

BULLDOZER TRENCHING REPORT

COAL LICENCE NO. 153

Report Submitted re: Section 19 (2) (e) and  
19 (h) of the Coal Act

N.T.S. 92-H-10

Latitude: 49°31'N  
Longitude: 120°44'W

Licensee: T. G. Stout  
Operator: Cyprus Anvil Mining Corporation

Field Work Completed from May 12 - 21, 1982

By:

T. J. Adams

CYPRUS ANVIL MINING CORPORATION

GEOLOGICAL BRANCH  
June 1982 ASSESSMENT REPORT

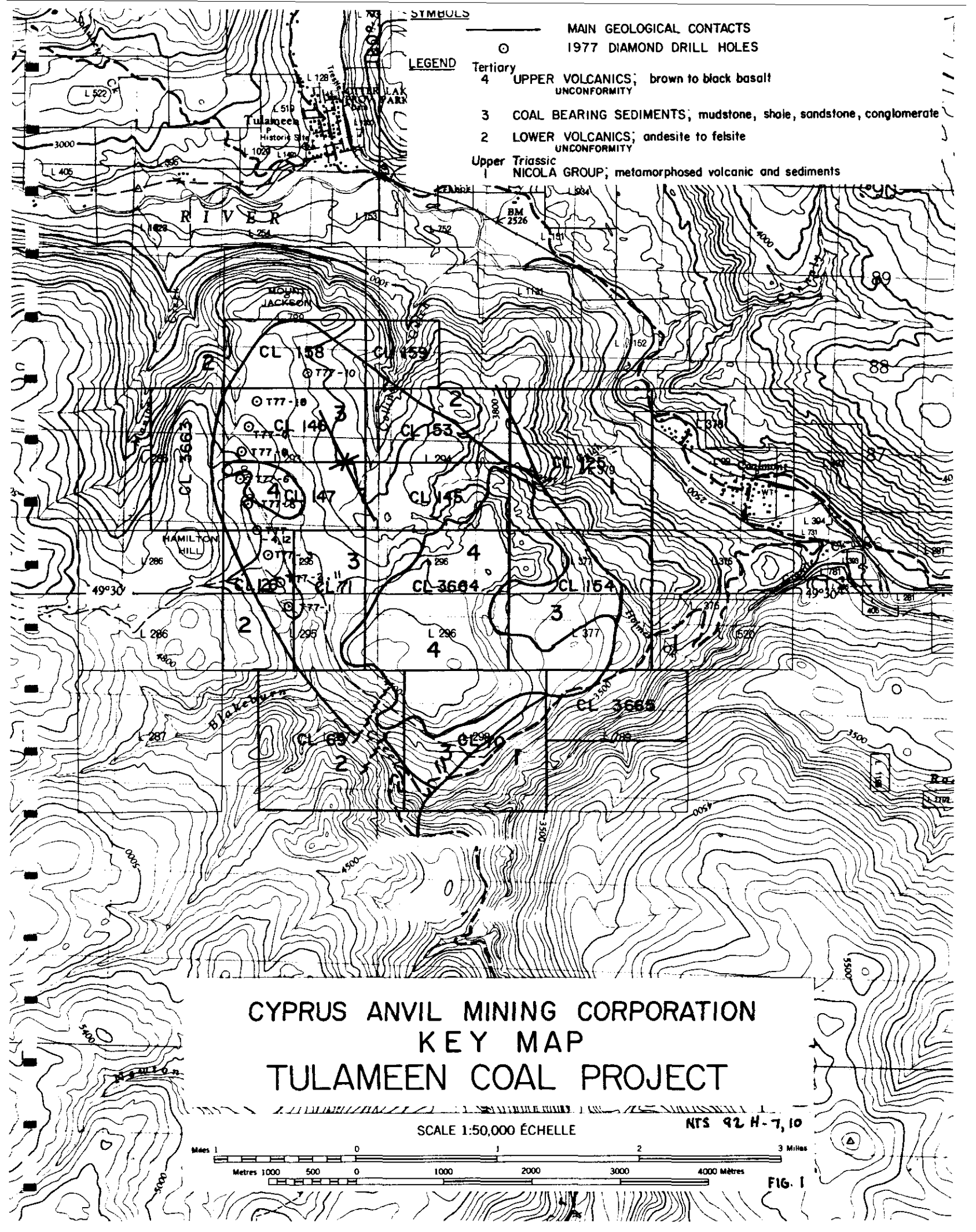
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TABLE OF CONTENTS

	<u>Page No.</u>
Key Map	
INTRODUCTION . . . . .	1
LOCATION AND ACCESS . . . . .	1
GEOLOGY . . . . .	2
TRENCHING . . . . .	5

List of Illustrations

Figure 1	Key Map (1:50,000)
Table 1	Table of Geologic Formations
APPENDIX I	Statement of Qualifications
APPENDIX II	Cost Statement; Invoices and Vouchers
Map No. 1, 1A	Coal Licence No. 153 - 1981 and 1982 Trenching; Trench Locations (1:50,000) and Trench Sketches (1:500)



CYPRUS ANVIL MINING CORPORATION  
 KEY MAP  
 TULAMEEN COAL PROJECT

SCALE 1:50,000 ÉCHELLE

NTS 92 H-7, 10



FIG. 1

## INTRODUCTION

By an agreement entered into on April 10, 1981 with T. G. Stout, licensee of Coal Licence No. 153, Cyprus Anvil Mining Corporation undertook a second small bulldozer trenching program on this licence in May, 1982.

This licence is contiguous with Cyprus Anvil's other Tulameen Coal Project land holdings. Work was carried out under Surface Work Permit No. C-115.

A total of two long trenches were excavated, with a total length of 320 meters, in addition to nine small test pits. On completion of this trenching, all trenches were completely backfilled. All disturbed areas were then seeded and fertilized.

## LOCATION AND ACCESS

The Tulameen Coalfield is located in southwestern British Columbia on the east flank of the Cascade Mountains, about 170 air-kilometers E.N.E. of Vancouver, and 48 kilometers north of the United States border. Coal Licence No. 153 is located south of the town of Tulameen and west of the town of Coalmont.

There is good private gravel road access to the property from Coalmont, a distance of about five kilometers. A paved road connects Coalmont with Princeton, a distance of about 20 kilometers to the southeast.

A C.P. Rail branch line runs from Princeton, through Coalmont and Tulameen, connecting the main line at Spences Bridge. The rail distance from Coalmont to Vancouver is 420 kilometers.

## GEOLOGY

The Tulameen basin consists of an elongate, oval-shaped, synclinally folded sequence of Tertiary sediments, including coal seams and volcanics which rest unconformably on a basement of Upper Triassic Nicola Group metamorphosed volcanics and sediments.

Underground coal mining was carried out along the southwestern margin of the Tulameen basin from 1919, continuously until 1940 by Coalmont Collieries Ltd. in three adjacent mines. A small open pit mine was operated in the same area during the mid-1950's by Mullins Strip Mine Ltd. Approximately 2,150,000 tonnes were extracted from the underground workings and 225,000 tonnes were obtained from the open pit.

