

SOUTH FORKS

1985 EXPLORATION WORK

TWINFORKS COAL MINING LTD. COAL LICENCE, No. 7961

NANAIMO COAL FIELD, LOT 16, DOUGLAS LAND DISTRICT

Lat. 49 deg. 06', Long. 123 deg. 59'

NTS Sheet 92 G/4

EAST CENTRAL VANCOUVER ISLAND

BRITISH COLUMBIA

~~CONFIDENTIAL~~

Prepared For :

TWINFORKS COAL MINING LTD.

VICTORIA, BRITISH COLUMBIA

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00719

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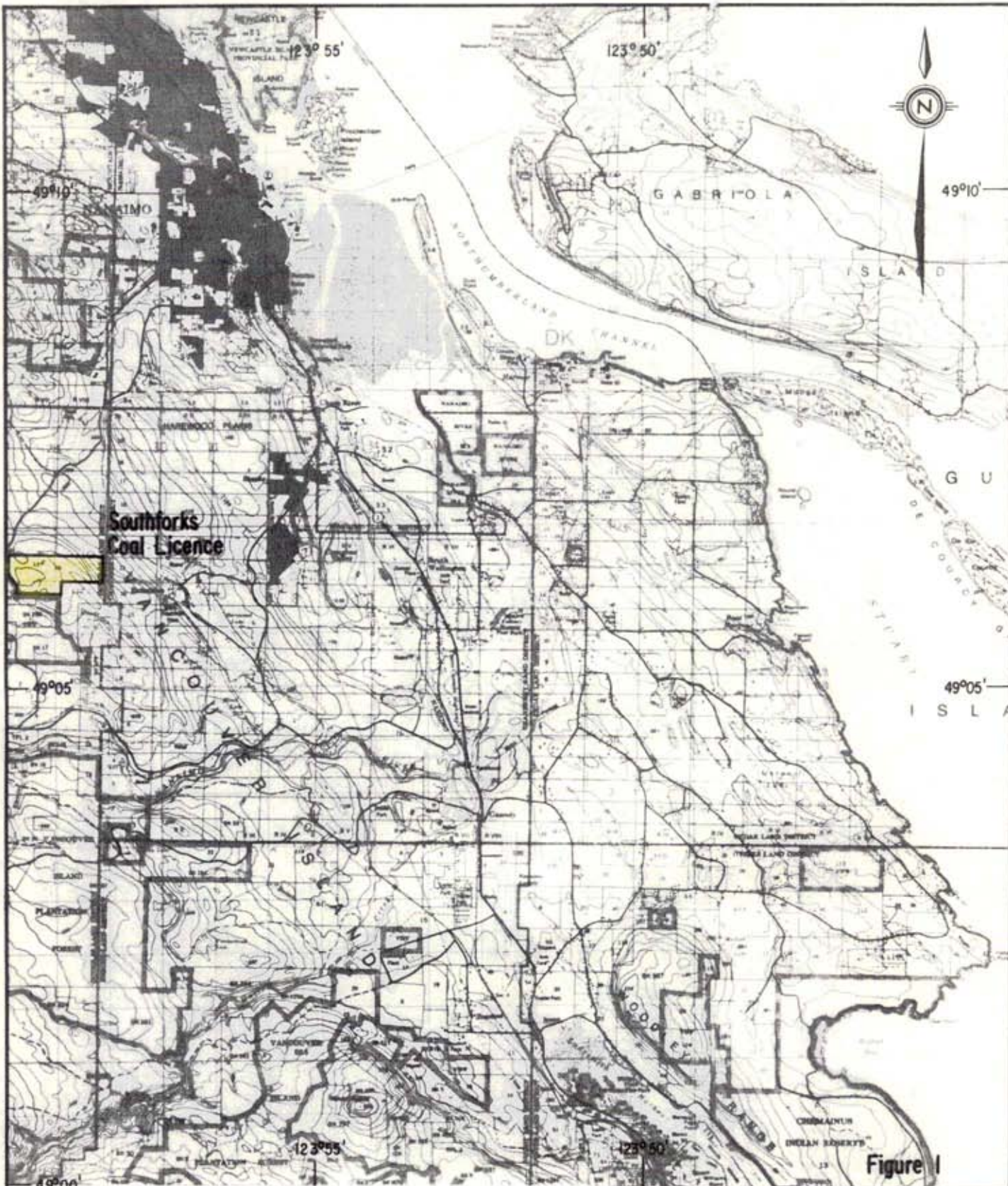


Figure 1

SOUTHFORKS COAL PROPERTY
LOCATION MAP
SOUTHFORKS COAL LICENCE



SCALE: 1:100 000		NTS REFERENCE 92 G/4	
DRAWN BY: S.L.GARDNER	CHECKED BY:	DRAFTED BY: S.L.D.	DATE: JAN 1985

0.1 INTRODUCTION

This report summarizes exploration work conducted on the Southforks Coal Property, Coal Licence No. 7961 for the year 1985. The work consists of a number of exploration drill holes that are part of an evaluation of an area of potential near-surface coal reserves that may have been overlooked during past mining operations in the area. This report documents the work completed with an estimate of total costs, outlines the geology of the area as determined from geologic reports plus the new information gain, details results of the work and draws possible conclusions as to potential coal reserves.

