

014545

CYPRUS ANVIL MINING CORPORATION  
ROSS RIVER COAL PROJECT  
PRELIMINARY MINE LIFE PLAN

Prepared for: J. Purkis, Chief Engineer

Prepared by: J. Bowers, Mine Engineer

April 13, 1982

## TABLE OF CONTENTS

	<u>Page</u>
1. INTRODUCTION	1
2. LOCATION AND ACCESS	3
3. GEOLOGY	5
4. COAL QUALITY	8
5. 1982 MINE PLAN	10
6. MINE LIFE PLAN	13
7. DEVELOPMENT INFORMATION	14
7.1 Five Year Mine Scheduling	15
7.2 Reclamation	15
7.3 Equipment Requirement List	15

## LIST OF FIGURES AND TABLES

FIGURE 1	Key Map - 1" = 100 Miles	2
FIGURE 2	Key Map - 1" = 1/2 Mile	4
FIGURE 3	Generalized Stratigraphic Section	6
FIGURE 4	Typical Mine Cross-Section	12
TABLE 1	Table of Geologic Formations	7
TABLE 2	Coal Analysis Results	9

## APPENDICES

APPENDIX 1	Ross River Coal Property - 1:2000 Scale
APPENDIX 2	1:250,000 Site Location Map
APPENDIX 3	1982 Mine Plan
APPENDIX 4	Ultimate Mine Plan

## 1. INTRODUCTION

During 1980, Cyprus Anvil Mining Corporation acquired three mining leases, known to contain coal, just south of the settlement of Ross River.

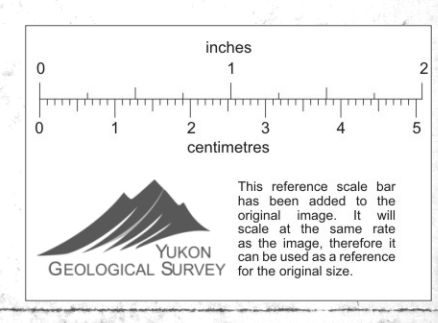
That same year, a drilling programme was initiated to determine the extent of coal contained within the leases. Results of the drilling did indicate coal, but were inconclusive. A trenching programme was carried out in August, 1981, to better define the reserves and quality of the Ross River coal.

Approximately 90,000 tonnes of reserves of probable coal were indicated by the exploration programme. The indicated reserves should be sufficient to supply the Faro operation for five years.

The 1982 Mine Plan calls for recovery of approximately 20,000 tonnes of coal at a stripping ratio of approximately 6.4:1, cubic meters of waste to tonne of coal.



