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CARMACKS SOUTH COAL PROJECT

REPORT ON 1979 AND 1980 FIELD WORK

Whitehorse Mining District
Yukon Territory

N.T.S. 115-I-1

Lat. 62°05' N

Long. 136°15' W

By:

T. J. Adamson

CYPRUS ANVIL MINING CORPORATION

May 1981

090815

This report has been examined by the Geological Evaluation Unit and is recommended to the Commissioner to be considered as representation work in the amount of

\$ 7,915.00

Ruth Debrick *Act. Res. Geol*
Resident Geologist or
Resident Mining Engineer *June 19/88*

Considered as representation work under
~~Section 53 (4) Yukon Quartz Mining Act.~~

*SECTIONS 22(1) & (2) TERRITORIAL
COAL REGULATIONS.*

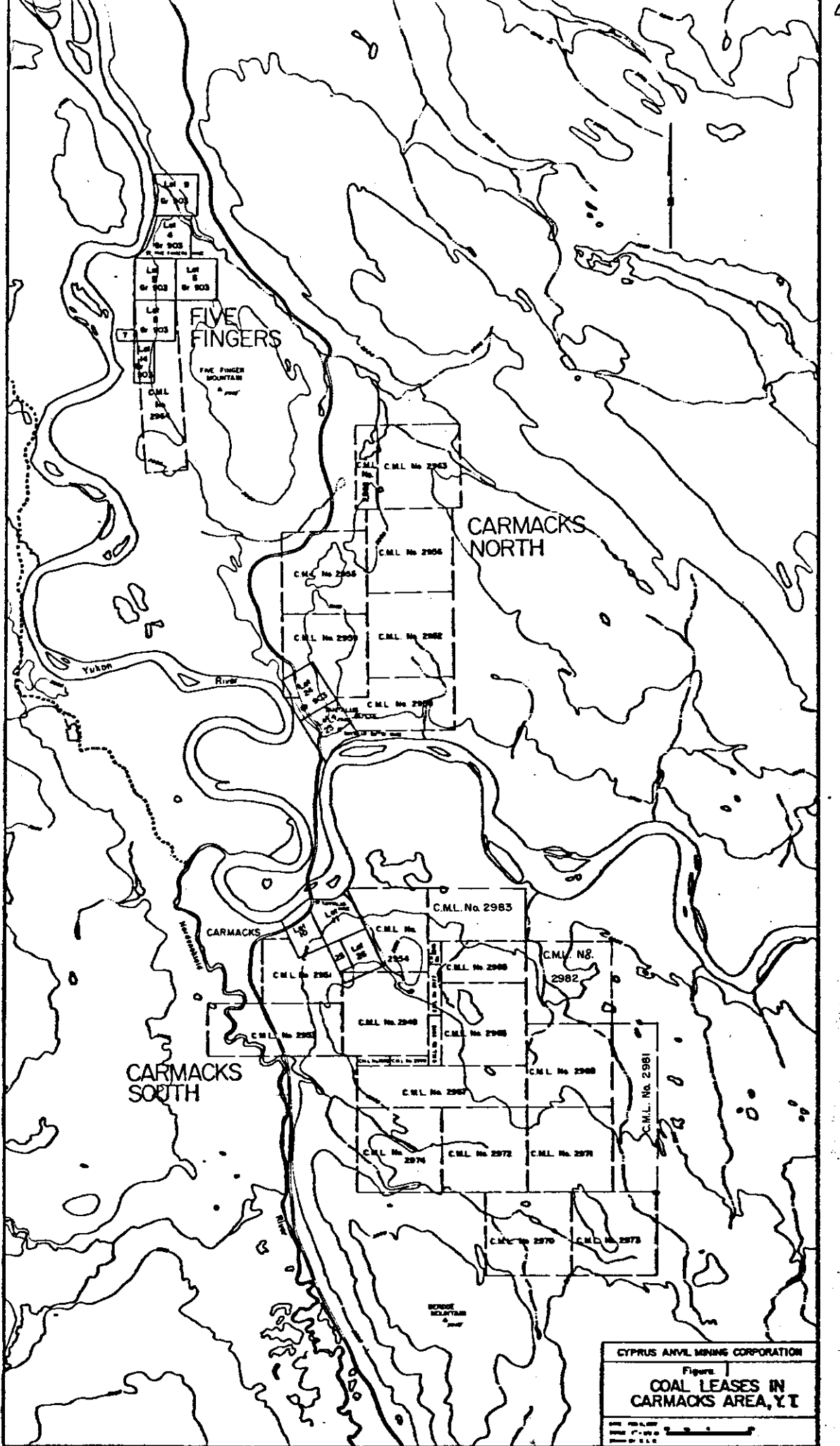
For MINISTER OF I.A. & N.D.
Commissioner of Yukon Territory

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CYPRUS ANVIL MINING CORPORATION
 Figure 1
COAL LEASES IN CARMACKS AREA, Y.T.

CARMACKS SOUTH COAL PROJECT

INTRODUCTION

A substantial amount of exploration work was carried out on the Carmacks South coal leases by Cyprus Anvil Mining Corporation in 1976 and 1977. This work is described in detail in reports titled "Report on Preliminary Evaluation - Carmacks Coal Project", February 1977, by R.P. Hill, and "Report on 1977 Field Program - Carmacks Coal Project", April 1978, by R.P. Hill.

On these coal leases work has been hampered by extensive thick overburden cover. As a result, especially in the southern portion of the leases, geological interpretations were extremely speculative.

During 1979, a program of "down-the-hole-hammer" rotary drilling was initiated on Carmacks South leases in a previously unexplored area of almost total overburden cover. The objectives of this drilling program were to define the Tantalus Formation stratigraphy and investigate the coal potential of a large synclinal structure that was suggested by an earlier (1977) E.M. geophysical survey.

During the summer of 1980, as follow-up to the 1979 drilling, a number of new bulldozer trenches were excavated to expose coal seams for mapping and sampling. At the same time, a number of pre-existing bulldozer trenches were deepened for mapping and sampling purposes.

The 1979 and 1980 fieldwork has resulted in significant changes in the overall geological interpretation on the Carmacks South coal leases.

Presented in this report are the following:-

- A revised geology map (1" = 800') and sections (1" = 200')
- Rotary drill hole logs (holes CS-79-01 through CS-79-32)
- Rotary drill hole electrologs
- Analyses of rotary drill hole coal samples
- Geological sketches of 1980 bulldozer trenches and analyses of trench samples
- geological sketches of selected deepened pre-existing trenches and analyses of trench samples

LOCATION AND ACCESS

The "Carmacks South" block of coal leases are located south of the Yukon River and east of the Nordenskiöld River, immediately south of the village of Carmacks, Y.T.

From Carmacks to the area of the leases on which drilling and trenching has been carried out, access is possible on bulldozer trails using four-wheel drive vehicles.

DRILLING

The 1979 down-hole-hammer rotary drilling was carried out under contract by Midnight Sun Drilling Ltd. of Whitehorse, Y.T. using a Schram T64 truck-mounted drill rig.

Footage drilled in the period August 17 - September 24, 1979, in 32 holes, totaled 11,041 feet (3365 m).

Chip samples were logged continuously at the drill site as drilling progressed. As long as the hole was dry, all return from coal seam intersections was collected. Samples from seam intersections greater than about 1 metre were retained for analyses. It was impossible to obtain a representative sample from coal intersections in wet holes.

ELECTROLOGGING

Electrologging of drill holes in which coal seams were intersected was carried out by BPB Instruments (Canada) Ltd. Logging was done in open holes. Some holes could not be logged at all, or to the planned depth because of caving. The suite of logs run included gamma ray, long spacing density, short spacing density, neutron and caliper logs. An attempt to run dipmeter logs was unsuccessful because of design problems with a new dipmeter sonde. Drill hole electrologs are included with this report as Appendix IV.

GEOLOGY (See Maps #1, 2, 3)

The 1979 rotary drilling was successful in defining the overall stratigraphy of the Tantalus Formation in the area drilled. Although no direct dip measurements are possible with rotary drilling, and the attempt to measure dips by an electrolog procedure was unsuccessful, sufficient distinctive units and distinctive contacts were encountered in the succession to define the general structural picture in the area of drilling. All drill holes were wholly within the Tantalus Formation. No holes encountered the underlying Laberge Group.

TABLE OF GEOLOGIC FORMATIONS

Age	Unit	Map Symbol	Thickness	Lithology
Pleistocene & Recent				Glacial and fluvioglacial gravels, sands, silts, volcanic ash
— Unconformity —				
Eocene or Younger	Carmacks Group	3	up to 610 m	Basaltic, andesitic, dacitic, trachytic, and rhyolitic flow, breccias, tuffs
— Unconformity —				
Lower Cretaceous and/or U. Jurassic	Tantalus Fm.	2	573 - 775 m	
		2i	33+ m	Conglomerate (quartz and chert pebbles)
		2h	107 - 152 m	Coal measures
		2h ₂		Mudstone, sandstone, minor coal
		2h ₁		Mudstone, sandstone, coal, conglomerate, ± felsitic flows or sills
		2g	137 - 198 m	
		2g ₂		Conglomerate, conglomeratic sandstone, sandstone, minor mudstone, coal
		2g ₁		Sandstone, conglomerate, mudstone, coal
		2f	24 - 34 m	Gritty mudstone
		2e	21 - 107 m	Quartzose conglomeric sandstone and sandstone
		2d	20 m	Mudstone
		2c	91 m	Very clean quartz sandstone
		2b	18 m	Conglomerate (quartz & chert pebbles)
2a	122+ m	Sandstone, conglomeratic sandstone, minor conglomerate		
— Unconformity —				
Lower and Middle Jurassic	Laberge Group	1	up to 2750 m	Sandstone, arkosic sandstone, cobble conglomerate (granite and volcanic cobbles) tuffaceous sandstone, shale

Within the Tantalus Formation, two significant coal members have been identified, that is, unit 2g₁ and unit 2h.

Coal along the ridge in the northwest portion of the mapped area, and which was investigated by diamond drilling and trenching in 1976, was originally interpreted (Hill 1976/77) as occurring at the top of the Laberge Group. The 1979 drilling indicated that this coal was well within the Tantalus Formation, and at that time was thought to be in unit 2h. Bulldozer trenching in 1980, in trenches on lines 51+00 S, 104+00 S, 112+00 S, 120+00 S, and 124+00 S have now shown that this coal is, in fact, in unit 2g. The coal seams in this area are very lensey with very rapid variations in thickness both along strike and down dip. This is seen on examination of the 1980 geology map, trench sketches, and 1976 drill hole profiles. It is very difficult to correlate individual seams between even closely adjacent drill holes or trenches.

The unit 2g coals intersected in rotary drill hole CS-79-24 were followed up by surface trenching on lines 104+00 S, 112+00S, 120+00 S and 124+00 S. The surface work exposed a seam with a maximum thickness of about 2.1 m rather than the 4+ m that was interpreted from the drill hole intersection. The trenching also showed rapid lensing and extensive faulting in this area. It is probable that drill hole CS-79-24, because of structural complexity, intersected the coal seam at a much smaller angle than had been originally estimated.

The subdivision of unit 2g into units 2g₁ and 2g₂ is only possible along the west side of the basin. The two thin dirty coal seams, in an interval of mudstones and coaly mudstones, intersected in rotary drill holes CS-79-12, 4, 6, and 5 are in unit 2g but apparently higher in the sequence than the coal in drill hole CS-79-24.

Unit 2h can only be subdivided into unit 2h₁ and 2h₂ in the south area of the rotary drilling. In this area, 2h₂ is restricted to mudstone, sandstone and minor coal, while unit 2h₁ includes some conglomerate, more and thicker coal seams and some felsitic volcanic components. These volcanics have had the effect of metamorphosing the adjacent coal seams.

Unit 2h coal seams are generally less than 3 m thick with the vast majority less than 2 m thick. Seams exposed in trench L51S range up to about 3 m thick. The estimated true thickness of some of the 2h seams intersected in the rotary drill holes are probably in error because of undefined local structural complexities.

The unit 2h coal seams, like the unit 2g, coals appear to be very lensey and discontinuous making seam correlation very difficult. This is best illustrated on the Geological Cross Sections (Map #2).

