

WORK REPORT FOR YEAR ENDING DECEMBER 31/69

SCURRY-RAINBOW OIL LIMITED

ELK RIVER COAL PROJECT

UPPER ELK RIVER COAL FIELDS

KOOTENAY LAND DISTRICT

BRITISH COLUMBIA

By: D. M. Lane, P.Geol., P.Eng.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

00 267

~~CONFIDENTIAL~~

K-ELK RIVER 69(1)C

CONFIDENTIAL

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MARCH, 1970

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WORK REPORT FOR YEAR ENDING DECEMBER 31, 1969

SCURRY-RAINBOW OIL LIMITED

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UPPER ELK RIVER COAL FIELDS

KOOTENAY LAND DISTRICT

BRITISH COLUMBIA

By: D. M. Lane, P.Geol., P. Eng.

The following work report for the year ending December 31, 1969 is herewith respectfully submitted as required under Provision 3 (2) of the Coal Licences listed below:

Numbers 64 & 65 issued September 25, 1953 and assigned to Scurry July 22, 1968

Numbers 421 - 434 inclusive, issued December 5, 1967

Numbers 481 - 489 inclusive, issued July 16, 1968

Number 515 issued August 29, 1968

Numbers 771 - 779 inclusive issued October 27, 1969

SUMMARY OF MAJOR WORK COMPLETED
DURING YEAR ENDING DECEMBER 31, 1969
ON LANDS HELD UNDER THE FOLLOWING LICENCES:
64 & 65, 421 - 434, 481 - 489, 515, 771 - 779

(1) Preliminary Mining Study (Exhibit "A" - Confidential)

Elk River Coal Reserve, Southeastern British Columbia for
Scurry-Rainbow Oil Limited, Calgary, Alberta, Canada

By: John T. Boyd Company

Mining Engineers

Pittsburg, Pennsylvania

June, 1969 (cover) Enclosure letter dated July 30, 1969.

This study was based on information obtained the previous summer plus preliminary information on Scurry's Diamond Drill Holes SR-1 to SR-5 inclusive.

(2) Topographic Maps (Control)

(a) Spartan Air Services

Spartan extended the coverage of a 1,000 scale map prepared the previous year from photos flown during 1968. (Map not included with Report)

(b) McElhanney Surveying and Engineering Limited

McElhanney Surveying and Engineering Limited established ground control tying to the coordinate system and elevation datum their company established for Cominco Limited (Fording River). Control stations were targeted (Scurry staff targeted all drill hole entries and major trenches) prior to flying photography at the scale of 1,000 feet to the inch. Topographic maps were prepared (a) for Scurry's entire holdings, scale

1,000 feet to the inch with 20-foot contours and (b) 200 feet to the inch with 5-foot contours for the area north and south of Weary Creek.

The 1,000 scale map (Control Map) is included in Exhibit "B".

The eight 200 scale maps are included in Exhibit "C".

Ground control survey data is included in Exhibit "D".

The 200 and 1,000 scale topographic maps prepared by McElhanney were received late in December, 1969.

(3) Diamond Drilling

9,646 feet of HQ wireline coring was completed by Canadian Longyear during the period June to October, 1969. The locations of the sixteen core holes completed are shown on Exhibits "B" and "C" (SR-1 through SR-16). All holes were drilled vertical with the exception of DDH SR-11 drilled at 45°E on a bearing of 75° east of north.

Drill logs for the above holes are shown on Exhibit "E", in addition, Gamma-Ray Neutron logs run on all holes with the exception of DDH SR-1, SR-2, SR-5 and SR-6 which were not logged and are included in Exhibit "F".

Assays by Cyclone Engineering Sales Limited of coal seams cored are included in Exhibit "G" (Confidential). Reports enclosed are Cyclone Engineering Sales Limited's Report Nos. RI-69.03, RI-69.04, RI-69.05 and RI-69.06. The diamond drill cores obtained are presently stored in steel racks in a covered building in Blairmore, Alberta.

(4) Adits on Entries (1,089 feet)

(a) Four adits were driven on four different seams located on the south bank of Weary Creek using a Salem 1530 auger belonging to Cambridge Oil

Exploration. These adits were later timbered, trimmed, crosscut and each bulk sampled (one ton samples) by two four-man mining crews under the supervision of Frank McVeigh (Fire boss).

(b) Short entries were driven on seven seams cut by an old 630 foot tunnel (Aldridge Tunnel) and bulk sampled.

(c) Two old adits (short) and one new adit were driven on coal seams, on the west side of the Elk River, and bulk samples obtained by the mining crews.

A total of 1,089 feet of drilling and crosscutting was completed during 1969.

Plans and sections of the above adits, etc., are included in Exhibit "H".

Assays and Float-Sink data completed on adit samples by Cyclone Engineering Sales Limited's Report Nos. RI-69.07 through RI-69.07.i.

Location of entries are shown on the location maps (Appendix "B" and Appendix "C").

(5) Dozer Work (Total 1,787 cat hours)

Up to three cats (two D-7E and one D-8) were employed, trenching coal seams, building access roads preparing drill sites and moving drilling equipment including the Salem Auger. These cats were supplied by Fernie Contractors.

The majority of the trenching was conducted in the Weary Creek area and on the west side of the Elk River. Old trenches (1968) in the Weary Creek area were also cleaned out to enable measurement of coal seams.

Plans and sections of trenches are included in Exhibit "C", 200 scale and the remainder on the Control Map, Exhibit "B", 1000 scale. Access roads

to trenches and drill sites are shown on both maps.

(6) Access Roads and Bridges

(a) Drain Brothers Construction installed eleven C.M.P. culverts and repaired washouts between Round Prairie and Weary Creek during May, 1969 prior to moving in camp and exploration equipment.

(b) Fernie Contractors rebuilt a condemned bridge across the Fording River near Mile 22 on the CNI logging road to enable Scurry to move in the Salem Auger drill of Cambridge Oil Exploration. The road from this bridge to the Elk River then north to Aldridge Creek had to be widened and repaired in several places to enable equipment to be moved in.

(c) Bleasdel Creek access road - An access road (plus a bridge across the Elk River) was constructed from Aldridge Creek to a point three miles north of Aldridge Creek by Fernie Contractors to enable Scurry to move cats, drilling equipment, mining equipment and to service same.

Access routes are shown on the Control maps.

(7) Base camp

The base camp for this operation was located on the south Bank of Aldridge Creek near its mouth (See control map).

The camp consisted of 9 trailers: three 32' six man sleepers, one 50' 10 man sleeper, one kitchen diner, one 32' washhouse, one 32' office trailer, one 30 KV power trailer and one 35' wellsite unit.

All of the trailers were rented from Nodwell Brothers, Calgary, with the exception of the Wellsite unit which belonged to Scurry. The camp was catered to be Foothills Caterers of Calgary. The number of men in camp

varied from 8 to 34, averaging about 18 for the June to October period.

(8) Supervisory Personnel (on site)

D. M. Lane, P. Geol. ,Senior Geologist, Non-Metallics 1/c

R. F. Vernon, P. Eng., Mining Engineer 2/c

F. McVeigh, Fire boss (Seasonal)

(9) Reserve Calculations, Feasibility and Mining Studies

Reserve calculation, feasibility and mining studies are presently being compiled from data obtained during 1968 and 1969 using the topographic maps prepared by McElhanney which were received late in December, 1969.

STATEMENT OF EXPENDITURES (AFFIDAVIT OF WORK)
FOR YEAR ENDING DECEMBER 31, 1969 AS REQUIRED
UNDER PROVISION 3(2)(b)

Three copies of the Statement of Expenditures was delivered by hand to Mr. R. H. McCrimmon on Monday, March 16, 1970.

Note: In reviewing the Affidavit of Work under the heading Road & Bridges work performed by Fernie Contractors reads \$2,970.83. This should read \$8,367.16 (an additional \$5,397.33 which was inadvertently coded under "Grade Determinations, including underground work adits and evaluation - surface stripping"). The same amount should be subtracted from the \$59,254.96 expenditure shown for surface stripping (trenching, drill site preparation). The total for this should read \$53,857.63.

The information data submitted herewith to the best of my knowledge represents a true and accurate account of work done during the year ending December 31, 1969.

D. M. Lane
P. Geol. (Alta.) L-345
P. Eng. (Sask.) L-1145

/lb

March 23, 1970

LIST OF EXHIBITS

- Exhibit A - Preliminary Mining Study
Elk River Coal Reserve

By: John T. Boyd Company
- Exhibit B - Property Location Map

1" = 1,000'

NM 231-0-K
- Exhibit C - Elk River Coal Project

Topographic Maps & Stations E-2, E-3, F-2, F-3,
G-3, G-4, H-3, H-4
- Exhibit D - Elk River Coal Project

Control Survey

1" = 50,000'
- Exhibit E - Diamond Drill Holes 1969 Project

SRO 1-16
- Exhibit F - Elk River Coal Project

Roke Gamma Ray Neutron Log

Hole Number SRO-3, SRO-4, SRO-7, SRO-8, SRO-9, SRO-10,
SRO-11, SRO-12, SRO-13, SRO-14, SRO-15, SRO-16
- Exhibit G - Reports on Analyses of Borehole Samples on Raw Coal
- Exhibit H - Preliminary Plan & Horizontal Section
- | | |
|-----------------------------------------------------|----------------|
| Aldridge Tunnel & Core Hole | Elk 231-4-28 ✓ |
| Weary Creek Area | |
| Adit No. 8, Plan & Section | NM 231-4-37 ✓ |
| Adit No. 7, Plan & Section | NM 231-4-37 ✓ |
| Adit No. 9, Plan & Section | NM 231-4-38 ✓ |
| Adit No. 4, Plan & Section | NM 231-4-39 ✓ |
| Adit No. 10, Plan & Section | NM 231-4-40 ✓ |
| Adit No. 3, Plan & Section | NM 231-4-41 ✓ |
| Adit No. 2, Plan & Section | NM 231-4-42 ✓ |
|
 | |
| P-1 Entry No. 9 Seam Plan &
Section | NM 231-4-43 ✓ |
| S-1 Entry No. 9 Seam Plan &
Section | NM 231-4-44 ✓ |
| Adit No. 1 Plan & Section | NM 231-4-45 - |
|
 | |
| Bleasdel Creek Area - Adit
No. 9, Plan & Section | NM 231-4-46 |

List of Exhibits (Cont'd)

Exhibit I - Reports on Cleaning Coking Coal

Exhibit J - Coal Logs of Trenches - Little Weary 1 - 10 ✓
Big Weary 11 - 18
Big Weary 1A; 2A, B-1 to B-4

Bleasdel Trench 1000' South Coal Creek	DWG. NM 231-4-29
Bleasdel Trench Bank North Coal Creek	DWG. NM 231-4-30
Bleasdel Trench Section 140 + 00	DWG. NM 231-4-31
Bleasdel Trench Section 160 + 00	DWG. NM 231-4-32
Bleasdel Trench Section 200 + 00	DWG. NM 231-4-33
Bleasdel Trench Section 260 + 00	DWG. NM 231-4-34
Bleasdel Trench Section 300 + 00	DWG. NM 231-4-35

82J-7E-10

[REDACTED]

EXHIBITS "G" & "I"

K-ELK RIVER 69(4)C

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KOOTENAY LAND DISTRICT

BRITISH COLUMBIA

By: D. M. Lane, P.Geol., P.Eng.

Aug 19 1969

00267

Exhibit "G"

REPORT ON
ANALYSES OF BOREHOLE SAMPLES
ON RAW COAL

For
SCURRY RAINBOW OIL LIMITED

Submitted by
CYCLONE ENGINEERING SALES LTD.
EDMONTON - ALBERTA - CANADA

Report No.: RI - 69.03

C.E.S. Project No.: S1 - 58

Scurry Rainbow Sample Nos.: 5201 - 5230 (incl.)
5232 - 5236 (incl.)

Date: August 19, 1969

REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited		
Project:	Elk River Coal 2-56		
C.E.S. Project Number:	S1 - 58		
Sample: S.R. #	5201		
Origin:	Borehole Sample		
Sample Number: C.E.S.	01		
Date Received:	July 25, 1969		
D. M. Lane	SR #1	11.5'	(Core HQ) Interval 163.5 - 175 Upper part #9 seam
<u>MOISTURE CONTENT:</u>			
Weight loss on air drying in weight percent: (on as received basis)			1.52
Residual moisture in weight percent: (on air dry basis)			0.75
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)			
Ash:			23.70
V.M.:			18.13
F.S.I.:			1½ - 1½ - 1½
B.T.U./lb.:			11087
Sulphur:			0.32
F.C.:			57.42
RANK:			1vb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: R. Sehgal
R. Sehgal
Head of Laboratory

REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5202
Origin:	Borehole sample
Sample Number: C.E.S.	02
Date Received:	July 25, 1969
D.M. Lane SR #1 10.4' (HQ Core) Interval 175.0 - 185.4. Lower part of #9 seam	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.86
Residual moisture in weight percent: (on air dry basis)	0.80
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	13.19
V.M.:	18.82
F.S.I.:	2 - 2½ - 2½
B.T.U./lb.:	13,087
Sulphur:	0.37
F.C.:	67.19
RANK:	lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: R. Sehgal
R. Sehgal
Head of Laboratory


REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5203
Origin:	Borehole sample
Sample Number: C.E.S.	03
Date Received:	July 25, 1969
D. M. Lane SR #1 142' 14.2 (HQ Core) Interval 324 to 338.2 Upper portion of #8 seam	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.00
Residual moisture in weight percent: (on air dry basis)	0.71
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	11.12
V.M.:	19.09
F.S.I.:	5 - 5½ - 5½
B.T.U./lb.:	13,348
Sulphur:	0.41
F.C.:	69.08
RANK:	1vb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory


REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5204
Origin:	Borehole sample
Sample Number: C.E.S.	04
Date Received:	July 25, 1969
D.M. Lane	SR #1 5.2' Bone Interval 338.4 - 343.4 Bone layer #8 Seam
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.58
Residual moisture in weight percent: (on air dry basis)	0.84
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	85.08
V.M.:	7.16
F.S.I.:	N.A.
B.T.U./lb.:	1,709
Sulphur:	0.06
F.C.:	6.92
RANK:	Not ranked

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory

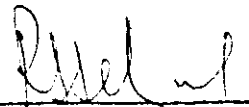
REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5205
Origin:	Borehole sample
Sample Number: C.E.S.	05
Date Received:	July 25, 1969
D. M. Lane SR #1	9.1' (HQ Core) Interval 343.4 - 352.5. Lower portion No. 8 Seam
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.84
Residual moisture in weight percent: (on air dry basis)	0.65
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	13.89
V.M.:	19.85
F.S.I.:	3½ - 3½ - 4
B.T.U./lb.:	12,873
Sulphur:	0.41
F.C.:	65.61
RANK:	mvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory

REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5206
Origin:	Borehole sample
Sample Number: C.E.S.	06
Date Received:	July 25, 1969
D.M. Lane SR #1 8'	(HQ Core) Interval 398 - 406 No. 7 Seam

MOISTURE CONTENT:

Weight loss on air drying in weight percent: (on as received basis)	0.80
Residual moisture in weight percent: (on air dry basis)	0.69

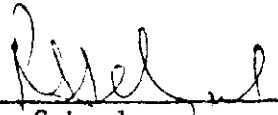
CHEMICAL ANALYSIS: (On air dry basis)

Ash:	16.13
V.M.:	17.78
F.S.I.:	2½ - 2½ - 3
B.T.U./lb.:	12,297
Sulphur:	0.58
F.C.:	65.40
RANK:	lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory

REPORT OF ANALYSES ON RAW SAMPLE

Client: Scurry Rainbow Oil Limited
Project: Elk River Coal 2-56
C.E.S. Project Number: S1 - 58
Sample: S.R. # 5207
Origin: Borehole sample
Sample Number: 07
Date Received: July 25, 1969
D.M. Lane SR #1 5.0' (HQ Core) Interval 463.3 - 468.3 No. 6 Seam

MOISTURE CONTENT:

Weight loss on air drying in weight percent: 0.78
(on as received basis)

Residual moisture in weight percent: 0.59
(on air dry basis)


CHEMICAL ANALYSIS: (On air dry basis)

Ash: 14.27
V.M.: 18.35
F.S.I.: $5\frac{1}{2} - 5\frac{1}{2} - 5\frac{1}{2}$
B.T.U./lb.: 13,030
Sulphur: 0.56
F.C.: 66.78
RANK: 1vb

C.E.S. Form 14

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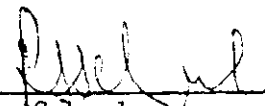
REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5208
Origin:	Borehole sample
Sample Number:C.E.S.	08
Date Received:	July 25, 1969
D. M. Lane SR #1 3.0' (HQ Core) Interval 469.5 - 472.5 No. 6 split	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.54
Residual moisture in weight percent: (on air dry basis)	0.51
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	28.87
V.M.:	16.96
F.S.I.:	4 - 4 - 3½
B.T.U./lb.:	10,380
Sulphur:	0.47
F.C.:	53.66
RANK:	1vb

C.E.S. Form 14

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Date: August 19, 1969

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Head of Laboratory

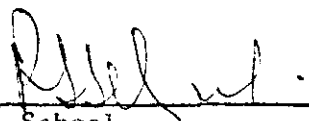
REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal - 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5209
Origin:	Borehole sample
Sample Number: C.E.S.	09
Date Received:	July 25, 1969
D.M. Lane SR #1 3.5' (HQ Core) Interval 480 - 483.5 Seam #6A	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.68
Residual moisture in weight percent: (on air dry basis)	0.56
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	14.82
V.M.:	18.19
F.S.I.:	3 - 3 - 3½
B.T.U./lb.:	13,177
Sulphur:	0.57
F.C.:	66.43
RANK:	lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory

REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5210
Origin:	Borehole sample
Sample Number:C.E.S.	10
Date Received:	July 25, 1969
D.M. Lane SR #5	15.5' (HQ Core) Interval 29.5 - 45. No. 10 Seam upper portion
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.45
Residual moisture in weight percent: (on air dry basis)	0.72
<u>CHEMICAL ANALYSIS: (On air dry basis)</u>	
Ash:	13.97
V.M.:	18.71
F.S.I.:	3 - 3 - 3
B.T.U./lb.:	12,930
Sulphur:	0.34
F.C.:	67.32
RANK:	1vb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: R. Sehgal
R. Sehgal
Head of Laboratory

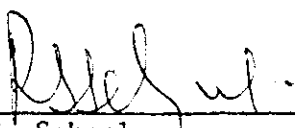
REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited		
Project:	Elk River Coal - 2-56		
C.E.S. Project Number:	S1 - 58		
Sample: S.R. #	5211		
Origin:	Borehole sample		
Sample Number:C.E.S.:	11		
Date Received:	July 25, 1969		
D.M. Lane	SR #5	11.0'	HQ Core Interval 45 - 56 middle part No. 10 seam
<u>MOISTURE CONTENT:</u>			
Weight loss on air drying in weight percent: (on as received basis)			1.50
Residual moisture in weight percent: (on air dry basis)			0.60
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)			
Ash:			12.34
V.M.:			19.86
F.S.I.:			5 - 5 - 5
B.T.U./lb.:			13,126
Sulphur:			0.31
F.C.:			67.20
RANK:			1vb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
 R. Sehgal
 Head of Laboratory


REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5212
Origin:	Borehole sample
Sample Number:C.E.S.:	12
Date Received:	July 25, 1969
D. M. Lane SR #5 10.4' HQ Core interval 56 - 66.4 lower part #10 seam	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.93
Residual moisture in weight percent: (on air dry basis)	0.57
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	31.46
V.M.:	16.93
F.S.I.:	2½ - 3 - 2½
B.T.U./lb.:	10,654
Sulphur:	0.49
F.C.:	51.04
RANK:	1vb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory

REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5213
Origin:	Borehole sample
Sample Number: C.E.S.:	13
Date Received:	July 25, 1969
Dave M. Lane SR #5 12.5' HQ Core interval 203.5 - 216 upper part Seam #9	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.07
Residual moisture in weight percent: (on air dry basis)	0.60
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	17.63
V.M.:	18.82
F.S.I.:	3 - 2½ - 2½
B.T.U./lb.:	12,260
Sulphur:	0.35
F.C.:	62.95
RANK:	1vb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: R. Sehgal
R. Sehgal
Head of Laboratory


REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5214
Origin:	Borehole sample
Sample Number:C.E.S.:	14
Date Received:	July 25, 1969
D.M. Lane SR #5 9.6' HQ core interval 216 - 225.4 lower part of #9 seam	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.03
Residual moisture in weight percent: (on air dry basis)	0.55
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	12.41
V.M.:	20.01
F.S.I.:	5 - 5 - 4½
B.T.U./lb.:	13,236
Sulphur:	0.35
F.C.:	67.03
RANK:	1vb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory

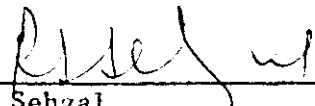
REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5215
Origin:	Borehole sample
Sample Number: C.E.S.:	15
Date Received:	July 25, 1969
D. M. Lane SR #5 14.0' HQ Core interval 321 - 335 upper part of #8 seam	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.64
Residual moisture in weight percent: (on air dry basis)	0.59
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	8.07
V.M.:	18.83
F.S.I.:	2½ - 3 - 3
B.T.U./lb.:	14,209
Sulphur:	0.52
F.C.:	72.51
RANK:	1vb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory

REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5216
Origin:	Borehole sample
Sample Number:	16
Date Received:	July 25, 1969
D. M. Lane SR #5 10.7' HQ Core interval 344 - 354.7 lower part of #8 seam	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.79
Residual moisture in weight percent: (on air dry basis)	0.55
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	17.00
V.M.:	18.39
F.S.I.:	2 - 2½ - 2½
B.T.U./lb.:	12,356
Sulphur:	0.38
F.C.:	64.06
RANK:	1vb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: R. Sehgal
R. Sehgal
Head of Laboratory

REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited		
Project:	Elk River Coal 2-56		
C.E.S. Project Number:	S1 - 58		
Sample: S.R. #	5217		
Origin:	Borehole sample		
Sample Number:	17		
Date Received:	July 25, 1969		
D. M. Lane	SR #4	26'	HQ Core #4 seam interval 231 - 257 upper part (coal rec. poor)
<u>MOISTURE CONTENT:</u>			
Weight loss on air drying in weight percent: (on as received basis)			0.69
Residual moisture in weight percent: (on air dry basis)			0.60
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)			
Ash:			28.33
V.M.:			16.35
F.S.I.:			1½ - 1½ - 2
B.T.U./lb.:			10,999
Sulphur:			0.24
F.C.:			54.72
RANK:			1vb

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C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: R. Sehgal
R. Sehgal
Head of Laboratory

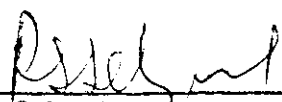
REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited		
Project:	Elk River Coal 2-56		
C.E.S. Project Number:	S1 - 58		
Sample: S.R. #	5218		
Origin:	Borehole sample		
Sample Number: C.E.S.:	18		
Date Received:	July 25, 1969		
D.M. Lane	SR #4	7.2'	HQ core interval 259.5 - 266.7 lower portion No. 4 sea
<u>MOISTURE CONTENT:</u>			
Weight loss on air drying in weight percent: (on as received basis)			0.65
Residual moisture in weight percent: (on air dry basis)			0.71
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)			
Ash:			67.01
V.M.:			9.32
F.S.I.:			$\frac{1}{2} - \frac{1}{2} - \frac{1}{2}$
B.T.U./lb.:			4,464
Sulphur:			0.17
F.C.:			22.96
RANK:			, lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory

REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal - 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5219
Origin:	Borehole sample
Sample Number:	19
Date Received:	July 25, 1969
D. M. Lane SR #4 4.7' HQ Core interval 393.3 - 398 No. 3 Seam	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.58
Residual moisture in weight percent: (on air dry basis)	0.49
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	8.00
V.M.:	19.36
F.S.I.:	8½ - 9 - 9
B.T.U./lb.:	14,096
Sulphur:	0.52
F.C.:	72.15
RANK:	lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: *R. Sehgal*
R. Sehgal
Head of Laboratory


REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5220
Origin:	Borehole sample
Sample Number:C.E.S.:	20
Date Received:	July 25, 1969
D. M. Lane SR #4	9.2' HQ core interval 466.8 - 476 No. 2 seam upper part
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.53
Residual moisture in weight percent: (on air dry basis)	0.43
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	25.54
V.M.:	17.02
F.S.I.:	4 - 4 - 3½
B.T.U./lb.:	11,306
Sulphur:	0.35
F.C.:	57.01
RANK:	lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
 R. Sehgal
 Head of Laboratory


REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5221
Origin:	Borehole sample
Sample Number:	21
Date Received:	July 25, 1969
Dave M. Lane SR #4 10' HQ Core interval 476 - 486, No2 seam lower part	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.45
Residual moisture in weight percent: (on air dry basis)	0.35
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	11.45
V.M.:	20.42
F.S.I.:	9 - 9 - 9
B.T.U./lb.:	13,492
Sulphur:	0.39
F.C.:	67.78
RANK:	mvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory


REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5222
Origin:	Borehole sample
Sample Number: C.E.S.:	22
Date Received:	July 25, 1969
D. M. Lane SR #3 12.5' HQ Core #4 seam upper part interval 123.5 - 136.0	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.03
Residual moisture in weight percent: (on air dry basis)	0.41
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	9.33
V.M.:	17.97
F.S.I.:	2 - 2 - 2
B.T.U./lb.:	13,688
Sulphur:	0.35
F.C.:	72.29
RANK:	lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory

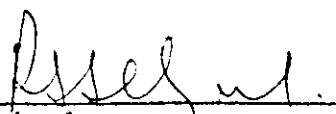
REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited		
Project:	Elk River Coal - 2-56		
C.E.S. Project Number:	S1 - 58		
Sample: S.R. #	5223		
Origin:	Borehole sample		
Sample Number:C.E.S.:	23		
Date Received:	July 25, 1969		
D. M. Lane	SR #3	13'	HQ Core interval 136 - 149. Middle part No. 4 seam
<u>MOISTURE CONTENT:</u>			
Weight loss on air drying in weight percent:		0.91	
(on as received basis)			
Residual moisture in weight percent:		0.61	
(on air dry basis)			
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)			
Ash:		13.58	
V.M.:		18.99	
F.S.I.:		2½ - 2½ - 2½	
B.T.U./lb.:		13,043	
Sulphur:		0.27	
F.C.:		66.82	
RANK:		lvb	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
 R. Sehgal
 Head of Laboratory

REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5224
Origin:	Borehole sample
Sample Number:C.E.S.:	24
Date Received:	July 25, 1969
D. M. Lane SR #3	3.0' HQ Core interval 149 - 152 No. 4 seam lower part
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.94
Residual moisture in weight percent: (on air dry basis)	0.87
<u>CHEMICAL ANALYSIS: (On air dry basis)</u>	
Ash:	36.04
V.M.:	14.26
F.S.I.:	2½ - 3 - 2½
B.T.U./lb.:	9,390
Sulphur:	0.27
F.C.:	48.83
RANK:	lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: R. Sehgal
R. Sehgal
Head of Laboratory

REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5225
Origin:	Borehole sample
Sample Number: C.E.S:	25
Date Received:	July 25, 1969
D. M. Lane SR #3 6.5' HQ core interval 300 - 306.5. No. 3 seam Rec. 5'	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.54
Residual moisture in weight percent: (on air dry basis)	0.71
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	6.87
V.M.:	19.74
F.S.I.:	8 - 8 - 8
B.T.U./lb.:	14,340
Sulphur:	0.52
F.C.:	72.68
RANK:	lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: R. Sehgal
R. Sehgal
Head of Laboratory


REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5226
Origin:	Borehole sample
Sample Number: C.E.S.:	26
Date Received:	July 25, 1969
D. M. Lane SR #3 19.0' HQ Core interval 377 - 396. No. 2 seam. Rec. 17'	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	2.08
Residual moisture in weight percent: (on air dry basis)	0.58
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	12.06
V.M.:	19.34
F.S.I.:	7½ - 7½ - 7½
B.T.U./lb.:	13,602
Sulphur:	0.39
F.C.:	68.02
RANK:	1vb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory

REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	SI - 58
Sample: S.R. #	5227
Origin:	Borehole sample
Sample Number: C.E.S.:	27
Date Received:	July 25, 1969
D.M. Lane SR #2 10.4' HQ core interval 22.3 - 32.7. #8 seam upper portion	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.01
Residual moisture in weight percent: (on air dry basis)	0.65
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	9.83
V.M.:	18.68
F.S.I.:	3 - 3½ - 3½
B.T.U./lb.:	13,570
Sulphur:	0.44
F.C.:	70.84
RANK:	lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: *R. Sehgal*
 R. Sehgal
 Head of Laboratory

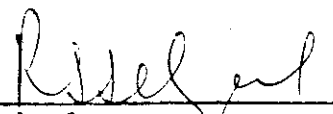
REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited		
Project:	Elk River Coal 2-56		
C.E.S. Project Number:	S1 - 58		
Sample: S.R. #	5228		
Origin:	Borehole sample		
Sample Number: C.E.S.:	28		
Date Received:	July 25, 1969		
D.M. Lane	SR #2	11.5'	HQ core interval 38 - 49.5. #8 seam lower portion Rec. 10'
<u>MOISTURE CONTENT:</u>			
Weight loss on air drying in weight percent: (on as received basis)			0.65
Residual moisture in weight percent: (on air dry basis)			0.68
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)			
Ash:			12.69
V.M.:			18.79
F.S.I.:			3½ - 3½ - 4
B.T.U./lb.:			13,464
Sulphur:			0.45
F.C.:			67.84
RANK:			lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory


REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58 .
Sample: S.R. #	5229
Origin:	Borehole sample
Sample Number: C.E.S.:	29
Date Received:	July 25, 1969
D. M. Lane SR #2 9'	HQ core interval 115 - 124. No. 7 seam
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.54
Residual moisture in weight percent: (on air dry basis)	0.63
<u>CHEMICAL ANALYSIS: (On air dry basis)</u>	
Ash:	17.84
V.M.:	18.10
F.S.I.:	2½ - 3 - 3
B.T.U./lb.:	12,249
Sulphur:	0.54
F.C.:	63.43
RANK:	1vb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
 Head of Laboratory


REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5230
Origin:	Borehole sample
Sample Number:C.E.S.:	30
Date Received:	July 25, 1969
Dave M. Lane SR #2 4.4'	HQ Core interval 187 - 191.4 No. 6 seam (Stray) Recovery full.
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.48
Residual moisture in weight percent: (on air dry basis)	0.62
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	15.12
V.M.:	17.69
F.S.I.:	2½ - 3 - 3
B.T.U./lb.:	12,696
Sulphur:	0.65
F.C.:	66.57
RANK:	lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory

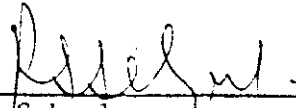
REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited		
Project:	Elk River Coal 2-56		
C.E.S. Project Number:	S1 - 58		
Sample: S.R. #	5232		
Origin:	Borehole sample		
Sample Number: C.E.S.:	32		
Date Received:	July 25, 1969		
D.M. Lane	SR #2	17.5'	HQ Core interval 407.5 - 425 upper portion #4 seam
<u>MOISTURE CONTENT:</u>			
Weight loss on air drying in weight percent: (on as received basis)			0.57
Residual moisture in weight percent: (on air dry basis)			0.65
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)			
Ash:			15.10
V.M.:			17.45
F.S.I.:			3 - 3½ - 3½
B.T.U./lb.:			12,789
Sulphur:			0.43
F.C.:			66.80
RANK:			lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory


REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5233
Origin:	Borehole sample
Sample Number: C.E.S.:	33
Date Received:	July 25, 1969
D.M. Lane	SR #2 7.0' HQ core interval 425 - 432 middle interval #4 seam
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.66
Residual moisture in weight percent: (on air dry basis)	0.56
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	12.38
V.M.:	18.06
F.S.I.:	4 - 3½ - 3
B.T.U./lb.:	13,128
Sulphur:	0.36
F.C.:	69.00
RANK:	sa

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory

REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5234
Origin:	Borehole sample
Sample Number:C.E.S.:	34
Date Received:	July 25, 1969
Dave M. Lane SR #2	9.8' HQ core interval 507 - 516.8. #3 seam. Rec. 9'
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.39
Residual moisture in weight percent: (on air dry basis)	0.58
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	14.64
V.M.:	18.59
F.S.I.:	7 - 7 - 7
B.T.U./lb.:	13,326
Sulphur:	0.45
F.C.:	66.19
RANK:	lvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: R. Sehgal
R. Sehgal
Head of Laboratory

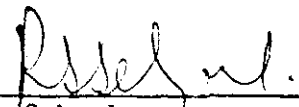
REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5235
Origin:	Borehole sample
Sample Number: C.E.S.:	35
Date Received:	July 25, 1969
D.M. Lane SR #2 21' HQ Core interval 569 - 590 #2 seam. Rec. 20.5'	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.43
Residual moisture in weight percent: (on air dry basis)	0.59
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	30.95
V.M.:	17.05
F.S.I.:	5 - 5 - 5½
B.T.U./lb.:	10,218
Sulphur:	0.52
F.C.:	51.41
RANK:	1vb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: 
R. Sehgal
Head of Laboratory

REPORT OF ANALYSES ON RAW SAMPLE

Client:	Scurry Rainbow Oil Limited
Project:	Elk River Coal 2-56
C.E.S. Project Number:	S1 - 58
Sample: S.R. #	5236
Origin:	Borehole sample
Sample Number: C.E.S.:	36
Date Received:	July 25, 1969
D. M. Lane SR #2 2'	Interval 603 - 605, No. 1 Seam
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.16
Residual moisture in weight percent: (on air dry basis)	0.41
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	7.02
V.M.:	22.22
F.S.I.:	9-9-9
B.T.U./lb.:	14,422
Sulphur:	0.74
F.C.:	70.35
RANK:	mvb

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: August 19, 1969

Per: *R. Sehgal*
R. Sehgal
Head of Laboratory

REPORT ON
ANALYSES OF BOREHOLE SAMPLES
ON FLOAT-SINKS

For
SCURRY RAINBOW OIL LIMITED

Submitted By
CYCLONE ENGINEERING SALES LTD.
EDMONTON - ALBERTA - CANADA

Report No.: RI - 69.04
C.E.S. Project No.: S1 - 58
Scurry Rainbow Sample Nos.: 5201 - 5230 (incl.)
5232 - 5236 (incl.)
Date: September 5, 1969

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5201	C.E.S. Sample No.: 01				
D. M. Lane SR #1 (Core HQ) Interval 163.5 - 175 Upper part #9 Seam					
11.5' Width <u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	75.71				
20 x 100 mesh	19.47				
- 100 mesh	<u>4.82</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	51.48				
Sinks @ 1.5 in 1/4" x 20 mesh -	24.23				
Floats @ 1.5 in 20 x 100 mesh -	15.77				
Sinks @ 1.5 in 20 x 100 mesh -	3.70				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	67.25	7.02	19.38	3 - 3 - 3	0.43
Combined sinks @ 1.5	27.93	67.74			0.14
- 100 mesh	4.82	15.56	19.25	3 - 3½ - 3	0.38
Total	100	24.39	*		0.34
* Total of Floats only.					

C.E.S. Form 15

Date: September 5, 1969

CYCLONE ENGINEERING SALES LTD.

Per: 

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5202	C.E.S. Sample No.: 02				
D.M. Lane SR #1 (HQ Core) Interval 175.0 - 185.4; lower part of #9 seam					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	76.21				
20 x 100 mesh	19.57				
- 100 mesh	<u>4.22</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	64.78				
Sinks @ 1.5 in 1/4" x 20 mesh -	11.43				
Floats @ 1.5 in 20 x 100 mesh -	17.61				
Sinks @ 1.5 in 20 x 100 mesh -	1.96				
<u>ANALYSES.</u>					
<u>Property</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
<u>Fraction</u>					
Combined floats @ 1.5	82.39	7.13	19.38	3½, 3½, 3½	0.38
Combined sinks @ 1.5	13.39	53.14			0.18
- 100 mesh	4.22	10.96	20.28	4, 3½, 3½	0.38
Total	100	13.45	*		0.36
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1 - 58				
Client Sample No.: 5203	C.E.S. Sample No.: 03				
D.M. Lane SR #1 142' HQ Core Int. 324 - 338.2; Upper portion #8 seam					
Rec. 14.2'					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	72.35				
20 x 100 mesh	23.52				
- 100 mesh	<u>4.13</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	62.22				
Sinks @ 1.5 in 1/4" x 20 mesh -	10.13				
Floats @ 1.5 in 20 x 100 mesh -	21.64				
Sinks @ 1.5 in 20 x 100 mesh -	1.88				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	83.86	6.39	20.40	5½, 6, 6	0.42
Combined sinks @ 1.5	12.01	46.35			0.24
- 100 mesh	4.13	8.56	20.90	7, 7, 7½	0.43
Total	100	11.28	*		0.40
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: 

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1 - 58				
Client Sample No.: 5204	C.E.S. Sample No.: 04				
D.M. Lane SR #1 Bone Interval 338.4 - 343.4; bone layer #8 seam; Rec. 5.2'					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	80.99				
20 x 100 mesh	14.25				
- 100 mesh	<u>4.76</u>				
Total	100				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	2.99				
Sinks @ 1.5 in 1/4" x 20 mesh -	78.00				
Floats @ 1.5 in 20 x 100 mesh -	2.85				
Sinks @ 1.5 in 20 x 100 mesh -	11.40				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	5.84	6.68	21.08	10, 9, 10	0.57
Combined sinks @ 1.5	89.40	90.16			0.09
- 100 mesh	4.76	67.07	11.18	N.A.	0.29
Total	100	84.19	*		0.11
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969																														
Project:	C.E.S. Project No.: S1-58																														
Client Sample No.: 5205	C.E.S. Sample No.: 05																														
D.M. Lane SR #1 9.1' HQ Core Int. 343.4 - 352.5; lower portion No. 8 Seam																															
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>																															
<u>Fraction</u>	<u>Weight %</u>																														
1/4" x 20 mesh	75.01																														
20 x 100 mesh	20.89																														
- 100 mesh	<u>4.10</u>																														
Total	100.00																														
<u>FLOAT-SINK ANALYSES.</u>																															
	<u>Weight %</u>																														
Floats @ 1.5 in 1/4" x 20 mesh -	63.76																														
Sinks @ 1.5 in 1/4" x 20 mesh -	11.25																														
Floats @ 1.5 in 20 x 100 mesh -	19.01																														
Sinks @ 1.5 in 20 x 100 mesh -	1.88																														
<u>ANALYSES.</u>																															
<table border="1"> <thead> <tr> <th>Property Fraction</th> <th>Weight %</th> <th>Ash %</th> <th>V.M. %</th> <th>F.S.I.</th> <th>Sulphur %</th> </tr> </thead> <tbody> <tr> <td>Combined floats @ 1.5</td> <td>82.77</td> <td>7.63</td> <td>19.36</td> <td>4, 3½, 4</td> <td>0.49</td> </tr> <tr> <td>Combined sinks @ 1.5</td> <td>13.13</td> <td>57.93</td> <td></td> <td></td> <td>0.23</td> </tr> <tr> <td>- 100 mesh</td> <td>4.10</td> <td>11.02</td> <td>21.12</td> <td>6, 6, 6</td> <td>0.46</td> </tr> <tr> <td>Total</td> <td>100</td> <td>14.37</td> <td>*</td> <td></td> <td>0.44</td> </tr> </tbody> </table>	Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %	Combined floats @ 1.5	82.77	7.63	19.36	4, 3½, 4	0.49	Combined sinks @ 1.5	13.13	57.93			0.23	- 100 mesh	4.10	11.02	21.12	6, 6, 6	0.46	Total	100	14.37	*		0.44	
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %																										
Combined floats @ 1.5	82.77	7.63	19.36	4, 3½, 4	0.49																										
Combined sinks @ 1.5	13.13	57.93			0.23																										
- 100 mesh	4.10	11.02	21.12	6, 6, 6	0.46																										
Total	100	14.37	*		0.44																										
* Total of Floats only.																															

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5206	C.E.S. Sample No.: 06				
D.M. Lane SR #1 8 ^N HQ Core Interval 398 - 406, No. 7 Seam					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	72.33				
20 x 100 mesh	23.25				
- 100 mesh	<u>4.42</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	50.63				
Sinks @ 1.5 in 1/4" x 20 mesh -	21.70				
Floats @ 1.5 in 20 x 100 mesh -	20.46				
Sinks @ 1.5 in 20 x 100 mesh -	2.79				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	71.09	8.33	18.95	3½, 3, 3	0.63
Combined sinks @ 1.5	24.49	41.45			0.45
- 100 mesh	4.42	9.57	19.89	5½, 5½, 5	0.69
Total	100	16.49	*		0.59
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal
R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5207	C.E.S. Sample No.: 07				
D.M. Lane SR #1 5.0' HQ Core Int. 463.3 - 468.3; No. 6 Seam					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	79.44				
20 x 100 mesh	17.68				
- 100 mesh	<u>2.88</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	67.52				
Sinks @ 1.5 in 1/4" x 20 mesh -	11.92				
Floats @ 1.5 in 20 x 100 mesh -	15.91				
Sinks @ 1.5 in 20 x 100 mesh -	1.77				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	83.43	9.57	18.78	6, 6, 6	0.60
Combined sinks @ 1.5	13.69	40.13			0.55
- 100 mesh	2.88	11.18	19.57	7, 7, 6½	0.64
Total	100	13.80	*		0.59
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal
R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited Date Received: July 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5208 C.E.S. Sample No.: 08
 D.M. Lane SR #1 3.0' HQ Core Interval 469.5 - 472.5; No. 6 split

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	76.31
20 x 100 mesh	19.60
- 100 mesh	<u>4.09</u>
Total	100

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	41.97
Sinks @ 1.5 in 1/4" x 20 mesh -	34.34
Floats @ 1.5 in 20 x 100 mesh -	14.50
Sinks @ 1.5 in 20 x 100 mesh -	5.10

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	56.47	12.12	19.23	9, 9½, 9	0.58
Combined sinks @ 1.5	39.44	53.72			0.42
- 100 mesh	4.09	19.39	19.20	8, 8, 7½	0.61
Total	100	28.82	*		0.51

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5209	C.E.S. Sample No.: 09				
D.M. Lane SR #1 3.5' HQ Core Int. 480 - 483.5; Seam #6A					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	72.70				
20 x 100 mesh	22.25				
- 100 mesh	<u>5.05</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	58.89				
Sinks @ 1.5 in 1/4" x 20 mesh -	13.81				
Floats @ 1.5 in 20 x 100 mesh -	20.03				
Sinks @ 1.5 in 20 x 100 mesh -	2.22				
<u>ANALYSES.</u>					
<u>Property</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
<u>Fraction</u>					
Combined floats @ 1.5	78.92	7.64	19.09	5, 5, 5	0.61
Combined sinks @ 1.5	16.03	48.46			0.35
- 100 mesh	5.05	9.67	19.47	5½, 6, 5½	0.57
Total	100	14.29	*		0.56
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal
R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5210	C.E.S. Sample No.: 10				
D.M. Lane SR #5 15.5' HQ Core Int. 29.5 - 45; No. 10 Seam upper portion					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	77.48				
20 x 100 mesh	16.57				
- 100 mesh	<u>5.95</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	66.63				
Sinks @ 1.5 in 1/4" x 20 mesh -	10.85				
Floats @ 1.5 in 20 x 100 mesh -	15.08				
Sinks @ 1.5 in 20 x 100 mesh -	1.49				
<u>ANALYSES.</u>					
<u>Property</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
<u>Fraction</u>					
Combined floats @ 1.5	81.71	6.72	20.07	4, 4, 4½	0.38
Combined sinks @ 1.5	12.34	68.47			0.17
- 100 mesh	5.95	13.32	20.74	3, 3, 3½	0.48
Total	100	14.73	*		0.36
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal
R. Sehgal, Head of Laboratory

Client:	Scurry Rainbow Oil Limited	Date Received:	July 25, 1969		
Project:		C.E.S. Project No.:	S1-58		
Client Sample No.:	5211	C.E.S. Sample No.:	11		
D.M. Lane SR #5 11.0' HQ Core Interval 45 - 56 middle part No. 10 seam					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
	<u>Fraction</u>		<u>Weight %</u>		
	1/4" x 20 mesh		75.86		
	20 x 100 mesh		17.88		
	- 100 mesh		<u>6.26</u>		
	Total		100.00		
<u>FLOAT-SINK ANALYSES.</u>					
			<u>Weight %</u>		
	Floats @ 1.5 in 1/4" x 20 mesh	-	66.00		
	Sinks @ 1.5 in 1/4" x 20 mesh	-	9.86		
	Floats @ 1.5 in 20 x 100 mesh	-	16.45		
	Sinks @ 1.5 in 20 x 100 mesh	-	1.43		
<u>ANALYSES.</u>					
<u>Property</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
<u>Fraction</u>					
Combined floats @ 1.5	82.45	6.31	20.72	6, 6, 5½	0.33
Combined sinks @ 1.5	11.29	60.73			0.16
- 100 mesh	6.26	10.41	20.94	4½, 4½, 5	0.39
Total	100	12.78	*		0.31
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5212	C.E.S. Sample No.: 12				
D.M. Lane SR #5 10.4' HQ Core interval 56 = 66.4 lower part #10 seam					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	75.89				
20 x 100 mesh	18.41				
- 100 mesh	<u>5.70</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	45.57				
Sinks @ 1.5 in 1/4" x 20 mesh -	30.32				
Floats @ 1.5 in 20 x 100 mesh -	11.91				
Sinks @ 1.5 in 20 x 100 mesh -	6.50				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	57.48	6.96	20.50	5½, 5½, 5	0.56
Combined sinks @ 1.5	36.82	70.21			0.47
- 100 mesh	5.70	19.17	20.10	4, 4, 4½	0.58
Total	100	30.94	*		0.52
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: 

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited Date Received: July 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5213 C.E.S. Sample No.: 13
 D.M. Lane SR #5 12.5' HQ Core Coal Int. 203.5 - 216 upper part SEam #9

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	77.13
20 x 100 mesh	19.51
- 100 mesh	<u>3.36</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	57.85
Sinks @ 1.5 in 1/4" x 20 mesh -	19.28
Floats @ 1.5 in 20 x 100 mesh -	16.58
Sinks @ 1.5 in 20 x 100 mesh -	2.93

ANALYSES.

Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	74.43	6.82	19.53	3½, 3½, 4	0.43
Combined sinks @ 1.5	22.21	55.80			0.22
- 100 mesh	3.36	14.68	19.64	4, 4, 3½	0.42
Total	100	17.96	*		0.38

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: 

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5214	C.E.S. Sample No.: 14				
D.M. Lane SR #5 9.6' HQ Core int. 216 - 225.4 lower part of #9 seam					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	81.24				
20 x 100 mesh	16.02				
- 100 mesh	<u>2.74</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	69.87				
Sinks @ 1.5 in 1/4" x 20 mesh -	11.37				
Floats @ 1.5 in 20 x 100 mesh -	14.58				
Sinks @ 1.5 in 20 x 100 mesh -	1.44				
<u>ANALYSES.</u>					
<u>Property</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
<u>Fraction</u>					
Combined floats @ 1.5	84.45	6.07	20.27	5½, 5½, 6	0.41
Combined sinks @ 1.5	12.81	57.95			0.19
- 100 mesh	2.74	11.00	20.64		0.42
Total	100	12.85	*		0.38
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5215	C.E.S. Sample No.: 15				
D.M.Lane SR #5 14.0' HQ Core interval 321 - 335 upper part of #8 seam					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	75.65				
20 x 100 mesh	19.66				
- 100 mesh	<u>4.69</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	71.11				
Sinks @ 1.5 in 1/4" x 20 mesh -	4.54				
Floats @ 1.5 in 20 x 100 mesh -	18.87				
Sinks @ 1.5 in 20 x 100 mesh -	0.79				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	89.98	5.55	20.16	3½, 4, 3½	0.56
Combined sinks @ 1.5	5.33	50.96			0.29
- 100 mesh	4.69	7.89	19.77		0.54
Total	100	8.08	*		0.54
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5216	C.E.S. Sample No.: 16				
D.M. Lane SR #5 10.7' HQ Core int. 344 - 354.7 lower part of #8 seam					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	81.65				
20 x 100 mesh	15.53				
- 100 mesh	<u>2.82</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	66.95				
Sinks @ 1.5 in 1/4" x 20 mesh -	14.70				
Floats @ 1.5 in 20 x 100 mesh -	13.36				
Sinks @ 1.5 in 20 x 100 mesh -	2.17				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	80.31	8.30	19.44	3½, 4, 4	0.43
Combined sinks @ 1.5	16.87	57.65			0.20
- 100 mesh	2.82	13.06	19.33		0.46
Total	100	16.76	*		0.39
* Total of Floats only.					

C.E.S. Form 15

Date: September 5, 1969

CYCLONE ENGINEERING SALES LTD.

Per: R. Sehgal
R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited Date Received: July 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5217 C.E.S. Sample No.: 17
 D.M. Lane SR #4 HQ Core #4 seam int. 231 - 257 upper part (coal rec. poor)

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	70.25
20 x 100 mesh	22.58
- 100 mesh	<u>7.17</u>
Total	100

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	48.47
Sinks @ 1.5 in 1/4" x 20 mesh -	21.78
Floats @ 1.5 in 20 x 100 mesh -	14.68
Sinks @ 1.5 in 20 x 100 mesh -	7.90

ANALYSES.

<u>Property</u> <u>Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	63.15	6.22	19.20	3, 3, 3	0.32
Combined sinks @ 1.5	29.68	73.91			0.13
- 100 mesh	7.17	23.41	17.78	3, 3, 3	0.30
Total	100	27.54	*		0.26

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal
R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited Date Received: July 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5218 C.E.S. Sample No.: 18
 D.M. Lane SR #4 7.2' HQ core interval 259.5 - 266.7 lower portion #4 seam

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	75.45
20 x 100 mesh	18.61
- 100 mesh	<u>5.94</u>
Total	100

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	14.34
Sinks @ 1.5 in 1/4" x 20 mesh -	61.11
Floats @ 1.5 in 20 x 100 mesh -	8.93
Sinks @ 1.5 in 20 x 100 mesh -	9.68

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	23.27	7.70	18.01	3½, 3½, 4	0.38
Combined sinks @ 1.5	70.79	88.57			0.07
- 100 mesh	5.94	40.27	14.48	1½, 1, 1	0.28
Total	100	66.88	*		0.16

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969
 Per: R. Sehgal
 R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5219	C.E.S. Sample No.: 19				
D.M. Lane SR #4 4.7' HQ Core interval 393.3 - 398; No. 3 seam					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	74.59				
20 x 100 mesh	20.88				
- 100 mesh	<u>4.53</u>				
Total	100				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	69.37				
Sinks @ 1.5 in 1/4" x 20 mesh -	5.22				
Floats @ 1.5 in 20 x 100 mesh -	19.63				
Sinks @ 1.5 in 20 x 100 mesh -	1.25				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	89.00	6.13	20.65	9, 9, 10	0.54
Combined sinks @ 1.5	6.47	38.01			0.34
- 100 mesh	4.53	10.43	20.11	4½, 4½, 5	0.47
Total	100	8.38	*		0.52
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969
 Per: R. Sehgal
 R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5220	C.E.S. Sample No.: 20				
D.M. Lane SR #4 9.2' HQ core interval 466.8 - 476 No. 2 seam upper part					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	74.77				
20 x 100 mesh	20.86				
- 100 mesh	<u>4.37</u>				
Total	100 .00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	53.83				
Sinks @ 1.5 in 1/4" x 20 mesh -	20.94				
Floats @ 1.5 in 20 x 100 mesh -	15.44				
Sinks @ 1.5 in 20 x 100 mesh -	5.42				
<u>ANALYSES.</u>					
<u>Property</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
<u>Fraction</u>					
Combined floats @ 1.5	69.27	9.14	19.47	6, 5½, 5½	0.38
Combined sinks @ 1.5	26.36	67.83			0.28
- 100 mesh	4.37	26.01	19.26	5½, 6, 6	0.46
Total	100	25.34	*		0.36
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal
R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited Date Received: July 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5221 C.E.S. Sample No.: 21
 D.M. Lane SR #4 10' HQ Core interval 476 - 486; No. 2 seam lower part

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	69.42
20 x 100 mesh	24.82
- 100 mesh	5.76
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	62.48
Sinks @ 1.5 in 1/4" x 20 mesh -	6.94
Floats @ 1.5 in 20 x 100 mesh -	23.08
Sinks @ 1.5 in 20 x 100 mesh -	1.74

ANALYSES.

<u>Property</u> <u>Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	85.56	8.37	20.28	9, 10, 10	0.38
Combined sinks @ 1.5	8.68	43.40			0.31
- 100 mesh	5.76	10.46	20.12	9, 9, 9	0.45
Total	100	11.53	*		0.38

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited Date Received: July 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5222 C.E.S. Sample No.: 22
 D.M. Lane SR #3 12.5 HQ Core #4 seam upper part; interval 123.5 - 136.0

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	73.15
20 x 100 mesh	22.17
- 100 mesh	<u>4.68</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	65.84
Sinks @ 1.5 in 1/4" x 20 mesh -	7.31
Floats @ 1.5 in 20 x 100 mesh -	20.62
Sinks @ 1.5 in 20 x 100 mesh -	1.55

ANALYSES.

<u>Property</u> <u>Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	86.46	6.84	19.30	2½, 2½, 2½	0.39
Combined sinks @ 1.5	8.86	36.35			0.31
- 100 mesh	4.68	6.25	19.60	5, 5, 5	0.40
Total	100	9.42	*		0.37
* Total of Floats only.					

C.E.S. Form 15

Date: September 5, 1969

CYCLONE ENGINEERING SALES LTD.

Per: R. Sehgal
 R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5223	C.E.S. Sample No.: 23				
D.M. Lane SR #3 13 ^b HQ Core interval 136 - 149; middle part No. 4 seam					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	66.89				
20 x 100 mesh	26.98				
- 100 mesh	<u>6.13</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	56.19				
Sinks @ 1.5 in 1/4" x 20 mesh -	10.70				
Floats @ 1.5 in 20 x 100 mesh -	23.47				
Sinks @ 1.5 in 20 x 100 mesh -	3.51				
<u>ANALYSES.</u>					
<u>Property</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
<u>Fraction</u>					
Combined floats @ 1.5	79.66	6.97	19.20	3, 3, 3	0.33
Combined sinks @ 1.5	14.21	56.32			0.14
- 100 mesh	6.13	9.77	19.83	4½, 5, 4½	0.36
Total	100	14.15	*		0.30
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal
R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5224	C.E.S. Sample No.: 24
D.M. Lane SR #3 3.0' HQ Core interval	149 - 152 No. 4 seam lower part

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	44.06
20 x 100 mesh	38.48
- 100 mesh	<u>17.46</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	25.55
Sinks @ 1.5 in 1/4" x 20 mesh -	18.51
Floats @ 1.5 in 20 x 100 mesh -	22.32
Sinks @ 1.5 in 20 x 100 mesh -	16.16

ANALYSES.

Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	47.87	6.79	20.02	5, 5, 4½	0.31
Combined sinks @ 1.5	34.67	78.73			0.14
- 100 mesh	17.46	35.08	15.91	1, 1, 1	0.27
Total	100	36.67	*		0.25

* Total of Floats only.

C.E.S. Form 15

Date: September 5, 1969

CYCLONE ENGINEERING SALES LTD.

Per: R. Sehgal
R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited Date Received: July 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5225 C.E.S. Sample No.: 25
 D.M. Lane SR #3 6.5' HQ Core interval 300 - 306.5; No. 3 seam; Rec. 5'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	77.19
20 x 100 mesh	19.80
- 100 mesh	<u>3.01</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	74.10
Sinks @ 1.5 in 1/4" x 20 mesh -	3.09
Floats @ 1.5 in 20 x 100 mesh -	18.41
Sinks @ 1.5 in 20 x 100 mesh -	1.39

ANALYSES.

Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	92.51	4.51	21.20	9, 9, 10	0.49
Combined sinks @ 1.5	4.48	46.81			0.30
- 100 mesh	3.01	12.26	19.64	4½, 4½, 5	0.43
Total	100	6.64	*		0.48

* Total of Floats only.

C.E.S. Form 15

Date: September 5, 1969

CYCLONE ENGINEERING SALES LTD.

Per: 

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5226	C.E.S. Sample No.: 26				
D.M. Lane SR #3 19.0' HQ Core interval 377 - 396; No. 2 seam; Rec. 17					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	81.02				
20 x 100 mesh	15.10				
- 100 mesh	3.88				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	72.11				
Sinks @ 1.5 in 1/4" x 20 mesh -	8.91				
Floats @ 1.5 in 20 x 100 mesh -	14.04				
Sinks @ 1.5 in 20 x 100 mesh -	1.06				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	86.15	7.48	19.93	8½, 8½, 9	0.38
Combined sinks @ 1.5	9.97	47.92			0.26
- 100 mesh	3.88	11.29	21.00	7, 7½, 7	0.43
Total	100	11.67	*		0.37
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal
R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5227	C.E.S. Sample No.: 27				
D.M. Lane SR #2 10.4' HQ Core interval 22.3 - 32.7; #8 Seam upper part					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	76.52				
20 x 100 mesh	18.88				
- 100 mesh	4.60				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	69.63				
Sinks @ 1.5 in 1/4" x 20 mesh -	6.89				
Floats @ 1.5 in 20 x 100 mesh -	17.75				
Sinks @ 1.5 in 20 x 100 mesh -	1.13				
<u>ANALYSES.</u>					
<u>Property</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
<u>Fraction</u>					
Combined floats @ 1.5	87.38	6.40	19.03	4, 4, 4	0.39
Combined sinks @ 1.5	8.02	47.09			0.27
- 100 mesh	4.60	8.56	19.83	4½, 4, 4	0.41
Total	100	9.76	*		0.38
* Total of Floats only.					

C.E.S. Form 15

Date: September 5, 1969

CYCLONE ENGINEERING SALES LTD.

Per: R. Schgal

R. Schgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited Date Received: July 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5228 C.E.S. Sample No. 28
 D.M. Lane SR #2 11.5' HQ Core interval 38 - 49.5'; #8 seam lower part

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	75.58
20 x 100 mesh	19.09
- 100 mesh	<u>5.33</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	64.24
Sinks @ 1.5 in 1/4" x 20 mesh -	11.34
Floats @ 1.5 in 20 x 100 mesh -	17.37
Sinks @ 1.5 in 20 x 100 mesh -	1.72

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	81.61	7.01	19.16	4½, 4, 4	0.43
Combined sinks @ 1.5	13.06	53.40			0.30
- 100 mesh	5.33	10.84	20.10	4½, 4½, 5	0.48
Total	100	13.27	*		0.42

* Total of Floats only.

C.E.S. Form 15

Date: September 5, 1969

CYCLONE ENGINEERING SALES LTD.

Per: 

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5229	C.E.S. Sample No.: 29				
D.M. Lane SR #2 9' HQ Core interval 115 - 124; No. 7 Seam					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	69.37				
20 x 100 mesh	24.43				
- 100 mesh	<u>6.20</u>				
Total	100 .00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	50.64				
Sinks @ 1.5 in 1/4" x 20 mesh -	18.73				
Floats @ 1.5 in 20 x 100 mesh -	21.25				
Sinks @ 1.5 in 20 x 100 mesh -	3.18				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	71.89	8.87	19.08	3½, 4, 4	0.52
Combined sinks @ 1.5	21.91	51.03			0.37
- 100 mesh	6.20	10.82	21.45	6½, 7, 6½	0.56
Total	100	18.22	*		0.49
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal
R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited Date Received: July 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5230 C.E.S. Sample No.: 30
 D.M. Lane SR #2 4.4' HQ Core interval 187 - 191.4; No. 6 Seam (Stray)

Full Recovery

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	80.80
20 x 100 mesh	15.58
- 100 mesh	<u>3.62</u>
Total	100

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	63.02
Sinks @ 1.5 in 1/4" x 20 mesh -	17.78
Floats @ 1.5 in 20 x 100 mesh -	13.40
Sinks @ 1.5 in 20 x 100 mesh -	2.18

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	76.42	9.43	18.15	4, 4, 3½	0.67
Combined sinks @ 1.5	19.96	41.65			0.47
- 100 mesh	3.62	13.91	18.53	4½, 5, 4½	0.65
Total	100	16.02	*		0.63

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: 

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited Date Received: July 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5232 C.E.S. Sample No.: 32
 D.M. Lane SR #2 17.5' HQ Core interval 407.5 - 425 upper portion #4 seam

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	75.95
20 x 100 mesh	18.87
- 100 mesh	<u>5.18</u>
Total	100

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	58.48
Sinks @ 1.5 in 1/4" x 20 mesh -	17.47
Floats @ 1.5 in 20 x 100 mesh -	16.23
Sinks @ 1.5 in 20 x 100 mesh -	2.64

ANALYSES.

Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	74.71	6.01	20.40	4½, 4, 4½	0.42
Combined sinks @ 1.5	20.11	53.14			0.15
- 100 mesh	5.18	11.08	18.95	6, 6, 6½	0.37
Total	100	15.42	*		0.38

* Total of Floats only.

C.E.S. Form 15

Date: September 5, 1969

CYCLONE ENGINEERING SALES LTD.

 Per: R. Sehgal
 R. Sehgal, Head of Laboratory

Client:	Scurry Rainbow Oil Limited	Date Received:	July 25, 1969		
Project:		C.E.S. Project No.:	S1-58		
Client Sample No.:	5233	C.E.S. Sample No.:	33		
D.M. Lane SR #2 7.0' HQcore interval 425 - 432; middle interval #4 seam					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	71.11				
20 x 100 mesh	22.57				
- 100 mesh	6.32				
Total	100 .00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	63.29				
Sinks @ 1.5 in 1/4" x 20 mesh -	7.82				
Floats @ 1.5 in 20 x 100 mesh -	20.76				
Sinks @ 1.5 in 20 x 100 mesh -	1.81				
<u>ANALYSES.</u>					
<u>Property</u> <u>Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	84.05	6.81	18.54	4, 4½, 4½	0.32
Combined sinks @ 1.5	9.63	60.53			0.12
- 100 mesh	6.32	7.72	20.39	7½, 7, 7	0.36
Total	100	12.04	*		0.32
* Total of Floats only.					

C.E.S. Form 15

Date: September 5, 1969

CYCLONE ENGINEERING SALES LTD.

Per: R. Sehgal
R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited Date Received: July 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5234 C.E.S. Sample No.: 34
 D.M. Lane SR #2 9.8' HQ core interval 507 - 516.8; #3 seam; Rec. 9'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	71.49
20 x 100 mesh	22.77
- 100 mesh	<u>5.74</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	62.20
Sinks @ 1.5 in 1/4" x 20 mesh -	9.29
Floats @ 1.5 in 20 x 100 mesh -	20.72
Sinks @ 1.5 in 20 x 100 mesh -	2.05

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	82.92	7.40	20.02	8, 8, 8	0.41
Combined sinks @ 1.5	11.34	63.29			0.23
- 100 mesh	5.74	16.66	19.31	6, 6, 6	0.42
Total	100	14.27	*		0.39

* Total of Floats only.

C.E.S. Form 15

Date: September 5, 1969

CYCLONE ENGINEERING SALES LTD.

Per: R. Sehgal
R. Sehgal, Head of Laboratory

Client:	Scurry Rainbow Oil Limited	Date Received:	July 25, 1969		
Project:		C.E.S. Project No.:	S1-58		
Client Sample No.:	5235	C.E.S. Sample No.:	35		
D.M. Lane SR #2 21' HQ Core Interval 569 - 590; #2 seam; Rec. 20.5'					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	75.04				
20 x 100 mesh	19.96				
- 100 mesh	<u>5.00</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	44.27				
Sinks @ 1.5 in 1/4" x 20 mesh -	30.77				
Floats @ 1.5 in 20 x 100 mesh -	16.77				
Sinks @ 1.5 in 20 x 100 mesh -	3.19				
<u>ANALYSES.</u>					
<u>Property</u> <u>Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	61.04	8.00	19.64	10, 10, 10	0.47
Combined sinks @ 1.5	33.96	75.64			0.72
- 100 mesh	5.00	15.78	19.81	8½, 9, 8½	0.51
Total	100	31.35	*		0.55
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: 

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: July 25, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5236	C.E.S. Sample No.: 36				
D.M. Lane SR #2 2' Interval 603 - 605; No. 1 seam					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	67.00				
20 x 100 mesh	26.59				
- 100 mesh	6.41				
Total	100				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	65.18				
Sinks @ 1.5 in 1/4" x 20 mesh -	1.82				
Floats @ 1.5 in 20 x 100 mesh -	26.06				
Sinks @ 1.5 in 20 x 100 mesh -	0.53				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	91.24	6.04	22.04	10, 10, 10	0.54
Combined sinks @ 1.5	2.35	39.17			0.48
- 100 mesh	6.41	5.76	23.08	9, 9, 9	0.59
Total	100	6.80	*		0.73
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 5, 1969Per: R. Sehgal

R. Sehgal, Head of Laboratory

REPORT ON
ANALYSES OF BOREHOLE SAMPLES
ON RAW COAL

For
SCURRY RAINBOW OIL LIMITED

Submitted by
CYCLONE ENGINEERING SALES LTD.
EDMONTON - ALBERTA - CANADA

Report No: RI - 69.05

C.E.S. Project No.: S1-58

Scurry Rainbow Sample Nos.: ²5137 - ²5150 (incl1)
1531 - 1540 (incl.)

