull banded, stick, relatively hard, listricated
	592.75	0.01	COAL, bright stick.
	592.79	0.04	COAL, dull banded, listricated, relatively hard stick.
	592.83	0.04	COAL, dull lustrous, fragmented.
	592.90	0.07	CORE LOSS - COAL
	592.91	0.01	COAL, dull, dense, hard, calcareous, thin bright streaks, stick.
	592.92	0.01	COAL, bright, broken stick
	592.95	0.03	COAL, dull, lustrous, highly sheared, broken stick.
	593.00	0.05	COAL, highly sheared, type indistinguishable, very broken stick.
	593.02	0.02	COAL, fragments as above.
	593.09	0.07	CORE LOSS - COAL.
	593.13	0.04	COAL, highly sheared, dull, very broken stick.
	593.19	0.06	COAL, dull, banded, highly sheared, broken stick.
	593.25	0.06	COAL, highly sheared, probably dull and bright, broken stick.
	593.32	0.07	COAL, dull banded, 60° striated planes traversing core broken stick.
	593.37	0.05	COAL, dull lustrous, highly sheared, broken stick, steep plane, traversing core.
	593.50	0.13	COAL, dull lustrous, sheared, occasional thin bright bands, broken stick, steep striated planes through core.
	593.54	0.04	COAL, sheared, dull and bright (probably), broken stick
	593.55	0.01	COAL, dull, highly sheared, broken.
	593.58	0.03	COAL, dull banded, hard, listricated, broken stick.

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	593.61	0.03	COAL, brightly sheared, probably dull & broken stick,
	593.67	0.06	COAL, dull, quite hard, sheared, occasional bright
	593.70	0.03	COAL, highly sheared, broken, indistinguishable.
	593.73	0.03	COAL, sheared, probably dull, broken stick.
	593.78	0.05	COAL, fragments, sheared, some dull and bright, some dull.
	593.92	0.14	CORE LOSS - COAL.
	593.94	0.02	COAL, bright, highly sheared, broken stick
	593.95	0.01	COAL, dull and bright, broken stick
	593.99	0.04	COAL, bright, highly sheared, broken stick
	594.01	0.02	COAL, bright banded, broken stick
	594.07	0.06	COAL, fragments of highly sheared coal, indistinguishable
	594.21	0.14	CORE LOSS-COAL
	594.33	0.12	COAL, large pieces, very sheared, probably of dull coal
	594.36	0.03	COAL, small fragments, rounded, probably dull lustrous and sheared coal
	594.48	0.12	CORE LOSS-COAL
	594.54	0.06	COAL, large pieces and rounded, dull banded, dull sheared
	594.62	0.08	COAL, dull and bright, sheared
	594.64	0.02	COAL, fragments, small pieces, dull and bright
	594.76	0.12	CORE LOSS-COAL
	594.93	0.17	COAL, dull and bright, sheared, broken stick
	594.95	0.02	COAL, bright, sheared, broken stick
	595.02	0.07	COAL, dull and bright, sheared, broken stick
	595.03	0.01	COAL, sheared, probably dull, broken stick
	595.06	0.03	COAL, bright, sheared, high angle striated planes passing through the core, broken stick
	595.10	0.04	COAL, bright banded, sheared, broken stick
	595.12	0.02	COAL, bright coal, small fragments
	595.17	0.05	COAL, fragments of bright banded and dull lustrous, banded, friable

BH Nos. 32A

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	595.41	0.24	CORE LOSS-COAL
	595.50	0.09	COAL, sheared, dull lustrous, banded, broken stick
	595.57	0.07	COAL, as above, broken stick, highly sheared
	595.59	0.02	COAL, fragments, probably same as above
	595.70	0.11	CORE LOSS-COAL
	595.76	0.06	COAL, dull, highly sheared, stick
	595.81	0.05	COAL, dull and bright, sheared, stick
	595.83	0.02	COAL, soft, highly sheared, pulverized, type indistinguishable, stick
	595.86	0.03	COAL, dull and bright, highly sheared
	596.13	0.27	COAL, highly sheared, probably dull banded, soft friable stick.
	596.31	0.18	COAL, highly sheared, type indistinguishable, stick
	596.39	0.08	COAL, highly sheared, friable, probably dull banded, broken stick.
	596.46	0.07	COAL, sheared, (highly) listricated, type unknown, broken stick.
	596.50	0.04	COAL, highly sheared, type not known, broken stick,
	596.56	0.06	COAL, same as above, broken stick
	596.61	0.05	COAL, highly sheared, probably dull lustrous banded, broken stick.
	596.62	0.01	COAL, dull and bright, broken stick.
	596.72	0.10	CORE LOSS-COAL
	596.80	0.08	SANDSTONE, black, richly coaly, thin bright bands in top 0.04m, some listric surfaces
	597.82	1.02	SANDSTONE, light/medium grey, carbonaceous at top, medium-grained. lower end well-sorted, somewhat mottled look, Chamberlain Floor
	599.23	1.41	SANDSTONE, medium grey, (some zones medium/coarse-grained) medium-grained, cherty, quartzose, occasional cross-stratified units, clean and well-sorted, non calcareous
	601.98	2.75	SANDSTONE, identical to above, bottom 0.62m with numerous listric surfaces, 1cm weathered clayey zone toward base, bottom 10cm fragmented

BH Nos. 32A

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	603.50	1.52	SANDSTONE, light grey, medium-grained, clean, well-sorted, cross-bedded throughout, large (0.55m) near vertical fracture 0.30m from top, calcareous
	606.24	2.74	SANDSTONE, similar to above, very strongly calcareous
	608.38	2.14	SANDSTONE, identical to above, very strongly calcareous, two fractures at 45° traversing core
	610.55	2.17	SANDSTONE. similar to above, very strongly calcareous, numerous calcite filled fractures,slickenslided surface
	611.43	0.88	SANDSTONE, light grey, fine/medium-grained, very clean and well-sorted regularly cross-bedded, two large fractures 60° from horizontal, very strongly calcareous
	611.95	0.52	SANDSTONE, as above, extensive fracturing along calcitic planes, core fragmented, strongly calcareous
40°	613.19	1.24	SANDSTONE, light grey, fine-grained, very clean, regularly laminated, strongly calcareous, large fracture toward base, abrupt basal contact
25°	615.96	2.77	MUDSTONE/SANDSTONE, 60:40, medium grey, very fine-grained laminated sands interbedded with dark grey mudstone-mud/sand boundary invariably erosional, sands generally lenticular, few muddy clasts and burrows, some local silty layers, locally some finely broken carbonized plant matter (thin layers and laminae), very strongly calcareous throughout, bottom 0.13m with lenticles of fine to medium-grained sands, locally pin burrows, many listric surfaces
	617.52	1.56	SANDSTONE, light/medium grey, medium-grained, top 0.80m with three coarse-grained sandstone zones aggregating 0.26m, these coarse zones entomb large numbers of silty intraclasts, (many of these still retaining original sedimentary structures), generally well-sorted, strongly cross-bedded throughout, very strongly calcareous
	618.30	0.78	SANDSTONE, as above, some large burrows (similar to the ones encountered below Chamberlain), some finely particulate carbonaceous matter, most of interval fractured (calcite encrustations), very strongly calcareous, basal contact very gradual
	620.57	2.27	SANDSTONE, light grey, fine/medium-grained, regularly cross-stratified, 0.85m zone abounds in large burrows, very clean, sorted, top 0.16m with some dark laminae, very strongly calcareous
	623.62	3.05	SANDSTONE, as above, minus burrows, many calcite encrusted fractures, 45° to core axis, very strongly calcareous throughout

BH Nos. 32A

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	626.67	3.05	SANDSTONE, as above, many small-scale fractures calcite infilled, cross-bedded, numerous listricated surfaces, very strongly calcareous
55°	629.72	3.05	SANDSTONE, as above, much fracturing, numerous slickensided surfaces, very strongly calcareous
	631.99	2.27	SANDSTONE, light grey, fine/medium-grained, very clean, well-sorted, cross-stratified throughout, much small-scale fracturing, calcite mineralization, 0.13m muddy zone with lightly listricated surfaces (0.28m from base), very strongly calcareous throughout
	632.76	0.77	SANDSTONE, grey, fine-grained, thin mineralized fractures passing through core at 45°
	634.29	1.53	SANDSTONE, as above, many fractures, bedding dipping 45° to base
	635.81	1.52	SANDSTONE, as above, broken stick
	636.27	0.46	SANDSTONE, grey, fine, with thin laminae of mudstone, dipping at about 30°, mineralized fractures, broken stick
	638.32	2.05	SANDSTONE, as above, many striated planes passing through core, mineralized bedding dipping at about 30°
	639.20	0.88	SANDSTONE, as above

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 33

Contractor: Longyear

Commenced: Sept 18, 1977

Completed: Sept 19, 1977

Co-ordinates: 6,115,546.61 N
595.009.26 E

Surface Elevation: 1,446.70 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by: Geologist Andy Newson Depth 9.30-46.63

Final Depth: 46.63

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar			
U. Gething			

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION

BIRD

CHAMBERLAIN

F.PR.	23.35	Fractures & steep dips
F.PR.	44.31	Fractures

Collared below Chamberlain

BH Nos. 33

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	9.30	9.30	CASING
	9.75	0.45	SANDSTONE, medium-grained, medium grey, micaceous, poorly developed bedding, abrupt below.
	12.80	3.05	SANDSTONE, as above.
	13.87	1.07	SANDSTONE, as above.
	14.33	0.46	MUDSTONE & INTERBEDDED SANDSTONE; 50:50, sharp contacts, abrupt below.
	15.85	1.52	MUDSTONE, as above.
	18.12	2.27	SANDSTONE, medium/coarse-grained, medium grey, well-bedded and cross-bedded, abrupt below, occasional calcite-filled fractures.
	19.96	1.84	SANDSTONE WITH INTERBEDDED MUDSTONES, 50:50, boundaries less abrupt, convoluted, occasional coarser layers, minor calcite filled fractures in sands and in muds.
	21.84	1.88	SANDSTONE, with calcite fractures, fault breccia.
25°	23.35	1.51	SANDSTONE, medium/coarse-grained, light grey, faintly bedded, some calcite fractures, abrupt below, calcite fractures strike 10° and dip 65° in opposite direction to COM B.C.A.
	23.47	0.12	SANDSTONE, as above.
	24.92	1.45	SANDSTONE, as above.
	26.52	1.60	SANDSTONE & INTERBEDDED MUDS, fine-grained, sharp contacts, bioturbated, calcite filled fractures at base.
	27.83	1.31	SANDSTONE/INTERBEDDED MUDSTONE.
	28.09	0.26	SANDSTONE, coarse/medium-grained, with very coarse angular conglomerate at base.
	29.57	1.48	SANDSTONE, coarse-grained, well bedded, bioturbated, in places with large worm burrows, fining down to medium-grained at base, abrupt below.
	32.61	3.04	SANDSTONE, as above.
	35.66	3.05	SANDSTONE, as above.
	38.71	3.05	SANDSTONE, as above.
	41.76	3.05	SANDSTONE, as above.
	42.31	0.55	SANDSTONE, as above.
	44.31	2.00	SANDSTONE & INTERBEDDED MUDSTONE; 50:50, sharp contacts, calcite fractures especially at base with breccia (bottom 0.45m), dips locally 70°.
10°	44.81	0.50	SANDSTONE, medium-grained, light grey, faintly bedded.
	46.63	1.82	SANDSTONE, as above.

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 34

Contractor: Tonto

Commenced: Sept 19, 1977

Completed: Sept 20, 1977

Co-ordinates: 6,115,186.02 N
594,883.96 E
Surface Elevation: 1,427.99 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by:

Geologist	Depth
Peter Raymond	16.77-24.73
Andy Newson	26.21-50.74
	71.93-84.12
Peter Caine	51.56-68.88

Final Depth: 84.12

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar			
U. Gething	65.64		1,362.35

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD				
CHAMBERLAIN	65.64			1,362.35

F.PR. Chamberlain seam vastly overthickened - fault in coal?

BH Nos. 34

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	16.77	3.05	DRIFT, brown togrey clay with boulders and pebbles, one large boulder (0.21) sandstone grey, medium-grained, mottled (Bird or Chamberlain floor). Very broken stick.
	17.03	0.26	DRIFT, as above, very broken stick.
	17.11	0.08	DRIFT, as above, broken stick.
	17.37	0.26	MUDSTONE, grey, silty, broken. Rock bit to 20.42.
	21.03	3.66	COAL, soft, powdered, fragments.
	21.39	0.36	COAL, as above.
	21.56	0.17	COAL, highly weathered, muddy, soft, broken.
	21.95	0.39	DRIFT, as before.
	22.39	0.44	DRIFT, as above.
	22.61	0.22	DRIFT, as above.
	23.16	0.55	SANDSTONE, grey, medium grained, small worm burrows ("pin" type) mottled - Bird floor, broken stick.
	24.73	1.57	SANDSTONE, as above, stick with few breaks, "pin" type burrows.
	26.21	1.48	SANDSTONE, light grey, coarse tomedium-grained, mottled (i.e. many small worm burrows), poorly bedded, transitional below.
	26.58	0.37	AS ABOVE
	28.56	1.98	SANDSTONE, light grey, medium-grained, bedding fairly well developed, abrupt below.
	29.26	0.70	SANDSTONE, light grey, medium-grained, bedding poorly developed, occasional mudstone bands 1 cm, thick developed, transitional below.
	29.76	0.50	AS ABOVE.

BH Nos. 34

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	30.93	1.17	SANDSTONE, light grey, medium-to-coarse-grained, slightly carbonaceous, poorly bedded, abrupt below.
	32.31	1.38	SANDSTONE, light grey, fine-to-medium-grained, bedding poorly developed, occasional large worm burrows, vaguely calcareous, abrupt below.
	35.36	3.05	AS ABOVE
	36.56	1.20	AS ABOVE
	37.56	1.00	AS ABOVE, with high angle (70 - 80°) joints.
	38.36	0.80	AS ABOVE, (no joints).
	41.36	3.00	AS ABOVE
	42.12	0.76	AS ABOVE
	44.04	1.92	SANDSTONE, medium, with interbedded mudstone, 60:40, carbonaceous, occasional coaly layers, bioturbated, disturbed, becoming very micaceous at base, abrupt. below.
	45.46	1.42	AS ABOVE.
	45.71	0.25	AS ABOVE.
	45.76	0.05	MUDSTONE, carbonaceous, sheared and broken, Coal seam, Shelly equipment.
	46.22	0.46	COAL, 0.11 bright, 0.07 bright with dull bands, 0.10 bright.
	46.25	0.03	MUDSTONE, carbonaceous, coaly stringers
	46.48	0.23	AS ABOVE
	46.68	0.20	MUDSTONE, carbonaceous, silty interbeds, abrupt below with listric surfaces.
	47.18	0.50	COAL, dull metallic with bright bands 0.07, dull sheared 0.20, dull 0.05.
	47.29	0.11	MUDSTONE, carbonaceous, silty, transitional below.

Bil Nos. 34

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	49.09	1.80	SANDSTONE, medium to coarse-grained with mudstone interbeds, (60:40), irregular spacing and thicknesses sands with fair to welldeveloped bedding. Mudstones well defined mixed; abrupt below.
	49.29	0.20	SANDSTONE, as above.
	49.59	0.30	MUDSTONE, with interbedded silts, 50:50, carbonaceous, minor medium-grained sandstone layers, some bioturbation, units 1 - 2 cm in thickness, laminated, abrupt below, patchily calcareous.
	50.74	1.15	MUDSTONE; as above,
	51.56	0.82	MUDSTONE, grey, laminated with siltstone
			CHAMBERLAIN SEAM - Upper Plate
	51.72	0.16	COAL, dull, lustrous, banded, highly sheared, broken stick.
	51.78	0.06	COAL, lustrous with bright bands, sheared, broken stick.
	51.85	0.07	COAL, pulverized, dull, sheared.
	52.16	0.31	Core loss - coal
	52.46	0.30	COAL, pulverized, large fragments of bright/lustrous banded coal at top of section.
	52.77	0.31	Core loss - coal
	52.81	0.04	COAL, dull, pulverized.
	52.95	0.14	COAL, lustrous with sub-microscopic bright bands, badly broken stick.
	52.99	0.04	COAL, dull, intensely listricated.
	53.02	0.03	COAL, lustrous.
	53.10	0.08	Core Loss - Coal
	53.27	0.17	COAL, pulverized with fragments of dull, lustrous coal.

BH Nos. 34

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	53.31	0.04	COAL, dull/bright banded.
	53.39	0.08	Core Loss - Coal
	53.48	0.09	COAL, bright and dull, banded with numerous listric surfaces, core fragments.
	53.52	0.04	COAL, pulverized, mainly dull, sheared.
	53.65	0.13	COAL, bright banded, broken stick.
	53.68	0.03	COAL, dull, pulverized.
	53.84	0.16	COAL, lustrous, major listric surface at 70°, coal is highly listricated, broken stick.
	53.88	0.04	COAL, dull, highly listricated.
	53.98	0.10	COAL, lustrous, sheared, broken stick.
	54.03	0.05	COAL, dull with bright bands, sheared, broken stick.
	54.10	0.07	COAL, lustrous, with submicroscopic bright bands, stick, highly listricated to sheared.
	54.18	0.08	COAL, bright/lustrous, many listric surfaces, broken stick.
	54.21	0.03	COAL, dull, sheared.
	54.27	0.06	COAL, bright/dull banded, highly listricated to sheared, broken stick.
	54.31	0.04	COAL, bright banded.
	54.34	0.03	COAL, dull, sheared, fragmented, pulverized.
	54.44	0.10	Core Loss - Coal
	54.45	0.01	COAL, dull.
	54.46	0.01	COAL, bright banded.
	54.51	0.05	COAL, lustrous/bright, sheared.

BH Nos. 34

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	54.61	0.10	Core Loss - Coal
	54.64	0.03	COAL, pulverized, dull.
	54.66	0.02	COAL, dull, lustrous.
	54.69	0.03	COAL, bright banded.
	54.72	0.03	COAL, lustrous, sheared.
	54.75	0.03	COAL, bright, sheared.
	54.85	0.10	COAL, lustrous with bright bands, highly listricated, broken stick.
	54.90	0.05	COAL, dull, listricated, broken stick.
	55.01	0.11	Core Loss - Coal
	55.11	0.10	COAL, pulverized, small fragments of dull sheared coal.
	55.17	0.06	COAL, dull to lustrous, highly listricated, broken stick.
	55.26	0.09	COAL, lustrous with bright bands, sheared.
	55.31	0.05	COAL, pulverized, probably bright banded.
	55.48	0.17	COAL, lustrous with bright bands, highly sheared, broken stick.
	55.53	0.05	COAL, pulverized, probably dull.
	55.59	0.06	COAL, bright banded, broken stick.
	55.66	0.07	COAL, dull.
	55.69	0.03	COAL, bright.
	55.73	0.04	COAL, dull banded, stick.
	55.76	0.03	COAL, bright banded, stick, listric surface at base @ 15°.
	55.82	0.06	COAL, lustrous with bright bands.

BH Nos. 34

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	55.90	0.08	COAL, pulverized, mainly dull
	55.93	0.03	COAL, lustrous.
	56.04	0.11	Core Loss - Coal
	56.12	0.08	COAL, pulverized, dull, sheared fragments.
	56.18	0.06	Core Loss - Rock
	56.38	0.20	Core Loss - Coal
	56.43	0.05	MUDSTONE, grey, coaly at top and base, listricated, stick.
	56.52	0.09	COAL, bright and banded, highly listricated, stick.
	56.53	0.01	COAL, dull banded.
	56.58	0.05	COAL, bright banded, listricated, broken stick.
	56.65	0.07	COAL, dull banded, with occasional bright bands, stick.
	56.70	0.05	COAL, bright, stick.
	56.75	0.05	COAL, dull/bright banded, stick.
	56.77	0.02	COAL, bright. stick.
	56.87	0.10	COAL, dull to lustrous stick.
	56.91	0.04	COAL, dull, sheared.
	56.97	0.06	COAL, dull lustrous, stick.
	57.03	0.06	COAL, bright/dull banded, stick.
	57.08	0.05	COAL, dull, banded, listric at 15° at base, stick.
	57.17	0.09	COAL, lustrous with bright bands, slightly sheared, stick.
	57.19	0.02	COAL, lustrous.
	57.23	0.04	COAL, dull/bright banded, 60/40, stick.
	57.31	0.08	COAL, bright, broken stick.

BH Nos. 34

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	57.33	0.02	COAL, dull.
	57.36	0.03	COAL, bright band, stick.
	57.76	0.40	COAL, pulverized, fragments of dull/bright/lustrous, some shearing.
	57.95	0.19	Core Loss - Coal
	57.97	0.02	COAL, dull, lustrous.
	57.98	0.01	MUDSTONE, grey, carbonaceous to coaly.
	58.07	0.09	COAL, lustrous with bright bands.
	58.08	0.01	COAL, bright.
	58.12	0.04	COAL, dull to lustrous, stick.
	58.17	0.05	COAL, lustrous, stick.
	58.20	0.03	COAL, bright, stick.
	58.25	0.05	COAL, bright banded, sheared.
	58.26	0.01	COAL. bright.
	58.31	0.05	COAL, dull.
	58.34	0.03	COAL, bright/dull banded, sheared.
	58.41	0.07	COAL, dull banded.
	58.47	0.06	COAL, dull, sheared.
	58.56	0.09	COAL, lustrous, with bright streaks, core broken.
	58.57	0.01	COAL, dull, inferior, hard.
	58.62	0.05	COAL, dull banded, broken stick.
	58.66	0.04	COAL, bright, broken stick.
	58.75	0.09	COAL, lustrous with bright streaks, core fragmented.
	58.77	0.02	COAL, bright banded.

BH Nos. 34

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	58.85	0.08	COAL, lustrous with numerous bright bands, stick.
	58.88	0.03	COAL, bright banded.
	58.90	0.02	COAL, dull.
	59.04	0.14	COAL, lustrous with thin bright streaks, stick,
	59.06	0.02	COAL, bright.
	59.14	0.08	COAL, pulverized, very soft, possible fault zone.
	59.48	0.34	Core Loss - Coal
	59.74	0.26	SILTSTONE, dark grey, laminated with mudstone, core very badly broken, and fragmented, possible Chamberlain roof.
			CHAMBERLAIN SEAM - Lower Plate
	59.79	0.05	COAL, dull banded with bright bands, broken stick.
	59.86	0.07	COAL, lustrous with bright bands, slightly sheared, broken stick.
	59.88	0.02	COAL, dull banded, broken stick.
	59.94	0.06	COAL, dull, sheared, broken stick.
	59.99	0.05	COAL, bright banded, broken stick.
	60.07	0.08	COAL, dull, banded, sheared, listric surface at 70°, broken stick.
	60.21	0.14	COAL, lustrous with bright streaks, sheared.
	60.24	0.03	COAL, bright banded.
	60.29	0.05	COAL, lustrous, thinly banded, horizontal listric surfaces through core.
	60.35	0.06	COAL, bright banded, highly listricated to sheared.
	60.40	0.05	COAL, lustrous, with sub-horizontal to horizontal listric surfaces, broken stick.

BH Nos. 34

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	60.51	0.11	COAL, dull to lustrous with bright bands, broken stick.
	60.56	0.05	COAL, bright, broken stick.
	60.59	0.03	COAL, dull banded, broken stick.
	60.63	0.04	COAL, dull banded, stick.
	60.68	0.05	COAL, bright banded, stick.
	60.69	0.01	COAL, bright.
	60.76	0.07	COAL, dull/bright banded, stick.
	60.86	0.10	COAL, pulverized, fragments of lustrous coal.
	61.10	0.24	Core Loss - Coal
	61.13	0.03	COAL, dull, calcareous, 5 mm. of bright coal at top, stick.
	61.83	0.70	Core Loss - Coal
	61.88	0.05	COAL, pulverized, fragments of dull/lustrous coal.
	61.93	0.05	COAL, lustrous.
	62.00	0.07	COAL, bright banded, 5 mm. of bright coal at base, stick.
	62.02	0.02	COAL, dull, thinly banded, bright coal streaks, calcareous, banding at 18^{0}, stick.
	62.05	0.03	COAL, bright banded, stick.
	62.07	0.02	COAL, lustrous with bright bands.
	62.21	0.14	COAL, bright, highly cleated, stick.
	62.22	0.01	COAL, dull.
	62.32	0.10	COAL, dull to lustrous, banded.
	62.33	0.01	COAL, bright.

