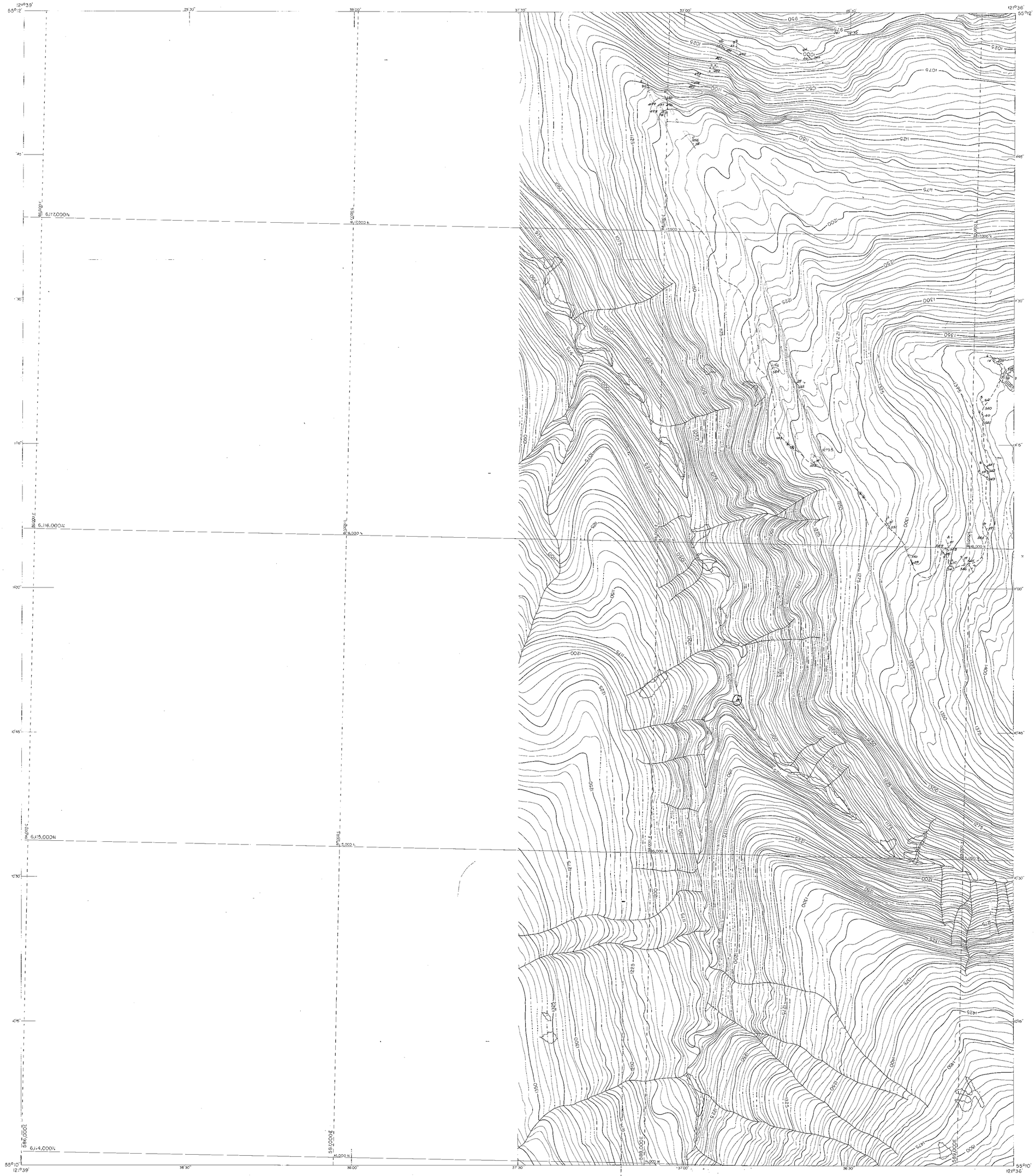
PR-SUKUNKA 78(2)A.

TOPOGRAPHICAL MAPS.

MONUMENT, DRILL HOLE, TRENCH, + ADIT LOCATIONS

-1978-



LEGEND

Improved road	River
Secondary road	Stream
Track or trail	Intermittent stream
Cut line	Swamp
Tree area	Contours 2100
Adit A-6	Spot elevation 2534.5
Trench	Photo point 51
	Drill hole C4

NOTE: •T42 DRILL HOLE LOCATIONS SHOWN THUS ARE APPROXIMATE

SCALE 1:5000

METRES 100 0 200 400 600 800 METRES

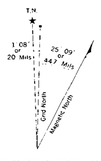
FEET 400 0 400 800 1200 1600 2000 2400 2800 FEET

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

COMPILED BY
burnett resource surveys ltd.
ENGINEERS • PHOTOGRAMMETRISTS • SURVEYORS

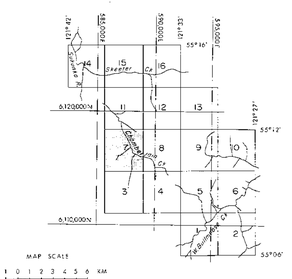
SURVEY NOTE

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, Hewlitt Packard Distance Meter and Kern DKM2A Theodolites. Horizontal Co-ordinates are derived from Trig. Station 2496 Lat. 55° 09' 30.8560" 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 2496, 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.



APPROXIMATE MEAN DECLINATION 1985
Annual change decreasing 4.1'

KEY MAP



MAP SCALE
1 0 1 2 3 4 5 6 KM

PR - SUKUNKA 74 (2) A. 665

BP Exploration Canada Limited
COAL DIVISION

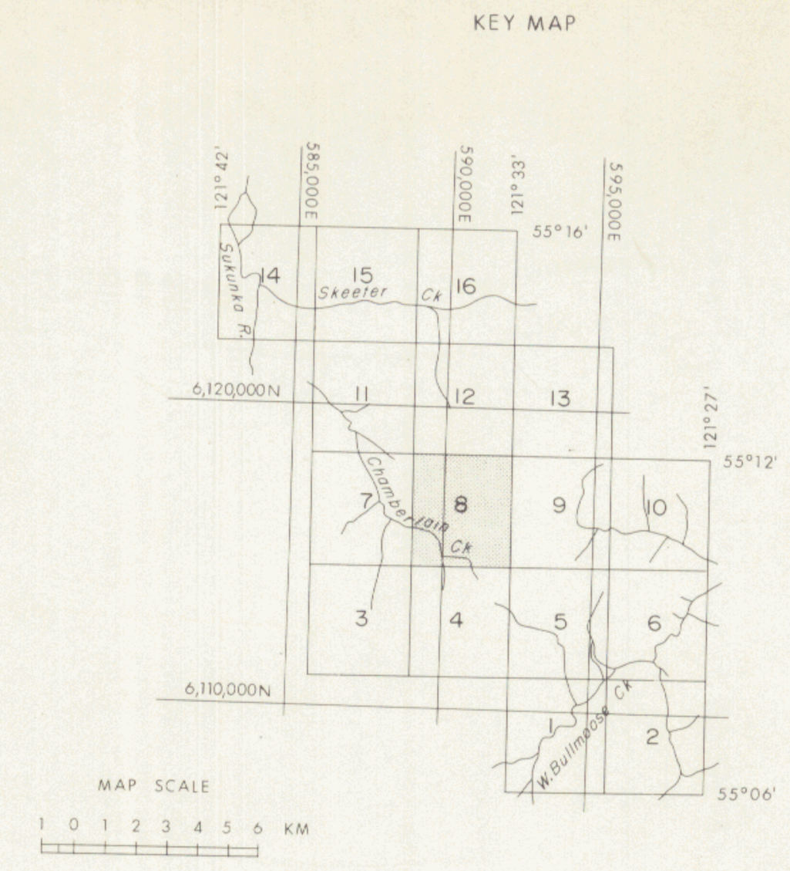
Sukunka / Bullmoose Coal Mining Project
N E British Columbia

TOPOGRAPHICAL MAP SHOWING MONUMENT, DRILL HOLE, TRENCH AND ADIT LOCATIONS

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

MAP NO. 7

3 P/4E



LEGEND

Improved road		River	
Secondary road		Stream	
Track or trail		Intermittent stream	
Cut line		Swamp	
Tree area		Contours	2100
Adit	A-6	Spot elevation	2634.5
Trench		Photo point	+61
		Drill hole	⊙ C4

NOTE:
•T42 DRILL HOLE LOCATIONS SHOWN THUS ARE APPROXIMATE

SCALE 1:5000

METRES 100 0 200 400 600 800 METRES
FEET 400 0 400 800 1200 1600 2000 2400 2800 FEET

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

COMPILED BY
burnett resource surveys ltd.
ENGINEERS · PHOTOGRAMMETRISTS · SURVEYORS

SURVEY NOTE

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665

PR. SUKUNKA 78 (2)A.

BP Exploration Canada Limited
COAL DIVISION

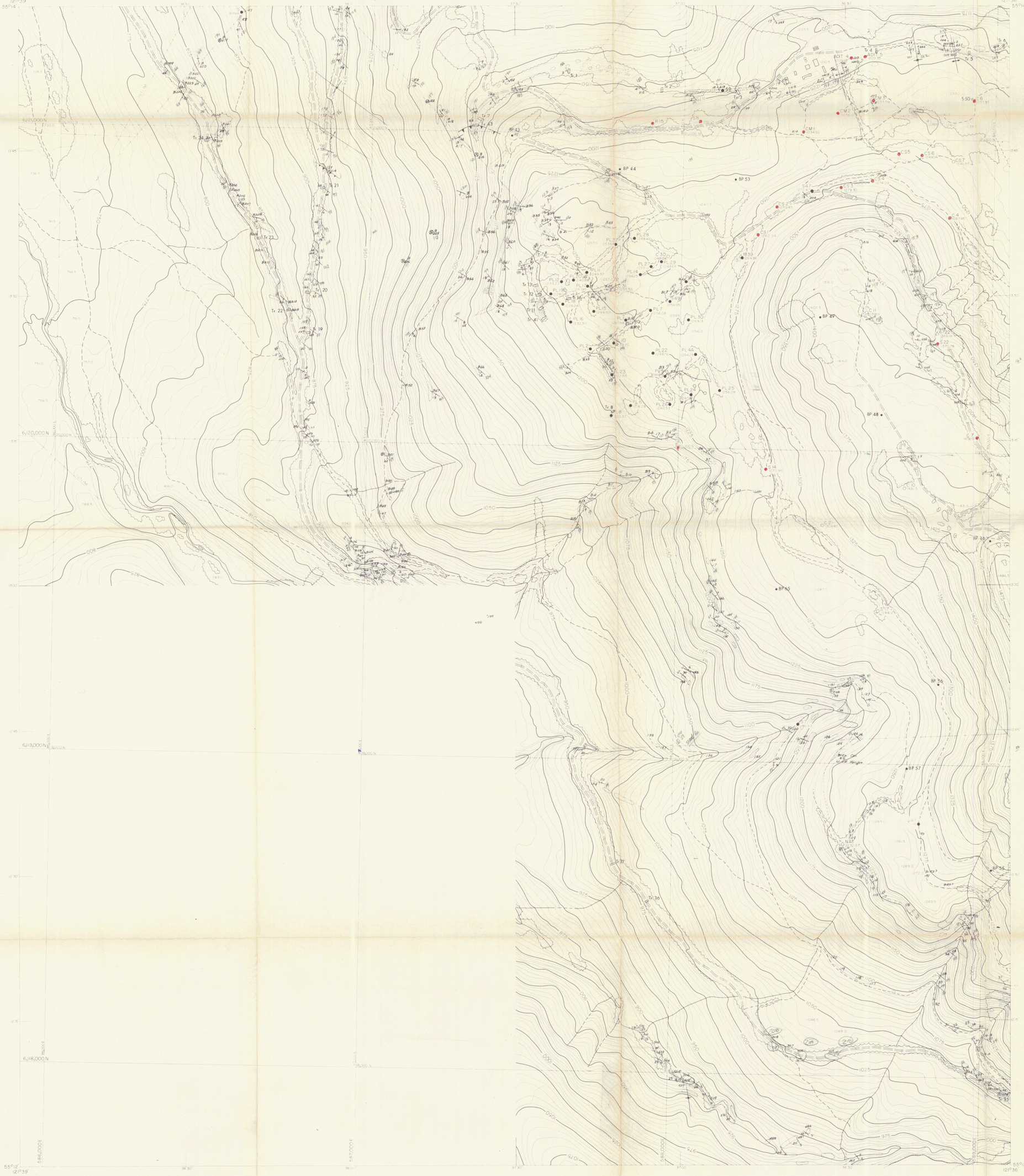
Sukunka / Bullmoose Coal Mining Project
N E British Columbia

TOPOGRAPHICAL MAP SHOWING MONUMENT, DRILL HOLE, TRENCH AND ADIT LOCATIONS

digitized map #79

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

MAP NO. 8



LEGEND

Improved road	═══	River	≈
Secondary road	═ ═ ═	Stream	~
Track or trail	– – – –	Intermittent stream	– ~ –
Cut line	— – —	Swamp	
Tree area		Contours	—2100—
Adit	≻—A-6	Spot elevation	2634.5
Trench	▭	Photo point	+61
		Drill hole	⊙ C4

NOTE
●T42 DRILL HOLE LOCATIONS SHOWN THUS
ARE APPROXIMATE

SCALE 1:5000

METRES 100 0 200 400 600 800 METRES
FEET 400 0 400 800 1200 1600 2000 2400 2800 FEET

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

COMPILED BY
burnett resource surveys ltd.
ENGINEERS · PHOTOGRAMMETRISTS · SURVEYORS

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APPROXIMATE MEAN DECLINATION 1965
Annual change decreasing 4.1'

KEY MAP

Pr - Sukunka 78(2)A. 665

BP Exploration Canada Limited
COAL DIVISION

Sukunka / Bullmoose Coal Mining Project
N E British Columbia

TOPOGRAPHICAL MAP SHOWING MONUMENT, DRILL HOLE, TRENCH AND ADIT LOCATIONS

207
digitized
Map #30 BP

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

MAP NO. 11

665

Pr - Sukunka 78 (2) A.

LEGEND

Improved road		River	
Secondary road		Stream	
Track or trail		Intermittent stream	
Cut line		Swamp	
Tree area		Contours	2100
Adit	A-6	Spot elevation	2634.5
Trench		Photo point	+61
		Drill hole	C4

NOTE: T42 DRILL HOLE LOCATIONS SHOWN THUS ARE APPROXIMATE

SCALE 1:5000

METRES 100 0 200 400 600 800 METRES

FEET 400 0 400 800 1200 1600 2000 2400 2800 FEET

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

COMPILED BY
burnett resource surveys ltd.
ENGINEERS · PHOTOGRAMMETRISTS · SURVEYORS

SURVEY NOTE

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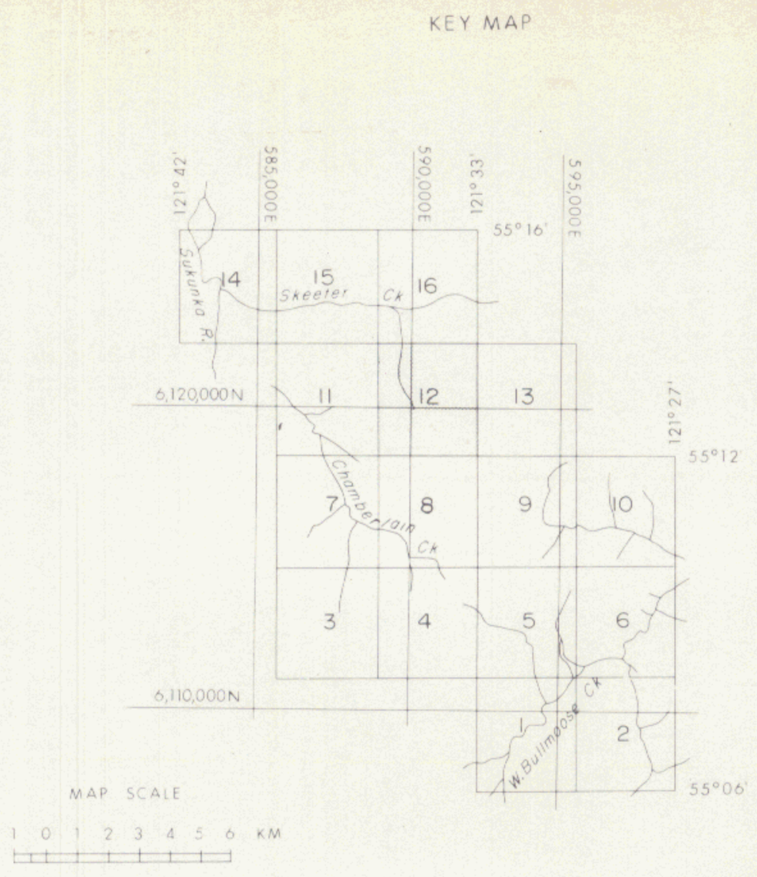
KEY MAP



MAP SCALE
1 0 1 2 3 4 5 6 KM

BP Exploration Canada Limited
COAL DIVISION

Sukunka / Bullmoose Coal Mining Project
N E British Columbia

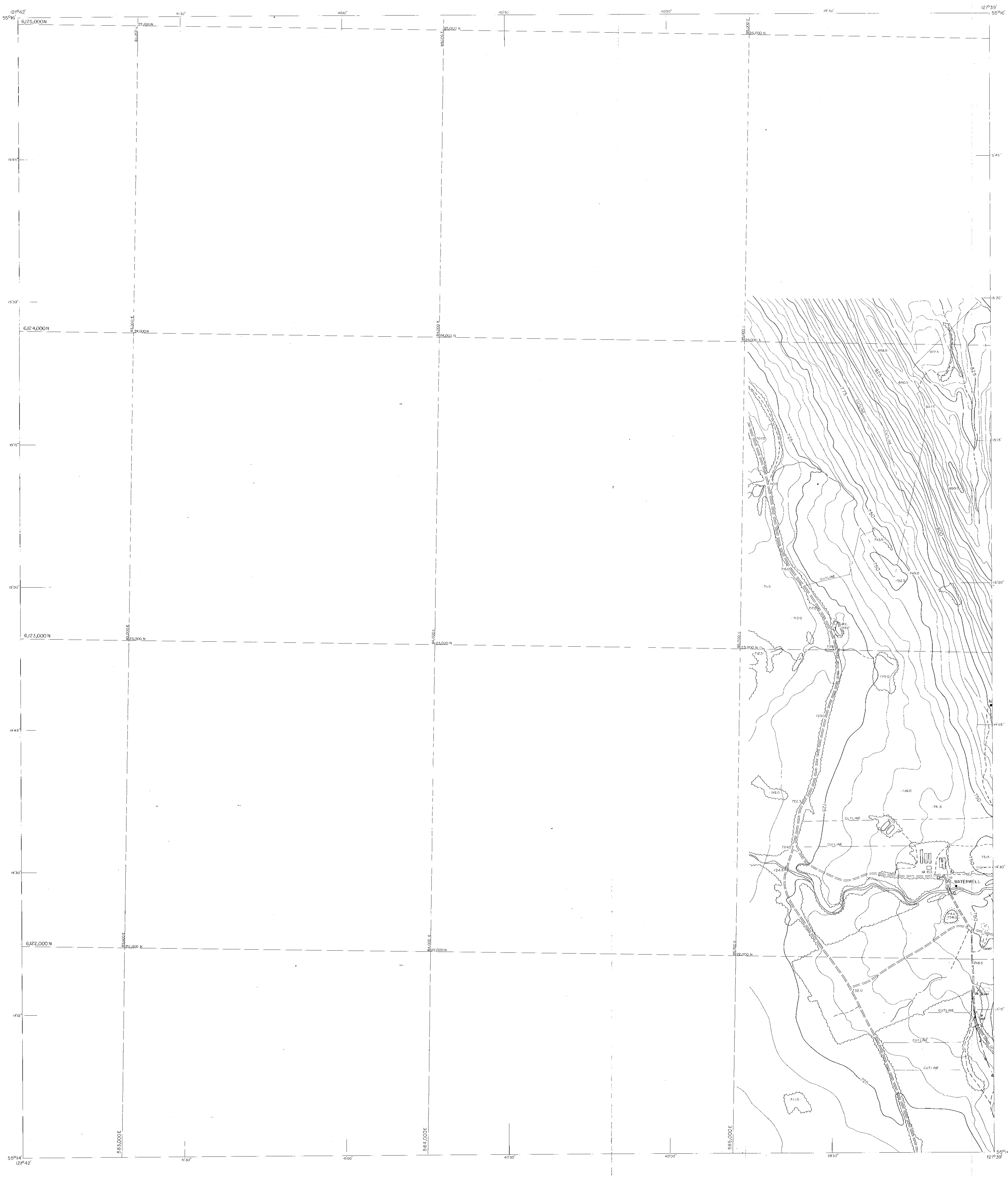
TOPOGRAPHICAL MAP SHOWING MONUMENT, DRILL HOLE, TRENCH AND ADIT LOCATIONS

digitized

Map #31 BP

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

MAP NO. 12



LEGEND

Improved road		River	
Secondary road		Stream	
Track or trail		Intermittent stream	
Cut line		Swamp	
Tree area		Contours	2100
Adit	A-6	Spot elevation	2634.5
Trench		Photo point	+61
		Drill hole	⊙ C4

NOTE:
•T42 DRILL HOLE LOCATIONS SHOWN THUS ARE APPROXIMATE

SCALE 1:5000

METRES 100 0 200 400 600 800 METRES

FEET 400 0 400 800 1200 1600 2000 2400 2800 FEET

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

COMPILED BY
burnett resource surveys ltd.
ENGINEERS · PHOTOGRAMMETRISTS · SURVEYORS

SURVEY NOTE

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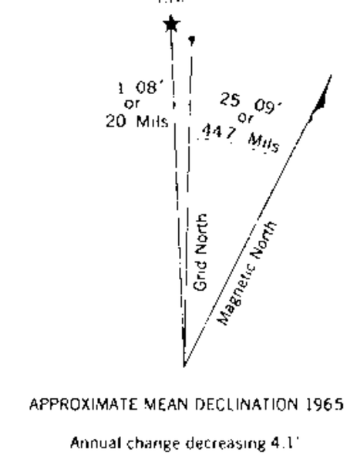
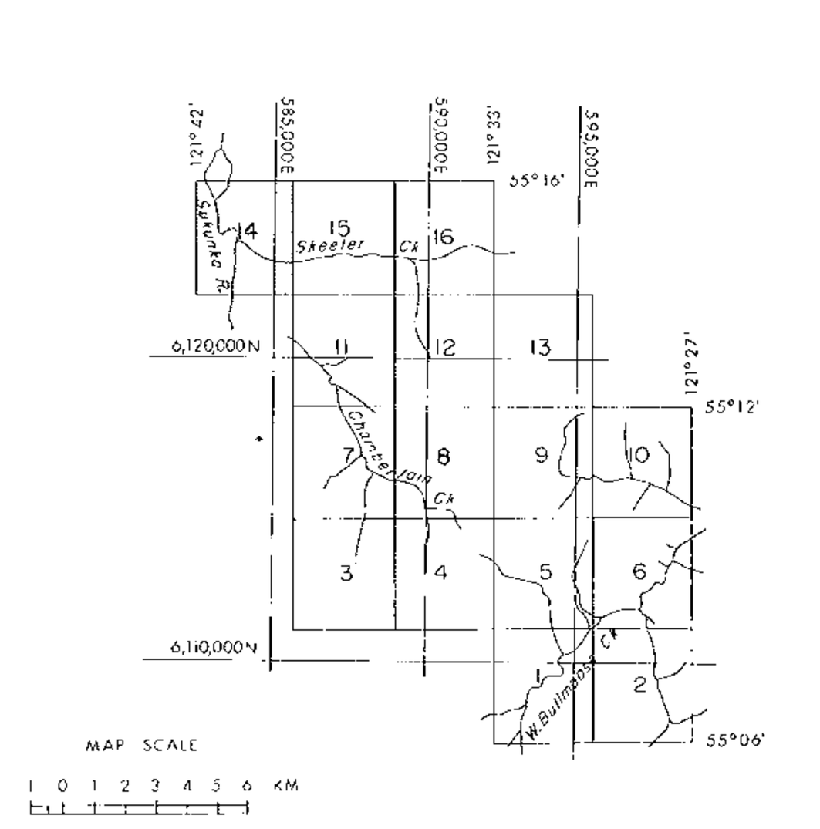


APPROXIMATE MEAN DECLINATION 1965
Annual change decreasing 4.1'

KEY MAP



MAP SCALE
1 0 1 2 3 4 5 6 KM

Pr - Sukunka 78(2)A. 665

BP Exploration Canada Limited
COAL DIVISION

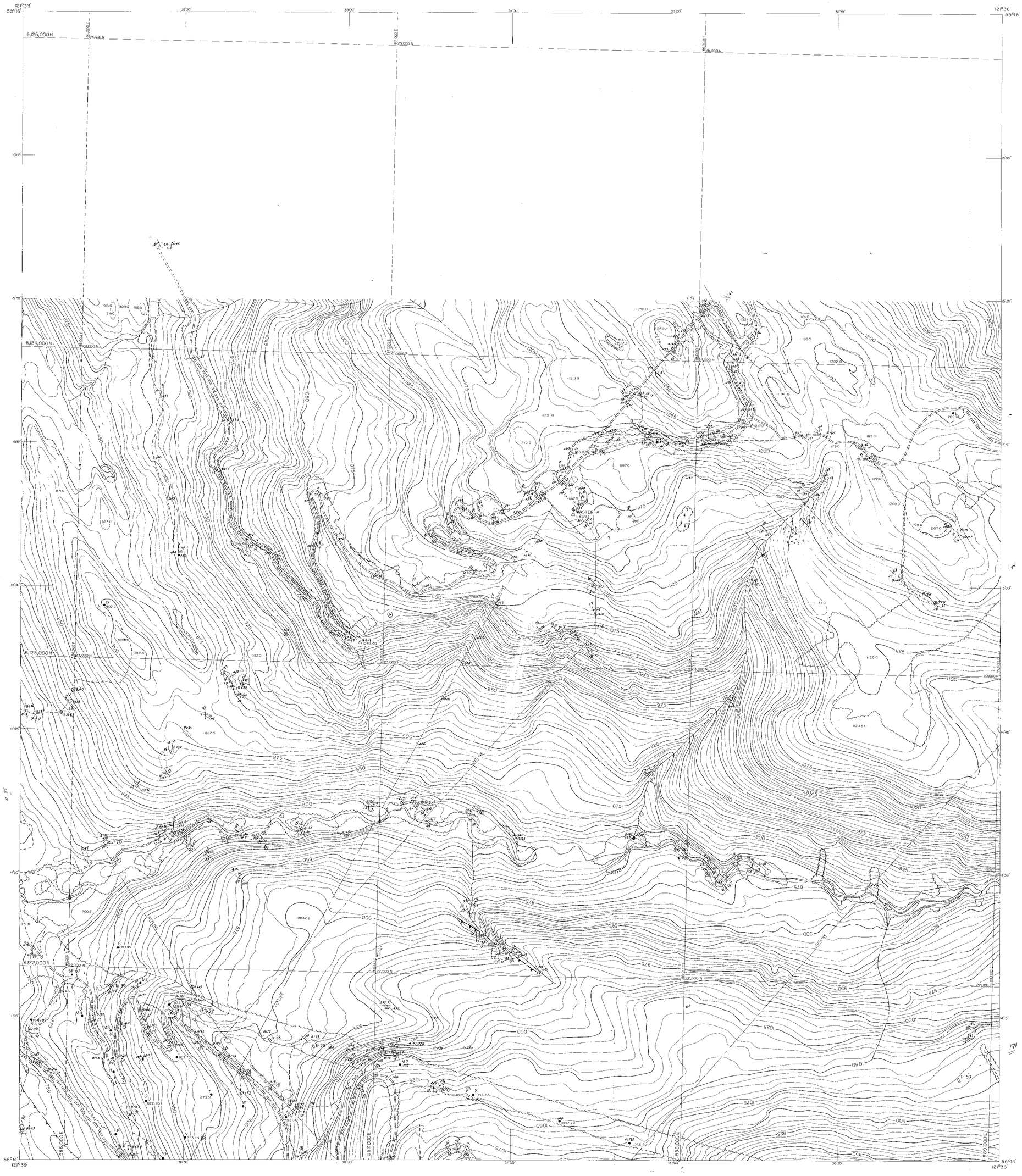
Sukunka / Bullmoose Coal Mining Project
N E British Columbia

TOPOGRAPHICAL MAP SHOWING MONUMENT, DRILL HOLE, TRENCH AND ADIT LOCATIONS

Map #32 BP digitized

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

MAP NO.14



LEGEND

Improved road		River	
Secondary road		Stream	
Track or trail		Intermittent stream	
Cut line		Swamp	
Tree area		Contours	2100
Adit	A-6	Spot elevation	2634.5
Trench	▭	Photo point	+61
		Drill hole	⊙ C4

NOTE:
•T42 DRILL HOLE LOCATIONS SHOWN THUS ARE APPROXIMATE

SCALE 1:5000

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

COMPILED BY
burnett resource surveys ltd.
ENGINEERS • PHOTOGRAMMETRISTS • SURVEYORS

SURVEY NOTE

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APPROXIMATE MEAN DECLINATION 1965
Annual change decreasing 4.1'

PR - SUKUNKA 78 (2)A. 665

BP Exploration Canada Limited
COAL DIVISION

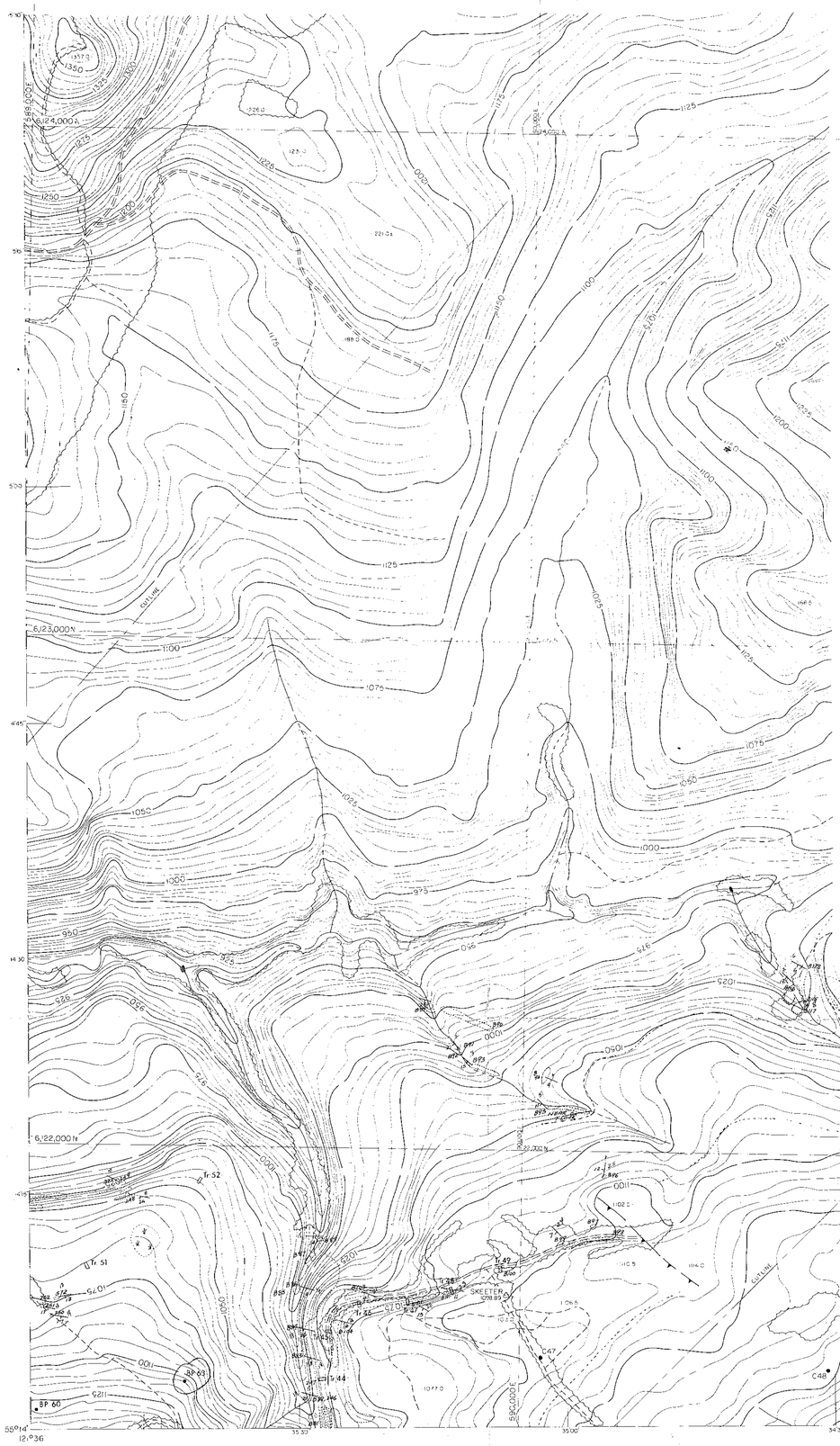
Sukunka / Bullmoose Coal Mining Project
N E British Columbia

TOPOGRAPHICAL MAP SHOWING MONUMENT, DRILL HOLE, TRENCH AND ADIT LOCATIONS

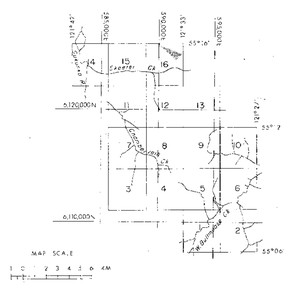
Map# 33 BP Digitized

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

MAP NO. 15



KEY MAP



MAP SCALE

1 0 1 2 3 4 5 6 KM

LEGEND

Improved road		River	
Secondary road		Stream	
Track or trail		Intermittent stream	
Cut line		Swamp	
Tree area		Contours	2100
Adit	A-6	Spot elevation	2634.5
Trench		Photo point	161
		Drill hole	C4

NOTE T42 DRILL HOLE LOCATIONS SHOWN THUS ARE APPROXIMATE

SCALE 1:5000

METRES 100 0 200 400 600 800 METRES

FEET 400 0 400 800 1200 1600 2000 2400 2800 FEET

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

COMPILED BY
burnett resource surveys ltd.
ENGINEERING IN PHOTOGRAMMETRY · SURVEYORS

SURVEY NOTE

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APPROXIMATE MEAN DECLINATION 1965
Annual change decreasing 4.1'

Re- Sukunka 78(2)A. 665

BP Exploration Canada Limited
COAL DIVISION

Sukunka / Bullmoose Coal Mining Project
N E British Columbia

TOPOGRAPHICAL MAP SHOWING MONUMENT, DRILL HOLE, TRENCH AND ADIT LOCATIONS

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

MAP NO.16

PR-SUKUNKA 78(2)A.

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THE GOVERNMENT OF THE PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF MINES AND PETROLEUM RESOURCES

MINERAL RESOURCES BRANCH
INSPECTION AND ENGINEERING DIVISION

RECLAMATION REPORT – COAL EXPLORATION

To be submitted in duplicate to Senior Reclamation Inspector, Victoria. *See* note at bottom of page.

1. FOR CALENDAR YEAR 19 78 PERMIT NO. 117

2. COMPANY bp Exploration Limited NAME OF OFFICIAL J. Stobernack
ADDRESS 335 Eighth Avenue S.W. SIGNATURE
Calgary, Alberta DATE SUBMITTED September 27/78

3. DETAILS OF WORK DONE AND DESCRIPTION OF RECLAMATION

Use metric measure. (1 metre = 3.3 feet). Show method of reclamation, for example, backfill of excavated earth and replacement of topsoil, seed type, fertilizer used and application, etc. Use back of sheet if required. Reference locations on 1:50,000 map (Coal Titles Reference Maps).

	Area Disturbed	Area Reclaimed
ROADS: Indicate lengths of individual roadways built and approximate width both cut and fill.	(approx. avg.)	(includes outstanding 1977 work as well as 1978)
1978 New Roads 1,757 m in length x 4 m top	____ m²	____ m²
x 6 m cut	10,542 m²	10,542 m²
1978 Reopened Roads 11,534 m in length x 4 m	46,136 m²	46,136 m²
Roads (new and reopened) 16,764 m x 6 m	- m²	100,584 m²
left over from the 1977 program		
TEST PITS:		
Nil	____ m²	____ m²
	____ m²	____ m²
	____ m²	____ m²
	____ m²	____ m²
TRENCHES: Indicate lengths, widths, and ground slope.		
50 trenches	____ m²	____ m²
approx. 6 m x 1 m - usually vertical	300 m²	300 m²
	____ m²	____ m²
	____ m²	____ m²
ADITS:		
Total No. Nil	____ m²	____ m²
DRILL SITES:		
Total No. 30	15,000 m²	15,000 m²
OTHER:		
73 drill sites and trenches left over	- m²	36,500 m²
from the 1977 program.	____ m²	____ m²
Total Disturbed and Reclaimed Area (square metres)	71,978 m²	209,062 m²
Total Disturbed and Reclaimed Area (hectares) (1 hectare = 10 000 square metres)	7.19 ha	20.90 ha

4. GENERAL COMMENTS:

All the outstanding 1977 reclamation work has been completed along with the 1978 program. Seeding which took place in July has already started to germinate particularly in the Bullmoose area, and also in parts of the 1978 reclamation area (please turn over).

NOTE: Refer to original 'Application for a Reclamation Permit' and note work done on two copies of the 1:50,000 map. Specify where work done has varied from that which was proposed. Attach to this report. Refer to booklet entitled, *Guidelines for Coal and Mineral Exploration*, available at the office of the District Inspector of Mines, for reclamation advice. Attach photographs or other support data if desired to supplement this format.

1. The following contractors were employed in the 1978 Program:

   a) Peace Oilfield Contracting Ltd. (Fort St. John) - Slashing

   b) Tompkins Contracting (1977) Ltd. (Fort St. John) - Road Construction Restoration - large scale earth moving of roads and drill sites.

   c) North Star Fabricating (Chetwynd) - Restoration - 1) small scale earth moving eg. erosion bars, scarifying of roads and drill sites. 2) seeding & fertilizing.

2. Method of Reclamation:

   a) All roads, drill sites and trenches were backfilled where required and pulled back to natural grade.

   b) Scarifying to brake up 'hard pan'.

   c) Seeding and fertilizing - see items 3 & 4 for mixture and application.

   d) Re-scarifying to cover seed and fertilizer.

   e) Formation of erosion bars.

   f) Hand seeding of erosion bars.

3. The seed mixture used in the reclamation of the 1978 Sukunka program was as follows:

   33% Creep Red Fescue (N.B. Red Top was not available at the
   22% Alsike Clover local distributor in Dawson Creek.)
   28% Climax Timothy - The Forestry Mixture left over from
   17% Carleton Bromgrass the 1977 Program was used up in 1978.

   Rate: 50 lb./acre (1 acre - ¼ mile of road)

4. A mixture of 65 lbs. Nitrogen, 65 lbs. Phosphorus and 65 lbs. Nitrogen was applied per acre.

COAL EXPLORATION FORM 7–8

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THE GOVERNMENT OF THE PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF MINES AND PETROLEUM RESOURCES
MINERAL RESOURCES BRANCH
INSPECTION AND ENGINEERING DIVISION

NOTICE OF WORK ON A COAL LICENCE

Pursuant to section 7 of the *Coal Mines Regulation Act* this notice is to be completed by all companies or individuals carrying out exploration work prior to commencement of work, and within one month of cessation of work and one copy is to be sent to each of the following:

Senior Reclamation Inspector, Victoria
District Inspector of Mines
Regional Water Rights Engineer
District Forester or Forest Ranger
Regional Fish and Wildlife Office

PERMIT NO. 117

1. NAME OF PROPERTY: Sukunka

Coal Licence Numbers: 3089-3129, 3014-3023, 3026, 3033, 3038, 3554-3557, 3559.

2. LOCATION: Mining Division 9 Prince George B.C. NTS Map Sheet No. 93 P/3,4,5

Lat. 55 ° 11 ' Long. 121 ° 31 ' Locality and Access Sukunka - access from Chetwynd via the Sukunka Valley Road to Mile 37 (Coalition Mine Camp)

3. OWNER: Name BP Exploration Canada Free Miner's Cert. No. 166491

Address 335-8th Avenue S.W. City Calgary Prov. Alta.

4. OPERATOR: Name As above Free Miner's Cert. No. As above

Company Telephone No. (403) 266-7071

Address City Prov.

5. ESTIMATED DURATION OF WORK: From to

6. ACTUAL DATE WORK COMPLETED: Day 22 Month September 19 78

7. APPROXIMATE NUMBER OF MEN EMPLOYED: 55

8. EXPLORATION WORK: Proposed ☐ Completed ☒ (Use metric measure – 1 metre = 3.3 feet.)

Linecutting (distance, width, method)

(Requires approval of Forest Service. 'Licence to Cut' or 'Free Use Permit' may be withheld until Reclamation Permit approval.)

Drilling – No. of Sites 30 Total Area 15,000 square metres

Road Construction – Total Length 1,757 m (new road) 11,534 m (re-opened road) metres Approximate Width 4 m top, 6 m cut metres

Underground Exploration nil (type)

Trenching – Number 50 Total Length 300 metres. Width 1.00 metres

Test Pitting – Number nil Total Disturbed Area nil square metres

Work by Self ☒ OR Name of Contractor

(Owner is responsible for ensuring the Contractor complies with pertinent regulations, *see* section 8, *Coal Mines Regulation Act*.)

9. DATE FOREST SERVICE ADVISED BY OPERATOR: March 30/78 September 25/78

Name and Title of Forest Official Forest Ranger - John Hall

Address Chetwynd, British Columbia

NOTE: Pursuant to section 8, subsection 2(a) of the *Coal Mines Regulation Act*, '...where the employment of mechanical equipment is likely to disturb the surface of the land in clearing, stripping, trenching...' the Application for a Reclamation Permit on the reverse side is also to be submitted.

SIGNATURE OF APPLICANT J. Stobernack TITLE Exploration Manager

PRINT NAME Just Stobernack DATE September 25, 1978

PR - SUKUNKA - 78 (3) A.

SUKUNKA 1978 EXPLORATION PROGRAM

APPENDIX B1

Geophysical Logs

SUKUNKA 1978 EXPLORATION

PROGRAM

APPENDIX B2

Geophysical Logs

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PR - SUKUNKA - 78(3)A -

SUKUNKA 1978 EXPLORATION

PROGRAM

APPENDIX B3

Geophysical Logs

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PR- SUKUNKA 78 (3)A.

SUKUNKA 1978 EXPLORATION

PROGRAM

APPENDIX B4

Geophysical Logs

PR-SUKUNKA 78(4)A.

SUKUNKA 1978 EXPLORATION

PROGRAM

ANALYTICAL DATA

665

OPEN FILE

SUKUNKA 1978 EXPLORATION PROGRAM

COAL QUALITY RESULTS

Key to Sample Numbers:

BP42/ - Borehole Number

TR1/ - Trench Number

/BD/ - Bird Seam

/CHU/ - Upper Chamberlain Seam

/UCH/ - Upper Chamberlain Seam

LCH=/CHL/ - Lower Chamberlain Seam

/CHS/ - Sub-Chamberlain Seam

/B/ - 'B' Seam - Lower Gething

/BL/ - Lower 'B' Seam - Lower Gething

/C/ - 'C' Seam - Lower Gething

/CL/ - Lower 'C' Seam - Lower Gething

/D/ - 'D' Seam - Lower Gething

/E/ - E Seam - Lower Gething

/R - Roof Sample

/1 - Ply Sample

For Ply thicknesses see Geologists Logs and Trench Descriptions.

CLIENT: BP EXPLORATION CANADA LTD. October 27, 1978

SAMPLE: CORE SAMPLES (INSTRUCTIONS REC'D OCTOBER 5, 1978)

LAB. NO.	SAMPLE NO.	S.G.	H2O%	ASH%	VM.%	F.S.I.	S%	C.V.	AIR DRIED WT. (GRMS)
1899	BP42/BD/5	2.75	0.5	74.5	--	N.A.	17.00	----	107.9
1900	BP42/BD/4 X	1.68	0.4	26.7	--	1	10.25	----	175.6
1901	BP42/BD/3 + BD-1 X	1.49	0.5	21.1	--	8 1/2	4.00	----	1977.0
1902	BP42/BD/2	2.37	--	83.0	--	---	--	----	646.6
1903	BP42/CHU/5	2.54	0.7	80.7	--	N.A.	0.11	----	118.2
1904	BP42/CHU/4	1.41	0.5	15.4	--	3 1/2	0.55	---	486.9
1905	BP42/CHU/3	1.36	0.5	9.9	--	5	0.69	----	858.6
1906	BP42/CHU/2	2.01	--	65.8	--	---	--	----	304.4
1907	BP42/CHU/1	1.68	0.5	42.2	--	2	0.41	----	223.5
1908	BP42/CHL/R	2.60	--	92.2	--	---	--	----	459.2
1909	BP42/CHL/7	1.77	0.5	46.2	--	1	1.65	----	377.7
1910	BP42/CHL/6	1.34	0.4	6.2	--	4	0.51	----	360.1
1911	BP42/CHL/5	1.32	0.5	3.5	--	7 1/2	0.45	----	974.5
1912	BP42/CHL/4	1.34	0.5	5.7	---	4 1/2	0.36	----	705.1
1913	BP42/CHL/3	1.36	0.5	7.7	--	8	0.52	----	1276.3
1914	BP42/CHL/2	1.32	0.4	4.6	--	9	0.53	----	1090.4
1915	BP42/CHL/1	1.48		24.0	--	8	1.16	----	188.8
1916	BP47/BD/R	2.72	0.4	88.4	--	N.A.	1.66	----	431.5
1917	BP47/BD/1	1.60	0.3	22.2	--	6	10.62	----	333.5
1918	BP47/BD/2	1.89	0.4	51.4	--	1	5.30	----	79.7

BP42/BD/1 - not delivered.
BP47/BD/R - rec'd but not in list.

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SAMPLE: CORE SAMPLES (INSTRUCTIONS REC'D OCTOBER 5, 1978)

LAB. NO.	SAMPLE NO.	S.G.	H2O%	ASH%	VM.%	F.S.I.	S%	C.V.	AIR DRIED WT. (GRMS)
1919	BP47/BD/3	1.60	0.3	28.5	--	3 1/2	5.32	----	63.8
1920	BP47/BD/4	2.10	0.4	70.8	--	1/2	0.53	----	46.8
1921	BP47/BD/5	1.47	0.3	16.4	--		4.95	----	176.8
1922	BP53/BD/1	2.45	0.5	79.7	--	1/2	6.26	----	238.6
1923	BP53/BD/2	1.50	0.4	16.4	--	8	8.81	----	1292.5
1924	BP53/C/R	2.32	--	80.9	--	---	--	----	424.9
1925	BP53/C/1	1.97	0.5	60.9	8.2	1/2	0.23	5634	390.5
1926	BP53/C/2	1.37	0.5	8.2	18.1	3 1/2	0.69	14234	735.5
1927	BP53/C/3	1.48	--	13.6	--	---	--	----	19.1
~~1928~~ 1928	BP53/C/4	1.40	0.5	12.5	17.9	7 1/2	0.50	13536	985.8
1929	BP53/C/5	2.54	--	83.2	--	---	--	----	116.9
1930	BP53/C/6	1.44	0.5	19.0	16.9	6	0.39	12489	776.4
1931	BP53/C/7	2.28	--	79.6	--	---	--	----	366.5
1932	BP53/C/8	1.29	--	2.0	--	---	0.57	15103	13.0
1933	BP53/D/1	2.29	--	79.0	--	---	--	----	237.9
1934	BP53/D/2	2.31	--	81.1	--	---	--	----	142.9
1935	BP53/D/3	2.41	--	86.4	--	---	--	----	970.0
1936	BP53/D/4	1.72	--	43.1	--	---	--	----	558.0
1937	BP53/D/5	1.46	0.4	14.9	14.0	1	0.61	13045	357.7
1938	BP53/D/6	1.67	--	40.5	--	---	--	----	315.4

BP47/BD/5 - rec'd but not in list.

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SAMPLE: CORE SAMPLES (INSTRUCTIONS REC'D OCTOBER 5, 1978)

LAB. NO.	SAMPLE NO.	S.G.	H20%	ASH%	VM.%	F.S.I.	S%	C.V.	AIR DRIED WT. (GRMS)
1939	BP53/D/7	1.88	--	56.6	--	---	--	----	133.3
1940	BP53/D/8	1.41	0.5	15.5	17.0	4 1/2	0.67	13023	57.8
1941	BP53/D/9	2.44	--	85.0	--	---	--	----	535.0
1942	BP53/D/10	1.48	--	22.2	--	---	--	----	102.8
1943	BP53/D/11	1.40	0.4	13.1	18.5	5	0.73	13304	190.6
1944	BP 3/D/12	2.50	--	88.9	--	---	--	----	1193.9
1945	BP53/D/13	1.81	--	51.1	--	---	--	----	221.7
1946	BP53/CL/R	2.53	--	90.4	--	---	--	----	382.7
1947	BP 3/CL/1	1.97	--	61.4	--	---	--	----	1336.0
1948	BP 3/CL/2	1.42	0.5	14.1	16.1	1 1/2	0.53	13232	1210.2
1949	BP53/CL/3	1.88	--	57.7	--	---	--	----	73.5
1950	BP53/CL/4	1.54	0.6	29.8	16.8	3 1/2	0.39	10465	238.7
1951	BP53/CL/5	2.29	--	79.7	--	---	--	----	1511.0
1952	BP53/CL/6	1.52	0.5	28.4	16.3	4 1/2	0.46	10889	177.0
1953	BP53/E/1	1.60	--	29.5	--	---	--	----	365.1
1954	BP65/B/R1	2.62	--	93.2	--	---	--	----	651.0
1955	BP65/B/R2	2.19	--	74.8	--	---	--	----	489.9
1956	BP65/B/1	1.33	0.6	4.2	18.6	1/2	0.45	14718	316.7
1957	BP65/B/2	2.64	--	94.3	--	---	--	----	5053.2
1958	BP65/B/3	1.94	0.7	54.9	12.9	1	0.34	6451	272.7

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SAMPLE: CORE SAMPLES (INSTRUCTIONS REC'D OCTOBER 5, 1978)

LAB. NO.	SAMPLE NO.	S.G.	H20%	ASH%	VM.%	F.S.I.	S%	C.V.	AIR DRIED WT. (GRMS)
1959	BP65/B/4	1.35	0.6	5.7	18.5	1	0.49	14536	2279.0
1960	BP65/B/5	2.10	0.7	66.4	13.7	1/2	0.20	----	99.1
1961	BP65/B/6	1.42	0.5	14.5	18.5	2 1/2	0.62	13134	679.9
1962	BP65/B/7	2.36	--	78.3	--	---	--	----	2105.4
1963	BP65/B/8	1.83	0.6	48.0	14.0	1	0.31	7660	403.8
1964	BP65/B/9	2.24	--	77.2	--	---	--	----	1936.0
1965	BP65/B/10	1.38	0.4	12.3	20.9	8 1/2	0.61	13624	193.6
1966	BP60/CHU/1	2.56	0.9	85.1	--	N.A.	3.71	----	375.3
1967	BP60/CHU/2	2.56	0.4	90.6	--	N.A.	0.75	----	555.3
1968	BP60/CHU/3	1.46	0.5	19.4	--	7	0.72	----	261.0
1969	BP60/CHU/4	1.36	0.5	7.6	--	6	0.76	----	557.3
1970	BP63/CHU/1	1.68	0.5	42.1	--	2 1/2	2.44	----	33.6
1971	BP63/CHU/2	2.16	--	73.9	--	---	--	----	279.9
1972	BP63/CHU/3	1.34	0.5	7.4	--	7 1/2	1.05	----	1017.0
1973	BP63/CHU/4	1.36	0.4	8.8	--	9	0.59	----	83.5
1974	BP63/CHU/5	1.31	0.5	4.0	--	9	0.55	----	805.7
1975	BP63/CHU/6	1.29	0.5	2.7	--	9	0.56	----	154.1
1976	BP63/CHU/7	1.31	0.5	4.5	--	9	0.55	----	446.1
1977	BP63/CHU/8	1.42	0.5	17.0	--	9	0.82	----	136.0

BP63/CHU/8 - rec'd but not in list.