0.1.1 Location and Description of Property

The Southforks Coal Property is located in southeastern Vancouver Island, approximately 3.4 mi. (5.5 km.) southwest of Nanaimo City Limits or approximately 8 road miles (13 road km.) from the barge-loadout facility at Departure Bay in downtown Nanaimo.

The property is accessible via Southforks Road, which joins Harewood Road near the Nanaimo City Limits. A small unused road branching off from Southforks Road near the Wolf Mountain turnoff has been rehabilitated enough to allow vehicle traffic on to the

potential reserve area. This branch road is approximately 2000 ft. in length (610 m.).

The property consists of two contiguous licence blocks: Coal Licence No. 7961, legally described as Lot 16, Douglas Land District, consisting of some 104 ha (257 acres) and a pending licence application covering Section 14, Range VII, Douglas Land District, consisting of some 40 ha (100 acres). These licences are held under the name of Thomas D. McEwan for the recently formed company Twin Forks Mining Ltd. Surface rights are owned by MacMillan Bloedel Ltd.

0.2 HISTORY OF MINING IN THE AREA

Mining began on what is now the Southforks Coal Property around the turn of the century. The "Old No. 1 Mine" was in fact the first mine in the Extension Coalfield. The workings of this mine are immediately to the south of the present area of investigation. The old No. 1 as it was called, had a very brief history, as evidenced by this account¹ from the book "Boss Whistle":

The first major loss of life occurred just two years after the operations opened. The original mine at Extension was situated up above and behind the later workings. Spontaneous combustion started a fire in "Old Number One" on September 30, 1901, in which seventeen men were killed.

The old No. 1 mine was found to be still burning two years later when attempts to reopen it gave way to permanent closure. Small operators continued to work the area for many years after:²

There was a shortage of markets, not a shortage of coal, and small groups of miners continued to work the deposits. Chamber's Mine worked all through the Great Depression on one side of the Old Number One site and Beban Mine worked the other side.

1. Bowen, Lynne : "Boss Whistle", Dolichan Books, Lantzville, 1982, pp. 39

2. Bowen, Lynne : "Boss Whistle", Dolichan Books, Lantzville, 1982, pp. 42

"People went in after and pulled the pillars. We put in about seven or eight years doin' that. When the company was retractin' the pillars of coal sometimes the roof come down and they had to leave it, eh? So goin' in from the outside, from the surface in, we could get near these pillars because we had the plans and could see where they were. ... We had a little fan there run by a car engine.....

The latest mining activity to occur in the area was in the early 50's by Ralph Chambers or his son when a small area was stripped by bulldozer and about two thousand tons of coal mined.

The pillar robbing and prospecting activities of the 30's and 40's is not well documented and as such represents one of the dangers of the evaluation of the prospective area.

0.3 GEOLOGIC SUMMARY

The following is a Table of Formations relative to the immediate area of the Southforks Property :

TABLE 1. - TABLE OF FORMATIONS, NANAIMO GROUP
SOUTHFORKS PROPERTY

FORMATION	THICKNESS (Ft.)	DESCRIPTION
Extension- Protection Fm.	600	Thick-bedded conglomerate. Towards the base grades into pebbly or gritty sandstone. Base of fm. (roof of Wellington seam) is usually sandy shale.
Wellington Coal Seam	5 - 26 avg. 7	Variable thickness, some sections of rash or dirty coal. Variations in roof, floor usually regular.
East Wellington Sandstone	25 - 50	Floor, Wellington Seam. Thin-bedded, flaggy fine to medium grained, chiefly quartz w/ some feldspar and mica.
Haslam Fm.	600	Marine shale, concentrically weathering, argillaceous, sandy near top.

Recent exploration work has established these formational units in the general area of the Southforks Property. It is the opinion of the author that with the exception of some variability in the immediate roof of the Wellington Coal Seam (greater or lesser sandy interbeds), the general lithological descriptions given above adequately describe the formational units.

Structure

The Southforks Property is a structurally complex area. This statement has great importance in that it is probably the major factor in preventing the Wellington seam from possibly being located and/or mined during past operations in the area in question.

A well-documented reverse thrust fault cuts through the area, striking in a northwest to southeast orientation. The vertical displacement on this fault is approximately 150 ft. Thrusts of this type usually foster numerous secondary fault planes of minor displacement in the 0 to 25 ft. range. Sometimes these fault planes result in tight overturned fold structures. One of these structures has been worked in the stripping pit mined by Chambers in the early 50's. It is hoped that a similar structure or a small downfaulted area occurs within the present area of investigation.