BH Nos. 34

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	62.36	0.03	COAL, dull, broken stick.
	62.44	0.08	COAL, lustrous with numerous bright bands, broken stick.
	62.49	0.05	COAL, bright banded.
	62.56	0.07	COAL, dull to lustrous, broken stick.
	62.63	0.07	COAL, bright and dull, banded, bright bands to 5 mm., stick.
	62.69	0.06	COAL, bright banded, stick.
	62.71	0.02	COAL, bright, listricated at base, sub-horizontal.
	62.73	0.02	COAL, bright, stick broken.
	62.75	0.02	COAL, dull banded, stick.
	62.77	0.02	COAL, bright.
	62.78	0.01	COAL, dull, calcareous, thin bright streaks.
	62.89	0.11	COAL, dull to lustrous, stick.
	62.93	0.04	COAL, lustrous, stick.
	62.99	0.06	COAL, bright, thinly banded, broken stick.
	63.00	0.01	COAL, dull.
	63.07	0.07	COAL, bright, stick.
	63.10	0.03	COAL, lustrous banded, stick.
	63.13	0.03	COAL, bright, stick.
	63.18	0.05	COAL, bright banded, stick.
	63.22	0.04	COAL, bright, stick.
	63.27	0.05	COAL, bright/dull banded, broken stick, ankerite on cleat surfaces, listric surface at 20°, banding at 18°.

BH Nos. 34

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	63.31	0.04	COAL, dull with thin bright streaks, fragments.
	63.51	0.20	Core Loss - Coal
	63.66	0.15	COAL, pulverized, small fragments of lustrous coal.
	63.86	0.20	Core Loss - Coal
	63.92	0.06	COAL, dull banded, fragments.
	64.12	0.20	Core Loss - Coal
	64.18	0.06	COAL, dull, banded, stick.
	64.26	0.08	COAL, bright/dull, banded, bright bands to 5 mm., stick.
	64.30	0.04	COAL, dull, stick.
	64.33	0.03	COAL, bright, broken stick.
	64.40	0.07	COAL, pulverized, with small fragments of bright banded and lustrous coal.
	64.76	0.36	Core Loss - Coal
	64.90	0.14	MUDSTONE, black, carbonaceous, stick.
	65.25	0.35	MUDSTONE, as above with listric surfaces at 10°.
	65.31	0.06	COAL; dull/bright, thinly banded.
	65.36	0.05	COAL, dull.
	65.42	0.06	COAL, bright, broken stick.
	65.48	0.06	COAL, dull-lustrous, banded with bright coal to 2 mm.
	65.51	0.03	COAL, bright, listric surface at base 20°.
	65.54	0.03	COAL, dull/bright banded, pyrite blebs at base, broken core.
	65.63	0.09	COAL, dull with irregular lenses of sandstone, carbonaceous.
	65.64	0.01	COAL, bright banded.
	66.09	0.45	SANDSTONE, grey, medium-grained, highly carbonaceous at top, coal streaks and carbonized, plant remains throughout.

BH Nos. 34

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	68.08	1.99	SANDSTONE, grey, fine to medium-grained cross-bedding, clear, well-sorted, numerous calcitic fractures, micaceous fragmented at base.
	68.88	0.80	SANDSTONE, as above, highly fractured, slickensided, no dominant fracture direction.
	71.93	3.05	SANDSTONE, medium grey, medium-grained, poorly-bedded. Two right way up structures.prove it is the right way up, some jointing at high angle (70° com B.C.A.) and some horizontal calcite filled joints.
	72.23	0.30	AS ABOVE, burrows large.
	74.98	2.75	AS ABOVE, no burrows.
	77.91	2.93	AS ABOVE
	78.03	0.12	MUDSTONE, with siltstone interbeds, 50:50, sharp contacts between units about 1.7 cm. thick, occasional worm burrows, abrupt below.
	78.74	0.71	AS ABOVE
	79.48	0.74	SANDSTONE, medium-grained, finely bedded, abrupt below, carbonaceous, pyritic.
	80.08	0.60	MUDSTONE, AND INTERBEDDED SILTSTONES: 50:50, sharp contacts, occasional worm burrows, abrupt below.
	80.71	0.63	SANDSTONE, course to fine-grained with interbedded mudstones, coaly stringers, occasional intraclasts.
	81.08	0.37	SANDSTONE, medium-grained, poorly-bedded, some bioturbation and disturbance, occasional high-angle calcite filled joints (70° COM B.C.A.).
	83.93	2.85	AS ABOVE
	84.12	0.19	AS ABOVE, worm burrows large.

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 35

Contractor: Longyear

Commenced: Sept 21, 1977

Completed: Sept 23, 1977

Co-ordinates: 6,115,500.46 N
594,851.10 E
Surface Elevation: 1,440.15 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by:

Geologist	Depth
Andy Newson	9.45-33.86
	38.95-89.28
Peter Caine	34.08-38.75

Final Depth: 89.28

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar			
U. Gething	37.76		1,402.39

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD				
CHAMBERLAIN	37.76			1,402.39
F.PO.	13.84			

BH Nos. 35

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	9.45	1.83	SANDSTONE, medium-light grey, coarse/medium-grained, poorly bedded, small calcite-filled fractures with occasional slickensides, generally very broken. calcareous, abrupt below, shear surface 30-40° COM B.C.A
	10.11	0.66	SANDSTONE, as above.
	11.02	0.91	SANDSTONE, as above.
	12.22	1.20	SANDSTONE, as above.
	13.02	0.80	SANDSTONE, as above, 0.3 of coaly material at 12.19m (Is this the Shelly Equivalent repeat?).
	13.44	0.42	MUDSTONE, silty, carbonaceous and coaly especially toward base.
	13.84	0.40	SANDSTONE, medium-grained, dark grey, fairly well-bedded, minor calcite-filled joints, shear surface 40° COM B.C.A.
	15.66	1.82	SANDSTONE, as above.
	17.19	1.53	SANDSTONE, as above.
	17.24	0.05	SANDSTONE, as above.
	17.49	0.25	MUDSTONE, carbonaceous, coaly very broken and weathered, (Is this the Shelly Equivalent repeat?).
	17.66	0.17	SILTSTONE, silty, broken with calcite filled joints.
	18.12	0.46	MUDSTONE, carbonaceous, coaly, very broken and filled with clay, slickensides.
	18.41	0.29	SANDSTONE, carbonaceous, very broken and calcite filled.
	18.51	0.10	SANDSTONE, very broken with slickensides, coaly fragments.
	21.51	3.00	SANDSTONE, light grey, medium-grained, poorly bedded, broken stick, calcite filled joints, (Is this the Chamberlain Laminite?) abrupt below, broken.
	22.61	1.10	SANDSTONE, as above.
35°	24.11	1.50	MUDSTONE with INTERBEDDED FINE SILTSTONES. pyritic, worm burrows, finely laminated. (slickensides, shear surface)
	24.15	0.04	MUDSTONE, very carbonaceous, slickensides.
	24.35	0.20	SANDSTONE, coarse/medium-grained, poorly bedded, vaguely carbonaceous, broken.
	24.55	0.20	SANDSTONE, as above.
	24.71	0.16	MUDSTONE, carbonaceous, coaly to base, abrupt below with listric surfaces
	27.20	2.49	SANDSTONE, medium/fine-grained, broken, calcite infilling on joints 50° COM B.C.A., poorly-bedded, transitional below.
	28.40	1.20	SANDSTONE, as above.
	29.00	0.60	MUDSTONE WITH INTERBEDDED SANDS, some disturbance, carbonaceous, abrupt below.

BH Nos. 35

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	29.96	0.96	SHELLY EQUIVALENT COAL, dominantly dull, some bright, lumps of carbonaceous mudstone (geophysical log shows 0.24m of Mudstone).
	31.70	1.74	SANDSTONE, fine-grained with interbedded mudstone, 70:30, disturbed and bioturbated, minor calcite filled fractures, transitional below, stick.
	32.36	0.66	SANDSTONE, as above.
	33.86	1.50	MUDSTONE WITH INTERBEDDED SILTSTONE, finely laminated, 0.5-1.0cm thick.
	34.08	0.22	MUDSTONE, grey, slickensided @ 20°, core badly broken especially at base.
			CHAMBERLAIN SEAM
	34.09	0.01	COAL, dull, core fragments.
	34.13	0.04	COAL, lustrous sheared, core fragments.
	34.16	0.03	COAL, bright/dull banded, core fragments.
	34.26	0.10	COAL, lustrous with bright coal, core pulverized with some fragments.
	34.71	0.45	CORE-LOSS COAL
	34.79	0.08	COAL, lustrous, stick, listricated.
	34.81	0.02	COAL, dull, sheared.
	34.84	0.03	COAL, lustrous, listricated.
	34.86	0.02	COAL, dull, sheared.
	34.91	0.05	COAL, dull to lustrous with listric surfaces throughout.
	35.08	0.17	COAL, dull to slightly lustrous, sheared in places, irregular listric surfaces throughout.
	35.12	0.04	COAL, dull as above.
	35.19	0.07	COAL, lustrous.
	35.20	0.01	COAL, dull, inferior, calcareous, granular.
	35.21	0.01	COAL, bright banded.
	35.22	0.01	COAL, dull, inferior, calcareous.
	35.24	0.02	COAL, bright banded.
	35.26	0.02	COAL, dull, sheared, 3mm of calcareous coal at base
	35.32	0.06	COAL, lustrous to dull, listricated surfaces of 10° 8mm from base, listric surfaces also at 70°.
	35.35	0.03	COAL, bright banded.
	35.44	0.09	COAL, dull to lustrous.
	35.50	0.06	COAL, dull, sheared.
	35.65	0.15	COAL, dull to lustrous, slightly sheared, broken stick.

BH Nos. 35

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	35.68	0.03	COAL, dull, broken stick.
	35.79	0.11	COAL, dull, sheared, slightly lustrous, friable, broken stick.
	35.88	0.09	COAL, lustrous to dull, listric surfaces throughout, broken stick.
	35.98	0.10	COAL, dull, moderately hard, listric surfaces throughout, broken stick.
	36.55	0.57	CORE-LOSS COAL
	36.66	0.11	COAL, dull, stick.
	36.85	0.19	COAL, dull, sheared, broken stick.
	36.88	0.03	COAL, dull banded, broken stick.
	36.94	0.06	COAL, dull with specks of pyrite.
	37.01	0.07	COAL, dull, broken stick.
	37.07	0.06	COAL, dull, sheared, broken stick.
	37.16	0.09	COAL, pulverized dull, highly sheared.
	37.22	0.06	MUDSTONE, dark grey, slightly carbonaceous, sheared.
	37.38	0.16	MUDSTONE, as above, with 70° listric surfaces, sheared at base.
	37.48	0.10	CORE-LOSS COAL
	37.56	0.08	COAL, bright/dull banded, sheared.
	37.64	0.08	COAL, pulverized, mainly sheared, dull coal.
	37.68	0.04	COAL, bright banded, sheared.
	37.75	0.07	COAL, pulverized, bright/dull, sheared.
	37.76	0.01	COAL, dull, inferior, hard.
	37.79	0.03	SANDSTONE, grey/black, medium grained, carbonaceous, 2mm of bright at top, irregular contact with coal seam.
	38.75	0.96	SANDSTONE, grey, medium-grained, unbedded, calcite mineralization(1mm) 0.33m from base, subhoriaontal, calcite filled joint @75° 0.25m from base.
	38.95	0.20	SANDSTONE, coarse-grained, medium-dark grey, carbonaceous, transitional below, small coaly stringers.
	40.95	2.00	SANDSTONE, coarse-grained, poorly-bedded, transitional below, occasional calcite filled fractures at 65-75° COM B.C.A.
	41.80	0.85	SANDSTONE, medium-grained, light grey, poorly-bedded, homogeneous, abrupt below.
	44.85	3.05	SANDSTONE, as above.
	47.90	3.05	SANDSTONE, as above.
	50.95	3.05	SANDSTONE, as above.

BH Nos. 35

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	51.25	0.30	SANDSTONE, as above.
	53.99	2.74	SANDSTONE WITH INTERBEDDED MUDS, 70:30, sharp contacts sand unit usually 1-2cm thick, can be up to 30cm thick, sands becoming increasingly coarser towards the base with basal fine conglomerate, muddy stringers, very little bioturbation, occasional worm burrows.
	54.51	0.52	SANDSTONE, as above.
5°	56.93	2.42	SANDSTONE, coarse/medium-grained, medium grey, well-bedded, gradational below
	57.04	0.11	SANDSTONE, medium-grained, light grey, generally heterogeneous, small (2-3cm) bands with fragments of planty material towards bottom, basal 15cm with fine conglomerate and numerous carbonaceous mudstone stringers.
	60.09	3.05	SANDSTONE, as above.
	63.14	3.05	SANDSTONE, as above.
	66.19	3.05	SANDSTONE, as above.
	68.16	1.97	SANDSTONE, as above.
	69.23	1.07	SANDSTONE WITH INTERBEDDED MUDSTONES 80:20, contacts generally sharp with some disturbance and bioturbation, occasional large worm burrows, sands medium-grained, poorly-bedded, abrupt below.
	72.28	3.05	SANDSTONE, as above.
	73.92	1.64	SANDSTONE, as above.
	75.34	1.42	MUDSTONES & INTERBEDDED SILTSTONES 55:50, sharp boundaries with disturbance, bioturbation increasing to base giving less well defined boundaries, transitional below, occasional horizontal shear surfaces at 74.3m ÷ 80.4 m calcite filled.
	78.38	3.04	MUDSTONE/SILTSTONE, as above.
	81.43	3.05	MUDSTONE/SILTSTONE, as above.
	84.47	3.04	MUDSTONE/SILTSTONE, as above.
	87.52	3.05	MUDSTONE/SILTSTONE, as above.
	88.26	0.74	MUDSTONE/SILTSTONE, as above.
	89.28	1.02	MUDSTONE, generally homogeneous, dark grey, a near horizontal shear surface and slickensides and calcite at 88.70 m.

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 86

Contractor: Tonto

Commenced: Sept 21, 1977

Completed: Sept 22, 1977

Co-ordinates: 6,115,040.28 N
595,009.79 E
Surface Elevation: 1,438.53 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by:

Geologist	Depth
Andy Newson	23,47-30.91
	35.83-64.87
	71.93-76.91
Peter Caine	31.09-34.77
	65.57-70.59

Final Depth: 76.91

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar	31.20		1,407.32
U. Gething	70.59		1,367.94

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD	34.77			1,403.76
CHAMBERLAIN	70.59			1,367.94

BH Nos. 36

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	23.47	0.30	Very broken rock with clay and pebbles intermixed, mainly Moosebar lithology.
	24.32	0.85	AS ABOVE
	25.34	1.02	AS ABOVE
	26.44	1.10	AS ABOVE
	28.00	1.56	AS ABOVE
	29.95	1.95	AS ABOVE
	30.55	0.60	AS ABOVE
	30.91	0.36	SILTSTONE, pyritic, glauconitic, hard, broken by surface disturbance.
	31.09	0.18	SANDSTONE, grey/green, medium-grained, glauconitic and pyritic.
	31.20	0.11	SANDSTONE, as above with mud infilling of 60° fracture.
			BIRD SEAM
	31.28	0.08	CORE LOSS=ROCK
	31.54	0.26	COAL, dull to lustrous with bright coal bands up to 5mm, possibly slightly weathered, mud from joint in roof continues.
	31.63	0.09	COAL, bright banded, mud as above.
	31.67	0.04	COAL, bright.
	31.72	0.05	COAL, dull with bright bands, hard.
	31.78	0.06	COAL, bright.
	31.81	0.03	CORE LOSS=COAL
	31.91	0.10	MUDSTONE, brown, hard, coal streaks throughout, 60° joint with mud.
	31.98	0.07	COAL, bright banded.
	32.01	0.03	COAL, lustrous, sheared, pulverized.
	32.04	0.03	COAL, bright.
	32.05	0.01	COAL, dull.
	32.14	0.09	COAL, bright/lustrous, banded.
	32.20	0.06	COAL, bright/dull banded, closely cleated at 85° .
	32.21	0.01	COAL, dull.
	32.26	0.05	COAL, bright/dull banded core fragments.
	32.36	0.10	CORE LOSS=COAL
	32.46	0.10	COAL, dull banded.
	32.57	0.11	COAL, dull, sheared, possibly slightly weathered.

BH Nos. 36

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	32.61	0.04	COAL, dull, pulverized.
	32.69	0.08	COAL, dull.
	32.92	0.23	COAL, weathered, soft, remnants of dull coal.
	33.03	0.11	COAL, dull, pulverized, large fragments of dull coal.
	33.13	0.10	CORE LOSS-COAL
	33.23	0.10	COAL, bright/dull, pulverized, large fragments of bright banded coal.
	33.29	0.06	COAL, dull with bright, pulverized.
	33.37	0.08	COAL, dull/bright banded, core badly broken.
	33.47	0.10	COAL, dull, core badly broken.
	33.57	0.10	CORE LOSS-COAL
	33.61	0.04	COAL, pulverized and fragmented, probably bright coal.
	33.74	0.13	COAL, dull, inferior with numerous bright streaks.
	33.80	0.06	MUDSTONE, grey carbonaceous.
	33.87	0.07	COAL, inferior, dull with bright streaks.
	33.93	0.06	SILTSTONE, grey, carbonaceous.
	34.55	0.62	MUDSTONE, dark grey/black, carbonaceous, occasional weathered bands.
	34.60	0.05	COAL, dull banded.
	34.66	0.06	COAL, dull/bright, banded.
	34.70	0.04	SANDSTONE, black, medium-grained, very coaly.
	34.77	0.07	COAL, dull with bright bands, pulverized and fragmented.
	35.83	1.06	MUDSTONE, carbonaceous, silty, coaly stringers, broken and fractured.
	38.58	2.75	SANDSTONE, coarse-grained, light/medium-grey, mottled.
	40.18	1.60	SANDSTONE, as above
10°	41.63	1.45	SANDSTONE, coarse-grained, light/medium-grey, fairly well bedded with cross-bedding and regular bedding, minor muddy layers, abrupt below.
	43.10	1.47	SANDSTONE, as above.
	44.30	1.20	SANDSTONE, as above.
	44.93	0.63	SANDSTONE, light grey, medium-grained, poorly-bedded, calcareous, basal 0.20m becomes carbonaceous, and coarse-grained, abrupt below.
	46.45	1.52	SANDSTONE, as above.
	49.97	3.52	SANDSTONE, as above.
	53.02	3.05	SANDSTONE, as above.
	54.82	1.80	SANDSTONE, as above.

BH Nos. 36

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	57.38	2.56	SANDSTONE, as above, with high angle (70-80°) calcite-filled fractures.
	57.56	0.18	COAL, broken and powdery, dull, sheared.
	57.63	0.07	SANDSTONE, medium/coarse, very carbonaceous, coaly, slickensides.
	58.48	0.85	SANDSTONE, medium-grained, carbonaceous stringers, occasional coaly stringers, occasional slickensides abrupt below.
			SHELLY EQUIVALENT
	59.04	0.56	COAL, broken up, a mixture of dull and bright and dull coal.
	59.30	0.26	MUDSTONE, carbonaceous coaly stringers, listric surfaces on 50° joint surfaces.
	59.40	0.10	MUDSTONE, as above.
	59.88	0.48	COAL, dull, metalic lustre.
5°	62.38	2.50	SANDSTONE, coarse-to fine-grained with minor interbedded muddy layers, bedding fairly well developed with cross-bedding, gradational below.
	63.57	1.19	SANDSTONE, as above.
10°	64.87	1.30	MUDSTONES & INTERBEDDED FINE SANDS 60:40, laminated, in ½-1cm units, minor fault zone in middle.
15°	65.57	0.70	MUDSTONE, grey, frequent laminations of grey siltstone.
	65.67	0.10	MUDSTONE, grey, very soft, possible gouge zone.
	65.71	0.04	MUDSTONE, dark grey, very slightly silty.
			CHAMBERLAIN SEAM
	65.83	0.12	CORE LOSS-COAL
	65.92	0.09	COAL, dull, highly sheared, core broken.
	65.99	0.07	COAL, dull, highly sheared, broken stick.
	66.13	0.14	COAL, dull, slightly sheared.
	66.15	0.02	COAL, lustrous, many small listric surfaces, broken stick.
	66.18	0.03	COAL, dull with numerous listrications, broken stick.
	66.38	0.20	COAL, dull, friable, with many listric surface 30° and 60° and becoming sheared to base, broken stick.
	66.50	0.12	COAL, dull to lustrous, listricated @ 40°, broken stick.
	66.64	0.14	COAL, dull to lustrous, fragmented and pulverized coal is sheared.
	66.92	0.28	CORE-LOSS COAL
	67.04	0.12	COAL, dull to lustrous with a few very thin bright bands, highly sheared.

BH Nos. 36

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	67.14	0.10	COAL, dull to lustrous, pulverized, with occasional fragments.
	67.42	0.28	CORE LOSS-COAL
	67.44	0.02	COAL, bright/dull, thinly banded.
	67.52	0.08	COAL, dull with bright bands, listricated, small amount of ankerite on listric surfaces.
	67.60	0.08	COAL, lustrous with irregular listrications.
	67.69	0.09	COAL, dull and bright banded, numerous listrications at 80°.
	67.72	0.03	COAL, bright, highly cleated.
	67.73	0.01	MUDSTONE, dark grey/black, carbonaceous with coal streaks, listricated.
	67.83	0.10	COAL, bright, highly listricated at ± 10° with closely packed cleats at 80°, large listric surface at base @40°.
	68.77	0.94	CORE-LOSS COAL
	68.81	0.04	COAL, dull with bright bands, ankerite, listric surface 85°.
	68.84	0.03	COAL, bright/dull.
	68.92	0.08	COAL, bright with numerous listric surfaces at 85°.
	68.94	0.02	COAL, dull/bright, broken stick.
	69.04	0.10	COAL, lustrous with sub microscopic bright streaks, listricated at base, broken stick.
	69.09	0.05	COAL, bright and dull, broken stick.
	69.14	0.05	COAL, bright, friable, broken stick.
	69.30	0.16	COAL, dull to lustrous, listricated at base, broken stick.
	69.42	0.12	COAL, pulverized with fragments of dull and bright sheared coal.
	69.56	0.14	CORE LOSS-COAL
	69.60	0.04	COAL, dull banded with bright coal, numerous listric surfaces intersecting, broken stick.
	69.64	0.04	COAL, dull, sheared, core fragments.
	69.77	0.13	CORE LOSS-COAL
	69.80	0.03	COAL, bright, sheared.
	69.89	0.09	COAL, lustrous with bright streaks, core broken, sheared to base.
	69.99	0.10	COAL, pulverized, numerous fragments of bright sheared coal.
	70.13	0.14	CORE LOSS-COAL
	70.37	0.24	MUDSTONE, dark grey, slightly silty, highly slickensided at 70°, contact with coal irregular and listricated.

BH Nos. 36

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	70.45	0.08	MUDSTONE, as above, becoming carbonaceous to coaly at base.
	70.51	0.06	COAL, dull with numerous bright bands.
	70.55	0.04	COAL, dull, lustrous.
	70.59	0.04	COAL, lustrous with bright bands, core fragmented.
	71.93	1.34	SANDSTONE, coarse/medium-grained, light grey, poorly-bedded, generally broken with calcite filled fractures at 40-50°.
	74.98	3.05	SANDSTONE, as above, bedding becoming more distinct.
40°	76.91	1.93	SANDSTONE, as above, becoming disturbed with calcite fractures and steep dips.

