M.L.S.

Ministry of Northern Development and Mines

Ontario

DOCUMENT No. W9190 • 09

31L01NE0001 2.14028 MARIA 900

Mining Act

Report of Work
(Expenditures, Subsection 77(19)) 2.

Type of Work Performed	Mining Division	Township or Area
ASSAYS, METALLURGICAL TESTING	SOUTHERN ONTARIO	MARIA TWP. - RENFREW CO.

Recorded Holder: NORTH COAST INDUSTRIES LTD. Rob Klassen 1-604-681-0799

Prospector's Licence No.: T. 4866

Address: 700-1177 WEST HASTINGS VANCOUVER, BC V6E 2K3

Telephone No.: 604-681-0799

Work Performed By: LAKEFIELD RESEARCH, ORTECH INTERNATIONAL, BACON, DONALDSON & ASSC. LTD. COMINCO ENGINEERING SERVICES LTD.

Name and Address of Author (of Submission): R.M. BLAIS PINEWOOD PARK DR P.O. BOX 237 NORTH BAY, ONTARIO P1B 8H2

Date When Work was Performed From: 15 12 89 (Day Mo Yr.) To: 22 10 90 (Day Mo Yr.)

All the work was performed on Mining Claim(s): Indicate no. of days performed on each claim. *See Note No. 1 on reverse side

Mining Claim	No. of Days
608347	13,393

RECEIVED FEB 25 1991 MINING LANDS SECTION

Instructions
Total Days Credits may be apportioned at claim holder's choice. Enter number of days credits per claim in the expenditure days credit column (below).

Calculation of Expenditure Days Credits: Total Expenditures $ 200,903.30 ÷ 15 = Total Days Credits 13,393

Total Number of Mining Claims Covered by this Report of Work: 18

Mining Claims (List in numerical sequence). If space is insufficient, attach schedules with required information

Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.
50	998754	60	50	998763	60	50	1084570	60	WORK	ASSIGNMENT	
	998755	60	50	998942	60		1084571	60	EO	608347	
	998756	60					1084572	60	3337	-1080 = 2257	
	998757	60					1084573	60		days	
	998758	60					1084574	60		balance	
	998759	60					1084575	60			
	998760	60					1084576	60			
50	998761	60				50	1084577	60			

ONTARIO GEOLOGICAL SURVEY ASSESSMENT FILES

Total Number of Days Performed	Total Number of Days Claimed	Total Number of Days to be Claimed at a Future Date
13,393	1080	—

Certification of Beneficial Interest *See Note No. 2 on reverse side

I hereby certify that, at the time the work was performed, the claims covered in this report of work were recorded in the current recorded holder's name or held under a beneficial interest by the current recorded holder.

Date: FEB. 8, 1991 Recorded Holder or Agent (Signature): [signature]

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Address of Person Certifying: R.M. BLAIS PINEWOOD PARK DR. P.O. BOX 237 NORTH BAY, ONT. P1B 8H2

Telephone No.: 705-474-4110 Date: FEB. 8, 1991 Certified By (Signature): [signature]

For Office Use Only

Total Days Cr. Recorded: 1080

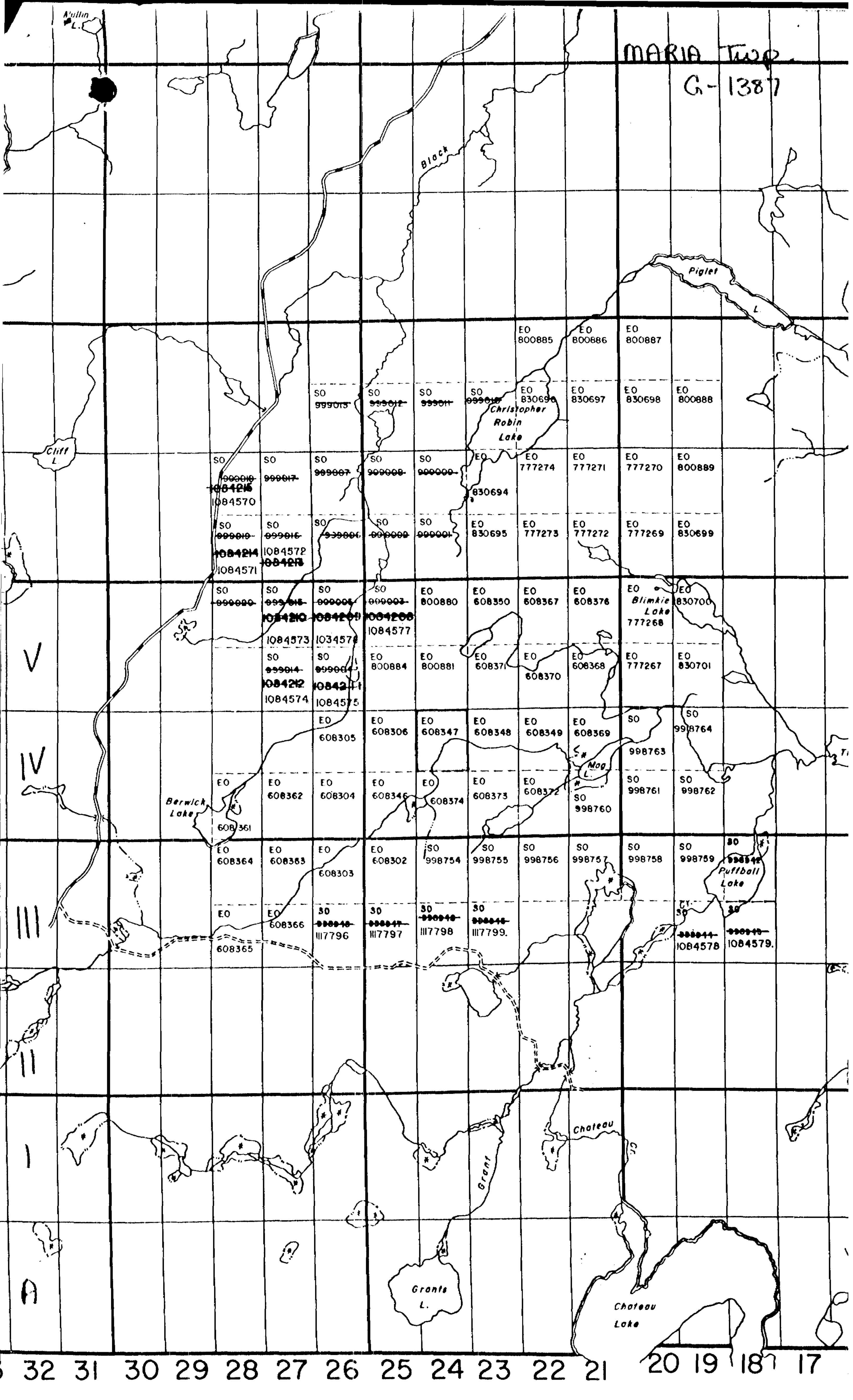
Date Recorded: FEB 14/91

Mining Recorder: [signature]

Date Approved as Recorded: Sept 11/91

Provincial Manager, Mining Lands: [signature]

Received Stamp: SOUTHERN ONTARIO MINING DIVISION RECEIVED FEB 11 1991 AM PM 7,8,9,10,11,12,1,2,3,4,5,6


MARIA Twp.
G-1387
Black
Piglet L.
Cliff L.
Christopher Robin Lake
Blimkie Lake
Berwick Lake
Mog L.
Puffball Lake
Chateau
Grant
Grants L.
Chateau Lake
EO 800885
EO 800886
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SO ~~999013~~
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SO ~~999010~~
EO 830696
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EO 830698
EO 800888
SO ~~999018~~ ~~1084215~~ 1084570
SO ~~999017~~
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EO 830694
EO 777274
EO 777271
EO 777270
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SO ~~999016~~ 1084572 ~~1084213~~
SO ~~999006~~
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SO ~~999005~~ ~~1084209~~ 1034576
SO ~~999003~~ ~~1084208~~ 1084577
EO 800880
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EO 608367
EO 608376
EO 777268
EO 830700
SO ~~999014~~ ~~1084212~~ 1084574
SO ~~999004~~ ~~1084211~~ 1084575
EO 800884
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EO 608368
EO 777267
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EO 608306
EO 608347
EO 608348
EO 608349
EO 608369
SO 998763
SO 998764
EO 608361
EO 608362
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EO 608374
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SO 998760
SO 998761
SO 998762
EO 608364
EO 608363
EO 608302
EO 608303
SO 998754
SO 998755
SO 998756
SO 998757
SO 998758
SO 998759
SO ~~998842~~
EO 608365
EO 608366
SO ~~998848~~ 1117796
SO ~~998847~~ 1117797
SO ~~998846~~ 1117798
SO ~~998845~~ 1117799.
SO ~~998844~~ 1084578
SO ~~998843~~ 1084579.
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North Coast Industries Ltd
Suite 1575
200 Granville St
Vancouver BC
Canada V6C 1S4
Tel: 604/681.0799
Fax: 604/681.2741
#700 - 1177 W. HASTINGS ST.
VANCOUVER, B.C. V6E 2K3

RECEIVED

MINING LANDS SECTION

Mining Land Section
Mineral Developement Program
MNDM
159 Cedar St., 4th Floor
Sudbury, Ont., P3E 6A5

March 28, 1991

Re: Report of Work(Doc W190.09) claims SO998754 et al.

Dear Sirs,

Enclosed are a Report of Work dated February 14, 1991 and the accompanying Technical Reports, invoices and cancelled checks for Metallurgical Testing performed on samples from the Bisset Creek Project in the Southern Ontario Mining Division.

Reports included are:

Metallurgical Testing of Bisset Creek Graphite
Final Report(Complete)
July 1990
By: Bacon Donaldson and Associates Ltd.

Metallurgical Testing of Bisset Creek Graphite
Final Report(Summary)
July 1990
By: Bacon Donaldson and Associates Ltd.

Metallurgical Investigation and Plant Flowsheet Developement for the Bisset Creek Flake Graphite Ore
June 1990
Cominco Engineering Services Ltd.

Metallurgical Report on the Variability Test Results of the Bisset Creek Flake Graphite Ore.
September 1990
Cominco Engineering Services Ltd.

Please advise us if any additional information is required.

RECEIVED

APR 02 1991

MINING LANDS SECTION

Yours sincerely,

For

Hardy Forzley

Ontario

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Mining Lands Section
159 Cedar Street, 4th Floor
Sudbury, Ontario
P3E 6A5

Telephone: (705) 670-7264
Fax: (705) 670-7262

August 8, 1991

Report of work # W9190.09

Mr Rob Klassen
North Coast Industries Ltd.
700-1177 West Hastings
Vancouver, B.C.
V6E 2K3

Dear Sir:

RE: Expenditures submitted on Mining Claims SO 998754 et al. in the Township of Maria.

As per our telephone conversation of August 7th 1991, I have encountered a problem regarding the total of $ 200903.30 you are claiming.

When expenditures are submitted we require proof of payment which in this case involves the submission of **invoices** and **cancelled cheques**.

I have been able to verify payment of $ 108454.32 (7230 **days**), but am unable to verify the remainder as I cannot match up all the submitted invoices and cancelled cheques.

I have enclosed two lists and photocopies of those invoices and cheques that cannot be matched up. Could you please try to match these up,(or submit further ones if required), and return this information to this office no later than 30 **days** from the date of this letter.

When returning this information please quote file # 2.14028

If you require further information please contact Clive Stephenson at (705) 670-7254.

Yours truly

C. D. Stephenson

for Ron C. Gashinski
Provincial Manager, Mining Lands
Mines and Minerals Division

CDS/cs
Encl:

cc: Mining Recorder
Southern Ontario

R.M. Blais
North Bay, Ontario

Suite 1575
200 Granville St
Vancouver BC
Canada V6C 1S4

Tel: 604/681.0799
Fax: 604/681.2741

700 - 1177 West Hastings
Vancouver, B.C.
V6E 2K3

5 September 1991

Clive Stephenson
Ministry of Northern Development and Mines
Mining Land Section
159 Cedar Street, 4th Floor
Sudbury, Ontario
P3E 6A5

RE: Submission of Invoices and Cancelled Cheques File # 2.14028

Dear Sir:

As per your letter dated August 8, 1991, please find enclosed a complete resubmission of invoices and cancelled cheques for the Bissett Creek project. Our accounting staff have documented the cross matching and adjustment of various accounts to clearly illustrate the balance of accounts.

We apologize for any inconvenience caused by our initial submission.

If you require further information please contact Rob Klassen or Laurie Forzley at (604) 681-0799.

Yours sincerely

Rob Klassen
North Coast Industries

RECEIVED
SEP 10 1991
MINING LANDS SECTION

2.14028 part 2

INVOICES without matched cancelled Cheques

INVOICE FROM	INVOICE BILLING PERIOD AND INVOICE #		DATE	AMOUNT
Cominco Eng.	Feb, 90	02-CECV011	Mar 08, 90	$ 3965.12
Cominco Eng.	Mar, 90	03-CECV011	Apr 09, 90	$ 6526.22
Cominco Eng.	Apr, 90	04-CECV011	May 08, 90	$ 6169.72
Cominco Eng.	May, 90	05-CECV011	Jun 08, 90	$ 3658.92
Cominco Eng.	Jun, 90	06-CECV011	Jul 10, 90	$ 12542.43
Cominco Eng.	Jul, 90	07-CECV011	Aug 10, 90	$ 7968.99
Cominco Eng.	Aug, 90	08-CECV011	Sep 11, 90	$ 2588.13
Ortech Int.		14357	Feb 15, 90	$ 10824.60
			TOTAL	$ 54244.13

note: The total amount for the Ortech invoice (# 14357) is $ 20324.60 of which a cancelled cheque for $ 9500.00 (advance payment) has been submitted. This leaves a balance of $ 10824.60 which still requires proof of payment.

CHEQUES without matched Invoices

PAYEE	DATE OF CHQ	CHEQUE #	AMOUNT
Bacon Donaldson & Assoc.	Dec 20, 89	1057	$ 496.57
Cominco Engineering	Feb 16, 90	1134	$ 1559.75
Cominco Engineering	Mar 31, 90	0019	$ 3897.12
Cominco Engineering	Jul 06, 90	0043	$ 10000.00
Cominco Engineering	Aug 03, 90	1295	$ 6354.86
Cominco Engineering	Sep 01, 90	1318	$ 8000.00
Ortech Int.	May 08, 90	0032	$ 7763.65
Ortech Int.	Jul 06, 90	0045	$ 5000.00
Ortech Int.	Mar 25, 90	0024	$ 2820.35
		TOTAL	$ 45892.30

NORTH COAST INDUSTRIES LTD.
700 - 1177 West Hastings Street
Vancouver, B.C.
V6E 2K3

RECONCILIATION OF REPORT OF WORK

Bacon Donaldson & Associates Ltd.				
Invoice # 8494		$ 18,899.80		
Invoice # 8495		10,348.61		
		29,248.41	CK # 027	$ 29,248.41
			CK # 1268	30,000.00
			CK # 1288	20,000.00
			CK # 1317	10,000.00
			CK # 084	42,000.00
Invoice	145,864.89*	102,000.00		102,000.00
		$ 131,248.48		$ 131,248.48
Cominco Engineering Services Ltd.				
Invoice # 01-CEC V011		$ 9,705.91	CK # 016	$ 9,705.91
Invoice # 02-CEC V011	3,965.12+	3,897.12	CK # 019	3,897.12
Invoice # 04-CEC V011		6,169.72		
Invoice # 03-CEC V011		6,526.22	CK # 043	10,000.00
Invoice # 05-CEC V011		3,658.92	CK # 1295	6,354.00
		16,354.86		16,354.86
Invoice # 06-CEC V011	12,542.43			
Invoice # 07-CEC V011	7,968.99		CK # 1318	8,000.00
	2,588.13		CK # 132	12,500.00
	23,099.55°	20,500.00		20,500.00
		$ 50,457.89		$ 50,457.89
Ortech International				
Invoice # 14976		$ 2,820.35	CK # 024	$ 2,820.35
Invoice # 14357		20,324.60	CK # 003	9,500.00
Invoice # 16329 (credit)		(3,060.95)	CK # 032	7,763.65
		17,263.65		17,263.65
Invoice # 17111		5,000.00	CK # 045	5,000.00
		$ 25,084.00		$ 25,084.00

* This invoice was subsequently settled for $102,000.00
\+ The invoice was adjusted by $68.00 to reflect an outstanding credit.
o This account was subsequently settled for $20,500.00.

Lakefield Research

Invoice # 03235	$ 252.00		
Invoice # 03278	168.00		
	420.00	CK # 009	$ 420.00
Invoice # 03707	1,950.00	CK # 031	1,950.00
Invoice # 04067	329.50		
Invoice # 04080	44.00		
	373.50	CK # 1320	373.50
	$ 2,743.50		$ 2,743.50
TOTAL EXPENDITURES	$ 209,533.80		$ 209,533.80

INVOICE

BACON, DONALDSON & ASSOCIATES LTD.
12271 Horseshoe Way, Richmond, B.C. V7A 4Z1 • Phone: 277-2322 • Fax: 274-7235

In Account With NORTHCOAST INDUSTRIES
1270 - 601 W. Hastings St.
Vancouver, B.C.
V6B 5A6

Attention: Laurie Forzley

Invoice No. 8494

File No. M90-088

Purchase Order No.

Date 1990 March 13

Re: Batch Laboratory Testwork on Bissett Project to February 28, 1990.

PROFESSIONAL SERVICES			
	Technicians	126.0 hrs. @ $ 50.	$ 6,300.00
		27.0 hrs. @ $ 30.	810.00
		1.0 hrs. @ $ 60.	60.00
		2.0 hrs. @ $ 57.	114.00
	Engineers	119.0 hrs. @ $ 75.	8,925.00
		3.5 hrs. @ $100.	350.00
	Secretarial	2.1 hrs. @ $ 30.	63.00
	Assays - BDA	22 @ $ 20.	440.00
	- Chemex		1,107.45
EXPENSES			
	Vancouver Petrographics		672.75
	Fax charges		57.60
TOTAL			$ 18,899.80

This is a professional invoice and is due when presented
1.5% per month charged on invoices over 30 days.
(18% per annum)

INVOICE

BACON, DONALDSON & ASSOCIATES LTD.
12271 Horseshoe Way, Richmond, B.C. V7A 4Z1 • Phone: 277-2322 • Fax: 274-7235

In Account With NORTHCOAST INDUSTRIES
1270 - 601 W. Hastings St.
Vancouver, B.C.
V6B 5A6

Attention: Laurie Forzley

Invoice No. 8495

File No. M90-088

Purchase Order No.

Date 1990 March 13

Re: Pilot-Scale Testing of Bissett Graphite Project to February 28, 1990.

PROFESSIONAL SERVICES		
1. Circuit Set-Up		
Technicians	50.0 hrs. @ $ 50.	$ 2,500.00
Engineers	38.0 hrs. @ $ 65.	2,470.00
Consumables		1,178.61
2. Receipt & Crushing of Ore		
	11.5 hrs. @ $ 30.	345.00
	3.0 hrs. @ $ 65.	195.00
	20.0 hrs. @ $ 50.	1,000.00
3. Preliminary Test Runs		
	34.5 hrs. @ $ 30.	1,035.00
	25.0 hrs. @ $ 65.	1,625.00
TOTAL		$ 10,348.61

This is a professional invoice and is due when presented.
1.5% per month charged on invoices over 30 days.
(18% per annum)

NORTHCOAST INDI""TRIES LTD.
1270 - 601 WEST HA NGS STREET
VANCOUVER, B.C. V6B 5A6

0027

March 31 19 90

PAY TO THE ORDER OF Bacon, Donaldson & Associates $ 29248.41

twenty nine thousand two hundred & forty eight — 41/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTHCOAST INDUSTRIES LTD.

PER

PER

FOR # 8494, 8495

⑈000027⑈ ⑆08120⑉001⑆ 1243⑉347⑈ ⑈0002924841⑈

03 APR 90

FOR DEPOSIT ONLY
& ASSOCIATES LTD.

AP '90 03
ROYAL BANK
BRITISH COLUMBIA
PC

AP '90 03
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE
07860-001

North Coast
Industries Ltd.

~~Suite 1575
200 Granville St
Vancouver BC
Canada V6C 1S4~~

Tel: 604/681.0799
Fax 604/681.2741

#700 - 1177 W. HASTINGS ST.
VANCOUVER, B.C. V6E 2K3

February 28, 1991

Bacon Donaldson & Associates Ltd.
12271 Horseshoe Way
Richmond, B.C.
V7A 4Z1
Attn: Lee Schneider, Controller

Dear Sir:

Re: Settlement of our account

As per your letter dated February 21, 1991, enclosed please find our cheque in the amount of $42,000.00 representing full settlement of the North Coast Industries Ltd.'s account with Bacon Donaldson & Associates Ltd.

We trust this is satisfactory.

Yours very truly,

NORTH COAST INDUSTRIES LTD.

Harold H.G. Forzley
Vice President

/rr

NCT:BaconPay

BACON
DONALDSON
ASSOCIATES LTD.

12271 HORSESHOE WAY
RICHMOND, B.C.
CANADA V7A 4Z1
TELEPHONE: (604) 277-2322
FACSIMILE : (604) 274-7235

February 21, 1991

File Number: M90-088

NORTHCOAST INDUSTRIES
1270 - 601 West Hastings Street
Vancouver, B.C.
V6B 5A6

Attention: Ron Thiessen

Dear Sir,

Re: Settlement of Your Account

This will confirm your recent discussions with Messrs. Gord Bacon and Morris Beattie regarding your overdue account with Bacon, Donaldson and Associates Ltd. Upon receipt of the agreed upon final settlement amount of $42,000 we will issue a credit note for the balance then owing.

Yours truly,
BACON DONALDSON & ASSOCIATES LTD.

Lee Schneider, Controller
SLS/jlb

BACON DONALDSON ASSOCIATES LTD.
12271 HORSESHOE WAY
RICHMOND, B.C.
CANADA V7A 4Z1
TELEPHONE: (604) 277-2322
FACSIMILE : (604) 274-7235

BREAKDOWN OF INVOICE #1071
BISSETT CREEK PROJECT
NORTH COAST INDUSTRIES

A. Preliminary testwork and pilot palnt operation.

PERSON	HOURS	RATE	TOTAL
Brent Peacock	22	50	$ 1,100
Bruce Smith	189	50	9,450
	13	57	741
Ted Joyce	284	50	14,200
Clint Rule	7.5	50	375
Diane Baker	33	60	1,980
Ed Henrioulle	521	75	39,075
Gus Chow	8	50	400
Ed Klassen	26.8	75	2,010
Jack Richards	355.7	30	10,671
	107.2	37	3,966.40
Jasman Yee	301	65	19,565
Keith Davidson	181	50	9,050
	12	57	684
Martin Schuchow	62.5	50	3,125
	4	57	228
Morris Beattie	48.5	100	4,850
Peter Tse	335	50	16,750
	26	57	1,482
Richard Steel	13.5	50	675
Ron Williams	1.5	60	90
Shawna Martin	169.5	50	8,475
	4.5	57	256.50
Trish Hosepdales	49	60	2,940
Vince Brusnyk	191.5	30	5,745
	4	37	148
Gord Bacon	2	100	200.00
		Sub	TOTAL $ 158,231.90

Assay and Fax Charges	5,588.42
Outside Analysis and Direct Expenses	15,544.69
Sub TOTAL	$ 179,365.01
Less Previous Invoices	- 29,248.41
Less write down for pilot plant set-up at BDA's expense	- $ 36,258.45
Sub TOTAL	$ 113,858.15

B. Variability Testwork and Final Reporting

PERSON	HOURS	RATE	TOTAL
Bruce Smith	31	50	1,550
Clint Rule	3	50	150
Ed Henrioulle	170.9	75	12,817.50
Grant Morgan	3	60	180
Jack Richman	25.6	30	768
Jasman Yee	15	65	975
Keith Davidson	3	50	150
Morris Beattie	2.5	100	250
Peter Tse	80	50	4,000
Ron Williams	1	57	57
	2	60	120
Shawna Martin	17	50	850
Vince Brusnyk	27.5	30	825
Secretarial	52.1	30	$ 1,563
		Sub TOTAL	$ 24,255.50

Assay and Fax charges	$ 3,837.50
Outside analyses and direct expenses	$ 3,913.74
Sub TOTAL	$ 32,006.74

Total this Invoice	$ 145,864.89
Less Advances	- $ 60,000.00
BALANCE DUE	$ 85,864.89

NORTH COAST INDUSTRIES LTD.
PRICE WATERHOUSE CENTRE
#1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 5A6

1268

July 6 1990

PAY TO THE ORDER OF Bacon Donaldson $30,000.00

Thirty thousand dollars ——— xx/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTH COAST INDUSTRIES LTD.

FOR Payment on acct.

M90-088

PER [signature]

⑈001268⑈ ⑆08120⑉001⑆ 1239⑉102⑈ ⑈0003000000⑈

BACON, DONALDSON & ASSOCIATES
FOR DEPOSIT ONLY

09 JUL 90

JY '90' 09
ROYAL BANK
BRITISH COLUMBIA
PC

04800-003

JY '90' 09
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE
07850-001

NORTH COAST ''DUSTRIES LTD.
PRICE WATE JUSE CENTRE
#1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 5A6

1288

Aug 3 19 90

PAY TO THE ORDER OF Bacon Donaldson + Associates Ltd $ 20,000 00

twenty thousand dollars ——— xx/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTH COAST INDUSTRIES LTD.

FOR Payment on acct
M90-088

PER

⑈001288⑈ ⑆08120⑉001⑆ 1239⑉102⑈ ⑈0002000000⑈

FOR DEPOSIT ONLY
DONALDSON & ASSOCIATES LTD.

04800 - 003
THE ROYAL BANK OF CANADA
ROAD AND COOK BRANCH
RICHMOND, B.C.
04800

AG '90 08
ROYAL BANK
BRITISH COLUMBIA
PC

NORTH COAST I USTRIES LTD.
PRICE WATERH UUSE CENTRE
#1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 5A6

1317

Sept 1 19 90

PAY TO THE ORDER OF Bacon Donaldson + Associates $10,000.00

Ten thousand dollars ——— xx/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTH COAST INDUSTRIES LTD.

FOR On acct - Bissett Creek
M90-088 - Advance

PER [signature]

⑈001317⑈ ⑆08120⑉001⑆ 1239⑉102⑈ ⑈0001000000⑈

BACON DONALDSON & ASSOCIATES LTD.
FOR DEPOSIT ONLY

SE '90 05
ROYAL BANK
BRITISH COLUMBIA PC

04800 - 003
THE ROYAL BANK OF CANADA
*SE '90 05
RICHMOND B.C.
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE

NORTH COA INDUSTRIES LTD.
700 - 1177 WE. I HASTINGS STREET
VANCOUVER, BC V6E 2K3
PHONE 681-0799

0084

Feb 28 19 91

PAY TO THE ORDER OF Bacon Donaldson & Associates $ 42,000.00

Forty-two thousand ———— 00/100 DOLLARS

RE: on account

NORTH COAST INDUSTRIES LTD.

PER

PER

Bank of Montreal
VANCOUVER MAIN OFFICE
FIRST BANK TOWER, 595 BURRARD ST.
VANCOUVER, B.C. V7X 1L7

#1071

⑈000084⑈ ⑆00040⑉001⑆ 1251⑉893⑈ ⑈0004200000⑈

FB '91' 28
ROYAL BANK
BRITISH COLUMBIA
PC

BACON, DONALDSON & ASSOCIATES LTD.
FOR DEPOSIT ONLY

FB '91' 28
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE
07860-001

Cominco Engineering Services Ltd.

100 - 1200 West 73rd Ave., Vancouver, B.C., Canada V6P 6G5 / Tel. (604) 264-5500 / Telex 04-55357 / Fax (604) 264-5555

February 20, 1990

North Coast Industries Ltd.
1270 - 601 W. Hastings Street
Vancouver, B.C.
V6B 5A6

Attention: Mr. Dave Copeland

Dear Sir:

Re: Bisset Creek Metallurgical Testwork

Please find attached our January 1990 invoice with respect to the above mentioned project:

January Invoice #01-CECV011 $9,705.91

Should you have any questions, please call.

Regards,

OK 476

G.R. Albright
Revenue and Project
Accounting Manager

GRA/jmh
Attach.

FI.01

Cominco Engineering Services Ltd.

Invoice No. 01-CECV011

Date 90-02-09

NORTH COAST INDUSTRIES LTD.
1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C.
V6B 5A6

Accounting Inquiries
Phone - (604) 264-5525

Technical Inquiries
Name - VCR:HM BOLU
Phone - (604) 264-5596

ATTENTION: DAVE COPELAND

Reference No.

JANUARY, 1990 EXPENDITURES AS ATTACHED

CEC.V01.1 - BISSET CREEK METALLURGICAL TESTWORK

PROFESSIONAL ENGINEERING SERVICES (SEE ATTACHMENT 1)	$8,002.50
REIMBURSABLES (SEE ATTACHMENT 2)	$1,703.41
TOTAL THIS INVOICE	$9,705.91

Remit To -- Suite 100 - 1200 West 73rd Avenue
Vancouver, B.C. V6P 6G5

Net 30 Days

Interest Charged at 1½% Per Month on Overdue Accounts

NORTHCOAST INDUSTRIES LTD.
1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 5A6

0016

March 15 1990

PAY TO THE ORDER OF Cominco Engineering Services Ltd $9705.91

nine thousand seven hundred & five dollars 91/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTHCOAST INDUSTRIES LTD.

PER

PER

01-
FOR CEC V011

⑈000016⑈ ⑆08120⑉001⑆ 1243⑉347⑈ ⑈0000970591⑈

FOR DEPOSIT ONLY
TO THE CREDIT OF
COMINCO ENGINEERING SERVICES LTD.

Bank of Montreal
27270-001
MAR 13 1990
67th & Granville
Vancouver, B.C.
29

MR '90 13
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE

MAR 13 90
0780-001
BANK OF MONTREAL
VANCOUVER BC
050

CESL

01007

Expense Account

Do not use pencil.

Name MATT BOLU

Date	Location	Daily General Expense	Hotel Accommodation	Transportation	Description of item	Sundry	Entertainment
		Disbursements — see instructions on reverse side of form			Other expenses		
16JAN90	TORONTO	59.65	R	1314.00			
17 "	"		256.03	R			
					Brought forward from reverse		
	Sub-totals	$ 59.65	$256.03	$ 1314.00		$	$

Advances from CESL			Employee Expenses Reported			Recap		
Cash	—		Daily General Expense	59	65	Ttl. Exp. $Cdn. (2)	1629	68
Transportation	1314	00	Hotel Accommodation	256	03	Less:		
Other			Transportation	1314	00	Net Advances (1)	1314	00
			Sundry	—		Balance owing:	315	68
Sub-total	1314	00	Entertainment	—		— to me 124	315	68
Less: Unused air fare (attach tickets)	SEE REFUND SLIP FOR BUS. CLASS TO ECONOMY		Total Expenses	1629	68	— to CESL		
			Exchange Rate			(cheque attached)		
			Total Expense $Cdn. (2)	1629	68			
Net advances (1)	1314	00						

Distribution of Expense Code	Amount	
V.011-0200	1629	00
Total Expense $Cdn.		

Purpose of Trip or Expenditure

SUPERVISION OF LAB TESTS AT ORTECH WITH THE CLIENT D. COPELAND.

For Office Use Only	Debit		Credit	
1101 V011 0200	1629	68		
1103 0202			1629	68

[signature] 18JAN'90

Certified as a true accounting of my expenses — Date

[signature] — Approved for distribution and payment

900123 [signature] — Audited by

CESL 301

COMINCO ENGINEERING SERVICES LTD.

90-02-02

JS644

CUMULATIVE TIME DISTRIBUTION FOR JAN , ENDING 90/01/31

ATTACHMENT 1

CECV01-1 BISSET CK METALLURGICAL TESTWORK P.O. NO:

CHARGE CODE	MAN NO.	NAME	REG HRS	OVT HRS	TOTAL HRS	CHARGE RATE	CHARGE AMOUNT	OVERTIME PREMIUM	TOTAL AMOUNT
OFFICE SERVICES									
V0110100	800278	DJ WILLIAMS	5.0		5.0	27.50	137.50		137.50
		ACTIVITY TOTALS	5.0		5.0		137.50		137.50
METAL'L ENGINEERS									
V0110100	800303	MM BOLU	117.0	13.0	130.0	60.50	7,865.00		7,865.00
		ACTIVITY TOTALS	117.0	13.0	130.0		7,865.00		7,865.00
		CHARGE CODE TOTALS	122.0	13.0	135.0		8,002.50		8,002.50
		JOB TOTALS	122.0	13.0	135.0		8,002.50		8,002.50

708 COMINCO ENGINEERING SERVICES LTD PAGE: 1

C.V011 BISSET CK METALLURGICAL TESTWORK 90-02-08

REIMBURSABLES ATTACHMENT 2

B	CODE	SUPPLIER NAME	SUPPLIER INVOICE NUMBER	AMOUNT
11	0200	BOLU, H.M. C/O #400	E/A 900118B	1629.68
	0200	DWARF COURIER LTD.	C141231	7.25
	0200	REPRO CHGES - JAN/90	J/E 00024	0.90
	0200	TEL CHGES - JAN/90	J/E 00026	17.26
	0200	TEL CHGES - JAN/90	J/E 00028	48.32
			JOB TOTAL	$1703.41

dwarf COURIER

(Division of RICHMOND dwarf COURIER LTD.)

Small in Name – BIG IN RELIABILITY!

5 Simpson Rd.
Richmond, B.C.
V6X 2R2
Dispatch: 276-1955
Admin: 276-6044

01003

INVOICE NO.	
C141231	
INVOICE DATE	**ACCOUNT NO.**
12/31/89	C14

TO:

COMINCO ENGINEERING
100-1200 WEST 73RD.,
VANCOUVER, B.C.
V6P 6G5

TERMS: NET 15 DAYS - 2% CHARGED ON ALL OVERDUE ACCOUNTS.

TRANSACTION DATE	INVOICE NO.	DESCRIPTION	AMOUNT	BALANCE
11/30/89	C141130		675.45	675.45
12/31/89		INTEREST	13.32	688.77
12/31/89	C141231	~~111~~ 110 WAYBILLS	700.65	1,389.42

AGE	CURRENT	30 DAYS	60 DAYS	90 DAYS	TOTAL
AMOUNT	713.97	675.45	0.00	0.00	1,389.42

ORIGINAL INVOICE

CHECKS	GOODS SERVICE RECEIVED	PRICE	TAXES	EXTENSION

G.L	JOB #	PCIS	AMOUNT
1150	L032	8137	81.50
~~1101~~	H952	0200	11.00
1101	~~E159~~ CAP	~~4200~~ 0003	110.45
1101	T031	0900	7.50
1150	T151	8137	36.75
1150	T171	8137	17.00
1101	V20	EX10	37.25
1101	R411	3000	15.35
1101	V011 MISC	0200	7.35
~~8401~~			12.75
1150	F002	8090	12.00
1101	V301	EX10	15.25

(E159)

ORIGINAL INVOICE

CHECKS			
1101	K888	X100	5.00
8401	MISC		29.50
1150	L032	8137	4.50
1101	N884	EX10	7.25
8401	R380	0200	5.00
8401	A110	0200	5.00
1101	P069	R500	15.00
1101	S421	0200	3.75
1106	S533	0200	10.00
1101	T97F	0300	10.00
1101	T901	0300	10.00
1150	F062	SE80	3.25
1103	0232		5.00
1103	0254		3.75
1150	K524	8327	5.00
1150	T151	8137	6.00
1101	B501	6530	5.00

dwarf COURIER

(Division of RICHMOND dwarf COURIER LTD.)

Dispatch: 278-1935
Admin: [illegible]8-8044

WAYBILL NO. 236146

SMALL IN NAME
BIG IN RELIABILITY

MONTH	DAY	YEAR
12	22	89

FROM: PREPAID ☐	TO: COLLECT ☐		
COMINCO ENGINEERING	Mr. DAVID COPELAND.	ADVANCE CHARGE	
100-1200 WEST 73RD.,	CEC ENGINEERING LTD	ADVANCE AMOUNT	
VANCOUVER, B.C.	SUITE 1270-601 WEST HASTINGS	WAITING TIME	
V6P 6G5 C14	VCR. TEL		
THIRD PARTY CHARGE	HOT ☐ RUSH ☒ REG. ☑	WEIGHT CHARGE	
	N/D ECONO ☒ RETURN ☐ CONTRACT ☐	DELIVERY CHARGE	
INSTRUCTIONS	NO. OF PIECES: 1 / WEIGHT LBS. / KGS.	RETURN CHARGE	
		OTHER	
RE: V01.10200 PMA		TOTAL	7.25

SHIPPER	TIME	DRIVER P/U	RECEIVED IN APPARENT GOOD ORDER.. (PLS. PRINT)	TIME	DRIVER DEL	RETURN RECEIVED IN APPARENT GOOD ORDER. (PLS. PRINT)	TIME	DRIVER DEL
M.M.	A.M. P.M. 2:55	12	DAVE	A.M. P.M. 3:05	12		A.M. P.M.	

IMPORTANT: MAXIMUM LIABILITY OF CARRIER IS $4.41 PER KG. OR $50.00 PER SHIPMENT. ALL CLAIMS MUST BE SUBMITTED WITHIN 30 DAYS OF SHIPMENT. PLEASE REFER TO TERMS AND CONDITIONS ON REVERSE SIDE.

CASH ☐ CHEQUE ☐

OFFICE COPY

COMINCO ENGINEERING SERVICES LTD.
REPRODUCTION USAGE CHARGES
JANUARY 1990

USER ID.	JOB NUMBER	COPIES MADE	RATE	AMOUNT CHARGED
8011	V011 BISSET CREEK METALLURGICAL REVIEW			
	1ST FLOOR - CANON NP-7550	0	0.15	$0.00
	1ST FLOOR - MITA DC-313Z	0	0.15	0.00
	3RD FLOOR - CANON NP-8570	3	0.15	0.45
	3RD FLOOR - XEROX 1045	0	0.15	0.00
	4TH FLOOR - CANON 6650	3	0.15	0.45
	TOTAL CHARGES	6		$0.90

COMINCO ENGINEERING SERVICES LTD. (Vancouver)

oday's date: 90/02/02 00:18

GENESIS Telephone Management System

ccount code: [redacted]

V011

Period starting 89/12/29
ending 90/02/01

ACCOUNT CODE DETAIL REPORT

Date	Time	Ext.	Trunk	Type	.......Number Dialed	Loc	Duration	Cost
90/01/12	11:59	5596	T002003	C002	1-416-822-4111	ON	0:24:37	17.26
Totals	1 calls						0:24:37	17.26

yes V.01.1

GENESIS Telephone Management System

count code: [redacted]1

Period starting 89/12/29
ending 90/02/01

ACCOUNT CODE DETAIL REPORT

Date	Time	Ext.	Trunk	Type	.......Number Dialed	Loc	Duration	Cost
90/01/18	13:34	5596	T002005	C002	1-416-822-4111	ON	0:01:47	1.38
90/01/19	08:16	5596	T002001	C002	1-416-822-4111	ON	0:14:31	10.35
90/01/19	12:55	5596	T002008	C002	1-416-964-0411	ON	0:01:13	1.38
90/01/24	11:09	5596	T002006	C002	1-416-822-4111	ON	0:01:53	1.38
90/01/24	13:36	5596	T002004	C002	1-416-822-4111	ON	0:23:31	16.57
90/01/25	14:08	5596	T002002	C002	1-416-822-4111	ON	0:24:43	17.26
Totals	6 calls						1:07:38	48.32

Cominco Engineering Services Ltd.

100 - 1200 West 73rd Ave., Vancouver, B.C., Canada V6P 6G5 / Tel. (604) 264-5500 / Telex 04-55357 / Fax (604) 264-5555

March 29, 1990

North Coast Industries Ltd.
1270 - 601 West Hastings Street
Vancouver, B.C.
V6B 5A6

Attention: Mr. Dave Copeland

Dear Sir:

Re: Bisset Creek Metallurgical Testwork

Please find attached our February 1990 invoice with respect to the above mentioned project:

February Invoice #02-CECV011 $3,965.12

Should you have any questions, please call.

Regards,

G.R. Albright
Revenue and Project
Accounting Manager

GRA/mlw

Attach.

Ltr.Mar.29

Cominco Engineering Services Ltd.

Invoice No. 02-CECV011

Date 90-03-08

Accounting Inquiries

Phone - (604) 264-5525

Technical Inquiries

Name - VCR:HM BOLU

Phone - (604) 264-5596

Reference No.

NORTH COAST INDUSTRIES LTD.
1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C.
V6B 5A6

ATTENTION: DAVE COPELAND

FEBRUARY, 1990 EXPENDITURES AS ATTACHED

CEC.V01.1 - BISSET CREEK METALLURGICAL TESTWORK

PROFESSIONAL ENGINEERING SERVICES (SEE ATTACHMENT 1)	$3,660.25
REIMBURSABLES (SEE ATTACHMENT 2)	$304.87
TOTAL THIS INVOICE	$3,965.12

Remit To — Suite 100 - 1200 West 73rd Avenue
Vancouver, B.C. V6P 6G5

Net 30 Days

Interest Charged at 1½% Per Month on Overdue Accounts.

JS644 CUMULATIVE TIME DISTRIBUTION FOR FEB , ENDING 90/02/28 ATTACHMENT 1

CECV01-1 BISSET CK METALLURGICAL TESTWORK P.O. NO:

CHARGE CODE	MAN NO.	NAME	REG HRS	OVT HRS	TOTAL HRS	CHARGE RATE	CHARGE AMOUNT	OVERTIME PREMIUM	TOTAL AMOUNT
METAL'L ENGINEERS									
V0110100	800303	HM BOLU	48.5	12.0	60.5	60.50	3,660.25		3,660.25
		ACTIVITY TOTALS	48.5	12.0	60.5		3,660.25		3,660.25
		CHARGE CODE TOTALS	48.5	12.0	60.5		3,660.25		3,660.25
		JOB TOTALS	48.5	12.0	60.5		3,660.25		3,660.25

JJ708 COMINCO ENGINEERING SERVICES LTD PAGE: 1

CEC.V011 BISSET CK METALLURGICAL TESTWORK 90-03-08

REIMBURSABLES ATTACHMENT 2

JOB	CODE	SUPPLIER NAME	SUPPLIER INVOICE NUMBER	AMOUNT
V011	0200	BOLU, H.M. C/O #400	E/A 900219A	257.23
	0200	REPRO CHGES - JAN/90	J/E 00027	33.00
	0200	TEL CHGES - FEB/90	J/E 00054	14.64
			JOB TOTAL	$304.87

CESL

02007

Expense Account

Do not use pencil.

Name H. Matt Bolu

Date	Location	Daily General Expense	Hotel Accommodation	Transportation	Other expenses: Description of item	Sundry	Entertainment
28 Jan '90	Vcr airport	19.55	R				
1 Feb '90	Marl, W. Germany		140.09	R → (190	DM × 0.735 = C$ 140.09)		
1 Feb. '90	Dusseldorf, "			66.15	R → (90 DM × 0.735 = C$ 66.15)		
1 Feb. '90	London, UK	7.44	→ (£ 3.72 × 2.0	= C$ 7.44)			
1 Feb '90	Vcr Airport		R	4 days of	Airport Parking	24.00	
					Brought forward from reverse		
	Sub-totals	$ 26.99	$ 140.09	$ 66.15		$ 24.00	$

Advances from CESL		
Cash		
Transportation		
Other		
Sub-total		
Less: Unused air fare (attach tickets)		
Net advances (1)		

Employee Expenses Reported		
Daily General Expense	26	99
Hotel Accommodation	140	09
Transportation	66	15
Sundry	24	00
Entertainment		
Total Expenses	257	23
Exchange Rate	(included)	
Total Expense $Cdn. (2)	257	23

Recap		
Ttl. Exp. $Cdn. (2)	257	23
Less:	–	
Net Advances (1)	–	
Balance owing:	257	23
— to me 2/21	257	23
— to CESL (cheque attached)		

Distribution of Expense Code	Amount	
V.01.1 0200	257	23
Total Expense $Cdn.		

Purpose of Trip or Expenditure

Accompanying the client for Meetings in Germany with KHD and EKOF representatives.

For Office Use Only	Debit		Credit	
1101 V011. 0200	257	23		
1103. 0202			257	23

H M Bolu. 16 Feb. '90

Certified as a true accounting of my expenses — Date

Approved for distribution and payment

Audited by

CESL 30

COMINCO ENGINEERING SERVICES LTD.
REPRODUCTION USAGE CHARGES
FEBRUARY 1990

USER ID.	JOB NUMBER	COPIES MADE	RATE	AMOUNT CHARGED
8011	V011			
	BISSET CREEK METALLURGICAL REVIEW			
	1ST FLOOR - CANON NP-7550	0	0.15	$0.00
	1ST FLOOR - MITA DC-313Z	0	0.15	0.00
	3RD FLOOR - CANON NP-8570	138	0.15	20.70
	3RD FLOOR - XEROX 1045	0	0.15	0.00
	4TH FLOOR - CANON 6650	82	0.15	12.30
	TOTAL CHARGES	220		$33.00

oday's date: 90/02/28 00:15

GENESIS Telephone Management System

ccount code: V011

Period starting 90/02/02
ending 90/02/27

ACCOUNT CODE DETAIL REPORT

Date	Time	Ext.	Trunk	Type	.......Number Dialed	Loc	Duration	Cost
90/02/07	07:58	5596	T002007	C002	1-416-822-4111	ON	0:01:25	0.55
90/02/07	08:17	5596	T002002	C002	1-416-781-5890	ON	0:00:43	0.69
90/02/16	15:26	5596	T002007	C002	1-403-246-2411	AB	0:01:49	1.31
90/02/19	08:54	5596	T002003	C002	1-416-292-8822	ON	0:13:21	9.66
90/02/23	12:05	5596	T002001	C002	1-509-922-8787	WA	0:03:01	2.43
Totals	5 calls						0:20:19	14.64

NORTHCOAST INDUSTRIES LTD.
1270 - 601 WEST HASTING REET
VANCOUVER, B.C. V6B 5A6

0019

March 31 19 90

PAY TO THE ORDER OF Cominco Engineering Services Ltd $ 3897.12

three thousand eight hundred & ninety seven 12/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTHCOAST INDUSTRIES LTD.

PER L Longley

PER M Fowler

FOR 02 - CECV011

⑈000019⑈ ⑆08120⑉001⑆ 1243⑉347⑈ ⑈0000389712⑈

MR '90 30
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE

Bank of Montreal
MAR 30 1990
67th & Granville
Vancouver, B.C.
27270-001

FOR DEPOSIT ONLY
TO THE CREDIT OF
COMINCO ENGINEERING SERVICES LTD.

Cominco Engineering Services Ltd.

Invoice No. 04-CECV011

Date 90-05-08

Accounting Inquiries

Phone – (604) 264-5525

Technical Inquiries

Name – VCR:HM BOLU

Phone – (604) 264-5596

Reference No.

NORTH COAST INDUSTRIES LTD.
1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C.
V6B 5A6

ATTENTION: DAVE COPELAND

APRIL, 1990 EXPENDITURES AS ATTACHED

CEC.V01.1 - BISSET CREEK METALLURGICAL TESTWORK

PROFESSIONAL ENGINEERING SERVICES (SEE ATTACHMENT 1)	$5,682.75
REIMBURSABLES (SEE ATTACHMENT 2)	$486.97
TOTAL THIS INVOICE	$6,169.72

Remit To — Suite 100 - 1200 West 73rd Avenue
Vancouver, B.C. V6P 6G5

Net 30 Days

Interest Charged at 1½% Per Month on Overdue Accounts.

JS644 CUMULATIVE TIME DISTRIBUTION FOR APR , ENDING 90/04/30 ATTACHMENT 1

CECV01-1 BISSET CK METALLURGICAL TESTWORK P.O. NO:

CHARGE CODE	MAN NO.	NAME	REG HRS	OVT HRS	TOTAL HRS	CHARGE RATE	CHARGE AMOUNT	OVERTIME PREMIUM	TOTAL AMOUNT
MINING									
V0110100	800386 F	FABIAN	4.0		4.0	41.00	164.00		164.00
		ACTIVITY TOTALS	4.0		4.0		164.00		164.00
PROJ OFFICE SERVICES									
V0110100	800188 SE	WOODHOUSE	4.0		4.0	27.50	110.00		110.00
		ACTIVITY TOTALS	4.0		4.0		110.00		110.00
MECH GENERAL									
V0110100	800346 AL	WATSON	-9.0		-9.0	41.00	-369.00		-369.00
		ACTIVITY TOTALS	-9.0		-9.0		-369.00		-369.00
METAL'L ENGINEERS									
V0110100	800303 HM	BOLU	93.5	2.0	95.5	60.50	5,777.75		5,777.75
		ACTIVITY TOTALS	93.5	2.0	95.5		5,777.75		5,777.75
		CHARGE CODE TOTALS	92.5	2.0	94.5		5,682.75		5,682.75
		JOB TOTALS	92.5	2.0	94.5		5,682.75		5,682.75

JJ708 COMINCO ENGINEERING SERVICES LTD PAGE: 1

CEC.V011 BISSET CK METALLURGICAL TESTWORK 90-05-08

REIMBURSABLES ATTACHMENT 2

JOB	CODE	SUPPLIER NAME	SUPPLIER INVOICE NUMBER	AMOUNT
V011	0200	BOLU-CREDIT	3185	-76.42
	0200	DWARF COURIER JAN/90	J/E 00026	19.00
	0200	DWARF COURIER JAN/90	J/E 00026	7.25
	0200	VAN. PETROGRAPHICS	8870	362.00
	0200	VCR COMP USAGE - APRIL 90	J/E 00128	167.58
	0200	VCR REPRO CHARGES - APR/90	J/E 00029	4.80
	0200	VCR TEL CHGES - APRIL/90	J/E 00116	2.76
			JOB TOTAL	$486.97

Hagen's TRAVEL

Suite 185 Airport Square, 1200 W. 73rd Ave.
Vancouver, B.C., Canada V6P 6J3
Tel. (604) 263-2581 • Tlx. 04-54365

1 OF	2 SM	3 ACCOUNT	INIT	YEAR	MO	DAY	INVOICE
08	02	5453		90	03	28	3185

INVOICE TO:

CESL
100-1200 West 73rd Ave
Vancouver

04005

RESERVATION DETAILS

Credit invoice-to credit our invoice
no 1961
Mr Matt Bolu

Credit amount $76.42

PAYMENT IS DUE ______________ (DATE)

OVERDUE ACCOUNTS SUBJECT TO 24% INTEREST PER ANNUM.

OFFICE USE			DOCUMENT NUMBERS	U	AMOUNT	TAX
00	33	988	CREDIT		76 42	
0033		988	AMOUNT DUE			

ORIGINAL INVOICE

CHECKS	GOODS/SERVICE RECEIVED	PRICE	TAXES	EXTENSION
		SUB-TOTAL		

G.L	JOB	ADJUSTMENTS	AMOUNT
~~1102~~			
1101	V011	0200	(76.42)

APPROVAL:

PAY DATE:

90/03/14
Return call -
Noreline -
Record credit to
north coast a/c +
debit Matt Bolu adv a/c
Credit from Hagens will
clear advance a/c debit

Business class, and
this should be
deducted from the
full fare of $1314.00
Please look into this
and let me know.
Thanx. Matt.
Also I count 131 hrs for Jan 90
instead of 117 hrs for my time.
?

CESL
Cominco Engineering Services Ltd.

JOURNAL VOUCHER

MONTH OF :	EFFECT DATE YR.	MTH.	DAY		TRANSACTION DESCRIPTION
- 1990 April	90	04	30		DWARF COURIER WAYBILLS

TYPE
P-SERV A-ADMIN
O-OVT L-SALE
D-DAY K-EXP
F-FIX J-NON REIMB
C-CASH

CHARGE NAME	LEDGER CODE	SUB / INVOICE	T	DEBIT	CREDIT	DESCRIPTION
	5175	K888		8.00		DWARF COURIER JAN/90
	1150	L032 8137	K	15.00		
	5175	N67F		15.00		
	1101	N884 EX10	K	1118.75		
	5401	R110		5.00		
	1101	R411 3000	K	10.00		
	1101	R849 R500	K	5.00		
	1181	R991 A700		23.00		
	1101	T021 0200	K	10.00		
	1101	T901 0200	K	7.00		
	1101	V011 0200	K	19.00		
	1199				1235.75	
	1101	V011 0200	K	7.25		
	1199				7.25	

JOURNAL ENTRY EXPLANATION: To allocate Jan/90 Dwarf Courier waybills to appropriate jobs.

SIGNED: Sharlene Roots

APPROVED:

ENTRY NO. 26

5GP

dwarf COURIER

(Division of RICHMOND dwarf COURIER LTD.)

Small in Name — BIG IN RELIABILITY!

2895 Simpson Rd.
Richmond, B.C.
V6X 2R2
Dispatch: 278-1935
Admin: 278-8044

TO:

COMINCO ENGINEERING
100-1200 WEST 73RD.,
VANCOUVER, B.C.
V6P 6G5

INVOICE NO.	
C140228	
INVOICE DATE	ACCOUNT NO.
02/28/90	C14

TERMS: NET 15 DAYS - 2% CHARGED ON ALL OVERDUE ACCOUNTS.

TRANSACTION DATE	INVOICE NO.	DESCRIPTION	AMOUNT	BALANCE
01/31/90	C140131		994.00	994.00
02/28/90	C140228	119 WAYBILLS	764.10	1,758.10

AGE	CURRENT	30 DAYS	60 DAYS	90 DAYS	TOTAL
AMOUNT	1,758.10	0.00	0.00	0.00	1,758.10

PAID MARCH 7/90

CHARGED TO 1199

dwarf COURIER Admin: 278-8044 NO.

(Division of RICHMOND dwarf COURIER LTD.)

SMALL IN NAME
BIG IN RELIABILITY

MONTH	DAY	YEAR
01	10	90

FROM: PREPAID ☒

COMI[illegible] ENGINEERING
100-1200 WEST 73RD.,
VANCOUVER, B.C.
V6P 6G5

TO: COLLECT ☐

MR. MATT BOLU
10453 NEWARK PLACE
SURREY, B.C.

TEL. 581-8941

THIRD PARTY CHARGE

HOT ☒ RUSH ☐ REG. ☐
N/D ECONO ☐ RETURN ☐ CONTRACT ☐

INSTRUCTIONS

RE: V011 / D WILLIAMS.

NO. OF PIECES	WEIGHT
1	LBS. / KGS.

ADVANCE CHARGE	
ADVANCE AMOUNT	
WAITING TIME	
WEIGHT CHARGE	
DELIVERY CHARGE	
RETURN CHARGE	
OTHER	
TOTAL	1900

SHIPPER	TIME	DRIVER P/U	RECEIVED IN APPARENT GOOD ORDER (PLS. PRINT)	TIME	DRIVER DEL.	RETURN RECEIVED IN APPARENT GOOD ORDER. (PLS. PRINT)	TIME	DRIVER DEL.
[signature]	A.M. P.M. 1430	01	M Bolu	A.M. 1543	01		A.M. P.M.	

IMPORTANT: MAXIMUM LIABILITY OF CARRIER IS $4.41 PER KG. OR $50.00 PER SHIPMENT. ALL CLAIMS MUST BE SUBMITTED WITHIN 30 DAYS OF SHIPMENT. PLEASE REFER TO TERMS AND CONDITIONS ON REVERSE SIDE.

CASH ☐ CHEQUE ☐

OFFICE COPY

dwarf COU..IER

(Division of RICHMOND dwarf COURIER LTD.)

Dispatch: 278-1935
Admin: 278-8044

WAYBILL NO. 254119

SMALL IN NAME
BIG IN RELIABILITY

MONTH	DAY	YEAR
01	26	90

FROM: PREPAID [X]

COMINCO ENGINEERING
100-1200 WEST 73RD.,
VANCOUVER, B.C.
V6P 6G5 C14

TO: COLLECT [ ]

NORTHCOAST INDUSTRIES.
SUITE 1270 - 601 W. HASTINGS ST.
VANCOUVER, B.C.

TEL.

THIRD PARTY CHARGE

HOT [ ] RUSH [X] REG. [ ]
N/D ECONO [ ] RETURN [ ] CONTRACT [ ]

INSTRUCTIONS

V011
RE: 1101 / MML

NO. OF PIECES	WEIGHT
1	LBS. / KGS.

ADVANCE CHARGE	
ADVANCE AMOUNT	
WAITING TIME	
WEIGHT CHARGE	
DELIVERY CHARGE	
RETURN CHARGE	
OTHER	
TOTAL	$ 7.25

SHIPPER	TIME	DRIVER P/U	RECEIVED IN APPARENT GOOD ORDER (PLS. PRINT)	TIME	DRIVER DEL	RETURN RECEIVED IN APPARENT GOOD ORDER. (PLS. PRINT)	TIME	DRIVER DEL.
[signature]	9:42	13	J Dell...	11:22	13		A.M. / P.M.	

IMPORTANT: MAXIMUM LIABILITY OF CARRIER IS $4.41 PER KG. OR $50.00 PER SHIPMENT. ALL CLAIMS MUST BE SUBMITTED WITHIN 30 DAYS OF SHIPMENT. PLEASE REFER TO TERMS AND CONDITIONS ON REVERSE SIDE.

OFFICE COPY

CASH [ ] CHEQUE [ ]

VPL

Vancouver Petrographics Ltd.

8080 Glover Rd
~~8887 NASH STREET~~ — P.O. BOX 39 — FORT LANGLEY, B.C. V0X 1J0
Telephone (604) 888-1323

INVOICE 8870

Customer Order No. ______

Customer Charge Code ______

Ordered By: Matt Bolu

FOR

Cominco Engineering Services Ltd
400- 1200 West 73rd
Vancouver, B.C.

QUANTITY	DESCRIPTION	COST
	THIN SECTIONS	
	POLISHED THIN SECTIONS	
4	POLISHED ORE MOUNTS @ $18 ea.	$ 72.00
	GROUND & LABELLED THIN SECTION REJECT SLICES	
	POLISHED MINERAL GRAIN MOUNTS	
	MINERAL GRAIN THIN SECTIONS	
	MINERAL GRAIN POLISHED THIN SECTIONS	
	THIN SECTION K-SPAR STAINS	04005
	ROCK K-SPAR STAINS	
	CERAMIC PULVERIZER PLATES LAPPED	
	REPORT	290.00
	SHIPPING	
	TOTAL	$362.00

ORIGINAL INVOICE

CHECKS	GOODS/SERVICE RECEIVED	PRICE	TAXES	EXTENSION

G.L.	JOB #	PCIS	AMOUNT
1101	V011	0200	362.00

APPROVAL.

PAY DATE:

Shipping Date March 1990

Via ______

To ACCOUNTING
Please Process
V.011.0300

Matt Bolu

H Matt Bolu.

age No. 34
5/04/90

COMINCO ENGINEERING LTD.
COMPUTER USAGE INVOICE (SUMMARY FORM)

VANCOUVER
APRIL 1990

OB No. [illegible]11

	USER	TOTAL TIME	RATE/HR.	CHARGES
ACHINE No. 8056	APPLICATIONS ENG. STATION			
	HMB800303	24:23	5.00	$ 121.91
OTAL MACHINE 8056		24:23		$ 121.91
OTALS FOR PROJECT V011		24:23		$ 121.91

age No. 1
5/04/90

COMINCO ENGINEERING LTD.
COMPUTER USAGE INVOICE (SUMMARY FORM)

VANCOUVER
APRIL 1990

OB No. 8011

	USER	TOTAL TIME	RATE/HR.	CHARGES
ACHINE No. 8018	FULL TIME CAD STATION FF800386	4:34	10.00	$ 45.67
OTAL MACHINE 8018		4:34		$ 45.67
OTALS FOR PROJECT 8011		4:34		$ 45.67

COMINCO ENGINEERING SERVICES LTD.
REPRODUCTION USAGE CHARGES
APRIL 1990

USER ID.	JOB NUMBER	COPIES MADE	RATE	AMOUNT CHARGED
8011	V011 BISSET CREEK METALLURGICAL REVIEW			
	1ST FLOOR - CANON NP-7550	0	0.15	$0.00
	1ST FLOOR - MITA DC-313Z	0	0.15	0.00
	3RD FLOOR - CANON NP-8570	0	0.15	0.00
	3RD FLOOR - XEROX 1045	0	0.15	0.00
	4TH FLOOR - CANON 6650	32	0.15	4.80
	TOTAL CHARGES	32		$4.80

count code: V011

Period starting 90/04/07
ending 90/05/03

ACCOUNT CODE DETAIL REPORT

Date	Time	Ext.	Trunk	Type	.......Number Dialed	Loc	Duration	Cost
90/04/24	08:45	5596	T002005	CD02	1-705-652-3341	ON	0:03:29	2.76
Totals	1 calls						0:03:29	2.76

Cominco Engineering Services Ltd.

Invoice No. 03-CECV011

Date 90-04-09

NORTH COAST INDUSTRIES LTD.
1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C.
V6B 5A6

Accounting Inquiries GR ALBRIGHT
Phone - (604) 264-5525

Technical Inquiries
Name - VCR:HM BOLU
Phone - (604) 264-5596

ATTENTION: DAVE COPELAND

Reference No.
PO #

MARCH, 1990 EXPENDITURES AS ATTACHED

CEC.V01.1 - BISSET CREEK METALLURGICAL TESTWORK

PROFESSIONAL ENGINEERING SERVICES: (SEE ATTACHMENT 1)	$ 6,503.75
REIMBURSABLES: (SEE ATTACHMENT 2)	22.47
TOTAL THIS INVOICE	$ 6,526.22

Remit To — Suite 100 · 1200 West 73rd Avenue
Vancouver, B.C. V6P 6G5

Net 30 Days

Interest Charged at 1½% Per Month on Overdue Accounts.

COMINCO ENGINEERING SERVICES LTD. 90-04-05

JS644 CUMULATIVE TIME DISTRIBUTION FOR MAR, ENDING 90/03/31

CECV01-1 BISSET CREEK METALLURGICAL TESTWORK P.O. NO. ATTACHMENT 1

CHARGE CODE	MAN NO.	NAME	REG HRS	OVT HRS	TOTAL HRS	CHARGE RATE	CHARGE AMOUNT	OVERTIME PREMIUM	TOTAL AMOUNT
METAL'L ENGINEERS									
V0110100	800303	HM BOLU	105.5	2.0	107.5	60.50	6,503.75	0.00	6,503.75
		ACTIVITY TOTALS	105.5	2.0	107.5		6,503.75		6,503.75
		CHARGE CODE TOTALS	105.5	2.0	107.5		6,503.75		6,503.75
		JOB TOTALS	105.5	2.0	107.5		6,503.75		6,503.75

JJ708 COMINCO ENGINEERING SERVICES LTD PAGE: 1

CEC.V011 BISSET CK METALLURGICAL TESTWORK 90-04-09

REIMBURSABLES ATTACHMENT 2

JOB	CODE	SUPPLIER NAME	SUPPLIER INVOICE NUMBER	AMOUNT
V011	0200	REPRO CHGES - MARCH/90	J/E 00021	1.80
	0200	VCR COMP CHGES-MARCH/90	J/E 00128	20.67
			JOB TOTAL	$22.47

COMINCO ENGINEERING SERVICES LTD.
REPRODUCTION USAGE CHARGES
MARCH 1990

USER ID.	JOB NUMBER	COPIES MADE	RATE	AMOUNT CHARGED
8011	V011 BISSET CREEK METALLURGICAL REVIEW			
	1ST FLOOR - CANON NP-7550	0	0.15	$0.00
	1ST FLOOR - MITA DC-313Z	0	0.15	0.00
	3RD FLOOR - CANON NP-8570	0	0.15	0.00
	3RD FLOOR - XEROX 1045	0	0.15	0.00
	4TH FLOOR - CANON 6650	12	0.15	1.80
	TOTAL CHARGES	12		$1.80

Page No. 31
04/02/90

COMINCO ENGINEERING LTD.
COMPUTER USAGE INVOICE (SUMMARY FORM)

VANCOUVER
MARCH 1990

JOB No. V011

	USER	TOTAL TIME	RATE/HR.	CHARGES
MACHINE No. 8056	APPLICATIONS ENG. STATION			
	HMB800303	4:08	5.00	$ 20.67
TOTAL MACHINE 8056		4:08		$ 20.67
TOTALS FOR PROJECT V011		4:08		$ 20.67

Cominco Engineering Services Ltd.

Invoice No. 05-CECV011

Date 90-06-08

Accounting Inquiries

Phone – (604) 264-5525

Technical Inquiries

Name – VCR:HM BOLU
Phone – (604) 264-5596

Reference No.

NORTH COAST INDUSTRIES LTD.
1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C.
V6B 5A6

ATTENTION: DAVE COPELAND

MAY, 1990 EXPENDITURES AS ATTACHED

CEC.V01.1 - BISSET CREEK METALLURGICAL TESTWORK

PROFESSIONAL ENGINEERING SERVICES (SEE ATTACHMENT 1)	$3,404.75
REIMBURSABLES (SEE ATTACHMENT 2)	$254.17
TOTAL THIS INVOICE	$3,658.92

Remit To -- Suite 100 - 1200 West 73rd Avenue
Vancouver, B.C. V6P 6G5

Net 30 Days

Interest Charged at 1½% Per Month on Overdue Accounts.

0027

COMINCO ENGINEERING SERVICES LTD.

90-06-04

JS644

CUMULATIVE TIME DISTRIBUTION FOR MAY , ENDING 90/05/31

ATTACHMENT 1

CECV01-1 BISSET CK METALLURGICAL TESTWORK P.O. NO:

CHARGE CODE	MAN NO.	NAME	REG HRS	OVT HRS	TOTAL HRS	CHARGE RATE	CHARGE AMOUNT	OVERTIME PREMIUM	TOTAL AMOUNT
MINING									
V0110100	800386 F	FABIAN < ?	10.0		10.0	41.00	410.00		410.00
		ACTIVITY TOTALS	10.0		10.0		410.00		410.00
METAL'L ENGINEERS									
V0110100	800303 HM	BOLU	39.5	10.0	49.5	60.50	2,994.75		2,994.75
		ACTIVITY TOTALS	39.5	10.0	49.5		2,994.75		2,994.75
		CHARGE CODE TOTALS	49.5	10.0	59.5		3,404.75		3,404.75
		JOB TOTALS	49.5	10.0	59.5		3,404.75		3,404.75

JJ708 COMINCO ENGINEERING SERVICES LTD PAGE: 1

CEC.V011 BISSET CK METALLURGICAL TESTWORK 90-06-07

REIMBURSABLES ATTACHMENT 2

JOB	CODE	SUPPLIER NAME	SUPPLIER INVOICE NUMBER	AMOUNT
V011	0200	BOLU, H.M. C/O #400	E/A 900521	102.15
	0200	LAKEFIELD RESEARCH	C 03722	61.50
	0200	VCR COMP USAGE - MAY/90	J/E 00203	43.26
	0200	VCR PHOTOCOPY CHARGES - MAY/90	J/E 00129	13.65
	0200	VCR TEL CHGES - MAY/90	J/E 00209	33.61
			JOB TOTAL	$254.17

CESL

Expense Account 05008

Do not use pencil.

Name MATT BOLU

Date	Location	Daily General Expense	Hotel Accommodation	Transportation	Other expenses: Description of item	Sundry	Entertainment
22/02/90	VANCOUVER				PARKING	R 10.00	
1/05/90	"				FILM	R 3.70	
3/05/90	"				FILM PROCESSING	R 10.45	
JAN-MAY '90	DRIVING TO BDA RICHMOND FOR MEETINGS AND PILOT PLANT TESTING						
	13 TIMES, 12 KM EACH WAY @ $0.25/KM					$78.00	
					Brought forward from reverse		
	Sub-totals	$	$	$		$ 102.15	$

Disbursements — see instructions on reverse side of form

Advances from CESL		
Cash		
Transportation		
Other		
Sub-total		
Less: Unused air fare (attach tickets)		
Net advances (1)		

Employee Expenses Reported		
Daily General Expense		
Hotel Accommodation		
Transportation		
Sundry	102	15
Entertainment		
Total Expenses		
Exchange Rate		
Total Expense $Cdn. (2)	102	15

Recap		
Ttl. Exp. $Cdn. (2)	102	15
Less:		
Net Advances (1)		
Balance owing:	102	15
— to me 524	102	15
— to CESL		
(cheque attached)		

Distribution of Expense Code	Amount	
V.011 0200	102	15
Total Expense $Cdn.		

Purpose of Trip or Expenditure

VARIOUS MINOR EXPENSES INCURRED DURING THE COURSE OF THE PROJECT PERIOD UP TO 21 ~~24TH~~ MAY 90.

For Office Use Only	Debit		Credit	
1101 V011 0200	102	15		
1103 0202			102	15

M Bolu

Certified as a true accounting of my expenses

21 ~~24~~ May '90

Date

Approved for distribution and payment

900524

Audited by

CESL 301

05005

INVOICE

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED
P.O. Box 430, 185 Concession St., Lakefield, Ontario KOL 2HO
Phone: (705) 652-3341
Telex No. 06 962842
Fax No. (705) 652-6365

No.: C 03722

DATE April 25, 1990

SENT TO: Mr. Matt Bolu

Cominco Engineering Services Ltd
Suite 100-1200 West 73rd Avenue
Vancouver, BC V6P 6G5

Our Certificate Of Analysis Number(s): 5773
Our Reference Number: 9034117
Number of Samples: RE: Bissett Creek

Analytical Cost

Qty.	Symbol	Element	Unit Price	Assay Cost
3	C(g) %	2-Carb(Graphitic)	$18.00	$54.00

please process
V.011-0200

M Bolu
02/05/90

ORIGINAL INVOICE

CHECKS	GOODS/SERVICE RECEIVED	PRICE	TAXES	EXTENSION

G.L	JOB #	PCIS	AMOUNT
1101	V011	0200	61.50

APPROVAL

PAY DATE:

$54.00

3 x 2.50 pulverizing

Additional Costs:

Sample Preparation:	
Pulverizing:	$7.50
Long Dist.Phone:	
Telex:	
Facsimile:	
Courier/Spec.Del.:	
Freight:	
Custom/Broker:	
Storage:	
hrs: @ :	
Extras	$7.50

% Discount	$0.00	
Net Cost	$54.00	$54.00
Extras	$7.50	$61.50
Less Advance Payment:		

Invoice Amount $61.50

PLEASE PAY BY INVOICE — Terms: Net 30 days. 2% service charge per month on overdue accounts

Page No. 27
05/31/90

COMINCO ENGINEERING LTD.
COMPUTER USAGE INVOICE (SUMMARY FORM)

VANCOUVER
MAY 1990

JOB No. V011

	USER	TOTAL TIME	RATE/HR.		CHARGES
MACHINE No. 8056	APPLICATIONS ENG. STATION				
	HMB800303	8:39	5.00	$	43.26
TOTAL MACHINE 8056		8:39		$	43.26
TOTALS FOR PROJECT V011		8:39		$	43.26

COMINCO ENGINEERING SERVICES LTD.
PHOTOCOPY USAGE CHARGES
MAY 1990

USER ID.	JOB NUMBER	COPIES MADE	RATE	AMOUNT CHARGED
8011	V011 BISSET CREEK METALLURGICAL REVIEW			
	1ST FLOOR - CANON NP-7550	0	0.15	$0.00
	1ST FLOOR - CANON NP-6650	2	0.15	0.30
	3RD FLOOR - CANON NP-8570	39	0.15	5.85
	3RD FLOOR - XEROX 1045	0	0.15	0.00
	4TH FLOOR - CANON 6650	50	0.15	7.50
	4TH FLOOR - MITA DC-313Z	0	0.15	0.00
	TOTAL CHARGES	91		$13.65

COMINCO ENGINEERING SERVICES LTD. (Vancouver)

Today's date: 90/06/06 08:33

GENESIS Telephone Management System

Account code: [redacted]

Period starting 90/05/04
ending 90/06/04

ACCOUNT CODE DETAIL REPORT

Date	Time	Ext.	Trunk	Type	.......Number Dialed	Loc	Duration	Cost
90/05/14	11:10	5596	T002007	C002	1-705-652-3341	ON	0:01:35	1.38
90/05/22	15:57	5555	T002006	C002	1-303-987-8907	CO	0:04:49	3.57
90/05/23	15:19	5596	T002009	COco	1-303-986-6350	CO	0:14:15	10.71
90/06/04	09:03	5596	T002003	C002	1-705-652-3341	ON	0:00:57	0.69
90/06/04	10:13	5596	T002009	COco	1-705-652-3341	ON	0:04:23	3.45
90/06/04	11:51	5596	T002009	COco	1-705-652-3341	ON	0:18:13	13.12
90/06/04	17:00	5555	T002007	C002	1-705-652-6365	ON	0:00:51	0.69
Totals	7 calls						0:45:03	33.61

NORTH COAST INDUSTRIES LTD.
PRICE WATERHOUSE CENTRE
#1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 5A6

1295

Aug 3 19 90

PAY TO THE ORDER OF Cominco Engineering Services Ltd $6354.86

six thousand three hundred & fifty four — 86/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTH COAST INDUSTRIES LTD.

FOR Balance of acct

PER [signature]

⑈001295⑈ ⑆08120⑉001⑆ 1239⑉102⑈ ⑈0000635486⑈

AG '90 07
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE
07860-001

FOR DEPOSIT ONLY
TO THE CREDIT OF
COMINCO ENGINEERING SERVICES LTD.

Bank of Montreal
AUG - 7 1990
Pender & Granville
Vancouver, B.C.
27270-001

NORTHCOAST INDUSTRI[illegible]S LTD.
1270 - 601 WEST HASTIN[illegible] [illegible]TREET
VANCOUVER, B.C. V6B 5A6

0043

July 6 19 90

PAY TO THE ORDER OF Cominco Engineering Services Ltd $ 10,000.00

ten thousand dollars ——— xx/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTHCOAST INDUSTRIES LTD.

PER

PER

FOR Payment on acct.

⑈000043⑈ ⑆08120⑉001⑆ 1243⑉347⑈ ⑈0001000000⑈

Bank of Montreal
6?th & Granville
Vancouver, B.C.
JUL - 9 1990
27270-001

JY '90 09
[B]ANK OF MONTREAL
[V]ANCOUVER REGIONAL
DATA CENTRE
07869-001

FOR DEPOSIT ONLY,
TO THE CREDIT OF
COMINCO ENGINEERING SERVICES LTD.

Cominco Engineering Services Ltd.

Invoice No. 06-CECV011

Date 90-07-10

Accounting Inquiries

Phone - (604) 264-5525

Technical Inquiries

Name - VCR:HM BOLU
Phone - (604) 264-5596

Reference No.

NORTH COAST INDUSTRIES LTD.
1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C.
V6B 5A6

ATTENTION: DAVE COPELAND

JUNE, 1990 EXPENDITURES AS ATTACHED

CEC.V01.1 - BISSET CREEK METALLURGICAL TESTWORK

PROFESSIONAL ENGINEERING SERVICES (SEE ATTACHMENT 1)	$11,542.75
REIMBURSABLES (SEE ATTACHMENT 2)	$999.68
TOTAL THIS INVOICE	$12,542.43

Remit To — Suite 100 - 1200 West 73rd Avenue
Vancouver, B.C. V6P 6G5

Net 30 Days

Interest Charged at 1½% Per Month on Overdue Accounts.

JS644 CUMULATIVE TIME DISTRIBUTION FOR JUN , ENDING 90/06/31 ATTACHMENT 1

CECV01-1 BISSET CK METALLURGICAL TESTWORK P.O. NO:

CHARGE CODE	MAN NO.	NAME	REG HRS	OVT HRS	TOTAL HRS	CHARGE RATE	CHARGE AMOUNT	OVERTIME PREMIUM	TOTAL AMOUNT
MINING									
V0110100	800386 F	FABIAN	2.0		2.0	41.00	82.00		82.00
		ACTIVITY TOTALS	2.0		2.0		82.00		82.00
ENGINEERING QUALITY									
V0110100	800229 RJ	TUCKER	7.0	2.0	9.0	70.00	630.00		630.00
		ACTIVITY TOTALS	7.0	2.0	9.0		630.00		630.00
MECH GENERAL									
V0110100	800066 TH	ITTER	26.0	2.0	28.0	60.50	1,694.00		1,694.00
		ACTIVITY TOTALS	26.0	2.0	28.0		1,694.00		1,694.00
PIPING									
V0110100	800088 SE	SCHROEDER	17.0		17.0	41.00	697.00		697.00
		ACTIVITY TOTALS	17.0		17.0		697.00		697.00
METAL'L ENGINEERS									
V0110100	800303 HM	BOLU	115.5	24.0	139.5	60.50	8,439.75		8,439.75
		ACTIVITY TOTALS	115.5	24.0	139.5		8,439.75		8,439.75
		CHARGE CODE TOTALS	167.5	28.0	195.5		11,542.75		11,542.75
		JOB TOTALS	167.5	28.0	195.5		11,542.75		11,542.75

JJ708 COMINCO ENGINEERING SERVICES LTD PAGE: 1

CEC.V011 BISSET CK METALLURGICAL TESTWORK 90-07-10

REIMBURSABLES ATTACHMENT 2

JOB	CODE	SUPPLIER NAME	SUPPLIER INVOICE NUMBER	AMOUNT
V011	0200	LAKEFIELD RESEARCH	C 03877	326.00
	0200	VCR COMP USAGE - JUNE/90	J/E 00145	551.23
	0200	VCR PHOTOCOPY - JUNE/90	J/E 00090	24.30
	0200	VCR TEL CHGES - JUNE/90	J/E 00186	98.15
			JOB TOTAL	$999.68

06 010

INVOICE

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED
P.O. Box 430, 185 Concession St., Lakefield, Ontario K0L 2H0
Phone: (705) 652-3341
Telex No. 06 962842
Fax No. (705) 652-6365

No.: C 03877

DATE June 8, 1990

SENT TO: Mr. Matt Bolu

Cominco Engineering Services Ltd.
Suite 100-1200 West 73rd Avenue
Vancouver, BC V6P 6G5

Our Certificate Of Analysis Number(s):
Our Reference Number:
Number of Samples: RE: Bissett Creek - Graphitic Carbon

Analytical Cost

Qty.	Symbol	Element	Unit Price	Assay Cost
12	C(g)	1-Carb. graphitic	$18.00	$216.00
		Manhours	$55.00	$110.00

ORIGINAL INVOICE

GOODS SERVICE RECEIVED	PRICE	TAXES	EXTENSION

G/L	JOB #	FCIS	AMOUNT
1101	V011	0300	326.00

APPROVAL:
PAY DATE:

Please process
V.01.1.0300
M Bolu
8 Jun 90

Additional Costs: $326.00

Sample Preparation:
Pulverizing:
Long Dist.Phone:
Telex:
Facsimile:
Courier/Spec.Del.:
Freight:
Custom/Broker:
Storage:
hrs: @ :

Extras

% Discount $0.00
Net Cost $326.00 $326.00
Extras $326.00
Less Advance Payment:

Invoice Amount $326.00

PLEASE PAY BY INVOICE — Terms: Net 30 days. 2% service charge per month on overdue accounts

Page No. 1
07/04/90

COMINCO ENGINEERING LTD.
COMPUTER USAGE INVOICE (SUMMARY FORM)

VANCOUVER
JUNE 1990

JOB No. ~~8011~~ V011

	USER	TOTAL TIME	RATE/HR.	CHARGES
MACHINE No. 8018	FULL TIME CAD STATION FF800386	10:09	10.00	$ 101.51
TOTAL MACHINE 8018		10:09		$ 101.51
TOTALS FOR PROJECT ~~8011~~ V011		10:09		$ 101.51

Page No. 33
07/04/90

COMINCO ENGINEERING LTD.
COMPUTER USAGE INVOICE (SUMMARY FORM)

VANCOUVER
JUNE 1990

JOB No. V011

	USER	TOTAL TIME	RATE/HR.	CHARGES
MACHINE No. 8004	FULL TIME CAD STATION			
	RBW800159	2:58	14.00	$ 41.53
TOTAL MACHINE 8004		2:58		$ 41.53
MACHINE No. 8044	FULL TIME CAD STATION			
	SES800088	13:39	14.00	$ 191.08
TOTAL MACHINE 8044		13:39		$ 191.08
MACHINE No. 8056	APPLICATIONS ENG. STATION			
	HMB800303	43:25	5.00	$ 217.11
TOTAL MACHINE 8056		43:25		$ 217.11
TOTALS FOR PROJECT V011		60:02		$ 449.72

COMINCO ENGINEERING SERVICES LTD.
PHOTOCOPY USAGE CHARGES
JUNE 1990

USER ID.	JOB NUMBER	COPIES MADE	RATE	AMOUNT CHARGED
8011	V011			
	BISSET CREEK METALLURGICAL REVIEW			
	1ST FLOOR - CANON NP-7550	0	0.15	$0.00
	1ST FLOOR - CANON NP-6650	3	0.15	0.45
	3RD FLOOR - CANON NP-8570	46	0.15	6.90
	3RD FLOOR - XEROX 1045	59	0.15	8.85
	4TH FLOOR - CANON 6650	54	0.15	8.10
	4TH FLOOR - MITA DC-313Z	0	0.15	0.00
	TOTAL CHARGES	162		$24.30

COMINCO ENGINEERING SERVICES LTD.
PHOTOCOPY USAGE CHARGES
JUNE 1990

USER ID.	JOB NUMBER	COPIES MADE	RATE	AMOUNT CHARGED
8011	V011 BISSET CREEK METALLURGICAL REVIEW			
	1ST FLOOR - CANON NP-7550	0	0.15	$0.00
	1ST FLOOR - CANON NP-6650	3	0.15	0.45
	3RD FLOOR - CANON NP-8570	46	0.15	6.90
	3RD FLOOR - XEROX 1045	59	0.15	8.85
	4TH FLOOR - CANON 6650	54	0.15	8.10
	4TH FLOOR - MITA DC-313Z	0	0.15	0.00
	TOTAL CHARGES	162		$24.30

COMINCO ENGINEERING SERVICES LTD. (Vancouver)

oday's date: 90/07/08 07:57

GENESIS Telephone Management System

ccount code: V011

Period starting 90/07/01
ending 90/07/08

ACCOUNT CODE DETAIL REPORT

Date	Time	Ext.	Trunk	Type	.......Number Dialed	Loc	Duration	Cost
90/06/06	11:31	5596	T002006	C002	1-705-652-3113	ON	0:13:13	9.66
90/06/11	11:57	5576	T002003	C002	1-414-769-4300	WI	0:04:41	3.69
90/06/11	12:32	5555	T002004	C002	1-414-747-0338	WI	0:02:11	2.21
90/06/18	10:23	5596	T002004	C002	1-819-597-2911	PQ	0:00:39	0.69
90/06/18	10:24	5596	T002004	C002	1-819-597-2911	PQ	0:01:45	1.38
90/06/18	12:08	5596	T002001	C002	1-819-597-2911	PQ	0:04:07	3.45
90/06/18	13:48	5596	T002008	C002	1-819-597-2911	PQ	0:01:33	1.38
90/06/19	08:15	5596	T002009	COco	1-705-682-0649	ON	0:02:13	2.07
90/06/19	08:19	5596	T002001	C002	1-819-597-2911	PQ	0:04:45	3.45
90/06/19	08:28	5596	T002004	C002	1-416-335-4555	ON	0:02:57	2.07
90/06/19	15:12	5596	T002004	C002	1-705-675-1123	ON	0:02:41	2.07
90/06/19	16:01	5596	T002007	C002	1-705-675-1123	ON	0:00:45	0.69
90/06/25	09:56	5596	T002002	C002	1-865-2271	BC	0:04:23	2.05
90/06/25	13:17	5596	T002007	C002	1-865-2271	BC	0:00:21	0.60
90/06/25	13:20	5596	T002002	C002	1-306-931-0801	SK	0:11:07	8.28
90/06/25	14:40	5596	T002009	COco	1-216-676-2212	OH	0:00:51	0.74
90/06/26	08:28	5596	T002008	C002	1-216-676-2400	OH	0:15:13	11.79
90/06/27	08:40	5596	T002008	C002	1-216-676-2400	OH	0:18:05	14.00
90/06/27	12:56	5596	T002007	C002	1-306-931-0801	SK	0:22:23	15.88
90/06/27	13:20	5596	T002002	C002	1-865-2271	BC	0:01:31	0.96
90/06/28	11:29	5596	T002009	COco	1-306-931-0801	SK	0:00:59	0.69
90/06/28	12:50	5596	T002004	C002	1-306-931-0801	SK	0:14:57	10.35
Totals	22 calls						2:11:20	98.15

Cominco Engineering Services Ltd.

Invoice No. 07-CECV011

Date 90-08-10

NORTH COAST INDUSTRIES LTD.
1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C.
V6B 5A6

Accounting Inquiries GR ALBRIGHT
Phone - (604) 264-5525

Technical Inquiries
Name - VCR:HM BOLU
Phone - (604) 264-5596

ATTENTION: MR. DAVE COPELAND

Reference No.

JULY, 1990 EXPENDITURES AS ATTACHED

CEC.V01.1 - BISSET CREEK METALLURGICAL TESTWORK

PROFESSIONAL ENGINEERING SERVICES: (SEE ATTACHMENT 1)	$ 7,426.00
REIMBURSABLES: (SEE ATTACHMENT 2)	542.99

TOTAL THIS INVOICE	$ 7,968.99
	==========

Remit To — Suite 100 - 1200 West 73rd Avenue
Vancouver, B.C. V6P 6G5

Net 30 Days

Interest Charged at 1½% Per Month on Overdue Accounts.

JS644 CUMULATIVE TIME DISTRIBUTION FOR JUL , ENDING 90/07/31 ATTACHMENT 1

CECV01-1 BISSET CK METALLURGICAL TESTWORK P.O. NO:

CHARGE CODE	MAN NO.	NAME	REG HRS	OVT HRS	TOTAL HRS	CHARGE RATE	CHARGE AMOUNT	OVERTIME PREMIUM	TOTAL AMOUNT
MINING									
V0110100	800386 F	FABIAN	14.0		14.0	41.00	574.00		574.00
		ACTIVITY TOTALS	14.0		14.0		574.00		574.00
PROJ OFFICE SERVICES									
V0110100	800188 SE	WOODHOUSE	20.5	6.5	27.0	27.50	742.50		742.50
V0110100	800278 DJ	WILLIAMS	4.0		4.0	27.50	110.00		110.00
		ACTIVITY TOTALS	24.5	6.5	31.0		852.50		852.50
MECH GENERAL									
V0110100	800096 WJ	ROSS	1.0		1.0	47.00	47.00		47.00
		ACTIVITY TOTALS	1.0		1.0		47.00		47.00
PIPING									
V0110100	800088 SE	SCHROEDER	5.0		5.0	41.00	205.00		205.00
		ACTIVITY TOTALS	5.0		5.0		205.00		205.00
METAL'L ENGINEERS									
V0110100	800303 HM	BOLU	95.0		95.0	60.50	5,747.50		5,747.50
		ACTIVITY TOTALS	95.0		95.0		5,747.50		5,747.50
		CHARGE CODE TOTALS	139.5	6.5	146.0		7,426.00		7,426.00
		JOB TOTALS	139.5	6.5	146.0		7,426.00		7,426.00

JJ708 COMINCO ENGINEERING SERVICES LTD 90-08-10

CEC.V011 BISSET CREEK METALLURGICAL TESTWORK
REIMBURSABLES ATTACHMENT 2

JOB	CODE	SUPPLIER NAME	SUPPLIER INVOICE NUMBER	AMOUNT
V011	0200	DWARF COURIER LTD.	J/E 00061	$10.00
	0200	VANCOUVER COMPUTER CHARGES - JULY/90	J/E 00111	386.69
	0200	VANCOUVER PHOTOCOPY CHARGES - JULY/90	J/E 00041	139.05
	0200	DWARF COURIER LTD.	C140630	7.25
			JOB TOTAL	$542.99

Dwarf Courier Breakdown - April 90

G/L	Sub	DCIS		
1103	Ø389		35.25	L. Novakowski Courier
1103	Ø177		10.00	T. Marlow Courier
1103	Ø287		33.00	T. Hamel Courier
1150	CAP1		100.75	E1598300
1150	F062	8E8Ø	5.00	
8401	H95Ø		3.75	
1150	K525	8327	32.00	
1150	LØ32	8137	102.75	
7401	M15Ø		20.00	
5175	N884		50.00	
1101	P669	R5ØØ	57.50	
5401	R11Ø		23.25	
5401	R38Ø		5.00	
1101	R849	R5ØØ	3.75	
1101	R991	A700	13.00	
1150	T151	8137	195.75	
1101	TØ21	Ø2ØØ	7.50	
1150	T171	8131	5.00	
1101	T7ØF	A700	20.25	
1101	T31F	0200	5.00	
1101	VØ11	02ØØ	10.00	
5401	V15Ø		4.50	
1101	V441	R5ØØ	10.00	
5113			10.00	
1101	V591	V81Ø	20.75	
5401	V61Ø		7.25	
5401	V77Ø		5.00	
1101	T7ØF	A7ØØ	10.00	

dwarf COURIER
(Division of RICHMOND dwarf COURIER LTD.)
Small in Name — **BIG IN RELIABILITY!**

2895 Simpson Rd.
Richmond, B.C.
V6X 2R2
Dispatch: 278-1935
Admin: 278-8044

06 008

TO:

COMINCO ENGINEERING
100-1200 WEST 73RD.,
VANCOUVER, B.C.
V6P 6G5

INVOICE NO.	
C140430	
INVOICE DATE	ACCOUNT NO.
04/30/90	C14

TERMS: NET 15 DAYS - 2% CHARGED ON ALL OVERDUE ACCOUNTS.

