FOWARD

ET AL

IZOK M-20

9211-F9-1-2

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

| | | | | | |
|---|---|---|---|---|---|
| Nova Scotia | ☐ | West Coast | ☐ | Exploratory | XX |
| Newfoundland | ☐ | Northern | XX | 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: Forward et al Izok M-20

Operator: Forward Resources Ltd. | Drilling Program No.: n/a

Contractor: Three Hundred Drilling Ltd. | Permit or Lease No.: 3926

Drilling Rig or Unit: Ben | Estimated Well Cost: Approximately 3.9 million

Location-Unit: M | Section: 20 | Grid Area: 67-20-123-45

Coordinates: Lat.: 67° 20' | Long.: 123° 45'

Area: Lac Maunoir, N.W.T. | Field/Pool: n/a

Elevation KB: 299.2 m (ASL) | Seafloor: - (BRT)

Approx. Spud Date: Feb. 1/83 | Estimated Days on Location: 42

Anticipated Total Depth: 1864 m | Target Horizon(s) Old Fort Island/Shaler Group

## EVALUATION PROGRAM

Ten-metre sample intervals: n/a

Five-metre sample intervals: n/a

Canned sample intervals: 3 m intervals

Conventional cores at: none

Logs and Tests: Any porosity and hydrocarbons/laterolog, acoustilog, compensated gamma neutron/density

## CASING AND CEMENTING PROGRAM

| O.D. | Weight: kg/m | Grade: | Setting Depth Below Seafloor: | Cementing Program (Volumes): |
|---|---|---|---|---|
| 339.7 mm | 71.1 | H-40 | 60 m | 5.2 T |
| 244.5 mm | 48.1 | ERW H-276 | 463 m | 36.4 T |
| 114.3 mm | 14.1 | ERW J-379 | 1864 m | 22.9 T permafrost + 58.6 T class "G" |

B.O.P. Equipment: Shaffer Spherical bag assembly; blind shaffer MNLR type; Pipe $H_2S$ trim assembly size 9" - series 3000; Drilling Spool serier 3000 with 9" x 3000

Other Information: Under exploratory licence no. 366. Land use permit N 82 A 792 issued Dec. 8/82. Land Use access permit issued Dec. 8/82 - N82 B786

Signed: [signature] | Title: Vice - President

Date: December 27, 1982 | Company: Forward Resources Ltd.

## APPROVAL

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

Signed: [signature]
Engineering Branch

Date: January 24 1983

File: 7140-1017

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

D.A. 1017

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

| | | | | Well Status | |
|---|---|---|---|---|---|
| Nova Scotia | ☐ | West Coast | ☐ | Suspended | ☐ |
| Newfoundland | ☐ | Northern | ☒ | Completed | ☐ |
| Gulf of St. Lawrence | ☐ | Hudson Bay | ☐ | Abandoned | ☒ |

# WELL TERMINATION RECORD

This record is submitted in triplicate in compliance with Section 184 of the Canada Oil and Gas Drilling Regulations.

## WELL DATA

Well Name: Forward et al Izok D-11 Area: Colville Hills, N.W.T.

Grid Area: 67-20-123-45 Field/Pool: Not Applicable

Lease No.: 3926 Final Coordinates: Lat. 67° 20' 01.42" Long: 123° 40' 17.45"

Drilling Rig: "Mr. Ben" ✓ Elevations: RKB: 305.12 m ✓ GRADE: 300.78 m ✓

Spud Date: 83 02 15 ✓ Rig Released: 83 04 01 ✓ Total Depth: 900 m ✓

## CASING AND CEMENTING

| O.D.: | Weight: | Grade: | Depth Set: | Cement and Additives: |
|---|---|---|---|---|
| 339.7 mm | 71.1 kg/m | H-40 | 35.00 m | 7.4 T Permafrost ✓ |
| 244.4 mm | 48.1 kg/m | H-276 | 427.21 m | 6.3 T Neat Class "G" Lead ✓ |
| | | | | 21.6 T Permafrost + 8% Gel Tail ✓ |
| 177.8 mm | 38.7 kg/m | S95 | 589.00 m | 12.3 T Neat Class "G" ✓ |

## PLUGGING PROGRAM

Approval of the following program was obtained by (person) Gary Laviolette ✓ from (person) John Hamilton of the Canada Oil and Gas Lands Administration by means of (Verbal) Confirmation on March 29 1983. Written approval followed. ✓

| Type of Plug: | Interval: | Felt: | Cement and Additives: |
|---|---|---|---|
| Cement | 800 - 900 m | No | 3.2 T Neat Class "G" ✓ |
| Cement | 540 - 640 m | No | 3.2 T Neat Class "G" ✓ |
| 244 mm Bridge Plug | 280 m | Wireline set and pressure tested to 7000 kPa ✓ | |
| Cement | 0 - 50 m | No | 2.0 T Permafrost ✓ |

The 244.4 mm casing was cut off 1 m below ground level and a plate was welded on top of the casing

Lost Circulation/Pressure Zones: Noted at 404 m, 424 m and 432 - 443 m ✓

Equipment left in Hole: X

Provision for Re-entry (Describe and attach sketch): N/A

Cores: Type: No Cores Were Cut Intervals: N/A

Other Downhole Completion/Suspension Equipment: N/A

## CERTIFICATION

I certify on the basis of personal knowledge of operations undertaken at the above named well that the above information is accurate.

Signed: A. Laviolette P. Eng. Title: Special Projects Engineer

Name: Gary Laviolette Date: March 30, 1984

Acknowledged by: J. Hamilton Engineering Branch

Date: 84-05-23

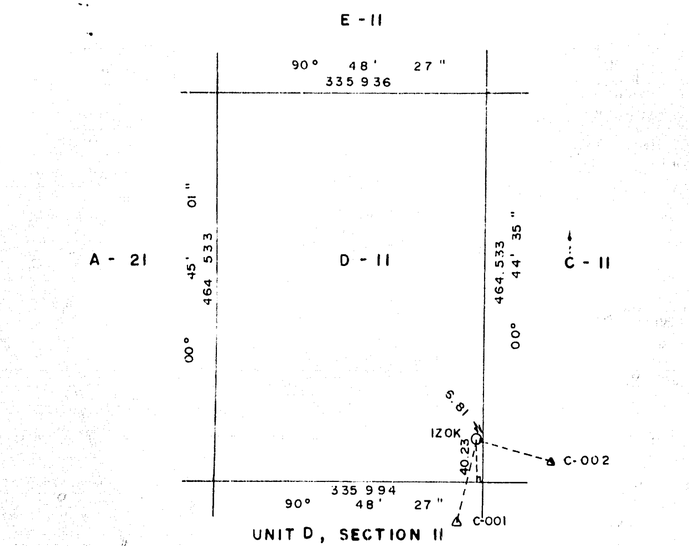
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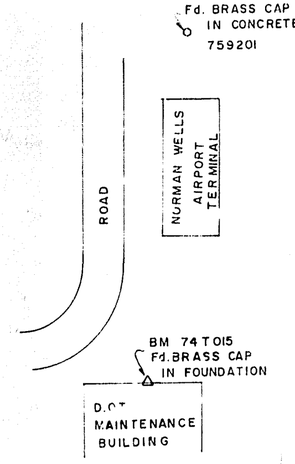
Department of Energy, Mines and Resources / Ministère de l'Énergie, des Mines et des Ressources