The primary object of exploration work carried out by Cyprus Anvil since 1977 within the Tulameen basin has been to prove coal reserves that would be minable at a low stripping ratio. For this reason, work has been concentrated along the western margin of the basin. In this area, dips are moderate (25 - 45°E) and, for a considerable strike distance, the topographic slope tends to fall off the east, resulting in a favourable surface mining situation. Mapping is very sketchy and incomplete along the eastern and southern margins of the basin because of a lack of bedrock exposure.

Tulameen basin stratigraphy is summarized as follows:

Nicola Group (unit 1) rocks are exposed along the extreme south and eastern contacts of the Tulameen Tertiary basin. The Nicola Group of Upper Triassic age consists mostly of a varied assemblage of metamorphosed, highly fractured quartz and carbonate veined volcanic rocks

Table 1

TABLE OF GEOLOGIC FORMATIONS

TERTIARY

4 UPPER VOLCANICS

Brown to black, fine-grained basalt.

Unconformity.

3 COAL - BEARING TERTIARY SEDIMENTS

3c UPPER SANDSTONES (600 m)

3c2 Granule conglomerate, coarse sandstone, minor shale, mudstone.

3c1 Transitional unit; interbedded sandstone, mudstone, minor thin coal.

3b COAL MEMBER: Shales, mudstone, tuffs, coal. (130 m)

3b10 Blocky breaking mudstone and shales.

3b9 Finely laminated, fissile shales.

3b8 Interbedded thin dirty coal, bentonite, shales, mudstones.

3b7 Main coal seam

3b6 Light grey, medium-grained sandstone; white muddy matrix.

3b5 Dark grey, massive, blocky breaking mudstone.

3b4 Distinctive color banded, light to dark grey, interbedded shales, mudstones, muddy sandstone.

3b3 Mudstone, medium brownish grey to dark grey, massive to medium laminated.

3b2 Lower coal seam.

3b1 Interbedded fragmental bentonitic tuff, thin coal seams, coaly bentonitic mudstone.

3a LOWER SANDSTONE: Coarse to fine sandstone, interbedded with mudstone and shale (100 - 150 m).

2 LOWER VOLCANIC:

Massive to porphyritic or fragmental; andesitic to felsitic.

Unconformity.

UPPER TRIASSIC

1 NICOLA GROUP:

Highly metamorphosed volcanic and sediments.

varying from porphyritic and non-porphyritic dacite to basalt. Also present are minor argillite, tuffs, limestone and chlorite and sericite schist.

Unit 2, the Lower Volcanics, are the oldest Tertiary rocks in the area and they unconformably overlie the Nicola volcanics. This unit consists of a wide variety of generally light colored, massive to porphyritic and/or fragmental andesite to felsites. This is a very resistant outcrop forming unit. Best exposures are on Hamilton Hill and Jackson Mtn. along the western and northern margin of the basin. Total thickness of this unit, in Collins Gulch, is about 500 meters.

Unit 3 includes the Tertiary sedimentary strata. Unit 3 can be further broken down into a lower sandstone unit (3a); unit 3b, the coal-bearing member consisting of shales, mudstone tuffs, flows and coal; and an upper sandstone horizon (3c).

Unit 3a is a recessive, poorly exposed, poorly cemented, often arkosic, coarse to fine-grained sandstone, interbedded with minor thin mudstones and shales. The thickness of this unit in the western and northern basin is in the order of 100 - 150 meters.

Unit 3b, the coal member, is about 130 meters thick along the western margin of the basin. This unit appears to conformably overlie unit 3a along the western and northern portions of the basin but, to the east and south, it progressively overlaps unit 3a and unit 2 to lie directly on the Upper Triassic Nicola Group basement. Using drill cores and electrologs, unit 3b has been further broken down into a

number of sub-units ( $3b_{1-10}$ ). These units are readily identifiable in core and electrologs and have been correlated between all holes in the area drilled along the west margin of the basin. Unit 3b is a very recessive weathering unit with very few natural exposures. In weathered surface exposures (outcrop, road cuts, shallow cat and backhoe trenches), it is very difficult to differentiate between the various unit 3b shale and mudstone sub-units.

The Tertiary sediments are folded into an asymmetric, northwest trending synclinal structure. In the area of the old underground mines along the southwest margin of the basin, the beds dip between  $20^{\circ}$  and  $25^{\circ}$  to the northeast. To the north of this area, between Sections 1 and 5 in the area of proposed surface mining, dips increase from  $25^{\circ}$  to  $45^{\circ}$ . The beds tend to flatten to about  $20^{\circ}$  around the northern nose of the syncline and then steepen  $40^{\circ}$  to  $80^{\circ}$  to the southwest around most of the eastern margin of the basin. The structure around the southeastern margin of the basin, because of the almost total lack of unit 3 rocks exposed, is unclear.

A major northeast trending fault zone exists between the abandoned No. 3 and No. 4 underground mines. A similar major northeast fault zone has been described as forming the southeast limit of the No. 3 underground mine. No surface evidence of this zone has been seen. Although numerous small scale faults and drag folds have been encountered throughout the basin, no other faults with major displacements are indicated.



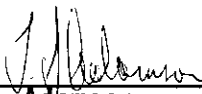
TRENCHING

Cyprus Anvil acquired Coal Licence No. 153 in 1981. Within this licence there is very little natural bedrock exposure within the coal-bearing section. Small trenching programs were carried out within this licence during 1981 and 1982 to define the stratigraphy of the area and to expose coal seams for examination and sampling. The trenches are fully described on Map No. 1, which indicates the geological units exposed, the trench dimensions, and shows their locations with respect to boundaries of the licence, access roads, drill sites, and other surface workings.

Trenching during the 1982 program was carried out during the period May 12 - 21. Equipment utilized consisted of a Caterpillar D6D bulldozer and a Caterpillar 225 backhoe excavator.

On the completion of the 1982 program, all new trenches and test pits were completely backfilled and all disturbed areas were seeded and fertilized.

Respectfully submitted,

  
\_\_\_\_\_  
T. J. Adamson  
Senior Geologist, Coal Projects

June 24/82  
(Date)

Cyprus Anvil Mining Corporation

300, 355 Burrard Street      Telex 04508594  
Vancouver, British Columbia  
V6C 2G8  
Telephone (604) 687-2586

APPENDIX I

STATEMENT OF QUALIFICATIONS

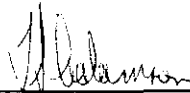
I, Thomas J. Adamson, geologist, with business address at 300 - 355 Burrard Street, Vancouver, British Columbia, and residential address at 3842 - West 23rd Avenue, Vancouver, British Columbia, hereby state that:

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 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 1982 field work on Coal Exploration Licence No. 153 and have compiled and interpreted all data resulting from this work.



