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WELDWOOD OF CANADA LIMITED VANCOUVER, BRITISH COLUMBIA

Prepared For :

Prepared By :

NTS Sheet 92 F.11

BRITISH COLUMBIA

EAST CENTRAL VANCOUVER ISLAND

HAMILTON LAKE COAL LICENCE No. 7483, NELSON LAND DISTRICT. CUMBERLAND COAL FIELD, Lat. 49 deg. 34', Long. 125 deg. 03'

1984 EXPLORATION WORK

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GEOLOGICAL BRANCH

ASSESSMENT REPORT

Jon 4, 1985

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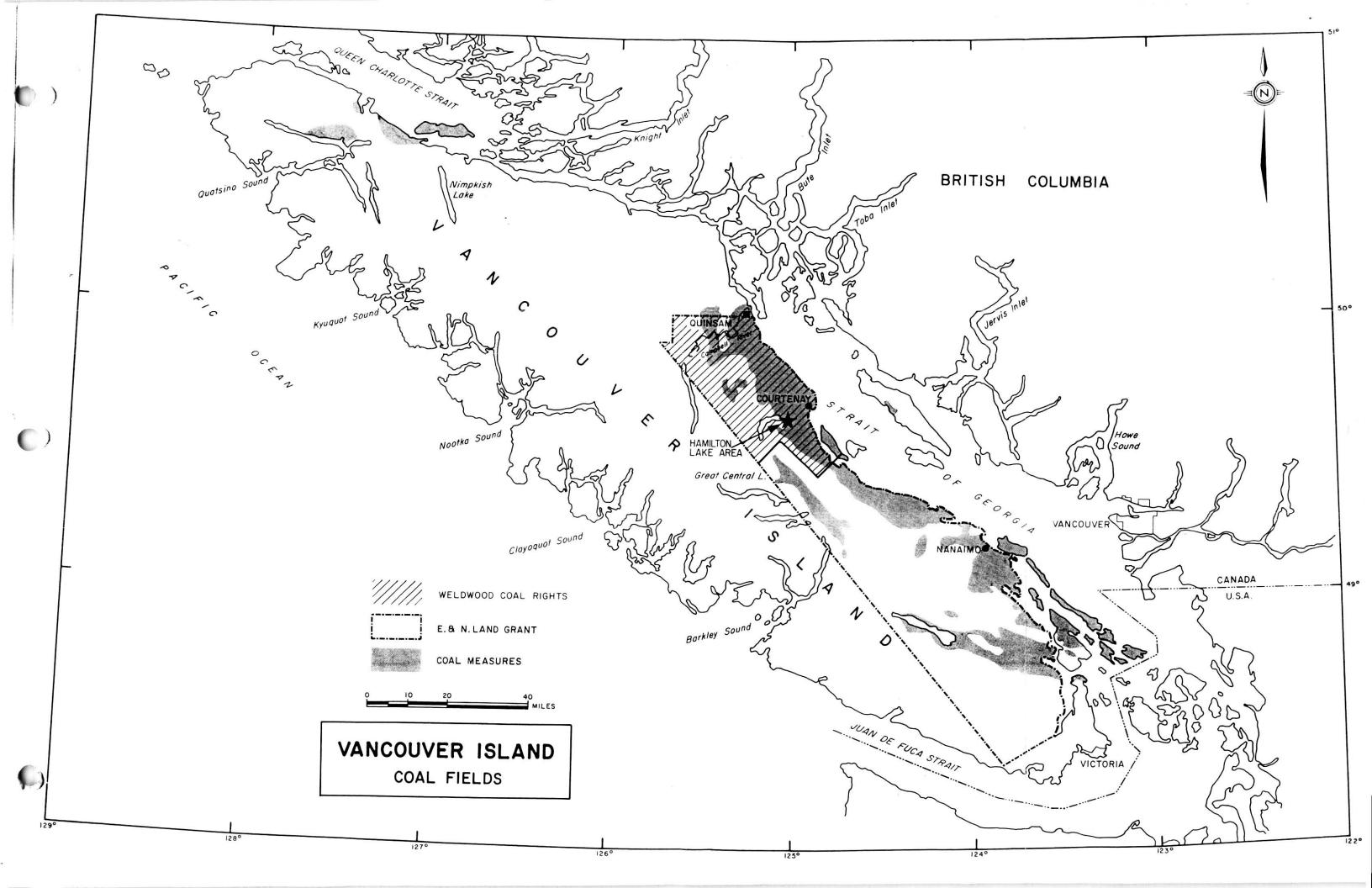
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INTRODUCTION

1.1 LOCATION AND DESCRIPTION OF THE HAMILTON LAKE COAL LICENCES

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Coal Licence Numbers 7480, 7481, 7482 and 7483, held by Weldwood of Canada Limited, are located in the Cumberland Coalfield on the east coast of Vancouver Island between Latitude 49 degrees 34 ' to 49 degrees 36' and Longitude 125 degrees 02' to 125 degrees 05'. Weldwood of Canada Limited owns extensive fee-simple coal rights throughout the Cumberland-Comox area. In addition to these large holdings of fee-simple rights, some of the outlying areas of the coalfield are held by Weldwood of Canada Limited under licence from the British Columbia Provincial Government. The Hamilton Lake area, covering the aforementioned coal licences, is one of these areas.

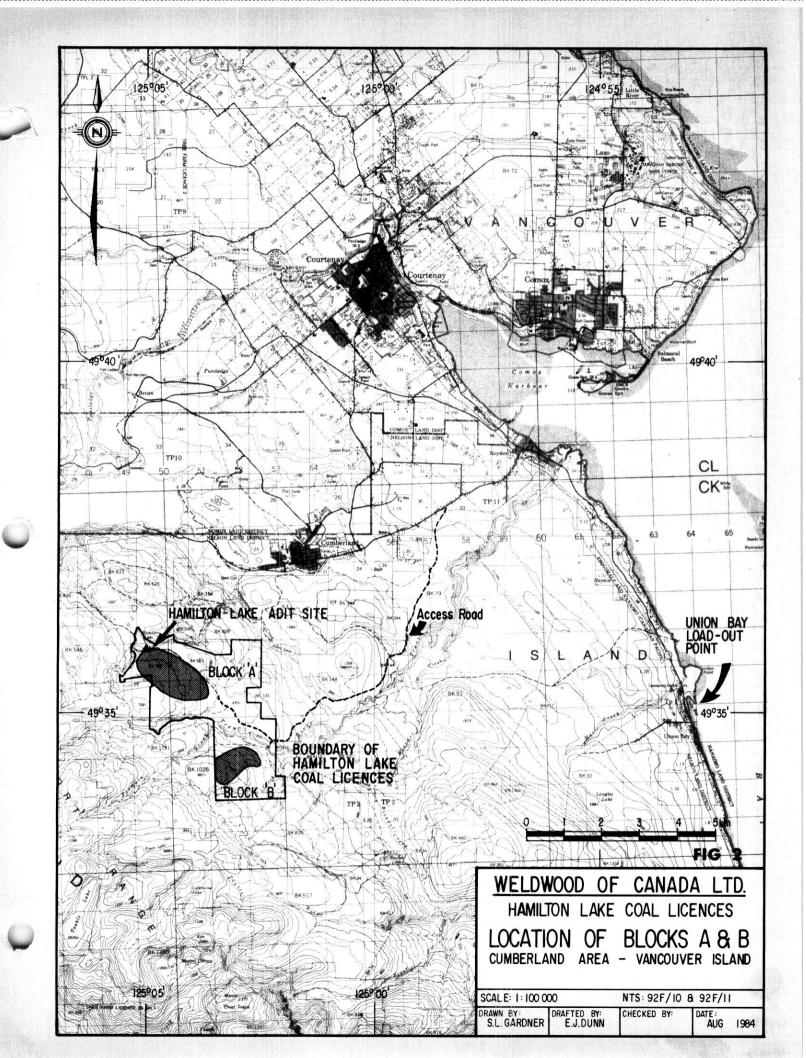
The present coal licences were once part of the the Esquimalt and Nanaimo Railway Land Grant and were held fee simple by Weldwood of Canada Limited after its purchase of Canadian Collieries in 1964. In 1973 Weldwood cut down on the size of its coal holdings within the Railway Belt. The Hamilton Lake area was surrendered to the Crown. After further evaluations, the company decided to reacquire the area, which necessitated applications for licence.

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The Hamilton Lake coal licences, issued on October 1, 1982 form a contiguous block of licences covering approximately 1091 hectares. They lie in the Nelson Land District, approximately 6.5 km due southwest of the village of Cumberland. Access to the area is via 12 km of good gravelled logging road owned and maintained by Pacific Forest Products Ltd.. This logging road joins the Royston-Cumberland highway approximately 3 km northeast of Cumberland. The total road to the old Union Bay shipping wharf is 23 kilometres.

1.1.1 Physiography

The Hamilton Lake Coal Licences cover a high plateau area that overlooks the broad Comox Valley. The towns of Courtenay, Comox and the Comox airport are all visible in the distance to the northeast. The topography on this plateau ranges from 400 to 650 metres above sea level. The plateau is one of a number of low ridges that form the foothills along the east side of the Beaufort Mountains.



The northern part of the licence area covers part of the Cumberland waterworks district. Hamilton Lake, which is the highest dammed lake in the water supply, directly abuts the coal measures on the north end of the licence area. In keeping with previous studies on the Hamilton Lake licences, this northern part of the licence area is termed Block 'A'.

Drainage in the middle and south end of the licence area occurs in deep, steep-sided valleys. The Trent River is the major drainage in this part of the licence area. Between the Trent River and Idle Creek to the south, a small area of sedimentary deposition occurs. This is termed the Block 'B' area. All of the current year's exploration work is confined to this Block 'B' area.

1.1.2 Description of Previous Work

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The coal seams at Hamilton Lake were known about for many years but the relatively inaccessible nature of the area during the mining period and the generally dirty characteristics of the coal at outcrop deterred development.

As part of an on-going program of evaluation and assessment of its holdings, Weldwood of Canada Limited constructed a bulk sample adit in the coal measures near the edge of Hamilton Lake in 1976. A 20 ton bulk sample was extracted and shipped to Birtley Engineering in Calgary for float-sink and washability testing.

As a follow-up to this work, a number of exploratory drillholes were completed in 1978 in order to determine the size and extent of the coal reserve. These holes confirmed the presence of a number of coal seams in the Block 'A' area north of the Trent River, and the Block 'B' area, south of the Trent River. The scattered nature of the drillholes allowed preliminary reserve estimates to be made for each of the two areas, however it was recognized that more work was required in order to establish the boundaries of each deposit and determine the geology with respect to the coal measures.

In 1983, a small program of field-mapping and surface geology led to the planning of a more detailed drilling program covering both areas, staged over a period of years. The initial stage of this drilling program was completed in June of 1984.

1.2 DESCRIPTION OF PRESENT WORK

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The 1984 drill program was confined to the Block 'B' area, south of the Trent River. A total of 10 drillholes were completed in this area between June 18 and June 29, 1984. Certain coal sections were cored in three of these holes. Total drilling amounted to 354 metres, with an additional 33 metres cored.

1.2.1 Method of Operations

Drilling was conducted on existing access roads which were upgraded with the aid of a D-7 Caterpillar. One Bucyrus-Erie Model 24R air rotary drilling rig equipped with a drill-thru casing hammer for overburden work and a downhole percussion hammer for rock drilling was employed. All holes were cased to the rock with heavy-duty 15.2 cm. water-well casing. Core was retrieved with a standard 3 metre long conventional Christiensen core barrel, cutting 7.6 cm. core. Holes were geophysically. logged with a standard gamma-density resistance-caliper log suite. | Hole locations were surveyed to a benchmark elevation. Casing was cut off below ground level and holes were cemented with surface plugs.

1.2.2 Cost Summary

Table 1 summarizes the field costs of the 1984 work : "

ITEM	TOTAL COST	
Drilling	\$ 8,375.00	
Coring	1,400.00	
Cementing	562.50	
Bits & Consumables	1,116.00	
Fuel	408.00	
Casing	1,611.00	
Travel	315.00	
Room & Board	1,050.00	
Mobilization	650.00	
SUB-TOTAL		\$ 15,244.50
Cat Work & Reclamatio	n	2,125.00
Geophysical Logging		2,803.58
Surveying		1,000.00
Supervision		5,506.62
Miscellaneous Supplie	5	595.10
TOTAL ON-PROPERT	Y EXPENDITURE :	\$ 27,274.80
FF-PROPERTY COSTS :	,	
Map Freparation		3,300.00
Final Reporting		4,900.00
Drafting and Reproduc	tion	912.43
Office and Miscellane		273.48
Word Processing		50.00
Laboratory Analytical	Work	5,507.70
TOTAL OFF-PROPERT	Y EXPENDITURE* :	\$ 14,943.61
GRAND TOT		\$ 42,218.41

TABLE 1. - COST SUMMARY, 1984 EXPLORATION PROGRAM

* NOTE : Does not include head office and administration charges.

The overall cost per foot for this program is \$33.42, or \$110.00 per metre. The direct drilling cost per foot is \$12.95, or

\$42.50 per metre.

The following is a list of contractors which supplied services to Weldwood of Canada Limited during the course of the 1984 field work :

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McElhanney Surveying and Engineering, Vancouver, B. C. Drillwell Enterprises Ltd., Cowichan Bay, B. C. D. Prowse Bulldozing, Courtenay, B. C. Don J. Campbell Surveying, Lantzville, B. C. Canadian Arctic Survey Systems Ltd., Calgary, Alberta Gardner Exploration Consultants, Nanaimo, B. C.

In addition to these contractors, numerous supplies and services were purchased from local businesses in the Courtenay area.

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SUMMARY AND CONCLUSIONS

As a result of the current year's exploration on the Block 'B' area of the Hamilton Lake coal licences, the following conclusions can be drawn:

- A total in→situ coal reserve of 2.21 million tonnes has been proven to occur in the Block 'B' area, within an approximate 10 : 1 raw overburden to coal ratio.
- This coal reserve is contained within 3 main coal zones in the reserve area, of which the middle zone in particular consists of a number of coal bands separated by rock partings.
- 3. The seams display a variance in quality and thickness from hole to hole. This variance is due to depositional factors affecting coal seam generation, rather than structural complications.
- 4. The structure of the area is relatively simple, with the formation dipping uniformly to the northeast, forming a

dip-slope mining situation along the edge of the plateau area.

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- 5. The coal is ranked High Volatile Bituminous 'A', with a Sulphur Content of approximately 2 %. It exhibits good coking qualities, with some sections being high in ash on a raw basis.
- 6. Drilling shows a continuation of the lowermost and possibly the middle coal zones outside of the existing licence boundary to the southwest.

GEOLOGIC SETTING

Because of its marginal continental location, the geologic history of Vancouver Island is chiefly related to plate tectonics and massive crustal movements on the Pacific margin of North America. Vancouver Island represents submarine and later terrestrial vulcanism associated with rifting along an ocean floor subduction zone, formed from the Pacific oceanic plate colliding with the western edge of the North American continental plate and being subducted beneath the continental margin. These crustal movements began in Paleozoic time and have continued to the present. Most of the vulcanism associated with the rifting

took place in early Mesozoic time. During Jurassic and Triassic time, massive outpourings of pillow and flow lavas, and aquagene tuffs formed volcanic island arcs which eventually formed the Insular Mountain Belt, which covers Vancouver Island, the Queen

^{1.} Muller, J. E., "Evolution of the Pacific Margin, Vancouver Island and Adjacent Regions", Can. Journal of Earth Science, Vol. 14, 1977

Charlotte Islands, the Alaska Panhandle and the Wrangell and St. Elias ranges of Alaska. These volcanic buildups are represented on Vancouver Island by the thick basalts of the Triassic Karmutsen Formation, and the major batholiths of the acidic Island Intrusions. These volcanic complexes form the basement rock upon which later clastic sediments of Cretaceous Age were deposited.

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3.1 SEDIMENTATION

In the Cumberland area, Upper Cretaceous sediments of the Nanaimo Group occur in unconformable contact with the volcanic basement rock of the Triassic Karmutsen Formation. The Nanaimo Group in this area is represented by Comox Formation sandstones, siltstones, shales and coal beds. In addition to these, the Benson basal conglomerate member of the Comox Formation is evident. This basal member signifies the beginnings of Late Cretaceous Nanaimo Group deposition on the old erosional surface of the Triassic basalts.

3.2 STRUCTURE

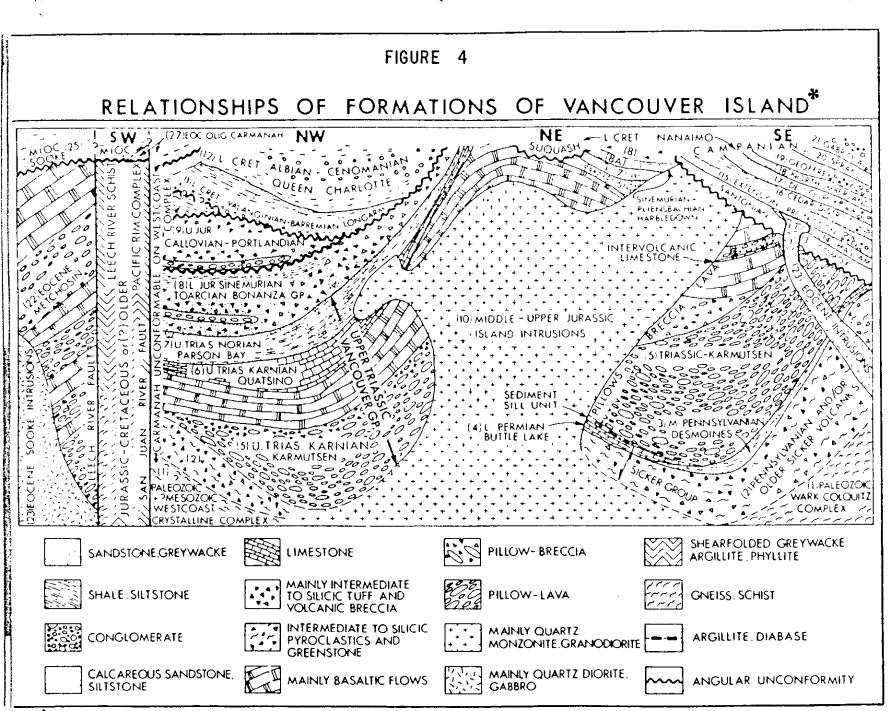
The structure of the Cumberland coalfield and areas to the south

TABLE OF FORMATIONS OF VANCOUVER ISLAND*

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	PERI	OD	STAGE	GROUP	FORMATION	SYM- BOL	AVERAGE	LITHOLOGY
S					late Tert.volc's of Port McNeill	T∨s		
ENOZOIC	ļ				SOOKE BAY	трТѕв		conglomerate, sandstone, shale
			EOCENE to		CARMANAH	eoTc	1,200	sandstone, siltstone, coglomerate
Ž			OLIGOCENE		ESCALANTE	eTE	300	conglomerate, sandstone
บ	_		early EOCENE		METCHOSIN	еТм	3,000	basaltic lava, pillow lava, breccia, tuff
			MAESTRICHTIAN		GABRIOLA	uKGA	350	sandstone, conglomerate
					SPRAY	υKs	200	shale, siltstone
			CAMPANIAN		GEOFFREY	υKG	150	conglomerate, sandstone
					NORTHUMBERLAND	υKN	250	siltstone, shale, sandstone
		ш щ			DE COURCY	uKbc	350	conglomerate, sandstone
		<			CEDAR DISTRICT	uKcd	300	shale, siltstone, sandstone
					EXTENSION - PROTECTION	υΚερ	300	conglomerate,sandstone,shale, coal
ر					HASLAM	υКн	200	shale, siltstone, sandstone
Z 0 I			SANTONIAN		СОМОХ	υKc	350	sandstone, conglomerate, shale, coal
		٢	CENOMANIAN ALBIAN	QUEEN	conglomerate unit	IKoc	900	conglomerate, greywacke
s S		RL	APTIAN?	CHARLOTTE	siltstone shale unit	IKap	50	siltstone, shale
Ц			VALANGINIAN BARREMIAN		LONGARM	lΚι	250	greywacke, conglomerate, siltstone
S NS	SSIC	MIDIO	TITHONIAN CALLOVIAN		Upper Jurassic sediment unit	υJs	500	siltstone.argillite.conglomerate
		(≻_	TOARCIAN?	0.0010.017.0	volcanics	IJв	1.500	basaltic to rhyolitic lava, tuff, brecci minor argillite, greywacke
	JUR		PLIENSBACHIAN SINEMURIAN		HARBLEDOWN	IJн		argillite, greywacke, tuff
	<u>v</u>	ш	NORIAN		PARSON BAY	URPB	450	calcareous siltstone, greywacke, silty limestone, minor conglomerate, brecc
	SSI	AT	KARNIAN	VANCOUVER	QUATSINO	URQ	400	limestone
	A	-			KARMUTSEN	muλκ	4,500	basaltic lava, pillow lava, breccia, tu
	TR	MID	LADINIAN		sediment – sill unit	Teds	750	metasiltstone, diabase, limestone
PALEOZOIC	p.				BUTTLE LAKE	СРві	300	limestone, chert
	PENN.and ? PER.M.	ļ		SICKER	sediments	CPSs	600	metagreywacke,arg.illite, schist, marb
0	PEA PEA				volcanics	CPsv	2,000	basallic to rhyolitic metavolcanic
PALE	DEV. or EARLIER							flows, tuff, agglomerate

* Courtesy: Muller, J.E., "Geology of Vancouver Island" G.S.C. No. O.F. 463, 1977



*Courtesy: Muller, J.E., "Geology of Vancouver Island", G.S.C. No. O.F. 463, 1977

of the coalfield is dominated by major normal faults that strike in a general northwest to southeast orientation. These faults are usually downthrown to the northeast. Secondary reverse faulting also occurs. These reverse faults are hinged, so that displacements along the fault line vary from zero to 10 or 20 metres. In the Hamilton Lake area, sedimentary blocks that have been uplifted as a result of tectonic movement are isolated from each other by volcanic terrain from which the later sediments have been completely eroded away, exposing the old Triassic unconformity.

Sedimentary blocks usually dip to the northeast at angles of 6 to 16 degrees. However, near fault zones and areas of intense structural disturbance, dips can be steeper.

3.3 SURFICIAL GEOLOGY

The uplifted sedimentary areas, such as the Block 'A' and Block 'B' areas at Hamilton Lake, have been subjected to considerable glacial scour. On the tops of these plateau areas, striations and grooves created by the movement of ice are visible. These striations are aligned in an east-northeasterly direction.

Because of the relatively steep nature of the flanks of the uplifted sedimentary blocks, glacial deposition occurs,

especially on the northeast side of these areas, which is the lee side of the ice movement. Up to 30 metres of glacial till is present in these areas and in the valleys separating them. These till accumulations on the flanks of the hills mask fault contacts and generally smooth out the topographic contours of the Cretaceous erosional surface.

DESCRIPTION OF THE COAL MEASURES

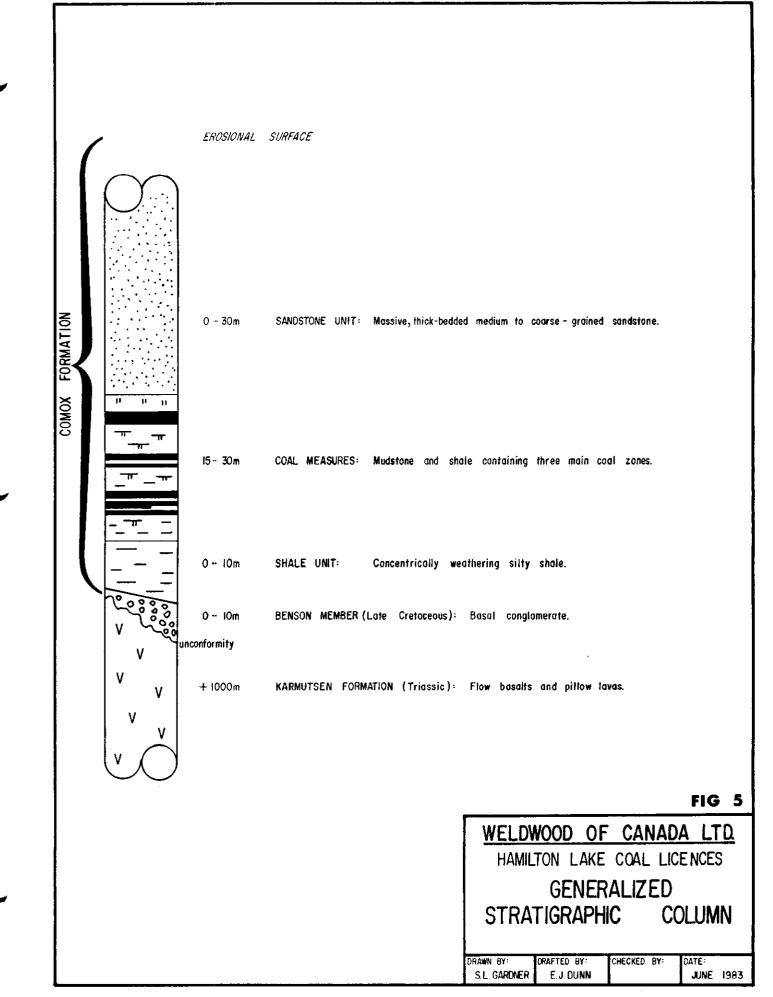
Field work and past drilling indicates that as much as 100 meters of the lowermost part of the Comox Formation occurs in the Hamilton Lake area. This consists of a series of silty shales and mudstones which contains 3 main coal zones and a number of thin coal bands, overlain by a thick-bedded medium to coarse-grained arkosic sandstone. The total thickness of the coal-bearing unit varies from 15 metres in the north part of Block 'A' to 50 metres near the southeast end of Block 'A' and in Figure 5. illustrates the generalized the Block 'B' area. stratigraphic column of the Comox Formation in the Hamilton Lake area.

1983 work established a correlation between the coal seams found in the Block 'A' area and Block 'B' area, illustrated by Figure 6. This correlation is further supported by the 1984 drilling on Block 'B', of which Hole HL-84-10C, shown on Figure 6., is an example. As no further work on the Block 'A' area was undertaken in 1984, the reader is referred to the 1983 report entitled, "The Geology and Coal Resources of the Hamilton Lake Coal Licences, Cumberland Area, Vancouver Island" for a more complete description of the coal measures in Block 'A'.

4.1 BLOCK 'B' COAL MEASURES

The 1984 drilling program, confined to the Block 'B' area of the Hamilton Lake Coal Licences, increased the amount of information about the coal measures in this area. The general nature of the coal seam deposition as outlined in the 1983 work was confirmed, and no structural complications, such as faults, appear to have disturbed the coal measures on Block 'B'. The variation in coal seam generation from hole to hole appears to be a result of a changing environment of deposition during the time that the coal seams were laid down. Figure 7. illustrates a correlation of coal seams using the geophysical logs from the present drilling on Block 'B' in a transverse section northwest to southeast. The section illustrates the rapid lateral changes in coal seam generation across the Block 'B' area.

As a result of work to date, 3 main coal zones occur within the basal 50 metres of the Comox Formation on the Block 'B' area. These three zones are most strongly represented in Hole HL-84-10C, (see Appendix Map IA, and Appendix III).

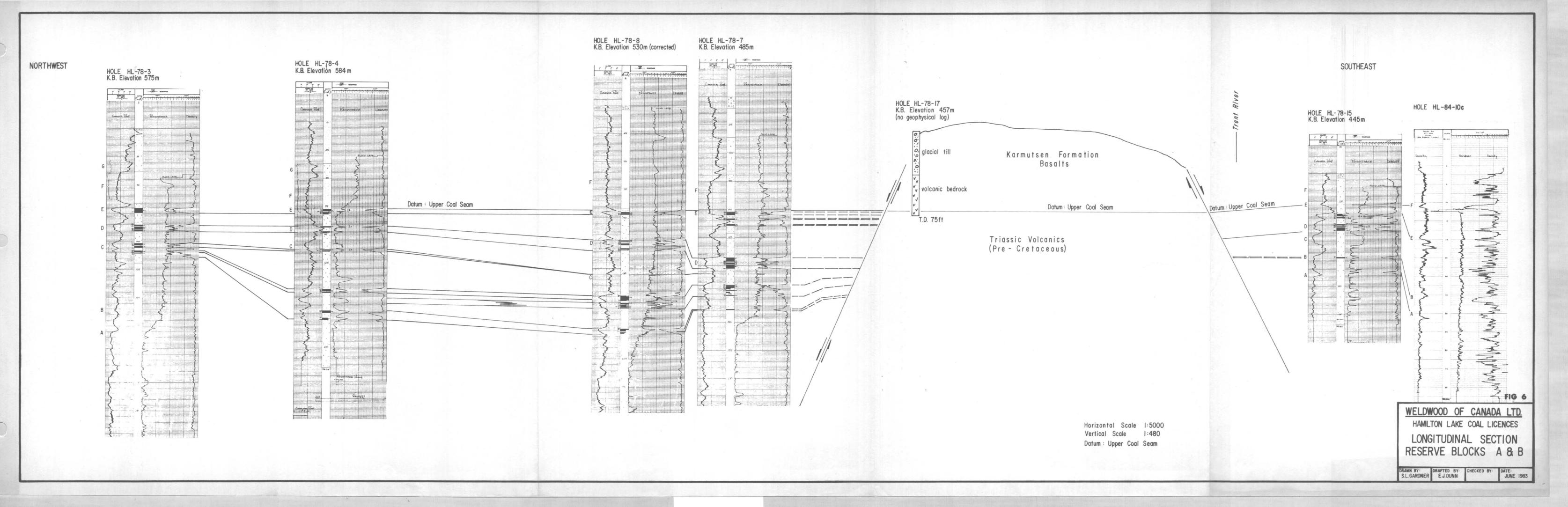


The upper of these zones usually consists of 0.60 to 1.00 metres of coal contained in one band. This upper zone has been subjected to glacial erosion in the northern part of the reserve area and is not found in holes 01, 02 and 07C. Appendix Map IB. illustrates the structure contours, or elevation of the seam above sea level, and shows the areas of erosion or The uniform nature of these contours suggest non-deposition. that no faulting has taken place over the Block 'B' area.

The middle coal zone consists of a number of thin coal bands ranging from 0.20 m in thickness to as much as 1.5 m., separated from each other by 0.50 to 4 metres of siltstone and/or shale. The coal bands themselves suffer from a contamination of parting material, where as much as 50 % of the coal section can be dirt or rock partings.

The lower coal zone is usually the most continuous and uniform of the three, and varies from 0.50 to 1.5 metres in thickness. It is this lowermost coal zone which presents a target for further drilling to the southwes't, with possibilities of expanding the reserve area in this direction.

Appendix II contains a number of cross-sections which illustrate the correlation of coal seams over the Block 'B' area.



CALCULATION OF IN-SITU COAL RESERVES, BLOCK 'B' AREA

The recent drilling has identified boundaries of the coal reserve on the north, east and southeast. Previous mapping work has located the volcanic-sedimentary contact on the west and southwest. Further follow-up drilling is required to prove that the coal seams continue in this direction to the volcanic-sedimentary contact.

Table 2. illustrates the aggregate raw coal thickness for each of the drillholes within the presently defined boundaries of the coal reserve in Block 'B' :

HOLE NUMBER	AGGREGATE COAL THICKNESS (m)*	VERTICAL OVERBURDEN TO COAL RATIO **
HL-84-01	1.85	8.89 : 1
HL-84-02	2.85	7.12 : 1
HL-84-03	2.14	20.93 : 1
HL-84-04	3.25	8.46 : 1
HL-84-05C	2.30	7.87 : 1
HL-84-07C	2.70	4.13 : 1
HL-84-08	1.35	6.44 : 1
HL-84-09	2.80	8.71 : 1
HL-84-10C	4.50	7.22 : 1
HL-78-11	2.62	10.73 : 1
HL-78-15	2.81	4.48 : 1

TABLE 2. AGGREGATE RAW COAL THICKNESS - BLOCK 'B' COAL RESERVE

* : includes all seams 0.50 m. or greater

: includes all partings less than 0.10 m. thick

- **: includes all overburden, interburden, plus partings greater than 0.10 m. thick
 - : does not include additional overburden associated with pit walls or mining benches
 - : does not take into account coal losses associated with mining

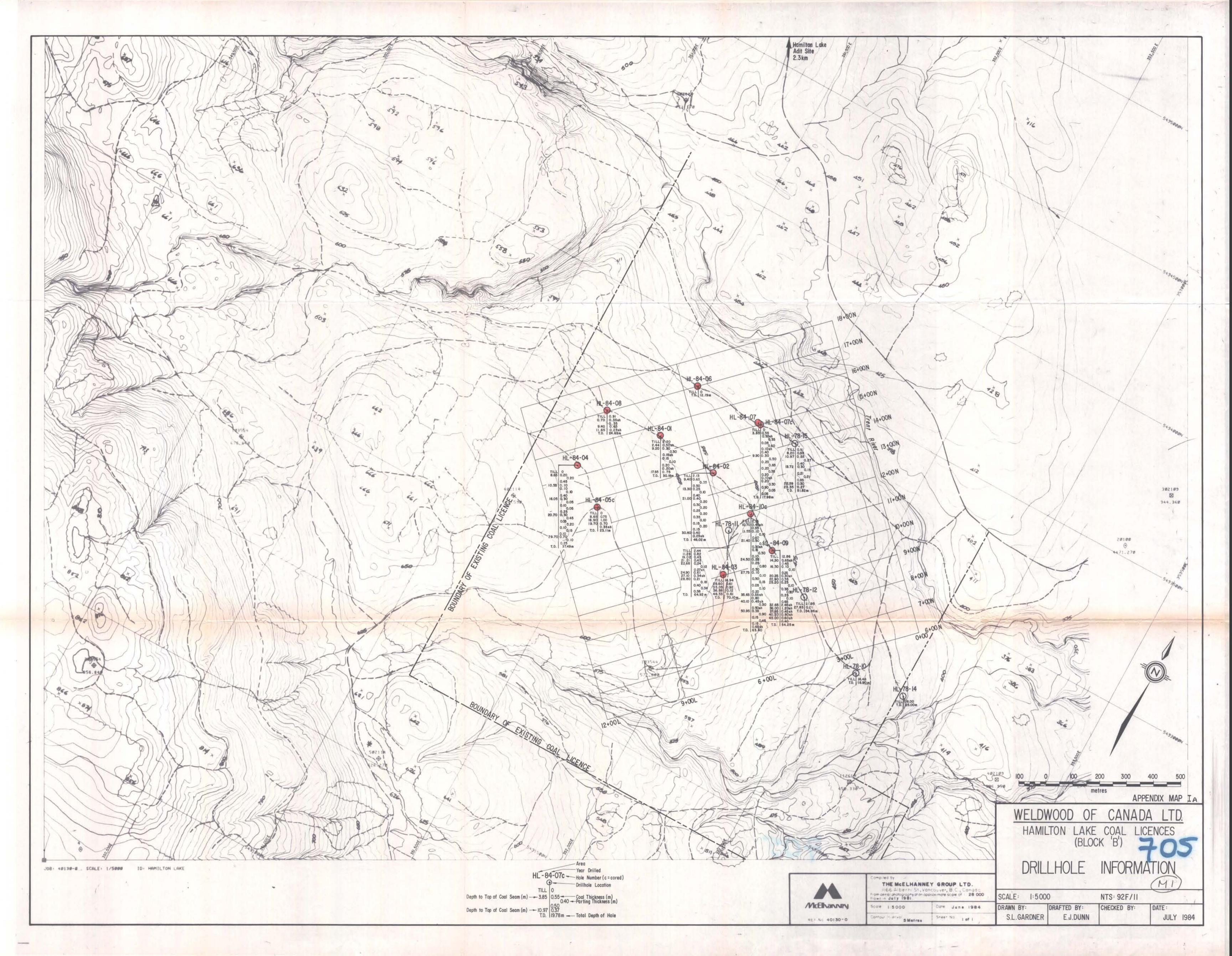
As a result of these drillhole intersections, a boundary for the calculation of in-situ coal reserves can be inferred. This boundary, shown on Appendix Map IC, is arbitrarily placed at the approximate 10 : 1 vertical overburden to coal ratio. In areas where the seams thin or disappear as shown by the drilling, the boundary is drawn to the midway point between holes. Where the reserve area is open, such as the southwest side of the deposit, the reserve boundary is drawn to a 150 metre radius of investigation around each drillhole.