Department of Indian Affairs and Northern Development / Ministère des Affaires indiennes et du Nord canadien

Canada

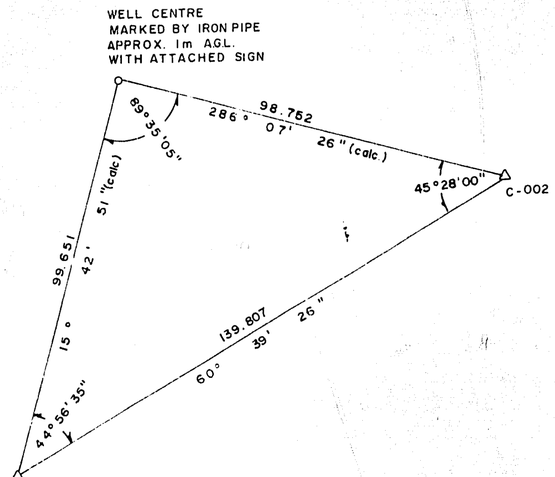
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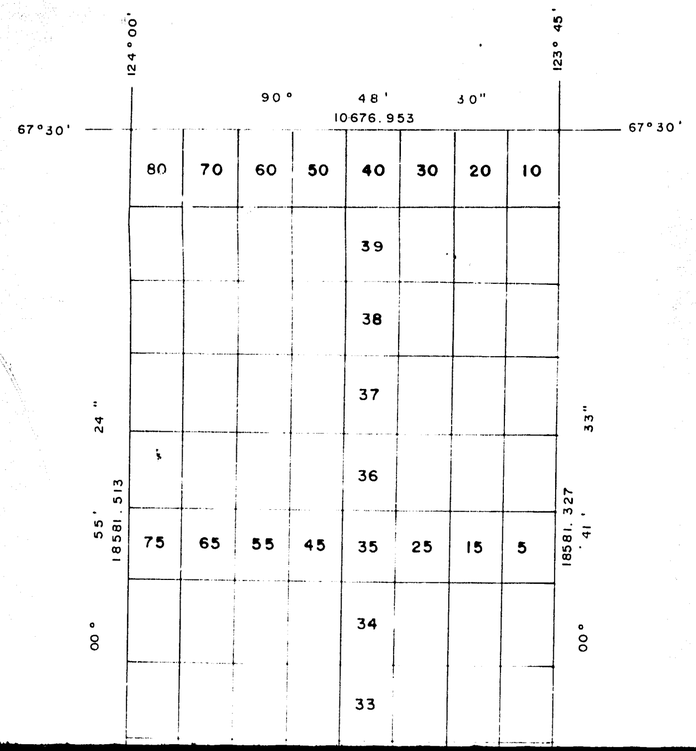




SKETCH SHOWING CONTROL IN NORMAN WELLS

not to scale




STATION DETAIL C 001




| LEVEL LINE B.M.74TOI5 to 759201 | | | |
|---|---|---|---|
| B.S. | F.S. | ELEV. | STA. |
| 3.772 | | 65.489 | 74TOI5 |
| | 0.401 | | |
| 2.158 | | | |
| | 1.288 | 69.730 | 759201 |
| 1.305 | | | |
| | 2.175 | | |
| 0.418 | | | |
| | 3.785 | 65.493 | 74 TOI5 |

| GEOGRAPHIC AND U.T.M. CO-ORDINATES, (1927 NAD) | | | | |
|---|---|---|---|---|
| STATION | LATITUDE | LONGITUDE | NORTHINGS | EASTINGS |
| **GRID AREA** | | | | |
| N.E. | 67° 30' | - 123° 45' | 7 487129.40 | 467970.33 |
| N.W. | 67° 30' | - 124° 00' | 7 487280.04 | 457294.44 |
| S.E. | 67° 20' | - 123° 45' | 7 468549.43 | 467745.75 |
| S.W. | 67° 20' | - 124° 00' | 7 468700.94 | 456995.01 |
| D-II , N.E. | | | 7 469047.07 | 465400.05 |
| D-II , N.W. | | | 7 469051.80 | 465064.15 |
| D-II , S.E. | | | 7 468582.57 | 465394.03 |
| D-II , S.W. | | | 7 468587.31 | 465058.07 |
| **CONTROL MONUMENTS** | | | | |
| C-001 | 67°19'58.31" | - 123°48'19.60" | 7 468 526.97 | 465 360.75 |
| C-002 | 67°20'00.57" | - 123°48'09.47" | 7 468 595.48 | 465 482.62 |
| **WELL** | | | | |
| IZOK | 67°20'01.42" | - 123°48'17.45" | 7 468 622.90 | 465 387.74 |

SUMMARY OF DOPPLER SATELLITE POSITION - TRANSLOCATION SURVEY

| CONTROL STATION NORMAN WELLS GSC STA. No. 759201 186 ACCEPTED PASSES BETWEEN. 02 h G.M.T. DAY 113 AND 07 G.M.T. DAY 121 | | | DERIVED STATION C 001 42 ACCEPTED PASSES BETWEEN 21 h G.M.T. DAY 114 AND 12 h.G.M.T. DAY 116 | | |
|---|---|---|---|---|---|
| 1927 N.A.D CO-ORDINATES | WGS. 72 GEOCENTRIC CO-ORDINATES | DERIVED DATUM SHIFT (MAD - | WGS 72 GEOCENTRIC CO-ORDINATES (BROADCAST EPHEMERIS) | DERIVED 1927 N.A.D. CO-ORDINATES (GEOCENTRIC + DATUM SHIFT) | |