\_\_\_\_\_  
T. J. Adamson  
Senior Geologist, Coal Projects

June 24/82

(Date)

**CYPRUS ANVIL**

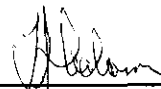
APPENDIX II

COAL LICENCE NO. 153

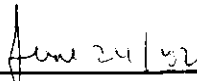
1982 Trenching Cost Statement

Equipment Rental	- D6D bulldozer, Cat 225 Backhoe	
	- Tri Valley Construction Ltd.	\$4,032.00
Transportation	- Cara Truck Rentals	849.54
	- Gas	143.00
Accommodation	- Sandman Inn, Princeton	267.38
Salaries	- one man, 9 days	2,114.00
Reclamation	- seed, Buckerfields Ltd.	216.90
	- seed spreader, fertilizer, Knapps Ltd.	75.76
		<hr/>
		\$7,698.58

I, Thomas J. Adamson, do hereby state that, to the best of my knowledge and belief, the above statement of costs is both correct and true.



\_\_\_\_\_  
T. J. Adamson  
Senior Geologist, Coal Projects



\_\_\_\_\_  
(Date)

PHONES:

T. G. Stout  
295-3944

W. Wilkinson  
295-6186

L. Mckenzie  
295-6270

# Tri Valley Construction Ltd.



PRINCETON, B. C.

Bulldozing & Craning

May 21. 1982

P. O. BOX 808

Cyprus Anvil  
Mining Comp.  
355 Burrard St.  
Vancouver, B.C.  
V6C 2G8

Att.: Tom Adamson

### S T A T E M E N T

Re: Equipment rental

D-6D	10 hrs @ \$ 78.00	\$	780.00
225 Excavator	33½ Hrs @ \$ 88.00	\$	2,948.00
Moving charges	4 hrs @ \$ 76.00	\$	304.00
			<hr/>
Total	.....	\$	4,032.00
			<hr/> <hr/>

O.K

TULAHKEN BULLDOZER TRENCHING

# RENTALS LTD.

2725 KINGSWAY  
Vancouver, B.C. V5R 5H4

PHONE:  
430-2427

ALL CORRESPONDENCE  
REMITTANCES MUST SHOW  
THIS RENTAL AGREEMENT  
NUMBER.

RENTAL  
AGREEMENT NO. 19044

TO BE PAID BY	CYPRUS ANVIL		MAKE AND MODEL	CAR RETURNED AT		DATE AND TIME	
	330-355 BARRARD		G.M.C.	VAN		IN: MAY 25/86	
	VANCOUVER B.C.		LICENSE NUMBER	VAN		9 PM	
	V6C 258		3233 FV	PRINCE		OUT: MAY 17/86	
TOM J. ADAMSON		UNIT NUMBER	PRINCE		2:15 PM		
269		DESTINATION		CAR TO BE RETURNED		26582	
TYPE OF CHARGE CARD		EXPIRES		CAR WILL BE USED IN PROVINCES OR STATES OF		AUTHORIZED	
PURCHASE ORDER NO.				B.C.		EXTENDED BY	
HARD NO.		MILEAGE DETERMINED BY FACTORY INSTALLED ODOMETER		HOURS @			
DRIVER'S LICENSE NO.		PROV.	AGE	EXPIRES	DAYS @ 40		
1007580 BC			25	185	WEEKS @ 20		400.00
LOCAL ADDRESS		MILEAGE IN		MILEAGE OUT			
		84778		83043			
PHONE NO.		MILES DRIVEN		DEPOSIT			
		1735		\$ CHX.			
SECOND DRIVER		PROV.	AGE	EXPIRES	TOTAL TIME & MILEAGE CHARGES		712.30
CO. EMP. 219 OKER					SPARC JACK ETC		
C. NO.		COLLISION PROTECTION		INITIALS			
		BY HIS INITIAL, CUSTOMER AGREES TO PAY A FEE STIPULATED BELOW AND LESSOR AGREES TO WAIVE ALL CLAIMS OF DAMAGE BY COLLISION EXCEPT AS SPECIFIED BELOW TO VEHICLE WHILE IT IS USED, OPERATED OR DRIVEN IN CONFORMANCE WITH THIS RENTAL AGREEMENT, BUT NOT WITHSTANDING PAYMENT OF SAID FEE CUSTOMER SHALL BE FULLY LIABLE FOR ALL COLLISION DAMAGE IF VEHICLE IS USED, OPERATED OR DRIVEN IN VIOLATION OF ANY OF THE PROVISIONS OF THIS RENTAL AGREEMENT.		I AGREE TO PAY:			
		6.00 PER DAY OR FRACTION THEREOF FOR 300.00 DEDUCTIBLE COLLISION					
30.00 WK.		CUSTOMER SUPPLIES GAS.		SOURCE		DOCUMENT / UNIT	
MINIMUM CHARGE ONE DAY PLUS MILEAGE.		CUSTOMER IS LIABLE FOR ALL PARKING AND TRAFFIC VIOLATIONS.		31		2691	
I HAVE READ AND UNDERSTAND THE TERMS AND CONDITIONS ON THE REVERSE SIDE OF THIS AGREEMENT AND AGREE THERETO:		X SIGNATURE		Revenue - Cars			
				Revenue - Trucks		712.30	
				Tax 7%		42.74	
				Collision Damage Waiver - Cars			
				Collision Damage Waiver - Trucks		60.00	
				Gasoline +		345.00	
				Amount Due		849.54	
				Less Deposit			
				Less Maintenance - Cars			
				Less Maintenance - Trucks			
				Net Due:		849.54	
				Charge Customer No.		I	
				Cash Report No.		I	
				PREPARED BY:		REFUND RECEIVED (SIGNATURE)	
				PAID CHX.		COMPLETED BY:	

SEE REVERSE SIDE



4510 407 169 600 02700

09/83 VISA

THOMAS ABANSON

0134  
PRINCETON CHEVRON 051282  
PRINCETON 618470

5 000

618 470 CHARGES SALES DRAFT - FACTURE  
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LE DÉTENTEUR DE CETTE CARTE PAIERA À LA BANQUE QUI A ÉMIS LA CARTE...  
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MISC. FEES			
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CDN. \$			527.00

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GAS			454.5000
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MISC. FEES			
TAX / TAXE			
CDN. \$			500.00

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OR FUEL			
MISC. FEES			
TAX / TAXE			
TOTAL			25.00

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OR FUEL			
MISC. FEES			
TAX / TAXE			
TOTAL			41.75

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CYPHUS ANVIL MINING  
NOV 82

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PRINCETON 618470

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PRINCETON 618470

ITEM	QUANTITY	PRICE	AMOUNT / MONTANT
GAS			45.6
OR FUEL			
MISC. FEES			
TAX / TAXE			
TOTAL			20.00

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VEHICLE LICENSE NUMBER

CUSTOMER'S COPY

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# sandman INNS [

PHONE VANCOUVER 681-2211 FOR RESERVATIONS

211 ] PRG LTD. 60435

NAME T J ADAMSON

STREET 300-355 BURNARD ST

CITY VAN.