Sperry-Sun Survey

Date: 5th October 1977

Borehole: BP 37 Sukunka 77

Compass: 20° Maximum to Magnetic North

BPB Operator: R. Bishop

Measured Depth	Tilt	Tilt Direction
380m	3° -	N 38° E
340m	2° 30'	N 40° E
300m	2° -	N 42° E
250m	1° 45'	N 37° E
200m	1° 45'	N 37° E
150m	1° 15'	N 34° E
100m	1° 30'	N 22° E
50m	1° 15'	N 17° E

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 37

Contractor: Longyear

Commenced: Sept 23, 1977

Completed: Oct 11, 1977

Co-ordinates: 6,116,037.31 N
593,961.17 E
Surface Elevation: 1,638.00 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } See detail page 1a
Hole Azimuth: }

Logged by:

Geologist	Depth
Bill Nyland	9.81-321.34
Ali Chowdry	322.41-381.30

Final Depth: 381.30

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates	52.80	52.80	1,585.2
Sukunka	185.00	132.20	1,453.0
Moosebar	323.42	138.42	1,314.58
U. Gething	375.34	51.92	1,262.66

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD	325.87			1,312.13
CHAMBERLAIN	375.34			1,262.66

F.PR.	64.62-65.60	Fractured, gouge
F.PO.	138-184	High angle fracture throughout
F.PR.	200-318	Slickensided, fractured & brecciated
F.PO.	331-352	Numerous fractures
F.PR.	379.98	Brecciated

BH Nos. 37

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	9.81	0.67	CONGLOMERATE, varicolored chert and quartzite pebbles, poorly sorted, subangular to well rounded, iron stained.
	9.83	0.02	COAL, bright, cleavage parallel to axis.
	10.53	0.70	CONGLOMERATE, pebbles 3 to 5mm in a medium sandstone matrix, chert and quartzite pebbles angular to rounded, coaly lens @ 11.95m.
	12.19	1.66	CONGLOMERATE, as above, pebbles .25mm to 5mm highly weathered zone from 10.58m to 10.78m, iron stained, highly weathered zone from 12.02 to 12.19m, iron stained.
	12.61	0.42	CONGLOMERATE, pebbles .25m to 5m in a medium-grained sandstone matrix, chert and quartzite varicolored pebbles, more sandy towards base, minor coaly lens at base.
	12.98	0.37	SANDSTONE, fine to medium grained, finely-bedded, carbonaceous, material poorly-sorted, sub-angular grains, pebbles towards bottom.
	13.87	0.89	CONGLOMERATE, varicolored, poorly sorted, sub-angular to well-rounded pebbles, medium-grained, lithic sandstone matrix.
	15.24	1.37	SANDSTONE, medium- to fine-grained, calcareous, finely bedded carbonaceous material, cross-bedded and ripple marked, occasional bioturbated zones, iron stained along fractures, moderately weathered zone ironstained at 15.24m.
	17.60	2.36	SANDSTONE, as above, iron stained fracture at 16.21 @ 80° to axis, listric surface calcified and iron stained @ 16.18m@ 15°, @16.28m@ 15°
10°	18.59	0.99	SANDSTONE, medium-grained, well sorted, uniform, faintly banded, iron stained bedding fractures, occasional chert pebbles, calcareous.
0°	21.64	3.05	SANDSTONE, as above, weakly calcareous, fracture @ 21.64m @ 50° to axis, iron stained.
	24.69	3.05	SANDSTONE, as above, fracture @ 21.93m @37° to axis, iron stained.
	25.06	0.37	SANDSTONE, as above.
	25.48	0.42	SANDSTONE, medium- to fine-grained, bedded, calcareous material, large worm burrows.
	27.13	1.65	SANDSTONE, medium-grained, well-sorted, uniform, cross-bedded, weakly calcareous.
10°	27.23	0.10	MUDSTONE, black, fissile sandstone inclusions at top and bottom of mudstone grading back to sandstone.
	27.74	0.51	SANDSTONE, medium-grained, bedded, well- sorted, stylolite, weakly calcareous.

BH Nos.

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	30.79	3.05	SANDSTONE, as above, fracture @ 28.17 @ 70° to axis, iron stained, mudstone beds, worm burrowed, sandstone lenses, fracture at 29.57m @ 39°.
6°	33.83	3.04	SANDSTONE, as above, mudstone beds, sandstone lens, worm burrowed, gouge zone @ 32.52 10mm thick, mud clasts toward bottom of run, minor iron staining, fractured.
	35.01	1.18	SANDSTONE, as above.
	36.00	0.99	SANDSTONE, SILTY MUDSTONE, interbedded 40/60, carbonaceous lenses, loadcasts and slump structures, bioturbated areas, very fine sandstone lenses.
	36.42	0.42	SANDSTONE, medium-to fine-grained, silty interbeds slumped and rippled, minor bioturbation, calcareous.
	36.63	0.21	SANDSTONE, very fine-grained, silty mudstone interbeds 30/70, calcareous.
	36.88	0.25	SANDSTONE, fine grained, well-sorted, uniform, calcreous.
	37.76	0.88	SANDSTONE, very fine grained, silty mudstone interbedded, 30/70, sandstone lenses bioturbated, worm burrowed, pebbly towards bottom.
	38.18	0.42	CONGLOMERATE, poorly-sorted, fine grained sandstone matrix, carbonaceous stringers, sandy lenses, pebbles sub-angular to well-rounded.
10°	39.93	1.75	SANDSTONE, medium-grained, well-sorted, uniform, highly calcareous.
	41.10	1.17	SANDSTONE, fine-grained, siltstone interbeds 50/50, sandstone lenses within siltstone beds.
	43.28	2.18	SANDSTONE, medium-to fine-grained, cross-bedded, large worm burrows, bioturbated zones.
	45.58	2.30	SANDSTONE, as above, numerous mud clasts, cross-bedded, fault zone from 43.89 to 44.39, angle of top listric surface is 20°, and is calcite coated, angle of bottom listric surface is 60°, listric surface @45.15 @65° and @45.24 @76°, large mudstone clast at 45.29, fault affected.
13°	45.80	0.22	MUDSTONE, black, sandstone-mudstone contact @ 70°, listrified.
	46.33	0.53	SANDSTONE, medium-grained, bedded, carbonaceous material, mud clasts, minor listric surfaces on bedding planes, calcareous
	47.06	0.73	SANDSTONE, medium-grained, well sorted, calcareous, irregular listric surface @ 46.43m.
	48.08	1.02	SANDSTONE, medium-to fine-grained, numerous mud clasts and slump structures, high-angle fractures, iron stained
	49.38	1.30	SANDSTONE, fine-grained, SILTY MUDSTONE, interbedded, sandstone bioturbated, sandstone lenses in mudstone, carbonaceous stringers, fractured at a high-angle.

BH Nos. 37

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	50.18	0.80	SANDSTONE-SILTY MUDSTONE, as above.
	52.31	2.13	SANDSTONE, fine-grained, well-sorted, uniform, calcareous, minor bedded carbonaceous material, cross-bedded.
	52.80	0.49	SANDSTONE, fine-to medium-grained, thinly bedded, small mud clasts, carbonaceous.
			GATES / SUKUNKA
	55.47	2.67	SANDSTONE-SILTY MUDSTONE INTERBEDDED, sandstone medium-to fine-grained, bedded, grading to siltstone and mudstone, numerous small worm burrows and bioturbated zones, slump structures occasionally noted throughout section.
	58.52	3.05	SANDSTONE-SILTSTONE, as above,60/40, numerous high-angle fractures.
	59.37	0.85	SANDSTONE-SILTSTONE, as above,60/40.
	61.57	2.20	SANDSTONE-SILTSTONE, as above, 50/50, numerous high-angle fractures.
	64.62	3.05	SANDSTONE-SILTSTONE, as above, 60/40, listric surface @ 62.36 @22°, listric surface @ 63.51 @ 28°.
	65.60	0.98	SANDSTONE-SILTSTONE, as above,70/30, gouge zone, extremely weathered and fractured zone @ 65.71 to 66.13.
	67.09	1.49	SANDSTONE-SILTSTONE, as above, 70/30.
	67.67	0.58	SANDSTONE-SILTSTONE, as above, 60/40.
	70.71	3.04	SANDSTONE-SILTSTONE, as above, 60/40, high-angle fractures.
	73.76	3.05	SANDSTONE, SILTSTONE, as above 50/50.
	77.11	3.35	SANDSTONE-SILTSTONE, as above 50/50.
	77.86	0.75	SANDSTONE-SILTSTONE, as above.
	79.16	1.30	SANDSTONE-SILTSTONE, as above, 30/70.
	80.16	1.00	SANDSTONE-SILTSTONE, as above but extremely fractured and broken in a spiral manner(torque fractures?).
	83.21	3.05	SANDSTONE-SILTSTONE, 20/80, numerous small worm burrows.
	86.26	3.05	SANDSTONE-SILTSTONE, as above,20/80, high angle fractures.
	89.31	3.05	SANDSTONE-SILTSTONE, as above, 50/50.
	92.35	3.04	SANDSTONE-SILTSTONE, as above,60/40.
	95.40	3.05	SANDSTONE-SILTSTONE, as above, 70/30.
	98.45	3.05	SANDSTONE-SILTSTONE, as above, 70/30.
	101.50	3.05	SANDSTONE-SILTSTONE, as above, 60/40.
	104.50	3.00	SANDSTONE-SILTSTONE, as above,60/40, pyrite nodules.
	107.59	3.09	SANDSTONE-SILTSTONE, as above,60/40.
	110.64	3.05	SANDSTONE-SILTSTONE, as above, 60/40.

BH Nos. 37

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	113.69	3.05	SANDSTONE-SILTSTONE, as above, 60/40.
	116.49	2.80	SANDSTONE-SILTSTONE, as above, 60/40.
°	116.74	0.25	SANDSTONE, medium-grained, bedded, large worm burrows, bioturbated.
	119.74	3.00	SANDSTONE, as above.
	119.79	0.05	SANDSTONE-SILTSTONE, interbedded worm burrows and bioturbated, occasional pyritic nodules, slump structures and cross-bedding, thinly to thickly laminated, calcareous.
	122.83	3.04	SANDSTONE-SILTSTONE, as above, 80/20.
	125.88	3.05	SANDSTONE-SILTSTONE, as above, 90/10.
	128.93	3.05	SANDSTONE-SILTSTONE, as above, 90/10.
	131.98	3.05	SANDSTONE-SILTSTONE, as above, 80/20.
	135.03	3.05	SANDSTONE-SILTSTONE, as above, 80/20.
	138.38	3.35	SANDSTONE-SILTSTONE, as above, 50/50.
	141.43	3.05	SANDSTONE-SILTSTONE, as above, 60/40, high-angle fracture @ 80°.
	144.48	3.05	SANDSTONE-SILTSTONE, as above 60/40, high-angle fractures @ 80°.
	147.52	3.04	SANDSTONE-SILTSTONE, as above 50/50, high-angle fractures @ approx. 80°.
	150.57	3.05	SANDSTONE-SILTSTONE, as above, 40/60.
	153.62	3.05	SANDSTONE-SILTSTONE, as above, 40/60.
	156.67	3.05	SANDSTONE-SILTSTONE, as above 40/60, high angle fractures @ approx. 80°, listric surfaces, broken @ 156.57.
	159.72	3.05	SANDSTONE-SILTSTONE, as above 50/50, high angle fractures @ approx. 80° to 90°.
	162.76	3.04	SANDSTONE-SILTSTONE, as above, 40/60.
	165.81	3.05	SANDSTONE-SILTSTONE, as above, 40/60.
	168.86	3.05	SANDSTONE-SILTSTONE, as above, 30/70.
	171.91	3.05	SANDSTONE-SILTSTONE, as above, 40/60, high-angle fractures @ approx. 80°.
	174.96	3.05	SANDSTONE-SILTSTONE, as above 30/70, high-angle fractures @ approx. 80°.
	181.36	6.40	SANDSTONE-SILTSTONE, as above, 20/80.
	184.40	3.04	SANDSTONE-SILTSTONE, as above, 20/80. high-angle to vertical fractures @ approx. 80° to 90°.
S/M	185.00	0.60	SANDSTONE-SILTY MUDSTONE, 10/90 SUKUNKA/MOOSEBAR
	186.84	1.84	MUDSTONE, black, small worm burrows occasionally apparent, pyritic blebs noted in increasing quantity.

BH Nos. 37

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			towards base of Moosebar Member, ferrugenous bands noted.
	189.89	3.05	MUDSTONE, black, as above.
	193.24	3.35	MUDSTONE, black, as above, listric surface @ 192.65 @ 20° and @ 193.24 @ 26°.
	195.38	2.14	MUDSTONE, black, as above, high-angle fractures.
	197.21	1.83	MUDSTONE, black, as above.
	199.95	2.74	MUDSTONE, black, as above, numerous high-angle fractures, rock severely broken along fracture planes.
	201.74	1.79	MUDSTONE, black, as above, high-angle fractures @ 60° to 70°.
	203.00	1.26	MUDSTONE, black, as above, high-angle fractures on a 0.20m. spacing.
	206.04	3.04	MUDSTONE, black, as above, high-angle fracture on approx. 40cm spacing.
	209.09	3.05	MUDSTONE, black, as above, high-angle fracture on approx. 20cm to 40cm spacing.
	212.14	3.05	MUDSTONE, black, as above, high-angle fractures on approx. 15cm to 30cm spacing.
	214.58	2.44	MUDSTONE, black, as above, high-angle fractures on approx. 15cm to 30cm, listric surface @ 214.08 @ 20°.
	218.24	3.66	MUDSTONE, black, as above, listric surface @ 214.68 m@ 20°.
	221.28	3.04	MUDSTONE, black, as above, listric surface @ 219.74 m@ 29°.
	224.33	3.05	MUDSTONE, black, as above, listric surfaces @222.24 m@ 5° and @ 222.62 m@ 52°.
	227.32	2.99	MUDSTONE, black, as above.
	230.43	3.11	MUDSTONE, black, as above, fault zone from 229.97 to 230.33 top angle 30°, bottom angle 30°.
	233.48	3.05	MUDSTONE, black, as above, listric surfaces @ 230.63 m @ 40°, 231.03 m@ 32° and 231.18 m@ 24°
	236.52	3.04	MUDSTONE, black, as above, listric surfaces @ 234.40 m @ 57° and @ 235.60 m@ 59°
	242.62	6.10	MUDSTONE, black, as above, high-angle fractures @ 10cm to 50cm, spacing angle from 70° to 90°.
	245.67	3.05	MUDSTONE, black, as above.
	248.72	3.05	MUDSTONE, black, as above, listric surfaces @ 246.97 @ 8° (planar), siliceous coating @ 248.72m@ 35° (curved), @ 247.92m@ 50° and @248.60m@ 18°-siliceous coating.
	249.94	1.22	MUDSTONE, black, as above
	252.98	3.04	MUDSTONE, black, as above, fault zone from 251.38 to 251.71 with bottom angle @ 60° & has a siliceous coating: fault zone.

BH Nos. 37

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			from 252.54 m. to 252.98, with top angles varying & with siliceous and pyritic in filling bottom angle @ approx. 62.
	254.51	1.53	MUDSTONE, black, as above, listric surfaces @ 253.13 @ 75°, 253.3 @ 40°, @ 253.58 @ 28° and @ 254.51 @ 54°.
	256.03	1.52	MUDSTONE, black, as above, listric surfaces @ 255.39 @ 27°, 255.70 @ 60°
	257.56	1.53	MUDSTONE, black, as above, scattered pyritic worm burrows, some siliceous bands infilling listric surfaces.
	259.08	1.52	MUDSTONE, black, as above, listric surfaces and slickensided @ 257.86 @ 40°, @ 258.31 @ 35°.
	259.69	0.61	MUDSTONE, black as above.
	261.21	1.52	MUDSTONE, black, as above, scattered worm burrows, pyritic listric surfaces @ 259.69 @ 29°, 259.54 @ 60°, 260.1 @ 43°.
	262.74	1.53	MUDSTONE, black, as above, numerous pyritic worm burrows, listric surfaces @ 261.41 @ 0°, 262.52 @ 37°, 262.60 @ 50°.
	264.26	1.52	MUDSTONE, black, as above, numerous pyritic worm burrows, listric surface @ 263.29 @ 45°
	265.79	1.53	MUDSTONE, black, as above, pyritic worm burrows, listric surface @ 265.79 @ 43°.
	267.92	2.13	MUDSTONE, black, as above, pyritic worm burrows, listric surfaces @ 267.63 @ 52°, 267.92 @ 47°.
	269.75	1.83	MUDSTONE, as above, pyritic worm burrows.
	270.97	1.22	MUDSTONE, as above, pyritic worm burrows, calcareous and siliceous fracture filling circular grinding marks
	272.49	1.52	MUDSTONE, as above, pyritic worm burrows, high angle fractures.
	273.71	1.22	MUDSTONE, as above, pyritic worm burrows, listric surfaces @ 272.60 @ 85°, 273.49 @ 45°.
	275.54	1.83	MUDSTONE, as above, high angle fractures, listric surfaces @ 274.11 @ 30° @ 274.55 @ 42° and @ 274.69 @ 40°, numerous listric surfaces towards bottom of section, highly fractured and broken.
	277.86	2.32	MUDSTONE, as above, section exhibits numerous torque fractures and listric surfaces, section totally broken.
	278.59	.73	MUDSTONE, black, numerous slickensided and listric surfaces possibly a minor movement area, angles from 15° to 50°, siliceous and calcareous infilling.
	280.11	1.52	MUDSTONE, as above, pyritized worm burrows.
	281.01	0.90	MUDSTONE, as above.
	281.09	0.08	CLAY BAND, beige-grey, worm burrows, sheared at top @ 50°.
	281.64	0.55	MUDSTONE, as above.
	283.16	1.52	MUDSTONE, as above, high angle fractures, listric surface @ 282.86 @ 55°
	284.68	1.52	MUDSTONE, as above, breccia zones @ 283.56 and @ 283.86.
	285.53	0.85	MUDSTONE, as above.

BH Nos. 37

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	285.60	0.07	CLAY BAND, beige-grey, sheared, calcareous shear angle 18°.
	285.90	0.30	MUDSTONE, as above, broken torque fractures.
	286.51	0.61	MUDSTONE, as above, high-angle fractures :
	288.04	1.53	MUDSTONE, as above, slickensided at 286.91 m @ 70°.
	289.56	1.52	MUDSTONE, as above, shear zone angle varies @ 288.29m, listric surface @ 288.96 m @ 50°.
	290.78	1.22	MUDSTONE, as above, listric surface @ 289.66 m @ 30°, shear zone @ 290.12 angles vary.
	292.30	1.52	MUDSTONE, as above, shear zone from 291.11m to 291.50m @54° to 35°, siliceous and calcareous infilling.
	293.83	1.53	MUDSTONE, as above, numerous listricated and slickensided planes from 70° to 30°.
	295.66	1.83	MUDSTONE, as above, listricated from 90° to 50°.
	297.18	1.52	MUDSTONE, as above, large ferrugenous bands.
	299.01	1.83	MUDSTONE, as above, low-angle fractures, minor listrication.
	300.53	1.52	MUDSTONE, as above, shear zone, numerous listrication and slickensided surfaces at various angles, main movement plane at angles of 20° to 80° depths from 299.15 m to 300.30.
	302.06	1.53	MUDSTONE, as above, minor listricated planes low-angle.
	303.58	1.52	MUDSTONE, as above, minor listric surfaces, gouge @ 302.70 m @ 30° 1cm thick.
	305.00	1.42	MUDSTONE, as above, minor pyritic blebs and worm burrows.
	305.55	0.55	MUDSTONE, as above.
	305.63	0.08	CLAY, beige, mottled, worm burrowed (?) listricated, bottom contact @ 30°.
	306.63	1.00	MUDSTONE, as above, minor listrications @ 30°.
	308.15	1.52	MUDSTONE, as above, en/echelon listric surfaces @ 307.10 m sub-parallel to axis.
	309.69	1.54	MUDSTONE, as above, numerous pyritic blebs and worm burrows, large ferrugenous concretions.
	309.73	0.04	MUDSTONE, black, as above.
	309.80	0.07	CLAY BAND, mottled, beige, bottom contact sheared @ 28°.
	311.20	1.40	MUDSTONE, as above, minor listrications @ 60°
	312.72	1.52	MUDSTONE, as above, minor low-angle fractures.
	314.25	1.53	MUDSTONE, as above, minor low-angle listrications.
	315.77	1.52	MUDSTONE, as above, minor listrication, siliceous filling and ferrugenous bands.
	315.88	0.11	MUDSTONE, as above.
	315.92	0.04	CLAY, beige with 40% mudstone inclusions, elongated, large and small.
	317.30	1.38	MUDSTONE, as above, numerous pyritic blebs and worm burrows minor low angle listrications at bottom of section.

BH Nos. 37

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	317.98	0.68	MUDSTONE, as above, listricated and slickensided zone from 317.57 m to 318.04 m angles from 90° to 30°.
	318.01	0.03	CLAY, beige with 40° mudstone inclusions, elongated.
	318.82	0.81	MUDSTONE, as above, very small pyritic blebs and clay bands, minor low-angle listrications.
	320.34	1.52	MUDSTONE, as above, low angle fractures.
	321.34	1.00	MUDSTONE, as above, low angle listrications, large ferrugenous band.
	322.41	1.07	MUDSTONE, dark grey, Moosebar lighology, structureless, locally pyritic, non-calcareous.
	322.48	0.07	BENTONITE, buff grey, chalky looking, friable, gradational at top and base.
	322.67	0.19	MUDSTONE, medium-grey, structureless, homogeneously silty, irregular basal contact.
	322.77	0.10	MUDSTONE/BENTONITE, mixture of bentonitic clays and silty mudstones, seems to have undergone some transportation and reworking before final deposition.
	322.81	0.04	BENTONITE, buff grey, soapy texture, broken.
	323.31	0.50	SANDSTONE, medium grey, fine/medium-grained, highly argillaceous, glauconitic, pyritic burrows, some carbonized plant debris.
	323.33	0.02	SANDSTONE, fragments, same as above.
	323.42	0.09	SANDSTONE, as above, richly pyritized.
			MOOSEBAR GETHING BIRD COAL SEAM
	323.45	0.03	PYRITE/COAL, slickensided, coal essentially dirty.
	323.46	0.01	COAL, dull, listricated, broken stick.
	323.56	0.10	COAL, dull, sheared, listricated, occasional bright, broken stick.
	323.63	0.07	COAL, as above, broken stick.
	323.76	0.13	COAL, dull with occasional bright, listricated, broken stick.
	324.04	0.28	COAL, dull, occasional bright streaks and laminae, broken stick.
	324.17	0.13	COAL, dull, occasional thin bright bands, pyritic, fusain bands, sheared, reacts with HCl, broken stick.
	324.21	0.04	COAL, dull, highly sheared, broken stick.
	324.22	0.01	COAL, fragments of sheared coal and mudstone fragments.
	324.26	0.04	CORE LOSS-COAL

BH Nos. 37

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	324.32	0.06	CORE LOSS- ROCK
	324.80	0.48	MUDSTONE, grey buff, plant remains, listricated, broken stick.
	325.23	0.43	MUDSTONE, same as above, slickensided surfaces, pyrite blebs throughout, at base several large pieces with mineralized surfaces passing 45° through core.
	325.34	0.11	CORE LOSS- COAL
	325.41	0.07	COAL, dull banded, pyrite specks, sheared, broken stick, striated planes at 45° passing through core.
	325.50	0.09	COAL, dull, lustrous, banded, sheared, broken stick.
	325.52	0.02	COAL, dull and bright, sheared, broken stick.
	325.53	0.01	COAL, dull, pyritic, sheared, broken stick.
	325.58	0.05	COAL, dull, lustrous with bright bands, sheared, broken stick.
	325.64	0.06	CORE LOSS- COAL
	325.72	0.08	COAL, dull, listricated, bright bands, sheared, broken stick.
	325.78	0.06	COAL, dull, lustrous, thin bright bands, 45° striated surfaces passing through core, broken stick.
	325.85	0.07	COAL, dull, highly sheared, few bright bands, broken stick.
	325.87	0.02	COAL, dull, lustrous, bright bands, broken stick, sheared.
	325.96	0.09	SANDSTONE, black, extremely coaly, thin bright band at top, 45° listricated at base.
	326.44	0.48	SANDSTONE, medium-grey, medium-grained, slightly carbonaceous, occasional thin white mineralized fractures, mottled, broken.
	327.15	0.71	SANDSTONE, medium grey, clean and well-sorted as above, 60° fracture passing through core, 30° at base, irregular polished and striated surfaces.
	327.96	0.81	SANDSTONE, dark grey, medium-grained, mottled, hard, listric, little or no indication of primary sedimentary lamination, few mineralized tension fractures.
	329.49	1.53	SANDSTONE, as above, generally clean, mineralized tension fractures (at random orientation).