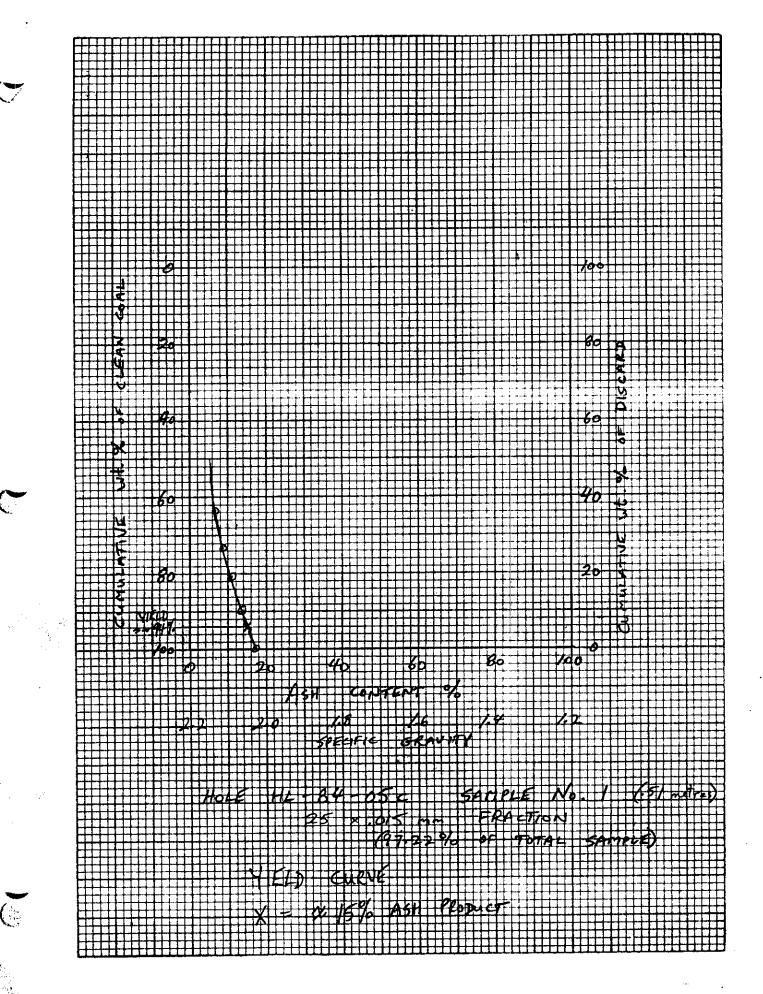
5.1 METHOD OF CALCULATION OF COAL RESERVES

As described in the above section, a boundary has been placed on the coal reserves in Block 'B' using certain criteria which approximate a total in-situ raw overburden to coal ratio of 10: 1, based on vertical coal seam and overburden thicknesses. By employing areal calculations on plan for the area contained within this reserve boundary, a total reserve area of 532,475 sq. metres is arrived at. In order to derive a volume of coal present within this area, an average aggregate seam thickness of 2.71 metres can be used. This thickness results from taking a simple average of the aggregate coal thicknesses of the drillholes within the reserve area. These holes are relatively evenly spaced throughout this area, thus are weighted evenly. An average dip of 10 degrees on the coal measures can be used to apply a correction factor for dip. This 10 degree figure has been confirmed from surface readings of the formation dip and strike, and can be measured on the cross-sections, which are at right angles to the formation strike. Assuming an average 10 degree dip, a coal thickness of 2.71 metres and a Relative Density of the coal of 1.5, a figure of 41,421 tonnes per hectare can be used to calculate the total coal in-place within the reserve area -

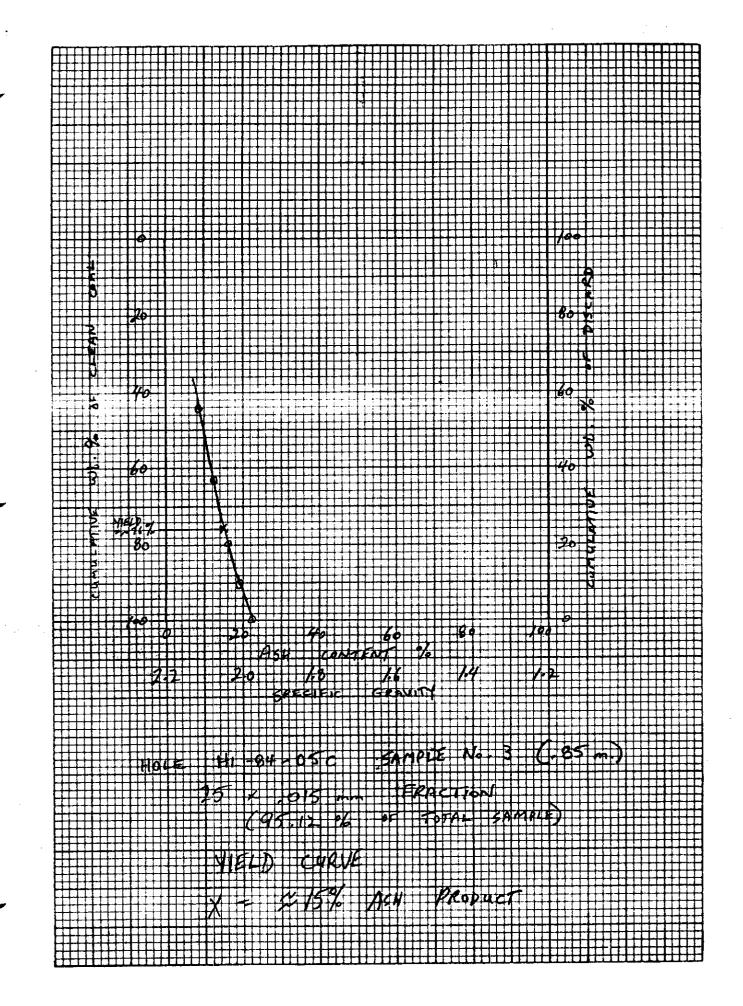
41,421 tonnes/ha X 53.25 ha = 2,205,668 tonnes in-situ OR, 2.21 million tonnes

 m_{I}

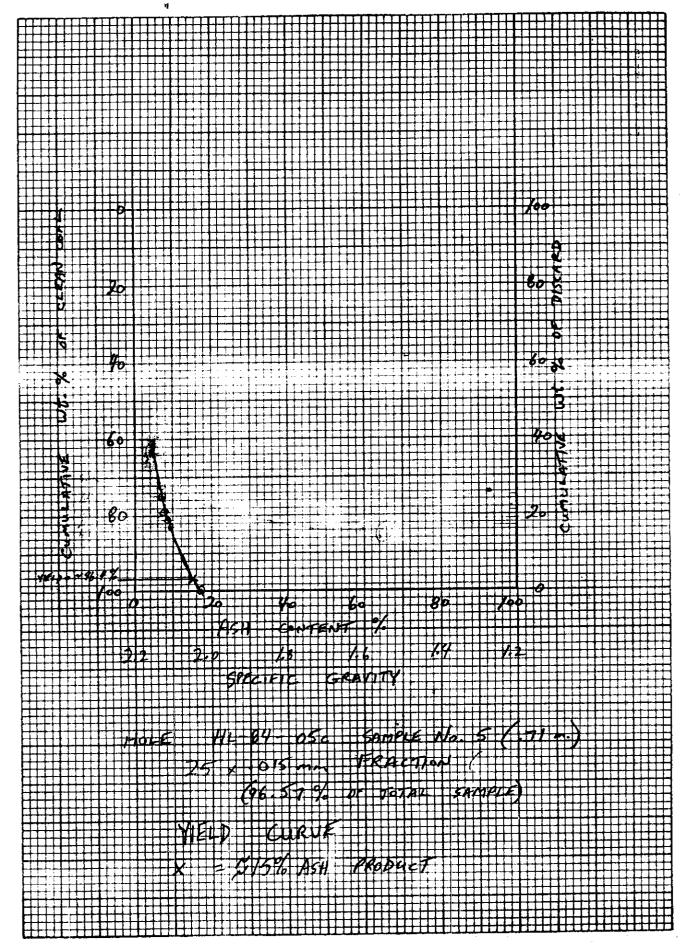




G----1



G---- 1



G--- 1

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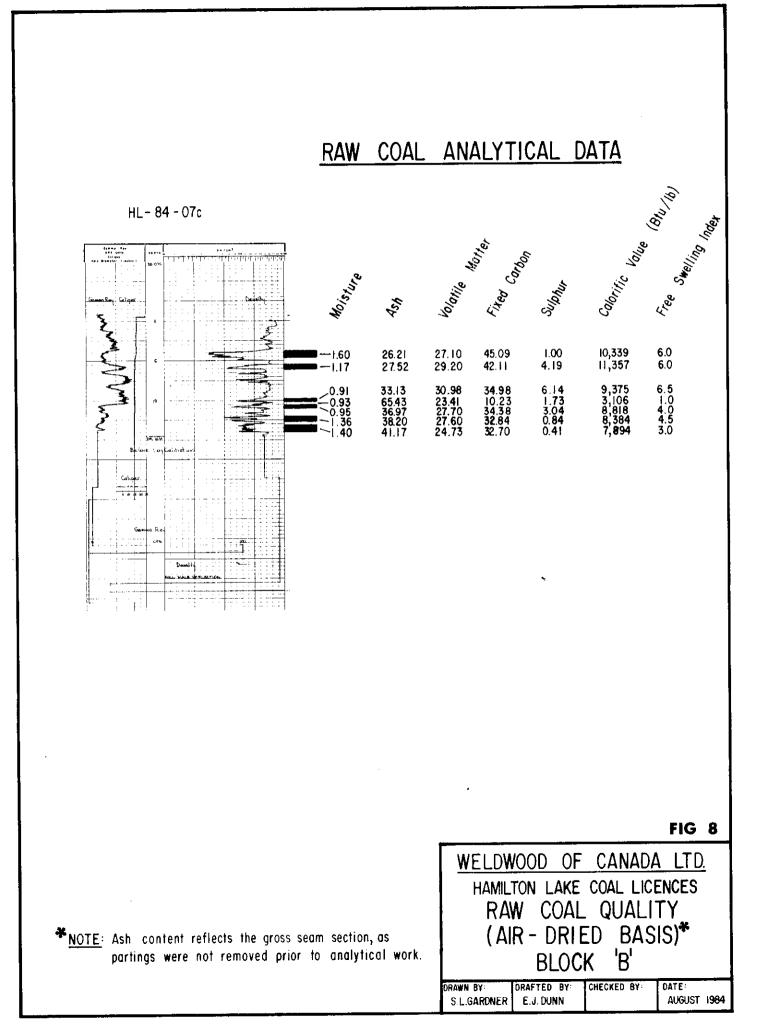
COAL QUALITY

In order to evaluate coal quality trends in the Block 'B' area, coal sections in three of the ten holes were cored. Coring was performed with a conventional 3 metre long Christiensen core barrel, cutting 7.62 cm. diameter core. A modified insert type core bit was used, with air as the flushing medium. Core recoveries were greater than 90 % in all holes.

Appendix IV contains quality information gathered as a result of the coring work. This appendix section includes corehole log descriptions of the cored sections, sample inventories for each of the holes, analytical flowsheets, washability tables plus all of the raw laboratory data. Due to budget constraints, core samples recovered from hole HL-84-10C were not analysed. These samples are stored at General Testing Labs in Vancouver for possible future work.

Figure 8 illustrates head assays of raw coal samples for Hole HL-84-07C prior to any screening or float/sink testing. A number of conclusions can be drawn from the analytical work on the Block

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'B' area :

- All of the coal seams exhibit good coking qualities, with F.S.I.'s ranging from 8.5 in the cleaner raw coal sections to 3 in the high ash seams. This coking tendency is comparable to the seam analysed in the Bulk Sample work of 1975 on the Block 'A' area.
- 2. Sulphur contents are variable and range from less than 1 % to as much as 6 %. Sulphur is present as pyritic nodules and bands within the seam. Pyritic material is also present within the mudstone partings and silty interburden material. Washability testing on different size fractions in Hole HL-84-07C shows that the pyrite material is not concentrated in the finer fractions, which indicates that processing of the coal will have only a minimal effect on sulphur content. Selective mining methods will, however, be able to remove some of the pyritic accumulations. The composite of all the coal samples from hole HL-84-07C contains 2.02 % sulphur. This value probably represents a good average value for the coal seams on the Block 'B' area.
- 3. The in-situ ash content of the composite of all of the coal samples from Hole HL-84-07C is 40 %. Hole HL-84-05C, which is southwest of Hole HL-84-07C, shows in-situ ash contents

of 17 to 20 % in the raw coal samples, however the seam sections in 05C are thinner. The yield curves included in Appendix IV for each of the holes indicate that clean coal yields of about 50% could be expected for the dirtier seams in the northern part of Block 'B' around hole 07C, while yields of about 78 % could be expected for the southwestern part of Block 'B' around hole 05C. These yield figures do not include losses associated with mining and delivery of raw coal to the plant.

4. Laboratory testing indicates that the percentage of 0.15 mm X O fraction is low. This very fine fraction is usually less than 4 % of the total sample in the cleaner, low ash seams, and usually less than 7 % of the total sample in the dirtier seams.

6.1 Recommendations as a Result of the Analytical Work

It is recommended that Hole HL-84-10C be recored during the next program, with additional seam sections in the lower part of the hole cored for washability testing. The original samples could also be included in this work.

Any further washability testing should include a wider range of Relative Densities, starting from 1.3 and scaling up in increments of .10 to 1.9 R. D. This would entail 7 separating specific gravities on each sample rather than the current 4.

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Chapter 7

CONCLUSIONS AND RECOMMENDATIONS

As a result of the 1984 exploration work and previous year's findings, the following conclusions can be drawn with regards to the Hamilton Lake Block 'B' area :

- A total in-situ coal reserve of 2.21 million tonnes has been proven to occur in the Block 'B' area, within an approximate 10 : 1 raw overburden to coal ratio.
- This coal reserve is contained within 3 main coal zones in the reserve area, of which the middle zone in particular consists of a number of coal bands separated by rock partings.
- 3. The seams display a variance in quality and thickness from hole to hole. This variance is due to depositional factors affecting coal seam generation, rather than structural complications.
- 4. The structure of the area is relatively simple, with the formation dipping uniformly to the northeast, forming a

dip-slope mining situation along the edge of the plateau area.

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- 5. The coal is ranked High Volatile Bituminous 'A', with a Sulphur Content of approximately 2 %, and generally exhibits good coking qualities, with some sections being high in ash on a raw basis.
- 6. Drilling shows a continuation of the lowermost and possibly the middle coal zones outside of the existing licence boundary to the southwest.

As a result of the current work, and because of the company's demonstrated committment to its present holdings in the area, the author recommends that an additional licence area to the southwest of the existing licences be applied for, in order to maximize the company's reserve base. This recommendation is outlined on Appendix Map ID. The additional licence area to be applied for covers approximately 160 ha and would involve an initial cash outlay of less than \$1,000.00 to secure.

Exploration drilling will be required to confirm the maximum extent of the coal seams in the new area. In addition, more coring work on the Block 'B' area would be desirable.

7.1 1985 EXPLORATION PROPOSAL, HAMILTON LAKE BLOCK 'B'

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Appendix Map ID outlines additional exploration work required to prove the extension of the coal seams to the southwest of the present licence area and properly define the southern limit of economic mining on the present licence area. Also, coring work on the present licences will augment coal quality information (refer to Section 6.1, Coal Quality).

Using this year's exploration work as a guide to estimating costs of the 1985 program, the proposed work will cost approximately \$55,000.00 to complete. This includes all laboratory costs.

REFERENCES

- 1. Curcio, M. P., "1978 Exploration Work, Hamilton Lake Coal Licences" (Oct. 1978), Weldwood of Canada Limited
- 2. Gardner, S. L., "The Geology and Coal Resources of the Hamilton Lake Coal Licences, Cumberland Area, Vancouver Island" (May, 1983), Weldwood of Canada Limited
- 3. Horvat, F., "Hamilton Lake Bulk Sample Work", (Feb., 1977), Birtley Engineering Ltd. for Weldwood of Canada Limited
- Muller, J. E., "The Geology of Vancouver Island", (1977), Geological Survey of Canada O.F. 463
- Muller, J. E., "Evolution of the Pacific Margin, Vancouver Island and Adjacent Regions", Can. Journal of Earth Science, Vol. 14, 1977
- Muller, J. E. & Jeletsky, J. A., "Geology of the Upper Cretaceous Nanaimo Group, Vancouver Island and Gulf Islands, British Columbia", (1970), G. S. C. Paper 69-25



PLATE I. - Bucyrus Erie Model 24R drilling rig used in Hamilton Lake drilling and coring operations.



PLATE II. - Welding two 6 metre joints of casing during overburden drilling, Hole HL-84-03.



PLATE III. - Rock drilling with downhole percussion hammer.



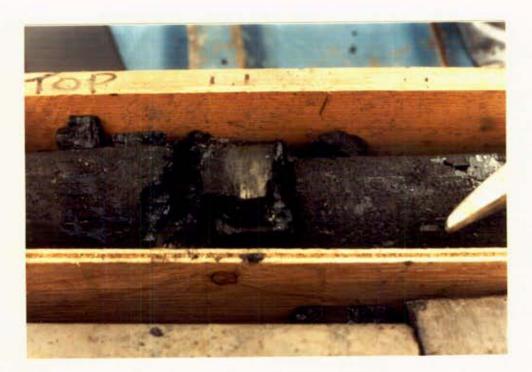
PLATE IV. - Core retrieval operations, Hole HL-84-05C.





PLATES V. & VI. - Cored sections, 7.77 m. - 23.13 m., Hole $\rm HL-84{-}05C$





PLATES VII. & VIII. - Close-up of pyritic sulphur band in coal seam at 20.22 m. depth in HL-84-05C.



PLATE IX. - Cored sections, 4.88 m. - 16.04 m., Hole HL-84-07C



PLATE X. - Cores 1 & 2, 12.50 m. - 18.50 m., Hole HL-84-10C Note : Error in labelling depths in photograph.



PLATE XI. - Cores 3 & 4, 18.50 m. - 24.50 m., Hole HL-84-10C



PLATE XII. - Core 4, HL-84-10C, showing pyritic bands at base of coal and in partings.



PLATE XIV. - Cementing and abandonment operations.



PLATE XV. - Reclamation operations.

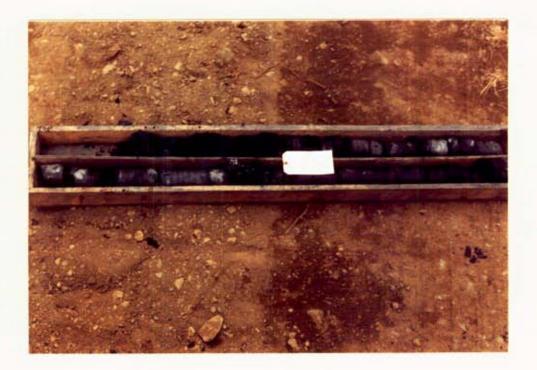
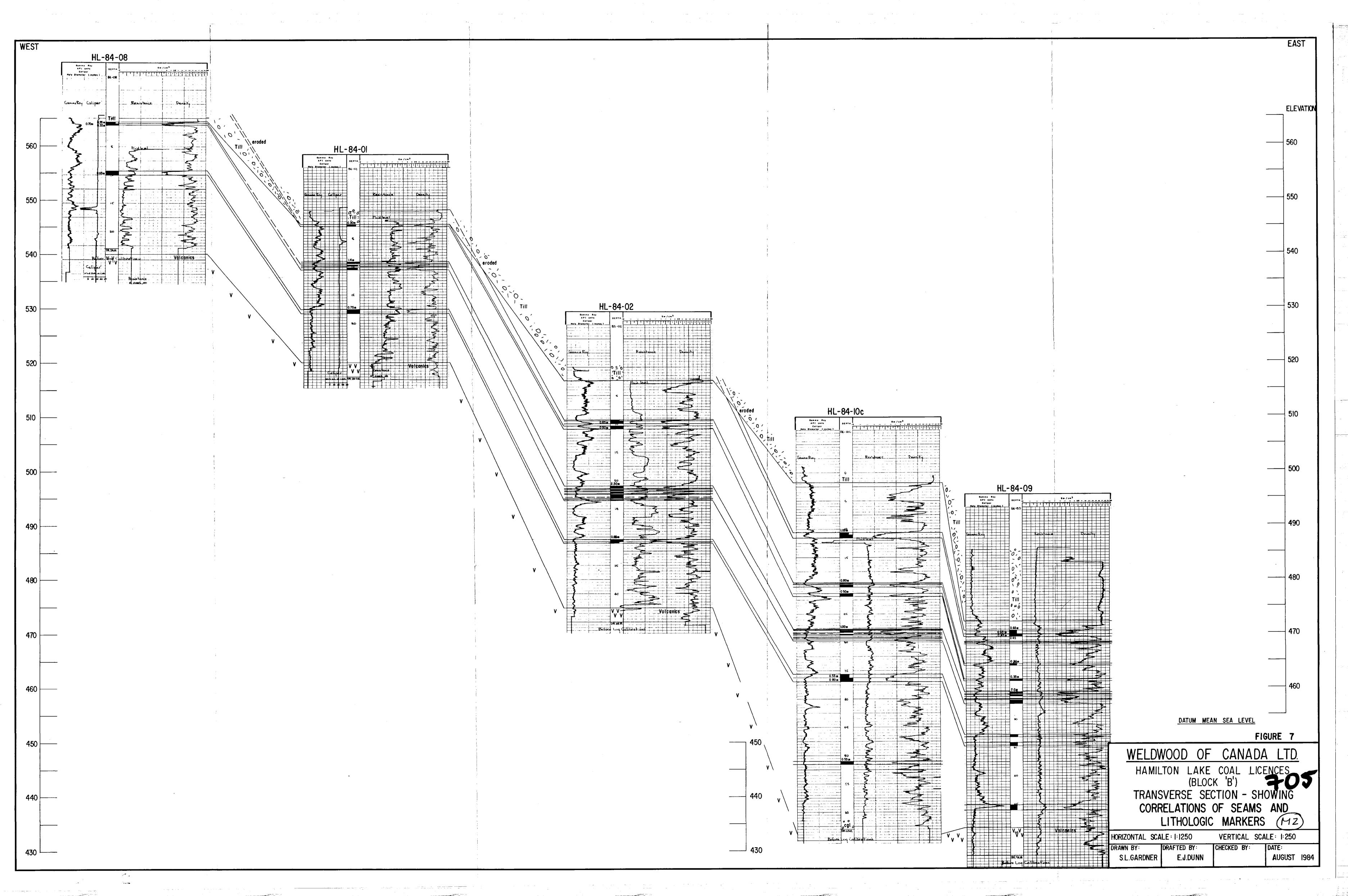
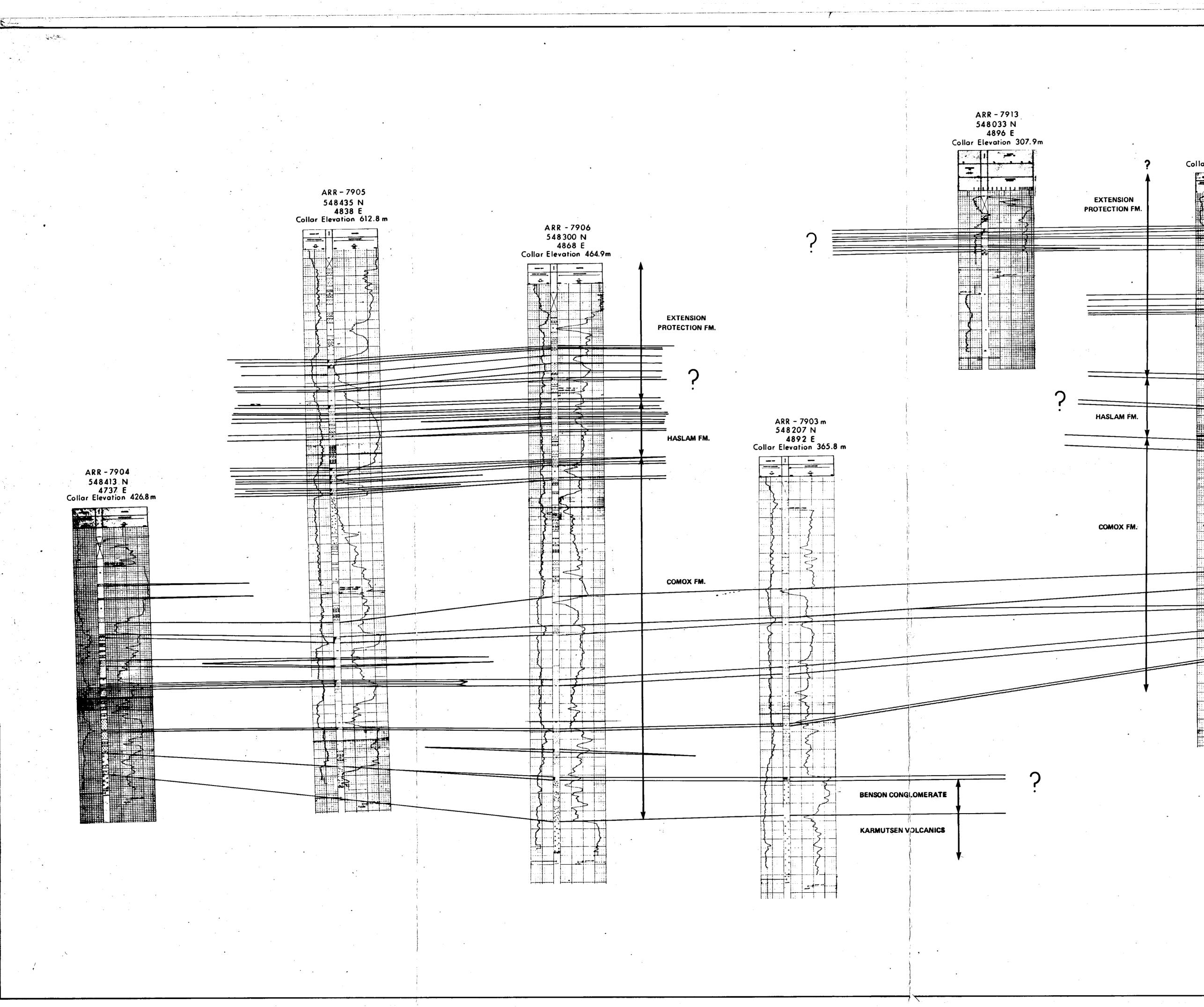


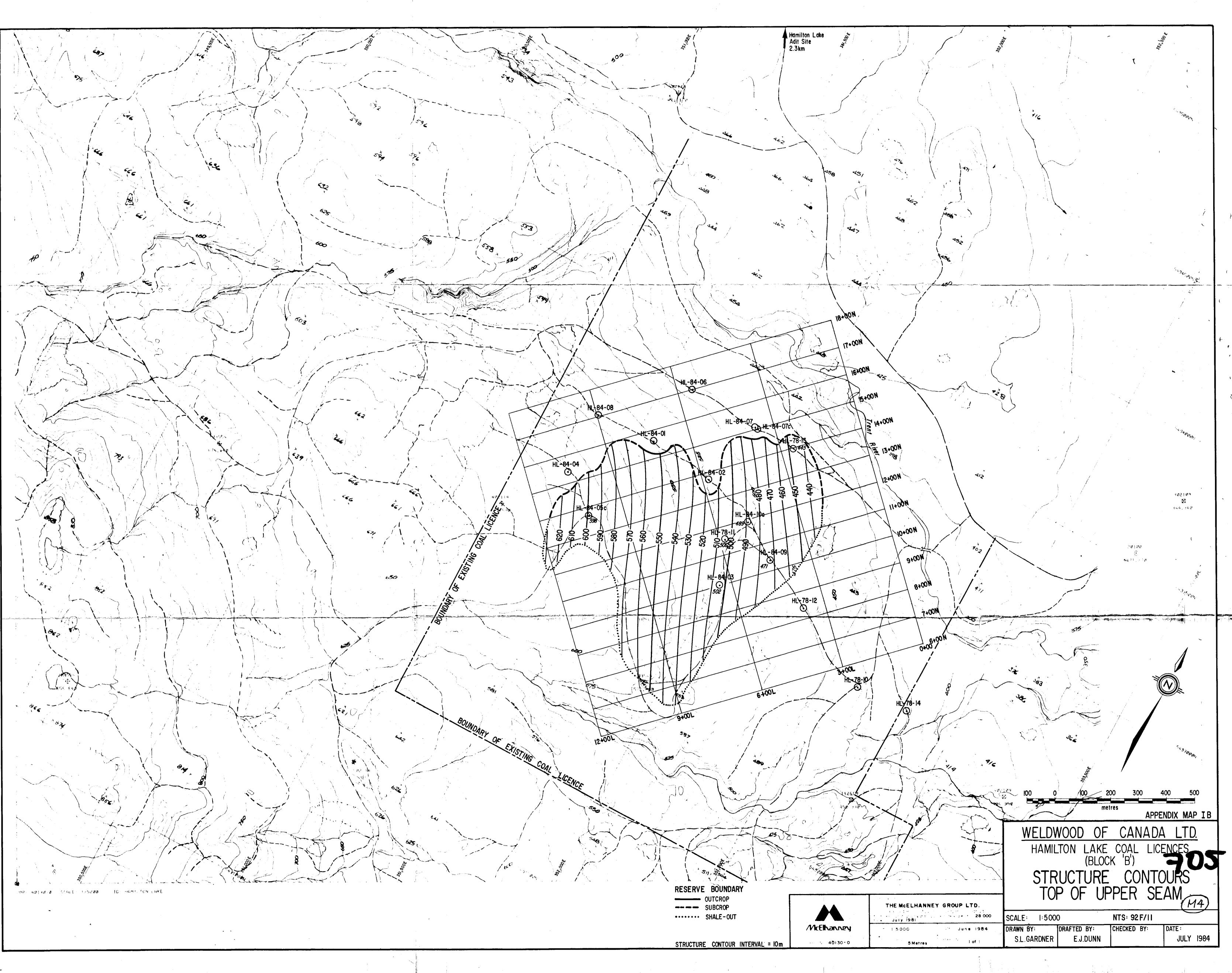
PLATE XIII. - Core 5, 24,50 m. - 27.50 m., Hole HL-84-10C



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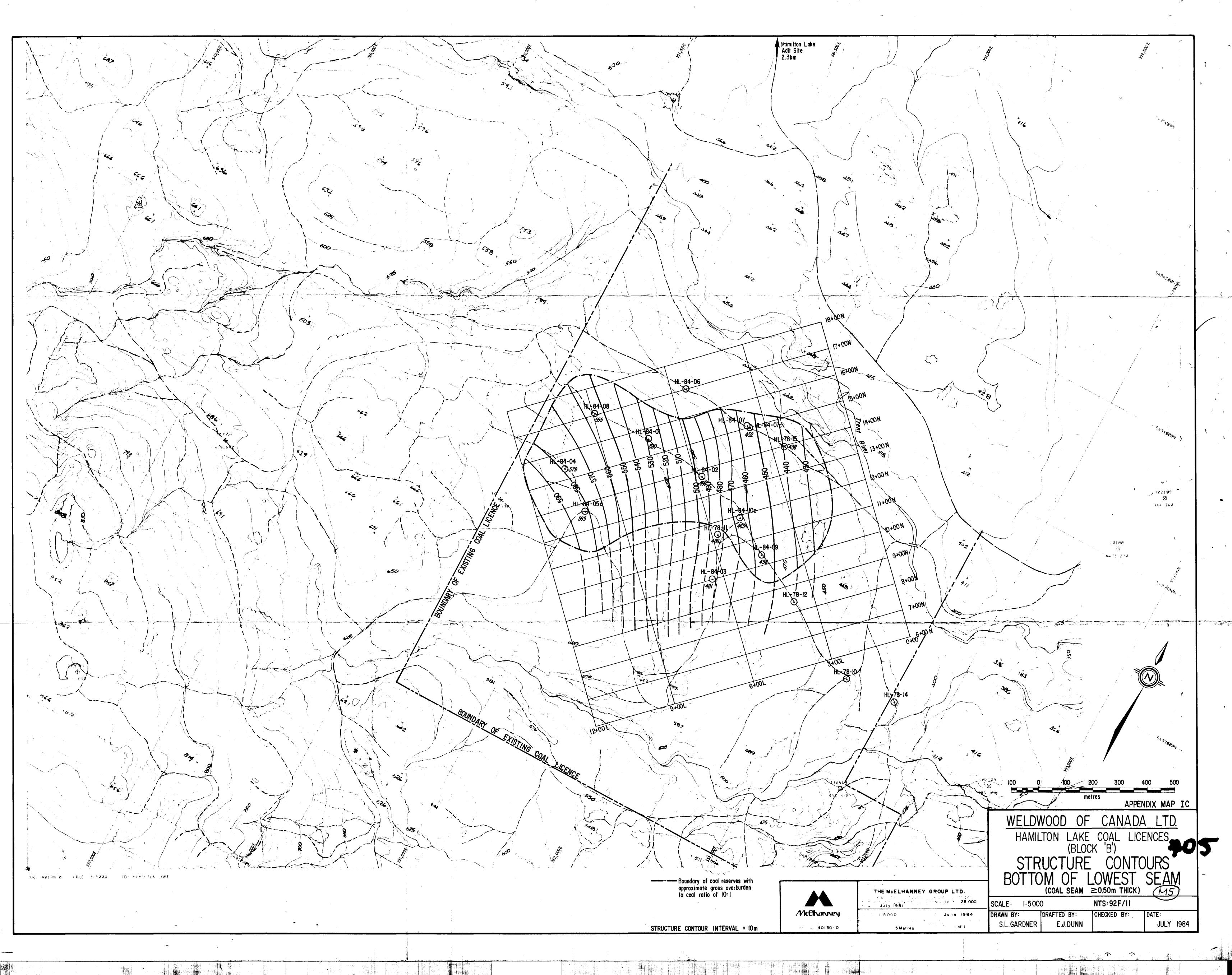


