PARAMOUNT RESOURCES LIMITED

DRILLING PROGRAM
PARAMOUNT ET AL CAMERON B·8
PARAMOUNT ET AL CAMERON L·47
CAMERON HILLS PROJECT 1989

9211-P33-4-2

4100-FIRST CANADIAN CENTRE, 350 7th AVENUE, S.W., CALGARY, ALBERTA, T2P 3W5

TELEPHONE: (403) 266-2047

SIERRA RIG #2

COMMENTS SHEET

PROJECT/FILE NO. 9211- P33-4-2

DOCUMENT TITLE: ADW - Paramount etal CAMERON L-47

ENGINEERING BR.

~~-engineer~~

- see comments for B-08

An intermediate string set at 900m to case off Slave Point before entering primary would ensure a good evaluation H.

RESOURCE EVALUATION BR.

See comments for B-08

W. J. WARD 89 01 03

ENVIRONMENTAL PROTECTION BR.

RIGHTS MANAGEMENT BR.

POLICY ANALYSIS & COORD. BR.

Statement required from Paramount Resources Limited that it will adhere to the Benefits Statement of Principles and Procedures in the Guidelines for Benefits Approvals and Reports, for the NWT and Yukon.

ADW ITEMS

Regional Office

Northern component

Other agencies notified/satisfied

Seabed description

Drilling mud program

Measures to protect the natural environment

Confirmation of:

. forecast program

. observation program

. alert program

Confirmation of:

. contingency plan

. financial security

Inspection and approvals during drilling

Well termination and site restoration

Well history report and environmental information

ENVIRONMENTAL PROTECTION BRANCH, COGLA HQ

AUTHORITY TO DRILL A WELL

Well name PARAMOUNT ET AL CAMERON L-47

Drilling Unit SIERRE RIG #2

Region CAMERON HILLS, N.W.T.

Program 9211-P33-4-2

Outstanding items and qualifying comments:

Land well. No physical environment requirements
Aon 05/12/88

(*) contacted Paramount on Jan 3 1989 asking for their securities. Was tentatively promised them by to-day - but I have my doubts since like Chalsea was on a northern communities tour this week. Proof of financial responsibility is inadequate. I suppose the ADW could be issued provisional upon meeting the requirement by a later date - say Jan 13. - SGill.

(*) Same comments pertain to this well as with the Cameron B-08.

D. Hardie
6/1/89.

K. Sato Ksato

R. Engelhardt Approved, conditional to receipt of acceptable waste discharge program. Engelhardt Jan 5/89

S. Gill (*) SGill Jan 6'89 - AM

PLEASE REVIEW THE ATTACHED WITHIN ONE DAY OF RECEIPT AND PASS IT ON TO THE NEXT DIVISION, OTHERWISE ADVISE KEN SATO OF ANY DELAY.

Circulated To:

~~EAST~~/NORTH

PROJECT: 9211-P33-4-2

TITLE: ADW - Paramount et al

WELL : CAMERON L-47

ENGINEERING BRANCH:

F.H. LEPINE

P.P. SIMARD

~~R. LANDRY~~

~~P. GUENARD~~/P. RAGUSA

R. SMITH/J. NAZARETH

RESOURCE EVALUATION BRANCH:

~~G.R. CAMPBELL~~

~~D. SMITH~~/W. WARD W. J. WARD 89 0103

ENVIRONMENTAL PROTECTION BRANCH:

V. LAFFERTY * see EPB comment

RIGHTS MANAGEMENT BRANCH:

~~J.W. GALLAGHER~~

L.J. KELLY

POLICY ANALYSIS & COORD:

D. WHELAN Felix Kwamena

See PAC comment

PLS CIRCULATE QUICKLY. THKS.

Please return to Engineering Branch as soon as possible. Thank you.

```
Well Name: CAMERON L-47
      Rig: SIERRA RIG #2
 Operator: PARAMOUNT


*******************************************
*                                         *
*                                         *
*  LATITUDE:     60~  6'  32.0000'' N     *
*                                         *
* LONGITUDE:    117~ 39'  12.0000'' W     *
*                                         *
*             L -  47                     *
*                                         *
*  grid area latitude:  60~ 10'           *
* grid area longitude: 117~ 30'           *
*                                         *
*******************************************

restart the program ,yes = 1  no = 2   scroll = 3
```

1

PostFax
MONTREAL, QUEBEC
CR213-10N

CAMERON HILLS

PART ONE

GENERAL WELL INFORMATION

CAMERON HILLS

TABLE OF CONTENTS

CAMERON HILLS

INTRODUCTION

OUTLINE: Paramount Resources Ltd. has undertaken to drill Paramount et al Cameron B-8 and Paramount et al Cameron L-47 during the first quarter of 1989.

See Index Maps for location of project.

TIME SCHEDULE: Drilling the B-8 well is scheduled to commence January 1, 1989. It is estimated that the drilling operation will be completed by January 31, 1989.

The enclosed report is to be considered the operating manual for the drilling of the above mentioned wells. Reference to the appropriate sections of the Canada Oil and Gas Drilling Regulations are dealt with throughout the body of the program.

LAND INTEREST: Paramount, as Operator and Representative of the Interest Owners of Exploration Licence No. 312 is drilling these wells to further evaluate the hydrocarbon potential.

PARTICULARS: With reference to Section 8 of the Canada Oil and Gas Drilling Regulations

a) The specifics of the drilling rig are contained in the body of the report. For details refer to the section entitled "Rig Equipment".

b) To the best of our knowledge no known conditions or circumstances that may affect the safety of the drilling operation are foreseeable or anticipated at this time.

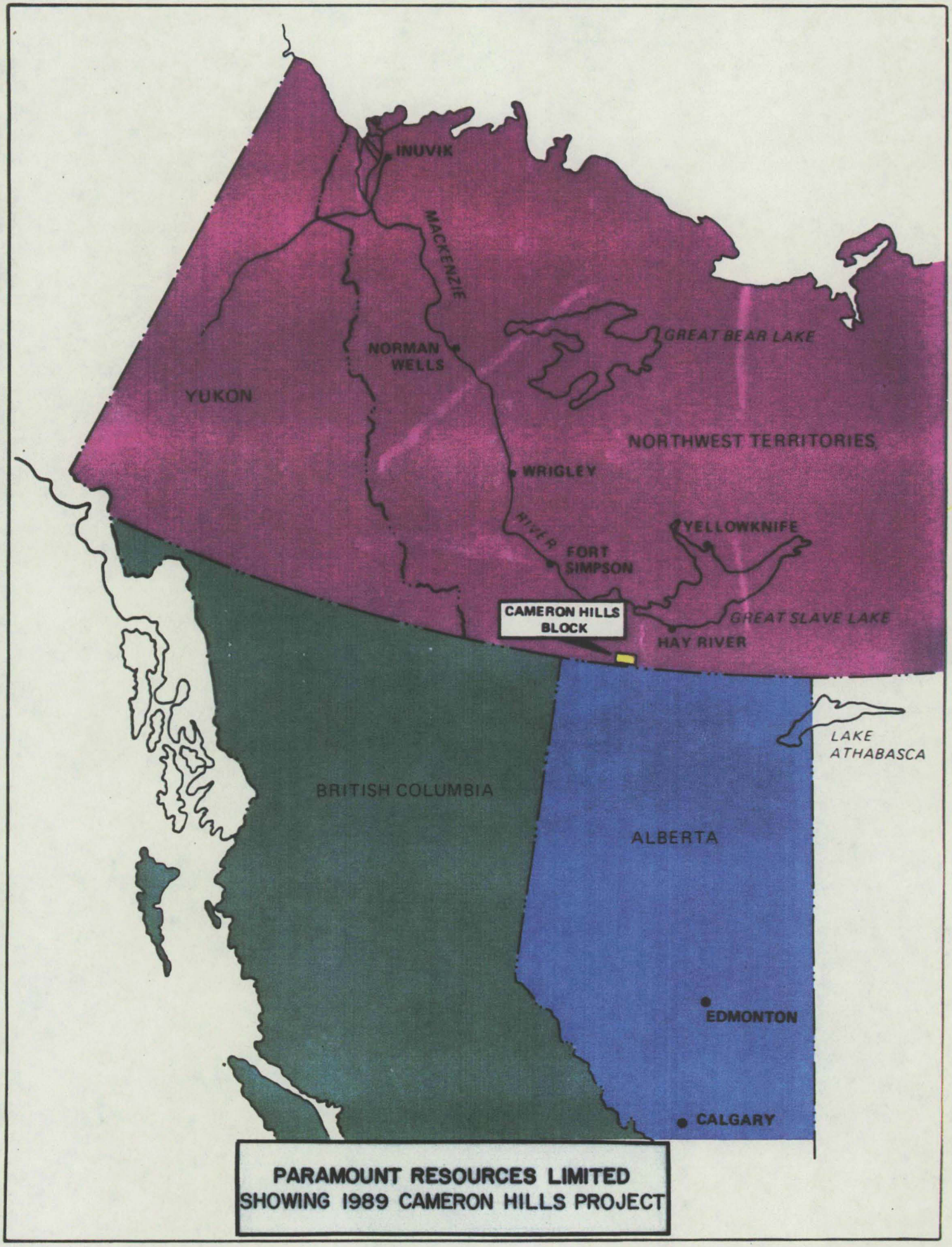
c) The general dimensional drawings of the drilling rig are enclosed herein. The office are will be located on the wellsite at the prescribed distance from the well bore in accordance with government regulations. The camp facilities will be located at a central location as shows on Index Map #4.

d) Finally, the scheduling of rig supplies, personnel and related equipment will be conducted through expediters in Edmonton, Alberta, who will work in conjunction with the Calgary Office of Paramount Resources Ltd.

INDEX MAPS

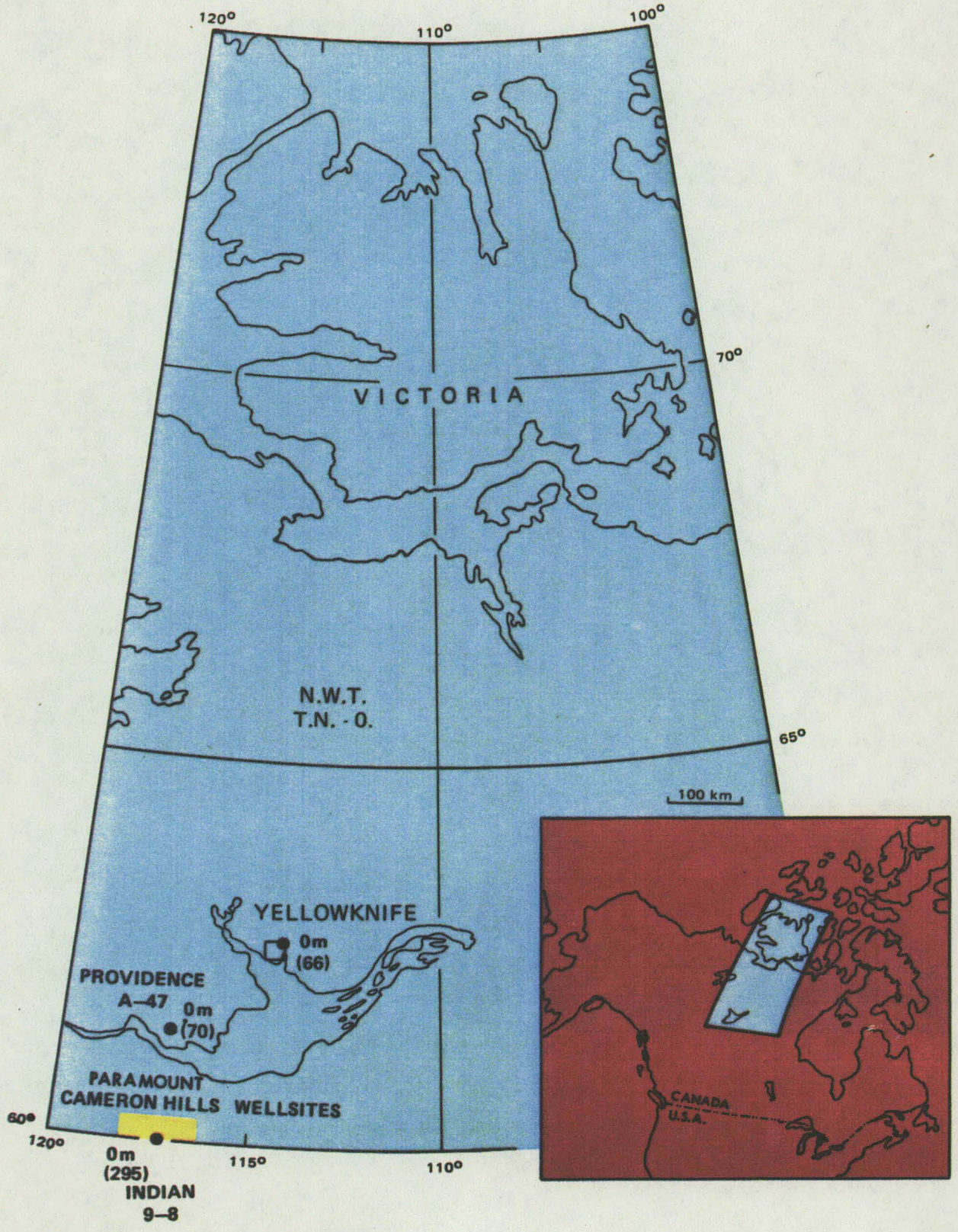
CAMERON HILLS

TABLE OF MAPS

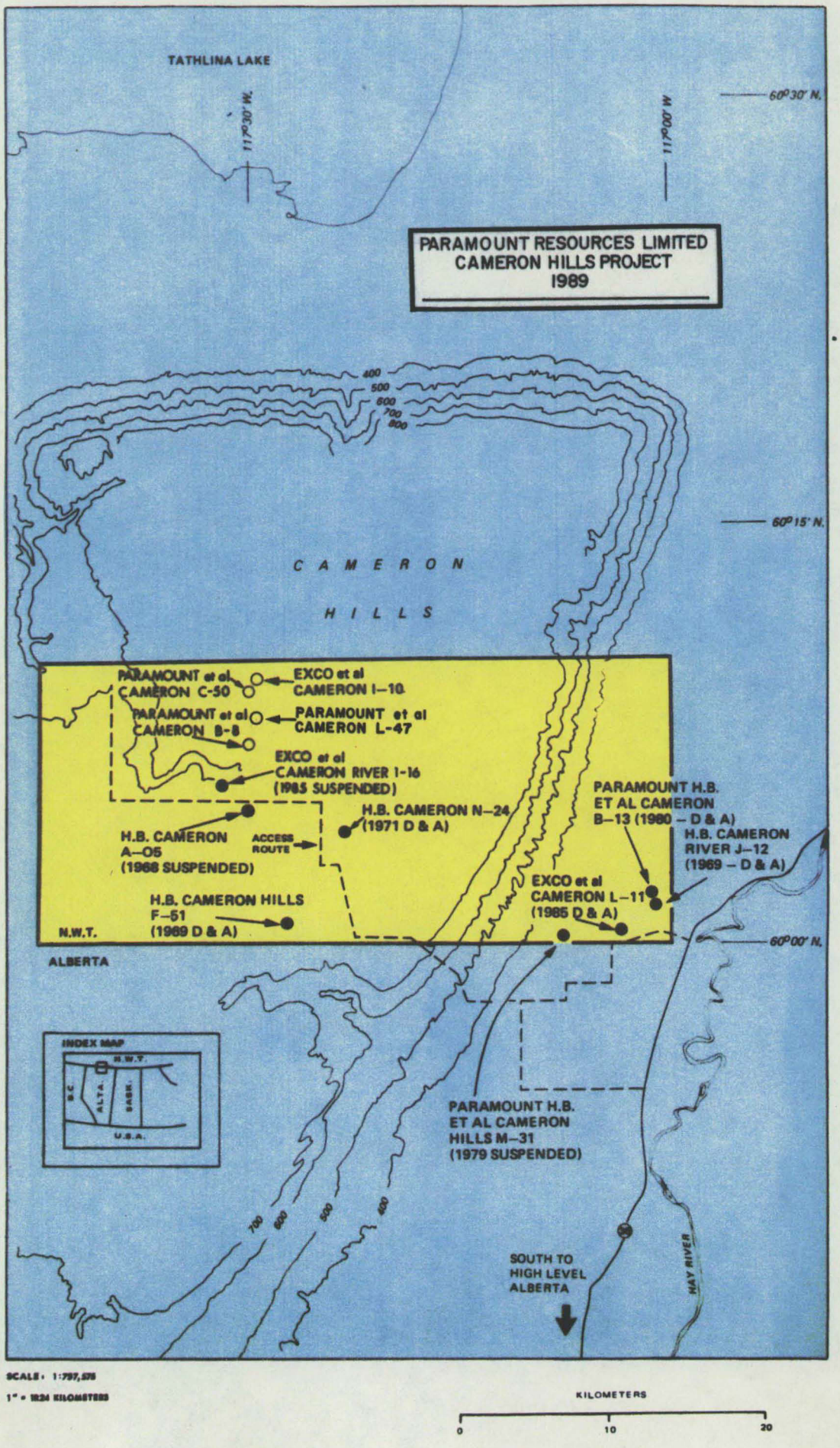


PARAMOUNT RESOURCES LIMITED
SHOWING 1989 CAMERON HILLS PROJECT

PARAMOUNT RESOURCES LIMITED
CAMERON HILLS PROJECT 1989
PERMAFROST DEPTH AT SELECTED WELLSITES



INFORMATION SOURCE: Energy Mines and Resources Canada
Earth Physics Branch Gravity
and Geodynamics Branch


TATHLINA LAKE
117°30' W.
117°00' W.
60°30' N.
PARAMOUNT RESOURCES LIMITED
CAMERON HILLS PROJECT
1989
400
500
600
700
800
60°15' N.
CAMERON
HILLS
PARAMOUNT et al
CAMERON C-50
EXCO et al
CAMERON I-10
PARAMOUNT et al
CAMERON B-8
PARAMOUNT et al
CAMERON L-47
EXCO et al
CAMERON RIVER I-16
(1985 SUSPENDED)
H.B. CAMERON N-24
(1971 D & A)
PARAMOUNT H.B.
ET AL CAMERON
B-13 (1980 - D & A)
H.B. CAMERON
RIVER J-12
(1969 - D & A)
H.B. CAMERON
A-05
(1968 SUSPENDED)
ACCESS
ROUTE
EXCO et al
CAMERON L-11
(1985 D & A)
H.B. CAMERON HILLS
F-51
(1969 D & A)
N.W.T.
ALBERTA
60°00' N.
INDEX MAP
N.W.T.
B.C.
ALTA.
SASK.
U.S.A.
PARAMOUNT H.B.
ET AL CAMERON
HILLS M-31
(1979 SUSPENDED)
700
600
500
400
SOUTH TO
HIGH LEVEL
ALBERTA
HAY RIVER
SCALE: 1:797,376
1" = 1126 KILOMETERS
KILOMETERS
0
10
20

WELL INFORMATION

CAMERON HILLS

WELL INFORMATION

OPERATOR	Paramount Resources Ltd.
WELL NAME	Paramount et al Cameron B-8
LOCATION	Latitude 60° 07' 06.80" N Longitude 117° 30' 46.21" W
AREA	Cameron Hills
PROVINCE	N.W.T.
EXPLORATORY AGREEMENT NO.	213
DRILLING LICENCE NO.	Pending Application Approval
LEASE NO.	N/A
GROUND ELEVATION	786.21 m (Actual)
ESTIMATED K.B. ELEVATION	790.21 m
OBJECTIVE	Keg River Oil (Primary) Slave Point Gas (Secondary) Bistcho Gas (Secondary)
PROJECTED TOTAL DEPTH	1528 m TVD (Estimated)
WELL STATUS	Wildcat
DRILLING CONTRACTOR	Sierra Drilling Ltd.
ENGINEERING SUPERVISION	Southridge Petroleum Consultants Ltd. Calgary Office: Lorne Marshall, P.Eng. Wellsite: Michael Cholach,

CAMERON HILLS

WELL INFORMATION

OPERATOR	Paramount Resources Ltd.
WELL NAME	Paramount et al Cameron L-47
LOCATION	Latitude 60° 06' N Approx. Location Longitude 117° 39' W Not Surveyed
AREA	Cameron Hills
PROVINCE	N.W.T.
EXPLORATORY AGREEMENT NO.	213
DRILLING LICENCE NO.	Pending Application Approval
LEASE NO.	N/A
ESTIMATED GROUND ELEVATION	790.0 m
ESTIMATED K.B. ELEVATION	
OBJECTIVE	Keg River Oil (Primary) Slave Point Gas (Secondary) Bistcho Gas (Secondary)
PROJECTED TOTAL DEPTH	1528 m TVD (Estimated)
WELL STATUS	Wildcat
DRILLING CONTRACTOR	Sierra Drilling Ltd.
ENGINEERING SUPERVISION	Southridge Petroleum Consultants Ltd. Calgary Office: Lorne Marshall, P.Eng. Wellsite: Michael Cholach,

DRILLING PROGRAM APPLICATIONS

Canada Oil and Gas Lands Administration / Administration du pétrole et du gaz des terres du Canada

Nova Scotia	☐	West Coast	☐	Exploratory	☐
Newfoundland	☐	Northern	☐	Development	☐
Gulf of St. Lawrence	☐	Hudson Bay	☐	Delineation	☐
				Service	☐

AUTHORITY TO DRILL A WELL

APPLICATION

This application is submitted with Section 82 of the Canada Oil and Gas Drilling Regulations. When approved under Section 83 of the Regulations, it is the requisite authority for the commencement of drilling operations.

Well Name in Full: PARAMOUNT ET AL CAMERON L-47

Operator: PARAMOUNT RESOURCES LTD. | Drilling Program No.: N/A

Contractor: SIERRA DRILLING LTD. | Permit or Lease No.: N/A

Drilling Rig or Unit: | Estimated Well Cost: LESS THAN ONE (1) MILLION DOLLARS

Location-Unit: L | Section: 47 | Grid Area: 60 10' 117 30'

Coordinates: Lat.: | Long.:

Area: CAMERON HILLS | Field/Pool: N/A

Elevation-RT/KB: (ASL) | ~~Seabed~~: GROUND: 786.20 (BRT)

Approx. Spud Date: JANUARY 1, 1989 | Estimated Days on Location: 25

Anticipated Total Depth: 1528 m | Target Horizon(s): SLAVE POINT, SULPHUR POINT

EVALUATION PROGRAM

Ten-metre sample intervals: N/A

Five-metre sample intervals: AS SPECIFIED FROM UNDER CONDUCTOR CASING TO T.D.

Canned sample intervals: AT 10 M INTERVALS FOR GEOCHEMICAL ANALYSIS

Conventional cores at: NOT ANTICIPATED

Logs and Tests: AS SPECIFIED IN DRILLING PROGRAM: VELOCITY SURVEY, DIL/CDL-CNS-GR, TESTS TO CONDUCTED ACROSS ZONES INDICATING POTENTIAL HYDROCARBONS. (IE TARGET ZONES)

CASING AND CEMENTING PROGRAM

O.D.	Weight:	Grade:	Setting Depth Below Seafloor:	Cementing Program (Volumes):
244	53.57	J-55	390 m	CLASS G 100% EXCESS + 2% $CACL_2$
139.7	20.83	J-55	1528 m	CLASS G + 0.75% T-10 20% EXCESS

PLEASE REFER TO DETAILED DRILLING PROGRAM, SEE "CEMENTING PROGRAM".

B.O.P. Equipment: ONE (1) HYDRIL GK 9-9000 SPHERICAL
TWO (2) SHAFFER TYPE E SINGLE GATE, 9" - 3000 PSI
C/W 4½ AND PIPE RAMS

Other Information: PLEASE REFER TO DETAILED DRILLING PROGRAM, SEE "RIG INVENTORY".

Signed: LLOYD JEFFRIES | Title: DRILLING MANAGER

Date: DECEMBER 9, 1988 | Company: PARAMOUNT RESOURCES LTD.

APPROVAL

An approved copy of this notice is to be posted at each wellsite.

Signed: Engineering Branch

Date:

File:

Canada Oil and Gas Lands Administration | Administration du pétrole et du gaz des terres du Canada

Nova Scotia	☐	West Coast	☐	Exploratory	☐
Newfoundland	☐	Northern	☐	Development	☐
Gulf of St. Lawrence	☐	Hudson Bay	☐	Delineation	☐
				Service	☐

AUTHORITY TO DRILL A WELL

APPLICATION

This application is submitted with Section 82 of the Canada Oil and Gas Drilling Regulations. When approved under Section 83 of the Regulations, it is the requisite authority for the commencement of drilling operations.

Well Name in Full: PARAMOUNT ET AL CAMERON B-8

Operator: PARAMOUNT RESOURCES LTD. | Drilling Program No.: N/A

Contractor: SIERRA DRILLING LTD. | Permit or Lease No.: N/A

Drilling Rig or Unit: | Estimated Well Cost: LESS THAN ONE (1) MILLION DOLLARS

Location-Unit: B Section: 8 | Grid Area: 60 10' 117 30'

Coordinates: Lat.: 60° 10' 06.80" | Long.: 117° 30' 46.21"

Area: CAMERON HILLS | Field/Pool: N/A

Elevation-RT/KB: (ASL) | ~~Seabed~~: GROUND: 786.20 (BRT)

Approx. Spud Date: JANUARY 1, 1989 | Estimated Days on Location: 25

Anticipated Total Depth: 1528 m | Target Horizon(s): SLAVE POINT, SULPHUR POINT

EVALUATION PROGRAM

Ten-metre sample intervals: N/A

Five-metre sample intervals: AS SPECIFIED FROM UNDER CONDUCTOR CASING TO T.D.

Canned sample intervals: AT 10 M INTERVALS FOR GEOCHEMICAL ANALYSIS

Conventional cores at: NOT ANTICIPATED

Logs and Tests: AS SPECIFIED IN DRILLING PROGRAM: VELOCITY SURVEY, DIL/CDL-CNS-GR, TESTS TO CONDUCTED ACROSS ZONES INDICATING POTENTIAL HYDROCARBONS. (IE TARGET ZONES)

CASING AND CEMENTING PROGRAM

O.D.	Weight:	Grade:	Setting Depth Below Seafloor:	Cementing Program (Volumes):
244	53.57	J-55	390 m	CLASS G 100% EXCESS + 2% $CACL_2$
139.7	20.83	J-55	1528 m	CLASS G + 0.75% T-10 20% EXCESS

PLEASE REFER TO DETAILED DRILLING PROGRAM, SEE "CEMENTING PROGRAM".