CYPRUS ANVIL MINING CORPORATION  
ROSS RIVER COAL PROJECT  
1982 ULTIMATE MINE PLAN



DATE	BY	REVISION

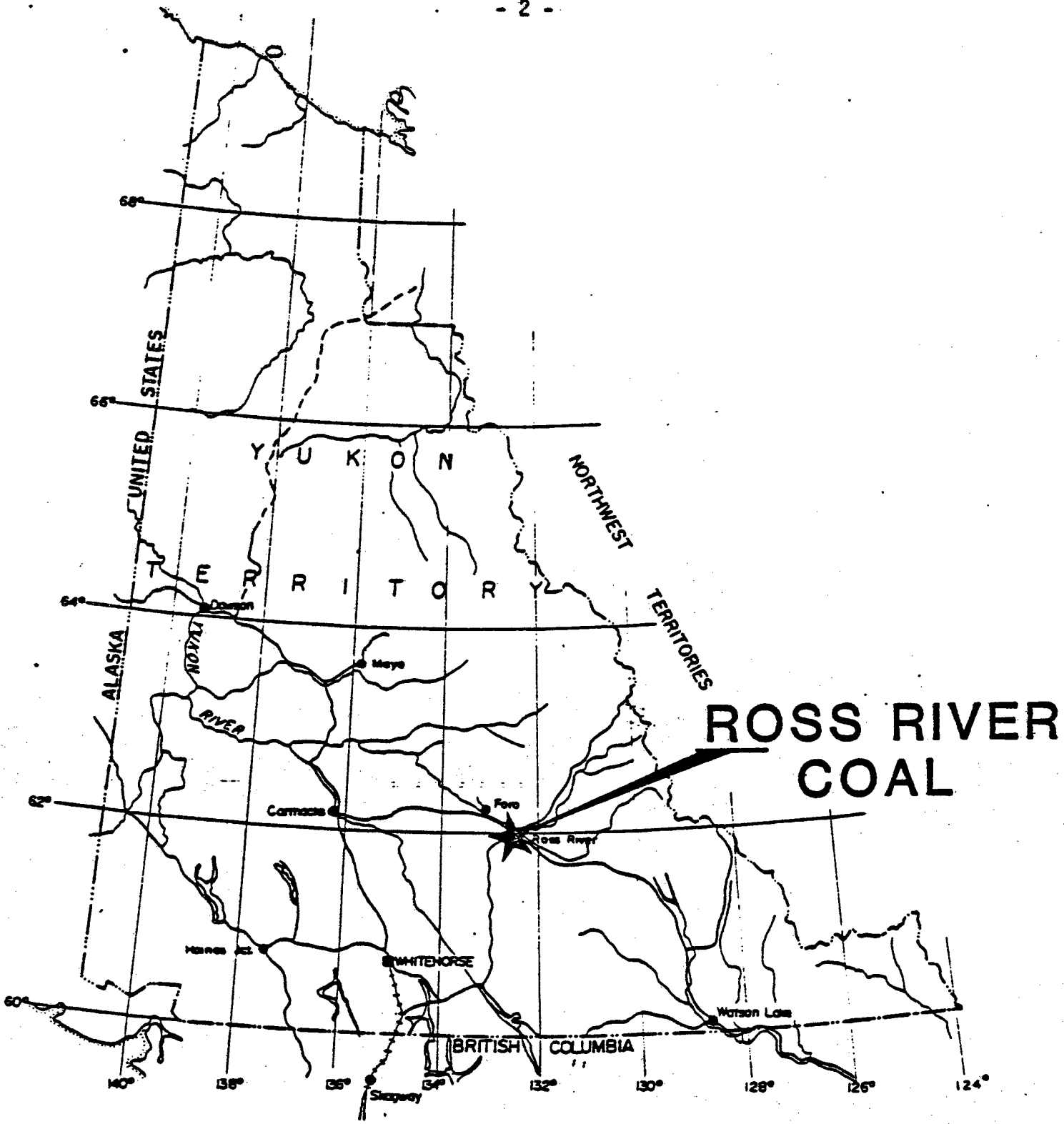


FIGURE 1  
CYPRUS ANVIL MINING CORPORATION  
LOCATION MAP  
ROSS RIVER COAL PROJECT

YUKON  
SCALE · 1" = 100 MILES

## 2. LOCATION AND ACCESS

Coal lease numbers 2984, 2985 and 2986 are centered approximately 3 km southwest of the settlement of Ross River, Yukon. The leases straddle the boundary between N.T.S. map sheets 105-F-15 and 105-F-16.

The Robert Campbell Highway traverses the coal leases in an east-west direction and is paralleled about 0.5 km to the north by a power line right-of-way. A number of old bulldozer trails between the highway and the power line provide good access to the mine site. The trail indicated on the 1:2000 orthophoto will be upgraded to serve as the mine access road.

The road distance to Whitehorse, Yukon, from the property is approximately 358 km, and the road distance to Faro, Yukon, is approximately 67 km.