PROV BC

YEAR & MAKE OF CAR

ACT OR N.W.C.T. NO CYPRUS ANVIL MINING CORP

CAR LICENSE & PROV

	MON	TUES	WED	THURS	FRI	SAT	SUN	TOTAL
DATE			12/13/82	13/13/82				
ROOM			34.00	34.00				
TAX			2.01	2.04				
PHONE								
MEALS				16.95				
TOTAL			36.04	52.99				

MENT  
CLUDED  
AU RECT

ROOM NO 365	CASH	OUT	PHONE METER
NO. IN PARTY 1	CHARGE	IN	
		NO OF CALLS	



*T J Adams*  
SIGNATURE

TOTAL \$ 88.93

4510 407 169 600

# sandman INNS [

PHONE VANCOUVER 681-2211 FOR RESERVATIONS

511 ] PRG LTD. 60515

NAME T J ADAMSON

STREET 300-355 BURNARD ST

CITY VAN.

PROV.

YEAR & MAKE OF CAR

ACT OR N.W.C.T. NO CYPRUS ANVIL MINING

CAR LICENSE & PROV

	MON	TUES	WED	THURS	FRI	SAT	SUN	TOTAL
DATE	17/5/82	18/5/82	19/5/82	20/5/82			21/5/82	
ROOM	30.00	30.00	30.00	30.00			30.00	
TAX	1.90	1.90	1.90	1.90			1.90	
PHONE								
MEALS		10.95						
		8.50						
TOTAL	31.90	51.25	31.90	31.90			31.90	

REL  
D'AR

ROOM NO 363	CASH	OUT	PHONE METER
NO. IN PARTY 1	CHARGE VISA	IN	
		NO OF CALLS	



*T J Adams*  
SIGNATURE

TOTAL \$ 175.45

4510-407-169-600

Mr. T.J. Adamson  
3842 West 23rd Ave.  
Vancouver, B.C. V6S 1K9

March 10 1982

Pay to the order of Vanier Field Ltd \$ 216.90

Two Hundred + Sixteen 90 Dollars  
100

BANK OF MONTREAL  
Marine Building  
385 Burrard Street  
Vancouver, B.C. V6C 2J4

*T.J. Adamson*

RE: CYPRES ANNU SEED / FERTILIZER ORDER.

⑆07730⑆00⑆⑆ 3014⑆663⑆ ⑆0000021690⑆

⑆520⑆07⑆169⑆600  
09/83 VISA

THOMAS ADAMSON

ART KNAPP  
NURSERIES  
CLEARBROOK BC  
645267 CX0030

210582

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LE DETENTEUR DE LA CARTE PAIERA A LA BANQUE OUI A EUE LA CARTE ICY PRE-CHARGEX SENTES, LE MONTANT QU'INDIQUE CONFORMEMENT AUX CONDITIONS REGISSANT L'EMISSON DE CETTE CARTE AVEC LA BANQUE EMETTRICE.

SALES DRAFT	DATE	DEPT. RAYON	CLERK COSMIS	AUTHORIZATION NO D'AUTORISATION
FACTURE	3/21/82		E/C	
QUANTITY	DESCRIPTION	PRICE	AMOUNT - MONTANT	
	SEED SPREADER FERT		75.76	
	RE TURNER # 18			
CUSTOMER SIGNATURE DU CLIENT				TAX TAXE
X	<i>T.J. Adamson</i>		\$ CDN CAN 75.76	