TRANSACTION DATE	INVOICE NO.	DESCRIPTION	AMOUNT	BALANCE
03/31/90	C140331		1,063.85	1,063.85
04/30/90	C140430	185 WAYBILLS	1,088.60	2,152.45

ORIGINAL INVOICE

	PRICE	TAXES	EXTENSION
RECEIVED			

G.L.	JOB #	PCIS	AMOUNT
1199			1088.60

APPROVAL

PAY DATE

1199 JE DONE SP

CURRENT	30 DAYS	60 DAYS	90 DAYS	TOTAL
1,088.60	1,063.85	0.00	0.00	2,152.45

dwarf COURIER
(Division of RICHMOND dwarf COURIER LTD.)

2895 Simpson Rd.
Richmond, B.C.
V6X 2R2

REMITTANCE STUB

AMOUNT REMITTED ____________

INVOICE NO.	
C140430	
INVOICE DATE	ACCOUNT NO.
04/30/90	C14

PLEASE CHECK INDIVIDUAL INVOICES PAID.

INVOICE NO.	AMOUNT DUE
C140331	1,063.85
C140430	1,088.60
BALANCE DUE	TOTAL
	2,152.45

dwarf COURIER

(Division of RICHMOND dwarf COURIER LTD.)

Dispatch: 278-1935
Admin: 278-8044

WAYBILL NO. 338043

MONTH	DAY	YEAR
04	27	90

SMALL IN NAME
BIG IN RELIABILITY

FROM: PREPAID [X]

COMINCO ENGINEERING
100-1200 WEST 73RD.,
VANCOUVER, B.C.
V6P 6G5 C14

TO: COLLECT [ ]

AEC ENGINEERING LTD.
SUITE 1270 - 601 W. HASTINGS ST
VCR
ATT: DAVE COPELAND
TEL. 684-6328

THIRD PARTY CHARGE

HOT [X] RUSH [ ] REG. [ ]
N/D ECONO [ ] RETURN [ ] CONTRACT [ ]

INSTRUCTIONS

RE: 6011/MB.

NO. OF PIECES	WEIGHT
1	LBS. / KGS.

ADVANCE CHARGE	
ADVANCE AMOUNT	
WAITING TIME	
	–
WEIGHT CHARGE	
DELIVERY CHARGE	
RETURN CHARGE	
OTHER	
TOTAL	$10.00

SHIPPER	TIME	DRIVER P/U	RECEIVED IN APPARENT GOOD ORDER (PLS. PRINT)	TIME	DRIVER DEL.	RETURN RECEIVED IN APPARENT GOOD ORDER. (PLS. PRINT)	TIME	DRIVER DEL.
M. Mulholland	1:35 PM	34	[signature]	1:45 PM	34		A.M. P.M.	

IMPORTANT: MAXIMUM LIABILITY OF CARRIER IS $4.41 PER KG. OR $50.00 PER SHIPMENT. ALL CLAIMS MUST BE SUBMITTED WITHIN 30 DAYS OF SHIPMENT. PLEASE REFER TO TERMS AND CONDITIONS ON REVERSE SIDE.

11:55AM

OFFICE COPY

CASH [ ] CHEQUE [ ]

07/30/90

COMINCO ENGINEERING LTD.
COMPUTER USAGE INVOICE (SUMMARY FORM)

VANCOUVER
JULY 1990

JOB No. V011

	USER	TOTAL TIME	RATE/HR.		CHARGES
MACHINE No. 8018	FULL TIME CAD STATION				
	FF800386	14:00	14.00	$	196.00
TOTAL MACHINE 8018		14:00		$	196.00
MACHINE No. 8044	FULL TIME CAD STATION				
	SES800088	5:13	14.00	$	73.04
TOTAL MACHINE 8044		5:13		$	73.04
MACHINE No. 8051	FULL TIME CAD STATION				
	WJR800096	2:06	14.00	$	29.40
TOTAL MACHINE 8051		2:06		$	29.40
MACHINE No. 8056	APPLICATIONS ENG. STATION				
	HMB800303	17:39	5.00	$	88.25
TOTAL MACHINE 8056		17:39		$	88.25
TOTALS FOR PROJECT V011		38 :58		$	386.69

COMINCO ENGINEERING SERVICES LTD.
PHOTOCOPY USAGE CHARGES
JULY 1990

USER ID.	JOB NUMBER	COPIES MADE	RATE	AMOUNT CHARGED
8011	V011 BISSET CREEK METALLURGICAL REVIEW			
	1ST FLOOR - CANON NP-7550	0	0.15	$0.00
	1ST FLOOR - CANON NP-6650	0	0.15	0.00
	3RD FLOOR - CANON NP-8570	769	0.15	115.35
	3RD FLOOR - XEROX 1045	0	0.15	0.00
	4TH FLOOR - CANON 6650	158	0.15	23.70
	4TH FLOOR - MITA DC-313Z	0	0.15	0.00
	TOTAL CHARGES	927		$139.05

Dwarf Courier
June /90

	5113		216.63
150	E159	~~7500~~	35.75
50	F062	8E80	4.50
150	K525	8327	28.50
150	L032	8137	14.25
175	N884	EX10	11.00
101	P669	R500	26.75
401	R110		8.50
401	R380		8.00
101	R849	R500	3.25
101	T021	0200	7.50
150	T151	8137	15.00
150	T171	8137	33.00
401	T680		5.00
961	J21E		7.50
101	V011	0200	7.25 ✓
101	V441	R500	17.10
101	V591	~~V801~~ V810	3.75
106	V921	0900	7.00
401	V990		10.50
401	W420		8.00
401	W430		8.00
401	W380		14.75
401	X500		7.25
103	0393	Gord Douglas	3.75
961	J21E		3.75
	Suite 600		14.50
101			
			$783.73

027

0130—H.P

dwarf COURIER

(Division of RICHMOND dwarf COURIER LTD.)

Small in Name — **BIG IN RELIABILITY!**

150-2981 Simpson Rd.
Richmond, B.C.
V6X 2R2
Dispatch: 278-1935
Admin: 278-8044

INVOICE

TO:

COMINCO ENGINEERING
100-1200 WEST 73RD.,
VANCOUVER, B.C.
V6P 6G5

INVOICE NO.	
C140630	
INVOICE DATE	ACCOUNT NO.
06/30/90	C14

TERMS: NET 15 DAYS - 2% CHARGED ON ALL OVERDUE ACCOUNTS.

TRANSACTION DATE	INVOICE NO.	DESCRIPTION	AMOUNT	BALANCE
06/30/90	C140630	138 WAYBILLS	783.73	783.73

AGE	CURRENT	30 DAYS	60 DAYS	90 DAYS	TOTAL
AMOUNT	783.73	0.00	0.00	0.00	783.73

dwarf COURIER

(Division of RICHMOND dwarf COURIER LTD.)

150 - 2981 Simpson Rd.
Richmond, B.C.
V6X 2R2

REMITTANCE STUB 07004

AMOUNT REMITTED ______

INVOICE NO.	
C140630	
INVOICE DATE	ACCOUNT NO.
06/30/90	C14

PLEASE CHECK INDIVIDUAL INVOICES PAID.

INVOICE NO.	AMOUNT DUE	✓
C140630	783.73	
BALANCE DUE	TOTAL	
	783.73	

dwarf COURIER

(Division of RICHMOND dwarf COURIER LTD.)

Dispatch: 278-1935
Admin: 278-8044

WAYBILL NO. 287904

SMALL IN NAME
BIG IN RELIABILITY

MONTH	DAY	YEAR
06	27	90

FROM: PREPAID ☒
COMINCO ENGINEERING 8011
100-1200 WEST 73RD.,
VANCOUVER, B.C.
V6P 6G5 C14

TO: COLLECT ☐
North Coast Industries Ltd.
Suite 1270
600 West Hastings St.
Vancouver, B.C.
V6B 5A6 TEL.

THIRD PARTY CHARGE

HOT ☐ RUSH ☒ REG. ☐
N/D ECONO ☐ RETURN ☐ CONTRACT ☐

ADVANCE CHARGE	
ADVANCE AMOUNT	
WAITING TIME	
WEIGHT CHARGE	
DELIVERY CHARGE	
RETURN CHARGE	
OTHER	
TOTAL	7.25

INSTRUCTIONS: 1 envelope

RE: V011

NO. OF PIECES: 1
WEIGHT: LBS. KGS.

SHIPPER:	TIME	DRIVER P/U	RECEIVED IN APPARENT GOOD ORDER (PLS. PRINT)	TIME	DRIVER DEL	RETURN RECEIVED IN APPARENT GOOD ORDER. (PLS. PRINT)	TIME	DRIVER DEL.
de Stegman	17:1	9	M YATES	1:11	9		A.M. P.M.	

IMPORTANT: MAXIMUM LIABILITY OF CARRIER IS $4.41 PER KG. OR $50.00 PER SHIPMENT. ALL CLAIMS MUST BE SUBMITTED WITHIN 30 DAYS OF SHIPMENT. PLEASE REFER TO TERMS AND CONDITIONS ON REVERSE SIDE.

OFFICE COPY

CASH ☐ CHEQUE ☐

Cominco Engineering Services Ltd.

100 - 1200 West 73rd Ave., Vancouver, B.C., Canada V6P 6G5 / Tel. (604) 264-5500 / Telex 04-55357 / Fax (604) 264-5555

September 17, 1990

North Coast Industries Ltd.
1270 - 601 West Hastings Street
Vancouver, B.C.
V6B 5A6

Attention: Dave Copeland

Dear Sir:

Re: Bisset Creek Metallurgical Testwork

Please find enclosed our August, 1990 invoice with respect to the above mentioned project:

August Invoice #08-CECV011 $ 2,588.13

Should you have any questions, please call.

Regards,

G.R. Albright
Revenue and Project
Accounting Manager

GRA/cjb

Encl.

Cominco Engineering Services Ltd.

Invoice No. 08-CECV011

Date 90-09-11

Accounting Inquiries

Phone - (604) 264-5525

Technical Inquiries

Name - VCR:HM BOLU

Phone - (604) 264-5596

Reference No.

NORTH COAST INDUSTRIES LTD.
1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C.
V6B 5A6

ATTENTION: DAVE COPELAND

AUGUST, 1990 EXPENDITURES AS ATTACHED

CEC.V01.1 - BISSET CREEK METALLURGICAL TESTWORK

PROFESSIONAL ENGINEERING SERVICES (SEE ATTACHMENT 1)	$2,450.25
REIMBURSABLES (SEE ATTACHMENT 2)	$137.88
TOTAL THIS INVOICE	$2,588.13

Remit To — Suite 100 · 1200 West 73rd Avenue
Vancouver, B.C. V6P 6G5

Net 30 Days

Interest Charged at 1½% Per Month on Overdue Accounts.

(18% Per Annum)

309

JS644 CUMULATIVE TIME DISTRIBUTION FOR AUG , ENDING 90/08/31 ATTACHMENT 1

CECV01-1 BISSET CK METALLURGICAL TESTWORK P.O. NO:

CHARGE CODE	MAN NO.	NAME	REG HRS	OVT HRS	TOTAL HRS	CHARGE RATE	CHARGE AMOUNT	OVERTIME PREMIUM	TOTAL AMOUNT
METAL'L ENGINEERS									
V0110100	800303	HM BOLU	40.5		40.5	60.50	2,450.25		2,450.25
		ACTIVITY TOTALS	40.5		40.5		2,450.25		2,450.25
		CHARGE CODE TOTALS	40.5		40.5		2,450.25		2,450.25
		JOB TOTALS	40.5		40.5		2,450.25		2,450.25

CEC.V011 BISSET CK METALLURGICAL TESTWORK 90-09-11

REIMBURSABLES ATTACHMENT 2

JOB	CODE	SUPPLIER NAME	SUPPLIER INVOICE NUMBER	AMOUNT
V011	0200	DWARF COURIER LTD.	C140731	20.00
	0200	VCR COMP CHGES JULY/90	J/E 00027	116.08
	0200	VCR PHOTOCOPY - AUG/90	J/E 00077	1.80
			JOB TOTAL	$137.88

Richmond

File Note

File No. | By | Date
Persons Present
Subject

Dwarf Courier - July 1990

5113			190.70	
1150	CAP 1	0200	59.45	(E1598300)
1150	CAP 1	0200	52.50	(E1688240)
1150	KS2	8327	199.50	
1150	L032	8131	3.75	
1150	US61	0200	4.50	
1103	0393		3.75	(Douglas ")
1103	0389		3.25	(Novakowski ")
1103	0393		5.00	(Douglas ")
1103	0287		6.50	(Hamel ")
1103	0545		7.00	(Stegman ")
1103	0184		10.00	(Williams ")
1106	V921	0900	3.75	
5401	W380		10.00	
1101	V011	0200	20.00	
5401	M150		5.00	
1150	L032	8131	7.50	
1150	T171	8137	10.75	
5401	W480		3.25	
4961	J21E		15.50	
1101	P669	R500	5.00	
5401	R380		5.00	
5401	R110		21.95	
1101	R849	R500	4.50	
1150	T151	8137	3.25	
1150	U171	8131	11.00	

(Division of RICHMOND dwarf COURIER LTD.)

Small in Name — **BIG IN RELIABILITY!**

INVOICE 08005

INVOICE NO.	
C140731	
INVOICE DATE	ACCOUNT NO.
07/31/90	C14

TO:

COMINCO ENGINEERING
100-1200 WEST 73RD.,
VANCOUVER, B.C.
V6P 6G5

TERMS: NET 15 DAYS · 2% CHARGED ON ALL OVERDUE ACCOUNTS.

TRANSACTION DATE	INVOICE NO.	DESCRIPTION	AMOUNT	BALANCE
07/31/90	C140731	125		672.35

ORIGINAL INVOICE

CHECKS	GOODS/SERVICE RECEIVED	PRICE	TAXES	EXTENSION

G.L	JOB #	PCIS	AMOUNT
See Attached			

APPROVAL

PAY DATE:

RECEIVED AUG 10 1990

AGE	CURRENT	30 DAYS	60 DAYS	90 DAYS	TOTAL
AMOUNT	672.35	0.00	0.00	0.00	672.35

...patch: 278-19...
Admin: 278-8044

...COURIER

(Division of RICHMOND dwarf COURIER LTD.)

MONTH	DAY	YEAR
7	31	90

BIG IN RELIABILITY

FROM: PREPAID ☒	TO: COLLECT ☐	ADVANCE CHARGE	
COMINCO ENGINEERING	North Coast Industries Ltd.	ADVANCE AMOUNT	
100-1200 WEST 73RD.,	1270-601 W. HASTINGS	WAITING TIME	
VANCOUVER, B.C.	VANCOUVER BC		
V6P 6G5 C14	TEL.	WEIGHT CHARGE	
THIRD PARTY CHARGE	HOT ☒ RUSH ☐ REG. ☐	DELIVERY CHARGE	
	N/D ECONO ☐ RETURN ☐ CONTRACT ☐	RETURN CHARGE	
INSTRUCTIONS: 1 Envelope	NO. OF PIECES: 1 / WEIGHT LBS. KGS.	OTHER	
RE: ~~801~~ ~~KDW~~ 1101 VØ11 0200		TOTAL	10.00

SHIPPER	TIME	DRIVER P/U	RECEIVED IN APPARENT GOOD ORDER. (PLS. PRINT)	TIME	DRIVER DEL.	RETURN RECEIVED IN APPARENT GOOD ORDER. (PLS. PRINT)	TIME	DRIVER DEL.
M Jones	3:30	8		4:50	8		A.M. P.M.	

IMPORTANT. MAXIMUM LIABILITY OF CARRIER IS $4.41 PER KG. OR $50.00 PER SHIPMENT. ALL CLAIMS MUST BE SUBMITTED WITHIN 30 DAYS OF SHIPMENT. PLEASE REFER TO TERMS AND CONDITIONS ON REVERSE SIDE.

CASH ☐ CHEQUE ☐

OFFICE COPY

---

dwarf COURIER

(Division of RICHMOND dwarf COURIER LTD.)

Dispatch: 278-1935
Admin: 278-8044

WAYBILL NO. 287931

SMALL IN NAME
BIG IN RELIABILITY

MONTH	DAY	YEAR
07	09	90

FROM: PREPAID ☒	TO: COLLECT ☐	ADVANCE CHARGE	
COMINCO ENGINEERING	NORTH COAST INDUSTRIES	ADVANCE AMOUNT	
100-1200 WEST 73RD.,	SUITE 1270	WAITING TIME	
VANCOUVER, B.C.	601 WEST HASTINGS ST.		
V6P 6G5 C14	VANCOUVER.		
	TEL.	WEIGHT CHARGE	
THIRD PARTY CHARGE	HOT ☑ RUSH ☐ REG. ☐	DELIVERY CHARGE	
	N/D ECONO ☐ RETURN ☐ CONTRACT ☐	RETURN CHARGE	
INSTRUCTIONS	NO. OF PIECES / WEIGHT LBS. KGS.	OTHER	
RE: VØ11		TOTAL	$ 10.00

SHIPPER	TIME	DRIVER P/U	RECEIVED IN APPARENT GOOD ORDER. (PLS. PRINT)	TIME	DRIVER DEL.	RETURN RECEIVED IN APPARENT GOOD ORDER. (PLS. PRINT)	TIME	DRIVER DEL.
M Mulholland				4:45	12		A.M. P.M.	

IMPORTANT. MAXIMUM LIABILITY OF CARRIER IS $4.41 PER KG. OR $50.00 PER SHIPMENT. ALL CLAIMS MUST BE SUBMITTED WITHIN 30 DAYS OF SHIPMENT. PLEASE REFER TO TERMS AND CONDITIONS ON REVERSE SIDE.

3:25

CASH ☐ CHEQUE ☐

OFFICE COPY

COMINCO ENGINEERING LTD.
COMPUTER USAGE INVOICE (SUMMARY FORM)

VANCOUVER
JULY 1990

	USER	TOTAL TIME	RATE/HR.	CHARGES
ACHINE No. 8059	SECRETARIAL STATION SEW800188	0:22	5.00	$ 1.83
OTAL MACHINE 8059		0:22		$ 1.83
ACHINE No. 8065	SEW800188	22:51	5.00	$ 114.25
OTAL MACHINE 8065		22:51		$ 114.25
OTALS FOR PROJECT V01F		23:13		$ 116.08

COMINCO ENGINEERING SERVICES LTD.
PHOTOCOPY USAGE CHARGES
AUGUST 1990

USER ID.	JOB NUMBER	COPIES MADE	RATE	AMOUNT CHARGED
8011	V011 BISSET CREEK METALLURGICAL REVIEW			
	1ST FLOOR - CANON NP-7550	0	0.15	$0.00
	1ST FLOOR - CANON NP-6650	0	0.15	0.00
	3RD FLOOR - CANON NP-8570	0	0.15	0.00
	3RD FLOOR - XEROX 1045	0	0.15	0.00
	4TH FLOOR - CANON 6650	12	0.15	1.80
	4TH FLOOR - MITA DC-313Z	0	0.15	0.00
	TOTAL CHARGES	12		$1.80

NORTH COAST I[illegible]USTRIES LTD.
PRICE WATERHOUSE CENTRE
#1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 5A6

1318

Sept 1 19 90

PAY TO THE ORDER OF Cominco Engineering Services $ 8000.00

eight thousand dollars —— xx/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTH COAST INDUSTRIES LTD.

FOR Payment on June work

PER [signature] [signature]

⑈001318⑈ ⑆08120⑉001⑆ 1239⑉102⑈ ⑈0000800000⑈

SE '90 04
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE
07990-001

27270-001
Bank of Montreal
SEP 04 1990
67th & Granville
Vancouver, B.C.
27270-001
27

FOR DEPOSIT ONLY
TO THE CREDIT OF
COMINCO ENGINEERING SERVICES LTD.

NC H COAST INDUSTRIES LTD.
,00 - 1177 WEST HASTINGS STREET
VANCOUVER, BC V6E 2K3
PHONE 681-0799

0132

May 6 19 91

PAY TO THE ORDER OF Cominco Engineering Services Ltd. $ 12,500.00

Twelve thousand and five hundred —— xx/100 DOLLARS

RE: balance of account

NORTH COAST INDUSTRIES LTD.

PER

PER

Bank of Montreal
VANCOUVER MAIN OFFICE
FIRST BANK TOWER, 595 BURRARD ST.
VANCOUVER, B.C. V7X 1L7

⑈000132⑈ ⑆00040⑉001⑆ 1251⑉893⑈ ⑈0001250000⑈

MY '91 13
DATA CENTRE

25 Vancouver, B.C. 67th & Granville
MAY 13 1991
Bank of Montreal
27270-001

MAY 13 91

FOR DEPOSIT ONLY TO THE CREDIT OF
COMINCO ENGINEERING SERVICES LTD.
07860-001

INVOICE

№ 14976

ORTECH
INTERNATIONAL
2395 Speakman Drive
Mississauga, Ontario L5K 1B3
(416) 822-4111
Telefax (416) 823-1446

ISSUED TO North Coast Industries Ltd.
200 Granville St.
Suite 1575
Vancouver, B.C.

Attn: David J. Copeland

DATE March 15, 1990

TERMS: PAYABLE UPON RECEIPT
1-1/2% PER MONTH ON PAST DUE ACCOUNTS

YOUR ORDER NUMBER	OUR REPORT NUMBER	DEPARTMENT
Signed Proposal	P-6226 CI	41-11318

Bench and Pilot Plant testing of Bissett Creek Deposit	$2,820.35

[illegible]

THIS IS A COPY OF THE INVOICE WHICH HAS BEEN FORWARDED DIRECTLY TO YOUR ACCOUNTS PAYABLE DEPT.

PLEASE PAY FROM THIS INVOICE — NO STATEMENT SENT

COPIES. WHITE & BLUE: Customer · GREEN & CANARY: Accounting · PINK & GOLD: Department
(A Division of ORTECH Corporation)

NORTHCOAST INDUSTRI... LTD.
1270 - 601 WEST HASTING... .REET
VANCOUVER, B.C. V6B 5A6

0024

March 25 19 90

PAY TO THE ORDER OF Optech International $ 2820.35

twenty eight hundred & twenty dollars — 35/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTHCOAST INDUSTRIES LTD.

PER

PER

FOR 14976

⑈000024⑈ ⑆08120⑉001⑆ 1243⑉347⑈ ⑈0000282035⑈

MAR 29 1990

TOR ONT.

MR '90 29
BANK OF MONTREAL
TORONTO REGIONAL
DATA CENTER

04962-001

00422-010

ORTECH
INTERNATIONAL
2395 Speakman Drive
Mississauga, Ontario L5K 1B3
(416) 822-4111 (800) 268-5390
Telefax (416) 823-1446

INVOICE

№ 14357

ISSUED TO North Coast Industries Ltd.
200 Granville st.
Suite 1575
Vancouver, B.C.

Attn: David J. Copeland

DATE February 15, 1990

TERMS: PAYABLE UPON RECEIPT
1-1/2% PER MONTH ON PAST DUE ACCOUNTS

YOUR ORDER NUMBER	OUR REPORT NUMBER	DEPARTMENT
Signed Proposal	P-6226 CI	41-11318

Bench and Pilot Plant testing of Bissett Creek deposit ore

Advance payment	9,500.00	
inv. 14357	20,324.60	
Amount due	10,824.60	$20,324.60

Arlene
Ext 273

THIS IS A COPY OF THE INVOICE WHICH HAS BEEN FORWARDED DIRECTLY TO YOUR ACCOUNTS PAYABLE DEPT.

PLEASE PAY FROM THIS INVOICE – NO STATEMENT SENT

COPIES WHITE & BLUE Customer GREEN & CANARY Accounting PINK & GOLD: Department
(A Division of ORTECH Corporation)

ORTECH
INTERNATIONAL
2395 Speakman Drive
Mississauga, Ontario L5K 1B3
(416) 822-4111
Telefax (416) 823-1446

INVOICE
№ 16329

ISSUED TO North Coast Industries ltd.
601 West Hasting St.
Suite 1270
Vancouver, B.C.
B6B 5A6

DATE April 24, 1990

TERMS: PAYABLE UPON RECEIPT
1-1/2% PER MONTH ON PAST DUE ACCOUNTS

YOUR ORDER NUMBER	OUR REPORT NUMBER	DEPARTMENT
		41-11318

CREDIT NOTE

To adjust invoice #14357 dated February 15, 1990 ($3,060.95) CREDIT

Invoice 14357	10,824.60
Cr. note	3,060.95
Balance owing	7,763.65

PLEASE PAY FROM THIS INVOICE – NO STATEMENT SENT

COPIES WHITE & BLUE: Customer GREEN & CANARY: Accounting PINK & GOLD: Department
(A Division of ORTECH Corporation)

NORTHCOAST INDUS[illegible]ES LTD.
1270 - 601 WEST HASTI[illegible]S STREET
VANCOUVER, B.C. V6B 5A6

✓ 0003

Jan 29 19 90

PAY TO THE ORDER OF Ortech Corporation $ 9500.00

ninety five hundred dollars —— xx/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTHCOAST INDUSTRIES LTD.

PER M Varley

PER L Zoyly

FOR Samples Processing

⑈000003⑈ ⑆08120⑉001⑆ 1243⑉347⑈ ⑈0000950000⑈

FB '90 02
[illegible]K OF MONTREAL
[illegible]ONTO REGIONAL
DATA CENTER
04962-001

NORTHCOAST INDUSTRIES LTD.
1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 5A6

0032

May 8 1990

PAY TO THE ORDER OF Optech International $7763.65

seven thousand seven hundred & sixty three 65/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTHCOAST INDUSTRIES LTD.

PER

PER

FOR #16329

⑈000032⑈ ⑆08120⑉001⑆ 1243⑉347⑈ ⑈0000776365⑈

MY '90 11
C.I.B.C.
DATA CENTRE
TOR. ONT.

MY '90 11
BANK OF MONTREAL
TORONTO REGIONAL
DATA CENTER
04962-001

ORTECH
INTERNATIONAL
2395 Speakman Drive
Mississauga, Ontario L5K 1B3
(416) 822-4111
Telefax (416) 823-1446

INVOICE
№ 17111

ISSUED TO North Coast Industries Ltd.
1270-601 West Hastings Street
Vancouver, B.C.
V6B 5A6

Attn: Mr. H. Forzley
President

DATE June 21, 1990

TERMS: PAYABLE UPON RECEIPT
1-1/2% PER MONTH ON PAST DUE ACCOUNTS

YOUR ORDER NUMBER	OUR REPORT NUMBER	DEPARTMENT
		41-23011

For services rendered re:

Testing Bisset Creek Graphite for Exfoliation $5,000.00 | $5,000.00

PLEASE PAY FROM THIS INVOICE – NO STATEMENT SENT

COPIES: WHITE & BLUE: Customer · GREEN & CANARY: Accounting · PINK & GOLD: Department
(A Division of ORTECH Corporation)

NORTHCOAST INDUSTP'¨S LTD.
1270 - 601 WEST HASTIN STREET
VANCOUVER, B.C. V6B 5A6

0045

July 6 1990

PAY TO THE ORDER OF Optech International $5000.00

five thousand dollars —— xx/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTHCOAST INDUSTRIES LTD.
PER
PER

FOR 17111

⑈000045⑈ ⑆08120⑉001⑆ 1243⑉347⑈ ⑈0000500000⑈

SHERIDAN CORPORATE CENTRE
JUL 9 1990
BANK OF COMMERCE

JY '90 09
C.I.B.C.
DATA CENTRE
TORONTO

JY '90 09
BANK OF MONTREAL
TORONTO REGIONAL
DATA CENTER
04962-001

INVOICE

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED
Box 430, 185 Concession St., Lakefield, Ontario K0L 2H0
one: (705) 652-3341
Telex No. 06 962842
Fax No. (705) 652-6365

No.: C 03235

DATE January 11, 1990

SENT TO: Mr. D. Coupland

North Coast Industries Ltd.
1201-601 West Hastings St., Price Waterhouse
Vancouver, B. C., V6B 5A6

Our Certificate Of Analysis Number(s): 5235
Our Reference Number: 9033488
Number of Samples: RE: 9 Samples for Carbon total and graphitic

Analytical Cost

Qty.	Symbol	Element	Unit Price	Assay Cost
9	C(T) %	1-Carbon Total	$10.00	$90.00
9	C(G) %	1-Carb. Graphitic	$18.00	$162.00

Additional Costs.	$252.00	
% Discount	$0.00	
Net Cost	$252.00	$252.00
Extras		$252.00
Less Advance Payment:		
Invoice Amount		$252.00

Sample Preparation:
Pulverizing:
Long Dist.Phone:
Telex:
Facsimile:
Courier/Spec.Del.:
Freight:
Custom/Broker:
Storage:
hrs:@ :
Extras

PLEASE PAY BY INVOICE —Terms: Net 30 days. 2% service charge per month on overdue accounts

INVOICE

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED
P.O. Box 430, 185 Concession St., Lakefield, Ontario K0L 2H0
Phone: (705) 652-3341
Telex No. 06 962842
Fax No. (705) 652-6365

No.: C 03278

DATE January 24, 1990

SENT TO: Mr. D. Coupland

North Coast Industries Ltd.
1201-601 West Hastings St., Price Waterhouse
Vancouver, B. C., V6B 5A6

Our Certificate Of Analysis Number(s): 5308
Our Reference Number: 9033551
Number of Samples:

Analytical Cost

Qty.	Symbol	Element	Unit Price	Assay Cost
6	C(T) %	1-Carbon(Total)	$10.00	$60.00
6	C(g) %	1-Carb(Graphitic)	$18.00	$108.00
				$168.00

Additional Costs.

Sample Preparation:	
Pulverizing:	
Long Dist.Phone:	
Telex:	
Facsimile:	
Courier/Spec.Del.:	
Freight:	
Custom/Broker:	
Storage:	
hrs: @	
Extras	

% Discount	$0.00	
Net Cost	$168.00	$168.00
Extras		$168.00
Less Advance Payment:		
Invoice Amount		$168.00

PLEASE PAY BY INVOICE — Terms: Net 30 days. 2% service charge per month on overdue accounts

INVOICE

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED
P.O. Box 430, 185 Concession St., Lakefield, Ontario KOL 2HO
Phone: (705) 652-3341
Telex No. 06 962842
Fax No. (705) 652-6365

No.: C 03707

DATE April 23, 1990

SENT TO: Mr. D. Coupland

North Coast Industries Ltd.
Suite 1270-601 West Hastings St.,
Vancouver, B. C., V6B 5A6

Our Certificate Of Analysis Number(s): 5763, 5764
Our Reference Number: 9034116
Number of Samples: RE: Bissett Creek Project

Analytical Cost

Qty.	Symbol	Element	Unit Price	Assay Cost
130	C(g) %	1-Graphitic Carb.	$12.00	$1560.00

Bissett
F lw Tk.
ok DC

Additional Costs. $1560.00

Sample Preparation:		
Pulverizing:	$390.00	130 x 3.00 pulverizing
Long Dist.Phone:		
Telex:		
Facsimile:		
Courier/Spec.Del.:		
Freight:		
Custom/Broker:		
Storage:		
hrs:@ :		
Extras	$390.00	

% Discount	$0.00	
Net Cost	$1560.00	$1560.00
Extras	$390.00	$1950.00
Less	Advance Payment:	
Invoice Amount		$1950.00

PLEASE PAY BY INVOICE — Terms: Net 30 days. 2% service charge per month on overdue accounts

INVOICE

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED
P.O. Box 430, 185 Concession St., Lakefield, Ontario KOL 2HO
Phone: (705) 652-3341
Telex No. 06 962842
Fax No. (705) 652-6365

No.: C 04067

DATE August 8, 1990

SENT TO:

North Coast Industries Ltd.
Suite 1575, 200 Granville Street
Vancouver, B. C., V6C 1S4

Our Certificate Of Analysis Number(s): 10436
Our Reference Number: 9034788
Number of Samples: 16 samples for Graphitic Carbon

Analytical Cost

	Qty.	Symbol	Element	Unit Price	Assay Cost
9034788	16	C(g) %	1-Carb (graphitic)	12.00	$192.00
					$192.00

Additional Costs.

Sample Preparation:	$137.50	2.5 hrs. sample prep
Pulverizing:		
Long Dist.Phone:		
Telex:		
Facsimile:		
Courier/Spec.Del.:		
Freight:		
Custom/Broker:		
Storage:		
hrs: ● **:**		
Extras	$137.50	

% Discount	$0.00	
Net Cost	$192.00	$192.00
Extras	$137.50	$329.50
Less Advanced Payment		
Invoice Amount		$329.50

PLEASE PAY BY INVOICE — Terms: Net 30 days. 2% service charge per month on overdue accounts

INVOICE

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED
P.O. Box 430, 185 Concession St., Lakefield, Ontario K0L 2H0
Phone: (705) 652-3341
Telex No. 06 962842
Fax No. (705) 652-6365

No.: C 04080

DATE August 15, 1990

SENT TO:

R. M. Blais & Associates
P.O. Box 237
North Bay, Ontario P1B 8H2

Our Certificate Of Analysis Number(s): 10512
Our Reference Number: 9034840
Number of Samples: 2

Analytical Cost

	Qty.	Symbol	Element	Unit Price	Assay Cost
9034840	2	Cg %	1-Carb (graphitic)	18.00	$36.00
					$36.00

Additional Costs.

Sample Preparation:	$8.00
Pulverizing:	
Long Dist.Phone:	
Telex:	
Facsimile:	
Courier/Spec.Del.:	
Freight:	
Custom/Broker:	
Storage:	
hrs:@	
Extras	$8.00

2 x 4.00 sample prep

% Discount	**$0.00**	
Net Cost	**$36.00**	**$36.00**
Extras	**$8.00**	**$44.00**
Less Advanced Payment		
Invoice Amount		**$44.00**

PLEASE PAY BY INVOICE — Terms: Net 30 days. 2% service charge per month on overdue accounts

NORTHCOAST INDUS IES LTD.
1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 5A6

✓ 0009

Feb 20 1990

PAY TO THE ORDER OF Lakefield Research

$ 420.00

four hundred & twenty dollars —xx/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTHCOAST INDUSTRIES LTD.

PER [signature]

PER L Longley

FOR 03278, 03235.

⑈000009⑈ ⑆08120⑉001⑆ 1243⑉347⑈ ⑈0000042000⑈

FB '90 27
C.I.B.C.
DATA CENTRE
TOR. ONT.

FEB 26 1990

FB '90 28
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE

FB '90 27
BANK OF MONTREAL
TORONTO REGIONAL
DATA CENTER

NORTHCOAST IN STRIES LTD.
1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 5A6

✓ 0031

May 22 19 90

PAY TO THE ORDER OF Lakefield Research $ 1950.00

nine teen hundred & fifty dollars xx/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTHCOAST INDUSTRIES LTD.

PER [signature]

PER [signature]

FOR

⑈000031⑈ ⑆08120⑉001⑆ 1243⑉347⑈ ⑈0000195000⑈

FOR DEPOSIT ONLY

CANADIAN IMPERIAL BANK OF COMMERCE
MAY 16 1990
LAKEFIELD, ONTARIO
04942-010

BANK OF MONTREAL
TORONTO REGIONAL DATA CENTER
04982-001

DATA CENTRE
TOR ONT.

NORTH COAST ' USTRIES LTD.
PRICE WATERHOUSE CENTRE
#1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 5A6

1320

Sept 7 19 90

PAY TO THE ORDER OF Lakefield Research $ 373.50

three hundred + seventy three ——— 50/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTH COAST INDUSTRIES LTD.

PER

FOR C04067 C04080

⑈001320⑈ ⑆08120⑉001⑆ 1239⑉102⑈ ⑈0000037350⑈

04012-010
CANADIAN IMPERIAL BANK OF COMMERCE
LAKEFIELD, ONT.
SEP 11 1990

FOR DEPOSIT ONLY TO THE CREDIT OF
LAKEFIELD RESEARCH
(A DIVISION OF FALCONBRIDGE LTD.)
CANADIAN IMPERIAL BANK OF COMMERCE

SE '90 11
C.I.B.C.
DATA CENTRE
TOR. ONT.

SE 90 12
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE

Table 3 **Graphite percentages per Size Fraction**
(Summary of Table 2)

	Size fractions (mm)								
	<0.07	<0.12	<0.2	<0.3	<0.5	<0.7	<1.0	<1.3	>1.3
#2	0.22	2.5	5.5	11.2	27.2	26.3	16.9	10.2	-
#1Com	0.39	2.9	6.8	16.6	22.5	20.3	12.7	14.5	3.3
#2Com	0.19	1.4	3.2	8.6	17.3	26.7	21.1	13.2	8.3
#8	0.05	0.8	2.9	9.1	18.4	24.8	18.2	18.1	7.7

Note: total for each sample is between 99.95 and 100.05%

Conclusions:

1. A reasonable correlation exists between assay values of graphite and the total volume of graphite in each sample. However, because of the lack of control on the traverse density, such values are semi-quantitative.

2. The samples with a higher graphite content have a moderately coarser grain size. This is particularly evident in the grains above 1.3 mm in size, which are more abundant in the higher-grade samples, and in grains below 0.5 mm in size, which are moderately to strongly more abundant in the lower grade samples.

3. The lower-grade samples have a modal flake length of 0.5 mm (0.3-0.5 mm and 0.5-0.7 mm values are about the same), whereas the higher-grade samples have a modal flake length of 0.5-0.7 mm. Thus the main difference between the high and low grade samples is the greater abundance of coarse flakes in the high-grade samples, which have a strong influence on the total volume percentages.

4. Because of the varying orientation of flakes with respect to the section, it is difficult to determine whether the width of the flakes is an important feature geologically, or whether much of the variation in width depends on orientation of flakes with respect to the plane of the section.

John G. Payne
604-986-2928

APPENDIX III

Bench-Scale Flotation

TESTWORK PROCEDURE

Test No: M90-088 F7 Date: Jan 29/90

Purpose: Initial flotation test. Copy procedure from previous investigation.
1)Increase percent solids of rougher flotation to 40%.
2)Include 48 and 100 mesh screening of graphite conc.
3)Include gravity concentration of +48 # graphite conc.

(Composite 1)

STAGE	TIME (Minutes)	ADDITIONS	
		g/tonne	REAGENT
Grind: 2 x 2 kg charge (Target: 95-98% -800 microns)	4.5		1/2 regular rod charge 50-60% solids
			pH= 7.6
Condition (Using DENVER Sub-A machine)	5	150	40% solids EKOF 452 G
Rougher	10		
Condition	2	15	EKOF 452 G
Scavenger (to barren tail)	4		pH= 8.2
1st Cleaner	9.5		
Condition	1	15	EKOF 452 G
1st Cleaner Scavenger	0.5		
2nd Cleaner	8.5		
Condition	1	15	EKOF 452 G
2nd Cleaner Scavenger	0.5		

TESTWORK PROCEDURE

Test No: M90-088 F7 Date: Jan 29/90

Purpose: Initial flotation test. Copy procedure from previous investigation.

1)Increase percent solids of rougher flotation to 40%.

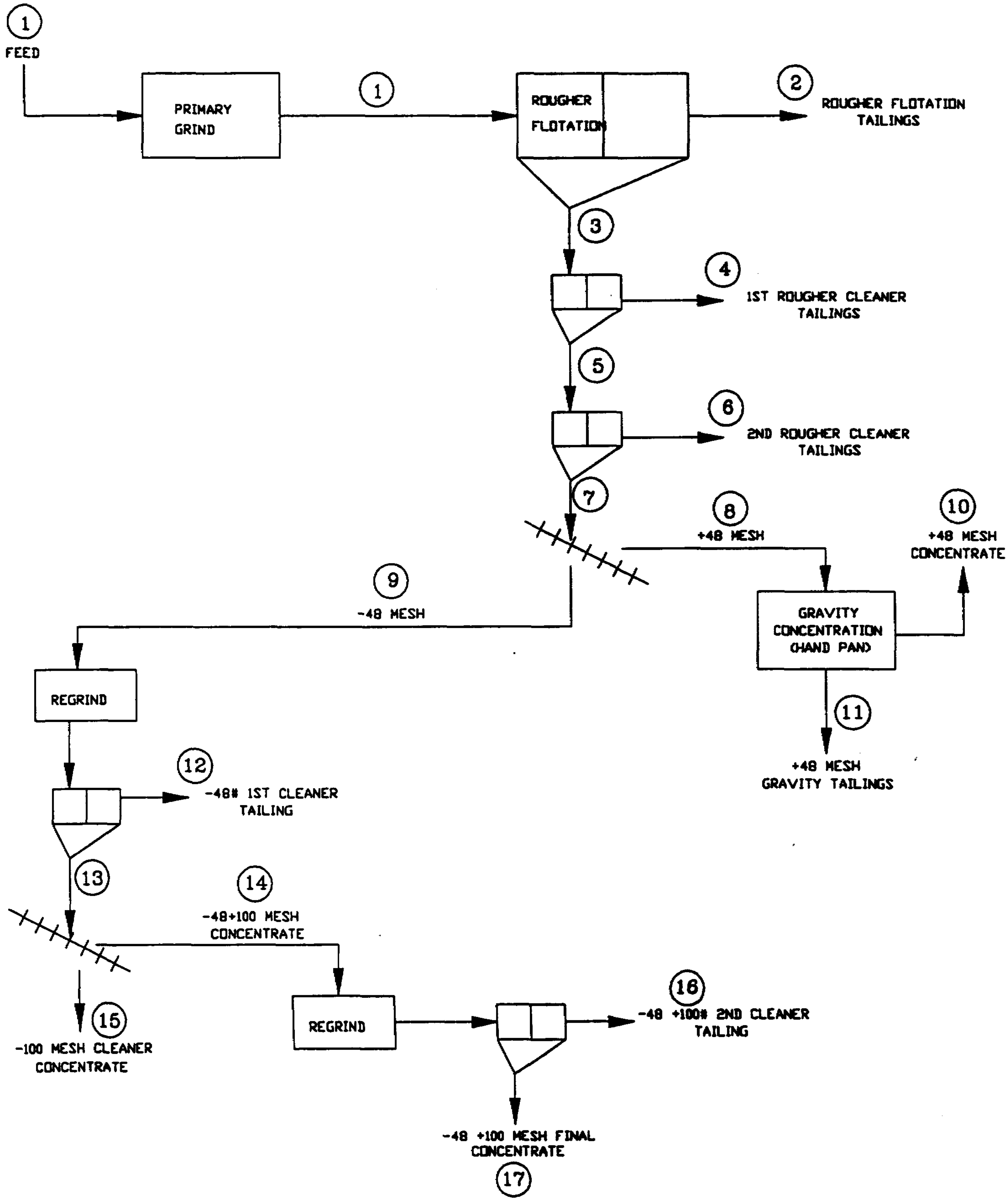
2)Include 48 and 100 mesh screening of graphite conc.

3)Include gravity concentration of +48 # graphite conc.

(Composite 1)

STAGE	TIME (Minutes)	ADDITIONS	
		g/tonne	REAGENT
Screening:			
Wet Screen Graphite 2nd Cleaner Concentrate at 48 mesh			
Gravity Concentration:			
Hand Panning			+ 48 mesh graphite conc
Cleaning Flotation (Cont'd):			- 48 mesh grahite conc
Regrind (25 - 30% solids) (Ceramic mill & media)	30 sec		
3rd Cleaner	5		
Condition	1	15	EKOF 452 G
3rd Cleaner Scavenger	2		
Screening:			
Wet Screen Graphite 3rd Cleaner Concentrate at 100 mesh			
Cleaning Flotation (Cont'd):			- 48 + 100 mesh grahite conc
Regrind (25 - 30% solids) (Ceramic mill & media)	30 sec		(ie. Screened 3rd cleaner conc)
4th Cleaner	5		
Condition	1	15	EKOF 452 G
4th Cleaner Scavenger	2		

Bench-Test F7



TEST NUMBER: M90-088 F7

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	% DIST C
10)+48# Gravity Conc	34.3	0.78	88.60	30.33
11)+48# Gravity Tails	55.4	1.27	54.41	30.08
8)+48# 2ND RO CL CONC	89.7	2.05	67.48	60.41
17)-48+100# Final Conc	28.4	0.65	67.36	19.08
16)-48+100# 2nd Cl Tails	1.9	0.04	2.96	0.06
14)-48+100# 1ST CL CONC	30.3	0.69	63.29	19.13
15)-100# Cl Conc	18.4	0.42	73.33	13.48
13)-48# 1ST CL CONC	48.7	1.11	67.09	32.61
12)-48# 1st Cl Tails	4.9	0.11	1.88	0.09
9)-48# 2ND RO CL CONC	53.6	1.23	61.13	32.71
7)2ND ROUGHER CL CONC	143.3	3.28	65.10	93.12
6)2nd Rougher Cl Tails	13.9	0.32	2.14	0.30
5)1ST ROUGHER CL CONC	157.2	3.60	59.54	93.41
4)1st Rougher Cl Tails	56.6	1.30	1.38	0.78
3)TOTAL ROUGHER CONC	213.8	4.89	44.14	94.19
2)Final Rougher Tails	4155.8	95.11	0.14	5.81
1)CALCULATED FEED	4369.6	100.0	2.29	100.00
ASSAY HEAD			2.45	

TEST NUMBER: M90-088 F7

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	UNITS C
10)+48# Gravity Conc	34.3	0.78	88.60	69.54
11)+48# Gravity Tails	55.4	1.27	54.41	68.98
8)+48# 2ND RO CL CONC	89.7	2.05	67.48	138.52
17)-48+100# Final Conc	28.4	0.65	67.36	43.75
16)-48+100# 2nd Cl Tails	1.9	0.04	2.96	0.13
14)-48+100# 1ST CL CONC	30.3	0.69	63.29	43.88
15)-100# Cl Conc	18.4	0.42	73.33	30.91
13)-48# 1ST CL CONC	48.7	1.11	67.09	74.79
12)-48# 1st Cl Tails	4.9	0.11	1.88	0.21
9)-48# 2ND RO CL CONC	53.6	1.23	61.13	75.0
7)2ND ROUGHER CL CONC	143.3	3.28	65.10	213.5
6)2nd Rougher Cl Tails	13.9	0.32	2.14	0.68
5)1ST ROUGHER CL CONC	157.2	3.60	59.54	214.20
4)1st Rougher Cl Tails	56.6	1.30	1.38	1.79
3)TOTAL ROUGHER CONC	213.8	4.89	44.14	215.99
2)Final Rougher Tails	4155.8	95.11	0.14	13.31
1)CALCULATED FEED	4369.6	100.0	2.29	229.30
ASSAY HEAD			2.45	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 F7 HEAD

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 20	1.21	98.79
- 20 + 28	4.42	94.37
- 28 + 48	32.76	61.60
- 48 + 65	16.43	45.17
- 65 + 100	13.63	31.54
- 100 + 150	9.80	21.74
- 150 + 200	7.37	14.37
- 200 + 325	5.92	8.45
- 325 + 400	0.59	7.86
- 400	7.86	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 F7 - R0 TLS

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	3.34	96.66
- 28 + 48	32.83	63.83
- 48 + 100	29.23	34.60
- 100 + 200	17.04	17.56
- 200	17.56	

TEST NUMBER: M90-088 F7-Ro Tails				
PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	% DIST C
+28 mesh	4.68	3.39	0.41	10.14
+48 mesh	45.89	33.25	0.17	41.21
+100 mesh	40.85	29.60	0.08	17.26
+200 mesh	23.81	17.25	0.02	2.52
-200 mesh	22.78	16.51	0.24	28.88
CALC HEAD	138.01	100.0	0.14	100.00

TEST NUMBER: M90-088 F7-Ro Tails

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	UNITS C
+28 mesh	4.68	3.39	0.41	1.39
+48 mesh	45.89	33.25	0.17	5.65
+100 mesh	40.85	29.60	0.08	2.37
+200 mesh	23.81	17.25	0.02	0.35
-200 mesh	22.78	16.51	0.24	3.96
CALC HEAD	138.01	100.0	0.14	13.72

TESTWORK PROCEDURE

Test No: M90-088 F7 Date: Feb 13/90

Purpose: Scavenger flotation on coarse fraction (+48 mesh) of F7 Rougher Tailings:
-to determine if scavenging is worthwhile

(COMPOSITE 1)

STAGE	TIME (Minutes)	ADDITIONS lb/ton	REAGENT	
48 Mesh Screening:			F7 Rougher Tails	
Regrind:			+48 mesh fraction	
Regrind	3		Rod Mill (1/2 rod charge)	
Flotation:				
Condition	5	150	EKOF 452 G	pH=7.1
Rougher	4			
Condition	2	15	EKOF 452 G	
Scavenger	1			pH=7.2

TEST NUMBER: M90-088 F7 Scavenger (+48 mesh Rougher Tails)

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	% DIST C
Scavenger Conc	11.3	0.63	8.21	30.62
Scavenger Tail	871.5	48.69	0.16	46.02
+48 MESH ROUGHER TAIL	882.8	49.32	0.26	76.65
-48 mesh Rougher Tail	907.0	50.68	0.08	23.35
CALC ROUGHER TAIL	1789.8	100.0	0.17	100.00
ASSAY ROUGHER TAIL			0.16	

TEST NUMBER: M90-088 F7 Scavenger (+48 mesh Rougher Tails)

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	UNITS C
Scavenger Conc	11.3	0.63	8.21	5.184
Scavenger Tail	871.5	48.69	0.16	7.791
+48 MESH ROUGHER TAIL	882.8	49.32	0.26	12.974
-48 mesh Rougher Tail	907.0	50.68	0.08	3.953
CALC ROUGHER TAIL	1789.8	100.0	0.17	16.927
ASSAY ROUGHER TAIL			0.16	

ASSAY VALUES

SAMPLE	C(g)%
A	3.06
B	3.23
C	3.07
D	2.94
E	3.60
AVG.	3.18

SAMPLE	C(g)%
010	3.31
011	2.97
012	3.48
013	2.61
014	2.64
015	2.87
AVG.	2.98

SAMPLE	C(g)%
021 (EAST)	3.25
022 (WEST)	3.41
023 (NORTH)	2.84
024 (SOUTH)	3.60
AVG.	3.28

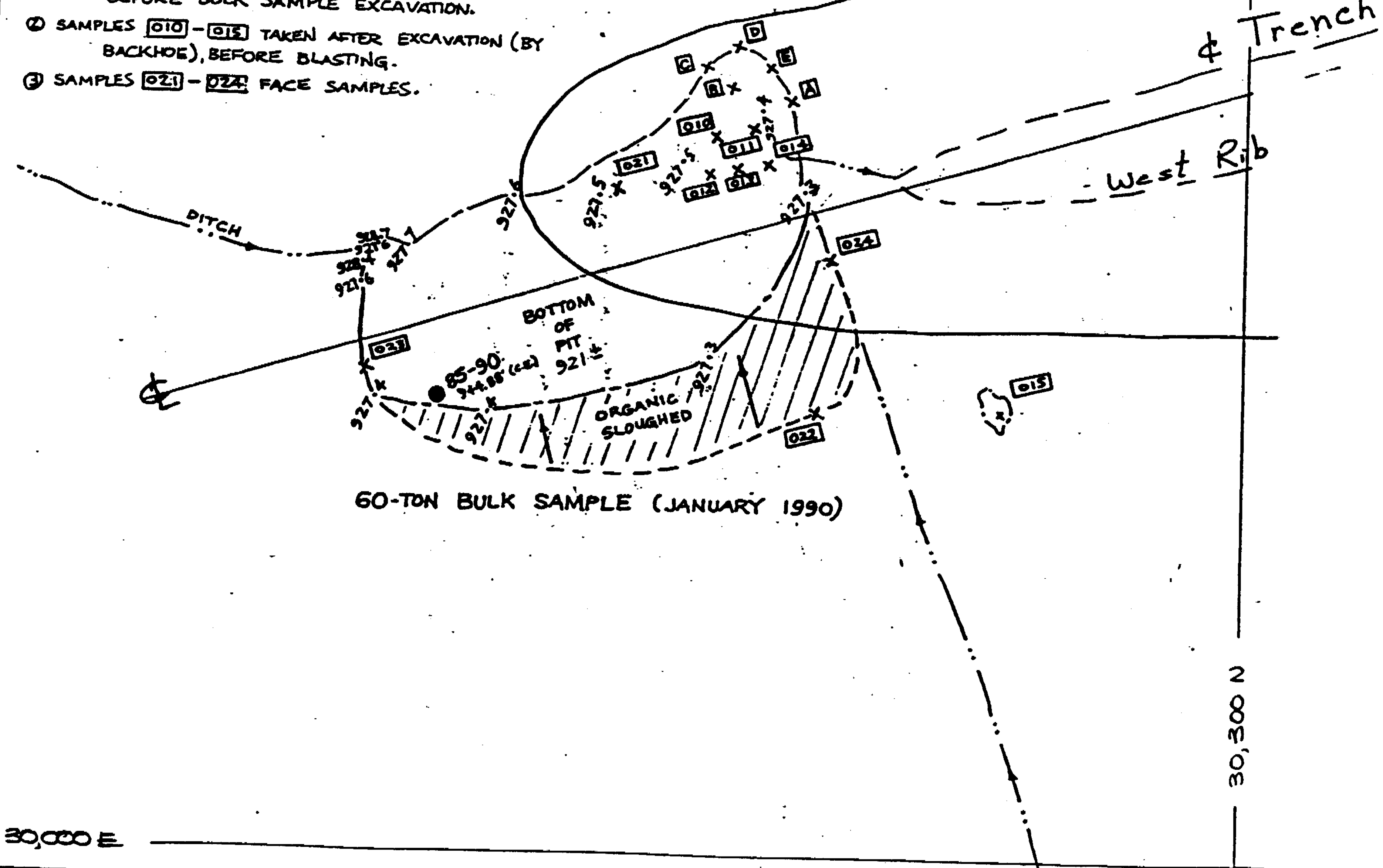
AVG. OF ALL SAMPLES = 3.15

NOTE:

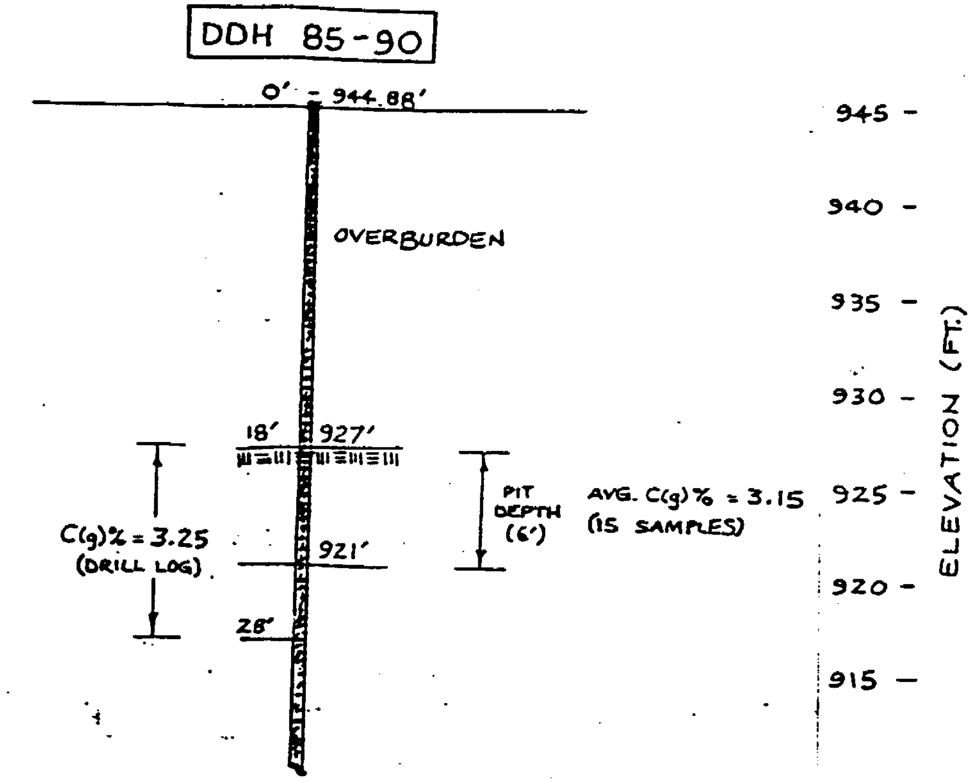
① SAMPLES A – E TAKEN @ BOTTOM EXISTING TRENCH BEFORE BULK SAMPLE EXCAVATION.

② SAMPLES 010 – 015 TAKEN AFTER EXCAVATION (BY BACKHOE), BEFORE BLASTING.

③ SAMPLES 021 – 024 FACE SAMPLES.



60-TON BULK SAMPLE (JANUARY 1990)



R.M. Blais & Associates Ltd.
C.E.C. Engineering Ltd.

North Coast Industries Ltd.

60–TON Bulk Sample Location

BISSETTE CK. GRAPHITE PROJECT
MARIA TWP., ONTARIO

Date: April, 1990	Dwg. No.:
Scale: 1 inch = 10 feet	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 F7 +48 Final Tails (Scavenger Head)

Ground 3 min at 60 solids

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	0.60	99.40
- 28 + 48	35.11	64.29
- 48 + 65	30.15	34.14
- 65 + 100	13.71	20.43
- 100 + 150	7.40	13.03
- 150 + 200	4.42	8.61
- 200 + 325	3.51	5.10
- 325 + 400	0.28	4.82
- 400	4.82	

TESTWORK PROCEDURE

Test No: M90-088 F8   Date: Feb 9/90

Purpose: As F7: 1)Increase size of test to 24 kg feed.
2)Screen 2nd cleaner conc into: 28, 48, 100, 200 mesh.
3)Assay and hold 2nd cleaner conc size fractions.

(COMPOSITE 2)

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Grind: 24 kg charge	2.5		1/2 regular rod charge
(Target: 95-98% -800 microns)			Large batch rod mill
			50-60% solids
Flotation:			
(float in 2 x 12 kg stages)			pH= 7.3
Condition	5		40% solids
(Using 1 cubic foot machine)		150	EKOF 452 G
Rougher	7.5		
Condition	2	15	EKOF 452 G
Scavenger	2		
(to barren tail)			pH= 7.5
1st Ro Cleaner	10		
Condition	1	15	EKOF 452 G
1st Ro Cleaner Scavenger	0.5		
2nd Ro Cleaner	12		
Condition	1	15	EKOF 452 G
2nd Ro Cleaner Scavenger	0.5		
Screening:			
1. Perform screen analysis on 2nd rougher cleaner concentrate (save all screen fractions and use for further testwork)			
2. Screen 2nd rougher cleaner concentrate into +48 mesh and -48 mesh			

TESTWORK PROCEDURE

Test No: M90-088 F8 **Date:** Feb 9/90

Gravity/Regrind/Screening Study:

1)Investigate optimum regrind procedure for +48 mesh gravity tailings

STAGE	TIME (Minutes)	ADDITIONS	
		g/tonne	REAGENT
Gravity Concentration:			
Hand Panning			+ 48 mesh graphite conc
Screening:			
1. Perform screen analysis on +48 mesh gravity tailings (save all screen fractions and use for further testwork)			
Long Regrind:			1/2 of +48 mesh gravity tails
Regrind	5		full ceramic charge
Screen at 48 mesh			regrind discharge
Short Regrind:			1/2 of +48 mesh gravity tails
Regrind	2.5		1/2 ceramic charge
Screen at 48 mesh			regrind discharge

TESTWORK PROCEDURE

Test No: M90-088 F8 R/C - 1 Date: Feb 15/90

Regrind/Cleaning Study: **Investigate optimum regrind/cleaning procedure for -48 mesh Rougher 2nd Cleaner Conc**

Test R/C-1: Short Regrind

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Short Regrind:			-48 mesh 2nd Ro Cl Conc
Regrind	2		1/2 ceramic charge
			25-30% solids
			pH= 5.7
Screening:			
Perform screen analysis on regrind product (Save all screen fractions and use for cleaning flotation)			
Cleaning Flotation:			
-48 # Cleaner 1	5		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	0.5		
-48 # Cleaner 2	7		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	0.5		
Screening:			
Wet Screen Graphite -48 # 2nd Cleaner Concentrate at 100 mesh (Save -100 # portion for future testwork)			

TESTWORK PROCEDURE

Test No: M90-088 F8 R/C - 2 **Date:** Feb 15/90

Regrind/Cleaning Study: **Investigate optimum regrind/cleaning procedure for -48 mesh Rougher 2nd Cleaner Conc**

Test R/C-2: Intermediate Regrind

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Medium Regrind:			-48 mesh 2nd Ro Cl Conc
Regrind	5		1/2 ceramic charge
			25-30% solids
			pH= 5.7
Screening:			
Perform screen analysis on regrind product (Save all screen fractions and use for cleaning flotation)			
Cleaning Flotation:			
-48 # Cleaner 1	5		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	3		
-48 # Cleaner 2	4.5		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	1.5		
Screening:			
Wet Screen Graphite -48 # 2nd Cleaner Concentrate at 100 mesh (Save -100 # portion for future testwork)			

TESTWORK PROCEDURE

Test No: M90-088 F8 R/C - 3 Date: Feb 15/90

Regrind/Cleaning Study: **Investigate optimum regrind/cleaning procedure for -48 mesh Rougher 2nd Cleaner Conc**

Test R/C-3: Long Regrind (extra ceramic charge)

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Long Regrind:			-48 mesh 2nd Ro Cl Conc
Regrind	5		full ceramic charge
			25-30% solids
			pH= 5.6
Screening:			
Perform screen analysis on regrind product			
(Save all screen fractions and use for cleaning flotation)			
Cleaning Flotation:			
-48 # Cleaner 1	4.5		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	3		
-48 # Cleaner 2	4		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	1		
Screening:			
Wet Screen Graphite -48 # 2nd Cleaner Concentrate at 100 mesh			
(Save -100 # portion for future testwork)			

TESTWORK PROCEDURE

Test No: M90-088 F8 Date: Feb 15/90

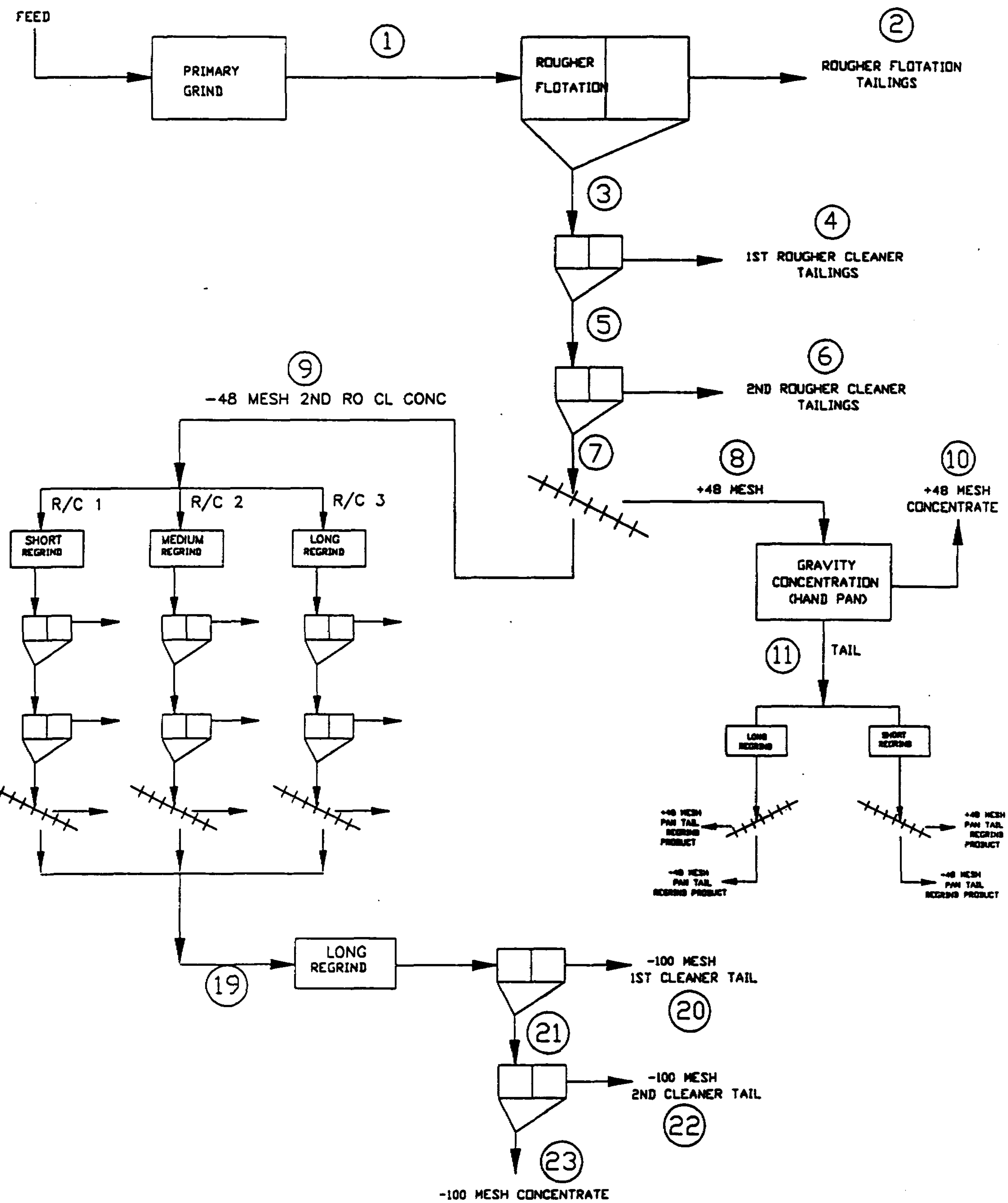
-100 Mesh Flotation:

1)Utilize most rigorous regrind (full ceramic charge, 5 minutes)
2)Standard 2-stage cleaning flotation

STAGE	TIME (Minutes)	ADDITIONS g/tonne	REAGENT
Combine -100# 2nd Cleaner Concs from R/C-1, R/C-2, R/C-3			
Screening:			
1. Perform screen analysis on -100 mesh product from R/C-1, R/C-2, R/C-3 (save all screen fractions and use for further testwork)			
Long Regrind:			Total -100# product
Regrind	5		full ceramic charge
Screening:			
1. Perform screen analysis at 400 mesh on -100 mesh regrind product (save all screen fractions and use for further testwork)			
Cleaning Flotation:			regrind product
-100# Cleaner 1	5		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	0.5		
-100# Cleaner 2	7		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	0.5		

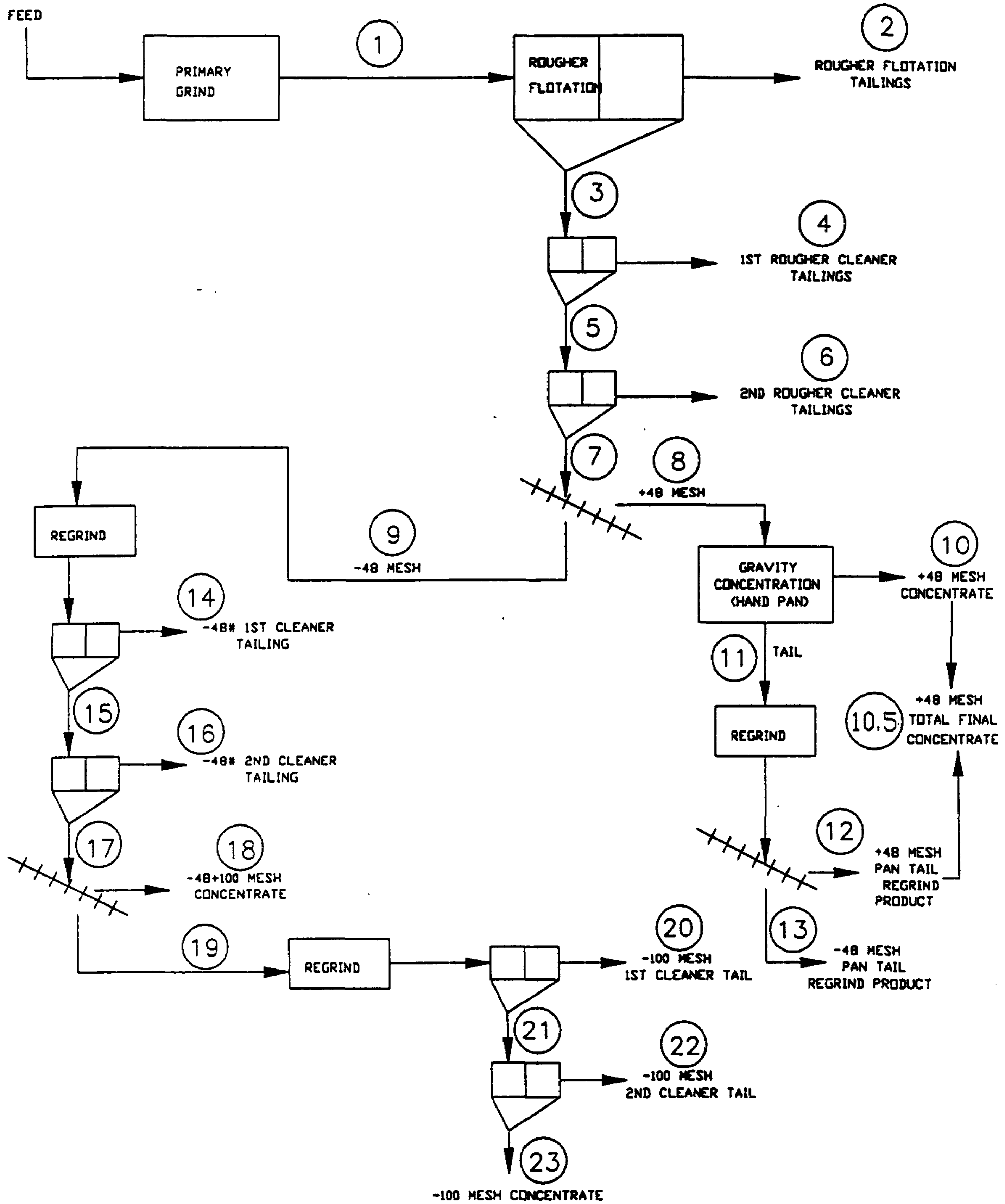
Bench Test F8: Actual Flowsheet

Figure 3.1



Bench-Test F8: Calculated Flowsheet

FIGURE 3.2



TEST NUMBER: M90-088 F8 (Calculated Balance)

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	% DIST C
23)-100# Final Conc	84.1	0.36	92.65	9.04
22)-100# 2nd Cl Tail	1.6	0.01	38.40	0.07
21)-100# 1ST CL CONC	85.7	0.37	91.64	9.12
20)-100# 1st Cl Tail	3.6	0.02	22.30	0.09
19) TOTAL -100#	89.3	0.38	88.84	9.21
18)Total -48+100# Final Conc	168.5	0.72	90.97	17.79
17)TOTAL -48# 2ND CL CONC	257.8	1.11	90.24	27.00
16)Total -48# 2nd Cl Tail	5.9	0.03	10.88	0.07
15)TOTAL -48# 1ST CL CONC	174.4	0.75	88.26	17.87
14)Total -48# 1st Cl Tail	19.1	0.08	4.02	0.09
9)TOTAL -48# (2nd Ro Cl Conc)	282.8	1.22	82.76	27.17
12)Total +48# Pan Tail Regrind Product	399.9	1.72	88.67	41.16
13)Total -48# Pan Tail Regrind Product	33.6	0.14	34.75	1.36
11)TOTAL +48# PAN TAIL	433.5	1.86	84.49	42.51
10)+48# Pan Conc	223.3	0.96	96.34	24.97
10.5)TOTAL +48 MESH FINAL CONC	623.2	2.68	91.42	66.13
8)TOTAL +48# (2nd Ro Cl Conc)	656.8	2.82	88.52	67.48
7)TOTAL 2ND ROUGHER CLEANER CONC	939.6	4.04	86.78	94.65
6)2nd Rougher Cleaner Tail	39.7	0.17	4.47	0.21
5)1ST ROUGHER CLEANER CONC	979.3	4.21	83.45	94.85
4)1st Rougher Cleaner Tail	160.1	0.69	1.43	0.27
3)ROUGHER CONC	1139.4	4.90	71.92	95.12
2)Rougher Tail	22129.1	95.10	0.19	4.88
1)CALC FEED	23268.5	100.0	3.70	100.00

TEST NUMBER: M90-088 F8 (Calculated Balance)

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	UNITS C
23)-100# Final Conc	84.1	0.36	92.65	33.49
22)-100# 2nd Cl Tail	1.6	0.01	38.40	0.28
21)-100# 1ST CL CONC	85.7	0.37	91.64	33.75
20)-100# 1st Cl Tail	3.6	0.02	22.30	0.35
19) TOTAL -100#	89.3	0.38	88.84	34.10
18)Total -48+100# Final Conc	168.5	0.72	90.97	65.88
17)TOTAL -48# 2ND CL CONC	257.8	1.11	90.24	99.98
16)Total -48# 2nd Cl Tail	5.9	0.03	10.88	0.28
15)TOTAL -48# 1ST CL CONC	174.4	0.75	88.26	66.16
14)Total -48# 1st Cl Tail	19.1	0.08	4.02	0.33
9)TOTAL -48# (2nd Ro Cl Conc)	282.8	1.22	82.76	100.58
12)Total +48# Pan Tail Regrind Product	399.9	1.72	88.67	152.39
13)Total -48# Pan Tail Regrind Product	33.6	0.14	34.75	5.02
11)TOTAL +48# PAN TAIL	433.5	1.86	84.49	157.41
10)+48# Pan Conc	223.3	0.96	96.34	92.45
10.5)TOTAL +48 MESH FINAL CONC	623.2	2.68	91.42	244.84
8)TOTAL +48# (2nd Ro Cl Conc)	656.8	2.82	88.52	249.86
7)TOTAL 2ND ROUGHER CLEANER CONC	939.6	4.04	86.78	350.44
6)2nd Rougher Cleaner Tail	39.7	0.17	4.47	0.76
5)1ST ROUGHER CLEANER CONC	979.3	4.21	83.45	351.20
4)1st Rougher Cleaner Tail	160.1	0.69	1.43	0.98
3)ROUGHER CONC	1139.4	4.90	71.92	352.19
2)Rougher Tail	22129.1	95.10	0.19	18.07
1)CALC FEED	23268.5	100.0	3.70	370.25

TEST NUMBER: M90-088 Test F8 (+48# Pan Tails LONG REGRIND)				
PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	% DIST C %
+48 mesh	60.20	88.66	90.50	95.85
-48 mesh	7.70	11.34	30.60	4.15
CALC HEAD	67.90	100.0	83.71	100.00
ASSAY HEAD			84.49	

TEST NUMBER: M90-088 Test F8 (+48# Pan Tails LONG REGRIND)

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	UNITS C
+48 mesh	60.20	88.66	90.50	8023.71
-48 mesh	7.70	11.34	30.60	347.01
CALC HEAD	67.90	100.0	83.71	8370.72
ASSAY HEAD			84.49	

TEST NUMBER: M90-088 Test F8 (+48# Pan Tails SHORT REGRIND)				
PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	% DIST C %
+48 mesh	64.40	95.55	87.10	97.65
-48 mesh	3.00	4.45	44.90	2.35
CALC HEAD	67.40	100.0	85.22	100.00
ASSAY HEAD			84.49	

TEST NUMBER: M90-088 Test F8 (+48m Pan Tails SHORT REGRIND)

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	UNITS C
+48 mesh	64.40	95.55	87.10	8322.31
-48 mesh	3.00	4.45	44.90	199.85
CALC HEAD	67.40	100.0	85.22	8522.17
ASSAY HEAD			84.49	

TEST NUMBER: M90-088 R/C1 (2 min regrind, half charge)				
PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	% DIST C
+100# 2nd Cl Conc	30.3	63.18	87.34	67.29
-100# 2nd Cl Conc	14.4	30.03	87.25	31.95
TOTAL 2ND CL CONC	44.7	93.20	87.31	99.23
2nd Cl Tails	1.5	3.13	11.80	0.45
1ST CL CONC	46.2	96.33	84.86	99.68
1st Cl Tails	1.8	3.67	7.05	0.32
CALC HEAD	48.0	100.0	82.00	100.00

TEST NUMBER: M90-088 R/C1 (2 min regrind, half charge)

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	UNITS C
+100# 2nd Cl Conc	30.3	63.18	87.34	5517.62
-100# 2nd Cl Conc	14.4	30.03	87.25	2619.68
TOTAL 2ND CL CONC	44.7	93.20	87.31	8137.30
2nd Cl Tails	1.5	3.13	11.80	36.91
1ST CL CONC	46.2	96.33	84.86	8174.21
1st Cl Tails	1.8	3.67	7.05	25.87
CALC HEAD	48.0	100.0	82.00	8200.08

TEST NUMBER: M90-088 R/C2 (5 min regrind, half charge)

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	% DIST C
+100# 2nd Cl Conc	29.2	59.82	91.40	66.11
-100# 2nd Cl Conc	15.4	31.57	87.25	33.30
TOTAL 2ND CL CONC	44.6	91.40	89.97	99.42
2nd Cl Tails	0.8	1.64	10.60	0.21
1ST CL CONC	45.4	93.03	88.57	99.63
1st Cl Tails	3.4	6.97	4.45	0.37
CALC HEAD	48.8	100.0	82.71	100.00

TEST NUMBER: M90-088 R/C2 (5 min regrind, half charge)

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	UNITS C
+100# 2nd Cl Conc	29.2	59.82	91.40	5467.90
-100# 2nd Cl Conc	15.4	31.57	87.25	2754.60
TOTAL 2ND CL CONC	44.6	91.40	89.97	8222.50
2nd Cl Tails	0.8	1.64	10.60	17.37
1ST CL CONC	45.4	93.03	88.57	8239.87
1st Cl Tails	3.4	6.97	4.45	31.00
CALC HEAD	48.8	100.0	82.71	8270.87

TEST NUMBER: M90-088 R/C3 (5 min regrind, full charge)

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	% DIST C
+100# 2nd Cl Conc	27.1	55.31	94.70	63.89
-100# 2nd Cl Conc	16.4	33.47	87.25	35.62
TOTAL 2ND CL CONC	43.5	88.78	91.89	99.51
2nd Cl Tails	0.8	1.63	9.67	0.19
1ST CL CONC	44.3	90.41	90.40	99.70
1st Cl Tails	4.7	9.59	2.54	0.30
CALC HEAD	49.0	100.0	81.98	100.00

TEST NUMBER: M90-088 R/C3 (5 min regrind, full charge)				
PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	UNITS C
+100# 2nd Cl Conc	27.1	55.31	94.70	5237.21
-100# 2nd Cl Conc	16.4	33.47	87.25	2920.20
TOTAL 2ND CL CONC	43.5	88.78	91.89	8157.42
2nd Cl Tails	0.8	1.63	9.67	15.79
1ST CL CONC	44.3	90.41	90.40	8173.21
1st Cl Tails	4.7	9.59	2.54	24.36
CALC HEAD	49.0	100.0	81.98	8197.57

SIZE DISTRIBUTION

SAMPLE NO. M90-088 F8 HEAD (Average of 2)

Ground 2.5 mins. at 65% solids

FLOWSHEET STREAM # 1

Size Fraction (mesh)	Individual Percentage Retained %		Cumulative Percentage Passing %
+ 28	11.14	11.14	88.86
- 28 + 48	37.40	48.54	51.46
- 48 + 65	16.03	64.57	35.42
- 65 + 100	11.24	75.81	24.18
- 100 + 150	7.97	83.78	16.21
- 150 + 200	5.30	89.08	10.91
- 200	10.91	100.00	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 F8A Rougher Tails

FLOWSHEET STREAM # 2

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	2.02	97.98
- 28	+ 48	37.00	60.98
- 48	+100	31.67	29.31
-100	+200	17.03	12.28
-200		12.28	

TEST NUMBER: M90-088 F8A Rougher Tails				
PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	% DIST C
+28	2.1	2.02	0.191	2.04
-28+48	38.0	37.00	0.155	30.53
-48+100	32.5	31.67	0.058	9.78
-100+200	17.5	17.03	0.144	12.98
-200	12.6	12.28	0.685	44.67
CALC HEAD	102.6	100.0	0.188	100.00
ASSAY HEAD				

TEST NUMBER: M90-088 F8A Rougher Tails

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	UNITS C
+28	2.1	2.02	0.191	0.385
-28+48	38.0	37.00	0.155	5.753
-48+100	32.5	31.67	0.058	1.843
-100+200	17.5	17.03	0.144	2.446
-200	12.6	12.28	0.685	8.417
CALC HEAD	102.6	100.0	0.188	18.84

SIZE DISTRIBUTION

SAMPLE NO. M90-088 F8 2nd Cl. Conc.

FLOWSHEET STREAM # 7

Size Fraction	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	9.48	90.52
- 28 + 48	48.22	42.3
- 48 + 65	19.60	22.70
- 65 + 100	9.14	13.56
- 100 + 150	4.71	8.85
- 150 + 200	2.65	6.20
- 200	6.20	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 F8: -48 Mesh 2nd Cl Conc.