COAL QUALITY

A. Coal in Unit 2g₁

Analyses of unit 2g₁ coals have been carried out on samples obtained from 1976 diamond drill holes (C-76-4, 6), from 1979 rotary drill hole CS-79-24, from 1976 trenches 29S, 30S, and from 1980 trenches on lines 112+00 S and 124+00 S.

Rank determination of unit 2g₁ coals (ASTM method), based on the analyses of unoxidized drill hole samples, all indicate a rank of medium volatile bituminous. The trench samples all indicate a high degree of oxidation relative to the drill hole samples, with high residual moistures, higher volatiles, and lower heating values.

In the area of the 1976 diamond drill holes, the range of ash content (d.b.) in drill hole samples from C-76-4 and C-76-6 is from 22.1% to 51.4%. The ash content of seams exposed in trenches in this same area ranges from 28.4 - 38.6%. As noted earlier, correlation of coal seams along strike between trenches or down dip between trenches and drill holes is difficult with very rapid lensing and pinching of seams indicated.

The best quality of coal, on an as-received basis, from any small mineable blocks that may possibly be defined in this area is approximately as follows:-

<u>TM</u>	<u>Ash</u>	<u>Btu/lb.</u>	<u>Rank</u>
8 - 10%	30%	9000	MvB

The coal intersected in rotary drill hole CS-79-24 suggested a thick seam of relatively low ash (22.1%), high heating value (11761 Btu/lb.), medium volatile bituminous coal. This seam, exposed in 1980 in bulldozer trenches on lines 104S, 112S, 120S, and 124S was seen at surface to have a maximum thickness of about 7' (2.1 m) with an ash content ranging from 31.9% to 48.9%. The coal exposed in trenches was very oxidized. Extensive faulting and lensing was evident in these trenches. There is no possibility of defining surface mineable reserves in this area.

B. Coal in Unit 2h

Analyses have been carried out on coal samples from seams intersected in the 1979 rotary drill holes. Unit 2h coals have only been exposed on surface in a 1980 trench (TR L51 S) located to the east of 1976 diamond drill hole CS-76-6. A number of analyses have been made of coal seams exposed in this trench.

On the basis of the 1979 rotary drill hole samples, unit 2h coals are seen, throughout the area drilled, to be very high in ash content (most samples in the range 40 - 65% ash, d.b.). The few thin 2h₂ coals have a rank of medium-low volatile bituminous. In unit 2h₁, the rank of coals is much higher, ranging from semi-anthracite to meta-anthracite. As was discussed previously, the reason for this high rank is thought to be the influence of some felsic volcanic components within the unit 2h₁ section in this area. The flat lying area of unit 2h₁, intersected by rotary holes CS-79-3, 12, and 4, on Section 112+00 S, provides the best coal section from a mining point of view. The average quality of all 2h₁ seams greater than 1 m thick, from the above three drill holes is as follows (d.b.):-

<u>Ash</u>	<u>Btu/lb.</u>	<u>Rank</u>
45.9%	5940	AN

The best quality seam in this block, only 1.1 m thick, is as follows:-

<u>Ash</u>	<u>Btu/lb.</u>	<u>Rank</u>
28.7%	9867	AN

Sampling and analyses was carried out on 2h coals exposed in trench L51 S. Sample locations are shown on the trench sketch (Map #3). The A.S.T.M. rank of all coals exposed in this trench is medium volatile bituminous. The possibility exists, however, that the trench samples are highly oxidized and the calculated rank may be somewhat lower than the true unoxidized rank. Rank determinations based on vitrinite reflectance are not influenced to any great extent by oxidation. A check of the rank of these coals by reflectance measurements is being made. No volcanic members, thought responsible for the very high rank of unit 2h coals in the area of rotary drilling, were seen in this trench.

The range of ash and heating values for sampled seams, 1.5 - 3 m thick, in TR L51 S, is as follows (d.b.):-

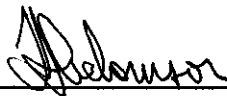
Ash 24.3% - 38%
Btu/lb. 10325 - 7807

The lowest ash coal occurs in a seam only 1.5 m thick.

The best quality of coal, on an as received basis, that could be mined from a combination of the two thickest seams in this area (3 m, 2.1 m) would be approximately as follows:-

<u>TM</u>	<u>Ash</u>	<u>Btu/lb.</u>	<u>Rank</u>
8 - 10%	31%	8050	MvB

Respectfully submitted,



T. J. Adamson

Cyprus Anvil Mining Corporation

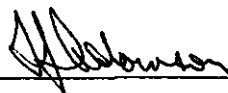
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APPENDIX I

Statement of Qualifications

I, Thomas J. Adamson, geologist, with business address at 330 - 355 Burrard Street, Vancouver, British Columbia, and residential address at 3842 West 23rd Avenue, Vancouver, British Columbia, hereby state that:

1. I graduated from the University of British Columbia in 1967 with a B.Sc., majoring in geology.
2. From 1967 to the present, I have been actively engaged as a geologist on mineral and coal exploration programs in British Columbia, Alberta, and the Yukon Territory.
3. From 1972 to the present, I have been employed by Cyprus Anvil Mining Corporation of Vancouver, British Columbia.
4. I personally participated in and supervised all the 1979 and 1980 field work on the Carmacks South Coal Project and have compiled and interpreted all data resulting from this work.



T. J. Adamson

May, 1981

CYPRUS ANVIL

APPENDIX II

ROTARY DRILL HOLE LOG

Carmacks South Project 1979

Hole No. CS-79-01

Coal Lease No.: 2965
 Grid Co-ordinates: 112S, 1+10W
 Bearing: -
 Dip: -90°
 Commenced: August 18, 1979
 Completed: August 19, 1979
 Ultimate Depth: 93.0 m
 Electrologged: No

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INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
0.0- 4.0	0.0- 1.2		Overburden.								
4.0-135.0	1.2- 41.1	2i	Conglomerate; pebbles of white to black chert, white to grey quartzite; matrix of fine-grained, light grey s.s.								
135.0-136.0	41.1- 41.5	2h ₂	Coaly m.s.								
136.0-150.0	41.5- 45.7	+	Dark grey to black m.s.; some slightly carbonaceous.								
150.0-151.0	45.7- 46.0		Very carbonaceous m.s.								
151.0-155.0	46.0- 47.2		Grey m.s.								
155.0-156.0	47.2- 47.5		Black m.s.								
156.0-161.0	47.5- 49.1		Coaly m.s.								
161.0-173.0	49.1- 52.7		Thinly interbedded grey m.s. and coaly m.s.								

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
173.0-190.0	52.7- 57.9	2h ₂	Massive medium grey m.s.								
190.0-195.0	57.9- 59.4	4	Medium grey, gritty m.s.								
195.0-202.0	59.4- 61.6		Massive dark grey m.s.								
202.0-205.0	61.6- 62.5		Interbedded grey m.s. and coaly m.s.								
205.0-255.0	62.5- 77.7		Massive medium to dark grey m.s. @ 255', 6" coaly m.s.								
255.0-277.0	77.7- 84.4		Interbedded grey m.s. and black carbonaceous m.s.								
277.0-280.0	84.4- 85.3		<u>COAL.</u>								
280.0-285.0	85.3- 86.9		Very carbonaceous m.s.								
285.0-289.0	86.9- 88.1		<u>COAL.</u>	86.9-88.1	1.2	1.2	69.6			0.24	
289.0-293.0	88.1- 89.3		Coaly m.s.								
293.0-297.0	89.3- 90.5		<u>COAL.</u>	89.3-90.5	1.2	1.2	75.5			0.24	
297.0-305.0	90.5- 93.0		Dark grey m.s.								

END OF HOLE 93.0 m.

Estimated Average Dip: 0°

Total Estimated True Thickness of Coal in seams >1 m: 2h₂ - 2.4 m

DIAMOND DRILL HOLE LOG

Hole No. CS-79-02

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INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
431.0-435.0	131.4-132.6	2h ₁	<u>COAL.</u>	131.4-132.6	1.2	1.0					
435.0-439.0	132.6-133.8	†	Mudstone.								
439.0-440.0	133.8-134.1		Felsite.								
440.0-442.0	134.1-134.7		Black carbonaceous m.s.								
442.0-449.0	134.7-136.9		Very fine-grained, medium grey "salt and pepper" s.s.								
449.0-454.0	136.9-138.4		<u>COAL.</u>	136.8-138.4	1.5	1.3					
454.0-456.0	138.4-139.0		Fine-grained "salt and pepper" s.s.								
456.0-460.0	139.0-140.2		Interbedded coaly m.s., m.s., thin coal.								
460.0-473.0	140.2-144.2		Fine-grained, slightly "salt and pepper" s.s. Note: 473'+ - difficult to log, lots of cave, "blow-out" around casing.								
473.0-474.0	144.2-144.5		<u>COAL.</u>								
474.0-477.0	144.5-145.4		Porphyritic felsite.								
477.0-478.5	145.4-145.8		<u>COAL.</u>								
478.5-480.0	145.8-146.3		Sandstone and mudstone.								
480.0-484.0	146.3-147.5		Carbonaceous m.s.								
484.0-490.0	147.5-149.4		<u>COAL</u> , minor m.s.	147.5-149.4	1.9	1.6					

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)								
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank
490.0-494.0	149.4-150.6	2h ₁	Fine-grained, slightly "salt and pepper" s.s.									
		+										
494.0-500.0	150.6-152.4		Dark grey, fine-grained s.s.									

END OF HOLE 152.4 m.

Estimated Average Dip: 30⁰

Total Estimated True Thickness of Coal in seams >1 m:
 2h₂ - 5.1 m
 2h₁ - 3.9 m

ROTARY DRILL HOLE LOG

Hole No. 79-CS-03

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INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)								
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank
76.0- 82.0	23.2- 25.0	2h ₁	Brownish-grey, carbonaceous m.s.									
82.0- 88.0	25.0- 26.8	+	Interbedded m.s., dark grey s.s., thin coal.									
88.0- 89.0	26.8- 27.1		<u>COAL.</u>									
89.0- 94.0	27.1- 28.7		Black m.s.									
94.0-100.0	28.7- 30.5		<u>COAL.</u>	28.7-30.5	1.8	1.8	60.7			0.31		
100.0-104.0	30.5- 31.7		Mudstone.									
104.0-110.0	31.7- 33.5		<u>COAL.</u>	31.7-33.5	1.8	1.8	52.8			0.18		
110.0-118.0	33.5- 36.0		Sandstone.									
118.0-121.0	36.0- 36.9		<u>COAL.</u>	36.0-36.9	0.9	0.9	42.6	6.7	50.7	0.32	3,135	AN
121.0-124.0	36.9- 37.8		Medium grey, fine-grained s.s.									
124.0-131.0	37.8- 39.9		Interbedded m.s., s.s., minor thin coal.									
131.0-138.0	39.9- 42.1		Grey to black m.s.									
138.0-148.0	42.1- 45.1		Brownish grey, muddy s.s.									
148.0-150.0	45.1- 45.7		Mudstone.									
150.0-152.0	45.7- 46.3		<u>COAL.</u>									
152.0-154.0	46.3- 46.9		Mudstone.									
154.0-157.0	46.9- 47.9		<u>COAL.</u>	46.9-47.9	1.0	1.0	61.1			0.33		

ROTARY DRILL HOLE LOG

Hole No. CS-79-03

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INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)								
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank
312.0-314.0	95.1- 95.7	2g	COAL.									
314.0-360.0	95.7-109.7	+	Conglomerate.									
360.0-393.0	109.7-119.8		Fine-grained, medium grey, homogeneous "salt and pepper" s.s. Coarser grained with increasing depth.									
393.0-397.0	119.8-121.0		Dark grey-brown, slightly coaly m.s.									
397.0-500.0	121.0-152.4		Conglomerate.									

END OF HOLE 152.4 m.

Estimated Average Dip: 0°

Total Estimated True Thickness of Coal in seams >1 m: 2h₁ - 11.9 m

ROTARY DRILL HOLE LOG

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Hole No. CS-79-04

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
380.0-386.0	115.8-117.7	2g	Brown mudstone.								
386.0-409.0	117.7-124.7	+	COAL, coaly m.s., black m.s. Difficult to log, only black sludge return.	-	-	?	61.7			0.22	
409.0-440.0	124.7-134.1		Brown to black m.s.								
440.0-500.0	134.1-152.4		Tantalus conglomerate.								

END OF HOLE 152.4 m.