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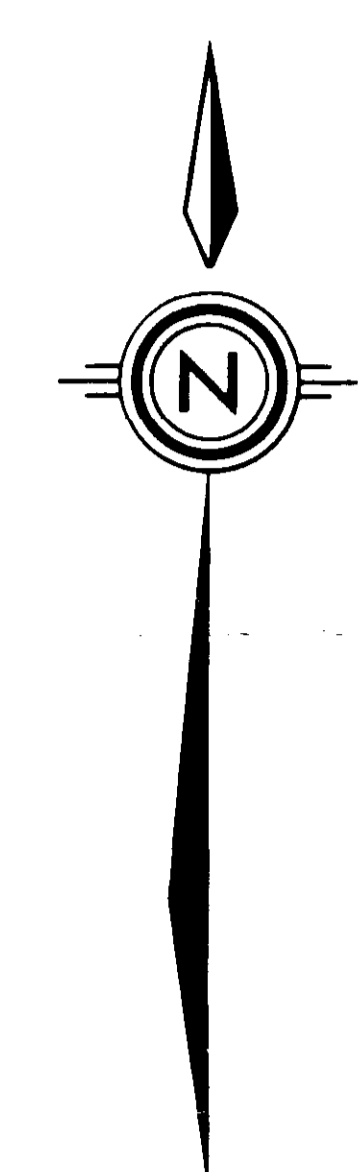
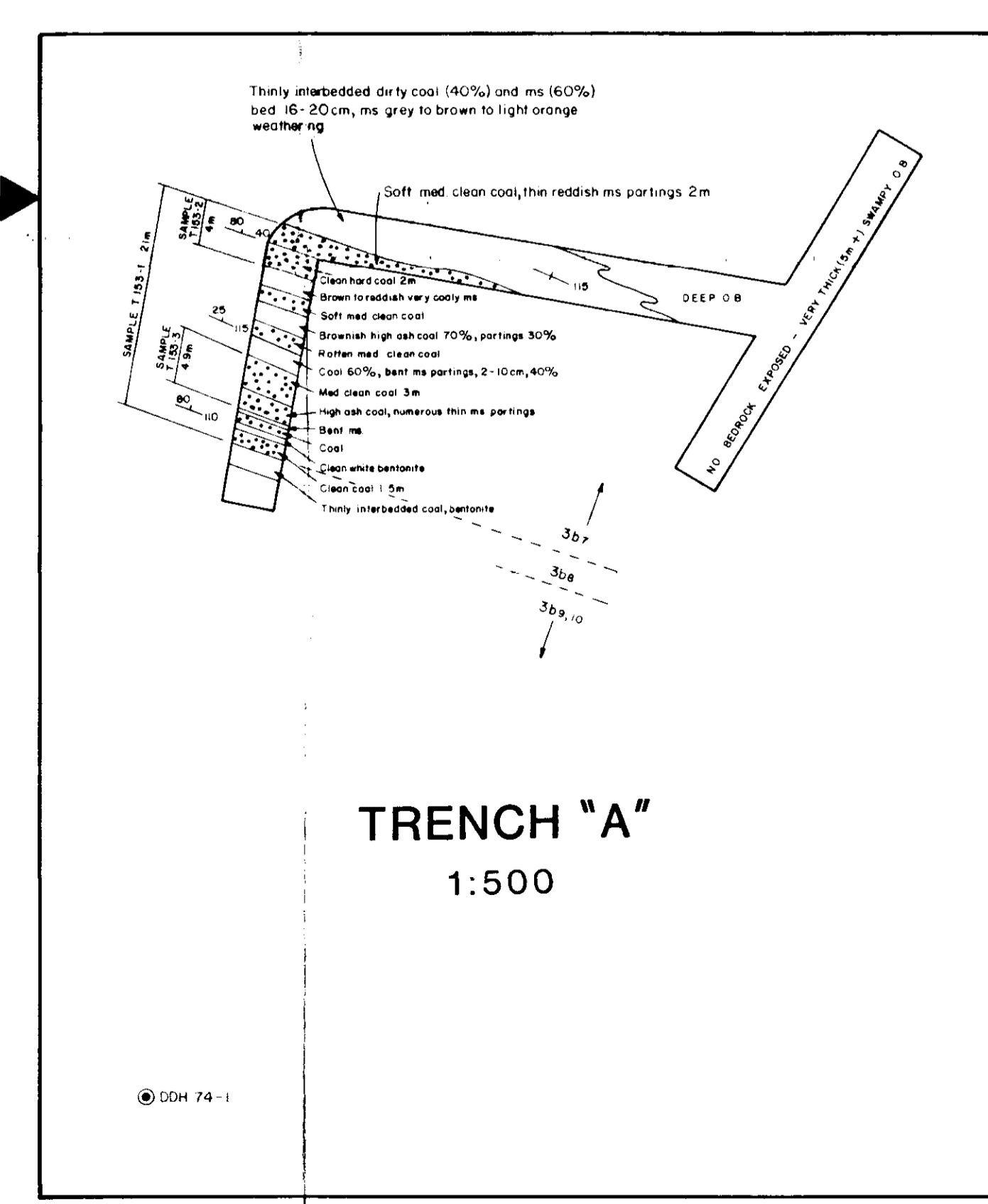
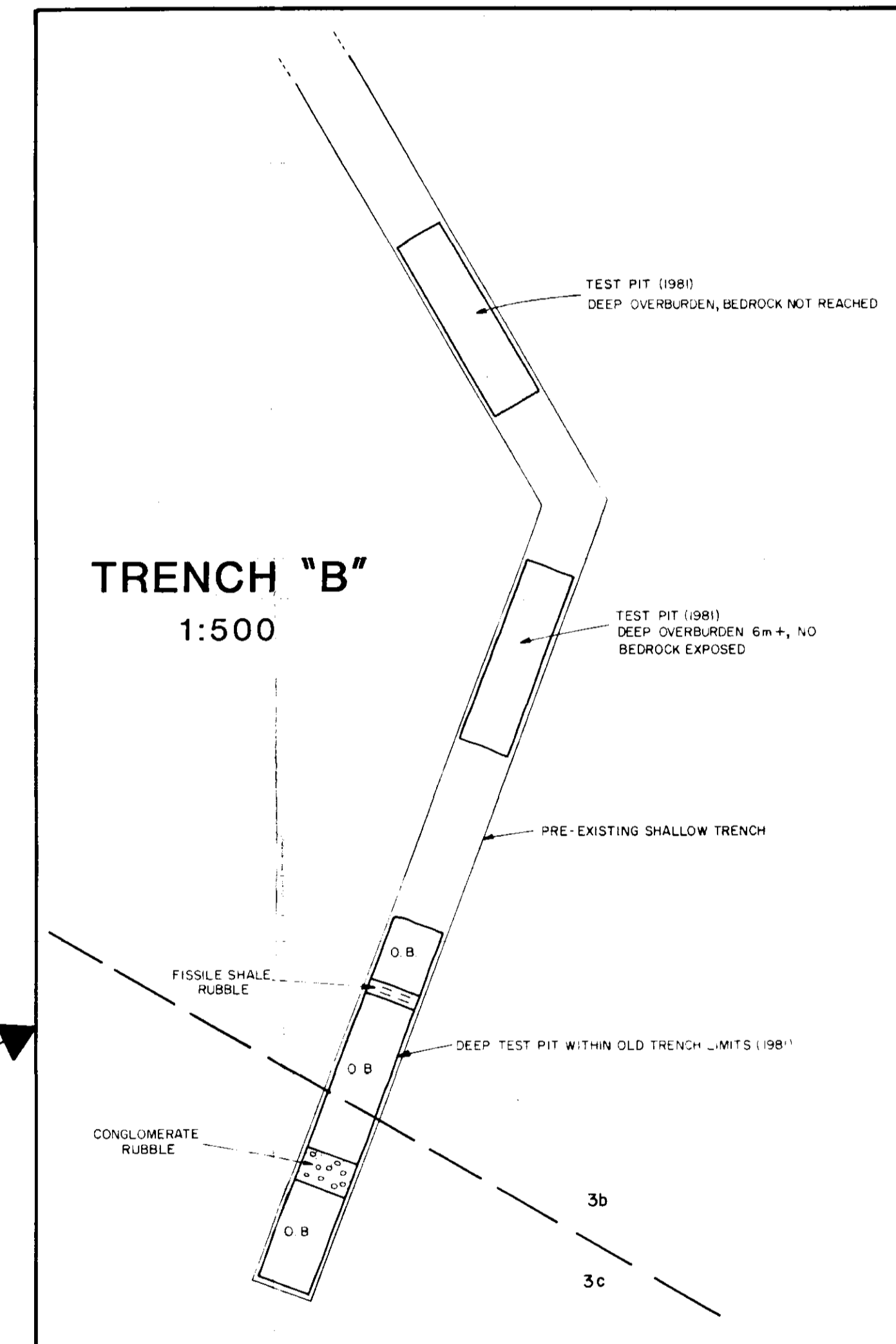
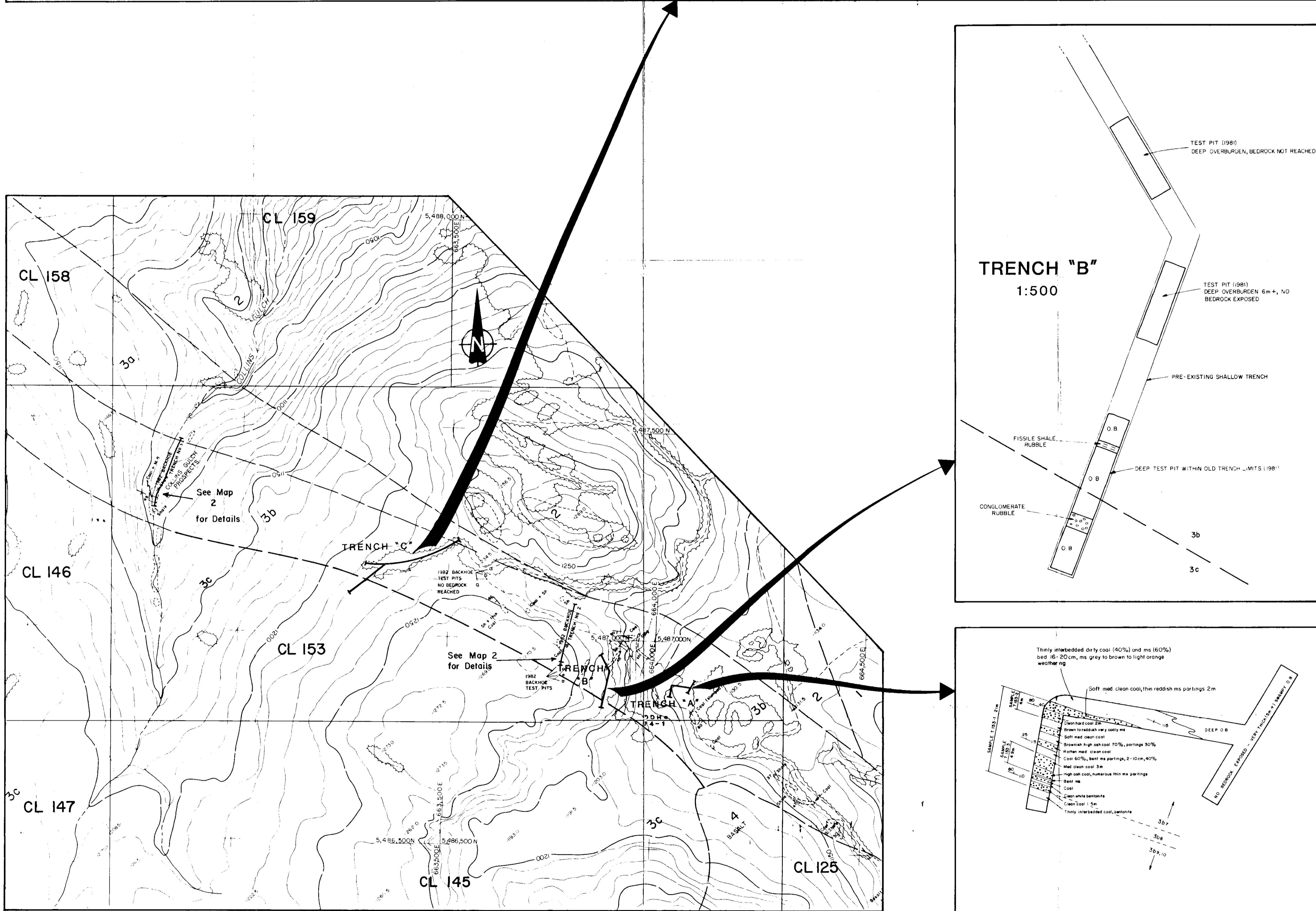
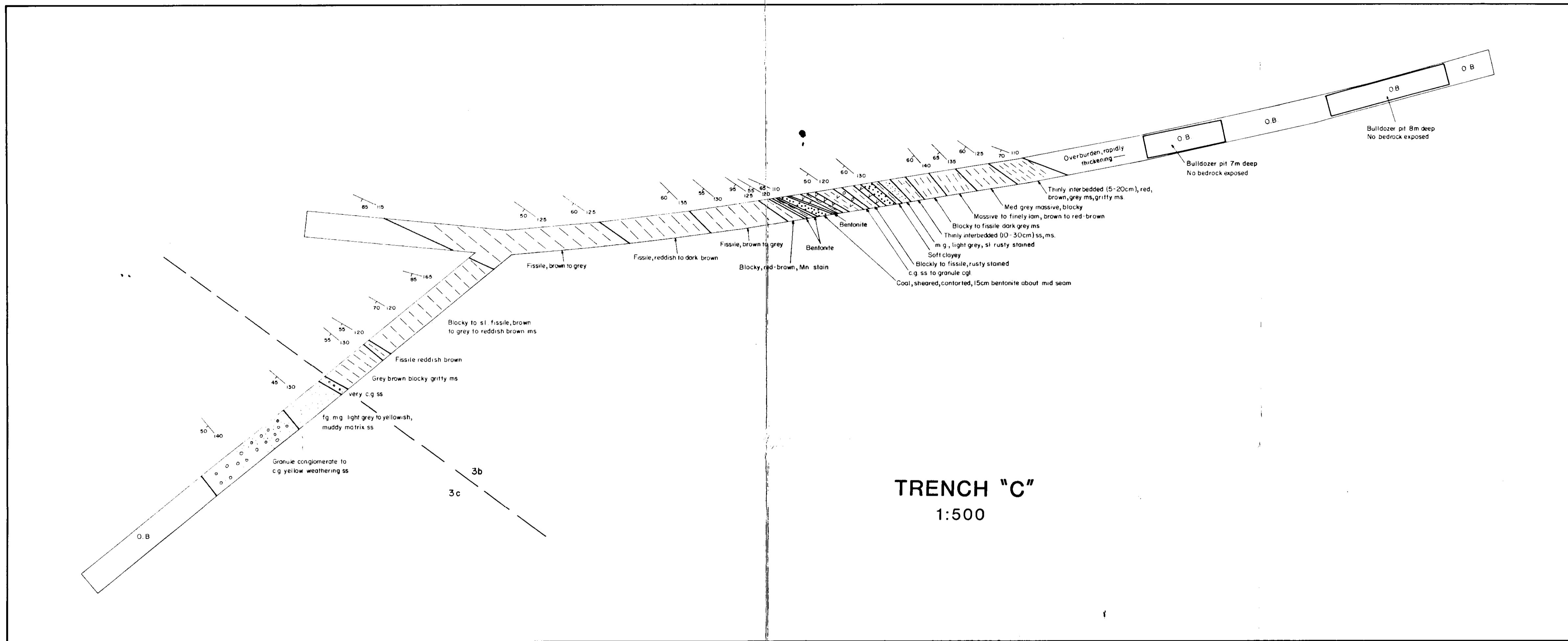
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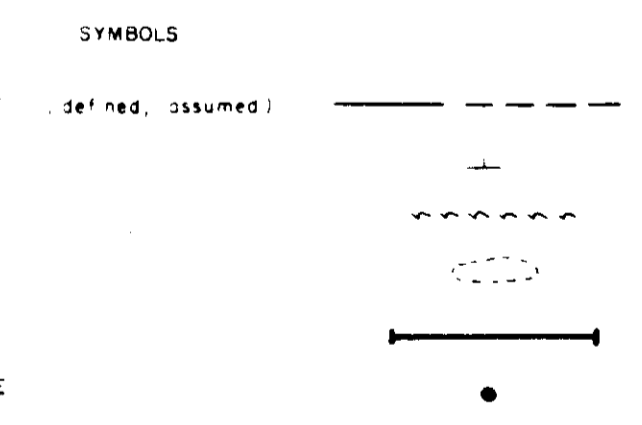