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LAB. NO.	SAMPLE NO.	S.G.	H2O%	ASH%	VM.%	F.S.I.	S%	C.V.	AIR DRIED WT. (GRMS)
1978	BP63/CHL/R	2.69	--	88.9	---	---	---	---	375.0
1979	BP63/CHL/1	1.69	0.6	33.6	--	1/2	0.25	---	498.9
1980	BP63/CHL/2	1.41	0.8	8.9	--	1/2	0.36	---	25.7
1981	BP63/CHL/3	1.35	0.6	7.1	--	4 1/2	0.46	---	673.6
1982	BP63/CHL/4	1.32	0.6	4.3	--	7 1/2	0.41	---	673.7
1983	BP63/CHL/5	1.31	0.6	2.2	--	5 1/2	0.36	---	15.6
1984	BP63/CHL/6	1.32	0.4	2.9	--	8 1/2	0.45	---	322.6
1985	BP63/CHL/7	1.98	0.4	62.7	--	1 1/2	0.22	---	37.3
1986	BP66/CHU/1	1.46	0.5	16.8	--	7 1/2	2.50	---	225.0
1987	BP66/CHU/2	2.40	0.7	85.2	--	N.A.	0.27	---	15.8
1988	BP66/CHU/3	1.32	0.5	4.8	--	8	1.39	---	77.9
1989	BP66/CHU/4	2.57	--	90.4	--	---	--	---	614.8
1990	BP66/CHU/5	1.36	0.4	6.8	--	7 1/2	0.87	---	705.6

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LAB. NO.	SAMPLE NO.	S.G.	H2O%	ASH%	VM.%	F.S.I.	S%	C.V.	AIR DRIED WT. (GRMS)
1991	BP66/CHU/6	2.49	0.7	88.8	--	N.A.	0.23	----	11.9
1992	BP66/CHU/7	1.32	0.5	4.9	--	9	0.71	----	269.9
1993	BP66/CHL/R	2.74	--	85.4	--	---	--	----	437.2
1994	BP66/CHL/1	1.34	0.4	5.3	--	8	1.00	----	71.7
1995	BP66/CHL/2	2.67	0.8	87.8	--	N.A.	0.12	----	39.4
1996	BP66/CHL/3	1.35	0.4	6.8	--	7 1/2	0.64	---	202.0
1997	BP66/CHL/4	1.32	0.5	3.3	--	8 1/2	0.53	----	387.1
1998	BP66/CHL/5	1.34	0.4	3.6	--	3 1/2	0.53	----	517.1
1999	BP66/CHL/6	1.30	0.6	2.4	--	9	0.54	----	32.6
2000	BP66/CHL/7	2.57	--	94.8	--	---	--	----	40.4
2001	BP66/CHL/8	1.31	0.6	2.8	--	8	0.50	----	183.3
2002	BP66/CHL/9	2.64	--	97.4	--	N.A.	0.09	----	23.9
2003	BP66/CHL/10	1.31	0.5	2.9	--	9	0.55	----	253.9
2004	BP66/CHL/11	1.32	0.5	3.6	--	8 1/2	0.45	----	543.6
2005	BP66/CHL/12	1.33	0.5	4.8	--	7 1/2	0.57	----	63.2
2006	BP66/CHS/1	1.31	0.6	3.9	--	9	0.59	----	447.8
2007	TR1/LCH/1	1.32	--	4.6	--	7	--	----	16200.0
2008	TR1/LCH/2	1.77	--	44.5	--	N.A.	--	----	1554.8

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LAB. NO.	SAMPLE NO.	S.G.	H2O%	ASH%	VM.%	F.S.I.	S%	C.V.	AIR DRIED WT. (GRMS)
2009	TR3/UCH/1	1.66	--	35.0	--	1/2	--	----	3695.8
2010	TR3/UCH.2	2.58	--	91.9	--	N.A.	--	----	574.5
2011	TR3/UCH/3	1.46	--	9.7	--	N.A.	--	----	6130.0
2012	TR2/UCH/1	1.38	--	8.0	--	1/2	--	----	3050.0
2013	TR5/LCH/1	1.35	--	3.3	--	1/2	--	----	3840.6
2014	TR5/LCH/2	1.81	--	47.8	--	N.A.	--	----	1455.0
2015	TR8/LCH/1	1.37	--	5.8	--	1/2	--	----	3544.0
2016	TR8/LCH/2	1.82	--	46.2	--	N.A.	--	--	1524.1
2017	TR11/LCH/1	1.47	--	8.3	--	N.A.	--	----	8800.0
2018	TR11/LCH/2	1.83	--	38.6	--	N.A.	--	----	1212.8
2019	TR12/LCH/1	1.34	--	3.9	--	1	--	----	6040.0
2020	TR12/LCH/2	1.81	--	45.1	--	N.A.	--	----	897.4
2021	TR16/UCH/1	1.67	--	34.6	--	N.A.	--	----	2320.2
2022	TR16/UCH/2	1.97	--	55.0	--	N.A.	--	--	1225.5
2023	TR16/UCH/3	1.53	--	14.9	--	N.A.	--	--	4100.0
2024	TR16/UCH/4	2.46	--	85.2	--	N.A.	--	----	1109.5
2025	TR16/UCH/5	1.49	--	10.5	--	N.A.	--	----	3858.5

R10/UCH/1 - not delivered.

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LAB. NO.	SAMPLE NO.	S.G.	H20%	ASH%	VM.%	F.S.I.	S%	C.V.	AIR DRIED WT. (GRMS)
2026	TR17/UCH/1	1.68	--	31.7	--	N.A.	--	----	13400.0
2027	TR18/UCH/1	1.70	--	33.3	--	N.A.	--	----	6300.0
2028	TR18/UCH/2	2.23	--	74.1	--	N.A.	--	----	481.6
2029	TR18/UCH/3	1.48	--	7.9	--	N.A.	--	----	4450.0
2030	TR19/B/1	1.44	3.7	9.3	23.3	N.A.	0.36	11869	10420.0
2031	TR20/C/1	1.80	7.2	44.5	16.7	N.A.	0.38	5723	2122.7
2032	TR20/C/2	2.28	2.8	70.8	16.4	N.A.	0.10	----	1330.0
2033	TR20/C/3	1.53	16.2	12.1	23.9	N.A.	0.37	8612	2960.9
2034	TR20/C/4	1.91	7.5	50.9	16.5	N.A.	0.30	4632	1621.8
2035	TR21/D/1	1.88	5.3	49.8	15.6	N.A.	0.33	5338	2960.0
2036	TR21/D/2	2.28	--	76.2	--	---	--	----	4420.0
2037	TR21/D/3	1.72	7.9	35.8	19.3	N.A.	0.39	6994	1812.7
2038	TR22/BL/1	2.01	4.3	61.2	16.1	N.A.	0.29	----	2806.0
2039	TR22/BL/2	2.29	--	77.7	--	---	--	----	3852.0
2040	TR22/BL/3	1.58	8.5	24.7	21.7	N.A.	0.41	8561	2760.0
2041	TR22/BL/4	2.39	--	82.6	--	---	--	----	188.4
2042	TR22/BL/5	1.63	9.6	29.7	20.2	N.A.	0.36	7709	1975.4
2043	TR22/BL/6	1.48	16.3	10.4	25.0	N.A.	0.43	8926	3035.8

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LAB. NO.	SAMPLE NO.	S.G.	H2O%	ASH%	VM.%	F.S.I.	S%	C.V.	AIR DRIED WT. (GRMS)
2044	TR23/C/1	1.50	5.2	15.3	20.3	N.A.	0.39	10836	2418.6
2045	TR23/C/2	1.52	4.6	18.8	20.0	N.A.	0.39	10460	2372.5
2046	TR23/C/3	1.49	5.8	12.9	20.7	N.A.	0.41	11015	3995.0
2047	TR23/C/4	2.46	--	84.9	--	---	--	---	3116.5
2048	TR23/C/5	1.92	--	51.9	--	---	--	4852	3220.6
2049	TR24/D/1	1.53	5.2	13.2	18.5	N.A.	0.45	11085	4300.00
2050	TR26/B/R	2.62	--	89.3	--	---	--	---	4775.0
2051	TR26/B/1	1.42	2.9	10.6	18.9	1/2	0.53	12534	5892.0
2052	TR26/B/2	2.51	--	84.3	--	---	--	---	1776.9
2053	TR26/B/3	1.37	1.7	10.9	21.6	1	0.54	13322	4290.0
2054	TR26/B/4	1.63	1.2	37.6	15.1	1 1/2	0.39	9211	4605.0
2055	TR26/B/5	2.26	--	79.3	--	---	--	---	3520.0
2056	TR26/B/6	1.40	1.2	12.5	18.7	1	0.49	13212	3882.3
2057	TR26/B/7	1.58	1.1	33.0	15.4	1	0.41	9991	2418.9
2058	TR26/B/8	1.89	--	56.3	--	---	--	6089	1974.9
2059	TR28/BL/1	2.51	--	89.9	--	---	--	---	5755.0
2060	TR28/BL/1	1.78	6.0	43.0	16.6	N.A.	0.27	6268	2613.7
2061	TR28/BL/3	1.44	4.2	13.6	20.4	1/2	0.57	11823	4624.0
2062	TR28/BL/4	2.41	--	76.9	--	---	--	---	1785.0
2063	TR28/BL/5	1.36	3.7	6.2	19.2	1/2	0.50	13331	9852.0

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LAB. NO.	SAMPLE NO.	S.G.	H2O%	ASH%	VM.%	F.S.I.	S%	C.V.	AIR DRIED WT. (GRMS)
2064	TR29/LCH/2	1.81	--	46.7	--	N.A.	--	---	1834.2
2065	TR29/LCH/1	1.41	--	9.9	--	1/2	--	---	10454.0
2066	TR33/LCH/2	1.64	--	26.6	--	N.A.	--	---	458.1
2067	TR33/LCH/1	1.38	--	9.1	--	1	--	---	5919.0
2068	TR34/UCH/3	1.63	--	32.1	--	N.A.	--	---	2093.1
2069	TR34/UCH/2	1.97	--	63.6	--	N.A.	--	---	2665.4
2070	TR34/UCH/1	1.51	--	24.9	--	1/2	--	---	2977.4
2071	TR35/B/R	2.58	--	92.9	--	---	--	---	919.2
2072	TR35/B/1	1.52	6.9	13.6	25.3	N.A.	0.40	9974	5757.0
2073	TR35/B/2	2.50	--	81.3	--	---	--	---	586.1
2074	TR35/B/3	1.69	7.5	31.2	20.0	N.A.	0.28	7802	6515.0
2075	TR35/B/4	1.65	2.2	37.3	16.0	1/2	0.30	7799	9010.0
2076	TR35/B/5	1.59	1.0	31.5	14.5	N.A.	0.39	9927	12500.0
2077	TR35/B/6	2.45	--	87.1	--	---	--	---	14396.0
2078	TR35/B/7	1.56	5.6	18.3	23.7	1/2	0.34	9478	1827.0
2079	TR35/B/9	1.40	3.4	6.2	20.7	N.A.	0.48	13227	5832.0
2080	TR35/B/10	2.55	--	87.6	--	--	--	---	144.4
2081	TR35/B/11	1.57	2.1	30.1	16.9	N.A.	0.41	9563	2656.1
2082	TR35/B/12	2.06	--	65.5	--	---	--	---	13777.0
2083	TR35/B/13	1.75	--	45.7	--	---	--	6301	3074.2

TR35/B/8 - not delivered.
TR35/B/R - rec'd but not in list.

Birtley Coal & Minerals Testing

A DIVISION OF GREAT WEST STEEL INDUSTRIES LTD

CLIENT: BP EXPLORATION CANADA LTD. October 27, 1978

SAMPLE: CORE SAMPLES (INSTRUCTIONS REC'D OCTOBER 5, 1978)

LAB. NO.	SAMPLE NO.	S.G.	H2O%	ASH%	VM.%	F.S.I.	S%	C.V.	AIR DRIED WT. (GRMS)
2084	TR35/B/14	1.70	8.2	34.1	19.6	N.A.	0.34	7653	15000.0
2085	TR35/B/15	1.90	--	54.0	--	---	--	4071	13770.0
2086	TR35/B/16	1.63	--	26.0	--	---	--	8671	11822.0
2087	TR35/B/17	2.24	--	75.6	--	---	--	---	13000.0
2088	TR35/B/18	1.48	8.4	12.2	23.8	N.A.	0.46	10240	11509.0
2089	TR35/B/19	1.46	2.4	17.9	17.4	N.A.	0.39	---	16000.0
2090	TR35/B/20	2.48	--	83.2	--	---	--	---	3942.5
2091	TR35/B/21	1.34	1.1	10.3	20.2	1	0.53	13472	11117.0
2092	TR39/B/1	2.51	--	85.1	--	---	--	---	1272.5
2093	TR39/B/2	1.61	8.5	21.0	23.9	N.A.	0.27	8646	6662.0
2094	TR39/B/3	1.64	9.9	28.4	21.1	N.A.	0.27	7433	6367.0
2095	TR39/B/4	1.62	4.6	29.1	18.1	N.A.	0.28	8861	10121.0
2096	TR39/B/5	1.52	2.0	21.8	17.1	N.A.	0.32	10925	8746.0
2097	TR44/CH/1	1.34	--	4.0	--	2 1/2	---	---	1287.6
2098	TR44/CH/2	1.46	--	7.6	--	N.A.	--	---	2166.0
2099	TR48/UCH/1	1.86	--	50.7	--	1/2	--	---	681.3
2100	TR48/UCH/2	1.41	--	8.7	--	1/2	--	---	856.0
2101	TR48/UCH/3	1.43	--	6.6	--	1/2	--	---	7154.0
2102	TR48/UCH/4	1.95	--	55.3	--	N.A.	--	---	644.3
2103	TR48/UCH/5	1.43	--	11.9	--	1/2	--	---	324.1

CLIENT: BP EXPLORATION CANADA LTD. October 27, 1978

SAMPLE: CORE SAMPLES (INSTRUCTIONS REC'D OCTOBER 5, 1978)

LAB. NO.	SAMPLE NO.	S.G.	H2O%	ASH%	VM.%	F.S.I.	S%	C.V.	AIR DRIED WT. (GRMS)
2104	TR/38/1	1.55	--	25.8	--	---	--	---	3106.6

TR/[redacted]1 - rec'd but not in list.

Birtley Coal
& Minerals Testing
A DIVISION OF GREAT WEST STEEL INDUSTRIES LTD

PR-SUKUNKA 78(3)A.

SUKUNKA 1978 EXPLORATION

PROGRAM

APPENDIX A

Geologists Logs

3 of 7

PR-SUKUNKA 78(3)A

SUKUNKA 1978

EXPLORATION PROGRAM

Trench Description 1 of 7

665

Trenching Programme 1978

52 trenches, in 9 groupings, were cut,logged and surveyed.

Personnel responsible for logging were D.J.W. Mitchell, P.M. Caine, K. Kim, A. Chowdry, C. Bickford, L. Rindero.

Group One

Plate 2a northern crop, Upper and Lower Chamberlain Seams. No's 1-3, 7, 43.

Group Two

Plate 2b northern crop, Upper and Lower Chamberlain Seams No's 4-6.

Group Three

Plate 1 northern crop, Upper and Lower Chamberlain Seams. No's 8-18, 41.

Group Four

Plate 1 northern crop, Middle Coals Seams B to D. No's 19-24.

Group Five

Plate 2a northern crop, Middle Coals, B Seams. No's 25-28, 39.

Group Six

Plate 2a, south bank Chamberlain Creek, Upper and Lower Chamberlain Seams. No's 29-34, 42.

Group Seven

Plate 1, western crop, Middle Coals, B Seam. No. 35 (Composite of 5 trenches).

Group Eight

Plate 1, western crop, Middle coals B Seams. No's 36-40.

Group Nine

Plate 3, northern crop, Upper and Lower Chamberlain Seams No's 44-52.

BP Canada

SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR.1 SEAM NAME LOGGED BY P.M.Caine DATE 28.July 1978

Plate 2a
Northern crop

LOWER CHAMBERLAIN SAMPLED BY D.J.W.M. DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		1.1+		MUDSTONE, silty, grey	
		0.3		MUDSTONE, CANNELOID, black, pulverised	TR1/LCH/2
		1.59		COAL, few low-angle polished slips.	TR1/LCH/1
		+		SANDSTONE	

BP Canada

SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR 2 SEAM NAME UPPER CHAMBERLAIN LOGGED BY D.J.W.Mitchell DATE 5th August 1978

Plate 2a
Northern crop

SAMPLED BY .. DATE ..

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.24+		SANDSTONE, medium -grained.	
		0.22		SILTSTONE, medium grey, well bedded.	
		1.23		COAL, pulverized and sooty in top .10m, sheared below.	TR2/UCH/1
		0.45		SILTSTONE, medium-grey, micaceous, muddy top and base, ferruginous weathering. Common rootlets, irregular thickness.	
		0.56		COAL, sheared.	
		0.10 +		SILTSTONE, medium grey, micaceous.	

BP Canada

SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR 3 SEAM NAME LOGGED BY D.J.W.Mitchell DATE July 29, 1978

Location: Plate 2a Northern crop UPPER CHAMBERLAIN BY P.M.Caine DATE ..

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		1.0+		SANDSTONE, medium-grained, medium-grey, cross-bedded; thinly bedded	
				coaly partings in basal 0.72m.	
		0.06		MUDSTONE & COAL-(Rider Coal)	
		0.08		SILTSTONE, argillaceous	
		0.24		SANDSTONE, fine to medium-grained, rootlets	
		0.09		SILTSTONE, fining down to mudstone - thin bedded.	
		1.60		COAL-UPPER LEAF. Top 1.17m sheared.	TR3/UCH/3
		0.06		SILTSTONE, argillaceous, 0.04 to 0.09m thickness. Ferruginous in part, rootlets.	TR3/UCH/2
		0.69		COAL, with low-angle polished planes. Basal contact sharp. (LOWER LEAF).	TR3/UCH/1
		+		MUDSTONE, dark grey with rootlets.	

BP Canada

SHEET No. 1 of 3

COAL SEAM DETAILS

BOREHOLE No. TR 4 SEAM NAME LOGGED BY D.J.W.Mitchell DATE August 9,1978

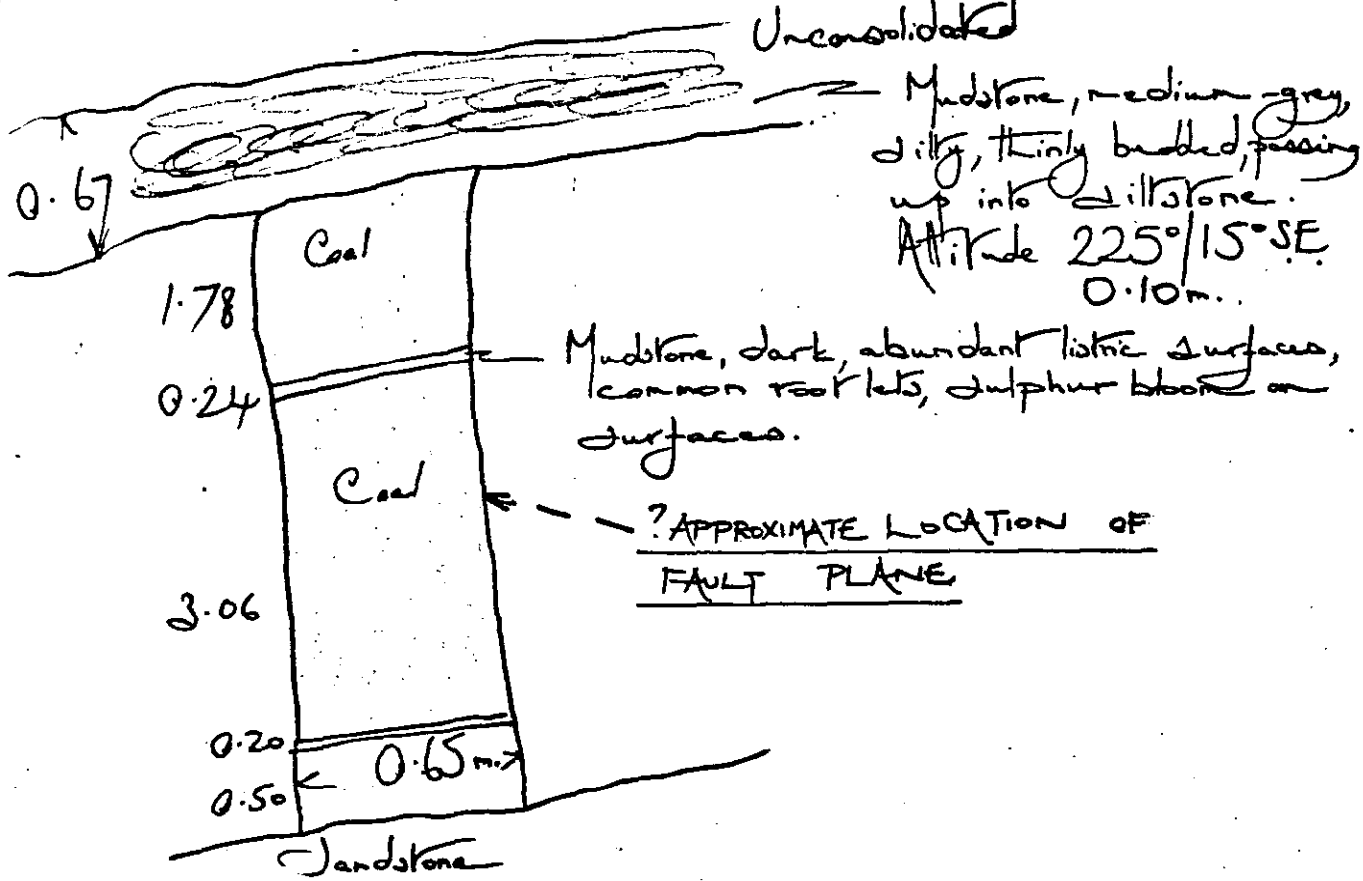
Location: Junction Plate 2A/2B Northern crop.

UPPER CHAMBERLAIN AT POND FAULT

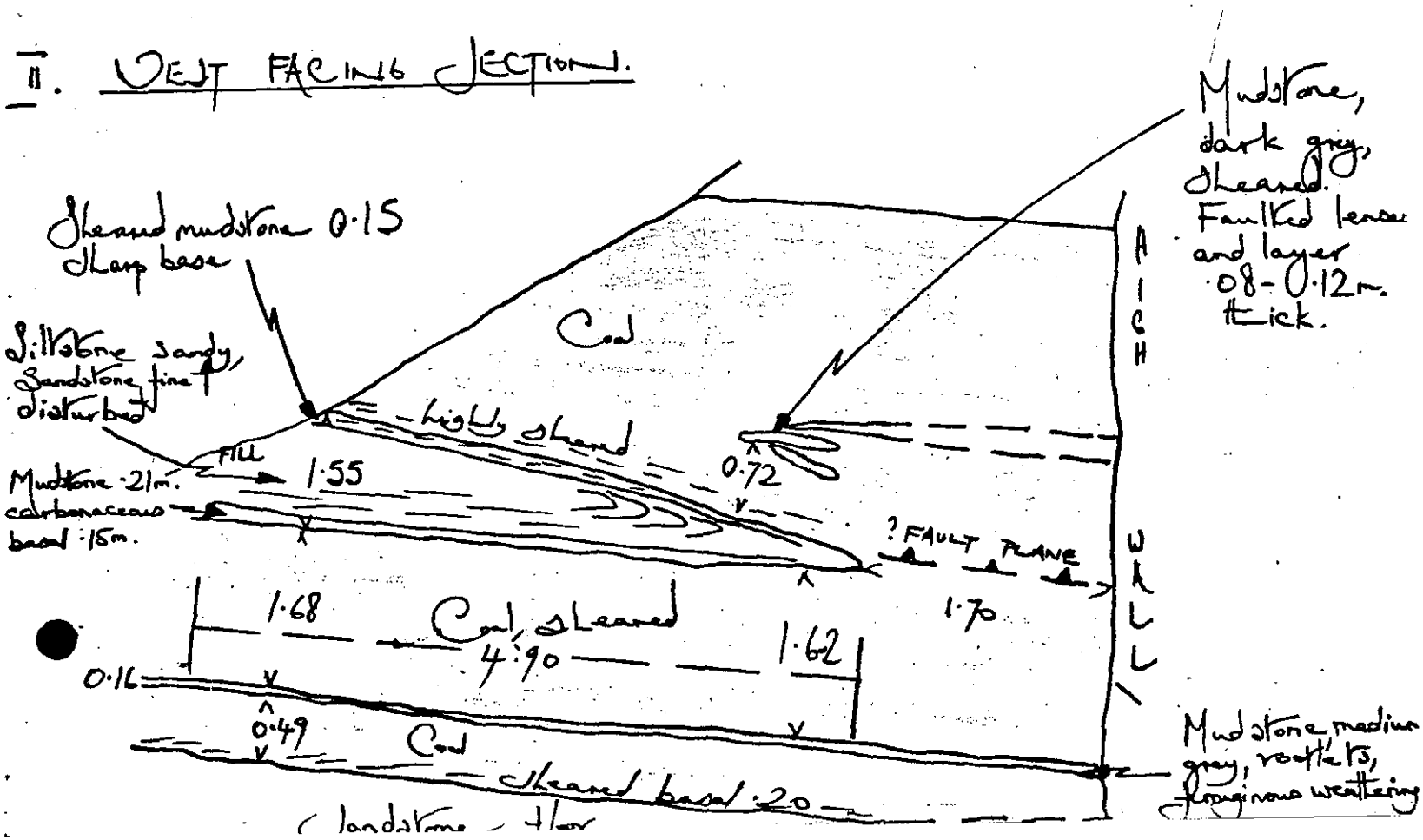
DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.354		SANDSTONE, fine-grained, micaceous, thinly bedded, common plant debris,	
				rusty weathering.	
		0.30		SILTSTONE, sandy, medium-grey, thinly bedded.	
		0.07		MUDSTONE, carbonaceous, common coal streaks. (Rider Coal Horizon)	
		0.22		SANDSTONE, Fine-grained, micaceous, medium-grey,common rootlets.	
		0.10		SILTSTONE, medium-grey, thinly bedded, pasing down to MUDSTONE silty,	
				225°/15° S.E.	
				COAL- UPPER CHAMBERLAIN SEAM, faulted and overthickened by the Pond Fault.	
				For thicknesses and descriptions see sketch sections overleaf.	
				SEAM NOT SAMPLED.	

TR #4 POND FAULT ~ U. CHAMBERLAIN JAN. 1993

I. NORTH FACING SECTION. TRENCH TRENDS 8°



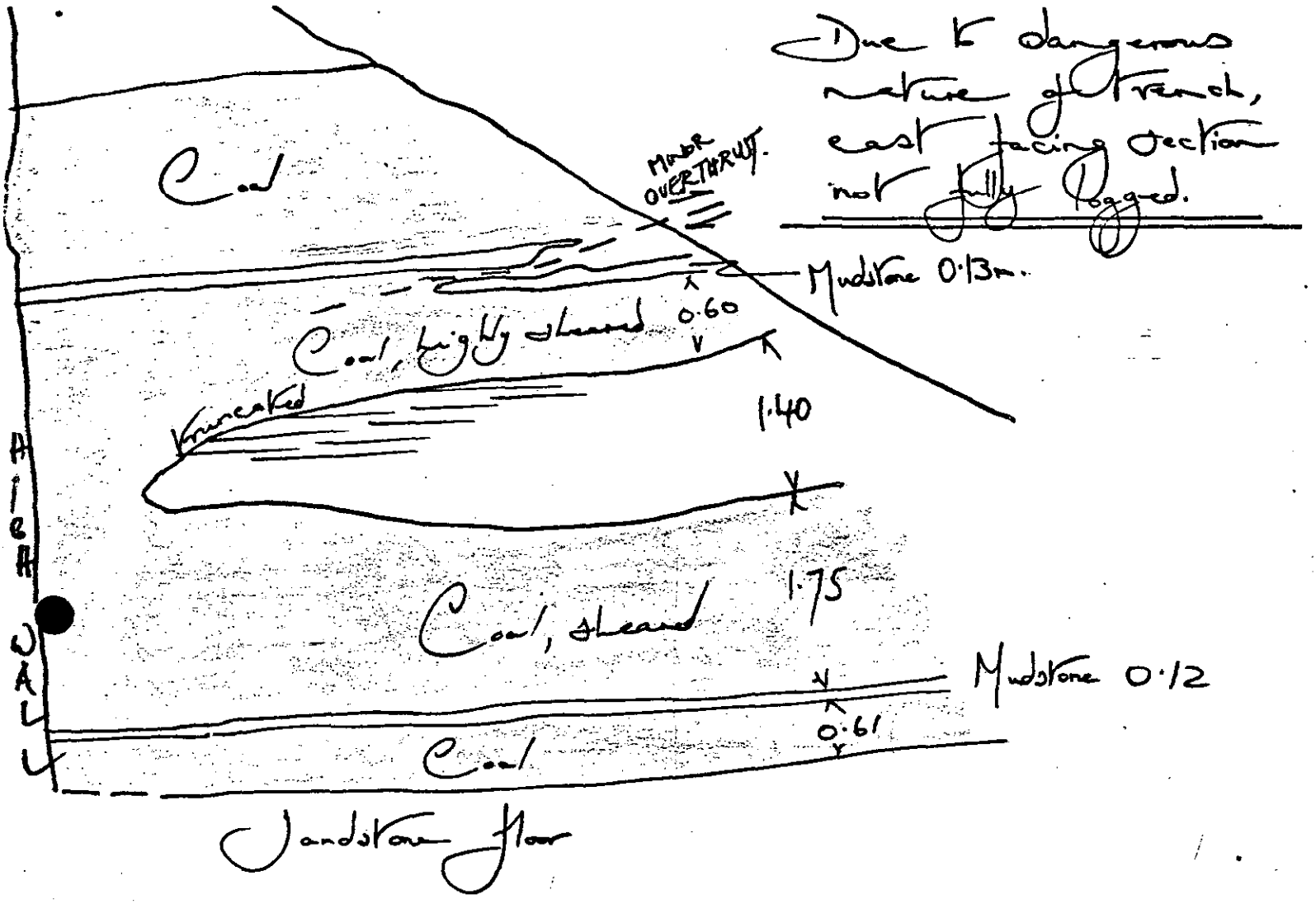
II. VENT FACING SECTION.



TR # 4

Level 3.43

III EAST FACING SECTION.



BP Canada

SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR 5 SEAM NAME LOWER CHAMBERLAIN SEAM LOGGED BY D.J.W.Mitchell DATE August 10,1978

Plate 2B
Northern crop

SAMPLED BY .. DATE ..

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		1.0 +		SANDSTONE, dune set, massive, joints and weathered surfaces commonly ferri-	
				ginous.	
				Sharp, non erosive.	
		1.60		MUDSTONE, medium grey, colour banded, thinly bedded. Few low angle shear	
				planes (for attitude see structural feature 3, in mudstone unit below.)	
		0.05		Sigmoidal laminite, Sigmoids dip to S.W. Thickens up to .20m immediately	
				to east.	
		1.80		MUDSTONE, medium-grey, colour banded, thinly bedded. Common minor structural	
				disturbance: 1) Few laterally discontinuous bedding plane shears 2) Later-	
				ally extensive .01 soft and weathered bedded shear layer .55m. above base	
				3) Immediately to east, few shear planes dipping east (apparent) 25° to lam-	
				ination. 4) Few minor undulations in immediate roof of exposure to west.	
				Attitude 246°/6°S.E.	
				Sharp	
		0.16		MUDSTONE, black and carbonaceous, canneloid in basal .01m. Sheared above	
				basal .01m, cornflakes locally.	TR5/LCH/2
				Sharp	
		1.58		COAL, dull and bright banded, common small and large shear planes. 2 domin-	TR5/LCH/1
				ant shear attitudes. 1) 243°/48-56° S.E. 2) 190°-205°/54°-61° E.	
		+		SANDSTONE, undulatory.	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 6 SEAM NAME LOGGED BY D.J.W.Mitchell DATE August 10, 1978

Plate 2B
Northern crop

LOWER CHAMBERLAIN SEAM ROOF

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		3.5 +		MUDSTONE, medium-grey, colour banded, thinly bedded, occasional ferriginous	
				weathering. Attitude 184°/19° E.	
				(Hardrock floor, seam not exposed, backhoe unable to deepen.)	

BP Canada

SHEET No. 1 of 1

COAL SEAM DETAILS

BOREHOLE No. TR 7 SEAM NAME LOWER CHAMBERLAIN LOGGED BY D.J.W.Mitchell DATE August 9,1978

Location: Plate 2A
Northern crop.

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				Trench caved in. Replaced by TR43.	

BP Canada

SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR 8 A,B,C SEAM NAME UPPER CHAMBERLAIN SEAM LOGGED BY D.J.W.Mitchell, A.Chowdry DATE JULY 29,1978

Plate 1
Northern crop

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				Trenches totally flooded. Waste pile consists of sandstone, siltstone and abundant coal fragments.	
				(Surveyed for subcrop location).	

BP Canada

SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR 8 SEAM NAME LOGGED BY A. Chowdry DATE July 29, 1978

Plate 1
Northern crop. LOWER CHAMBERLAIN SAMPLED BY D.J.W.Mitchell DATE

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.40 +		SANDSTONE, thinly bedded, argillaceous layers.	
		3.00		MUDSTONE, laminated, occasional ferruginous bands, two shear planes centrally:	
				sub parallel to bedding and 15° to bedding. Tigmoidal laminite absent.	
		0.14		MUDSTONE, sheared, dark with coaly streaks. Attitude 245°/8° N.W.	
				sharp, ferruginous	
		0.08		MUDSTONE, canneloid, highly sheared and pulverised, ferruginous joints.	TR8/LCH/2
		1.11 +		COAL, dull banded with thick bright bands, mostly sheared. Base not seen.	
				Bottom .20m. not sampled due to flooding.	TR8/LCH/1

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 9A&B SEAM NAME UPPER CHAMBERLAIN LOGGED BY A.Chowdry DATE July 29,1978

Plate 1
Northern crop

D.J.W.Mitchell

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.40 +		SANDSTONE (Upper Chamberlain higher roof), seam obscurred by flooding.	
				(Accurately plotted for sub-crop location, not surveyed.)	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. 10 A&B SEAM NAME LOGGED BY D.J.W.Mitchell DATE July 29, 1978

Plate 1
Northern crop

LOWER CHAMBERLAIN SEAM

A.Chowdry

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				Seam obscured by flooding.	
				(Accurately plotted for sub-crop location, not surveyed.)	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 11 | SEAM NAME | LOGGED BY D.J.W.Mitchell | DATE JULY 29, 1978

Plate 1
Northern crop

LOWER CHAMBERLAIN | SAMPLED BY A.Chowdry | DATE ..

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.45		MUDSTONE, silty, highly weathered.	
		0.22		COAL, sooty, weathered at top.	TR11/LCH/2
		1.36		COAL, bright and dull banded, weathered.	
		0.82		COAL, bright, and dull, slightly weathered, occasionally sheared. Basal .16m pulverized.	TR11/LCH/1
				Sharp	
		+		SANDSTONE, highly uneven.	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 12 — Plate 1 — Northern crop

SEAM NAME: LOWER CHAMBERLAIN

LOGGED BY D.J.W.Mitchell DATE July 29,1979

SAMPLED BY A.Chowdry DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		+		SANDSTONE, fine grained, thinly bedded.	
		2.70		MUDSTONE, colour banded, thinly bedded, few sheared layers but sigmoidal laminite absent. Attitude: 210°/4° S.E. Joints: 280°/88°S., 178°/88°W., equally dominant.	
		0.09		MUDSTONE, highly sheared and pulverized, variable thickness .06 - .13m.	
		0.08		MUDSTONE, CANNELOID, highly sheared and sooty.	TR12/LCH/2
		0.32		COAL, dull banded, two sets of shear planes: 240°/45° S.E. (dominant) 290°/43° NE.	TR12/LCH/1
		1.34		COAL, dominantly dull banded with frequent bright bands. Strong, few shear planes 300°/35°N.E. Cleats 354°/79° W. (dominant), 260°/vertical. Basal .09m highly sheared.	
		+		SANDSTONE, dark grey, uneven.	

BP Canada

SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR 13 SEAM NAME LOGGED BY D.J.W.Mitchell DATE July 29, 1978

Plate 1
Northern crop

LOWER CHAMBERLAIN

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.49		MUDSTONE, slightly disturbed.	
				sharp, uneven	
		0.04		MUDSTONE, light-grey, highly pulverized, variable thickness.	
		0.08		MUDSTONE, carbonaceous, sooty and pulverized.	
		0.25		MUDSTONE, dark-grey, carbonaceous, locally sheared.	
		1.77		COAL, dull, with some bright bands, weathered, commonly sheared in top	NOT
				.45m and basal .25m.	SAMPLED
		+		SANDSTONE, uneven.	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 14A SEAM NAME LOWER CHAMBERLAIN SEAM LOGGED BY D.J.W.Mitchell, A.Chowdry DATE July 29, 1978

Plate 1
Northern crop

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.55		Drift.	
		0.50 +		COAL, dull and bright. Soft and weathered with few bedding plane shears.	NOT
				Irregular weathered top, base obscured.	SAMPLED
		+		Floor: SANDSTONE, medium-grey, fine to medium-grained. Dip slope exposed to	
				north of trenches. Attitude 275°/23° S.	
				(Backhoe unable to bottom trench. Surveyed for subcrop location.)	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 14B SEAM NAME LOWER CHAMBERLAIN SEAM LOGGED BY D.J.W.Mitchell DATE July 29, 1978

Plate 1
Northern crop

A.Chowdry

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.69		DRIFT.	
		0.60+		COAL, dull and bright. Soft and weathered. Irregular weathered top, base	NOT
				obscurred.	SAMPLED
				(Backhoe unable to bottom trench. Surveyed for subcrop location.)	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 15 SEAM NAME LOGGED BY D.J.W.Mitchell DATE July 29, 1978

Section from sequence between UCH and LCH

Location: Plate 1 Northern crop A.Chowdry

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.45 +		SANDSTONE, fine to very fine grained, thinly bedded, occasional rootlets.	
				Attitude 300°/30° S.W.	
					NOT SAMPLED
		0.70 +		MUDSTONE, well bedded, common carbonaceous plant debris and few extensive	
				carbonaceous laminae.	

BP Canada

SHEET No. 1 of 2

COAL SEAM DETAILS

TRENCH No. TR 16 SEAM NAME LOGGED BY D.J.W.Mitchell DATE July 30,1978

Location: Plate 1 Northern crop UPPER CHAMBERLAIN SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.10 +		SANDSTONE, medium-grained, medium-grey, appears thinly bedded.	
		0.43		SILTSTONE, medium-grey, thinly bedded, highly weathered. Attitude: 135°/18°S.W.	
		0.23		MUDSTONE, thinly bedded, highly weathered.	
		0.10		COAL, dirty, highly weathered.	
		0.30 - 0.36		SILTSTONE, medium-grey, thinly bedded, common ferruginous weathering. Occasional roots, common coal laminae .	
				Ferruginous	
		0.96		COAL, highly weathered.	TR16/UCH/5
		0.10		MUDSTONE, dark and carbonaceous, sheared, common ferruginous weathered surfaces.	TR16/UCH/4
		0.20		COAL, highly weathered.	TR16/UCH/3

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 16 SEAM NAME UPPER CHAMBERLAIN LOGGED BY D.J.W.Mitchell DATE July 30,1978

SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.20		COAL, highly sheared and weathered.	
		0.19		MUDSTONE, dark grey, highly sheared, light brown weathering. Common fine, few thick coal streaks.	TR16/UCH/2
		0.13		COAL, bright banded, dirty appearance.	TR16/UCH/1
		0.10 +		SANDSTONE, fine-grained, dark and carbonaceous, common coaly rootlets.	
				(Hardrock floor, backhoe unable to deepen.)	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 17 SEAM NAME LOGGED BY D.J.W.Mitchell DATE July 30, 1978

Location: Plate 1
Northern crop

UPPER CHAMBERLAIN SAMPLED BY .. DATE ..

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.30 +		SANDSTONE, fine-grained, medium-grey, thinly bedded, common carbonaceous roots.	
				Primary joints 194°/2°S.	
		0.15		MUDSTONE, silty, well bedded, highly weathered with abundant ferruginous	
				surfaces. Attitude: 345°/6° S.W.	
		0.81		COAL, highly weathered, locally sheared.	
					TR17/UCH/1
		0.52		COAL, highly weathered and sheared.	
		0.10 +		SILTSTONE, sandy, medium-grey, common coal streaks.	
				(Hardrock floor, backhoe unable to deepen).	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 18 SEAM NAME LOGGED BY D.J.W.Mitchell DATE July 30, 1978

Location: Plate 1 Northern crop UPPER CHAMBERLAIN SAMPLED BY " DATE August 10, 1978

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.16 +		SANDSTONE, fine-grained, thinly bedded, medium-grey, common rootlets.	
		0.13		MUDSTONE, silty, medium-grey, well bedded, highly weathered, ferruginous.	
				Attitude 60°/11° S.E.	
		0.84		COAL, bright banded, weathered.	TR18/UCH/3
		0.03		MUDSTONE, dark, common fine coal strucks, rusty weathering.	TR18/UCH/2
		0.57		COAL, highly sheared and weathered.	
					TR18/UCH/1
		0.35		COAL, bright banded, slightly sheared and weathered. 0.05m dirty band	
				.23m above base.	
		0.22		MUDSTONE, silty, medium-grey, coarsening down into siltstone.	
		0.85		SANDSTONE, very fine-grained, micaceous, light-grey with few darker carbona-	
				ceous and ? silty laminae. Thinly bedded, yellow-brown ferruginous weather-	
				ing. Common rootlets, ripple setscentrally.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 18 SEAM NAME UPPER CHAMBERLAIN LOGGED BY D.J.W.Mitchell DATE July 30,1978

SAMPLED BY " DATE August 10,1978

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.12		SILTSTONE,medium-grey, thinly bedded, common rootlets and plant debris,	
				yellow-brown ferruginous weathering.	
		0.03		MUDSTONE, medium-grey, soft and pulverized, irregular thickness.	
		0.13		COAL, bright, few dull bands, common sheared dirt partings. Lensing	NOT
				ferruginous and weathered mudstone layer up to .03m thick, .03m from top.	SAMPLED
		0.15		MUDSTONE, sheared, dark and carbonaceous in top .05m, grey-brown below	
				with ferruginous weathered surfaces, thinly bedded.	
		0.10		COAL, cleated, weathered, dirty appearance.	
					NOT
		0.24		MUDSTONE, dark, very carbonaceous, abundant listric surfaces.	SAMPLED
		0.04		COAL, weathered and dirty appearance.	

BP Canada

SHEET No. 3 of 3

COAL SEAM DETAILS

TRENCH No. TR 18 SEAM NAME UPPER CHAMBERLAIN LOGGED BY D.J.W.Mitchell DATE July 30, 1978

SAMPLED BY " DATE August 10, 1978

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.05		MUDSTONE, dark, carbonaceous, common coal streaks and listric surfaces.	
		0.16 +		COAL, bright banded in top .07m, sooty and pulverized below. Base obscurred	NOT
				by flooding but thickness estimated to be .32m.	SAMPLED
				Section is cut by two minor compressional fault structures one metre apart:	
				1) .24m. overthrust lined with .03m listric mudstone containing coal	
				fragments, attitude 188°/72° W. 2) Minor over thrusting and seam thicken-	
				ing, dip unclear, strike 140°.	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 19 SEAM NAME LOGGED BY D.J.W.Mitchell DATE July 30,1978

Location: Plate 1 Northern crop MIDDLE COALS 'B' SEAM SAMPLED BY A.Chowdry DATE ..

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.25 +		MUDSTONE, thinly bedded, light grey. Attitude 305°/37° S.W.	
		1.56		COAL, highly sheared and folded with dips up to 90°, folds are small and tight.	
		0.04		SILTSTONE, argillaceous, dark-grey, coal streaks, ferruginous weathering.	
		1.77		COAL, highly sheared and folded with dips up to 90°, folds are small and light.	TR19/B/1
		0.04		SILTSTONE, argillaceous, dark-grey, coal streaks, ferruginous weathering. Highly folded, fold magnitude .5m.	
		0.99		COAL, highly sheared and folded with dips up to 90°, folds are small and tight.	
		0.30 +		MUDSTONE, silty, black and carbonaceous, very hard.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 20 SEAM NAME LOGGED BY A. Chowdry DATE July 30, 1978

Location: Plate 1 Northern crop MIDDLE COALS 'C' SEAM SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		+		MUDSTONE, silty, medium-grey.	
				Gradational	
		0.22		MUDSTONE, black, highly carbonaceous, progressively coaly downwards.	
		0.16		COAL, apparently shaly with minor bright coal bands throughout.	TR20/C/4
		0.48		COAL, weathered locally highly pulverized, dominantly dull appearance.	TR20/C/3
		0.20		COAL, high ash appearance, sheared.	TR20/C/2
		0.31		COAL, highly sheared and pulverized, listricated.	TR20/C/1
				Sharp	
		1.00 +		MUDSTONE, medium-grey, locally carbonaceous, silty, abundant roots.	

BP Canada

SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR 21 SEAM NAME LOGGED BY D.J.W.Mitchell DATE July 30,1978

Location: Plate 1 Northern crop MIDDLE COAL 'D' SEAM SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.60		MUDSTONE, dark and carbonaceous, highly sheared.	
		0.45		MUDSTONE, light-grey, highly sheared.	
		0.35		MUDSTONE, dark and carbonaceous, common thin coal laminae, highly sheared.	
		0.28		COAL, sheared and tightly folded with steep irregular dips. Dirty appearance.	TR21/D/3
		0.47		MUDSTONE, dark ,common thin coal streaks, common ferruginous weathered surfaces.	TR21/D/2
		0.45		COAL, sheared and tightly folded with steep irregular dips.	TR21/D/1
		0.25 +		MUDSTONE, dark-grey, common carbonaceous rootlets, common orange ferruginous weathered surfaces.	
				(Above trench section is highly sheared and is not representative of the D seam.)	

BP Canada

SHEET No. 1 of 2

COAL SEAM DETAILS

TRENCH No. TR 22 SEAM NAME LOGGED BY D.J.W.Mitchell DATE July 31, 1978

Location: Plate One Northern crop MIDDLE COALS ' B LOWER ' SEAM SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.25		MUDSTONE, medium-grey, thinly bedded, occasional fine coal streaks, highly	
				weathered. Attitude 300°/26° S.W.	
		0.38		COAL, bright banded. Common small curved shear planes sub parallel to	
				lamination.	TR22/BL/6
		0.18		COAL, bright banded, dirty appearance.	TR22/BL/5
		0.02		MUDSTONE, ferruginous weathering.	TR22/BL/4
		0.27		COAL, dull and bright, dirty appearance in top..10m. Tectonically disturbed;	
				irregular thickness with uneven base.	TR22/BL/3
		0.19		MUDSTONE, medium-grey, occasional rootlets.	TR22/BL/2
		0.04		COAL, bright.	TR22/BL/1

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 22 SEAM NAME MIDDLE COALS ' B LOWER' SEAM

LOGGED BY D.J.W.Mitchell DATE JULY31,1978

SAMPLED BY .. DATE ..

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.21		MUDSTONE, dark-grey, commonly carbonaceous. Occasional thick coal streaks. Irregular thickness.	
		0.74		SILTSTONE, unlaminated, common coaly rootlets, becoming sandy towards base.	
				NOTE: Low-angle normal fault cuts left hand side of trench. Apparent strike and dip 280°/23° N.E., throw less than .5m.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 23 SEAM NAME LOGGED BY D.J.W.Mitchell DATE July 31, 1978

Location: Plate one Northern crop. MIDDLE COALS 'C' SEAM SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		1.0 +		MUDSTONE, silty, medium-grey.	
		0.80		SANDSTONE, very fine-grained, light-grey, common silt laminae; occasional car-	
				bonaceous plant debris. Ferruginous and mineralized joints 295°/64° N.E. and	
				200°/68° E. spacing .05 - .40m. Attitude 290°/26°S.W.	
		0.04		SILTSTONE, muddy, medium-grey, thinly bedded, few coal streaks.	
		0.65		MUDSTONE, dark-grey, carbonaceous, and COAL interleaved, 75:25. Common	
				shear planes dipping at low andle to lamination, occasional small folds.	TR23/C/5
		0.21		MUDSTONE, medium-grey, poorly bedded, few thick coal streaks.	TR23/C/4
		0.85		COAL, abundant small shear planes dipping at low angle to lamination,	
				pulverized in top .02m.	TR23/C/3
				sheared	
		0.29		COAL, dirty, few thin laterally discontinuous mudstone bands.	TR23/C/2

BP Canada

COAL SEAM DETAILS

SHEET No. 2 of 2

TRENCH No. TR 23 SEAM NAME MIDDLE COALS 'C' SEAM

LOGGED BY D.J.W.Mitchell DATE July 31,1978

SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.34		COAL, dull and bright, commonly sheared, heavily sheared in basal .10m.	TR23/C/1
		0.40+		MUDSTONE, silty, medium-grey, unlaminated, common rootlets.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 24 SEAM NAME LOGGED BY D.J.W.Mitchell DATE July 31,1978

Location: Plate 1 Northern crop.

MIDDLE COALS ' D' SEAM SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.70 +		SANDSTONE, very fine-grained, medium-grey, thinly bedded, highly weathered. Attitude 300°/47° S.W.	
		0.13		MUDSTONE, dark-grey, thinly bedded, common carbonaceous plant debris, highly weathered.	
		0.25		MUDSTONE, dark-grey, carbonaceous, highly weathered. Sheared with few small tight folds.	
		0.29		MUDSTONE, medium-grey, unbedded, common rootlets, sheared and highly weathered.	
		0.13		MUDSTONE, dark-grey, very carbonaceous, sheared with common small tight folds.	
		0.31		MUDSTONE, medium-grey, unlaminated, common rootlets, commonly sheared and weathered.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 24 SEAM NAME MIDDLE COALS ' D ' SEAM LOGGED BY D.J.W.Mitchell DATE July 31, 1978

SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.93		COAL, dull and dirty appearance, highly sheared in top .11m, weathered.	
				Common extensive shear planes sub-parallel and dipping up to 30° to lamination.	TR24/D/1
				Dominant clear 210°/52° N.W.	
		0.30 +		MUDSTONE, silty, passing down to siltstone, unlaminated. Common rootlets,	
				rare coal laminae up to .01m. thick.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 25 SEAM NAME Below "B" zone, Lower Gething LOGGED BY Corey Bickford DATE July 30, 1978

Location: Conveyor Decline on site of previous stripped outcrop SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.55		SANDSTONE- very fine grained, argillaceous, orange-brown weathering. Thin to medium bedded, low-angle cross-laminated. Strongly calcareous, blocky-weathering. Rootlets. Attitude: 045/7 E.	
		0.64		MUDSTONE- dark brownish grey, listricated. Finely broken plant fragments throughout, with coaly bands (0.001 to 0.003m thick). Rubbly weathering strongly calcareous.	
		0.28		MUDSTONE- dark grey to black, carbonaceous, with finely broken plant debris and occasional bright coaly bands. Rubbly weathering.	
		0.70		MUDSTONE, silty/SILTSTONE- interbedded. MUDSTONE: dark grey brown, partly carbonaceous, abundant plant debris, thin coaly stringers throughout; rubbly weathering. SILTSTONE: brown weatherin, spheroidal to blocky-weathering. Finely broken plant debris; strongly calcareous. Attitude: 152/15 SW.	
		0.10		MUDSTONE- dark grey to black, carbonaceous, sheared. Weakly calcareous.	
		2.71		SILTSTONE- thick bedded, orange-weathering, soft. Abudant carbonized plant debris. Blocky weathering. Sheared bright coal intruded along near vertica joints. Bedding contorted. Occasional bands of coaly mudstone from 1.00 to	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 25 SEAM NAME Below "B" zone, Lower Gething LOGGED BY Corey Bickford DATE July 30, 1978

SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				1.37m below top (0.01 to 0.07m thick). These bands pinch and swell laterally	
				Strongly calcareous. Attitude, at north end of trench (base of sectron):	
				124/25 S.W.	
				BASE OF MEASURED SECTION	
				Trench bearing 196°; section measured with 1.50m tape. All thicknesses true	
				measured in field. Section is trench is disturbed and broken by minor	
				faulting and folding, especially at base.	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 26 SEAM NAME Lower Gething "B" Seam LOGGED BY Corey Bickford DATE August 3, 1978

Location: Conveyor Decline SAMPLED BY " " DATE " "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				Top of Measured Section:	
		5±		SANDSTONE- reddish- weathering.	TR26/B/
		5.2		(concealed)	
		0.5		MUDSTONE- dark grey.	
		0.14		MUDSTONE- orange weathering, "ironstone". Attitude 110/17 S.W.	
		1.90		MUDSTONE- dark grey, calcareous, small dark burrows; Pelecypod fossils.	
		0.01 to 0.08		CONGLOMERATE- chert pebbles, well rounded, to 0.08m diameter. Erosional.	TR26/B/R [BASAL 0.25m]
		1.01		COAL- hard, strong, dull and bright.	TR26/B/ 1
		0.04		MUDSTONE- silty, carbonaceous. Afew disseminated sand grains. Attitude 110/13 S.W.	TR26/B/ 2
		0.18		COAL- bright; vertical, closely splaced cleats.	TR26/B/ 3
		0.24		COAL- sheared and pulverized.	TR26/B/ 4

BP Canada

COAL SEAM DETAILS

SHEET No. 2 of 2

TRENCH No. TR 26 SEAM NAME Lower Gething "B" Seam LOGGED BY Corey Bickford DATE August 3, 1978

Location: Conveyor Decline SAMPLED BY " " DATE " "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.14 to 0.18		MUDSTONE- black, carbonaceous. A few thin coaly bands.	TR26/B/ 5
		1.02		COAL- hard blocky. Coal type not distinguishable.	TR26/B/ 6
		0.53		COAL- sheared and pulverised, with water seeping from base.	TR26/B/ 7
		0.80 ±		MUDSTONE- black, canneloid, blocky. Poorly exposed dueto caving from seam and roof. Sampled from spoil pile made by cat.	TR26/B/8
		Floor		SILTSTONE- argillaceous, medium to dark grey.	
				Base of Measured Section.	
				NOTE: data from field traverse, 12 June, 1978 and from trench clearing and detailed logging/sampling on 3 August 1978. Measurements from 1.50m tape; true thicknesses measured in field.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 27
Location: Conveyor decline

SEAM NAME B LOWER FLOOR

LOGGED BY _____ DATE _____

SAMPLED BY _____ DATE _____

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				Natural exposure; for full description, see field notes.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 28 SEAM NAME Lower Gething "Lower B" LOGGED BY C.Bickford DATE July 30, 1978

Location: Conveyor Decline SAMPLED BY " " DATE " "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.90		SILTSTONE- argillaceous, highly weathered, soft, blocky to rubbly, calcareous	
				with carbonaceous mudstone laminae in basal 0.15m. Sheared basal contact.	NOT SAMPLED
		1.11		MUDSTONE- dark grey to brown. Sheared and listricated. Soft. Coaly lenses	
				in top 0.10m. Bright orange rusty bands at 0.63, 0.65, and 0.90m below top	
				(0.001 to 0.002m thick.) Non-calcareous throughout. Abrupt at base.	TRZB/BL/1
		0.31 to	0.46	COAL and MUDSTONE- sheared, friable.	TRZB/BL/2
		0.22 to	0.32	COAL- sheared, listricated.	TRZB/BL/3
		0.05		SANDSTONE- medium grained, very poorly sorted, abundant argillaceous matrix.	
				Exposure broken and repeated by minor faulting. Displacement- 0.10m.	TRZB/BL/4
		0.69		COAL- sheared and polished.	TRZB/BL/5
		0.08		MUDSTONE- dark brownish grey, carbonaceous, sheared and listricated. Atti-	
				tude: 121/25 SW	NOT SAMPLED
		0.37		MUDSTONE- brownish orange weathering; scattered carbonized plant fragments.	NOT SAMPLED

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 28 SEAM NAME Lower Gething "Lower B" LOGGED BY C.Bickford DATE July 30,1979

Location: Conveyor Decline SAMPLED BY " " DATE " "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.21		MUDSTONE- black, carbonaceous, wtih coaly band.	NOT SAMPLED
		0.24		SILTSTONE- argillaceous, brownish orange weathering.	NOT SAMPLED
				Base of Measured Section	
				Section measured by 1.50m tape. Section undisturbed except for minor	
				faulting and shearing. All thicknesses true, measured in field.	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 29 SEAM NAME LOGGED BY D.J.W.Mitchell DATE July 31, 1978

Location: Plate 2a, South Bank Chamberlain Creek. LOWER CHAMBERLAIN SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		1.75 +		MUDSTONE- colour banded, thinly bedded, medium-grey. Sigmoidal laminite not present. Attitude 320°/13° S.W.	
		0.30		MUDSTONE- dark grey, carbonaceous, few thick coal laminae, ferruginous weathered surfaces. Sheared and folded in top 0.09m., occasionally below. Irregular thickness.	TR29/LCH/2
		3.55		COAL- dull and bright, highly sheared in basal .14m. Seam is tectonically disturbed- coal laminae are commonly bounded by small shear planes, the whole dipping up to 25° steeper to the south-west than the seam boundaries.	TR29/LCH/1
				Highly irregular	
		0.20 +		SANDSTONE, medium-grained, medium-grey.	