The structure has been further complicated by Pleistocene or Recent glaciation. During the glacial period, ice movements over the ground surface resulted in periods of scour, when the surface was subjected to great erosional pressures, then subsequent periods of deposition, when clay and boulder overburden was deposited in bowls and depressions caused by the scouring action

or other factors. Glacial scour has taken greatest effect where softer rock units such as shales and coal seams approach the surface of the ground, or structural pressures such as faulting have fractured the harder formations to such an extent as to weaken them to a great degree, thus allowing later scouring action to take place.

0.3.1 Description of the Wellington Seam

This section details descriptions of Wellington Seam, which is the target seam, in the Extension area from old geologic reports

3
and mine records :

The thickness of the Wellington seam varies where mined, from virtually nothing to nearly 30 ft., and has perhaps an average thickness of 4 to 7 feet. This extreme variation is best described further by considering the structure of the seam and associated measures.

The floor of the seam is virtually always the firm, but thin-bedded to flaggy, East Wellington sandstone. In places, there are lentils of shale between the seam and the floor, and interbeds of shale in the sandstone floor. The roof varies in character. Most commonly it is a sandy shale, carbonaceous and even coaly in places. It varies in thickness from nothing to up to 20 or 25 feet... Near Extension, the conglomerate itself is in many places the roof of the seam. In a few places the roof is sandstone. ...

The most conspicuous feature of the seam is its variability in thickness caused chiefly by minor faults, folds, or bends usually in the roof, while the floor is fairly regular and even, although a few sharp

3. Clapp, C. H., "Geology of the Nanaimo Map Area", Geological Survey of Canada Memoir 51, 1914, pp. 101 - 108

rolls do occur in it. ... at the bends of some of the larger folds affecting the entire seam, the seam pinches and is in places composed almost entirely of rash.

0.4 SUMMARY OF WORK TO DATE

0.4.1 PHASE 1 DRILLING

The following is a summary of drilling for the Phase 1 of the exploration work. This drilling was performed by a Bucyrus Erie 24 R rotary drilling rig owned by Drillwell Enterprises Ltd. of Cowichan Bay, B. C.

During the period March 23 - 29, 1985, 5 holes were drilled for a total footage of 176 ft. (53.6 m). A summary of the drillholes is as follows:

HOLE No.	DEPTH (ft.)		DESCRIPTION
	From	To	
SF-85-01	0	3.5	Roadfill and Glacial Till
	3.5	15	Sandstone; med. grey, hard, fine to med. grained uniform; fracture plane at 15'
	15	40	Sandstone; as above
	40	48	Sandstone; finer grained, fault plane at 48 ft.
	48	63	Sandstone; very fine grained; darker
SF-85-02	0	22.5	Siltstone; cubical fracture; dark grey to brownish grey
	22.5	30	COAL; soft; generally bright and clean
	30	33	Sandstone; dark grey; fine - med. grained
SF-85-03	0	17	Glacial till; very hard and well cemented numerous boulders
	17	40	Sandstone; fine to med. grained; light to med. grey; hard
SF-85-04	0	6.5	Tailings and glacial till
	6.5	18.0	Sandstone; light to med. grey, fine to med. grained; hard
SF-85-05	0	5	Glacial Till
	5	7	Sandstone; buff to brown; muddy; oxidized
	7	22	Sandstone; light to med. grey, fine to med. grained; hard

0.4.2 PHASE 2 DRILLING

As a follow-up to the initial work, additional drilling in the period April 5 to May 6 is summarized below:

HOLE No.	DEPTH (ft.)		DESCRIPTION
	From	To	
SF-85-06	0	70	Sandstone, white
SF-85-07	0	18	Mudstone; sandy
	18	30	Lost circulation; old workings
SF-85-08	0	18	Mudstone; sandy
	18	30	Lost circulation; old workings
SF-85-09	0	24	Mudstone
	24	25	COAL
	25	30	Lost circulation; old workings?
SF-85-10	0	16	Mudstone
	16	17	Lost circulation; old workings?
	17	28	Fractured formation; old workings?
	28	30	No returns; harder formation

SF-85-11	0	20	Till
	20	22	COAL
	22	26	Sandstone
SF-85-12	0	24	Mudstone; sandy beds; soft
	24	26.5	COAL
	26.5	27.5	Mudstone parting
	27.5	29.5	COAL
	29.5	36	COAL; with numerous shaly zones
	36	40	Sandstone; white to grey
SF-85-13	0	8.5	Mudstone
	8.5	9.5	COAL
	9.5	11	Sandstone
SF-85-14	0	8.5	Mudstone
	8.5	9.5	COAL
	9.5	11	Sandstone
SF-85-15	0	20	Mudstone
	20	22	Old workings
SF-85-16	0	21	Mudstone
	21	32	COAL
	32	32.5	Mudstone
	32.5	35	COAL
	35	42	Sandstone floor