CANADA LANDS SURVEYS RECORDS
6 8 9 7 5
Date 29 NOV 1983

POSITIONING IS RECORDED F.B. 33336

# PLAN AND FIELD NOTES OF SURVEY OF

# WELL SITE FORWARD ET AL IZOK D-II

## IN UNIT D, SECTION II
## GRID AREA 67° 30', 123° 45'

## NORTHWEST TERRITORIES

CANADA OIL AND GAS LAND REGULATIONS

SCALE 1: 1000
LEASE No. 3926

SURVEYED BY NORTECH SURVEYS (CANADA) IN
SURVEYED FOR FORWARD RESOURCES

**LEGEND**

ALL CO-ORDINATES SHOWN ARE ON 1927 N.A.D. BASED ON THE CO-ORDINATE AS SHOWN IN "SUMMARY OF DOPPLER SATELLITE POSITION - TRANSLOCAT
U.T.M. CO-ORDINATES ARE COMPUTED FOR ZONE 10, CENTRAL MERIDIAN -
BEARINGS WERE DERIVED FROM A SUN OBSERVATION AT STATION C001
DISTANCES ARE IN METRES AND DECIMALS THEREOF.
THE CENTRAL MERIDIAN IS GIVEN A FALSE EASTING OF 500 000.
0.013 m sq. by 0.457 IRON BAR WITH ALUMINIUM CAP MARKED "NORTECH SURVEYS" AND STATION No. PLANTED SHOWN THUS ----
POSITIONING FOR C001 WAS DONE BY SIMULTANEOUS DOPPLER SATELLITE
USING JMR I AND IA RECIEVERS. COMPUTATIONS WERE DONE USING PROGR
(DOCUMENTATION AVAILABLE FROM GEODETIC SURVEYS OF CANADA).
ALL DISTANCES, AZIMUTHS AND ANGLES SHOWN IN STATION DETAIL WERE IN THE FIELD UNLESS SHOWN OTHERWISE.

I, J. HAGGLUND, OF THE CITY OF CALGARY, ALBERTA, CANADA LAND SURVEY MAKE OATH AND SAY THAT I HAVE IN MY OWN PROPER PERSON, ACCORDING THE LAW AND THE INSTRUCTIONS OF THE SURVEYOR GENERAL OF CANADA LANDS, FAITHFULLY AND CORRECTLY EXECUTED THE SURVEY SHOWN BY TH PLAN AND FIELD NOTES, AND THAT THE SAID PLAN AND FIELD NOTES ARE CORRECT AND TRUE TO THE BEST OF MY KNOWLEDE AND BELIEF.
SO HELP ME GOD

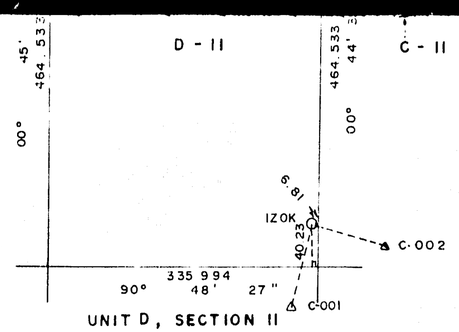
SWORN BEFORE ME AT CALGARY ALBERTA
ON THIS 6th DAY OF JUNE 1983

J. E. Haggland
CANADA LAND SURVEYOR

M. Schacht
A COMMISSIONER FOR OATHS IN AND FOR
THE PROVINCE OF ALBERTA
MANFRED SCHACHT (Exp. JULY 24/84)

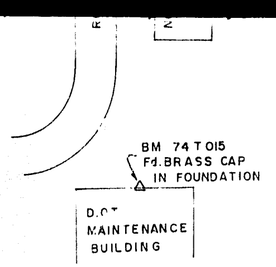
THE SURVEY WAS EXECUTED DURING APRIL 1983

CANADA LANDS SURVEYS RECORDS
6 8 9 7 5



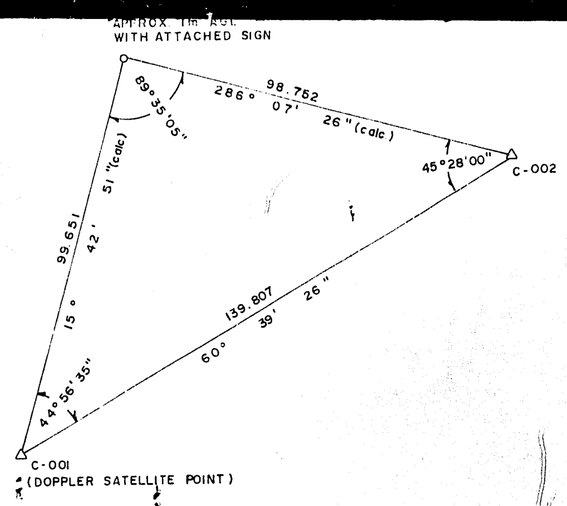

UNIT D, SECTION II

SCALE 1: 5000

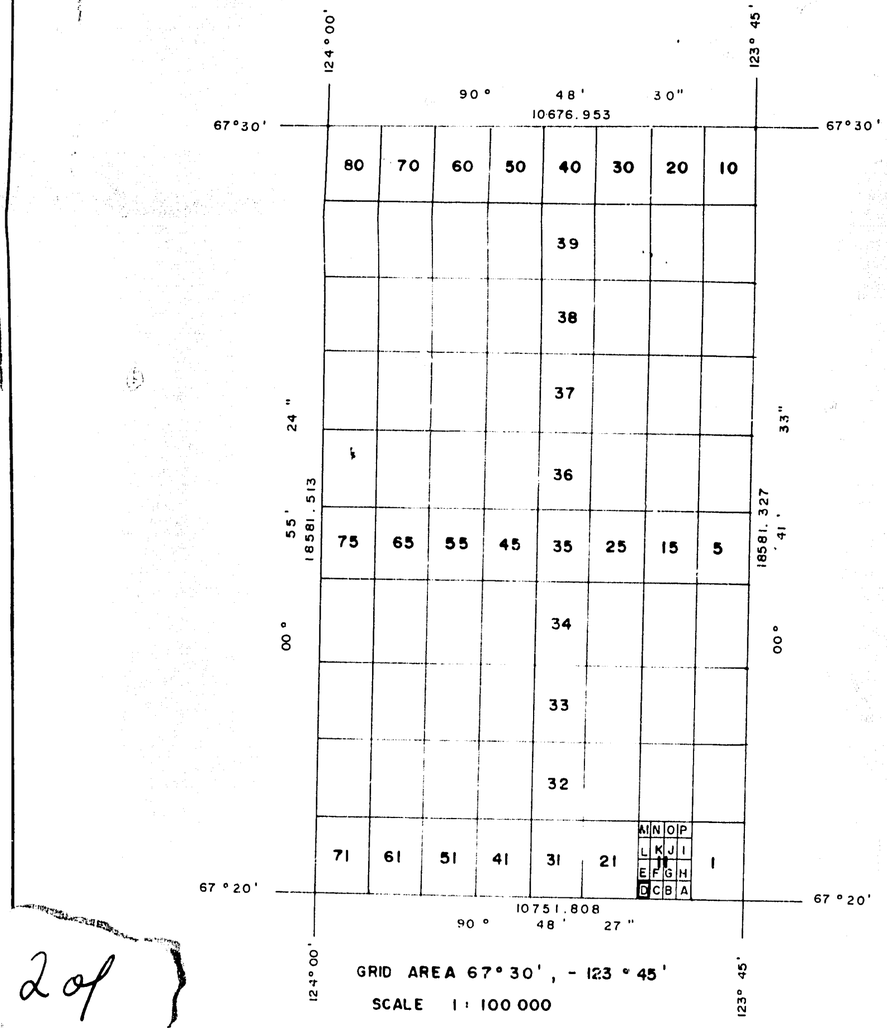



SKETCH SHOWING CONTROL
IN NORMAN WELLS

not to scale




STATION DETAIL C 001




GRID AREA 67° 30', - 123° 45'