Regrind Feed (Calculated Size Distribution)

FLOWSHEET STREAM # 9

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 65	46.3	53.7
- 65 + 100	21.6	32.1
- 100 + 150	11.1	21.0
- 150 + 200	6.3	14.7
- 200	14.7	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 F8: -R/C 1 Regrind Product

Reground 2 mins at 50% solids with 1/2 ceramic charge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 65	3.71	96.29
- 65 + 100	51.00	45.29
- 100 + 150	15.22	30.07
- 150 + 200	8.79	21.28
- 200	21.28	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 F8 - R/C 2 Regrind Product

Reground 5 mins at 50% solids with 1/2 ceramic charge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 65	21.53	78.47
- 65 + 100	29.75	48.72
- 100 + 150	15.82	32.90
- 150 + 200	9.84	23.06
- 200	23.06	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 F8 - R/C 3 Regrind Product

Reground 5 mins at 50% solids with full ceramic charge

Size Fraction (mesh)		Individual Percentage Retained %	Cumulative Percentage Passing %
	+ 65	20.89	79.11
- 65	+ 100	27.52	51.59
- 100	+ 150	15.03	36.56
- 150	+ 200	10.00	26.56
- 200		26.56	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 F8 +48 Pan Tails

Flowsheet Stream #11

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	7.53	92.47
- 28 + 48	77.65	14.82
- 48 + 65	14.12	0.70
- 65 + 100	0.65	0.05
+ 150	0.05	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 F8 -100 Mesh Regrind Feed

FLOWSHEET STREAM # 19

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 65		
- 65 + 100		
- 100 + 150	14.72	85.28
- 150 + 200	22.42	62.86
- 200 + 325	22.61	40.25
- 325 + 400	3.96	36.29
- 400	36.29	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 F8 -100 Regrind Discharge

Ground 5 min at 70% solids

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 400	60.38	39.62
- 400	39.62	

TESTWORK PROCEDURE

Test No: M90-088 F9 Date: Feb 26/90

Purpose: As F8: 1)Switch reagent from EKOF 452 G to VARSOL/MIBC
2)Rougher float only (stop after 2nd ro cleaner)

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Grind: 2kg charge (Target: 95-98% -800 microns)	2.5		1/2 regular rod charge 50-60% solids
Flotation:			
Condition	3		32 % solids pH= 8.0
		50	VARSOL
Rougher	9		MIBC
Condition	2	10	VARSOL
Scavenger (to barren tail)	7		MIBC pH= 7.8
1st Cleaner	10		MIBC
Condition	1	10	VARSOL
1st Cleaner Scavenger	1		MIBC
2nd Cleaner	7		MIBC
Condition	1	10	VARSOL
2nd Cleaner Scavenger	1		MIBC

TEST NUMBER: M90-088 F9

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	% DIST C
2nd Cleaner Conc	74.9	3.83	89.90	93.04
2nd Cleaner Tails	0.3	0.02	6.23	0.03
1ST CLEANER CONC	75.2	3.84	89.57	93.07
1st Cleaner Tails	13.7	0.70	1.15	0.22
TOTAL RO CONC	88.9	4.54	75.94	93.29
Final Tails	1868.5	95.46	0.26	6.71
CALC HEAD	1957.4	100.0	3.70	100.00

TEST NUMBER: M90-088 F9

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	UNITS C
2nd Cleaner Conc	74.9	3.83	89.90	344.00
2nd Cleaner Tails	0.3	0.02	6.23	0.10
1ST CLEANER CONC	75.2	3.84	89.57	344.10
1st Cleaner Tails	13.7	0.70	1.15	0.80
TOTAL RO CONC	88.9	4.54	75.94	344.90
Final Tails	1868.5	95.46	0.26	24.82
CALC HEAD	1957.4	100.0	3.70	369.72

SIZE DISTRIBUTION

SAMPLE NO. M90-088 F9 HEAD

Ground 2.5 min at 60 solids

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	15.15	84.85
- 28 + 48	30.52	54.33
- 48 + 65	13.53	40.80
- 65 + 100	10.55	30.25
- 100 + 150	8.67	21.58
- 150 + 200	6.32	15.26
- 200 + 325	6.07	9.19
- 325 + 400	0.53	8.66
- 400	8.66	

SIZE DISTRIBUTION

SAMPLE NO:M90-088 F9 Rougher Tails

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	17.9	82.1
- 28	+ 48	35.6	46.5
- 48	+100	22.2	24.3
-100	+200	12.9	11.4
-200		11.4	

TEST NUMBER: M90-088 (Test F9 - Rougher Flotation Tailings)

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	% DIST C %
+28 mesh	17.90	17.90	0.08	5.50
+48 mesh	35.60	35.60	0.19	25.97
+100 mesh	22.20	22.20	0.17	14.49
+200 mesh	12.90	12.90	0.95	47.05
-200 mesh	11.40	11.40	0.16	7.00
CALC HEAD	100.00	100.0	0.26	100.00

TEST NUMBER: M90-088 (Test F9 - Rougher Flotation Tailings)

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS C %	UNITS C
+28 mesh	17.90	17.90	0.08	1.43
+48 mesh	35.60	35.60	0.19	6.76
+100 mesh	22.20	22.20	0.17	3.77
+200 mesh	12.90	12.90	0.95	12.26
-200 mesh	11.40	11.40	0.16	1.82
CALC HEAD	100.00	100.0	0.26	26.05

TESTWORK PROCEDURE

Test No: M90-088 F10-A **Date:** 5-Apr-90

Purpose: To investigate the low recovery of Pilot Plant #4A Rougher Flotation Circuit

STAGE	TIME (Minutes)	ADDITIONS	
		g/t	REAGENT
Grind (#4A Rougher Flotation Feed)	0		
Rougher Flotation:			35% solids
Rougher Flotation 1	1.5		
Condition	1	11	EKOF 452G
Rougher Flotation 2	2		
Condition	1	18	EKOF 452G
Rougher Flotation 3	3		
Condition	1	18	EKOF 452G
Rougher Flotation 4	3		
Condition	1	18	EKOF 452G
Rougher Flotation 5	2.5		
Condition	1	101	EKOF 452G
Rougher Flotation 6	9.5		
Condition	1	126	EKOF 452G
Rougher Flotation 7	1.5		
Cleaner Flotation:			
Condition	1	83	EKOF 452 G
Cleaner Flotation 1	18.5		
Condition	1	36	EKOF 452 G
Cleaner Flotation 2	12		

TEST NUMBER: M90-088 F10-A: Bench-scale test on Run #4 Flotn Feed

PRODUCT	WEIGHT kg	WEIGHT %	Graphitic Carbon % (ASSAYS)	Graphitic Carbon % (% DIST)
Cleaner Conc	6.6	0.63	61.48	50.82
Cleaner Tails	16.5	1.57	3.82	7.89
ROUGHER CONC	23.1	2.19	20.29	58.72
Rougher Tails	1030.0	97.81	0.32	41.28
CALC FEED (Stream 6)	1053.1	100.0	0.76	100.00
ASSAY FEED (Stream 6)			1.21	

TEST NUMBER: M90-088 F10-A: Bench-scale test on Run #4 Flotn Feed

PRODUCT	WEIGHT kg	WEIGHT %	ASSAYS Graphitic Carbon %	UNITS Graphitic Carbon
Cleaner Conc	6.6	0.63	61.48	38.531
Cleaner Tails	16.5	1.57	3.82	5.985
ROUGHER CONC	23.1	2.19	20.29	44.516
Rougher Tails	1030.0	97.81	0.32	31.298
CALC FEED (Stream 6)	1053.1	100.0	0.76	75.814
ASSAY FEED (Stream 6)			1.21	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 F10 Head (F10-A)

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	4.45	95.55
- 28	+ 48	35.49	60.06
- 48	+100	26.32	33.73
-100	+200	16.25	17.49
-200		17.49	

TESTWORK PROCEDURE

Test No: M90-088 F10-B **Date:** 2-Apr-90

Purpose: Scavenging of Pilot Plant Run #4A Rougher Flotation Tails.
1)NO regrind

STAGE	TIME (Minutes)	ADDITIONS	
		g/t	REAGENT
Grind (Rougher Flotation Tails)	0		
Scavenger Flotation 1	2	32	EKOF 452G
Scavenger Flotation 2	2	48	EKOF 452G

TEST NUMBER: M90-088 F10-8: NO REGRIND
(Bench-scale scavenger flotation of Run #4-A Flotn tails)

PRODUCT	WEIGHT kg	WEIGHT %	ASSAYS Graphitic Carbon %	% DIST Graphitic Carbon %
Scavenger Conc	5.6	0.99	1.79	10.09
Scavenger Tails	558.4	99.01	0.16	89.91
CALC FEED (Stream 8)	564.0	100.0	0.18	100.0
ASSAY FEED (Stream 8)			0.22	

TEST NUMBER: M90-088 F10-B: NO REGRIND (Bench-scale scavenger flotation of Run #4-A Flotn tails)				

PRODUCT	WEIGHT kg	WEIGHT %	ASSAYS Graphitic Carbon %	UNITS Graphitic Carbon
Scavenger Conc	5.6	0.99	1.79	1.777
Scavenger Tails	558.4	99.01	0.16	15.841
CALC FEED (Stream 8)	564.0	100.0	0.18	17.6
ASSAY FEED (Stream 8)			0.22	

TESTWORK PROCEDURE

Test No: M90-088 F10-C **Date:** 2-Apr-90

Purpose: Scavenging of Pilot Plant Run #4A Rougher Flotation Tails.
1)Include short regrind

STAGE	TIME (Minutes)	ADDITIONS	
		g/t	REAGENT
Grind (Rougher Flotation Tails)	2		
Scavenger Flotation 1	2	32	EKOF 452G
Scavenger Flotation 2	2	48	EKOF 452G

TEST NUMBER: M90-088 F10-C: SHORT REGRIND
(Bench-scale scavenger flotation of Run #4-A Flotn tails)

PRODUCT	WEIGHT kg	WEIGHT %	ASSAYS Graphitic Carbon %	% DIST Graphitic Carbon %
Scavenger Conc	7.7	1.40	5.12	39.79
Scavenger Tails	542.3	98.60	0.11	60.21
CALC FEED (Stream 8)	550.0	100.0	0.18	100.0
ASSAY FEED (Stream 8)			0.22	

TEST NUMBER: M90-088 F10-C: SHORT REGRIND
(Bench-scale scavenger flotation of Run #4-A Flotn tails)

PRODUCT	WEIGHT kg	WEIGHT %	ASSAYS Graphitic Carbon %	UNITS Graphitic Carbon
Scavenger Conc	7.7	1.40	5.12	7.168
Scavenger Tails	542.3	98.60	0.11	10.846
CALC FEED (Stream 8)	550.0	100.0	0.18	18.0
ASSAY FEED (Stream 8)			0.22	

APPENDIX IV

Pilot Plant Testwork

PILOT RUN #1

PILOT RUN #1

DATE: March 9, 1990

DURATION: 4 hours

ASSAY HEAD: 3.55 %C(g)

THROUGHPUT: 1150 kg

REAGENT COSUMPTION: 110 g/tonne EKOF 452 G
REAGENT ADDITION: Rod Mill Discharge

FLOWSHEET MODIFICATIONS:

1) Initial Production Pilot Run

2) Used 24# screen for primary screen (20# unavailable)

3) Total Primary Mill Rod Charge = 2000 lbs

4)

5)

6)

7)

RESULTS:

Final Concentrates:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.79	93.40	73.34	80.48
-50+100# Concentrate	0.45	90.70	11.57	12.70
-100# Concentrate	0.24	90.40	6.21	6.82
Combined Concentrates	3.48	92.84	91.12	100.00

TEST NUMBER: Pilot Plant Run #1

Flowsheet Stream No	PRODUCT	WEIGHT Kg/hr	WEIGHT %	ASSAYS, %C(g) Assayed	ASSAYS, %C(g) Calc	UNITS OF C(g) Calc	DISTRIBUTION %C(g) Calc
Primary Circuit:							
1	Belt Feed	287.00	100.00	3.550	3.550	355.000	100.00
2	Rod Mill Discharge	298.60	104.04	4.210	3.925	408.340	115.03
3	Unit Cell Conc	10.19	3.55	73.500	72.800	258.478	72.81
4	Unit Cell Tail	288.41	100.49	2.100	1.491	149.862	42.21
5	20# Screen O/S	8.30	2.89	9.220	9.220	26.664	7.51
6	20# Screen U/S	280.11	97.60	1.180	1.262	123.198	34.70
7	Rougher Flot Conc	6.11	2.13	50.400	48.451	103.149	29.06
8	Rougher Flot Tail	274.00	95.47	0.210	0.210	20.049	5.65
9	1st Ro Clnr Conc	3.91	1.36	60.500	69.017	94.027	26.49
10	1st Ro Clnr Tail	2.20	0.77	11.900	11.900	9.122	2.57
11	2nd Ro Clnr Conc	2.80	0.98	77.400	78.366	76.473	21.54
12	2nd Ro Clnr Tail	1.10	0.38	45.800	45.800	17.554	4.94
13	50# Screen O/S (Table Feed)	11.50	4.01	83.500	86.370	346.080	97.49
14	+50# Table Conc	8.00	2.79	93.400	93.400	260.348	73.34
15	+50# Table Tail	3.50	1.22	70.300	70.300	85.732	24.15
16	Regrind Discharge						
17	50# Screen Feed	12.99	4.53		74.000	334.951	94.35
18	50# Screen U/S	4.99	1.74	42.800	42.800	74.603	21.01
-50 Mesh Circuit:							
19	2nd Cl (Scav) Conc	1.10	0.38	74.800	74.800	28.669	8.08
20	Regrind Discharge						
21	1st Cl Conc	2.20	0.77	92.800	87.905	67.383	18.98
22	2nd Cl (Scav) Tail	2.79	0.97	7.880	7.425	7.220	2.03
23	-50 +100# Final Conc	1.30	0.45	90.700	90.700	41.084	11.57
-100 Mesh Circuit:							
24	100 Mesh Screen U/S	0.90	0.31	86.400	83.867	26.300	7.41
25	2nd Cl (Scav) Conc	0.40	0.14	90.000	90.000	12.544	3.53
26	Regrind Discharge						
27	2nd Cl (Scav) Tail	0.20	0.07	61.000	61.000	4.251	1.20
28	-100# Final Conc	0.70	0.24	90.400	90.400	22.049	6.21
	CALC BELT FEED	286.99	100.0		3.550	355.000	100.00

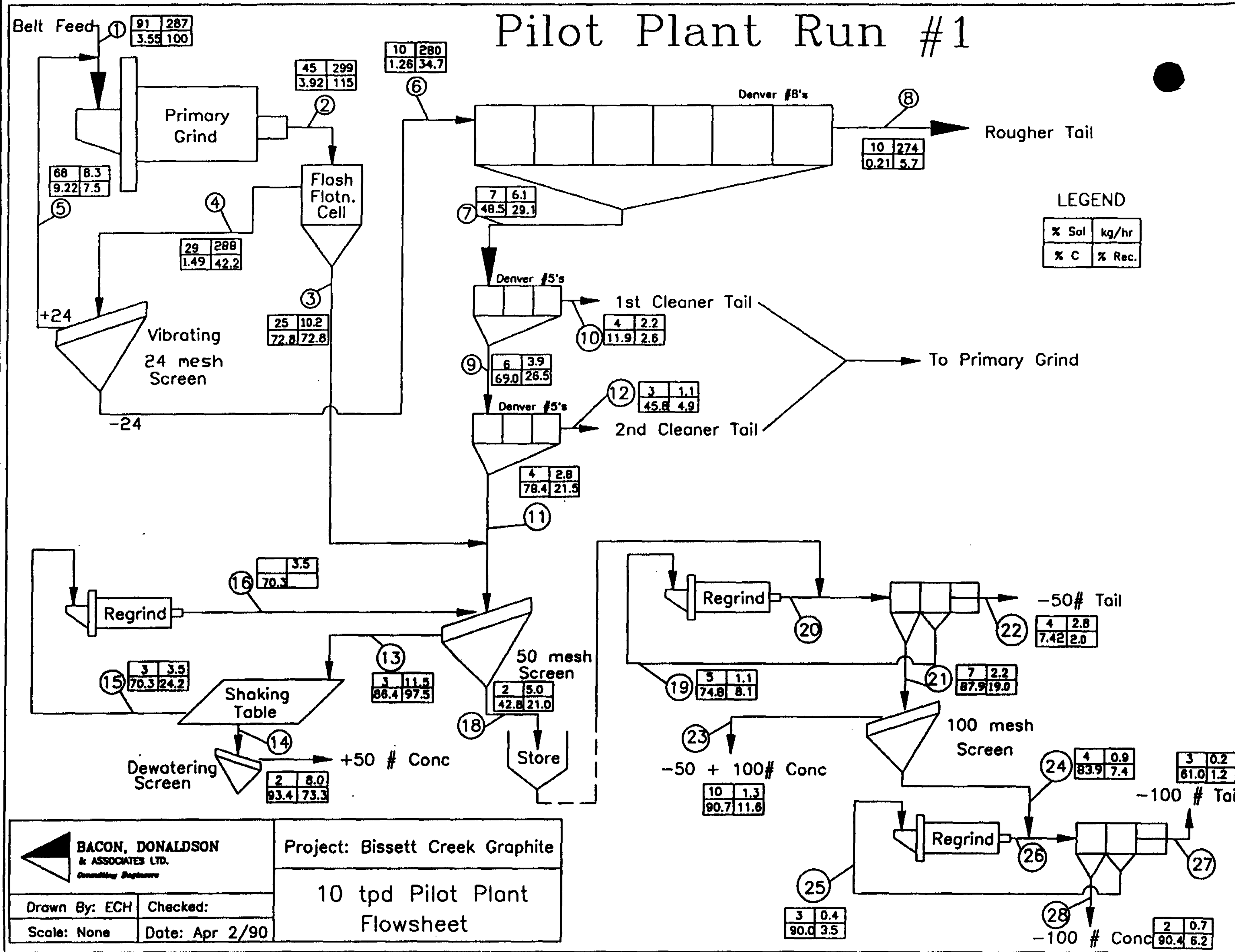
Notes:

1)Product #5 is calculated using pilot plant flowrate measurement

2)Belt Feed (#1), 50# Screen Feed (#17), +50# Table Conc (#14), Rougher Flot Tail (#8), -50# Screen U/S (#18), -50+100# Conc (#23), -100# Conc (#28) are all taken as gospel.

CONCENTRATES:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.79	93.40	73.34	80.48
-50+100# Concentrate	0.45	90.70	11.57	12.70
-100# Concentrate	0.24	90.40	6.21	6.82
Combined Concentrates	3.48	92.84	91.12	100.00

Pilot Plant Run #1



BACON, DONALDSON & ASSOCIATES LTD.
Consulting Engineers

Project: Bissett Creek Graphite

10 tpd Pilot Plant Flowsheet

Drawn By: ECH | Checked:
Scale: None | Date: Apr 2/90

GRINDING OPERATION SHEET

Project No.: M90-088 Date: 9-Mar-90

Project Name: Bissett Creek Graphite Operator Name: Jack R.

RUN # 1-A

Time	Feed Rate (lb/hr)	Belt Cut (g)	Feed Water Addition (l/min)	Discharge % Solids	Reagent Feed (ml/min)	Pump Box Level
11:45	1312	3309	4	46	9.04	~1/4
12:00	1153	2909	4	50	9.08	mt
12:15	946	2385	4	55	9.1	mt
12:35	827	2086	4	47	13.15	mt
1:00	680	1715	4	35	13.25	mt
1:45	697	1758	2.76	40	13.3	mt
2:30	722	1822	-	35	13.03	mt
3:20	430	1086	4	50	12.98	mt

Sampling:

Time	Belt Feed	Primary Mill Discharge	Vibrating Screen O/S	Thickener Feed	Thickener O/F	Tailings Conditioner O/F
11:45		✓	✓	✓	×	✓
12:35		✓	✓	✓	×	✓
1:00		✓	✓	✓	×	✓
1:45		✓	✓	✓	×	✓
2:30		✓	✓	✓	×	✓
3:20		✓	✓	✓	×	✓

Comments:

Time	Comments
11:30	Start up.
12:55	Drive motor bearings noisy - #3 C.V.
2:00	Ball mill reducer bearings warm - all others cool
2:30	Cut ball mill feed water to zero
3:30	Shut down.

FLOTATION OPERATION SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: March 9/90
Operator Name: Ed H. & Peter T.

RUN # 1-A

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level						Froth Description					
		Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
1:00	15	G	G	U	U	U	U	G/H	G/H	G/H	M/L	M/L	M/L
1:45	14	G	G	U	U	U	U	G/H	G/H	M/L	M/L	M/L	M/L
2:30	5	G	G	U	U	U	U	G/H	G/H	M/L	M/L	M/L	M/L
3:15	6	G	G	U	U	U	U	G/H	G/H	M/L	M/L	M/L	M/L

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

Time	1st Cleaner Bank						2nd Cleaner Bank					
	Flotation Cell Level			Froth Description			Flotation Cell Level			Froth Description		
	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
1:00	H	H	H	G/L	G/L	M/L	G	G	G	M/L	P/L	P/L
1:45	G	G	G	G/M	G/M	G/M	L	L	G	G/M	P/L	M/M
2:30	H	L	G	G/L	G/H	G/M	G	H	G	G/H	P/M	M/M
3:15	G	L	G	G/M	G/M	G/M	G	L	G	G/H	M/H	M/L

Comments:

Time	Comments
1:00	Cleaners working poorly - no solids
1:00	Unit cell working well
1:00	Spot reagent addition to rougher feed pump
1:30	Unit cell conc line plugged - 15 minutes downtime
2:00	Main reagent feed line broke - 15 minutes down

FLOTATION SAMPLING SHEET

Project No.: M90-088 Date: March 9/90

Project Name: Bissett Creek Graphite Operator Name: Ed H. & Peter T.

RUN # 1-AA & 1-AB

Sample	Cut Time	Time								
			1:00	1:45	2:00	3:15				
3. Unit Cell Concentrate	30 s		✓	✓	✓	✓				
4. Unit Cell Tailing	5 s		✓	✓	✓	✓				
8. Rougher Flotation Feed	5 s		✓	✓	✓	✓				
9. Rougher Flotation Conc	30 s		✓	✓	✓	✓				
10. Rougher Flotation Tailing	-		✓	✓	✓	✓				
11. 1st Ro Cleaner Conc	-		✓	✓	✓	✓				
12. 1st Ro Cleaner Tail	20 s		✓	✓	✓	✓				
13. 2nd Ro Cleaner Conc	-		✓	✓	✓	✓				
14. 2nd Ro Cleaner Tail	20 s		✓	✓	✓	✓				
15. ~~50 mesh Screen Feed~~										

Comments:

Time	Comments
2:30	Change sampling buckets (ie. Run #1-AB)

FLOTATION OPERATION SHEET

Project No.: M90-088 Date: March 13/90
Project Name: Bissett Creek Graphite Operator Name: Ed H. & Peter T.

RUN # 1-B

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

	1st Cleaner Bank						2nd Cleaner Bank					
	Flotation Cell Level			Froth Description			Flotation Cell Level			Froth Description		
Time	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
1:10	G	G	G	G/H	G/H	G/H						
1:25	G	G	G	G/H	G/M	G/M						
1:45	G	G	G	G/H	G/H	G/H						
2:10	G	G	G	G/H	G/H	G/H						
2:45	G	G	G	G/H	G/H	G/M						
3:05	G	G	G	G/H	G/H	G/M						
3:20	G	G	G	G/H	G/H	G/M						

Comments:

Time	Comments
2:03	Problem with air pump on feed
2:15	Switched -100 mesh tank
2:25	Additional 10 kg media to regrind
2:37	Feed pump down (~2 minutes)
2:50	Lightnin mixer no longer mixing feed tank. Change impeller
3:15	2nd lightnin mixer no longer mixing feed tank

FLOTATION SAMPLING SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: March 13/90
Operator Name: Ed H. & Peter T.

RUN # 1-BA & 1-BB

Sample	Cut Time	Time								
			1:25	1:45	2:10	2:45	3:05	3:20		
-50 mesh Feed	20 s		✓	✓	✓	✓	✓	✓		
Regrind Discharge	60 s		✓	✓	✓	✓	✓	✓		
-100 mesh Product	60 s		✓	✓	✓	✓	✓	✓		
1st Cleaner Conc	60 s		✓	✓	✓	✓	✓	✓		
+100 mesh Conc	3 min		✓	✓	✓	✓	✓	✓		
2nd Cleaner Conc	60 s		✓	✓	✓	✓	✓	✓		
2nd Cleaner Tail	15 s		✓	✓	✓	✓	✓	✓		

Comments:

Time	Comments
2:45	Switch sample buckets (ie. Run #1-BB)

FLOTATION OPERATION SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: March 13/90
Operator Name: Ed H. & Peter T.

RUN # 1-C

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

Time	1st Cleaner Bank Flotation Cell Level Cell 1	Cell 2	Cell 3	1st Cleaner Bank Froth Description Cell 1	Cell 2	Cell 3	2nd Cleaner Bank Flotation Cell Level Cell 1	Cell 2	Cell 3	2nd Cleaner Bank Froth Description Cell 1	Cell 2	Cell 3
4:20	G	G	G	G/H	G/H	G/H						
4:25	G	G	L	G/H	G/M	G/H						
4:30	G	G	G	G/H	G/H	G/H						
4:45	G	G	L	G/H	G/M	G/H						
4:55	G	G	L	G/H	G/H	G/H						

Comments:

Time	Comments
4:20	Start up
4:30	1st feed tank empty. Switch to 2nd feed tank
4:57	2nd feed tank empty

FLOTATION SAMPLING SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: March 13/90
Operator Name: Ed H. & Peter T.

RUN # 1-C

Sample	Cut Time	Time								
			4:30	4:47	4:52					
-100 mesh Feed	20 s		✓	✓	✓					
Regrind Discharge	30 s		✓	✓	✓					
1st Cleaner Conc	60 s		✓	✓	✓					
2nd Cleaner Conc	30 s		✓	✓	✓					
2nd Cleaner Tail	20 s		✓	✓	✓					

Comments:

Time	Comments

SIZE DISTRIBUTION

SAMPLE NO. M90-088: Pilot Plant Run #1-A (March 9, 1990)
Belt Feed (0-2 hours)

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 1"	11.4	88.6
- 1" + 3/4"	24.1	64.5
- 3/4" + 1/2"	13.6	50.9
- 1/2" + 3/8"	16.4	34.5
- 3/8" + 3 mesh	6.3	28.2
- 3 + 4 mesh	3.9	24.3
- 4 + 6	2.7	21.6
- 6 + 8	2.1	19.5
- 8 + 10	1.0	18.5
- 10 + 14	2.4	16.1
- 14 + 20	1.8	14.3
- 20 + 28	1.0	13.3
- 28 + 35	2.7	10.6
- 35 + 48	1.9	8.7
- 48 + 65	2.0	6.7
- 65 + 100	1.7	5.0
- 100 + 150	1.4	3.6
- 150 + 200	1.1	2.5
- 200	2.5	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Pilot Plant Run #1-AA

March 9, 1990

Unit Cell Concentrate (0-2 hours)

Size Fraction		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	3.07	96.93
- 28	+ 48	44.59	52.34
- 48	+100	29.24	23.10
-100	+200	12.57	10.53
-200		10.53	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Pilot Plant Run #1-AA

March 9, 1990

Table Tails (0-2 hours)

Size Fraction		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	1.26	98.74
- 28	+ 48	46.70	52.04
- 48	+100	46.23	5.81
-100	+200	4.40	1.41
-200		1.41	

SIZE DISTRIBUTION

SAMPLE NO:M90-088 Pilot Plant Run #1-AA

March 9, 1990

Flotation Rougher Tails

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	0.00	100.00
- 28	+ 48	14.03	85.97
- 48	+100	33.78	52.19
-100	+200	25.83	26.35
-200		26.35	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Pilot Plant Run #1-AA

March 9, 1990

Regrind Discharge (0-2 hours)

Size Fraction		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	0.26	99.74
- 28	+ 48	33.44	66.30
- 48	+100	42.89	23.41
-100	+200	13.86	9.55
-200		9.55	

SIZE DISTRIBUTION

SAMPLE NO. M90-088: Pilot Plant Run #1-A (March 9, 1990)

Thickener Feed (0-2 hours)

Size Fraction (mesh)		Individual Percentage Retained %	Cumulative Percentage Passing %
	+ 20		
- 20	+ 28	0.1	99.9
- 28	+ 48	19.3	80.6
- 48	+ 100	34.0	46.6
- 100	+ 200	22.0	24.6
- 200		24.6	

SIZE DISTRIBUTION

SAMPLE NO. M90-088: Pilot Plant Run #1-A (March 9, 1990)

Rod Mill Discharge (0-2 hours)

Size Fraction (mesh)		Individual Percentage Retained %	Cumulative Percentage Passing %
	+ 20	1.2	98.8
- 20	+ 28	1.3	97.5
- 28	+ 48	24.5	73.0
- 48	+ 100	31.8	41.2
- 100	+ 200	20.2	21.0
- 200		21.0	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Run #1 - AB

Rod Mill Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 65	54.3	45.7
- 65 + 100	12.0	33.7
- 100 + 150	8.9	24.8
- 150 + 200	6.7	18.1
- 200	18.1	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Run #1 - BA

1st Cl Conc.

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 65	7.4	92.6
- 65 + 100	27.9	64.7
- 100 + 150	26.7	38.0
- 150 + 200	16.5	21.5
- 200	21.5	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Run #1 - BA

2nd Cl Conc.

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 65	7.7	92.3
- 65 + 100	29.7	62.6
- 100 + 150	25.9	36.7
- 150 + 200	14.4	22.3
- 200	22.3	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Run #1 - BA

Regrind Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 65	15.2	84.8
- 65 + 100	17.7	67.1
- 100 + 150	20.3	46.8
- 150 + 200	17.4	29.4
- 200	29.4	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Run #1 - C

Regrind Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 65	5.1	94.9
- 65 + 100	14.8	80.1
- 100 + 150	24.7	55.4
- 150 + 200	23.3	32.1
- 200 + 325	20.6	11.5
- 325	11.5	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Run #1 - C

2nd Cl Conc.

Size Fraction (mesh)		Individual Percentage Retained %	Cumulative Percentage Passing %
	+ 65	1.6	98.4
- 65	+ 100	4.9	93.5
- 100	+ 150	24.9	68.6
- 150	+ 200	27.8	40.8
- 200	+ 325	25.2	15.6
- 325		15.5	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Run #1 - C

1st Cl Conc.

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 65	1.6	98.4
- 65 + 100	5.5	92.9
- 100 + 150	30.0	62.9
- 150 + 200	29.5	33.4
- 200 + 325	21.6	11.8
- 325	11.8	

PILOT RUN #2

PILOT RUN #2

DATE: March 15, 1990

DURATION: 6 hours — ASSAY HEAD: 3.67 %C(g)

THROUGHPUT: 2160 kg

REAGENT COSUMPTION: 150 g/tonne EKOF 452 G
REAGENT ADDITION: Rod Mill Discharge, Rougher Flotation Cell #1

FLOWSHEET MODIFICATIONS:

1) Removed 512 lbs rods from Primary Rod Mill (approx 1500 lbs remaining)

2) Install 20# Sweco (Primary) screen

3) Reagent addition point added to 1st Rougher Cell

4) Removed Thickener from circuit and replaced with a 900 litre surge tank (between 20# U/S and rougher flotation)

5)

6)

7)

RESULTS:

Final Concentrates:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.28	91.70	56.91	60.36
-50 Product	2.46	56.10	37.38	39.64
Combined Concentrates	4.73	73.23	94.29	100.00

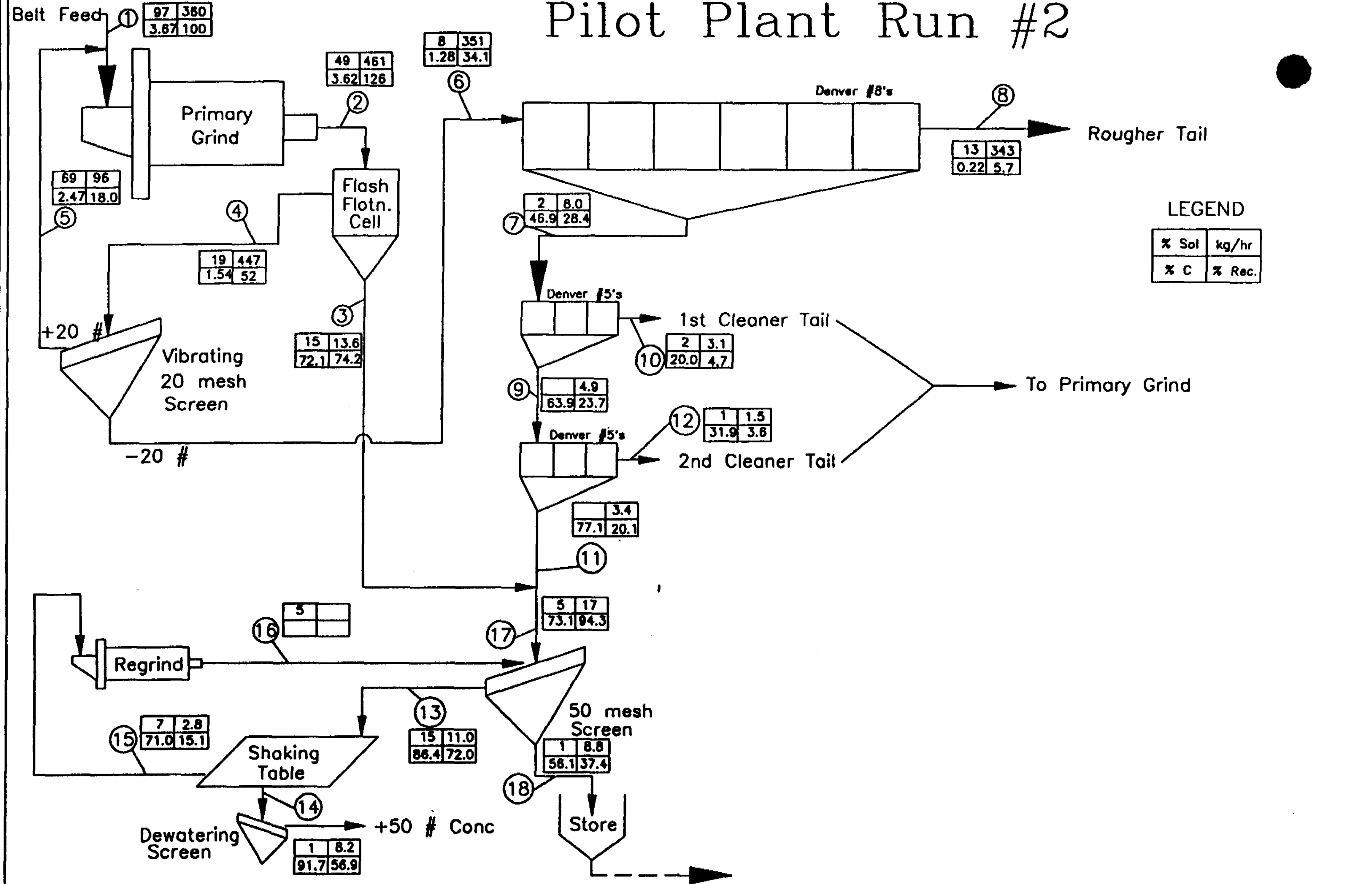
TEST NUMBER: Pilot Plant Run #2

Flowsheet Stream No	PRODUCT	WEIGHT Kg/hr	WEIGHT %	ASSAYS, %C(g) Assayed	ASSAYS, %C(g) Calc	UNITS OF C(g) Calc	DISTRIBUTION %C(g) Calc
Primary Circuit:							
1	Belt Feed	360.00	100.00	3.670	3.670	367.000	100.00
2	Rod Mill Discharge	460.60	127.94	3.270	3.622	463.381	126.26
3	Unit Cell Conc	13.60	3.78	67.300	72.100	272.378	74.22
4	Unit Cell Tail	447.00	124.17	1.300	1.538	191.003	52.04
5	20# Screen O/S	96.00	26:67	2.470	2.470	65.867	17.95
6	20# Screen U/S	351.00	97.50	1.940	1.283	125.136	34.10
7	Rougher Flot Conc	8.00	2.22	38.600	46.879	104.175	28.39
8	Rougher Flot Tail	343.00	95.28	0.220	0.220	20.961	5.71
9	1st Ro Clnr Conc	4.90	1.36	59.200	63.884	86.953	23.69
10	1st Ro Clnr Tail	3.10	0.86	29.400	20.000	17.222	4.69
11	2nd Ro Clnr Conc	3.44	0.96	68.200	77.052	73.661	20.07
12	2nd Ro Clnr Tail	1.50	0.42	31.900	31.900	13.292	3.62
13	50# Screen O/S (Table Feed)	11.00	3.06	81.100	86.431	264.094	71.96
14	+50# Table Conc	8.20	2.28	91.700	91.700	208.872	56.91
15	+50# Table Tail	2.80	0.78	74.000	71.000	55.222	15.05
16	Regrind Discharge						
17	50# Screen Feed	17.04	4.73	73.100	73.100	346.039	94.29
18	50# Screen U/S	8.84	2.46	56.100	56.100	137.167	37.38
	CALC BELT FEED	360.04	100.0		3.670	367.000	100.00

Notes:
1)Product #5 is calculated using pilot plant flowrate measurement
2)Belt Feed (#1), 50# Screen Feed (#17), +50# Table Conc (#14), Rougher Flot Tail (#8), -50# Screen U/S (#18) are all taken as gospel.

CONCENTRATES:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.28	91.70	56.91	60.36
-50# Product	2.46	56.10	37.38	39.64
Combined Concentrates	4.73	73.23	94.29	100.00

Pilot Plant Run #2



BACON, DONALDSON & ASSOCIATES LTD. Consulting Engineers	Project: Bissett Creek Graphite
Drawn By: ECH / Checked: / Scale: None / Date: Apr 2/90	10 tpd Pilot Plant Flowsheet

GRINDING OPERATION SHEET

Project No.: M90-088 Date: March 15, 1990

Project Name: Bissett Creek Graphite Operator Name: Jack R.

RUN # 2-A

Time	Feed Rate (lb/hr)	Belt Cut (g)	Feed Water Addition (l/min)	Discharge % Solids	Reagent Feed (ml/min)	Pump Box Level
2:20	528	1331	-	35	13.01	mt
2:40			-	42		
3:00	1455	1694	-	55	18.65	mt
3:20	910	1434	-	62	18.79	mt
3:45	912	1438	-			
4:10	722	1138	-	48	18.74	mt
5:05	697	1098	-	47	13.57	mt

Sampling:

Time	Belt Feed	Primary Mill Discharge	Vibrating Screen O/S	Thickener Feed	Thickener O/F	Tailings Conditioner O/F
2:20		✓	✓			
2:30		✓	✓			
2:45		✓	✓			
3:00		✓	✓			
3:20		✓	✓			
4:10		✓	✓			
5:10		✓	✓			

Comments:

Time	Comments
11:45	Start up
12:30	Shut down. Many materials handling problems.
2:00	Start up with new configuration.
2:30	Belt speed raised from 10% to 15%
3:20	Belt speed reduced to 12.5%
6:00	Shut down.

FLOTATION OPERATION SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite
Date: March 15/90
Operator Name: Ed H. & Peter T.

RUN # 2-A

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
11:55		H	H	L	L	L	L	M/L	M/L	-	-	-	-
3:00		G	G	G	G	G	G	G/H	M/H	M/H	G/L	G/L	G/L
4:50		G	G	L	L	L	L	G/H	G/H	G/H	G/H	G/H	flat
5:30		G	G	G	G	L	L	G/H	G/H	G/H	G/H	G/H	flat

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

Time	1st Cleaner Bank: Flotation Cell Level Cell 1	Cell 2	Cell 3	Froth Description Cell 1	Cell 2	Cell 3	2nd Cleaner Bank: Flotation Cell Level Cell 1	Cell 2	Cell 3	Froth Description Cell 1	Cell 2	Cell 3
11:55	G	H	H	G/H	G/H	G/H	G	L	L	G/H	-	-
3:00	L	L	L	G/H	G/H	G/H	L	L	L	G/H	M/H	M/H
4:50	G	L	G	G/H	G/M	G/L	G	L	G	G/H	M/M	M/M
5:30	G	L	G	G/H	G/M	G/M	G	L	G	G/H	M/M	M/L

Comments:

Time	Comments
11:43	Start up
12:00	Table feed starts
12:30	Shut down
2:00	Start up again
3:00	Going well so far
4:50	Dirty rougher froth. No reagent to rougher flotn.

FLOTATION SAMPLING SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: March 15/90
Operator Name: Ed H. & Peter T.

RUN # 2-A

Sample	Cut Time	Time								
			4:50	5:30						
Unit Cell Concentrate	30 s		✓	✓						
Unit Cell Tailing	5 s		✓	✓						
Rougher Flotation Feed	5 s		✓	✓						
Rougher Flotation Conc	30 s		✓	✓						
Rougher Flotation Tail	-		✓	✓						
1st Ro Cleaner Conc	-		✓	✓						
1st Ro Cleaner Tail	30 s		✓	✓						
2nd Ro Cleaner Conc	-		✓	✓						
2nd Ro Cleaner Tail	30 s		✓	✓						
50 mesh Screen Feed	30 s		✓	✓						

Comments:

Time	Comments
12:15	20# O/S line plugged
12:25	line replaced
12:35	Shut down: 1. Add surge tank between 20# u/s & Ro Flotn
	2. Switch rougher cells back to sub-A's
	3. Switch rougher feed pump to large air pump
	4. Lunch
2:00	Start up with new configuration
5:50	Shut down: 1. 50# u/s storage capacity full
	2. Rougher cells sanded out

SIZE DISTRIBUTION

SAMPLE NO:M90-088 Pilot Plant Run #2-A

March 15, 1990

Belt Feed

Size Fraction		Individual Percentage Retained	Cumulative Percentage Passing
	+1"	20.31	79.69
-1"	+3/4"	15.02	64.68
-3/4"	+1/2"	23.83	40.84
-1/2"	+3/8"	7.15	33.70
-3/8"	+ 10	14.07	19.63
- 10	+ 28	5.37	14.26
- 28	+ 48	5.20	9.06
- 48	+100	3.91	5.15
-100	+200	2.54	2.62
-200		2.62	

SIZE DISTRIBUTION

SAMPLE NO:M90-088 Pilot Plant Run #2-AA

March 15, 1990

Flotation Rougher Tails

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	0.55	99.45
- 28	+ 48	20.02	79.43
- 48	+100	31.45	47.97
-100	+200	24.37	23.60
-200		23.60	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Pilot Plant Run #2-AA

March 15, 1990

Unit Cell Concentrate

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	3.14	96.86
- 28	+ 48	48.16	48.70
- 48	+100	28.60	20.10
-100	+200	11.21	8.88
-200		8.88	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Pilot Plant Run #2-AA

March 15, 1990

Rougher Flotation Feed

Size Fraction (mesh)		Individual Percentage Retained		Cumulative Percentage Passing
	+ 28	2.00		98.00
- 28	+ 48	24.45	26.45	73.54
- 48	+100	29.00		44.55
-100	+200	20.98		23.57
-200		23.57		

SIZE DISTRIBUTION

SAMPLE NO:M90-088 Pilot Plant Run #2-AA

March 15, 1990

Rod Mill Discharge

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	15.00	85.00
- 28	+ 48	30.46	54.54
- 48	+100	25.37	29.17
-100	+200	15.38	13.80
-200		13.80	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Plant Run #2 - A (March 15, 1990)

Tables Tailings (Regrind Feed)

Size Fraction (mesh)		Individual Percentage Retained %	Cumulative Percentage Passing %
	+ 20	1.0	99.0
- 20	+ 28	6.3	92.7
- 28	+ 48	58.6	34.1
- 48	+ 65	27.1	7.0
- 65	+ 100	4.7	2.3
- 100	+ 150	1.4	0.9
- 150	+ 200	0.6	0.3
- 200	+ 325	0.2	0.1
- 325		0.1	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Plant Run #2 - A

Regrind Discharge

Size Fraction (mesh)		Individual Percentage Retained %	Cumulative Percentage Passing %
	+ 20	0.2	99.8
- 20	+ 28	2.4	97.4
- 28	+ 48	47.9	49.5
- 48	+ 65	31.9	17.6
- 65	+ 100	9.7	7.9
- 100	+ 150	4.4	3.5
- 150	+ 200	2.0	1.5
- 200	+ 325	1.0	0.5
- 325		0.5	

PILOT RUN #3

PILOT RUN #3

DATE: March 21, 1990

DURATION: 6 hours

ASSAY HEAD: 3.53 %C(g)

THROUGHPUT: 1750 kg

REAGENT COSUMPTION: 120 g/tonne EKOF 452 G
REAGENT ADDITION: Rod Mill Discharge, Ro Flot Cell #1

FLOWSHEET MODIFICATIONS:

1) Removed 512 lbs rods from Primary Rod Mill (approx 1000 lbs remaining)

2)

3)

4)

5)

6)

7)

RESULTS:

Final Concentrates:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.86	91.60	74.14	84.82
-50 Product	0.65	71.60	13.27	15.18
Combined Concentrates	3.50	87.92	87.41	100.00

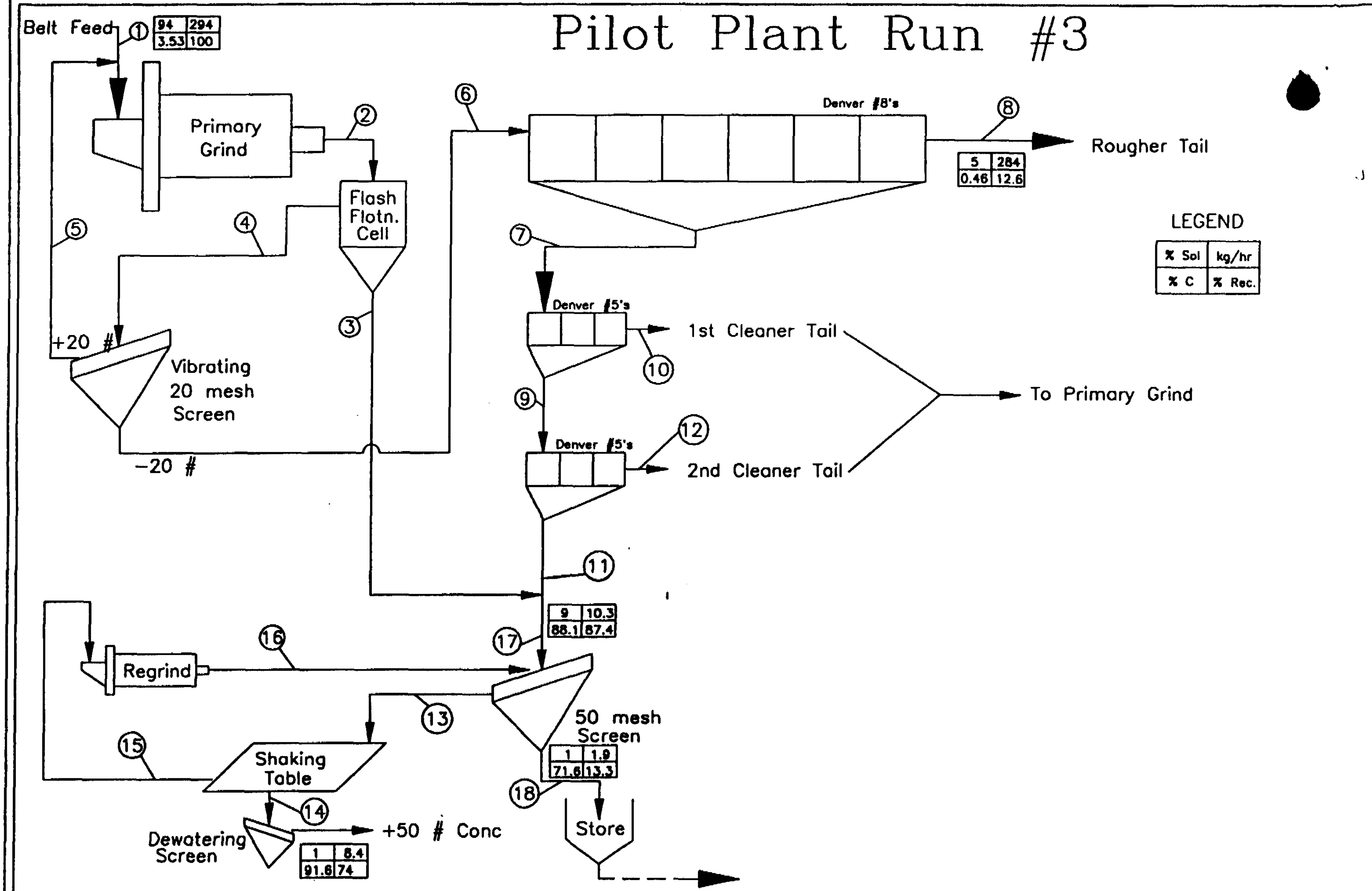
TEST NUMBER: Pilot Plant Run #3

Flowsheet Stream No	PRODUCT	WEIGHT Kg/hr	WEIGHT %	ASSAYS, %C(g) Assayed	ASSAYS, %C(g) Calc	UNITS OF C(g) Calc	DISTRIBUTION %C(g) Calc
Primary Circuit:							
1	Belt Feed	294.00	100.00	3.530	3.530	353.000	100.00
2	Rod Mill Discharge						
3	Unit Cell Conc						
4	Unit Cell Tail						
5	20# Screen O/S						
6	20# Screen U/S						
7	Rougher Flot Conc						
8	Rougher Flot Tail	284.00	96.60	0.460	0.460	44.435	12.59
9	1st Ro Clnr Conc						
10	1st Ro Clnr Tail						
11	2nd Ro Clnr Conc						
12	2nd Ro Clnr Tail						
13	50# Screen O/S (Table Feed)						
14	+50# Table Conc	8.40	2.86	91.600	91.600	261.714	74.14
15	+50# Table Tail						
16	Regrind Discharge						
17	50# Screen Feed	10.30	3.50	88.100	88.100	308.565	87.41
18	50# Screen U/S	1.90	0.65	71.600	71.600	46.850	13.27
	CALC BELT FEED	294.30	100.0		3.530	353.000	100.00

Notes:
1)Product #5 is calculated using pilot plant flowrate measurement
2)Belt Feed (#1), 50# Screen Feed (#17), +50# Table Conc (#14), Rougher Flot Tail (#8), -50# Screen U/S (#18) are all taken as gospel.

CONCENTRATES:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.86	91.60	74.14	84.82
-50# Product	0.65	71.60	13.27	15.18
Combined Concentrates	3.50	87.92	87.41	100.00

Pilot Plant Run #3



BACON, DONALDSON & ASSOCIATES LTD. Consulting Engineers

Project: Bissett Creek Graphite	
10 tpd Pilot Plant Flowsheet	
Drawn By: ECH	Checked:
Scale: None	Date: Apr 2/90

GRINDING OPERATION SHEET

Project No.: M90-088 Date: March 21,1990

Project Name: Bissett Creek Graphite Operator Name: Jack R.

RUN # 3-A

Time	Feed Rate (lb/hr)	Belt Cut (g)	Feed Water Addition (l/min)	Discharge % Solids	Reagent Feed (ml/min)	Pump Box Level
9:45	1013	2615	-			
10:00	697	1800	-			
10:20	1192	3079	-			
10:40	1018	2630	-	61	14.16	up & down
12:20	707	1827	-			
1:00	813	2100	-			
1:30	771	1992	-			
2:00	752	1943	-	50		mt
2:45	668	1725	-	35		mt
3:30	640	1653	-	34		mt

Sampling:

Time	Belt Feed	Primary Mill Discharge	Vibrating Screen O/S	Thickener Feed	Thickener O/F	Tailings Conditioner O/F
2:00	✓	✓	✓			
2:45	✓	✓	✓			
3:30	✓	✓	✓			

Comments:

Time	Comments
9:30	Start up
3:30	Shut down. Many materials handling problems.

FLOTATION OPERATION SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: March 21/90
Operator Name: Ed H. & Peter T.

RUN # 3-A

Rougher Flotation:

	Feed	Flotation Cell Level						Froth Description					
	%	Cell	Cell	Cell	Cell	Cell	Cell	Cell	Cell	Cell	Cell	Cell	Cell
Time	Solids	1	2	3	4	5	6	1	2	3	4	5	6
2:30	12	G	G	G	G	G	G	G/H	G/M	G/M	G/M	M/M	M/L
3:15	12	G	G	G	G	G	G	G/H	G/M	G/M	G/M	M/M	M/L

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

	1st Cleaner Bank						2nd Cleaner Bank					
	Flotation Cell Level			Froth Description			Flotation Cell Level			Froth Description		
	Cell	Cell	Cell	Cell	Cell	Cell	Cell	Cell	Cell	Cell	Cell	Cell
Time	1	2	3	1	2	3	1	2	3	1	2	3
2:40	G	G	G	G/H	G/H	L/M	G	L	M	G/H	M/M	M/M
3:25	G	G	G	G/H	G/H	L/M	G	L	M	G/H	M/M	M/M

Comments:

Time	Comments

FLOTATION SAMPLING SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: March 21/90
Operator Name: Ed H. & Peter T.

RUN # 3-A

Sample	Cut Time	Time								
			2:30	3:15						
Unit Cell Concentrate	30 s		✓	✓						
Unit Cell Tailing	5 s		✓	✓						
Rougher Flotation Feed	5 s		✓	✓						
Rougher Flotation Conc	30 s		✓	✓						
Rougher Flotation Tail	-		✓	✓						
1st Ro Cleaner Conc	-		✓	✓						
1st Ro Cleaner Tail	30 s		✓	✓						
2nd Ro Cleaner Conc	-		✓	✓						
2nd Ro Cleaner Tail	30 s		✓	✓						
50 mesh Screen Feed	30 s		✓	✓						

Comments:

Time	Comments

SIZE DISTRIBUTION

SAMPLE NO. Pilot Run #3 - A

Belt Feed

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 1"	13.5	86.5
- 1" + 3/4"	20.5	66.0
- 3/4" + 1/2"	17.2	48.8
- 1/2" + 3/8"	7.0	41.8
- 3/8" + 10#	18.7	23.1
- 10# + 28#	5.7	17.4
- 28# + 48#	6.4	11.0
- 48# + 100#	4.5	6.5
- 100# + 200#	3.2	3.3
- 200#	3.3	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Run #3 - A

Rougher Flotation Feed

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	7.7	92.3
- 28 + 48	28.6	63.7
- 48 + 100	29.4	34.3
- 100 + 200	18.5	15.8
- 200	15.8	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Plant Run #3 - A

Rod Mill Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	21.9	78.1
- 28 + 48	29.2	48.9
- 48 + 100	22.8	26.1
- 100 + 200	12.4	13.7
- 200	13.7	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Pilot Plant Run #3A
Rougher Flotation Tails

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	0.45	99.55
- 28	+ 48	4.18	95.36
- 48	+100	22.86	72.51
-100	+200	35.18	37.32
-200		37.32	

PILOT RUN #4

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Pilot Plant Run #3A
Rougher Flotation Tails

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	0.45	99.55
- 28	+ 48	4.18	95.36
- 48	+100	22.86	72.51
-100	+200	35.18	37.32
-200		37.32	

PILOT RUN #4

PILOT RUN #4

DATE: March 29, 1990

DURATION: 3 hours

ASSAY HEAD: 3.51 %C(g)

THROUGHPUT: 820 kg

REAGENT COSUMPTION: 200 g/tonne EKOF 452 G (Rougher)
REAGENT ADDITION: Rod Mill Discharge, Ro Cell #1, Ro Cell #4

FLOWSHEET MODIFICATIONS:

1)Relocated unit cell to concrete floor level

2)Install recycle loops to stabilize feed to unit cell and rougher flotation

3)Modified Denver #8 sub-A cells to a "semi-DR", cell to cell type design

4)Install a sand relief dart valve at the end of rougher bank of cells

5)Added reagent addition point to Rougher cell #4

6)Reduced speed of rougher froth paddles by 20%

7)

RESULTS:

Final Concentrates:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.24	88.40	56.47	63.90
-50+100# Concentrate	0.74	86.40	18.27	20.68
-100# Concentrate	0.58	82.10	13.63	15.42
Combined Concentrates	3.57	86.95	88.38	100.00

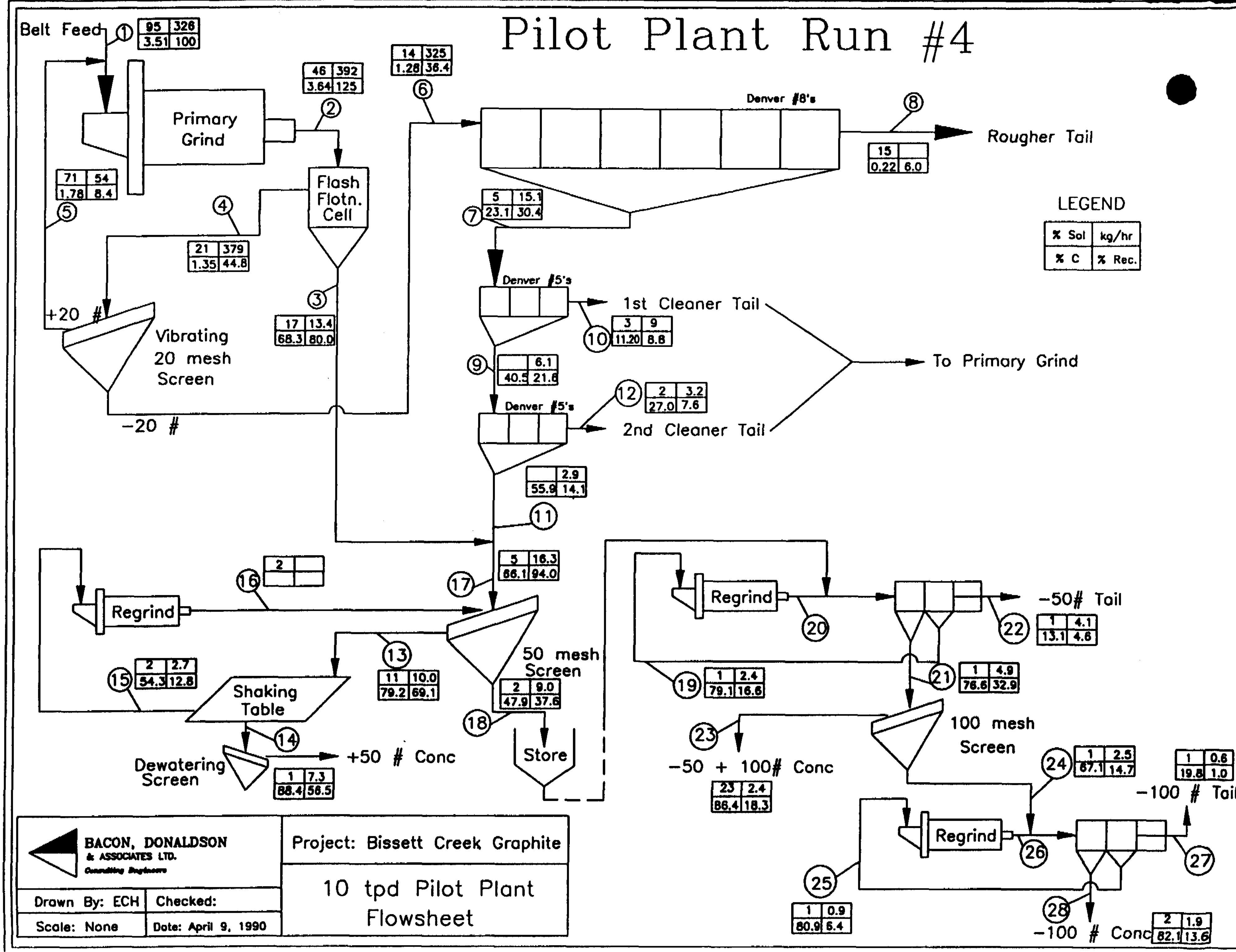
TEST NUMBER: Pilot Plant Run #4

Flowsheet Stream No	PRODUCT	WEIGHT Kg/hr	WEIGHT %	ASSAYS, %C(g) Assayed	Calc	UNITS OF C(g) Calc	DISTRIBUTION %C(g) Calc
Primary Circuit:							
1	Belt Feed	326.00	100.00	3.510	3.510	351.000	100.00
2	Rod Mill Discharge	392.200	120.31	3.790	3.840	437.908	124.76
3	Unit Cell Conc	13.40	4.11	60.400	68.300	280.742	79.98
4	Unit Cell Tail	378.80	116.20	1.480	1.353	157.166	44.78
5	20# Screen O/S	54.00	16.56	1.780	1.780	29.485	8.40
6	20# Screen U/S	324.80	99.63	1.210	1.282	127.681	36.38
7	Rougher Flot Conc	15.10	4.63	29.700	23.053	106.781	30.42
8	Rougher Flot Tail	309.70	95.00	0.220	0.220	20.900	5.95
9	1st Ro Clnr Conc	6.10	1.87	28.700	40.542	75.861	21.61
10	1st Ro Clnr Tail	9.00	2.76	11.200	11.200	30.920	8.81
11	2nd Ro Clnr Conc	2.88	0.88	35.000	55.865	49.358	14.06
12	2nd Ro Clnr Tail	3.20	0.98	27.000	27.000	26.503	7.55
13	50# Screen O/S (Table Feed)	10.01	3.07	84.600	79.202	243.194	69.29
14	+50# Table Conc	7.31	2.24	88.400	88.400	198.222	56.47
15	+50# Table Tail	2.70	0.83	54.300	54.300	44.972	12.81
16	Regrind Discharge						
17	50# Screen Feed	16.28	4.99	66.100	66.100	330.100	94.05
18	50# Screen U/S	8.97	2.75	47.900	47.900	131.878	37.57
-50 Mesh Circuit:							
19	2nd Cl (Scav) Conc	2.40	0.74	79.100	79.100	58.233	16.59
20	Regrind Discharge						
21	1st Cl Conc	4.92	1.51	80.100	76.617	115.631	32.94
22	2nd Cl (Scav) Tail	4.05	1.24	13.200	13.077	16.247	4.63
23	-50 +100# Final Conc	2.42	0.74	86.400	86.400	64.137	18.27
-100 Mesh Circuit:							
24	100 Mesh Screen U/S	2.50	0.77	67.200	67.148	51.494	14.67
25	2nd Cl (Scav) Conc	0.90	0.28	80.900	80.900	22.334	6.36
26	Regrind Discharge						
27	2nd Cl (Scav) Tail	0.60	0.18	16.400	19.800	3.644	1.04
28	-100# Final Conc	1.90	0.58	82.100	82.100	47.850	13.63
	CALC BELT FEED	325.98	100.0		3.510	351.000	100.00

Notes:
1)Product #5 is calculated using pilot plant flowrate measurement
2)Belt Feed (#1), 50# Screen Feed (#17), +50# Table Conc (#14), Rougher Flot Tail (#8), -50# Screen U/S (#18), -50+100# Conc (#23), -100# Conc (#28) are all taken as gospel.

CONCENTRATES:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.24	88.40	56.47	63.90
-50+100# Concentrate	0.74	86.40	18.27	20.68
-100# Concentrate	0.58	82.10	13.63	15.42
Combined Concentrates	3.57	86.95	88.38	100.00

Pilot Plant Run #4



GRINDING OPERATION SHEET

Project No.: M90-088

Project Name: Bissett Creek Graphite

Date: March 28,1990

Operator Name: Jack R.

RUN # 4-A

Time	Feed Rate (lb/hr)	Belt Cut (g)	Feed Water Addition (l/min)	Discharge % Solids	Reagent Feed (ml/min)	Pump Box Level
2:40	832	2148	-	44	13.28	mt
3:00	948	2448	-	46	13.25	mt
3:30	967	2497	-	44	13.25	mt
4:00	735	1897	-	32	13.24	mt
4:20	993	2565	-			
4:30	1142	2949	-	26	13.23	mt

Sampling:

Time	Belt Feed	Primary Mill Discharge	Vibrating Screen O/S
3:00	✓	✓	✓
3:30	✓	✓	✓
4:00	✓	✓	✓
4:30	✓	✓	✓

Comments:

Time	Comments
1:30	Start up
4:00	Feed becoming coarser & slightly drier - raised gate on F.O.B.
4:40	Shut down

FLOTATION OPERATION SHEET

Project No.: M90-088 Date: March 28/90
Project Name: Bissett Creek Graphite Operator Name: Ed H. & Peter T.

RUN # 4-A

Rougher Flotation:

	Feed	Flotation Cell Level						Froth Description					
Time	% Solids	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
3:10		G	G	G	G	L	U	G/H	M/L	M/L	P/L	P/L	M/L
3:30	20	G	G	G	L	L	U	G/H	M/L	M/L	P/L	M/L	M/L
4:00	18	G	G	G	L	L	U	G/H	M/L	M/L	P/L	M/L	M/L
4:30	14	G	G	G	L	U	U	G/H	M/L	M/L	P/L	M/L	M/L

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

	1st Cleaner Bank						2nd Cleaner Bank					
	Flotation Cell Level			Froth Description			Flotation Cell Level			Froth Description		
Time	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
2:30	H	G	L	G/L	G/L	G/L	G	L	L	G/L	P/L	P/L
3:00	G	G	G	G/M	G/L	G/L	H	L	G	G/L	P/L	G/L
3:30	H	H	H	G/M	G/M	G/M	H	L	G	G/M	P/M	G/M
4:00	G	G	G	G/M	G/M	G/M	G	L	G	G/M	P/M	G/M
4:30	H	G	G	G/M	G/M	G/M	H	L	G	G/M	P/M	G/M

Comments:

Time	Comments
2:30	Unit cell appears to be recovering almost all graphite
3:10	Tailings box sanded out
3:20	Increase rougher feed flow rate
3:20-3:40	Cleaner paddles broken and being fixed

FLOTATION SAMPLING SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: March 28/90
Operator Name: Ed H. & Peter T.

RUN # 4-A

Sample	Cut Time	Time								
			3:00	3:30	4:00	4:30				
Unit Cell Concentrate	30 s		✓	✓	✓	✓				
Unit Cell Tailing	5 s		✓	✓	✓	✓				
Rougher Flotation Feed	-		✓	✓	✓	✓				
Rougher Flotation Conc	10 s		✓	✓	✓	✓				
Rougher Flotation Tail	-		✓	✓	✓	✓				
1st Ro Cleaner Conc	-		✓	✓	✓	✓				
1st Ro Cleaner Tail	20 s		✓	✓	✓	✓				
2nd Ro Cleaner Conc	-		✓	✓	✓	✓				
2nd Ro Cleaner Tail	30 s		✓	✓	✓	✓				
50 mesh Screen Feed	15 s		✓	✓	✓	✓				

Comments:

Time	Comments

FLOTATION OPERATION SHEET

Project No.: M90-088 Date: April 2/90
Project Name: Bissett Creek Graphite Operator Name: Ed H. & Bruce S.

RUN # 4-B

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

Time	1st Cleaner Bank Flotation Cell Level Cell 1	Cell 2	Cell 3	Froth Description Cell 1	Cell 2	Cell 3	2nd Cleaner Bank Flotation Cell Level Cell 1	Cell 2	Cell 3	Froth Description Cell 1	Cell 2	Cell 3
9:10	G	G	G	G/H	G/H	G/H						
9:25	G	G	L	G/H	G/M	G/M						
9:45	G	G	L	G/H	G/H	G/H						
10:05	G	G	L	G/H	G/H	G/H						
10:25	G	G	G	G/H	G/H	G/H						

Comments:

Time	Comments
9:05	Start up
9:10	Start collecting scav tails in settling tub
9:25	settling tub full
9:35	Start collecting 2nd tub of scav tails
10:00	2nd settling tub full
10:35	Shut down. Feed tank empty

FLOTATION SAMPLING SHEET

Project No.: M90-088 Date: April 2/90

Project Name: Bissett Creek Graphite Operator Name: Ed H. & Bruce S.

RUN # 4-B

Sample	Cut Time	Time								
			9:11	9:25	9:45	10:05				
-50 mesh Feed	20 s		✓	✓	✓	✓				
Regrind Discharge	20 s		✓	✓	✓	✓				
-100 mesh Product	20 s		✓	✓	✓	✓				
1st Cleaner Conc	20 s		✓	✓	✓	✓				
+100 mesh Conc	-		–	–	–	–				
2nd Cleaner Conc	20 s		✓	✓	✓	✓				
2nd Cleaner Tail	20 s		✓	✓	✓	✓				

Comments:

Time	Comments

FLOTATION OPERATION SHEET

Project No.: M90-088 Date: April 2/90
Project Name: Bissett Creek Graphite Operator Name: Ed H. & Bruce S.

RUN # 4-C

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level						Froth Description					
		Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

Time	1st Cleaner Bank						2nd Cleaner Bank					
	Flotation Cell Level			Froth Description			Flotation Cell Level			Froth Description		
	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
12:50	G	G	G	G/H	G/H	G/H						
12:58	G	G	G	G/H	G/M	G/H						
1:05	G	G	G	G/H	G/H	G/H						
1:14	G	G	G	G/H	G/H	G/H						

Comments:

Time	Comments
12:42	Start up
12:45	Start collecting scav tail in tub #1
1:00	Tub #1 full. Start tub #2
1;17	Feed gone
1:20	Shut down

FLOTATION SAMPLING SHEET

Project No.: M90-088 Date: April 2/90

Project Name: Bissett Creek Graphite Operator Name: Ed H. & Bruce S.

RUN # 4-C

Sample	Cut Time	Time	12:47	12:55	1:03	1:11				
-100 mesh Feed	20 s		✓	✓	✓	✓				
Regrind Discharge	20 s		✓	✓	✓	✓				
1st Cleaner Conc	-		-	-	-	-				
2nd Cleaner Conc	20 s		✓	✓	✓	✓				
2nd Cleaner Tail	20 s		✓	✓	✓	✓				

Comments:

Time	Comments

SIZE DISTRIBUTION

SAMPLE NO. Pilot Run #4 - A

Belt Feed

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 1"	11.2	88.8
- 1" + 3/4"	21.6	67.2
- 3/4" + 1/2"	24.6	42.6
- 1/2" + 3/8"	7.4	35.2
- 3/8" + 10#	14.3	20.9
- 10# + 28#	5.4	15.5
- 28# + 48#	5.6	9.9
- 48# + 100#	4.1	5.8
- 100# + 200#	2.8	3.0
- 200#	3.0	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #4 - A

Rod Mill Discharge

Size Fraction (mesh)		Individual Percentage Retained %	Cumulative Percentage Passing %
	+ 28	9.6	90.4
- 28	+ 48	30.0	60.4
- 48	+ 100	25.4	35.0
- 100	+ 200	18.7	16.3
- 200		16.3	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Run #4A
Unit Cell Concentrate

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	7.47	92.53
- 28	+ 48	35.29	57.25
- 48	+100	25.44	31.80
-100	+200	13.80	18.00
-200		18.00	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #4 - A

Rougher Flotation Feed

Size Fraction (mesh)		Individual Percentage Retained %	Cumulative Percentage Passing %
	+ 28	5.5	94.5
- 28	+ 48	40.1	54.4
- 48	+ 100	22.4	32.0
- 100	+ 200	14.8	17.2
- 200		17.2	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #4 - A

Rougher Flotation Tailings

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	3.7	96.3
- 28 + 48	28.1	68.2
- 48 + 100	21.9	46.3
- 100 + 200	23.4	22.9
- 200	22.9	

SIZE DISTRIBUTION

SAMPLE NO:M90-088 Pilot Plant Run #4A Rougher Tails

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	4.32	95.68
- 28	+ 48	26.82	68.86
- 48	+100	22.82	46.05
-100	+200	20.38	25.66
-200		25.66	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Run #4B

1st Cleaner Concentrate

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	0.00	100.00
- 28	+ 48	9.28	90.72
- 48	+100	42.32	48.41
-100	+200	28.70	19.71
-200		19.71	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Run #4C
1st Cleaner Concentrate
(-100 mesh Final Concentrate)

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	0.50	99.50
- 28	+ 48	4.64	94.86
- 48	+100	19.49	75.37
-100	+200	40.65	34.71
-200		34.71	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Run #4B

2nd Cleaner Concentrate

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	0.00	100.00
- 28	+ 48	18.20	81.80
- 48	+100	39.12	42.68
-100	+200	22.59	20.08
-200		20.08	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Run #4B
Regrind Discharge

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	2.95	97.05
- 28	+ 48	12.45	84.60
- 48	+100	28.41	56.19
-100	+200	22.75	33.44
-200		33.44	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Run #4C

2nd Cleaner Concentrate

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	0.00	100.00
- 28	+ 48	8.08	91.92
- 48	+100	24.94	66.98
-100	+200	31.35	35.63
-200		35.63	

SIZE DISTRIBUTION

SAMPLE NO: M90-088 Run #4C
Regrind Discharge

Size Fraction (mesh)		Individual Percentage Retained	Cumulative Percentage Passing
	+ 28	0.76	99.24
- 28	+ 48	7.72	91.52
- 48	+100	38.14	53.38
-100	+200	26.57	26.81
-200		26.81	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #4 - A

Table Tailings (Regrind Feed)

Size Fraction (mesh)		Individual Percentage Retained %	Cumulative Percentage Passing %
	+ 28	1.1	98.9
- 28	+ 48	49.0	49.9
- 48	+ 100	39.9	10.0
- 100	+ 200	7.5	2.5
- 200		2.5	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #4 - A

Regrind Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	0.4	99.6
- 28 + 48	34.1	65.5
- 48 + 100	29.8	35.7
- 100 + 200	19.2	16.5
- 200	16.5	

PILOT RUN #5

PILOT RUN #5

DATE: April 25, 1990

DURATION: 6.5 hours

ASSAY HEAD: 3.40 %C(g)

THROUGHPUT: 2000 kg

REAGENT COSUMPTION: 230 g/tonne EKOF 452 G (Rougher)
20 g/tonne EKOF 452 G (Undersize)

REAGENT ADDITION: RM Discharge, Ro Cell #1, Ro Cell #4 (Rougher)
1st Cl Feed, Regrind Feed (Undersize)

FLOWSHEET MODIFICATIONS:

1)Removed 2x2 Allis Chalmers pump and used 1 1/2" vertical pump for rod mill discharge

2)Added agitator to tailings disharge box of rougher cells

3)Thickened feed prior to -48# circuit (approx 12% solids)

4)Increased flotation capacity from 3 to 7 cells for the -48# circuit

5)Tabled -48+100# concentrate

6)Tabled -100# concentrate

7)Added reagent addition to -48# and -100# circuits

RESULTS:

Final Concentrates:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.43	94.30	67.36	72.97
-50+100# Concentrate	0.45	94.20	12.33	13.36
-100# Concentrate	0.53	81.50	12.62	13.68
Combined Concentrates	3.40	92.30	92.31	100.00

TEST NUMBER: Pilot Plant Run #5

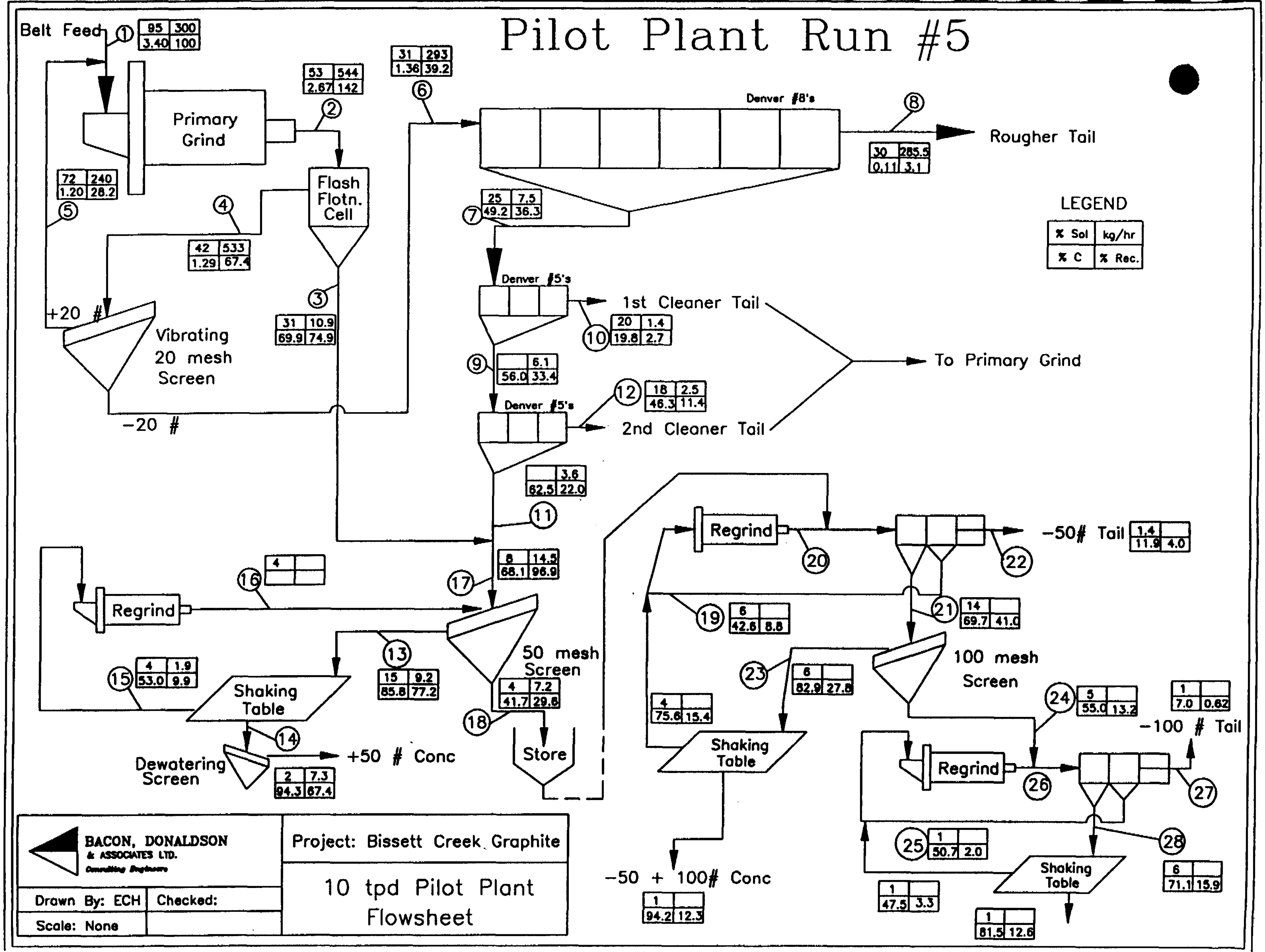
Flowsheet Stream No	PRODUCT	WEIGHT Kg/hr	WEIGHT %	ASSAYS, %C(g) Assayed	ASSAYS, %C(g) Calc	UNITS OF C(g) Calc	DISTRIBUTION %C(g) Calc
Primary Circuit:							
1	Belt Feed	300.00	100.00	3.400	3.400	340.000	100.00
2	Rod Mill Discharge	543.90	181.30	2.670	2.669	483.823	142.30
3	Unit Cell Conc	10.92	3.64	58.900	69.940	254.582	74.88
4	Unit Cell Tail	532.98	177.66	0.840	1.290	229.242	67.42
5	20# Screen O/S	240.00	80.00	1.150	1.200	96.000	28.24
6	20# Screen U/S	292.98	97.66	1.370	1.364	133.242	39.19
7	Rougher Flot Conc	7.48	2.49	49.200	49.241	122.773	36.11
8	Rougher Flot Tail	285.50	95.17	0.110	0.110	10.468	3.08
9	1st Ro Clnr Conc	6.08	2.03	55.800	56.020	113.533	33.39
10	1st Ro Clnr Tail	1.40	0.47	19.800	19.800	9.240	2.72
11	2nd Ro Clnr Conc	3.60	1.20	62.500	62.514	74.950	22.04
12	2nd Ro Clnr Tail	2.50	0.83	46.300	46.300	38.583	11.35
13	50# Screen O/S (Table Feed)	9.19	3.06	85.700	85.758	262.590	77.23
14	+50# Table Conc	7.29	2.43	94.300	94.300	229.023	67.36
15	+50# Table Tail	1.90	0.63	52.500	53.000	33.567	9.87
16	Regrind Discharge						
17	50# Screen Feed	14.52	4.84	68.100	68.100	329.532	96.92
18	50# Screen U/S	7.23	2.41	41.700	41.700	100.508	29.56
-50 Mesh Circuit:							
19	2nd Cl (Scav) Conc	2.10	0.70	42.600	42.600	29.820	8.77
20	Regrind Discharge						
21	1st Cl Conc	5.87	1.96	69.900	69.700	139.29	40.97
22	2nd Cl (Scav) Tail	3.45	1.15	4.490	11.872	13.636	4.01
23	-50 +100# 1st Cl Conc (Table Feed)	3.42	1.14	88.000	82.871	94.335	27.75
23A	-50 +100# Final Conc (Table Conc)	1.34	0.457	94.200	94.200	41.919	12.33 12.67
23B	-50 +100# Table Tail	2.08	0.69	75.600	75.600	52.418	15.42
-100 Mesh Circuit:							
24	100 Mesh Screen U/S	2.45	0.82	54.600	55.045	44.953	13.22
25	2nd Cl (Scav) Conc	0.40	0.13	50.700	50.700	6.760	1.99
26	Regrind Discharge						
27	2nd Cl (Scav) Tail	0.87	0.29	7.000	7.000	2.030	0.60
28	-100# 1st Cl Conc (Table Feed)	2.28	0.76	69.300	71.061	54.007	15.88
28A	-100# Final Conc (Table Conc)	1.58	0.53	81.500	81.500	42.923	12.62
28B	-100# Table Tail	0.70	0.23	47.500	47.500	11.083	3.26
	CALC BELT FEED	300.02	100.0		3.400	340.000	100.00

Notes:

1)Product #5 is calculated using pilot plant flowrate measurement

2)Belt Feed (#1), 50# Screen Feed (#17), +50# Table Conc (#14), Rougher Flot Tail (#8), -50# Screen U/S (#18), -50+100# Conc (#23), -100# Conc (#28) are all taken as gospel.

CONCENTRATES:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.43	94.30	67.36	72.97
-50+100# Final Concentrate	0.45	94.20	12.33	13.36
-100# Final Concentrate	0.53	81.50	12.62	13.68
Combined Concentrates	3.40	92.30	92.31	100.00



Pilot Plant Run #5
LEGEND
% Sol | kg/hr
% C | % Rec.
Belt Feed
1
95 | 300
3.40 | 100
Primary Grind
2
53 | 544
2.67 | 142
Flash Flotn. Cell
3
31 | 10.9
69.9 | 74.9
4
42 | 533
1.29 | 67.4
5
72 | 240
1.20 | 28.2
Vibrating 20 mesh Screen
+20 #
-20 #
6
31 | 293
1.36 | 39.2
Denver #8's
8
30 | 285.5
0.11 | 3.1
Rougher Tail
7
25 | 7.5
49.2 | 36.3
Denver #5's
10
20 | 1.4
19.8 | 2.7
1st Cleaner Tail
9
6.1
56.0 | 33.4
Denver #5's
12
18 | 2.5
46.3 | 11.4
2nd Cleaner Tail
To Primary Grind
3.6
62.5 | 22.0
11
17
8 | 14.5
68.1 | 96.9
16
4
Regrind
50 mesh Screen
13
15 | 9.2
85.8 | 77.2
15
4 | 1.9
53.0 | 9.9
Shaking Table
14
Dewatering Screen
+50 # Conc
2 | 7.3
94.3 | 67.4
18
4 | 7.2
41.7 | 29.8
Store
Regrind
20
22
-50# Tail
1.4
11.9 | 4.0
19
6
42.6 | 8.8
21
14
69.7 | 41.0
100 mesh Screen
23
6
82.9 | 27.8
4
75.6 | 15.4
Shaking Table
-50 + 100# Conc
1
94.2 | 12.3
24
5
55.0 | 13.2
1
7.0 | 0.62
-100 # Tail
Regrind
26
27
25
1
50.7 | 2.0
28
6
71.1 | 15.9
1
47.5 | 3.3
Shaking Table
1
81.5 | 12.6
BACON, DONALDSON & ASSOCIATES LTD.
Consulting Engineers
Project: Bissett Creek Graphite
10 tpd Pilot Plant Flowsheet
Drawn By: ECH
Checked:
Scale: None

GRINDING OPERATION SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: April 25/90
Operator Name: Jack R.

RUN # 5-A

Time	Feed Rate (lb/hr)	Belt Cut (g)	Feed Water Addition (l/min)	Discharge % Solids	Reagent Feed (ml/min)	Pump Box Level
2:00	1078	2176	-	47	20.11	1/2
2:50	850	1716	-	50		
3:50	779	1572	-	55	20.11	1/4
5:10	827	1669	-	52	20.11	1/4
5:30	724	1461	-	53	20.11	1/4
5:50	917	1851	-	56	20.15	1/4

Sampling:

Time	Belt Feed	Primary Mill Discharge	Vibrating Screen O/S	Unit Cell Feed
5:10				43%
5:30				46%
5:50				45%

Comments:

Time	Comments

FLOTATION OPERATION SHEET

Project No.: M90-088   Date: April 25/90

Project Name: Bissett Creek Graphite   Operator Name: Ed H. & Peter T.

RUN # 5-A

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
4:00	24	G	G	G	G	L	U	G/H	M/L	M/L	P/L	P/L	M/L
4:30	30	G	G	G	L	L	U	G/H	M/L	M/L	P/L	M/L	M/L
5:00	33	U	U	U	U	U	U	G/H	M/L	M/L	P/L	M/L	M/L
5:20	31	G	G	G	G	U	U	G/H	M/L	M/L	P/L	M/L	M/L
5:50	28	G	G	G	G	G	G	G/H	M/L	M/L	P/L	M/L	M/L

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

Time	1st Cleaner Bank Flotation Cell Level Cell 1	Cell 2	Cell 3	1st Cleaner Bank Froth Description Cell 1	Cell 2	Cell 3	2nd Cleaner Bank Flotation Cell Level Cell 1	Cell 2	Cell 3	2nd Cleaner Bank Froth Description Cell 1	Cell 2	Cell 3
4:00	G	G	G	G/M	G/M	G/M	H	G	H	G/M	G/M	G/M
4:30	G	H	G	G/H	G/M	G/M	G	G	G	G/H	G/M	G/M
5:00	G	L	G	G/H	G/M	G/M	G	L	L	G/M	P/M	G/M
5:25	G	L	G	G/H	G/M	G/M	G	L	G	G/M	P/M	G/M
5:50	G	L	L	G/H	G/M	G/M	H	L	G	G/M	P/M	G/M

Comments:

Time	Comments
1:30	Running well 2 hours now, looks good, call Matt.
2:05	Matt arrives.
5:00	Begin sampling.
6:00	Shut down.

FLOTATION SAMPLING SHEET

Project No.: M90-088 Date: April 25/90

Project Name: Bissett Creek Graphite Operator Name: Ed H. & Peter T.

RUN # 5-A

Sample	Cut Time	Time								
			5:00	5:25	5:50					
Unit Cell Concentrate	30 s		✓	✓	✓					
Unit Cell Tailing	10 s		✓	✓	✓					
Rougher Flotation Feed	-		✓	✓	✓					
Rougher Flotation Conc	10 s		✓	✓	✓					
Rougher Flotation Tail	7s		✓	✓	✓					
1st Ro Cleaner Conc	-		✓	✓	✓					
1st Ro Cleaner Tail	20 s		✓	✓	✓					
2nd Ro Cleaner Conc	-		✓	✓	✓					
2nd Ro Cleaner Tail	20 s		✓	✓	✓					
50 mesh Screen Feed	15 s		✓	✓	✓					

Comments:

Time	Comments
11:30	Start up (pre-production): completelt new unit cell configuration.
1:00	Increase all reagent flowrates by 50%.
2:10	Matt & MJVB are adjusting rougher cells - unsteady.

FLOTATION OPERATION SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: Jun 5/90
Operator Name: Jasman & Bruce S.

RUN # 5-B

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level						Froth Description					
		Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

Time	Feed % Solids	Flotation Cell Level						Froth Description					
		Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
10:45	16	G	G	G	ML	L	VL	G/H	G/H	M/M	M/M	P/L	P/L
12:46		G	G	G	ML	L	VL	G/H	G/H	M/M	M/M	P/L	P/L
1:00		G	G	G	M	ML	L	G/H	G/H	M/M	M/M	P/L	P/L

Comments:

Time	Comments
9:45	Start up (Pre-production):
	1. First 2 cells pulling high grade. Switch launders to reflect this.
	2. Reagent feeding at 1/2 strength
	3. Dewatering screen switched to 200 mesh
	4. Adjusted stroke on shaking table

FLOTATION SAMPLING SHEET

Project No.: M90-088 Date: Jun 5/90

Project Name: Bissett Creek Graphite Operator Name: Jasman & Bruce S.

RUN # 5-B

	Cut	Time								
Sample	Time		12:25	12:55	1:25	1:55	2:25			
-50 mesh Feed	30 s		30 s	2 min	30 s	2 min	30 s			
Regrind Feed	30 s		✓	✓	✓	✓	✓			
Regrind Discharge	30 s		✓	✓	✓	✓	✓			
-100 mesh Product	30 s		✓	✓	✓	✓	✓			
1st Cleaner Conc	30 s		✓	✓	✓	✓	✓			
Table Feed	30 s		✓	✓	✓	✓	✓			
Table Conc	Total		✓	✓	✓	✓	✓			
Table Tail	30 s		✓	✓	✓	✓	✓			
2nd Cleaner Conc	30 s		✓	✓	✓	✓	✓			
2nd Cleaner Tail	30 s		✓	✓	✓	✓	✓			
Table Conc (+100 mesh)	30 s		✓	✓	✓	✓	✓			

Comments:

Time	Comments
10:45	Not enough feed for the table
11:00	Start tabling
11:45	Start reagent feed to cleaner cell #4 (3 ml/min)
12:20	Start sampling
12:40	Densities: 1)Feed = 20%, 2)Tails = 14%, 3)Regrind Disch = 5%
1:10	Reagent switched from cell #4 to cell #3
1:15	Reagent reduced to 2 ml/min
2:10	Densities: 1)Feed = 14%, 2)Tails = 8%, 3)Regrind Disch = 5%
2:10	Reagent: 1)Regrind: = 5ml/min, 2)cell #3 = 2 ml/min
2:30	Shut down

FLOTATION OPERATION SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: Jun 5/90
Operator Name: Jasman & Bruce S.

RUN # 5-C

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
2:30	4	G	G	G	ML	L	VL	G/H	G/H	M/M	M/M	P/L	P/L
3:30		G	G	G	ML	L	VL	G/H	G/H	M/M	M/M	P/L	P/L
4:30		G	G	G	M	ML	L	G/H	G/H	M/M	M/M	P/L	P/L

Comments:

Time	Comments
2:30	Begin -100 mesh feed
	reagents off
	table conc to blue tank
3:00	Reagent: 1)cell #3 = 2 ml/min
3:10	Band (approx 3 cm wide) observed during tabling of -100 mesh conc

FLOTATION SAMPLING SHEET

Project No.: M90-088 | Date: Jun 5/90
Project Name: Bissett Creek Graphite | Operator Name: Jasman & Bruce S.