SF-85-17	0	20	Mudstone
	20	32	COAL
	32	32.5	Mudstone, and COAL
	32.5	37	Sandstone
SF-85-18	0	6	Till
	6	16	Mudstone
	16	27	COAL ,some dirty zones
	27	27.5	Mudstone
	27.5	29.5	COAL
	29.5	32	Sandstone
SF-85-19	0	22	Mudstone, w/sandy layers
	22	29	COAL
	29	31	Mudstone, some COAL
	31	32	COAL , dirty
	32	34	COAL , some dirt
	34	34.5	Mudstone
	34.5	36	COAL
	36	42	Sandstone floor
SF-85-20	0	13	Till
	13	28	COAL
	28	32	Sandstone
SF-85-21	0	10	Till
	10	16	Mudstone
	16	29	COAL , last 3 ft. w/mudstone

SF-85-22	0	13	Till
	13	22	COAL
	22	22.5	Mudstone
	22.5	24	COAL
	24	32	Sandstone
SF-85-23	0	9	Till
	9	14	Mudstone
	14	25	COAL
	25	25.5	Mudstone
	25.5	27	COAL
	27	32	Sandstone
SF-85-24	0	12	Till
	12	25	COAL
	25	25.5	Mudstone
	25.5	27	COAL
	27	32	Sandstone
SF-85-25	0	16	Till
	16	25.5	COAL
	25.5	32	Sandstone
SF-85-26	0	3	Till
	3	24	Mudstone
	24	31	COAL
	31	32	Sandstone
SF-85-27	0	21	Mudstone
	21	35	COAL
	35	42	Sandstone
SF-85-28	0	17.5	Till
	17.5	38	Sandstone, white

TOTAL FOOTAGE : 764 FT. (233 m.)

This drilling was performed by an Ingersoll-Rand Airtrack blasthole rig equipped with a Gardner-Denver 150 p.s.i./ 600 c.f.m. air compressor. Holes were 2.5 inches in diameter. This method of drilling was much more cost efficient than the previous

program, however the lack of drill cuttings makes a definitive assessment of coal and parting thicknesses impossible.

None of the holes were geophysically logged.

Only the 5 six-inch large diameter rotary holes were cemented. The remainder of the smaller diameter two inch holes were left open.

All the holes were surveyed in with a level and chain. Spot elevations were also taken with the level and chain in order to prepare a topographic plan of the coal reserve area.

0.4.3 Calculation of Reserves

An average of 12 ft. of coal is used for the calculation of in-situ coal reserves in the new coal area :

Area - 12,320 sq. ft. X 12 ft.
Volume - = 5,480 cu. yds.
Tonnage - 5,480 cu. yds. X 1.2 short tons/cu. yd.

= 6,571 short tons

Overburden -
Area - 12,320 sq. ft. X 18 ft. avg.

Volume - = 8,213 b.c.y.
With slopes, roughly 9,000 b. c. y.

Mining Ratio - 1.37 : 1

Cost Summary

The following is an approximate summary of costs incurred for the 1985 program:

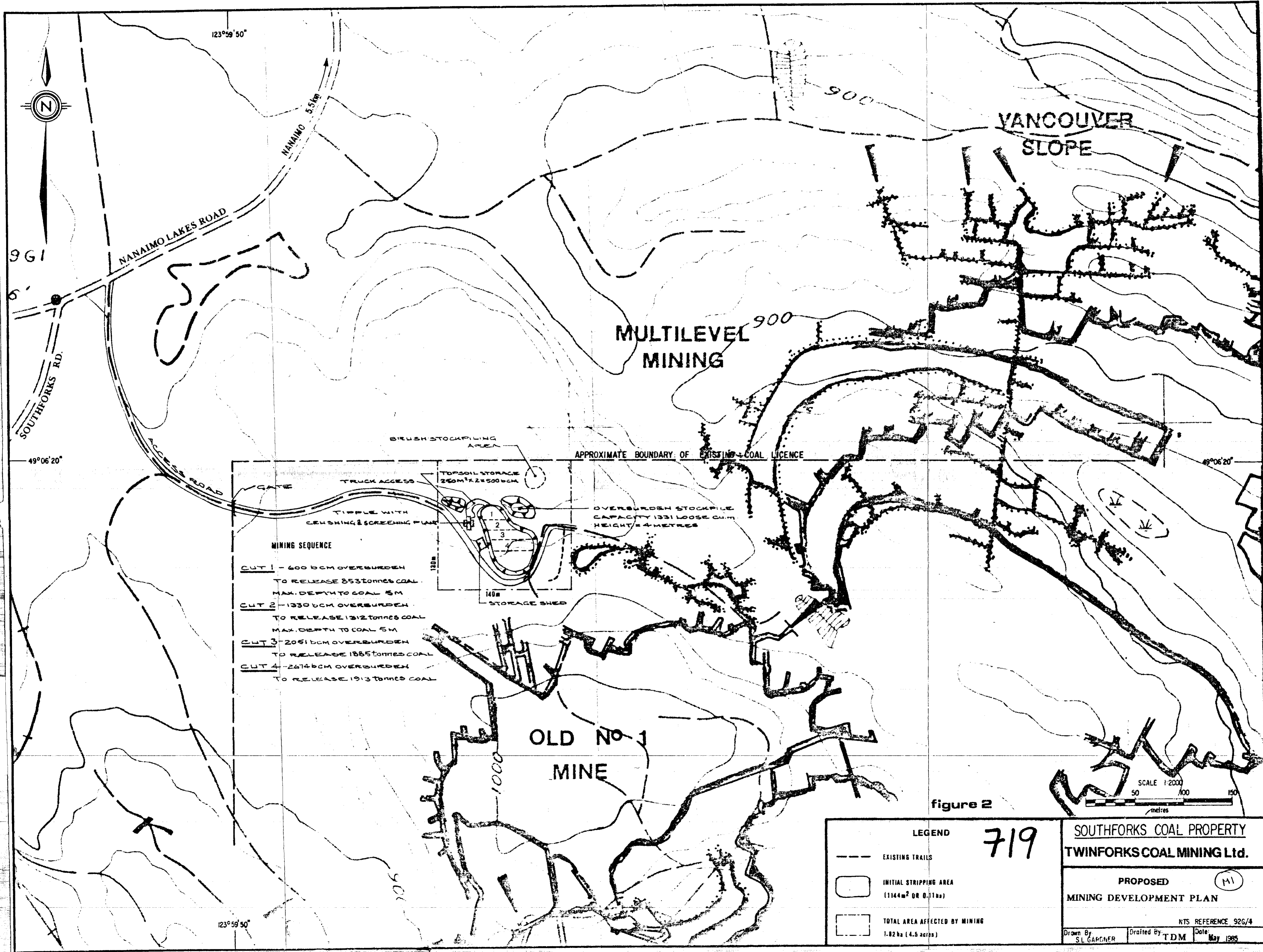
Drilling operations, Rotary Rig	\$ 2,000.00
Drilling operations, Airtrack Rig ...	\$ 3,000.00
Site Access work	\$ 1,020.00
Right of Entry	\$ 300.00
Incidentals,	\$ 300.00
Map, Report Preparation, Etc. ...	\$ 350.00

TOTAL	\$ 6,970.00

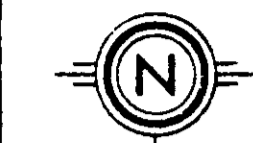
0.5 CONCLUSIONS

As a result of the exploration work, the following conclusions can be drawn:

- the stratigraphic section as described in the geologic summary has been confirmed. In general, the roof of the coal is a soft shaly or silty, easily drilled formation, while the floor is a firm, hard, fairly uniform sandstone.
- There are no structural complications in the limited area of the coal reserve that would complicate mining operations.
- All of the holes were dry, indicating that no groundwater problems would be encountered during the course of coal removal.
- The drilling identified a limited area of unworked coal, all of which lies from 8 to a maximum of 25 ft. below ground level. This coal reserve is calculated at approximately 6,600 short tons or 5,989 metric tonnes.
- This area appears to be a depositional anomaly, as the coal seam pinches out along strike to the east and to the west.



123°59'50"



961

6'

SOUTHFORKS RD.

49°06'20"