Date: September 16, 1969

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5137	C.E.S. Sample No.: 37
D. M. Lane 7.0'	HQ Core Coal Seam #4 Stray 183 - 190' - Rec. 2.5'
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.88
Residual moisture in weight percent: (on air dry basis)	0.77
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	29.12
V.M.:	25.68
F.S.I.:	4 - 4 - 3½
B.T.U./lb.:	11,379
Sulphur:	0.52
F.C.:	44.43
Rank:	hvAb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: R. S. Sehgal
R. S. Sehgal
Head of Laboratory


BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5138	C.E.S. Sample No.: 38
D.M. Lane SR #7 5.7 ^b	Clean Coal HQ Interval 112.8 ~ 119.5'
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.14
Residual moisture in weight percent: (on air dry basis)	1.07
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	4.46
V.M.:	31.94
F.S.I.:	9 - 9 - 10
B.T.U./lb.:	12,128
Sulphur:	0.74
F.C.:	62.53
Rank:	hvCb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5139	C.E.S. Sample No.: 39
D.M. Lane SR #7 11.9 ^b Interval 192.5 - 204.4, Rec. 11.9 ^b Parting 193.3 - 193.5	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.35
Residual moisture in weight percent: (on air dry basis)	1.06
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	6.98
V.M.:	29.78
F.S.I.:	8½ - 9 - 9
B.T.U./lb.:	14,027
Sulphur:	0.63
F.C.:	62.18
Rank:	hvAb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: R. S. SehgalR. S. Sehgal
Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5140	C.E.S. Sample No.: 40
D.M. Lane SR #7 8' HQ Core Coal Int. 490 - 498, Rec. 6'	
0.2' parting @ 491	
0.9' parting @ 494	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.64
Residual moisture in weight percent: (on air dry basis)	1.02
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	25.67
V.M.:	24.70
F.S.I.:	8 - 7½ - 8
B.T.U./lb.:	13,631
Sulphur:	0.69
F.C.:	50.25
Rank:	mvb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: *R. S. Sehgal*
R. S. Sehgal
Head of Laboratory

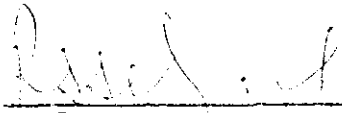
BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5141	C.E.S. Sample No.: 41
D.M. Lane SR #7 7.5'	HQ Core Coal Int. 511.5 - 519, Rec. 7.0'
No Parting	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.02
Residual moisture in weight percent: (on air dry basis)	1.02
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	7.60
V.M.:	28.09
F.S.I.:	9 - 9 - 9
B.T.U./lb.:	14,169
Sulphur:	0.68
F.C.:	63.29
Rank:	mvb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory


BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5142 [?]	C.E.S. Sample No.: 42
D. M. Lane SR #7 11' HQ Core Coal Int. 671.5 - 680 plus 683 - 685.5	
Full Recovery, 0.2' parting @ 675.0'	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.62
Residual moisture in weight percent: (on air dry basis)	1.05
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	9.59
V.M.:	25.74
F.S.I.:	9 - 9 - 9
B.T.U./lb.:	13,918
Sulphur:	0.74
F.C.:	63.62
Rank:	rnb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969
 Per: 
 R. S. Sehgal
 Head of Laboratory

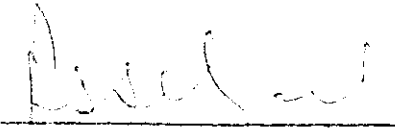
BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5143	C.E.S. Sample No.: 43
D.M. Lane SR #7 11 th Dirty Coal HQ Core Interval 801 - 812; Rec. 8 th	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.41
Residual moisture in weight percent: (on air dry basis)	0.88
<u>CHEMICAL ANALYSIS: (On air dry basis)</u>	
Ash:	23.07
V.M.:	22.78
F.S.I.:	9 - 10 - 10
B.T.U./lb.:	13,402
Sulphur:	0.63
F.C.:	53.27
Rank:	mvb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client:	Scurry Rainbow Oil Limited	Date Received:	August 11, 1969
Project:		C.E.S. Project No.:	S1-58
Client Sample No.:	5144	C.E.S. Sample No.:	44
D.M. Lane	SR #8	17.5 ⁿ	HQ Core Coal Int. 375 - 392.5. Rec. 98%

MOISTURE CONTENT:

Weight loss on air drying in weight percent: (on as received basis)	0.95
Residual moisture in weight percent: (on air dry basis)	1.05


CHEMICAL ANALYSIS: (On air dry basis)

Ash:	5.30
V.M.:	30.14
F.S.I.:	9 - 9 - 9
B.T.U./lb.:	14,314
Sulphur:	0.45
F.C.:	63.51
Rank:	lvAb

REMARKS:

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969
 Per: 
 R. S. Sehgal
 Head of Laboratory

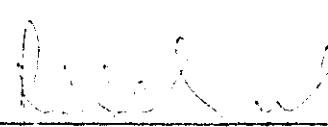
BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5145	C.E.S. Sample No.: 45
D.M. Lane SR #8 6.5 ^b HQ Core Coal Int. 636 - 642.5 ^b ; Rec. 6.0 ^b	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.75
Residual moisture in weight percent: (on air dry basis)	0.92
<u>CHEMICAL ANALYSIS: (On air dry basis)</u>	
Ash:	10.20
V.M.:	29.11
F.S.I.:	9 . 9 - 10
B.T.U./lb.:	13,708
Sulphur:	0.73
F.C.:	59.77
Rank:	hvAb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5146	C.E.S. Sample No.: 46
D.M. Lane SR #9 5.5 ^b HQ Core Int, 157.5 - 163.0; Rec. 4.0 ^b	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.64
Residual moisture in weight percent: (on air dry basis)	1.02
<u>CHEMICAL ANALYSIS: (On air dry basis)</u>	
Ash:	5.48
V.M.:	32.56
F.S.I.:	9 . 9 . 9
B.T.U./lb.:	12,185
Sulphur:	0.72
F.C.:	60.94
Rank:	h _v C _b
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 13, 1969Per: *R. S. Sehgal*
R. S. Sehgal
Head of Laboratory

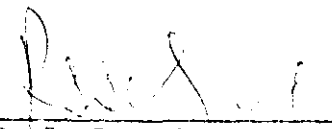
BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5147	C.E.S. Sample No.: 47
D. M. Lane SR #9 4.4' HQ Core Coal Interval 377.8 - 382.2; Rec. 3.4	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.30
Residual moisture in weight percent: (on air dry basis)	0.86
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	22.51
V.M.:	26.15
F.S.I.:	9 . 9 . 9
B.T.U./lb.:	12,693
Sulphur:	0.77
F.C.:	50.48
Rank:	lvAb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory


BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5148	C.E.S. Sample No.: 48
D.M. Lane SR #10 8 ^{1/2} HQ Core Coal Int. 185 - 193.0 Rec. 7.0 ^{1/2}	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.93
Residual moisture in weight percent: (on air dry basis)	1.00
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	9.90
V.M.:	24.74
F.S.I.:	9 - 9 - 9
B.T.U./lb.:	13,869
Sulphur:	0.80
F.C.:	64.36
Rank:	mvb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory

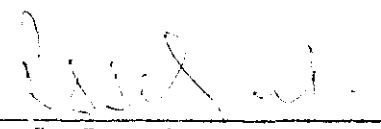
BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5149	C.E.S. Sample No.: 49
D.M. Lane SR #10 9.0 ⁿ HQ Core 369.5 - 378.5 Rec. 8.0'; Bone @ 377.0 ⁿ (0.4 ⁿ)	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.59
Residual moisture in weight percent: (on air dry basis)	0.93
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	21.84
V.M.:	23.96
F.S.I.:	8 - 8 - 8½
B.T.U./lb.:	12,660
Sulphur:	0.64
F.C.:	53.27
Rank:	mvb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory

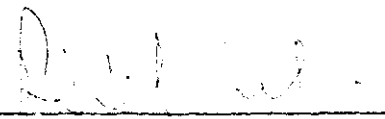
BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 5150	C.E.S. Sample No.: 50
D. M. Lane SR #10 4.8 ⁿ HQ Core Coal 507.2 - 512.0; Rec. 4.0' GR=N logs indicate 7.0' coal	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.64
Residual moisture in weight percent: (on air dry basis)	0.94
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	19.80
V.M.:	23.96
F.S.I.:	9 - 9 - 9
B.T.U./lb.:	12,910
Sulphur:	0.74
F.C.:	55.30
Rank:	m vb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory

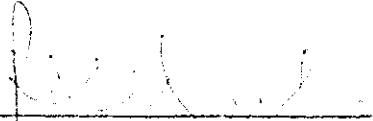
BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 1531	C.E.S. Sample No.: 51
D.M. Lane SR #6 10.5' HQ Core Coal Int. 260.0 - 270.5; Bone 260.8 - 261.2; Siltstone 268.0 - 268.8	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.33
Residual moisture in weight percent: (on air dry basis)	1.08
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	17.96
V.M.:	25.09
F.S.I.:	7 - 7½ - 7½
B.T.U./lb.:	12,040
Sulphur:	0.49
F.C.:	55.87
Rank:	m vb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory

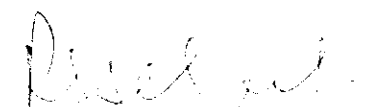
BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 25, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 1532	C.E.S. Sample No.: 52
D.M. Lane SR #6 14.0' HQ Core Coal Int. 293 - 307; Poor Rec.	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.23
Residual moisture in weight percent: (on air dry basis)	0.95
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	23.10
V.M.:	21.55
F.S.I.:	8 - 8 - 8½
B.T.U./lb.:	11,357
Sulphur:	0.64
F.C.:	54.40
Rank:	m/b
<u>REMARKS:</u>	

G.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 25, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 1533	C.E.S. Sample No.: 53
D.M. Lane ^{SR-6} 4.5' HQ Core Coal Int. 486.5 - 491; Rec. 4.0'	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.46
Residual moisture in weight percent: (on air dry basis)	0.94
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	22.45
V.M.:	20.58
F.S.I.:	9 - 8½ - 8½
B.T.U./lb.:	11,519
Sulphur:	0.71
F.C.:	56.03
Rank:	m vb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: R. S. Sehgal
Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 25, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 1534	C.E.S. Sample No.: 54
D.M. Lane SR #6 7.0' HQ Core Coal Int. 568.0 - 575.0, Good Core; Rec. 5.0'	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.48
Residual moisture in weight percent: (on air dry basis)	1.02
<u>CHEMICAL ANALYSIS: (On air dry basis)</u>	
Ash:	5.14
V.M.:	22.08
F.S.I.:	9 - 9 - 9
B.T.U./lb.:	14,342
Sulphur:	0.83
F.C.:	71.76
Rank:	mvb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: R. S. Sehgal
Head of Laboratory


BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 25, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 1535	C.E.S. Sample No.: 55
D. M. Lane SR #6 8.8' HQ Core Coal Int. 602.0 - 610.8; Rec. 4.5'	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	0.62
Residual moisture in weight percent: (on air dry basis)	0.91
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	8.26
V.M.:	23.43
F.S.I.:	9 - 10 - 10
B.T.U./lb.:	14,021
Sulphur:	0.97
F.C.:	67.40
Rank:	m/b
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory


BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 25, 1969
Project:	C.E.S. Project No.: S1.58
Client Sample No.: 1536	C.E.S. Sample No.: 56
D.M. Lane SR #11 34.5' HQ Core Int. 126.5 - 161 (Logs 124.0 - 162) Rec. approx. 10.0'; very poor	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.00
Residual moisture in weight percent: (on air dry basis)	2.42
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	16.77
V.M.:	29.66
F.S.I.:	1 - 1 - 1
B.T.U./lb.:	11,429
Sulphur:	0.34
F.C.:	51.15
Rank:	hvBb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client:	Scurry Rainbow Oil Limited	Date Received:	August 25, 1969
Project:		C.E.S. Project No.:	S1-58
Client Sample No.:	1537	C.E.S. Sample No.:	57
D. M. Lane	^{SR-11} 8.0' HQ Core Coal Int. 335.0 - 343.0; Rec. 4.0'		

MOISTURE CONTENT:

Weight loss on air drying in weight percent: (on as received basis)	0.74
Residual moisture in weight percent: (on air dry basis)	2.76

CHEMICAL ANALYSIS: (On air dry basis)

Ash:	13.48
V.M.:	29.39
F.S.I.:	1 - 1 - 1½
B.T.U./lb.:	12,057
Sulphur:	0.48
F.C.:	54.37
Rank:	hvAb

REMARKS:

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: R. S. Sehgal
R. S. Sehgal
Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 25, 1969
Project:	C.E.S. Project No.: S1-58
Client Sample No.: 1538	C.E.S. Sample No.: 58
D.M. Lane SR #11 22.4' HQ Core Coal Int. 348.0 - 370.4; Bone 352 - 354.0	
Rec. 16.5'	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.20
Residual moisture in weight percent: (on air dry basis)	2.72
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	14.18
V.M.:	29.91
F.S.I.:	1 - 1 - 1
B.T.U./lb.:	11,852
Sulphur:	0.54
F.C.:	53.19
Rank:	hvAb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: R. S. Sehgal
Head of Laboratory


BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 25, 1969
Project:	C.E.S. Project No.: 81-58
Client Sample No.: 1539	C.E.S. Sample No.: 59
D.M. Lane SR #11 15' HQ Core Coal Int. 493.0 - 508.0; Rec. 12.5'	
Bone 503.6 - 505.0 499.6 - 500.0	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.37
Residual moisture in weight percent: (on air dry basis)	2.51
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	21.82
V.M.:	31.40
F.S.I.:	2 - 2 - 2
B.T.U./lb.:	10,439
Sulphur:	0.83
F.C.:	44.27
Rank:	hV Bb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory

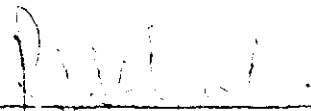
BOREHOLE SAMPLES:

REPORT OF ANALYSES ON RAW MATERIAL

Client: Scurry Rainbow Oil Limited	Date Received: August 25, 1969
Project:	C.E.S. Project No.: S1-33
Client Sample No.: 1570	C.E.S. Sample No.: 60
D.M. Lane SR #11 19' HQ Core Coal 559 - 578; Rec. 4.0'	
<u>MOISTURE CONTENT:</u>	
Weight loss on air drying in weight percent: (on as received basis)	1.38
Residual moisture in weight percent: (on air dry basis)	2.48
<u>CHEMICAL ANALYSIS:</u> (On air dry basis)	
Ash:	36.94
V.M.:	25.74
F.S.I.:	1½ - 1½ - 1½
B.T.U./lb.:	8,460
Sulphur:	0.35
F.C.:	34.84
Rank:	hAb
<u>REMARKS:</u>	

C.E.S. Form 14

CYCLONE ENGINEERING SALES LTD.

Date: September 16, 1969Per: 
R. S. Sehgal
Head of Laboratory

REPORT ON
ANALYSES OF BOREHOLE SAMPLES
ON FLOAT-SINKS

For
SCURRY RAINBOW OIL LIMITED

Submitted By
CYCLONE ENGINEERING SALES LTD.
EDMONTON - ALBERTA - CANADA

Report No.: RI - 69.06
C.E.S. Project No.: S1 - 58
Scurry Rainbow Sample Nos.: 5237 - 5250 (incl.)
1531 - 1540 (incl.)
Date: September 30, 1969

Client: **Scurry Rainbow Oil Limited** Date Received: **August 11, 1969**
 Project: C.E.S. Project No.: **S1-58**
 Client Sample No.: **5237** C.E.S. Sample No.: **37**
 D.M. Lane 7.0' HQ Core coal Seam #4 Stray 183 - 190' - Rec. 2.5'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	77.56
20 x 100 mesh	15.98
- 100 mesh	<u>6.46</u>
Total	100 .00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	43.43
Sinks @ 1.5 in 1/4" x 20 mesh -	34.13
Floats @ 1.5 in 20 x 100 mesh -	11.83
Sinks @ 1.5 in 20 x 100 mesh -	4.15

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	55.26	6.44	29.51	6, 6, 5½	0.52
Combined sinks @ 1.5	38.28	62.90			0.36
- 100 mesh	6.46	17.73	18.35	5½, 5½, 6	0.56
Total	100	28.78	*		0.47
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 30, 1969Per: R. Sehgal
R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: **Scurry Rainbow Oil Limited** Date Received: **August 11, 1969**
 Project: C.E.S. Project No.: **S1-58**
 Client Sample No.: **5238** C.E.S. Sample No.: **38**
 D.M. Lane SR #7 5.7' Clean coal HQ interval 112.8 - 119.5'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	73.75
20 x 100 mesh	21.51
- 100 mesh	<u>4.74</u>
Total	100.00

FLOAT-SINK ANALYSES.


	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	72.85
Sinks @ 1.5 in 1/4" x 20 mesh -	0.90
Floats @ 1.5 in 20 x 100 mesh -	21.08
Sinks @ 1.5 in 20 x 100 mesh -	0.43

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	93.93	3.25	32.50	9½, 9, 10	0.75
Combined sinks @ 1.5	1.33	69.58			0.33
- 100 mesh	4.74	7.44	28.70	8½, 9, 8½	0.45
Total	100	4.35	*		0.72
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 30, 1969Per: 
R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969																														
Project:	C.E.S. Project No.: S1-58																														
Client Sample No.: 5239	C.E.S. Sample No.: 39																														
D.M. Lane SR #7 11.9' Interval 192.5 - 204.4; Rec. 11.9'; Parting 193.3 - 193.5																															
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>																															
<u>Fraction</u>	<u>Weight %</u>																														
1/4" x 20 mesh	72.88																														
20 x 100 mesh	22.68																														
- 100 mesh	<u>4.44</u>																														
Total	100.00																														
<u>FLOAT-SINK ANALYSES.</u>																															
	<u>Weight %</u>																														
Floats @ 1.5 in 1/4" x 20 mesh -	67.78																														
Sinks @ 1.5 in 1/4" x 20 mesh -	5.10																														
Floats @ 1.5 in 20 x 100 mesh -	21.55																														
Sinks @ 1.5 in 20 x 100 mesh -	1.13																														
<u>ANALYSES.</u>																															
<table border="1"> <thead> <tr> <th>Property Fraction</th> <th>Weight %</th> <th>Ash %</th> <th>V.M. %</th> <th>F.S.I.</th> <th>Sulphur %</th> </tr> </thead> <tbody> <tr> <td>Combined floats @ 1.5</td> <td>89.33</td> <td>4.57</td> <td>30.92</td> <td>9, 9, 9</td> <td>0.57</td> </tr> <tr> <td>Combined sinks @ 1.5</td> <td>6.23</td> <td>47.33</td> <td></td> <td></td> <td>0.55</td> </tr> <tr> <td>- 100 mesh</td> <td>4.44</td> <td>10.71</td> <td>29.92</td> <td>8½, 9, 8½</td> <td>0.65</td> </tr> <tr> <td>Total</td> <td>100</td> <td>7.50</td> <td>*</td> <td></td> <td>0.58</td> </tr> </tbody> </table>	Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %	Combined floats @ 1.5	89.33	4.57	30.92	9, 9, 9	0.57	Combined sinks @ 1.5	6.23	47.33			0.55	- 100 mesh	4.44	10.71	29.92	8½, 9, 8½	0.65	Total	100	7.50	*		0.58	
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %																										
Combined floats @ 1.5	89.33	4.57	30.92	9, 9, 9	0.57																										
Combined sinks @ 1.5	6.23	47.33			0.55																										
- 100 mesh	4.44	10.71	29.92	8½, 9, 8½	0.65																										
Total	100	7.50	*		0.58																										
* Total of Floats only.																															

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 30, 1969Per: 

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 11, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5240 C.E.S. Sample No.: 40
 D.M. Lane SR #7 8' HQ Core Coal Int. 490 - 498; Rec. 6'; 0.2' parting @ 491
 0.9' parting @ 494

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	68.99
20 x 100 mesh	25.63
- 100 mesh	<u>5.38</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	42.08
Sinks @ 1.5 in 1/4" x 20 mesh -	26.91
Floats @ 1.5 in 20 x 100 mesh -	20.25
Sinks @ 1.5 in 20 x 100 mesh -	5.38

ANALYSES.

<u>Property</u> <u>Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	62.33	5.87	27.85	8½, 9, 8½	0.68
Combined sinks @ 1.5	32.29	66.65			0.47
- 100 mesh	5.38	17.57	25.70	8½, 9, 9	0.74
Total	100	26.12	*		0.64

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 30, 1969Per: R. Sehgal
R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969				
Project:	C.E.S. Project No.: S1-58				
Client Sample No.: 5241	C.E.S. Sample No.: 41				
D.M. Lane SR #7 7.5' HQ Core Coal int. 511.5 - 519; Rec. 7.0'					
No Parting					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	77.36				
20 x 100 mesh	17.82				
- 100 mesh	<u>4.82</u>				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	70.40				
Sinks @ 1.5 in 1/4" x 20 mesh -	6.96				
Floats @ 1.5 in 20 x 100 mesh -	16.39				
Sinks @ 1.5 in 20 x 100 mesh -	1.43				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	86.79	4.70	29.23	9, 9, 10	0.59
Combined sinks @ 1.5	8.39	45.74			1.44
- 100 mesh	4.82	4.99	27.70	9, 9, 9	0.60
Total	100	8.12	*		0.66
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 30, 1969Per: 

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES: REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 11, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5242 C.E.S. Sample No.: 42
 D.M. Lane SR #7 11' HQ Core Coal Int. 671.5 - 680 plus 683 - 685.5

Full recovery; 0.2^l parting @ 675.0^l

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	78.94
20 x 100 mesh	17.34
- 100 mesh	<u>3.72</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	71.84
Sinks @ 1.5 in 1/4" x 20 mesh -	7.10
Floats @ 1.5 in 20 x 100 mesh -	16.30
Sinks @ 1.5 in 20 x 100 mesh -	1.04

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	88.14	4.98	26.57	9, 9, 10	0.73
Combined sinks @ 1.5	8.14	64.34			0.25
- 100 mesh	3.72	10.78	24.80	8, 8½, 8½	0.73
Total	100	10.02	*		0.69

* Total of Floats only.

C.E.S. Form 15

Date: September 30, 1969

CYCLONE ENGINEERING SALES LTD.

Per: R. Sehgal
 R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 11, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5243 C.E.S. Sample No.: 43
 D.M. Lane SR #7 11' Dirty Coal HQ Core Interval 801 - 812; Rec. 8'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	65.00
20 x 100 mesh	28.69
- 100 mesh	<u>6.31</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	42.25
Sinks @ 1.5 in 1/4" x 20 mesh -	22.75
Floats @ 1.5 in 20 x 100 mesh -	23.24
Sinks @ 1.5 in 20 x 100 mesh -	5.45

ANALYSES.

Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	65.49	5.51	25.18	10, 10, 9	0.58
Combined sinks @ 1.5	28.20	63.72			0.63
- 100 mesh	6.31	13.21	24.73	8 $\frac{1}{2}$, 9, 9	0.58
Total	100	22.41	*		0.59

* Total of Floats only.

C.E.S. Form 15

Date: September 30, 1969

CYCLONE ENGINEERING SALES LTD.

Per: 

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 11, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5244 C.E.S. Sample No.: 44
 D.M. Lane SR #8 17.5' HQ Core Coal Int. 375 - 392.5; Rec. 98%

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	72.18
20 x 100 mesh	22.86
- 100 mesh	4.96
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	67.85
Sinks @ 1.5 in 1/4" x 20 mesh -	4.33
Floats @ 1.5 in 20 x 100 mesh -	21.72
Sinks @ 1.5 in 20 x 100 mesh -	1.14

ANALYSES.

Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	89.57	3.20	30.45	9, 9, 10	0.47
Combined sinks @ 1.5	5.47	45.24			0.21
- 100 mesh	4.96	3.94	29.69	8½, 9, 9	0.43
Total	100	5.53	*		0.45

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 30, 1969Per: 

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 11, 1969
 Project: C.E.S. Project No.: SL-58
 Client Sample No.: 5245 C.E.S. Sample No.: 45
 D.M. Lane SR #8 6.5' HQ Core coal Int. 636 - 642.5'; Rec. 6.0'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	73.70
20 x 100 mesh	22.08
- 100 mesh	<u>4.22</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	66.33
Sinks @ 1.5 in 1/4" x 20 mesh -	7.37
Floats @ 1.5 in 20 x 100 mesh -	20.09
Sinks @ 1.5 in 20 x 100 mesh -	1.99

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	86.42	4.94	29.94	9, 10, 10	0.69
Combined sinks @ 1.5	9.36	57.00			0.35
- 100 mesh	4.22	7.70	28.08	9, 9, 10	0.73
Total	100	9.92	*		0.66

* Total of Floats only.

C.E.S. Form 15

Date: September 30, 1969

CYCLONE ENGINEERING SALES LTD.

Per: 

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 11, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5246 C.E.S. Sample No.: 46
 D.M. Lane SR #9 5.5' HQ Core Int. 157.5 - 163.0; Rec. 4.0'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	74.58
20 x 100 mesh	21.50
- 100 mesh	<u>3.92</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	67.87
Sinks @ 1.5 in 1/4" x 20 mesh -	6.71
Floats @ 1.5 in 20 x 100 mesh -	13.71
Sinks @ 1.5 in 20 x 100 mesh -	2.79

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	86.58	3.31	33.67	9, 9, 10	0.61
Combined sinks @ 1.5	9.50	34.79			1.12
- 100 mesh	3.92	6.10	30.95	8½, 9, 9	0.85
Total	100	6.01	*		0.67

* Total of Floats only.

C.E.S. Form 15

Date: September 30, 1969

CYCLONE ENGINEERING SALES LTD.

Per: 

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 11, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5247 C.E.S. Sample No.: 47
 D.M. Lane SR #9 4.4' HQ Core Coal Int. 377.8 - 382.2; Rec. 3.4'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	75.15
20 x 100 mesh	20.71
- 100 mesh	<u>4.14</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	53.36
Sinks @ 1.5 in 1/4" x 20 mesh -	21.79
Floats @ 1.5 in 20 x 100 mesh -	18.03
Sinks @ 1.5 in 20 x 100 mesh -	2.28

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	71.79	4.21	29.57	10, 10, 10	0.89
Combined sinks @ 1.5	24.07	79.23			0.22
- 100 mesh	4.14	11.32	26.56	9, 9, 10	0.80
Total	100	22.56	*		0.73
* Total of Floats only.					

C.E.S. Form 15

Date: September 30, 1969

CYCLONE ENGINEERING SALES LTD.

Per: 

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 11, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 5248 C.E.S. Sample No.: 48
 D.M. Lane SR #10 8' HQ Core Coal Int. 185 - 193.0; Rec. 7.0'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	58.13
20 x 100 mesh	31.58
- 100 mesh	<u>10.29</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	51.15
Sinks @ 1.5 in 1/4" x 20 mesh -	6.98
Floats @ 1.5 in 20 x 100 mesh -	29.69
Sinks @ 1.5 in 20 x 100 mesh -	1.89

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	80.84	4.90	26.39	9, 9, 10	0.73
Combined sinks @ 1.5	8.87	51.79			1.18
- 100 mesh	10.29	11.48	2.70	9, 9, 9	0.73
Total	100	9.73	*		0.77

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 30, 1969Per: 

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited	Date Received: August 11, 1969				
Project:	C.E.S. Project No.: 81-58				
Client Sample No.: 5249	C.E.S. Sample No.: 49				
D.M. Lane SR #10 9.0' HQ Core 369.5 - 378.5; Rec. 8.0'; Bone @ 377.0' (0.4')					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	73.90				
20 x 100 mesh	21.77				
- 100 mesh	4.29				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	51.02				
Sinks @ 1.5 in 1/4" x 20 mesh -	22.92				
Floats @ 1.5 in 20 x 100 mesh -	18.07				
Sinks @ 1.5 in 20 x 100 mesh -	3.70				
<u>ANALYSES.</u>					
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	69.09	5.61	25.26	9, 10, 10	0.67
Combined sinks @ 1.5	26.62	65.65			0.43
- 100 mesh	4.29	18.09	23.56	8 1/2, 8 1/2, 8	0.58
Total	100	22.12	*		0.61
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 30, 1969Per: 

R. Sehgal, Head of Laboratory

Client:	Scurry Rainbow Oil Limited	Date Received:	August 11, 1969		
Project:		C.E.S. Project No.:			
Client Sample No.:	52.50	C.E.S. Sample No.:	81-58		
			50		
D.M. Lane SR #10 4.8' HQ Core Coal 507.2 - 512.0; Rec. 4.0'					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u> GR-N logs indicate 7.0' coal					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	77.14				
20 x 100 mesh	19.15				
- 100 mesh	3.71				
Total	100				
.00					
<u>FLOAT-SINK ANALYSES.</u>			<u>Weight %</u>		
Floats @ 1.5 in 1/4" x 20 mesh	-	60.94			
Sinks @ 1.5 in 1/4" x 20 mesh	-	16.20			
Floats @ 1.5 in 20 x 100 mesh	-	16.60			
Sinks @ 1.5 in 20 x 100 mesh	-	2.26			
<u>ANALYSES.</u>					
<u>Property</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
<u>Fraction</u>					
Combined floats @ 1.5	77.60	6.83	24.96	10, 10, 10	0.81
Combined sinks @ 1.5	18.69	75.16			0.21
- 100 mesh	3.71	25.51	24.92	9, 9, 9	0.67
Total	100				
* Total of Floats only.		20.29			0.70

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 30, 1969

Per: R. Sehgal
R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES: REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 11, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 1531 C.E.S. Sample No.: 51
 D.M. Lane SR #6 10.5' HQ Core Coal Int. 260.0 - 270.5; Bone 260.8 - 261.2; Siltstone 268.0 - 268.8

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	72.93
20 x 100 mesh	21.79
- 100 mesh	<u>5.28</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	53.24
Sinks @ 1.5 in 1/4" x 20 mesh -	19.59
Floats @ 1.5 in 20 x 100 mesh -	18.30
Sinks @ 1.5 in 20 x 100 mesh -	3.87

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	71.54	5.14	26.70	8 $\frac{1}{2}$, 8 $\frac{1}{2}$, 8 $\frac{1}{2}$	0.62
Combined sinks @ 1.5	23.18	33.72			0.26
- 100 mesh	5.28	14.02	23.55	7 $\frac{1}{2}$, 7 $\frac{1}{2}$, 7 $\frac{1}{2}$	0.47
Total	100	18.03	*		0.32

* Total of Floats only.

C.E.S. Form 15

Date: September 30, 1969

CYCLONE ENGINEERING SALES LTD.

Per: 

R. Sehgal, Head of Laboratory

Client: Scurry Rainbow Oil Limited Date Received: August 25, 1969
 Project: C.E.S. Project No.: 51-58
 Client Sample No.: 1532 C.E.S. Sample No.: 52
 D.M. Lane SR #6 14.0' HQ Core Coal Int. 293 - 307; Poor Rec.

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	70.93
20 x 100 mesh	23.44
- 100 mesh	<u>5.58</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	46.14
Sinks @ 1.5 in 1/4" x 20 mesh -	24.84
Floats @ 1.5 in 20 x 100 mesh -	19.69
Sinks @ 1.5 in 20 x 100 mesh -	3.75

ANALYSES.

Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	65.83	7.25	24.32	9, 9, 9	0.65
Combined sinks @ 1.5	28.59	61.38			0.13
- 100 mesh	5.58	15.69	23.49	8, 8, 8	0.60
Total	100	23.19	*		0.59

* Total of Floats only.

C.E.S. Form 15

Date: September 30, 1969

CYCLONE ENGINEERING SALES LTD.

Per: R. Sehgal

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 25, 1969
 Project: C.E.S. Project No.: SI-58
 Client Sample No.: 1533 C.E.S. Sample No.: 53
 D.M. Lane 4.5' HQ Core Coal int. 486.5 - 491; Rec. 4.0'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	69.19
20 x 100 mesh	24.18
- 100 mesh	<u>6.63</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	49.12
Sinks @ 1.5 in 1/4" x 20 mesh -	20.07
Floats @ 1.5 in 20 x 100 mesh -	21.52
Sinks @ 1.5 in 20 x 100 mesh -	6.63

ANALYSES.

Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	70.64	6.10	23.68	9, 9, 10	0.83
Combined sinks @ 1.5	22.73	78.45			0.18
- 100 mesh	6.63	11.41	22.41	9, 9, 9	0.79
Total	100	22.90	*		0.68

* Total of Floats only.

C.E.S. Form 15

Date: September 30, 1969

CYCLONE ENGINEERING SALES LTD.

Per: R. Sehgal

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 1534 C.E.S. Sample No.: 54
 D.M. Lane SR #6 7.0' HQ Core Coal Int. 568.0 - 575.0; Good Core; Rec. 5.0'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	75.13
20 x 100 mesh	20.54
- 100 mesh	<u>4.23</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	72.68
Sinks @ 1.5 in 1/4" x 20 mesh -	2.25
Floats @ 1.5 in 20 x 100 mesh -	20.23
Sinks @ 1.5 in 20 x 100 mesh -	0.1

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	93.11	4.05	23.79	9, 9, 9	0.85
Combined sinks @ 1.5	2.76	49.80			0.44
- 100 mesh	4.23	4.87	23.82	9, 9, 9	0.78
Total	100	5.35	*		0.83
* Total of Floats only.					

C.E.S. Form 15

Date: September 30, 1969

CYCLONE ENGINEERING SALES LTD.

Per: 

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 1535 C.E.S. Sample No.: 55
 D.M. Lane SR #6 8.8' HQ Core Coal Int. 602.0 - 610.8; Rec. 4.5'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	59.63
20 x 100 mesh	28.47
- 100 mesh	<u>11.90</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	52.47
Sinks @ 1.5 in 1/4" x 20 mesh -	7.10
Floats @ 1.5 in 20 x 100 mesh -	26.70
Sinks @ 1.5 in 20 x 100 mesh -	1.71

ANALYSES.

<u>Property</u> <u>Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	79.23	4.26	24.91	9, 10, 10	0.84
Combined sinks @ 1.5	8.87	51.90			1.85
- 100 mesh	11.90	5.01	33.30	9 $\frac{1}{2}$, 9 $\frac{1}{2}$, 10	0.88
Total	100	8.58	*		0.94

* Total of Floats only.

C.E.S. Form 15

Date: September 30, 1969

CYCLONE ENGINEERING SALES LTD.

Per: 

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited	Date Received: August 25, 1969				
Project:	C.E.S. Project No.: S1-53				
Client Sample No.: 1536	C.E.S. Sample No.: 56				
D.M. Lane SR #11 34.5' HQ Core Int. 126.5 - 161 (Logs 124.0 - 162)					
Rec. approx. 10.0% - very poor					
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>					
<u>Fraction</u>	<u>Weight %</u>				
1/4" x 20 mesh	79.03				
20 x 100 mesh	16.10				
- 100 mesh	4.82				
Total	100.00				
<u>FLOAT-SINK ANALYSES.</u>					
	<u>Weight %</u>				
Floats @ 1.5 in 1/4" x 20 mesh -	63.26				
Sinks @ 1.5 in 1/4" x 20 mesh -	15.02				
Floats @ 1.5 in 20 x 100 mesh -	13.12				
Sinks @ 1.5 in 20 x 100 mesh -	3.28				
<u>ANALYSES.</u>					
<u>Property</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
<u>Fraction</u>					
Combined floats @ 1.5	75.33	7.73	31.05	1, 1 $\frac{1}{2}$, 1 $\frac{1}{2}$	0.43
Combined sinks @ 1.5	19.10	35.45			0.25
- 100 mesh	4.52	19.05	28.57	1 $\frac{1}{2}$, 1 $\frac{1}{2}$, 1 $\frac{1}{2}$	0.37
Total	100	17.26	*		0.38
* Total of Floats only.					

C.E.S. Form 15

Date: September 30, 1969

CYCLONE ENGINEERING SALES LTD.

Per:

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 1537 C.E.S. Sample No.: 57
 D.M. Lane 8.0' HQ Core Coal Int. 335.0 - 343.0; Rec. 4.0'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	76.93
20 x 100 mesh	17.13
- 100 mesh	<u>3.94</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	67.00
Sinks @ 1.5 in 1/4" x 20 mesh -	11.81
Floats @ 1.5 in 20 x 100 mesh -	14.73
Sinks @ 1.5 in 20 x 100 mesh -	2.40

ANALYSES.

Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	81.82	5.25	31.36	14, 14, 14	0.48
Combined sinks @ 1.5	11.26	61.21			0.13
- 100 mesh	3.94	18.91	28.15	14, 2, 14	0.14
Total	100	13.75	*		0.47
* Total of Floats only.					

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 30, 1969Per: R. Sehgal

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 1538 C.E.S. Sample No.: 58
 D.M. Lane SR #11 22.4' HQ Core Coal Int. 348.0 - 370.4; Bone 352 - 354.0
 Rec. 16.5'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	75.53
20 x 100 mesh	18.50
- 100 mesh	<u>5.77</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	63.33
Sinks @ 1.5 in 1/4" x 20 mesh -	12.10
Floats @ 1.5 in 20 x 100 mesh -	15.74
Sinks @ 1.5 in 20 x 100 mesh -	1.83

ANALYSES.

<u>Property Fraction</u>	<u>Weight %</u>	<u>Ash %</u>	<u>V.M. %</u>	<u>F.S.I.</u>	<u>Sulphur %</u>
Combined floats @ 1.5	60.27	4.97	32.50	1, 1 $\frac{1}{2}$, 1 $\frac{1}{2}$	0.57
Combined sinks @ 1.5	13.96	65.70			0.23
- 100 mesh	5.77	17.22	32.40	1, 1, 1 $\frac{1}{2}$	0.62
Total	100	13.98	*		0.53

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 30, 1969Per: 

R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited	Date Received: August 25, 1969																														
Project:	C.E.S. Project No.: S1-58																														
Client Sample No.: 1539	C.E.S. Sample No.: 59																														
D.M. Lane SR #1 15' HQ Core Coal Int. 493.0 - 508.0; Rec. 12.5'; Bone 503.6 - 505.0; 499.6 - 500.0																															
<u>SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.</u>																															
<u>Fraction</u>	<u>Weight %</u>																														
1/4" x 20 mesh	78.02																														
20 x 100 mesh	17.84																														
- 100 mesh	<u>4.14</u>																														
Total	100 .00																														
<u>FLOAT-SINK ANALYSES.</u>																															
	<u>Weight %</u>																														
Floats @ 1.5 in 1/4" x 20 mesh -	63.83																														
Sinks @ 1.5 in 1/4" x 20 mesh -	21.19																														
Floats @ 1.5 in 20 x 100 mesh -	13.56																														
Sinks @ 1.5 in 20 x 100 mesh -	4.28																														
<u>ANALYSES.</u>																															
<table border="1"> <thead> <tr> <th>Property Fraction</th> <th>Weight %</th> <th>Ash %</th> <th>V.M. %</th> <th>F.S.I.</th> <th>Sulphur %</th> </tr> </thead> <tbody> <tr> <td>Combined floats @ 1.5</td> <td>67.39</td> <td>4.92</td> <td>34.99</td> <td>2, 2, 2</td> <td>0.8</td> </tr> <tr> <td>Combined sinks @ 1.5</td> <td>28.47</td> <td>60.92</td> <td></td> <td></td> <td>1.77</td> </tr> <tr> <td>- 100 mesh</td> <td>4.14</td> <td>26.15</td> <td>31.32</td> <td>1, 1, 1/2</td> <td>0.73</td> </tr> <tr> <td>Total</td> <td>100</td> <td>21.74</td> <td>*</td> <td></td> <td>0.85</td> </tr> </tbody> </table>	Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %	Combined floats @ 1.5	67.39	4.92	34.99	2, 2, 2	0.8	Combined sinks @ 1.5	28.47	60.92			1.77	- 100 mesh	4.14	26.15	31.32	1, 1, 1/2	0.73	Total	100	21.74	*		0.85	
Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %																										
Combined floats @ 1.5	67.39	4.92	34.99	2, 2, 2	0.8																										
Combined sinks @ 1.5	28.47	60.92			1.77																										
- 100 mesh	4.14	26.15	31.32	1, 1, 1/2	0.73																										
Total	100	21.74	*		0.85																										
* Total of Floats only.																															

C.E.S. Form 15

Date: September 30, 1969

CYCLONE ENGINEERING SALES LTD.

Per: R. Sehgal
R. Sehgal, Head of Laboratory

BOREHOLE SAMPLES:

REPORT OF ANALYSES ON FLOAT-SINK SAMPLES

Client: Scurry Rainbow Oil Limited Date Received: August 25, 1969
 Project: C.E.S. Project No.: S1-58
 Client Sample No.: 1540 C.E.S. Sample No.: 60
 D.M. Lane SR #11 19^b HQ Core Coal 559 - 578; Rec. 4.0'

SCREEN ANALYSES OF 1/4" x 0 CRUSHED SAMPLE.

<u>Fraction</u>	<u>Weight %</u>
1/4" x 20 mesh	4.20
20 x 100 mesh	41.70
- 100 mesh	<u>13.0</u>
Total	100.00

FLOAT-SINK ANALYSES.

	<u>Weight %</u>
Floats @ 1.5 in 1/4" x 20 mesh -	27.84
Sinks @ 1.5 in 1/4" x 20 mesh -	17.05
Floats @ 1.5 in 20 x 100 mesh -	17.51
Sinks @ 1.5 in 20 x 100 mesh -	2.19

ANALYSES.

Property Fraction	Weight %	Ash %	V.M. %	F.S.I.	Sulphur %
Combined floats @ 1.5	45.35	3.75	30.22	2, 2, 2	0.35
Combined sinks @ 1.5	41.25	73.16			0.35
- 100 mesh	13.40	38.45	26.39	1, 1, 1½	0.31
Total	100	37.04	*		0.34

* Total of Floats only.

C.E.S. Form 15

CYCLONE ENGINEERING SALES LTD.

Date: September 30, 1969Per: 

R. Sehgal, Head of Laboratory

00267

Exhibit "I"

REPORT ON
CLEANING COKING COAL
from the
ELK RIVER PROSPECT
for
SCURRY RAINBOW OIL LTD.
Adit #1, Seam #4

Submitted by
CYCLONE ENGINEERING SALES LTD.
EDMONTON - ALBERTA - CANADA

Report No.: RI-69.07

Job No.: S1 - 58

Dated: October 6, 1969

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REPORT ON
CLEANING COKING COAL
from the
ELK RIVER PROSPECT
for
SCURRY RAINBOW OIL LTD.
Adit #1, Seam #4

SUMMARY.

The data presented in this report refers to coal from
Seam #4.

The analysis and the washability indicates that this
coal is of the low volatile bituminous rank with a relatively high
ash content (25.14%) and low sulphur content (0.33%). See Table
1 for general information.

INTRODUCTION.

This report is the first one of a series providing

- a. Washability data of size fractions.
- b. Performance evaluation data for cleaning coking coal from the Elk River prospect at various levels of efficiency.
- c. Residual moisture contents on size fractions.
- d. F.S.I. determinations on size and specific gravity fractions.

The objective of this and following reports is to provide analytical data about the coal and to provide basic engineering data for the design of facilities for preparing this coal to market specifications.

This report is of a preliminary character in that it deals with one adit sample only. Subsequent adit samples now being analysed will most likely have different composition and cleaning characteristics.

After all borehole and adit samples have been analysed a final study can be made as to mining, blending (if required) and cleaning.

Allowance should be made with regard to the contamination with some foreign material from roof and floor strata that is unavoidably produced along with the coal.

The cleaning characteristics of the coal are based on the error curve, a parameter for cleaning efficiency that is largely independent of the gravimetric composition of the coal (ash distribution) and can be used for comparing coal cleaning systems whose probable error values are known.

In the last section of this report examples of this method for predicting coal cleaning results are presented for the coarse coal fraction (2" x 28 mesh) and the fines fraction (28 x 100 mesh) when using equipment operating with a probable error of 0.10 for this coal.

Methods of coal cleaning can be directly compared for a range of cut points and the yield losses of each cleaning system can be properly balanced against the cost of cleaning.

WASHABILITY CHARACTERISTICS.

The overall weight and ash distribution of the raw coal, crushed to minus 2", is shown on Table 3. Ash contents were done for each individual size - gravity fraction and these values are shown in brackets. Sulphur analyses were done on size fractions only in view of the low sulphur level. (See table 2.)

The minus 100 mesh fraction constitutes a minor part of the coal only (2.22% by weight). The weights and ash contents of this size fraction were found not by direct analyses, but by calculation from the other size gravity fractions.

From the master table, washability data have been derived for the 2" x 20 mesh and 20 x 100 mesh fractions. This information is presented on Tables 5 and 6, respectively. Washability curves for these two main size fractions are presented on Figures 1 and 3.

Table 4 shows the volatile matter in weight percent against size and specific gravity fractions.

Table 7 shows the free swelling indexes for all size and specific gravity fractions.

PERFORMANCE EVALUATION.

The washability curves of both size fractions of the raw coal indicates that the cleaning of this coal is encumbered by intergrown ash. Yield of recovery at an ash content of 8.75% is therefore depressed.

The 2" x 20 mesh fraction constitutes the major part of the mine run (88.14% of the total, see Table 3). Figure 2 illustrates that with 25.71% ash on raw, the actual yield at 8.75% ash in the clean coal can be expected to range from 48% to 63% depending on the efficiency of the coal cleaning equipment.

Performance Evaluation (P.E.) curves, relating yield and ash contents of coal and reject, are shown for separation efficiencies corresponding with probable error values ranging from 0.06 to 0.12

The 20 x 100 mesh fraction constitutes 9.64% by weight of the mine run. Figure 4 shows the P.E. curves for probable error values ranging from 0.08 to 0.14. An example illustrates the actual yield that can be expected at these efficiencies when cleaning the coal to 8.75% ash.

It is noted that the "yield error" can be found in each case by subtracting the expected actual yield from the corresponding theoretical yield read on the "theoretical curve" at the point vertically above it.

Similarly the "ash error" can be read directly from the P.E. graph along a horizontal line corresponding with the actual yield that is being considered. The ash error is the difference between the theoretical ash (intersect with "theoretical" curve) and the actual ash (intersect with the selected P.E. curve).

Respectfully submitted,

CYCLONE ENGINEERING SALES LTD.

Per:



P.D.J. Vinkenburg, P. Eng.
General Manager

T A B L E 1. SEAM #4.

SCURRY RAINBOW OIL LTD.

Classification by Rank.

Ash:	25.14%
Volatile Matter:	15.47 %
Residual Moisture:	0.67%
Fixed Carbon:	58.72%
Sulphur:	0.33%
B.T.U./lb.	11,684
Rank:	Low volatile bituminous

T A B L E 2. SEAM #4.

Size Analysis - Sulphur, B.T.U. and Residual Moisture.

Size	Weight %	Sulphur %	B.T.U./lb.	R.M. %
2" x 1"	24.83	0.31	11,010	0.64
1" x 1/2"	20.52	0.32	11,010	0.69
1/2" x 1/4"	17.35	0.32	11,110	0.65
1/4" x 8 m.	18.32	0.33	11,100	0.67
8 x 20 m.	7.12	0.36	11,360	0.71
20 x 100 m.	9.64	0.40	12,090	0.74
- 100 m.	2.22	0.42	12,690	0.64
Total	100.00	0.33	11,684	0.67

T A B L E 3. SEAM #4.

SCURRY RAINBOW OIL LTD.

Weight and Ash Distribution vs. Size and Specific Gravity.

(Figures in Brackets show the Ash Content of Individual Fractions)

Size \ Sp.Gr.	Sp.Gr.							Total
	1.30	1.35	1.40	1.50	1.60	1.80		
2" x 1"	6.92 (4.65)	5.47 (7.70)	3.87 (12.23)	2.34 (20.80)	0.99 (34.06)	0.94 (46.06)	4.30 (80.07)	24.83 (23.82)
1" x 1/2"	6.96 (4.61)	3.07 (7.85)	2.67 (12.32)	1.85 (20.43)	0.81 (32.57)	0.75 (43.57)	4.41 (80.01)	20.52 (26.25)
1/2" x 1/4"	5.73 (4.26)	2.38 (7.59)	2.38 (12.14)	1.54 (19.99)	0.84 (31.94)	1.12 (45.63)	3.36 (78.36)	17.35 (25.55)
1/4" x 8 m.	6.35 (3.79)	2.02 (8.81)	1.64 (12.74)	1.58 (18.55)	0.89 (31.50)	1.90 (45.89)	3.94 (76.40)	18.32 (27.74)
8 x 20 m.	2.50 (3.10)	0.79 (7.69)	0.70 (13.28)	0.58 (21.53)	0.37 (31.65)	0.77 (43.29)	1.41 (73.83)	7.12 (25.94)
20 x 100 m.	4.15 (2.91)	1.25 (8.34)	0.70 (13.51)	0.69 (26.90)	0.50 (32.71)	0.82 (41.86)	1.53 (72.33)	9.64 (21.97)
Total	32.67 (4.06)	14.98 (7.91)	11.96 (12.43)	8.58 (20.70)	4.40 (32.50)	6.30 (44.72)	18.95 (77.90)	97.78 (25.34)
- 100 m.	This fraction forms 2.22% of the total sample and has an ash content of 16.21%, thus giving a total sample ash value of 25.14%.							

T A B L E 4. SEAM #4.

SCURRY RAINBOW OIL LTD.

Weight % and Volatile Matter % vs. Size and Specific Gravity.

(Figures in Brackets give Volatile Matter.)

Sp.Gr. Size	1.30	1.35	1.40	1.50	1.60	1.80	Total	
2" x 1"	6.92 (17.17)	54.7 (16.52)	3.87 (16.00)	2.34 (16.15)	0.99 (14.64)	0.94 (14.37)	4.30 (10.55)	24.83 (15.39)
1" x 1/2"	6.96 (17.13)	3.07 (16.08)	2.67 (15.80)	1.85 (15.74)	0.81 (14.69)	0.75 (13.76)	4.41 (9.92)	20.52 (14.90)
1/2" x 1/4"	5.73 (18.27)	2.38 (16.92)	2.38 (15.90)	1.54 (15.40)	0.84 (14.49)	1.12 (12.86)	3.36 (9.69)	17.35 (15.31)
1/4" x 8m	6.35 (18.84)	2.02 (17.34)	1.64 (16.80)	1.58 (15.73)	0.89 (15.03)	1.90 (13.33)	3.94 (9.60)	18.32 (15.47)
8 x 20 m.	2.50 (18.09)	0.79 (17.48)	0.70 (16.46)	0.58 (16.14)	0.37 (15.01)	0.77 (14.17)	1.41 (9.41)	7.12 (15.40)
20 x 100 m.	4.15 (19.34)	1.25 (17.61)	0.70 (16.59)	0.69 (15.52)	0.50 (15.19)	0.82 (14.37)	1.53 (10.91)	9.64 (16.66)
Total	32.61 (18.02)	14.98 (16.74)	11.96 (16.10)	8.58 (15.79)	4.40 (14.79)	6.30 (13.69)	18.95 (9.99)	97.78 (15.41)
- 100 m.	This fraction forms 2.22% of the total sample and has a volatile matter content of 18.05%, thus giving a total sample volatile matter content of 15.47%.							

T A B L E 5. SEAM #4.

SCURRY RAINBOW OIL LTD.

Washability Data - 2" x 20 mesh

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	32.29	4.23	32.29	4.23	100.00	25.71	7.6
1.30 - 1.35	15.58	7.88	47.87	5.42	67.71	35.96	3.0
1.35 - 1.40	12.78	12.37	60.65	6.88	52.13	44.35	1.7
1.40 - 1.50	8.95	20.16	69.60	3.59	39.35	54.74	1.5
1.50 - 1.60	4.42	32.48	74.02	10.02	30.40	64.92	1.2
1.60 - 1.80	6.22	45.18	80.24	12.74	25.98	70.44	1
+ 1.80	19.76	78.39	100.00	25.71	19.76	78.39	N.A.
Total	100.00	25.71					

T A B L E 6. SEAM #4.

Washability Data - 20 x 100 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	43.05	2.91	43.05	2.91	100.00	21.98	10
1.30 - 1.35	12.97	8.34	56.02	4.18	56.95	36.39	5.2
1.35 - 1.40	7.26	13.51	63.23	5.24	43.98	44.66	2.8
1.40 - 1.50	7.16	26.90	70.44	7.44	36.72	50.82	1.8
1.50 - 1.60	5.19	32.71	75.63	9.17	29.56	56.61	1.2
1.60 - 1.80	8.50	41.86	84.13	12.47	24.37	61.70	1
+ 1.80	15.87	72.33	100.00	21.98	15.87	72.33	N.A.
Total	100.00	21.98					

T A B L E 7. SEAM #4.

SCURRY RAINBOW OIL LTD.

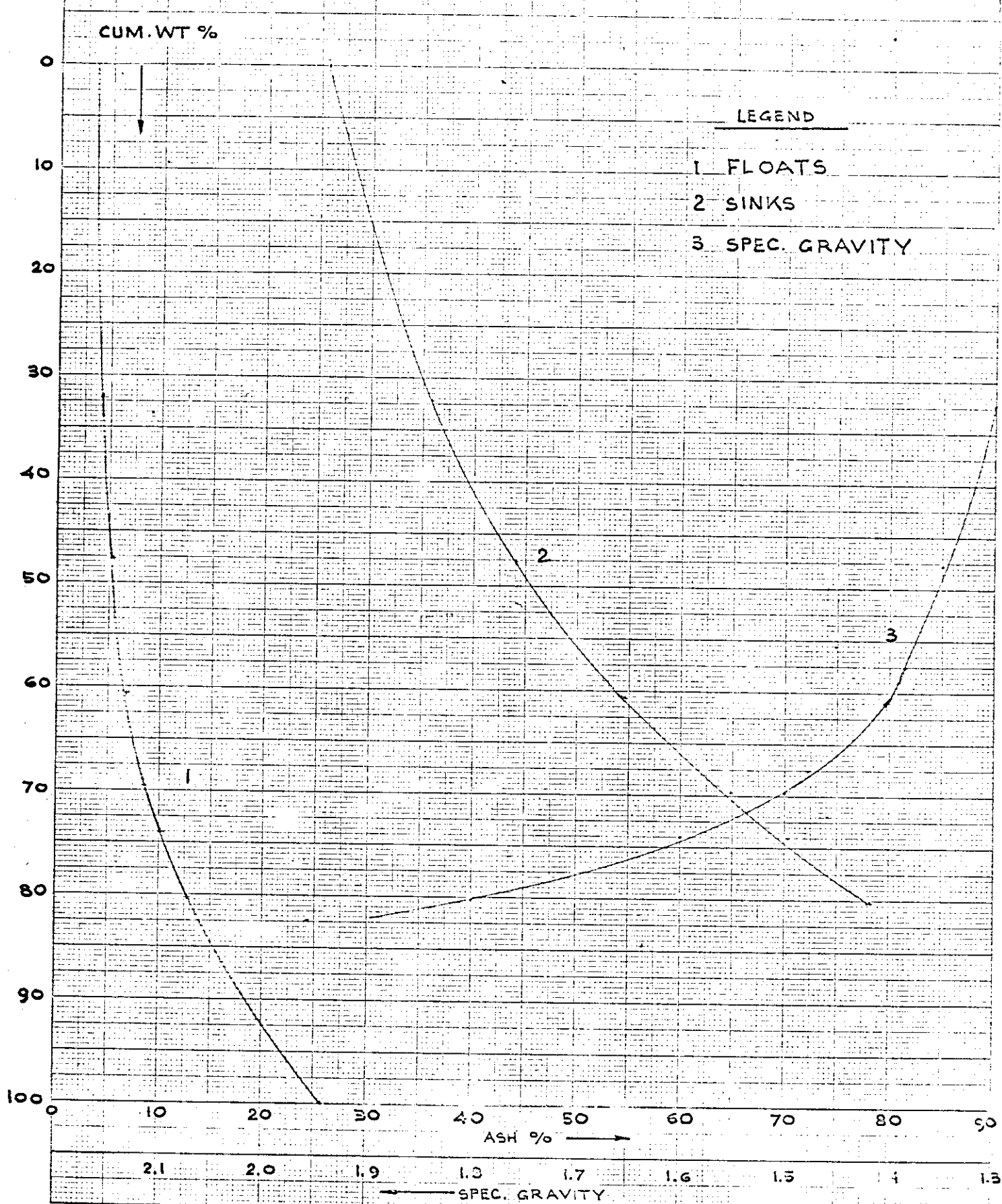
Free Swelling Index

Sp.Gr. \ Size	2" x 1"	1" x 1/2"	1/2" x 1/4"	1/4" x 8 m.	8 x 20 m.	20 x 100 m.
- 1.30	5½, 5½, 6	5½, 6, 6	8½, 8½, 9	10, 10, 10	8½, 8½, 9	10, 10, 10
1.30 - 1.35	1½, 2, 2	2, 2, 2½	4, 4, 4	5, 5½, 5½	5, 5½, 5½	5, 5, 5½
1.35 - 1.40	1½, 1½, 1½	1½, 1½, 1½	1½, 1½, 1½	2½, 2½, 2½	3, 3, 3	2½, 3, 3
1.40 - 1.50	1½, 1½, 1½	1½, 1½, 1½	1½, 1½, 1½	1½, 1½, 1½	2, 2, 2	1½, 2, 2
1.50 - 1.60	1, 1, 1	1, 1, 1	1½, 1½, 1½	1, 1½, 1	1½, 2½, 1½	1, 1, 1½
1.60 - 1.80	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1
+ 1.80	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

NOTE: F.S.I. on - 100 mesh fraction is 8, 8, 8.

FIG. 1 SCURRY RAINBOW - SEAM NO. 4

WASHABILITY CURVES OF 2in x 20m.

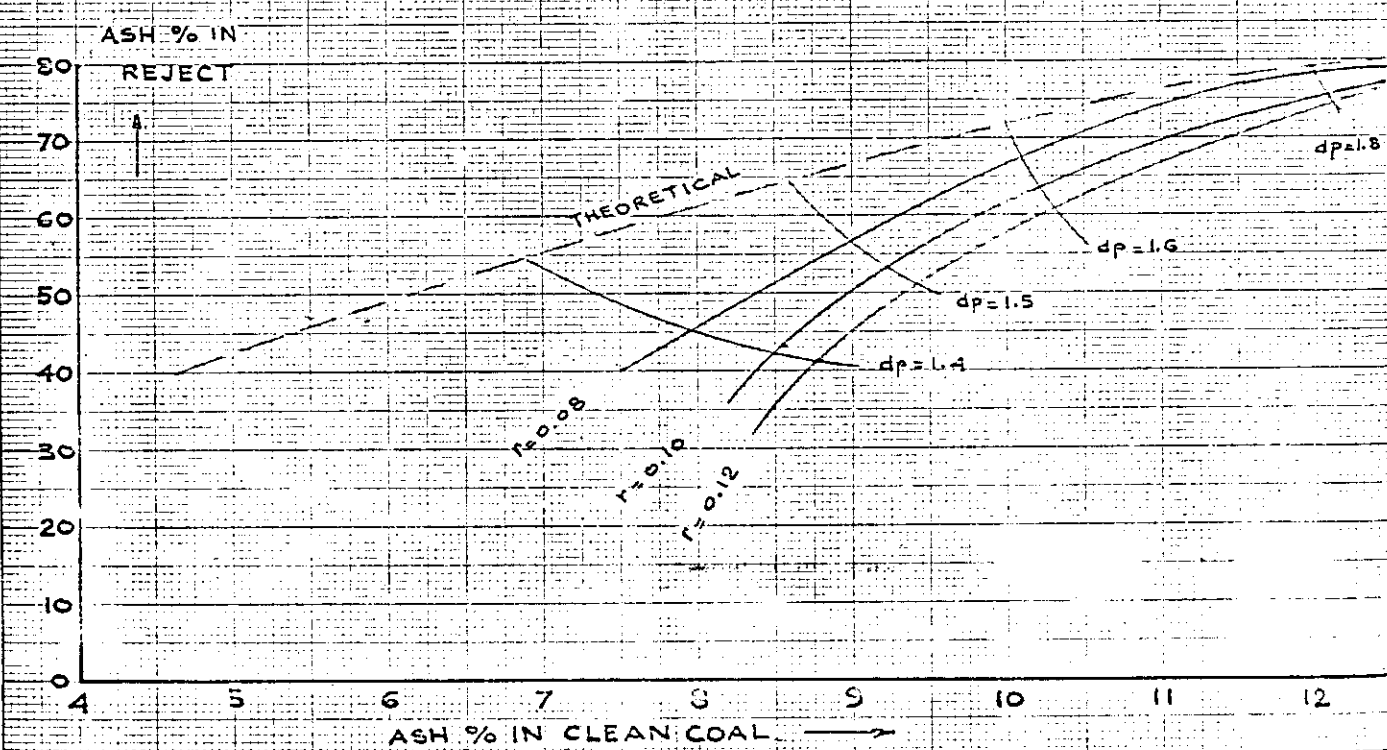
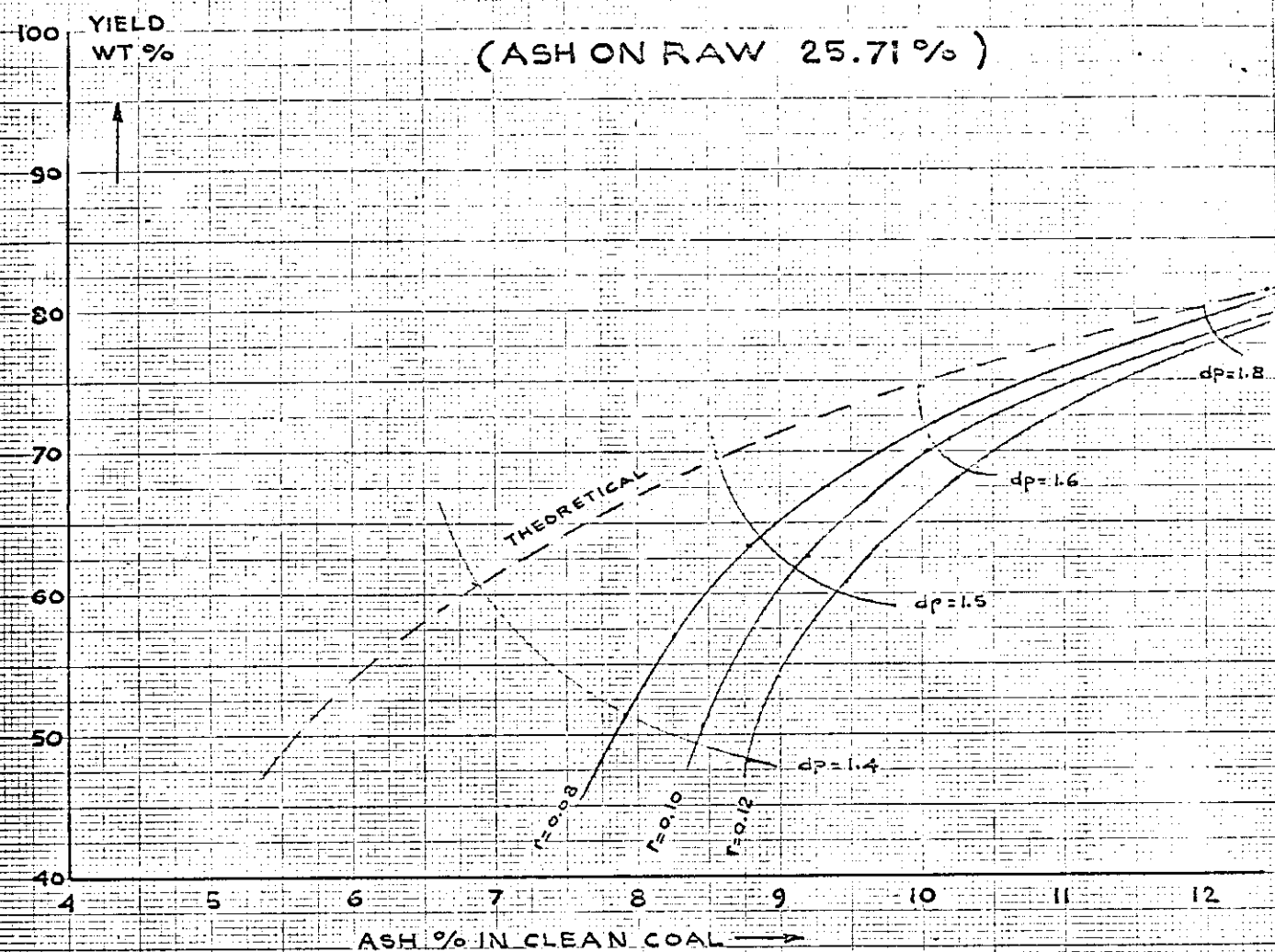


10 X 10 TO THE CENTIMETER 46 1512
 MADE IN U.S.A.
 KEUFFEL & ESSLER CO.

G. LAMAN OCT. 6/69

CYCLONE ENGINEERING SALES LTD.
 EDMONTON ALBERTA CANADA

FIG. 2 SCURRY RAINBOW - SEAM NO. 4
 PERFORMANCE EVALUATION CURVES FOR 2" x 20 m.



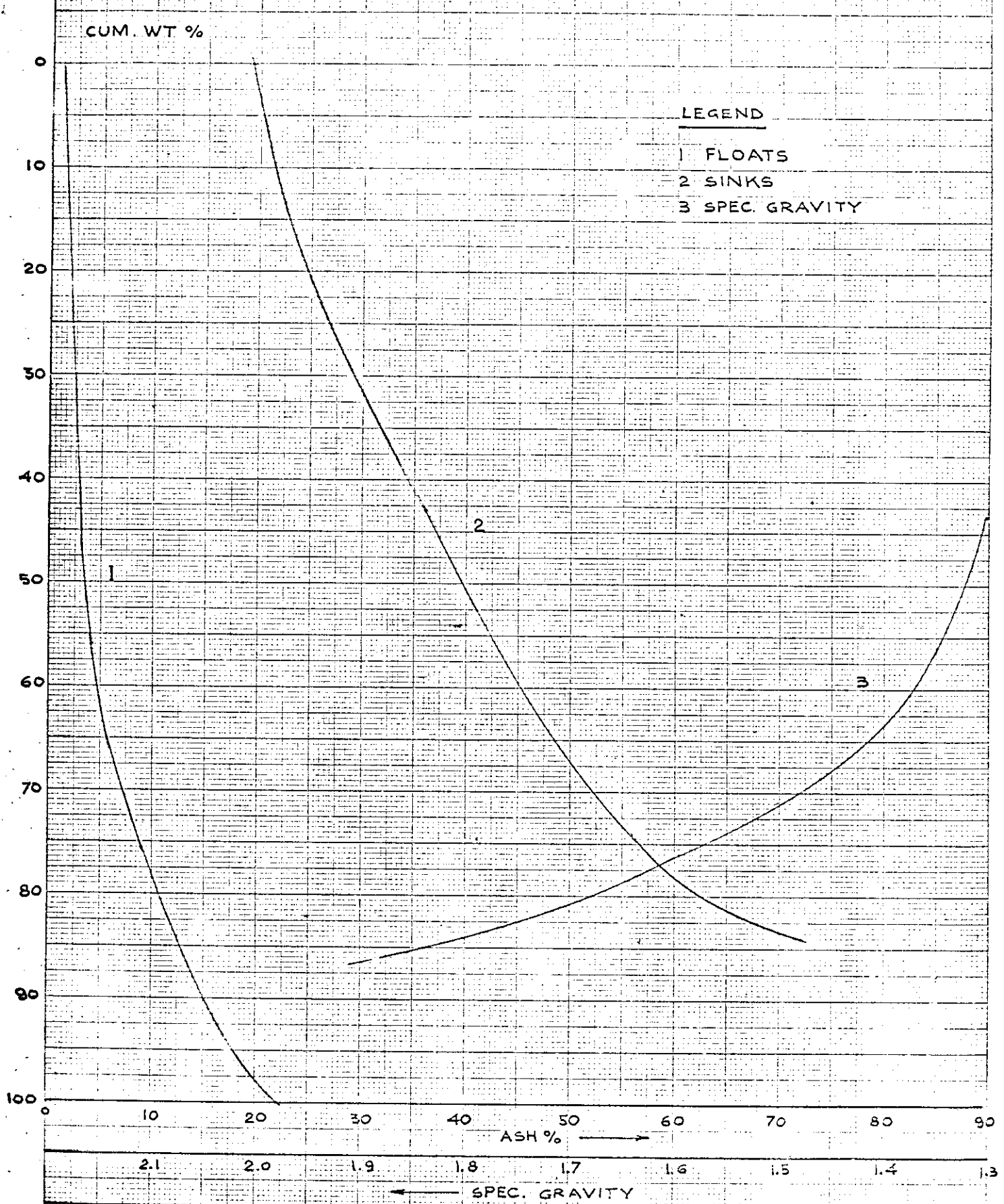
KE 10 X 10 TO THE CENTIMETER 46 1512
 18 X 25 CM. MADE IN U.S.A.
 KEUFFEL & ESSER CO.

a. LAMAN OKT. 6/69

CYCLONE ENGINEERING SALES LTD.
 EDMONTON ALBERTA CANADA

FIG. 3 SCURRY RAINBOW - SEAM NO. 4

WASHABILITY CURVES OF 20 x 100 m.