BP Canada

SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR 30 SEAM NAME LOWER CHAMBERLAIN LOGGED BY D.J.W.Mitchell DATE August 31, 1978

Location: Plate 2a, South Bank- Chamberlain Creek.

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		1.20 +		MUDSTONE, medium-grey, colour banded, thinly bedded.	NOT SAMPLED
		0.35		MUDSTONE, very carbonaceous, highly sheared in top .15m, locally sheared	
				below.	NOT SAMPLED
		3.53 +		COAL, dull and bright. Common small shear planed dipping up to 25° steeper	
				to the south-west than the seam boundaries. Cleats occasionally ferruginous.	
				Primary cleat 169°/61° E. Attitude 315°/22° S.W.	NOT SAMPLED
				(Trench infilled with water, seam thickness measured to water level.)	

BP Canada

SHEET No. 1 of 2

COAL SEAM DETAILS

TRENCH No. TR 31 SEAM NAME LOWER CHAMBERLAIN LOGGED BY D.J.W.Mitchell DATE August 1, 1978

Location: Plate 2a, South bank-Chamberlain Creek

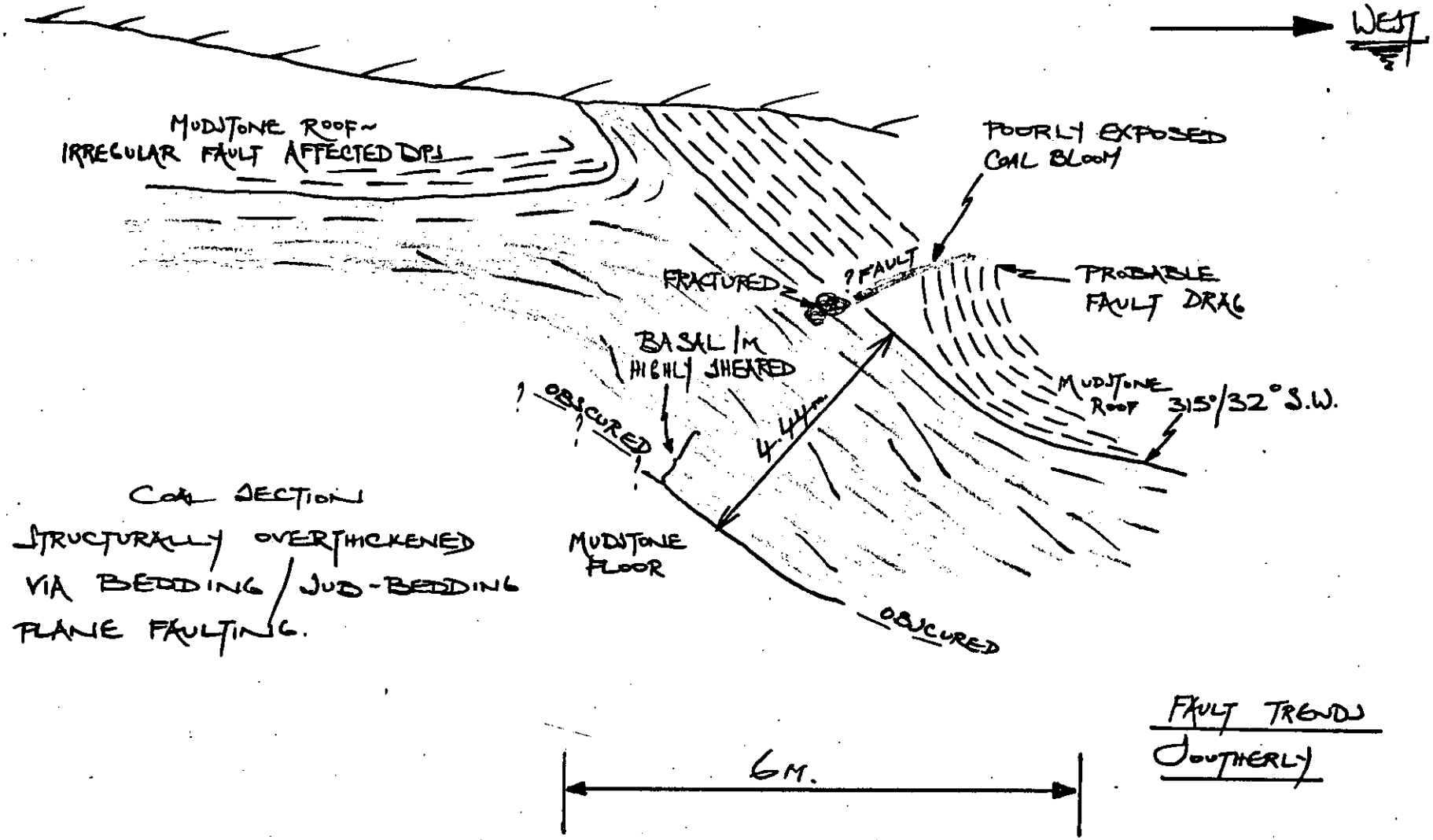
DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.40 +		MUDSTONE, medium-grey, colour banded, thinly bedded.	
		0.24		MUDSTONE, medium-grey, irregular carbonaceous and sheared layer at top .02	
				-.24m. thick, locally sheared below.	
		4.20		COAL, dull and bright. Common small and large shear planes, few thin later-	
				ally discontinuous sheared layers, sub-parallel to lamination or forming	NOT
				incipient sigmoids dipping up to 30° steeper to the south-west than seam	SAMPLED
				boundaries. Highly sheared in basal .04m.	
		0.34 +		MUDSTONE, dark-grey, abundant fine coal streaks and ? rootlets.	
				Faulted exposure see Sheet 2 for detailed section.	

TRENCH No. TR31. SECTION ACROSS FAULT ZONE.

1ST. AUGUST, 1978.

Sheet 2

Logged by: J.J.W.H.



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COAL SEAM DETAILS

TRENCH No. TR 32 SEAM NAME LOGGED BY D.J.W.Mitchell DATE August 1,1978

Location: Plate 2a, South Bank- Chamberlain Creek.

LOWER CHAMBERLAIN

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.30 +		MUDSTONE, medium-grey, colour banded, thinly bedded.	
		0.55		Sigmoidal laminite, sigmoids dip to S.W.	
		2.70		MUDSTONE, medium-grey, colour banded, thinly bedded. Attitude $300^{o}/5^{o}$ S.W.	
		0.06		MUDSTONE, very carbonaceous, pulverized and sooty.	
		2.02		COAL, bright and dull. Sheared in basal .26m, corn flakes in basal .08m, appears competent with only occasional low angle shear planes above.	NOT SAMPLED
		0.32 +		MUDSTONE, dark grey and carbonaceous, common fine coal streaks. Heavily sheared, common small ferruginous weathered patches.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 33 SEAM NAME LOGGED BY D.J.W.Mitchell DATE August 1, 1978

Location: Plate 2a, South Bank-Chamberlain Creek LOWER CHAMBERLAIN SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.25 +		MUDSTONE, colour banded, well bedded, highly weathered.	
		0.10		MUDSTONE, very carbonaceous, highly weathered - sooty. Junction with	
				seam indistinct.	TR33/LCH/2
		2.35		COAL, bright and dull. Common shear planes dipping at low angle to lamin-	
				ation, cornflakes in basal .03m.	TR33/LCH/1
		0.10		MUDSTONE, dark-grey, slightly carbonaceous with occasional fine coal streaks.	
				Totally listric.	
		0.49 +		SILTSTONE, fining down into mudstone, medium-grey, unlaminated. Few rootlets,	
				ferruginous weathered joints $192^{o}/71^{o}$ W.	

BP Canada

SHEET No. 1 of 2

COAL SEAM DETAILS

TRENCH No. TR 34 SEAM NAME LOGGED BY D.J.W.Mitchell DATE August 1,1978

Location: Plate 2a, South bank- Chamberlain Creek

UPPER CHAMBERLAIN SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		2.00 +		SANDSTONE, medium-grained, light g ey, dune set.	
				passage	
		1.30		MUDSTONE, medium-grey, thinly bedded. Attitude 320°/10° N.E.	
		0.25		COAL, highly sheared.	TR34/UCH/3
		0.12		MUDSTONE, dark-grey, carbonaceous, common thick coal laminae.	
		0.10		COAL, bright and dull.	
		0.10		MUDSTONE, medium-grey, few thin coal laminae, commonly sheared.	TR34/UCH/2
		0.39		MUDSTONE, silty, unlaminated, grey-brown. Common rootlets, ferruginous	
				weathering.	

BP Canada

SHEET No. 2 of 2

COAL SEAM DETAILS

TRENCH No. TR 34 SEAM NAME LOGGED BY D.J.W.Mitchell DATE August 1,1978

Location: Plate 2a, South Bank-Chamberlain Creek — UPPER CHAMBERLAIN — SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.04		COAL, bright and dull, ferruginous weathered lamination, irregular thickness.	
		0.12		MUDSTONE, medium-grey, unlaminated, common rootlets.	TR34/UCH/2
		0.11		COAL, mostly bright.	
		0.41		MUDSTONE, grey-brown, unlaminated, common rootlets, ferruginous weathered surfaces.	
		0.35		COAL, highly sheared.	TR34/UCH/1
		0.25 +		SANDSTONE, fine-grained, silty in top .05m, common rootlets.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 35 SEAM NAME Lower Gething "B" zone LOGGED BY C.Bickford DATE August 2, 1978

Location: Sukunka Main Road SAMPLED BY " " DATE " "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				Top of Trench Exposure	TR35/B/
		0.40 +		MUDSTONE- dark brown, rusty weathering. No basal pebble band.	ROOF
		0.81		COAL- strongly cleated, weathered.	TR35/B/1
		0.03		SILTSTONE- dark brown; abundant fine to very fine sand. Soft and crumbly	
				Abundant carbonised, plant debris.	TR35/B/2
		1.61		COAL- sheared and listricated at approximately 50° to bedding.	
				(top 0.50m)	TR35/B/3
				(middle 0.50m)	TR35/B/4
				(bottom 0.61m)	TR35/B/5
		0.95		MUDSTONE- dark grey to brown. Rusty weathering along joints. Rubbly;	
				listricated at top. Occasional plant fragments. Slightly carbonaceous in	
				basal 0.15m; gradational at base.	
					TR35/B/6
		0.35		MUDSTONE- dark brown, slightly silty. Blocky, chalky light grey brown	
				weathering. Abrupt at base.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 35 SEAM NAME LOGGED BY C.Bickford DATE August 2, 1978

Location: Sukunka Main Road SAMPLED BY " " DATE " "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.15		MUDSTONE, dark grey to brown, rubbly , gradational at base.	TR35/B/6
		0.53		MUDSTONE- carbonaceous.; bright coal bands up to 0.010m, thick. Bright	
				orange rusty bands 0.001m thick, at base and at 0.025m above base.	
		0.09		COAL - weathered, dominantly bright.	TR35/B/7
		0.04		MUDSTONE- carbonaceous, rubbly. Rusty bands at top and base.	TR35/B/8
		0.83		COAL- weathered.	TR35/B/9
		0.025		SILTSTONE- dark brown, rusty weathering	TR35/B/10
		0.18		COAL- sheared	TR35/B/11
		0.003		SILTSTONE- rusty brown weathering, soft. Bed crumpled and contorted.	TR 35/B/12
		0.06		COAL- sheared.	
		0.35		mudstone;carbonaceous/COAL (50:50)- listricated at base.	

BP Canada

SHEET No. 3 of 5

COAL SEAM DETAILS

TRENCH No. TR 35 SEAM NAME LOGGED BY C. Bickford DATE August 2, 1978

Location: Sukunka Main Road SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.53		MUDSTONE- carbonaceous, listricated, thin bright coal bands (0.001m)	TR35/B/12
		0.24		MUDSTONE, very carbonaceous/COAL (50:50)	TR35/B/13
		0.23		MUDSTONE- silty, heavily listricated perpendicular to bedding. Dark olive grey; devoid of lamination, possible seatearth, possible rootlets. Grading to siltstone at base.	
		0.26		SANDSTONE- fine grained, orange weathering, argillaceous. Non calcareous. Carbonized plant fragments.	NOT SAMPLED
		0.28		MUDSTONE- carbonaceous with bright coal bands up to 0.010m thick. Sheared listricated, rusty-weathering, rubbly.	
		0.41		COAL- weathered	TR35/B/14
		0.88		MUDSTONE, carbonaceous/COAL (20:80 at top grading to 90:10 at base)- thinly interbedded, rubble.	TR35/B/15
		1.03		SILTSTONE- medium grey, argillaceous, blocky to rubbly, light brown grey weathering. Gradational.	NOT SAMPLED

BP Canada

COAL SEAM DETAILS

Trench No. TR 35 SEAM NAME LOGGED BY C.Bickford DATE August 2, 1978

Location: Sukunka Main Road SAMPLED BY " DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		1.36		MUDSTONE- dark brownish grey, rusty weathering, concretionary, blocky to rubbly,	
				gradational.	NOT SAMPLED
		0.72		MUDSTONE- black, canneloid.	TR35/B/16
		0.45		MUDSTON- dark grey to black, carbonaceous, thin coaly bands (0.002m).	
				Gradational.	TR35/B/17
		0.34		MUDSTONE- dark brownish grey, slightly rusty weathering. Carbonised plant	
				debris; a few thin coaly bands near top and base. Rubbly.	
		0.40		COAL- hard. Overall dull and bright.	TR35/B/18
		1.85		COAL- hard and blocky. Dominantly dull with metallic lustre; probably high	TR35/B/19
				ash. Abrupt and attached at base.	
		0.04 to 0.06		SANDSTONE- fine grained, orange weathering, dark brownish grey, very argilla-	
				ceous; abundant carbonised plant debris. Very hard.	TR35/B/20
		0.25		COAL- sheared, dominantly bright	TR35/B/21

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 35 SEAM NAME LOGGED BY C.Bickford DATE August 2, 1978

Location: Sukunka Main Road SAMPLED BY " " DATE " "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		1.40 +		MUDSTONE- dark brown, light brown weathering, slightly silty. Rubbly.	
				Top 0.35m carbonaceous. Base not seen.	
				BASE of TRENCH EXPOSURE	
				NOTE: TR 35 is a composite of five short backhoe cuts into the outcrop of	
				the B coaly zone, near the Sukunka Main Collery, along the road cut. All	
				thicknesses true, measured with 1.50m tape.	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 36 SEAM NAME N/A LOGGED BY C.Bickford DATE August 3,1978

Location: Sukunka Main Road SAMPLED BY N/A DATE

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		2m +		OVERBURDEN- unconsolidated clay-rich till with irregular bands of coal spoil,	
				probably moved down slope. Not logged in detail, not sampled, due to lack of	
				reliable exposure. Trench partially caved in soft, wet bank.	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 37 SEAM NAME N/A LOGGED BY C.Bickford DATE August 3,1978

Location: Sukunka Main Road SAMPLED BY N/A DATE

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		4m +		OVERBURDEN - coaly spoil and mud, with blocks and chips of sandstone. No	— —
				rock in place. Trench very wet and caved in with collapse extending up slope	
				from head of trench. Entire slope unstable. Material dug by backhoe	
				examined, but no rock or coal appears to have been recovered. Not logged	
				or sampled due to lack of reliable exposure.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 38 SEAM NAME LOGGED BY C. Bickford DATE ~~August 3, 1978~~

Location: Sukunka Main Road POSSIBLE LOWER GETHING "C" SEAM SAMPLED BY N/A DATE

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.51m +		MUDSTONE- dark browish grey, locally rusty weathering, occasional thin coaly bands up to 0.005m. Locally slightly darker and slightly carbonaceous; rubbly, abrupt at base.	
		0.71m		MUDSTONE- hard, blocky to rubbly, dark brownish grey, with rootlets in upper 0.08m. No listrication. Slightly carbonaceous with occasional bright coaly bands up to 0.003m, from 0.28 to 0.39m below top. Slightly darker towards base; gradational. (this unit forms floor of TR 40)	
		0.17m		COAL - pulverised with 25% carbonaceous mudstone: rusty with bright coaly bands. Abrupt.	
		0.04m		MUDSTONE- dark brown, listricated, abrupt.	
		0.06m		MUDSTONE- carbonaceous, sheared, thin bright coaly bands up to 0.002m. Abrupt	
		0.11m		MUDSTONE- dark brown, hard, rubbly, slightly silty. Abrupt.	
		0.12m		MUDSTONE- carbonaceous, with thin bright coaly bands at top, increasing to base, with 0.04m coal, pulverised, at base. Abrupt.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 38 SEAM NAME LOGGED BY C.Bickford DATE August 3, 1978

Location: Sukunka Main Road

POSSIBLE LOWER GETHING "C" SAMPLED BY _____ DATE _____

SUKUNKA MAIN ROAD

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.59		MUDSTONE- brownish grey, rusty grey weathering, few thin coaly bands in top	
				0.04m, up to 0.002m thick. Listricated throughout at high angle to bedding.	
				Abrupt.	
		0.06		COAL- sheared and weathered. Yellow sulphur bloom on surface. Abrupt.	
		0.10		MUDSTONE- dark brown, strongly rusty weathering, concretionary and rubbly.	
				Abrupt.	
		0.26		COAL- pulverised, sheared, wtih 40% carbonaceous mudstone. Abrupt.	
		0.30		MUDSTONE- dark brownish grey,blocky, strongly rusty weathering; water seep-	
				ing from base of unit.	
		0.20		COAL- sheared, listricated, iridescent on shear surfaces (due to oxidation.)	TR38/1
		0.15 +		MUDSTONE- dark brownish grey, rusty weathering, rubbly, listricated at top.	
				125/24° S.W.	NOT SAMPLED
				BASE OF TRENCH SECTION	
				All thicknesses are true, as measured in field. TR38 is approximately 25m	
				southerly of TR40, along roadside.	

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COAL SEAM DETAILS

TRENCH No. TR 39 SEAM NAME LOWER GETHING "B" SEAM LOGGED BY C.Bickford DATE August 3, 1978

SAMPLED BY " DATE "

AT WEST END OF CONVEYOR CLEARING

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				TOP OF MEASURED SECTION	
		1.75		COAL- sheared. Eroded at top.	TR39/B/2
		0.04		SILTSTONE- very argillaceous, dark brownish grey. Few disseminated fine sand grains. (parting 1)	PART OF TR39/B/1
		1.50		COAL- sheared.	TR39/B/3
		0.03 to	0.05	SILTSTONE- very argillaceous, brown, few disseminated fine grains. 139/52SW (parting 2)	PART OF TR39/B/1
		2.80		COAL- sheared, locally tightly folded: (includes parting 3, sampled as part of sample TR39/B/1.)	TR39/B/4
		0.03		SILTSTONE- brown, rusty weathering, very argillaceous, few disseminated fine sand grains. 130/35SW (parting 4)	PART OF TR39/B/1
		7.50		COAL- sheared, harder towards base. Locally tightly folded.	TR39/B/5
		0.43		MUDSTONE- canneloid, sheared at base.	NOT SAMPLED

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SHEET No. 2 of 2

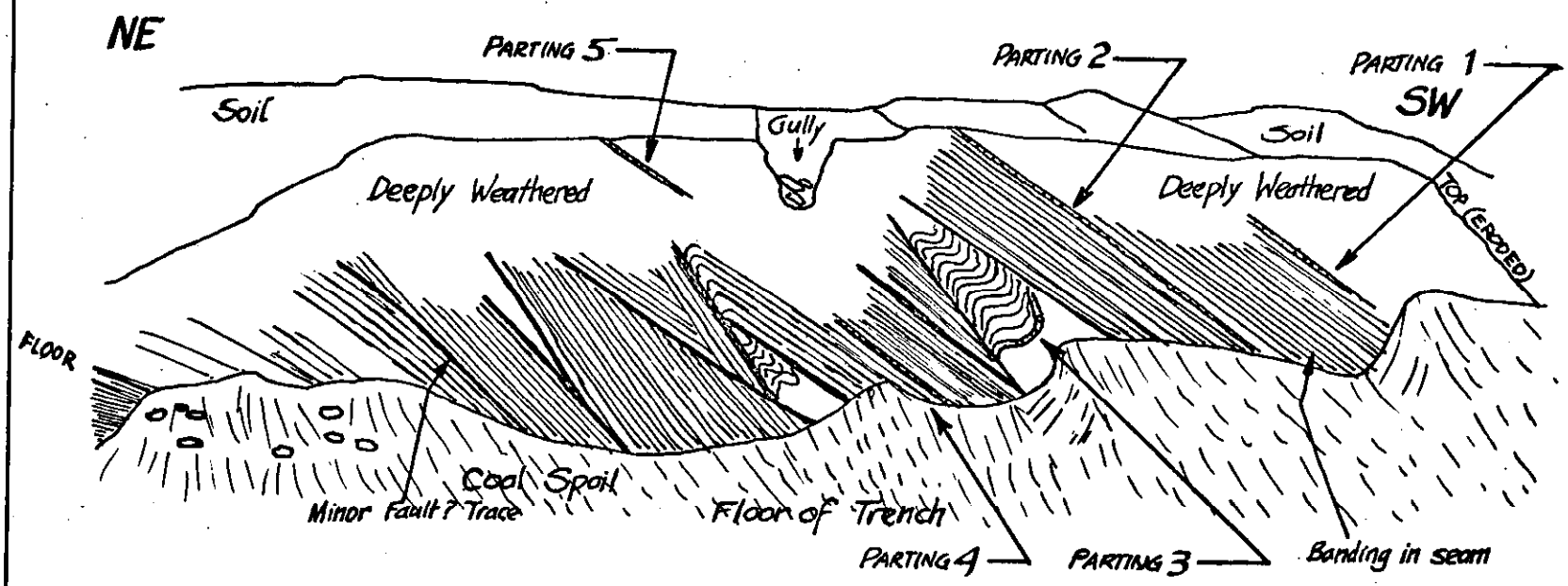
COAL SEAM DETAILS

TRENCH No. TR 39 SEAM NAME Lower Gething "B" Seam LOGGED BY C.Bickford DATE August 3, 1979

SAMPLED BY " - DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.23		COAL	
		0.18		SANDSTONE- very fine grained, dark grey, carbonaceous, devoid of lamination	
				argillaceous, rootlets.	
		0.10		COAL	
		0.32		SANDSTONE-as above.	
		0.08		COAL	
		0.30		COAL, dirty- with mudstone bands. Base not seen.	
				BASE OF MEASURED SECTION	
				NOTES: this section incorporates floor lithology data from field traversing	
				on 13 June, and coal thicknesses from trench measurement on 3 August, 1978.	
				Thicknesses are true, measured perpendicular to bedding.	
				All partings intersected during sampling were combined as sample	
				TR39/B/1.	

Sketch of Trench 39, looking SE:



Note: partings are numbered for field identification only.

Parting:	Thickness:	Lithology:
2	0.03 to 0.05	Siltstone ~ brown, very argillaceous, few disseminated fine sand grains
3	0.03	as above, dark brownish-grey
4	0.03	as above, brown, rusty-weathering
1	0.04	as above, dark brownish-grey
5	(inaccessible)	interpreted as being continuation of Parting 4 through sheared area.

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COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 40 SEAM NAME Trench in Lower Gething - above possible Lower Gething "C" seam LOGGED BY C.Bickford DATE August 3, 1978

Sukunka Main Road SAMPLED BY N/A DATE

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		2.40+		MUDSTONE- dark brown to dark grey rubbly. 20% carbonaceous mudstone, with a few thin coal bands, up to 0.005m. Rusty weathering, locally listricated.	
		0.03 to	0.06	MUDSTONE- black, carbonaceous, listricated, wtih 20% bright coaly bands. Variation in thickness due to shearing.	
		0.36		MUDSTONE- locally silty, blocky, dark brownish grey, locally rusty weathering basal 0.06m grades to carbonaceous mudstone. Gradational 120/6 S.W.	
		0.93		MUDSTONE- dark brown to black, with 30% carbonaceous mudstone phases. Rubbly, rusty weathering. Listricated in carbonaceous phases. Coal, pulverised, at top, laterally discontinuous, 0 to 0.02m, thick.	NOT SAMPLED
		Floor		MUDSTONE- dark brown, rusty weathering, hard, silty, with abundant large carbonized plant fragments. This mudstone is equivalent to the 0.71m mudstone near the top of TR38.	
				BASE OF MEASURED SECTION	
				Section measured with 1.50m tape; all thicknesses true, as measured in field. Section is disturbed by shearing and minor low-angle faulting, displacements less than 0.15m.	

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SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR 41 SEAM NAME LOGGED BY D.J.W.Mitchell DATE August 7,1978

Location: Plate 1 Northern Crop LOWER CHAMBERLAIN

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		0.29 +		MUDSTONE, thinly bedded, sooty and highly weathered.	
		0.21		MUDSTONE, black, highly carbonaceous, sooty and highly weathered.	
		2.17		COAL, highly weathered, sheared in basal .13m, rarely sheared above.	NOT
					SAMPLED
		+		SANDSTONE, undulatory.	

BP Canada

COAL SEAM DETAILS

TRENCH No. TR 42 SEAM NAME LOGGED BY D.J.W.Mitchell DATE August 1, 1978

Location: Plate 2a, South Bank LOWER CHAMBERLAIN SEAM

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				Trench caved in. Waste pile consist of mudstone and coal fragments.	
				(Accurately plotted for subcrop location, not surveyed.)	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 43 SEAM NAME LOWER CHAMBERLAIN SEAM LOGGED BY ~~P.H.C., K.K.~~ L.R. DATE ~~August 28, 1979~~

Location: Plate 3
Northern crop.

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				Highly sheared, over thickened. Lower (Chamberlain Seam). Highly contorted	NOT
				Lower Gething sandstone, overlying over thickened Chamberlain Seam	SAMPLED
				Refer photograph.	
				3 photographs taken.	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 44 SEAM NAME LOWER CHAMBERLAIN LOGGED BY P.M.Caine, K.Kim DATE August 17, 1979

Plate 3 SAMPLED BY " DATE "

Northern crop

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
		+		Roof: mudstone; silty, highly weathered	
		1.40		COAL; weathered, sheared	TR44/CH/2
		0.68		COAL: bright banded	TR44/CH/1
		+		Floor: Sandstone: hard	
				smooth contact with coal.	
				N75°W 16°SW	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 45 SEAM NAME Lower Chamberlain Seam LOGGED BY P.M.Caine, K.Kim DATE August 17th, 1978

Location: Plate 3
Northern crop

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
			+	ROOF: MUDSTONE: dark grey, silty. Iron rusted at base (± 0.10m)	
			1.1	COAL: weathered, sheared	
			0.56	COAL: bright, banded.	
					NOT
			0.1	COAL: dull banded.	SAMPLED
			0.79	COAL: bright banded.	
			+	Floor: SANDSTONE: medium-grained. Carbonaceous, dark grey. Irregular con-	
				tact with coal.	
				N80°W 10°SW	

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COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 46 SEAM NAME LOGGED BY P.M.Caine DATE August 17, 1978.

Location:
Plate 3
Northern crop

LOWER CHAMBERLAIN SEAM

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
			+	Roof: MUDSTONE: grey, silty, weathered, blocky. Iron rusted at base(0.05m)	
			1.58	COAL: Highly weathered (top 0.50m)	
					NOT
			0.38	COAL: Bright banded	SAMPLED
			+	Floor: SANDSTONE: medium grained, grey, carbonaceous. Thickly bedded.	
				N8°W FLAT.	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 47 SEAM NAME UPPER CHAMBERLAIN LOGGED BY P.M.Caine DATE August 17, 1978

Location: Plate 3
Northern crop

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
			+	Roof: SANDSTONE: medium-grained, medium-grey, thinly bedded.	
			0.13	COAL: bright, weathered, sheared.	
			0.11	MUDSTONE: carbonaceous weathered, Iron rusted.	NOT
					SAMPLED
			1.59	COAL: Maily dull with bright bands, especially in basal 0.30m.	
			+	Floor: MUDSTONE: dark grey, silty. Plant debris.	
				N20°W 9°SW	

BP Canada

SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR 48 | SEAM NAME | LOGGED BY P.M.Caine | DATE 17 August, 1978

Location: Plate 3 Northern crop | UPPER CHAMBERLAIN SEAM | SAMPLED BY - | DATE "

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
			+	Roof: SANDSTONE: medium-grained, medium-grey, thinly bedded.	
			0.11	COAL: dull weathered (Rider)	TR48/UCH/5
			0.12	MUDSTONE: Carbonaceous, sheared, weathered (Rider parting)	TR48/UCH/4
			1.77	COAL (U.L.) dull and bright banded, weathered.	TR48/UCH/3
			1.1	MUDSTONE: with plant debris in top 0.30m. 0.45m from base a 0.08m zone	NOT
				with bright coal bands.	SAMPLED
			0.32	COAL: dull weathered. } (U.L.)	TR48/UCH/2
			0.19	COAL: dull inferior very shaly to coaly shale. } (U.L.)	TR48/UCH/1
				N35°W 7°SW	

BP Canada

COAL SEAM DETAILS

SHEET No. 1 of 1

TRENCH No. TR 49 SEAM NAME UPPER CHAMBERLAIN SEAM LOGGED BY P.M.Caine, K.Kim DATE August 23 1978.

Location: Plate 3
Northern crop

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				Surface	
			0.20	COAL bloom	
			0.53	MUDSTONE: weathered	
			1.33	COAL: weathered, highly sheared.	
			1.42	MUDSTONE: weathered, sheared.	NOT
					SAMPLED
			2.90	COAL: weathered, sheared.	
			3.30	MUDSTONE: weathered, sheared.	
			3.79	COAL; weathered, sheared.	
			+	Floor: SANDSTONE.	

BP Canada

SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR 50 SEAM NAME LOGGED BY P.M.Caine, K.Kim DATE August 23, 1978

Location: Plate 3
Northern crop

LOWER CHAMBERLAIN SEAM FLOOR

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				DIRECTION: S35°W	
				6m long, ½m deep. N.r. end of trench. Bottom S.S.	
				(Chamberlain floor Sandstone?) Bedrock? or Boulder?	
				N65°W dip unkown due to rolling surface.	

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SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR 51 SEAM NAME LOGGED BY K.Kim, P.M.Caine DATE August 23, 1978

Location: Plate 3

Northern crop

LOWER CHAMBERLAIN SEAM

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				DIRECTION: S10°E 15m long, ½m deep No bedrock.	

BP Canada

SHEET No. 1 of 1

COAL SEAM DETAILS

TRENCH No. TR 52 SEAM NAME LOGGED BY P.M.Caine, K.Kim DATE August 27, 1978

Location: Plate 3
Northern crop

LOWER CHAMBERLAIN SEAM

DIP°	DEPTH m	THICKNESS MEASURED	THICKNESS TRUE	DESCRIPTION	SAMPLE No.
				DIRECTION: N50°E 7m long. 1m deep.	
				No bedrock.	

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EXPLORATION PROGRAM

Field Descriptions 2 OF 7

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B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Chamberlain Mine Area. ELEVATION: _____.
GEOLOGIST: Kiwan Kim.

Station		Description
1		MUDSTONE - silty, thinly bedded, carbonaceous, iron rusted on weathering surface, (just above the Chamberlain Seam).
2		MUDSTONE - silty, thinly bedded. Section: TOP MUDSTONE - silty, thinly bedded sigmoidal laminite 30 to 40 cm BASE MUDSTONE
3		COAL - (Chamberlain Seam), old adit, caved in, direction N75°E
4		COAL - (Chamberlain Seam), bright, hard, banded 1.5 - 1.6m thick, N33°W 6°SE
5		SANDSTONE - silty, broken, mixed with dirt.
6		SANDSTONE - fine to medium-grained, well bedded, well sorted, brown colored on weathering surface. N41°W 10°NE. Section: TOP SANDSTONE - coarse-grained SILTSTONE and/or MUDSTONE 20cm BASE SANDSTONE - medium to fine-grained
7		SANDSTONE - medium-grained, medium grey, carbonaceous, massive, non-calcareous, (Chamberlain floor Sandstone on the road)
8		COAL - (Chamberlain Seam), bright, hard, +2m thick. N40°W 14°NE Section: TOP MUDSTONE 2m SILTSTONE or silty mudstone 2m including 20-25 cm sigmoidal mudstone, carbonaceous 0.15m at base BASE Chamberlain Seam
9		COAL - (Chamberlain Seam), hard, bright, dull banded, 2.5 to 2.8m thick N39°W 4°NE
10		SANDSTONE - fine to medium-grained, thinly bedded, well sorted, brown-weathering. N30°W 5°NE
11		SANDSTONE - fine to medium-grained, brown-weathering, dark grey on fresh surface, thinly bedded. N45°W 12°NE
12		MUDSTONE - dark grey, weathered, broken

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: East of Chamberlain Mine. ELEVATION: _____.
GEOLOGIST: Kiwan Kim.

13		SANDSTONE - medium to fine-grained, same as Station 11.
		EW 12°N
14		COAL - (Chamberlain Seam) - N75°W 10°NE Section:
		TOP siltstone and/or mudstone, few nodules present 0.60m
		mudstone, black 0.15m
		bone coal 0.05m
		BASE coal, hard, bright, dull banded 0.15m
		(Due to covered dirt true thickness unknown)
15		SANDSTONE - medium-grained, medium grey, thickly bedded, well sorted N80°W 10°NE
16		SANDSTONE - medium-grained, medium grey, cross-bedding N60°W 9°NE
17		SANDSTONE - medium-grained, thickly bedded, cross-bedded N65°W 12°NE
18,18A		MUDSTONE - weathered, broken
19		MUDSTONE - creek bank outcrop. Rusty-weathering nodules 10 to 15 cm diameter are in bed.
20		COAL - (Bird Seam) 0.60m + dirty coal. Section:
		TOP overburden
		coal, dirty 0.60m +
		BASE mudstone, black, rusty-weathering
		N64°W 2°SW
21		SANDSTONE - medium-grained, thickly bedded, brown-weathering well-sorted N24°W 14°NE
22		COAL - (Skeeter Seam) near creek. Shell horizon 15cm thick
		N50°W 11°NE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: South of Chamberlain Mine. ELEVATION: _____.
GEOLOGIST: K. Kim.

23		MUDSTONE - silty, dark grey, brown-weathering, iron rusted nodules. Vertical jointing developed N55°E 10°NW Thinly bedded
24		MUDSTONE - silty, dark grey; similar to station 23 N65°E 5°NW
25		SILTSTONE - medium grey, brown-weathering, thinly laminated, with mudstone interbeds, 10 to 15 cm thick.
26		MUDSTONE - (marine), brown-weathering, jointing perpendicular to strike
27		SILTSTONE - medium grey, brown-weathering, with very fine-grained sandstone interbeds. N80°W 10°NE
28		Section, looking north: TOP Massive, sandstone (GEL) approx. 30 m medium-grained, orange weathering BASE Mudstone (marine) approx. 15m grey, calcareous
29		MUDSTONE and/or silty MUDSTONE - medium grey, brown-weathering, jointing perpendicular to strike. Sandstone - mudstone contact is approximately 10m above Station 29 N45°W 12°NE
30		SANDSTONE - medium-grained, medium grey, thinly bedded N24°W 4°NE
31		SANDSTONE - massive, thickly bedded N32°W 9°NE
32		SANDSTONE - medium-grey, medium-grained, thickly bedded, well-sorted
33		SANDSTONE - grey, medium-grained, thickly bedded, well-sorted, abundant plant fossils N35°W 15°NE
34		SANDSTONE - medium-grained, medium grey, well-sorted, thickly bedded N50°W 4°SW
35		SANDSTONE - medium-grained, medium grey, thickly bedded N85°W 4°S
36		SANDSTONE - medium-grained, grey, abundant worm burrows throughout. Thickly bedded. (Base of the Bird Seam sandstone) N60°E 5°SE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: South of Chamberlain Seam. ELEVATION: _____.
GEOLOGIST: K. Kim.

37		SANDSTONE - medium-grained, brown-weathering, thinly bedded N45°W 21°SW
38		SANDSTONE - medium-grained, thinly bedded, brown-weathering N30°W 25°SW
39		SANDSTONE - same as station 38. Outcrop direction N25°E. N30°W 26°SW
40		SANDSTONE - same as station 39. NS 25°W
41		ADIT - N33°W direction. Caved. See field sketch for details
42		SANDSTONE - medium-grained, brown-weathering, thinly bedded N75°E 11°NW
43		MUDSTONE - silty, medium grey, blocky, iron rusted in weathering surface. N28°W 28°SW Section: TOP mudstone carbonaceous mudstone 0.15m bone coal 0.05m coal hard, bright, dull banded 0.90m BASE sandstone
44		SANDSTONE - (floor of Chamberlain Seam), medium-grained, medium to dark grey, thickly bedded, carbonaceous, non-calcareous N30°W 12°SW
45		CONTACT - between (Chamberlain Seam) and well bedded silty mudstone N23°W 23°SW Section: TOP mudstone, dark grey, well bedded +15m no sigmoidal laminite bone coal 0.05m coal (Chamberlain Seam) BASE creek bed
46		MUDSTONE - dark grey, silty, well bedded
47		SANDSTONE - fine-grained, thinly laminated. (This sandstone might be in between Skeeter and Chamberlain Seams). N35°W 20°SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: South of Chamberlain Seam. ELEVATION: _____.
GEOLOGIST: K.Kim.

48		SANDSTONE - fine-grained, same as station 47. N22°W 14°SW
49		MUDSTONE - silty and/or sandstone, very fine-grained. N25°W 18°SW
50		SANDSTONE - outcrop, very poor strike and dip. Unable to measure attitute.
51		SANDSTONE - fine-grained, brown-weathering; shell fossils thinly bedded, 1.0 - 1.5 cm, N25°W 19°SW
52		SANDSTONE - fine to medium-grained, medium to dark grey. Abundant worm burrows. Broken sandstone outcrop throughout. (Floor of Bird Seam) N50°E 80°SE
53		SANDSTONE - fine to medium-grained, heavily weathered, brown-weathering. N80°E 10°SE From Station 52 to 53, broken sandstone (Bird Floor) throughout the road.
54		SANDSTONE - fine-grained, thinly bedded, medium grey, brown-weathering. (Bird) coal bloom ?
55		COAL BLOOM - (Chamberlain), SANDSTONE - medium-grained, grey, thickly bedded, to massive. (Floor of Chamberlain Seam) N35°W 5°NE
56		SANDSTONE - fine to medium-grained, brown-weathering, thickly bedded, Calcareous N10°W 11°NE
57		SANDSTONE - massive, broken, brown-weathering
58		SANDSTONE - medium-grained, brown-weathering, thickly bedded. Abundant worm burrows. Iron rusted mudstone nodules, 2 to 3 cm diameter. N50°W 12°SW
59		SANDSTONE - fine to medium-grained N15°E 10°SE Section:
		TOP — Sandstone, massive
		siltstone 30 to 40 cm
		Mudstone 40 cm
		(Coal, bright banded 30 cm
		(Parting 15 cm
		(Skeeter Seam) (Coal, bright banded 25 cm
		(Parting 25 cm
		(Coal ? ± 150 cm

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Chamberlain Mine Area. ELEVATION: _____.
GEOLOGIST: _____.

		BASE sandstone - fine-grained, ripple marks
60		MUDSTONE - silty mudstone, and coal bloom (Chamberlain) - 10m above massive sandstone outcrop on road (Chamberlain Seam Floor) N30°E 4°SW
61		MUDSTONE - silty, well bedded N30°E 1°SE
62		SKETCH - see field sheets
63		SKETCH - see field sheets
64		MUDSTONE - silty, well bedded (just above Chamberlain Seam) N10°W 13°SW
65		MUDSTONE, silty and/or SILTSTONE - well bedded, grey N6°SW 18°NE
66		ADIT (Skeeter Seam) - direction N47°W. Caved in Section: (Beside portal)
		TOP mudstone
		coal 0.30m
		mudstone, coaly 0.10m
		coal 0.30m
		coal 0.20m
		BASE mudstone
67		SANDSTONE - fine to medium-grained, thinly bedded, brown-weathering
68		SANDSTONE - fine-grained, thinly bedded, brown-weathering N25°W 17°SW
69		SANDSTONE - medium-grained, thinly bedded, brown-weathering abundant worm burrows penetrating bedding plane, NS18°W
70		SANDSTONE - same as station 69. N30°W 4°NE
71		SANDSTONE - medium-grained, grey, thinly bedded N25°E 15°NW
72		SANDSTONE - medium-grained, massive N35°W 25°SW 5 cm pelecypod fossil (This sandstone below Skeeter Seam)
73		MUDSTONE grey/SANDSTONE - interbedded, thinly bedded N10°W 38°NE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Plate 1 South. ELEVATION: _____.
GEOLOGIST: _____.

74		SILTSTONE/MUDSTONE - interbedded, thinly bedded, brown-weathering N30°W 28°NE. Abundant tiny pelecypods in siltstone section. 5 to 10 cm long worm burrows start mudstone to sandstone section.
75		MUDSTONE/SILTSTONE - interbedded. Thinly bedded, brown-weathering N40°W 25°NE
76		MUDSTONE - becoming gradually dominant. 1 to 2 cm coaly streak interbedded in black mudstone. Typical worm burrows in mudstone (Lower Gething Marine)
77		SILTY MUDSTONE and/or very fine-grained sandstone, interbedded with mudstone. Brown-weathering, iron rusted. N25°W 30°NE
78 A		COAL - (Lower Gething "A" Horizon); Section: TOP mudstone coal, dirty 0.55 to 0.60 m BASE mudstone Section at Stations 78 and 77, see sketch: TOP mudstone conglomerate 0.30 m sandstone, medium-grained mudstone 0.60 m Coal ("A") BASE sandstone, fine-grained to siltstone 10 m
78 B		SANDSTONE - medium-grained, grey, brown-weathering. Thickly bedded. N68°W 27°NE
79		MUDSTONE - grey (Lower Gething marine), nodules, brown-weathering
80		MUDSTONE - SILTSTONE interbedded, brown-weathering. N60°W 34°NE
81		SANDSTONE, very fine-grained and/or SILTSTONE - thinly bedded, grey, brown-weathering. N55°W 15°NE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____

PROJECT: _____ DATE: _____

LOCATION: Plate 1 South ELEVATION: _____

GEOLOGIST: _____

82 and 83		Section from station 83 (NW) to station 82 (SE). See sketch TOP, Station 83: sandstone, fine to medium-grained N45°W 29°NE mudstone, nodular 6 to 7 m conglomerate ± 0.30m Sandstone, fine to medium-grained 0.60m Mudstone, coaly, with lenticular coal stringer 1.15m Coal 0.32m Mudstone, Coaly 1.05m Coal 0.70m Mudstone 0.25m Coal 0.20m Mudstone, Coaly 0.04m BASE, Station 82
	("A" and "B" HORIZON)	
84		SANDSTONE - fine-grained, grey, brown-weathering, thinly-bedded. (Pelecypod fossils abundant N50°W 28°NE
85		COAL BLOOM - on surface (Chamberlain Seam)
86		MUDSTONE, silty and/or siltstone - thinly bedded. (Coal Bloom on surface might be Skeeter Seam) N30°W 5°NE
87		SANDSTONE - medium-grained. Thinly bedded. N20°W 13° NE (Recessive zone immediately below the outcrop might be shell horizon, coaly mudstone and/or coaly siltstone; top of Skeeter Seam)
88		SANDSTONE - medium-grained, thickly bedded. N45°W 5°NE
89		SANDSTONE - fine to medium-grained, thinly bedded platy fracture. N40°W 12°NE
90 and 91		MUDSTONE - broken, on road

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Plate 1 South. ELEVATION: _____.
GEOLOGIST: _____.

92		COAL BLOOM - on road
93		Broken Mudstone (Moosebar) on road
94		SANDSTONE - fine to medium-grained, thinly bedded, brown-weathering, N45°W 10°NE
95		SANDSTONE - medium - grained, thinly bedded, brown-weathering cross-bedded N30°W 10°NE
96		SANDSTONE - medium-grained, dark grey, brown-weathering, carbonaceous, thickly bedded N30°W 5°NE (Base of Chamberlain Seam)
97		COAL BLOOM - (Chamberlain Seam)
98		SANDSTONE - medium-grained, thinly bedded, recessive (Lower Gething), thinly cross-bedded N25°W 7°NE
99		SANDSTONE - dark grey, thickly bedded, carbonaceous, cross-bedded (FLoor of Chamberlain Seam) N45°W 5°NE
100		SANDSTONE - dark grey, thickly bedded, carbonaceous (Floor of Chamberlain Seam) N45°W 15°NE
101		SANDSTONE - medium-grained, massive (FLoor of Chamberlain Seam) N45°W 7°NE
102		SANDSTONE - medium-grained, thinly bedded, recessive NS 10°E
103		SANDSTONE - medium-grained, thinly bedded, recessive N25°E 8°NW
104		SANDSTONE - same as Station 103, N20°W 5°NE
105		COAL BLOOM - (Skeeter?) on road, Section: TOP sandstone, thinly bedded BASE mudstone, coaly. Shelly horizon (upper portion of Skeeter) N55°W 10°NE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Plate 1 South . ELEVATION: _____.
GEOLOGIST: _____.

106		SANDSTONE - medium to coarse-grained, carbonaceous, broken (This sandstone might be floor of Bird ?)
107		COAL BLOOM - (Bird Seam)
108		SANDSTONE - fine to medium-grained, thinly bedded, large-scale cross-bedded, brown-weathering, large burrows. Recessive type. N25°E 8°SE
109		SANDSTONE - medium-grained, dark grey, carbonaceous, brown-weathering, thickly bedded N10°W 3°NE
110		SANDSTONE - medium-grained, thickly bedded; shell horizon overlain by sandstone N30°W 11°NE Section:
		TOP Sandstone
		Mudstone, carbonaceous, shell
		BASE horizon, iron rusted 1m
111		COAL BLOOM - (Skeeter Seam) on road
112		Section from stations 111 to 112, see field sketch:
		TOP Sandstone
		Shell horizon
		Mudstone N50°W 15°NE 2m+
		BASE Coal (Chamberlain Seam)
		Note: in the mudstone there is no sign of sigmoidal laminite, but moderate folding
113		SANDSTONE - medium-grained, carbonaceous (Chamberlain Floor) N48°W 17°NE
114		SANDSTONE - same as Station 113, N35°W 15°NE
115		SANDSTONE - medium-grained, thinly bedded, brown-weathering N30°W 17°NE
116		SANDSTONE - medium-grained, thinly bedded, brown-weathering N45°W 17°NE
117		SANDSTONE - very coarse-grained and/or conglomeratic, carbonaceous, dark grey, iron rusted on weathering surface. Broken

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____

PROJECT: _____ DATE: _____

LOCATION: Plate 1 South ELEVATION: _____

GEOLOGIST: _____

118		SANDSTONE - similar to Station 117, conglomeratic, grey, carbonaceous. Pebbles of chert, quartzite; round to subangular, 0.05 m diameter.
119		MUDSTONE - dark grey, broken, carbonaceous (?)
120		Same as Stations 117,118
121		SANDSTONE - medium-grained, thickly bedded, grey, brown-weathering NS 8°E
122		Contact of siltstone and mudstone - medium grey, blocky, thinly laminated siltstone overlying (marine) mudstone N60°W 30°NE
123		SANDSTONE - fine to medium-grained, thinly bedded cross-bedded, recessive N70°W 25°NE
124		Same as Station 123
125		SANDSTONE - medium-grained, siliceous, dark carbonaceous (Might be floor of Chamberlain Seam)
126		SANDSTONE - medium-grained, thick-bedded to massive, overlain by thinly bedded, fine-grained sandstone N45°W 26°NE
127		SANDSTONE - fine to medium-grained, thinly bedded, cross-bedded. N30°W 15°NE
128		SANDSTONE - medium-grained, carbonaceous, thickly bedded N60°E 15°SE
129		MUDSTONE - carbonaceous, broken; just below the medium-grained sandstone
130		SANDSTONE - medium-grained. grey, thinly bedded, orange weathering N50°E 17°SE
131		COAL BLOOM - (Chamberlain Seam)

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____

PROJECT: _____ DATE: _____

LOCATION: Plate 1 (middle to north) ELEVATION: _____

GEOLOGIST: _____

132		SANDSTONE - medium-grained, thinly bedded, brown-weathering N15°W 28°NE
133		SANDSTONE - carbonaceous, thickly bedded to massive (FLoor of Chamberlain Seam)
134		COAL BLOOM - on surface
135		SANDSTONE - brown-weathering, medium-grained, thickly bedded. Mudstone (marine) below this outcrop
136		SANDSTONE - medium-grained, thickly bedded, cross-bedded. Very hard to measure dip and strike
137		SANDSTONE - medium-grained, grey, massive, cross-bedded orange weathering
138		COAL BLOOM
139		SANDSTONE - medium grey, carbonaceous, thickly bedded N75°E 20°SE
140		SANDSTONE - fine to medium-grained, dark grey, carbonaceous thinly bedded, recessive type. Some sandstone float (Bird Floor) on road.
141		SANDSTONE - fine to medium-grained, thinly bedded, recessive. Small-scale ripples, 3 to 4 cm wide. N40°W 10°NE
142		Section of (Chamberlain Seam) and Floor: TOP Coal (Chamberlain Seam) bright banded, hard 2.2m BASE Sandstone floor N45°W 12° - 15°NE.
143		MUDSTONE - broken, on surface
144		SANDSTONE - fine to medium-grained, thinly bedded, cross-bedded. (This sandstone might be below the Chamberlain) N30°W 7°NE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Plate 1 (Middle) _____. ELEVATION: _____.
GEOLOGIST: _____.