ACCESS ROAD

NANAIMO LAKES ROAD

NANAIMO 5.5 km

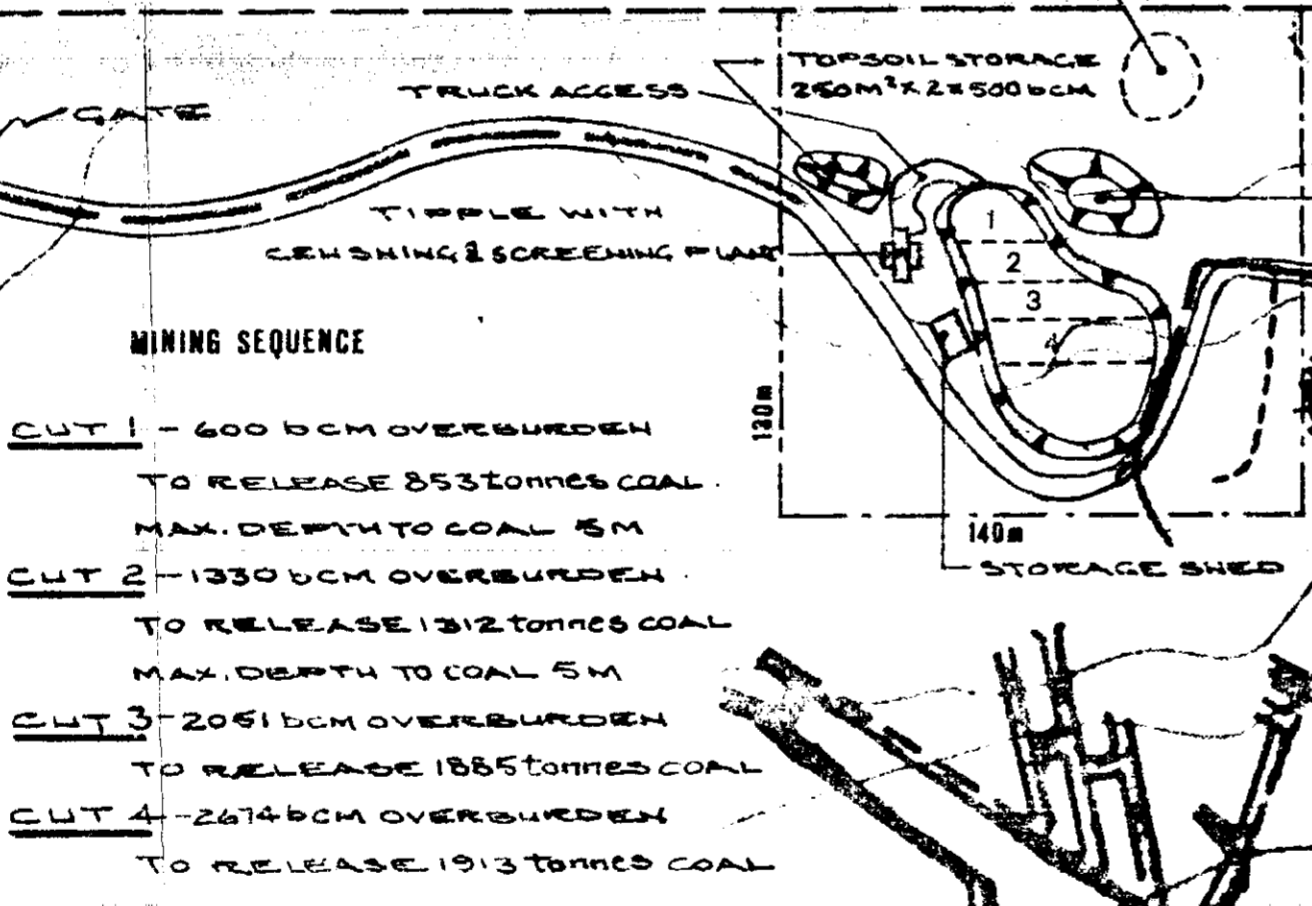
MULTILEVEL MINING

VANCOUVER SLOPE

BRUSH STOCKPILING AREA

APPROXIMATE BOUNDARY OF EXISTING COAL LICENCE

49°06'20"