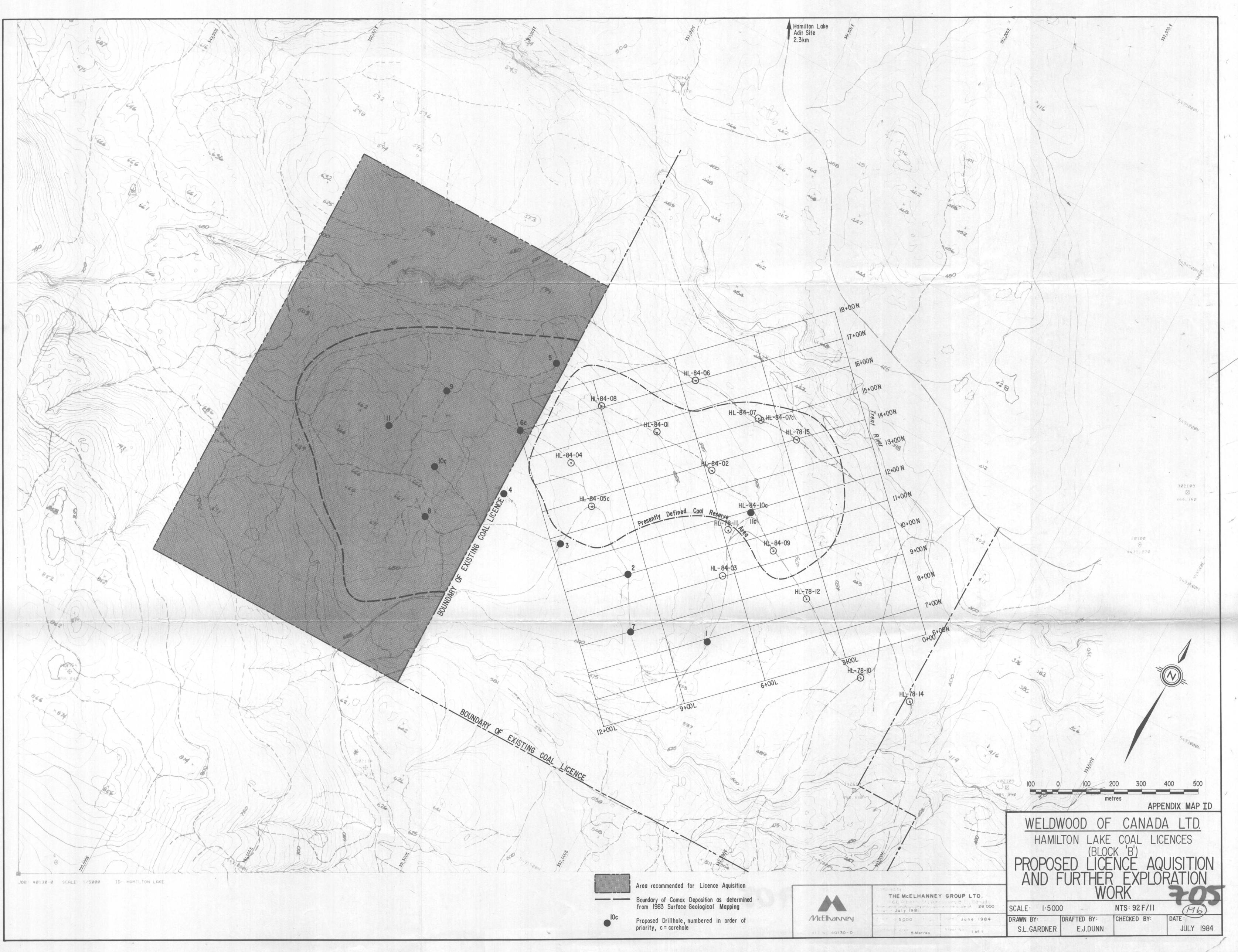
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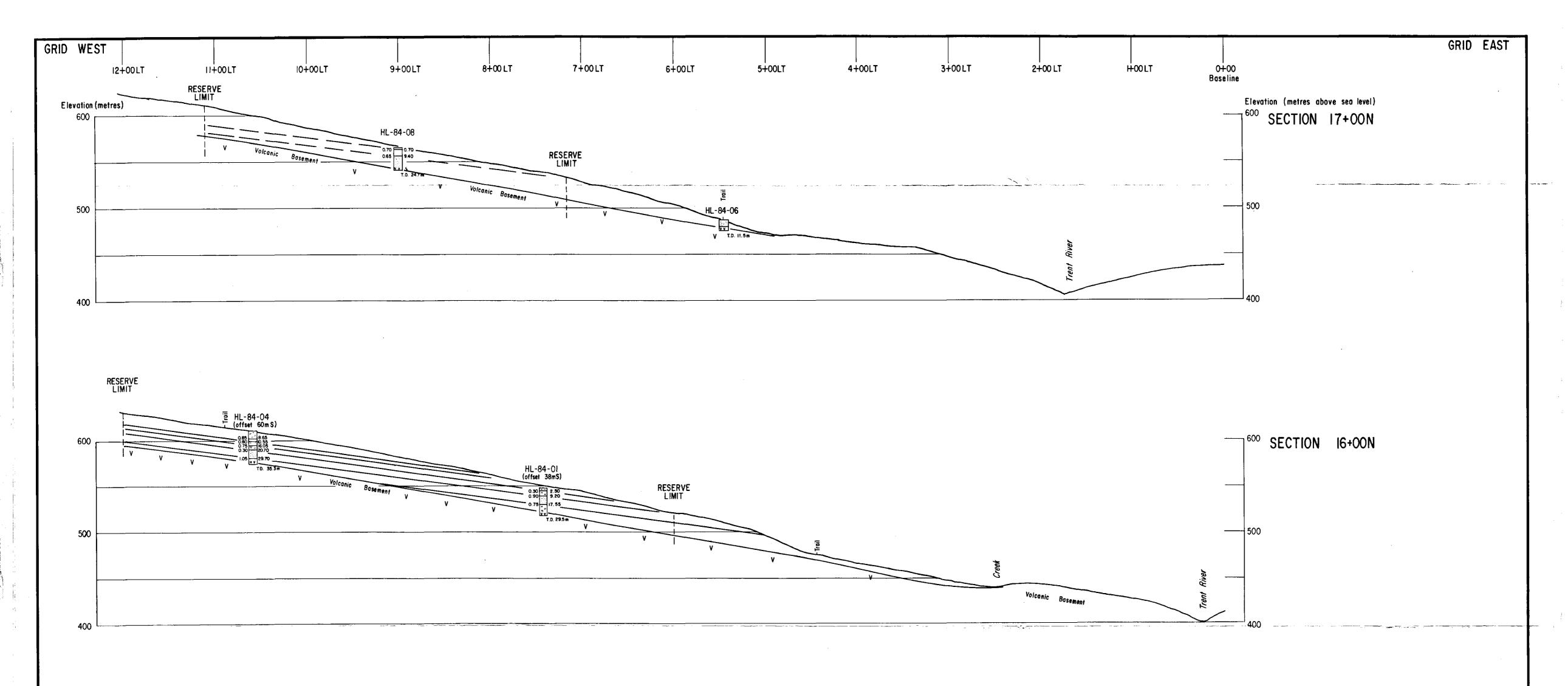
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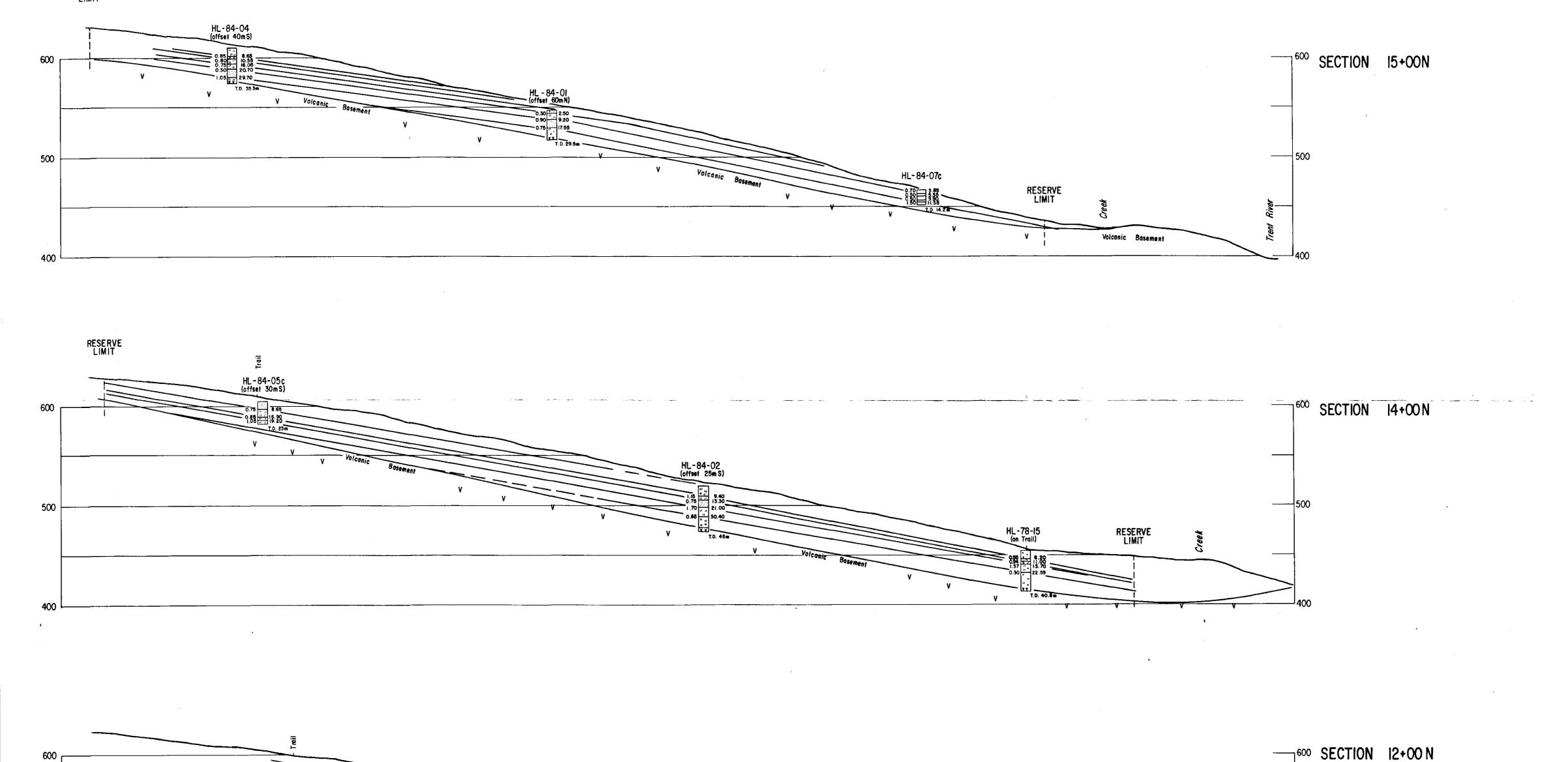


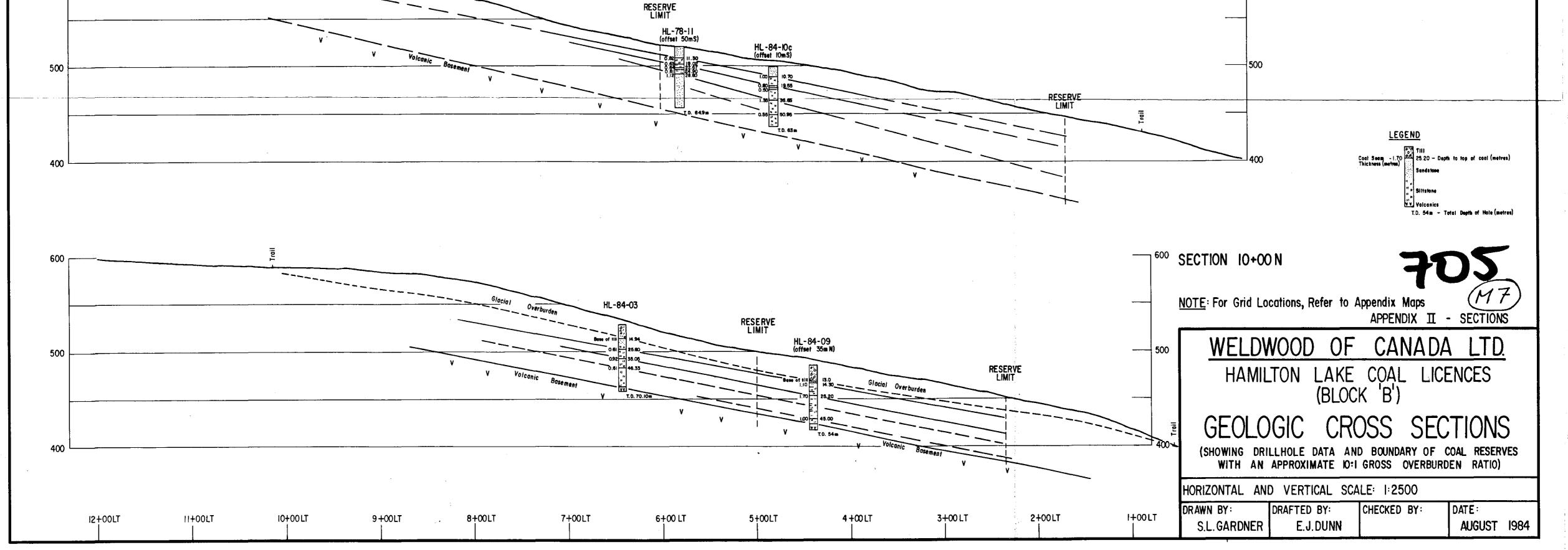
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RESERVE LIMIT





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LOCATION : 493,072 N. - 351,564 E. ELEVATION : 547.8 m

DATE COMPLETED : June 19, 1984

DRILLER : Drillwell Enterprises Ltd. T. Stallybrass

DEPTH (metres)

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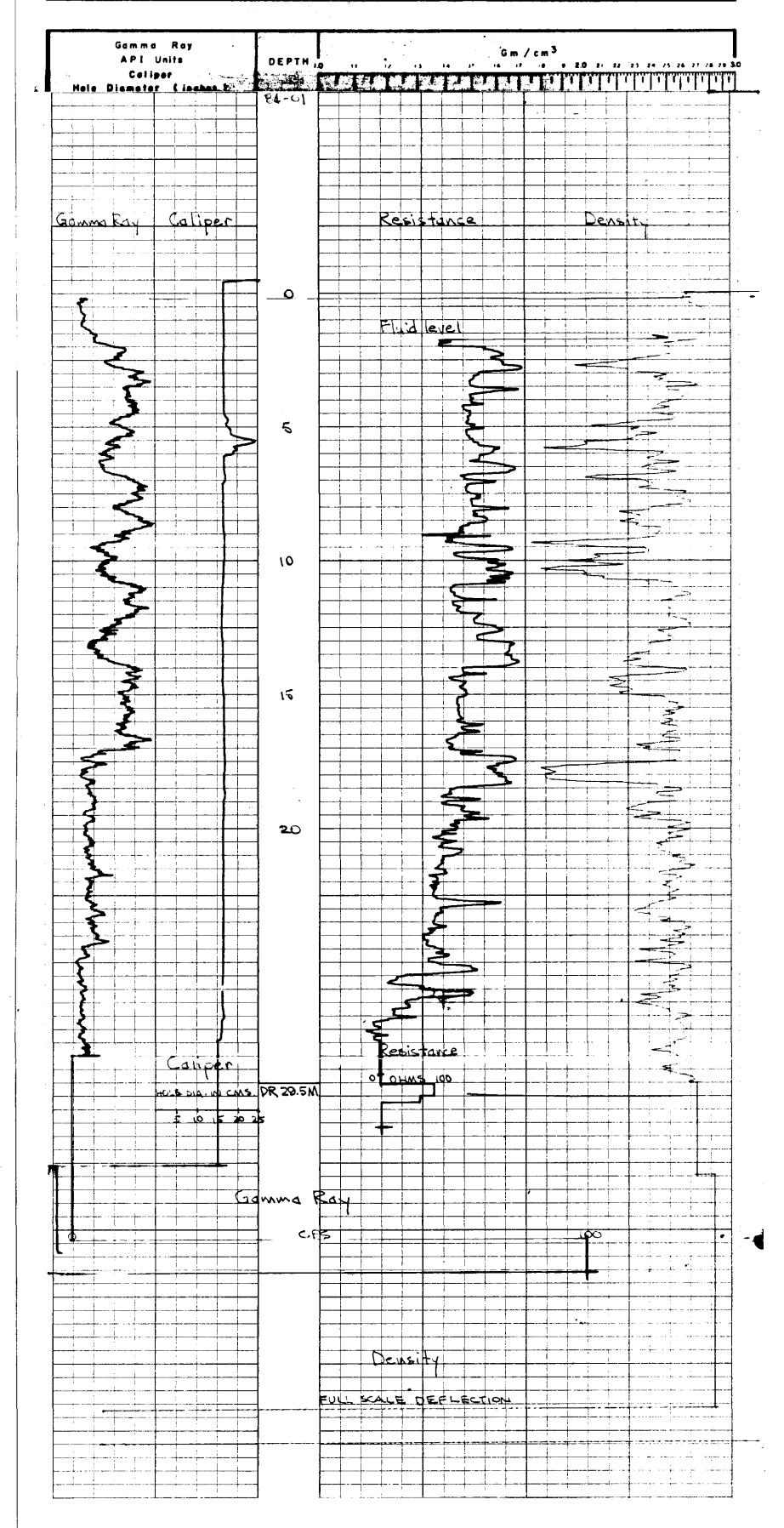
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DESCRIPTION

From	To	Thickness	
0	2.44	2.44	Till Overburden
2.44	2.74	.30	Siltstone
2.74	3.35	.61	COAL
3.35	12.19	8.84	Siltstone
12.19	16.46	4.27	Sandstone
16.46	17.98	1.52	Siltstone
17.98	18.29	.31	COAL
18.29	26.52	8.23	Siltstone
26.52	30.18	3.66	Volcanics

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LOCATION : 493,043 N. - 351,804 E. ELEVATION : 519.1 m

DATE COMPLETED : June 20, 1984

DRILLER : Drillwell Enterprises Ltd. T. Stallybrass

DEPTH (metres)

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DESCRIPTION

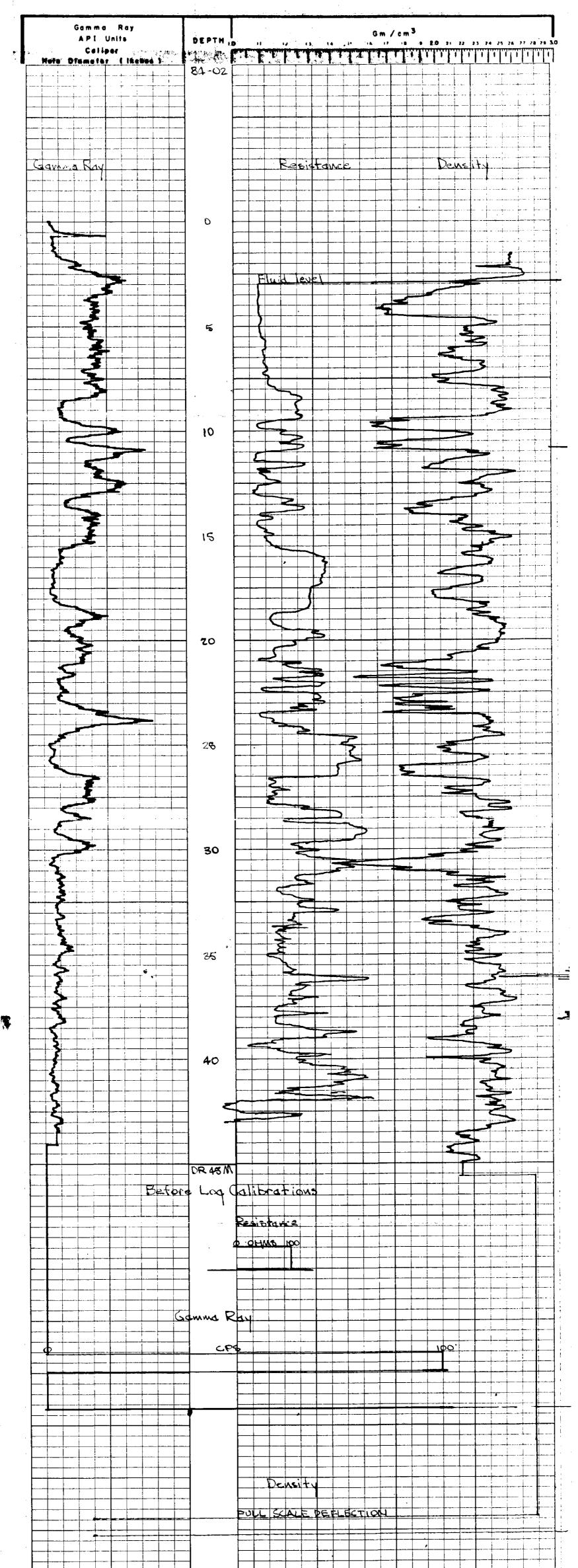
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0	2.13	2.13	Till
2.13	8.23	6.10	Siltstone
8.23	9.14	0.91	Sandstone
9.14	10.06	0.92	COAL
10.06	10.36	0.30	Siltstone
10.36	10.97	0.61	COAL
10.97	13.11	2.14	Siltstone
13.11	13.72	0.61	COAL
13.72	15.54	1.82	Siltstone
15.54	18.90	3.36	Sandstone
18.90	21.95	3.05	Siltstone
21.95	23.16	1.21	COAL
23.16	25.91	2.75	Sandstone
25.91	27.74	1.83	Siltstone
27.74	29.57	1.83	Sandstone
29.57	40.84	11.27	Siltstone
40.84	41.45	0.61	Sandstone
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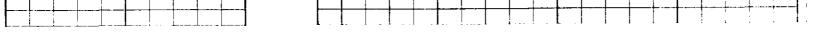
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LOCATION : 492,735 N. - 352,016 E. ELEVATION : 527.8 m

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DATE COMPLETED : June 21, 1984

DRILLER : Drillwell Enterprises Ltd. T. Stallybrass

DEPTH (metres) DESCRIPTION

From	To	Thickness	
0	14.94	14.94	Till overburden
14.94	23.47	8.53	Sandstone
23.47	25.60	2.13	Silty Shale
25.60	26.21	0.61	COAL
26.21	35.05	8.84	Siltstone
35.05	35.97	0.92	COAL
35.97	36.88	0.91	Siltstone
36.88	37.00	0.12	COAL
37.00	46.33	9.33	Siltstone
46.33	46.94	0.61	COAL
46.94	47.68	2.74	Siltstone
49.68	53.34	3.66	Sandstone
53.34	61.87	8.53	Siltstone
61.87	63.40	1.53	Sandstone
63.40	64.62	1.22	Siltstone
64.62	70.10	5.48	Volcanics

HOLE BRIDGED : NO GEOPHYSICAL LOG

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LOCATION : 492,830 N. - 351,348 E. ELEVATION : 609.8 m

DATE COMPLETED : June 22, 1984

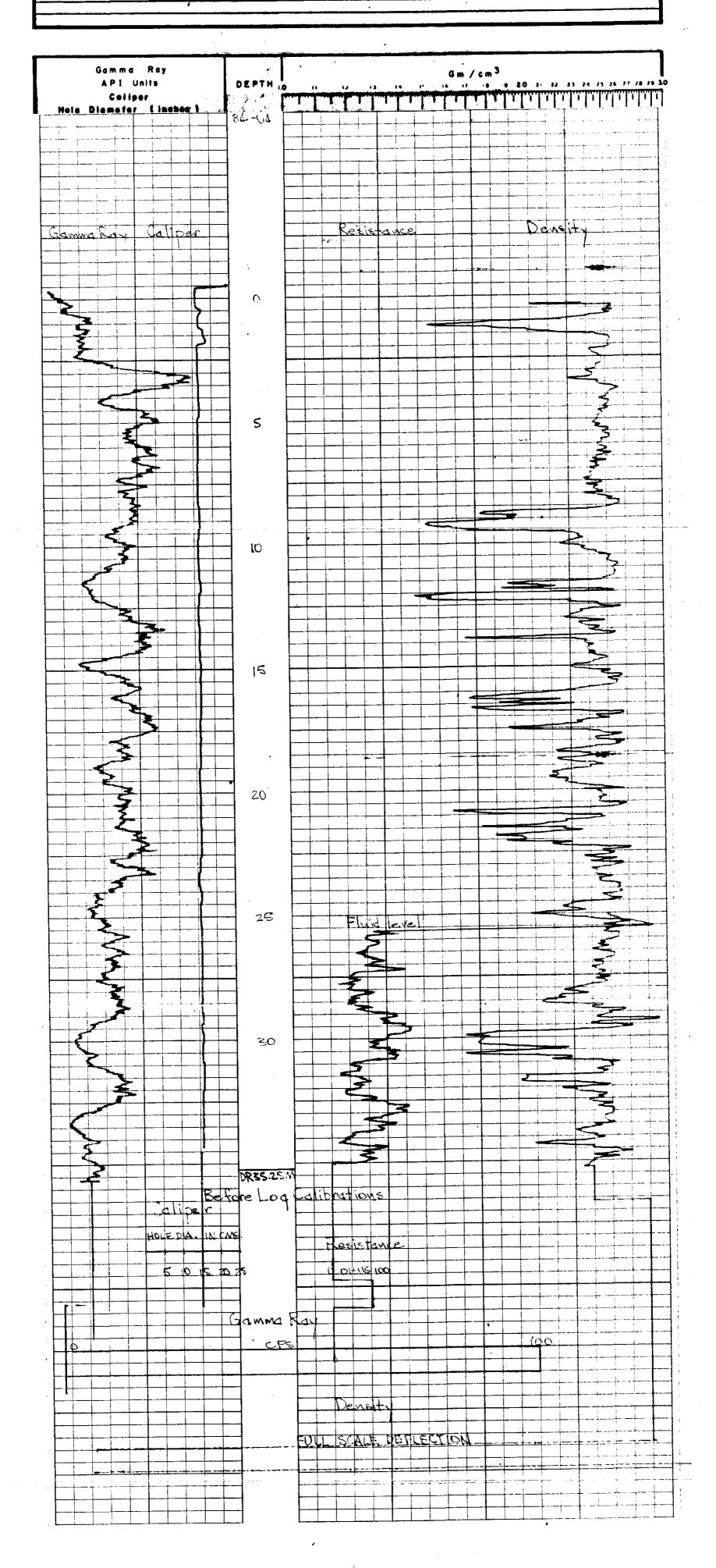
DRILLER : Drillwell Enterprises Ltd. T. Stallybrass

DEPTH (metres) DESCRIPTION

From	Το	Thickness	
0	.91	0.91	Sandstone
.91	8.23	7.32	Silty Shale
8.23	9.14	0.91	Sandstone
9.14	9.75	0.61	COAL
9.75	11.58	1.83	Silty Shale
11.58	12.50	0.92	COAL
12.50	17.07	4.57	Silty Shale
17.07	17.15	0.08	COAL
17.15	19.50	2.35	Siltstone
19.50	19.60	0.10	COAL
19.60	26.82	7.22	Siltstone
26.82	30.18	3.36	Sandstone
30.18	31.39	1.21	CDAL
31.39	32.00	0.61	Sandstone
32.00	32.10	0.10	COAL
32.10	36.58	4.48	Siltstone
36.58	37.49	0.91	Volcanics

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Romarks: Drillwell Enterprises



HL - 84 - 05 C

LOCATION : 492,728 N. - 351,488 E. ELEVATION : 606.2 m

DATE COMFLETED : June 22, 1984

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DRILLER : Drillwell Enterprises Ltd. T. Stallybrass

D	EPTH (metr	es)	DESCRIPTION	
From	To	Thickness		
0	7.77	7.77	Sandstone	
7.77	8.66	0.89	Mudstone	
8.66	9.42	0.76	COAL	
9.42	16.76	7.34	Siltstone	
16.76	16.98	0.22	Sandstone	
16.98	17.98	0.99	COAL	
17.98	19.75	1.77	Siltstone	
19.75	20.82	1.07	COAL	
20.82	23.11	2.29	Siltstone	

REMARKS : Cored Interval - 7.77 to 23.11 metres.

CORE DESCRIPTIONS

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HOLE HL-84-05C

INTEF FROM	VAL(m) TO	THICKNESS(m)	DESCRIPTION
7.77	8.52	.75	Mudstone: Medium brown; soft; thin coaly laminae throughout
8.52	8.66	.14	Mudstone: As above; highly fractured and broken; thin coal bands; abundant pyrite
8.66	8.78	.12	COAL: Completely crushed & badly mixed with thin rock bands and powdery coal material
8.78	8.99	.21	COAL: Bright and blocky; completely crushed; clean; soft; brittle;no visible pyrite
8.99	9.24	.25	COAL: Harder; relatively unbroken; Bright and blocky; some boney and dirty layers
9.24	9.29	.05	COAL: Soft; broken up; some dirty coal mixed in;
9.29	9.33	.04	BONE: sandy texture; greenish at top grading down to dark grey-black; carbonaceous at bottom;
9.33	9.39	.06	COAL: Bright and blocky; hard; fairly clean;
9.39	9.42	.03	COAL: Soft; powdery; fairly clean; mixed up;
9.42	10.77	1.35	Siltstone: Dark grey; uniform; some thin calcite veins horizontal to bedding; sandy near base;
10.77	13.88	3.11	Siltstone: Medium brown to grey muddy; fairly soft; uniform;
13.88	16.76	2.88	Siltstone: As above;
16.76	16.78	.22	Sandstone: Medium grey; medium grained; salt & pepper texture; hard; thin black wisps of coaly material;
16.98	17.22	.24	COAL: Bright and blocky; clean; some pyrite; light in weight

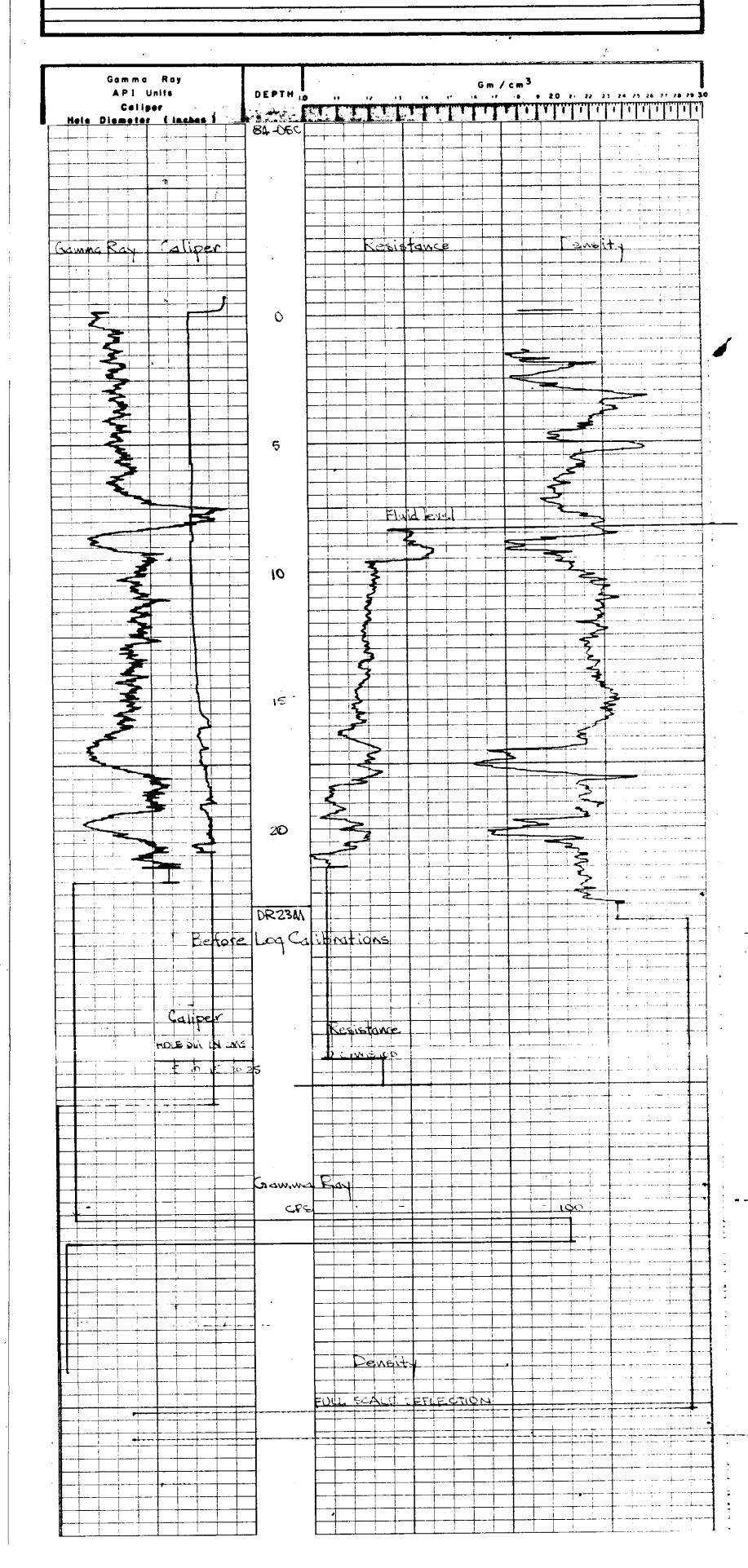
INTEF FROM	(VAL (m) TO	THICKNESS(m)	DESCRIPTION
17.22	17.32	.10	COAL: Soft; crushed; powdery; clean; visible pyrite
17.32	17.51	.19	COAL: Bright and blocky; clean; broken up;
17.51	17.83	.32	COAL: Bright and blocky; clean; unbroken; vertical calcite veining; some visible pyrite
17.83	17.93	.10	COAL: Dull; dirty; boney
17.93	17.98	.05	Shale: Dark grey to black; very thin bright coaly laminae throughout;
17.98	19.75	1.77	Siltstone: Dark grey; muddy; uniform; soft; some visible pyrite
19.75	19.88	.13	COAL: Bright and blocky; clean
19.88	19.91	.03	Mudstone: carbonaceous
19.91	20.11	.20	COAL: Bright and blocky; clean;
20.11	20.22	.11	COAL: As above;
20.22	20.24	.02	Pyrite Band
20.24	20.46	. 22	COAL: Bright and blocky; clean; vertical calcite on cleats;
20.46	20.58	.12	BONE; sandy texture; coaly; dull; hard
20.58	20.76	.18	COAL: Blocky; dull; dirty
20.76	20.82	.06	Shale and coal mixed; thin interbedded bands;
20.82	23.11	2.29	Siltstone: Dark grey; soft; uníform; some thín coal laminae in places; end of core

CORE RECOVERY: 99.8 %

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Romarks: Drillwell Enterprises. Califert & Gamma curves recorded, 5M shallow.