K&E 10 X 10 TO THE CENTIMETER 46 1512
 MADE IN U.S.A.
 KEUFFEL & ESSER CO.

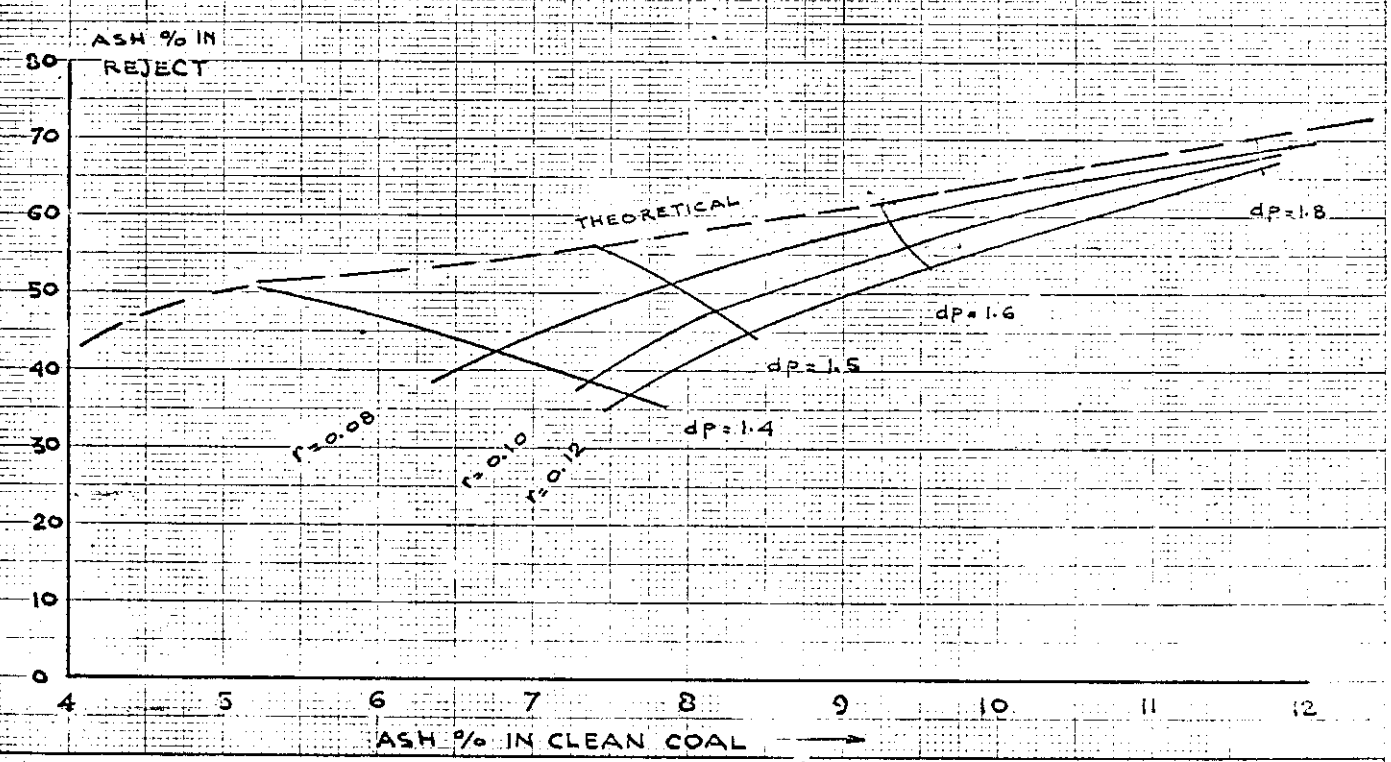
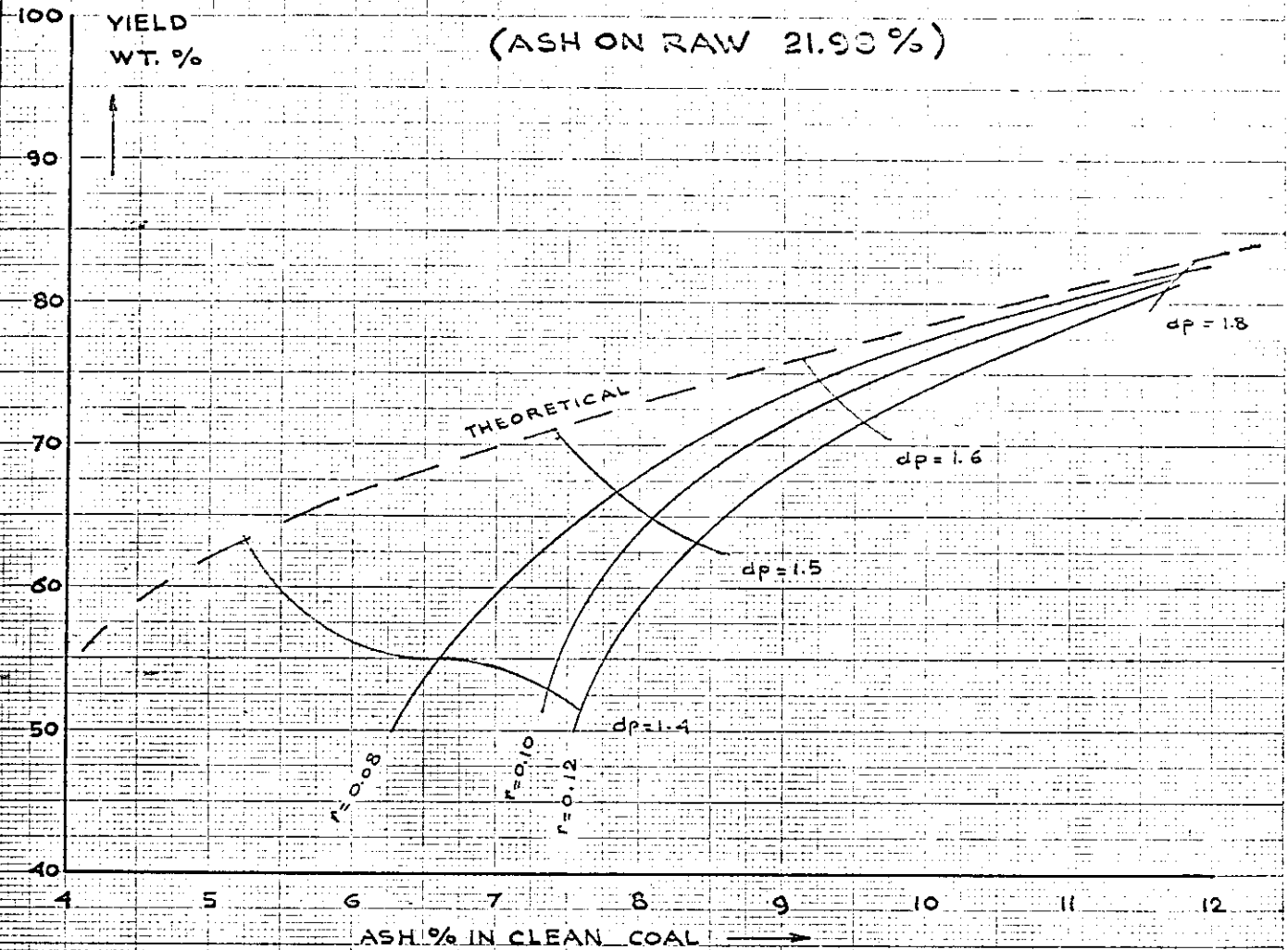
LAMAN OCT. 6/69

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FIG. 4 SCURRY RAINBOW - SEAM NO. 4

PERFORMANCE EVALUATION CURVES FOR 20 x 100 m

(ASH ON RAW 21.93%)



KEUFEEL & ESSER CO.
 10 X 10 TO THE CENTIMETER 46 1512
 18 X 25 CM. MADE IN U.S.A.

G. LAMAY
OCT. 8/69

CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

REPORT ON
CLEANING COKING COAL
from the
ELK RIVER PROSPECT
for
SCURRY RAINBOW OIL LTD.
Adit #2, Seam #7

Submitted by
CYCLONE ENGINEERING SALES LTD.
EDMONTON - ALBERTA - CANADA

Report No.: RI-69.07.a

Job No.: S1 - 58

Dated: October 21, 1969

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SUMMARY

The data presented in this report refers to coal from Seam #7.

The analysis and the washability indicates that this coal is of low volatile bituminous rank with a moderate ash content of 14.46% and an acceptable sulphur content (0.59%).

The ash distribution over the various specific gravity fractions indicate that cleaning by heavy medium circuits may be required if an ash content of 8% in the clean coal is specified.

It is noted that the F.S.I. values of the 2" x 1" and 1" x 1/2" fractions of the floats at 1.3 and 1.35 were found much lower than those of the fine size fractions.

This is a very unusual phenomenon and for this reason we have contacted the Department of Energy, Mines & Resources for petrographic analysis and coke oven test. A copy of our letter to the Department is enclosed in this report for your information. We also have been in touch with the Alberta Research Council. As soon as any additional information is available we will forward this to you as an addendum to this report.

Cyclone Engineering Sales Ltd.

Gravity Separation of Bulk Materials

Telephone 429 - 5708

Manufacturers and
Suppliers
of Compound Water
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Credit Foncier Building
10275 Jasper Avenue
Edmonton, Alberta

Engineering and
Testing Services

CABLE ADDRESS :
Cyclone, Edmonton

COPY

October 20, 1969

Dr. J. Visman, Head
Dept. of Energy, Mines & Resources
P.O. Box Sub 11
University of Alberta
Edmonton 7, Alberta

Dear Dr. Visman:

We are forwarding two samples to you for the purpose of having a coking test performed on them in Ottawa. The samples are from Scurry Rainbow Seams #7 and #8.2.1. They are both floats at 1.30 of the size fraction 2" x 1". The liquid used for float sink was a solution of zinc chloride.

Contrary to our usual experience (we always get an F.S.I. of about 8 for floats at 1.30) these two samples are giving very low F.S.I. of 2 to 3.

Futhermore the free swelling index for floats at 1.30 of all size fractions below 1/4" is very much as expected.

There seems to be something wrong only with the two top size fractions of 2" x 1" and 1" x 1/2".

An actual 20 lb. coke oven test will help us provide Scurry Rainbow with more definite information on coking characteristics than is possible at the present moment.

Thank you.

Very truly yours,

CYCLONE ENGINEERING SALES LTD.

Per: 

R. S. Sehgal
Head of Laboratory

RSS:sw

T A B L E 1. SEAM #7.

SCURRY RAINBOW OIL LTD.

Classification by Rank.

Ash:	14.46%
Volatile Matter:	17.85%
Residual Moisture:	0.44%
Fixed Carbon:	67.25%
Sulphur:	0.59%
B.T.U./lb.	12,860
Rank:	Low volatile bituminous

T A B L E 2. SEAM #7.

Size Analysis - Sulphur, B.T.U. and Residual Moisture.

Size	Weight %	Sulphur %	B.T.U./lb.	R.M. %
2" x 1"	16.41	0.64	13,030	0.44
1" x 1/2"	22.74	0.58	12,820	0.43
1/2" x 1/4"	19.44	0.57	12,400	0.44
1/4" x 8 m.	17.75	0.57	12,750	0.41
8 x 20 m.	9.76	0.60	12,930	0.47
20 x 100 m.	11.24	0.62	13,360	0.48
- 100 m.	2.66	0.65	13,740	0.45
Total	100.00	0.59	12,860	0.44

T A B L E 3. SEAM #7.

SCURRY RAINBOW OIL LTD.

Weight and Ash Distribution vs. Size and Specific Gravity.
(Figures in Brackets show the Ash content of individual fractions)

Size \ Sp.Gr.								Total
	1.30	1.35	1.40	1.50	1.60	1.80		
2" x 1"	7.24 (4.76)	3.52 (8.24)	1.31 (12.90)	2.32 (21.35)	1.37 (30.84)	0.36 (38.69)	0.29 (72.51)	16.41 (12.62)
1 x 1/2"	9.28 (5.05)	4.09 (8.47)	2.36 (12.42)	3.61 (21.41)	1.89 (32.95)	0.70 (39.90)	0.81 (76.36)	22.74 (14.95)
1/2 x 1/4"	6.51 (4.23)	3.66 (9.10)	2.44 (12.46)	3.66 (20.38)	1.54 (32.10)	0.94 (41.75)	0.69 (74.88)	19.44 (15.75)
1/4" x 8 m.	7.66 (4.38)	1.77 (8.66)	2.93 (13.17)	2.27 (22.13)	1.43 (31.08)	0.85 (42.29)	0.84 (71.83)	17.75 (15.68)
8 x 20 m.	5.09 (4.40)	0.74 (8.60)	1.33 (14.21)	0.91 (21.52)	0.66 (30.67)	0.54 (40.54)	0.49 (68.68)	9.76 (14.65)
20 x 100 m.	6.35 (3.30)	1.24 (9.63)	0.83 (13.85)	0.91 (19.97)	0.90 (30.56)	0.59 (38.35)	0.42 (75.98)	11.24 (12.86)
Total	42.14 (4.40)	15.02 (8.69)	11.20 (13.00)	13.68 (21.15)	7.79 (31.59)	3.98 (40.59)	3.54 (73.57)	97.34 (14.57)
- 100 m.	This fractions forms 2.66% of the total sample and has an ash content of 10.46%, thus giving a total sample ash value of 14.46%.							

- 3 -

T A B L E 4. SEAM #7.

SCURRY RAINBOW OIL LTD.

Weight % and Volatile Matter % vs. Size and Specific Gravity.

(Figures in brackets give Volatile Matter)

Size \ Sp.Gr.	1.30	1.35	1.40	1.50	1.60	1.80	Total	
2" x 1"	7.24 (18.01)	3.52 (16.71)	1.31 (16.91)	2.32 (16.69)	1.37 (16.59)	0.36 (15.47)	0.29 (14.71)	16.41 (17.22)
1" x 1/2"	9.28 (18.20)	4.09 (16.70)	2.36 (17.30)	3.61 (17.00)	1.89 (16.42)	0.70 (15.66)	0.81 (14.46)	22.74 (17.28)
1/2" x 1/4"	6.51 (18.92)	3.66 (16.70)	2.44 (17.22)	3.66 (16.70)	1.54 (16.04)	0.94 (15.38)	0.69 (14.01)	19.44 (17.29)
1/4" x 8 M.	7.66 (19.45)	1.77 (18.55)	2.93 (17.46)	2.27 (17.02)	1.43 (16.64)	0.85 (16.20)	0.84 (13.34)	17.75 (18.05)
8 x 20 m.	5.09 (20.50)	0.74 (19.44)	1.33 (17.93)	0.91 (17.44)	0.66 (17.38)	0.54 (16.84)	0.49 (13.28)	9.76 (19.00)
20 x 100 m.	6.35 (20.88)	1.24 (19.08)	0.83 (18.16)	0.91 (18.04)	0.90 (17.36)	0.59 (17.42)	0.42 (14.80)	11.24 (19.56)
Total	42.14 (19.18)	1.502 (17.25)	11.20 (17.41)	13.68 (16.96)	7.79 (16.60)	3.98 (16.11)	3.54 (14.00)	97.34 (17.84)
- 100 m.	This fraction forms 2.66% of the total sample and has a volatile matter content of 18.39%, thus giving a total sample volatile matter content of 17.85%.							

T A B L E 5. SEAM #7.

SCURRY RAINBOW OIL LTD.
Washability Data - 2" x 20 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	41.56	4.61	41.56	4.61	100.00	14.81	5.6
1.30 - 1.35	16.01	8.61	57.57	5.72	58.44	22.06	1.5
1.35-1.40	12.04	12.93	69.61	6.97	42.43	27.13	1.7
1.40 - 1.50	14.83	21.24	84.44	9.48	30.39	32.76	1.3
1.50 - 1.60	8.00	31.73	92.44	11.90	15.56	43.73	1.1
1.60 - 1.80	3.94	40.99	96.38	12.61	7.56	56.44	1.1
+ 1.80	3.62	73.25	100.00	14.81	3.62	73.25	0.1
Total	100.00	14.81					

T A B L E 6. SEAM #7.

Washability Data - 20 x 100 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	56.49	3.30	56.49	3.30	100.00	12.87	9.4
1.30 - 1.35	11.03	9.63	67.52	4.33	43.51	25.29	4.9
1.35 - 1.40	7.38	13.85	74.90	5.27	32.48	30.61	2.2
1.40 - 1.50	8.10	19.97	83.00	6.71	25.10	35.54	1.5
1.50 - 1.60	8.01	30.56	91.01	8.81	17.00	42.96	1
1.60 - 1.80	5.25	38.35	96.26	10.42	8.99	54.00	1
+ 1.80	3.74	75.98	100.00	12.87	3.74	75.98	1.5
Total	100.00	12.87					

T A B L E 7. SEAM #7.

SCURRY RAINBOW OIL LTD.

FREE SWELLING INDEX

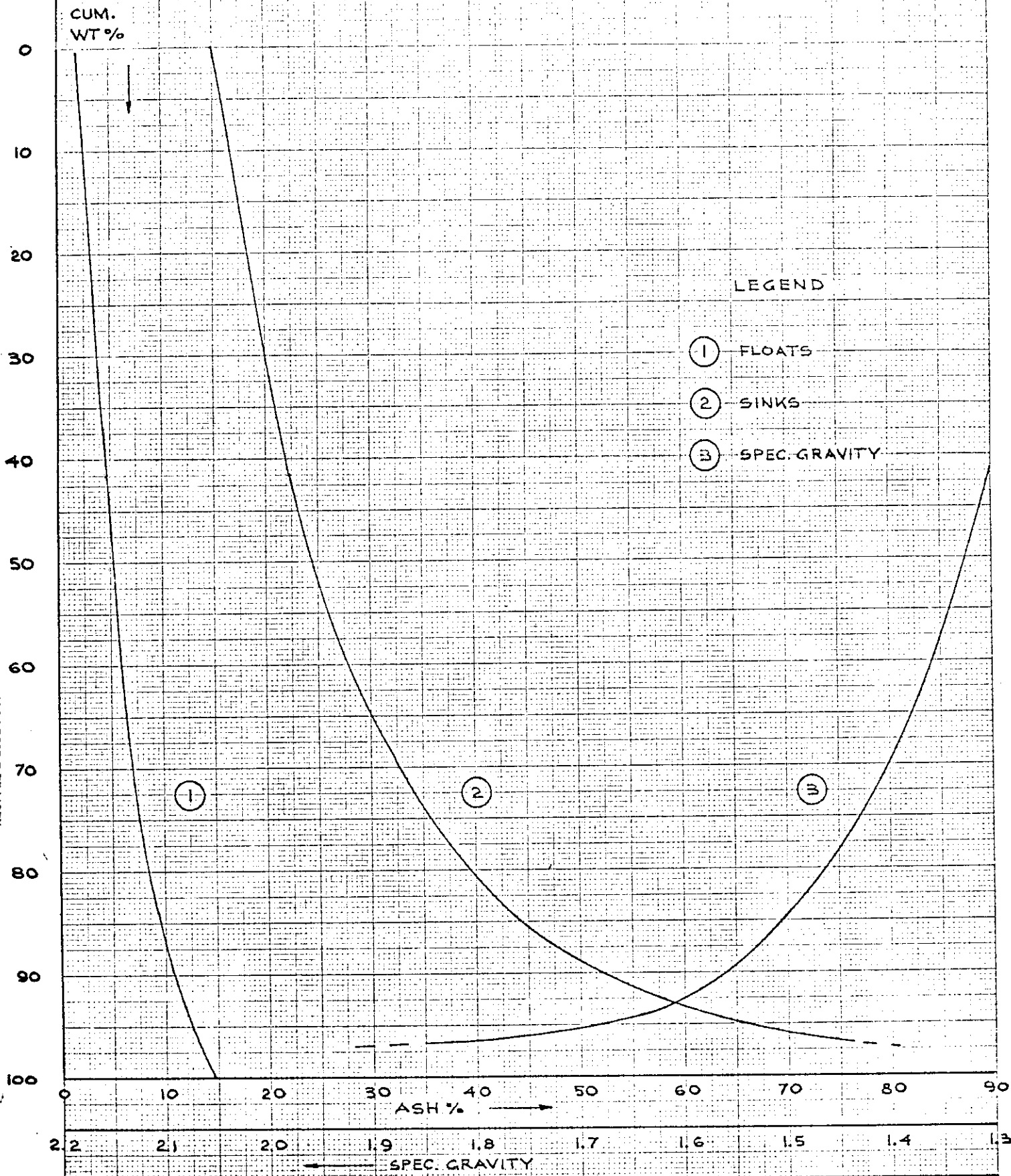
Sp.Gr. \ Size	2" x 1"	1" x 1/2"	1/2" x 1/4"	1/4" x 8 m.	8 x 20 m.	20 x 100 m.
- 1.30	3, 3, 3½	3½, 3½, 4	5½, 6, 6	7½, 8, 8	8½, 9, 9	9, 9½, 9½
1.30 - 1.35	1, 1, 1	1, 1, 1	½, ½, ½	4, 4, 4	5, 5, 5½	4½, 5, 5,
1.35 - 1.40	1, 1½, 1½	1½, 1½, 1½	1½, 1½, 1½	2, 2, 2	2, 2, 2½	2, 2, 2½
1.40 - 1.50	1½, 1½, 1½	1, 1½, 1½	1, 1, 1½	1, 1½, 1½	1, 1, 1½	1½, 1½, 1½
1.50 - 1.60	1, 1, 1	1, 1, 1½	1, 1, 1½	1, 1, 1½	1, 1, 1	1, 1, 1
1.60 - 1.80	1, 1, 1	1, 1, 1	1, 1, 1½	1, 1, 1½	1, 1, 1	1, 1, 1
+ 1.80	N.A.	N.A.	N.A.	N.A.	½, ½, ½	½, ½, ½

NOTE: F.S.I. on - 100 mesh fraction is 8, 8, 8.

1
9
1

FIG. 1 SCURRY RAINBOW SEAM No. 7

WASHABILITY CURVES FOR 2" x 20 m.



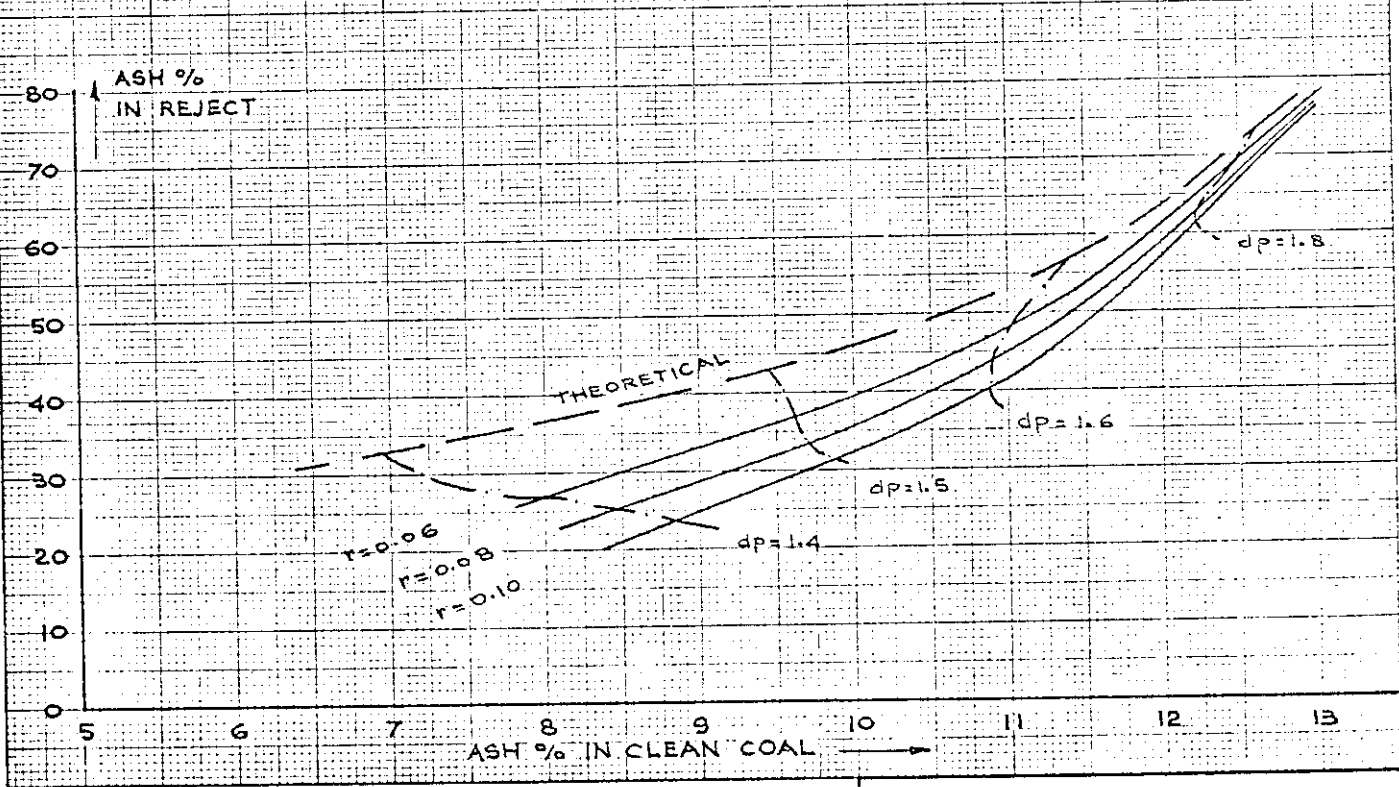
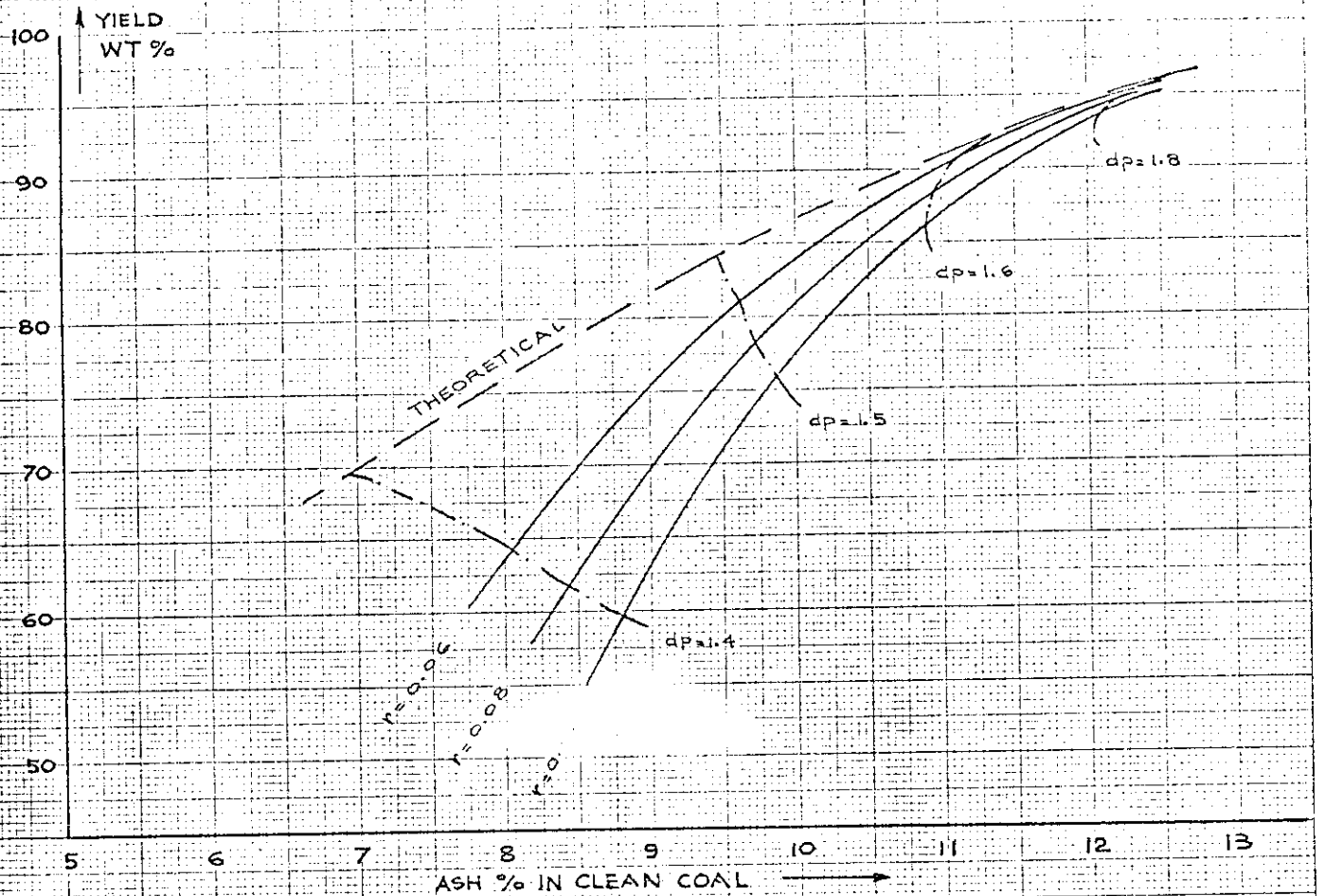
KE 10 X 10 TO THE CENTIMETER 46 1512
 MADE IN U.S.A.
 KEUFFEL & ESSER CO.

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CYCLONE ENGINEERING SALES LTD.
 EDMONTON ALBERTA CANADA

FIG. 2 SCURRY RAINBOW SEAM No. 7

PERFORMANCE EVALUATION CURVES FOR 2⁴ x 20 m.
(ASH ON RAW 14.81 %)



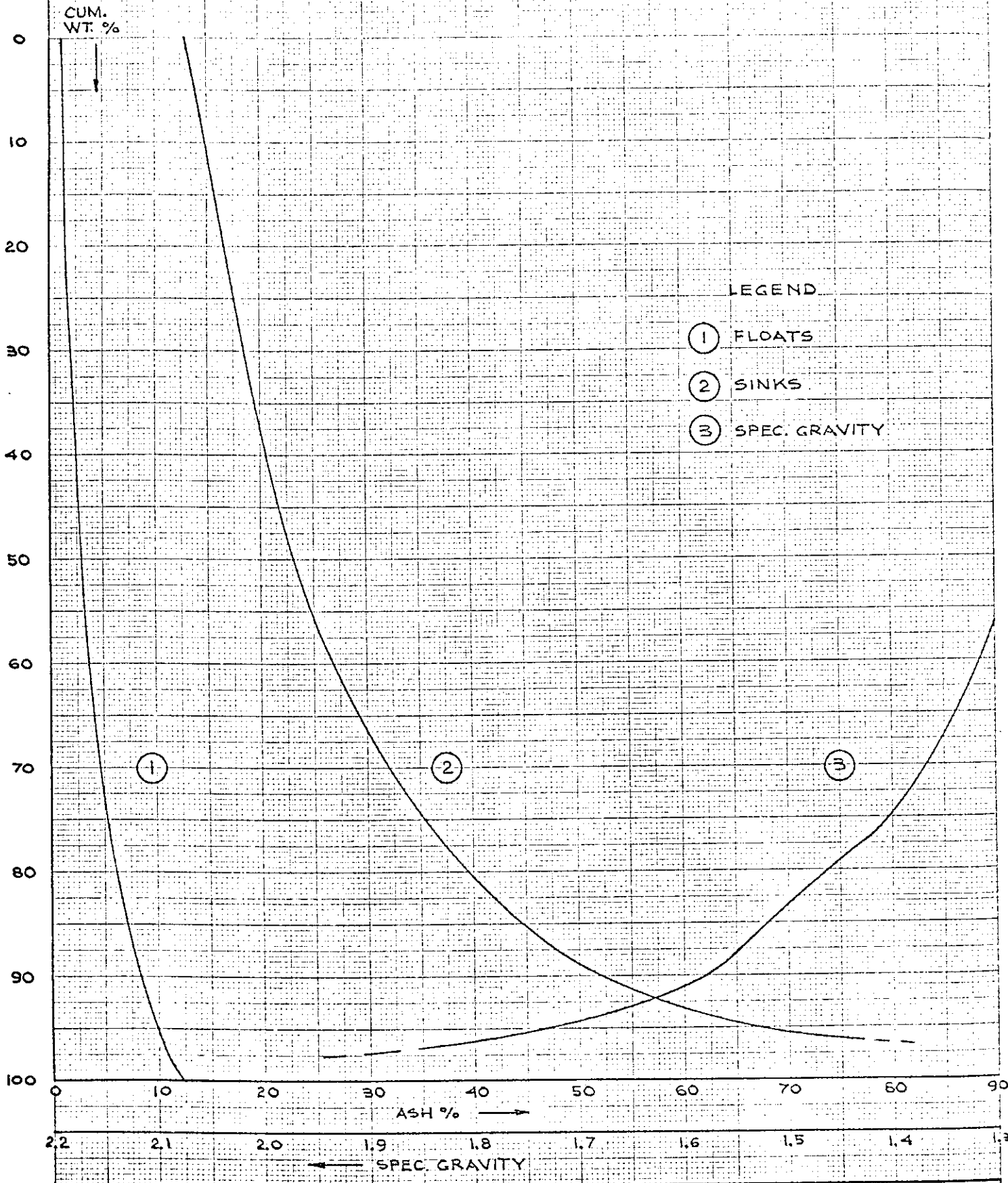
KE 10 X 10 TO THE CENTIMETER 46 1512
 18 X 25 CM. MADE IN U.S.A.
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EDMONTON - ALBERTA - CANADA

FIG. 3 SCURRY RAINBOW SEAM No. 7

WASHABILITY CURVES FOR 20 m. x 100 m.



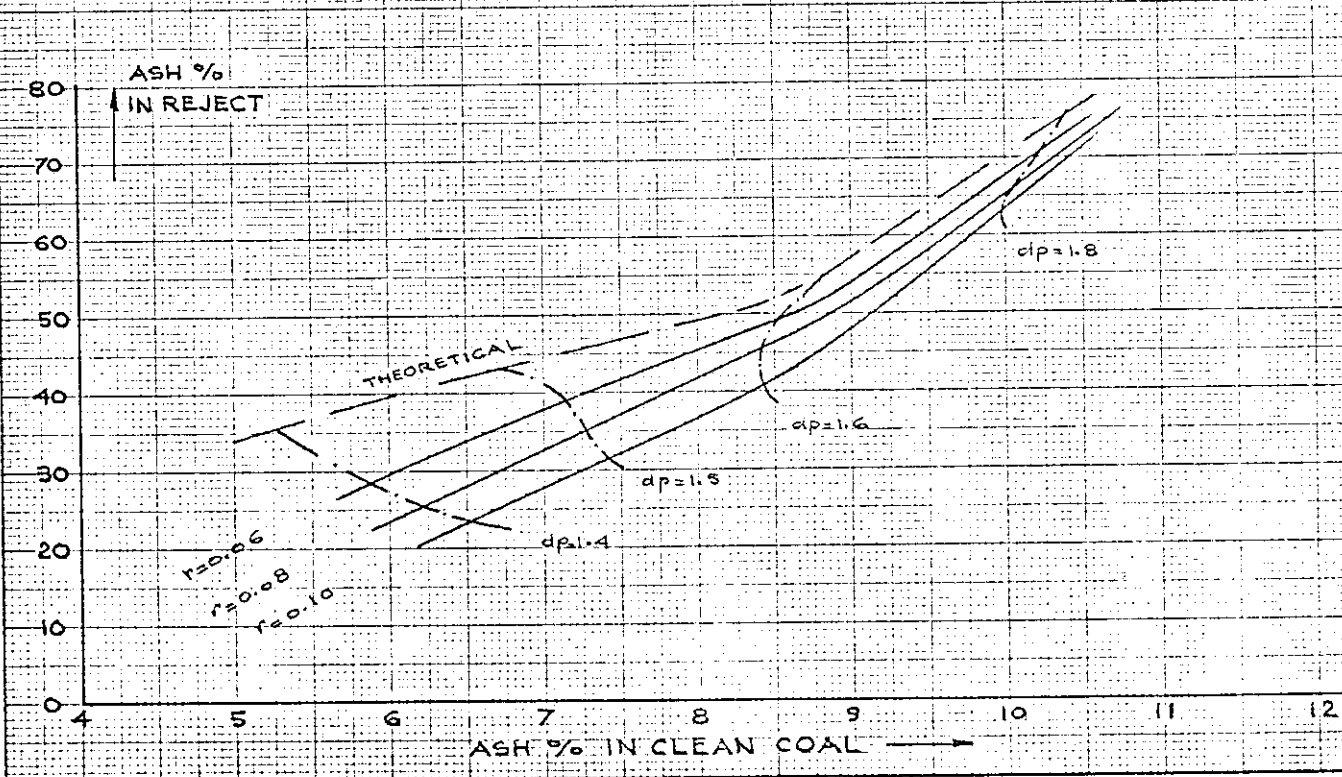
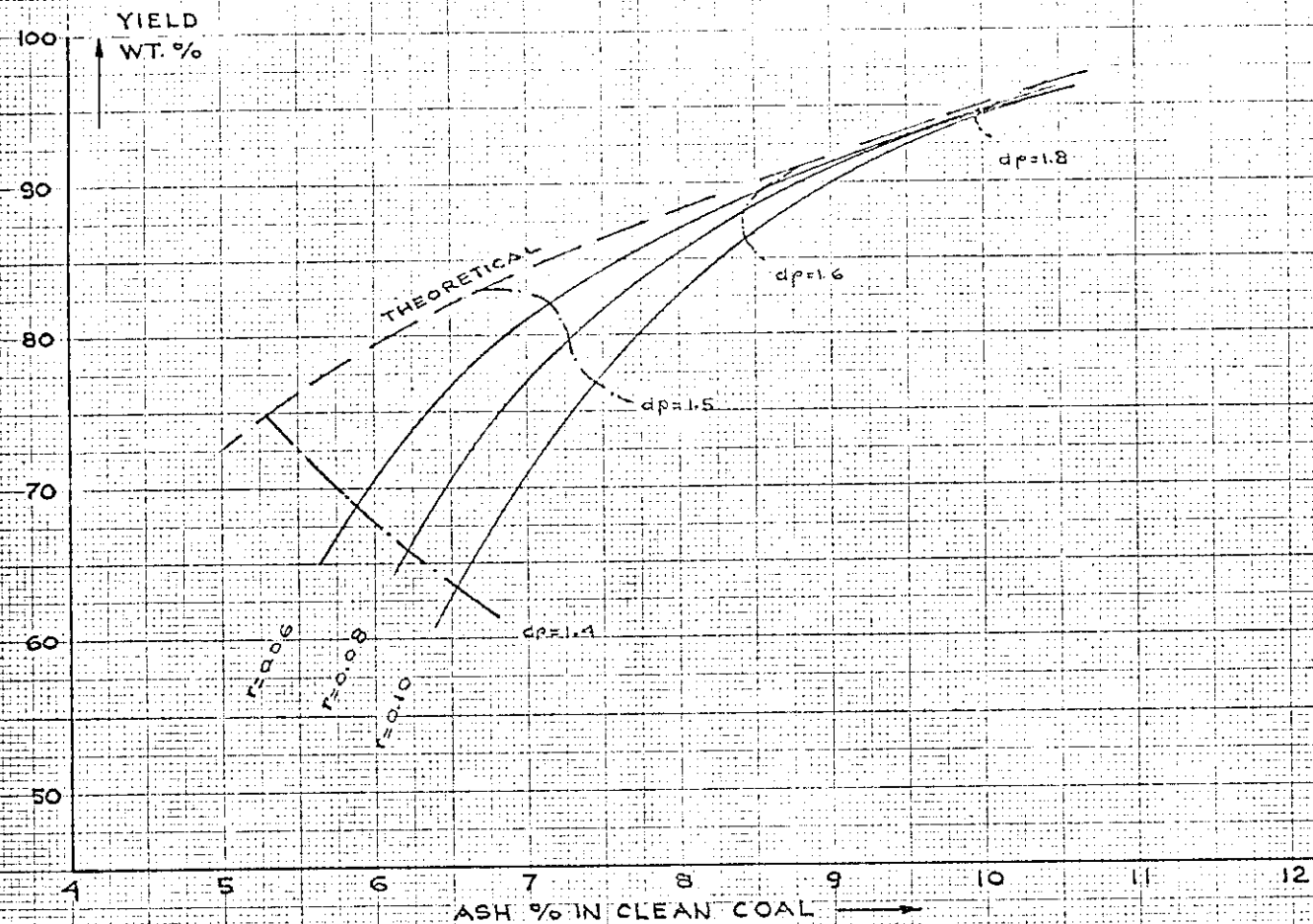
KE 10 X 10 TO THE CENTIMETER 46 1512
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FIG. 4 SCURRY RAINBOW SEAM No. 7

PERFORMANCE EVALUATION CURVES FOR 20m.x100m.
(ASH ON RAW 12.37%)



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CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

REPORT ON
CLEANING COKING COAL
from the
ELK RIVER PROJECT
for
SCURRY RAINBOW OIL LTD.
Adit #3, Seam #8.2.1

Submitted by
CYCLONE ENGINEERING SALES LTD.
EDMONTON - ALBERTA - CANADA

Report No.: RI-69.07.b
Job No.: S1 - 58
Dated: October 24, 1969

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1. Washability Curves on 2" x 20 mesh.
2. Performance Evaluation Curves on 2" x 20 mesh.
3. Washability Curves on 20 x 100 mesh.
4. Performance Evaluation Curves on 20 x 100 mesh.

SUMMARY

The data presented in this report refers to coal from Seam #8.2.1.

The coal from this adit is of low volatile bituminous rank with an ash content (16.90%) somewhat higher than in Seam #7 but still considerably lower than in Seam #4.

Sulphur content is 0.40% which is acceptable.

The F.S.I. values shown the same phenomenon in the coarse floats (2" x 1/2" fraction) and we will come back on this in an addendum after additional information is received.

T A B L E 1. SEAM #8.2.1.

SCURRY RAINBOW OILLTD.

Classification by Rank.

Ash:	16.90%
Volatile Matter:	17.86%
Residual Moisture:	0.42%
Fixed Carbon:	64.82%
Sulphur:	0.43%
B.T.U./lb.	12,430
Rank:	Low volatile bituminous

T A B L E 2. SEAM #8.2.1.

Size Analysis - Sulphur, B.T.U. and Residual Moisture.

Size	Weight %	Sulphur %	B.T.U./lb.	R.M. %
2 x 1"	17.21	0.37	12,030	0.35
1 x 1/2"	21.88	0.36	11,790	0.42
1/2 x 1/4"	17.91	0.35	11,480	0.34
1/4" x 8 m.	18.81	0.38	12,600	0.60
8 x 20 m.	8.68	0.43	13,450	0.43
20 x 100 m.	12.10	0.45	13,840	0.36
- 100 m.	3.41	0.46	14,020	0.41
Total	100.00	0.40	12,430	0.42

T A B L E 3. SEAM # 8.2.1.

SCURRY RAINBOW OIL LTD.

Weight&Ash Distribution vs. Size and Specific Gravity.
(Figures in brackets show the Ash content of individual fractions)

Size \ Sp.Gr.	Sp.Gr.							Total
	1.30	1.35	1.40	1.50	1.60	1.80		
2" x 1"	7.62 (5.18)	2.77 (7.44)	1.49 (12.03)	1.35 (18.56)	1.29 (30.90)	1.01 (42.03)	1.68 (80.52)	17.21 (18.63)
1 x 1/2"	7.34 (4.75)	3.44 (7.98)	3.03 (12.29)	2.57 (20.64)	1.86 (30.72)	1.05 (38.09)	2.59 (78.31)	21.88 (20.68)
1/2 x 1/4"	6.05 (5.03)	2.42 (7.66)	2.72 (11.33)	2.42 (19.58)	1.33 (29.87)	0.97 (41.62)	2.00 (77.20)	17.91 (20.19)
1/4" x 8 m.	6.33 (2.80)	4.23 (7.48)	2.37 (12.91)	1.91 (23.01)	1.19 (32.21)	0.98 (45.23)	1.80 (76.01)	18.81 (18.25)
8 x 20 m.	4.61 (2.15)	1.41 (7.44)	0.74 (12.66)	0.83 (19.83)	0.32 (30.27)	0.28 (42.81)	0.49 (73.30)	8.68 (11.96)
20 x 100 m.	7.60 (1.84)	1.64 (6.39)	0.89 (11.36)	0.73 (18.22)	0.40 (26.26)	0.30 (40.66)	0.54 (70.46)	12.10 (8.97)
Total	39.55 (3.70)	15.91 (7.49)	11.24 (12.10)	9.81 (20.30)	6.39 (30.55)	4.59 (41.68)	9.10 (77.28)	96.59 (17.50)
- 100 m.	This fraction forms 3.41% of the total sample and has an ash content of 8.97%, thus giving a total sample ash value of 16.90%.							

T A B L E 4. S E A M # 8.2.1.

SCURRY RAINBOW OIL LTD.

Weight % and Volatile Matter % vs. Size and Specific Gravity.

(Figures in brackets give Volatile Matter)

Size	Sp.Gr.							Total
	1.30	1.35	1.40	1.50	1.60	1.80		
2 x 1"	7.62 (18.09)	2.77 (18.05)	1.49 (17.89)	1.35 (16.87)	1.29 (15.99)	1.01 (14.45)	1.68 (9.97)	17.21 (16.80)
1 x 1/2"	7.34 (19.42)	3.44 (18.22)	3.03 (17.70)	2.57 (16.78)	1.86 (15.86)	1.05 (15.28)	2.59 (10.62)	21.88 (17.13)
1/2 x 1/4"	6.05 (18.06)	2.42 (18.72)	2.72 (17.96)	2.42 (17.66)	1.33 (16.52)	0.97 (15.06)	2.00 (11.34)	17.91 (17.05)
1/4" x 8 m.	6.33 (20.78)	4.23 (18.32)	2.37 (17.70)	1.91 (16.84)	1.19 (16.36)	0.98 (15.22)	1.80 (12.22)	18.81 (18.05)
8 x 20 m.	4.61 (21.63)	1.41 (18.61)	0.74 (17.57)	0.83 (17.35)	0.32 (16.51)	0.28 (15.69)	0.49 (12.43)	8.68 (19.48)
20 x 100 m.	7.60 (21.82)	1.64 (19.20)	0.89 (17.88)	0.73 (17.64)	0.40 (17.00)	0.30 (16.38)	0.54 (13.24)	12.10 (20.24)
Total	39.55 (19.89)	15.91 (18.42)	11.24 (17.79)	9.81 (17.13)	6.39 (16.22)	4.59 (15.13)	9.10 (11.22)	96.59 (17.83)
- 100 m.	This fraction forms 3.41% of the total sample and has a volatile matter content of 18.78%, thus giving a total sample volatile matter content of 17.86%.							

- 4 -

T A B L E 5. SEAM #8.2.1.

SCURRY RAINBOW OIL LTD.
Washability Data - 2" x 20 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	37.82	4.14	37.82	4.14	100.00	18.75	4.8
1.30 - 1.35	16.89	7.62	54.71	5.21	62.18	27.64	2.3
1.35 - 1.40	12.24	12.17	66.95	6.49	45.29	35.10	1.5
1.40 - 1.50	10.75	20.74	77.70	8.46	33.05	43.60	1.3
1.50 - 1.60	7.09	30.84	84.79	10.33	22.30	54.62	1.2
1.60 - 1.80	5.08	41.75	89.87	12.11	15.21	65.70	1
+ 1.80	10.13	77.71	100.00	18.75	10.13	77.71	0.03
Total	100.00	18.75					

T A B L E 6. SEAM #8.2.1.

Washability Data - 20 x 100 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	62.81	1.84	62.81	1.84	100.00	8.98	10
1.30 - 1.35	13.55	6.39	76.36	2.64	37.19	21.03	3.3
1.35 - 1.40	7.36	11.36	83.72	3.41	23.64	29.42	1.7
1.40 - 1.50	6.03	18.22	89.75	4.41	16.28	37.58	1.3
1.50 - 1.60	3.31	26.26	93.06	5.19	10.25	48.98	1.2
1.60 - 1.80	2.48	40.66	95.54	6.11	6.94	59.81	1
+ 1.80	4.46	70.46	100.00	8.98	4.46	70.46	0.5
Total	100.00	8.98					

T A B L E 7. SEAM # 8.2.1.

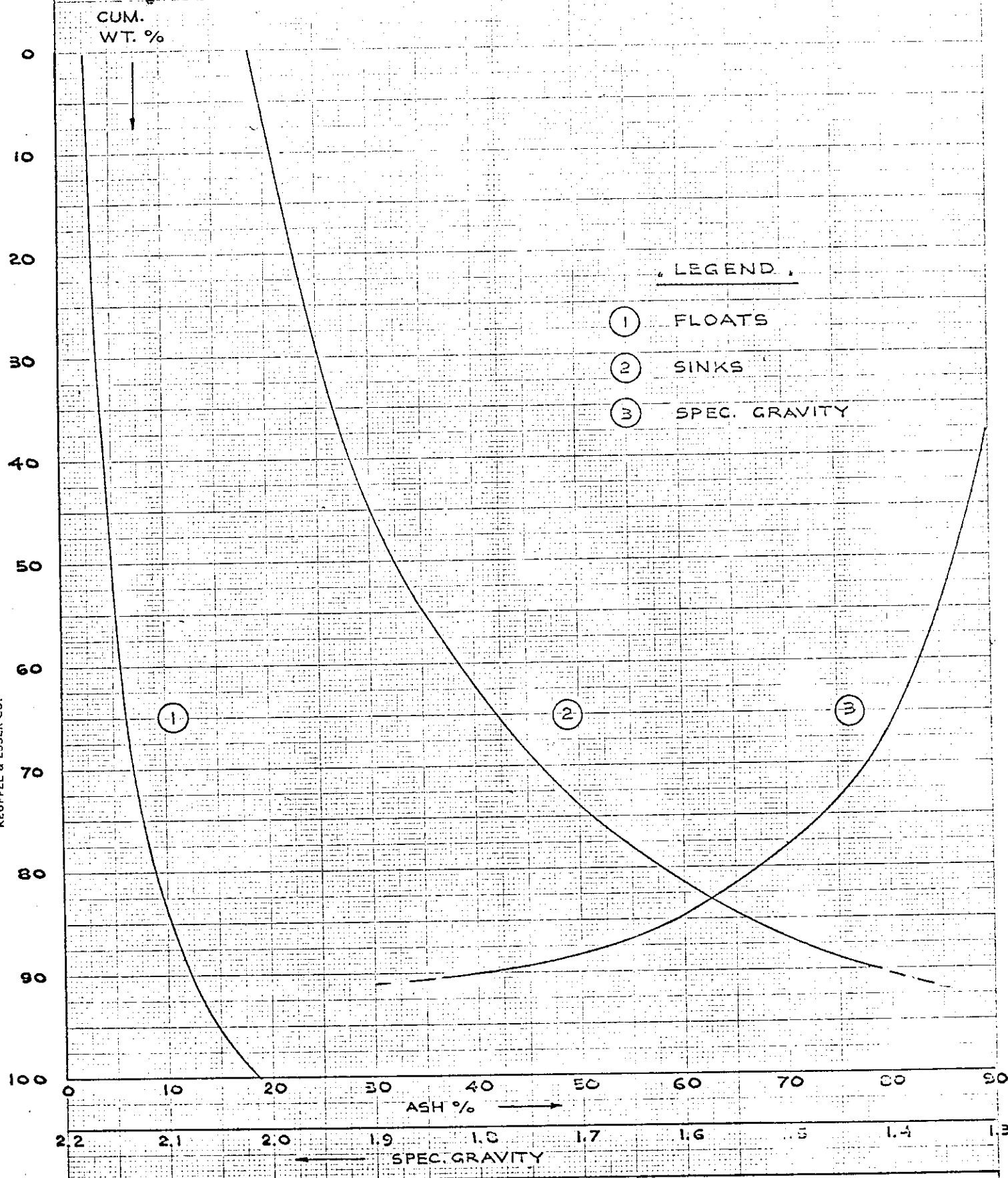
SCURRY RAINBOW OIL LTD.

FREE SWELLING INDEX

Sp. Gr. \ Size	2 x 1"	1 x 1/2"	1/2 x 1/4"	1/4" x 8 m.	8 x 20 m.	20 x 100 m.
- 1.30	2, 2, 2	3½, 3½, 3½	1, 1, 1½	9½, 9½, 9½	10, 10, 10	10, 10, 10
1.30 - 1.35	2, 2, 2	2, 2½, 2½	2, 2, 1½	2½, 2½, 3	2½, 2½, 2½	3, 3½, 3½
1.35 - 1.40	1, 1½, 1½	2, 2, 1½	1, 1½, 1½	1½, 1½, 1½	1½, 1½, 1½	1½, 1½, 2
1.40 - 1.50	1, 1, 1½	1½, 1½, 1	1½, 1½, 1	1, 1½, 1½	1, 1, 1½	1, 1½, 1½
1.50 - 1.60	1, 1, 1½	1, 1, 1½	1½, 1, 1	1, 1, 1½	1, 1, 1	1, 1, 1½
1.60 - 1.80	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1
+ 1.80	N.A.	N.A.	N.A.	½, ½, ½	½, ½, ½	½, ½, ½

NOTE: F.S.I. on - 100 mesh fraction is 9, 9, 9.

FIG. 1 SCURRY RAINBOW SEAM, No. 0.2.1
WASHABILITY CURVES FOR 2" x 20m.

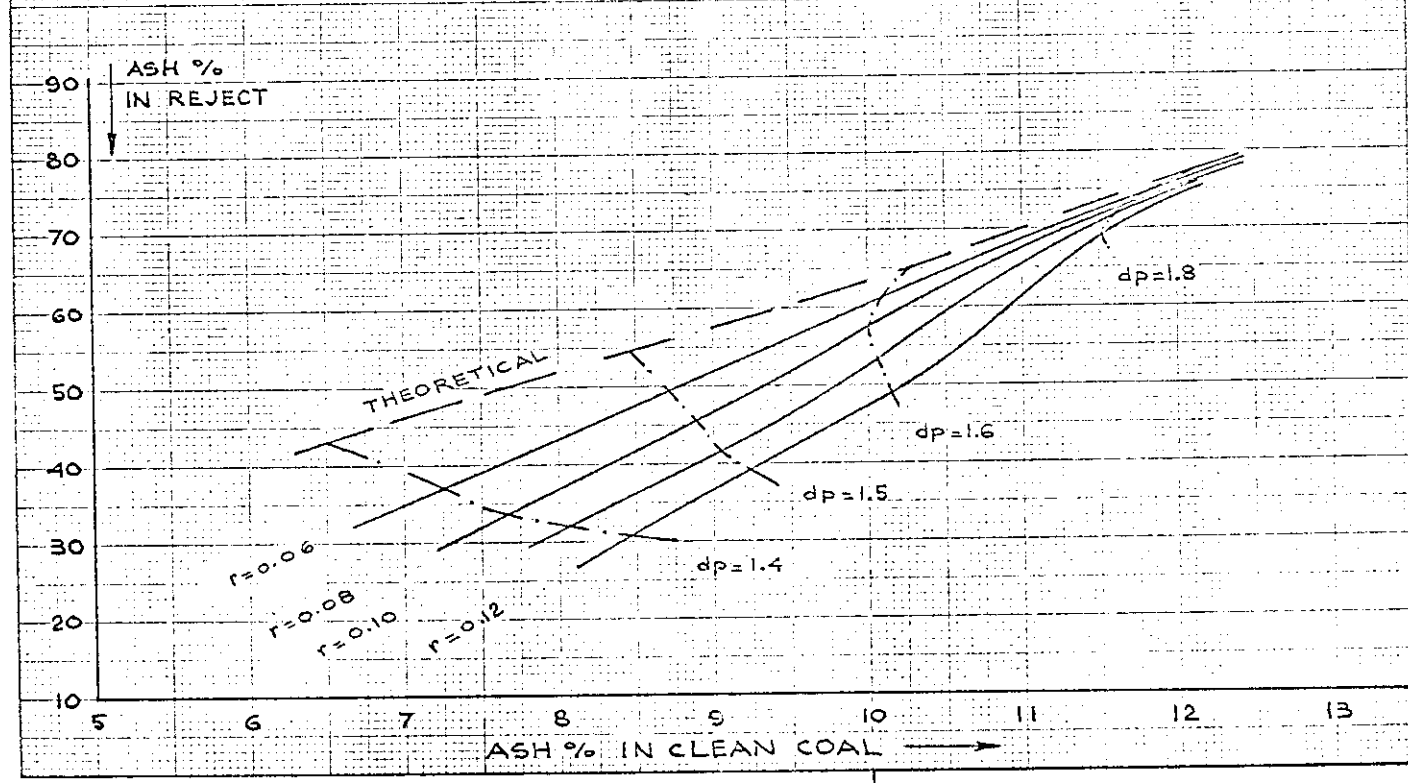
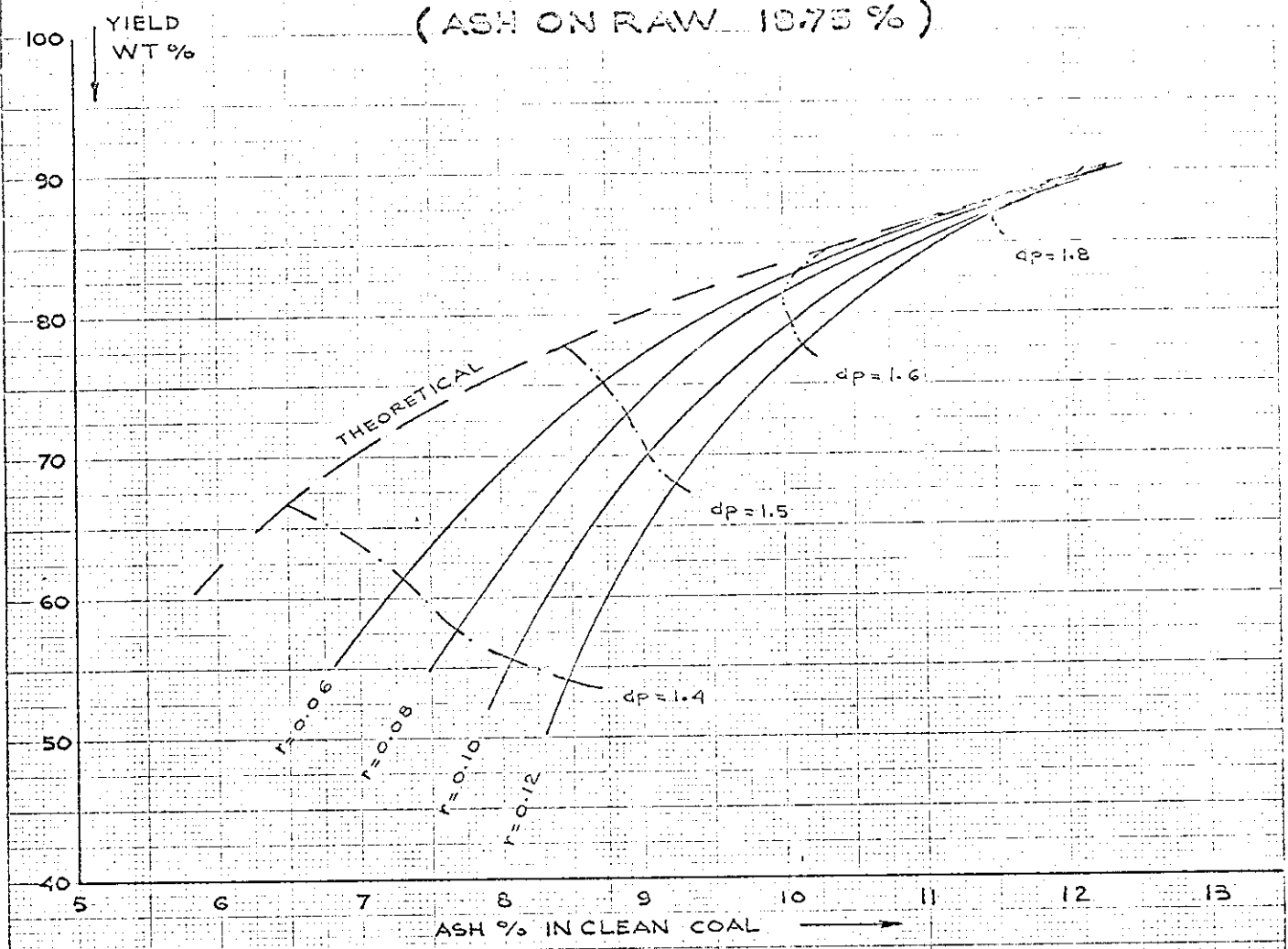


KE 10 X 10 TO THE CENTIMETER 46 1512
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FIG. 2 SCURRY RAINBOW SEAM No. 0.2.1
PERFORMANCE EVALUATION CURVES FOR 2" X 20 m.
(ASH ON RAW 18.75 %)



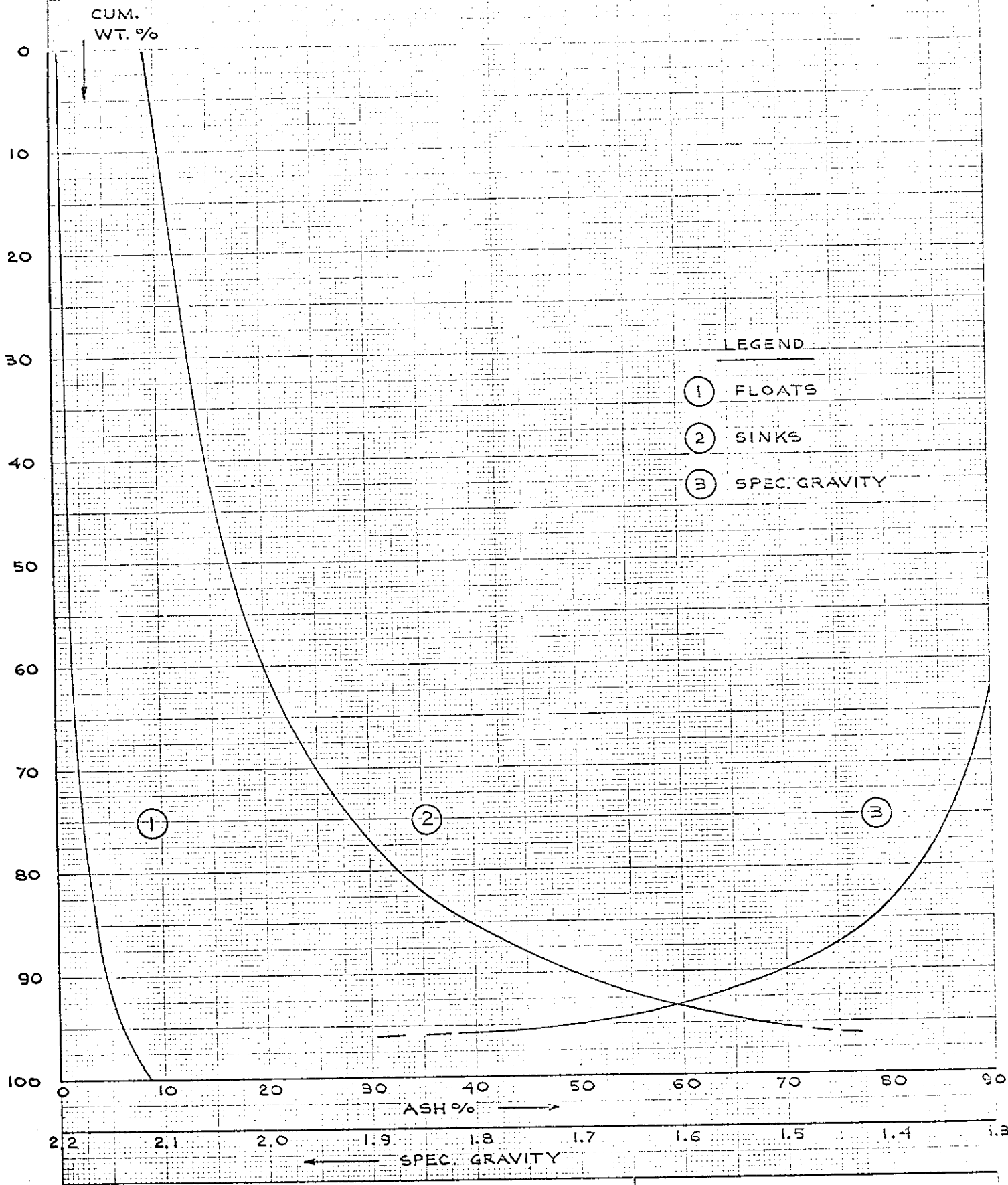
KE 10 X 10 TO THE CENTIMETER 46 1512
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FIG. 2 SCURRY RAINBOW SEAM No. 0.2.1

WASHABILITY CURVES FOR 20m x 100m.