SCALE 1: 100 000

| LEVEL LINE B.M. 74TO15 to 759201 | | | |
|---|---|---|---|
| B.S. | F.S. | ELEV | STA. |
| 3.772 | | 65.489 | 74TO15 |
| | 0.401 | | |
| 2.158 | | | |
| | 1.288 | 69.730 | 759201 |
| 1.305 | | | |
| | 2.175 | | |
| 0.418 | | | |
| | 3.785 | 65.493 | 74 TO15 |

| GEOGRAPHIC AND U.T.M. CO-ORDINATES, (1927 NAD) | | | | |
|---|---|---|---|---|
| STATION | LATITUDE | LONGITUDE | NORTHINGS | EASTINGS |
| **GRID AREA** | | | | |
| N.E. | 67° 30' | - 123° 45' | 7 487 129.40 | 467 970.33 |
| N.W. | 67° 30' | - 124° 00' | 7 487 280.04 | 457 294.44 |
| S.E. | 67° 20' | - 123° 45' | 7 468 549.43 | 467 745.75 |
| S.W. | 67° 20' | - 124° 00' | 7 468 700.94 | 456 995.01 |
| D-11, N.E. | | | 7 469 047.07 | 465 400.05 |
| D-11, N.W. | | | 7 469 051.80 | 465 064.15 |
| D-11, S.E. | | | 7 468 582.57 | 465 394.03 |
| D-11, S.W. | | | 7 468 587.31 | 465 058.07 |
| **CONTROL MONUMENTS** | | | | |
| C-001 | 67° 19' 58.31" | - 123° 48' 19.60" | 7 468 526.97 | 465 360.75 |
| C-002 | 67° 20' 00.57" | - 123° 48' 09.47" | 7 468 595.48 | 465 482.62 |
| **WELL** | | | | |
| IZOK | 67° 20' 01.42" | - 123° 48' 17.45" | 7 468 622.90 | 465 387.74 |

## SUMMARY OF DOPPLER SATELLITE POSITION - TRANSLOCATION SURVEY

| | CONTROL STATION NORMAN WELLS GSC STA No. 759201 186 ACCEPTED PASSES BETWEEN. 02 h G.M.T. DAY 113 AND 07 G.M.T. DAY 121 | | | DERIVED STATION C001 42 ACCEPTED PASSES BETWEEN 21 h G.M.T. DAY 114 AND 12 h G.M.T. DAY 116 | |
|---|---|---|---|---|---|
| | 1927 N.A.D. CO-ORDINATES | W.G.S. 72 GEOCENTRIC CO-ORDINATES (BROADCAST EPHEMERIS) | DERIVED DATUM SHIFT (NAD - GEOCENTRIC) | W.G.S. 72 GEOCENTRIC CO-ORDINATES (BROADCAST EPHEMERIS) | DERIVED 1927 N.A.D. CO-ORDINATES (GEOCENTRIC + DATUM SHIFT) |
| CARTESIAN CO-ORDINATES X | - 1 601 965.99 | - 1 601 960.04 | - 5.95 | - 1 371 594.69 | - 1 371 600.64 |
| Y | - 2 142 202.75 | - 2 142 039.42 | -163.33 | - 2 048 288.11 | - 2 048 451.44 |
| Z | 5 770 645.08 | 5 770 813.85 | -168.77 | 5 863 086.33 | 5 862 917.56 |
| LATITUDE | 65° 16' 42.16565" | | | | 67° 19' 58.31" |
| LONGITUDE | -126° 47' 22.55699" | | | | -123° 48' 19.60" |
| HEIGHT A.M.S.L. H | 69.73 | | | | 299.83 |
| GEOID HEIGHT (WGS - 72) N | - 12.36 | | | | - 18.06 |
| HEIGHT ABOVE SPHEROID (WGS - 72) h | 57.37 | | | | 281.77 |

THE DOPPLER DATA WAS PROCESSED USING PROGRAM GEODOP. THE N.W.L. 9-D ELLIPSOID PARAMETERS WERE USED. THE RESULTS WERE THEN CONVERTED TO WGS-72 USING THE SEPPLIN TRANSFORMATION. THE DATUM SHIFTS WERE COMPUTED BY SUBTRACTING THE DERIVED WGS-72 CO-ORDINATES FROM STATION 759201 FROM THE PUBLISHED VALUES (N.A.D.-27). HEIGHT A.M.S.L. FOR STATION 759201 WAS OBTAINED BY SPIRIT LEVEL FROM B.M. 74TO15

# WELL SITE
# FORWARD ET AL IZOK D-11
## IN UNIT D, SECTION II
## GRID AREA 67° 30', 123° 45'

NORTHWEST TERRITORIES

CANADA OIL AND GAS LAND REGULATIONS

SCALE 1: 1000

LEASE No. 3926

SURVEYED BY: NORTECH SURVEYS (CANADA) L
SURVEYED FOR: FORWARD RESOURCES

**LEGEND**

ALL CO-ORDINATES SHOWN ARE ON 1927 N.A.D. BASED ON THE CO-ORDINA
AS SHOWN IN "SUMMARY OF DOPPLER SATELLITE POSITION - TRANSLOCA
U.T.M. CO-ORDINATES ARE COMPUTED FOR ZONE 10, CENTRAL MERIDIAN
BEARINGS WERE DERIVED FROM A SUN OBSERVATION AT STATION C001
DISTANCES ARE IN METRES AND DECIMALS THEREOF.
THE CENTRAL MERIDIAN IS GIVEN A FALSE EASTING OF 500 000.
0.013 m sq by 0.457 IRON BAR WITH ALUMINIUM CAP MARKED
"NORTECH SURVEYS" AND STATION No. PLANTED SHOWN THUS ----
POSITIONING FOR C001 WAS DONE BY SIMULTANEOUS DOPPLER SATELLITE
USING JMR I AND IA RECIEVERS. COMPUTATIONS WERE DONE USING PRO
(DOCUMENTATION AVAILABLE FROM GEODETIC SURVEYS OF CANADA).
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I, J. HAGGLUND, OF THE CITY OF CALGARY, ALBERTA, CANADA LAND SURVE
MAKE OATH AND SAY THAT I HAVE IN MY OWN PROPER PERSON, ACCORDING
THE LAW AND THE INSTRUCTIONS OF THE SURVEYOR GENERAL OF CANADA
LANDS, FAITHFULLY AND CORRECTLY EXECUTED THE SURVEY SHOWN BY T
PLAN AND FIELD NOTES, AND THAT THE SAID PLAN AND FIELD NOTES ARE
CORRECT AND TRUE TO THE BEST OF MY KNOWLEDE AND BELIEF.
SO HELP ME GOD