B.O.P. Equipment: ONE (1) HYDRIL GK 9-9000 SPHERICAL
TWO (2) SHAFFER TYPE E SINGLE GATE, 9" - 3000 PSI
C/W 4½ AND PIPE RAMS

Other Information: PLEASE REFER TO DETAILED DRILLING PROGRAM, SEE "RIG INVENTORY".

Signed: [signature] | Title: DRILLING MANAGER

LLOYD JEFFRIES

Date: DECEMBER 9, 1988 | Company: PARAMOUNT RESOURCES LTD.

APPROVAL

An approved copy of this notice is to be posted at each wellsite.

Signed: Engineering Branch

Date:

File:

Department of Energy, Mines and Resources | Ministère de l'Énergie, des Mines et des Ressources

Department of Indian Affairs and Northern Development | Ministère des Affaires indiennes et du Nord Canadien

Canada

OPERATING AUTHORITIES

INSURANCE CERTIFICATES

MINET
OLYMPIC AWARDS

COVER NOTE

J H Minet & Co Ltd
Lloyd's & International Insurance Brokers
Registered England 513938

Registered Office
Minet House 100 Leman Street
London E1 8HG and at Lloyd's
Tel 01-481 0707
Telegraph Minsuret London E1
Telex 8813901 JHMLDN G
Facsimile 01-488 9786

Western Underwriting Managers Limited,
40, University Avenue,
Suite 512,
Toronto,
Ontario M5J 1T1,
Canada

DATE: 13th April 1988

NUMBER: D10107400

RENEWING: D10074200

ASSURED: PARAMOUNT RESOURCES LIMITED.

PERIOD: 12 months at 1st May 1988 Local Standard Time.

ADDITIONAL ASSUREDS: As Attached.

ON: Operators Extra Expense.

LIMIT OF LIABILITY: CAN$ 5,000,000 any one accident or occurrence for 100%

CONDITIONS:
Per E.E.D. Wording (8.86)
Deductible CAN$ 25,000 any one accident or occurrence for 100% in respect of Cost of Control.
Deductible CAN$ 25,000 any one accident or occurrence for 100% in respect of Seepage and Pollution etc.
Deductible CAN$ 25,000 any one accident or occurrence for 100% in respect of Cost of Redrilling.
Shut-In Wells upto 11,000' rated as 'A' Depth.
Clause Paramount deleted.
Warranted assured will continue as Contract Operator on 14 wells which have been sold to Esso.

Continued/

Registered Office
Minet House 100 Leman Street
London E1 8HG and at Lloyd's
Tel 01-481 0707
Telegraph Minsuret London E1
Telex 8813901 JHMLDN G
Facsimile 01-488 9786

PREMIUM: Minimum and Deposit CAN$ 19,068 adjustable at expiry as follows:-

Drilling:	Area 1a	CAN$ 0.588	per foot drilled.
Producing:	Area 1a	CAN$ 0.118	per foot drilled.
Shut-In:	Area 1a	CAN$ 0.0588	per foot drilled.
	Area 1b	CAN$ 0.089	per foot drilled.

COMMISSION: 10% plus Tax if applicable.

SECURITY: 59.745% Lloyd's Underwriters

For and on behalf of
J.H. MINET & CO. LTD.

DIRECTOR
OIL, GAS AND PETROCHEMICAL DIVISION

Please examine the terms, conditions and security shown on this Cover Note. Please check that the Cover Note is in accordance with your instructions and if any change is required or if any security is not acceptable to you, then contact us immediately in writing. If you do not contact us you will be bound by these arrangements and by the terms and conditions of the Contract or Insurance Policy of this market(s).

THE DOMINION OF CANADA GROUP

HEAD OFFICE: TORONTO, CANADA

THE COMPANY DESIGNATED BELOW BY AN ☒ IS HEREINAFTER CALLED THE INSURER

☐ THE DOMINION OF CANADA GENERAL INSURANCE COMPANY
☒ THE CANADIAN INDEMNITY COMPANY
☐ THE CASUALTY COMPANY OF CANADA

POLICY No. CCP

The Canadian Commercial Policy

POLICY DECLARATIONS – PAGE 1

POLICY No. CCP 8075740

☒ INDICATES THE PURPOSE OF THIS DOCUMENT (SEE DEFINITIONS OVERLEAF) ☐ NEW ☒ RENEWAL ☐ CHANGE ☐ SUBSCRIPTION

AGENT/ BROKER: HILLCOFF-LANGFORD INSURANCE BROKERS LTD — CODE No. 1465

POLICY PERIOD OR DATE OF CHANGE	DAY	MONTH	YEAR		DAY	MONTH	YEAR
	01	05	88	TO	01	05	89

12:01 A.M. STANDARD TIME AT THE ADDRESS OF THE NAMED INSURED AS STATED HEREIN.

NAMED INSURED AND MAILING ADDRESS
PARAMOUNT RESOURCES LIMITED
4100 - 350 7TH AVENUE S.W.
CALGARY, ALBERTA T2P 3W5

INSURED LOCATION, IF OTHER THAN MAILING ADDRESS

DESCRIPTION OF INSURED BUSINESS OPERATIONS: OIL AND GAS EXPLORATION, DEVELOPMENT AND PRODUCTION

OTHER OCCUPANCIES IN SAME BUILDING: VARIOUS

CONSTRUCTION: FIRE RESISTIVE
NO. OF STOREYS: MULTIPLE
ROOF: CONCRETE

FORM OF BUSINESS: ☐ INDIVIDUAL ☐ JOINT VENTURE ☐ PARTNERSHIP ☐ ORGANIZATION (OTHER THAN PARTNERSHIP OR JOINT VENTURE)

LOSS, IF ANY, UNDER SECTION 1 – COVERAGE (ABSENCE OF ENTRY INDICATES LOSS PAYABLE TO INSURED)

INSURANCE IS PROVIDED ONLY FOR THOSE SECTIONS AND COVERAGES FOR WHICH A SPECIFIC LIMIT OF INSURANCE AND/OR PREMIUM IS INDICATED.

SECTION 1 – PROPERTY, GLASS OR BOILER

COVERAGE	FORM NUMBER	CO. INS. %	DEDUCTIBLE $	LIMIT OF INSURANCE $	RATE $	PREMIUM (CR INDICATES REFUND OR RETURN)
A. BUILDING						
B. EQUIPMENT						
C. STOCK						
D.						
E.						
F.						
G.						
H.						
I.						
J.						
K.						
L.						
M. INFLATION GUARD ☐ YES ☐ NO						
ENDORSEMENTS						
SUPPLEMENTARY DECLARATION PAGE	5505 (9/87)					ATTACHED

☒ INDICATES THE ITEMS CHANGED BY THIS DOCUMENT

THIS POLICY HAS BEEN ISSUED TO REPLACE POLICY No. BL 8020836

THIS POLICY CONTAINS A CLAUSE(S) THAT MAY LIMIT THE AMOUNT PAYABLE

The Canadian Commercial Policy

POLICY No. CCP 8075740

POLICY DECLARATIONS – PAGE 2

SECTION 2 CRIME

INSURING AGREEMENTS / COVERAGE	FORM NUMBER	DEDUCTIBLE OR RETAINED LIMIT $	LIMIT OF INSURANCE $	RATE $	PREMIUM CR INDICATES REFUND OR RETURN
A. DISHONESTY, DISAPPEARANCE, DESTRUCTION					
I – EMPLOYEE DISHONESTY – FORM A					
– EMPLOYEE DISHONESTY – FORM B					
II – LOSS INSIDE THE PREMISES					
III – LOSS OUTSIDE THE PREMISES					
IV – MONEY ORDERS OR COUNTERFEIT PAPER CURRENCY					
V – DEPOSITORS FORGERY					
B. INSIDE AND OUTSIDE ROBBERY					
C. SAFE BURGLARY					
D. DAMAGE TO BUILDINGS BY BURGLARY					
E. SCHEDULED FIDELITY BOND					
F.					
ENDORSEMENTS					

SECTION 3 LIABILITY

A. COMMERCIAL GENERAL LIABILITY					
AGGREGATE	5586 (12/87)		5,000,000.		INCLUDED
EACH OCCURRENCE	5586 (12/87)	25,000.	5,000,000.	VRS.	25,000.
PERSONAL INJURY	5586 (12/87)		5,000,000.		INCLUDED
TENANTS' LEGAL – ANY ONE PREMISES	5586 (12/87)		1,300,000.		700.
MEDICAL EXPENSES – ANY ONE PERSON	5586 (12/87)		2,500. PERSON/ 25,000. ACCIDENT		INCLUDED
RETROACTIVE DATE (APPLICABLE TO FORM No 5585)					
(COVERAGES A AND D OF FORM 5585 DO NOT APPLY TO "BODILY INJURY" OR "PROPERTY DAMAGE" WHICH OCCURS BEFORE THE RETROACTIVE DATE)					
B. FARMERS' LIABILITY					
ENDORSEMENTS – NON OWNED AUTOMOBILE ☒ YES ☐ NO	5583 (9/87)		5,000,000.		INCLUDED
PREMIUM COMPUTATION	5629 (1/88)				ATTACHED
LEGAL LIABILITY FOR DAMAGE TO HIRED	5642 (2/88)			FLAT	70.
EMPLOYERS' BODILY INJURY LIABILITY	5561 (9/87)		5,000,000.	FLAT	200.
C. COMMERCIAL UMBRELLA LIABILITY					
EACH OCCURRENCE					
ANNUAL AGGREGATE					
ENDORSEMENTS					
FOREST FIRE FIGHTING EXPENSE	5573 (9/87)		500,000.	FLAT	350.
TENANTS' LEGAL LIABILITY (BROAD)	5564 (9/87)		AS ABOVE		INCLUDED
COVERAGE TERRITORY LIMITATION	5577 (9/87)				ATTACHED
OIL AND GAS OPERATIONS	5630 (9/87)				ATTACHED

SCHEDULE OF UNDERLYING INSURANCE (APPLICABLE TO FORM No.5627)

CARRIER, POLICY No. AND TERM	TYPE OF POLICY	APPLICABLE LIMITS

PREMIUM ADJUSTMET – ITEM ..... (ABSENCE OF AN ENTRY INDICATES NON ADJUSTABLE)

PREMIUM LOCATION 1	$ 26,320.00
ADDITIONAL LOCATION (S) PREMIUM	$
TOTAL PREMIUM PAYABLE	$ 26,320.00

☒ INDICATES THE ITEMS CHANGED BY THIS DOCUMENT

THIS POLICY CONTAINS A CLAUSE(S) THAT MAY LIMIT THE AMOUNT PAYABLE

IN WITNESS WHEREOF, THE INSURER HAS CAUSED THIS POLICY TO BE SIGNED BY ITS PRESIDENT BUT THIS POLICY SHALL NOT BE VALID UNTIL COUNTERSIGNED BY A DULY AUTHORIZED REPRESENTATIVE OF THE INSURER.

THE DOMINION OF CANADA GROUP

PRESIDENT

HILLCOFF LANGFORD INSURANCE BROKERS LIMITED

COUNTERSIGNED AUTHORIZED REPRESENTATIVE

PART TWO

SAFETY PRECAUTIONS

CAMERON HILLS

SUBSURFACE CONDITIONS ANTICIPATED

Qualifying Statement

Listed below are the subsurface conditions anticipated for each section of the hole to be drilled.

Conductor Hole
0 - 25 m (Approx.)

1. Surface deposits of glacial till appear to be minimal at this location. Conductor casing is expected to be set no deeper than 25 m.

2. Control wells indicate that permafrost does not extend this far south. This fact has been confirmed by the Department of Energy, Mines and Resources - Geothermics Division. For details refer to the enclosed area map entitled "Depth of Permafrost at Selected Wellsites in N.W.T."

   To ensure that a competent bond is achieved on the upper hole section the cementing program will incorporate Class "G" plus 3% $CaCl_2$ cement for the conductor and surface casing.

3. Generally, lost circulation can be expected while drilling the loose, unconsolidated sands and gravels that are common to surface formations. For example, on the H.B. Cameron River J-12 well, the conductor washed while drilling surface hole which necessitated a remedial cement job.

Surface Hole
25 m - 380 m

1. Lost circulation was noted on the H.B. Cameron A-05 well from approximately the 569 m mark to 685 m inclusive. In review, the losses averaged 8 - 10 m^3 of mud. Generally, the addition of LCM material cured the problem with good returns following after. Similarly, on the Exco et al Cameron I-16 well, lost circulation was noted at the 85 m depth. Before full circulation was regained nearly 20 m^3 of mud had been lost to the thief zone.

2. Cementing this hole section has presented few problems. On H.B. Cameron river J-12, 244.4 mm surface casing was set at 203.7 with Class "G" +

3% $CaCl_2$. Cement returns were obtained to surface. Similarly, on the Paramount H.B. et al Cameron Hills M-31 well, 219 mm surface casing was set at 164.6 m with Type "A" cement plus 2% $CaCl_2$. Again, the M-31 well record indicates that cementing did not present a problem.

Similarly, on the recently drilled Cameron River L-11 location good cement returns were obtained while running 255 mm surface casing.

3. Deviation is expected to remain near the vertical by simply following recommended drilling practices. Nevertheless, surveys will be taken at regular intervals to monitor the hole angle. It should be noted that on the H.B. Cameron A-05 well deviation was 1 1/4° at 844 m, increasing to 2 3/8° at 1399 m.

Main Hole
390 m - 1528 m

1. Hole problems on offset wells varied from twisted off collars on H.B. Cameron J-12 to extensive reaming on the Paramount et al Cameron Hills M-31 well. However, delays were temporary and did not seriously hamper drilling progress.

2. Formation Integrity Test - On the Paramount M-31 well a leak off test was conducted which indicated a pressure gradient exceeding 27 kPa/m. In comparison, a normal pressure gradient is considered to be 11 kPa/m.

3. Geologically, drilling through the Muskeg Formation will necessitate pre-treating of the drilling fluid with soda ash to counter the clobbering effect of the anhydrite.

4. Gas kicks were not encountered on the original I-10 well but it should be noted while drilling through the Slave Point Formation. However, drill stem test data for the Slave Point on the Cameron J-12 and Paramount H.B. et al Cameron Hills M-31 wells has provided pressure gradients and the required equivalent mud circulating density as follows:

	H.B. Cameron J-12	Paramount H.B. et al Cameron M-31
Slave Point	813 m	757 m (2485 ft)
ISI BHP	8730 kPa	8349 kPa (1224 psi)

Calculated -
Pressure Gradient - 10.7 kPa/m ^{3} 11.1 kPa/m
Equivalent Mud Wt. - 1095 kPa/m^3 1135 kg/m^3

Unless the Operator plans to drill into the slave Point under balanced, a recommended drilling procedure calls for increasing the drilling fluid density from approximately 1080 kg/m^3 to 1140 kg/m^3 prior to penetrating the Salve Point. Furthermore, in the interest of safety, all BOP equipment should be checked at this time.

Lower downhole in the Sulphur Point formation offset drill stem test information obtained on the Paramount M-31 well indicates that a formation pressure gradient of 13.25 kPa/m may be expected requiring a corresponding drilling fluid weight of 1352 kg/m^3 to stabilize the well. This data is confirmed by the fact that at total depth the mud weight on the Paramount M-31 well varied between 1340 - 1360 kg/m^3. Again, serious consideration should be given to raising the mud weight before penetrating the Keg River.

5. Sour Gas - H_2S Release Rate Calculation

Wells reviewed: Paramount HB et al Cameron J-62
Paramount HP et al Cameron M-31
2-5-125-18W5M
6-25-125-18W5M
12-21-126-18W5M
12-26-126-18W5M
3-32-126-18W5M
5-24-126-18W5M

Formations evaluated: Slave Point
Sulphur Point
Keg River
Muskeg

Formation - Slave Point

Wellhead deliverability:

A production rate of 28.15 10E3 m^3/d was derived from a four-point test report dated March 1980 for the Paramount HB et al Cameron M-31 well.

Sour Gas Content: (H_2S)

A sample analysis of DST 2 from the well 3-32-126-8W5M revealed an H_2S content of 1.34 (volume %).

Calculations:

Gas Release Rate:

$$m^3/sec = 28.15\ 10E3\ \frac{m^3}{day} \times \frac{1\ day}{24\ hrs} \times \frac{1\ hr}{60\ min} \times \frac{1\ min}{60\ sec} = .3257$$

Given an H_2S content of 1.34 (volume %) the potential H_2S release rate is:

$$m^3/sec = .3257\ \frac{m^3}{sec} \times \frac{1.34}{100} = .044$$

Formation - Sulphur Point

Wellhead deliverability:

An AOF rate of 62.554 10E3 m^3/d (2.22 MMcf/d) was derived from test report dated February 1981 for the Paramount HB et al Cameron J-62 well. Since AOF is at 0 sandface pressure this is considered the "worst case" scenario.

Sour Gas Content: (H_2S)

A DST sample analysis from the 5-24-126-22W5M well records an H_2S content of 2.26 (volume %).

Calculation:

Gas Release Rate:

$$m^3/sec = 62.54\ 10E3\ \frac{m^3}{day} \times \frac{1\ day}{24\ hrs} \times \frac{1\ hr}{60\ min} \times \frac{1\ min}{60\ sec} = .7238$$

Given an H_2S content of 2.26 (volume %) the potential H_2S release rate is:

$$m^3/sec = .724\ \frac{m^3}{sec} \times \frac{2.26}{100} = 0.164$$

Formation - Keg River And Muskeg:

Analyse of natural gas from the Keg River and Muskeg formations from some wells in the northern regions of Alberta record H_2S content. A review of the available data indicates that the Keg River and muskeg zones in the

Cameron Hills area are not sour gas bearing. It should be noted however that on the Paramount M-31 well, DST #1 reported a light H_2S concentration although gas analysis reported 0 mole fraction H_2S.

Conclusion:

The combined H_2S release rates for Slave Point and Sulphur Point formations is .0208 m^3/sec. Utilizing the contamination rate of 100 ppm isoplat designed in the Alberta Energy Resources Conservation Board guidelines the radius of the emergency planning zone calculated as follows:

Radius = 0209 E.51 x 2 = 212 m

EMERGENCY RESPONSE PLAN

PARAMOUNT RESOURCES LIMITED

EMERGENCY RESPONSE PLAN

PARAMOUNT ET AL CAMERON B-8

AND

PARAMOUNT ET AL CAMERON L-47

DECEMBER 9, 1988

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TABLE OF CONTENTS

SECTION 1

INTRODUCTION

Paramount Resources Ltd. intends to drill the B-8 and L-47 wells, complete well C-50 and workover well I-10 during the first quarter of 1989.

A base camp will be used. Off-Duty and Medical Personnel will be stationed there. Safety Personnel will be stationed on site during testing operations.

This manual provides the Operating Personnel with guidelines for handling emergency situations and is prepared in accordance with the "Canadian Oil and Gas Drilling Regulations", of November 1980.

Every precaution necessary will be undertaken to:

1. Protect the health and safety of employees and area occupants from any adverse conditions that may be presented.

2. Protect the environment from any long term contamination.

PLAN RECEIPT FORM

Date: _____

TO: Standard Safety & Consulting Services (1978) Ltd.
3120 - 93 Street
EDMONTON, Alberta
T6H 1C7

Attention: Mr. Brian Christensen

Re: Emergency Response Plan For Cameron Hills Project

I have received the above mentioned plan. the manual has been reviewed by the undersigned and the contacts, phone numbers and duties appear to be correct. Any changes to this plan will require notification to Paramount Resources Ltd. and Standard Safety & Consulting Services (1978) Ltd.

_____
Plan Holder's Signature

Copy # _____

SUMMARY OF DRILLING EMERGENCY PLAN BY ALERT STAGE AND ZONE

ALERT STAGE	WELL CONDITION OR EMERGENCY	ACTION WITHIN PLANNING ZONE	ADDITIONAL ACTION
0	- No problem	- Awareness of activities	-
I	- Odor Complaint (H_2S)	- Alert Wellsite/Camp Personnel - Prepare to don breathing apparatus	- Investigate odor source and contain

	- Well kick (flow controlled) or other severe drilling problem
	  - Failure of essential well control or safety equipment
	  - B.O.P. System
	  - Mud Circulating System due to
	  - pump failure
	  - drill pipe separation
		- Alert Wellsite/Camp Personnel
		- Block access roads (using non-essential Personnel)
			- Notify Company Personnel

	- Severe weather	- Travel advisory - check in and out	- Advise support services
II	- Control equipment failure while circulating kick - Partial Control of Flow	- Block access roads (using non-essential Personnel)	- Notify and mobilize Company and Government Personnel - Monitor gas levels downwind and ignite if human safety cannot be assured
	- Minor fire	- Alert Wellsite/Camp Personnel - Extinguish fire	- Consider outside help
	- Minor pollutant spill	- Contain spill (saw dust) - Commence cleanup operations	- Report incident to authorities and company
	- Minor injury	- Alert medical staff - Preserve incident site	- Arrange for medi-vac if required - Report incident to Company and Government Personnel
III	- Serious injury or death	- Alert medical and safety staff - Eliminate hazards to others - Preserve accident site - Suspend operations	- Arrange for medi-vac - Report incident to Company and Government Personnel
	- Major fire - camp - Rig, other than blowout	- Evacuate camp - head count - Contain fire - Shut in well - Evacuate rig - head count - Contain fire	- Contact emergency support services - Notify Company and Government Personnel - Contact emergency support services - Notify Company and Government Personnel
	- Loss or disablement of drilling rig	- Shut in well - Evacuate wellsite - head count	- Contact emergency support services - Notify Company and Government Personnel
	- Major pollutant spill (Including fuel truck roll over) - Loss of support craft (i.e., air craft)	- Arrange for fire protection - Contain spill (dyke using clay or bags of sawdust) - Alert medical and safety staff	- Report incident to Company and Government Personnel - Notify National Defence - Contact emergency support services - Notify Company and Government Personnel
	- Uncontrolled flow from well - Concentrations of H_2S in excess of 20 ppm in unevacuated areas	- Evacuate wellsite and camp as required - Block access roads (using non-essential Personnel)	- Initiate Sour Gas Emergency Response Plan - Monitor downwind area and ignite if human safety cannot be assured

SECTION 2

EMERGENCY DEFINITIONS AND PROCEDURES

Three stages of alert are discussed in this section.

Stage I Alert

Criteria:

Stage I will include all minor situations where the emergency is confined to the immediate area of the wellsite. No hazard to the workers exists and outside help is not required.

No immediate hazard to people exists but the situation has the potential to escalate to Stage II.

Stage I Includes:

1. Emergency:

   - Fugitive odor complaint from company personnel (H_2S or other contaminant)
   - Well kick but flow is controlled
   - Problem encountered during operations

   Action:

   - Alert should be given to individuals in the 400 meter planning radius
   - Monitoring will be initiated downwind by personnel with portable H_2S detectors
   - Assemble non-essential wellsite personnel, brief and equip them to block access roads and evacuate camp (if required)

2. Emergency:

   - Severe weather

   Action:

   - Travel advisory - all persons (employee or support services) will be required to check in and out to insure no one is stranded

Stage II Alert

Criteria:

Stage II will include all minor situations which have escalated into a potential hazard to the public and outside help is required.

Stage II Includes:

1. Emergency:

   - Failure of control equipment while circulating well kick
   - Partial control of flow

   Action:

   - Notify and mobilize company, government and emergency services
   - Monitor gas levels downwind and ignite if human safety cannot be assured

2. Emergency:

   - Minor fire/spill

   Action:

   - Alert wellsite/camp personnel - head count
   - Extinguish fire
   - Commence cleanup operations
   - Notify company and government personnel

3. Emergency:

   - Minor injury

   Action:

   - Arrange for medi-vac (if required)
   - Report incident to company and government (Workers' Compensation, etc.) personnel

Stage III Alert

Criteria:

Stage III will include all major situations where the emergency cannot be controlled or eliminated with personnel and supplies onsite.

Stage III Includes:

1. Emergency:

   - Serious injury or death

   Action:

   - Alert medical and safety staff
   - Arrange for medi-vac
   - Suspend all operations. However, if failure to resume operations potentially endangers other personnel at the work site, corrective measures should be taken to eliminate the hazard, insuring that all evidence relating to the accident is preserved.
   - Report accident to R.C.M.P., company and other government personnel

2. Emergency:

   - Major fire - camp

   Action:

   - Evacuate camp - head count
     - open all window covers - check each room
   - Contact emergency services
   - Contain fire/shut-in propane and other flame sources
   - Notify applicable government and company personnel

3. Emergency:

   - Major fire - rig (other than blowout)

   Action:

   - All of the applicable above and,
   - Shut in well- contain fire
   - Evacuate rig - head count

Stage III Alert cont'd...

4. Emergency:

- Loss or disablement of drilling rig

Action:

- Shut-in well
- Head count - evacuate rig (if required)
- Commence remedial actions
- Notify applicable company and government personnel

5. Emergency:

- Major pollutant spill including fuel truck rollover

Action:

- Alert medical and safety staff
- Contain spill (dyke using clay or bags of sawdust)
- Arrange for fire protection
- Commence clean-up and disposal in accordance with federal regulations
- Notify company and governing agencies (i.e., Environment Protection Service, etc.)

6. Emergency:

- Loss of support craft (i.e., aircraft)

Action:

- Alert medical and safety staff
- Contact emergency support services
- Notify Department of Transport and National Defence
- Notify company and other governing agencies

Stage III Alert cont'd...

7. Emergency:

- Uncontrolled flow from well containing H_2S
- Concentrations of H_2S in excess of 20 ppm in unevacuated areas

Action:

- Evacuate 400 meter planning radius - account for all persons
- Block access roads
- Notify company and government personnel

Note: If the emergency has deteriorated and a <u>major</u> catastrophe (loss of aircraft) is imminent or has occurred, contact National Defence, Yellowknife).

SECTION 3

DUTIES OF PERSONNEL

a) On-Site Consultant

In the event of an emergency, the On-Site Consultant will become the on-scene commander.

In the event the On-Site Consultant is unable to perform his responsibilities, for whatever reasons, the chain of authority will be as follows:

First	-	Rig Manager
Second	-	Driller
Third	-	Safety Supervisor

Immediate Actions

On-Scene Commander has the responsibility to evaluate the situation, commence with remedial actions, insuring preservation of human life and protection of the environment.

Assess the Situation

Initiation of notification procedures beginning with an assessment of the situation determining whether emergency is minor or major.