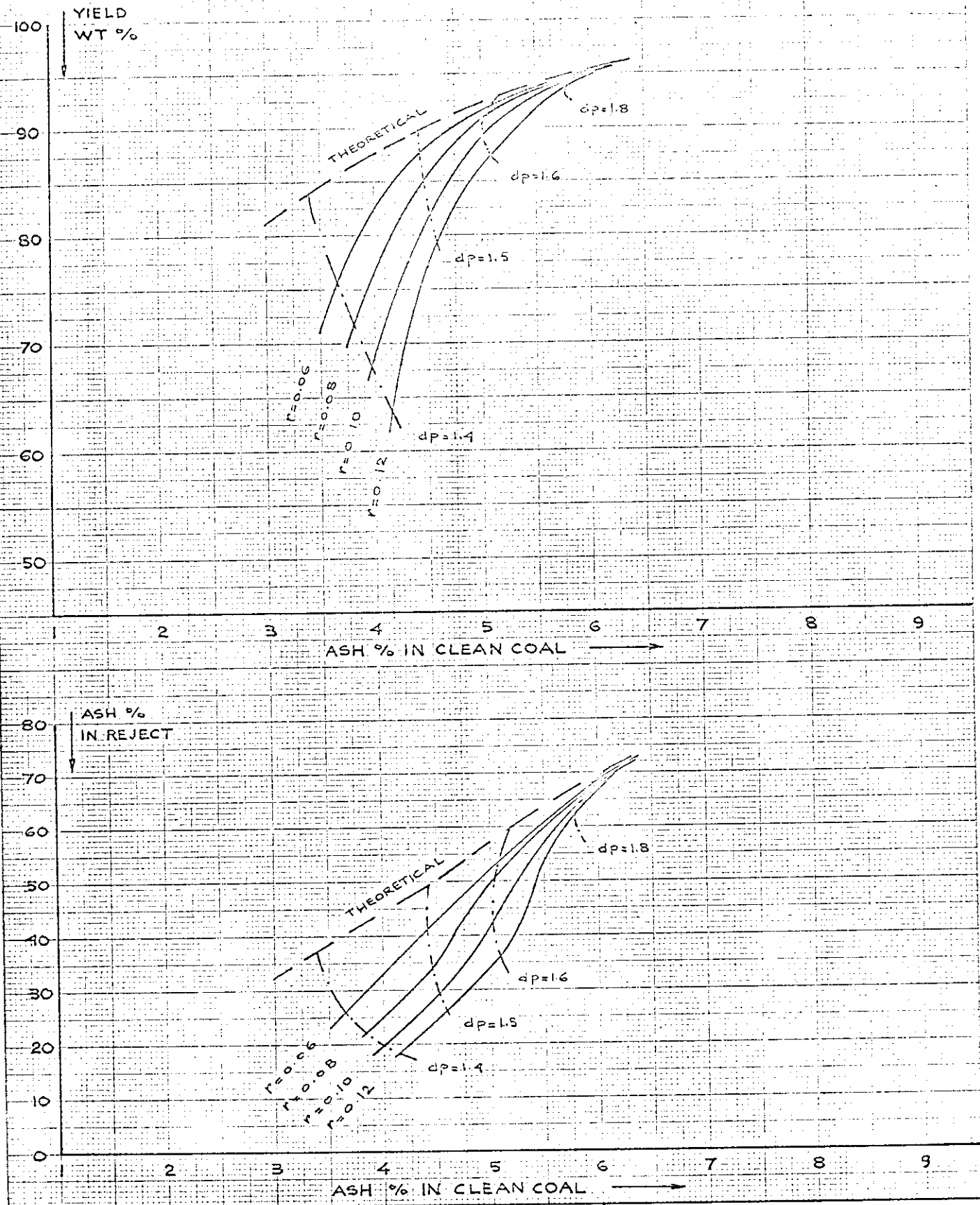


10 X 10 TO THE CENTIMETER 46 1512
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FIG. 4 SCURRY HANBOW SEAM No. C.2.1
PERFORMANCE EVALUATION CURVES FOR 20m x 100m.
(ASH ON RAW 0.00 %)



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CYCLONE ENGINEERING SALES LTD.
 EDMONTON ALBERTA CANADA

REPORT ON
CLEANING COKING COAL
from the
ELK RIVER PROJECT
for
SCURRY RAINBOW OIL LTD.
Adit #4, Seam #8.2.2

Submitted by
CYCLONE ENGINEERING SALES LTD.
EDMONTON - ALBERTA - CANADA

Report No.: RI-69.07.c
Job No.: S1 - 58
Dated: November 6, 1969

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SUMMARY

The data presented in this report refers to coal from Seam #8.2.2.

The coal from this adit is of low volatile bituminous rank with relatively low ash (11.34%) and sulphur (0.41%) contents.

Free swelling indexes are excellent.

Washing characteristics make this coal easy to clean at a required ash content of 8.75%.

SCURRY RAINBOW OIL LTD.

T A B L E 1. SEAM #8.2.2.

Classification by Rank.

Ash:	11.34%
Volatile Matter:	19.34%
Residual Moisture:	0.51%
Fixed Carbon:	68.81%
Sulphur:	0.41%
B.T.U./lb.:	13,530
Rank:	Low volatile bituminous

T A B L E 2. SEAM # 8.2.2.

Size Analysis - Sulphur, B.T.U. and Residual Moisture.

Size	Weight %	Sulphur %	B.T.U./lb.	R.M.%
2 x 1"	21.94	0.41	13,930	0.51
1 x 1/2"	20.17	0.42	13,740	0.53
1/2 x 1/4"	15.52	0.41	13,270	0.55
1/4" x 8 m.	17.96	0.38	13,180	0.45
8 x 20 m.	8.23	0.42	13,380	0.44
20 x 100 m.	11.88	0.44	13,390	0.53
- 100 m.	4.30	0.43	13,580	0.50
Total	100.00	0.41	13,530	0.51

T A B L E 3. SEAM #8.2.2

SCURRY RAINBOW OIL LTD.

Weight & Ash Distribution vs. Size and Specific Gravity.

(Figures in brackets show the Ash content of individual fractions.)

Size \ Sp.Gr.	Sp.Gr.							Total
	1.30	1.35	1.40	1.50	1.60	1.80		
2 x 1"	5.30 (3.64)	11.53 (6.40)	3.16 (11.70)	1.04 (18.92)	0.23 (30.32)	0.29 (40.93)	0.39 (71.93)	21.94 (8.96)
1 x 1/2"	6.97 (3.37)	7.12 (6.16)	3.56 (10.91)	1.22 (18.57)	0.31 (29.12)	0.29 (39.55)	0.70 (77.14)	20.17 (10.08)
1/2 x 1/4"	5.10 (3.07)	5.03 (6.50)	2.50 (11.66)	1.19 (18.80)	0.34 (25.58)	0.31 (43.45)	1.05 (74.80)	15.52 (12.92)
1/4" x 8 m.	7.39 (2.30)	5.60 (7.60)	1.40 (14.24)	1.36 (21.73)	0.43 (32.02)	0.52 (44.16)	1.26 (71.88)	17.96 (13.15)
8 x 20 m.	5.51 (3.54)	0.74 (10.93)	0.37 (15.07)	0.41 (22.28)	0.22 (32.35)	0.33 (44.26)	0.65 (66.37)	8.23 (13.02)
20 x 100 m.	7.95 (2.29)	0.93 (9.55)	0.71 (12.99)	0.55 (20.58)	0.27 (31.14)	0.43 (42.66)	1.04 (65.80)	11.88 (12.02)
Total	38.22 (2.96)	30.95 (6.78)	11.70 (11.94)	5.77 (19.88)	1.80 (29.98)	2.17 (42.72)	5.09 (71.26)	95.70 (11.35)
- 100 m.	This fraction forms 4.30% of the total sample and has an ash content of 11.06%, thus giving a total sample ash value of 11.34%.							

*
T A B L E 4. SEAM #8.2.2

SGURRY RAINBOW OIL LTD.

Weight % and Volatile Matter % vs. Size and Specific Gravity.

(Figures in brackets give Volatile Matter.)

Size \ Sp.Gr.	Sp.Gr.							Total
	1.30	1.35	1.40	1.50	1.60	1.80		
2 x 1"	5.30 (19.95)	11.53 (18.41)	3.16 (17.45)	1.04 (16.81)	0.23 (16.01)	0.29 (15.13)	0.39 (11.67)	21.94 (18.37)
1 x 1/2"	6.97 (21.65)	7.12 (19.69)	3.56 (18.79)	1.22 (18.25)	0.31 (17.09)	0.29 (15.15)	0.70 (11.37)	20.17 (19.72)
1/2 x 1/4"	5.10 (21.95)	5.03 (19.81)	2.50 (18.85)	1.19 (18.37)	0.34 (17.91)	0.31 (14.79)	1.05 (11.83)	15.52 (19.56)
1/4 x 8 m.	7.39 (21.85)	5.60 (18.49)	1.40 (18.71)	1.36 (18.31)	0.43 (17.75)	0.52 (15.71)	1.26 (11.81)	17.96 (19.30)
8 x 20 m.	5.51 (21.00)	0.74 (19.08)	0.37 (18.94)	0.41 (19.08)	0.22 (17.72)	0.33 (16.10)	0.65 (12.20)	8.23 (19.65)
20 x 100 m.	7.95 (21.27)	0.93 (19.14)	0.71 (18.69)	0.55 (18.91)	0.27 (17.77)	0.43 (16.29)	1.04 (12.65)	11.88 (19.82)
Total	38.22 (21.32)	30.95 (18.98)	11.70 (18.42)	5.77 (18.15)	1.80 (17.44)	2.17 (15.59)	5.09 (11.96)	95.70 (19.31)
- 100 m.	This fraction forms 4.30% of the total sample and has a volatile matter content of 19.96%, thus giving a total sample volatile matter content of 19.34%.							

T A B L E 5. SEAM #8.2.2

SCURRY RAINBOW OIL LTD.

Washability Data - 2" x 20 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	36.11	3.14	36.11	3.14	100.00	11.27	9.3
1.30 - 1.35	35.81	6.70	71.92	4.91	63.89	15.86	3.2
1.35 - 1.40	13.11	11.87	85.03	5.99	28.08	27.54	2.0
1.40 - 1.50	6.23	19.81	91.26	6.93	14.97	41.27	1.9
1.50 - 1.60	1.83	29.78	93.09	7.38	8.74	56.57	1.5
1.60 - 1.80	2.08	42.75	95.17	8.15	6.91	63.66	1
+ 1.80	4.83	72.67	100.00	11.27	4.83	72.67	0.3
Total	100.00	11.27					

T A B L E 6. SEAM #8.2.2

Washability Data - 20 x 100 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	66.92	2.29	66.92	2.29	100.00	12.02	9.5
1.30 - 1.35	7.83	9.55	74.75	3.05	33.08	31.70	5.5
1.35 - 1.40	5.98	12.99	80.73	3.79	25.25	38.57	4.5
1.40 - 1.50	4.63	20.58	85.36	4.70	19.27	46.51	4
1.50 - 1.60	2.27	31.14	87.63	5.38	14.64	54.70	2
1.60 - 1.80	3.62	42.66	91.25	6.86	12.37	59.03	1
+ 1.80	8.75	65.80	100.00	12.02	8.75	65.80	0.5
Total	100.00	12.02					

T A B L E 7. SEAM #8.2.2

SCURRY RAINBOW OIL LTD.

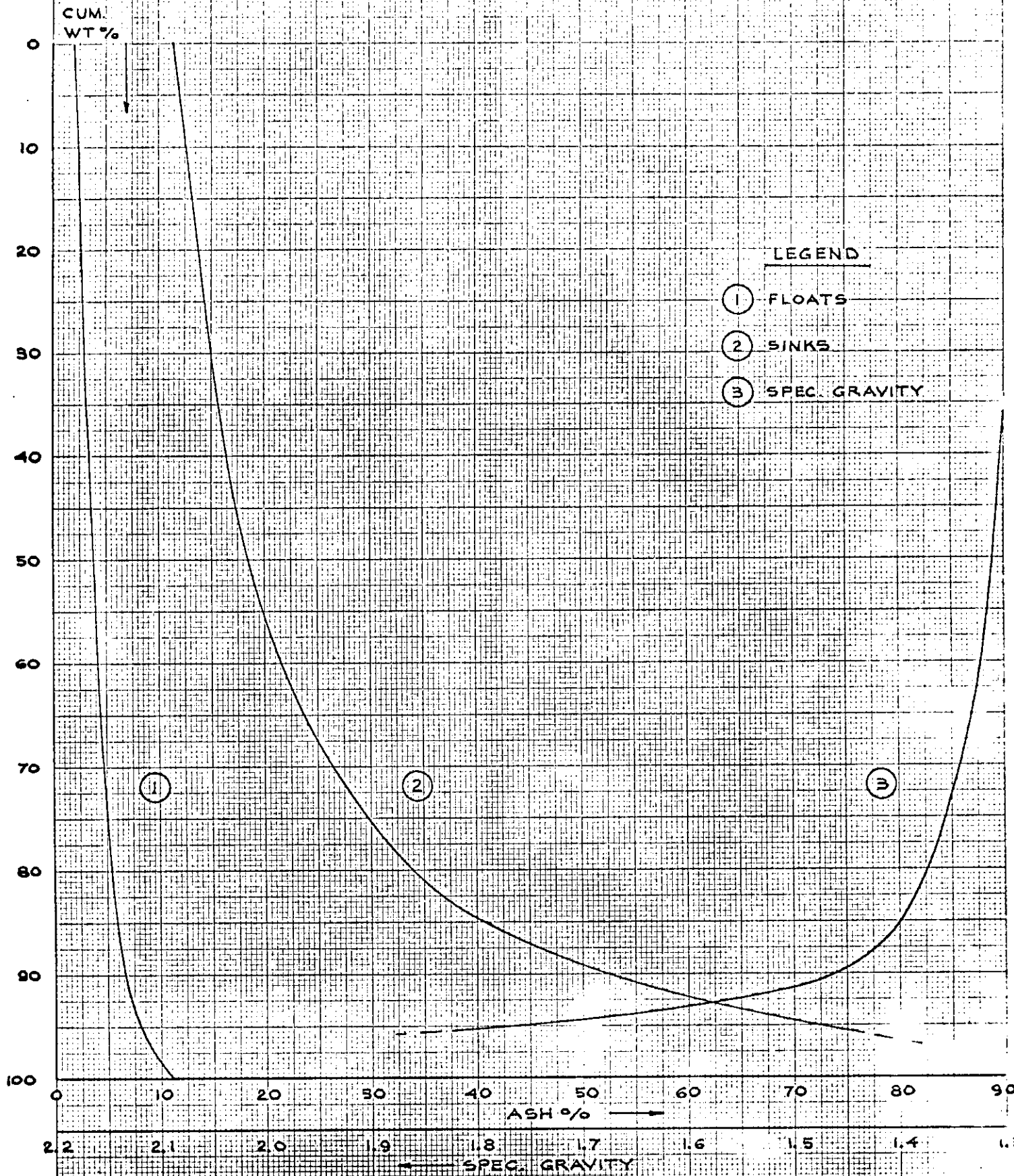
Free Swelling Index

Size Sp.Gr.	2 x 1"	1 x 1/2"	1/2 x 1/4"	1/4" x 8 m.	8 x 20 m.	20 x 100 m.
- 1.30	9, 9, 9	9,9,9	9½, 9½, 9½	9½, 9½, 9½	9½, 9½, 9½	9½, 9½, 9½
1.30 - 1.35	3, 3, 3	3,3, 3	3, 3, 3	4, 4, 4	4, 4½, 4½	5½, 5½, 5½
1.35 - 1.40	2, 2, 2	1½, 1½, 1½	1½, 1½, 1½	3½, 3½, 3½	4, 4, 4	4½, 4½, 4½
1.40 - 1.50	1½, 1½, 1½	1, 1, 1	1, 1, 1½	3, 3, 3½	3½, 3½, 4	4, 4, 4
1.50 - 1.60	1½, 1½, 1	1, 1, 1	1½, 1½, 1½	2, 2, 2	1½, 1½, 1½	2, 2, 2,
1.60 - 1.80	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1
+ 1.80	½, ½, ½	N.A.	N.A.	½, ½, ½	½, ½, ½	½, ½, ½

NOTE: F.S.I. on - 100 mesh fraction is 9, 9, 9.

FIG. 1 SCURRY RAINBOW SEAM No. 3.2.2

WASHABILITY CURVES FOR 2" x 20 m.



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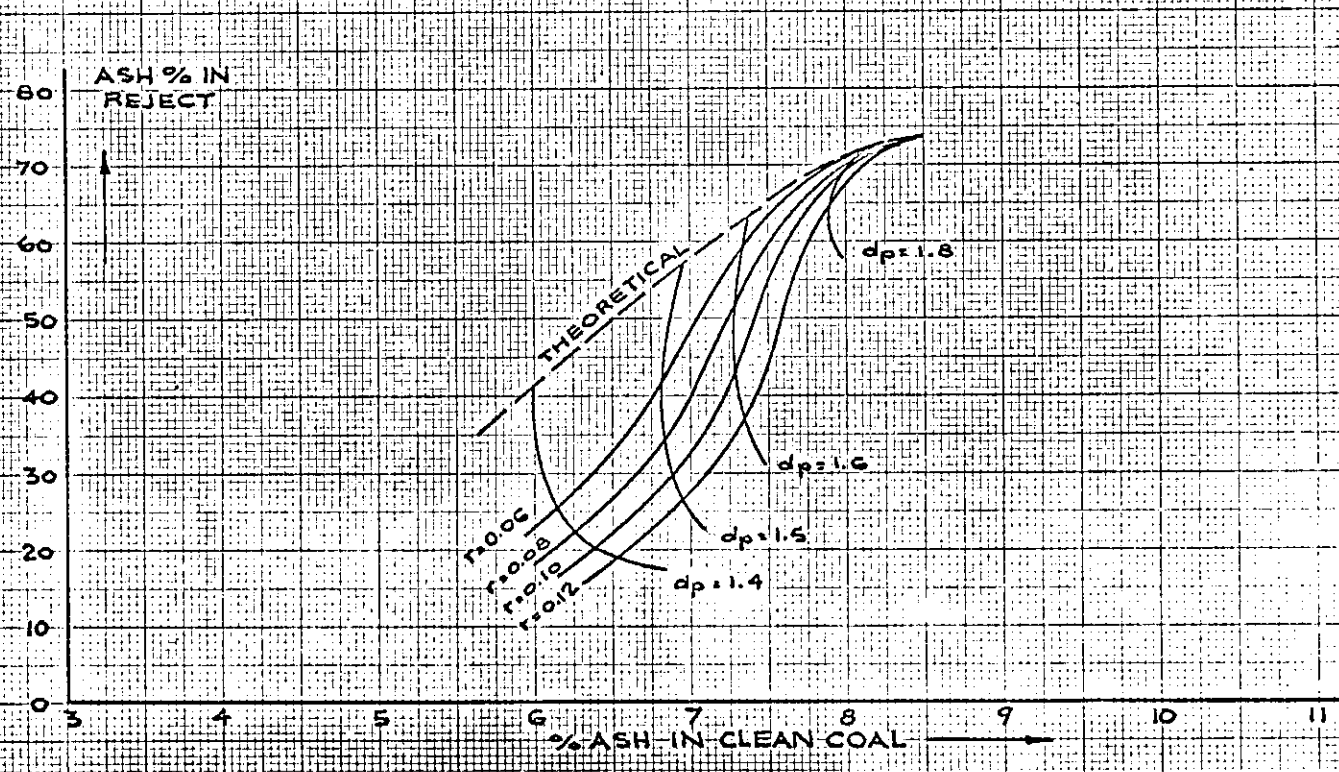
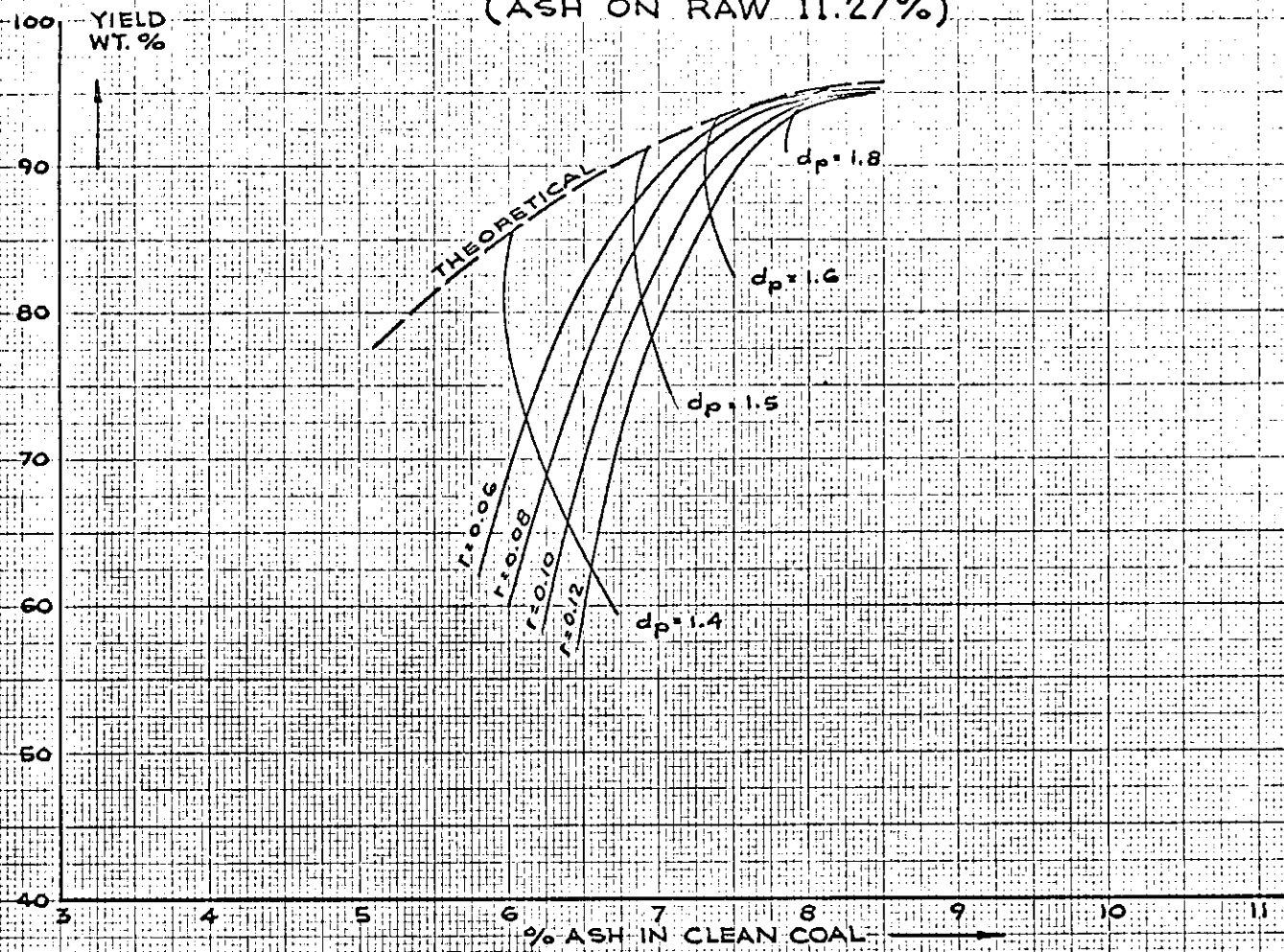
NOV. 5 / '69 LAMAN

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 EDMONTON ALBERTA CANADA

FIG. 2 SCURRY RAINBOW - SEAM NO. 8.2.2.

PERFORMANCE EVALUATION CURVES FOR 2" x 20m

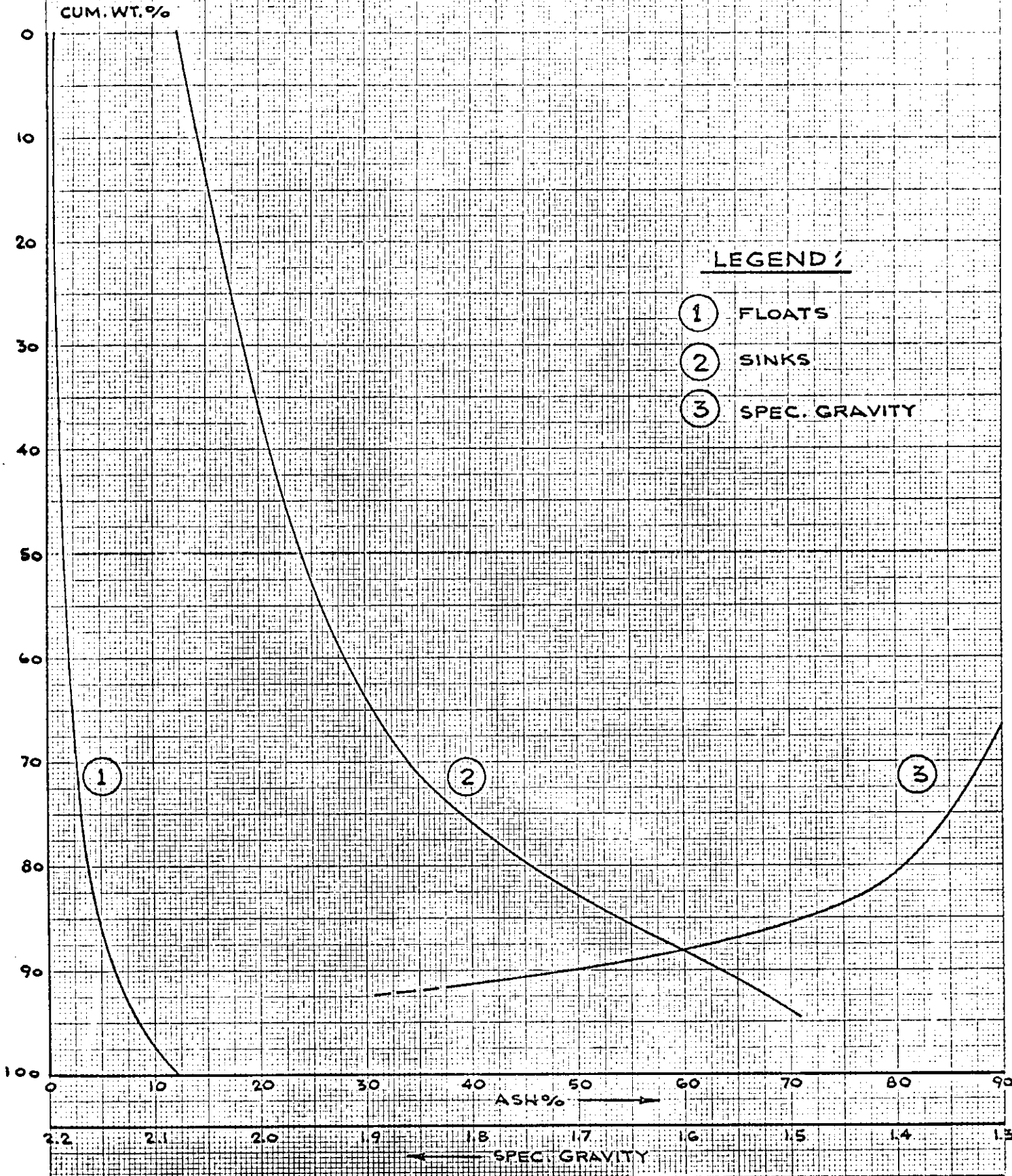
(ASH ON RAW 11.27%)



KE 10 X 10 TO THE CENTIMETER 46 1512
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FIG. 3 SCURRY RAINBOW - SEAM No. 8.2.2.

WASHABILITY CURVES FOR 20m x 100m

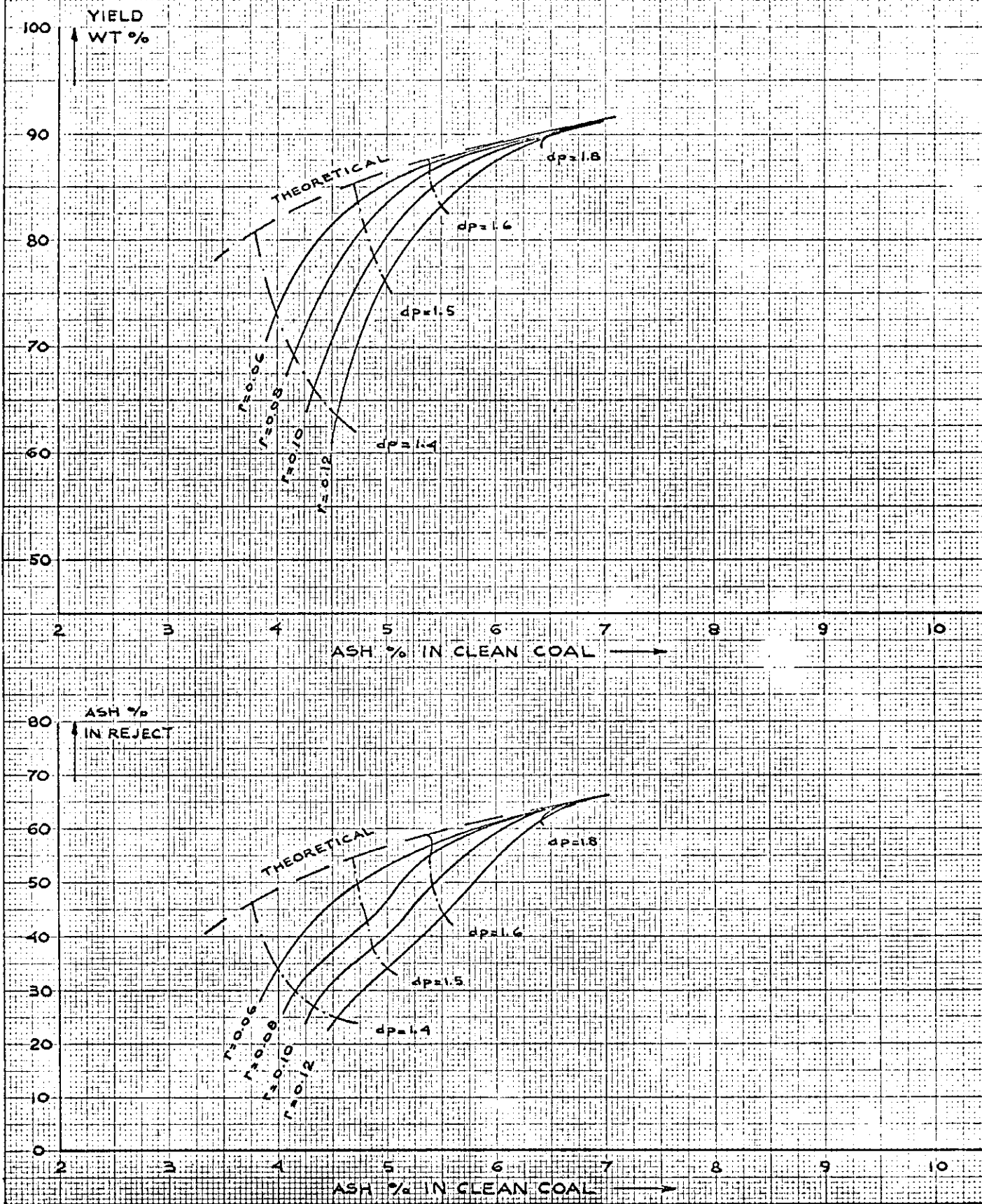


KEUFFEL & ESSER CO. KE 10 X 10 TO THE CENTIMETER 46 1512 MADE IN U.S.A.

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FIG. 4 SCURRY RAINBOW SEAM No. 8.2.2
PERFORMANCE EVALUATION CURVES FOR 20m x 100m.
(ASH ON RAW 12.02 %)



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REPORT ON
CLEANING COKING COAL
from the
ELK RIVER PROJECT
for
SCURRY RAINBOW OIL LTD.
Adit #5. Seam #9.2

Submitted by
CYCLONE ENGINEERING SALES LTD.
Edmonton - Alberta - Canada

Report No.: RI-69.07.d

Job No.: S1-58

Dated: November 18, 1969

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SUMMARY

The data presented in this report refers to coal from Seam #9.2.

The coal from this adit is of low volatile bituminous rank with relatively low ash (13.66%) and sulphur (0.42%), with excellent free swelling indexes.

Washing characteristics make this coal easy to clean at a required ash content of 8.75%.

SCURRY RAINBOW OIL LTD.

T A B L E 1. SEAM #9.2

Classification by Rank.

Ash:	13.66%
Volatile Matter:	19.27%
Residual Moisture:	0.68%
Fixed Carbon:	66.39%
Sulphur:	0.42%
B.T.U./lb.:	12,940
Rank:	Low volatile bituminous

T A B L E 2. SEAM #9.2.

Size Analysis - Sulphur, B.T.U. and Residual Moisture.

Size	Weight %	Sulphur %	B.T.U./lb.	R.M. %
2 x 1"	36.62	0.44	13,030	0.71
1 x 1/2"	23.47	0.41	12,350	0.68
1/2 x 1/4"	11.72	0.45	12,040	0.63
1/4" x 8m.	13.62	0.39	13,380	0.65
8 x 20 m.	5.43	0.35	13,910	0.62
20 x 100 m.	7.41	0.42	14,060	0.72
- 100 m.	1.73	0.51	13,960	0.60
Total	100.00	0.42	12,940	0.68

T A B L E 3. SEAM #9.2

SCURRY RAINBOW OIL LTD.

Weight & Ash Distribution vs. Size and Specific Gravity.

(Figures in brackets show the Ash content of individual fractions.)

Size \ Sp.Gr.								Total
	1.30	1.35	1.40	1.50	1.60	1.80		
2 x 1"	6.54 (2.91)	17.87 (6.11)	3.29 (11.16)	3.05 (18.97)	1.61 (27.73)	1.55 (41.49)	2.71 (70.18)	36.62 (14.25)
1 x 1/2"	4.75 (2.69)	8.78 (6.00)	2.82 (12.01)	2.88 (20.03)	1.21 (29.37)	0.96 (44.33)	2.07 (69.89)	23.47 (16.18)
1/2 x 1/4"	2.82 (2.51)	3.70 (5.89)	1.29 (11.63)	1.31 (19.12)	0.83 (25.69)	0.65 (42.67)	1.12 (73.72)	11.72 (17.11)
1/4" x 8 m.	6.46 (1.53)	2.60 (5.47)	1.47 (10.51)	1.40 (18.23)	0.48 (28.28)	0.41 (41.68)	0.80 (71.31)	13.62 (11.21)
8 x 20 m.	3.49 (1.36)	0.71 (5.94)	0.39 (10.76)	0.38 (18.38)	0.15 (28.24)	0.11 (40.75)	0.20 (70.62)	5.43 (7.91)
20 x 100 m.	4.70 (1.16)	1.02 (4.94)	0.57 (9.74)	0.53 (16.74)	0.20 (26.42)	0.15 (39.27)	0.24 (71.39)	7.41 (7.18)
Total	28.76 (2.05)	34.68 (5.97)	9.83 (11.27)	9.55 (19.05)	4.48 (27.81)	3.83 (42.31)	7.14 (70.83)	98.27 (13.74)
- 100 m.	This fraction forms 1.73% of the total sample and has an ash content of 9.25%, thus giving a total sample ash value of 13.66%.							

1
3
1

T A B L E 4. SEAM #9.2

SCURRY RAINBOW OIL LTD.

Weight % and Volatile Matter % vs. Size and Specific Gravity.

(Figures in brackets give Volatile Matter)

Sp.Gr. Size	1.30	1.35	1.40	1.50	1.60	1.80	Total	
2 x 1"	6.54 (20.29)	17.87 (19.33)	3.29 (18.63)	3.05 (17.91)	1.61 (17.55)	1.55 (16.79)	2.71 (15.63)	36.62 (18.86)
1 x 1/2"	4.75 (20.44)	8.78 (19.34)	2.82 (18.50)	2.88 (17.60)	1.21 (17.26)	0.96 (16.42)	2.07 (14.22)	23.47 (18.57)
1/2 x 1/4"	2.82 (21.43)	3.70 (19.13)	1.29 (18.45)	1.31 (17.91)	0.83 (17.59)	0.65 (16.25)	1.12 (14.25)	11.72 (18.73)
1/4" x 8 m.	6.46 (22.13)	2.60 (19.75)	1.47 (18.55)	1.40 (17.97)	0.48 (17.45)	0.41 (17.33)	0.80 (14.19)	13.62 (20.08)
8 x 20 m.	3.49 (22.42)	0.71 (19.72)	0.39 (18.56)	0.38 (18.16)	0.15 (17.64)	0.11 (17.16)	0.20 (14.46)	5.43 (20.96)
20 x 100 m.	4.70 (22.86)	1.02 (19.90)	0.57 (19.12)	0.53 (18.34)	0.20 (17.80)	0.15 (17.08)	0.24 (15.34)	7.41 (21.34)
Total	28.76 (21.51)	34.68 (19.36)	9.83 (18.58)	9.55 (17.85)	4.48 (17.48)	3.83 (16.68)	7.14 (14.80)	98.27 (19.24)
- 100 m.	This fractions forms 1.73% of the total sample and has a volatile matter content of 21.00%, thus giving a total sample volatile matter content of 19.27%.							

T A B L E 5. SEAM #9.2

SCURRY RAINBOW OIL LTD.

Washability Data - 2" x 20 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	26.48	2.22	26.48	2.22	100.00	14.28	8.2
1.30 - 1.35	37.05	6.00	63.53	4.42	73.52	18.62	2.3
1.35 - 1.40	10.19	11.36	73.72	5.38	36.47	31.45	1.6
1.40 - 1.50	9.93	19.19	83.65	7.02	26.28	39.24	1.1
1.50 - 1.60	4.71	27.88	88.36	8.13	16.35	51.42	1.1
1.60 - 1.80	4.05	42.44	92.41	9.63	11.64	60.94	1.1
+ 1.80	7.59	70.81	100.00	14.28	7.59	70.81	0.5
Total	100.00	14.28					

T A B L E 6. SEAM #9.2

SCURRY RAINBOW OIL LTD.

Washability Data - 20 x 100 mes.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	63.43	2.05	63.43	2.05	100.00	8.25	10
1.30 - 1.35	13.77	5.97	77.20	2.75	36.57	19.01	3.6
1.35 - 1.40	7.69	11.27	84.89	3.52	22.80	26.88	1
1.40 - 1.50	7.15	19.05	92.04	4.73	15.11	34.83	1
1.50 - 1.60	2.70	27.81	94.74	5.39	7.96	49.00	1
1.60 - 1.80	2.02	42.31	96.76	6.16	5.26	59.88	1
+ 1.80	3.24	70.83	100.00	8.25	3.24	70.83	0
Total	100.00	8.25					

T A B L E 7. SEAM #9.2

SCURRY RAINBOW OIL LTD.

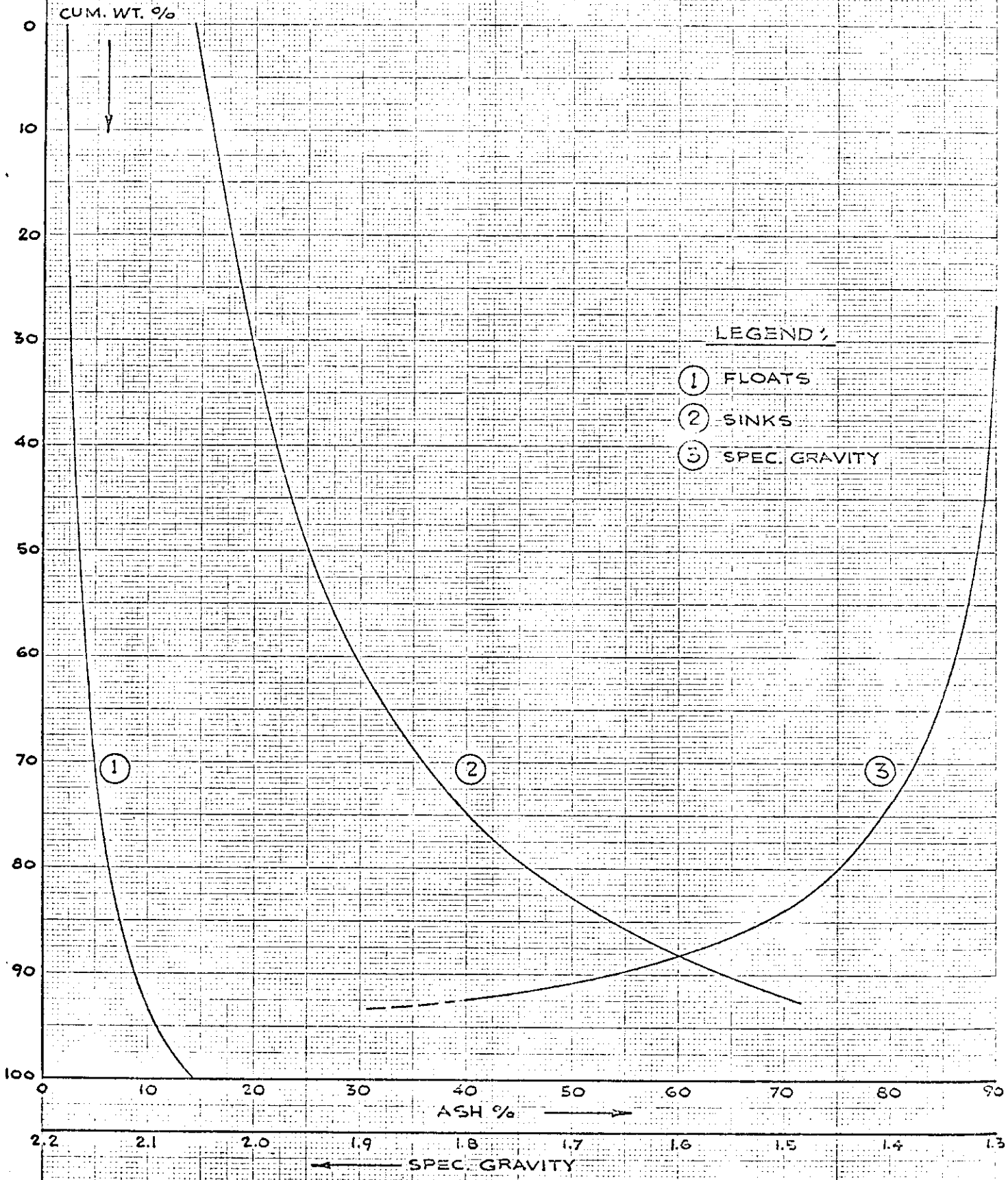
Free Swelling Index.

Sp. Gr. \ Size	2 x 1"	1 x 1/2"	1/2 x 1/4"	1/4" x 8 m.	8 x 20 m.	20 x 100 m.
- 1.30	6, 6½, 6½	6½, 6½, 7	8, 8, 8½	10, 10, 10	10, 10, 10	10, 10, 10
1.30 - 1.35	2, 2½, 2½	2, 2, 2½	2, 2, 2½	2½, 2½, 3	2½, 3, 3	4, 3½, 3½
1.35 - 1.40	2, 2, 1½	1½, 1½, 1½	1, 1, 1½	1½, 1½, 1½	1, 1, 1	1, 1, 1
1.40 - 1.50	1, 1, 1	1, 1, 1½	1, 1, 1	1, 1, 1½	1, 1, 1	1, 1, 1
1.50 - 1.60	1, 1, 1½	1, 1, 1½	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1
1.60 - 1.80	1, 1½, 1½	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1
+ 1.80	½, ½, ½	½, ½, ½	½, ½, ½	½, ½, ½	N.A.	N.A.

NOTE: F.S.I. on - 100 mesh fraction is 7½, 7½, 8

FIG. 1 SCURRY RAINBOW - SEAM NO. 9.2.

WASHABILITY CURVES FOR 2" x 20m



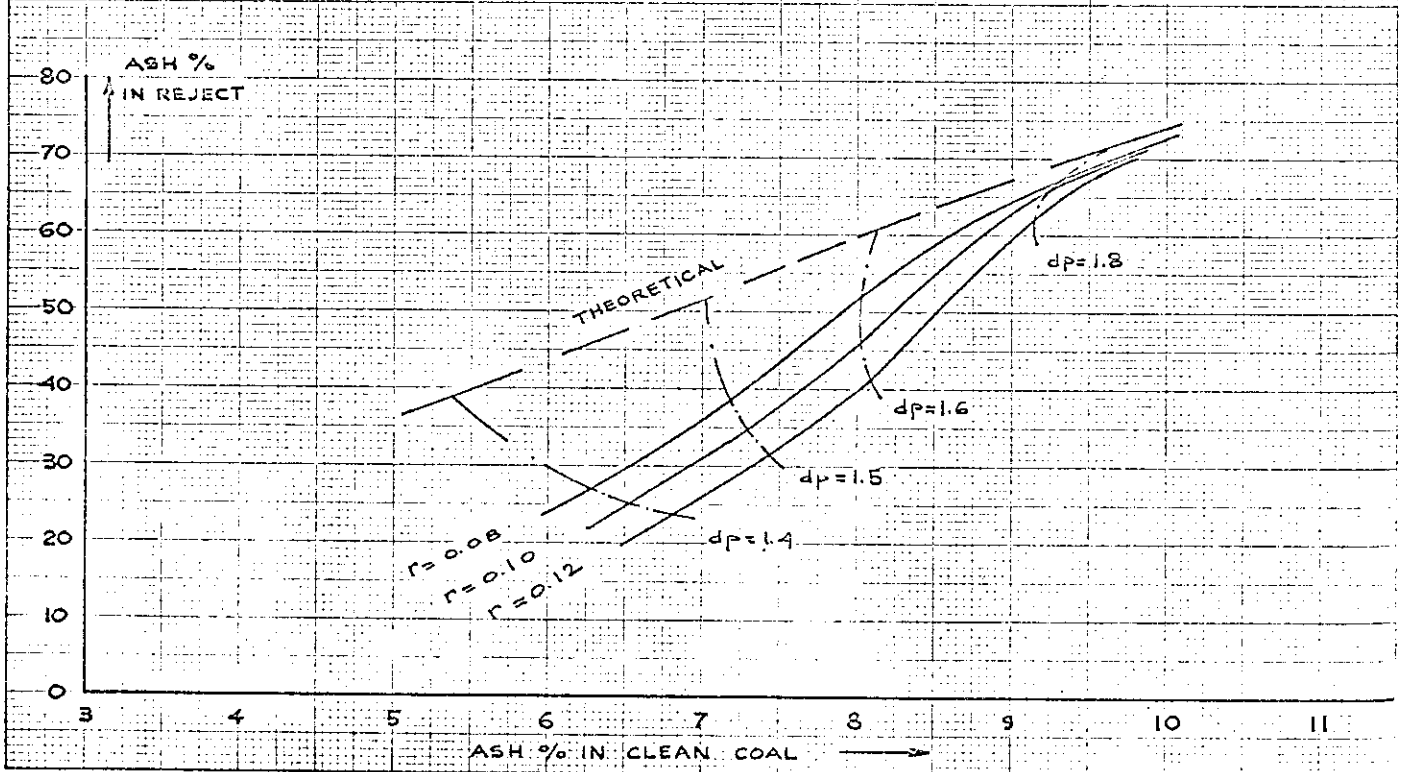
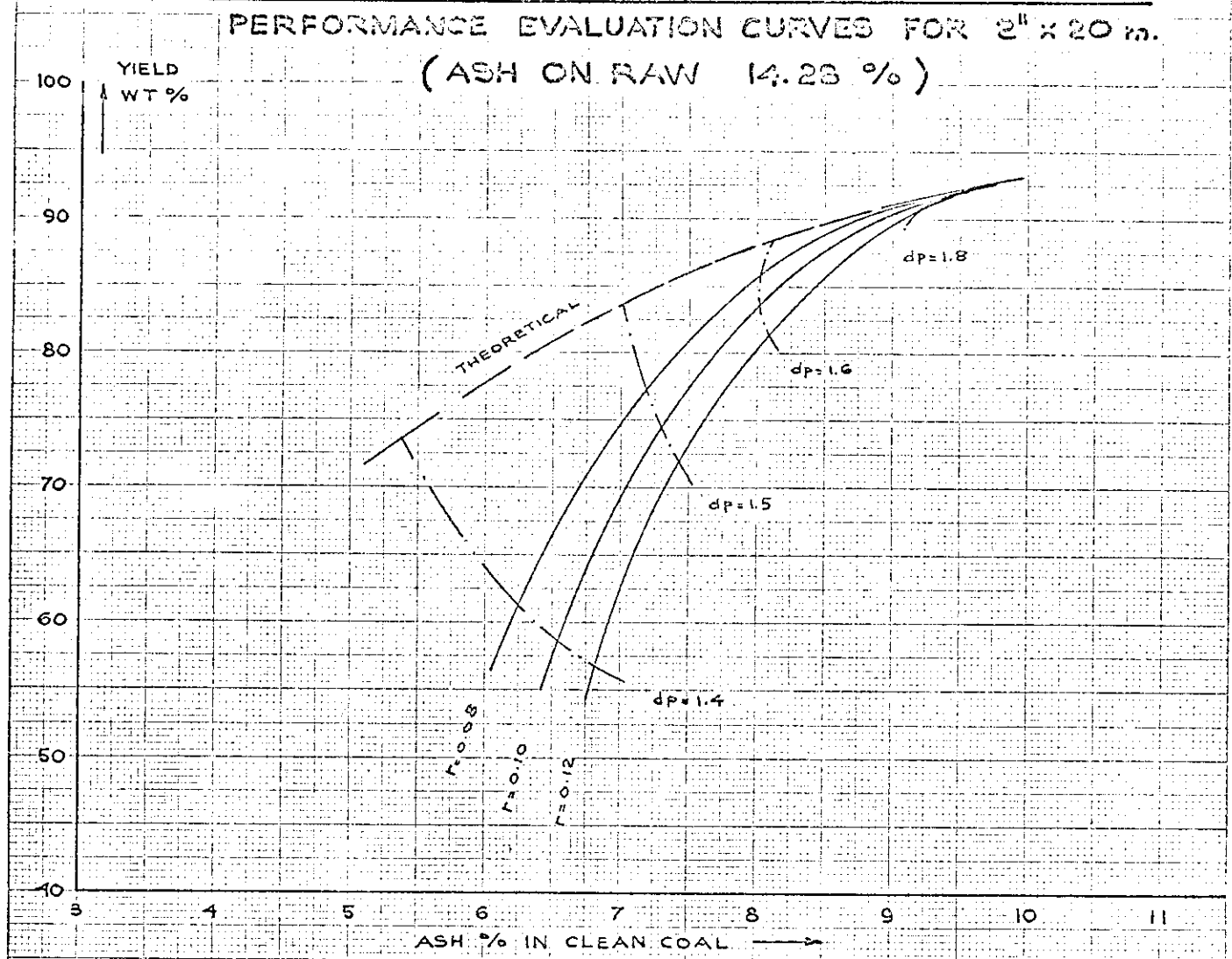
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FIG. 2 SCURRY RAINBOW SEAM No. 9.2

PERFORMANCE EVALUATION CURVES FOR 2" x 20 m.
(ASH ON RAW 14.28 %)



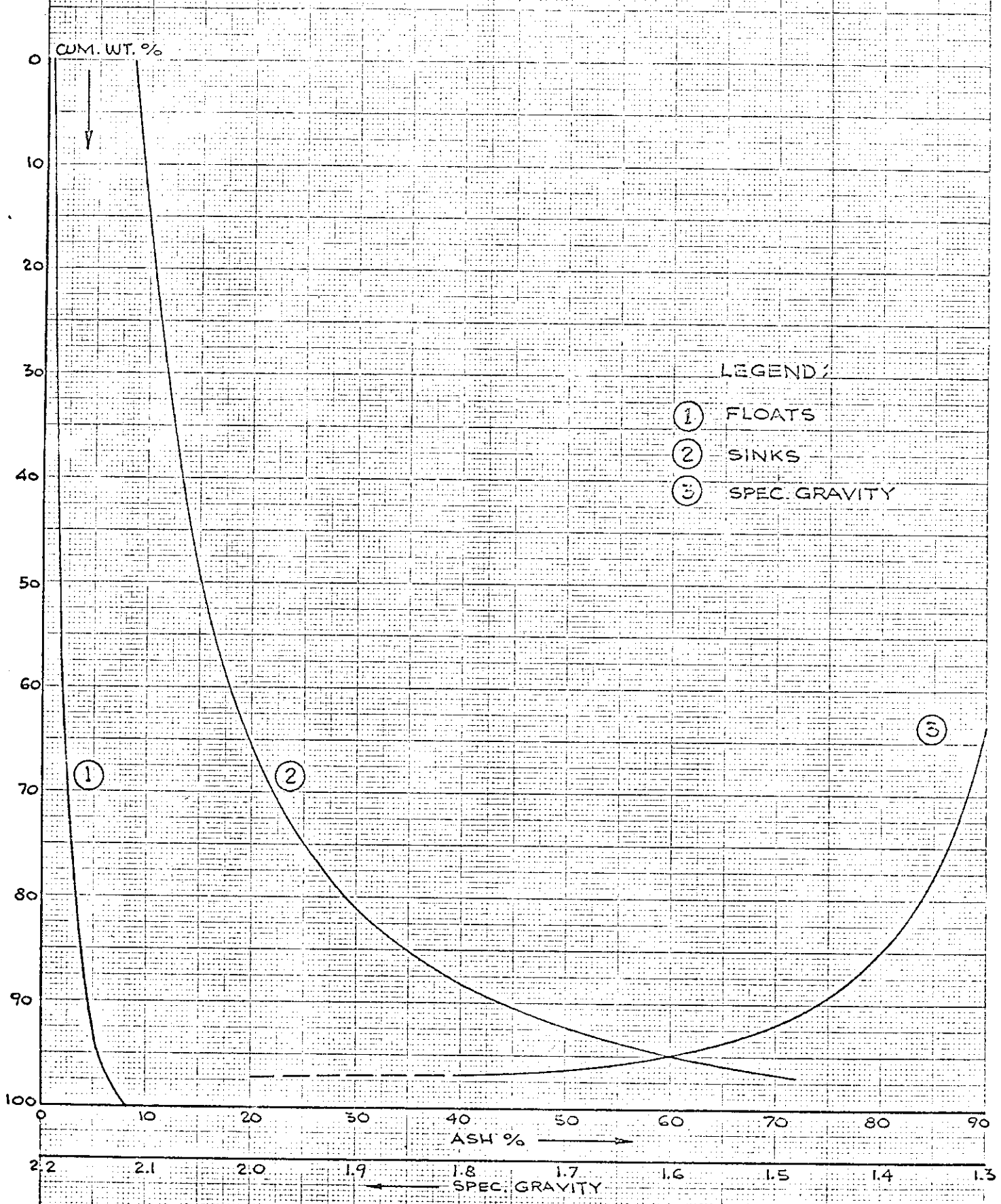
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FIG. 3 SCURRY RAINBOW- SEAM NO. 9.2.

WASHABILITY CURVES FOR 20 m x 100 m



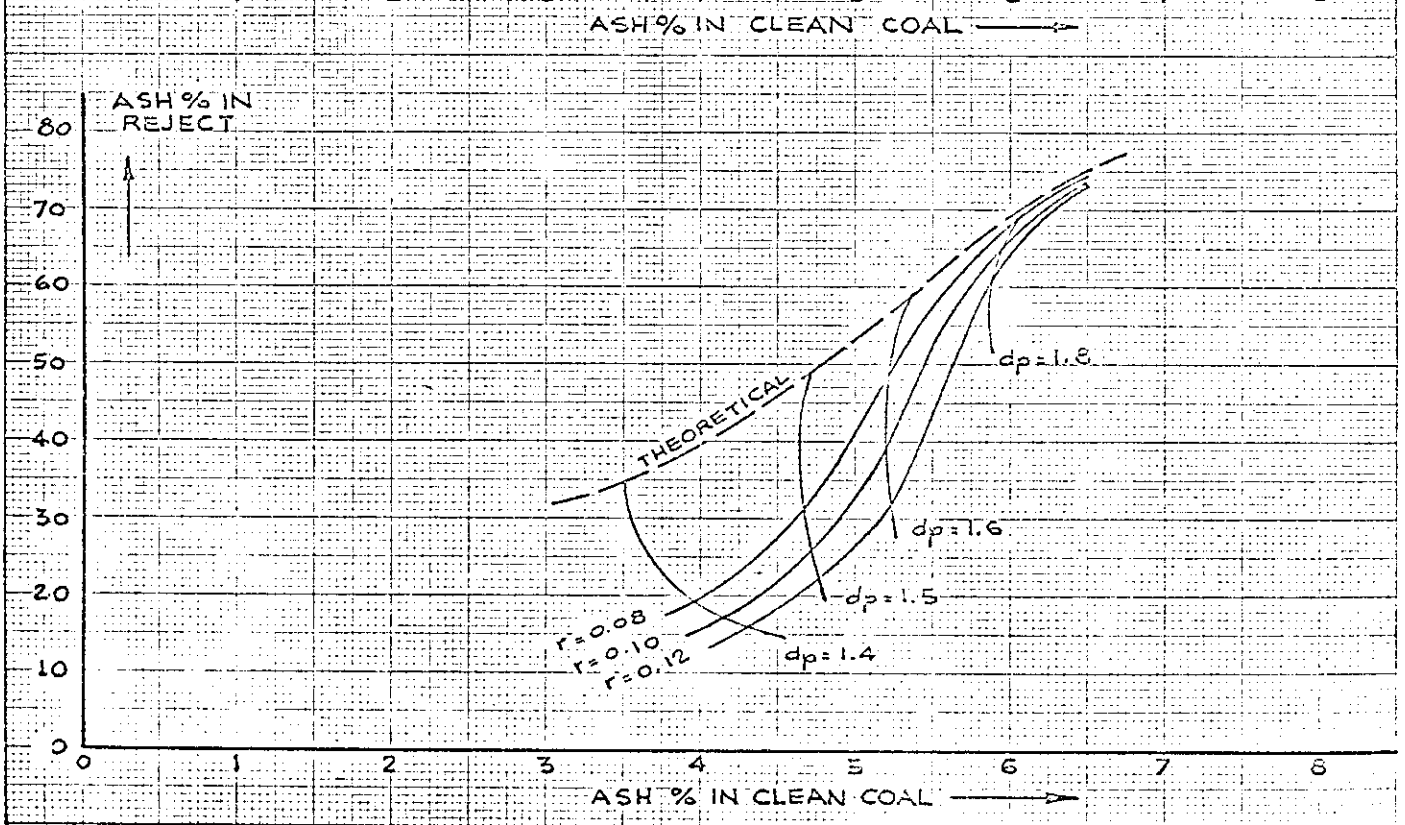
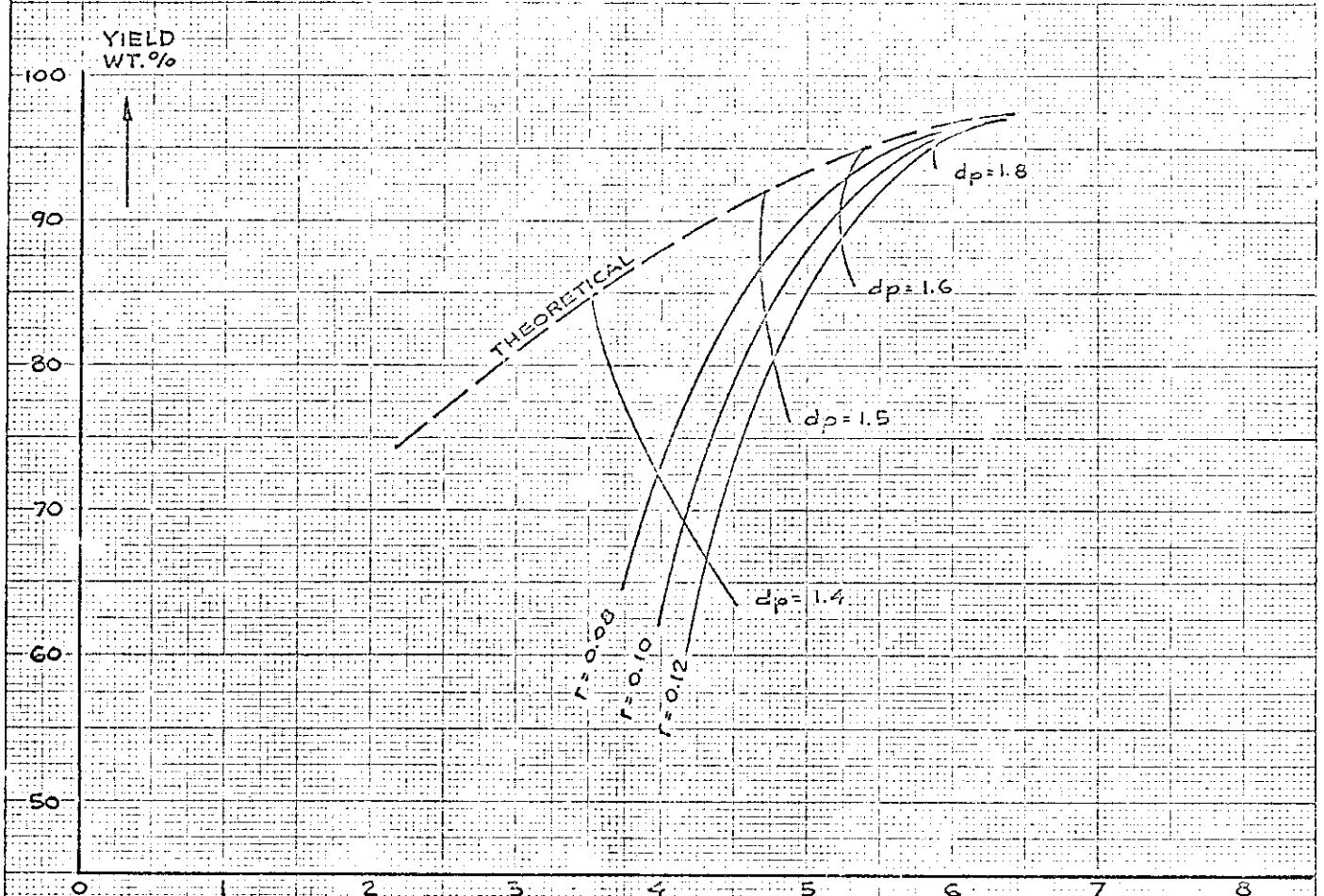
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FIG. 4 SCURRY RAINBOW - SEAM NO. 9.2.

PERFORMANCE EVALUATION CURVES FOR 20m x 100m
(ASH ON RAW 8.25%)



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CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

REPORT ON
CLEANING COKING COAL
from the
ELK RIVER PROJECT
for
SCURRY RAINBOW OIL LTD.
Adit #6. Seam #8.1.1

Submitted by
CYCLONE ENGINEERING SALES LTD.
Edmonton - Alberta - Canada

Report No.: RI-69.07.e
Job No.: S1 - 58
Dated: November 26, 1969

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SUMMARY

The data presented in this report refers to coal from Seam #8.1.1.

The Analysis and the washability data indicate that this coal is of low volatile bituminous rank with a moderate ash content of 15.75% and a low sulphur content (0.36%).

The ash distribution over the various specific gravity fractions indicate that this coal is a difficult coal and cleaning by heavy medium circuit may be required if an ash content of 8% in the clean coal is specified.

It is noted that coking properties are excellent and therefore cleaning to a higher ash content of clean coal and blending with low swell, low ash coal should be considered.

SCURRY RAINBOW OIL LTD.

T A B L E 1. SEAM #8.1.1

Classification by Rank.

Ash:	15.75%
Volatile Matter:	18.89%
Residual Moisture:	0.60%
Fixed Carbon:	64.76%
Sulphur:	0.36%
B.T.U./lb.:	12,820
Rank:	Low volatile bituminous

T A B L E 2. SEAM #8.1.1

Size Analysis - Sulphur, B.T.U. and Residual Moisture.

Size	Weight %	Sulphur %	B.T.U./lb.	R.M. %
2 x 1"	17.22	0.40	12,990	0.63
1 x 1/2"	19.71	0.33	12,510	0.62
1/2 x 1/4"	18.74	0.32	11,850	0.59
1/4" x 8 m.	12.21	0.36	12,610	0.52
8 x 20 m.	14.81	0.36	13,330	0.58
20 x 100 m.	13.77	0.38	13,700	0.61
- 100 m.	3.54	0.46	13,920	0.63
Total	100.00	0.36	12,820	0.60

T A B L E 3. SEAM #8.1.1

SCURRY RAINBOW OIL LTD.

Weight & Ash Distribution vs. Size and Specific Gravity.
(Figures in brackets show the Ash content of individual fractions.)

Sp.Gr. Size	1.30	1.50	1.40	1.50	1.60	1.80	Total	
2 x 1"	1.00 (3.13)	7.30 (6.73)	3.83 (11.54)	2.19 (17.29)	0.88 (26.49)	1.16 (39.83)	0.86 (68.17)	17.22 (15.24)
1 x 1/2"	1.35 (3.31)	7.55 (7.87)	3.66 (12.05)	2.55 (18.61)	1.37 (28.52)	1.73 (45.59)	1.50 (70.63)	19.71 (19.24)
1/2 x 1/4"	1.93 (2.90)	6.56 (6.89)	3.05 (12.14)	2.70 (18.82)	0.75 (29.34)	2.85 (41.95)	1.40 (75.35)	18.74 (19.46)
1/4" x 8 m.	2.42 (2.32)	3.51 (6.16)	2.24 (11.63)	1.49 (19.11)	0.60 (28.70)	0.85 (42.62)	1.10 (68.70)	12.21 (17.26)
8 x 20 m.	6.08 (2.31)	3.08 (6.66)	1.88 (10.88)	1.40 (17.90)	0.55 (19.17)	0.78 (42.55)	1.04 (67.18)	14.81 (13.07)
20 x 100 m.	5.71 (1.36)	3.89 (3.88)	1.46 (9.09)	1.02 (16.28)	0.39 (26.89)	0.51 (41.08)	0.79 (63.31)	13.77 (9.74)
Total	18.49 (2.19)	31.89 (6.61)	16.12 (11.48)	11.35 (18.17)	4.54 (27.01)	7.38 (42.55)	6.69 (69.58)	96.46 (16.01)
- 100 mesh	This fraction forms 3.54% of the total sample and has an ash content of 8.75%, thus giving a total sample ash value of 15.75%.							

T A B L E 4. SEAM #8.1.1

SCURRY RAINBOW OIL LTD.

Weight % and Volatile Matter % vs. Size and Specific Gravity.
(Figures in brackets give Volatile Matter.)

Size \ Sp.Gr.	Sp.Gr.							Total
	1.30	1.35	1.40	1.50	1.60	1.80		
2 x 1"	1.00 (20.54)	7.30 (18.96)	3.83 (18.36)	2.19 (18.42)	0.88 (18.14)	1.16 (17.12)	0.86 (15.32)	17.22 (18.50)
1 x 1/2"	1.35 (21.00)	7.55 (18.48)	3.66 (18.32)	2.55 (17.92)	1.37 (17.16)	1.73 (15.26)	1.50 (12.72)	19.71 (17.73)
1/2 x 1/4"	1.93 (21.50)	6.56 (19.40)	3.05 (18.32)	2.70 (18.12)	0.75 (17.30)	2.35 (15.84)	1.40 (12.54)	18.74 (18.21)
1/4" x 8 m.	2.42 (22.50)	3.51 (19.68)	2.24 (18.84)	1.49 (17.96)	0.60 (17.88)	0.85 (16.82)	1.10 (13.72)	12.21 (19.05)
8 x 20 m.	6.08 (22.02)	3.08 (19.28)	1.88 (18.64)	1.40 (18.36)	0.55 (17.50)	0.78 (16.50)	1.04 (13.80)	14.81 (19.63)
20 x 100 m.	5.71 (22.40)	3.89 (21.90)	1.46 (19.12)	1.02 (18.38)	0.39 (18.28)	0.51 (17.24)	0.79 (15.58)	13.77 (20.91)
Total	18.49 (21.99)	31.89 (19.40)	16.12 (18.51)	11.35 (18.16)	4.54 (17.60)	7.38 (16.18)	6.69 (13.68)	96.46 (18.87)
- 100 m.	This fraction forms 3.54% to the total sample and has a volatile matter content of 19.57%, thus giving a total sample volatile matter content of 18.89%.							

- 4 -

T A B L E 5. SEAM #8.1.1

SCURRY RAINBOW OIL LTD.

Washability Data - 2" x 20 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	15.46	2.57	15.46	2.57	100.00	17.06	8.1
1.30 - 1.35	33.86	7.00	49.32	5.61	84.54	19.71	2.5
1.35 - 1.40	17.73	11.72	67.05	7.23	50.68	28.20	1.3
1.40 - 1.50	12.49	18.36	79.54	8.97	32.95	37.07	1.1
1.50 - 1.60	5.02	27.02	84.56	10.05	20.46	48.50	1.0
1.60 - 1.80	8.31	42.66	92.87	12.96	15.44	55.48	1.0
+ 1.80	7.13	70.42	100.00	17.06	7.13	70.42	0.5
Total	100.00	17.06					

T A B L E 6. SEAM #8.1.1

Washability Data - 20 x 100 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	41.47	1.36	41.47	1.36	100.00	9.74	9.7
1.30 - 1.35	28.25	3.88	69.72	2.38	58.53	15.68	8.5
1.35 - 1.40	10.60	9.09	80.32	3.27	30.28	26.70	1.7
1.40 - 1.50	7.41	16.28	87.73	4.37	19.68	36.18	1.0
1.50 - 1.60	2.83	26.89	90.56	5.07	12.27	48.20	1.0
1.60 - 1.80	3.70	41.08	94.26	6.48	9.44	54.59	1.0
+ 1.80	5.74	63.30	100.00	9.74	5.74	63.30	0.5
Total	100.00	9.74					

T A B L E 7. SEAM #8.1.1

SCURRY RAINBOW OIL LTD.