SWORN BEFORE ME AT CALGARY ALBERTA
ON THIS 6th DAY OF JUNE 1983

J. E. Haggl
CANADA LAND SURVE

M. Schacht

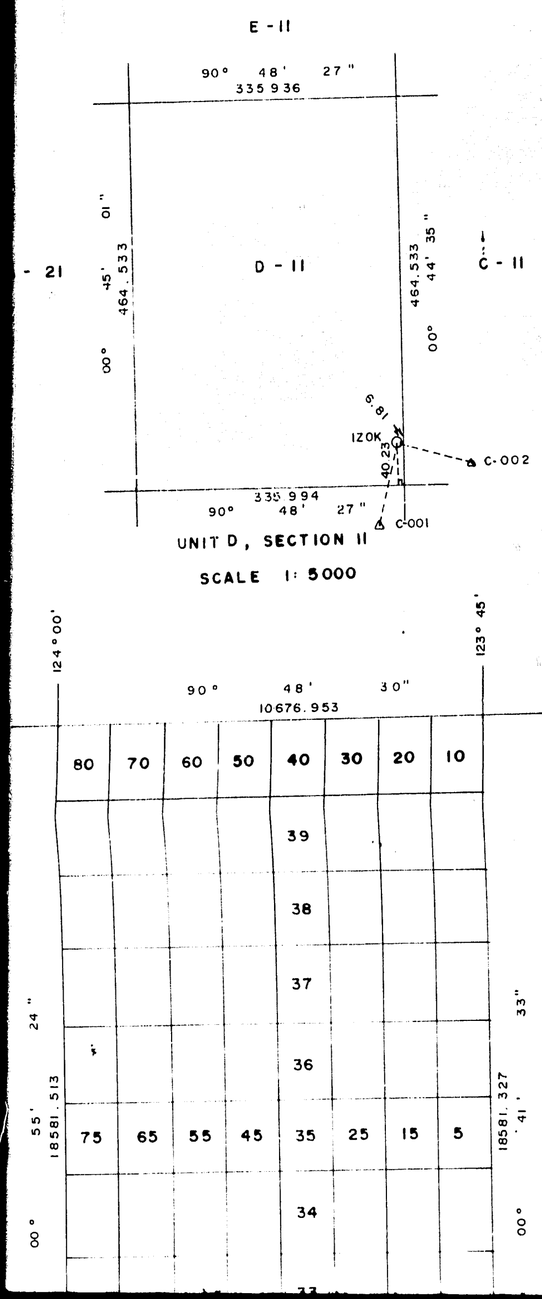
A COMMISSIONER FOR OATHS IN AND FOR
THE PROVINCE OF ALBERTA
MANFRED SCHACHT (Exp. JULY 24/84)

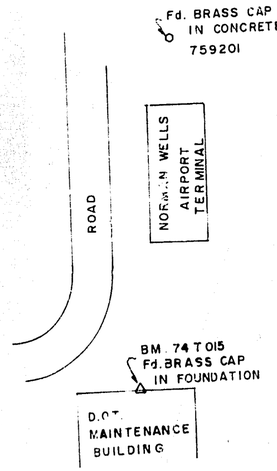
THE SURVEY WAS EXECUTED DURING APRIL 1983

CANADA LANDS SURVEYS RECORDS
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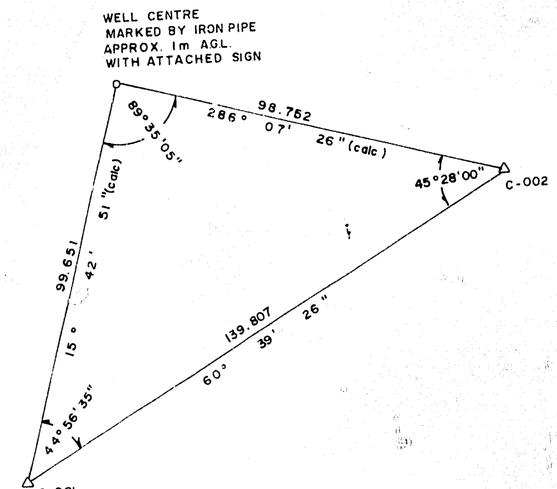
2 of

9211-F9-1-2




SKETCH SHOWING CONTROL
IN NORMAN WELLS
not to scale




STATION DETAIL C 001

| LEVEL LINE B.M.74T015 to 759201 | | | |
|---|---|---|---|
| B.S. | F.S. | ELEV. | STA. |
| 3.772 | | 65.489 | 74T015 |
| | 0.401 | | |
| 2.158 | | | |
| | 1.288 | 69.730 | 759201 |
| 1.305 | | | |
| | 2.175 | | |
| 0.418 | | | |
| | 3.785 | 65.493 | 74T015 |
| | | | |

| GEOGRAPHIC AND U.T.M. CO-ORDINATES, (1927 NAD) | | | | |
|---|---|---|---|---|
| STATION | LATITUDE | LONGITUDE | NORTHINGS | EASTINGS |
| **GRID AREA** | | | | |
| N.E. | 67° 30' | - 123° 45' | 7 487129.40 | 467970.33 |
| N.W. | 67° 30' | - 124° 00' | 7 487280.04 | 457294.44 |
| S.E. | 67° 20' | - 123° 45' | 7 468549.43 | 467745.75 |
| S.W. | 67° 20' | - 124° 00' | 7 468700.94 | 456995.01 |
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| D-II, S.E. | | | 7 468582.57 | 465394.03 |
| D-II, S.W. | | | 7 468587.31 | 465058.07 |
| **CONTROL MONUMENTS** | | | | |
| C-001 | 67°19'58.31" | - 123°48'19.60" | 7 468526.97 | 465360.75 |
| C-002 | 67°20'00.57" | - 123°48'09.47" | 7 468595.48 | 465482.62 |
| **WELL** | | | | |
| IZOK | 67° 20' 01.42" | - 123° 48' 17.45" | 7 468622.90 | 465387.74 |

| SUMMARY OF DOPPLER SATELLITE POSITION - TRANSLOCATION SURVEY | | | | |
|---|---|---|---|---|
| | CONTROL STATION NORMAN WELLS GSC STA. No. 759201 186 ACCEPTED PASSES BETWEEN. 02 h G.M.T. DAY 119 AND 07 G.M.T. DAY 121 | | DERIVED STATION C 001 42 ACCEPTED PASSES BETWEEN 21 h G.M.T. DAY 114 AND 12 h G.M.T. DAY 116 | |
| | 1927 N.A.D. | WGS. 72 GEOCENTRIC | DERIVED DATUM | WGS 72 GEOCENTRIC CO-ORDINATES | DERIVED 1927 N.A.D. CO-ORDINATES |

CANADA LANDS SURVEYS RECORDS
6 8 9 7 5
Date 29 NOV 1983

POSITIONING REPORT FOR THIS PLAN IS RECORDED UNDER No.
F.B. 33336 C.L.S.R.