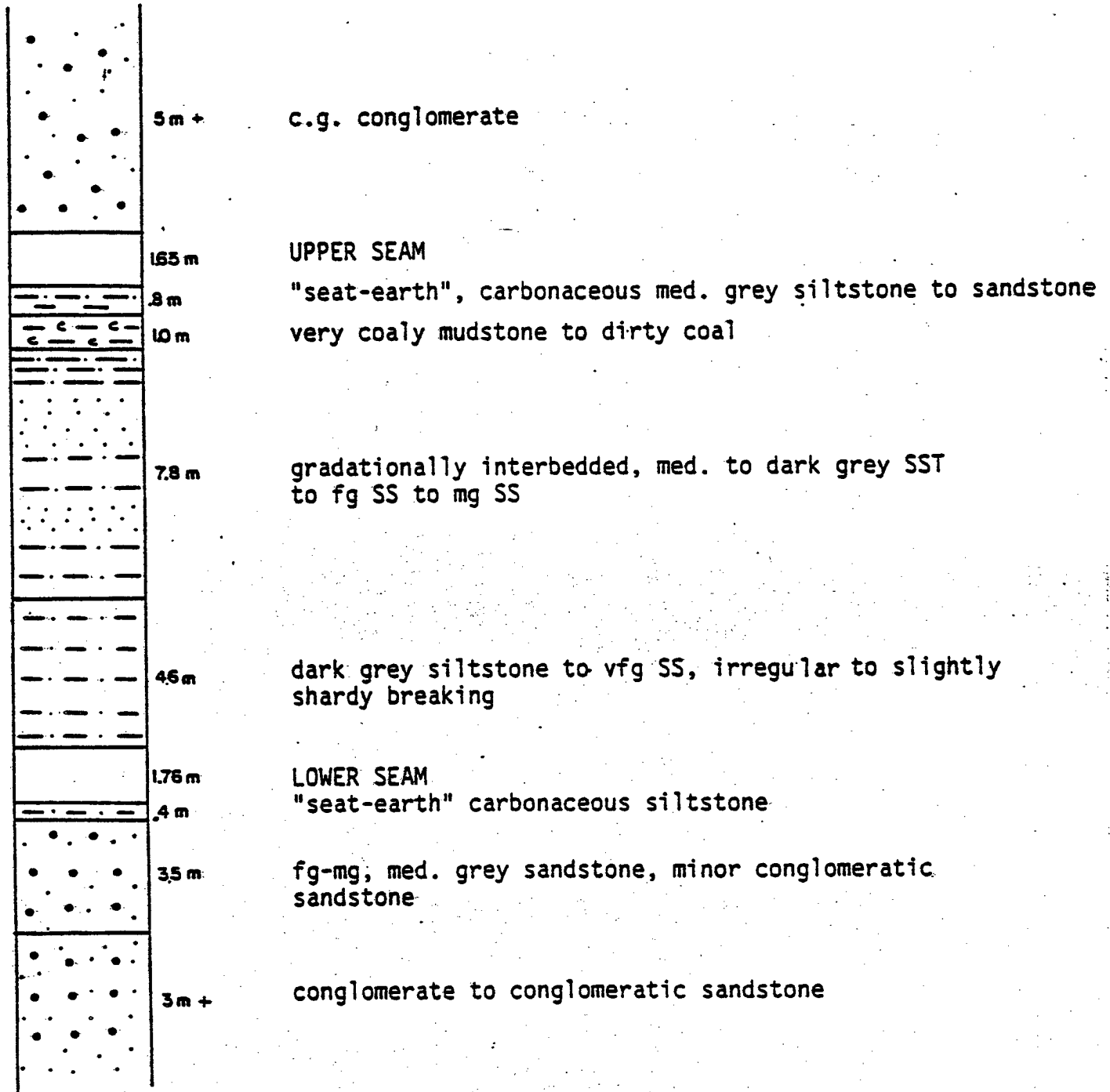
### 3. GEOLOGY

The regional scale geology of coal leases 2984, 2985 and 2986 is described in "Ross River Coal Project - Report on 1980 Field Work," by T. J. Adamson, February, 1980.

Strata of tertiary age containing coal seams have been known to exist in the region for many years. Two relatively thick seams of coal were intersected in the 1980 drilling programme. The economic limits of coal extend north from trench number TR-81-3 approximately 515 m to trench number TR-81-9. The first 215 m strikes N 45° E and dips approximately 30° SE. The second leg, 300 m long, strikes N 20° E and dips approximately 35° SE.

The coal seam strike, from trench 1980-A adjoining the highway to trench 81-3, climbs a steep grassy slope of approximately 30%. This area is considered unminable, primarily for aesthetic reasons.