Estimated Average Dip: 15°

Total Estimated True Thickness of Coal in seams >1 m: 2h₁ - 11.7 m

ROTARY DRILL HOLE LOG

Hole No. CS-79-05

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INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
129.0-133.0	39.3- 40.5	2g	Coaly m.s.								
133.0-135.0	40.5- 41.1	+	<u>COAL.</u>								
135.0-137.0	41.1- 41.8		Mudstone.								
137.0-322.0	41.1- 98.1		Tantalus conglomerate to coarse-grained quartzose s.s.								
322.0-334.0	98.1-101.8		Distinctive reddish-brown, gritty m.s.								
334.0-375.0	101.8-114.3		Conglomerate.								
375.0-380.0	114.3-115.8		Interbedded, coarse-grained s.s. and reddish, gritty m.s.								
380.0-404.0	115.8-121.3		Conglomerate and conglomeratic, coarse-grained quartzose s.s.								

END OF HOLE 121.3 m.

Estimated Average Dip: 38⁰

Total Estimated True Thickness of Coal in seams >1 m: 2g - 2.8 m

ROTARY DRILL HOLE LOG

Hole No. CS-79-06

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INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)								
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank
173.0-177.0	52.7- 53.9	2g	COAL.	52.7-53.9	1.2	.94	35.0	19.8	45.2	0.51	5,212	MvB
177.0-190.0	53.9- 57.9	+	Mudstone.									
190.0-224.0	57.9- 68.3		Conglomerate and coarse-grained s.s.									

END OF HOLE 68.3 m.

Estimated Average Dip: 38°

Total Estimated True Thickness of Coal in seams >1 m: 1.9 m

ROTARY DRILL HOLE LOG

Hole No. CS-79-07

Page 2 of 2

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
300.0-303.0	91.4- 92.4	2e	Medium to coarse-grained quartzose s.s.								
303.0-314.0	92.4- 95.7	+	Fine-grained, brownish-grey, muddy matrix s.s., slightly conglomeratic.								
314.0-410.0	95.7-125.0		Fine-grained, grey, slightly "salt and pepper" s.s., scattered thin conglomeratic beds and 365-385 conglomeratic.								
410.0-440.0	125.0-134.1		Interbedded, fine to coarse-grained quartzose s.s.								
440.0-444.0	134.1-135.3		Very fine-grained, dark grey s.s.								
444.0-456.0	135.3-139.0		Interbedded, fine to coarse-grained quartzose s.s.								
456.0-459.0	139.0-140.0		Coarse-grained, quartzose s.s.								
459.0-470.0	140.0-143.3		Interbedded fine to coarse-grained quartzose s.s., some slightly conglomeratic.								
470.0-478.0	143.3-145.7		Conglomeratic, coarse-grained, quartzose s.s.								
478.0-489.0	145.7-149.0		Interbedded, fine to coarse-grained quartzose s.s.								
489.0-500.0	149.0-152.4	2d?	Dark grey m.s., some sections gritty.								

END OF HOLE 152.4 m.

ROTARY DRILL HOLE LOG

Carmacks South Project 1979

Hole No. CS-79-08

Coal Lease No.: 2965
 Grid Co-ordinates: 112+00S, 22+50E
 Bearing: -
 Dip: -90°
 Commenced: August 27, 1979
 Completed: August 27, 1979
 Ultimate Depth: 39.6 m
 Electrologged: No

Page 1 of 1

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
0.0-	7.0		Overburden.								
7.0-	31.0	2g	Conglomerate.								
31.0-	32.0	+	Muddy matrix s.s.								
32.0-	107.0		Conglomerate.								
107.0-	128.0		Medium brown, massive, gritty m.s. to m.s.								
128.0-	130.0		Dark grey m.s.								

END OF HOLE 39.6 m.

ROTARY DRILL HOLE LOG

Hole No. CS-79-09

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<u>INTERVAL</u>		<u>UNIT</u>	<u>DESCRIPTION</u>	<u>ANALYSES (db)</u>									
<u>Feet</u>	<u>Metres</u>			<u>Interval</u>	<u>Thick.</u>	<u>Est. T.T.</u>	<u>Ash %</u>	<u>Vol.%</u>	<u>F.C.%</u>	<u>S%</u>	<u>Cal/GM.</u>	<u>Rank</u>	
295.0-308.0	89.9- 93.9	2e	Very fine-grained, brownish, muddy matrix s.s.										
308.0-374.0	93.9-114.0	2d	Dark greyish-brown m.s., massive to finely laminated. Same unit as bottom of Hole No. CS-79-07.										
374.0-443.0	114.0-135.0	2c +	Fine to coarse-grained, very light grey to white, very quartzose s.s., layer rounded quartz grains throughout; voluminous white dust; distinctive.										
443.0-444.0	135.0-135.3		Brown m.s.										
444.0-500.0	135.3-152.4		Fine to coarse-grained, very light grey to white, very quartzose s.s., layer rounded quartz grains throughout; voluminous white dust; distinctive.										

END OF HOLE 152.4 m.

ROTARY DRILL HOLE LOG

Carmacks South Project 1979

Drill Hole No. CS-79-10

Coal Lease No.: 2965
 Grid Co-ordinates: 112+00S, 33+00E
 Bearing: -
 Dip: -90°
 Commenced: August 29, 1979
 Completed: August 30, 1979
 Ultimate Depth: 135.6 m
 Electrologged: No

Page 1 of 1

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
0.0- 7.0	0.0- 2.1		Overburden.								
7.0- 31.0	2.1- 9.4	2d	Dark brown m.s.								
31.0- 45.0	9.4- 13.7	†	Very dark, greyish-brown m.s.								
45.0- 62.0	13.7- 18.9		Brown, very gritty m.s. to muddy s.s.								
62.0-445.0	18.9-135.6	2c	Very clean, pure, light grey to white quartz s.s., voluminous white dust. 62.0- 64.0: fine-grained; 64.0-315.0: interbedded, fine-grained; medium-grained, coarse-grained; 315.0-445.0: coarse-grained predominates, thin beds fine-grained, medium-grained.								

END OF HOLE 135.6 m.

ROTARY DRILL HOLE LOG

Carmacks South Project 1979

Drill Hole No. CS-79-11

Coal Lease No.: 2965
 Grid Co-ordinates: 112+00S, 38+50E
 Bearing: -
 Dip: -90°
 Commenced: August 30, 1979
 Completed: September 6, 1979
 Ultimate Depth: 178.0 m
 Electrologged: No

Page 1 of 2

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Ca/GM.
0.0-	6.0		Overburden.								
6.0-	54.0	1.8-	16.5	2b	Typical Tantalus conglomerate.						
54.0-	56.0	16.5-	20.1	2a	Light grey, clean, medium to fine-grained quartzose s.s.						
66.0-	69.0	20.1-	21.0	†	Fine-grained, brownish muddy matrix s.s.						
69.0-	72.0	21.0-	21.9		Clean, light grey, medium-grained s.s.						
72.0-	75.0	21.9-	22.9		Fine-grained, brownish muddy matrix s.s.						
75.0-	186.0	22.9-	56.7		Clean, light grey, medium-grained quartzose s.s.						
186.0-	188.0	56.7-	57.3		Dark grey-brown m.s.						
188.0-	195.0	57.3-	59.4		Interbedded, fine-grained, light grey s.s., brownish, fine-grained s.s., and dark brown to grey m.s.						
195.0-	219.0	59.4-	66.8		Fine-grained, medium to light grey s.s.						
219.0-	221.0	66.8-	67.4		Dark brownish-grey, massive m.s.						

ROTARY DRILL HOLE LOG

Hole No. CS-79-11

Page 2 of 2

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)								
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank
221.0-225.0	67.4- 68.6	2a	Medium, brownish-grey, finely laminated, gritty m.s.									
225.0-234.0	68.6- 71.3	+	Massive, gritty m.s.. to muddy, very fine-grained s.s.									
234.0-260.0	71.3- 79.2		Fine-grained, muddy matrix, crumbly s.s.									
260.0-278.0	79.2- 84.7		Interbedded, dark brown, slightly coaly m.s. and brown m.s.									
278.0-292.0	84.7- 89.0		Very fine-grained, brownish-grey s.s.									
292.0-330.0	89.0-100.6		Fine-grained, grey s.s.									
330.0-424.0	100.6-129.2		Light grey, medium-grained s.s.									
424.0-584.0	129.2-178.0		Medium-grained, grey, quartzose s.s., slightly conglomeratic. 454.0-464.0: conglomeratic s.s.									

END OF HOLE 178.0 m.

ROTARY DRILL HOLE LOG

Carmacks South Project 1979

Hole No. CS-79-12

Coal Lease No.: 2965
 Grid Co-ordinates: 112+00S, 9+50E
 Bearing: -
 Dip: -90°
 Commenced: September 6, 1979
 Completed: September 8, 1979
 Ultimate Depth: 167.0 m
 Electrologged: No

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INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)								
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank
0.0- 20.0	0.0- 6.1		Overburden; some very coaly layers in overburden.									
20.0- 24.0	6.1- 7.3	3h ₁	Grey-brown, fine-grained, biotitic sill.									
24.0- 34.0	7.3- 10.4	+	<u>COAL.</u>	7.3-10.4	3.1	3.1	49.1	8.7	42.2	0.32	3,222	SA
34.0- 43.0	10.4- 13.1		Carbonaceous m.s., thin voluminous, gritty m.s.									
43.0- 52.0	13.1- 15.8		Quartzite.									
52.0- 54.0	15.8- 16.5		Mudstone.									
54.0- 55.0	16.5- 16.8		<u>COAL.</u>									
55.0- 66.0	16.8- 20.1		Porphyritic felsite sill.									
66.0- 66.5	20.1- 20.3		<u>COAL.</u>									
66.5- 82.0	20.3- 25.0		Fine-grained, light grey, porphyritic biotitic sill.									
82.0- 99.0	25.0- 30.2		<u>COAL.</u> , thin m.s.	25.0-30.2	5.2	5.2	38.1	7.1	54.8	0.49	4,926	AN

ROTARY DRILL HOLE LOG

Hole No. CS-79-12

Page 4 of 4

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
504.0-514.0	153.6-156.7	2a	Dark brown m.s. and grey gritty m.s.								
514.0-520.0	156.7-158.5	†	Gritty m.s.								
520.0-525.0	158.5-160.0		Dark brown m.s.								
525.0-535.0	160.0-163.1		Gritty m.s.								
535.0-545.0	163.1-166.1		Dark brown m.s. and grey gritty m.s.								
545.0-548.0	166.1-167.0		Conglomeratic s.s.								

END OF HOLE 167.0 m.

Estimated Average Dip: 0°

Total Estimated True Thickness of Coal in seams >1 m: 2h₁ - 12.6 m
2g - 3.9 m

ROTARY DRILL HOLE LOG

Hole No. CS-79-14

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INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)									
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank	
371.0-383.0	113.1-116.7	2g	Conglomerate.										

END OF HOLE 116.7 m.

Estimated Average Dip: 25°

Total Estimated True Thickness of Coal in seams >1m: 2h₂ - 5.7 m
2h₁ - 5.2 m

ROTARY DRILL HOLE LOG

Hole No. CS-79-15

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INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
75.0- 81.0	22.9- 24.7	2h ₁	COAL.	22.9-24.7	1.8	1.5					
81.0- 86.0	24.7- 26.2	+	Coaly m.s.								
86.0- 89.0	26.2- 27.1		COAL.								
89.0- 93.0	27.1- 28.3		Dark grey-brown, massive m.s.								
93.0-108.0	28.3- 32.9	2g ↓	Grey, gritty m.s. to fine-grained muddy matrix s.s., slightly "salt and pepper".								
108.0-135.0	32.9- 41.1		Fine to medium-grained, "salt and pepper" s.s.								
135.0-240.0	41.1- 73.2		Conglomerate.								
240.0-260.0	73.2- 79.2		Very fine-grained to fine-grained, slightly "salt and pepper", medium grey s.s.								
260.0-284.0	79.2- 86.6		Medium-grained conglomeratic s.s.								
284.0-403.0	86.6-122.8		Conglomerate, 313-316', thin coal seam interbedded.								

END OF HOLE 122.8 m.