BH Nos. 37

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	331.01	1.52	SANDSTONE, as above, tension fracture, some listricated surfaces, 5mm silty/muddy bands towards base and slickensided along this plane.
	331.29	0.28	SANDSTONE, as above, basal 0.05m slickensided, fractured.
	331.60	0.31	COAL, badly fragmented and pulverized, coal fragments highly listricated and sheared, probably dull and some dull and bright coal, fragmented at base.
	332.54	0.94	SANDSTONE, medium grey, medium-grained, clean, sorted, listric, many tension fractures, mineralized.
	334.06	1.52	SANDSTONE, medium grey, medium-grained, numerous fractures at 50° from horizontal.
	335.58	1.52	SANDSTONE, medium grey, medium-grained, thin internal exhibits extensive mottling, top 0.54m with abundant small burrows, few tension fractures.
	337.11	1.53	SANDSTONE, similar to above, 1cm dark grey silty band toward base, numerous slickensided surfaces, cross-laminated.
	338.38	1.27	SANDSTONE, as above, calcareous.
	338.63	0.25	SANDSTONE, as above, calcareous, one fracture along bedding.
	340.16	1.53	SANDSTONE, medium grey, medium-grained, top 0.10m has a large channel (0.07m wide) infilled with laminated sands with scattered medium to coarse grains toward base, large burrows in sands (10cm) immediately below channel, rest clean current bedded sands, calcareous, many tension fractures, mineralized, some fractures along bedding.
	341.68	1.52	SANDSTONE, as above.
	343.20	1.52	SANDSTONE, as above, 2cm thick fracture zones, heavily calcite encrusted, very clean and uniform sands, slightly calcareous.
15°	344.73	1.53	SANDSTONE, identical to above.
	346.25	1.52	SANDSTONE, as above, fine/medium-grained, clean and well-sorted, strongly calcareous, cross-stratified throughout, basal 0.10m fragmented, tension fractures mineralized.
	347.78	1.53	SANDSTONE, similar to above.
	349.30	1.52	SANDSTONE, light/medium grey, fine/medium-grained, very clean, well-sorted, cross-bedded, abundant small-scale mineralized tension fractures, randomly oriented, weakly calcareous.
	349.46	0.16	SANDSTONE, as above, with high-angle mineralized fracture.
	350.82	1.36	SANDSTONE, identical to above, numerous fractures, calcareous.

BH Nos. 37

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	352.01	1.19	SANDSTONE, identical to above, tension fractures, abrupt below.
	352.27	0.26	MUDSTONE/SANDSTONE, dark-grey, interbedded sequence of sands very fine-grained, erosional mutual contacts, 70:30.
	352.54	0.27	COAL, highly sheared and pulverized, abrupt at base.
	352.64	0.10	MUDSTONE, dark grey, silty, carbonaceous, erosional at base.
	352.97	0.33	SANDSTONE, dark grey, fine/medium-grained, laminated, calcareous, erosional at base .
	353.87	0.90	MUDSTONE, medium grey, very silty, lower half strongly calcareous, basal 0.10m fragmented .
	355.40	1.53	MUDSTONE, as above, slightly more silty/sandy.
	355.76	0.36	MUDSTONE, as above, gradual basal contact, a fracture toward base (along bedding plane).
	356.92	1.16	SANDSTONE, light grey, fine/medium-grained, somewhat graded locally, current-bedded, strongly calcareous, few silty intraclasts, fracture at base.
	357.83	0.91	SANDSTONE, light grey, fine/medium-grained, cross-bedded, relatively clean, well-sorted, strongly calcareous, erosional basal contacts.
30°	358.44	0.61	MUDSTONE, medium grey, top half with regular silty intercalations and laminated, rest homogeneously silty, structureless, calcareous throughout.
	359.85	1.41	MUDSTONE, similar to above, abundant and regular silty wisps and lenses throughout.
	361.09	1.24	MUDSTONE/SANDSTONE, top half richly argillaceous, silty and calcareous, rest silty mudstone, laminae and layers of silts throughout, abrupt below.
	361.40	0.31	SANDSTONE, light grey, fine-grained, calcareous, laminated, top 0.07m somewhat burrowed, erosional at base.
	361.66	0.26	SANDSTONE/SILTSTONE, dark grey, sands very fine-grained, very argillaceous, interbedded with silts, some argillaceous intervals, laminated; calcareous.
	362.40	0.74	MUDSTONE/SILTSTONE, dark grey to black, alternating sequences of muds and silts with lenticles of very fine grained sands, laminated, bottom 0.16m with abundant shell debris, calcareous (patchily) throughout.
			COAL SEAM, SHELLY EQUIPMENT
	362.80	0.40	COAL, mainly clean coal, basal 0.07m hard, dense, argillaceous.

BH Nos. 37

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	362.91	0.11	MUDSTONE, dark grey, richly pyritic, carbonaceous, somewhat canneloid, a fine silty/sandy layer 5mm thick toward base.
	363.52	0.61	SANDSTONE/MUDSTONE, top 0.25m essentially very fine-grained; sand, lenticula, argillaceous, interlayered with laminated siltstones; rest dominantly muddy with lenticles and ripples of very fine sand and siltstone.
	363.69	0.17	COAL, highly sheared, powdered and pulverized.
	363.86	0.17	MUDSTONE, black, sheared and listricated surfaces, carbonaceous.
	364.31	0.45	COAL/MUDSTONE, interbedded, carbonaceous, coaly mudstone with dull, dense, muddy coal, highly listricated surfaces and much shearing.
	364.48	0.17	MUDSTONE, dark grey, carbonaceous, abundant carbonized plant debris, calcite impregnation (on plant debris), very gradual at base (silty content increasing).
	364.54	0.06	SILTSTONES, dark grey, richly argillaceous, vaguely laminated, calcareous, abundant calcite impregnation.
	366.06	1.52	SANDSTONE, light/medium grey, fine-to very fine-grained, locally grading with silty zones and argillaceous intervals, irregularly laminated, some disturbance of lamination, micro-erosional fractures and a large channel, calcareous throughout, basal 0.15 very muddy.
	366.29	0.23	MUDSTONE, medium grey, very silty, vaguely laminated, calcareous, very gradual at base, few circular burrows.
	366.69	0.40	SANDSTONE, medium grey, very fine-grained, richly argillaceous, laminated, micro-erosional features with silty and muddy zones, calcareous, interbedded below.
20°	367.59	0.90	SANDSTONE/MUDSTONE, top half interbedded, very fine sand, laminated, rest silty mudstones, charateristic lenticular nature of silty/sandy intervals, sporadically calcareous, two listricated surfaces (essentially along bedding).
	368.85	1.26	MUDSTONE, medium-grey, silty disseminations as well as laminations breaks with semi-conchoidal fracture, numerous listricated surfaces (mainly breaking off along laminae) calcite-filled fracture toward the base (this is also following the bedding plane), non-calcareous throughout.
12°	368.94	0.09	MUDSTONE, medium grey, silty, slickensided, striations parallel to bedding.
	369.52	0.58	MUDSTONE, medium grey, locally slightly carbonaceous, patchily silty, thinly-bedded, bedding plane slips at top, base broken and listricated, broken stick.
	369.54	0.02	COAL, highly sheared with numerous calcite veins, stick.

BH Nos. 37

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	369.59	0.05	COAL, dull, sheared, calcite veins, stick.
	369.62	0.03	COAL, highly sheared, dull, calcite veining, stick.
	369.69	0.07	COAL, dull, minor bright band, highly sheared, stick, fracturing.
	369.74	0.05	COAL, as above, stick, minor fracturing.
	369.77	0.03	COAL, dull, highly sheared, broken.
	369.92	0.15	COAL, highly sheared, type indistinct, stick.
	370.19	0.27	COAL, highly sheared, possibly dull to dull lustrous, stick, shearing at 6° from horizontal
	370.26	0.07	COAL, dull banded, highly sheared, lustrous, stick.
	370.35	0.09	COAL, dull, lustrous and banded, highly sheared, stick.
	370.41	0.06	COAL, highly sheared, probably dull and bright, stick.
	370.47	0.06	COAL, fragments, dull lustrous with 30% bright bands, sheared.
	370.65	0.18	COAL, highly sheared, probably dull banded, shearing surface at 60° passing through core, stick.
	370.80	0.15	COAL, alternating bands of bright and dull, 5mm to 1cm thick, bedding 35° from horizontal, sheared, stick, large bright bands at base, relatively hard.
	370.83	0.03	COAL, bright, cleated and sheared, stick.
	370.90	0.07	COAL, dull, lustrous with bright bands, sheared, stick.
	370.96	0.06	COAL, dull, lustrous, relatively hard, broken stick.
	371.05	0.09	COAL, highly sheared, 60° shear planes, possibly dull, stick.
	371.11	0.06	COAL, dull, lustrous banded, highly sheared, stick.
	371.16	0.05	COAL, as above, highly sheared, stick.
	371.20	0.04	COAL, highly sheared, possibly dull, stick, striated surface at 60° running through core.
	371.26	0.06	COAL, very highly sheared, pulverized, type indistinct.
	371.42	0.16	COAL, highly sheared, dull banded, some lustrous, stick.
	371.43	0.01	COAL, very highly sheared, pulverized, stick.
	371.46	0.03	MUDSTONE, dark, sandy, carbonaceous, listricated, banded. stick, dipping 35°, clean contact at top, gradational base.
	371.60	0.14	COAL, dull, banded, sheared, listricated, stick.
	371.66	0.06	COAL, bright banded, listricated, stick.
	371.69	0.03	COAL, dull, banded, with one major 5mm band in middle, stick.

BH Nos. 37

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	371.73	0.04	COAL, bright banded, listricated, stick.
	371.81	0.08	COAL, dull banded, listricated, coal bedding 35°, dull appears dense and reacts with HCl.
	371.91	0.10	COAL, dull, lustrous banded, listricated, major striated planes passing through core, stick with few breaks.
	371.94	0.03	COAL, bright, cleated, with one thin dull lustrous band in middle, dipping at 35°, stick.
	371.95	0.01	COAL, dull, lustrous, banded, broken.
	372.03	0.08	CORE LOSS=COAL
	372.04	0.01	COAL, dull, lustrous, banded, all fragments.
	372.06	0.02	COAL, dull and bright, moderately thick band (up to ½cm) sheared, stick.
	372.17	0.11	COAL, dull, lustrous, banded with 1cm bright band, large striated planes, stick
	372.26	0.09	COAL, highly sheared, relatively listricated type indistinct, stick.
	372.28	0.02	COAL, very highly sheared, pulverized, stick.
	372.30	0.02	COAL, bright, dipping 35°, stick.
	372.40	0.10	COAL, dull banded with about 30% bright layers, stick.
	372.44	0.04	COAL, dull and bright, sheared, stick.
	372.47	0.03	COAL, very highly sheared, type indistinct, stick.
	372.67	0.20	COAL, dull banded sheared, stick.
	372.70	0.03	COAL, dull and bright, sheared, stick, striated planes 60° through core.
	372.83	0.13	COAL, dull, dense, granular texture, reacts with HCl, bright bands, pyrite species, quite hard, stick, with thin coaly mudstone bands.
	372.85	0.02	COAL, bright, cleated, stick, striated planes at 60°
	373.07	0.22	COAL, dull with bright bands, sheared, quite hard, stick, striated planes at 60°.
	373.11	0.04	COAL, bright banded, shear planes at 60°, stick.
	373.22	0.11	COAL, dull and bright, listricated, steep striated planes passing through core, stick.
	373.29	0.07	COAL, dull banded, listricated, striated plane, stick.
	373.30	0.01	COAL, bright banded, listricated, steep striated planes passing through core, stick.
	373.32	0.02	MUDSTONE, black, carbonaceous, dipping at 30°, stick.
	373.37	0.05	COAL, highly sheared, probably dull banded, stick.

BH Nos. 37

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	373.38	0.01	COAL, dull with minor bright banded, stick.
	373.40	0.02	COAL, bright banded, listricated, stick.
	373.41	0.01	COAL, dull banded, listricated, stick.
	373.47	0.06	COAL, highly sheared, probably dull banded, stick.
	373.59	0.12	COAL, fragments of dull and bright and bright banded.
	373.71	0.12	CORE LOSS-COAL
	373.72	0.01	COAL, dull banded, listricated, bright, striated planes, stick.
	373.74	0.02	COAL, bright banded, listricated, high striated planes, stick.
	373.75	0.01	COAL, dull, listricated, dip of banding 30°, stick.
	373.77	0.02	COAL, dull, lustrous, banded, listricated, stick.
	373.82	0.05	COAL, dull and bright, sheared, listricated, stick.
	373.92	0.10	COAL, sheared, friable, probably dull banded.
	373.95	0.03	COAL, dull and bright, listricated, stick.
	373.99	0.04	MUDSTONE, black, coaly, hard, gradational at base, stick
	374.02	0.03	COAL, dull, dense, hard with about 30% bright coal, stick
	374.07	0.05	COAL, bright banded, stick, high-angle shear planes.
	374.17	0.10	COAL, dull, dense, hard with bright bands, high-angle striated planes.
	374.21	0.04	COAL, dull and bright, listricated, hard relatively, stick.
	374.24	0.03	MUDSTONE, black, coaly, listricated, thin coal bands, stick.
	374.28	0.04	COAL, bright banded, highly sheared, broken stick.
	374.33	0.05	COAL, bright banded, cleated, listricated, high striated planes, stick.
	374.35	0.02	COAL, dull with thin bright bands, calcareous, stick.
	374.39	0.04	COAL, bright, cleated, high-angle striated planes passing through core, stick.
	374.53	0.14	COAL, dull banded, lustrous, sheared, stick, high-angle striated planes through core.
	374.56	0.03	COAL, bright, cleated, friable, stick.
	374.65	0.09	COAL, lustrous, banded, striated planes at high angle, stick.
	374.74	0.09	COAL, dull and bright, large bands of bright (up to 1cm) stick.

BH Nos. 37

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	374.79	0.05	COAL, dull banded, listricated, striated planes at high-angle, stick.
	374.82	0.03	COAL, bright banded, listricated, stick.
	374.95	0.13	COAL, bright, cleated, listricated, stick.
	375.12	0.17	CORE LOSS—COAL & ROCK
	375.16	0.04	COAL, fragments, mudstones, carbonaceous, listricated, fragments of coal, dull, hard.
	375.21	0.05	COAL, dull, dense, hard, thin vitrain layers, silty.
	375.34	0.13	COAL, dull banded, sheared, silty laminae at base, listricated, contact clean break at base, basal surface horizontal.
	376.50	1.16	SANDSTONE, medium-grey, medium-grained, listricated surfaces, very hard, listric, non calcareous, large 60° polished surface at base with some mineralization.
	376.88	0.38	SANDSTONE, light/medium grey, medium-grained, clean, well-sorted, tension fractures (mineralized).
	378.26	1.38	SANDSTONE, medium-grey, fine/medium-grained, clean and well-sorted, rounded, widely spaced cross-bedded units, non-calcareous, listric.
	379.78	1.52	SANDSTONE, similar to above, 0.03m fracture zone (mineralized in middle).
	379.98	0.20	SANDSTONE, medium-grey, medium-grained, many large silty/sandy interclasts, few very fine cherty pebbles, well-rounded, this unit is bounded at its base by 0.04m brecciated zone, very vuggy and mineralized (quartz).
	380.77	0.79	SANDSTONE, top 0.03m medium-grained sands, rest fine/medium-grained, some fine-grained sand zones.
	381.30	0.53	SANDSTONE, medium grey, fine-grained, slightly calcareous, structureless.

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 38

Contractor: Tonto

Commenced: Sept 22, 1977

Completed: Sept 24, 1977

Co-ordinates: 6,115,230.19 N
594,703.66 E
Surface Elevation: 1,443.75 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by:

Geologist	Depth
Andy Newson	21.34-63.13
	71.03-90.88
	97.45-120.75
Peter Caine	63.23-64.89
Ali Chowdry	64.94-69.81
Andy Bowler	91.16-96.05

Final Depth: 120.75

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar			
U. Gething	69.81 96.05		1,373.94 1,347.70

SEAMS		DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD					
CHAMBERLAIN	UP	69.81			1,373.94
	LP	96.05			1,347.70

F.PR. 41.95 Fractured & slickensided
F.E. 86.87 Brecciated

BH Nos. 38

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	21.34	21.34	Casing
	24.74	3.40	SANDSTONE, Light-dark grey, coarse-grained, poorly bedded, mottled, transitional below (Bird Floor Sandstone)
	26.21	1.47	SANDSTONE, Light-dark grey, coarse-grained, fairly well bedded, carbonaceous, abrupt below
	26.87	0.66	SANDSTONE,AS ABOVE
	29.26	2.39	SANDSTONE, medium to fine-grained, generally clean,poorly-bedded, minor mudstone bands at top, occasional calcite filled joints at 70-80° Com B.C.A. minor slickensides abrupt below
	32.31	3.05	SANDSTONE, as above
	35.36	3.05	SANDSTONE, as above
	38.36	3.00	SANDSTONE, as above
	39.06	0.70	SANDSTONE, Medium-grained, carbonaceous, fairly well-bedded, disturbed, occasional minor muddy layers
	39.17	0.11	MUDSTONE, Carbonaceous, small calcite infilled fractures, disturbed, broken with slickensides
	39.57	0.40	MUDSTONE, Extremely carbonaceous and coaly, polished and slickensided
25°	41.45	1.88	SANDSTONE, Medium/fine-grained, carbonaceous, bedding fairly well defined by carbonaceous layers, calcite infilling on joints at high-angle (70-80° Com B.C.A.) slickensides on some surfaces not consistent direction but generally parallel with dip and strike of rock.
	44.50	3.05	SANDSTONE, Medium-grained, medium-grey, clean, poorly-bedded. Top 0.5m very structurally disturbed. Rest has numerous calcite-filled fractures and slickensides some parallel to bedding others giving high-angle (75-85°) Com B.C.A. Bedding/Cross-Bedding at a high-angle.
	47.55	3.05	SANDSTONE, as above
	48.23	0.68	SANDSTONE, as above
	49.73	1.50	MUDSTONE & INTERBEDDED SILTS, Laminated in 1-2cm, minor sandy layers, broken top 0.40m sandy & carbonaceous with a very coaly slickensided junction above, broken and slickensided junction below
	50.39	0.66	SANDSTONE, Carbonaceous, steeply dipping, disturbed bedding, broken
	50.49	0.10	MUDSTONE, Carbonaceous, coaly, broken up, slickensides and polished junction below
25°	51.21	0.72	SANDSTONE, Carbonaceous, bedding well developed but disturbed, faulted below
	53.64	2.43	SANDSTONE, as above
	54.92	1.28	SANDSTONE, poorly-bedded medium/fine-grained, carbonaceous, broke, becomes very coaly and carbonaceous at base, abrupt below
	55.52	0.60	SKEETER SEAM CORE LOSS? -COAL
	55.88	0.36	MUDSTONE, very carbonaceous, numerous coaly stringers, listric surfaces, occasional fine sandy interbeds,
	56.42	0.54	CORE LOSS - COAL

BH Nos. 38

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	57.94	1.52	SANDSTONE, Fine-grained with interbedded muds, carbonaceous, disturbed. Broken, minor calcite infillings on joints. Bedding and X-Bedding apparently near vertical. Faulted below.
45°	58.23	0.29	SANDSTONE, Medium-grained, very broken and sheared, numerous slickensides
	58.73	0.50	SANDSTONE, as above
	59.48	0.75	SANDSTONE, medium/coarse-grained, some mudstone interbeds, broken stick, some slickensides, abrupt below
35°	61.18	1.70	SANDSTONE, argillaceous, medium/fine-grained, well developed bedding and cross-bedding, some muddy interbeds, broken, calcite filled joints. Abrupt below.
20°	63.13	1.95	MUDSTONE AND INTERBEDDED SILTSTONES 80:20, well laminated in 1-2cm units, occasional burrows, abrupt below, minor calcite filled joints
	63.23	0.10	MUDSTONE, dark-grey, calcite fractures dip @ 8°
	63.27	0.04	MUDSTONE, black, carbonaceous to coaly, irregular contact with coal below
			CHAMBERLAIN SEAM - UPPER PLATE
	63.34	0.07	COAL, dull banded, core in fragments
	63.60	0.26	CORE LOSS-COAL
	63.62	0.02	COAL, bright banded, core fragments
	63.73	0.11	COAL, core fragmented, dull banded with bright bands
	63.86	0.13	CORE LOSS-COAL
	63.95	0.09	COAL, lustrous, core fragments.
	64.08	0.13	CORE LOSS-COAL
	64.12	0.04	COAL, bright, listric surfaces @ 90°, core broken
	64.18	0.06	COAL, lustrous with bright bands, core broken
	64.22	0.04	CORE LOSS-COAL
	64.24	0.02	COAL, fragments pulverized, lustrous with bright streaks
	64.28	0.04	COAL, lustrous with bright bands, core broken
	64.30	0.02	COAL, bright banded
	64.37	0.07	COAL, dull lustrous, some bright bands, large fragments
	64.46	0.09	CORE LOSS-COAL
	64.60	0.14	COAL, mixture of pulverized and broken pieces (dull banded)
	64.65	0.05	COAL, fragments-coal dull banded and coaly mudstone
	64.74	0.09	CORE LOSS-COAL
	64.77	0.03	COAL, bright, somewhat cleated
	64.85	0.08	COAL, dark, lustrous, with minor bright bands, heavily cleated
	64.89	0.04	COAL, dull, lustrous, as above, broken
	64.94	0.05	COAL, dull, lustrous with minor bright laminae, broken stick.
	64.98	0.04	COAL, as above, brightly sheared,
	65.05	0.07	COAL, dull, lustrous with minor bright band, mixed up large fragments
	65.13	0.08	COAL, bright or; lustrous (weathered), possibly bright weathered, heavily cleated, very broken stick.
	65.19	0.06	COAL, dull, lustrous, numerous striations, large fragments
	65.28	0.09	CORE LOSS-COAL

BH Nos. 38

Dip o	DEPTH m.	THICKNESS m	DESCRIPTION
	65.35	0.07	COAL, fragments: dull banded, highly sheared
	65.39	0.04	COAL, highly sheared, dull, lustrous, weathered fragments
	65.48	0.09	CORE LOSS-COAL
	65.55	0.07	COAL, dull banded, fragments with 1cm band of bright (indicated), highly sheared
	65.64	0.09	CORE LOSS-COAL
	65.78	0.14	COAL, dull and bright, granular texture, cleated, strongly calcareous, (uniformly dispersed in matrix)
	65.81	0.03	COAL, as above mainly as fragments
	65.90	0.09	CORE LOSS-COAL
	65.97	0.07	COAL, dull with thin bright bands, sheared, broken
	66.04	0.07	COAL, dull banded, striated surfaces, broken up
	66.15	0.11	COAL, dull lustrous, occasional bright bands, heavily sheared
	66.25	0.10	COAL, dull banded, striated planes, sheared, very broken stick
	66.31	0.06	COAL, dull, lustrous, banded, sheared, listricated, broken
	66.42	0.11	COAL, dull lustrous, highly sheared, very broken
	66.60	0.18	CORE LOSS-COAL
	66.65	0.05	COAL, fragments of bright and fragments of bright and dull
	66.74	0.09	COAL, dull banded with large bright band, striated surfaces, broken
	66.83	0.09	COAL, fragments, dull highly sheared, relatively hard, some bright bands
	67.01	0.18	CORE LOSS-COAL
	67.08	0.07	COAL, dull lustrous with streaks of bright coal, broken stick
	67.13	0.05	COAL, as above, highly sheared
	67.21	0.08	COAL, small fragments, bright sheared coal, dull sheared coal, large piece of dull lustrous with thin bright bands
	67.25	0.04	COAL, dull, lustrous, banded
	67.32	0.07	COAL, dull and bright, striated planes passing through core, relatively hard, broken stick
	67.40	0.08	COAL, large fragments: dull and bright, heavily cleated striated surfaces
	67.70	0.30	CORE LOSS-COAL
	67.76	0.06	COAL, dull, lustrous, banded, thin bright streaks, cleated, striated, broken stick
	68.02	0.26	CORE LOSS-COAL
	68.10	0.08	COAL, dull, fragments, 50% highly powdered, broken coal, rest fragments of dull banded and dull and bright coal
	68.20	0.10	CORE LOSS-COAL
	68.42	0.22	COAL, fragments: dull and bright, dull bands, bright coal, 30% highly fragmented and powdered
	68.52	0.10	CORE LOSS-COAL
	68.58	0.06	COAL, dull and bright, striated planes, broken stick
	68.62	0.04	COAL, bright banded, fragments
	68.73	0.11	CORE LOSS-COAL
	68.80	0.07	COAL, fragments of dull banded highly sheared coal

BH Nos. 38

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	68.95	0.15	CORE LOSS-COAL
	68.97	0.02	COAL, small fragments, dull and bright, some fragments of bright
	69.12	0.15	CORE LOSS-COAL
	69.23	0.11	COAL, fragments of dull and bright, sheared
	69.38	0.15	CORE LOSS-COAL
	69.42	0.04	COAL, bright fragmented, sheared
	69.57	0.15	CORE LOSS-COAL
	69.59	0.02	COAL, bright banded, slightly sheared, broken stick
	69.69	0.10	MUDSTONE, dark grey, carbonaceous and coaly at top, silty, listric surfaces, some mineralization
	69.79	0.10	MUDSTONE, as above, plant debris, broken
	69.81	0.02	MUDSTONE, dark grey, very carbonaceous, thin coaly bands, polished, basal contact with sands
	71.03	1.22	SANDSTONE, coarse-medium grained, carbonaceous, poorly bedded transitional below, broken stick with some calcite-filled fractures
10°	71.43	0.40	SANDSTONE, medium-grained, carbonaceous, bedding fairly well developed, transitional below
	74.43	3.00	SANDSTONE, as above
	74.59	0.16	SANDSTONE, as above
	74.94	0.35	SANDSTONE, medium grained, bedding poorly developed, faulted contact below, broken, calcite-filled fractures.
	76.67	1.73	SANDSTONE, medium grained, clean, broken with some calcite filled joints (60° COM B.C.A.), faulted below
	79.31	2.64	SANDSTONE, as above
	81.13	1.82	SANDSTONE, as above
	81.33	0.20	SANDSTONE, as above, very broken much calcite, lumps up to 2x2cm
80°	81.83	0.50	SANDSTONE, as above, slickensides, numerous small calcite filled cracks, vertical dips on bedding, broken and shattered
	84.87	3.04	SANDSTONE, as above
	86.17	1.30	SANDSTONE, as above
	86.87	0.70	SANDSTONE, very broken, brecciated
	87.75	0.88	SANDSTONE, medium-grained, carbonaceous, slickensides, calcite-filled cracks, some mudstone interbeds, transitional below
	87.85	0.10	SANDSTONE, as above
	89.83	1.98	MUDSTONE and interbedded fine siltstones 70:30, minor biotubation, laminated 1-2cm layers, some faulting at top, amount of siltstone content becomes small towards base, transitional below
30°			
	90.13	0.30	SANDSTONE, as above
	90.63	0.50	MUDSTONE, homogeneous, dark grey-black, sheared and slickensides, coaly layers and carbonaceous towards base, abrupt below
	90.88	0.25	SANDSTONE, as above
	91.16	0.28	MUDSTONE, silty, dark grey at top, medium grey to base, laminated, listric surfaces, calcite veins near top, shear planes sub-parallel to core axis

BH Nos.