145		SANDSTONE - fine to medium-grained, thinly bedded cross-bedded, brown-weathering N45°W 2°NE
146		SANDSTONE - medium-grained, brown-weathering, thinly bedded, cross-bedded, N45°W 7°NE
147		SANDSTONE - similar to Station 146. N45° – 50°W 7°NE
148		SANDSTONE - same as Station 147. N60°W 20°NE
149		SANDSTONE - medium-grained, carbonaceous, broken (Chamberlain Floor)
150		SANDSTONE - same as Station 147. Broken N25°W 11°NE
151		SANDSTONE - medium-grained, thinly bedded, brown-weathering N70°W 21°NE
152		MUDSTONE, silty/mudstone - interbedded, thinly bedded (marine band). N60°W 6°NE
153		SANDSTONE, very coarse-grained and/or conglomeratic - chert pebble conglomerate; 0.5 to 1.0 cm black chert pebbles in a very coarse-grained sandstone N55°W 30°NE
154		SANDSTONE - medium-grained, thickly bedded, cross-bedded. grey, brown-weathering, calcareous. Plant debris. N75° – 80°W 20°NE
155		MUDSTONE - silty, thinly bedded, brown-weathering N10°W 15°SW
		Section: TOP sandstone 5m
		mudstone, carbonaceous 0.5m
		sandstone 1m
		mudstone, coaly, coal at bottom 2.5 to 3.0 m
		mudstone 3m
		mudstone, coaly, and coal 1m
		mudstone 0.5m
		BASE coal and mudstone, coaly, interbedded 6 to 7 m

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Plate 1(From Chamberlain Mine road junction to No.1 Mine road). ELEVATION: _____.
GEOLOGIST:

156		SANDSTONE, fine to medium-grained/mudstone - interbedded. (Floor of coal) N35°W 15°SW
		NOTE: Station 155 and 156 are located out of map.
157		MUDSTONE - (Lower Gething marine), nodular, thinly bedded. Sheared coal, dirty coal. N50°W 40°SW
158		SANDSTONE, fine-grained and/or siltstone - carbonaceous brown-weathering N55°W 43°SW
159		MUDSTONE - carbonaceous, broken, weathered.
160		SANDSTONE - medium-grained, brown-weathering, carbonaceous N60°W 35°SW
161		SANDSTONE - medium-grained, thickly bedded, broken outcrop
162		MUDSTONE - carbonaceous, coaly stringers. N50°W 23°SW
163		SILTSTONE - brown-weathering, thinly bedded. N45°W 35°SW
164		SANDSTONE - medium-grained, dark grey, thickly bedded. N35°W 35°SW
165		SANDSTONE - medium-grained, grey, thickly bedded. N30°W 24°SW Section: TOP sandstone mudstone ± 3m (including coal seam at 0.15m) BASE mudstone, carbonaceous, broken
166		SANDSTONE - medium-grained, dark grey, carbonaceous, thickly bedded. N30°W 21°SW
167		SANDSTONE - medium-grained, thickly bedded, carbonaceous N50°W 16°SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Plate 1(From Chamberlain Mine ELEVATION: _____.
GEOLOGIST: road junction to No.1 Mine Road)

168		MUDSTONE - carbonaceous, with interbeds of coal, sheared, weathered N55°W 45°SW
169		Fault zone: SANDSTONE - fine to medium-grained, mudstone interbedded iron rusted on weathered surface. irregular calcite veinlets filling joints. Highly disturbed, broken, fault plane. N45°W 41°SW
170		MUDSTONE - (marine) medium grey, nodular, calcite coated on bedding planes. N70°W 10°SW
171		Anticlinal axial plane N58°W
172		MUDSTONE - as above, with two siltstone bands at 0.30 m each. Total thickness 10m. N55°W 3°NE See field sketch of anticlinal exposure from Station 170 and 172
173		MUDSTONE - end of solid outcrop. Strike and dip same as Station 172
174		MUDSTONE/SILTSTONE - interbedded N45°W 38°SW
175		MUDSTONE - broken
176		GLAUCONITIC SANDSTONE - TOP medium-grained sandstone, calcareous Glauconitic sandstone 0.97m Highly weathered N35°W 25°SW BOTTOM Sandstone: medium-grained. Highly calcareous, orange weathering N30°W 42°SW
177		SANDSTONE - fine-grained, thinly laminated, calcareous orange weathering
178		SANDSTONE - very fine-grained, thinly laminated, orange weathering Strongly calcareous. This sandstone unit is a lying above marine mudstone N75°W 10°SW
179		SILTSTONE - brown-weathering, thinly bedded. N70°W 9°NE
180		MUDSTONE - broken zone
181		SILTSTONE/MUDSTONE - interbedded N80°W 12°SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Plate 1 _____. ELEVATION: _____.
GEOLOGIST: _____.

182		SILTSTONE/MUDSTONE - interbedded N85°W 11°SW
183		SANDSTONE- medium-grained, broken. Cross-bedded, thinly laminated, brown-weathering N30°W 11°NE
184		SANDSTONE - fine-grained, thinly bedded, small-scale, cross-bedded. Brown-weathering N20°W 5°NE
185		SANDSTONE - medium-grained, brown-weathering, thinly bedded N20°W 12°NE
186		SANDSTONE - fine-grained, thinly bedded, brown-weathering N20°W 9°NE
187		SANDSTONE - medium to coarse-grained, carbonaceous, slickensides many places broken. siliceous
188		Sheared broken (floor of Chamberlain Seam) sandstone outcrop-(Chamberlain fault), folded, contorted. N45°W 80°NE N40°W 55°NE
189		MUDSTONE - dark, easily broken on weathering surface, thinly bedded. N20°W 12°SW . See field sketch
190		See field sketch
		Disturbed zone, folded, overthickened Chamberlain Seam, at least 2 minor thrust fault. Approximately 100 m long from Station 188.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Plate 2a, No.1 Mine Area. ELEVATION: _____.
GEOLOGIST: _____.

191		(immediately above the Chamberlain Seam) - N35°W 5°SW No sigmoidal laminite.
192		SANDSTONE - medium to coarse-grained, carbonaceous. (Floor of Chamberlain Seam) N45°W 5°SW
193		SANDSTONE - medium-grained, dark grey, carbonaceous, thinly bedded. N30°W 7°SW
194		SANDSTONE - medium-grained, thickly bedded to massive, N10°W 5° - 10°SW
195		SANDSTONE, very fine-grained and/or siltstone - broken recessive, thinly - and well bedded.
196		SANDSTONE - medium-grained, dark grey, thickly bedded, carbonaceous. (Floor of Chamberlain?) N25°W 40° - 42°NE
197		SANDSTONE - medium-grained, massive, carbonaceous N5° - 10°W 13° NE
198		SANDSTONE - medium-grained, broken
199		SANDSTONE - medium-grained, massive, dark grey, brown-weathering, carbonaceous N38°W 25°SW
200		COAL - (Skeeter Seam). N5°W to 10°W 8°SW Section: TOP: Sandstone, thinly bedded, medium-grained brown-weathering +3m BASE: Coal Seam Base unknown due to covered by dirt.
201		SKEETER SEAM

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: No.1 Mine Area . ELEVATION: _____.
GEOLOGIST: _____.

202		Fault in coal (Skeeter Seam) - see field sketch Minor thrust fault N30°W 23°SW
203		Adit 4 - direction S30°E, incline 5°. Section: See field sketch: TOP Sandstone, fine-grained, thinly bedded Mudstone 30 cm Coal (Skeeter Seam), Adit 3 Mudstone BASE Coal (Chamberlain Seam) Adit 4
204		MUDSTONE - weathered outcrop, steep bank N50°W 13°SW
205		MUDSTONE - broken, well weathered, on road
206		MUDSTONE - broken, on surface
207		SANDSTONE - coarse-grained, cherty, thickly bedded (Bird Seam Floor) N25°W 5°NE
208		MUDSTONE - broken, on road
209		SANDSTONE - medium-grained, thinly laminated, very hard to measure strike and dip.
210		SANDSTONE - broken, on road. (Bird Floor)
211		COAL SEAM (Chamberlain) contacts - section: TOP Mudstone, thinly bedded, (no sigmoidal laminite just above seam) Coal (Chamberlain Seam) ± 2m BASE Sandstone, medium-grained, carbonaceous N30°W 2°SW
212		SANDSTONE - medium to coarse-grained, thickly laminated, dark grey, brown-weathering, ripple marks. N50°W 4°SW
213		SANDSTONE - fine-grained and/or siltstone, thinly bedded brown-weathering (This sandstone is inbetween Chamberlain and Skeeter Seam) N25°W - 30°W 15°SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: No.1 Mine Area . ELEVATION: _____.
GEOLOGIST: _____.

214		SANDSTONE - medium-grained, carbonaceous, brown-weathering, thickly laminated. N25° - 30°W 25°SW
215		SANDSTONE - medium to fine-grained, thinly laminated, recessive N40°W 12°SW
216		SANDSTONE - medium-grained, dark grey, carbonaceous, thickly bedded. N60°W 19°SW (Chamberlain floor sandstone)
217		MUDSTONE - carbonaceous, (just above the Chamberlain Seam), behind mine building N20°W 5°SW Section: TOP: Sandstone, fine-grained, thinly laminated 1m Siltstone 1 to 1.5 m Mudstone 0.60 m BASE: Coal
218		COAL (Skeeter Seam) - section: TOP: Sandstone, fine-grained and/or siltstone, recessive Mudstone, carbonaceous 0.10m BASE: Coal N20°W 6°SW
219		COAL (Skeeter Seam) - N20°W 1°SW Section: TOP: Sandstone, fine-grained 3m mudstone 0.30m Coal 1.5m Mudstone, carbonaceous 0.30m BASE: Coal 1 m
220		COAL (Chamberlain Seam) - N20°W 2°SW Section: TOP: Mudstone BASE: Coal seam
221		COAL (Chamberlain Seam) - N20°W 4°NE
222		SANDSTONE - medium-grained, thickly laminated, brown-weathering N15°W 10°SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: No.1 Mine Area, Windy Fall Creek ELEVATION: _____.
GEOLOGIST: _____.

223		Same as Station 221 (above Chamberlain Seam) - N14°W 7°NE
224		SANDSTONE - grey, medium-grained, carbonaceous, thickly bedded. Non-calcareous. (floor of Chamberlain Seam) N25°W 13°SW
225		COAL (Chamberlain Seam) - N25°W 10°SW. Approximately 5m of mudstone above the Chamberlain Seam. No sigmoidal laminite.
226		SANDSTONE - medium-grained, carbonaceous. (Floor of Chamberlain Seam) N15° W 6°SW
227		COAL (Chamberlain Seam) - contact with mudstone N10°W 2°NE
228		COAL (Chamberlain Seam) - contact with mudstone N10°W 6°NE
229		MUDSTONE/SILTSTONE - interbedded (Lower Gething marine) NS 5°E
230		MUDSTONE - See Station B177
231		SANDSTONE - medium-grained, grey, brown-weathering, thinly laminated. (This is above Skeeter Seam) N5°W 5°NE
232	and	SANDSTONE - fine to medium-grained, some sandstone on road
233		(Bird Seam Floor)
234		SANDSTONE - medium to coarse-grained, cherty, carbonaceous, (might be floor of Bird Seam on road)
235		COAL BLOOM - (Bird Seam?), mixed with overburden
236		SANDSTONE - broken, around site of drillhole CM-8
237		SANDSTONE - medium-grained, dark grey, thickly bedded on creek bed. N75°W 10°SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Windy Fall Creek. ELEVATION: _____.
GEOLOGIST: _____.

238		SANDSTONE - medium-grained, massive, thinly laminated, brown-weathering. N50°W 6°SW
239		SANDSTONE - medium-grained, grey, thinly laminated grey-brown-weathering N50°W 8°SW
240		SANDSTONE - medium-grained, massive, dark grey, carbonaceous, thickly laminated, small-scale ripple marks. (Resembles Base of Chamberlain Seam sandstone) N40°W 10°SW
241		See Station B72
242		Fault gouge zone SANDSTONE: - light to medium grey, fine to medium-grained, thinly laminated. Broken, breccia See field sketch N15°W 68°SW
243		SANDSTONE - fine to medium-grained, thinly bedded, recessive N30°W 9°SW Coal (Skeeter Seam?) True thickness unknown due to thick coal bloom. +2m(?) Sheared, pulverised, right below the coal seam, mudstone, silty, carbonaceous. Iron rusted on surface.
244		SANDSTONE - medium-grained, thickly bedded to massive, light to medium grey, (Resembles Lower Gething Sandstones). N20°W 33°SW
245		SANDSTONE - fine-grained, medium grey, brown-weathering, thinly bedded; large 5 to 10 mm worm burrows. N10°W 7°NE
246		See Station B82
247		SANDSTONE - medium-grained, carbonaceous, cherty. (Base of Chamberlain Seam)
248		SANDSTONE - fine-grained, medium grey, brown-weathering, thinly laminated, calcareous N80°W 24°SW
249		SANDSTONE - fine to medium-grained, medium grey, brown-weathering Calcareous N60°W 32°SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Plate 2b, South of Chamberlain. ELEVATION: _____.
GEOLOGIST: Seam.

250		SANDSTONE - medium-grained, grey, thinly bedded N80°W 17°SW
251		SANDSTONE - medium-grained, grey, thickly bedded, orange weathering N80°W 17°SW
252		Below end of water-filled trench SKEETER SEAM TOP Sandstone, medium grey, orange-weathering, thickly bedded, cross-bedded N75°W 15°SW Mudstone, coaly 0.08m ± Coal; dull, weathered, pulverised, +0.60m (?) BASE NOT SEEN DUE TO SOIL COVER
253		SANDSTONE - medium-grained, thinly laminated, medium grey, brown-weathering N30° - 35°W 17° SW
254		COAL (Chamberlain Seam) - minor thrust fault, see field sketch N35°W 15°NE TOP Sandstone: medium-grained, grey Siltstone: 0.6m carbonaceous Coal : ± 2.0m hard, bright, banded BASE UNKNOWN DUE TO COVERED BY SOIL
255		SANDSTONE - medium-grained, thinly bedded, (top of Skeeter Seam) N30°W 9°SW
256		Highly disturbed, folded, broken floor of Chamberlain S.S. N30°E 80°SE (see sketch)
257		SANDSTONE - broken with calcite veinlets irregularly filling joints NS43°W (fault zone)
258		SANDSTONE - fine to medium-grained, thinly bedded, brown-weathering NS 20°E
259		SANDSTONE - fine-grained, grey, thinly bedded, recessive, N10°W 20°NE
260		SANDSTONE - medium-grained, medium grey, thinly laminated with interbedded black mudstone stringers N45°W 20°SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Plate 2b, South of Chamberlain Creek. ELEVATION: _____.
GEOLOGIST: _____.

261		MUDSTONE - coaly stringers, overlain by sandstone, (This unit is Lower Gething marine). N80°W 19°SW
262		SANDSTONE - medium-grained, thinly bedded, orange-weathering N40°W 5°NE
		Number not used from 263 - 280

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Chamberlain Mine Road . ELEVATION: _____.
GEOLOGIST: _____.

281		COAL BLOOM (?) - Associated with dirt.
282		SANDSTONE - medium-grained, light grey, thickly bedded to massive, brown-weathering. N10°W 20°SW
283		SANDSTONE - massive, similar to Station 282. Blocky. N23°W 17°SW and N25°W 78°NE - small scale anticlinal structure.
284		MUDSTONE - dark grey, thinly bedded, sheared. N4°W 69°SW
285		SANDSTONE - medium-grained, light grey, massive
286		MUDSTONE - silty, thinly laminated, blocky, brown-weathering N16°W 24°NE
		NOTE: see field sketch for relations from Station 283 to 286
287		MUDSTONE - silty, dark grey, blocky, brown-weathering, thinly laminated. 20cm nodule diameter. Strike and dip same as previous station .
288		MUDSTONE - medium grey, brown-weathering N45° - 50°W 23°SE
289		MUDSTONE - silty, grey, (marine), thinly laminated, blocky. N23°W 15°NE
290		MUDSTONE - same as station 289. N17°W 12°SW See field sketch
291		SILTSTONE - medium grey, thinly laminated, blocky, brown-weathering. N30°W 18°SW
292		MUDSTONE - medium grey, blocky, brown-weathering, nodular N25°W 25°NE
293		SILTSTONE and/or silty sandstone
294		MUDSTONE - dark, blocky N20°W 30°NE
295		CONGLOMERATE - 10 to 15cm thick; well rounded, black chert pebbles cemented in a cherty matrix. Section: TOP Conglomerate 0.10 to 0.15m Sandstone, fine to medium-grained 0.15 to 0.20m

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Chamberlain Mine Road. ELEVATION: _____.
GEOLOGIST: _____.

		Sandstone, silty 0.15 to 0.20m
		Mudstone, carbonaceous 0.10m
		Coal, sheared, dull and bright 0.40 to 0.50m
		Sandstone, fine-grained 2.50 to 3.0m
		BASE: Sandstone, fine to medium-grained 3.0m
296		SILTSTONE/MUDSTONE - interbedded, Broken.
297		SANDSTONE - thickly bedded, silty, broken
298		COAL HORIZON - split by 0.5m sandstone bed N17°W 40°NE
299		MUDSTONE - slightly silty, thinly bedded. N25°W 42°NE
300		Same as Station 299 - no silt
301		MUDSTONE - with thin siltstone laminae, brown-weathering. Coal stringers, 0.25m N22°W 24°NE
302		MUDSTONE - thickly bedded, brown-weathering N30°W 26°NE
303		SILTSTONE/MUDSTONE - interbedded. Siltstone: 1.5 to 2.0m Mudstone: 0.5m, carbonaceous. Brown-weathering, nodules in mudstone N35°W 23°NE
304		SANDSTONE - medium to coarse-grained to pebbly, light grey, brown-weathering, carbonised plant remains and coaly stringers N29°W 16°NE
305		SILTSTONE/MUDSTONE - interbedded, Siltstone weathered; brown-weathering N70°W 10°SE
306		SILTSTONE - thinly laminated, grey, brown-weathering. N35°W 16°SW
307		SILTSTONE/MUDSTONE - interbedded, brown-weathering.
308		SILTSTONE/MUDSTONE - interbedded, Mudstone: black, carbonaceous. Siltstone: grey, thinly laminated N15°W 3°NE
309		MUDSTONE: See Station B120

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Chamberlain Mine Road (From _____. ELEVATION: _____.
GEOLOGIST: south to north) Skeeter Creek West

310		Sheared zone - from station 309 to station 310. Broken mudstone, dark grey, brown-weathering
311		See Station B121
312		SANDSTONE - medium-grained, calcareous. Dark to medium grey. Calcite stringers irregularly filling joints. See field sketch N25°W 80°SW
313		See Station B123
314		Station 314 not used
315		CONGLOMERATE - black chert pebbles, white quartzite, angular to subangular, 1 to 3 cm diameter. Cemented in a matrix of cherty sandstone. Iron rusted on surface.
316		MUDSTONE - black, carbonaceous, partly sheared, broken, from stations 315 to 316
317		SANDSTONE ; fine-grained and/or siltstone - interbedded. 1 to 5 cm coal stringers N10°W 75°NE
318 (B130)		SANDSTONE - fine-grained, finely cross-laminated, orange-weathering; orange matrix. Thin to medium-bedded. Argillaceous laminae. Strongly calcareous. Attitude: 140/32 SW
319 (B131)		SANDSTONE - medium-grained, well-sorted, thin-bedded, non-calcasreous. Orange specks: 5%. Chert: 30-35%. Rest quartz. Quartz-lithic. (Riverine appearance). Trace of detrital mica. Attitude: 165/22 SW
320 (B132)		SANDSTONE/SILTSTONE/MUDSTONE - Section at B132 TOP Sandstone- medium to coarse-grained 2m (Riverine as before), cross-stratified, tops-up; chert pebbles. 140/36 SW Mudstone - dark grey, carbonaceous 5m COAL BLOOM siltstone - thin-bedded, rusty-weathering 2m small-scale cross-lamination, rootlets at top. Lots of plant debris.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Skeeter Creek. ELEVATION: _____.
GEOLOGIST: _____.

		Dark silty mudstone interbeds at base; plant remains, devoid of lamination, non-calcareous; (paleosal?) Attitude: 140/40 SW
		Mudstone - carbonaceous, black 2m
		Mudstone - brown-grey 2m
		Mudstone - carbonaceous, dark grey 6m
		Base of Section Photographs taken
		0.50 to 1.70 m below top of siltstone unit, interbeds of siltstone and very fine-grained sandstone. Micro-erosional, (riverine, flood-plain type.) Orange-weathering nodules at base of this interval.
321 (B133)		CONGLOMERATE - poorly-sorted, thickbedded; matrix is coarse sand to granules. Framework of sub-rounded to rounded chert pebbles, dominantly dark grey. Maximum 30mm; average 10 to 15mm. Attitude: 180/30 W
322 (B134)		SANDSTONE, medium-grained, to conglomerate - Thickly interbedded. Conglomerate dominantly granules to small pebbles. Sandstone parallel laminated. Siliceous. Attitude: 020/24 NW
323 (B135)		SANDSTONE, very fine-grained and/or siltstone - brown-weathering, thinly laminated, weakly calcareous, with thin, 1 to 2 mm, stringers of black mudstone. Rootlets.
324 (B136)		SILTSTONE - dark grey, non-calcareous, strong, thick-bedded to massive. Cross-stratified. 130/30 SW
325 (B137)		SANDSTONE - medium-grained, dark cherts; distinctly orange matrix. Massive, medium to dark grey; non-calcareous, with orange calcareous weathering-rind. Cross-bedded; forms 7m scarp. Attitude: 135/10 SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Skeeter Creek. ELEVATION: _____.
GEOLOGIST: _____.

		Section of Coal Seam at Base, B137
		TOP Sandstone, see above 7m
		abrupt.
		Coal - bright, soft and 0.20m
		weathered. Abrupt.
		Mudstone - very carbonaceous 0.50m
		plant debris. Abrupt.
		Sandstone - fine-grained 0.30m +
		BASE OF SECTION
326,327		MUDSTONE/SILTSTONE/COAL -
(B138)		Section at B138
		TOP Sandstone - fine to medium-
		grained, quartz-lithic, 1.0m+
		Mudstone - dark grey 0.05 m
		Coal - canneloid, greasy
		lustre, compare to "bone"
		at top of Chamberlain 0.30m
		Seam
		Coal - bright 0.36m
		Siltstone - argillaceous,
		rooty. Plant fragments 1.0m
		Coal 0.15m
		Mudstone/siltstone - dark
		brown-grey, rootlets. Tops up.
		Thin to medium bedded. Few thin
		very shaly coaly bands. 3.30m
		Attitude: 110/18 NE
		BASE OF SECTION
		SANDSTONE - angular, broken jumbled blocks, in a matrix
		of mud and rock chips. Exposure 20 m wide by 15 m high;
		5 m downstream from coaly sequence. (Fault, possible).
		Fabric of blocks: (very approximate) 010/25 W.
		Abundant calcite on joints in fallen blocks.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Skeeter Creek, Master A . ELEVATION: _____.
GEOLOGIST: (Skeeter Creek North) .

328 (B139)		SANDSTONE - medium-grained, quartz and chert, orange specks of detrital carbonate. Calcareous, laminated, massive, cross-stratified. Orientation uncertain.
329, 330 (B140)		SANDSTONE - fine-grained, quartz-lithic, orange-weathering, orange specks of detrital carbonate, calcareous. Thin to medium bedded, clean, cross-laminated, tops up. 6 m. Underlain by dark grey, medium brown-grey-weathering marine mudstone. Abundant small dark burrows; interbedded with siltstone and very fine-grained sandstone. (Reminiscent of top part of Lower Gething marine sequence.) Attitudes: sandstone 142/50 SW mudstone 137/52 SW
331 (B141,	B142)	SILTSTONE - highly argillaceous/mudstone/coal Section at B141 to B142 TOP siltstone - highly argillaceous, dark brown grey. Plant debris; interbeds of carbonaceous mudstone and thin coal seam. Discontinuous outcrop. 24.25 m Attitude: 136/48 SW siltstone - thinly bedded, abundant plant debris, medium to dark grey, 0.45 m orange-weathering. Attitude: 149/57 SW. Abrupt. mudstone - dark grey, light grey - 0.50 m weathering. Gradational. mudstone - dark grey to black, carbonaceous, plant fragments, rubbly, thin coaly seams, base not seen. 3.10 m BASE OF SECTION
332 (B143)		COAL BLOOM - on fresh mudslide. Suspected location of "Lower Coals" outcrop. More likely that this is in the Middle Coals. (Note: from further field mapping this area, it appears probable that this is the Lower Gething "B" horizon Aug.4,78)
333 (B144)		SANDSTONE - fine-grained, quartz-lithic, calcareous, orange-

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Skeeter Creek, Master A . ELEVATION: _____.
GEOLOGIST: (Skeeter Creek North) .

		weathering. Finely cross-laminated; low-angle laminated. Thin-bedded at top, to thick-bedded at base. 3 m section exposed. (Very similar to B140; typical of upper part of Gel.) Attitude: 060/8 SE
334		SANDSTONE - medium-grained, brown to orange-weathering, thinly bedded. N45°W 15°NE
335		SANDSTONE - medium to coarse-grained, cherty. Many 0.5 to 1.0 cm worm burrows. Cross-bedded. (FLoor of Bird Seam) N45°W 63°NE
336		SANDSTONE - (Bird Seam Floor), N43°W 19°SW; synclinal structure - Between Station 335,336
337		SANDSTONE - medium-grained, grey, thinly laminated, cross-bedded. Orange to brown-weathering. 0.5 to 1.0 cm burrows. Non-calcareous N68°W 21°NE
338		SANDSTONE - medium-grained, grey, orange to brown-weathering, thinly laminated, calcareous, recessive, N35°W 21°NE
339		SANDSTONE - medium-grained, grey, siliceous, calcareous, blocky, thickly bedded. N45°W 29°SW
340		SANDSTONE - medium-grained, medium grey, brown and orange-weathering, weakly calcareous, cross-bedded
341		SANDSTONE - medium-grained, grey, orange-weathering, weakly calcareous, thinly bedded, cross-bedded, thinly laminated. N45°W 38°NE
342		SANDSTONE - medium-grained, brown to orange-weathering, small-scale cross-bedding, thinly laminated, weakly calcareous, recessive. N45°W 29°SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Skeeter Cr. North. ELEVATION: _____.
GEOLOGIST: _____.

343		SANDSTONE - medium-grained, grey, brown to orange-weathering, thickly bedded to massive. N15°W 36°NE
344		SANDSTONE - medium-grained, brown-weathering, calcareous, thinly laminated, recessive. N40°W 30°NE
345		SANDSTONE - medium-grained, grey, brown-weathering, thickly bedded, cross-bedded. N35°W 31°SW
346		COAL (CHAMBERLAIN SEAM) - Section:
		TOP laminite
		concealed 3.0m
		sandstone, fine-grained argillaceous, small-scale
		cross-bedding. N40°W 54°NE 1.2m
		Coal 2.7m
		BASE sandstone (Ch. Floor) N30°W 54°NE
		NOTE: all thicknesses at 54° to bedding, thus apparent thicknesses
347		Number not used
348		Number not used
349		Number not used
350		Number not used
351		Number not used
352		Number not used

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Master A (North of property). ELEVATION: _____.
GEOLOGIST: _____.

353		See Station 458
354		See Station 460
355		SANDSTONE - coarse-grained, grey, thickly-bedded. 0.5 to 1.5 cm black chert and white quartz pebbles in matrix Float (?)
356		SANDSTONE - medium to coarse-grained, grey, thickly laminated, abundant worm burrows in matrix. (Floor of Bird Seam) N55°W 10°SW
357		See Station 462
358		SANDSTONE - medium-grained, grey, thinly laminated. Abundant worm burrows. Recessive, with irregular calcite veinlets. N15°W 30°NE
359		SANDSTONE , very fine-grained and/or SILTSTONE - orange-weathering, thinly laminated. N25°W 20°SW
360		SANDSTONE - fine to medium-grained, thinly laminated, orange-weathering; lithic. Iron staining on weathering surface, with irregular calcite veinlets filling joints. (Chamberlain Floor S.S.) N30°W 25°SW
361		SANDSTONE - same as station 360. N31°W 14°NE Abundant shelly fossils in a sandy matrix, 0.5 to 2.5 cm. See field sketch. Recessive, thinly bedded
362		MUDSTONE - grey, iron rusted, nodular, blocky, calcareous, with tiny worm burrows. (Lower Gething marine mudstone). N60°W 11°NE
363		Same as Station 362
364		SANDSTONE - very fine-grained, thinly laminated, with interbedded silty mudstone. Orange-weathering, with tiny worm burrows. N55°W 17°NE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: West of Master A . ELEVATION: _____.
GEOLOGIST: (North of Skeeter Cr.) .

365		MUDSTONE, grey/SILTSTONE - interbedded. Worm burrows and shell fossils. See field sketch. (Marine) N50°W 20°NE
366		Number not used
367		MUDSTONE - carbonaceous. No conglomerate overlies this unit: the immediate contact with grey mudstone is sheared and shiny. Tiny worm burrows. Abundant pyrite crystals in the carbonaceous mudstone. N75°W 20°NE. (Might be "A" Horizon, but note the absence of any overlying conglomerate).
368		SANDSTONE - medium to coarse-grained, dark grey, iron rusted, cherty, thickly laminated, coaly wisps, plant imprints N70°W 5°NE (Floor of Chamberlain Seam?)
369		SANDSTONE - medium-grained, grey, orange-brown-weathering, thinly laminated; large worm burrows. Non-calcareous. N45°W 17°NE
370		SANDSTONE - same as station 369. N55°W 7°NE Local cherty pebbles, associated with coarse-grained sandstone, with iron staining around pebbles. Plant imprints and some worm burrows.
371		SANDSTONE - medium-grained, grey, thinly laminated. Recessive, broken: Highly disturbed, Contorted (thrust plane?) irregular calcite veinlets.
372		SANDSTONE - medium-grained, same as station 369. N5°W 5°NE . Thinly laminated. Worm burrows. Associated with mudstone.
373		SANDSTONE - medium-grained, grey, thinly laminated, lithic, clean. N50°W 20°SW
374		SANDSTONE - medium-grained, thickly bedded to massive, large-scale cross-bedded. 0.30 m silty mudstone band. (This sandstone is 40 m below the Chamberlain seam.)
375		MUDSTONE - grey, blocky, brown-weathering. Shell fossils and tiny worm burrows. Calcareous, (marine), underlain by massive sandstone. FW 13°N

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: North of Skeeter Creek. ELEVATION: _____.
GEOLOGIST: Conveyor decline.

376		MUDSTONE - same as station 375. Anticlinal structure N40°W 18°SW
377		MUDSTONE - same as station 375. N50°W 18°SW Grey, very fine-grained sandstone interbeds. Nodular, with tiny worm burrows.
378		MUDSTONE - (marine) same as station 379 EW 19°S
379		MUDSTONE - similar to station 378; calcareous. EW 20°S
380		MUDSTONE - grey, many tiny worm burrows in matrix, (marine) N80°W 16°SW
381		MUDSTONE - grey, brown-weathering, blockly; big nodules any tiny worm burrows. (Marine) 10 to 15 cm interbeds of very fine-grained sandstone. N60°W 22°SW
382		SANDSTONE - very fine-grained, thinly laminated, orange-weathering, calcareous; tiny worm burrows N50°W 18°SW
383		MUDSTONE - same as station 382 N55°W 17°SW
384		MUDSTONE - (Lower Gething Marine) N35° to 45°W 23°SW
385		SILTSTONE/MUDSTONE, grey - interbedded, brown-weathering, blocky; calcareous, local iron staining. Tiny little worm burrows. EW 11°S
386		See station B179
387		SANDSTONE - similar to station 386 N55°W 22°SW
388		MUDSTONE - dark grey, brown-weathering, conchoidal fracture, calcareous, (marine). Immediate contact with fine-grained, brown-weathering sandstone N50°E 10°SE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Conveyor Decline. ELEVATION: _____.
GEOLOGIST: Chamberlain Mine Road.

389		CONGLOMERATE - underlain and overlain by (marine) mudstone. Bottom mudstone is especially carbonaceous. Conglomerate: dark grey to black with subrounded to rounded pebbles of black chert. 1 to 1.5 cm diameter, in a cherty matrix. 30 cm thick. EW (?) 10°S See field sketch.
390		MUDSTONE - carbonaceous. Weathering surface. Some coal (?) ("A" Horizon)
391		SANDSTONE - medium-grained, grey, brown to orange-weathering, thinly laminated, calcite-coated on weathering surface. N70°E 9°SE. Weakly calcareous on fresh surface; moderately calcareous on weathering surface. 2mm patches of carbonaceous mudstone in a sandstone matrix. Abundant worm burrows, some 2 to 3 mm plant imprints (?)
392		SANDSTONE - medium-grained, thinly bedded to massive, grey, orange-weathering. N65°E 12°SE. (Above "B" Seam)
393		COAL - ("B" Seam) Section: Note: August 4th 1978. See Trench No.26
394		SANDSTONE - fine-grained, broken, brown-weathering. Some carbonaceous mudstone
395		MUDSTONE - silty, slate-like; abundant plant debris. carbonaceous, brown-weathering. N40°W 45°SW
396		SANDSTONE - siliceous, medium grey, cooked, massive, thinly laminated.
397		SANDSTONE - siliceous, medium to dark grey, with slickensides and calcite N50°W 75°SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Chamberlain Mine road. ELEVATION: _____.
GEOLOGIST: Conveyor Decline.

398		SANDSTONE, very coarse-grained/pebbly (75:25) - siliceous, medium grey. N34°W 70°SW
399		SANDSTONE - fine-grained, medium grey, thinly bedded, siliceous; slightly carbonaceous material on bedding plane N18°W 87°SW
400		SANDSTONE - very fine-grained, medium grey, argillaceous, with silty laminae, on bedding planes. Thinly laminated. Somewhat carbonaceous, distinctly orange-weathering, calcareous. N35°W 9°SW; N50°W 12°SW
401		SANDSTONE - fine to medium-grained, grey, thinly laminated, orange-weathering, broken outcrop. Calcareous. Impossible to determine dip and strike.
402		MUDSTONE - (marine, same as at junction near this area). Broken, medium grey, with tiny worm burrows. Section:
		TOP Mudstone 0.60m
		Conglomerate band, rounded to subrounded pebbles and cobbles 0 to 0.15 m
		Mudstone, carbonaceous 0.60m
		Coal, dirty ("A" Horizon) 0.30m
		BASE N20°W 10°SW
403		SANDSTONE - fine-grained, calcareous, brown-weathering, broken, (between "A" and "B" Horizons)
404		Drill hole M2 -
405		SANDSTONE - fine-grained, grey, orange-weathering, thinly laminated, calcareous; broken outcrop. Beside hole K. shell and plant debris. N60°W 18°SW
406		Drill hole L - no indication of hole site on ground
407		Drill hole M - no indication of hole site on ground

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: South Slope of Skeeter Creek. ELEVATION: _____.
GEOLOGIST: _____.

408		SANDSTONE - fine to very fine-grained, medium grey, clean, strongly calcareous. Brown-weathering, medium bedded, platy (might be upper part of sandstone?) N50°W 38°SW
409		SANDSTONE - same as station 408. Broken outcrop; slab. Impossible to measure strike and dip.
410		SANDSTONE - fine to very fine-grained, medium grey, clean, strongly calcareous, medium bedded. N50°W 34°SW
411		SANDSTONE - same as sandstones at stations 408,409. N35°W 45°SW
412		SANDSTONE - fine-grained, clean, medium grey, brown-weathering, medium bedded. N40°W 52°SW. Platy; strongly calcareous.
413		SANDSTONE - fine-grained, medium grey, brown-weathering, strongly calcareous, clean, thickly bedded. Some calcite veinlets. Calcite crystals on bedding surfaces and slickensides.
414		Section in creek, showing thrust fault - see field sketch Thurst plane: N15°W 65°SW
415		SANDSTONE - fine-grained, same as previous sandstone N25°W 47°SW
416		SANDSTONE - very fine-grained, medium grey, orange-weathering, calcareous, thinly bedded. Large burrows, fine shell fragments. N40°W 58°SW
417		SANDSTONE - fine to medium-grained, medium grey, orange-weathering, thinly bedded, calcareous. Small burrows. N60°W 48°SW
418		MUDSTONE - dark grey, iron rusted weathering surface, worm burrows, calcareous nodules. (marine). N35°W 45°SW
419		See station B160

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Master A Cutline, Conveyor Decline. ELEVATION: _____.
GEOLOGIST: _____.

420		SANDSTONE - medium-grained, medium grey, orange-weathering, strongly calcareous, thinly bedded, recessive.
421		SANDSTONE - medium-grained, medium grey, thickly bedded to massive. Clean, non-calcareous. Many calcite veinlets, irregularly filling joints. Very hard to measure strike and dip due to massive outcrop. (Similar to base of Chamberlain Sandstone)
422		SANDSTONE - medium-grained, medium grey, orange-weathering, calcareous. Thinly bedded, small-scale cross-bedded. Small worm burrows. N40°W 12°NE
423		MUDSTONE - broken, grey, calcareous, small worm burrows.
424		SANDSTONE - medium-grained, medium grey, thinly laminated, clean, calcareous. Impossible to measure strike and dip due to broken outcrop.
425		SANDSTONE - very coarse-grained, medium grey, non-calcareous, broken outcrop.
426		MUDSTONE - silty, grey, calcareous, abundant shell fossils, calcite veinlets, broken outcrop.
427		SANDSTONE - fine to medium-grained, slightly calcareous, thinly laminated, thinly bedded, small-scale cross-bedded. N70° - 75°E, 5° - 10°SE. (Just above "B" Seam) Section: TOP: Sandstone Mudstone BASE: ("B" Seam)
428		SANDSTONE - fine to medium-grained, same as station 427. Grey, orange-weathering, thinly bedded, small-scale cross-bedded. Calcareous. N45°W 4°SW
429		MUDSTONE - broken, outcrop (marine mudstone), grey, calcareous. (This mudstone is just above "B" Seam Horizon)
430		SANDSTONE - fine-grained, broken calcite on slickensides.
431		SANDSTONE - fine-grained, grey, brown-weathering, thinly laminated, strongly calcareous.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: South and North slope of _____. ELEVATION: _____.
GEOLOGIST: Skeeter Creek _____.

432		SANDSTONE - fine-grained, grey, thinly laminated, non-calcareous, broken outcrop.
433		SANDSTONE - medium-grained, siliceous, coaly material in matrix. Coal patches. EW 36°S
434		SANDSTONE - medium-grained, siliceous, orange-weathering, thickly bedded to massive. Clean. N60°W 28°SW
435		SANDSTONE - similar to station 434, non-calcareous. orange-weathering, abundant small plant debris.
436		SANDSTONE - medium-grained, grey, calcareous, thickly bedded, abundant carbonized plant debris and rootlets N60°W 33°SW
437		SANDSTONE and CONGLOMERATE - contact. Conglomerate: (Cadomin) 6m thick; subrounded to rounded chert pebbles cemented in a conglomeratic sandstone matrix. Sandstone: medium to coarse-grained, plant debris and carbonized debris. Non-calcareous. N40°W 43°SW
438		SANDSTONE - fine-grained, grey, orange-weathering, calcareous, thinly bedded. Recessive big float, not outcrop.
439		SANDSTONE - fine-grained, dark grey, siliceous, thickly bedded. N70°W 28°SW
440		CONGLOMERATE (Cadomin) - angular to subangular quartz pebbles in a conglomerate matrix. Mostly 1 to 3 cm N50°W 23°SW
441		SANDSTONE - very similar to station 439. (This sandstone lies above conglomerate). Grey, fine-grained, siliceous, thickly bedded. N65°W 24°SW
442		SANDSTONE - siliceous, similar to station 339. Broken outcrop.
443		Drill hole A - SAndstone, fine-grained, thinly bedded, recessive, N10°W 53°(?) Hole marked by stick.
444		SILTSTONE - fine-grained, thinly bedded, calcareous, brown-weathering, with calcite on surface. N5°W 47°NE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: North slope of Skeeter Cr. . ELEVATION: _____.
GEOLOGIST: Master A .

445		COAL BLOOM - along road
446		SILTSTONE, broken and/or SANDSTONE, fine-grained - similar to station 444.
447		SANDSTONE - very fine-grained, orange-weathering, calcareous, thinly laminated, thinly bedded, small-scale cross-bedded. N5°W 34°SW Abundant small shells
448		see station 451
449		see station 452
450		SANDSTONE - medium-grained, orange-weathering, thickly bedded, slightly calcareous, some plant debris. N65°W 25°SW (This sandstone just below the Chamberlain Seam)
451		SANDSTONE - (Chamberlain Floor), medium grey, cherty, siliceous, non-calcareous, clean, thickly bedded. N65°W 30°SW
452		COAL BLOOM - (Chamberlain Seam?) Associated with dirt
453		SANDSTONE - medium-grained, grey orange-weathering, thinly bedded, calcareous. Abundant big, lcm, worm burrows and iron rusted plant debris. N70°W 38°SW
454		SANDSTONE - medium-grained, grey, orange-weathering, thinly bedded, clean, non-calcareous. N55°W 44°SW
455		SANDSTONE - medium-grained, grey, orange to brown-weathering, thinly laminated, thinly bedded, abundant orange specks on bedding planes. Abundant shells. N65°W 38°SW
456		SANDSTONE - medium-grained, grey to dark grey, thinly bedded, non-calcareous, iron rusted on bedding planes. (Resembles Chamberlain Floor sandstone). N65°W 41°SW
457		COAL BLOOM - (Chamberlain Seam?), greater than 30 cm clean coal powder, sheared. N15°E 13°NW Section:
		TOP Siltstone 0.05m
		Sandstone, coarse-grained 0.10m
		BASE: Coal 0.30m +
		(True thickness unknown due to covered by dirt).

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Master A Area . ELEVATION: _____.
GEOLOGIST: _____.

458		MUDSTONE - grey, thinly interbedded siltstone bands; small worm burrows; shell fossils. N45°W 40°SW
459		SANDSTONE - very fine-grained, grey, orange-weathering, clean, calcareous. N40°W 46°SW
460		SANDSTONE - medium-grained, grey, non-calcareous, siliceous, thinly laminated, thinly bedded with 0.5 cm chert pebbles in places. Plant debris. N60°W 30°SW
461		SANDSTONE - medium-grained, grey, siliceous, pebbly in places: chert pebbles, angular to subangular. Small-scale cross-bedded N80°W 22°SW
462		SANDSTONE - medium to coarse-grained, grey, siliceous, thickly bedded to massive. Pebbles in places: chert pebbles, angular to subangular N70°W 17°SW
463		SANDSTONE - medium grey, siliceous, clean, somewhat carbonaceous. Irregular calcite stringers, mostly perpendicular to bedding. (Chamberlain Floor)
464		SANDSTONE - medium-grained, grey, orange-weathering, massive, thickly bedded. Thinly laminated. Calcareous, N5°W 18°NE
465		number not used
466		number not used
467		SANDSTONE - medium to coarse-grained, siliceous, grey, worm burrows, thickly bedded (Bird Floor). N20°W 4°NE
468		SANDSTONE - medium to coarse-grained, thickly bedded to massive, siliceous, small worm burrows (Bird Floor)
469		SANDSTONE - medium-grained, orange-weathering, massive, (might be floor of Bird)

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Master A Area. ELEVATION: _____.
GEOLOGIST: _____.

470		SANDSTONE - medium-grained, grey, brown-weathering, thinly bedded, calcareous, local brown mudstone patches in matrix. N20°W 30°SW
471		SANDSTONE - fine to medium-grained, thinly bedded, local subangular to angular chert pebbles. Calcareous, recessive. Brown-weathering N25°E 42°NW
472		SANDSTONE - dark grey, massive, iron rusted on surface, non-calcareous. N80°W 18°NE (Chamberlain Floor)
473		SANDSTONE - medium-grained, grey, brown-weathering, calcareous, thinly bedded; local black mudstone patches N45°W 37°SW
474		SANDSTONE - same as station 473 N50°W 30°SW
475		SANDSTONE - medium-grained, grey, massive, iron-rusted. (Chamberlain Floor) N55°W 22°SW
476		SANDSTONE - medium-grained, grey, orange-weathering, thinly-bedded, abundant small worm burrows. (Bird Floor sandstone?) N30°W 18°SW
477		SANDSTONE - similar to station 475 N45°W 7°NE (Chamberlain Floor)
478		SANDSTONE - medium-grained, thinly bedded, non-calcareous. Large, 0.5 cm; worm burrows. N35°W 10°SW
479		SANDSTONE - medium-grained, grey, locally with black chert pebbles in a matrix. N15°W 35°NE
480		SANDSTONE - medium-grained; grey, carbonaceous, thickly bedded to massive, non-calcareous, iron-rusted on surface. N40°W 45°NE (Chamberlain Floor)
481		SANDSTONE - medium-grained, brown-weathering, thinly bedded, calcareous. Towards west, outcrop badly broken. N40°W 12°NE, N45°W 15°NE (This sandstone is underneath Chamberlain sandstone)
483		COAL BLOOM

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Master A, plate 1 _____. ELEVATION: _____.
GEOLOGIST: _____.

484		SANDSTONE - medium-grained to fine-grained, grey, brown-weathering, calcareous, thinly bedded. N40°W 10°SW
485		SANDSTONE - medium-grained, siliceous, carbonaceous, thickly bedded. N25°W 53°NE (Chamberlain Floor)
486		CONGLOMERATE - chert pebble, 0.5 to 1.0 cm, subrounded to rounded, cemented in a conglomeratic sandstone matrix. Massive, blockly. N50°W 33°SW (might be below "D" Horizon) Poorly sorted, abundant orange specks throughout, siliceous. Approx. 40 cm. of conglomeratic sandstone interbedded.
487		CONGLOMERATE - N30°W 20°SW Section: TOP Sandstone, fine-grained, thinly bedded calcareous, recessive 1m conglomerate 1.5m Sandstone, fine-grained, with 1-4.5 cm pebbles 1.5m BASE: Conglomerate 0.6m +
488		SANDSTONE - fine to medium-grained, medium grey, orange-weathering. Thinly cross-laminated; massive N45°W 31°NE
489		SANDSTONE - fine-grained, grey, siliceous, thickly bedded to massive, micaceous (?) NS 27°W
490		SANDSTONE - solid outcrop Direction: N40°W TOP: Sandstone, siliceous, thinly bedded, recessive quartzose, burrows(?), non-calcareous, fine-grained, clean, well-sorted 1.5m BASE: Sandstone, siliceous, as at Station 489 N35°W 15°SW
491		SANDSTONE - medium-grained, grey, siliceous, quartzose, clean, thickly bedded to massive, blocky.
492		SANDSTONE - coarse-grained and conglomeratic, siliceous. Talus area
493		SANDSTONE - pebbly, grey, siliceous, thickly bedded to massive, with angular to subangular black chert pebbles in a cherty sandstone matrix.
494		MUDSTONE - broken, highly calcareous, abundant plant debris

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Southwest slope of Chamberlain Mine, Chamberlain Creek. ELEVATION: _____.
GEOLOGIST: _____.

495		SANDSTONE - medium-grained, Locally medium to coarse-grained; grey, brown-weathering, thickly bedded to massive, blocky, siliceous, clean. Some carbonaceous, coaly stringers in matrix.
496		SANDSTONE - medium-grained, grey, thickly bedded to massive, siliceous, non-calcareous N25°W 80°NE
497		SANDSTONE - similar to station 496 N15°W 74°SW
498		CONGLOMERATE - angular to subrounded white to milky white, 1 to 5 cm chert pebbles cemented in a conglomerate matrix. Becoming coarse-grained sandstone at bottom. Overall approximately 15 metres thick.
499		Contact - conglomerate and coarse-grained sandstone N15°W 80°SW
500		SILTSTONE - on creek side, Carbonaceous, thinly laminated, non-calcareous, hairlines of coal in places; many rootlets. N45°W 18°SW Section: TOP Mudstone, carbonaceous, eroded Coal, hard, bright 0.35 m ± Mudstone, coaly 0.25 m Coal, hard, bright 0.15 m BASE Mudstone, carbonaceous 0.35 m + See field sketch ("D" Seam?)
501		COAL - (Same horizon as station 500), hard, bright, beside creek. N45°W 18°SW
502		COAL BLOOM
503		COAL BLOOM - Section: TOP Sandstone, medium to coarse-grained, poorly sorted siliceous, cross-bedded Mudstone, carbonaceous 1.5m Coal, dirty 1 m N60°W 25°NE, N65°W 18°NE BASE Siltstone, thinly laminated, strongly calcareous

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Chamberlain Cr., Master A Area ELEVATION: _____.
GEOLOGIST: _____.

504		SILTSTONE - grey, orange-weathering, calcareous, thinly laminated. N65°W 23°SW
505		SANDSTONE - fine-grained, grey, thinly laminated, clean, well-sorted, calcareous, gradationally pebbled at base N40°W 25°SW
506		SILTSTONE - grey, orange-weathering, thinly laminated, calcareous, abundant plant debris. N30°W 32°SW This siltstone is just underlain by pebbly sandstone.
507		See field sketch
508		SANDSTONE - medium-grained, dark grey, clean, well-sorted, non-calcareous, siliceous, 90% Quartz N50°W 24°SW Similar to station 495
509		SANDSTONE - thickly bedded, similar to station 508 N20°W 32°SW
510		SANDSTONE - fine-grained, grey, calcareous, thinly laminated, small-scale cross-bedded. N40°W 25°SW
511		SANDSTONE - medium-grained, grey, carbonaceous, clean, well-sorted, with stringers of calcite irregularly filling joints N40°W 44°NE (Chamberlain Floor)
512		COAL BLOOM - (Chamberlain Seam)
513		SANDSTONE - medium-grained, grey, siliceous, clean, quartz 50%, chert 50%, well-sorted, with orange specks in matrix. N50°W 29°SW. (Chamberlain Floor?)
514		SANDSTONE - medium-grained, dark grey, carbonaceous, with patches of coal. Siliceous, clean, thickly bedded.
515		SANDSTONE - fine-grained, grey, orange-weathering, calcareous, thinly bedded, recessive. Outcrop direction N80°W N22°W 25°NE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Master A Area, South slope of _____. ELEVATION: _____.
GEOLOGIST: Chamberlain Mine _____.

516		SANDSTONE - same as station 515. Thinly bedded, small-scale cross-bedded, locally contorted bedding (N40°E 15°NW) Abundant orange-specks in matrix.
517		SANDSTONE - fine-grained, grey, orange-weathering, thinly bedded; thickly bedded to massive at base. N30°W 15°NE Section: TOP: - Sandstone, thinly bedded, thinly laminated 1.5 m BASE: - Sandstone, fine-grained, massive 1.5 to 2 m
		Clean, well-sorted, massive, calcareous. (This sandstone might be below the Chamberlain Floor)
518		SANDSTONE - fine-grained, grey, thickly bedded to massive, clean, calcareous. Bedding planes calcite-coated. Weathering surface is white just like limestone. Blocky. N60°W 11°NE (This sandstone is underlain by Chamberlain sandstone.)
519		SANDSTONE - fine-grained, thinly bedded, calcareous, clean. N60°W 11° - 23° NE.
520		SANDSTONE - carbonaceous, siliceous, blocky, massive. Hard to measure strike and dip. (Chamberlain Floor)
521		MUDSTONE/SILTSTONE - dark grey, nodular; mudstone: small black worm burrows, strongly calcareous. Siltstone: thinly laminated, strongly calcareous. N60°W 12°NE
522		SANDSTONE - medium-grained, grey, orange-weathering, cherty, some worm burrows. Clean, well-sorted, massive, blocky. EW 12°S
523		Drillhole C41 Broken mudstone around drill site
524		SANDSTONE - medium to fine-grained, orange-weathering, large worm burrows. Broken. (Between Bird and Skeeter Seams)
525		SANDSTONE - fine-grained, grey, thinly bedded, calcareous, with small burrows. Calcite on bedding planes, and abundant orange specks. N45°W 14°SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Southwest slope of Chamberlain Mine ELEVATION: _____.
GEOLOGIST: _____.