RUN # 5-C

Sample	Cut Time	Time								
			12:25	12:55	1:25	1:55	2:25			
-100 mesh Feed	30 s		30 s	2 min	30 s	2 min	30 s			
Regrind Discharge	30 s		✓	✓	✓	✓	✓			
1st Cleaner Conc	30 s		✓	✓	✓	✓	✓			
Table Feed	30 s		✓	✓	✓	✓	✓			
Table Conc	Total		✓	✓	✓	✓	✓			
Table Tail	30 s		✓	✓	✓	✓	✓			
2nd Cleaner Conc	30 s		✓	✓	✓	✓	✓			
2nd Cleaner Tail	30 s		✓	✓	✓	✓	✓			

Comments:

Time	Comments
3:30	Started sampling
4:00	Densities: 1)Feed = 4%, 2)2nd Cleaner Tails = 1%
4:00	Reagent: 1)cell #3 = 2 ml/min
4:55	Shut down

SIZE DISTRIBUTION

SAMPLE NO.M90-088 Pilot Run #5-A

Belt Feed

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 1"	5.1	94.9
- 1" + 3/4"	17.2	77.7
- 3/4" + 1/2"	22.3	55.4
- 1/2" + 3/8"	8.2	47.2
- 3/8" + 10#	17.8	29.4
- 10# + 28#	8.2	21.2
- 28# + 48#	6.3	14.9
- 48# + 100#	5.9	9.0
- 100# + 200#	3.9	5.1
- 200#	5.1	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #5-A

20 Mesh Screen Oversize

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	70.8	29.2
- 28 + 48	20.6	8.6
- 48 + 100	5.5	3.1
- 100 + 200	1.5	1.6
- 200	1.6	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #5-A

Rod Mill Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	40.6	59.4
- 28 + 48	27.0	32.4
- 48 + 100	16.2	16.2
- 100 + 200	8.0	8.2
- 200	8.2	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #5-A

Unit Cell Concentrate

Size Fraction (mesh)		Individual Percentage Retained %	Cumulative Percentage Passing %
	+ 28	9.3	90.7
- 28	+ 48	33.5	57.2
- 48	+ 100	29.1	28.1
- 100	+ 200	13.1	15.0
- 200		15.0	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #5-A

Unit Cell Tails

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	38.7	61.3
- 28 + 48	26.8	34.5
- 48 + 100	17.4	17.1
- 100 + 200	9.1	8.0
- 200	8.0	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #5-A

Rougher Flotation Feed

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	7.5	92.5
- 28 + 48	32.3	60.2
- 48 + 100	29.3	30.9
- 100 + 200	17.1	13.8
- 200	13.8	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #5-A

Rougher Flotation Tail

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	8.3	91.7
- 28 + 48	32.0	59.7
- 48 + 100	28.4	31.3
- 100 + 200	16.7	14.6
- 200	14.6	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #5-A

Table Tails

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	12.1	87.9
- 28 + 48	49.1	38.8
- 48 + 100	34.2	4.6
- 100 + 200	4.1	0.5
- 200	0.5	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #5-A

Regrind Discharge

Size Fraction (mesh)		Individual Percentage Retained %	Cumulative Percentage Passing %
	+ 28	1.3	98.7
- 28	+ 48	32.2	66.5
- 48	+ 100	29.9	36.6
- 100	+ 200	18.9	17.7
- 200		17.7	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run#5-B

1st Cleaner Concentrate

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
- 28 + 48	3.0	97.0
- 48 + 100	42.4	54.6
- 100 + 200	24.3	30.3
- 200	30.3	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #5-B

Regrind Feed

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
- 28 + 48	7.9	92.1
- 48 + 100	44.1	48.0
- 100 + 200	14.5	33.5
- 200	33.5	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #5-B

Regrind Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	0.2	99.8
- 28 + 48	9.5	90.3
- 48 + 100	29.7	60.6
- 100 + 200	13.6	47.0
- 200	47.0	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #5-C

1st Cleaner Concentrate

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	0.8	99.2
- 28 + 48	4.7	94.5
- 48 + 100	13.5	81.0
- 100 + 200	40.3	40.7
- 200	40.7	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #5-C

2nd Cleaner Concentrate

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	0.9	99.1
- 28 + 48	22.6	76.5
- 48 + 100	14.8	61.7
- 100 + 200	19.8	41.9
- 200	41.9	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #5-C

Regrind Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	0.6	99.4
- 28 + 48	9.5	89.9
- 48 + 100	22.3	67.6
- 100 + 200	36.7	30.9
- 200	30.9	

TEST NUMBER: M90-088 Run 5C Table Conc -100 mesh

SIZE FRACTION	WEIGHT GMS	WEIGHT %	ASSAYS GRAPHITIC C %	% DIST
+56.3 microns	9.5	13.55	73.020	12.09
-56.3 +38.8 microns	8.8	12.55	88.130	13.52
-38.8 +25.9 microns	10.8	15.40	89.155	16.78
-25.9 +20.1 microns	9.7	13.83	88.215	14.91
-20.1 +14.7 microns	7.3	10.41	86.715	11.03
-14.7 microns*	24.0	34.26	75.635	31.66
*calculated from assay head				
CALC HEAD	70.1	100.0	81.825	100.00
ASSAY HEAD			81.825	

PILOT RUN #6A

PILOT RUN #6A

DATE: May 1, 1990

DURATION: 7 hours — ASSAY HEAD: 3.52 %C(g)

THROUGHPUT: 3000 kg

REAGENT COSUMPTION: 230 g/tonne EKOF 452 G (Rougher)
20 g/tonne EKOF 452 G (Undersize)

REAGENT ADDITION: RM Discharge, Ro Cell #1, Ro Cell #4 (Rougher)
1st Cle Feed, Regrind Feed (Undersize)

FLOWSHEET MODIFICATIONS:

1)Recirculate 1st cleaner tails to rougher feed

1)Recirculate 2nd cleaner tails to 1st Cl Feed

3)Removed unit cell from circuit

4)-100# circuit simulated on bench-scale

5)

6)

7)

RESULTS:

Final Concentrates:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.17	93.75	57.79	69.02
-50+100# Concentrate	0.59	89.88	15.06	17.98
-100# Concentrate	0.43	90.14	10.89	13.00
Combined Concentrates	3.18	92.55	83.73	100.00

TEST NUMBER: Pilot Plant Run #6A

Flowsheet Stream No	PRODUCT	WEIGHT Kg/hr	WEIGHT %	ASSAYS, %C(g) Assayed	ASSAYS, %C(g) Calc	UNITS OF C(g) Calc	DISTRIBUTION %C(g) Calc
Primary Circuit:							
1	Belt Feed	424.00	100.00	3.520	3.520	352.000	100.00
2	Rod Mill Discharge	667.000	157.31	2.560	2.937	462.038	131.26
5	20# Screen O/S	243.00	57.31	1.920	1.920	110.038	31.26
6	20# Screen U/S	424.00	100.00	3.710	3.520	352.000	100.00
6A	Rougher Flot Feed	432.00	101.89		4.233	431.245	122.51
7	Rougher Flot Conc	25.00	5.90	73.340	70.209	413.967	117.60
7A	1st Ro Clnr Feed	30.70	7.24		67.441	488.309	138.72
8	Rougher Flot Tail	407.00	95.99	0.180	0.180	17.278	4.91
9	1st Ro Clnr Conc	22.70	5.35	73.350	76.407	409.064	116.21
10	1st Ro Clnr Tail	8.00	1.89	42.000	42.000	79.245	22.51
11	2nd Ro Clnr Conc	17.00	4.01	78.600	83.484	334.722	95.09
12	2nd Ro Clnr Tail	5.70	1.34	55.300	55.300	74.342	21.12
13	50# Screen O/S (Table Feed)	10.60	2.50	86.300	88.342	220.854	62.74
14	+50# Table Conc	9.20	2.17	93.750	93.750	203.420	57.79
15	+50# Table Tail	1.40	0.33	52.800	52.800	17.434	4.95
16	Regrind Discharge						
17	50# Screen Feed	16.80	3.96	84.500	84.500	334.722	95.09
18	50# Screen U/S	7.60	1.79	68.200	68.200	131.302	37.30
-50 Mesh Circuit:							
19	2nd Cl (Scav) Conc	6.80	1.60	73.200	73.200	117.396	33.35
20	Regrind Discharge						
21	1st Cl Conc	5.44	1.28	86.300	83.762	107.468	30.53
22	2nd Cl (Scav) Tail	2.16	0.51	10.200	46.882	23.833	6.77
23	-50 +100# Final Conc	2.50	0.59	89.880	89.880	52.995	15.06
-100 Mesh Circuit:							
24	100 Mesh Screen U/S	2.94	0.69	78.560	78.560	54.473	15.48
26	1st Cl Tail	1.04	0.24	37.440	59.528	14.555	4.13
27	2nd Cl Tail	0.10	0.02	67.200	67.200	1.598	0.45
28	-100# Final Conc	1.80	0.43	90.140	90.140	38.322	10.89
	CALC BELT FEED	423.80	100.0		3.520	352.000	100.00

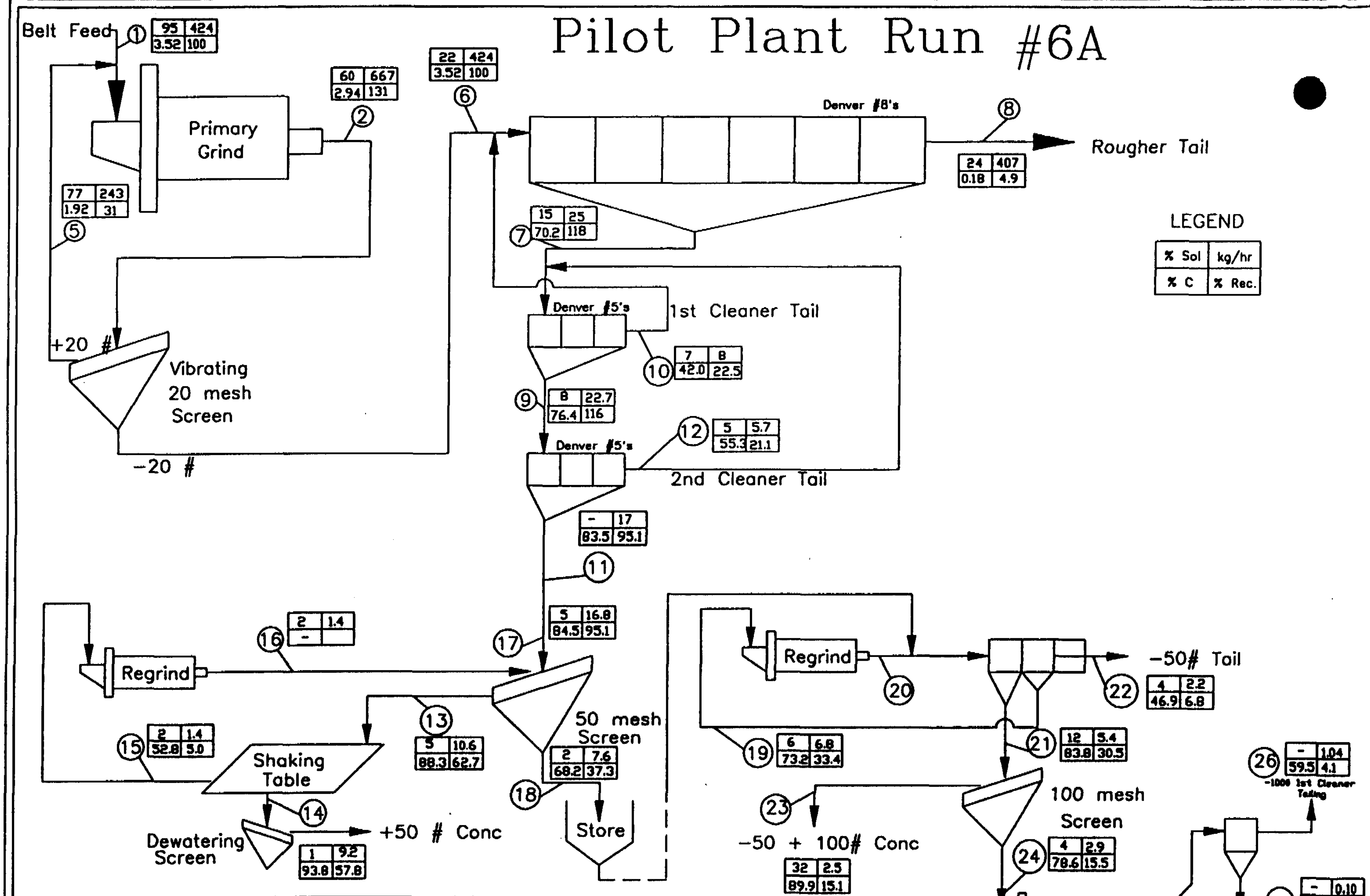
Notes:

1)Product #5 is calculated using pilot plant flowrate measurement

2)Belt Feed (#1), 50# Screen Feed (#17), +50# Table Conc (#14), Rougher Flot Tail (#8), -50# Screen U/S (#18), -50+100# Conc (#23), -100# Conc (28) are all taken as gospel.

CONCENTRATES:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.17	93.75	57.79	69.02
-50+100# Concentrate	0.59	89.88	15.06	17.98
-100# Concentrate	0.43	90.14	10.89	13.00
Combined Concentrates	3.18	92.55	83.73	100.00

Pilot Plant Run #6A



BACON, DONALDSON & ASSOCIATES LTD.
Consulting Engineers

Drawn By: ECH	Checked:
Scale: None	Date: May 11/90

Project: Bissett Creek Graphite

10 tpd Pilot Plant Flowsheet

TESTWORK PROCEDURE

Test No: M90-088 6-C-AA **Date:** May 16/90

Purpose: Small bench-scale flotation of sample of -100# product from Pilot Run #6-B-AA

STAGE	TIME (Minutes)	ADDITIONS	
		g/tonne	REAGENT
Regrind	5		Full Media Charge
-100# Cleaner 1	7		
Condition	1	15	EKOF 452 G
Cleaner Scav	3		
-100# Cleaner 2	7		
Condition	1	15	EKOF 452 G
Cleaner Scav	2		

TEST NUMBER: M90-088 Cleaner flotation of run 6AA -100#

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS Graphitic C %	UNITS Graphitic C
Cl conc	28.6	50.75	90.14	4574.864
2nd Cl Tails	1.6	2.83	67.20	190.455
1ST CL CONC	30.2	53.59	88.93	4765.320
1st Cl Tails	26.2	46.41	37.44	1737.694
TOTAL -100# CONC	56.4	100.0	65.03	6503.013

TEST NUMBER: M90-088 Cleaner flotation of run 6AA -100#				
PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS Graphitic C %	% DIST Graphitic C
Cl conc	28.6	50.75	90.14	70.35
2nd Cl Tails	1.6	2.83	67.20	2.93
1ST CL CONC	30.2	53.59	88.93	73.28
1st Cl Tails	26.2	46.41	37.44	26.72
TOTAL -100# CONC	56.4	100.0	65.03	100.00

78.6

GRINDING OPERATION SHEET

Project No.: M90-088

Project Name: Bissett Creek Graphite

Date: May 1/90

Operator Name: Jack R.

RUN # 6-AA

Time	Feed Rate (lb/hr)	Belt Cut (g)	Feed Water Addition (l/min)	Discharge % Solids	Reagent Feed (ml/min)	Pump Box Level
10:00	685	1383	4.2	55	20	m.t
10:20	888	1792	4.2	61	20	m.t
10:35	570	1150	-			m.t
10:50	729	1470	-			
11:10	1039	2097	-		20	
11:35	889	1793	-			m.t
2:30	1045	2109	-	60		
2:45	917	1851	-	54		
3:15	911	1838	-	55	20	
4:00	902	1820	4.5	52		
4:15	1030	2079	4.5	62	20	m.t
4:30	1034	2087	-	57	20	m.t
4:45	872	1759	-	55	20	m.t
5:00	1013	2044	-	57	20	m.t

927 → 440 / 405

Sampling:

Time	Belt Feed	Primary Mill Discharge	Vibrating Screen O/S	Unit Cell Feed
4:00	✓	✓	✓	46%
4:15	✓	✓	✓	42%
4:30	✓	✓	✓	
4:45	✓	✓	✓	37%
5:00	✓	✓	✓	41%

Comments:

Time	Comments

FLOTATION OPERATION SHEET

Project No.: M90-088 Date: May 1/90
Project Name: Bissett Creek Graphite Operator Name: Ed H. & Peter T.

RUN # 6-AA

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
10:15		U	U	U	U	U	U	G/H	G/H	G/H	G/MH	M/M	M/M
10:50	27	U	U	U	U	U	U	G/H	G/H	G/H	G/MH	M/M	M/M
11:20		U	U	U	U	U	U	G/H	G/H	G/H	G/MH	M/M	M/M
11:50	28	G	G	G	G	G	G	G/H	G/H	M/M	M/L	M/L	M/L
12:00	24	G	G	G	G	G	G	G/H	G/MH	G/M	M/L	M/L	M/L
12:20	19	G	G	G	G	G	G	G/H	G/H	G/MH	M/L	M/L	M/L
3:20	25	G	G	G	G	G	G	G/H	G/MH	G/M	M/M	M/L	M/L
3:45	25	G	G	G	G	G	G	G/H	G/MH	G/M	M/M	M/L	M/L
4:15	20	G	G	G	G	G	G	G/H	G/MH	G/MH	M/M	M/L	M/L
4:35	23	G	G	G	G	G	G	G/H	G/MH	G/MH	M/M	M/L	M/L
5:00	23	G	G	G	G	G	G	G/H	G/MH	G/MH	M/M	M/L	M/L

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

Time	1st Cleaner Bank Flotation Cell Level Cell 1	Cell 2	Cell 3	Froth Description Cell 1	Cell 2	Cell 3	2nd Cleaner Bank Flotation Cell Level Cell 1	Cell 2	Cell 3	Froth Description Cell 1	Cell 2	Cell 3
10:10	U	U	U	G/H	G/H	G/M	U	U	U	G/H	G/M	G/M
10:50	U	U	U	G/H	G/H	G/M	U	U	U	G/H	G/H	G/M
11:20	G	G	G	M/H	G/H	G/H	G	G	G	G/VH	G/H	G/H
11:50	G	G	G	G/H	G/H	G/M	G	G	G	G/H	G/H	G/M
12:20	G	G	G	G/H	G/H	G/M	G	G	G	G/VH	G/H	G/M
3:20	G	G	L	G/H	G/H	G/H	G	G	G	G/VH	G/H	G/H
3:45	G	G	G	G/H	G/H	G/MH	G	G	G	G/VH	G/H	G/MH
4:15	G	G	G	G/H	G/MH	G/M	G	G	G	G/VH	G/H	G/M
4:30	G	G	G	G/H	G/H	G/MH	G	G	G	G/VH	G/H	G/M
5:00	G	G	G	G/H	G/H	G/MH	G	G	G	G/VH	G/H	G/M

FLOTATION SAMPLING SHEET

Project No.: M90-088 Date: May 1/90

Project Name: Bissett Creek Graphite Operator Name: Ed H. & Peter T.

RUN # 6-AA

Sample	Cut Time	Time								
		12:10	12:25		3:50	4:15	4:30	4:42	5:00	
Rougher Flotation Feed		✓	X		✓	✓	✓	X	✓	
Rougher Flotation Conc		120 s	X		55 s	25 s	30 s	X	30 s	
Rougher Flotation Tail	30 s	✓	✓		✓	✓	✓	X	✓	
1st Ro Cleaner Conc		✓	✓		10 s	10 s	10 s	10 s	10 s	
1st Ro Cleaner Tail	30 s	✓	20 s		30 s	✓	✓	✓	✓	
2nd Ro Cleaner Conc	-	✓	✓		✓	✓	✓	✓	✓	
2nd Ro Cleaner Tail	30 s	✓	✓		20 s	20 s	20 s	20 s	20 s	
50 mesh Screen Feed	30 s	✓	X		✓	✓	✓	X	✓	

Comments:

Time	Comments
9:35	Start up (pre-production): Unit cell removed from circuit
10:10	Roughers unsteady - problems with level control
10:45	Comparatively little material reporting to shaking table - because of no unit cell?
11:45	Roughers and cleaners settling down
11:48	Mechanical problem with 20# sweco. Very noisy. Call electrician.
12:10	Start sampling
12:13	20# Sweco died. Shut down grinding circuit.
12:30	Rougher surge tank empty. Stop sampling. Shut down remaining circuit.
2:12	20# Sweco fixed (loose motor mounts). Start up mill
	Allow rougher surge tank to fill
2:54	Start up flotation circuit
3:00	Shaking table: Still comparatively little feed, less coarse wood contamination
3:50	Begin sampling
4:30	Everything running very well
5:00	Sample run #6-AA complete

FLOTATION OPERATION SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: May 16/90
Operator Name: Ed H. & Bruce S.

RUN # 6-B-AA

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
12:00	5	G	G	G	ML	L	VL	G/H	G/H	G/MH	M/M	M/M	P/L
12:30		G	G	G	ML	L	VL	G/H	G/H	G/MH	M/M	M/M	P/L
12:45		G	G	G	M	ML	L	G/H	G/H	G/MH	G/MH	M/M	P/L
12:57		G	G	G	M	ML	L	G/H	G/H	G/MH	G/MH	M/M	P/L
1:03		G	G	G	M	ML	L	G/H	G/H	G/MH	G/MH	M/M	P/L

Comments:

Time	Comments
11:00	Start up (Pre-production):
	1. First 2 cells pulling high grade. Switch launders to reflect this.
	2. Add extra 3 cells of scavenger flotation.
	3. Remove 14 kg of regrind media (8 kg remaining)
	4. Quickie siza analysis on -50# feed: 33% +100# and 67% -100#

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AA

Rougher Flotation Feed

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	6.1	93.9
- 28 + 48	28.0	65.9
- 48 + 100	28.2	37.7
- 100 + 200	19.4	18.3
- 200	18.3	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AA

Rougher Flotation Tail

Size Fraction (mesh)	Individual Percentage Retained %	[illegible] %
+ 28	7.8	92.9
- 28 + 48	31.3	[illegible]
- 48 + 100	27.4	[illegible]
- 100 + 200	16.2	17.3
- 200	17.3	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AA

Table Tails

Size Fraction (mesh)	Individual Percentage Retained %	[illegible] %
+ 28	3.7	96.3
- 28 + 48	53.7	42.6
- 48 + 100	32.2	10.4
- 100 + 200	7.7	2.7
- 200	2.7	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AA

Regrind Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	0.3	99.7
- 28 + 48	20.4	79.3
- 48 + 100	21.3	58.0
- 100 + 200	25.5	32.5
- 200 +	32.5	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AA

Rod Mill Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	38.1	61.9
- 28 + 48	22.2	39.7
- 48 + 100	17.4	22.3
- 100 + 200	11.4	10.9
- 200	10.9	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AA

20 Mesh Screen Oversize

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 10	19.2	80.8
- 10 + 20	49.4	31.4
- 20 + 28	21.3	10.1
- 28 + 48	8.2	1.9
- 48 + 100	1.0	0.9
- 100 + 200	0.2	0.7
- 200	0.7	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-B-AA

1st Cleaner Concentrate

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	0.1	99.9
- 28 + 48	4.1	95.8
- 48 + 100	43.1	52.7
- 100 + 200	26.9	25.8
- 200	25.8	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-B-AA

2nd Cleaner (Scavenger) Concentrate

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	0.2	99.8
- 28 + 48	7.8	92.0
- 48 + 100	40.4	51.6
- 100 + 200	21.0	30.6
- 200	30.6	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-B-AA

Regrind Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	0.2	99.8
- 28 + 48	8.3	91.5
- 48 + 100	37.2	54.3
- 100 + 200	25.6	28.7
- 200	28.7	

PILOT RUN #6B

PILOT RUN #6B

DATE: May 1, 1990

DURATION: 4.5 hours

ASSAY HEAD: 3.56 %C(g)

THROUGHPUT: 1800 kg

REAGENT COSUMPTION: 230 g/tonne EKOF 452 G (Rougher)
20 g/tonne EKOF 452 G (Undersize)

REAGENT ADDITION: RM Discharge, Ro Cell #1, Ro cell 34 (Rougher)
1st Cl Feed, Regrind Feed (undersize)

FLOWSHEET MODIFICATIONS:

1)Recirculate 1st cleaner tails to rougher feed

1)Recirculate 2nd cleaner tails to 1st Cl Feed

3)Unit cell returned to circuit (relocated above 20 mesh screen)

4)-100# circuit simulated on bench-scale

5)

6)

7)

RESULTS:

Final Concentrates:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.46	95.50	65.96	72.62
-50+100# Concentrate	0.62	87.90	15.36	16.90
-100# Concentrate	0.37	90.80	9.52	10.48
Combined Concentrates	3.45	93.62	90.84	100.00

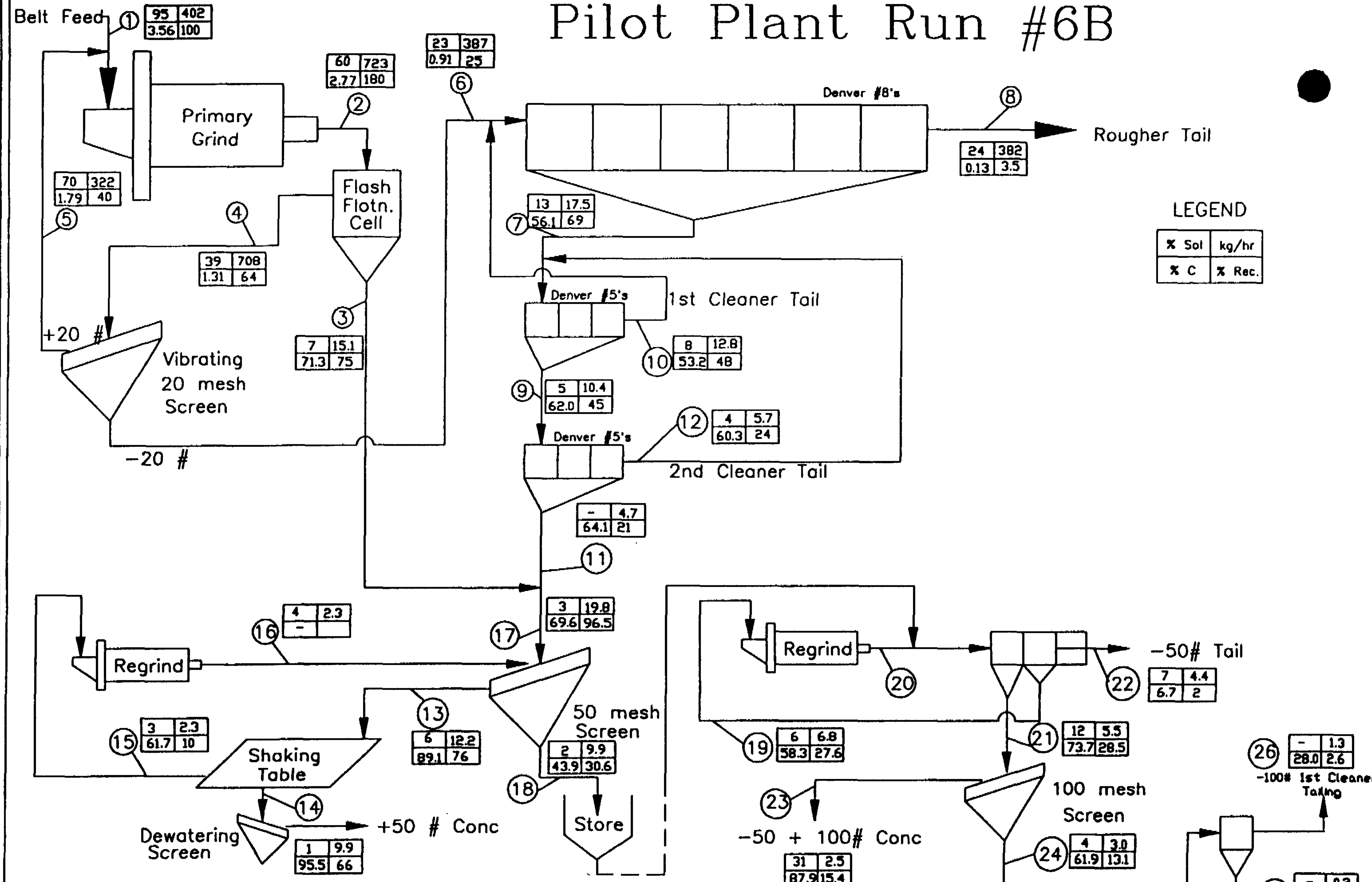
TEST NUMBER: Pilot Plant Run #68

Flowsheet Stream No	PRODUCT	WEIGHT Kg/hr	WEIGHT %	ASSAYS, %C(g) Assayed	ASSAYS, %C(g) Calc	UNITS OF C(g) Calc	DISTRIBUTION %C(g) Calc
Primary Circuit:							
1	Belt Feed	402.00	100.00	3.560	3.560	356.000	100.00
2	Rod Mill Discharge	724.000	180.10	2.160	2.773	499.378	140.27
3	Unit Cell Conc	15.10	3.76	71.300	71.300	267.818	75.23
4	Unit Cell Tail	708.90	176.34	1.070	1.313	231.560	65.04
5	20# Screen O/S	322.00	80.10	1.790	1.790	143.378	40.27
6	20# Screen U/S	386.90	96.24	0.910	0.916	88.182	24.77
6A	Rougher Flot Feed	399.70	99.43		2.591	257.575	72.35
7	Rougher Flot Conc	17.70	4.40	65.600	55.694	245.221	68.88
7A	1st Ro Clnr Feed	23.40	5.82		56.816	330.721	92.90
8	Rougher Flot Tail	382.00	95.02	0.130	0.130	12.353	3.47
9	1st Ro Clnr Conc	10.60	2.64	57.600	61.183	161.328	45.32
10	1st Ro Clnr Tail	12.80	3.18	53.200	53.200	169.393	47.58
11	2nd Ro Clnr Conc	4.75	1.18	58.300	64.194	75.828	21.30
12	2nd Ro Clnr Tail	5.70	1.42	60.300	60.300	85.500	24.02
13	50# Screen O/S (Table Feed)	12.19	3.03	89.100	89.120	270.131	75.88
14	+50# Table Conc	9.89	2.46	95.500	95.500	234.830	65.96
15	+50# Table Tail	2.30	0.57	61.700	61.700	35.301	9.92
16	Regrind Discharge						
17	50# Screen Feed	19.85	4.94	69.600	69.600	343.647	96.53
18	50# Screen U/S	9.96	2.48	43.900	43.900	108.817	30.57
-50 Mesh Circuit:							
19	2nd Cl (Scav) Conc	6.80	1.69	58.300	58.300	98.617	27.70
20	Regrind Discharge						
21	1st Cl Conc	5.44	1.35	73.700	75.537	102.22	28.71
22	2nd Cl (Scav) Tail	4.52	1.13	6.700	5.863	6.60	1.85
23	-50 +100# Final Conc	2.50	0.62	87.900	87.900	54.664	15.36
-100 Mesh Circuit:							
24	100 Mesh Screen U/S	2.94	0.73	61.900	65.024	47.555	13.36
26	1st Cl Tail	1.26	0.31	33.900	33.900	10.625	2.98
27	2nd Cl Tail	0.18	0.04	68.100	68.100	3.049	0.86
28	-100# Final Conc	1.50	0.37	90.800	90.800	33.881	9.52
	CALC BELT FEED	401.85	100.0		3.560	356.000	100.00

Notes:
1)Product #5 is calculated using pilot plant flowrate measurement
2)Belt Feed (#1), 50# Screen Feed (#17), +50# Table Conc (#14), Rougher Flot Tail (#8), -50# Screen U/S (#18), -50+100# Conc (#23), -100# Conc (#28) are all taken as gospel.

CONCENTRATES:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	2.46	95.50	65.96	72.62
-50+100# Concentrate	0.62	87.90	15.36	16.90
-100# Concentrate	0.37	90.80	9.52	10.48
Combined Concentrates	3.45	93.62	90.84	100.00

Pilot Plant Run #6B



BACON, DONALDSON & ASSOCIATES LTD.
Consulting Engineers

Project: Bissett Creek Graphite

10 tpd Pilot Plant Flowsheet

Drawn By: ECH	Checked:
Scale: None	Date: June 8/90

TESTWORK PROCEDURE

Test No: M90-088 6-C-AB Date: May 16/90

Purpose: Small bench-scale flotation of sample of -100# product from Pilot Run #6-B-AB

STAGE	TIME (Minutes)	ADDITIONS	
		g/tonne	REAGENT
Regrind	5		Full Media Charge
-100# Cleaner 1	7		
Condition	1	15	EKOF 452 G
Cleaner Scav	3		
-100# Cleaner 2	7		
Condition	1	15	EKOF 452 G
Cleaner Scav	2		

TEST NUMBER: M90-088 Pilot Plant run 6AB -100# Cleaner Flotation

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS Graphitic C	% DIST Graphitic C
2nd Cl Conc	525.9	69.86	84.14	90.91
2nd Cl Tails	33.8	4.49	29.85	2.07
1ST CL CONC	559.7	74.35	80.86	92.98
Scav Conc	36.0	4.78	58.46	4.32
1st Cl Tails	157.1	20.87	8.35	2.70
TOTAL -100# CONC	752.8	100.0	64.66	100.0

TEST NUMBER: M90-088 Pilot Plant run 6AB -100# Cleaner Flotation

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS Graphitic C	UNITS Graphitic C
2nd Cl Conc	525.9	69.86	84.14	5877.952
2nd Cl Tails	33.8	4.49	29.85	134.024
1ST CL CONC	559.7	74.35	80.86	6011.976
Scav Conc	36.0	4.78	58.46	279.564
1st Cl Tails	157.1	20.87	8.35	174.254
TOTAL -100# CONC	752.8	100.0	64.66	6465.795

TESTWORK PROCEDURE

Test No: M90-088 Date: 25-May-90

Purpose: Cleaner Flotation on Run 6AB -100# materials.

STAGE	TIME (Minutes)	ADDITIONS	
		g/t	REAGENT
Grind	5		
Cleaner Flotation			
1st Cleaner Float	18		
Condition	1	15	EKOF
Scavenger Float 1	2		
Condition	1	30	EKOF
Scavenger Float 2	3		
Condition	1	60	EKOF
Scavenger Float 3	3		
Condition	1	60	EKOF
Scavenger Float 4	3		
2nd Cleaner Float	26		
Condition	1	15	EKOF
Scavenger Float 1	2		
Condition	1	60	EKOF
Scavenger Float 2	3		

TEST NUMBER: M90-088 Cleaner flotation of run 6AB -100#

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS Graphitic C %	% DIST Graphitic C
Cl conc	33.8	50.15	90.79	70.62
2nd Cl Tails	4.0	5.93	68.09	6.27
1ST CL CONC	37.8	56.08	88.39	76.89
1st Cl Tails	29.6	43.92	33.93	23.11
TOTAL -100# CONC	67.4	100.0	64.47	100.00
ASSAY HEAD			61.9	

TEST NUMBER: M90-088 Cleaner flotation of run 6AB -100#

PRODUCT	WEIGHT GMS	WEIGHT %	ASSAYS Graphitic C %	UNITS Graphitic C
Cl conc	33.8	50.15	90.79	4552.970
2nd Cl Tails	4.0	5.93	68.09	404.095
1ST CL CONC	37.8	56.08	88.39	4957.065
1st Cl Tails	29.6	43.92	33.93	1489.881
TOTAL -100# CONC	67.4	100.0	64.47	6446.947

GRINDING OPERATION SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: May 1/90
Operator Name: Jack R.

RUN # 6-AB

Time	Feed Rate (lb/hr)	Belt Cut (g)	Feed Water Addition (l/min)	Discharge % Solids	Reagent Feed (ml/min)	Pump Box Level
7:30 PM	900	1817	4	57	20.8	m.t
7:45	949	1915	4	55	20.8	m.t
8:00	826	1666	4	57	20.8	m.t
8:15	940	1896	4	53	20.8	m.t
8:30	1025	2069	4	57	20.7	m.t
8:45	1010	2038	4	56	20.7	m.t
9:00	863	1741	4	53	20.7	m.t
9:15	944	1905	4	55	20.7	m.t
9:30	943	1902	4	56	20.7	m.t

Sampling:

Time	Belt Feed	Primary Mill Discharge	Vibrating Screen O/S	Unit Cell Feed
7:30	✓	✓	✓	40%
7:45	✓	✓	✓	39%
8:00	✓	✓	✓	
8:15	✓	✓	✓	37%
8:30	✓	✓	✓	
8:45	✓	✓	✓	
9:00	✓	✓	✓	38%
9:15	✓	✓	✓	40%
9:30	✓	✓	✓	37%

Comments:

Time	Comments

FLOTATION OPERATION SHEET

Project No.: M90-088 Date: May 1/90

Project Name: Bissett Creek Graphite Operator Name: Ed H. & Peter T.

RUN # 6-AB

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
6:30 PM		G	G	G	G	G	G	G/H	G/H	M/MH	M/M	M/L	M/L
7:00 PM		G	G	G	G	G	G	G/H	G/MH	M/M	M/M	M/L	M/L
7:30	32	G	G	G	G	G	G	G/MH	G/M	G/M	M/L	M/L	M/L
8:30	22	G	G	G	G	G	G	G/M	G/M	M/ML	M/L	M/L	M/L
8:45	24	G	G	G	G	G	G	G/MH	M/M	M/ML	M/L	M/L	M/L
9:00	23	G	G	G	G	G	G	G/MH	G/M	M/ML	M/L	M/L	M/L
9:20	22	G	G	G	G	G	G	G/MH	G/MH	M/M	M/L	M/L	M/L

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

Time	1st Cleaner Bank Flotation Cell Level Cell 1	Cell 2	Cell 3	Froth Description Cell 1	Cell 2	Cell 3	2nd Cleaner Bank Flotation Cell Level Cell 1	Cell 2	Cell 3	Froth Description Cell 1	Cell 2	Cell 3
6:30	G	G	G	G/MH	G/MH	G/MH	G	G	G	G/MH	G/M	G/M
7:00	G	G	G	G/M	G/M	G/M	G	G	G	G/H	G/M	G/M
7:30	G	G	G	G/M	G/M	G/M	G	G	G	G/MH	G/M	G/M
8:30	G	G	G	G/M	G/M	G/M	G	G	G	G/MH	G/M	G/M
8:45	G	G	G	G/M	G/M	G/M	G	G	G	G/MH	G/M	G/ML
9:00	G	G	G	G/M	G/M	G/M	G	G	G	G/MH	G/M	G/ML
9:20	G	G	G	G/M	G/M	G/M	G	G	G	G/MH	G/M	G/ML

FLOTATION SAMPLING SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: May 1/90
Operator Name: Ed H. & Peter T.

RUN # 6-AB

Sample	Cut Time	7:30	8:30	8:45	9:00	9:15	9:30			
Unit Cell Concentrate	20 s	✓	✓	✓	✓	✓	✓			
Unit Cell Tailing	10 s	✓	✓	✓	✓	✓	✓			
Rougher Flotation Feed	-	✓	✓	✓	✓	✓	✓			
Rougher Flotation Conc	-	✓	✓	✓	✓	✓	✓			
Rougher Flotation Tail	30 s	60 s	30 s	✓	✓	✓	✓			
1st Ro Cleaner Conc	20 s	✓	✓	✓	✓	✓	✓			
1st Ro Cleaner Tail	30 s	✓	✓	✓	✓	✓	✓			
2nd Ro Cleaner Conc	-	✓	✓	✓	✓	✓	✓			
2nd Ro Cleaner Tail	20 s	✓	✓	✓	✓	✓	✓			
50 mesh Screen Feed	30 s	✓	✓	✓	✓	✓	✓			

Comments:

Time	Comments
5:10	Unit cell back into circuit (no down time)
	Allow circuit to come to steady state
7:05	Rod mill discharge pump down - shut down grinding circuit
	- replace recycle valve
	- continue running remaining circuit
7:16	Rougher flotation surge tank almost empty
7:19	Pump fixed - restart grinding circuit
7:50	Shaking table feed interupted - stirring motor down
7:55	Rougher tailings line plugged - circuit upset
	- Sampling suspended while circuit settles down
8:00	50 # U/S tank #1 full. Some spillage while switching tanks
9:00	Plant running very well
9:30	Sample run #6-AB complete

FLOTATION OPERATION SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: May 16/90
Operator Name: Ed H. & Bruce S.

RUN # 6-B-AB

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
1:30	11	G	G	G	ML	L	VL	G/MH	G/MH	G/M	M/ML	P/L	P/L
1:45		G	G	G	ML	L	VL	G/MH	G/MH	G/M	M/ML	P/L	P/L
1:52		G	G	G	M	ML	L	G/MH	G/MH	G/M	M/ML	P/L	P/L
1:59		G	G	G	M	ML	L	G/MH	G/MH	G/M	M/ML	P/L	P/L
2:04		G	G	G	M	ML	L	G/MH	G/MH	G/M	M/ML	P/L	P/L

Comments:

Time	Comments
1:17	6-AB -50# feed tank hooked up
1:21	Begin feeding. Switch all appropriate tanks and buckets.
	Allow circuit to reach steady state with new feed.
	Note: use same cct configuration as run 6-B-AA

FLOTATION SAMPLING SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: May 16/90
Operator Name: Ed H. & Bruce S.

RUN # 6-B-AB

Sample	Cut Time	Time								
			1:40	1:44	1:53	1:59	2:05			
-50 mesh Feed	30 s		30 s	2 min	30 s	2 min	30 s			
Regrind Discharge	30 s		✓	✓	✓	✓	✓			
-100 mesh Product	30 s		✓	✓	✓	✓	✓			
1st Cleaner Conc	30 s		✓	✓	✓	✓	✓			
+100 mesh Conc	Total		✓	✓	✓	✓	✓			
2nd Cleaner Conc	30 s		✓	✓	✓	✓	✓			
2nd Cleaner Tail	30 s		✓	✓	✓	✓	✓			

Comments:

Time	Comments
1:35	All froth looks lower grade than previous run
1:40	Coarse graphite flakes observed in tails (vaning plaque)
1:45	Experiment with small extra additions of EKOF
	-seems to help
1:51	Feed tank no longer mixing
2:10	Feed tank empty

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AB

Belt Feed

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 1"	12.4	87.6
- 1" + 3/4"	21.6	66.0
-3/4" + 1/2"	30.4	35.6
-1/2" + 3/8"	9.2	26.4
-3/8" + 10	14.6	11.8
- 10 + 28	3.3	8.5
- 28 + 48	2.4	6.1
- 48 + 100	2.2	3.9
-100 + 200	1.6	2.3
-200	2.3	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AB

Rougher Flotation Feed

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	7.8	92.2
- 28 + 48	30.9	61.3
- 48 + 100	27.9	33.4
- 100 + 200	17.4	16.0
- 200	16.0	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AB

Rougher Flotation Tail

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	8.0	92.0
- 28 + 48	30.9	61.1
- 48 + 100	29.0	32.1
- 100 + 200	16.9	15.2
- 200	15.2	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AB

Unit Cell Concentrate

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	4.3	95.7
- 28 + 48	34.5	61.2
- 48 + 100	31.8	29.4
- 100 + 200	13.6	15.8
- 200	15.8	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run # 6-AB

Table Tails

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	7.5	92.5
- 28 + 48	57.2	35.3
- 48 + 100	29.9	5.4
- 100 + 200	4.2	1.2
- 200	1.2	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run # 6-AB

Regrind Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	0.5	99.5
- 28 + 48	26.3	73.2
- 48 + 100	26.0	47.2
- 100 + 200	26.1	21.1
- 200	21.1	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AB

Unit Cell Tailings

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	47.4	52.6
- 28 + 48	21.3	31.3
- 48 + 100	13.9	17.4
- 100 + 200	7.8	9.6
- 200	9.6	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AB

Rod Mill Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	46.6	53.4
- 28 + 48	21.6	31.8
- 48 + 100	14.4	17.4
- 100 + 200	8.3	9.1
- 200	9.1	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AB

20 Mesh Screen Oversize

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 10	10.1	89.9
- 10 + 20	41.6	48.3
- 20 + 28	24.4	23.9
- 28 + 48	16.6	7.3
- 48 + 100	4.8	2.5
- 100 + 200	1.3	1.2
- 200	1.2	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run# 6-B-AB

1st Cleaner Concentrate

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28		
- 28 + 48	5.5	94.5
- 48 + 100	40.9	53.6
- 100 + 200	27.1	26.5
- 200	26.5	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-B-AB

2nd Cleaner (Scavenger) Concentrate

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	0.7	99.3
- 28 + 48	6.5	92.8
- 48 + 100	29.4	63.4
- 100 + 200	16.2	47.2
- 200	47.2	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-B-AB

Regrind Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	0.1	99.9
- 28 + 48	3.8	96.1
- 48 + 100	34.8	61.3
- 100 + 200	18.4	42.9
- 200	42.9	

PILOT RUN #6C

PILOT RUN #6C

DATE: May 1, 1990

DURATION: 4.0 hours

ASSAY HEAD: 3.44 %C(g)

THROUGHPUT: 1000 kg

REAGENT COSUMPTION: 150 g/tonne VARSOL, 30 g/tonne MIBC

REAGENT ADDITION: RM Discharge, switched to RM Feed, Ro Cell #1, Ro Cell #4

FLOWSHEET MODIFICATIONS:

1)Recirculate 1st cleaner tails to rougher feed

1)Recirculate 2nd cleaner tails to 1st Cl Feed

3)Unit cell removed from circuit

4)Did not run -50# or -100# circuits

5)Changed main reagent addition point from Rod Mill discharge to Rod Mill Feed

6)Switched reagent from EKOF 452 G to a VARSOL/MIBC combination (similar addition rates)

7)

RESULTS:

Final Concentrates:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	1.76	95.40	48.82	100.00
Combined Concentrates	1.76	95.40	48.82	100.00

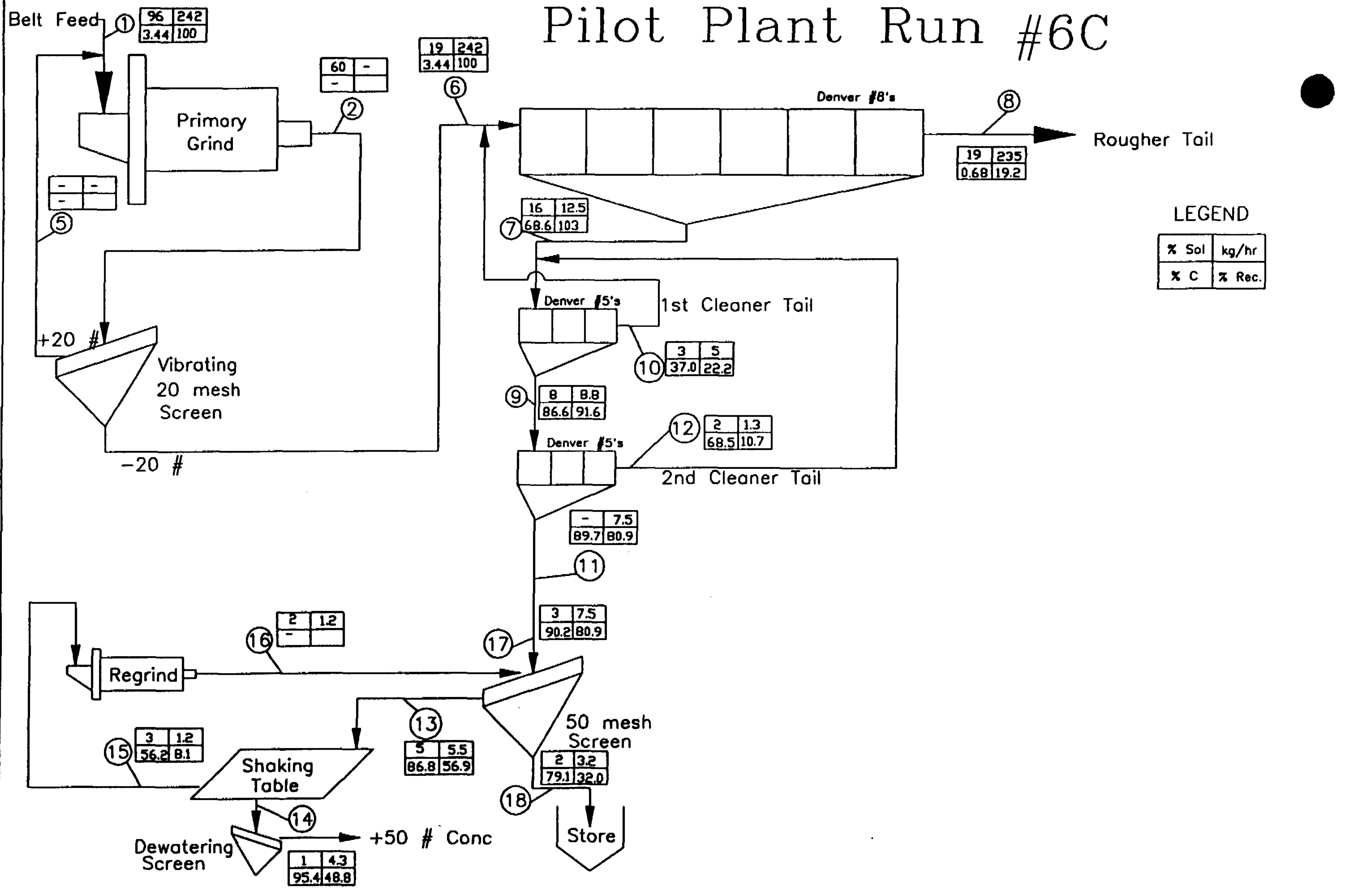
TEST NUMBER: Pilot Plant Run #6C

Flowsheet Stream No	PRODUCT	WEIGHT Kg/hr	WEIGHT %	ASSAYS, %C(g) Assayed	ASSAYS, %C(g) Calc	UNITS OF C(g) Calc	DISTRIBUTION %C(g) Calc
Primary Circuit:							
1	Belt Feed	242.00	100.00	3.440	3.440	344.000	100.00
2	Rod Mill Discharge						
5	20# Screen O/S						
6	20# Screen U/S	242.00	100.00	3.500	3.440	344.000	100.00
6A	Rougher Flot Feed	247.00	102.07		4.119	420.446	122.22
7	Rougher Flot Conc	12.50	5.17	83.600	68.642	354.554	103.07
7A	1st Ro Clnr Feed	13.80	5.70		68.632	391.373	113.77
8	Rougher Flot Tail	234.50	96.90	0.680	0.680	65.893	19.15
9	1st Ro Clnr Conc	8.80	3.64	86.500	86.605	314.926	91.55
10	1st Ro Clnr Tail	5.00	2.07	37.000	37.000	76.446	22.22
11	2nd Ro Clnr Conc	7.50	3.10	89.900	89.736	278.107	80.85
12	2nd Ro Clnr Tail	1.30	0.54	68.540	68.540	36.819	10.70
13	50# Screen O/S (Table Feed)	5.46	2.26	92.800	86.774	195.779	56.91
14	+50# Table Conc	4.26	1.76	95.400	95.400	167.936	48.82
15	+50# Table Tail	1.20	0.50	56.150	56.150	27.843	8.09
16	Regrind Discharge						
17	50# Screen Feed	7.46	3.08	90.200	90.200	278.107	80.85
18	50# Screen U/S	3.20	1.32	79.070	79.070	110.172	32.03
-50 Mesh Circuit:							
-100 Mesh Circuit:							
	CALC BELT FEED	241.96	100.0		3.440	344.000	100.00

Notes:
1)Product #5 is calculated using pilot plant flowrate measurement
2)Belt Feed (#1), 50# Screen Feed (#17), +50# Table Conc (#14), Rougher Flot Tail (#8), -50# Screen U/S (#18) are all taken as gospel.

CONCENTRATES:	WT %	% C(g)	% REC'Y	% DIST
+50# Concentrate	1.76	95.40	48.82	100.00
-50+100# Concentrate				
-100# Concentrate				
Combined Concentrates	1.76	95.40	48.82	100.00

Pilot Plant Run #6C



LEGEND

% Sol	kg/hr
% C	% Rec.

BACON, DONALDSON & ASSOCIATES LTD. Consulting Engineers	Project: Bissett Creek Graphite
Drawn By: ECH / Checked:	10 tpd Pilot Plant Flowsheet
Scale: None / Date: May 11/90	

GRINDING OPERATION SHEET

Project No.: M90-088
Project Name: Bissett Creek Graphite

Date: May 1/90
Operator Name: Jack R.

RUN # 6-AC

Time	Feed Rate (lb/hr)	Belt Cut (g)	Feed Water Addition (l/min)	Discharge % Solids	Reagent Feed (ml/min)	Pump Box Level
11:30 PM	754	1521	4	55	20.8	m.t
12:00	834	1682	4	59	25.4	m.t
1:15	922	1860	3.51	60	15.1	m.t

Sampling:

Time	Belt Feed	Primary Mill Discharge	Vibrating Screen O/S	Unit Cell Feed

Comments:

Time	Comments
	No sampling of grinding circuit - pumps & lines sanded, mill discharge
	% solids too high, trommel screen plugged.

FLOTATION OPERATION SHEET

Project No.: M90-088 Date: May 1/90

Project Name: Bissett Creek Graphite Operator Name: Ed H. & Peter T.

RUN # 6-AC

Rougher Flotation:

Time	Feed % Solids	Flotation Cell Level Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Froth Description Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
11:00 PM		G	G	G	G	G	G	M/MH	M/M	M/L	M/L	M/L	M/L
12:00 AM		G	G	G	G	G	G	M/MH	M/M	M/L	M/L	M/L	M/L
1:00 AM		U	U	U	U	U	U	M/M	M/M	M/L	M/L	M/L	M/L
1:30	17	U	U	U	U	U	U	M/M	M/M	M/L	M/L	M/L	M/L
1:40	23	G	G	G	G	G	G	M/M	M/M	M/L	M/L	M/L	M/L
1:50	12	G	G	G	G	G	G	M/M	M/M	M/L	M/L	M/L	M/L

LEGEND

Cell Level: H = High, G = Good, U = Unsteady, L = Low

Froth Description: G/ = Strong Froth, M/ = Medium Froth, P/ = Poor Froth; /H = High grade, /M = Medium grade, /L = Low grade

Cleaner Flotation:

Time	1st Cleaner Bank Flotation Cell Level Cell 1	Cell 2	Cell 3	Froth Description Cell 1	Cell 2	Cell 3	2nd Cleaner Bank Flotation Cell Level Cell 1	Cell 2	Cell 3	Froth Description Cell 1	Cell 2	Cell 3
11:00	G	G	G	G/MH	G/MH	G/MH	G	G	G	G/H	G/MH	G/M
12:00	G	G	G	G/MH	G/MH	G/MH	G	G	G	G/H	G/MH	G/M
1:00	U	U	U	G/MH	G/MH	G/MH	U	U	U	G/H	G/MH	G/M
1:30	G	G	L	G/MH	G/MH	G/MH	L	G	L	G/H	G/MH	G/MH

FLOTATION SAMPLING SHEET

Project No.: M90-088 Date: May 1/90

Project Name: Bissett Creek Graphite Operator Name: Ed H. & Peter T.

RUN # 6-AC

Sample	Cut Time	Time 1:30	1:40	1:50						
Rougher Flotation Feed	-	✓	✓	✓						
Rougher Flotation Conc	-	✓	✓	✓						
Rougher Flotation Tail	30 s	✓	✓	✓						
1st Ro Cleaner Conc	10 s	✓	✓	✓						
1st Ro Cleaner Tail	20 s	✓	✓	✓						
2nd Ro Cleaner Conc	-	✓	✓	✓						
2nd Ro Cleaner Tail	20 s	✓	✓	✓						
50 mesh Screen Feed	30 s	✓	✓	✓						

Comments:

Time	Comments
9:40 PM	Switch reagents to Varsol/MIBC (no down time)
	Allow circuit to come to steady state
10:30	Unit cell appears to be much less efficient (froth looks thin & barren)
	- rougher flotation too
11:05	Problems with rougher tailings discharge - circuit upset
11:20	Large graphite flakes visible in rougher tails - reagent not working?
11:35	First reagent addition point switched to mill feed
12:10 AM	Continuous problems with grinding circuit: - sanding
	- trommel screen clogged
1:15 AM	Remove unit cell from circuit
1:30	Begin sampling
1:35	Rod mill discharge pump down - shut down grinding circuit
	- continue running remaining circuit
	- continue sampling
1:55	Rougher surge tank empty - shut down plant

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AC

Belt Feed

Size Fraction (mesh)		Individual Percentage Retained %	Cumulative Percentage Passing %
	+ 1"	6.4	93.6
- 1"	+ 3\4"	19.4	74.2
-3/4"	+ 1/2"	22.5	51.7
-1/2"	+ 3/8"	8.1	43.6
-3/8"	+ 10	17.2	26.4
- 10	+ 28	6.8	19.6
- 28	+ 48	5.6	14.0
- 48	+ 100	5.4	8.6
-100	+ 200	3.7	4.9
-200		4.9	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run # 6-AC

Rougher Flotation Feed

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	3.3	96.7
- 28 + 48	24.5	72.2
- 48 + 100	31.8	40.4
- 100 + 200	22.0	18.4
- 200 +	18.4	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AC

Rougher Flotation Tail

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	7.3	92.7
- 28 + 48	27.7	65.0
- 48 + 100	28.3	36.7
- 100 + 200	19.9	16.8
- 200	16.8	

SIZE DISTRIBUTION

SAMPLE NO. M90-088 Pilot Run #6-AC

Regrind Discharge

Size Fraction (mesh)	Individual Percentage Retained %	Cumulative Percentage Passing %
+ 28	1.5	98.5
- 28 + 48	43.2	55.3
- 48 + 100	24.3	31.0
- 100 + 200	22.5	8.5
- 200	8.5	

APPENDIX V

Graphitic Carbon Assay Study
Bissett Creek Graphite

GRAPHITIC CARBON ASSAY STUDY

1.0 PURPOSE

1. To gather information and data about the various methods for graphitic carbon assaying:

   - Double loss on ignition (Double L.O.I.)
   - Acid leach loss on ignition (Acid Leach L.O.I.)
   - Leco

2. To assess the repeatability and accuracy of each assay method.

3. To determine the optimum assay method(s) for our various purposes.

2.0 INTRODUCTION

These are two main categories of carbon assays: Leco assays, and loss on ignition (L.O.I.) assays. During bench-scale testwork, it was noted that the Leco assays did not correspond well with the L.O.I. assays. The L.O.I. assays were consistently higher than the Lecos, and on low grade sample, this difference was often as great as an order of magnitude. Obviously, flotation results were significantly affected by the choice of assays used. These observations led to a general awareness of our dependence on accurate assays, and ultimately led to this whole assay study.

It is important to note that, from the beginning of this project, it was understood that the L.O.I. methods of assaying were the industry standard for high grade samples. It was not the intention of this study to dispute this fact, but rather to make sure that each product was assayed by the most "appropriate method".

2.1 Carbon Assay Methods

There are several recognized methods of assaying for graphitic carbon. The methods investigated in this study are:

1. <u>Double Loss On Ignition (Double L.O.I.)</u>

   This method involves two stages of heating (loss on ignition), both in an oxygen environment. The first stage heats the sample to 400°C for several hours. The weight lost during heating is called "% volatiles". The second stage heats the sample to 900°C for about 8 hours. The weight loss during this stage is the "% carbon", with the remaining solids being "% ash".

2. <u>Acid Leach Loss On Ignition (Acid Leach L.O.I.)</u>

   This method involves pre-leaching the sample with strong nitric acid. The weight loss from acid leaching is determined, then the sample is heated in a furnace to 900°C in an oxygen environment. The weight remaining after this <u>single</u> loss on ignition is referred to as "% ash". The loss of weight during the furnace step is assumed to be graphitic carbon.

3. <u>LECO</u>

This method involves burning the assay sample in an oxygen filled atmosphere where all the carbon is oxidized into CO_2. The emitted CO_2 absorbs infrared energy (produced by the assay instrument) at a precise wavelength within the infrared spectrum. This absorbtion is measured by the instrument and the concentration of CO_2 is calculated as changes in energy at the detector. The assay instrument used for this method is called a Leco Carbon Analyzer, and the instrument measures the total amount of carbon contained in the sample.

There are several sub-categories of the Leco assay, with the differences depending on the pre-treatment steps before the actual Leco assay for % C:

3a. <u>Standard Total Organic Carbon Leco (T.O.C. Leco)</u>

- Involves leaching sample with dilute HCl to detect carbon content of sample which is due to presence of carbonate minerals.
- This carbonate carbon is then deducted from the total carbon detected by Leco.

3b. <u>Nitric Leco</u>

- Involves leaching sample with stronger (~25%) HNO_3 to detect carbon content due to carbonate minerals, and to dissolve sulphide minerals which tend to interfere with the subsequent Leco assay.
- To some extent, the nitric acid will also dissolve some organic carbon (plant matter, wood).

3c. Nitric Leach + L.O.I. + Leco (L.O.I. Leco)

- Involves first leaching the sample with HNO_3, then heating the insoluble residue to 470°C in an O_2 atmosphere to drive off organic carbon. This is essentially a loss on ignition step.
- The remaining ash from the L.O.I. step is then assayed by Leco for graphitic carbon.

2.2 Assay Sample Preparation

All samples that are to be assayed for graphitic carbon are first riffled down to approximately 10 grams, then this cut is pulverized in a ring and puck pulverized to 100% minus 200 mesh. The pulverized cut is then submitted for assay.

3.0 ASSAY STUDY PROCEDURE

There are four parts to this assay study:

1. Triplicate assays of various samples.
2. Microscopic (Volumetric) assay of tailings.
3. Wood contamination.
4. Detailed summary of methods.

3.1 Part One: Triplicate Assays of Various Samples

Method

It was decided to thoroughly investigate the various assay methods. This would involve triplicate assays of each method on both low grade and high grade samples. The triplicate assay would allow an assessment of the repeatability of each assay method, while the study as a whole would provide a large data base from which to select the best assay method for our purposes.

It should be noted that at this point of the assay investigation, the only Leco assay method we were utilizing was the T.O.C. Leco. The other Leco assay methods did not come under investigation until much later when it was realized that contamination of samples with wood was affecting assay results.

The triplicate assays were divided into 3 phases:

Phase 1: Direct assay of low grade flotation tails
- Using 3 assay methods
  - T.O.C. Leco, Double L.O.I., Acid Leach L.O.I.
  - Each in triplicate

Phase 2: Size assay of flotation tails

- Screen flotation tailings into size fractions
- Assay fractions with 2 methods only
  - T.O.C. Leco and Acid leach L.O.I.
  - Each in triplicate

Phase 3: Direct Assay of flotation concentrate (high grade)

- Using 2 methods only
  - Double L.O.I. and Acid leach L.O.I.
  - Each in triplicate

Through previous assay analyses it had already been indicated that the Double L.O.I. method gave erroneous results on extremely low grade samples, while the Leco method was suspect on high grade samples. For this reason, Phase 2 and Phase 3 did not each test all 3 assay methods.

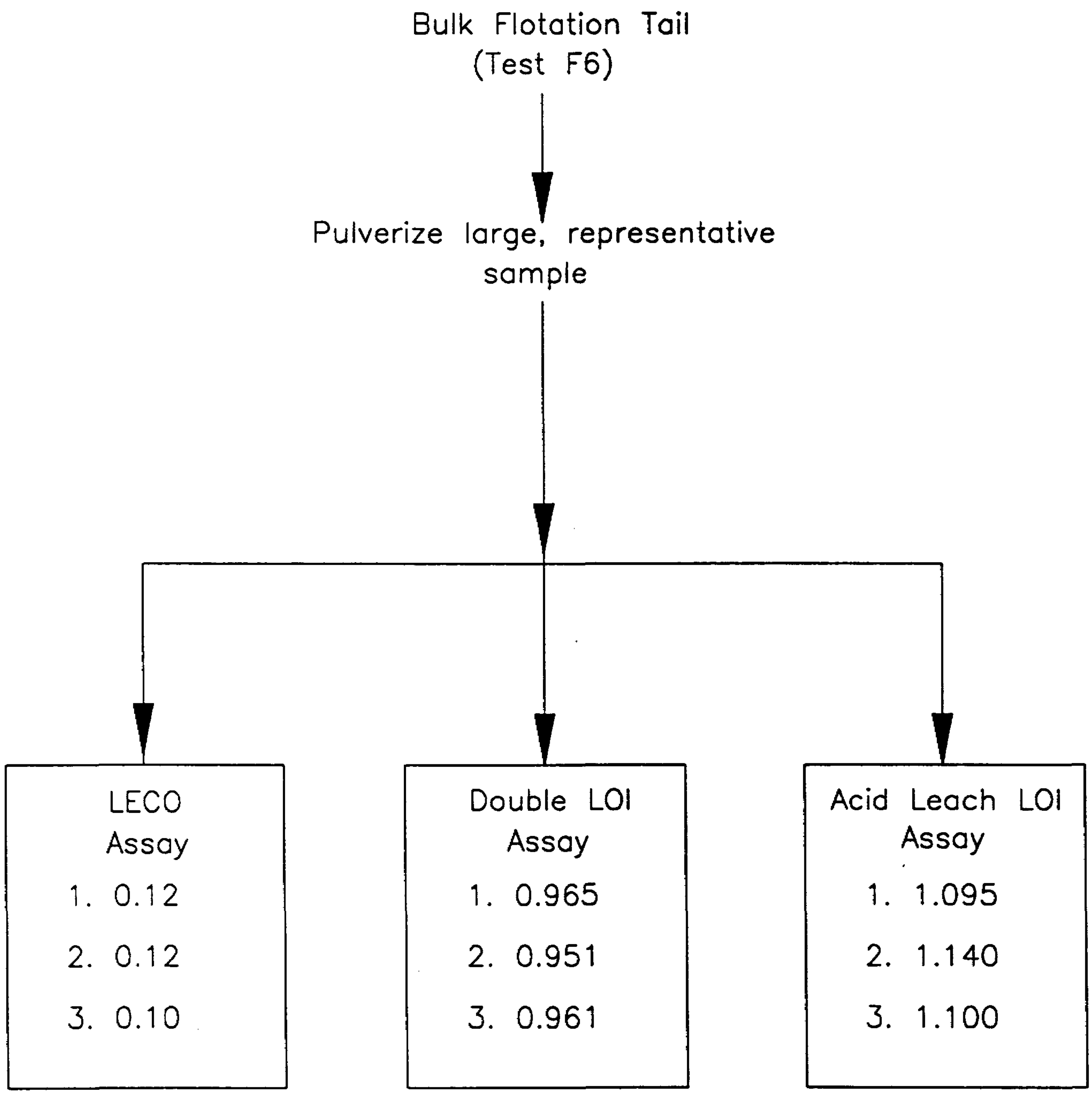
Results

The results of the three phases of this triplicate analysis are presented in the next 5 pages. The results clearly demonstrate the following points:

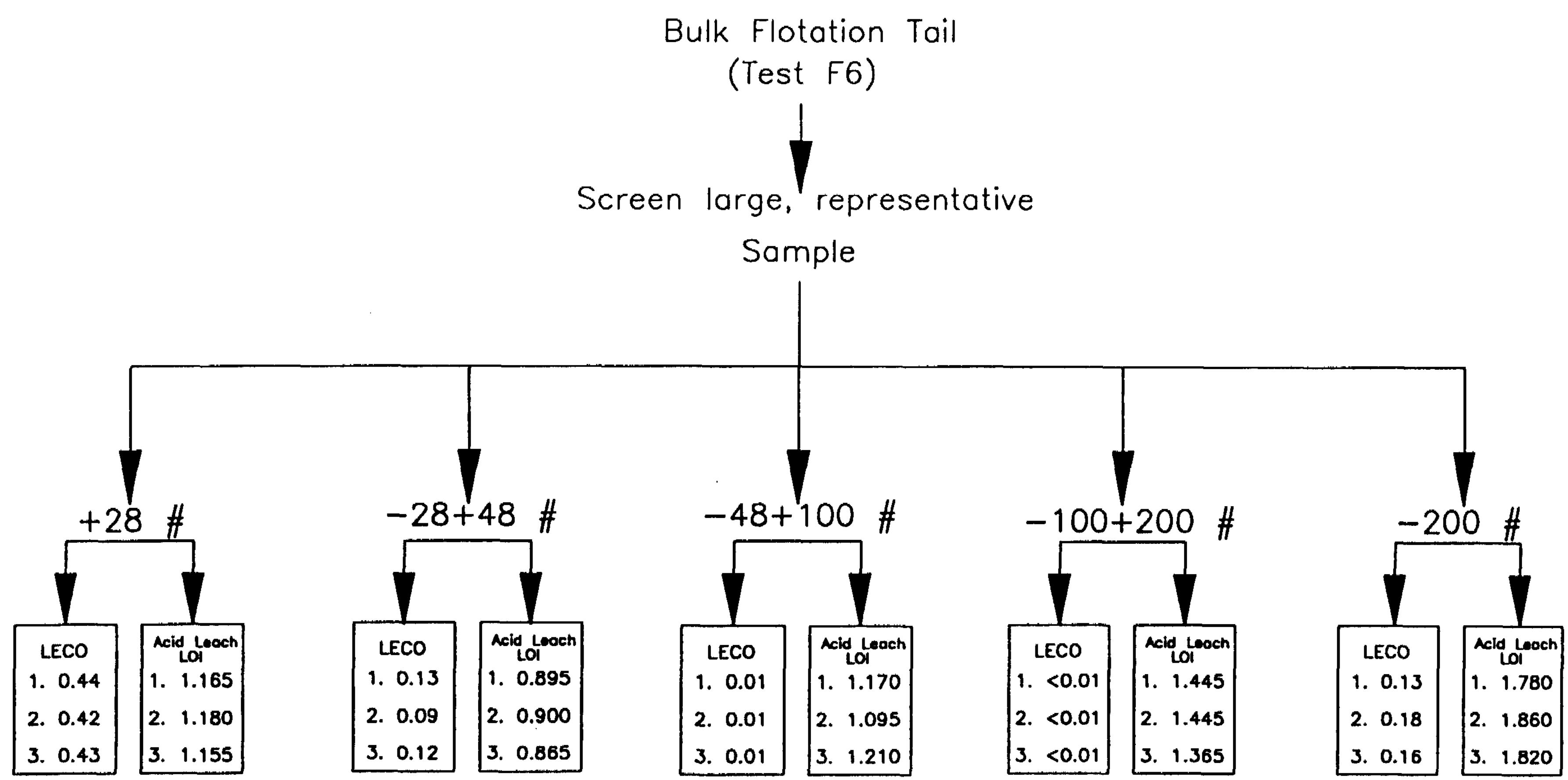
1. Good repeatability within each assay method.
2. Good correlation between Double L.O.I. and Acid Leach L.O.I. assay methods.
3. Significantly lower results (orders of magnitude) obtained with Leco assays.

Another point that is not so obvious is suggested by the Phase 2 section (the assay results of the size fractions). The Leco results follow a pattern of higher results for the larger screen fractions, almost zero results for the intermediate screen fractions, and higher results again for the undersize. The Acid Leach L.O.I. results do not follow this pattern, in fact, they do not display any particular pattern at all. Our understanding of the flotation of the Bissett Creek ore suggests that the pattern of assays displayed by the Leco results is correct; the highest flotation recoveries occur in the intermediate size fractions.

ASSAY STUDY: Phase 1 – Direct Assay of Flotation Tail



ASSAY STUDY: Phase 2 – Size Assay of Flotation Tail



TEST NUMBER: M90-088 Assay Study: Size Assay of F6 Bulk Tails

ACID LEACH L.O.I. RESULTS (Assays in Triplicate)

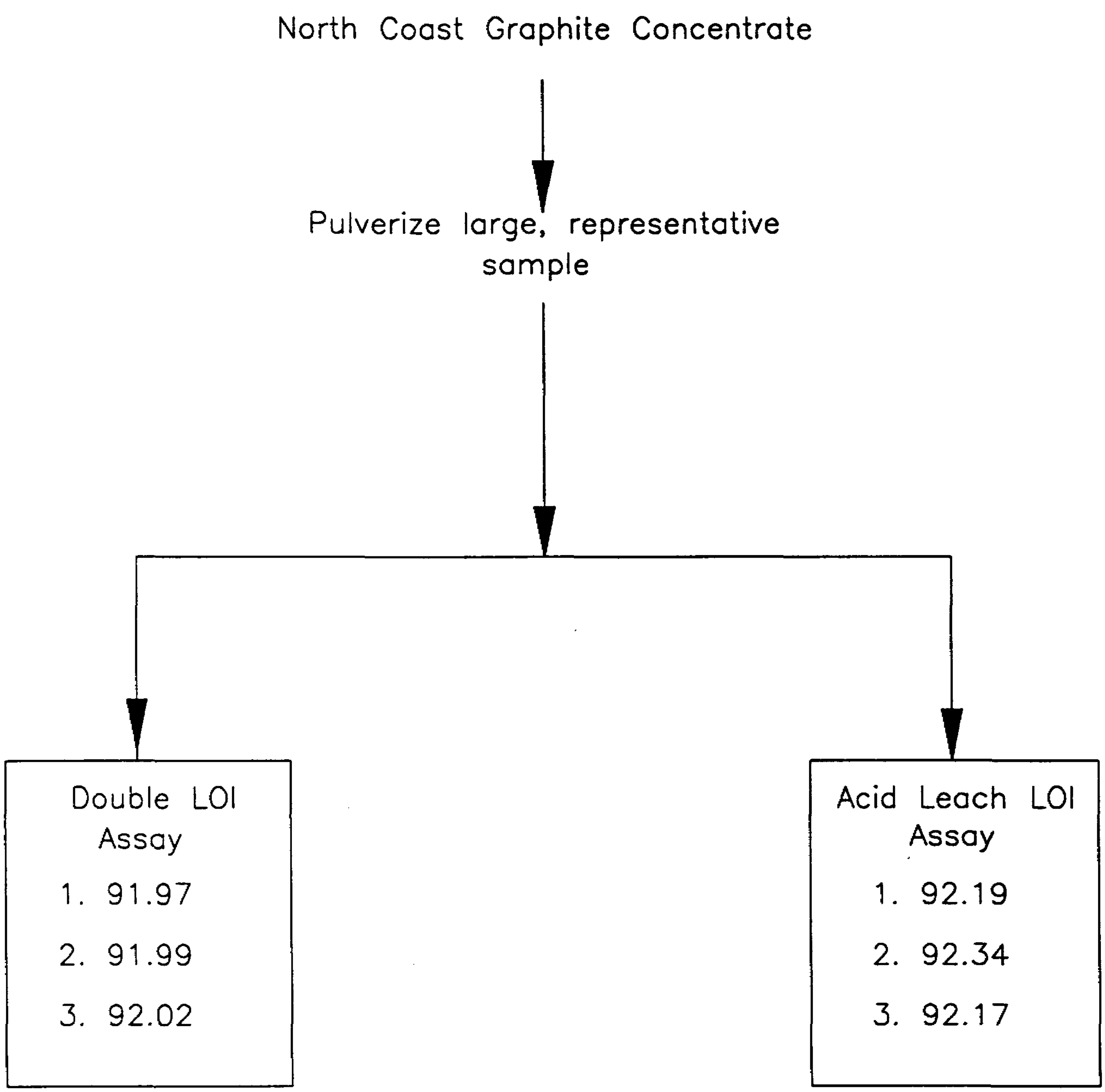
PRODUCT	WEIGHT GMS	WEIGHT %	GRAPHITIC CARBON BY ACID LEACH LOI 1 OF 3 %	2 OF 3 %	3 OF 3 %	% DIST 1 OF 3 %	2 OF 3 %	3 OF 3 %
+28 mesh	215.58	23.78	1.16	1.18	1.16	22.64	23.00	22.57
+48 mesh	224.80	24.79	0.90	0.90	0.87	18.16	18.29	17.62
+100 mesh	219.83	24.25	1.17	1.10	1.21	23.22	21.76	24.11
+200 mesh	119.89	13.22	1.45	1.45	1.37	15.64	15.66	14.83
-200 mesh	126.57	13.96	1.78	1.86	1.82	20.34	21.28	20.88
CALC HEAD	906.67	100.0	1.22	1.22	1.22	100.00	100.00	100.00
ASSAY HEAD BY ACID LEACH LOI			1.11					

TEST NUMBER: M90-088 Assay Study: Size Assay of F6 Bulk Tails

LECO RESULTS (Assays in Triplicate)

PRODUCT	WEIGHT GMS	WEIGHT %	GRAPHITIC CARBON BY LECO 1 OF 3 %	2 OF 3 %	3 OF 3 %	% DIST 1 OF 3 %	2 OF 3 %	3 OF 3 %
+28 mesh	215.58	23.78	0.44	0.42	0.43	66.23	66.46	65.00
+48 mesh	224.80	24.79	0.13	0.09	0.12	20.41	14.85	18.92
+100 mesh	219.83	24.25	0.01	0.01	0.01	1.54	1.61	1.54
+200 mesh	119.89	13.22	0.00	0.00	0.00	0.33	0.35	0.34
-200 mesh	126.57	13.96	0.13	0.18	0.16	11.49	16.72	14.20
CALC HEAD	906.67	100.0	0.16	0.15	0.16	100.00	100.00	100.00
ASSAY HEAD BY LECO			0.12					

ASSAY STUDY: Phase 3 – Direct Assay of Graphite Concentrate



3.2 Part Two: Microscopic (Volumetric) Assay of Flotation Tailings

Method

The indication to this point was that the Leco results were more accurate than the L.O.I. methods for low grade samples. Before basing an entire feasibility study on this belief, this assumption needed to be tested with an unbiased "assay" method. Since we were trying to distinguish between an order of magnitude difference in assay values, this seemed a reasonable goal.

A sample of the same flotation tailings as used in Phase 1 and Phase 2 was screened into size fractions and submitted to Vancouver Petrographics Ltd. for a "visual volumetric assay".

We outlined our assay difficulties to Vancouver Petrographics personnel and suggested they use their mineralogical expertise to do a "graphite grain count" and then convert their visual observations to a "volumetric assay". It was felt that this volumetric assay would indicate the more accurate assay method for low grade samples (to our order of magnitude level of certainty).

Results

Vancouver Petrographics complete report is presented in the following 4 pages. We have also converted their volumetric assay values to calculated weight percentages and from these figures calculated the graphitic carbon assay of the sample. The calculated value from the "volumetric" assay (0.085 % graphitic carbon) supports the value obtained using the Leco method of assaying (0.11% graphitic carbon).

Vancouver Petrographics Ltd.

JAMES VINNELL, Manager
JOHN G. PAYNE, Ph.D. Geologist
CRAIG LEITCH, Ph.D. Geologist
JEFF HARRIS, Ph.D. Geologist
KEN E. NORTHCOTE, Ph.D. Geologist

P.O. BOX 39
8080 GLOVER ROAD,
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V0X 1J0
PHONE (604) 888-1323
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Report for: Ed Henrioulle,
Bacon, Donaldson & Associates,
12271 Horseshoe Way,
RICHMOND, B.C., V7A 4Z1

Invoice 8823
February 1989

F6
Sample: M90-088 ~~M6~~-Ro Tails

P.O.: 32717

Purpose:

To analyze nine size fractions of tailings for graphite content, and to compare the results with those of the Leco method (average 0.11%) and the Double L.O.I. method (average 1.1%).

Method:

Polished thin sections were made for the following size fractions:

+28, +35, +48, +65, +100, +150, +200, +325, -325.

Traverses were made across the sample to cover 90-95% of the total area of the section; for coarser samples these were made using a 4X objective lens (field of view = 30 sq.mm), and for finer samples with a 10X objective lens (field of view = 9.1 sq.mm).

In the coarsest sample, individual particles were counted and their average size noted. In finer samples, the density of particles was measured at several points in the section, and the average particle size were measured. These results were used to calculate the total area of particles along the traverse lines.

The size and shape of graphite grains and aggregates was recorded in five size categories and in two shape categories. Size fractions are as follows:

0.03-0.05 mm, 0.05-0.1 mm, 0.1-0.2 mm, 0.2-0.3 mm, 0.3-0.4 mm

The two shape categories are as follows:

1) flakes (average length to width ration 3/1 to 5/1),
2) equant patches (average length to width ratio 1/1 to 2/1).

The nature of intergrowths of graphite with other minerals was divided into three categories as follows:

1) free graphite grains (F)*
2) graphite grains or aggregates on surface of particles (S)*
3) graphite grains or aggregates included in particles. (I)*

* these letters to designate classes in Table 2

Average areas were calculated for the two shapes of flakes in each size fraction. These were multiplied by the number of occurrences of graphite in each category. Addition of these values yielded the volume content of graphite in each fraction.

In Table 1 is shown the average area of grains in each size and shape fraction. In Table 2 is shown the total area occupied by graphite in each category (calculated by multiplying the number of occurrences by the average area of a single occurrence).

Table 1. Area of Grains of Different Sizes and Shapes (sq.mm)

shape	length of flake or average dimension of equant patch (mm)				
	0.03-0.05 A	0.05-0.1 B	0.1-0.2 C	0.2-0.3 D	0.3-0.4 E *
flake	0.0005	0.002	0.005	0.010	0.020
equant patch	0.0015	0.005	0.020	0.060	0.120

* these letters are used for size categories in Table 2

Table 2. Distribution of Graphite

Shape		flake					patch				
Size		A	B	C	D	E	A	B	C	D	E
+28	S	-	-	0.005	0.050	0.040	-	0.015	0.080	0.060	-
	I	-	0.016	0.040	0.030	0.040	-	-	-	-	-
+35	S	-	0.002	0.010	0.020	0.040	-	0.005	0.020	-	0.120
	I	-	0.010	0.035	0.050	0.040	-	-	0.020	0.120	-
+48	S	-	0.006	0.005	0.020	-	-	-	0.020	0.060	-
	I	-	0.006	0.020	-	-	-	-	-	-	-
+65	S	-	-	-	-	0.040	-	-	0.020	-	-
	I	-	-	-	0.010	-	-	0.005	0.020	-	-
+100	S	-	-	-	0.010	-					
	I	-	0.002	-	-	-					
+150	F	-	-	0.005							
	S	-	0.006	-	-	-	-	-	-	-	-
	I	-	0.002	-	-	-	-	0.010	-	-	-
+200	F	-	-	-	-	-	-	-	0.020	-	-
	S	-	0.004	0.005	-	-	-	0.005	-	-	-
+325		no graphite grains seen									
-325	F	0.002	0.004	-	-	-	-	-	-	-	-

Table 3. Per Cent Graphite by Area in Size Fractions
(all sizes in sq.mm)

Size Fract.	Average Particle Size	Area Total	Area Graphite	% Graphite
+28	0.80	249	0.376	0.151
+35	0.36	175	0.492	0.281
+48	0.16	187	0.137	0.073
+65	0.09	193	0.095	0.049
+100	0.04	224	0.012	0.005
+150	0.02	156	0.023	0.015
+200	0.007	60	0.034	0.057
+325	0.0035	109	0.000	0.000
-325	0.0008	29	0.006	0.021

Note: Some of these values are not the same as the preliminary values I quoted to you by telephone on February 10th. Some of these preliminary values have been adjusted after further examination of the sections.

Conclusions:

1. Most of the graphite is in the coarsest two fractions. The abundance of graphite decreases erratically towards the finer fractions, with an unusual peak in the -200 fraction. Note that this is the smallest sample (area of particles on section), and because of this, the graphite percentage may be of lower precision than for the other samples.

2. Graphite is about equally divided between slender flakes and equant clusters of grains (flakes and/or equant grains).

3. Graphite occurs in about equal abundances on surfaces of particles and as inclusions in particles of silicates. Only locally in the finer fractions does it occur as free grains.

4. Results agree well with the Leco method of analysis.

John G Payne

John G. Payne,
986-2928

TEST NUMBER: M90-088: Vancouver Petrograhics Volumetric Size Assay
F6 (M90-036) Flotation tailings

PRODUCT	WEIGHT GMS	WEIGHT %	Calculated Weight Percent Graphitic Carbon %	% DISTRIBUTION Graphitic Carbon %
+ 28 mesh	11.7	20.55	0.127	30.57
- 28 + 35 mesh	10.1	17.72	0.236	48.99
- 35 + 48 mesh	6.3	11.09	0.061	7.93
- 48 + 65 mesh	6.1	10.69	0.041	5.13
- 65 + 100 mesh	5.1	8.89	0.004	0.42
- 100 + 150 mesh	4.1	7.19	0.013	1.09
- 150 + 200 mesh	3.2	5.61	0.048	3.15
- 200 + 325 mesh	3.1	5.38	0.000	0.00
- 325	7.3	12.88	0.018	2.72
CALC HEAD	56.9	100.0	0.085	100.00

3.3 Wood Contamination Study

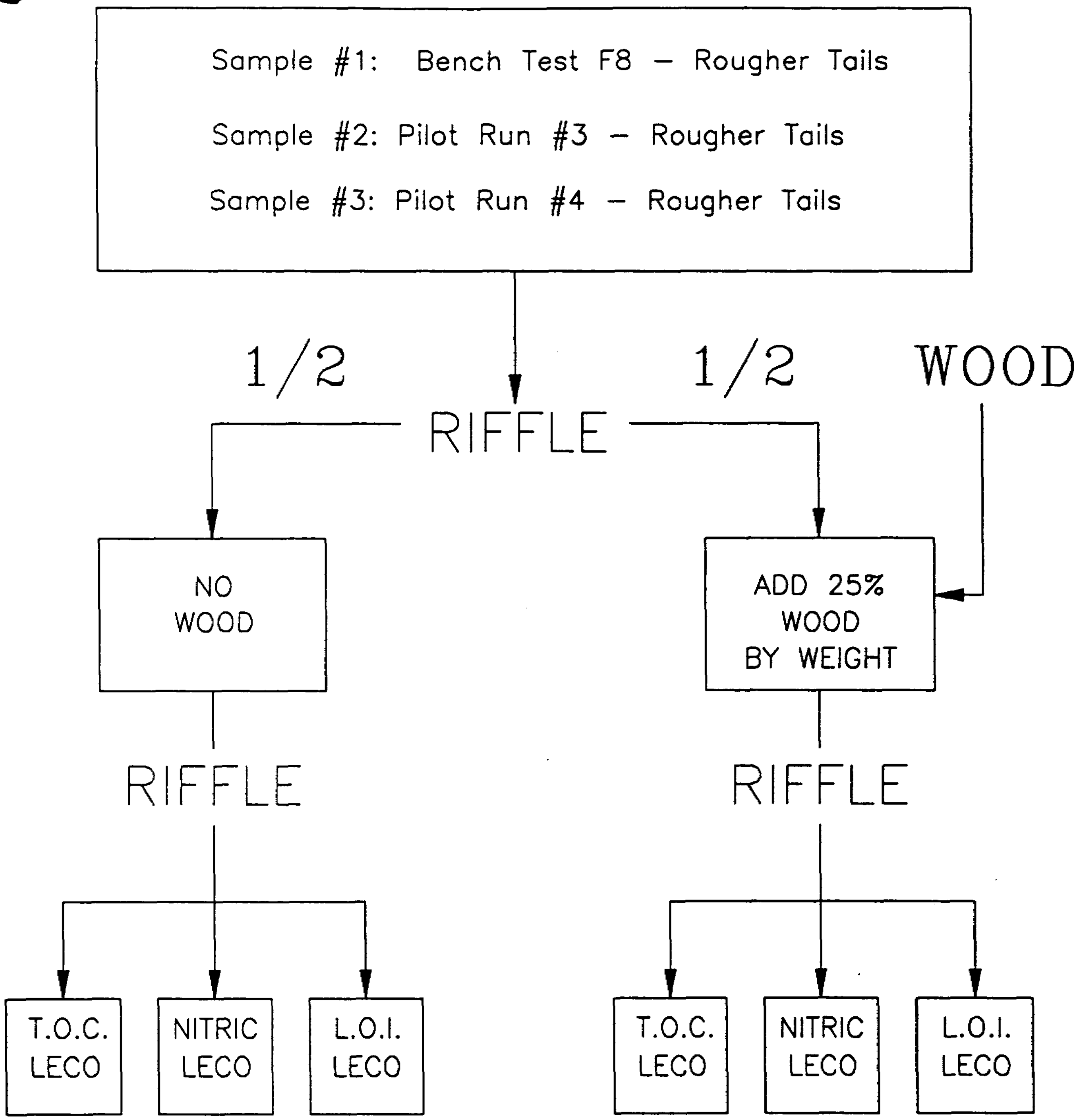
Later in the investigation of the Bissett Creek graphite ore (during pilot plant testwork), discrepancies were experienced with the graphitic carbon assays of low grade samples; results were significantly higher than expected.

After much investigation, the cause of the problem was isolated, and it was found to be organic carbon (tramp wood and plant matter). It now remained to be seen if an assay method could be developed that would account for the organic carbon contamination.

Interestingly, the problem was outlined to both Chemex Laboratories Ltd. and Bacon Donaldson and Associates' own assay department, and both parties independently came up with a similar solution: include a low temperature loss on ignition step prior to the normal Leco assay for % total carbon. The L.O.I step would volatilize the organic carbon without affecting the graphitic carbon. As a further measure, Chemex included a Nitric Acid pre-leach in their procedure to account for carbonate carbon. The "new" assay method was therefore "nitric acid leach, followed by a 2-3 hour loss on ignition at 470°C, followed by Leco assay for total carbon". The total carbon detected by the Leco assay was assumed to be graphitic carbon.

This new assay method needed to be proven. To do it is, B.D.A. prepared several low grade sample from the pilot plant and "doctored" half of each with a known amount of wood (25% by weight). The samples (doctored and undoctored) were then assayed by the three methods of Leco assay: 1) T.O.C. Leco, 2) Nitric leco, 3) L.O.I. Leco. A flowsheet depicting this doctoring / assaying procedure is presented on the following page. The detailed procedures for the three assay methods are presented in section 3.4 of this study.

The results of the B.D.A. wood assay study are presented in the following table.



BDA WOOD ASSAY PROCEDURE

B.D.A. Wood Assay Study

Sample Description		Graphitic Carbon Assays T.O.C. LECO	Nitric LECO	L.O.I. LECO
F8 - Rougher Tails	- No Wood	0.19	0.14	0.18
	- Yes Wood	10.60	7.03	0.09
Run #3 - Rougher Tails	- No Wood	0.44	0.25	0.18
	- Yes Wood	11.60	2.81	0.15
Run #4 - Rougher Tails	- No Wood	0.59	0.25	0.21
	- Yes Wood	11.70	2.83	0.14
"Pure" Wood		49.8	10.04	0.33

It can be seen from the results that:

1. The T.O.C. Leco method reports all the organic (wood) carbon as graphitic carbon.

2. The Nitric Leco method reports some of the organic carbon as graphitic carbon.

3. The L.O.I. Leco method reports none of the organic carbon as graphitic carbon.

A similar study was subsequently conducted by Lakefield Research at their laboratories in Lakefield, Ontario. A copy of their complete report is presented in the following 3 pages. The results of the Lakefield Wood assay study support the results of B.D.A.'s wood assay study.

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED

PHONE (705) 652-3341
TELEX NO. 06962842
FACSIMILE NO. (705) 652-6365

June 8, 1990

Mr. Matt Bolu
Cominco Engineering Services Ltd.
Suite 100-1200 West 73rd Avenue
Vancouver, BC V6P 6G5

Dear Matt:

Re: Bissett Creek(graphitic carbon)

In response to your request to determine the effect of tramp wood, in test products, on the analysis of C(g), several tests were conducted. The testwork included the following variables:

1) Effect of roasting graphitic carbon at 400°C for 3 hours

2) Effect of roasting wood at 400°C for 3 hours

3) Effect of leaching with HNO_3

4) Effect of leaching with HNO_3 plus roasting at 400°C

Procedure:

Test 1 - A 1% graphitic carbon standard was placed in a muffle at 400°C for 3 hours. The standard was removed, cooled and assayed by Leco for carbon.

Test 2 - 1% graphitic carbon standard was leached with HNO_3, dried and assayed by Leco for carbon, according to our standard C(g) procedure.

Test 3 - A 25% weight equivalent of wood was treated under the same conditions as Test 1.

Test 4 - To the 1.0% C(g) standard, a 25% weight equivalent of wood was added. The mixture was leached with HNO_3(standard procedure), followed by roasting at 400°C for 3 hours.

Test 5 - As for Test 4 except roasting step left out.

Procedures - continued...

Results are tabled below:

Test No.	Procedure	Feed	%C(g) Recovered	%C(g) Added
1A	Roast 400°C	1% C(g) Standard	1.01	1.00
1B	Roast 400°C	1% C(g) Standard	1.01	1.00
1C	Roast 400°C	1% C(G) Standard	1.01	1.00
2A	HNO_3 Leach	1% C(g) Standard	0.98	1.00
2B	HNO_3 Leach	1% C(g) Standard	0.99	1.00
2C	HNO_3 Leach	1% C(g) Standard	1.02	1.00
3A	Roast 400°C	Wood	0.15	*25.0
3B	Roast 400°C	Wood	0.15	*25.0
4A	HNO_3 Leach and Roast	1% C(g) Std + 25% Wood	1.02	**26.0
4B	HNO_3 Leach and Roast	1% C(g) Std _ 25% wood	1.02	**26.0
5A	HNO_3 Leach	1% C(g) Std + 25% Wood	11.1	**26.0
5B	HNO_3 Leach	1% C(g) Std + 25% Wood	10.3	**26.0

* 25% = Wood added at 25% of sample weight
** 26% = 1% C(g) standard plus Wood at 25% sample weight

The above results indicate, that in order to eliminate the adverse effect of wood on your C(g) assays, the samples require roasting at 400°C plus the HNO_3 leach.

Matt, I suspect this type of investigation could justify a lot more work, and if you have any questions, or require more work, please do not hesitate to contact me at any time.