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	91.36	0.20	MUDSTONE, silty, dark-grey, slickensided throughout thin silt/sand laminae, calcite on shear planes
	91.38	0.02	MUDSTONE, black, carbonaceous, sheared throughout, coal contact adhering to base
			CHAMBERLAIN SEAM (Lower Plate)
	91.51	0.13	COAL, dull, fragmented, highly sheared
	91.58	0.07	CORE LOSS-COAL
	92.06	0.48	COAL, dull, lustrous, fragmented, highly sheared, irregular listric surfaces throughout, ankerite present on some shear planes near top
	92.13	0.07	CORE LOSS-COAL
	92.17	0.04	COAL, dull, lustrous with bright bands, highly sheared, fragmented
	92.25	0.08	COAL, dull, lustrous, highly sheared, fragmented
	92.32	0.07	CORE LOSS-COAL
	92.40	0.08	COAL, dull, lustrous, as above, slickensided
	92.47	0.07	CORE LOSS-COAL
	93.02	0.55	COAL, dull, lustrous with occasional bright bands, highly sheared and fragmented
	93.09	0.07	COAL, dull/bright, sheared, fragmented
	93.12	0.03	MUDSTONE, silty, dark grey, carbonaceous, very hard, slickensided, calcareous
	93.16	0.04	COAL, dull, lustrous, fragmented, highly sheared
	93.23	0.07	CORE LOSS-ROCK
	93.27	0.04	MUDSTONE, very silty, rooty, carbonaceous, calcareous, dark grey, hard, slickensided base
	93.71	0.44	COAL, dull, lustrous, highly sheared, slickensided throughout, fragmented
	93.77	0.06	CORE LOSS-COAL
	94.10	0.33	COAL, dull lustrous, as above
	94.16	0.06	CORE LOSS-COAL
	94.44	0.28	COAL, dull lustrous, as above
	94.50	0.06	CORE LOSS-COAL
	94.80	0.30	COAL, dull lustrous, with occasional bright bands, highly sheared and slickensided, fragmented
	94.86	0.06	CORE LOSS-COAL
	95.20	0.34	COAL, dull lustrous, as above
	95.36	0.16	COAL. dull lustrous, sheared, fragmented throughout
	95.43	0.07	CORE LOSS-COAL
	95.52	0.09	COAL, dull, pulverized, sheared
	95.62	0.10	COAL, dull lustrous, highly sheared, fragmented
	95.69	0.07	CORE LOSS-COAL
	95.89	0.20	MUDSTONE, slightly silty, dark grey, slickensided, shear planes at 45° to core axis
	96.05	0.16	MUDSTONE, silty, medium-grey, slickensided, shear planes throughout
	97.45	1.40	SANDSTONE, coarse/medium-grained, carbonaceous, becoming cleaner to base, poorly bedded, occasional small calcite filled fractures
	98.85	1.40	SANDSTONE, medium-grained, bedding fairly well developed occasional muddier layers, vaguely carbonaceous, abrupt

BH Nos. 38

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			below, minor calcite fractures with slickensides
	102.15	3.30	SANDSTONE, as above
	105.20	3.05	SANDSTONE, as above
	108.30	3.10	SANDSTONE, as above
	110.20	1.90	SANDSTONE, as above
20°	111.55	1.35	SANDSTONE with interbedded mudstones 50:50, sands vary from thin layers of fine sands to thicker layers of coarse sands, becoming increasingly sandy to base, sharp boundaries, abrupt below, with a conglomerate at base, minor structural disturbance
	113.60	2.05	SANDSTONE, as above
20°	117.65	4.05	SANDSTONE, carbonaceous, well defined bedding, medium-grained, occasional large worm burrows esp. at 117.3m some calcite filled joints
	120.75	3.10	SANDSTONE, as above

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 39

Contractor: Longyear

Commenced: Sept 25, 1977

Completed: Sept 26, 1977

Co-ordinates: 6,115,755.12 N
595,001.19 E
Surface Elevation: 1,479.74 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by:

Geologist	Depth
Andy Newson	11.90-40.60
	49.66-69.06
Ali Chowdry	41.56-49.26
Peter Raymond	70.76-78.99

Final Depth: 78.99

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar			
U. Gething	48.88		1,430.86

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD				
CHAMBERLAIN	48.88			1,430.86
F.PO.	26.22		Fracturing	
F.PO.	52.9-65.84		Broken, sheared, gouge at 62	

BH Nos. 39

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	11.90	11.90	CASING
	14.03	2.13	SANDSTONE, light grey, medium-grained, mottled, broken. with clay weathered zones, abrupt below (base of Bird sandstone)
	14.73	0.70	SANDSTONE, as above
	17.08	2.35	SANDSTONE, light grey, medium-grained, fairly well bedded. abrupt below.
	20.13	3.05	SANDSTONE, as above
	22.18	2.05	SANDSTONE, as above
	22.77	0.59	MUDSTONE, dark grey-black, pyritic, carbonaceous, abrupt below, , slickensides at base, 0° COM B.C.A.
	23.17	0.40	SANDSTONE, dark grey, coarse/medium-grained, carbonaceous and coaly stringers, abrupt below
	23.96	0.79	MUDSTONE, very carbonaceous, dark grey-black, pyritic, transitional below, broken
	26.22	2.26	SANDSTONE, medium-grained, carbonaceous, faintly bedded, abrupt below, broken, minor calcite filled fractures, slickensides, (at 60° to core axis, slickensides @ 0°).
	28.32	2.10	SANDSTONE, as above
	28.60	0.28	SANDSTONE, as above SHELLY EQUIVALENT
	31.20	2.60	COAL, broken and powdery, sheared at base
	31.42	0.22	SANDSTONE & INTERBEDDED MUDSTONE 70:30 Carbonaceous numerous small listric surfaces, broken and sheared, (grinding of core-core loss ?)
	32.20	0.78	SANDSTONE, as above
	32.76	0.56	COAL, bright, sheared.
	33.06	0.30	MUDSTONE, arenaceous, carbonaceous 50/50, black, becoming sandier to base
5°	34.69	1.63	SANDSTONE, medium/fine-grained, medium-dark grey, carbonaceous, minor calcite filled cracks at top, poorly-bedded, abrupt below, each unit fairly well defined, some disturbance
	35.94	1.25	SANDSTONE, as above
	37.55	1.61	MUDSTONE & INTERBEDDED FINE SILTSTONES, 50:50, minor bioturbation and disturbance, fairly well defined laminations of 0.5-1cm each, two zones of sandier content at 38.7, 0.9m. and at 40.2m., 0.6m thick, becomes very carbonaceous at base, abrupt below, broken and listric surfaces
	40.60	3.05	SANDSTONE, as above
	41.56	0.96	MUDSTONE, medium grey, silty wisps and lenses, one large fractire 60° from horizontal, broken stick
	41.78	0.22	MUDSTONE, as above, badly broken, carbonaceous in middle COAL SEAM: CHAMBERLAIN
	41.82	0.04	COAL, dull, lustrous, banded, cleated, stick
	41.85	0.03	COAL, bright banded, broken
	41.88	0.03	COAL, completely pulverized, with fragments of dull sheen coal
	42.02	0.14	COAL, dull, lustrous, banded, broken
	42.10	0.08	MUDSTONE, medium grey, silty, slightly carbonaceous, small

BH Nos.

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			banded fragments and occasional coal fragments
	42.19	0.09	COAL, dull, lustrous, banded, sheared, broken stick
	42.31	0.12	COAL, soft and mushy, highly sheared, broken stick
	42.36	0.05	COAL, dull, sheared, broken stick
	42.43	0.07	COAL, dull banded, highly sheared, very broken stick
	42.46	0.03	COAL, dull banded, highly sheared, broken stick
	42.52	0.06	COAL, as above, but broken
	42.70	0.18	CORE LOSS-COAL
	42.82	0.12	COAL, dull, lustrous, highly sheared, stick
	42.95	0.13	COAL, dull banded, sheared, very broken stick
	43.13	0.18	CORE LOSS-COAL
	43.21	0.08	COAL, dull and bright, relatively hard, listric, broken stick
	43.24	0.03	COAL, bright banded, broken stick
	43.28	0.04	COAL, dull, lustrous, with large bright band, broken stick
	43.33	0.05	COAL, dull, lustrous, cleated, ankeritic, broken
	43.35	0.02	COAL, dull and bright, relatively hard, broken
	43.85	0.50	CORE LOSS-COAL
	43.92	0.07	COAL, dull, lustrous, banded, relatively hard, very broken stick
	43.94	0.02	COAL, dull and bright, banded sheared
	43.95	0.01	COAL, dull bright with dull band in middle
	43.96	0.01	COAL, dull and bright, ankeritic, broken stick
	43.98	0.02	COAL, dull banded, ankeritic on cleats, broken stick
	43.99	0.01	COAL, bright, ankeritic on cleated surface, broken stick
	44.00	0.01	COAL, dull banded, cleated, encrusted with ankerite, broken stick
	44.03	0.03	COAL, bright mostly, slightly weathered, cleated, ankeritic, broken
	44.11	0.08	COAL, dull, lustrous, with thin bright band, sheared, cleated, ankeritic, slightly weathered, broken
	44.61	0.50	CORE LOSS-COAL
	44.66	0.05	COAL, pulverized, highly sheared, powdered
	44.69	0.03	MUDSTONE, coaly, pyritic, weathered, broken
	44.72	0.03	COAL, dull and bright, pulverized, broken
	44.76	0.04	COAL, mostly bright, broken
	44.80	0.04	CORE LOSS-COAL
	44.82	0.02	COAL, dull, dense with minor bright bands
	44.85	0.03	COAL, bright banded, sheared at base, broken stick
	44.95	0.10	COAL, dull, lustrous with bright bands, broken stick
	45.00	0.05	COAL, dull, lustrous, minor bright band, stick relatively hard, listric
	45.04	0.04	COAL, dull and bright, banded, slick
	45.07	0.03	COAL, dull, with sporadic bright bands, stick, hard
	45.35	0.28	CORE LOSS-COAL
	45.38	0.03	COAL, dull banded, lustrous, broken, listricated
	45.41	0.03	COAL, highly sheared, dull and bright, broken
	45.46	0.05	COAL, dull, lustrous, hard, listricated, broken stick
	45.51	0.05	COAL, dull banded, highly sheared, broken stick
	45.79	0.28	CORE LOSS-COAL
	45.81	0.02	COAL, fragments, dull and bright
	45.85	0.04	COAL, dull and bright, listricated, broken stick
	45.93	0.08	COAL, dull lustrous, banded with bright band in middle, listricated, relatively hard, broken stick

BH Nos. 39

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	45.95	0.02	COAL, bright, stick
	46.06	0.11	COAL, dull and bright, granular texture, calcareous, (dull bands react with hydrochloric acid)
	46.12	0.06	COAL, dull, lustrous with thin bright band
	46.16	0.04	COAL, dull and bright, dull bands calcareous, sheared, broken
	46.25	0.09	COAL, dull, lustrous, with bright bands, pyritic, broken stick, relatively hard
	46.28	0.03	COAL, dull and bright, fragmented, highly sheared
	46.35	0.07	COAL, dull, lustrous with thin bright bands, listricated
	46.42	0.07	COAL, bright banded, relatively hard, ankeritic, broken stick
	46.46	0.04	COAL, as above broken
	46.48	0.02	COAL, bright, cleated, some ankerite, broken stick
	46.50	0.02	COAL, dull band with minor bright, broken stick
	46.54	0.04	COAL, bright, heavily cleated, broken stick
	46.55	0.01	COAL, dull, rather dense, broken stick
	46.58	0.03	COAL, bright banded, cleated, encrusted with ankerite, broken
	46.62	0.04	COAL, bright banded, broken stick
	46.64	0.02	COAL, dull lustrous with bright bands
	46.69	0.05	COAL, bright banded, hard, broken stick
	46.72	0.03	COAL, fragments, sheared, probably dull and bright
	46.75	0.03	COAL, bright banded, ankerite on cleats, broken stick
	46.98	0.23	CORE LOSS-COAL
	47.17	0.19	COAL, highly sheared, pulverized, soft, pyritic, 0.06m from top, stick
	47.35	0.18	CORE LOSS-COAL
	47.38	0.03	COAL, bright banded, hard, cleated, broken stick
	47.40	0.02	COAL, dull, dense, minor bright, granular, calcareous
	47.43	0.03	COAL, bright banded, hard, broken stick
	47.48	0.05	COAL, bright, with fracture parallel to core axis, ankeritic encrusted, ? weathered
	47.59	0.11	COAL, dull with fracture as above, some pyritic ankerite, stick
	47.99	0.40	CORE LOSS-COAL
	48.02	0.03	COAL, mostly powdered, with some large fragments of dull and bright
	48.05	0.03	COAL, bright banded, listricated, broken stick
	48.10	0.05	COAL, dull, lustrous, with thin bright bands, relatively hard, broken stick
	48.16	0.06	COAL, completely sheared, powdered, stick
	48.51	0.35	CORE LOSS-COAL
	48.55	0.04	COAL, highly sheared, listricated, possibly coal and mudstone, broken stick
	48.60	0.05	MUDSTONE, black, carbonaceous, highly sheared, broken stick
	48.64	0.04	COAL, dull with minor bright, listricated, broken stick
	48.72	0.08	MUDSTONE, black, coaly, highly sheared, coal streaks, broken stick
	48.83	0.11	COAL, bright banded, stick, striated planes passing through core

BH Nos. 39

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	48.88	0.05	COAL, dull and bright, sheared, listricated, ankerite, irregular base
	49.26	0.38	SANDSTONE, medium grey, medium-grained, carbonaceous at top, mottled appearance, low-angle striation passing through core
	49.66	0.40	SANDSTONE, coarse/medium-grained, light-dark grey, carbonaceous especially at top, occasional coaly stringers abrupt below.
	52.01	2.35	SANDSTONE, as above
5°	52.91	0.90	SANDSTONE, medium-grained, light grey, clean, poorly bedded, occasional large worm burrows, broken stick with increase in calcite filled joints towards the base (high angle — 60-70° COM B.C.A.)
	55.91	3.00	SANDSTONE, as above
	57.86	1.95	SANDSTONE, as above
	58.36	0.50	SANDSTONE, as above, very broken with much calcite infilling of joints and cracks, slickensides in every direction.
5°	61.46	3.10	SANDSTONE, joints commonly 60° COM B.C.A.
	62.06	0.60	SANDSTONE, as above, fault gouge (?)
	62.36	0.30	SANDSTONE, broken
	63.27	0.91	MUDSTONE, very broken and sheared
10°	64.92	1.65	MUDSTONE & INTERBEDDED SANDS, fairly sharp contacts between units, broken, sheared a lot of calcite filled joints and cracks, slickensides and shearing, becomes less broken towards the base, abrupt below with a conglomerate
	65.84	0.92	SANDSTONE, medium-grained, light-grey, fairly well bedded, broken stick, numerous calcite-filled joints, at 60-70° COM B.C.A. dips locally up to 70-80°, broken gouge zone at 66.75 - 67.97m.
	67.36	1.52	SANDSTONE, as above
	69.06	1.70	SANDSTONE, as above
	70.76	1.70	SANDSTONE, grey, fine-to medium-grained, mottled at top. thin laminae of mudstone further down, dipping @ 20°, calcite fractures, broken stick
	71.63	0.87	SANDSTONE, as above, fragments
	72.24	0.61	SANDSTONE, as above, fragments
	72.69	0.45	SANDSTONE, as above, abundant calcite fractures, fragments
	73.03	0.34	SANDSTONE, as above, near vertical calcite fracture in last 0.23m broken stick
	73.76	0.73	SANDSTONE, as above, near vertical fracture passing through core, broken stick
	74.98	1.22	SANDSTONE, as above, abundant high angle (80-90°) calcite fractures passing along core, very broken stick
	76.98	2.00	SANDSTONE, as above, calcitic fractures, bedding near horizontal, broken stick
	78.03	1.05	SANDSTONE, as above, 80° calcitic fractures passing through core, bedding apparantly near horizontal
	78.99	0.96	SANDSTONE, as above, no fractures, broken stick

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 40

Contractor: Longyear

Commenced: Sept 26, 1977

Completed: Sept 30, 1977

Co-ordinates: 6,115,337.26 N
594,425.46 E
Surface Elevation: 1,479.65 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by:

Geologist	Depth
Andy Newson	4.15-129.27
	139.23-145.68
	150.86-178.64
	190.50-205.92
Ali Chowdry	130.20-138.03
Andy Bowler	145.94-150.21
	178.64-189.43

Final Depth: 205.92

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar	±78		1,401.65
U. Gething	~~UP 137.45~~ MP 150.96 ~~LP 189.43~~		~~1,342.20~~ 1,328.69 ~~1,290.22~~

SEAMS		DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD		±82			
CHAMBERLAIN	UP	137.45			1,342.2
	MP	150.96			1,328.69
	LP	189.43			1,290.22

F.E. 140.68
F.E. 159.51
F.E. 195-204

BH Nos. 40

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	41.15	41.15	DRIFT, with a lot of Moosebar mudstones, well consolidated.
	83.82	42.67	NO CORE (note the geophysical log shows coal at 78-82m - the Bird seam)
	86.87	3.05	SANDSTONE, medium/coarse-grained, medium grey, faintly mottled, very poorly bedded, abrupt below, coarse at base.
	88.84	1.97	SANDSTONE, as above.
25°	89.92	1.08	SANDSTONE, as above, well bedded, some broken stick with calcite infilled joints, (45° com B.C.A.) becoming medium to fine-grained below.
	92.05	2.13	SANDSTONE, as above.
	95.10	3.05	SANDSTONE, as above.
	98.30	3.20	SANDSTONE, as above
	101.50	3.20	SANDSTONE, as above, some brecciation, numerous calcite filled irregular joints, broken stick, slicks.
	102.26	0.76	AS ABOVE
	103.33	1.07	SANDSTONE, medium-grained, medium-dark grey, poorly bedded (apparently about horizontal), clean, homogenous abrupt below.
	105.15	1.82	SANDSTONE, as above.
	108.20	3.05	AS ABOVE, broken stick, some slickensides.
	111.25	3.05	AS ABOVE
	113.10	1.85	SANDSTONE, as above
	114.20	1.10	MUDSTONE, with interbedded fine siltstone, 70:30, evenly spaced variations with relatively undisturbed boundaries, some jointing (calcite filled & slick at 115.21m 116.13m brupt below.

BH Nos. 40

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	116.40	2.20	MUDSTONE, as above.
	117.17	0.77	SANDSTONE, very argillaceous 60:40, disturbed with slump structures, calcite filled shear zone 0.10 m thick at 117.04m
	118.57	1.40	SANDSTONE, argillaceous, 70:30, medium-coarse-grained fairly well bedded, zones of varying % muds throughout, abrupt below.
	120.27	1.70	SANDSTONE, argillaceous, dark grey, poorly bedded, some disturbance of bedding, some bioturbation with occasional pelecypod casts.
	122.77	2.50	SANDSTONE, as above
	123.12	0.35	MUDSTONE, silty, carbonaceous, minor coaly stringer SHELLY EQUIVALENT
	123.77	0.65	COAL, 0.04 dull, sublustrous 0.10 dull, sheared 0.24 dull, lustrous 0.04 bright 0.08 dull sublustrous
	126.17	2.40	SANDSTONE, argillaceous 60:40, interbedded disturbed on junctions, rolling, slumping; faulted below.
	126.67	0.50	SANDSTONE, as above.
	127.27	0.60	SANDSTONE, medium-grained light grey, argillaceous interbeds, sheared & slickensides fault breccia for top 0.3.m.
	129.02	1.75	MUDSTONE with interbedded fine siltstones, laminated in units of 0.5 - 1 cm., some disturbance, load structures etc., abrupt below.
	129.27	0.25	MUDSTONE, with interbedded, laminated siltstones.
	130.20	0.93	MUDSTONE, medium grey, laminated silty streaks and lenses, slightly carbonaceous to base, large striated planes 30° from horizontal, last 0.10m with sigmoidal structures.
	130.27	0.07	MUDSTONE, dark grey, carbonaceous, highly sheared, broken.