526		SANDSTONE - medium-grained, grey, clean, well-sorted, some rootlets. Quartz 70%, black chert 30%. N75°W 14°SW
527		SANDSTONE - fine-grained, grey, siliceous, clean, well-sorted, thinly bedded. N80°W 24°SW
528		SANDSTONE - siliceous, similar to Station 526. From Stations, 527 to 528, broken, fine-grained sandstone, with large worm burrows. N20°W 75°SW
529		Coal licence post - No. 43, to S.E. corner, 1970 BRAMEDA RESOURCES LIMITED, 1250 ' S 55 E, August 5
530		SANDSTONE - fine-grained, grey, orange-weathering, abundant large worm burrows, thinly bedded, non-calcareous. N10°W 43°NE
531		SANDSTONE - similar to Station 530. N20°W 32°NE
532		SANDSTONE - fine-grained, grey, orange-weathering, siliceous, large burrows, thinly bedded. N30°W 60°NE
533		SANDSTONE - medium-grained, grey, siliceous, well-sorted, massive.
534		SANDSTONE - medium-grained, grey, massive, siliceous. Quartz 80%, black chert 15% to 20%. Thickly bedded, blocky. Abundant small worm burrows. N55°W 43°NE (Bird Seam Floor)
535		SANDSTONE - medium-grained, grey, massive, thickly laminated, large-scale cross-bedded, small worm burrows. N25°W 56°NE (Floor of Bird Seam)
536		SILTSTONE - orange-weathering, thinly laminated, non-calcareous N28°W 35°NE
537		SILTSTONE - worm burrows, non-calcareous. N30°W 40°NE
538		SANDSTONE - fine-grained, orange-weathering, calcareous, thinly bedded, thinly laminated; small worm burrows. NS 11°W

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____

PROJECT: _____ DATE: _____

LOCATION: Southwest slope of Chamberlain Mine ELEVATION: _____

GEOLOGIST: _____

539		SANDSTONE - fine-grained, brown-weathering, thinly laminated, thinly bedded, calcareous, plant debris N60°W 25°SW
540		SANDSTONE - fine-grained, dark grey, brown-weathering, thinly laminated, calcareous. N25°W 84°NE
541		SANDSTONE - fine-grained, grey, brown-weathering, abundant large worm burrows, calcareous, sheared, many broken slickensides. N25°W 60°NE
542		SANDSTONE - medium-grained, brown-weathering, thickly bedded to massive, calcareous. N45°W 54°NE (?). (This sandstone might be below the Chamberlain Sandstone) Between Station 541 and 542, broken fine to medium-grained sandstone with large worm burrows.
543		SANDSTONE - medium-grained, with pebbly interbeds. N60°W 59°NE. Pebbles are subrounded to rounded, black chert in cherty matrix. Section:
		TOP: Sandstone Sandstone, pebbly 0.30 m BASE: Siltstone, non-calcareous
544		SANDSTONE - medium-grained, grey, orange-weathering, thinly bedded, small-scale cross-bedded. Calcareous N25°W 39°NE
545		SANDSTONE - medium-grained, grey, orange-weathering, thickly bedded, cross-bedded, calcareous N30°E 39°NE
546		SILTSTONE/MUDSTONE - interbedded, calcareous. N25°W 39°NE
547		SANDSTONE - medium-grained, thickly-bedded, dark grey, contorted texture. Chert, black 50%, quartz 50%. Abundant carbonized plant debris (?) N25°W 37°NE
548		SANDSTONE - medium-grained, contorted texture, siliceous, similar to Station 547. N20°W 37°NE
549		SANDSTONE - conglomeratic N35°W 45°NE Section: TOP Sandstone, conglomeratic. Toward bottom: Sandstone, coarse-grained, light grey, BASE quartz 80 to 90%, black chert 10%

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Southwest slope of Chamberlain ELEVATION: _____.
GEOLOGIST: Mine, Master A Area.

550		SANDSTONE - medium-grained, grey, quartzose. Quartz 95% +, chert 5%. Clean, well-sorted, thickly bedded, cross-bedded. Non-calcareous, pyritic nodules. N20°W 28°NE
551		SANDSTONE - medium-grained, grey, well-sorted, clean. Quartz 95%, black chert 3% to 5% +. Some plant debris N35°W 37°NE
552		CONGLOMERATE - chert pebbles, subangular to subrounded, 2 to 3 cm, cemented in a chert conglomerate matrix. N35°W 39°NE Immediately below the conglomerate, 2 to 3 m + of siltstone and carbonaceous mudstone, orange-weathering, non-calcareous, thinly laminated.
553		SANDSTONE - coarse-grained, grey. Quartz 50%, black chert 50%. Well-sorted, clean. Local chert pebbles. Thickly bedded, non-calcaroeus, brown-weathering.
554		SANDSTONE - coarse-grained and pebbly. Poorly sorted; 50% quartz, 50% chert. Non-calcareous. Chert pebbles: 1 to 1.5 cm, subrounded to rounded. Thickly bedded. N25°W 15°NE
555		SANDSTONE - pebbly, poorly sorted, thickly bedded, with local chert pebbles. 50% quartz, 50% chert. Grading to massive chert pebble conglomerate at base. N50°W 29°NE
556		SANDSTONE - medium to coarse-grained, 50% black chert, 50% quartz. Poorly sorted, thickly bedded, non-calcareous, quartzose N35°W 78° NE
557		SANDSTONE - medium-grained, brown-weathering, orange specks throughout. Thickly bedded; abundant pin burrows. Quartz 30°, chert 70%. Well-sorted. N35°W 18°SW
558		SANDSTONE - medium-grained, orange-weathering, abundant shells. N30°W 25°SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER : _____.
PROJECT : _____. DATE: _____.
LOCATION: Master A Area . ELEVATION: _____.
GEOLOGIST: _____.

559		SANDSTONE - medium-grained, grey, iron-rusted on surface. Thickly bedded, well-sorted. 50% chert, 50% quartz. N45°W 20°SW. (Chamberlain Floor-type sandstone).
560		SANDSTONE - fine to medium-grained, thinly bedded, but outcrop broken. Orange-weathering, calcareous, with pyrite nodules.
561		SANDSTONE - medium-grained, thinly bedded, orange-weathering, calcareous, same as Station 560. N80°E 13°SE
562		SANDSTONE - medium-grained, grey, orange-weathering. Thinly bedded, small-scale cross-bedded. N10°W 18°NE (This sandstone is below the Chamberlain sandstone).
563		MUDSTONE - (marine) nodular, calcareous, with thin glauconitic (?) sandstone. Abundant small black wrom burrows N25°W 10°NE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Windy Fall Cr. South slope of. ELEVATION: _____.
GEOLOGIST: chamberlain Mine, plate 2b.

564		SANDSTONE - medium-grained, grey, thinly bedded, 50% chert, 50% quartz. Well-sorted, moderately calcareous. N15°W 15°NE
565		SILTSTONE and/or SILTY SANDSTONE, interbedded with silty MUDSTONE and SILTSTONE - thinly bedded, grey, orange-weathering, calcareous, clean. N10°W 5°SW. Section: TOP: Siltstone/mudstone 2 m + Sandstone, fine-grained, massive, weakly calcareous 1.5 m Sandstone, fine-grained, BASE: thinly bedded, weakly calcareous 10 m N65°W 12°SW
566		SANDSTONE - medium-grained. Orange-weathering, thickly bedded to massive, calcareous
567		MUDSTONE - calcaroeus with 2 cm interbedded siltstone band. Dark grey. Ferruginous band.
568		SANDSTONE - fine to medium-grained, orange-weathering, thinly bedded, calcareous, large worm burrows.
569		SANDSTONE - medium-grained, orange-weathering, thickly bedded, calcareous, large worm-burrows, small-scale cross-bedded.
570		SANDSTONE - medium-grained, orange-weathering, thinly bedded, calcareous, large worm burrows. N53°W 22°NE
571		SANDSTONE - fine-grained, thinly bedded, brown-weathering. Cross-bedded, calcareous, recessive N65°W 5°SW
572		SANDSTONE - medium-grained, thinly laminated, cross-bedded, calcareous N75°E 13°SE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Plate 2a (High Level Area) . ELEVATION: _____.
GEOLOGIST: _____.

		Station number not used (from 572 to 600)
601		SANDSTONE - very fine-grained, brownish-grey. Silty. small and large dark worm burrows. Plant debris. Argillaceous, rubble. Brown-weathering, iron-rusted, poorly bedded due to broken N75°E 3°SE
602		SANDSTONE - very fine-grained, brownish-grey, silty, bioturbated, small and large worm burrows. Iron-rusted. N85°E 5°SE
603		SILTSTONE - bronwish grey, thinly laminated, bioturbated, small and large worm burrows, iron-rusted on surface N75°W 5°SW
604		SILTSTONE - similar to station 603 N30°W 5°NE
605		SANDSTONE - very fine-grained, brownish-grey. Small-scale of cross-bedded. Small and large worm burrows. Iron-rusted. rubble From station 604 to station 605: dip slope N75°W 8°NE
606		SANDSTONE - very fine-grained, rubbly surface, iron-rusted N85°W 10°NE
607		SANDSTONE - very fine-grained, bioturbated. Large and small worm burrows, convex surface might be disturbance? N25°W 65°NE
608		SANDSTONE - very fine-grained., silty. Brownish-grey. Small and large worm burrows, bioturbated, argillaceous. Iron-rusted

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Plate 2a . ELEVATION: _____.
GEOLOGIST: _____.

609		SANDSTONE - very fine-grained, brownish-grey. Small and large worm burrows., silty, rubbly.
610		SANDSTONE - very fine-grained., grey thinly laminated, Becoming from station 609 sandy amount increased, platy, pyritic nodules in places. Small and large worm burrows. EW 3°S
611		SANDSTONE - very fine-grained, brown-weathering, small and large worm burrows. thinly laminated. N80°W 5°SW
612		Covered by dirt. No exposure
613		SANDSTONE - similar to station 611 N80°W 10°SW
614		SANDSTONE - very fine-grained, orange-weathering, thinly laminated, small-scale of cross-bedded, wavy strucutre,. 30 cm of fine-grained sandstone, interbedded. EW 10°S
615		SANDSTONE - very fine-grained, brownish-grey, broken, rubble. Brownish white-weathering. Small and large worm burrows.
616		SANDSTONE - very fine-grained, brown-weathering, rubble, small and large worm burrows.
617		SANDSTONE - very fine-grained, brownish-grey-weathering. Small worm burrows, rubble
618		SANDSTONE - very fine-grained, silty, grey. Small worm burrows. Rubble. Station 617 - station 618 dip slope. N10°W 12°NE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: Northeast of Chamberlain Mine. ELEVATION: _____.
GEOLOGIST: _____.

619		SANDSTONE - very fine-grained, orange-weathering, silty, rubble. Small and large worm burrows. N35°W 10°NE
620		SANDSTONE - medium-grained, orange-weathering. thinly laminated. N50°W 10°SW
		TOP Sandstone 0.70 m Mudstone 2.4 m (iron-rusted, rubble, slightly carbonaceous)
621		TOP mudstone, silty, grey ± 1.2 m COAL disturbed, over-thickened, sheared, ± 30 m long. Thrust: EW or N85°W, 23°S - 23° SW Bottom side of thrust is SANDSTONE, fine-grained, brown-weathering. Thinly laminated. x-bedded.
622		SANDSTONE - very fine-grained, ORANGE, brown-weathering, thinly laminated, small and large worm burrows. N45°W 15°SW
623		SANDSTONE - very fine-grained ORANGE brown-weathering. Small and large worm burrows. Iron-rusted similar to station 622
624		SANDSTONE - fine-grained. Brown-weathering. Thinly laminated, occasional tiny worm burrows, iron-rusted. N50°E 10°SE
625		(GATES MEMBER) Top: SANDSTONE 5m - fine-grained, medium-grey. Becoming dark grey at base. Brown-weathering, thickly bedded with interbedded thin-bedded sandstone. Iron-rusted Conglomerate - 0.3 m finely generally pea sized, easily weathered, lots of sandy matrix. COAL - 0.4 m. dull-banded, exposed no bottom due to covered dirt. N35°E 8°SE
626		SANDSTONE - very fine-grained, grey, argillaceous, bioturbated. Sukunkoid horizon (?) Sukunka type (?) worm burrows. Some nodules in places. This unit very similar to Sukunka sandstone. This station is situated ± 5m above station. 625. Very few pebbles in places. N65°E 13°SE
627		SANDSTONE - very fine-grained, similar to station 626

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Plate 1 North, No.1

PROJECT: Sukunka 1978 . DATE: May 30, 1978

LOCATION: . ELEVATION: .

GEOLOGIST: C.L. Bickford, M.A. Chowdry

Station		Description
B1		SANDSTONE - medium-grained, dark grey, slightly carbonaceous. Concretionary; (probably Bird Seam floor). Attitude 176/7 E
B2		SANDSTONE - as above; brown-weathering. Attitude 203/6 E
B3		SANDSTONE - medium-grained, dark grey, brown-weathering; chert granules; (definite base of Bird Seam). Cross-laminated. Attitude: 225/10 SE
B4		SANDSTONE - coarse-grained, dark grey to black, dark grey-weathering. (Chamberlain Seam floor). Near DDH PL-6. Attitude: 110/17 NE. Since last point, float of Geu sandstone
B5		MUDSTONE/SILTSTONE - thinly bedded and laminated. Sandstone above; 1 metre exposed of both sandstone and mudstone/siltstone units. (Chamberlain Seam roof). Attitude: 116/10 NE
B6		SANDSTONE - fine-grained; and siltstone. Sandstone is rusty-brown-weathering, thinly bedded and cross-bedded, very fine to fine-grained; argillaceous. Attitude: 120/12 NE
B7		SANDSTONE - (Chamberlain Seam floor). Coal float above. 3 metres above floor is outcrop of laminated siltstone/mudstone, 50 cm thick, overlain by orange-weathering, very fine to fine-grained sandstone.
B8		SANDSTONE - fine-grained to medium-grained, massive, red-orange-weathering. Forms cliff running up slope to SE. Attitude: 135/8 NE. Another outcrop of sandstone at ± 1200 m.
B9		SANDSTONE - very fine-grained. Orange-weathering, slightly carbonaceous, argillaceous. Plant debris. Finely laminated Outcrop in creek; attitude: 125/4 NE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Plate 1 North, No.1

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B10		SANDSTONE - on north side of creek. Section exposed in cliff.
		TOP: Sandstone, fine-grained to medium-grained, massive, well cross-bedded. Orange-weathering. 4.6 m + thick.
		Sandstone, fine-grained, 15 to 30 cm beds, orange-weathering, marked by shaly intervals.
		1.8 m thick shale, dark grey, weathered, papery. Estimate, 4.6 m + thick.
		Attitude: 095/11 NE
		Entire section of sandstone forms near-vertical scarp.
B11		COAL - float in bank, also seen in roots of overturned tree. (Interpreted as coming from nearby).
B12		SHALE - coaly and carbonaceous. Float, under tree. Since last point, scattered exposures of weathered, carbonaceous shale in creek bank.
B13		SANDSTONE - very fine-grained, dark grey; shaly at base; shale is carbonaceous in part. Outcrop continues down northwest side of creek. Attitude: 125/19 SW
B14		SANDSTONE - massive, fine-grained to medium-grained. Grey. Outcrop in small cataract in creek, below junction with gully from north west, (Not the same sandstone as seen at B13). Thickness 11 metres +; coalified log impression 2 metres below top. Attitude: 140/22 SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Plate 1 North, No:2

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B15		SANDSTONE - medium-grained, dark grey, grey-weathering, salt-and-pepper. (Bird Seam floor). Attitude 031/10 SE. Near DDH PL-13
B16		SANDSTONE - medium-grained, cross-bedded. Orange-grey-weathering. Attitude: (May be on cross-bed) 088/14 S
B17		SANDSTONE - fine-grained to medium-grained. Orange-weathering. Chert pebbles; One quartzite pebble; on bedding plane. Smooth bedding plane forms surface of outcrop. Attitude: 031/10 SE
B18		SANDSTONE - as above; (below Bird Seam). Fossil locality: one Pelecypod sampled (in place): B18F. Four more Pelecypods seen in rubble near outcrop. Near seismic line. Attitude: 040/12 SE.
B19		SANDSTONE - medium grey, orange-weathering. Fine-grained. At DDH PL-10. Attitude: 122/10 SW.
B20		SANDSTONE - (as before). Road follows dip slope of this sandstone. Since B18, traversed over an anticline. Attitude: 129/11 SW.
B21		SANDSTONE - fine-grained to medium-grained, medium-grey. Outcrop in bank above DDH PL-23. Attitude: 165/23 SW.
B22		SANDSTONE - in bank above road. Attitude: 130/20 SW. (as above).
B23		SANDSTONE - fine-grained. Overlies slightly silty mudstone. Sandstone is 1 metre thick; mudstone is 1.5 metres thick; (may represent a "laminite" unit).
B24		SANDSTONE - dark grey to black; medium-grained. (Chamberlain Seam floor); 2 metres exposed. Attitude: 100/16 SW.
B25		SANDSTONE - medium-grained; orange-weathering; dark grey. Disseminated carbonaceous fragments. Cross laminated, with pin-prick burrows. Attitude: 066/3 SE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Plate 1 North, No.2 .
PROJECT: _____ . DATE: _____ .
LOCATION: _____ . ELEVATION: _____ .
GEOLOGIST: _____ .

B26		SANDSTONE - medium-grained, medium grey, quartz-lithic. Since last point, nearly continuous outcrop along road, (on same bedding surface as B25). Dip rolling over to west and steepening. (indicating passage down anticlinal limb). Attitude: 155/16 SW.
B27		COAL - weathered, powdery texture. Near DDH PL-17.
B28		Trench exposing Lower Chamberlain Seam with roof and floor.
		Section in trench wall:
		ROOF - 4.0 m total thickness: siltstone/vfg sandstone, grading to: mudstone, grading to: siltstone/mudstone "laminite". COAL - Lower Chamberlain Seam, 1.8m thick. FLOOR - Sandstone, dark grey to black; carbonaceous Medium to coarse-grained, quartz-lithic
		Attitude of seam: 080/4 SE
B29		SANDSTONE - (Chamberlain Seam , floor as above. Since last point, following floor.) Attitude: 082/6 SE and 035/7 SE ; floor is uneven.
B30		SANDSTONE - (as above). Large flat bedding plane, (about 0.3 m below Chamberlain Seam floor level); attitude: 072/6 SE.
B31		SANDSTONE - as above,) on large dip slope. No evidence of faulting; rather, near-continuous outcrop describes a synclinal flexure. Attitude: 111/17 SW
B32		SANDSTONE - very fine to fine-grained. Abundant plant fragments. (Probably forms top of "laminite" succession between Skeeter and Chamberlain SEams.) Argillaceous.
B33		SANDSTONE - (as above). On road below seismic line. Abundant plant debris. Attitude: 142/14 SW
B34		SANDSTONE - medium-grained, quartz-lithic. (Chamberlain SEam floor), on dip-slope. Northern limit of outcrop not seen. Attitude: 111/16 SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Plate 1 North, No.2

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B35		SANDSTONE - fine-grained, light-grey, rusty-weathering, platy. 1 cm beds. 3 metres exposed. Forms scarp, continuing to north and south.
B36		SANDSTONE - orange-grey weathering, platy, cross-bedded. 10 metres exposed in scarp, continuing to north and south. Attitude: 108/14 SW
B37		SANDSTONE - fine-grained to medium-grained. Rusty-weathering. Attitude: 016/7 SE
B38		SANDSTONE - rusty bronw, (as at B35). Attitude: 105/16 SW
B39		SANDSTONE - fine-grained, rusty brown. Attitude (poor measurement 060/13 SE
B40		SANDSTONE - fine-grained, rusty brown. Attitude: 089/10 S
B41		SANDSTONE - dark grey, (below Chamberlain Seam)
B42		SANDSTONE - dark grey. (Chamberlain Seam floor), Outcrop apparently continuous from southwest. Attitude: 035/12 SE
B43		SANDSTONE - argillaceous, (similar to that above the "laminite") float.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Plate 1 West.
PROJECT: _____. DATE: _____.
LOCATION: _____. ELEVATION: _____.
GEOLOGIST: _____.

B44		SANDSTONE - very fine-grained, medium grey orange-weathering. Remarkably clean. Parallel to low-angle lamination. Large shaly intraclasts. 1.5 metre bed. Small Pelecypods on base of bed. Stratigraphically upright. Attitude: 013/70 E, at base of shell bed; 180/56 E in very fine-grained, platy sandstone and shale about 10 m south of B44, and about 5 metres stratigraphically higher.
B45		SANDSTONE - medium to coarse-grained, dark grey, rusty-weathering, very hard and siliceous or cherty, wtih distinct orange specks. Sheared and shattered, "cooked" appearance. Numerous thin veinlets of calcite; argillaceous and carbonaceous, with plant impressions. Distance contrast between this unit and that at B44. Sandstone is 5 to 6.5 m thick.
		Sharp upper contact with dark grey, carbonaceous shales, silty at base. Estimated 1 metre thick. (Abrupt change in dip and rock type suggests a fault between B44 and B45, following gully between the two outcrops.) Gully trends 040°, slope angle +21°.
		Note: the term "cooked" is used to describe a siliceous, quartzose sandstone of distinctive appearance, characterised by apparent welding of grains, and extremely hard and splintery nature. No metamorphic connotation is intended.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Plate 1 West .
PROJECT: _____ . DATE: _____ .
LOCATION: _____ . ELEVATION: _____ .
GEOLOGIST: _____ .

B46		SHALE - weathered, dark grey. Rubbly to blocky, devoid of lamination, silty and perhaps pyritic. To southeast of B44, on road.
B47		SANDSTONE - conglomeratic, dark grey, tought (as at B45); and carbonaceous shale. Sandstone about 2 metres thick, with shale above. Attitude: 012/80 E. To northwest of B45, on road.
B48		SANDSTONE - medium-grained, dark grey, resistant, siliceous, (similar to that at B45). Cross-bedding and scours indicates tops up. Attitude: 172/67 E
B49		MUDSTONE - dark grey, silty, carbonaceous. Bedding rolls, strike is constant, but dip varies. Attitude: 160/50 to 80 E.
B50		SANDSTONE - dark grey, siliceous, and mudstone - dark grey, carbonaceous. Exposed as float blocks in road surface.
B51		SANDSTONE - very fine-grained, thinbedded, parallel laminated, fossils at base seen only in float blocks; (Mytlius sp.) Trace fossils on bedding in place, probably worm trails. Large shaley intraclasts. Compare to B44. Orange-weathering. Attitude: 150/42 W
B52		SANDSTONE - orange-weathering, laminated. Fossiliferous; Pelecypod collected, no. B52 F. Exposed only as float blocks, along road since B51. (FLoat probably derived from GEL outcrops above road).
B53		SANDSTONE - fine to medium-grained, brownish-grey, orange-weathering. Attitude: 041/6 SE
B54		MUDSTONE - medium grey, light grey-weathering. Beds from 2 cm to 15 cm, with thicker beds less common. (Below stratigraphic level of B53). Spheroidal weathering; rubbly. Small dark burrows. Sample B54F: small burrows, with possible pelecypod. Attitude: 120/24 SW
B55		SANDSTONE - fine-grained, orange-weathering. Argillaceous. Pelecypods accompany a band of dark chert granules. Float Sample B55F

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Plate 1 West

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B56		SANDSTONE - very fine to fine-grained, argillaceous in part. Low-angle and parallel lamination. Shaley bands. Attitude: 104/7 SW
B57		SANDSTONE - (as before) Attitude: 124/23 SW
B58		SANDSTONE - fine-grained, orange-brown platy-weathering, cross-bedded. Attitude: 115/24 SW
B59		SANDSTONE - cross-bedded. Since last point continuous outcrop. Attitude: 090/13 S
B60		SANDSTONE - as above. Continuous outcrop. Attitude 145/11 SW
B61		SANDSTONE - as above. Attitude: 135/13 SW
B62		SANDSTONE - as above. Attitude: 142/18 SW
B63		SANDSTONE - as above. Large area of fallen blocks on surface, downslope to west. Attitude: 134/20 SW
B64		SANDSTONE - as above. Measurement on dip, slope surface, above scarp. Attitude: 122/18 SW
B65		SANDSTONE - fine-grained, red-weathering, platy. Base scarp of dip slope. Attitude: 120/15 SW
B66		SANDSTONE - as above. Following outcrop since last point. Attitude: 130/12 SW
B67		SANDSTONE - on top of scarp. (Stratigraphically below), and downslope from, B66. Scarp 8 m high. Attitude: 120/13 SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Windy Falls Creek, South.
PROJECT: _____. DATE: _____.
LOCATION: _____. ELEVATION: _____.
GEOLOGIST: _____.

B68		MUDSTONE - dark grey. Attitude 157/16 SW
B69		SANDSTONE - dark grey, fine to medium-grained; quartz-lithic. (Below Bird Seam) Attitude 107/16 SW. Uneven bedding surface.
B70		SANDSTONE - fine-grained, massive, medium grey. Forms 3 m waterfall. Attitude: 080/2 SE
B71		SANDSTONE - medium-grained, medium grey, calcaroeus. Attitude: 115/24 SW
B72		SANDSTONE - fine-grained, medium brownish grey, light brown-weathering, argillaceous, calcareous; wavy bedding; plant material. Attitude: 138/7 SW
B73		COAL - exposure in east bank of creek. Coal about 2 metres thick, overlain abruptly by massive sandstone. (Coal is interpreted to be the Skeeter Seam). Coal is frozen, sheared, and pulverised. Floor of seam exposed at north end of outcrop: siltstone - dark grey, orange-weathering.
B74		SANDSTONE - medium-grained, dark grey, quartz-lithic. (Chamberlain Seam floor); forms ledge across creek. Chamberlain Seam is suspected to lie between this sandstone and the overlying dark grey siltstone. Attitude: 143/22 SW
B75		SANDSTONE - fine-grained to medium-grained, blocky. Attitude: 163/17 SW
B76		SANDSTONE - platy. Since last point, sandstone has become finer and has ubiquitous lamination. Attitude: 161/44 SW. 30 cm down creek from B76, sandstones are intensely crumpled and broken. (Fault, probable.) Top plate of fault shows thick-bedded (GEL) sandstone, and bottom plate shows platy sandstone as at B76. Attitude of fault plane: 163/30 SW. Photographs taken showing fault and associated crumpling and folding. Minor anticline on west side of creek, opposite fault exposure, is 3 m wide at water line.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Windy Falls Creek South

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B77		SANDSTONE - platy, as before. Attitude 095/35 S
B78		SANDSTONE - medium-grained, orange-grey. Cross-bedded and laminated; calcareous, massive, very clean. Pebble band; (compare to Bird Seam floor). Attitude: 130/38 SW
B79		SANDSTONE - massive, as before. Attitude: 137/26 SW
B80		SANDSTONE - as at B79
B81		High scarp to east of creek. Outcrop of dark grey sandstone in creek, overlain by 30 to 40 m scarp of orange-weathering, massive sandstone. Abundant talus. Photograph.
B82		At junction of Windy Falls Creek with straight, steep gully from southwest, containing active debris flow. Section exposed in east bank of Windy Falls Creek. TOP: sandstone, brown-weathering, massive, partly obscured by moss: 4 to 5 metres COAL, weathered, appears to be in place: 2 metres Siltstone or mudstone, grey, orange-weathering: 1 metre BASE NOT SEEN
		(Probably Skeeter Seam). The top of the coal appears to be in normal, unfaulted contact with the overlying sandstone. Contact is notably abrupt. Attitude of roof of seam: 104/21 SW
		(Chamberlain Seam floor) is exposed in east side of creek, about 15 m north of B82. Attitude: 130/25 SW. Chamberlain Seam is not exposed.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Windy Falls Creek North

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B83		SANDSTONE - orange-weathering; medium to thick bedded. Attitude: 115/13 SW
B84		SANDSTONE - orange-weathering: platy-weathering; massive, thin low-angle cross-beds. Attitude: 102/14 SW. Since last point near-continuous outcrop in east bank of creek. At this point sandstone forms scarp in east bank.
B85		Station on west bank, above creek at elevation 1005. East bank shows 50 metre face of (Lower Gething) sandstones. Recessive interval 20 to 25 m below the top of the face; rest is strongly outcropping.
B86		SANDSTONE overlying (marine) MUDSTONE - in cliff. Photograph taken. Mudstone: silty, calcareous; pyritized plant debris. Pelecypod fossils. Two specimens taken: B86F. Uneven, strongly orange-weathering bands to 20 cm thick: Attitude: 110/14 SW
B87		MUDSTONE - silty, strongly calcareous, orange-weathering, very hard. Forms resistant bed about 0.75 m thick.
B88		MUDSTONE - silty; small dark burrows. Finely disseminated pyrite, Small-scale cross-lamination; silty bands. Stratigraphically below last point. Strongly calcareous. Attitude: 088/14 S. At top of clear area in creek floor.
B89		SANDSTONE - orange-weathering, brown-grey, calcareous, fine-grained, massive and hard. Forms waterfall in creek. Attitude: 106/25 SW
B90		SANDSTONE - massive, orange-weathering, as at B89. Forms scarp bearing 110°. Maximum height 10 m.
B91		SILTSTONE - dark grey, argillaceous. Thinly bedded, strongly calcareous. Attitude: 134/21 SW
B92		SANDSTONE - fine-grained, massive.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Windy Falls Creek North .
PROJECT: _____ . DATE: _____ .
LOCATION: _____ . ELEVATION: _____ .
GEOLOGIST: _____ .

B93		SANDSTONE - massive, fine-grained to medium-grained. Brown; orange-weathering. Strongly calcareous. Very clean. Large-scale cross-beds. Attitude: at B93 130/15 SW; 5 m up creek: 114/15 SW
B94		SANDSTONE - medium-grained, very porous, thin-bedded. Not calcareous. Attitude: 112/9 SW
B95		SANDSTONE - medium-grained, massive, dark grey; irregular bedding surfaces. (Below Chamberlain Seam floor). Attitude: 135/11 SW
B96		SANDSTONE - fine-grained, clean, red-weathering, low-angle cross sets. Medium grey. Calcareous. Cannot determine whether GEU or GEL. Attitude: 010/12 W
B97		SANDSTONE - medium-grained, dark grey light-grey-weathering. Non-calcareous. Quartz-lithic. (Compare with sandstone 3 m below Chamberlain Seam).
B98		("LAMINITE" - Chamberlain Seam roof). Exposed in side of old road or seam-trace. Numerous small-scale thrusts, resulting in dislocation and thickening of this unit. Photograph.
B99		SANDSTONE - (Chamberlain Seam floor) Attitude: 137/7 SW
B100		COAL - weathered. (Skeeter Seam) with siltstone floor. A minor thrust fault has folded and broken this outcrop. Siltstone is strongly calcareous. Attitude (above fault in indisturbed siltstone) 127/12 SW. Photograph.
B101		COAL - with sandstone roof. (Skeeter Seam.) Very abrupt and clean contact of coal with roof of thin-bedded, medium-grained sandstone. (Rider coal) is 8 cm thick; (Rider Parting) is 10 cm of carbonaceous mudstone. Attitude: 100/11 S. Photograph.
B102		as before. Attitude: 120/15 SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Windy Falls Creek North

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B103		SANDSTONE - (Chamberlain Seam Floor), exposed in road; attitude 110/9 SW. Road cut shows "laminite", (Skeeter Seam), and sandstone roof. (Chamberlain Seam is here either absent or very thin, and concealed between the floor and the laminite). It is not exposed in the bank or in the road.
		SECTION:
		TOP: sandstone
		COAL, (Skeeter Seam, upper leaf). 1.5 m
		silty mudstone, finely laminated, calcareous 1.0 m
		carbonaceous shale 0.05 m
		mudstone 0.15 m
		COAL, (Skeeter Seam, lower leaf) 0.40 m
		mudstone 1.20 m
		concealed (Chamberlain Seam?) 0.5 m
		BASE: sandstone, hard, dark grey, carbonaceous
B104		as before. Attitude of mudstone (below base of Skeeter Seam): 105/14 SW. (Chamberlain Seam appears to have drastically thinned here; concealed by mudstone debris). Photograph

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Rain Creek

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B105		MUDSTONE - in road cut at site C34
B106		Large outcrop of mudstone (Moosebar) overlain by interbedded mudstone and sandstone (Sukunka). Attitude of mudstone: 136/7 NE.
B107		SANDSTONE - very fine-grained, argillaceous, medium grey, rubbly-weathering. Highly bioturbated; dark, serrated burrows. Non-calcareous. Attitude: 150/20 SW
B108		SANDSTONE - fine-grained, calcareous, carbonaceous specks; large and small dark burrows. Slightly argillaceous. Medium-grey, buff-weathering. Bedding highly churned and bioturbated, (Indicative of shallow-water deposition). Attitude: 145/14 NE
B109		SANDSTONE - very fine-grained, argillaceous, medium grey, rubbly-weathering. Bedding highly churned and bioturbated; non-calcareous. Dark burrows; serrated. Attitude: 142/13 NE
B110		SANDSTONE - very fine-grained, argillaceous, medium to dark grey, rubbly and blocky-weathering. Non-calcareous; abundant dark burrows, some serrated . Orange-weathering slickensides on bedding planes. Attitude: 105/19 NE
B111		SANDSTONE - vfg, dark grey, argillaceous. Dark burrows, some serrated. Bioturbated. Attitude: 113/9 SW
B112		SANDSTONE - very fine-grained, interlaminated with mudstone, orange-weathering and cross laminated. Silty mudstone interbeds. Attitude: 150/15 SW
B113		MUDSTONE - dark grey.
B114		SANDSTONE - (Bird Seam floor, defined by Pin Prick burrows.) Medium to coarse-grained, medium grey quartz-lithic, cross-laminated. Mildly calcareous. Forms prominent scarp. Attitude: 155/15 SW
B115		SANDSTONE - fine-grained, massive, low-angle cross-lamination, very clean, strongly calcareous. Attitude: 085/14 SE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Rain Creek

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B116		SANDSTONE - fine-grained to medium-grained; massive, as above. Forms ledge in valley side. Strongly calcareous. Very clean. Attitude: 130/12 SW
B117		LANDSLIDE - possible location of Ch.Sm. subcrop. No float observed.
B118		SANDSTONE - continuous with B115 and B116. Attitude: 119/6 SW
B119		SANDSTONE - fine-grained, thin-bedded, cross-bedded, red-weathering, calcareous. Slumped block; entire east side of valley wall from this point south is covered with large slumped block. Open cracks and changing orientation of blocks suggest that most of these blocks have moved from the original positions.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Main Roadcut

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B120		MUDSTONE - dark grey, strongly silty. Peruasive near-vertical cleavage not dewatering fractures. Prominent orange-weathering bands, parallel to bedding and lamination. Elongate, elliptical concretions, parallel to cleave; containing pyrite and rust-weathering small and large burrows. Cleavage and concretions contribute to appearance of vertical bedding. Tiny dark burrows in non-concretionary portion. (probably Lower Gething marine sequence .) A thin stringer of coal squeezed in along crumpled bedding. Small, pyritized burrows and plant specks. Orange bands are strongly calcareous Unit is siltier at base, with more siltstone laminae. Fossil, indistince, B120F. Attitude: 122/12 NE. Cleavage: 161/85-90 NE. Bedding steepens to west. (The strong cleavage and crumpling of this unit, increasing to the west, suggest a thrust fault between this unit and the sandstone conglomerate unit to the west. A similar relationship was seen at B44 to B47, 75 m NE and uphill.)
B121		SANDSTONE - very fine-grained, laminated, plant fragments. Carbonaceous mudstone, 1 metre, at top. Gradational into (marine) mudstone of B120. No evidence of a fault between B120 and B121. Ripple cross-lamination establishes tops to east. Attitude: 016/84 overturned to NW.
B122		MUDSTONE as at B120 and sandstone as at B121. Pebbly sandstone lenses in sandstone; also shelly fossils. Specimen B121F. 10 metres above road.
B123		SANDSTONE - medium to coarse-grained; conglomerate, conglomeratic sandstone; thin bands of sheared coal and carbonaceous siltstone and mudstone. Extensional fractures in massive sandstones; bedding near-vertical; tops not known.
		Section at B123, from west to east:
	WEST	CONGLOMERATE - pebble (ave. 5 to 10 mm; max. 30 mm) grading eastwards to granules and coarse-grained (minor medium-grained) sandstone. Individual beds 1.0 to 1.5 m thick.
	8.3¼ m	Westward 3 m dominantly sandstone and granules. Eastward 5 m dominantly pebble conglomerate. Pebbles of light and dark grey chert, few quartzite pebbles. Matrix dominantly non-calcareous, coarse-grained sandstone, as are sandstone beds at west. Slickensides on bedding surfaces. Abrupt. Attitude: 157/85 - 90 E Tops?

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Main Roadcut

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B123 (cont'd)	0.30 m	SANDSTONE - very fine-grained, dark grey, gradational eastwards to dark grey, sheared mudstone. Non-calacareous. Unit has been thickened and thinned by low-angle and bedding-plane faulted. Abrupt slick-ensided and rolled. Attitude: 157/90
	9.22 m	SANDSTONE - medium to coarse-grained, dominantly calcareous. Medium grey-rusty bronw-weathering. Scoured bedding; slickensides on bedding surfaces. 1.0 to 1.5 m beds; thin pebble bands, to 0.3 m, on west edge of some beds. Pebbles of light and dark chert, and light quartzite. Calcite on joints and fractures in eastward 2 m of unit. Dark, fine-grained, laminated sandstone band, 10 cm thick, 80 cm west of east edge of unit. Siliceous. Abrupt.
	0.12 m	SILTSTONE - dark grey, sheared and listricated; calcareous. Abrupt.
	4.72 m	SANDSTONE - fine to medium-grained, medium-grey, rusty-weathering, calcareous. Beds broken and displaced by low and high-angle joints and shears. Laminated, siliceous, abrupt.
	0.25 m	MUDSTONE - dark grey to black, coaly fragments near east; listricated. Abrupt.
	1.47 m	SANDSTONE - medium to coarse-grained, medium-grey, rusty-weathering. Siliceous, calcareous. Beds broken by joints at 60° to bedding. Orange specks (detrital carbonates). Pebble band to west end of bed. Abrupt.
	0.15 m	SANDSTONE - as above. Few listricated dark grey mudstone chips. Sheared and broken. Siliceous, calcareous.
	13.36 m	SANDSTONE - fine-grained to coarse-grained, pebbly bands. Bedding broken and crumpled; beds dislocated by joints and shears. Originally thick-bedded to massive; now broken by closely-set joints. Siliceous, calcareous, few carbonized log impressions.
		Rolled contact; abrupt. May be faulted.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Main Roadcut

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B123 (cont'd)	4.50 m	SANDSTONE - very fine-grained, and siltstone, argillaceous, thinly bedded and laminated. Attitude: 157/80. SW; Tops not known. Coaly stringers.
	5 m +	MUDSTONE - dark grey, and siltstone, dark grey, thinly bedded. Mudstone is silty.
		EAST. END OF MEASURED SECTION
B124		SANDSTONE - medium to coarse-grained. Siliceous, dark grey.
B125		MUDSTONE - silty, medium brownish grey; abundant plant debris. Attitude, approximate: 142/70 SW, Tops not known.
B126		SANDSTONE - medium-grained, siliceous, orange specks. Conglomerate phases. Attitude: 156/18 NE
B126a		SANDSTONE and CONGLOMERATE. Tops up. 5 m SE of B126b. Attitude: 150/47 NE
B126b		SANDSTONE and CONGLOMERATE. 7 m S of B126. Attitude: 157/36 NE
B126c		SANDSTONE and CONGLOMERATE. 5 m S of B126 Attitude: 132/27 NE
B127		SANDSTONE - medum to coarse-grained, and chert pebble conglomerate. Attitude: 139/85 NE
B128		CONGLOMERATE - 152/74 NE

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Skeeter Creek West.
PROJECT: _____. DATE: _____.
LOCATION: _____. ELEVATION: _____.
GEOLOGIST: _____.

B129		SANDSTONE and CONGLOMERATE -
		Section at B129
		TOP: SANDSTONE - fine-grained to medium- 1.52 m
		grained. Clean, siliceous, uniformly
		medium grey. Orange specks.
		Non-calcareous
		SANDSTONE - conglomeratic (gritty, 2.14 m
		pebbly).
		SANDSTONE - medium-grained, laminated. 0.31 m
		CONGLOMERATE - pebble 1.37 m
		BASE OF SECTION. ABRUPT. Attitude: 160/75 SW
B130		SANDSTONE - fine-grained, finely cross-laminated, orange-
		weathering; orange matrix. Thin to medium-bedded. Argillaceous
		laminae. Strongly calcareous. Attitude: 140/32 SW
B131		SANDSTONE - medium-grained, well-sorted, thin-bedded, non-
		calcareous. Orange specks: 5%. Chert: 30-35%. Rest quartz.
		Quartz-lithic. (Riverine appearance). Trace of detrital mica.
		Attitude: 165/22 SW
B132		SANDSTONE, SILTSTONE, MUDSTONE -
		Section at B132
		TOP: SANDSTONE - medium to coarse-grained 2 m
		(riverine as before), cross-stratified
		tops-up; chert pebbles. 140/36 SW
		MUDSTONE - dark grey, carbonaceous 5 m
		COAL BLOOM
		SILTSTONE - thin-bedded, rusty-weathering. 2 m
		small-scale cross-lamination, rootlets at
		top. Lots of plant debris. Dark silty
		mudstone interbeds at base; plant remains,
		devoid of lamination, non-calcareous;
		(paleosol?) Attitude: 140/40 SW
		MUDSTONE - carbonaceous, black. 2 m
		MUDSTONE - brown-grey 2 m
		MUDSTONE - carbonaceous, dark grey 6 m

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Skeeter Creek West

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B132 (cont'd)		BASE OF SECTION. Photograph taken 0.50 to 1.70 m below top of siltstone unit, interbeds of siltstone and very fine-grained sandstone. Micro-erosional, (riverine, flood-laine type.) Orange-weathering nodules at base of this interval.
B133		CONGLOMERATE -poorly-sorted, thickbedded; matrix is coarse sand to granules. Framework of sub-rounded to rounded chert pebbles, dominantly dark grey. Maximum 30 mm; average 10 to 15 mm. Attitude: 180/30 W.
B134		SANDSTONE, medium-grained, to conglomerate - thickly interbedded. Conglomerate dominantly granules to small pebbles. Sandstone parallel laminated. Siliceous. Attitude: 020/24 NW
B135		SANDSTONE - very fine-grained, laminated, graded. Rootlets. As broken blocks in river bank.
B136		SILTSTONE - dark grey, non-calcareous, strong, thick-bedded to massive. Cross-stratified. 130/30 SW.
B137		SANDSTONE - medium-grained, dark cherts; distinctly orange matrix. Massive, medium to dark grey, non-calcareous, with orange, calcareous weathering-rind. Cross-bedded; forms 7 m scarp. Attitude: 135/10 SW
		SECTION OF COAL SEAM AT BASE, B137
		TOP: sandstone, see above. 7 m
		abrupt.
		COAL - bright; soft and weathered. Abrupt. 0.20 m
		MUDSTONE - very carbonaceous; plant debris. Abrupt. 0.50 m
		SANDSTONE - fine-grained 0.30 m +
		BASE OF SECTION.
B138		MUDSTONE/SILTSTONE/COAL:
		SECTION AT B138

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Skeeter Creek West

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B138	(cont'd)	TOP	SANDSTONE - fine to medium-grained, quartz-lithic	1.0 m +
			MUDSTONE - dark grey	0.05 m
			COAL - canneloid, greasy lustre.	0.30 m
			COAL - bright	0.36 m
			SILTSTONE - argillaceous, rooty. Plant fragments	1.0 m
			COAL	0.15 m
			MUDSTONE/SILTSTONE - dark brown-grey, rootlets. Tops up. Thin to medium bedded. Few thin, very shaly coaly bands. Attitude: 110/18 NE	3.30 m
		BASE OF SECTION		
		SANDSTONE - angular, broken jumbled blocks, in a matrix of mud and rock chips. Exposure 20 m wide by 15 m high; 5 m downstream from coaly sequence. (Fault, possible). Fabric of blocks: (very approximate) 010/25 W. Abundant calcite on joints in fallen blocks.		
B139		SANDSTONE - medium-grained, quartz and chert, orange specks of detrital carbonate. Calcareous, laminated, massive, cross-stratified. Orientation uncertain.		
B140		SANDSTONE - fine-grained, quartz-lithic, orange-weathering, orange specks of detrital carbonage, calcareous. Thin to medium bedded, clean, cross-laminated, tops up. 6 m. Underlain by dark grey, medium brown-grey-weathering mudstone. Abundant small dark burrows; interbedded with siltstone and very fine-grained sandstone. (Reminiscent of top part of Lower Gething marine sequence). Attitude: sandstone 142/50 SW mustone 137/52 SW		
B141, B142		SILTSTONE - highly argillaceous/MUDSTONE/COAL		
		SECTION AT BASE B141 to B142		

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Skeeter Creek West

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B141 and B142 (cont'd)	TOP:	SILTSTONE - highly argillaceous, dark brown grey, plant debris; interbeds of carbonaceous mudstone and thin coal seams. Discontinuous outcrop. Attitude: 136/48 SW	24.25 m
		SILTSTONE - thinly bedded, abundant plant debris, medium to dark grey, orange-weathering. Attitude: 149/57 Abrupt.	0.45 m
		MUDSTONE - dark grey, light grey, weathering. Gradational.	0.50 m
		MUDSTONE - dark grey to black, carbonaceous, plant fragments, rubbly, thin coaly seam, base not seen.	3.10 m
		BASE OF SECTION	
B143		COAL BLOOM - on fresh mudslide. Suspected location of "Lower Coals" outcrop. More likely that this is in the Middle Coals.	
B144		SANDSTONE - fine-grained, quartz-lithic, calcareous, orange-weathering. Finely cross-laminated; low-angle laminated. Thin-bedded at top, to thick-bedded at base. 3 m section exposed. (Very similar to B140; typical of upper part of GEL). Attitude: 060/8 SE.	

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Skeeter Creek East.
PROJECT: _____. DATE: _____.
LOCATION: _____. ELEVATION: _____.
GEOLOGIST: _____.

B145		SANDSTONE - fine-grained, light to medium grey, light grey brown-weathering. Cross - laminated. Non-calcareous. (Abundant large burrows suggests GEU, below Bird Seam but above Skeeter Seam). Attitude: 112/21 NE.
B146		SANDSTONE - fine to medium-grained, medium grey, medium grey brown-weathering. Low-angle cross-lamination large burrows. Dark grey with abundant chert granules at top. (Bird Seam Floor). Attitude: (fair, near base): 105/16 NE, (good, at top): 101/11 NE.
B147		SANDSTONE - medium to coarse-grained, dark grey, low angle and cross-laminated. Abundant white Pin Pricks. Attitude: 112/31 NE
B148		MUDSTONE - dark grey, rubbly. Exposed in cut on side of drill pad at end of road. NQ casing left in hole; hole appears to be not older than one year (general appearance of casing slashing, roads, etc. is fresh) Not on map. Attitude of mudstone (frost-heaved, hence not reliable: 050/9 NW)
B148 a		SANDSTONE - burrowed (similar to Bird floor). Float.
B149		SANDSTONE - fine to medium-grained, dark grey. Small white Pin Pricks: (Bird Seam Floor). Dip slope, attitude: 126/21 SW.
B150		SANDSTONE - as above. Dip slope. Attitude 117/36 SW.
B151		SANDSTONE - float; (compare to Bird Seam Floor)
B152		MUDSTONE - dark grey, rubbly, rusty concretions/siltstone/ very fine-grained sandstone.
		SECTION AT B152
		TOP COAL BLOOM and carbonaceous shale -- poorly exposed
		mudstone - dark grey, silty, finely broken plant debris; hard, orange-weathering concretions. 5.4m
		siltstone/ argillaceous, rooty, some very fine-grained sandstone interbeds; rootlets are long and deep (to 22 cm)
		Specimen B 152 PF. 1.9m
		BASE OF SECTION. Attitude: nearly flat-lying; gently warped, dips only a few degrees. Photographs.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Skeeter Creek East

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B153		SANDSTONE - very fine to fine-grained, very clean, small- scale cross-lamination; calcareous, orange-weathering. Below sequence at B152. Highly bumpy surface; attitude: 161/18 SW. (30 to 40 m stratigraphically below B154. To floor B159.
B154		SANDSTONE/MUDSTONE: SECTION AT B154 TOP sandstone - medium bedded, light grey 2m+ to weathering. MUDSTONE - dark grey, silty, worm tubes; argillaceous siltstone bands 7 m. SANDSTONE - very fine to fine-grained, interbedded with dark grey siltstone 8 m
		BASE OF SECTION: attitude 140/29 SW. Forms 8 m scarp, rising in section uphill. (Overlies B152 and B153.
B155		SANDSTONE - very fine to fine-grained. (near top of basal sandstone of B154.) Very strongly calcareous. Small-scale cross-lamination. Plant remains; dark rusty grey-weathering. Attitude 142/21 SW.
B156		SANDSTONE - fine-grained, light grey, silghtly orange grey weathering; low-angle corss-lamination. Clean: thick-bedded. Attitude: 125/26 SW. From here to B157, creek follows strike. No section gained or lost.
B157		SANDSTONE - as above. Attitude: 132/25 SW.
B158		SANDSTONE - as above. Attitude: 142/26 SW.
B159		SANDSTONE - as above. Underlain in north bank of creek by partly concealed shale and thin-bedded sandstone (comparable to top part, and middle part of B154.) Attitude: 144/26 SW. Lots of burrow in thin-bedded sandstone.
B160		SANDSTONE - very fine-grained, orange-brown-weathering, strongly carcareous. Thin to medium bedded. Laminated. Attitude: 005/18 W

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Conveyor Decline .
PROJECT: _____ . DATE: _____ .
LOCATION: _____ . ELEVATION: _____ .
GEOLOGIST: _____ .

B161		MUDSTONE - dark grey, strongly calcareous; burrows and plant remains, (possibly float block.) Attitude: 170/28 W.
B162		SILTSTONE/MUDSTONE AND SANDSTONE
		SECTION AT B162:
		TOP: SANDSTONE - very fine-grained, blocks. ---
		COAL BLOOM and weathered, dark grey shale. 1.3 m
		SANDSTONE - fine to very fine-grained, orange-weathering, strongly calcareous; large-scale low-angle, cross-lamination; plant debris; thick to massive at base thin-bedded at top. One thin shale band. 6.0 m
		Basal contact concealed by talus.
		Siltstone, argillaceous/ mudstone, silty/ Sandstone-very fine-grained (80:15:5) thinly interbedded rubbly to blocky, abundant dark burrows; strongly calcareous. 4.0 m
		mudstone - weathered, float. Silty, calcareous, includes marine and carbonaceous mudstone and coal bloom. Mostly concealed. 20.4 m
		COAL BLOOM "B" Seam 1 m +
		BASE OF SECTION - Attitude; 164/18 SW
B163		SANDSTONE - medium-grained, light to medium grey, light grey-weathering; siliceous, "cooked" appearance orange specks, but non-calcareous. Tough and hard, splintery. Carbonised branch impressions. Siliceous fractures. No calcite. (Similar to sandstone at Main Roadcut area, near the base of the lower Gething) (fault, definite marked by linear depression and marked change in lithology between here and B162). (NOTE: August 4th, 1970; possibly Chamberlain Fault).
B164		SANDSTONE - fine to medium-grained, very thin-bedded, calcareous, interbedded with silty mudstone. Finely broken plant debris on bedding surface. Attitude: 001/23 W.
B165		MUDSTONE - dark grey, rubbly, light brown-weathering; One orange weathering silty band. Plant debris. Since last point float of carbonaceous to coaly shale(representing "A" horizon). Attitude: 162/4 W
B166		MUDSTONE - brownish-grey, light brown-weathering, strongly calcareous. Band of well-rounded, dark chert pebbles at base.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Conveyor Decline .
PROJECT: _____ . DATE: _____ .
LOCATION: _____ . ELEVATION: _____ .
GEOLOGIST: _____ .

B166 Cont		6 m section of mudstone, underlain by 2 m of darker grey mudstone, in part carbonaceous, and siltstone. A few coaly bands ("A" horizon). Attitude: 150/14 SW. (The brownish-grey mudstone is definitely in the lower Gething marine sequence as confirmed by abundant small, dark burrows: B166 F.).
B167		MUDSTONE - silty, light grey-weathering. Medium brownish grey. burrowed; stronly calcareous. Very fine-grained, oragne-weathering sandy and silty phases. 135/18 SW
B168		SANDSTONE - very fine grained, argillaceous, shaly laminae. Light brownish, grey, light brown-weathering, strongly calcareous. Thin to medium bedded. 1 metre thick. (probably a sandy band within the silty mudstone sequence). Thin burrows and plant debris Attitude: 124/10 SW
B169		MUDSTONE - silty, dark grey, rubbly. (still in Gem marine sequence). Dark burrows; one small Pelecypod fossil, B169 F. Attitude 145/35 SW
B170		Coaly interval - ("A" horizon):
		SECTION AT B170:
	TOP	mudstone - (marine), with rusty-weathering chert pebble band at base. Unconformable — 5.0 m +
		mudstone - carbonaceous, dark grey to black, splintery listricated, very thinly laminated. Abundant plant fragments ("A" horizon) — 1.0 m
		sandstone - fine-grained, carbonaceous poorly exposed, gradational at base — 2.5 m
		sandstone - medium-grained massive clean rippled at top. (compare with sandstone at B162). — 8.7m
		BASE of measured section. Attitude: 150/41 SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Conveyor Decline .
PROJECT: _____ . DATE: _____ .
LOCATION: _____ . ELEVATION: _____ .
GEOLOGIST: _____ .

