BW- Bowron River TT (10) A.

TABLE OF CONTENTS

00015(01)

SECTION 1

ZULU EXPLORATIONS LTD. (N.P.L.)

PARTIAL SHAREHOLDERS LIST

NAME & ADDRESS	SHARE #	AMOUNT	
A.J. Garraway	1	192,500	
	2	102,500	
	26	95,000	
	27	35,000	
			425,000
J.D. Garraway 2101 McDonald Prince George BC	28	15,000	
Harvey Strang 5180 Wallace Dr. Delta BC	29	45,000	
	30	35,000	
W.D. Waines 2216 W. 15th Vancouver, B.C.	31	15,000	
	32	5,000	
R.S. McDonald 5209 Lynn Place Delta BC	33	7,500	
	34	2,500	
W. Wiedmann 4664 Willow Cr. West Vancouver, BC	35	7,500	
	36	2,500	
Kenneth G. Botte 2415 Millstream Rd. Victoria BC	00073	45,000	
Ray Bradley #311, 925 Esquimalt Rd. Victoria BC		16,000	
T.C. Allam 127-1 - 102 Ave. North Surrey BC	00063	14,000	
Joyce Lillian Price 2775 Vantelberg Cres. Victoria BC	00128	24,000	
	00129	50,250	
M.J. McNamara 849 Old Esquimalt Rd. Victoria BC	00121	28,000	
Ray Legate 2670 Capital Heights Victoria BC	00012	20,000	
Mrs. Elsa K. Johnston 4624 William Head Rd. Victoria BC		20,000	

George A. Gray 220 Bay Street Victoria, B.C.		24,000
Donald Deveau 2060 Sooke Rd. Victoria BC	00086	45,000
C.A. Price 2775 Vantilberg Cr. Victoria BC	00043 44	30,000 20,000
John Grzyb 108 Cariboo Tr. Park Prince George BC	00055 00056 0004 0003	100,000 30,000 90,000 100,000
Frank Losychuk c/o Grzyb 108 Cariboo Tr. Park Prince George BC	0027	60,000

ZULU EXPLORATIONS LTD. (N.P.L.)

SHAREHOLDERS' DATA

Information Circular

May 5, 1976

Shares outstanding	2,059,875
Shares held by Garraway	130,000
Shares held by John Grzyb	130,000

INFORMATION FROM NATIONAL TRUST

November 1976

A.J. Garraway	#1 - 192,500		
	#2 - 102,500		
	#26 - 95,000		
	#27 - 35,000		
		425,000	425,000
J.D. Garraway		15,000	15,000
John Grzyb	#00055 - 100,000		
	#00056 - 30,000		
	#0004 - 90,000		
	#0003 - 100,000		
		320,000	320,000
			760,000

It would appear that J.D. Garraway and family members owned at least 760,000 shares in Zulu Explorations Ltd. as of November 1976.

SECTION 2

Zulu Explorations Ltd. (N.P.L.)
725 Suffolk Street
Victoria, British Columbia
Phone 382-8666
January 5th, 1977

Mr. Morris M. Menzies, President
Norco Resources Ltd.
711 - 850 West Hastings Street
Vancouver, B.C.
V6C 1E2

Dear Mr. Menzies:

Re: Bowron River Coalfield
Coal and Minerals

Our letter of December 6, 1976, invited proposals of Norco, by which Zulu could acquire Norco's three coal licences and the division of title to the Bowron Coalfield could be avoided.

Doubtless you are aware that Zulu has applied for coal licences on the Bowron Coalfield - we emphasize this to make sure of your understanding. Also we stress that Zulu places little or only minor economic value, or other advantages on the coal reserves of Norco's licences, they are not necessary or even contributory to Zulu's enterprises, except in regard to the matter of bringing the total mineral resources of the Bowron Coalfield under a form of unified or co-operative development .

We interpret your reply of December 8th, 1976, "there will be no compromise on the Bowron Coal potential" as rejecting any co-operative agreement to develop the Bowron prospects. It would appear to be your decision to end the matter here. However, we will leave the door open for you to initiate any proposals which could lead to a fair and workable agreement between Norco and Zulu on the Bowron coal and mineral prospects.

Zulu has no plans to drill the radioactive shales under Norco's three coal licences at the present time or in the near future, for technical reasons. In addition, there is Norco's refusal to open negotiations on the Bowron prospects. Zulu intends to conduct its affairs accordingly.

If you wish to reconsider Norco's position, we would be interested in holding discussions with you.

On behalf of Zulu Explorations Ltd. (N.P.L.)

A. J. GARRAWAY
PRESIDENT

AJG:jk
c.c. The Honourable James Chabot
Minister of Mines

Dr. James T. Fyles
Deputy Minister of Mines

NORCO RESOURCES LTD.

711 - 850 West Hastings Street

Vancouver, B. C., V6C 1E2

December 8, 1976

C O P Y

Mr. A. J. Garraway
Zulu Explorations Ltd.
725 Suffolk Street
Victoria, B. C.

Dear Mr. Garraway:

Re: Bowron Mineral Properties
Your letter dated Dec. 6/76

As you know full well, 971 shareholders of Northern Coal Mines Ltd. supported you loyally over several years at great personal cost. Many of these people were then retired or approaching retirement and a regrettable number of them are now deceased.

The Norco management has a deep and unshakeable commitment to their shareholders, particularly the very old and the infirm. After many years of fading hope, and very real suffering for some, their reward is now within sight. I am pledged to see that they will not grow older or more infirm without a just return on an investment made in good faith so long ago.

You have misread me and my intent. There will be no compromise on the Bowron Coal potential but I stand ready, at a very small cost to the Zulu shareholders, to systematically drill off the radioactive shales which lie below the coal measures. All core recovered below the coal measures would be delivered to you or your representative at the drill site at only an incremental cost and not on a pro-rated basis. Thus Zulu's radioactive shales could be explored systematically at depth on a grid basis at a cost of less than 15 percent of any program undertaken directly by them.

Mr. Wilson is available at short notice to negotiate with you on the above basis but any agreement must be ratified by Norco's Board of Directors.

I wish you personally and all the shareholders of Zulu Explorations Ltd. (N.P.L.) a Merry Christmas and a happy and successful New Year.

Yours very truly,

M. M. Menzies
President

MMM/klw

c.c. The Honourable James Chabot
Minister of Mines & Petroleum Resources

Dr. James T. Fyles
Deputy Minister of Mines & Petroleum Resources

c.c. All Norco Directors

All Shareholders of Zulu Explorations Ltd.

Zulu Explorations Ltd. (N.P.L.)
725 Suffolk Street
Victoria, British Columbia
Phone 382-8666
December 6, 1976

Mr. Morris M. Menzies, President
Norco Resources Ltd.
711 - 850 West Hastings Street
Vancouver, B.C.

Dear Mrs. Menzies:

Re: Bowron River Coalfield
Coal and Minerals

Thank you for your letter of November 29, 1976, and your agreement to discuss the Bowron coal and mineral properties.

We will proceed on the understanding that Mr. John Wilson, Director and Secretary of Norco Resources Ltd., will represent Norco with the authority accredited by statement of your letter.

As you are aware from our former meeting of November 22nd, 1973, it is Zulu's intention to develop a producing mine on the Bowron property. This development may, or may not, depend on any agreement between Zulu and Norco.

The management and directors of Zulu are prepared to consider any reasonable and equitable proposal from Norco, whereby it would be possible for Zulu to acquire the three coal licences held by Norco, and whereby division of the coal titles to the Bowron Coalfield could be eliminated.

If Norco are willing to indicate their intent, or otherwise their views on the subject of discussions here proposed by Zulu, we can save much time.

We will be glad to have Norco's initial response to the basis of the proposed discussions. We would appreciate your reply by letter. If suitable we can then proceed directly to comprehensive discussions.

For meetings, we can suggest schedules from December 9th, which can be arranged by telephone.

Yours truly,

On behalf of Zulu Explorations Ltd. (N.P.L.)

A. J. Garraway
President

c.c. Mr. John Wilson
Director and Secretary
Norco Resources Ltd.

c.c. The Honourable James Chabot
Minister of Mines

c.c. Dr. James T. Fyles
Deputy Minister of Mines

NORCO RESOURCES LTD.

711, 850 W. Hastings St.
Vancouver, B.C., V6C 1E2
Phone 688-6231

November 29, 1976

Mr. A.J. Garraway
President
Zulu Explorations Ltd. (NPL)
725 Suffolk Street
Victoria, B.C.

Dear Mr. Garraway:

I am pleased to acknowledge your letter of November 23 and have considered its import.

As I will be away from my office a good deal of time over the next two months, I must ask Mr. John Wilson, Director and Secretary of Norco Resources Ltd., to make himself available for discussions with you.

You may contact him by letter at the Company's offices or phone him if you prefer.

Yours very truly

M. . Kenzies
President

M K/rbb

c.c. The Honourable James Chabot
Minister of Mines

Dr. James T. Fyles
Deputy Minister of Mines

Zulu Explorations Ltd (NPL)
725 Suffolk Street,
Victoria, British Columbia

Phone 382 - 8666

November 23rd 1976

Mr. Morris M. Menzies, President,
Norco Resources Ltd.,
711 - 850 West Hastings Street,
Vancouver, B.C.

Dear Mr. Menzies,

Bowron River Coalfield: Coal and Minerals

I write to follow up my letter to you of November 2nd, in which I had proposed discussions on behalf of Zulu and Norco to exchange views to possible agreements on developing coal and minerals in the Bowron coalfield.

We have not received any reply or form of acknowledgement to Date.

The reasons for Zulu's approach are obvious, in view of the ground shared by Norco's three coal licences and Zulu's mineral claims, and in view of Zulu's standing and current application for coal licences on the Bowron coalfield.

I would regard it as a kind consideration and condescension if you are interested to reply to our proposals of November 2nd, and would look forward to opening discussions with Norco as soon as possible.

Yours Truly,
On behlf of Zulu Explorations Ltd. (NPL)

A.J. Garraway,
President

c.c. The Honourable James Chabot
Minister of Mines

Dr. James T. Fyles
Deputy Minister of Mines

SECTION 3

ZULU EXPLORATIONS LTD (NPL)

DIRECTORS REPORT TO SHAREHOLDERS

May 5th, 1976

Although this Report is expected to cover the period from the last Annual Meeting held on May 2nd, 1975, to the forthcoming Meeting to be held on May 28th, 1976, we must consider all developments since July 31st, 1974.

At that time we were attempting to organize, and have the Securities Commission approve, a Rights Offering to the shareholders, in order to obtain funds to complete the drilling and work recommended by Zulu's consulting engineers, Dr. J.E. Hughes, Consulting Geologist, and H.S. Haslam, P.Eng., Consulting Coal Mining Engineer.

We were fortunate that certain of the Directors and shareholders advanced funds by way of loans to Zulu, so that the Company's properties could be maintained in good standing by continued drilling. A Resolution is being proposed at the Annual Meeting approving the issuance of shares to these Directors and shareholders, thereby discharging the Company's obligation to them. The Resolution also proposes approving the issuing of shares to Mr. Cy Keyes of Air Power Ltd., in partial reduction of the Company's debt to Air Power Ltd., for drilling services.

The Balance Sheet of the enclosed Financial Statement to November 30th, 1975, shows that advances from Directors and shareholders amounted to $58,375.00. Since then there have been further advances bringing the total to this date at $70,525.00.

Without these advances, Zulu would have been unable to record assessment work and pay rental on the mineral claims, and would have been in danger of losing this important property.

At July 31st, 1974, the Z5 and Z6 drill holes had been completed, and assessment work recorded and rental paid by August 14th, 1974, on the U.G. Group of 30 claims for two years. Also, the Z7 drill hole had been completed and assessment work recorded and rental paid by November 14th, 1974, on the LAD SIX Group of 40 claims, for two years.

WORK IN 1974

On July 31st, 1974, the Z10 drill hole was at a depth of 525 feet. This drill hole was completed to a depth of 818 feet, and assessment work work recorded and rental paid by August 21st, 1974, on the LAD FIVE GROUP of 40 claims, for one year.

In the Fall of 1974, the Z8 drill hole was put down 117 feet, the Z9 (1) 232 feet, and the Z9 drill hole completed to a depth of 815 feet, and assessment work recorded and rental paid on April 24th, 1975, on the LAD ONE GROUP of 40 claims for two years.

WORK IN 1975

In 1975, when drilling was resumed, the P(a) drill holes (see June Report) was drilled near the site of the Z10 drill hole. The P(a) drill hole was put down 615 feet, and assessment work recorded and rental paid by August 21st, 1975, on the LAD FIVE GROUP of 40 claims, for two years. This drill hole was extended down to a depth of 850 feet by November 1975.

. . . . 2

Without the advances from Directors and shareholders, it would have been impossible to carry out any drilling, and Zulu would have been obliged to pay $200.00 per claim in lieu of work, and $10.00 rental, on each claim, for each year.

Also, without the co-operation, understanding and trust, of Mr. Cy Keyes of Air Power Ltd., the owner of the diamond drill, it would have been impossible to carry out the drilling and maintain the property in good standing.

Zulu Explorations Ltd (NPL) hold 150 mineral claims in good standing to various dates from August 14th, 1976 to August 21st, 1977, as follows:

U.G. GROUP		ANNIVERSARY DATE
U.G. 1 - 6		August 14th, 1976
U.G. 7 - 12		September 17th, 1976
U.G. 13 - 18		October 24th, 1976
U.G. 19 - 30	30 CLAIMS	November 8th, 1976
LAD ONE GROUP		
LAD 1 - 22		
LAD 27 - 44	40 CLAIMS	April 24th, 1977
LAD FIVE GROUP		
LAD 89 - 110		
LAD 137 - 154	40 CLAIMS	August 21st, 1977
LAD SIX GROUP		
LAD 177 - 198		
LAD 199 - 216	40 CLAIMS	August 14th, 1976

On March 16th, 1976, Zulu renewed the applications for 10 coal licences of November 14th, 1974, and we were informed that the applications will be retained on file for future consideration.

WORK REQUIRED IN 1976

The foregoing table shows that assessment work must be recorded on the U.G. Group of 30 claims by August 14th, 1976, and on the LAD SIX Group of 40 claims by November 14th, 1976.

In their Reports, Dr. Hughes and Mr. Haslam recommend that a drill hole should be put down on each of these Groups of claims. We propose drilling these holes in the U.G. 24, and the LAD 181 mineral claims.

. . . . 3

At present the diamond drill is located on the P(a) drill hole on the LAD FIVE GROUP. The drill should not be moved until this drill hole, at a depth of 850 feet, is completed to 1,400 or 1,500 feet, as recommended by Dr. Hughes in his Report of June 1975.

The P(a) drill hole is located on the LAD 90 mineral claim, and is farther out into the valley plain to the northeast, and down dip, than any of the holes drilled by Zulu to date. The drill core at a depth of between 700 and 850 feet indicates that the strata has flattened to less than 10 degrees in this area.

This P(a) drill hole appears to confirm the findings of the other drill holes that the attitude of the seams under the valley plain, on the east side of the river, are comparatively flat.

Not only would the completion of these three drill holes provide valuable information on the Uranium / Germanium bearing shales, and the coal seams for our consulting engineers, but when recorded as assessment work would maintain 110 mineral claims in good standing for an additional two years. This means that two Groups of 70 claims would be protected until August and November 1978, and one Group of 40 claims until August 1979.

Failing to drill these three holes would result in Zulu having to pay $23,100.00 in lieu of work in order to maintain the 110 mineral claims in good standing for one year. In our opinion, the payment of such a large sum of money in lieu of work is foolish and wasteful, provides no information, and does not increase the value of the property.

In order that these three drill holes are completed on time, it is vitally important that drilling is resumed as soon as possible.

Reports prepared by Dr. J.E. Hughes and H.S. Halsm dated January and April 1975, respectively, were distributed to all of the shareholders of the Company. Enclosed is the Report by Dr. J.E. Hughes of June 1975.

The Directors and shareholders of Zulu are all well aware of the somewhat unique position of the Company with respect to its 150 mineral claims insofar as it has been necessary to first drill through coal seams in order to explore the underlying minerals in the shale seams. Although Zulu is the registered owner of all of its mineral claims, it does not hold any coal licences, and to date has not been able to obtain such licences. The Company is continuing its efforts to obtain coal licences covering that portion of its mineral claims which it feels are also prospective for coal, and the Company is optimistic that it will be able to obtain coal licences in that if production of coal and metals is attainable it would appear that any mining to exclude one or other as a consequence of the division of coal and mineral titles would lead to considerable difficulties in mining practice, increased costs and other factors which would not make separate production feasible.

Only Development Drilling and Underground Exploration can determine the feasibility of developing a mine into production.

. . . . 4

To finance the Development Drilling, followed by underground exploration, would require the participation of a major company.

In the meantime, the Directors with the support of all the shareholders must make every effort to complete the drilling recommended for 1976, and maintain the property in good standing.

Your Directors intend to keep in close contact with the Government in the hope that with the new coal policy, Zulu will be granted the necessary coal licences which will enable your Company to proceed with the development of your property without delay.

On Behalf of the Directors,

A. J. GARRAWAY,
President

ZULU EXPLORATIONS LTD (NPL)

NOTICE OF ANNUAL GENERAL MEETING

TO THE SHAREHOLDERS:

Notice is herby given that the Annual General Meeting of ZULU EXPLORATIONS LTD (NPL) will be held in the Goldstream Masonic Temple, 679 Goldstream Avenue, Victoria, B.C., on Friday, May 28th, 1976 at 8:30 p.m., Victoria time, for the following purposes:

1. To receive and approve the Annual Report of the Directors to the shareholders and the audited financial statements of the Company for the period from date of incorporation December 12th, 1972, to November 30th, 1975, together with the report of the Auditors theron.

2. To appoint Auditors and to authorize the Directors to fix the remuneration to be paid to the Auditors.

3. To receive the report of Dr. J.E. Hughes of June 1975.

4. To elect Directors.

5. To consider proposed Resolution.

6. To transact such other business as may properly come before the meeting.

Accompanying this Notice of Meeting is an Information Circular and Instrument of Proxy. If you are unable to attend the meeting in person, kindly read the Notes accompanying the Instrument of Proxy enclosed and complete and return the Proxy within the time and to the location set out in the said notes.

DATED at Victoria, B.C., this 5th day of May, 1976.

BY ORDER OF THE BOARD

A.J. Garraway

"A.J. GARRAWAY" President

ZULU EXPLORATIONS LTD (NPL)

INFORMATION CIRCULAR
AS AT MAY 5, 1976

REVOCABILITY OF PROXY

A member giving a proxy has the power to revoke it in any manner permitted by law.

PERSONS MAKING THE SOLICITATION

This Information Circular is furnished in connection with the solicitation by management of the Company of the proxies to be used at the Annual General Meeting of the Shareholders of Zulu Explorations Ltd (NPL) to be held in the Goldstream Masonic Temple, 679 Goldstream Avenue, Victoria, B.C., on the day, year and time as set out in the Notice attached, and the cost of the solicitation will be borne by the Company.

VOTING SHARES AND PRINCIPAL HOLDERS THEROF

The Company is authorized to issue 3,000,000 shares with a par value of 50¢ each, of which 2,059,875 shares are issued and outstanding.

The holders of these shares are entitled to one vote for each such share registered in their name.

To the knowledge of the Directors and Senior Officers of the Company, there are no persons or companies who or which beneficially own, directly or indirectly equity shares carrying more than 10% of the voting rights attached to all the shares of the Company.

ELECTION OF DIRECTORS

The Directors of the Company are elected annually and hold office until the next Annual General Meeting of the Shareholders or until their successors in office are duly elected. The management of the Company proposes to nominate the persons listed below for election as Directors of the Company to serve until their successors are elected or appointed. In the absence of instructions to the contrary, Proxies given pursuant to the solicitation by management of the Company will be voted for the nominees listed in the circular.

The following table sets out the names of the persons proposed to be nominees for election as Directors, the positions and offices which they hold with the Company, their respective principal occupations or employments, the period during which each has served as a Director of the Company, and the number of shares of the Company and its subsidiaries which each beneficially owns directly or indirectly.

10,000 10000
10000 20000
19,000. 9200
39000

NAME	PRINCIPAL OCCUPATION	DIRECTOR SINCE	SHARES OWNED BENEFICIALLY
ALFRED J. GARRAWAY	Mining Executive	December 12th, 1972	130,000
Cyril A. Price	Businessman	December 12th, 1972	77,500
John Grzyb	Mine Foreman	June 1973	130,000
Bernard Lake	Retired R.C.N.	May 1975	22,500
Ross Simms	Teacher	May 1975	30,000

APPOINTMENT OF AUDITORS

The person named in the enclosed form of proxy intends to vote for the appointment of Messrs. Peat, Marwick, Mitchell & Company, Chartered Accountants, as the Auditors of the Company.

OTHER MATTERS TO BE ACTED UPON AND INTEREST OF MANAGEMENT THERIN

The Shareholders are being asked to consent to a Resolution approving the issuance of shares for monies advanced by Directors and shareholders of the Company, and for drilling services provided by Mr. Cy Keyes of Air Power Ltd.

The Directors and certain shareholders of Zulu advanced the Company funds in the amount of $70,525.00. The Resolution proposes to cancel these advances by the issuing of 282,100 shares at $0.25 per share. The Resolution also proposes to issue 60,000 shares at $0.25 per share to Mr. Cy Keyes of Air Power Ltd., and thereby reduce Zulu's debt to Air Power Ltd by the sum of $15,000.00.

This Resolution is subject to the approval of the Securities Commission of British Columbia.

REMUNERATION OF MANAGEMENT

1. The only remuneration received by any present Director or Officer during the last fiscal year has been for services rendered by John Grzyb and Fred Garraway as driller and project manager respectively and not for services as Directors or Officers.

2. No pension or retirement benefit plans have been instituted by the Company and none is proposed at this time.

3. No remuneration has been paid to any senior officers of the Company or Directors of the Company pursuant to any plan or otherwise.

GENERAL

The management knows of no other matters other than those set forth in the Notice of Annual General Meeting which will come before the Shareholders of such Annual General Meeting but if any such matters should arise before the day of holding such meeting the shareholders will be informed.

ZULU EXPLORATIONS LTD. (N.P.L.)

Auditors' Report

Financial Statements - November 30, 1975

PEAT, MARWICK, MITCHELL & CO.
CHARTERED ACCOUNTANTS
Fifth Floor, Scotia Bank Building
1488 Fourth Avenue
Prince George, British Columbia

AUDITORS' REPORT

The Shareholders
Zulu Explorations Ltd. (N.P.L.)

We have examined the balance sheet of Zulu Explorations Ltd. (N.P.L.) as at November 30, 1975 and the statements of deferred exploration and development costs and changes in financial position for the year then ended. Our examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as we considered necessary in the circumstances except as referred to in the following paragraph.

We were unable to satisfy ourselves as to the carrying value if any of the mining claims and deferred exploration and development costs included in the accompanying balance sheet in the amount of $419,693. In addition, the carrying value is dependent upon the company's ability to obtain funds in order to carry out sufficient work to keep the claims in good standing as set out in Note 2 to the financial statements.

Because of the possible effect of any adjustments which might have been required had we been able to satisfy ourselves as to the carrying value of the mining claims and deferred exploration and development costs, we are unable to express an opinion on the financial position of the Company as at November 30, 1975 or the changes in financial position for the period then ended. In our opinion, however, cash, equipment, accounts payable and accrued expenses, advances from directors and shareholders and capital stock of the Company as at November 30, 1975 are presented fairly in the balance sheet in accordance with generally accepted accounting principles. In addition, the statement of deferred exploration and development costs presents fairly the costs which were incurred during the year ended November 30, 1975.

Peat, Marwick, Mitchell & Co.

Prince George, British Columbia
February 3, 1976

Chartered Accountants

ZULU EXPLORATIONS LTD. (N.P.L.)

Balance Sheet

November 30, 1975

(With comparative figures for 1974)

Assets	1975	1974
Current assets:		
Cash	$ 521	60
Refundable licence application fees	-	6,400
Total current assets	521	6,460
Equipment, at cost	1,585	-
Less accumulated depreciation	143	-
	1,442	-
Mining claims and deferred exploration and development costs, at cost (Notes 1 and 2):		
Expenditures and value of work prior to incorporation	122,750	122,750
Costs since incorporation, per accompanying statement	296,943	202,717
	419,693	325,467
	$ 421,656	331,927
Liabilities and Shareholders' Equity		
Current liabilities:		
Bank loan	$ -	2,000
Accounts payable and accrued expenses (Note 3)	112,365	61,836
Advances from directors and shareholders	58,375	17,175
Total current liabilities	170,740	81,011
Shareholders' equity:		
Capital stock (Note 3):		
Common shares of par value of $.50 per share. Authorized 3,000,000 shares; issued 1,200,000 shares	127,500	127,500
Shares subscribed for, allotted and unissued	123,416	123,416
	250,916	250,916
	$ 421,656	331,927

See accompanying notes to financial statements.

On behalf of the Board:

A.J. Garraway Director

G.A. Pine Director

ZULU EXPLORATIONS LTD. (N.P.L.)

Statement of Changes in Financial Position

Year ended November 30, 1975

	Year ended November 30, 1975	December 12 1972 to November 30, 1974	December 12 1972 to November 30, 1975
Source of funds:			
Consideration received for shares (Note 3):			
Shares issued	$ -	127,500	127,500
Shares subscribed for, allotted and unissued	-	123,416	123,416
	-	250,916	250,916
Application of funds:			
Mining claims and deferred exploration and development costs (Notes 1 and 2)	94,226	325,467	419,693
Less depreciation	143	-	143
	94,083	325,467	419,550
Purchase of equipment	1,585	-	1,585
	95,668	325,467	421,135
Increase in working capital deficiency	95,668	74,551	170,219
Working capital deficiency, beginning of period	74,551	-	-
Working capital deficiency, end of period	$ 170,219	74,551	170,219

See accompanying notes to financial statements.

ZULU EXPLORATIONS LTD. (N.P.L.)

Statement of Deferred Exploration and Development Costs

Year ended November 30, 1975

	Year ended November 30, 1975	December 12 1972 to November 30, 1974	December 12, 1972 to November 30, 1975
Accounting and audit	$ 2,972	3,656	6,628
Assays	500	144	644
Bank charges and interest	195	168	363
Consulting	3,614	4,679	8,293
Drilling expense, rental, bits and supplies	39,545	64,077	103,622
Camp expenses	4,498	8,635	13,133
Fuel	4,317	5,101	9,418
Legal	6,051	3,200	9,251
Miscellaneous	1,345	1,308	2,653
Office and telephone	1,391	4,060	5,451
Rental, recording assessment work and licences	2,048	7,876	9,924
Repairs and maintenance	-	1,024	1,024
Travel	194	3,740	3,934
Truck lease and expense	2,347	5,164	7,511
Wages, management fee and benefits	25,209	89,885	115,094
	$ 94,226	202,717	296,943

See accompanying notes to financial statements.

ZULU EXPLORATIONS LTD. (N.P.L.)

Notes to Financial Statements

November 30, 1975

1. Significant accounting policies:

   It is the company's policy to consider all expenses, including administration, as deferred exploration and development costs until a decision is made as to whether a mining operation is viable. When such a decision is made, these costs will be amortized against future revenues of such property. If, on the other hand, the costs did not develop a viable mining property they would be written off to deficit.

2. Mining claims and deferred exploration and development costs:

   The deferred exploration and development costs relate to two groups of mineral claims recorded as the U.G. group of 30 claims and the Lad group of 120 claims. The company is required to carry out assessment work in the amount of or pay fees of $200 per claim each year in order to keep the claims in good standing. As of November 30, 1975, assessment work and rentals on these claims were in good standing to various dates from August 14, 1976 to August 21, 1977.

   The expenditures and value of work done by the vendors (certain shareholders of the company who were the original owners of mining claims) prior to incorporation totalling $122,750, represents monies spent by them in the amount of $38,700, the value attributed to exploration and development work done by them in the amount of $46,550 and the value attributed to shares issued for transfer of the mining properties in the amount of $37,500.

3. Share capital:

   From incorporation 2,059,875 shares have been subscribed for and allotted as follows:

	Shares	Par Value	Discount	Consideration
750,000 vendor shares for transfer of certain mining properties, the value assigned to the property and the shares is $.05 per share	750,000	$ 375,000	337,500	37,500
454,500 shares in consideration of cash of $49,400 and value of development work carried out of $46,550	454,500	227,250	131,300	95,950

ZULU EXPLORATIONS LTD. (N.P.L.)

Notes to Financial Statements

November 30, 1975

3. Share capital (continued):

	Shares	Par Value	Discount	Consideration
855,375 shares for cash consideration	855,375	427,687	310,221	117,466
	2,059,875	1,029,937	779,021	250,916
Less 750,000 vendor shares and 450,000 treasury shares issued	1,200,000	600,000	472,500	127,500
Shares subscribed for, allotted and unissued	859,875	$ 429,937	306,521	123,416

The 1,200,000 issued shares are subject to an escrow agreement which restricts the sale of the shares.

Mr. C.C. Keyes, President of Air Power Limited, the largest creditor of the company, has agreed to purchase 60,000 shares at twenty-five ($.25) cents per share, for a total of $15,000 to be applied to reduce the company's account. To date no shares have been allotted to Mr. Keyes.

4. Statutory information:

Remuneration paid or payable to the five highest paid employees of the company, including directors and senior officers, amounted to $25,000 for the year ended November 30, 1975.

ZULU EXPLORATIONS LTD. (N.P.L.)

Victoria, B.C.

INFORMATION ON APPLICATION
TO THE
BRITISH COLUMBIA SECURITIES COMMISSION

June 1975

J.E. Hughes, P. Eng.

TELEPHONE
(604) 477-4228

4155 LONG VIEW DRIVE
VICTORIA, BRITISH COLUMBIA

J. E. HUGHES
CONSULTING GEOLOGIST

PROPOSAL TO ADDITIONAL EXPLORATION, 1975

Zulu Explorations propose an addition to their 1975 exploration programme (- as set out in the Report: Information to the British Columbia Securities Commission for a Rights Offering: J.E. Hughes, and H.S. Haslam; January 1975). The proposal is for drilling a third location, P (a), illustrated in Figure 1.

This addition follows earlier recommendations made by the consultants, H.S. Haslam, and J.E. Hughes, in their planning of the 1975 exploration, December 1974 (see Figure 3).

The proposal for drilling, location P (a) can be described, as follows:

SPECIFICATIONS

(1) Location, - Lad 90 Claim, or adjacent in the Lad Five Group of Claims - as shown in Figure 1.

(2) Drilling to be carried into the base of the Tertiary beds underlying the coal measures, - estimated depth of 420 to 460 metres (1,400 to 1,500 feet).

(3) Beds of economic interest, including the radioactive shale zone to be cored: cores to be assayed, as appropriate.

COSTS

The estimated cost of drilling location P (a), and related work (assays, logging, etc.) is $25,000.

REMARKS

(1) The drill location P (a), is planned to determine structure, stratigraphy, and the distribution and grade of uranium and germanium: and to test the projected flexure and change of bedding to lower dips in subsurface to the northeast of the Bowron River.

(2) The proposed drilling, location P (a) will replace drillhole Z10 which was abandoned at 260 metres (850 feet), at entry into the coal measures, due to compounding difficulties brought on by caving in loose shales under the casing.

(3) The proposed drilling, location P (a) is considered adviseable in order to meet requirements of assessment work, and thereby achieve economy and useful work instead of payment to rentals: the record for assessment work on the 40 Claims of Lad Five Group is due, August 21/75.

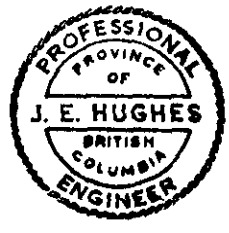
(4) In view of the required assessment work, it will be necessary for Zulu to adjust schedules, and the sequence of its drilling in the 1975 exploration programme, for the proposed additional drill hole, location P (a), to be drilled first, and to be completed by August 21/75.

PLANS

Figure 1. Proposed Drill Hole
Addition to Exploration Programme 1975

Figure 2. Drilling 1973 and 1974

Figure 3. Proposed Drill Locations, December 1974



J.E. Hughes, Ph,D., P.Eng.
Consulting Geologist
Victoria, B.C.

June 30th 1975

Figure 1

Zulu Explorations Ltd. (NPL)
BOWRON PROPERTY
ADDITION TO EXPLORATION 1975
July 1975

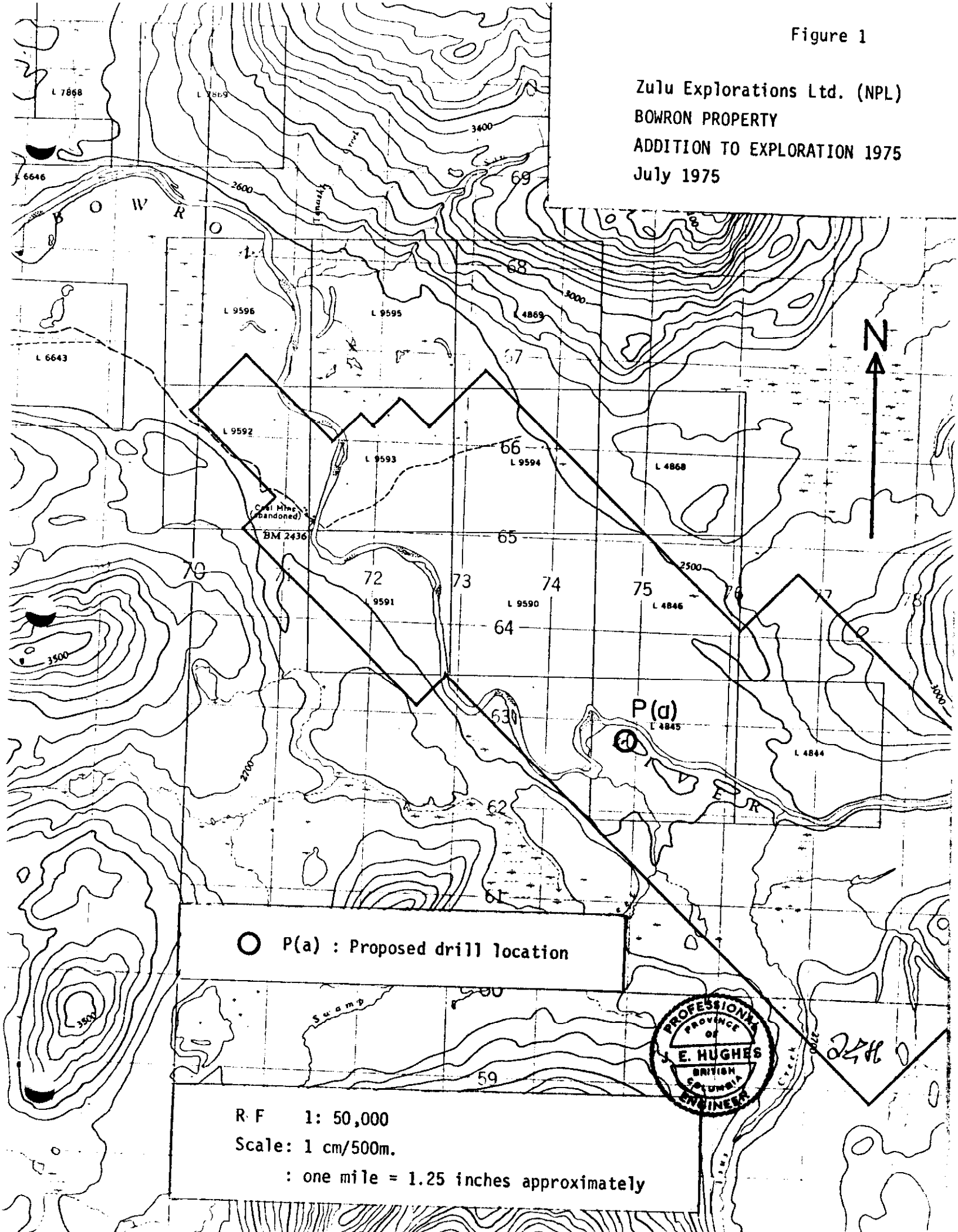
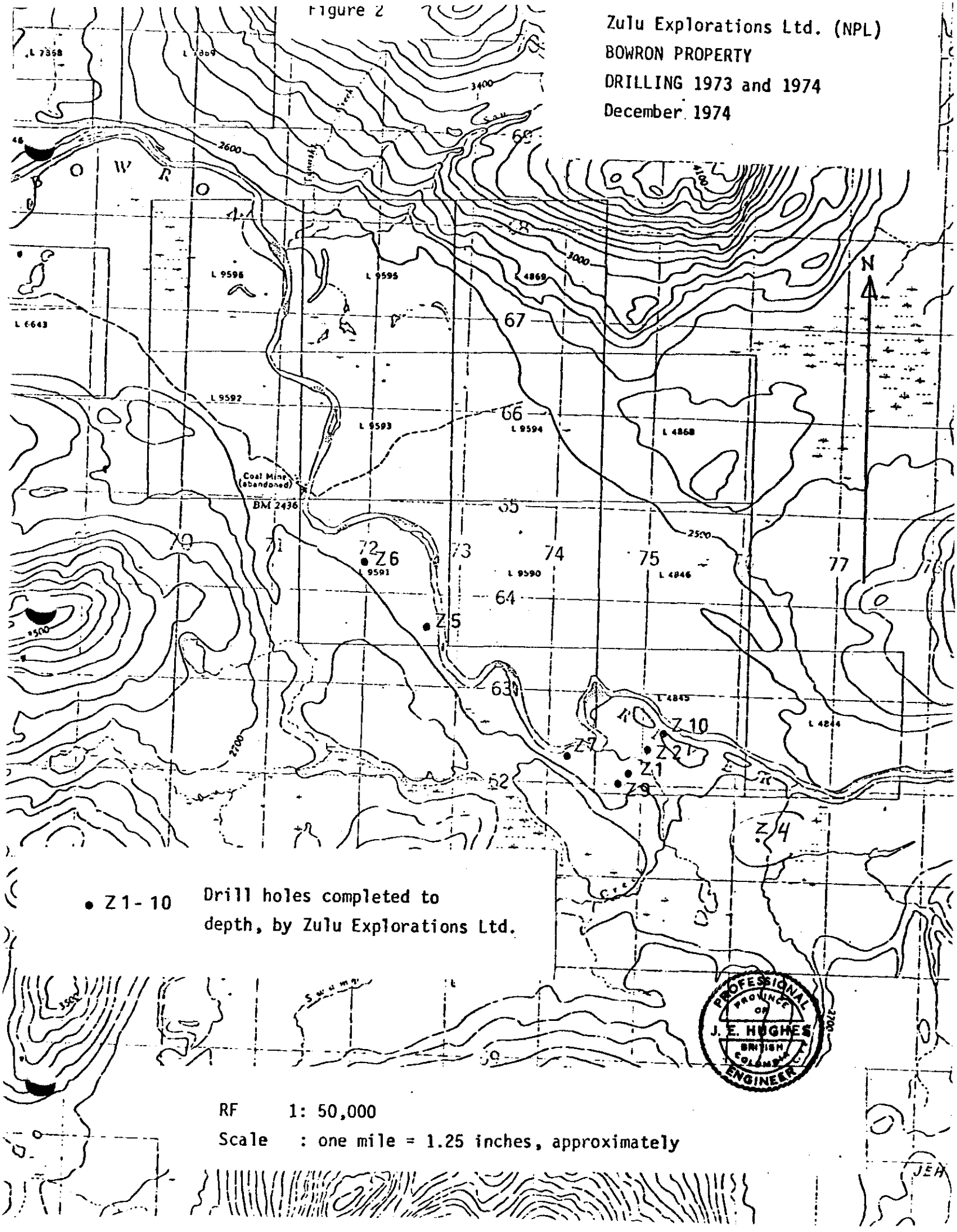


Figure 2

Zulu Explorations Ltd. (NPL)
BOWRON PROPERTY
DRILLING 1973 and 1974
December 1974

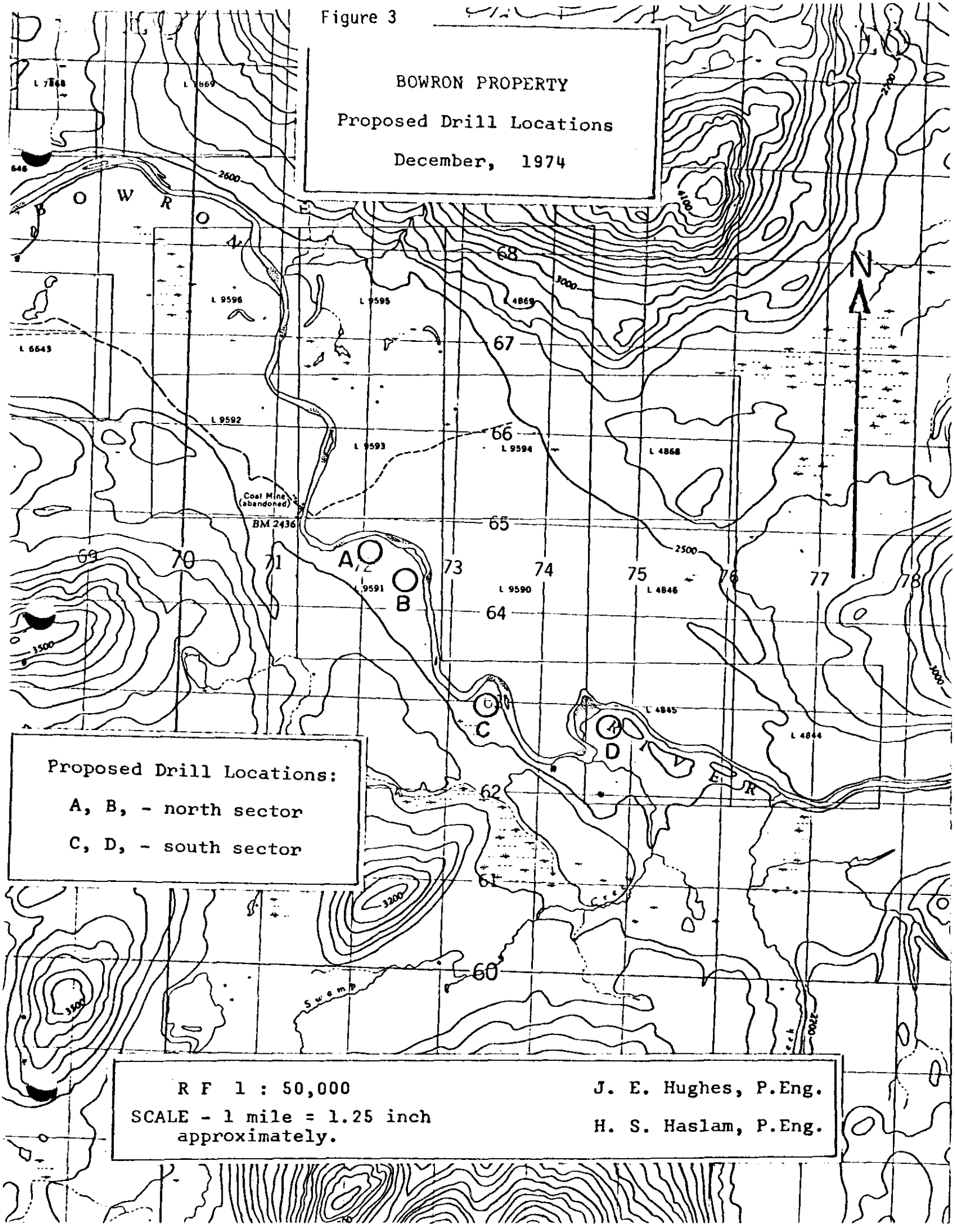


• Z1-10 Drill holes completed to depth, by Zulu Explorations Ltd.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
J. E. HUGHES

RF 1: 50,000
Scale : one mile = 1.25 inches, approximately

Figure 3


BOWRON PROPERTY
Proposed Drill Locations
December, 1974
B O W R O
N
Coal Mine (abandoned)
BM 2436
A
B
C
D
RIVER
Swamp
Proposed Drill Locations:
A, B, - north sector
C, D, - south sector
R F 1 : 50,000
SCALE - 1 mile = 1.25 inch approximately.
J. E. Hughes, P.Eng.
H. S. Haslam, P.Eng.