1. Current Situation
   - Area of gas flow, i.e. drill pipe (tubing) or annulus.
   - Status of BOP equipment - i.e. - good, failed, burned, etc.
   - Status of major rig equipment - i.e. pumps, motors, mud systems.
   - Estimate of flow rate.
   - Shut in pressures (if possible)
   - Define status of support equipment i.e. power, lights, communications.

2. Potential hazards
   - Gas release
   - Risk of Fire.
   - Risk of explosion.
   - Hazardous materials in vicinity.

3. Weather conditions
   - Wind speed and direction.
   - Visibility.
   - Air temperature.
   - Rain/snow/sleet.

4. Wellsite & Campsite Evacuation
   - If wind - evacuate upwind.
   - If no wind - evacuate uphill.

On-scene Commander will notify Safety Personnel to begin immediate evacuation of on-site personnel who may be affected by the hazards (e.g., H_2S, fire).

On-scene Commander will then contact the Superintendent on call who will determine further action.

b) **Superintendent on Call**

The Superintendent on Call, will receive a call from the lease. He will discuss the situation with the On-scene Commander and assess:

1. The severity of the situation.
2. Whether evacuation is required.
3. Additional personnel and services that may be required.
4. Remedial actions.

Superintendent on Call Duties:

1. Call and brief the Off-Duty Supervisor.

The Superintendent will then proceed by the quickest means possible to the emergency area where he will further assess the situation and commence appropriate steps to bring the emergency to an end.

c) Off-duty Supervisor

The Off-duty Supervisor will contact all company personnel and governing agencies required depending on the type and severity of the emergency.

Stage I Emergency:

- Notify company personnel
- Notify governing agencies
- notify emergency support services

Stage II Emergency:

- Notify company personnel
- Notify governing agencies
- Notify emergency support services

Stage III Emergency:

- Notify company personnel
- Notify governing agencies
- Notify emergency support services

He will then open communications to receive information from lease representatives, etc.

d) Safety Supervisor On-Site

On-Duty Safety Supervisor

Is responsible for co-ordinating the following:

- Safety of on-site personnel, insuring all well site Personnel have quick access to breathing apparatus.

- After receiving order from On-Site Consultant, ignition of gas plume - follow ignition guidelines.

e) **Medical Staff**

Each employee will report the medic prior to commencing the first shift. A well maintained, confidential medical record system is essential to assessing the nature and origin of health problems that arise during employment. Relatively minor injuries can be treated at the site; others, the patient will be stabilized in preparation for medi-vac to the hospital.

- The medical staff will be responsible for ground to air communication for all incoming and out-going flights.

- The medical staff will prepare a passenger and cargo manifest for all out-going flights (first copy to pilot, second to wellsite supervisor, third to keep).

- The medical staff will be responsible for issuing a severe weather warning and completing the severe weather check-in form.

SECTION 4

These wells will penetrate two formations that contain hydrogen sulphide (H_2S) in an amount that may pose a hazard should the well effluent reach surface, they are:

Slave Point @ 1.34% H_2S
Sulphur Point @ 2.26% H_2S

The maximum flow rate potential was calculated for the two above mentioned formations. The calculations indicate a 212 meter hazard zone. For the purpose of this plan and as an additional safety factor a 400 meter planning and evacuation radius will be used.

The probability of an uncontrolled H_2S release is very remote, however should the situation occur, evacuate the 400 meter planning radius and block access roads. (See Map)

Isolation of the Hazard Area

The hazardous area is the region lying within the 400 meter planning radius. Only authorized Personnel may enter this area and they must take the following precautions:

1. Use the Buddy System
2. Every individual entering the Hazard Area must be equipped with breathing apparatus.
3. Individuals entering Hazard Area must continuously monitor Hydrogen Sulphide levels using one of the following:
   i) Sampling Tube, i.e., Drager or Gas Tech
   ii) Electronic Sensor

   NOTE: THE LEAD ACETATE AMPULE IS NOT ACCEPTABLE
4. Individuals entering the Hazard Area must keep in contact through the use of two-way radios or mobile telephones with those giving them authorization of entry. This would most likely be the On-Scene Commander (i.e., report in every 10-15 minutes). Anyone in the Hazard Area, other than authorized Emergency Personnel, must be evacuated immediately.

Arrangements have been made with the R.C.M.P. assist with road blocks. However, road blocks will initially be set up by off-duty crews and non-essential personnel. Road blocks will be manned, personnel can place their vehicles across the road, blocking access. Signs warning of the hazards and area closure will be posted. Should the area closure be required for long term (i.e., over 12 hours), a security company has been designated to operate the road blocks.

MONITORING

Short Term

Downwind monitoring will be initiated to monitor and track the H_2S and/or SO_2 gas plume on the first indication of a gas release. Personnel will be dispatched from the wellsite to evacuate area occupants and block access roads. While travelling in and around the planning zone(s), personnel will continuously test for ambient levels of H_2S and SO_2.

Long Term

A mobile monitoring unit will be dispatched to the emergency area at the first indication of a gas release.

Protection

1. Use Buddy System when possible
2. Breathing apparatus for all personnel
   - be prepared to don apparatus quickly

Detection

1. Multi-gas detector (Draeger c/w SO_2 and H_2S tubes)
2. Record all information

   a. Concentrations in ppm or ppb
   b. Location and time of readings
   c. Wind speed and direction
   d. Who was evacuated and where they are going (phone numbers, etc.)

Wind

Speed and direction of wind may vary, therefore, be prepared to track gas plume.

Communication

1. Notify On-Scene Commander of events taking place
2. Notify Road Block Personnel and work crews of hazard area changes

EQUIPMENT LIST

On-Site Safety Equipment

May Include

Wellsite

- Wellsite trailer
- Service vehicles
- Mobile & 2-way communications
- H_2S detection device(s)
- (8) 30 min. self-contained air paks
- (1) O_2 resuscitator
- (1) flare gun
- (1) electronic H_2S detector
- (1) ignition kit
- Wind socks
- (1) 350 lb wheeled fire extinguisher
- (5) Hand held radios

Safety Trailer

- (10) 300 cu.ft. cylinders air
- (6) 7 cu.ft. Airline paks
- (2) 40 cu. ft. Air paks
- (1) resuscitator
- 300 ft. 1/2" air hose
- 600 ft. 1/4" air hose
- (2) air line manifolds
- H_2S warning signs
- folding stretcher
- first aid kit

Campsite

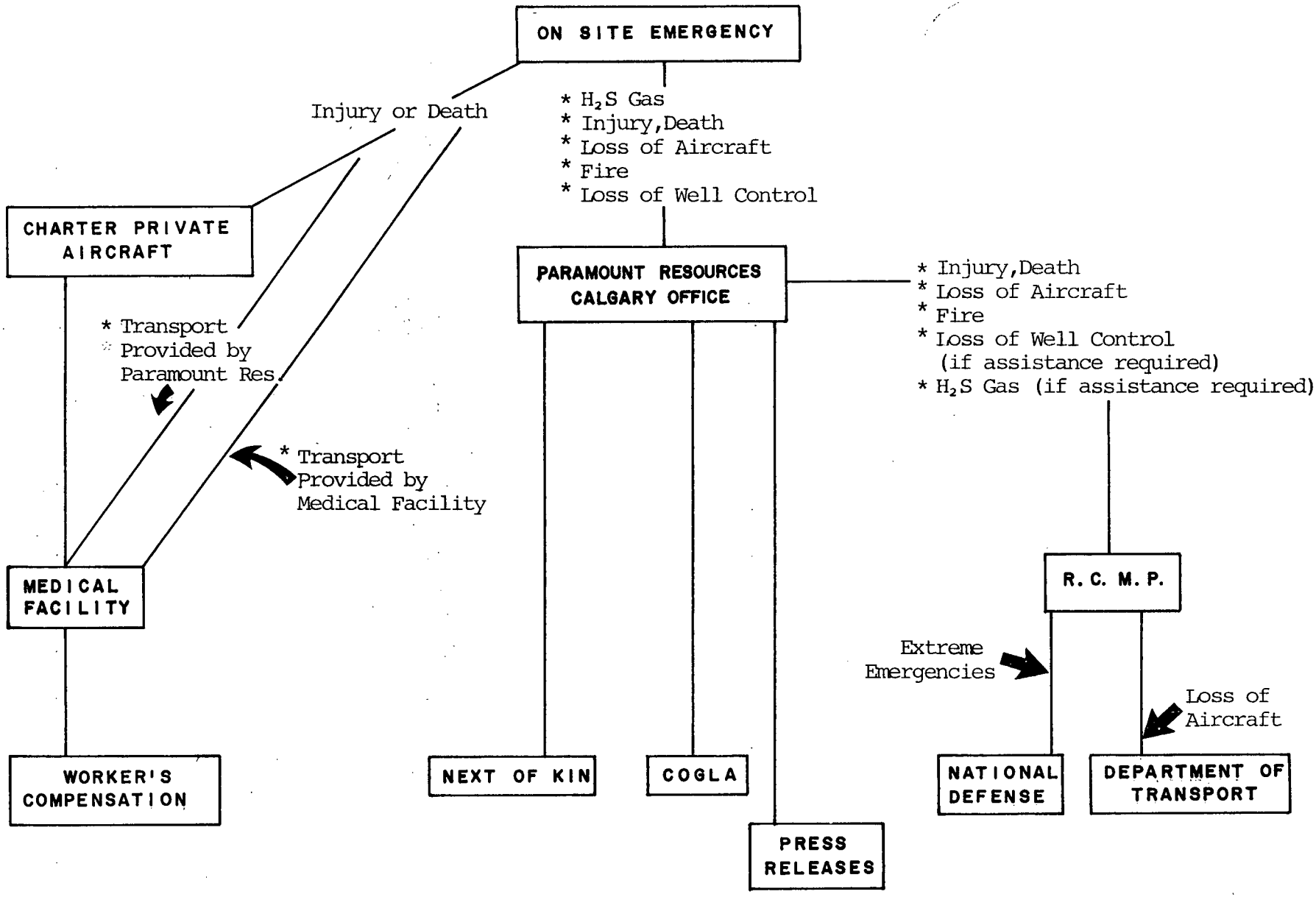
- (6) 30 min self-contained air paks
- (1) H_2S detector (hand-held)
- (1) 150 lb wheeled fire extinguisher
- (1) Hand held radio (medical shack)
- (1) Base station (camp)

Emergency Equipment on Standby

- Road block kits (as necessary)
- Continuous monitor unit
- (6) 2-way radios - compatible with monitor units
- additional electronic H_2S detector
- additional air paks
- security personnel for road blocks

SECTION 5

CONTACT PROCEDURE IN THE EVENT OF AN EMERGENCY



Communications

Emergency Operations Centre

During all emergency situations it is essential that an individual or group of people be aware of all that is happening in the area at all times. The location from which this takes place is the Emergency Operations Centre.

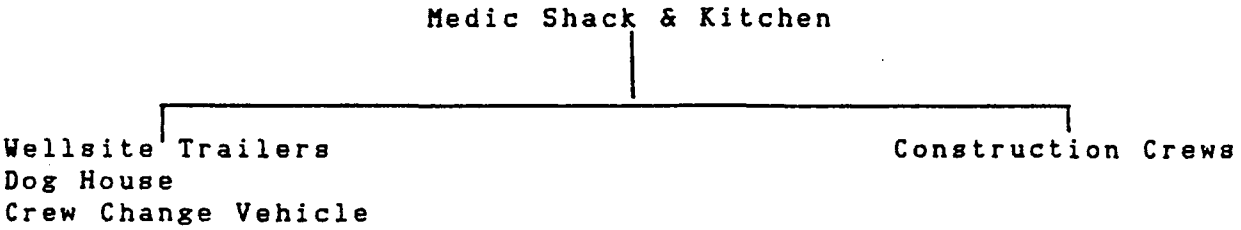
Location: 1) Campsite
2) Road Block A (alternate)

Communication System

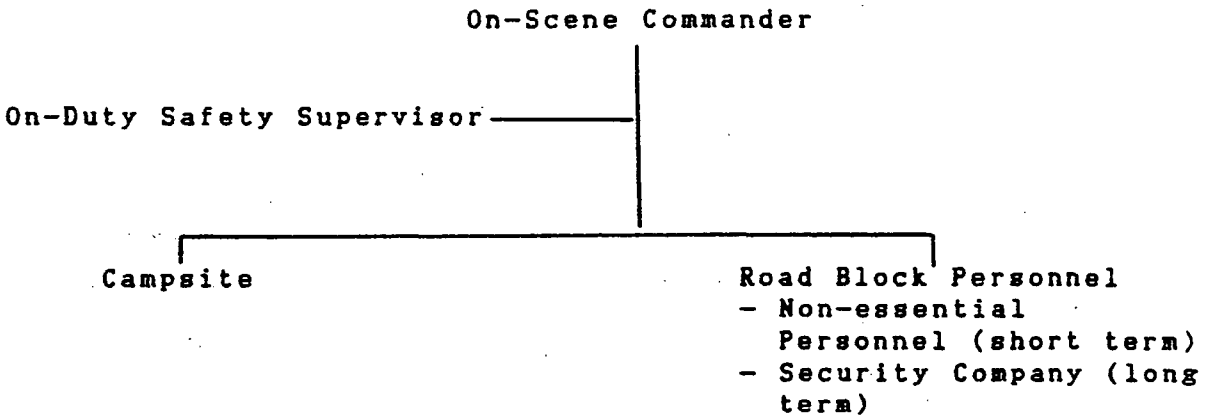
Communications are essential for effective Emergency Response. A system of hand held radios will be on-site prior to penetrating the H_2S bearing formation(s). The radios will be distributed and maintained by the On-Duty Safety Supervisor. Additional radios will be provided should the need arise.

The following charts show the radio locations prior and during an emergency:

Non-Emergency



Emergency



TELEPHONE CONTACTS

1. PARAMOUNT RESOURCES LTD.
   4100 First Canadian Centre
   350 - 7th Avenue S.W.
   Calgary, Alberta T2P 3W5
   (403) 266-2047
   Fax (403) 262-7994

2. SOUTHRIDGE PETROLEUM CONSULTANTS
   1707, 520 - 5th Avenue S.W.
   Calgary, Alberta T2P 3R7
   (403) 263-3035

3. STANDARD SAFETY & CONSULTING SERVICES LTD.
   3120 - 93 Street
   Edmonton, Alberta T2P 1C7
   (403) 463-9077

4. SIERRA DRILLING LTD.
   Box 177
   Medicine Hat, Alberta T1A 7E8
   (403) 265-6150

5. MEDIC

   R.N. PETRO MEDIC SERVICES
   Box 351
   Grande Prairie, Alberta T8V 3A7
   (403) 539-6461

6. WELLSITE

   Medic Shack/Campsite XJ5-8437

   On-Site Consultant - Michael Cholach XJ4-2477

   Rig Manager - Ivan LeBlanc XJ8-7257

   Geologist -

   Safety Supervisor - Standard Safety Consulting

   Mobile Channels - Indian Cabins Or Steen River

7. SUPERINTENDENT ON-CALL (Drilling Contractor)

   Gene Carriere (403) 526-0489

8. OFF-DUTY SUPERVISOR

1. Lloyd Jeffries	Office	(403) 266-2047
2. Lorne Marshall	Office	(403) 263-3035

9. R.C.M.P.

Box 1006 Hay River, N.W.T. XOE ORO	(403) 874-6555
High Level, Alberta	(403) 926-3013
Yellowknife, Alberta	(403) 920-8311
All Areas	Zenith 50000

10. DEPARTMENT OF TRANSPORT

Canadian Aviation Safety Board Edmonton, Alberta	(403) 495-3815
	(403) 495-3865
24 Hour Emergency	(403) 495-3999

Flight Services
Contact Nearest Office With Flight Plan

M.O.T. Hay River Officer In Charge	(403) 874-2441
M.O.T. Yellowknife Officer In Charge	(403) 873-4049
R.C.M.P. Complaints And Inquiries Yellowknife, N.W.T.	(403) 920-8311

Or

R.C.M.P. Peace River, Alberta Air Detachment - Airport	(403) 624-2010

11. NATIONAL DEFENCE

Northern Region Headquarters Yellowknife, N.W.T.	(403) 873-4011

12. CANADIAN OIL AND GAS LANDS ADMINISTRATION
(C.O.G.L.A.)
Box 1500
Yellowknife, N.W.T. X1A 2R3 (403) 920-8175

M.D. Thomas - Manager Northern Region
- Ken Shingh

CANADIAN OIL AND GAS LANDS ADMINISTRATION
(C.O.G.L.A.)
Box 2638, Station "M"
Calgary, Alberta T2P 3C1 (403) 292-5631

13. SPILL REPORT 24 Hour (403) 920-8130
Fax (403) 920-8127
Telex 03445519

14. INDIAN AND NORTHERN AFFAIRS
Box 1500
Yellowknife, N.W.T. X1A 2R3

Pierre LaPorte (403) 920-8110

15. EMERGENCY MEDICAL ASSISTANCE, HOSPITALS, AND TRANSPORTATION

A. YELLOWKNIFE, N.W.T.

(i) Department Of Health
Government Of The Northwest Territories
Transportation Branch
Yellowknife, N.W.T.

Pat Cassidy, Supervisor 24 Hour (403) 920-8496
Or
Mara Rogers (403) 873-5204

The Department Of Health has a staff of St. John's Ambulance Registered Nurse on call to assist in medical emergencies and access to aircraft in Yellowknife.

When requesting assistance please provide the following basic information:

Name Of Injured
Birthdate
Home Address
Health Care Number And Province Of Coverage
Next Of Kin
Nature Of Injury

W.C.B. Number - If Available

(ii) Hospital:
Stanton Yellowknife Hospital
Yellowknife, N.W.T. (403) 920-4111

(iii) Helicopter Service:
Aero Artic Limited
Yellowknife, N.W.T. (403) 873-5230

(iv) Fixed Wing - Aircraft:
Ptarmigan Airways Ltd.
Yellowknife, N.W.T. (403) 873-4461

LaRange Aviation Services
Yellowknife, N.W.T. (403) 873-5330

Raecom Air Ltd.
Yellowknife, N.W.T. (403) 920-4177

B. HAY RIVER, N.W.T.

(i) Hospital:
H. H. Williams Memorial Hospital
Hay River, N.W.T. (403) 874-6512

(ii) Ambulance:
Hay River has a volunteer ambulance service and all of the attendants have E.M.T. training. The ambulance service is managed by the H. H. Williams Memorial Hospital.

(iii) The H. H. Williams memorial Hospital can arrange for a Lear Jet with a doctor and nurse from Edmonton for critical emergencies,
or
can arrange for air charter service from Hay River to Yellowknife or Edmonton.

(iv) Helicopter:
Nation Wide Helicopters
Hay River, N.W.T. (403) 874-2750

(v) Fixed Wing Aircraft:
Buffalo Airways
Hay River, N.W.T. (403) 874-3333

Carter Air Services Ltd.
Hay River, N.W.T. (403) 874-2281

Landa Aviation
Hay River, N.W.T. (403) 874-3500

C. FORT PROVIDENCE, N.W.T.

Fixed Wing Aircraft:
Air Providence Ltd.
Fort Providence, N.W.T. (403) 699-3551

D. FORT SIMPSON, N.W.T.

Fixed Wing Aircraft:
Simpson Air (1981) Ltd.
Ft. Simpson, N.W.T. (403) 695-2505

E. HIGH LEVEL, ALBERTA

(i) Hospital:
High Level Community Health Centre
High Level, Alberta (403) 926-3791

(ii) Ambulance:
Ambulance Or Air Ambulance
Service With Paramedics Office (403) 926-2166
Emergency (403) 926-2545
(403) 926-3890

F. EDMONTON, ALBERTA

(i) Hospitals:
University Of Alberta Hospital
Edmonton, Alberta (403) 432-8822

Charles Camsell Provincial
General Hospital
Edmonton, Alberta (403) 453-5311

G. CALGARY, ALBERTA

(i) Air Ambulance:
Sunwest Charters ltd.
675 Aviation Boulevard N.E.
Calgary, Alberta (403) 275-8121

SECTION 6

IGNITION GUIDELINES

In the event of a major emergency where H2S is being released and Public safety cannot be assured, the senior on-site company representative is responsible for the ignition of the uncontrolled flow. The criteria for the ignition, as set out by the E.R.C.B. in its Decision Report D 84-28 are:

"The well must be ignited as soon as all personnel working at the site can be cleared to a safe distance under any of the following conditions:

1. The well is experiencing an uncontrolled flow, the well effluent has reached the surface, and the flow may lead to loss of life.

2. The well is flowing sour gas to surface and public safety cannot be assured because:

   a) Evacuations of residents within the Emergency Planning Zone has not been accomplished, and:

   b) Monitoring data indicate H_2S levels in excess of 20 ppm in unevacuated areas, or:

   c) Monitoring is not taking place due to unforseen circumstances, such as bad weather, or in the event of communications breakdown and public safety cannot be assured.

NOTE: Uncontrolled flow defined as: flow to surface that cannot be shut off at operator's discretion.

Ignition Procedure:

1) Take the appropriate mask up and buddy system precautions.

2) Approach the well from the upwind side while monitoring with an explosive meter and an H2S detector. Ignition should be implemented from the maximum upwind range of the flare-gun. Flare shells should be shot towards the sour gas release point in such a manner that ignition will occur at the farthest outside radius of the explosive gas plume.

3) Approach no further than warranted and make sure that an explosive mixture does not exist in your immediate proximity.

4) Ignite the gas release.

5) If possible, have a radio and vehicle equipped with safety backup team on standby at a safe distance.

6) If possible, remain on standby at the ignited source to reignite if required.

SECTION 7

EVACUATION EXPOSURE LEVELS FOR AREA OCCUPANTS

These are the Standards Adopted to Protect Human Health from Emissions of H_2S and SO_2 and shall be used as guidelines pending decision by the Board of Health.

Hydrogen Sulphide

(a) if concentrations exceed 5 ppm for 1 hours
- advise occupants evacuate the area, and

(b) if concentrations exceed 20 ppm (3 minute average)
- evacuation will be considered mandatory

(c) occupants with health problems will be evacuated at 1 ppm

Sulphur Dioxide

(a) if concentrations exceed 1 ppm for 2 to 3 hours
- evacuation will be considered mandatory

METHOD OF CONTACT

In the event of an emergency resulting from operations, all persons in the exposed area will be contacted by visitation and advised as to the nature of the emergency situation. Occupants in the planning radius will be notified and requested to evacuate their premises immediately. Starting with those downwind.

NOTE: USE THE BUDDY SYSTEM IF POSSIBLE

- Each vehicle must be equipped with breathing apparatus, gas detection equipment and communication system.

Occupants contacted for evacuation will be given the direction to take to exit the affected area. Transportation will be made available for those who do not have a means of leaving the area.

Evacuation, unless under extreme circumstances, should only be required for a short period of time until elimination of the emergency has taken place.

NOTE: R.C.M.P. will not enter hazardous area unless trained on the hazards of H_2S and the use of Breathing Apparatus.

SECTION 8

NEWS RELEASES

Written statements will be released to media by the office of the President, Paramount Resources Limited, Calgary.

NO news releases, written or otherwise, will be released by Company or Contract Personnel.

RETURN TO NORMAL

Once the emergency is over, an orderly return to normal affairs must be initiated. Contact all persons (i.e., occupants, agency and company personnel) who were informed about the emergency. Ensure that they understand it is over. Provide assistance to those requiring help to return home. Provide instruction for settlement of out-of-pocket expenses or other costs directly caused by the emergency.

VIOLATION OF THE CRIMINAL CODE OR PROVINCIAL LAW

The On-site Drilling Supervisor is instructed to call the R.C.M.P. at the first indication that there has been a crime committed, pursuant to the Criminal Code, or an infraction of any Provincial Law. For example, all personnel on location have been instructed that the use or possession of non-prescription drugs, by anyone on location, will be immediate grounds for dismissal. Furthermore, in such situations the R.C.M.P. will be contacted.

EMERGENCY RESPONSE PLAN SUMMARY

1. Have Kick Procedures been followed? _____

2. Are BOP's shut-in? _____

   a. What is sequence:

      Blind Ram _____ How Many? _____

      Pipe Ram _____ How Many? _____

      Hydril _____

3. Are all motors killed with air shut-offs? _____

4. Are all electrical controls shut off? _____

5. Is all personnel accounted for? _____

   Number Dead _____

   Number Missing _____

   Number Trapped _____

   Number Present _____

6. Is medical aid required by any people? _____

   Names _____ Position _____

   _____ _____

   _____ _____

   _____ _____

   _____ _____

   _____ _____

   _____ _____

7. Has gas been ignited? _____

Emergency Response Plan Summary cont'd...