B171		MUDSTONE - carbonaceous and coaly. Exposure in old trench wall:
		SECTION AT B171:
		TOP mudstone - black very carbonaceous 1.8 m
		mudstone - black, coaly 1.0 m
		(concealed) to trench floor 2.0 m
		BASE floor of trench is dark grey to black, weathered mudstone.
B172		COAL BLOOM and weathered, dark grey mudstone. (Note: August 4th 1978: see trench no. 28; probably Lower B seam)
B173		COAL and MUDSTONE - weathered. Siltstone, argillaceous medium grey at base. Exposed in a reclaimed, shallow trench, bearing 080°. Attitude of 130/13 SW (Note: August 4th, 1978: see trench no. 25)
B174		COAL - "B" Seam: Exposed in trench along conveyor decline. (NOTE: August 4th, 1978: see trench no. 26).
B175		SANDSTONE - fine-grained, reddish-grey-weathering, thickly bedded cross-stratified, strongly calcareous. 3 m exposed. Fine plant debris on bedding surfaces. (Probably the sandstone between "A" and "B" horizons). Attitude: 045/4 SE
B176		SANDSTONE/MUDSTONE
		Section at B176
		TOP mudstone - brown, (marine) chert pebble conglomerate band at base; 2.3 to 2.5 m
		conglomerate band is planar at top, channeled at base.
		mudstone - as above 0.5 to 0.7 m
		COAL and shale - weathered, float. ("A" horizon) 3.0 m

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Conveyor Decline.
PROJECT: _____. DATE: _____.
LOCATION: _____. ELEVATION: _____.
GEOLOGIST: _____.

B176 (continued)		sandstone - fine to very fine-grained, argillaceous with thin shaly bands, orange-weathering. Thick-bedded; low-angle cross-lamination. (On top of sandstone seen at B175). 0.8 m
		BASE OF SECTION. Attitude: 060/9 SE
B177		MUDSTONE - light brownish-grey, light brown-weathering abundant dark tiny burrows; strongly calcareous Interbeds of sandstone, very fine-grained, orange-weathering, low-angle small-scale cross-lamination; Strongly calcareous. (Still in lower Gething marine sequence) Sttitude: 147/8 NE.
B178		MUDSTONE - dark brown to dark grey, sheared and weathered, carbonaceous in part. Sandstone, very fine-grained argillaceous, as interbeds. (Marine) mudstone and chert, pebble conglomerate at top of exposure in road cut; (defining this exposure as "A" horizon). (Marine mudstone established by dark burrows).
B179		SANDSTONE - fine-grained, orange-weathering, abundant finely macerated plant debris on bedding. laminated. Strongly calcareous. (Between "A" and "B" horizons). Attitude: 125/33 SW
B180		SANDSTONE - as before with a few chips of dark grey mudstone. Coal Bloom and carbonaceous mudstone float on seismic line to northwest.
B181		SANDSTONE - fine-grained orange-weathering strongly calcareous. Attitude: 126/38 SW.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Pit Area, No. 1.
PROJECT: _____. DATE: _____.
LOCATION: _____. ELEVATION: _____.
GEOLOGIST: _____.

B182		COAL - ("B" Seam) as seen in trench no.39 (August 4th,1978)
B183		SANDSTONE - medium-grained, "cooked", light to medium grey, siliceous, non-calcareous, orange specks, pockets of large muddy intraclasts. Few chips of dark grey, argillaceous sandstone. Attitude: 150/39 SW.
B184		SANDSTONE - dark grey, argillaceous, carbonaceous, calcareous. Plant debris. Does not appear "cooked".
B185		SANDSTONE - very fine-grained, dark grey, argillaceous, soft. Siliceous, with plant debris. Overlies dark, siliceous, "cooked" tough, fine to medium grained sandstone. The argillaceous sandstone forms a 50 cm thick "veneer" on the dip slope formed by the "cooked" sandstone. Attitude: 132/22 SW.
B186		SANDSTONE - fine to medium-grained, dark grey, siliceous, non-calcareous, uniform "cooked" appearance. Tough. Attitude: 114/28 SW.
B187		SANDSTONE- medium-grained, light to medium grey, siliceous and cherty, calcareous, gritty to pebbly, with orange laminae. Large plant fragments (log impressions) and finely broken, plant debris. Attitude: 115/20 SW.
B188		SANDSTONE - medium-grained, quartz-lithic, siliceous; conglomeratic bands, orange specks, non-calcareous, orange-weathering bands. (Few metres below B187.) Attitude: 105/14 SW.
B189		Conglomerate/sandstone - near hole "F".

Section at B189

TOP	conglomerate and sandstone, non-calcareous,	1.0 m +
	siltstone - carbonaceous	0.2 m
	sandstone - argillaceous, concareous	0.5 m +

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Pit Area No. 1.
PROJECT: _____. DATE: _____.
LOCATION: _____. ELEVATION: _____.
GEOLOGIST: _____.

		BASE OF SECTION
B190		COAL - weathered, sheared, in side of road. (Between B190 and B189, probable fault) (Note: this coal is B seam, and was formerly trenched and refilled: J. Burns, personal communication. August 2, 1978).

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Pit Area No.2

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

B191		SANDSTONE - fine to medium-grained, laminated, strongly calcareous, orange-weathering, orange, specks. Attitude 003/14 W.
B192		at RDH M6: SANDSTONE - very fine-grained, strongly calcareous abundant plant debris; orange-weathering similar to sandstone between "A" and "B" horizons.)
		Exposure in bank above drillhole: siltstone, dark grey, highly argillaceous. Abundant, plant debris and rootlets.
B193		MUDSTONE - silty, dark grey-brown. (Lower Gething marine sequence). Attitude (two measurements average 160/48 SW
B194		MUDSTONE - dark grey to balck, weathered, carbonaceous to coaly ("A" horizon). Overlain by dark grey-brown, (marine) mudstone (of the Lower Gething marine sequence)
		Contact defined by blocks of rusty-weathering, dark grey chert pebble conglomerate.
B195		SANDSTONE - fine-grained, orange-weathering, finely broken plant debris. (Below "A" horizon). Caltareous orange specks. Attitude: 150/43 SW.
B196		SANDSTONE - brown-weathering, fine-grained, parallel to low-angle lamination, cross-stratified. Argillaceous partings on bedding surfaces. Very fine-grained. Orange specks. Strongly calcareous. Attitude: 135/39 SW.
B197		MUDSTONE - dark brown, slightly silty. (Probably Lower Gething marine sequence). Near RDH "W".
B198		SANDSTONE- FLOAT; fine to medium-grained, siliceous, light to medium grey, pinkish-weathering non-calcareous. (Fault, possible, since last point. Based on change of lithology and the presence of a linear gully, possible fault trace parallel to structural grain). Also some float of medium to coarse-grained sandstone and conglomerate, similar to exposures at Main Roadcut outcrop).
B199		SANDSTONE - very fine to fine-grained, dark grey argillaceous; plant debris. Strongly calcareous. Bedding warped; slickensides. Strongly jointed. Distinctly different from B198. Attitude 142/45 SW.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Pit Area, No. 2.
PROJECT: _____. DATE: _____.
LOCATION: _____. ELEVATION: _____.
GEOLOGIST: _____.

B200		SANDSTONE - very fine-grained. Interbedded with mudstone, silty, with rootlets. Attitude (disturbed sequence; unreliable;) 026/62 SE.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Middle Coals Section.
PROJECT: _____. DATE: _____.
LOCATION: _____. ELEVATION: _____.
GEOLOGIST: _____.

		NOTE: Section measured by Jacob's staff and 1.5 metre tape. All thicknesses calculated in field. Observations made on Sukunka Main Road, incorporating outcrop sections at stations. B201 to B213.
		TOP OF SECTION: approximately 75 m north of junction of Sukunka Main and No. 1 Mine access roads, on east side of Sukunka Main Road.
B213		MUDSTONE (subcrop) - dark grey, carbonaceous at base slightly canneloid; brown-grey and non-carbonaceous at tops. Shelly fossils (B213 F). (Base of "B" horizon).
B212	1.0 m	SANDSTONE - fine to medium-grained, dark grey, light grey-weathering. Siliceous, massive low-angle lamination. Few small plant fragments. Attitude: 129/36 SW.
	2.1 m	SANDSTONE - very fine to coarse-grained, poorly sorted. Abundant intraclasts, coaly lenses (drift logs?). Tough, Bedding indistinct, lenticular. Calvareous, except at top
B211	8.0 m	SILTSTONE/SANDSTONE, very fine-grained- light grey, sporadically calcareous. Rubble.
B210		SILTSTONE- medium grey, strongly calcareous. Rubble.
B209	1.30 m	SANDSTONE - fine-grained, dark grey, strongly calcareous, thinly laminated. Very thin, low-angle cross-sets (less than 1 cm). Attitude: 165/36 SW. Basal contact concealed by talus.
	4.60	SANDSTONE - fine to coarse-grained; dominantly medium-grained Well sorted. Medium to dark grey, light -brown-weathering strongly calcareous. Two shaly bands of 10 cm each. Granular, with mudclasts, at top. Large plant impressions (wood chips?). Thich-bedded to massive with medium-scale low-angle cross-lamination. Highly uneven bedding; rolled and gently folded. Basal contact gradational by interbedding.
	1.00 m	MUDSTONE - medium grey, slightly silty, strongly calcareous. Gradational.
	0.78 m	SANDSTONE - very fine-grained, medium-grey, argillaceous, strongly calcareous. Small-scale cross-lamination Attitude: 150/30 SW Gradational.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Middle Coals Section

PROJECT: _____ DATE: _____

LOCATION: _____ ELEVATION: _____

GEOLOGIST: _____

	0.13 m	MUDSTONE - highly carbonaceous, sheared.
	0.16 m	COAL - sheared and pulverised.
	0.33 m	MUDSTONE - silty, carbonaceous, abundant plant debris, sheared
	1.39 m	COAL - weathered, sheared.
	0.58 m	MUDSTONE - dark grey, light grey-weathering. Non-carbonaceous non-calcareous.
	0.60 m	COAL - weathered, sheared.
	0.07 m	SANDSTONE - very fine-grained, very dark grey. Homogeneously carbonaceous, non-calcareous.
	0.61 m	MUDSTONE - dark grey, highly carbonaceous, listricated.
	0.20 m	SILTY MUDSTONE and siltstone - dark grey.
B208	0.40 m	(concealed) Bed of small stream.
	6.50 m	SANDSTONE - very fine-grained. Minor siltstone, (85:15) dark grey, light grey-weathering. Non-calcareous. Few small specks of plant debris. Sporadic rootlets at top Bedding poorly defined. Rubbly to blocky. Poorly exposed in top 1.0 m. Attitude at base of interval: 105/10 SW.
	1.75 m	SILTSTONE - dark grey, poorly exposed.
B207	0.50 m	concealed
	1.55 m	SILTSTONE - locally sandstone, very fine-grained. Dark grey light grey-weathering. Siliceous. Rubbly to blocky. Sporadic rootlets. Attitude: 147/17 SW.
B206	1.5 m	MUDSTONE - carbonaceous, rubble.
B205	0.50 m	SILTSTONE - dark grey to brown light to medium - grey - weathering Rubbly. Rootlets.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Middle Coal Section .
PROJECT: _____ . DATE: _____ .
LOCATION: _____ . ELEVATION: _____ .
GEOLOGIST: _____ .

B203	0.68 m	concealed (probably siltstone.
	1.82 m	SILTSTONE - dark grey, very tough. Minor carbonized plant fragments; thin, 3 to 5 cm argillaceous interbeds. Siliceous. Thick-bedded, with irregular bedding surfaces Attitude: 154/30 SW. Abrupt.
	2.55m	SANDSTONE - fine to medium-grained, clean, well-sorted,
B203 and B204		light grey. Siliceous, with quartz veinlets. Massive. Attitude: 160/40 SW at B203; 150/33 WW at B204. Abrupt.
B203	0.70 m	SANDSTONE - medium to coarse-grained, pebbly, conglomeratic, poorly sorted. Log impressions. Siliceous Aburpt.
	2.60 m	SANDSTONE - very fine-grained/SILTSTONE - dark grey, Siliceous. Rubbly at top. Thinly bedded and interbedded, small-scale low-angle cross-lamination. Quartz veinlets. Attitude: 130/44 SW. Basal contact concealed by talus.
	0.75 m	SANDSTONE - medium-grained, dark grey, light grey-weathering. Siliceous; well-sorted. Leaf impressions. Thick-bedded. Abrupt.
	1.00 m	SANDSTONE - fine to medium-grained, strongly rusty-weathering Poorly sorted; siliceous. Dark shaly and sandy intraclasts at base. Abundant carbonised plant debris (bark chips?). Thinly bedded with highly irregular bedding surfaces. Abrupt. Attitude: 160/45
	2.15 m	SANDSTONE - medium to coarse-grained, dark grey, rusty yellow-weathering on joint faces. Pebbly and granular lenses; poorly sorted. Coaly lenses (carbonized logs?). Lenticular bedding; channeling indicates "Tops Up". Siliceous, "cooked", quartz veinlets. Abrupt.
	1.35 m	SILTSTONE - dark grey, argillaceous, abundant plant debris. Rubbly, bedding poorly defined. Non-calcareous. Rooty. Bedding plane slickensides; 245/36, quartz. Gradational at base by interbedding.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Middle Coals Section .
PROJECT: _____ . DATE: _____ .
LOCATION: _____ . ELEVATION: _____ .
GEOLOGIST: _____ .

	0.05 m	COAL - highly sheared and pulverised.
	0.30 m	MUDSTONE - dark grey, carbonaceous, rubbly.
	0.08 m	MUDSTONE - rusty, (paleosol features as above, but laterally discontinuous.)
		SECTION CONTINUED BELOW MINOR FAULT, 10 cm THROW.
	0.05 m	COAL - pulverised
	0.50 m	MUDSTONE - dark grey, carbonacous
	0.12 m	MUDSTONE - rusty, with carbonaceous interbeds. (Paleosol features)
	0.32 m	MUDSTONE - dark grey, carbonaceous, coaly lenses.
	0.22 m	SILTSTONE - medium grey, highly argillaceous.
	0.65 m	MUDSTONE - dark grey, carbonaceous, very thin coaly stringers, 1 to 2 cm thick.
	0.14 m	SILTSTONE - light grey
	0.05 m	COAL - highly sheared
	0.20 m	MUDSTONE - dark grey, rusty-weathering. Highly carbonaceous and highly sheared.
	0.05 m	COAL - highly sheared
	0.14 m	SILTSTONE - light to medium grey, sheared
	1.70 m	MUDSTONE - highly sheared. Dark grey, rusty-weathering, carbonaceous to coaly, with sheared coaly bands.
		BASE OF MEASURED SECTION. Below this point, strata are folded and sheared, and poorly exposed. Station B202 is located within this highly distrubed sequence, (and represents an unknown stratigraphic level, apparently below the base of the section).
B202		MUDSTONE - medium grey, light grey-weathering. Silty; strongly calcareous, with calcite veins. Locally carbonaceous, large plant impressions on bedding surfaces. Attitude: 150/76 W.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Middle Coals Section.
PROJECT: _____. DATE: _____.
LOCATION: _____. ELEVATION: _____.
GEOLOGIST: _____.

	3.25 m	SANDSTONE - fine-grained, dark grey; thin shaly partings. Thin to medium bedded, 12-15 cm beds. Blocky, Siliceous, "cooked"; quartz veinlets.
	2.0 m	Dark grey mudstone talus. Carbonaceous to coaly in upper 0.5 m.
	4.0 m	concealed
B201		
	0.20 m	SILTSTONE/SANDSTONE, very fine-grained - light grey; rooty bed. Small-scale cross-lamination. Non-calcareous.
	0.67 m	SILTSTONE, argillaceous/MUDSTONE, silty - light grey, yellow-orange weathering. Thin bedded, rooty, non-calcareous. Attitude: 147/28 SW.
	2.78 m	MUDSTONE - dark grey, locally carbonaceous, rubbly. Abrupt.
	2.21 m	SANDSTONE - very fine-grained, dark grey, yellow-weathering calcareous. Beds 30 cm thick, separated by 4 to 5 cm mudstone bands.
	0.30 m	MUDSTONE - dark grey, medium grey-weathering. Highly silty.
	0.54 m	SANDSTONE - very fine-grained, dark grey, yellow-weathering, calcareous.
	0.18 m	COAL - thin mudstone partings.
	0.15 m	MUDSTONE - carbonaceous
	0.20 m	COAL
	0.37 m	MUDSTONE - carbonaceous, highly sheared.
	0.80 m	COAL - sheared.
	1.75 m	MUDSTONE - dark grey, very silty, carbonaceous
	0.25 m	MUDSTONE - rusty "reworked" with rusty tubes with inner canals (rootlets ?) (possible paleosol).
	1.05 m	MUDSTONE - dark grey, very silty, carbonaceous.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: _____.
PROJECT: _____. DATE: _____.
LOCATION: _____. ELEVATION: _____.
GEOLOGIST: _____.

R1		SANDSTONE - fine-grained, medium-dark grey, orange-weathering minor crossbedding, strongly calcareous. 2-3 m thick, forming a steep slope. Attitude: 142/10 SW.
R2		GRITSTONE - coarse sand to granular, float, medium grey, siliceous. Chert pebbles.
R3		SANDSTONE - as at R1. Attitude: 118/10 SW
R4		SANDSTONE - fine-grained, medium-dark grey, red-brown weathering, massive, cherty, strongly calcareous.
R5		MUDSTONE - silty, medium brown-grey, strongly calcareous, few burrows, 0.5 m thick
		SILTSTONE - medium grey, thinly laminated, strongly calcareous, plant debris. Attitude: 103/12 SW
R6		SANDSTONE - very fine-grained, medium-dark grey, light brown weathering, silty interbeds. Thinly laminated, thinly bedded, strongly calcareous.
R7		MUDSTONE - grey-brown, slightly silty, rubbly. Small dark burrow. (Definite Lower Gething marine sequence).
R8		SANDSTONE - with finely broken plant debris. Fine-grained medium grey, orange-weathering. Thinly laminated thinly bedded, calcareous. (Between A and B seams). Attitude: 159/40 SW

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Middle Coals Seismic Lines No. 1
PROJECT: _____. DATE: _____.
LOCATION: _____. ELEVATION: _____.
GEOLOGIST: _____.

B214		FAULT TRACE - exposure approximately 75 m south of road junction near Milepost 6 of No. 1 Mine Road Fault plane attitude: 124/54 SW. (Probable Chamberlain Fault).
B215		SANDSTONE - float, very fine-grained, orange-weathering clean, laminated, strongly calcareous.
B216		SANDSTONE - float, abundant angular blocks, fine to medium grained, dark grey, medium-grey-weathering, clean, massive Non-calcareous, with log impressions.
B217		SANDSTONE - fine to medium-grained, dark grey, light grey-weathering, distinctly cherty, non-calcareous, with quartz veinlets in some float blocks. Red-weathering siliceous, slickensided coatings on joints. Abundant rubble along line since last point and also upslope, of this rock type, (which resembles sandstone from below the Lower Gething "C" horizon.) Also some rubble of dirty, "cooked", carbonaceous sandstone. Attitude: 058/42 SE.
B218		SANDSTONE- float, fine-grained, orange-weathering. Clean, platy, cross-bedded, strongly calcareous. (Definitely sandstone below Chamberlain Seam). Since last point, gentle, swampy topography, no outcrops. (Fault, defined (Chamberlian Fault) on the basis of abrupt change in lithology and stratigraphic level since last point). Attitude: 109/6 SW.
B219		MUDSTONE - carbonaceous to coaly, float, and sandstone, very fine - grained, float, argillaceous, laminated, plant debris, sporadically strongly calcareous. (NOTE: August 4, 1978: Probably Lower Gething "B" horizon).
B220		SILTSTONE - dark grey, orange-weathering, strongly calcareous interbedded with mudstone. Plant debris, rubbly. Tops not known; attitude: 165/90. (Possible fault somewhere in vicinity, based on high dip at this point).
B221		COAL BLOOM - associated with chips of hard, strongly calcareous siltstone/ mudstone, and blocks of hard dark grey fine-grained siliceous sandstone. (Possibly Lower Gething "C" Seam).
B222		see next page
B223		SANDSTONE - very fine to medium-grained, dominantly fine-grained. Poorly sorted. Few granular, intraclastic, and

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Middle Coals Section Lines No. 1
PROJECT: _____. DATE: _____.
LOCATION: _____. ELEVATION: _____.
GEOLOGIST: _____.

		"wood chip" horizons. Siliceous, with quartz veinlets. Attitude: 157/43 SW. (location approximate) Since last point, rubble of strongly calcareous sandstone.
B224		SANDSTONE - fine-grained, medium grey, reddish-weathering platy, cross-bedded, clean, strongly calcareous. Attitude: 109/7 SW.
B225		SANDSTONE - fine to very-fine-grained, as above. Float.
B226		SANDSTONE - fine to very fine-grained, as above. Float.
B227		SANDSTONE - fine to medium-grained, medium grey light brownish rusty-weathering. Strongly jointed and strongly calcareous. Thick-bedded with low and high-angle cross-lamination Rusty calcite films on joints. Attitude: 113/12 NE.
B228		SANDSTONE - fine-grained, dark grey, rusty-weathering. Strongly calcareous; abundant calcite on joints. Rubble and blocks. Some broken carbonaceous mudstone and rooty siltstone. Generally fragmental and broken with high southerly dips, shearing and small-scale-folding. (Fault, indicated, to south of the point.)
B222		SANDSTONE- very fine grained, dark grey, light grey- weathering, small-scale cross-lamination. Blocky to rubbly, calcite veins. (Possible roof of "C" Seam.) Attitude: 125/49 S.W.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER MIDDLE COALS SEISMIC LINES NO.2
PROJECT: _____ . DATE: _____ .
LOCATION: _____ . ELEVATION: _____ .
GEOLOGIST: _____ .

B229		SANDSTONE - float, medium-grained, medium grey. Large-scale cross-lamination muddy clasts, strongly calcareous Probably between "B" and "C" horizons).
B230		SANDSTONE - fine-grained, medium to dark grey, medium gray-weathering, strongly calcareous. Small-scale cross-laminae to 1 cm. Fine stringers of silt along cross-lamination planes. Thin-bedded. Attitude: 141/47 SW.
B231		SANDSTONE - fine to medium grained, quartz-lithic, with abundant orange-weathering specks. Non-calcareous. Dominantly quartz.. minor chert. Thin-bedded, with large-scale, low-angle cross-bedding. Light grey-weathering (May be correlative with the riverine sandstone seen at B131.) Attitude145/28 SW.
B232		SANDSTONE - medium-grained, orange-grey, medium grey weathering. Medium-bedded, low-angle cross-lamination. Non-calcareous, quartz-lithic, with orange-weathering specks. Dominantly chert; hence darker than last outcrops. Attitude: two measurements: 165/43 SW 162/38 SW.
B233		Conglomerate-pebble, and coarse-grained, conglomeratic sandstone. Estimated 3 + m thick.
B234		SANDSTONE - fine to medium-grained. Light grey clean, hard and siliceous. Dominantly quartz (85 to 90%), chert (1 to 15%), Chert grains appear to be finer than quartz grains. No orange specks. Massive, blocky. Appears to be in place. Few blocks of pebbly sandstone. Attitude: 177/9 SW.
B235		conglomerate - pebble. Massive. Attitude: 124/12 SW. 130/15 SW, 155/15 SW.
B236		SANDSTONE - very fine-grained, small-scale cross-laminated, thin-bedded, silty, argillaceous laminae, plant debris, strongly calcareous. Attitude: 159/45 SW. Rusty-weath.
B237		SANDSTONE - fine to medium-grained, dark brown-grey weathering, quartz-lithic, strongly calcareous. Disseminated orange specks; large plant impressions. Alternately clean and argillaceous. Attitude: 172/24 SW.
B238		COAL BLOOM - and float of weathered, carbonaceous mudstone.

B.P. CANADA LTD. COAL GROUP

TRAVERSE / TRENCH NUMBER: Middle Coals Seismic Lines No. 2
PROJECT: _____ . DATE: _____ .
LOCATION: _____ . ELEVATION: _____ .
GEOLOGIST: _____ .

B239		SANDSTONE - very fine-grained, light grey light grey-weathering thin-bedded, strongly calcareous. Finely broken carbonized plant debris on bedding surfaces. Attitude 137/35 SW/
B240		SANDSTONE - float fine-grained, dark grey, thin bedded, strongly calcareous; no plant debris. (Compare to B230).
B241		SANDSTONE - medium to coarse-grained, conglomeratic and pebbly phases; siliceous. Sandstone dominantly clean and quartzose. Massive, 4 m thick. Attitude: 139/26 SW.
B242		SANDSTONE - medium to coarse-grained, light to medium grey. light grey-brown-weathering, very lcean. Low-angle cross-lamination, thick-bedded to massive and blocky. Log impressions, coaly inclusion, orange-weathering specks. Siliceous. Pebble phases- 0.005 to 0.040 m clasts in a matrix of medium to coarse-grained sandstone. Poorly sorted, to 22 cm thick Attitude: 062/9 SE.
		At north end of outcrop, slickensides abundant quartz Veining and disturbed bedding; attitude: 159/58 SW (Probable minor fault).
		Continuing southerly along outcrop, rapid horizontal and vertical changes in lithology, including: quartz-chert propertions, bed thickness, siliceous or calcareous cement, sorting, intraclasts, orange specks, log impressions, and grain size (from mg to conglomerate). (Such rapid changes suggest and upper-fluvial environment.)
B243		SANDSTONE - fine to coarse-grained, with conglomeratic phases. Thin to thick-bedded. Medium grey, light to medium grey-weathering. Siliceous. Locally with orange-weathering specks. Attitude: 150/66 SW. Tops up. Conglomerate is thick-bedded.
		At north end of outcrop 20 m N of the last measurement outcrop of medium-grained, sandstone with interbeds of dark grey, "cooked" siltstone, also siliceous. Attitude: 159/85 to 90 SW.
		(Low angle cross-bedding at south end of outcrop suggests overall "riverine" environment).

PR - SUKUNKA 78(3)A

SUKUNKA 1978 EXPLORATION

PROGRAM

BP S 19

(DDH)

665

SUKUNKA 1978 B.H.No. BPS19

Contractor: CMS (deepening) Co-ordinates:

Commenced: 10 July, 1978 Surface Elevation: 1214.17 m AMSL

Completed: 13 July, 1978

Core Size: NQ Casing Left in Hole:

Hole Angle: } see next page Geologist Depth

Hole Azimuth: } see next page Logged by: C. Bickford 60.1 to 188.83

Final Depth: 188.83 Depth to top of cored section: 60.1

9.14 m casing in original hole.

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
GATES			
SUKUNKA			
MOOSEBAR			
GETHING: UPPER	91.12 UP	81.98+ UP 56.33+ LP	1173.05 UP
MIDDLE		41.38 UP	
LOWER			

NOTE: UP: upper plate LP: lower plate

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
U. Chamberlain	42.56 UP	2.83 (split)	see McElroy	1171.61
	171.27 LP	4.30 (split)	41.16%	1042.90
L. Chamberlain	49.0 UP	1.88	see McElroy	1165.17
	178.09 LP	1.97	47.72%	1036.08
Sub-Chamberlain	51.0 UP	0.73	see McElroy	1163.17
	184.93 LP	0.20	0%	1029.24

14 July 1978

BP-S19 - SUKUNKA 1978

Depth	Inclination	Deviation
50 m	N 40° W	1° 45'
100 m	N 62° W	2° -
150 m	N 25° W	2° -
188 m	N 21° W	2° -

-oooOooo-

Bll Nos. BP S19

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			UPPER GETHING, UPPER PLATE
	60.1 65.85	5.75	START CORING SANDSTONE - fine-grained, medium grey, clean, well-sorted. Well-defined medium to large-scale, low-angle cross-lamination. Dark grey mudstone band, erosional at base; top ground out from 65.17 to 65.21 m. Calcite from 64.77 to 64.97 m (12° CA); 65.16 m (76° CA); 65.17 m (crystals to 0.001 m, 50° CA) 65.30 to 65.50 m (6° to 15° CA). Unit very strongly calcareous throughout; abrupt at base. Core loss at top: 0.88m
13° at 7° at	71.64 65.89 68.75	5.79	SANDSTONE - fine to very fine-grained/MUDSTONE (65:35)- interbeds of sandstone (0.01 to 0.44 m thick) and mudstone (0.01 to 0.09 m thick); with sharp, erosional contacts at base of sandstone, gradational upward to mudstones. Sandstones are light to medium grey, argillaceous, strongly calcareous, with small-scale low-angle and trough cross-lamination. Local small dark worm burrows. Mudstones are dark grey, slightly silty, with low-angle silty lamination. Moderately calcareous, with small sand-filled worm burrows. Medium to coarse-grained clean sandstone from 71.33 to 71.43 m; 30% coarse sand grains in mudstone from 71.43 to 71.50 m; coarse sand to granules, from 71.54 m to base. Abrupt at base. Slickensides and calcite in mudstone at 66.05 m (75° CA), 66.16 m (75° CA), 66.26 m (78° CA). Calcite veinlets from 67.90 to 68.01 m (68° CA, displaced by set at 12° CA, displaced by slickensided fracture at 60° CA), and from 68.29 to 68.43 m (near parallel to CA). Calcite at 68.80 m (78° CA). Pelecypod fossils from 69.73 to 70.04 m (specimen # BP S19 /F1)
5° at 13° at	91.12 85.84 81.88	19.48	SANDSTONE - fine-grained, medium grey, clean, well-sorted, large-scale low-angle lamination throughout, well-defined except from 71.64 to 72.54 m, where mottling is evident. Sporadic flat, dark grey mudstone intraclasts from 76.79 78.86 m; concentration of spheroidal, dark grey mudstone intraclasts from 80.71 to 80.74 m. 50% mudstone as laminae from 81.85 to 81.95 m. Sporadic intraclasts from 84.75 m to base. 5% mudstone bands below 87.65 m. Dark-rimmed worm burrows, medium sized (0.002 m), throughout. Unit very strongly calcareous throughout. Calcite from 72.86 to 73.11 m (10° CA), 75.08 to 75.16 m (12° CA). Rough, dark grey stylolite from 75.31 to 75.38 m (45° CA). Calcite from 75.72 to 76.60 m (dominantly at 10° to 30° CA, and 82° CA). Curved, slickensided fracture from 81.89 to 82.01 m (0° to 30° CA). Calcite from 81.96 to 82.11 m (13° CA). Core broken with calcite (50° to 90° CA) from 86.24 to 87.36 m. Fault, possible. Core broken from 87.67 to 88.13 m, with some calcite, but less marked distrubance than between 86.24 and 87.36 m. Core broken, with slickensides and calcite from 90.59 to 90.67 m (72° CA). Abrupt.
17° at 19° at	87.67 90.16		
	UPPER GETHING MIDDLE GETHING		

BH Nos. BP S19

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
8° at	94.49 91.33	3.37	SANDSTONE, very fine-grained/MUDSTONE (55:45)- light grey, very strongly calcareous sandstone with interbeds of dark grey calcareous mudstone. Sandstones, low-angle cross-laminated, abrupt to erosional at base, grade up to mudstone Scattered small dark worm burrows in mudstone; medium (0.002 m) light, sandy worm burrows and large (up 0.025 m) pelecypod burrows throughout. Calcite at 91.33 (90° CA).
10° at 6° at	93.55 94.49		
5° at	107.01 99.55	12.52	MUDSTONE/SANDSTONE, very fine-grained (70:30) - interbedded from (0.01 to 0.10 m) light to medium grey, low-angle and ripple cross-laminated strongly calcareous clean sandstone and dark grey, silty, strongly calcareous mudstone Abundant small (0.001 m) worm burrows and large (0.020 m) pelecypod burrows. Sandstone component becomes less abundant and markedly argillaceous towards base. Rough joint with calcite, 98.54 to 98.62 m (30° CA). Slickensides and calcite at 101.44 m (79° CA). Gradational at base. Small pyritized pelecypod fossil at 102.57 m (specimen # BP S19/F2).
11° at	116.87 107.56	9.86	MUDSTONE/SANDSTONE, very fine-grained (95:5) - dark grey, strongly calcareous, silty mudstone with small dark worm burrows and scattered pyrite flecks, interbedded with light medium grey, clean, low-angle cross-laminated very strongly calcareous sandstone. Sandstones abrupt at base, gradational at top, with some vertical pelecypod burrows. Calcite from 111.70 to 111.76 m (45° CA), and at 112.17 m (83° CA). Core broken and ground at 108.2 and at 113.9, no calcite or slickensides noted. Calcite from 114.79 to 114.84 m (38° CA), and 116.65 to 116.66 m (70° to 85° CA). Abrupt at base.
12° at	115.81		
	120.27	3.40	SANDSTONE, very fine-grained/MUDSTONE (90:10 - grading down to 70:30 at base) - medium grey, dominantly argillaceous (locally clean) low-angle, medium-scale cross-laminated sandstone, with interbedded dark grey silty mudstone. Local concentrations of small dark worm burrows, large (0.003 to 0.004 m) light worm burrows and pelecypod burrows. Bedding locally obliterated by intense bioturbation. Strongly calcareous throughout. Calcite from 117.20 to 117.28 m (26° CA), 117.26 to 117.35 m (30° CA), 117.89 to 117.86 m (30° CA), 118.79 to 118.77 (40° CA), 118.99 m (75° CA). Rough, rusty joint with trace of calcite from 119.06 to 119.23m (15° CA). Calcite from 119.10 to 119.22 m (22° CA), and from 119.17 to 119.26 (26° CA). Rough rusty joints from 119.71 to 119.76 m (45° CA) and from 119.80 to 119.87 m (42° CA). Calcite at 120.03, 120.05, and 120.08 m (72°, 85°, and 85° CA). Abrupt base.
	123.20	2.93	MUDSTONE/SANDSTONE, very fine-grained (95:5) - dark grey silty mudstone with thin, widely spaced (0.005 m, at 0.10 m) interbeds of medium grey, argillaceous sandstone. Ubiquitous small dark burrows; general intense bioturbation.
12° at	123.30		

BH Nos. BP S19.

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			Strongly calcareous throughout; gradational at base.
	132.50	9.30	MUDSTONE - dark grey, homogeneously silty, strongly calcareous throughout. Rubbly, strongly jointed. Pyritic flecks throughout. Calcite from 123.09 to 123.15 m (41° CA) Calcite-filled mudstone breccia from 123.40 to 123.43 m. Calcite at 123.50 m (90° CA), 123.94 m (72° CA), 123.95 m (80° CA), 128.39 m (60° CA), 128.61 m (80° CA), 130.54 to 130.60 m (tension fracture fillings 40° to 50° CA); calcite from 130.64 to 131.34 (numerous near-parallel fracture fillings 45° to 75° CA). Core broken from 131.72 m to base; core loss (estimated) 0.40 m at base. Some calcite tension fracture fillings in broken core near base. Unit in fault contact at base.
	MIDDLE	GETHING	
			FAULT, ESTABLISHED
			UPPER GETHING, LOWER PLATE
	134.41	1.91	BRECCIA - calcite-veined fragments of fine and medium-grained light grey sandstone, in a sheared matrix of dark grey mudstone and calcite. Fault defined by brecciation and lithologic change across fault. Broken at base. *Coaly smudge on some joint surfaces possibly squeezed along fault from Bird Seam. Core loss 1.24m at top.
10° at	147.00 134.60 m	12.59	SANDSTONE - light to medium grey, fine-grained, clean, well-sorted. Fine to medium-grained (with medium-grained phases) from 136.14 m to top. Large-scale, low-angle cross-lamination. Strongly to very strongly calcareous throughout. From 137.73 m to top, local concentrations of faintly dark-rimmed worm burrows, from 0.003 to 0.004 m diameter. This interval generally mottled, but individual burrows are only vaguely recognisable. From 136.21 m to top, core increasingly broken, with calcite and slickensides at 75° and 80° CA, and 10° to 20° CA (offset by the 75° to 80° set). Calcite from 136.56 to 136.76 m (15° CA), 141.56 (68° CA), and from 141.42 to 141.74 (24° CA), at 90° to 68° Set.) Calcite from 141.87 to 142.33 m up to 0.005 m thick (48° CA), 0.05 to 0.10 m apart, and at 10° to 20° CA, displaced by set of 48° CA. Calcite near parallel to CA, from 142.33 to 142.93, and from 142.79 to 142.86 m (32° CA), up to 0.005 m thick. Calcite from 142.86 to 142.99 m (25° CA), and from 143.36 to 143.52 (10° CA). Calcite near parallel to CA, from 145.75 to 146.26, and from 146.71 to 146.99. Erosional at base.
	152.02	5.02	SILTSTONE/MUDSTONE/SANDSTONE, very fine to fine-grained (60:30:10) - Interbeds of light to medium grey clean, low-angle cross-laminated sandstone, abrupt at base, grading upward to medium grey siltstone and dark grey, silty mudstone,

BH Nos. BP S19

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	6° to 12°		with abundant small dark horizontal worm burrows throughout. Medium (0.003 m) dark rimmed worm burrows and vertical pelecypod burrows scattered throughout. Lower half of interval generally churned and bioturbated. Strongly calcareous throughout. Slickensides and calcite at 148.19 m (88° CA). Abrupt at base.
	153.00	0.98	SANDSTONE - fine to coarse-grained, as discrete, clean well-sorted laminae and beds, from 0.002 to 0.20 m thick. Approximately 50% of interval is coarse-grained; rest is dominantly fine with some very fine and medium-grained
10° at	152.04 m		sandstone. Medium grey, strongly calcareous throughout. One 0.01 m band of dark grey mudstone, 0.02 m below top. Slickensides and calcite at 0.18 m (77° CA), 0.26 m (78° CA), 0.28 m (85° CA), and 0.38 m (78° CA) below top.
	156.20	3.20	SANDSTONE, very fine-grained/SILTSTONE (75:25) grading down to silstone/mudstone (50:50) grading down to mudstone-laminated sequence, fining-downward, of light to medium grey, strongly calcareous sandstone, medium grey moderately calcareous siltstone, and dark grey, weakly calcareous, slightly silty mudstone. Lower 0.09 m carbonaceous. A few calcite veinlets at 55°, 80°, 85°, CA, concentrated within mudstone phases. Abrupt at base.
	166.97	10.77	SANDSTONE - fine to medium-grained, medium grey, clean, well-sorted, moderately calcareous throughout.
5° at	156.32 m		Argillaceous laminae in top 0.30 m. Faint, dark-rimmed worm burrows (0.003 to 0.004 m) from 158.33 to 158.37.
8° at	161.25 m		Medium to large-scale, low-angle cross-lamination in top 4.0 m; small-scale low-angle and ripple cross-lamination below, to base, except basal 1.52 m, which consists of
12° at	161.69 m		medium to coarse-grained clean sandstone with large-scale low-angle cross-lamination. Faint, dark-rimmed worm burrows (0.003 to 0.005 m) from 163.65 to 164.01.
5° at	162.57 m		Core badly broken between 158.46 and 160.12. Recovery
4° at	166.17 m		0.30 m. Core loss: 1.36 m. Broken pieces covered with calcite films. Within the 1.50 m interval below this broken ground, some calcite at 5°, 32°, 38°, 48°, and 62° CA. From 161.59 to 162.00 sheared coaly partings in otherwise clean sandstone. Core broken in part, abundant calcite parallel to care axis, probably slump structure. Unit abrupt at base.

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			TOP OF UPPER CHAMBERLAIN SEAM, LOWER PLATE
	167.13	(0.16)	CORE LOSS - COAL
	167.26	0.13	MUDSTONE - dark brown, with coaly streaks, Pyritic in basal 0.07 m. Listricated and badly broken throughout. Plant fragments; possible seatearth. BP S19/CHU/1
	167.32	(0.06)	CORE LOSS - ROCK DD 167.6
		(1.75)	CORE LOSS - COAL (NOT LOCATED DUE TO POOR CORE RECOVERY).
		0.045	COAL - dull and bright, stick
		0.025	COAL - dull, stick
		0.04	COAL - dull banded
		0.01	COAL - dull and bright, stick
		0.03	COAL - dull, sheared, stick BP S19/CHU/2
		0.05	COAL - dull banded, stick
		0.05	COAL - sheared, badly broken. Dominantly dull lustrous; very hard; a few fragments of bright coal; some specks of pyrite.
		0.025	COAL - dull and bright, sheared, stick
		0.02	COAL - dull, lustrous, sheared, stick
		0.025	COAL - dull and bright, sheared, stick
		0.01	COAL - undifferentiated, sheared and badly broken
		0.07	COAL - dull banded, sheared stick
		0.04	COAL - undifferentiated, sheared, broken stick
		0.06	COAL - undifferentiated, sheared, badly broken
		0.09	COAL - undifferentiated, sheared, pulverised
		0.04	COAL - undifferentiated, sheared, broken
		0.03	COAL - undifferentiated, sheared, stick
		0.04	COAL - dull banded, sheared, broken. Listric surfaces at base.

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			DD 169.8
	169.82	(0.05)	CORE LOSS - ROCK NOT SAMPLED
	170.76	0.94	MUDSTONE/SILTSTONE (60:40) - interlaminated dark grey silty mudstone and medium to dark grey, weakly calcareous siltstone. Top 0.05 m of unit is mudstone only, with plant fragments, possible seatearth. Lamination is indistinct at top of unit; some vague ripple cross-laminae (within 0.001 to 0.005 m thick siltstone laminae) towards base. Sheared, pyritic coaly streaks on base of unit. Broken stick.
	171.27	0.51	CORE LOSS - COAL AND ROCK - Lower Leaf
			BASE OF UPPER CHAMBERLAIN SEAM, LOWER PLATE
3° to 6° throughout, except from 173.65 to 173.87 m where dip increases abruptly to 50° at top and 55° at base. Possible "sigmoidal Laminite".	174.79	3.52	MUDSTONE/SILTSTONE (60:40) - interlaminated dark grey silty mudstone and medium to dark grey, moderately calcareous siltstone. Top 0.18 m is listricated, dark grey silty mudstone with a few plant fragments; possible seatearth. Lamination is indistinct in upper 1.0 m of unit Local ripple cross-lamination with siltstone laminae, which are from 0.001 to 0.005 m thick. Core badly broken and ground, between 171.84 and 173.65 m. Recovery: 0.20 m (lost: 1.61 m). Numerous slickensided surfaces between top and 171.84 m (80° to 90° CA), and discontinuous calcite at 0° to 20° CA, interrupted in areas of concentrated slickensiding across core axis. Core broken in basal 0.80 m of unit, in pieces 0.02 to 0.10 m long, by slickensided surfaces at 70° to 80° CA. Gradational at base.
	176.12	1.33	MUDSTONE - dark grey, homogeneous, easily broken along surfaces at 83° to 88° (? bedding), some of which are listricated. Basal contact with coal not recovered. 10 cm roof sample BP S19/CHL/R.
			TOP OF LOWER CHAMBERLAIN SEAM, LOWER PLATE
		0.13	COAL - sheared, undifferntiated. Broken BP S19/CHL/1
		0.01	COAL - dull banded, sheared, stick
		0.015	COAL - dull banded, sheared, stick Sheared at 65° to 70° CA
		0.035	COAL - sheared, undifferentiated, broken DD 176.8
		0.01	COAL - sheared, undifferentialed, pulverised.
		0.02	COAL - sheared, undifferentiated, broken stick
		0.02	COAL - dull banded, sheared broken stick.

Dip θ	DEPTH m	THICKNESS m	DESCRIPTION	
		0,02	COAL - bright banded, sheared, broken	
		0,02	COAL - bright, broken stick	
		0,04	COAL - bright banded, broken	
		0,01	COAL - dull, lustrous, stick	
25°		0,01	COAL - dull banded, lustrous, stick	
		0,02	COAL - dull, lustrous, broken stick	BP S19/CHL/1
		0,025	COAL - bright banded, stick	
		0,015	COAL - dull banded, stick	
		0,03	COAL - bright banded, stick	
		0,02	COAL - dull banded, sheared, stick	
		0,04	COAL - dull, sheared, stick	DD 177.4
		0,03	COAL - dull, sheared, broken stick	
		0,06	COAL - dull banded, sheared, broken stick	
		0,03	COAL - dull banded, sheared, stick	
		0,02	COAL - dull banded, stick	
		0,035	COAL - dull, sheared, stick	
		0,025	COAL - dull, lustrous, stick	
		0,03	COAL - dull banded, stick	
		0,04	COAL - dull banded, stick	
		0,015	COAL - dull, stick	
		0,015	COAL - dull and bright, stick	
		0,02	COAL - dull and bright, sheared, broken stick	DD 178.0
		0,01	COAL - sheared, undifferentiated, broken	
		0,08	COAL - dull banded, sheared, broken stick	BP S19/CHL/1
		0,02	COAL - sheared, undifferentiated, stick	
		0,02	COAL - dull and bright, stick	

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	178.09	(1.03)	CORE LOSS (COAL) - not apportioned due to low recovery
			BASE OF LOWER CHAMBERLAIN SEAM, LOWER PLATE
	188.83	10.74	SANDSTONE - medium grained (fine to medium-grained from 178.09 to 178.42 m; medium to coarse-grained from 178.42 to 179.32 m; fine-grained from 187.13 m to base), dark grey, clean, well-sorted throughout. Abundant disseminated carbonaceous material in uppermost 0.06 m, listricated carbonaceous stringers at low CA, in uppermost 0.37 m, possible rootlets. Thin (0.001 to 0.002 m) partings of carbonaceous to coaly mudstone at 180.48, and 180.66 m and 181.80 m. Sandstone with abundant bright and coal bands, badly broken with bright coal fragments in box, from 184.63 to 184.93 m. Core loss, 0.20 m. Geophysics indicates thin coal seam at this level. Sheared coaly parting (0.001) m thick) at 185.20 m. Large-scale low-angle cross-lamination throughout unit. Core broken with botryoidal incrustation of calcite from 179.95 ot 180.04 m (15° CA) with a partially filled fracture extending down to 180.26 m (15° CA), containing a porous filling a sandgrains, quartz and calcite. No evidence of displacement across this fracture, which may represent a dewatering channel, formed during soft-sediment compaction. Slickensides at 182.03 m (82° CA) 182.16 m (85° CA), 182.28 m (78° CA), 182.29 to 182.50 m (broken zone, 38, 57, 90° CA). Slickensided stylolite from 182.50 to 182.62 m (10° to 30° CA). Slickensides at 182.78 m (80° CA), 182.91 m (75° CA), 183.01 m (78° CA), 183.38 m (67° CA), 183.45 m (82° CA), 184.09 m (60° CA), 184.41 m (62° CA). Calcite from 184.93 to 185.27 m (5° CA), 188.33 to 188.43 m (15° CA), and 188.47 m to base (15° to 20° CA). Intense bioturbation (mottling) from top to 180.15 , and small, horizontal worm burrows from 185.02 to 185.63 m, unit non-calcareous from top to 182.52, weakly calcareous to 187.79, and moderately calcareous down to base of hole.
4° at 180.51 10° at 180.66 4° at 181.80 8° at 185.20			
			END OF HOLE 188.83 m
			(Drillers' Depth 189.3 m)

PR - SUKUNKA 78 (3) A.

SUKUNKA 1978 EXPLORATION

PROGRAM

BP S 23

(DDH)

665

SUKUNKA 1978

B.H.No. BP523

Contractor: CMS (deepening)

Co-ordinates:

Commenced: 22 August 1978

Surface Elevation: 1511.90 m AMSL

Completed: 24 August 1978

Core Size: NQ

Casing Left in Hole:

Hole Angle: } see details on next page

Hole Azimuth: }

Geologist Depth

Logged by: P.M. Caine and K. Kim 444.0 to 465.60

Final Depth: 465.60

Depth to top of cored section: 444.0

6.71 m casing in original hole.

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
GATES	112.80	106.09 +	1399.10
SUKUNKA	250.60	137.80	1261.30
MOOSEBAR	328.28	77.68	1183.62
GETHING: UPPER		137.32 +	
MIDDLE			
LOWER			

NOTE: UP: upper plate LP: lower plate

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
Bird	330.79 UP	2.50 (split)	} see McElroy	1181.11
	346.16 LP	3.40 (split)		1165.74
U. Chamberlain	420.28 LP	2.84 (split)	see McElroy	1091.62
L. Chamberlain	NOT INTERSECTED. FAULTED OUT AT 428.40.			(Elev. 1083.50)

BPB INSTRUMENTS (CANADA) LTD

P.O. BOX 5638, POSTAL STATION "A", CALGARY, ALBERTA

24 August 1978

BP S 23 - Sukunka 1978

Depth	Tilt	Azimuth
50m.	1° 30'	--
100m.	1° 15'	N 72° E
150m.	1° 15'	N 84° E
200m.	1° 30'	N 70° E
250m.	1° 30'	N 60° E
300m.	1° 45'	N 48° E
350m.	2° -	N 43° E
400m.	1° 45'	N 45° E
450m.	2° 45'	N 41° E
465m.	4° 30'	N 35° E

-oooOooo-

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	444.0		Clean out of original hole
			UPPER GETHING
80° at 444.5 35° at base	449.0	5.0	SANDSTONE - grey, medium grained, finely bedded, calcareous well sorted highly fractured with slickensides and calcite infilling.
15°	454.38	5.38	SANDSTONE - grey, fine-medium grained, finely bedded, calcareous, occasional calcite veins, well sorted.
15°	455.06	0.68	SILTSTONE - dark grey-black, interbedded with fine grained, grey sandstone, occasional worm burrows, calcareous.
15°	455.48	0.42	SANDSTONE - grey, fine-medium grained, finely bedded, calcareous.
17°	456.83	1.35	SILTSTONE - dark grey-black, interbedded with fine grained grey sandstone, slumped bedding throughout. Worm burrows Calcareous.
15°	457.36	0.53	SANDSTONE - grey, grey, fine grained, finely bedded, calcareous, well sorted. 5 cm of siltstone, with thin sandy bands at 457.16
0°	460.53	3.17	SILTSTONE - dark grey-black, interbedded, with fine grained sandstone, calcareous, worm burrows throughout. Pyrite module at 459.38. Bedding is slumped and occasionally cross bedded 35 cm of fine grained sandstone at 458.32. Worm burrows toward base.
	460.79	0.26	SANDSTONE - grey, coarse grained, poorly sorted, with interbeds of dark grey siltstone. Pin burrows within the siltstone. Slickensided at base. Calcareous.
5°	465.60	4.81	SANDSTONE - grey, medium grained, well sorted, thinly bedded calcareous. Top 11 cm very coarse grained, poorly sorted sandstone, highly calcareous. Grains angular to sub anglar 2 - 4 mm in diameter.
			END OF HOLE

AR - SUKUNKA 78 (3) A.