Best regards.

Yours sincerely,
LAKEFIELD RESEARCH

A. E. Carr,
Manager - Assay Services

AEC/dje

M. Bolu
Cominco/297

3.4 Part Four: Detailed Summary of Assay Methods

This final part of the assay study involved summarizing and contrasting the details (both procedural methods and accuracy/efficiency considerations) for each assay method. The results of this summary are presented over the next 6 pages.

1. Double L.O.I.

Procedure

- Sample weighed into tared porcelain crucible.
- Dried at 106°C (90 min). Put into desiccator, cooled and weighed - to obtain % of moisture.
- The same dried sample is put into furnace at 400°C with permanent access to fresh air for 2 1/2 hours. It is removed, put into desiccator, cooled and weighed to obtain % volatiles.
- The same sample is returned to the furnace and the temperature raised to 900°C with permanent access to fresh air. The sample is left in the furnace overnight (>8 hours). It is put into a desiccator, cooled and weighed to obtain % ash.

From these tests, fixed carbon or graphitic carbon is determined.

e.g. 100 - (% ash + % volatiles) = % C

Comments

1. From an analytical viewpoint, this method is good in that there is very little source of error due to sample treatment and manipulation.

2. The problem or largest source of error lies in the fact that it is

assumed that the weight loss from furnacing at 900°C (>400°C) is from the oxidation or ashing of graphitic carbon only. This weight loss could be attributed to loss from : water of crystallization, breaking down (oxidation of sulphides), reduction of SO_4 from heat and C, and loss of CO_2 from carbonates.

Summary

1. We have found that this method is more accurate is measuring high concentrations of graphitic carbon where there is much less chance of minerals occurring with the above interferences.

2. Unless the samples to be tested by the above method have been analyzed and found to be free from the above interferences the method will be unreliable (especially low grade samples).

2. Acid Leach L.O.I.

Procedure

- 2 g sample weighed into porcelain (or Pt) crucible and dried at 106°C for 90 minutes.
- Put into desiccator, cool and weigh to obtain % moisture.
- Transfer to 250 ml beaker and add 100 ml 20% HNO_3 and boil for 1 hour.
- Cool and filter through tared (or untared) gooch grucible and wash thoroughly with distilled H_2O. Care must be taken to transfer all sliming graphite from beaker to gooch.
- Dry, put into desiccator, cool and weigh.
- Transfer to prepared porcelain or platinum crucible and place in furnace (care must be taken in transferring all sample to crucible).
- Raise temperature to 900°C with permanent access to fresh air.
- Remove from furnace, cool in desiccator and weigh ash.

- This loss in weight is assumed to be due to oxidation of graphitic carbon and is reported as such.

Comments

1. From an analytical viewpoint this method is cumbersome in that the sample must be treated and transferred many times and is therefore subject to error by loss of sample.

2. The leaching step affected the low grade samples in particular by making them gelatinous and extremely difficult to filter (took 2 - 3 days to filter 21 samples).

Summary

1. Although this method partially eliminates the interferences from sulphides and carbonates it is still subject to error from sulphates and water of crystallization.

2. The method is too time consuming and cumbersome.

3. Leco Method

General Leco Procedure:

- Small sample (about 0.2 grams) is placed in special crucible and heated in an O_2 current.
- The CO_2 expelled from sample during heating is measured by the assay instrument (CO_2 absorbs infrared energy at a precise wavelength).
- Total carbon content of sample is determined.
- The assay instrument used for this procedure is called a Leco Carbon Analyzer.

Comments

- Quick, easy and accurate from the stand point of laboratory procedure.
- The very small size of the sample makes representativeness a factor in assay reliability.
- This method does not accurately determine carbon content of samples which are greater than 30% carbon.
- There are several sub-categories of this assay method, with the differences depending on the particular pre-treatment step prior to the actual Leco assay:

3a. Total Organic Carbon Leco (T.O.C. Leco)

Procedure

- Another portion of the sample is taken for determination of carbonate carbon.
- Sample is placed in closed system with traps for removing gasses that interfere.
- Hydrochloric Acid (5 - 10%) is added to the system, and CO_2 is expelled, absorbed and measured.
- This carbon amount is deducted from the total carbon value obtained by Leco to produce a value reported as graphitic carbon on T.O.C.

Comments

- This method does not account for organic (but non-graphitic) carbon such as wood or plant matter.

3b. Nitric Leco

Procedure

- Sample is pre-leached with strong (~25%) HNO_3 to detect carbon content due to carbonate minerals, and to dissolve sulphide minerals which may interfere with subsequent Leco assays.

Comments

- To some extent, the nitric acid will also dissolve some organic carbon (plant matter, wood).

3c. Nitric Leach + L.O.I. + Leco (L.O.I. Leco)

Procedure

- Sample is preleached with HNO_3 to evolve CO_2 attributable to carbonate minerals.
- Leach residue is heated to 470°C in an O_2 atmosphere for 2 hours. This Loss on Ignition step "burns off" any organic carbon.
- The ash from the L.O.I. step is assayed by Leco for total carbon which is interpreted to be % graphitic carbon.

Comments

- Because of the extra step (L.O.I.), this assay method is more complicated and costly then the other Leco methods.

Leco Summary

1. We have found that, in general, the acid-wash Leco method is an accurate method of measuring low concentrations of graphitic carbon.

2. When wood contamination is present, the L.O.I. Leco method is used because of its greater accuracy.

3. When no wood contamination is present, the T.O.C. Leco method is used because of its less costly and complicated procedure.

4.0 SUMMARY AND CONCLUSION

This assay study has gathered a large data base of information on the various methods of assaying for graphitic carbon. Other than the increased familiarity and confidence with each method derived from this detailed investigation, the main conclusions are:

1. Leco assays are more accurate than L.O.I. assays for low grade samples.

2. While their accuracy is not <u>proven</u> by this study, L.O.I. methods are the industry standard for high grade samples.

3. All assay methods give good repeatability.

4. The Double L.O.I. method is less difficult and contains less sources of potential error than the Acid leach L.O.I. method.

5. When low grade samples are contaminated by organic carbon (plant matter, wood), then the L.O.I. Leco gives the most accurate assay for graphitic carbon.

APPENDIX VI

Vancouver Petrographics Report
on +50 Mesh Concentrate Impurities

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: BACON, DONALDSON & ASSOCIATES LTD.,
12271 HORSESHOE WAY
RICHMOND, BC
V7A 4Z1

Project : M90-088
Comments: ATTN: RON WILLIAMS

Page Number : 1
Total Pages : 1
Invoice Date: 25-APR-90
Invoice No. : I-9014338
P.O. Number : 791

CERTIFICATE OF ANALYSIS A9014338

SAMPLE DESCRIPTION	PREP CODE		Al_2O_3 %	BaO %	CaO %	Fe_2O_3 %	K_2O %	MgO %	MnO %	Na_2O %	P_2O_5 %	SiO_2 %	TiO_2 %	TOTAL %		
3AA TABLECONCASH	225	200	14.96	0.04	2.21	12.40	3.78	7.18	0.26	2.09	0.23	53.92	1.17	98.23		

RECEIVED MAY 0 1 1990

CERTIFICATION : B. Cargill

VP

Vancouver Petrographics Ltd.

JAMES VINNELL, Manager
JOHN G. PAYNE, Ph.D. Geologist
CRAIG LEITCH, Ph.D. Geologist
JEFF HARRIS, Ph.D. Geologist
KEN E. NORTHCOTE, Ph.D. Geologist

P.O. BOX 39
8080 GLOVER ROAD,
FORT LANGLEY, B.C.
V0X 1J0
PHONE (604) 888-1323
FAX. (604) 888-3642

Report for: Ed Henrioulle,
Bacon, Donaldson & Associates,
12271 Horseshoe Way,
RICHMOND, B.C., V7A 4Z1

Invoice
June 1990

and: Matt Bolu,
Cominco Engineering Services Ltd.,
100 - 1200 West 73rd Street,
VANCOUVER, B.C., V6P 6G5

Sample: M90-088 +50 mesh graphite concentrate, 95% purity

Problem: to identify, determine approximate abundances, and photograph the impurities in the sample

Summary:

The sample was studied as grains on a glass plate under transmitted and reflected light.

The impurities in the sample are fragments of two main types, wood and biotite, in about equal abundances. The density difference (biotite >> wood) is offset by the volume difference (wood > biotite, because biotite fragments are very thin flakes and wood particles are more three-dimensional). Thus, the weight percentages of the two major impurity phases are about equal.

Minor fragment types (less than 5% of the fragments) include muscovite, filter paper(?), and an unknown, probably manufactured type.

Many tabular fragments of wood and lesser elongate fragments of wood are stuck moderately firmly to graphite flakes. This may be part of the reason why they were not separated during processing. Biotite flakes commonly are attached electrostatically to graphite flakes of similar size.

Description of fragments:

Wood fragments are of two main shapes with gradations between them. Many are elongate fibrous fragments averaging 0.7-1.5 mm in length, with a few up to 3.5 mm long. Color ranges from light brown and greyish brown to semiopaque. They show an elongate, cellular structure. Some are warped slightly and a few are bent sharply. Some are stuck moderately firmly to graphite flakes.

Other tabular wood fragments averaging 0.4-0.8 mm in size show a similar elongate cellular structure. A few fragments show cross sections of the cells. Some tabular fragments are warped moderately. Most are stuck moderately firmly to graphite flakes. Tabular fragments commonly have ragged ends. A few fragments have an unusual cellular structure, which may represent a different type of wood (one has a texture resembling cactus wood).

Biotite forms equant flakes averaging 0.4-0.8 mm across. The color ranges from light to medium/dark brown to slightly reddish brown. Commonly flakes are locked electrostatically to graphite flakes of similar size.

Several flakes averaging 0.1-0.5 mm in size are of colorless **muscovite** to pale brown **phlogopite**.

One **paper?** fragment contains a dense core 0.2 mm across of white material with a high internal reflection. A few wispy, colorless, fibrous strands up to 0.3 mm long extend outward from the core. This may be a fragment of the filter.

A few flakes of an **unknown material** are isotropic and medium brown in color. These have a mottled texture. When touched with a needle one broke along the fracture shown in the photograph. It has an unusual rippled texture and contains spots of highly reflective material. They do not cling to graphite flakes. These may represent a manufactured product.

A very few **string-like fibers** are up to a few mm long. These may be of something like cotton.

One equant tabular particle 0.2 mm across may be of plastic. It is colorless and isotropic.

John G Payne

John G. Payne
604-986-2928

Photographs

Numbers refer to number on negative and on back of print. All photos were taken with transmitted and reflected light except where noted.

Number	Description
0	Wood fragment locked between three graphite fragments. Length of photo: Length of photo: 1.52 mm.
1	Fragment of filter)(?) 0.4 mm across with graphite flakes and one biotite flake. Length of photo: 1.52 mm.
2	Red-brown biotite flake with graphite flakes. Length of photo 1.52 mm.
3	Wood fragment locked on graphite flake. Length of photo 0.6 mm.
4	Biotite flake beneath graphite flake, electrostatically held together. Length of photo 1.52 mm.
5	Wood fragment and biotite flake with graphite flakes. Small fibrous fragment in corner. Length of photo 1.52 mm.
6	Tabular wood fragment with graphite flakes. Length of photo 0.6 mm.
7	Tabular wood(?) fragment locked between two graphite flakes. The texture of this fragment resembles that of cactus wood. Length of photo 1.52 mm
8	Elongate fibrous wood fragment, bent, stuck to large graphite flake. Smaller equant wood fragment. Length of photo 0.61 mm.
9	Tabular fragment of unknown material showing rippled surface and fracture produced by pin, and graphite flake. Length of photo 0.6 mm.
10	Elongate fibrous wood fragment, free of graphite. Length of photo 1.52 mm.
11	Biotite flake and two fibrous wood fragments with graphite flakes. Length of photo 1.52 mm.
12	Tabular wood fragment, warped moderately, with graphite flakes. Length of photo 0.6 mm.
13	Biotite flake and equant wood fragment with graphite flakes. Transmitted light only. Length of photo 1.52 mm/

APPENDIX VII

Air Classification Study

M90-088

AIR WINNOW TEST ON A SAMPLE OF GRAPHITE TABLE CONCENTRATE SAMPLE

PROCEDURE

An Air Winnow was used to determine if the separation of wood matter from a graphitic concentrate by a current of air was feasible. In the test, a graphite concentrate sample was winnowed into five fractions. Quantitative measurements other than the weight of fraction, were not taken. Qualitative measurements such as visual and microscopic observations to determine if wood matter was present in the fractions were pursued to give a rough estimate of separation efficiency. This preliminary report summarizes the qualitative results found in the test.

METHOD

On June 20. 1990, a bulk sample of 4A Graphite concentrate was selected as feed for the Air Winnow test. A small sub sample was cut out from the bulk sample. A quick visual inspection of the sub sample was carried out to verify that the sample did contain wood particles, was dry to touch, and that the sample did not contain lumps that could plug up the Air Winnow feed hopper. At first, a few scoops of the sample was fed slowly into the hopper to check the degree of separation in all five of the collection vessels. This process of trial and error was repeated until a reasonable separation was found. Then the remainder of the sample was winnowed. The winnow fractions were collected in small pans, weighed, and then taken to Microscopy room for qualitative observations, as seen through a ten power objective lens.

DATA

Fraction	Sample Weight (g)	Comments
1	47.6	Coarsest particle size of wood matter, silica, and graphite.
2	146.2	Coarse particle size, wood matter, silica, and graphite.
3	148.0	Similar to fraction 1 and 2.
4	68.5	Some finer particles of wood matter present.
5	217.0	Finest particle size and highest concentration of wood.

SUMMARY

One Air Winnow test on a sample of 4A graphite table concentrate was completed. Wood particles were observed in all five winnow fractions. The greatest concentration of wood particles, of finer size, were observed in the fifth fraction. Coarser wood particles were seen in first three fractions. The test did not adequately separate wood matter from the graphite concentrate sample to warrant further tests.

APPENDIX VIII

Qualitative Settling Testwork

Pr[redacted] No: M90-088 (Settling Test)
Date: June 11, 1990

Test product: -100 mesh graphite
Flocculant type: Percol 351
Settling vessel: 500 ml graduated cylinder

Test	% solids	Reagent Dosage lb/ton	Observations
S1	2	0	-Very difficult to determine the interface -start settling slowly at 20 minutes
S2	2	0.01	-Formed large floc -No interface formed -Clear supernatant after 50 minutes, some fines still suspend in solution
S3	2	0.005	-formed large floc -start settling at 3 minutes -no interface formed -supernatant slightly cloudier than S2 after 50 minutes
S4	2	0.001	-no interface formed -smaller floc than S2 and S1 -still cloudy after 40 minutes
S5	4	0.01	-formed large floc -start settling at 1.5 minutes -no interface formed -clear at 40 minutes, few fines and large floc in solution -80 ml of graphite on the surface
S6	4	0.10	-formed large floc -started to settle at 2 minutes -no interface formed -clear at 36 minutes with few fines and large floc suspend in solution -45% of graphite floated on top

METALLURGICAL INVESTIGATION AND PLANT FLOWSHEET DEVELOPMENT FOR THE BISSETT CREEK FLAKE GRAPHITE ORE

Prepared for
NORTH COAST INDUSTRIES LTD.

JUNE 1990

Prepared by: Cominco Engineering Services Ltd.
Date: July 6, 1990

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TABLE OF CONTENTS (cont'd)

1.0 INTRODUCTION

This report summarizes and evaluates the results of laboratory bench scale and pilot plant testwork of the Bissett Creek flake graphite ore samples from Maria Township in Ontario.Further, the report deals with the development of a production plant flowsheet on the basis of the test results.

The study was carried out for North Coast Industries Ltd.(North Coast),the project owners.

The testwork was conducted at Ortech International (Ortech) and Bacon Donaldson and Associates (BDA) testing laboratories during January-June, 1990. Detailed test results and other specific information of the ore samples are documented in a report titled "Metallurgical Testing Of Bissett Creek Graphite Final Report" by Bacon Donaldson and Associates in July 1990.

Test samples for this test program were provided by North Coast Industries Ltd. as representative of the Bissett Creek ore.

The purpose of the testwork was to confirm and/or improve the metallurgy developed in an earlier study, followed by the demonstration of the flowsheet in a continuous pilot plant operation. Further, the results of pilot plant tests were used to form the basis of a production scale plant flowsheet development.

Metallurgical targets set for the testwork were as follows:

a. Overall concentrate grade of approximately 92-95% C(g).
b Overall graphite recovery to concentrates of 93-95% C(g).
c. A high proportion of flakes in the +48 mesh size fraction, ie..50% by weight or greater.

Metallurgical development and the direction of testwork was provided by Cominco Engineering Services Ltd.(CESL).

2.0 SUMMARY

Results of metallurgical testwork conducted on the drill core and bulk samples of Bissett Creek graphite ore demonstrate that the material is highly amenable to upgrading by conventional processing methods.Bench scale and continuous pilot plant tests recovered flake graphite concentrates containing 91-96% C(g) at 92-94% recoveries. The distribution to the +48 mesh flake concentrate was, on average, 65-67% of total graphitic carbon content of the feed, or 72.5% of the total recovered to concentrates.

The general processing philosophy applied for the recovery of high grade and coarse flake graphite concentrates from Bissett Creek ore samples is as follows:

> A coarse primary grind combined with flotation of the mill discharge followed by rougher flotation to produce a low weight, high recovery graphite concentrate. The combined concentrates are then upgraded by flotation, regrinding and gravity separation into three sizes in three stages.

The proposed production scale plant flowsheet consists of two stage crushing of the ore to -1" followed by a single stage rod milling. The primary grind is 20 mesh and the only flotation reagent (collector/frother) used is EKOF-452 G at 250 g/t of mill feed. Three sizes of final flake graphite concentrates are recovered by conventional flotation,screening and gravity methods and equipment before going for dewatering and drying. Dried products are then blended and packaged into bags to meet various market requirements.

2.1 BENCH SCALE TESTS

Initial bench testwork was centered on grinding and flotation characteristics of the ore samples. Other parameters tested included pulp density,reagents and regrind requirements. Later a gravity step introduced for the upgrading of +48 mesh fraction of flotation concentrates gave improved results.

Test F8 was a bulk bench test using a 24 Kg sample and employing all the processing steps of the bench scale flowsheet. In this test , a bench scale flowsheet was finalized using the optimized process conditions, and following the achievement of the targeted results a decision was made to proceed to continuous pilot plant testing of the bulk ore.

Results of Test F8 using the optimized conditions are presented in Figure 2.1 on the following page:

FIGURE 2.1

BENCH-TEST F8 METALLURGICAL BALANCE
(using best of regrind tests)

	WEIGHT %	ASSAY % C(g)	DISTR. %
Feed:	3.65	100.00	100.00
Concentrates:			
+48# Cleaner Concentrate	2.62	92.53	66.3
-48#+100# Cleaner Concentrate	0.67	94.70	17.4
-100# Cleaner Concentrate	0.38	92.65	9.6
TOTAL	3.67	92.94	93.3
Tailings:			
Rougher Flotation Tailings	95.10	0.16	4.2
Combined Cleaner Tailings	1.23	7.55	2.5
TOTAL	96.33	0.25	6.7

2.2 PILOT PLANT TESTS

The optimized process flowsheet of Test F8 was scaled up and used as the basis for the pilot plant flowsheet which essentially remained intact throughout the pilot study with minor modifications to reagents and the upgrading of -48 mesh circuit products . A significant addition to the pilot circuit configuration was the inclusion of a unit cell within the grinding circuit.

A total of 30 tonnes of ore was processed at a rate of approx 360 Kg/h in a number of pilot runs. Evaluation of results of each run led to circuit configuration improvements before proceeding with the next run.

Pilot Run #5 and #6B are considered to be the most successful of the tests, both from the operating and metallurgical points of view, and the summary of results are presented in Figure 2.2 on the following page:

FIGURE 2.2

PILOT PLANT RUNS #5 and #6B METALLURGICAL BALANCE

	PILOT RUN #5			PILOT RUN #6B		
	Wt %	%C(g)	Distr. %	Wt %	%C(g)	Distr. %
Belt Feed:	100.00	3.40	100.00	100.00	3.56	100.00
Bulk Concentrates:						
Unit Cell Concentrate	3.64	69.95	74.9	3.76	71.30	75.4
Rougher Cleaner Concentrate	1.20	62.50	22.1	1.17	64.14	21.1
TOTAL	4.84	68.10	97.0	4.94	69.60	96.5
Final Concentrates:						
+48# Concentrate	2.43	94.30	67.4	2.46	95.54	65.9
-48# +100 Concentrate	0.46	94.20	12.7	0.62	87.90	15.4
-100# Concentrate	0.52	81.80	12.4	0.38	90.79	9.6
TOTAL	3.40	92.39	92.5	3.46	93.64	91.0
Tailings:						
Rougher Tailings	95.16	0.11	3.1	95.06	0.13	3.5
-48# Circuit Tailings	1.14	11.53	3.9	1.10	6.70	2.1
-100# Circuit Tailings	0.30	7.00	0.6	0.34	32.83	3.5
TOTAL	96.60	0.27	7.6	96.54	0.33	9.1

The flowsheet configurations of Pilot Runs #5 and #6B are provided in Figures 3.4 and 3.6 in section 3.5.3 respectively, along with the complete metallurgical balances. Results of Pilot Runs #5 and #6B demonstrate the following:

a. The process flowsheet chosen, a combination of flotation, screening and gravity separation is a viable metallurgical route for the recovery of flake graphite from the Bissett Creek ore samples.

b. The ore tested is highly amenable to concentration by conventional processing methods and equipment producing high grade graphite concentrates containing 91-96% C(g) with 91-92.5% recoveries.

c. 66-67% of graphite flakes in the feed can be concentrated into +48 mesh size fraction.

d. The unit cell proved to be an important unit operation of the pilot flowsheet for the maximization of the recovery of graphite to the +48# product.

2.3 PLANT FLOWSHEET DEVELOPMENT

Following the successful completion of the pilot plant test program at BDA a production scale plant process flowsheet was developed for the treatment of the Bissett Creek ore using the process parameters established during testing.Metallurgical results of Pilot Runs #5 and #6B were used as the basis for the development of the final plant flowsheet and the plant metallurgical balance.

The plant process definition is as follows:

The run of mine ore will be crushed in two stages and further communition will take place in a rod mill to achieve graphite flake liberation. A flash cell will be included in the grinding circuit. Ground ore will go to rougher and cleaner flotation and the resultant concentrate will join flash cell concentrate for screening at 48 mesh. The +48 mesh product will be gravity upgraded on a shaking table producing the final +48 mesh concentrate while the -48 mesh screen undersize will be floated and screened at 100 mesh. Similarly, the +100 mesh product will be upgraded on a shaking table which will produce a final -48+100 mesh concentrate. The -100 mesh undersize is subjected to further cleaning by flotation to produce a final -100 mesh concentrate. Gravity tailings will be polished in a single regrind pebble mill, and flotation cleaner tailings recirculated back to the primary rod mill. Final concentrates will be dewatered through a centrifuge prior to drying ,blending and packaging.

Summary of the predicted plant metallurgical balance is given in Figure 2.3 on the following page:

FIGURE 2.3

PREDICTED PLANT METALLURGICAL BALANCE

	WEIGHT %	ASSAY %C(g)	DISTR. %
Mill Feed:	100.00	3.40	100.00
Final Concentrates:			
+48# Table Concentrate	2.43	94.30	67.36
+100# Table Concentrate	0.46	94.20	12.67
-100# Cleaner Concentrate	0.57	85.00	14.36
TOTAL	3.46	92.74	94.39
Tailings:			
Rougher Flotation Tailings	96.14	0.11	3.08
-100# Cleaner Tailings	0.40	21.50	2.53
TOTAL	96.54	0.20	5.61

Some of the more important plant operating parameters are as follows:

Rod Mill Feed:	1"
Grinding Circuit Product:	-20 mesh (P80:0.450mm)
Flotation Reagents:	EKOF-452G @ 250 g/t of mill feed
Flotation pH:	Natural pH, 7-7.5
Flash Flotation Time:	3 minutes
Rougher Flotation Time:	20 minutes
Other Reagents:	Flocculant @ 25 g/t of concentrate

3.0 DISCUSSION OF METALLURGICAL TEST RESULTS

3.1 Introduction

The first phase of the bench scale testwork conducted at Ortech was general amenability testing and it dealt with liberation, grinding and flotation characteristics of the ore samples. Although a formal report from the testing laboratory was not available on this testwork at time of writing, the metallurgical results are available in a report by CESL titled "Summary Report Of Laboratory Tests On Bissett Creek Graphite Ore" dated April 27,1990.(See Appendix A)

Following the first phase, the test program was moved to BDA in Vancouver, B.C., mainly for logistics and laboratory scheduling reasons.

The second phase of the testwork at BDA consisted of a series of grinding, flotation, screening and gravity tests for the development of a bench scale flowsheet which led to the continuous pilot plant testing of the bulk ore in phase three.

Total of 30 tonnes of ore was processed through the pilot plant in a number of pilot runs. Results of each run was evaluated and the necessary modifications and improvements were made before proceeding with the next run.

3.2 Sample Source

Samples used for the benches and pilot testing were supplied by North Coast Industries Ltd. The two batches of samples were identified to be "60 ton bulk sample" for pilot testing and "200 lb. mini bulk", a representative of the 60 ton bulk sample for bench scale testing. A 60 ton bulk sample report detailing sample location and assays by R.M. Blais and Associated Ltd. is provided in Appendix B.

3.3 Ore Mineralogy

Mineralogical examination of the ore samples conducted by Vancouver Petrographics Ltd. indicated the following: "Samples 44395 and 44396 are graphitic quartzo-feldspathic schists, dominated by quartz, plagioclase, and microcline, with minor biotite, pyrrhotite, and graphite. Graphite forms slender flakes which generally are not intergrown with other minerals. Graphite generally forms slender planar flakes averaging 0.3-1.5mm long and 0.03-0.07mm wide. These commonly occur adjacent to flakes of biotite of similar size or are associated with patches of pyrrhotite. Such grains would be separated readily from biotite and pyrrhotite by crushing". Further details of the findings can be found in a report by Vancouver Petrographics Ltd. in Appendix B.

3.4 Bench Scale Test Results

Details of bench scale test results documented in a report by CESL is included in Appendix A.

Test F8 was a series of tests and it finalized the bench scale flowsheet development. In this test a large bulk sample was used in order to produce larger quantity of product samples allowing parallel metallurgical investigations on the intermediate products.

The ore was ground to 51% -48 mesh in a batch rod mill followed by a rougher and cleaner flotation. The cleaner concentrate with a recovery of only 4% by weight of the feed was screened on a 48 mesh screen. +48 mesh product was subjected to staged gravity and regrind parallel tests resulting in a high grade final +48 mesh concentrate and a low grade gravity tailing product.

The -48 mesh product was also subjected to a staged regrind and flotation parallel tests followed by screening of the concentrates on a 100 mesh screen producing a high grade final +100 mesh concentrate.

The -100 mesh product was reground using the optimum conditions established above and was floated producing the -100 mesh final concentrate.

Regrind test results indicated that in order to achieve a clean and high grade graphite concentrate the flake surfaces had to be polished and, this tended to make the fine gangue particles hydrophobic due to the smearing of the graphite on the surfaces. Therefore, screening of the products subsequent to regrind and flotation gave immediate results in terms of upgrading by the physical elimination of the fines.

Results of Test F8 was considered to be successful and a decision was made to proceed with the continuous pilot plant testing of the ore using that flowsheet and test parameters.

3.4 Bench Scale Test Results

Details of bench scale test results documented in a report by CESL is included in Appendix A.

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The ore was ground to 51% -48 mesh in a batch rod mill followed by a rougher and cleaner flotation. The cleaner concentrate with a recovery of only 4% by weight of the feed was screened on a 48 mesh screen. +48 mesh product was subjected to staged gravity and regrind parallel tests resulting in a high grade final +48 mesh concentrate and a low grade gravity tailing product.

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Results of Test F8 was considered to be successful and a decision was made to proceed with the continuous pilot plant testing of the ore using that flowsheet and test parameters.

'etallurgical results of the Test F8 using the best of the parallel regrind investigations, the test flowsheet are presented in Figures 3.1 and 3.2 on the following pages. 'led test procedures by BDA are included in Appendix A.

FIGURE 3.1
BDA BENCH TEST F8
BISSETT CREEK GRAPHITE METALLURGICAL RESULTS
Using Best Of Regrind Results

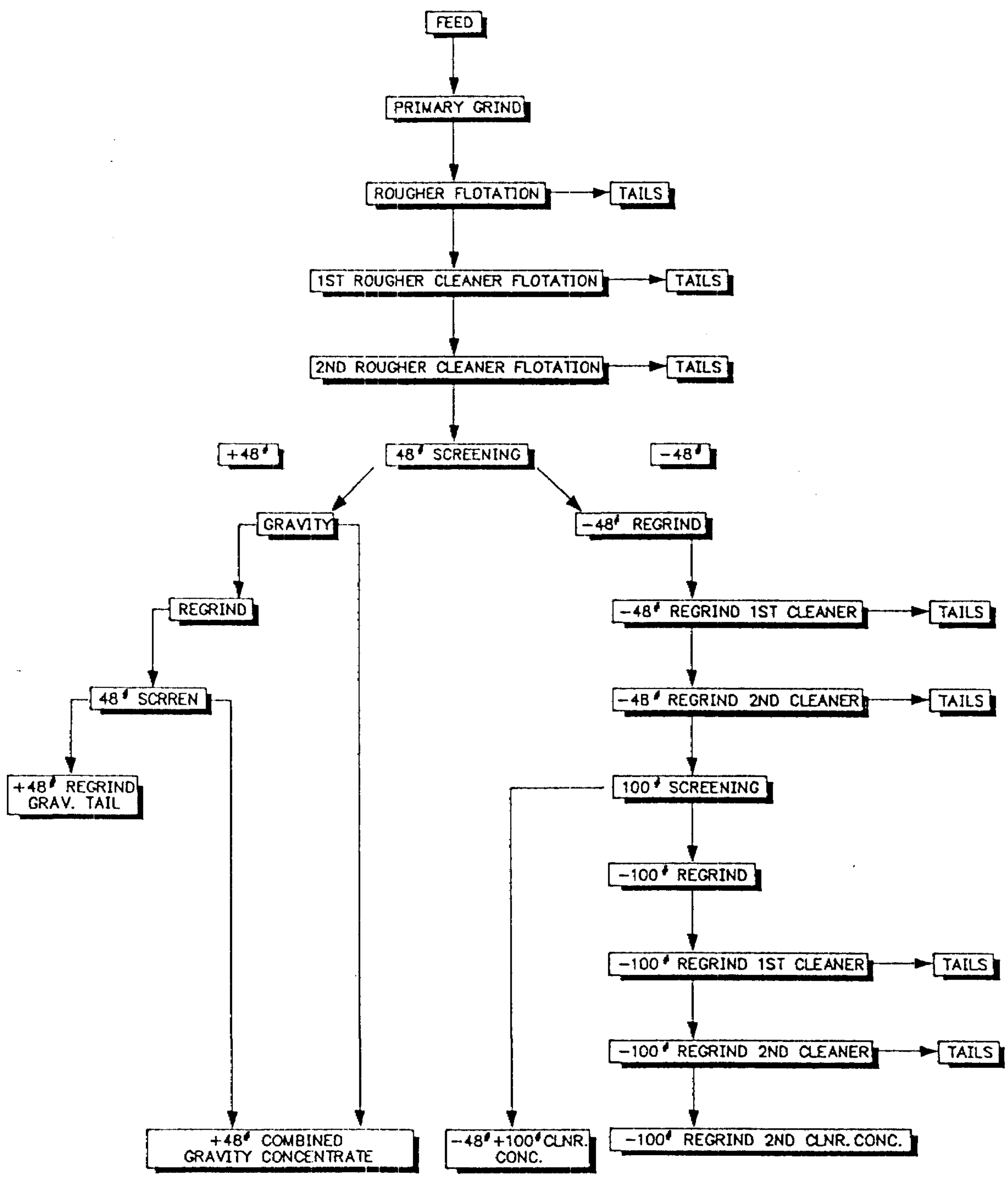
Products	Weight g	Weight %	Assay % C(g)	Dist'n. %
Head (Calc)	23268.5	100.00	3.65	100.0
Ro. Flot'n. Tails	22129.1	95.10	0.16	4.2
Ro. Flot'n. Conc.	1139.4	4.90	71.50	95.8
1st Ro. Clnr Tails	160.1	0.69	1.43	0.3
1st Ro. Clnr Conc.	979.3	4.21	82.96	95.6
2nd Ro. Clnr Tails	39.7	0.17	4.47	0.2
2nd Ro. Clnr Conc	939.6	4.04	86.28	95.4
+ 48# 2nd Ro.Clnr Conc	656.8	2.82	88.01	68.0
+ 48# Gravity Conc	224.4	0.96	96.34	25.4
+ 48# Regrind Gravity Conc	384.5	1.65	90.30	40.8
+ 48# Regrind Gravity Tail	47.9	0.21	30.60	1.7
- 48# 2nd Ro.Clnr Conc	282.8	1.22	82.25	27.4
- 48# Regrind 1st Clnr Tails	27.1	0.12	2.54	0.1
- 48# Regrind 1st Clnr Conc	255.7	1.10	90.70	27.3
- 48# Regrind 2nd Clnr Tails	4.6	0.02	9.67	0.1
- 48# Regrind 2nd Clnr Conc	251.1	1.08	92.19	27.2
- 48# +100# Clnr Conc	156.4	0.67	94.70	17.4
- 100# Screen U'size	94.7	0.41	88.04	9.8
- 100# Regrind 1st Clnr Tail	4.9	0.02	22.30	0.1
- 100# Regrind 1st Clnr Conc	89.8	0.39	91.62	9.7
- 100# Regrind 2nd Clnr Tail	1.7	0.01	38.40	0.1
- 100# Regrind 2nd Clnr Conc	88.1	0.38	92.65	9.6

Combined Products:	Concs Wt%	Weight %	Assay % C(g)	Dist'n. %
Concentrates:				
+ 48# Gravity Conc	26.29	0.96	96.34	25.4
+ 48# Regrind Gravity Conc	45.05	1.65	90.30	40.8
Total + 48# Clnr Conc	71.35	2.62	92.53	66.3
- 48# +100# Clnr Conc	18.33	0.67	94.70	17.4
- 100# Regrind 2nd Clnr Conc	10.32	0.38	92.65	9.6
Total Concentrates	100.00	3.67	92.94	93.3
Tailings:				
Total Clnr Tails		1.23	7.55	2.5
Ro. Flot'n. Tails		95.10	0.16	4.2
Total Tails		96.33	0.25	6.7

Notes: Feed sample is Comp 2
Primary grind is 51.0 % - 48#
Reagent used is EKOF 452G @ 200 g/t

Figure 3.2

FLOWSHEET FOR BDA TEST F.8



LAST UPDATE: 90/07/06

CAD FILE NAME: V011E004

Revision							
Rev.	Date	By	Chk'd	App'd	App'd By		
					Chk'd By		
Issue:					Drawn By	F.F	90/07/06
					Dsgn'd By	H.M.B	90/07/06

CESL

Job No. V011

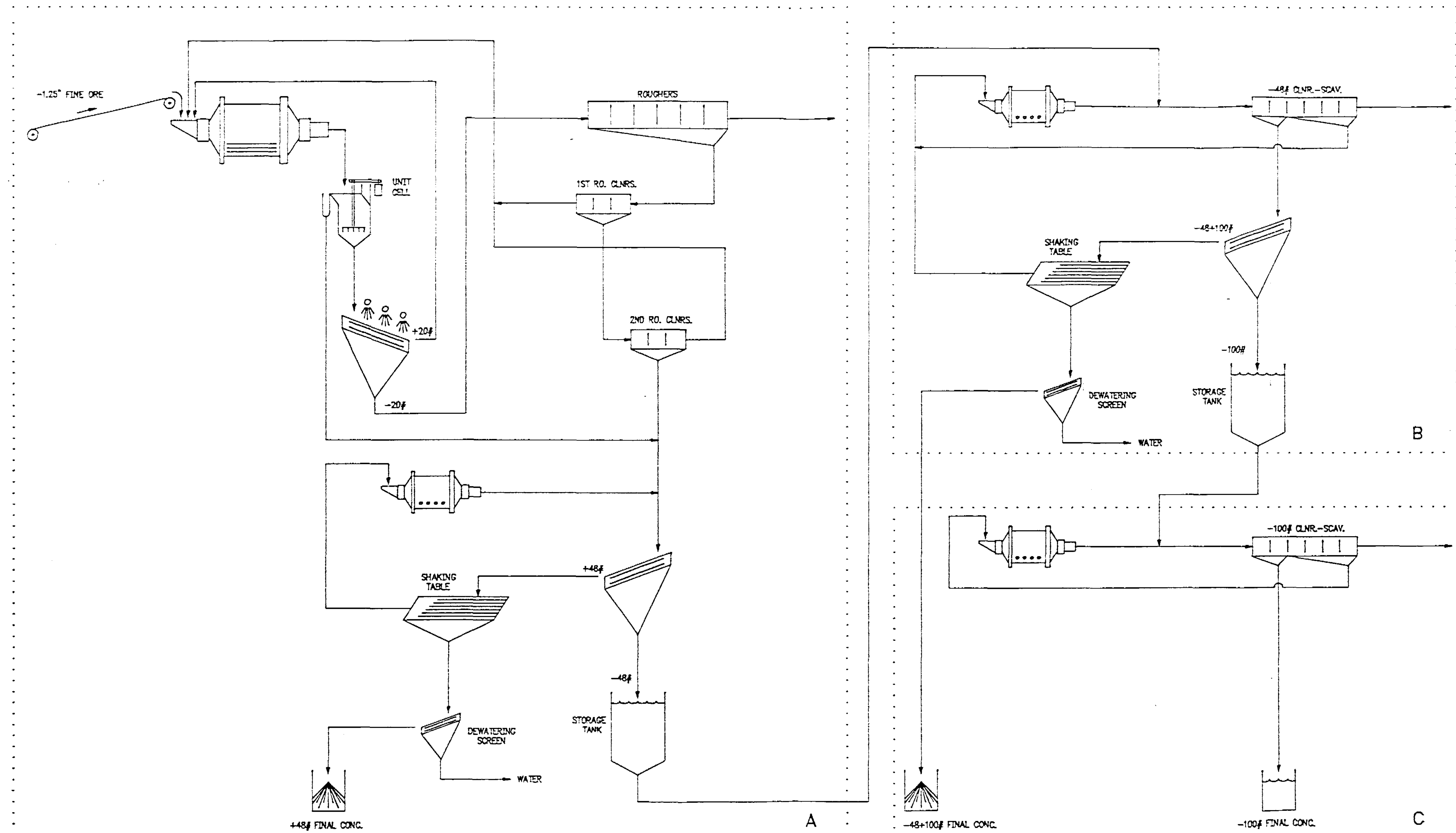
Title FLOWSHEET FOR BDA TEST F.8

Drawing No. V011-E-004

Rev.

Figure 3.3

PILOT PLANT FLOWSHEET



ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT

Control Systems
Electrical
Mechanical
Piping
Civil/Structural
Process Eng.
Checked By
Drawn By F.FABIAN
Designed By M.BOLU
ENGINEERING REVIEW
Client Dwg. No.
Job No.
Scale N.T.S

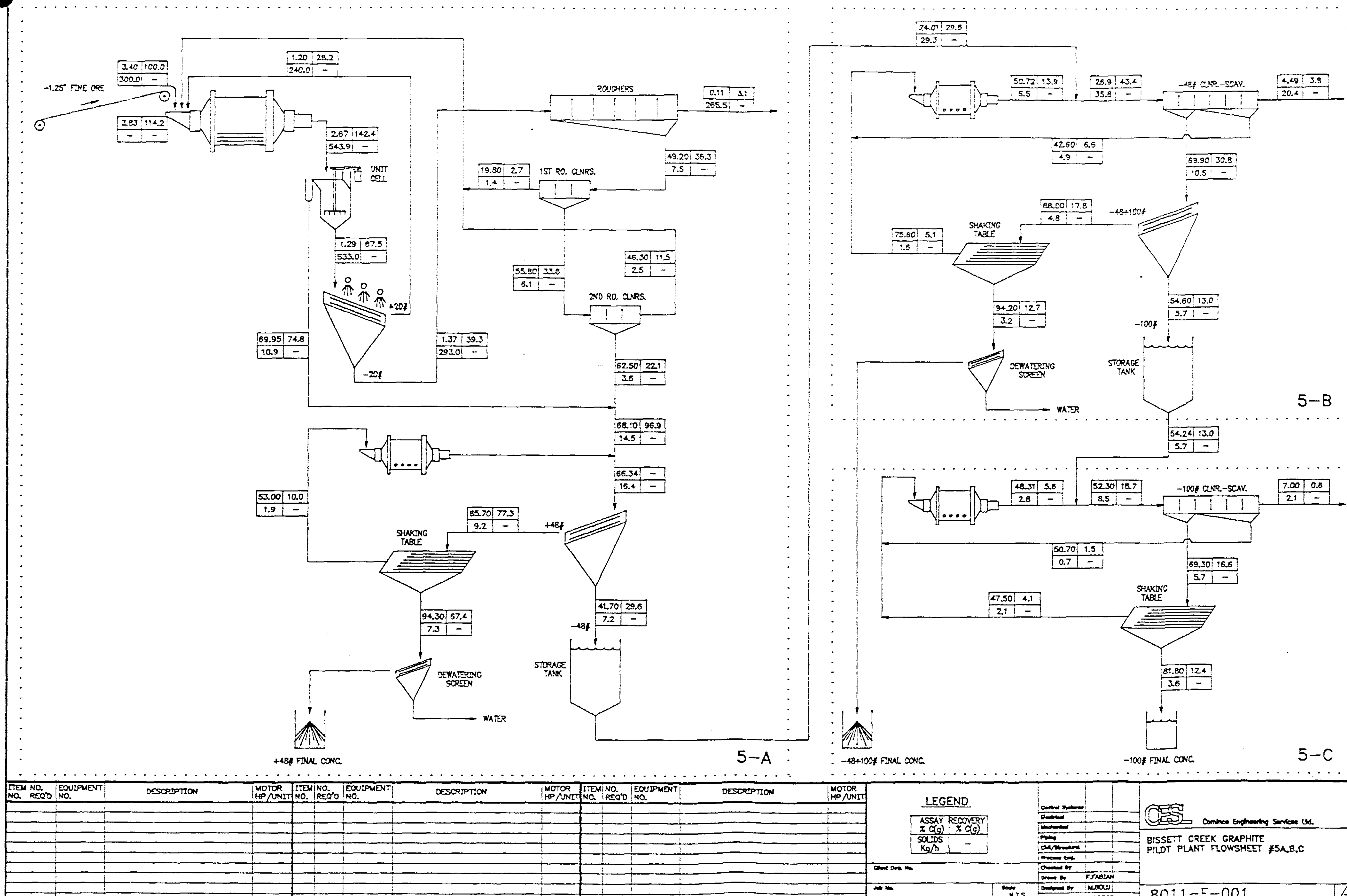
Cominco Engineering Services Ltd.

BISSETT CREEK GRAPHITE
GENERAL PILOT PLANT FLOWSHEET

8011-E-002

LAST UPDATE: 90/07/06
CAD FILE NAME: 8011E002

Figure 3.4 PILOT PLANT RUN #5 PROCESS FLOWSHEET



3.5 Pilot Plant Test Results

3.5.1 Introduction

30 tonnes of Bissett Creek ore was tested in a number of pilot runs in a continuous pilot plant configured at the facilities of BDA. Pilot plant flowsheet was developed using Test F8 bench scale flowsheet mentioned above with an important addition of a unit flotation cell within the grinding circuit.The purpose of the unit cell was to scalp off the coarse liberated graphite flakes from the rod mill discharge preventing further grinding of the +20 mesh product. The unit cell floated approx 75% of the graphite and is considered to be a significant component of the flowsheet.

3.5.2 Description of Pilot Plant Flowsheet

The pilot plant flowsheet, which did not change significantly between runs, is depicted in figure 3.3 on the following page. The -6" bulk ore was reduced to -1.25" in a jaw crusher followed by rod mill grinding in closed circuit with a unit cell and 20 mesh screen.

The finished product (-20 mesh) from the grinding circuit was subjected to flotation to produce a rougher concentrate and a rougher tailing. The rougher tailing contained the bulk of the material and was the major waste stream discharged from the circuit. The rougher concentrate was subjected to two stages of cleaning and the cleaned concentrate was combined with the unit cell concentrate. The cleaner tailing was returned to the rod mill for further grinding.

The combined unit cell and cleaner concentrates were screened at 48 mesh. Plus 48 mesh material was upgraded on a shaking table to produce a final +48 mesh concentrate and a table tails. The table tailing was subjected to pebble milling in closed circuit with the 48 mesh screen.

Due to the low flow rates, the -48 mesh screen undersize was stored in a stock tank and processed separately, subsequent to the primary circuit run. The secondary run involved two stage cleaner flotation of the -48 mesh material and screening of the concentrate at 100 mesh. The +100 mesh material was either accepted as a final +100 mesh concentrate or subjected to tabling for further upgrading followed by pebble mill regrinding of the table tails in closed circuit with the 100 mesh screen.

The -100 mesh material from the screen was again stored to provide sufficient volume and processed in two stages of cleaner flotation to produce a -100 mesh flotation concentrate which was either accepted as final product, or tabled. The cleaner flotation tailing was considered a discardable product.

3.5.3 Test Runs

Pilot runs #1 to #4 used the flowsheet described above with the exclusion of -48 mesh products tabling, however the mechanical configuration of the circuit evolved considerably, particularly in the materials handling area.The main metallurgical improvement from run #1 to #4 was coarsening of the primary grind to the targeted levels which were established in bench scale tests as 98% -20 mesh.

Pilot runs #5 and #6B were the most successful runs, both from the operating and the metallurgical points of view. The metallurgical results achieved were comparable to those of Test F8 bench scale. Pilot runs #5 and #6B both used essentially similar circuits except in run #5 tabling was introduced for +100 mesh screen oversize and the -100 mesh flotation concentrate.The +100 mesh product responded very well to gravity upgrading by producing a concentrate which assayed 94.2% C(g). However, the same cannot be said for the -100 mesh product tabling which produced a concentrate grade of 81.8% C(g). This is believed to be due to the slimy nature of table feed.

In pilot run #6A the unit cell was eliminated from the circuit, and the resulting +48 mesh concentrate recovery and the overall recovery deteriorated from 67.4% and 92.5% in pilot run #5 to 57.8% and 72.9% respectively. This reduction demonstrated the significance of the unit cell for the recovery of large flakes from the Bissett Creek ore. Therefore, in the production plant flowsheet described in Section 5.1 a flash flotation cell is proposed due to its better design for handling coarse feed as is the case with Bissett Creek rod mill discharge, instead of a conventional unit cell.

Pilot run #6C was operated using exactly the same flowsheet as #6A, with a reagent switch from EKOF 452 G to Varsol/MIBC combination. The +48 mesh concentrate recovery further deteriorated to 48.8% contradicting the results of bench test F9 which indicated comparable metallurgy with Varsol/MIBC.

Flowsheets and the attendant metallurgical balance calculations for pilot run #5 is presented in Figures 3.4, 3.5 and 3.5A, and pilot run #6B is presented in Figures 3.6 and 3.7 respectively on the following pages.

Details of all the pilot runs are documented in a report by BDA titled "Metallurgical Testing of Bissett Creek Graphite, Final Report", July, 1990.

FIGURE : 3.5A
NORTH COAST INDUSTRIES LTD
BISSETT CREEK GRAPHITE
PILOT PLANT RUNS # 5-A,B,C METALLURGICAL BALANCE

Adjusted for continous flow

PRODUCTS	ID #	WEIGHT Kg/hr	WEIGHT %	ASSAY, % C(g) Assayed	ASSAY, % C(g) Calc'd	RECOVERY % C(g) Unit	RECOVERY % C(g) Overall
PP #5-A, GRINDING AND +48# CIRCUIT							
BELT FEED	1	300.00	100.00	3.40	3.40		100.00
BELT FEED + RO CLNR TAILS	1A	303.92	101.31		3.83		114.21
ROD MILL DISCH.,UNIT CELL FEED	2	543.92	181.31	2.67	2.67		142.38
UNIT CELL CONC	3	10.92	3.64	58.90	69.95	52.57	74.85
UNIT CELL TAIL ,20# SCR FEED	4	533.00	177.67	0.84	1.29		67.53
20# SCREEN O'SIZE	5	240.00	80.00	1.15	1.20		28.17
20# SCREEN U'SIZE	6	293.00	97.67	1.37	1.37	58.28	39.35
RO FLOT'N CONC	7	7.52	2.51	49.20	49.20	92.18	36.28
RO FLOT'N TAIL	8	285.48	95.16	0.11	0.11	7.82	3.08
1st RO CLNR CONC	9	6.14	2.05	55.80	55.80	92.62	33.60
1st RO CLNR TAIL	10	1.38	0.46	19.80	19.80		2.68
2nd RO CLNR CONC	11	3.60	1.20	62.50	62.50	65.68	22.07
2nd RO CLNR TAIL	12	2.54	0.85	46.30	46.30		11.53
48# SCR O'SIZE,TABLE FEED	13	9.20	3.07	85.70	85.70		77.32
+48# TABLE CONC	14	7.29	2.43	94.30	94.30	87.12	67.36
+48# TABLE TAIL ,REGRIND FEED	15	1.92	0.64	53.00	53.00		9.96
+48# REGRIND DISCH	16						
U CELL CONC + 2nd RO CLNR CONC	17	14.52	4.84	68.10	68.10		96.92
48# SCR FEED (COMB'D)	17A	16.43	5.48		66.34		106.88
48# SCREEN U'SIZE	18	7.23	2.41	41.70	41.70		29.56
PP #5-B, -48# CIRCUIT:							
-48# CCT FEED	18	7.23	2.41	28.40	41.70		29.56
-48# SCAV CONC	19	2.10	0.70	42.60	42.60		8.78
-48# REGRIND DISCH	20	2.79	0.93		50.72		13.86
-48# CLNR FEED	20A	10.02	3.34		44.21		43.42
-48# CLNR CONC ,100# SCR FEED	21	4.51	1.50	69.90	69.65	70.92	30.80
-48# SCAV TAIL	22	3.41	1.14	4.49	11.53		3.85
100# SCR O'SIZE ,TABLE FEED	23	2.06	0.69	88.00	88.00	57.67	17.76
+100# TABLE TAIL	23T	0.69	0.23	75.60	75.60		5.09
+100# TABLE CONC	23C	1.37	0.46	94.20	94.20	71.36	12.67
100# SCR U'SIZE	24	2.45	0.82	54.60	54.24		13.04
PP #5-C, -100# CIRCUIT							
-100# CCT FEED	24	2.45	0.82	49.10	54.24		13.04
-100# SCAV CONC	25	0.30	0.10	50.70	50.70	8.02	1.50
-100# REGRIND DISCH	26	1.19	0.40		48.31		5.63
-100# CLNR FEED	26A	3.64	1.21	48.70	52.31		18.67
-100# SCAV TAIL	27	0.90	0.30	7.00	7.00	3.32	0.62
-100# CLNR CONC ,TABLE FEED	28	2.44	0.81	69.30	69.30	88.66	16.55
-100# TABLE TAIL	28T	0.89	0.30	47.50	47.50		4.13
-100# TABLE CONC	28C	1.55	0.52	81.80	81.80	75.02	12.42
TOTAL CONCENTRATES:							
+48# TABLE CONC	14	7.29	2.43	94.30	94.30		67.36
+100# TABLE CONC	23C	1.37	0.46	94.20	94.20		12.67
-100# TABLE CONC	28C	1.55	0.52	81.80	81.80		12.42
TOTAL:		10.21	3.40		92.39		92.45
TOTAL TAILINGS:							
RO FLOT'N TAIL	8	285.48	95.16	0.11	0.11		3.08
-48# SCAV TAIL	22	3.41	1.14	4.49	11.53		3.85
-100# SCAV TAIL	27	0.90	0.30	7.00	7.00		0.62
TOTAL:		289.79	96.60		0.27		7.55

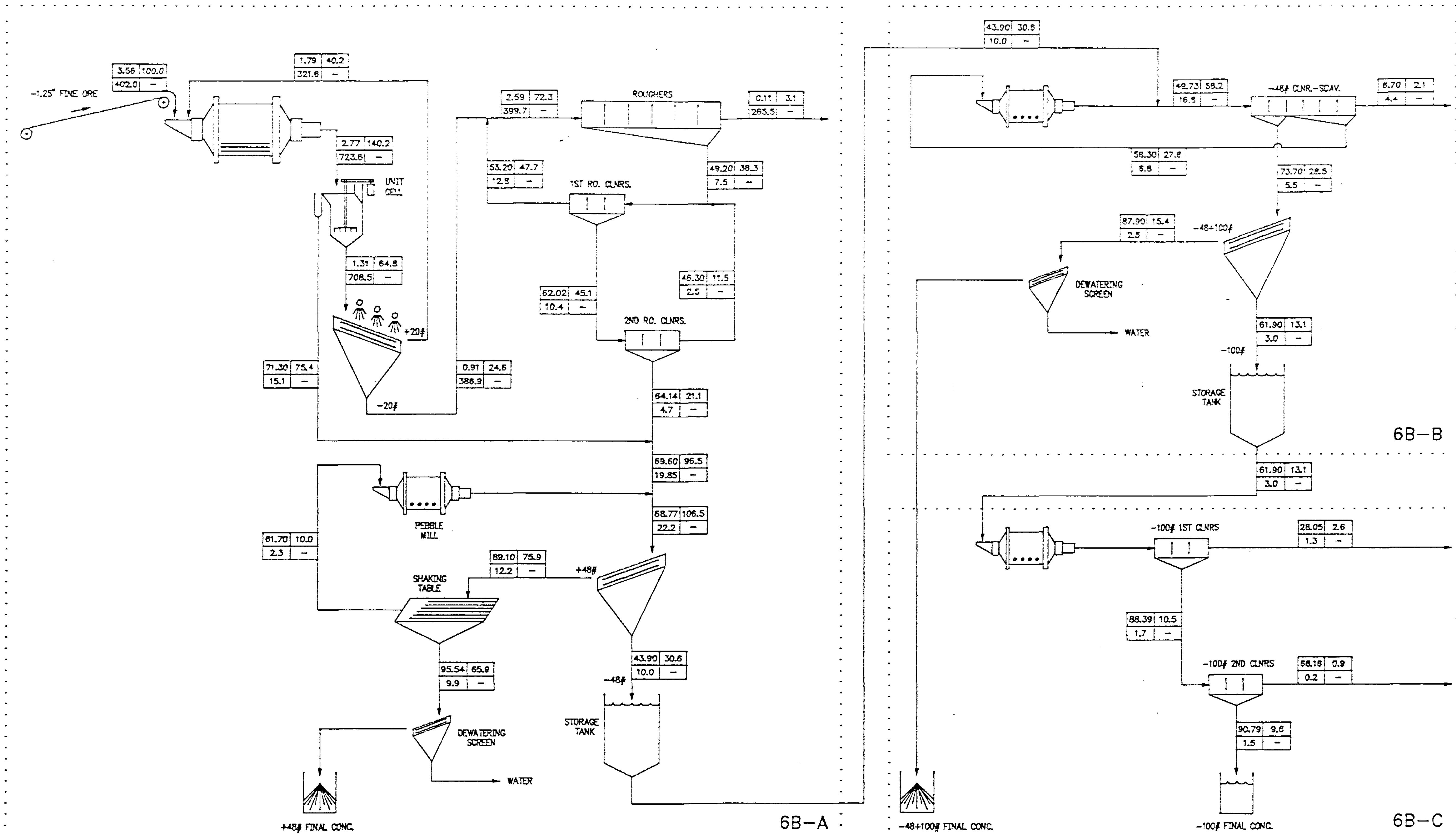
Figure : 3.5
NORTH COAST INDUSTRIES LTD.
BISSETT CREEK GRAPHITE
PILOT PLANT RUNS # 5-A,B,C METALLURGICAL BALANCE

PRODUCTS	ID #	WEIGHT Kg/hr	WEIGHT %	ASSAY, % C(g) Assayed	ASSAY, % C(g) Calc'd	RECOVERY % C(g) Unit	RECOVERY % C(g) Overall
PP #5-A, GRINDING AND +48# CIRCUIT:							
BELT FEED	1	300.00	100.00	3.40	3.40		100.00
BELT FEED + RO CLNR TAILS	1A		101.31		3.83		114.21
ROD MILL DISCH.,UNIT CELL FEED	2	543.92	181.31	2.67	2.67		142.38
UNIT CELL CONC	3	10.92	3.64	58.90	69.95	52.57	74.85
UNIT CELL TAIL ,20# SCR FEED	4	533.00	177.67	0.84	1.29		67.53
20# SCREEN O'SIZE	5	240.00	80.00	1.15	1.20		28.17
20# SCREEN U'SIZE	6	293.00	97.67	1.37	1.37	58.28	39.35
RO FLOT'N CONC	7	7.52	2.51	49.20	49.20	92.18	36.28
RO FLOT'N TAIL	8	285.48	95.16	0.11	0.11	7.82	3.08
1st RO CLNR CONC	9	6.14	2.05	55.80	55.80	92.62	33.60
1st RO CLNR TAIL	10	1.38	0.46	19.80	19.80		2.68
2nd RO CLNR CONC	11	3.60	1.20	62.50	62.50	65.68	22.07
2nd RO CLNR TAIL	12	2.54	0.85	46.30	46.30		11.53
48# SCR O'SIZE,TABLE FEED	13	9.20	3.07	85.70	85.70		77.32
+48# TABLE CONC	14	7.29	2.43	94.30	94.30	87.12	67.36
+48# TABLE TAIL ,REGRIND FEED	15	1.92	0.64	53.00	53.00		9.96
+48# REGRIND DISCH	16						
U CELL CONC + 2nd RO CLNR CONC	17	14.52	4.84	68.10	68.10		96.92
48# SCR FEED (COMB'D)	17A	16.43	5.48		66.34		
48# SCREEN U'SIZE	18	7.23	2.41	41.70	41.70		29.56
PP #5-B, -48# CIRCUIT:							
-48# CCT FEED	18	29.28	100.00	28.40	24.01		29.56
-48# SCAV CONC	19	4.90	16.74	42.60	42.60		8.78
-48# REGRIND DISCH	20	6.50	22.20		50.72		13.86
-48# CLNR FEED	20A	35.78	122.20		28.87		43.42
-48# CLNR CONC ,100# SCR FEED	21	10.48	35.79	69.90	69.90	70.92	30.80
-48# SCAV TAIL	22	20.40	69.68	4.49	4.49		3.85
100# SCR O'SIZE ,TABLE FEED	23	4.80	16.39	88.00	88.00	57.67	17.76
+100# TABLE TAIL	23T	1.60	5.46	75.60	75.60		5.09
+100# TABLE CONC	23C	3.20	10.93	94.20	94.20	71.36	12.67
100# SCR U'SIZE	24	5.68	19.39	54.60	54.60	42.33	13.04
PP #5-C, -100# CIRCUIT:							
-100# CCT FEED	24	5.70	100.00	49.10	54.24		13.04
-100# SCAV CONC	25	0.70	12.28	50.70	50.70		1.50
-100# REGRIND DISCH	26	2.76	48.50		48.31		5.63
-100# CLNR FEED	26A	8.46	148.50	48.70	52.30		18.67
-100# SCAV TAIL	27	2.10	36.84	7.00	7.00		0.62
-100# CLNR CONC ,TABLE FEED	28	5.66	99.37	69.30	69.30	88.66	16.55
-100# TABLE TAIL	28T	2.06	36.21	47.50	47.50		4.13
-100# TABLE CONC	28C	3.60	63.16	81.80	81.80	75.02	12.42

Figure : 3.7
NORTH COAST INDUSTRIES LTD.
BISSETT CREEK GRAPHITE
PILOT PLANT RUNS # 6B-A,B,C METALLURGICAL BALANCE

PRODUCTS	ID #	WEIGHT Kg/hr	WEIGHT %	ASSAY, % C(g) Assayed	ASSAY, % C(g) Calc'd	RECOVERY % C(g) Unit	RECOVERY % C(g) Overall
PP #6B-A, GRINDING AND +48# CIRCUIT:							
BELT FEED	1	402.00	100.00	3.56	3.56		100.00
ROD MILL DISCH.,UNIT CELL FEED	2	723.60	180.00	2.16	2.77		140.22
UNIT CELL CONC	3	15.13	3.76	71.30	71.30	53.77	75.40
UNIT CELL TAIL ,20# SCR FEED	4	708.47	176.24	1.07	1.31	46.23	64.82
20# SCREEN O'SIZE	5	321.60	80.00	1.79	1.79	62.05	40.22
20# SCREEN U'SIZE	6	386.87	96.24	0.91	0.91	37.95	24.60
RO FLOT'N FEED	6A	399.71	99.43		2.59		72.34
RO FLOT'N CONC	7	17.56	4.37	65.60	56.14	95.20	68.87
RO FLOT'N TAIL	8	382.15	95.06	0.13	0.13		3.47
1st RO CLNR FEED	7A	23.25	5.78		57.15		92.82
1st RO CLNR CONC	9	10.40	2.59	57.55	62.02	48.57	45.08
1st RO CLNR TAIL	10	12.84	3.19	53.20	53.20		47.74
2nd RO CLNR CONC	11	4.71	1.17	58.32	64.14	46.86	21.13
2nd RO CLNR TAIL	12	5.69	1.42	60.26	60.26		23.96
48# SCR O'SIZE,TABLE FEED	13	12.20	3.03	89.10	89.10		75.95
+48# TABLE CONC	14	9.88	2.46	95.54	95.54	86.82	65.94
+48# TABLE TAIL ,REGRIND FEED	15	2.32	0.58	61.70	61.70		10.01
+48# REGRIND DISCH	16						
U CELL CONC + 2nd RO CLNR CONC	17	19.85	4.94	69.60	69.60		96.53
48# SCR FEED	17A	22.17	5.51		68.77		106.54
48# SCREEN U'SIZE	18	9.97	2.48	43.90	43.90		30.58
PP #6B-B, -48# CIRCUIT:							
-48 # CCT FEED	18	9.97	2.48	43.90	43.90	0.00	30.58
-48# SCAV CONC ,REGRIND FEED	19	6.78	1.69	58.30	58.30		27.60
-48# REGRIND DISCH	20						
-48# CLNR FEED	20A	16.75	4.17		49.73		58.19
-48# CLNR CONC, 100# SCR FEED	21	5.54	1.38	73.70	73.70		28.51
-48# SCAV TAIL	22	4.43	1.10	6.70	6.70		2.08
100# SCR O'SIZE , -48+100# CONC	23	2.51	0.62	87.90	87.90	54.13	15.43
100# SCR U'SIZE	24	3.02	0.75	61.90	61.90		13.08
PP #6B-C, -100# CIRCUIT:							
-100# CCT FEED	24	3.02	0.75	61.90	61.90		13.08
-100# REGRIND DISCH	25						
-100# 1st CL TAIL	26	1.33	0.33	33.93	28.05		2.60
-100# 1st CL CONC	27	1.70	0.42	88.39	88.39	80.11	10.48
-100# 2nd CL TAIL	28	0.18	0.04	68.09	68.16		0.86
-100# 2nd CL CONC (-100# CONC)	29	1.52	0.38	90.79	90.79	91.82	9.62
TOTAL CONCENTRATES:							
+48# TABLE CONC	14	9.88	2.46	95.54	95.54		65.94
-48+100# CONC	23	2.51	0.62	87.90	87.90		15.43
-100# CONC	29	1.52	0.38	90.79	90.79		9.62
TOTAL:		13.91	3.46		93.64		90.99
TOTAL TAILINGS:							
RO FLOT'N TAIL	8	382.15	95.06	0.13	0.13		3.47
-48# SCAV TAIL	22	4.43	1.10	6.70	6.70		2.08
-100# 1st CL TAIL	26	1.33	0.33	33.93	28.05		2.60
-100# 2nd CL TAIL	28	0.18	0.04	68.09	68.16		0.86
TOTAL:		388.09	96.54		0.33		9.01

Figure 3.6 PILOT PLANT RUN #6B PROCESS FLOWSHEET



ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT

LEGEND

ASSAY % C(g)	RECOVERY % C(g)
SOLIDS Kg/h	–

Cominco Engineering Services Ltd.

BISSETT CREEK GRAPHITE
BDA PILOT PLANT FLOWSHEET
#6B–A;6B–B;6B–C

Scale N.T.S
Drawn By F.FABIAN
Designed By M.BOLU

8011–E–003

4.0 OTHER RELATED TESTS AND ANALYSIS

In the following paragraphs, summary results of analyses performed on ore and concentrate samples by various laboratories are documented. Reports of analysis for the respective studies are provided in Appendix C.

4.1 Ore Grade, Flake Size Distribution and Recovery Relationship

Semi-quantitative modal analysis were done on polished thin sections of chip samples of varying grades in an attempt to find a correlation between ore grade and graphite flake size distribution if one existed.

Also, variability tests are presently being conducted on varying feed grades to determine the metallurgical response of various ore samples to the flowsheet developed. These tests will help to understand if there is a relationship between feed grade, concentrate recoveries and flake size distribution.

Results of these tests and analysis will be made available in a follow-up report when the tests are finalized.

4.2 Microscopic Examination of Concentrate Samples

A sample of +48 mesh table concentrate (95.5% C(g)) from Pilot run #6B was submitted to Vancouver Petrographics Ltd. for mineralogical identification and determination of approximate abundances of impurities. The main impurities were identified to be fragments of wood and biotite, in about equal abundance by weight. Minor fragments included muscovite and other unidentified foreign material of less than 5% by weight of the fragments. The report on this study is provided in Appendix C.

4.3 Concentrate Impurity Tests

Subsequent to the findings of the above mentioned study the following tests were performed at BDA in an attempt to remove the major impurities from the concentrates.

a. Wood Elimination

Concentrate samples were dried in an oven at 400°C for 45 minutes to eliminate wood by way of Loss on Ignition. Dried samples showed total elimination of wood from the sample without any ash residue. There was no observable visible effect to graphite flakes when examined under a binocular microscope with 40X magnification. Total weight loss (LOI) was 0.4%. Further tests should be carried out at lower temperatures for shorter periods, ie. 300° - 350°C for 10-20 minutes, to determine if a production plant dryer would also eliminate wood in concentrates just as effectively.

b. Biotite Leaching

Hand picked biotite particles were leached in weak H_2SO_4 on a hot plate for 2 hours. The residue was examined under a binocular microscope and it was found that the biotite flakes were completely leached of their metallic content. The dark brown appearance of the flakes was replaced with a colourless transparent silica flake of the same size.

4.4 Whole Rock Analysis

Whole rock analysis were done on Composite 1 and Composite 2 ore samples and the results are presented in Figure 4.3 below.

FIGURE 4.3

WHOLE ROCK ANALYSIS
OF ORE SAMPLES

	COMPOSITE 1	COMPOSITE 2
SiO_2	69.51%	76.86%
Al_2O_3	11.07%	8.60%
Fe_2O_3	4.31%	3.28%
MgO	2.50%	1.05%
CaO	3.21%	2.05%
Na_2O	1.80%	2.13%
K_2O	2.65%	1.28%
TiO_2	0.47%	0.32%
P_2O_5	0.25%	0.34%
MnO	0.10%	0.05%
BaO	0.09%	0.08%
LOI	4.51%	4.67%
TOTAL	100.45%	100.70%

The certificate of analysis is provided in Appendix C.

5.0 PLANT FLOWSHEET DEVELOPMENT

Subsequent to the successful completion of the pilot plant test program, a production scale plant process flowsheet was developed for the treatment of the Bissett Creek ore.

The flowsheet developed for this study consisted of crushing and grinding of the run of mine ore, followed by grinding, concentrating, and product drying, blending and packaging. It is strictly based on the metallurgical results of the test samples indicated to be representative of the Bissett Creek graphite ore.

The estimate of mass and metallurgical balances are based on an annual treatment of 700,000 tonnes of ore with a 3.40% C(g) average graphitic carbon grade. Process data is based on a mill feed rate of 86 tonne/hr. Estimated annual graphite production is as follows:

	Tonnes/yr	Grade % C(g)
+48 Mesh Concentrates	17,000	94.3
-48+100 Mesh Concentrates	3,200	94.2
-100 Mesh Concentrates	4,020	85.0
TOTAL	24,220	92.74

Tailings disposal was not included in the scope of this study. The various aspects of the plant flowsheet and unit operations are as follows:

5.1 Description Of Plant Flowsheet

The process flowsheets described below are outlined in CESL drawings V011-A-001, 002, and 003 titled "North Coast Industries Ltd. Bissett Creek Graphite Process Flowsheets", and are included at the end of this section. Attendant process mass and metallurgical balances are also included in Figures 5.1 and 5.2 respectively.

5.1.1 Crushing Plant

Run of mine ore is delivered to a dump hopper (101) equipped with a grizzly. The hopper discharge is fed to a jaw crusher (103) set at 5" discharge by a vibrating grizzly feeder (102) with a 5" opening. The grizzly feeder undersize and the jaw discharge join together on a conveyor belt (104) and are transferred to screen feed conveyor (105). A tramp iron magnet (106) is located at the discharge of this conveyor belt for the protection of subsequent equipment. A double deck vibrating screen with a 1" bottom deck removes the -1" ore and it is conveyed to the fine ore stockpile via a conveyor belt (109). The +1" product of the double deck screen is gravity fed to an impact crusher (108) which will be set to produce a product 85% passing 1". Impact crusher discharge joins the jaw crusher discharge on conveyor belt (104) for screening on the closed circuit double deck screen. The ore retrieval from the fine ore stockpile will be done by vibrating feeders (110) and a conveyor belt (111) located in a tunnel underneath the fine ore stockpile.

5.1.2 Grinding and Flotation

Fine ore is fed to a rod mill by a belt conveyor (111) after being weighed on a belt scale (201). A rod mill feed sampler (202) is also provided at the belt discharge. The ground ore is pumped to a flash flotation cell (205) using a centrifugal slurry pump (204). Concentrate is gravity fed to a concentrate surge tank (403), and the tailing discharges onto a vibrating screen (206) in closed circuit with the rod mill. The screen has a 20 mesh opening, and the oversize goes to rod mill for further grinding while the -20 mesh product proceeds to a bank of rougher flotation cells (301). Ekof-452G graphite collector/frother is added at the rod mill feed chute, and at the rougher flotation feed box.

Rougher flotation tailings are sent to final mill tails pump (303) for disposal to tailings pond after passing through a final tails sampler (302). Rougher concentrate is pumped to a bank of cleaner flotation cells (401) for two stage upgrading. Cleaner tails from this circuit are circulated back to the primary rod mill with a centrifugal slurry pump (402) for further liberation. The cleaner concentrate joins the flash concentrate in the concentrate surge tank (403) before being fed to a vibrating screen (501) with a 48 mesh opening. The surge tank will absorb the feed fluctuations to the subsequent gravity and flotation circuits for maximum stability.

5.1.3 +48 Mesh Circuit

The 48 mesh screen oversize is gravity fed to a deck of shaking tables (502) for the production of +48 mesh final graphite concentrate which then leaves the circuit via a vertical slurry pump (503) for dewatering. Table tails are dewatered on a vibrating screen (901) for density control and then are fed to a regrind pebble mill (902) for the polishing of graphite flake surfaces. The degree of regrinding ,found to be critical in achieving the upgrading required, will be controlled by adjustment of the mill density, which is made possible by the dewatering screen. The table regrind circuit will ensure that a high quality +48 mesh product is produced from this circuit by allowing a tight grade control on table and further control on surface cleaning/polishing in regrind mill through density and mill charge. The circuit will also absorb and smooth out any concentrate grade fluctuations from the rougher cleaner flotation circuit by observing the heavy mineral (gangue) band on the table. Pebble mill discharge is circulated by a centrifugal pump (903) back to the concentrate surge tank for further processing.

5.1.4 -48+100 Mesh Circuit

The 48 mesh screen undersize is gravity fed to a bank of flotation cells (601) for two stage cleaning. The cleaner tails are pumped (602) to primary rod mill for further grinding, and the concentrate is pumped, using a vertical slurry pump (603), to a vibrating screen (701) with a 100 mesh opening. In a similar manner as with the 48 mesh circuit, 100 mesh screen oversize is gravity fed to a shaking table (702) for the production of +100 mesh final graphite concentrate which also leaves the circuit via a vertical slurry pump (703) for dewatering. Table tails are sent to the regrind pebble mill for further polishing of the flake surfaces.

5.1.5 -100 Mesh Circuit

The 100 mesh screen undersize is gravity fed to a bank of flotation cells (801) for two stage cleaning. The cleaner tails are sent to final mill tails pump (303) for disposal ,and the cleaner concentrate leaves the circuit as -100 mesh final graphite concentrate for dewatering.

5.1.6 Dewatering & Drying

The gravity products, namely +48 mesh and +100 mesh final graphite concentrates are combined and dewatered on a high frequency vibrating screen (1001) to remove excess water and then sent to a centrifuge surge tank (1003). The -100 mesh final graphite concentrate is thickened in a rake thickener (1002) before being pumped to the same surge tank. The flocculant is added to the thickener feed at the feed pump box.

Thickened concentrates are pumped at a steady rate using a vertical slurry pump (1004) to a solid bowl centrifuge (1005) to further remove excess water from the solids. Centrifuge tests have not been conducted on samples, however, less than 15 % cake moisture from the centrifuge would be a reasonable expectation. The centrate is sent to settling pond to be reclaimed, and the cake is fed to a rotary dryer (1102) using a screw feeder (1101). The dryer includes an exhaust dust cyclone (1103) and a dust collector (1104), the solids from which are screw fed, along with the dryer discharge, to product bins (1203) via pneumatic conveyers (1201). A concentrate sampler is provided at the feed stream of product bins for metallurgical and quality control.

5.1.7 Blending & Packaging

The concentrate from the product bins is screw (1204) fed to a double deck vibrating sizing screen (1206) producing three size fractions of required specifications. The three screen fractions are each fed by pneumatic conveying (1201) to four product bins (1208). From each of these bins the product is discharged through a weigh feeding system to allow the blending of the various screen fractions at any combination at a controlled rate to meet market requirements. The blended product is then pneumatically conveyed either to a storage bin (1211) for recycling or, to a receiving bin (1212) which feeds a bagging bin (1213). The product is packed into specified bags by a bagger (1214). Product bags are sealed and flattened through a bag handling system (1218) prior to palletizing (1219). Dust control is provided by a dust collector (1205).

5.2 Ore Characterization

Physical characteristics:	Free from clay, granular with some slabby pieces. Gneissic appearance with visible flakes of graphite.
Specific Gravity:	2.64
Bulk Density of 1 1/4" Crushed Ore:	1.4 tonnes/m^3
Moisture:	4.0% (assumed for mass balances)
Ore Composition:	3.40% C(g)

WHOLE ROCK ANALYSIS (Pilot Bulk Ore Sample)	
SiO_2	76.86%
Fe_2O_3	8.60%
MgO	1.05%
CaO	2.05%
Na_2O	2.13%
K_2O	1.28%
TiO_2	0.32%
P_2O_5	0.34%
MnO	0.05%
BaO	0.03%
LOI	4.67%

5.3 Plant Production Criteria

Annual Ore Tonnage:	700,000 t/yr (771,775 stpy)
Operating days per year:	365
Plant Availability:	93%
Ore Feed Rate:	2,062 t/d or 86 t/h design; 1,918 t/d or 80 t/h average

Predicted Concentrate grades and recoveries:

	Grade %C(g)	Recovery %	Dist'n %
+48 Mesh Concentrates	94.3	67.36	71.36
-48+100 Mesh Concentrates	94.2	12.67	13.42
-100 Mesh Concentrates	85.0	14.36	15.22
TOTAL	92.74	94.39	100.00

Predicted Production:

	Tonnes/yr	% Wt
+48 Mesh Concentrates	17,000	70.19
-48+100 Mesh Concentrates	3,200	13.21
-100 Mesh Concentrates	4,020	16.60
TOTAL	24,220	100.00

5.4 Process Criteria

5.4.1 Crushing and Fine Ore Storage

Expected design basis is as follows:

Operating Schedule:	2x8hr shifts/day, 7 days/week
Crusher Availability:	70%
Crushing Plant Feed rate:	Design for 1,000,000 tonnes/yr at: 245 t/h design, 171 t/h average
Primary Crusher:	Jaw Crusher
Secondary Crusher:	Impact Crusher
Ore Sizes:	
Jaw Feed:	will depend on mining method
Jaw Discharge:	-5"
Impact Discharge:	-1"

Screen Opening:	3" top deck, 1" bottom deck
Fine Ore Storage:	Stockpile on pad with a conveyor tunnel, 2500 tonnes live storage capacity
Angle of Repose of 1 1/4" crushed ore:	37°

5.4.2 Grinding and Flash Flotation

Ore Sizes:	
Mill Feed:	-1"
F80:	5/8"
Closed circuit Screen U/S:	98% -20 mesh
P80:	35 mesh
Rod Mill Discharge:	75% solids
Circulating Load	200%
Work Index:	11.0 (average of 3 calculated Wi values from pilot runs #1, #2 and #6B. However, a standard bond test should be done before sizing equipment).
Flash Flotation:	
Density:	53% solids
Pulp pH:	Natural pH (7.3)
Time:	1.5 minute flotation time
Screen opening:	20 mesh
Reagent addition:	Ekof-452G* @ 150 g/t, at rod mill feed

5.4.3 Rougher - Cleaner Flotation

Rougher Pulp Density:	40% solids
Flotation Time:	21 minutes for rougher 4 minutes for 1st cleaners 8 minutes for 2nd cleaners
Flotation pH:	Natural pH
Reagent Addition:	Ekof-452G at 100 g/t to rougher feed
2nd Cleaner Concentrate:	
Specific Gravity:	2.24
Grade:	61.8% C(g)

* Ekof-452G, a higher aliphatic alcohols with pine oil, is available by Harcros Chemical group at a price of $2.20 per Kg FOB Toronto. A material safety data sheet on the reagent is included in Appendix C.

5.4.4 +48 Mesh Circuit

Screen Opening:	48 mesh
Table Feed Density:	25% solids
Table Concentrate Grade:	94.3% C(g)
Production:	2.09 t/h
Specific Gravity:	2.10
Bulk Density	0.59 t/m^3
Regrind Dewatering Screen:	150 mesh opening
Regrind Pebble Mill Discharge Density:	25% solids
Regrind Pebble Mill Charge:	Ceramic or Pebble

5.4.5 -48 +100 Mesh Circuit

Flotation Pulp Density:	21% solids
Flotation Pulp pH:	Natural pH
Flotation Time:	4 minutes 1st Cleaners 8 minutes 2nd Cleaners
Screen Opening:	100 Mesh
Table Feed Density:	25% solids
Table Concentrate:	
Specific Gravity:	2.10
Bulk Density:	0.510 t/m^3
Grade:	94.2% C(g)
Production:	0.39 t/h

5.4.6 -100 Mesh Circuit

Flotation Density:	13% solids
Pulp pH:	Natural pH
Time:	4 minutes 1st cleaners 8 minutes 2nd cleaners
Concentrate:	
Specific Gravity:	2.17
Bulk Density:	0.320 g/ml
Grade:	85.00% C(g), predicted
Production:	0.49 t/h

5.4.7 Concentrate Dewatering

Dewatering Screen Opening:	150 mesh
Dewatering Screen o/size density:	50% solids
Thickener Feed Density:	10.8% solids
Thickener Underflow Density:	30% solids (estimated)
Flocculant Addition:	25 g/t of concentrate
Centrifuge Feed Density:	45% solids
Centrifuge Cake Density:	15% solids (estimated)
Dryer Discharge Moisture:	0.2% water

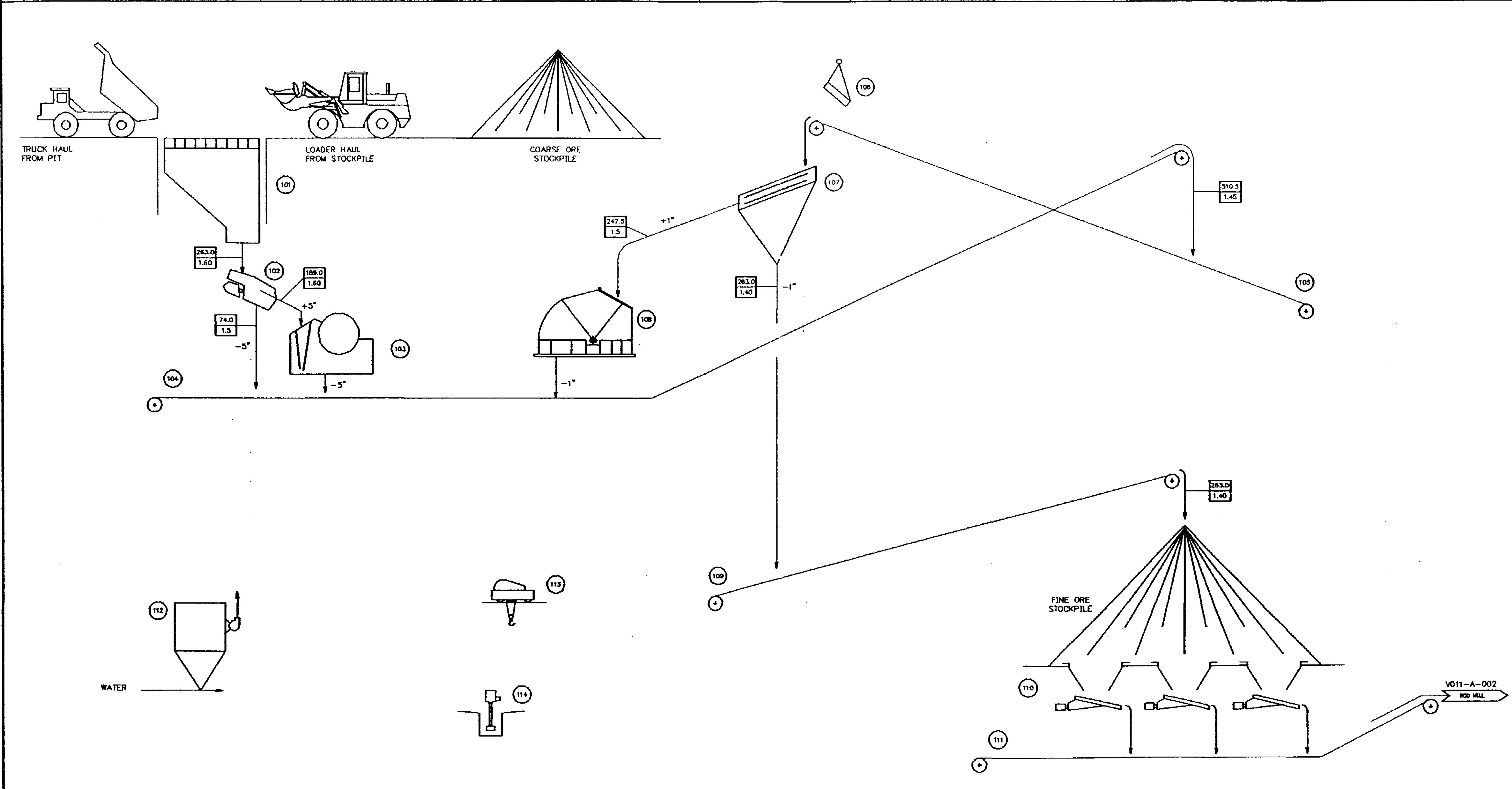
FIGURE 5.1
NOTH COAST INDUSTRIES LTD
BISSETT CREEK GRAPHITE
700,000 t/y PLANT MASS BALANCE

PRODUCTS	ID #	SOLIDS tonne/h	SOLIDS % Wt	SOLIDS % Dens	SOLIDS S.G.	WATER m3/h	SLURRY S.G.	SLURRY m3/h
BELT FEED	201	86.00	100.00	96.00%	2.64	3.58	2.47	36.22
BELT FEED+603	202	87.17	101.36	92.23%	2.64	7.34	2.34	40.42
BELT FEED+603+403	203	88.42	102.82	90.49%	2.64	9.29	2.28	42.84
BELT FEED+603+403+209	204	174.42	202.82	84.99%	2.64	30.79	2.12	96.98
ROD MILL DISCH, 204	205	174.42	202.82	75.00%	2.64	58.14	1.87	124.32
UNIT CELL FEED	206	174.42	202.82	52.65%	2.64	156.89	1.49	223.07
UNIT CELL CONC	207	3.31	3.85	30.00%	2.20	7.72	1.20	9.23
UNIT CELL TAIL, 20# SCR FEED	208	171.11	198.97	53.43%	2.64	149.17	1.50	213.89
+20# SCR O'SIZE	209	86.00	100.00	80.00%	2.64	21.50	1.99	54.03
-20# SCR U'SIZE	210	85.11	98.97	40.00%	2.64	127.67	1.33	159.86
RO FLOTN FEED	301	85.11	98.97	40.00%	2.64	127.67	1.33	159.86
RO FLOTN TAIL	302	82.68	96.14	40.10%	2.65	123.53	1.33	154.70
RO FLOTN CONC	303	2.43	2.83	37.00%	2.35	4.14	1.27	5.17
RO CLNR CCT FEED, 303	401	2.43	2.83	37.00%	2.35	4.14	1.27	5.17
1st RO CLNR FEED 401+406	402	3.43	3.99	37.07%	2.35	5.82	1.27	7.28
1st RO CLNR TAIL	403	1.25	1.46	39.10%	2.45	1.95	1.30	2.47
1st RO CLNR CONC	404	2.17	2.53	36.00%	2.28	3.86	1.25	4.82
2nd RO CLNR FEED, 404	405	2.17	2.53	36.00%	2.28	3.86	1.25	4.82
2nd RO CLNR TAIL	407	1.00	1.16	37.26%	2.34	1.68	1.27	2.10
2nd RO CLNR CONC	406	1.18	1.37	35.00%	2.24	2.19	1.24	2.71
U C C + 2 R CL C ; 207+406	500	4.49	5.22	31.17%	2.21	9.91	1.21	11.94
48# SCR FEED ; 500+904	501	5.50	6.40	29.81%	2.21	12.95	1.20	15.44
-48# SCR U'SIZE	502	2.60	3.03	20.56%	2.35	10.05	1.13	11.16
+48# SCR O'SIZE	503	2.90	3.37	50.00%	2.15	2.90	1.37	4.25
+48# TABLE FEED, 504	504	2.90	3.37	25.00%	2.15	8.70	1.15	10.05
+48# TABLE TAIL	505	0.81	0.94	9.05%	2.24	8.16	1.05	8.52
+48# TABLE CONC	506	2.09	2.43	15.75%	2.10	11.17	1.09	12.17
-48# CLNR CCT FEED, 502	601	2.60	3.03	20.56%	2.35	10.05	1.13	11.16
-48# 1st CLNR FEED	602	3.33	3.87	20.83%	2.35	12.65	1.14	14.07
-48# 1st CLNR TAIL	603	1.17	1.36	23.70%	2.55	3.76	1.17	4.21
-48# 1st CLNR CONC	604	2.16	2.51	19.56%	2.22	8.89	1.12	9.87
-48# 2nd CLNR FEED, 604	605	2.16	2.51	19.56%	2.22	8.89	1.12	9.87
-48# 2nd CLNR TAIL	607	0.73	0.85	21.88%	2.25	2.60	1.14	2.92
-48# 2nd CLNR CONC	606	1.43	1.67	18.56%	2.20	6.30	1.11	6.95
100# SCR FEED, 607	701	1.43	1.67	18.56%	2.20	6.30	1.11	6.95
-100# SCR U'SIZE	702	0.84	0.98	12.82%	2.25	5.70	1.08	6.07
+100# SCR O'SIZE	703	0.60	0.69	50.00%	2.15	0.60	1.37	0.87
+100# TABLE FEED	704	0.60	0.69	25.00%	2.15	1.79	1.15	2.07
+100# TABLE TAIL	705	0.20	0.24	6.48%	2.18	2.93	1.04	3.02
+100# TABLE CONC	706	0.39	0.46	6.48%	2.10	5.67	1.04	5.86
-100# CLNR CCT FEED, 702	801	0.84	0.98	12.82%	2.25	5.70	1.08	6.07
-100# 1st CLNR FEED	802	1.01	1.18	13.28%	2.25	6.62	1.08	7.07
-100# 1st CLNR TAIL	803	0.34	0.40	17.44%	2.55	1.63	1.12	1.77
-100# 1st CLNR CONC	804	0.67	0.78	11.82%	2.19	4.99	1.07	5.29
-100# 2nd CLNR FEED, 804	805	0.67	0.78	11.82%	2.19	4.99	1.07	5.29
-100# 2nd CLNR TAIL	807	0.17	0.20	16.01%	2.24	0.92	1.10	0.99
-100# 2nd CLNR CONC	806	0.49	0.57	10.82%	2.17	4.07	1.06	4.30
TABLE TAILS, 505+705	901	1.01	1.18	8.39%	2.23	11.08	1.05	11.54
T TAILS DEW SCR U'FLOW	902	0.00	0.00	0.00%		10.07		
REGRIND MILL FEED	903	1.01	1.18	50.00%	2.23	1.01	1.38	1.47
REGRIND MILL DISCH	904	1.01	1.18	25.00%	2.23	3.04	1.16	3.50
TOTAL CONCENTRATES :								
+48# TABLE CONC	506	2.09	2.43	15.75%	2.10	11.17	1.09	12.17
+100# TABLE CONC	706	0.39	0.46	6.48%	2.10	5.67	1.04	5.86
-100# 2nd CLNR CONC	806	0.49	0.57	10.82%	2.17	4.07	1.06	4.30
TOTAL :		2.98	3.46	12.46%	2.10	20.91	1.07	22.33
TOTAL TAILINGS								
RO FLOTN TAIL	302	82.68	96.14	40.10%	2.65	123.53	1.33	154.70
-100# 1st CLNR TAIL	803	0.34	0.40	17.44%	2.55	1.63	1.12	1.77
TOTAL :		83.02	96.54	39.88%	2.65	125.16	1.33	156.49

FIGURE 5.2
NORTH COAST INDUSTRIES LTD
BISSETT CREEK GRAPHITE
700,000 t/yr PLANT METALLURGICAL BALANCE

		SOLIDS		ASSAY	RECOVERY
PRODUCTS	ID #	tonne/h	% Wt	% C(g)	% C(g)
BELT FEED	201	86.00	100.00	3.40	100.00
BELT FEED+603	202	87.17	101.36	3.65	108.68
BELT FEED+603+403	203	88.42	102.82	4.12	124.70
BELT FEED+603+403+209	204	174.42	202.82	2.60	155.23
ROD MILL DISCH, 204	205	174.42	202.82	2.60	155.23
UNIT CELL FEED	206	174.42	202.82	2.60	155.23
UNIT CELL CONC	207	3.31	3.85	71.30	80.72
UNIT CELL TAIL, 20# SCR FEED	208	171.11	198.97	1.27	74.51
+20# SCR O'SIZE	209	86.00	100.00	1.04	30.52
-20# SCR U'SIZE	210	85.11	98.97	1.51	43.99
RO FLOTN FEED	301	85.11	98.97	1.51	43.99
RO FLOTN TAIL	302	82.68	96.14	0.11	3.08
RO FLOTN CONC	303	2.43	2.83	49.20	40.91
RO CLNR CCT FEED, 303	401	2.43	2.83	49.20	40.91
1st RO CLNR FEED 401+406	402	3.43	3.99	49.05	57.50
1st RO CLNR TAIL	403	1.25	1.46	37.35	16.02
1st RO CLNR CONC	404	2.17	2.53	55.80	41.48
2nd RO CLNR FEED, 404	405	2.17	2.53	55.80	41.48
2nd RO CLNR TAIL	407	1.00	1.16	48.68	16.59
2nd RO CLNR CONC	406	1.18	1.37	61.83	24.89
U C C + 2 R CL C ; 207+406	500	4.49	5.22	68.82	105.61
48# SCR FEED ; 500+904	501	5.50	6.40	68.25	128.43
-48# SCR U'SIZE	502	2.60	3.03	48.80	43.42
+48# SCR O'SIZE	503	2.90	3.37	85.70	85.01
+48# TABLE FEED, 504	504	2.90	3.37	85.70	85.01
+48# TABLE TAIL	505	0.81	0.94	63.57	17.65
+48# TABLE CONC	506	2.09	2.43	94.30	67.36
-48# CLNR CCT FEED, 502	601	2.60	3.03	48.80	43.42
-48# 1st CLNR FEED	602	3.33	3.87	51.21	58.31
-48# 1st CLNR TAIL	603	1.17	1.36	21.76	8.68
-48# 1st CLNR CONC	604	2.16	2.51	67.10	49.62
-48# 2nd CLNR FEED, 604	605	2.16	2.51	67.10	49.62
-48# 2nd CLNR TAIL	607	0.73	0.85	59.84	14.89
-48# 2nd CLNR CONC	606	1.43	1.67	70.78	34.74
100# SCR FEED, 607	701	1.43	1.67	70.78	34.74
-100# SCR U'SIZE	702	0.84	0.98	58.90	16.89
+100# SCR O'SIZE	703	0.60	0.69	87.49	17.85
+100# TABLE FEED	704	0.60	0.69	87.49	17.85
+100# TABLE TAIL	705	0.20	0.24	74.50	5.18
+100# TABLE CONC	706	0.39	0.46	94.20	12.67
-100# CLNR CCT FEED, 702	801	0.84	0.98	58.90	16.89
-100# 1st CLNR FEED	802	1.01	1.18	59.77	20.71
-100# 1st CLNR TAIL	803	0.34	0.40	21.50	2.53
-100# 1st CLNR CONC	804	0.67	0.78	79.50	18.17
-100# 2nd CLNR FEED, 804	805	0.67	0.78	79.50	18.17
-100# 2nd CLNR TAIL	807	0.17	0.20	63.94	3.82
-100# 2nd CLNR CONC	806	0.49	0.57	85.00	14.36
TABLE TAILS, 505+705	901	1.01	1.18	65.76	22.82
T TAILS DEW SCR U'FLOW	902	0.00	0.00	0.00	0.00
REGRIND MILL FEED	903	1.01	1.18	65.76	22.82
REGRIND MILL DISCH	904	1.01	1.18	65.76	22.82
TOTAL CONCENTRATES :					
+48# TABLE CONC	506	2.09	2.43	94.30	67.36
+100# TABLE CONC	706	0.39	0.46	94.20	12.67
-100# 2nd CLNR CONC	806	0.49	0.57	85.00	14.36
TOTAL :		2.98	3.46	92.74	94.39
TOTAL TAILINGS :					
RO FLOTN TAIL	302	82.68	96.14	0.11	3.08
-100# 1st CLNR TAIL	803	0.34	0.40	21.50	2.53
TOTAL :		83.02	96.54	0.20	5.61

ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT
101	1		DUMP HOPPER c/w GRIZZLY		111	1		BELT CONVEYOR																
102	1		GRIZZLY FEEDER		112	1		DUST COLLECTION SYSTEM																
103	1		JAW CRUSHER		113	1		CRUSHER O/H CRANE																
104	1		BELT CONVEYOR		114	1		CRUSHER AREA SUMP																
105	1		BELT CONVEYOR																					
106	1		TRAMP IRON MAGNET																					
107	1		DOUBLE DECK SCREEN																					
108	1		IMPACT CRUSHER																					
109	1		BELT CONVEYOR																					
110	1		VIBRATING FEEDERS																					



LEGEND

(100) ITEM NUMBER

100	SOLIDS (tonne/hr)
1.5	DENSITY (BULK) (tonne/m³)

Rev. | REVISION DESCRIPTION | Date | By | Chk'd | App'd | No. | Dwg. No. | REFERENCE DRAWINGS | PRINT RECORD | ENGINEERING REVIEW

For Tender / For Approval / For Checking / Date / Issue To

Approved By / Checked By / Drawn By SES 90/06/20 / Designed By

CLIENT APPROVAL By Date

Client Dwg. No.