3 of

# PLAN AND FIELD NOTES OF SURVEY OF

# WELL SITE
# FORWARD ET AL IZOK D-II
## IN UNIT D, SECTION II
## GRID AREA 67° 30', 123° 45'

**NORTHWEST TERRITORIES**
CANADA OIL AND GAS LAND REGULATIONS
SCALE 1: 1000
LEASE No. 3926

SURVEYED BY: NORTECH SURVEYS (CANADA) INC.
SURVEYED FOR: FORWARD RESOURCES

**LEGEND**
ALL CO-ORDINATES SHOWN ARE ON 1927 N.A.D BASED ON THE CO-ORDINATES AS SHOWN IN "SUMMARY OF DOPPLER SATELLITE POSITION - TRANSLOCATION SURVEY" ON THIS PLAN.
U.T.M. CO-ORDINATES ARE COMPUTED FOR ZONE 10, CENTRAL MERIDIAN - 123°.
BEARINGS WERE DERIVED FROM A SUN OBSERVATION AT STATION C 001
DISTANCES ARE IN METRES AND DECIMALS THEREOF.
THE CENTRAL MERIDIAN IS GIVEN A FALSE EASTING OF 500 000.
0.013 m sq. by 0.457 IRON BAR WITH ALUMINIUM CAP MARKED "NORTECH SURVEYS" AND STATION No. PLANTED SHOWN THUS ----Δ.
POSITIONING FOR C 001 WAS DONE BY SIMULTANEOUS DOPPLER SATELLITE OBSERVATIONS USING JMR I AND IA RECIEVERS. COMPUTATIONS WERE DONE USING PROGRAM GEODOP (DOCUMENTATION AVAILABLE FROM GEODETIC SURVEYS OF CANADA).
ALL DISTANCES, AZIMUTHS AND ANGLES SHOWN IN STATION DETAIL WERE MEASURED IN THE FIELD UNLESS SHOWN OTHERWISE.

I, J. HAGGLUND, OF THE CITY OF CALGARY, ALBERTA, CANADA LAND SURVEYOR, MAKE OATH AND SAY THAT I HAVE IN MY OWN PROPER PERSON, ACCORDING TO THE LAW AND THE INSTRUCTIONS OF THE SURVEYOR GENERAL OF CANADA LANDS, FAITHFULLY AND CORRECTLY EXECUTED THE SURVEY SHOWN BY THIS PLAN AND FIELD NOTES, AND THAT THE SAID PLAN AND FIELD NOTES ARE CORRECT AND TRUE TO THE BEST OF MY KNOWLEDE AND BELIEF.
SO HELP ME GOD

SWORN BEFORE ME AT CALGARY ALBERTA
ON THIS 6th DAY OF JUNE 1983

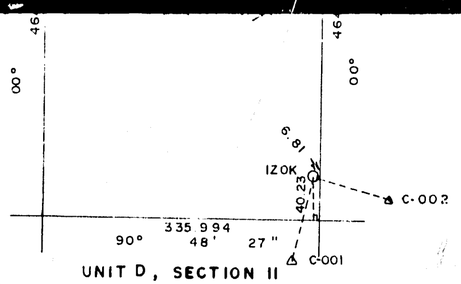
J. E. Haggland
CANADA LANDS SURVEYOR

M. Schacht
A COMMISSIONER FOR OATHS IN AND FOR THE PROVINCE OF ALBERTA
MANFRED SCHACHT (Exp. JULY 24/84)

THE SURVEY WAS EXECUTED DURING APRIL 1983

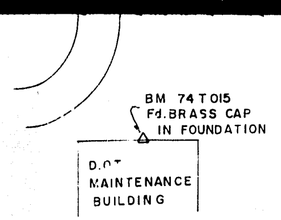
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CANADA LANDS SURVEYS RECORDS
6 8 9 7 5



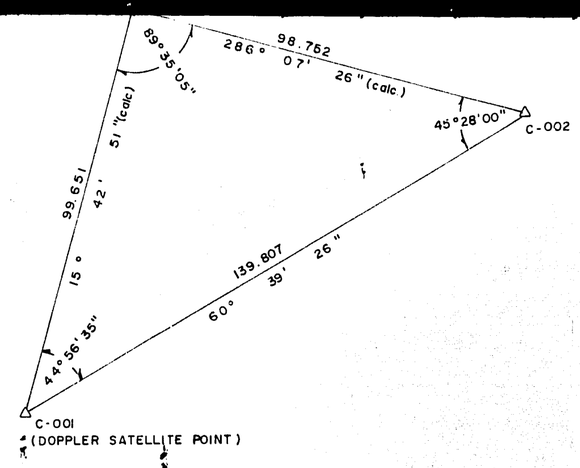

UNIT D, SECTION II

SCALE 1: 5000

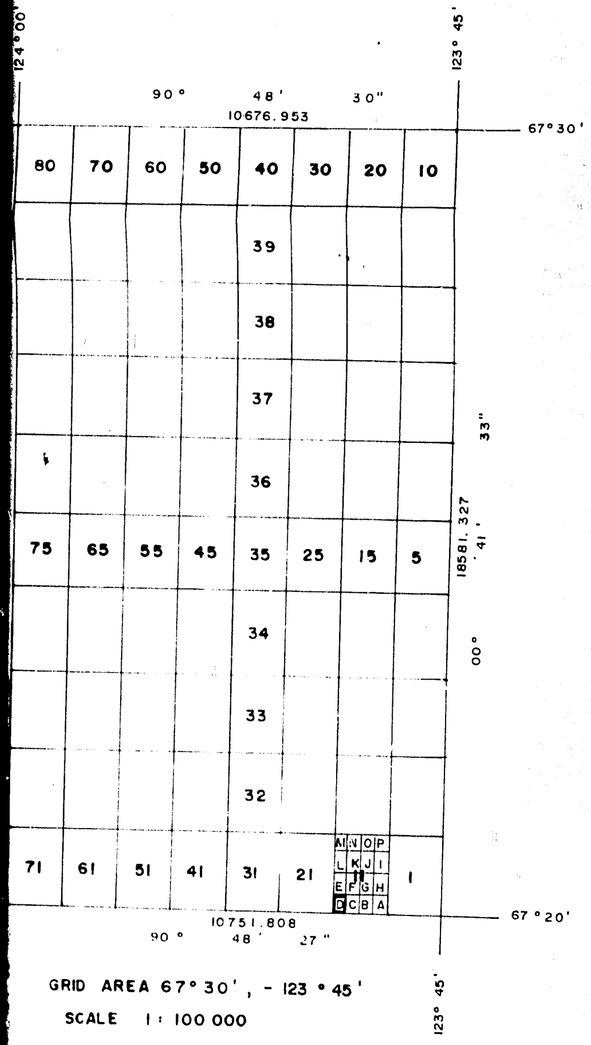



SKETCH SHOWING CONTROL
IN NORMAN WELLS

not to scale




STATION DETAIL C 001




GRID AREA 67° 30', - 123° 45'