FIGURE 3



1:200  
Ross River Coal  
Generalized Stratigraphic between  
Lower Seam - Upper Seam Interval

TABLE 1

TABLE OF GEOLOGIC FORMATIONS

<u>Age</u>	<u>Symbol</u>	<u>Thickness</u>	<u>Lithology</u>
Tertiary Paleocene-Eocene?	Ts	570 m +	Sandstone, shale, conglomerate, <u>coal</u>
	Ts <sub>5</sub>	120 m +	Conglomerate, conglomeratic sandstone, coarse grained sandstone, very minor mudstone.
	Ts <sub>4</sub>	130 m	Sandstone, conglomeratic sandstone, mudstone, <u>coal</u> , minor conglomerate. (11 coal seams .2 - 1.7 m thick, distributed throughout section).
	Ts <sub>3</sub>	140 m	Mudstone, siltstone, very fine-grained sandstone, minor conglomerate, very minor thin <u>coal</u> . (3 seams .3 - .5 m thick)
	Ts <sub>2</sub>	60 m +	Dark brown to grey to black mudstone, siltstone.
	Ts <sub>1</sub>	120 m +	Top 40 m + thinly interbedded mudstone, very fine-grained, light grey sandstone, dirty coal seams; middle 20 m fine-grained very clean quartzose sandstone; lower 60 m + light grey to pink clean siliceous siltstone to very fine-grained clean sandstone.
	Carboniferous or Permian	Pc	
CPv			Basalt, tuff, minor augite porphyry.
Age Unknown	PIPk		Phyllite, greywacke, marble.

4. COAL QUALITY

Coal samples were taken from the 1981 trenches. Analytical work was carried out by Birtley Coal & Mineral Testing of Calgary, Alberta. Samples were subjected to proximate, sulphur and heating value determinations. These results are included as Appendix I.

The rank (A.S.T.M.) of both seams trends towards the boundary of a medium to low volatile bituminous coal. Fixed carbon percentages fall in the range of 73.7% to 79.4%.

The fuel ratio of fixed carbons to volatiles ranges from 2.9:1 to 3.7:1.

The average analysis of air dried samples is as follows:

	<u>Moisture %</u>	<u>Ash %</u>	<u>Sulphur %</u>	<u>Cal./gm</u>	<u>BTU/lb.</u>
Upper Seam	3.6	6.5	0.20	6,971	12,547
Lower Seam	3.9	8.1	0.18	6,737	12,127

TABLE 2

CLIENT : CYPRUS ANVIL - ROSS RIVER  
 PROJECT: COAL SAMPLES Received August 24, 1981  
 RAW COAL ANALYSIS , air dried basis

LAB NO	SAMPLE I.D.	ADM%	MOIST%	ASH%	VOL%	F.C.%	S%	C.V. Cal/gm	EQUIL. MOIST%
8967	TR3 US	5.4	2.7	9.8	19.4	68.1	0.21	6876	5.7
8968	TR4 US	3.3	2.9	5.5	19.8	71.8	0.22	7239	6.4
8969	TR5 US	5.5	2.7	4.3	20.6	72.4	0.18	7329	6.3
8970	TR6 US	6.2	2.7	3.8	20.7	72.8	0.18	7233	8.2
8971	TR7 US	11.5	2.4	8.7	21.8	67.1	0.21	6703	6.6
8972	TR8 US	8.0	8.0	6.9	21.6	63.5	0.17	6444	5.8
8973	TR2 LS	3.0	4.0	7.4	20.2	68.4	0.20	7014	12.0
8974	TR3 LS	9.6	6.1	10.1	22.8	61.0	0.15	6143	12.3
8975	TR5 LS	5.9	3.8	8.3	21.7	66.2	0.18	6617	8.8
8976	TR6 LS	7.5	3.9	8.6	21.9	65.6	0.17	6467	8.1
8977	TR8 LS	6.7	3.2	8.3	19.1	69.4	0.20	6914	6.1
8978	TR9 LS	5.9	2.4	5.7	19.4	72.5	0.19	7267	5.0

PETROGRAPHIC SAMPLES PREPARED:

<u>No.</u>	<u>D.M.M.F.</u>	<u>F.C.%</u>	<u>RANK</u>
8967	78.7		m-lvb
68	78.9		m-lvb
69	78.2		m-lvb
8970	78.2		m-lvb
71	76.3		m vb
72	75.2		m vb
73	77.9		m vb
74	73.7		m vb
75	76.0		m vb
76	75.8		m vb
77	79.1		lvb
78	79.4		lvb

Birtley Coal  
 & Minerals Testing

ANALYSIS OF COALS AND MINERALS

## 5. 1982 MINE PLAN

The 1982 open pit mine at Ross River will be 400 m long by 56 m wide by 9 m deep. Approximately 20,000 t of coal will be recovered at an overall stripping ratio of 6.4:1 (cu. m waste vs. t of coal). The design mine floor will somewhat parallel the surface contour to minimize waste stripping.