OLD NO. 1 MINE

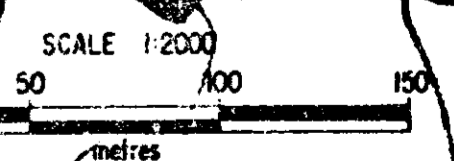
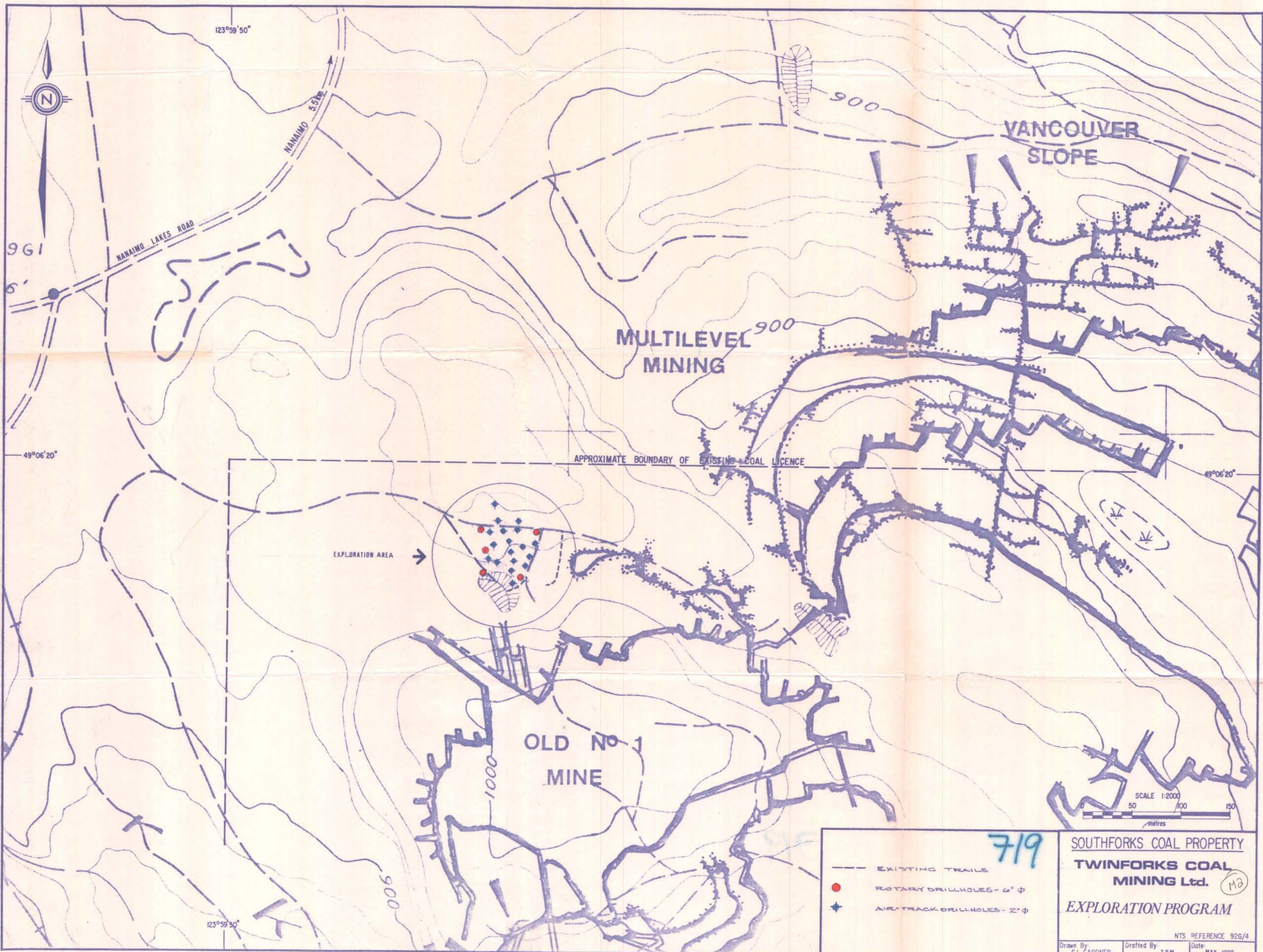


figure 2

LEGEND		719	SOUTHFORKS COAL PROPERTY	
---			TWINFORKS COAL MINING Ltd.	
---	EXISTING TRAILS		PROPOSED	
□	INITIAL STRIPPING AREA (1144m ² OR 0.11ha)		MINING DEVELOPMENT PLAN	
□	TOTAL AREA AFFECTED BY MINING 1.82 ha (4.5 acres)		NTS REFERENCE 92G/4	
Drawn By: S.L. GARDNER		Drafted By: TDM		Date: May 1985

123°59'50"



123°59'50"

NANAIMO 5.5 km

NANAIMO LAKES ROAD

961

6'

49°06'20"

APPROXIMATE BOUNDARY OF EXISTING COAL LICENCE

EXPLORATION AREA



OLD NO. 1 MINE

123°59'50"