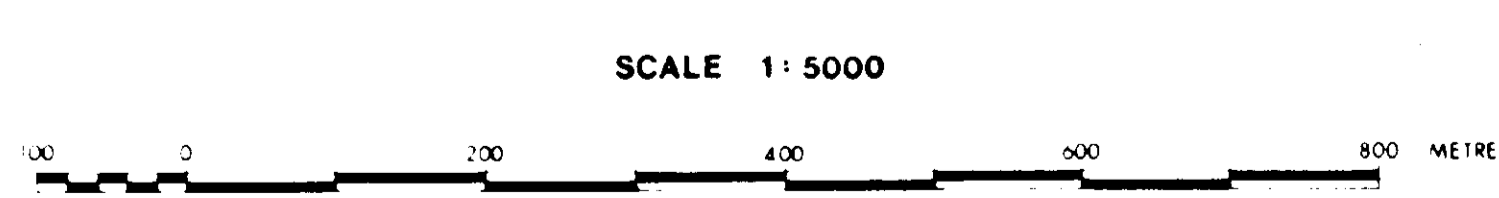


LEGEND

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  - Unconformity
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  - 3b9 Finely laminated, fissile shales
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- 2 LOWER VOLCANIC, Massive to porphyritic or fragmental, andesitic to felsitic
- UPPER TRIASSIC
- 1 NICOLA GROUP, Highly metamorphosed volcanic and sediments