LOCATION : 493,305 N. - 351,100 E. ELEVATION : 487.5 m

DATE COMPLETED : June 23, 1984

DRILLER : Drillwell Enterprises Ltd. T. Stallybrass

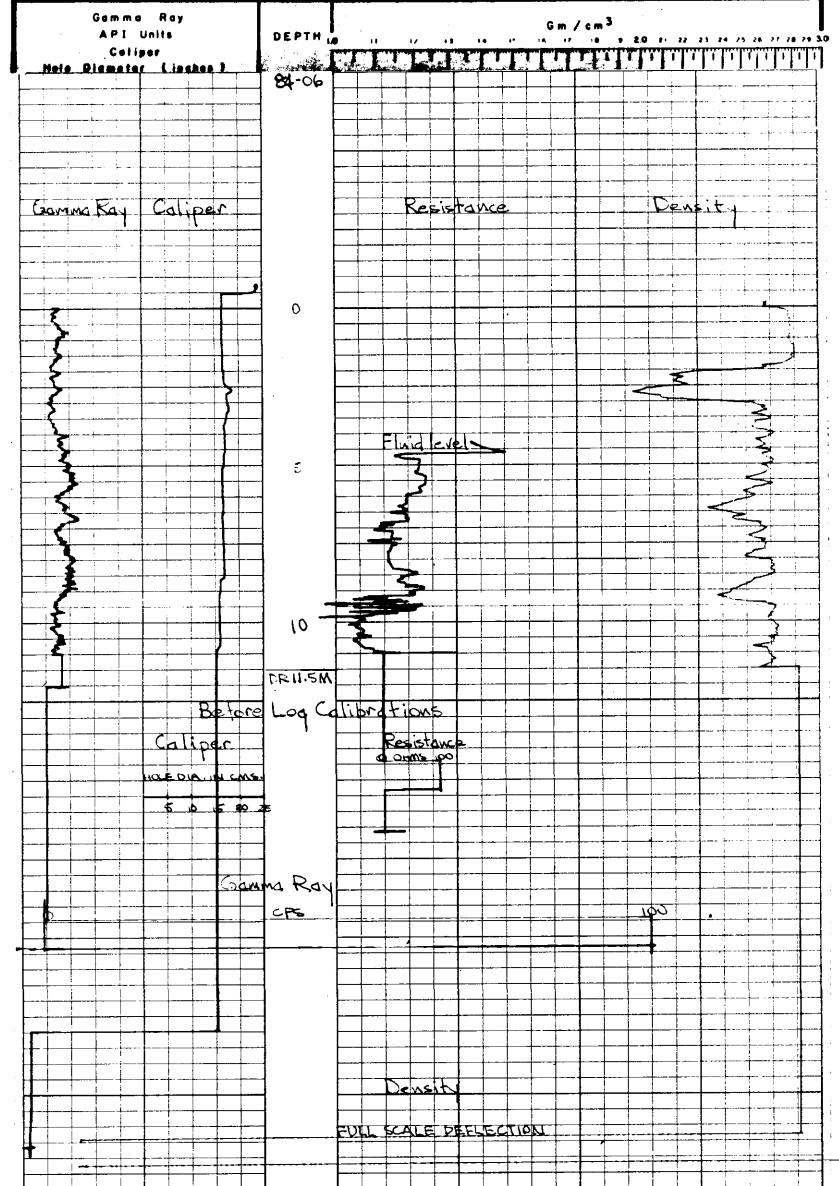
DEPTH (metres)

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DESCRIPTION

	 То	Thickness	
0	3.05	3.05	Weathered Shale
3.05	8.23	5.18	Sandstone
8.23	12.19	3.96	Volcanics

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Run No. Tool Model No. Diameter Detector Model No Type Length Hoist Truck No. Inst. Truck No. Location Genera Depth Run No. From I II.S.M	Dne 104 2.6cm CP-51b Scint. 3.8cm Gene 4. Courtemy D 3.3 Internet Speed To Minimo D 3.3	Rey rei T.C. Sec. 1	Sent				Run Tool Diami Type Spaci Spaci Horiz R Sourc Seria Isoto Stran DATA ey I. API	No. Mode Iter ng Sci m (P ie Mo I No. P g1h G.R.	ole op odel Units	7.C 5.0 7.C		Ionco IOA DSCMA F 	С 2. 2. 4. 4. 4. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2.	- 04 - 05 - 5 - 8 - 8 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7	L-IM L-IM Z.CUM EM
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Run No. Tool Model No. Diameter Detector Model No Type Langth Hoist Truck No. Inst. Truck No. Location Genera Depth Run No. From I U.S.M Reference Litera	Dne 104 2.6cm CP-51b Scint. 3.8cm Gene 4. Courtemy D 3.3 Internet Speed To Minimo D 3.3	Rey rei T.C. Sec. 1	Sent				Run Tool Diami Type Spaci Spaci Horiz R Sourc Seria Isoto Stran DATA ey I. API	No. Mode Iter ng Sci m (P ie Mo I No. P g1h G.R.	ole or or or or units	7.C 5.0 7.C		Ionco IOA DSCMA F 	С 2. 2. 4. 4. 4. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2.	- 04 - 05 - 5 - 8 - 8 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7	



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LOCATION : 493,285 N. - 351,864 E. ELEVATION : 465.6 m

DATE COMPLETED : June 23, 1984

DRILLER : Drillwell Enterprises Ltd. T. Stallybrass

DEPTH (metres)

DESCRIPTION

From	То	Thickness	
0	2.44	2.44	Weathered Shale
2.44	4.88	2.44	Shale
4.88	5.18	0.30	Sandstone
5.18	5.79	0.61	COAL
5.79	6.10	0.31	Shale
6.10	6.71	0.61	COAL
6.71	10.36	3.65	Shale
10.36	10.41	0.05	COAL
10.41	11.28	0.88	Shale
11.28	11.33	0.05	COAL
11.33	13.11	1.78	Shale
13.11	13.19	Ŏ.Ò8	COAL
13.19	14.02	0.83	Shale
14.02	14.09	0.07	COAL
14.09	15.24	1.15	Shale
15.24	17.98	2.74	Sandstone

HL - 84 - 07 C

LOCATION : 493,285 N. - 351,867 E. ELEVATION : 465.6 m

DATE COMPLETED : June 23, 1984

DRILLER : Drillwell Enterprises Ltd. T. Stallybrass

DEPTH (metres)

DESCRIPTION

From	To	Thickness	
0	4.88	4.88	Shale
4.88	4.93	0.05	Sandstone
4.93	5.52	0.59	COAL
5.52	5.57	0.05	Claystone
5.57	5.63	0.06	COAL
5.63	6.13	0.50	Siltstone
6.13	6.66	0.53	COAL
6.66	7.09	0.43	Siltstone
7.09	7.10	0.01	COAL
7.10	7.21	0.11	Siltstone
7.21	7.22	0.01	COAL
7.22	7.60	0.38	Siltstone
REMARKS	: Cored	Interval - 4.	88 - 7.60 metres

HL-84-07C

INTER FROM	VAL (m) TO	THICKNESS(m)	DESCRIPTION
4.88	4.93	.05	Sandstone: Dark grey; medium grained; very hard
4.93	5.13	.20	COAL: Soft and broken; fissile; powdery; abundant pyrite
5.13	5.38	.25	COAL: bright and blocky; hard; clean unbroken; abundant pyrite;
5.38	5.52	.14	COAL: Soft; crushed and broken powdery; soft; fissile
5.52	5.57	.05	Claystone: Soft; wet; plastic; greenish-grey; coal mixed in;
5.57	5.63	.06	COAL: As above; high angle fracture on lower contact;
5.63	6.13	.50	Siltstone: Dark grey; muddy; soft; uniform; pyritic lenses
6.13	6.19	.06	COAL: Hard; dull; boney; dirty
6.19	6.33	.14	COAL: bright and blocky; cleaner; fairly hard; some shaly material in thin bands;
6.33	6.41	.08	COAL: Soft; crushed; powdery; some dirt mixed in;
6.41	6.61	.20	COAL: Hard; unbroken; clean bright and blocky
6.61	6.66	.05	COAL: bright and blocky layers with thin boney sections mixed in;
6.66	7.09	.43	Siltstone: Dark grey; muddy uniform; soft; minor coaly laminae at top;
7.09	7.10	.01	COAL: vitrinite
7.10	7.21	-11	Siltstone: As above, but with some lensoid coaly material;
7.21	7.22	.01	COAL: bright and blocky; clean
7.22	7.60	.38	Siltstone: As above with some carbonaceous material; pyritic bands throughout;
7.60	7.65	.05	Siltstone; As above;
7.65	7.75	.10	CDAL: dull; dirty; fissile
7.75	7.77	.02	COAL: dull; shaley;

INTEF FROM	RVAL (m) TO	THICKNESS(m)	DESCRIPTION
7.77	8.18	. 41	Siltstone: hard; coaly
8.18	8.28	.10	Sandstone; Medium greenish
			grey; fine-grained; thin
			coaly wisps throughout;
			hard; resistant;
8.28	8.39	.11	COAL: unbroken; some dull, dirty sections near base
8.39	9.84	1.45	Siltstone: dark grey to
Q_ U7	1.07	ት በ ውስጥ የት በ በ የ ት በ ት በ ት በ ት በ ት በ ት በ ት በ ት በ ት በ	brown; muddy; uniform; one
			waterbearing high angle
			fracture:
9.84	9.86	.02	COAL: clean and bright
9.86	10.22	. 36	Siltstone: As above;
10.22	10.61	.39	Mudstone: Dark brown; thin
			bright coal laminae
			throughout;
10.61	10.91	.30	COAL: bright and blocky; clean;
			contains hard boney lenses
			pyritic nodule 3 cm. in diameter
10.91	11.14	.23	Mudstone: dark grey; shaley
10271	11.14		broken; coaly at base
11.14	11.22	.08	Coal and Mudstone mixed in
			core tube
11.22	11.32	.10	Mudstone: Dark brown;
			carbonaceous; fissile
11.32	11.41	.07	Mudstone: silty; harder;
4 4 4 4	11.63	. 22	carbonaceous; unbroken COAL: soft; crushed; clean
11.41	11.60	• 22	and blocky
11.63	12.18	.55	Mudstone: medium grey; with
11.00	14.10		dark grey bands; silty
12.18	12.24	.06	Mudstone: soft; powdery;
			carbonaceous and coaly
12.24	12.42	.18	COAL: bright and blocky, but
			dirty at top
12.42	12.80	.38	Siltstone; medium grey; muddy
		4.5	dark grey bands throughout
12.80	12.99	.19	COAL: bright and blocky; clean
12.99	13.05	.06	hard; unbroken COAL: dull; fissile; dirty
12.99	13.03	.19	COAL: bright and blocky; clean
10100	1.0.27	• * /	hard; unbroken; slightly
			dirty at base;
13.24	13.49	.25	Mudstone: Medium to dark brown
			soft; unbroken;

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	INTERVAL(m) THICKNESS(m)		DESCRIPTION
FROM			
13.49	13.76	.27	COAL: bright and blocky; clean; hard; some thin dull bands in middle; visible pyrite
13.76	14.18	- 42	COAL: As above; visible pyrite clean; bright and blocky
14.18	14.25	.07	COAL: dull; platy; fissile
14.25	14.35	.10	COAL: clean; hard; abundant pyrite; bright and blocky
14.35	14.41	.06	Mudstone; dark brown to black; abundant coaly material
14.41	14.48	.07	COAL: clean; bright and blocky; some dull bands
14.48	15.30	.82	Sandstone: dark grey grading downward to light grey; fine grained grading downward to medium grained; hard and massive; thin black coaly laminae throughout;
15.30	15.86	.56	Sandstone: As above; alternating light and dark bands;

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CORE RECOVERY = 98.4 %

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RUN BORE - HO	Level Max. rec. temp. deq. Operating rig time Recorded by Witnessed by	· 노 나라 ! ^ ! ? ! ? !	Dete Dete Run No. Type Log Depth - Driller Depth - Logger		FIELD	SURVEY CON	CANADIAN Arctic
HOLE						COMPANY	
RECORD To Size	N/A N/A S. Samebuck M		27 June 184 Orice Nuclear Jennar	B.C. 3,285 N 351	CUMBERLAND	708 - 33 A STR WELDWOOI	GAMMA -DENSITY
CASING			Two Res.	1.861E	HL-84-07	et n.w.	Ωρ
From			Three Caliper	Elev.	5 (5)	CALGARY , A	RESISTANCE
To			j ř ľ				
Fold Here		<u> </u>	Heading and	Log Conforms to Al	T NP 33	I I -	
			EQUIPMEN	T DATA			7
	Gamma	Ray			Resistance	Density	Caliper
Run No. Tool Model No.	<u>0.00</u> L-104		·	Run No. Tool Model No.	Two L-104	<u>Cne</u> L-114	<u>17,726</u>
Diameter	2.bcm	t	<u> </u>	Diameter	2,6cm	<u> </u>	7
Detector Model No	(P-516			Type	ME.	E	EAA
Туре	Scint.	 		Spacing		2 8 cm	├ ─── ┨
Length	3.8cm	}		Length	5cm		
· · · · · · · · · · · · · · · · · · ·				Horiz, Scale	40 s (div.		Sandil
	Gan	rel		Rm (P *F	N/A		
Hoist Truck No.			•	Source Model		HDVP	
inst. Truck No. Location	Courtena			Serial No. Isotope	}	687 Am 124-1	
	I VOW TENC			teniobe	Í		

Remarks: Drillwell Enterprises

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General

Depths

Reference Literature: N/A

From 14.25M

Run No.

T.C.

Sec.

Speed

M/Min. 3-3

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Sens.

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Settings IR

API G.R. Units Zero Bix L or R per Log Div.

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Strength LOGGING DATA Gemma Rey

1200 m C

Zero

Div. L or R

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Density

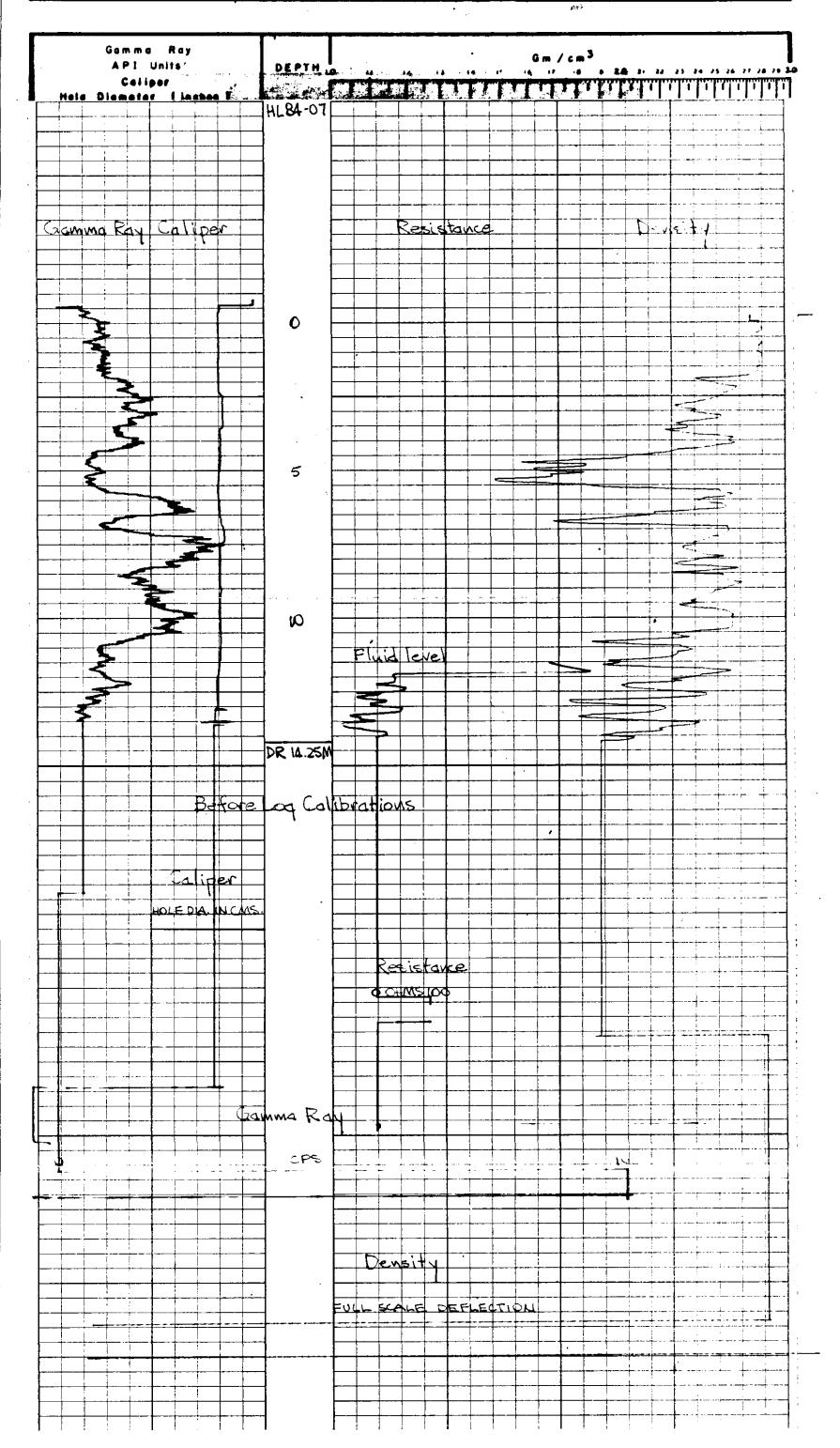
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Settings

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T.C.

Sec.



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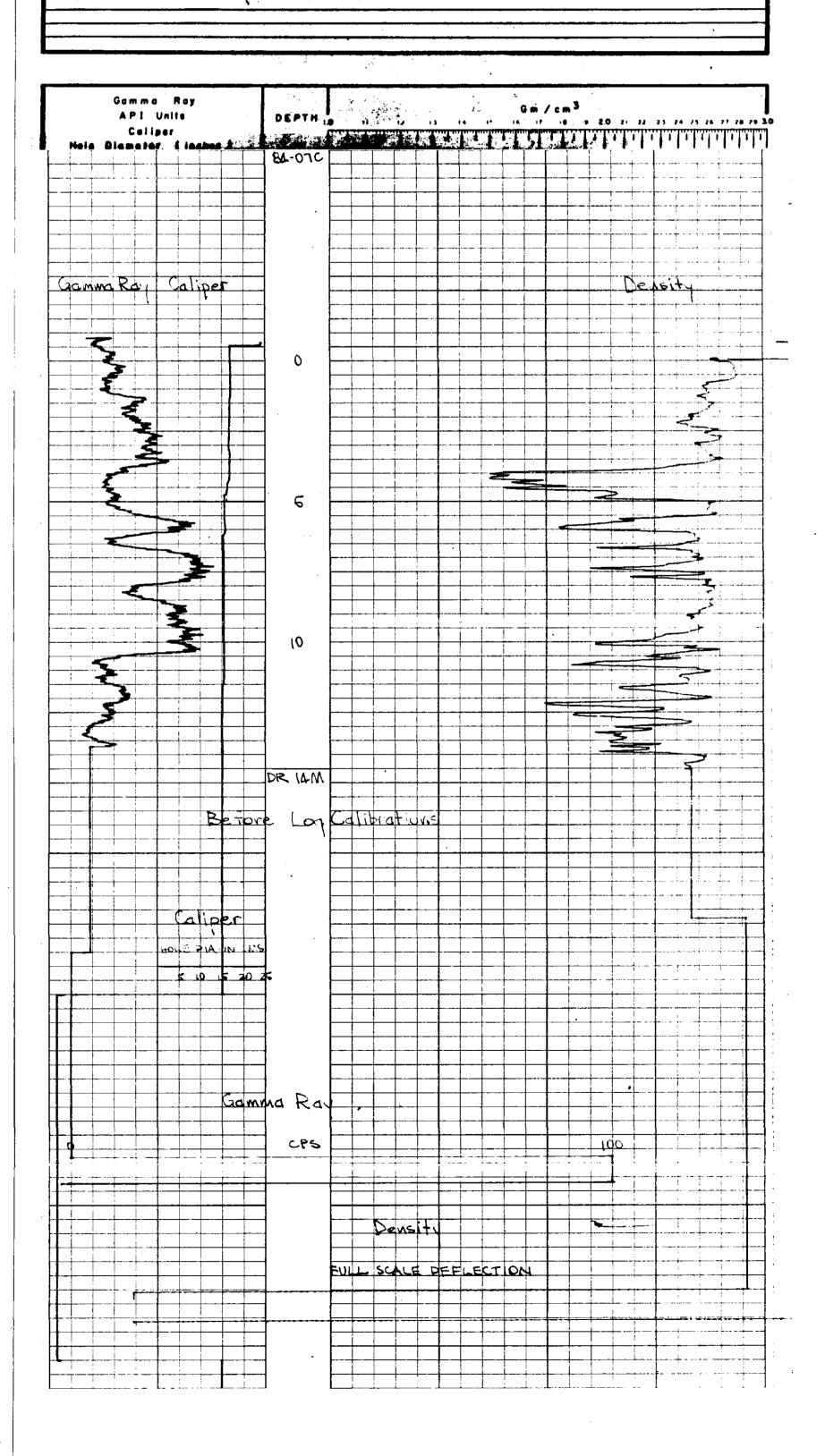
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RUN BORE - HO No. Bit From 1 15cm Swit	Level Max. rec. temp. deq. Operating rig time Recorded by Witnessed by	Bettom lagged interval Tog logged interval Type fluid in hole Salinity, PPM Cl. Dansity	Dete Run No. Type Leg Depth - Drillet Depth - Legar	ent Detun	FIELD	SURVEY Systems LTD.	C AN ADIAN A RCTIC
MOLE RECORD CASING RECORD em To Size Wgt. From To ut To Size Wgt. From To	r. N/A N/A G. Sawchuck Jr. S. Gardener	N/A N/A	" e.c. e.c. e.c	R.C. Tup. Rge. W. Other	CUMBERLAND	708 - 35 A STREET N.W. CALGARY, ALTA:	GAMMA - DENSITY & RESISTANCE
Fold Here	an in the second	This	Heading and	Log Conforms to Al	PI RP 33		
			EQUIPMEN	T DATA			
Run No.	Gamme	Rey		Run No.	Resistence	Density (Caliper
Tool Model No. Diameter	L-104 CP-516			Tool Model No. Diameter		L = LA CP = - h	- <u>A</u> Z ^
Detector Model No	2. bein		•	Type		2.6cm	ΞM
Type	Scint.			Spacing		F	
Length	3.8cm			Length	f	3.864	
	1			Horiz, Scale			Ecm/dis.
	Gene	rel		Rm (P °F		-	
Hoist Truck No. Inst. Truck No.	4	•	·· ·· · · · ·	Source Model Serial No.	 	HDVP 687	<u> </u>]
Lecation	Contenas			lsotope		Am137-1	
				Strength		120 mC	
			LOGGING	DATA			

Remarks: Drillwell Enterprises



HL - 84 - 08

LOCATION : 493,058 N. - 351,348 E. ELEVATION : 565.1 m

DATE COMPLETED : June 24, 1984

DRILLER : Drillwell Enterprises Ltd. T. Stallybrass

DEPTH (metres)

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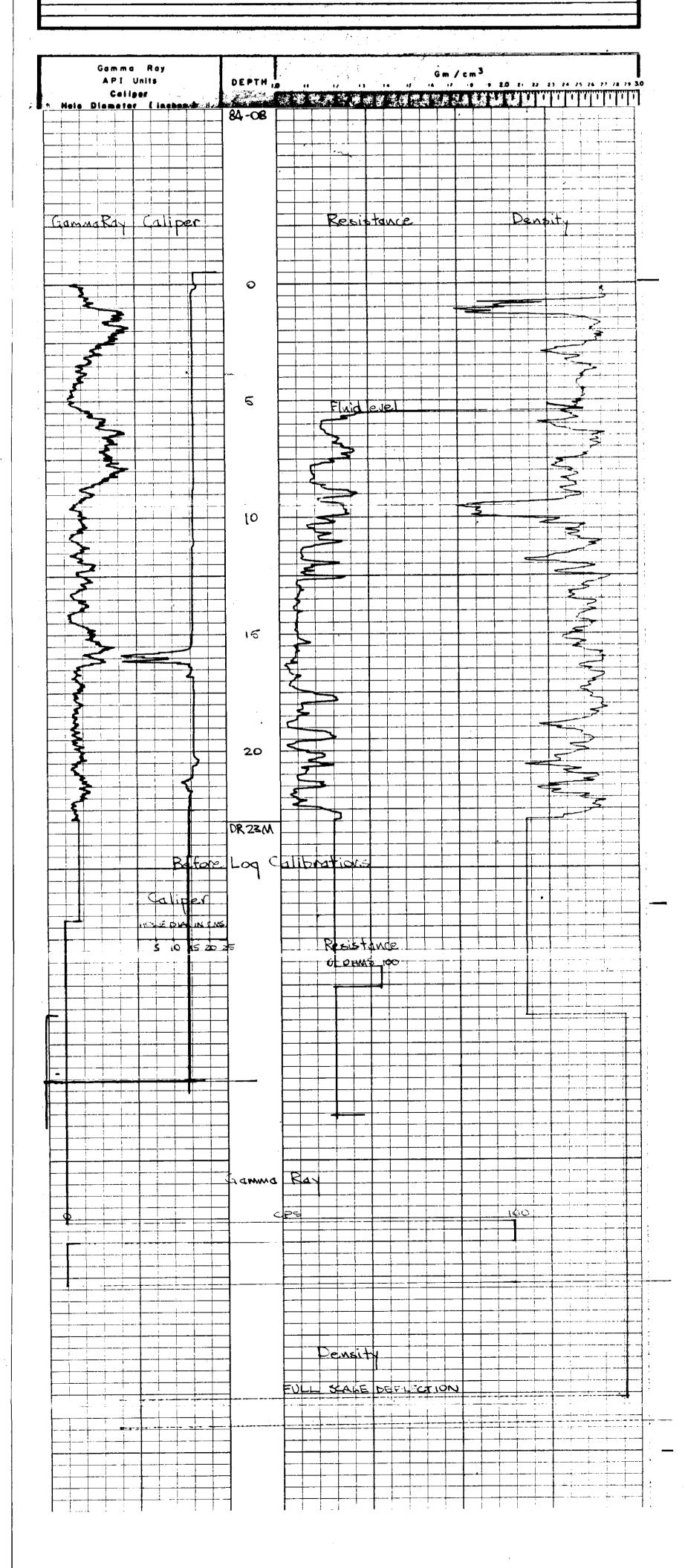
DESCRIPTION

Το	Thickness	
0.91	0.91	Till
1.52	0.61	COAL
3.05	1.53	Siltstone
5.79	2.74	Sandstone
6.40	0.61	Siltstone
7.62	1.22	Sandstone
9.14	1.52	Siltstone
9.75	0.61	COAL
11.89	2.14	Siltstone
12.19	0.30	COAL
13.72	1.53	Siltstone
20.73	7.01	Sandstone
23.16	2.43	Siltstone
24.08	0.92	Sandstone
24.69	0.61	Volcanics
	0.91 1.52 3.05 5.79 6.40 7.62 9.14 9.75 11.89 12.19 13.72 20.73 23.16 24.08	0.91 0.91 1.52 0.61 3.05 1.53 5.79 2.74 6.40 0.61 7.62 1.22 9.14 1.52 9.75 0.61 11.89 2.14 12.19 0.30 13.72 1.53 20.73 7.01 23.16 2.43 24.08 0.92

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RUN BORE - HO	Level Max. rec. temp. deg. Operating rig time Recorded by Wilnessed by	Briton toppod intervel Top toppod intervel Type fluid in hole Salihily, PPM Cl. Density			FIELD COMP	CANADIAN Arctic Survey Systems LTD.	
HOLE RECORD	F. N/2 5.5 5.5 5.5 7 7		nom G.L. 26 June Nuclear 24 M		COMPANY WELDWOOD	GAMMA 708 - 35	
Size Wgt.	M nrs. huek.lr		τ Φ π	48		-DENSITY	
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Pold Heru-	Fold Hers						
			EQUIPMEN	DATA			
Run No.	Gamma	Ray		Run No.		ensity Colliper	
Tool Model No.	L-104			Tool Model No.	L-104 . L-	104 $1-i04$	
Diameter	2.6cm	•		Diometer	2.6cm 2.	ben 2.ben	
Delector Model No Type	Scint.	·····	·····	Type Spacing	ME	F EM	
Length	3.8cm				tt²		
				Length	Sava		
				Horiz, Scale	40 s. div.	Tem die	

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Rm (°F N/A General Source Model HDVP Holat Truck No. L 687 Serial No. Inst. Truck No. Δ Ary 1324 Isotope ourtena Lecation 128 m C Strength LOGGING DATA Density General Gamma Rey API G.R. Units T.C. Sens. T:C. Zero Zero Depths Speed Sens. Settings Div. L or R FL/Min. Sec. Settings Dix L of R per Log Div. Sec. Run No. From To <u>IK</u> 2.3M IR 16 Surt 100 23M1 1 Reference Literature: N/A -. Remarks: Drillwell Futexprises



HL - 84 - 09

LOCATION : 492,895 N. - 352,136 E. ELEVATION : 485.4 m

DATE COMPLETED : June 25, 1984

DRILLER : Drillwell Enterprises Ltd. T. Stallybrass

DEFTH (metres)

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DESCRIPTION

1.71			
From	To	Thickness	
0	12.80	12.80	Till
		1.22	
14.06	14.33	0.27	COAL
		1.21	
15.54	16.15	0.61	COAL
16.15	22.25	6.10	Siltstone
22.25	22.56	0.31	COAL
22.56	24.08	1.52	Siltstone
24.08	24.18	0.10	COAL
24.18	24.69	0.51	Siltstone
24.69	26.21	1.52	COAL
26.21	28.04	1.83	Sandstone
28.04	28.65	0.61	Siltstone
28.65	32.00	3.35	Siltstone
32.00	33.22	1.22	COAL, w/ siltstone parting
33.22	37.49	4.27	Siltstone
37.49	37.79	0.30	COAL
37.79	39.01	1.22	Siltstone
39.01	39.62	0.61	COAL
39.62	41.76	2.14	Sandstone
41.76	44.50	2.74	Siltstone
44.50	45.11	0.61	COAL
45.11	45.72	0.61	Siltstone
45.72	46.63	0.91	COAL
46.63	49.38	2.75	Siltstone
49.38	54.25	4.87	Volcanics

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- NON	Level Mex. rec. Operating Recorded Witnessed	Type flu Selinity, Density	Ĩ	Depth - Oriller Depth - Lagger					•	. <u>.</u>		S	ÞC
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Public Hara	Gemme	Roy					DATA			r 33			Caliper
Pete Here Run No.	Che.	Roy	· ;				Run No.	2445 To		elistance	Density		Caliper
Poho Hara	L-104	Roy					Run No. Toal Mo	dat No		-104			Callper
Run No. Tool Model No. Dlameter Detector Model No	L-104 2.6cm CP-F16	Roy					Run No. Toal Mo Diameter Type	2450 F0		Two.	Density Lowe L-104 2.000		Caliper
Run No. Tool Model No. Diameter Detector Model No Type	L-104 2.bcm SP-F1b Scint.	Rey					Run No. Toal Mo Diameter	2450 F0		-104 -104	Density Long L-104 2.000		Caliper
Run No. Tool Model No. Dlameter Detector Model No	L-104 2.6cm CP-F16	Roy					Run No. Toal Mo Diometer Type Spacing Leng			-104 -104 ME_ 5cm	Density 1.~104 2.007 F= 3.8.07		Callper
Run No. Tool Model No. Diameter Detector Model No Type	L-104 2.bcm SP-F1b Scint. 3.Bcm						Run No. Toal Mo Diometer Type Spacing Leng Horiz, S	dat No r		LINO - 104 .bcm ME- 5cm Scm	Density 1.~104 2.007 F= 3.8.07		Caliper
Run No. Tool Model No. Diameter Detector Madel No Type Length Heist Truck No.	L-104 2.bcm SP-F1b Scint.						Run No. Toal Mo Diameter Type Spacing Long Horiz, S Rm Source	phile te del Ng r th Scale @ °F Model		-104 -104 ME_ 5cm	Denelly L-IUA 2.UCA E 3.8.CA		Callper
Run No. Tool Model No. Diameter Delector Model No Type Length Holet Truck No. Inst Truck No.	L-104 2.6cm CP-F16 Ceint. 3.8cm Gono A	rel					Run No. Toal Mo Diameter Type Spacing Long Horiz, S Rm Source Serial P	th Scale Bodel No.		LINO - 104 .bcm ME- 5cm Scm	Densilty L.~104 2.000 F 3.800 HDVP 687		Callper
Pohe Hore Run No. Tool Model No. Diameter Detector Madel No Type Length Hoist Truck No.	L-104 2.bcm SP-F1b Scint. 3.Bcm	rel					Run No. Toal Mo Diometer Type Spacing Leng Horiz. S Rm Source Serial P Leotope Strength	th Scale @ °F Model No.		LINO - 104 .bcm ME- 5cm Scm	Denelly L-IUA 2.UCA E 3.8.CA		Caliper
Run No. Tool Model No. Diameter Delector Model No Type Length Holet Truck No. Inst Truck No.	L-104 2.6cm CP-F16 Ceint. 3.8cm Gono A A Courtenay	rel			0661		Run No. Toal Mo Diometer Type Spacing Leng Horiz, S Rm Source Serial P Leotope Strength ATA	th Scale @ °F Model No.		5cm NZAiv	Densily L-104 2.007 E 3.807 HDVP 687 Camiš74 128 mC		Callper
Run No. Tool Model No. Diameter Detector Model No. Type Length Hoist Truck No. Inst Truck No. Lecation Genere Depths	Line 1-104 2.6cm CF-E16 CE-E16 Cint. 3.8cm Gono A A Courtenny	rel T.C.			0 G G I I G g m m	NG C	Run No. Toal Mo Diameter Type Spacing Leng Horiz, S Rm Source Serial I Leotope Strength IdTA Y API G.1	All and a second		- 104 .6cm ME- 5cm Sc. / iv. N/A	Densily Densily Const Densily Zero		
Run No. Tool Model No. Diameter Detector Model No. Type Length Holet Truck No. Inst Truck No. Lecation Genere Depths	Line L-104 2.6cm CF-E16 Cint. 3.8cm Gono Gono A A Constemay	rel T.C. Sec.	S: 3:		OGGI Gamm 20 Div	NG Change and the second secon	Run No. Toal Mo Diameter Type Spacing Leng Horiz, S Rm Source Serial I Leotope Strength IdTA Y API G.1	Alle te del No r th Scale @ OF Model No.		Sens.	Densily Densily Const Densily Zero		Caliper
Run No. Tool Model No. Diameter Detector Model No. Type Length Hoist Truck No. Inst Truck No. Lecation Genere Depths	L-104 2.6cm CP-E16 Cint. 3.8cm Gono Gono A Contensy I Speed RAMin	rel T.C. Sec.			OGGI Gamm 20 Div	NG C	Run No. Toal Mo Diameter Type Spacing Leng Horiz, S Rm Source Serial I Leotope Strength IdTA Y API G.1	All and a second		- 104 .6cm ME- 5cm Sc. / iv. N/A	Densily Densily Const Densily Zero		Callper
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Pohé Here Run No. Tool Model No. Diameter Detector Model No Type Length Holet Truck No. Inst Truck No. Lecation Genere Depthe UN No. From	Line L-104 2.6cm CF-E16 Cint. 3.8cm Gono Gono A A Constemay	rel T.C. Sec.	S: 3:		OGGI Gamm 20 Div	NG Change and the second secon	Run No. Toal Mo Diameter Type Spacing Leng Horiz, S Rm Source Serial I Leotope Strength IdTA Y API G.1	All and a second		Sens.	Densily Densily Construction Densily Zero		
Run No. Tool Model No. Diameter Detector Model No Type Length Molat Truck No. Inst Truck No. Lecotion Genere Depthe Un No. From	Line L-104 2.6cm CF-E16 Scint. 3.8cm 4 Courtenay 1 Speed To KAMIN U 3.3	rel T.C. Sec.	S: 3:		OGGI Gamm 20 Div	NG Change and the second secon	Run No. Toal Mo Diameter Type Spacing Leng Horiz, S Rm Source Serial I Leotope Strength IdTA Y API G.1	All and a second		Sens.	Densily Densily Construction Densily Zero		
Run No. Tool Model No. Diameter Detector Model No. Type Length Holet Truck No. Inst Truck No. Lecation Genere Depths	Line L-104 2.6cm CF-E16 Scint. 3.8cm 4 Courtenay 1 Speed To KAMIN U 3.3	rel T.C. Sec.	S: 3:		OGGI Gamm 20 Div	NG Change and the second secon	Run No. Toal Mo Diameter Type Spacing Leng Horiz, S Rm Source Serial I Leotope Strength IdTA Y API G.1	All and a second		Sens.	Densily Densily Construction Densily Zero		Callper Callper
Pohé Here Run No. Tool Model No. Dlameter Detector Model No Type Length Holet Truck No. Inst Truck No. Lecation Genere Un No. From E SAM	Line L-104 2.6cm CF-E16 Scint. 3.8cm 4 Courtenay 1 Speed To KAMIN U 3.3	rel T.C. Sec.	S: 3:		OGGI Gamm 20 Div	NG Change and the second secon	Run No. Toal Mo Diameter Type Spacing Leng Horiz, S Rm Source Serial I Leotope Strength IdTA Y API G.1	All and a second		Sens.	Densily Densily Construction Densily Zero		
Publi Were Run No. Tool Model No. Dlameter Detector Model No Type Length Holat Truck No. Inst Truck No. Lecotion Genere Depthe un No. From From Reference Literat	L-IDA 2.6cm CP-EIb Cint. 3.8cm Gono A A Constensy I Speed To KAMIN U 3.3 Ure: N/A		S: 3:		OGGI Gamm 20 Div	NG Change and the second secon	Run No. Toal Mo Diameter Type Spacing Leng Horiz, S Rm Source Serial I Leotope Strength IdTA Y API G.1	All and a second		Sens.	Densily Densily Constity		
Run No. Tool Model No. Diameter Detector Model No Type Length Holat Truck No. Inst Truck No. Lecation Genere Depthe In No. From	L-IDA 2.6cm CP-EIb Cint. 3.8cm Gono A A Constensy I Speed To KAMIN U 3.3 Ure: N/A		S: 3:		OGGI Gamm 20 Div	NG Change and the second secon	Run No. Toal Mo Diameter Type Spacing Leng Horiz, S Rm Source Serial I Leotope Strength IdTA Y API G.1	All and a second		Sens.	Densily Densily Construction Densily Zero		