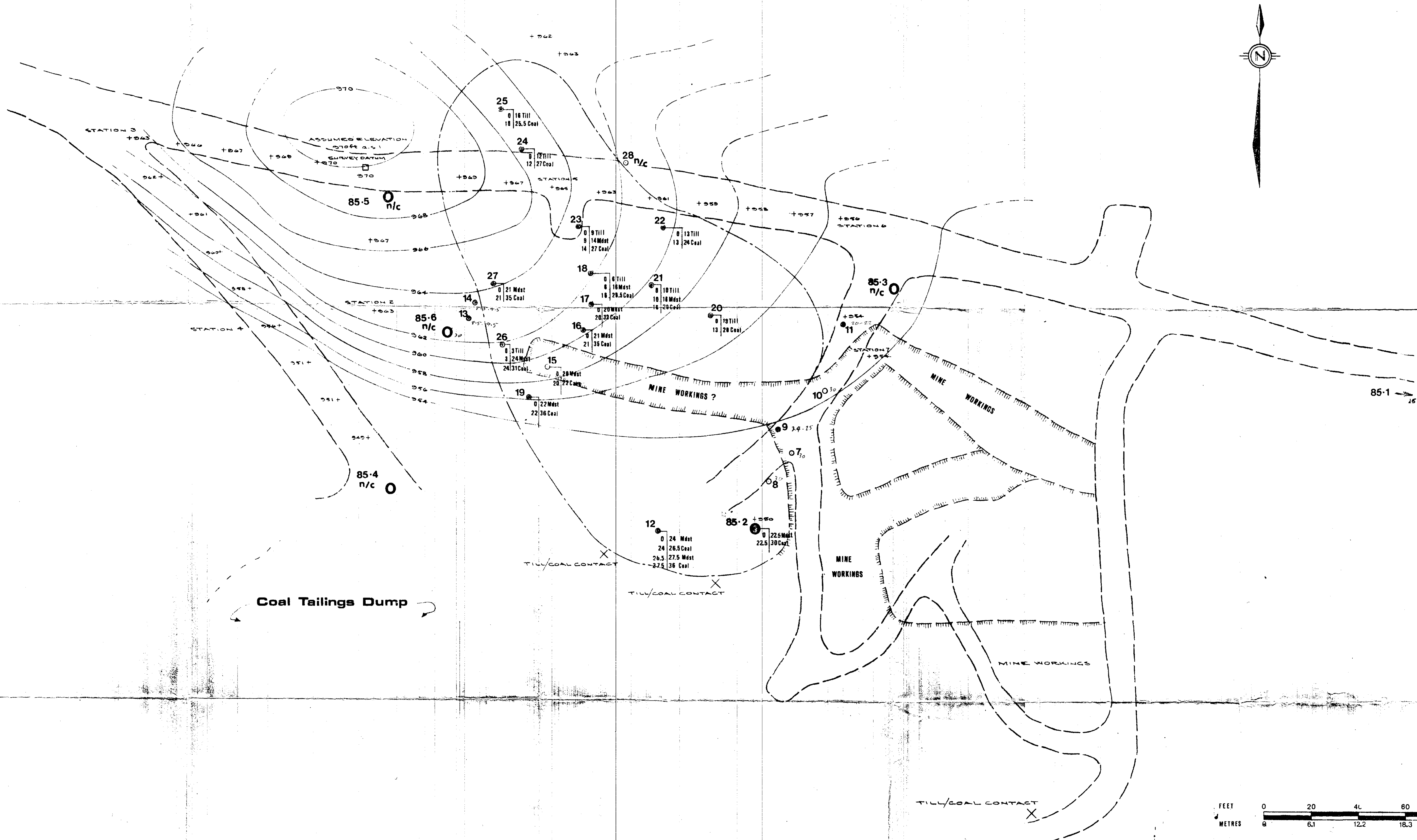
719

- EXISTING TRAILS
- ROTARY DRILLHOLES - 6" φ
- ◆ AIR-TRACK DRILLHOLES - 2" φ

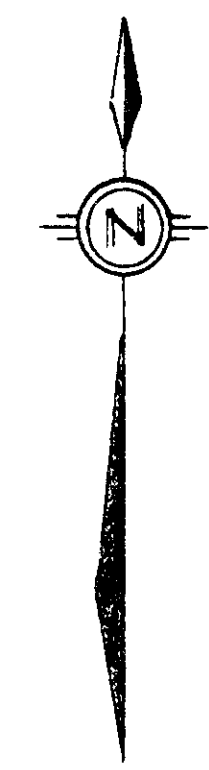
SOUTHFORKS COAL PROPERTY
TWINFORKS COAL MINING Ltd. (Ma)
 EXPLORATION PROGRAM

NTS REFERENCE 926/4
 Drawn By: S.L. GARDNER Drafted By: T.O.M. Date: MAY 1985

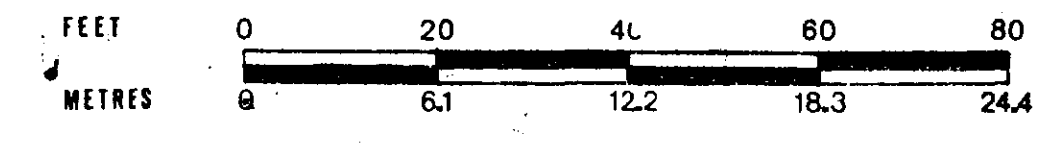




48°08'17"



Coal Tailings Dump



123° 59' 35"

719

LEGEND

- O** drillhole locations - 6 in. diam. boundary - old workings
- o** air-track drillhole locations - 2 in. diam. boundary - proposed mining area
- +** surveyed elevation - chain & level vehicle access trails
- 0** datum elevation (assumed)

PROPERTY DESCRIPTION

Lot 16 Douglas Land District
Coal Licence 7961

TWINFORKS COAL MINING LTD.

Victoria, B.C.
Part of South Forks coal property showing
the location of drillholes & proposed mining area

scale 1" = 20' May 1985

contour intervals = 2 feet

DRAWN: S.L. GARDNER DRAFTED: T.D. McEWAN