Free Swelling Index.

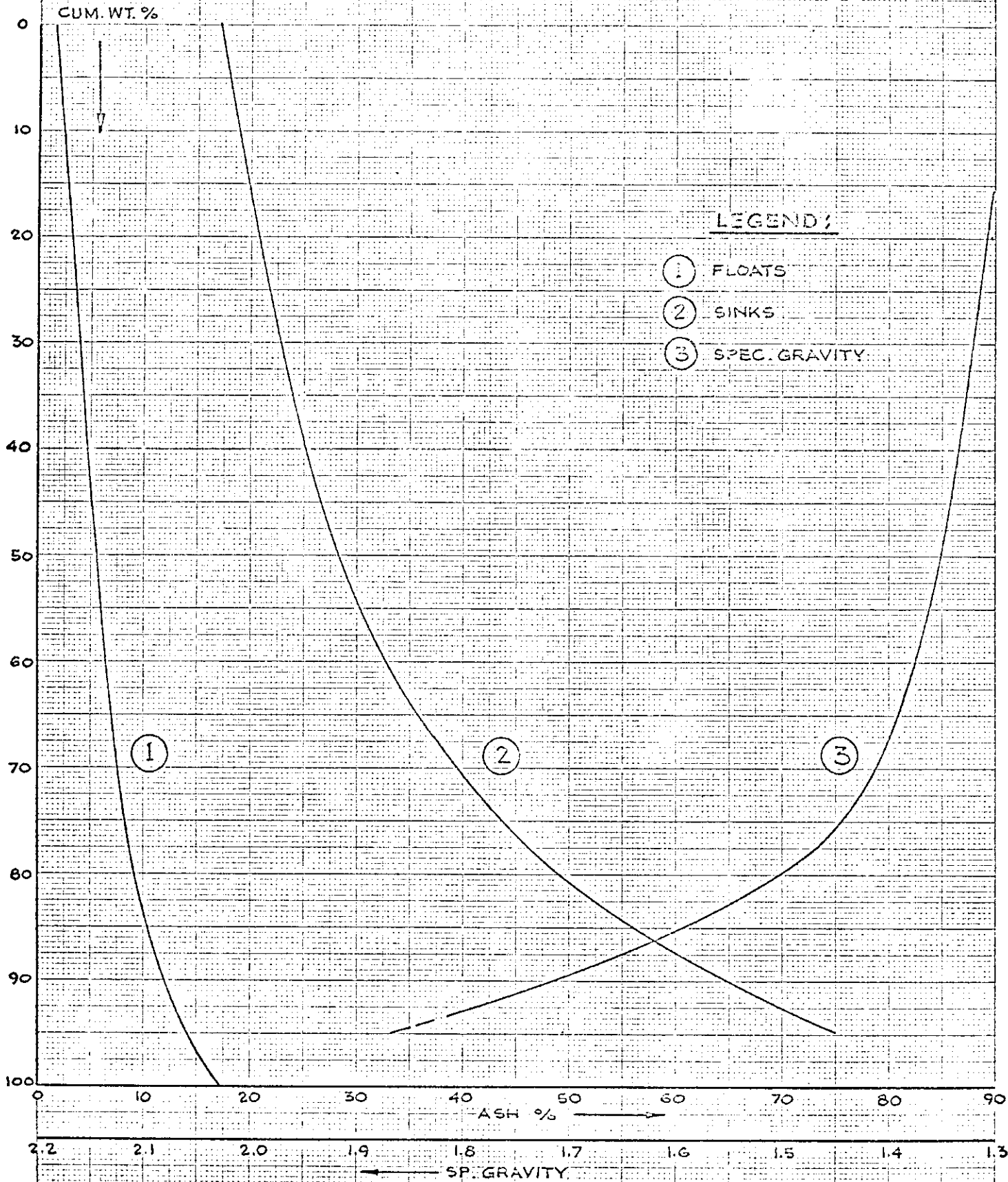
Sp.Gr. \ Size	2 x 1"	1 x 1/2"	1/2 x 1/4"	1/4" x 8 m.	8 x 20 m.	20 x 100 m.
- 1.30	8½, 8½, 8½	8½, 8½, 9	9, 9, 9½	9½, 9½, 9½	9½, 9½, 10	9½, 9½, 10
1.30 - 1.35	1½, 1½, 1½	1½, 1½, 2	3, 3, 3½	3½, 3½, 4	3½, 4, 4	8½, 8½, 8½
1.35 - 1.40	1, 1, 1½	1, 1½, 1½	1½, 1½, 1½	1, 1½, 1½	1, 1, 1	1½, 1½, 2
1.40 - 1.50	1, 1, 1	1, 1, 1	1, 1, 1½	1, 1½, 1½	1, 1, 1	1, 1, 1
1.50 - 1.60	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1
1.60 - 1.80	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1
+ 1.80	N.A.	½, ½, ½	½, ½, ½	½, ½, ½	½, ½, ½	½, ½, ½

NOTE: F.S.I. on - 100 mesh fraction is 8, 8, 8½

FIG. 1

SCURRY RAINBOW - SEAM # 3.1.1.

WASHABILITY CURVES FOR 2" x 20m



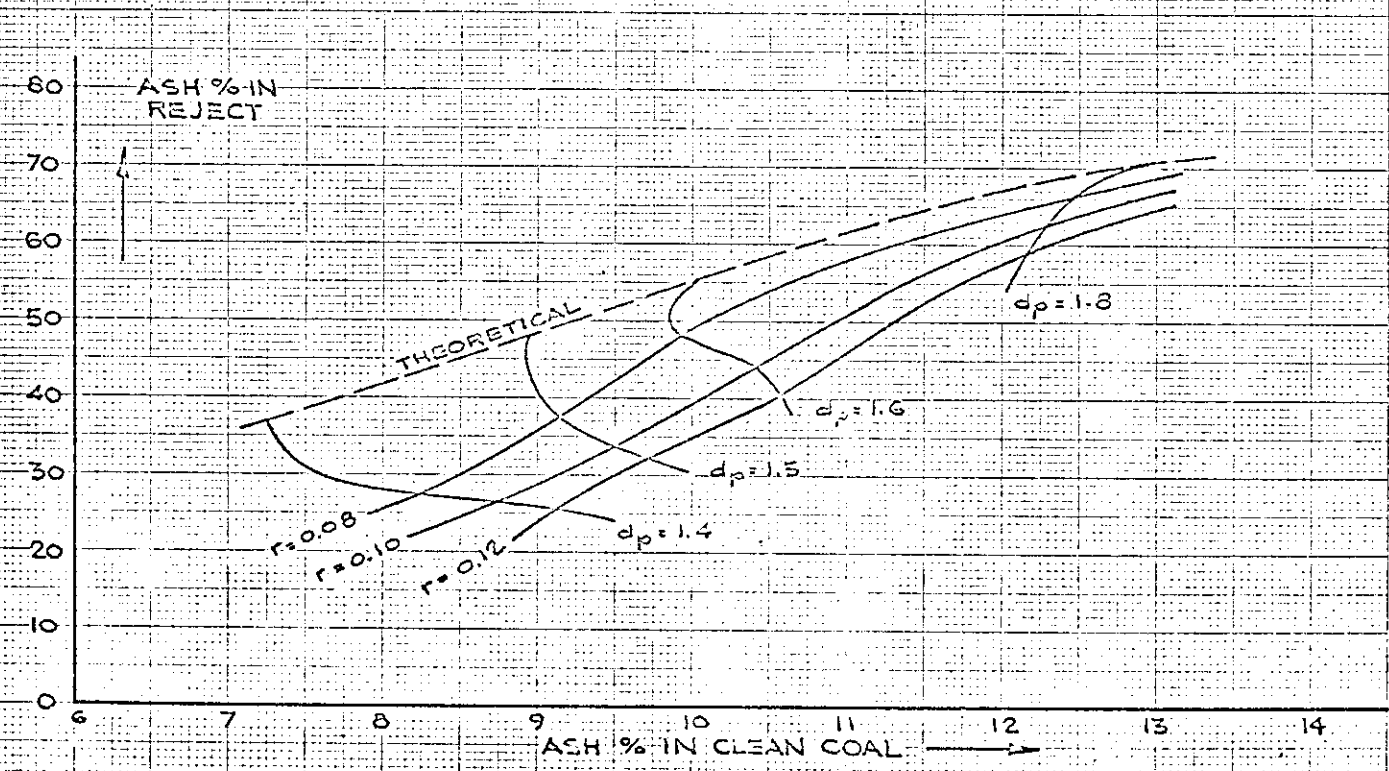
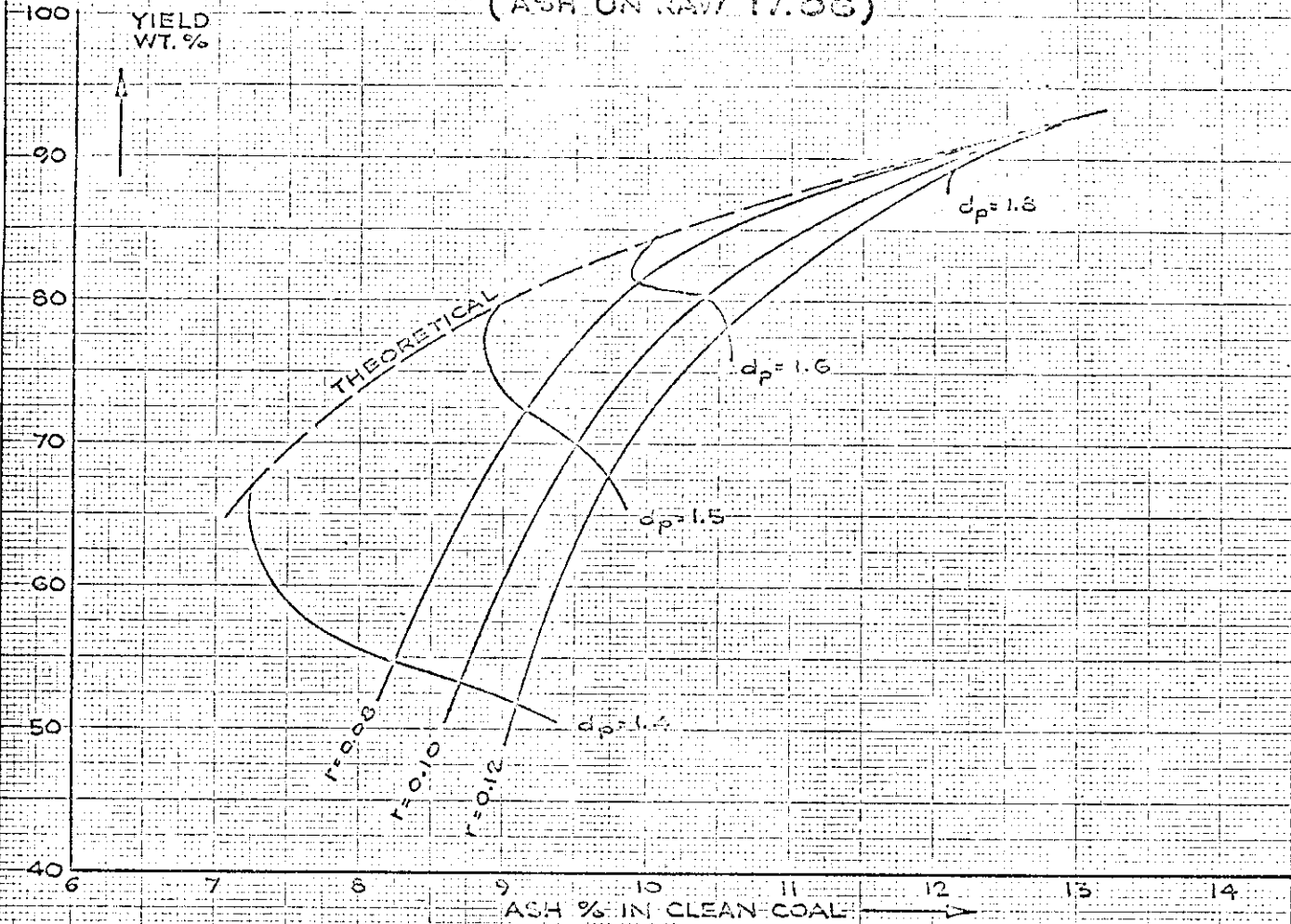
KE 10 X 10 TO THE CENTIMETER 46 1512 MADE IN U.S.A. KEUFFEL & ESSER CO.

NOV. 25. / 69 H. SCH.

CYCLONE ENGINEERING SALES LTD. EDMONTON ALBERTA CANADA

FIG. 2 SCURRY RAINBOW - SEAM #3 S.I.I.

PERFORMANCE EVALUATION CURVES FOR 2" x 20" m
(ASH ON RAW 17.06)



NOV. 26./69 H. SCH.

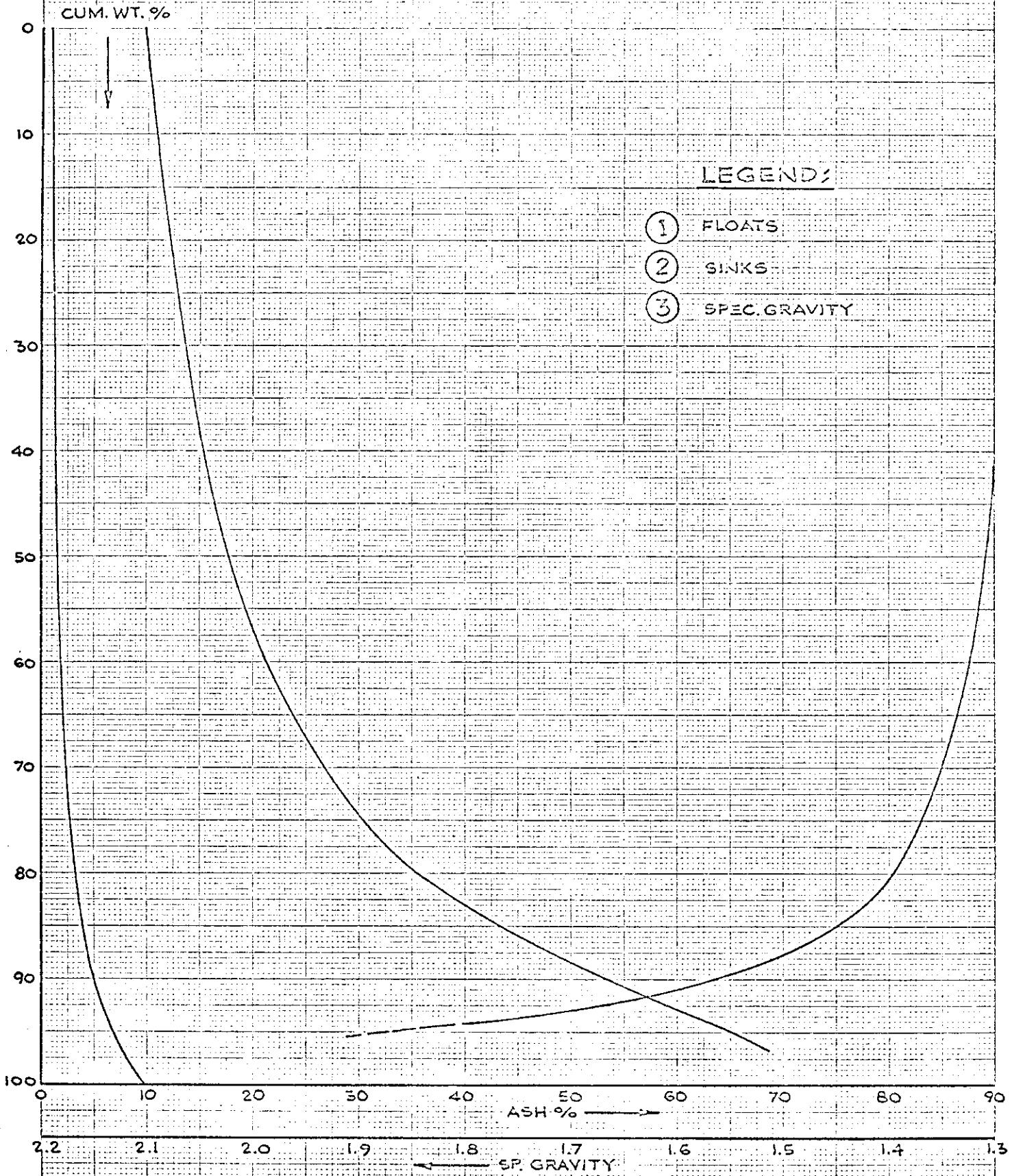
CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

KE 10 X 10 TO THE CENTIMETER 46 1512
 10 X 25 CM. MADE IN U.S.A.
 KEUFFEL & ESSER CO.

FIG. 3

SCURRY RAINBOW - SEAM # 6.1.1.

WASHABILITY CURVES FOR 20m x 100m



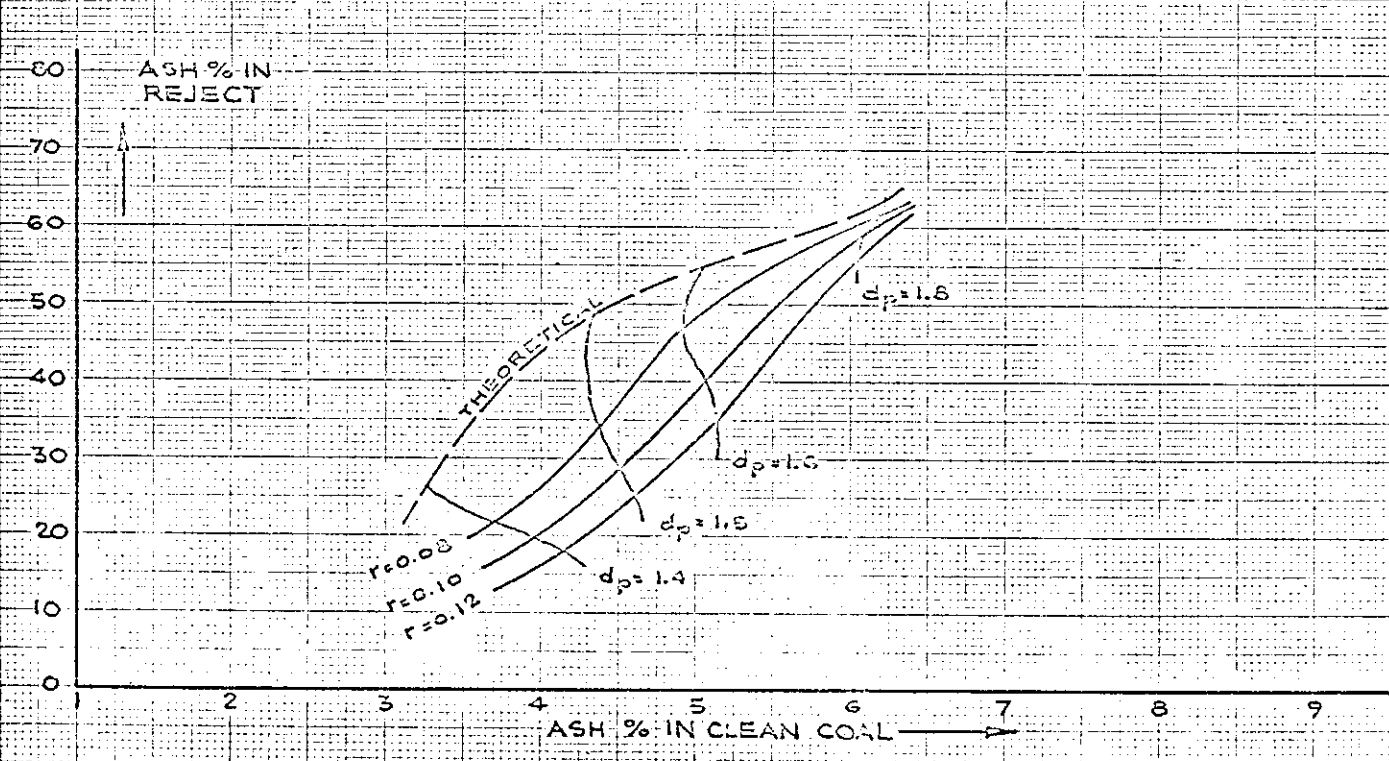
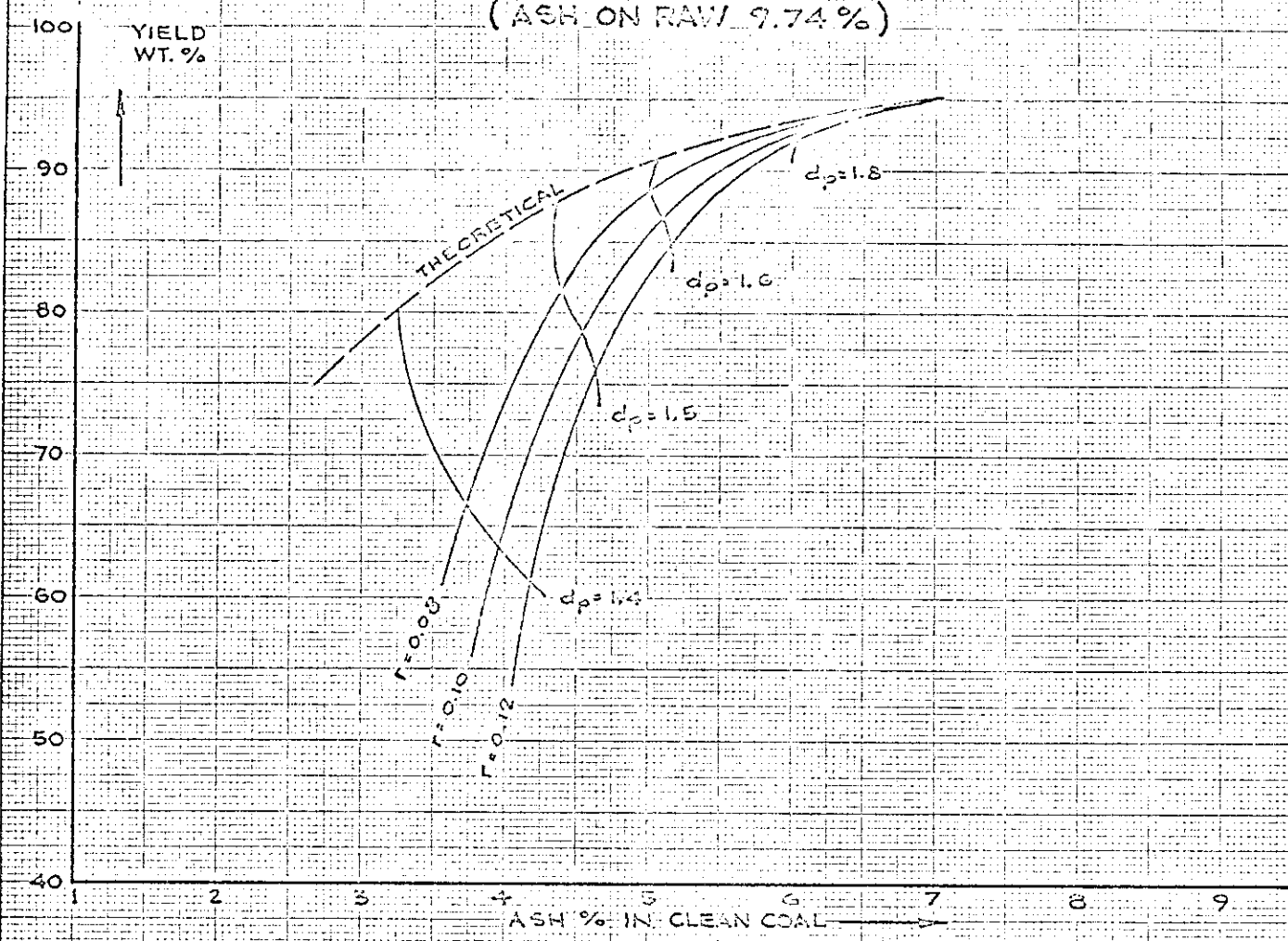
KE 10 X 10 TO THE CENTIMETER 46 1512 MADE IN U.S.A. KEUFFEL & ESSER CO.

NOV. 25./69 H. SCH.

CYCLONE ENGINEERING SALES LTD. EDMONTON ALBERTA CANADA

FIG. 4 SCURRY RAINBOW - SEAM # 0.1.1.

PERFORMANCE EVALUATION CURVES FOR 20m x 100m
(ASH ON RAW 9.74%)



NOV. 25./69 H.SCH.

CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

KEUFFEL & ESSER CO.
10 X 10 TO THE CENTIMETER 46 1512
MADE IN U.S.A.

REPORT ON
CLEANING COKING COAL

from the

ELK RIVER PROJECT

for

SCURRY RAINBOW OIL LTD.

Adit #7. Seam #8.1.2

Submitted by

CYCLONE ENGINEERING SALES LTD.

EDMONTON - ALBERTA - CANADA

Report No.: RI-69.07.f

Job No.: S1 - 58

Dated: December 5, 1969

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SUMMARY

The data presented in this report refers to coal from Seam #8.1.2.

The analysis and the washability data indicate that this coal is of low volatile bituminous rank with a low ash content of 11.91% and a low sulphur content (0.36%).

Washing characteristics make this coal easy to clean at a required ash content of 8.75%.

It is noted that coking properties are very good.

SCURRY RAINBOW OIL LTD.

T A B L E 1. SEAM #8.1.2.

Classification by Rank.

Ash:	11.91%
Volatile Matter:	18.94%
Residual Moisture:	0.68%
Fixed Carbon:	68.47%
Sulphur:	0.37%
B.T.U./lb.:	13,240
Rank:	Low volatile bituminous

T A B L E 2. SEAM # 8.1.2.

Size Analysis - Sulphur, B.T.U. and Residual Moisture.

Size	Weight %	Sulphur %	B.T.U./lb.	R.M. %
2 x 1"	22.78	0.36	12,830	0.61
1 x 1/2"	20.64	0.34	12,890	0.65
1/2 x 1/4"	16.55	0.36	13,120	0.68
1/4" x 8 m	12.74	0.36	13,160	0.78
8 x 20 m.	12.85	0.40	13,800	0.70
20 x 100 m.	11.72	0.41	14,130	0.71
- 100 m.	2.72	0.44	14,110	0.75
Total	100.00	0.37	13,240	0.68

T A B L E 3. SEAM #8.1.2.

SCURRY RAINBOW OIL LTD.

Weight and Ash Distribution vs. Size and Specific Gravity.
(Figures in brackets show the Ash content of individual fractions.)

Size \ Sp.Gr.	Sp.Gr.							Total
	1.30	1.35	1.40	1.50	1.60	1.80		
2 x 1"	2.14 (2.66)	10.70 (5.24)	4.03 (11.14)	2.32 (19.16)	1.03 (28.34)	1.21 (32.95)	1.35 (51.22)	22.78 (12.70)
1 x 1/2"	2.48 (2.34)	8.40 (5.36)	3.92 (11.48)	2.40 (18.35)	1.03 (27.95)	1.17 (45.02)	1.24 (60.51)	20.64 (14.35)
1/2 x 1/4"	2.41 (2.43)	6.36 (5.16)	3.14 (10.88)	2.02 (18.19)	0.78 (28.68)	1.03 (32.35)	0.81 (71.06)	16.55 (13.46)
1/4" x 8 m.	3.61 (1.95)	4.00 (5.34)	2.01 (10.56)	1.45 (18.10)	0.58 (28.64)	0.48 (41.39)	0.61 (66.26)	12.74 (11.99)
8 x 20 m.	6.03 (1.66)	2.84 (5.68)	1.50 (10.40)	1.16 (17.64)	0.46 (27.40)	0.36 (39.89)	0.50 (65.77)	12.85 (9.49)
20 x 100 m.	6.32 (1.17)	2.16 (4.44)	1.31 (8.39)	0.92 (15.54)	0.34 (25.55)	0.26 (37.84)	0.41 (65.74)	11.72 (7.48)
Total	22.99 (1.81)	34.46 (5.25)	15.91 (10.80)	10.27 (18.13)	4.22 (28.02)	4.51 (37.67)	4.92 (61.38)	97.28 (12.03)
- 100 mesh	This fraction forms 2.72% of the total sample and has an ash content of 7.49%, thus giving a total sample ash value of 11.91%.							

T A B L E 4. SEAM #8.1.2

SCURRY RAINBOW OIL LTD.

Weight % and Volatile Matter % vs. Size and Specific Gravity.
(Figures in brackets give Volatile Matter)

Size \ Sp.Gr.								Total
	1.30	1.35	1.40	1.50	1.60	1.80		
2 x 1"	2.14 (20.95)	1.070 (19.95)	4.03 (18.19)	2.32 (17.35)	1.03 (15.77)	1.21 (15.35)	1.35 (13.55)	22.78 (18.65)
1 x 1/2"	2.48 (21.35)	8.40 (19.07)	3.92 (18.45)	2.40 (17.09)	1.03 (16.09)	1.17 (14.69)	1.24 (13.79)	20.64 (18.28)
1/2 x 1/4"	2.41 (21.48)	6.36 (19.22)	3.14 (18.50)	2.02 (17.24)	0.78 (16.14)	1.03 (15.54)	0.81 (13.90)	16.55 (18.53)
1/4" x 8 m.	3.61 (22.00)	4.00 (19.03)	2.01 (17.75)	1.45 (17.18)	0.58 (16.26)	0.48 (15.50)	0.61 (13.68)	12.74 (18.94)
8 x 20 m.	6.03 (21.60)	2.84 (19.34)	1.50 (18.02)	1.16 (17.40)	0.46 (16.38)	0.36 (16.24)	0.50 (13.88)	12.85 (19.66)
20 x 100 m.	6.32 (21.79)	2.16 (20.03)	1.31 (18.75)	0.92 (17.97)	0.34 (16.85)	0.26 (16.87)	0.41 (14.33)	11.72 (20.31)
Total	22.99 (21.61)	34.46 (19.44)	15.91 (18.28)	10.27 (17.30)	4.22 (16.13)	4.51 (15.39)	4.92 (13.78)	97.28 (18.91)
- 100 mesh	This fraction forms 2.72% of the total sample and has a volatile matter content of 19.87%, thus giving a total sample volatile matter content of 18.94%.							

T A B L E 5. SEAM #8.1.2

SCURRY RAINBOW OIL LTD.

Washability Data - 2" x 20 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	19.48	2.06	19.48	2.06	100.00	12.66	9.2
1.30 - 1.35	37.75	5.31	57.23	4.20	80.52	15.23	3.2
1.35 - 1.40	17.06	11.02	74.29	5.77	42.77	23.98	1.5
1.40 - 1.50	10.93	18.39	85.22	7.39	25.71	32.59	1.3
1.50 - 1.60	4.54	28.24	89.76	8.44	14.78	43.08	1
1.60 - 1.80	4.97	37.67	94.73	9.93	10.24	49.67	1
+ 1.80	5.27	60.98	100.00	12.66	5.27	60.98	0.8
Total	100.00	12.66					

T A B L E 6. SEAM #8.1.2

Washability Data - 20 x 100 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	53.92	1.81	53.92	1.81	100.00	9.37	10
1.30 - 1.35	18.43	5.25	72.35	2.69	46.08	16.05	5
1.35 - 1.40	11.18	10.80	83.53	3.77	27.65	23.25	2.3
1.40 - 1.50	7.85	18.13	91.38	5.01	16.47	31.70	1
1.50 - 1.60	2.90	28.02	94.28	5.71	8.62	44.05	1
1.60 - 1.80	2.22	37.67	96.50	6.45	5.72	52.18	1
+ 1.80	3.50	61.38	100.00	8.37	3.50	61.38	0.5
Total	100.00	8.37					

T A B L E 7. SEAM #8.1.2

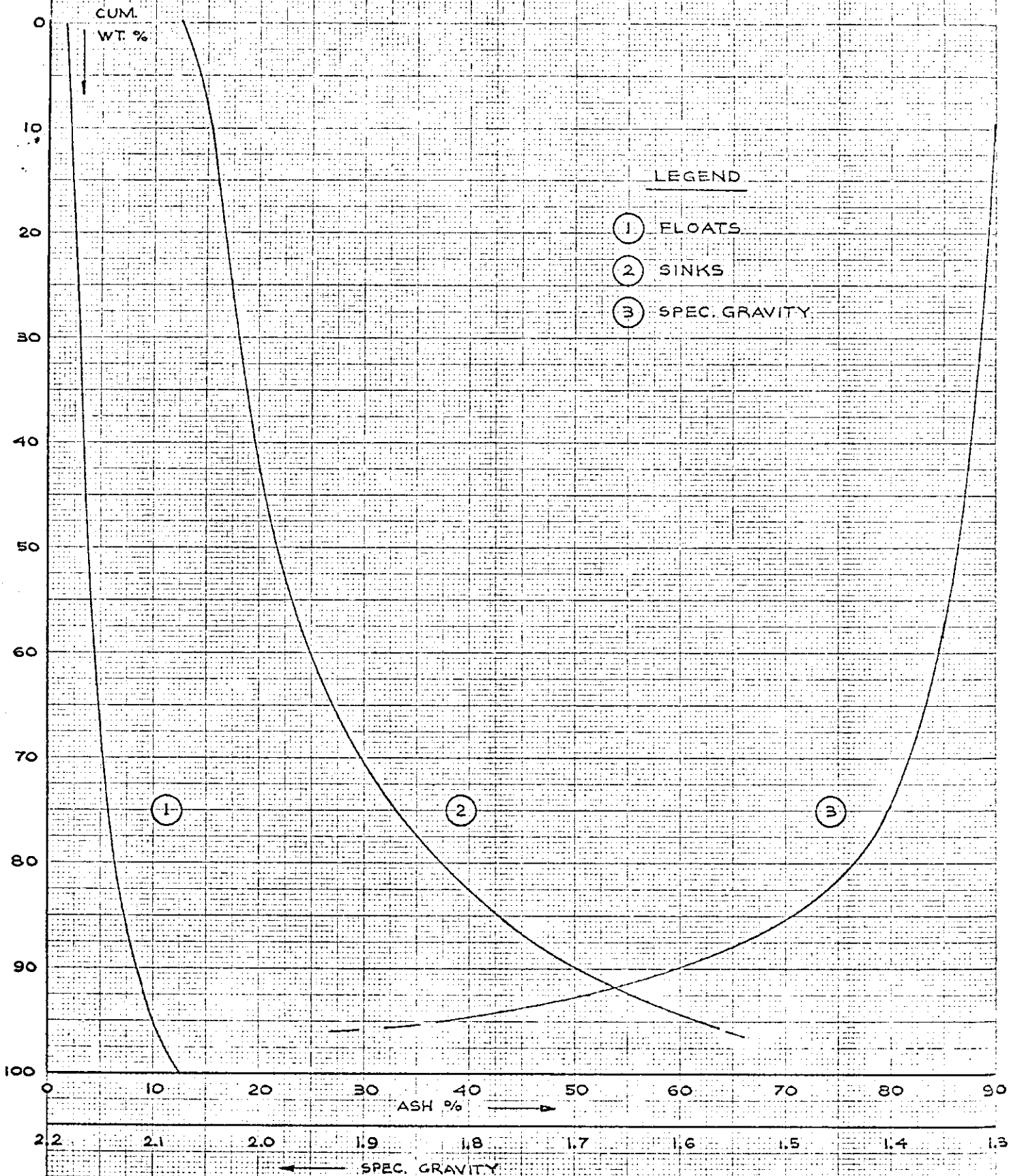
SCURRY RAINBOW OIL LTD.

Free Swelling Index

Sp. Gr. \ Size	2 x 1"	1 x 1/2"	1/2 x 1/4"	1/4" x 8 m.	8 x 20 m.	20 x 100 m.
- 1.30	8½, 8½, 8½	9, 9, 9	9, 9, 9	9½, 9½, 9½	9, 9½, 9½	10, 10, 10
1.30 - 1.35	3, 3, 3	3, 3, 3	4, 4½, 4½	3, 3, 3	2½, 2½, 2½	5, 5, 5
1.35 - 1.40	1, 1, 1	1½, 1½, 1½	1½, 1½, 2	1½, 1½, 2	1½, 1½, 1½	2, 2½, 2½
1.40 - 1.50	1, 1, 1	1½, 1½, 1½	1½, 1½, 1½	1, 1, 1	1, 1, 1½	1, 1, 1
1.50 - 1.60	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1
1.60 - 1.80	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1
+ 1.80	1, 1, 1	1, 1, 1	½, ½, ½	½, ½, ½	½, ½, ½	½, ½, ½

NOTE: F.S.I. on - 100 mesh fraction is 7, 7, 7,

FIG. 1 SCURRY RAINBOW SEAM # 3.1.2
WASHABILITY CURVES FOR 2" x 20 m.

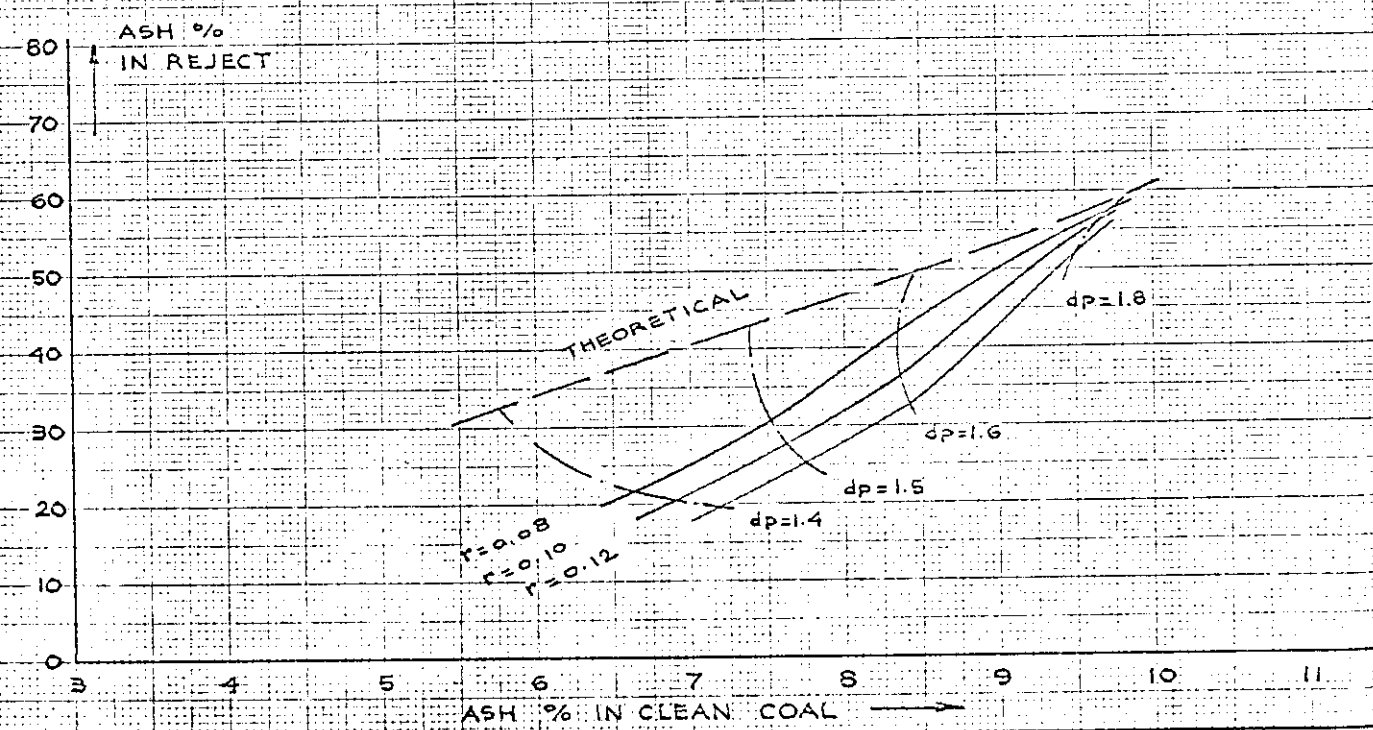
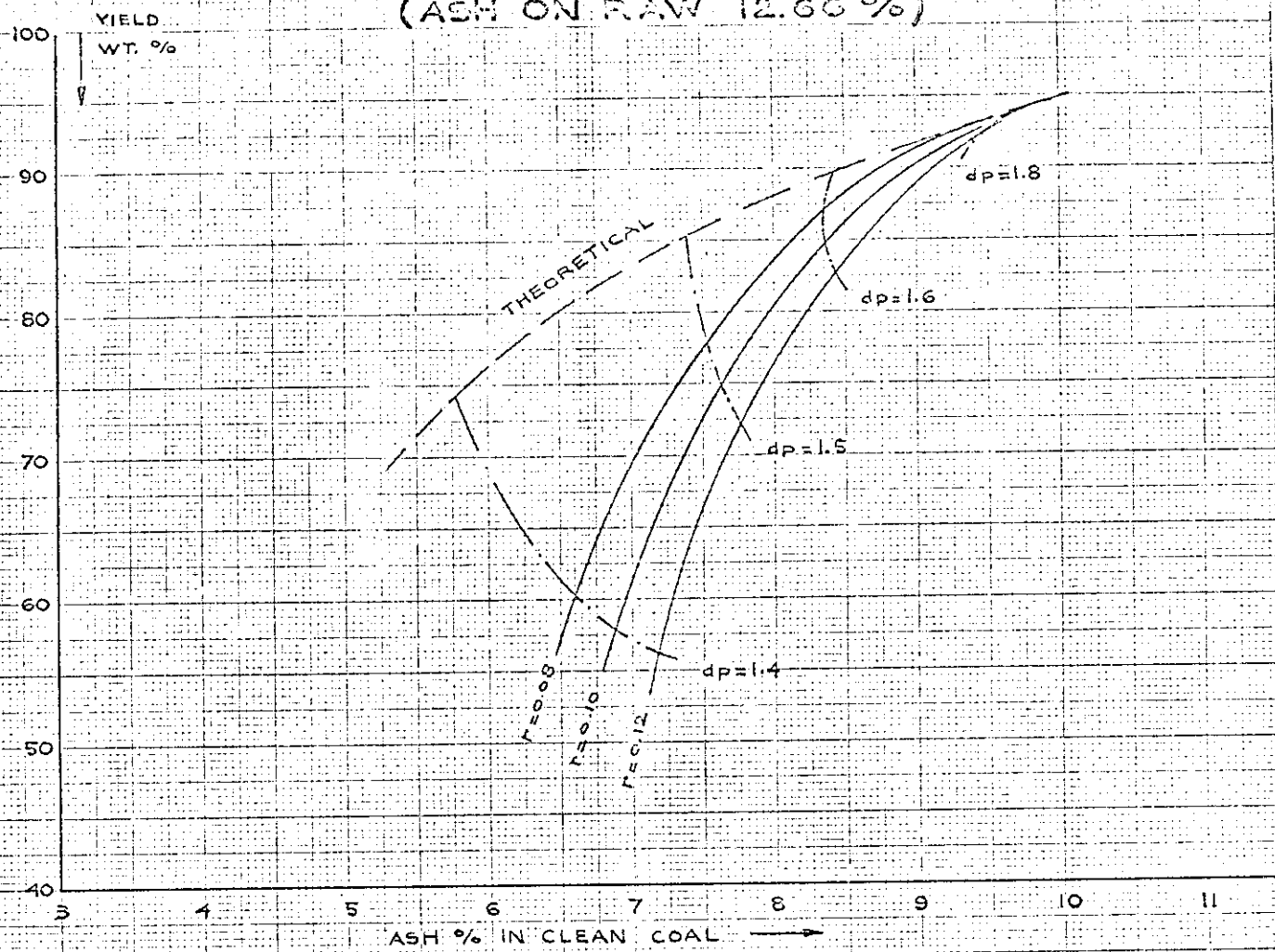


KE 10 X 10 TO THE CENTIMETER 46 1512
10 X 25 CM.
MADE IN U.S.A. •
KEUFFEL & ESSER CO.

FIG. 2

SCURRY WINDOW SEAM # 0.1.2

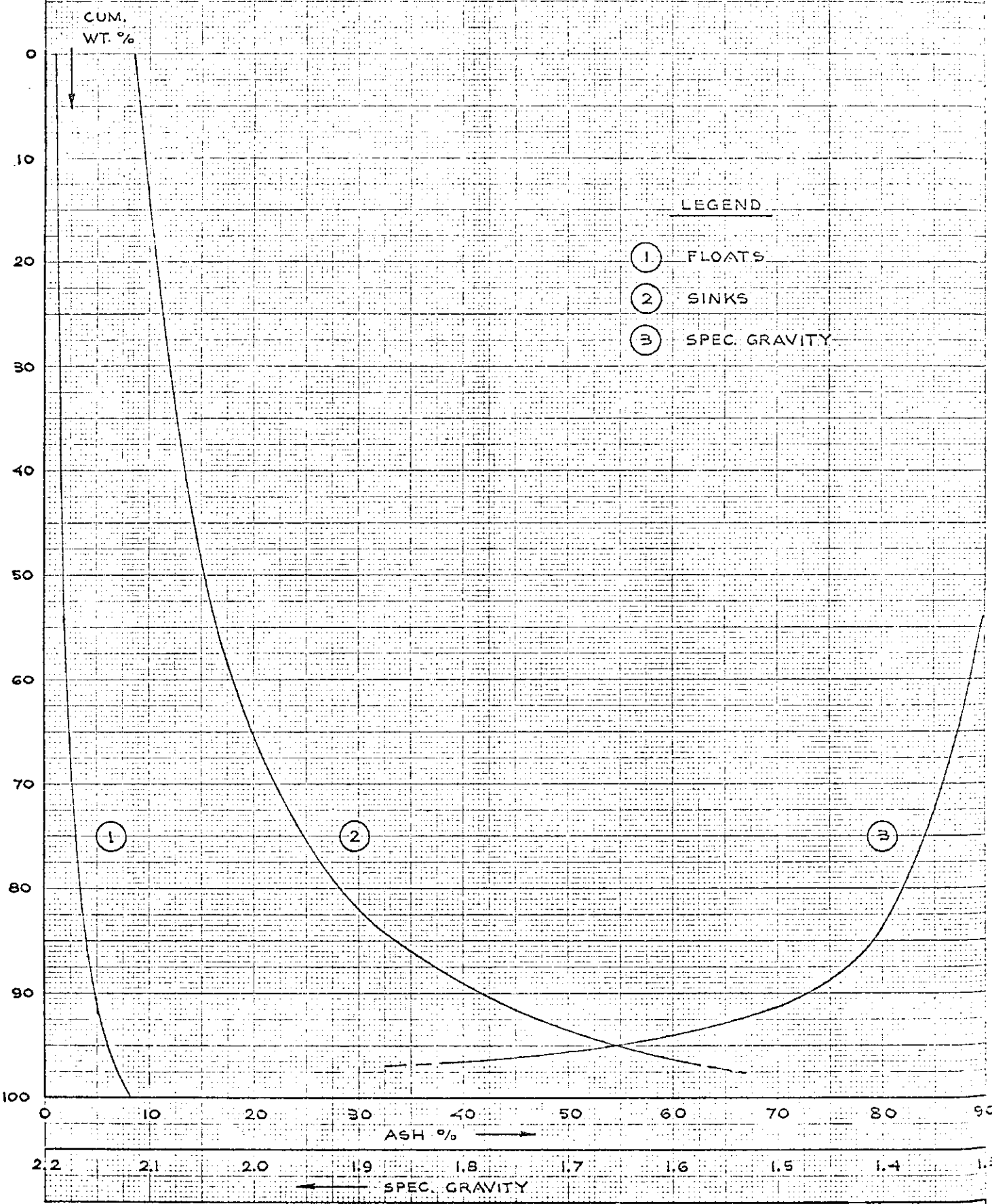
PERFORMANCE EVALUATION CURVES FOR 2" x 20 m.
(ASH ON RAW 12.66 %)



KE 10 X 10 TO THE CENTIMETER 46 1512
 MADE IN U.S.A. •
 KEUFFEL & ESSERT CO.

FIG. 3 SCURRY RAINBOW SEAMTM 3.1.2

WASHABILITY CURVES FOR 20m. X 100m.



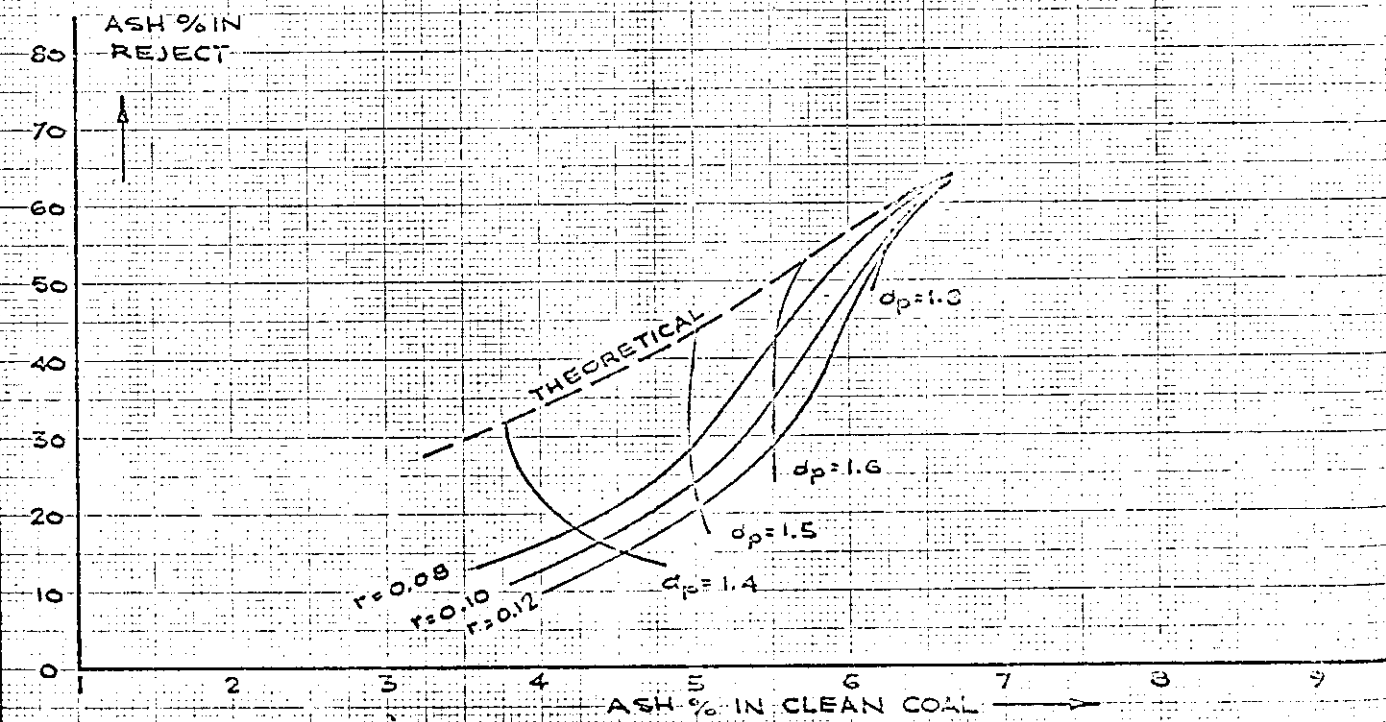
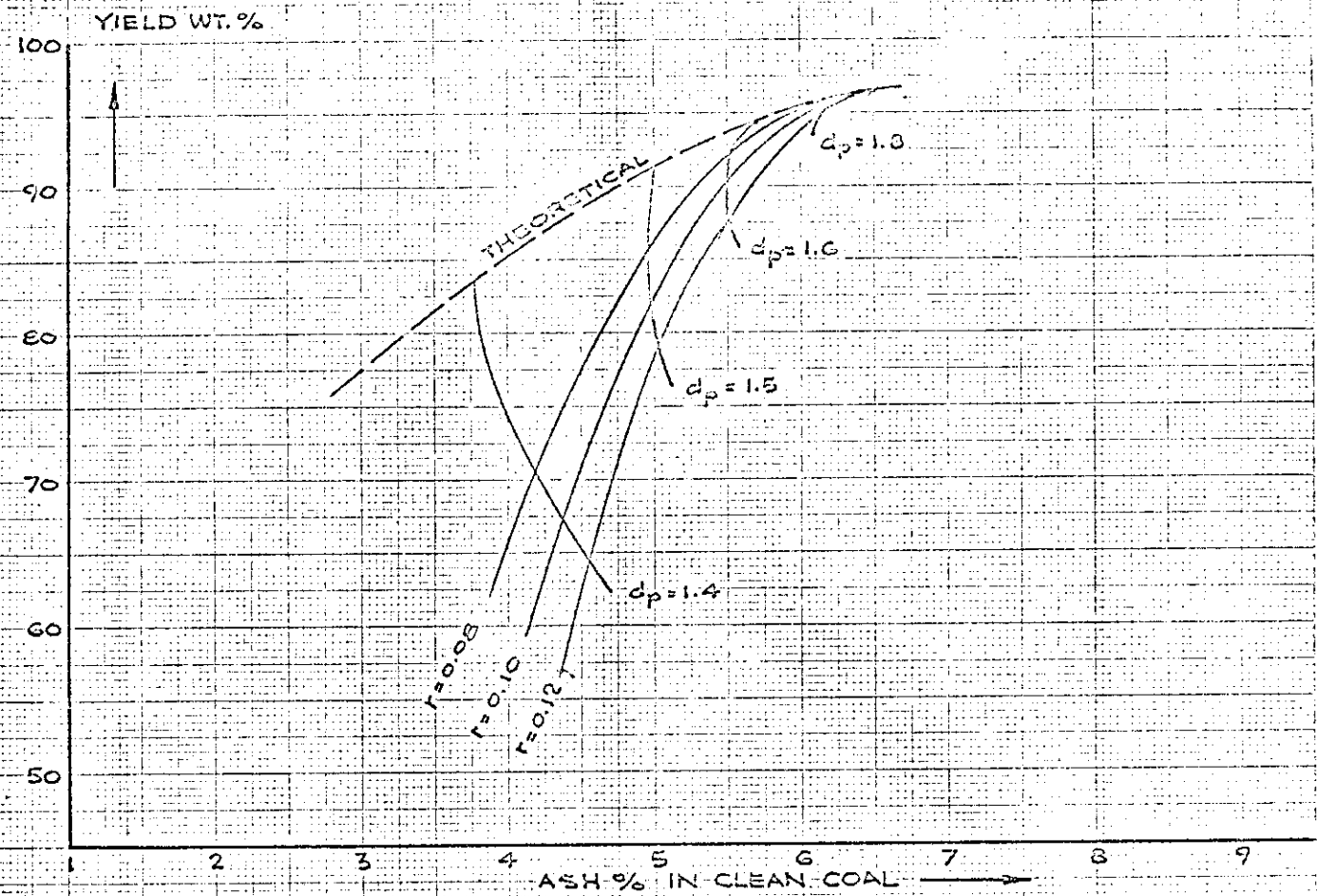
KEUFFEL & ESSER CO. MADE IN U.S.A. 46 1512
 10 X 10 TO THE CENTIMETER
 10 X 25 CM.

DEC 4 / '69 LAMAN

CYCLONE ENGINEERING SALES LTD.
 EDMONTON ALBERTA CANADA

FIG. 4 SCURRY RAINBOW SEAM # 8.1.2.

PERFORMANCE EVALUATION CURVES FOR 20m x 100m
(ASH ON RAW 8.37%)



KE 10 X 10 TO THE CENTIMETER 46 1512
 18 X 25 CM. MADE IN U.S.A.
 KEUFFEL & ESSER CO.

REPORT ON
CLEANING COKING COAL
from the
ELK RIVER PROJECT
for
SCURRY RAINBOW OIL LTD.
Adit #8. SEAM #9.1

SUBMITTED BY
CYCLONE ENGINEERING SALES LTD.
Edmonton - Alberta - Canada

Report No.: RI-69.07.g

Job No.: S1-58

Dated: December 17, 1969

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SUMMARY

The data presented in this report refers to coal from Seam #9.1.

The analysis and washability data indicate that this coal is of low bituminous rank with a moderate ash content of 14.90% and low sulphur content (0.44%).

Washing characteristics of this coal show that yield losses, when cleaned to an ash content of 8.75%, are relatively small. The coking characteristics are good.

SCURRY RAINBOW OIL LTD.

T A B L E 1. SEAM #9.1

Classification by Rank.

Ash:	14.90%
Volatile Matter:	19.41%
Residual Moisture:	0.64%
Fixed Carbon:	65.05%
Sulphur:	0.44%
B.T.U./lb.:	12,670
Rank:	Low volatile bituminous

T A B L E 2. SEAM #9.1

Size Analysis - Sulphur, B.T.U. and Residual Moisture.

Size	Weight %	Sulphur %	B.T.U./lb.	R.M. %
2 x 1"	33.63	0.44	12,250	0.62
1 x 1/2"	22.87	0.42	12,410	0.65
1/2 x 1/4"	12.40	0.42	12,130	0.61
1/4" x 8 m.	10.04	0.42	12,820	0.71
8 x 20 m.	10.14	0.46	13,910	0.69
20 x 100 m.	8.62	0.49	14,090	0.59
- 100 m.	2.30	0.52	12,810	0.72
Total	100.00	0.44	12,670	0.64

*
T A B L E 3. SEAM #9.1

SCURRY RAINBOW OIL LTD.

Weight & Ash Distribution vs. Size and Specific Gravity.

(Figures in brackets show the Ash content of individual fractions.)

Sp.Gr. Size	1.30	1.35	1.40	1.50	1.60	1.80	Total	
2 x 1"	3.37 (3.17)	16.94 (6.29)	5.25 (10.81)	3.11 (20.53)	1.59 (27.57)	1.38 (47.40)	1.99 (72.61)	33.63 (14.61)
1 x 1/2"	3.17 (3.23)	9.39 (6.40)	3.06 (12.08)	2.81 (20.25)	1.02 (30.12)	1.38 (45.62)	2.04 (72.54)	22.87 (17.74)
1/2 x 1/4"	2.39 (2.83)	3.66 (6.56)	1.72 (11.97)	1.87 (21.98)	0.54 (29.79)	0.74 (45.01)	1.48 (74.54)	12.40 (20.33)
1/4" x 8 m.	3.73 (1.98)	2.27 (6.01)	1.24 (11.34)	1.21 (18.20)	0.49 (29.02)	0.38 (41.21)	0.77 (71.92)	10.04 (4.03)
8 x 20 m.	6.05 (1.72)	1.37 (6.39)	0.90 (11.18)	0.82 (18.35)	0.29 (27.55)	0.25 (41.10)	0.46 (70.70)	10.14 (9.37)
20 x 100 m.	5.14 (1.40)	1.17 (5.72)	0.77 (9.72)	0.69 (15.96)	0.25 (29.34)	0.21 (39.24)	0.39 (68.46)	8.62 (8.66)
Total	23.85 (2.20)	34.80 (6.31)	12.94 (11.27)	10.51 (19.97)	4.13 (28.75)	4.34 (45.12)	7.13 (72.56)	97.70 (14.94)
- 100 mesh	This fraction forms 2.30% of the total sample and has an ash content of 13.24%, thus giving a total sample ash value of 14.90%.							

T A B L E 4. SEAM #9.1

SCURRY RAINBOW OIL LTD.

Weight % and Volatile Matter % vs. Size and Specific Gravity

(Figures in brackets give Volatile Matter.)

Sp.Gr. Size								Total
	1.30	1.35	1.40	1.50	1.60	1.80		
2 x 1"	3.37 (20.74)	16.94 (19.40)	5.25 (18.78)	3.11 (17.94)	1.59 (18.10)	1.38 (16.74)	1.99 (16.46)	33.63 (18.95)
1 x 1/2"	3.17 (20.99)	9.39 (19.35)	3.06 (19.13)	2.81 (17.93)	1.02 (17.79)	1.38 (16.85)	2.04 (14.21)	22.87 (18.69)
1/2 x 1/4"	2.39 (20.95)	3.66 (19.33)	1.72 (18.61)	1.87 (17.91)	0.54 (17.85)	0.74 (16.49)	1.48 (14.05)	12.40 (18.46)
1/4" x 8 m.	3.73 (22.57)	2.27 (19.43)	1.24 (18.59)	1.21 (17.79)	0.44 (17.91)	0.38 (17.25)	0.77 (14.37)	10.04 (19.75)
8 x 20 m.	6.05 (23.03)	1.37 (19.61)	0.90 (18.89)	0.82 (18.35)	0.29 (18.03)	0.25 (17.59)	0.46 (14.99)	10.14 (21.18)
20 x 100 m.	5.14 (23.05)	1.17 (19.69)	0.77 (19.19)	0.69 (18.63)	0.25 (18.71)	0.21 (17.75)	0.39 (17.49)	8.62 (21.38)
Total	23.85 (22.15)	34.80 (19.39)	1.294 (18.85)	10.51 (17.99)	4.13 (18.00)	4.34 (16.87)	7.13 (15.05)	97.70 (19.35)
- 100 mesh	This fraction forms 2.30% of the total sample and has a volatile matter content of 22.08%, thus giving a total sample volatile matter content of 19.41%.							

T A B L E 5. SEAM #9.1

SCURRY RAINBOW OIL LTD.

Washability Data - 2" x 20 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
-1.30	21.00	2.43	21.00	2.43	100.00	15.56	8.1
1.30-1.35	37.75	6.34	58.75	4.94	79.00	19.05	2.5
1.35-1.40	13.66	11.37	72.41	6.15	41.25	30.68	2.0
1.40 - 1.50	11.02	20.26	83.43	8.02	27.59	40.24	1.3
1.50-1.60	4.36	28.71	87.79	9.05	16.57	53.53	1.1
1.60-1.80	4.64	45.43	92.43	10.87	12.21	62.40	1
+1.80	7.57	72.80	100.00	15.56	7.57	72.80	1
Total	100.00	15.56					

T A B L E 6. SEAM #9.1

Washability Data - 20 x 100 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
-1.30	59.63	2.20	59.63	2.20	100.00	9.99	10
1.30-1.35	13.57	6.31	73.20	2.96	40.37	21.49	4
1.35-1.40	8.93	11.27	82.13	3.87	26.80	29.13	2
1.40-1.50	8.01	19.97	90.14	5.30	17.87	38.13	1.3
1.50-1.60	2.90	28.75	93.04	6.03	9.86	52.88	1
1.60-1.80	2.44	45.12	95.48	7.03	6.96	62.94	1
+1.80	4.52	72.56	100.00	9.99	4.52	72.56	0.5
Total	100.00	9.99					

T A B L E 7. SEAM #9.1

SCURRY RAINBOW OIL LTD.

Free Swelling Index.

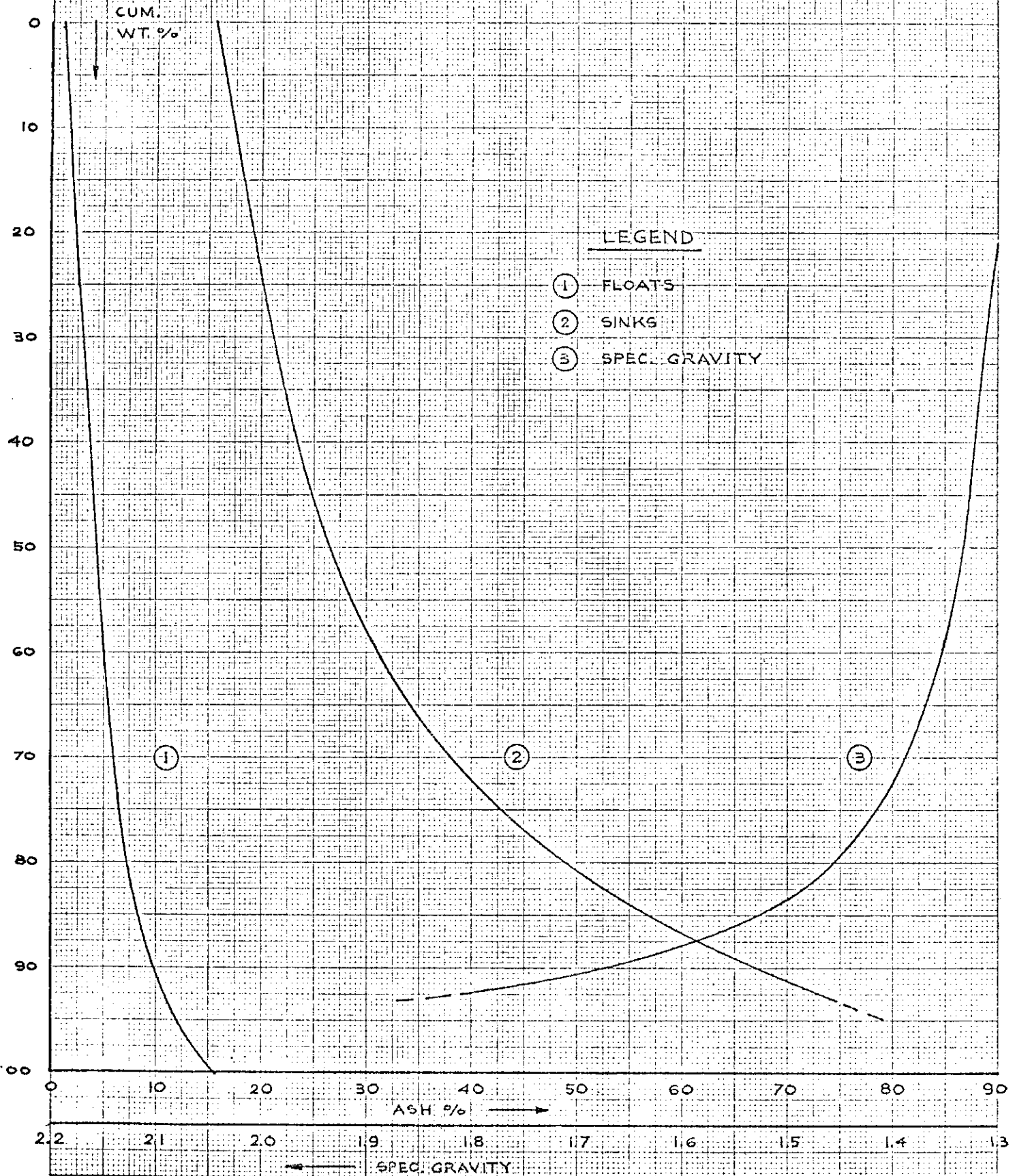
Sp.Gr. \ Size	2 x 1"	1 x 1/2"	1/2 x 1/4"	1/4" x 8 m.	8 x 20 m.	20 x 100 m.
- 1.30	6, 6, 6	6, 6, 6	7, 7, 7½	9, 9, 9½	10, 10, 10	10, 10, 10
1.30 - 1.35	2, 2½, 2½	2½, 2½, 2½	2½, 2½, 2½	3, 3, 3	3, 3, 3½	4, 4, 4,
1.35 - 1.40	2, 2, 2	2, 2, 2	1½, 1½, 2	2, 2, 2	2, 2, 2	2, 2, 2
1.40 - 1.50	1, 1½, 1½	1½, 1½, 1	1½, 1½, 1	1, 1, 1½	1, 1, 1½	1, 1½, 1½
1.50 - 1.60	1, 1, 1½	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1
1.60 - 1.80	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1
+ 1.80	½, ½, ½	½, ½, ½	½, ½, ½	½, ½, ½	N.A.	½, ½, ½

NOTE: F.S.I. on - 100 mesh fraction is 6½, 7, 7.