SECTION 4

on the understanding that the mine would be closed and all creditors paid immediately.
On the 5th. of August 1966 I learned that work was still in progress at the property and that no serious attempt had been made to pay trade accounts. I immediately submitted my resignation to the Board of Directors of Northern Coal and indicated that since I expected neither payment for nor return of the stock I was now ~~credit~~ considering the the transaction a transfer.
I strongly disagree with the company management.

FORM 15

THE GOVERNMENT OF THE PROVINCE OF BRITISH COLUMBIA

SECURITIES ACT, 1967

Report of Insider on Changes in Ownership of Capital Securities

1. Name of corporation of which the undersigned is insider NORTHERN COAL MINES LTD.

2. Full name of the undersigned MORRIS McCALLUM MENZIES

3. Business address of the undersigned 401-111 WEST HASTINGS STREET, VANCOUVER 1, B.C.

4. Indicate in what capacity or capacities the undersigned qualifies as an insider (*see* instruction 3) MAJOR SHARE HOLDER

5. Information given for calendar month of AUGUST 1968

6. Changes during month in the undersigned's direct or indirect beneficial ownership of capital securities of corporation:—

Designation of Security (*See* instruction 5.)	Date of Purchase or Sale Transaction (*See* instruction 6.)	Amount or Number Purchased or Otherwise Acquired (*See* instruction 7.)	Amount or Number Sold or Otherwise Disposed Of (*See* instruction 7.)	Price per Share or Unit at Which Sold or Purchased or Otherwise Acquired or Disposed Of	Nature of Ownership (*See* instruction 8.)
Common	5 August 68	~~20,000~~	20,000	Nil	Direct *

7. Capital securities of corporation beneficially owned directly or indirectly by the undersigned at end of month:—

Designation of Security (*See* instruction 5.)	Amount or Number (*See* instruction 7.)	Nature of Ownership (*See* instruction 8.)
Common	102,187 escrow	Indirect (M.M. MENZIES holdings Ltd.)
Common	1,500	Direct

8. Additional remarks I served since October 1967 as a director of Northern Coal at the request of Pacex Mines Ltd., a major shareholder.

I loaned the above 20,000 shares to the directors of Northern Coal on or about July 19, 1968

(over)

The undersigned hereby certifies that the information given in this report is true and complete in every respect.

10th September 1968 (Date of report.)

M.M. Menzies (Signature.) (See instruction 11.)

It is an offence under the *Securities Act, 1967*, to file a false or misleading report.

See reverse side of this form for instructions.

VOLUME I

SUMMARY REPORT

- OF A -

DEVELOPMENT DRILLING PROGRAMME (1977)

- ON THE -

BOWRON RIVER COAL DEPOSIT

- FOR -

NORCO RESOURCES LTD.,

#2050 - 200 GRANVILLE STREET,

VANCOUVER, B. C.

015

PREPARED BY

KERR, DAWSON & ASSOCIATES LTD.
1 - 219 Victoria Street
Kamloops, B.C.
JOHN R. KERR, P. ENG.,
JANUARY 5TH., 1978.

00015(02)

BW - Bowron River 77 (1) B.

OPEN FILE

JOHN R. KERR, P.ENG.
GEOLOGICAL ENGINEER

9 – 219 VICTORIA STREET
KAMLOOPS, B.C.

PHONE (604) 374-5427

January 5th., 1978.

The Board of Directors,
Norco Resources Ltd.,
#2050 - 200 Granville Street,
VANCOUVER, B. C.

GENTLEMEN:

I am pleased to submit five copies of my final report regarding the 1977 Field Programme on the Bowron River Coal Property.

The report is submitted in three volumes:

VOLUME I - Written Text of report, with small maps and appendices.

VOLUME II - 1:1,000 scale sections, with ore reserve calculations.

VOLUME III - Appendix G - Geological Logs

Only one copy of Volume III is submitted to alleviate unnecessary reproduction. This volume does not need to accompany all reports.

The report incorporates conversion to the metric system. As the programme was completed using American Standards of measurements, reference is made to feet, inches, etc.; however, where confusion may exist, both measurement standards are referred to.

I must apologize for any ambiguity that may arise in retaining the use of American weight standards (BTU/lb; pounds), when reference is made to the value of coal and resin, while converting

to the metric tonne in ore calculations. The reason for this is that the marketing of these products are done under American weight standards in the North American continent.

I wish to express my appreciation to the Board of Directors of Norco for entrusting this project and compilation to the staff of Kerr, Dawson and Associates Ltd.

Yours very truly,

KERR, DAWSON & ASSOCIATES LTD.,

John R. Kerr, P. Eng.,
GEOLOGIST

JRK:rd

Encl.

SUMMARY REPORT

- OF A -

DEVELOPMENT DRILLING PROGRAMME (1977)

- ON THE -

BOWRON RIVER COAL DEPOSIT

- FOR -

NORCO RESOURCES LTD.,

#2050 - 200 GRANVILLE STREET,

VANCOUVER, B. C.

PREPARED BY:

KERR, DAWSON & ASSOCIATES LTD.,
#1 - 219 VICTORIA STREET,
KAMLOOPS, B. C.
JOHN R. KERR, P. ENG.,
JANUARY 5TH., 1978.

INDEX

LIST OF APPENDICES:

LIST OF MAPS:

GEOLOGICAL SECTIONS:

ORE RESERVE SECTIONS (VOLUME II):

Figure 152-13 - Section 24 + 00N

Figure 152-14 - Section 25 + 50N

Figure 152-15 - Section 27 + 00N

Figure 152-16 - Section 28 + 50N

Figure 152-17 - Section 30 + 00N

Figure 152-18 - Section 31 + 50N

Figure 152-19 - Section 33 + 00N

Figure 152-20 - Section 34 + 50N

Figure 152-21 - SURVEY MAP

SUMMARY

During 1977, Norco Resources Ltd. completed a development drilling programme on three coal licences in the Bowron River valley, 40 miles east of Prince George. The objective of the programme was to establish reserves in a small portion of the Bowron River coal basin.

The reserves in the basin are summarized as follows:

PROVEN (Probable) RESERVES - 5,940,000 Tonnes
Kerr (1977) - 90% Proven

DRILL INDICATED RESERVES - 55,000,000 Tonnes
Trenholme (1975), Revised
Kerr (1977)

UNEXPLORED POTENTIAL - 100-250,000,000 Tonnes
Dolmage, Campbell,
and Associates (1975)

The three Norco licences contain all the proven reserves, 70% of the drill indicated reserves, and only 10% of the unexplored portion of the basin. Additional licences have been applied for, to cover the full extent of the basin.

The coal is indicated to be a good quality thermal coal, ranked as High Volatile B Bituminous. Tests performed on clean coal (9% ash) substantiate a 12,360 BTU/lb. product. Run-of-mine coal contains an average ash content of 37%, with an average thermal rating of 8,090 BTU/lb. Sulphur content is indicated to be 1.30%, however is contained partly in sulphide minerals.

Natural resins occur in coal and interbedded shale. The "Amber" resin is megascopic, occuring as blebs up to 1.5 cm in diameter. Visual estimates indicate an average content of 1.05%. The "Refined" resin is microscopic, occuring as part of the hydrocarbon of coal. Earlier research has indicated contents of 5 - 8%.

Wright Engineers Ltd. have completed a preliminary feasibility study of a proposed 900 Tonne/day mining operation. Conclusions indicate that the cost of producing an 11,000 BTU/lb. coal product would be $33/Tonne. ($30/short ton). The optimum market for a 900 Tonne/day coal product would be sales to local Prince George pulp mills, valued at $15.90/Tonne ($14.30/Ton). The economics of a 900 Tonne per day operation would depend entirely upon the content, quality, recoverability and marketability of the contained resins.

The value of the resin has not yet been determined. "Amber" resins are reported to be sold in North America with values ranging from $0.40-1.50/lb. It is obvious that if a 900 Tonne/day operation is economic, much more research is required regarding the true value of the resin in the Bowron River coal.

Better markets do exist for the coal. Ontario Hydro pays $1.85/million BTU for Alberta coal. This represents $44/Tonne for an 11,000 BTU/lb. coal product. Japanese, Korean, and European markets have not yet been exploited. Transportation is the key determining factor in studying the economics of distant markets.

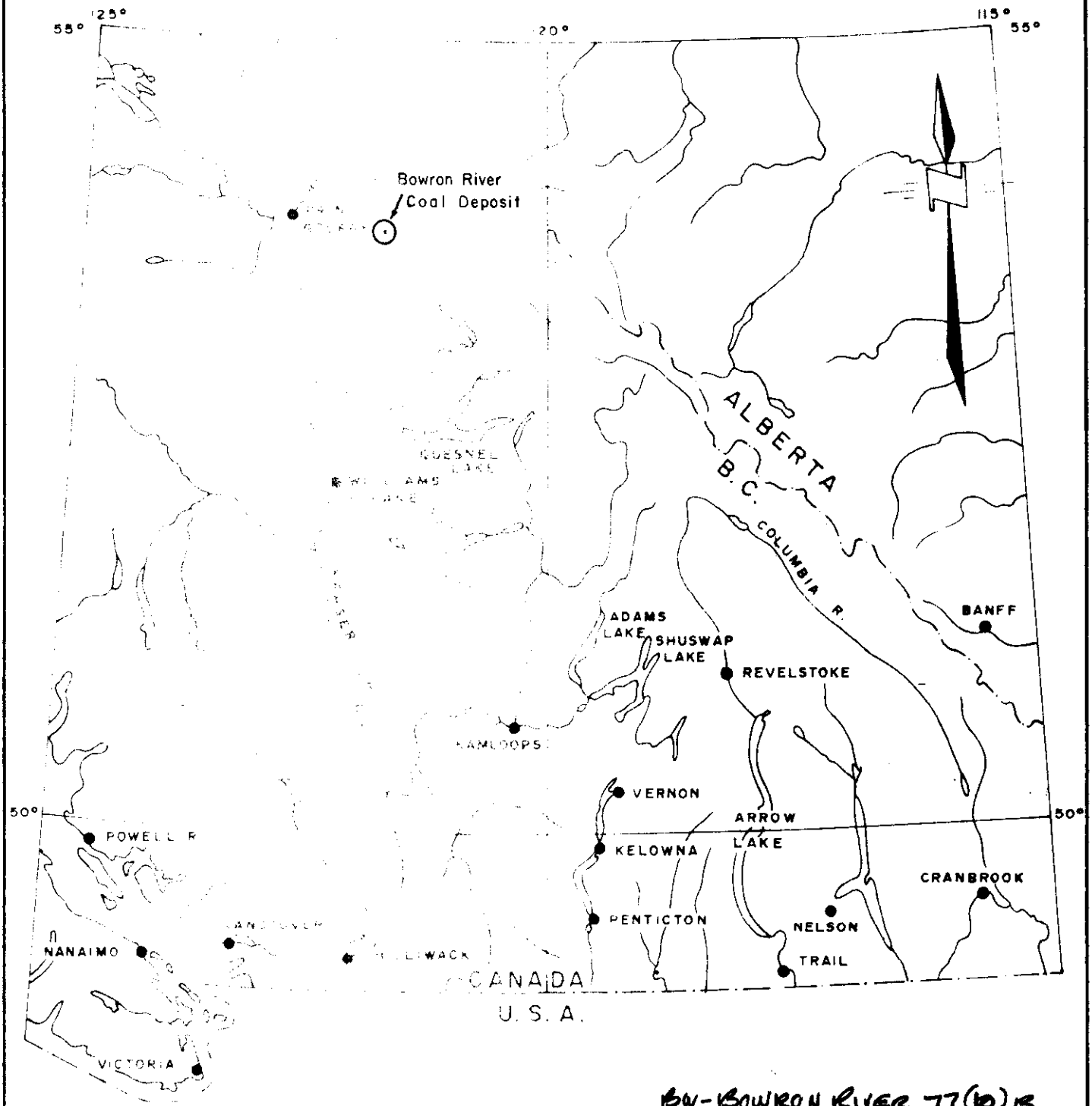
For the following reasons, a 500 - 1,000 Tonne/day operation is not the optimum production rate for Bowron River coal:

(1). The cheapest form of ground transportation are unit trains, demanding a minimum production rate of 3,000 Tonnes/day.

(2). A larger mining operation would reduce the unit costs of production.

(3). B. C. Hydro would consider installing a generating station on site with a minimum capacity of 600 Megawatts. This represents a minimum production rate of 5,500 Tonnes/day.

It is therefore recommended that further work on the property be oriented at developing a 3,000 - 6,000 Tonne/day operation. Further work includes continued development drilling, large diameter drilling for bulk samples and continued laboratory, market and feasibility research of the coal and by-products. The cost of the recommended programme is $625,000.



BW-BOWRON RIVER 77(10)15.

NORCO RESOURCES LTD.

LOCATION MAP
of the
BOWRON RIVER COAL DEPOSIT
Cariboo Mining Division
British Columbia

Date: Dec. 1977	Scale: 1" = 64 Miles
Dwn by: W.G.	Dwg no. 152-1

INTRODUCTION

GENERAL STATEMENT:

Norco Resources Ltd. have completed an initial phase programme to develop coal reserves in a small portion of the Bowron River coal fields. During the period April 22nd. - October 25th., 1977, 25 holes totalling 5701.3 m. (18,706 ft.) were completed. This report summarizes all work completed during the 1977 field season.

Kerr - Dawson and Associates Ltd. were engaged by Norco Resources Ltd. to supervise all aspects of the field programme. The terms of engagement are summarized as follows:

(1). Supervise the drill programme and on-site field activities.

(2). Provide detailed geological logs of each drill hole.

(3). Prepare suitable samples of coal intersections for laboratory analysis.

(4). Prepare sections of the drill holes, indicating geological coal reserves.

(5). Compile all data in report form.

The writer managed all aspects of the development programme, and was present on the property during the periods April 22 - May 6, May 12 and 13, May 17 - 20, June 1 - 3, July 5 - 7, July 19 - 25, August 3 - 5, August 29 - September 2, September 11 - 14, October 6 and 7, and October 18 - 20, 1977. Mr. T. D. Lewis, resident geologist under the employ of Kerr - Dawson and Associates Ltd. was responsible for all field activities and logging of the drill core.

The writer acknowledges the immense amount of back-up services and data supplied for this compilation. L. S. Trenholme, P. Eng. contributed essential information of previous programmes completed on the property. Nick Krpan, P. Eng. of Wright Engineers Ltd., provided technical information regarding feasibility of mining, processing and marketing the coal and byproducts. J. Sharpe, B.C.L.S. and T. Connelly, B.C.L.S. of Underhill and Underhill, provided data from previous surveys and completed a comprehensive ground and airborne photogrammetric survey of the property. Mr. K. Douglass, P. Eng., has investigated various environmental aspects of developing and mining coal from this area of British Columbia. Messrs. M. M. Menzies and H. J. Wilson, directors of Norco, have provided utmost cooperation in authorizing essential back-up services for the overall success of the project.

LOCATION AND ACCESS:

The property is located in the Bowron River Valley, approximately 56 kilometers east of Prince George, B. C. Geographic coordinates are 52°20'N and 122°W (NTS Reference 93H/13W 1/2).

Access to the mine camp on the west side of the Bowron River is possible along a gravel logging road, 59 km. east of Highway #97 at Buckhorn. Buckhorn is a small community, 16 km. south of Prince George. Access to the licences on the east side of the Bowron River is possible along a gravel logging road, 8 km. south of Highway #16 at Purden Lake. Purden Lake is 64 km. east of Prince George. There is no bridge across the Bowron River at the mine site.

TOPOGRAPHY AND VEGETATION:

The property is located in the broad, flat - bottomed valley of the Bowron River. Relief is in the order of 490 m. ranging from 730 m. (a.s.l.) in the Bowron River to over 1,220 m. (a.s.l.) in the surrounding hills.

PROPERTY:

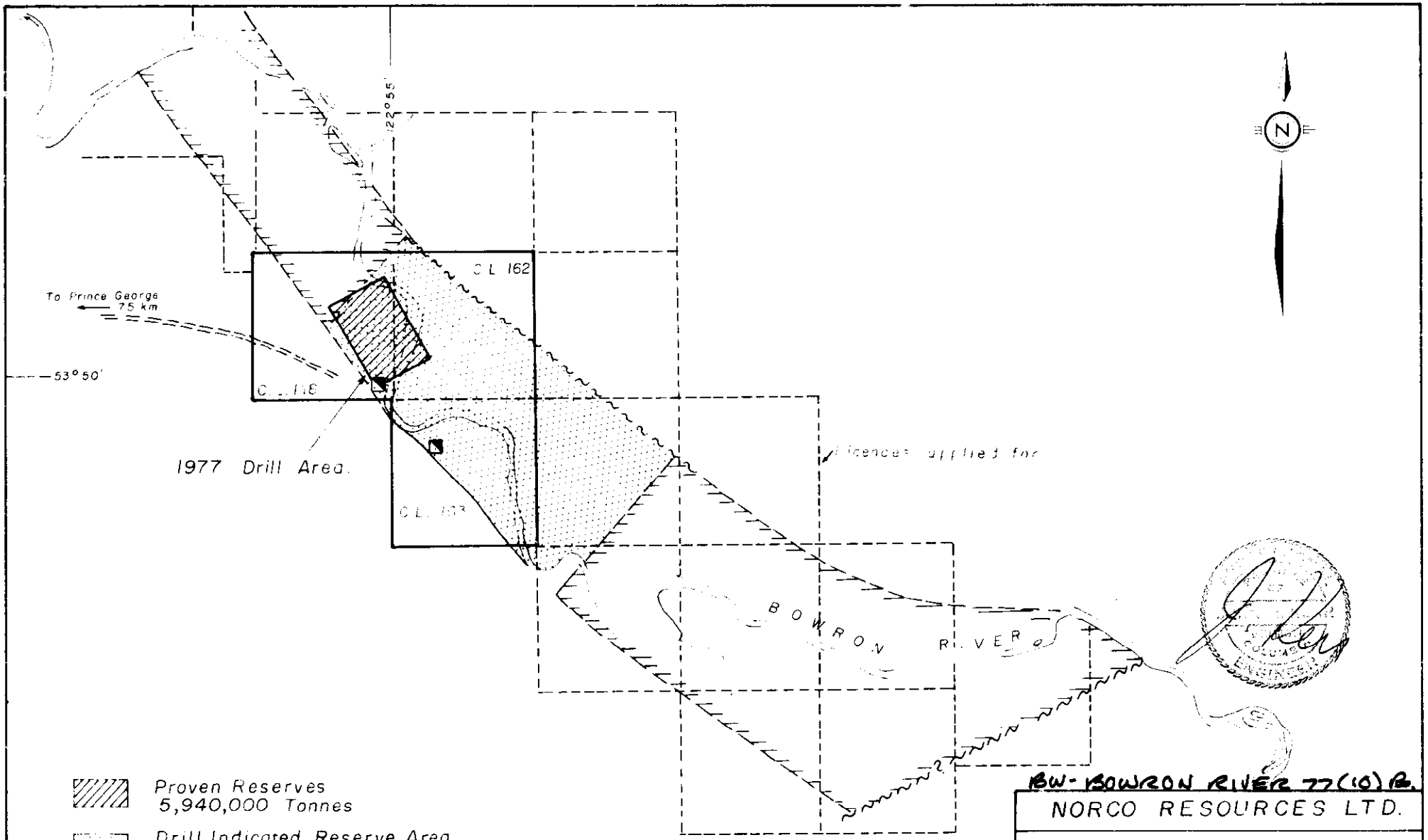
The Norco property consists of three contiguous coal licences, numbered 148, 162, and 163, identified as Lots #9591, #9692, and #9593 on Provincial Land Maps. The licences are registered to Norco Resources Ltd. under the Coal Act of British Columbia. Additional contiguous licences have been applied for; however, have not been granted at this time.

Work completed on the property during 1977 is sufficient to hold the licences for several years. All documents for licence extension were properly filed prior to the date of licence expiry - November 11th., 1977.

The three licences contain 70% of the drill indicated and inferred reserves, as discussed in this report.

HISTORY OF DEVELOPMENT:

Coal was discovered in the Bowron River Valley in 1870 by G. M. Dawson of the Geological Survey of Canada. Prior to 1960, several small companies and operators explored and developed the near surface coal measures. It is reported that some coal was hand sorted, shipped and sold locally in the City of Prince George.



BW-BOWRON RIVER 77(10)B.

NORCO RESOURCES LTD.

BOWRON RIVER COAL DEPOSIT

Cariboo Mining Division
British Columbia

Tech. Work by: K.D.A.	Scale: 1 in. = 1 mi.
Drawn by: W.	Date: December 1977.
Approved by: J.R.K.	Fig. No. 152-2

Northern Coal Mines Ltd. acquired coal licences covering the entire basin during the 1960's. During the period 1964 - 1966, approximately 32 drill holes, 50 - 150m. deep, were completed near the surface project of the coal seams. Results of this programme are very poorly documented and the core has been destroyed; therefore, data cannot be used for coal reserve calculations.

During 1967, under the supervision of Dr. J. M. Black, 10 BQ diamond drillholes, 200 - 400m. deep, were completed. Information from these holes is well documented and most of the core is in tact at the mine site. Some of this core is being relogged and resampled, and can be used for coal reserve calculations.

During 1966 and 1967, two entries were driven:

(a). The north "entry" slope was driven at -12 degrees to expose coal from the upper and middle coal seams. The entry is within the southern portion of current drilling area.

(b). The south "entry" slope, 1,000 m. to the southeast, explored the upper seams of coal and is outside the current drilling area.

Northern Coal Mines Ltd. optioned the property to Bethlehem Copper Mines Ltd. during 1971. Under the

supervision of Dr. R. E. Kucera, Bethlehem completed five NQ diamond drill holes to establish the nature and structure of the coal measures at depth and at the eastern limits of the coal basin. Dr. Kucera compiled a comprehensive report including detailed stratigraphic and structural interpretation based on drill core studies, surface mapping and photogeological studies.

During the period 1971 - 1976, there was no exploration or development work on the property. Due to their inability to maintain commitments, the company dropped all but three of the key coal licences. The company was reorganized and renamed Norco Resources Ltd.

During the fall of 1976, under the supervision of H. S. Haslam, P. Eng., the north "entry" was dewatered so that a 12 tonne sample could be mined from the upper seam. Eleven tonnes of this sample were shipped to the Department of Energy, Mines and Resources and Cyclone Engineering Sales Ltd. in Edmonton for coal analysis.

GEOLOGY

The Bowron River coal deposits occur in the basal unit of Tertiary sediments, consisting of shale, sandstone and conglomerate. The sediments were deposited in a graben-formed basin, unconformably overlying tuffs and volcanic rocks of the Mississippian Slide Mountain Group. The depositional environment of the basal unit was a quiet, shallow, inland lake, contained over the full extent of the basin. Three continuous seams of coal have been interpreted from drill results completed to date, suggesting that extensive swamp conditions prevailed over most portions of the basin in at least three periods of time.

Lower Seam	- 1.5 - 9 m. thickness of coal is located 18 - 36 m. above the basement unconformity.
Middle Seam	- .3 - 3 m. thickness of coal is located 24 - 30 m. above the lower seam.
Upper Seam	- A discontinuous seam of coal up to 24 m. thick is located 18 m. above the middle seam.

Immediately overlying the lower coal seam, a one foot thick fragmental (angular) rock occurs. This rock is quite unique to the sedimentary sequence, and may have had a volcanic (pyroclastic) origin.

There are local conglomerate beds in the basal unit, marking discharge points of feeder creeks in the basin. The basal unit of the sedimentary sequence is estimated to be 90 m. thick.

Subsidence in the basin, probably more rapid than deposition, created deep water with only local swamp conditions. Deposition in the lake included mud, silt, sand and gravel, giving rise to the upper unit (600 m. thick) of irregularly interbedded sandstone, shale, and conglomerate.

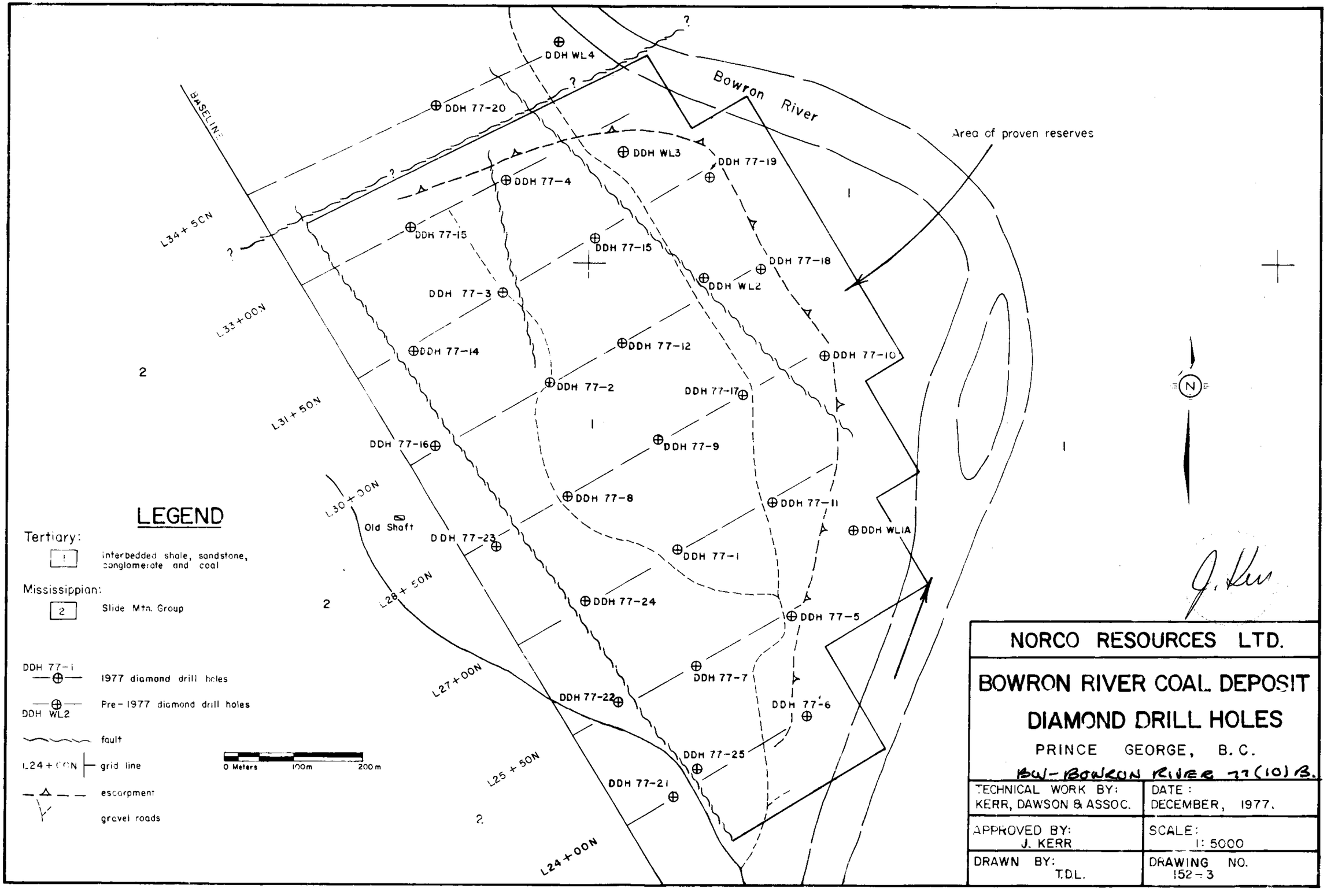
During deposition, there is evidence of more rapid subsidence of the basin to the east. After deposition further subsidence to the east and/or uplift to the west gives rise to the current structural trend of the beds - strike 150 degress; dip 20 - 35 degrees NE.

At least three post-depositional faults are interpreted in the area of intense drilling. All faults have a steep-vertical dip. The western fault appears to mark the western limit of exposed Tertiary sediments. This fault is definitely post-depositional, and cannot

be interpreted as the main graben structure forming the western limits of the basin. The fault caused uplift of at least 100 meters.

Very little information is known of the northern fault lying between L33+00N and L34+50N. DDH #77-20 intersected 100 meters of sediments before entering the basement. None of the three major coal seams were intersected. It is apparent from logs of the drill hole that the sediment/basement contact was not a fualt. The fact that no coal occurs in the lower 50 - 100 meters of the sediments, leads one to the conclusion that the basement was high before deposition. Therefore, the interpreted fault is possibly pre-deposition. Further drilling in this area is required to substantiate this interpretation. The economic significance of this structure is important, as this may terminate extensions of the coal seams to the north.

Geological logs, rock descriptions and a geological section of each hole is presented in Appendices F & G of this report.



LEGEND

Tertiary:

1 — interbedded shale, sandstone, conglomerate and coal

Mississippian:

2 — Slide Mtn. Group

DDH 77-1 — 1977 diamond drill holes

DDH WL2 — Pre-1977 diamond drill holes

fault

L24+00N — grid line

escarpment

gravel roads

J. Kerr

NORCO RESOURCES LTD.

BOWRON RIVER COAL DEPOSIT
DIAMOND DRILL HOLES

PRINCE GEORGE, B.C.

BW-BOWRON RIVER 77(10)B.

TECHNICAL WORK BY: KERR, DAWSON & ASSOC.	DATE: DECEMBER, 1977.
APPROVED BY: J. KERR	SCALE: 1:5000
DRAWN BY: T.D.L.	DRAWING NO. 152-3

W

E

DDH 77-21

DDH 77-25
(15 m North of section)

DDH 77-6

Bowron R.

DDH 77-2

35.7m

114.9 m

O/B

Interbedded shale, sandstone and conglomerate
(Minor coal)

Dominantly shale

Upper Coal Seam

Middle Coal Seam

Lower Coal Seam

Basement Slide Mt Group

273.4m

401.7 m.

BW-BOWRON RIVER 77 (10) B.

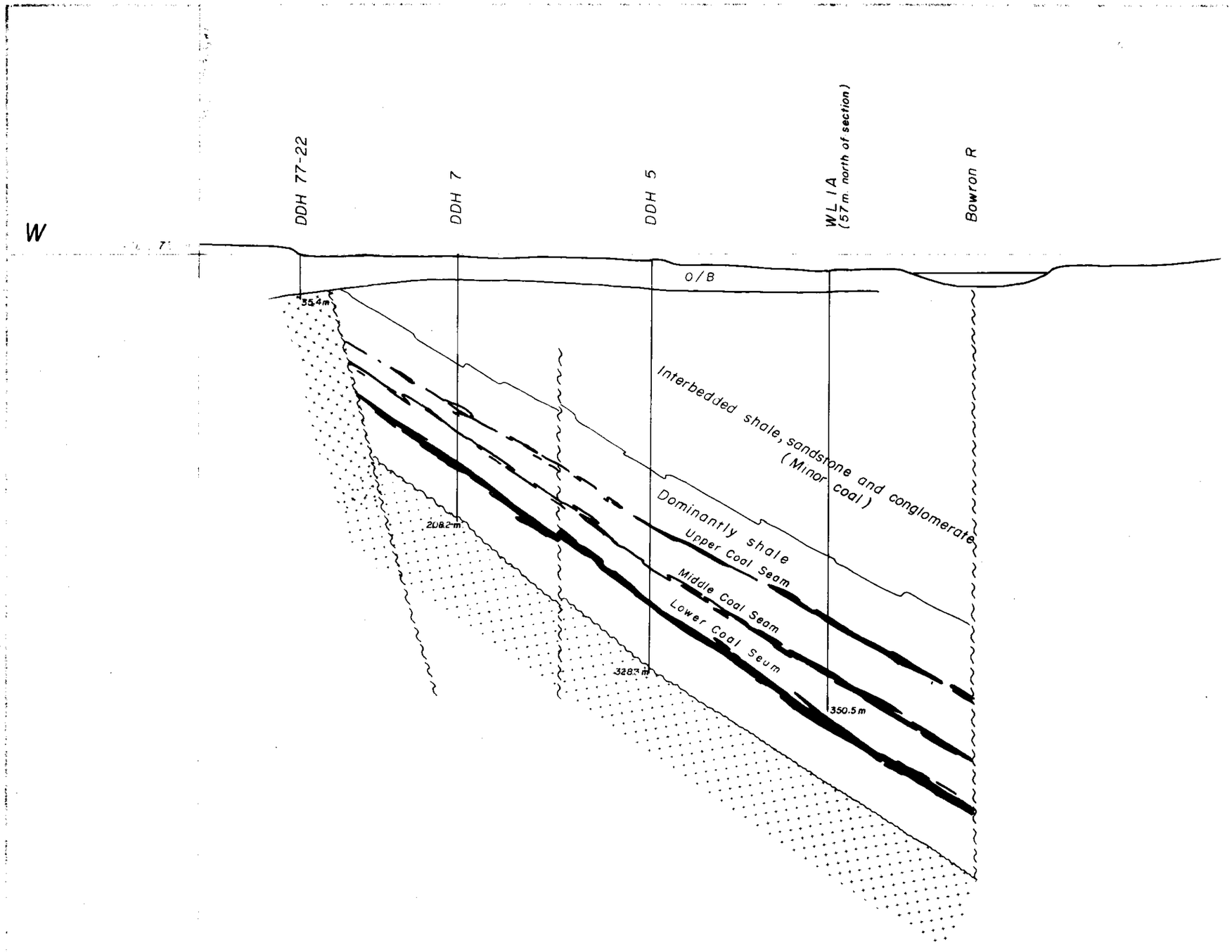
NORCO RESOURCES LTD.

GEOLOGICAL SECTION

SECTION 24+00 N

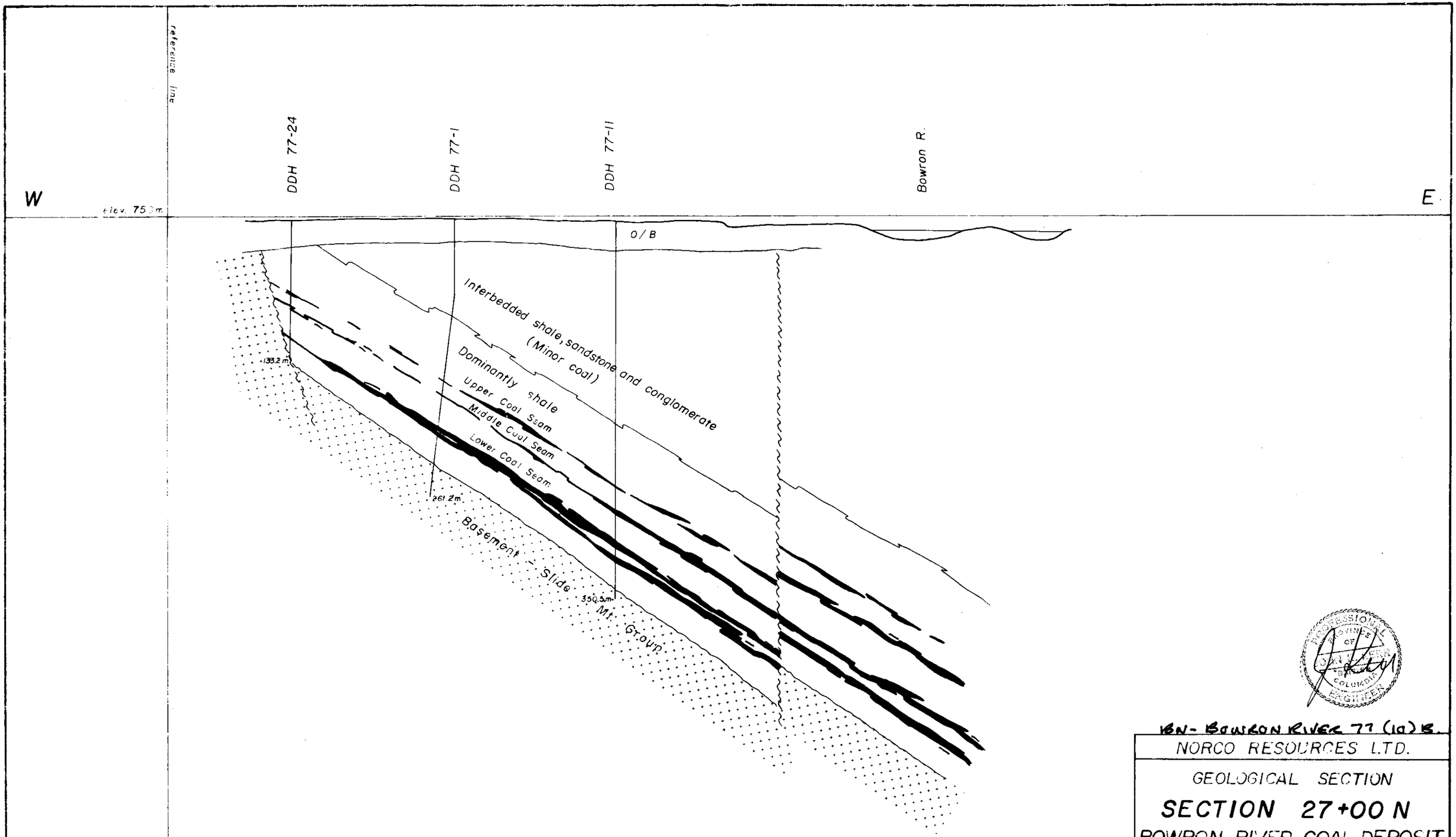
BOWRON RIVER COAL DEPOSIT

Tech. Work by: R.J.A.	Scale: 1" = 100'
Date: Dec 1977	Drawn by: P.D.L.
Approved by: J.H.K.	Fig. No. 152-4



BN-BOWRON RIVER 77 (10) B.