SCALE 1: 100 000

| LEVEL LINE B.M. 74 TO15 to 759201 | | | |
|---|---|---|---|
| B.S. | F.S. | ELEV. | STA. |
| 3.772 | | 65.489 | 74 TO15 |
| | 0.401 | | |
| 2.158 | | | |
| | 1.288 | 69.730 | 759201 |
| 1.305 | | | |
| | 2.175 | | |
| 0.418 | | | |
| | 3.785 | 65.493 | 74 TO15 |
| | | | |

| GEOGRAPHIC AND U.T.M. CO-ORDINATES, (1927 N.A.D.) | | | | |
|---|---|---|---|---|
| STATION | LATITUDE | LONGITUDE | NORTHINGS | EASTINGS |
| **GRID AREA** | | | | |
| N.E. | 67° 30' | - 123° 45' | 7 487 129.40 | 467 970.33 |
| N.W. | 67° 30' | - 124° 00' | 7 487 280.04 | 457 294.44 |
| S.E. | 67° 20' | - 123° 45' | 7 468 549.43 | 467 745.75 |
| S.W. | 67° 20' | - 124° 00' | 7 468 700.94 | 456 995.01 |
| D-11, N.E. | | | 7 469 047.07 | 465 400.05 |
| D-11, N.W. | | | 7 469 051.80 | 465 064.15 |
| D-11, S.E. | | | 7 468 582.57 | 465 394.03 |
| D-11, S.W. | | | 7 468 587.31 | 465 058.07 |
| **CONTROL MONUMENTS** | | | | |
| C-001 | 67° 19' 58.31" | - 123° 48' 19.60" | 7 468 526.97 | 465 360.75 |
| C-002 | 67° 20' 00.57" | - 123° 48' 09.47" | 7 468 595.48 | 465 482.62 |
| **WELL** | | | | |
| IZOK | 67° 20' 01.42" | - 123° 48' 17.45" | 7 468 622.90 | 465 387.74 |

| SUMMARY OF DOPPLER SATELLITE POSITION - TRANSLOCATION SURVEY | | | | | |
|---|---|---|---|---|---|
| | CONTROL STATION NORMAN WELLS GSC STA. No. 759201 186 ACCEPTED PASSES BETWEEN. 02 h G.M.T. DAY 115 AND 07 G.M.T. DAY 121 | | | DERIVED STATION C 001 42 ACCEPTED PASSES BETWEEN 21 h G.M.T. DAY 114 AND 12 h G.M.T. DAY 116 | |
| | 1927 N.A.D. CO-ORDINATES | W.G.S. 72 GEOCENTRIC CO-ORDINATES (BROADCAST EPHEMERIS) | DERIVED DATUM SHIFT (NAD - GEOCENTRIC) | W.G.S. 72 GEOCENTRIC CO-ORDINATES (BROADCAST EPHEMERIS) | DERIVED 1927 N.A.D. CO-ORDINATES (GEOCENTRIC + DATUM SHIFT) |
| CARTESIAN CO-ORDINATES X | - 1 601 965.99 | - 1 601 960.04 | - 5.95 | - 1 371 594.69 | - 1 371 600.64 |
| Y | - 2 142 202.75 | - 2 142 039.42 | - 163.33 | - 2 048 288.11 | - 2 048 451.44 |
| Z | 5 770 645.08 | 5 770 813.85 | - 168.77 | 5 863 086.33 | 5 862 917.56 |
| LATITUDE | 65° 16' 42.16565" | | | | 67° 19' 58.31" |
| LONGITUDE | - 126° 47' 22.55699" | | | | - 123° 48' 19.60" |
| HEIGHT A.M.S.L. H | 69.73 | | | | 299.83 |
| GEOID HEIGHT N (WGS - 72) | - 12.36 | | | | - 18.06 |
| HEIGHT ABOVE SPHEROID h (WGS - 72) | 57.37 | | | | 281.77 |

THE DOPPLER DATA WAS PROCESSED USING PROGRAM GEODOP. THE N W L 9 - D ELLIPSOID PARAMETERS WERE USED. THE RESULTS WERE THEN CONVERTED TO WGS-72 USING THE SEPPLIN TRANSFORMATION. THE DATUM SHIFTS WERE COMPUTED BY SUBTRACTING THE DERIVED WGS - 72 CO-ORDINATES FROM STATION 759201 FROM THE PUBLISHED VALUES (N.A.D.-27). HEIGHT A.M.S.L. FOR STATION 759201 WAS OBTAINED BY SPIRIT LEVEL FROM B.M. 74 TO15

# FORWARD ET AL IZOK D-11
## IN UNIT D, SECTION 11
## GRID AREA 67° 30', 123° 45'

## NORTHWEST TERRITORIES

CANADA OIL AND GAS LAND REGULATIONS

SCALE 1: 1000

LEASE No. 3926

SURVEYED BY: NORTECH SURVEYS (CANADA) INC.
SURVEYED FOR: FORWARD RESOURCES

**LEGEND**

ALL CO-ORDINATES SHOWN ARE ON 1927 N.A.D. BASED ON THE CO-ORDINATES AS SHOWN IN "SUMMARY OF DOPPLER SATELLITE POSITION - TRANSLOCATION SURVEY" ON THIS PLAN. U T M CO-ORDINATES ARE COMPUTED FOR ZONE 10, CENTRAL MERIDIAN - 123°.

BEARINGS WERE DERIVED FROM A SUN OBSERVATION AT STATION C 001

DISTANCES ARE IN METRES AND DECIMALS THEREOF.

THE CENTRAL MERIDIAN IS GIVEN A FALSE EASTING OF 500 000.

0.013 m sq. by 0.457 IRON BAR WITH ALUMINIUM CAP MARKED "NORTECH SURVEYS" AND STATION No. PLANTED SHOWN THUS ----Δ.

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MANFRED SCHACHT (Exp. JULY 24/84)

THE SURVEY WAS EXECUTED DURING APRIL 1983

4 of 4

e 8 e 2
CANADA LANDS SURVEYS RECORDS

CANADA OIL AND GAS LANDS
ADMINISTRATION
ADMINISTRATION DU PÉTROLE ET DU GAZ
JUIN 7 1983
MONITORING AND CONTROL BRANCH
TECHNIQUE ET DU CONTRÔLE

# FORWARD ET AL IZOK

9211-F9-1-2

## M-20

## DRILLING SUMMARY

**PREPARED FOR:**

FORWARD RESOURCES LTD.