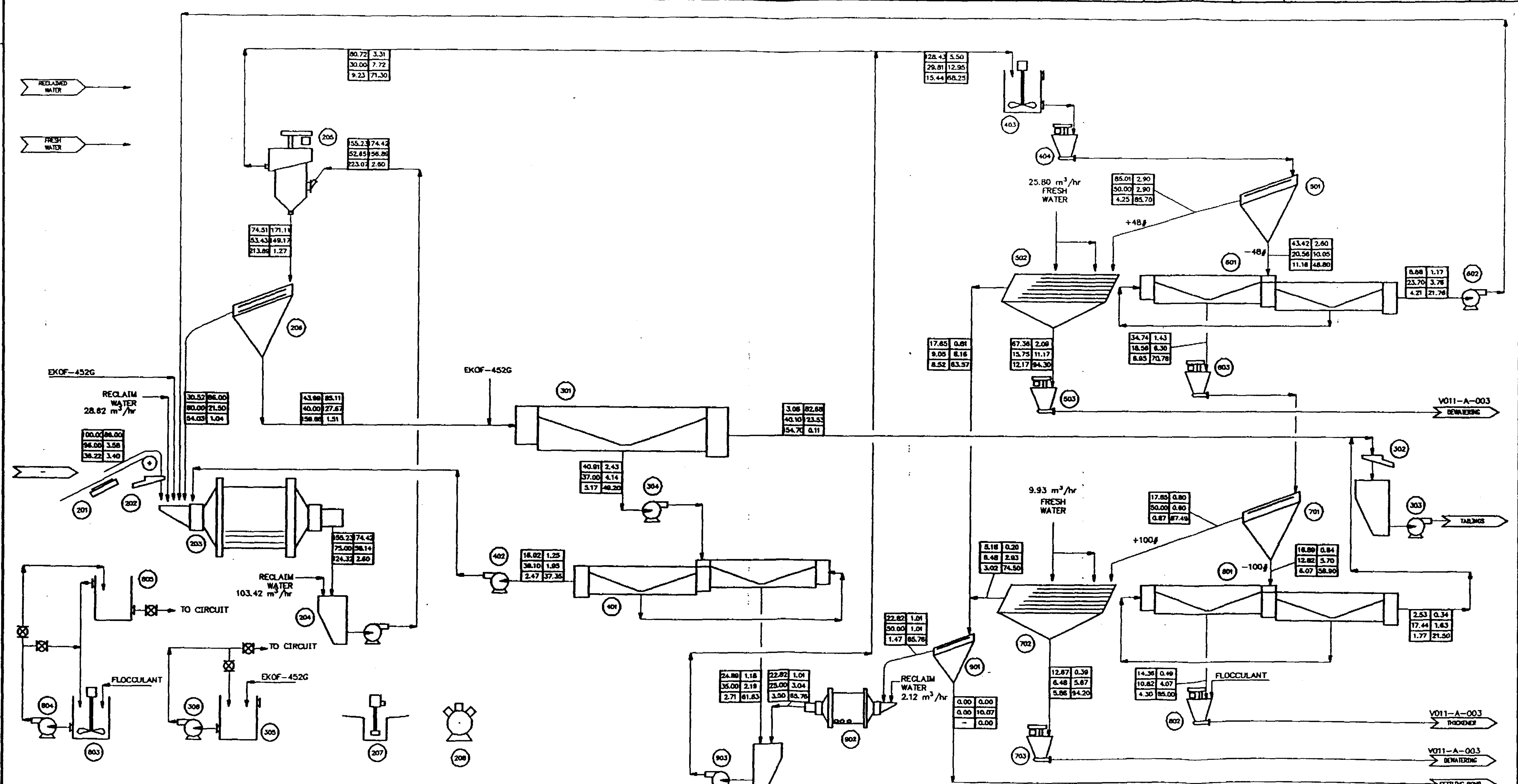
Job No. V011 | Scale NTS

Cominco Engineering Services Ltd.

Title: NORTH COAST INDUSTRIES LTD.
BISSETT CREEK GRAPHITE
CRUSHING CIRCUIT
PROCESS FLOWSHEET

Drawing No. V011-A-001 | Rev. A

NO.	REQ'D	NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT	ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT
201	1		ROD MILL BELT SCALE		301	1		FLOTATION CELLS, ROUGHER, SCAVENGER		501	1		VIBRATING SCREEN 48#		701	1		VIBRATING SCREEN		901	1		VIBRATING SCREEN, DEWATERING, 150#	
202	1		BELT FEED SAMPLER		302	1		AUTOMATIC SAMPLER, FINAL TAILS		502	1		SHAKING TABLE		702	1		SHAKING TABLE		902	1		PEBBLE MILL	
203	1		ROD MILL		303	1		CENTRIFUGAL SLURRY PUMP & PUMPBOX		503	1		VERTICAL SLURRY PUMP		703	1		VERTICAL SLURRY PUMP		903	1		CENTRIFUGAL SLURRY PUMP	
204	1		CENTRIFUGAL SLURRY PUMP		304	1		CENTRIFUGAL SLURRY PUMP																
205	1		FLASH FLOTATION CELL		305	1		REAGENT TANK																
206	[illegible]		VIBRATING SCREEN, 20# BOTTOM DECK		306	1		REAGENT FEED PUMP		601	1		FLOTATION CELLS, -48# CLNR.		801	1		FLOTATION CELLS, -100# CLNR						
207	[illegible]		AREA SUMP PUMP		401	1		FLOTATION CELLS, ROUGHER CLEANER		602	1		CENTRIFUGAL SLURRY PUMP		802	1		VERTICAL SLURRY PUMP						
208	1		PLANT AIR COMPRESSOR		402	1		CENTRIFUGAL SLURRY PUMP		603	1		VERTICAL SLURRY PUMP		803	1		FLOCCULANT MIXING TANK						
					403	1		SURGE TANK							804	1		FLOCCULANT FEED PUMP						
					404	1		VERTICAL SLURRY PUMP							805	1		FLOCCULANT HEAD TANK						



LEGEND

assay % C(g)	solids t/hr
density % sol	water m³/hr
slurry m³/hr	% dist'n C(g)

(201) ITEM NUMBER

Rev.	REVISION DESCRIPTION	Date	By	Chk'd	App'd	No.	Dwg. No.	REFERENCE DRAWINGS	Date	Issue To	PRINT RECORD		ENGINEERING REVIEW	
											For Tender		Approved By	
											For Approval		Checked By	
											For Checking		Drawn By	SES 90/06/20
													Designed By	

Cominco Engineering Services Ltd.

Title
NORTHCOAST INDUSTRIES LTD.
BISSETT CREEK GRAPHITE
GRINDING & FLOTATION
PROCESS FLOWSHEET

Client Dwg. No.

CLIENT APPROVAL By Date

Job. No. V011

Scale NTS

Drawing No. V011-A-002

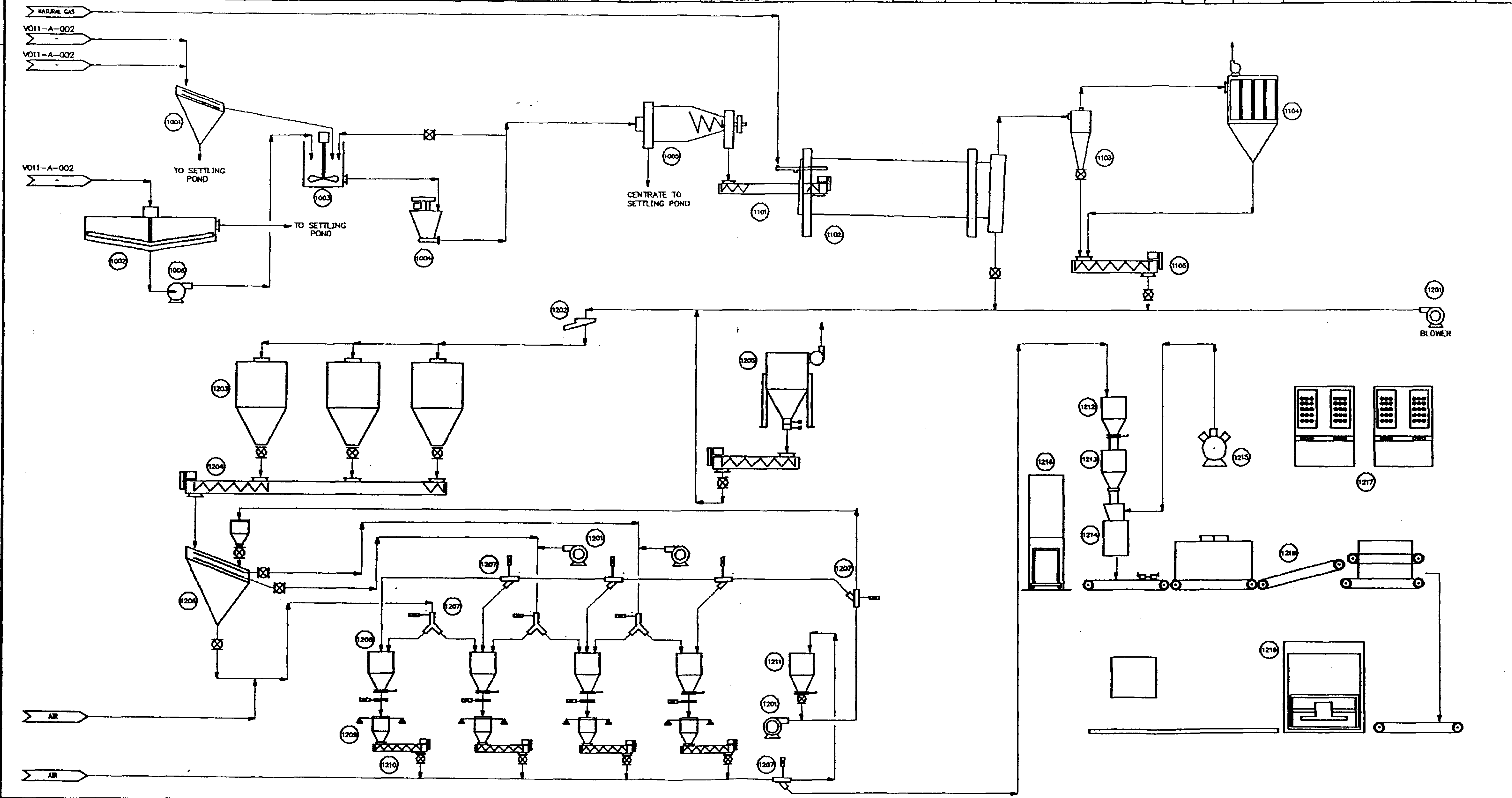
Rev. A

ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT
1001	1		VIBRATING SCREEN 150#	
1002	1		THICKENER	
1003	1		SURGE TANK c/w MIXER	
1004	1		VERTICAL SLURRY PUMP	
1005	1		CENTRIFUGE	
[illegible]	1		CENTRIFUGAL SLURRY PUMP	

ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT
1101	1		SCREW FEEDER	
1102	1		ROTARY DRYER	
1103	1		DUST CYCLONE	
1104	1		DUST COLLECTOR c/w FAN	
1105	1		SCREW CONVEYOR	

ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT
1201	1		BLOWER	
1202	1		AUTOMATIC SAMPLER	
1203	1		PRODUCT BINS	
1204	1		SCREW CONVEYOR	
1205	1		DUST COLLECTOR	
1206	1		VIBRATING SCREEN, DOUBLE DECK	
1207	1		DIVERTER VALVE	
1208	1		PRODUCT BINS	
1209	1		WEIGH FEEDING SYSTEM	
1210	1		SCREW CONVEYOR	

ITEM NO.	NO. REQ'D	EQUIPMENT NO.	DESCRIPTION	MOTOR HP/UNIT
1211	1		PRODUCT BIN	
1212	1		RECEIVING BIN	
1213	1		BAGGING BIN	
1214	1		BAGGER	
1215	1		COMPRESSOR	
1216	1		BAG PLACER	
1217	1		CONTROL STATION	
1218	1		BAG HANDLING SYSTEM	
1219	1		PALLETIZER	



V011-A-003

LAST UPDATE: 90/07/03

CAD FILE NAME: V011A003

Rev.	REVISION DESCRIPTION	Date	By	Chk'd	App'd	No.	Dwg. No.	REFERENCE DRAWINGS
						9		
						8		
						7		
						6		
						5		
						4		
						3		
						2		
						1		

PRINT RECORD: For Tender; For Approval; For Checking; Date; Issue To

ENGINEERING REVIEW: Approved By; Checked By; Drawn By SES 90/06/21; Designed By HMB

CLIENT APPROVAL: By; Date

Client Dwg. No.

Job. No. V011 | Scale NTS

CESL Cominco Engineering Services Ltd.

Title
NORTHCOAST INDUSTRIES LTD.
BISSETT CREEK GRAPHITE
DEWATERING, BLENDING & PKG.
PROCESS FLOWSHEET

Drawing No. V011-A-003 | Rev. A

6.0 ASSAY METHODS

Three graphitic carbon assay methods were used throughout the metallurgical investigation of Bissett Creek graphite. Each method is found to have a specific use depending on the contents of the associated gangue material, such as carbonates, volatiles and organic matter.

Following is a brief description of the three carbon assay methods as they were used for Bissett Creek test samples.

a. Mid - High Grade Samples; >15% C(g):
The method is a Double Loss On Ignition procedure conducted at two temperature levels of 470° C and 900° C on dried samples. The procedure details were supplied by KHD Humboldt Wedag, and is the industry standard for graphitic carbon concentrates. Complete procedure is included in Appendix D.

b. Low Grade Samples; <15% C(g):
The method used is a Total Organic Carbon (TOC) method which uses total carbon determination by a Leco induction furnace, and carbonate carbon determination by an HCl leach/Gasometer procedure. The difference, reported as % TOC, is considered to be a reliable graphitic carbon result when there is no organic carbon present in the sample such as wood, plants, bones etc., other than graphite carbon. The accuracy of this procedure was verified in a study conducted by Vancouver Petrographics Ltd. by physical counting of graphite flakes subsequently converted to volume and mass. The report on this analysis, and the TOC assay procedure by Chemex Labs Ltd. are included in Appendix D.

The TOC procedure, also loosely termed as Acid Leach/Leco method, is similar in nature to the Nitric Leach/Leco procedure used by some laboratories such as Lakefield Research and that the acid used is HNO_3 instead of the HCl mentioned above.

During pilot runs the presence of wood was observed in some of the samples. A study undertaken revealed that wood will add to graphitic carbon content of the sample when assayed by the TOC method. This increase can especially be pronounced when assaying very low grade samples (0.1 - 0.2% C(g)) such as tailings products. Wood found in pilot plant test samples contain approximately 50% organic (cellulose) carbon, and a 0.2% actual wood content in samples will increase the total organic carbon assay by 0.1 percentage points, ie., from 0.15% true graphite carbon to 0.25% TOC. Therefore a new procedure, simply a deviation of the TOC method, was developed for samples suspected to contain cellulose matter. The new procedure was named HNO_3/LOI/Leco method (an abbreviation of the steps used).

In this method the dry sample is "roasted" in an oven @ 400° C for Loss On Ignition following a HNO_3 acid leach and the weight loss is recorded. Later the sample is combusted in a Leco induction furnace for total carbon and the difference in weight losses is reported as % graphitic carbon. Details of this procedure by Chemex Labs are included in Appendix D along with a report by Lakefield Research on "The effect of tramp wood in test products".

SUMMARY REPORT OF LABORATORY TESTS

ON

BISSETT CREEK GRAPHITE ORE

CESL, APRIL 27, 1990

SUMMARY REPORT OF LABORATORY TESTS

ON BISSETT CREEK GRAPHITE ORE

PREPARED FOR:

NORTH COAST INDUSTRIES LTD.

BY: H.M. Bolu

DATE: April 27, 1990
REF: 012

Cominco Engineering Services Ltd.

100 - 1200 West 73rd Ave., Vancouver, B.C., Canada V6P 6G5 / Tel. (604) 264-5500 / Telex 04-55357 / Fax (604) 264-5555

April 27, 1990

CEC Engineering Ltd.
Suite 1270 -601 West Hastings Street
Vancouver, B.C.
V6B 5A6

Attention: Mr. D.J. Copeland

Re: Summary of Laboratory Tests on Bissett Creek Ore

Dear Mr. Copeland::

Attached please find a brief summary report of laboratory tests on Bissett Creek ore samples as you requested. The report covers the tests performed both at Ortech International and Bacon, Donaldson, and Associates just prior to the start of the pilot plant test program.

Yours truly,

H. Matt Bolu
Senior Metallurgist

HMB:sew

TABLE OF CONTENTS

1.0 INTRODUCTION

This report summarizes the results of laboratory testwork on Bissett Creek flake graphite ore. The testwork was conducted at Ortech International (Ortech) and Bacon, Donaldson and Associates (B.,D. & A.) testing laboratories during January - March, 1990 on behalf of North Coast Industries Ltd. (N.C.I.).

The purpose of the testwork was to confirm and improve the flowsheet developed in an earlier study and, to form the basis of small scale pilot plant testing of the ore for the confirmation of the flowsheet in a continuous environment.

Samples used for the tests were provided by Mr. D. Copeland of C.E.C. Engineering. After compositing, two test materials were designated as Composite 1 and Composite 2, assaying approximately 2.3% C(g) and 3.7% C(g) respectively.

Following the first four bench tests at Ortech in Toronto, the test program was moved to B., D. & A. in Vancouver, mainly for logistics and laboratory scheduling reasons.

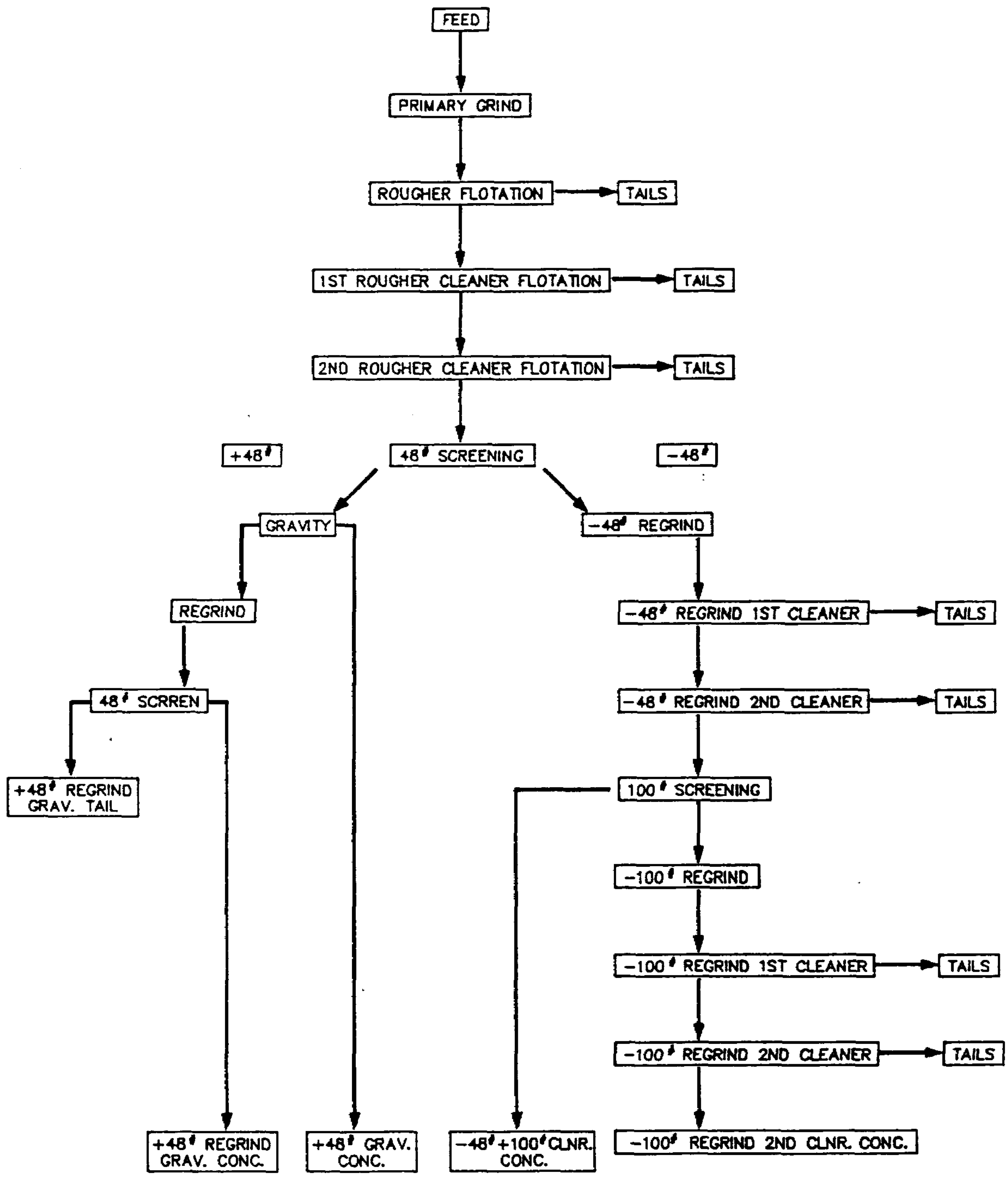
2.0 SUMMARY

The test program was directed towards the development of a flotation - gravity procedure that would produce a flake graphite concentrate of approximately 92-95% C(g) with a high proportion of the flakes in the +48# size fraction, i.e. >50% by weight. Targeted concentrate recoveries were 93-95% as indicated as achievable in an earlier study.

In Test No. 8, average concentrate grade of 92.94% C(g) was achieved at an overall recovery of 93.3% using the flowsheet shown below which formed the basis of the pilot plant circuit configuration currently being tested at the facilities of B.D. & A. A summary of the results for Test No. 8 is presented below.

	Wt %	C(g) %	DISTRIBUTION %
CONCENTRATES			
+48# Clnr. Conc.	2.62	92.53	66.3
-48# +100 Clnr. Conc.	0.67	94.70	17.4
-100# Clnr. Conc.	0.38	92.65	9.6
Total Conc.:	3.67	92.94	93.3
TAILINGS			
Total Clnr. Tailings	1.23	7.55	2.5
Ro. Flotation Tailings	95-10	0.16	4.2
Total Tailings	96.33	0.25	6.7
FEED (CALCULATED)	100.00	3.65	100.0

FLOWSHEET FOR TEST No.8



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Cominco Engineering Services Ltd.

3.0 DISCUSSION OF TEST RESULTS

First two tests, No. 1 and No. 2 at Ortech were general amenability tests using a primary grind of 98.3% -48# and 84.0% -48# respectively on Composite 2 material. Rougher flotation was carried out and the concentrate was cleaned twice prior to screening of the second cleaner concentrate at 48#. The -48# fraction was reground and cleaned twice and the cleaner concentrate was screened at 100# producing the -48# +100# cleaner concentrate. The -100# fraction was subjected to a similar regrind/cleaning step as above, producing the -100# cleaner. concentrate. Other parameters were essentially the same. Although the concentrate grades of No. 1 test were exceptionally high at 97.2 - 98.2% C(g), the overall recovery was low at 79.7%. (Refer to table for Test No. 1). In Test No. 2, the overall concentrate recovery was increased to 86.5% using a coarser primary grind, however this was achieved at a reduced concentrate grade which averaged 91.46% C(g). Also, the +48# concentrate recovery was up to 53.4% from 40.7% in Test No. 1.

At this point, it was apparent that major carbon losses were occurring in the rougher flotation tailings possibly due to fine primary grind and therefore the following general approach was adopted for the remainder of the testwork:

> "A coarse primary grind followed by rougher-scavenger flotation to produce a concentrate of approximately 60% C(g) at a high bulk recovery of +95%. At this stage the scavenger tails, constituting 94-95% by weight of the feed can be discarded leaving a much smaller rougher concentrate weight for further processing. Upgrading would then be carried out in a sequential regrinding-cleaning-screening manner in order to preserve the flake size."

On the basis of the above, the primary grind was further coarsened in Tests No. 3 and No. 4, to 68.5% -48# and 51.6% -48# respectively, resulting in an increased overall recovery of approximately 90% for both. In both tests, -48# cleaner concentrate grades range from 90.8 % to 94.3% C(g), however, +48# cleaner concentrate grade was low at 71.6% C(g) and 79.2% C(g) in Tests No. 3 and No. 4 respectively. (Refer to tables for Tests No. 3 and No. 4).

In the next test, B. D. & A. No. 7, a gravity separation stage was introduced for the upgrading of the +48# Cleaner. concentrate following the project move from Toronto to Vancouver. (B. D. & A Tests No. 1-6 were for a study of flotation kinetics on Bissett Creek ore and the results were reported separately by B.D. & A. in December, 1989).

B. D. & A. Test No. 7 was done on the Composite 1 sample pending the shipment of the Composite 2 from Ortech. The objective of the test was to establish some reference points regarding optimum conditions for the gravity separation and concentrate regrinding prior to a bulk bench test.

In Test No. 7, following the rougher and cleaner flotation steps, the +48# screen oversize was gravity upgraded using a vanning plaque. The -48# fraction was reground very lightly under controlled conditions and cleaned twice before screening over a 100# screen. The test was ended at this stage due to insufficient sample size for further testing. Concentrate grades at 88.6% C(g) and 67.1% C(g) were lower than expected, and as a result, the following procedural variations were adopted for the next test:

a) A large bulk sample would be used in order to provide sufficient concentrate products for regrind/cleaning studies.

b) Gravity separation tailings would be reground lightly to further clean flake surfaces before screening.

c) Regrind studies would be done on the cleaner concentrates with varying mill charges and grinding times for optimum grind conditions.

Test No. 8 was a bulk test using approximately 24 Kg of the Composite 2 sample. The ore was ground to 51.0% -48# in a batch rod mill under controlled conditions followed by rougher flotation in a 1 cu. ft. pilot size Denver Sub-A flotation cell. The only flotation reagent used was EKOF-452G at a total dosage of approximately 200g/tonne.

Rougher concentrate was cleaned twice before screening on a 48# sieve. The +48# fraction was gravity upgraded using a vanning plaque and the concentrate assayed 96.34% C(g), (A shaking table could not be used due to an insufficient sample size). Two portions of the gravity tailings samples were subjected to a regrind study designated as short and long, to determine the optimum grind/concentrate grade relationship. Long regrind produced a +48# Regrind Gravity Concentrate assaying 90.3% C(g) in comparison to 87.1% C(g) for the short regrind. (Refer to table for laboratory test No. 8B).

Three portions of the -48# second rougher cleaner concentrate was also subjected to a regrind study designated as long, medium and short regrinds. In each case, the ground product was cleaned twice and the resulting -48# cleaner concentrate was screened at 100#. The -48# +100# cleaner concentrates assayed 94.7% C(g), 91.4% C(g) and 87.3% for long, medium and short regrinds respectively. (Refer to table for laboratory test No. 8C).

The -100# product was reground using the above mentioned long regrind conditions and was cleaned in two stages. The resulting -100# cleaner concentrate assayed 92.65% C(g).

In Test No. 9 a Varsol/MIBC reagent combination was tried instead of EKOF-452G using only the rougher cleaner flotation steps. Other test parameters were the same as test No. 8. Second cleaner concentrate grade was 89.9% C(g) at 98.65% recovery, confirming the metallurgical results of the previous test.

At this point is was felt that there was enough data to proceed with continuous pilot plant testing of the Composite 2 ore sample.

4.0 ASSAY METHODS

Assay methods used throughout this test program are as follows:

a) All concentrate products expected to be approximately 15% C(g) or greater were assayed using a Double Loss on Ignition method as provided by KHD Humboldt Wedag.

b) All tailing products of Ortech tests were assayed using an Acid Leach/Loss on Ignition method by Assayers Ontario Laboratories.

c) All tailing products of B. D. & A. tests were assayed using an Acid Leach/Leco method by Chemex Laboratories.

5.0 CONCLUSIONS

1. Bissett Creek Graphite Ore Composite 2 sample is amenable to processing by conventional grinding and flotation methods for the production of high grade flake graphite concentrates at reasonably high recoveries.

2. A coarse primary grind at approximately 98% -20# and sequential grinding-flotation-screening, combined with a gravity step for the +48# concentrate proved to be an essential route to follow in order to achieve high concentrate grades while maintaining a high distribution of graphite to the coarser products.

3. Total cleaner tails in test No. 8 contained 2.5% of the graphite in the feed. In a continuous process some of the graphite in these tails would be recovered by recirculating, however, this will have to be tested in pilot plant tests.

4. There is not enough significant difference in metallurgical performance favouring any of the two reagents used in the tests, however, Varsol/MIBC was used at approximately 40% the dosage rate of EKOF-452G.

APPENDIX A

ORTECH INT. LAB TEST No 1
BISSETT CREEK GRAPHITE METALLURGICAL RESULTS

Products	Weight g	Weight %	Assay % C(g)	Dist'n. %
Head (Calc)	1415.6	100.00	4.17 *	100.0
Ro. Flot'n. Tails	1336.0	94.38	0.61	13.8
Ro. Flot'n. Conc.	79.6	5.62	63.87 *	86.2
Ro. Clnr. Tails	18.6	1.31	2.22	0.7
Ro. Clnr. Conc.	61.0	4.31	82.66 *	85.5
+ 48# Clnr. Conc.	24.5	1.73	97.90	40.7
- 48# Screen U'size	36.5	2.58	72.44 *	44.8
- 48# Regrind-Clnr Tails	7.5	0.53	13.40	1.7
- 48# Regrind-Clnr Conc.	29.0	2.05	87.70 *	43.1
- 48# +100# Clnr. Conc.	16.1	1.14	98.20	26.8
- 100# Screen U'size	12.9	0.91	74.60 *	16.3
- 100# Regrind-Clnr Tails	5.5	0.39	44.20	4.1
- 100# Clnr. Conc.	7.4	0.52	97.20	12.2

Combined Products	Weight % Of Concs.	Weight %	Assay % C(g)	Dist'n. %
Concentrates				
+ 48# Clnr. Conc.	51.04	1.73	97.90	40.7
- 48# +100# Clnr. Conc.	33.54	1.14	98.20	26.8
- 100# Clnr. Conc.	15.42	0.52	97.20	12.2
Total Concs.	100.00	3.39	97.89	79.7
Tails				
Ro.Clnr Tails		1.31	2.22	0.7
- 48# Regrind Clnr Tails		0.53	13.40	1.7
- 100# Regrind Clnr Tails		0.39	44.20	4.1
Total Clnr Tails		2.23	12.18	6.53
Ro. Flot'n. Tails		94.38	0.61	13.8
Total Tails		96.61	0.88	20.3

Notes :
Feed sample is Comp 2
All assays marked with an "*" are calculated assays.
Main test variable : Primary grind is 98.3% - 48#
Reagents used are Varsol @ 50 g/t, and MIBC as required.

ORTECH INT. LAB TEST No 2
BISSETT CREEK GRAPHITE METALLURGICAL RESULTS

Products	Weight g	Weight %	Assay % C(g)		Dist'n. %
Head (Calc)	1412.4	100.00	3.79	*	100.0
Ro. Flot'n. Tails	1336.4	94.62	0.34		8.5
Ro. Flot'n. Conc.	76.0	5.38	64.54	*	91.5
Ro. Clnr. Tails	13.0	0.92	1.41		0.3
Ro. Clnr. Conc.	63.0	4.46	77.57	*	91.2
+ 48# Clnr. Conc.	32.1	2.27	89.10		53.4
- 48# Screen U'size	30.9	2.19	65.59	*	37.8
- 48# Regrind-Clnr Tails	8.5	0.60	8.86		1.4
- 48# Regrind-Clnr Conc.	22.4	1.59	87.11	*	36.4
- 48# +100# Clnr. Conc.	13.4	0.95	95.00		23.8
- 100# Screen U'size	9.0	0.64	75.37	*	12.7
- 100# Regrind-Clnr Tails	3.8	0.27	45.90		3.3
- 100# Clnr. Conc.	5.2	0.37	96.90		9.4

Combined Products	Weight % Of Concs.	Weight %	Assay % C(g)	Dist'n. %
Concentrates				
+ 48# Clnr. Conc.	63.31	2.27	89.10	53.4
- 48# +100# Clnr. Conc.	26.43	0.95	95.00	23.8
- 100# Clnr. Conc.	10.26	0.37	96.90	9.4
Total Concs.	100.00	3.59	91.46	86.5
Tails				
Ro.Clnr Tails		0.92	1.41	0.3
- 48# Regrind Clnr Tails		0.60	8.86	1.4
- 100# Regrind Clnr Tails		0.27	45.90	3.3
Total Clnr Tails		1.79	10.60	5.00
Ro. Flot'n. Tails		94.62	0.34	8.5
Total Tails		96.41	0.53	13.5

Notes :
Feed sample is Comp 2
All assays marked with an "*" are calculated assays.
Main test variable : Primary grind is 84.0 % - 48#
Reagents used are Varsol @ 50 g/t, and MIBC as required.

CESL/V01BENCH/hmb 26-Apr-90

ORTECH INT. LAB TEST No 3
BISSETT CREEK GRAPHITE METALLURGICAL RESULTS

Products	Weight g	Weight %	Assay % C(g)	Dist'n. %
Head (Calc)	1415.0	100.00	3.70 *	100.0
Ro. Flot'n. Tails	1304.0	92.16	0.22	5.5
Ro. Flot'n. Conc.	111.0	7.84	44.53 *	94.5
Ro. Clnr. Tails	27.0	1.91	0.70	0.4
Ro. Clnr. Conc.	84.0	5.94	58.62 *	94.2
+ 48# Clnr. Conc.	45.0	3.18	71.60	61.6
- 48# Screen U'size	39.0	2.76	43.64 *	32.5
- 48# Regrind-Clnr Tails	17.7	1.25	1.66	0.6
- 48# Regrind-Clnr Conc.	21.3	1.51	78.52 *	32.0
- 48# +100# Clnr. Conc.	12.3	0.87	90.90	21.4
- 100# Screen U'size	9.0	0.64	61.60 *	10.6
- 100# Regrind-Clnr Tails	4.5	0.32	30.90	2.7
- 100# Clnr. Conc.	4.5	0.32	92.30	7.9

Combined Products	Weight % Of Concs.	Weight %	Assay % C(g)	Dist'n. %
Concentrates				
+ 48# Clnr. Conc.	72.82	3.18	71.60	61.6
- 48# +100# Clnr. Conc.	19.90	0.87	90.90	21.4
- 100# Clnr. Conc.	7.28	0.32	92.30	7.9
Total Concs.	100.00	4.37	76.95	90.9
Tails				
Ro.Clnr Tails		1.91	0.70	0.4
- 48# Regrind Clnr Tails		1.25	1.66	0.6
- 100# Regrind Clnr Tails		0.32	30.90	2.7
Total Clnr Tails		3.48	3.81	3.58
Ro. Flot'n. Tails		92.16	0.22	5.5
Total Tails		95.63	0.35	9.1

Notes :
Feed sample is Comp 2
All assays marked with an "*" are calculated assays.
Main test variable : Primary grind is 68.5 % - 48#
Reagents used are Varsol @ 50 g/t, and MIBC as required.

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ORTECH INT. LAB TEST No 4
BISSETT CREEK GRAPHITE METALLURGICAL RESULTS

Products	Weight		Assay		Dist'n.
	g	%	% C(g)		%
Head (Calc)	1419.7	100.00	3.69	*	100.0
Ro. Flot'n. Tails	1336.0	94.10	0.26		6.6
Ro. Flot'n. Conc.	83.7	5.90	58.40	*	93.4
Ro. Clnr. Tails	15.5	1.09	2.17		0.6
Ro. Clnr. Conc.	68.2	4.80	71.18	*	92.7
+ 48# Clnr. Conc.	40.6	2.86	79.20		61.4
- 48# Screen U'size	27.6	1.94	59.38	*	31.3
- 48# Regrind-Clnr Tails	9.2	0.65	6.63		1.2
- 48# Regrind-Clnr Conc.	18.4	1.30	85.76	*	30.1
- 48# +100# Clnr. Conc.	11.4	0.80	94.30		20.5
- 100# Screen U'size	7.0	0.49	71.86	*	9.6
- 100# Regrind-Clnr Tails	3.0	0.21	46.60		2.7
- 100# Clnr. Conc.	4.0	0.28	90.80		6.9

Combined Products	Weight %	Weight	Assay	Dist'n.
Concentrates	Of Concs.	%	% C(g)	%
+ 48# Clnr. Conc.	72.50	2.86	79.20	61.4
- 48# +100# Clnr. Conc.	20.36	0.80	94.30	20.5
- 100# Clnr. Conc.	7.14	0.28	90.80	6.9
Total Concs.	100.00	3.94	83.10	88.9
Tails				
Ro.Clnr Tails		1.09	2.17	0.6
- 48# Regrind Clnr Tails		0.65	6.63	1.2
- 100# Regrind Clnr Tails		0.21	46.60	2.7
Total Clnr Tails		1.95	8.46	4.48
Ro. Flot'n. Tails		94.10	0.26	6.6
Total Tails		96.06	0.43	11.1

Notes :
Feed sample is Comp 2
All assays marked with an "*" are calculated assays.
Main test variable : Primary grind is 51.6 % - 48#
Reagents used are Varsol @ 50 g/t, and MIBC as required.

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B.,D.& ASSOC. LAB TEST No 7
BISSETT CREEK GRAPHITE METALLURGICAL RESULTS

Products	Weight g	Weight %	Assay % C(g)	Dist'n. %
Head (Calc)	4369.6	100.00	2.29 *	100.0
Ro. Flot'n. Tails	4155.8	95.11	0.14	5.8
Ro. Flot'n. Conc.	213.8	4.89	44.14 *	94.2
1st Ro. Clnr Tails	56.6	1.30	1.38	0.8
1st Ro. Clnr Conc.	157.2	3.60	59.54 *	93.4
2nd Ro. Clnr Tails	13.9	0.32	2.14	0.3
2nd Ro. Clnr Conc	143.3	3.28	65.10 *	93.1
+ 48# 2nd Ro.Clnr Conc	89.7	2.05	67.48 *	60.4
+ 48# Gravity Tails	55.4	1.27	54.41	30.1
+ 48# Gravity Conc	34.3	0.78	88.60	30.3
- 48# 2nd Ro.Clnr Conc	53.6	1.23	61.12 *	32.7
- 48# Regrind-Clnr Tails	4.9	0.11	1.88	0.1
- 48# Regrind-Clnr Conc	48.7	1.11	67.08 *	32.6
- 48# +100# Clnr Conc	30.3	0.69	63.29	19.1
- 100# Screen U'size	18.4	0.42	73.33	13.5

Tails	Weight %	Assay % C(g)	Dist'n. %
1st Ro. Clnr Tails	1.30	1.38	0.8
2nd Ro. Clnr Tails	0.32	2.14	0.3
- 48# Regrind-Clnr Tails	0.11	1.88	0.1
Total Clnr Tails	1.73	1.55	1.17
Ro. Flot'n. Tails	95.11	0.14	5.8
Total Tails	96.83	0.17	7.0

Notes :
Feed sample is Comp 1
All assays marked with an "*" are calculated assays.
Primary grind is 61.6 % - 48#
Reagent used is EKOF 452G @ 200 g/t

B.,D.& ASSOC. LAB TEST No 8
BISSETT CREEK GRAPHITE METALLURGICAL RESULTS
USING BEST OF REGRIND TESTS

Products	Weight g	Weight %	Assay % C(g)	Dist'n. %
Head (Calc)	23268.5	100.00	3.65 *	100.0
Ro. Flot'n. Tails	22129.1	95.10	0.16	4.2
Ro. Flot'n. Conc.	1139.4	4.90	71.50 *	95.8
1st Ro. Clnr Tails	160.1	0.69	1.43	0.3
1st Ro. Clnr Conc.	979.3	4.21	82.96 *	95.6
2nd Ro. Clnr Tails	39.7	0.17	4.47	0.2
2nd Ro. Clnr Conc	939.6	4.04	86.28 *	95.4
+ 48# 2nd Ro.Clnr Conc	656.8	2.82	88.01 *	68.0
+ 48# Gravity Conc	224.4	0.96	96.34	25.4
+ 48# Regrind Gravity Conc	384.5	1.65	90.30	40.8
+ 48# Regrind Gravity Tail	47.9	0.21	30.60	1.7
- 48# 2nd Ro.Clnr Conc	282.8	1.22	82.25 *	27.4
- 48# Regrind 1st Clnr Tails	27.1	0.12	2.54	0.1
- 48# Regrind 1st Clnr Conc	255.7	1.10	90.70 *	27.3
- 48# Regrind 2nd Clnr Tails	4.6	0.02	9.67	0.1
- 48# Regrind 2nd Clnr Conc	251.1	1.08	92.19 *	27.2
- 48# +100# Clnr Conc	156.4	0.67	94.70	17.4
- 100# Screen U'size	94.7	0.41	88.04 *	9.8
- 100# Regrind 1st Clnr Tail	4.9	0.02	22.30	0.1
- 100# Regrind 1st Clnr Conc	89.8	0.39	91.62 *	9.7
- 100# Regrind 2nd Clnr Tail	1.7	0.01	38.40	0.1
- 100# Regrind 2nd Clnr Conc	88.1	0.38	92.65	9.6

Combined Products:	Concs Wt%	Weight %	Assay % C(g)	Dist'n. %
Concentrates:				
+ 48# Gravity Conc	26.29	0.96	96.34	25.4
+ 48# Regrind Gravity Conc	45.05	1.65	90.30	40.8
Total + 48# Clnr Conc	71.35	2.62	92.53	66.3
- 48# +100# Clnr Conc	18.33	0.67	94.70	17.4
- 100# Regrind 2nd Clnr Conc	10.32	0.38	92.65	9.6
Total Concentrates	100.00	3.67	92.94	93.3
Tailings:				
Total Clnr Tails		1.23	7.55	2.5
Ro. Flot'n. Tails		95.10	0.16	4.2
Total Tails		96.33	0.25	6.7

Notes: Feed sample is Comp 2
Primary grind is 51.0 % - 48#
Reagent used is EKOF 452G @ 200 g/t
All assays marked with an "*" are calculated assays.

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26-Apr-90

B.,D.& ASSOC. LAB TEST No 8
BISSETT CREEK GRAPHITE METALLURGICAL RESULTS
USING AVERAGE OF REGRIND TESTS

Products	Concs Wt%	Weight g	Weight %	Assay % C(g)	Dist'n. %
Head (Calc)		23,266.7	100.00	3.67 *	100.0
Ro. Flot'n. Tails		22,129.1	95.11	0.16	4.2
Ro. Flot'n. Conc.		1,137.6	4.89	71.88 *	95.8
1st Ro. Clnr Tails		160.1	0.69	1.43	0.3
1st Ro. Clnr Conc.		977.5	4.20	83.42 *	95.6
2nd Ro. Clnr Tails		39.7	0.17	4.47	0.2
2nd Ro. Clnr Conc		937.8	4.03	86.76 *	95.4
+ 48# 2nd Ro.Clnr Conc		657.0	2.82	88.50 *	68.2
+ 48# Gravity Conc		223.3	0.96	96.34	25.2
+ 48# Regrind Gravity Conc		399.9	1.72	88.67	41.6
+ 48# Regrind Gravity Tail		33.8	0.15	34.75	1.4
- 48# 2nd Ro.Clnr Conc		280.8	1.21	82.70 *	27.2
- 48# Regrind 1st Clnr Tails		19.1	0.08	4.02	0.1
- 48# Regrind 1st Clnr Conc		261.7	1.12	88.44 *	27.1
- 48# Regrind 2nd Clnr Tails		5.9	0.03	10.88	0.1
- 48# Regrind 2nd Clnr Conc		255.8	1.10	90.23 *	27.1
- 48# +100# Clnr Conc		166.5	0.72	90.97	17.8
- 100# Screen U'size		89.3	0.38	88.84 *	9.3
- 100# Regrind 1st Clnr Tail		3.6	0.02	22.30	0.1
- 100# Regrind 1st Clnr Conc		85.7	0.37	91.64 *	9.2
- 100# Regrind 2nd Clnr Tail		1.6	0.01	38.40	0.1
- 100# Regrind 2nd Clnr Conc		84.1	0.36	92.65	9.1
Combined Products:					
Concentrates:					
+ 48# Gravity Conc	25.56		0.96	96.34	25.2
+ 48# Regrind Gravity Conc	45.77		1.72	88.67	41.6
Total + 48# Clnr Conc	71.32		2.68	91.42	66.8
- 48# +100# Clnr Conc	19.05		0.72	90.97	17.8
- 100# Regrind 2nd Clnr Conc	9.62		0.36	92.65	9.1
Total Concentrates	100.00		3.76	91.45	93.7
Tailings:					
Total Clnr Tails			1.13	7.06	2.2
Ro. Flot'n. Tails			95.11	0.16	4.2
Total Tails			96.24	0.24	6.3

Notes: Feed sample is Comp 2
Primary grind is 51.0 % - 48#
Reagent used is EKOF 452G @ 200 g/t
All assays marked with an "*" are calculated assays.

CESL/V01BENCH/hmb 26-Apr-90

B.,D.& ASSOC. LAB TEST No 8B
BISSETT CREEK GRAPHITE METALLURGICAL RESULTS
FOR + 48# REGRIND/CLEANER FLOTN STUDY

Products	Weight		Assay	Dist'n.
	g	%	% C(g)	%
LONG REGRIND:				
+ 48# 2nd Ro.Clnr Conc	103.1	100.00	87.89	100.0
+ 48# Gravity Conc	35.2	34.16	96.30	37.4
+ 48# Gravity Tail	67.9	65.84	83.53	62.6
+ 48# Regrind Screen O'size	60.2	58.37	90.30	60.0
+ 48# Regrind Screen U'size	7.7	7.47	30.60	2.6
SHORT REGRIND:				
+ 48# 2nd Ro.Clnr Conc	102.4	100.00	89.00	100.0
+ 48# Gravity Conc	35.0	34.16	96.30	37.0
+ 48# Gravity Tail	67.4	65.84	85.22	63.0
+ 48# Regrind Screen O'size	64.4	62.91	87.10	61.6
+ 48# Regrind Screen U'size	3.0	2.93	44.80	1.5

Notes:
Relative differences in regrind conditions are as follows:
Long regrind : 5 minutes using full regular mill charge
Short regrind : 2 minutes using 1/2 of regular mill charge

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B.,D.& ASSOC. LAB TEST No 8C
BISSETT CREEK GRAPHITE METALLURGICAL RESULTS
FOR - 48# REGRIND/CLEANER FLOTN STUDY

Products	Weight		Assay	Dist'n.
LONG REGRIND:	g	%	% C(g)	%
- 48# 2nd Ro.Clnr Conc	49.0	100.00	82.26	100.0
- 48# Regrind 1st Clnr Tails	4.7	9.59	2.54	0.3
- 48# Regrind 1st Clnr Conc	44.3	90.41	90.72	99.7
- 48# Regrind 2nd Clnr Tails	0.8	1.63	9.67	0.2
- 48# Regrind 2nd Clnr Conc	43.5	88.78	92.21	99.5
- 48# +100# Clnr Conc	27.1	55.31	94.70	63.7
- 100# Screen U'size	16.4	33.47	88.09	35.8
MEDIUM REGRIND:				
- 48# 2nd Ro.Clnr Conc	48.5	100.00	82.26	100.0
- 48# Regrind 1st Clnr Tails	3.4	7.01	4.45	0.4
- 48# Regrind 1st Clnr Conc	45.1	92.99	88.13	99.6
- 48# Regrind 2nd Clnr Tails	0.8	1.65	10.60	0.2
- 48# Regrind 2nd Clnr Conc	44.3	91.34	89.53	99.4
- 48# +100# Clnr Conc	29.2	60.21	91.40	66.9
- 100# Screen U'size	15.1	31.13	85.90	32.5
SHORT REGRIND:				
- 48# 2nd Ro.Clnr Conc	48.0	100.00	82.26	100.0
- 48# Regrind 1st Clnr Tails	1.8	3.75	7.05	0.3
- 48# Regrind 1st Clnr Conc	46.2	96.25	85.19	99.7
- 48# Regrind 2nd Clnr Tails	1.5	3.13	11.80	0.4
- 48# Regrind 2nd Clnr Conc	44.7	93.13	87.65	99.2
- 48# +100# Clnr Conc	30.3	63.13	87.30	67.0
- 100# Screen U'size	14.4	30.00	88.40	32.2

Notes:
Relative differences in regrind conditions are as follows:
Long regrind : 5 minutes using full regular mill charge
Medium regrind : 5 minutes using 1/2 of regular mill charge
Short regrind : 2 minutes using 1/2 of regular mill charge

CESL/V01BENCH/hmb

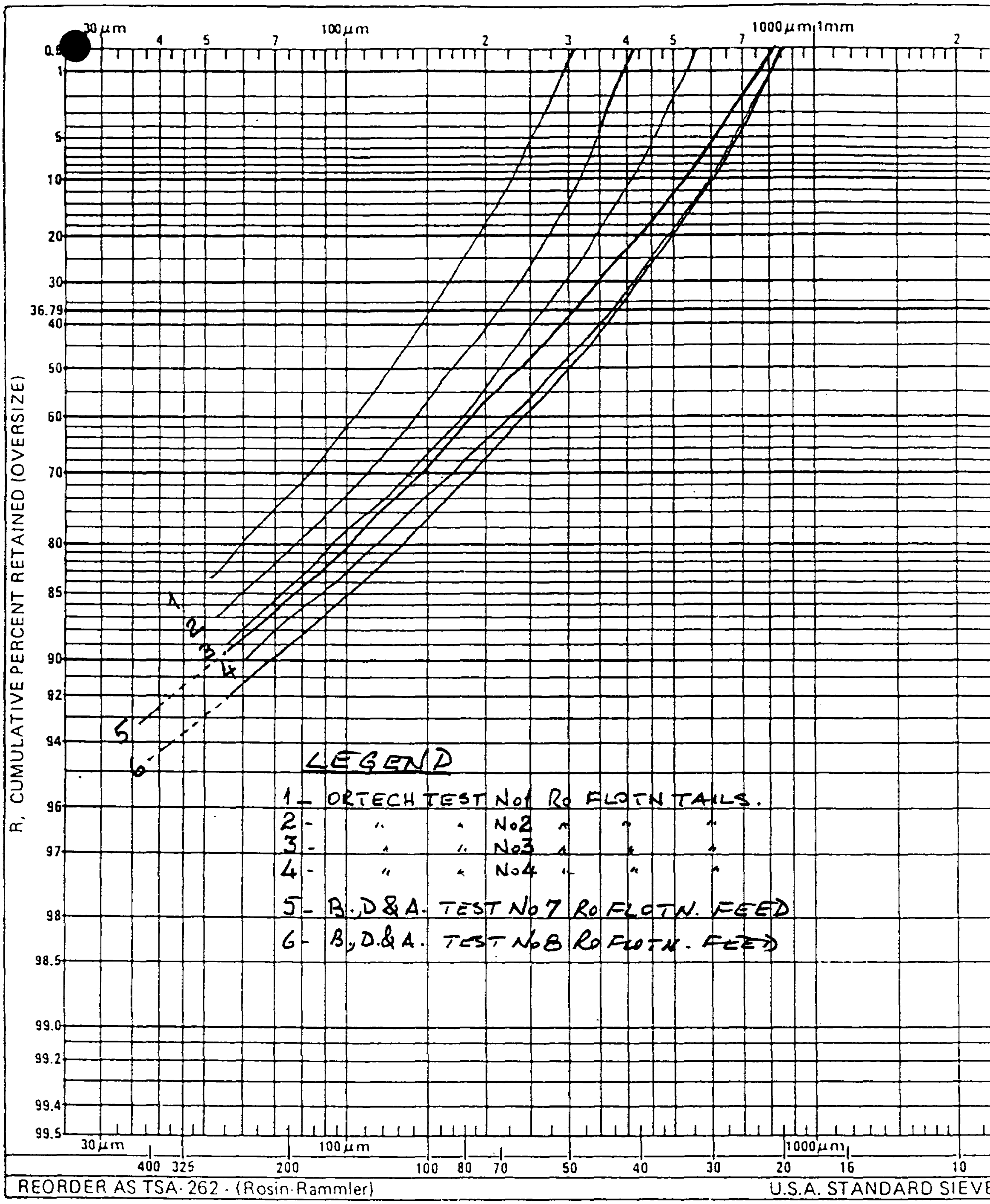
26-Apr-90

B.,D.& ASSOC. LAB TEST No 9
BISSETT CREEK GRAPHITE METALLURGICAL RESULTS

Products	Weight		Assay		Dist'n.
	g	%	% C(g)		%
Head (Calc)	1,957.4	100.00	3.49	*	100.0
Ro. Flot'n. Tails	1,868.5	95.46	0.04		1.1
Ro. Flot'n. Conc.	88.9	4.54	75.94	*	98.9
1st Ro. Clnr Tails	13.7	0.70	1.15		0.2
1st Ro. Clnr Conc.	75.2	3.84	89.57	*	98.7
2nd Ro. Clnr Tails	0.3	0.02	6.23		0.0
2nd Ro. Clnr Conc	74.9	3.83	89.90		98.6

Notes:
Switched reagent to VARSOL/MIBC, added 80 g/t
Rougher and Ro Clnr flotation only to observe
conc grade/recovery trends
All other parameters (ie.,grind, density, etc.)are the same as test No 8

ROSIN-RAMMLER SCREEN/S



$R = 100e^{-\left(\frac{x}{\bar{x}}\right)^n}$

Log Log R = −n log x + K

Where X = Particle Size

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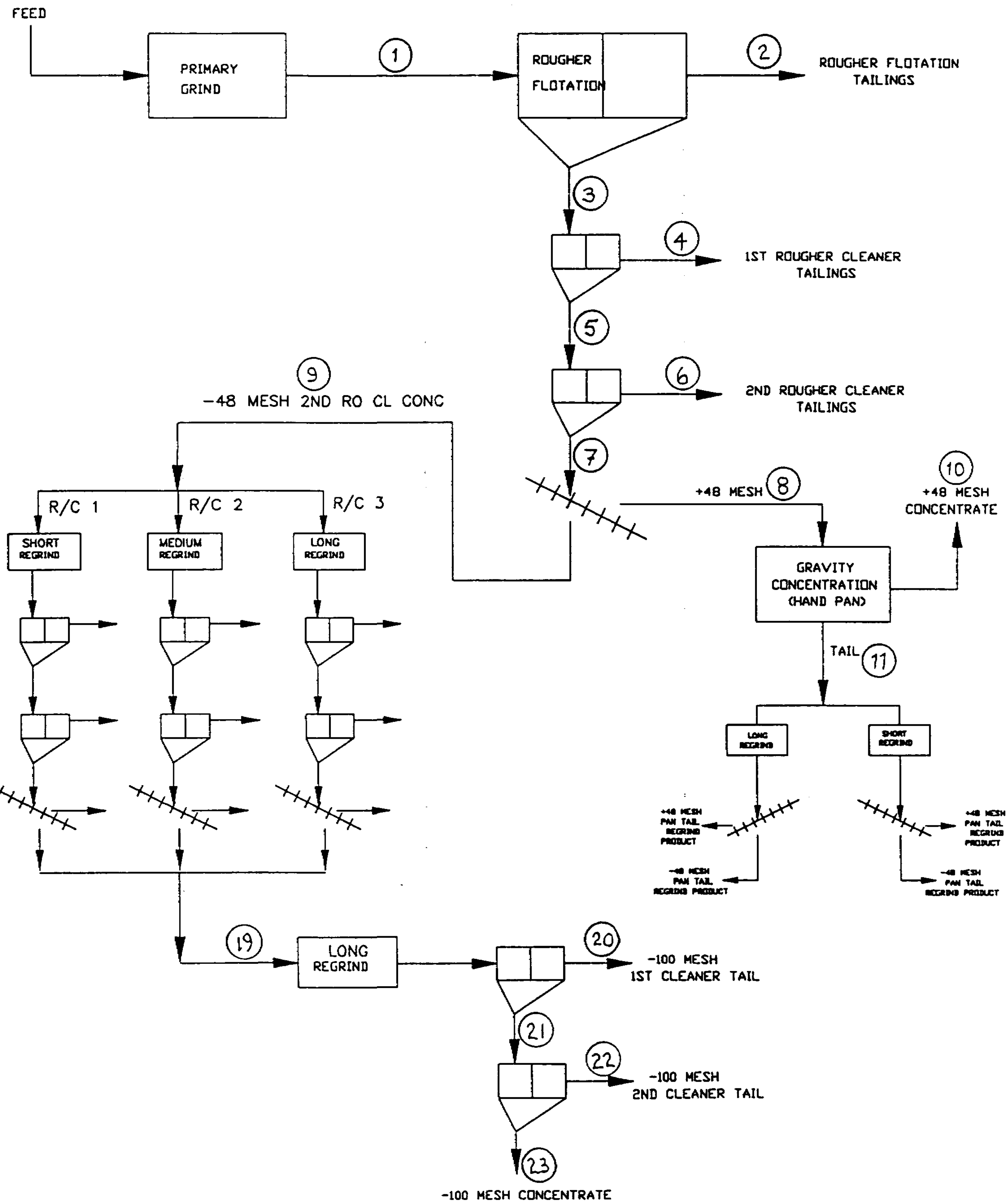
BDA BENCH - TEST F8

TESTWORK FLOWSHEET DETAILS

Bench-Test F8:



BDA BENCH - TEST F8

TESTWORK PROCEDURE DETAIL

TESTWORK PROCEDURE

Test No: M90-088 F8 Date: Feb 9/90

Purpose: As F7: 1)Increase size of test to 24 kg feed.
2)Screen 2nd cleaner conc into: 28, 48, 100, 200 mesh.
3)Assay and hold 2nd cleaner conc size fractions.

(COMPOSITE 2)

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Grind: 24 kg charge (Target: 95-98% -800 microns)	2.5		1/2 regular rod charge Large batch rod mill 50-60% solids
Flotation: (float in 2 x 12 kg stages)			pH= 7.3
Condition (Using 1 cubic foot machine)	5	150	40% solids EKOF 452 G
Rougher	7.5		
Condition	2	15	EKOF 452 G
Scavenger (to barren tail)	2		- pH= 7.5
1st Ro Cleaner	10		
Condition	1	15	EKOF 452 G
1st Ro Cleaner Scavenger	0.5		
2nd Ro Cleaner	12		
Condition	1	15	EKOF 452 G
2nd Ro Cleaner Scavenger	0.5		

Screening:
1. Perform screen analysis on 2nd rougher cleaner concentrate (save all screen fractions and use for further testwork)
2. Screen 2nd rougher cleaner concentrate into +48 mesh and -48 mesh

TESTWORK PROCEDURE

Test No: M90-088 F8 **Date:** Feb 9/90

Gravity/Regrind/Screening Study:

1)Investigate optimum regrind procedure for +48 mesh gravity tailings

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Gravity Concentration:			
Hand Panning			+ 48 mesh graphite conc
Screening:			
1. Perform screen analysis on +48 mesh gravity tailings (save all screen fractions and use for further testwork)			
Long Regrind:			1/2 of +48 mesh gravity tails
Regrind	5		full ceramic charge
Screen at 48 mesh			regrind discharge
Short Regrind:			1/2 of +48 mesh gravity tails
Regrind	2.5		1/2 ceramic charge
Screen at 48 mesh			regrind discharge

TESTWORK PROCEDURE

Test No: M90-088 F8 R/C - 1 Date: Feb 15/90

Regrind/Cleaning Study: **Investigate optimum regrind/cleaning procedure for -48 mesh Rougher 2nd Cleaner Conc**

Test R/C-1: Short Regrind

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Short Regrind:			-48 mesh 2nd Ro Cl Conc
Regrind	2		1/2 ceramic charge
			25-30% solids
			pH= 5.7
Screening:			
Perform screen analysis on regrind product			
(Save all screen fractions and use for cleaning flotation)			
Cleaning Flotation:			
-48 # Cleaner 1	5		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	0.5		
-48 # Cleaner 2	7		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	0.5		
Screening:			
Wet Screen Graphite -48 # 2nd Cleaner Concentrate at 100 mesh			
(Save -100 # portion for future testwork)			

TESTWORK PROCEDURE

Test No: M90-088 F8 R/C - 2 Date: Feb 15/90

Regrind/Cleaning Study: **Investigate optimum regrind/cleaning procedure for -48 mesh Rougher 2nd Cleaner Conc**

Test R/C-2: Intermediate Regrind

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Medium Regrind:			-48 mesh 2nd Ro Cl Conc
Regrind	5		1/2 ceramic charge
			25-30% solids
			pH= 5.7
Screening:			
Perform screen analysis on regrind product			
(Save all screen fractions and use for cleaning flotation)			
Cleaning Flotation:			
-48 # Cleaner 1	5		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	3		
-48 # Cleaner 2	4.5		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	1.5		
Screening:			
Wet Screen Graphite -48 # 2nd Cleaner Concentrate at 100 mesh			
(Save -100 # portion for future testwork)			

TESTWORK PROCEDURE

Test No: M90-088 F8 R/C - 3 Date: Feb 15/90

Regrind/Cleaning Study: **Investigate optimum regrind/cleaning procedure for -48 mesh Rougher 2nd Cleaner Conc**

Test R/C-3: Long Regrind (extra ceramic charge)

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Long Regrind:			-48 mesh 2nd Ro Cl Conc
Regrind	5		full ceramic charge
			25-30% solids
			pH= 5.6
Screening:			
Perform screen analysis on regrind product (Save all screen fractions and use for cleaning flotation)			
Cleaning Flotation:			
-48 # Cleaner 1	4.5		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	3		
-48 # Cleaner 2	4		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	1		
Screening:			
Wet Screen Graphite -48 # 2nd Cleaner Concentrate at 100 mesh (Save -100 # portion for future testwork)			

TESTWORK PROCEDURE

Test No: M90-088 F8 Date: Feb 15/90

-100 Mesh Flotation:

1)Utillize most rigorous regrind (full ceramic charge, 5 minutes)
2)Standard 2-stage cleaning flotation

STAGE	TIME (Minutes)	ADDITIONS g/tonne	REAGENT
Combine -100# 2nd Cleaner Concs from R/C-1, R/C-2, R/C-3			
Screening:			
1. Perform screen analysis on -100 mesh product from R/C-1, R/C-2, R/C-3 (save all screen fractions and use for further testwork)			
Long Regrind:			Total -100# product
Regrind	5		full ceramic charge
Screening:			
1. Perform screen analysis at 400 mesh on -100 mesh regrind product (save all screen fractions and use for further testwork)			
Cleaning Flotation:			regrind product
-100# Cleaner 1	5		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	0.5		
-100# Cleaner 2	7		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	0.5		

MINERALOGICAL ANALYSIS OF SAMPLES

44395 AND 44396

VANCOUVER PETROGRAPHICS

Vancouver Petrographics Ltd.

JAMES VINNELL, Manager
JOHN G. PAYNE, Ph.D. Geologist
CRAIG LEITCH, Ph.D. Geologist
JEFF HARRIS, Ph.D. Geologist
KEN E. NORTHCOTE, Ph.D. Geologist

P.O. BOX 39
8080 GLOVER ROAD,
FORT LANGLEY, B.C.
V0X 1J0
PHONE (604) 888-1323
FAX. (604) 888-3642

Report for: Dave Copeland,
C.E.C. Engineering Ltd.,
1270 - 601 West Hastings Street
VANCOUVER, B.C.

Invoice 8779
January 1990

Project: Bissett Creek Graphite
(Phone 684-6328)
Samples: 44395, 44396

Summary:

Sample 44395 is a graphitic quartzo-feldspathic schist dominated by quartz, plagioclase, and microcline, with minor biotite, tremolite/actinolite, pyrrhotite, and graphite, and accessory sphene. Graphite forms slender flakes which generally are not intergrown with other minerals. Foliation is defined by orientation of slender graphite flakes, and less commonly by orientation of biotite.

Sample 44396 is a graphitic quartzo-feldspathic schist, which is similar to Sample 44395, but contains more biotite and less sphene, and lacks tremolite/actinolite. Foliation is defined by parallel orientation of biotite and graphite flakes and by lenses rich in microcline.

Graphite generally forms slender, planar flakes averaging 0.3-1.5 mm long and 0.03-0.07 mm wide. These commonly occur adjacent to flakes of biotite of similar size or are associated with patches of pyrrhotite. Such grains would be separated readily from biotite and pyrrhotite by crushing. Much less commonly, books of a few flakes are contorted or warped, and minor quartz or less commonly biotite occurs between the individual flakes.

Photographs were taken to illustrate typical textures of graphite.

John G. Payne
John G. Payne
604-986-2928

Sample 44396 **Graphitic Quartzo-feldspathic Schist with Biotite and Pyrrhotite**

The sample is similar to 44395, but contains more biotite and Ti-oxide, and less sphene, and lacks tremolite/actinolite. Foliation is defined by parallel orientation of biotite and graphite flakes and by lenses rich in microcline.

quartz	30-35%	chalcopyrite	minor
plagioclase	30-35	hornblende(?)	minor
microcline	15-17	chlorite	trace
biotite	10-12	zircon	trace
pyrrhotite	3- 4		
graphite	3- 4		
apatite	0.4		
sphene	0.2		
Ti-oxide	0.1		

Quartz forms anhedral grains averaging 0.3-1 mm in size.

Plagioclase forms anhedral, equant grains averaging 0.5-1 mm in size, with a few up to 2 mm across. Alteration is very slight to extremely fine grained sericite.

Microcline forms anhedral grains averaging 0.3-1 mm in size. In a few lenses it is concentrated with less quartz and plagioclase; in these, microcline grains are up to a few mm across.

Biotite forms subhedral flakes averaging 0.3-1 mm long. It is concentrated moderately in a few lenses up to 1 mm wide parallel to foliation of subparallel flakes. Pleochroism is from pale straw to light/medium orangish to reddish brown.

Pyrrhotite forms anhedral grains averaging 0.1-0.5 mm in size, with a few up to 1 mm across. Many patches are associated with biotite and/or graphite flakes.

Graphite forms slender flakes averaging 0.5-1.5 mm long and 0.03-0.05 mm wide. Many flakes are planar, and a small percentage are moderately warped. Most flakes are associated with biotite as parallel flakes and some flakes are associated with pyrrhotite. A few books are warped slightly to moderately, and contain minor, very fine grained quartz between individual flakes.

Accessory minerals commonly are associated with clusters of one or more of biotite, pyrrhotite, and graphite.

Apatite forms disseminated, anhedral to subhedral grains averaging 0.1-0.25 mm in size, with a few up to 0.3 mm long, and one equant grain 0.5 mm across.

Sphene forms anhedral grains averaging 0.05-0.15 mm in size, with a few up to 0.4 mm across. In some biotite-rich patches, sphene forms slender, wedge-shaped interstitial grains between biotite flakes. Locally it forms thin rims on pyrrhotite grains.

Ti-oxide forms a few anhedral grains averaging 0.2-0.4 mm in size. It has a deep purplish grey color in transmitted light and a light bluish grey color in reflected light. Some Ti-oxide grains are rimmed by sphene.

Hornblende(?) forms a few anhedral grains up to 0.7 mm in size. It is altered completely to an aggregate of cryptocrystalline, light brown chlorite(?).

Chalcopyrite forms anhedral grains averaging 0.05-0.1 mm in size associated with pyrrhotite, and mainly along borders of pyrrhotite patches.

Zircon forms a few anhedral grains up to 0.05 mm in size.

Pyrrhotite forms anhedral to subhedral, equant grains, and elongate lenses averaging 0.5-1 mm in size. Associated with some pyrrhotite patches are irregular patches of bright orange-brown limonite.

Sphene forms anhedral to subhedral grains averaging 0.1-0.3 mm in size, with a few up to 0.9 mm long. They are associated mainly with actinolite and biotite.

Apatite forms subhedral, stubby prismatic grains averaging 0.05-0.07 mm in length, and a few clusters of elongate prismatic grains up to 0.3 mm long associated with graphite. A few equant grains are up to 0.3 mm in cross section. One subhedral prismatic grain 0.4 mm long is associated with pyrrhotite and biotite.

Clinozoisite forms clusters up to 0.4 mm in size of extremely fine to very fine grained aggregates. It is concentrated strongly in one band parallel to foliation in which it forms very fine grained aggregates intergrown coarsely with tremolite/actinolite and pyrrhotite.

Chlorite forms a few flakes up to 0.2 mm in size associated with pyrrhotite or tremolite/actinolite. Some of it is secondary after biotite.

Zircon forms a few equant, anhedral grains averaging 0.02-0.03 mm in size, mainly enclosed in biotite, and commonly having dark pleochroic halos. A few subhedral, prismatic grains are up to 0.15 mm long.

Chalcopyrite forms a few anhedral, equant grains averaging 0.02-0.05 mm in size associated with pyrrhotite.

Sample 44395 **Graphitic Quartzo-feldspathic Schist with Biotite, Tremolite/Actinolite, and Pyrrhotite**

The rock is a moderately foliated schist dominated by quartz, plagioclase, and microcline, with minor biotite, tremolite/actinolite, pyrrhotite, and graphite, and accessory sphene. Graphite forms slender flakes which generally are not intergrown with other minerals. Foliation is defined by orientation of slender graphite flakes, and less commonly by orientation of biotite.

quartz	30-35%
plagioclase	25-30
microcline	15-17
biotite	6- 8
tremolite/actinolite	5- 7
pyrrhotite	4- 5
graphite	**3- 4**
sphene	0.8
apatite	0.3
clinozoisite	0.2
chlorite	0.1
epidote	minor
zircon	trace

Quartz forms anhedral grains averaging 0.3-0.5 mm in size; and is concentrated in lenses and patches parallel to foliation in which grains are up to 2.5 mm long.

Plagioclase forms anhedral grains averaging 0.7-1.2 mm in size, with a few up to 2.5 mm across. Alteration is slight to extremely fine grained flakes of sericite, and less commonly to very fine grained aggregates of epidote. AS few grains adjacent to microcline grains contain minor myrmekitic quartz in elongate lenses.

Microcline forms anhedral grains averaging 0.5-1.5 mm in size. It is concentrated strongly in a few bands parallel to foliation.

Biotite is concentrated in certain layers, commonly with quartz and microcline. It forms stubby to slender flakes averaging 0.3-0.8 mm in length, with a few up to 1.5 mm long. Pleochroism is from nearly colorless to light orangish brown. Flakes commonly are concentrated in clusters and some are associated with graphite.

Tremolite/actinolite forms subhedral to anhedral, equant to prismatic grains averaging 0.5-1 mm in size. They commonly are concentrated in clusters of a few to several grains, associated with which commonly are flakes of graphite and grains of sphene. Pleochroism is weak and the color is pale green. Some grains are altered in irregular patches to cryptocrystalline aggregates of light to medium green chlorite/amphibole, commonly stained orangish brown by limonite.

Graphite forms slender flakes averaging 0.5-1.5 mm long and 0.03-0.07 mm wide. A few flakes average 0.3-0.5 mm long and 0.02-0.03 mm wide. It commonly is concentrated moderately in clusters of flakes which are associated with patches of pyrrhotite and/or flakes of biotite. A few clusters of smaller graphite flakes are bent moderately; intergrown with some of these clusters are lenses of very fine grained quartz. A few other bent clusters are associated with clusters of tremolite/actinolite. A few clusters of graphite flakes are intergrown with pyrrhotite.

(continued)

LIST OF PHOTOGRAPHS

Note: Photo numbers refer to numbers on negative film and on backs of prints. Photos were taken in combined reflected and transmitted light unless indicated otherwise.

Photo	Sample	Description
0	44395-A	graphite flakes and pyrrhotite in feldspar-quartz-biotite. reflected light. Length of Photo (LOP): 1.52 mm (100X)
1	44395-A	graphite flakes (some contorted) and pyrrhotite in feldspar-quartz. reflected light. LOP: 3.04 mm (50X)
2	44395-A	graphite flakes, pyrrhotite in feldspar-quartz-biotite; LOP: 3.04 mm (50X)
3	44395-B	similar to Photo 2; LOP: 3.04 mm (50X)
4	44395-B	similar to Photo 2; LOP: 3.04 mm (50X)
5	44395-B	same as Photo 4; LOP: 1.52 mm (100X)
6	44396-A	graphite, pyrrhotite, Ti-oxide (bluish grey) in feldspar-quartz-biotite; LOP: 1.52 mm (100X)
7	44396-A	pyrrhotite and minor chalcopyrite in feldspar-quartz-biotite-(sphene); LOP: 0.61 mm (250 X)
8	44396-A	graphite with biotite and sphene in feldspar-quartz; transmitted light only; LOP 0.61 mm (250X)
9	44396-A	graphite flakes (some contorted) with plagioclase and biotite; transmitted light only; LOP: 0.61 mm (250X)
10	44396-A	graphite flakes, pyrrhotite (with minor chalcopyrite), Ti-oxide rimmed by sphene in feldspar-quartz-biotite; LOP: 1.52 mm (100X)
11	44396-A	clusters of graphite flakes, minor pyrrhotite in feldspar-quartz-biotite; LOP: 1.52 mm (100X)
12	44395-B	graphite with sphene and tremolite-actinolite in quartz-feldspar-biotite; transmitted light only; LOP: 0.61 mm (250X)
13	44395-B	graphite flakes in biotite; equant pyrrhotite in feldspar-quartz; tiny zircon with dark, pleochroic halo in biotite; transmitted light only; LOP: 0.61 mm (250X)

60 TON BULK SAMPLE REPORT

R.M. BLAIS AND ASSOCIATES

60 TON BULK SAMPLE
REPORT

BISSETT CREEK GRAPHITE PROJECT

MARIA TOWNSHIP, ONTARIO

for

NORTH COAST INDUSTRIES LTD.

by

R.M. BLAIS & ASSOCIATES LTD.

REPORT

60 TON BULK SAMPLE

Bissett Creek Graphite Project
Maria Township - Renfrew County
Province of Ontario

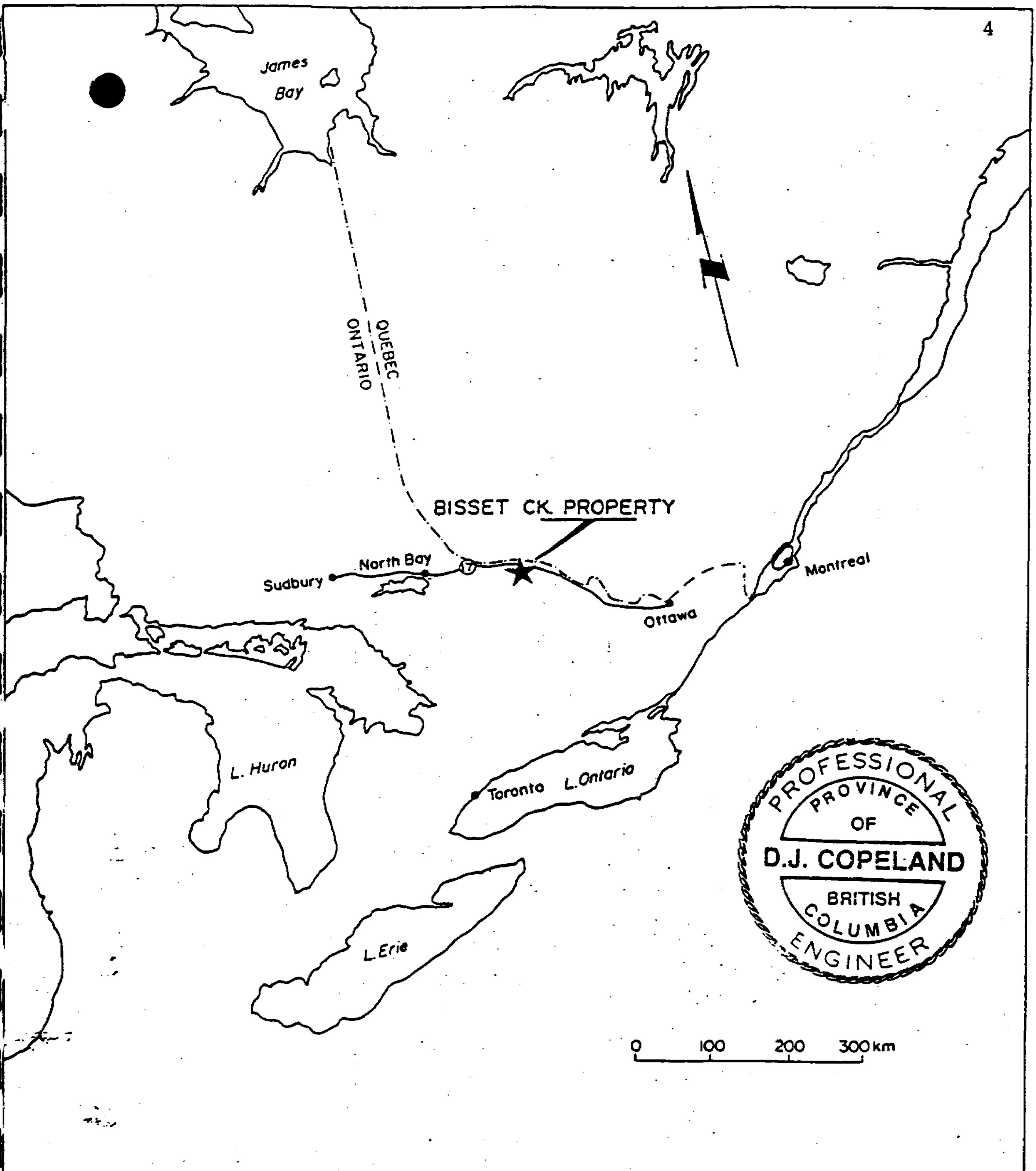
The following report summarizes the Sampling Program carried out by R.M. Blais and Associates Ltd. for North Coast Industries Ltd. during the period from December 27th, 1989 to January 10th, 1990. This program is referred to as 60 Ton Bulk Sample.

Sample area of 60 Ton Bulk Sample is located at North end of PLUG TRENCH in vicinity of Diamond Drill Hole 85-90. Plug Trench Area is located on unpatented mining claim E.O.608347. This open cut plug trench is located on the eastern side of the proposed open pit and was selected because of the density of drill holes in the area and the ability to achieve a reasonable depth of cut into the ore zone.

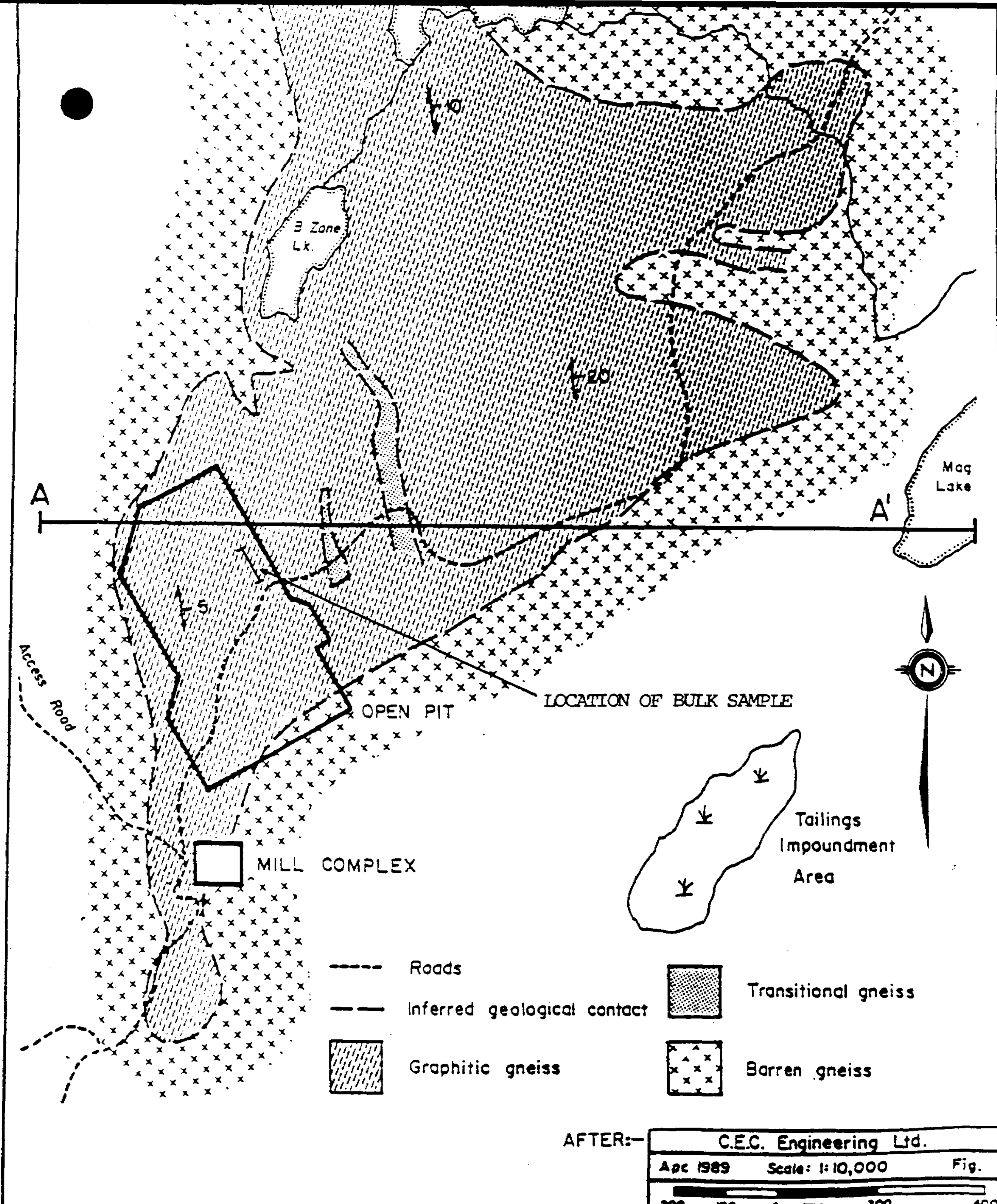
The bulk sample pit area was surveyed and tied into the existing mine co-ordinate grid system. Elevations were taken to establish vertical control related to existing topographic features, diamond drill and percussion holes. At this time, the first sampling was completed. Sample series A-E were taken at the bottom of the existing cut.