The first step in initiating the 1982 mine plan calls for upgrading the existing access road, followed by clearing approximately 3 ha of surface cover and the topsoil/till. The till cover varies from one to three feet above bedrock. Segregation of soils would be extremely difficult; therefore, the soil and till will be stockpiled together on the southwest footwall side of the lower seam in an area set aside for the purpose of utilizing it for future reclamation.

Following till removal, waste stripping the coal can begin. The upper seam is to be mined first, advancing southwest from trench TR-81-8, sinking in 2 m intervals, the length of design strike to trench TR-81-3, until design depth is reached. The hangingwall of the upper seam is conglomerate and will require drilling and blasting. Waste rock is hauled in retreat of the advancing pace.

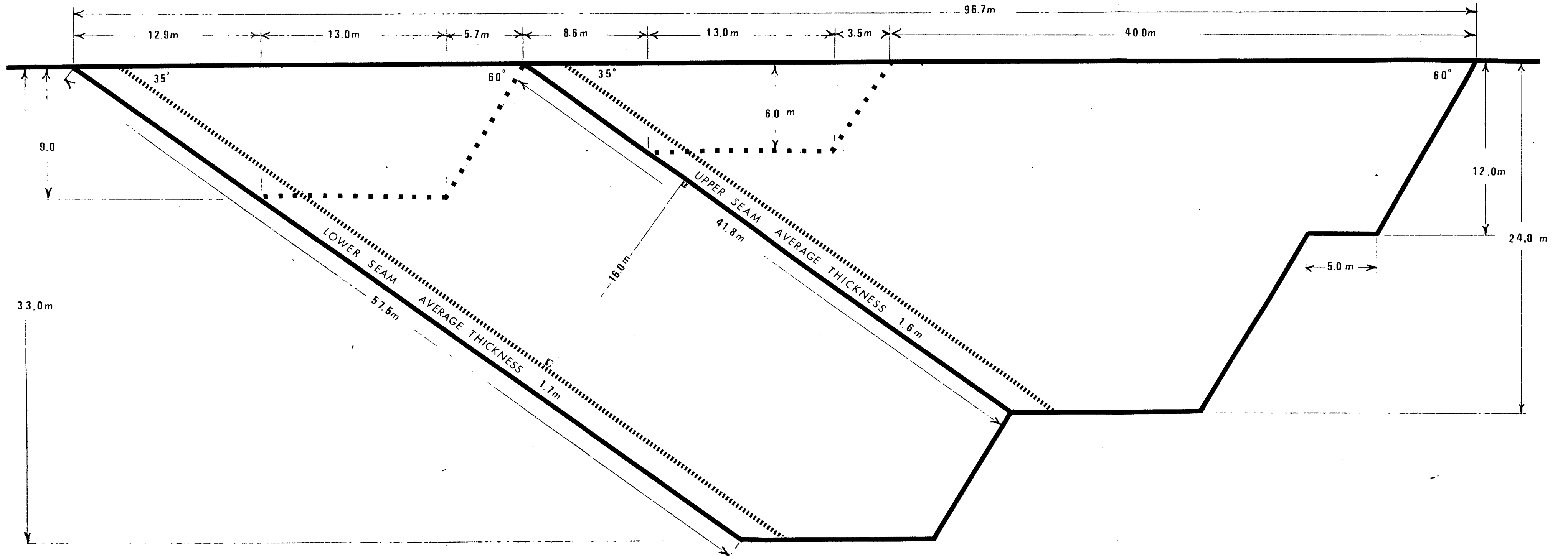
A loader/haul truck will be used to haul coal and waste rock to separate stockpile areas located on the footwall side of the lower seam.