SECTION 25+50 N



BN - BOWRON RIVER 77 (10) 15.

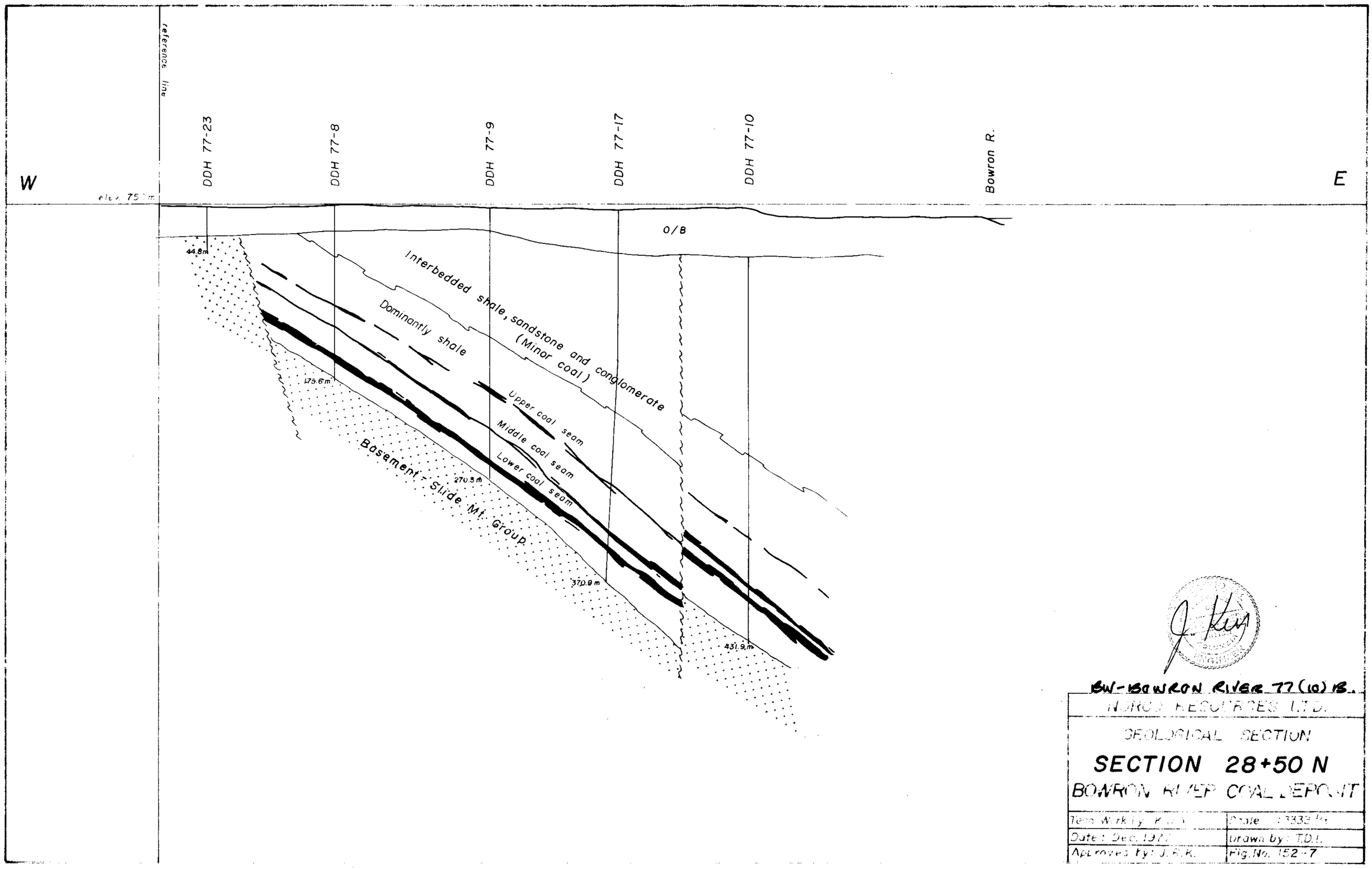
NORCO RESOURCES LTD.

GEOLOGICAL SECTION

SECTION 27+00 N

BOWRON RIVER COAL DEPOSIT

Tech. Work by: K.D.A.	Scale 1:3333 1/3
Date: Dec. 1977	Drawn by: T.D.L.
Approved by: J.R.K.	Fig. No. 152-6



BW-BOWRON RIVER 77(10)B.

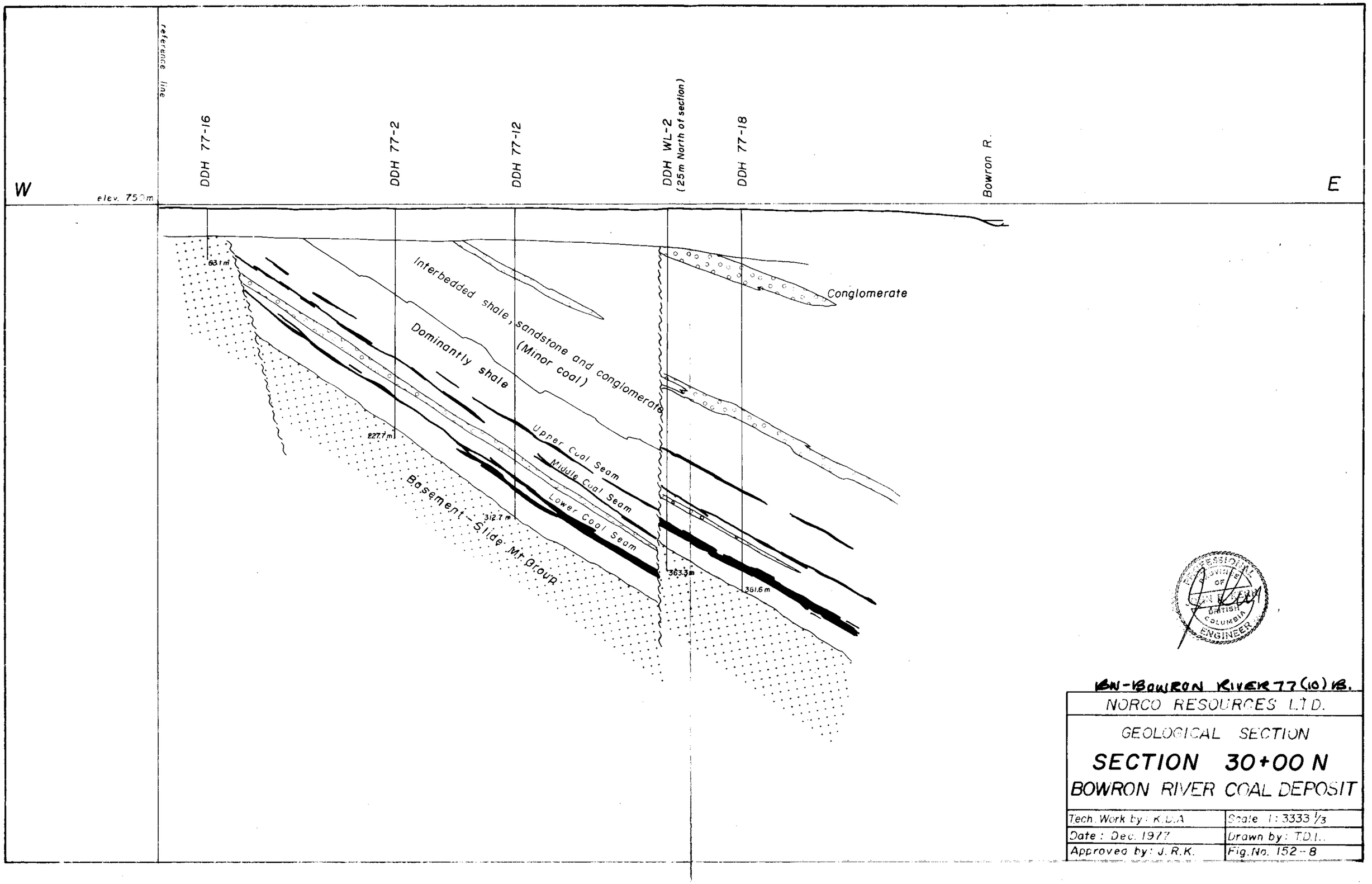
INTRACO RESOURCES LTD.

GEOLOGICAL SECTION

SECTION 28+50 N

BOWRON RIVER COAL DEPOSIT

Team Work by: K.J.K.	Scale: 1"=33.3'
Date: Dec. 1977	Drawn by: T.D.L.
Approved by: J.A.K.	Fig. No. 152-7



BN-BOWRON RIVER 77(10)13.

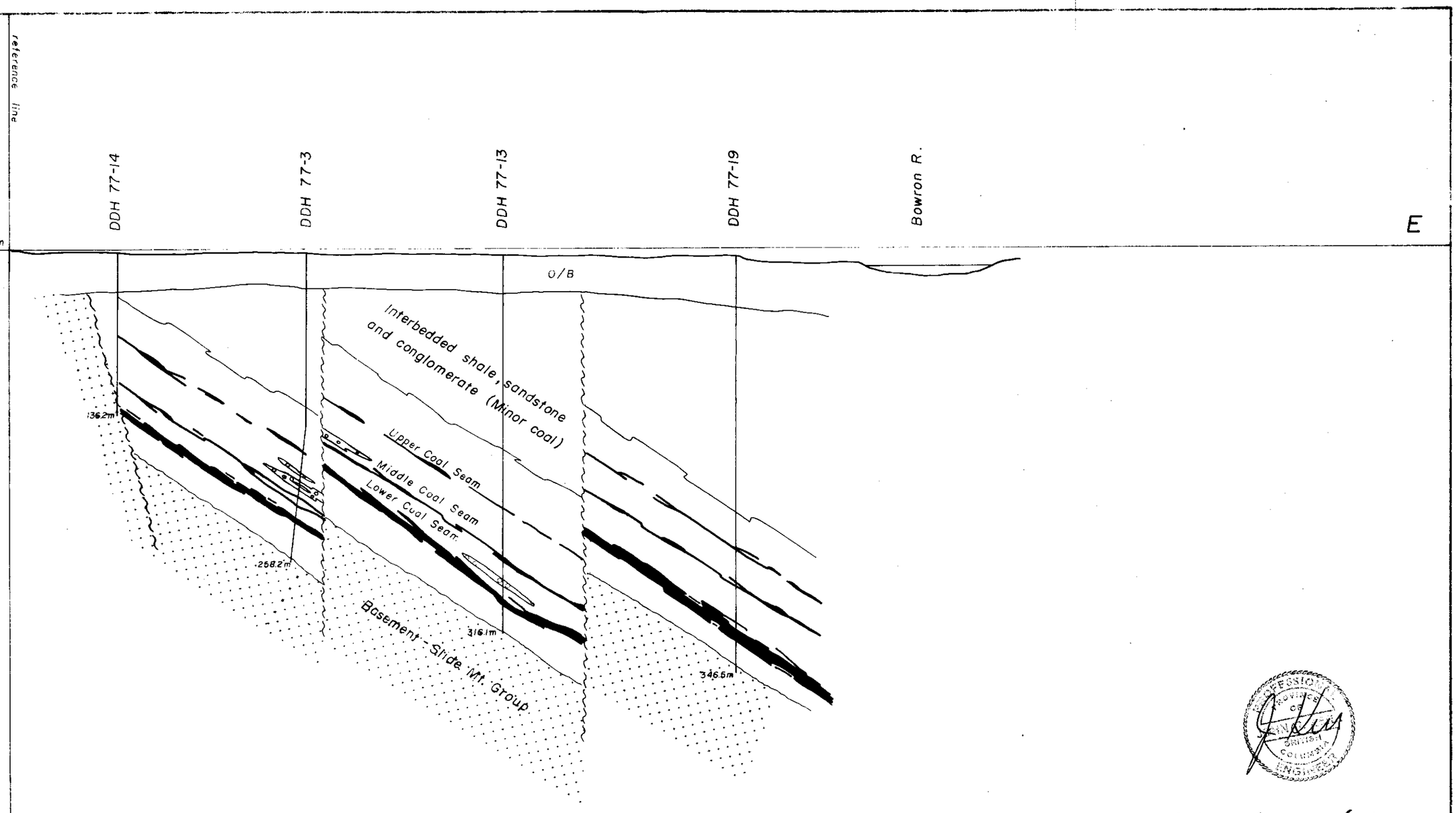
NORCO RESOURCES LTD.

GEOLOGICAL SECTION

SECTION 30+00 N

BOWRON RIVER COAL DEPOSIT

Tech. Work by: K.D.A	Scale 1:3333 1/3
Date: Dec. 1977	Drawn by: T.D.L.
Approved by: J.R.K.	Fig. No. 152-8



BW- BOWRON RIVER 77(10) B.

NORCO RESOURCES LTD.

GEOLOGICAL SECTION

SECTION 31+50 N

BOWRON RIVER COAL DEPOSIT

Tech. Work by: K.D.A.	Scale 1:3333 1/3
Date: Dec. 1977.	Drawn by: T.D.L.
Approved by: J.R.K.	Fig. No. 152-9

W

E

DDH 77-15

DDH 77-4

DDH WL-3

Bowron R.

O/B

Interbedded shale and sandstone, minor coal

Dominantly Shale

Upper Coal Seam

Conglomerate

Lower Coal Seam

236.8m

296.3m

Basement - Slide Mt. Group

J. Ken

BN-BOWRON RIVER 77(10)-S.

SECTION 33+00 N

10

1 : 3000

W

elev. 750m

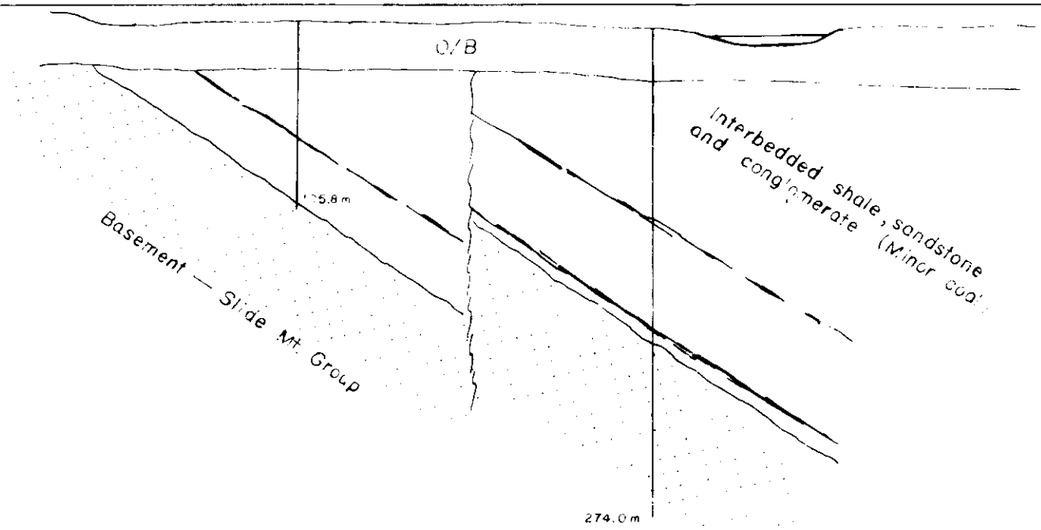
reference line

DDH 77-20

DDH WL-4

Bowron R.

E



BW-BOWRON RIVER 77 (10) B.

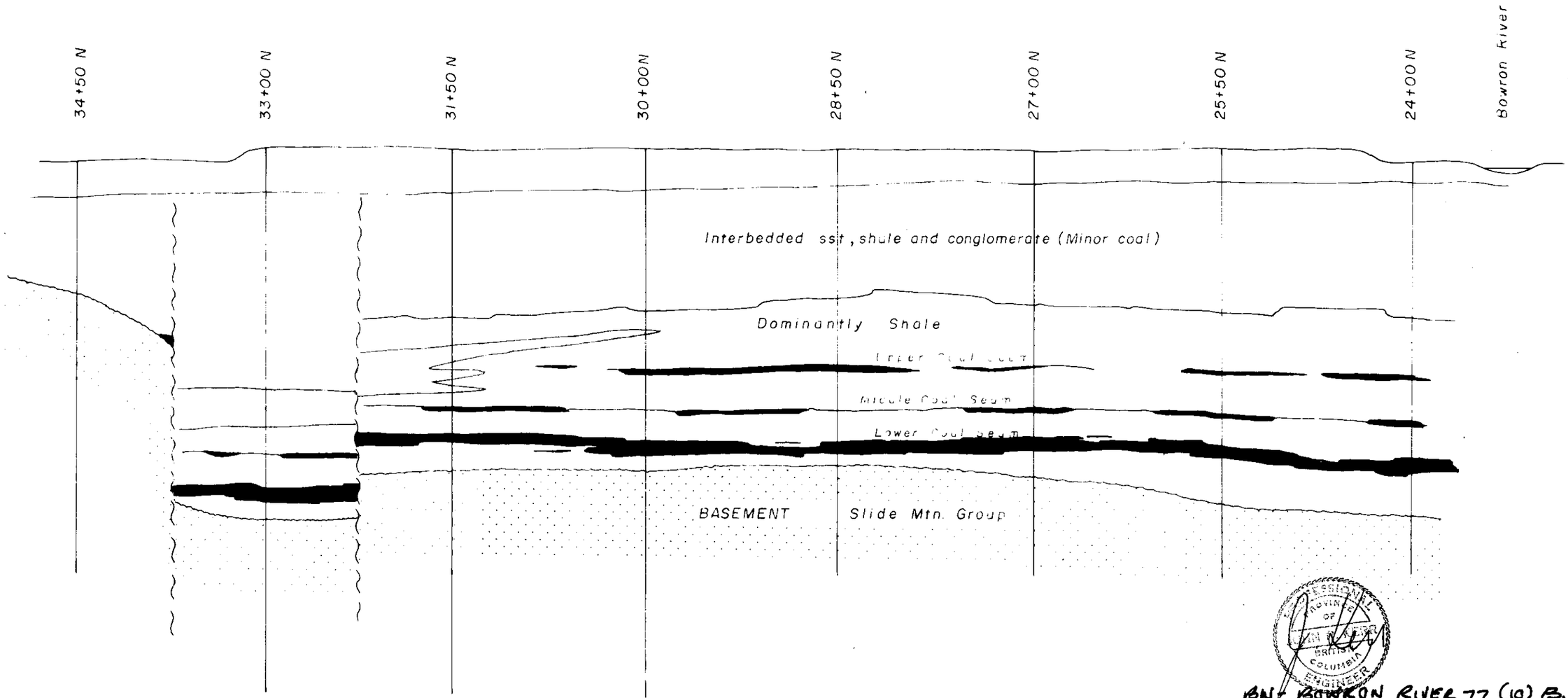
NORCO RESOURCES LTD.

GEOLOGICAL SECTION

SECTION 34+50 N

BOWRON RIVER COAL DEPOSIT

Tech. Work by: K.D.A.	Scale 1 3333 1/3
Date: Dec. 1977.	Drawn by: T.D.L.
Approved by: J.R.K.	Fig. No. 152-11



BN - BOWRON RIVER 77 (10) B.

NORCO RESOURCES LTD.

LONGITUDINAL SECTION
ALONG
3+00 E
BOWRON RIVER COAL DEPOSIT

Tech. Work by V.D.A.	Scale 1:3333 1/3
Date: Dec. 1977	Drawn by: W.G.
Approved by: J.R.K.	Fig. No. 152-12

1977 FIELD PROGRAMME

The 1977 field programme was primarily a development drill programme to establish proven reserves in a small portion of the Bowron River coal fields. The objective of the programme was to establish 2,700,000 - 4,500,000 tonnes (3,000,000 - 5,000,000 tons) of clean coal, sufficient to initiate a 500 - 1,000 tonne per day mining operation. This is being accomplished by drilling an area 1,050 meters long by 750 meters wide at 150 meter centers. Although 150 meter centers will not fully delineate the lenticular nature of the coal seams, it is hoped to provide sufficient data to compile a statistical estimate of proven reserves. Figure #152-3 indicates the selected area, and the location of diamond drill holes.

The selection of the area was based on the following parameters:

(1). An area where previous drilling had indicated the best quality coal over the thickest and most continuous seam.

(2). An area where the coal seams are relatively close to the surface and provide a tolerable dip for mining purposes.

(3). The area most likely to contain all required coal.

(4). An area where previous drilling had indicated consistent resin content throughout the coal seam.

The initial concerns of developing reserves directly beneath the Bowron River are unfounded. Studies of mining methods to be used, indicate that sufficient support will remain to cause no subsidence at the surface.

Four drill contractors submitted tender to complete a minimum of 4,500 ft. (1,370 m.) of drilling. Connors Drilling Ltd. of Vancouver was awarded the contract on the basis that their bid was the lowest. Twenty-five holes totalling 5,701.3 m. (18,706 ft.) were completed. The table on the following pages summarizes all drill holes.

In summary, the programme was completed in six months, average rate of 950 m/mo. (3,000 ft./mo.), using a Boyles 45A drill. Size of core is NQ, and core recovery is considered excellent. In several holes, difficulty was encountered while drilling through 20-50 meters of very gravelly overburden. Average cost of drilling was $11.06/ft. (36.28/m.)

TABLE I - NORCO RESOURCES LTD.

SUMMARY OF DIAMOND DRILL HOLES - 1977

Hole No.	Location	Date Commenced	Date Completed	Head	Dip Tests	Depth(Feet)	Depth(Meters)
77-1	L27^{N}@2+75^{E}	April 27, 1977	May 4, 1977	90°	150m-83° 260m-81°	857'	261.3m
77-2	L30^{N}@2+44^{E}	May 5, 1977	May 8, 1977	90°	150m-85° 225m-83°	747'	227.7m
77-3	L31+50^{N}@2+44^{E}	May 10, 1977	May 13, 1977	90°	160m-85° 258m-83°	847'	258.2m
77-4	L33^{N}@3+35^{E}	May 16, 1977	May 20, 1977	90°	150m-88° 282m-87°	927'	282.6m
77-5	L25+50^{N}@3+65^{E}	May 24, 1977	May 27, 1977	90°	150m-90° 328m-84°	1,077'	328.4m
77-6	L24^{N}@3+05^{E}	May 28, 1977	June 3, 1977	90°	150m-74° 273m-78°	897'	273.4m
77-7	L25+50^{N}@2+15^{E}	June 4, 1977	June 8, 1977	90°	208m-90°	683'	208.2m
77-8	L28+50^{N}@1+85^{E}	July 5, 1977	July 7, 1977	90°	150m-90°	576'	175.6m
77-9	L28+50^{N}@3+35^{E}	July 8, 1977	July 11, 1977	90°	150m-90° 270m-87°	887'	270.3m
77-10	L28+50^{N}@6+10^{E}	July 13, 1977	July 29, 1977	90°	150M-88° 300m-85.5° 430m-85°	1,417'	431.9m
77-11	L27^{N}@4+25^{E}	Aug. 3, 1977	Aug. 9, 1977	90°	150m-90° 300m-88.5°	1,150'	350.5m
77-12	L30^{N}@3+65^{E}	Aug. 11, 1977	Aug. 17, 1977	90°	150m-86° 240m-88.5°	1,026'	312.7m
77-13	L31+50^{N}@3+95^{E}	Aug. 17, 1977	Aug. 21, 1977	90°	150m-90° 300m-88.5°	1,037'	316.1m
77-14	L31+50N@0+90^{E}	Aug. 22, 1977	Aug. 24, 1977	90°	150m-88°	447'	136.2m
77-15	L33^{N}@1+85^{E}	Aug. 24, 1977	Aug. 27, 1977	90°	150m-90°	777'	236.8m

TABLE I - (continued)

SUMMARY OF DIAMOND DRILL HOLES - 1977

Hole No.	Location	Date Commenced	Date Completed	∠ Head	Dip Tests	Depth (Feet)	Depth (Meters)
77-16	L30^{N}@0+60^{E}	Aug. 28, 1977	Aug. 29, 1977	90°		207'	63.1m
77-17	L28+50^{N}@4+70^{E}	Aug. 29, 1977	Sept. 15, 1977	90°	150m-90° 300m-80° 370m-82°	1,217'	370.8m
77-18	L30^{N}@5+95^{E}	Sept. 15, 1977	Sept. 24, 1977	90°	150m-90° 300m-85.5° 381m-85°	1,252'	381.6m
77-19	L31+50^{N}@5+90^{E}	Sept. 26, 1977	Oct. 1, 1977	90°	150m-88° 308m-86°	1,137'	346.4m
77-20	L34+50^{N}@3+05^{E}	Oct. 4, 1977	Oct. 6, 1977	90°	---	347'	105.8m
77-21	L24^{N}@0+90^{E}	Oct. 11, 1977	Oct. 13, 1977	90°	---	117'	35.6m
77-22	L25+50^{N}@0+90^{E}	Oct. 13, 1977	Oct. 15, 1977	90°	---	116'	35.3m
77-23	L28+50N@0+60^{E}	Oct. 15, 1977	Oct. 16, 1977	90°	---	147'	44.8m
77-24	L27^{N}@1+20^{E}	Oct. 17, 1977	Oct. 22, 1977	90°	---	437'	133.2m
77-25	L24^{N}@1+35^{E}	Oct. 23, 1977	Oct. 25, 1977	90°	---	377'	114.8m
					Totals	18,706'	5,701.3m

Type of Drill - Boyles Brothers 45A

Size of Core - NQ

Core Recovery - ~ 98%

Average Drill Cost - $11.06/ft. (36.28/m.)

All core was collected at the drill site in 5 ft. (1.52m) core boxes, and transported to the main camp, where it was logged in detail (See Appendix G). Geological strips were prepared for each hole (Appendix F). Coal intersections from the main seam, for all holes were sampled. Samples consist of split core over a continuous length of the coal intersection. Samples from holes #77-1 through #77-7 were shipped to Cyclone Engineering Sales Ltd. in Edmonton, Alberta, and samples from holes #77-8 through #77-19 were shipped to Commercial Testing and Engineering Co. in Vancouver, B. C. Analysis included ash content, fixed carbon, volatile material, moisture content, sulphur content and BTU/lb. Samples were analyzed on an as-received and dry basis. The labs were asked for a visual estimate of amber resin content. Lab results are included as Appendix E.

During the period October 17 - November 20, 1977, a permanent core storage facility was built at the main campsite. All core is stored in this building.

During the period September 8 - 23, 1977, Underhill and Underhill completed a topographic survey of the project area. This survey included:

(1). Locating old Iron Pins from 1967 survey.

(2). Surveying in all 1977 drill holes.

(3). Establishing survey points and targets for air photographs.

(4). Low - level air photography for detailed ground mapping on a scale of 1:2,500 ft. The mapping has not been completed.

All survey pins and drill holes have been tied into the UTM coordinate system, with coordinates expressed in meters. Underhill has provided a 1:50,000 scale map of all drill hole locations, included as Figure #152-21 of this report.

Wright Engineers Ltd. prepared a preliminary feasibility study of a 900 Tonne/day operation at Bowron River during the period July 20 - November 10, 1977. Nick R. Krpan, P. Eng., L. S. Gormely, P. Eng., and G. B. Henson, P. Eng., of Wright contributed data regarding methods and costs of the operation, and potential markets for the coal and resins. K. Douglass, P. Eng., an independent consultant, contributed data pertinent to some of the environmental impacts of such an operation. The writer contributed data pertaining to the geology and 1977 development programme.

COAL RESERVES

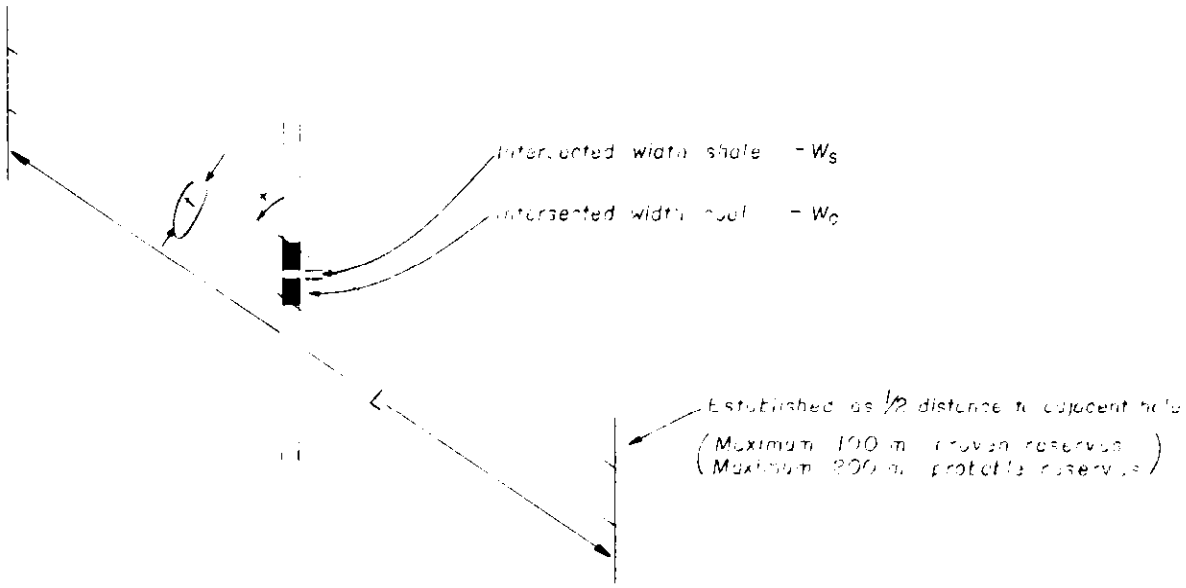
Ore reserves in the Bowron River basin have been classified into the following three categories:

I. PROVEN (Probable) RESERVES: Based on the results of the 1977 field programme, 5,940,000 Tonnes of "run-of-mine" coal were established in the selected area of intense drilling. By the methods and parameters used (Chart 1), 90% of these reserves are classified as proven reserves, the remaining 10% classified as probable reserves.

The average ash content of the proven coal reserves is calculated at 37%. All of the ash can be considered shale, occuring as small lenses and seams within the coal. Therefore 3,683,000 Tonnes of clean coal exist within the proven reserves.

Proven geological coal reserves contain lenses of barren shale, which may be sorted during a mining process. 1,798,000 Tonnes of barren shale (waste) are included within seams of proven reserves. These lenses of barren shale do contain minor coal content ($<$ 50% by volume), therefore further analysis of drill core is reuiqred to study the dilution effect of the barren shale during a mining process.

COAL RESERVE CALCULATION



Assume :

S.G coal = 1.45
S.G. shale = 2.5
Distance between sections = 152.4 m

V_T - Total Volume
V_{CC} - Volume clean coal
V_{BS} - Volume barren shale
V_{SC} - Volume shale in coal

$V_S\%$ - % shale by volume
$W_S\%$ - % shale by weight
= ash content

$V_T = L \times t \times 152.4\ m^3$, where $t = \sin\alpha(W_C + W_S)$ $[t \geq 1.25\ m]$

$V_{BS} = L \times 152.4 \times W_S \sin\alpha\ m^3$

$V_{SC} + V_{CC} = V_T - V_{BS}$

$$V_S\% = \frac{1.45\ W_S}{2.5 - 1.05\ W_S\%}\ \%$$

$$\therefore\quad V_{SC} = (V_T - V_{BS}) \times \frac{1.45\ W_S\%}{2.5 - 1.05\ W_S\%}\ m^3$$

& $V_{CC} = V_T - V_{BS} - V_{SC}\ m^3$

$\therefore$ Tonnes Clean Coal = $V_{CC} \times 1.45$
Tonnes Shale in Coal = $V_{SC} \times 2.5$
Tonnes Barren Shale = $V_{BS} \times 2.5$

Table 2, on the following page, summarizes the section by section coal reserves. Figures #152-13 through #152-20, indicates the individual reserve blocks as calculated.

II. DRILL INDICATED (Possible) RESERVES:

L. S. Trenholme, in 1975, estimated the drill indicated reserve potential of the Bowron River Basin as 74,000,000 Tonnes (81,000,000 short tons). These reserves were based on wide spaced drill holes (avg. > 600m), with some of the data very poorly documented. Included in the estimates were seams of coal, less than the minimum thickness of mining. The writer has reviewed the 1975 Trenholme calculation process, and with the knowledge of the 1977 reserve calculations, feels that Trenholme's estimate was 10 - 15% too high. Therefore, the drill indicated reserves of the Bowron River basin have been revised to 55,000,000 Tonnes.

TABLE 2 - SUMMARY ORE RESERVES

NORCO RESOURCES LTD.

	ORE RESERVES - TONNES						CONTENTS		
	Seam	Clean Coal	Shale in Coal	Run-of-Mine Coal	% Proven	Barren Shale	Amber Resin	Sulphur	Cal.Value BTU/lb.
24+00N	Lower	223,580	102,400	325,980	79%	12,820	1.0%	.84%	8,030
	Other	136,570	127,560	264,130	91%	---			
25+50N	Lower	405,850	189,660	595,510	78%	186,070	1.6%	1.31%	9,280
27+00N	Lower	601,900	351,500	953,400	77%	273,630	1.2%	1.62%	8,278
	Other	189,360	86,780	276,140	65%	148,760			
28+50N	Lower	454,210	206,250	660,460	100%	276,140	1.0%	1.74%	9,184
	Other	116,900	125,350	242,250	100%	61,680			
30+00N	Lower	415,940	280,520	696,460	96%	280,350	.9%	1.19%	7,000
	Other	67,850	38,990	106,840	100%	46,790			
31+50N	Lower	557,340	410,110	967,450	95%	258,220	.8%	1.17%	7,525
33+00N	Lower	513,490	337,840	851,330	100%	253,750	1.0%	1.08%	7,706
34+50N	--	--	--	--	--	--	--	--	--
TOTALS		3,682,990	2,256,960	5,939,950	90%	1,798,210	Avg. 1.05%	1.30%	8,090

Ore Reserve Calculations Based on SG Coal - 1.45
SG Shale- 2.5

Amber Resin Content - Visual Estimate

Average Ash Content - $\frac{\text{Shale in Coal}}{\text{Run-of-Mine Coal}} \times 100 = 37\%$

III. UNEXPLORED POTENTIAL: With the knowledge that coal seams exist in the basal 100 meters of the Bowron River sediments, it is not unreasonable to project potential reserves into areas of the basin that have not been explored by drilling; however, which are known to contain outcrop of the Bowron River sediments. Dolmage, Campbell and Associates in a report to B. C. Hydro (1975) estimated the ultimate potential of the Bowron River basin to contain an additional 100,000,000 - 250,000,000 Tonnes.

The following summarizes the total geological potential reserves at Bowron River.

PROVEN RESERVES	- 6,000,000 Tonnes
DRILL INDICATED RESERVES	-55,000,000 Tonnes
UNEXPLORED POTENTIAL RESERVES	-100 - 250,000,000 Tonnes
TOTAL RESERVE POTENTIAL	-161 - 311,000,000 Tonnes

Figure #152-2 indicates the areas of the three classifications of reserves.

COAL QUALITY

Bowron River coal is indicated to be a good quality thermal coal, ranked as High Volatile B Bituminous. Tests performed on clean coal (9% ash) from a 11 Tonne bulk sample substantiate a 12,360 BTU/lb. coal product. It is possible that some of the coal may be used as a blend for metallurgical purposes.

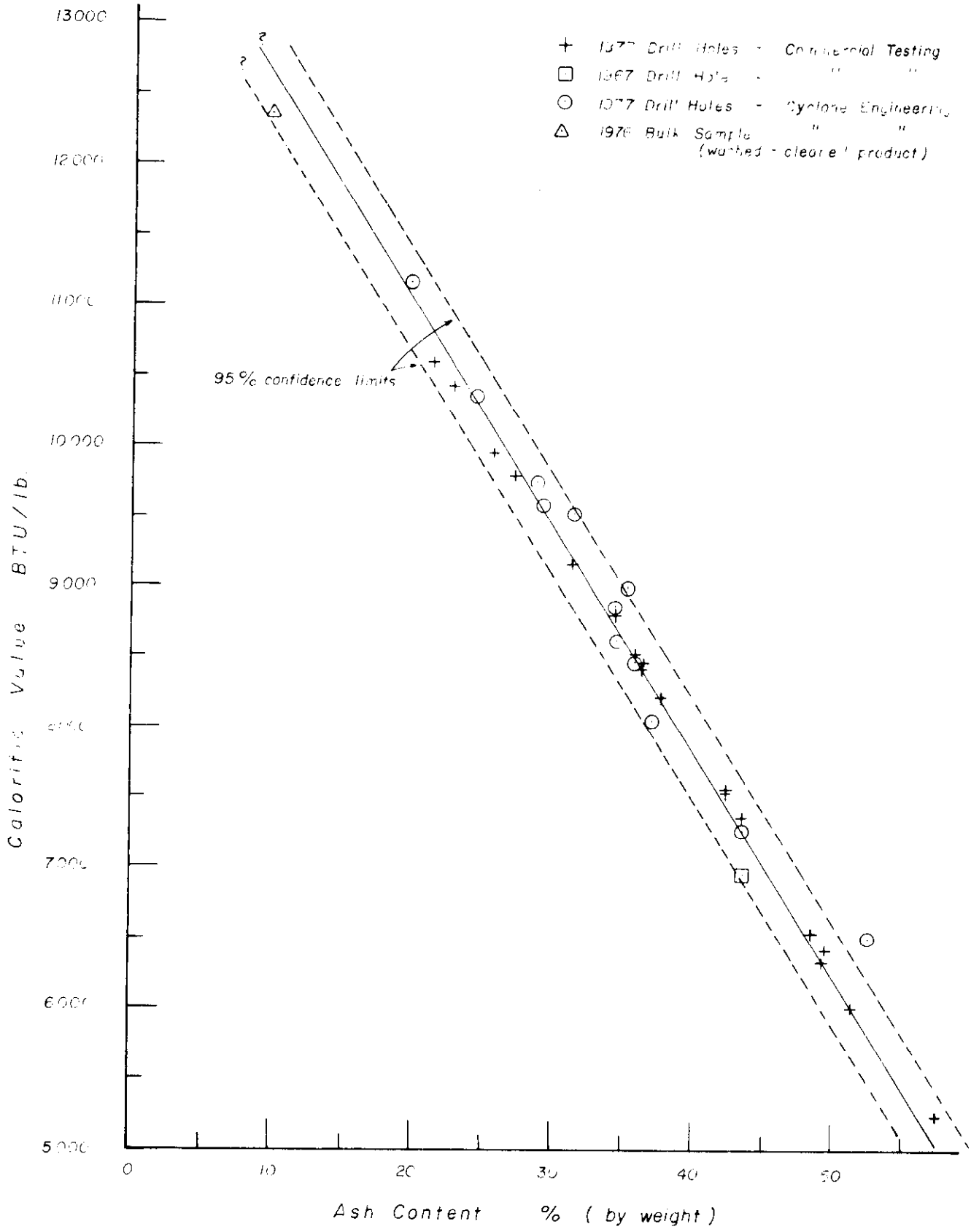
Tests completed on drill core submitted for analysis indicate an average of 8,090 BTU/lb. for the coal product with included ash content (37%). The clean coal (ash content removed) would provide a greater energy product, approaching 13,000 BTU/lb. The graph on the following page (chart 2) substantiates this estimate.