8. Where is gas directed to? _____

9. In what direction is the wind blowing? _____

10. What is the mud weight? _____

11. What depth are we at? _____

12. What time did this occur? _____

13. What was the status at this time? _____

14. Who has been contacted? _____

_____

_____

_____

_____

_____

_____

15. Is safety company there? _____

Who is it? _____

Company Rep.? _____

16. Is an evacuation required? _____

17. Has it commenced? _____

18. What other steps have been taken? _____

_____

_____

_____

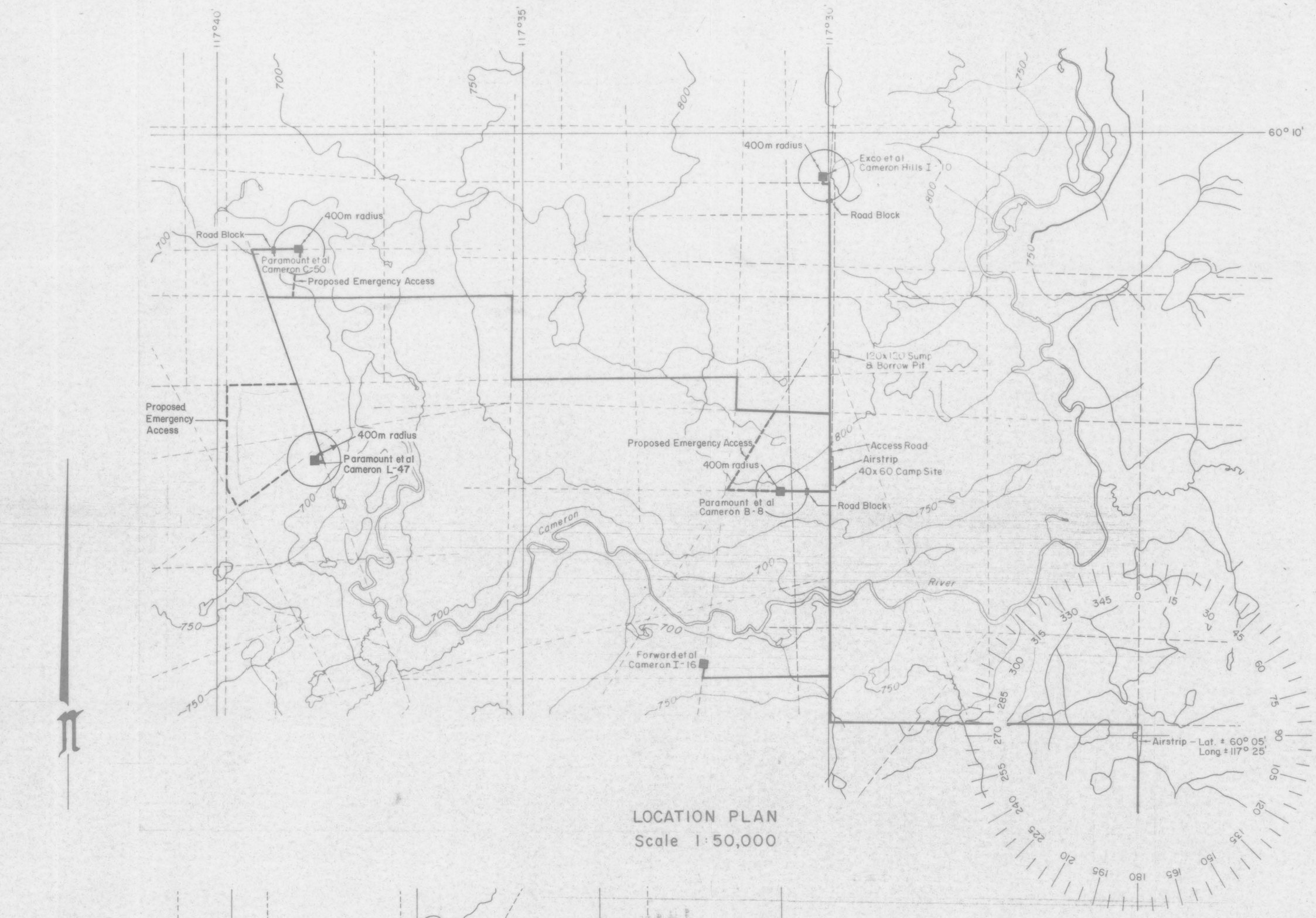
_____

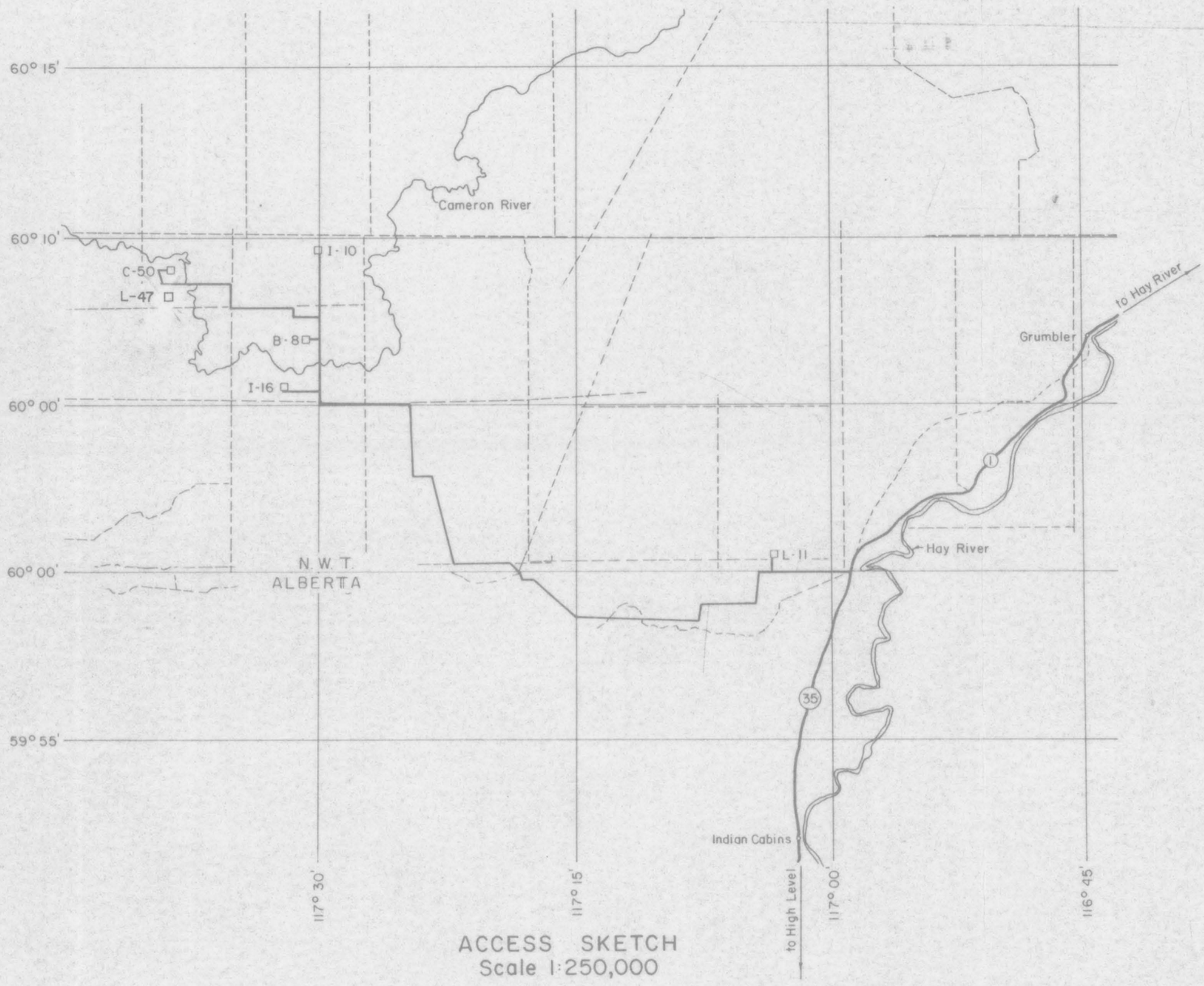
DISTRIBUTION LIST

COPY #	NAME	COMPANY	LOCATION
01		C.O.G.L.A.	Ottawa
02		C.O.G.L.A.	Ottawa
03		C.O.G.L.A.	Ottawa
04		C.O.G.L.A.	Yellowknife
05		C.O.G.L.A.	Yellowknife
06		C.O.G.L.A.	Yellowknife
07		Indian & Northern Affairs	Yellowknife
08		Paramount	Calgary
09		Paramount	Calgary
10		Southridge	Calgary
11		R.C.M.P.	Hay River
12	Drilling Consultant		Rig Site
13	Rig Manager		Rig Site
14	Medic		Rig Site
15		Standard Safety Consulting	High Level

SEVERE WEATHER CHECK-IN FORM

NAME	COMPANY	STARTING POINT PHONE NUMBER	DEPARTURE TIME	ESTIMATED TRIP TIME	DESTINATION POINT PHONE NUMBER	ARRIVAL TIME





PARAMOUNT RESOURCES LIMITED

PLAN OF

ACCESS & PLANNING RADIUS MAP

FOR

PARAMOUNT C-50, B-8, I-10 & L-47 WELL LOCATIONS

CAMERON HILLS AREA
N.W.T.

RAYMAC SURVEYS LTD.
No. 10, 9715 HORTON ROAD
CALGARY, ALBERTA 259-5423

OUR FILE : 86-2008

3

PART THREE

GEOLOGY

CAMERON HILLS

GEOLOGICAL PROGNOSIS

PARAMOUNT ET AL CAMERON B-8

Elevations: Ground: 786.20 (actual) K.B.: 790.21 m

	Sub-Sea	Drilling Depth
Wabamum	+ 330 m	460.2 m
Twin Falls	- 20 m	810.2 m
Slave Point	- 542 m	1,332.2 m
Watt Mountain	- 592 m	1,382.2 m
Bistcho-Sulphur Point	- 614 m	1,404.2 m
Muskeg	- 632 m	1,422.2 m
Keg River	- 687 m	1,477.2 m
Pre-Devonian	- 722 m	1,512.2 m
T.D.	- 738 m	1,528.2 m

Testing during penetration at decretion of the wellsite geologist.

Suggested Logs:	DILL	T.D. - Surface Casing
	CNL-FDC	T.D. - Surface Casing
	VELOCITY SURVEY	T.D. - Surface Casing
	COMPENSATED SONIC NEUTRON	T.D. - Surface Casing
	MICROLOG	T.D. - Surface Casing

Wellsite Geologist:

CAMERON HILLS

GEOLOGICAL PROGNOSIS

SP 253 LINE 84-28

PARAMOUNT ET AL CAMERON L-47

Elevations: Ground: 722.00 (estimate) K.B.: 726.00 m

	Sub-Sea	Drilling Depth
Wabamum	+ 235 m	491.0 m
Slave Point	- 614 m	1,340.0 m
Watt Mountain		1,390.0 m
Bistcho-Sulphur Point		1,400.0 m
Muskeg		1,415.0 m
Keg River		1,495.0 m
Chinchaga		1,560.0 m
Pre-Devonian		1,604.0 m
T.D.		1,620.0 m

Testing during penetration at decretion of the wellsite geologist.

Suggested Logs:	DILL	T.D. - Surface Casing
	CNL-FDC	T.D. - Surface Casing
	VELOCITY SURVEY	T.D. - Surface Casing
	COMPENSATED SONIC NEUTRON	T.D. - Surface Casing
	MICROLOG	T.D. - Surface Casing

Wellsite Geologist:

OFFSET WELL INFORMATION

H.B. Cameron A-05

Date: 1968
Drilling Authority: 291

Location: 60_0 04' 02.14" N, 117_0 30' 27.44" W

Ground Elevation:		775.11 m
K.B.	:	779.07 m
Status	:	Suspended gas well
Total Depth	:	1514.55 m
Spud	:	68-01-28
Rig Release	:	68-02-24
Total Days	:	28
Casing	:	219.0 mm x 248.7 m 139.7 mm x 1511.2 m 73.0 mm x 1306.1 m
Sizes of Holes	:	311.0 mm 0 - 253.9 m 200.0 mm 253.9 - 1514.6 m

Details:

Surface Hole

January 28, 1968	Spud at 1200 hours. Drill 311 mm hole.
January 29, 1968	Drill 311 mm hole to 134 m.
January 30, 1968	Drill 311 mm hole from 134 m to 153 m. Drill ahead in 200 mm hole from 153 m to 253 m. Note: Boulders encountered from 25 m to 32 m; stringers of gravel all the way down to 150 m.
January 31, 1968	Drill 200 mm hole from 253 m to 274 m. Ream out to 252 m. Ran 219 mm, J-55, 35.7 kg/m casing; landed at 251.76 m. Cemented with 465 sks + 2% $CaCl_2$.
February 1, 1968	Wait on cement; nipple up BOP's.
February 2, 1968	Drill 200 mm hole from 252 m to 389 m.
February 3, 1968	Drill 200 mm hole from 389 m to 573 m. Lost circulation noted at 569.9 m to 573.0 m. Mix lost circulation material.
February 4, 1968	Drill 200 mm hole from 573.0 m to 630.3 m. Lost circulation noted from 579.4 m to 586.4 m. - no returns. Pump approximately 8-10 m^3 of mud and obtain returns. Lost circulation again noted at 586.4 m. Mix LCM material and pump down hole : good returns obtained. Lost circulation noted at 630.0 m - pull 6 stands - good returns.

February 5, 1968	Drill 200 mm hole from 630.3 m to 685.5 m. Mix and pump lost circulation material - lost circulation noted at 662.3 m and 685.5 m.
February 6, 1968	Drill 200 mm hole from 685.5 m to 804.4 m. On trip for bit 6 m of fill was noted. Work tight hole. Gel system with viscosity of 39 sec/L.
February 7, 1968	Drill 200 mm hole from 804.4 m to 899.5 m. No problems with lost circulation noted.
February 8, 1968	Drill 200 mm hole from 899.5 to 1063.8 m.
February 9, 1968	Drill 200 mm hole from 1063.8 m to 1203.7 m.
February 10, 1968	Drill 200 mm hole from 1203.7 m to 1321.3 m using a gypsum system.
February 11, 1968	Drill 200 mm hole from 1321.3 m to 1354.2 m. Circulate sample, hoist to test.
February 12, 1968	Run DST #1, cut Core #1.
February 13, 1968	Cut Core #1 from 1354.2 m to 1372.5 m. (Slave Point). Drill ahead from 1372.5 m to 1402.7m.
February 14, 1968	Run DST #2, cut Core #2 - ream rathole. Drill ahead from 1402.7 m to 1410.3 m. Run in hole and ream rathole.
February 15, 1968	Drill 200 mm hole from 1413.3 m to 1437.1 m.
February 16, 1968	Drill 200 mm hole from 1437.1 m to 1463.0 m.
February 17, 1968	Drill 200 mm hole from 1463.0 m to 1485.9 m using a gypsum system.
February 18, 1968	Run DST #3, cut Core #3 from 1485.9 m to 1495.9 m.
February 19, 1968	Recover core, run in hole with DST #4, misrun, pull out of hole. Run in hole - circulate and clean 20' fill to bottom, ream 157.2 mm hole to 200 mm, circulate, pull out of hole to run DST #5.
February 20, 1968	Run DST #5, cut core #4 from 1496.3 m to 1508.5 m.
February 21, 1968	Recover core, run in hole and drill to 1514.5 m.
February 22, 1968	Circulate, logging, run in hole and circulate.

February 23, 1968 — WOO - wait on orders.

February 24, 1968 — Lay down drill collars, rig to run casing, circulate to cement tear out : rig released at 1600 hours.

Mud System

Lime Bentonite Spud Mud	0 m - 252 m
Water	252 m - 570 m
Gel	570 m - 1204 m
Gypsum	1204 m - 1538 m

Deviation

Depth (ft. - K.B.)	Deviation (degrees)
100	1/2
151	1/2
245	1/2
335	1/2
430	3/4
503	1/2
740	1/2
826	1/2
1,284	1/2
1,680	1/2
2,050	3/4
2,376	1/2
2,770	1 1/4
2,845	1
3,300	1/2
3,560	1/2
3,775	3/4
4,050	1 1/2
4,150	1 1/2
4,270	2
4,408	2
4,590	2 3/8
4,810	2

H.B. Cameron A-05
Drill Stem Test Data

No.	Date	Formation	From (m)	To (m)	VO (min)	ISI (min)	FSI (min)	ISIBHP (kPa)	FSIBHP (kPa)	IFBHP (kPa)	FFBHP (kPa)	IHP (kPa)	FHP (kPa)
1.	1968/02/12	Slave Point	4379	4463	65	45	30	1674	1649	547	631	2253	2215
2	1968/02/14	Bistcho	4573	4602	65	30	30	1379	1242	450	353	2371	2321
3	1968/02/18	Keg River	4643	4878	65	30	30	1512	1408	300	454	2572	2543
4	1968/02/19	Keg River	4873	4963									
5	1968/02/20	Keg River	4876	4909	65	40	30	1445	1423	74	83	2571	2521

H.B. Cameron A-05
Bit Record

No.	Size (mm)	Make	Type	Depth Out	Meterage (m)	Hours	Rate of Penetration (m/hr)	Accum hrs
1A	311	OSC-3J	HW	35.1	35.1	8.25	4.25	8.25
2A	311	OSC-3J	HW	133.6	98.5	19.50	5.05	27.75
3A	200	OSC-37	HW	254.6	121.0	16.00	7.56	43.75
1	200	X1G	HW	508.5	253.9	14.00	18.14	57.75
2	200	X1G	HW	698.4	189.9	12.00	15.83	69.75
3	200	X1G	HW	865.7	167.3	26.75	6.25	96.50
4	200	S4T-J	SEC.	1125.4	259.7	36.35	7.14	132.85
5	200	OSC-1G	HW	1288.8	163.4	29.50	5.53	162.35
6	200	X1G	HW	1299.5	10.7	8.25	0.28	170.60
7	157	DIAMOND	-	1320.5	(21.0)	(19.75)	-	-
8	200	M4NG	SEC.	1366.2	45.7	12.50	3.66	183.10
9	157	DIAMND	-	1373.8	(7.6)	(5.2)	-	-
10	200	OWV	HW	1397.9	24.1	14.50	1.66	197.60
11	200	M4NG	SEC.	1431.1	33.2	23.00	1.44	220.60
12	200	OWV	HW	1454.0	22.9	18.25	1.25	238.85
13	157	DIAMOND	-	1464.1	(10.1)	(7.25)	-	-
14	200	M4NG	SEC.	1474.5	10.4	17.50	0.59	256.35
15	157	DIAMOND	-	1486.7	(12.2)	(12.50)	-	-
16	200	M4NG	SEC.	1498.9	14.3	7.50	1.91	263.85
17	200	WD7J	HW	1502.8	3.9	4.75	0.82	268.60

CAMERON HILLS

Paramount H.B. et al Cameron Hills M-31

Date: 1979
Drilling Authority: 926

Location: 60° 00' 55.97" N, 117° 07' 22.30" W

Ground Elevation:		354.7 m
K.B.	:	358.4 m
Status	:	Suspended
Total Depth	:	1060 m
Spud	:	79-03-08 @ 1500 hours
Rig Release	:	79-04-02
Total Days	:	27
Drilling Rig	:	Hi-Tower Drilling
Casing	:	244.5 mm x 200.0 m
		177.8 mm x 796.0 m
		114.3 mm x 1061.4 m
Sizes of Holes	:	311.2 mm 0 - 200 m
		222.3 mm 200 - 796 m
		158.7 mm 796 - 1060 m

Details

Surface Hole

March 8, 1979	Spud at 1500 hours. Set conductor at 20.3 m. Drill 222 mm hole to 101 m.
March 9, 1979	Drill 222 mm hole from 101 m to 200 m. Ream out with 311 mm bit to 48 m.
March 10, 1979	Ream 311 mm hole from 48 m to 200 m. Temporarily stuck in hole (2015 hrs. to 2400 hrs.)
March 11, 1979	Run in hole with magnet (0000 hrs. to 0900 hrs.). Run 18 jts., 244.4 mm, 48.07 kg/m, H-40, ST&C. Cement to surface (returns noted) with 13.5 T G + 3% $CaCl_2$.
March 12, 1979	Nipple up.

Main Hole

March 13, 1979	Pressure test. 1600 hrs. - drill out shoe with 222 mm bit - drill ahead from 210 m - 281 m in 7 3/4 hrs. using X1G (9.16 m/hr.).
March 14, 1979	Drill 222 mm hole from 281 m to 366 m with water.

CAMERON HILLS

March 15, 1979	Drill 222 mm hole from 366 m to 568 m. 366 m - 439 m in 7 1/2 hrs. with J1 (9.27 m/hr.). 439 m - 568 m in 12 3/4 hrs (10.12 m/hr.).
March 16, 1979	Drill 222 mm hole from 568 m - 613 m. Work on minor repairs, RIH, bridged off.
March 17, 1979	Log casing, make up casing roller (later found that 244 mm casing had parted - casing dropped downhole - located from 207 m to 251.7 m). Bridged at 345 m, 417 m. Ream from 555 m. Drill ahead from 613 m to 681 m.
March 18, 1979	Drill 222 mm hole from 612 m to 796 m. WOO - circulate sample - WOO.
March 19, 1979	Circulate - wait on logging truck. Log hole.
March 20, 1979	Run 177 mm casing, 67 jts., 25.3 kg/m, H-40, ST&C. Cement with 20.3 T Class "G" - cemented to surface.
March 21, 1979	Pressure test - drill out.
March 22, 1979	Drill from 806 m - 851 m in 14 1/2 hrs.
March 23, 1979	Drill from 851 m - 914 m Circulate a gas kick between 851 m and 880 m. Circulate another kick between 880 m and 895 m.
March 24, 1979	Drill 159 mm hole from 914 m to 989 m.
March 25, 1979	Drill 159 mm hole from 989 m to 1026 m. Density 1180 kg/m^3, well kicking while tripping. Drill from 1026 m to 1047 m - mix weight material and raise weight to 1190 kg/m^3.
March 26, 1979	Drill to 1058 m. Stuck in hole (1600 hrs. - 2400 hrs.).
March 27, 1979	Kill gas kick - circulate and condition mud - raise density to 1250 kg/m^3. POOH and log. Drill to total depth at 1060 m.
March 28, 1979	Log, POOH and run DST #1 - 997 m - 1015 m. Wait on ammonia.
March 29, 1979	Run DST #2 879 m - 897 m DST #3 855 m - 873 m

March 30, 1979	Run DST #4 879 m - 900 m DST #5 854 m - 875 m DST #6 813 m - 834 m DST #7 814 m - 793 m
March 31, 1979	POOH : recover fluid. Run DST #8 793 m - 814 m.
April 1, 1979	POOH - well kicking : circulate through manifold : RIH - circulate and condition mud - POOH sideways - run casing.
April 2, 1979	Circulate casing - cement. Rig released.

Geological Summary

Formation	Interval	Particulars
Slave Point	811 m - 843 m	a limeston with very poor porosity and condensate stain at the top.
Fort Vermilion	848 m - 863 m	shows no porosity
Watt Mountain	863 m - 868 m	dolomite limestone with very poor vuggy porosity.
Sulphur Point	878 m - 890 m	the dolomite has a fair intercrystalline and vuggy porosity.
Muskeg	890 m - 978 m	predominantly dolomite with layers and stringers of anhydrate, with good intercrystalline porosity.
Keg River	978 m - 1037 m	
Precambrian	1037 m	

Mud Products

Gel	363 sacks
Caustic	6 sacks
Lime	2 sacks
Barite	1005 sacks
Peltex	5 sacks

Paramount H.B. et al Cameron Hills M-31
Drill Stem Test Data

No.	Date	Formation	From (m)	To (m)	VO (min)	ISI (min)	FSI (min)	ISIBHP (kPa)	FSIBHP (kPa)	IFBHP (kPa)	FFBHP (kPa)	IHP (kPa)	FHP (kPa)
1	1979/03/28	Keg River	997	1015	30		60		9506	2493	4288	13125	12781
2	1979/03/28	Muskeg	879	897	60		120		11316	11461	1461	10712	10712
3	1979/03/29	Sulphur Point	855	873	15		60		2063	2063	2063	10454	10454
4	1979/03/30	Muskeg	879	900	60	30	120	11660	11833	429	343	12091	12091
5	1979/03/30	Sulphur Point	854	875	15		30		859	773	773	11833	11833
6	1979/03/30	Lower Slave Pt.	813	834	60	30	1209	7782	8730	2149	2149	10971	10971
7	1979/03/31	Slave Pt.	793	814	15	30	60	2837	2837	2832	2857	10626	10626
8	1979/03/31	Slave Pt.	793	814	15	30	60	2837	2837	2837	2837	10616	10626

Paramount H.B. et al Cameron Hills M-31
Bit Record

No.	Size (mm)	Make	Type	Jet Size	Depth Out	Meterage (m)	Hours	Rate of Penetration (m/hr)	Accum hrs	Bit Condition	Wt M lbs	RPB	Mud wt (kg/m^3)
1A	222.3	HW	X1G	OPEN	200	200	15.50	23.90	15.50	4 1 I	14	140	1080
2A	311.1	HW	X1G	OPEN	200	REAM 200	21.25	9.31	26.75	4 1 I	14	120	1150
1RR	222.3	HW	X1G	3-7.1	361	161	22.75	7.08	59.50	8 8 1/16	15	120	1090
2	222.3	HW	01	2-10.3 1-11.1	612	251	27.00	9.80	86.50	4 6 1/4	12	120	1100
3	222.3	HW	X1G	2-10.1 1-11.1	796	184	21.50	8.50	108.00	3 1 I	14	90	1140
18	158.7	SMITH	V2	CONV.	836	40	9.53	4.21	117.50	2 4 I	12	90	1100
28	158.7	SMITH	F2	3-11.9	1028	192	57.75	3.12	175.25	8 7	12	90	1240
38	158.7	SMITH	F5	3-11.9	1058	30	13.75	2.18	199.00	5 2 I	13	60-70	1305

CAMERON HILLS

H.B. Cameron River J-12

Date: 1969
Drilling Authority: 338

Location: 60° 01' 30.20" N, 117° 02' 22.56" W

Ground Elevation:		311.51 m
K.B.	:	315.20 m
Status	:	Dry & Abandoned
Total Depth	:	1054.6 m
Spud	:	69-01-12
Rig Release	:	69-02-17
Total Days	:	36
Drilling Rig	:	Brinkerhoff 39-H (National T-20)
Casing	:	219.1 mm x 164.6 m
		168.3 mm x 867.8 m

Sizes of Holes	:	311.1 mm	0 - 164.6 m
		200.0 mm	164.6 - 868.7 m
		149.2 mm	868.7 - 958.6 m
		142.9 mm	958.6 - 1054.6 m

Cored Intervals : 765.0 m - 783.3 m Slave Point

Details:

Surface Hole

January 12, 1969	Spud - drill 311 mm hole from 0 m to 40.5 m with gel-chemical system.
January 13, 1969	Drill 311 mm hole from 40.5 m to 70.1 m. Conductor washed - wait on cement.
January 14, 1969	Drill 311 mm hole from 70.1 m to 131.1 m. Work stuck pipe (0100 hours : 0500 hours).
January 15, 1969	Drill 311 mm hole from 131.1 m to 165.2 m. Drill 200 mm hole from 165.2 m to 204.8 m.
January 16, 1969	Drill 200 mm hole from 204.8 m to 267 m. Clean hole to 165.2 m.
January 17, 1969	Run casing - 14 jts., 36 kg/m, J-55, ST&C to 165.2 m - run construction cement plus 2% $CaCl_2$.