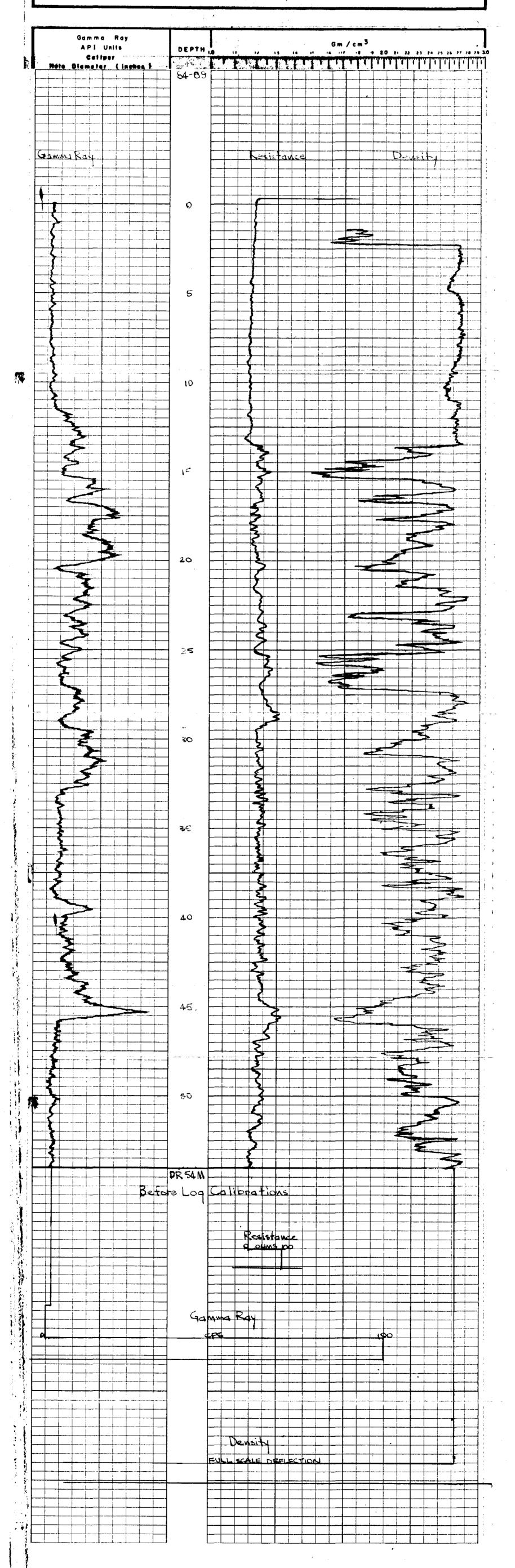
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HL-84-10C

INTEF FROM	RVAL(m) TO	THICKNESS(m)	DESCRIPTION
12.50	15.50	3.00	Siltstone; Dark grey; sandy; highly fractured at 60 degrees to horizontal;
15.50	16.83	1.33	Siltstone: As above;
16.83	17.43	. 60	Siltstone; medium grey; soft and crushed;
17.43	18.10	.67	LOST CORE
18.10	18.50	.40	Siltstone; medium to dark grey; slightly harder; broken at base
18.50	18.80	.30	Siltstone; As above; shattered
18.80	19.32	.52	Sandstone: medium grey; medium grained; pyritic; coaly wisps throughout
19.32	19.42	.10	COAL: soft; shaley; dirty; pyritic
19.42	19.52	.10	Siltstone: carbonaceous; slickensided and fractured;
19.52	19.68	.16	COAL: bright and blocky; hard pyrite throughout; some fissile layers; slickensides near horizontal fractures
19.68	19.70	.02	COAL: soft; dull; shaley
19.70	20.13	. 43	COAL: bright and blocky; some fissile layers; visible pyrite
20.13	20 .97	.84	Siltstone: Medium to dark grey; uniform; highly pyritic
20.97	21.50	.53	LOST CORE?
21.50	21.74	. 24	Siltstone: As above; pyritic layers near base
21.74	21.82	.08	COAL: Bright and blocky; with layers of vitrinite up to 1 cm
21.82	21.87	.05	COAL: Softer; shaley; dull
21.87	21.92	.05	COAL: Bright and blocky; clean; hard
21.92	21.93	.01	Mudstone: Dark brown; slightly carbonaceous; fairly hard
21.93	22.20	.27	COAL: Bright and blocky; hard, clean abundant pyrite in cleats; slightly dirty near base

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	RVAL(m) TO	THICKNESS(m)	DESCRIPTION
		67	DVDITE RAND, band, barnet longoid
22.20 22.22	22.22 23.10	.02 .88	FYRITE BAND: hard; boney; lensoid Mudstone: Dark grey; highly pyritic with thin, horizontal pyritic layers & pyrite sheeting on high angle fractures; slightly carbonaceous near top; broken in middle
23.10	23.29	.19	BONE COAL: Brown coal bands up to .5 cm.; interbedded with silty mudstone & boney layers; hard
23.29	23.46	.17	COAL: Bright and blocky; clean; hard; some visible pyrite
23.46	23.49	.03	Sandstone: Dark brownish grey; fine grained; very hard; coaly wisps throughout
23.49	23.60	. 11	Sandstone: Medium grey; fine grained; very hard; highly pyritic at base
23.60	23.67	.07	COAL: Bright and blocky; clean becoming soft & dirty near base
23.67	24.36	. 69	Mudstone: Dark grey to brown; some thin coal laminae at top; carbonaceous; thin pyritic bands throughout; thin horizontal calcite bands in middle; bottom contact is slickensided high angle fracture plane
24.36	24.43	.07	COAL: fractured parallel to high angle fracture at upper contact; could be repeat section; fissile but fairly clean;
24.43	24.50	.07	LOST CORE?
24.50	24.60	.10	COAL: Dull; fissile; dirty; shaley; broken up
24.60	24.85	.25	COAL: Soft; crushed & mixed with shale; some bright, blocky pieces
24.85	25.00	.15	Mudstone: Medium grey; soft; crushed and mixed with some coal
25.00	25.33	.33	LOST CORE ?
25.33	27.26	1.93	Siltstone; Medium grey; some soft
2 62 8 12°12'		secti	
27.26	27.40	. 14	COAL: Bright and blocky; broken up; pyritic
27.40	27.50	.10	Siltstone: As above; end of core
	conveev -		

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HL - 84 - 10 C

LOCATION : 492,976 N. - 352,000 E. ELEVATION : 499.6 m

DATE COMPLETED : June 25, 1984

DRILLER : Drillwell Enterprises Ltd. T. Stallybrass

DEPTH (metres)

DESCRIPTION

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Di	EFIN MECK	23/	
From	Το	Thickness	
Ö	2.13	2.13	Till
2.13	10.36	8.23	Sandstone
10.36		0.61	Shale
10.97	11.28	0.31	COAL
11.28	12.50	1.22	Siltstone
12.50	18.80	6.30	Siltstone
18.80	19.32	0.52	Sandstone
19.32	19.42	0.10	COAL
19.42	19.52	0.10	Siltstone
19.52	20.13	0.61	COAL
20.13	21.74	1.61	Siltstone
21.74	21.92	0.18	CDAL
21.92	21.93	0.01	Mudstone
21.93	22.20	0.27	COAL
22.20	22.22	0.02	Pyrite band
22.22	23.10	0.88	Mudstone
23.10	23.29	0.19	Boney Coal
23.29	23.46	0.17	COAL
	23.60	0.14	Sandstone
	23.67	0.07	COAL
23.67	24.36	0.69	Mudstone
24.36	24.43	0.07	COAL
24.43	24.50	0.07	Lost Core?
24.50	24.85	0.35	COAL
	25.00	0.15	Mudstone
25.00	26.93	1.93	Siltstone
26.93	27.07	0.14	COAL
27.07	27.17	0.10	Siltstone
27.17	27.50	0.33	Lost Core?
27.50	29.26	1.76	Siltstone
29.26	29.87	0.61	CDAL
29.87		1.22	Siltstone
31.09	35.97	4.88	Sandstone
35.97	37.19	1.22	COAL
37.19		2.43	Siltstone
39.62	39.93	0.31	COAL
	48.46	8.53	Siltstone

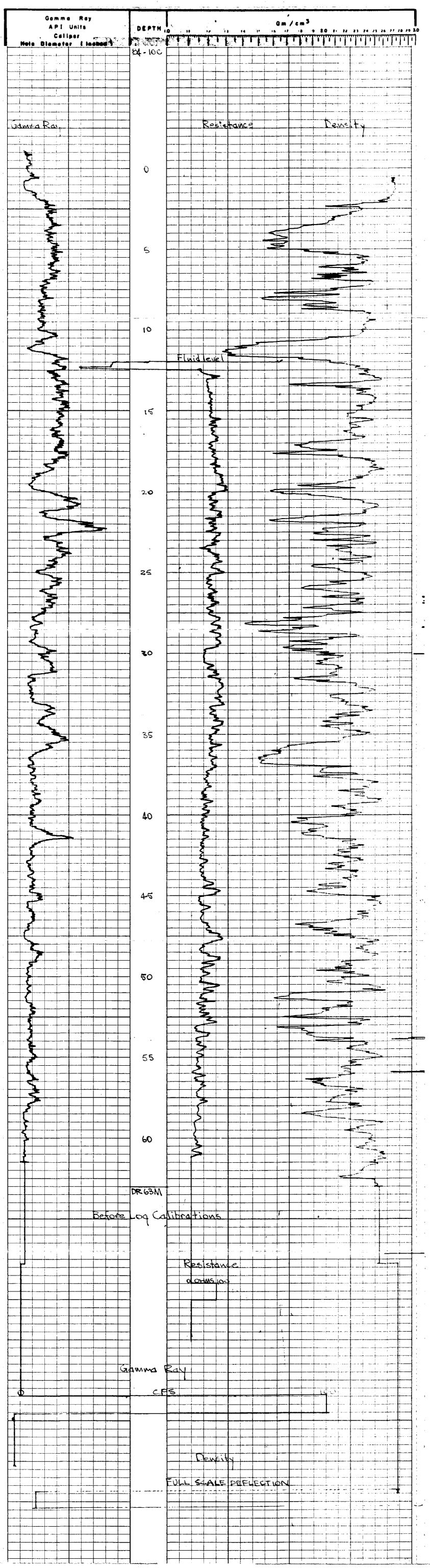
48.46	49.38	0.92	Sandstone
49.38	53.64	4.26	Siltstone
53.64	54.00	0.36	COAL
54.00	54.56	0.56	Siltstone
54.56	54.86	0.30	COAL
54.86	56.69	1.83	Siltstone
56.69	57.00	0.31	COAL
57.00	59.74	2.74	Siltstone
59.74	63.40	3.66	Conglomerate

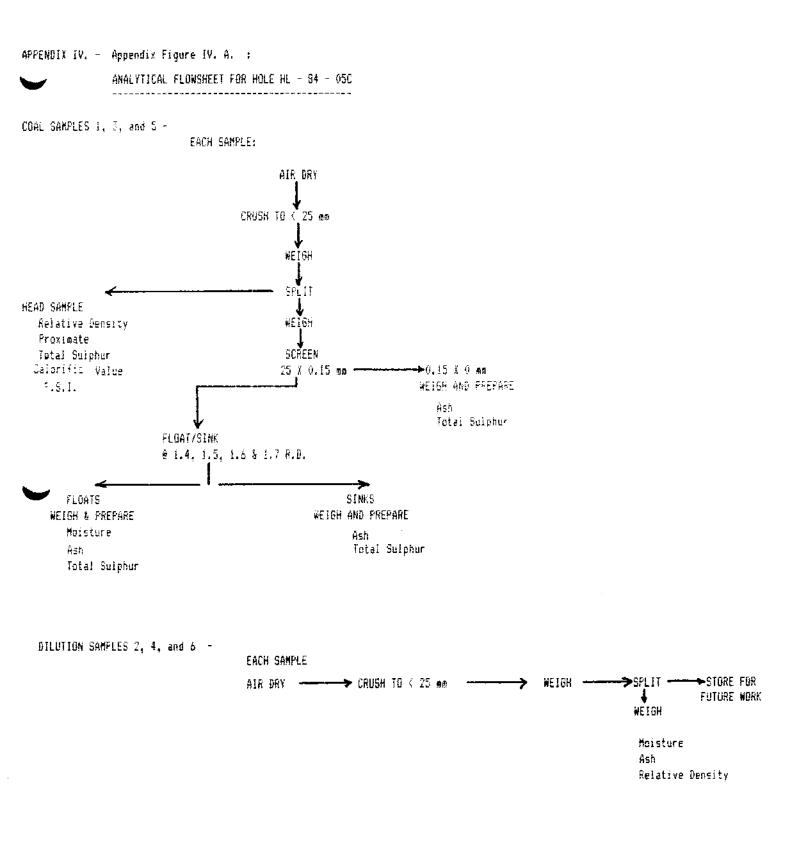
REMARKS : Cored Interval, 12.50 - 27.50 metres.

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		From	E - HOLE					ci.	hole	401						from	from	um 6.1	194	492	PROVINCE	FIELD	WELL		COMPANY	LTD.		
		1.0	RECORD	S. Gardemer	ſ		N0.21	N/A	Water	b	MS4	h2M	Nuclear		27 June. 18	<u> 6.L.</u>	<u>6 L</u>		Sec. Twp.	492,976 N 3	B.C.	CUMBERLA	DRILLHOLE		WELDWOOD	708 - 35 A	GAMMA -D	
		Size Wgt.			5								Res	Two	84.		ft. abave pe	EI.v. 499.6M	Rge.	352,000E		AND	HL-		OF	STREET N	-DENSITY	
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Reference Literature: N/A

Romarka: Drillwell Enterprises Caliper curve NI/A Tamma & Resistance curves recorded .5M shallow.





HOLE NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL (metres)	THICKNESS	SAMPLE DESCRIPTION
HL-84-05C	1	8.78 - 9.29	.51	COAL (upper)
HL-84-05C	2	9.29 - 9.42	.13	FLOOR MATERIAL
HL-84-05C	3	16.98 - 17.83	.85	COAL (middle)
HL-84-05C	4	17.83 - 17.98	.15	FLOOR MATERIAL
HL-84-05C	5	19.75 - 20.46	.71	COAL (lower)
HL-84-05C	6	20.46 - 20.82	.36	FLOOR MATERIAL
HL-84-07C	1	4.93 - 5.63	. 70	COAL (upper)
HL-84-07C	2	5.63 - 6.13	.50	PARTING (upper)
HL-84-07C	3	6.13 - 6.66	.53	COAL (upper)
HL-84-07C	4	6.66 - 6.74	.08	FLOOR MATERIAL
HL-84-07C	5	10.61 - 10.91	.30	COAL (middle)
HL-84-07C	6	10.91 - 11.41	.50	SHALE (middle)
HL-84-07C	7	11.41 - 11.63	. 22	COAL (middle)
HL-84-07C	8	12.80 - 13.24	_ 44	COAL (lower)
HL-84-07C	9	13.24 - 13.49	.25	ROCK (lower)
HL-84-07C	10	13.49 - 14.35	.86	COAL (lower)
HL-84-07C	11	14.35 - 14.48	.13	FLOOR MATERIAL
HL-84-10C	1	19.32 - 20.13	.81	COAL (middle)
HL-84-10C	2	21.74 - 22.20	. 46	COAL (middle)
HL-84-10C	2	23.10 - 23.46	.36	COAL (middle)

CORE SAMPLE INVENTORY

Hole Number: HL-84-05C HAMILTON LAKE BLOCK 'E'

AreHAMILTON LAKE BLOCK 'B'

Location:

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492,728 N. - 351,488 E.

Elevation:____ Page ____ of ____ 4

MUDSTONE Medium brown; soft; thin coaly laminae throughout. MUDSTONE : As above; highly fractured & broken; more abundant thin coal bands; abundant pyrite COAL : Completely crushed and badly mixed with thin rock bands & powdery coal material COAL : Bright and blocky, but crushed; clean; soft but brittle; no visible pyrite COAL : Harder, relatively unbroken; generally bright & blocky; fairly clean but some boney layers COAL : Soft; broken up; bright w/ dirty coal mixed BOME : Sandy texture; greenish black COAL : Hard; bright & blocky; fairly clean COAL : Soft; powdery; fairly clean; mixed up SILISIONE : Dark grey; massive and uniform; some very thin calcite veins parallel to bedding; becoming sandy near base.

Hole	Number :	HL-84-05C	Area:	HAMILTON	LAKE BLOCK	Ъ.	

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Location: _____ 492,728 N. - 351,488 E. ____ Elevation: ____606.2 m.

_____ Page__ pf_____ 4___

e Contractor an

DESCRIPTION	SAMPLE INTERVAL		CORE Scale:	COLUMN I:40	
		CORE DEPTH RECOVERED (m)	LITHOLOGY	THICKNESS (m)	% RE
		11.00 -	u		
			- n 11		
		11.50	te 1 te		
SILTSTONE :			- 1		
Medium brown to grey; muddy; Soft; Uniform; Unbroken;		12.0	-		
			- '	3.11 m	
			- 11		
		12.50 -	- 1, - 1,		
			11 11		
		13.00 -			
			,		
		13.50 -			
			" "		
		14.00-			
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SANDSTONE : Medium grey to white; med. grained; hard;

COAL : Clean, but crushed and powdery; visible pyrite

COAL : Clean, bright & blocky; some visible pyrite

lithic; thin black wisps of coaly matter

Location:	, 4	192,728 N 351,488	Area: E.			Elevatio	n:606.2 m	
						Page	<u>3 of `4</u>	
	D	ESCRIPTION	SAMPLE INTERVAL			CORE Scale:	COLUMN I:40	
				CORE RECOVERED	DEPTH (m)	LITHOLOGY	THICKNESS (m)	% REC
					14.00-	if yr h		
				14.50	lı n y			
		·.			-	- In 		
					- 15.00	ti ft rt		
	SILTSTONE :	Medium brown to grey; muddy;				ы ы 19 19		
		Soft; Uniform;			15.50- - -	ч т т	3.10 •	
				- 16.0 0 -	H 11			
				<i>,</i>	-	и И И		
			•		-	4 		

16.50

17.00

17.50

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COAL : Clean, bright & blocky, broken up and fractured Sample #3

16.98

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Hole Number:	HL-84-05C	_ Area:	H		TON LAK	E BLOCK 'B'	
	492,728 N 351,488	Ε	'		Elevation	606.2 ·	m
						40f4	
	DESCRIPTION	SAMPLE INTERVAL			CORE Scale:	COLUMN I:40	
			CORE RECOVERED	DEPTH (m)	LITHOLOGY	THICKNESS (m)	REC
pyrite; COAL : Dull; di SHALE : Dark gr	k blocky; clean; unbroken; some visible vertical calcite veining; irty; boney rey to black; very thin bright coaly e throughout;	17.83 ^{#3} #4 17.98		17.50 18.00 18. 5 4		.32 = .10 = .05 =	
SILTSTONE : D	ark grey; muddy; soft; uniform; pyritic				- 1 1	1.77 🛥	

A state

SILTSTONE : Dark grey; muddy; soft; uniform; pyritic		19.00 -	11 		1.77 🔹	
		- 19.50- -	u u u u			
COAL : Clean; bright & blocky; MUDSTONE : Carbonaceous; COAL : Clean; bright & blocky; COAL : Clean; bright & blocky;	19.75 Gample #5	20.00		.02 •	.13 • .20 •	
COAL : Boney, sandy texture; hard; dull COAL : Dull; dirty; blocky	Dample #3 20.46 Sample #6 Sample #6	20.50			.22 • .12 • .18 •	
SHALE & COAL MIXED : Thin interbedded bands; SILTSTONE : Dark grey; soft; uniform; occasional thin coal laminae;	20.82	21.00-			2.29 •	

General Testing Laboratories A Division of SGS Supervision Services Inc.

TO: STEPHEN L. GARDENER, 274 Westwood Road, R.R. #3, Site 'S' Nanaimo, B.C., V9R 5K3

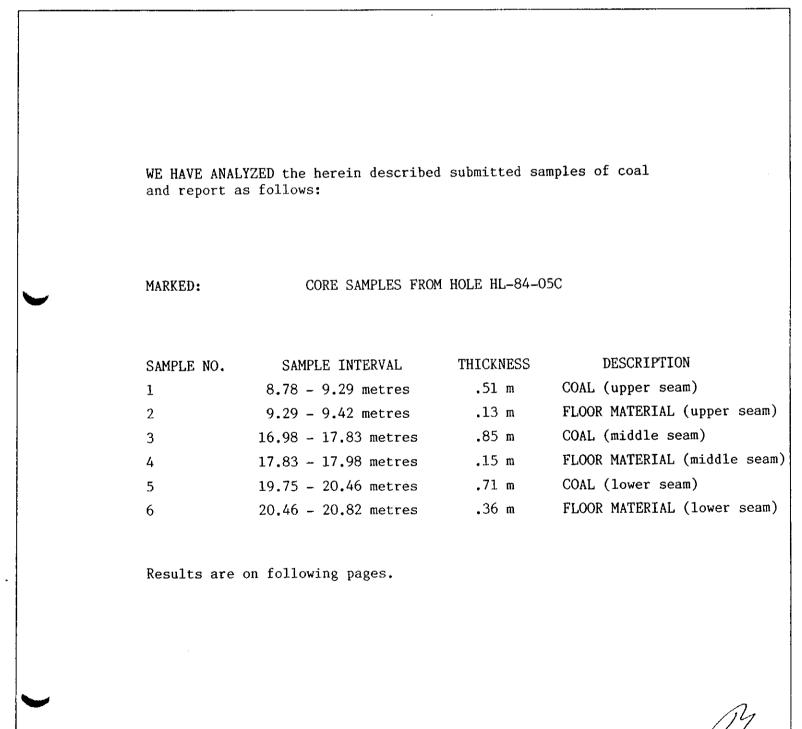
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1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No. FILE: 64-21659

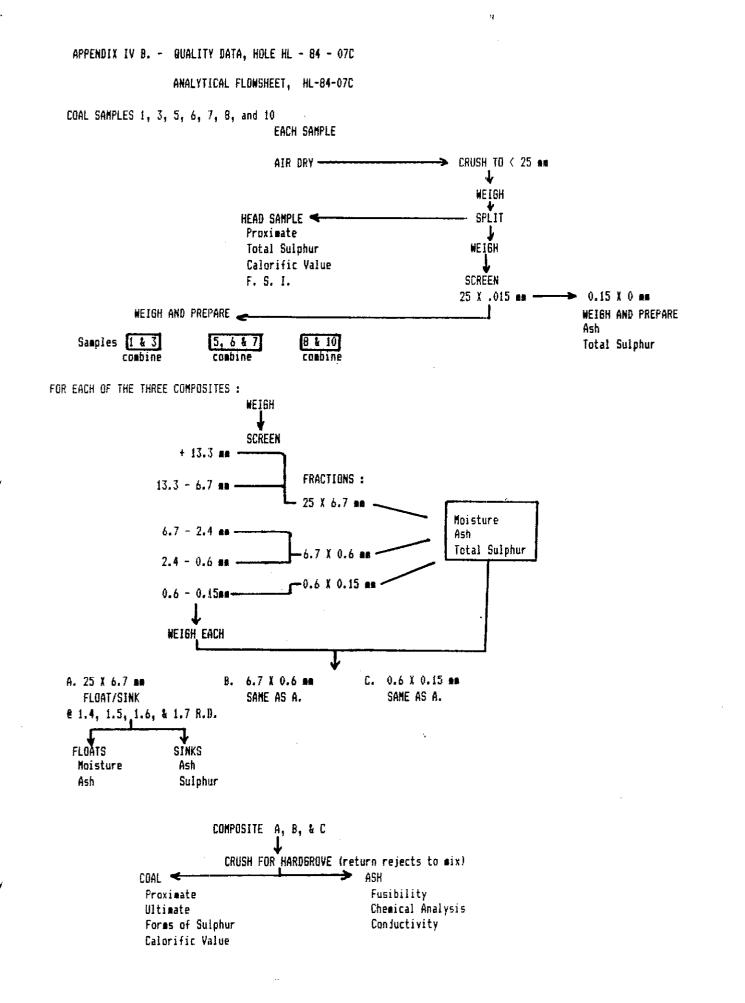
DATE: August 14, 1984



THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE. OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE

SIGNATURE AND TITLE

Analytical and Consulting Chemists, Bulk Cargo Specialists, Surveyors, Inspectors, Samplers, Weighers MEMBER American Society For Testing Materials - The American Oil Chemists Society - Canadian Testing Association REFEREE AND OR OFFICIAL CHEMISTS FOR - National Institute of Oilseed Products - The American Oil Chemists Society OFFICIAL WEIGHMASTERS FOR Vancouver Board of Trade



HOLE NUMBER	SAMPLE NUMBER	SAMPLE INTERVAL (metres)		SAMPLE DESCRIPTION
HL-84-05C	1	8.78 - 9.29	.51	COAL (upper)
HL-84-05C	2	9.29 - 9.42	.13	FLOOR MATERIAL
HL-84-05C	3	16.98 - 17.83	.85	COAL (middle)
HL-84-05C	4	17.83 - 17.98	.15	FLOOR MATERIAL
HL-84-05C	5	19.75 - 20.46	.71	COAL (lower)
HL-84-05C	6	20.46 - 20.82	.36	FLOOR MATERIAL
HL-84-07C	1	4.93 - 5.63	.70	COAL (upper)
HL-84-07C	2	5.63 - 6.13	.50	PARTING (upper)
HL-84-07C	3	6.13 - 6.66	.53	COAL (upper)
HL-84-07C	4	6.66 - 6.74	.08	FLOOR MATERIAL
HL-84-07C	5	10.61 - 10.91	.30	COAL (middle)
HL-84-07C	6	10.91 - 11.41	.50	SHALE (middle)
HL-84-07C	7	11.41 - 11.63	.22	COAL (middle)
HL-84-07C	8	12.80 - 13.24	. 44	COAL (lower)
HL-84-07C	9	13.24 - 13.49	.25	ROCK (lower)
HL-84-07C	10	13.49 - 14.35	.86	COAL (lower)
HL-84-07C	11	14.35 - 14.48	.13	FLOOR MATERIAL
HL-84-10C	i	19.32 - 20.13	.81	COAL (middle)
HL-84-10C	2	21.74 - 22.20	.46	COAL (middle)
HL-84-10C	3	23.10 - 23.46	.36	COAL (middle)

CORE SAMPLE INVENTORY

 \checkmark

1997 - X

Hole Number:	HL-84-07C	Area:	HAMILTON LAKE BLOC	Ж ′В′
Location:	493,285 N 351,86	7 E.	Elevation:	465.6 m.

Page _/_ of _3_ CORE COLUMN SAMPLE DESCRIPTION Scale: 1:20 INTERVAL DEPTH LITHOLOGY % REC. THICKNESS CORE RECOVERED (m) (m) 4.50 .05 4.93 5.00 .20 Sample #1 .25 .14 5.50 .05 ,06 5.63 .50 Sample ∎2 6.00 -

Sandstone: dark grey, medium grained COAL: soft, fissile, powdery COAL: hard, bright and blocky COAL: soft, fissile, powdery Claystone COAL: hard, boney, dull Siltstone: soft, uniform, auddy 6.13 .06 COAL: dull, boney . 14 COAL: hard, bright and blocky Sample #3 COAL: soft, crushed, powdery .08 6.50 COAL: clean, bright and blocky .20 Sample #4^{6.66} .05 CDAL: clean and dirty layers 6.74 Siltstone: pyritic bands throughout; .43 auddy, uniform ١. 7.00 h •01 .11 ... Thin, clean coal bands 01 6 .38 ۰. Siltstone: As above 7.50-.05 COAL: dull and dirty .10 .02 a .41 Siltstone: hard, some coaly material B.00 k •

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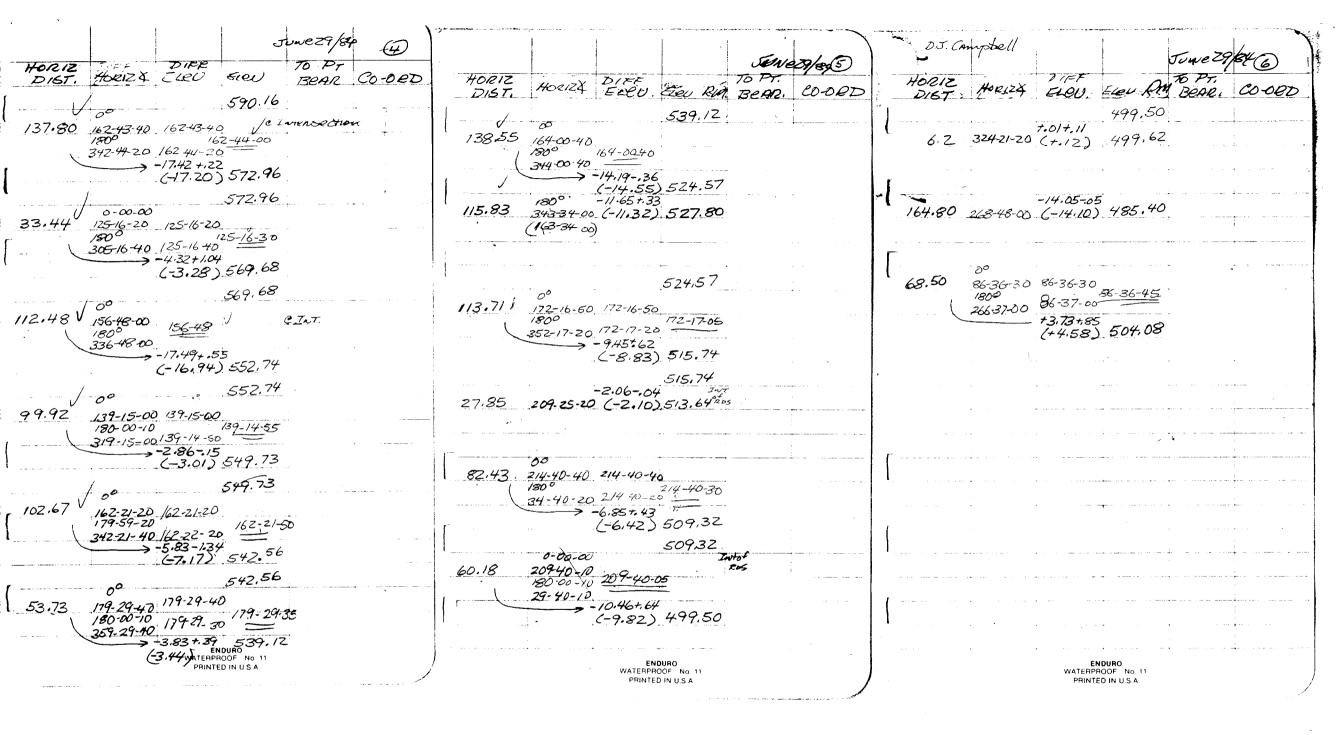
Hole Number:	HL-84-07C		Area:	нам	ILTOP	N LAKE	BLOCK (B)	
_ocation:	493.285 N	351,867					465. tion:	6, m.
							2 of 3	
	DESCRIPTION	, i*Marila* kerana	SAMPLE			CORE Scale:	COLUMN I:20	
	· · · · · · · · · · · · · · · · · · ·			CORE RECOVERED	DEPTH (m) 8.00	LITHOLOGY	THICKNESS (m)	% REC
ndstone: Nedium o	Preyn fine grained				0.00_			
1	dull sections at base			-		1. II	.10 .11	
					8,50 -	- 11		
Siltstone: dark unifo	grey to brown; auddy Fra				-	11 11	1.45	
					9.00	- η. η.		1
					-	- 11		
					9.50-	ы Н		
COAL: Thin, clea	n band				1	4 4 4	. 02	
Siltstone: As ab	ove;				10.00	ել ել 10-10-10-10-10-10-10-10-10-10-10-10-10-1	. 36	
Mudstone: Dark b	rown; thin bright coal				-	* 	.39	
lamina	e throughout blocky; pyritic nodule		10.61		10.50			
3 cm. in d		Sam	ple #5				.30	
Mudstone: dark g	rey; shaley	Sam	10.91 ple #6		11.00-		. 23	
Coal and Mudston Mudstone: carbon	e mixed in core tube aceous						.08 .19	
COAL: Soft; crus	hed; bright and blocky	Sam	11.41 ple 7 11.63		11.50		.22	
			[T				