Estimated Average Dip: 30°

Total Estimated True Thickness of Coal in seams >1 m: 2h₁ ~ 1.5 m

ROTARY DRILL HOLE LOG

Hole No. CS-79-16

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<u>INTERVAL</u>		<u>UNIT</u>	<u>DESCRIPTION</u>	<u>ANALYSES (db)</u>							
<u>Feet</u>	<u>Metres</u>			<u>Interval</u>	<u>Thick.</u>	<u>Est. T.T.</u>	<u>Ash %</u>	<u>Vol.%</u>	<u>F.C.%</u>	<u>S%</u>	<u>Cal/GM.</u>
265.0-286.0	80.8- 87.2	2h ₁	Brownish-grey, gritty m.s. to muddy s.s.								
286.0-297.0	87.2- 90.5	2g	Fine-grained, grey "salt and pepper" s.s.								
297.0-320.0	90.5- 97.5	+	Conglomeratic, medium-grained "salt and pepper" s.s.								
320.0-405.0	97.5-123.4		Conglomerate, some thin beds conglomeratic s.s.								

END OF HOLE 123.4 m.

Estimated Average Dip: 10⁰

Total Estimated True Thickness of Coal in seams >1 m: 2h₂ - 1.2 m
2h₁ - 4.4 m

ROTARY DRILL HOLE LOG

Hole No. CS-79-17

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INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)								
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank
244.7-268.0	74.6- 81.7	2g	Conglomeratic, medium-grained s.s.									
268.0-303.0	81.7- 92.4	†	Conglomerate.									

END OF HOLE 92.4 m.

Estimated Average Dip: 15°

Total Estimated True Thickness of Coal in seams >1 m: 2h₁ - 13.6 m??

ROTARY DRILL HOLE LOG

Carmacks South Project 1979

Hole No. CS-79-18

Coal Lease No.: 2965
 Grid Co-ordinates: 100+00S, 14E
 Bearing: -
 Dip: -90°
 Commenced: September 15, 1979
 Completed: September 15, 1979
 Ultimate Depth: 37.5 m
 Electrologged: No

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INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)								
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank
0.0- 13.0	0.0- 4.0		Overburden.									
13.0- 27.0	4.0- 8.2	2h ₁ +	COAL; dirty, oxidized, brownish chert to 20'.	6.1- 8.2	2.1	1.7	44.9	6.8	48.3	0.36	3,427	AN
27.0- 45.0	8.2- 13.7		Medium brown m.s., some slightly coaly.									
45.0- 53.0	13.7- 16.2		Grey-brown, slightly gritty m.s.									
53.0- 74.0	16.2- 22.6	2g +	Fine to medium-grained, "salt and pepper" s.s.									
74.0- 93.0	22.6- 28.3		Conglomeratic s.s.									
93.0-123.0	28.3- 37.5		Conglomerate.									

END OF HOLE 37.5 m.

Estimated Average Dip: 35°

Total Estimated True Thickness of Coal in seams >1 m: 2h₁ - 1.7 m

ROTARY DRILL HOLE LOG

Hole No. CS-79-19

Page 2 of 2

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
80.0- 82.0	24.4- 25.0	2h ₁	<u>COAL.</u>								
82.0- 83.0	25.0- 25.3	+	Mudstone.								
83.0- 84.0	25.3- 25.6		<u>COAL.</u>								
84.0- 96.0	25.6- 29.3		Dark brownish-grey m.s.								
96.0-103.0	29.3- 31.4	2g	Slightly "salt and pepper", gritty m.s.								
103.0-125.0	31.4- 38.1	+	Fine to medium-grained "salt and pepper" s.s.								
125.0-137.0	38.1- 41.8		Conglomeratic, medium-grained "salt and pepper" s.s.								
137.0-155.0	41.8- 47.2		Conglomerate.								

END OF HOLE 47.2 m.

Estimated Average Dip: 35^o

Total Estimated True Thickness of Coal in seams > 1 m: 2h₁ - 4.6 m

ROTARY DRILL HOLE LOG

Hole No. CS-79-20

Page 5 of 5

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
513.0-523.0	156.4-159.4	2g	Conglomeratic s.s.								
523.0-544.0	159.4-165.8	†	Conglomerate.								

END OF HOLE 165.8 m.

Estimated Average Dip: 10°

Total Estimated True Thickness of Coal in seams >1 m: $2h_2 - 2.5$ m
 $2h_1 - 7.8$ m

ROTARY DRILL HOLE LOG

Carmacks South Project 1979

Hole No. CS-79-21

Page 1 of 4

Coal Lease No.: 2965
 Grid Co-ordinates: 110+80S, 4+50W
 Bearing: -
 Dip: -90°
 Commenced: September 18, 1979
 Completed: September 19, 1979
 Ultimate Depth: 123.4 m
 Electrologged: No

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
0.0- 38.0	0.0- 11.6		Overburden.								
38.0- 50.0	11.6- 15.2	2h ₂	Dark grey-brown m.s.								
50.0- 52.0	15.2- 15.8	†	Gritty m.s.								
52.0- 54.0	15.8- 16.5		Dark grey m.s.								
54.0- 71.0	16.5- 21.6		Grey gritty m.s., some finely laminated.								
71.0- 73.0	21.6- 22.3		Fine-grained, light to medium grey, slightly "salt and pepper" s.s.								
73.0- 97.0	22.3- 29.6		Conglomerate.								
97.0-103.0	29.6- 31.4		Conglomeratic, medium-grained "salt and pepper" s.s.								
103.0-106.0	31.4- 32.3		Conglomerate.								
106.0-110.0	32.3- 33.5		Abrupt contact to massive, dark brown m.s.								
110.0-112.0	33.5- 34.1		Clean, fine-grained quartzose s.s.								
112.0-114.0	34.1- 34.7		Coaly m.s.								

ROTARY DRILL HOLE LOG

Hole No. CS-79-21

Page 3 of 4

<u>INTERVAL</u>		<u>UNIT</u>	<u>DESCRIPTION</u>	<u>ANALYSES (db)</u>							
<u>Feet</u>	<u>Metres</u>			<u>Interval</u>	<u>Thick.</u>	<u>Est. T.T.</u>	<u>Ash %</u>	<u>Vol.%</u>	<u>F.C.%</u>	<u>S%</u>	<u>Cal/GM.</u>
226.0-230.0	68.9- 70.1	2h ₁	<u>COAL.</u>	68.9-70.1	1.2	1.1					
230.0-238.0	70.1- 72.5	+	Interbedded thin coal, coaly m.s., m.s.??								
238.0-246.0	72.5- 75.0		Dark grey m.s.								
246.0-251.0	75.0- 76.5		?								
251.0-253.0	76.5- 77.1		Coaly m.s.								
253.0-256.0	77.1- 78.0		Medium-grained, slightly conglomeratic s.s.								
256.0-266.0	78.0- 81.1		Black m.s., some coaly, some gritty.								
266.0-283.0	81.1- 86.3		Medium to coarse-grained, quartzose s.s., thin m.s. beds and thin "salt and pepper" s.s. beds.								
283.0-285.0	86.3- 86.9		<u>COAL.</u>								
285.0-292.0	86.9- 89.0		Fine-grained, light grey sill.								
292.0-294.0	89.0- 89.6		<u>COAL.</u>								
294.0-296.0	89.6- 90.2		Coaly m.s.								
296.0-301.0	90.2- 91.7		<u>COAL</u> , minor dirty coal, coaly m.s.	90.2-91.7	1.5	1.4					
301.0-308.0	91.7- 93.9		Fine-grained, medium grey, porphyritic intrusive sill.								
308.0-312.0	93.9- 95.1		<u>COAL</u> , appears very dirty.	93.9-95.1	1.2	1.1					

ROTARY DRILL HOLE LOG

Hole No. CS-79-21

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INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
312.0-337.0	95.1-102.7	2h ₁ +	Fine-grained, light to medium grey, slightly porphyritic (feld. lath.) intrusive sill.								
337.0-339.0	102.7-103.3		<u>COAL.</u>								
339.0-343.0	103.3-104.5		Interbedded thin coal, m.s., s.s.								
343.0-349.0	104.5-106.4		Light grey s.s.???								
349.0-352.0	106.4-107.3		Mudstone.'								
352.0-371.0	107.3-113.1	2g +	Fine to medium-grained "salt and pepper" s.s.								
371.0-397.0	113.1-121.0		Conglomeratic, medium-grained "salt and pepper" s.s.								
397.0-405.0	121.0-123.4		Conglomerate.								

END OF HOLE 123.4 m.

Estimated Average Dip: 25°

Total Estimated True Thickness of Coal in seams >1 m: 2h₂ - 3.9 m
2h₁ - 3.6 m

ROTARY DRILL HOLE LOG

Carmacks South Project 1979

Hole No. CS-79-22

Page 1 of 4

Coal Lease No.: 2965
 Grid Co-ordinates: 112S, 9+50W
 Bearing: -
 Dip: -90°
 Commenced: September 20, 1979
 Completed: September 20, 1979
 Ultimate Depth: 98.5 m
 Electrologged: 0 - 94.5 m

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
0.0-	11.0		Overburden.								
11.0-	16.4	3h ₁	Mudstone, coaly m.s.								
16.4-	22.3	+	COAL, very soft, rotten, ashy.	5.0- 6.8	1.8	1.6					
22.3-	42.7		Mudstone, gritty m.s., some slightly coaly.								
42.7-	52.5		Fine-grained, muddy matrix, light grey s.s.								
52.5-	55.8		Gritty m.s.								
55.8-	56.8		Felsite sill??								
56.8-	59.1		Gritty m.s.								
59.1-	62.3		Mudstone.								
62.3-	64.3		COAL.								
64.3-	66.3		Brown m.s.								
66.3-	69.5		COAL.	20.2-21.2	1.0	0.9	34.7	19.4	45.9	0.51	5,303 MvB

ROTARY DRILL HOLE LOG

Hole No. CS-79-22

Page 4 of 4

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
275.6-282.2	84.0- 86.0	2g	Medium grey, medium-grained, slightly conglomeratic s.s.								
		+									
282.2-295.3	86.0- 90.0		Conglomeratic s.s.								
295.3-323.2	90.0- 98.5		Conglomerate.								

END OF HOLE 98.5 m.

Estimated Average Dip: 25°

Total Estimated True Thickness of Coal in seams >1 m: 3h₁ - 6.5 m

ROTARY DRILL HOLE LOG

Hole No. CS-79-23

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INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)									
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank	
281.0-283.0	85.6- 86.3	2g	Fine-grained, medium grey, slightly "salt and pepper" s.s.										
		+											
283.0-291.0	86.3- 88.7		Interbedded, dark m.s. and fine-grained s.s.										
291.0-320.0	88.7- 97.5		Conglomeratic, medium-grained "salt and pepper" s.s.										
320.0-340.0	97.5-103.6		Conglomerate.										
340.0-343.0	103.6-104.5		Conglomeratic, medium-grained "salt and pepper" s,s.										

END OF HOLE 104.5 m.

ROTARY DRILL HOLE LOG

Hole No. CS-79-24

Page 4 of 4

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
419.0-432.0	127.7-131.7	2g	Conglomerate.								
432.0-444.0	131.7-135.3	↓	Conglomeratic, dark grey s.s.								

END OF HOLE 135.3 m.

Estimated Average Dip: 65°

Total Estimated True Thickness of Coal in seams >1 m: 2g - 4.3 m

ROTARY DRILL HOLE LOG

Carmacks South Project 1979

Drill Hole No. CS-79-25

Coal Lease No.: 2965
 Grid Co-ordinates: 112+00S, 17+60W
 Bearing: -
 Dip: -90°
 Commenced: September 21, 1979
 Completed: September 22, 1979
 Ultimate Depth: 36.9 m
 Electrologged: No

Page 1 of 1

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)																	
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank									
0.0-	6.0	0.0-	1.8																		
0.0-	6.0																				
6.0-	23.0	1.8-	7.0	2g																	
6.0-	23.0	1.8-	7.0																		
23.0-	32.0	7.0-	9.8																		
23.0-	32.0	7.0-	9.8																		
32.0-	105.0	9.8-	32.0																		
32.0-	105.0	9.8-	32.0																		
105.0-	114.0	32.0-	34.7																		
105.0-	114.0	32.0-	34.7																		
114.0-	117.0	34.7-	35.7																		
114.0-	117.0	34.7-	35.7																		
117.0-	121.0	35.7-	36.9																		

END OF HOLE 36.9 m.