BH Nos. 40

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	130.31	0.04	SILTSTONE, coaly, black striated surfaces, sandy admixture, calcitic
			Coal seam: CHAMBERLAIN (Upper Plate).
	130.52	0.21	COAL, highly sheared, probably dull, lustrous with occasional bright bands.
	130.59	0.07	COAL, dull lustrous, minor bright bands, listricated relatively hard, stick.
	130.66	0.07	COAL, dull, sublustrous with occasional thin bands, moderately hard, sheared
	130.71	0.05	COAL, highly sheared, dull with some bright bands broken fragments
	130.76	0.05	COAL, as above, highly sheared.
	130.98	0.22	Core loss - Coal
	131.03	0.05	COAL, dull lustrous, with thin bright bands, sheared.
	131.09	0.06	COAL, fragments, dull banded, bright bands.
	131.18	0.09	COAL, dull with bright bands, listricated, broken stick.
	131.22	0.04	COAL, as above, broken stick.
	131.29	0.07	COAL, as above, broken stick.
	131.38	0.09	COAL, badly sheared, probably dull banded, broken stick.
	131.41	0.03	COAL, as above, broken.
	131.44	0.03	COAL, dull lustrous, relatively hard, calcareous, stick
	131.50	0.06	COAL, dull and bright, highly sheared, friable, broken.
	131.64	0.14	COAL, mostly dull, lustrous, listricated, highly sheared zone, 0.05m from top, broken stick.

BH Nos. 40

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	131.74	0.10	COAL, dull and bright with 1 cm. bright band, 0.02m from top, listricated, sheared, broken stick.
	131.77	0.03	MUDSTONE, black, carbonaceous, coaly intercalations, listric surfaces, broken stick.
	131.85	0.08	COAL, highly sheared, probably dull with some bright bands, broken stick.
	131.97	0.12	Core loss - Rock
	132.01	0.04	MUDSTONE, black, carbonaceous, coaly intercalations, broken stick
	132.11	0.10	COAL, dull banded with thick bright bands in middle, listricated, broken stick.
	132.16	0.05	COAL, fragmented, sheared, probably dull with some bright bands.
	132.22	0.06	COAL, dull and bright, listricated, broken
	132.32	0.10	COAL, dull, lustrous, sheared, thick bright band.
	132.36	0.04	COAL, highly sheared, probably dull lustrous, broken.
	132.49	0.13	COAL, dull lustrous with minor bright bands, sheared.
	132.55	0.06	COAL, same as above, broken.
	132.70	0.15	COAL, dull banded, lustrous, cleated, some thick bright bands, broken stick.
	132.72	0.02	COAL, dull, minor bright streaks, broken stick.
	132.76	0.04	COAL, dull and bright, sheared, broken stick.
	132.81	0.05	COAL, dull and bright, stick.
	132.83	0.02	COAL, dull, stick.
	132.87	0.04	COAL, probably dull banded, highly sheared, stick.

BH Nos. 40

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	133.00	0.13	COAL, dull lustrous, sheared, stick.
	133.15	0.15	COAL, highly sheared, probably dull lustrous, stick
	133.25	0.10	COAL, dull, banded, highly sheared, lustrous, listricated, stick.
	133.30	0.05	COAL, dull and bright, highly sheared.
	133.36	0.06	COAL, highly sheared, friable, dull with some bright bands, stick.
	133.39	0.03	COAL, highly sheared, bright banded.
	133.58	0.19	COAL, fragmented, sheared, pulverized fragments of bright bands, dull and bright.
	133.79	0.21	COAL, dull, lustrous with minor bright bands, listricated, broken stick.
	133.87	0.08	COAL, dull and bright, sheared, broken.
	133.96	0.09	COAL, dull banded, relatively hard, striated plane passing through coal.
	134.00	0.04	COAL, dull, sheared, fragmented, apparent fragments of bright coal.
	134.10	0.10	COAL, dull and bright, highly sheared, broken and fragmented, chunks of bright.
	134.27	0.17	Core loss - coal
	134.29	0.02	COAL, completely pulverized.
	134.42	0.13	COAL, highly sheared, broken, fragmented, probably dull banded and dull and bright.
	134.48	0.06	Core Loss - Coal.
	134.57	0.09	COAL, as above
	134.63	0.06	Core loss - Coal

BH Nos. 40

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	134.64	0.01	COAL, dull, sheared, broken stick.
	134.72	0.08	COAL, dull banded, highly sheared, fragments.
	134.78	0.06	Core loss - Coal
	134.92	0.14	COAL, dull banded, sheared, broken stick.
	135.09	0.17	COAL, highly sheared, listicated, possibly dull banded or dull and bright, broken stick.
	135.12	0.03	COAL, as above.
	135.19	0.07	COAL, dull with minor bright bands, sheared, broken.
	135.28	0.09	COAL, highly sheared, listricated, possibly dull and bright, broken stick.
	135.33	0.05	COAL, fragments, dull and bright, sheared.
	135.39	0.06	COAL, bright banded, bedding dipping at 60° with multiple striated planes along bedding.
	135.44	0.05	COAL, dull and bright, sheared, broken.
	135.64	0.20	COAL, highly sheared, broken, possibly dull banded and dull and bright.
	135.70	0.06	COAL, dull and bright, striated planes passing at high angles through core.
	135.73	0.03	COAL, highly sheared, fragmented, broken,bright fragments.
	135.80	0.07	COAL, highly sheared, fragmented, bright fragments (possibly bright banded or dull and bright).
	135.88	0.08	COAL, bright, sheared, friable, possibly dull and bright, broken stick.
	135.96	0.08	COAL, bright banded, sheared, but relatively hard, broken stick
	136.03	0.07	COAL, as above, broken stick

BH Nos. 40

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	136.67	0.64	Core loss - Coal
	137.07	0.40	COAL, highly sheared, pulverized and powdered, type completely indistinguishable.
	137.27	0.20	Core loss - Coal
	137.36	0.09	COAL, as above, highly pulverized, powder.
	137.45	0.09	MUDSTONE, dark grey, silty, carbonaceous, highly listricated.
	138.03	0.58	SANDSTONE, medium grey, medium-grained, polished surface at top, fractured and vuggy.
	139.23	1.20	SANDSTONE, dark to medium grey, poorly-bedded, medium-to coarse-grained, some calcite infilled joints and slicks, abrupt below.
35°	140.68	1.45	SANDSTONE, medium-grained, medium grey, fairly well bedded, calcite filled cracks & joints.
90°	143.88	3.20	SANDSTONE, as above, dip vertical, calcite filled joints, becoming carbonaceous to base.
	145.68	1.80	SANDSTONE, as above.
	145.94	0.26	Coal seam: CHAMBERLAIN (Middle Plate) Core Loss=Coal
	146.04	0.10	COAL, dull lustrous, highly sheared, fragmented occasional bright bands.
	146.11	0.07	Core loss - Coal
	146.27	0.16	Core loss - Rock
	146.45	0.18	COAL, dull lustrous, highly sheared, broken pieces.
	146.75	0.30	Core loss - Coal.
	146.77	0.02	COAL, dull, slightly shaley, calcareous, slickensided.
	146.93	0.16	COAL, dull, highly sheared, fragmented
	147.33	0.40	Core loss - Coal

BH Nos. 40

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	147.57	0.24	COAL, dull, highly sheared, broken pieces, slickensided throughout.
	147.87	0.40	Core loss - Coal
	148.17	0.20	COAL, dull, fragmented, pulverized in part, highly sheared with occasional mudstone and silty fragments (not in/situ) which are carbonaceous and scattered about in the coal.
	148.36	0.19	Core loss - Rock
	148.67	0.31	COAL, same as above
	148.89	0.22	Core loss - Coal
	149.02	0.13	COAL, dull, lustrous with occasional thin bright bands, highly sheared, broken pieces.
	149.24	0.22	Core loss - Coal
	149.36	0.12	COAL, dull, highly sheared, slightly calcareous near top, slickensided throughout.
	149.58	0.22	Core loss - Coal
	149.88	0.30	COAL, dull, highly sheared and fragmented, some small pieces containing thin bright bands, (basically a mush).
	150.00	0.12	Core loss - Coal
	150.02	0.02	MUDSTONE, light grey, soft, highly sheared.
	150.12	0.10	COAL, mush, bright, dull, highly sheared.
	150.13	0.01	MUDSTONE, light grey, soft, highly sheared.
	150.21	0.08	MUDSTONE, silty, medium grey, laminated, vertical bedding, calcite veining throughout, slickensided.
	150.86	0.65	SANDSTONE, medium-grained, lighty grey, some argillaceous interbeds, very broken, calcite filled joints, slickensides.
	150.96	0.10	COAL, broken, powdery
	151.08	0.12	SANDSTONE, medium-grained, lighty grey, poorly bedded, calcite filled joints and cracks, slickensides on shear surface, shear surfact at 50° from B.C.A.

BH Nos. 40

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	151.99	0.91	AS ABOVE, numerous calcite filled joints.
	153.54	1.55	SANDSTONE, as above
	156.50	2.96	SANDSTONE, as above
	159.51	3.01	AS ABOVE, calcite filled joints. Bedding or cross-bedding appears vertical or steeply dipping (70°-80°). Joints horizontal and at $70 - 80^{\circ}$.
	161.21	1.70	AS ABOVE, fracture surfaces with slickensides, parallel to dip and strike of fracture surface.
	162.51	1.30	SANDSTONE, medium-grained, broken stick to very broken. Carbonaceous, fragments of carbonaceous siltstone, numerous calcite infillings of cracks, much slickensiding, and shearing, some coal fragments.
	163.64	1.13	MUDSTONE, relatively homogenous, broken and sheared, abrupt below.
	165.66	2.02	SANDSTONE, fine-grained and interbedded mudstone, 70:30, disturbed, well-bedded, some slumping load structures, minor bioturbation, occasionaly calcite-filled cracks, abrupt below with strong bioturbation.
	168.70	3.04	SANDSTONE, coarse-medium grained, dark grey, fairly well-bedded, with some disturbance, some pelecypod casts, occasional calcite filled joints.
	170.30	1.60	SANDSTONE, as above.
	171.90	1.60	SANDSTONE, as above.
	171.94	0.04	SANDSTONE, as above
	172.20	0.26	SILTSTONE, argillaceous, very carbonaceous, dark grey to black, abrupt below.
	172.60	0.40	SHELLY EQUIVALENT COAL, dull with bright bands, .13m., dull, lustrous .0.10m. dull, sheared
	172.80	0.20	MUDSTONE, with minor sands, bound by listric surfaces, shearing throughout.

BH Nos. 40

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	173.24	0.44	COAL, dull with bright bands, broken and powdery.
	173.46	0.22	SANDSTONE, argillaceous, carbonaceous, dirty, very broken, large vertical fractures, some slickensides coarse- medium-grained.
	174.99	1.53	SANDSTONE, finely interbedded mudstones, well-bedded in 0.5 - 1 cm. units, slightly disturbed by loading and slumping, transitional below.
	176.49	1.50	AS ABOVE.
	177.94	1.45	MUDSTONE, with finely interbedded fine siltstones, laminated in 0.5 - 1 cm. layers, consistant bedding, approx. horiz, numerous listric surfaces.
	178.44	0.50	AS ABOVE
	178.50	0.06	MUDSTONE, dark grey to black, homogenous, sheared with numerous listric surfaces.
			Coal Seam: CHAMBERLAIN (Lower Plate)
	178.64	0.14	Core Loss - Coal
	178.74	0.10	Core Loss - Rock
	178.80	0.06	MUDSTONE, silty, hard, highly carbonaceous, also thin bright coal layers, 45° inclined, slickensided roof and floor.
	179.17	0.37	COAL, dull lustrous, highly sheared, inclined roof, occasional thin bright coal bands, slickensided throughout, broken stick.
	179.34	0.17	COAL, dull banded, sheared, fragmented, slickensided.
	179.72	0.38	COAL, dull with thin bright bands, sheared, slickensided throughout, fragmented.
	180.42	0.70	COAL, dull with occasional thin bright bands, variable angles, sheared and slickensided throughout, broken stick .
	180.63	0.21	COAL, dull with occasional thin bright bands, sheared and slickensided.

BH Nos. 40

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	180.82	0.19	COAL, dull with occasional thin bright bands, sheared and slickensided.
	180.83	0.01	COAL, dull,shaley, calcareous, granular.
	181.07	0.24	COAL, dull, highly sheared and slickensided.
	181.69	0.62	COAL, dull, sheared, predominant shear planes at 45°, slickensided throughout and a 0.01mgranular calcareous band 0.09mfrom base.
	181.70	0.01	COAL, dull, granular,calcareous, probably inferior.
	182.15	0.45	Core Loss - Coal
	182.17	0.02	COAL, dull, granular, hard, probably inferior, slickensided top.
	182.75	0.58	COAL, dull, highly sheared, slickensided, soft at top.
	183.47	0.72	COAL, probably mainly dull, highly sheared and slickensided throughout, occasional thin bright bands, mainly in stick form.
	183.58	0.11	COAL, dull, sheared, slickensided, thin calcareous bands near base, stick.
	183.96	0.38	Core Loss - Coal
	183.97	0.01	COAL, dull, hard,granular, calcareous.
	184.47	0.50	COAL, dull with occasional bright bands, highly sheared and slickensided, mainly stick.
	184.78	0.31	COAL, dull, sheared with a few bright bands, stick.
	184.81	0.03	COAL, dull, shaley, very hard, probably high ash, contains bright coal streaks, slickensided top and bottom at 45° to Core axis.
	184.87	0.06	MUDSTONE, hard, carbonaceous, silty, dark grey to black, broken stick.

BH Nos. 40

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	184.89	0.02	MUDSTONE, silty, very hard, dark grey, carbonaceous slightly calcareous.
	184.97	0.08	COAL, dull, highly sheared, thin bright bands, broken stick.
	185.08	0.11	COAL, sheared (highly), dull, occasional bright bands, friable, stick..
	185.36	0.28	COAL, dull banded, fractures 30° to core axis, sheared, hard, stick, regular streaks of bright coal.
	185.37	0.01	COAL, bright, stick,
	185.40	0.03	COAL, dull banded, stick,
	185.51	0.11	COAL, dull, sheared, minor bright streaks.
	185.66	0.15	COAL, dull banded, hard, bright streaks, slightly sheared, stick.
	185.69	0.03	COAL, dull banded, more sheared and softer than the above, stick.
	185.84	0.15	COAL, dull, lustrous, banded, slightly sheared, shear planes at 45° to core axis, stick.
	185.87	0.03	COAL, bright, highly cleated, parallel to core axis.
	185.91	0.04	COAL, dominantly dull with minor bright bands. shear plane at 45° to core axis.
	185.96	0.05	COAL, heavily sheared, predominantly bright.
	186.18	0.22	COAL, dull banded, slightly sheared & slickensided, major shear planes at 45° to core axis, stick.
	186.28	0.10	COAL, highly sheared, fragmented, slickensided, dull and bright.
	186.52	0.24	Core Loss - Coal.
	186.55	0.03	COAL, dull, lustrous, sheared, slickensided.

BH Nos. 40

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	186.71	0.16	COAL, dull, lustrous, sheared with occasional bright bands, stick.
	186.72	0.01	COAL, bright.
	186.84	0.12	COAL, dull banded, sheared,broken stick.
	186.91	0.07	COAL, bright banded, sheared, fragmented.
	187.15	0.24	Core Loss - Coal
	187.20	0.05	COAL, dull lustrous with occasional bright bands, stick.
	187.22	0.02	COAL, bright sheared.
	187.37	0.15	COAL, dull, lustrous, banded, sheared, stick.
	187.43	0.06	COAL, dull with thin bright, sheared, stick.
	187.50	0.07	COAL, dull, lustrous, highly sheared, stick.
	187.53	0.03	COAL, dull, lustrous, highly sheared, fragments.
	187.55	0.02	COAL, dull bright, sheared, slightly calcareous.
	187.79	0.24	Core Loss - Coal
	187.86	0.07	COAL, dull, hard,stick.
	187.89	0.03	COAL, dull banded, sheared, slickensided, fragmented.
	187.95	0.06	COAL, dull, lustrous, highly sheared, broken stick.
	188.11	0.16	COAL, dull, bright bands, highly sheared, slickensided.
	188.13	0.02	COAL, dull, hard,granular, slightly calcareous.
	188.22	0.09	COAL, dull, lustrous, sheared with bright bands, slickensided.
	188.26	0.04	COAL, dull, hard.
	188.31	0.05	COAL, dull, lustrous.

BH Nos. 40

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	188.41	0.10	COAL, dull with bright bands, fragmented, sheared.
	188.64	0.23	Core Loss - Coal
	188.68	0.04	COAL, dull with bright bands, sheared.
	188.85	0.17	COAL, highly sheared, mush, slickensided, dull.
	189.08	0.23	MUDSTONE, highly sheared, slickensided, carbonaceous, black to dark grey with thin bright coal bands.
	189.16	0.08	COAL, duff - pulverized, sooty, slightly clayey.
	189.28	0.12	COAL, dull, lustrous, banded, hard, stick, sheared, high angle slickensided shear planes.
	189.36	0.08	COAL, dull and bright - 45° floor, stick.
	189.43	0.07	Core Loss - Coal
	190.50	1.07	SANDSTONE, coarse, medium-grained, dark grey to black, carbonaceous, broken stick, poorly bedded, transitional below, some minor calcite jointing.
	190.90	0.40	SANDSTONE, as above.
	192.02	1.12	SANDSTONE, medium-grained, dark grey fairly well-bedded, calcite filled cracks, some joints with minor slickensides, occasional worm burrows, cross bedding at 45°.
	193.55	1.53	AS ABOVE
	195.07	1.52	AS ABOVE, zone of intense calcite filled cracks, broken stick.
	196.60	1.53	AS ABOVE
	198.12	1.52	AS ABOVE
	199.64	1.52	AS ABOVE
	201.17	1.53	AS ABOVE, some calcite infilling of joints.
	202.69	1.52	AS ABOVE, much calcite infilling of cracks and joints, at 200.86 zone of intense cracking with slickensides.

BH Nos.40

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	204.22	1.53	AS ABOVE, calcite-filled joints up to 2 cm. wide, with slickensides parallel to dip and strike of joint which is 45 - 50°, 203-203.3 m. zone of intense cracking with calcite infilling.
	205.92	1.70	AS ABOVE

BP COAL
CANADA

AREA SUKUNKA B. H. No. BP 41

Contractor: Tonto

Commenced: Sept 24, 1977

Completed: Sept 26, 1977

Co-ordinates: 6,115,490.34 N
594,678.19 E
Surface Elevation: 1,444.51 m

Core Size: HQ

Casing Left in Hole: m

Hole Angle: } No Information
Hole Azimuth: }

Logged by:

Geologist	Depth
Andy Newson	26.68-58.62
	65.57-97.22
Ali Chowdry	59.03-64.87

Final Depth: 97.22

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
Boulder Creek			
Hulcross			
Gates			
Sukunka			
Moosebar			
U. Gething	64.35		1,380.16

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
BIRD				
CHAMBERLAIN	64.35			1,380.16
F.PR.	80.70		Breccia	

BH Nos. 41

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	26.68	26.68	Casing
	28.18	1.50	SANDSTONE, very broken with clay and pebbles mixed in.
	31.08	2.90	SANDSTONE, light-dark grey, medium/coarse-grained, broken stick with some weathered bands, mottled, transitional below (Bird Sandstone).
	31.58	0.50	SANDSTONE, as above, coarse-grained.
5	34.11	2.53	SANDSTONE, light-grey, medium-grained, clean, poorly-bedded, abrupt below.
	35.01	0.90	SANDSTONE, as above.
	37.11	2.10	SANDSTONE, light-grey, medium-grained, clean, poorly-bedded, transitional below.
	40.07	2.96	SANDSTONE, as above.
	43.32	3.25	SANDSTONE, as above.
	44.60	1.28	SANDSTONE, as above.
	46.20	1.60	MUDSTONE, silty, with occassional fine sandstone layers, carbonaceous, minor bioturbation, abrupt below.
	46.70	0.50	SANDSTONE, medium-grained, poorly-bedded.
	47.20	0.50	SANDSTONE, medium-grained, light-grey, poorly-bedded, abrupt below.
	49.00	1.80	MUDSTONE, silty with fine sand interbeds 60:40, poorly-defined, carbonaceous, some disturbance.
	50.00	1.00	SANDSTONE, argillaceous 50:50, poorly-bedded, becoming sandier at base, patchily carbonaceous, some minor disturbance.
	53.10	3.10	SANDSTONE, as above.
	53.70	0.60	SANDSTONE, as above.
	54.00	0.30	SILTSTONE, argillaceous, carbonaceous, abrupt below.
	54.24	0.24	SHELLEY EQUIVALENT COAL SEAM: 0.10 - Dull with bright bands, 3-4mm thick. 0.04 - Dull sub-lustrous. 0.10 - Dull with bright bands, 1-2mm thick.
	54.45	0.21	MUDSTONE, dark grey-black, carbonaceous, listric surfaces at top and base.
	54.57	0.12	COAL, very broken and powdery, dull, sheared.

BH Nos.

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	55.47	0.90	SANDSTONE, argillaceous and carbonaceous, disturbed with some rolling and slumping, erosional below. Becoming sandier to base.
	55.68	0.21	MUDSTONE, light-medium grey, disturbed with rolling and slump structures.
	55.90	0.22	MUDSTONE, as above.
5	56.60	0.70	SANDSTONE with argillaceous interbeds 70:30, fairly well-bedded, becoming muddier towards base, transitional below.
	58.54	1.94	MUDSTONE, siltstone interbeds, laminated in 1-2cm units.
	58.62	0.08	MUDSTONE, as above.
	59.03	0.41	MUDSTONE, medium-grey, streaks and layers of silt, occasionally laminated, patchily calcareous.
	59.19	0.14	MUDSTONE, dark-grey, silty, laminated, listricated at low angles to core axis, broken up base.
	59.25	0.06	MUDSTONE, dark-grey, silty, slightly carbonaceous with brownish streaks, listric surfaces parellel to bedding. COAL SEAM CHAMBERLAIN, roof contact with Coal separated.
	59.30	0.05	COAL, dull, lustrous with bright bands, 2-3mm fusain, ankeritic encrustation, highly listricated, broken.
	59.42	0.12	COAL, dull, lustrous, highly cleated, sheared, 3 directions of polished surfaces passing through the coal stick.
	59.47	0.05	COAL, as above.
	59.51	0.04	COAL, bright, cleated parallel to core axis.
	59.52	0.01	COAL, pulverized, powdered, few bright specks.
	59.53	0.01	COAL, dull, listricated perpendicular to core axis.
	59.60	0.07	COAL, dull and banded, 2-3mm bright band in middle.
	59.65	0.05	COAL, dull banded, listricated, hard, stick, broken.
	59.69	0.04	COAL, dull, lustrous, with dull thin bands.

BH Nos. 41

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	59.71	0.02	COAL, dull and bright, highly listricated, relatively hard, broken stick.
	59.82	0.11	COAL, dull, lustrous with bright bands, relatively hard, bright, cleated, stick.
	59.89	0.07	COAL, dull, lustrous with large bright bands (30% bright), large polished surfaces, broken stick.
	59.92	0.03	COAL, as above, stick.
	59.94	0.02	COAL, dull and bright, broken, pieces, large striated surfaces passing through core.
	59.97	0.03	COAL, dull banded, sheared, ankerite, broken stick.
	60.01	0.04	COAL, dull banded, lustrous, broken stick.
	60.04	0.03	COAL, dull and bright, broken stick.
	60.06	0.02	COAL, bright, ankerite on cleats.
	60.12	0.06	COAL, dull and bright, listricated,stick with few broken.
	60.14	0.02	COAL, bright banded, stick.
	60.19	0.05	COAL, dull banded, highly sheared, listricated, relatively hard, broken stick.
	60.23	0.04	COAL, dull banded, highly listricated, striated surfaces passing through core in various directions.
	60.44	0.21	COAL, dull banded, lustrous, relatively hard, large striated, planes passing through core at 30°, broken stick.
	60.46	0.02	COAL, bright banded, broken stick.
	60.47	0.01	COAL, bright, broken stick.
	60.52	0.05	COAL, dull banded with bright band in middle, highly cleated, ankerite on cleats parallel to axis, weathered appearance, stick.
	60.56	0.04	COAL, mostly powdered, some fragments of dull and bright with ankerite, similar appearance to above.
	60.68	0.12	CORE LOSS-COAL.
	60.71	0.03	MUDSTONE, coaly, listricated, stick.
	60.75	0.04	COAL, highly sheared, pulverised.