							<u> </u>		
ocation:4	<u> 93,285 N 351.6</u>	<u>367 E</u>	- 		<u>. </u>	_ Eleva	tion:	465.	<u>6 m</u>
						Page.	<u>3</u> of <u>3</u>		<u> </u>
DE	ESCRIPTION		Sample Interval			CORE Scale:	COLUMN 1:20		
				CORE RECOVERED	DEPTH (m)	LITHOLOGY	THICKNES: (m)	S	% REC
Mudstone: Medium grey	, silty				12.00-	++	.55		$\frac{1}{1}$
Hudstone: Soft, carbo	inaceous						. 06		
COAL: Bright and bloc	ky, dirty at top				-	i the second second	.18		
Siltstone: Medium gre	y, s uddy				12.50 -	31 (I 6	.38		
			12.80		_	ч ч "н			
COAL: Clean, bright a	nd blocky						.19		
COAL: Dull, fissile		Sample	e #8		13.00-		. 06		
COAL: Clean, bright a	nd blocky, hard				-		.19		
			13.24	-	<u>-</u>	T T			
Mudstone: Nedium to d	ark brown, soft	Sampli	e #9 13.49			₩ ₩ ₩ ₩	.25		
CDAL: Clean, bright a visible pyrite, in middle	nd blocky, hard some thin dull bands	Sample	■ #10		13.50		-27		
COAL: As above					14.00		.42		
COAL: Dull, platy, shi COAL: Clean, hard, br	aly bands ight and blocky, abundant pyr:	ite					.07 .10		-
Mudstone: abundant co	aly material	1	14.35		{		. 06		
CONE: Dright and Dioci	ky, some dull bands, broken	Sample	14.48		14.50-	• • •	.07		
	grading downward to light grey ed grading downward to med. gr k-bedded				4		.82	i.	
					15.00				
					4				
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					15.50	• •	.56		
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the second s D.Compbell Jone 29/24 D June 2 5/04 (2)DIFF QUEU R.M. BEARTO CO-ORD'S HEIZ D June 29/84 3 HORIZ HORIZ HORIZ DIFE Elev. TO PT. DIST HORIZ HORIZ DIFF Ger Ra BEAR, CO-ORD RA BEAR, DIST Caru CO-ORD BALANCED = 45 ¥..... D15T. 4 ELEU 642,59 612.99 -20,65-.05 0-00-00 606.14 170.50 00 204-08-00 204-08-00 (-20,70) 621.89 57.38 44.89 V 245-19-00 245-19-00. 180-00-00 245-19-00. 180-00-00 204.08-10 24-08-20 204-08-20 245-19-10 -1.68+,40 65-19-20 745-19-20 79.98 245-53 50 (-1.28) 641.31 -8.01+1.16 180.00-00 (-6.85) 606.14 54.99 (27-29-20) (- 6.84) 606.15 602.13 207-29-20 222-59-20 222-59-20 180-00-00 59.62 641.31 +.46 +.82 42-59-20 222-59-20 NAILTou 131-46-00 (+1.28) 642590 HUB 72,0 ->-2.15+.07 606.14 NAILIN (-2.08) 600.05 .107-09-20 107-09-20 66.43 HUB 180-00-20 107-09-00 == → +2,18+.81 (+2,99) 609,13² 600.05 00 622.03 79,95 V 188-32-00 188-32-00 621.89 609.13 188-31-50 +20.85-42 00 8-31-40 188-31-40 168.42 00 (+20,43)642,32 231-00.00 64.50 187-19-40 187-19-40 -> -1.98 +.9Z (-1.86) 598.99 187-20-00 180-00-20 7-20-40 187-20-20 BALANCEDTP2=622.03 -.53+.06 (-.47) 608,66 598,99 608.66 0-00-00 97.01 153-00-00 124.65 96-4340 96-43-40 180-00-00 153-00-00 96-44-00 179-59-40 333-00-00 276-44-00 96-44-20 2 +.95+.14 42,18 142-57-40 (+1.09) 609.75 > +.68+.10 - 8.30-74 (±.78) 599.77 (-9.04), 612.99 599.77 234.70 V 215-50-10 215-50-10 / 179-59-20 215-50 215-50-25 179-89-20 35-50-00215-50-40 -> -8,45-1.16 (-9.61) 590,16 50 190 ENDURO WATERPROOF No. 11 ENDURO WATERPROOF No. 11 PRINTED IN U.S.A. ENDURO PRINTED IN U.S.A. WATERPROOF No. 11 PRINTED IN U.S.A. 705

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-118		л — —	•	4		1		•				·	(
7	263-04-20	2.000	1.725	1.4#2	55,8		1.47	Te TPE	Ζ	BS THE	••••••••••••••••••••••••••••••••••••••	1	1.52		TOTO	•	BSTP#11	•••	•
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30 7	Te TP 6		TON B 555				1.42 .TP10	27024-10	- (0.930	97.0				· · · · · · · · · · · · · · · · · · ·	:		
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ź	98-4Z-2D	1.600	1.388	1.178	42.2				····			en e						2,370	103.0
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1:54	AC TP#	1.7	135 TP	*16		1.51	TEPEZ		BSTP#2	<i>p</i>	•	1.51	TO TP 2	2	BSTPE	, <u> </u>	504,08
.90 TP/2	g 95-50-50	2 600	. 1,900	70 *2 =	140.0	1.40 DH 4C HL-8410	27 <i>0-0346</i>	2 1.400	, <i>1.3</i> 68	. 7.338	. 6.2	1.32 10	2382-51-5	0.63.78	63.28	+7.92+.10 (+8.11	512.19
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1.56	TETPHS	· •	BS TEXT 17	-	1	.66 TTO#	86-53-1U	0, 1.000	0.660	0.313	68.7		÷			а 4 а 4	•
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<u>L-46-78</u> 2	1 04-13-80	1.700	1.560	1,420	28.0				· • · · · · · · · · · · · · · · · · · ·								
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1.09 TP20	265-15-00	1.500	1.088	0.670	83.0			· · · · · · · · · · · · · · · · · · ·	• ··· ·· · · · · · · · · · · · · · · ·			1.66 TP-25	83-24-30	153.55	152.57	+17.63-22 (+17.41)	546.31
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1.530 ·	Nette 20	<u>.</u>	351P#19	• • • • • • • • • •	{	· · · · · · · · · · · · · · · · · · ·		•				1-52 1.25 (0)49 442-84-01	TeTP25		rs 7224	+1.24+127	5462P
			0.890	0.580	62.0	-					_	42-84-01	36-29-40	20.21	20.16	4.51)	547.82
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OVERCAST Light EAIN RAINING D. CAmpbell June"30/84 (7) Jone 30/84 @ June 30/84 @ TOPT TOR RemARKS REMARKS TO PT BEAR HORIZ & HOEVZ & REMARKS BEAR. Bean Co-oed Co-ORD HORIZ X COORDS 00 t 000 to 0 000 147-48-45 147-48-45 1 00 158-13-10 158-13-10 1500 338-13-30 158-13-30 165-28-30 11 165-28-31 179-69-40 327-48-30147-98-50 47-48-47 1:58-13-20 180-00-03 165-28-32 345-28-35/65-28-32 07 00 196-28-00 241-53-00 241-53-00 179-99-45 241-53-18 61-53-20241-53-35 153-46-10 196-28-15 1800 16-28-30 00 195-53-00 179-01-10 179-01-10 179-55 179-01-27 359-01-40 179-01-45 172-50-40 172-50-40 190 172-50-35 352-50-30 172-50-35 208-13-10 208-13-10 180 00 00 208-13-25 162-40-10 COALOUTCROP 215-49-20 215-49-20 190° 215-49-10 35-49-00 215-49-00 28-13-40 208-13-40 00 162-05-10 162-05-10 179-59-50 342-05-20162-05-30162-05-20 187-29-00 187-29-00 179-59-30 187-29-15 7-29-0018729-30 00 253-03-20253-03-20 180-00-08 253-03-2/ 73-03-30253-03-22 ____ 211-43-05 nº 0 146.31.30 145-31-30 193-06-20 193-06-30 179-59.30 145-32-00 1800 325-32-00 14532-30-----13-06-40 ENDURO • ENDURO WATERPROOF No 11 ENDURO WATERPROOF No. 11 WATERPROOF No. 11 PRINTED IN U.S.A. PRINTED IN U.S.A. PRINTED IN U.S.A. man wind

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1.46 The Total B5 Total 550,26 (1.36 55-18-50 174.28 173.71 (+14.34),564.60	1.75 TO - 88-24.40 2	BSTP30 +.887.20	568.31 1.52	N.C. 7236	537235 539,24 {
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25 10 91-27-40 50.82 50.80 (-1.04) 565.39	1.54 JOTOS	Dr 7/1			
	1,25 24 97-05-00 110	R5 34 2.58 169.74 (-13.64+.29 (-13.35)	552,39 1.54	Летр40 B	7239 485.57
1.52 50-72-	- <u>5 w 11</u> c	2.58 104.14 (-13.35)	539,24 125 DH 9 1 12-84-00	85-42-40 21.47 2	1.40 H.90 487.47
1.52 XCTP30 BSTP29 565.39 1.25 TP312742420 34 45 34.36 (+2 82) F1831			· · · · · · · · · · · · · · · · · · ·		•
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HOMIZX TO PT JUNE 30/84 D BEAR CO-ORD	HI SLOPE TOP R.R. & R.R. Bot. RR SLOIDE HI &	DH LOCATIONS
HOMIZZ BEAR CO-ORD	$n_1 / h_{000}, o_0$ n_1	DH LOCATON ELEU
	1.490 RC TP#1 E 10,000.00 35 TP#2 E 1.54 TP2 96 5420 2.400 1.540 0.670 173.0	HL-34-01 N 493,072,00 547.8 E 351,564,00
26-33-40 COACEON	1.09 1014 91-12-20 1.500 1.090 0.700 80,0	HL-84-02 N 493,043,00 519.1 E 351,804.00
00 195-03-00 1800 195-03-09		HL-84-03 N 492,735.00 527.8
180° 145-03-09	1.560 TC TITA ESTP#1 .74 89.37.50 1.100 0.740 0.3800	E 352,016.00 HL-84-04 N 492,830.00 609.8
		E 351, 348.00 HL-84-05C NJ 492,728.00 606.2
168-39-40		E 351,488.00 HL-84-06 N 493,305.00 487.5
	1.530 Ne TP#2 = BSTP#1 1.95 TP#1 277-03-202.800 1.952 1.090 171.0	E 351,100.00 HL-84-07 N 493,285.00 465.6
142-84-07 3 m Reyond		E 351,864.00
	2.27 10 \$ 266-11-20 2900 2.274 1.648 125,2	HL-84-07c N 493,285.00 465.6 E 351,867.00
· · · · · · · · · · · ·		HL-84-08 N 493,058,00 565.1 E 351,348.00
· · · · · · · · · · · · · · · · · · ·		HL-84-09 N 492,895.00 485.4 E 352,136.00
		HL-84-10C N 492,976.00 499.6 E 352,000.00
ENDURO WATERPROOF No 11		COAL outerop nº 493,065,00 542.7 E 351,622.00
PRINTED IN U.S.A.		COAL SEAM N. 493,279.00 495.3 E 351,806.00 495.3

609.8

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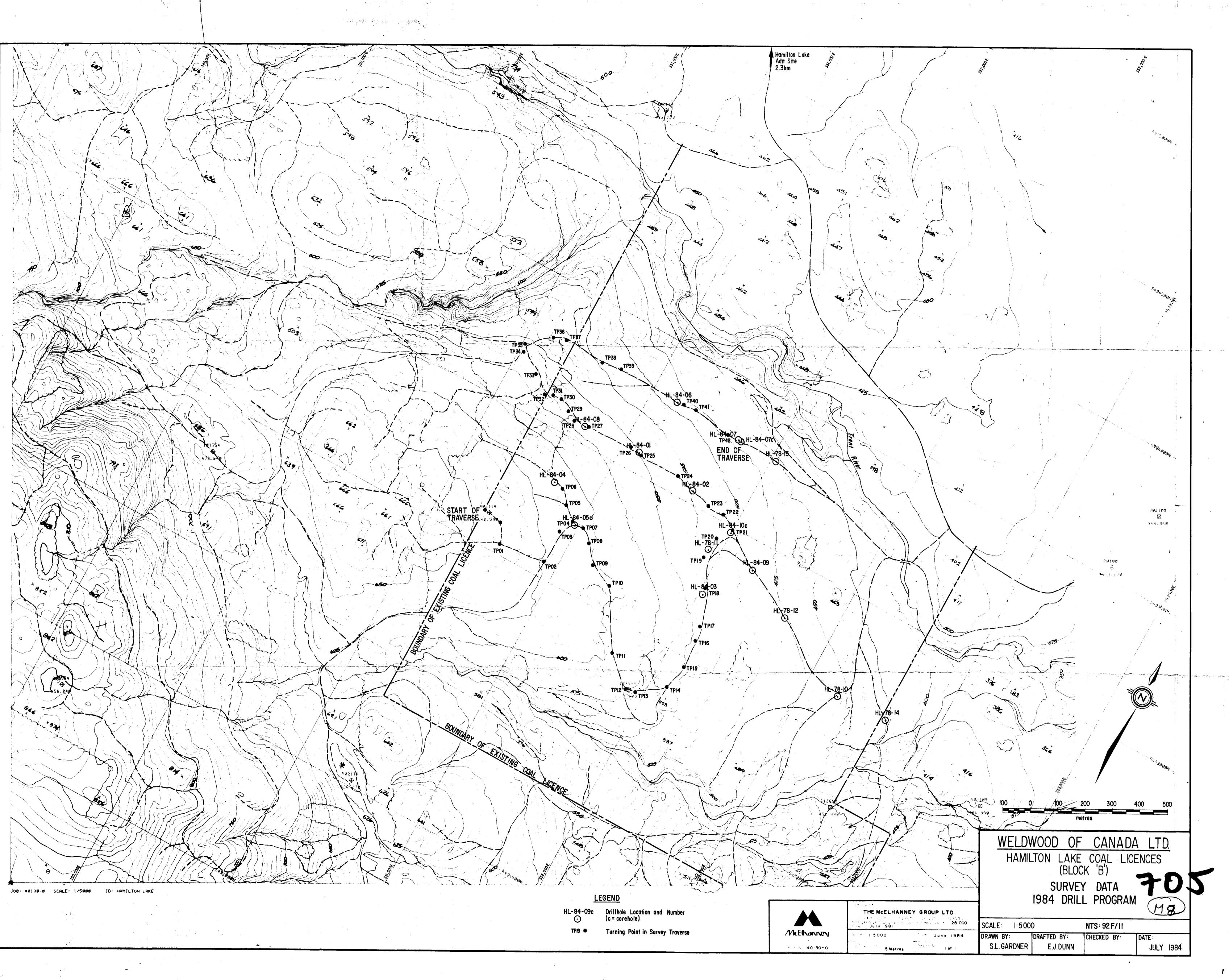
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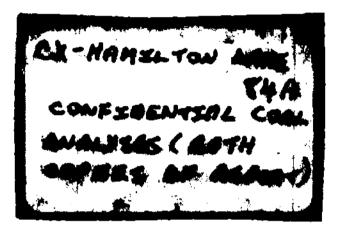
میلو بند • Rom HL 84-06 DH9 HL 84-07 (12) 25 H 67- (12) 25 H 654-07- Park JUNE 30/84 (7) 642 596 REMARTS BEAR. HORIZ & June 25 CO-ORD 00 200-55-60 200-55-00 180-00-10 20 20-55-40 20-55-30 00 204-04 -50 204 -04-55 -50 00 167:58-10 179-59-50 347-59-00 167-59-10 JOHN PHILAPPS ~ DAN AITHEN σ^{O} 187-52-10 180-00-10 7-52-40 18 345-44-20 ÷ 4 00 ----173-24-00 173-24-00 - 353-24-00 ENDURO WATERPROOF No 11 PRINTED IN U.S.A. X = X1 ب

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HORIZ DIFF DIST ELEV. FLEV SLOPE. DIST. scopi Ž HI 480.88 BSTP40 1.51 T.C. T.P41. 14,09 (+14,16) 495.34 73-24-40 14.70 1,25 1.25 17 94.46-50 141,65 141,15 (-11,54) 469,34 42 TO TP 42 469,34 1.45 35 TD41 1,25 CH. 94-40-00 48,78 48,62 (-3,77) 465,57 + + +÷ 「「「」「「「」」」



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1001 East Pender Street,



	<u> </u>	1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2				
TO:	Telephone: (6	04) 254-1647 Telex: 04-507514 Cable: Supervise				
STEPHEN L. GARDENER	CERTIFICATE OF ANALYSIS					
	No.	DATE:				
,	FILE;	August 14, 1984				

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		NO: H				<u> </u>		•		PAGE N	0:	1
		Y MOIST										_
						. Speci	fic Gra	vity, F	SI			
			-			т.5.	C.V. CAL/G					i
-	A.D. DRY	1.26 -	21.00 21.26	34.25 34.68	43.49 44.04	2.96 2.99	6205 6285	1.42	6.5 -			
		RACTION	- Scre	een Yie	lds				_			
	FRACTI MM 25 X O .015 X	. 15						YIEL (%) 97.2 2.7	22			
	FRACTI	ON ANAL	YSIS -	Ash, T	otal Su	lphur						
	FRACTI MM				ASH X					TOTAL	SULPH X	HÚR
	.15 X	0			26.	27			ur 294. 1	1. M	. 52	
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	ADE AND OF SC							SIGNATUR	RE AND TITL	Ē		1

Analytical and Consulting Chemists, Bulk Cargo Specialists, Surveyors, Inspectors, Samplers, Weighers MEMBER American Society For Testing Maleriais - The American OK Chemists Society - Canadian Testing Association REFEREE AND OR OFFICIAL CHEMISTS FOR - National Institute of Oriseed Products - The American OK Chemists Society OFFICIAL WEIGHMASTERS FOR Vancouver Board of Trade

1001 East Pender Street,

Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

Vancouver, B.C. Canada V6A 1W2



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TO:		
IU:		

STEPHEN L. GARDENER

CERTIFIC	CATE OF ANALYSIS
No.	DATE:
FILE:	August 14, 1984

PAGE NO: 2

FRACTION: 25.0 X .015 MM

Float/Sink - Residual Moisture, Ash, Sulphur

S.G.	BASIS	YIELD Z	R.M. %	ASH %	т.s. %
1.4F	A.D.	63,77	0.81	6.76	-
1.SF	DRY A.D.	- 9.05	1.06	6.81 22.16	-
1.6F	DRY A.D.	- 7.92	- 1.05	22.39 32.38	-
1.7F	DRY A.D.	- 9.17	- 1.17	32.72 39.50	-
	DRY	10.09		39.96 51.92	- 5.03
1.78	A.D.	70.03	-	DI. 9C	5.03

..../3

SIGNATURE AND TITLE

THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE



TO:

STEPHEN L. GARDENER

ų,

1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No. DATE: August 14, 1984 FILE:

	STEVE (SARDNI	er - F	LOW	shee	- 1			
	SAMPLE NO: H	CL-084-05(с з					PAGE NO:	: 3
	AIR DRY MOIST	URE (%):	2.58						
	RAW COAL-Prox	imate, To	tal Sulphur	, Speci	fic Grav	vity, F	BI		
	BASIS R.M. %		M. F.C. Z	T.S. %	C.V. CAL/G	5.6.	FSI		
L	A.D. 1.75 DRY -	23.41 2 23.82 3	9.64 45.20 0.16 46.00	2.25 2.29	5920 6025	1.47	8.5		
	SIZE FRACTION	- Screen	Yields						
	FRACTION MM					YIEL (%)			
	25 X 0.15 .015 X 0					95.1 4.8	2		
	FRACTION ANAL	YSIS - As	h, Total Su	lphur					
	FRACTION MM		ASH %	ł				TOTAL S X	
	.15 X O		32.	13				1.4	5
								/4	
OFI	COMPANY ACCEPTS NO RES	SPONSIBILITY EXCEP	T FOR THE DUE PERFOR	IMANCE		CIOMA		<u>/}.</u>	
INE	TRADE AND OF SCIENCE			· · · · · · · · · · · · · · · · · · ·				····	

TO:	
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STEPHEN L. GARDENER

1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

1984

No.	DATE:	
FILE:	August	14,

PAGE NO: 4 FRACTION: 25.0 X .015 MM Float/Sink - Residual Moisture, Ash, Sulphur S.G. BASIS YIELD R.M. ASH T.S. X X X X 1.4F A.D. 44.27 1.14 8.57 - DRY 8.66 - 1.5F A.D. 19.32 1.05 21.39 - DRY 22.12 - 1.6F A.D. 15.41 1.14 30.65 - DRY 31.00 - 1.7F A.D. 11.32 1.03 39.20 - DRY 33.60 - 1.7S A.D. 9.68 - 51.54 2.98							
PAGE NO: 4 FRACTION: 25.0 X .015 MM Float/Sink - Residual Moisture, Ash, Sulphur S.G. BASIS YIELD R.M. ASH T.S. X X X X 1.4F A.D. 44.27 1.14 8.57 - DRY 8.66 - 1.5F A.D. 19.32 1.05 21.89 - DRY 22.12 - 1.6F A.D. 15.41 1.14 30.65 - DRY 31.00 - 1.7F A.D. 11.32 1.03 39.20 - DRY 39.60 -							
PAGE NO: 4 FRACTION: 25.0 X .015 MM Float/Sink - Residual Moisture, Ash, Sulphur S.G. BASIS YIELD R.M. ASH T.S. X X X X 1.4F A.D. 44.27 1.14 8.57 - DRY 8.66 - 1.5F A.D. 19.32 1.05 21.89 - DRY 22.12 - 1.6F A.D. 15.41 1.14 30.65 - DRY 31.00 - 1.7F A.D. 11.32 1.03 39.20 - DRY 39.60 -							
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FRACTION: 25.0 X .015 MM Float/Sink - Residual Moisture, Ash, Sulphur S.G. BASIS YIELD R.M. ASH T.S. X X X X 1.4F A.D. 44.27 1.14 8.57 - DRY 8.66 - 1.5F A.D. 19.32 1.05 21.89 - DRY 22.12 - 1.6F A.D. 15.41 1.14 30.65 - DRY 31.00 - 1.7F A.D. 11.32 1.03 39.20 - DRY 33.60 -							
FRACTION: 25.0 X .015 MM Float/Sink - Residual Moisture, Ash, Sulphur S.G. BASIS YIELD R.M. ASH T.S. X X X X 1.4F A.D. 44.27 1.14 8.57 - DRY 8.66 - 1.5F A.D. 19.32 1.05 21.89 - DRY 22.12 - 1.6F A.D. 15.41 1.14 30.65 - DRY 31.00 - 1.7F A.D. 11.32 1.03 39.20 - DRY 33.60 -						DAGE NO	
Float/Sink - Residual Moisture, Ash, Sulphur S.G. BASIS YIELD R.M. ASH T.S. X X Z X 1.4F A.D. 44.27 1.14 8.57 - DRY 8.66 - 1.5F A.D. 19.32 1.05 21.89 - DRY 22.12 - 1.6F A.D. 15.41 1.14 30.65 - DRY 31.00 - 1.7F A.D. 11.32 1.03 39.20 - DRY 39.60 -						PAGE NO	- 4
Float/Sink - Residual Moisture, Ash, Sulphur S.G. BASIS YIELD R.M. ASH T.S. X X Z X 1.4F A.D. 44.27 1.14 8.57 - DRY 8.66 - 1.5F A.D. 19.32 1.05 21.89 - DRY 22.12 - 1.6F A.D. 15.41 1.14 30.65 - DRY 31.00 - 1.7F A.D. 11.32 1.03 39.20 - DRY 39.60 -					1.43×4		
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$		Float/	Sink - R	esidual M	oisture,	Ash, Sul	phur
1.4F A.D. 44.27 1.14 8.57 - DRY - - 8.66 - 1.5F A.D. 19.32 1.05 21.89 - DRY - - 22.12 - 1.6F A.D. 15.41 1.14 30.65 - DRY - - 21.20 - 1.6F A.D. 15.41 1.14 30.65 - DRY - - 31.00 - DRY - - 39.20 - DRY - - 39.60 -		S.G.	BASIS				
DRY 8.66 - 1.5F A.D. 19.32 1.05 21.89 - DRY 22.12 - 1.6F A.D. 15.41 1.14 30.65 - DRY 31.00 - 1.7F A.D. 11.32 1.03 39.20 - DRY 39.60 -	-			X	%	X.	7.
1.5F A.D. 19.32 1.05 21.89 - DRY - - 22.12 - 1.6F A.D. 15.41 1.14 30.65 - DRY - - 31.00 - 1.7F A.D. 11.32 1.03 39.20 - DRY - - 33.60 -		1,4F					
DRY 22.12 - 1.6F A.D. 15.41 1.14 30.65 - DRY 31.00 - 1.7F A.D. 11.32 1.03 39.20 - DRY 39.60 -							-
1.6F A.D. 15.41 1.14 30.65 - DRY 31.00 - 1.7F A.D. 11.32 1.03 39.20 - DRY 39.60 -		1.5*					_
DRY 31.00 - 1.7F A.D. 11.32 1.03 39.20 - DRY 39.60 -		1.6F					-
DRY 39.60 -			DRY				-
		1.7F					-
TPLE STATE STATE		1 79					2.98
		1.10	F •9•			J T	
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THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE

SIGNATURE AND TITLE

Analytical and Consulting Chemists, Bulk Cargo Specialists, Surveyors, Inspectors, Samplers, Weighers MEMBER American Society For Testing Materials - The American Oil Chemists Society - Canadian Testing Association REFEREE AND OR OFFICIAL CHEMISTS FOR - National inatiluite of Oilseed Products - The American Oil Chemists Society OFFICIAL WEIGHMASTERS FOR Vancouver Board of Trade



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STEPHEN L. GARDENER

1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

DATE: No. FILE:

August	14.	1984

STEVE GARD	NER - F	"LOW	si-iee	T				
SAMPLE NO: HCL-084-	-05C 5					PAGE NO): !	5
AIR DRY MOISTURE (%)	: 1.35							
RAW COAL-Proximate,	Total Sulphur	, Speci	fic Gra	vity, FS	31			
BASIS R.M. ASH % %	V.M. F.C. % %	T.S. %	C.V. CAL/G	5.G.	FSI			
A.D. 1.27 17.35 DRY - 17.57	32.26 49.12 32.67 49.75	3.53 3.57	6626 6711	1.41	8.5			
SIZE FRACTION - Scr	een Yields							
FRACTION MM 25 X 0.15 .015 X 0				YIEL (%) 96.5 3.4	7			
FRACTION ANALYSIS -	Ash, Total Su	lphur						
FRACTION MM	ASH Z					TOTAL	SULPH %	łUR
.15 X Q	23.	79	•			э.	35	
						/5		
THIS COMPANY ACCEPTS NO RESPONSIBILITY E OF INSPECTION AND/OR ANALYSIS IN GOOD FAIT THE TRADE AND OF SCIENCE				Signa		1 TITLE	1.	

1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.	DATE:
FILE:	August 14. 1984

				PAGE N	0: 5
FRACTI	ON: 25.() X .015	MM		
Float/	Sink - Re	esidual M	oisture,	Ash, Sul	phur
S.G.	BASIS	YIELD X	R.M. X	ASH %	T.S. %
<u>1</u> .4F	A.D. DRY	74,80	1.21	7.39 7.48	
1.5F	A.D. DRY	4.31	0.80 -	18.09 18.23	-
1.6F	A.D. DRY	2.14	0.94	28.19 28.45	.e.
1.7F	A.D. DRY	2.18	0.92	37.32 37.66	-
1.75	A.D.	16.57		59.85	10.06

STEPHEN L. GARDENER

TO:

THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE. OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE

SIGNATURE AND TITLE

Analytical and Consulting Chemists, Bulk Cargo Specialists, Surveyors, Inspectors, Samplers, Weighers MEMBER American Society For Testing Materials - The American Oil Chemists Society - Canadian Testing Association REFEREE AND OR OFFICIAL CHEMISTS FOR - National Institute of Oliseed Products - The American Oil Chemista Society OFFICIAL WEIGHMASTERS FOR Vancouver Board of Trade



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THE TRADE AND OF SCIENCE

TO		

STEPHEN L. GARDENER

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1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2

Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.	

DATE:		
August	14.	1984

FLOWSHEET STEVE GARDNER ----PAGE ND: 7 SAMPLE NO: HCL-084-050 Ē 0.47 AIR DRY MOISTURE (%): RAW CDAL-residual moisture, ash, Specific Gravity S.G. R.M. ASH BASIS Z 7 1.67 34.13 A.D. 1.13 34.52 DRY/8 THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF

Analytical and Consulting Chemists, Bulk Cargo Specialists, Surveyors, Inspectors, Samplers, Weighers MEMBER American Society For Testing Materials - The American Oil Chemists Society - Canadian Testing Association REFEREE AND OR OFFICIAL CHEMISTS FOR - National Institute of Oilseed Products - The American Oil Chemists Society OFFICIAL WEIGHMASTERS FOR Vancouver Board of Trade

1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.	
FILE:	

DATE:		
August	14.	1984

			·		
STEVE	GARDNER	- FLOWS	BHEET		
SAMPLE NO:	HCL-084-050 4			PAGE NO: 8	
AIR DRY MOT	STURE (%): 1.	03			
		<u></u>			
RAW COAL-Re	sidual Moisture,	Ash, Specific	Gravity		
BASIS	R.M. %	ASH %	5.G.		
A.D. DRY	1.07	48.69 49.21	1.85		
				/9	
\checkmark				1-)
THIS COMPANY ACCEPT OF INSPECTION AND/OF THE TRADE AND OF SCI	IS NO RESPONSIBILITY EXCEPT FO ANALYSIS IN GOOD FAITH AND AC ENCE	R THE DUE PERFORMANCE CORDING TO THE RULES OF		SIGNATURE AND TITLE	•

TO:

STEPHEN L. GARDENER

1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.	DATE:	
FILE:	August 14	1984



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STEPHEN L. GARDENER

TO:

			FILE:		August 14 1984		
	·				·	<u></u>	
STEVE	GARDNER	- FLCINS					
SAMPLE NO:	HCL-084-050 6			PAGE	NO: 9		
				, , , , , , , , , , , , , , , , , , ,			
UR DRY MOI	STURE (%): 0.	92					
RAW COAL-Re	sidual Moisture,	Ash, Specific	= Gravity				
BASIS	R.M. <u>%</u>	ASH Z	5.G.				
A.D. DRY	0.90	60.70 61.25	2.08				
		••••					
						:	
			•				

THIS COMPANY ACCEPTS: NO RESPONSIBILITY EXCEPT FOR THE OUE PERFORMANCE OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE

SIGNATURE AND TITLE



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HL-84-05C SAMPLE No. 1 25 X .015mm FRACTION

5. 6. FRACTION	Wt. X	Ash %	% Wt. cf Ash of Tctal	Cum. Wt. % of Ash		Cum. Ash % of Floats	Sink Wt. of Ash %	Cum. Wt. % of Sinks	Cum Ash X of Sinks	S.G. DISTRIBUTION Wt. %
-1.3			0	0	0					
1.3-1.4	63.77	6.76	4,31	4.31	63,77	6.76	13,43	36.23	37,07	72.82
1.4-1.5	9.05	22.16	2.01	6.32	72.82	8.67	11.43	27.18	42.04	16.97
1,5-1.6	7.9Z	32,38	2.56	8.88	80.74	11.00	6.86	17.26	46.01	17.09
1.6-1.7	9.17	3 9.5 0	3.62	(2,50	89.91	13.91	5.24	10.09	51.92	19.26
1.7 +	10.09	51.92	5.24	17.74	100.00	17.74	0	Û	-	-

17.74

22.17

HL-84-05C SAMPLE No. 5 25 X .015mm FRACTION

HL-84-05C

SAMPLE No. 3 25 X .015mm FRACTION

S. G. FRACTION	Wt. %	Ash X	% Wt. of Ash of Total	i Cum. Ht. X of Ash	Cum. Wt.X of Floats	Cum. Ash Z of Floats	Sink Wt. of Ash %	Cue. Wt. X of Sinks	Cum Ash X of Sinks	S.G. DISTRIBUTION Wt. %
-1.3			Ú	Û	0					
1.3-1.4	44.27	8.57	3.79	3.79	44.27	8,57	18.38	55.73	32.98	63.59
1.4-1.5	19.32	21.89	4.23	8,02	63.59	12.62	j4, i 5	36.41	38.86	34.73
1.5-1.6	15.41	30.65	4,12	12.75	79.00	16.13	9,43	21.00	44.89	26.73
1.6-1.7	11.32	37.20	4.14	17.18	90.32	19.03	4,99	9.68	51.54	21.00
1.7 +	9,68	51.54	4.79	22.17	100.00	22.17	0	0	_	-

1.5-1.6 2.14 28.19 0.60 6.91 B1.25 B.51 15.26 1B.75 81.40 11.21

9.26

100.00 17,64

14.45

4.53 0

7.72 83.43

17.64

4,20

-

16.57 87.20 1B.75

-

1.6-1.7 2.18 37.32

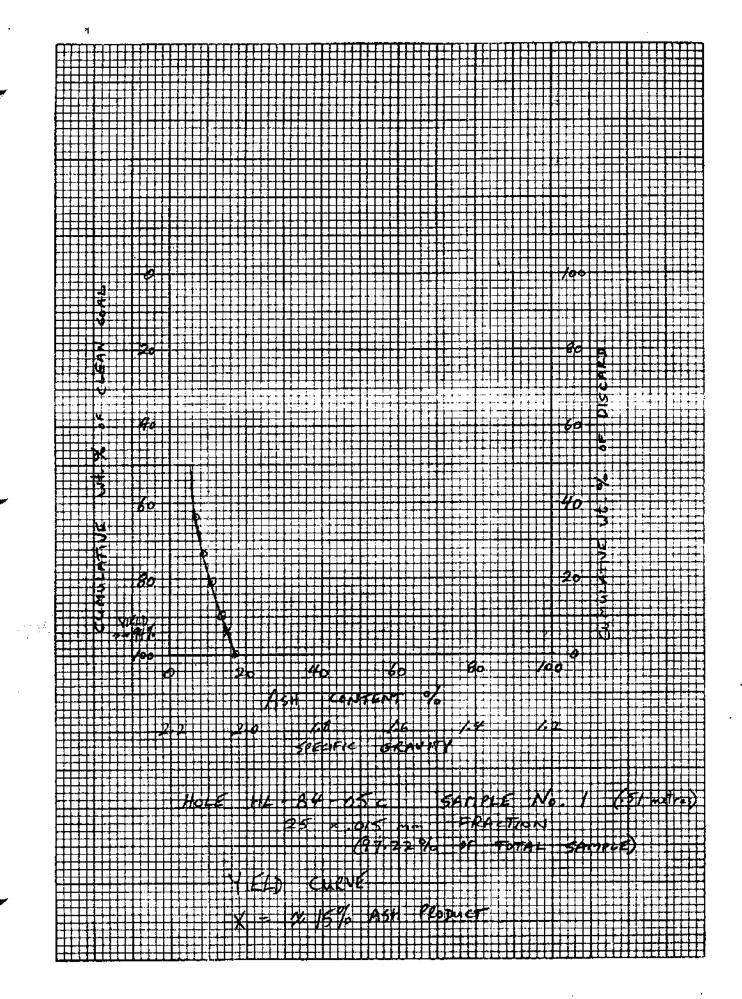
59.85

1.7 + 16.57

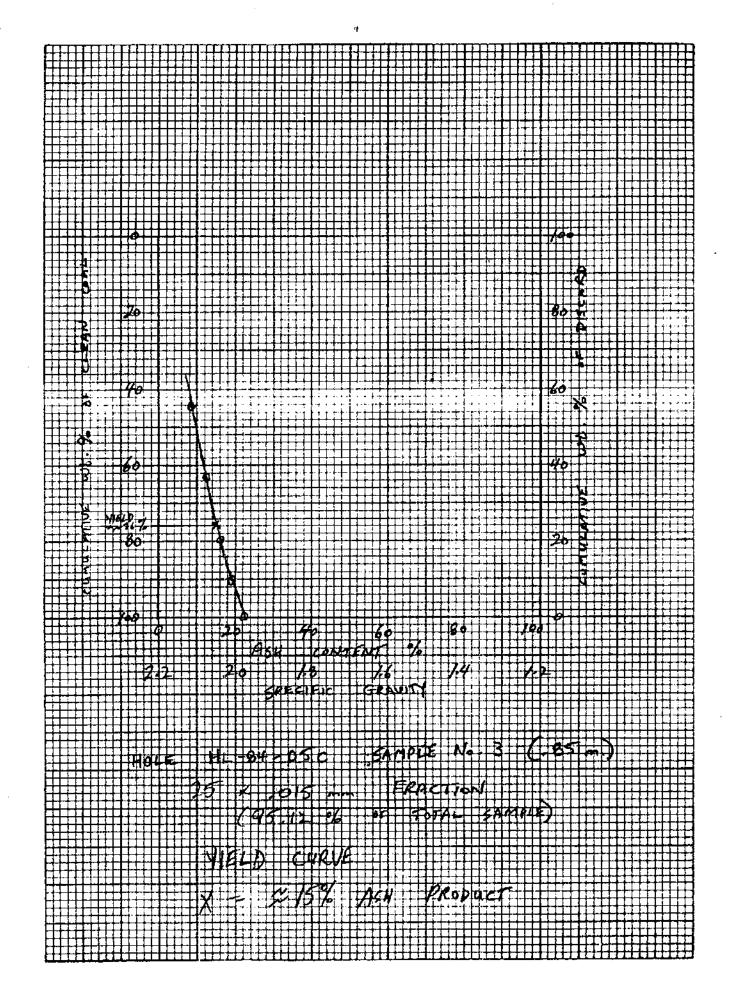
S. G. Wt. X Ash X X Nt. of Ash Cum. Wt. X Cum. Wt.X Cum. Ash X Sink Wt. Cum. Wt. X Cum Ash X S.G. DISTRIBUTION FRACTION of Total of Ash of Floats of Floats of Ash X of Sinks of Sinks Wt. X FRACTION (() 0 -1.3 1.3-1.4 74.80 7.39 5.53 5.53 74.80 7.39 16.65 25.20 86.05 63.59 1.4-1.5 4.31 18.09 0.78 6.31 79.11 7.97 15.87 20.89 75.95