FIG. 1

SCURRY RAINBOW SEAM No. 9.1

WASHABILITY CURVES FOR 2" x 20 rr.

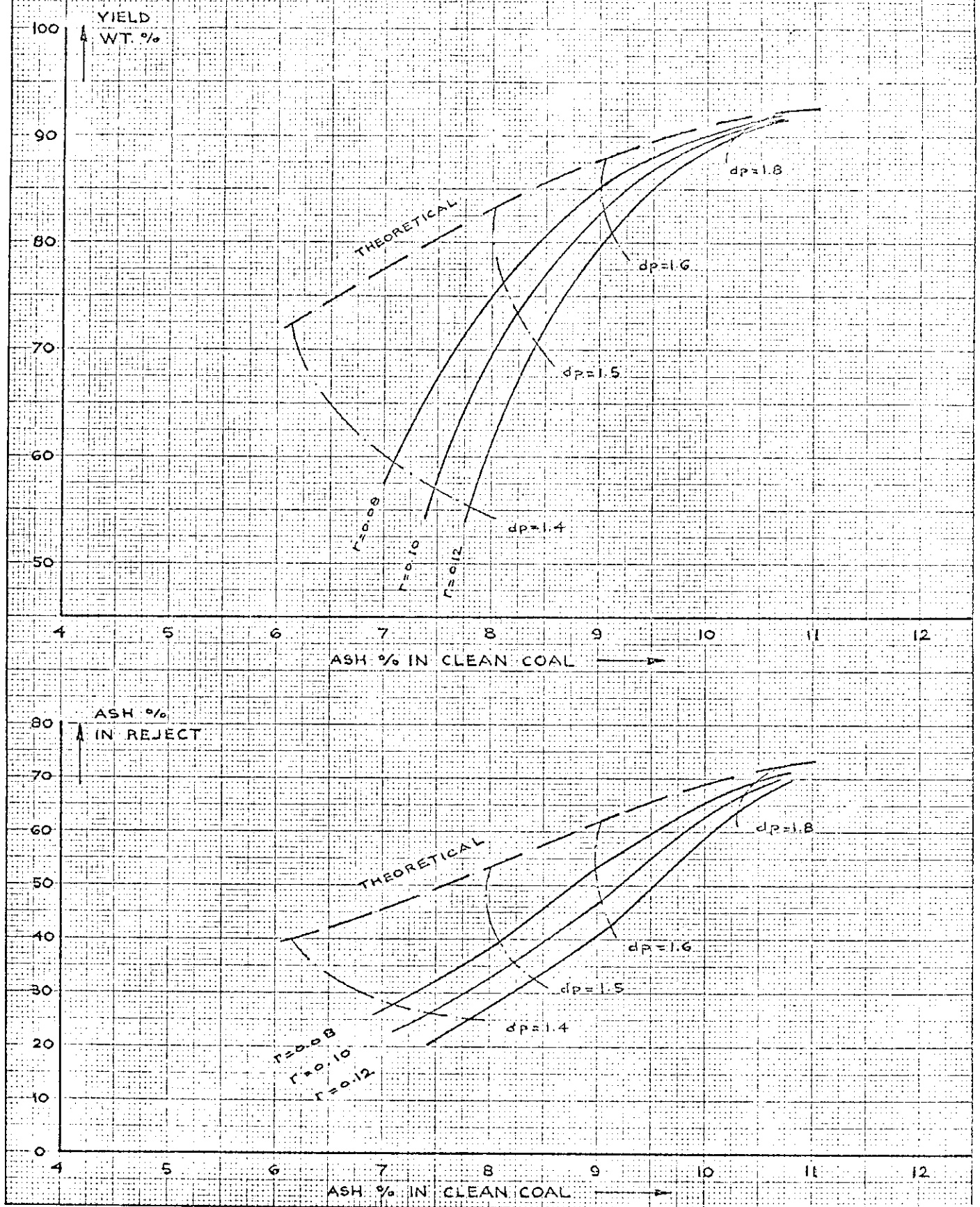


KE 10 X 10 TO THE CENTIMETER 46 1512
MADE IN U.S.A.
KEUFFEL & ESSER CO.

FIG. 2

SCURRY RAINBOW SEAM No. 9.1

PERFORMANCE EVALUATION CURVES FOR 2" x 20 m.
(ASH ON RAW 13.56 %)

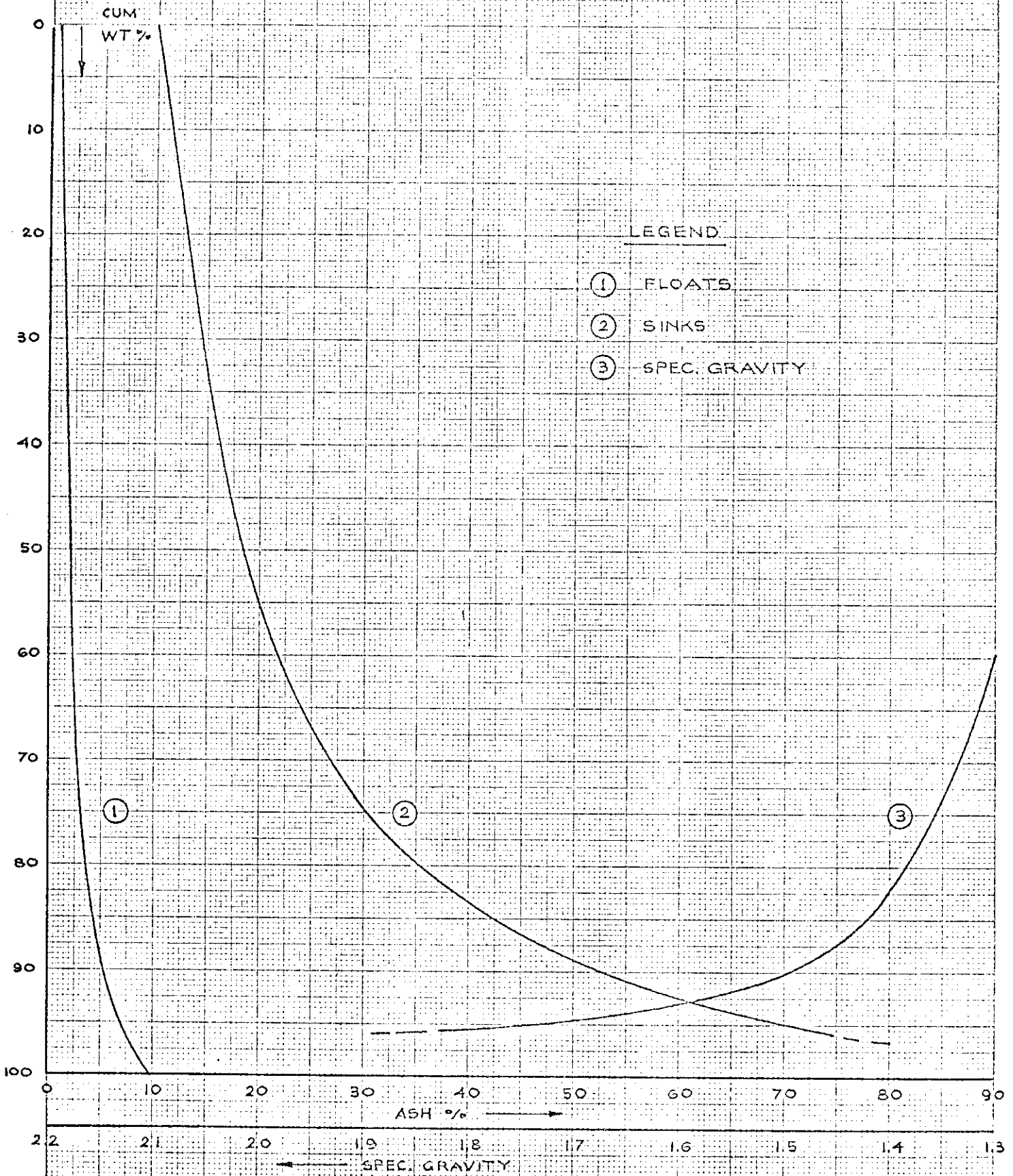


KE 10 X 10 TO THE CENTIMETER 46 1512
 MADE IN U.S.A.
 KEUFFEL & ESSER CO.

FIG. 3

SCURRY BRANDOW BEAM No. 9.1

WASHABILITY CURVES FOR 20mm x 100mm.



KE 10 X 10 TO THE CENTIMETER 46 1512
16 X 25 CM. MADE IN U.S.A. •
KEUFFEL & ESSER CO.

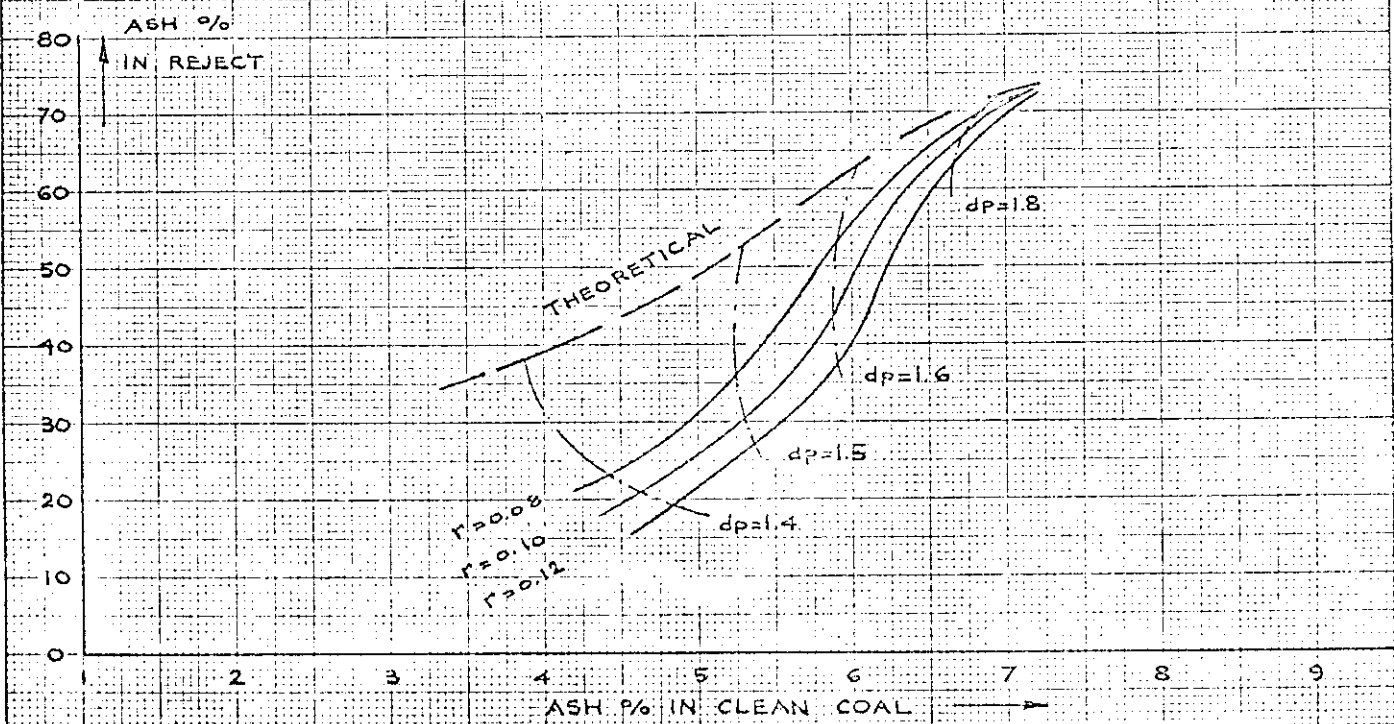
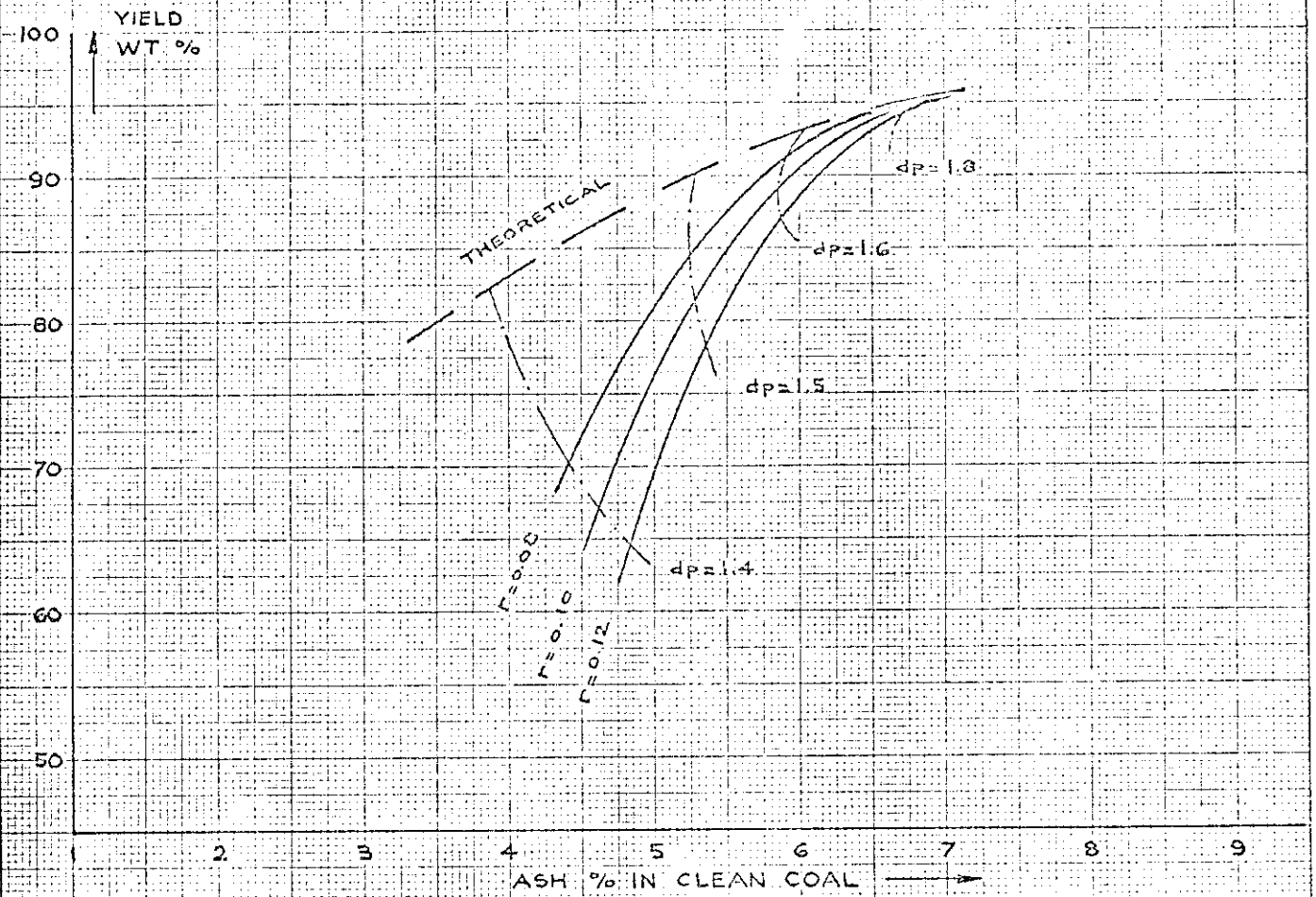
DEC. 17/69

CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

FIG. 4

SCURRY RAINBOW SEATA No. 9.1

PERFORMANCE EVALUATION CURVES FOR 20m. X 100m.
(ASH ON RAW = 9.99%)



10 X 10 TO THE CENTIMETER 46 1512
MADE IN U.S.A.
KEUFFEL & ESSER CO.

REPORT ON
CLEANING COKING COAL
from the
ELK RIVER PROJECT
for
SCURRY RAINBOW OIL LTD.
Adit #9. SEAM #H-1

Submitted by
CYCLONE ENGINEERING SALES LTD.
Edmonton - Alberta - Canada

Report No.: RI-69.07.h

Job No.: S1-58

Dated: December 19, 1969

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RESUME

The data presented in this report refers to coal from Seam #H-1.

The analysis and the washability data indicate that this coal is of medium volatile bituminous rank with a low ash content of 10.50%.

The ash distribution over the various specific gravity fractions indicate that this coal is an "easy" coal and can be cleaned to a low ash content of 7% with little yield loss.

It is noted that the coking properties are excellent.

Sulphur content, however, is extremely high (2.13%) and large pyrite crystals are immediately discovered on visual inspection.

If this coal will be mined together with coal from low sulphur seams, or, if the amount of reserves, represented by this adit, is large and is to be incorporated in total reserves, than sulphur reduction will be required.

T A B L E 1. SEAM #H-1

SCURRY RAINBOW OIL LTD.

Classification by Rank.

Ash:	10.50%
Volatile Matter:	22.91%
Residual Moisture:	0.67%
Fixed Carbon:	65.92%
Sulphur:	2.13%
B.T.U./lb.:	13,440
Rank:	Medium volatile bituminous

T A B L E 2. SEAM #H-1

Size Analysis - Sulphur, B.T.U. and Residual Moisture.

Size	Weight %	Sulphur %	B.T.U./lb.	R.M. %
2 x 1"	14.63	6.78	11,360	0.69
1 x 1/2"	18.26	1.56	13,430	0.65
1/2 x 1/4"	17.69	1.55	13,270	0.64
1/4" x 8 m.	16.30	1.24	13,900	0.68
8 x 20 m.	16.32	1.13	14,240	0.70
20 x 100 m.	13.70	1.11	14,270	0.63
- 100 m.	3.10	1.13	13,960	0.72
Total	100.00	2.13	13,440	0.67

T A B L E 3. SEAM #H-1

SCURRY RAINBOW OIL LTD.

Weight & Ash Distribution vs. Size and Specific Gravity.

(Figures in brackets show the Ash content of individual fractions.)

Size \ Sp.Gr.								Total
	1.30	1.35	1.40	1.50	1.60	1.80		
2 x 1"	3.52 (3.32)	4.62 (6.56)	2.56 (10.76)	0.92 (18.63)	0.17 (30.89)	0.12 (45.20)	2.72 (65.76)	14.63 (18.88)
1 x 1/2"	6.38 (3.15)	5.26 (6.79)	3.21 (11.88)	1.44 (18.57)	0.36 (23.54)	0.22 (31.16)	1.39 (60.38)	18.26 (12.04)
1/2 x 1/4"	7.76 (3.27)	4.66 (6.25)	2.39 (12.28)	1.39 (19.78)	0.44 (29.53)	0.25 (44.24)	0.80 (66.71)	17.69 (10.67)
1/4" x 8 m.	8.93 (2.40)	3.64 (7.80)	1.70 (12.49)	1.04 (20.23)	0.34 (28.84)	0.18 (39.00)	0.47 (65.56)	16.30 (8.57)
8 x 20 m.	11.10 (2.23)	2.41 (7.95)	1.21 (12.80)	0.79 (19.48)	0.27 (28.97)	0.17 (42.63)	0.37 (66.00)	16.32 (7.00)
20 x 100 m.	9.89 (1.64)	1.63 (6.61)	0.81 (11.00)	0.62 (17.66)	0.22 (27.73)	0.17 (39.60)	0.36 (67.83)	13.70 (6.13)
Total	47.58 (2.51)	22.22 (6.90)	11.88 (11.84)	6.20 (19.15)	1.80 (28.02)	1.11 (39.94)	6.11 (64.78)	96.90 (10.55)
- 100 mesh	This fraction forms 3.10% of the total sample and has an ash content of 9.05%, thus giving a total sample ash value of 10.50%.							

T A B L E 4. SEAM #H-1

SCURRY RAINBOW OIL LTD.

Weight % and Volatile Matter % vs. Size and Specific Gravity.

(Figures in brackets give Volatile Matter.)

Sp.Gr. Size	1.30	1.35	1.40	1.50	1.60	1.80	Total	
2 x 1"	3.52 (24.79)	4.62 (20.47)	2.56 (19.61)	0.92 (19.23)	0.17 (18.89)	0.12 (18.93)	2.72 (20.65)	14.63 (21.28)
1 x 1/2"	6.38 (24.59)	5.26 (21.61)	3.21 (19.91)	1.44 (19.45)	0.36 (18.99)	0.22 (19.55)	1.39 (19.45)	18.26 (21.94)
1/2 x 1/4"	7.76 (25.18)	4.66 (23.24)	2.39 (20.22)	1.39 (19.88)	0.44 (18.94)	0.25 (18.16)	0.80 (19.40)	17.69 (23.06)
1/4" x 8 m.	8.93 (25.70)	3.64 (22.10)	1.70 (20.42)	1.04 (19.84)	0.34 (18.98)	0.18 (18.96)	0.47 (17.44)	16.30 (23.51)
8 x 20 m.	11.10 (25.00)	2.41 (22.54)	1.21 (21.14)	0.79 (20.04)	0.27 (19.26)	0.17 (18.32)	0.37 (16.32)	16.32 (23.74)
20 x 100 m.	9.89 (25.05)	1.63 (22.77)	0.81 (21.29)	0.62 (20.87)	0.22 (19.77)	0.17 (19.05)	0.36 (15.65)	13.70 (23.96)
Total	47.58 (25.10)	22.22 (21.98)	11.88 (20.19)	6.20 (19.79)	1.80 (19.10)	1.11 (18.80)	6.11 (19.41)	96.90 (22.90)
- 100 mesh	This fraction forms 3.10% of the total sample and has a volatile matter content of 23.04%, thus giving a total sample volatile matter content of 22.91%.							

T A B L E 5. SEAM #H-1

SCURRY RAINBOW OIL LTD.

Washability Data - 2" x 20 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
-1.30	45.30	2.74	45.30	2.74	100.00	11.28	9.9
1.30-1.35	24.75	6.93	70.05	4.22	54.70	18.36	6.2
1.35-1.40	13.30	11.90	83.35	5.45	29.95	27.81	2.3
1.40 - 1.50	6.71	19.32	90.06	6.48	16.65	40.51	2.2
1.50-1.60	1.90	28.07	91.96	6.93	9.94	54.82	1.2
1.60-1.80	1.13	40.01	93.09	7.33	8.04	61.14	1.5
+1.80	6.91	64.59	100.00	11.28	6.91	64.59	0.1
Total	100.00	11.28					

T A B L E 6. SEAM #H-1

Washability Data - 20 x 100 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
-1.30	72.19	1.64	72.19	1.64	100.00	6.14	9.8
1.30-1.35	11.90	6.61	84.09	2.34	27.81	17.82	8.8
1.35 - 1.40	5.91	11.00	90.00	2.91	15.91	26.21	3.2
1.40-1.50	4.52	17.66	94.52	3.62	10.00	35.20	2
1.50-1.60	1.61	27.73	96.13	4.02	5.48	49.66	1
1.60 - 1.80	1.24	39.60	97.37	4.47	3.87	58.78	1
+1.80	2.63	67.83	100.00	6.14	2.63	67.83	0.5
Total	100.00	6.14					

T A B L E 7. SEAM #H-1

SCURRY RAINBOW OIL LTD.

Free Swelling Index.

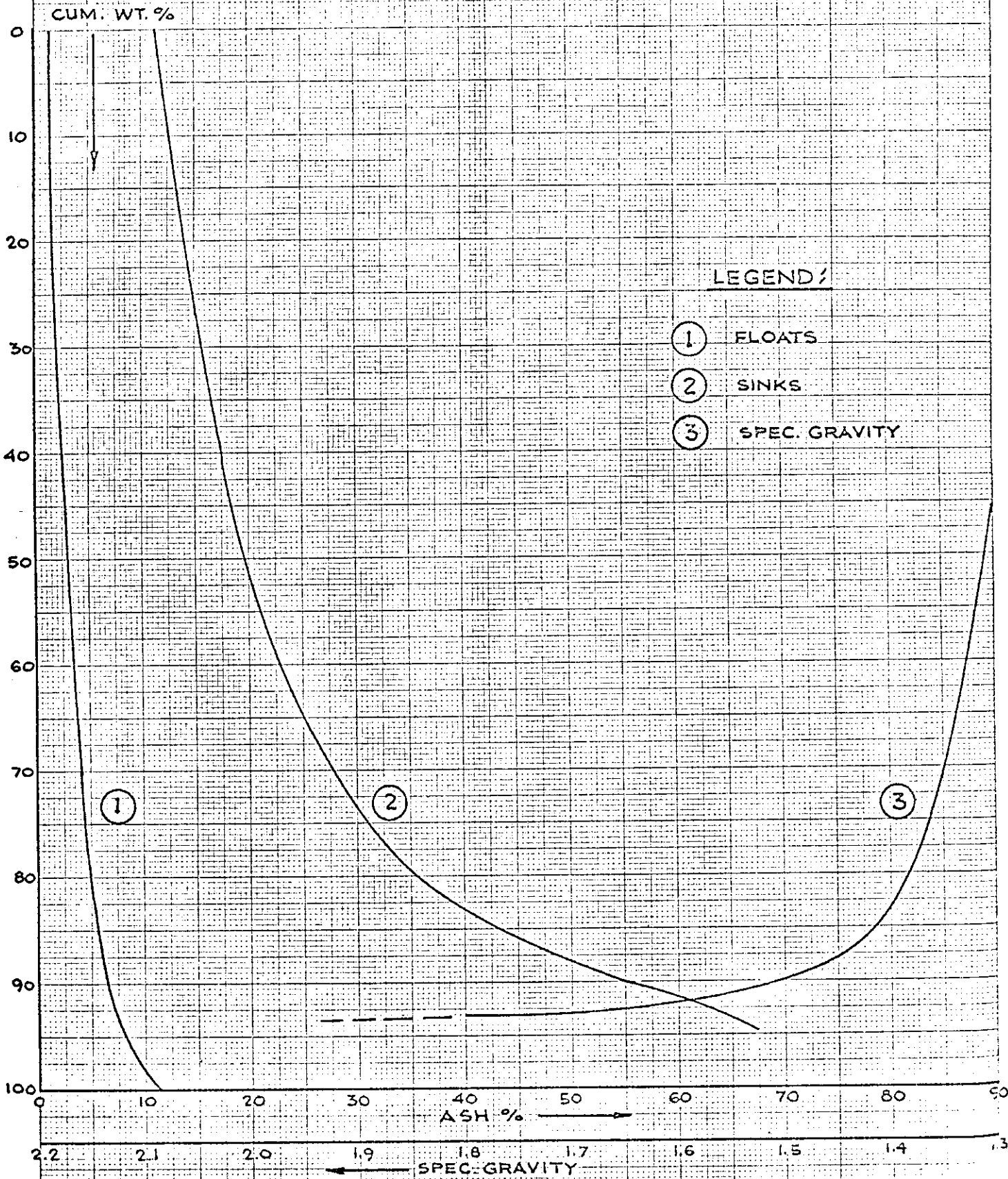
Size Sp.Gr.	2 x 1"	1 x 1/2"	1/2 x 1/4"	1/4" x 8 m.	8 x 20 m.	20 x 100 m.
- 1.30	9½, 10, 10	10, 10, 10	9½, 10, 10	10, 10, 10	10, 10, 10	9½, 10, 10
1.30 - 1.35	2½, 3, 3	4½, 4½, 5	8½, 9, 9	8, 8, 8½	7½, 7½, 8	8½, 9, 9
1.35 - 1.40	1½, 1½, 1½	2, 2½, 2½	2, 2, 2	3, 3, 3½	3½, 3½, 3½	3, 3, 3½
1.40 - 1.50	2, 2, 2	1½, 1½, 2	2½, 2½, 2½	2½, 2½, 3	2, 2½, 2½	2, 2, 2
1.50 - 1.60	1½, 1½, 1½	1, 1, 1	1, 1, 1½	1½, 1½, 1½	1, 1, 1	1, 1, 1
1.60 - 1.80	2½, 2½, 2½	2½, 2½, 2½	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1
+ 1.80	N.A.	N.A.	½, ½, ½	½, ½, ½	½, ½, ½	½, ½, ½

NOTE: F.S.I. on - 100 mesh fraction is 9, 9, 9.

FIG. 1

SCURRY RAINBOW- SEAM #H-1

WASHABILITY CURVES FOR 2 INCH x 20 MESH

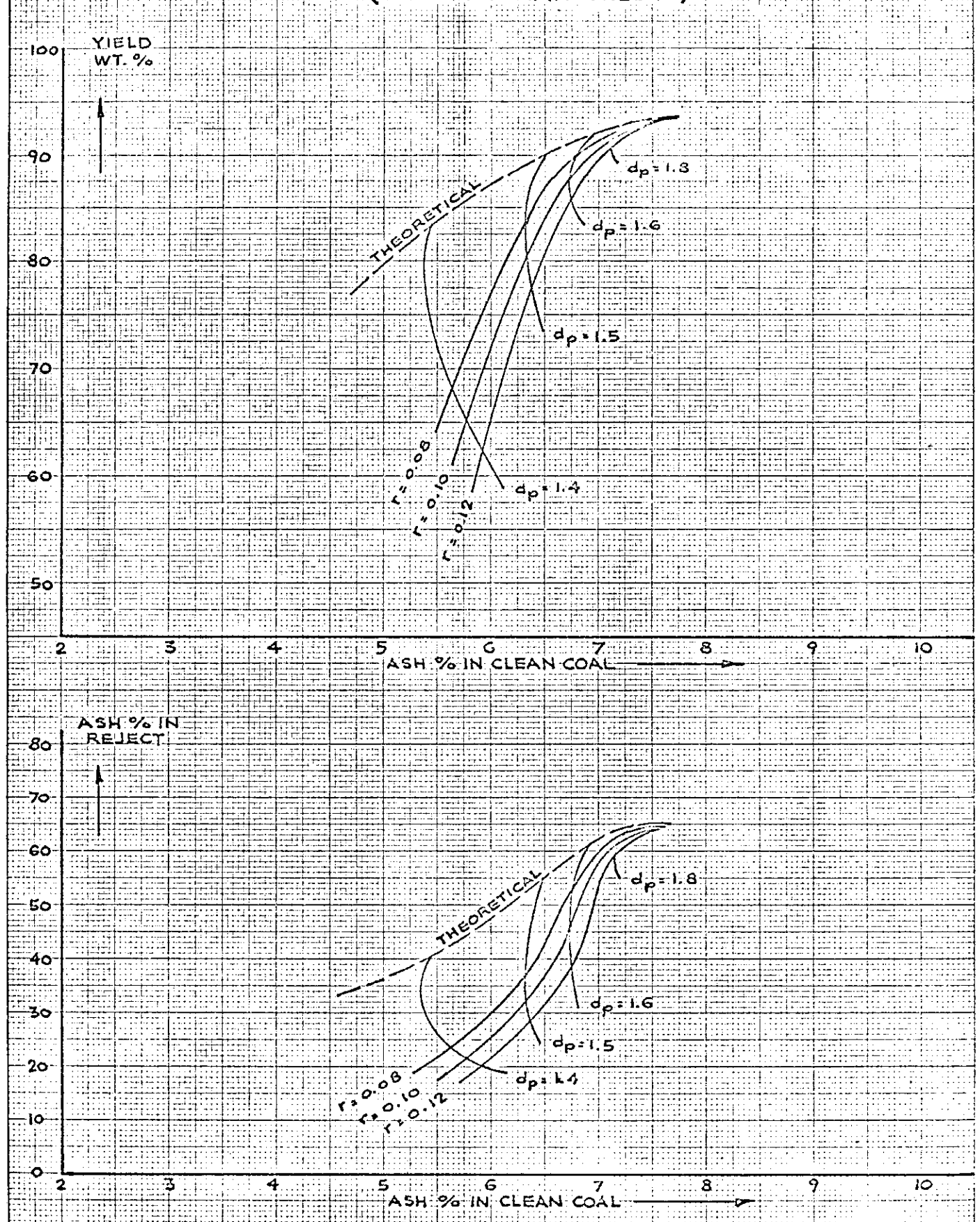


KE 10 X 10 TO THE CENTIMETER 46 1512
18 X 25 CM. MADE IN U.S.A. KEUFFEL & ESSER CO.

FIG. 2

SCURRY RAINBOW - SEAM H-1

PERFORMANCE EVALUATION CURVES FOR 2" x 20 m
(ASH-ON-RAW 11.28%)



DEC. 19 / 69 H. SCH.

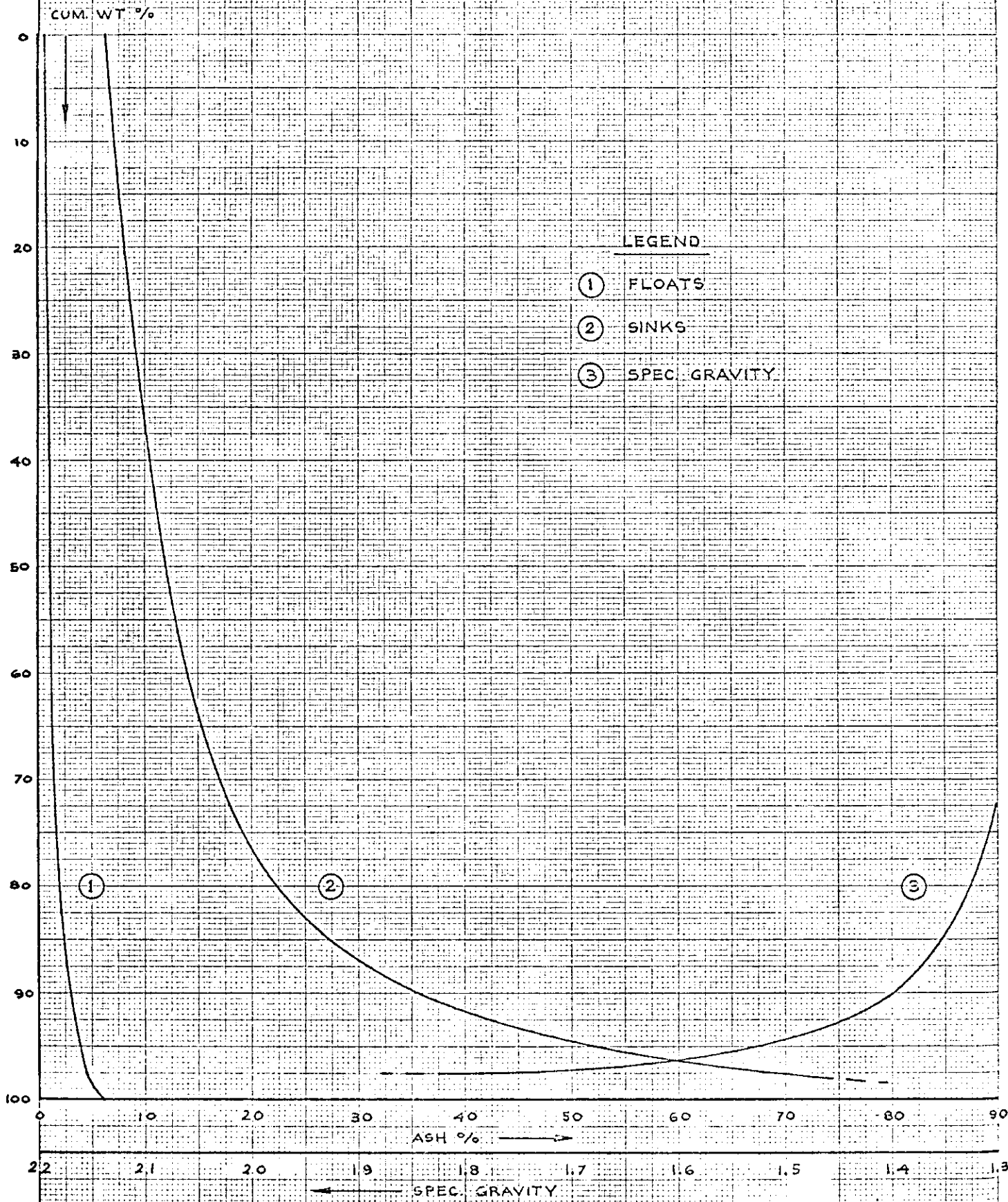
CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

KE 10 X 10 TO THE CENTIMETER 46 1112
18 X 25 CM. MADE IN U.S.A.
KEUFFEL & ESSER CO.

FIG. 3

SCURRY RAINBOW SEAM^o H.1

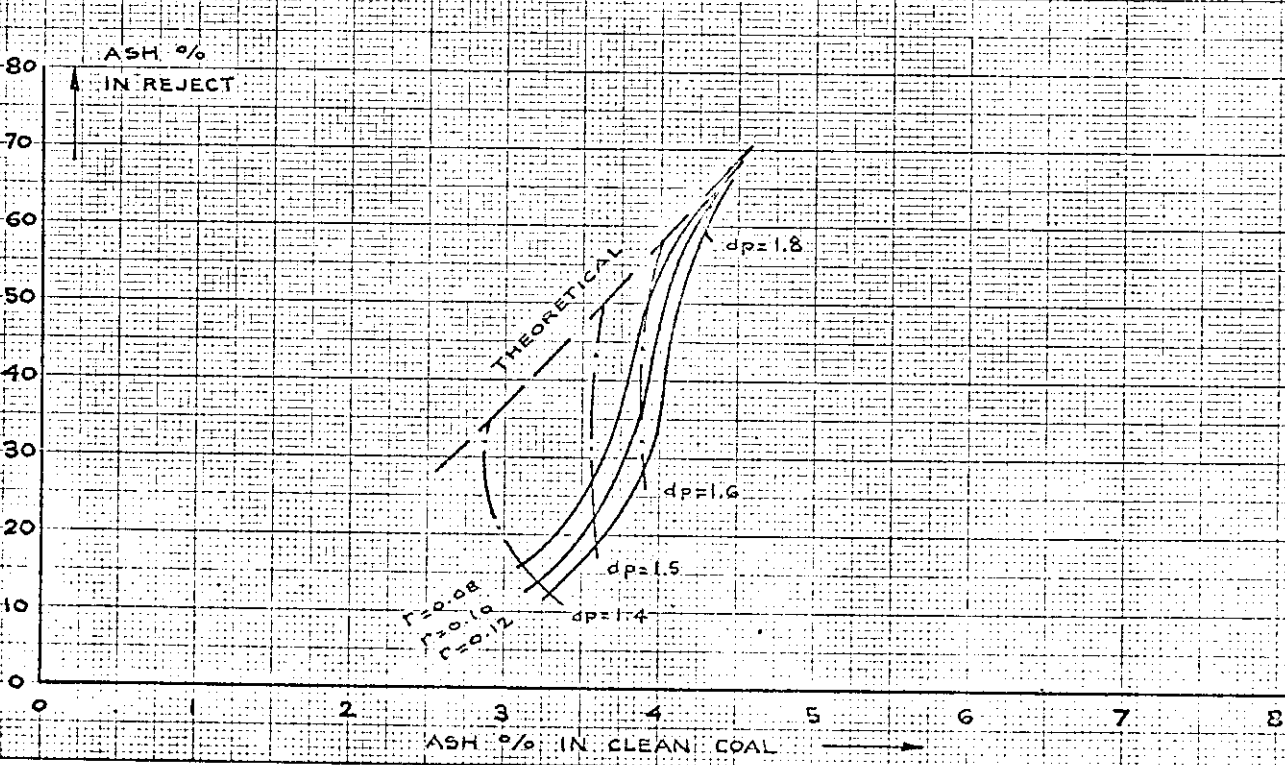
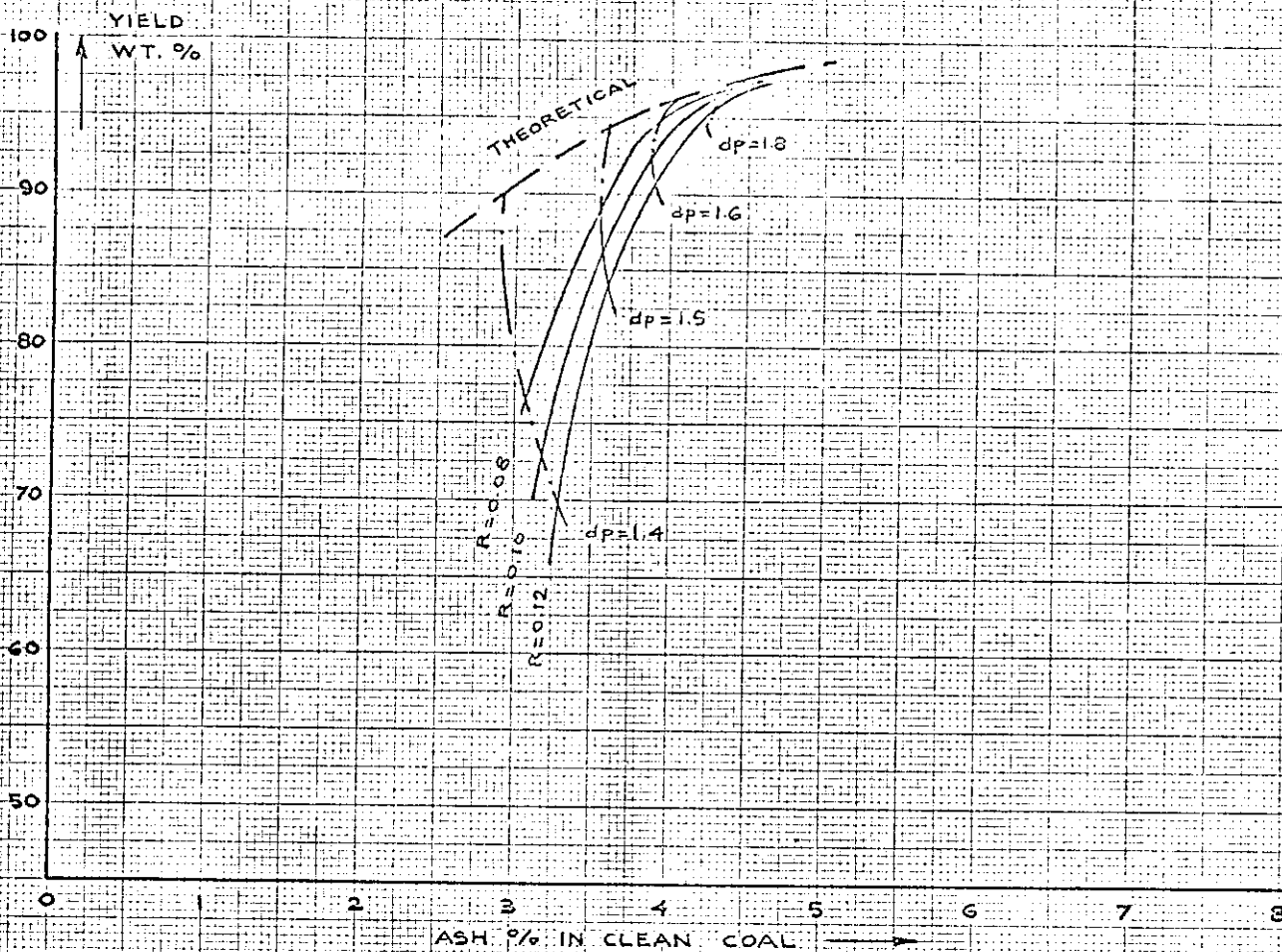
WASHABILITY CURVES FOR 20m. x 100m.



KE 10 X 10 TO THE CENTIMETER 46 1512
MADE IN U.S.A.
KEUFFEL & ESSER CO.

FIG. 4 SCURRY RAINBOW - SEAM H-1

PERFORMANCE EVALUATION CURVES FOR 20m. x 100m.
(ASH ON RAW 6.14 %)



KEUFFEL & ESSER CO.
 MADE IN U.S.A.
 46 1512
 10 X 10 TO THE CENTIMETER
 16 X 25 CM.

REPORT ON
CLEANING COKING COAL
from the
ELK RIVER PROJECT
for
SCURRY RAINBOW OIL LTD.
Adit #10. SEAM #H-2.

Submitted by
CYCLONE ENGINEERING SALES LTD.
Edmonton - Alberta - Canada

Report No.: RI-69-07.i

Job No.: S1 - 58

Dated: December 24, 1969

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SUMMARY

The data presented in this report refers to coal from Seam #H-2.

The sample did not contain sufficient material of the 2" x 1" fraction to qualify this fraction as representative. A total weight of 650 lbs. is the A.S.T.M. requirement.

The coal is of a medium volatile bituminous rank with a low ash content (11.83%) and a higher than normal sulphur content (0.99%).

Coking properties are very good and the washability shows that this coal is very easy to clean for ash.

This coal can be qualified as an excellent coal depending on the cleaning characteristics for sulphur reduction.

T A B L E 1. SEAM #H-2.

SCURRY RAINBOW OIL LTD.

Classification by Rank.

Ash:	11.83%
Volatile Matter:	23.73%
Residual Moisture:	0.67%
Fixed Carbon:	63.77%
Sulphur:	0.99%
B.T.U./lb.:	12,860
Rank:	Medium volatile bituminous

T A B L E 2. SEAM #H-2.

Size Analysis - Sulphur, B.T.U. and Residual Moisture.

Size	Weight %	Sulphur %	B.T.U./lb.	R.M. %
2 x 1"	6.23	1.62	13,680	0.71
1 x 1/2"	16.58	1.25	13,750	0.68
1/2 x 1/4"	14.68	0.86	13,070	0.73
1/4" x 8 m.	13.51	0.93	12,840	0.63
8 x 20 m.	17.35	0.95	12,280	0.67
20 x 100 m.	22.87	0.84	12,400	0.62
- 100 m.	8.78	0.87	12,650	0.69
Total	100.00	0.99	12,860	0.67

T A B L E 3. SEAM #H-2.

SCURRY RAINBOW OIL LTD.

Weight and Ash Distribution vs. Size and Specific Gravity.

(Figures in brackets show the Ash content of individual fractions.)

SP. GR. Size								Total
	1.30	1.35	1.40	1.50	1.60	1.80		
1 x 1/2"	11.76 (2.36)	2.96 (5.65)	0.59 (11.06)	0.30 (19.08)	0.27 (30.47)	0.07 (42.07)	0.63 (76.97)	16.58 (7.01)
1/2 x 1/4"	9.92 (2.92)	2.50 (5.99)	0.73 (12.53)	0.46 (18.03)	0.17 (29.02)	0.20 (48.29)	0.70 (76.62)	14.68 (8.82)
1/4" x 8 m.	7.99 (2.34)	2.01 (6.43)	1.16 (10.30)	0.70 (19.54)	0.29 (29.14)	0.22 (41.47)	1.05 (74.40)	13.51 (11.45)
8 x 20 m.	9.77 (2.21)	2.29 (7.10)	1.41 (11.38)	1.36 (20.44)	0.57 (29.14)	0.44 (41.91)	1.51 (74.01)	17.35 (13.17)
20 x 100 m.	8.40 (1.58)	4.72 (2.93)	3.30 (7.29)	1.83 (18.04)	0.97 (28.01)	0.83 (40.45)	2.82 (71.51)	22.87 (15.15)
Total	47.84 (2.30)	14.48 (5.15)	7.19 (9.42)	4.74 (19.04)	2.27 (28.80)	1.76 (41.89)	6.71 (73.57)	84.99 (11.47)
2" x 1"	This fraction forms 6.23% of the total sample and has an ash content of 10.31%.							
- 100 mesh	This fraction forms 8.78% of the total sample and has an ash content of 16.45%, thus giving a total sample ash value of 11.83%.							

T A B L E 4. SEAM #H-2.

SCURRY RAINBOW OIL LTD.

Weight % and Volatile Matter % vs. Size and Specific Gravity.

(Figures in brackets give Volatile Matter.)

Sp.Gr. Size	1.30	1.35	1.40	1.50	1.60	1.80	Total	
1 x 1/2"	11.76 (25.95)	2.96 (22.95)	0.59 (21.59)	0.30 (21.65)	0.27 (20.67)	0.07 (21.11)	0.63 (12.35)	16.58 (24.55)
1/2 x 1/4"	9.92 (24.98)	2.50 (21.84)	0.73 (21.64)	0.46 (21.40)	0.17 (21.04)	0.20 (16.60)	0.70 (11.78)	14.68 (23.37)
1/4" x 8 m.	7.99 (25.60)	2.01 (22.14)	1.16 (21.94)	0.70 (21.46)	0.29 (19.34)	0.22 (16.96)	1.05 (13.06)	13.51 (23.27)
8 x 20 m.	9.77 (26.40)	2.29 (22.16)	1.41 (21.90)	1.36 (21.50)	0.57 (19.96)	0.44 (18.06)	1.51 (14.92)	17.35 (23.66)
20 x 100 m.	8.40 (25.80)	4.72 (25.50)	3.30 (24.70)	1.83 (22.16)	0.97 (20.92)	0.83 (18.38)	2.82 (18.70)	22.87 (23.93)
Total	47.84 (25.75)	14.48 (23.35)	7.19 (23.14)	4.74 (21.74)	2.27 (20.45)	1.76 (17.99)	6.71 (15.64)	84.99 (23.79)
2" x 1"	This fraction forms 6.23% of the total sample and has an ash content of 24.65%.							
- 100 mesh	This fraction forms 8.78% of the total sample and has a volatile matter content of 22.49%, thus giving a total sample volatile matter value of 23.73%.							

T A B L E 5. SEAM #H-2.

SCURRY RAINBOW OIL LTD.

Washability Data - 1" x 20 mesh.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	63.49	2.46	63.49	2.46	100.00	10.13	10
1.30 - 1.35	15.71	6.24	79.20	3.21	36.51	23.46	5.8
1.35 - 1.40	6.26	11.23	85.46	3.80	20.80	36.47	4
1.40 - 1.50	4.69	19.67	90.15	4.62	14.54	47.34	4.5
1.50 - 1.60	2.09	29.40	92.24	5.18	9.85	60.52	2.5
1.60 - 1.80	1.50	43.19	93.74	5.79	7.76	68.90	1
+ 1.80	6.26	75.06	100.00	10.13	6.26	75.06	N.A.
Total	100.00	10.13					

T A B L E 6. SEAM #H-2.

Washability Data - 20 x 100 m.

Specific Gravity Fraction	Fractional		Cumulative				F.S.I.
	Wt. %	Ash %	Floats		Sinks		
			Wt. %	Ash %	Wt. %	Ash %	
- 1.30	36.73	1.58	36.73	1.58	100.00	15.26	10
1.30 - 1.35	20.64	2.93	57.37	2.07	63.27	23.20	10
1.35 - 1.40	14.43	8.00	71.80	3.26	42.63	33.01	8
1.40 - 1.50	8.00	18.04	79.80	4.74	28.20	45.80	5.17
1.50 - 1.60	4.24	28.01	84.04	5.91	20.20	56.80	2.5
1.60 - 1.80	3.63	40.45	87.67	7.34	15.96	64.45	1
+ 1.80	12.33	71.51	100.00	15.26	12.33	71.51	N.A.
Total	100.00	15.26					

T A B L E 7. SEAM #H-2.

SCURRY RAINBOW OIL LTD.

Free Swelling Index

Sp.Gr. \ Size	1 x 1/2"	1/2 x 1/4"	1/4" x 8 m.	8 x 20 m.	20 x 100 m.
- 1.30	10, 10, 10	10, 10, 10	10, 10, 10	10, 10, 10	10, 10, 10
1.30 - 1.35	6½, 7, 7	3½, 3½, 4	4½, 5, 5	7½, 7½, 7½	10, 10, 10
1.35 - 1.40	6, 6, 6	3, 3, 3	3½, 3½, 3½	4, 4, 4	8, 8, 8
1.40 - 1.50	4, 4, 4½	5, 5, 5	4, 4, 4½	4½, 4½, 5	5, 5, 5½
1.50 - 1.60	3, 3½, 3½	2, 2, 2	1½, 1½, 1½	3, 2½, 2½	2½, 2½, 2½
1.60 - 1.80	1½, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1	1, 1, 1
+ 1.80	N.A.	N.A.	N.A.	N.A.	N.A.

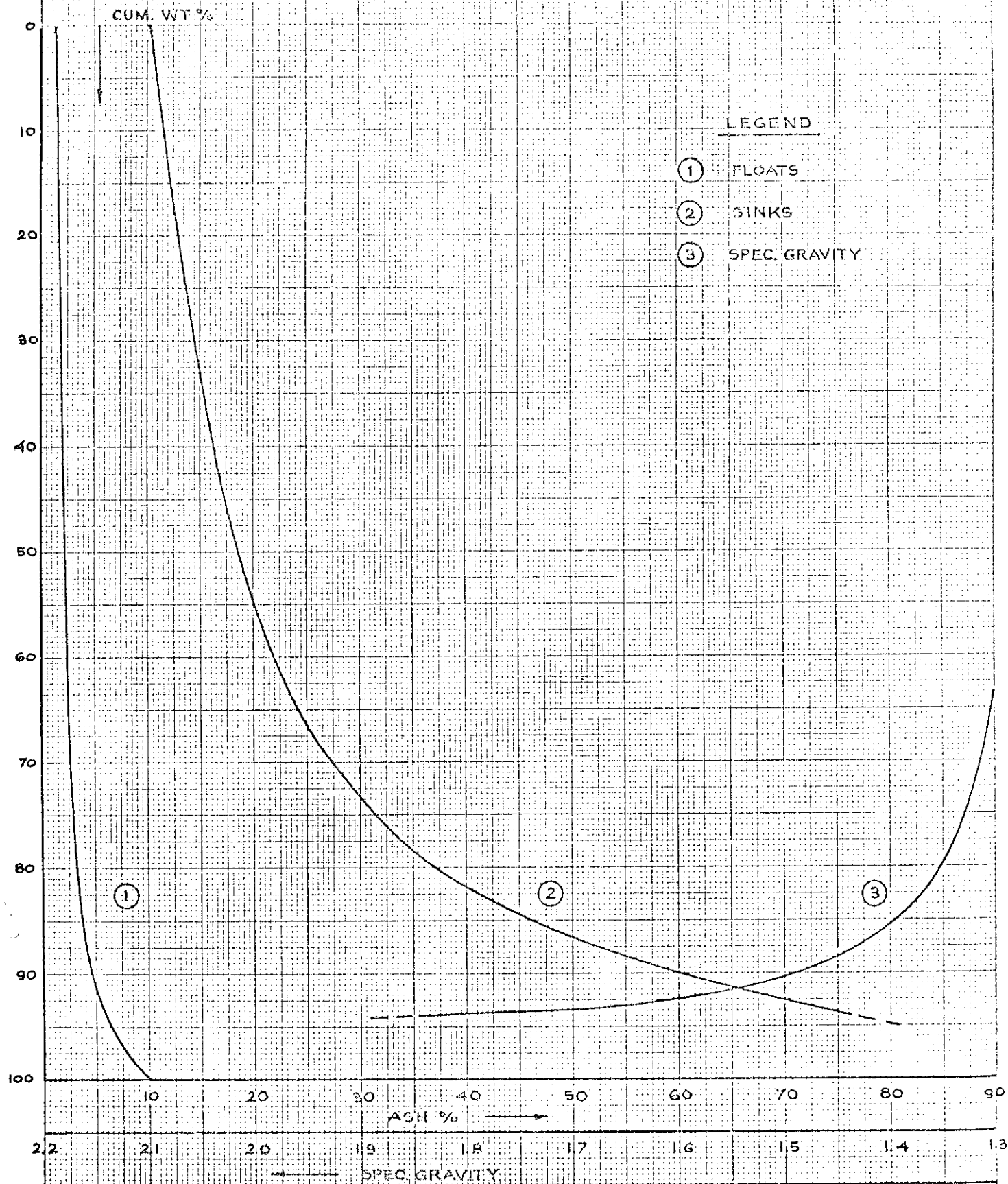
NOTE: F.S.I. on: 2" x 1" is 9½, 9, 9½.

- 100 mesh is 8½, 8, 8.

- 9 -

FIG. 1 SCURRY RAINBOW SEAM # H-2

WASHABILITY CURVES FOR 1" x 20 m.



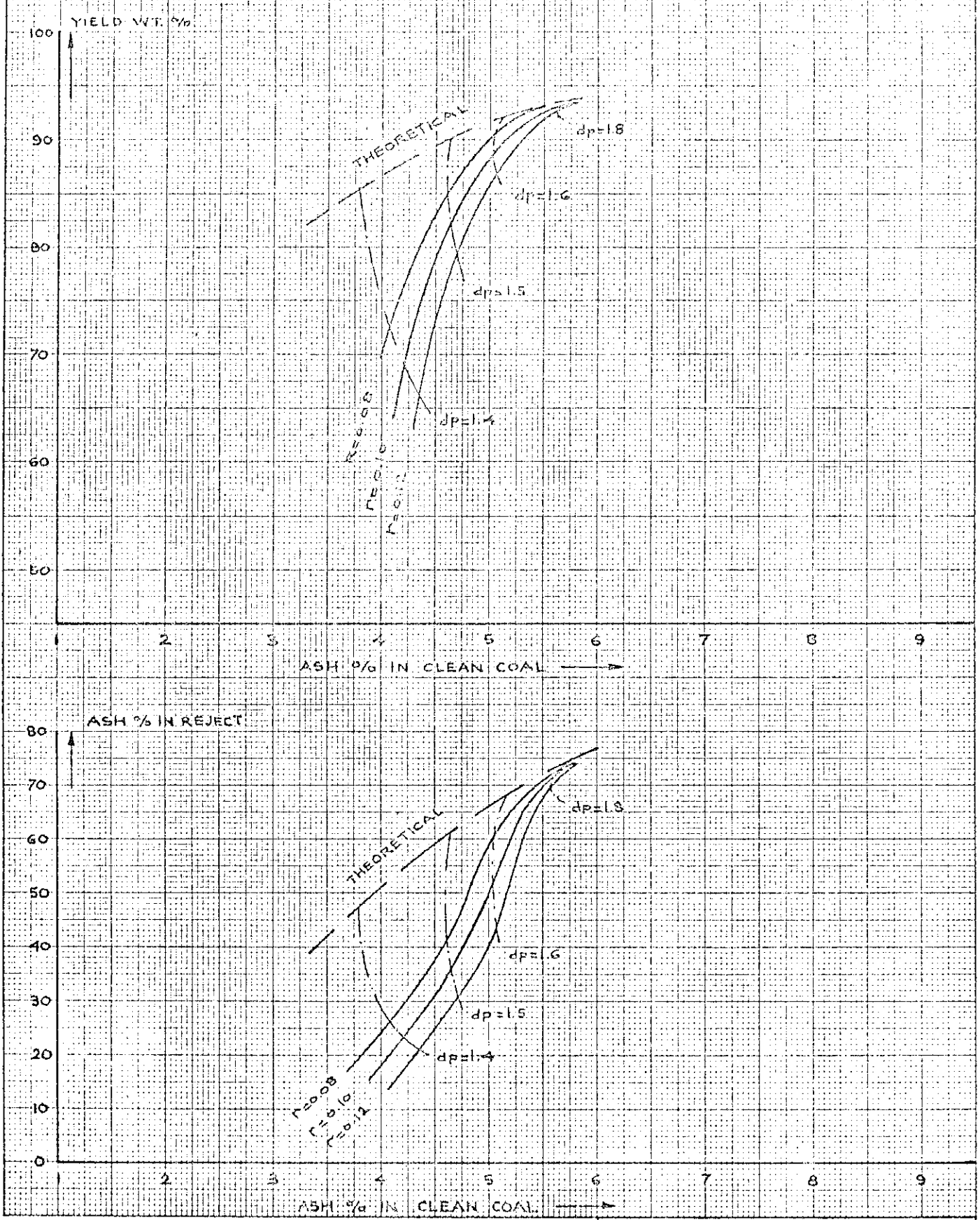
KE 10 X 10 TO THE CENTIMETER 46 1512
 MADE IN U.S.A.
 KEUFFEL & ESSER CO.

LAMAN

CYCLONE ENGINEERING SALES LTD.
 EDMONTON ALBERTA CANADA

FIG. 2 SCURRY RAINBOW SEAM[®] H-2

PERFORMANCE EVALUATION CURVES FOR 1" x 20 m.
(ASH ON RAW 10.13 %)



DEC. 23 /'69

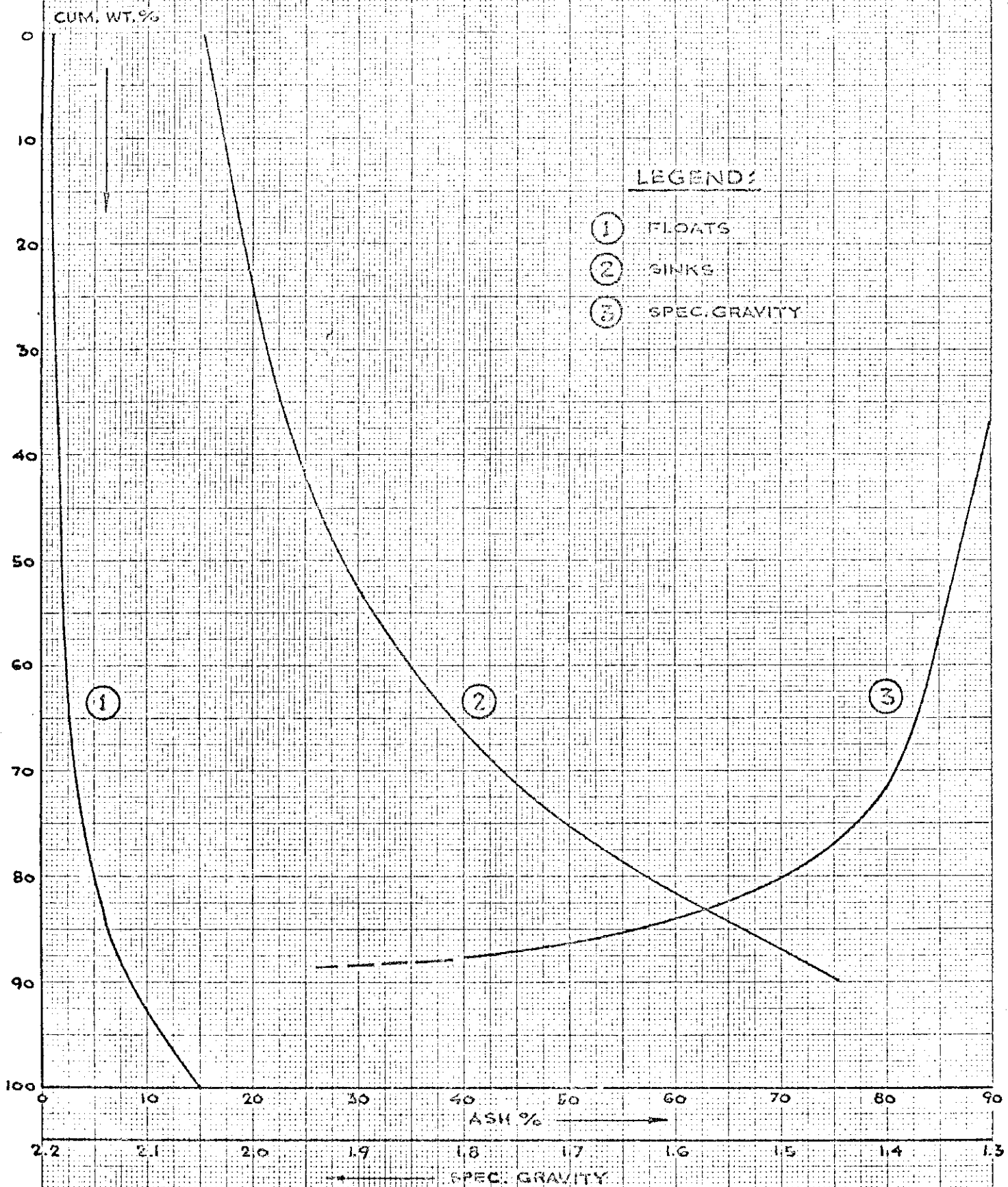
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CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

FIG. 3

SCURRY RAINBOW - SEAM # 4-2

WASHABILITY CURVES FOR 20m x 100m



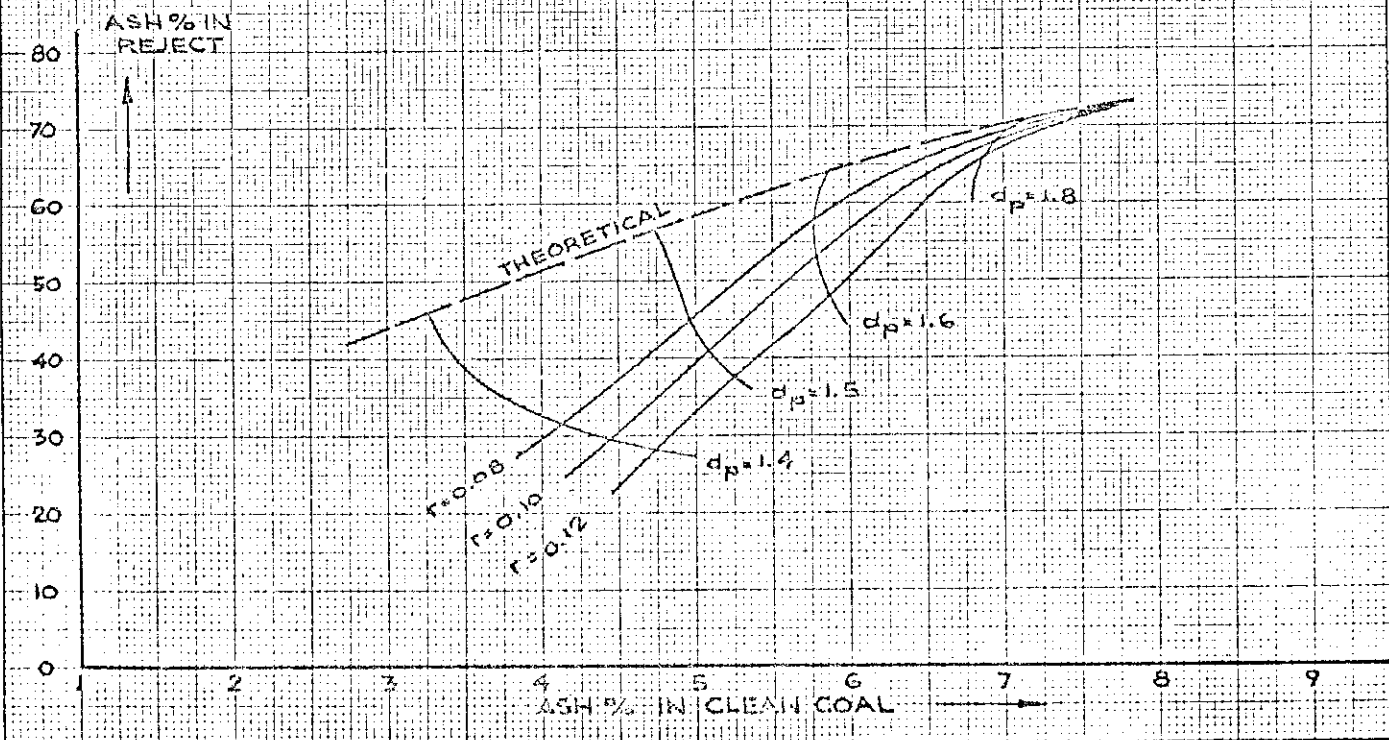
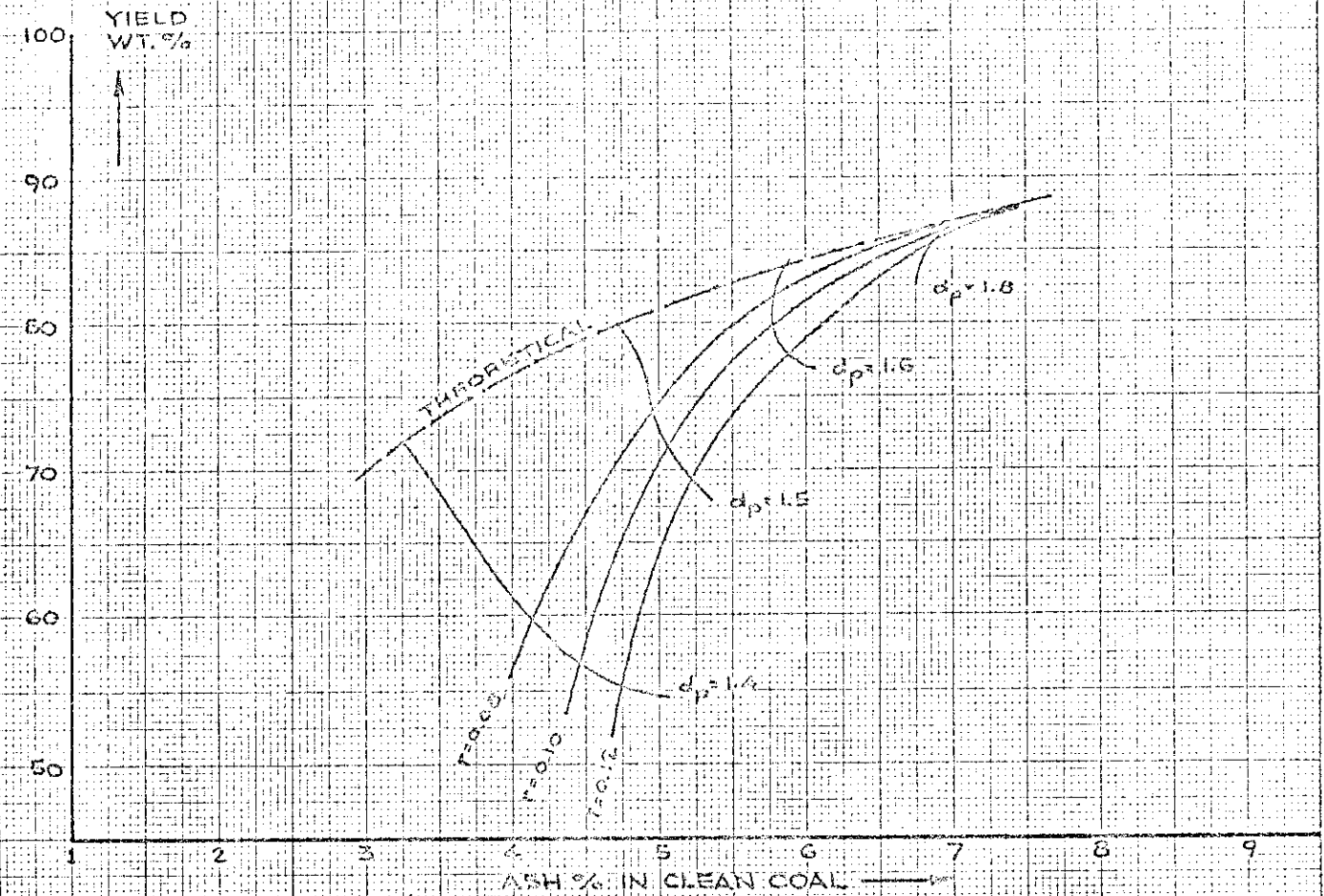
KE 10 X 10 TO THE CENTIMETER 46 1512
10 X 25 CM. MADE IN U.S.A.
KEUFFEL & ESSER CO.