SUKUNKA 1978 EXPLORATION

PROGRAM

BP-42

(DDH)

665

SUKUNKA 1978

B.H.No. BP42

Contractor: CMS

Commenced: 9. June, 1978

Completed: 24. June, 1978

Co-ordinates: 61 18353.374 N
5 90445.656 E

Surface Elevation: 1410.82 m

Core Size: NQ

Hole Angle: } no details

Hole Azimuth: }

Casing Left in Hole:

Logged by:

Geologist	Depth
C. Bickford	3.00 to 365.85, 367.08 to 377.07, 380.32 to 386.25
D.J. Mitchell	365.85 to 367.08
P.M. Caine	377.07 to 380.32

Final Depth: 386.25

Depth to top of cored section: 3.00 m

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
GATES	95.60	92.60+	1315.22
SUKUNKA	222.50	129.90	1188.32
MOOSEBAR	313.80	91.30	1097.02
GETHING: UPPER		72.45+	
MIDDLE			
LOWER			

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
Gates B	27.86	0.47	72.34%	1382.96
Gates A	33.44	1.74 (mudstone)	33.91%	1377.38
Bird	316.40 UP	2.60 (split)	87.12%	1094.42
	327.20 LP	1.50+ (split)	87.33%	1083.62
U. Chamberlain	369.20	3.34 (split)	94.01%	1041.62
L. Chamberlain	380.32	3.25	77.67%	1030.50

BH Nos. BP 42

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
	3.00	3.00	Overburden - no core
			GATES MEMBER
	3.14	0.14	Core Loss
7 at top 11 at base	19.20	16.06	SANDSTONE - medium-grained, medium grey, rusty orange-weathering along joints. Dominantly cherty (70%, quartz 30%). Weakly calareous throughout; strongly calcareous patches, especially in rusty bands near joints. Clean, well-sorted, laminated, locally medium-scale cross-laminated. Pebbles (0.002 to 0.005 m) from 6.99 to 7.02, and from 6.61 to 6.63. Mudstone, dark grey, slightly silty, from 18.90 to 18.95, passing to enclosing sandstones by convoluted interbeds. Sandy, medium (0.003 m) burrows from 18.90 to 18.95 ; large (0.005 m) burrows from 3.33 to 4.66. Joints, rusty, strongly calcareous, from 3.5 to 8.0 (60^{o} to 90^{o} CA), and from 14.0 to 18.0 (0^{o} to 30^{o} CA). 0.08 m thick, very rusty band (70^{o} CA) with clayey gouge at 15.21, very strongly calcareous.
12 at 21.40	27.07	7.87	SANDSTONE/MUDSTONE (60:40) - sandstone, fine-grained to medium-grained, medium to dark grey interbedded with dark grey to black mudstone. Sandstone is locally clean and finely laminated , more commonly finely interbedded and laminated with mudstone. Bedding locally convoluted and churned. Small (.001 to .002 m) dark burrows and large (.002 to .004 m) sandy burrows. Sandstone is weakly calcareous, mudstone is non-calcareous. Local cross- lamination and erosional features. Muddy intraclasts in clean sandstone from 21.31 to 21.35 m. Bright coaly bands with pyrite at 24.31. Coaly stringers at 24.92 and 25.44. Abrupt.
	27.19	0.12	CONGLOMERATE - pebbles to 0.012 m floating in hard, dark argillaceous siltstone. Pebbles rounded, dominantly of dark grey chert, with a few, smaller, of white quartzite and coarse dark grey chert sand. Traces of pyrite in matrix. Non-calcareous; poorly sorted. 0.002 m bright coaly lens at base. Abrupt.
	27.39	0.20	MUDSTONE - dark grey, homogeneous, soft. Two thin (0.003 to 0.004 m) lenses of fine-grained, medium grey sandstone. Several well rounded dark chert pebbles at base, (0.010 to 0.020 m diameter). Moderately calcareous. Abrupt.
	27.86	0.47	COAL - Gates "B" Seam, 0.34 m, sheared, pulverised and broken at base. Abrupt. Coreloss: 0.13 m

BH Nos. BP 42

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	31.70	3.84	SILTSTONE, argillaceous/ SANDSTONE, very fine to fine-grained/MUDSTONE (60:15:25)-medium to dark grey, gradational between lithologies, medium-scale cross-lamination. Locally darker grey, carbonaceous mudstone with listricated coaly bands. Mudstone concentrated between 27.70 and 29.01 and 31.39 to base. Plant debris, mostly finely broken and carbonized, with some large plant fragments partially replaced by pyrite. CORE LOSS at base 0.10 m.
	32.00	0.30	MUDSTONE - dark grey, carbonaceous, listricated, broken. CORE LOSS in this interval, 0.15 m.
	33.44	1.44	MUDSTONE - dark grey, carbonaceous, listricated. Finely broken plant debris. Broken at top. CORE LOSS at top 1.00 m. Abrupt. Interval from 31.70 to 33.44 is Gates "A" horizon.
3 at 39.69	45.38	11.94	SANDSTONE - medium-grained, medium grey, clean, well-sorted dominantly cherty (65%, 35% quartz). Weakly calcareous to 35.73 m, moderately calcareous from 35.73 to 36.47 m, strongly calcareous from 36.47 to base. Medium to large-scale cross-lamination. Large, horizontal burrows (0.005 m) at 39.53 to 40.15. Large, vertical burrow (0.17 m deep) from 39.62 to 39.80. Core rusty, broken, slickensided with calcite at 34.58 (75° CA), 35.04 (75° CA), 35.31 (65° CA), 35.80 (75° CA), 40.96 (50° CA), 44.95 to 45.16 (0° to 40° CA). Calcite-filled slickensided fractures at 44.95 (80° CA). Gradational.
	50.12	4.74	SANDSTONE- fine-grained, medium grey, clean, well-sorted, dominantly cherty, (70%; 30% quartz). Strongly calcareous throughout. Low-angle cross-lamination. Few mudstone laminae near top and base. Large, muddy intraclast at 49.10 m. Coaly lens (.004 m) at 49.92 m. Calcite filled fractures with slickensides at 45.45 (85° CA), 45.53 (85° CA), 45.61 (85° CA), 45.63 (75° CA), 45.86 (90° CA), 46.95 (90° CA), 47.23 (75° CA), 47.55 (80° CA), 47.40 (85° to 90° CA), 47.10 (25° CA).
	53.45	3.33	SANDSTONE, very fine-grained/MUDSTONE (65:35)-sandstone grading to siltstone, medium and small scale cross-laminated, light to medium grey, grading to dark grey mudstone. Slump structures, erosional contacts, bioturbated and churned zones, especially toward base. Between these zones of intense bioturbation, lamination is essentially undisturbed, except for small dark and large light burrows. Small load casts at base of some sandstone beds.

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
12 to 15	60.90	7.45	SANDSTONE - fine grained, light to medium grey, laminated, locally clean, dominantly cherty. Occassional mudstone laminae and bands, with large burrown; increasing frequency to base. Weakly calcareous. Slump structures at 57.36 m Rusty, rough joint at 54.00 (85° CA), 53.95 (75° CA), 55.54 (65° CA) and 55.74 (60° CA). Core broken and listricated, with calcite, 56.40 to 56.46. Core broken near parallel to core axis, 57.56 58.20, and 58.30 to 58.50.
15	63.65	2.75	SANDSTONE, fine grained/MUDSTONE dark grey (50:50) sandstone:light to medium grey, low-angle cross-laminated, dominantly clean, interbedded and laminated with mudstone. Patchily calcareous above 62.97 strongly calcareous from 62.97 to base. Dominantly sandy from 62.97 to base. Locally churned and bioturbated. Occasional large (to .005 m) sandy burrows in mudstone. Calcite joints at 61.53 (80° CA) and 61.75 (80° CA) Abrupt.
	64.50	0.85	SANDSTONE - fine-grained, medium grey, low-angle lamination and medium-scale cross-lamination 5% dark grey siltstone and mudstone. Calcareous. Lamination locally destroyed by intense burrowing. Burrows large (.003 to .005 m) and sandy. Abrupt.
12	83.44	18.94	SANDSTONE - very fine to fine-grained/ SILTSTONE/MUDSTONE (40:30:30) - sandstone and siltstone light to medium grey; mudstone dark grey. Lenticular, laminated, and interbedded. Locally small to medium-scale cross-lamination. Large, sandy burrows scattered throughout, also small, dark burrows. Intensely churned zones, where lamination has been completely obliterated. Pyrite band, .001 m at 74.97. Gradational. Sandstone moderately to strongly calcareous, mudstone non-calcareous.
	88.31	4.87	MUDSTONE/SILTSTONE/SANDSTONE - fine to very fine-grained (60:30:10) medium grey; where sandstone is present, light to medium grey. Most of the interval is highly churned and bioturbated, with abundant small dark burrows. Typical Sukunkoid lithology. Where bedding is preserved, low-angle cross-lamination.
8° at base			SANDSTONE - strongly calcareous, siltstone weakly calcareous, mudstone non-calcareous. Core broken at 83.90 to 84.17 (20° to 25° CA). Thin calcite veinlets at 86.22 (80° CA), 86.30 (80° CA), 86.32 (80° CA) 86.54 (80° CA), 86.57 (80° CA). Coarse calcite (.002 to .005 thick) at 87.34 and 87.39 (75° CA), 87.58 (70° CA) and 87.91 (80° CA).

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			Thin, rusty calcite veinlet at 88.10 (83° CA). Broken at base.
	95.60	7.29	SANDSTONE - fine-grained/SILTSTONE/MUDSTONE (80:10:10)- dark grey. Medium-scale low-angle cross-laminated.
70 at	89.80		Abundant small, dark worm burrows. Core badly broken and ground out from 88.31 to 89.0.
90°	at 89.80		(Core loss in this interval 0.46 m.) Calcite
35°	at 90.10		veinlets and listrication. Core broken, listricated
35°	at 90.65		and contorted from 89.0 to 90.2, with dips to 90° and local overturning near 89.80. Near-vertical listrication
30°	at 91.60		from 89.50 to 90.00. Thin calcite veinlets. Core loss in
10°	at 93.70		this run 0.42 m. Breccia from 90.20 to 90.30. Thick, white calcite filling tension gash from 90.36 to 90.49. Joints, with well-developed slickensides and listric surfaces, closely spaced from 90.55 to 90.85 (65° CA). Rough, curved joint at 90.90 (27° CA). Listricated, slickensided joints with thin calcite (65° CA) at 90.95, 90.97, 91.07, 91.14, 91.31, 91.41, 91.53. Calcite-filled fractures parallel to core axis from 91.53 to 91.63. Core badly sheared and broken from 91.63 to 91.82; brecciated from 91.82 to 91.90. Core broken near parallel to core axis from 91.90 to 93.50. Core loss 0.12 m between 93.30 and 93.50. Recovered core is hard and strong; apparently ground out at top. Fault, possible at 90.70
	GATES		Dominantly mudstone with minor siltstone, from 92.35 to 93.73. Abrupt.
10	SUKUNKA 97.30	1.70	MUDSTONE/SILTSTONE/SANDSTONE, very fine-grained (30:30:40) - medium to dark grey, sporadically weakly calcareous. Load casts, rapidly alternating lithologies, laminated and interbedded. Few small dark burrows throughout; local concentrations of large (.003 m) sandy burrows. Locally churned. Fractures with slickensides and calcite at 96.31 to 96.33 (80° CA), 96.56 (70° CA); Curved, rough, rusty joint at 94.80 (30° CA) Gradational.
	107.51	10.21	MUDSTONE/SILTSTONE/SANDSTONE, very fine-grained (40:40:20) mudstone and siltstone, medium to dark grey, churned together and intensely bioturbated, interbedded with very fine-grained, medium grey, low-angle cross-laminated sandstone. Abundant small dark burrows. Channeling at base of sandstone beds. Patchily calcareous throughout. Fractures: 97.98 core ground out, .001 m band of strongly calcareous mud and granules of mudstone, possible fault gouge (80° CA); 105.32-105.37 core ground out, three bands of strongly calcareous, slightly rusty mud and granules of mudstone, within an interval of .005 m, also possible fault gouge (85° to 90° CA); 99.23 to 99.30 rough, rusty joint (20° CA). Core ground out at 99.97, but no

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			sign of shearing; 100.45 slickensides and calcite (87° CA) 100.99, slickensides and calcite (85° CA); 100.31 to 100.45 rough, rusty fracture parallel to core axis; 103.42 to 103.50 core broken, with rough rusty joint (15° CA); 103.80 listricated, ground out, minor calcite (90° CA); 106.61 to 106.88 rough, rusty joint (10° CA). Gradational.
	122.28	14.77	MUDSTONE/SILTSTONE/SANDSTONE, very fine grained (60:35:5) - generally churned and bioturbated, with sandstone preserved as medium grey lenses (to .005 m thick), in a groundmass of dark grey silty mudstone. Local flaser structure with sandstone filling ripple troughs in siltstone and mudstone. Abundant small dark burrows. Weakly calcareous. Rough, rusty joint 110.03 to 110.16 (15° CA); 114.69 (87° CA), dark grey, strongly calcareous mud, with rock chips 115.73 to 115.92. 118.81 to 118.99 core broken and cracked with 1 cm bands of calcareous, soft, dark grey mud. CORE LOSS between 118.81 and 119.2: 0.21 m. Slickensides, calcite 119.24 (70° CA), rough, calcitic joint 121.09 to 121.38 (85 - 90° CA) Gradational.
3°	131.01	8.73	SANDSTONE, very fine-grained/SILTSTONE /MUDSTONE (40:40:20)- light to medium grey, dominantly churned and bioturbated, but well-preserved low-angle lamination in dominantly sandy beds to 0.27 m thick, with erosional bases. Abundant dark burrows. Local slumping and load casts. Large vertical burrows at top. Weakly calcareous throughout, locally strongly calcareous in well-bedded sandy units. Rough, calcite-filled joint 122.86 to 123.01 (0° CA); calcite-filled fractures at 122.87 and 122.91 (90° and 80° CA); rough, calcite- filled fractures at base of load-casted sand unit at 125.29 (75° - 90° CA); rough, calcite-filled joint at 125.37 to 125.50 (20° CA), slickensided calcite-filled fractures at 125.81 and 125.84 (87° and 85° CA). Rusty, curved calcitic joint at 126.01 to 126.23 (75° to 90° CA). Core broken, with rusty, calcitic joints at 127.01 to 127.28 (30° to 90° CA). Rusty, rough calcitic at 130.39 (33° CA). Rusty, rough, calcitic joint at 130.98 (85° - 90° CA). Gradational.
	157.73	26.72	MUDSTONE/SILTSTONE/SANDSTONE very fine-grained (40:40:20) —dominantly churned and bioturbated, medium to dark grey, with intervals to 0.20 m of laminated sandstone and siltstone, medium grey. Small-scale cross-lamination within laminated intervals; ubiquitous dark burrows throughout. Scattered large vertical burrows in interval 145.0 to 147.5.

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			Sporadically weakly calcareous, except within laminated sandstone layers, which are locally very strongly calcareous. Rough, rusty joint at 131.80 (85° to 90° CA); calcite, rusty, slickensides at 132.22 (75° CA) and 132.29 (70° CA); rough, rusty at 132.55 (25° CA); and 132.78 (20° CA); rusty, silicified, coalified "wood chip" at 133.09; rusty, rough joints 134.30 (0° to 20° CA); rusty, rough joint at 134.49 (85° CA); 134.59 (70° CA); calcite stringers at 134.07; rusty, rough joint at 135.08 (38° CA); calcite and slickensides at 134.72 (75° CA); rough, rusty, joint at 136.10 (80° CA) and 136.25 (30° CA). Core broken parallel to core axis, rough and rusty 136.79 to 136.93. Calcite, slickensides at 138.51 (89° CA). Calcite at 141.35 (20° CA), core broken, calcite at 143.21 (35° CA);
3 at 150.00 /			Slickensides, finely crystalline calcite and euhedral, striated quartz crystals to .003 m long, at 149.30 (87° CA). Rough, rusty, calcitic at 150.19 (82° CA). Rough, calcitic at 151.29 (83° CA). Rough, rusty joints from 151.95 to 152.41 (0° to 20° CA). Dark calcitic filling at 156.61 (85° CA). Scoured at base, with 0.025 m medium to coarse-grained sand in a muddy matrix at immediate basal contact. Erosional. Two pelecypod valves at base.
	166.82	9.09	SANDSTONE - Fine to very fine-grained/silty mudstone (90:10) - medium grey; sandstone locally clean, but generally with mudstone laminae; where preserved, lamination is dominantly low-angle to parallel, with local slumping and small-scale cross-lamination. Locally bioturbated in top half, with vaguely preserved lamination and small, dark burrows. Extensive bioturbated intervals towards base, with abundant small and large dark burrows, and some large sandy burrows (Gates type from 163.11 to 163.17, abundant). Intraclastic bands at 162.11 and 162.91. Large sandy burrows from 157.73 to 157.92 both horizontal and vertical. Very strongly calcareous throughout.
			Rough, rusty joint at 158.67 (15° CA); rusty, listricated at 158.78 (80° CA); rough, rusty at 159.11 (22° CA); rusty and slickensided, calcitic, at 159.21 (70° CA); core broken, slickensided, with calcite, at 159.20 to 159.95. Probable core loss in this interval. Calcite, slickensided, at 160.08 (53° CA). Calcite stringers near parallel to core axis, at 160.44 to 160.60. Slickensides, calcite, parallel to lamination, at 160.81 (77° CA); calcite, rusty, some slickensides, at 161.26 (75° CA); 161.38 (85° CA); 161.45 (80° CA); 161.60 (73° CA); 161.76 (65° CA); core broken with abundant calcite veinlets and slickensides, from 162.21 to 162.46. Rough, rusty joint at 162.51 (23° CA). Calcite vein at

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			163.44 (85° CA); rough rusty joint from 163.49 to 163.66 (10° to 20° CA). Calcite veinlets from 163.70 to 163.95 (60° to 80° CA), with ground rock chips, crumpled fragmental, rusty, very strongly calcareous, at 163.80. Possible fault gouge? Calcite, slickensided, at 163.72 (80° CA). Abrupt.
	205.62	38.80	MUDSTONE, silty/SANDSTONE, very fine-grained (80:20)— medium grey. Dominantly bioturbated and churned, with lenses of laminated sandstone to 0.16 m thick. Abundant dark burrows. Sandy units erosional at base; local small-scale cross-lamination, where bedding has not been destroyed by bioturbation. Pyrite band, strongly calcareous, estimated 85% finely crystalline pyrite, containing ? shelly fossil debris 0.0045 to 0.0075 m thick, at 145.54. Core rusty, broken, at 169.50 to 169.58, 0.0009 m thick coaly lens at 201.55, 169.50 to 169.58 calcite at 169.59 (80° CA) and 169.58 (75° CA); calcite and slickensides at 171.30 (90° CA); 176.55 (75° CA); 176.57 (90° CA), 176.81 (80° to 90° CA); rusty, calcite, slickensides at 179.13 (90° CA); rough, rusty joint at 179.72 to 179.77 (15° to 40° CA); rusty calcite at 180.08 (90° CA). NOTE: marker block "182.0" is in wrong place. Calcite at 179.93 (85° CA) and 180.02 (80° CA). Rusty, rough joint from 181.58 to 181.81 (0° to 25° CA).
5° at	192.46		Core broken with calcite, near parallel to CA, from 187.95 to 188.10 m. Rusty calcite at 188.88 (88° CA). Rusty, rough joint with calcite at 196.95 (35° CA). Calcite at 205.31 (80° CA). Gradational; strongly calcareous throughout.
	222.50	16.88	MUDSTONE, silty/SANDSTONE very fine-grained/SILTSTONE (90:5:5) - dominantly churned and intensely bioturbated, distroying all lamination except for lenses of sand near top, and silt near base. Overall fining-downward sequence. Small, dark burrows throughout. Bright, rusty coal, one stringer (probably detrital). Calcareous throughout from top to 216.96, sporadically calcareous to base. Basal contact is taken as the base of the last calcareous band. Rough, calcite joint 205.96 to 206.73 (15° CA). Rough, rusty calcite at 213.65 to 213.84 (5° CA). 0.012 m of brown mud inserted into corebox at 213.96, probably not part of recovered core, since core above and below fits together well. Rough, rusty calcite from 214.71 to 214.91 (8° CA). Rough, rusty calcite from 215.16 to 215.37 (5° CA). Core broken, rough, rusty, calcite from 216.11 to 216.55 (10° CA). Calcite at 216.60 (90° CA). Core rusty and broken, 216.72 to 216.80. Rough, rusty calcite from 218.98 to 219.12 (10° CA). Mud, brown, inserted as before, at 219.54. Calcite near parallel to

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			CA, core broken from 220.67 to 221.12. Rough, calcite from 221.25 to 221.46 (10° CA). Rough, rusty from 221.79 to 221.89 (25° CA). Gradational at base.
	Sukunka		
	Moosebar		
	313.20	90.70	MUDSTONE - dark grey, homogeneously silty, non-calcareous. Network of calcite veinlets (near 90° CA) form 223.47 to 223.48. Rough, rusty calcite from 223.69 to 223.93 (18° CA), and from 224.39 to 224.74 (0° to 20° CA). Core broken and calcite at 231.26 (0° CA). Nodular band with calcite and pyrite at 236.0. Slickensides and calcite from 238.07 to 238.62. Ferruginous band at 241.39 to 241.43 (90° BCA). Calcite at 242.94 (70° CA). Slickensides and calcite at 243.18 and 243.28 to 243.49 (10° to 30°, and 65° CA). Core broken, with slickensides and calcite, (near (20° CA) at 246.0. Slickensides and calcite, 259.95 to 260.7 (45° CA). Slickensides at 260.97 (45° CA), and 261.21 (20° - 30° CA), and 261.28 (40° CA). Core badly broken, slickensides and calcite veining from 261.30 to 263.30. Within this 2.00 m interval, 0.70 m CORE LOSS. Fault,possible at 262.00 Slickensides and calcite from 265.53 to 265.70 (85° and 45° CA). Slickensides and calcite from 266.10 to 266.41, with core badly broken from 266.23 to 266.33. Slickensides at 0° to 90° CA. Slickensides at 267.28 (45° CA). Core broken and slickensides from 267.58 to 268.00 (90° to 45° CA), with calcite at 268.00. Overall, the interval from 259.95 to 268.00 is marked by a concentration of slickensides suggesting a fault of minor to moderate displacement. Core broken with calcite veining, at 270.06 to 270.19. Within the interval 271.90 to 272.30, only 0.12 m core recovered out of 0.40 m. The remainder has probably been ground out. Approximately 0.13 m of soft brown mud has been inserted at the middle of this interval. This non-calcareous substance is most likely drilling mud. Pyritised worm burrows and a few near-vertical calcite veins at 272.63. Core broken, with slickensides and calcite, 273.10 to 273.29. Slickensides and coarse calcite at 273.62 (40° CA). Calcite at 276.17 (65° CA). Calcite network at 279.52 to 279.62. Slickensides at 281.97 (50° CA). Calcite veinlets, partly open (40° to 60° CA) at 285.52. Slickensides and calcite at 287.23 to 287.32 (40° to 45° CA). Coarse calcite with open space at 288.20 (10° to 60° CA). Slickensides at 288.37 (40° CA). Coarse calcite with open space at 288.20 (10° to 60° CA). Slickensides at 288.37 (40° CA). Lenticular calcite veinlets at 288.62 to 288.66 (0° CA). Slickensides with calcite at 289.0 to 289.10 (35° to 55° CA), and 290.61 (55° CA). Small and large pyritized worm burrows, and pyrite blebs and specks, from 289.0 down to base.

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION	
			Ferruginous bands with clacite, at 290.82 to 290.89, 291.50 to 291.61, 291.70 to 291.77, 293.00 to 293.11 294.32 to 294.42, 295.47 to 295.60 (fragmental texture, probably effect of volume change due to recrystallisation) Bentonite from 295.27 to 295.43 (soft and crumbly, greasy texture) 300.58 to 300.60 (soft) 303.67 to 303.81 (hard), 306.88 to 306.90 (hard with small dark burrows, 308.63 to 308.64 (hard), 311.34 to 311.36 (hard, churned at top), 312.93 to 313.01 (waxy, hard), 313.19 to 313.20 (at base of Moosebar mudstone). Slickensides and calcite at 297.32 (55° CA), Core badly broken and slickensided at 298.85 to 299.00. Core broken and slickensided at 301.87 to 302.01, slickensided with clacite at 302.25 and 302.36 (60° and 60° CA). Core slickensided with calcite at 303.62 (55° CA) 304.14 (65° CA), 307.77 (80° CA). Abrupt.	
	313.80	0.60	SANDSTONE - fine to medium-grained, glauconitic, pyritic, dark grey-green, weakly calcareous. Few silica-rimmed, well-rounded chert pebbles. Burrowed; burrows are pyritised. One slickensided fracture at 60° CA. Basal contact churned, attached and abrupt.	
	Moosebar		TOP OF BIRD SEAM, UPPER PLATE	
	Upper Gething			
	313.84	0.04	COAL - sheared, pyritic blebs, broken	BP 42/BD 5
	313.89	0.05	COAL - sheared, broken, trc. pyrite	BP 42/BD 4
	313.92	0.03	COAL - dull banded, sheared, stick	
	314.07	(0.15)	CORE LOSS - coal and rock	LOSS
	314.10	0.03	COAL - dull, sheared and broken	
	314.14	0.04	COAL - dull and bright, stick	BP 42/BD 3
	314.21	0.07	COAL - dull and bright, stick	
	314.255	0.045	COAL - bright banded	
	314.265	0.01	COAL - dull, stick	
	314.28	0.015	MUDSTONE, dark grey, carbonaceous, bright coal bands, stick	
	314.34	0.06	COAL - dull, lustrous, stick	DD 314.6
	314.40	0.06	COAL - dull banded, stick	Top of Box 111
	314.44	0.04	COAL - dull and bright, broken	
	314.52	0.08	COAL - dull banded, broken stick	

BH Nos. BP 42

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	314.54	0.02	MUDSTONE - dark grey, carbonaceous, with bright coal bands to 0.005 m thick. Stick. BP 42/BD 2
	314.55	0.01	MUDSTONE - as above, stick
	314.59	0.04	MUDSTONE - dark grey, carbonaceous, with bright coal bands to 0.001 m thick. Stick.
	314.69	0.10	MUDSTONE - dark grey, carbonaceous, abundant coaly plant fragments. Stick.
	314.72	0.03	MUDSTONE - dark grey, carbonaceous, as above, with bright coal bands to 0.002 m. Stick.
	314.77	0.05	COAL - dull and bright, stick. BP 42/BD 1
	314.815	(0.045)	CORE LOSS - COAL Note: BP 42/BD 1
	314.825	0.01	COAL - dull banded, broken and BP 42/BD 3 were sampled together
	314.855	0.03	COAL - dull banded, stick. and BP 42/BD 3 separately
	314.865	0.01	MUDSTONE - dark grey, stick.
	314.895	(0.03)	CORE LOSS - COAL
	314.925	0.03	COAL - dull banded
	314.965	0.04	COAL - dull and bright
	315.065	0.10	COAL - bright banded, stick.
	315.135	0.07	COAL - bright banded.
	315.18	0.045	COAL - dull and bright, stick.
	315.25	0.07	COAL - dull and bright, stick.
	315.40	0.15	COAL - dull and bright, stick.
	315.42	0.02	MUDSTONE - dark grey, pyritic, carbonaceous; 0.005 m bright coal at base. Stick. DD 315.5
	315.45	0.03	MUDSTONE - dark grey, carbonaceous. listricated, thin coaly stringers. Stick.
	315.47	0.02	MUDSTONE - as above, stick.
	315.58	0.11	MUDSTONE - dark grey, carbonaceous, listric surfaces (45° CA), thin coaly stringers, stick.
	315.93	0.35	MUDSTONE - dark grey, carbonaceous at top, listric surfaces, thin coaly stringers at top. Slickensides and calcite
6° at	316.13		(62° CA), 0.13 m below top. Silty laminae toward base, with low angle, medium-scale cross-lamination. Stick.
	316.25	0.32	MUDSTONE - dark grey, as above. Scattered pyritic worm burrows near top. Thin coaly lens, 0.10 m below top. Slickensided at base (37° CA).

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	316.29 316.40	0.04 (0.11)	COAL - dull banded, sheared and broken. CORE LOSS - COAL
			BASE OF BIRD SEAM, UPPER PLATE
	316.54	0.14	SANDSTONE - medium-grained, medium to dark grey quartz-chert, abundant carbonaceous stringers. Small, white "Pin Prick" burrows. Listricated upper contact with coal (80° CA). Listricated coaly parting with pyrite. 0.05 m below top (60° CA). Listricated surface with bright coal particles, 0.10 to 0.15 m below top (40° to 60° CA). Weakly calcareous. Top contact dip 14°
5° at	316.97 316.79	0.43	SANDSTONE - medium-grained, medium grey, quartz-chert; carbonaceous content decreasing to 0 at 0.13 m below top. Abundant small, white "Pin Pricks". Large-scale low-angle cross-lamination. Strongly calcareous except weakly calcareous where carbonaceous. DD 317.3 at base.
	317.29	0.32	SANDSTONE - Fine to medium grained, as above, clean, well sorted. "Pin Pricks" as above, also larger (0.004 m) "Gates-type" burrows at 317.15 m.
4° at	317.98 317.46	0.69	SANDSTONE - as above, with well-developed alternation of darker grey and lighter grey beds (0.02 to 0.12 m thick), reflecting different proportions of quartz to chert. Large-scale, low-angle to parallel lamination.
5° at	318.42 318.42	0.44	SANDSTONE - as above, with few mica flecks on basal surface. Abundant medium-sized (0.001 m) white burrows from 0.21 to 0.34 below top.
	318.53	0.11	SANDSTONE - as above, medium-scale low-angle cross-lamination. DD 318.8 at base.
	318.57	0.04	SANDSTONE - as above, with 0.001 m rusty coal at base. Listricated at base (86° CA).
	319.76	1.19	SANDSTONE - fine to medium-grained as above. Medium grey medium-scale low-angle cross-lamination. A few coarse-grained lenses 0.50 m below top. Strongly calcareous throughout. Core broken, vaguely slickensided 0.04 m below top (86° CA). Core broken 0.22 m below top (15° CA), with some calcite film on surface of fracture. Core broken 0.57 m below top (75° CA).
	319.95	0.19	SANDSTONE - as above. DD 320.3 at base.
6° at	320.44 320.44	0.49	SANDSTONE - as above. Thin carbonaceous parting in basal 0.01 m. Listricated, slickensided at base (79° CA).
	320.89	0.45	SANDSTONE - as above, 0.005 m dark grey mudstone at top,

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			slickensided with calcite (86° CA). Calcite at 0.17 m (78° CA), 0.18 m (80° CA), and 0.19 m (80° CA) below top.
	321.09	0.20	SANDSTONE - as above. Slickensided with calcite at top (85° CA). Listricated at base (82° CA).
6° at	321.47 321.47	0 38	SANDSTONE - as above. Large (0.006 m) "Gates type" burrows at top. 0.005 m dark grey mudstone at base. DD 321.9 at base.
	323.05	1.58	SANDSTONE - as above but fine-grained, with parallel or large-scale low-angle cross-lamination. "Gates type" burrows 0.25 to 0.31 m below top. DD 323.5 at base.
	324.56	1.51	SANDSTONE - as above. DD 325 at base.
	325.70	1.14	SANDSTONE - as above, with calcite at 0.09 (10° CA), 0.13 to 0.21 (32° CA), 0.36 (70° CA, slickensided), 0.46 (65° CA), 0.50 to 0.72 (15° CA). Slickensides at 0.83 to 0.91 below top (35° CA). Calcite veining, with open spaces, near parallel to CA from 0.91 to base. Rounded sandstone inclusions in a dark, sandy, muddy matrix at base. Probably a sedimentary feature. Dark brown, non-calcareous mud smeared on base of core, which is polished and striated (80° CA). DD 326.1 at base. Established fault at 325.7 m.
			FAULT ESTABLISHED
			BIRD SEAM, LOWER PLATE
	325.87	0.17	MUDSTONE - hard, dark grey, pyrite blebs. Sheared and broken, abundant listric surfaces. Ground by drill. DD 326.2 at base.
	326.15	0.28	MUDSTONE - hard, dark grey, pyritised burrows and blebs. Plant debris, with abundant listric surfaces within continous cor Listricated at base. DD 326.5 at base.
	326.80	0.65	MUDSTONE - hard, gark grey, non-calcareous, with 10% calcareous light grey siltstone as convoluted stringers and laminae. Pyritic blebs and pyritised burrows. Plant debris. Listric surfaces and slickensides at
6° at	326.75		82° CA, in upper 0.38 m.
	326.98	0.18	MUDSTONE - as above. Slity laminae more numerous at base. One coaly stringer. Slickensides and calcite (CA 65°), 0.09 m below top.
	327.17	0.19	CORE LOSS - COAL
	327.20	0.03	COAL, dull banded, recovered 0.03 m. Abrupt.

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			BASE OF BIRD SEAM, LOWER PLATE
	327.48	0.28	SANDSTONE - Medium-grained, medium to dark grey, very carbonaceous at top. DD 327.7 at base. Calcareous at base.
8° at	328.89 327.83	1.41	SANDSTONE - Fine to medium-grained, medium grey, quartz-chert, strongly calcareous. Small white "Pin Prick" burrows. Parallel to large-scale low-angle cross-lamination. Clean and well-sorted. Large "Gates-type" burrows from 0.63 to 0.70 m below top. Abundant medium-sized (0.001 to 0.002 m) burrows from 1.21 m below top to base. Slickensides and calcite 0.91 below top (87° CA). DD 329.2 at base.
	330.48	1.59	SANDSTONE - fine to medium-grained, slightly coarser than above. Medium grey. Dominantly quartz (70%) chert (30%), clean, well sorted, strongly calcareous. Medium to large-scale low-angle cross-lamination. Medium burrows as above for 0.47 m below top, pyritised at 0.25 m below top. Slickensides and calcite at top (87° CA), at 0.31 m (89° CA). Carbonized and pyritsed wood chips at 0.79 m. DD 330.8 at base.
5° at	332.04 331.44	1.56	SANDSTONE - medium-grained. Medium grey, clean, well-sorted dominantly quartz (65% to 75%) chert (25% to 35%), strongly calcareous. Medium-scale low-angle cross-lamination, with some cross-sets up to 30° off bedding angle. Band of very fine-grained sand and mud, with calcite at 0.955 m below top (0.15 m thick; 85° CA). Coaly mudstone band at 1.06 m below top. DD 332.2 at base.
	333.59	1.55	SANDSTONE - medium to coarse grained from top to 0.70 m below top; fine to medium grained to 1.16 m below top; fine-grained to base. Overall fining-downwards sequence, but individual laminae are well-sorted, fining-upward. Medium grey. Overall about 70% quartz, 30% chert, proportions vary slightly between laminae. Very strongly calcareous. Large "Gates-type" burrows from 0.71 m to 0.76 m, and 1.14 m to 1.16 m below top. Thin band (0.003 m) of broken, carbonaceous, silty black mudstone with coal lenses, at 0.23 below top. DD 333.8 at base.
	335.18	1.59	SANDSTONE - fine-grained, medium grey. Clean, well-sorted overall about 75% quartz, 25% chert; strongly calcareous. Large-scale, low-angle to parallel lamination. DD 335.4 at base.
	336.74	1.56	SANDSTONE - as above. DD 337.0 at base.
	338.34	1.60	SANDSTONE - as above. Lamination partially obscured by burrowing: medium burrows (.003 m) from 0.17 to 0.46 m

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			below top; large "Gates type" (.006 to .008 m) burrows with dark rims, from 1.04 to 1.12 m below top. Slickensides with calcite from 0.84 to 0.92 m below top (65° and 87° CA). DD 338.4 at base.
3° at	339.90 339.00	1.56	SANDSTONE - as above. Dark muddy laminae from 0.65 to 0.69 m below top, with calcite stringers. Large, "Gates type" burrows, some with dark rims, from 0.46 to 0.65 m below top. Lamination churned in this interval. Strongly calcareous throughout, as before. DD 339.9 at base.
	341.49	1.59	SANDSTONE - as above, with dark argillaceous laminae towards base. Churned and bioturbated from 0.60 m to base; medium and large "Gates type" burrows from 0.60 m to 1.19 m. Large vertical burrows from 0.96 to 1.28 m; all with dark rims. Strongly calcareous, throughout. DD 341.5 at base.
	343.08	1.59	SANDSTONE - as above, medium to dark grey, with argillaeous laminae from top to 0.77 m below top. Churned and burrowed from top to 0.93 m below top. Calcite stringers parallel to lamination at 0.32 m (76° CA). Slickensides and calcite at 0.68 m below top (52° CA). DD 343.0 at base.
	344.31	1.23	SANDSTONE - fine-grained, locally very fine-grained near base. Medium to dark grey. Vaguely laminated, probably bioturbated, but no visible vurrows. Quartz 60%, chert 35%, strongly calcareous. Clear and well-sorted. Coarsely crystalline calcite lens (0.003 m thick) 0.95 m below top, possible thick-shelled pelecypod fragment. Small shell fragment 1.01 m below top. Basal contact shows load structure.
	334.61	0.30	SANDSTONE - very fine-grained/MUDSTONE 50:50 - lenticles of sandstone and mudstone together, with thin, bright coal lenses, commonly rimmed with very thin stringers of calcite. Local small, dark burrows and slump structures. Coal commonly listricated. Grade beds (.01 m), at base, of sandstone, siltstone, and mudstone, fining upwards. DD 334.8 at base.
	345.01	0.40	MUDSTONE/SANDSTONE - as above, but individual graded units well preserved. Basal contacts of sand over bud are erosional. Sandstone: very fine-grained, medium grey, low-angle cross-laminated; Mudstone: dark grey few pyritised worm burrows. Gradational at base by interbedding.
	345.58	0.57	SANDSTONE - very fine-grained, medium to dark grey, low-angle large scale cross-lamination. Strongly calcareous. Abrupt.
	345.91	0.33	MUDSTONE/SANDSTONE (40:60) - as above, with a few medium sized vertical burrows. Strongly calcareous. DD 346.3 at base.
	347.5	1.59	MUDSTONE/SILTSTONE/SANDSTONE (50:30:20) - as above, but with

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			local concentrations of large and small burrows. Strongly calcareous. DD 347.6 at base. NOTE: core breaks easily within this unit.
	347.55	0.05	MUDSTONE/SILTSTONE/SANDSTONE - as above, core ground.
	348.77	1.22	SANDSTONE - fine to very fine-grained, medium grey. Clean well-sorted, low-angle, large-scale cross-lamination overall except from top to 0.23 m, where fine to medium grained, with small-scale, low cross-lamination at top, and near-parallel lamination to base of interval 50% mudstone as lenticles from 0.23 to 0.42 m below top. Strongly calcareous throughout. Calcite (60 to 90° CA) at 0.07 to 0.09 m; 0.68 to 0.70 (70° CA, slickensided) and 0.93 (82% CA; coarsely crystalline). A few muddy lenses in basal 0.25 m.
	349.02	0.25	SANDSTONE - as above, a few muddy lenses. DD 349.4 at base.
	349.09	0.07	MUDSTONE - dark grey, few silty stringers, flecks of pyrite.
	349.81	0.72	SANDSTONE - fine to very fine-grained, large-scale low-angle corss-lamination or parallel lamination. Mudstone lenticles in top 0.02 m. Strongly calcareous. Coarsely crystalline calcite at 0.37 m below top. 0.05 m mudstone at base; muddy intraclasts scattered from 0.05 to 0.12 m above base.
	350.02	0.21	MUDSTONE/SILTSTONE/SANDSTONE, very fine-grained (30:60:10)l interlaminated, with small-scale cross-lamination. Core ground at base, strongly calcareous. DD 350.4 at base.
	350.15	0.13	MUDSTONE - dark grey; 5% silty stringers. Strongly calcareous.
	350.53	0.38	SANDSTONE - very fine-grained, medium grey, medium-scale low-angle cross-lamination. Strongly calcareous. Argillaceous laminae in lower 0.27 m.
	350.95	0.42	SANDSTONE - as above, with small, dark burrows and muddy intraclasts, 0.11 to 0.14 and 0.29 to 0.31 m below top.
	351.60	0.65	MUDSTONE - dark grey, 5% silty stringers. Strongly calcareous. Large, pyritized burrow at base.
0° at	352.18 351.83	0.58	SANDSTONE - fine to very-fine grained, medium grey, low-angle cross-lamination. Calcareous throughout. DD 352.4 at base.
	352.36	0.18	SANDSTONE - fine to very fine-grained, medium grey low-angle cross-lamination. Calcareous. Core ground at three points.
	353.77	1.41	SANDSTONE - fine to medium-grained, medium grey, low-angle cross-lamination. Calcareous. Lares "Gates-type" burrows 0.40 m below top.

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	353.79	0.02	MUDSTONE - dark grey. Calcite and slickensides (90° CA) at base. DD 353.9 at base. NOTE: Core between 348.77 and 353.79 was reconstructed from scrambled core, boxes 123 and 124.
	354.51	0.72	SANDSTONE, fine-grained/SILTSTONE (95:5 at top, 90:10 at base) - sandstone: medium grey, quartx dominant over chert, interlaminated with dark grey siltstone on bedding surfaces. Lamination well preserved throughout, medium-scale, low-angle. A few flecks of mica on bedding surfaces. Calcite on bedding surface (86° CA) at 0.64 below top. Calcareous throughout.
	354.78	0.27	SANDSTONE/SILTSTONE - as above, with 15% siltstone at base A large intraclast of dark grey siltstone and mudstone, with swirled lamination, from 0.04 m to 0.08 m below top. Slickensides and calcite at 0.10 m below top (75° CA). DD 355.2 at base.
	354.815	0.035	SANDSTONE/SILTSTONE (85:15 as above, Core broken.
	354.86	0.045	SANDSTONE/SILTSTONE (95:5) - as above. One coaly inclusion at base. Core broken at base, with slickensides (45° CA).
	354.91	0.05	SANDSTONE - fine-grained, as above, less than 5% silty laminae. Erosional at base.
	355.02	0.11	MUDSTONE - carbonaceous - dark grey to balck few thin bright coaly inclusions. Marker: Pelecypod shells. Sampled for paleontological investigation: specimen BP 42/F1 Gradational at base.
	355.34	0.32	SANDSTONE, fine-grained/SILTSTONE (95:5) - medium grey sandstone with laminae of dark grey siltstone. Small- to-medium scale cross-lamination. 50% mudstone, carbonaceous, dark grey from 0.06 to 0.12 m below top. with sandstone lenses similar to flaser structures, and pyrite specks and poorly preserved pelecypod. Pyrite band (0.002 m) 0.16 m below top. Listricated at 0.07 and 0.08 m below top (80° to 90° CA), vaguely slickensided at 0.25 m below top (80° CA). Gradational at base.
	355.44	0.10	MUDSTONE - carbonaceous, dark grey to black, thin silty laminae. Core badly broken. A few coaly fragments in core box. Poorly preserved pelecypod fossils.
	355.48	0.04	MUDSTONE - as above, erosional at base. Calcite stringers parallel to erosional contact (45° CA), with slickensides. Pelecypod fossils sampled for identification. Specimen no. BP 42/F2

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Dip o	DEPTH m	THICKNESS m	DESCRIPTION
4°	355.85	0.37	SANDSTONE, fine-grained/SILTSTONE (90:10) - sandstone, medium grey, with laminae of dark grey siltstone. Lamination mostly parallel, locally convoluted and low-angle cross-laminated. Small sandy burrows at base. Strongly calcareous throughout with irregular fragments of brown-stained calcite at top. Gradational at base.
	356.14	0.29	MUDSTONE/SILTSTONE (50:50) - dark grey, interlaminated, with specks of pyrite. Non-calcareous; carbonaceous at base, a few stringers of fine to very-fine grained sandstone, appearing to have been injected along bedding in the mudstone. Rusty; shelly fossils, fragmented, at base.
	356.26	0.12	MUDSTONE - carbonaceous, dark grey to black with bright coal lenses to 0.005 m, and blebs of siltstone.
	357.22	0.96	MUDSTONE - carbonaceous , with broken fragments of coal 0.05 m below top, and thin (0.001 m) bright coal bands from 0.05 to 0.09 m below top. Core ground, locally badly broken and pulverised. CORE LOSS 0.09 m.
	358.07	0.85	MUDSTONE - dark grey to black. Plant fragments, locally sheared at top
	358.92	0.85	MUDSTONE - dark grey to black. Carbonaceous at top, silty at base. Gradational.
	359.60	0.68	SILTSTONE - dark grey. Gradational downwards from siltstone/mudstone (50:50) at top, to siltstone/sandstone, very fine-grained (50:50) at base. Small and medium-scale cross-laminsyion throughout. DD 360.1 at base.
	359.96	0.36	SANDSTONE, very fine-grained/SILTSTONE (80:20) - medium grey, small to medium scale cross-laminated. Sandstone strongly calcareous, siltstone moderately calcareous.
	360.30	0.34	SILTSTONE - dark grey, coaly lenses to 0.002 m thick. CORE LOSS 0.25 m.
	360.57	0.27	SILTSTONE - dark grey, coaly lenses. Grading downward to siltstone/sandstone, very fine-grained (20:80); medium scale low-angle cross-lamination, partially destroyed by bioturbation. Muddy intraclasts. One large vertical burrow. Calcareous. Erosional at base.
	360.62	0.05	MUDSTONE?SILTSTONE (70:30) dark grey; siltstone as lenses in mudstone. Weakly calcareous.
	360.89	0.27	SANDSTONE, very fine-grained/SILTSTONE (80:20) - medium grey. High-angle, large-scale cross-lamination. Thin coaly lens near base. Calcareous throughout.
	360.93	0.04	MUDSTONE/SILTSTONE (50:50) - dark grey, siltstone as laminae and lenses. Calcareous.

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	360.98	0.05	MUDSTONE/SILTSTONE - as above. Core slightly ground at top with calcite (79° CA). DD 361.7 at base.
	361.0	0.03	SANDSTONE/SILTSTONE (80:20) - sandstone very fine-grained medium grey. Siltstone dark grey. Core badly ground
	361.09	0.08	MUDSTONE - dark grey, silty. Core badly ground. Probable overdrill.
	361.20	0.11	SILTSTONE/MUDSTONE (50:50) - dark grey. Siltstone with argilaceous laminae at top. Mudstone with silty laminae at base. Core shows polishing and drillmarks on upper surface. Siltstone calcareous; mudstone non-calcareous.
	361.40	0.20	MUDSTONE, carbonaceous/COAL - broken fragments in core bos. Recovery: 0.04 m. CORE LOSS 0.16 m.
	362.87	1.47	SANDSTONE, very fine-grained/SILTSTONE (75:25) - interlaminated medium grey sandstone and dark grey siltstone, with predominantly muddy intervals from top to 0.20 m below top, 0.53 to 0.76, and 0.90 to 0.95 m below top. Carbonaceous clasts with calcite rims, from 0.77 m to 0.82 m below top. Calcite veinlets at top, (85° to 90° CA). Carbonaceous, with plant fragments, in upper 0.20 m. Core ground at 0.20, 0.26 0.36, 0.49 (Core lost?) and 0.62 m below top. Slickensides at 0.81 m (40° CA), 0.94 m (85° CA) and 1.13 m (57° CA) below top. Siltstone and sandstone moderately calcareous. Mudstone non-calcareous. DD 363.1 at base.
	364.37	1.50	SANDSTONE/SILTATONE - as above. 50% mudstone from 0.15 into 0.52 m below top with parallel and locally convolute lamination. Clean, very-fine-grained sandstone with small-scale cross lamination from 0.53 m to 0.64 m and 0.66 m to 0.72 m below top. Mudstone band from 0.64 to 0.66 m below top. Clean sandstone from 1.09 m to 1.37 m below top; Mudstone bands from 1.06 to 1.09 m and 1.37 m to base. Core ground at 0.11 m. Slickensides with calcite from 0.26 m to 0.32 m (35° CA) and 0.32 m to 0.37 m (35° CA) with accessory calcite veining at 90° to core axis. Slickensides and calcite at 0.65 m (85° CA, vague) and 0.78 m (85° CA). Bedding crumpled with calcite-rimmed carbonaceous inclusions from 0.82 to 0.83 m below top. Slickensides and calcite at 0.97 m (85° to 90° CA). Slickensides and calcite at base (90° CA). Unit strongly calcareous throughout. DD 364.6 at base.
0° to 5° at base	2° 365.86	1.49	SILTSTONE/MUDSTONE (50:50) - thinly laminated, dark grey mudstone and medium grey siltstone. Dominantly parallel-laminated; some small-scale cross-lamination in siltstone. Few thin sandy lenses in upper 0.20 m. Basal 0.03 m slightly carbonaceous, with slickensides and calcite (67° CA). Shedred, calcite-filmed coal at base. Core dished at 0.94 m but no core loss observed. Calcareous throughout. Sharp, unattached. Basal 0.03 m sampled BP 42/CHU/5

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			TOP OF UPPER CHAMBERLAIN SEAM
	365.95	0.09	COAL - bright banded, stick
	366.03	0.08	COAL - bright banded, broken
	366.04	0.01	MUDSTONE- carbonaceous, roots, sheared
	366.08	0.04	COAL-dull, stick BP 42/CHU/4
	366.13	0.05	COAL - bright banded, broken stick
	366.15	(0.02)	CORE LOSS, COAL/MUDSTONE
	366.16	0.01	MUDSTONE - carbonaceous, roots, sheared NOT SAMPLED
	366.18	(0.02)	CORE LOSS, COAL/MUDSTONE
	366.28	0.10	COAL - dull, lustrous, stick,
	366.37	0.09	COAL - dull and bright
	366.67	0.30	COAL - dull banded in parts, lustrous sheared, broken stick BP 42/CHU/3
	366.77	0.10	MUDSTONE- carbonaceous stick BP 42/CHU/2
	366.79	(0.02)	CORE LOSS, MUDSTONE
	366.90	0.11	COAL - sheared, pulverised? burned by drill/fault
	366.99	(0.09)	CORE LOSS, COAL
	367.03	0.04	COAL, sheared and pulverioed,? burned by drill/fault BP 42/CHU/1
	367.08	(0.05)	CORE LOSS, Coal
	367.20	0.12	MUDSTONE- poorly laminated. Medium to dark grey-brown. Few plant fragments, possible rootlets. Core badly broken with calcite veinlets perpendicular to core axis. Few fragments of baked coal and calcite in box.
	368.88	1.68	MUDSTONE - medium to dark, grey-brown. Few plant fragments at 0.45 m above base, thin fine silty laminae, parallel-laminated. Calcareous throughout. Aprupt.
	369.20	0.32	MUDSTONE - dark grey, calbonaceous, locally black, canneloid with bright coal bands. Listricated calcite at 45° CA near base. Non-calcareous. Core badly broken throughout. Abrupt. Equivalent to Lower Leaf of Upper Chamberlain Seam.
			BASE OF UPPER CHAMBERLAIN SEAM
	370.37	1.17	SANDSTONE/SILTSTONE (70:30) - medium to dark grey, very fine-grained sandstone with thin interbeds and laminae of dark grey siltstone. Overall, poorly sorted. Sandstone strongly siltstone moderately calcareous. Slickensided at 0.15 m below top (78° CA) thin band (0.005 m) of crumpled calcite veinlets, 0.60 m below top. DD 311.0 at base - should be 371.0.
	371.99	1.62	SANDSTONE, very fine-grained/SILTSTONE (80:20) - medium to dark grey sandstone with laminae and thin interbeds of dark grey siltstone. Sorting poor. The sandstone component is dominantly fine-grained in the basal 0.44 m. Parallel to low-angle cross-lamination throughout with medium-scale low-angle cross-lamination dominant in the fine-grained sandstones, towareds the base of the interval. Core groung

BH Ros. BP 42

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			at 1.18, 1.26, and 1.56 m below base. Calcareous at top, increasing gradually to strongly calcareous at base. DD 372.6 at base.
	372.48	0.49	SANDSTONE , very fine-grained/SILTSTONE (60:40) - interlaminated medium to dark grey sandstone and grey siltstone; small-scale cross-lamination from top to 0.155 m below topl sandstone component lacking, replaced by dark grey mudstone and siltstone from 0.155 to 0.28 m siltstone and sandstone as before from 0.28 to base, but lamination largely obscured by bioturbation; some small sandy burrows preserved in this interval. Calcareous throughout.
	372.86	0.38	SILTSTONE/MUDSTONE (50:50) - dark grey, thinly laminated. Calcareous throughout. This section of core shows vertical grooves from drilling equipment; it may not be in its correct place in the sequence.
	372.88	0.02	SILTSTONE/SANDSTONE, very fine-grained (50:50) - calcareous thinly laminated, medium grey sandstone and dark grey siltstone. As the preceding section this may not be in the correct place.
	373.96	1.08	SILTSTONE/MUDSTONE/SANDSTONE, very fine-grained (60:30:10)- thinly laminated, medium grey sandstone and dark grey siltstone and mudstone. Locally bioturbated, obscuring lamination. Sporadic small worm burrows. Calcareous. DD 374.1 at base.
	374.58	0.62	SILTSTONE/MUDSTONE/SANDSTONE (75:20:5) - thinly laminated dark grey siltstone and mudstone with lenses of medium grey sandstone. Parallel lamination throughout. Strongly calcareous throughout. Slickensides and calcite at 0.045 m below top (80° CA); 0.395 m (85° CA).
0° at 30° from 0° to 1° at base	375.40 to 374.68	0.82 to 375.08	MUDSTONE/SILTSTONE (50:50) - dark grey, interlaminated. Parallel lamination throughout, with local small-scale low-angle cross-lamination. Weakly to moderately calcareous throughout. Thin, irregular calcite veins from 0.02 to 0.09 m below top (0° to 20° CA). Slickensides at 0.085 m (87° CA). Listricated at 0.20 m (85° CA), slickensides at 0.24 m (85° to 90° CA) and 0.31 m (87° CA). Calcite vein at 0.32 m (35° CA) and 0.40 m (42° CA). Slickensides at 0.42 m (80° CA), 0.47 m (65° CA) and 0.50 m (85° CA). Lamination dipping 30° from 0.465 m to 0.50 m below top, associated calcite parallel to lamination. Possible "sigmoidal laminite" type structure. Slickensides at 0.80 m (86° CA). DD 375.6 at base.
	376.95	1.55	SILTSTONE/MUDSTONE (50:50) - grading down to 100% mudstone- dark grey mudstone with medium to dark grey silty lenses and laminae. Mudstone is laminated throughout: alternating

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION	
5° at	375.58		dark grey, with very dark grey, probably reflecting the presence or absence of silt and organic matter. Siltstone	
2° at	375.58	Dominantly	lenses convex-up, planar base, suggesting ripples. Dominatly parallel lamination; some low-angle small-scale cross-lamination. Moderately calcareous throughout. DD 377.1 at base.	
	377.07	0.12	MUDSTONE - dark grey, homogenous, structureless. Core baked by drilling. Non-calcareous. Broken, abrupt	10 cm ROOF SAMPLE BP 42/CH/R
			TOP OF LOWER CHAMBERLAIN SEAM	
	377.09	(0.02)	Core loss - rock	
	377.23	0.14	MUDSTONE - black, canneloid (bone)	BP 42/CH/7
	377.29	0.06	COAL - bright banded, broken stick	
	377.32	0.03	COAL - dull, stick	
	377.36	0.04	COAL - dull and bright stick	BP 42/CH/6
	377.40	0.04	COAL - dull, lustrous, stick	
	377.49	(0.09)	Core Loss - COAL	
	377.51	0.02	COAL - dull, lustrous, stick	
	377.61	0.10	COAL - bright, broken, stick	
	377.73	0.12	COAL - dull, lustrous, broken stick	
	377.98	0.25	COAL - bright banded, broken stick	BP 42/CH/5
	378.08	0.10	COAL - dull banded, broken stick	
	378.21	0.13	COAL - dull and bright, stick	
	378.24	0.03	COAL - bright stick	
	378.34	0.10	COAL - dull and bright broken	BP 42/CH/4
	378.46	(0.12)	Core loss - COAL	
	378.52	0.06	COAL - dull and bright badly broken	
	378.76	0.24	COAL - dull banded, broken stick	
	378.85	0.09	COAL - dull; minor bright bands, stick	
	378.96	0.11	COAL - bright banded, stick	BP 42/CH/3
	379.04	0.08	COAL - dull banded, broken	
	379.16	0.12	COAL - dull and bright, stick	
	379.52	0.36	COAL - bright banded, slightly sheared at top	0.15 BP/42/CH/2

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION	
	379.59	0.07	COAL - bright, broken	BP/42/CH/2
	379.73	0.14	COAL - bright, stick	
	380.21	(0.48)	core loss - COAL	
	380.23	0.02	COAL - dull, stick	
	380.26	0.03	COAL - bright banded, broken	BP/42/CH/1
	380.32	0.06	COAL - bright, thin sandy stringers at base. Stick gradational and attached at base.	
			BASE OF LOWER CHAMBERLAIN SEAM	
	380.53	0.21	SANDSTONE - Lower Chamberlain Seam Floor - Medium to coarse grained, dark grey. Carbonaceous, with coaly stringers at top, grading over a thickness of 0.01 m into the Chamberlain Seam proper. Quartz-chert, well-sorted, non-calcareous. Slickensided surface with coaly materal and calcite, 0.08 m below top (71° CA). Coaly band (0.001 m thick) 0.13 to 0.17 m below top (45° CA), may mark a scour surface. Gradational at base.	
	386.25	5.72	SANDSTONE - medium-grained, grading down to fine-grained at base. Medium to dark grey, estimated quartz 60%, chert 40%, distinctive "salt and pepper" appearance. Clean, well-sorted. Massive at top, large-scale cross-stratification at base. Coaly fragments at 1.02 m. 1.72 m and 1.75 m below top. Core slickensided with calcite at 2.38 m (50° CA), 2.44 m (75° CA), 2.49 m (70° CA) and 2.53 m (75° CA). Shaly intraclast at 2.74 m below top. Very fine-grained sandy and silty laminae comprise 5% of the interval from 3.20 to 3.49 m belowtop. Mudstone from 3.49 to 3.51 m, polished and slickensided at 85° CA. Slickensides and calcite at 3.55 m (80° CA), 3.62 m (87° CA) and 3.73 m below top (75° CA). Core broken from 4.70 to 4.87 (15° CA) with patchy calcite. Slickensides and calcite at 4.99 (70° CA) 5.07 (82° CA), 5.23 (70° CA), 5.30 (60° CA), 5.37 (57° CA) 5.42 (37° CA), 5.44 (60° CA), 5.56 (33° CA), 5.58 (40° CA) m below top. Core broken at low angle to core axis at base. Unit calcareous to 4.41 m belwo top; gradational to strongly calcareous at base.	
	386.25		BASE OF HOLE - DD 386.4 m	

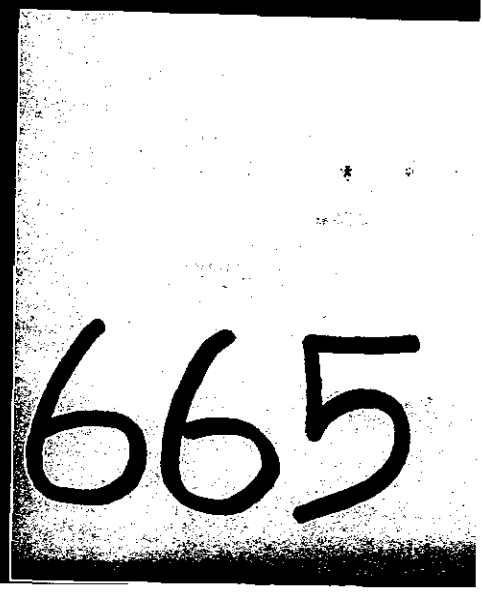
PR- SUKUNKA 78 (3) A.