0.81

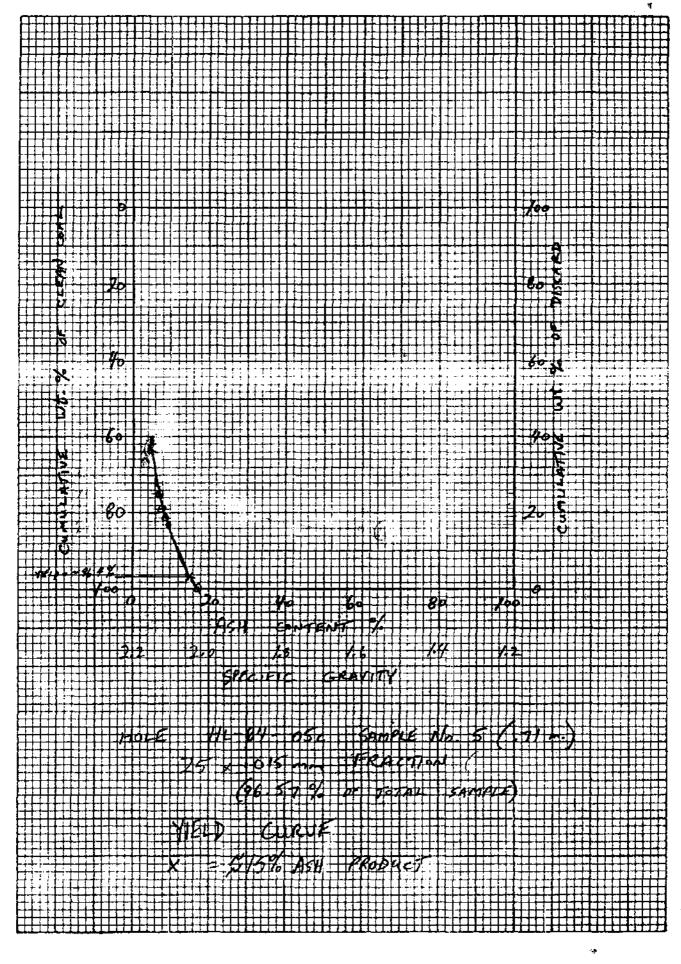
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1001 East Pender Street,



TO: STEPHEN L. GARDENER, 274 Westwood Road, R.R. #3, Site 'S' Nanaimo, B.C. V9R 5K3

Vancouver, B.C. Canada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

DATE:

CERTIFICATE OF ANALYSIS

No. FILE: 8406-2752C

٠

August 15, 1984

	RE: HL-84-07C Samples 1, 3, 5, 6, 7, 8 and 10	
	WE HAVE ANALYZED the herein described submitted samples of Coal an report as follows:	nd
	STEVE GARDNER - FLOWSHEET	
	SAMPLE NO: HCL-084-07C 1	
	AIR DRY MOISTURE (%): 2.45	
_	RAW CDAL-Proximate, Total Sulphur, Specific Gravity, FSI	
	BASIS R.M. ASH V.M. F.C. T.S. C.V. S.G. FSI % % % CAL/G	
	A.D. 1.60 26.21 27.10 45.09 1.00 5739 - 6.0 DRY - 26.63 27.54 45.82 1.01 5832	
	SIZE FRACTION - Screen Yields	
	FRACTIONYIELDMM(%)25 X 0.1592.80.015 X 07.20	
	FRACTION ANALYSIS - Ash, Total Sulphur	
	FRACTION ASH 7 MM %	TOTAL SULPHUF %
	.15 X O 37.90	0.87
THIS	S COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE NSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF	M.
	SIGNATURE AND TITLE	

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Telephone: (6	1001 East Pender Street Vancouver, B.C. Canada V6A 1W2 (04) 254-1647 Telex: 04-507514 Cable: Supervise
C	ERTIFICATE OF ANALYSIS
No.	DATE:
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	CI No.

1

STEVE GARDNE	ER - FLOW	SHEET	
SAMPLE NO: HCL-084-07(с з		
AIR DRY MOISTURE (%):	1.90		
RAW COAL-Proximate, To	tal Sulphur, Speci	fic Gravity, FSI	:
BASIS R.M. ASH V.M	ч. F.C. T.S. % %		SI
A.D. 1.17 27.52 2 DRY - 27.84 2	9.20 42.11 4.19 9.54 42.60 4.23	6304 - 6378 -	6.0 -
SIZE FRACTION - Screen	Yields		
FRACTION MM 25 X 0.15		YIELD (%) 92.92	
.015 X 0		7.08	
FRACTION ANALYSIS - As	h, Total Sulphur		
FRACTION MM	ASH Z		TOTAL SULPHUR %
.15 X O	35.80		2.59
THIS COMPANY ACCEPTS NO RESPONSIBILITY EX			¥1.
THIS COMPANY ACCEPTS NO RESPONSIBILITY EX OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH THE TRADE AND OF SCIENCE	AND ACCORDING TO THE RULES OF	Sign	ATURE AND TITLE

General Testing Laboratories

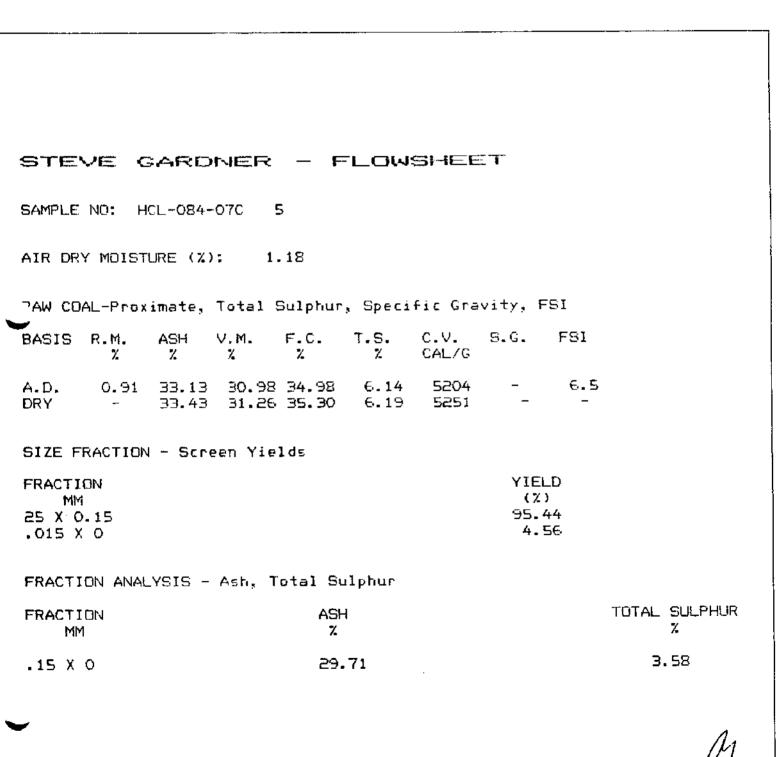
A Division of SGS Supervision Services Inc.

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FILE:	

DA.	IE:

STEVE GARDNER - FLOW	SH-1EE T
SAMPLE NO: HCL-084-070 6	
AIR DRY MDISTURE (%): 1.64	
RAW COAL-Proximate, Total Sulphur, Specif	Fic Gravity, FSI
MSIS R.M. ASH V.M. F.C. T.S. 2 2 2 2 2 2 2	C.V. S.G. FSI CAL/G
A.D. 0.93 65.43 23.41 10.23 1.73 DRY - 66.04 23.62 10.32 1.74	
SIZE FRACTION - Screen Yields	
FRACTION MM	YIELD (%)
25 X 0.15 .015 X 0	93.68 6.32
FRACTION ANALYSIS - Ash, Total Sulphur	
FRACTION ASH	TOTAL SULPHUR Z
.15 X O 51.73	1.84
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TO:

 	1001 East Pender Str. Vancouver, B.C. Canada V&A 1	W2
Telephone: (004) 254-1647 Telex: D4-507514 Cable: Supervise CERTIFICATE OF ANALYSIS		
No.	DATE:	
FILE:		

STEVE GARDNER - FLOWSHEET	STEVE GARDNER - FLOWSHEET					
SAMPLE NO: HCL-084-070 7						
AIR DRY MOISTURE (%): 4.21						
RAW CDAL-Proximate, Total Sulphur, Specific Gravity, FSI						
BASIS R.M. ASH V.M. F.C. T.S. C.V. S.G. FSI % % % % CAL/G						
A.D. 0.95 36.97 27.70 34.38 3.04 4895 - 4.0 DRY - 37.32 27.96 34.70 3.06 4941						
SIZE FRACTION - Screen Yields						
FRACTION YIELD MM (%) 25 X 0.15 89.04 .015 X 0 10.96						
FRACTION ANALYSIS - Ash, Total Sulphur						
FRACTION ASH TOTAL SL MM % % %	JLPHUR					
.15 X 0 35.68 2.03	3					
	Λ					
THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE SIGNATURE AND TITLE	17.					

General Testing Laboratories

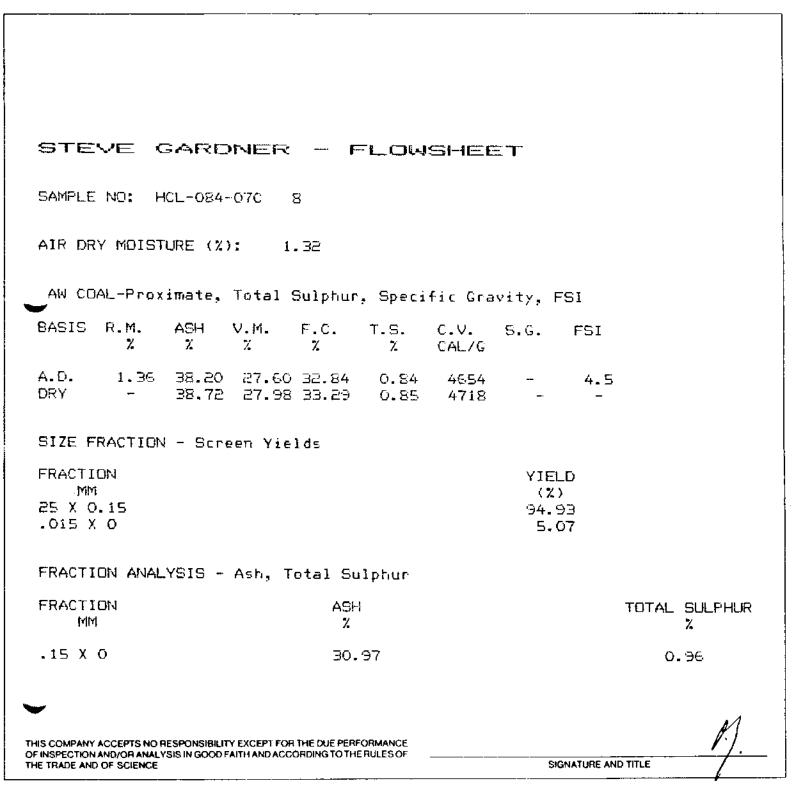
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No.	DATE:
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4
SHEET
ific Gravity, FSI
C.V. S.G. FSI CAL/G
4382 - 3.0 4444
YIELD (Z)
95.86 4.14
TOTAL SULPHUR %
0.52
SIGNATURE AND TITLE



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FILE:	

DATE:

SAMPLE	ND: HCL-084-07C F	RACTION O.6 X C	.15 MM COMPOSITE A+B+C	
EED CO Fractio	DAL-Residual Moistur on:	e, Ash, Total S	ulphur	
BASIS	R.M. Z	ASH %	T.S. %	
A.D. DRY	0.98	31.03 31.33	1.65 1.66	
/				
	ON: 25.0 X .015 MM			
	ON: 25.0 X .015 MM Sink - Residual Mois		իսո	
	Sink - Residual Mois		ohur T.S. X	
Float/	Sink - Residual Mois BASIS YIELD F % A.D. 50.12	sture, Ash, Sulp R.M. ASH Z Z 1.18 5.76	T.S.	
Float/ S.G. 1.4F	Sink - Residual Mois BASIS YIELD F X A.D. 50.12 DRY -	sture, Ash, Sulg R.M. ASH Z Z 1.18 5.76 - 5.82	T.S.	
Float/ S.G. 1.4F 1.5F	Sink - Residual Mois BASIS YIELD F % A.D. 50.12 DRY - A.D. 7.14 DRY -	sture, Ash, Sulg R.M. ASH Z Z 1.18 5.76 - 5.82 1.24 7.23 - 7.32	T.S.	
Float/ S.G. 1.4F	Sink - Residual Mois BASIS YIELD F X A.D. 50.12 DRY - A.D. 7.14 DRY - A.D. 4.85	sture, Ash, Sulp R.M. ASH Z X 1.18 5.76 - 5.82 1.24 7.23 - 7.32 1.66 9.58	T.S.	
Float/ S.G. 1.4F 1.5F	Sink - Residual Mois BASIS YIELD F % A.D. 50.12 DRY - A.D. 7.14 DRY -	sture, Ash, Sul; R.M. ASH Z Z 1.18 5.76 - 5.82 1.24 7.23 - 7.32 1.66 9.58 - 9.74 2.05 11.71	τ.s. χ	
Float/ S.G. 1.4F 1.5F 1.6F	Sink - Residual Mois BASIS YIELD F X A.D. 50.12 DRY - A.D. 7.14 DRY - A.D. 4.85 DRY - A.D. 4.63 DRY -	sture, Ash, Sulg R.M. ASH Z Z 1.18 5.76 - 5.82 1.24 7.23 - 7.32 1.66 9.58 - 9.74	T.S. %	

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No.	DATE:
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SAMPLE	NO: HOL	- 084-070	FRACTI	ON 6.7 X	0.6 MM COMPOSITE	A+B+C
FIID C Fracti		dual Mois	ture, Ast	, Total S	սլքիսո	
BASIS		R.M. %		NSH X	T.S. %	
A.D. DRY		1.02		35.35 35.71	1.95 1.97	
	ON: 25.(D X .015 I		22.11	1.21	
Fr/CTI Float/		D X .015 I	માર્ચ	Ash, Sul; ASH X		
FC/CT1 Float/ S.C.	Sink - R	D X .015 M esidual Ma YIELD	MM oisture, R.M. Z	Ash, Sul; ASH	ħur T.S.	
FC/CTI Float/ S.C.	Sink - R BASIS A.D. DRY A.D.	D X .OI5 M esidual M YIELD X	MM oisture, R.M. Z	Ash, Sul; ASH % 7.20 7.28 22.85	ħur T.S.	
FC/CTI Float/ S.C. 1.4F	Sink - R BASIS A.D. DRY A.D. DRY A.D.	D X .015 K esidual M4 YIELD Z 41.17 9.14 6.34	MM oisture, R.M. Z 1.22 0.91	Ash, Sul; ASH % 7.20 7.28 22.85 23.05 30.80	ħur T.S.	
FT/CTI Float/ S.C. 1.4F 1.55 1.65	Sink - R BASIS A.D. DRY A.D. DRY	D X .015 M esidual M YIELD X 41.17 9.14	MM oisture, R.M. Z 1.22 0.91 0.94	Ash, Sul; ASH % 7.20 7.28 22.85 23.05	ħur T.S.	

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	No.	DATE:
	FiLE:	

STEVE GARDNER - FLOWSHEET

77

SAMPLE NO: HCL-084-070 FRACTION 25 X 6.7 MM COMPOSITE A+B+C

FEED COAL-Residual Moisture, Ash. lotal Sulphur Fraction:

BASIS	R.M.	ASH	T.S.
	%	%	%
₩D.	1.07	46.57	1.60
DRY		47.07	1.61

FRACTION: 25.0 X .015 MM

Float/Sink - Residual Moisture, Ash, Sulphur

S.G.	BASIS	VIELD X	R.M. %	ASH %	T.S. %
1.4	A.D.	20.09	1.16	9.20	-
	DRY	-	-	9.30	-
1.5F	A.D.	10.12	1.12	23.21	.—
	DRY	-		23.47	-
1.6F	A.D.	8.30	1.13	33.08	-
	DRY	-		33.45	
1.7F	4. D.	8.51	1.02	40.50	-
	DRM	-		40.91	-
1.75	A.D.	52.98	-	54.90	3.22

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No.	
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TO:

STEVE CARDNER - FLOWSHEET: SAMPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 Screen Yields FRACTION YIELD MM (7) +13.3 13.6 X 6.7 44.40	TEVE CARDNER FLOWSHEET APLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 ACTION YIELD MM (Z) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
STEVE GARDNER - FLOWSHEELT SAMPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 Screen Yields FRACTION YIELD MM (Z) +13.3 13.6 X 6.7 44.40	TEVE CARDNER FLOWSHEET APLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 reen Yields YIELD (Z) 3.3 4.12 (Z) 3.3 4.12 (Z) 3.3 4.12 (Z) 3.4 26.73 44.40 7 X 2.4 26.73 45.49 5 X 0.15 5.25 5.25				
SAMPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 Screen Yields FRACTION YIELD MM (%) +13.3 13.6 % 6.7	MPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 reen Yields ACTION YIELD (%) MM (%) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
SAMPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 Screen Yields FRACTION YIELD MM (%) +13.3 13.6 % 6.7	MPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 reen Yields ACTION YIELD (%) MM (%) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
SAMPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 Screen Yields FRACTION YIELD MM (%) +13.3 13.6 % 6.7	MPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 reen Yields ACTION YIELD (%) MM (%) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
SAMPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 Screen Yields FRACTION YIELD MM (%) +13.3 13.6 % 6.7	MPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 reen Yields ACTION YIELD (%) MM (%) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
SAMPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 Screen Yields FRACTION YIELD MM (%) +13.3 13.6 % 6.7	MPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 reen Yields ACTION YIELD (%) MM (%) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
SAMPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 Screen Yields FRACTION YIELD MM (%) +13.3 13.6 % 6.7	MPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 reen Yields ACTION YIELD (%) MM (%) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
SAMPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 Screen Yields FRACTION YIELD MM (%) +13.3 13.6 % 6.7	MPLE ND: HCL-084-07C COMPOSITE NO. C SAMPLES 8+10 reen Yields ACTION YIELD (%) MM (%) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
Screen Yields FRACTION YIELD MM (7) +13.3 13.6 X 6.7 4.12 44.40	reen Yields ACTION YIELD MM (%) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25	areve		ν •Υ β = Ε	
Screen Yields FRACTION YIELD MM (7) +13.3 13.6 X 6.7 4.12 44.40	reen Yields ACTION YIELD MM (%) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25		HOL-084-070 COMPOSITE NO D		
FRACTION Y1ELD (%) MM (%) +13.3 4.12 13.5 % 6.7 44.40	ACTION MM (7) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
FRACTION Y1ELD (%) MM (%) +13.3 4.12 13.5 % 6.7 44.40	ACTION MM (7) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
FRACTION Y1ELD (%) MM (%) +13.3 4.12 13.5 % 6.7 44.40	ACTION MM (%) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
FRACTION Y1ELD (%) MM (%) +13.3 4.12 13.5 % 6.7 44.40	ACTION MM (%) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25	Screen Viel	de		
MM (%) +13.3 4.12 13.5 % 6.7 44.40	MM (%) 3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
+13.3 4.12 13.6 X 6.7 44.40	3.3 4.12 .6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
19.6 X 6.7 44.40	. 6 X 6.7 44.40 7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25	1*11*0			
	7 X 2.4 26.73 4 X 0.6 15.49 5 X 0.15 9.25				
	5 X 0.15 9.25	6.7 X 2.4		26.73	
		0.6×0.15			
		0.10 × 0		0.01	

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TO:

	STEN	o <u>a rome</u> r				
	SAMPLE ND:	Hol - 094 - 070	CENECUTE NO.	6 SAMPLES 5	5÷€+7	
\sim						
	Screen Yield	e le				
	FRACTION MM			YIELÐ (%)		
	+13.3 13.3 X 6.7			3.20 43.49 25.77		
	6.7 X 2.4 2.4 X 0.6 0.6 X 0.15			16.79 9.66		
	0.15 X O			1.09		

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1001 East Pender Street,

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Vancouver, B.C. Canada V6A 1W2

		GARDNER - FLOWSHEET
		HCL-084-07C COMPOSITE NO. A SAMPLES 1+3
-	Screen Yiel	de
	FRACTION MM	YIELD (Z)
	+13.3 12.3 Y 6.7 6.7 X 2.4 2.4 X 0.6 0.6 X 0.15	2.43 34.64 30.39 20.07 10.86
	0.15 X 0	1.61

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	No.	DATE:
	FILE:	

COMPOSITE ANALYSIS

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AIR DRY BASIS:

Residual	Moisture	1.27%
Ash		39.98%
Volatile	Matter	26,28%
Sulphur		2.02%
FSI		$3\frac{1}{2}$

DRY	BASI	S:

Calorific	Value 4476 cal./gram
Carbon	46.38%
Hydrogen	3.42%
Chlorine	0.12%
ASH FUSION:	
IT	2570°F
ST	2700+°F
НТ	2700+°F
FT	2700+°F
	<u>^</u> ,

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1.15

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P.J. Jordan

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HL-84-05C SAMPLE No. 1 25 X .015mm FRACTION

	•• ••	-								
S. G. FRACTION	WŁ. X	Ash X	% Wt. of Ash of Total	Eum. Wt. X of Ash	Cum. Wt.X of Floats		Sink Wt. of Ash Z	Cum. Wt. X of Sinks	Cum Ash X of Sinks	S.G. DISTRIBUTION Wt. X
-1.3			0	Ũ	0					
1.3-1.4	63.77	6.76	4.31	4.31	63.77	6.76	13.43	36.23	37.07	72.92
1.4-1.5	9.05	22.16	2.01	6.32	72.82	8.67	11.43	27.18	42.04	16.97
1.5-1.6	7.92	32.38	2.56	8.69	80.74	11.00	8.86	19.26	46.01	17.09
1.6-1.7	9.17	37.50	3.62	12.50	89.71	13.91	5.24	10.07	51.92	19.26
i.7 +	10.09	51,92	5.24	17.74	100.00	17.74	0	Û	-	-

17.74

u	-04	-050
- ni	07	-030

SAMPLE No. 3 25 X .015mm FRACTION

S. G. FRACTION	Wt. %	Ash %	X Wt. of Ash of Total	Cus. Wt. X of Ash	Cum. Wt.% of Floats	Cum. Ash X of Floats	Sink Wt. of Ash X	Cum. Nt. X of Sinks	Cum Ash 1 of Sinks	S.G. DISTRIBUTION Wt. %
-1.3			0	Û	0					
1.3-1.4	44.27	8.57	3.79	3,79	44.27	8.57	18,38	55.73	32.98	63.59
1.4-1.5	19.32	21.89	4.23	8.02	63.59	12,62	14.15	36.41	38.64	34.73
1.5-1.6	15.41	30.65	4.72	12.75	79.00	16.13	9.43	21.00	44.89	26.73
1.6-1.7	11.32	39.20	4, 44	17.18	90.32	19.03	4.99	9.68	51.54	21.00
i.7 +	9.68	51.54	4.99	22,17	100.00	22.17	0	0	-	-
			22.17							
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HL-84-05C		SAMPLE No.	5	25 X .015ee	FRACTION					
S. 6. FRACTION	Wt. X	Ash X	2 Wt. of Ash of Total	of Ash	Cua. Wt.% of Floats	Cum. Ash X of Floats	Sink Wt. of Ash Z	Eum. Wt. X of Sinks	Cum Ash X of Sinks	S.G. DISTRIBUTION Wt. Z
-1.3			0	0	0					
1.3-1.4	7 4. B0	7.39	5.53	5.53	7 4. B0	7.39	\$6.65	25.20	66.05	63.59
1.4-1.5	4.31	18.09	0.78	6.31	79.11	7.97	15.87	20.89	75.95	4.20
1.5-1.6	2,14	28.19	0.60	6.91	61.25	8.51	15.26	18.75	81.40	11.21
1.6-1.7	2.18	37.32	0.81	7.72	83.43	9.26	14.45	16.57	87.20	18.75
1.7 +	16.57	59,85	9.92	17.64	100.00	17.64	4.53	0	-	-

17.64

HL-84-07C COMPOSITE SAMPLES A+B+C 0.6 X .15mm FRACTION

S. G. Fraction	Wt. X	Ash %	2 Wt. of Ash of Total	Cum. Wt. 2 of Ash		Cum. Ash % of Floats	Sink Wt. of Ash X	Cum. Wt. Z of Sinks	Cum Ash X of Sinks	S.G. DISTRIBUTION Wt. Z
-1.3			0	0	0					
1.3-1.4	50.12	5.76	2.89	2.89	50.12	5.76	22.24	49.88	44.60	57.26
1.4-1.5	7.14	7.23	0,52	3,40	57.26	5.94	21.73	42,74	50.B4	11.99
1.5-1.6	4.85	9.58	0.46	3.87	62.11	6.23	21.26	37.89	56.12	9.48
1.6-1.7	4.63	11.71	0.54	4.41	66.74	6.61	20.72	33.26	62.30	37.89
1.7 +	33.26	62.30	20.72	25.13	100.00	25.13	0	0		

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HL-B4-07C COMPOSITE SAMPLES A+B+C 6.7 X .6 mm FRACTION

S. G. FRACTION	Wt. X	Ash X	% Wt. of Ash of Total	Cum. Wt. % of Ash		Cum. Ash % of Floats	Sink Wt. of Ash %	Cum. Wt. Z of Sinks	Cue Ash X of Sinks	S.G. DISTRIBUTION Wt. 2
-1.3			0	0	ŷ					
1.3-1.4	41.17	7.20	2,96	2.96	41.17	7.20	30.50	58.83	51.84	50.31
1,4-1.5	9,14	22.85	2.09	5.05	50.31	10.04	28.41	49.69	57,17	15.40
1.5-1.6	6.34	30.80	1.95	7.01	56.65	12.37	26.45	43.35	61.03	11.93
1.6-1.7	5.59	37.42	2.09	9.10	62.24	14.62	24.36	37.76	64.52	43.35
1.7 +	37.76	64.52	24.36	33,46	100.00	33.46	0	Û	-	-

33.46

HL-84-07C COMPOSITE SAMPLES A+B+C 25 X 6.7 em FRACTION

S. 6. Fraction	WŁ. X	Ash X	X Wt. of Ash of Total	cum. Wt. X of Ash		Cum. Ash % of Floats	Sink Wt. of Ash X	Cum. Wt. X of Sinks	Cue Ash X of Sinks	S.S. DISTRIBUTIO Nt. Z
-1.3			0	0	0					
1.3-1.4	20.09	9.20	1.85	1.85	20.09	9.20	37.63	79.91	47.09	30.21
1.4-1.5	10.12	23.21	2.35	4.20	30.21	13.89	35.28	69.79	50.55	18.42
1.5-1.6	8.30	33.0B	2.75	6.94	38.51	18.03	32,53	61.49	52.91	16.81
1.6-1.7	B.51	40.50	3,45	10.39	47.02	22.10	29.09	52.98	54.90	61.49
1.7 +	52.98	54.90	29.09	39.4B	100.00	37.48	0	0	-	-

HL-84-07C COMPOSITE SAMPLES A+8+C

0.6 X .15mm FRACTION

S. G. FRACTION	Wt, %	Ash X	% Wt. of Ash of Total	Cum. Nt. % of Ash	Cum. Wt.X of Floats		Sink Wt. of Ash %	Cue. #t. % af Sinks	Cum Ash X of Sinks	5.G. DISTRIBUTION Wt. %
-1.3			0	0	Q ,					
1.3-1.4	50.12	5.76	2.89	2.89	50.12	5.76	22.24	49.88	44.60	57.26
1.4-1.5	7.14	7,23	0,52	3.40	57.26	5.94	21,73	42.74	50.84	11.99
1.5-1.6	4.85	9.5B	0.40	3.87	62.11	6.23	21.26	37,89	56,12	9.48
1.6-1.7	4.63	11.71	0,54	4,41	66.74	6.61	20.72	33.26	62.30	37 . B9
1.7 +	33.26	62.30	20,72	25,13	100.00	25. 13	0	0		

25.40

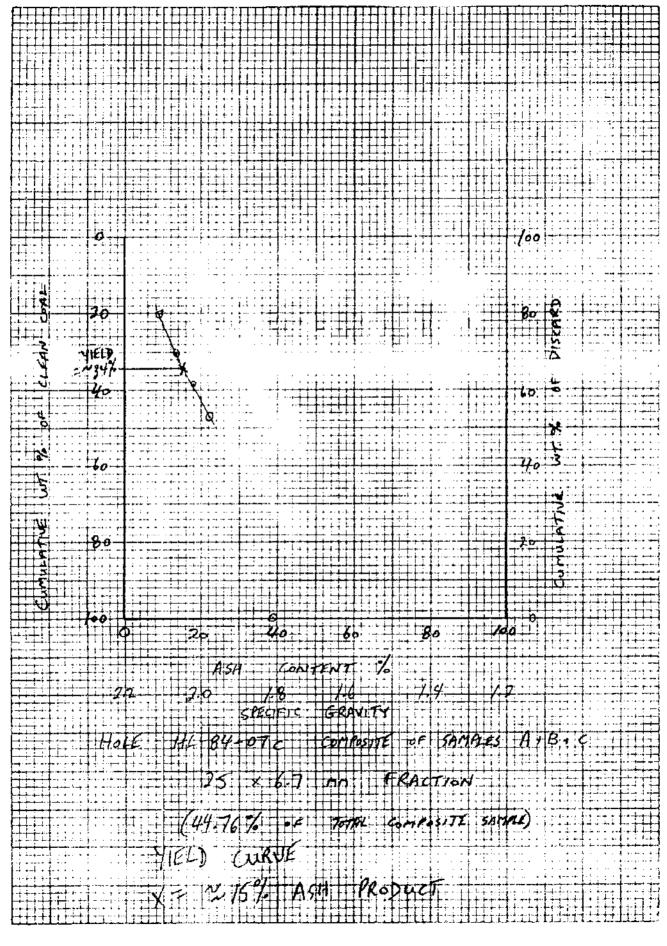
HL-84-07C COMPOSITE SAMPLES A+8+C 6.7 X .6 mp FRACTION

S. G. Wt. X Ash X X Wt. of Ash Cum. Wt. X Cum. Wt.X Cum. Ash Z Sink Wt. Cum. Wt. Z Cum Ash X S.G. DISTRIBUTION FRACTION of Total of Ash of Floats of Floats of Ash X of Sinks of Sinks Wt. Z FRACTION 0 Û Û -1.3 7.20 30.50 58.83 51.84 50.31 2.90 41.17 1.3-1.4 41.17 7.20 2.96 49.69 10.04 28.41 57,17 2.01 5.05 50.31 15.48 1.4-1.5 9,14 22.85 6.34 30.80 1.9i 7.01 56.65 12.37 26.45 43.35 61.03 11.93 1.5-1.6 5.59 37.42 2.07 9.10 62.24 14.62 24.36 37.76 64,52 43.35 1.6-1.7 64.52 24.35 33.46 100.00 33.46 0 Û -1.7 + 37.76 -

33.45

HL-84-07C COMPOSITE SAMPLES A+8+C 25 X 6.7 BA FRACTION

S. G. FRACTION	Wt, %	Ash X	X Wt. of Ash of Total	Com, Wt. % of Ash		Cum. Ash 2 of Floats	Sink Wt. of Ash X	Cue. Wt. Z of Sinks	Cus Ash X af Sinks	S.G. DISTRIBUTION Wt. %
-1.3			0	0	0					
1.3-1.4	20.09	7.20	1.85	1.85	20.09	9.20	37.63	79.91	47.09	30.21
1.4~1.5	10.12	23.21	2.35	4.20	30.21	13.89	35,28	69.79	50.55	18.42
1.5-1.6	B,30	33.0B	2.75	6.94	38.51	18.03	32.53	61.49	52.91	16.91
1.6-1.7	8.51	40.50	3.45	10.39	47.02	22.10	29.09	52.98	54.90	61.49
1.7 +	52.98	54,90	29.09	39.48	100.00	39.48	Ũ	0	-	-