CAMERON HILLS

Main Hole

January 18, 1969	Nipple up - pressure test, drill out - drill from 267.9 m to 274.3 m.
January 19, 1969	Drill 200 mm hole from 274.3 m to 357.5 m. Twist off 11 drill collars.
January 20, 1969	Fishing for drill collars.
January 21, 1969	Fishing. Drill ahead from 358.4 m to 369.4 m.
January 22, 1969	Drill from 369.4 m to 652.2 m.
January 23, 1969	Drill from 652.2 m to 765.0 m. Circulate out gas.
January 24, 1969	Mix weight material and circulate - POOH to test.
January 25, 1969	Run DST #1 - 757.4 m to 765.0 m. Core 765.0 m to 776.3 m.
January 26, 1969	Core 776.3 m to 783.3 m. Make up DST #2.
January 27, 1969	Run DST #2 - 762.9 m - 783.3 m.
January 28, 1969	Ream, drill ahead, trip because bit was plugged, thaw mud lines.
January 29, 1969	Drill from 783.3 m to 802.5 m - circulate and condition mud as it is contaminated - build volume.
January 30, 1969	Drill from 802.5 m to 827.5 m. Lost circulation, build volume and mix lost circulation material.
January 31, 1969	Mix lost circulation material. Drill 200 mm hole from 827.5 m to 843.7 m.
February 1, 1969	Drill from 843.7 m to 868.7 m. Circulate sample - trip out to log.
February 2, 1969	Logging.
February 3, 1969	Run DST #3 - 796.7 m - 868.7 m.
February 4, 1969	Run casing - 90 jts. of 168 mm, 38.7 kg/m casing with 50.8 mm slip collars.
February 5, 1969	WOC, nipple up.
February 6, 1969	Drill 149.2 mm hole from 868.7 m to 890.9 m.

CAMERON HILLS

February 7, 1969	Drill 149.2 mm hole from 890.9 m to 931.1 m.
February 8, 1969	Drill 149.2 mm hole from 931.1 m to 956.5 m.
February 9, 1969	Drill 149.2 mm hole from 956.5 m to 970.8 m. Rig up DST #5.
February 10, 1969	Run DST #5, encounter problems with packer seat, break and lay down packer.
February 11, 1969	Run DST #6 - 850.4 m to 970.8 m. Circulate out gas.
February 12, 1969	Drill from 976.9 m - 1008.3 m.
February 13, 1969	Drill from 1008.3 m - 1031.7 m.
February 14, 1969	Drill from 1031.7 m - 1053.7 m.
February 15, 1969	Logging, WOO.
February 16, 1969	Run plugs.
February 17, 1969	Rig release.

Mud Products

Gel	41,100 lbs	411 sacks
Barite	203,900 lbs	2,039 sacks
Qu-Broxin	3,550 lbs	71 sacks
Caustic	3,200 lbs	64 sacks
Calcium Chloride	800 lbs	18 sacks
Cellex	375 lbs	9 sacks
SAPP	210 lbs	5 sacks
Bicarbonate	200 lbs	5 sacks
Lime	50 lbs	2 sacks
Sawdust	25 sacks	25 sacks
Fibroseal	10 sacks	10 sacks

H.B. CAMERON RIVER J-12
Drill Stem Test Data

No.	Date	Formation	From (m)	To (m)	VO (min)	ISI (min)	FSI (min)	ISIBHP (kPa)	FSIBHP (kPa)	IFBHP (kPa)	FFBHP (kPa)	IHP (kPa)	FHP (kPa)
1	1969/01/26	Slave Point	757.4	765.0	90	30	60	8439	8439	234	469	11250	10783
2	1969/01/26	Slave Point	762.9	783.3	240	30	60	7501	8439	234	469	11250	11250
3	1969/02/03	Bistcho	796.7	868.7	90	15	60	10267	10294	1296	4592	12150	12087
4	1969/02/09	Keg River	954.0	970.8			Misrun						
5	1969/02/11	Keg River	949.5	970.8			Misrun						
6	1969/02/11	Keg	850.4	970.8	240	45	60	7750	7964	731	1689	10770	10598

H.B. Cameron River J-12
Bit Record

No.	Size (mm)	Type	Make	In (m)	Out (m)	Interval (m)	Hours	Rate of Penetration (m/hr)	Accum hrs
1A	311	S4	RT	0.0	40.5	40.5	11.00	3.68	11.00
2A	311	S3	Sec.	40.5	83.2	42.7	15.00	2.85	26.00
3A	311	OSC-3	RT	83.2	165.2	82.0	17.75	4.62	43.75
1	200	X1GJ	HW	165.2	267.9	102.7	18.00	5.71	8.00
2	200	X1GJ	HW	267.9	357.5	89.6	10.75	8.33	28.75
1B	200	X1GJ	HW	357.5	678.2	320.7	25.00	12.83	53.75
3	200	M44N	REED	678.2	765.0	86.8	12.25	7.09	66.00
	155.6			765.0	783.3	18.3	13.25	1.38	79.25
3RR	200	M44N	REED	783.3	789.7	6.4	15.00	0.43	99.25
4	200	SNG	SEC	789.7	842.8	53.1	38.25	1.39	132.25
5	200	XV	HW	842.8	868.7	25.9	17.25	1.50	149.75
6	149.2	YSR	REED	868.7	890.0	21.3	12.25	1.74	162.00
7	149.2	YHW	REED	890.0	931.2	41.2	20.50	2.01	182.50
8	149.2	YHW	REED	931.2	958.0	26.8	20.00	1.34	202.50
9	142.9	YSR	REED	958.0	970.8	12.8	5.50	2.33	208.00
10	142.9	YSR	REED	970.8	1000.7	29.9	17.25	1.73	225.25
11	142.9	OWC	HW	1000.7	1022.3	21.6	14.25	1.52	239.50
12	142.9	W7R	HW	1022.3	1031.7	9.4	8.50	1.11	248.00
12RR	142.9	YSR	REED	1031.7	1045.5	13.8	8.50	1.62	256.50
13	142.9	W7R	HW	1045.5	1054.6	9.1	7.25	1.26	263.75

CAMERON HILLS

Exco et al Cameron L-80
Spudded: 1985/02/19 0815 hours

Date: 1985

Surface Hole

February 19, 1985	Spud at 0815 hours Survey, drill to 60m, hoist to run casing
February 20, 1985	Run 339.7mm casing (5 joints 81.1 kg/m K-55 ST&C new casing), landed at 49.75m Circulate casing, cement with 11.6 tonnes "G" + 2% $CaCl_2$, plug down at 0700 hours. Nipple up
February 21, 1985	Drill to 143m
February 22, 1985	Drill to 360m
February 23, 1985	Drill to 387m Run 244mm casing, (34 joints 244.5mm 53.57 kg/m K-55 ST&C, Baker float shoe, centralizers on 1st, 3rd and 5th joints)
February 24, 1985	Cement casing, with 29.6 tonnes "G" plus 2% $CaCl_2$. $8m^3$ cement returns Cut off casing, weld on bowl, nipple up BOP's
February 25, 1985	Mix and condition mud Drill to 614m
February 26, 1985	Trip for bit, slip and cut line Drill to 698m
February 27, 1985	Trip for bit, drill to 810m (kick off point)
February 28, 1985	Make up kick off assembly, RIH, wash to bottom Drill to 892m
March 01, 1985	Rig service, drill and survey to 950m
March 02, 1985	Trip for bit #5, rig service Drill with survey every connection Blow kelly, pull out of hole

March 03, 1985	Lay down 28 singles and magnadrill Make up BHA and run in hole, Ream rathole to 1015m Pull out of hole, lay down stabilizers, pick up magnadril and run in hole Rig up steering tools Drill and survey to 1040m
March 04, 1985	Ream to bottom, Rig out steering tools, pull out of hole, lay down magnadrill Make up BHA, run in hole to 1092m
March 05, 1985	Ream rathole 1015 - 1078m, drill ahead Drill and survey to 1148m Pull out of hole to run and and build hole angle
March 06, 1985	Make up BHA, run in hole Ream from 1126 - 1140m Drill and survey to 1228m
March 07, 1985	Drill and survey to 1332m
March 08, 1985	Pull out of hole, change BHA, run in hole with DC's Slip and cut drilling line Run in hole to 1249m, ream to 1334m Drill to 1363m
March 09, 1985	Drill and survey to 1433m
March 10, 1985	Drill and survey to 1529m
March 11, 1985	Drill and survey to 1613m
March 12, 1985	Work stuck pipe 1200 - 1400m, mix $4m^3$ diesel and kum-free Wait on oil, work stuck pipe Depth 1613m
March 13, 1985	Circulate and work stuck pipe, pump $7.6m^3$ Rig up McCullough
March 14, 1985	Circulate and work stuck pipe Pull out of hole with DP - 75 stands Pick up and make up fishing BHA, run in hole
March 15, 1985	Run in hole, screw into fish, jar on fish, no success Circulate and work tight hole, back ream
March 16, 1985	Circulate and work tight hole, pull out of hole with fishing string, Make up bit with string stabilizer, run in hole to 780m, ream from 780m down

March 17, 1985	Ream 780 - 1014m, Ream 1014 - 1409m top of fish, circulate and work tight hole
March 18, 1985	Circulate and work tight hole, pull out of hole Make up fishing assembly, run in hole to top of fish, jar fish, run sinker bars, jar on fish
March 19, 1985	Jar on fish, rig up endless tubing, run down drill pipe, circulate at 1405m Run free point tool, fishing string stuck 4 DC's below DC, at approx. 1353m
March 20, 1985	Run string shots, run free point, Pull out of hole, make up washpipe assembly, run in hole, bridge at 844m Wash over from 1314m (top of fish) to 1349m Circulate, pull out of hole with washpipe
March 21, 1985	Run in hole with screw in sub and jar assembly Circulate top of fish and screw in Run wireline tools - impression block indicates collapsed or twisted drill pipe at 1322m Wait on endless tubing unit,
March 22, 1985	Wait on endless tubing unit Run slim line tools unable to getpast 1315m Rig up and circulate, apparent hole in joint of DP, top of fish Run wireline tools, run string shot, back off pipe at 1322m (top of fishing tools), rig out wireline POOH with fish
March 23, 1985	Make up BHA fishing tools and RIH Tag fish, circulate and screw into fish, run freepoint, unable to enter fish Run stringshot and back off fish POOH, make up washover and RIH slow Washover fish at 1322.5m to 1340m
March 24, 1985	Washover from 1320 - 1372m, circulate Hoist out, rig up endless tubing unit, rig up and run in free point - mechanically back off collars
March 25, 1985	Run in wireline tools, hoist fish (recovered 5 DC) Clean to top of fish, wash over fish hole sloughing in Top of fish at 1369m
March 26, 1985	Wash over, hoist, wash over (shoe damaged) Make up overshot and run in, circulate and try to hook fish, hoist out (grapple broke) Make up fishing tool, run in with overshot

March 27, 1985	Circulate and hook fish, jar, run in wireline free point Rig up endless tubing, clean from 1369 - 1496m
March 28, 1985	Hoist endless tubing, rig out Run wire line, work wire line, hoist out, cut wire line and strip out and chain out No recovery, free point tool left in hole
March 29, 1985	Make up BHA, overshot, jar, bumber Hoist with fish, recover 1 drill collar
March 30, 1985	Hoist out, recover 1 drill collar, run in with wash over pipe, and circulate, hoist out with wash over Top of fish at 1381m
March 31, 1985	Change BHA, slip drilling line and set brake Run in with screw-in sub, run collar locator Circulate, work sub in top fish, Hoist out with screw-in sub Pulled 2 joints drill pipe out
April 01, 1985	Run in drill pipe open-ended, circulate Rig cementers, run 2 plugs
April 02, 1985	Run plug #3 and plug #4 Rig release 1985/04/02 2000 hours

PART FOUR

DRILLING PROGRAM

DETAILED DRILLING PROGNOSIS

Well Name: Paramount et al Cameron B-8

Location: Coordinates Latitude 60° 10' 06.80" N
Longitude 117° 30' 46.21" W

And

Well Name: Paramount et al Cameron L-47

Location: Coordinates Latitude 60° 10' N
Longitude 117° 30' W Approximately

I GENERAL

		Business	Mobile/Home
a) Contractor:	Sierra Drilling	(403) 526-0489	
Toolpusher:	Ivan LeBlanc		XJ8-7257
b) Field Reps:	Southridge	263-3035 (24 Hours)	
Operational:	Michael Cholach		XJ4-2477
Geological:			

c) Reports & Logs: Daily drilling reports are to be phoned in to Paramount by 08:30, after which the report shall be faxed to C.O.G.L.A. in Yellowknife by Paramount - Calgary Office. Tour Sheets shall be submitted to the Chief as per S 174(2). Geological reports, describing lithology and any other pertinent information, shall be submitted to C.O.G.L.A. in Yellowknife on a weekly basis S 179 (1), (2).

d) Direction to Lease: At the intersection of the MacKenzie Highway and Alberta - N.W.T. border turn west (left hand turn). Follow this road for approximately 30 km. The Camp will be just to the right of the access road. From the campsite turn west (left hand turn) and follow the access road about 0.5 km to the drill site.

e) Credit Card No. A.F.E. No.

f) A geolograph is to be used and charts inserted into the drillfield file.

g) One copy of the tour sheet to be sent to the Chief by Paramount Calgary Office and one inserted into the field file.

h) Notify the Chief and Paramount 24 hours prior to spud.

II SURFACE HOLE

a) Cellar: 0.9 m x 1.8 m diameter, drainage from the cellar will be made possible with the use of a 460 mm diameter culvert from the cellar to the drilling sump.

b) Conductor Pipe: The rathole drilling contractor shall drill and set approximately 25 m of 346.1 mm conductor pipe. In accordance with S 106(1)(a) a diverter system shall be installed.

c) Hole Size: 311 m hole, form surface to 390 m.

d) Casing: In accordance with sections 69 and 70(1)C surface casing will be set at 380 m and cemented to surface. Centralize shoe joint, third joint and fifth joint.

Size	Interval	Mass	Grade	Connection
244.5	Surface 390 m	53.57	K-55	ST & C

Refer to the cementing program for a detailed description of the cementing procedure.

Wait on cement a minimum of 12 hours. Cut off casing and weld on the following casing barrel: ODS 21.0 MPa, 279.5 mm x 244.5 mm Slip on Bowl c/w 2 x 50.8 m 34.5 MPx EFSO Flanged Casing valves. Nipple up BOP (detailed diagram enclosed in section seven of this report). Pressure test and function

test BOP pursuant to sections 60 and 105 as stated in the Regulations.

III MAIN HOLE

a) Hole Size: 222 mm 390 m to 1528 mKB (estimated).

b) Leak Off Test: After drilling out the shoe, drill 5 m of new hole and perform a leak off test in accordance with S 122(2) of the "Regulations". Note results and record in tour book. Post maximum hold back pressure in the dog house and at the manifold.

c) Bits: Drill out utilizing a FDT or equivalent and increasing hardness to J-22 etc. as per consultant's discretion. Review nearby bit records for optimum selection.

d) Drilling Fluid: Refer to the mud program for a detailed description of the drilling fluid system.

e) Deviation: Deviation surveys will be taken in accordance with section 128 (1)(2) of the Regulations.

f) Pressure Testing: As required by S 116 (1)(c) of the Regulations, casing is to be pressure tested once every 1000 rotating hours.

g) Samples: Samples shall be taken at 5 m intervals beginning at surface. These drill cuttings will be collected in accordance with Section 223(1).

h) Total Depth: The total depth as been tentatively set at 1528 mKb (estimated).

i) Downhole Tools: Use shock sub on main hole while drilling our the shoe through to T.D.

j) Logging: <u>DIS SFL INDUCTION LATERLOG</u>

1:240 - Logarithmic Scale - T.D. to surface casing shoe.
1:600 - Linear Scale - T.D. to surface casing shoe.
Resistivity Scale: 0 - 50 ohm - meters.
Conductivity Scale: 0 - 500 - 1000 millisiemens/m.
SP: Possible 10 - 15 millivolt scale per division.

CNL-FDC

1:240 - T.D. to surface casing.
Roll #1 - 1:240.
Bulk Density - 1000 - 3000 kg/m^3 with correction curve.
Gamma Scale - 0 - 150 API units.
Roll #2 - 1:240.
Limestone porosity scale:
Run a repeat at T.D. (memorizer in).

BHCS-GRC

1:240 T.D. to surface casing shoe.
1:600 T.D. to surface casing shoe.
Using standard S.I. scales.

MICROLOG

1:240 T.D. to surface casing shoe.

VELOCITY SURVEY

Note: Logs to be run and scales to be used may be redetermined upon reaching T.D. subject to prevailing hole conditions and interpretation of sample lithology logs.

FLUID SAMPLES AND ANALYSES

Three one litre mud samples are to be caught at 15 minute intervals for Rm and Rmf measurements, while circulating prior to logging.

k) Mud Logging: A mud logging unit will be on location and available to begin gas detection as specified by the Calgary Office (pursuant to S 75(3)(e), S 1900). This facility has the capability to:

a) Measure the methane and total gas from 0 - 100% gas in air.

b) Accurately record gas readings in air.

c) Ascertain the presence of H_2S gas.

In addition to the above mentioned, a hydrocarbon log will furnish the following information:

a) Measure of total gas from the drilling fluid.

b) Chromotographic analysis of hydrocarbons in the mud.

c) A record of the amount of all combustible gases and the amount of methane from the drilling fluid.

d) An interpretive lithology with associated drilling data and hole conditions.

l) Testing: Primary zones in interest are the Slave Point and Sulphur Point formations, DST's will only run if called by Calgary Office. Run bottom hole test with dual packers, safety joint, jars, pump out sub, extra recorder and bottom hole sampler for maximum information. Report all flow rates and any water salinity. Times to be given by Calgary Office. FSI to 1 1/2 times FF. Measure BHT. Samples to be caught at top, middle and bottom of recovery and sent immediately to Chemex Labs. Water resistivity measurement required. Ensure all information on sample bottles. After log evaluation if more than one test anticipated test utilizing inflatable packers.

m) Abandonment: If the well proves to be non-productive the abandonment procedure will be determined by the Calgary Office after consultation with the Chief Conservation engineer (pursuant to section 129 and section 203 - 216 inclusive of the regulations).

A suggested abandonment procedure includes running three (3) plugs in the manner described below:

Plug #1 - Run a bottom plug of Class "G" to 2% $CaCl_2$ to cover the interval from total depth to 100 m above total depth.

Plug #2 - run a 100 m plug of Class "G" + 3% $CaCl_2$ across the porous zones. Run in with drill pipe and tag the top of the plug.

Plug #3 - Run and set a 60 m plug of Class "G' + 3% $CaCl_2$, cementing 30 m below and 30 m above the 244 mm surface casing shoe.

Plug #4 - Pull up hole to the 25 m mark and run Permafrost cement to surface.

n) Casing:

Make 15 stand dummy trip and circulate a minimum of 1 hour prior to cementing, or until hole is circulated clean. The annular velocity with 139.7 mm casing cannot exceed 40 m/min while circulating the hole clean.

Casing string:

Size	Interval	Mass	Grade	Connection
139.77	0 - 1528 m	20.83 kg/m	J-55	ST & C

Placement of scratchers and centralizers will be determined by the Calgary Office prior to running casing.

CEMENTING PROGRAM

An International Company
NOWSCO Well Service Ltd.
1300, 801 - 6th AVENUE S.W., CALGARY, ALBERTA, CANADA T2P 4E1 TELEPHONE (403) 261-2990 TELEX 03-825617 FACSIMILE (403) 264-7489

CEMENT PROGRAM

PARAMOUNT CAMERON HILLS

B-8, L-47

BASIC WELL DATA

Surface:	Casing Size:	244.5 mm
	Bit Size:	349.2 mm
	Depth:	390.0 m
Production:	Casing Size:	139.7 mm
	Bit Size:	222.2 mm
	Depth:	1569.0 m

PREPARED FOR: Mr. Mike Cholack
PARAMOUNT RESOURCES LTD.
4100 First Canadian Centre
350 - 7 Avenue S.W.
Calgary, Alberta T2P 3W5

NOWSCO REPRESENTATIVE: L. Hooker

PREPARED BY: S. Cunningham

DATE: 1988 12 15

For Service Call: High Level at 926-3823

c.c.: R. Underwood - High Level - 926-3823

/cb

PROCEDURE - Surface Casing

1. Dress casing with guide shoe, suitable float equipment, and a minimum of two centralizers on bottom two joints. This equipment together with the bottom three joints should be coated with thread locking compound if K-55 grade or stronger; or welded if weaker.

2. Conduct a pretreatment safety meeting with all personnel on location detailing program, pressure limitations, personnel responsibilities, and safety precautions. Discuss pressure limitations with oil company representative on location.

3. Condition hole with casing on bottom.

4. Ensure pressure recorder is rigged in and serviceable. (Chart to be attached to job ticket.)

5. Pump 3.0 m^3 of water ahead as a preflush.

6. Continuous mix and pump 26.7 tonne of Class "G" cement mixed at 1901 kg/m^3. Cement to contain 3.0% $CaCl_2$.

7. Drop plug and start displacement.

8. Slow displacement rate to 0.3 m^3/min or less prior to bumping plug. Bump plug at 3500 kPa over final pumping pressure. Do not exceed 60% of casing internal yield pressure.

9. Do not disturb casing until cement has reached a compressive strength of 3500 kPa or greater (usually 6-8 hours).

PARAMOUNT CAMERON HILLS B-8, L-47

Bit size	:	349.2 mm
Casing size	:	244.5 mm
Depth	:	390.0 m
Annular volume	:	0.04882 m3/m

Cement top surface

Prewash: Water Volume (m3) 3.0

Cement: 0:1:0 + 3.00% CaCl2

Interval (m)	0.0 - 390.0	Yield (m3/t)	0.758
Slurry volume (m3)	20.20	Density (kg/m3)	1901.
Cement required (t)	26.67	Water (m3/t)	0.440

Additive Description

CaCl2	cement accelerator

COST ESTIMATE

PARAMOUNT CAMERON HILLS B-8, L-47

EQUIPMENT			
Cement services to 390 m			3089.50
1 244.5 mm Rubber plug		374.00 ea.	374.00
Travel charge on cementer	520 km	2.30/km	1196.00
EQUIPMENT TOTAL			4659.50
PRODUCT - HIGH LEVEL			
Class G Oilwell cement	26.7 t	368.00/t	9814.56
CaCl2 cement accelerator	0.8 t	833.00/t	666.40
Cement blending			1601.43
Cement bulk delivery			6070.60
PRODUCT TOTAL			18152.99
TOTAL PRICE (EQUIPMENT AND PRODUCT)			22812.49

ADDITIONAL CHARGES

Water supply and cartage
Planks for cement bin (if necessary)
Cement bin cartage
Provincial sales taxes (where applicable)

F.O.B. LOCATION PRICES

PARAMOUNT CAMERON HILLS B-8, L-47

Cement: 0:1:0 + 3.00% CaCl2

Class G Oilwell cement	1.000 t	368.00/t	368.00
CaCl2 cement accelerator	0.030 t	833.00/t	24.99
Cement blending			60.05
Cement bulk delivery			227.63
PRICE PER TONNE (F.O.B. LOCATION)			680.67

PROCEDURE - Production Casing

1. Dress casing with guide shoe, scratchers, suitable float equipment and at least six centralizers. Run at least one centralizer per joint of casing over the zone of interest, and one every two joints for 60 m above.

2. Conduct a pretreatment safety meeting with all personnel on location detailing program, pressure limitations, personnel responsibilities, and safety precautions.

3. Circulate the hole with reconditioned mud. Lower yield point and plastic viscosity as much as possible. (To be determined by mud engineer.)

4. Ensure pressure recorder is rigged in and serviceable. (Chart to be attached to job ticket.)

5. Pressure test surface equipment to 60% of internal yield of casing.

6. Install a casing wiper plug and pump 2.0 m^3 of water ahead as a preflush.

7. Continuous mix and pump 70.0 tonne of 0:1:0 Class "G" cement mixed at 1901 kg/m^3. Cement to contain:

   0.75% T-10 dispersant
   0.20% R-5 cement retarder

8. Drop top plug and displace at flow rates that will provide turbulent flow. If turbulent flow cannot be obtained then plug flow rates should be considered.

9. Reciprocate casing during displacement.

10. Slow displacement rate to 0.3 m^3/min or less prior to bumping plug. Bump plug at 3500 kPa over final pumping pressure. Do not exceed 60% of casing internal yield pressure.

11. Set casing slips. Do not disturb casing until cement has reached a compressive strength of 3500 kPa.

PARAMOUNT CAMERON HILLS B-8, L-47

Bit size	:	222.2 mm
Casing size	:	139.7 mm
Depth	:	1569.0 m
Annular volume	:	0.02345 m3/m

Cement top surface

Prewash: Water Volume (m3) 2.0

Cement: 0:1:0 + 0.75% T-10 + 0.20% R-5

Interval (m)	0.0 - 1569.0	Yield (m3/t)	0.758
Slurry volume (m3)	52.98	Density (kg/m3)	1901.
Cement required (t)	69.94	Water (m3/t)	0.440

Additive Description

T-10	cement dispersant
R-5	regular retarder

COST ESTIMATE

PARAMOUNT CAMERON HILLS B-8, L-47

EQUIPMENT			
Cement services to 1569 m			4165.20
2 139.7 mm Rubber plugs		146.00 ea.	292.00
Travel charge on cementer	520 km	2.30/km	1196.00
EQUIPMENT TOTAL			5653.20
PRODUCT - HIGH LEVEL			
Class G Oilwell cement	69.9 t	368.00/t	25737.92
T-10 cement dispersant	525.0 kg	12.60/kg	6615.00
R-5 regular retarder	140.0 kg	7.30/kg	1022.00
Cement blending			4116.34
Cement bulk delivery			15603.96
PRODUCT TOTAL			53095.22
TOTAL PRICE (EQUIPMENT AND PRODUCT)			58748.42

ADDITIONAL CHARGES

Water supply and cartage
Planks for cement bin (if necessary)
Cement bin cartage
Provincial sales taxes (where applicable)

F.O.B. LOCATION PRICES

PARAMOUNT CAMERON HILLS B-8, L-47

Cement: 0:1:0 + 0.75% T-10 + 0.20% R-5

Class G Oilwell cement	1.000 t	368.00/t	368.00
T-10 cement dispersant	7.500 kg	12.60/kg	94.50
R-5 regular retarder	2.000 kg	7.30/kg	14.60
Cement blending			58.85
Cement bulk delivery			223.10
PRICE PER TONNE (F.O.B. LOCATION)			759.05

PARAMOUNT RESOURCES

WELL NAME: PARAMOUNT et al CAMERON B-8
LOCATIONS: 60° 10' N 117° 30' W

DRILLING FLUID PROGRAM

DECEMBER 12, 1988

Prepared for: Lloyd Jeffries
Mike Cholach

Prepared by: H. Udo Zeidler

INDEX

SECTION 1

WELL NAME: PARAMOUNT et al CAMERON B-8
LOCATIONS: 60° 10' N 117° 30' W

ENGINEERING SUPERVISION AND MATERIAL SUPPLY

ENGINEERING SUPERVISION

Supervision for this well will be supplied by Randy Gobeil with back up by Dave King. Should the need arise, further assistance will be provided from our Calgary office. Contact Udo Zeidler, Manager, Engineering, at 263-0160.