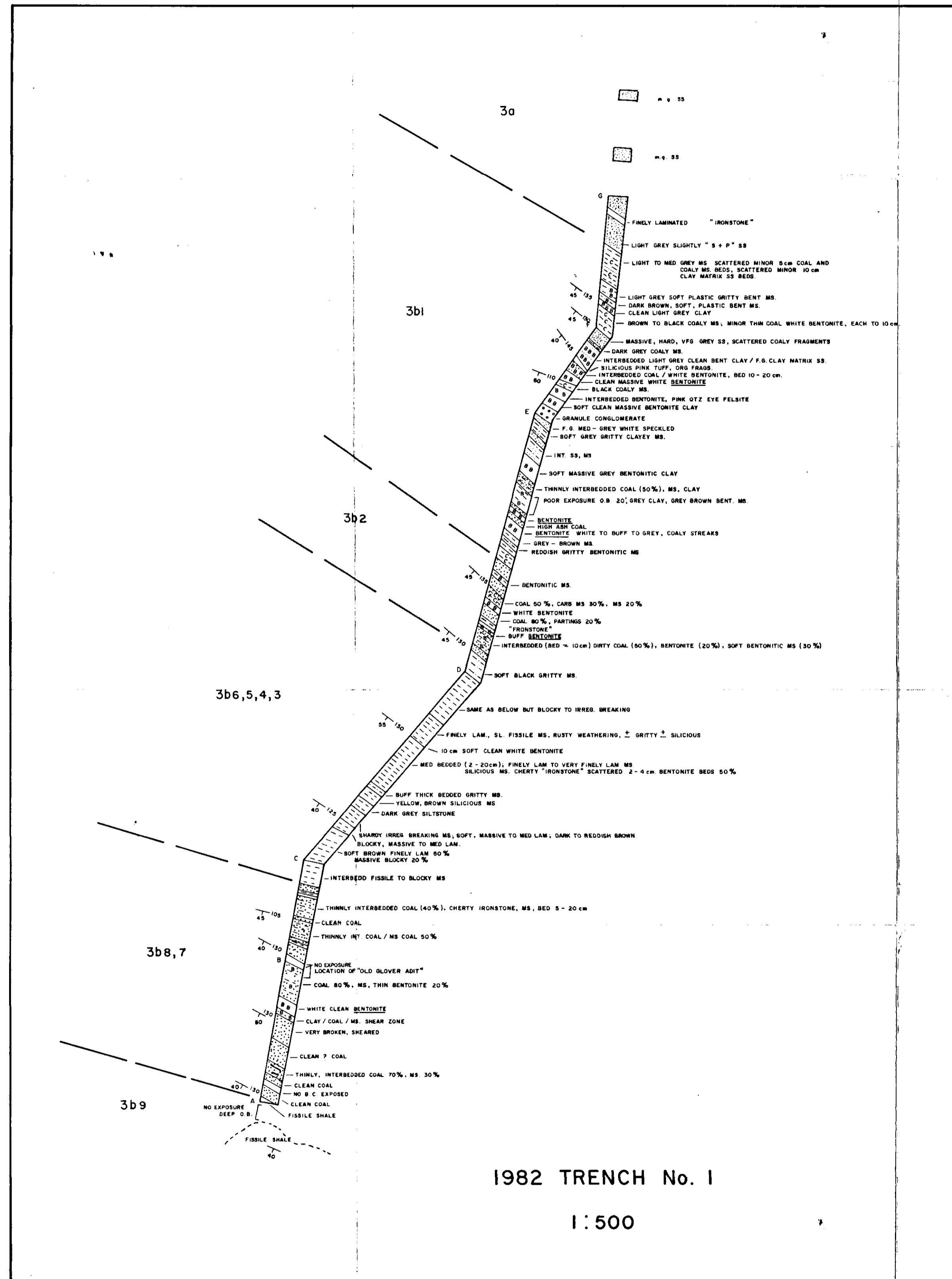
- TRENCH LITHOLOGY SYMBOLS
- OVERBURDEN
  - COAL
  - CARBONACEOUS MUDSTONE
  - MUDSTONE and SILTSTONE
  - GRITTY MUDSTONE
  - SANDSTONE
  - CONGLOMERATIC SANDSTONE
  - CONGLOMERATE