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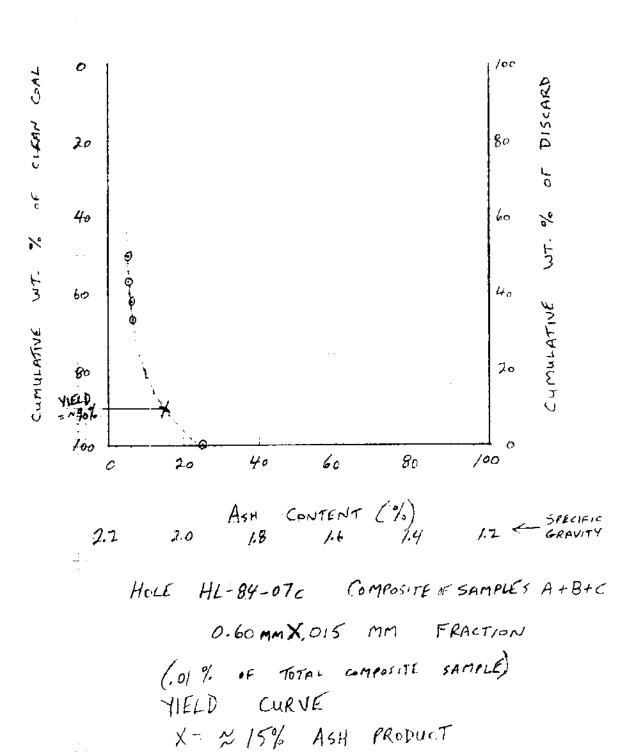
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TO: Mr. Stephen L. Gardener, 274 Westwood Road, R.R. #3, Site "S" Nanaimo, B.C., V9R 5K3

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Telephone: (804) 254-164	17 Telex:	04-6075	14 Cable:	Supervise
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CERTIFICATE OF ANALYSIS

No.		D/
FILE:	8406-27520	A

ATE: August 22, 1984

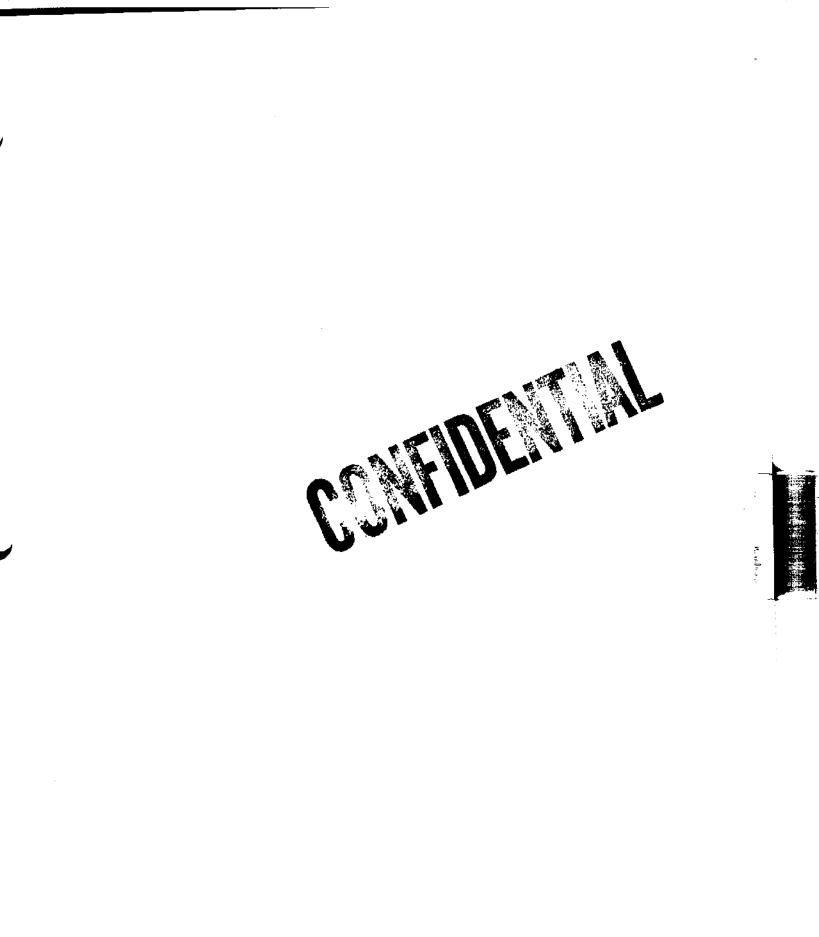
1001 East Pender Street. Vancouver, B.C. Canada V6A 1W2

SAMPLE IDENTITY:		HL - 84 - 070 (Composite)
		COAL ASH
MINERAL ANALYSIS	OF ASH	PERCENT WEIGHT IGNITED BASI
Silica	SiO ₂	44.73
Alumina	A1203	34.03
Titania	TiO ₂	2.11
Ferric Oxide	$\operatorname{Fe}_2^2_3$	11.69
Lime	CaO	4.24
Magnesia	MgO	0.52
Potassium Oxide	к ₂ 0	0.12
Sodium Oxide	Na ₂ 0	0.04
Sulfur Trioxide	so ₃	1.86
Phos. Pentoxide	P ₂ 0 ₅	0.36
Strontium Oxide	Sr0	0.05
Barium Oxide	BaO	0.03
Manganese Oxide	Mn 304	0.17
	54	99.95

THIS COMPANY ACCEPT OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE

١,

SIGNATURE AND TITLE





TO:

STEPHEN L. GARDENER

1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (804) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.	DATE:					
FILE:	August	14.	1984			

												ł
	ste'	VE G	ARD	NER		LOW	SHEE	T				
	SAMPLE	140; H	CL-084-	050 1	L					PAGE N	D: 1	
	AIR DRY MOISTURE (%): 0.87											
	RAW COAL-Proximate, Total Sulphur, Specific Gravity, FSI											
	BASIS	R.M. Z	ASH X	V.M. Z	F.C. %	т.S. %	C.V. CAL/G	S.G.	FSI			
~	A.D. DRY	1.26	21.00 21.26	34.25 34.68	43.49 44.04	2.96 2.99	6206 6285	1.42 -	6.5 -	,		
	SIZE F	RACTION	I - Scr	een Yie	lds							
	FRACTI MM 25 X C .015 X	1).15						YIEL (%) 97.2 2.7	22			
	FRACTION ANALYSIS - Ash, Total Sulphur											
	FRACT I 附				ASH X	ł				TOTAL	SULPH %	ÚR
	.15 X	0			26.	.27				1	.52	
										/2	_	
OF INS	COMPANY ACCE SPECTION AND/OF S	OR ANALYSIS IN	NSIBILITY EXC GOOD FAITH /	EPT FOR THE C	DUE PERFORMA IGTOTHE RULE	ANCE IS OF		SIGNATU	RE AND TIT		<u>]</u>	_

Analytical and Consulting Chemists, Bulk Cargo Specialists, Surveyors, Inspectors, Samplers, Weighers MEMBER American Society For Testing Materials - The American OI Chemists Society - Canadian Testing Association REFEREE AND OR OFFICIAL CHEMISTS FOR - National Institute of Okased Products - The American Di Chemists Society OFFICIAL WEIGHMASTERS FOR Vancouver Board of Trade

1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.	DATE:	
FILE:	August 14, 1984	

PAGE NO: 2

FRACTION: 25.0 X .015 MM

STEPHEN L. GARDENER

Float/Sink - Residual Moisture, Ash, Sulphur

S.G.	BASIS	YIELD %	R.M. %	ASH %	T.S. %
1.4F	A.D.	63.77	0.81	6.76	
	DRY			6.81	
1.5F	A.D.	9.05	1.06	22.16	-
	DRY			22.39	-
1.6F	A.D.	7.92	1.05	32.38	-
	DRY			32.72	-
1.7F	A.D.	9.17	1.17	39.50	-
	DRY	-		39.96	
1.75	A.D.	10.09	****	51.92	5.03

..../3

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TO:

1001 East Pender Street,



TO:		- - -
STEPHEN	L.	GARDENER

CERTIFIC	CATE OF ANALYSIS
No.	DATE:

Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

Vancouver, B.C. Canada V6A 1W2

FILE:	August	14,	1984	

a	TEVE	= C	ARD	NER		- LOW:	SHEE					
SA	MPLE NO): HC	L-084-	05C 3	3					PAGE N	10:	3
AI	r dry M	DISTU	RE (%)	: 2.	52							
RA	W COAL-	Proxi	mate,	Total 9	Sulphur	, Speci	fic Gra	vity, F	SI			
BA	SIS R.		ASH X	V.M. %	F.C. %	T.S. %	C.V. CAL/G	S.G.	FSI			
U A. DR		- 7 5	23.41 23.82	29.64 30.16	45.20 46.00	2.25 2.29	5920 6025	1.47	8.5			
SI	ZE FRAC	TION	- Scre	en Yie	lds							
25	ACTION MM X 0.19 15 X 0	5						YIEL (%) 95.1 4.8	2			
FR	ACTION	ANALY	/SIS -	Ash, T	otal Su	lphur						
FR	ACTION MM				ASH %	İ				TOTAL	SULP %	HUR
. 1	5 X O				32.	13				1	.45	
										/4		
OF INSPEC	PANY ACCEPT CTION AND/OFI E AND OF SCIE	ANALYSISI	ONSIBILITY E IN GOOD FAIT	XCEPT FOR TH H AND ACCORI	E DUE PERFOR DING TO THE RI	RMANCE		SIGNA	TURE AND		М ₁ }.	

1001 East Pender Street. Vancouver, B.C. Canada V6A 1W2

Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.		DATE:
FILE:	A	ugust

DATE:			
August	14.	1984	

					,
				PAGE NO:	: 4
FRACTI	on: 25.(0 X .015	MM		
Float/	Sink - Re	esidual M	oisture,	Ash, Sulp	shur
S.G.	BASIS	YIELD	R.M.	ASH	T.S.
-3 = -3 «	CHOIC	× ×	× 1	7	%
		~			
1.4F	A.D.	44,27	1.14	8.57	-
	DRY	-		8.66	
1.SF	A.D.	19.32	1.05	21.89	-
	DRY	-	-	22.12	-
1.6F	A.D.	15.41	1.14	30.65	-
	DRY		-	31.00	
1.7F	A.D.	11.32	1.03	39.20	-
	DRY			39.60	-
1.75	A.D.	9.62		51.54	2.98

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ųł,

STEPHEN L. GARDENER

THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE. OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE

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STEPHEN L. GARDENER

1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.	DATE:
FILE:	August 14, 1984

	STEV	e G	ARD	NER		LOW:	51-1EE	T				
	SAMPLE N	;0: HC	L-084-	050	5					PAGE NO:	5	5
	AIR DRY	MOISTL	JRE (%)	: 1.	36							
	RAW COAL	Proxi	mate,	Total S	Sulphur	, Speci	fic Gra	vity, F	SI			
	BASIS F	R. М. %		V.M. Z	F.C. %		C.V. CAL/G	s.G.	FSI			
	A.D. DRY	1.27	17.35 17.57	32.26 32.67	49.12 49.75	3.53 3.57	6626 6711	1.41 -	8.5			
	SIZE FRA	ACTION	- Scre	en Yie	lds							
	FRACTIO MM 25 X 0.3 .015 X (15						YIEL (%) 96.5 3.4	7			
	FRACTIO	N ANALY	YSIS -	Ash, T	otal Su	lphur						
	FRACTIO	N			ASH %					TOTAL S %		UR
	.15 X Q				23.	79				3.3	5	
										/5		
OF	S COMPANY ACCE INSPECTION AND/C TRADE AND OF SI	OR ANALYSIS	ONSIBILITY E	KCEPT FOR TH	E DUE PERFOR XNG TO THE RU	MANCE LESOF		SIGNA	TURE AND	TITLE	7.	

1001 East Pender Street, Vancouver, S.C. Cenada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.	DATE:
FILE:	August 14. 1984



TO:			

STEPHEN L. GARDENER

PAGE NO: 6

FRACTION: 25.0 X .015 MM

Float/Sink - Residual Moisture, Ash, Sulphur

S.G.	BASIS	YIELD Z	R.M. Z	ASH %	T.S. %
1.4F	A.D.	74.80	1.21	7.39	
	DRY		-	7.48	
1.5F	A.D.	4.31	0.80	18.09	
`	DRY		-	18.23	
1.6F	A.D.	2.14	0.94	28.19	
	DRY	_	_	28.45	-
1.7F	A.D.	2.18	0.92	37.32	
~~ · · ·	DRY	-	-	37.66	-
1.75	A.D.	16.57		59.85	10.06

..../7

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SIGNATURE AND TITLE

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IO:			
IU.			

STEPHEN L. GARDENER

1001 East Pender Street,
Vancouver, B.C. Canada V6A 1W2
Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.	DATE:
FILE:	August 14. 1984

	STEVE G	ARDNER	- FLONS	sheet		
	SAMPLE NO: HCL	-084-050 2			PAGE NO	1: 7
	AIR DRY MOISTUR	RE (%): 0.4	7			
Ì	RAW COAL-reside	ual moisture,	ash, Specific	Gravity		
	BASIS	R.M. %	ASH Z	S.G.		
	A.D. DRY	1.13	34.13 34.52	1.67		
						•
					/8	
$\mathbf{\vee}$					13	
OFI	5 COMPANY ACCEPTS NO RESPO: NSPECTION AND/OR ANALYSIS IN TRADE AND OF SCIENCE			SIGN		

Analytical and Consulting Chemists, Bulk Cargo Specialists, Surveyors, Inspectors, Samplers, Weighers MEMBER American Society For Testing Materials - The American Oil Chemists Society - Canadian Testing Association REFEREE AND OR OFFICIAL CHEMISTS FOR - National Institute of Oilseed Products - The American Oil Chemists Society OFFICIAL WEIGHMASTERS FOR Vancouver Board of Trade

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TO:

STEPHEN L. GARDENER

1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.		
FILE	,	

DATE: August 14. 1984

·····					
STEVE	GARDNER	- FLOWS	SHEET		
SAMPLE NO:	HCL-084-05C 4	ł		PAGE NO: 8	
		JR, 44-1,			
AIR DRY MOIS	STURE (%): 1.	.03			
RAW COAL-Res	sidual Moisture,	Ash, Specific	: Gravity		
BASIS	R.M. %	ASH X	S.G.		
A.D.	1.07				
DRY		48.69 49.21	1.85		
				/9	
\sim					1
THIS COMPANY ACCEPT	S NO RESPONSIBILITY EXCEPT F	OR THE DUE PERFORMANCE		6	17
OF INSPECTION AND/OR THE TRADE AND OF SCI	ANALYSIS IN GOOD FAITH AND A	CORDING TO THE RULES OF		SIGNATURE AND TITLE	· <u>·</u> ····

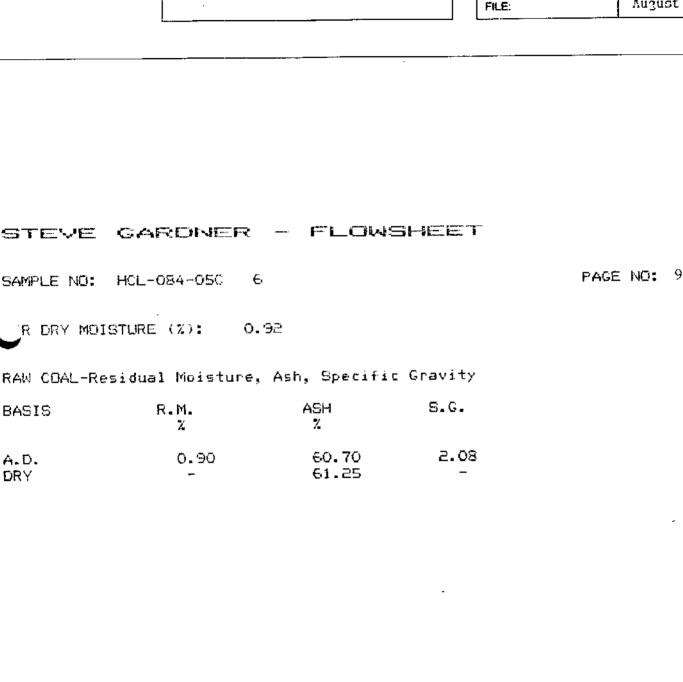
Analytical and Consulting Chemists, Bulk Cargo Specialists, Surveyors, Inspectors, Samplers, Weighers MEMBER American Society For Testing Materials - The American Of Chemists Society - Canadian Testing Association REFEREE AND OR OFFICIAL CHEMISTS FOR - National Institute of Oxiseed Products - The American Of Chemists Society OFFICIAL WEIGHMASTERS FOR Vancouver Board of Trade

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Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.	DATE:
FILE:	August 14, 1984



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TO:

STEPHEN L. GARDENER

SIGNATUR E AND TITLE



TO: STEPHEN L. GARDENER, 274 Westwood Road, R.R. #3, Site 'S' Nanaimo, B.C. V9R 5K3

1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (004) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No. FILE: 8406-2752C

٠

DATE: August 15, 1984

RE:	HL-84-07C Samples 1, 3,	5679	and 10				
	_					_	
WE HAVE ANALYZEI report as follow		scribed sub	mitted s	amples of (Coal a	and	
STEVE GARD	NER -	FLOW	Shee	T			
SAMPLE ND: HCL-084-	-07C 1		•				
AIR DRY MOISTURE (%)	: 2.45						
RAW COAL-Proximate,	Total Sulphu	ır, Speci	fic Gra	vity, FSI	Ĺ		
BASIS R.M. ASH Z Z	V.M. F.C. Z Z	т.s. %	C.V. CAL/G	5.G. F	SI		
A.D. 1.60 26.21 DRY - 26.63	27.10 45.09 27.54 45.82	9 1.00 2 1.01	5739 5832		6.0 -		
SIZE FRACTION - Scr	een Yields						
FRACTION				YIELO			
MM 25 X 0,15 .015 X 0				92.80 7.20			
FRACTION ANALYSIS -	Ash, Total	Sulphur					
FRACTION MM		SH Z				TOTAL	SULPHUR %
.15 X O	Э	7.90				0.	.87
COMPANY ACCEPTS NO RESPONSIBILITY EX SPECTION AND/OR ANALYSIS IN GOOD FAITH	CEPT FOR THE DUE PERFO AND ACCORDING TO THE F	RMANCE RULES OF			<u>.</u>	· · · · · · · · · · · · · · · · · · ·	þ.
RADE AND OF SCIENCE				SIGNATURE	AND TITL	Ē	•

1001 East Pender Street, Vencouver, B.C. Canada VSA 1W2 Telephone: (504) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.	
FIL E:	

DATE:	

STEVE GARDNER - FLOW	19HEET
SAMPLE ND: HCL-084-07C 3	
AIR DRY MOISTURE (%): 1.90	
RAW COAL-Proximate, Total Sulphur, Spec	ific Gravity, FSI
BASIS R.M. ASH V.M. F.C. T.S. %	
A.D. 1.17 27.52 29.20 42.11 4.19 DRY - 27.84 29.54 42.60 4.23	6304 - 6.0 6378
SIZE FRACTION - Screen Yields	
FRACTION MM	YIELD (%) 92.92
25 X 0.15 .015 X 0	7.08
FRACTION ANALYSIS - Ash, Total Sulphur	
FRACTION ASH MM Z	· TOTAL SULPHUR %
.15 X O 35.80	2.59
\sim	1.1
THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE	SIGNATURE AND TITLE

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TO:

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1001 East Pender Street
Vancouver, B.C. Canada V6A 1W2
Telephone: (804) 254-1647 Telex: 04-507514 Cable: Supervisi

CERTIFICATE OF ANALYSIS

No. FILE:

DA	TE	:		

			. <u> </u>	<u>. </u>		
NER - FL	_ O W\$	SHEE				
·07C 5						
Total Sulphur,	Speci	fic Gra	vity, F	SI		
V.M. F.C. T	.s.	c.v.	s.c.	FSI		
				6.5		
31.20 35.30	6.19	2621		-		
een Yields						
			YIEL	D		
			(%)			
				-		
Ash, Total Sulp	phur					
ASH					TOTAL	SULPHUR
7.						7.
29,73	1				з.	58
						M
IT EXCEPT FOR THE DUE PERFOR FAITH AND ACCORDING TO THERL	ULESOF		SK	SNATURE AN		/` <u> </u> ·
	-07C 5 1.18 Total Sulphur, V.M. F.C. 7 20.98 34.98 31.26 35.30 een Yields Ash, Total Sulp ASH 29.7	-07C 5 : 1.18 Total Sulphur, Speci V.M. F.C. T.S. X X X 30.98 34.98 6.14 31.26 35.30 6.19 een Yields Ash, Total Sulphur ASH	•07C 5 •: 1.18 Total Sulphur, Specific Grave V.M. F.C. Z Z OAL/G 30.98 34.98 31.26 35.30 een Yields Ash, Total Sulphur ASH Z 29.71	 i.18 Total Sulphur, Specific Gravity, F V.M. F.C. T.S. C.V. S.G. X X Z CAL/G 30.98 34.98 6.14 5204 - 31.26 35.30 6.19 5251 - aen Yields YIEL (X) 95.4 4.5 Ash, Total Sulphur ASH X 29.71 	•: 1.18 Total Sulphur, Specific Gravity, FSI V.M. F.C. T.S. C.V. S.G. FSI X X CAL/G 30.98 34.98 6.14 5204 31.26 35.30 een Yields YIELD (X) 95.44 4.56	$ \begin{array}{rrr} 5 \\ 5 \\ 5 \\ 5 \\ 5 \\ 7 \\ 1.18 \\ \hline 1.18 $

TO:

1001 East Pender Street,
Vancouver, B.C. Ganada V6A 1W2
Telephone: (804) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No.	
FILE:	

DATE:		

STEVE GARDNER - FLOW	SHEET
SAMPLE ND: HCL-084-070 6	
AIR DRY MOISTURE (%): 1.64	
RAW COAL-Proximate, Total Sulphur, Speci-	fic Gravity, FSI
SIS R.M. ASH V.M. F.C. T.S. 7 7 7 7 7 7	C.V. S.G. FSI CAL/G
A.D. 0.93 65.43 23.41 10.23 1.73 DRY - 66.04 23.62 10.32 1.74	1724 - 1.0 1740
SIZE FRACTION - Screen Yields	1
FRACTION	YIELD
MM 25 X 0.15	(%) 93.68
.015 X O	6.32
FRACTION ANALYSIS - Ash, Total Sulphur	`
FRACTION ASH X	TOTAL SULPHUR %
.15 X O 51.73	1.84
THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE	SIGNATURE AND TITLE



TO:

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CERTIFICATE OF ANALYSIS

No. FILE:

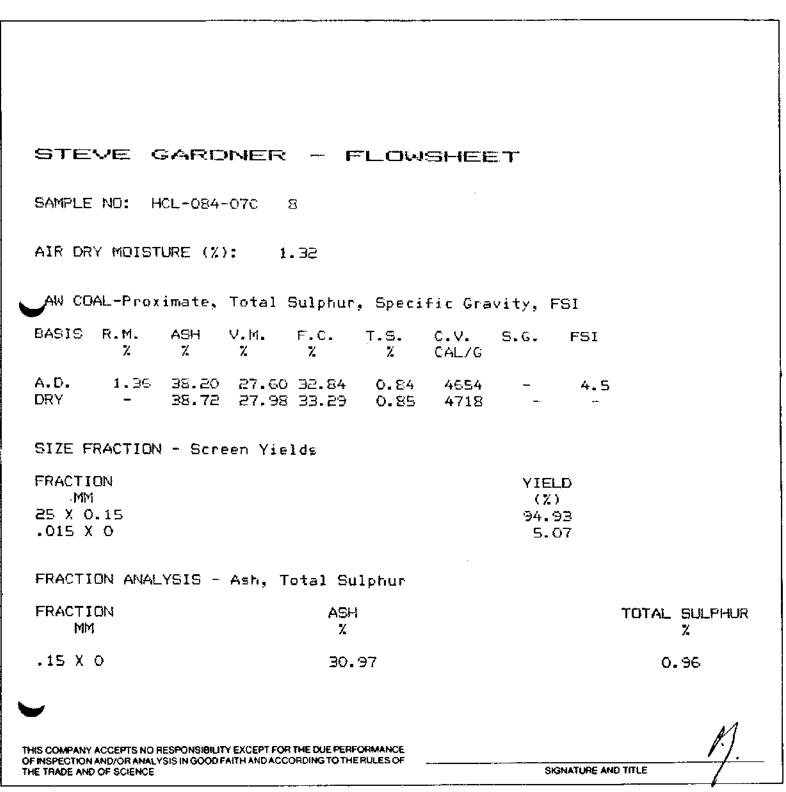
DATE:	

STEVE GARDNER -	FLOW	SHEE			
SAMPLE NO: HCL-084-07C 7					
AIR DRY MOISTURE (%): 4.21					
RAW CDAL-Proximate, Total Sulp	shur, Speci	fic Gra	vity, FS	51	
BASIS R.M. ASH V.M. F.C X X X X			5.6.	FSI	
A.D. 0.95 36.97 27.70 34. DRY - 37.32 27.96 34.				4.0	
SIZE FRACTION - Screen Yields					
FRACTION MM 25 X 0.15 .015 X 0			YIEL (%) 89.0 10.9	4	
FRACTION ANALYSIS - Ash, Tota	l Sulphur				
FRACTION MM	ASH %				TOTAL SULPHUR %
.15 X O	35.€8				2.03
THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORD					A
OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORD THE TRADE AND OF SCIENCE		·	5	SIGNATURE .	AND TITLE

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CERTIFICATE OF ANALYSIS

No.		



Analytical and Consulting Chemists, Bulk Cargo Specialists, Surveyors, Inspectors, Samplers, Weighers MEMBER American Society For Testing Materials - The American Oil Chemista Society - Canadian Testing Association REFEREE AND OR OFFICIAL CHEMISTS FOR - National Institute of Oilseed Products - The American Oil Chemists Society OFFICIAL WEIGHMASTERS FOR Vancouver Board of Trade



TO:

TO:

1001 East Pender St	reet
Vancouver, B.C. Canada V6A	1W2
Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supe	viet

CERTIFICATE OF ANALYSIS

No.	
FILE:	

DATE:	

	······································
STEVE GARDNER - FLOW	ISHEET
SAMPLE NO: HCL-084-07C 10	
AIR DRY MDISTURE (%): 1.85	
RAW COAL-Proximate, Total Sulphur, Spec:	ific Gravity, FSI
BASIS R.M. ASH V.M. F.C. T.S.	C.V. S.G. FSI
7. 7. 7. 7. 7.	CAL/G
A.D. 1.40 41.17 24.73 32.70 0.41	4382 - 3.0
	4444
	•
SIZE FRACTION - Screen Yields	
FRACTION	YIELD
MM	(%)
25 X 0.15 .015 X 0	95.86 4.14
.013 % 0	4.14
FRACTION ANALYSIS - Ash, Total Sulphur	
FRACTION ASH	TOTAL SULPHUR
mini %	Z.
.15 X 0 33.92	0.52
\checkmark	AI
	11
THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF	<u>/''/,</u>
THE TRADE AND OF SCIENCE	SKGNATURE AND TITLE

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1001 East Pender Street, Vancouver, B.C. Canada VBA 1W2



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TO:		

	Telephone: (804) 254-1643	7 Telex: 04-507514 Cebie: Supervise
!	CERTIFIC	CATE OF ANALYSIS
No.		DATE:

FILE:

steve (GARDNER	: - FLOW	SHEET	
SAMPLE NO: H	ICL-084-07C	FRACTION O.6 X	0.15 MM COMPOSITE A+B+	-C
FEED COAL-Re Fraction:	sidual Moistu	re, Ash, Total	Sulphur	
BASIS	R.M. %	ASH %	T.S. 2	
A.D. DRY	0.98	31.03 31.33	1.65 1.66	
FRACTION: 2	5.0 X .015 MM	i		
		sture, Ash, Su	ւթեսո	
	Residual Moi		lphur T.S. %	
Float/Sink - S.G. BASI 1.4F A.D.	Residual Moi S YIELD % 50.12	sture, Ash, Su R.M. ASH % % 1.18 5.76	T.S. %	
Float/Sink - S.G. BASI 1.4F A.D. DRY 1.5F A.D.	Residual Moi S YIELD % 50.12 7.14	sture, Ash, Su R.M. ASH Z Z 1.18 5.76 - 5.82 1.24 7.23	T.S. %	
Float/Sink - S.G. BASI 1.4F A.D. DRY 1.5F A.D. DRY 1.6F A.D.	Residual Moi S YIELD % 50.12 7.14 4.85	sture, Ash, Su R.M. ASH Z Z 1.18 5.76 - 5.82 1.24 7.23 - 7.32 1.66 9.58	T.S. %	
Float/Sink - S.G. BASI 1.4F A.D. DRY 1.5F A.D. DRY	Residual Moi S YIELD % 50.12 7.14 4.85 4.63	sture, Ash, Su R.M. ASH % 1.18 5.76 - 5.82 1.24 7.23 - 7.32	T.S. %	

THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE. OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE

Analytical and Consulting Chemists, Bulk Cargo Specialists, Surveyors, Inspectors, Samplers, Weighers MEMBER American Society For Testing Materials - The American Of Chemists Society - Canadian Testing Association REFEREE AND OR OFFICIAL CHEMISTS FOR - National Institute of Oliseed Products - The American Of Chemists Society DEFICIAL WEIGHMANTERS FOR - Variouver Board of Trade



TO:		1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise CERTIFICATE OF ANALYSIS		
	No.	DATE:		
	File:			

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ste,	STEVE GARDNER - FLOWSHEET					
SAMPLE	NO: HCL	084-070	FRACTI	ON 6.7 X	0.6 1414	COMPOSITE A+B+C
FIID CO Fractio		ual Mois [.]	ture, Ast	, Total (Sulphur	
PASIS		R.M. X		ishi 2	T.S. %	
A.D. DRY		1.02		35.35 35.71	1.95 1.97	
FRACTI	ON: 25.0	X .015	۲ţź.			
Float/	Sink - Re	sidual M	oisture,	Ash, Sul	phur	
9.C.	BASIS	YIELD Z	R.M. X	ASH X	T.S. %	
1.4F	A.D. DRY	41.17	1.22	7.20 7.28	-	
1.57	A.D. DRY	9.14	0.91	22.85 23.05		
1.6F	A.D. DRY	6.34	0.94	30.80 31.09	-	
1.7F	A.D. DRY	5.59	0.91	37.42 37.76	 	
1.75	A.D.	37.76		64.52	2.52	
-						
THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE						

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TO:			1001 East Pender Street, Vancouver, B.C. Canada V&A 1W2 17 Telex: 04-507514 Cable: Supervise CATE OF ANALYSIS
	No.	· · · · · · · · · · · · · · · · · · ·	DATE:
	FIL	E:	

STE	ve gr	ARDNE	R -	FLOW	SHEET	
SAMPLE	NO: HCL	-084-070	FRACTIC	N 25 X 6.	7 MM COMPOSITE A+B+	с
FEED CO Fractic		lual Moist	ture, Ast	, iotal S	Bulphur	
BASIS		R. M. Z	4	NSH Z	т.s. Х	
DRY		1.07		46.57 47.07	1.60 1.61	
FRACTI	DN: 25.(0 X .015	MM			
Float/	Sink - Re	esidual m	oisture,	Ash, Sul	phur	-
S.G.	BASIS	YIELD Z	R.M. %	ASH Z	T.S. %	
1.4F	A.D. DRY	20.09	1.16	9.20 9.30	- ,	
1.5F		10.12	1.12	23.21 23.47		
1.6F	A.D. DRY	8.30	1.13	33.08 33.45	-	
1.7F	A.D. DRM	8.51	1.02	40.50 40.91	- -	
1.75	A.D.	52.98		54.90	3.22	
-						NT

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	CE	ERTIFICATE OF ANALYSIS
	No.	DATE:
	FILE;	

STEVE GARDNER FLOWSHEET ----

SAMPLE NO: HCL-084-070 COMPOSITE NO. C SAMPLES 8+10

Screen Yields

FRACTION	VIELD
MM	(X)
+13.3	4.12
19.6 X 6.7	44.40
6.7 X 2.4	26.73
2.4 X 0.6	15.49
0.6 X 0.15	9.25
0.15 X 0	0.01

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SIGNATURE AND TITLE

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1001 East Pender Street, Vancouver, B.C. Canada V6A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

CERTIFICATE OF ANALYSIS

No. FILE:

 DATE:



TO:

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	STEVE	CARDINE	▽ ~ Г`∟	CRASHIEE		
	SAMPLE NO:	HCL-084-070	COMPOSITE	NG. 6 SAM	LES 5+6+7	
\sim						
	Screen Yiel	lds				
	FRACTION MM			YIELD (%)		
	+13.3 13.3 X 6.7			3.20 43.49		
	6.7 X 2.4 2.4 X 0.6			25.77 16.79		
	0.6 X 0.15 0.15 X 0			9.66 1.09		
•	90 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9					

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1001 East Pender Street,

TO:	Telepho	Vancouver, B.C. Canad one: (604) 254-1847 Telex: 04-507514 Cable	4 V6A 1W2
		CERTIFICATE OF ANA	LYSIS
	No.	DATE:	
	FILE:		

STE	IVE GARDNER -	FLOUSHEET	
GAMPL	E NO: HCL-084-07C COMP(DSITE NO. A SAMPLE	5 1+3
Scree	n Yields		
FRACT MM		VIELD (X)	
+13.3 13.7	Y 5.7	2.43 34.64	
6.7) 2.4)	2.4	30.39 20.07	
0.6) 0.15	(0.15 X 0	10.88 1.81	

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ТО:		1001 East Pender Street Vencouver, B.C. Ceneda V6A 1W. Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise CERTIFICATE OF ANALYSIS		
	No.	DATE:		
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COMPOSITE ANALYSIS

AIR DRY BASIS:

Residual	Moisture	1.27%
Ash		39.98%
Volatile	Matter	26,28%
Sulphur		2.02%
FSI		$3\frac{1}{2}$

DRY BASIS:

Calorific Value	4476 cal./gram
Carbon	46.38%
Hydrogen	3.42%
Chlorine	0.12%
ASH FUSION:	
IT	2570°F
ST	2700+°F
HT	2700+°F
FT	2700 +° F
	_

SIGNATURE AND TITLE

THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE

P.J. Jordan

General Testing Laboratories

A Division of SGS Supervision Services Inc.



TO: Mr. Stephen L. Gardener, 274 Westwood Road; R.R. #3, Site "S" Nanaimo, B.C., V9R 5K3 1001 East Pender Street, Vancouver, B.C. Canada V&A 1W2 Telephone: (604) 254-1647 Telex: 04-507514 Cable: Supervise

DATE:

CERTIFICATE OF ANALYSIS

No. FILE: 8406-2752C

August 22, 1984

WE HAVE ANALYZED the herein described submitted sample of COAL and report as follows: HL - 84 - 07C COMPOSITE A+B+C SAMPLE IDENTITY: COAL ASH PERCENT WEIGHT IGNITED BASIS MINERAL ANALYSIS OF ASH 44.73 Si0₂ Silica 34.03 A1,03 Alumina 2.11 Ti0, Titania 11.69 Fe₂0₂ Ferric Oxide 4.24 Ca0 Lime 0.52 Mg0 Magnesia K20 0.12 Potassium Oxide 0.04 Na₂0 Sodium Oxide 1.86 Sulfur Trioxide SO₂ 0.36 $P_{2}O_{5}$ Phos. Pentoxide 0.05 Strontium Oxide Sr0 0.03 Barium Oxide Ba0 0.17 Manganese Oxide Mn₃0₄ 99.95

THIS COMPANY ACCEPTS NO RESPONSIBILITY EXCEPT FOR THE DUE PERFORMANCE OF INSPECTION AND/OR ANALYSIS IN GOOD FAITH AND ACCORDING TO THE RULES OF THE TRADE AND OF SCIENCE Roberto

R. Roberts - General Manager

SIGNATURE AND TITLE

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