MATERIAL SUPPLY

The drilling mud products which will be required for this well will be supplied from our facilities in Zama City, F.O.B. Location.

Shipment of these materials to the location will be carried out by:

Mission Mud Control Ltd.
Sec 12, Twp 117, Rge 5 W6M
Zama City, Alberta
Phone: (403) 683-2424

FIELD SUPERVISION

BIOGRAPHICAL SYNOPSIS OF RANDY GOBEIL

Randy has been with Mission Mud since 1984. He began his employment as supervisor of operations at the Company's Zama City Facility. Since that time he has gained his experience as a drilling mud supervisor throughout all of Alberta. The Company's winter operations take Randy to Northern Alberta as its drilling mud supervisor with the additional responsibility of being in charge of our Zama City warehouse facility.

BIOGRAPHICAL SYNOPSIS OF DAVE KING

Dave began his work in the oilfield service industry in 1973. After four years of employment with various drilling contractors, he enrolled at the Southern Alberta Institute of Technology and graduated with a Diploma in Civil Engineering Technology in 1979. After graduating, he began working in the drilling fluid industry for National Mud Control Laboratories. With additional training through specialized courses in drilling fluid rheology, hydraulics, and chemistry, he was later appointed to the position of Area Supervisor, Northern Alberta, the position he held until his departure in 1988. Presently he is associated with Mission Mud as a Shareholder holding the positions of Operations Manager and Senior Drilling Fluid Supervisor.

MISSION MUD CONTROL LTD

SECTION 2

WELL NAME: Paramount et al Cameron B-8
LOCATION : 60° 10' N 117° 30' W

LITHOLOGY - DRILLING PROGNOSIS - COST ESTIMATES				
DRILLING INTERVAL	DEPTH (m)	MUD SYSTEMS, COMMENTS	TIME (Day)	COSTS ($)
311mm SURFACE HOLE	0	Gel/Lime Slurry	3	
Set 244mm casing	390	Possible boulders and gravel, mud rings.	2	1740.00
WOC, nipple up, etc.				
222mm MAIN HOLE				
SAPP Water Drilling	390	Treat out Cement with BiCarb prior to SAPP treatments.		
Wabamum	460			
Mud Up	750	Make up pre-mixed mud while SAPP/Water Drilling.	1	300.00
Twin Falls	810			
Slave Point	1332	Displace hole to premixed mud		1320.00
Watt Mountain	1382	Maintain Gel - MonEx Mud: VIS = 40-45 pH =9.0-9.5	3	3720.00
Bistcho - Sulfur Pt.	1404	FL = 10-12 DENS= Minimum Lightly Disperse Mud @ Watt Mtn		
Muskeg	1422	VIS = 45-50 pH =10.5-11.0		
Keg River	1477	FL = 8-9 DENS= Minimum Possible Anhydrite below Slave Point		
Pre-Devonian	1512	Possible Lost Circulation in Wabamum and U Keg River	7	1380.00
Total depth	1528			
Estimated Cost and Time			16	20960.00
Add Daywork Cost to Log, Evaluate and Complete			5	1000.00
TOTAL ESTIMATED COST AND TIME			21	21960.00

** Prospective Horizon

The total time and cost are only an estimate which is based on reference well data and our experience in the area. The cost of transportation, (estimated to be 20 % of the total cost), as well as the cost of those products which may be required for lost circulation and/or abnormal pressure, are not included in this estimate. All prices for products which are listed herein are F.O.B. our warehouse in Zama City, Alberta.

WELL NAME: PARAMOUNT et al CAMERON B-8
LOCATIONS: 60° 10' N 117° 30' W

BREAKDOWN OF ESTIMATED COSTS

SURFACE HOLE			
Bentonite	:	100 sacks x $ 15.50/sack	$ 1550.00
Caustic Soda	:	3 sacks x $ 54.40/sack	$ 162.00
Lime	:	2 sacks x $ 15.40/sack	$ 30.80
		Estimated, Rounded Sub-Total	$ 1740.00
MAIN HOLE			
(1) SAPP Water			
Bicarb.	:	2 sacks x $ 63.80/sack	$ 127.60
SAPP	:	1 sack x $ 173.00/sack	$ 173.00
		Estimated, Rounded Sub-Total	$ 300.00
(2) Extended Bentonite			
(a) Mud UP (approximately 70 m^3)			
Bentonite	:	70 sacks x $ 15.50/sack	$ 1085.00
Mon Ex	:	10 bags x $ 18.10/bag	$ 181.00
Caustic	:	1 sack x $ 54.00/sack	$ 54.00
(b) Maintenance (Beneficiated Mud)			
Bentonite	:	21 sx/day x 3 days x $ 15.50/sx	$ 976.50
Mon Ex	:	3 bg/day x 3 days x $ 18.10/bg	$ 162.90
Caustic	:	2 sx/day x 3 days x $ 54.00/sx	$ 324.00
Drispac	:	2 sx/day x 3 days x $ 255.00/sx	$ 1530.00
Peltex	:	(pre-treat.) 15 sx x $ 48.40/sx	$ 726.00
(c) Maintenance (Lightly Dispersed)			
Bentonite	:	30 sx/day x 7 days x $ 15.50/sx	$ 3255.00
Peltex	:	6 sx/day x 7 days x $ 48.40/sx	$ 2032.80
Caustic	:	4 sx/day x 7 days x $ 54.00/sx	$ 1512.00
Drispac	:	3 sx/day x 7 days x $ 255.00/sx	$ 5355.00
Soda Ash	:	(Anhydrite) 50 sx x $ 34.30/sx	$ 1725.00
		Estimated, Rounded Sub-Total	$ 18920.00
DAYWORK (Log, test, complete): 5 days x $ 200.00/day			$ 1000.00

ESTIMATED TOTAL MUD COST $ 21960.00

SECTION 3

WELL NAME: PARAMOUNT et al CAMERON B-8
LOCATIONS: 60° 10' N 117° 30' W

REGIONAL LITHOLOGY

WABAMUM GROUP (D-1): Upper Devonian

CARBONATE: Dolomitic limestone and calcareous dolomites

TWIN FALLS: Grumbler Group, Late Devonian

CALCARENITE (Limestone): Light buff to brown,non-skeletal fossiliferous limestones with inter-beds green shale commonly near the top; locally the formation is altered to a white dolomite or fossiliferous limestone in a green shale matrix.

SLAVE POINT: Upper or Middle Devonian

LIMESTONE: Light yellowish brown to dark brown limestone interbedded with fine, crystalline dolomite and thin shale laminae. Locally re-crystallized to crystalline dolomite.

BISTCHO: Devonian

CARBONATE: greyish-brown, laminated dolomite overlain by brown limestone.

SULPHUR POINT: Middle Devonian

LIMESTONE: light buff to brown, non-skeletal and fossiliferous limestones with green shales.

MUSKEG: Elk Point Group, Middle Devonian

EVAPORITE: Interbedded and interfingered series of evaporite and carbonate rocks including salt, anhydrite, limestone and dolomite.

KEG RIVER: Elk Point Group, Middle Devonian

DOLOMITE: Grey and brown dolomite with poor intercrystalline or vuggy porosity; dense, brown, slightly argillaceous wacke stones; also, dark brown limestones.

PRE-DEVONIAN: Early Devonian

VARIABLE: Brick red dolomite or calcareous, red shales; red sandy shale to greenish-grey sandstone; evaporites

SECTION 4

WELL NAME: PARAMOUNT et al CAMERON B-8
LOCATIONS: 60° 10' N 117° 30' W

REFERENCE WELLS

1. Miami Amoco Swede O-22
   60° 11' 50" N 117° 34' 25" W

2. HB Cameron H A-05
   60° 04' 02" N 117° 30' 27" W

3. HB Cameron Hills F-51
   60° 00' 15" N 117° 25' 31" W

4. Miami Amoco Kakisa R I-52
   60° 01' 34" N 117° 54' 42" W

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REFERENCE WELL NO. 1

Miami Amoco Swede 0-22
60° 11' 50"N 117° 34' 25"W

SURFACE HOLE

- spud 1974-03-05 at 23:00 hours.
- drill 381mm hole to 171m in 18.5 rotating hours (1.3 days).
- no problem reported drilling surface hole using a Gel/Caustic Soda mud.
- maximum deviation 7/8° casing.
- set 273mm casing.
- run casing, cement, WOC, nipple up in 2.3 days.

MAIN HOLE

- drilled 222mm hole to 1569m in 230.5 rotary hours (15.0 days).
- used beneficiated Gel mud under the shoe.
- partially dispersed the mud and used Soda Ash for Anhydrite.
- ream bridge at 350m while running in at 557m.
- lost circulation at 635-655m (93m into Wabamum).
- losing volume at 747m (top of Hay River - below Twin Falls).
- losing volume at 1170m (lower Hay River).
- maximum deviation 4 3/4° at 1340m.
- maximum mud density 1176 kg/m^3 at TD (drilled solids).
- log and complete in 3.6 days.

Total Depth - 1569m
Total Days - 22.3

DST Data
Interval - 1452-1507m
Formation - Keg River
Pressures - inconclusive

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REFERENCE WELL NO. 2

HB Cameron H A-05
60-04-02N 117 30 27 W

SURFACE HOLE

- spud 1968-01-28 at 23:15 hours.
- drilled 311mm hole to 252m in 50 rotating hours (2.5 days).
- drilled 200mm pilot hole from 153m.
- no problems indicated.
- maximum deviation 3/4°.
- maximum mud density (1200 kg/m³ - drilled solids).
- run 219mm casing, cement, WOC, nipple up (2.2 days).

MAIN HOLE

- drilled 200mm hole to 1515m in 242.5 rotary hours (14.4 days).
- cored Watt Mountain (18m), Muskeg (8m) and Keg River (22m).
- lost circulation 570-685m; lower Wabamum (28 hours) to Winterburn (above Twin Falls).
- maximum deviation 2.3° at 1399m (lower Bistcho).
- maximum mud density 1189 kg/m³.
- log, evaluate and complete in 7.5 days.

Total Depth - 1515m
Total Days - 26.6

DST DATA

Interval : 1335-1354m, Slave Point
- gas to surface in 3 min, 2MMEF/D after 20 min.
- max SIP; 1134 kpa (866 kg/m³ equivalent density)

Interval : 1394-1403m, Bistcho
- gas to surface in 3 min, 1MMCF/D steady
- recover 9m Sulfur water, 22580 mg/L chlorides

Interval : 1477-1486m, Keg River
- gas to surface in 4 min, 1MMCF/D, 4.5m Sulfur drilling mud
- maximum SIP 10360 kPa (715 kg/m³ equivalent density)

Interval : 1486-1496m
- gas to surface in 3 min, 500 MCF/D, 34m sulfur gas cut mud
- maximum SIP 10190 kPa (699 kg/m³ equivalent density)
- H_2S content = 1.14%

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REFERENCE WELL NO. 3

HB Cameron Hills F-51
60 00 15 N 117 25 31 W

SURFACE HOLE

- spud 1969-03-09 at 00:45 hours.
- drilled 349mm hole to 313m in 42.3 rotating hours (2.3 days).
- spud with water and mud up to Gel-Lime mud in first 40m.
- no problems reported.
- maximum deviation, 0.75°.
- ran 244mm casing, cement, WOC, nipple up (2.3 days).

MAIN HOLE

- drilled 222mm hole to 1543m in 239.5 rotary hours (12.5 days).
- drill out with SAPP/Water
- mudded up at 1117m to a dispersed, low fluid loss starch mud.
- circulate gas cut mud at 1308m, Slave Point and 1362m, Bistcho while drilling with 1105 kg/m³ mud.
- maximum deviation 4° at 1451m, lower Muskeg.
- maximum mud density, 1115 kg/m³ at TD.
- log, evaluate and complete well (7.9 days).

Total Depth - 1543m
Total Days - 25

DST DATA

Interval : 1284-1305m, Slave Point
- GTS 2 min, increased L 3.8MMCF/D in 30 min.
- recovered 88m clean salt water, 22942 mg/L NaCl.

Interval : 1291-1297m, Slave Point
- GTS 7 min, at 295-330MCF/D
- recovered 204m salt water, 22888 mg/L NaCl.
- SIP 10930 kPa (868 kg/m³ equivalent density)

Interval : 1341-1361m, Bistcho
- GTS in 3 min, 857 MCF/D.
- recovered 73m gassy mud, 52m muddy salt water, 23,649 mg/L NaCl.
- SIP 10930 kPa (717m)

Interval : 1460-1486m, Keg River
- recovered 15m sulfur gas cut mud, 34m oil cut mud, 18m mud cut oil, 4605 mg/L NaCl.
- SIP 5089 kPa

Interval : 1398-1437m, Muskeg
- recover 9m mud
- SIP 4523 kPa

Interval : 1485-1513m, Keg River
- recover 37m mud
- SIP 10460 kPa

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REFERENCE WELL NO. 4

Miami Amoco Kakisa R. 1-52
60 01 34 N 117 54 42 W

SURFACE HOLE

- spud 1974-01
- drilled 319mm hole to 195m in 51.5 rotating hours (3 days).
- used Gel/Lime mud.
- reported boulders and gravel on surface.
- maximum deviation, 1° at 46m.
- run 244mm casing, cement, WOC re-cement and nipple up (4.5 days).

MAIN HOLE

- drilled 222mm hole to 1722m in 269.8 rotary hours (14.4 days).
- used beneficiated gel mud; treated Anhydrite with Soda Ash and thinners beginning in Watt Mountain.
- clean to bottom at 350m, 838m (Hay River), 1372m (Beaver Hill Lake, above Slave Point) and 1600m (Muskeg); total 36 hours.
- maximum deviation 3° (BHL to Muskeg).
- maximum mud density, 1190 kg/m^3 (drilled solids).
- mudded up to low fluid loss, dispersed starch mud.
- log, evaluate and abandon well (4.5 days).

WELL NAME: PARAMOUNT et al CAMERON B-8
LOCATIONS: 60° 10' N 117° 30' W

SUMMARY OF REFERENCE WELL INFORMATION

SURFACE HOLE

For any particular well, surface hole problems are unpredictable due to the nature of the glacial deposits common to this area. Gravel and boulders, drilled solids build-up and deviation appear to be major drilling problems which may occur.

MAIN HOLE

Some sloughing can be expected from the Ft. Simpson (above the Twin Falls) and continue in minor amounts throughout the main hole. The cavings of the Fort Simpson are usually identified as long slivers. The lower bulk density of the middle portion of the Fort Simpson when compared to the density of the upper and lower sections is a possible indication of abnormally pressured shale and could explain the sliver like cavings shape. This changing bulk density can also create deviation control problems as the bit proceeds into the less dense section of the formation.

Sloughing may also occur in the Slave Point and regionally in the Watt Mountain, Bistcho and Sulphur Point. Torquing and excessive hole drag are commonly associated symptoms. These formations are often fractured and result in blocky cavings.

The Watt Mountain and lower formations will contain varying amounts of anhydrite. Gas analyses indicate the presence of minor amounts of hydrogen sulfide gas in the Sulphur Point, Slave Point and Keg River formations.

One can expect lost circulation in the lower Wabamum and Keg River formations whenever vuggy porosity exists. These formations can be so vuggy that the Kelly may drop several metres. It is a good idea to dress the bit with large nozzles when the main hole is drilled. This will prevent plugging of the bit with lost circulation material and permit the proper size and high concentration of lost circulation material that will be required should losses occur.

Drill stem test data indicates that none of the reference well experienced any abnormal pressure in the producing formations.

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SECTION 5

WELL NAME: PARAMOUNT et al CAMERON B-8
LOCATIONS: 60° 10' N 117° 30' W

MUD SYSTEM SELECTIONS

SURFACE HOLE

Area data indicates that very few problems arise which could be remedied with the choice of mud system. Therefore, a simple Bentonite-Lime slurry will be adequate. It is recommended to mud up to a low viscosity system prior to drilling out in order that the conductor annulus will be cleaned. This will prevent the annulus from loading up with cuttings and thereby reduce the potential for lost circulation due to an unnecessary hydrostatic head which the cuttings load creates.

MAIN HOLE

Lithologically, formation type and burial depth indicate the possibility of dispersible cuttings and cavings. Solids dispersion can result in,

(a) differential sticking.
(b) well bore instability as a result of the effect of solids related, adverse, rheological properties.
(c) mud rings.
(d) formation damage.

To minimize the potential for these problems it is normally recommended that clear water drilling is utilized. However, because mud up should occur above the Twin Falls this relatively short interval can be SAPP water drilled.

The unstable and often incompetent nature of the Fort Simpson (above the Twin Falls) and Slave Point indicate that mud up should occur above the Fort Simpson to a low solids mud with good carrying capacity. Bentonite can be used as the primary viscosifier, however, to maximize the ability to retain a low solids environment it is recommended that the Bentonite yield is enhanced through a polymeric extender, MonEx. This, coupled with the use of Drispac (a secondary, water phase viscosifier) for fluid loss and filter cake control will reduce the amount of Bentonite (and therefore low gravity solids) which will be necessary for adequate hole cleaning.

For the anhydrite which may occur any time below the Slave Point, extender additions will be discontinued to permit treatment with Peltex and Soda Ash.

Once the anhydrite which presents itself, the lightly dispersed Bentonite and polymer (Drispac) viscosified mud system would be ideally suited.

The natural conversion from a beneficiated to lightly dispersed mud system is recommended primarily because of its stabilizing effect on the rheological properties of a drilling mud in the presence of dispersible solids and anhydrite. Furthermore, the potential for formation damage in the vicinity of the well bore (skin damage) can be minimized by maintaining a low solids environment. Such an environment is also beneficial for the prevention of differential sticking from the point of view that:

(a) filter cake quality is enhanced.
(b) hydrostatic pressure and total well bore pressure is reduced and this subsequently reduces differential (well bore-formation) pressure.

To ensure that the low solids environment can be realized, a dual purpose, viscosifying and fluid loss reducing polymer, Drispac, is recommended. This, together with the use of Peltex will provide rheological and filtrate control with a resultant, thin, tough filter cake. Soda Ash treatments will vary and depend on the effectiveness of all the products in a high calcium environment. It should not be necessary to treat out all the calcium at any time.

SECTION 6

WELL NAME: PARAMOUNT et al CAMERON B-8
LOCATIONS: 60° 10' N 117° 30' W

RECOMMENDED DRILLING FLUID PROCEDURES AND GUIDELINES

SURFACE HOLE: Drill 311mm to 390m, set 244.5mm surface casing

This first section of the well will be drilled with a bentonite-lime slurry. Sufficient carrying capacity for cleaning the annulus (especially the conductor-drill pipe annulus) can achieved by flocculating the mud with addition of small amounts of lime. A sufficient volume for spudding (45-50 m^3) can be prepared as follows:

1. Clean all mud tanks thoroughly and fill them to a desired volume with fresh water. Check the make-up water for hardness and treat out the Calcium ion concentration to 40 mg/L or less with Soda Ash. (A treatment of 0.25 kg/m^3 of Soda Ash will treat out about 300 mg/L of Calcium ions.

2. Add 45-50 kg/m^3 Bentonite through the hopper at a rate of 6-8 min/sack in order to achieve nearly optimal yielding of the Bentonite as the mud is being prepared.

3. Increase the pH to 9.0 with Caustic Soda. To mix Caustic Soda, fill the chemical to approximately 3/4 volume with cold water. Slowly and carefully add 1 sack of Caustic Soda while stirring. Allow the solution to mix for a few minutes and add to the active mud system over a period of 20-30 minutes. Use extreme caution to avoid skin contact with Caustic Soda solutions - they are extremely harmful.

Spud with this fluid and maintain the viscosity at 40-45 sec/L throughout the surface hole interval. Increase the viscosity as necessary for optimum hole cleaning conditions. Run water continually into the active system to maintain an adequate circulating volume. Mix additional Bentonite, Caustic Soda and Lime as required to maintain the following properties:

Funnel Viscosity

Maintain the Funnel Viscosity at 40-45 sec/L or as required to clean the hole. The rheological properties can be increased by flocculating the Bentonite with small amounts of Lime.

Note: The conductor hole annulus may be difficult to clean with this viscosity if adequate pump is not available. This is especially so if gravel or large cuttings exist.

Mud Density

Maintain the mud density as low as possible by optimal shaker screen selection, desilting and as a last resort, dumping and diluting if necessary.

Alkalinity (pH)

The pH should be maintained at 9.0 to assist in yielding of the Bentonite.

Fluid Loss

A natural fluid loss is adequate for this interval.

Just prior to reaching the casing point it is suggested to raise the viscosity to 65-70 s/L with Bentonite and small amounts of Lime.

Possible Surface Hole Problems

Mud Rings

Mud rings are the result of an accumulation of fines (clays, silts, sands) into a densely packed ring which forms on the drill string. Mud rings are often formed while unconsolidated formations are being drilled, especially when annular velocities are low. The binding agent in a mud ring is dispersed or hydratable shale or mudstone and therefore, mud ring build-up can be controlled with the use of a dispersant such as SAPP (Sodium Acid Pyrophosphate).

SAPP will not break up a mud ring that has already formed, it will only prevent its further formation. SAPP can be added through the hopper or directly into the drill pipe on connections. Commonly one full Vis Cup (about 1 kg) is added on each connection. Since SAPP is very acidic, care should be taken to place it inside the string and below the tool joint threads of the box end in order to avoid tool joint corrosion. If mud rings do present themselves and the mud requires viscosity for adequate hole cleaning, then it is suggested to use 0.3-0.5 kg/m^3 Drilling Detergent to prevent further mud rings from forming.

Lost Circulation

If the severity of lost circulation is not known regionally, any first occurrence should be treated as being SEVERE. That is, a lost circulation material (LCM) pill should be made up which contains a high (maximum) concentration of material--the total LCM concentration should be 80-115 kg/m^3 depending the type of material used. If the cause of the lost

circulation, eg., fractures, vuggy porosity, etc., is not known, the material size range should be wide enough to encompass a wide variety of conditions.

It is preferable to prepare a "pill" in an isolated compartment with direct access to a mud pump suction. A water based pill should contain a clay mineral which has a high spurt loss to maximize the potential for bridging of the LCM which attempts to flow into the thief zone. In the absence of attapulgite clay flocculated bentonite can be substituted. Flocculation can be achieved from the use of lime, small quantities of cement or salts such as potassium chloride, calcium chloride, etc. The clay mineral base will have a high YP/PV ratio and a high spurt loss. The base viscosity (prior to addition of the LCM) should be high enough to carry the material - a funnel viscosity of 50-60 s/L is usually sufficient. The size of the pill should be sufficient cover a significant section of the annulus and at the same time allow adequate flow to promote plugging. An LCM pill is commonly 10 m^3 or greater.

Once the pill is pumped across the thief zone, circulation should cease to allow flow and consequent plugging. Normally a 15-20 min wait is given between successive, small displacement which are measured in terms of pump strokes to achieve the desired displacement volume.

Upon regaining circulation, the LCM should be retained in the Mud system for at least one additional circulation back into the mud tanks by by-passing the shale shaker before the LCM is removed from the active system. If there is a high probability of lost circulation in an area and the zone is known, bit nozzles should be removed on the previous trip (at least the largest nozzles should be run). Similarly, if the shale shaker is being continually, or persistently bypassed, no nozzles or the largest nozzles should be used to avoid plugging of the bit - "spudding the pipe" in an attempt to unplug nozzles will aggravate lost circulation and possibly fracture a formation.

MAIN HOLE: Drill 222mm hole to 1528m

A. SAPP Water Drilling (to 750m)

Drill out with water circulating in the mud tanks. Discard the cement cuttings and badly contaminated fluid to the disposal sump. Treat out the residual cement contamination with Bicarbonate of Soda (approx. 2 sx). Drill ahead with water, adding 1 Vis Cup (1 - 1.5kg) of SAPP down the drill string per connection to alleviate mud ring build up.

NOTE: SAPP can be very corrosive due to its low pH. Therefore, it is recommended to reduce the mud level in the tool joint below the threads of the box end prior to adding the SAPP. Alternately, SAPP can be premixed in the chemical barrel an amount equivalent to 1-1.5 kg per drilled single.

PRE-MIXED MUD

While SAPP water drilling, the mud system for the main hole can be made up in the mud tanks. A total volume of about 70m³ will be required to displace the hole and permit circulation in the mud tank. It is preferable to have a sufficient volume that will displace and circulate the hole. In the absence of an adequate volume, material additions should be equal to the amounts established on the basis of the estimated requirements for displacing and circulating the mud.

While drilling with water prepare the mud system as follows:

1. Fill the mud tank compartments to the required volume with clear, fresh water.

2. Treat out Calcium hardness to less than 40mg/L using Soda Ash.

   NOTE: 0.3 kg/m³ Soda Ash will treat out about 100mg/L of Calcium hardness.

3. Add Bentonite at 6-8 min/sack and MonEx together with the Bentonite in a 1:7 ratio.

4. While the Bentonite is being mixed, simultaneously add Caustic Soda to the mud system through the chemical barrel until a pH of 9.0-9.5 is achieved. (Normally this requires 0.2-0.3 kg/m³ Caustic Soda).

5. Continue to circulate the pre-mix until it is ready to be displaced. If necessary, make final pH adjustments with Caustic Soda to ensure that the pH is 9.0-9.5.

(B) MUD-UP AT 750m - TOTAL DEPTH

This portion of the well will be drilled using an extended Bentonite mud system. Mud up will begin at approximately 750m in order to have adequate physical properties in the circulation mud system for drilling the Fort Simpson shale above the Watt Mountain.

At mud up displace the hole to mud, diluting and mixing additional volume if necessary. When all materials have been added and all the mud has circulated at least once check the mud

system physical properties and maintain them within the guidelines given below:

Funnel Viscosity

Maintain the funnel viscosity at 40-45 sec/L or as required to clean the hole. The rheological properties can be increased adding Bentonite and MonEx in a 7-8:1 ratio. Do not add Bentonite faster than 8-10 minutes per sack.