ROTARY DRILL HOLE LOG

Carmacks South Project 1979

Hole No. CS-79-26

Coal Lease No.: 2978
 Grid Co-ordinates: 112+00S, 24+00W
 Bearing: -
 Dip: -90°
 Commenced: September 22, 1979
 Completed: September 22, 1979
 Ultimate Depth: 32.0 m
 Electrologged: No

Page 1 of 1

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
0.0- 18.0	0.0- 5.5		Overburden.								
18.0-105.0	5.5- 32.0	2c	Very clean, white quartzose s.s.; coarse- to medium to fine-grained, slightly yellowish near surface, very clean white with depth, voluminous white dust; re- cessive; poorly cemented; same unit as intersected in lower Hole CS-79-10.								

END OF HOLE 32.0 m.

ROTARY DRILL HOLE LOG

Hole No. CS-79-27

Page 3 of 3

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)								
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank
145.0-154.0	44.2- 46.9	2e	Medium-grained s.s. with coarse-grained quartzose sand grain to 10%, slightly conglomeratic.									
		+										
154.0-160.0	46.9- 48.8		Coarse sand size quartzose grain to 50% in medium-grained, "salt and pepper" s.s. matrix.									
160.0-180.0	48.8- 54.9		Fine to medium-grained, medium grey, slightly "salt and pepper" s.s., minor interbeds black m.s., gritty m.s.									
180.0-207.0	54.9- 63.1		Coarse to medium-grained, quartzose s.s., massive to slightly "salt and pepper".									
207.0-220.0	63.1- 67.1		Very fine-grained, medium grey s.s.									
220.0-227.0	67.1- 69.2	2d	Grey m.s., some gritty.									
227.0-232.0	69.2- 70.7	+	Dark grey-brown, massive m.s., not gritty.									
232.0-234.0	70.7- 71.3		Dark grey, gritty m.s.									

END OF HOLE 71.3 m.

ROTARY DRILL HOLE LOG

Hole No. CS-79-28

Page 5 of 5

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)								
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank
397.0-403.5	121.0-123.0	2h ₁	Dark brown m.s.									
403.5-413.4	123.0-126.0	+	Dark grey, gritty m.s.									
413.4-429.8	126.0-131.0	2g	Medium grey, fine-grained, "salt and pepper" s.s.									
429.8-438.0	131.0-133.5	+	Conglomeratic, medium-grained, "salt and pepper" s.s.									

END OF HOLE 133.5 m.

Estimated Average Dip: 10⁰

Total Estimated True Thickness of Coal in seams > 1 m:
 2h₂ - 2.2 m
 2h₁ - 10.9 m

ROTARY DRILL HOLE LOG

Hole No. CS-79-29

Page 2 of 5

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
111.5-144.4	34.0- 44.0	2h ↓	Fine-grained, muddy matrix s.s. to gritty m.s., finely laminated m.s., minor coaly m.s.								
144.4-150.9	44.0- 46.0		Light grey, muddy matrix s.s.								
150.9-152.2	46.0- 46.4		Mudstone.								
152.2-156.2	46.4- 47.6		Very dirty <u>COAL</u> .								
156.2-160.8	47.6- 49.0		Mudstone.								
160.8-165.7	49.0- 50.5		<u>COAL</u> .	49.0-50.5	1.5	1.1					
165.7-167.3	50.5- 51.0		Coaly m.s.								
167.3-170.1	51.0- 52.0		Gritty grey m.s.								
170.1-177.2	52.0- 54.0		Fine-grained s.s., muddy.								
177.2-178.8	54.0- 54.5		Coaly m.s.								
178.8-183.7	54.5- 56.0		<u>COAL</u> .	54.5-56.0	1.5	1.1	49.4	9.5	41.1	0.18	3,009 SA
183.7-185.4	56.0- 56.5		Black m.s.								
185.4-189.6	56.5- 57.8		Fine-grained, dark grey trap rock, may be sill.								
189.6-191.9	57.8- 58.5		Light grey s.s.								
191.9-195.2	58.5- 59.5		Dark m.s.								
195.2-204.7	59.5- 62.4		<u>COAL</u> .	59.5-62.4	2.9	2.2					

ROTARY DRILL HOLE LOG

Hole No. CS-79-29

Page 4 of 5

<u>INTERVAL</u>		<u>UNIT</u>	<u>DESCRIPTION</u>	<u>ANALYSES (db)</u>							
<u>Feet</u>	<u>Metres</u>			<u>Interval</u>	<u>Thick.</u>	<u>Est. T.T.</u>	<u>Ash %</u>	<u>Vol.%</u>	<u>F.C.%</u>	<u>S%</u>	<u>Cal/GM.</u>
313.0-314.0	95.4- 95.7	2h +	<u>COAL.</u>								
314.0-317.0	95.7- 96.6		Light grey, fine-grained, siliceous, quartzose feldspar porphyry, pyritic.								
317.0-320.0	96.6- 97.5		Mudstone.								
320.0-326.0	97.5- 99.4		Light grey, fine-grained, siliceous quartzose feldspar porphyry, pyritic.								
326.0-334.0	99.4-101.8		<u>COAL.</u>	99.4-101.8	2.4	1.8					
334.0-335.0	101.8-102.1		Mudstone.								
335.0-348.0	102.1-106.1		Dirty coal, minor m.s.								
348.0-359.0	106.1-109.4		Dark grey to black m.s.								
359.0-368.0	109.4-112.2		Fine-grained, medium grey, quartz eye porphyry.								
368.0-370.0	112.2-112.8		Mudstone.								
370.0-373.0	112.8-113.7		<u>COAL.</u>								
373.0-377.0	113.7-114.9		Dark grey m.s.								
377.0-387.0	114.9-118.0		Dark grey, very fine-grained s.s. or siliceous m.s.								
387.0-415.0	118.0-126.5	2g +	Fine-grained, medium grey, slightly "salt and pepper" s.s.								
415.0-431.0	126.5-131.4		Conglomeratic, fine to medium-grained "salt and pepper" s.s.								

ROTARY DRILL HOLE LOG

Hole No. CS-79-29

Page 5 of 5

<u>INTERVAL</u>		<u>UNIT</u>	<u>DESCRIPTION</u>	<u>ANALYSES (db)</u>								
<u>Feet</u>	<u>Metres</u>			<u>Interval</u>	<u>Thick.</u>	<u>Est. T.T.</u>	<u>Ash %</u>	<u>Vol.%</u>	<u>F.C.%</u>	<u>S%</u>	<u>Cal/GM.</u>	<u>Rank</u>
431.0-434.0	131.4-132.3	2g	Conglomerate.									

END OF HOLE 132.3 m.

Estimated Average Dip: 40⁰???

Total Estimated True Thickness of Coal in seams >1 m: 2h - 13.1 m

ROTARY DRILL HOLE LOG

Carmacks South Project 1979

Hole No. CS-79-30

Coal Lease No.: 2949
 Grid Co-ordinates:
 Bearing: -
 Dip: -90°
 Commenced: September 25, 1979
 Completed: September 25, 1979
 Ultimate Depth: 19.5 m
 Electrologged: No

Page 1 of 1

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)									
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank	
0.0- 8.0	0.0- 2.4		Overburden.										
8.0- 16.0	2.4- 4.9	2e	Coarse-grained, clean, quartzose s.s.										
16.0- 30.0	4.9- 9.1	+	Medium to coarse-grained, slightly conglomeratic s.s.										
30.0- 58.0	9.1- 17.7		Light grey, coarse-grained, clean, quartzose s.s., some conglomeratic with white quartz and white to light grey chert pebbles.										
58.0- 60.0	17.7- 18.3		Medium-grained, "salt and pepper" s.s.										
60.0- 64.0	18.3- 19.5		Medium-grained, white quartzose s.s.										

END OF HOLE 19.5 m.

NOTE: All Tantalus lithologies. Appear to be the varied quartz sand unit which overlies the coarse-grained, very pure white sandstone unit which was intersected in holes CS-79-10 and 20.

ROTARY DRILL HOLE LOG

Carmacks South Project 1979

Hole No. CS-79-31

Page 1 of 1

Coal Lease No.: 2949
 Grid Co-ordinates: -
 Bearing: -
 Dip: -90°
 Commenced: September 25, 1979
 Completed: September 25, 1979
 Ultimate Depth: 19.8 m
 Electrologged: No

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)							
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.
0.0- 12.0	0.0- 3.7		Overburden.								
12.0- 65.0	3.7- 19.8	2g	Conglomeratic, medium grey, muddy matrix, slightly "salt and pepper" s.s.; conglomeratic pebbles are white and clear quartz; minor grey chert.								

END OF HOLE 19.8 m.

ROTARY DRILL HOLE LOG

Hole No. CS-79-32

Page 3 of 3

INTERVAL		UNIT	DESCRIPTION	ANALYSES (db)								
Feet	Metres			Interval	Thick.	Est. T.T.	Ash %	Vol.%	F.C.%	S%	Cal/GM.	Rank
129.6-139.4	39.5- 42.5	2h ₁	Medium-grained, muddy matrix "salt and pepper" s.s.									
139.4-185.0	42.5- 56.4	↓	Medium-grained, conglomeratic "salt and pepper" s.s.									

END OF HOLE 56.4 m.

Estimated Average Dip: 45⁰???

Total Estimated True Thickness of Coal in seams > 1 m:

APPENDIX III

CLIENT: CYPRUS ANVIL MINING CORPORATION

SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT

DRILL HOLE NO.: CS-79-01

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	C. V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
3973	2.8	0.8	69.0	--	--	0.24	--	--	13.542	adb
86.9-88.1		3.6	67.1	--	--	0.23	--	--	--	arb
			69.6	--	--	0.24	--	--	--	db
3974	3.1	0.8	74.9	--	--	0.24	--	--	3.089	adb
89.3-90.5		3.9	72.6	--	--	0.23	--	--	--	arb
			75.5	--	--	0.24	--	--	--	db

CLIENT: CYPRUS ANVIL MINING CORPORATION

SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT

DRILL HOLE NO.: CS-79-02

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	C.V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
3975	3.9	0.7	24.2	24.0	51.1	0.53	6149	6	8.302	adb
55.8-57.3		4.6	23.3	23.1	49.0	0.51	5909	--	--	arb
			24.4	24.2	51.4	0.53	6192	--	--	db

DMMF F.C.%RANK

3975

70.6

MVB

CLIENT: CYPRUS ANVIL MINING CORPORATION
 SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT
 DRILL HOLE NO.: CS-79-03

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	C. V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
3976 11.0-12.4	3.4	0.9	50.0	16.9	32.2	0.47	3156	1	4.402	adb
		4.3	48.3	16.3	31.1	0.45	3049	--	--	arb
			50.5	17.1	32.4	0.47	3185	--	--	db
3977 13.6-14.6	5.5	0.9	34.8	16.7	47.6	0.60	5096	N.A.	1.506	adb
		6.4	32.9	15.8	44.9	0.57	4816	--	--	arb
			35.1	16.9	48.0	0.61	5142	--	--	db
3978 28.7-30.5	4.3	1.1	60.0	--	--	0.31	--	--	7.430	adb
		5.4	57.4	--	--	0.30	--	--	--	arb
			60.7	--	--	0.31	--	--	--	db
3979 31.7-33.5	3.9	1.0	52.3	--	--	0.18	--	--	20.476	adb
		4.9	50.3	--	--	0.17	--	--	--	arb
			52.8	--	--	0.18	--	--	--	db
3980 36.0-36.9	4.7	1.0	42.2	6.6	50.2	0.32	3104	N.A.	4.281	adb
		5.7	40.2	6.3	47.8	0.30	2958	--	--	arb
			42.6	6.7	50.7	0.32	3135	--	--	db
3981 46.9-47.9	6.7	1.1	60.4	--	--	0.33	--	--	7.800	adb
		7.7	56.4	--	--	0.31	--	--	--	arb
			61.1	--	--	0.33	--	--	--	db
1982 53.9-56.1	7.9	1.0	52.0	--	--	0.38	--	--	31.041	adb
			47.9	--	--	0.35	--	--	--	arb
			52.5	--	--	0.38	--	--	--	db
3983 56.1-57.6	6.5	1.0	55.3	--	--	0.26	--	--	8.267	adb
			51.7	--	--	0.24	--	--	--	arb
			55.9	--	--	0.26	--	--	--	db
3984 60.4-61.6	11.3	0.9	44.2	8.4	46.5	0.24	3173	N.A.	15.277	adb
		12.1	39.2	7.5	41.2	0.21	2814	--	--	arb
			44.6	8.5	46.9	0.24	3202	--	--	db