Chart 2 illustrates several interesting features of the quality of the coal.

(1). The relationship of the ash content to the calorific value (BTU/lb.) is a straight line progression.

(2). The true quality of a clean coal product in the tested area of the basin apparently is quite uniform (± 200 BTU/lb.)

(3). The slight deviation of the samples may reflect a laboratory error. It is interesting to note that the Cyclone analyses are higher with respect to the line, than the



BOWRON RIVER COAL DEPOSIT

RELATIONSHIP OF CALORIFIC VALUE TO ASH CONTENT

Chart No. 2

Commercial analyses.

(4). Given the ash content, it is possible to estimate the calorific value to ± 200 BTU/lb.

(5). Indication from analysis of only one 1967 core sample is that the thermal quality of coal does not significantly deteriorate when exposed for great periods of time (10 years).

Total sulphur content of drill core averages 1.30%. Sulphide minerals, pyrite and marcasite, have been recognized on fracture faces, and are believed to contribute significantly to the sulphur content. Coal washing and beneficiation tests are required to determine the extent to which sulphide content can be reduced.

Preliminary investigations by Wright Engineers Ltd. have indicated several potential markets for thermal coal.

(1). B. C. Hydro:

Value to supplement coal at the Hat Creek generating station

- $0.50/million BTU

(2). Prince George Pulp Mills:

Currently pay for Hog Fuel

- $0.66/million BTU

(3). Ontario Hydro:

Value at Ontario generating stations

- $1.85/million BTU

(4). Alberta Utilities:

Has sufficient supply of coal - very unlikely to import.

Other potential markets for the coal are Japanese, Korean, U. S. and European utility companies. The value of coal to these countries have yet to be exploited. With the projected energy demands for the mid nineteen eighties, the value of thermal coal, especially in foreign markets, is expected to dramatically rise.

RESIN

Two types of natural resins occur within the coal measures at Bowron River.

(1). "Amber" resin occurs as blebs (up to 1.5 cm. diameter), generally elongated along the bedding plane axis, within the coal and interbedded shale. Visual estimates of the drill core indicate an average "Amber" resin content of 1.05% (Table 2). Satisfactory laboratory methods for determining the "Amber" resin content have not yet been established.

Cyclone Engineering attempted "sink float" and "hand sorting" methods of analyzing the resin conent. The writer feels these estimates are inadequate. The best estimate of the "Amber" resin has been visual estimates in drill core. Experimentation has been done to improve the visual estimates by tracing the resin blebs on paper to identify and compare with known "percentage content"charts.

(2). "Refined"resin is microscopic and is believed to be part of the hydrocarbon of the coal. Previous research by Batelle Memorial Institute indicates that the "Refined" resin is totally soluable in pyridine and content estimated to be 5 - 8%.

The value and marketability of the resins is very uncertain at this time. Preliminary estimates of the value indicated that the value of the resin ranged from $0.50 - 1.50/lb. Investigations into the marketability of resin by Wright Engineers indicated Hercules Inc. of Wilmington, Delaware currently pays $0.40 - 0.45/lb. for "Amber" resin from a Utah coal mine. Very little is known of the value of the "Refined" resin.

For a 500 - 1,000 Tonne/day operation, it has been shown in the "Wright" report that the viability of the operation depends entirely on the value and marketability of the resin products. It is recommended that a concerted market and laboratory research programme be completed on resin. As part of a continued development programme on the property, large bulk samples of coal containing significant contents of resin should be obtained for qualitative studies of the resin by various users such as Hercules Inc.

ECONOMIC POTENTIAL

In the Interim Conceptual Study of the Bowron River Coal Deposit by Wright Engineers Ltd., the operating cost to produce an 11,000 BTU/lb. coal product for a 900 Tonne/day operation, has been estimated at $1.39/million BTU or $33/Tonne.

Considering the excessive freight rates to distant sales outlets, the Prince George pulp mills appear to be the optimum market for a 900 tonne/day operation. The value of the coal sold at Prince George is $0.66/million BTU, or $15.90/Tonne less transportation costs. Therefore, the economics of the deposit would depend on a minimum value of $17.00/tonne of the contained resin.

The visual estimate of 1.05% "Amber" resin (23 lbs./Tonne), with values of $0.40 - 1.50/lb. indicates a potential value of $9 - 34/Tonne. With better estimates of the content and market value of resin, the economics of a 900 Tonne/day operation could be more fully evaluated. The value of the "Refined" resin has yet to be established.

It is felt that the objective of a 500 - 1,000 Tonne/day operation may not be the most optimum for the Bowron River Coal deposit.

(1). The best markets available for coal are outside the Province of British Columbia. Transportation rates are greatly reduced by employing unit trains - a minimum of 1,000,000 Tonnes/year (3,000 Tonnes/day).

(2). The unit operating costs of a larger mining operation would be somewhat lower than a 900 Tonne/day operation.

(3). B. C. Hydro has stated that the minimum sized generating station they would consider on site would be 600 Megawatts, with a minimum coal reserve for 35 years. This, in the writer's opinion, would provide the best ultimate market for the coal. Such an operation would demand production of 5,500 Tonnes/day of an 11,000 BTU/lb. coal product. Ultimate reserves would have to be established at a minimum of 70,000,000 Tonnes.

It is felt that at a larger scale of mining, say 3,000 to 6,000 Tonnes/day, the Bowron River coal reserves may be economic on marketing the coal alone. Further feasibility and market studies are required to substantiate this statement.

RECOMMENDATIONS

Continued development work is recommended, which is oriented at proving substantial reserves for a 3,000 - 6,000 Tonne/day operation.

(1). 10,000 meters of NQ diamond drilling, in an area to the south and east of the 1977 area. Drill hole spacing should be 300 meters, with 150 meter spacing in areas of faults and geological contacts.

(2). 1,000 meters of large diameter diamond drill holes (.1 -.15 meters) to obtain a sufficient bulk sample of coal (1/2 - 1 tonne) for quality studies of the coal and resin. 7 - 8 holes are required, each 120 - 150 meters deep. The location of the holes should be in areas known from the 1977 programme to contain substantial thicknesses of coal (> 6 meters), and high resin content.

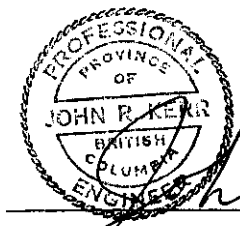
(3). Continued laboratory testing of coal properties and research regarding resin quality and content.

(4). Continued mine feasibility studies, environmental studies and market research of the coal and by-products.

Costs for the above programme are estimated at $625,000.00 and are shown in Appendix A.

Respectfully Submitted By:

KERR, DAWSON & ASSOCIATES LTD.,



John R. Kerr, P. Eng.,
GEOLOGIST

Kamloops, B. C.,

January 5th., 1978.

APPENDIX A

COST ESTIMATES

COST ESTIMATES

Diamond Drilling	
NQ - 10,000 meters @ $40.00/meter	$400,000
Large Diameter 1,000 meters @ $100.00/meter	100,000
Lab Testing and Research	10,000
Continued Mine Feasibility	30,000
Supervision, includes compilation of data and report	45,000
Room and Board	6,000
Supplies, Travel, Equipment rental, etc.	34,000
TOTAL	$625,000

APPENDIX B

EXPENDITURES - 1977

EXPENDITURES - 1977

Consulting	$29,897
Diamond Drilling (18,706 ft.)	206,837
Equipment Rental	9,551
Assays	920
Travel	3,586
Misc. Supplies and Services	13,493
Feasibility and Environmental Study	32,000
Core Storage Facility	13,500
Survey Control	12,000
TOTAL	$321,784

I HEREBY CERTIFY that the expenditures to the best of my knowledge, represent a true and actual cost of work performed on the Bowron River Coal Deposit during 1977.

John R. Kerr

John R. Kerr, P. Eng.

APPENDIX C

WRITER'S CERTIFICATE

JOHN R. KERR, P.ENG.
GEOLOGICAL ENGINEER

9—219 VICTORIA STREET
KAMLOOPS, B.C.

PHONE (604) 374-6427

CERTIFICATE

I, JOHN R. KERR, OF THE CITY OF KAMLOOPS, DO HEREBY CERTIFY THAT:

(1). I am a member of the Association of Professional Engineers in the Province of British Columbia, and a Fellow of the Geological Association of Canada.

(2). I am employed by Kerr, Dawson, and Associates Ltd., with my office at #1 - 219 Victoria Street, Kamloops, B. C.

(3). I have practised continuously as a geologist since graduation from the University of British Columbia in 1964 with a B. A. Sc. in Geological Engineering.

(4). I have not directly or indirectly received nor do I expect to receive any interest in the properties or securities of Norco Resources Ltd., or any beneficial interest in any of the securities of Norco Resources Ltd.

(5). This report is based on an exhaustive study of all available data, published and unpublished reports and my periodic attendance on the property during the initial phase of drilling April 22nd. to October 25th., 1977.

(6). Permission is hereby granted to Norco Resources Ltd. to use this report to satisfy requirements of Securities Commission, Stock Exchanges, and the British Columbia Ministry of Mines.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA JOHN R. KERR

John R. Kerr, P. Eng.,
GEOLOGIST

Kamloops, B. C.,
January 5th., 1978.

APPENDIX C

REFERENCES

REFERENCES

Trenholme, L. S. - Report on the Bowron River Coal Deposit, January 27th., 1977.

- Report on the Bowron River Coal Deposit, March 10th., 1976.

- Norco Resources Ltd., Summary Report, August 25th., 1975.

Donaldson, J. R. - Petrography of the Coal from the Garroway Mine in the Bowron River Coal Area, British Columbia, G. S. C. Report No. 93 - H - 13 W - 1, 1972.

Dolmage, Campbell and Associates Ltd. - Bowron River Coal Deposit, 1975. Excerpt from "Coal Resources of British Columbia" prepared for B. C. Hydro and Power Authority.

Black. J. M. - Report on Northern Coal Mines Ltd., September 8th., 1967.

Haslam, H. S. - Bowron River Coal Mine Dewatering and Bulk Sampling, September, 1976.

Kerr, J. R. - Report on the Bowron River Coal Deposit, March 10th., 1977.

Wright Engineers Ltd.

Krpan, N. R.
Gormely, L. S.
Henson, G. P.
Douglass, K.
Kerr, J. R.

- Interim Conceptual Evaluation, Bowron River Coal Project, November, 1977.

- Numerous other published and unpublished documents, letters, maps, and laboratory and research reports.

APPENDIX E

LAB REPORTS

NORCO RESOURCES LTD.

PROJECT: Bowron River

HOLE #: 77-1

Footage: 632.0 - 637.5

	Air-dry Basis	Dry Basis
Ash %	19.13	19.95
R.M. %	4.07	--
V.M. %	32.42	33.79
F.C. %	44.38	46.26
S. %	1.24	1.29
BTU/lb.	10,720	11,170

Estimated Amber Resin Content: 0.4%

CYCLONE ENGINEERING SALES LTD.

NORCO RESOURCES LTD.

PROJECT: Bowron River

HOLE #: 77-1

Footage: 639.0 - 647.5

	Air-dry Basis	Dry Basis
Ash %	27.74	28.83
R.M. %	3.77	--
V.M. %	29.39	30.54
F.C. %	39.10	40.63
S. %	2.11	2.19
BTU/lb.	9,370	9,740

Estimated Amber Resin Content: 0.3%

CYCLONE ENGINEERING SALES LTD.

NORCO RESOURCES LTD.

PROJECT: Bowron River

HOLE #: 77-1

Footage: 651.5 - 659.0

	Air-dry Basis	Dry Basis
Ash %	34.02	35.23
R.M. %	3.43	--
V.M. %	28.11	29.11
F.C. %	34.44	35.66
S. %	2.87	2.97
BTU/lb.	8,690	9,000

Estimated Amber Resin Content: 0.6%

CYCLONE ENGINEERING SALES LTD.

NORCO RESOURCES LTD.

PROJECT: Bowron River

HOLE: DDH 77-2

Footage: 623' - 628'

	Air-dry basis	Dry basis
Ash %	30.57	31.83
R.M. %	3.95	--
V.M. %	29.94	31.17
F.C. %	35.54	37.00
S. %	1.37	1.43
B.T.U./lb.	9,140	9,520

Estimated Amber Resin Content: 0.8%

CYCLONE ENGINEERING SALES LTD.

NORCO RESOURCES LTD.

PROJECT: Bowron River

HOLE: DDH 77-3

Footage: 765' - 774'

	Air-dry basis	Dry basis
Ash %	50.98	52.54
R.M. %	2.97	--
V.M. %	22.89	23.59
F.C. %	23.16	23.87
S. %	0.79	0.81
B.T.U./lb.	6,310	6,500

Estimated Amber Resin Content: 0.1%

CYCLONE ENGINEERING SALES LTD.

NORCO RESOURCES LTD.

PROJECT: Bowron River

HOLE: 77-4

Footage: 756' - 765'

	Air-dry basis	Dry basis
Ash %	34.88	35.97
R.M. %	3.03	--
V.M. %	27.85	28.72
F.C. %	34.24	35.31
S %	1.32	1.36
BTU/lb.	8,120	8,370

Estimated Amber Resin Content: 0.1%

CYCLONE ENGINEERING SALES LTD.

NORCO RESOURCES LTD.

PROJECT: Bowron River

HOLE: 77-4

Footage: 765' - 773'

	Air-dry basis	Dry basis
Ash %	42.26	43.31
R.M. %	2.42	--
V.M. %	25.79	26.43
F.C. %	29.53	30.26
S %	0.76	0.78
BTU/lb.	7,090	7,270

Estimated Amber Resin Content: 0.09%

CYCLONE ENGINEERING SALES LTD.

NORCO RESOURCES LTD.

PROJECT: Bowron River

HOLE: 77-4

Footage: 773' - 778'

	Air-dry basis	Dry basis
Ash %	28.16	29.09
R.M. %	3.19	--
V.M. %	31.90	32.95
F.C. %	36.75	37.96
S %	0.73	0.75
BTU/lb.	9,280	9,590

Estimated Amber Resin Content: 0.1%

CYCLONE ENGINEERING SALES LTD.

NORCO RESOURCES LTD.

PROJECT: Bowron River

HOLE# 77-5

Footage: 893' - 909'

	Air-dry basis	Dry basis
Ash %	33.36	34.37
R.M. %	2.95	--
V.M. %	31.20	32.15
F.C. %	32.49	33.48
S. %	1.11	1.14
BTU/lb.	8,350	8,600

Estimated Amber Resin Content: 0.09%

CYCLONE ENGINEERING SALES LTD.

NORCO RESOURCES LTD.

PROJECT: Bowron River

HOLE: #77-6

Footage: 695.5' - 709.5

	Air-dry basis	Dry basis
Ash %	36.08	37.05
R.M.%	2.62	--
V.M.%	33.04	33.93
F.C. %	28.26	29.02
S. %	0.82	0.84
BTU/lb.	7,820	8,030

Estimated Amber Resin Content: 0.16%

CYCLONE ENGINEERING SALES LTD.

NORCO RESOURCES LTD.

PROJECT: Bowron River

HOLE: 77-5

Footage: 912' - 919'

	Air-dry basis	Dry basis
Ash %	33.25	34.27
R.M. %	2.98	--
V.M. %	30.37	31.30
F.C. %	33.40	34.43
S.	2.01	2.01
BTU/lb.	8,600	8,860

Estimated Amber Resin Content: 0.23%

CYCLONE ENGINEERING SALES LTD.

NORCO RESOURCES LTD.

PROJECT: Bowron River

HOLE: 77-7

Footage: 528.5' - 538'

	Air-dry basis	Dry basis
Ash %	23.65	24.62
R. M. %	3.93	--
V. M. %	36.08	37.56
F. C. %	36.34	37.83
S. %	1.13	1.18
BTU/lb.	9,940	10,350

Estimated Amber Resin Content: 0.26 %

CYCLONE ENGINEERING SALES LTD.

CABLE ADDRESS COMTECO
TELEX 04-352697

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

Please address all correspondence to:
147 Riverside Dr., North Vancouver, B.C. V7H 1T6

SINCE 1908

Office: Tel. (604) 929-2228

September 15, 1977

WRIGHT ENGINEERS LTD.
Ste. #100 - 1444 Alberni St.
VANCOUVER, BC
V6G 2Z4

Report No. 64-16093 - 101

Sample Identification:

77-8	471-478'	77-11	988-997'
77-8	478-485'	77-11	1038-1045'
77-9	835-839.5'	77-12	919-927.5'
77-10	1262.5-1271'	77-13	958.5-962.5'
		77-15	697.5-707'

PROXIMATE ANALYSES

Sample No.		As Received	Dry Basis
77-8 471-478'	% Moisture	4.77	xxxxx
	% Ash	24.52	25.75
	% Volatile	29.33	30.80
	% Fixed Carbon	41.38	43.45
		100.00	100.00
	Btu	9481	9956
	% Sulphur	1.73	1.82
77-8 478-485'	% Moisture	5.07	xxxxx
	% Ash	25.69	27.06
	% Volatile	29.30	30.86
	% Fixed Carbon	39.94	42.08
		100.00	100.00
	Btu	9297	9794
	% Sulphur	1.46	1.54
77-9 835-839.5'	% Moisture	4.32	xxxxx
	% Ash	21.84	22.83
	% Volatile	30.33	31.70
	% Fixed Carbon	43.51	45.47
		100.00	100.00
	Btu	9976	10426
	% Sulphur	2.71	2.83

Continued Page 2/ ...

Sample No.		As Received	Dry Basis
77-10	% Moisture	3.29	xxxxx
1262.5-1271'	% Ash	41.23	42.63
	% Volatile	22.57	23.34
	% Fixed Carbon	32.91	34.03
		100.00	100.00
	Btu	7267	7514
	% Sulphur	1.17	1.21
77-11	% Moisture	3.22	xxxxx
988-997'	% Ash	42.13	43.53
	% Volatile	22.94	23.70
	% Fixed Carbon	31.71	32.77
		100.00	100.00
	Btu	7134	7371
	% Sulphur	1.65	1.70
77-11	% Moisture	4.36	xxxxx
1038-1045'	% Ash	29.81	31.17
	% Volatile	26.38	27.58
	% Fixed Carbon	39.45	41.25
		100.00	100.00
	Btu	8763	9163
	% Sulphur	1.22	1.28
77-12	% Moisture	3.36	xxxxx
919-927.5'	% Ash	46.94	48.57
	% Volatile	19.93	20.62
	% Fixed Carbon	29.77	30.81
		100.00	100.00
	Btu	6307	6526
	% Sulphur	0.83	0.86
77-13	% Moisture	4.64	xxxxx
958.5-962.5'	% Ash	20.89	21.91
	% Volatile	32.12	33.68
	% Fixed Carbon	42.35	44.41
		100.00	100.00
	Btu	10012	10499
	% Sulphur	0.96	1.01

Continued Page 3/ ...

September 15, 1977

Sample No.		As Received	Dry Basis
77-15	% Moisture	4.33	xxxxx
697.5-707'	% Ash	34.37	35.93
	% Volatile	26.35	27.54
	% Fixed Carbon	34.95	36.53
		100.00	100.00
	Btu	8125	8493
	% Sulphur	1.34	1.40

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

C. D. Saville
Manager

js

CABLE ADDRESS COMTECO
TELEX 04-352697

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

Please address all correspondence to:
147 Riverside Dr., North Vancouver, B.C. V7H 1T6

SINCE 1908

Office: Tel. (604) 929-2228

September 27, 1977

WRIGHT ENGINEERS LTD.
Ste. #100 - 1444 Alberni St.
VANCOUVER, BC
V6G 2Z4

Report No. 64-16148 - 50

Attention: Dr. L. S. Gormely, Mr. N. R. Krpan

Sample Identification:
DDH WL-3 846-859'
DDH 77-17 1109-1114.5'
DDH 77-17 1048.5-1057'

PROXIMATE ANALYSES

Sample No.		As Received	Dry Basis
WL-3 846-859'	% Moisture	4.49	xxxxx
	% Ash	41.37	43.32
	% Volatile	24.72	25.88
	% Fixed Carbon	29.42	30.80
		100.00	100.00
	BTU	6646	6958
	% Sulphur	0.96	1.00
77-17 1109-1114.5'	% Moisture	3.68	xxxxx
	% Ash	35.07	36.41
	% Volatile	25.99	26.98
	% Fixed Carbon	35.26	36.61
		100.00	100.00
	BTU	8095	8404
	% Sulphur	1.09	1.13
77-17 1048.5-1057'	% Moisture	2.92	xxxxx
	% Ash	55.83	57.51
	% Volatile	19.90	20.50
	% Fixed Carbon	21.35	21.99
		100.00	100.00
	BTU	5103	5256
	% Sulphur	0.50	0.51

Continued Page 2/ ...

CABLE ADDRESS COMTECO
TELEX 04-352697

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

Please address all correspondence to:
147 Riverside Dr., North Vancouver, B.C. V7H 1T6

Office: Tel. (604) 929-2228

October 12, 1977

WRIGHT ENGINEERS LTD.
Ste. #100 - 1444 Alberni Street
VANCOUVER, BC
V6G 2Z4

Report No. 64-16162-64

Attention: Dr. L. S. Gormely
Mr. N. R. Krpan

Sample Identification: DDH 77-18 1145 - 1158.5'
1161 - 1167.5'
1169 - 1175'

PROXIMATE ANALYSIS

SAMPLE NO.		AS RECEIVED	DRY BASIS
DDH 77-18	% Moisture	3.42	xxxxx
1145-1158.5'	% Ash	47.86	49.56
	% Volatile	22.66	23.46
	% Fixed Carbon	26.06	26.98
		100.00	100.00
	BTU	6194	6413
	% Sulphur	1.06	1.10
DDH 77-18	% Moisture	3.03	xxxxx
1161-1167.5'	% Ash	47.90	49.40
	% Volatile	23.85	24.60
	% Fixed Carbon	25.21	26.00
		100.00	100.00
	BTU	6132	6324
	% Sulphur	1.23	1.27
DDH 77-18	% Moisture	3.93	xxxxx
1169-1175'	% Ash	36.30	37.79
	% Volatile	27.48	28.60
	% Fixed Carbon	32.29	33.61
		100.00	100.00
	BTU	7883	8205
	% Sulphur	1.58	1.64

DENSITY: DDH 77-18 1161 - 1167.5' = 98.3 lbs/cu ft.

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

C. D. Saville
Manager

jp

cc: Mr. J. Kerr, Kamloops, BC

CABLE ADDRESS COMTECO
TELEX 04-352697

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

Please address all correspondence to:
147 Riverside Dr., North Vancouver, B.C. V7H 1T6

SINCE 1908

Office: Tel. (604) 929-2228

October 12, 1977

WRIGHT ENGINEERS LTD.
Ste. #100 - 1444 Alberni Street
VANCOUVER, BC
V6G 2Z4

Report No. 64-16211-13

Attention: Dr. L. S. Gormely
Mr. N. R. Krpan

Sample Identification: DDH 77-19 1015.5 - 1027'
1027 - 1040'
1040 - 1047'

PROXIMATE ANALYSIS

SAMPLE NO.		AS RECEIVED	DRY BASIS
DDH 77-19	% Moisture	3.53	xxxxx
1015.5-1027'	% Ash	40.69	42.18
	% Volatile	19.22	19.92
	% Fixed Carbon	36.56	37.90
		100.00	100.00
	BTU	7278	7544
	% Sulphur	1.34	1.39
DDH 77-19	% Moisture	3.04	xxxxx
1027-1040'	% Ash	49.84	51.40
	% Volatile	19.42	20.03
	% Fixed Carbon	27.70	28.57
		100.00	100.00
	BTU	5828	6011
	% Sulphur	1.42	1.46
DDH 77-19	% Moisture	4.21	xxxxx
1040-1047'	% Ash	34.73	36.26
	% Volatile	19.16	20.00
	% Fixed Carbon	41.90	43.74
	BTU	8104	8460
	% Sulphur	1.28	1.34

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

C. D. Saville
Manager

jp

(M1)

DDH	NORTHING	EASTING	ELEVATION
4	5 964 314.8	571 910.0	748.4
6	64 576.66	71 716.71	733.5
7	64 536.46	71 688.22	740.4
9	64 358.8	71 951.9	748.4
10	64 376.62	71 863.05	746.1
11 & 12	64 515.44	71 666.46	740.4
13	64 563.93	71 620.86	740.3
14	64 579.24	71 631.68	739.9
15	64 595.29	71 642.56	740.0
17	64 706.39	71 642.77	739.8
18	64 684.14	71 588.87	739.3
19	64 738.01	71 566.11	740.0
20	64 856.76	71 517.86	740.3
21	64 923.47	71 493.87	739.8
23	64 847.26	71 493.52	740.0
24	64 980.71	71 415.36	739.6
25	64 723.46	71 510.44	740.0
26	64 727.22	71 529.19	739.9
27	65 168.59	71 295.19	743.8
29	65 277.32	71 200.69	747.8
30	65 391.34	71 [illegible].12	748.0
33	65 455.47	71 [illegible].31	748.6
31	66 535.54	70 965.19	749.2
32	65 613.55	70 888.86	748.9
WL 1 A	65 610.45	71 385.65	739.0
WL 2	65 572.1	71 167.1	746.7
WL 3	66 154.69	71 047.96	746.4
WL 4	66 318.36	70 952.37	739.5
WL 5	63 497.66	72 567.96	764.8
WL 6	63 852.54	72 294.10	760.9
WL 7	64 [illegible]0.03	72 689.75	745.1
EX 4	63 697.26	72 757.82	748.0
EX 5	63 561.65	72 665.15	751.7
[illegible]	65 [illegible]	71 386.85	733.9
[illegible] 3	65 [illegible]37.06	71 144.87	747.7
[illegible] 4	65 [illegible]37.16	70 [illegible]51.87	752.7
[illegible]	64 852.06	71 453.90	739.1
[illegible] 35 & 36	64 963.45	71 237.25	
7465	65 122.11	71 221.65	
7466	64 968.87	71 251.53	
7467	64 813.35	71 257.82	
7468	64 717.87	71 281.15	
7469	64 618.52	71 364.01	
7470	64 604.89	71 446.84	
7471	64 474.23	71 613.86	
7472	64 402.67	71 677.31	
7473	64 401.28	71 723.40	
7474	64 417.83	71 760.73	
7475	63 917.19	72 428.84	
7476	64 [illegible]92.92	72 464.58	
7478	64 725.30	72 554.79	
7479	65 [illegible]56.56	71 [illegible]43.88	
7477	65 [illegible]31.46	70 973.80	
75-11	65 537.80	70 912.29	

[illegible]			
1			749.35
2			780.03
3			783.76
4			752.56
5			745.48
6			765.15
7			750.09
8			755.93

DDH	NORTHING	EASTING	ELEVATION
77-1	5 965 585.50	571 130.26	748.04
77-2	65 825.58	70 943.93	747.58
77-3	65 958.24	70 876.06	747.51
77-4	66 120.24	70 877.88	746.84
77-5	65 487.26	71 296.12	748.17
77-6	65 344.36	71 318.49	748.39
77-7	65 415.74	71 157.34	749.32
77-8	65 662.55	70 970.35	748.86
77-9	65 740.49	71 102.37	747.73
77-1[illegible]	65 865.57	71 342.25	744.90
77-11	65 652.62	71 266.89	746.98
77-12	65 882.98	71 049.02	747.41
77-13	66 037.48	71 007.39	747.01
77-14	65 874.60	70 744.05	748.03
77-15	66 051.86	70 740.18	747.76
77-16	65 732.45	71 [illegible]71.47	748.27
77-17	65 [illegible]06.77	71 224.70	746.45
77-18	65 995.25	71 [illegible]48.74	744.24

LEGEND

THIS PLAN SHOWS UNIVERSAL TRANSVERSE MERCATOR CO-ORDINATES ZONE 10
TO OBTAIN GROUND LEVEL CO-ORDINATES DIVIDE BY COMBINED FACTOR OF 0.999545
GRID BEARING REFERRED TO THE 123RD MERIDIAN OF WEST LONGITUDE
ELEVATIONS ARE TO GEODETIC DATUM AND OBTAINED FROM FOURTH ORDER GOVERNMENTAL CONTROL

IRON POST ET	SHOWN THUS ● IP
BENCH MARK 16" SPIKE IN TREE CARVED (B.M.11)	⊗
DIAMOND DRILL HOLE	⊕ D.D.H. 20

DDH	NORTHING	EASTING	ELEVATION (M.)
77-19	5 966 123.00	571 178.32	744.31
77-20	66 224.12	70 777.78	742.21
77-21	65 228.84	71 126.76	756.26
77-22	65 366.16	71 044.68	749.62
77-23	65 591.57	70 867.80	749.41
77-24	65 512.08	70 997.99	749.20
77-25	65 269.59	71 161.12	756.38

DDH 77-19 to DDH 77-25 surveyed by KERR, DAWSON & ASSOCIATES LTD.

D.L. 9592
CL 148

D.L. 9593
CL 162

D.L. 4868

D.L. 9590

D.L. 9591
CL 163

5,965,866N.
571,342E.

5,965,826N.
570,944E.

5,965,344N
571,319E

5,964,924N.
571,458E.

5,964,315N. (100' in Alces Claim)
571,910E

5963,498N.
572,568E.

DDH 7102
DDH 7105
DDH 7101
DDH 7103
DDH 7104

TO PRINCE GEORGE 90 MILES

Camp Area

BOWRON RIVER

ROAD

TO SAN MILL 8 MILES

5,966,000 N
5,965,000 N
5,964,000 N
571,000 E
572,000 E
573,000 E

15

BW-Bowron River 77-25

Drawing No. 152-21

UNDERHILL & UNDERHILL PROFESSIONAL SURVEYORS & ENGINEERS VANCOUVER, BRITISH COLUMBIA WHITEHORSE, YUKON	UU	W Connelly BCLS	BENCH MARK	NO	DATE	BY	REVISION	APP'D	DESIGN BY J.R.K. DRAWN BY F.H. APPROVED JOB NO 7868 DATE Oct 5, 1977 SCALE 1:5000	CLIENT NORCO RESOURCES LTD. PROJECT BOWRON RIVER COAL DEPOSIT	TITLE PLAN OF DIAMOND DRILL HOLES AND MINE WORKINGS SHEET / OF / DRAWING NUMBER A-411 REVISION

DEC/77 KERR DAWSON & ASSOCIATES LTD

FB 307 DESTROY PRINTS BEARING PREVIOUS NUMBER

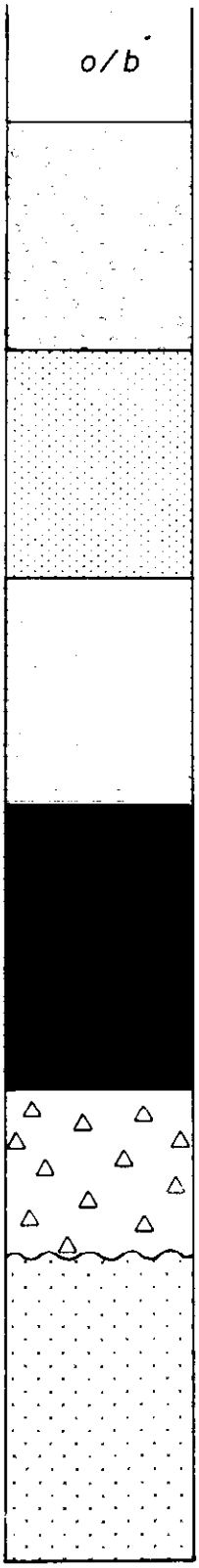
APPENDIX F

GEOLOGICAL STRIPS

00015(03)

ROCK CLASSIFICATION & DESCRIPTIONS

BOWRON RIVER SEDIMENTS
Tertiary (Eocene ?)



Overburden

Poorly-sorted, well washed conglomerate, with sub-rounded to rounded pebbles & cobbles up to 15 cm. diam, reflecting dominantly a Slide Mtn. origin, consisting of quartzite, chert, volcanic rocks, limestone, shale & some coal. The matrix, where present, is sand.

Conglomerate beds represent old creek beds that fed the basin.

Fine - coarse grained, light brown-gray, gritty sandstone. Graded bedding frequently occurs, occasionally grading into conglomerate (above)

Distorted bedding resulted from turbidity currents, and slumping of softer sediments during deposition.

Interbedded shale/sst represents seasonal/cyclic deposition.

F grained, light brown-black, laminated shale. Slumping features common, as a result of softer sediments during deposition. Brown tube-like remnants common indicate burrowing animals.

Thin veins, lenses & small seams of coal are present throughout shale, frequency & content increasing near major seams. Shale, with coal, reflects quiet, shallow swamp-like deposition.

Black, competent, hard, vitreous coal, often interbedded with shale.

Coal classification by volume% (visual estimate)

Clean coal	-	80 - 100% coal
Shaley coal	-	50 - 80% coal
Coaley shale	-	20 - 50% coal
Shale	-	< 20% coal

"Amber" resin most abundant in lower seam ranging 0.5 - 2.5% content (average ~ 1%)

Coarse grained, gritty, waterlain tuff, with angular - subangular fragments, 3 cm diam. (max.)

Possibly of pyroclastic volcanic origin. Occurs at or near top of lower coal seam. Provides good marker horizon.

~~~~~~~~~~ UNCONFORMITY ~~~~~~~~~~

SLIDE MTN. GROUP
Mississippian.

Dominantly soft, putty-like, brown, tuffaceous sandstone, with vague, subangular monolithologic fragments, and occasional bedding

Clay minerals abundant as rock swells & deteriorates rapidly when exposed.
~~~~~~~~~~

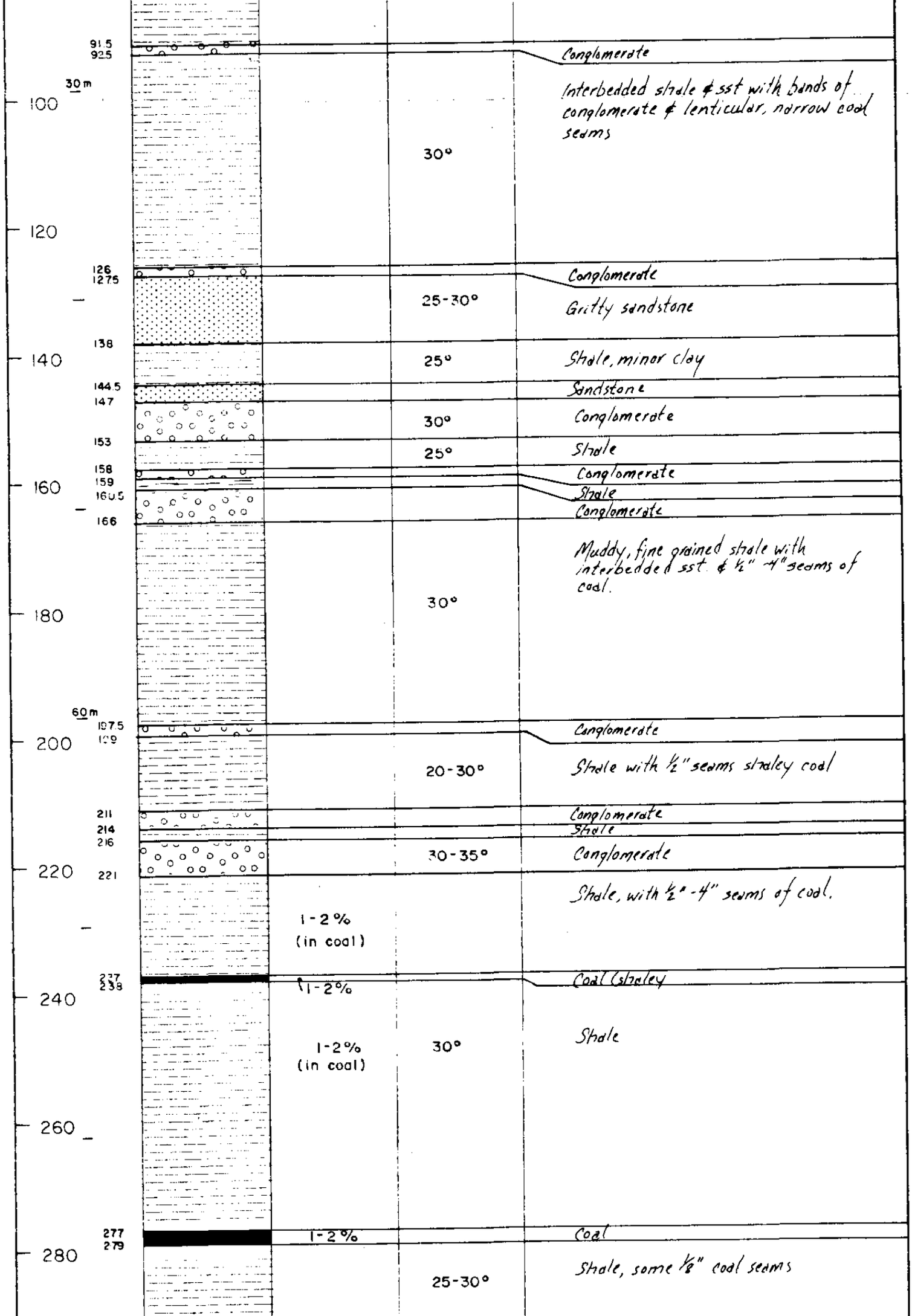
M1

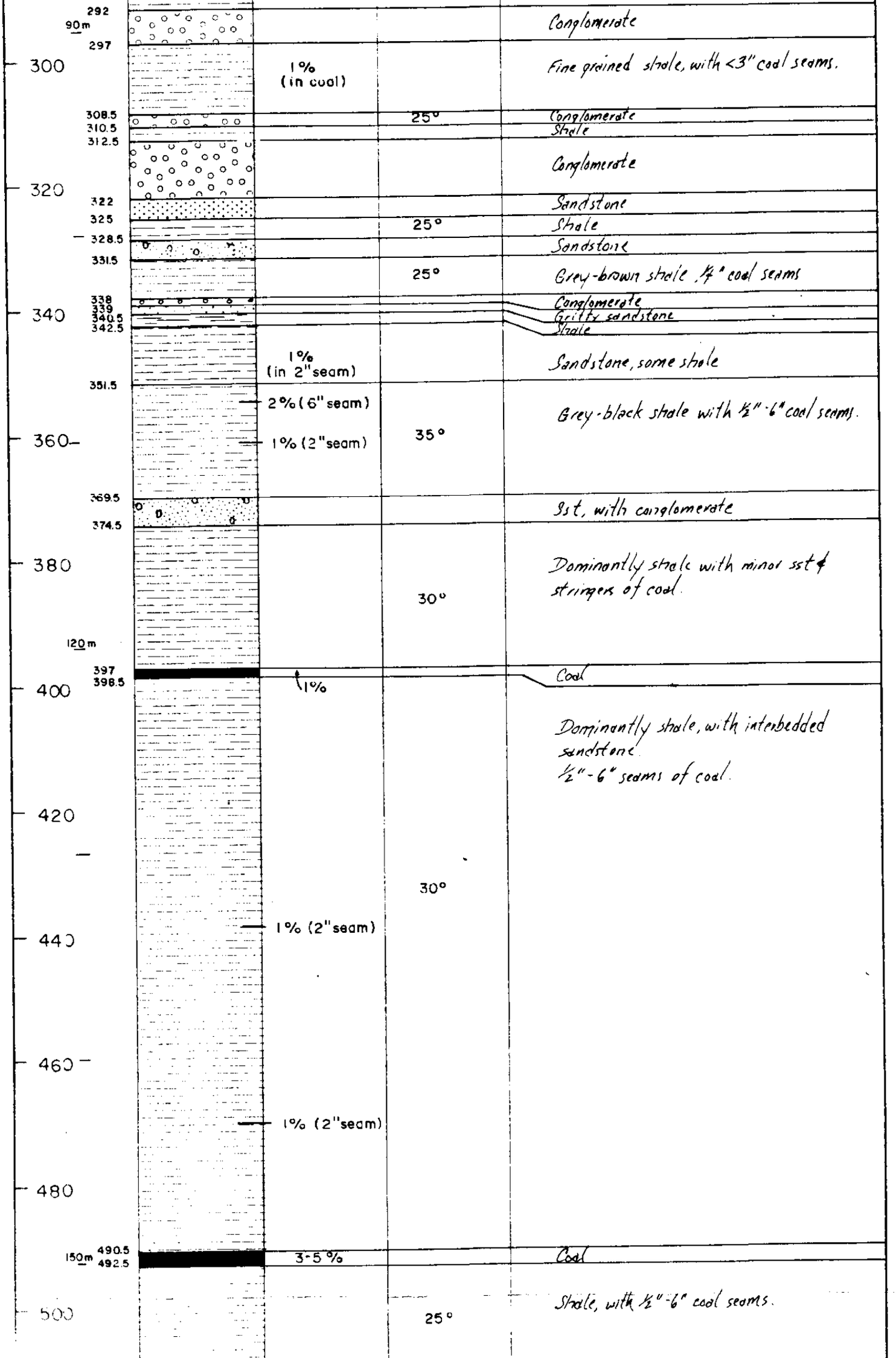
GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-1

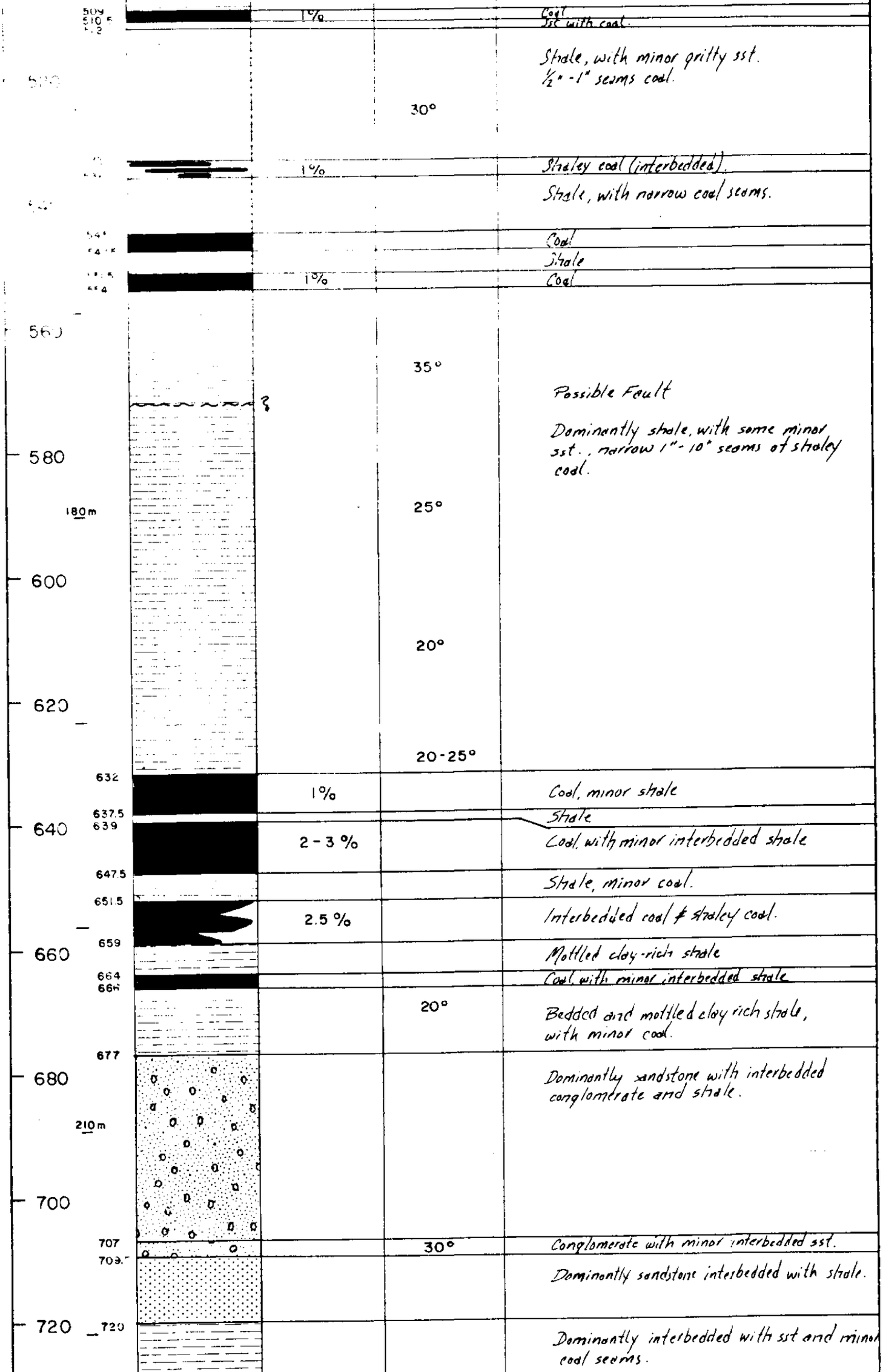
BR- BOWRON RIVER 77 (3) B.