SUKUNKA 1978 EXPLORATION

PROGRAM

BP-47

(DDH)



SUKUNKA 1978 B.H.No. BP 47

Contractor: CMS

Commenced: 26. June, 1978

Completed: 4. July, 1978

Co-ordinates: 61 19035.937 N
5 89947.322 E

Surface Elevation: 1495.49 m

Core Size: NQ

Casing Left in Hole:

Hole Angle: } see details on next page

Hole Azimuth: }

Logged by: C. Bickford — Depth 6.65 to 293.38
D.J. Mitchell — 293.38 to 401.60

Final Depth: 401.60

Depth to top of cored section: 6.65m

FORMATION/MEMBER	DEPTH	THICKNESS	ELEVATION
GATES	82.26	75.61+	1413.23
SUKUNKA	216.14	133.88	1279.35
MOOSEBAR	293.25	79.11	1202.24
GETHING: UPPER	379.60	86.35	1115.89
MIDDLE		22.00+	
LOWER			

SEAMS	DEPTH	THICKNESS	%RECOVERY	ELEVATION
Gates B	26.12	1.18 (mudstone)	63.56 %	1469.37
Gates A	29.37	0.49 (mudstone)	48.98 %	1466.12
Bird	294.54	1.29 (split)	32.56 %	1200.95
U. Chamberlain	332.55	2.10 (split)	70.95 %	1162.94
L. Chamberlain	343.42	2.76	51.81 %	1152.07

BPB INSTRUMENTS (CANADA) LTD

From:

To:

Date: 6 July 1978

BP # 47 - SUKUNKA 1978

Depth	Inclination	Deviation
50 m.	N 34° W	2° -
100 m.	N 25° W	2° 45'
150 m.	N 32° W	2° 30'
200 m.	N 22° W	2° 45'
250 m.	N 28° W	2° 45'
300 m.	N 29° W	3° 15'
350 m.	N 23° W	3° 30'
400 m.	N 19° W	4° -

---oooOooo---

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	6.65	6.65	OVERBURDEN- no core. Pebbles in core box.
			GATES
	16.47	9.82	SANDSTONE- fine to medium-grained; dominantly medium-grained from top to 9.2m; dominantly fine-grained from 15.10m to base. Medium grey, clean, well-sorted. Moderately to strongly calcareous throughout. Quartz 65-70%, chert 30-35%. Medium to large-scale low-angle cross-lamination. Small, thin (0.0002m) shaly intraclasts from 8.97m to 8.99m. Sporadic, faint, medium-sized (0.003m) worm burrows with faint dark rims, from 12.57m to 13.58m. Small (0.001m) faint burrows from 15.99m to 16.23m. Large (0.004m) faint, dark rimmed burrows from 16.18m to 16.33m Joints at 6.95m (75°CA; core rusty for 0.01 to 0.02m on either side), 7.08m (83°CA; core rusty for 0.005m on either side), 7.6m (88°CA; core rusty for 0.005m on either side), 7.85m (89°CA; core rusty for 0.005m above joint). Core broken, slightly rusty, from 8.20m to 8.24m. Joints at 9.25m and 9.26m (85°CA; core rusty between joints and for 0.005m above). Rusty joint at 10.41m (78°CA), and 11.41m (85° to 90°CA). Joint at 11.44m (45°CA), with dark grey stain parallel to joint, for 0.02m below joint, and faint parallel dark bands for 0.13m below joint. Core broken from 11.63m to 11.70m, (34°CA) with parallel dark bands as above. Core ground at 13.30, core loss on the order of a few centimetres at most. Joints at 13.80 (25°CA and 84°CA, core rusty for 0.005m below). Joints at 14.70m (35°CA), 14.79m (60°CA), 14.85m (65°CA), 14.96m (65°CA) 15.03m (55°CA). Rusty patches througout the interval, from 14.70m to 15.03m. Joint planes intersect at ~45° angle.
	16.59	0.12	MUDSTONE- dark grey, very badly broken and coated with a thick layer of drilling mud. Baked appearance, probably bit "burned in " at this point.
5°at	24.76 18.35m	8.17	SANDSTONE, fine-grained / MUDSTONE(50:50)- medium-grey sandstone, both as clean, well-sorted beds to 0.25m thick, and interbedded in various proportions (average 70% mudstone) with dark grey silty mudstone. Clean sandstone composed of 65% quartz, 35% chert; strongly calcareous, with medium-scale low-angle cross-lamination, local abundant shaly intraclasts, erosional with load casts at base. Interbedded sandstones less well-sorted, non-calcareous, commonly grading upward into silty mudstone, and erosional at base. Local small dark burrows in the mudstone; abundant large (0.004 to .005m) sandy burrows throughout the interbedded intervals. Abundant carbonised plant fragment and two thin coaly lenses in basal 0.04m. Abundant listri surfaces throughout on mudstone laminae and interbeds, generally parallel to lamination. Slickensides and minor calcite from 17.82m to 17.86m (75°CA). Slickensides and

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			calcite at 21.90m (75°CA). Core badly broken with rough, rusty slickensides and calcite at 22.69m. Abrupt at base.
	24.94	0.18	CONGLOMERATE- clasts of dark grey chert, black chert, greenish grey chert, white quartzite, all well rounded, many with weathering rinds, in a porous, non-calcareous fine sand matrix, with carbonaceous fragments at the top. Matrix is indistinguishable from the overlying sandstone, which is also non-calcareous. Clasts range from very coarse sand size to pebbles grater than 0.045m (core diameter). Sorting within this sunit is poor. As the base of the unit is represented by a single large clast completely occupying the core, the basal contact may or may not be erosional, but is abrupt.
			TOP OF GATES "B" SEAM
	24.98	0.04	COAL- dull, broken.
	26.12	1.14	MUDSTONE- dark grey, carbonaceous at top, becoming silty towards middle; sheared, broken, carbonaceous with coaly bands at base. Slump structure in upper 0.10m of unit. Bedding is churned throughout; few small (0.001m to 0.002m) burrows. Slickensides at 45°CA at 25.14m. Abundant shearing and slickensides from 25.45m to base (30° to 55° CA). Between 25.52m and 26.12m, 0.17m core recovered, badly broken, including a fragment of coal, bright banded (0.01m). CORE LOSS 0.43m.
			BASE OF GATES "B" SEAM
3°at	28.88 26.52m	2.76	SANDSTONE, fine to very fine-grained/SILTSTONE, argillaceous(50:50)- medium grey, interbedded and interlaminated. Small to medium-scale low-angle cross-lamination. Abundant plant fragments. Phases of dark grey, carbonaceous mudstone from 26.22m to 26.37m, 26.90m to 27.02m , and 28.12m to 28.28m. Sandstones only locally clean;generally silty or argillaceous. Unit non-calcareous at top; calcareous at base. Basal 0.37m dominantly clean sand. Abrupt.
			TOP OF GATES "A" SEAM
	29.37	0.49	MUDSTONE- dark grey, carbonaceous. Coal at base, recovered 0.04m of coal, dull and bright. Upper 0.13m of unit recovered fully, but 0.25m core loss at base of unit, probably above the coal.
			BASE OF GATES "A" SEAM
	41.75	12.38	CONGLOMERATE- well-rounded pebbles of white quartzite, light and dark grey chert, grey-green chert. No matrix

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			observed; clasts are well cemented by interstitial silica. Weathering rinds on many clast, and good rounding suggest second cycle origin. Rock very strong and hard; locally porous. Sorting generally good; clasts range from very coarse sand and granular to pebbles of 0.03m. Mean 0.005 to 0.006m. From 41.37m to base, increasing proportion of fine-grained sand until base is reached; taken as base of granules. Gradational.
3°at	52.76m 48.63	11.01	SANDSTONE- fine-grained, medium grey, clean, well-sorted. Quartz 65% chert 35%. Weakly calcareous at top, grading to strongly calcareous from 42.98m to base. Locally abundant carbonised plant fragments, from 41.85m to 42.60m. Granules at 42.67m; pebbles at 43.62m, 43.72m and 44.33m. Calcite at 46.74m (88°CA). Core rusty and broken at 46.99m (70°CA). Slickensides and calcite at 47.19m (82°CA). Core rusty and broken from 47.14m to 47.44m (0° to 15°CA). Calcite at 47.34m (85°CA) and 47.44m (coarsely crystalline 75°CA). Slickensides and clacite at 47.50m (88°CA), and 50.18 to 50.43m. Slickensides and clacite at 50.81m (88°CA). Rough, rusty fracture from 50.72 to 50,87m (0° to 70°CA). Calcite veinlet at 50.85m (18°CA), and 50.93m (90°CA). Calcite with slickensides (0.005m thick) at 50.94m (80°CA). Slickensides and calcite at 51.37m (70° CA), also rough, rusty fractures near parallel to core axis. Slickensides and calcite at 51.47m (88°CA). Core broken from 52.31m to 52.50m, with slickensided surfaces from 65° to 90°CA, with rough, rusty joint at 15°CA, and calcite at 28°CA. Silty laminae from 52.38m (50% of rock) to 52.59m (5% of rock.) Abrupt.
8°at	56.18 53.78	3.42	SANDSTONE, fine to very fine-grained/MUDSTONE(50:50)- Lenticular laminae and interbeds of dark grey silty mudstone and medium grey, low-angle cross-laminated sandstone. Sandstone with minor argillaceous laminae, from 53.02m to 53.12m , and 55.71m to 56.03m. Common erosional contacts at base of sandstones,with load casts into underlying mudstones. Mudstones generally as discrete layers, although some upwards gradation from sandstone to mudstone. Abundant intraclasts and wisps of sand and mud. A few small (0.001m) dark burrows, and medium (0.003m) sandy burrows. Local intense bioturbation. Slickensides and calcite from 53.14m to 53.22m (85°CA). Core polished, with clacite, at 54.78m (88°CA). Listricated and slickensided at base (82°CA). Sandstones strongly, mudstones weakly calcareous Abrupt.
	67.35	11.17	SANDSTONE- fine-grained, medium grey, with thin dark grey argillaceous laminae. Quartz 65%, chert 35%, sorting good but low porosity due to argillaceous content. Large-scale

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			low-angle cross-lamination. Weakly to moderately calcareous. Intensely bioturbated, burrowed sandstone/mudstone (50:50) at 59.00 to 59.17m, 59.46 to 59.33m, 60.10 to 60.28m,(with coaly stringers), 62.42 to 62.80m, 63.07 to 63.12m, 63.24 to 63.39m, 65.53 to 65.74m, 66.97 to 67.04m, and 67.10 to 67.29m. Slickensides and calcite at 56.36m (79°CA). Listric surfaces and calcite from 56.46 to 57.39m, at 30°, 50°, 80°CA range. Core broken with listric surfaces, slickensides and clacite from 57.31 to 58.38m. Core badly broken from 57.53 to 57.72m. Fault, possible. Slickensides and calcite at 58.63m (85°CA). Core badly broken, some shearing and calcite, from 59.75m to 59.00m Core ground, 58.99 to 59.25m. Slickensides and calcite at 59.17 (60°CA), 59.25 (78°CA), 59.37 (84°CA) 59.45 (68°CA) 59.52 (70°CA) 59.60 (87° CA). Core broken, rough and rusty from 59.45 to 59.60 (20°CA). Calcite at 61.44 (90°CA) and 61.49 (88°CA).
7°at	65.93		NOTE: DD Bocks 59, 60.1 and 62.4 are out of place, due to leaving core in hole on barrel pulls. Core broken with slickensides and calcite from 62.10 to 62.40m (80°CA). Slickensides and clacite at 63.55m (87°CA). Listric surfaces at 70° to 90° CA in sandstone/mudstone from 65.52 to 65.74m, and in mudd y parting at 65.93m. Slickensides in sandstone, possibly "baked"at 66.23m. (68°CA). Abrupt at base.
	67.43	0.08	CONGLOMERATE- subrounded to rounded pebbles and granules (0.002 to 0.008m) within 30% matrix of very fine to fine-grained sand. Clasts of dark and light grey chert, greenish grey chert, white quartzite and shell fragments. Sandstone lens at base. Calcareous throughout. Erosional
	68.13	0.70	MUDSTONE/SANDSTONE (50:50)- sandstone, very fine to fine-grained, medium grey, interbedded with mudstone, silty, dark grey. Bedding generally destroyed by intense bioturbation. Scattered large (0.004m) burrows. Coarse-grained, clean sandstone, strongly calcareous, from 67.53 to 67.66m. Elsewhere, weakly calcareous. Core broken parallel to core axis, from 67.55 to 68.40m (below base of interval.) Abrupt.
	70.96	2.83	SANDSTONE/MUDSTONE (80:20)- sandstone, fine-grained, mediu grey, quartz-chert, strongly calcareous, thin argillaceous laminae, ripple to large-sxale, low-angle cross-laminated, interbedded with mudstone, very silty, dark grey. Extensive bioturbation towards base; sporadic large (0.004m) burrows and small shaly intraclasts. Sandstones erosional and load-casted at base. Abrupt.
	82.26	11.30	SANDSTONE, fine to very fine-grained/ SILTSTONE/MUDSTONE

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
4°at	76.22		(40:30:30)- rapidly alternating lenses and interbeds of medium grey sandstone and dark grey siltstone and mudstone. Sandstones erosional at base, grading upward to siltstone and mudstone. Locally intense bioturbation; large (0.004 to 0.005m) and small, dark (0.001m) burrows. Strongly calcareous throughout, with local very strongly calcareous, clean, fine to medium-grained sandstone, with probably abundant detrital carbonate. Core broken parallel to core axis 70.96 - 71.47, 73.06 - 73.24. Calcite and slickensides 79.34 (70°CA). Core broken parallel to axis 80.33 to 80.50. Listicated coaly parting 80.85. Calcite and slickensides 80.97 (62°CA). Core broken, rough and rusty 81.40 - 81.70 (10°CA), 81.89 - 82.13.
GATES			
SUKUNKA			
	87.17	4.91	SANDSTONE, fine to very fine-grained/SILTSTONE (80:20)- interbedded, medium grey small cross-laminated sands, grading upwards into medium grey silts. Sands erosional and load casted at base. Abundant medium and large burrows (.003 - .005), small dark burrows (less that 0.001), and large pelecypod burrows (.025). Generally bioturbated, commonly slumped. Sheared coaly lenses 84.40 - 84.45. Slickensides, and calcite 84.54 (80°CA), slickensides and coarsely crystalline rusty calcite 84.82 (47°CA), 84.84 (83°CA); calcite 84.88 (85°CA); slickensides 85.75 (87°CA), slickensides at 86.08 (88°CA).
6°at	86.31		
	98.28	11.11	SANDSTONE, very fine-grained/SILTSTONE(60:40)- light to medium grey sandstone with silty laminae, interbedded with dark grey siltstone. Medium-scale low-angle cross-lamination where preserved; unit generally intensively bioturbated. Weakly calcareous throughout; locally moderately calcareous in unchurned sandstones. Ubiquitous small dark (0.001m) burrows; sporadic large (0.004m) sandy burrows. Slickensides and calcite at 95.56m (68°CA) and 96.07m (80°CA), 97.83m (52°CA). Gradational.
3°at	96.45m		
0°at	102.68m		SILTSTONE, argillaceous/SANDSTONE, very fine-grained (95:5)-
	103.72	5.44	dark grey, extensively bioturbated siltstone with lenses of ripple-laminated sandstone. Abundant small, dark burrows Sporadic medium (0.003m) worm burrows, both horizontal and vertical, and large (0.015 to 0.020m0 pelecypod burrows. Weakly calcareous throughout. Slickensides at 98.30m (90°CA). Core broken near core axis (10°CA) from 99.11 to 99.50m and parallel to core axis from 100.01 to 100.28. Core broken, rough, slightly rusty, from 100.84 to 100.93 (22°CA), and 101.06 to 101.15m (23°CA), and 101.35 to 102.10m (0° to 25°CA). Core badly broken 101.70 to 101.96 -does not appear to be structural origin, but rather due

BH Nos. BP47

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			to hammering. Gradational.
	112.74	9.02	MUDSTONE, silty/SILTSTONE, (95:5)- Intensively bioturbated dark grey mudstone, with scattered lenses of medium grey siltstone. Vague low-angle lamination. Ubiquitous small, dark burrows, and serrated burrows. Siltstone lenses generally burrowed and partially obscurred, with some large (0.004m) light, silty burrows. Sporadically, weakly calcareous. Core broken near parallel to core axis from 103.72 to 103.98m, trace of rusty calcite (0° to 20°CA). Trace of calcite at 104.52m (40°CA). Core broken from 105.45 to 105.60m, with joint at 10°CA. Core ground at 105.60m. Core broken but no calcite, from 106.10 to 106.40m. Core broken parallel to core axis from 108.29 to 108.97m. Mud, very light grey, poorly indurated, from 109.01 to 109.39. Interbedded with normal silty mudstone, slumped together, appears reworked. Composition:- 20% calcite (secondary, as veinlets and impregnation); 10% biotite, as brown hexagonal plates; 70% clay. Probable reworked tuff. Fractures, filled with calcite at 109.09 (20°CA). Core broken near parallel to core axis, from 109.39 to 101.96.
	122.03	9.29	SILTSTONE/SANDSTONE, very fine-grained (95:5)- medium to dark grey, intensively bioturbated, with vague remnant lamination and local sandstone lenses toward base. Abundant small dark burrows from top to 116.0m; local concentrations of burrows from 116.0 to base. A few serrated dark burrows. Large, vertical pelecypod burrows at 121.20. Strongly calcareous throughout very fine-grained sandstone bed from 116.10 to 116.42. Weakly calcareous throughout rest of unit. Rough joint with calcite at 116.19m (50°CA), and 116.37m (80°CA). Some calcite at 120.97 (90°CA). 121.07 (88°CA), 121.10m (85°CA). 20% sandstone in basal 1.0 meter; gradational.
1°at	148.27 128.61m	26.24	SILTSTONE/MUDSTONE/SANDSTONE, VERY FINE-GRAINED (70:25:5)- intensely bioturbated, weakly calcareous, siltstone and mudstone (indistinguishably churned together) with thin interbeds of sandstone, also bioturbated, but recognisable. Ubiquitous small dark burrows, and abundant medium (0.003 to 0.005m) sandy, light burrows. A few large vertical pelecypod burrows near base. Undisturbed sandstone bed from 141.33 to 141.35m shows ripple cross-lamination. Calcite at 126.71m (90°CA). Core broken parallel to core axis from 127.32 to 127.44m, with calcite and minor pyrite. Poorly preserved pelecypod valve at 129.56m; specimen BP47/F1. Core broken at 20°CA, rough, no mineralization, from 130.36 to 130.50m and 130. 47 to 130.56m (parallel fractures). Calcite at 135.19m (83°CA). ?shell fragments at 135.31 and 135.22m;

BH Nos - BP47

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			0.009 to 0.030m long, 0.0007m thick, with a columnar structure reiniscent of that in Inoceramus. Calcite at 135.33m (85°CA). Calcite at 135.50m (90°CA), adjacent to pyritic nodule in siltstone. Rough joints 136.56 to 136.87 m (5°CA), and 138.16 to 138.48m (0° to 10°CA). Pelecypods at 139.78 and 139.93 (specimens, BP47/F2 and BP47/F3). Cephalopods at 138.62m (poorly preserved: BP47/F4). Rough fracture parallel to core axis, from 142.32 to 142.62. Calcite at 143.30m (81°CA), and 143.81m (80°CA). Pelecypod at 143.97m (BP47/F5). Rough fracture from 147.62 to 147.79m (10°CA). Gradational.
	153.31	5.04	SANDSTONE, fine to very fine-grained/SILTSTONE/MUDSTONE (80:15:5)- medium grey sandstone with silty laminae, interbedded with bioturbated, churned dark grey siltstone
1°at	148.52		and mudstone. Low-angle medium-scale cross-lamination and large (0.005m) dark-rimmed, sandy "Gates-type" burrows in sandstone. Mica flecks. Small dark burrows in siltstone and mudstone. Sandstones erosional, load-casted at base, sometimes bioturbated at top below siltstone beds. Strongly calcareous throughout. Calcite at 148.69m (88°CA). Gradational.
	158.40	5.09	MUDSTONE, SILTY/SANDSTONE, very fine-grained(75:25)- dark grey silty mudstone, intensely bioturbated, with interbeds and laminae of medium grey sandstone. Some low-angle and ripple lamination in sandstones. Small dark burrows in mudstones; sandstones are not burrowed except at top : occasional pelecypod burrows. Strongly calcareous throughout. Calcite at 153.81m (90°CA). Rough fracture with calcite (5° to 30°CA) from 154.73 to 154.82m. Fractures at 0° to 30°CA, but unmineralised, from 155.22 to 156.02m, and 157.27 to 157.84m. Gradational.
	195.38	36.98	MUDSTONE/SILTSTONE/SANDSTONE, very fine-grained (75:20:5)- dark grey, bioturbated siltstone and mudstone, intimately churned together, with lenses of medium grey siltstone and sandstone, and interbeds of sandstone to 0.18m thick. Bioturbation is generally so complete that burrows are difficult to recognise, but abundant dark burrows are evident
4°at	159.96		where the degree of churning is not as high. A few pelecypod burrows. Sandstones generally with silty laminae;
6°at	176.66		dominantly low-angle, medium-scale cross-lamination, with
6°at	196.08		some ripple lamination. Strongly calcareous throughout. Rough fracture from 159.16 to 159.30m (18°CA). Calcite at 166.34m (35°CA). Rough fracture from 171.83 to 171.90m (30°CA). Rough fracture with patchy calcite at 172.45m (86°CA). Slickensides and calcite at 173.67m (78°CA). Calcite at 176.50m (87°CA). Rough, slightly rusty fracture at 177.85 to 177.91m (35°CA). Rough fractures from 180.62 to 180.88m (82°CA) and 181.69 to 181.89m (79°CA).

BH Nos. BP47

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			Rough, slightly rusty fractures from 182.23 to 182.36m (18°CA), and 180.69 to 180.74m (42°CA). Core broken from 0° to 20° CA, patchily rusty and calcareous, from 185.59 to 185.98m, and from 186.60 to 187.07m. Core broken near parallel to core axis, from 194.65 to 194.83m.
	201.92	6.54	MUDSTONE/SILTSTONE/SANDSTONE, very fine-grained (85:10: 5)- dark grey, intensely bioturbated mudstone and siltstone, indistinguishably churned at top and abrupt at base. Small-scale, low-angle cross-lamination is preserved in the sandstones; siltstones and mudstones are only vaguely banded. Scattered small dark burrows. ? Shell fragments similar to those observed at 135.21 and 135.22m, at 200.31 m. Specimen BP47/F6. Core broken 198.36 to 198.54 (10° and 25°CA), 198.90 to 191.52m (0° to 20°CA), and 201.39 to 201.48m (0°CA). Unit strongly calcareous throughout; gradational base.
3°at	200.52		
	216.14	14.22	MUDSTONE/SILTSTONE (90:10 to 98:2) at base.- dark grey mudstone and siltstone, intensely bioturbated and churned together. Vague banding of lighter silt-rich layers and darker muddy layers. Basal contact taken at base of last calcareous band. Unit strongly calcareous at top, grading to sporadically calcareous at base. Slickensides and calcite at 203.69m (89°CA). Core broken with clacite along rough surface from 203.84 to 204.07 (5° to 15°CA), and core broken from 204.12 to 204.26m (18°CA) and from 204.82 to 204.90m (0° to 5° CA). Core broken near paralle to core axis, from 206.83 to 207.23m. Slickensides and calcite at 201.49m (90°CA). Gradational at base.
SUKUNKA			
MOOSEBAR			
	292.27	76.13	MUDSTONE- dark grey, homogeneously slightly silty. Common pyritized worm burrows from 250m to base. Non-calcareous throughout. Core broken, rough, unmineralised, from 216.75 to 216.84m (48°CA; three parallel fractures). Core ground at 218.6; no loss indicated. Core broken at 5° to 14°CA from 221.96 to 222.18m, and at 0°CA from 222.32 to 222.62m. Calcite veinlet from 223.37 to 223.44m (14°CA). Smooth fracutre from 224,28 to 224.34m (30°CA); rough fracture from 224.52 to 224.58m (35°CA), and 225.49 to 225.56m (28°CA). Patchy calcite from 228.07 to 228.13m (40°CA). Slickensides and coarse calcite at 229.18m (83° CA); slickensides and clacite from 230.80 to 231.07m (5° CA); core broken at 2° to 7° CA from 231.10 to 231.40m. Unidentifiable shell fragments at 232.69 and possible pygitised gastropod (poorly preserved). Core broken (0° to 20°CA) from 233.90 to 234.40m. Core broken (60° to 70°CA) from 234.83 to 234.94m, from 235.14 to 235.35m (40° to 60° CA), and from 235.62 to 235.80m (45°CA). Core broken at 237.55m (67°CA). Slickensides at 237.84m

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			(87°CA); core broken at 75° to 90°CA. Slickensides and calcite at 78°CA at 238.90m. Slightly grooved fractures at 240.29m (75°CA) and 240.37m (72°CA). Fracture at 240.37 to 240.44m (20°CA). Rough fractures with gauge bands from 240.62 to 240.69m., (25° and 75°CA). Abundant rough fractures from 240.60 to 241.20m (40° to 45°CA). Core broken with slickensides and calcite from 243.35 to 243.55m (0° to 35°CA). Slickensides and calcite at 244.16 (80° to 85° CA). Core broken from 244.53 to 244.63m (65° ti 70°CA), and from 244.78 to 245.27m (probably due to hammering of core). Slickensides, quartz and calcite at 245.49 and 245.56m (68°CA). Core listricated, with calcite at 246..20m (67°CA). Slickensides and calcite at 246.07m (81°CA), at 246.40m (55°CA), 246.70m (80°CA), 246.81m (80°), 246.83m (50°), 246.90m (60°). Calcite from 246.70 to 246.81m (10°CA). Slickensides and calcite at 247.01m (40° and 68°CA) and 247.03m (77°CA). Listric surface at 247.16m (88°CA). Ferruginous band from 250.46m to 250.50m. Rough slickensides at 252.34m(88°CA). ?shell fragments from 252.50 to 252.52m, similar to those at 135.21 and 200.31m. Listric surface (82°CA) at 254.98m. Core broken at 0° to 5°CA, from 254.98 to 255.20m. Listric surfaces from 255.37 to 255.56m
2° at	250.46		(50° to 80°CA). Core broken parallel to core axis from 255.85 to 256.19. Smooth fractures across core from 255.85 to 259.43m; 0.05 to 0.20m apart, at 45° to 70°CA. Calcite at 45°, 58° and 90°CA, at 258.36m. Slickensides and calcite at 261.22 and 261.26m (55° and 60°CA). Core broken parallel to core axis, from 261.30 to 261.46m; 263.20 to 263.35m, and 263.91 to 264.07m. Slickensides and calcite at 263.75m (52°CA), 265.33m (20°CA), 265.36m (80° CA), 265.39m (80°CA), 265.58m (62°CA), 266.00m (46°CA), 266.17m (88°CA). Core internally sheared and listricated at 267.37m. Calcite veinlets at 80° to 85°CA, from 267.42 to 267.44m. Ferruginous band from 269.16 to 269.29m; modular structure with calcite veining. Slickensides and calcite at 272.91m (38°CA). Core sheared and broken (45° to 60°CA) from 273.30 to 273.42m. Slickensides at 52°, at 273.56m. Ferruginous band with nodular structure and calcite veining as above, from 273.62 to 273.70m. Listrication and coarse calcite at base. Slickensides and calcite at 273..85m (72° CA). Bentonite band: hard, sheared, with dark worm burrows, from 274.77 to 274.87m. Calcite at 276.78m (68°CA) and277.17m (80°CA). Slickensides
6° at	284.64		at 277.02m (38°CA). Bentonite, hard, greasy lusture and surface, soft and sheared in top 0.05m; from 280.03 to 280.22m. Calcite at 282.88m (68°CA). Ferruginous bands, with burrows, from 283.32 to 283.47m and 284.88 to 284.96m. Lens of fine-grained, medium grey sandstone at 284.63 to 284.64m. Slcikensides at 285.48m (32°CA). Pyritic bands from 285.69 to 285.91m. Slickensides at 287.80 and 287.85

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			(88°CA). Bentonite from 288.45 to 288.47 (hard, bioturbated, 50% dark mudstone churned in); 291.13m (0.005m churned stringer; hard), from 291.52m to 291.62m (estimated 10% of inerval is bentonite as wisps and burrow-fillings); 292.16 to 292.23m (10% of interval ; churned, hard and sheared at base); 292.57m to 292.66n: 0.04m at top churned and burrowed, hard with greasy surface; underlain by 0.01m soft and muddy; basal 0.04m is hard and fragmented. Abrupt basal contact with normal dark grey mudstone. Base of Moosebar mudstone is marked by 0.03m bentonite band, from 292.82 to 292.85m: hard, greasy, with large worm burrows filled with dark grey-green, glauconitic mudstone. Abrupt base.
			SANDSTONE- dark green, glauconitic, pyritic. Muddy matrix, floating medium-grained sand and chert granules. Matrix increases to top (10% to 60%). Interpreted as basal transgressive facies of the Moosebar. Erosional. Slickensides and calcite from 293.07 to 293.33. (45°, 62°, 75°CA). Basal 0.11 sampled. Erosional base, dip 0° to 50°.
	293.25	0.98	BP47/BD/R
MOOSEBAR			
			TOP OF BIRD SEAM
UPPER GETHING			
		0.03	COAL- sheared with calcite veinlets and 30% pyrite as worm burrows. Stick.
		(0.36)	CORE LOSS - coal.
		0.05	COAL- dull banded, sheared, pyritic in basal 0.02. Core ground at top. Stick.
			BP47/BD/5
		0.03	COAL- dull banded, common pyrite. Stick.
		0.03	COAL- dull banded. Stick.
		0.05	COAL- dull, sheared, common pyrite, slickensides 80°CA at base. Stick.
		0.02	MUDSTONE- dark grey, carbonaceous, listricated. Broken stick.
		0.05	COAL and MUDSTONE fragments, 65:35. Coal, dull, sheared and pyritic; mudstone dark grey, carbonaceous, sheared with bright coal streaks.
			BP47/BD/4
		(0.19)	CORE LOSS- COAL
		0.02	COAL- dull, lustrous, pyritic, ground at top. Stick.
			BP47/BD/3
		0.02	MUDSTONE- dark grey, carbonaceous, listricated. Stick.
			BP47/BD/2
		(0.32)	CORE LOSS-COAL

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
		0.05	COAL- bright banded, ground at top and base. Stick.
			BP47/BD/1
		0.05	COAL - bright, slickensided. Fragments.
	294.54	0.02	COAL- dull, lustrous, slickensided. Gragments. Sharp irregular, unattached base.
			BASE OF BIRD SEAM
	294.72	0.18	SEAT EARTH MUDSTONE- dark grey and carbonaceous with abundant coaly and listric roots.
	295.14	0.42	MUDSTONE- medium grey, few silty laminae. Parallel bedded. Few coaly plant fronds, leaves, and roots throughout. Sharp vague rotation surface and minor core loss at base.
	295.26	0.12	SANDSTONE- medium grained, quartz/chert, dark-grey top becoming lighter to base, carbonaceous matrix, well-sorted, siliceous. Irregular surface with few vitrain fragments at top. Massive.

Dip °	DEPTH m	THICKNESS m	DESCRIPTION
Sedimentary dips up to 20°.	312.02	16.76	SANDSTONE- medium grained to 301.24, fine below; quartz/chert (70:30), light grey, locally medium grey, strongly calcareous. Massive and poorly laminated to 296.90, parallel bedded 296.90 to 297.58 cross set 298.60 to 301.23, generally parallel bedded with dips up to 20° and few ripple sets below to base. Abundant white pin burrows 297.35 to 298.66, few dark mudstone in filled pin burrows. Irregular high angle rough locally calcite lined and slickensided joint passes down core 296.11 to 296.98. Occasional locally common calcite in filled high angle inclined fractures (15 to 25°CA), top to 305.25.
	316.78	4.76	MUDSTONE/SILTSTONE/SANDSTONE/ fine to very fine-grained (50:30:20), interlaminated and thinly interlayered. Dark and light grey banded. Light grey sandstones strongly calcareous, dark grey siltstones and mudstones moderately calcareous. Abundant light and dark pin, light cuspate, few large dark burrows, few pelecypod burrows; locally bioturbated. Common small scale slumping with load casts. Sand layers commonly cross-set with erosive bases and generally gradational locally sharp eroded tops. Sand and silt layers occasionally include small mudstone brecciated stringers. Few pyritic burrows 312.08. Fine pyritic coal streak 312.13. Mud and silt layers occasionally contain disseminated pyrite. Bedding lined with .001m calcite 312.65 and 312.83. Few small pelecypod valves at 313.52.
	317.22	0.44	PASSAGE BED, SANDSTONE medium-grey/MUDSTONE silty dark and carbonaceous; interlayered. Sand layers consist of thinly interlayered fine and medium-grained sandstone. Sand layers strongly calcareous, mud layers very weakly calcareous. Few large sand filled burrows in mud layers, common brecciated angular mud fragments in 0.06 sand layer at 317.00. Sand layers have sharp eroded and locally slumped tops. Few sub vertical, ?carbonaceous roots 316.79 to 316.89. Interconnecting trellise of fine calcite in filled fractures 316.82 to 316.86 (65° to 75°CA). 317.13 to 317.20 (25° to 40°CA). Listric slickensided parting 316.88 (47°CA.), semi-polished parting 316.16 (65°CA). Listric bedding plane at base (87°CA).
2° at	318.35 318.00	1.13	SANDSTONE fine-grained, light grey, calcareous, quartz/chert (60:40) - clean and well sorted, generally massive with vague parallel bedding. 0.02 siltstone rounded lense at 318.01. ____sharp, listric, non-erosive, 2° dip._____
1° at	318. 318.55	0.26	MUDSTONE- dark and carbonaceous in top 0.09 with common

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			plant debris, few silt laminae below increasing in frequency to base. Non-calcareous. Rough joint at 318.56. (10°CA). Abundant fine carbonaceous plant debris.
	319.18	0.57	SILTSTONE, muddy & SANDSTONE very fine-grained 65:35, 40:60 below 318.81. Interlaminated, sand laminae, calcareous, silt and mud weakly calcareous. Parallel bedded in basal 0.19. Common cross-sets top to 318.89, 318.94 to base. Train drift 318.89 to 318.94. Very brief passage, fairly sharp base.
	320.10	0.92	SANDSTONE, fine-grained top becoming medium to base, fairly well sorted, highly calcareous, light-grey; quartz/chert (60:40). Large cross-sets, few locally common small sub-rounded mudstone clasts and fine coal streaks. Diastem at 319.97.
			sharp, sub-horizontal, slightly erosive.
2° at 320°	322.00	1.90	MUDSTONE and SILTSTONE- interlaminated 70:30 to 321.85, few silt laminae only below. Calcareous, colour banded. Common pin burrows, few pyritic worm tubes throughout. Crumpling and slumping adjacent to soft sediment microfaulting 320.15 - 320.27. Core heavily shattered along sub-vertical rough joint at 321.39; .09m core lost. Occasional disseminated pyrite. Coaly parting at base.
			fairly sharp, irregular, 5° dip.
	325.30	3.30	SANDSTONE/ medium-grained, medium-grey/ few locally common dark carbonaceous muddy and silty laminae and fine layers to 323.08. Quartz/chert(60:40), well sorted. Dark with carbonaceous matrix in top 0.10m. Common ripples and small scale cross-sets where mud laminae/layers present, large cross-sets where absent. Occasional fine coal streaks. Sub-vertical rough joint passes down core 322.36 to 322.49, rough joint at 323..02 (3 to 10°CA). Occasional polished or semi-polished calcite lined and slickensided bedding planes to 323.08 and at 323.83. Fine calcitic bedding planes and small irregular tension fractures 323.77 to 323.86. Large globose burrows 325.93 to 326.05.
	326.90	1.60	SANDSTONE, fine-grained, medium-grey/MUDSTONE silty, dark and carbonaceous. Interlaminated and thinly interlayered. 40:60 to 325.55, 60:40 below. 0.35 layer with 85% sand at 326.34. Sands weakly calcareous, muds non-calcareous. Occasional ripple cross-lamination. Crumpled with some root disturbances to 325.79. Coaly roots and thoroughly root disturbed 325.99 to 326.15. Few small occasionally

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			large sand filled burrows 325.79 to 325.99, 326.15 to base; 0.13m. bioturbated layer at 326.35. Sub-horizontal slickensided bedding planes with parallel fine calcite veining adjacent, at 325.67. Rough joint at 326.87 (10°CA)/ Abundant coal flecks and fine coaly plant debris in muddy layers. Occasional disseminated pyrite and pyritic burrows in muddy layers. Occasional, locally common small pelecypod valves to 325.99 ; (kept for identification, sample number, BP47/F7).
			sharp, slightly erosive
	327.72	0.82	MUDSTONE- silty, few silt laminae, dark and carbonaceous. Occasional burrows. Small pelecypod valve at 327.25. Common disseminated pyrite, occasional small pyrite lenses. Common vitrainous and fusainous plant debris.
	328.04	0.32	SILTSTONE/SANDSTONE very fine-grained (70:30)- interlaminated, dark grey, slightly calcareous. Common roots. Laminae sommonly crumpled and root disturbed. Thoroughly disturbed in top 0.15m.
	328.47	0.43	MUDSTONE- dark and slightly carbonaceous, poorly laminated, non-calcareous. Common fine coaly plant debris.
	328.49	0.02	MUDSTONE- unlaminated, carbonaceous, abundant coaly plant debris. Basal 0.02 sampled. BP47/CHU/7
			sharp, unattached, rotation surface
			TOP OF SHELL COAL
		0.13	MUDSTONE- very carbonaceous, common fine coal streaks, few semi-polished bedding planes. Fitting discs.
		0.02	COAL- bright and dull banded, slightly dirty. Disc.
		0.06	MUDSTONE- very carbonaceous, common fine coal streaks, few semi-polished bedding planes. Discs. BP47/CHU/6
		0.05	MUDSTONE- silty, dark and slightly carbonaceous. Discs.
		0.01	MUDSTONE- very carbonaceous, common fine coal streaks. Disc
	328.76		sharp, listric BASE OF SHELL COAL
	328.87	0.11	SANDSTONE- very fine-grained, dark and carbonaceous, unlaminated. Abundant coaly roots. NOT SAMPLED

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			VERY BRIEF PASSAGE
	330.17	1.30	SILTSTONE/dark and muddy/SANDSTONE- very fine to fine - grained, interlaminated, ranging from 70:30 to 30:70. Crumpled with root disturbance to 329.34, rare below. Ripple drift at 329.80. Few diastems, rare ripple sets. Few low angle calcite in filled fractures 329.63 to 329.73.
5° at base.			Few small burrows in base. 0.29m core lost at 329.63. MUDSTONE-poorly laminated, dark , occasional fine coaly plant debris, few pin burrows. Locally shattered with minor
	330.45	0.28	core loss. NOT SAMPLED
			TOP OF UPPER CHAMBERLAIN SEAM
		0.05	MUDSTONE- silty, poorly laminated, dark, occasional fine coaly plant debris, few pin burrows. BP47/CHU/5
		0.01	MUDSTONE-dark carbonaceous, rotation surface at base. Disc. BP47/CHU/4
	330.51		TOP OF UPPER LEAF
		0.10	COAL- dull and lustrous; few polished planes dip 47°. ragments.
		0.04	COAL- dull banded, few polished planes dip 47°. Fragments. BP47/CHU/3
		( )	CORE LOST - COAL.
4°		0.06	COAL- dull banded, single microfault dip 45°. Stick.
		0.03	COAL- dull banded. Stick.
		0.08	COAL- dull banded, sheared; cleats dip 30°, listric plane at base dip 40°. Stick.
		0.05	COAL- bright. Semi- polished plane centrally dip 40°. Fitting discs. BP47/CHU/2
		( )	CORE LOST- COAL.
		0.07	COAL- bright banded. Fragments.
		0.11	COAL- bright, sheared; cleats dip 15°. Stick.
		0.02	COAL- bright banded. Partial disc and fragments. BP47/CHU/1
	331.68		
			BASE OF UPPER LEAF
	331.84	0.16	MUDSTONE- silty, dark grey, common carbonaceous root-lets. Calcite lined and slickensided polished plane 331.72 (45°CA)

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
			——————BRIEF PASSAGE——————
	332.36	0.52	SILTSTONE, poorly laminated, dark-grey, common rootlets. Core shattered with few high angle listric breaks 332.08 to 332.21, 0.15 core lost at base.
			——————UPPER CHAMBERLAIN SEAM, LOWER LEAF, (not sampled)
	332.55	0.19	MUDSTONE- very carbonaceous, fragments. 0.01m fragments recovered, thickness from geophysical log.
			—————— BASE OF UPPER CHAMBERLAIN SEAM ——————
	333.47	0.92	SILTSTONE- muddy, unlaminated, dark with abundant coaly plant debris and roots; hard, medium-grey, slightly calcareous, seatearth appearance. Common rregular fine sub-horizontal calcite lined coal streaks. Rough joint at 332.89 (5° CA).
	334.30	0.83	MUDSTONE dark/SILTSTONE- sandy, medium-grey, 60:40, locally 70:30, interlaminated. Few thin very fine grained sand layers. Strongly calcareous. Crumpled and slightly disturbed with vague burrows. Cross sets 333.71 to 333.89.
Sedimentary dips up to 4°.	340.66	6.36	MUDSTONE- dark with common silt laminae. Few very fine sand laminae and rippled lenses 337.00 to 340.32. Colour laminated, weakly calcareous. Slightly crumpled appearance with common pin burrows. Sand laminae occasionally bioturbated. Few pelecypod burrows 337.10 and occasionally below. Pelecypod valve at 337.15. Occasional coaly plant debris. Calcitic fractures 336.46 to 336.93. Poorly laminated in basal 0.06. Listric and calcite lined sub-horizontal bedding plane at base. Basal 0.06 Sampled. BP47/CHL/R
			—————— TOP OF LOWER CHAMBERLAIN SEAM ——————
	340.66	(0.07)	CORE LOSS- CANNELOID MUDSTONE.
		0.04	CANNELOID MUDSTONE- sharp attached BP47/CHL/5
		0.04	COAL- dull. Stick.
		0.07	COAL- bright. Stick.
		0.06	COAL- bright banded. Partial stick. BP47/CHL/4

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
		0.01	COAL- bright banded. Fragments.
		0.08	COAL- bright banded. Stick and partial stick.
		0.04	COAL- dull and bright banded. Fragments.
		(0.12)	CORE LOSS- COAL.
		0.11	COAL- bright banded. Partial stick.
		0.05	COAL- dull banded. Partial stick.
		0.08	COAL- dull and bright banded. Partial sticks. BP47/CHL/3
		0.03	COAL,- bright banded. Fragments.
		0.02	COAL- bright banded. Stick.
		0.10	COAL- bright banded. Stick.
		0.08	COAL- dull banded. Stick. BP47/CHL/3
		0.04	COAL- bright banded. Partial stick.
		0.05	COAL- bright, few dulls. Partial stick.
		0.10	COAL- bright banded. Fragments.
		0.03	COAL- bright banded. Fragments.
		(0.47)	CORE LOSS- COAL.
		0.06	COAL- bright, rotation surface at top. Stick.
		0.04	COAL- bright banded. Partial sticks.
		0.05	COAL- bright banded. Stick. BP47/CHL/2
		0.01	COAL- bright banded. Partial disc.
		0.04	COAL- bright banded. Stick.
		0.06	COAL- bright banded, few low angle polished planes. Fragments.
		(0.33)	CORE LOSS- Dirty COAL/MUDSTONE. (from geophysical logs).
		0.09	COAL- bright and dull banded. Stick.
		0.01	COAL- bright and dull banded. Partial disc. BP47/CHL/1
		0.04	COAL- bright. Partial stick. Semi-polished base, 5° dip.

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Dip °	DEPTH m	THICKNESS m	DESCRIPTION
	343.42	(0.34)	CORE LOSS- COAL.
			BASE OF LOWER CHAMBERLAIN SEAM
	343.47	0.05	SANDSTONE, medium-grained, quartz/chert, dark-grey with carbonaceous matrix, non-calcareous.
Sedimentary dips up to 15°.	355.60	12.13	SANDSTONE, medium-grained and moderately calcareous to 347.44, fine-grained and highly calcareous below. Quartz/chert, 60:40, well sorted. Massive and thoroughly bioturbated to 346.48, becoming well laminated below. Occasional, locally common small dark burrows to 347.90. Few local croos-sets. Generally parallel bedded with dunes and occasional diastems. Few extensive unmineralized or calcite conjugate joint pairs to 352.4 (7° to 13° CA), core badly fractured with ? slickensided calcitic joints (15 to 20° CA), 344.10 to 344.95.
			sharp, slightly irregular, erosive, 5° dip.
	361.80	6.20	MUDSTONE, dark and SILTSTONE/SANDSTONE very fine-grained 60:40, light grey, thinly interlayered. Highly calcareous throughout. Sand layers commonly have erosive bases and gradational tops. 0.22 sand layer at 356.39 with common diastems and large angular tabloid, generally flow aligned mudstone clasts. Sand layers and lenses occasionally cross-set or containing angular mudstone clasts. Few, locally common small light and dark burrows. Sand layers commonly crumpled and slumped, mudstone layers commonly contain load casts. Few pelecypod burrows below 361.25. Few low angle irregular calcitic tension fractures 361.22 to 361.30. 0.98 SANDSTONE fine-grained, well sorted, light-grey, highly calcareous, quartz lithic, parallel bedded unit with few ripple sets at top and bottom, erosive base at 358.23. 0.33 parallel bedded layer with 0.05 coarse grain sand, small calcite and mudstone clasts at erosive base 360.15. Few thin coarse and very coarse sand layers and infilled large burrows below 360.99. 0.16 very coarse sandstone at base of unit.
5° at	357.70		
			sharp, irregular, erosive
Sedimentary dips up to 15°	379.60	17.80	SANDSTONE, fine-grained, medium-grey becoming lighter down, quartz/chert 60:40, highly calcareous, well sorted. Parallel bedded with low angle dunes and few diastems. Partly bedded and massive 378.17 to 378.89. Few thin black mudstone layers up to 0.03 thick with rare sand load casts, sand filled burrows and ripple set sand lenses. Occasional horizons of small or thin layers of large sub-angular to sub-rounded flow aligned tabular mudstone clasts. 0.62 cank band, ? ferruginous, at 377.90. Two large sand

Dip o	DEPTH m	THICKNESS m	DESCRIPTION
			filled pelecypod burrows, 0.05 and 0.08 long at 374.91. Occasional calcite lined joints (17 to 27°CA). Irregular interconnecting trellise of calcite infilled fractures, general trend 37° CA, 379.08 to 379.18.
	UPPER GETHING / MIDDLE GETHING		EXTENDED PASSAGE
	401.60	22.00	MUDSTONE/SILTSTONE/SANDSTONE- fine to very fine-grained, 40:30:30 becoming 60:25:15 below 388.70. Generally thinly interlayered, occasionally interlaminated. Sand and occasionally silt commonly cross-set with erosive bases. Highly calcarous throughout. Abundant crumpling and slumping, common small dark muddy burrows, large sand filled worm and irregular extensive pelecypod burrows. Sand layers contain common small, few large angular brecciated mudstone clasts. Few large pyrite concretions up to 0.05 with calcite lined bedding planes at 387.40. Occasional sand load casts in silt layers. Occasional fine carbonaceous plant debris.
			BASE OF BOREHOLE.