DMMF F.C. %

RANK

3976	72.8	MVB
3977	85.6	LVB
3980	95.3	AN
3984	92.0	AN

Birtley Coal
& Minerals Testing

CLIENT: CYPRUS ANVIL MINING CORPORATION

SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT

DRILL HOLE NO.: CS-79-04

LAB.NO.	A.D.M.	MOIST.	ASH%	VOL%	FC.%	S.%	C.V. Cal./gm.	F.S.I.	a.d. Wt. (kg.)	
3985 7.3- 7.9	5.5	1.0	72.1	--	--	0.11	--	--	14.012	adb
		6.4	68.1	--	--	0.10	--	--	--	arb
			72.8	--	--	0.11	--	--	--	db
3986 14.2-15.0	8.0	1.3	56.0	--	--	0.35	--	--	4.878	adb
		9.2	51.5	--	--	0.32	--	--	--	arb
			56.7	--	--	0.35	--	--	--	db
3987 16.0-17.1	7.3	1.0	28.4	7.3	63.3	0.37	5328	N.A.	15.547	adb
		8.2	26.3	6.8	58.7	0.34	4939	--	--	arb
			28.7	7.4	63.9	0.37	5382	--	--	db
3988 18.0-19.8	4.9	1.0	33.9	8.4	56.7	0.47	4787	N.A.	10.800	adb
		5.9	32.2	8.0	53.9	0.45	4552	--	--	arb
			34.2	8.5	57.3	0.47	4835	--	--	db
3989 20.0-21.6	6.6	0.7	41.1	10.6	47.6	0.44	3303	N.A.	29.583	adb
		7.3	38.4	9.9	44.4	0.41	3085	--	--	arb
			41.4	10.7	47.9	0.44	3326	--	--	db
3990 22.0-22.6	4.3	0.6	57.0	--	--	0.42	--	--	5.323	adb
		4.9	54.5	--	--	0.40	--	--	--	arb
			57.3	--	--	0.42	--	--	--	db
3991 24.7-27.0	5.7	1.0	40.8	7.6	50.6	0.44	4444	N.A.	15.980	adb
		6.6	38.5	7.2	47.7	0.41	4191	--	--	arb
			41.2	7.7	51.1	0.44	4489	--	--	db
3992 30.6-31.2	3.5	1.1	78.0	--	--	0.11	--	--	22.196	adb
		4.6	75.3	--	--	0.11	--	--	--	arb
			78.9	--	--	0.11	--	--	--	db
3993 32.3-32.8	3.8	0.9	79.4	--	--	0.11	--	--	11.807	adb
		4.7	76.4	--	--	0.11	--	--	--	arb
			80.1	--	--	0.11	--	--	--	db
3994 40.4-43.0	4.9	1.1	62.0	--	--	0.25	--	--	52.356	adb
		5.9	59.0	--	--	0.24	--	--	--	arb
			62.7	--	--	0.25	--	--	--	db
3995 43.0-44.5	6.2	1.3	50.8	--	--	0.35	--	--	12.640	adb
		7.4	47.7	--	--	0.33	--	--	--	arb
			51.5	--	--	0.35	--	--	--	db

Birtley Coal
& Minerals Testing

CLIENT: CYPRUS ANVIL MINING CORPORATION
 SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT
 DRILL HOLE NO.: CS-79-04

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	C. V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
3996 7.8-50.2	6.7	1.0	50.9	--	--	0.22	--	--	31.428	adb
		7.6	47.5	--	--	0.21	--	--	--	arb
			51.4	--	--	0.22	--	--	--	db
3997 117.7- 124.7	6.1	0.5	61.4	--	--	0.22	--	--	2.728	adb
		6.6	57.7	--	--	0.21	--	--	--	arb
			61.7	--	--	0.22	--	--	--	db

DMMF F.C.%RANK

3987	93.4	AN
3988	91.8	AN
3989	87.9	SA
3991	93.4	AN

CLIENT: CYPRUS ANVIL MINING CORPORATION

SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT

DRILL HOLE NO.: CS-79-05

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	E. V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
3998	2.6	0.6	59.5	--	--	0.19	--	--	45.074	adb
30.8-34.4		3.2	58.0	--	--	0.19	--	--	--	arb
			59.9	--	--	0.19	--	--	--	db

20 November 1979

CLIENT: CYPRUS ANVIL MINING CORPORATION

SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT

DRILL HOLE NO.: CS-79-06

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	C. V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
3999	3.7	0.5	34.8	19.7	45.0	0.51	5186	4 1/2	11.987	adb
52.7-53.9		4.2	33.5	19.0	43.3	0.49	4994	--	--	arb
			35.0	19.8	45.2	0.51	5212	--	--	db

DMMF F.C. %

RANK

3999

73.6

MVB

**Birtley Coal
& Minerals Testing**

A DIVISION OF GREAT WEST STEEL INDUSTRIES LTD

CLIENT: CYPRUS ANVIL MINING CORPORATION
 SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT
 DRILL HOLE NO.: CS-79-12

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	T. V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
4000	5.7	0.8	48.7	8.6	41.9	0.32	3196	N.A.	16.277	adb
7.3-10.4		6.5	45.9	8.1	39.5	0.30	3013	--	--	arb
			49.1	8.7	42.2	0.32	3222	--	--	db
4001	7.2	0.8	37.8	7.0	54.4	0.49	4887	N.A.	40.844	adb
25.0-30.2		7.9	35.1	6.5	50.5	0.45	4535	--	--	arb
			38.1	7.1	54.8	0.49	4926	--	--	db
4002	3.6	0.7	46.6	12.7	40.0	0.32	3439	N.A.	10.517	adb
17.8-40.8		4.3	44.9	12.2	38.6	0.31	3315	--	--	arb
			46.9	12.8	40.3	0.32	3463	--	--	db

DMMF F.C.%RANK

4000	91.9	SA
4001	94.3	AN
4002	83.4	LVB

CLIENT: CYPRUS ANVIL MINING CORPORATION
 SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT
 DRILL HOLE NO.: CS-79-16

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	C. V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
4003 16.0-17.2	4.6	0.6	19.8	25.5	54.1	0.42	6450	5 1/2	6.556	adb
		5.2	18.9	24.3	51.6	0.40	6153	--	--	arb
			19.9	25.7	54.4	0.42	6489	--	--	db
4004 160.7-61.5	3.3	0.8	62.1	--	--	0.15	--	--	6.507	adb
		4.1	60.1	--	--	0.15	--	--	--	arb
			62.6	--	--	0.15	--	--	--	db
4005 14.2-66.3	4.8	1.1	48.1	5.2	45.6	0.24	3099	N.A.	28.450	adb
		5.8	45.8	5.0	43.4	0.23	2950	--	--	arb
			48.6	5.3	46.1	0.24	3133	--	--	db
4006 167.5-68.5	6.6	0.7	35.5	6.9	56.9	0.44	4845	N.A.	6.129	adb
		7.3	33.2	6.4	53.1	0.41	4525	--	--	arb
			35.8	6.9	57.3	0.44	4879	--	--	db

	<u>DMMF F.C.%</u>	<u>RANK</u>
4003	69.7	MVB
4005	98.9	MA
4006	94.5	AN

CLIENT: CYPRUS ANVIL MINING CORPORATION

SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT

DRILL HOLE NO.: CS-79-17

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	C.V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
4007 31.2-33.0	9.3	1.4	31.2	5.9	61.5	0.11	5022	N.A.	12.563	adb
		10.6	28.3	5.4	55.7	0.10	4555	--	--	arb
			31.6	6.0	62.4	0.11	5093	--	--	db
4008 35.0-41.2	8.4	1.1	43.5	5.3	50.1	0.15	3244	N.A.	67.696	adb
		9.4	39.8	4.9	45.9	0.14	2972	--	--	arb
			44.0	5.4	50.6	0.15	3280	--	--	db
4009 44.8-46.8	5.3	0.8	40.5	7.8	50.9	.035	3433	N.A.	20.825	adb
		6.1	38.4	7.4	48.1	0.33	3251	--	--	arb
			40.8	7.9	51.3	0.35	3461	--	--	db

DMMF F.C. %RANK

4007	95.7	AN
4008	98.2	MA
4009	93.1	AN

CLIENT: CYPRUS ANVIL MINING CORPORATION

SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT

DRILL HOLE NO.: CS-79-18

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	C. V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
4010	9.6	2.1	44.0	6.7	47.2	0.35	3355	N.A.	25.795	adb
		11.5	39.8	6.1	42.6	0.32	3033	--	--	arb
6.1- 8.2			44.9	6.8	48.3	0.36	3427	--	--	db

DMMF F.C.%RANK

4010

95.5

AN

CLIENT: CYPRUS ANVIL MINING CORPORATION
 SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT
 DRILL HOLE NO.: CS-79-22

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	C. V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
4011 20.2-21.2	3.1	0.7	3.45	19.3	45.5	0.51	5266	1	10.451	adb
		3.8	33.4	18.7	44.1	0.49	5103	--	--	arb
			34.7	19.4	45.9	0.51	5303	--	--	db
4012 27.0-29.0	2.8	0.8	43.3	16.9	39.0	0.38	3516	N.A.	18.837	adb
		3.6	42.1	16.4	37.9	0.37	3418	--	--	arb
			43.6	17.0	39.4	0.38	3544	--	--	db
4013 31.0-32.0	3.5	1.1	49.2	10.6	39.1	0.22	2960	N.A.	16.451	adb
		4.6	47.5	10.2	37.7	0.21	2856	--	--	arb
			49.7	10.7	39.6	0.22	2993	--	--	db
4014 37.1-37.9	3.6	0.8	47.4	12.9	38.9	0.44	3292	N.A.	8.832	adb
		4.4	45.7	12.4	37.5	0.42	3173	--	--	arb
			47.8	13.0	39.2	0.44	3319	--	--	db
4015 65.8-67.8	5.4	0.9	64.0	--	--	0.25	--	--	17.050	adb
		6.3	60.5	--	--	0.24	--	--	--	arb
			64.6	--	--	0.25	--	--	--	db

DMMF F.C. %

RANK

4011	74.4	MVB
4012	75.8	MVB
4013	87.6	SA
4014	82.7	LVB

CLIENT: CYPRUS ANVIL MINING CORPORATION

SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT

DRILL HOLE NO.: CS-79-24

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	C. V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
4016	3.2	0.6	22.0	18.9	58.5	0.49	6495	1	54.077	adb
48.4-58.6		3.8	21.3	18.3	56.6	0.47	6287	--	--	arb
			22.1	19.0	58.9	0.49	6534	--	--	db
4017	2.1	0.5	65.4	--	--	0.33	--	--	11.954	adb
115.8- 117.0		2.6	64.0	--	--	0.32	--	--	--	arb
			65.7	--	--	0.33	--	--	--	db

DMMF F.C. %RANK

4016

77.8

MVB

CLIENT: CYPRUS ANVIL MINING CORPORATION

SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT

DRILL HOLE NO.: CS-79-28

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	C. V. Cat./gm.	F. S. I.	a. d. Wt. (kg.)	
4018	4.4	0.8	63.0	--	--	0.46	--	--	12.522	adb
34.5-36.7		5.2	60.2	--	--	0.44	--	--	--	arb
			63.5	--	--	0.46	--	--	--	db
4019	4.7	1.0	80.0	--	--	0.13	--	--	7.994	adb
80.5-81.5		5.7	76.2	--	--	0.12	--	--	--	arb
			80.8	--	--	0.13	--	--	--	db

CLIENT: CYPRUS ANVIL MINING CORPORATION
 SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT
 DRILL HOLE NO.: CS-79-29