The excavating program was carried out during December 27, 1989 to January 10, 1990. With the pit laid out and overburden excavated, an area of approximately 14 feet by 20 feet by 5 feet deep was drilled and blasted. This yielded approximately 122 short tons of ore that was excavated with a John Deere 892 Hydraulic backhoe equipped with a 1-1/2 cu. yd. bucket. Ore muck was loaded into four tandem trucks and transported to Birch's Road yard in North Bay and dumped. It is estimated that 80 to 90 short tons were dumped at the North Bay yard. Sample series 010 to 015 were taken after blasting and excavation on the new pit floor and samples 021 to 024 were taken as face samples around the perimeter of the new pit.

Run of mine ore was loaded into three tandem trucks on January 8th, 1990 and sent to a crushing operation in the Huntsville area. Three truck loads were crushed to 4 1/2" minus material. Trucks #1 and #2, carrying crushed material, continued on to pilot plant facilities at Ortech International in Mississauga, Ontario for mill testing.

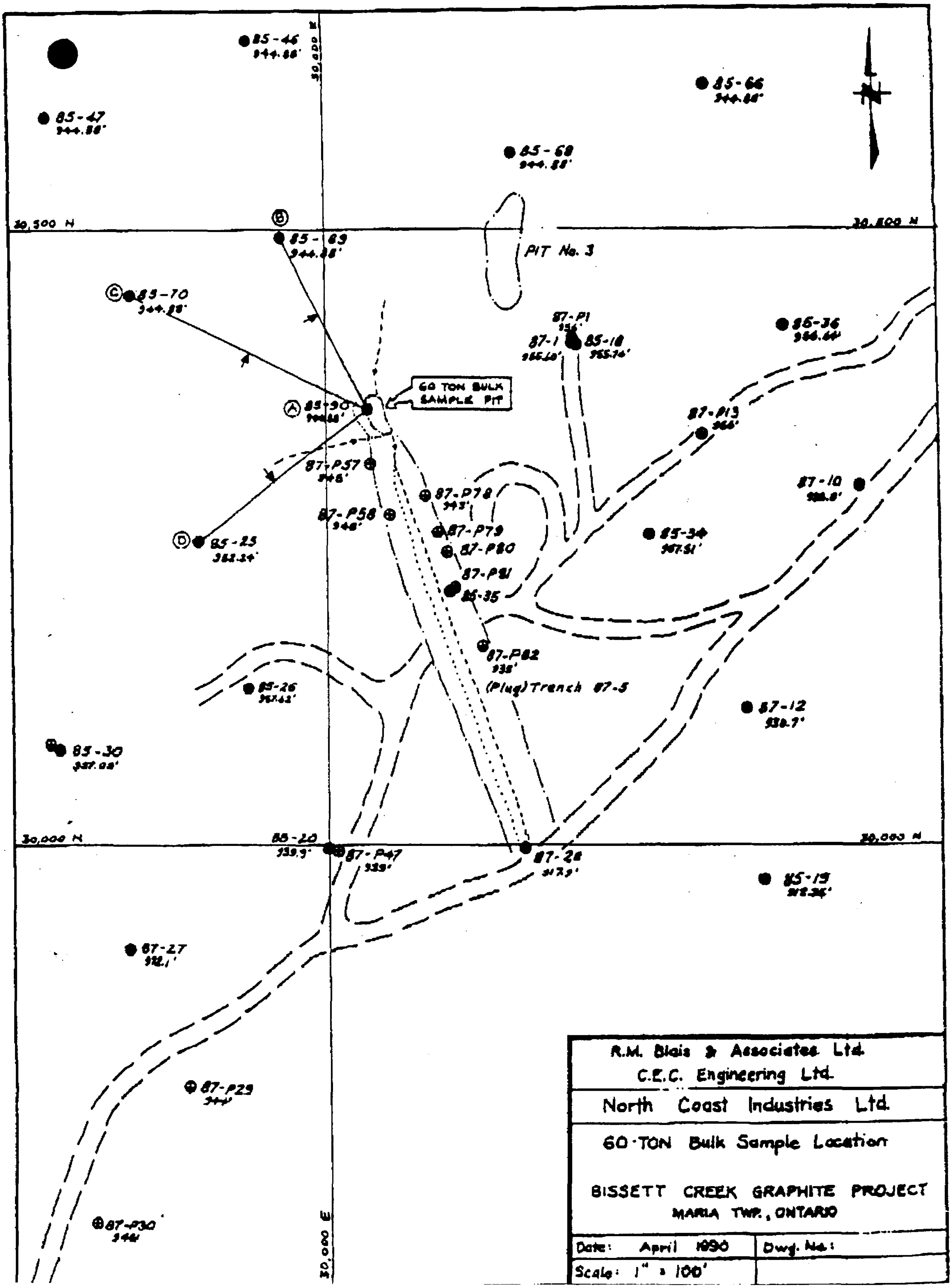


NORTH COAST INDUSTRIES LTD.			
BISSET CREEK PROPERTY		MARIA TWP., ONTARIO	
LOCATION			
SCALE	DATE	N.T.S.	FIG. No
1 : 7,500,000	Jan. '85	31L / 1E	1



CLIENT: NORTH COAST INDUSTRIES LTD	BISSETT CREEK
LOCATION: MARIA TWP. ONTARIO	CRYSTALLINE GRAPHITE PROJECT
KILBORN	DEPOSIT GEOLOGY

SCALE	DESIGNED	DRAWN	APPROVED	DATE	PROJECT NO	DRAWING NO	REV
				APR.89	7948-18	FIG. 5.2-1	A


85-46
85-47
85-66
85-68
30,500 N
PIT No. 3
85-69
85-70
87-P1
87-1
85-18
85-36
60 TON BULK SAMPLE PIT
85-90
87-P13
87-P57
87-P78
87-10
87-P58
87-P79
87-P80
85-34
85-25
87-P81
85-35
87-P82
(Plug) Trench 87-5
85-26
87-12
85-30
30,000 N
88-20
87-P47
87-28
85-15
87-27
87-P29
87-P30
30,000 E
R.M. Blais & Associates Ltd.
C.E.C. Engineering Ltd.
North Coast Industries Ltd.
60-TON Bulk Sample Location
BISSETT CREEK GRAPHITE PROJECT
MARIA TWP., ONTARIO
Date: April 1990
Dwg. No.:
Scale: 1" = 100'

Truck #3 returned to North Bay with crushed material and dumped load at the Birch's Road yard. The crushed material from Truck and the remaining run of mine ore is now stored at Bakk Transport yard in North Bay.

The material at Ortech was then placed in 45 gal. drums for ease handling. Of this material, some 20 tonnes was shipped to Ba Donaldson on February 4, 1990. On March 26, 1990, a further tonnes were shipped from Birch's Road yard.

Summary of samples and assay results are outlined on Summary As Sheet - 60 ton Bulk Sample - January 1990 attached to this repo

The following is a list of equipment and work crew members used the sampling program.

EQUIPMENT

John Deere 892 - 1 1/2 cu. yd. Hydraulic Backhoe
185 CFM Diesel Compressor (2 Jack Hammers, Oilers, Hose, etc.)
Blasting Supplies
1989 4x4 3/4 ton GMC Truck
4 Tandem Trucks

WORK CREW

R.M. Blais	Supervisor
B. Belanger	Driller
A. Waldriff	Driller
R. Scanlon	Blaster
D. Priolo	Backhoe Operator

PLANS

1. Property plan showing location performed work
2. Location Plan showing Sampling Pit Location
3. Summary Assay Sheets
4. Certificate of Analysis
5. X-Sections (2 Pages)
6. Detail Plan (Scale 1" = 10') showing Sample and As Locations and other details

Report Date: February 1990

MMARY ASSAY SHEET - 60 TON BULK SAMPLE
JANUARY 1990

	North Coast Lab		Lakefield LECO	
Sample	L.O.I.	C(T)%	C(g)%	
A	3.82	3.52	3.06	Grab Sample Top End Plug Trench at Swamp
B	3.67	3.36	3.23	Grab Sample Top End Plug Trench at Swamp
C	3.91	3.52	3.07	Grab Sample Top End Plug Trench at Swamp
D	3.70	3.26	2.94	Grab Sample Top End Plug Trench at Swamp
E	4.26	3.85	3.60	Grab Sample Top End Plug Trench at Swamp
010	3.72	3.58	3.31	See Attached Sketch
011	3.56	3.39	2.97	
012	3.91	3.71	3.48	
013	3.46	3.17	2.61	
014	3.12	2.84	2.64	
015	3.70	3.25	2.87	See Attached Sketch
018	3.27	3.29	2.97	Truck #1 ROM from 60 Ton Bulk Sample (RMB Yard)
019	3.39	3.22	3.04	Truck #2 ROM from 60 Ton Bulk Sample (RMB Yard)
020	3.85	3.78	3.62	Truck #3 ROM from 60 Ton Bulk Sample (RMB Yard)
021	3.49	3.49	3.25	East Face-Jan 1990 Trench
022	3.60	3.58	3.41	West Face-Jan 1990 Trench
023	3.36	3.16	2.84	North Face-Jan 1990 Trench
024	3.77	3.74	3.60	South Face-Jan 1990 Trench
025	3.47	3.37	3.18	200 lb. Mini Bulk Shipped by Purolator to ORTECH
028	3.51	3.75	3.51	Truck #4 ROM from 60 Ton Bulk Sample (RMB Yard)
029	3.68	3.61	3.54	Truck #1 Crushed - 4-1/2" Hauled to ORTECH (in bldg)
030	3.61	3.48	3.31	Truck #2 Crushed - 4-1/2" Hauled to ORTECH (outside)
031		3.40	3.16	Truck #3 Crushed - 4-1/2" Hauled Back to RMB Yard

Average of 23 samples - 3.18

C(T)% Carbon (Total)
C(g)% Carbon (Graphitic)

AKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED
P.O. Box 430, 185 Concession St., LAKEFIELD, ON K0L 2H0
Phone: (705) 652-3341, Facsimile: (705) 652-6365, Telex: 0696-2842

No.: 5166

CERTIFICATE OF ANALYSIS

North Coast Industries
1201 - 601 West Hastings
Price Waterhouse Centre, Vancouver, BC V6B 5AG

Mr. Dave Copeland

Date: December 22, 1989
Sample Received: November 20, 1989
No. of Samples: 11
Our Reference No.: 8933421
Your P.O. No.:

Samples submitted to us show results as follows:

Sample	C(T) %	C(g) %
Dec. 13/89		
A	3.52	3.06
B	3.36	3.23
C	3.52	3.07
D	3.26	2.94
E	3.85	3.60
Dec. 18/89		
010	3.58	3.31
011	3.39	2.97
012	3.71	3.48
013	3.17	2.61
014	2.84	2.64
015	3.25	2.87
Totals:	11	11

Additional Copies to R. M. Blais

Signed: [signature]

A. E. Carr, Manager - Assay Services

NOTE: Rejects will be discarded after 6 months
Please, inquire about our long-term storage facilities

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED
P.O. Box 430, 185 Concession St., LAKEFIELD, ON K0L 2H0
Phone: (705) 652-3341, Facsimile: (705) 652-6365, Telex: 0696-2842

No.: 5235

CERTIFICATE OF ANALYSIS

North Coast Industries Ltd.
1201-601 West Hastings St., Price Waterhouse Centre
Vancouver, B. C., V6B 5A6

Mr. Dave Coupland

Date: January 11, 1990
Sample Received: January 8, 1990
No. of Samples: 9
Our Reference No.: 9033482
Your P.O. No.:

Samples submitted to us show results as follows:

Sample	C(T) %	C(G) %
018	3.29	2.97
019	3.22	3.04
020	3.78	3.62
021	3.49	3.25
022	3.58	3.41
023	3.16	2.84
024	3.74	3.60
025	3.37	3.18
026 (028)	3.75	3.51
Totals:	9	9

JAN 12 '90 11:27 LAKEFIELD RESEARCH 652 6365 P.2/2

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED
P.O. Box 430, 185 Concession St., LAKEFIELD, ON K0L 2H0
Phone: (705) 652-3341, Facsimile: (705) 652-6365, Telex: 0696-2842

No.: 5235

CERTIFICATE OF ANALYSIS

North Coast Industries Ltd.
1201-601 West Hastings St., Price Waterhouse Centre
Vancouver, B. C., V6B 5A6

Mr. Dave Coupland

Date: January 11, 1990
Sample Received: January 8, 1990
No. of Samples: 9
Our Reference No.: 9033482
Your P.O. No.:

Samples submitted to us show results as follows:

Sample	C(T) %	C(G) %
018	3.29	2.97
019	3.22	3.04
020	3.78	3.62
021	3.49	3.25
022	3.58	3.41
023	3.16	2.84
024	3.74	3.60
025	3.37	3.18
026 (028)	3.75	3.51
Totals:	9	9

Additional Copies to Mr. W. Moffat

Signed:

NOTE: Rejects will be discarded after 6 months
Please, inquire about our long-term storage facilities

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED
P.O. Box 430, 185 Concession St., LAKEFIELD, ON K0L 2H0
Phone: (705) 652-3341, Facsimile: (705) 652-6365, Telex: 0696-2842

No.: 5308

CERTIFICATE OF ANALYSIS

North Coast Industries Ltd.
1201-601 West Hastings St., Price Waterhouse Centre
Vancouver, B. C., V6B 5A6

Mr. Dave Coupland

Date: January 24, 1990
Sample Received: January 18, 1990
No. of Samples: 6
Our Reference No.: 9033551
Your P.O. No.:

Samples submitted to us show results as follows:

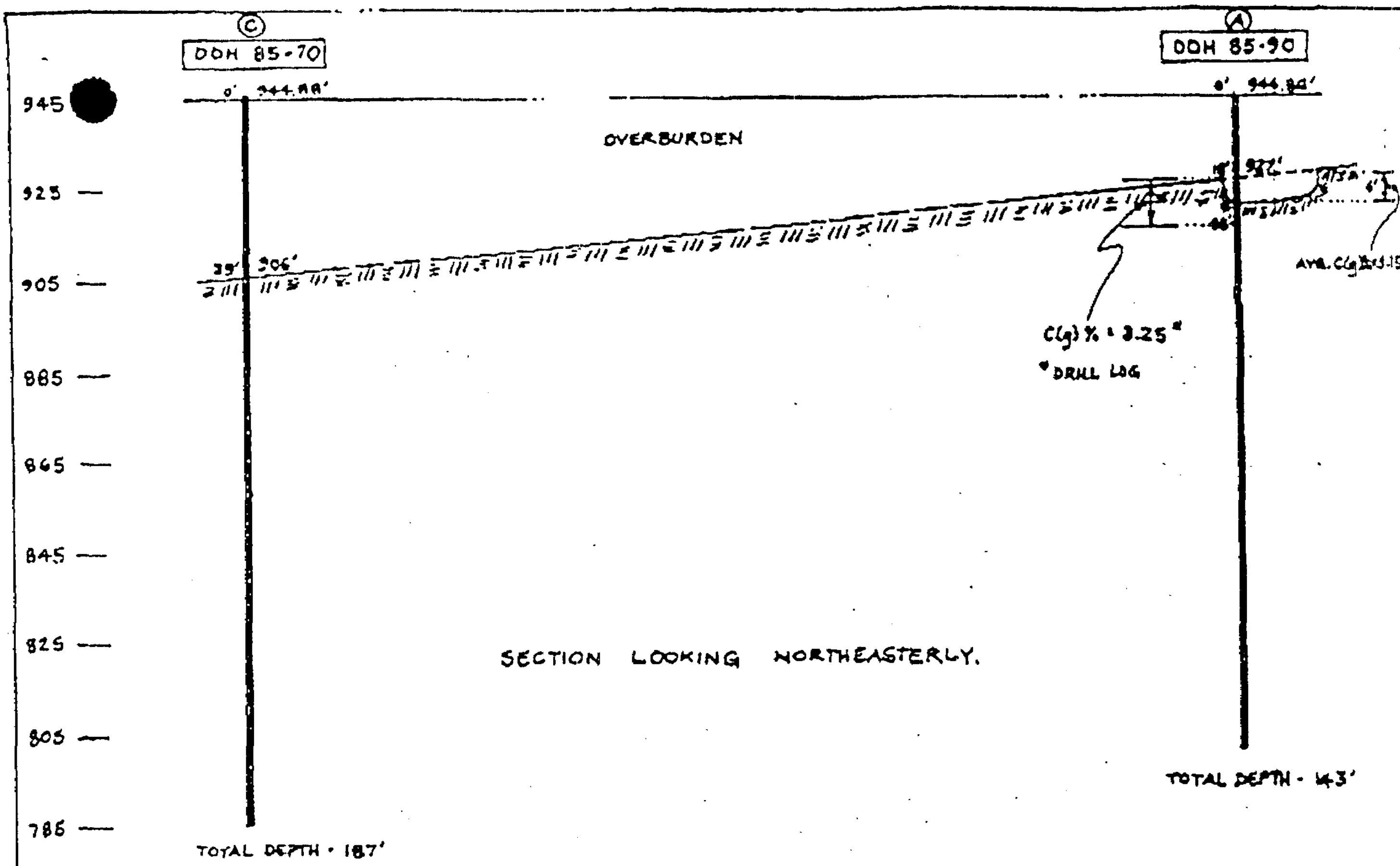
Sample	C(T) %	C(g) %	
029	3.61	3.54	
030	3.48	3.31	
031	3.40	3.16	
032	2.04	1.83	NOT BULK SAMPLE
033	2.04	1.92	
034	2.32	2.15	
Totals:	6	6	

Additional Copies to Mr. W. Moffat

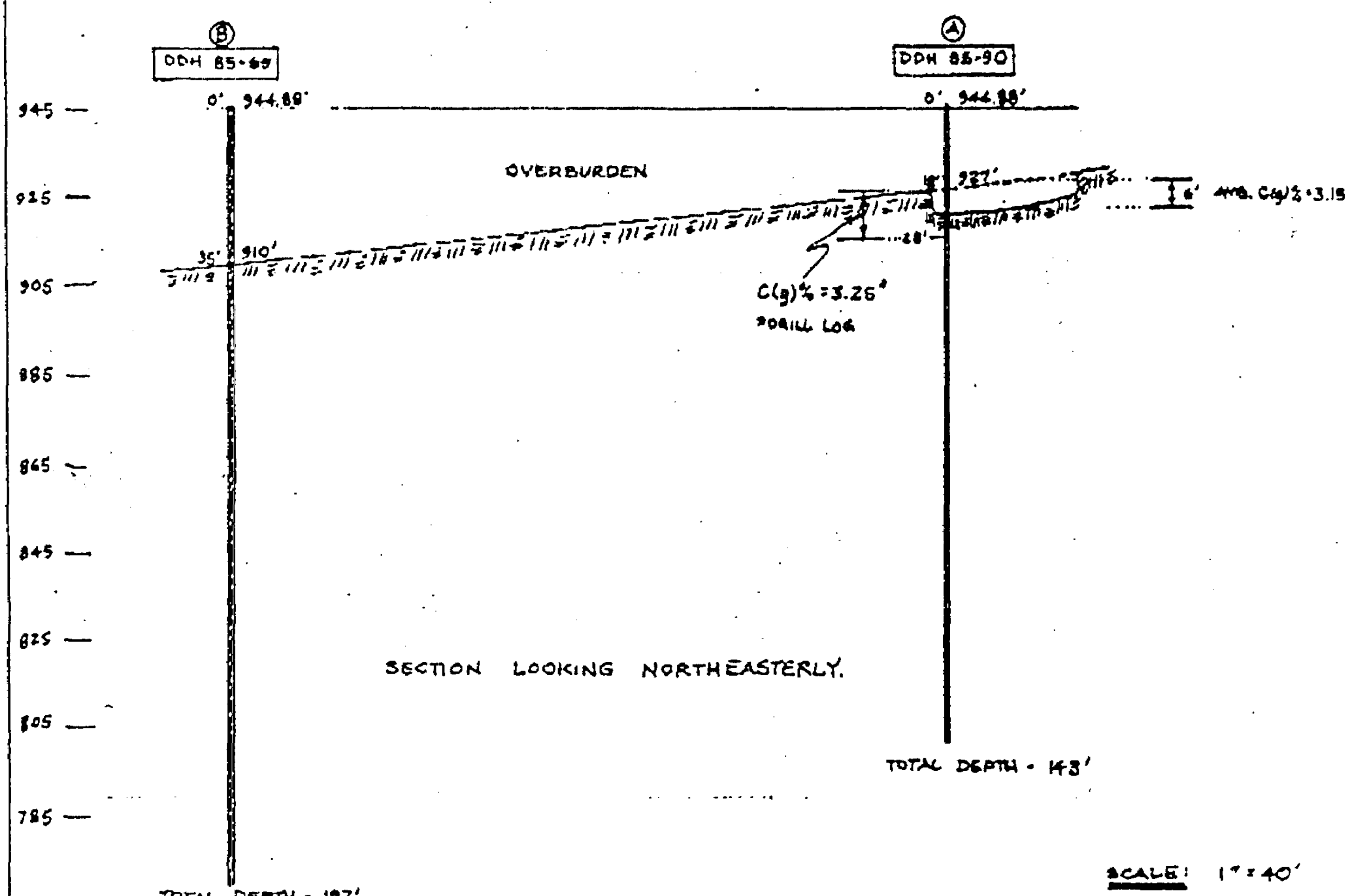
Signed:

A. E. Carr, Manager - Assay Services

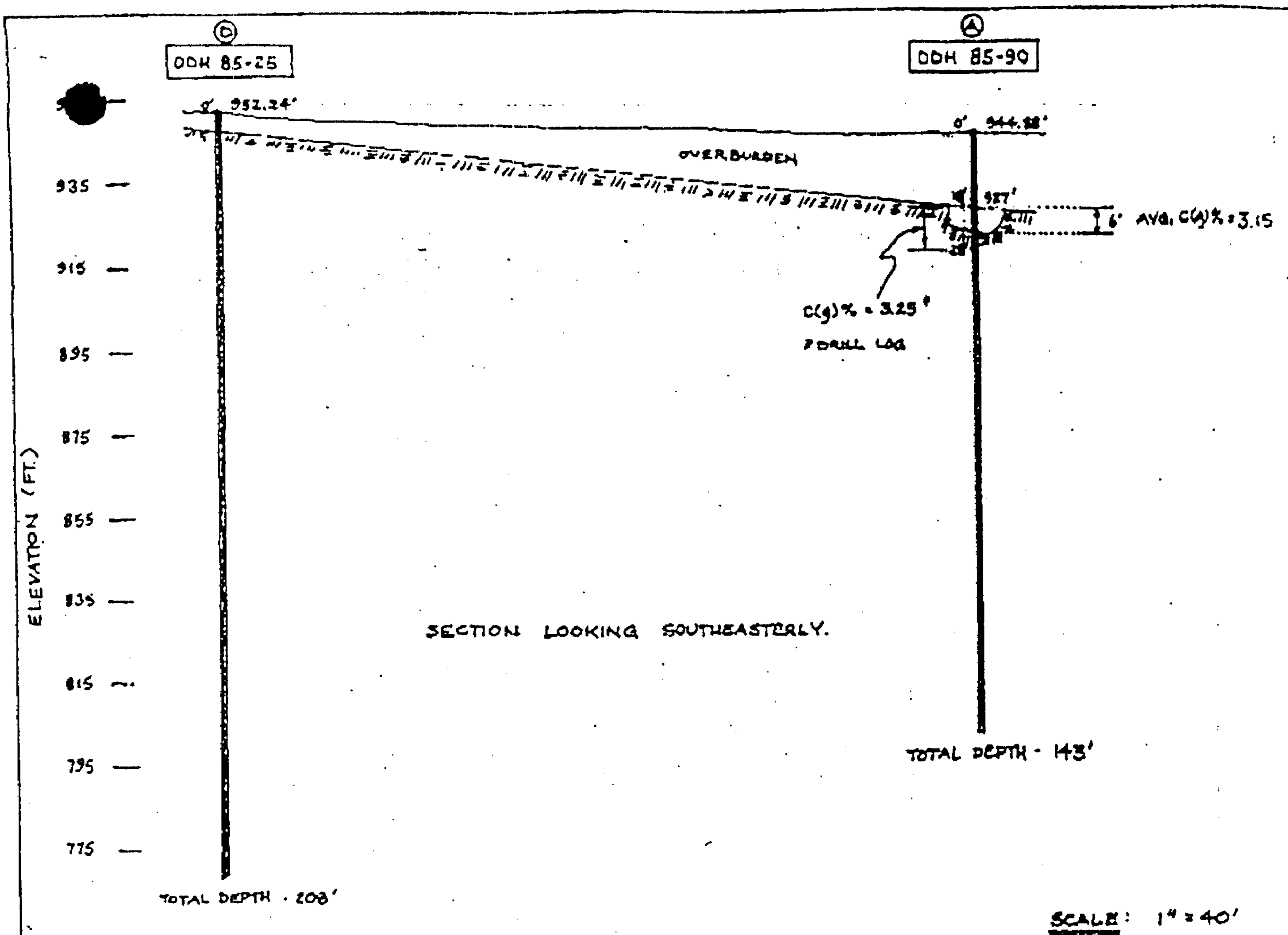
NOTE: Rejects will be discarded after 6 months
Please, inquire about our long-term storage facilities



Ⓒ
DDH 85-70
Ⓐ
DDH 85-90
945
925
905
885
865
845
825
805
785
OVERBURDEN
0' 944.88'
0' 944.80'
39' 906'
C(g)% = 3.25*
*DRILL LOG
AVG. C(g)% = 3.15
6'
SECTION LOOKING NORTHEASTERLY.
TOTAL DEPTH - 143'
TOTAL DEPTH - 187'



Ⓑ
DDH 85-69
Ⓐ
DDH 85-90
945
925
905
885
865
845
825
805
785
0' 944.89'
0' 944.88'
OVERBURDEN
927'
6'
AVG. C(g)% = 3.15
35' 910'
28'
C(g)% = 3.26*
*DRILL LOG
SECTION LOOKING NORTHEASTERLY.
TOTAL DEPTH - 143'
SCALE: 1" = 40'
TOTAL DEPTH - 197'



Ⓓ
DDH 85-25
Ⓐ
DDH 85-90
0' 952.24'
0' 944.88'
OVERBURDEN
937'
6' AVG. C(g)% = 3.15
C(g)% = 3.25 *
* DRILL LOG
935
915
895
875
855
835
815
795
775
ELEVATION (FT.)
SECTION LOOKING SOUTHEASTERLY.
TOTAL DEPTH - 143'
TOTAL DEPTH - 208'
SCALE: 1" = 40'

30,100 E

ASSAY VALUES

SAMPLE	C(g)%
A	3.06
B	3.23
C	3.07
D	2.94
E	3.60
AVG.	3.18

SAMPLE	C(g)%
010	3.31
011	2.97
012	3.48
013	2.61
014	2.64
015	2.87
AVG.	2.98

SAMPLE	C(g)%
021 (EAST)	3.25
022 (WEST)	3.41
023 (NORTH)	2.84
024 (SOUTH)	3.60
AVG.	3.28

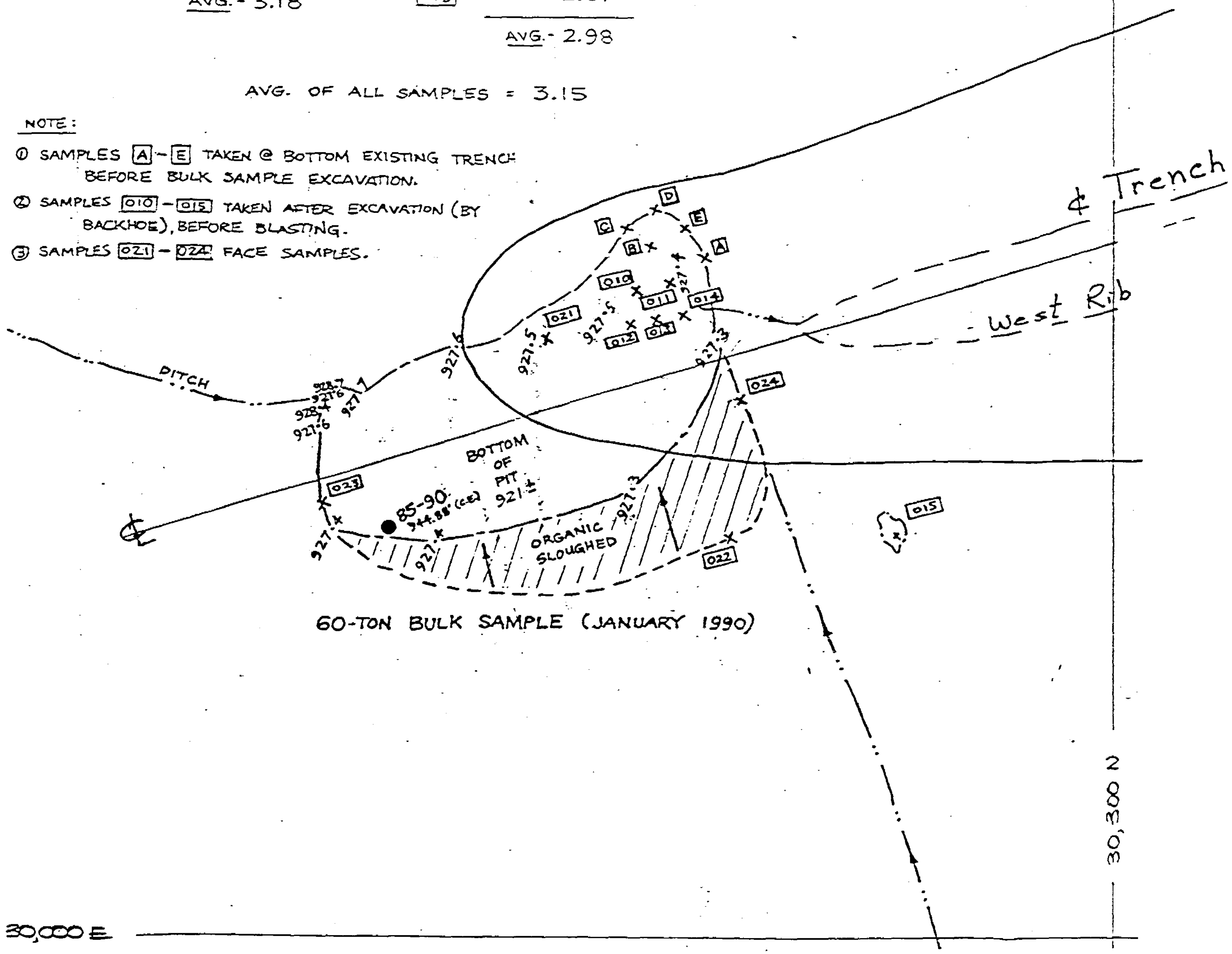
AVG. OF ALL SAMPLES = 3.15

NOTE:

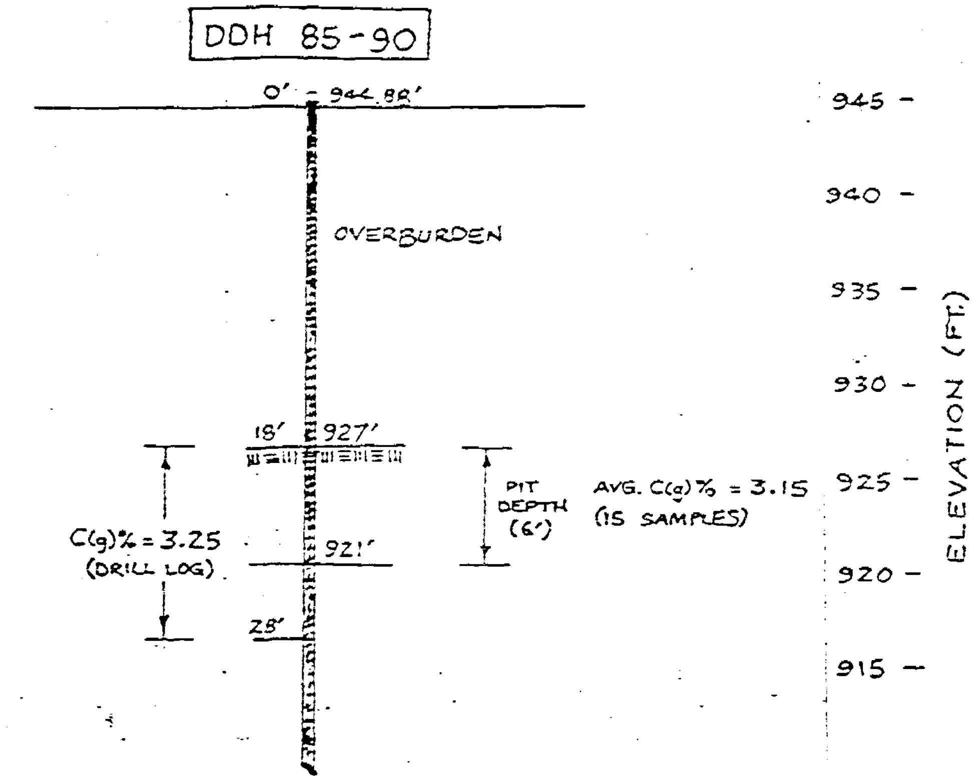
① SAMPLES A – E TAKEN @ BOTTOM EXISTING TRENCH BEFORE BULK SAMPLE EXCAVATION.

② SAMPLES 010 – 015 TAKEN AFTER EXCAVATION (BY BACKHOE), BEFORE BLASTING.

③ SAMPLES 021 – 024 FACE SAMPLES.



60-TON BULK SAMPLE (JANUARY 1990)



30,300 N

30,000 E

R.M. Blais & Associates Ltd.
C.E.C. Engineering Ltd.

North Coast Industries Ltd.

60–TON Bulk Sample Location

BISSETTE CK. GRAPHITE PROJECT
MARIA TWP., ONTARIO

Date: April, 1990	Dwg. No.:
Scale: 1 inch = 10 feet	

CONCENTRATE IMPURITY ANALYSIS

VANCOUVER PETROGRAPHICS LTD.

Vancouver Petrographics Ltd.

JAMES VINNELL, Manager
JOHN G. PAYNE, Ph.D. Geologist
CRAIG LEITCH, Ph.D. Geologist
JEFF HARRIS, Ph.D. Geologist
KEN E. NORTHCOTE, Ph.D. Geologist

P.O. BOX 39
8080 GLOVER ROAD,
FORT LANGLEY, B.C.
V0X 1J0
PHONE (604) 888-1323
FAX. (604) 888-3642

Report for: Ed Henrioulle,
Bacon, Donaldson & Associates,
12271 Horseshoe Way,
RICHMOND, B.C., V7A 4Z1

Invoice 8823
February 1990

Sample: M90-088 ~~M6~~ F6-Ro Tails

P.O.: 32717

Purpose:

To analyze nine size fractions of tailings for graphite content, and to compare the results with those of the Leco method (average 0.11%) and the Double L.O.I. method (average 1.1%).

Method:

Polished thin sections were made for the following size fractions:

+28, +35, +48, +65, +100, +150, +200, +325, -325.

Traverses were made across the sample to cover 90-95% of the total area of the section; for coarser samples these were made using a 4X objective lens (field of view = 30 sq.mm), and for finer samples with a 10X objective lens (field of view = 9.1 sq.mm).

In the coarsest sample, individual particles were counted and their average size noted. In finer samples, the density of particles was measured at several points in the section, and the average particle size were measured. These results were used to calculate the total area of particles along the traverse lines.

The size and shape of graphite grains and aggregates was recorded in five size categories and in two shape categories. Size fractions are as follows:

0.03-0.05 mm, 0.05-0.1 mm, 0.1-0.2 mm, 0.2-0.3 mm, 0.3-0.4 mm

The two shape categories are as follows:

1) flakes (average length to width ration 3/1 to 5/1),
2) equant patches (average length to width ratio 1/1 to 2/1).

Other tabular wood fragments averaging 0.4-0.8 mm in size show a similar elongate cellular structure. A few fragments show cross sections of the cells. Some tabular fragments are warped moderately. Most are stuck moderately firmly to graphite flakes. Tabular fragments commonly have ragged ends. A few fragments have an unusual cellular structure, which may represent a different type of wood (one has a texture resembling cactus wood).

Biotite forms equant flakes averaging 0.4-0.8 mm across. The color ranges from light to medium/dark brown to slightly reddish brown. Commonly flakes are locked electrostatically to graphite flakes of similar size.

Several flakes averaging 0.1-0.5 mm in size are of colorless **muscovite** to pale brown **phlogopite**.

One **paper?** fragment contains a dense core 0.2 mm across of white material with a high internal reflection. A few wispy, colorless, fibrous strands up to 0.3 mm long extend outward from the core. This may be a fragment of the filter.

A few flakes of an **unknown material** are isotropic and medium brown in color. These have a mottled texture. When touched with a needle one broke along the fracture shown in the photograph. It has an unusual rippled texture and contains spots of highly reflective material. They do not cling to graphite flakes. These may represent a manufactured product.

A very few **string-like fibers** are up to a few mm long. These may be of something like cotton.

One equant tabular particle 0.2 mm across may be of plastic. It is colorless and isotropic.

John G. Payne

John G. Payne
604-986-2928

Photographs

Numbers refer to number on negative and on back of print. All photos were taken with transmitted and reflected light except where noted.

Number	Description
0	Wood fragment locked between three graphite fragments. Length of photo: Length of photo: 1.52 mm.
1	Fragment of filter)(?) 0.4 mm across with graphite flakes and one biotite flake. Length of photo: 1.52 mm.
2	Red-brown biotite flake with graphite flakes. Length of photo 1.52 mm.
3	Wood fragment locked on graphite flake. Length of photo 0.6 mm.
4	Biotite flake beneath graphite flake, electrostatically held together. Length of photo 1.52 mm.
5	Wood fragment and biotite flake with graphite flakes. Small fibrous fragment in corner. Length of photo 1.52 mm.
6	Tabular wood fragment with graphite flakes. Length of photo 0.6 mm.
7	Tabular wood(?) fragment locked between two graphite flakes. The texture of this fragment resembles that of cactus wood. Length of photo 1.52 mm
8	Elongate fibrous wood fragment, bent, stuck to large graphite flake. Smaller equant wood fragment. Length of photo 0.61 mm.
9	Tabular fragment of unknown material showing rippled surface and fracture produced by pin, and graphite flake. Length of photo 0.6 mm.
10	Elongate fibrous wood fragment, free of graphite. Length of photo 1.52 mm.
11	Biotite flake and two fibrous wood fragments with graphite flakes. Length of photo 1.52 mm.
12	Tabular wood fragment, warped moderately, with graphite flakes. Length of photo 0.6 mm.
13	Biotite flake and equant wood fragment with graphite flakes. Transmitted light only. Length of photo 1.52 mm/

MATERIAL SAFETY DATA SHEET

FOR

Ekof-452G COLLECTOR/FROTHER

Ekof Erz-und Kohlaflotation Gmbh

SAFETY DATA SHEET

(according to DIN 52'900, 10/1988)

Manufacturer: EKOF Erz- und Kohleflotation GmbH

Brand name: EKOFOL 452 G

1.1 Chemical characterization:
formulation of higher aliphatic alcohols with non-ionic tensides and pine oils

1.2 State: liquid

1.3 Colour: yellow brown

1.4 Scent: higher aliphatic alcohol

2. Physical and safety-related data

2.1 Change of state: boiling at abt. 160 ° C (i.e. 320 ° F)

2.2 Density: (at 20 ° C) abt. 0,86 g/cm³

2.3 Vapor pressure: (20 ° C) < 1 mbar

2.5 Solubility in water: insoluble

2.7 Flah point: > 60 ° C (140 ° F)

2.8 Ignition temperature: 270 ° C (518 ° F)

2.9 Explosion range: lower: 1.1 gas vol. %) in air
upper: 7.7 gas vol. %)in air

3. Protecting Measures, Storage and Handling

3.1 Personal Protection Equipment

Hand protection: plastic or rubber gloves
Eye protection : safety goggles

3.2 Disposal: combustion

4. Emergency Measure - Accidents and Fires

4.1 Extinguishing Agents - suitable:
foam, CO_2, dry fire fighting powder

4.2 First Aid:
After swallowing larger amounts, initiate vomitting
In case of contact with skin, clean with soap and water
If product splashed into eyes, immediately rinse eyes
with plenty of water for several minutes

5. Toxicologic Characterization:
Acute oral toxicity (LD50 = letal dosage 50 %) with
rats:
abt. 8 g/kg weight of body
slightly irritating for skin
irritating for mucous membranes

6. Ecologic Effects
slightly toxic for fish
Biodegradable > 80 %

7. Further References
No dangerous product in the sense of the relevant safety
rules of the European Community.

WHOLE ROCK ANALYSIS

CHEMEX LABS LTD.

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: BACON, DONALDSON & ASSOCIATES LTD.,

12271 HORSESHOE WAY
RICHMOND, BC
V7A 4Z1

Project : M90-088
Comments: ATTN: HENRIOULLE

Page Number : 1
Total Pages : 1
Invoice Date: 09-MAR-90
Invoice No. : I-9012177
P.O. Number : 32722

CERTIFICATE OF ANALYSIS A9012177

SAMPLE DESCRIPTION	PREP CODE		SiO2 %	Al2O3 %	Fe2O3 %	MgO %	CaO %	Na2O %	K2O %	TiO2 %	P2O5 %	MnO %	BaO %	LOI %	TOTAL %	
HEAD COMP. 1	225	200	69.51	11.07	4.31	2.50	3.21	1.80	2.65	0.47	0.25	0.10	0.09	4.51	100.45	
HEAD COMP. 2	225	200	76.86	8.60	3.28	1.05	2.05	2.13	1.28	0.32	0.34	0.05	0.08	4.67	100.70	

CERTIFICATION:________________

REPORT ON GRAIN COUNT ANALYSIS FOR ASSAY COMPARISON

VANCOUVER PETROGRAPHICS

Vancouver Petrographics Ltd.

JAMES VINNELL, Manager
JOHN G. PAYNE, Ph.D. Geologist
CRAIG LEITCH, Ph.D. Geologist
JEFF HARRIS, Ph.D. Geologist
KEN E. NORTHCOTE, Ph.D. Geologist

P.O. BOX 39
8080 GLOVER ROAD,
FORT LANGLEY, B.C.
V0X 1J0
PHONE (604) 888-1323
FAX. (604) 888-3642

Report for: Ed Henrioulle,
Bacon, Donaldson & Associates,
12271 Horseshoe Way,
RICHMOND, B.C., V7A 4Z1

Invoice 8823
February 19~~89~~ 90

Sample: M90-088 ~~M6~~ F6-Ro Tails

P.O.: 32717

Purpose:

To analyze nine size fractions of tailings for graphite content, and to compare the results with those of the Leco method (average 0.11%) and the Double L.O.I. method (average 1.1%).

Method:

Polished thin sections were made for the following size fractions:

+28, +35, +48, +65, +100, +150, +200, +325, -325.

Traverses were made across the sample to cover 90-95% of the total area of the section; for coarser samples these were made using a 4X objective lens (field of view = 30 sq.mm), and for finer samples with a 10X objective lens (field of view = 9.1 sq.mm).

In the coarsest sample, individual particles were counted and their average size noted. In finer samples, the density of particles was measured at several points in the section, and the average particle size were measured. These results were used to calculate the total area of particles along the traverse lines.

The size and shape of graphite grains and aggregates was recorded in five size categories and in two shape categories. Size fractions are as follows:

0.03-0.05 mm, 0.05-0.1 mm, 0.1-0.2 mm, 0.2-0.3 mm, 0.3-0.4 mm

The two shape categories are as follows:

1) flakes (average length to width ration 3/1 to 5/1),
2) equant patches (average length to width ratio 1/1 to 2/1).

The nature of intergrowths of graphite with other minerals was divided into three categories as follows:

1) free graphite grains (F)*
2) graphite grains or aggregates on surface of particles (S)*
3) graphite grains or aggregates included in particles. (I)*

* these letters to designate classes in Table 2

Average areas were calculated for the two shapes of flakes in each size fraction. These were multiplied by the number of occurrences of graphite in each category. Addition of these values yielded the volume content of graphite in each fraction.

In Table 1 is shown the average area of grains in each size and shape fraction. In Table 2 is shown the total area occupied by graphite in each category (calculated by multiplying the number of occurrences by the average area of a single occurrence).

Table 1. Area of Grains of Different Sizes and Shapes (sq.mm)

shape	length of flake or average dimension of equant patch (mm)				
	0.03-0.05 A	0.05-0.1 B	0.1-0.2 C	0.2-0.3 D	0.3-0.4 E *
flake	0.0005	0.002	0.005	0.010	0.020
equant patch	0.0015	0.005	0.020	0.060	0.120

* these letters are used for size categories in Table 2

Table 2. Distribution of Graphite

Shape		flake					patch				
Size		A	B	C	D	E	A	B	C	D	E
+28	S	-	-	0.005	0.050	0.040	-	0.015	0.080	0.060	-
	I	-	0.016	0.040	0.030	0.040	-	-	-	-	-
+35	S	-	0.002	0.010	0.020	0.040	-	0.005	0.020	-	0.120
	I	-	0.010	0.035	0.050	0.040	-	-	0.020	0.120	-
+48	S	-	0.006	0.005	0.020	-	-	-	0.020	0.060	-
	I	-	0.006	0.020	-	-	-	-	-	-	-
+65	S	-	-	-	-	0.040	-	-	0.020	-	-
	I	-	-	-	0.010	-	-	0.005	0.020	-	-
+100	S	-	-	-	0.010	-					
	I	-	0.002	-	-	-					
+150	F	-	-	0.005							
	S	-	0.006	-	-	-	-	-	-	-	-
	I	-	0.002	-	-	-	-	0.010	-	-	-
+200	F	-	-	-	-	-	-	-	0.020	-	-
	S	-	0.004	0.005	-	-	-	0.005	-	-	-
+325		no graphite grains seen									
-325	F	0.002	0.004	-	-	-	-	-	-	-	-

Table 3. Per Cent Graphite by Area in Size Fractions
(all sizes in sq.mm)

Size Fract.	Average Particle Size	Area Total	Area Graphite	% Graphite
+28	0.80	249	0.376	0.151
+35	0.36	175	0.492	0.281
+48	0.16	187	0.137	0.073
+65	0.09	193	0.095	0.049
+100	0.04	224	0.012	0.005
+150	0.02	156	0.023	0.015
+200	0.007	60	0.034	0.057
+325	0.0035	109	0.000	0.000
-325	0.0008	29	0.006	0.021

Note: Some of these values are not the same as the preliminary values I quoted to you by telephone on February 10th. Some of these preliminary values have been adjusted after further examination of the sections.

Conclusions:

1. Most of the graphite is in the coarsest two fractions. The abundance of graphite decreases erratically towards the finer fractions, with an unusual peak in the -200 fraction. Note that this is the smallest sample (area of particles on section), and because of this, the graphite percentage may be of lower precision than for the other samples.

2. Graphite is about equally divided between slender flakes and equant clusters of grains (flakes and/or equant grains).

3. Graphite occurs in about equal abundances on surfaces of particles and as inclusions in particles of silicates. Only locally in the finer fractions does it occur as free grains.

4. Results agree well with the Leco method of analysis.

John G. Payne,
986-2928

BACON, DONALDSON & ASSOCIATES LTD.
12271 Horseshoe Way
Richmond, B.C. V7A 4Z1

TELECOPIER COVER SHEET

Message No. 4955

Page 1 of 5

File No. M90 - 088

Attention	MATT BOLU
Company	C.E.S.L.
Fax No.	264-5555

Matt,

Enclosing a copy of Vancouver Petrographic's report detailing their "volumetric assay procedure" for graphite. Report is very thorough and should answer all your questions. If not, let me know and I'll give them a call.

Ed.

Note: Volumetric percentages are slightly different from those I faxed you yesterday.

From	ED HENRIOULLE

If you do not receive all the pages, or if they are not legible, please call:

Telephone (604) 277-2322
Telefax (604) 274-7235

Date Feb. 13/90

Operator Laurel

DOUBLE LOI ASSAY PROCEDURE

KHD - HUMBOLDT WEDAG

L.O.I Analytical Procedure

1. **Moisture content analysis:**

1 g of sample (ground to minus 70 um if tailings or head sample, but kept at original size if product or middlings) is exactly weighted to ± 0.0001 g in a porcelain bowl. This sample is dried in a dryer at 106°C ± 2°C until constant weight is obtained (duration approx. 90 minutes). After the sample has cooled down to room temperature in a desiccator the bowl is weighed again.

Determination of moisture:

$$\frac{\text{difference in weight}}{\text{original weight}} \times 100 = \%\ \text{moisture}$$

2. Ash analysis

1 g of sample (ground to minus 70 um if tailings or head sample, but kept at original size if product or middlings) is exactly weighted to ± 0.0001 g in a porcelain bowl that has been heated to 1000°C prior to analysis. This sample is then pretreated in a de-asher at 600 - 700°C for approx. one hour. Afterwards the sample is burnt in a muffle furnace (wide body) at 875°C - 900°C under addition of oxygen (about 100 litres/hour) for 4 to 5 hours (depending on hardness of graphite). After this treatment the sample is cooled down in a desiccator and weighed again.

Determination of ash:

$$A \text{ (without water)} = \frac{a - 100}{b} \times \frac{100}{100 - W \text{ (wet)}} \quad (\%)$$

a = weight of ash in analytical wet sample in grams

b = weight of analytical wet sample in grams

w(wet) = water content of wet sample in mass %

3. <u>Volatiles analysis</u>:

1 g of sample (ground to minus 70 um if tailings or head sample, but kept at original size if product or middlings) is exactly weighted to ± 0.0001 g in a procelain bowl that has been heated to 1000°C prior to analysis. The sample is treated in a muffle furnace at 375°C to 400°C with permanent access to fresh air (oxygen loaded but not pure oxygen) until constant weight has been gained (± 2 hours).

Determination of volatiles (v):

$$v = \frac{a-b}{a} \times 100 - W\ (\text{wet})$$

a = weight of wet sample in grams

b = weight of remaining coke of wet sample in grams

w(wet) = water content of wet sample in mass %

4. <u>C fix (graphitic carbon) determination</u>:

100 - (% of ash + % volatiles) = % C fix

HNO_3-LOI-LECO ASSAY PROCEDURE

CHEMEX LABS LTD.

TOTAL ORGANIC CARBON (TOC) ASSAY PROCEDURE

CHEMEX LABS LTD.

Chemex Labs Ltd.

212 Brooksbank Avenue
N. Vancouver B.C. V7J 2C1
telephone: 604-984-0221
fax: 604-984-0218

Fax Cover Sheet

Company Name:	Bacon Donaldson
Contact Name:	Matt Bolen
Fax Number:	264 5555

Sender:	
Description:	

Number of pages (including this page) :	2
Date Sent:	Mar 21/90

If there are any problems with this transmission, please call our office immediately at (604) 984-0221

Chemex charges clients $0.50 per page of analytical results faxed within North America and $2.00 per page faxed outside North America (billed monthly).

Chemex Labs Form

CODE 367% CARBON

A 0.2 gram sample is combusted in an induction furnace. Total carbon is measured by an infrared detector and reported to 0.01% C.

CODE 368% CARBON DIOXIDE

A 0.2 - 0.5 gram sample is decomposed in hydrochloric acid. The evolved carbon dioxide is carried, in oxygen gas, through water and sulphur scrabbers. The total gas volume (carbon dioxide and oxygen) is measured in a gasometer buret. The carbon dioxide is then dissolved in potassium hydroxide solution and the oxygen returned to the buret. The difference in volume is calibrated as % carbon dioxide in the sample (corrected for temperature and pressure).

THE EFFECT OF TRAMP WOOD IN TEST SAMPLES

LAKEFIELD RESEARCH

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED

PHONE (705) 652-3341
TELEX NO. 06962842
FACSIMILE NO. (705) 652-6365

June 8, 1990

Mr. Matt Bolu
Cominco Engineering Services Ltd.
Suite 100-1200 West 73rd Avenue
Vancouver, BC V6P 6G5

Dear Matt:

Re: Bissett Creek(graphitic carbon)

In response to your request to determine the effect of tramp wood, in test products, on the analysis of C(g), several tests were conducted. The testwork included the following variables:

1) Effect of roasting graphitic carbon at 400°C for 3 hours

2) Effect of roasting wood at 400°C for 3 hours

3) Effect of leaching with HNO_3

4) Effect of leaching with HNO_3 plus roasting at 400°C

Procedure:

Test 1 - A 1% graphitic carbon standard was placed in a muffle at 400°C for 3 hours. The standard was removed, cooled and assayed by Leco for carbon.

Test 2 - 1% graphitic carbon standard was leached with HNO_3, dried and assayed by Leco for carbon, according to our standard C(g) procedure.

Test 3 - A 25% weight equivalent of wood was treated under the same conditions as Test 1.

Test 4 - To the 1.0% C(g) standard, a 25% weight equivalent of wood was added. The mixture was leached with HNO_3(standard procedure), followed by roasting at 400°C for 3 hours.

Test 5 - As for Test 4 except roasting step left out.

Procedures - continued...

Results are tabled below:

Test No.	Procedure	Feed	%C(g) Recovered	%C(g) Added
1A	Roast 400°C	1% C(g) Standard	1.01	1.00
1B	Roast 400°C	1% C(g) Standard	1.01	1.00
1C	Roast 400°C	1% C(G) Standard	1.01	1.00
2A	HNO_3 Leach	1% C(g) Standard	0.98	1.00
2B	HNO_3 Leach	1% C(g) Standard	0.99	1.00
2C	HNO_3 Leach	1% C(g) Standard	1.02	1.00
3A	Roast 400°C	Wood	0.15	*25.0
3B	Roast 400°C	Wood	0.15	*25.0
4A	HNO_3 Leach and Roast	1% C(g) Std + 25% Wood	1.02	**26.0
4B	HNO_3 Leach and Roast	1% C(g) Std _ 25% wood	1.02	**26.0
5A	HNO_3 Leach	1% C(g) Std + 25% Wood	11.1	**26.0
5B	HNO_3 Leach	1% C(g) Std + 25% Wood	10.3	**26.0

* 25% = Wood added at 25% of sample weight
** 26% = 1% C(g) standard plus Wood at 25% sample weight

The above results indicate, that in order to eliminate the adverse effect of wood on your C(g) assays, the samples require roasting at 400°C plus the HNO_3 leach.

Matt, I suspect this type of investigation could justify a lot more work, and if you have any questions, or require more work, please do not hesitate to contact me at any time.

Best regards.

Yours sincerely,
LAKEFIELD RESEARCH

A. E. Carr,
Manager - Assay Services

AEC/dje

M. Bolu
Cominco/297

METALLURGICAL REPORT ON THE VARIABILITY TEST RESULTS OF THE BISSETT CREEK FLAKE GRAPHITE ORE

Prepared for:
NORTH COAST INDUSTRIES LTD.
Vancouver, B.C.

SEPTEMBER 1990

Prepared by:
Cominco Engineering Services Ltd.

1.0 INTRODUCTION

This report deals with the results of bench-scale variability testwork performed on varying grades of the Bissett Creek flake graphite ore samples from Maria Township in Ontario. The testwork was conducted at the testing facilities of Bacon, Donaldson and Associates Ltd. during July - September 1990 on behalf of North Coast Industries Ltd.

The purpose of the testwork was to assess the metallurgical response of various grade ore samples to the flowsheet developed from the previous testwork. A report ,issued by CESL in June 1990 documented and discussed the results of the previous bench-scale and pilot plant testwork which led to the development of a production plant flowsheet.

The variability testing utilized the basic steps of the previously developed Test (F8) flowsheet comprising conventional flotation and gravity techniques. Minor modifications to the basic flowsheet were made in order to simulate the continuity of a plant flowsheet and to maximize concentrate grade and recoveries.

Detailed test results and other specific information with regard to methods and procedures, are documented in a report issued by Bacon, Donaldson and Associates Ltd.

Test samples for the variability testing were provided by North Coast Industries Ltd. as representative of the Bissett Creek ore with graphitic carbon contents ranging from 1.35% C(g) to 3.28% C(g) covering a wide grade spectrum of the ore body.

Metallurgical direction of testwork was provided by Cominco Engineering Services Ltd.

2.0 SUMMARY

Results of the variability testwork conducted on seven drill core samples of Bissett Creek graphite ore demonstrate that the material is highly amenable to upgrading utilizing the conventional flotation and gravity techniques as developed in the previous bench-scale (Test F8) and pilot plant testwork.

The variability tests produced flake graphite concentrates assaying 87 - 95% C(g) with 91 - 95% recoveries. The distribution to the +48 mesh flake concentrate was, on average, 52.36% of total graphitic carbon content of the feed and it ranged from a low of 47.3% to a high of 65.32%.

Samples used for this test program covered a wide spectrum of graphitic carbon values in the feed ranging from 1.35% to 3.28% . Summary of concentrate grade and recoveries along with their attendant head grades are presented in Table 2.1 below.

Metallurgical results of the variability tests do not demonstrate any meaningful correlation between head grades and overall recoveries or +48 mesh concentrate distributions. Overall concentrate recoveries at mid - low nineties do not appear to be sensitive to changing head grades. The difference in recoveries for the whole range of grades tested is probably within the margin of test error and too small to draw any relationships.

However, the distribution of +48 mesh concentrates fluctuated significantly for the samples tested in that; the lowest head grade sample (F11) achieved the highest distribution at 65.3% while the highest head grade sample (F16) produced a +48 mesh concentrate with 48.3% distribution. There is no satisfactory metallurgical explanation offered for this and further mineralogical examination of the ore samples is recommended.

The description of the "generic" flowsheet applied to all seven samples is as follows:

> A coarse primary grind followed by rougher, scavenger and cleaner flotation to produce a low weight and high recovery graphite concentrate. The cleaner concentrate is screened on a 48 mesh screen with the oversize being subjected to a sequential gravity - regrind closed circuit upgrading thereby producing a final +48 mesh concentrate.

The combined -48 mesh products are then combined and cleaned twice by flotation before screening on a 100 mesh screen. +100 mesh screen oversize forms the final -48+100 mesh concentrate and the -100 mesh product is cleaned twice more to produce a final -100 mesh concentrate. A light regrind is applied prior to both, -48 mesh and -100 mesh cleaner flotation steps to clean the surfaces of the flakes from physical attachments of gangue.

The general flowsheet described above is shown in Figure 2.1 and presented below. Throughout the test program no attempt was made to optimize or significantly change the flowsheet outside the general boundaries mentioned above.

The only reagent used throughout the test program was EKOF 452G at approximately 150 - 200 g/t addition rates. Pulp pH was neutral at 7.6 - 7.8 . Targeted primary grind was 96 -98% passing 20 mesh.

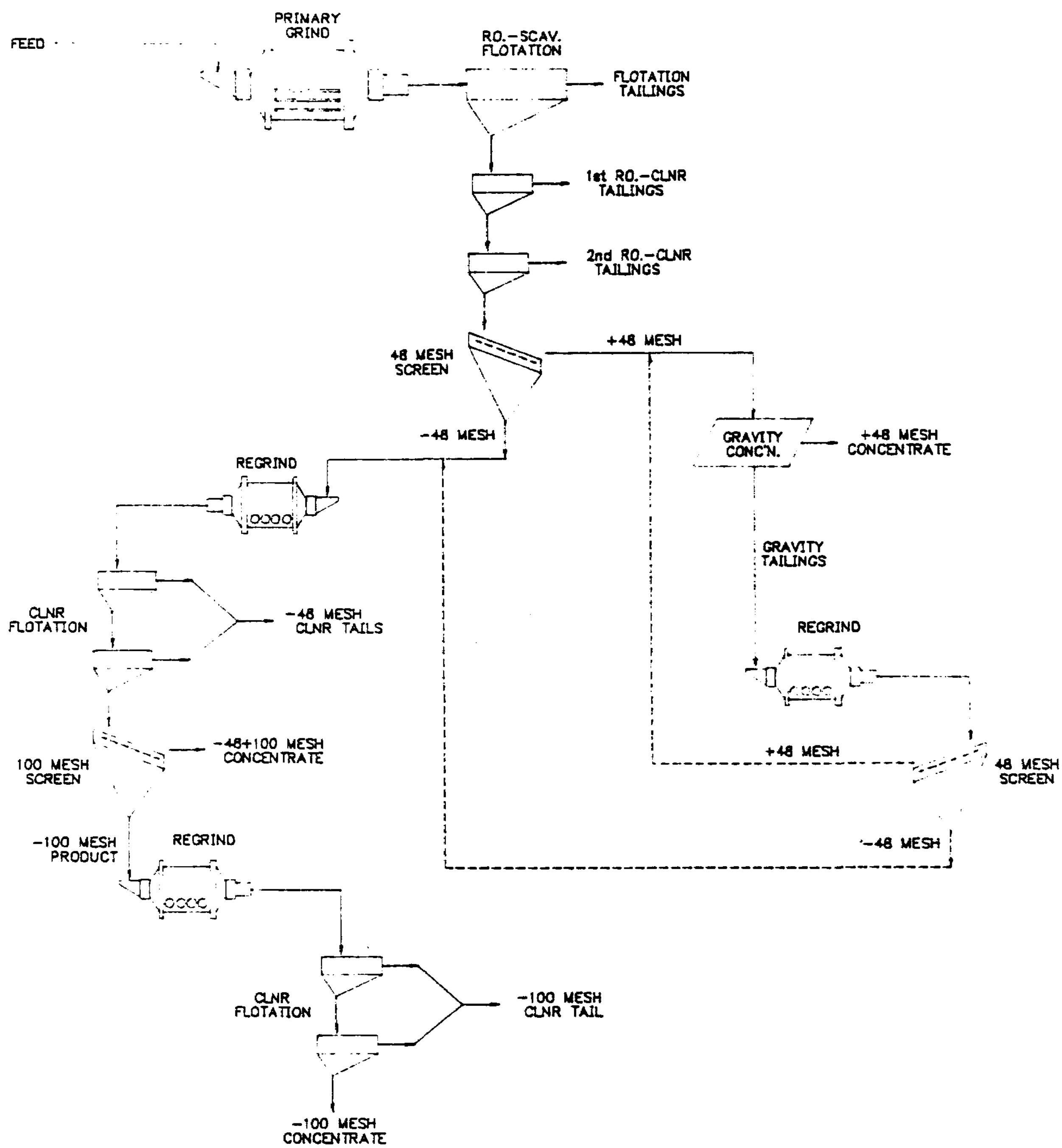
Table 2.1
BISSETT CREEK GRAPHITE
VARIABILITY TESTS F11 - F17
SUMMARY OF RESULTS

TEST No	HEAD GRADE %C(g)	PRODUCTS	GRADE %C(g)	RECOVERY %
F11	1.35	+48# Conc	93.34	65.32
		-48 + 100# Conc	90.30	15.45
		-100# Clnr Conc	79.19	12.25
		Total Conc:	90.70	93.01
F12	2.47	+48# Conc	89.03	56.84
		-48 + 100# Conc	84.30	20.75
		-100# Clnr Conc	84.15	16.43
		Total Conc:	87.07	94.02
F13	2.86	+48# Conc	91.73	52.36
		-48 + 100# Conc	89.10	26.40
		-100# Clnr Conc	88.31	14.86
		Total Conc:	90.42	93.62
F14	2.71	+48# Conc	92.16	50.78
		-48 + 100# Conc	93.30	23.40
		-100# Clnr Conc	90.05	19.54
		Total Conc:	91.99	93.72
F15	2.4	+48# CONC	94.51	47.30
		-48+100# CONC	95.28	32.37
		-100# CONC	94.23	11.99
		Total Conc:	94.74	91.66
F16	3.28	+48# CONC	92.89	48.33
		-48+100# CONC	93.30	33.31
		-100# CONC	91.83	13.34
		Total Conc:	92.88	94.98
F17	2.67	+48# CONC	92.28	49.43
		-48+100# CONC	94.29	31.18
		-100# CONC	92.61	14.26
		Total Conc:	92.98	94.87

Ref:f11-7SUM

Figure 2.1

BISSETT CREEK GRAPHITE GENERAL FLOWSHEET FOR VARIABILITY TESTS F11–F17



LAST UPDATE: 90/10/01

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Revision								
						App'd By		
Rev.	Date	By	Chk'd	App'd		Chk'd By		
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CESL

Job No. V.011

Title
BISSETT CREEK GRAPHITE
GENERAL FLOWSHEET FOR
VARIABILITY TESTS F11–F17

Drawing No. V011–A–001

Rev.

3.0 DISCUSSION

The seven variability tests were conducted in two groups with the first four tests F11 - F14, utilizing approximately 7 kg test charges.This proved to be an insufficient sample weight especially towards the end of each test flowsheet when there was only a few grams of material to work with. Therefore the second group of three tests, F15 - F17 were conducted with approximately 12 kg test charges.

All test samples were subjected to the same basic procedure and test conditions as follows:

1. Primary Grind :
   - 96 -98% passing 20 mesh
2. Rougher - Scavenger Flotation:
   - natural pH
   - 35% solids pulp density
   - 165 g/t collector/frother (EKOF 452G)
   - float to barren tail
3. Rougher - Cleaner Flotation:
   - up to 30 g/t additional collector/frother
   - selective flotation almost to barren tail
4. Screen "2nd Ro Clnr Conc" at 48 mesh
5. +48 mesh Fraction Upgrading:
   - Gravity concentration to produce final +48 mesh concentrates
   - Gravity tails are further upgraded by a combination of regrind/rescreen/gravity as would be done in a continuous operation.
6. -48 mesh Fraction Upgrading:
   - A sequential regrind/cleaner flotation/screening (100 mesh) to produce final -48+100 mesh concentrates.
   - up to 15 g/t additional collector/frother

7. -100 mesh Fraction Upgrading:

- A sequential regrind/cleaner flotation procedure similar to above to produce final -100 mesh concentrates.
- up to 15 g/t additional collector/frother

Detailed test procedures and flowsheets for individual tests are included in Appendix A.

Primary grinds for tests F11 to F14 were too coarse (75 - 93% passing 20 mesh) resulting in lower than expected rougher concentrate recoveries with the exception of F11 which produced a rougher concentrate assaying 56.1% at 94.23% recovery. Further regrind was therefore necessitated on rougher tails for F12, F13 and F14 prior to scavenger flotation. Additional scavenger cleaner concentrate recoveries were 2.76%, 5.52% and 1.24% respectively. The test charges for F15, F16 and F17 were stage ground until the desired grind was achieved therefore scavenger flotation was performed immediately preceding rougher flotation. Average size distribution of primary grinds (rougher or scavenger as the case may be) are as follows:

PRIMARY GRIND AVERAGE SIZE DISTRIBUTION FOR TESTS F11 - F17

SIZE FRACTION MESH		% RETAINED INDIV.	CUM.
	+20	2.0	2.0
-20	+48	36.3	38.3
-48	+100	28.1	66.4
-100	+200	16.8	83.2
-200		16.8	100.0

Final grind size distribution analysis for individual tests are included in Appendix B.

+48 mesh Circuit upgrading was conducted in one to three stages, each time utilizing the generic gravity/regrind/screen sequential processing approach which was developed in Test F8. This was done in order to achieve high quality +48 mesh concentrates and to simulate the process continuity of plant flowsheet. +48 mesh concentrates produced in each stage was kept separately and the screen undersize products were combined for -48 mesh upgrading by flotation.

Gravity upgrading was performed using a vanning plaque due to very small quantity samples instead of preferred shaking table. A superpanner was considered, however it was not used due to its almost perfect separation which could not be duplicated with shaking tables.

All seven samples were subjected to identical treatment for the -48 circuit upgrading. Combined -48 mesh products were lightly ground in a ceramic mill with ceramic ball charge prior to two stages of cleaner flotation and 100 mesh screening. -48 +100 mesh concentrate varied in grade from 84% C(g) to 94% C(g) at 15 - 33% distribution. -100 mesh screen undersize was again lightly ground in a ceramic mill before cleaner flotation which produced final -100 mesh concentrate.

PRODUCTS	GRADE % C(g)	RECOVERY %	DIST'N. %
+48 mesh concentrate	92.3	52.9	56.4
-48 +100 mesh concentrate	91.4	26.1	27.9
-100 mesh concentrate	88.6	14.7	15.7
TOTAL:	91.5	93.7	100.0

4.0 ASSAY METHODS

Assay methods used throughout this test program are as follows:

a. Mid - High Grade Samples; >15% C(g) : The method used is a Double Loss On Ignition procedure conducted at two temperature levels of 470°C and 900°C on dried samples. The procedure details were supplied by KHD Humboldt Wedag, and is the industry standard for graphitic carbon concentrates. All high grade samples were assayed in house at Bacon, Donaldson Associates Ltd. using this procedure.

b. Low grade samples; <15% C(g): The procedure used is a deviation of the Total Organic Carbon (TOC) method and is named HNO3/LOI/Leco procedure. In this method the dry sample is roasted in an oven at 400°C for Loss On Ignition following a HNO3 acid leach and the weight loss is recorded. Later the sample is combusted in a Leco induction furnace for total carbon and the difference in weight losses is reported as % graphitic carbon. Low grade samples throughout this testwork were assayed by Chemex Labs in Vancouver using this procedure.

5.0 CONCLUSIONS

1. Seven Bissett Creek graphite ore samples tested for variability in this investigation are highly amenable to upgrading by the conventional flotation and gravity techniques utilized in the previously developed Test (F8) and pilot plant flowsheets.

2. The overall recoveries and concentrate grades achieved in these tests compare favourably with those of the Test (F8) and pilot plant runs. A metallurgically meaningful correlation does not seem to exists between head grade versus overall recovery or the +48 mesh concentrate recovery.

3. The distribution of +48 mesh flake concentrate at 52.36% on average is comparatively lower than achieved previously. The reasons for this is not fully understood and further mineralogical examination of the samples is recommended.

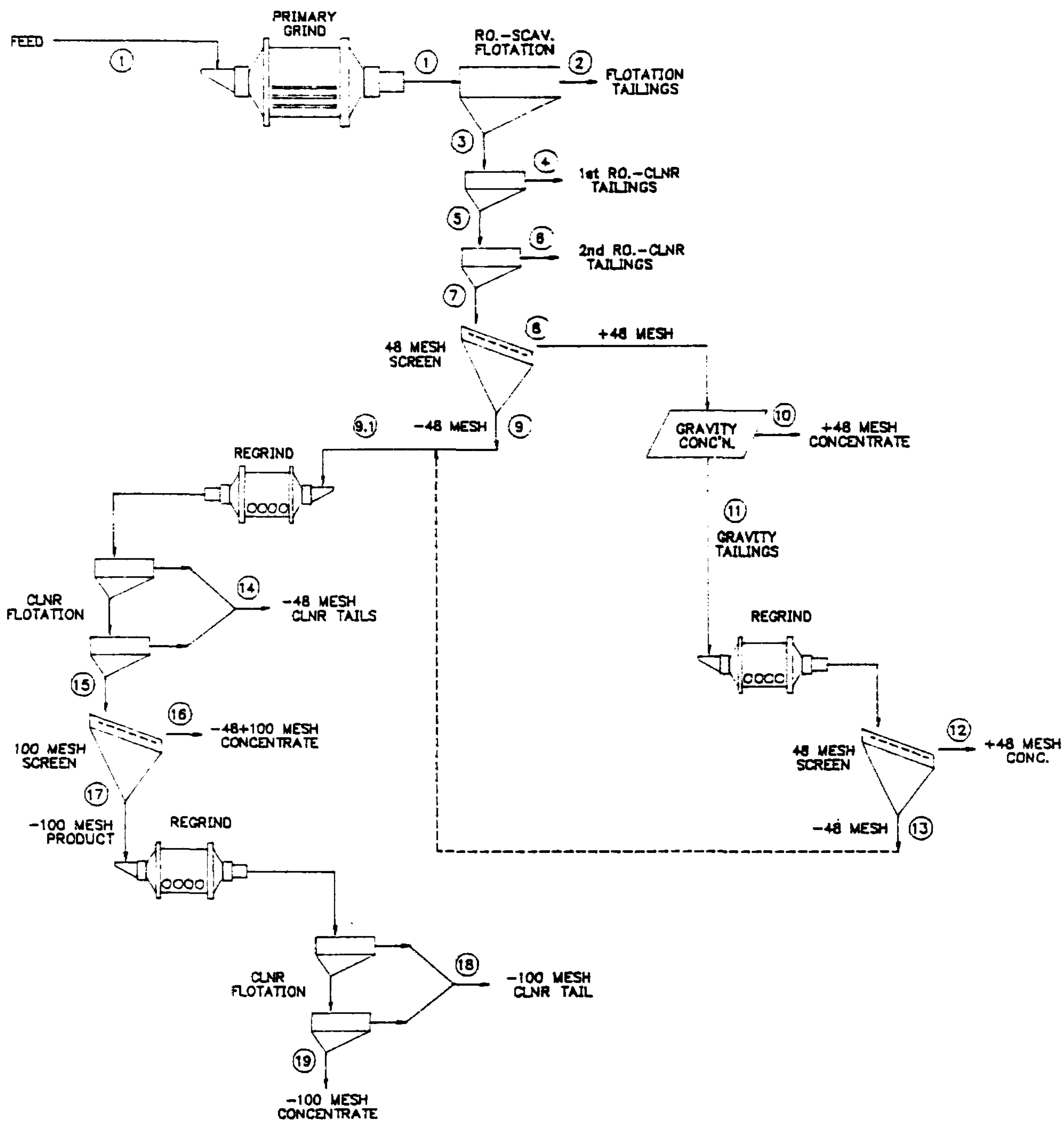
4. Following aspects of the flowsheet utilized makes the process simple and worth mentioning:

   a. Processing techniques used are all conventional methods of crushing, grinding, froth flotation and gravity separation.

   b. For flotation, a single and readily available collector/frother reagent is used and pH regulation is not required.

   c. Coarse primary grind required at 98% passing 20 mesh to preserve coarse flake size and quality is also a cost advantage in a production plant.

BISSETT CREEK GRAPHITE
VARIABILITY TEST No.F11
FLOWSHEET



CAD FILE NAME: V011A002 LAST UPDATE: 90/10/01

Revision								CESL	Title BISSETT CREEK GRAPHITE VARIABILITY TEST No.F11 FLOWSHEET
					App'd By				
	Rev.	Date	By	Chk'd	App'd	Chk'd By			
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					Dsgn'd By	H.M.B.	90/10/01		

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NORTH COAST INDUSTRIES LTD.
BISSETT CREEK GRAPHITE VARIABILITY TEST No F11
METALLURGICAL BALANCE

	PRODUCTS	WEIGHTS g	%	ASSAY %C(g)	RECOVERY %
1)	Feed	7,383.7	100.00	1.35	100.00
2)	Ro Tail	7,215.6	97.72	0.08	5.77
3)	Ro Conc	168.1	2.28	56.07	94.23
4)	1st Ro Clnr Tail	39.0	0.53	1.16	0.45
5)	1st Ro Clnr Conc	129.1	1.75	72.66	93.78
6)	2nd Ro Clnr Tail	10.5	0.14	0.92	0.10
7)	2nd Ro Clnr Conc	118.6	1.61	79.01	93.68
8)	+48# 2nd Ro Clnr Conc	77.4	1.05	87.66	67.83
9)	-48# 2nd Ro Clnr Conc	41.2	0.56	62.76	25.85
	+48# Circuit:				
10)	1st Pass Grav Conc	19.1	0.26	95.20	18.18
11)	1st Pass Grav Tail	58.3	0.79	85.19	49.65
12)	1st P G Tail Scr O/S	50.9	0.69	92.64	47.14
13)	1st P G Tail Scr U/S	7.4	0.10	33.92	2.51
10+12)	Comb'd +48# Grav Conc	70.0	0.95	93.34	65.32
	-48# Circuit:				
9.1)	Comb'd -48# Cct Feed Products (9+13)	48.6	0.66	58.37	28.36
14)	-48# Clnr Tail	14.6	0.20	2.81	0.41
15)	-48# Clnr Conc	34.0	0.46	82.32	27.95
16)	-48 + 100# Conc	17.1	0.23	90.30	15.45
17)	-100# Product	16.9	0.23	74.22	12.50
18)	-100# Clnr Tail	1.4	0.02	18.70	0.26
19)	-100# Clnr Conc	15.5	0.21	79.19	12.25

Ref:F11PRN

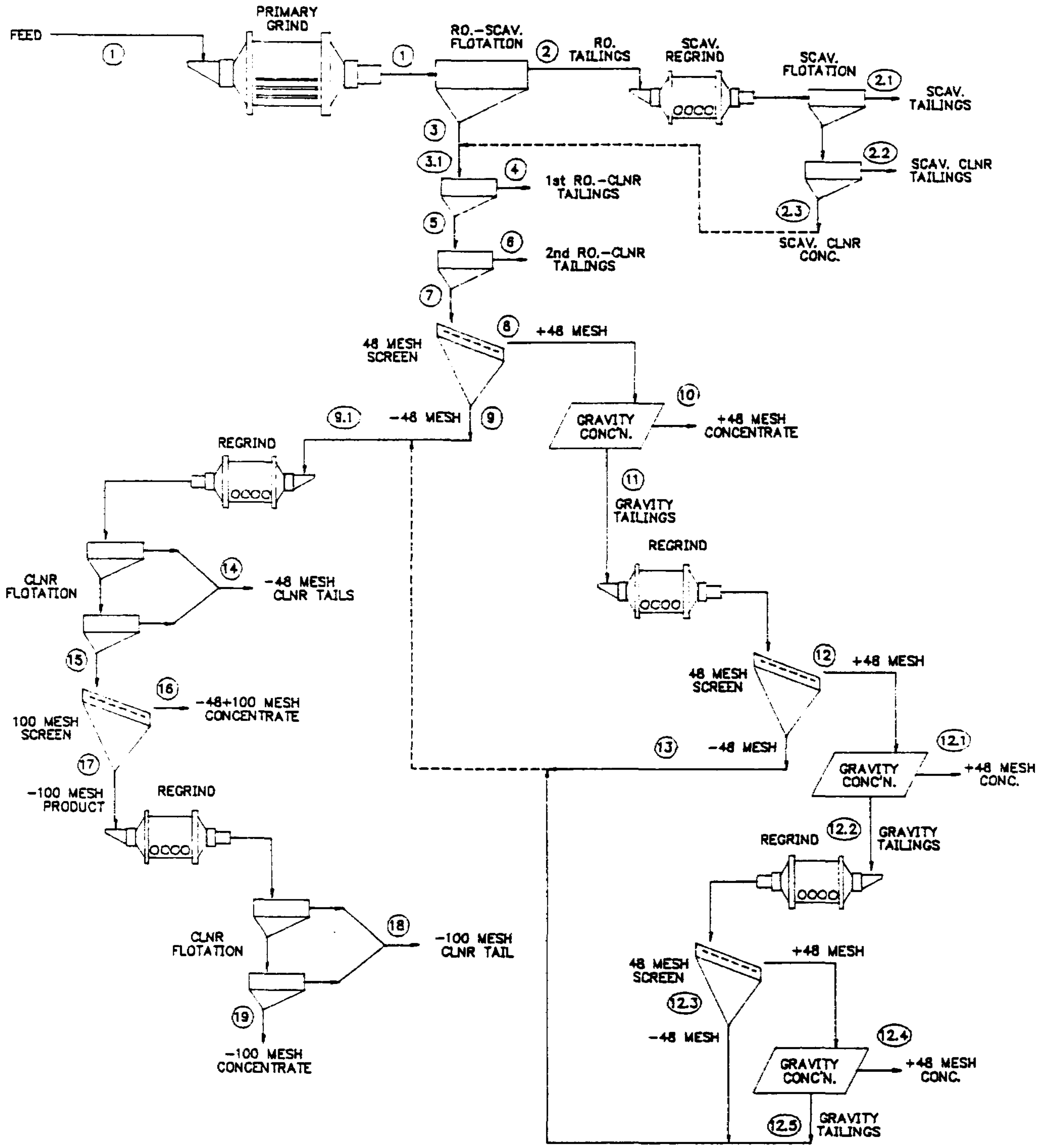
NORTH COAST INDUSTRIES LTD.
BISSETT CREEK GRAPHITE VARIABILITY TESTS
PRIMARY GRIND SIZE DISTRIBUTION ANALYSIS

Size Fraction	F11		F12		F13		F14		F15		F16		F17	
	% Retained		% Retained		% Retained		% Retained		% Retained		% Retained		% Retained	
mesh	Indiv.	Cum.	Indiv.	Cum.	Indiv.	Cum.	Indiv.	Cum.	Indiv.	Cum.	Indiv.	Cum.	Indiv.	Cum.
+ 20	9.6	9.6	0.3	0.3	0.4	0.4	0.7	0.7	1.1	1.1	0.4	0.4	1.5	1.5
− 20 + 48	45.2	54.8	35.3	35.6	32.0	32.4	33.8	34.5	35.9	37.0	35.3	35.7	36.4	37.9
− 48 +100	21.5	76.3	28.9	64.5	24.7	57.1	29.8	64.3	29.5	66.5	32.2	67.9	30.3	68.2
−100 +200	11.8	88.1	17.5	82.0	19.5	76.6	18.3	82.6	16.9	83.4	17.3	85.2	16.5	84.7
−200	11.9	100.0	18.0	100.0	23.4	100.0	17.4	100.0	16.6	100.0	14.9	100.1	15.3	100.0

AVERAGE SIZE DISTRIBUTION
FOR TESTS F11 − F17

Size Fraction	% Retained	
mesh	Indiv.	Cum.
+ 20	2.0	2.0
− 20 + 48	36.3	38.3
− 48 +100	28.1	66.4
−100 +200	16.8	83.2
−200	16.8	100.0

BISSETT CREEK GRAPHITE
VARIABILITY TEST No.F12
FLOWSHEET



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					App'd By			CESL	
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						Dsgn'd By	H.M.B.	90/10/01	Job No. V.011	Drawing No. V011-A-007	Rev.

NORTH COAST INDUSTRIES LTD.
BISSETT CREEK GRAPHITE VARIABILITY TEST No F12
METALLURGICAL BALANCE

	PRODUCTS	WEIGHTS g	%	ASSAY %C(g)	RECOVERY %
1)	Feed	7,160.1	100.00	2.47	100.00
2)	Ro Tail	6,847.3	95.63	0.19	7.36
3)	Ro Conc	312.8	4.37	52.32	92.64
2.1)	Scav. Tail	6,753.8	94.33	0.11	4.25
2.2)	Scav Clnr Tail	60.6	0.85	1.05	0.36
2.3)	Scav Clnr Conc	32.9	0.46	14.80	2.76
3.1)	Ro + Scav Conc	345.7	4.83	48.75	95.39
4)	1st Ro Clnr Tail	80.1	1.12	0.66	0.30
5)	1st Ro Clnr Conc	265.6	3.71	63.26	95.09
6)	2nd Ro Clnr Tail	16.5	0.23	1.31	0.12
7)	2nd Ro Clnr Conc	249.1	3.48	67.36	94.97
8)	+48# 2nd Ro Clnr Conc	177.2	2.47	68.75	68.95
9)	−48# 2nd Ro Clnr Conc	71.9	1.00	63.94	26.02
	+48# Circuit:				
10)	1st Pass Grav Conc	27.9	0.39	91.40	14.46
11)	1st Pass Grav Tail	149.2	2.08	64.51	54.49
12)	1st P G Tail Scr O/S	106.5	1.49	79.41	47.85
13)	1st P G Tail Scr U/S	42.8	0.60	27.42	6.64
12.1)	2nd Pass Grav Conc 1−7	62.5	0.87	87.96	31.10
12.2)	2nd Pass Grav Tail	44.0	0.61	67.27	16.75
12.3)	2nd P G Tail Scr U/S	9.2	0.13	39.94	2.09
12.4)	3rd Pass Grav Conc	22.4	0.31	89.06	11.28
12.5)	3rd Pass Grav Tail	12.4	0.17	48.26	3.38
	Comb'd +48# Grav Conc (10+12.1+12.4)	112.8	1.58	89.03	56.84
	Comb'd +48# Grav Tail (13+12.3+12.5)	64.4	0.90	33.22	12.11
	−48# Circuit:				
9.1)	Comb'd −48# Cct Feed (9+13+12.3+12.5)	136.3	1.90	49.43	38.13
14)	−48# Clnr Tail	56.1	0.78	2.01	0.64
15)	−48# Clnr Conc	80.2	1.12	82.56	37.49
16)	−48 + 100# Conc	43.5	0.61	84.30	20.75
17)	−100# Product	36.7	0.51	80.50	16.74
18)	−100# Clnr Tail	2.3	0.03	24.58	0.31
19)	−100# Clnr Conc	34.5	0.48	84.15	16.43

Ref:F12PRN

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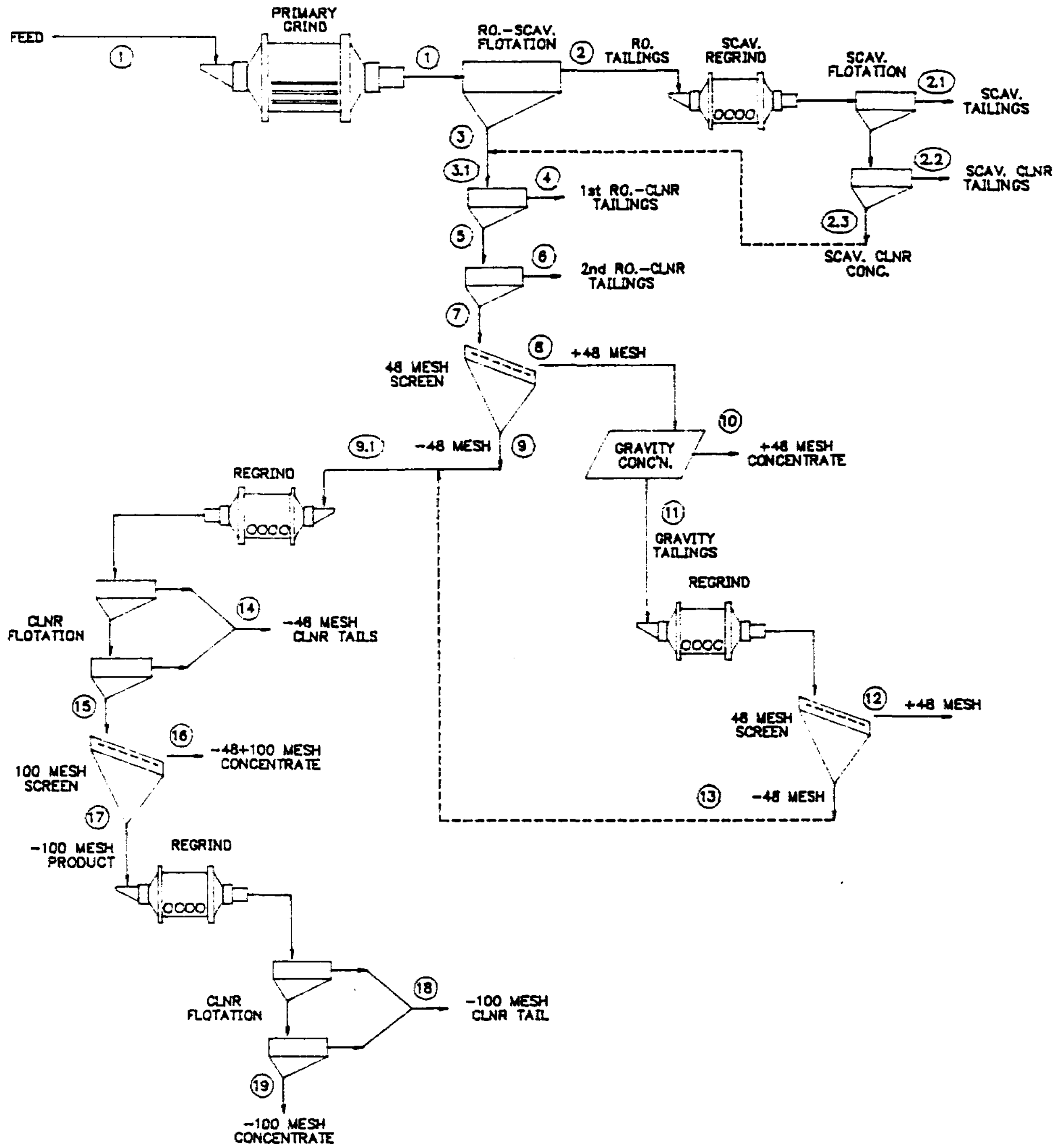
BISSETT CREEK GRAPHITE
VARIABILITY TEST No.F13
FLOWSHEET



Revision									Title
									BISSETT CREEK GRAPHITE VARIABILITY TEST No.F13 FLOWSHEET
					App'd By			CESL	
	Rev.	Date	By	Chk'd	App'd	Chk'd By			
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						Dsgn'd By	H.M.B.	90/10/01	Job No. V.011

Drawing No. V011-A-008 | Rev.