> Note: The mud system should have a YP/PV ratio greater than 0.5:1. If not the Bentonite may be peptized and MonEx additions should be discontinued at least temporarily. Drilling coal seams could also make the mud have a lower YP/PV ratio; if so, MonEx additions may be increased.
>
> Note: Due to the natural tendency to build drilled solids in the mud it will be beneficial to add Drispac as a secondary viscosifier. This will allow viscosity maintenance and at the same time minimize the solids build up, improve the YP/PV ratio, control fluid loss and reduce filter cake thickness. Additions of 1 sack over a circulation each day should be adequate.
>
> At the top of the Watt Mountain formation (1343 m) the mud system will be lightly dispersed with 15 sacks of Peltex as a pre-treatment for the anhydrite in the formations below. In preparation for this, MonEx additions should be discontinued. To prevent a large viscosity fluctuation during the initial treatment, add Peltex and Bentonite in a 2:1 ratio through the hopper. (At the same time add 1 sack of Caustic Soda for every 3 sacks of Peltex to raise the pH to 10.5-11.0).
>
> Once the mud system has been dispersed, add Bentonite, Peltex and Drispac in a 10:2:1 ratio to maintain or build viscosity without increasing the solids content unnecessarily.

Mud Density

Maintain the mud density as low as possible by optimal shaker screen selection, desilting, sand trap dumping and as a last resort, dumping and diluting active compartments if necessary. Fresh water should be regulated into the mud system continually in an amount that will maintain an adequate, constant circulating volume in the mud tank and make up for losses from dumping the sand trap, from the solids removal equipment underflow and for the new hole that is being drilled. It is always beneficial to monitor and record the water addition rate and total volume added on each tour.

Alkalinity (pH)

The pH should be maintained at 9.0-9.5 initially to assist in yielding of the Bentonite and to control corrosion. At the top of the Watt Mountain the mud system will be lightly dispersed. At this time the pH should be raised to 10.5-11.0 and maintained at this level. A reduction in pH can occur as a result of encountering anhydrite or hydrogen sulfide gas.

Fluid Loss

Although fluid loss is not a consideration from the point of view of formation protection, some control is necessary in order to prevent an excessive filter cake thickness with the dry, sticky texture typical of mud systems which are prone to solids accumulation as a result of shale dispersion. Control the fluid loss at 10.0-12.0 ml throughout. When the system is lightly dispersed the fluid loss may reduce itself further. However it is recommended that Drispac additions continue in order to maintain more beneficial rheological characteristics, (better YP/PV ratio). Once the mud is dispersed the FL should be maintained @ 8-9ml to prevent a fluffy, soft filter cake when the Anhydrite is encountered.

Possible Main Hole Problems

Sloughing Shale

Increased viscosity can clean sloughing shales but it cannot hold them back. Once formations which are prone to sloughing have been penetrated, good drilling practices must be adhered to at all times in order not to aggravate conditions. At times in this area it has been found that an increase in density (as high as 1200 kg/m^3) has been required in order to contain the Fort Simpson and lower formations. If sloughing does persist an increased density is recommended provided that mud losses have not been severe to this point.

Anhydrite

Significant amounts of anhydrite can be expected once the Watt Mountain has been penetrated. Peltex will control the associated rheological problems provided it is present in sufficient quantities and the pH is above 9.3. At a lower pH the Peltex becomes ineffective and the contaminated mud behaves as though no Peltex was present. The presence of Calcium may not affect rheological properties when adequate amounts of Peltex exist, however, there are some products which are in effective or their effect on a mud system changes in the presence of excessive Calcium ions (CMC and Cypan are examples of polymers that are effected and Bentonite itself becomes less yielding with time as it changes from a sodium to a calcium montmorillonite).

Therefore, Soda Ash may be required along with the Peltex for complete control.

Anhydrite is a mineral consisting of anhydrous calcium sulfate, $CaSO_4$. It is gypsum without its water of crystallization and it usually appears as a white or slightly colored, granular to compact mass.

Soda Ash, Na_2CO_3, can be used to treat out the calcium in the form as an insoluble precipitate, $CaCO_3$. The chemical reaction is:

$$Na_2CO_3 + CaSO_4 = CaCO_3 + Na_2SO_4$$

For each 100 mg/L of dissolved calcium that is present, about 0.25 kg/m^3 Soda Ash are required.

Solids Dispersion

Solids dispersion is a common problem, especially in areas where less swelling shales, clays or mudstones exist. As solids reduce in size their surface area increases and this can create unexpected rheological control problems even at seemingly low mud densities. Good solids control equipment is essential in order to avoid excessive mud costs that frequent dumping would otherwise incur.

Lost Circulation

Lost circulation is a distinct possibility in the main hole interval. It is recommended to have a high surface volume in order to regain circulation quickly in the event off complete losses. Adequate amounts of lost circulation material should be on hand at all times while the main hole is being drilled and consideration should also be given to drilling without nozzles in the bit. Treat all circulation as being severe. If an increased mud density is required, bypass the shale shaker and continue to mix and maintain LCM while the density is gradually increased.

Hydrogen Sulfide Gas

Gas analyses indicate that varying amounts of Hydrogen Sulfide gas may be present in the Sulphur Point, Slave Point and the Keg River. The urban environment, the amount of Hydrogen Sulfide gas present, and the anticipated gas flow rate will establish the ERCB Severity Level Classification.

When the gas is present, alkalinity control with pH levels in the range of 10.5-11.0 is ideally optimum in the absence of any Hydrogen Sulfide scavengers. The use of alkaline additives such as Lime or Caustic Soda provides the hydroxyl ions necessary to react (ionize) Hydrogen Sulfide. These

reactions are reversible and consequently alkalinity control is only a "temporary" measure for Hydrogen Sulfide gas.

Scavengers which irreversibly react with Hydrogen Sulfide gas are the only permanent method of eliminating the gas once it enters the well bore and it is present in the drilling mud. Care must be taken to ensure that the alkalinity (pH) level in the mud is correct for the type of scavenger which will be used, eg., Ironite Sponge favors a low pH (less than 9.5) for faster reaction rates. Regardless of the alkalinity level the presence of Hydrogen Sulfide gas (like Anhydrite) will result in a pH reduction.

Abnormal Pressure

DST data indicates that abnormal pressure is not severe in this area. However, it is recommended that a supply of Barite will be available to increase the drilling mud density if it is necessary and possible.

SECTION 7

WELL NAME: PARAMOUNT et al CAMERON B-8
LOCATIONS: 60° 10' N 117° 30' W

HYDRAULICS CONSIDERATIONS

SURFACE HOLE

A significant length of surface hole is expected for this well. This, together with the fact that the 346mm conductor ID will be larger dictated that surface hole should be spudded with a light viscosity Gel/Lime mud. The typical 45s/L mud of this type will have the following additional properties.

PV - 16
YP - 8
Gels - 2/5
Density - 1080

The primary consideration for the surface hole interval is adequate carrying capacity in the open-hole drill pipe and conductor-drill pipe annulus. For a pump output of 2.0 m^3/min the table below provides the carrying capacity data form which the maximum particle size for adequate cleaning can be established.

Part. Size	311 x 114mm Annulus			323 x 114mm Annulus		
(mm)	Annular Velocity (m/min)	Slip Velocity (m/min)	Carrying Capacity Index	Annular Velocity (m/min)	Slip Velocity (m/min)	Carrying Capacity Index
15	30.4	5.7	.71	27.9	5.3	.71
20		8.8	.59		8.3	.58
25		11.6	.49		11.1	.47

From the results, the maximum size cuttings or cavings which can be adequately cleaned under these conditions for normal penetration rates is 25mm. For larger cavings or more rounded particles eg., gravel of about 15mm, the carrying capacity is generally inadequate and requires a significant increase in flow rate or rheological properties. If the flow rate is reduced to 1.5m^3, the maximum permissible particles size is reduced to 20mm (or 10mm pea gravel).

Bit Hydraulics on surface hole is normally just adequate to prevent bit balling. At the recommended 2.0m^3/min pump out put the surface hole bit dressed with 3-14.3mm nozzles would yield the following bit hydraulics:

Mud Density	- 1080
Pump Output	- 2.0m³/min
Nozzles	- 3x14.3 min
Nozzle Velocity	- 69.2m/s
Nozzle Pressure	- 2870 kPa

At the surface casing depth, 390m, the standpipe pressure would be about 7300 kPa.

MAIN HOLE SAPP-WATER HYDRAULICS

In SAPP water drilling, carrying capacity is achieved primarily from annular velocity. A non-related but important consideration for SAPP water drilling is the annular velocity required to prevent mud ring formation with normal SAPP additions. This normally requires an annular velocity of 50m/min or greater.

For SAPP water drilling the following hydraulics are recommended:

Pump output	- 1.5m³/min
Annular Velocity	- 52.6m/min
Nozzles	- 3x14.1mm
Nozzle Velocity	- 85.8m/s
Nozzle Pressure	- 4300 kPa
Stand Pipe Pressure	- 6600 kPa @ 750m
Hydraulic Power	- 2.8 W/mm²

The recommended bit hydraulics are adequate for bottom hole cleaning and yet they are not too excessive to create bit nozzle jetting (erosion at the bit).

NOTE: Penetration rates in excess of 9min/single could overload the annulus and cause sticking or excessive working of pipe on connections.

MAIN HOLE WITH BENEFICIATED MUD

With good solids removal equipment the beneficiated mud should be capable of maintaining a mud density of 1120 kg/m³ or less. For the recommended 40-45 s/L Funnel Viscosity the mud will have the following approximate rheological properties.

PV - 15
YP - 7
Gels - 1.5/4

Typically, in the absence of major sloughing design considerations should provide adequate hole cleaning for 10-15mm particles and minimal cleaning for 25mm particles. For this range of properties, the minimum required pump out put will be 1.1m³/min. With this flow rate the bit hydraulics can

now be established such that the penetration rates are maximized, hole erosion is minimized and pump pressure limitations are not exceeded. The following hydraulics are recommended.

(a) 222m x 114mm DP - OH Annulus

Annular Velocity	- 38.6m/min
Slip Velocity of 10mm particles	- 4.9m/min
Carrying Capacity Index	- 0.79
Slip Velocity of 25mm particles	- 13.5m/min
Carrying Capacity Index	- 0.52 (acceptable)

(b) 222mm x 159mm DC -OH Annulus

Annular Velocity	- 58m/min
Slip Velocity of 10mm particles	- 6.6m/min
Carrying Capacity Index	- 0.81
Slip Velocity of 25mm particles	- 14.3m/min
Carrying Capacity Index	- 0.64
Pressure Loss Gradient	- 0.57 kPa/m
Reynolds Number	- 1400 (laminar)

(c) 222mm x 171mm DC - OH Annulus

Annular Velocity	- 69.9m/min
Pressure Loss Gradient	- 0.89 kPa/m
Reynolds Number	- 1610 (laminar)

Conclusion: The use of 171mm DC in 222mm hole does not create excess annular hydraulics under these conditions.

(d) Bit Hydraulics:

Nozzles : 2-8.73, 1-9.53mm	
Nozzle Velocity	- 96m/s
Nozzle Pressure	- 5730 kPa
Stand Pipe Pressure	- 8000 kPa @ 1380m

MAIN HOLE WITH LIGHTLY DISPERSED MUD

Since Anhydrite can be anticipated at any time below the Slave Point, the mud system will be lightly dispersed. This in conjunction with the possibility of an increased solids content will change the rheological properties. Typically, the 45-50 s/L lightly dispersed mud system which uses Drispac as a secondary viscosifier will have the following properties:

PV	- 18
YP	- 6
Gels	- 1/3
Density	- 1150

The increased Funnel Viscosity reflects the fact that a more dispersed drilling mud has less carrying capacity than a "non-dispersed" mud, eg., a beneficiated mud. With the practical limitation of maintaining the same flow rate and similar bit hydraulics the following well bore state is recommended for the lightly dispersed mud with a pump out put of 1.1m³/min.

(a) 222m x 114mm DP - OH Annulus

Annular Velocity	- 38.6m/min
Slip Velocity of 10mm particles	- 5.6m/min
Carrying Capacity Index	- 0.76
Slip Velocity of 25mm particles	- 13.6m/min
Carrying Capacity Index	- 0.52 (acceptable)

(b) 222mm x 159mm DC -OH Annulus

Annular Velocity	- 58m/min
Slip Velocity of 10mm particles	- 6.8m/min
Carrying Capacity Index	- 0.81
Slip Velocity of 25mm particles	- 14.0m/min
Carrying Capacity Index	- 0.64
Pressure Loss Gradient	- 0.54 kPa/m
Reynolds Number	- 1540 (laminar)

(c) 222mm x 171mm DC - OH Annulus

Annular Velocity	- 69.9m/min
Pressure Loss Gradient	- 0.86 kPa/m
Reynolds Number	- 1710 (laminar)

Conclusion: The use of 171mm DC in 222mm hole does not create excess annular hydraulics for the lightly dispersed mud.

(d) Bit Hydraulics:

Nozzles : 2-8.73, 1-9.53mm	
Nozzle Velocity	- 96m/s
Nozzle Pressure	- 5890 kPa
Stand Pipe Pressure	- 8500 kPa @ 1530m

SECTION 8

AGENT: Mission Mud Control 1988

PHONE: (403) 683-2424

DRILLING FLUID MATERIALS

PRICE LIST

ZAMA CITY

EFFECTIVE DATE: November 15, 1988

MISSION MUD CONTROL

722, 550 6th Ave. SW
Calgary, Alberta T2P 0S2
(403) 263-0160

BASIC DRILLING FLUID MATERIALS

AVONGEL	40 kg	$ 15.00	SALT GEL	50 lb	$ 20.70
BENTONITE (Wyoming)	40 kg	$ 15.50	BARITE	40 kg	$ 21.50
NATURAL GEL (Unpeptized)	100 lb	$ 18.40			

CHEMICAL ADDITIVES

ALCOMER 123L	20 L	$ 139.00	LIME	25 kg	$ 15.40
ALUMINUM STEARATE	25 lb	$ 105.00	MF-1	2 lb	$ 18.51
ANTISOL 380W*	50 lb	$ 396.00	NO-STIK	60 L	$ 614.00
BEN-EX (CAN-EX)	2 lb	$ 18.10	OIL/WATER EMULSIFIER	20 L	$ 128.00
BICARBONATE OF SODA	100 lb	$ 63.80	PAM 240L	20 L	$ 139.00
CALCIUM CARBONATE	25 kg	$ 11.10	PELTEX	25 kg	$ 48.80
CALCIUM CHLORIDE (Flake)	40 kg	$ 51.10	POLYGUARD	20 L	$ 90.70
CAUSTIC SODA	50 lb	$ 54.00	POTASH	25 kg	$ 17.40
CMC	25 kg	$ 239.00	PROTECTOMAGIC	50 lb	$ 72.60
CORINOX	20 L	$ 131.00	SALT	40 kg	$ 23.40
CYPAN	50 lb	$ 185.00	SAPP	40 kg	$ 173.00
DESCO	25 lb	$ 80.00	SEPERAN	50 lb	$ 479.00
DRILLING DETERGENT L	20 L	$ 56.90	SODA ASH	40 kg	$ 34.30
DRILLING DETERGENT P	50 lb	$ 83.10	SODIUM SULFITE (Catalyzed)	25 kg	$ 65.30
DRISPAC (Regular & Superlo)	50 lb	$ 255.00	STAFLO (Regular & Ex-Lo)	50 lb	$ 255.00
GYPSUM	50 lb	$ 16.80	STARCH (Pre-gelatinized)	50 lb	$ 38.30
IRONITE SPONGE*	50 lb	$ 115.00	XL DEFOAMER	20 L	$ 189.00
KELZAN XCD	25 kg	$ 640.00	X-PEL G	50 lb	$ 83.70
LIGNITE	50 lb	$ 19.90	ZINC CARBONATE*	50 lb	$ 152.00
LIGNITE CAUSTIC	50 lb	$ 27.50			

* This product is subject to a 10 % restocking charge

LOST CIRCULATION MATERIALS and TORQUE REDUCERS

CELLOPHANE	25 lb	$ 33.70	MICA (Fine & Medium)	25 kg	$ 29.30
GLASS BEADS	50 lb	$ 89.70	OPTI-SEAL	40 lb	$ 34.50
GRAPHITE	50 lb	$ 80.00	SAWDUST	1 Bag	$ 7.90
KWIK-SEAL (Fine, Med., Coarse)	40 lb	$ 34.50	WALNUT (Fine, Medium, Coarse)	50 lb	$ 32.80
MICA (Coarse)	25 kg	$ 31.00			

INVERT OIL EMULSION PRODUCTS

ASPHA-MUL	55 gal	$ 990.00	EM-20	55 gal	$ 1130.00
ASPHA-SEAL	50 lb	$ 63.80	MC-500	50 lb	$ 80.40
CALCIUM CHLORIDE HT	40 kg	$ 72.90	OMV-100 (OMG-40)	50 lb	$ 125.00
CSD-50	50 lb	$ 84.80	QUICK LIME	25 kg	$ 19.90
DWA-76	5 gal	$ 145.00	SALT	40 kg	$ 23.40

TERMS: 30 days net, all applicable taxes will be added. Monthly interest of 2 % may be charged on overdue accounts.

CONDITIONS: Prices are subject to change without notice. Addtional charges will be applied for tarps and pallets. Return credit for all materials and pallets in good condition. VAN or HI-BOY rental is available. Products not in stock at time of order will be charged at F.O.B. High Level prices.

WELL CONTROL

CAMERON HILLS

WELL CONTROL

General:

Outlined below are recommended rig procedures and equipment checks designed to minimize the possibility of a blowout situation. Where appropriate, related safety practices have also been referred to.

Safety & Blowout

S 150(s) ... all drilling supervisors involved with the project will have suitable qualifications, namely: First and Second Line Supervisory Blowout Prevention cerificates as conducted by the Alberta Petroleum Industry Training Service.

s 151(a) ... a fire drill is held at least once every two weeks.

s 151(f) ... a blowout prevention practice drill is held at least once each week ... and recorded in the tour book

Proper tripping practices should be followed at all times, including making a record of calculated and actual hole fill volumes, with constant monitoring of the hole as the pipe is tripped. Flow checks should be taken while pulling out on all trips, with intervals to be specified by the toolpusher or the operator's representative.

Equipment Checks

s 62 ... The blowout prevention equipment herein referred to will be enclosed in a heated area. All other lines and valves will be suitably winterized and not susceptable to freeze up.

s 110(7) ... For safety puroses the rig is equipped with an automatic choke.

s 112(4)(c) ... ensure the flare is properly installed and anchored.

s 115(a)(v) ... the blowout preventor ... is pressure tested not less than once every fifteen drilling days

s 116(1)(c) ... the casing is pressure tested at lease once every 1000 rotating hours

s 123(c) ... all pit level and flowline measuring devices are to be kept on and in working condition at all times after the surface casing shoe has been drilled out.

s 131(3) ... ensure that the major components of the blowout prevention system ... are actuated each day that drilling operations are carried out.

Working casing and pump pressure gauges should be in place at the choke manifold prior to drilling out the surface casing shoe.

Ensure that the stabbing valve is in working order and readily available.

BOP bolts should be checked weekly for tightness.

Well control and blow out manuals will be utilized by all supervisory personnel.

PART FIVE

REPORT PROCEDURES

CAMERON HILLS

GENERAL - Definition Selection

The following terms are defined in the Canada Oil and Gas Drilling Regulations and are applicable to the enclosed drilling program.

"Authority to Drill a Well" means the authority granted to an oerator pursuant to section 83 to drill a well.

"Chief" means the Chief Conservation Officer.

"Conductor Pipe" means a large diameter pipe installed in a well to provide a conductor for drilling fluid through surficial formations.

"Operator" means an individual or company that seeks or has been granted approval pursuant to these Regulations to conduct a drilling program.

"Permafrost Casing" means the conductor casing installed in a well to protect against the hazards associated with the thawing of a permafrost section or the liberation of gas within or immediately below a permafrost section.

"Section Casing" means the casing installed in a well to a depth sufficient to establish well control for the continuation of the drilling operations.

For additional definitions reference is made to the Interpretation section, section 2 of the above noted regulations.

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REPORT PROCEDURES: In accordance with the regulations concerning operational records and reporting, the following report procedures are to be follows.

S 171(1)

... Notification of Significant Event ... Every operator shall notify the Chief immediately... of any significant situation or event, including the loss of life ... serious injury ... loss of well control ... an oil or chemical spill, etc. (2) ... with a full written report to follow

S 172(b)

... Every operator shall, within 24 hours, notify a conservation officer ... hour and date of a spud in. In this respect notify:

Mr. Maurice Thomas
C.O.G.L.A.
P.O. Box 1500
Yellowknife, N.W.T.
X1A 2R3
(403) 920-8176

S 175(2)

... Every operator shall ensure that ... a legible copy of the tour sheets ... is submitted to the Chief at least once each week, at the address indicated above

S 178

... Every operator shall ensure that a daily record is kept of all persons employed or visiting at a drill site.

S 179(2)

... Every operator shall ... submit to the Chief daily drilling reports, with daily lithology reported. In addition to the Chief, these reports are to be delivered to the following personnel:

C.O.G.L.A., Yellowknife FAX # (403) 873-8707
Attention: Maurice Thomas

C.O.G.L.A., Ottawa Attention:	FAX # (613) 993-9897
Paramount Resources Ltd. Attention: Lloyd Jeffries	Courier Fax # (403) 262-7994
Partners	As specified - c/o Paramount Resources Ltd

S 180(2)(a)

... Every operator shall ... submit to the Chief wireline logs as indicated below.

C.O.G.L.A., Yellowknife Attention: Maurice Thomas	1 field print 1 final print to be submitted with final well summary
C.O.G.L.A., Ottawa Attention:	1 field print 3 final prints to be submitted with final well summary

Additional logs are to be sent to the following personnel:

Paramount Resources Ltd. Attention: Lloyd Jeffries	As specified
Partners	c/o Paramount Resources

S 182(1)

... Every operator shall submit to the Chief forthwith, any records made in accordance with a drill stem test. In this respect, the following personnel are to receive chart and fluid analysis reports:

C.O.G.L.A., Yellowknife Attn: Maurice Thomas	1 copy as soon as available 1 copy to submit with final report.
C.O.G.L.A. Director General 355 River Road, Tower B Vanier, Ont. K1A 0E4 Attn: Glen Yungblut	1 copy as soon as available 3 final prints to be submitted with well summary
Paramount Resources Ltd. Attn: Lloyd Jeffries	To be submitted after rig release with final reports
Partners	Paramount Resources

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S 227(1)(a)

... every operator shall deliver to the addresses specified below all samples.

Operators are responsible for the proper washing and packaging of all drill cuttings.

Washed Cuttings

Samples are to be taken at five-metre intervals, packaged in vials and properly labeled. One (1) set is to be forwarded to each of the following:

The Institute of Sedimentary and Petroleum Geology 3303 33rd Street NW Calgary, Alberta T2L 2A7	1 set of samples in 7ml vials
Manager, Northern Region Engineering Branch C.O.G.L.A., Yellowknife, NWT	1 set of samples in 7ml vials
Paramount Resources Ltd. (As specified)	1 set of samples in ERCB blue top vials
Partners (As specified)	

Unwashed Cuttings

Cuttings are to be taken at ten-metre intervals, below surface casing, and canned. One 500 gram sample is to be sent to:

The Institute of Sedimentary and Petroleum Geology
3303 33rd Street NW
Calgary, Alberta
T2L 2A7

Samples must be packaged in the prescribed manner. For details refer to the September, 1984 guidelines and procedures for Drilling for Oil and Gas on Canada Lands.

CAMERON HILLS

PART SIX

RIG RELATED RESPONSES TO

SPECIFIC SECTIONS OF THE REGULATIONS

CAMERON HILLS

RIG RELATED RESPONSES TO SPECIFIC SECTIONS OF THE REGULATIONS

GENERAL REQUIREMENTS

When rigging up, the drilling supervisor is to ensure that every effort is made to prevent erosion of the permafrost. In this respect, the drilling supervisor is to ensure that polyethelene and 2" insulation is positioned underneath the entire rig and associated buildings.

The supervisor is to inform all personnel on the job site of the wildlife precaution. Unless authorized by the appropriate Territorial agency, under no circumstances is wildlife to be killed or fired at.

SPECIFIC RESPONSES

S 20 ... The Rig is equipped with an automatic boiler. The boiler or boilers will have Alberta Inspection Certificates.

S 35 Provision has been made in the camp for a medical trailer equipped with; first aid door, treatment bed, running water, desk, cupboards, stretcher, along with a full complement of paramedic equipment, and a fully stocked emergency drug kit. The medical room will at all times be staffed by a certified paramedic.

Helicopter transport from the rig location to either Hay River or Yellowknife, N.W.T., will facilitate the movement of men and supplies in case of an emergency. A twin Otter airplane will be contracted for direct flight to a Hay River or Edmonton Hospital.

S 36 ... Five (5) Scott air packs suitable outfitted (model not applicable) will be located in the camp in compliance with S 36 81. In addition, four (4) Scott air packs are located at the rig. With the camp being located so far from the rig, several of the Scott air packs at camp may be moved to the rig if required.

... (1)(b) A hot wire unit will be used to monitor gas in the drilling fluid.

... (1)(c) At the present time the rig does not have a portable detector for combustible gases; however, arrangements have been made for the procurement of such a device.

CAMERON HILLS

S 42 ... Air circulation throughout the rig area is anticipated to be more than adequate. The accumulation of combustible gases is not at present expected to be a problem

S 45 ... Rig configuration and use of materials are designed to minimize the possibility of fire.

S 47 The drilling rig is equipped with six (6) General (30#) ABC Nitrogen-cylinder fire extinguishers.

S 49 ... As indicated in the attached rig schematic, all internal combustion engines are equipped with automatic shut-offs and located at the appropriate distance from the well bore.

S 75(2)(b)

... As noted in the rig inventory the capacity of the mud tanks is approximately approximately 95 m^3. The aggregate of hole volume at maximum anticipated depth of 1635m is calculated to be approximately 60m^3.

S 136 ... It is recommended that a 10 - 20 day fuel requirement for the rig be shipped into a central staging area at the same time the rig moves in. In this way there will be a guaranteed fuel supply in the event of extended periods of adverse weather. In compliance with S 136(d) of the regulations, all bulk fuel storage containers are to be dyked with an impermeable material to contain any quantity of fuel that may escape the tanks.

S 139 ... Incinerators have been provided and it is essential that all garbage be disposed of in this matter.

S 154 ... Crew personnel are to follow operators safety regulations when travelling by air transport.

RIG EQUIPMENT The particular drilling rig under contract to Paramount Resources Ltd. is known Sierra Drilling Ltd.