Mining the lower seam can begin following the completion of the first 2 m interval of the upper seam. Softer sediments of the lower seam's hangingwall can be ripped to mine depth. A lower seam mining interval of 2 m is also to be followed. Ripped waste rock can be excavated using either scrapers or a front end loader/haul truck combination. Coal extraction for both seams will require a front end loader and tandem dump trucks. The coal may require drilling and blasting prior to loading. The coal is to be stockpiled initially near the access road on the footwall side of the lower seam.

Transportation of coal from Ross River to Faro is to be handled separately by private contractor.

ROSS RIVER COAL PROJECT  
TYPICAL: CROSS SECTION

scale 1:200



## 6. MINE LIFE PLAN

At the indicated reserves, approximately five years of coal supply can be economically mined from Ross River. An extension of the 1982 pit to an overall length of 515 m and deepening to an ultimate depth of 25 m will yield approximately 90,000 t at an overall stripping ratio of 10:1, cubic meters of waste to tonnes of coal.

Following the 1982 Mine Plan, development of the ultimate pit is scheduled to provide for progressive backfilling, to follow approximately 100 m behind mine development, once lower mine design limits are reached. Backfilling to approximately original contour is planned, followed by recover of soil and seeding. Only the last 100 m of mining will remain in an open excavation state.

## 7. DEVELOPMENT INFORMATION

The project life is estimated to be five years. During this period, approximately \$10-15 million dollars will be spent to mine and deliver approximately 90,000 t of coal to the Faro minesite.

The project will operate only during the summer months (May to September). All mining will be contracted out. Initially, the project will require a 20-30 day season, with the final two years requiring 50-60 days to complete.

During the construction period, 60% to 80% of the work force will room and board at the hotel in Ross River. The balance will use existing camping facilities in the area. An estimated 15-20 men will make up the crew.

An existing access trail 1.5 km long will be upgraded to accommodate haul truck traffic to the minesite. Approximately 3,000 gallons per day of water will be pumped from Whiskers Lake to use for dust suppression on haul routes. No other water use requirements are foreseen.

7.1 FIVE YEAR MINE SCHEDULING:

<u>Year</u>	<u>Start</u>	<u>Finish</u>	<u>Tonnes Coal</u>	<u>Cu. M Waste</u>
1982	July 1-15	August 15	19,500	120,000
Year 2	May 1	June 15	18,000	150,000
Year 3	May 1	June 15	18,000	200,000
Year 4	May 1	July 1	18,000	210,000
Year 5	May 1	August 1	16,500	220,000

7.2 RECLAMATION:

Total Disturbed Area: 9 ha

Tentative Reclamation: 7 ha

7.3 EQUIPMENT REQUIREMENT LIST:

<u>Number</u>	<u>Type</u>
1	6 cu. yd. Front End Loader
3	35 Ton Off-Highway Rear Dump Trucks
3	30 cu. yd. Scrapers
2	D-9 Ripper Bulldozers
1	D-6 Bulldozer
1	Air Track Drill and Compressor
1	Grader
1	Water Truck
1	Camp Office Trailer
1	40,000 lb. Explosives Magazine and 1 Cap Magazine Various Support Equipment and Trailers