DEC. 23./69 H.SCH.

CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

FIG. 4 SCURRY RAINBOW-SEAM # H-2

PERFORMANCE EVALUATION CURVES FOR 20m x 100m
(ASH ON RAW 15.26%)



KE 10 X 10 TO THE CENTIMETER 46 1512
 MADE IN U.S.A.
 KEUFFEL & ESSER CO.

DEC. 23./69 H. SCH.

CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

SCURRY RAINBOW OIL LIMITED

818 - 814 AVENUE SOUTH WEST
CALGARY 2, ALBERTA

January 12, 1970

Mr. R. W. Lewis, P. Eng.
Inspector of Mines and Resident Engineer
Department of Mines and Petroleum Resources
P.O. Box 1290
Fernie, B. C.

Dear Mr. Lewis:

Please find attached a short report on the coal mining activities of our company in the East Kootenays for the current year as requested in your letter of December 30, 1969.

We received our topographical base maps, prepared from air photos, late in December and are presently compiling our data on these maps.

Washability and metallurgical tests of bulk coal samples taken are nearing completion.

Mr. Stitt and myself were sorry that we were unable to pay our respects in Fernie our last time through when you were in Japan.

All the best in 1970.

Yours very truly,

SCURRY RAINBOW OIL LIMITED

ORIGINAL SIGNED BY
D. M. LANED. M. Lane
Senior Geologist, Non-Metallics

/lb

Attach.

cc: W. C. Croome
W. C. Cheesman

267

SCURRY-RAINBOW OIL LIMITED

(50° - 114° SW)

P. Abt - Executive Vice-President
N. C. Croome - Vice-President and Manager, Mining Division
Head Office - 539 - 8th Avenue, SW
Calgary 2, Alberta

This company held 35 contiguous coal licences Nos. 64 & 65, 421 - 434, 481 - 489, 515 and 771 - 779 comprising approximately 17,000 acres in a block extending along the Elk River from Mosquito Flats to Cadorna Creek. The southern end of this block is located some 40 miles north of Sparwood Junction on the Canadian Pacific Railroad.

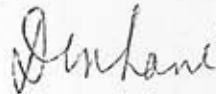
During the period June to October, 1969, an exploration program was conducted by Scurry-Rainbow Oil Limited to obtain additional data, particularly pertaining to coal quality, on Scurry's coal properties on the east side of the Elk River (Phase I) and to explore the potential of the coal measures on the west side of the Elk River.

This program involved 9,646 feet of HQ wireline coring in 16 holes, seven prospect adits driven on coal seams and crosscuts driven on seven seams in an old 630 foot adit for a total of 1,089 feet of tunneling and crosscutting in coal seams, 1,787 cat hours (two D-7E's and one D-8) spent on trenching coal seams, building access roads, preparing diamond drill sites and moving drill equipment.

Bulk samples (1 ton) from 13 seams are currently being analyzed by Cyclone Engineering and Sales of Edmonton under the direction of Dr. T. Visman of the Western Regional Laboratory, Fuels and Research Branch of the Department of Energy Mines and Resources.

Scurry-Rainbow Oil Limited, by an option agreement dated October 15, 1969, granted to Morrison-Knudsen Company Inc. an option to acquire an undivided one-half interest in Scurry's Elk River Coal Holdings. Morrison-Knudsen Company Inc. exercised this option on December 15, 1969 and assigned this option to Emkay Canada Natural Resources Limited.

Plans have been made to form an operating company under the name of Emkay-Scurry Limited.



D. M. Lane

January 12, 1970

/lb

PRELIMINARY MINING STUDY

ELK RIVER COAL RESERVE

SOUTHEASTERN BRITISH COLUMBIA, CANADA

FOR

SCURRY-RAINBOW OIL LIMITED

CALGARY, ALBERTA, CANADA

BY:

John T. Boyd Company
MINING ENGINEERS
PITTSBURGH, PENNSYLVANIA

JUNE 1969

WORK REPORT FOR YEAR ENDING DECEMBER 31/69

By: D. M. Lane, P. Geol., P. Eng.

EXHIBIT "A"

~~CONFIDENTIAL~~

K - ELK RIVER - 69(8)C

CONFIDENTIAL

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

00 267

JOHN T. BOYD COMPANY

MINING ENGINEERS AND GEOLOGISTS

JOHN T. BOYD
PRESIDENT
LARRY D. GENT
EXECUTIVE VICE PRESIDENT

OLIVER BUILDING - MELLON SQUARE
PITTSBURGH, PENNSYLVANIA 15222

PHONE: (412) 281-1219

ROBERT L. FRANTZ
VICE PRESIDENT
A. G. GILBERT
VICE PRESIDENT

July 30, 1969

Scurry-Rainbow Oil Limited
539 Eighth Avenue, S.W.
Calgary 2, Alberta

Attention: Mr. N. C. Croome
Manager, Mining Division

Dear Sirs:

In this cover is our report on a preliminary mining program and costs for strippable coal reserves controlled by Scurry-Rainbow Oil Limited. These reserves are located in the Upper Elk River Coal Field in southeastern British Columbia.

We have scrutinized the exploration data submitted to us by Scurry-Rainbow, established quantity, quality, and overburden ratios for the probable coal reserves, and used this information to develop our mining program.

This report develops the required capital expenditures, labor force, and total operating costs for the following raw coal production levels,

- Case A: 2.0 million annual tons for a 30-year mining period
- Case B: 3.0 million annual tons for a 30-year mining period
- Case C: 4.0 million annual tons for a 15-year mining period.

Cases A and B consider preparing both a steam coal and a metallurgical coal product. A 75% metallurgical coal recovery and a 95% steam coal recovery have been estimated based on the limited amount of quality data available. With respect to the metallurgical coal, it is assumed that all the coal seams are of coking quality.

The estimates for the required capital expenditures and production costs are realistic and based on data to date. However, the exploration program will have to be completed to confirm the coal reserves, quality and the overburden ratio figures used.

Very truly yours,


John T. Boyd
President

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EXHIBITS

- 1: Location of Elk River Coal Reserve
- 2: Scurry-Rainbow Oil Limited Coal License Area
- 3: Geology and Coal Reserves
- 4: Selected Mining Areas in Sequence - Case A and Case C
- 5: Selected Mining Areas in Sequence - Case B
- 6: Cross-sections - Big Weary Ridge
- 6A: Cross-sections - Little Weary Ridge
- 7: Proposed Mining Method

GENERAL STATEMENT

Scurry-Rainbow Oil Limited's controlled coal reserves in the Upper Elk River Coal Field are located in southeastern British Columbia approximately 45 miles north of Sparwood Junction. They consist of 26 contiguous coal licenses totaling 14,080 acres.

Railroad service can be provided by the extension of the Canadian Pacific Railroad line up the valley of the Elk River. Presently there are plans by the railroad to construct a branch line to service a coal development in the Fording River area southeast of the Scurry-Rainbow reserves. This would extend the line to within 35 miles of the plant site on the Scurry-Rainbow lands (see Exhibit 2).

The Scurry-Rainbow - North American Coal exploration program and estimates developed the following data used by the John T. Boyd Company to establish a mining program,

Reserves:	139 million recoverable raw tons
Coal Seams:	20
Overburden:	1,093,630,000 cubic yards
Average Inclination of Seams:	35° to west
Overburden Nature:	Sandstones and shales

In addition, topographic maps (scale, 1" = 1000 ft.) of a large part of the license area and logs of the exploration drill holes were furnished. The maps showed,

- Exploration drill hole locations
- Coal seam exposures (trenches)
- Exploration adit locations
- Inferred and known coal seam outcrops

By assignment, we have developed a mining program for,

<u>Case</u>	<u>Tons/Year^(a)</u>	<u>Life Years</u>	<u>Total Tons^(a)</u>
A	2,000,000	30	60,000,000
B	3,000,000	30	90,000,000
C	4,000,000	15	60,000,000

(a) Raw Coal

Cases A and B consider preparing both steam or metallurgical coal product. Case C considers a metallurgical coal product only. The reserve requirements for the three programs do not mine all of the coal as outlined by the reserve estimates. In locating the initial mining areas, coal thickness, haulage distance, and overburden ratios were considered.

This report applies modern and efficient stripping equipment and techniques, and assumes mine management to be skilled in the use of this type of equipment and a high tons per man operation. The mining plan is a combination of dragline stripping and shovel-truck overburden removal.

The cost of town site, housing and railroad extension are shown in the capital requirement schedule but are not included in the cost schedules or project evaluation.

A 75% metallurgical coal recovery and a 95% steam coal recovery have been estimated based on the limited amount of quality data available. In the metallurgical coal plan, it is assumed that all the coal seams exhibit satisfactory coking characteristics.

The engineer-writers are familiar with strip mining under a variety of conditions and have taken into account that the coal must be mined as cheaply as possible with due consideration to recovery and overall safety of the property.


Respectfully submitted,

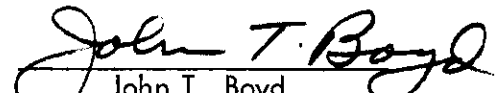
JOHN T. BOYD COMPANY

By:


Max C. Scheble


L. M. Thomas


Robert L. Frantz


John T. Boyd

SUMMARIZED FINDINGS

This summary is complete in itself. The following sections of this report with the exhibits, schedules and tabulations support these summarized statements.

1. The Scurry-Rainbow Oil Limited's controlled coal reserves in the Upper Elk River Coal Field consists of 26 contiguous coal licenses, totaling 14,080 acres located in southeastern British Columbia, approximately 45 miles north of the Canadian Pacific Railroad at Sparwood Junction and approximately 50 miles from Kaiser Resources Limited's Crows Nest coal area.

2. Exploration information to date consists of,

Vertical drill holes - 10 cored	5,535 feet
• 13 no core	7,600 feet
Horizontal drill hole - 1 in adit	1,000 feet
Numerous surface outcrop trench exposures on Big and Little Weary Ridges and adit development in coal seam outcrops.	

* All 13 non-core holes and one core hole logged with gamma-neutron well logging apparatus.

3. Additional exploration work consisting of core drilling, dozer trench exposures, bulk sampling by use of 30-in. diameter coal auger is underway at the present time.

4. Based on the limited data available, the quality of the metallurgical coal (low-volatile, as received basis) is,

4. (Continued)

Ash	%	8.0
Sulphur	%	.6
Moisture	%	6.0
F.S.I.		5 min.

5. This study assumes that all of the coal seams are of metallurgical quality at a preparation plant recovery of 75% for purposes of overburden ratio and mine cost calculations.

6. This study considers the coal reserves as "probable". Additional drilling, testing, and bulk sampling will be required to place the coals in a "proven" metallurgical reserve category.

7. The probable coal reserves by mining areas are,

Area	Recoverable ^(a) Raw Tons (millions)	Overburden Cu. Yds. (millions)	Ratio ^(b)	Clean Coal	
				Met. Tons ^(c) (millions)	Steam Tons ^(d) (millions)
Little Weary	24.90	129.48	5.20	18.67	23.65
Big Weary-North	21.00	122.85	5.85	15.75	19.95
Big Weary-South	94.00	841.30	8.95	70.50	89.30
Totals	<u>139.00</u>			<u>104.92</u>	<u>132.90</u>

(a) Raw tons from pit at 95% mining recovery.

(b) Cubic yards overburden to recoverable tons raw coal.

(c) At 75% cleaning plant recovery.

(d) At 95% rotary breaker recovery.

8. This study considers three raw coal strip mining programs:

	Case A	Case B	Case C
Production, tons per year	2.0 million	3.0 million	4.0 million
Mine Life, years	30	30	15
Required Reserve, tons	60 million	90 million	60 million

9. The Case A and Case B reserve area raw coal tons mined (in millions) and ratio by 15-year periods,

Area	Period	Case A		Case B	
		Tons	Ratio	Tons	Ratio
Little Weary Ridge	1 (0 - 15)	24.9	5.2	24.9	5.2
Big Weary Ridge-North	1 (0 - 15)	5.1	5.2	20.1	5.9
Subtotal	1 (0 - 15)	<u>30.0</u>	<u>5.2</u>	<u>45.0</u>	<u>5.5</u>
Big Weary Ridge-North	2 (16 - 30)	15.9	6.0	-	-
Big Weary Ridge-South	2 (16 - 30)	14.1	9.0	45.0	9.0
Subtotal	2 (16 - 30)	<u>30.0</u>	<u>7.4</u>	<u>45.0</u>	<u>9.0</u>
Total	(0 - 30)	60.0	6.3	90.0	7.3

Note: Case C has the same reserve area as Case A, only the 60.0 million ton coal reserve at a 6.3 ratio is mined in a 15-year period.

10. The overburden stripping will be done by two methods, (a) dragline equipped with a 300 ft. boom direct casting plus rehandling of the spoil, and (b) shovel loading into trucks for transportation. The percentage of overburden handled by each method is,

	Case A (%)	Case B (%)	Case C (%)
Dragline - Period 1	26	16	22.5
Shovel/Truck - Period 1	74	84	77.5
Total - Period 1	<u>100</u>	<u>100</u>	<u>100.0</u>
Dragline - Period 2	19	19	
Shovel/Truck - Period 2	81	81	
Total - Period 2	<u>100</u>	<u>100</u>	

Note: Dragline used for Cases A and B has 24 cu. yd. bucket; for Case C 50 cu. yd. bucket. The truck haul distance with overburden ranges from .75 to 1.25 miles.

11. Coal will be loaded with one 12 cu. yd. electric shovel and one 22 cu. yd. diesel front-end loader for Cases A, B and C. The average haul distance for Cases A and B ranges from 2.8 to 4.2 miles. Weighted average haul distance for Case C is 3.1 miles.
12. This report develops the required initial capital expenditures, plus replacement and mine extension capital, for the metallurgical coal operation in Cases A, B and C as follows:

	<u>Case A</u>	<u>Case B</u>	<u>Case C</u>
Tons per Year, raw coal (millions)	2.00	3.00	4.00
Tons per Year, metallurgical coal (millions)	1.50	2.25	3.00
Period, years	30	30	15
Total Tons, metallurgical coal (millions)	45.0	67.5	45.0
Total Initial Capital Investment ^(a) (000's)	\$30,444	\$35,240	\$43,001
Replacement and Extension Investment (000's)	\$25,366	\$36,181	\$ 9,374
Depreciation per Ton			
Initial Capital	\$0.677	\$0.522	\$0.956
Replacement and Extension	\$0.564	\$0.536	\$0.208

Note: See Schedules A-3, B-3, and C-3 for required capital investment.

13. The total out-of-pocket operating costs and cash flow before British Columbia and federal taxes were developed for two 15-year periods in Cases A and B and for one 15-year period in Case C, as follows:

13. (Continued)

	Case A		Case B		Case C
	1 (0 - 15)	2 (16 - 30)	1 (0 - 15)	2 (16 - 30)	1 (0 - 15)
Realization per Ton, f.o.b. mine	\$8.025	\$8.025	\$8.025	\$8.025	\$8.025
Out-of-Pocket Cost per Ton, f.o.b. mine ^(a)	5.490	6.430	5.453	7.550	5.690
Depreciation					
Initial Capital, per ton	\$0.677	\$0.677	\$0.522	\$0.522	\$0.956
Replacement and Extension, per ton	.564	.564	.536	.536	.208
Net Earnings per Ton ^(a)	\$1.294	\$0.354	\$1.514	(\$0.583)	\$1.171
Cash Flow per Ton ^(a)	\$2.535	\$1.595	\$2.572	\$.475	\$2.335
Net Earnings per Year ^(a) (000's)	\$3,803	\$2,393	\$3,407	(\$1,312)	\$3,513
Cash Flow per Year ^(a) (000's)	\$1,941	\$ 531	\$5,787	\$1,069	\$7,005

(a) Before British Columbia and federal taxes, return on investment or money rental.

14. The mining plan in overburden stripping applied 15 cu. yd. shovels and trucks with 100 ton capacity. This was due to the limited knowledge of the area, steepness of the terrain, and pitching seams. With additional information and study, there is a possibility of increasing the size of overburden shovels to 25 cu. yds. and trucks to 200 ton capacity. In Case C this would increase the initial capital investment by \$500,000 and would lower the mining cost \$0.280 per ton.

15. This report has considered the possibility of power plant fuel for the Upper Elk River Coal Field reserves. It would require a mine mouth or on-site plant with a minimum reserve of 30 years. In lieu of this we have taken Case A and Case B reserves which extend for a 30-year

15. (Continued)

period and converted the raw coal mining cost to a power plant fuel having a 5% reject. The cost per million BTU's, before British Columbia and federal taxes, money rental, and return on investment, are:

	CASE A				CASE B			
	2,000		1,900		3,000		2,850	
	5.2		7.4		5.5		8.95	
	Stripping Ratio							
	Period 1		Period 2		Period 1		Period 2	
	Cost per Net Ton		Cost per Net Ton		Cost per Net Ton		Cost per Net Ton	
	Raw Coal	Steam Coal	Raw Coal	Steam Coal	Raw Coal	Steam Coal	Raw Coal	Steam Coal
Raw Coal Production per Year - Net Tons(000's)								
Steam Coal Production @ 95% Yield								
Stripping Ratio								
Stripping, Coal Loading & Haulage	\$2.068	\$	\$2.634	\$	\$2.080	\$	\$3.347	\$
Auxiliary Mine Services, Drainage, Reclamation, etc.	.180		.180		.180		.180	
Preparation and Loading	.100		.100		.100		.100	
Miscellaneous Services and Labor	.050		.050		.050		.100	
Total Direct Cost - Mining and Preparation	2.398	2.524	2.964	3.120	2.410	2.537	3.727	3.923
Indirect Costs		.420		.470		.370		.420
Total Operating Cost		2.944		3.590		2.907		4.343
Total Administrative Costs		.820		.870		.820		.920
Total		3.764		4.460		3.727		5.263
Contingency (10%)		.376		.446		.373		.526
Total Operating & Administrative Costs		4.140		4.906		4.100		5.789
Depreciation (Excluding Town and Railroad):								
Initial Capital		.446		.446		.348		.348
Extension and Replacement		.406		.406		.391		.391
Total		0.852		0.852		0.739		0.739
Total Cost - (Excluding B. C. and Federal Taxes on Income or Profits):		\$4.992		\$5.758		\$4.839		\$6.528
Cost per Million BTU @ 12,500 BTU's per pound (Cents)		20.0		23.0		19.4		26.1

16. The initial capital investment, replacement and mine extension capital for a steam coal mining operation follows:

	Case A	Case B
Initial Capital (000's)	\$25,444	\$29,740
Replacement and Mine Extension (000's)	23,142	33,430
Total	\$48,586	\$63,170

17. The railroad and town capital installations costs have not been considered in the cost of coal f.o.b. mine. A preliminary estimate is,

Case A	\$14,427,000
Case B	\$16,319,000
Case C	\$17,490,000

There is a possibility that a joint townsite for Fording River and Upper Elk River Coal Fields could be financed through federal funds. The unit train freight rate of \$4.40 per net ton should finance the additional 35 miles of railroad track.

18. Additional exploration work is required to place the coal reserves in a proven metallurgical category.
19. The cash flow and required initial capital investment for the first 15 years of operation for Cases A, B, and C are, (000's)

<u>Case</u>	<u>Ratio*</u>	<u>Cash Flow</u>		<u>Initial Capital</u>	<u>Replacement and Extension Capital</u>
		<u>Annual</u>	<u>Total</u>		
A	5.2	\$3,803	\$57,045	\$30,444	\$ 9,357
B	5.5	5,787	86,805	35,240	11,339
C	6.3	7,005	105,075	43,001	9,374

* Cubic yards of overburden per ton of raw coal.

The above figures show that a minimum-sized operation is Case B, 2.25 million tons of metallurgical coal, and the ratio should be under 6.0.

20. The additional exploration work has a possibility of proving additional coal reserves with a ratio of 6.0 or under, which would be competitive.

21. The dollar figures in this report are expressed in Canadian dollars. The operational cost figures, realization, and required capital dollars are escalated to 1971.

Exhibit 4: Plan Map Scale, 1" = 1000 ft.

Topographic map of the Elk River Coal Reserve; it outlines the selected 30 year mining area for the 2.0 million ton per year plan and the 15 year selected area for the 4.0 million ton per year plan. It shows;

- (a) Location of drill holes, exploration adits, trench exposures and coal outcrops.
- (b) Profile locations.
- (c) Plant site area.
- (d) Main haul roads and dragline access road.
- (e) Dragline and shovel-truck operation areas.
- (f) Mining sequence by periods.

Exhibit 5: Plan Map Scale, 1" = 1000 ft.

Topographic map of the Elk River Coal Reserve; it defines the selected mining area for the 3.0 million ton per year production plan. Shown are,

- (a) Location of drill holes, exploration adits, trench exposures and coal seam outcrops.
- (b) Profile locations.
- (c) Plant site area.
- (d) Main haul roads and dragline access road.
- (e) Dragline and shovel-truck operation areas.
- (f) Mining sequence by periods.

Exhibit 6 Series: Profiles Scale, 1" = 200 ft.

Subsurface profiles constructed across the apparent strike of the coal seams showing,

- (a) Location of coal seams intersected in drill holes, outcrop trenches or adits, as projected from adjacent profiles.
- (b) Exploration drill holes.
- (c) Location of basal Kootenay sandstone member.

Exhibit 7: Plan and Profile

Profile Scale, 1" = 200 ft.
Plan Insert Scale, 1" = 100 ft.

Plan and profile showing proposed mining method. The profile shows the areas where the dragline and shovel-truck operation will strip overburden and expose the coal for loading. The plan inserts show in general the stripping and mining arrangement for dragline and shovel-truck operations.

GEOLOGY AND COAL RESERVES

Location and General:

The Elk River Coal Reserve area controlled by Scurry-Rainbow Oil Limited lies in the northern portion of the Upper Elk River Coal Field, which is a continuation of the well known Crowsnest Coking Coal Field. Geographically, it is situated 45 miles north of Sparwood Junction on the Canadian Pacific Railroad.

The coal license area covered is 12 miles from north to south and from 0.5 to 3.0 miles in an east-west direction and consists of 26 coal licenses aggregating 14,080 acres. Topographically, the coal-bearing area considered in this study ranges from 5200 ft. in elevation in the Elk River Valley to 7200 ft. at the highest point. This coal area is physically divided into two ridges by the Weary Creek drainage which flows into Elk River. The western slopes of the ridges generally range from 10 to 30 degrees in gradient down to the valley of Elk River.

Exhibit 2 of this report locates the total coal license area and the explored area in relation to the existing and proposed rail facilities and to the active Crowsnest Coal Field. The main coal field subdivisions and their respective reserves are shown on Exhibit 3 topographic map.

There is a 138 KV power line and attendant service road in the area. A railroad grade of less than 1% can be extended 35 miles into the site up the broad Elk River Valley where sufficient area is available for mine and townsite facilities.

Geology:

The coal-bearing Kootenay formation underlies a large part of the coal license area, achieving a thickness of as much as 2000 feet. This geologic unit consists of numerous coal seams separated by variable beds of shales and sandstones. Structurally, the beds strike from N 10° W to N 20° W, with dips ranging from 30 to 40 degrees to the west in the study area, forming a line of outcrops on the top and along the western and eastern flanks of Little Weary and Big Weary Ridges, the two principal coal-bearing areas.

The coal beds again outcrop on the west side of Elk River Valley, dipping near vertically where exposed near the Bleadsdell Creek area (see Exhibit 3). This repetition of the Kootenay coal-bearing formation is part of an overthrust fault block, or may be the western limit of a synclinal structure whose east flank is along Big and Little Weary Ridges.

With the limited amount of positive information relative to coal seams on the west side of Elk River Valley, no coal reserves in this area have been considered as of this time.

The seams which have been measured in a vertical section in Coal Creek have not been traced laterally along the outcrop for any distance. The Kootenay formation appears to be present on this side of the river for 9 miles in a northerly direction.

Exhibit 3, plan topographic map, shows the coal seam outcrop traces in the study area and the outcrop base of the coal-bearing (Kootenay) formation.

Although the region is characterized by numerous major thrust faults, locally this coal area appears to be relatively undisturbed by serious faulting. Because of the attitude of the bedding and an apparent weak member, some massive landsliding appears to have occurred on the Big Weary Ridge slopes. Float material, or talus, covers certain coal areas to variable depths (see Exhibit 3).

Exploration and Previous Development:

While the existence of coal in this area has been acknowledged since 1880, the earliest physical development in the Elk River Field began 60 to 70 years ago when several syndicates acquired coal holdings in the area. Around that time, the Northern Coal and Coke Company drove a 650 ft. long adit into Big Weary Ridge for exploration and sampling of the coal beds. During the early 1950's, the West Canadian Collieries Company conducted a program of prospecting and sampling work in the field.

In 1968, Scurry-Rainbow Oil Limited acquired certain coal licenses in the Elk River Field. Following evaluation of all existing information and a preliminary field examination, an exploration program consisting of core drilling, outcrop trenching, and adit driving for bulk samples of the coal seams was set up and carried out. The actual program during the year 1968 and 1969 to date consisted of,

10 - Vertical drill holes (cored)	5,335 ft.
13 - Vertical drill holes (no core)*	7,600 ft.
1 - Horizontal drill hole in adit	1,000 ft.

More than 40 surface outcrop trench exposures on Big and Little Weary Ridges and adit development in coal seam outcrops for sampling (see Exhibits 3, 4 and 5).

* All 13 non-core holes and one core hole logged with gamma-neutron well-logging apparatus.

All of the recent exploration activity was confined to Big and Little Weary Ridges where numerous seams were intersected by the drilling and trenching. Although there are known coal exposures on the west side of Elk River Valley and the Kootenay Formation is present over a long distance, exploration work has just started in this area (see Exhibits 2 and 3). Four angular core drill holes and out-crop exposure work is planned for the 1969 exploration season.

Coal Seams:

The Kootenay Formation in the study area has been found to contain as many as 20 coal seams or main seam splits that achieve a coal thickness of 5 ft. or greater. While all of these seam horizons have been penetrated by drilling, no individual drill hole has penetrated all of the seams. The surface geology from the trench exposures and adits, however, has confirmed the general continuity and constant dip of these seams throughout the study area. The seams do appear to exhibit a considerable variation in thickness laterally from area to area and in the interval between seams. Further core drilling will enable these variations to be more accurately determined.

On Little Weary Ridge, eight seams greater than 5 ft. in thickness have been outlined by the drilling and trenching work. By projection, two to three other seams will be present over a small area between Drill Hole A and the Elk River Valley (see Exhibit 6 profiles for typical coal seam occurrences on Little Weary Ridge). Nearly the entire section of Kootenay coal beds is exposed on Big Weary Ridge where at least 20 coal seams and splits have been traced and tentatively correlated. Exhibit 6A shows two subsurface profiles and the coal seams intersected or projected from nearby drill holes in those areas.

Coal Reserves:

The coal seams outlined by the subsurface drilling and surface trenching program were supplemented by field examination and photogeologic studies of the Kootenay formation in the study area. These seams have been correlated when possible by drill hole projections, surface geology, adits, and outcrop trenches and grouped into three areas, as follows,

Little Weary Ridge:

The area of coal measures east of the Elk River Valley, extending northward from Weary Creek approximately 9500 ft., where the Kootenay (coal-bearing) formation dips below the 5200 elevation and crosses the Elk River Valley.

Big Weary Ridge-North:

The area of coal measures east of Elk River Valley, beginning at Weary Creek and extending south for a distance of 11,500 ft. The area underlain by landslide debris has not been considered in the reserve estimates.

Big Weary Ridge-South:

This area abuts Big Weary-North extending southward to Aldridge Creek and taking in most of the Kootenay formation east of Elk River Valley, with the exception of a probable thin coal - high stripping ratio area adjacent to Elk River Valley.

On the west side of Elk River Valley, in the vicinity of Bleadshell Creek a thick, near vertical, section of coal beds has been measured. While these seams have not been explored to date nor traced for any distance along the strike, the Kootenay formation is known to outcrop on the west side of the valley for a distance of at least 9 miles and, in all probability, will contain strippable coal reserves.

The probable coal reserves, as outlined in each area, can be summarized as follows:

<u>Area</u>	Recoverable* Raw Tons (000's)	Overburden Cu. Yds. (000's)	<u>Ratio**</u>
Little Weary	24,900	129,480	5.20
Big Weary-North	21,000	122,850	5.85
Big Weary-South	<u>94,000</u>	<u>841,300</u>	<u>8.95</u>

* Raw tons from pit at 95% mining recovery.

** Cubic yards overburden to recoverable tons raw coal.

Tabulation 1, Summary of Strippable Coal Reserves, following this text tabulates the coal and overburden quantities by profiles.

Selected Mining Reserves:

Considering a mine life of 30 years, the total recoverable reserves necessary for the three mining programs are,

	<u>Case A</u>	<u>Case B</u>	<u>Case C</u>
Raw Coal Production, tons per year	2.0 million	3.0 million	4.0 million
Mine Life, years	30	30	15
Required Reserve, raw coal tons	60 million	90 million	60 million

The probable total reserves in the area explored to date (see Tabulation 1) are 139 million raw recoverable tons. In all cases, mining begins on Little Weary Ridge where the stripping ratio is lowest and the coal haul is shortest.

Following completion of mining down to the 5200 level in Little Weary, the mining operation will move to Big Weary-North, which also is close to the proposed preparation plant site. Final mining in all cases is conducted on Big Weary-South, mining from the top of the ridge down until the end of the respective

mining period. We have not considered these as reserves in the scope of this study because of the lack of positive information at this time. Exhibit 3 outlines these sub-areas within the overall exploration area.

Reserve Definitions:

In evaluating the coal reserves the basic subsurface profiles prepared by Scurry-Rainbow were used for the reserve work with certain adjustments made as to seam projections and coal seam thicknesses.

The amount of exploration work done to date places the reserves in a "probable" classification. To move them into a "proven" category of metallurgical quality will require additional exploration, sampling and test work.

The reserve definitions are:

Net Tons:

2000 pounds

Raw Recoverable Coal:

Coal mined from the strip pits at 95% recovery. Five percent deduction made for normal pit losses.

Clean Coal (metallurgical quality):

This considers that 75% of the raw recoverable coal feed will be metallurgical coal product.

Clean Coal (steam quality):

This considers 95% of the raw recoverable coal feed will be a steam coal product having 12,500 BTU's per pound.

Thin Coal:

Coal seams less than 5 feet thick were not considered as reserve.

Reserve Cut-off:

Coal below 5200 drainage level was not considered as reserve at this time.

Method of Calculation:

An area of influence of half the distance between adjacent profiles was used in computing the coal and overburden volumes. The thin coal seams were considered as overburden to be handled.

TABULATION 1
 SUMMARY OF STRIPPABLE COAL RESERVES
 ELK RIVER COAL FIELD
 Scurry-Rainbow Oil Ltd.

By
 John T. Boyd Company
 Mining Engineers
 June 1969

Tons and Cubic Yard Figures in Thousands

Profile Area*	No. of Seams	In-Place Tons	Recoverable Tons**		Overburden Cu. Yds.	Ratio***	
			Metallurgical	Steam		Met.	Steam
00+00 to 20+00	1	475	338	451	960	2.9	2.1
20+00 to 40+00	15	11,901	8,479	11,306	154,068	18.2	13.6
40+00 to 60+00	15	26,717	19,036	25,381	179,709	9.4	7.1
60+00 to 80+00	18	33,470	23,847	31,797	243,636	10.2	7.7
80+00 to 100+00	22	22,710	16,181	21,575	211,892	13.1	9.8
100+00 to 120+00	19	11,957	8,519	11,359	106,196	12.5	9.3
120+00 to 140+00	2	160	114	152	2,024	17.7	13.3
140+00 to 160+00	15	2,944	2,097	2,797	14,319	6.8	5.1
160+00 to 180+00	7	3,615	2,576	3,434	19,018	7.4	5.5
180+00 to 200+00	8	6,890	4,909	6,546	31,543	6.4	4.8
200+00 to 220+00	16	5,647	4,023	5,365	29,849	7.4	5.6
220+00 to 240+00	8	8,020	5,714	7,619	42,014	7.4	5.5
240+00 to 260+00	8	6,691	4,767	6,356	30,621	6.4	4.8
260+00 to 280+00	7	4,208	2,998	3,998	24,350	8.1	6.1
280+00 to 300+00	7	<u>1,576</u>	<u>1,123</u>	<u>1,497</u>	<u>1,306</u>	<u>1.2</u>	<u>.9</u>
Totals		146,981	104,721	139,633	1,091,505	10.5	7.8

* Refer to Exhibit 3 for profile locations.

** Based on average pit losses of 5% and plant recovery of 75% for metallurgical coal and 100% for steam coal.

*** Ratio of overburden cubic yards to recoverable tons clean coal.

Notes: Basic profile and seam data based on Scurry-Rainbow profiles and measurements with some refinements and additions by John T. Boyd Company.
 Reserves calculated to 5200 elevation.
 Seams less than 5 feet in thickness not included in tabulation.

MINING OPERATION

Metallurgical Coal

Mining Plan

The mining plan considers the joint application of draglines and shovels. The terrain is suited to dragline application along the top portion of Big Weary Ridge where the spoil can be placed in the valley to the east and along the lower portions of Big and Little Weary Ridges where the spoil can be placed in the valley to the west. A combination shovel loading and truck haulage of the overburden material is planned for the areas not practical for dragline application.

This report develops a mining program for,

<u>Case</u>	<u>Tons per Year</u>	<u>Years Life</u>	<u>Total Tons*</u>
A	2,000,000	30	60,000,000
B	3,000,000	30	90,000,000
C	4,000,000	15	60,000,000

* Raw coal

Note: Cases A and B consider preparing a steam or metallurgical coal product; Case C considers metallurgical coal only.

Exhibit 4 shows the proposed dragline and shovel-truck operating areas for Cases A and C and Exhibit 5 for Case B.

Initial mining in Cases A and B starts on Little Weary Ridge. This area has the benefit of lower overburden ratio (5.2 : 1), more favorable haulage grades, and shorter truck haulage to the plant. However, in Case C multiple areas are developed to average out the overburden ratios.

The overburden is composed of hard shales and sandstones and must be drilled and blasted. The drilling of the overburden will be with 60R type rotary drills (15 in. diameter blast hole). Ammonium nitrate/fuel oil will be used for blasting.

In Cases A and B the dragline operation consists of a 24 cu.yd. dragline having a 300 ft. boom. In Case C the dragline applied is a 50 cu.yd. machine with a 310 ft. boom. A 7 cu.yd. auxiliary diesel dragline will be utilized for bench preparation, road building, drainage, minor rehandling, and miscellaneous work. The dragline bench depth is limited to approximately 25 ft. by the reach of the 22 cu.yd. front-end coal loader.

Initially, the dragline will be located at the top of the No. 10 Seam outcrop on Little Weary Ridge from a dragline access road at approximately the 5600 ft. elevation above the dragline stripping area. In successive cuts of 25 ft. depth, the No. 10 Seam will be exposed and removed. When the No. 10 Seam lower stripping limits are reached, the dragline will walk along the coal haulage road and the dragline access road to the upper dragline position on the No. 9 Seam. Successive seams will be removed in a like manner.

The overburden shovel operation consists of 15 cu.yd. rock-shovels dumping into 105 ton end-dump trucks. Initial work will be applied along the upper elevations of Little Weary Ridge. Benches 30 ft. high will be extracted, beginning at the top levels and worked downward. The rock overburden will be hauled to waste disposal areas located to the north of the coal reserves (west side of ridge) and north of the main coal haulage road (east

side of ridge). The main rock disposal roads along the strike of the mountain at approximately 200 ft. elevation intervals will be connected to feeder roads from the benches.

A 22 cu.yd. front-end loader and a 12 cu.yd. shovel are utilized for loading coal into 100-ton coal trucks. The coal haulage roads down the mountain to the preparation plant have a 5% to 8% grade in the Little Weary Ridge area and a 5% to 10% grade in the Big Weary Ridge area.

The raw coal will be dumped into a truck hopper at the preparation plant.

Exhibits 4 and 5 of this report show the main haul roads, spoil roads, dragline and shovel-truck operation areas on Big and Little Weary Ridges. Exhibit 6, 6A and 7 cross-sections and mining plan show the typical overall mining sequence with a general arrangement of the stripping and coal loading operations.

Preparation (Metallurgical Coal)

The metallurgical coal preparation plant will have a rated raw coal tons per hour feed capacity of 650 in Cases A and B and 675 in Case C and be designed with two independent parallel circuits. The machinery will be sized to provide a 15% safety factor to compensate for surges in plant feed and allow for size gradation in the raw coal storage silo.

To process 2.0 million raw coal tons per year, the plant is scheduled to operate two shifts per day, 230 days per year, and will produce 1.5 million tons per year metallurgical grade product. The plant maintenance will be accomplished on the third shift each day.

To process 4.0 million tons per year, the feed rate to the plant will be increased to 675 tons per hour. The plant will be programmed to operate three shifts per day, 320 days per year, and will produce 3.0 million tons per year metallurgical grade product. The plant maintenance will be accomplished on alternate circuits, one shift each day.

The quality of the metallurgical coal (low volatile, as received basis) based on the limited amount of sampling data available is,

Ash	%	8.0
Sulphur	%	.6
Moisture	%	6.0
F.S.I.		5 min.

The plant also has the capability of producing a middling steam coal in addition to metallurgical grade coal. The steam coal product will have the following quality (as received basis),

Ash	%	20 to 30
Moisture	%	7 to 8
BTU's		10,000 to 11,200

The annual production of steam fuel will vary depending upon the coal seams. An accurate determination of the yield will require further study; an approximate estimate of the quantity is 5% of the raw coal feed to the plant.

The essential elements of the preparation plant and the method of coal preparation are,

<u>Section</u>	<u>Type</u>	<u>Size Feed</u>	<u>Tons per Hour</u>
Coarse Coal	Heavy Med. Vessels	1-1/2" x 3/8"	265
Fine Coal	Heavy Med. Vortex Vessels	3/8" x 28 M	285
Ultra Fine Coal	Froth Flotation	28 M x 0	100
Thermal Drying	Fluid Bed Dryers	3/8" x 0	375
Water Treatment	Closed Water Circuit	200 ft. dia. thickener and vacuum filters	
Raw Coal Storage	1 - 70 ft. dia. Concrete Silo	12,000 ton capacity*	
Coal Storage	2 - 70 ft. dia. Concrete Silos	20,000 ton capacity	
Loading-Out Facilities	Unit Train Load		4000

* For the 3.0 million ton and 4.0 million ton plans, the raw coal storage will be increased to 24,000 ton capacity.

Transportation and Port Facilities

The coal will be transported from the Upper Elk River Coal Field to the Roberts Bank Port, a distance of 745 miles, via the Canadian Pacific Railroad. Provisions have been made for unit train shipment with a load-out rate of 4000 tons per hour.

At the present time the railroad would have to be extended up the Elk River from the Sparwood Junction a distance of 45 miles. Plans are underway to extend the railroad into the Fording River Coal Field which would provide 10 miles along the Elk River (see Exhibit 2). The estimated unit train freight rate used in this report is \$4.40 (Can.) per net ton.

Westshore Terminals Ltd., a wholly-owned subsidiary of Kaiser Resources, Ltd., are constructing the Roberts Bank deep water port which is located 18 miles south of Vancouver and serviced by the Canadian Pacific Railroad. This port will accommodate ships up to 150,000 tons capacity and have a load-out rate of 6000 tons per hour.

Westshore Terminals Ltd. are obligated to handle bulk coal for other shippers. The estimated port charge used in this report is \$0.625 per net ton.

Following this text are tabulations and schedules based on a metallurgical coal product for Cases A, B and C,

		<u>Case</u>		
		<u>A</u>	<u>B</u>	<u>C</u>
Basic Production Data	Tabulation	A-3	B-3	C-3
Estimated Labor Force and Costs, Period 1,	Schedule	A-1	B-1	C-1
Estimated Stripping and Mining Cost	Schedule	A-2	B-2	C-2
Estimated Capital Expenditures	Schedule	A-3	B-3	C-3
Estimated Cash Flow and Earnings	Schedule	A-4	B-4	C-4

TABULATION A-3

PRODUCTION DATA - CASE A
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969

Period:	<u>1 (0 - 15 years)</u>	<u>2 (16 - 30 years)</u>
Annual Tons Raw Coal	2.0 M	2.0 M
Annual Tons Clean Coal	1.5 M	1.5 M
Total Tons Raw Coal	30.0 M	30.0 M
Total Overburden, cubic yards	156.0 M	222.3 M
Ratio (cu.yds. overburden to raw coal ton)	5.2	7.4
 <u>Overburden</u>		
Dragline:	1 (24 cu.yd.)	1 (24 cu.yd.)
Days per Year	320	320
Shifts per Year	960	960
Cubic Yards per Shift ^(a)	4,700	4,700
Total Virgin Cubic Yards per Year	2.7 M	2.82 M.
 Shovel-Truck		
Shovels:	2 (15 cu. yd.)	3 (15 cu. yd.)
Days per Year	230	320
Shovel Shifts per Year	1,335	2,080
Cubic Yards per Shovel Shift	5,760	5,760
Total Cubic Yards per Year	7.7 M	12.0 M
Truck Fleet	12 (100 ton)	12 (100 ton)
Truck Shifts per Year	5,780	7,250
Trucks Required per Shift	9	10
Cubic Yards per Truck Shift	1,332	1,656
Haulage Distance, miles	1.25	0.75
 <u>Coal Loading</u>		
Loading Units ^(b)	2	2
Days per Year	230	230
Shifts per Day	2	2
Loading Unit Shifts per Year	920	920
Truck Fleet	5	5
Trucks Required	4	4

(a) Includes 68% rehandle.

(b) 12 cu. yd. Shovel and 22 cu. yd. front-end loader.

M = Million

SCHEDULE A-1
CASE A

ESTIMATED LABOR FORCE AND COSTS
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By

John T. Boyd Company

Mining Engineers

June 1969

(Canadian Dollars)

Production: 2,000,000 Net Tons Raw Coal per Year

1,500,000 Net Tons Clean Coal per Year

	Period 1 - Stripping Ratio 5.20		
	No. Man- Shifts/Year	Dollars per Year	Equiv. Men @ 230 Man- Shifts/Year
<u>*MINE SUPERINTENDENT & STAFF:</u>			
*Mine Superintendent	230		1.0
Maintenance Superintendent	230		1.0
Preparation Plant Superintendent	230		1.0
General Mine Foreman	230		1.0
Mining Engineer	230		1.0
Electrical Engineer	230		1.0
Assistant Mining Engineer	230		1.0
Industrial Engineer	230		1.0
Purchasing Agent	230		1.0
Mine Accountant	230		1.0
Payroll and Cost Clerks	230		1.0
Laboratory - Samplers	230		1.0
Rodmen	230		1.0
Stenographers and Clerks	460		2.0
Subtotal	3,450	208,000	15.0
<u>WAREHOUSE & GENERAL OUTSIDE:</u>			
*Storekeeper	230	11,000	1.0
Warehousemen	460	14,400	2.0
Laborers	460	14,100	2.0
Miscellaneous Service and Labor	460	14,100	2.0
Subtotal	1,610	53,600	7.0
<u>PREPARATION PLANT, STORAGE & LOADOUT:</u>			
*Foreman	460	24,000	2.0
Preparation Plant Operator	920	31,600	4.0
Dryer Operator	460	15,800	2.0
Utility Men	2,300	73,600	10.0
Refuse Hauler	460	15,200	2.0
Loadout Man	460	14,600	2.0
Labor	920	28,200	4.0
Subtotal	6,440	217,600	28.0

SCHEDULE A-1 Continued
CASE A

	<u>No. Man- Shifts/Year</u>	<u>Dollars per Year</u>	<u>Equiv. Men @ 230 Man- Shifts/Year</u>
<u>OVERBURDEN STRIPPING, COAL LOADING AND HAULAGE:</u>			
*Foremen	1,380	72,000	6.0
Dragline Operator (24 cu.yd.)	960	38,000	4.2
Assistant Dragline Operator (24 cu.yd.)	960	33,200	4.2
Dragline Oiler and Ground Man (24 cu.yd.)	960	27,700	4.2
Dragline Operator (7 cu.yd.)	250	9,900	1.1
Shovel Operator - Stripping	1,335	48,900	5.8
Shovel Oiler - Stripping	1,335	41,500	5.8
Driller	2,000	70,400	8.7
Drill Oiler	2,000	61,300	8.7
Truck Drivers - Stripping	5,780	204,600	25.1
Front-end Loader Operator-Coal Loading	460	16,400	2.0
Shovel Operator - Coal Loading	460	16,800	2.0
Truck Driver - Coal Hauling	1,840	65,100	8.0
Powder Men	1,250	41,400	5.5
General Pit Labor, Dumpmen	2,250	69,100	9.7
Subtotal	<u>25,980</u>	<u>914,600</u>	<u>113.0</u>
<u>AUXILIARY SERVICES:</u>			
*Foremen	230	12,000	1.0
Water Truck Driver	250	8,300	1.1
Motor Grader Operator	250	8,300	1.1
Fuel Truck Operator	250	8,300	1.1
Lubrication Truck Operator	250	8,300	1.1
Snow Removal Equipment Operator	320	10,600	1.4
Subtotal	<u>1,550</u>	<u>55,800</u>	<u>6.8</u>
<u>LAND RECLAMATION:</u>			
Tractor Operator	250	8,900	1.1
Dump Truck and Laborer	250	8,100	1.1
Reseeding, etc.	250	8,100	1.1
Subtotal	<u>750</u>	<u>25,100</u>	<u>3.3</u>
<u>MAINTENANCE:</u>			
*Foremen	1,380	72,000	6.0
Mechanics	9,300	321,800	40.5
Electricians	1,550	53,600	6.8
Welders, General, etc.	3,150	109,000	13.6
Subtotal	<u>15,380</u>	<u>556,400</u>	<u>66.9</u>

SCHEDULE A-1 Continued
CASE A

	<u>No. Man- Shifts/Year</u>	<u>Dollars per Year</u>	<u>Equiv. Men @ 230 Man- Shifts/Year</u>
Total Wage Personnel (Straight Time)	48,030	1,632,100	205.7
Overtime Allowance (5% of Cost @ Time and One-Half)	<u>1,585</u>	<u>81,700</u>	
Total Wage Cost	49,615	1,713,800	
*Salaried Personnel	<u>7,130</u>	<u>399,000</u>	<u>31.0</u>
Total Wage and Salary Personnel	56,745	2,112,800	241.0
	<u>Wage</u>	<u>Salary</u>	<u>Total</u>
Tons Clean Coal per Man-Shift	30.2	210.4	26.4
Cost per Net Ton Clean Coal	\$1.143	\$0.266	\$ 1.409
Average Cost per Man Shift	\$34.54		
Number of Men	210	31	241

Note: Labor costs based on 1971 rates adjusted for 25% fringe benefits.

SCHEDULE A-4
CASE A

ESTIMATED CASH FLOW EARNINGS PROJECTION
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969
(Canadian Dollars)

Period:	<u>1 (0 - 15 Years)</u>	<u>2 (16 - 30 Years)</u>
Annual Production:		
Raw Coal - Net Tons	2,000,000	2,000,000
Clean Coal - Net Tons	1,500,000	1,500,000
Ratio	5.2	7.4
	<u>Clean Coal</u>	<u>Clean Coal</u>
	<u>per Net Ton</u>	<u>per Net Ton</u>
Realization at Port*	\$13.050	\$13.050
Freight and Port Charges*	5.025	5.025
Realization at Mine*	8.025	8.025
Production Cost	5.490	6.430
Cash Flow**	2.535	1.595
Depreciation	1.241	1.241
Net Earnings**	1.294	0.354
	<u>Dollars per Year (000's)</u>	
Cash Flow Before Taxes	\$ 3,803	\$ 2,393
Net Earnings Before Taxes	1,941	531

* Based on estimated coal realization adjusted to 1971 level and freight charges.

** Before B.C. Mine Tax and Federal Income Tax.

SCHEDULE A-2
CASE A

ESTIMATED STRIPPING AND MINING COSTS
(Canadian Dollars)
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969
(Net Tons and Cubic Yards in Thousands)
(Except Unit Costs)

Unit	Period 1 (0-15 Years)					Period 2 (16-30 Years)				
	Annual Volume	Unit Costs		Annual Cost	Clean Coal Cost per Net Ton	Annual Volume	Unit Costs		Annual Cost	Clean Coal Cost per Net Ton
		Overburden per Bank Cu. Yd.	Raw Coal per Net Ton				Overburden per Bank Cu. Yd.	Raw Coal per Net Ton		
Clean Coal Production (75% yield)	Net Tons	1,500	\$	\$	\$	\$			\$	\$
Raw Coal Production	Net Tons	2,000				2,000				
Direct Costs:										
Stripping - Dragline:										
Amount of Overburden Removed	Virgin Bank Cubic Yards	2,700				2,820				
Coal Exposed	Net Tons	493				380				
Drilling and Blasting	Bank Cu. Yds.	2,700	0.126	0.693	340	2,820	0.126	0.934	355	-
Overburden Removal	Virgin Bank Cu. Yds.	2,700	.145	.800	392	2,820	.200	1.484	564	-
Subtotal - Dragline		2,700	.271	1.493	732	2,820	.326	2.418	919	-
Stripping - Shovel & Truck Units:										
Overburden Removed	Bank Cu. Yds.	7,700				12,000				
Coal Uncovered	Net Tons	1,507				1,620				
Drilling and Blasting	Cubic Yards	7,700	.126	.643	970	12,000	.126	.934	1,512	-
Shovel Loading	Cubic Yards	7,700	.064	.326	493	12,000	.064	.474	768	-
Haulage and Road Maintenance	Cubic Yards	7,700	.177	.903	1,363	12,000	.114	.844	1,368	-
Subtotal - Shovel & Truck Units		7,700	.367	1.872	2,826	12,000	.367	2.252	3,648	-
Stripping Composite:										
Drilling and Blasting	Bank Cu. Yds.	10,400	.126	.655	1,310	14,820	.126	.934	1,867	-
Overburden Removal	Virgin Bank Cu. Yds.	10,400	.085	.442	885	14,820	.090	.666	1,332	-
Haulage	Bank Cu. Yds.	10,400	.131	.681	1,363	14,820	.092	.684	1,368	-
Total Stripping -		10,400	.342	1.778	3,538	14,820	.359	2.284	4,567	-
Coal Loading	Net Tons Raw Coal	2,000	-	.100	200	2,000	-	.100	200	-
Coal Hauling & Road Maintenance	Net Tons Raw Coal	2,000	-	.190	380	2,000	-	.250	500	-
Subtotal - Stripping, Coal Loading & Haulage			-	2.068	4,138		-	2.634	5,267	-
Bench devel., Drainage, Roads, etc.			-	.050	100		-	.050	100	-
Auxiliary Mine Services & Labor - General Labor, unallocated maintenance, warehouse, snow removal, etc.			-	.100	200		-	.100	200	-
Reclamation	Net Tons Raw Coal		-	.030	60		-	.030	60	-
Preparation:										
Washing, drying & loading	Net Tons Raw Coal		-	.500	1,000		-	.500	1,000	-
Miscellaneous Services & Labor			-	.050	100		-	.050	100	-
Total - Direct Costs				2.798	5,598			3.364	6,727	4.485
Indirect Costs:										
Mine Overhead and Supervision			-	-	\$ 450	\$0.300	-	-	\$ 525	\$0.350
UMWA Welfare Fund			-	-	105	.070	-	-	105	.070
Exploration			-	-	75	.050	-	-	75	.050
Total - Indirect Costs					630	0.420			705	0.470
Total - Operating Costs					\$6,228	\$4.151			\$7,432	\$4.955
Administrative Costs:										
Selling, General Administrative Expense					375	0.250			375	0.250
Insurance					30	.020			30	.020
Property and Land Taxes					450	.300			450	.300
Sampling and Weighing at Harbor					30	.020			30	.020
Royalties					375	.250			450	.300
Total Administrative Costs					1,260	0.840			1,335	0.890
Total Operating & Administrative Costs					7,488	4.991			8,767	5.845
Contingencies (10%)					749	.499			877	.585
Total - Operating and Administrative Costs					\$8,237	\$5.490			\$9,644	\$6.430
Depreciation*										
Initial						\$0.677				\$0.677
Extension and Replacement						.564				.564
Total - Depreciation					1,862	1.241			1,862	1.241
TOTAL COST (Excluding British Columbia & Federal Taxes on Income or Profits)					\$10,099	\$6.731			\$11,506	\$7.671

* Excluding Railroad and Town Depreciation of \$0.283 per ton.

SCHEDULE A
CASE A

ESTIMATED CAPITAL EXPENDITURES
(Canadian Dollars)
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969
(Dollars in Thousands)

Production: 2,000,000 Tons per Year Raw Coal
1,500,000 Tons per Year Clean Coal

Period:	Item	Years Life	Initial	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
A.	Preparation Plant, Truck Dump, Raw Coal Conveyor, Raw & Clean Coal Storage & Loading Facilities	20	\$7,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,625	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,625	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
B.	MINE SITE DEVELOPMENT: Including Exploration, Pre-production Shipping	30	1,265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C.	MINE ROADS	30	865	-	-	-	-	-	-	-	-	-	-	-	300*	-	-	-	-	-	-	-	-	-	-	300*	-	-	-	-	-	-	-	-	
D.	MAINTENANCE & SUPPLY FACILITIES: Shop, Garage, Warehouse and Equipment	20	1,160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	1 - Water Truck, 10,000 gal.	8	135	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1 - Truck Crane	15	108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1 - Shop Truck	8	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Misc. Trucks and Cars	6	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Subtotal - Item D		1,517	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E.	OTHER OUTSIDE FACILITIES: Office and equipment	20	125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Central heating plant	20	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total - Item E		325	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F.	OIL, GREASE & FUEL BUILDINGS	20	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G.	EXPLOSIVE MAGAZINE	20	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H.	DRAINAGE	10	15	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I.	STRIPPING EQUIPMENT: 1 - 24 Cu. Yd. Dragline, 1260W-Type	20	3,678	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1 - 7 Cu. Yd. Utility Dragline, 182 M-Type	20	541	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2 - 15 Cu. Yd. Rock Shovels, 191M or 280B-Type	20	1,600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12 - Rock Trucks, 100-ton cap.	8	2,880	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3 - 60-H Rotary Drills	20	1,215	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1 - 45-H Rotary Drill	20	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5 - D-9 Caterpillar Dozers	6	570	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total - Item I		10,784	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
J.	COAL LOADING AND HAULAGE: 1 - 12 Cu. Yd. Coal Shovel, Type 151-M	20	430	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1 - 22 Cu. Yd. Front-end Loader	6	236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5 - 100-ton Coal Trucks	8	1,200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2 - Dozers, rubber-tired	6	178	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1 - Road Grader, Caterpillar 16	10	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1 - Snow Removal Equipment	10	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total - Item J		2,194	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K.	SERVICE UTILITIES & POWER DISTRIBUTION: Including power line relocation	20	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
L.	MISCELLANEOUS: Engineering, development, legal and overhead during construction		730	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Interest during construction (7-1/2%)		1,931	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total - Item L		2,661	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Subtotal - Items A thru K		27,676	-	-	-	-	-	-	-	-	-	-	-	300	1,104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Contingency (10%)		2,768	-	-	-	-	-	-	-	-	-	-	-	30	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GRAND TOTAL		530,444	-	-	-	-	-	-	-	-	-	-	-	\$ 300	\$1,214	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Town Site and Housing		5,200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Railroad Extension, 33 miles		7,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Town and Railroad Interest (7-1/2%)		915	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Town and Railroad Contingency (10%)		1,312	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Subtotal - Town and Railroad		14,427	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Grand Total - Initial Capital Expenditures		\$44,871	-	-	-	-	-	-	-	-	-	-	-	\$ 300	\$1,214	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Mine Extension Requirements.

Note: Capital costs are based on estimated 1971 prices in Canadian funds.

Depreciation

	Mining Operation		Mining Operation, Town & Railroad	
	Dollars (000's)	Per Ton	Dollars (000's)	Per Ton
Initial	30,444	\$0.677	44,871	\$0.997
Extension & Replacement	25,366	0.564	25,366	0.564
Total	55,810	\$1.241	70,237	\$1.561

TABULATION B-3

PRODUCTION DATA - CASE B
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969

Period:	<u>1 (0 - 15 years)</u>	<u>2 (16 - 30 years)</u>
Annual Tons Raw Coal	3.0 M	3.0 M
Annual Tons Clean Coal	2.25 M	2.25 M
Total Tons Raw Coal	45.0 M	45.0 M
Total Overburden, Cubic yards	247.5 M	402.7 M
Ratio (cu.yds. overburden to raw coal ton)	5.50	8.95
 <u>Overburden</u>		
Dragline:	1 (24 cu.yd.)	1 (24 cu.yd.)
Days per Year	320	320
Shifts per Year	960	960
Cubic Yards per Shift ^(a)	4,700	4,700
Total Virgin Cubic Yards per Year	2.70 M	2.82 M
Shovel-Truck		
Shovels:	3 (15 cu.yd.)	5 (15 cu.yd.)
Days per Year	320	320
Shovel Shifts per Year	2,400	4,170
Cubic Yards per Shovel Shift	5,760	5,760
Total Cubic Yards per Year	13.08 M	24.03 M
Truck Fleet	15 (100 ton)	25 (100 ton)
Truck Shifts per Year	9,430	16,415
Trucks Required per Shift	12	21
Cubic Yards per Truck Shift	1,464	1,464
Haulage Distance, miles	1.00	1.00
 <u>Coal Loading</u>		
Loading Units ^(b)	2	2
Days per Year	230	230
Shifts per Day	3	3
Loading Unit Shifts per Year	1,380	1,380
Truck Fleet	5	5
Trucks Required	4	4

(a) Includes 68% rehandle.

(b) 12 cu.yd. Shovel and 22 cu.yd. front-end loader.

M = Million

SCHEDULE B-1
CASE B

ESTIMATED LABOR FORCE AND COSTS
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969

(Canadian Dollars)

Production: 3,000,000 Net Tons Raw Coal per Year
2,250,000 Net Tons Clean Coal per Year

	Period 1 - Stripping Ratio 5.5		
	No. Man- Shifts/Year	Dollars per Year	Equiv. Men @ 230 Man- Shifts/Year
<u>*MINE SUPERINTENDENT & STAFF:</u>			
Mine Superintendent	230		1.0
Maintenance Superintendent	230		1.0
Preparation Plant Superintendent	230		1.0
General Mine Foreman	230		1.0
Mining Engineers	230		1.0
Electrical Engineer	230		1.0
Assistant Mining Engineer	460		2.0
Industrial Engineer	230		1.0
Purchasing Agent	230		1.0
Mine Accountant	230		1.0
Payroll and Cost Clerks	460		2.0
Laboratory and Samplers	230		1.0
Rodmen	460		2.0
Stenographers and Clerks	460		2.0
Subtotal	4,140	240,000	18.0
 <u>WAREHOUSE & GENERAL OUTSIDE:</u>			
*Storekeeper	230	11,000	1.0
Warehousemen	460	14,400	2.0
Laborers	460	14,100	2.0
Miscellaneous Services and Labor	460	21,200	3.0
Subtotal	1,840	60,700	8.0
 <u>PREPARATION PLANT, STORAGE AND LOADOUT</u>			
*Foremen	690	36,000	3.0
Preparation Plant Operator	1,380	47,500	6.0
Dryer Operator	690	23,600	3.0
Utility Men	2,760	88,200	12.0
Refuse Hauler	690	22,800	3.0
Loadout Man	690	21,900	3.0
Crusher Operator	690	21,900	3.0
Labor	1,150	35,300	5.0
Subtotal	8,740	297,200	38.0

SCHEDULE B-1 - Continued
CASE B

	<u>Period 1 - Stripping Ratio 5.5</u>		
	<u>No. Man- Shifts/Year</u>	<u>Dollars per Year</u>	<u>Equiv. Men @ 230 Man- Shifts/Year</u>
<u>OVERBURDEN STRIPPING, COAL LOADING AND HAULAGE:</u>			
*Foremen	1,840	96,000	8.0
Dragline Operator (24 cu.yd.)	960	38,000	4.2
Assistant Drag Operator (24 cu.yd.)	960	33,200	4.2
Dragline Oiler & Ground Man (24 c.y.)	960	27,700	4.2
Dragline Operator (7 cu.yd.)	960	38,000	4.2
Shovel Operator - Stripping	2,400	87,800	10.4
Shovel Oiler - Stripping	2,400	74,500	10.4
Driller	3,175	111,800	13.8
Driller Oiler	3,175	97,300	13.8
Truck Drivers - Stripping	9,430	333,800	40.8
Front-end Loader Operator(Coal Loading)	690	24,600	3.0
Shovel Operator - (Coal Loading)	690	25,300	3.0
Truck Driver - (Coal Hauling)	2,760	97,700	12.0
Powder Men	1,950	64,500	8.5
Dozer Operator	3,220	114,600	14.0
General Pit Labor, Dumpmen	3,040	93,300	13.2
Subtotal	<u>38,610</u>	<u>1,358,100</u>	<u>167.7</u>
<u>AUXILIARY SERVICE:</u>			
*Foremen	460	24,000	2.0
Water Truck Driver	375	12,400	1.6
Motor Grader Operator	375	12,400	1.6
Fuel Truck Operator	375	12,400	1.6
Lubrication Truck Operator	375	12,400	1.6
Snow Removal Equipment Operator	320	10,600	1.4
Subtotal	<u>2,280</u>	<u>84,200</u>	<u>9.8</u>
<u>LAND RECLAMATION:</u>			
Tractor Operator	375	13,400	1.6
Dump Truck and Laborer	375	12,200	1.6
Reseeding, etc.	375	12,200	1.6
Subtotal	<u>1,125</u>	<u>37,800</u>	<u>4.8</u>
<u>MAINTENANCE:</u>			
*Foremen	2,070	108,000	9.0
Mechanics	14,000	484,400	61.1
Electricians	2,200	76,100	9.6
Welders, General, etc.	4,600	159,200	20.0
Subtotal	<u>22,870</u>	<u>827,700</u>	<u>99.7</u>

SCHEDULE B-1 - Continued
CASE B

	Period 1 - Stripping Ratio 5.5		
	No. Man- Shifts/Year	Dollars per Year	Equiv. Men @ 230 Man- Shifts/Year
Total Wage Personnel (straight time)	70,175	2,390,700	
Overtime Allowance (5% of cost at Time and One-half)	<u>2,315</u>	<u>119,500</u>	
Total Wage Cost	72,490	2,510,200	
*Salaried Personnel	<u>9,430</u>	<u>515,000</u>	
Total Wage and Salary Personnel	81,920	3,025,200	

	Wage	Salary	Total
Tons Clean Coal per Man Shift	31.0	238.6	27.5
Cost per Net Ton Clean Coal	\$1.116	\$0.229	\$1.345
Average Cost per Man Shift	\$34.63		
Number of Men	305	41	346

Note: Labor costs based on 1971 rates adjusted for 25% fringe benefits.