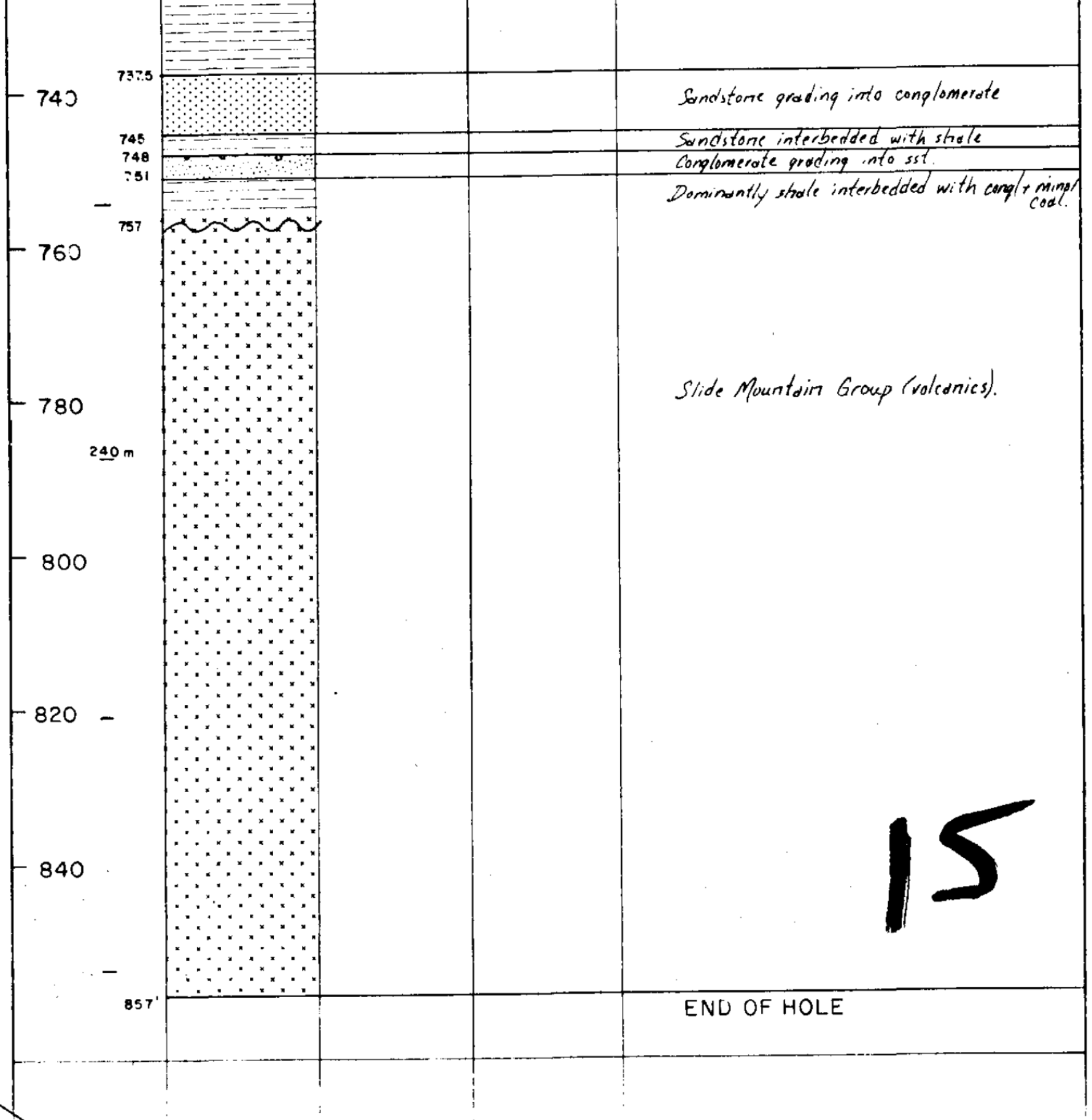
BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 27+00 N, 2+70 E	DIP TESTS : 500' -83° 857' -81° (303° tropari)
DATE BEGUN : APRIL 27, 1977	
DATE FINISHED : MAY 4, 1977	TOTAL DEPTH : 857' (261.28 m)
LOGGED BY : J.R. KERR	
SCALE : 1" = 20' or 1:240	

DEPTH FROM COLLAR FT. M	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0				
20	O/B			0-30' gravel 30'-60' clay 60'-69' boulders
40				
60				
69'				
80			20-30°	fine grained bedded shale, with interbedded sst. congl. & narrow lenticular coal seams


91.5
92.5
Conglomerate
30 m
100
Interbedded shale & sst with bands of conglomerate & lenticular, narrow coal seams
30°
120
126
127.5
Conglomerate
25-30°
Gritty sandstone
138
140
25°
Shale, minor clay
144.5
147
Sandstone
30°
Conglomerate
153
25°
Shale
158
159
160.5
160
Conglomerate
Shale
Conglomerate
166
Muddy, fine grained shale with interbedded sst. & ½" -4" seams of coal.
30°
180
60 m
197.5
199
200
Conglomerate
20-30°
Shale with ½" seams shaley coal
211
214
216
Conglomerate
Shale
30-35°
Conglomerate
220
221
Shale, with ½" -4" seams of coal.
1-2%
(in coal)
237
238
Coal (shaley
1-2%
240
Shale
1-2%
(in coal)
30°
260
277
279
1-2%
Coal
280
Shale, some ⅛" coal seams
25-30°


292
90m
297
300
1%
(in coal)
Conglomerate
Fine grained shale, with <3" coal seams.
308.5
310.5
312.5
25°
Conglomerate
Shale
Conglomerate
320
322
325
328.5
331.5
Sandstone
25°
Shale
Sandstone
25°
Grey-brown shale, ¼" coal seams
338
339
340.5
342.5
340
Conglomerate
Gritty sandstone
Shale
1%
(in 2" seam)
Sandstone, some shale
351.5
2% (6" seam)
1% (2" seam)
360
35°
Grey-black shale with ½"-6" coal seams.
369.5
374.5
Sst, with conglomerate
380
30°
Dominantly shale with minor sst & stringers of coal.
120m
397
398.5
400
1%
Coal
Dominantly shale, with interbedded sandstone.
½"-6" seams of coal.
420
30°
440
1% (2" seam)
460
1% (2" seam)
480
150m
490.5
492.5
3-5%
Coal
500
25°
Shale, with ½"-6" coal seams.


509
510.5
512
1%
Coal
Sst with coal.
Shale, with minor gritty sst.
½" - 1" seams coal.
30°
1%
Shaley coal (interbedded).
Shale, with narrow coal seams.
Coal
Shale
1%
Coal
560
35°
Possible Fault
Dominantly shale, with some minor sst., narrow 1" - 10" seams of shaley coal.
580
180m
25°
600
20°
620
20-25°
632
1%
Coal, minor shale
637.5
Shale
639
640
2 - 3 %
Coal, with minor interbedded shale
647.5
Shale, minor coal.
651.5
2.5 %
Interbedded coal & shaley coal.
659
660
Mottled clay-rich shale
664
Coal, with minor interbedded shale
20°
Bedded and mottled clay rich shale, with minor coal.
677
680
Dominantly sandstone with interbedded conglomerate and shale.
210m
700
707
30°
Conglomerate with minor interbedded sst.
709.5
Dominantly sandstone interbedded with shale.
720
720
Dominantly interbedded with sst and minor coal seams.


737.5
740
745
748
751
757
760
780
240 m
800
820
840
857'
Sandstone grading into conglomerate
Sandstone interbedded with shale
Conglomerate grading into sst.
Dominantly shale interbedded with congl + minor coal.
Slide Mountain Group (volcanics).
END OF HOLE
15

(MP)

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-2

AK-BOWRON RIVER 77(3)B.

BOWRON RIVER COAL DEPOSIT

CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 30+00 E, 2+36 E	DIP TESTS : 500' - 83° 747' - 83°
DATE BEGUN: MAY 5, 1977	
DATE FINISHED: MAY 8, 1977	TOTAL DEPTH : 747'(227.74 m)
LOGGED BY: T.D. LEWIS	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR FT. M	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0				
20	O/B			0' - 10' clay 10' - 25' gravel 25' - 80' clay + sand 80' - 102' clay, sand + some boulders.
40				
60				
80				
30m				
100	102			Conglomerate
	103.5		25-35°	Interbedded shale, sandstone, conglomerate + minor lenticular coal
120	115.5			Conglomerate
	118.5		25°	Interbedded shale and sst + minor lenticular coal
	125			Conglomerate
	130.5			Dominantly sandstone interbedded with shale, conglomerate, and minor lenticular coal seams.
140	142.5		25 - 30°	Dominantly shale, with interbedded sst, cong + thin coal
	145.5			Conglomerate
	147		30°	Dominantly shale interbedded with sst + cong. + minor lenticular coal.
	155			Sandstone giving into conglomerate
160	156.5			Shale with some sst.
	162			Interbedded coal + shale
	163			Dominantly shale interbedded with sandstone, conglomerate and minor coal seams.
180				
			25°	
60m	191.5			Conglomerate
	195			Dominantly shale + sst and lenticular coal
200	198			Conglomerate
	201	41%		Coal + shale
	204			Conglomerate
	205		25°	Dominantly sandstone with shale
	208			Shale
	209.5		20-25°	Interbedded sandstone and shale
220				
	226			Shale
	229		15°	Dominantly sandstone with conglomerate and shale
	232			Shale
	233.5			Conglomerate
	239			Interbedded sandstone and shale
240	242			Conglomerate
	243.5		20°	Shale
	246			Interbedded sandstone and shale
	254			
260	261.5		20°	Conglomerate
	271.5		25-30°	Interbedded shale and sandstone
	279.5			Conglomerate + interbedded sandstone
280				
				Shale + thin interbedded coal.
90m	288.5			Conglomerate
	290		20°	Shale + minor coal seams
300	300.5			Conglomerate
	302		25°	Interbedded shale + sandstone
	307.5			Conglomerate
	309.5			Shale with minor coal seams
	317.5			
320	320	1%	20°	Interbedded coal + shale
				Dominantly shale with sandstone
	326.5			Conglomerate
	329		30-40°	Interbedded shale and sandstone
	332			Conglomerate
	334			Interbedded shale + sst
340	336			Conglomerate
	339			Interbedded shale + sst
	341			Conglomerate
	343.5			Shale + minor coal seams
	347.5			Sandstone
	348.5			Interbedded shale + sst
	356			Shale
360				Dominantly shale + sst + cong?.
			25-30°	
	367.5			Conglomerate
	371.5			Shale
	377.5			Conglomerate
	381			Interbedded sst-shale + minor coal
120m	388.5			Conglomerate
	393.5			Interbedded sst-shale
400				
	404.5			Shale
	407.5			Conglomerate
	412.5			Sandstone
420	416			Dominantly shale with thin sst and coal layers
			25-30°	
	436			Sandstone
440	437			Shale + minor coal seams
	447	1%		Shaley coal
	449			Dominantly shale interbedded with sst + minor coal seams
460			25°-30°	
	468			Shale with minor coal seams
	478.5			Coal + shale
480	480	1%		Dominantly shale, with frequent thin seams of coal
	486			Shaley coal
	487			Dominantly shale with minor coal seams
150m	492	1%		Dominantly coal with shale
	498			Shale + minor coal seams
	497	1%		Coal
500	499			Dominantly shale with interbedded thin coal
			25-30°	
	518			Sandstone + cong?
520	520.5		20-25°	Dominantly shale interbedded with sst + thin coal seams.
540	541.5			Conglomerate
560				
580	582			Sandstone
180m	583.5			Shale with minor coal seams
			20-25°	
600	603.5			Coal + interbedded shale
	606			Dominantly shale with interbedded sst + coal.
620	623			
	628	2%		Coal with minor shale interbedded
	630			Shale
	631			Coal
640				Interbedded shale-sst + lenticular coal
			20°	
	650			Conglomerate
	653			
660				Dominantly sandstone with interbedded shale and minor lenticular coal seams.
680	681			
210m				Dominantly shale with interbedded clay, sst, and minor coal seams
700			30°	
	717			Tuff - Slide Mtn. Formation
720	720			Shale
				Tuff - Slide Mtn. Formation
74				

15

(M3)

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-3

BR-BOWRON RIVER 77(3)B

BOWRON RIVER COAL DEPOSIT

CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION: L 31+50N, 2+46E	DIP TESTS: 527' 85.5°
DATE BEGUN: MAY 10, 1977	847' 83° (tropari) 250° azimuth
DATE FINISHED: MAY 13, 1977	TOTAL DEPTH: 847' (258.23 m)
LOGGED BY: T. D. LEWIS	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR (FT.)	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0	O/B			0-25' gravel; 25'-80' clay, sand; 80'-96' boulders + hard pack
96'				Dominantly shale-sandstone with minor lenticular coal.
102'				Conglomerate
105'			20°-25°	Shale
109'				Dominantly conglomerate with sandstone
119.5'				Sandstone + minor coal stringers
121'				Dominantly shale with minor coal and congl. beds.
127'				Conglomerate
			25°	Interbedded sst-shale + minor coal seams
146.5				Conglomerate
157.5			25°	Interbedded shale
161				Conglomerate
169.5			20°	Interbedded shale-sst.
172				Conglomerate
174			20°-25°	Interbedded shale-sst + minor lenticular coal.
179.5				Dominantly sandstone with shale + congl.
186				Dominantly shale with sst, congl + minor coal
192				Conglomerate grading into sandstone
194.5				Shale with interbedded coal
196				Conglomerate
198			15°-20°	Dominantly shale with sst + minor coal
202				Conglomerate
207.5			20°	Dominantly shale with minor coal stringers
221				Conglomerate
223.5				Interbedded sst-shale
227				Coal + minor clay
228.5				Sandstone
231.5			20°-25°	Interbedded shale-sst + lenticular coal
237				Conglomerate
245.5				Interbedded sst-shale
250			20°-25°	Conglomerate
255.5				Dominantly sst + some shale
257.5				Conglomerate
265.5				Dominantly sandstone with conglomerate
272				Conglomerate
276				Sandstone
278			20°	Conglomerate
280.5				Shale
				Conglomerate
285			20°-25°	Interbedded sandstone-shale with minor coal seams
299				Sandstone grading into conglomerate
301.5				Interbedded shale-sst.
305				Conglomerate
307.5				Sandstone + minor conglomerate
310			15°	Conglomerate
315				Dominantly sandstone + shale and stringer coal
317.5				Dominantly shale with thin coal seams
322				Conglomerate
330			15°-20°	Dominantly shale with interbedded sst + congl. + minor coal seams.
				Dominantly sandstone with shale, congl + coal
344			20°-30°	Dominantly shale with interbedded sst + coal
354.5				Dominantly coal with shale
357				Interbedded shale + sst + coal stringers
				Conglomerate
372				Sandstone
373.5				Conglomerate
375				Sandstone
377				Conglomerate
378.5				Sandstone
380.5				Shale + minor coal seam
382			25°	Conglomerate
386.5			15°-20°	Dominantly shale with sst + coal
396.5				Conglomerate
			25°	Mostly shale with minor lenticular coal, sst
404				Conglomerate
405				Mostly shale with sst, congl. + coal stringers
408.5				Interbedded congl.-sst + coal stringers
410				Shale
411				Interbedded sst-congl.
414.5				Shale
				Conglomerate
416.5				Shale
427			20°	Sandstone
431				Shale
435.5				Conglomerate
437.5				Sandstone
438.5				Shale
440.5				Conglomerate
442				Mostly shale with interbedded sst. + minor coal stringers.
450.5				Conglomerate
452.5			30°-35°	Dominantly shale with interbedded shaley-coal + sst
474.5				Mostly sst with congl.
			20°	Mostly shale with sst + minor coal seams.
491.5		1%		Coal interbedded with some shale
493.5				Interbedded sst-shale
497		<1%		13" of coal
498			30-35°	Shale with minor coal seams + congl.
510				15" of coal
511.5				Mostly shale with interbedded sst + minor coal
514.5				Interbedded sst-congl.
522			20°	Sandstone + thin congl horizons.
524.5				Mostly shale with minor coal + sst.
533.5				Sandstone
535				Dominantly shale with thin coal seams
538.5		2%		15" of coal.
				Shale with coal seams.
547		1-2%		Dominantly coal with interbedded shale
549.5				Shale
551		<1%		Coal
553				Dominantly shale with minor coal
570				Coal with interbedded shale
571.5				Interbedded shale-sst + minor coal + stringers
589.5			25°	Conglomerate
598.5				Dominantly sandstone with interbedded shale
617				Dominantly conglomerate with interbedded sst.
629.5			40°	Dominantly shale with sst.
637.5				Conglomerate
643				Dominantly shale with sst. + minor coal
666				Sandstone
668.5				Shale
670				Coal with interbedded shale
673.5				Dominantly shale with interbedded sst. + coal
682				Sandstone
685			35°	Dominantly shale with coal seams
692.5				1' of shaley coal
				Dominantly shale with minor sst + coal
724			25°-30°	Sandstone with angular fragments - breccia
726.5				Shale
				Interbedded coal + shale
				Shale
729		2%		40" of coal with minor shale
732.5				Dominantly shale with the combined coal being 7" with 1-3% resin
742				Sandstone with angular fragment - breccia
				Dominantly shale with thin coal + sst.
756.5		1%		1' of shaley coal
759.5			25°	Shale with 6" of coal
763		1-2%		Interbedded coal with shale
765		1-2%		Dominantly coal interbedded with shale estimated 65% coal
774			25°	Dominantly shale with minor coal
789			20°-30°	Sandstone + minor congl.
798				Dominantly shale with minor coal + stringers
817				Sandstone + minor coal
822.5				Mudstone-shale
827.5				Conglomerate
829.5				Tuff (boulder?)
				Conglomerate
				fault
				conglomerate
838				Tuff, pyroclastic breccia
847				END OF HOLE

15

(M4)

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-4

BR - BOWRON RIVER 77(3) B

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 33+00 N, 3+35 E	DIP TESTS : 500' -88° / 927' 87°
DATE BEGUN : MAY 15, 1977	
DATE FINISHED : MAY 20, 1977	TOTAL DEPTH : 927' (282.62 m)
LOGGED BY : J. R. KERR	
SCALE : 1" = 20' or 1:240	

DEPTH FROM COLLAR (FT.)	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0–113' (O/B)			Overburden 105'-113' very hard clay with coarse boulders.
113'–116			Conglomerate
116–126			Shale, minor sst.
126–127			Conglomerate
127–132		30°	Shale, minor sst + coal
132–136			Conglomerate
136–138			Shale, minor coal
138–143.5			Conglomerate
143.5–147		20°	Shale, minor conglomerate + coal
147–166			Conglomerate
166–185		25-30°	Shale, with interbedded with sst, minor ... coal
185–199.5			Gritty sandstone with conglomerate
199.5–210.5			Coarse conglomerate
210.5–213			Brecciated shale - [illegible]
213–214			Coal
214–218			Conglomerate
218–229		25°	Fine grained well laminated shale, minor stringers of coal
229–237.5		10°?	Dominantly conglomerate with minor shale + sst.
237.5–243			Shale - stringers of coal
243–251			Conglomerate
251–255	1% (in coal)	25°	Shale - minor coal (resin)
255–263			Gritty sandstone - minor conglomerate
263–268			Conglomerate
268–275		20-35°	Interbedded sst & shale
275–276			Shaley coal
276–277.5			Conglomerate
277.5–279.5			Sst
279.5–294			Coarse conglomerate - minor shale
294–297		25°	Shale
297–300			Conglomerate
300–309.5		20-25°	Interbedded sandstone & shale
309.5–326.5		30°	Conglomerate grading into sandstone at end of section
326.5–334			Interbedded shale & sandstone minor coal.
334–336.5			Conglomerate
336.5–342		20-25°	Interbedded shale & sandstone
342–348			Well sorted conglomerate
348–371.5		20-25°	Dominantly fine grained laminated shale - minor coal seams 1"-4"
371.5–377.5			Conglomerate
377.5–381			Shale & sandstone
381–383			Conglomerate
383–388			Shale with minor coal
388–391.5			Conglomerate
391.5–398.5			Shale, lenses of coal
398.5–409			Conglomerate, minor sandstone
409–434	10" coal 6" coal 10" coal (2% resin)	45-50° 30°	Shale, with many thin veins & small seams of coal
434–436			Sandstone & conglomerate
436–440			Shale, minor sst & coal
440–442	1%		Shaley coal
442–447	6" coal (resin 1%)		Interbedded shale, sst & coal
447–448.5	<1%		Coal & shale
448.5–460			Interbedded shale & sst, many veinlets of coal
460–466.5			Coarse conglomerate, minor sst.
466.5–476		30-35°	Interbedded shale & sandstone
476–489			Dominantly gritty sandstone occasional conglomerate
489–495.5			Interbedded conglomerate & sandstone
495.5–500			Conglomerate
500–505.5		30°	Sandstone & shale
505.5–515			Gritty sandstone & conglomerate
515–610			Conglomerate - large chert pebbles > 4" in diameter Increasing content of coal fragments toward bottom. One seam shale @ 582'
610–641	4" 3"	30°	Shale, well laminated minor coal
641–651.5	1-3% (in coal)	25-30°	Interbedded shale & coal Estimated 45% coal
651.5–695	4" 3" 1% in coal 6" 6"	30°	Dominantly fine grained shale with many veinlets - 6" seams of coal.
695–697			Sandstone with angular frags. (pyroclastic?)
697–703		35°	Shale - thin veins of coal.
703–704.5	<1%		Coal with some shale
704.5–720			Shale, some interbedded sst minor coal.
720–724			Sandstone, coarse grained at 724
724–726	<1%		Coal
726–742.5	8" 4" 8" 1% (in coal)	25-30°	Shale with interbedded coal coal content ≈15%.
742.5–744			Sandstone with angular frags (pyroclastic?)
744–749			Shale
749–750.5			Sst. angular fragments
750.5–756			Shale, minor sst & coal.
756–765	1-2%		Coal, minor shale Estimate 85% coal.
765–773	0.5%		Coal interbedded with shale 65% coal
773–778	1%		Coal, minor shale (85% coal)
778–781			Gritty sst
781–786.5	<1%		Interbedded shale with coal (40% coal)
786.5–821	4"	30°	Shale, with some sst minor coal.
821–824			Coal, minor shale
824–833.5			Shale, minor sandstone
833.5–838			Coaly shale
838–			Dark brown fragmental breccia, probably of volcanic origin. Possible large slump block of basement - SLIDE MTN GROUP Some lenses of coal in fractures
			Interbedded shale & sandstone Veinlets of coal along partings
			Unconformity "zone" sst & large boulders
–927'			Fragmental breccia SLIDE MOUNTAIN GROUP
927'			END OF HOLE

15

(MS)

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-5

BR-BOWRON RIVER 77(3)B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 25+50 N, 3+60 E	DIP TESTS : 500' -90° / 1077' -84°
DATE BEGUN: MAY 24, 1977.	
DATE FINISHED: MAY 27, 1977.	TOTAL DEPTH : 1077' (328.35 m)
LOGGED BY: T.D. LEWIS	
SCALE 1"=20' or 1:240	

DEPTH FROM COLLAR (FT.)	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0	O/B			0' - 25' large boulders + sand + clay; 25'-84' sand, clay, occasional small boulders.
84'			25°-30°	dominantly shale with interbedded sandstone and minor coal seams and stringers.
120.5		1.0%		coal
121.5				dominantly shale with interbedded sst + minor coal.
127.5				conglomerate
131.5			35°	dominantly shale with interbedded sst, congl and minor coal.
153				sandstone with conglomerate capping
157.5			25°-30°	dominantly sandstone with interbedded shale and conglomerate and minor coal seams.
170.5			30°	dominantly shale with interbedded sst + minor coal.
177				conglomerate
182				shale - brownish
185.5				conglomerate
189			30°-35°	shale with interbedded sst + minor coal.
199				sandstone with some shale
200.5				dominantly shale with interbedded sst, clay-shale + minor coal
207.5				sandstone and conglomerate
209			25°	interbedded sandstone - shale
225			30°	dominantly shale with sandstone and thin coal stringers
244				sandstone with thin congl. layers.
247.5				shale
253				conglomerate
258.5			25°-30°	interbedded shale - sst.
268				conglomerate
270				shale
281				sandstone
283				shale - brown + grey
				conglomerate
285.5				shale
289				conglomerate
			35°	shale with minor sst + coal stringers
310				conglomerate bounded by sst.
312.5				dominantly shale with interbedded sst.
322.5				conglomerate
326.5				dominantly shale with sst + conglomerate
333.5				conglomerate
351			35°	shale
354				conglomerate
356				shale grading into sst grading into congl.
358			35°	dominantly shale interbedded with sandstone and conglomerate - minor coal seams + stringers
374.5				1.5' coal + shale
				dominantly shale interbedded with sandstone and conglomerate - minor coal seams + stringers.
443.5				conglomerate
				dominantly shale with sandstone + coal stringers
450.5				conglomerate
453.5			25°-30°	dominantly shale with interbedded sandstone + minor coal stringers.
481.5			20°	conglomerate
482.5				interbedded coal + shale
486.5				dominantly shale with interbedded sandstone and minor coal stringers
502.5				sandstone
504.5				dominantly shale with sandstone, conglomeratic and minor coal.
521.5				conglomerate
524				shale
525				conglomerate
				interbedded sandstone - shale
533				shale
535.5			25°-30°	interbedded sandstone - shale
542				conglomerate
543				dominantly shale with interbedded sandstone and minor coal.
557.5				dominantly sandstone with shale + minor coal.
563				shale
568.5		1%		coal
570				shale
571.5				coal + shale.
			25°	dominantly shale + thin conglomerate and coal seams 1"-9" thick.
610			30°	coal + some shale
612			30°-35°	shale + some sandstone and coal stringers
626.5				sandstone
				shale
659.5				conglomerate
664				mostly sandstone with some shale
669				fractured shale - possible fault.
678				sandstone
692			20°	fine grained shale (siltstone) + minor coal.
688.5				dominantly shale + interbedded sandstone and five 2" coal seams
707				sandstone
708.5				interbedded shale - sandstone
713		1.5%		coal with interbedded shale
717.5				dominantly shale with sst. and minor coal seams.
725		1.5%		coal.
727.5				shale with two thin coal seams (2"-4" thick)
732.5		1.5%		dominantly coal with interbedded shale
735				interbedded sandstone - shale with minor 2" coal seams
744				shale with minor coal.
755				conglomerate with interbedded sandstone
761				shaley coal
763				fractured shale
765				conglomerate
767				fractured shale
777				conglomerate
779.5			20°	dominantly shale with coal seams 1"-10" thick
814		1%		interbedded coal + shale (60% coal)
817.5				shale + 6" coal.
821		1%		coal + some shale
823.5				shale
834				coal
835			30°	shale + minor coal.
849.5				sandstone grading into conglomerate
852				interbedded sandstone - shale
860.5			20°	shale + ½"-6" coal seams
890				sandstone
891				shale
892.5				breccia
893.5		1-2%		dominantly coal with some interbedded shale 80% coal.
909				sandstone + minor conglomerate
911.5				shale
912.5		1-2%		70% coal with interbedded shale
919				dominantly shale with interbedded sandstone, conglomerate, breccia and minor coal
947				shaley coal
948				shale
950		1-2%		coal 70% + shale
953				shale
955				coal (60%) + shale
957.5		1%		shale + sandstone and minor coal.
959.5		1-3%		60% coal + shale 40%
962				shale + minor coal
968				sandstone
970				interbedded sandstone + conglomerate
976				shale + minor coal.
979				sandstone + some shale and coal.
981.5				shale + minor interbedded sandstone and coal.
990.5				interbedded sandstone + shale
				dominantly shale + sandstone and coal
998				conglomerate
999.5				dominantly shale + sandstone
1004				conglomerate
1008			35°-40°	interbedded sandstone - shale
1022				conglomerate
1024				clay-rich shale + conglomerate
1031				shale + interbedded sandstone
1042				conglomerate
1043.5				sandstone
1044.5				shale
1053				conglomerate
1054.5				shale
				Volcanic breccia (Slide Mt. Formation).

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-5

(MS)

BR - BOWRON RIVER 77(3)B.

BOWRON RIVER COAL DEPOSIT

CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 25+50 N, 3+60 E	DIP TESTS : 500' -90°; 1077' -84°
DATE BEGUN : MAY 24, 1977.	
DATE FINISHED : MAY 27, 1977.	TOTAL DEPTH : 1077' (328.35 m)
LOGGED BY : T.D. LEWIS	
SCALE 1"=20' or 1:240	

DEPTH FROM COLLAR (FT.)	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0 - 84'	O/B			0' - 25' large boulders + sand + clay; 25' - 84' sand, clay, occasional small boulders.
84'			25° - 30°	dominantly shale with interbedded sandstone and minor coal seams and stringers.
120.5		1.0%		coal
121.5				dominantly shale with interbedded sst + minor coal.
127.5				conglomerate
131.5			35°	dominantly shale with interbedded sst, congl and minor coal.
153				sandstone with conglomerate capping.
157.5			25° - 30°	dominantly sandstone with interbedded shale and conglomerate and minor coal seams.
170.5			30°	dominantly shale with interbedded sst + minor coal.
177				conglomerate
182				shale - brownish
185.5				conglomerate
189			30° - 35°	shale with interbedded sst + minor coal.
199				sandstone with some shale
200.5				dominantly shale with interbedded sst, clay-shale + minor coal
207.5				sandstone and conglomerate
209			25°	interbedded sandstone - shale.
225			30°	dominantly shale with sandstone and thin coal stringers
244				sandstone with thin congl. layers.
247.5				shale
253				conglomerate
258.5			25° - 30°	interbedded shale - sst.
268				conglomerate
270				shale
281				sandstone
283				shale - brown + grey
				conglomerate
285.5				shale
289				conglomerate
			35°	shale with minor sst + coal stringers
310				conglomerate bounded by sst.
312.5				dominantly shale with interbedded sst.
322.5				conglomerate
326.5				dominantly shale with sst + conglomerate
333.5				conglomerate
351			35°	shale
354				conglomerate
356				shale grading into sst grading into congl.
358			35°	dominantly shale interbedded with sandstone and conglomerate - minor coal seams + stringers
374.5				1.5' coal + shale
				dominantly shale interbedded with sandstone and conglomerate - minor coal seams + stringers.
443.5				conglomerate
				dominantly shale with sandstone + coal stringers
450.5				conglomerate
453.5			25° - 30°	dominantly shale with interbedded sandstone + minor coal stringers.
481.5			20°	conglomerate
482.5				interbedded coal + shale
486.5				dominantly shale with interbedded sandstone and minor coal stringers
502.5				sandstone
504.5				dominantly shale with sandstone, conglomerate and minor coal.
521.5				conglomerate
524				shale
525				conglomerate
				interbedded sandstone - shale
533				shale
535.5			25° 30°	interbedded sandstone - shale
542				conglomerate
543				dominantly shale with interbedded sandstone and minor coal.
557.5				dominantly sandstone with shale + minor coal.
563				shale
568.5		1%		coal
570				shale
571.5				coal + shale
			25°	dominantly shale + thin conglomerate and coal seams 1"-9" thick.
610			30°	coal + some shale
612			30° - 35°	shale + some sandstone and coal stringers
626.5				sandstone
				shale
659.5				conglomerate
664				mostly sandstone with some shale
669				fractured shale - possible fault.
678				sandstone
692			20°	fine greined shale (siltstone + minor coal
688.5				dominantly shale + interbedded sandstone and five 2" coal seams
707				sandstone
708.5				interbedded shale - sandstone
713		1.5%		coal with interbedded shale
717.5				dominantly shale with sst and minor coal seams.
725		1.5%		coal.
727.5				shale with two thin coal seams (2"-4" thick)
732.5		1.5%		dominantly coal with interbedded shale.
735				interbedded sandstone - shale with minor 2" coal seams
744				shale with minor coal.
755				conglomerate with interbedded sandstone
761				shaley coal
763				fractured shale
765				conglomerate
767				fractured shale
777				conglomerate
779.5			20°	dominantly shale with coal seams 1"-10" thick
814		1%		interbedded coal + shale (60% coal)
817.5				shale + 6" coal.
821		1%		coal + some shale
823.5				shale
834				coal
835			30°	shale + minor coal.
849.5				sandstone grading into conglomerate
852				interbedded sandstone - shale
860.5			20°	shale + ½"-6" coal seams
890				sandstone
891				shale
892.5				breccia
893.5		1-2%		dominantly coal with some interbedded shale 80% coal.
909				sandstone + minor conglomerate
911.5				shale
912.5		1-2%		70% coal with interbedded shale
919				dominantly shale with interbedded sandstone, conglomerate, breccia and minor coal
947				shaley coal
948				shale
950		1-2%		coal 70% + shale
953				shale
955		1%		coal (60%) + shale
957.5				shale + sandstone and minor coal.
959.5		1-3%		60% coal + shale 40%
962				shale + minor coal
968				sandstone
970				interbedded sandstone + conglomerate
976				shale + minor coal
979				sandstone + some shale and coal.
981.5				shale + minor interbedded sandstone and coal.
990.5				interbedded sandstone + shale
				dominantly shale + sandstone and coal
998				conglomerate
999.5				dominantly shale + sandstone
1004				conglomerate
1008			35° - 40°	interbedded sandstone - shale
1022				conglomerate
1024				clay-rich shale + conglomerate
1031				shale + interbedded sandstone
1042				conglomerate
1043.5				sandstone
1044.5				shale
1053				conglomerate
1054.5				shale
				Volcanic breccia (Slide Mt. Formation).