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	g.V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
4020 17.4-22.6	7.2	1.1	62.1	--	--	0.42	--	--	59.755	adb
		8.2	57.6	--	--	0.39	--	--	--	arb
			62.8	--	--	0.42	--	--	--	db
4021 28.5-31.0	7.8	0.8	51.5	--	--	1.18	--	--	32.266	adb
		8.5	47.5	--	--	1.09	--	--	--	arb
			51.9	--	--	1.19	--	--	--	db
4022 46.4-47.6	5.0	0.9	72.6	--	--	0.31	--	--	6.479	adb
		5.9	69.0	--	--	0.29	--	--	--	arb
			73.3	--	--	0.31	--	--	--	db
4023 49.0-50.5	3.8	0.8	53.8	--	--	0.30	--	--	15.618	adb
		4.6	51.8	--	--	0.29	--	--	--	arb
			54.2	--	--	0.30	--	--	--	db
4024 54.5-56.0	9.5	0.6	49.1	9.4	40.9	0.18	2991	N. A.	14.757	adb
		10.0	44.4	8.5	37.1	0.16	2707	--	--	arb
			49.4	9.5	41.1	0.18	3009	--	--	db

DMMF F.C.%RANK

4024

90.3

SA

CLIENT: CYPRUS ANVIL MINING CORPORATION

SAMPLE: ROTARY DRILL HOLE SAMPLES - CARMACKS SOUTH COAL PROJECT

DRILL HOLE NO.: CS-79-32

LAB. NO.	A. D. M.	MOIST.	ASH%	VOL%	FC. %	S. %	C. V. Cal./gm.	F. S. I.	a. d. Wt. (kg.)	
4025 18.6-20.0	3.2	0.8	43.4	17.5	38.8	0.42	3434	N.A.	10.818	adb
		4.0	42.0	16.9	37.1	0.41	3324	--	--	arb
			43.8	17.6	38.6	0.42	3462	--	--	db
4026 24.8-28.0	2.2	0.5	30.4	21.1	48.0	0.47	5558	1	33.848	adb
		2.7	29.7	20.6	47.0	0.46	5436	--	--	arb
			30.6	21.2	48.2	0.47	5586	--	--	db

DMMF F.C. %RANK4025
402674.5
72.7MVB
MVB

APPENDIX IV

CLIENT : CYPRUS ANVIL MINING
 PROJECT : SAMPLES RECEIVED JUNE 4, 1980

TRENCH SAMPLES - CARMACKS NORTH
 CARMACKS SOUTH

LAB NO.	SAMPLE I.D.	ADM ² MOIST	PROXIMATE				S %	BTU/ LB	FSI	EQUIL. MOISTURE	CALC * BASIS
			ASH %	VM %	FC %						
109	TR 16 N Main Seam	3.4	14.9	6.2	29.4	49.5	0.32	9004	N.A.	18.2	a.d.b.
			17.8	6.0	28.4	47.8	0.31	8698	N.A.		a.r.b.
				7.3	34.5	58.2	0.38	10580	N.A.		d.b.
110	TR 17 N Main Seam	5.4	14.6	5.6	29.8	50.0	0.33	9207	N.A.	17.5	a.d.b.
			19.2	5.3	28.2	47.3	0.31	8710	N.A.		a.r.b.
				6.6	34.9	58.5	0.39	10781	N.A.		d.b.
111	TR 19 N Main Seam	4.6	16.3	6.3	28.1	49.3	0.38	8713	N.A.	18.7	a.d.b.
			20.2	6.0	26.8	47.0	0.36	8312	N.A.		a.r.b.
				7.5	33.6	58.9	0.45	10410	N.A.		d.b.
112	TR 27 N Main Seam	6.5	7.0	9.4	25.9	57.7	0.38	10727	N.A.	9.0	a.d.b.
			13.0	8.8	24.2	54.0	0.36	10030	N.A.		a.r.b.
				10.1	27.8	62.1	0.41	11534	N.A.		d.b.
113	TR 29 S SAMPLE A	3.9	9.0	31.4	21.6	38.0	0.42	6702	N.A.	10.9	a.d.b.
			12.5	30.2	20.8	36.5	0.40	6441	N.A.		a.r.b.
				34.5	23.7	41.8	0.46	7365	N.A.		d.b.
114	TR 29 S SAMPLE B	4.1	9.9	29.0	22.8	38.3	0.44	6824	N.A.	12.8	a.d.b.
			13.6	27.8	21.9	36.7	0.42	6544	N.A.		a.r.b.
				32.2	25.3	42.5	0.49	7574	N.A.		d.b.
5115	TR 29 S SAMPLE C	2.3	8.4	35.4	22.0	34.2	0.40	6082	N.A.	10.8	a.d.b.
			10.5	34.6	21.5	33.4	0.39	5942	N.A.		a.r.b.
				38.6	24.0	37.4	0.44	6640	N.A.		d.b.

* air dried basis - a.d.b.
 as received basis - a.r.b.
 dry basis - d.b.

Birtley Coal
 & Minerals Testing

CLIENT : CYPRUS ANVIL MINING

PROJECT : SAMPLES RECEIVED JUNE 4, 1980

LAB NO.	SAMPLE I.D.	ADPK2	MOIST	PROXIMATE			S %	BTU/1B	FSI	EQUIL. MOISTURE	CALC * BASIS
				ASH %	VM %	FC %					
5.16	TR 30 S	6.5	5.6	26.8	21.7	45.9	0.53	8247	N.A.	10.2	a.d.b.
			11.7	25.1	20.3	42.9	0.50	7711	N.A.		a.r.b.
				28.4	23.0	48.6	0.56	8736	N.A.		d.b.
5.17	TR L112S 18+73 -18+79W	14.3	2.2	47.8	19.4	30.6	0.41	5483	N.A.	8.3	a.d.b.
			16.2	41.0	16.6	26.2	0.35	4699	N.A.		a.r.b.
				48.9	19.8	31.3	0.42	5606	N.A.		d.b.
5.18	TR L124S 17+20 -17+24.5W	13.9	5.9	30.0	23.7	40.4	0.48	7386	N.A.	22.4	a.d.b.
			19.0	25.8	20.4	34.8	0.41	6359	N.A.		a.r.b.
				31.9	25.2	42.9	0.51	7849	N.A.		d.b. 67.4

* air dried basis - a.d.b.
 as received basis - a.r.b.
 dry basis - d.b.

CLIENT : CYPRUS ANVIL MINING CORP.

CARMACKS SOUTH TRENCH SAMPLES

PROJECT: CARMACKS TRENCH L51S

received June 26, 1980

LAB NO.	SAMPLE I.D.	ADH2	MOIST.	PROXIMATE			S%	BTU/LB	EQUIL. MOIST. %	CALC BASIS
				ASH %	V.M.%	F.C.%				
237	14+ 52-	16.9	4.8	33.9	18.2	43.1	0.32	7715	17.7	a.d.b.
	14+ 61		20.9	28.2	15.1	35.8	0.27	6411	--	a.r.b.
					35.6	19.7	45.3	0.34	8104	--

LAB NO.	SAMPLE I.D.	ADH2	MOIST.	PROXIMATE			S%	BTU/LB	EQUIL. MOIST. %	CALC BASIS
				ASH %	V.M.%	F.C.%				
230	14 + 61-	18.3	4.2	25.9	19.0	50.9	0.39	8980	22.4	a.d.b.
	14 + 67		21.7	21.2	15.5	41.6	0.32	7337	--	a.r.b.
					27.0	19.8	53.2	0.41	9374	--

LAB NO.	SAMPLE I.D.	ADH2	MOIST.	PROXIMATE			S%	BTU/LB	EQUIL. MOIST. %	CALC BASIS
				ASH %	V.M.%	F.C.%				
23	13 + 91-	14.3	3.7	36.6	18.3	41.4	0.36	7518	14.4	a.d.b.
	14+ 00		17.5	31.4	15.7	35.4	0.41	6443	--	a.r.b.
					38.0	19.0	43.0	0.37	7807	--

DMMF F.C.

Rank

5237
5238
5239

74.5
75.7
73.9

MvB
MvB
MvB

Birtley Coal
& Minerals Testing

2 (Women)
2020-09

J.R. Contracting

44 Kitzg R.D.
White Horse N.Y.
2020-09 3542.50

TO

Cypress Canal

DATE

May 10/80 3542.50

AMOUNT OF REMITTANCE

[Empty box for remittance amount]

PLEASE RETURN THIS TOP PORTION WITH YOUR REMITTANCE

DATE	DETAILS	CHARGES	CREDITS	BALANCE
	BALANCE FORWARD			
	Carmacks coal property			
	DTE Cat 4w ripper			
1 May 6	Dozing 8.5 hrs @ \$75.00 per hr.			637.50
1 May 7	Dozing 5 hrs @ \$75.00 per hr.			375.00
1 May 7	Ripping 4 hrs @ \$80.00 per hr.			320.00
1 May 8	Dozing 6 hrs @ \$75.00 per hr.			450.00
1 May 8	Ripping 4 hrs @ \$80.00 per hr.			320.00
1 May 9	Dozing 6 hrs @ \$75.00 per hr.			450.00
1 May 9	Ripping 2.5 hrs @ \$80.00 per hr.			200.00
1 May 10	Dozing 2 hrs @ \$75.00 per hr.			150.00
1 May 10	Ripping 8 hrs @ \$80.00 per hr.			640.00
				PAID \$3542.50

IN ACCOUNT WITH

PAYMENTS MADE AFTER DATE SHOWN SHALL APPEAR ON NEXT STATEMENT

STATEMENT

LAST AMOUNT IN THIS COLUMN IS BALANCE OF YOUR ACCOUNT AT THE DATE SHOWN.

OK
3 Returns
2020-09

J.R. Contracting
90 R. Magnuson
44 Kiteg Rd.
Whitehall, VT VUA 308

ACCOUNT

TO: Cyprus Annual
202010 4 720 00

DATE: May 19/80 TOTAL AMOUNT TO PAY 4720 00

PLEASE RETURN THIS TOP PORTION WITH YOUR REMITTANCE



DATE	DETAILS	CHARGES	CREDITS	BALANCE
	BALANCE FORWARD			
	Carmacks Coal Property Cat D7E C/W Ripped			
May 11	3 hrs drying at \$75.00 per hr			225 00
May 11	7 hrs ripping at \$80.00 per hr			560 00
May 14	10 hrs clearing road building at \$75.00 per hr			750 00
May 15	6 hrs drying at \$75.00 per hr			450 00
May 15	6 hrs ripping at \$80.00 per hr			480 00
May 16	5 hrs ripping at \$80.00 per hr			400 00
May 16	4 hrs drying at \$75.00 per hr			300 00
May 18	7 hrs ripping at \$80.00 per hr			560 00
18	3 hrs drying at \$75.00 per hr			225 00
May 19	6 hrs drying at \$75.00 per hr			450 00
May 19	4 hrs ripping at \$80.00 per hr			320 00
			TOTAL	4720 00

CARMACKS NORTH

IN ACCOUNT WITH

PAYMENTS MADE AFTER DATE SHOWN SHALL APPEAR ON NEXT STATEMENT.

STATEMENT

LAST AMOUNT IN THIS COLUMN IS BALANCE OF YOUR ACCOUNT AT THE DATE SHOWN.

OK. 2020-10

2-1
 2-17
 Billman
 Carman - 723-1111

1930
 c/o Ray McAlmon
 411 North 23rd St.
 Milwaukee, Wisconsin U.S.A.

TO CUSTOMER AMIL

RE: CARNegie's COAL PROPERTY

DATE June 4 1930

AMOUNT OF REMITTANCE

[Empty box for remittance amount]

PLEASE RETURN THIS TOP PORTION WITH YOUR REMITTANCE

DATE	DETAILS	CHARGES	CREDITS	BALANCE
	BALANCE FORWARD			
June 1	15 hrs. shipping @	\$80.00 per hr.		\$1200.00
June 1	3 hrs. loading @	\$75.00 per hr.		\$ 600.00
June 3	6 hrs. shipping @	\$80.00 per hr.		\$ 480.00
June 3	5 hrs. loading @	\$75.00 per hr.		\$ 375.00
		total		\$2655.00

Thank you

R. J. [Signature]

2020-09

(P)

IN ACCOUNT WITH

PAYMENTS MADE AFTER DATE SHOWN SHALL APPEAR ON NEXT STATEMENT

STATEMENT

LAST AMOUNT IN THIS COLUMN IS BALANCE OF YOUR ACCOUNT AT THE DATE SHOWN.