SCHEDULE B-2
CASE B

ESTIMATED STRIPPING AND MINING COSTS
(Canadian Dollars)
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969

(All Figures in Thousands Except Unit Costs)

	Unit	Period 1 (0-15 Years)				Period 2 (16-30 Years)					
		Annual Volume	Unit Costs		Annual Cost	Clean Coal per Net Ton	Annual Volume	Unit Costs		Annual Cost	Clean Coal per Net Ton
			Overburden per Bank Cu. Yd.	Raw Coal per Net Ton				Overburden per Bank Cu. Yd.	Raw Coal per Net Ton		
Clean Coal Production (75% Yield)	Net Tons	2,250				2,250					
Raw Coal Production	Net Tons	3,000				3,000					
Direct Costs:											
<u>Stripping-Drumline:</u>											
Overburden Removed	Virgin Bank Cu. Yds.	2,700				2,820					
Coal Exposed	Net Tons	493				315					
Drilling and Blasting	Bank Cu. Yds.	2,700	\$0.126	\$0.693	\$ 340	2,820	\$0.126	\$1.128	\$ 355		
Overburden Removal	Virgin Bank Cu. Yds.	2,700	.145	.800	392	2,820	.200	1.790	564		
Subtotal - Drumline	Virgin Bank Cu. Yds.	2,700	.271	1.493	732	2,820	.326	2.918	919		
<u>Stripping-Shovel & Truck Units</u>											
Overburden Removed	Bank Cu. Yds.	13,800				24,030					
Coal Exposed	Net Tons	2,507				2,685					
Drilling and Blasting	Bank Cu. Yds.	13,800	.126	.693	1,739	24,030	.126	1.128	3,028		
Shovel Loading	Bank Cu. Yds.	13,800	.064	.352	883	24,030	.064	.573	1,538		
Haulage and Road Maintenance	Bank Cu. Yds.	13,800	.146	.803	2,015	24,030	.146	1.307	3,508		
Subtotal - Shovel & Truck Units	Bank Cu. Yds.	13,800	.336	1.848	4,637	24,030	.336	3.008	8,074		
<u>Stripping Composite:</u>											
Drilling and Blasting	Bank Cu. Yds.	16,500	.126	.693	2,079	26,850	.126	1.128	3,383		
Overburden Removal	Virgin Bank Cu. Yds.	16,500	.077	.426	1,275	26,850	.078	.700	2,102		
Haulage	Bank Cu. Yds.	16,500	.122	.672	2,015	26,850	.131	1.169	3,508		
Total Stripping	Bank Cu. Yds.	16,500	.325	1.790	5,369	26,850	0.335	2.997	8,993		
Coal Loading	Net Tons Raw Coal	3,000		0.100	300	3,000		0.100	300		
Coal Hauling & Road Maintenance	Net Tons Raw Coal	3,000		.190	570	3,000		.250	750		
Subtotal - Stripping, Coal Loading & Haulage				2.080	6,239			3.347	10,043		
Bench Devel., Drainage, Roads, etc.	Net Tons Raw Coal	3,000		0.050	150			0.050	150		
Auxiliary mine services & labor - general labor, unallocated maintenance, warehouse, snow removal, etc.				.100	300			.100	300		
Reclamation				.030	90			.030	90		
Preparation				.500	1,500			.500	1,500		
Miscellaneous Services & Labor				.050	150			.100	300		
Total - Direct Costs (Mining & Preparation)				\$2.810	\$8,429	\$3.747		\$4.127	\$12,383	\$5.504	
<u>Indirect Costs:</u>											
Mine Overhead and Supervision					563	.250			675	.300	
UMWA					158	.070			158	.070	
Exploration					113	.050			113	.050	
Total - Indirect Costs					834	3.70			946	.420	
Total - Operating Costs					9,263	4.117			13,329	5.924	
<u>Administrative Costs:</u>											
Selling, General Admin. Expense					563	.250			563	.250	
Insurance					45	.020			45	.020	
Property and Land Taxes					675	.300			675	.300	
Sampling and Weighing at Harbor					45	.020			45	.020	
Royalties					563	.250			788	.350	
Total Administrative Costs					1,891	.840			2,116	.940	
Total Operating & Administrative Costs					\$11,154	\$4.957			\$15,445	\$6.864	
Contingency (10%)					1,115	.496			1,545	.686	
Total - Operating and Administrative Costs					12,269	5.453			16,990	7.550	
<u>Depreciation:*</u>											
Initial Capital						0.522				0.522	
Extension and Replacement Capital						.536				.536	
Total - Depreciation					2,381	1.058			2,381	1.058	
TOTAL COST -(Excluding British Columbia and Federal Taxes on Income or Profits)					\$14,650	\$6.511			\$19,371	\$8.608	

* Excluding railroad and town depreciation of \$0.217 per ton.

SCHEDULE
CASE B

ESTIMATED CAPITAL EXPENDITURES
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1989
(Canadian Dollars)
(In Thousands)

Production: 3,000,000 Tons per Year Raw Coal
2,250,000 Tons per Year Clean Coal

Periods:	Years Life	Initial Capital	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
A. Preparation Plant, Truck Dumps, Raw Coal & Clean Coal Storage, and Loadout Facilities	20	\$7,800	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,950	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$1,950	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
B. MINE SITE DEVELOPMENT Including Exploration, Pre-production Stripping	30	1,720	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
C. MINE ROADS	30	865	-	-	-	-	-	-	-	300*	-	-	-	-	-	-	300*	-	-	-	-	-	-	-	100*	-	-	-	
D. MAINTENANCE & SUPPLY FACILITIES																													
Shop, Garage & Warehouse, Equip.	20	1,328	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1 - Water Truck, 10,000 gal.	8	113	-	-	-	-	-	-	-	-	-	113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1 - Truck Crane	15	108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	108	-	-	-	-	-	-	-	-	-	-	-	
1 - Shop Truck	8	16	-	-	-	-	-	-	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Misc. Trucks and Cars	6	120	-	-	-	-	-	-	-	-	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total - Item D		1,685	-	-	-	-	-	-	-	120	-	129	-	-	-	-	108	-	129	-	-	-	170	-	-	-	-	120	-
E. OTHER OUTSIDE FACILITIES																													
Office and equipment	20	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Central heating plant	20	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total - Item E		350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
F. OIL, GREASE & FUEL BUILDINGS	20	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
G. EXPLOSIVES MAGAZINE	20	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
H. DRAINAGE	10	15	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
I. STRIPPING EQUIPMENT																													
1 - 24 cu. yd. Dragline	20	3,478	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1 - 7 cu. yd. Dragline	20	541	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3 - 15 cu. yd. Rock Shovels	20	2,400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
15 - 105-ton Rock Trucks	8	3,600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4 - 60-R Rotary Drills	20	1,620	-	-	-	-	-	-	-	-	-	3,600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1 - 45-R Diesel-Electric Drill	20	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7 - D-9 Caterpillar Dozers	6	798	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total - Item I		12,937	-	-	-	-	-	-	-	798	-	3,600	-	-	-	-	(2*) 228	-	-	-	-	-	798	-	-	-	-	-	
J. COAL LOADING & HAULAGE																													
1 - 12 cu. yd. Coal Shovel	20	430	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1 - 22 cu. yd. Front-end Loader	6	236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5 - 100-ton Coal Trucks	8	1,200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2 - Dozers, rubber-tired	6	178	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1 - Road Grader, Caterpillar 16	10	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1 - Snow Removal equipment	10	30	-	-	-	-	-	-	-	-	-	-	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total - Item J		2,194	-	-	-	-	-	-	-	414	-	1,200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
K. Service Utilities & Power Distribution, Including Power Line Relocation	20	1,100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
L. MISCELLANEOUS																													
Engineering, Development, Legal, and Overhead during Construction		1,100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Interest during construction (7-1/2%)		2,233	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total - Item L		3,333	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal - Items A through L		32,036	-	-	-	-	-	-	1,332	300	4,929	-	2,115	-	1,332	-	300	5,146	4,929	-	1,332	-	3,606	228	100	2,100	5,029	-	
Contingency (10%)		3,204	-	-	-	-	-	-	133	30	493	-	212	-	133	-	30	515	493	-	133	-	361	23	10	210	503	-	
TOTALS		35,240	-	-	-	-	-	-	1,465	330	5,422	-	2,327	-	1,465	-	330	5,661	5,422	-	1,465	-	3,967	251	110	2,310	5,532	-	
Town Site and Housing		\$ 6,800																											
Railroad Extension, 35 miles		7,000																											
Town and Railroad Interest (7-1/2%)		1,035																											
Town and Railroad Contingency (10%)		1,484																											
Total Town Site and Railroad		16,319																											
Grand Total - Initial Capital Expenditures		\$51,559																											

* Mine Extension Requirements.

Note: Capital costs are based on estimated 1971 prices in Canadian funds.

	Mining Operation		Mining Operation, Town & Railroad	
	Dollars (000's)	Per Ton	Dollars (000's)	Per Ton
Initial	35,240	\$0.522	51,559	\$0.764
Extension & Replacement	36,181	.536	36,181	.536
Total	71,421	\$1.058	87,740	\$1.300

SCHEDULE B-4
CASE B

ESTIMATED CASH FLOW EARNINGS PROJECTION
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969
(Canadian Dollars)

Period:	<u>1 (0 - 15 Years)</u>	<u>2 (16 - 30 Years)</u>
Annual Production:		
Raw Coal - Net Tons	3,000,000	3,000,000
Clean Coal - Net Tons	2,250,000	2,250,000
Ratio	5.5	9.0
	<u>Clean Coal</u> <u>per Net Ton</u>	<u>Clean Coal</u> <u>per Net Ton</u>
Realization at Port*	\$13.050	\$13.050
Freight and Port Charges*	5.025	5.025
Realization at Mine*	8.025	8.025
Production Cost	5.453	7.550
Cash Flow**	2.572	0.475
Depreciation	1.058	1.058
Net Earnings**	1.514	(0.583)
	<u>Dollars per Year (000's)</u>	
Cash Flow Before Taxes	\$5,787	\$1,069
Net Earnings Before Taxes	\$3,407	(\$1,312)

* Based on estimated coal realization adjusted to 1971 level and freight charges.

** Before B. C. Mine Tax and Federal Income Tax.

TABULATION C-3

PRODUCTION DATA - CASE C
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969

Period:	<u>1 (0 - 15 years)</u>
Annual Tons Raw Coal	4.0 M
Annual Tons Clean Coal	3.0 M
Total Tons Raw Coal	60.0 M
Total Overburden, cubic yards	378.3 M
Ratio (cu. yds. overburden to raw coal ton)	6.30
<u>Overburden</u>	
Dragline:	1 (50 cu. yd.)
Days per Year	320
Shifts per Year	960
Cubic Yards per Shift ^(a)	9,700
Total Virgin Cubic Yards per Year	5.52 M
Shovel-Truck	
Shovels:	4 (15 cu. yd.)
Days per Year	320
Shovel Shifts per Year	3,410
Cubic Yards per Shovel Shift	5,760
Total Cubic Yards per Year	19.7 M
Truck Fleet	21 (100 ton)
Truck Shifts per Year	13,100
Trucks Required per Shift	14
Cubic Yards per Truck Shift	1,500
Haulage Distance, miles	0.95
<u>Coal Loading</u>	
Loading Units ^(b)	2
Days per Year	320
Shifts per Day	3
Loading Unit Shifts per Year	1,920
Truck Fleet	5
Trucks Required	4

(a) Includes 68% rehandle.

(b) 12 cu. yd. Shovel and 22 cu. yd. front-end loader.

M = Million

SCHEDULE C-1
CASE C

ESTIMATED LABOR FORCE AND COSTS
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969
(Canadian Dollars)

Production: 4,000,000 Net Tons per Year Raw Coal
3,000,000 Net Tons per Year Clean Coal

15-Year Period - Stripping Ratio 6.3

	<u>No. Man- Shifts/Year</u>	<u>Dollars per Year</u>	<u>Equiv. Men @ 230 Man- Shifts/Year</u>
<u>*MINE SUPERINTENDENT & STAFF:</u>			
Mine Superintendent	230		1.0
Preparation Plant Superintendent	230		1.0
Maintenance Superintendent	230		1.0
General Mine Foreman	230		1.0
Mining Engineer	230		1.0
Electrical Engineer	230		1.0
Assistant Mining Engineer	460		2.0
Industrial Engineer	230		1.0
Purchasing Agent	230		1.0
Mine Accountant	230		1.0
Payroll Cost Clerks	690		3.0
Laboratory and Smaplers	690		3.0
Rodmen	460		2.0
Stenographers and Clerks	920		4.0
Subtotal	<u>5,290</u>	<u>289,000</u>	<u>23.0</u>
<u>WAREHOUSE & GENERAL OUTSIDE:</u>			
*Storekeeper	230	11,000	1.0
Warehousemen	960	30,100	4.2
Laborers	1,600	49,100	7.0
Misc. Service and Labor	1,600	49,100	7.0
Subtotal	<u>4,390</u>	<u>139,300</u>	<u>19.2</u>

SCHEDULE C-1- Continued
CASE C

	<u>No. Man- Shifts/Year</u>	<u>Dollars per Year</u>	<u>Equiv. Men @ 230 Man- Shifts/Year</u>
<u>PREPARATION PLANT STORAGE AND LOADOUT:</u>			
*Foreman	960	48,000	4.0
Prep Plant Operator	1,920	66,000	8.4
Dryer Operator	960	33,000	4.2
Utility Men	1,920	61,400	8.4
Refuse Hauler	960	31,800	4.2
Loadout Man	960	30,400	4.2
Crusher Oper. and Raw Coal Storage Labor	960	29,500	4.2
Subtotal	<u>9,600</u>	<u>330,500</u>	<u>41.8</u>
<u>OVERBURDEN STRIPPING, COAL LOADING AND HAULING:</u>			
*Foremen	1,920	96,000	8.0
Dragline Operator (50 cu.yd.)	960	38,000	4.2
Assistant Dragline Operator (50 cu.yd.)	960	33,200	4.2
Dragline Oiler & Ground Man (50 cu.yd.)	960	29,700	4.2
Dragline Operator (7 cu.yd.)	960	38,000	4.2
Shovel Operator - Stripping	3,410	124,800	14.8
Shovel Oiler - Stripping	3,410	106,100	14.8
Driller	4,800	169,000	20.8
Driller - Oiler	4,800	147,100	20.8
Truck Drivers - Stripping	13,100	463,700	57.0
Front-end Loader Operator-Coal Loading	960	34,200	4.2
Shovel Operator - Coal Loading	960	35,100	4.2
Truck Driver - Coal Hauling	3,840	135,900	16.7
Powder Men	3,200	105,900	14.0
Dozer Operator	4,800	170,900	20.8
General Pit Labor, Dumpmen	4,160	127,700	18.1
Subtotal	<u>53,200</u>	<u>1,855,300</u>	<u>231.0</u>
<u>AUXILIARY SERVICE:</u>			
*Foremen	640	36,000	3.0
Water Truck Driver	640	21,200	2.8
Motor Grader Operator	640	21,200	2.8
Fuel Truck Operator	640	21,200	2.8
Lubrication Truck Operator	640	21,200	2.8
Snow Removal Equipment Operator	320	10,600	1.4
Subtotal	<u>3,520</u>	<u>131,400</u>	<u>15.6</u>
<u>LAND RECLAMATION:</u>			
Tractor Operator	500	17,800	2.2
Dump Truck and Laborer	500	16,300	2.2
Reseeding, etc.	500	16,300	2.2
Subtotal	<u>1,500</u>	<u>50,400</u>	<u>6.6</u>

SCHEDULE C-1 Continued
CASE C

	<u>No. Man- Shifts/Year</u>	<u>Dollars per Year</u>	<u>Equiv. Men @ 230 Man- Shifts/Year</u>
<u>MAINTENANCE:</u>			
*Foremen	2,760	144,000	12.0
Mechanics	19,000	657,400	80.5
Electricians	3,000	103,800	13.0
Welders, General	6,200	214,500	27.0
Subtotal	30,960	1,119,700	132.5
Total Wage - Personnel(straight time)	96,660	3,291,600	
Overtime Allowance (5% of Cost @ Time and One Half)	3,200	164,600	
Total Wage Cost -	99,860	3,456,200	
*Salaried Personnel	11,800	624,000	
Total Wage & Salary Personnel:	111,660	4,080,200	
	<u>Wage</u>	<u>Salary</u>	<u>Total</u>
Tons Clean Coal per Man Shift	30.04	254.2	26.9
Cost per Net Ton Clean Coal	\$1.152	\$0.208	\$1.360
Average Cost per Man Shift	\$34.61		
Number of Men	419	51	470

Note: Labor Costs based on 1971 rates adjusted for 25% fringe benefits.

SCHEDULE C-2
CASE C

ESTIMATED STRIPPING AND MINING COSTS
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969
(Canadian Dollars)

(All Figures in Thousands Except Unit Costs and Ratio)

Production: 4,000,000 Net Tons Raw Coal per Year
3,000,000 Net Tons Clean Coal per Year

	Unit	Annual Volume	Period 1 (0-15 Years)			Cost per Net Ton Clean Coal
			Unit Costs		Annual Cost	
			Overburden Bank Cu. Yds.	Raw Coal Net Tons		
Clean Coal Production	Net Tons	3,000				
Raw Coal Production	Net Tons	4,000				
Stripping Ratio	Cu. Yds./Net Ton Raw Coal	6.3				
Direct Costs:						
Stripping - Dragline:						
Amount of Overburden Removed	Virgin Bank Cu. Yds.	5,520				
Coal Exposed	Net Tons	873				
Ratio		6.32				
Drilling and Blasting	Bank Cu. Yds.	5,520	\$0.126	\$0.797	\$ 696	\$
Overburden Removal	Virgin Bank Cu. Yds.	5,520	.099	.625	546	
Subtotal - Dragline		5,520	.225	1.422	1,242	
Stripping - Shovel and Truck Units:						
Overburden Removed	Bank Cu. Yds.	19,700				
Coal Exposed	Net Tons	3,127				
Ratio		6.3				
Drilling and Blasting	Cu. Yds.	19,700	.126	.793	2,482	
Shovel Loading	Cu. Yds.	19,700	.064	.403	1,261	
Haulage and Road Maintenance (0.95 Miles)	Cu. Yds.	19,700	.140	.882	2,758	
Subtotal - Shovel & Truck Units		19,700	.330	2.078	6,501	
Stripping Composite:						
Drilling and Blasting	Bank Cu. Yds.	25,220	.126	.795	3,178	
Overburden Removal	Virgin Bank Cu. Yds.	25,220	.072	.452	1,807	
Haulage (0.95 Miles)	Bank Cu. Yds.	25,220	.109	.690	2,758	
Subtotal - Stripping			.307	1.937	7,743	
Coal Loading	Net Tons Raw Coal	4,000		.100	400	
Coal Hauling and Road Maintenance	Net Tons Raw Coal	4,000		.220	880	
Subtotal - Stripping, Coal Loading & Haulage				2.256	9,023	
Bench Development, Drainage, Roads, etc.				.050	200	
Auxiliary mine services and labor, general labor, unallocated maintenance, warehouse, snow removal, etc.	Net Tons Raw Coal			.100	400	
Reclamation	Net Tons Raw Coal			.030	120	
Preparation:						
Washing, Drying and Loading	Net Tons Raw Coal			.500	2,000	
Miscellaneous Services and Labor	Net Tons Raw Coal			.050	200	
Total - Direct Costs Mining and Preparation	Net Tons Raw Coal			\$2.986	\$11,943	\$3.981
Indirect Costs:						
Mine Overhead and Supervision					720	.240
UMWA Welfare Fund					210	.070
Exploration					150	.050
Total - Indirect Costs					1,080	.360
Total - Operating Costs					\$13,023	\$4.341
Administrative Costs:						
Selling, General Administrative Expense					750	.250
Insurance					60	.020
Property and Land Tax					800	.267
Sampling and Weighing at Harbor					60	.020
Royalties					825	.275
Total - Administrative Costs					2,495	.832
Total - Operating and Administrative					15,518	5.173
Contingencies (10%)					1,552	.517
Total - Operating and Administrative					17,070	5.690
Depreciation:						
Initial						.956
Extension and Replacement						.208
Total - Depreciation					3,492	1.164
TOTAL COST -					\$20,562	\$6.854

SCHEDULE C-3
CASE C
ESTIMATED CAPITAL EXPENDITURES
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969
(Canadian Dollars In Thousands)

Production: 4,000,000 Tons per Year Raw Coal
3,000,000 Tons per Year Clean Coal

Periods:	Years	Initial	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Totals
Item	Life	Capital																
A. Preparation Plant, Truck Dump, Raw & Clean Coal Storage, and Railroad Load-out Facilities.	15	\$ 8,100	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 810	\$ -	\$ -	\$ -	\$ -	\$ 8,910
B. MINE SITE DEVELOPMENT Including Exploration, Pre-production Stripping	15	2,150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,150
C. MINE ROADS	15	865	-	-	-	-	-	300*	-	-	-	-	300*	-	-	-	-	1,465
D. MAINTENANCE & SUPPLY FACILITIES Shop, Garage and Warehouse Equipment	15	1,500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,500
1 - Water Truck, 10,000 gal. capacity	8	113	-	-	-	-	-	-	-	-	113	-	-	-	-	-	-	226
1 - Truck Crane	15	108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	108
1 - Shop Truck	8	16	-	-	-	-	-	-	-	-	16	-	-	-	-	-	-	32
Miscellaneous Vehicles	6	130	-	-	-	-	-	-	130	-	-	-	-	-	130	-	-	390
Total - Item D		1,867	-	-	-	-	-	-	130	-	129	-	-	-	130	-	-	2,256
E. OTHER OUTSIDE FACILITIES Office and Equipment	15	175	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	175
Central Heating Plant	15	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200
Total - Item E		375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	375
F. OIL, GREASE & FUEL BUILDINGS	15	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30
G. EXPLOSIVES MAGAZINE	15	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
H. DRAINAGE	10	15	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-	30
I. STRIPPING EQUIPMENT 1 - 50 cu. yd. Dragline, 310 ft. boom	15	5,800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,800
1 - 7 cu. yd. Dragline	15	541	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	541
4 - 15 cu. yd. Rock Shovels	15	3,200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,200
21 - 105-ton Rock Trucks	8	(14) 5,040	-	-	-	-	-	-	-	(14) 3,360	-	-	-	-	-	-	-	8,400
5 - 60-R Rotary Drills	15	2,025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,025
1 - 45-R Diesel-Electric Drill	15	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300
7 - D-9 Type Dozers	6	912	-	-	-	-	-	-	912	-	-	-	-	-	275	-	-	2,099
Total - Item I		17,818	-	-	-	-	-	-	912	-	3,360	-	-	-	275	-	-	22,365
J. COAL LOADING AND HAULAGE 1 - 12 cu. yd. Coal Shovel, 151-M Type	15	430	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	430
1 - 22 cu. yd. Frontend Loader	6	236	-	-	-	-	-	-	236	-	-	-	-	-	120	-	-	592
6 - 100-ton Coal Trucks	8	1,440	-	-	-	-	-	-	-	-	1,440	-	-	-	-	-	-	2,880
2 - Rubber-tired Dozers	6	178	-	-	-	-	-	-	178	-	-	-	-	-	36	-	-	392
1 - Road Grader	10	120	-	-	-	-	-	-	-	-	-	-	120	-	-	-	-	240
Snow Removal Equipment	10	30	-	-	-	-	-	-	-	-	-	-	30	-	-	-	-	60
Total - Item J		2,434	-	-	-	-	-	-	414	-	1,440	-	150	-	156	-	-	4,594
K. POWER DISTRIBUTION Service Utilities and Power Distribution, including power line relocation.	15	1,400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,400
L. MISCELLANEOUS Engineering, Development, Legal, and Overhead during Construction		1,300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,300
Interest during Construction (7-1/2%)		2,727	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,727
Total - Item L		4,027	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,027
Subtotal - Items A through L:		39,091	-	-	-	-	-	300	1,456	-	4,929	-	1,275	-	561	-	-	47,612
Contingency (10%)		3,910	-	-	-	-	-	30	146	-	493	-	128	-	56	-	-	4,763
TOTALS -		\$43,001	-	-	-	-	-	\$ 330	\$1,602	-	\$5,422	-	\$1,403	-	\$ 617	-	-	\$52,375

* Mine Extension Requirements

Town Site and Housing	7,800
Railroad Extension (35 miles)	7,000
Town and Railroad Interest (7-1/2%)	1,100
Town and Railroad Contingency (10%)	1,590
Subtotal - Town Site and Railroad	17,490
Grand Total - Initial Capital Expenditures	\$60,491

Note: Capital Costs are based on estimated 1971 prices in Canadian Funds.

Depreciation

	Mining Operation		Mining Operation, Town & Railroad	
	Dollars (000's)	Per Ton	Dollars (000's)	Per Ton
Initial	\$3,001	\$0.956	\$60,491	\$1.344
Extension and Replacement	9,374	0.208	9,374	0.208
Total	52,375	\$1.164	\$69,865	\$1.552

SCHEDULE C-4
CASE C

ESTIMATED CASH FLOW EARNINGS PROJECTION
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969
(Canadian Dollars)

Period:	<u>1 (0 - 15 Years)</u>
Annual Production:	
Raw Coal - Net Tons	4,000,000
Clean Coal - Net Tons	3,000,000
Ratio	6.3
	<u>Clean Coal per Net Ton</u>
Realization at Port*	\$13.050
Freight and Port Charges*	5.025
Realization at Mine*	8.025
Production Cost	5.690
Cash Flow**	2.335
Depreciation	1.164
Net Earnings**	1.171
	<u>Dollars per Year (000")</u>
Cash Flow Before Taxes	\$7,005
Net Earnings Before Taxes	\$3,513

* Based on estimated coal realization adjusted to 1971 level and freight charges.

** Before B.C. Mine Tax and Federal Income Tax.

MINING OPERATION

Steam Coal

Mining Program

The coal stripping operation is the same as described in the Metallurgical Coal chapter.

Coal Preparation

The raw coal as mined will pass through a rotary breaker which will throw out the shale partings and hard bands. It is estimated that the rejected material will be 5%. The crushed coal product would average 12,500 BTU's per pound.

This report assumes that there would be an on-site power plant in the Upper Elk River Coal Field area.

Cost Estimates

The total production costs were figured before British Columbia and federal taxes for Case A (2.0 million tons per year raw coal) and Case B (3.0 million tons per year raw coal). The raw coal was adjusted to 95% recovery.

The preparation costs were adjusted only for crushing and coal handling.

The capital expenditures required were eliminated for the preparation plant and the unit train load-out facilities.

The cost per million BTU's range from 19.4¢ to 26.1¢. This range is due to the fact that an on-site power plant requires a minimum of a 30-year reserve.

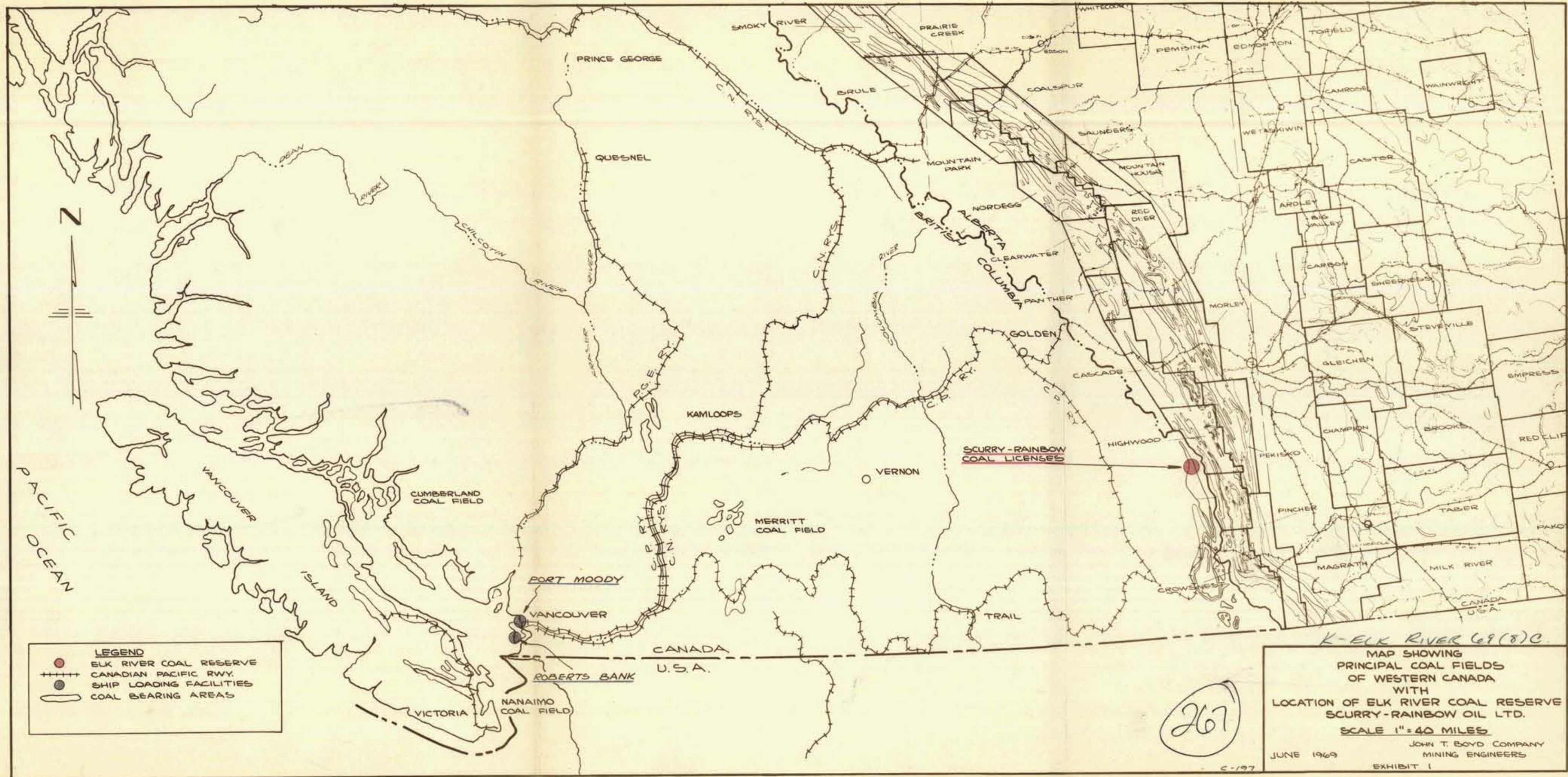
Following this text is Schedule A-B-5 showing Estimated Mining Costs before British Columbia and federal taxes. The final costs are expressed in cents per million BTU's.

SCHEDULE A-B-B

ESTIMATED STEAM COAL MINING COSTS
(Canadian Dollars)
ELK RIVER COAL FIELD
Scurry-Rainbow Oil Ltd.

By
John T. Boyd Company
Mining Engineers
June 1969

	CASE A				CASE B			
	5.2		7.4		5.5		8.95	
	Period 1		Period 2		Period 1		Period 2	
	Raw Coal	Steam Coal	Raw Coal	Steam Coal	Raw Coal	Steam Coal	Raw Coal	Steam Coal
Raw Coal Production per Year - Net Tons(000's)	2,000				3,000			
Steam Coal Production @ 95% Yield	1,900				2,850			
Stripping Ratio	5.2				8.95			
	Cost per	Net Ton	Cost per	Net Ton	Cost per	Net Ton	Cost per	Net Ton
Stripping, Coal Loading & Haulage	\$2.068	\$	\$2.634	\$	\$2.080	\$	\$3.347	\$
Auxiliary Mine Services, Drainage, Reclamation, etc.	.180		.180		.180		.180	
Preparation and Loading	.100		.100		.100		.100	
Miscellaneous Services and Labor	.050		.050		.050		.100	
Total Direct Cost -								
Mining and Preparation	2.398	2.524	2.964	3.120	2.410	2.537	3.727	3.923
Indirect Costs		.420		.470		.370		.420
Total Operating Cost		2.944		3.590		2.907		4.343
Total Administrative Costs		.820		.870		.820		.920
Total		3.764		4.460		3.727		5.263
Contingency (10%)		.376		.446		.373		.526
Total Operating & Administrative Costs		4.140		4.906		4.100		5.789
Depreciation (Excluding Town and Railroad):								
Initial Capital		.446		.446		.348		.348
Extension and Replacement		.406		.406		.391		.391
Total		0.852		0.852		0.739		0.739
Total Cost - (Excluding B.C. and Federal Taxes on Income or Profits):		\$4.992		\$5.758		\$4.839		\$6.528
Cost per Million BTU @ 12,500 BTU's per pound (Cents)		20.0		23.0		19.4		26.1



LEGEND
 ● ELK RIVER COAL RESERVE
 + + + + CANADIAN PACIFIC R.W.Y.
 ● SHIP LOADING FACILITIES
 ○ COAL BEARING AREAS

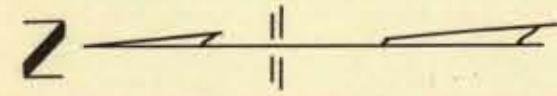
K-ELK RIVER 69(8)C
 MAP SHOWING
 PRINCIPAL COAL FIELDS
 OF WESTERN CANADA
 WITH
 LOCATION OF ELK RIVER COAL RESERVE
 SCURRY-RAINBOW OIL LTD.
 SCALE 1" = 40 MILES
 JOHN T. BOYD COMPANY
 MINING ENGINEERS
 JUNE 1969
 EXHIBIT I

267

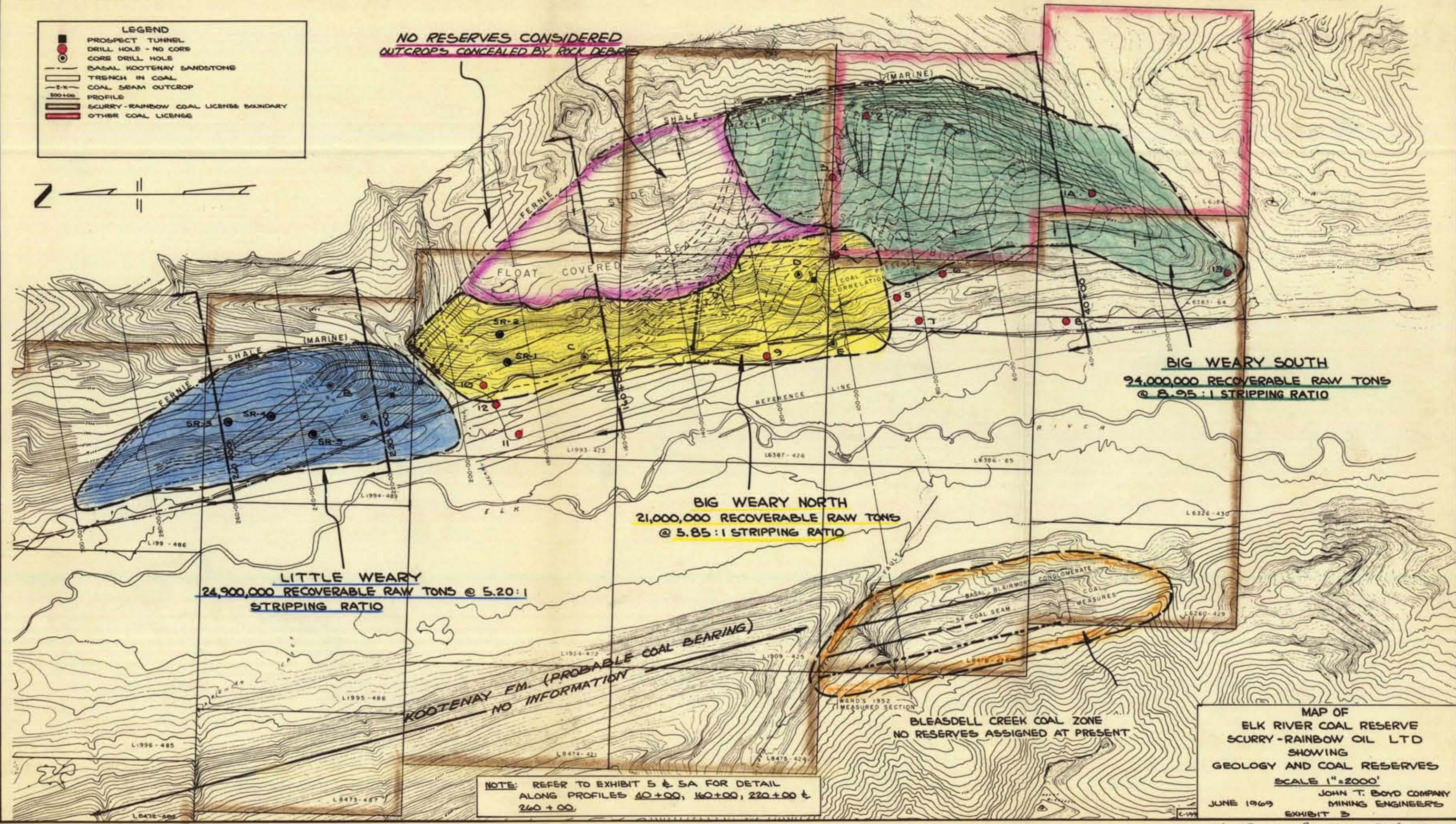
C-197

LEGEND

- PROSPECT TUNNEL
- DRILL HOLE - NO CORE
- CORE DRILL HOLE
- BASAL KOOTENAY SANDSTONE
- ▭ TRENCH IN COAL
- X- COAL SEAM OUTCROP
- 500+00 PROFILE
- ▭ SCURRY-RAINBOW COAL LICENSE BOUNDARY
- ▭ OTHER COAL LICENSE



**NO RESERVES CONSIDERED
OUTCROPS CONCEALED BY ROCK DEBRIS**



LITTLE WEARY
24,900,000 RECOVERABLE RAW TONS @ 5.20:1 STRIPPING RATIO

BIG WEARY NORTH
21,000,000 RECOVERABLE RAW TONS @ 5.85:1 STRIPPING RATIO

BIG WEARY SOUTH
94,000,000 RECOVERABLE RAW TONS @ 8.95:1 STRIPPING RATIO

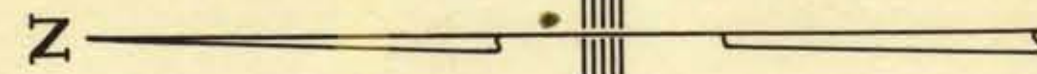
ROOTENAY FM. (PROBABLE COAL BEARING)
NO INFORMATION

BLEASDELL CREEK COAL ZONE
NO RESERVES ASSIGNED AT PRESENT

NOTE: REFER TO EXHIBIT 5 & 5A FOR DETAIL ALONG PROFILES 40+00, 160+00, 220+00 & 260+00.

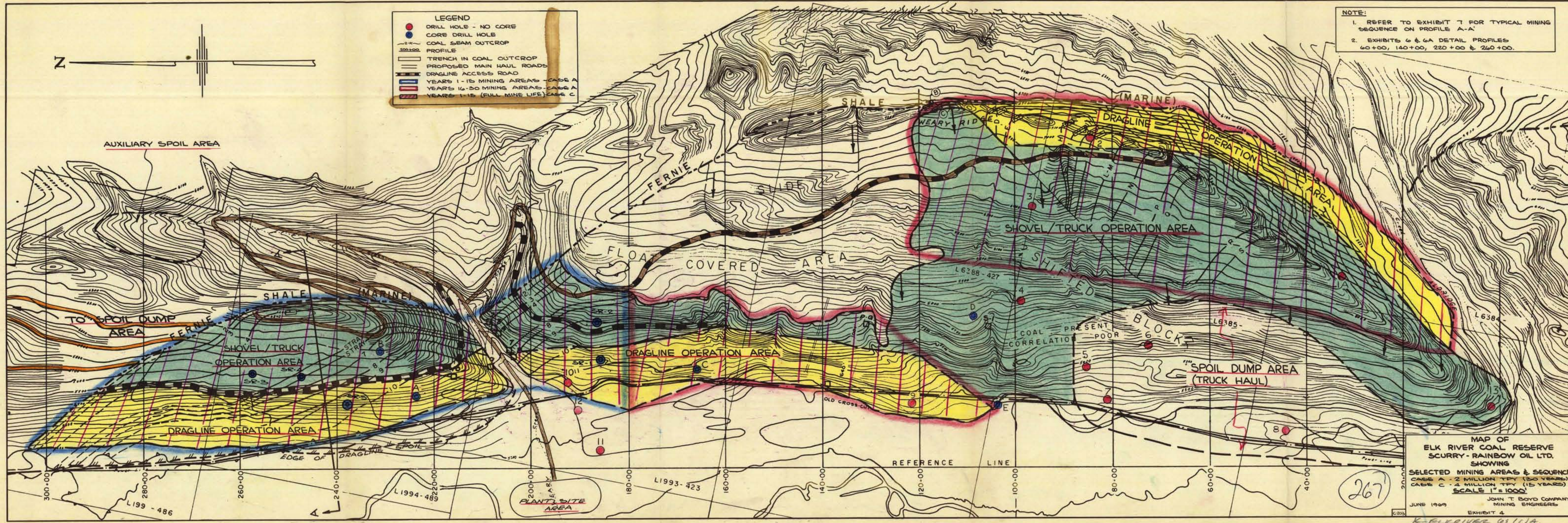
MAP OF
ELK RIVER COAL RESERVE
SCURRY-RAINBOW OIL LTD
SHOWING
GEOLOGY AND COAL RESERVES
SCALE 1"=2000'
JOHN T. BOYD COMPANY
MINING ENGINEERS
JUNE 1969
EXHIBIT 3

K-ELK RIVER 69(1)C



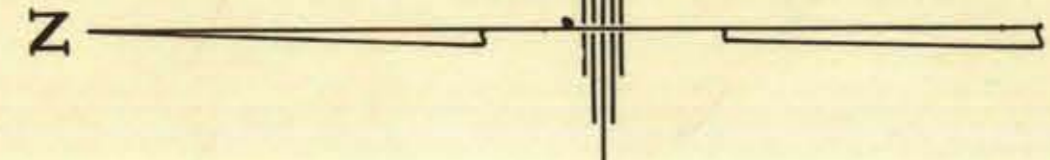
LEGEND	
● (Red)	DRILL HOLE - NO CORE
● (Blue)	CORE DRILL HOLE
— (Black)	COAL SEAM OUTCROP
— (Black)	PROFILE
— (Black)	TRENCH IN COAL OUTCROP
— (Black)	PROPOSED MAIN HAUL ROADS
— (Black)	DRAGLINE ACCESS ROAD
— (Blue)	YEARS 1-15 MINING AREAS - CASE A
— (Red)	YEARS 16-30 MINING AREAS - CASE A
— (Green)	YEARS 1-15 (FULL MINE LIFE) CASE C

NOTE:
1. REFER TO EXHIBIT 7 FOR TYPICAL MINING SEQUENCE ON PROFILE A-A'
2. EXHIBITS 6 & 6A DETAIL PROFILES 60+00, 140+00, 220+00 & 240+00.



MAP OF
ELK RIVER COAL RESERVE
SCURRY - RAINBOW OIL LTD.
SHOWING
SELECTED MINING AREAS & SEQUENCE
CASE A - 2 MILLION TPY (30 YEARS)
CASE C - 4 MILLION TPY (15 YEARS)
SCALE 1" = 1000'
JUNE 1969
JOHN T. BOYD COMPANY
MINING ENGINEERS
EXHIBIT 4
K. ELK RIVER 03 (1) 4.

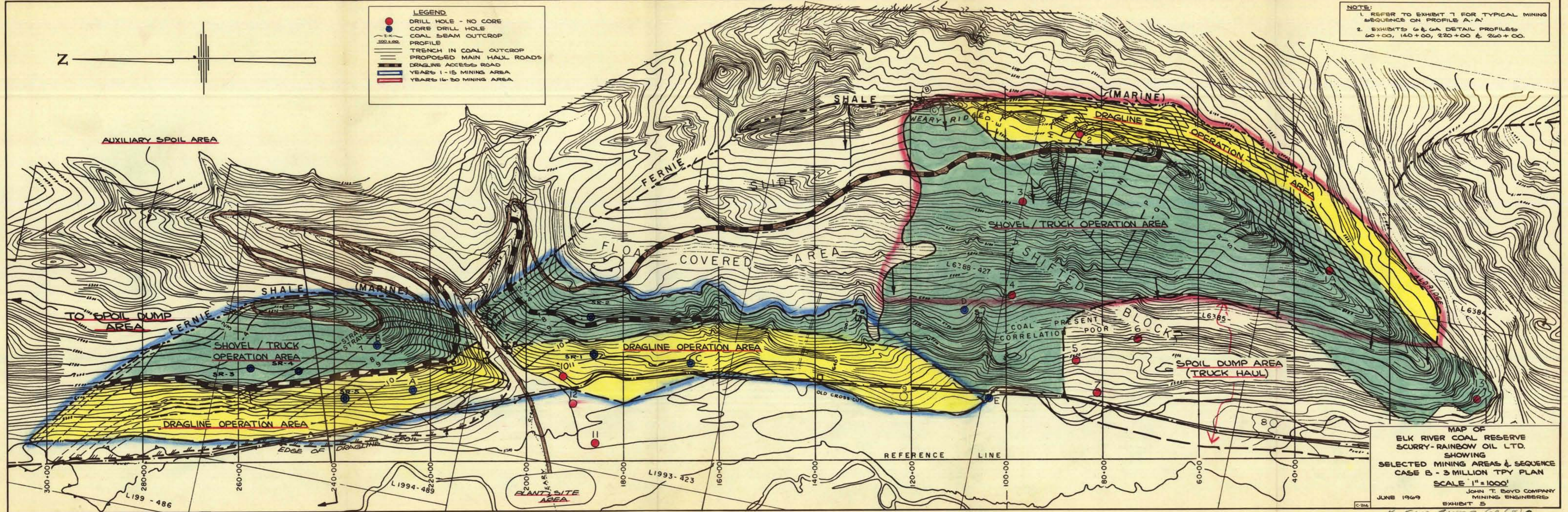
267



LEGEND

- DRILL HOLE - NO CORE
- CORE DRILL HOLE
- COAL SEAM OUTCROP
- PROFILE
- TRENCH IN COAL OUTCROP
- PROPOSED MAIN HAUL ROADS
- DRAGLINE ACCESS ROAD
- YEARS 1-15 MINING AREA
- YEARS 16-30 MINING AREA

NOTE:
1. REFER TO EXHIBIT 7 FOR TYPICAL MINING SEQUENCE ON PROFILE A-A'
2. EXHIBITS 6 & 6A DETAIL PROFILES 60+00, 140+00, 220+00 & 260+00.





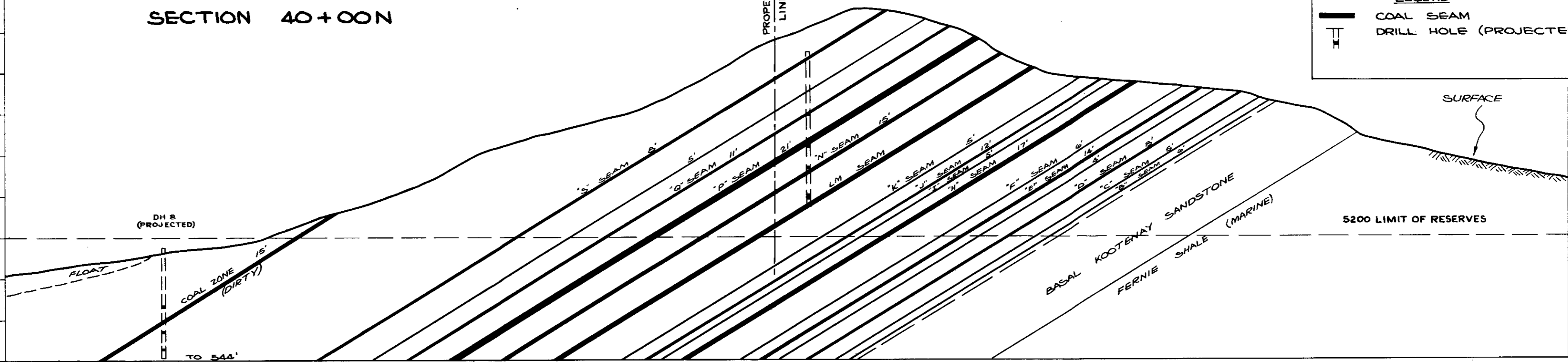
MAP OF
ELK RIVER COAL RESERVE
SCURRY-RAINBOW OIL LTD.
SHOWING
SELECTED MINING AREAS & SEQUENCE
CASE B - 3 MILLION TYPY PLAN
SCALE 1" = 1000'
JOHN T. BOYD COMPANY
MINING ENGINEERS
JUNE 1969
EXHIBIT 5
K-ELK RIVER 69(8)C

6400
6200
6000
5800
5600
5400
5200
5000
4800
4600

SECTION 40 + 00 N

SCURRY - RAINBOW
PROPERTY LINE
COMINCO

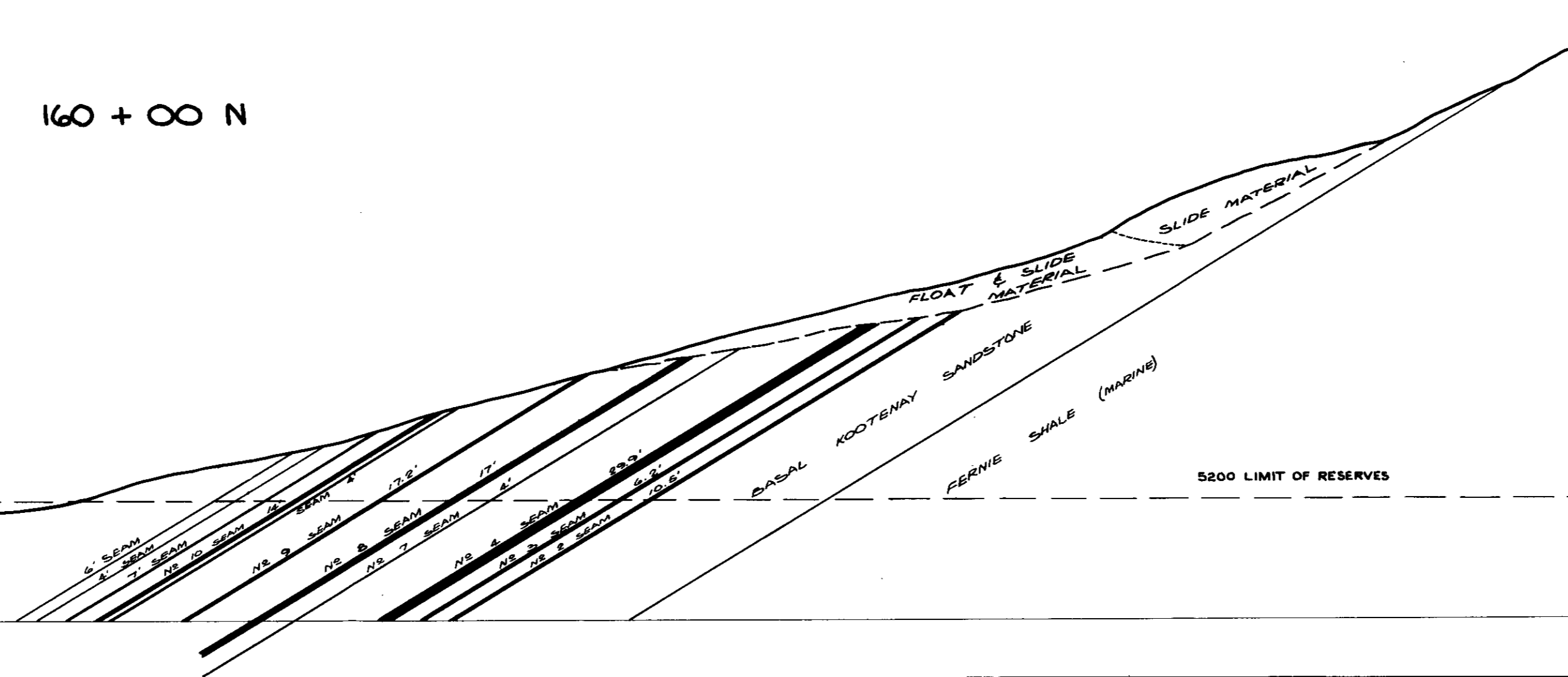
LEGEND
 COAL SEAM
 DRILL HOLE (PROJECTED)



5800
5600
5400
5200
5000
4800
4600

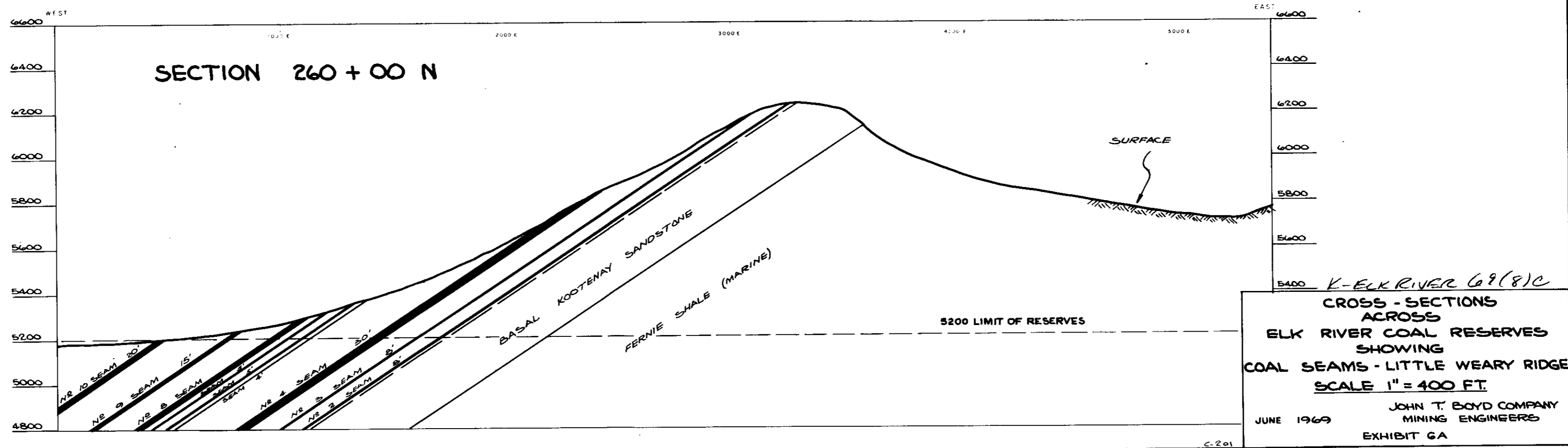
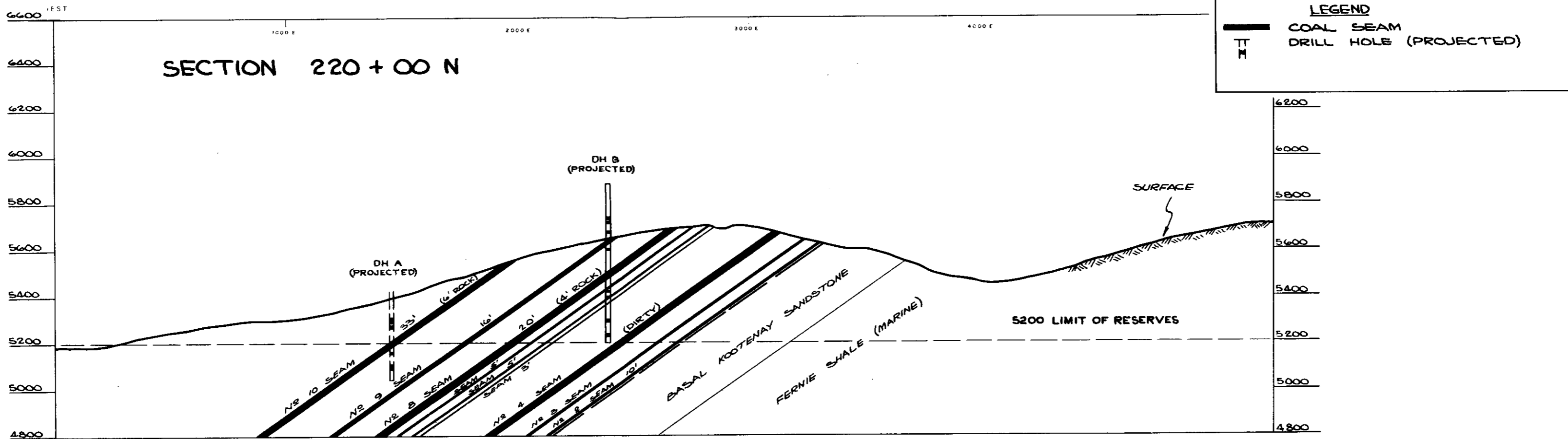
6600
6400
6200
6000
5800
5600
5400
5200
5000
4800

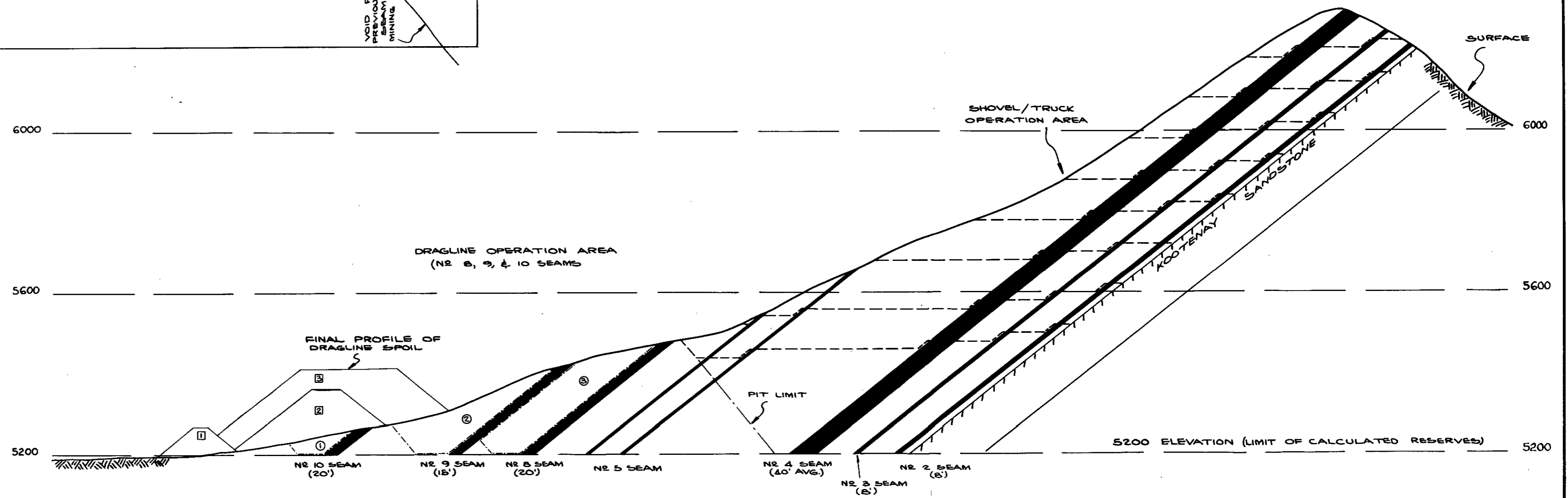
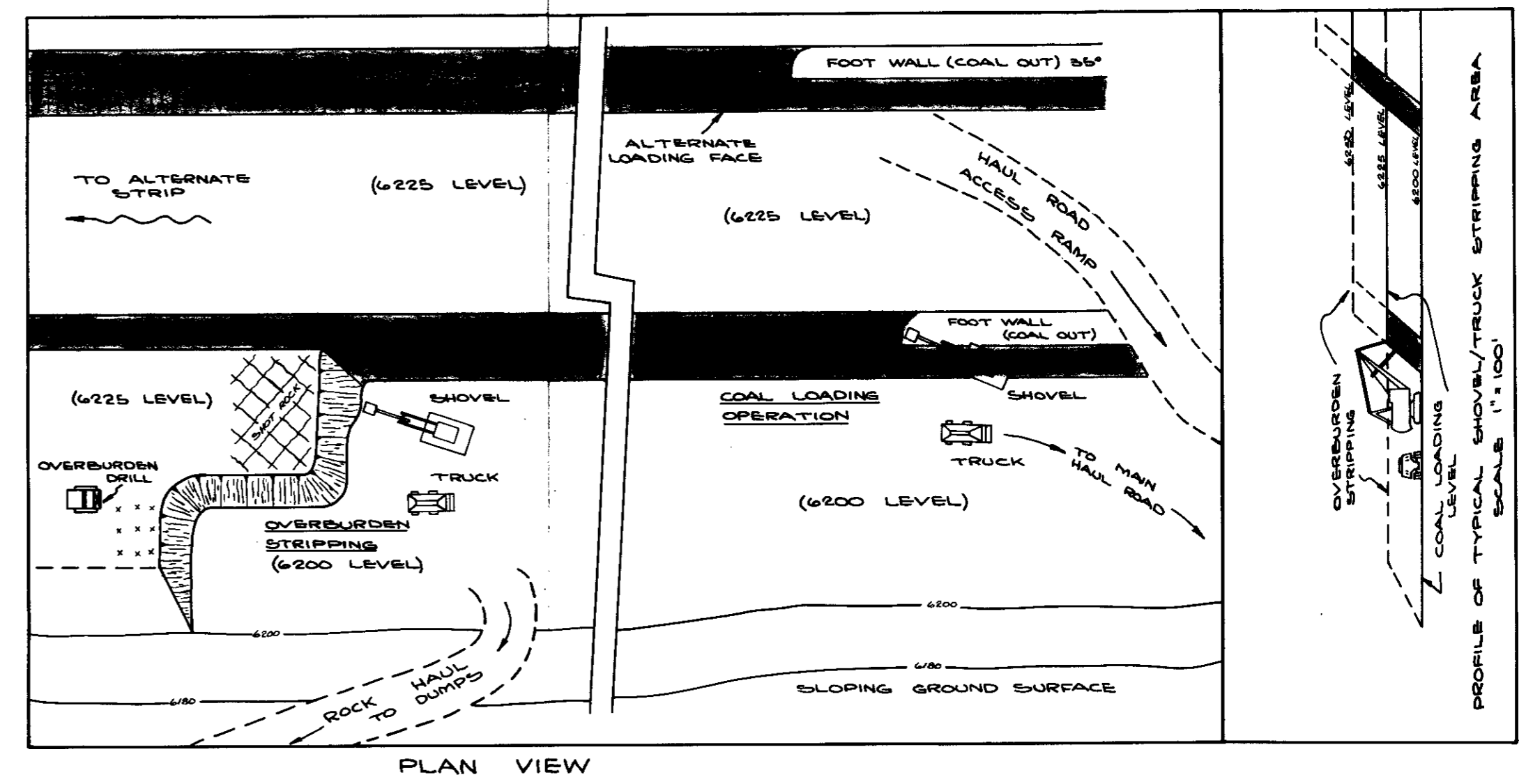
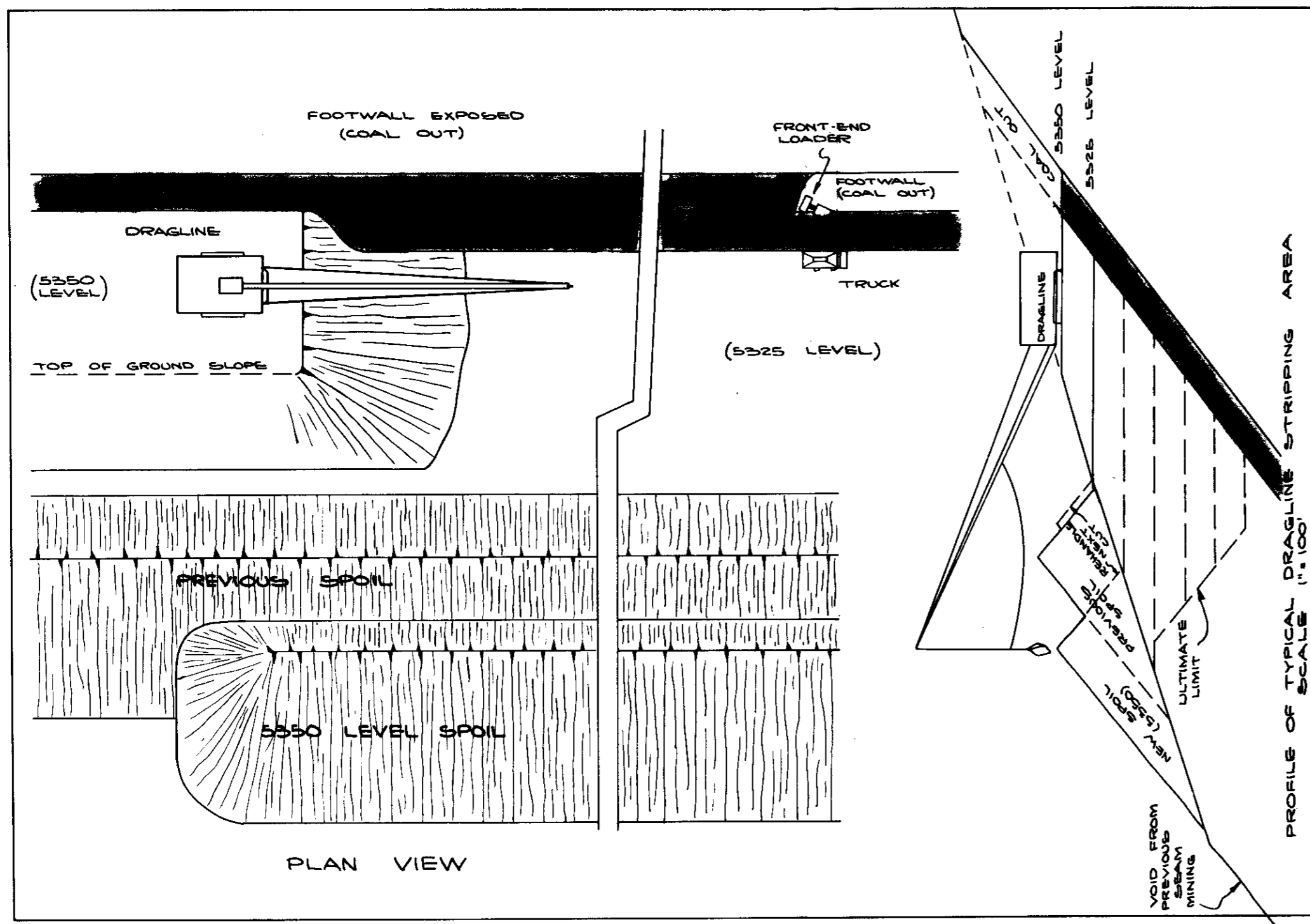
SECTION 160 + 00 N



6600
6400
6200
6000
5800
5600
5400

K-ELK RIVER 69 (8) C.
**CROSS-SECTIONS
 ACROSS
 ELK RIVER COAL RESERVES
 SHOWING
 COAL SEAMS - BIG WEARY RIDGE
 SCALE 1" = 400 FT.**
 JOHN T. BOYD COMPANY
 MINING ENGINEERS
 JUNE 1969
 EXHIBIT 6





NOTE:
REFER TO EXHIBITS 4 & 5 FOR
LOCATION OF SECTION.

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K-ELK RIVER (89(8)C)
PLAN AND PROFILE
SHOWING
PROPOSED MINING METHOD
ELK RIVER COAL RESERVE
SCURRY-RAINBOW OIL LTD.
SCALE 1" = 200'
JOHN T. BOYD COMPANY
MINING ENGINEERS
JUNE 1969
EXHIBIT 7