6 873 000 N

6 873 200 N

6 873 400 N

6 873 600 N

6 31 600 E

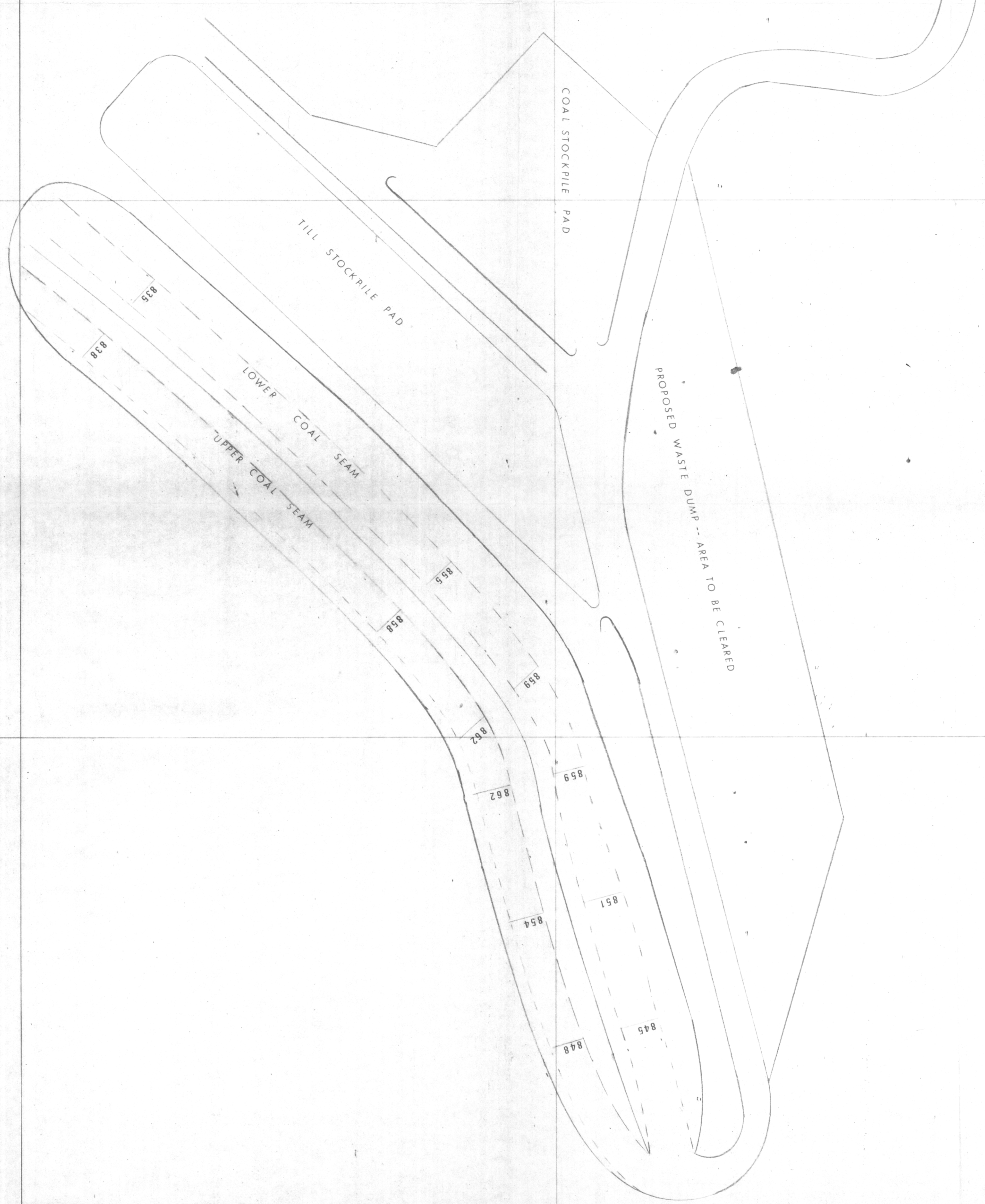
6 31 800 E

6 32 000 E

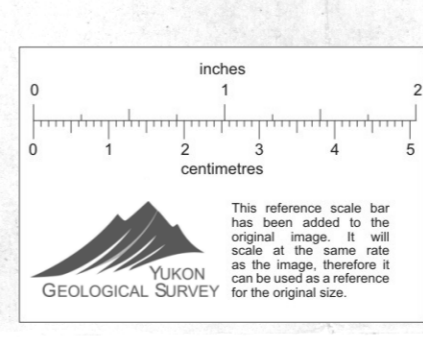
6 32 200 E



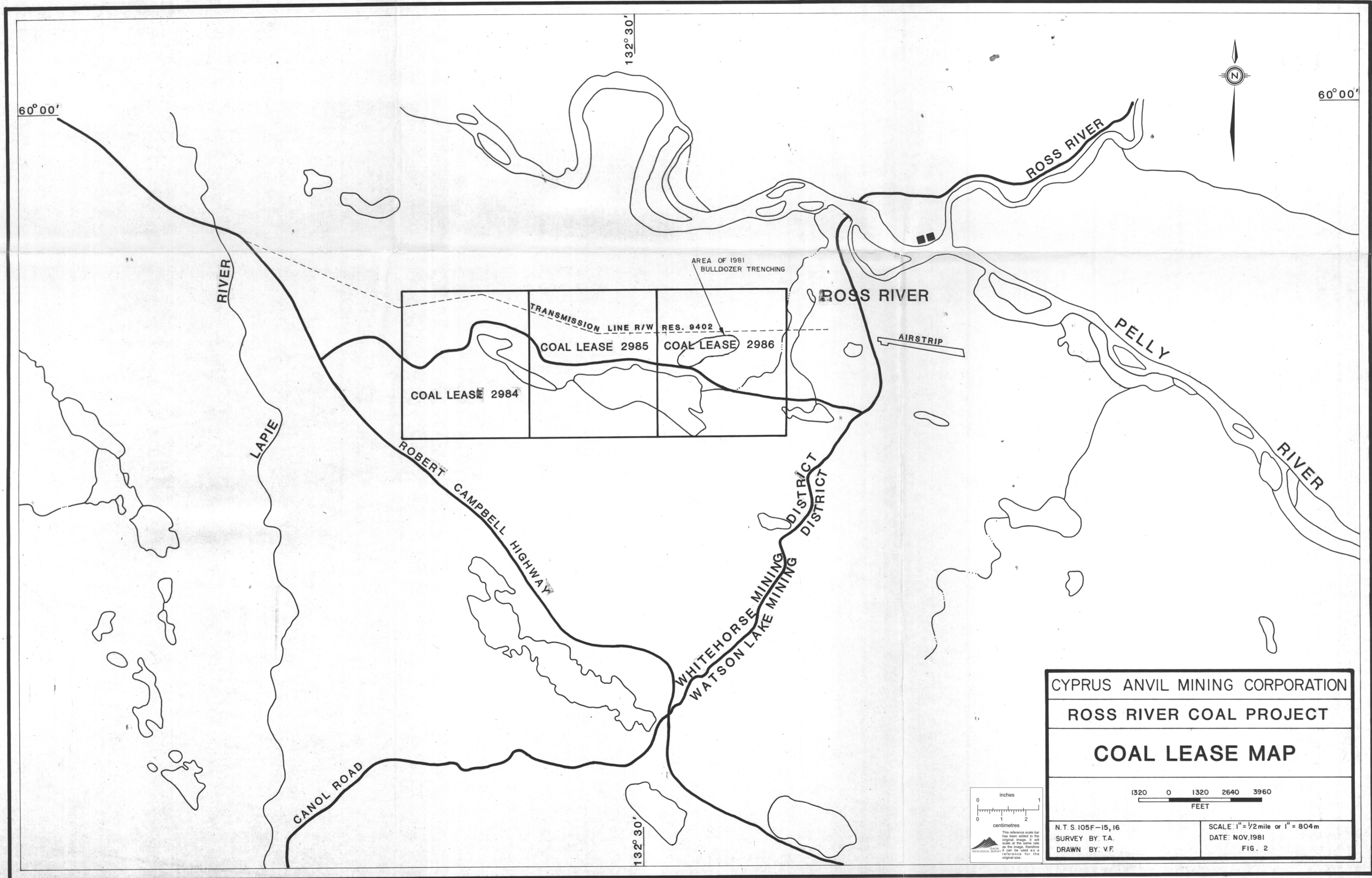
MAIN HAUL ROAD



CYPRUS ANVIL MINING CORPORATION  
 ROSS RIVER COAL PROJECT  
 1982 MINE PLAN



SCALE 1:1000  
 DATE 13/4/82  
 DRAWN BY JRB



CYPRUS ANVIL MINING CORPORATION  
 ROSS RIVER COAL PROJECT  
**COAL LEASE MAP**

1320 0 1320 2640 3960  
 FEET

N.T.S. 105F-15, 16  
 SURVEY BY: T.A.  
 DRAWN BY: V.F.

SCALE: 1" = 1/2 mile or 1" = 804m  
 DATE: NOV. 1981  
 FIG. 2