BH Nos. 41

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	60.79	0.04	CORE LOSS-COAL.
	60.84	0.05	COAL, dull, highly sheared, friable, stick.
	60.85	0.01	COAL, dull, very hard, dense, stick.
	60.97	0.12	COAL, dull and bright, highly sheared, large bands of dull and bright, stick.
	61.03	0.06	COAL, dull, lustrous, with minor bright bands, stick.
	61.25	0.22	COAL, as above, highly sheared, relatively hard .09mm from bottom , stick.
	61.39	0.14	COAL, dull with bright band, highly sheared, cleat directions with ankerite encrustation, broken.
	61.46	0.07	COAL, dull banded, with striated surfaces, quite hard, stick.
	61.54	0.08	COAL, lustrous, banded, as above..
	61.56	0.02	COAL, dull, highly sheared, broken
	61.61	0.05	CORE LOSS-COAL.
	61.66	0.05	COAL, dull, lustrous, with minor bright bands, listric surfaces, stick.
	61.69	0.03	COAL, dull and bright, highly sheared, some fusinite at base, broken.
	61.75	0.06	COAL, lustrous, dull banded, quite hard, stick.
	61.83	0.08	COAL, bright banded, three sets of striation directions, broken stick.
	61.85	0.02	COAL, dull, dense band with bright bands (25%).
	61.90	0.05	COAL, mostly bright, some dull bands, highly sheared, friable, broken stick.
	61.96	0.06	COAL, dull and bright, sheared especially in lower part, stick.
	62.01	0.05	COAL, dull with large bright bands, broken stick.
	62.11	0.10	COAL, dull lustrous, with minor bright streaks, large striated surfaces, one at 60° to core axis, stick.

BH Nos. 41

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	62.14	0.03	COAL, dull, lustrous with minor bright bands, broken.
	62.18	0.04	CORE LOSS-COAL.
	62.24	0.06	COAL, dull banded, broken, stick.
	62.34	0.10	COAL, dull, lustrous, with thin bright streaks, broken stick.
	62.37	0.03	COAL, dull, hard, dense with bright bands.
	62.45	0.08	COAL, dull, lustrous with some bright bands, striation planes, stick.
	62.46	0.01	COAL, bright banded, broken,
	62.56	0.10	COAL, dull and bright alternately banded (3-4mm), cleated, ankeritic on cleats, broken stick, friable.
	62.65	0.09	COAL, dull lustrous, with occasional think bright band, ankeritic, quite hard, stick.
	62.70	0.05	COAL, dull banded, with 3mm bright band at top, striation planes, passing through the core, stick.
	62.71	0.01	COAL, bright broken, sheared, ankeritic.
	62.76	0.05	COAL, bright banded, striation planes, moderately friable, ankeritic, broken stick.
	62.78	0.02	COAL, broken, powdered, mostly bright fragments.
	62.81	0.03	COAL, dull and bright, highly sheared, friable broken stick.
	62.88	0.07	COAL, dull, dense, hard, striation planes, stick.
	62.91	0.03	COAL, dull with thick bright bands at top and bottom (40%) thin streak of bright within, broken stick.
	62.95	0.04	COAL, dull and bright, sheared, ankeritic, broken stick.
	62.98	0.03	COAL, as above, highly sheared, broken stick.
	62.99	0.01	COAL, bright, stick.
	63.06	0.07	COAL, dull banded, lustrous, large striated planes, broken stick.
	63.11	0.05	COAL, dull and bright with large bright bands up to 5mm, broken stick.

BH Nos. 41

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	63.14	0.03	COAL, dull and bright as above, more friable.
	63.19	0.05	COAL, dull banded, broken stick.
	63.23	0.04	COAL, dull and bright, broken stick
	63.32	0.09	COAL, dull banded, ankerite on cleats.
	63.34	0.02	COAL, dark and bright, stick.
	63.42	0.08	COAL, bright, highly sheared, friable, broken stick.
	63.48	0.06	COAL, dull and bright, highly sheared, listric surfaces, broken stick.
	63.52	0.04	COAL, as above, highly sheared, broken stick.
	63.56	0.04	COAL, dull banded, highly sheared, broken stick.
	63.63	0.07	COAL, broken, highly sheared, fragments of dull banded.
	63.83	0.20	CORE LOSS-COAL.
	63.87	0.04	COAL, highly sheared, listricated, very friable,broken stick.
	63.98	0.11	COAL, completely pulverized and powdered.
	64.02	0.04	COAL, highly sheared, stick.
	64.17	0.15	COAL, completely powder,pulverized, with occassional specks of bright.
	64.34	0.17	CORE LOSS-COAL.
	64.35	.01	MUDSTONE, carbonaceous, coaly, listric surfaces.
	64.87	0.52	SANDSTONE, medium grey, medium-grained, mottled appearance, carbonaceous at top, numerous fractures nearly parallel to bedding, base broken with heavily striated surfaces parallel to core axis.
	65.57	0.70	SANDSTONE, corase-medium-grained, carbonaceous, poorly-bedded, some minor calcite infillings, transitional.
	68.37	2.80	SANDSTONE, medium grey, medium-grained, occasional worm burrows, poorly-bedded, abrupt below, occasional minor joints with calcite infilling (70-80°Com. B.C.A.).
	68.57	0.20	SANDSTONE, as above.

BH Nos. 41

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	71.50	2.93	SANDSTONE, medium grey, medium-grained, occassional worm burrows, poorly-bedded, abrupt below, occassional minor joints with calcite infilling (70-80°Com.B.C.A.).
	74.50	3.00	SANDSTONE, as above.
	74.96	0.46	SANDSTONE, with mudstone interbeds.
	77.66	2.70	SANDSTONE, with mudstone interbeds,60:40,sands becoming coarser and much more predominant towards base, sharp junctions, very little bioturbation, abrupt below with 4cm conglomerate.
5°	80.70	3.04	SANDSTONE, medium-grained, light grey, poorly-bedded, with some minor argillaceous layers at top. Basal 5cm with minor intraclasts of argillaceous material, fault breccia (3-4cm) and calcite veining at 89.92m, abrupt below.
	83.74	3.04	As above
	86.79	3.05	As Above
	89.84	3.05	As above
	92.24	2.40	As above
	92.92	0.68	SANDSTONE, with irregularly interbedded mudstones, 70:30,generally sharp contacts, some bioturbation and disturbance, occassional worm burrows, occassional layers of mudstone intraclasts, sands generally clean and sorted.
	95.97	3.05	As above
	97.22	1.25	As above

SUKUNKA-BULLMOOSE

Borehole Summary

Structural Data

B.H. No. T-20 Surface Elevation 1,813.56 m AMSL

Hole Angle
Azimuth

FORMATION	DEPTH	THICKNESS (m)	ELEVATION
Boulder Creek	82.60		1,730.96
Bulcross	185.01	102.41	1,628.55
Gates	383.13	198.12	1,430.43
Sukunka	518.16	135.03	1,295.40
Moosebar	591.92	73.76	1,221.64
U. Gething	652.12	60.2	1,161.44
Total Depth	654.71		1,158.85

SEAMS	DEPTH	ELEVATION	REMARKS
Bird	594.36	1,219.0	
Skeeter	640.38	1,173.18	
Chamberlain	652.12	1,161.44	

STRUCTURE

	DEPTH	ELEV.	REMARKS
F.PR.	624.08	1,189.48	

BH Nos. T20 (relog)

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	7.62	7.62	OVERBURDEN
8°	10.36	2.74	SANDSTONE: very fine-grained, grading to siltstone, argillaceous, sporadic rootlets, vague laminations, gradational to more defined laminations below.
	11.58	1.22	SANDSTONE: very fine-grained, regular small-scale cross-lamination, thin argillaceous bands, occasional lenses of coarser sand, gradational.
	16.91	5.33	SANDSTONE: dominantly medium-grained, clean, well-sorted, occasional coarse sandstone bands, large-scale cross-laminations, quartze to cherty.
	28.65	11.74	CONGLOMERATE: pebbles on average .005m, coarse rock fragments, cherts well rounded to sub-rounded, coarse sandy matrix, occasional bands of ferruginous pebbles and coal fragments, 22.25m-26.57m dominantly very fine sands with small cross-laminations and muddy intraclasts, calcareous clean sandstone, conglomerate contact abrupt.
	31.39	2.74	SHALES: dark grey to black, slightly carbonaceous, badly broken, silty below, gradational.
10°	32.91	1.52	SANDSTONE: very fine-grained to silty, slightly ferruginous, small-scale wavy cross-lamination, strongly calcareous, occasional fine sands, argillaceous, gradational, middle 0.76m silty mudstones.
	35.05	2.14	MUDSTONE/SILTSTONE: very carbonaceous, passing below to argillaceous, homogeneous silts with abundant rootlets, gradational.
	46.02	10.97	SANDSTONE: dominantly fine-grained, rapidly changing lithology of sands and argillaceous content, ripple and lensoid bedding, small-scale erosional features and slumping, strongly calcareous, 41.45m-44.04m dominantly muddy, 44.05m-46.02m light grey clean sands, fine-to medium-grained with granular layers, abrupt below.
9°	56.99	10.97	MUDSTONE/SILTY MUDSTONE: upper and lower third dark grey to black carbonaceous mudstone with stringers of coal, middle medium grey and richly silty, sporadic ripple lamination, gradational
	65.53	8.54	SANDSTONE: very fine-grained, light to dark grey, rapidly alternating lithology of sands, silts and argillaceous content, ubiquitous small-scale ripples, angular silty/shaly intraclasts, finely macerated carbonaceous material, sparingly burrowed, gradational, bioturbated.

BH Nos. T20

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	68.27	2.74	SANDSTONE: fine-grained, dominantly quarzose, upper part frequent argillaceous laminations, locally small-scale laminations and cross-laminations, minor ferruginous banding, weakly calcareous, transitional below.
	72.39	4.12	SANDSTONE/CONGLOMERATE: sands dominantly medium- grained, locally granular, very clean quartzose large-scale cross-lamination, well-sorted, bottom 1.52m conglomerate with pebbles averaging 0.05m of cherts, quartzites & low grade metamorphics, abrupt below.
12°	83.36	10.97	SANDSTONE: very fine-to fine-grained, generally clean with regular parallel to low-angle cross-lamination, small intervals with shale intercalations, top and bottom boundaries erosional, gradational.
8° 7° 5° 5° 3°	184.70	101.34	SILTSTONE/MUDSTONE: rapidly interbedded sequence of silts, muds and very fine sands, characterised by: 1. small-scale well defined ripple cross-lamination, 2. highly erosional mutual boundaries, 3. vertical and horizontal burrows, 4. numerous bentonitic bands, 5. conglomerate band at base, occasional slump structures, bentonitic bands at 115.82m-116.28m, 118.56m-118.78m, 131.21-131.36m, 166.57m-155.44m, 164.43m-164.74m.
	185.01	0.31	CONGLOMERATE: medium sized pebbles, dominantly dark, set in sandy/muddy matrix, erosional below.
	187.14	2.13	MUDSTONE: slightly carbonaceous with plant remains on bedding surface, bottom 0.30m very silty, calcareous, gradational.
	187.60	0.46	SANDSTONE: fine-grained, light grey, irregularly laminated, small-scale ripples, argillaceous with silty layers, calcareous, abrupt below.
	188.51	0.91	COAL: dominantly clarain, abrupt below.
5°	195.37	6.86	SANDSTONE: upper 0.76m mudstone, carbonaceous with small silty intercalations, gradational below to very fine-grained sands, abundantly cross-laminated and with small-scale ripples, scoured surfaces, sporadic burrowing, frequently interbedded with silty shaly layers (some carbonaceous), strongly calcareous, some ripple-drift cross-lamination, gradational below, fracture(75°)at 192.02m and 191.56m.
	195.68	0.31	MUDSTONE: slightly carbonaceous with abundant plant remains, listric surfaces.

BH Nos. T20

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	198.42	2.74	COAL/MUDSTONE: Coal, durain 0.60m Mudstone 0.39m Coal/Mudstone 0.45m Mudstone, carbonaceous 0.48m Coal, durain 0.67m Mudstone 0.30m Base of coal seam abrupt.
	198.88	0.46	SANDSTONE: fine-grained, light grey, homogeneous, 0.06m of dirty coal in middle, upper half calcareous, abrupt.
	201.16	2.28	MUDSTONE: dark grey to black, initial 0.91m locally ferruginous, 0.15m sandy layer at 200.25m, richly silty, vaguely laminated, partly bioturbated, strongly calcareous, gradational, slightly carbonaceous locally.
	201.93	0.77	SANDSTONE/SILTSTONE: interbedded with very fine argillaceous sands and argillaceous silts, vaguely laminated, strongly calcareous, gradational.
	202.53	0.60	MUDSTONE: fragmented, little or no silts, gradational.
3°	204.36	1.83	SANDSTONE/SILTSTONE: alternating bands of very fine-grained argillaceous sands and silts with mutual gradations, sporadic small-scale cross-lamination, burrows, gradational, patchily calcareous.
	205.43	1.07	MUDSTONE: silty, locally differentiating into silts, largely ferruginous, patchily calcareous where silty, gradational.
	207.11	1.68	SANDSTONE/MUDSTONE: interbedded fine sands, strongly calcareous, with silty muds, gradational.
	209.70	2.59	MUDSTONE: medium grey, sparingly silty, basal .3m richly carbonaceous and coaly.
	210.92	1.22	SANDSTONE/MUDSTONE: light grey, fine-grained sand, cross-laminated, muds very silty, occasional large burrows, some slightly carbonaceous layers, calcareous, gradational
5°	215.64	4.72	SILTSTONE: medium grey, occasionally brownish grey, irregularly laminated and cross-laminated, locally rusty, gradational.
	222.65	7.01	SANDSTONE: light grey, dominantly medium-grained (top 3.04m fine to medium-grained), generally very clean, well-sorted, fairly rounded, patchily cross-bedded (large-scale bands of sand with coaly stringers emphasizing lamination, occasional mud clasts, quartzitic, ½ are lithic, grains strongly calcareous, erosional.

BH Nos. T20

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	223.11	0.46	SILTSTONE: dark grey, argillaceous, vaguely laminated, abrupt below.
	224.18	1.07	SANDSTONE: fine-grained, medium grey, argillaceous, faint ripple lamination, abrupt below.
	224.63	0.45	SANDSTONE: light grey, fine-grained, calcareous, clean, one large slump structure, abrupt below.
	226.46	1.83	SANDSTONE/SILTSTONE: sands very fine-grained, medium to dark grey, some fine horizontal lamination, occasionally rippled, micro-erosional contacts, large vertical burrows, basal 0.91m mainly silts, slightly sandy, abrupt.
6°	234.08	7.62	SANDSTONE: medium-grained, light grey, massive, several intervals of fine-grained sand interspersed with thin silty argillaceous layer, small-scale ripples, sands clean, well-sorted, strongly calcareous, gradational below.
	238.65	4.57	SANDSTONE: fine-grained, frequent intercalations of argillaceous silty layers giving broadly banded appearance, occasional burrows, medium sands at base (richly calcareous), gradational below.
	243.23	4.58	MUDSTONE: medium grey, silty layers, local ferruginous nodules, gradational.
	244.75	1.52	SILTSTONE: medium grey, richly argillaceous, numerous fine-grained, well-laminated sands, abundance of large and pin prick burrows, semblance of bioturbation.
5°	250.08	5.33	SANDSTONE: fine-to very fine-grained, light to medium grey, regularly laminated, low-angle cross-bedding, ripple-laminations, top 1.22m richly argillaceous with large burrows (one burrow 0.45m long and 0.012m wide), many small burrows typical of marine intertidal environment, lower sands clean, well-sorted, locally weakly calcareous, basal 1.82m numerous shale bands, passage below by inter-bedding.
	251.15	1.07	SILTSTONE: medium to medium grey, argillaceous, structurless, gradational.
	255.42	4.27	MUDSTONE: dark grey to black, carbonaceous, thin coaly intervals, rest slightly silty with numerous ferruginous bands, gradational (N.B. 0.09m of conglomerate at 251.46m, pebbles under 0.012m set in muddy matrix, one pebble of quartzite 0.09m x 0.076m)
	256.94	1.52	SILTSTONE/SANDSTONE: top half richly argillaceous, sandy

BH Nos. T20

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			and ferruginous, numerous burrows with slump structures, rest very fine-grained, light grey, richly calcareous sandstone, gradational, structures similar to above.
	259.08	2.14	MUDSTONE: black carbonaceous, no lamination, gradational.
	259.99	0.91	COAL: claro-durain and durain.
	262.58	2.59	MUDSTONE: black, richly carbonaceous with coaly stringers.
	263.04	0.46	COAL: dull and shaly.
	263.49	0.45	MUDSTONE: black, richly carbonaceous with coaly stringers.
	264.87	1.38	COAL: hard with mudstones.
	266.39	1.52	COAL: sampled.
5°	269.44	3.05	SANDSTONE/SILTSTONE: alternating sequence of very fine-grained, highly argillaceous, irregularly laminated sands and argillaceous siltstones, patchily calcareous, gradual.
	270.41	0.97	COAL: clarain and durain.
	270.72	0.31	MUDSTONE: black with coaly intercalations, gradational.
	275.53	4.81	SANDSTONE/MUDSTONE 50:50: cyclic sequence of fine to very fine sands, irregularly laminated, argillaceous, strongly calcareous, mudstones medium grey, slightly silty, passage from sands to muds characterised by a narrow silty band, gradational.
	280.41	4.88	MUDSTONE: slightly silty, structureless, band of ferruginous silty mudstone at 279.50m-280.17m, basal 0.60m carbonaceous.
	282.39	1.98	COAL: sampled.
	282.94	0.55	SILTSTONE: highly muddy, gradational.
	283.76	0.82	SANDSTONE: fine-grained, well-laminated, bottom 0.15m granular and abrupt.
	285.44	1.68	MUDSTONE: black with numerous coaly intercalations, bottom 0.15m very silty and slightly ferruginous, gradational.
	286.81	1.37	SANDSTONE: dominantly fine-grained, initial 0.45m very fine-grained with abundant argillaceous and silty laminations, small-scale erosional features, 0.45m mudstone at 285.90m with large vertical burrow, abrupt below.

BH Nos. T20

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
5°	292.91	6.10	MUDSTONE: initial 0.60m very silty, slightly ferruginous and calcareous, several ferruginous bands 0.12m - 0.24m thick, rest of mudstone medium to dark grey with listric surfaces, bottom 0.60m shaley coal with mud bands, abrupt below.
	308.91	16.00	CONGLOMERATE: multicoloured pebbles of cherts, quartzites, low grade metamorphics, with some siltstones and sandstones, pebbles usually less than 0.025m, commonly less than 0.003m, matrix very fine to granular sands, abrupt below. (Core missing 301.14m-307.23m, 3.04m missing between these depths).
	330.40	21.49	SANDSTONE: light grey, fine-grained, very uniform, very clean, well-sorted, mostly devoid of lamination, initial 2.13m with granular bands, quartzose, bottom 1.02m with granular layers, abrupt below (grit layer of 0.06m near contact)
	331.07	0.67	COAL: mostly durain.
10°	335.43	4.36	SANDSTONE: medium grey, very fine-grained but abundantly argillaceous, silty and shaley lamination, numerous muddy intervals, some ripple-drift cross-lamination in 0.60m of calcareous brown grey sands, very gradational.
	337.10	1.67	MUDSTONE: black, very carbonaceous with coaly intercalations, pyritic, erosional below.
	346.55	9.45	CONGLOMERATES: multicoloured, granular to pebble, pebbles commonly less than 0.006m, basal 2.43m dominantly granular.
10°	358.29	11.74	SANDSTONE: fine-grained, very clean, well-sorted, faintly cross-laminated, many bioturbated zones, dominantly quartzose, two stylolites, lower 0.30m distinctly burrowed, abrupt below.
	363.62	5.33	CONGLOMERATE: granular to pebble, few thin shaley bands, abrupt below.
	384.96	21.34	SANDSTONE: fine-grained, uniform, clean, well-sorted, strongly calcareous, large-scale cross-lamination, many intervals homogenized by bioturbation, light grey, passage below by interbedding.
30° 50° 40° 30°	513.58	128.62	SANDSTONE/MUDSTONE/SILTSTONE: rapidly alternating layers of sands, silts and muds, passage by transition or abrupt and erosional, many small-scale cross-laminations, ripple laminations, flame structures, abundant large and small burrows, distinctive lithological variations at: 1) 448.05m-448.97m argillaceous glauconitic sands and silts, marker

BH Nos. T20

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			2) 448.66m-463.90m dominantly sandy with minor silty shales, strongly calcareous.
	587.59	74.01	MUDSTONE: medium to dark grey, little or no silts, mostly lacking sedimentary structures, from 563.88m-587.95m, 8 ferruginous bands ranging from 0.09-0.24m, impossible to get B.C.A. as no lithological variation.
	588.87	1.28	SANDSTONE: fine to medium-grained, dark grey to black with black argillaceous matrix, glauconitic?, widely dispersed granular material with occasional 0.006m pebbles, gradational below.
	591.92	3.05	SANDSTONE: fine-grained, light to medium grey, lacking laminations, clean, well-sorted, feebly calcareous, abrupt below.
	594.66	2.74	COAL: sampled.
6°	601.98	7.32	SANDSTONE: medium grey, medium-grained, clean, well-sorted large-scale cross-bedding, dominantly cherty, bottom 0.30m mudstone, gradational.
6°	611.42	9.44	SANDSTONE: light to medium grey, very uniform, clean, well-sorted, faint large-scale cross-lamination, richly calcareous, abrupt below.
	612.95	1.53	MUDSTONE: medium grey, middle interval very silty, bottom 0.60m slumped, strongly calcareous throughout, gradational below.
	615.63	2.68	SANDSTONE: light-medium grey , very fine-to medium-grained, lower 1.52m very argillaceous, sporadic burrows and shale clasts, upper 1.52m strongly calcareous, gradational below.
	616.45	0.82	MUDSTONE: dark grey, very silty, vaguely laminated, gradational.
	617.52	1.07	SANDSTONE: very fine-grained, medium to dark grey, argillaceous lamination, calcareous, abrupt.
12°	619.71	2.19	MUDSTONE: black, highly carbonaceous, listric surfaces on coaly intercalations, gradational.
8°	633.83	14.12	SANDSTONE: light to medium grey, clean, well-sorted, faint large-scale cross-laminations, richly calcareous, fractured sheared zone at 623.92m-625.14m (probably a fault), fractures infilled with calcite, abrupt below.

BH Nos. T20

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	634.13	0.30	SANDSTONE: medium-grained, dark grey, fractured and infilled with calcite, cherty, strongly calcareous, abrupt below.
	635.20	1.07	MUDSTONE: dark grey, medium silty, irregularly laminated, calcareous, gradational.
8°	638.86	3.66	SANDSTONE: initial 1.52m light grey, very fine-grained, small-scale cross-laminations, strongly calcareous, remainder dark grey with frequent intercalations of muds and silts, wavy to parallel laminations.
	640.38	1.52	COAL/MUDSTONE: initial 0.15m coaly, coal between 639.47m-639.77m, rest mudstone, gradational below.
	641.75	1.37	SILTSTONE/MUDSTONE 50:50: sporadically laminated, calcareous, gradational.
	645.87	4.12	SANDSTONE: fine-grained, clean, well-sorted, cross-laminated, strongly calcareous, bottom 0.45m medium-grained with higher cherty content, near vertical fractures at 645.56m-645.87m, abrupt below.
	649.22	3.35	MUDSTONE: upper 2.43m medium to dark grey, rusty, slightly silty, patchily calcareous, remainder mudstone, carbonaceous coal bands at 648.61m.
	651.65	2.43	COAL: sampled.
	653.49	1.84	MUDSTONE: black, highly carbonaceous, listric surfaces, thin coaly bands, sandy between 652.27m-652.57m.
	654.71	1.22	SANDSTONE: medium-grained, dark grey, cherty, initial 0.45m argillaceous with coaly layers.