For purposes of complying with the Canada Oil and Gas Drilling Regulations:

CAMERON HILLS

i) This complete rig is up to or exceed all API and CAODC standards;

ii) All electrical motors on this drilling rig are explosive proof and comply with API standards;

iii) All rig work areas are provided with standard CSA API approved lighting which meets the requirements of Alberta Workers' Health, Safety and Compensation;

iv) All fire fighting equipment complies with government regulations, including rig area and camp area,

Additional information that may be required pertaining to drilling equipment may be found in the attached original equipment rig up list.

COMMUNICATIONS: Communications will be maintained by mobil telephone from the Wellsite Supervisor's office and from the Rig Manager's office.

PART SEVEN

ADDITIONAL CONTRACTOR INFORMATION

SPECIFICATIONS FOR SIERRA RIG # 2

DRAWWORKS	- Sierra 5000 42 x 12 with 45,000 lbs. single line pull. Rig equipped with 6 line string up.
AUXILIARY BRAKE	- T.S.M. 22 S Hydromatic.
DERRICK	- 240,000 lbs. working capacity capable of setting angles of 1 1/2 degree increments from 45 degrees to 90 degrees.
SUBSTRUCTURE	- 250,000 lbs. capacity with 10' clearance incorporating hydraulic pipe tubs and hydraulic pipe handling arm.
POWER SWIVEL	- Bowen Model S 3.5 with available 10,000 ft./lb. torque.
PUMP	- T.S.M 500 H.P 12V 71 ~~D 8 V 71~~ powered by ~~GMC~~ engines housed in steel building.
FLOOR MOTOR	- 12 V 71 Detroit Diesel driving through Model 750 DRD 5-speed Allison transmission. 500 available horsepower.
DRILL PIPE	- 4 500' 4" 14.0 lb./ft. with 4 3/4" O.D. 3 1/2" I.F. tool joints.
DRILL COLLARS	- 20 - 4 3/4" O.D. x 2" I.D. with 3 1/2" I.F. connection.
	- 6 - 6 1/4" O.D. x 2 1/2" I.D. with 4 1/2" H-90 connections.
COMBINATION BUILDING	- 1 - 10 x 40 containing 250 BBL. water storage. Tool house and elevating doghouse., lowered into water tank for moving.
	- 1 - 10 x 36 housing Lite Plant accumulator, change house and 2500 gallon fuel storage.
LITE PLANT	- 150 K.W. powered by 3406 Caterpiller.
BOILER	- 80 H.P. volcano type by dupre Boiler.

SPECIFICATIONS FOR RIG 2

MUD TANK

- 10 " x 4 1/2" - 275 BBL working capacity complete with low pressure mud guns, 48" double deck high speed shale shaker and steel building on main skid, housing a 50 H.P. electric motor driving 4 x 6 centrifugal pump for high volume mixing or operating a large single cone desander.

- 1 - 5 x 6 mission centrifugal pump on tank to feed 12 cone desander.

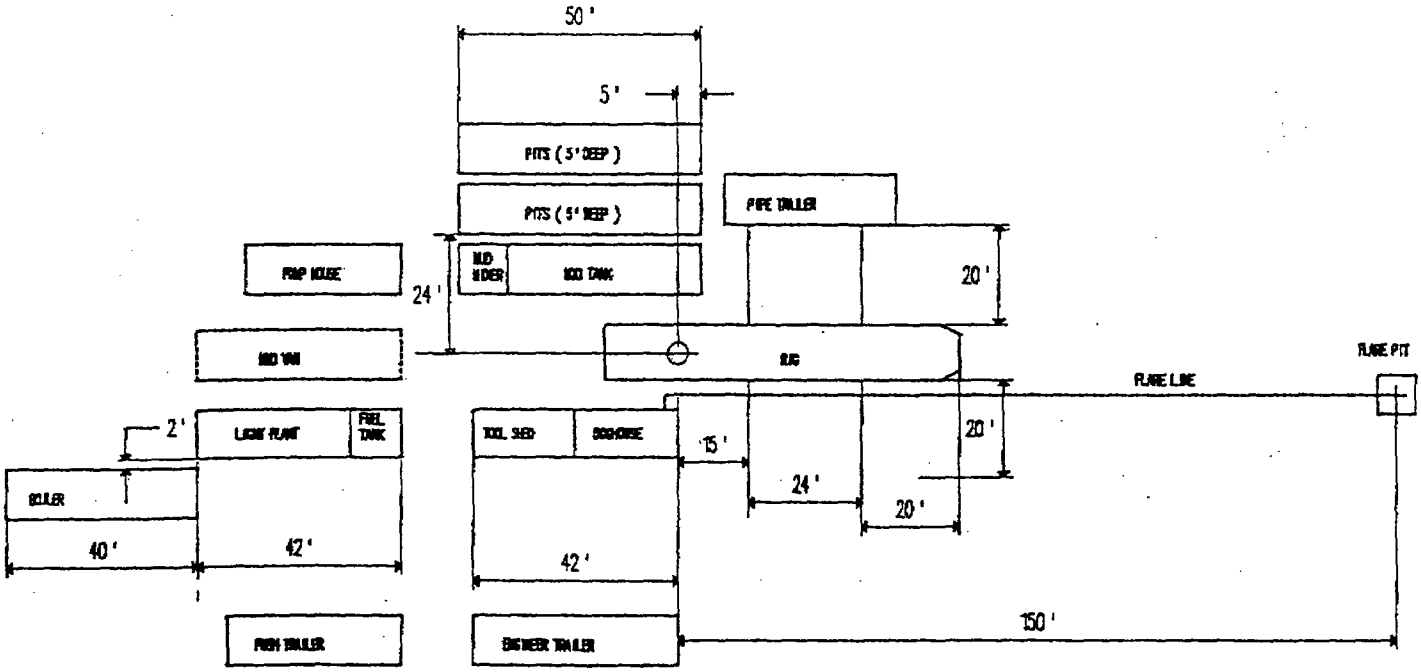
B.O.P.

- 1 - 8" Hydril Annular

- 2 - 8" Single Gate, with blind and pipe ram.

- 1 Koomey 80 gallon accumulator, with 4 station control bank and remote controls to driller's station and Armco dual choke bleed off manifold to comply with Class lV E.R.C.B. requirements or as required.

LOCATION LAY-OUT
RIG # 2 + 3 + 4 + 5



262-7994

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Allstack B.O.P. Sales & Svce. Ltd.

HEAD OFFICE
3701 - 19th Street N.E., Calgary, Alber
TELEPHONE: (403) 250-3326 TELEX
Box 186, 2001 - 8th Street, Nisku, Albe
TELEPHONE: (403) 955-24

SHOP SERVICE REPORT - B.O.P.'s

Customer: SIERRA Rig No.: 2 S/O No.: 896

EQUIPMENT FOR SERVICE

	Description	Working pres. kPa	Model	Make	S
1.	9"-3000# Annular	21,000	—	SHAFFER	1-
2.					
3.					
4.					
5.					

DESCRIPTION OF SERVICE 3 YEAR CERTIFICATION — BORE OF LID BADLY KELLY WHIPPED — LID WAS SAND BLASTED — MAG FOR CRACKS — BORE REBUILT — STRESS RELIEVED — MAC TO SPEC.

PRESSURE TEST

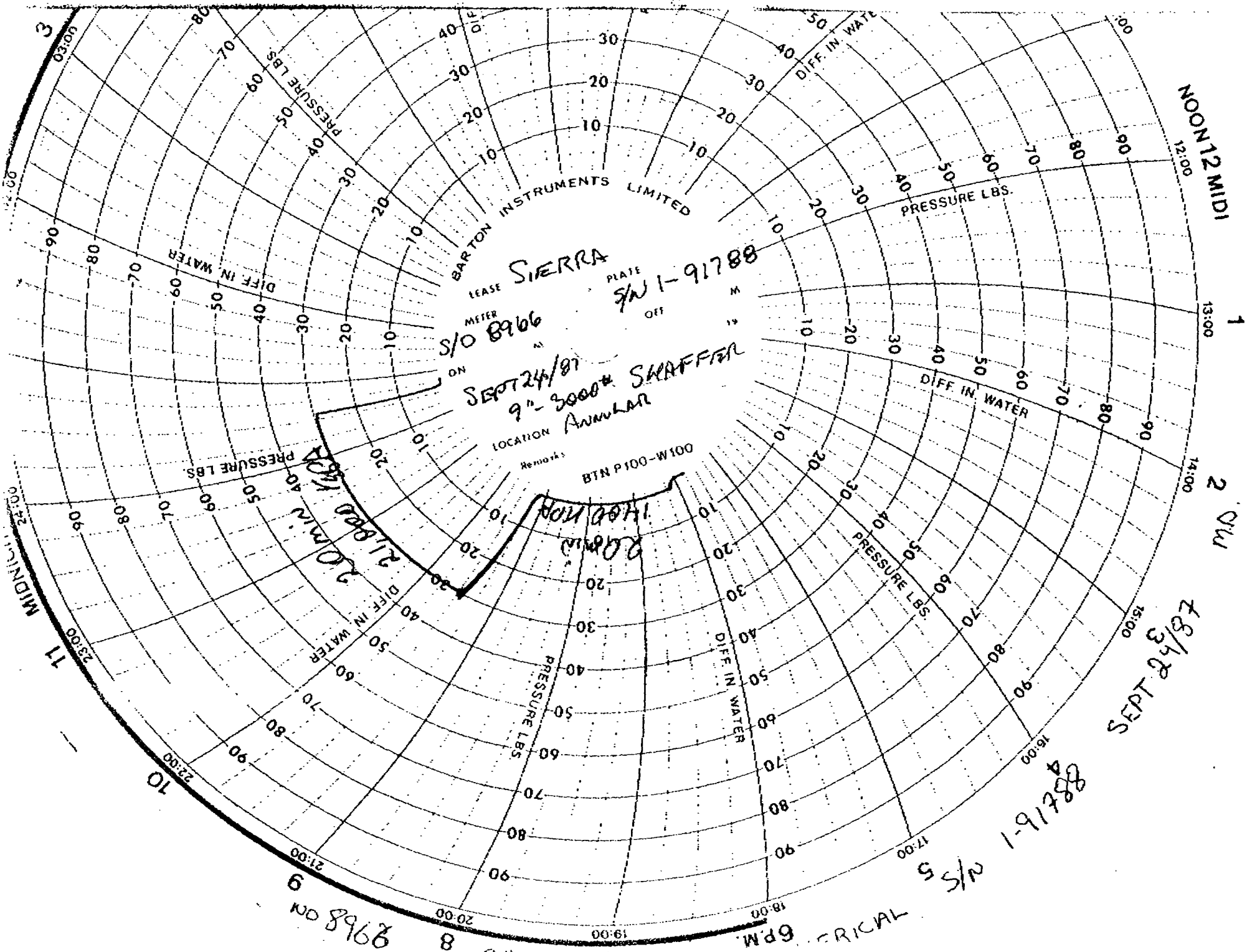
	ITEM	HYDRAULICS OPEN PRES. kPa	MIN.	CLOSE PRES. kPa	MIN.	SIMULATED WELL PR LOW PRES. kPa	MIN.	HIG PRES.
1.	9"-3000# Annular	10,500	20	10,500	20	1,400	20	24,8
2.								
3.								
4.								
5.								

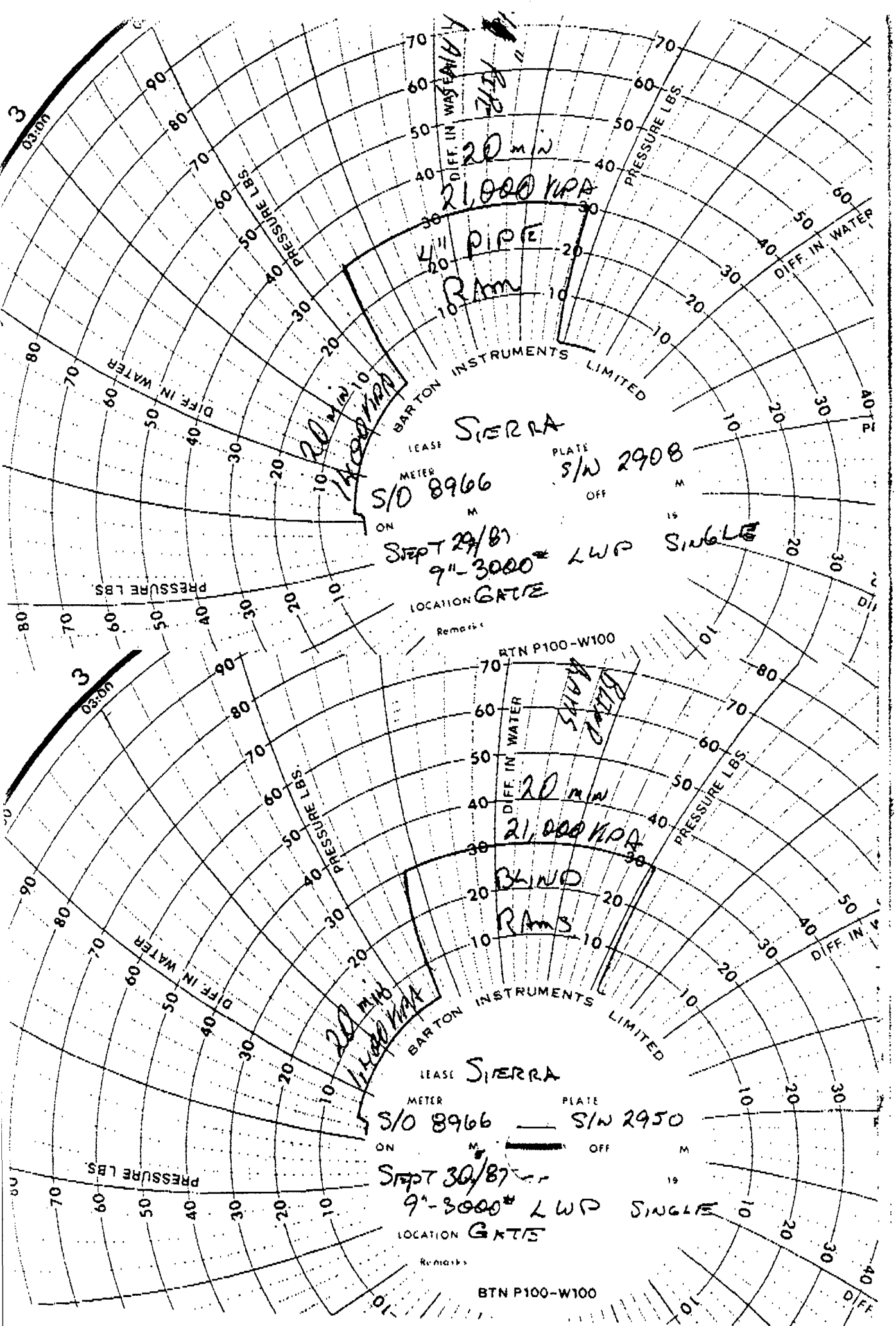
COMMENTS

Date Service Completed: SEP 29 1987 Tagged: —

Copies To: Field ____ Office ____ File ____

Service Code 2 Service Manager


BARTON INSTRUMENTS LIMITED
LEASE SIERRA
METER S/O 8966
PLATE S/N 1-91788
SEPT 24/87
9"- 3000# SHAFFER
LOCATION ANNULAR
Remarks
BTN P100-W100
ON
OFF
PRESSURE LBS.
DIFF. IN WATER
NOON 12 MIDI
MIDNIGHT
6P.M.
SEPT 24/87
S/N 1-91788
S/O 8968


BARTON INSTRUMENTS LIMITED
LEASE SIERRA
METER S/O 8966
PLATE S/N 2908
ON M
OFF M
SEPT 29/87
9"-3000# LWP SINGLE
LOCATION GATE
Remarks
DIFF. IN WATER
PRESSURE LBS.
20 MIN
21,000 KPA
4" PIPE RAMS
BTN P100-W100
BARTON INSTRUMENTS LIMITED
LEASE SIERRA
METER S/O 8966
PLATE S/N 2950
ON M
OFF M
SEPT 30/87
9"-3000# LWP SINGLE
LOCATION GATE
Remarks
BTN P100-W100
20 MIN
21,000 KPA
BLIND RAMS

Allstack B.O.P. Sales & Svce. Ltd.

HEAD OFFICE
3701 - 19th Street N.E., Calgary, Alberta T2
TELEPHONE: (403) 250-3325 TELEX: 03-

Box 186, 2001 - 8th Street, Nisku, Alberta T0
TELEPHONE: (403) 955-2413

SHOP SERVICE REPORT - B.O.P.'s

Customer: SIERRA Rig No.: 2 S/O No.: 8966

EQUIPMENT FOR SERVICE

	Description	Working pres. kPa	Model	Make	Ser. No
1.	9"-3000# SINGLE GATE	20,000	LWP	SHAFFER	295
2.	BLIND RAMS				
3.					
4.	9"-3000# SINGLE GATE	21,000	LWP	SHAFFER	2908
5.	4" PIPE RAMS				

DESCRIPTION OF SERVICE 3 YEAR CERTIFICATION - "CAVITY BADLY WOR CAVITY + RAM BLOCKS BUILT UP - STRESS RELIEVED MACHINED TO SPEC. ALL RAM SHAFTS + LOCKING SHAF RE CHROMED. MAGNETIC PARTICLE INSPECTION of BODIES FOR CRACKS SHOWED NO CRACKING

PRESSURE TEST

	ITEM	HYDRAULICS OPEN PRES. kPa	MIN.	CLOSE PRES. kPa	MIN.	SIMULATED WELL PRESSURE LOW PRES. kPa	MIN.	HIGH PRES. kPa	MIN
1.	BLIND RAMS	10,500	20	10,500	20	1,400	20	21,000	20
2.									
3.	PIPE RAMS	10,500	20	10,500	20	1,400	20	21,000	20
4.									
5.									

COMMENTS

Date Service Completed: SEPT 29 1987 Tagged: ✓

Copies To: Field ____ Office ____ File ____

Service Code 2

Service Manager

SIERRA
DRILLING LTD.
MEDICINE HAT, ALBERTA

Management Training Certificate

IN RECOGNITION OF TRAINING IN
THE MANAGEMENT SCIENCES

STEVE SEABOURNE
RECIPIENT

SIERRA DRILLING LTD.

St. John Ambulance

CERTIFIES THAT

YVON LeBLANC

HAS BEEN EXAMINED AND IS QUALIFIED IN

SAFETY ORIENTED FIRST AID

STANDARD LEVEL

CL. NO. 8732092 EXPIRES APR 1990

ELECTIVES

F 206815

Priory Secretary

FIRST LINE SUPERVISOR'S

Nº 6540 FLS

THIS IS TO CERTIFY THAT

YVON LEBLANC

Has Satisfactorily Completed A Written Examination On

BLOWOUT PREVENTION

Conducted By THE PETROLEUM INDUSTRY TRAINING SERVICE

Feb. 5 19 87 Executive Director

Expiry Date DEC 9 1990

SECOND LINE SUPERVISOR

Nº 3541SWC

THIS IS TO CERTIFY THAT

YVON LEBLANC

Has Satisfactorily Completed A Written Examination On

WELL CONTROL SIMULATOR TRAINING PROGRAM

Conducted By THE PETROLEUM INDUSTRY TRAINING SERVICE

Feb. 6 19 87 Executive Director

Expiry Date FEB 5 1989

Nº 2946

THIS IS TO CERTIFY THAT

YVON LEBLANC

has satisfactorily completed the

HYDROGEN SULPHIDE ALERT COURSE

Issued subject to the Standards of the
PETROLEUM INDUSTRY TRAINING SERVICE

April 10 19 85

Instructor Executive Director

St. John Ambu ance

CERTIFIES THAT

JOHN THERIAULT

HAS BEEN EXAMINED AND IS QUALIFIED IN

SAFETY ORIENTED FIRST AID

STANDARD LEVEL

ELECTIVES:

EXPIRES: OCTOBER 1990

CLASS No.: 8733323

Chief Executive Officer

F 338621

FIRST LINE SUPERVISORS

Nº 5792 FLS

THIS IS TO CERTIFY THAT

JOHN THERIAULT

Has Satisfactorily Completed A Written Examination On

BLOWOUT PREVENTION

Conducted By THE PETROLEUM INDUSTRY TRAINING SERVICE

April 18, 1986

Executive Director

Expiry Date Feb 12 1991

Nº 15413

THIS IS TO CERTIFY THAT

JOHN THERIAULT

has satisfactorily completed the

HYDROGEN SULPHIDE ALERT COURSE

Issued subject to the Standards of the
PETROLEUM INDUSTRY TRAINING SERVICE

March 31, 1987

Executive Director

Feb March 31, 1992

№ 15409

THIS IS TO CERTIFY THAT

GILLES LEBLANC

has satisfactorily completed the

HYDROGEN SULPHIDE ALERT COURSE

Issued subject to the Standards of the
PETROLEUM INDUSTRY TRAINING SERVICE

March 31, 1987

A H Anderson
Executive Director

St. John Ambulance
Canada

CERTIFIES THAT

GILLES LeBLANC

HAS BEEN EXAMINED AND IS QUALIFIED IN

SAFETY ORIENTED FIRST AID

CL NO 8632153 EXPIRES DEC 1989

STANDARD FIRST AID CERTIFICATE

DIRECTOR OF TRAINING

FIRST LINE SUPERVISOR'S

№ 6643 FLS

THIS IS TO CERTIFY THAT

GILLES LEBLANC

Has Satisfactorily Completed A Written Examination On

BLOWOUT PREVENTION

Conducted By THE PETROLEUM INDUSTRY TRAINING SERVICE

April 9 19 87

A H Anderson
Executive Director

Expiry Date April 19 91

ALBERTA
LABOUR
GENERAL SAFETY SERVICES DIVISION
BOILERS [redacted]

The Boilers and Pressure Vessels Act, 1975

Certificate of Competency Confirmation Card

This is to certify that

STEVE SEABOURNE File No. A-22039

is the holder of a

SPECIAL OILWELL Certificate of Competency.

Signature of Certificate Holder — Chief Inspector

FORM 1708-4

THIS IS TO CERTIFY THAT

STEVE SEABOURNE

has satisfactorily completed the

HYDROGEN SULPHIDE ALERT COURSE

Issued subject to the Standards of the
PETROLEUM INDUSTRY TRAINING SERVICE

February 18 19 86

Executive Director

St. John Ambulance
Canada

CERTIFIES THAT

STEVE SEABOURNE

HAS BEEN EXAMINED AND IS QUALIFIED IN

SAFETY ORIENTED FIRST AID

CL NO 8632153 EXPIRES DEC 1989

STANDARD FIRST AID CERTIFICATE — DIRECTOR OF TRAINING

FIRST LINE SUPERVISORS

No 7369 FLS

THIS IS TO CERTIFY THAT

STEVE SEABOURNE

Has Satisfactorily Completed A Written Examination On

BLOWOUT PREVENTION

Conducted By THE PETROLEUM INDUSTRY TRAINING SERVICE

Oct 26 19 87

Executive Director

Expiry Date OCT 26 1990

FLS 3741

THIS IS TO CERTIFY THAT

GEORGE CARRIERE

HAS SATISFACTORILY COMPLETED A WRITTEN EXAMINATION ON

BLOWOUT PREVENTION

First Line Supervisor's

April 4, 19 85

APR 0 4 1988

SIGNING OFFICER

EXPIRY DATE

SECOND LINE SUPERVISOR

№ 4645 SWC

THIS IS TO CERTIFY THAT

ROD CARRIERE

Has Satisfactorily Completed A Written Examination On

WELL CONTROL SIMULATOR TRAINING PROGRAM

Conducted By THE PETROLEUM INDUSTRY TRAINING SERVICE

Nov. 6, 1987

Executive Director

Expiry Date NOV 06 1988

ALBERTA

LABOUR

GENERAL SAFETY SERVICES DIVISION

BOILERS BRANCH

The Boilers and Pressure Vessels Act, 197

Certificate of Competency Confirmation Card

This is to certify that

GE[illegible] R. CARRIERE (Serial No.) A-22762

is the holder of a SPECIAL OILWELL Certificate of Competency

Signature of Certificate Holder Chief Inspector

FORM CR04

COMPANY	SERVICES
Sierra Drilling Ltd. Box 177 Medicine Hat, Alberta Toolpusher: Ivan LeBlanc Telephone: Medicine Hat (403) 265-6150	Drilling Contractor
To Be Selected From High Level, Alberta Or Hay River, N.W.T.	Construction Services - Lease Construction
A.C.T. 4524 - 97th Street Edmonton, Alberta	Rentals (Shocks, subs, Jars, Incinerators)
PTI Camp Services Ltd. Peace River, Alberta Telephone: (403) 624-3220	Catering Company
Zeta Oilfield Rentals Ltd. 904, 505 - 4th Avenue S.W. Calgary, Alberta Telephone: Nisku (403) 955-2170 Calgary (403) 263-2463	Rental Company (Storage Tanks, Burief Tanks, Etc.)
Data Log 7139K - 40th Street S.E. Calgary, alberta Telephone: (403) 279-5363	Mud Logging

Nowsco Well Service Ltd. — Cementing
1300, 801 - 6th Avenue S.W.
Calgary, Alberta T2P 3W2

Attention: Rick Smith

Telephone: (403) 261-2990

Computalog Gearhart Ltd. — Logging
700 - 6th Avenue S.W.
Calgary, Alberta T2P 0S5

Attention: Dave Tim (Calgary)
Telephone: (403) 265-2515

Attention: Rick Bottomly (Grande Prairie)
Telephone: (403) 539-6400

Mission Mud Control Ltd. — Mud
722, 550 - 6th Avenue S.W.
Calgary, Alberta

Telephone: (403) 263-0160

Sunwest Charters Ltd. — Air Support
675 Aviation Blvd. N.E.
Calgary, Alberta

Telephone: Calgary (403) 275-8121
Edmonton (403) 428-0354

Standard Safety Consulting Services (1978) Ltd. — Safety Supply Company
3120 - 93 Street
Edmonton, Alberta T6N 1C7

Attention: Brian Christensen

Telephone: (403) 463-9077

A Contractor From High Level, Alberta Or Hay River, N.W.T.	Water Hauling
Atco Rentals High Level, Alberta	Centrifuge Swaco
Big River Oil Ltd. P.O. Box 367 Hay River, N.W.T. XOE ORO	Fuel And Lube Supplies
King Welding Hay River, N.W.T. Attention: Russel King Telephone: Office (403) 874-6734 Residence (403) 874-6718	Welding
Scott Testers (1978) Ltd. Edmonton, Alberta	Conventional Testers