END OF HOLE

15

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-5

MS

BR-BOWRON RIVER 77(3)B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 25+50 N, 3+60 E	DIP TESTS : 500' -90° 1077' -84°
DATE BEGUN: MAY 24, 1977.	
DATE FINISHED: MAY 27, 1977.	TOTAL DEPTH : 1077' (328.35 m)
LOGGED BY: T.D. LEWIS	
SCALE 1"=20' or 1:240	

DEPTH FROM COLLAR (FT. M) | SECTION | VISUAL ESTIMATE OF RESIN IN COAL | ANGLE OF BEDDING TO CORE | DESCRIPTIVE NOTES

Depth scale (ft): 0, 20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400, 420, 440, 460, 480, 500, 520, 540, 560, 580, 600, 620, 640, 660, 680, 700, 720, 740, 760, 780, 800, 820, 840, 860, 880, 900, 920, 940, 960, 980, 1000, 1020, 1040, 1060, 1080

Metric marks: 30m, 60m, 90m, 120m, 150m, 180m, 210m, 240m, 270m, 300m, 330m

Section: O/B

Contact depths (ft): 84', 120.5, 121.5, 127.5, 131.5, 153, 157.5, 170.5, 177, 182, 185.5, 189, 199, 200.5, 207.5, 209, 225, 244, 247.5, 253, 258.5, 268, 270, 281, 283, 285.5, 289, 310, 312.5, 322.5, 326.5, 333.5, 351, 354, 356, 358, 374.5, 443.5, 450.5, 453.5, 481.5, 482.5, 486.5, 502.5, 504.5, 521.5, 524, 525, 533, 535.5, 542, 543, 557.5, 563, 568.5, 570, 571.5, 610, 612, 626.5, 659.5, 664, 669, 678, 692, 688.5, 707, 708.5, 713, 717.5, 725, 727.5, 732.5, 735, 744, 755, 761, 763, 765, 767, 777, 779.5, 814, 817.5, 821, 823.5, 834, 835, 849.5, 852, 860.5, 890, 891, 892.5, 893.5, 909, 911.5, 912.5, 919, 947, 948, 950, 953, 955, 957.5, 959.5, 962, 968, 970, 976, 979, 981.5, 990.5, 998, 999.5, 1004, 1008, 1022, 1024, 1031, 1042, 1043.5, 1044.5, 1053, 1054.5

Visual estimate of resin in coal	Angle of bedding to core	Descriptive notes
		0' - 25' large boulders + sand + clay; 25' - 84' sand, clay, occasional small boulders.
	25°-30°	dominantly shale with interbedded sandstone and minor coal seams and stringers.
1.0%		coal
		dominantly shale with interbedded sst + minor coal.
		conglomerate
	35°	dominantly shale with interbedded sst, congl and minor coal.
		sandstone with conglomerate capping.
	25°-30°	dominantly sandstone with interbedded shale and conglomerate and minor coal seams.
	30°	dominantly shale with interbedded sst + minor coal.
		conglomerate
		shale - brownish
		conglomerate
	30°-35°	shale with interbedded sst + minor coal.
		sandstone with some shale
		dominantly shale with interbedded sst, clay-shale + minor coal.
		sandstone and conglomerate
	25°	interbedded sandstone - shale
	30°	dominantly shale with sandstone and thin coal stringers
		sandstone with thin congl. layers.
		shale
		conglomerate
	25°-30°	interbedded shale - sst.
		conglomerate
		shale
		sandstone
		shale - brown + grey
		conglomerate
		shale
		conglomerate
	35°	shale with minor sst + coal stringers
		conglomerate bounded by sst.
		dominantly shale with interbedded sst.
		conglomerate
		dominantly shale with sst + conglomerate
		conglomerate
	35°	shale
		conglomerate
		shale grading into sst grading into congl.
	35°	dominantly shale interbedded with sandstone and conglomerate - minor coal seams + stringers
		1.5' coal + shale
		dominantly shale interbedded with sandstone and conglomerate - minor coal seams + stringers.
		conglomerate
		dominantly shale with sandstone + coal stringers
		conglomerate
	25°-30°, 20°	dominantly shale with interbedded sandstone + minor coal stringers.
		conglomerate
		interbedded coal + shale
		dominantly shale with interbedded sandstone and minor coal stringers
		sandstone
		dominantly shale with sandstone, conglomerate and minor coal.
		conglomerate
		shale
		conglomerate
		interbedded sandstone - shale
		shale
	25° 30°	interbedded sandstone - shale
		conglomerate
		dominantly shale with interbedded sandstone and minor coal
		dominantly sandstone with shale + minor coal
		shale
1%		coal
		shale
		coal + shale
	25°, 30°	dominantly shale + thin conglomerate and coal seams 1"-9" thick
		coal + some shale
	30°-35°	shale + some sandstone and coal stringers
		sandstone
		shale
		conglomerate
		mostly sandstone with some shale
		fractured shale - possible fault.
		sandstone
	20°	fine grained shale (siltstone) + minor coal
		dominantly shale + interbedded sandstone and five 2" coal seams
		sandstone
		interbedded shale - sandstone
1.5%		coal with interbedded shale
		dominantly shale with sst. and minor coal seams.
1.5%		coal.
		shale with two thin coal seams (2"-4" thick)
1.5%		dominantly coal with interbedded shale.
		interbedded sandstone - shale with minor 2" coal seams
		shale with minor coal.
		conglomerate with interbedded sandstone
		shaley coal
		fractured shale
		conglomerate
		fractured shale
		conglomerate
	20°	dominantly shale with coal seams 1"-10" thick
1%		interbedded coal + shale (60% coal)
		shale + 6" coal.
1%		coal + some shale
		shale
		coal
	30°	shale + minor coal.
		sandstone grading into conglomerate
		interbedded sandstone - shale
	20°	shale + 1/2"-6" coal seams
		sandstone
		shale
		breccia
1-2%		dominantly coal with some interbedded shale 80% coal.
		sandstone + minor conglomerate
		shale
1-2%		70% coal with interbedded shale
		dominantly shale with interbedded sandstone, conglomerate, breccia and minor coal
		shaley coal
		shale
1-2%		coal 70% + shale
		shale
1%		coal (60%) + shale
		shale + sandstone and minor coal.
1-3%		60% coal + shale 40%
		shale + minor coal
		sandstone
		interbedded sandstone + conglomerate
		shale + minor coal.
		sandstone + some shale and coal.
		shale + minor interbedded sandstone and coal.
		interbedded sandstone + shale
		dominantly shale + sandstone and coal
		conglomerate
		dominantly shale + sandstone
		conglomerate
	35°-40°	interbedded sandstone - shale
		conglomerate
		clay-rich shale + conglomerate
		shale + interbedded sandstone
		conglomerate
		sandstone
		shale
		conglomerate
		shale
		Volcanic breccia (Slide Mt. Formation).
		END OF HOLE

15

M8

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-6

BW- BOWRON RIVER 77(3) B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 24+00 N, 3+05 E	DIP TESTS : 500' -74°; 897' -78° at 229°
DATE BEGUN: MAY 28, 1977	
DATE FINISHED: JUNE 3, 1977	TOTAL DEPTH : 897'(273.48 m)
LOGGED BY: T.D. LEWIS	
SCALE 1"=20' or 1:240	

DEPTH FROM COLLAR (ft)	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0	O/B			0-20' gravel; 20-62' sand, clay and minor stones.
62'			25°-30°	dominantly shale with interbedded sandstone and minor coal (1"-6" seams)
75.5'				conglomerate
81'			30°-45°	dominantly shale with interbedded clay-shale, sandstone and minor coal stringers.
113'				sandstone
117'				shale with interbedded sst, conglomerate + minor coal.
122'				interbedded sandstone-shale
128.5				conglomerate
			35°	Interbedded sandstone-shale + minor coal seams and stringers
142.5				dominantly shale with interbedded clay-shale, sandstone and minor coal.
152.5'				Interbedded shale, sandstone and conglomerate
159.5'			35°-40°	Sandstone
165'				dominantly shale + thin beds of clay + minor coal.
171.5'				dominantly sandstone, with interbedded shale + conglom.
181.5'				conglomerate
184'				sandstone
186'			30°	dominantly shale with minor sandstone + coal seams (½"-3")
195'				Interbedded sandstone + shale
197'				Conglomerate
199'				dominantly shale + sandstone and conglomerate and minor coal stringers.
214.5'				dominantly sandstone + minor shale, congl + coal.
			30°-35°; 30°-35°	dominantly shale with interbedded sandstone and minor coal (1"-8" thick).
266.5'				finely laminated shale.
287'				shaley coal
288'				dominantly shale + interbedded sandstone
		1%		shaley coal
301.5'				sandstone
303.5'				conglomerate
307.5'			30°	dominantly shale + 1"-4" coal seams
324.5'				dominantly coal (80%) + shale.
328'			30°	mostly shale with interbedded sst + minor coal seams (½"-5" thick)
364				conglomerate
365			30°	shale + minor coal seams (2"-4" thick)
373				conglomerate
374				shale + minor coal seams (½"-4")
384.5				conglomerate
390				shale + minor interbedded sst.
395				1' coal
396				sandstone
				shale
				sandstone
401.5				shale
411				shaley coal
413				clay-shale + minor coal seams (2"-6" thick)
421.5				shaley sandstone + conglomerate
				shale
424				sandstone with interbedded shale + minor coal stringers
430.5			25°	shale + clay shale and minor coal stringers.
447				coal
448				dominantly shale + sandstone and 3 coal seams 1"-6" thick.
459.5			30°	sandstone
466				shale with lesser interbedded sandstone.
477.5				sandstone with lesser interbedded congl.
482			25°	shale + minor coal seams
497.5				sandstone + thin congl.
501.5			25°; 30°	dominantly shale + interbedded sandstone and numerous (1"-6") coal seams.
531				granule conglomerate
533.5				laminated shale
539		1%		60% coal with interbedded shale 545'-547' - more shale than coal.
547			25°	Interbedded shale-sandstone with minor coal seams.
561		1%		coal
			25°-30°	clay-brown shale
564.5'				gray sandstone
568				siltly shale
577.5				dominantly shale with interbedded sandstone + coal seams (1"-10" thick).
634.5		1%		coal (90%)
636.5				shale + minor coal
642.5		1%		mostly coal (60%) + some shale.
647			25°-30°	mostly shale with lesser sandstone, congl. and coal seams (1"-6" thick).
667				dominantly coal + shale
670			30°-35°	mostly shale with interbedded sandstone and minor coal seams
692.5				coal (60%)
694.5				shale
695.5		1%		70% coal + interbedded shale.
708				mostly shale + (2"-10") coal seams.
715		1%		coal
716.5				fractured shale
726				conglomerate (breccia)
735				dominantly shale with interbedded sandstone, breccia and minor coal seams.
755				coal (60%)
757				shale + minor coal
759				60% coal
760.5				mostly shale + interbedded sandstone
773				sandstone + lesser congl.
774.5				conglomerate
776				shale
777				60% coal
778.5				granule conglomerate
783			35°-40°	dominantly shale with interbedded sandstone and minor coal stringers.
811.5				conglomerate
816				sandstone
819				conglomerate
822.5				gray claystone (shale)
829				mixed granule conglomerate
835				Interbedded sandstone shale
846.5				conglomerate
850				Interbedded sandstone-shale
854				conglomerate
859.5				shale
861				Volcanic tuff and breccia (Slide Mountain basement).
897'				END OF HOLE

15

M9

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-7

BW-BOWRON RIVER 77(3)B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 25+50 N, 2+50 E	DIP TESTS : 683' -90°
DATE BEGUN: JUNE 4, 1977	
DATE FINISHED: JUNE 8, 1977	TOTAL DEPTH : 683' (208.23 m)
LOGGED BY: T.D. LEWIS	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR FT. / M	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0				
20	O/B			overburden.
40				
55				
60				dominantly shale + interbedded sandstone, clay and minor coal stringers.
64				conglomerate.
68				
80			35°	dominantly shale + interbedded sandstone, clay and minor coal stringers.
90.5				coal.
91.5				dominantly shale + interbedded sandstone, clay and minor coal.
30m 100				
104				conglomerate.
105.5				interbedded sandstone, shale + minor coal stringers.
115				conglomerate.
115				dominantly shale + interbedded sandstone + minor coal.
120				
123.5				conglomerate.
127				
140			20°-25°	mostly shale with interbedded sandstone and minor coal.
150.5				coal.
152				dominantly shale + sandstone + minor seams and stringers.
159.5				conglomerate.
161				dominantly shale with interbedded sandstone and minor coal.
175				conglomerate.
178				
180			40°	shale with thin coal seams.
182				coal + minor shale.
183.5				interbedded sandstone + shale.
185.5				70% coal + shale.
188.5				
60m 200				shale + minor coal.
203				sandstone.
204.5				
208.5				interbedded conglomerate and sandstone.
220			35°-45°	interbedded shale + sandstone, conglomerate.
235.5				conglomerate.
240				
260				interbedded shale-sandstone + numerous coal seams + stringers.
266				
267				
272				93% coal + shale.
273.5				
280				shale + minor coal seam stringers.
284.5				
288				interbedded sandstone - shale.
90m 300				dominantly shale with coal stringers.
303.5				80% coal + shale.
306.5				
320			30°	dominantly shale with minor conglomerate sandstone, and numerous coal seams (1"-3" thick).
340				
360			35°	
380			30°	
120m			25°	
397.5				60% coal.
399				sandstone with interbedded shale.
405				coal.
406				shale + frequent coal stringers.
409.5				coal (60%) + shale.
412				
420			30°	dominantly shale with interbedded sandstone, clay bands, shale + minor coal seams and stringers.
424.5				coal 70% + clay-arenaceous shale.
426.5				
440			30°	dominantly shale, + interbedded sandstone and silty shale.
445				70% coal + shale.
446.5				
460			35°	dominantly shale with lesser sandstone, numerous 1"-6" coal seams.
461.5		1%		coal.
465.5				dominantly shale with coal seams 2"-6" with 5-10% pyrite.
467				75% coal.
469				shale + stringers and 1" coal seam.
470.5		1%		80% coal.
473		2%		shale.
480			35°	75% coal.
150m				shale with numerous seams (2"-8") and stringers.
496				85% coal + shale.
497.5		1%		
500				dominantly shale with interbedded sandstone and minor coal seams (1"-4" thick).
520			25°-35°	
528.5				80% coal with shale and minor pyrite.
530		2%		
538				resinous, black shale with minor coal seams.
542		1-2%		interbedded coal + shale.
544				75%
546		1-2%		80% coal + shale and minor pyrite.
548			25°	shale with 2"-6" coal seams.
554.5				
560				conglomerate.
559.5				dominantly shale with interbedded sandstone, congl. and minor coal.
568.5			50	dominantly grey sandstone + minor shale + congl.
580				
581				conglomerate.
585				
180m			45°	dominantly shale with minor coal and sandstone.
598				
600				interbedded sandstone - shale.
612.5				
615.5				conglomerate.
620				dominantly shale, + interbedded sandstone and minor coal.
624				conglomerate (gravelly).
626.5				
640				shale with minor conglomerate + coal (2" seam).
641.5				sandstone with interbedded conglomerate + shale.
652.5			45°	conglomerate.
656.5				sandstone.
657				
660				conglomerate.
665				
672				shale.
675				sandstone with thin coal seams.

15

L10

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-8

BW-BOWRON RIVER 77(3)B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 28+50N, 1+72 E	DIP TESTS : 500' -90°
DATE BEGUN: JULY 5, 1977	
DATE FINISHED: JULY 7, 1977	TOTAL DEPTH : 576'(175.61)
LOGGED BY: T.D. LEWIS	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0 FT M				
20				
40	o/b			overburden
60				
80				
94' 30m				
100			30-35°	dominantly shale with interbedded sandstone and conglomerate. Minor coal stringers
120				
137				
140			35°	conglomerate
145.5				dominantly sandstone with lesser interbedded conglomerate and minor coal stringers.
155				
160			22°	dominantly shale with lesser interbedded sandstone and conglomerate
165.5				sandstone with thin interbedded shale and coal.
177				
180			35°	shale + minor sandstone + coal partings.
188.5 190				
60m 200				mostly shale + interbedded sandstone, conglomerate and minor coal.
			30°	
220				
223 224.5		1%		coal
229				shale
235.5				conglomerate
240				shale + interbedded sandstone, conglomerate and minor coal stringers
250.5				
260				conglomerate + sandstone + pebbly sandstone
267.5				
280			40°	shale with interbedded sandstone and numerous thin (1"-6") coal seams
			20°	
90m 300				
311.5				
314.5 316.5		1%		sandstone with conglomerate
320				coal
			30°	shale + interbedded sandstone and conglomerate
327 328.5				coal
340				shale with minor coal seams
			30°	
346.5 347.5				coal
352				interbedded sandstone - conglomerate
360			30°	shale with interbedded sandstone + minor coal partings
364 365				coal
				shale with interbedded sandstone + minor coal partings
376.5 377.5				coal
380				shale
382 386		2%		85% coal + minor shale
387.5 389.5				shale
				90% coal
120m 400			35°	shale with interbedded sandstone + minor coal seams and partings
405.5 406.5				shaley coal
414				sandstone + minor shale, congl + minor coal
420			30°	
				mostly shale with interbedded sandstone and minor coal.
440				
			25-30°	
460				
471				
		1-2%		80% coal + minor shale
480				
485 488				shaley coal (50%)
150m 492 493		1%		90% coal
				shale
				1 foot of coal
500				shale with numerous coal seams, often amber resin in shale.
500.5 503.5		1-2%		shaley coal (60%)
506 507.5		<1%		Shale.
				coal
518.5				shale with interbedded sandstone
520			20-25°	conglomerate with interbedded sandstone
530 532				basalt (?)
535				limestone
540			30-35°	bedded gritty sandy-shale with fragments of basement.
559				shaley coal
560				brown shale + minor coal
566				tuff breccia (Slide Mtn. Formation.
576'				
580				END OF HOLE
180m				

15

15

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-10

BN - BOWRON RIVER 77 (3) B

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L-28+50N, 5+96E	DIP TESTS : 500' -88°, 1000' -85.5°, 1417' -85° @ 321°
DATE BEGUN : JULY 13, 1977	
DATE FINISHED : JULY 29, 1977	TOTAL DEPTH : 1417' (432.01 m)
LOGGED BY : JRK + TDL	
SCALE : 1" = 20' or 1:240	

DEPTH FROM COLLAR (FT. M)	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES

DESCRIPTIVE NOTES (from top of hole; angle of bedding to core shown where given):

1. Overburden – sand, clay & gravel. (O/B)
2. Unconsolidated conglomerate
3. 20° – Dominantly sandstone, minor shale
4. Conglomerate
5. 25° – Sandstone, minor shale
6. Conglomerate
7. Gritty sandstone, minor shale – thin veins of coal
8. 20-25° – Conglomerate, minor sst.
9. 25° – Interbedded shale & gritty sandstone – minor coal seams. (3" coal, 2" coal)
10. Conglomerate
11. 25° – Sandstone
12. Conglomerate
13. 20° – Shale - minor coal 1-2"
14. Sandstone - minor coal < 2"
15. Conglomerate
16. 20-25° – Shale, minor sst. – lenses & veins of coal.
17. Conglomerate
18. Shale & sandstone - minor coal.
19. Conglomerate
20. Sandstone
21. Conglomerate
22. 25° – Shale - interbedded sandstone – <1' coal seams
23. Conglomerate
24. Sst & shale
25. 25-30° – Conglomerate - fault (?) 10° to core axis
26. Shale & sandstone 10" coal seam.
27. Conglomerate
28. Sandstone
29. Conglomerate
30. Sandstone, minor shale
31. Coarse washed conglomerate
32. Sandstone
33. Well-sorted, washed conglomerate – graded interbedded sandstone
34. 25° – Gritty sandstone - minor shale – small coal veins
35. Conglomerate
36. Coaly shale - ~40% coal (1%)
37. 20° – Graded gritty sandstone, some conglomerate
38. Conglomerate
39. Gritty sandstone
40. Conglomerate
41. 25° – Interbedded sandstone - shale with thin coal lenses
42. Sandstone and conglomerate
43. Interbedded shale - sandstone + 4" coal. Many thin coal lenses
44. Conglomerate
45. Interbedded shale - sandstone + many small seams and lenses of coal.
46. Conglomerate
47. 20° – Dominantly shale with sandstone and small coal stringers
48. Conglomerate + 6" band of sandstone
49. Sandstone
50. Conglomerate + minor shale and sandstone
51. 25° – Dominantly shale with sandstone and thin coal stringers.
52. Conglomerate + pebbly sandstone
53. Sandstone + thin shale
54. Conglomerate
55. Sandstone
56. Conglomerate
57. Sandstone
58. Conglomerate with interbedded sandstone and shale
59. Shale with grit and minor coal partings
60. Sandstone grading into conglomerate
61. Interbedded sandstone - shale with conglomerate and minor coal seams
62. Conglomerate
63. Shale with conglomerate and thin coal stringers
64. Conglomerate
65. Shale
66. Conglomerate with interbedded sandstone
67. Sandstone
68. Conglomerate
69. Dominantly shale with conglomerate & coal stringers.
70. Conglomerate with sandstone + thin coal seams.
71. Dominantly sandstone with interbedded conglomerate, shale and minor coal stringers.
72. Conglomerate
73. Interbedded sandstone - shale with thin conglomerate horizons and minor coal stringers
74. Conglomerate
75. Dominantly sandstone with interbedded shale and minor coal seams.
76. Conglomerate with pebbly sandstone
77. Interbedded shale - sandstone
78. Conglomerate
79. 10-15° – Interbedded sandstone - shale with minor coal.
80. Conglomerate
81. 20° – Interbedded sandstone - shale
82. Conglomerate with sandstone and minor coal partings
83. Sandstone with minor resinous shale
84. Conglomerate
85. Interbedded shale - sandstone
86. Conglomerate
87. Interbedded sandstone - shale with conglomerate and thin seams and stringers of coal.
88. Conglomerate
89. Shale with minor coal.
90. 25° – Sandstone and pebbly sandstone + minor coal lenses.
91. Conglomerate
92. Sandstone with coal stringers
93. 20-25° – Shale with coal stringers and conglomerate horizons.
94. Conglomerate
95. Dominantly sandstone with interbedded shale, conglomerate and minor (<1") coal stringers.
96. Conglomerate
97. Dominantly shale with interbedded sandstone and tiny coal stringers.
98. Coal
99. Shale + interbedded sandstone and coal stringers.
100. 15-21° – Sandstone with interbedded shale
101. Conglomerate.
102. Dominantly shale with sandstone
103. Conglomerate
104. Sandstone
105. Conglomerate
106. 20° – Sandstone with interbedded congl. + coal partings.
107. Conglomerate with interbedded sandstone
108. Dominantly sandstone + shale and minor coal stringers
109. Conglomerate
110. 0-20° – Interbedded sandstone - shale with lesser conglomerate and numerous seams and stringers of coal (1"-3" thick).
111. Dominantly conglomerate grading into sst. - shale.
112. Shale
113. Conglomerate
114. Interbedded sandstone - shale with thin conglomerate horizons
115. 95% coal. (0.5%)
116. Shale with lesser interbedded sandstone.
117. Conglomerate
118. Shale with sandstone interbedded.
119. Conglomerate.
120. 15-20° – Interbedded sandstone - shale with conglomerate, and coal seams + partings (3"-6" thick).
121. Conglomerate
122. Interbedded sandstone shale
123. Conglomerate
124. 15-25° – Dominantly sandstone with interbedded shale and coal stringers.
125. Dominantly conglomerate with interbedded sandstone
126. 25-35° – Interbedded sandstone - shale with minor coal seams and stringers
127. Shaley coal (0.5-1%)
128. 20° – Interbedded shale - sandstone with minor coal seams and partings
129. Dominantly shale with interbedded sandstone and coal seams and stringers (4"-6" thick).
130. 20° – Coal (<1%)
131. Interbedded sandstone - shale with small coal seams and lenses
132. Coal - 40% (0.5-1%)
133. 35° – Dominantly shale with interbedded sandstone, minor coal lenses.
134. Coal
135. Shale
136. Coal 85% (1%)
137. Shale
138. Mostly sandstone with interbedded shale and minor coal stringers.
139. Conglomerate
140. Sandstone
141. Conglomerate
142. 25-30° – Shale with sandy sections.
143. Conglomerate
144. Mostly shale with sandstone + numerous coal seams. (4"-7" thick)
145. 75% coal (0.5-1%)
146. Shale
147. 85% coal
148. Shale
149. Coal
150. 40° – Interbedded sandstone - shale + minor coal stringers.
151. Coal / shale
152. Conglomerate.
153. Shale + minor coal seams and partings.
154. Coal (0.5%)
155. 25° – Shale with gritty sections.
156. Mostly sandstone + thin interbedded shale and minor coal seams (~3").
157. 25-30° – Conglomerate
158. Interbedded sandstone - shale + coal seams and partings.
159. Conglomerate
160. Shale - grit.
161. Conglomerate
162. Interbedded sandstone - shale + minor coal.
163. Shaley coal
164. Shale
165. 75% coal (0.5%)
166. Shale + two 2" coal seams.
167. Shaley coal (1-1.5%)
168. Mostly sandstone + interbedded shale.
169. 35° – Shale + minor coal stringers.
170. Sandstone with thin interbedded shale
171. Conglomerate
172. 20-25° – Interbedded shale - sandstone.
173. Coal (0.5%)
174. Dominantly shale + interbedded sandstone and minor coal seams.
175. Sandstone and granule sandstone.
176. Interbedded sandstone - shale.
177. Conglomerate
178. 75% coal + shale (0.5-1%)
179. Shale with minor coal lenses.
180. Conglomerate
181. Shale with gritty section and minor coal seams (2"-4" thick).
182. Sandstone + granule conglomerate
183. Dominantly shale with interbedded sandstone + minor coal stringers.
184. 40% coal
185. Coaly shale - resin. (0.5-1%)
186. 70% coal (0.5-1%)
187. Shale + minor coal
188. 95% coal (<0.5%)
189. Interbedded sandstone - shale + two (2"-4") coal seams.
190. 85% coal. (<0.5%)
191. Shale with interbedded sandstone + minor coal seams.
192. Shaley coal
193. Dominantly shale + sandstone and minor coal.
194. 80% coal + shale (0.5%)
195. Sandstone
196. 60% coal. (0.5%)
197. Shale + minor coal seams.
198. Shaley coal (60%) (0.5%)
199. Shale + minor interbedded conglomerate
200. 40% coal + shale
201. Shale
202. Conglomerate
203. Gritty shale with interbedded conglomerate and sandstone + minor coal seams.
204. Conglomerate
205. Shale
206. Dominantly interbedded shale - sandstone + thin conglomerate beds + minor coal seams.
207. Conglomerate + interbedded sandstone.
208. Dominantly sandstone with interbedded shale.
209. 25-30° – Conglomerate + sandstone
210. Dominantly sandstone, with pebbly sandstone, conglomerate, and interbedded shale
211. Dominantly shale with interbedded sandstone
212. 20-25° – Dominantly dark brown sandstone, with shale and minor coal partings.
213. 30-40° – Tufferous sandstone and tuff.

END OF HOLE

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-11

15 (M1)

BW- Bowron River 77 (3) B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 27+00 N, 4+22 E	DIP TESTS : 500' -90°, 1000' -88.5°
DATE BEGUN : AUGUST 3, 1977	
DATE FINISHED : AUGUST 9, 1977	TOTAL DEPTH : 1150' (350.61 m)
LOGGED BY : T.D. LEWIS	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES

FT. M

Depth scale (ft): 0, 20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400, 420, 440, 460, 480, 500, 520, 540, 560, 580, 600, 620, 640, 660, 680, 700, 720, 740, 760, 780, 800, 820, 840, 860, 880, 900, 920, 940, 960, 980, 1000, 1020, 1040, 1060, 1080, 1100, 1120, 1140, 1160

Metre marks: 30m, 60m, 90m, 120m, 150m, 180m, 210m, 240m, 270m, 300m, 330m

Contact depths (ft): 92', 93.5, 95.5, 109, 110, 132.5, 142, 144, 145.5, 154, 167, 183, 184.5, 188, 191, 201.5, 204, 208.5, 211.5, 219, 235, 239, 240.5, 253, 282.5, 284, 301.5, 304, 310, 312, 328.5, 332, 350, 364.5, 374, 377, 387, 393, 412.5, 422.5, 425, 447.5, 449.5, 497, 502, 503, 582.5, 584, 585, 589, 590.5, 593, 596, 599, 606.5, 610.5, 615, 630, 648.5, 652, 662, 663.5, 675, 679, 685, 687.5, 690, 702.5, 704, 716.5, 723.5, 748, 749, 752, 755, 782.5, 786, 790.5, 793.5, 735.5, 797.5, 800.5, 803, 816, 817.5, 821.5, 834, 835.5, 837.5, 843.5, 854.5, 865, 866.5, 868.5, 874, 875.5, 886, 887.5, 889, 890, 891, 892, 893, 897, 903, 915, 916, 917, 922, 923.5, 982, 985, 997, 997.5, 1002, 1003.5, 1006, 1008, 1012, 1016, 1017, 1035, 1037, 1038, 1045, 1046.5, 1052.5, 1055, 1059, 1061, 1063, 1065.5, 1069.5, 1072, 1076.5, 1081, 1084, 1089.5, 1096.5, 1099.5, 1101.5, 1104.5, 1115, 1126.5, 1128.5, 1139, 1150'

Section: O/B

Visual estimate of resin in coal (top to bottom): <1%, 0.5%, 0.5%, 0.5%, 1%, 1%, 0.5%, 1%, 0.5%, 0.5%, 0.5-1%, 0.5%, 0.5%, 0.5-1%, 1-2%

Angle of bedding to core (top to bottom): 30-35°, 35°, 25-30°, 30°, 25-30°, 30°, 30°, 30-35°, 25-35°, 30°, 25°, 30-35°, 30°, 20-25°, 30°, 30°, 15-25°, 20°, 25-30°, 25-40°, 30-40°, 20-25°, 25-30°, 30°, 20-25°

Descriptive notes:

0 - 25' boulder gravel
25'- 85' clay + sand
85'-92' packed clay
Shale
Conglomerate
Dominantly sandstone with interbedded shale, clay + minor coal stringers
15% of shaly coal
Interbedded sandstone - shale with minor coal stringers + lenses.
Dominantly shale + sandstone + minor coal.
Sandstone + thin congl. horizons
Conglomerate
Interbedded sandstone - shale, with minor congl. and minor coal stringers
Dominantly shale with 1/2"-4" coal seams
Interbedded sandstone - shale with minor coal stringers and congl. horizons.
Conglomerate
Mostly shale with interbedded sandstone + minor coal
Conglomerate
Mostly sandstone + interbedded shale and minor coal
Conglomerate
Mostly sandstone with interbedded shale
Conglomerate
Gritty sandstone with interbedded shale and minor coal
Mostly conglomerate with interbedded sandstone
Mostly sandstone with interbedded shale + minor coal
Congl.
Dominantly shale with interbedded sandstone + minor coal seams (4"-2" seams).
Interbedded sandstone - shale + minor coal stringers
Conglomerate
Sandstone
Dominantly shale with sandy-shale and (1"-4") coal seams.
Conglomerate
Dominantly sandstone with interbedded conglomerate shale + one 6" coal seam
Conglomerate
Interbedded sandstone - shale with occasional conglomerate + coal
Conglomerate
Mostly sandstone with interbedded shale and conglomerate + minor stringers of coal.
Conglomerate with interbedded sandstone.
Interbedded sandstone - shale, with conglomerate and minor coal
Conglomerate
Dominantly sandstone with lesser conglomerate
Interbedded sandstone - shale, + conglomerate and minor coal (<2" thick)
Conglomerate with interbedded sandstone
Interbedded sandstone - shale + conglomerate and minor coal stringers
Conglomerate
Dominantly shale with interbedded sandstone conglomerate and minor coal (1", 2" & 8" seams).
Conglomerate
Dominantly shale with interbedded sandstone
Conglomerate
Coal
Dominantly shale with interbedded sandstone conglomerate and numerous coal seams (1"-2" thick). Also numerous fractured areas.
Sandstone with interbedded conglomerate
Conglomerate
Coal
Conglomerate
Interbedded sandstone - shale
Conglomerate
Mostly shale with interbedded sandstone
Conglomerate
Interbedded sandstone - shale
Conglomerate with interbedded sandstone
Dominantly sandstone with interbedded shale & congl.
Mostly grey and brown shale with interbedded sandstone + minor coal seams.
Dominantly sandstone or sandy-shale with interbedded shale + minor coal.
Coal - shale
Dominantly shale with interbedded sandstone and minor coal.
Sandstone
Interbedded sandstone - shale with minor coal.
Interbedded sandstone conglomerate
Dominantly shale with minor coal.
Sandy shale + minor coal and basal conglomerate
90% coal + shale
Mostly shale and sandy shale with interbedded sandstone + minor coal.
Sandstone + congl.
Mostly shale with interbedded sandstone with coal seams (1" & 2" thick).
Mostly sandstone with interbedded shale
Dominantly shale with interbedded sandstone and (2" & 4" thick) coal seams.
Coal - shale
Shale
Sandstone with coal partings.
Shale with minor interbedded sandstone and coal seams (1"-9" thick).
Conglomerate
Interbedded sandstone shale with 2 coal seams (<2").
Conglomerate
Shale
Coal
Shale + a 6" coal - shale seam.
85% coal
Mostly shale and sandy shale + 2 (1"-2" thick) coal seams
60% coal
Dominantly shale with interbedded sst + minor coal
Conglomerate
80% fractured
Shale laced with coal stringers
Conglomerate
Mostly sandstone with interbedded shale with two coal seams (1" & 2" thick).
Dominantly shale with interbedded sandstone and two coal seams (5" & 6" thick).
Sandstone
90% coal
Sandy shale with interbedded sandstone and minor coal
75% coal
Shale with two (1.5" & 3" thick) coal seams.
65% coal
Shale
80% coal
Shale
75% coal
Shale
75% coal
Shale
80% coal + minor pyrite
Shale with interbedded sandstone with two coal seams 1"-5" thick.
Conglomerate
Shale
Coal
Interbedded sandstone - shale + one (6") coal seam.
60% coal
Dominantly shale with interbedded sandstone and to a lesser extent conglomerate, + minor coal stringers.
Sandstone
Fractured, interbedded, sandstone - shale
65% coal
Shale
80% coal (2' core lost)
Fractured shale
60% coal (1.5' core lost)
Fractured shale
70% coal (1' core lost)
Shale
Coal
Shale with minor coal seams (1"-6" thick) + conglomerate horizons.
80% coal
Shale
80% coal
Sandstone grading into conglomerate
Dominantly shale with interbedded sandstone + two (6") coal seams
Coal - shale
Mostly shale with numerous coal lenses
Interbedded sandstone - shale
Conglomerate
Shale with minor coal
Sandstone grading into conglomerate
Interbedded sandstone - conglomerate
Conglomerate
Interbedded sandstone - shale
Shale
Conglomerate
Shale
Conglomerate with interbedded sandstone + shale
Shale
Conglomerate
Sandstone with interbedded shale
Mottled sandstone - shale
Volcanic tuff, breccia
Shale
Conglomerate
Volcanic breccia (tuff?)
END OF HOLE

(M13) **15**

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-12

BW-Bowron River 77(3)B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 30+00 N, 3+55 E	DIP TESTS : 500' -86°, 780' -88.5°
DATE BEGUN : AUGUST 11, 1977	
DATE FINISHED : AUGUST 17, 1977	TOTAL DEPTH : 1026' (312.80m)
LOGGED BY : T. D. LEWIS	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR (FT.)	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0			O/B Overburden
105'		28°	Conglomerate
108			Interbedded sandstone-shale with minor coal seams (1" & 2" thick).
116			Shale, with thin (<2") clay-rich sections, and two (1" & 2") coal seams.
124			Interbedded sandstone-shale with three conglomerate horizons.
139			Sandstone
140.5			Conglomerate
142			Dominantly shale with minor coal seams.
146			Conglomerate
152		30°	Interbedded sandstone-shale
162			Conglomerate
164			Sandstone with 1' of pebbly sandstone
168			Dominantly conglomerate with interbedded sandstone
184.5			Shale
188			Conglomerate
191			Shale with interbedded sandstone + 4" conglomerate
196		25°	Dominantly sandstone with interbedded shale, thin conglomerate, clay + minor coal stringers.
213			Conglomerate
234			Shale, + minor coal stringers
237.5			Conglomerate + 6" sandstone
243.5			Shale, with minor conglomerate beds and a few thin (~1") coal seams.
253.5			Conglomerate
263.5		25-30°	Interbedded sandstone-shale with conglomerate and minor coal lenses.
278			Conglomerate
282			Shale-sandstone
284			Conglomerate
286		35°	Shale with one conglomerate bed and minor coal
300.5			Conglomerate
305.5			Sandy shale
309			Conglomerate
317.5			Shale with minor coal and conglomerate.
321.5			Conglomerate
326			Dominantly shale with interbedded conglomerate and sandstone
339			Conglomerate
344		10-15°	Interbedded sandstone-shale
346.5			Conglomerate
350			Mostly shale + interbedded sandstone
353.5			Conglomerate
356			Shale + 4" shaley-coal
359			Conglomerate
365.5			Shale with numerous coal partings + 2" & 10" shaley coal seams.
374.5			Conglomerate
375.5		30-35°	Interbedded sandstone-shale
			Conglomerate
383			Dominantly shale, with interbedded sandstone and conglomerate.
396			Conglomerate
402			Mostly sandstone with interbedded shale + congl.
408.5			Conglomerate
410.5			Shale
413		20-40°	Mostly sandstone, with interbedded shale + congl.
421			Pebbly sandstone + conglomerate
424			Interbedded sandstone-shale
426			Conglomerate
431		25°	Mostly sandstone, with interbedded shale + congl.
			Conglomerate
441			Dominantly shale with interbedded sandstone and minor 1"-10" coally-shale seams.
457.5			Conglomerate
466			Shale with interbedded sandstone + coal partings.
471			Sandstone grading into conglomerate.
476			Mostly shale with four 2" to 6" coal seams.
489			Conglomerate
502.5			Dominantly sandstone with interbedded shale.
			Conglomerate
508.5		20-30°	Interbedded shale-sandstone with two 2" coal seams
521.5			Conglomerate
524.5			Dominantly sandstone with thin interbedded shale.
527			Conglomerate
539		30°	Mostly sandstone with interbedded congl. and shale + 4" coally-shale
546			Conglomerate
550			Dominantly shale with interbedded sst. + numerous coal seams (½"-2" thick).
593			Conglomerate
606		20-25°	Mostly shale with interbedded sandstone + three (1"-4") coal seams.
615			Pebbly sandstone with interbedded shale
			Mostly shale with sandstone
625.5			Interbedded sandstone + conglomerate
627.5			Conglomerate
629			80% coal.
631			Conglomerate.
635.5		15°	Mostly shale with interbedded sandstone and one 2" coal seam.
644			Sandstone with thin interbedded shale
647.5			Shale
649	<0.5%		95% coal
650.5		20°	Shale with one 6" coal seam.
654.5	0.5-1%		13" coal.
656		30°	Shale with four 1"-3" coal seams.
670			Conglomerate with 1' sandstone
674			Shale
675.5	0.5%		85% coal
677			Dominantly shale with interbedded sandstone and minor coal.
688.5			Interbedded sandstone-conglomerate
690.5			Mostly shale with 6" coal
692.5			80% coal.
694.5			Shale with six coal seams (1"-6" thick).
702.5			Interbedded shale-coal (50% coal)
706			65% coal
707			Shale
708			95% coal
711			Shale + 4" coal
713			80% coal
715.5			Mostly shale with 4 coal seams.
728			75% coal.
729.5			Shale with four (1"-2" thick) coal seams.
739.5			Sandstone
791			Shale + 3 coal seams (2"-6" thick)
745.5			Conglomerate
746.5			Dominantly shale with interbedded sandstone
750			Conglomerate
759			Sandstone with interbedded conglomerate
763		25°	Mostly shale with interbedded sandstone
781.5			Interbedded shale and sandstone
			Conglomerate
823.5			Shale with coal lenses and sandstone
830			Coally-shale
831.5		20°	Mostly shale with interbedded sandstone and conglomerate
841			Coally-shale (40% coal).
843			Shale
			Fractured coally shale
844	0.5%		70% coal.
846			Dominantly shale + one 2" coal seam
861			Coally-shale
862			Shale
864		15-20°	Sandstone
867.5			Laminated silty-shale
			Dominantly shale with interbedded sst. + 3 coal seams (1"-2" thick)
884.5			Sub angular conglomerate in brown matrix.
886	1%		90% coal.
891			Shale + 6" coal.
894			Coally-shale
895			Shale
897	0.5%		90% coal
898			Shale
906			Sandstone
908			Shale + four coal seams (2"-7" thick)
912	0.5%		Coal
913			Shale
914			90% coal
915.5	0.5%		Coal
917			Shale + 9" coal seam.
919	0.5%		85% coal.
927.5		20°	Dominantly shale with thin coal lenses and interbedded sandstone
948			Conglomerate
953		30-35°	Mostly shale with interbedded sandstone, conglomerate and minor coal lenses.
989			Conglomerate
994			Shale with sandstone at base
997			Conglomerate
1003.5			Sandstone
1005.5			Conglomerate
1010		10-35°	Shale with interbedded sandstone
1018			Volcanic tuff - partly bedded
1026'			END OF HOLE

15

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-13

BW- Bowron River 77(3)B.