SEAM	SAMPLE NUMBER	DEPTH
BP1		
Bird - Upper	102	501.02 - 501.42
	103	501.42 - 501.96
	104	501.96 - 502.00
	105	502.00 - 502.11
	106	502.11 - 502.17
	107	502.17 - 502.62
Bird - Lower	108	504.80 - 505.24
	109	505.24 - 505.64
	110	505.64 - 506.34
Chamberlain - Upper	111	551.74 - 552.14
	112	552.14 - 552.72
Chamberlain - Lower	113	554.66 - 554.76
	114	554.76 - 556.60
BP2		
Chamberlain	172	408.80 - 409.40
	173	409.40 - 409.73
	174	409.73 - 410.15
	175	410.15 - 412.72
	176	412.72 - 413.00
	177	413.00 - 413.80
BP2A		
Bird	236	374.22 - 374.65
	237	374.65 - 374.84
	238	374.84 - 375.33
	239	375.33 - 375.56
	240	375.56 - 375.84
	241	375.84 - 376.13
	242	376.13 - 376.40
	243	376.40 - 376.67
	244	376.67 - 377.06
BP3		
Skeeter	115	471.40 - 471.56
	116	471.56 - 471.57
	117	471.57 - 471.75
	118	471.75 - 471.78
	119	471.78 - 472.10

SEAM	SAMPLE NUMBER	DEPTH
	120	472.10 - 472.45
	121	472.45 - 472.86
	122	472.86 - 472.91
Chamberlain - Upper	123	478.73 - 478.79
	124	478.79 - 478.99
	125	478.99 - 479.17
	126	479.17 - 479.51
	127	479.51 - 479.75
	128	479.75 - 479.89
	129	479.89 - 480.44
	130	480.44 - 480.57
	131	480.57 - 480.88
	132	480.88 - 480.94
Chamberlain - Lower	133	482.99 - 483.04
	134	483.04 - 483.14
	135	483.14 - 483.74
	136	483.74 - 483.91
	137	483.91 - 484.96
Gates 'D'	138	Roof - 121.32
	139	121.32 - 121.50
	140	121.50 - 121.65
	141	121.65 - 122.03
	142	122.03 - 122.12
	143	122.12 - 122.42
	144	122.42 - 122.54
Gates 'E'	145	109.89 - 109.92
	146	110.95 - 111.21
	147	111.21 - 111.41
	148	111.41 - 111.82
	149	112.32 - 112.60
	150	112.32 - 112.60
	151	112.60 - 112.83
	152	112.83 - 112.87
	153	112.87 - 113.16
	154	113.16 - 113.49
	155	113.49 - 113.77
	156	113.77 - 113.80

SEAM	SAMPLE NUMBER	DEPTH
	157	113.80 - 113.89
	158	113.89 - 114.24
	159	114.24 - 114.66
	160	114.66 - 114.74
BP3A		
Chamberlain - L. Split	198	483.35 - 483.69
	199	483.69 - 483.77
	200	483.77 - 484.05
	201	484.05 - 484.28
	202	484.28 - 484.49
	203	484.49 - 484.80
	204	484.80 - 484.87
	205	484.87 - 485.02
	206	485.02 - 485.08
	207	485.08 - 485.14
Chamberlain - U. Split	208	478.51 - 478.70
	209	478.70 - 479.01
	210	479.01 - 479.46
	211	479.46 - 479.74
	212	479.74 - 479.83
	213	479.83 - 480.02
	214	480.02 - 480.25
	215	480.25 - 480.32
	216	480.32 - 480.54
Skeeter	217	471.84 - 471.86
	218	471.86 - 472.17
	219	472.17 - 472.47
	220	472.47 - 472.81
	221	472.81 - 473.15
Bird	222	445.40 - 445.49
	223	445.49 - 445.52
	224	445.52 - 446.15
	225	446.15 - 446.51
	226	446.51 - 447.17
	227	447.17 - 448.28
	228	448.28 - 448.38
	229	448.38 - 448.83
	230	448.83 - 449.20

SEAM	SAMPLE NUMBER	DEPTH
	231	449.20 - 449.55
	232	449.55 - 450.23
	233	450.23 - 450.62
	234	450.62 - 450.92
	235	450.92 - 450.98
BP4		
Bird - Upper	178	Roof - 489.11
	179	489.11 - 489.14
	180	489.14 - 489.41
	181	489.41 - 489.64
	182	489.64 - 489.83
Chamberlain - Upper	183	536.68 - 537.00
	184	537.16 - 537.36
Chamberlain - Lower	185	Roof - 540.52
	186	540.52 - 540.85
	187	540.85 - 541.14
	188	541.14 - 541.16
	189	541.16 - 543.46
BP5		
Skeeter	161	529.18 - 529.87
	162	529.87 - 530.22
Chamberlain	163	(Roof) 538.80 - 538.85
	164	538.85 - 538.94
	165	538.94 - 539.10
	166	539.10 - 539.21
	167	539.21 - 539.25
	168	539.25 - 540.03
	169	540.03 - 540.08
	170	540.08 - 541.76
	171	(Floor) 541.98 - 542.21
Bird	190	504.93 - 505.19
	191	505.19 - 505.45
	192	505.45 - 506.06
	193	506.06 - 506.16
	194	506.16 - 506.27
	195	506.27 - 506.69
	196	506.69 - 507.04
	197	507.04 - 507.35

SEAM	SAMPLE NUMBER	DEPTH
BP6		
Gates	449	297.20 - 297.86
	450	297.86 - 298.00
	451	298.00 - 298.16
Gates 'E'	452	284.58 - 284.96
	453	284.96 - 285.05
	454	285.05 - 285.21
Gates	455	290.06 - 290.47
	456	290.47 - 290.86
Gates 'B'	566	304.24 - 304.71
BP6A		
Bird	339	623.43 - 623.47
	340	623.47 - 623.99
	341	623.99 - 624.59
	342	624.59 - 625.10
	343	625.15 - 625.50
Chamberlain	344	(Roof) 664.84 - 665.78
	345	665.78 - 665.99
	346	665.99 - 666.09
	347	666.09 - 666.41
	348	666.41 - 666.43
	349	666.43 - 666.70
	350	666.70 - 666.74
	351	666.74 - 667.29
	352	667.29 - 668.06
	353	668.06 - 668.50
	354	668.50 - 668.80
	355	668.80 - 669.10
BP7		
Bird	245	349.77 - 350.60
	246	350.60 - 350.88
BP8		
Chamberlain - Lower	266	(Roof) 538.70 - 539.32
	267	539.32 - 539.91
	268	539.91 - 540.38
	269	540.38 - 540.84
	270	540.84 - 541.19
	271	541.19 - 541.46

SEAM	SAMPLE NUMBER	DEPTH
	272	541.46 - 542.00
	273	542.00 - 543.25
Chamberlain - Upper	274	480.80 - 482.11
	275	482.11 - 482.91
	276	482.91 - 483.60
	277	483.60 - 484.09
	278	484.09 - 484.39
	279	484.39 - 485.63
	280	485.63 - 485.85
	281	485.85 - 486.83
	282	486.83 - 487.21
	283	487.21 - 487.67
	284	487.67 - 488.57
Bird	285	416.95 - 417.12
	286	417.12 - 417.14
	287	417.14 - 417.70
	288	419.20 - 419.54
Gates	289	110.90 - 111.53
	290	111.53 - 111.80
BP9		
Chamberlain	247	(Roof) 520.11 - 520.59
	248	520.59 - 520.81
	249	520.81 - 521.28
	250	521.43 - 521.55
	251	521.55 - 522.19
	252	522.19 - 522.86
	253	(Floor) 522.86 - 523.18
Bird	254	478.87 - 479.58
	255	479.58 - 481.26
Gates	256	38mm on geophysical log
Gates 'B'	257	189.49 - 189.99
	258	189.99 - 190.05
	259	190.05 - 190.62
Gates 'D'	260	(Roof) 139.79 - 140.06
	261	140.06 - 140.72
	262	140.72 - 140.91
	263	140.91 - 141.01

SEAM	SAMPLE NUMBER	DEPTH
	264	141.01 - 141.16
	265	141.16 - 141.26
BP10		
Bird	305	614.02 - 614.50
	306	614.81 - 614.93
	307	614.93 - 615.17
	308	615.81 - 616.60
Chamberlain	309	675.27 - 675.44
	310	675.44 - 675.53
	311	675.53 - 676.38
BP11		
Bird	296	331.30 - 332.01
	297	332.01 - 332.86
	298	332.86 - 333.12
	299	333.12 - 333.42
	300	333.42 - 334.24
Skeeter	301	360.28 - 360.34
	302	360.34 - 360.55
	303	360.55 - 361.02
	304	361.02 - 361.23
Chamberlain	312	Roof
	313	366.22 - 366.63
	314	366.63 - 366.81
	315	366.81 - 367.47
	316	367.47 - 367.92
	317	367.92 - 370.27
BP12		
Bird	291	394.11 - 394.61
	292	394.61 - 395.58
	293	395.58 - 396.05
	294	396.05 - 396.73
	295	396.73 - 397.24
Chamberlain	318	420.81 - 421.04
	319	421.04 - 421.37
	320	421.98 - 422.41
	321	422.41 - 422.77
	322	422.77 - 422.86

SEAM	SAMPLE NUMBER	DEPTH
	323	422.86 - 422.93
	324	426.11 - 426.28
	325	426.28 - 426.41
	326	426.41 - 426.99
	327	426.99 - 427.53
BP13		
Bird	356	321.45 - 321.63
	357	321.63 - 321.96
	358	322.40 - 322.70
	359	322.70 - 322.73
	360	322.73 - 323.42
	361	324.30 - 324.77
	362	324.77 - 324.97
Skeeter	363	359.38 - 359.66
	364	359.66 - 360.20
BP14		
Bird	365	438.46 - 438.96
	366	440.84 - 441.19
Chamberlain	367	501.37 - 501.46
	368	501.46 - 501.88
	369	501.88 - 502.19
	370	502.19 - 502.60
	371	502.78 - 502.96
	372	503.12 - 503.35
	373	503.43 - 503.63
	374	503.63 - 504.22
	375	504.22 - 504.43
	376	504.51 - 504.96
	377	504.96 - 505.56
	378	505.56 - 505.80
	379	505.89 - 505.99
Gates 'E'	477	81.44 - 82.63
	478	85.52 - 85.92
BP15		
Bird	328	401.75 - 401.99
	329	401.99 - 402.70
	330	402.70 - 403.41
	331	403.41 - 403.71

SEAM	SAMPLE NUMBER	DEPTH
	332	403.71 - 404.08
Chamberlain	333	436.90 - 437.84
	334	437.93 - 438.42
	335	439.95 - 441.00
	336	441.28 - 441.83
	337	441.83 - 441.99
	338	441.99 - 442.20
BP16		
Chamberlain	457	(Roof) 604.44 - 604.53
	458	604.67 - 605.16
	459	605.16 - 605.32
	460	605.32 - 605.59
	461	605.59 - 605.81
	462	605.81 - 606.00
	463	606.00 - 606.45
	464	606.45 - 606.87
	465	606.87 - 607.28
	466	607.60 - 607.73
	467	607.80 - 607.88
Gates 'E'	468	158.21 - 158.62
	469	162.73 - 162.86
	470	165.80 - 166.16
Gates 'D'	471	184.60 - 185.32
	472	185.32 - 185.45
	473	185.45 - 186.19
	474	186.19 - 186.55
	475	187.13 - 187.76
Gates 'B'	476	232.82 - 233.43
Bird	479	558.68 - 559.20
	480	559.20 - 560.04
	481	560.04 - 560.42
	482	560.42 - 560.88
BP17		
Bird - Upper	380	355.67 - 355.82
	381	355.82 - 356.12
	382	356.12 - 356.30
	383	356.30 - 356.33

SEAM	SAMPLE NUMBER	DEPTH
	384	356.33 - 356.64
	385	356.64 - 356.69
	386	356.69 - 356.91
	387	356.91 - 357.08
	388	357.08 - 357.33
	389	357.33 - 357.45
	390	357.45 - 357.69
	391	357.69 - 358.24
Bird - Lower	392	371.65 - 371.72
	393	371.82 - 372.14
	394	372.14 - 372.57
	395	372.57 - 372.91
	396	372.91 - 373.16
	397	373.16 - 373.41
	398	373.41 - 373.57
	399	373.57 - 373.72
	400	374.13 - 374.23
	401	374.23 - 374.54
Chamberlain	437	(Roof) 399.33 - 399.42
	438	399.42 - 400.56
	439	400.56 - 401.19
	440	401.19 - 401.75
	441	401.75 - 402.17
	442	402.17 - 402.70
	443	402.70 - 403.17
	444	403.17 - 404.48
	445	404.48 - 404.89
	446	404.89 - 405.32
	447	405.32 - 405.63
	448	405.63 - 406.05
BP18		
Bird	524	631.76 - 632.10
	525	632.10 - 632.32
	526	632.32 - 632.37
	527	632.37 - 632.43
	528	632.43 - 632.78
	529	632.78 - 632.88
	530	632.88 - 633.29

SEAM	SAMPLE NUMBER	DEPTH
	531	633.29 - 634.14
Chamberlain	532	672.98 - 673.54
	533	673.54 - 674.13
	534	674.13 - 674.44
	535	674.50 - 674.95
	536	674.95 - 675.45
	537	675.52 - 675.90
	538	675.90 - 676.13
BP19		
Bird	542	612.66 - 612.68
	543	612.68 - 613.11
	544	613.11 - 613.74
	545	613.74 - 613.75
	546	613.75 - 614.52
	547	614.52 - 615.04
	548	615.04 - 615.49
	549	615.63 - 616.05
	550	616.05 - 616.07
	551	616.07 - 161.36
Chamberlain	584	657.24 - 657.27
		and 657.72 - 657.98
	585	657.57 - 657.72
	586	657.98 - 658.10
	587	658.10 - 658.25
	588	658.51 - 660.35
BP20		
Chamberlain	589	(Roof) 693.19 - 693.27
	590	693.27 - 693.57
	591	693.57 - 693.67
	592	693.97 - 694.10
	593	694.10 - 694.21
	594	694.21 - 694.65
	595	694.65 - 694.88
	596	694.96 - 695.31
	597	695.31 - 695.52
	598	695.57 - 695.93
	599	696.00 - 696.08

SEAM	SAMPLE NUMBER	DEPTH
Bird	600	(Roof) 651.13 - 651.14
	601	651.14 - 651.34
	602	651.34 - 651.67
	604	651.67 - 652.05
	605	652.05 - 652.32
	606	652.32 - 652.60
	607	652.60 - 652.92
	608	652.92 - 653.00
	609	653.00 - 653.03
	610	653.03 - 653.16
	611	653.16 - 653.60
BP21		
Chamberlain	663	Roof
	664	234.83 - 235.083
	665	235.083- 235.17
	666	235.26 - 235.54
	667	235.54 - 235.895
	668	235.895- 236.105
	669	236.105- 236.295
	670	236.295- 236.705
	671	236.705- 237.395
	672	237.395- 237.565
	673	237.565- 238.085
	674	238.085- 238.405
	675	238.625- 238.695
	676	238.755- 238.90
BP22		
Bird	552	72.54 - 72.77
	553	72.77 - 72.87
	554	72.87 - 73.37
	555	79.97 - 80.32
	556	80.99 - 81.16
Chamberlain	557	124.43 - 124.71
	558	125.09 - 125.43
	559	125.62 - 125.92
	560	126.25 - 126.69
	561	126.86 - 127.21
	562	127.34 - 128.06

SEAM	SAMPLE NUMBER	DEPTH
	563	128.06 - 128.46
	564	128.59 - 128.97
	565	128.97 - 129.39
BP24		
Chamberlain	483	40.24 - 40.67
	484	40.67 - 41.48
	485	41.48 - 41.50
	486	41.50 - 41.90
	487	41.90 - 42.36
	488	42.64 - 43.13
	489	43.13 - 43.17
	490	43.17 - 43.61
	491	43.61 - 43.63
	492	43.63 - 44.07
	493	44.07 - 44.41
	494	44.41 - 44.45
	495	44.45 - 45.12
	496	45.12 - 45.14
	497	45.16 - 45.44
	498	45.44 - 46.01
	499	46.01 - 46.44
BP25A		
Bird	539	11.07 - 12.21
	540	12.21 - 12.25
	541	12.25 - 12.74
Chamberlain	500	49.48 - 49.86
	501	49.92 - 50.30
	502	50.30 - 50.32
	503	50.32 - 50.78
	504	50.78 - 50.81
	505	50.81 - 51.60
	506	52.14 - 52.63
BP26		
Gates 'E'	829	116.35 - 117.65
Chamberlain	567	(Roof) 475.98 - 476.03
	568	476.03 - 476.66
	569	476.66 - 477.11
	570	477.11 - 477.36

SEAM	SAMPLE NUMBER	DEPTH
	571	477.64 - 477.87
	572	477.87 - 479.06
	573	479.06 - 479.35
	574	479.35 - 479.84
Bird	575	440.23 - 440.37
	576	440.37 - 440.59
	577	440.59 - 440.91
	578	440.91 - 441.01
	579	441.09 - 441.44
	580	441.44 - 441.49
	581	441.49 - 441.73
	582	441.73 - 442.05
	583	442.05 - 442.90
BP28		
Chamberlain	507	39.75 - 40.15
	508	40.85 - 41.20
	509	46.28 - 46.38
	510	46.66 - 47.42
	511	47.42 - 47.86
	512	47.86 - 47.90
	513	47.90 - 48.19
	514	48.19 - 48.22
	515	48.22 - 48.93
	516	48.93 - 49.21
	517	49.21 - 49.78
	518	50.10 - 50.60
	519	50.60 - 51.21
	520	51.21 - 51.53
	521	51.53 - 51.61
	522	51.61 - 52.07
	523	52.14 - 52.70
BP29		
Bird	612	529.28 - 529.575
	613	529.575- 529.875
	614	529.985- 530.135
	615	530.245- 530.615
	616	530.615- 530.845
	617	530.845- 530.975

SEAM	SAMPLE NUMBER	DEPTH
	618	530.975- 530.995
	619	530.995- 531.11
	620	531.11 - 531.21
	621	531.21 - 531.49
	622	531.49 - 531.70
	623	531.86 - 532.14
	624	532.14 - 532.58
Chamberlain - Lower Plate	625	620.07 - 620.48
	626	Roof
	627	620.83 - 620.89
	628	620.89 - 621.32
	629	621.46 - 621.74
	630	622.63 - 622.92
	631	623.68 - 623.83
	632	623.95 - 624.08
	633	Floor
Chamberlain - Upper Plate	634	583.36 - 583.56
	635	583.63 - 584.66
	636	584.76 - 585.23
	637	585.23 - 585.61
	638	585.61 - 585.87
	639	585.93 - 586.04
	640	586.94 - 587.07
BP30		
Chamberlain - Upper Split	677	Roof
	678	673.44 - 673.60
	679	673.66 - 674.07
	680	674.07 - 674.53
	681	674.58 - 674.61
Chamberlain - Lower Split	682	Roof
	683	677.43 - 677.48
	684	677.48 - 678.01
	685	678.10 - 678.38
	686	678.50 - 678.71
	687	678.71 - 678.88
	688	678.88 - 679.35
	689	679.35 - 680.08

SEAM	SAMPLE NUMBER	DEPTH
BP32A		
Gates	828	130.48 - 131.46
Chamberlain	788	Roof
	789	589.45 - 589.65
	790	589.65 - 589.74
	791	589.79 - 590.21
	792	590.21 - 590.26
	793	590.26 - 590.54
	794	590.54 - 590.82
	795	590.82 - 591.04
	796	591.04 - 591.13
	797	591.15 - 591.46
	798	591.46 - 591.94
	799	591.94 - 592.49
	800	592.49 - 592.83
	801	592.90 - 593.02
	802	593.09 - 593.50
	803	593.50 - 593.78
	804	594.76 - 595.17
	805	595.41 - 595.59
	806	595.70 - 596.13
	807	596.13 - 596.31
	808	596.31 - 596.62
BP34		
Chamberlain	690	Roof
	691	51.56 - 51.85
	692	52.77 - 54.34
	693	54.61 - 54.90
	694	55.01 - 55.93
	695	56.38 - 56.43
	696	56.43 - 56.77
	697	56.77 - 56.97
	698	56.97 - 57.36
	699	57.36 - 57.76
	700	57.95 - 59.06
	701	59.74 - 60.21
	702	60.21 - 60.86
	703	61.88 - 62.33

SEAM	SAMPLE NUMBER	DEPTH
	704	62.33 - 62.93
	705	62.93 - 63.31
	706	64.12 - 64.40
	707	64.76 - 65.25
	708	65.25 - 65.64
BP35		
Chamberlain	709	Roof
	710	36.08 - 36.26
	711	36.71 - 37.19
	712	37.19 - 37.35
	713	37.35 - 37.65
	714	37.65 - 37.98
	715	38.55 - 39.16
	716	39.16 - 39.38
	717	39.48 - 39.76
BP36		
Bird	641	31.28 - 31.54
	642	31.54 - 31.78
	643	31.81 - 31.91
	644	31.91 - 32.26
	645	32.36 - 33.03
	646	33.13 - 33.47
	647	33.67 - 33.74
	648	33.74 - 33.80
	649	33.80 - 33.87
Chamberlain	650	(Roof) 65.57 - 65.71
	651	65.83 - 66.13
	652	66.13 - 66.64
	653	66.92 - 67.14
	654	67.42 - 67.60
	655	67.60 - 67.72
	656	67.72 - 67.73
	657	67.73 - 67.83
	658	68.77 - 68.94
	659	68.94 - 69.42
	660	69.56 - 69.64
	661	69.77 - 69.99
	662	Floor

SEAM	SAMPLE NUMBER	DEPTH
BP37		
Chamberlain	810	Roof
	812	369.52 - 369.92
	813	369.92 - 370.19
	814	370.19 - 370.90
	815	370.90 - 371.05
	816	371.05 - 371.26
	817	371.26 - 371.60
	818	371.60 - 371.95
	819	372.03 - 372.44
	820	372.44 - 373.47
	821	373.47 - 373.59
	822	373.71 - 373.95
	823	373.95 - 374.24
	824	374.24 - 374.53
	825	374.53 - 374.79
	826	374.79 - 374.95
	827	375.16 - 375.34
BP38		
Chamberlain - Upper Plate	718	64.74 - 65.19
	719	65.90 - 66.42
	720	67.01 - 67.40
Chamberlain - Lower Plate	721	Roof
	722	91.38 - 92.06
	723	92.13 - 93.09
	724	93.09 - 93.12
	725	93.12 - 93.16
	726	93.23 - 93.27
	727	93.27 - 93.71
	728	93.77 - 94.10
	729	94.16 - 94.80
	730	94.86 - 95.62
BP39		
Chamberlain	731	Roof
	732	41.78 - 42.02
	733	42.02 - 42.10
	734	42.10 - 42.82
	735	44.61 - 44.76

SEAM	SAMPLE NUMBER	DEPTH
	736	44.80 - 45.07
	737	45.79 - 45.95
	738	45.95 - 46.06
	739	46.06 - 46.35
	740	46.35 - 46.75
	741	47.35 - 47.59
	742	48.51 - 48.72
	743	48.72 - 48.88
BP40		
Chamberlain - Upper Plate	744	Roof
	745	130.31 - 130.68
	746	131.09 - 131.74
	747	131.74 - 131.77
	748	131.77 - 131.85
	749	131.97 - 132.01
	750	132.01 - 132.55
	751	132.55 - 133.00
	752	133.00 - 133.58
	753	133.58 - 134.10
	754	134.78 - 135.88
	755	135.88 - 136.03
	756	136.67 - 137.36
	757	Floor
Chamberlain - Lower Plate	771	Roof
	772	178.74 - 178.80
	773	178.80 - 179.72
	774	179.72 - 180.42
	775	180.42 - 181.71
	776	182.15 - 183.58
	777	183.96 - 184.47
	778	184.47 - 184.81
	779	184.81 - 184.89
	780	184.89 - 185.40
	781	185.40 - 186.28
	782	186.52 - 186.91
	783	187.15 - 187.55
	784	187.29 - 188.41
	785	188.64 - 188.85

SEAM	SAMPLE NUMBER	DEPTH
	786	188.85 - 189.08
	787	189.08 - 189.36
BP41		
Chamberlain	758	Roof
	759	59.25 - 59.51
	760	59.51 - 59.82
	761	59.82 - 60.19
	762	60.19 - 60.56
	763	60.68 - 60.71
	764	60.71 - 60.97
	765	60.97 - 61.25
	766	61.25 - 61.75
	767	61.75 - 62.01
	768	62.01 - 62.65
	769	62.65 - 63.34
	770	63.34 - 63.63