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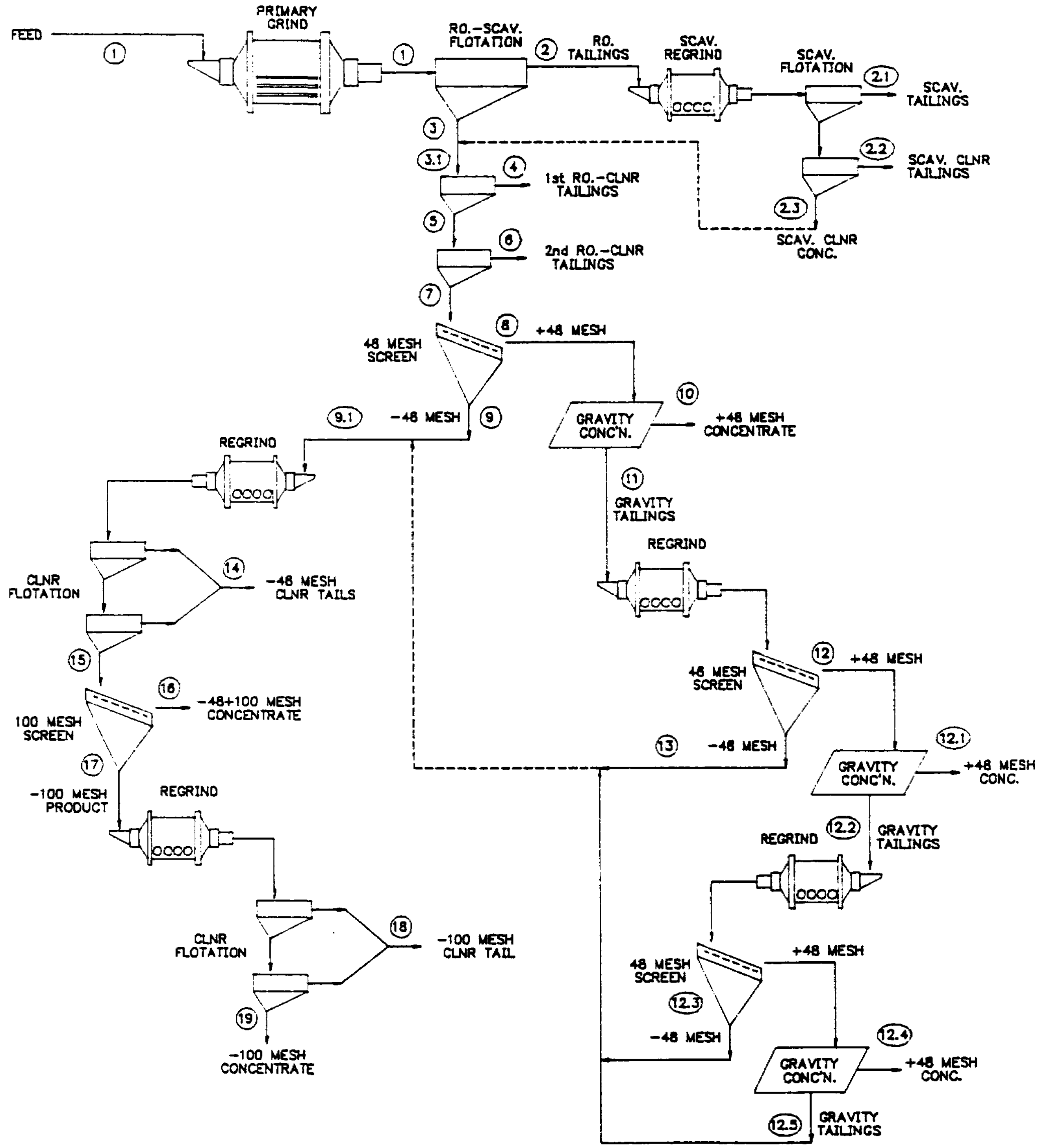
NORTH COAST INDUSTRIES LTD.
BISSETT CREEK GRAPHITE VARIABILITY TEST No F13
METALLURGICAL BALANCE

	PRODUCTS	WEIGHTS g	%	ASSAY %C(g)	RECOVERY %
1)	Feed	7,174.0	100.00	2.86	100.00
2)	Ro Tail	6,853.8	95.54	0.31	10.35
3)	Ro Conc	320.2	4.46	57.49	89.65
2.1)	Scav. Tail	6,710.1	93.53	0.14	4.46
2.2)	Scav Clnr Tail	94.6	1.32	0.80	0.37
2.3)	Scav Clnr Conc	49.1	0.68	23.10	5.52
3.1)	Ro + Scav Conc	369.3	5.15	52.92	95.18
4)	1st Ro Clnr Tail	101.4	1.41	0.81	0.40
5)	1st Ro Clnr Conc	267.9	3.73	72.63	94.78
6)	2nd Ro Clnr Tail	19.2	0.27	1.60	0.15
7)	2nd Ro Clnr Conc	248.7	3.47	78.11	94.63
8)	+48# 2nd Ro Clnr Conc	141.8	1.98	81.54	56.32
9)	-48# 2nd Ro Clnr Conc	106.9	1.49	73.56	38.31
	+48# Circuit:				
10)	1st Pass Grav Conc	30.7	0.43	94.90	14.18
11)	1st Pass Grav Tail	111.1	1.55	77.85	42.14
12)	1st P G Tail Scr O/S	86.5	1.21	90.60	38.18
13)	1st P G Tail Scr U/S	24.6	0.34	33.03	3.96
10+12)	Comb'd +48# Grav Conc	117.2	1.63	91.73	52.36
	-48# Circuit:				
9.1)	Comb'd -48# Cct Feed (9+13)	131.55	1.83	65.98	42.27
14)	-48# Clnr Tail	34.0	0.47	3.62	0.60
15)	-48# Clnr Conc	97.6	1.36	87.69	41.67
16)	-48 + 100# Conc	60.8	0.85	89.10	26.40
17)	-100# Product	36.7	0.51	85.35	15.27
18)	-100# Clnr Tail	2.2	0.03	38.64	0.41
19)	-100# Clnr Conc	34.6	0.48	88.31	14.86

Ref:F13PRN

BISSETT CREEK GRAPHITE
VARIABILITY TEST No.F14
FLOWSHEET



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Revision								Title
								BISSETT CREEK GRAPHITE VARIABILITY TEST No.F14 FLOWSHEET
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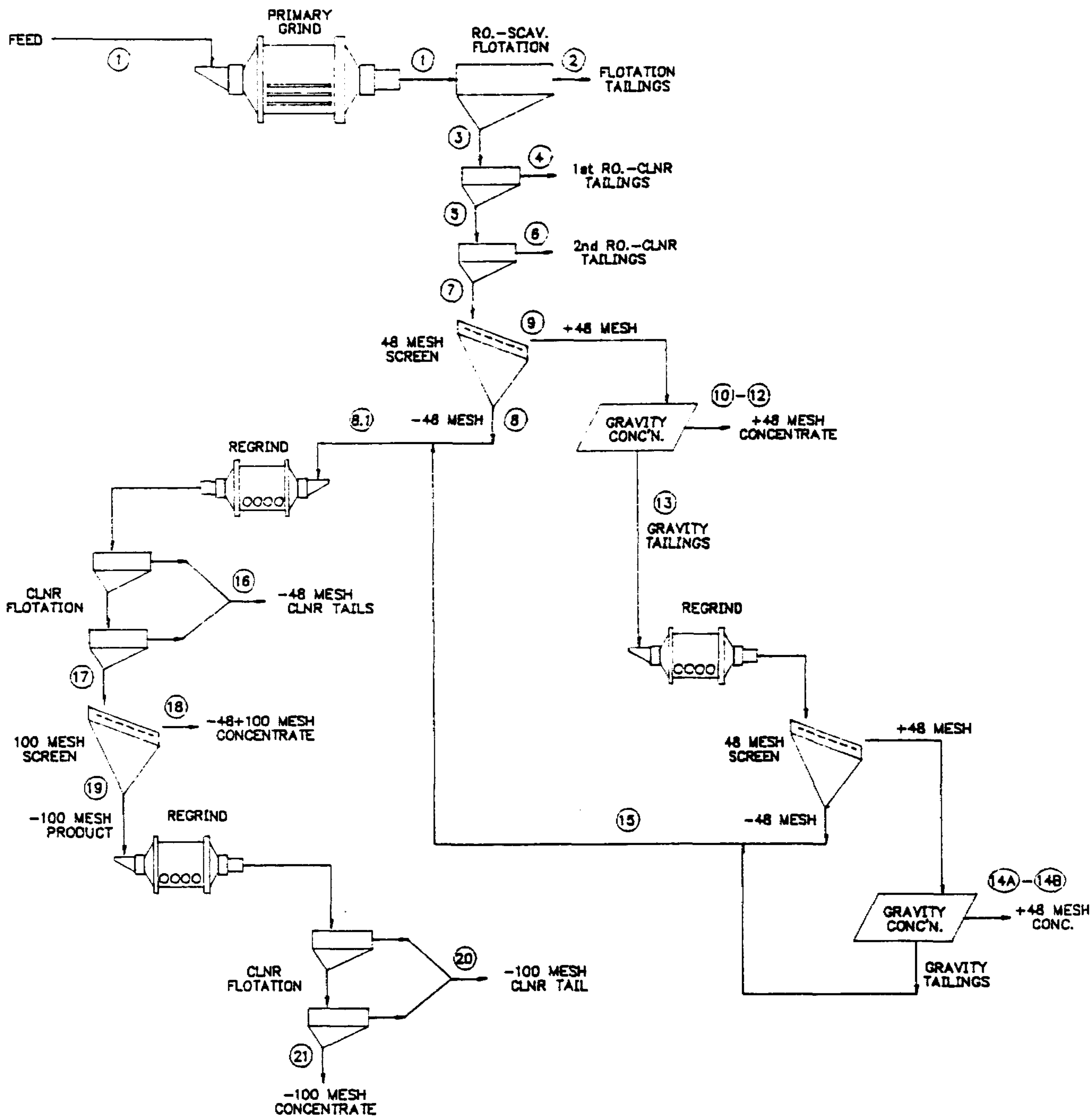
					Dsgn'd By	H.M.B.	90/10/01	

NORTH COAST INDUSTRIES LTD.
BISSETT CREEK GRAPHITE VARIABILITY TEST No F14
METALLURGICAL BALANCE

	PRODUCTS	WEIGHTS g	%	ASSAY %C(g)	RECOVERY %
1)	Feed	7,208.1	100.00	2.71	100.00
2)	Ro Tail	6,912.7	95.90	0.16	5.67
3)	Ro Conc	295.4	4.10	62.27	94.33
2.1)	Scav. Tail	6,864.3	95.23	0.12	4.20
2.2)	Scav Clnr Tail	32.0	0.44	1.36	0.22
2.3)	Scav Clnr Conc	16.4	0.23	14.80	1.24
3.1)	Ro + Scav Conc	311.8	4.33	59.77	95.57
4)	1st Ro Clnr Tail	64.2	0.89	1.70	0.56
5)	1st Ro Clnr Conc	247.6	3.44	74.82	95.01
6)	2nd Ro Clnr Tail	10.4	0.14	3.69	0.20
7)	2nd Ro Clnr Conc	237.2	3.29	77.95	94.82
8)	+48# 2nd Ro Clnr Conc	141.9	1.97	76.81	55.91
9)	-48# 2nd Ro Clnr Conc	95.3	1.32	79.65	38.91
	+48# Circuit:				
10)	1st Pass Grav Conc	25.4	0.35	94.00	12.26
11)	1st Pass Grav Tail	116.5	1.62	73.06	43.65
12)	1st P G Tail Scr O/S	94.6	1.31	84.32	40.91
13)	1st P G Tail Scr U/S	21.9	0.30	24.43	2.74
12.1)	2nd Pass Grav Conc 1-7	57.0	0.79	93.16	27.24
12.2)	2nd Pass Grav Tail	37.6	0.52	70.91	13.67
12.3)	2nd P G Tail Scr U/S	5.0	0.07	12.97	0.33
12.4)	3rd Pass Grav Conc	25.0	0.35	88.00	11.28
12.5)	3rd Pass Grav Tail	7.6	0.11	52.56	2.05
	Comb'd +48# Grav Conc (10+12.1+12.4)	107.4	1.49	92.16	50.78
	Comb'd +48# Grav Tail (13+12.3+12.5)	34.5	0.48	29.00	5.13
	-48# Circuit:				
9.1)	Comb'd -48# Cct Feed (9+13+12.3+12.5)	129.7	1.80	66.19	44.04
14)	-48# Clnr Tail	36.9	0.51	4.03	0.76
15)	-48# Clnr Conc	92.9	1.29	90.86	43.28
16)	-48 + 100# Conc	48.9	0.68	93.30	23.40
17)	-100# Product	44.0	0.61	88.15	19.88
18)	-100# Clnr Tail	1.7	0.02	39.71	0.34
19)	-100# Clnr Conc	42.3	0.59	90.05	19.54

BISSETT CREEK GRAPHITE
VARIABILITY TEST No.F15
FLOWSHEET



CAD FILE NAME: V011A003 LAST UPDATE: 90/10/01

Revision								CESL	Title BISSETT CREEK GRAPHITE VARIABILITY TEST No.F15 FLOWSHEET	
					App'd By					
	Rev.	Date	By	Chk'd	App'd	Chk'd By				
Issue:					Drawn By	F.F.	90/10/01	Job No. V.011	Drawing No. V011-A-003	Rev.
					Dsgn'd By	H.M.B.	90/10/01			

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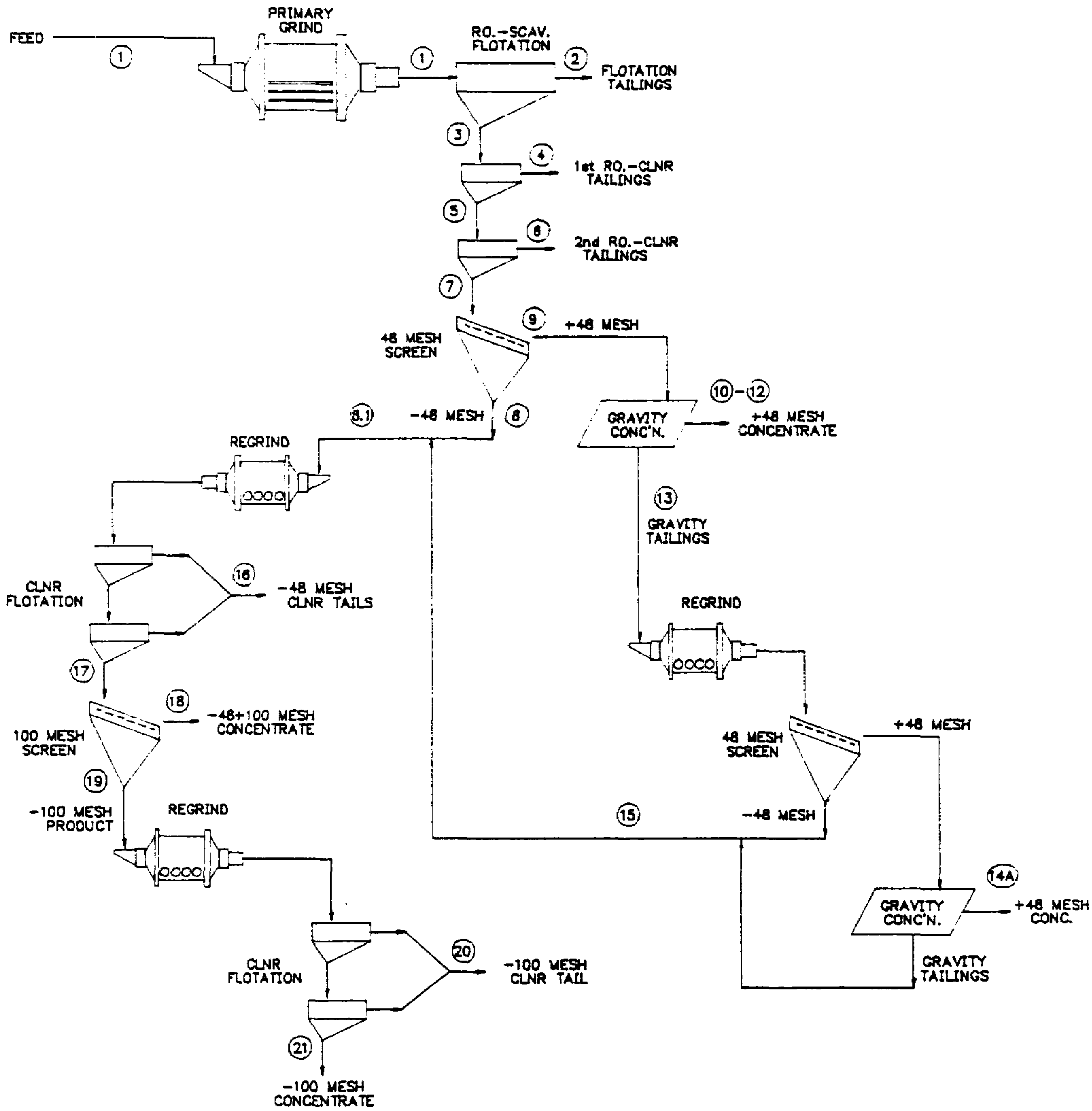
NORTH COAST INDUSTRIES LTD.
BISSETT CREEK GRAPHITE VARIABILITY TEST No F15
METALLURGICAL BALANCE

	PRODUCTS	WEIGHTS g	%	ASSAY %C(g)	RECOVERY %
1)	Feed	11,798.4	100.00	2.40	100.00
2)	Ro - Scav Tail	11,395.3	96.58	0.18	7.23
3)	Ro-Scav Conc	403.1	3.42	65.30	92.77
4)	1st Ro Clnr Tail	82.0	0.70	0.95	0.27
5)	1st Ro Clnr Conc	321.1	2.72	81.73	92.50
6)	2nd Ro Clnr Tail	14.2	0.12	4.65	0.23
7)	2nd Ro Clnr Conc	306.9	2.60	85.30	92.26
8)	-48# 2nd Ro Clnr Conc	153.3	1.30	82.06	44.34
9)	+48# 2nd Ro Clnr Conc	153.6	1.30	87.42	47.33
9)	" " " (Calc'd)	153.6	1.30	88.52	47.92
	+48# Circuit:				
10-12)	1st Pass Grav Conc	131.4	1.11	94.67	43.85
13)	1st Pass Grav Tail	22.2	0.19	52.13	4.08
14A)	2nd Pass Grav Conc	5.2	0.04	93.64	1.72
14B)	3rd Pass Grav Conc	5.4	0.05	91.32	1.74
15)	Comb'd +48# Grav Tails (13	11.6	0.10	15.27	0.62
	Comb'd +48# Grav Conc (10-12 + 14A + 14B)	142.0	1.20	94.51	47.30
	-48# Circuit:				
8.1)	Comb'd -48# Feed (8+15)	164.9	1.40	77.36	44.96
16.	-48# Clnr Tails	18.6	0.16	8.32	0.55
17.	-48# Clnr Conc	146.3	1.24	86.14	44.42
18.	-48+100# Conc	96.4	0.82	95.28	32.37
19.	-100# Product	49.9	0.42	68.49	12.05
20.	-100# Clnr Tails	13.81	0.12	1.22	0.06
21.	-100# Conc	36.1	0.31	94.23	11.99

Ref:F15PRN

BISSETT CREEK GRAPHITE
VARIABILITY TEST No.F16
FLOWSHEET



CAD FILE NAME: V011A004 LAST UPDATE: 90/10/01

Revision							
					App'd By		
Rev.	Date	By	Chk'd	App'd	Chk'd By		
Issue:					Drawn By	F.F.	90/10/01
					Dsgn'd By	H.M.B.	90/10/01

CESL	Title: BISSETT CREEK GRAPHITE VARIABILITY TEST No.F16 FLOWSHEET	
Job No. V.011	Drawing No. V011-A-004	Rev.

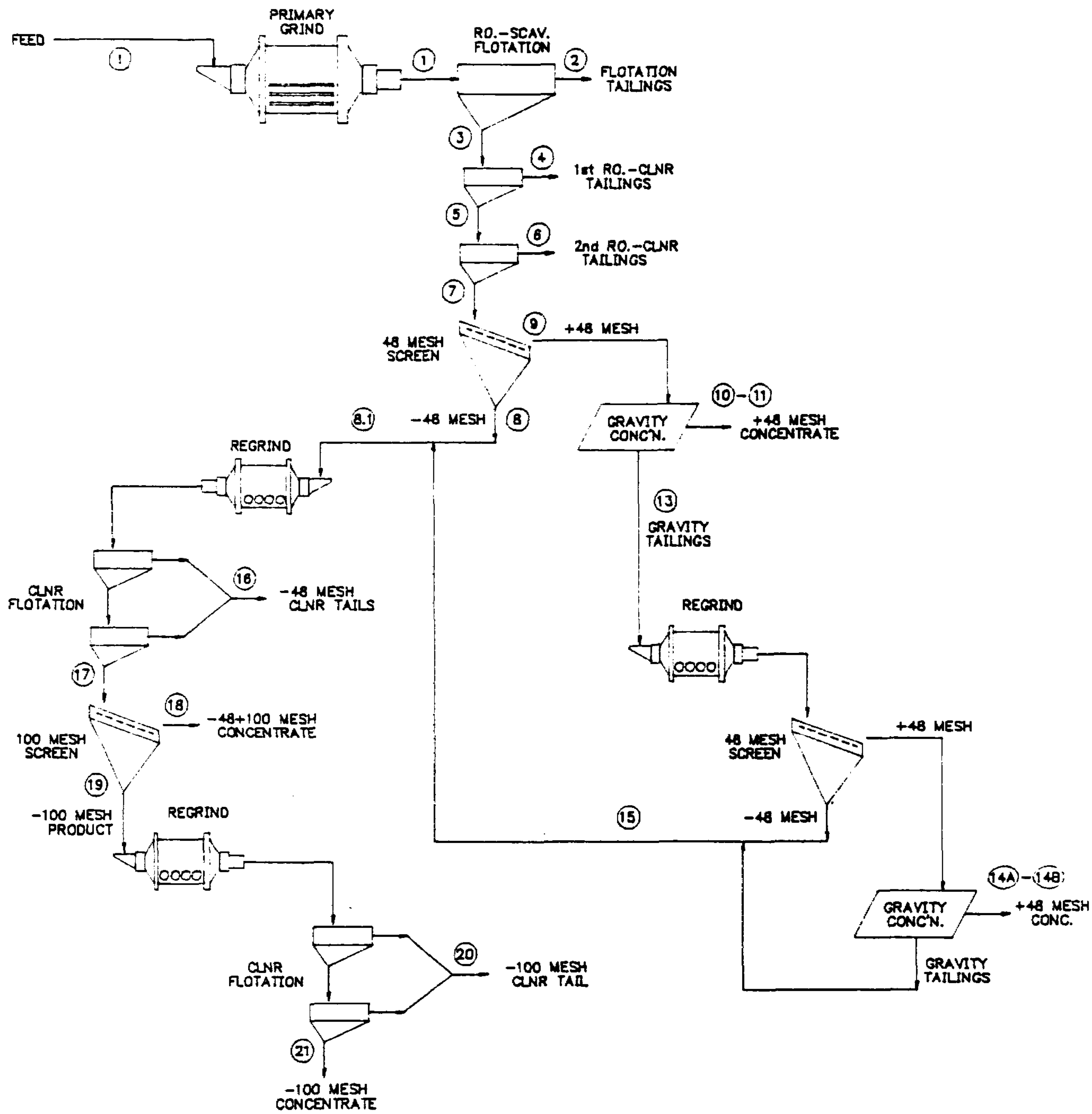
CESL\BISCRK\hmb

NORTH COAST INDUSTRIES LTD.
BISSETT CREEK GRAPHITE VARIABILITY TEST No F16
METALLURGICAL BALANCE

	PRODUCTS	WEIGHTS g	WEIGHTS %	ASSAY %C(g)	RECOVERY %
1)	Feed	11,551.9	100.00	3.28	100.00
2)	Ro - Scav Tail	11,053.0	95.68	0.13	3.79
3)	Ro-Scav Conc	498.9	4.32	73.16	96.21
4)	1st Ro Clnr Tail	66.7	0.58	1.11	0.20
5)	1st Ro Clnr Conc	432.2	3.74	84.28	96.02
6)	2nd Ro Clnr Tail	13.5	0.12	4.67	0.17
7)	2nd Ro Clnr Conc	418.7	3.62	86.85	95.85
8)	-48# 2nd Ro Clnr Conc	204.4	1.77	86.29	46.49
9)	+48# 2nd Ro Clnr Conc	214.3	1.86	88.77	50.14
9)	" " " (Calc'd)	214.3	1.86	87.38	49.36
	+48# Circuit:				
10-12)	1st Pass Grav Conc	190.3	1.65	92.86	46.58
13)	1st Pass Grav Tail	24.0	0.21	43.99	2.78
14A)	2nd Pass Grav Conc	7.1	0.06	93.64	1.75
15)	Comb'd +48# Grav Tails	16.9	0.15	23.13	1.03
	Comb'd +48# Grav Conc (10-12 + 14A)	197.4	1.71	92.89	48.33
	-48# Circuit:				
8.1)	Comb'd -48# Feed (8+15)	221.3	1.92	81.47	47.52
16.	-48# Clnr Tails	22.5	0.19	12.90	0.77
17.	-48# Clnr Conc	198.8	1.72	89.24	46.76
18.	-48+100# Conc	135.5	1.17	93.30	33.31
19.	-100# Product	63.3	0.55	80.54	13.44
20.	-100# Clnr Tails	8.22	0.07	4.86	0.11
21.	-100# Conc	55.1	0.48	91.83	13.34

REF:F16PRN

BISSETT CREEK GRAPHITE
VARIABILITY TEST No.F17
FLOWSHEET



CAD FILE NAME: V011A005 LAST UPDATE: 90/10/01

Revision							
					App'd By		
Rev.	Date	By	Chk'd	App'd	Chk'd By		
Issue:					Drawn By	F.F.	90/10/01
					Dsgn'd By	H.M.B.	90/10/01

CESL

Job No. V.011

Title BISSETT CREEK GRAPHITE VARIABILITY TEST No.F17 FLOWSHEET

Drawing No. V011-A-005

Rev.

CESL\BISCRK\hmb

NORTH COAST INDUSTRIES LTD.
BISSETT CREEK GRAPHITE VARIABILITY TEST No F17
METALLURGICAL BALANCE

	PRODUCTS	WEIGHTS g	%	ASSAY %C(g)	RECOVERY %
1)	Feed	11,891.9	100.00	2.67	100.00
2)	Ro - Scav Tail	11,432.0	96.13	0.10	3.60
3)	Ro-Scav Conc	459.9	3.87	66.52	96.40
4)	1st Ro Clnr Tail	85.4	0.72	1.04	0.28
5)	1st Ro Clnr Conc	374.5	3.15	81.45	96.12
6)	2nd Ro Clnr Tail	16.6	0.14	5.74	0.30
7)	2nd Ro Clnr Conc	357.9	3.01	84.96	95.82
8)	-48# 2nd Ro Clnr Conc	173.9	1.46	83.54	45.78
9)	+48# 2nd Ro Clnr Conc	184.0	1.55	86.85	50.36
9)	" " " (Calc'd)	184.0	1.55	86.30	50.04
	+48# Circuit:				
10-11)	1st Pass Grav Conc	146.8	1.23	92.68	42.88
13)	1st Pass Grav Tail	37.2	0.31	61.10	7.16
14A)	2nd Pass Grav Conc	18.0	0.15	91.21	5.17
14B)	3rd Pass Grav Conc	5.2	0.04	84.46	1.38
15)	Comb'd +48# Grav Tails	14.0	0.12	13.70	0.60
	Comb'd +48# Grav Conc (10-11 + 14A + 14B)	170.0	1.43	92.28	49.43
	-48# Circuit:				
8.1)	Comb'd -48# Feed (8+15)	187.9	1.58	78.34	46.38
16.	-48# Clnr Tails	29.5	0.25	9.55	0.89
17.	-48# Clnr Conc	158.4	1.33	91.13	45.50
18.	-48+100# Conc	104.9	0.88	94.29	31.18
19.	-100# Product	53.5	0.45	84.95	14.32
20.	-100# Clnr Tails	4.64	0.04	4.20	0.06
21.	-100# Conc	48.9	0.41	92.61	14.26

Ref:F17PRN

TEST F11 PROCEDURES

TESTWORK PROCEDURE

Test No: M90-088 F11 **Date:** 5-Jun-90

Purpose: Variability Testing:
1) Duplicate F8 procedure

Composite : Sample # 4

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Grind (Target: 95-98% -800 microns)	3		1/2 regular rod charge 50-60% solids
Flotation:			
Condition	5		40% solids pH= 8.2
		150	EKOF 452 G
Rougher	4		
Condition	2	15	EKOF 452 G
Scavenger (to barren tail)	2		pH= 8.6
1st Ro Cleaner	5		
Condition	5	15	EKOF 452 G
1st Ro Cleaner Scavenger	2		
2nd Ro Cleaner	6		
Condition	3	3	EKOF 452 G
2nd Ro Cleaner Scavenger	0.5		
Screening: Screen 2nd rougher cleaner concentrate into +48 mesh and -48 mesh			
Gravity Concentration: Hand Panning			+48 mesh graphite conc

TESTWORK PROCEDURE

Test No: M90-088 F11 **Date:** 5-Jun-90

Purpose: Variability Testing:

Regrind / cleaning procedure for -48 mesh Rougher 2nd Cleaner Conc

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Regrind (25 - 30% solids) (Ceramic mill & Full ceramic media charge)	5		30 grams of -48 mesh Ro 2nd Cl Conc
Cleaning Flotation:			
-48# Cleaner 1	6		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	2		
-48# Cleaner 2	6		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	2		
Screening: Wet Screen Graphite -48# 2nd Cleaner Concentrate at 100 mesh			

TESTWORK PROCEDURE

Test No: M90-088 F11 Date: 20-Jun-90

Purpose : Variability Testing: -100 Mesh Flotation
1)Utilize most rigorous regrind (full ceramic charge, 3 minutes)
2)Standard 2-stage cleaning flotation

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Regrind	3		full ceramic charge
Cleaning Flotation:			regrind product
-100# Cleaner 1	6		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	3		
-100# Cleaner 2	4		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	3		

TEST F12 PROCEDURES

TESTWORK PROCEDURE

Test No: M90-088 F12 Date: 5-Jun-90

Purpose: Variability Testing:
1) Duplicate F8 procedure

Composite : Sample # 6

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Grind (Target: 95-98% -800 microns)	3		1/2 regular rod charge 50-60% solids
Flotation:			
Condition	5		40% solids pH= 6.4
		150	EKOF 452 G
Rougher	6		
Condition	2	15	EKOF 452 G
Scavenger (to barren tail)	4		pH= 6.6
1st Ro Cleaner	6		
Condition	1	2	EKOF 452 G
1st Ro Cleaner Scavenger	1		
2nd Ro Cleaner	5		
Condition	1	2	EKOF 452 G
2nd Ro Cleaner Scavenger	1		
Screening: Screen 2nd rougher cleaner concentrate into +48 mesh and -48 mesh			
Gravity Concentration: Hand Panning			+48 mesh graphite conc

TESTWORK PROCEDURE

Test No: M90-088 F12 **Date:** 5-Jun-90

Purpose: Variability Testing:
Regrind / cleaning procedure for -48 mesh Rougher 2nd Cleaner Conc

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Regrind	5		30 grams of -48 mesh
(25 - 30% solids)			Ro 2nd Cl Conc
(Ceramic mill & Full ceramic media charge)			
Cleaning Flotation:			
-48# Cleaner 1	8		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	3		
-48# Cleaner 2	7		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	2.5		
Screening:			
Wet Screen Graphite -48# 2nd Cleaner Concentrate at 100 mesh			

TESTWORK PROCEDURE

Test No: M90-088 F12 Date: 20-Jun-90

Purpose : Variability Testing: -100 Mesh Flotation
1)Utilize most rigorous regrind (full ceramic charge, 3 minutes)
2)Standard 2-stage cleaning flotation

STAGE	TIME (Minutes)	ADDITIONS	
		g/tonne	REAGENT
Regrind	3		full ceramic charge
Cleaning Flotation:			regrind product
-100# Cleaner 1	3		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	4		
-100# Cleaner 2	3		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	2		

TEST F13 PROCEDURES

TESTWORK PROCEDURE

Test No: M90-088 F13 **Date:** 5-Jun-90

Purpose: Variability Testing:
1) Duplicate F8 procedure

Composite : Sample # 11

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT	
Grind	4		1/2 regular rod charge	
(Target: 95-98% -800 microns)			50-60% solids	
Flotation:				
Condition	5		40% solids	pH= 7.6
		150	EKOF 452 G	
Rougher	6			
Condition	2	15	EKOF 452 G	
Scavenger	3			
(to barren tail)				pH= 7.8
1st Ro Cleaner	6			
Condition	1	2	EKOF 452 G	
1st Ro Cleaner Scavenger	0.5			
2nd Ro Cleaner	5			
Condition	1	2	EKOF 452 G	
2nd Ro Cleaner Scavenger	0.5			
Screening:				
Screen 2nd rougher cleaner concentrate into +48 mesh and -48 mesh				
Gravity Concentration:				
Hand Panning			+48 mesh graphite conc	

TESTWORK PROCEDURE

Test No: M90-088 F13 Date: 5-Jun-90

Purpose: Variability Testing:

Regrind / cleaning procedure for -48 mesh Rougher 2nd Cleaner Conc

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Regrind	5		30 grams of -48 mesh
(25 - 30% solids)			Ro 2nd Cl Conc
(Ceramic mill & Full ceramic media charge)			
Cleaning Flotation:			
-48# Cleaner 1	6		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	2		
-48# Cleaner 2	6		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	1.5		
Screening:			
Wet Screen Graphite -48# 2nd Cleaner Concentrate at 100 mesh			

TESTWORK PROCEDURE

Test No: M90-088 F13 Date: 20-Jun-90

Purpose : Variability Testing: -100 Mesh Flotation
1)Utilize most rigorous regrind (full ceramic charge, 3 minutes)
2)Standard 2-stage cleaning flotation

STAGE	TIME (Minutes)	ADDITIONS	
		g/tonne	REAGENT
Regrind	3		full ceramic charge
Cleaning Flotation:			regrind product
-100# Cleaner 1	3		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	3		
-100# Cleaner 2	3		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	3		

TEST 14 PROCEDURES

TESTWORK PROCEDURE

Test No: M90-088 F14 Date: 5-Jun-90

Purpose: Variability Testing:
1) Duplicate F8 procedure

Composite : Sample # 15

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Grind (Target: 95-98% -800 microns)	4		1/2 regular rod charge 50-60% solids
Flotation:			
Condition	5		40% solids pH= 6.4
		150	EKOF 452 G
Rougher	5		
Condition	2	15	EKOF 452 G
Scavenger (to barren tail)	1		pH= 6.8
1st Ro Cleaner	5		
Condition	1	2	EKOF 452 G
1st Ro Cleaner Scavenger	0.5		
2nd Ro Cleaner	4		
Condition	1	2	EKOF 452 G
2nd Ro Cleaner Scavenger	0.5		
Screening: Screen 2nd rougher cleaner concentrate into +48 mesh and -48 mesh			
Gravity Concentration: Hand Panning			+48 mesh graphite conc

TESTWORK PROCEDURE

Test No: M90-088 F14 Date: 5-Jun-90

Purpose: Variability Testing:

Regrind / cleaning procedure for -48 mesh Rougher 2nd Cleaner Conc

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Regrind (25 - 30% solids) (Ceramic mill & Full ceramic media charge)	5		30 grams of -48 mesh Ro 2nd Cl Conc
Cleaning Flotation:			
-48# Cleaner 1	6		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	2		
-48# Cleaner 2	6		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	2		
Screening: Wet Screen Graphite -48# 2nd Cleaner Concentrate at 100 mesh			

TESTWORK PROCEDURE

Test No: M90-088 F14　　　　Date: 20-Jun-90

Purpose : Variability Testing: -100 Mesh Flotation

1)Utilize most rigorous regrind (full ceramic charge, 3 minutes)

2)Standard 2-stage cleaning flotation

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Regrind	3		full ceramic charge
Cleaning Flotation:			regrind product
-100# Cleaner 1	3		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	3		
-100# Cleaner 2	3		
Condition	1	15	EKOF 452 G
Cleaner Scavenger	2		

TEST 15 PROCEDURES

TESTWORK PROCEDURE

Test No: M90-088 F15 Date: 10-Aug-90

Purpose: Variability Testing
1) Duplicate F8 procedure

Composite: Bucket #1

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Grind 6 x 2 kg charge (Target: 95 to 100% -20 mesh)	4		1/2 regular rod charge 50 to 60% solids
Flotation (single 12 kg rougher)			
			pH=8.1
Condition (~35% solids)	5	150	EKDF 452 G
Rougher	8		
Condition	2	15	EKDF 452 G
Scavenger (to barren)	3.5		
			pH=8.2
1st Ro Cleaner	8		
Condition	1	15	EKDF 452 G
1st Ro Cleaner Scavenger	0		(no froth)
2nd Ro Cleaner	7		
Condition	1	15	EKDF 452 G
2nd Ro Cleaner Scavenger	0		(no froth)
Screening:			
Screen 2nd rougher cleaner conc into +48 mesh and -48 mesh			
Gravity Concentration:			
Hand panning .			+48 mesh graphite conc

TESTWORK PROCEDURE

Test No: M90-088 F15-Cleaner　　　Date: 29-Aug-90

Purpose: Upgrading +48 mesh pan tails and -48 mesh 2nd Rougher Cleaner concentrate to +90% grade

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
-48 Mesh Upgrading			
Regrind	7		Full charge
(+48 mesh pan tails pan tails + -48 mesh 2nd rougher cleaner conc)			
1st Cleaner Flotation:			
Condition	1	10	EKOF 452G
Cleaner Float	7		
Condition	1	10	EKOF 452G
Cleaner Float	3		
Condition	1	10	EKOF 452G
Cleaner Float	2		
Condition	1	10	EKOF 452G
Cleaner Float	1		
2nd Cleaner Flotation:			
Cleaner Float	5		
Condition	1	10	EKOF 452G
Cleaner Float	3		
Condition	1	10	EKOF 452G
Cleaner Float	2.5		
Condition	1	10	EKOF 452G
Cleaner Float	2.5		
Condition	1	10	EKOF 452G
Cleaner Float	1		
Screening:			
Wet screen graphite -48 mesh 2nd cleaner conc at 100 mesh.			

TESTWORK PROCEDURE

Test No: M90-088 F15-Cleaner (-100#) Date: 29-Aug-90

Purpose: Upgrading -100 mesh 2nd Cleaner concentrate to +90% grade

STAGE	TIME (Minutes)	ADDITIONS	
		g/tonne	REAGENT
-100 Mesh Upgrading			
Regrind (-100 mesh 2nd cleaner conc)	5		Full charge
1st Cleaner Flotation:			
Cleaner Float	4		
Condition	1	10	EKOF 452G
Cleaner Float	4		
Condition	1	10	EKOF 452G
Cleaner Float	3		
Condition	1	10	EKOF 452G
Cleaner Float	2.5		
Condition	1	10	EKOF 452G
Cleaner Float	1		
2nd Cleaner Flotation:			
Cleaner Float	5		
Condition	1	10	EKOF 452G
Cleaner Float	3		
Condition	1	10	EKOF 452G
Cleaner Float	2		
Condition	1	10	EKOF 452G
Cleaner Float	1		

TEST 16 PROCEDURES

TESTWORK PROCEDURE

Test No: M90-088 F16   Date: 13-Aug-90

Purpose: Variability Testing
1) Duplicate F8 procedure

Composite: Bucket #3

STAGE	TIME (Minutes)	ADDITIONS g/tonne	REAGENT
Grind 6 x 2 kg charge (Target: 95 to 100% -20 mesh)	4		1/2 regular rod charge 50 to 60% solids
Flotation (single 12 kg rougher)			
			pH=8.3
Condition (~35% solids)	5	150	EKDF 452 G
Rougher	7		
Condition	2	15	EKDF 452 G
Scavenger (to barren)	3		
			pH=8.3
1st Ro Cleaner	7		
Condition	1	15	EKDF 452 G
1st Ro Cleaner Scavenger	0		(no froth)
2nd Ro Cleaner	9		
Condition	1	15	EKDF 452 G
2nd Ro Cleaner Scavenger	0		(no froth)
Screening:			
Screen 2nd rougher cleaner conc into +48 mesh and -48 mesh			
Gravity Concentration:			
Hand Panning			48 mesh graphite conc

TESTWORK PROCEDURE

Test No: M90-088 F16-Cleaner Date: 29-Aug-90

Purpose: Upgrading +48 mesh pan tails and -48 mesh 2nd Rougher Cleaner concentrate to +90% grade

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
-48 Mesh Upgrading			
Regrind (+48 mesh pan tails + -48 mesh 2nd rougher cleaner conc)	7		Full charge
1st Cleaner Flotation:			
Condition	1	10	EKOF 452G
Cleaner Float	5		
Condition	1	10	EKOF 452G
Cleaner Float	3		
Condition	1	10	EKOF 452G
Cleaner Float	2.5		
Condition	1	10	EKOF 452G
Cleaner Float	1		
2nd Cleaner Flotation:			
Cleaner Float	9		
Condition	1	10	EKOF 452G
Cleaner Float	2		
Condition	1	10	EKOF 452G
Cleaner Float	1.5		
Condition	1	10	EKOF 452G
Cleaner Float	1		
Screening: Wet screen graphite -48 mesh 2nd cleaner conc at 100 mesh.			

TESTWORK PROCEDURE

Test No: M90-088 F16-Cleaner (-100#)   Date: 29-Aug-90

Purpose: Upgrading -100 mesh 2nd Cleaner concentrate to +90% grade

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
-100 Mesh Upgrading			
Regrind (-100 mesh 2nd cleaner conc)	5		Full charge
1st Cleaner Flotation:			
Cleaner Float	4		
Condition	1	10	EKOF 452G
Cleaner Float	4		
Condition	1	10	EKOF 452G
Cleaner Float	2		
Condition	1	10	EKOF 452G
Cleaner Float	1		
2nd Cleaner Flotation:			
Cleaner Float	5		
Condition	1	10	EKOF 452G
Cleaner Float	2		
Condition	1	10	EKOF 452G
Cleaner Float	2.5		
Condition	1	10	EKOF 452G
Cleaner Float	1		

TEST 17 PROCEDURES

TESTWORK PROCEDURE

Test No: M90-088 F17 Date: 13-Aug-90

Purpose: Variability Testing
1) Duplicate F8 procedure

Composite: Bucket #4

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
Grind 6 x 2 kg charge (Target: 95 to 100% -20 mesh)	4		1/2 regular rod charge 50 to 60% solids
Flotation (single 12 kg rougher)			
			pH=8.6
Condition (~35% solids)	5	150	EKDF 452 G
Rougher	8		
Condition	2	15	EKDF 452 G
Scavenger (to barren)	5		
			pH=8.9
1st Ro Cleaner	9		
Condition	1	2	EKDF 452 G
1st Ro Cleaner Scavenger	5		
2nd Ro Cleaner	7		
Condition	1	2	EKDF 452 G
2nd Ro Cleaner Scavenger	3		
Screening:			
Screen 2nd rougher cleaner conc into +48 mesh and -48 mesh			
Gravity Concentration:			
Hand Panning			+48 mesh graphite conc

TESTWORK PROCEDURE

Test No: M90-088 F17-Cleaner Date: 30-Aug-90

Purpose: Upgrading +48 mesh pan tails and -48 mesh 2nd Rougher Cleaner concentrate to +90% grade

STAGE	TIME (Minutes)	ADDITIONS g/tonne	ADDITIONS REAGENT
-48 Mesh Upgrading			
Regrind	7		Full charge
(+48 mesh pan tails pan tails + -48 mesh 2nd rougher cleaner conc)			
1st Cleaner Flotation:			
Condition	1	10	EKOF 452G
Cleaner Float	6		
Condition	1	10	EKOF 452G
Cleaner Float	4		
Condition	1	10	EKOF 452G
Cleaner Float	3		
Condition	1	10	EKOF 452G
Cleaner Float	1		
2nd Cleaner Flotation:			
Cleaner Float	5		
Condition	1	10	EKOF 452G
Cleaner Float	5		
Condition	1	10	EKOF 452G
Cleaner Float	2		
Condition	1	10	EKOF 452G
Cleaner Float	2		
Screening:			
Wet screen graphite -48 mesh 2nd cleaner conc at 100 mesh.			

TESTWORK PROCEDURE

Test No: M90-088 F17-Cleaner (-100#)　　Date: 29-Aug-90

Purpose: Upgrading -100 mesh 2nd Cleaner concentrate to +90% grade

STAGE	TIME (Minutes)	ADDITIONS	
		g/tonne	REAGENT
-100 Mesh Upgrading			
Regrind (-100 mesh 2nd cleaner conc)	5		Full charge
1st Cleaner Flotation:			
Cleaner Float	6		
Condition	1	10	EKOF 452G
Cleaner Float	5		
Condition	1	10	EKOF 452G
Cleaner Float	5		
Condition	1	10	EKOF 452G
Cleaner Float	1		
2nd Cleaner Flotation:			
Cleaner Float	5		
Condition	1	10	EKOF 452G
Cleaner Float	4		
Condition	1	10	EKOF 452G
Cleaner Float	2		
Condition	1	10	EKOF 452G
Cleaner Float	1		

H.L.S.

Ministry of Northern Development and Mines
Ontario

DOCUMENT No. W9190 • 09

31L01NE0001 2.14028 MARIA 900

Mining Act

Report of Work
(Expenditures, Subsection 77(19)) 2.

Type of Work Performed: ASSAYS, METALLURGICAL TESTING	Mining Division: SOUTHERN ONTARIO	Township or Area: MARIA TWP. - RENFREW CO.
Recorded Holder: NORTH COAST INDUSTRIES LTD. Rob Klassen 1-604-681-0799		Prospector's Licence No.: T. 4866
Address: 700-1177 WEST HASTINGS VANCOUVER, BC V6E 2K3		Telephone No.: 604-681-0799
Work Performed By: LAKEFIELD RESEARCH, ORTECH INTERNATIONAL, BACON, DONALDSON & ASSC. LTD. COMINCO ENGINEERING SERVICES LTD.		
Name and Address of Author (of Submission): R.M. BLAIS PINEWOOD PARK DR P.O. BOX 237 NORTH BAY, ONTARIO P1B 8H2		Date When Work was Performed From: 15 12 89 (Day Mo. Yr.) To: 22 10 90 (Day Mo. Yr.)

All the work was performed on Mining Claim(s): Indicate no. of days performed on each claim. *See Note No. 1 on reverse side

Mining Claim	No. of Days
608347	13393

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FEB 25 1991

MINING LANDS SECTION

Instructions
Total Days Credits may be apportioned at claim holder's choice. Enter number of days credits per claim in the expenditure days credit column (below).

Calculation of Expenditure Days Credits
Total Expenditures $ 200,903.30 ÷ 15 = Total Days Credits 13,393

Total Number of Mining Claims Covered by this Report of Work: 18

Mining Claims (List in numerical sequence). If space is insufficient, attach schedules with required information

Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.	Prefix	Number	Expend. Days Cr.
SO	998754	60	SO	998763	60	SO	1084570	60	WORK ASSIGNMENT		
	998755	60	SO	998942	60		1084571	60	EO	608347	
	998756	60					1084572	60	3337-1080=2257		
	998757	60					1084573	60		days	
	998758	60					1084574	60		balance	
	998759	60					1084575	60			
	998760	60					1084576	60			
SO	998761	60					1084577	60			

ONTARIO GEOLOGICAL SURVEY GIS - ASSESSMENT FILES RECEIVED 1991

Total Number of Days Performed	Total Number of Days Claimed	Total Number of Days to be Claimed at a Future Date
13,393	SE 1080	—

Certification of Beneficial Interest *See Note No. 2 on reverse side

I hereby certify that, at the time the work was performed, the claims covered in this report of work were recorded in the current recorded holder's name or held under a beneficial interest by the current recorded holder.

Date: FEB. 8, 1991 Recorded Holder or Agent (Signature): RM Blais

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Address of Person Certifying: R.M. BLAIS PINEWOOD PARK DR P.O. BOX 237 NORTH BAY, ONT. P1B 8H2

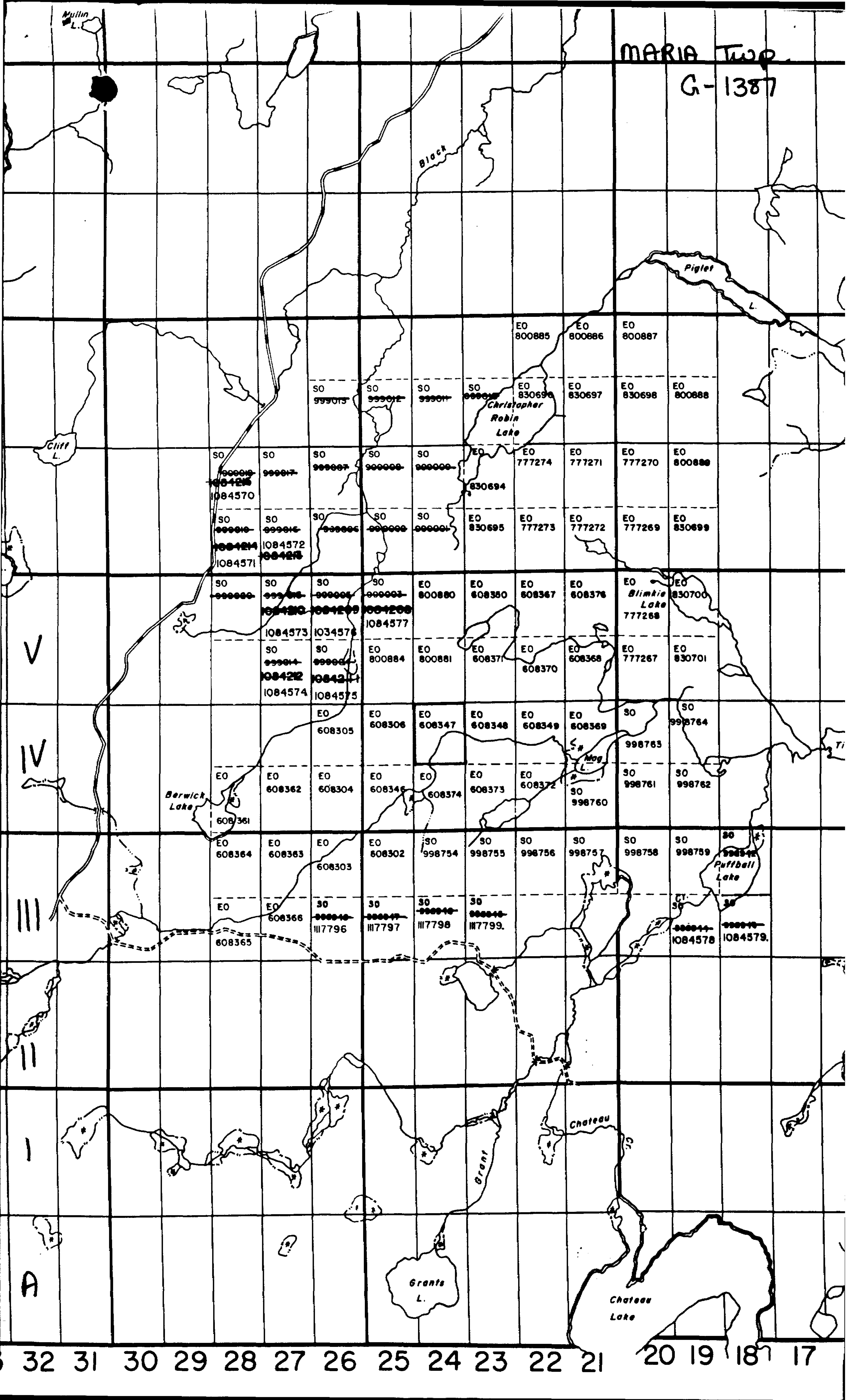
Telephone No.: 705-474-4110 Date: FEB. 8, 1991 Certified By (Signature): RM Blais

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
1080	FEB 14/91	[signature]
	Date Approved as Recorded: Sept 11/91	Provincial Manager, Mining Lands: [signature]

Received Stamp

SOUTHERN ONTARIO MINING DIVISION
RECEIVED
FEB 11 1991
AM PM
7,8,9,10,11,12,1,2,3,4,5,6



MARIA TWP.
G-1387
Mullin L.
Black
Piglet L.
Cliff L.
Christopher Robin Lake
Blimkie Lake
Mag L.
Berwick Lake
Puffball Lake
Chateau
Grant
Grants L.
Chateau Lake
EO 800885
EO 800886
EO 800887
SO
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EO 830697
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EO 800888
1084570
1084572
1084571
EO 777274
EO 777271
EO 777270
830694
EO 830695
EO 777273
EO 777272
EO 777269
EO 830699
1084573
1034576
1084577
EO 800880
EO 608350
EO 608367
EO 608376
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SO 998763
SO 998764
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North Coast Industries Ltd.
Suite 1575
200 Granville St
Vancouver BC
Canada V6C 1S4
Tel: 604/681.0799
Fax: 604/681.2741
#700 - 1177 W. HASTINGS ST.
VANCOUVER, B.C. V6E 2K3

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APR 02 1991

MINING LANDS SECTION

March 28, 1991

Mining Land Section
Mineral Developement Program
MNDM
159 Cedar St., 4th Floor
Sudbury, Ont., P3E 6A5

Re: Report of Work(Doc W190.09) claims S0998754 et al.

Dear Sirs,

Enclosed are a Report of Work dated February 14, 1991 and the accompanying Technical Reports, invoices and cancelled checks for Metallurgical Testing performed on samples from the Bisset Creek Project in the Southern Ontario Mining Division.

Reports included are:

<u>Metallurgical Testing of Bisset Creek Graphite Final Report(Complete)</u>
July 1990
By: Bacon Donaldson and Associates Ltd.

<u>Metallurgical Testing of Bisset Creek Graphite Final Report(Summary)</u>
July 1990
By: Bacon Donaldson and Associates Ltd.

<u>Metallurgical Investigation and Plant Flowsheet Developement for the Bisset Creek Flake Graphite Ore</u>
June 1990
Cominco Engineering Services Ltd.

<u>Metallurgical Report on the Variability Test Results of the Bisset Creek Flake Graphite Ore.</u>
September 1990
Cominco Engineering Services Ltd.

Please advise us if any additional information is required.

Yours sincerely,

For [signature]

Hardy Forzley

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APR 02 1991

MINING LANDS SECTION

Ontario

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Mining Lands Section
159 Cedar Street, 4th Floor
Sudbury, Ontario
P3E 6A5

Telephone: (705) 670-7264
Fax: (705) 670-7262

August 8, 1991

Report of work # W9190.09

Mr Rob Klassen
North Coast Industries Ltd.
700-1177 West Hastings
Vancouver, B.C.
V6E 2K3

Dear Sir:

RE: Expenditures submitted on Mining Claims SO 998754 et al. in the Township of Maria.

As per our telephone conversation of August 7th 1991, I have encountered a problem regarding the total of $ 200903.30 you are claiming.

When expenditures are submitted we require proof of payment which in this case involves the submission of **invoices** and **cancelled cheques**.

I have been able to verify payment of $ 108454.32 (7230 **days**), but am unable to verify the remainder as I cannot match up all the submitted invoices and cancelled cheques.

I have enclosed two lists and photocopies of those invoices and cheques that cannot be matched up. Could you please try to match these up,(or submit further ones if required), and return this information to this office no later than 30 **days** from the date of this letter.

When returning this information please quote file # 2.14028

If you require further information please contact Clive Stephenson at (705) 670-7254.

Yours truly

C. D. Stephenson

for Ron C. Gashinski
Provincial Manager, Mining Lands
Mines and Minerals Division

CDS/cs
Encl:

cc: Mining Recorder
Southern Ontario

R.M. Blais
North Bay, Ontario

North Coast
Industries Ltd

~~Suite 1575~~
~~200 Granville St~~
~~Vancouver BC~~
~~Canada V6C 1S4~~

Tel: 604/681.0799
Fax: 604/681.2741

700 - 1177 West Hastings
Vancouver, B.C.
V6E 2K3

5 September 1991

Clive Stephenson
Ministry of Northern Development and Mines
Mining Land Section
159 Cedar Street, 4th Floor
Sudbury, Ontario
P3E 6A5

[redacted]

RE: Submission of Invoices and Cancelled Cheques File # 2.14028

Dear Sir:

As per your letter dated August 8, 1991, please find enclosed a complete resubmission of invoices and cancelled cheques for the Bissett Creek project. Our accounting staff have documented the cross matching and adjustment of various accounts to clearly illustrate the balance of accounts.

We apologize for any inconvenience caused by our initial submission.

If you require further information please contact Rob Klassen or Laurie Forzley at (604) 681-0799.

Yours sincerely

Rob Klassen
North Coast Industries

RECEIVED
SEP 10 1991
MINING LANDS SECTION

2.14028 part 2

INVOICES without matched cancelled Cheques

INVOICE FROM	INVOICE BILLING PERIOD AND INVOICE #		DATE	AMOUNT
Cominco Eng.	Feb, 90	02-CECV011	Mar 08, 90	$ 3965.12
Cominco Eng.	Mar, 90	03-CECV011	Apr 09, 90	$ 6526.22
Cominco Eng.	Apr, 90	04-CECV011	May 08, 90	$ 6169.72
Cominco Eng.	May, 90	05-CECV011	Jun 08, 90	$ 3658.92
Cominco Eng.	Jun, 90	06-CECV011	Jul 10, 90	$ 12542.43
Cominco Eng.	Jul, 90	07-CECV011	Aug 10, 90	$ 7968.99
Cominco Eng.	Aug, 90	08-CECV011	Sep 11, 90	$ 2588.13
Ortech Int.		14357	Feb 15, 90	$ 10824.60
			TOTAL	$ 54244.13

note: The total amount for the Ortech invoice (# 14357) is $ 20324.60 of which a cancelled cheque for $ 9500.00 (advance payment) has been submitted. This leaves a balance of $ 10824.60 which still requires proof of payment.

CHEQUES without matched Invoices

PAYEE	DATE OF CHQ	CHEQUE #	AMOUNT
Bacon Donaldson & Assoc.	Dec 20, 89	1057	$ 496.57
Cominco Engineering	Feb 16, 90	1134	$ 1559.75
Cominco Engineering	Mar 31, 90	0019	$ 3897.12
Cominco Engineering	Jul 06, 90	0043	$ 10000.00
Cominco Engineering	Aug 03, 90	1295	$ 6354.86
Cominco Engineering	Sep 01, 90	1318	$ 8000.00
Ortech Int.	May 08, 90	0032	$ 7763.65
Ortech Int.	Jul 06, 90	0045	$ 5000.00
Ortech Int.	Mar 25, 90	0024	$ 2820.35
		TOTAL	$ 45892.30

NORTH COAST INDUSTRIES LTD.
700 - 1177 West Hastings Street
Vancouver, B.C.
V6E 2K3

RECONCILIATION OF REPORT OF WORK

Bacon Donaldson & Associates Ltd.

Invoice # 84984		$ 18,899.80		
Invoice # 8495		10,348.61		
		29,248.41	CK # 027	$ 29,248.41
			CK # 1268	30,000.00
			CK # 1288	20,000.00
			CK # 1317	10,000.00
			CK # 084	42,000.00
Invoice	145,864.89*	102,000.00		102,000.00
		$ 131,248.48		$ 131,248.48

Cominco Engineering Services Ltd.

Invoice # 01-CEC V011		$ 9,705.91	CK # 016	$ 9,705.91
Invoice # 02-CEC V011	3,965.12+	3,897.12	CK # 019	3,897.12
Invoice # 04-CEC V011		6,169.72		
Invoice # 03-CEC V011		6,526.22	CK # 043	10,000.00
Invoice # 05-CEC V011		3,658.92	CK # 1295	6,354.00
		16,354.86		16,354.86
Invoice # 06-CEC V011	12,542.43			
Invoice # 07-CEC V011	7,968.99		CK # 1318	8,000.00
	2,588.13		CK # 132	12,500.00
	23,099.55°	20,500.00		20,500.00
		$ 50,457.89		$ 50,457.89

Ortech International

Invoice # 14976	$ 2,820.35	CK # 024	$ 2,820.35
Invoice # 14357	20,324.60	CK # 003	9,500.00
Invoice # 16329 (credit)	(3,060.95)	CK # 032	7,763.65
	17,263.65		17,263.65
Invoice # 17111	5,000.00	CK # 045	5,000.00
	$ 25,084.00		$ 25,084.00

* This invoice was subsequently settled for $102,000.00
\+ The invoice was adjusted by $68.00 to reflect an outstanding credit.
o This account was subsequently settled for $20,500.00.

Lakefield Research

Invoice # 03235	$ 252.00		
Invoice # 03278	168.00		
	420.00	CK # 009	$ 420.00
Invoice # 03707	1,950.00	CK # 031	1,950.00
Invoice # 04067	329.50		
Invoice # 04080	44.00		
	373.50	CK # 1320	373.50
	$ 2,743.50		$ 2,743.50
TOTAL EXPENDITURES	$ 209,533.80		$ 209,533.80

INVOICE

BACON. DONALDSON & ASSOCIATES LTD.
12271 Horseshoe Way, Richmond, B.C. V7A 4Z1 • Phone: 277-2322 • Fax: 274-7235

In Account With NORTHCOAST INDUSTRIES
1270 - 601 W. Hastings St.
Vancouver, B.C.
V6B 5A6

Attention: Laurie Forzley

Invoice No. 8494

File No. M90-088

Purchase Order No.

Date 1990 March 13

Re: Batch Laboratory Testwork on Bissett Project to February 28, 1990.

PROFESSIONAL SERVICES			
	Technicians	126.0 hrs. @ $ 50.	$ 6,300.00
		27.0 hrs. @ $ 30.	810.00
		1.0 hrs. @ $ 60.	60.00
		2.0 hrs. @ $ 57.	114.00
	Engineers	119.0 hrs. @ $ 75.	8,925.00
		3.5 hrs. @ $100.	350.00
	Secretarial	2.1 hrs. @ $ 30.	63.00
	Assays - BDA	22 @ $ 20.	440.00
	- Chemex		1,107.45
EXPENSES			
	Vancouver Petrographics		672.75
	Fax charges		57.60
TOTAL			$ 18,899.80

This is a professional invoice and is due when presented.
1.5% per month charged on invoices over 30 days.
(18% per annum)

INVOICE

BACON, DONALDSON & ASSOCIATES LTD.
12271 Horseshoe Way, Richmond, B.C. V7A 4Z1 • Phone: 277-2322 • Fax: 274-7235

In Account With NORTHCOAST INDUSTRIES
1270 - 601 W. Hastings St.
Vancouver, B.C.
V6B 5A6

Attention: Laurie Forzley

Invoice No. 8495

File No. M90-088

Purchase Order No.

Date 1990 March 13

Re: Pilot-Scale Testing of Bissett Graphite Project to February 28, 1990.

PROFESSIONAL SERVICES			
1. Circuit Set-Up			
	Technicians	50.0 hrs. @ $ 50.	$ 2,500.00
	Engineers	38.0 hrs. @ $ 65.	2,470.00
	Consumables		1,178.61
2. Receipt & Crushing of Ore			
		11.5 hrs. @ $ 30.	345.00
		3.0 hrs. @ $ 65.	195.00
		20.0 hrs. @ $ 50.	1,000.00
3. Preliminary Test Runs			
		34.5 hrs. @ $ 30.	1,035.00
		25.0 hrs. @ $ 65.	1,625.00
TOTAL			$ 10,348.61

This is a professional invoice and is due when presented.
1.5% per month charged on invoices over 30 days.
(18% per annum)

NORTHCOAST INDUSTRIES LTD.
1270 - 601 WEST HA NGS STREET
VANCOUVER, B.C. V6B 5A6

0027

March 31 19 90

PAY TO THE ORDER OF Bacon, Donaldson & Associates $ 29248.41

twenty nine thousand two hundred & forty eight — 41/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTHCOAST INDUSTRIES LTD.

PER [signature]

PER [signature]

FOR # 8494, 8495

⑈000027⑈ ⑆08120⑉001⑆ 1243⑉347⑈ ⑈0002924841⑈

03 APR 90

04000-003

THE ROYAL BANK OF CANADA

FOR DEPOSIT ONLY

BACON, DONALDSON & ASSOCIATES LTD.

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AP '90 03
ROYAL BANK
BRITISH COLUMBIA PC

AP '90 03
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE
07860-001

North Coast Industries Ltd.

~~Suite 1575~~
~~200 Granville St~~
~~Vancouver BC~~
~~Canada V6C 1S4~~

Tel: 604/681.0799
Fax: 604/681.2741

#700 - 1177 W. HASTINGS ST.
VANCOUVER, B.C. V6E 2K3

February 28, 1991

Bacon Donaldson & Associates Ltd.
12271 Horseshoe Way
Richmond, B.C.
V7A 4Z1
Attn: Lee Schneider, Controller

Dear Sir:

Re: Settlement of our account

As per your letter dated February 21, 1991, enclosed please find our cheque in the amount of $42,000.00 representing full settlement of the North Coast Industries Ltd.'s account with Bacon Donaldson & Associates Ltd.

We trust this is satisfactory.

Yours very truly,

NORTH COAST INDUSTRIES LTD.

Harold H.G. Forzley
Vice President

/rr

NCT:BaconPay

BACON
DONALDSON
ASSOCIATES LTD.

12271 HORSESHOE WAY
RICHMOND, B.C.
CANADA V7A 4Z1
TELEPHONE: (604) 277-2322
FACSIMILE : (604) 274-7235

February 21, 1991

File Number: M90-088

NORTHCOAST INDUSTRIES
1270 - 601 West Hastings Street
Vancouver, B.C.
V6B 5A6

Attention: Ron Thiessen

Dear Sir,

Re: Settlement of Your Account

This will confirm your recent discussions with Messrs. Gord Bacon and Morris Beattie regarding your overdue account with Bacon, Donaldson and Associates Ltd. Upon receipt of the agreed upon final settlement amount of $42,000 we will issue a credit note for the balance then owing.

Yours truly,
BACON DONALDSON & ASSOCIATES LTD.

Lee Schneider, Controller
SLS/jlb

BACON DONALDSON ASSOCIATES LTD.

12271 HORSESHOE WAY
RICHMOND, B.C.
CANADA V7A 4Z1
TELEPHONE: (604) 277-2322
FACSIMILE : (604) 274-7235

BREAKDOWN OF INVOICE #1071
BISSETT CREEK PROJECT
NORTH COAST INDUSTRIES

A. Preliminary testwork and pilot palnt operation.

PERSON	HOURS	RATE	TOTAL
Brent Peacock	22	50	$ 1,100
Bruce Smith	189	50	9,450
	13	57	741
Ted Joyce	284	50	14,200
Clint Rule	7.5	50	375
Diane Baker	33	60	1,980
Ed Henrioulle	521	75	39,075
Gus Chow	8	50	400
Ed Klassen	26.8	75	2,010
Jack Richards	355.7	30	10,671
	107.2	37	3,966.40
Jasman Yee	301	65	19,565
Keith Davidson	181	50	9,050
	12	57	684
Martin Schuchow	62.5	50	3,125
	4	57	228
Morris Beattie	48.5	100	4,850
Peter Tse	335	50	16,750
	26	57	1,482
Richard Steel	13.5	50	675
Ron Williams	1.5	60	90
Shawna Martin	169.5	50	8,475
	4.5	57	256.50
Trish Hosepdales	49	60	2,940
Vince Brusnyk	191.5	30	5,745
	4	37	148
Gord Bacon	2	100	200.00
		Sub	TOTAL $ 158,231.90

Assay and Fax Charges	5,588.42
Outside Analysis and Direct Expenses	15,544.69
Sub TOTAL	$ 179,365.01
Less Previous Invoices	- 29,248.41
Less write down for pilot plant set-up at BDA's expense	- $ 36,258.45
Sub TOTAL	$ 113,858.15

B. Variability Testwork and Final Reporting

PERSON	HOURS	RATE	TOTAL
Bruce Smith	31	50	1,550
Clint Rule	3	50	150
Ed Henrioulle	170.9	75	12,817.50
Grant Morgan	3	60	180
Jack Richman	25.6	30	768
Jasman Yee	15	65	975
Keith Davidson	3	50	150
Morris Beattie	2.5	100	250
Peter Tse	80	50	4,000
Ron Williams	1	57	57
	2	60	120
Shawna Martin	17	50	850
Vince Brusnyk	27.5	30	825
Secretarial	52.1	30	$ 1,563
		Sub TOTAL	$ 24,255.50

Assay and Fax charges	$ 3,837.50
Outside analyses and direct expenses	$ 3,913.74
Sub TOTAL	$ 32,006.74

Total this Invoice	$ 145,864.89
Less Advances	- $ 60,000.00
BALANCE DUE	$ 85,864.89

NORTH COAST INDUSTRIES LTD.
PRICE WATERHOUSE CENTRE
#1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 5A6

1268

July 6 1990

PAY TO THE ORDER OF Bacon Donaldson $30,000.00

thirty thousand dollars ——— xx/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTH COAST INDUSTRIES LTD.

FOR Payment on acct.

PER [signature]

M90-088

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09 JUL 90

04800-003

THE ROYAL BANK OF CANADA
#3-KLCBOK BRANCH
RICHMOND
BRITISH COLUMBIA

9060236

FOR DEPOSIT ONLY
BACON, DONALDSON & ASSOCIATES

JY '90 09
ROYAL BANK
BRITISH COLUMBIA
PC

JY '90 09
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE
07860-001

NORTH COAST "'DUSTRIES LTD.
PRICE WATE JUSE CENTRE
#1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 5A6

1288

Aug 3 19 90

PAY TO THE ORDER OF Bacon Donaldson + Associates Ltd $ 20,000.00

twenty thousand dollars ——— xx/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTH COAST INDUSTRIES LTD.

FOR Payment on acct
M90-088

PER [signature]

⑈001288⑈ ⑆08120⑉001⑆ 1239⑉102⑈ ⑈0002000000⑈

FOR DEPOSIT ONLY
DONALDSON & ASSOCIATES LTD.

04800 - 003
THE ROYAL BANK OF CANADA
No 3 ROAD AND COOK BRANCH
RICHMOND, B.C.

BANK
VANCOUVER 04800 003
DATA CENTRE

AG '90 08
ROYAL BANK
BRITISH COLUMBIA PC

NORTH COAST INDUSTRIES LTD.
PRICE WATERHOUSE CENTRE
#1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C. V6B 5A6

1317

Sept 1 1990

PAY TO THE ORDER OF Bacon Donaldson & Associates $10,000.00

ten thousand dollars ——— xx/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTH COAST INDUSTRIES LTD.

FOR On acct - Bissett Creek PER [signature]

M90-088 - Advance

⑈001317⑈ ⑆08120⑉001⑆ 1239⑉102⑈ ⑈0001000000⑈

BACON DONALDSON & ASSOCIATES LTD.
FOR DEPOSIT ONLY

SE '90 05
ROYAL BANK
BRITISH COLUMBIA PC

04800 - 003
THE ROYAL BANK OF CANADA
SE 90 05
RICHMOND B.C.
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE

NORTH COAST INDUSTRIES LTD.
700 - 1177 WEST HASTINGS STREET
VANCOUVER, BC V6E 2K3
PHONE 681-0799

0084

Feb 28 1991

PAY TO THE ORDER OF Bacon Donaldson & Associates $ 42,000.00

Forty-two thousand ——— 00/100 DOLLARS

RE: On account

NORTH COAST INDUSTRIES LTD.

PER [signature]

PER [signature]

Bank of Montreal
VANCOUVER MAIN OFFICE
FIRST BANK TOWER, 595 BURRARD ST.
VANCOUVER, B.C. V7X 1L7

#1071

⑈000084⑈ ⑆00040⑉001⑆ 1251⑉893⑈ ⑈0004200000⑈

BACON, DONALDSON & ASSOCIATES LTD.
FOR DEPOSIT ONLY

FB '91 28
ROYAL BANK
BRITISH COLUMBIA
PC

FB '91 28
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE
07880-001

Cominco Engineering Services Ltd.

100 - 1200 West 73rd Ave., Vancouver, B.C., Canada V6P 6G5 / Tel. (604) 264-5500 / Telex 04-55357 / Fax (604) 264-5555

February 20, 1990

North Coast Industries Ltd.
1270 - 601 W. Hastings Street
Vancouver, B.C.
V6B 5A6

Attention: Mr. Dave Copeland

Dear Sir:

Re: Bisset Creek Metallurgical Testwork

Please find attached our January 1990 invoice with respect to the above mentioned project:

January Invoice #01-CECV011	$9,705.91

Should you have any questions, please call.

Regards,

G.R. Albright
Revenue and Project
Accounting Manager

GRA/jmh
Attach.

FI.01

Cominco Engineering Services Ltd.

Invoice No. 01-CECV011

Date 90-02-09

NORTH COAST INDUSTRIES LTD.
1270 - 601 WEST HASTINGS STREET
VANCOUVER, B.C.
V6B 5A6

Accounting Inquiries

Phone – (604) 264-5525

Technical Inquiries

Name – VCR:HM BOLU

Phone – (604) 264-5596

ATTENTION: DAVE COPELAND

Reference No.

JANUARY, 1990 EXPENDITURES AS ATTACHED

CEC.V01.1 - BISSET CREEK METALLURGICAL TESTWORK

PROFESSIONAL ENGINEERING SERVICES (SEE ATTACHMENT 1)	$8,002.50
REIMBURSABLES (SEE ATTACHMENT 2)	$1,703.41
TOTAL THIS INVOICE	$9,705.91

Remit To — Suite 100 · 1200 West 73rd Avenue
Vancouver, B.C. V6P 6G5

Net 30 Days

Interest Charged at 1½% Per Month on Overdue Accounts.

NORTHCOAST INDUSTRIES LTD.
1270 - 601 WEST HASTING STREET
VANCOUVER, B.C. V6B 5A6

0016

March 15 19 90

PAY TO THE ORDER OF Cominco Engineering Services Ltd $9705.91

nine thousand seven hundred & five dollars 91/100 DOLLARS

BANK OF MONTREAL
GRANVILLE & PENDER STREET BRANCH
500 - 520 GRANVILLE STREET
VANCOUVER, B.C. V6C 1W7

NORTHCOAST INDUSTRIES LTD.

PER

PER

01-
FOR CEC V011

⑈000016⑈ ⑆08120⑉001⑆ 1243⑉347⑈ ⑈0000970591⑈

FOR DEPOSIT ONLY
TO THE CREDIT OF
COMINCO ENGINEERING SERVICES LTD.

Bank of Montreal
27270-001
MAR 13 1990
67th & Granville
Vancouver

MR '90 13
BANK OF MONTREAL
VANCOUVER REGIONAL
DATA CENTRE

MAR 13 90
036 07800-001
BANK OF MONTREAL
VANCOUVER RDC
090

CESL

01007

Expense Account

Do not use pencil.

Name MATT BOLU

Date	Location	Daily General Expense	Hotel Accommodation	Transportation	Description of item	Sundry	Entertainment
16JAN90	TORONTO	59.65	R	1314.00			
17 "	"		256.03	R			
					Brought forward from reverse		
	Sub-totals	$ 59.65	$256.03	$ 1314.00		$	$

Disbursements — see instructions on reverse side of form; Other expenses

Advances from CESL		
Cash	—	
Transportation	1314	00
Other		
Sub-total	1314	00
Less: Unused air fare (attach tickets)	SEE REFUND SLIP FOR BUS. CLASS TO ECONOMY	
Net advances (1)	1314	00

Employee Expenses Reported		
Daily General Expense	59.	65
Hotel Accommodation	256	03
Transportation	1314	00
Sundry	—	
Entertainment	—	
Total Expenses	1629	68
Exchange Rate		
Total Expense $Cdn. (2)	1629	68

Recap		
Ttl. Exp. $Cdn. (2)	1629	68
Less:		
Net Advances (1)	1314	00
Balance owing:	315	68
— to me 124	315	68
— to CESL (cheque attached)		

Distribution of Expense Code	Amount	
V.011-0200	1629	00
Total Expense $Cdn.		

Purpose of Trip or Expenditure

SUPERVISION OF LAB TESTS AT ORTECH WITH THE CLIENT D. COPELAND.

For Office Use Only	Debit		Credit	
1101 V011 0200	1629	68		
1103 ~~HSE~~ 0202			1629	68

Certified as a true accounting of my expenses

18JAN'90 Date

Approved for distribution and payment

900123 Audited by

CESL 301

 COMINCO ENGINEERING SERVICES LTD. 90-02-02

JS644 CUMULATIVE TIME DISTRIBUTION FOR JAN , ENDING 90/01/31 ATTACHMENT 1

CECV01-1 BISSET CK METALLURGICAL TESTWORK P.O. NO:

CHARGE CODE	MAN NO.	NAME	REG HRS	OVT HRS	TOTAL HRS	CHARGE RATE	CHARGE AMOUNT	OVERTIME PREMIUM	TOTAL AMOUNT
OFFICE SERVICES									
V0110100	800278	DJ WILLIAMS	5.0		5.0	27.50	137.50		137.50
		ACTIVITY TOTALS	5.0		5.0		137.50		137.50
METAL'L ENGINEERS									
V0110100	800303	HM BOLU	117.0	13.0	130.0	60.50	7,865.00		7,865.00
		ACTIVITY TOTALS	117.0	13.0	130.0		7,865.00		7,865.00
		CHARGE CODE TOTALS	122.0	13.0	135.0		8,002.50		8,002.50
		JOB TOTALS	122.0	13.0	135.0		8,002.50		8,002.50

708 COMINCO ENGINEERING SERVICES LTD PAGE: 1

C.V011 BISSET CK METALLURGICAL TESTWORK 90-02-08

REIMBURSABLES ATTACHMENT 2

B	CODE	SUPPLIER NAME	SUPPLIER INVOICE NUMBER	AMOUNT
11	0200	BOLU, H.M. C/O #400	E/A 900118B	1629.68
	0200	DWARF COURIER LTD.	C141231	7.25
	0200	REPRO CHGES - JAN/90	J/E 00024	0.90
	0200	TEL CHGES - JAN/90	J/E 00026	17.26
	0200	TEL CHGES - JAN/90	J/E 00028	48.32
			JOB TOTAL	$1703.41

dwarf COURIER

(Division of RICHMOND dwarf COURIER LTD.)

Small in Name — BIG IN RELIABILITY!

5 Simpson Rd.
Richmond, B.C.
V6X 2R2
Dispatch: 278-1935
Admin: 278-6044

01003

INVOICE NO.	
C141231	
INVOICE DATE	ACCOUNT NO.
12/31/89	C14

TO:

COMINCO ENGINEERING
100-1200 WEST 73RD.,
VANCOUVER, B.C.
V6P 6G5

TERMS: NET 15 DAYS - 2% CHARGED ON ALL OVERDUE ACCOUNTS.

TRANSACTION DATE	INVOICE NO.	DESCRIPTION	AMOUNT	BALANCE
11/30/89	C141130		675.45	675.45
12/31/89		INTEREST	13.32	688.77
12/31/89	C141231	~~111~~ 110 WAYBILLS	700.65	1,389.42

AGE	CURRENT	30 DAYS	60 DAYS	90 DAYS	TOTAL
AMOUNT	713.97	675.45	0.00	0.00	1,389.42

ORIGINAL INVOICE

CHECKS	GOODS/SERVICE RECEIVED	PRICE	TAXES	EXTENSION

G.L	JOB #	PCIS	AMOUNT
1150	L032	8137	81.50
8401 ~~[illegible]~~	H952	0300	11.00
1101	CAP	[illegible]	110.45 (E159)
1101	T031	0400	7.50
1150	T151	8137	36.75
1150	T171	8137	17.00
1101	V20	EX10	[illegible]
1101	R411	3000	19.35
1101	V011 MIN	0200	7.35
[illegible]	[illegible]		12.75
1150	F002	5E80	13.00
1101	V301	EX10	15.35

ORIGINAL INVOICE

CHECKS				
	1101	K888	X100	5.00
	8401	MIS0		39.50

1150	L032	8137	4.50
1101	N884	EX10	7.25
8401	R380	0200	5.00
8401	A110	0200	5.00
1101	P669	R500	15.00
1101	S421	0200	3.75
1106	S533	0200	10.00
1101	T97F	0300	10.00
1101	T901	0300	10.00
1150	F062	5E80	3.25
1103	0232		5.00
1103	0254		9.75
1150	K524	8327	5.00
1150	T151	8137	[illegible]
1101	B501	6530	5.00

[illegible]

dwarf COURIER

(Division of RICHMOND dwarf COURIER LTD.)

Dispatch: 278-1935
Admin: [illegible]8-8044

WAYBILL NO. 236146

SMALL IN NAME
BIG IN RELIABILITY

MONTH	DAY	YEAR
12	22	89

FROM: PREPAID ☐	TO: X COLLECT ☐		
COMINCO ENGINEERING	Mr. DAVID COPELAND.	ADVANCE CHARGE	
100-1200 WEST 73RD.,	CEC ENGINEERING LTD	ADVANCE AMOUNT	
VANCOUVER, B.C.	SUITE 1270 - 601 West Hastings St	WAITING TIME	
V6P 6G5 C14	VCR.		
	TEL	WEIGHT CHARGE	
THIRD PARTY CHARGE	HOT ☐ RUSH ☒ REG. ☒	DELIVERY CHARGE	
	N/D ECONO ☒ RETURN ☐ CONTRACT ☐	RETURN CHARGE	

INSTRUCTIONS:	NO. OF PIECES	WEIGHT		
			OTHER	
		LBS.		
RE: V 01.1 0200 PMA	1	KGS.	TOTAL	7.25

SHIPPER:	TIME	DRIVER P/U	RECEIVED IN APPARENT GOOD ORDER. (PLS. PRINT)	TIME	DRIVER DEL	RETURN RECEIVED IN APPARENT GOOD ORDER. (PLS. PRINT)	TIME	DRIVER DEL.
M.M.	A.M. P.M. 12:57	12	DAVE	A.M. P.M. 2:06	12		A.M. P.M.	

IMPORTANT: MAXIMUM LIABILITY OF CARRIER IS $4.41 PER KG. OR $50.00 PER SHIPMENT. ALL CLAIMS MUST BE SUBMITTED WITHIN 30 DAYS OF SHIPMENT. PLEASE REFER TO TERMS AND CONDITIONS ON REVERSE SIDE.

OFFICE COPY

CASH ☐ CHEQUE ☐

COMINCO ENGINEERING SERVICES LTD.
REPRODUCTION USAGE CHARGES
JANUARY 1990

USER ID.	JOB NUMBER	COPIES MADE	RATE	AMOUNT CHARGED
8011	V011 BISSET CREEK METALLURGICAL REVIEW			
	1ST FLOOR - CANON NP-7550	0	0.15	$0.00
	1ST FLOOR - MITA DC-313Z	0	0.15	0.00
	3RD FLOOR - CANON NP-8570	3	0.15	0.45
	3RD FLOOR - XEROX 1045	0	0.15	0.00
	4TH FLOOR - CANON 6650	3	0.15	0.45
	TOTAL CHARGES	6		$0.90

COMINCO ENGINEERING SERVICES LTD. (Vancouver)

oday's date: 90/02/02 00:18

GENESIS Telephone Management System

ccount code: [redacted]

V011

Period starting 89/12/29
ending 90/02/01

ACCOUNT CODE DETAIL REPORT

Date	Time	Ext.	Trunk	Type	.......Number Dialed	Loc	Duration	Cost
90/01/12	11:59	5596	T002003	C002	1-416-822-4111	ON	0:24:37	17.26
Totals	1 calls						0:24:37	17.26

yes V.01.1

COMINCO ENGINEERING SERVICES LTD. (Vancouver)

day's date: 90/02/02 00:18

GENESIS Telephone Management System

count code: [redacted]

Period starting 89/12/29
ending 90/02/01

ACCOUNT CODE DETAIL REPORT

Date	Time	Ext.	Trunk	Type	.......Number Dialed	Loc	Duration	Cost
90/01/18	13:34	5596	T002005	C002	1-416-822-4111	ON	0:01:47	1.38
90/01/19	08:16	5596	T002001	C002	1-416-822-4111	ON	0:14:31	10.35
90/01/19	12:55	5596	T002008	C002	1-416-964-0411	ON	0:01:13	1.38
90/01/24	11:09	5596	T002006	C002	1-416-822-4111	ON	0:01:53	1.38
90/01/24	13:36	5596	T002004	C002	1-416-822-4111	ON	0:23:31	16.57
90/01/25	14:08	5596	T002002	C002	1-416-822-4111	ON	0:24:43	17.26
Totals	6 calls						1:07:38	48.32

Cominco Engineering Services Ltd.

100 - 1200 West 73rd Ave., Vancouver, B.C., Canada V6P 6G5 / Tel. (604) 264-5500 / Telex 04-55357 / Fax (604) 264-5555

March 29, 1990

North Coast Industries Ltd.
1270 - 601 West Hastings Street
Vancouver, B.C.
V6B 5A6

Attention: Mr. Dave Copeland

Dear Sir:

Re: Bisset Creek Metallurgical Testwork

Please find attached our February 1990 invoice with respect to the above mentioned project:

February Invoice #02-CECV011 $3,965.12

Should you have any questions, please call.

Regards,

G.R. Albright
Revenue and Project
Accounting Manager

GRA/mlw

Attach.

Ltr.Mar.29

LEGEND

HIGHWAY AND ROUTE No
OTHER ROADS
TRAILS
SURVEYED LINES:
TOWNSHIPS, BASE LINES, ETC
LOTS, MINING CLAIMS, PARCELS, ETC
UNSURVEYED LINES:
LOT LINES
PARCEL BOUNDARY
MINING CLAIMS ETC
RAILWAY AND RIGHT OF WAY
UTILITY LINES
NON-PERENNIAL STREAM
FLOODING OR FLOODING RIGHTS
SUBDIVISION OR COMPOSITE PLAN
RESERVATIONS
ORIGINAL SHORELINE
MARSH OR MUSKEG
MINES
TRAVERSE MONUMENT

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT	SYMBOL
PATENT, SURFACE & MINING RIGHTS	●
" , SURFACE RIGHTS ONLY	
" , MINING RIGHTS ONLY	
LEASE, SURFACE & MINING RIGHTS	■
" , SURFACE RIGHTS ONLY	
" , MINING RIGHTS ONLY	
LICENCE OF OCCUPATION	▼
ORDER-IN-COUNCIL	OC
RESERVATION	®
CANCELLED	
SAND & GRAVEL	

NOTE: MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 6, 1913, VESTED IN ORIGINAL PATENTEE BY ... LANDS ACT, R.S.O. 1970, CHAP. 380, SEC. ...

SCALE: 1 INCH = 40 CHAINS

FEET 0 1000 2000 4000 6000 8000
METRES 0 200 1000 (1 KM) 2000 (2 KM)

AREAS WITHDRAWN FROM DISPOSITION

M.R.O. – MINING RIGHTS ONLY
S.R.O. – SURFACE RIGHTS ONLY
M.+ S. – MINING AND SURFACE RIGHTS

Description	Order No.	Date	Disposition	File
R1		MARCH 3/72	S.R.O.	160707
R2	W 11/82	JULY 23/82	S.R.O.	14675
R3	AL-W-18-82	DEC. 13/82	S.R.O.	

NOTES

DES JOACHIMS DEVELOPMENT WATER POWER
LEASE No. 102

ALL THE UNALIENATED PART OF THE BED OF THE OTTAWA RIVER (ONTARIO SIDE) IN THE TOWNSHIP OF MARIA INCLUDING UNALIENATED ISLANDS THEREIN TOGETHER WITH THE RIGHT TO RAISE THE WATER LEVEL AND FLOOD CROWN LANDS UP TO 505' CONTOUR FROM EAST BOUNDARY OF TOWNSHIP TO TRAVERSE STATION B.117 IN CROWN RESERVE AND TO 506' CONTOUR FROM THIS POINT WESTERLY TO THE WEST BOUNDARY OF TOWNSHIP. GEODETIC SURVEY OF CANADA DATUM.

RES. GEO. DORSET
M.N.R. DIST. PEMBROKE

DATE OF ISSUE
DEC 17 1990

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.

TOWNSHIP
MARIA

M.N.R. ADMINISTRATIVE DISTRICT
PEMBROKE
MINING DIVISION
SOUTHERN ONTARIO
LAND TITLES / REGISTRY DIVISION
RENFREW

Ministry of Natural Resources
Ministry of Northern Development and Mines
Ontario

Date: MARCH / 1987
Number: G-1387

31L01NE0001 2.14028 MARIA
200