BOWRON RIVER COAL DEPOSIT

CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 31+50 N , 4+00 E	DIP TESTS : 500' -90°; 1000' -88.5°
DATE BEGUN: AUG. 17, 1977.	
DATE FINISHED: AUG 21, 1977.	TOTAL DEPTH : 1037' (316.16 m)
LOGGED BY: T. D. LEWIS	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR (FT.)	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0	O/B			Overburden
112'			25-30°	Sandstone
115'				Conglomerate
117				Sandstone
120.5				Conglomerate
142.5				Shale, with interbedded sandstone
145				Conglomerate
146.5				Shale + minor coal stringers
				Conglomerate
148				Sandstone with interbedded conglomerate.
154				Conglomerate
161				Sandy-shale + conglomerate and minor coal
165				Interbedded sandstone
169.5				Conglomerate
172.5				Sandstone + minor coal and 6" conglomerate
177				Conglomerate
179.5			20-25°	Dominantly sandstone + interbedded shale
184.5				Conglomerate
195				Sandy-shale + minor coal lenses.
200.5				Conglomerate
207.5				Sandstone
209.5				Conglomerate
217.5				Interbedded sandstone-shale + minor coal lenses
219.5				Conglomerate
221				Sandstone
223.5				Sandstone grading into conglomerate
225				Sandy-shale + interbedded sandstone
229.5				Conglomerate + interbedded sandstone
242				Sandy-shale
				Conglomerate
244.5				Sandstone + minor coal lenses.
251				Conglomerate
264.5			30°	Shaly-sandstone + minor coal.
				Conglomerate
266				Interbedded sandstone-shale + 10" conglomerate
272				Conglomerate
				Dominantly shale + interbedded sst + conglomerate
278.5				Sandstone + thin interbedded shale and congl.
282				Conglomerate + interbedded sandstone
301				Shale + minor coal.
303.5				Interbedded sandstone-conglomerate
306			25-30°	Dominantly shale + interbedded sandstone + minor coal.
316.5				Conglomerate
325.5				Mostly sandstone + interbedded conglomerate + shale
330				80% coal
331.5				Shale + 2" conglomerate
333				Conglomerate
340.5				Shale
342				Conglomerate + interbedded sandy-shale.
347.5				Mostly sandstone with interbedded shale + minor coal.
356.5				Conglomerate + interbedded sandstone
370.5			25°	Sandy-shale + thin coal lenses
373				Mostly sandstone + interbedded congl. + shale
375.5				Conglomerate
377				Sandy-shale.
378.5				Conglomerate
384			25°	Mostly sandy-shale + interbedded congl. + sandstone
394				Shale + thin lenses of coal.
398.5				Graded-bedded sandstone.
402				Conglomerate + interbedded sandstone
414.5			30-35°	Shale + minor thin coal lenses
417.5				Sandstone + pebbly sandstone
422.5				Shale + minor coal lenses.
426				Conglomerate
427				Sandy shale + minor coal stringers
429				Conglomerate
431.5				Dominantly sandstone with interbedded shale, pebbly sandstone and minor coal partings.
436.5				Conglomerate
444.5				Mostly sandstone + coal stringers
454.5				Conglomerate with sandstone.
467.5				Interbedded sandstone-shale + minor coal lenses
474				Coal
475			20°	Shale + minor coal.
479.5				Conglomerate.
486.5				Sandstone + minor coal partings.
490				Conglomerate + lesser sandstone.
498				Sandstone
499.5			30°	Dominantly shale with sandy-shale, sandstone and minor coal.
506				Conglomerate + interbedded sandstone
510.5				Sandy shale
514.5				Sandstone + minor coal stringers
516				Conglomerate
519				Interbedded sandstone-shale
524				Conglomerate with interbedded sandstone
530.5				Sandy-shale, thin coal lenses
539.5				Mostly sandstone with pebbly sandstone, conglomerate and minor coal partings.
549.5				Brown shale with coal lenses
550.5				Sandstone
551.5			15-20°	Shale + 4 coal seams (1"-2" thick)
567				Sandstone + interbedded shale
569				Conglomerate with minor sandstone
575				Sandy-shale with minor sandstone and congl.
578.5				Sandstone with thin interbedded shale
				Dominantly shale with sandy-shale and minor coal partings.
586.5				Conglomerate
589			25-30°	Dominantly sandy-shale with interbedded sandstone and coal stringers
605		0.5-1%		90% coal.
606.5				Dominantly sandstone with interbedded shale and coal partings.
613.5				Brown coally-shale (<20% coal).
616				Dominantly shale with sandy-shale + numerous minor coal seams
632				Conglomerate
641				Sandstone with interbedded shale
642		<0.5%		Coal
643			25°	Shale with interbedded sandstone
658				Conglomerate
660.5				Shale with six coal seams (1"-10" thick)
674				Sandstone with coal partings.
676			20-40°	Shale + two coal seams (½"+1" thick).
682		2-4%		Coal
683				Sandstone + congl
684.5				Shale + two coal seams (2"+4" thick)
685.5				85% coal.
687			25°	Shale and sandy-shale + interbedded sandstone and six coal seams (1"-4" thick).
700.5		0.5%		Interbedded coal + shale
702.5				Shale + two coal seams (1.5"-4")
706		0.5%		Coal
707.5				Sandstone with interbedded shale
709.5				Brown shale + interbedded sst.
711.5				Dominantly shale + interbedded sandstone, congl. and seven coal seams (1"-3" thick).
752				Sandstone
754				Conglomerate
			25°	Gritty shale and sandstone
768.5				Sandstone + conglomerate
775				Fractured shale
777				Sandstone + conglomerate
786			35°	Conglomerate
788.5				Sandstone + shale
795				Conglomerate
			25-30°	Shale with interbedded sandstone and numerous minor coal seams
830		0.5-1%		80% coal + shale
833				Sandstone + interbedded shale + two (2") coal seams.
836		0.5%		65% coal + minor pyrite and 35% shale
				Gritty shale + minor interbedded sandstone + congl.
845.5				Shaley-coal (coal 60%)
846.5			20-30°	Dominantly shale with interbedded sst + minor coal.
853.5		<0.5%		Coal.
855				Mostly shale + minor interbedded sandstone
883.5				Breccia with sedimentary fragments.
885				Sandstone with thin interbedded shale
890				Shale with lesser sandstone + two coal seams
893.5				Conglomerate
907				Shale with interbedded sst. or congl.
909.5		0.5%		Coally shale
911				Sandstone grading into congl.
912				Shale with interbedded sandstone and/or conglomerate + 3 coal seams
935				Sandstone grading into breccia.
936.5				Fractured shale + clay rich areas and two (2") coal seams.
943.5		<0.5%		Shaley-coal (coal 65%)
945				Shale + 4" coal seam
947.5		0.5%		70% coal + shale
949.5				Shale
950.5		0.5-1%		Coal
951.5				Shale
953				65% coal
955				Shale with three coal seams (3"-10" thick)
958.5		0.5-1%		75% coal
962.5				Interbedded shale and fragmented sandstone (?)
965		<0.5%		Shaley-coal (coal 55%)
966.5				Shale + three coal seams (1" thick)
968				Interbedded sandstone + conglomerate
969			20-30°; 25°	Shale with interbedded conglomerate and sandstone + minor coal seams.
1001.5				Sandstone
1003.5			35°	Volcanic breccia
1013.5				Mostly shale with interbedded sst + congl.
1031.5				Volcanic breccia.
1037'				END OF HOLE

15 (MK)

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-14

BW-Bowron River 77 (3) R.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 31+50 N, 0+88 E	DIP TESTS : 447' -88°
DATE BEGUN : AUG. 22, 1977	
DATE FINISHED : AUG. 24, 1977	TOTAL DEPTH : 447'(136.28 m)
LOGGED BY : T. D. LEWIS	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0 FT. M				
20	O/B			Overburden
40				
60				
80				
30m				
100				
120				
122				Sandstone + interbedded shale and minor coal.
124.5				Shale.
126				Conglomerate
129			25°	Dominantly shale, with interbedded sst + congl
137.5				Conglomerate
140.5				Mostly shale with interbedded sandstone + congl. + minor coal stringers.
153				Sandstone
156				Shale with interbedded clay, sandstone, congl and minor coal.
160				
170				Conglomerate
173				
180			30°	Dominantly shale, minor sandstone, and numerous coal seams.
60m				
197.5				Sandstone
200				Mostly shale, + interbedded sst, and minor coal.
201.5				
211.5				Coal + minor pyrite
212.5				
220			35-40°	Dominantly shale with interbedded sst, and 4 coal seams
233		~0.5%		Shaly coal
234				Shale
235				Coal - shale
236.5				Shale, three coal seams (2"-4" thick), + minor sst.
240		1%		
243				75% coal + pyrite
244.5				Sandy shale
247				Coal + pyrite
248			25°	Shale with interbedded sandstone, and three coal seams.
260				
265.5				Sandstone with interbedded shale.
275				
280			35°	Conglomerate, with interbedded sandstone
90m				
296				Shale, with interbedded sst, and minor coal lenses.
300				
303.5				Sandstone
305.5				
320				Conglomerate with lesser sandstone
327				Shale + minor sandstone and two coal seams (2@3")
331.5		~0.5%		Coal
332.5				Fractured shale + minor coal
334			30°	Shale with interbedded sandstone + nine coals seams 1"-4" thick.
340				
358.5		2-4%		70% coal
360.5				Shale + minor coal
360				
366.5				Sandstone + angular fragments.
380				
385				Conglomerate
388				Sandstone, interbedded shale and coal partings.
391.5				
120m			35-50°	Mostly shale with interbedded sandstone + minor coal lenses.
400				
406				Tuffaceous sandstone
408				Shale
409				
420			40°	Tuffaceous sandstone

END OF HOLE

15 (M16)

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-15

BCI-BOWRON RIVER 77 (3) B

BOWRON RIVER COAL DEPOSIT

CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 33+00 1+78 E	DIP TESTS : 507' -90
DATE BEGUN : AUG. 24, 1977	
DATE FINISHED : AUG. 27, 1977	TOTAL DEPTH : 777'(236.89 m)
LOGGED BY : T. D. LEWIS	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR (FT.)	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0 (O/B)			Overburden
110			Sandstone +6" congl
113			Conglomerate
116			Mostly shale, with interbedded congl. + coal lenses
121.5			Conglomerate
125.5		30°	Mostly shale, with interbedded sandstone and conglomerate
146			Conglomerate, + interbedded sandstone, shale
165.5			Shale, + interbedded sandstone
171			Brown muddy shale
172.5		25°	Mostly shale, with interbedded sandy shale and sandstone + minor coal seam
185.5			Conglomerate
189.5			Shale and/or sandy-shale, with interbedded sandstone + conglomerate
217			Conglomerate
			Interbedded shale-sandstone + minor coal
232			Conglomerate
			Mostly sandstone, + interbedded conglomerate
245			Conglomerate
250.5			Dominantly shale with interbedded sst. conglomerate and minor coal.
264.5	0.5-1%		Coal + minor pyrite
265.5		30-35°	Mostly shale, + interbedded sst. + minor coal
286			Mostly sandstone + interbedded conglomerate
290			Shale + 4" coal.
294			Conglomerate
308		30°	Dominantly sandstone + interbedded shale
311.5	<0.5%		60% coal
312.5			Dominantly sandy-shale, with sst, conglomerate and two (4") coal seams
327			Sandstone
328.5		30°	Interbedded sandstone-shale + two minor coal seams
351			Conglomerate
353.5		30°	Dominantly shale, with interbedded sandstone, congl & minor coal.
365.5	0.5%		Coal.
366.5		30°	Mostly shale, with interbedded sandstone & minor coal
401	<0.5%		14" coal
			Shale with sandy shale & minor coal stringers
404.5			Sandstone, with interbedded conglomerate
413		30°	Shale, with intebedded sandstone & numerous coal seams (1"-5" thick)
451	0.5-1%		75% coal + shale + minor pyrite
453			Shale
457.5	0.5%		80% coal
458.5			Shale with interbedded sst & coal partings.
478.5			Conglomerate
492		25-30°	Interbedded shale-sandstone
504.5			Conglomerate
506			Shale, with interbedded sandstone
517.5			Conglomerate
538.5		30°	Sandstone with interbedded shale
544			Conglomerate
554.5			Sandy shale, with interbedded sandstone
568.5			Clay-brown shale, with six coal seams (1"-6")
587	0.5%		80% coal
588.5			Shale
590	0.5%		85% coal + minor pyrite
591			Shale, + two (1" & 4") coal seams.
593.5	0.5-1%		80% coal
596			Shale, + five coal seams (2"-8")
599.5			Sandstone
601	1%		60% coal
602			Shale, with numerous coal seams, + minor sandstone
625.5			Brown sedimentary fragments.
626.5		15-25°	Shale
631.5			Mostly sandstone, + conglomerate and minor coal lenses
642			Conglomerate
649			Shale
650.5			60% coal + shale
651.5			Shale + 2" coal
652.5			Sandstone with interbedded conglomerate
654.5			Shale, + minor coal seams
662.5		20°	Sandstone with interbedded conglomerate
667			Conglomerate
674			Sandstone, with conglomerate
678.5			Shale, with interbedded sst + conglomerate
690.5	0.5-1%		60% coal + shale, and minor pyrite
694			Interbedded shale and granule conglomerate
695.5			Shale + two coal seams (6" & 8" thick)
697.5	0.5-1%		80% coal
699.5			Shale, + minor coal
700.5	0.5-1%		65% coal, minor pyrite & shale
706.5			Shale + numerous coal lenses
712	0.5-1%		65% coal + minor pyrite & shale
715			Sandstone
716.5			Breccia - sed. fragments
717.5			Mostly shale with interbedded sandstone & congl + numerous coal seams.
753.5		20°	Tuffaceous sandstone
763			Volcanic breccia
766			Tuffaceous sandstone
777'			END OF HOLE

M17 15

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-16

BW- BOWRON RIVER 77 (3) R.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 30+00N , 1+78 E	DIP TESTS :
DATE BEGUN : AUGUST 28, 1977	
DATE FINISHED : AUGUST 29, 1977	TOTAL DEPTH : 207' (63.11 m)
LOGGED BY : T.D.L.	
SCALE : 1" = 20' or 1:240	

DEPTH FROM COLLAR	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0 FT. M				
20				
40	O/B			Overburden - clay, sand + thin gravel beds
60				
80				
92'				Interbedded shale & sandstone minor coal seams & veins.
30 m 100				
107				Zone probably represents o/b of Slide Mtn. Group. Consists of Slide Mtn. rocks, some shale and coal veinlets.
120				
140				
160				
174				Slide Mtn. agglomerate.
180				
50 m 200				
207				END OF HOLE

15

M18

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-17

BW-BOWRON RIVER 77 (3) B.

CORE SIZE : NQ
LOCATION : L 28+50 N, 4+66 E
DATE BEGUN : AUGUST 31, 1977
DATE FINISHED : SEPT 15, 1977.
LOGGED BY : JRK & TDL
SCALE : 1" = 20' or 1:240

ANGLE OF HEAD : -90°
DIP TESTS : 497' -90°; 997' -79.5°; 1217' -82° (262° tropari)
TOTAL DEPTH : 1217' (371.04 m)

DEPTH FROM COLLAR (ft)	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0–142			Overburden
142			Shale - minor thin veins of coal
144			Conglomerate
146			Sandstone - 1" coal seam.
147.5		40	Conglomerate - two beds sst.
152			Sandstone
153			Conglomerate
155			Sandstone
156		35°	Interbedded shale and sandstone, minor coal.
174			Conglomerate
179			Shale
180.5			Interbedded conglomerate & sst.
184.5			Sandstone - minor coal.
186.5			Conglomerate
187.5			Sandstone
189		30°	Conglomerate
196.5		25-30°	Intebedded shale & sst, minor coal.
204			Conglomerate
209.5			Sandstone
212			Conglomerate
214		25°	Sandstone - thin veins of coal.
220.5			Conglomerate
230.5		30°	Shale & sst.
244			Shale - minor coal.
248			Sst & conglomerate
254.5			Conglomerate
257.5			Sst
259			Conglomerate
261		25°	Sandstone, lenses of coal.
267			Conglomerate
271			Interbedded sst & conglomerate
279		25-30°	Shale, minor sst - coal in veins
286			Sandstone
288		20-30°	Shale, minor sst several ½"-1" coal seams
302			Sandstone, veins of coal
310			Conglomerate, minor sst
323		30°	Interbedded shale & sst.
332			Conglomerate
333			Sst + shale
335.5			Conglomerate
340		25°	Sandstone
342.5			Conglomerate
346.5		25-30°	Sst, lenses of coal.
351			Conglomerate
356			Sandstone
360.5			Conglomerate
362		30°	Sandstone - veins of coal.
371	<0.5 %		95% coal
375			Sandstone
380			Conglomerate
382			Sandstone & shale, minor coal.
390			Conglomerate & sandstone
398			Conglomerate, minor sandstone
417		20-25°	Dominantly sandstone, with interbedded shale. Coal seams up to 3" thick.
445			Conglomerate
450			Sst.
451			Conglomerate
459		20-25°	Sandstone, minor shale, thin veins of coal
471			Conglomerate
481		30°	Sst
483.5			Conglomerate
487			Sandstone, some conglomerate
494			Conglomerate
497.5			Sandstone, minor coal
508.5			Conglomerate
510			Shale - 6" coal seam.
513			Interbedded sst & conglomerate
527		30°	Sandstone
531.5			Conglomerate
534			Dominantly shale - interbedded sst 4"-6" coal seams
572		30°	Sandstone
580			Conglomerate
584			Shale & sst - 8" bed of cong. 2"-3" coal seams.
590			Conglomerate
591		30°	Gritty sandstone, minor conglomerate >1" coal seams.
607			Conglomerate.
609			Sandstone
611			Conglomerate - unconsolidated.
623	0		Coal - sst
624			Sandstone
627		20°	Shale, minor sst, many coal stringers.
632.5			Sst
634			Conglomerate
637		25°	Gritty sandstone
643			Shale - abundant coal stringers (15-20%)
648.5		25°	Sst, minor conglomerate
652.5			Conglomerate
659			Sandstone
661			Shale - minor coal
669	0		Soft coal
671			Interbedded sst & shale - minor coal
682		25°	Gritty sandstone
695			Interbedded shale & sst < 1" coal seams
708		25-30°	Mainly shale - minor sst
715	0		Coal
717			Dominantly sst - minor shale 1-3" seams of coal
			Conglomerate - interbedded sandstone
784.5			Coaly-shale (50% coal)
785.5		25°	Sandstone
789			Conglomerate
792.5			Dominantly sandstone with shale + thin coal lenses + stringers
810	0.5-1.0%		Fractured coal
811.5			Shale with coal seams (4"-10" thick) + conglomerate horizons.
822.5			Sandstone + interbedded shale
827	0		Shaley-coal (60% coal)
829.5			Sandstone + shale
834	0		Shale + coal (60% coal)
835.5			Sandstone + frequent coal partings
854			Conglomerate + sandstone
856		25-30°	Sandstone + shale
861			Coal
862			Sandstone, interbedded shale + minor coal.
883			Shale + noted coal seams
887.5			Sandstone + interbedded shale
893			Shale + numerous coal lenses + seams (2"-6" coal).
904.5	0		Shaley-coal (Coal 65%)
905.5		30°	Sandstone + shale. Numerous coal partings + seams (2"-6")
916	0.5%		Shaley-coal (65% coal)
918.5			Shale + minor coal
920.5	0		Coal (95%)
923		20°	Sandstone + shale. Coal partings + seams (2"-6" thick).
950.5			Conglomerate + minor coal
955			Shale + sandstone
963			Sandstone + coal stringers
			Shale
	0.5%		Coal
		20°	Sandstone + shale + coal seams (3"-6" thick)
995.5			Conglomerate
997.5		25-30°	Sandstone + minor coal
999.5			Conglomerate
1003.5		30°	Sandstone
1006.5			Dominantly conglomerate - some sandstone
1011			Sandstone + interbedded shale, coal stringers.
1037.5			Conglomerate
1039		20°	Sandstone, shale + 2" coal seams.
1048.5	0		Coal (90%)
1050			Sst
1051	0.5%		Shaley-coal (70% coal) + pyrite
1054.5			Shale
1055.5	0.5%		Shaley-coal (50-60%)
1057			Shale + thin coal lenses
1059	1-2%		Shaley-coal (75% coal)
1060			Shale + coal seams
1062	1%		Shaley-coal (80% coal)
1063.5			Sandstone
1065.5	1-2%		Shaley coal (60% coal.)
1067.5		25-30°	Sandstone + interbedded shale
1074			Shale
1077.5			Breccia, quartzite + shale fragments.
1079			Shale + minor coal
1081.5	0.5-1%		Coal (90%)
1084.5			Shale + coal seams (0.5"-9" thick)
1095.5			Chert, shale + conglomerate
1098.5			Sandstone + shale + minor coal.
1105			Conglomerate, sandstone + minor coal
1107.5			Shale + coal
1109	1%	20-25°	Shaley-coal (65% coal)
1114.9			Sandstone
1115.5	0		Shaley-coal (60% coal)
1116.5			Sst
1118	0.5%		Shaley-coal (80% coal)
1119.5			Sandstone + shale with coal seams (2"-5")
1125.5	0.5%		Shaley-coal (60% coal)
1127.5			Shale + coal seams
1132.5			Shale + minor coal
1136			Sst
1137			Shale
1139			Fragments + sandstone
1141			Shale + fragments
1144.5			Shale + sandstone
1148		15°	Conglomerate + sandstone
1152			Sandstone + conglomerate
1176			Dominantly conglomerate + interbedded sandstone
1210		25°	Breccia + sandstone (tuff)
1217'			END OF HOLE

(M19) 15

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-18

BW-BOWRON RIVER 77(3)B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE: NQ	ANGLE OF HEAD: -90°
LOCATION: L 30+00 N 5+84 E	DIP TESTS: 500' -90°; 1000' -85.5°; 1252' -85°(301° trop)
DATE BEGUN: SEPT 16, 1977	
DATE FINISHED: SEPT 24, 1977	TOTAL DEPTH: 1252' (381.71 m)
LOGGED BY: T.D. LEWIS	
SCALE: 1"=20' or 1:240	

DEPTH FROM COLLAR (FT.)	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0–155' (O/B)			Overburden
155–156			Conglomerate
156–160			Sandstone + conglomerate
160–170.5			Conglomerate + some sandstone
170.5–173			Sandstone
173–184.5			Conglomerate + some fragments.
184.5–204			Sandstone + conglomerate
204–212			Conglomerate + interbedded sandstone
212–218			Shale + minor coal.
218–227			Dominantly conglomerate with some sandstone
227–231.5		20-25°	Sandstone
231.5–253.5			Conglomerate + some fragments and quartzite, shale & chert.
253.5–271.5		20°-25°	Dominantly sandstone + interbedded shale, minor coal.
271.5–272.5	0		Coal
272.5–278.5			Shale + interbedded sandstone
278.5–287			Conglomerate
287–289			Sandstone
289–295			Conglomerate
295–299.5		25°	Sandstone + conglomerate
299.5–302			Conglomerate
302–311.5			Sandstone + conglomerate
311.5–327			Conglomerate + noted sandstone
327–339.5		25°	Sandstone, shale + conglomerate, minor coal lenses.
339.5–346			Conglomerate + sandstone
346–351			Sandstone
351–365			Conglomerate
365–377			Dominantly sandstone + noted conglomerate
377–380			Conglomerate
380–385		20-30°	Sandstone + conglomerate
385–395			Conglomerate + noted sandstone
395–397.5			Sandstone
397.5–407			Conglomerate
407–414			Dominantly shale, some sandstone + minor coal
414–423			Conglomerate + sandstone
423–428		25°	Sandstone + minor coal
428–429			Conglomerate
429–434			Sandstone + some shale
434–436			Conglomerate
436–439			Sandstone + thin coal
439–443.5			Conglomerate
443.5–446.5			Sandstone + minor coal.
446.5–464			Conglomerate + noted sandstone
464–477.5		20-25°	Sandstone + noted coal (1"-4")
477.5–480.5			Conglomerate
480.5–494			Sandstone, some conglomerate + minor coal.
494–496.5			Conglomerate
496.5–505		25-30°	Sandstone + thin coal.
505–506.5			Conglomerate
506.5–518			Sandstone, minor coal + conglomerate
518–520			Conglomerate
520–521	0		Coal
521–524			Sandstone, shale + minor coal
524–526.5			Conglomerate
526.5–530			Sandstone + minor conglomerate
530–549.5			Conglomerate, interbedded sandstone
549.5–552			Sandstone
552–563.5		20°	Conglomerate + noted sandstone
563.5–567			Sandstone + some conglomerate
567–574			Conglomerate
574–579.5			Sandstone + minor coal
579.5–?			Conglomerate
?–610.5			Sandstone, conglomerate, + minor coal
610.5–622			Conglomerate + fragments
622–631.5		20°	Sandstone, conglomerate + minor coal
631.5–632.5	0		Shaley-coal (70% coal)
632.5–634			Shale
634–637.5			Conglomerate
637.5–650			Sandstone + conglomerate
650–694.5			Conglomerate + noted sandstone
694.5–707		20-25°	Dominantly sandstone, thin shale + minor coal
707–709.5			Shale + thin coal
709.5–711	0		Coal (80%)
711–714.5			Sandstone + minor coal
714.5–717.5			Conglomerate
717.5–720.5			Sandstone + shale, minor coal
720.5–723.5			Conglomerate
723.5–725.5		25-30°	Shale + sandstone
725.5–728.5			Conglomerate
728.5–730.5			Sandstone
730.5–732			Conglomerate
732–744			Sandstone, shale + minor coal.
744–746.5			Shale with clay + fragments
746.5–747.5			Conglomerate
747.5–749.5			Conglomerate + shale
749.5–751.5			Sandstone
751.5–752.5			Conglomerate
752.5–760.5			Dominantly shale, conglomerate, minor coal & minor sandstone
760.5–771		10-20°	Dominantly sandstone, some shale + minor coal
771–772			Coaly-shale (80%)
772–774.5			Sandstone
774.5–775.5			Conglomerate
775.5–793.5			Dominantly sandstone, some shale, conglomerate & minor coal
793.5–794.5			Coal (50%) + shale
794.5–797			Shale + minor coal (2"-3")
797–809.5			Sandstone + shale + minor coal
809.5–811.5		5-25°	Shale
811.5–813	0.5%		Coal (85%)
813–819.5			Shale, sandstone + minor coal.
819.5–833		15°	Conglomerate + sandstone
833–?		20°	Shale + sandstone, minor coal
?–850			Sandstone + conglomerate
850–851.5	0.5%		Coal
851.5–855.5			Sandstone
855.5–859.5			Conglomerate
859.5–867.5			Sandstone
867.5–870.5	0.5%		Two coal seams + shale (?% coal)
870.5–873.5			Shale + noted coal seams
873.5–890			Dominantly sandstone, minor shale, noted coal seams & some fragments (breccia-tuff)
890–898.5		20°	Dominantly shale, interbedded sandstone + minor coal
898.5	0.5-1%		Coal (60%) + shale
–909			Sandstone-shale + minor coal
909–910.5	0.5%		Shaley-coal (75% coal)
910.5–913			Shale + noted coal seams
913–914	0.5-1%		Shaley-coal (?% coal)
914–916.5			Shale + noted coal
916.5–919	0.5%		Coal + minor pyrite
919–926			Sandstone + minor coal
926–930.5			Shale + minor coal
930.5–941.5			Sandstone
941.5–942.5			Coal
942.5–946.5			Sandstone + conglomerate
946.5–948			Sandstone + minor coal
948–954			Conglomerate
954–955			Shale
955–968		25°	Sandstone + minor coal + resin.
968–977			Sandstone + shale, minor coal.
977–978.5			Sandstone + conglomerate
978.5–984			Sandstone + minor coal
984–990.5			Conglomerate
990.5–1009		20°	Sandstone, interbedded shale + minor coal.
1009–1022			Sandstone-shale + noted coal seams (2"-4" thick)
1022–1023			Shale + minor coal
1023–1024.5	2-3%		Shaley-coal (70% coal)
1024.5–1031.5		10°	Dominantly sandstone + interbedded shale with some coal seams
1031.5–1034	0.5-1%		Coaly-shale (90% coal)
1034–1047			Interbedded sandstone with noted coal & thin shale
1047–1048	0.5%		Coaly-shale (40% coal)
1048–1067.5		25°	Interbedded sandstone + shale + noted coal seams (2"-6" thick)
1067.5–1075.5			Conglomerate + some fragments
1075.5–1086.5			Interbedded shale + sandstone + minor coal lenses
1086.5–1089			Fragments + breccia
1089–1107			Interbedded shale + sandstone, numerous coal partings + lenses.
1107–1108			Shaley-coal (60% coal)
1108–1122			Shale, noted coal + interbedded sandstone
1122–1125.5			Sandstone + breccia
1125.5–1131			Interbedded sandstone + shale
1131–1133			Conglomerate + some sandstone
1133–1140.5		20°	Dominantly shale with noted conglomerate + sandstone
1140.5–1145			Sandstone + minor shale
1145–1146			Shale + noted coal seams
1146–1147	0.5%		Shaley-coal (70% coal)
1147–1149			Shaley + coal
1149–1150	0		Shaley-coal (90% coal)
1150–1152			Shale + noted coal seams
1152–1158.5	1%		Shaley-coal (60%-65% coal)
1158.5–1161			Shale + noted coal seams + lenses
1161–1162	0.5%		60% coal
1162–1163.5			Sandstone, shale + minor coal.
1163.5–1167.5	0.5-2%	15-20°	Shaley-coal (50% coal), shale + sandstone
1167.5–1169			Sandstone + shale, minor coal
1169–1175	0.5-1%		Shaley-coal (60% coal)
1175–1177			Sandstone
1177–1178			Shaley-coal (80% coal)
1178–1184			Shale + minor coal
1184–1186.5			Fragments + breccia
1186.5–1213.5			Dominantly shale, interbedded sandstone + conglomerate & minor coal.
1213.5–1217.5			Sandstone + some fragments
1217.5–1219			Conglomerate
1219–1234.5		25°	Sandstone + some fragments
1234.5–1238.5			Shale
1238.5–1252			Basement, fragments + limey sandstone

END OF HOLE

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-19

BW - Bowron River 77 (3) B.

(N20) 15

BOWRON RIVER COAL DEPOSIT

CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 31+50 N 5+95 E	DIP TESTS : 500' -88°; 1027' -86°
DATE BEGUN : SEPT. 26, 1977	
DATE FINISHED : OCT 1, 1977	TOTAL DEPTH : 1137' (346.65 m)
LOGGED BY : T. D. LEWIS	
SCALE : 1" = 20' or 1 : 240	

DEPTH FROM COLLAR (FT.)	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0 – 148			O/B – Overburden
148			Shale + sandstone
152			Conglomerate + fragments
164.5			Shale + minor coal
166.5			Conglomerate
169.5		20°	Sandstone
172			Conglomerate
173.5			Dominantly sandstone, some shale + conglomerate
184			Conglomerate
188			Sandstone
198			Conglomerate + interbedded sandstone
210			Sandstone + shale
224.5			Conglomerate
226			Conglomerate
227 – 229.5			Shale + sandstone
233			Conglomerate
238		25-30°	Sandstone + minor coal stringers
244.5			Conglomerate + sandstone
249			Sandstone
252			Conglomerate
257			Sandstone, shale + minor coal
265.5			Conglomerate + sandstone
279.5		20-25°	Sandstone-shale + minor coal.
287			Conglomerate + sandstone
290.5			Sandstone
295.5		20-25°	Conglomerate + some sandstone
323			Shale-sandstone + noted coal seams
328.5			Conglomerate + sandstone
332.5			Sandstone, conglomerate + minor coal
342.5			Conglomerate
358.5			Sandstone, shale + minor coal
364			Sandstone + conglomerate
374.5		25-35°	Sandstone-shale + noted coal
379			Conglomerate
381			Sandstone
386.5			Conglomerate
388.5			Sandstone
391			Conglomerate + interbedded sandstone
412		30°	Sandstone + noted conglomerate
419.5			Conglomerate + noted sandstone
432			Sandstone, conglomerate + minor coal.
438			Conglomerate
459		30°	Sandstone + conglomerate
462.5			Shale + minor coal
464.5			Sandstone
466			Conglomerate + some sandstone.
478.5			Sandstone
481			Conglomerate, interbedded sandstone + minor coal partings.
489			Dominantly sandstone, some shale
499			Conglomerate
506			Sandstone + minor coal
509			Conglomerate
514		25-30°	Dominantly sandstone, shale, conglomerate + minor coal
527			Conglomerate
529			Sandstone
533.5			Conglomerate + minor coal
535			Sandstone, shale + minor coal
540	0		Coal
541			Sandstone
545		25°	Sandstone, shale + minor coal
547.5			Conglomerate + sandstone
549.5			Sandstone + minor coal
552			Conglomerate
555.5			Dominantly sandstone, some shale
563			Conglomerate
567			Sandstone
577			Conglomerate
579		20-30°	Sandstone + noted conglomerate
594.5			Conglomerate with sandstone-shale
602.5			Sandstone + noted coal seams
607			Conglomerate
608.5		25-30°	Sandstone, shale + minor coal
618.5			Conglomerate
622			Sandstone, some shale + minor coal.
628			Conglomerate
630.5			Sandstone, some shale + minor coal.
638			Conglomerate + sandstone
645			Sandstone
647			Dominantly shale, noted coal seams
652.5			Conglomerate
653.5			Dominantly sandstone, some shale + conglomerate
666		30-45°	Shale + noted coal seams (2"-6")
670			Sandstone + noted coal (3"-4")
680			Conglomerate
681		20°	Sandstone - shale + minor coal
690.5			Conglomerate
697			Shale + noted coal seams.
699.5			Sandstone + thin shale
709	1%		Coal
710		20°	Interbedded sandstone-shale + minor coal partings.
726.5			Sandstone + conglomerate
730			Sandstone-shale + noted coal
734			Conglomerate + sandstone
737		20°-25°	Interbedded sandstone-shale + noted coal seams + lenses (1"-5" thick)
756			Shale, some sandstone + minor coal
760			Sandstone, noted coal + shale (1"-6" thick coal seams)
783	0.5-1%		Shaley-coal
784			Shale, sandstone + noted coal
789.5	0		Coal
792			Conglomerate
793		20-25°	Sandstone, some shale + minor coal.
801.5			Conglomerate
802.5			Coal
803.5			Shale + minor coal
806	0		Shaley-coal (65%)
807.5		20°	Sandstone-conglomerate
813			Shale + minor coal
815.5		25-30°	Sandstone, some shale + numerous coal seams (1"-2" thick)
827.5			Conglomerate
831.5			Sandstone-shale + coal lenses
839.5			Conglomerate
841			Sandstone + numerous coal stringers
849.5			Conglomerate + fragments
850.5			Conglomerate
852.5		20°-25°	Sandstone, noted coal seams + partings (1"-5")
876.5			Shale, sandstone + minor coal
889.5	0		Coal + minor pyrite
891			Shale + noted coal
895	0.5%		Coal (75%) + shale
899			Sandstone + shale
905.5			Coal (80%) + shale
907			Sandstone, some shale + conglomerate.
913			Shale + noted coal seams
915.5		30-40°	Sandstone + noted coal seams
933.5			Conglomerate + sandstone
937.5		25-30°	Sandstone + noted coal seams (1"-4" thick)
979.5			Breccia
980.5			Sandstone + shale + noted coal
983.5			Sandstone + interbedded shale
990	0.5%		Shaley-coal (70% coal)
992.5			Shale, sandstone + noted coal seams
996	0.5%		Shaley-coal (65% coal) + minor pyrite
999			Shale + noted coal seams (3"-6" thick)
1006.5			Conglomerate + noted shale
1011.5			Sandstone + shale, minor coal
1014			Conglomerate
1015.5	0.5%		Coal (70-75%) with 20% shale + sandstone (Mainly coal with thin interbedded coaly-shale + sandstone)
1040			Shale + minor coal
1042	0.5%		Coal (75-80%) + shale
1047			Shale, minor coal + sandstone
1052.5	0.5%		Shaley-coal (75-80% coal)
1054.5			Shale + sandstone, minor coal.
1058	0		Coal
1059		10-25°	Shale, interbedded sandstone + noted coal seams.
1080.5			Coal (95%)
1082.5			Shale + sandstone
1087			Conglomerate
1095			Fragments + breccia
1096		25-30°	Dominantly sandstone + shale
1110			Shale + noted coal seams (1"-2" thick)
1113.5	0		Shaley-coal
1114.5			Sandstone, shale + noted coal seams
1129 – 1137			Clay, breccia, fragments; Basement

END OF HOLE

M21 15

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-20

BW- BOWRON RIVER 77(3)B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 34+50 N , 3+03 E	DIP TESTS :
DATE BEGUN: OCT. 4, 1977	
DATE FINISHED: OCT 6, 1977	TOTAL DEPTH : 347' (105.79m)
LOGGED BY: J. R. KERR	
SCALE 1"=20' or 1:240	

DEPTH FROM COLLAR	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0 FT. M				
20				
40	O/B			Overburden.
60				
80				
91				Conglomerate
96			20°	Interbedded sandstone & shale
30m 100				
101.5				Conglomerate
102.5				Gritty sandstone
110.5				Conglomerate
112				Sandstone
116.5				Conglomerate
119.5			25°	Shale - minor coal seams
120				
123				Conglomerate
124				Sandstone
132				Conglomerate
133.5				Sandstone
137				Conglomerate
139				Gritty sandstone, minor conglomerate.
140				
145				Conglomerate
147.5			15°	Sandstone, minor interbedded shale - some coal seams.
160				
172				Conglomerate
173.5				Interbedded shale & sandstone
176.5				Conglomerate
179				Sandstone
180				
183				Conglomerate
186			20°	Gritty sandstone, minor shale minor coal seams.
60m 200				
203				Congl.
204				Sandstone
207			20-25°	Shale - some sandstone many small coal seams.
220				
225				Coal.
226				Shale - some coal.
232.5			20°	Med - coarse sandstone
240				
249				Conglomerate
260				
269.5				Sandstone, coal seams.
280				
90m 300				
303				Shale - many small seams of coal 318'-324' 321'-324' - sheared.
320				
324				Fault or Unconformity ??
340				Slide Mtn. Group. Tuff.
347'				END OF HOLE
360				

M22

15

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-21

BW-BOWRON RIVER 77(3)B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 24+00N, 0+80E	DIP TESTS :
DATE BEGUN: OCT 11, 1977	
DATE FINISHED: OCT 13, 1977	TOTAL DEPTH : 117' (35.67m)
LOGGED BY: T.D. LEWIS	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0 FT. M				
20				
40	O/B			Overburden
60				
80				
30m. 98				
100				Unconsolidated Conglomerate
100				Tuffaceous sandstone + breccia
107.5			30°	Sandstone + occasional fragments (100'-107' assumed to be basement.
117				
120				END OF HOLE

(MAP) 15

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-22

BW-BOWRON RIVER 77(3)B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 25+50 E , 0+82 E	DIP TESTS :
DATE BEGUN: OCT 13, 1977	
DATE FINISHED: OCT 14, 1977	TOTAL DEPTH : 116' (35.36m)
LOGGED BY: T.D. LEWIS	
SCALE : 1"=20' or 1 : 240	

DEPTH FROM COLLAR	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0 FT. M				
20				
40	O/B			Overburden
60				
80				
30m. 100				
100'				Clay + breccia
			45°	Slide Mountain volcanics + sediments.
118'				
120				END OF HOLE

M24

15

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-23

BW-BOWRON RIVER 77(3)B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 28+50 N, 0+47 E	DIP TESTS :
DATE BEGUN: OCT 15 1977	
DATE FINISHED: OCT 16, 1977	TOTAL DEPTH : 147' (44.82m.)
LOGGED BY: T. D. LEWIS	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
FT. M. 0				
20				
40				Overburden
60				
80				
30 m				
120				Slide Mt., volcanic conglomerate
140				
147'				END OF HOLE

M25

15

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-24

BW - BOWRON RIVER 77 (3) B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 27+00N 1+16 E	DIP TESTS : NIL
DATE BEGUN : OCT. 17, 1977	
DATE FINISHED : OCT 22, 1977	TOTAL DEPTH : 437'(133.23 m)
LOGGED BY : JRK & TDL	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0 FT. M				
84'				Sandstone
89				Shale + minor coal veinlets
91			20-25°	Sandstone with interbedded shale + minor coal lenses
30m 100				
102.5				Shale + minor seams of coal.
104.5				Dominantly sandstone, with interbedded shale + minor coal seams (<3" thick)
120				
125				Dominantly shale + coal lenses, veins & minor seams & interbedded sst.
140				
144				Sandstone + minor veinlets of coal
147.5			25-30°	Interbedded sandstone + shale & minor coal lenses
153				Sandstone
155				Dominantly shale, + small seams, lenses & veinlets of coal
160				
168.5				Sandstone
169			20°	Shale
172.5				Interbedded sandstone & shale + minor coal seams
180				
189.5			20-25°	Dominantly sandstone + interbedded shale, + minor coal lenses
60m 200				
200.5				Interbedded sandstone + shale
207				Conglomerate
212.5				Interbedded sandstone - shale
215.5				Interbedded conglomerate - sst.
217.5			20°	Mostly sandstone + interbedded shale + minor coal partings
220				
222.5				Shale + minor coal veinlets & seams
234				Sandstone
238				Mostly shale + interbedded sandstone & minor coal.
240				
245.5				Interbedded sandstone & conglomerate
247			45°	Mostly shale, + interbedded sandstone & minor coal seams
250.5				75% coal.
252				Interbedded sandstone + shale minor coal seams
257.5				Mostly shale, + interbedded sandstone + minor coal veinlets
260				
264				Fractured coal.
266				Shale + thin coal lenses
268				Coal
269		<0.5%		Shale + minor coal veinlets & seams (1"-9" thick)
276				Shaly-coal
277				Mostly sandstone + interbedded shale
280				
281				Coal + minor shale
285			30°	Mostly shale + interbedded sandstone + minor coal
286				Sandstone
293				Shale + minor coal
90m 295				Sandstone + coal veinlets
300				Dominantly shale + minor coal veinlets + seams.
311		0.5%		75% coal
312.5				
320				Shale, with coal seams
329.5				
340			25-30°	Dominantly sandstone with interbedded shale + minor coal veinlets
357				
358				Shale + minor coal veinlets
360				Sandstone with interbedded shale & minor coal.
363				
368		0.5-1%		Shaly-coal 70% coal. Minor pyrite.
375				Coaly-shale - 20% coal.
380				Shale, + minor coal veinlets & seams.
384				
391.5			25°	Sandstone with interbedded shale + minor coal lenses
120m				
398				Conglomerate
400				Sandstone + minor coal stringers
406.5				
416				Shale + minor coal veinlets
420				Sandstone, evidence of faulting
422.5				Interbedded sandstone - shale
426				Sedimentary breccia
430				Interbedded shale - sandstone + minor coal veinlets.
432.5				Slide Mt. basement.
437'				
440				END OF HOLE

15

GEOLOGICAL STRIP
DIAMOND DRILL HOLE 77-25

BW-BOWRON RIVER 77(3)B.