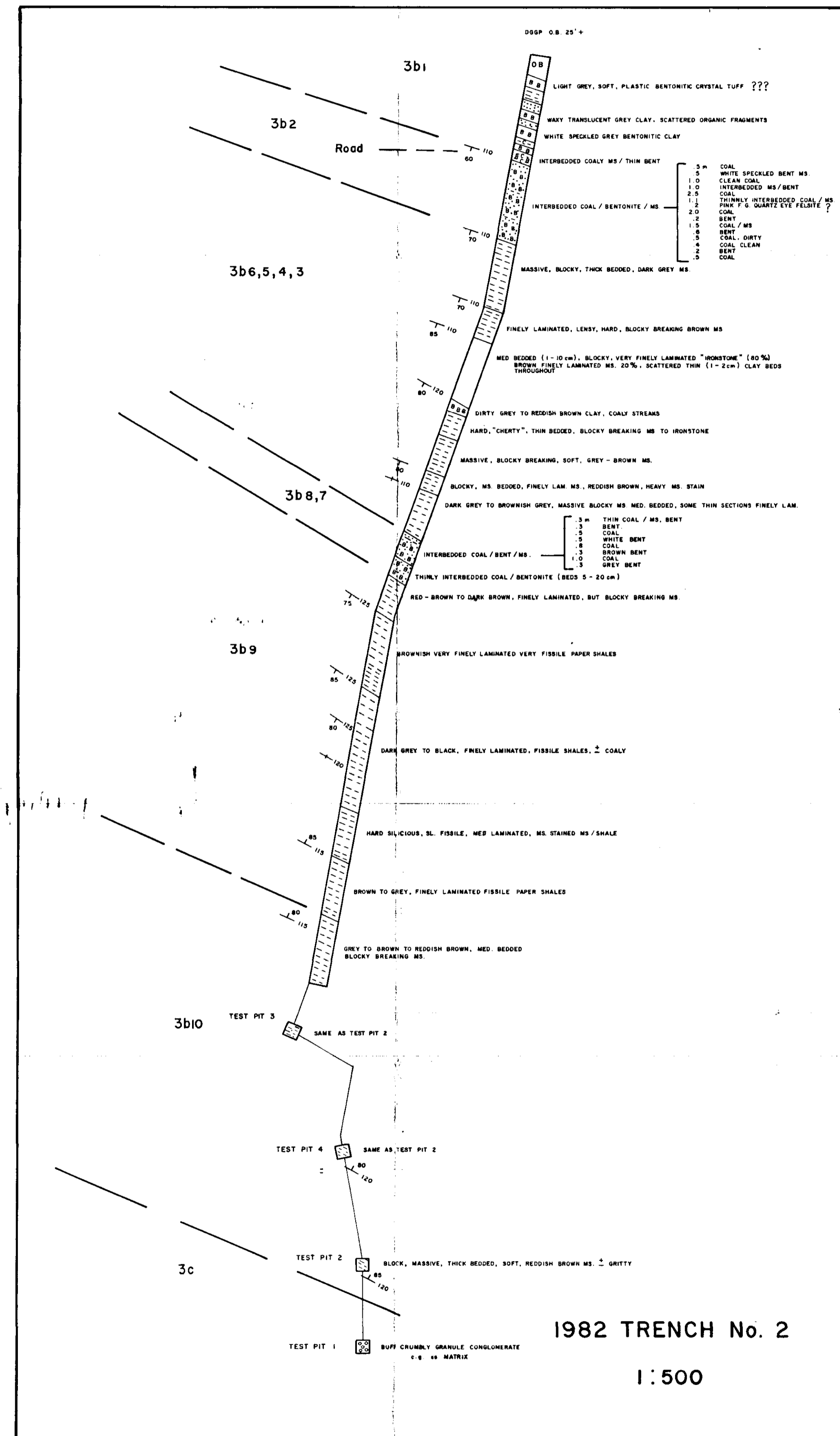
202

TK: Tulameen 32(2)A 52(1)

CYPRUS ANVIL MINING CORPORATION	
TULAMEEN COAL PROJECT	
BRITISH COLUMBIA	
1981 BULLDOZER TRENCHING	
COAL LICENCE # 153	
N.T.S. 92-H-7.10 SURVEY BY: T.A. [Signature] DRAWN BY: V.F.	DATE: AUG. 1981, AUG. 1982 MAP # 1



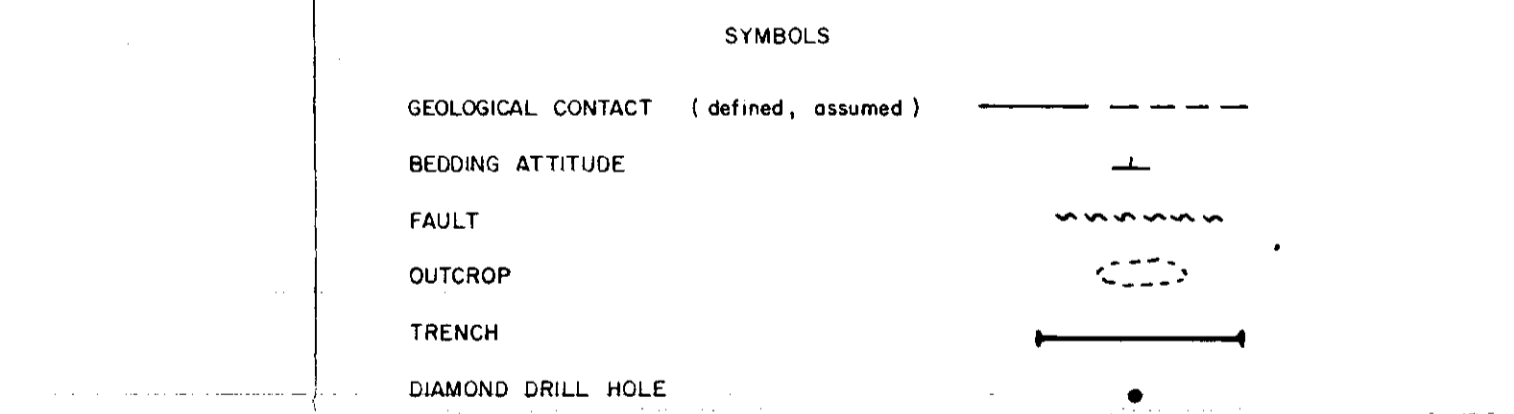
1982 TRENCH No. 1  
1:500



1982 TRENCH No. 2  
1:500

- LEGEND
- TERTIARY
- 4 UPPER VOLCANICS
    - Brown to black, fine grained basalt
    - Unconformity
  - 3 COAL BEARING TERTIARY SEDIMENTS
    - 3c UPPER SANDSTONES
      - 3ca Granule conglomerate, coarse sandstone, minor shale, mudstone
      - 3ci Transitional unit, interbedded sandstone, mudstone, minor thin coal.
    - 3b COAL MEMBER, Shales, mudstone, luffs, coal
      - 3bio Blocky breaking mudstone and shales
      - 3b9 Finely laminated, fissile shales.
      - 3ba Interbedded thin dirty coal, bentonite, shales, mudstones.
      - 3br Main coal seam (including interbedded volcanic horizons.)
      - 3bc Light grey, med grained sandstone, white muddy matrix
      - 3bd Dark grey, massive, blocky breaking mudstone.
      - 3be Distinctive color banded, light to dark grey, interbedded shales, mudstones, muddy sandstone.
      - 3bs Mudstone, medium brownish grey to dark grey massive to medium laminated.
      - 3bz Lower coal seam.
      - 3bi Interbedded fragmental bentonitic tuff, thin coal seams, coaly bentonitic mudstone.
  - 3a LOWER SANDSTONE, Coarse to fine sandstone, interbedded with mudstone and shale.
  - 2 LOWER VOLCANIC, Massive to porphyritic or fragmental, andesitic to felsitic.
  - Unconformity

- UPPER TRIASSIC
- 1 NICOLA GROUP, Highly metamorphosed volcanic and sediments.



- TRENCH LITHOLOGY SYMBOLS
- OVERBURDEN
  - COAL
  - CARBONACEOUS MUDSTONE
  - MUDSTONE & SILTSTONE
  - GRITTY MUDSTONE
  - SANDSTONE
  - CONGLOMERATIC SANDSTONE
  - CONGLOMERATE
  - BENTONITE or BENTONITIC

202

TK-Tulameen 82 (17A \*11)

CYPRUS ANVIL MINING CORPORATION	
TULAMEEN COAL PROJECT	
BRITISH COLUMBIA	
1982 BACKHOE TRENCHING	
NTS 92-H-7, 10 SURVEY BY: T.A. [Signature] DRAWN BY: C.L.C.	DATE: AUGUST, 1982 MAP No 2