000097

ATBE CONTRACTING LTD.
C/O RAY MAGNUSON
44 KETZA ROAD
WHITEHORSE, YUKON

CYPRUS ANVIL

RE: CARMACKS COAL PROPERTY

Sept 27, 1980--	8 hrs dozing @ \$75.00 per hr.	\$ 600.00
Sept 27, 1980--	2 hrs ripping @ \$80.00 per hr.	\$ 160.00
Oct 2, 1980--	7 hrs dozing @ \$75.00 per hr.	\$ 525.00
Oct 2, 1980--	4 hrs ripping @ \$80.00 per hr.	\$ 320.00
Oct 3, 1980--	9 hrs dozing @ \$75.00 per hr.	\$ 675.00
Oct 3, 1980--	3 hrs ripping @ \$80.00 per hr.	\$ 240.00
Oct 4, 1980--	4 hrs dozing @ \$75.00 per hr.	\$ 300.00
Oct 4, 1980--	6 hrs ripping @ \$80.00 per hr.	\$ 480.00

TOTAL ----- \$3300.00

ACCOUNT	AMOUNT
2020-09-09	3300.00

Thank you.

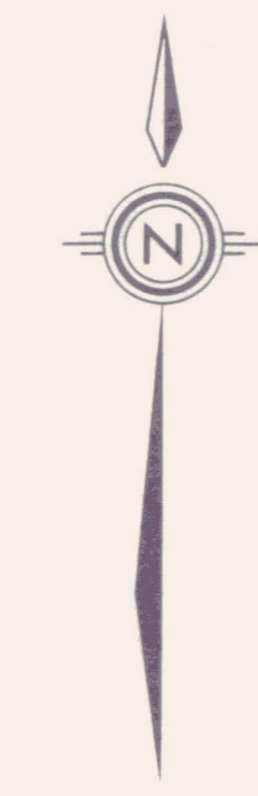


(P)

O.K.
A. Calamson
2020-09

YUKON RIVER

CARMACKS



CUT GRID LINES

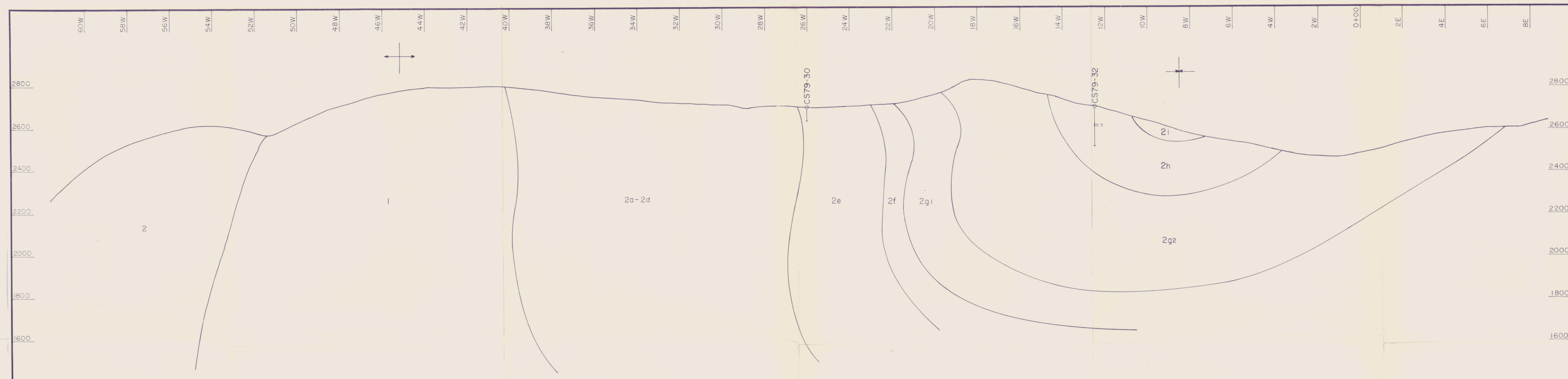
BL 0 + 00	40 S - 270 S
BL 20 + 00 W	70 S - 200 S
BL 20 + 00 E	90 S - 140 S
BL 40 + 00 E	100 S - 240 S
L 112 + 00 S	0 - 48 E
L 168 + 00 S	10 W - 60 E
L 224 + 00 S	0 - 50 E

LEGEND

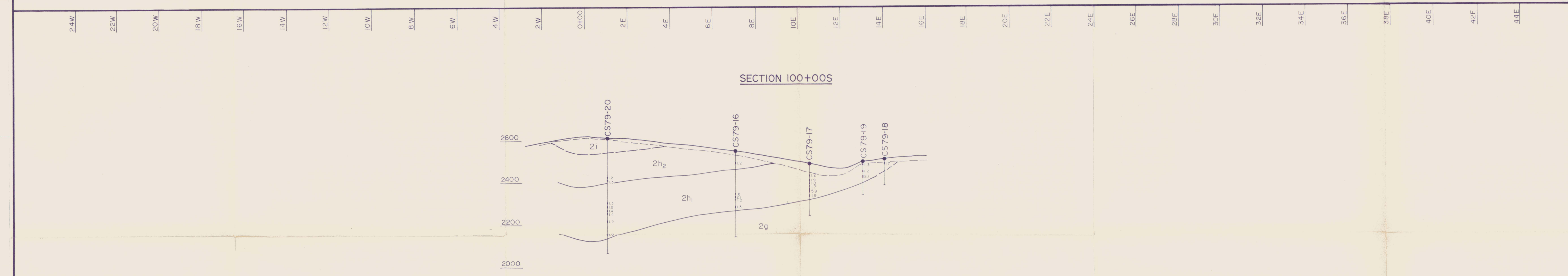
- Eocene or Younger**
- 3 CARMACKS GROUP
Basaltic and andesitic volcanics
- Lower Cretaceous and/or Upper Jurassic**
- 2 TANTALUS FORMATION
 - 2i Conglomerate (quartz & chert pebbles)
 - 2h Coal Measures
 - 2hg Mudstone, sandstone, minor coal
 - 2h Mudstone, sandstone, conglomerate, coal, felsitic flows or sills
 - 2g Conglomerate (quartz & chert pebbles), sandstone, minor mudstone, coal
 - 2gg Conglomerate, conglomeratic sandstone, sandstone, minor mudstone
 - 2gi Sandstone, conglomerate, mudstone, coal
 - 2f Gritty mudstone
 - 2e Quartzose, conglomeratic sandstone and sandstone
 - 2d Mudstone
 - 2c Very clean quartz sandstone
 - 2b Conglomerate (quartz & chert pebbles)
 - 2a Sandstone, conglomeratic sandstone, minor conglomerate
- Lower and Middle Jurassic**
- 1 LABERGE GROUP
Conglomerate (cobbles of dark volcanics, granitic rocks, siliceous dark mudstone, arkose, mudstone, minor coal)

- SYMBOLS**
- - - Fault
 - - - - - Trenching
 - + - - - - Synclinal axis
 - + - - - - Anticlinal axis
 - - - - - Geological contact
 - - - - - Access road
 - - - - - Access (see text)
 - Blunder drill hole
 - Blunder drill hole
 - - - - - - Outcrop limit
 - - - - - - Outcrop trench
 - cg - - - - - Conchiferous

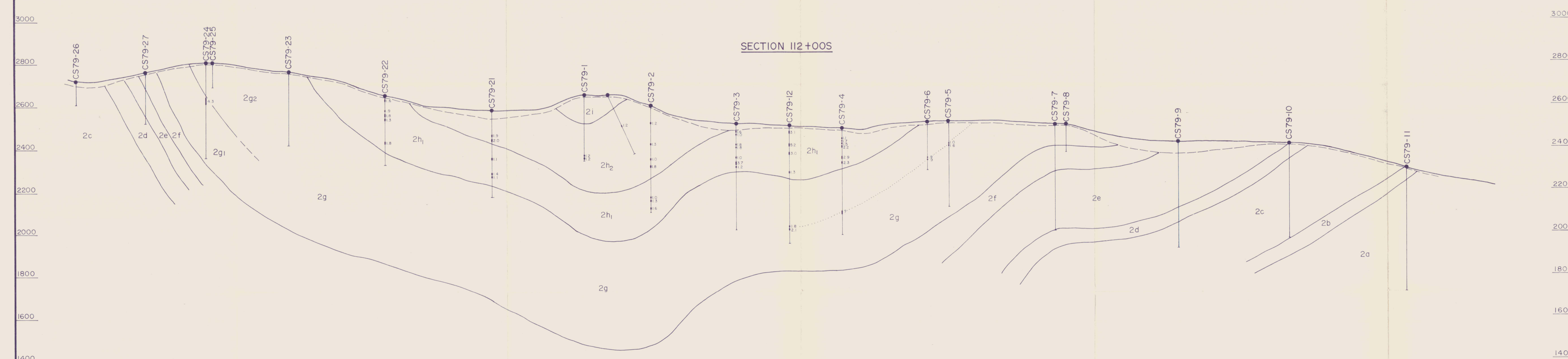
CYPRUS ANVIL MINING CORPORATION
 CARMACKS SOUTH COAL LEASE AREA
 YUKON TERRITORY
GEOLOGICAL MAP
 SCALE: 1" = 800'
 800 400 0 800 1600 2400
 NTS 98-1-1
 SURVEY BY TA
 DRAWN BY VF
 DATE SEPT, 1980



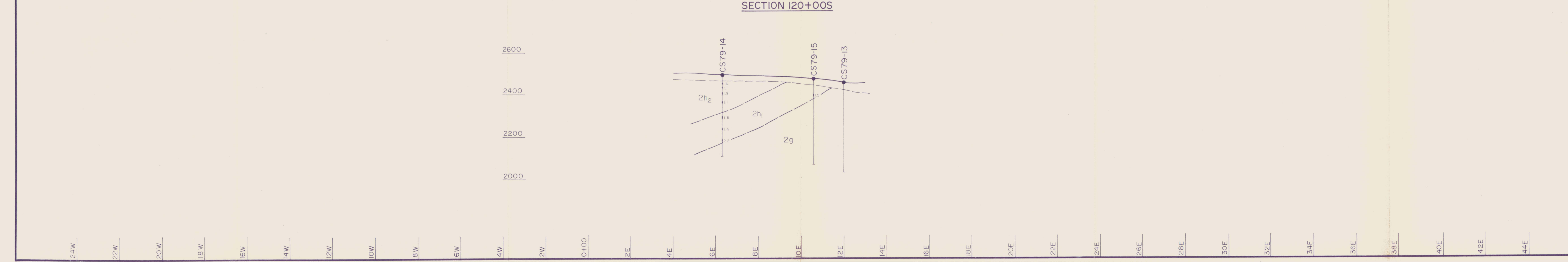
SECTION 58+00S



SECTION 100+00S



SECTION 112+00S



SECTION 120+00S

LEGEND

Eocene or Younger

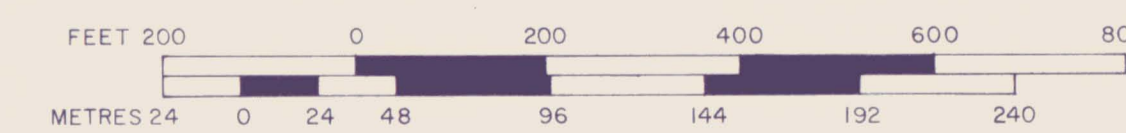
3 CARMACKS GROUP
Basaltic and andesitic volcanics

Lower Cretaceous and/or Upper Jurassic

2 TANTALUS FORMATION
2i Conglomerate (quartz & chert pebbles)
2h Coal Measures
2h₂ Mudstone, sandstone, minor coal
2h₁ Mudstone, sandstone, conglomerate, coal, felsitic flows or sills
2g Conglomerate (quartz & chert pebbles), sandstone, minor mudstone, coal
2g₂ Conglomerate, conglomeratic sandstone, sandstone, minor mudstone
2g₁ Sandstone, conglomerate, mudstone, coal
2f Gritty mudstone
2e Quartzose, conglomeratic sandstone and sandstone
2d Mudstone
2c Very clean quartz sandstone
2b Conglomerate (quartz & chert pebbles)
2a Sandstone, conglomeratic sandstone, minor conglomerate

Lower and Middle Jurassic

1 LABERGE GROUP
Conglomerate (boulders of dark volcanics, granitic rocks, siliceous dark mudstone, arkose, mudstone, minor coal)



CYPRUS ANVIL MINING CORPORATION	
CARMACKS COAL PROJECT	
YUKON TERRITORY	
GEOLOGICAL CROSS SECTIONS	
NTS 115-1-1	DATE: MARCH-1980
SURVEY BY: T.A.	SEPT, 1980
DRAWN BY: V.F./	