BOWRON RIVER COAL DEPOSIT

CORE SIZE : NQ	ANGLE OF HEAD : -90°
LOCATION : L 24+15N 1+30 E	DIP TESTS : NIL
DATE BEGUN : OCT. 23, 1977.	
DATE FINISHED : OCT. 25, 1977.	TOTAL DEPTH : 377'(114.94 m)
LOGGED BY : T. D. LEWIS	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR	SECTION	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
FT. M				
63'	O/B			Overburden
81			40°	Dominantly shale, with interbedded sandstone + minor coal veinlets.
82.5				Sandstone, with interbedded laminated shale
84				Shale
86.5				Sandstone + interbedded shale and 1" coal seam.
94				Dominantly shale, + interbedded sandstone + 2" coal seam
30m			40-45°	Sandstone, with interbedded shale + three 1" coal seams.
129.5				
130.5				Coaly-shale (40% coal)
			45°	Sandstone, with interbedded shale + minor coal
140.5				
142				Fractured, shaly coal - 80% coal
149				Sandstone + minor coal veinlets
155				Shale + minor coal seams
				Sandstone, interbedded shale, + minor coal veinlets.
167				
170				Shale, containing minor veinlets.
177				Interbedded sandstone-shale, + two 2" coal seams.
178				Shaly coal
60m			30-35°	Sandstone + minor coal seams and interbedded shale
225				
227.5				Shale + minor coal veinlets
231			30°	Sandstone with interbedded, laminated, shale + minor coal.
				Shale, with interbedded sandstone, minor coal
238				
243				Sandstone, with interbedded shale + minor coal veinlets
247.5				Shale with interbedded sandstone + minor coal.
			42°	Sandstone, with interbedded shale + minor coal veinlets
262				
267		<0.5%		95% coal (1.5' of core lost)
272				Shale + minor coal veinlets.
			45°	Sandstone + interbedded shale, minor coal.
90m				
297				
301.5				Shale, minor mudstone
303				Sandstone + minor coal seam (1" thick)
304.5				40% coal
309.5				Mostly shale, with interbedded sandstone + minor coal veinlets
316.5				Dominantly sandstone with interbedded shale + two 1" coal seams.
				Shale + coal veinlets
327			40°	Sandstone with interbedded shale
				Coaly-shale -10-20% coal (10' core missing) no visible resin
345				
346				Sandstone
347.5				Sedimentary breccia - conglomerate
354				Interbedded sandstone-shale, 4" coal seam
				Slide Mt. basement - volcanic fragments conglomerate.
377'				

END OF HOLE

M27 15

GEOLOGICAL STRIP
DIAMOND DRILL HOLE WL-2

BW- BOWRON RIVER 77 (3)B.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE: BQ	ANGLE OF HEAD: -90°
LOCATION: L 30+25 N, 5+06 E	DIP TESTS:
DATE BEGUN: SEPT 13, 1977	
DATE FINISHED: SEPT 22, 1977	TOTAL DEPTH: 1192' (363.41m)
LOGGED BY: T.D. LEWIS	
SCALE 1"=20' or 1:240	

DEPTH FROM COLLAR (FT.)	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0			Overburden (O/B)
132'			Sandstone with conglomerate horizons + minor shale.
154			Conglomerate
156		20°	Sandstone
158			Conglomerate
171			Sandstone
175			Conglomerate
176.5			Sandstone + minor coal
181			Conglomerate
183			Sandstone
185.5			Conglomerate + Sandstone
194.5			Sandstone with conglomerate + minor shale.
206.5			Conglomerate
212			Sandstone + minor shale
222			Conglomerate + interbedded sandstone
232.5			Sandstone with shale + conglomerate
244			Conglomerate with interbedded sandstone-shale
251			Sandstone + shale
260.5			Conglomerate
270			Sandstone with shale + minor + minor coal
276.5			Conglomerate
278			Sandstone
282			Conglomerate + some sandstone
288		15°	Dominantly sandstone, with interbedded shale + conglomerate
298.5			Conglomerate
305			Shale
306.5			Dominantly sandstone with conglomerate horizons.
316.5			Conglomerate
320.5			Sandstone
322.5			Conglomerate
336			Sandstone with conglomerate + minor coal
354.5			Conglomerate
362		25-35°	Sandstone with shale + conglomerate
368	0.5%		Coal + shale (50% coal)
369			Dominantly sandstone + minor shale
375			Conglomerate
380.5			Sandstone + shale, some conglomerate
396			Conglomerate
411			Sandstone
413			Conglomerate + minor sandstone.
419		40-50°	Sandstone + minor coal
422.5			Conglomerate
425			Sandstone
427.5			Conglomerate + interbedded sandstone
445.5			Sandstone + conglomerate
454			Conglomerate
459		25°	Sandstone, noted conglomerate + minor coal.
481.5			Conglomerate + some fragments of shale and glzite
486	1%		Coal (85%)
488			Sandstone + noted conglomerate
493.5			Conglomerate
503		30°	Sandstone + conglomerate
518			Conglomerate
534			Sandstone
539			Conglomerate
542.5			Sandstone + conglomerate
544			Shale + sandstone
549			Conglomerate + sandstone
564.5			Sandstone, shale + conglomerate
571			Conglomerate, sandstone + minor coal
592			Sandstone, shale + minor coal
597.5			Shale, noted coal + sandstone
603		20-25°	Sandstone, shale + minor coal
615			Conglomerate
621.5			Sandstone, conglomerate + noted coal.
630.5			Shale
633			Conglomerate
635			Shale + sandstone
640			Conglomerate
641.5			Sandstone + shale
646.5	0.5%		Coal (90%)
648			Sandstone, shale + minor coal
654		30-40°	Conglomerate + sandstone
661			Sandstone
664			Conglomerate
667			Shale + sandstone
680.5			Conglomerate + Sandstone
682.5		20°	Shale + sandstone + noted coal
690			Conglomerate
696			Shale, sandstone + minor coal stringers
706			Dominantly sandstone, thin shale + minor coal
725.5			Conglomerate
729			Sandstone, minor shale + conglomerate, thin coal seams
764.5			Coal
765.5			Shale + minor coal
771			Conglomerate
781.5			Shale + sandstone
790			Sandstone + conglomerate
791.5			Sandstone - shale
793			Shale + coal
794	1-2%		Coal
795		30°	Shale + sandstone, minor coal.
812			Shale + noted coal (1"-6" thick).
816.5			Sandstone + shale
826.5			Shale, sandstone + minor coal lenses
840			Coal + shale (80% coal)
842			Shale + minor coal
844.5	0.5%		Coal
846.5			Interbedded shale + sandstone, noted coal.
868.5			Coal (80%)
869.5			Sandstone + some shale
873.5			Conglomerate
876.5			Sandstone-shale + noted coal.
882	0		Shaley-coal
883.5			Sandstone, minor coal + some conglomerate
900			Conglomerate
901.5			Sandstone
903.5			Conglomerate
905.5		20-25°	Dominantly sandstone, some shale + noted coal seams
913			Conglomerate
920.5			Dominantly sandstone, some shale + coal.
924			Conglomerate
925			Interbedded shale + sandstone, noted coal seams (1"-6" thick).
959.5	2-4%		Shaley-coal (70% coal)
96.5			Sandstone + shale, noted coal seams.
967	0.5%		Shaley-coal (50% coal)
970			Sandstone + interbedded shale
975			Conglomerate
988.5			Dominantly sandstone, noted coal seams + some shale
996		15-20°	Shale + minor interbedded sandstone, minor coal
1025			Sandstone
1029			Sandstone-shale
1035			Conglomerate + fragments
1039.5			Shale + noted coal (1" 5" thick
1042	0.5%		Coal (90%
1043.5			Sandstone-shale + noted coal seams
1062			Conglomerate
1063			Dominantly shale, interbedded sandstone + noted coal seams (1"-10" thick)
1071	<0.5%		Shaley coal (75% coal)
1075			Shale
1076			Shaley coal - 60% coal
1078			S+C
1079.5			Coal (core missing - assume 100%
			Shale + noted coal
1084.5	0.5-1%		Shaley-coal (core missing) - assume 80% coal
1087.5			Sandstone + shale, minor coal
1091			Coal
1092			Shale + coal seam (1" thick)
1093.5	0		Shaley coal (80% coal)
1095			Shale + 1" coal seam
1098			Fragments + breccia
1099.5			Shaley-coal (60% coal)
1101.5			Sandstone
1111.5			Conglomerate
1113.5			Dominantly shale, interbedded sandstone + noted conglomerate
1136			Basement Clay, sandstone + fragments, breccia
1192'			

END OF HOLE

(M28) 15

GEOLOGICAL STRIP
DIAMOND DRILL HOLE WL-3

BW-BOWRON RIVER 77 (3) R.

BOWRON RIVER COAL DEPOSIT	
CORE SIZE : BQ	ANGLE OF HEAD : -90°
LOCATION : L 32+30 N, 5+00 E	DIP TESTS :
DATE BEGUN :	
DATE FINISHED :	TOTAL DEPTH : 972' (296.34 m)
LOGGED BY : T. LEWIS	
SCALE : 1"=20' or 1:240	

DEPTH FROM COLLAR (FT.)	VISUAL ESTIMATE OF RESIN IN COAL	ANGLE OF BEDDING TO CORE	DESCRIPTIVE NOTES
0			Overburden (O/B)
117'			Sandstone
125			Conglomerate + interbedded sandstone
140			Interbedded sandstone-shale + minor coal partings with conglomerate
150			Mixed pebble conglomerate with sandstone matrix.
163			Sandstone-shale and conglomerate
167			Mixed pebble conglomerate
170			Shale + sandstone
172.5			Pebble conglomerate + sandstone
			Sandy shale with interbedded sandstone + minor coal partings
186			Pebble conglomerate
187.5			Shale + interbedded sandstone
188.5			Pebble conglomerate + granite conglomerate
191			Sandstone, sandy shale + conglomerate
196			Granite pebble conglomerate with interbedded sandy shale + minor coal partings
210			Sandy-shale with interbedded sandstone. Minor coal seams + partings
227.5			Conglomerate + sandstone
233			Shale
236.5			Conglomerate + sandstone horizons.
245.5			Shale
247.5			Coal + shale
248.5			Shale + conglomerate + sandstone
250.5			Conglomerate
259			Shale with coal seams.
263.5			Conglomerate + sandstone
265.5			Sandstone + shale
267			Conglomerate
268			Conglomerate + sandstone
269.5			Conglomerate + sandstone
279		30° - 35°	Sandstone + conglomerate
282.5			Conglomerate
284			Shale - sandstone + conglomerate horizons
293			Conglomerate
298.5			Shale + sandstone + minor coal.
304			Sandstone
306.5			Conglomerate.
325			Sandstone + shale
330.5			Conglomerate
333.5			Shale with coal seams.
342.5			Conglomerate with sandstone + shale.
352.5			Sandstone
355.5			Conglomerate
359			Sandstone + shale with minor coal.
362.5			Conglomerate
370.5			Shale + sandstone + minor coal.
372			Conglomerate
374		25-30°	Shale + conglomerate
379.5			Coal + minor shale
380.5			Shale + sandstone
386			Sandstone, shale + conglomerate
389			Conglomerate
392		15-20°	Sandstone, shale, conglomerate
401.5			Conglomerate
403.5			Shale + minor coal.
405			Conglomerate
408.5			Shale + minor coal.
416			Conglomerate
418			Shale - sandstone + conglomerate
427			Conglomerate
430.5			Shale + interbedded sandstone
435			Conglomerate + sandstone
441		25°	Shale, sandstone + conglomerate. Minor coal stringers.
456.5	0.5%		Shaly-coal
457.5			Shale, sandstone + conglomerate
463.5			Conglomerate
467		35-40°	Sandstone with interbedded shale + minor coal stringers. Some conglomerate horizons.
487			Conglomerate
499	1-2%		Sandstone-shale + noted coal seams: 500' 2" coal; 505' 2' coal + resin; 514' 1" conglomerate
516.5			Conglomerate
519			Sandstone, shale + minor coal lenses.
526.5			Conglomerate
534.5			Sandstone
536	0.5%		Shaly coal
537		25-30°	Sandstone with minor coal stringers + conglomerate horizons
564			Conglomerate
566			Sandstone + shale
567.5			Conglomerate
569			Shale + sandstone + minor coal lenses and stringers
581			Sandstone + conglomerate
582.5		35-40°	Sandstone + shale with minor coal.
590.5			Shale, some sandstone + minor coal.
599.5	0.5%		80% coal (+ shale).
604			Sandstone + numerous coal stringers + seams.
616			Conglomerate
618.5			Sandstone + minor coal
623			Conglomerate
624.5			Sandstone + shale + minor coal.
629			Conglomerate with interbedded shale + sandstone
637			Shale, sandstone + minor coal.
640			Conglomerate
655.5		30 - 45°	Sandstone
658			Conglomerate
660			Sandstone + coal partings
665.5			Conglomerate
666.5			Sandstone, some shale + numerous coal partings.
677		40°	Conglomerate, some sandstone
686			Sandstone + minor shale
692.5			Shaly-coal (65% coal)
694			Shale, minor coal + sandstone.
697.5			Sandstone + conglomerate
703			Sandstone + shale
720			Siltstone
728			Sandy shale + minor coal seams.
731.5			Coal
732.5			Sandstone
735			Shale, some sandstone + noted coal seams 1"-4" thick
747.5			Sandstone + minor coal
757.5			Shaley-coal.
758.5		35°	Sandstone + noted coal seams + stringers.
789			Shale + other fragments
790.5		40-45°	Sandstone, some shale + minor coal.
814.5			Shaley coal (70% coal)
817			Shale, sandstone + minor coal.
820.5	2-3%		Shaley coal (70% coal).
821.5			Sandstone, minor shale + coal.
826.5			Shale + noted coal seams.
834.5			Conglomerate
836			Shale, sandstone + noted coal seams.
846	0.5%		Shaley-coal (70% coal)
848.5	0.5%		Shaley-coal (50% coal)
850	0.5%		Shaley-coal (70% coal)
855			Shale
856	0.5-1.0%		Shaley-coal (60% coal)
859			Shale + coal seams (2"-9" thick).
863	1%		Shaley-coal (60% coal)
867.5			Shale + some coal
870	0.5%		Coal
871.5			Shale
872.5	1-2%		Shaley-coal (85% coal)
874			Sandstone + breccia
876.5	0.5%		Coal (80%)
879			Shale
880	0.5%		Coal (85%)
881.5			Shale - sandstone
883.5			Breccia
885			Shale, sandstone + noted coal seams.
888.5			Coal
889.5		35°	Shale, sandstone + minor coal seams.
917			Breccia
918			Shale, sandstone + minor coal seams
950			Clay - basement
972'			END OF HOLE

REFERENCE LINE

DDH 77-21

DDH 77-25
(15m north of section)

DDH 77-6

DDH 71-2

Bowron River

ELEV. 750m

ELEV. 700m

ELEV. 650m

ELEV. 600m

ELEV. 550m

ELEV. 500m

ELEV. 450m

ELEV. 400m

ELEV. 350m

ELEV. 300m

ELEV. 250m

35.7m

Adit projected to section

1.32m
c c — 27,710 tonnes
s c — 2,410 tonnes
r — <1.9%

114.9m

c c — 12,030 tonnes
s c — 13,750 tonnes

Slide Mtn. Formation

c c — 46,980 tonnes
s c — 21,500 tonnes
b s — 2,760 tonnes

2.29m
c c — 59,240 tonnes
s c — 68,090 tonnes
r — 1%

1.30m
c c — 37,590 tonnes
s c — 45,210 tonnes
r — 1 %

4.87m

c c — 176,600 tonnes
b c — 80,900 tonnes
b s — 12,060 tonnes
c v — 8,030 BTU/lb.
s — .84 %
r — 1 %

273.4 m

Upper Seam

Middle Seam

Lower Seam

DRILL INDICATED RESERVES

Tertiary Sediments

Tertiary Sediments

Slide Mtn. Formation

401.7 m

LEGEND

Proven Reserves

Probable Reserves

Drill Indicated (Possible) Reserves

c c	clean coal
s c	shale in coal
b s	barren shale
c v	calorific value
s	sulphur content
r	resin content in coal (visual estimate)

COAL RESERVES (section 24 + 00N)
(TONNES)

LOWER SEAM	Proven	Probable	Total
clean coal	176,600	46,980	223,580
shale in coal	80,900	21,500	102,400
barren shale	10,060	2,760	12,820
calorific value	8,030 BTU/lb.		
sulphur content	.84 %		
resin content	1 %		
MIDDLE & UPPER SEAMS (combined)			
clean coal	124,540	12,030	136,570
shale in coal	113,810	13,750	127,560
barren shale	nil	nil	nil

NORCO RESOURCES LTD.
BR-BOWRON RIVER 77(2) 13.

DIAMOND DRILL SECTION

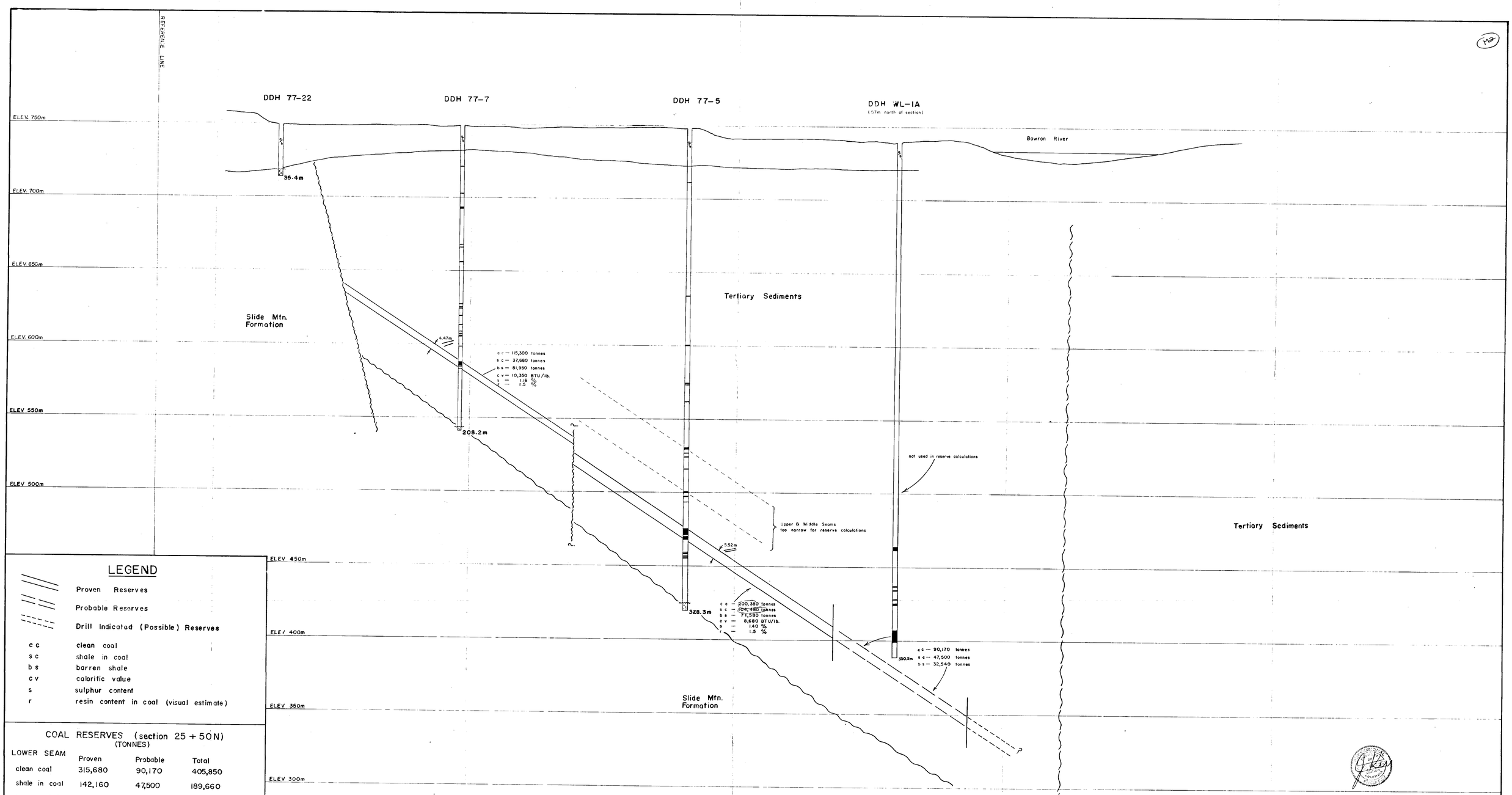
BOWRON RIVER COAL DEPOSIT

PRINCE GEORGE, B.C.

SECTION L24+ 00N

15

TECHNICAL WORK BY [illegible] & GAWN ASSOCIATES LTD.	DATE DECEMBER, 1977
APPROVED BY J. KERR	SCALE 1:1000
DRAWN BY [illegible]	DRAWING NO. 13



LEGEND

Proven Reserves

Probable Reserves

Drill Indicated (Possible) Reserves

c c	clean coal
s c	shale in coal
b s	barren shale
c v	calorific value
s	sulphur content
r	resin content in coal (visual estimate)

COAL RESERVES (section 25 + 50N)
(TONNES)

LOWER SEAM	Proven	Probable	Total
clean coal	315,680	90,170	405,850
shale in coal	142,160	47,500	189,660
barren shale	153,530	32,540	186,070
calorific value	9,280 BTU/lb.		
sulphur content	1.31 %		
resin content	1.6%		
MIDDLE & UPPER SEAMS (combined)			nil

NORCO RESOURCES LTD.
ER- BOWRON RIVER 77(2) B.

DIAMOND DRILL SECTION

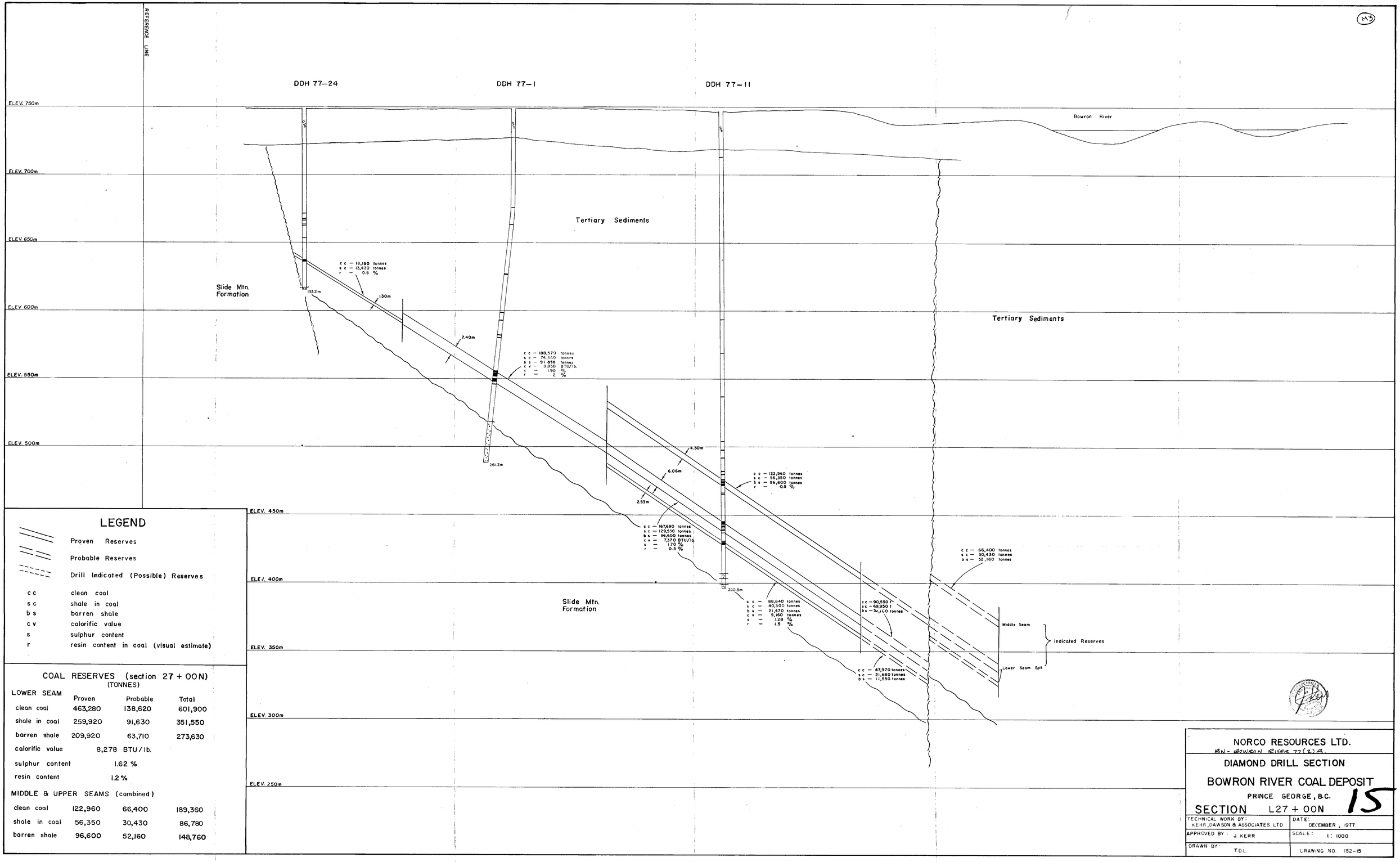
BOWRON RIVER COAL DEPOSIT

PRINCE GEORGE, B.C.

SECTION L25+50N

15

TECHNICAL WORK BY: R.E.G. DAWSON & ASSOCIATES LTD	DATE: DECEMBER, 1977
APPROVED BY: J. KERR	SCALE: 1:1000
DRAWN BY: T.L.L.	DRAWING NO: 152-14



LEGEND

- Proven Reserves
- Probable Reserves
- Drill Indicated (Possible) Reserves

c c	clean coal
s c	shale in coal
b s	barren shale
c v	calorific value
s	sulphur content
r	resin content in coal (visual estimate)

COAL RESERVES (section 27 + 00N)
(TONNES)

LOWER SEAM	Proven	Probable	Total
clean coal	463,280	138,620	601,900
shale in coal	259,920	91,630	351,550
barren shale	209,920	63,710	273,630
calorific value	8,278 BTU/lb.		
sulphur content	1.62 %		
resin content	1.2 %		
MIDDLE & UPPER SEAMS (combined)			
clean coal	122,960	66,400	189,360
shale in coal	56,350	30,430	86,780
barren shale	96,600	52,160	148,760

M3

NORCO RESOURCES LTD.

BN - BOWRON RIVER 77(3)A.

DIAMOND DRILL SECTION

BOWRON RIVER COAL DEPOSIT

PRINCE GEORGE, B.C.

SECTION L27 + 00N

15

TECHNICAL WORK BY: KERR, DAWSON & ASSOCIATES LTD	DATE: DECEMBER, 1977
APPROVED BY: J. KERR	SCALE: 1 : 1000
DRAWN BY: TDL	DRAWING NO. 152-15

RESERVE LINE

DDH 77-23 | DDH 77-8 | DDH 77-9 | DDH 77-17 | DDH 77-10

ELEV. 750m
ELEV. 700m
ELEV. 650m
ELEV. 600m
ELEV 550m
ELEV 500m
ELEV 450m
ELEV 400m
ELEV 350m
ELEV 300m
ELEV 250m

Bowron River

44.8m

Slide Mtn. Formation

5.81m

c c — 187,080 tonnes
s c — 67,190 tonnes
b s — 17,710 tonnes
c v — 9,875 BTU/lb
s — 1.68 %
r — 1.5 %

175.6m

Tertiary Sediments

5.56m

c c — 112,590 tonnes
s c — 33,320 tonnes
b s — 143,200 tonnes
c v — 10,426 BTU/lb.
s — 2.83 %
r — .75 %

270.3m

4.80m

2.65m

c c — 75,170 tonnes
s c — 101,370 tonnes
b s — 6,680 tonnes
c v — 5256 BTU/lb.
s — .51 %
r — 1.0 %

Slide Mtn. Formation

370.9m

c c — 53,680 tonnes
s c — 30,680 tonnes
b s — 36,510 tonnes
c v — 8,404 BTU/lb.
s — 1.13 %
r — .75 %

1.27m

4.30m

c c — 41,730 tonnes
s c — 23,980 tonnes
b s — 0 tonnes
r — .75 %

Tertiary Sediments

431.9m

c c — 100,860 tonnes
s c — 75,060 tonnes
b s — 76,720 tonnes
c v — 7514 BTU/lb.
s — 1.21 %
r — 0.5 %

Drill Indicated Reserves

LEGEND

- Proven Reserves
- Probable Reserves
- Drill Indicated (Possible) Reserves

c c	clean coal
s c	shale in coal
b s	barren shale
c v	calorific value
s	sulphur content
r	resin content in coal (visual estimate)

COAL RESERVES (section 28 + 50N)
(TONNES)

LOWER SEAM	Proven	Probable	Total
clean coal	454,210	—	454,210
shale in coal	206,250	—	206,250
barren shale	276,140	—	276,140
calorific value	9,184 BTU / lb.		
sulphur content	1.74 %		
resin content	1 %		
MIDDLE & UPPER SEAMS (combined)			
clean coal	116,900	—	116,900
shale in coal	125,350	—	125,350
barren shale	61,680	—	61,680

NORCO RESOURCES LTD.
BW-BOWRON RIVER 77(2)18

DIAMOND DRILL SECTION

BOWRON RIVER COAL DEPOSIT
PRINCE GEORGE, B.C.

SECTION L28+50N

15

TECHNICAL WORK BY: KERR, DAWSON & ASSOCIATES LTD	DATE: DECEMBER, 977
APPROVED BY: J. KERR	SCALE: 1:1000
DRAWN BY T.D.L.	DRAWING NO 152-16

REFERENCE LINE.

DDH 77-16

DDH 77-2

DDH 77-12

DDH WL-2
(125m north of section.

DDH 77-18

Bowron River

ELEV. 750m

ELEV. 700m

ELEV. 650m

ELEV. 600m

ELEV. 550m

ELEV. 500m

ELEV. 450m

ELEV. 400m

ELEV. 350m

ELEV. 300m

ELEV. 250m

63.1m

c c — 14,860 tonnes
s c — 5,870 tonnes
b s — 0

Slide Mtn. Formation

1.26m

c c — 42,220 tonnes
s c — 19,660 tonnes
b s — 0
c v — 9,520 BTU/lb.
s — 1.43 %
r — 2 %

Tertiary Sediments

227.7m

3.26m

c c — 67,850 tonnes
s c — 38,990 tonnes
b c — 46,790 tonnes
r — <0.5 %

1.27m

3.92m

c c — 38,440 tonnes
s c — 11,700 tonnes
b s — 0
r — 1.0 %

hole not on section

c c — 39,110 tonnes
s c — 16,860 tonnes
b s — 71,510 tonnes
c v — 6,804 tonnes
s — 1.27 %
r — 0.5 %

Tertiary Sediments

312.7m

c c — 73,020 tonnes
s c — 68,970 tonnes
b s — 46,840 tonnes
c v — 6,526 BTU/lb.
s — 0.86 %
r — 0.5 %

7.72m

7.51m

c c — 55,530 tonnes
s c — 23,930 tonnes
b s — 101,100 tonnes
c v — 6,804 BTU/lb.
s — 1.27 %
r — 0.5 %

Slide Mtn. Formation

363.3m

c c — 151,960 tonnes
s c — 131,530 tonnes
b s — 60,900 tonnes
c v — 6,804 BTU/lb.
s — 1.27 %
r — .75 %

381.6m

LEGEND

Proven Reserves

Probable Reserves

Drill Indicated (Possible) Reserves

c c	clean coal
s c	shale in coal
b s	barren shale
c v	calorific value
s	sulphur content
r	resin content in coal (visual estimate)

LOWER SEAM	Proven	Probable	Total
clean coal	401,080	14,860	415,940
shale in coal	274,650	5,870	280,520
barren shale	280,350	—	280,350
calorific value	7,000 BTU/lb.		
sulphur content	1.19 %		
resin content	0.8 %		
MIDDLE & UPPER SEAMS (combined)			
clean coal	67,850	—	67,850
shale in coal	38,990	—	38,990

NORCO RESOURCES LTD.

BN-BOWRON RIVER 77(2)8.

DIAMOND DRILL SECTION

BOWRON RIVER COAL DEPOSIT

PRINCE GEORGE, B.C.

SECTION L30+00N

15

TECHNICAL WORK BY: KE-HN, JAWSON & ASSOCIATES LTD.	DATE: DECEMBER, 1977
APPROVED BY: J. KERR	SCALE: 1:1000
DRAWN BY: T.U.L.	DRAWING NO. 152-17

REFERENCE LINE

DDH 77-14 | DDH 77-3 | DDH 77-13 | DDH 77-19

ELEV. 750m
ELEV. 700m
ELEV. 650m
ELEV. 600m
ELEV 550m
ELEV 500m
ELEV 450m
ELE/ 400m
ELEV 350m
ELEV 300m
ELEV 250m

Bowron River

Slide Mtn. Formation

Tertiary Sediments

136.2m

c c — 27,860 tonnes
s c — 30,800 tonnes
b c — 12,400 tonnes

3.92 m

c c — 64,790 tonnes
s c — 71,630 tonnes
b s — 29,140 tonnes
c v — 6,500 BTU/lb.
s — .81 %
r — 1.5 %

238.2m

c c — 32,400 tonnes
s c — 35,820 tonnes
b s — 14,510 tonnes
c v — 6,500 BTU/lb.
s — .81 %
r — 1.5 %

3.96m

5.88m

c c — 110,520 tonnes
s c — 31,020 tonnes
b s — 170,030 tonnes
c v — 10,499 BTU/lb.
s — 1.01 %
r — .5 %

316.1m

Slide Mtn. Formation

Tertiary Sediments

c c — 21,000 tonnes
s c — 5,900 tonnes
b s — 32,140 tonnes
c v — 10,499 BTU/lb.
s — 1.01 %
r — 0.5 %

8.05m

c c — 290,770 tonnes
s c — 234,940 tonnes
b s — 0" tonnes
c v — 7,115 BTU/lb.
s — 1.40 %
r — .5 %

346.1m

LEGEND

- Proven Reserves
- Probable Reserves
- Drill Indicated (Possible) Reserves

c c	clean coal
s c	shale in coal
b s	barren shale
c v	calorific value
s	sulphur content
r	resin content in coal (visual estimate)

COAL RESERVES (section 31 + 50N)
(TONNES)

LOWER SEAM	Proven	Probable	Total
clean coal	529,480	27,860	557,340
shale in coal	379,310	30,800	410,110
barren shale	245,820	12,400	258,220
calorific value	7,525 BTU/lb.		
sulphur content	1.17 %		
resin content	.8 %		

MIDDLE & UPPER SEAMS (combined)

nil

NORCO RESOURCES LTD.
BW-BOWRON RIVER 77 (2) B.

DIAMOND DRILL SECTION

BOWRON RIVER COAL DEPOSIT

PRINCE GEORGE, B.C.

SECTION L31+50N

15

TECHNICAL WORK BY: K.E.R.R. DAWSON & ASSOCIATES LTD.	DATE: DECEMBER, 1977
APPROVED BY: J. KERR	SCALE: 1: 1000
DRAWN BY: T.D.L.	DRAWING NO. 152-18

REFERENCE LINE

DDH 77-15

DDH 77-4

DDH WL-3
(50m south of section)

Bowron River

ELEV. 750m

ELEV. 700m

ELEV. 650m

ELEV. 600m

ELEV 550m

ELEV 500m

ELEV 450m

ELEV 400m

ELEV 350m

ELEV 300m

ELEV 250m

Tertiary Sediments

Slide Mtn. Formation

4.09m

c c — 104,860 tonnes
s c — 58,890 tonnes
b s — 93,780 tonnes
c v — 8,493 BTU/lb.
s — 1.40 %
r — .75 %

236.8m

c c — 55,630 tonnes
s c — 32,770 tonnes
b s — 0
c v — 8,250 BTU
s — 1.01 %
r — 1.3 %

5.62m

c c — 132,240 tonnes
s c — 78,040 tonnes
b s — 0
c v — 8,250 BTU/lb.
s — 1.01 %
r — 1.3 %

282.5m

9.07m

c c — 220,760 tonnes
s c — 168,140 tonnes
b s — 159,970 tonnes
c v — 6,958 BTU/lb.
s — 1.0 %
r — .75 %

296.3m

Drill Indicated reserves

Slide Mtn. Formation

LEGEND

Proven Reserves

Probable Reserves

Drill Indicated (Possible) Reserves

c c	clean coal
s c	shale in coal
b s	barren shale
c v	calorific value
s	sulphur content
r	resin content in coal (visual estimate)

COAL RESERVES (section 33 + 00N)
(TONNES)

LOWER SEAM

	Proven	Probable	Total
clean coal	513,490	—	513,490
shale in coal	337,840	—	337,840
barren shale	253,750	—	253,750
calorific value	7,706 BTU / lb.		
sulphur content	1.08 %		
resin content	1 %		

MIDDLE & UPPER SEAMS (combined)

nil

NORCO RESOURCES LTD.

BN - BOWRON RIVER 77 (2) B.

DIAMOND DRILL SECTION

BOWRON RIVER COAL DEPOSIT

PRINCE GEORGE, B.C.

SECTION L33 + 00N

15

TECHNICAL WORK BY: KERR, DAWSON & ASSOCIATES LTD.	DATE: DECEMBER, 1977
APPROVED BY: J. KERR	SCALE: 1: 1000
DRAWN BY TDL	DRAWING NO. 152-19

REFERENCE LINE

DDH 77-20

DDH WL-4

ELEV. 750m

ELEV. 700m

ELEV. 650m

ELEV. 600m

ELEV 550m

ELEV 500m

ELEV 450m

ELEV 400m

ELEV 350m

ELEV 300m

ELEV 250m

Bowron River

Tertiary Sediments

Slide Mtn. Formation

105.8m

274.0m

COAL RESERVES (section 34 + 50N)

NIL

NORCO RESOURCES LTD.

BW- BOWRON RIVER 77 (2) 18.

DIAMOND DRILL SECTION

BOWRON RIVER COAL DEPOSIT

PRINCE GEORGE, B.C.

SECTION L34 + 50N

15

TECHNICAL WORK BY: KERR, DAWSON & ASSOCIATES LTD.	DATE: DECEMBER, 1977
APPROVED BY: J. KERR	SCALE: 1 : 1000
DRAWN BY: T.D.L.	DRAWING NO. 152-20