MAY 1983

**PREPARED BY:**

Winterhawk Petroleum Consulting Services Ltd.
102, 1040 7th Avenue S.W., Calgary, Alberta T2P 3G9 Telephone: 237-8370

ACTION SLIP

WELL HISTORY REPORTS

Project No. 9211-F9-1-2

The following action has been taken:

| | |
|---|---|
| Receipt acknowledged | ✓ ok M-20 |
| Well card made | ✓ |
| Reports and maps and logs date-stamped | ✓ |
| Reports labelled | ✓ |
| Date Rec'd entered in Project Ledger | ✓ |
| Confidential Sections removed: | |
| (micro) paleontological | ✓ |
| palynological | |
| Source Rock Analyses OR Geochemical Analyses | |
| Other | ✓ |
| Land Management memo sent | |

REVIEW and APPROVAL MADE BY:

Engineering Branch [signature]

Resource Evaluation [signature] 83-11-18

Environmental Protection [signature]

PLEASE NOTE COMMENTS ON ATTACHED SHEET

## INTRODUCTION

Winterhawk Petroleum Consultants Ltd., acting as agents for Forward Resources Ltd., co-ordinated the logistics and drilling program during the winter season of 1982-83 for the drilling of two (2) wells, hereafter referred to as

Forward et al Izok M-20

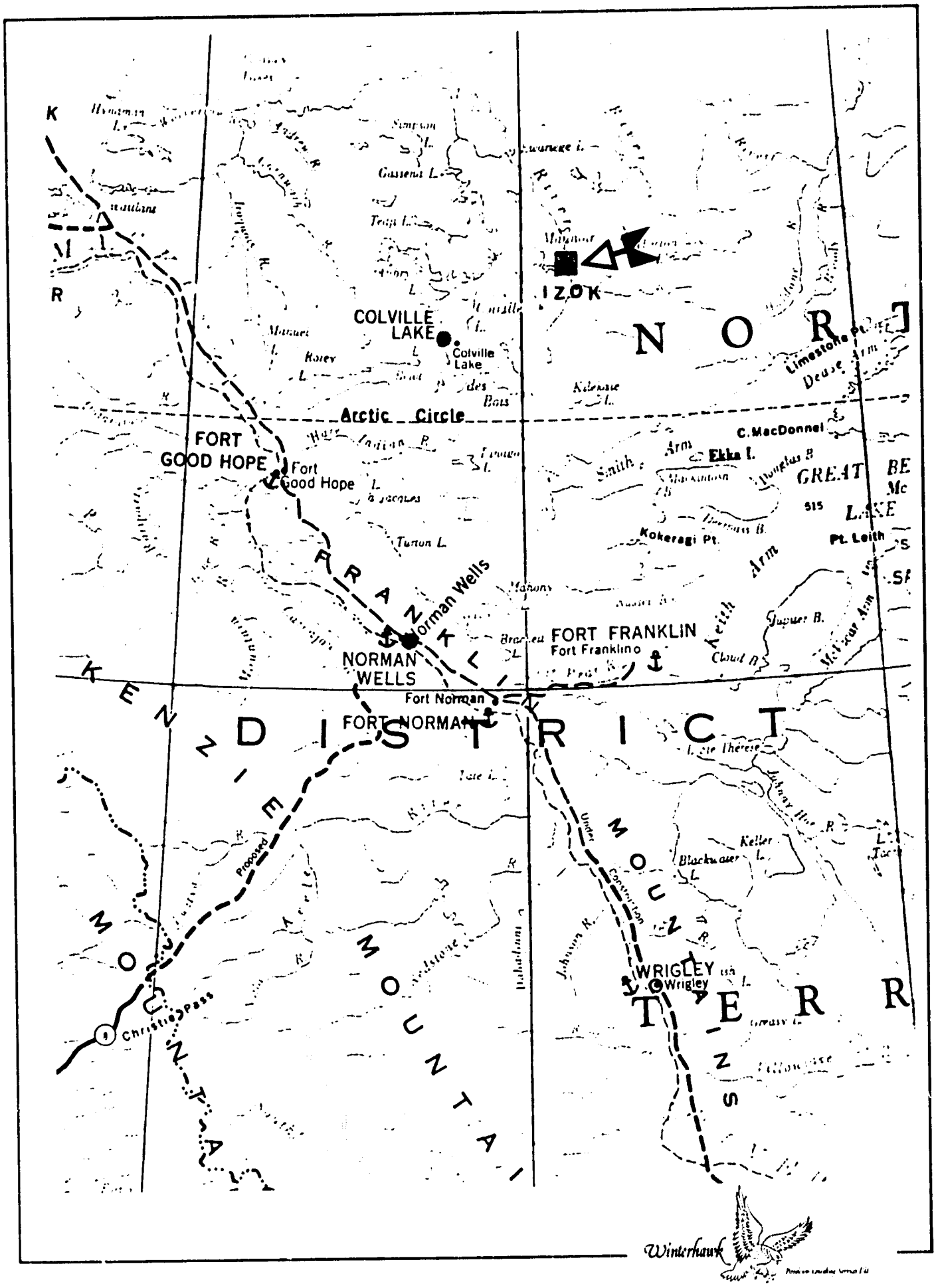
Forward et al Anderson C-51

The 1982-83 project represented a continuance of the exploration activity which began in 1981-82, pursuant to a farmout agreement between Imperial Oil and Forward Resources Ltd. In 1981-82 an extensive seismic operation was conducted in the Colville Hills area of the N.W.T., with Norman Wells acting as the base station.

Supplies and support services for this project were transported by barge to Norman Wells, N.W.T. in anticipation of a project start-up in early December 1982. Transportation of the rig and related equipment from Norman Wells began in the month of January and continued into February of 1983. Drilling commenced on the Izok M-20 well location in mid February, while the Anderson C-51 well was spudded in early April of 1983. The drilling program was completed by late April, at which time all equipment was transported to a pre-determined storage site.

Forward Resources hereby gives notice that the enclosed report is to be considered as the **final well summary** for the Izok M-20 well location.

Winterhawk


IZOK
COLVILLE LAKE
Colville Lake
Arctic Circle
FORT GOOD HOPE
Fort Good Hope
Norman Wells
NORMAN WELLS
FORT FRANKLIN
Fort Franklin
Fort Norman
FORT NORMAN
Ekka I.
C. MacDonnel
Kokeragi Pt.
Pt. Leith
GREAT BEAR LAKE
WRIGLEY
Wrigley
Christie Pass
Proposed
Winterhawk

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   - Cored Intervals, Description and Sample Description
   - Palentological Determinations — removed (confidential)

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   - Bit Record
   - Mud Report
   - Deviation Record
   - Abandonment Report
   - Lost Circulation Zones

4. LOGGING SUMMARY

5. DRILLING CURVE

6. DAILY DRILLING REPORTS

7. LOGS

   - DIFL
   - Dual Laterolog
   - Acoustic CB
   - Acoustic
   - Densilog Neutron
   - Mud
   - Lithology


Winterhawk

# SECTION I

## SUMMARY OF WELL DATA



## Addendum To Well Summary

Please be advised that the reported well co-ordinates, together with the kelly bushing and ground level elevations as used herein, are based on surveys taken from area topographical maps. At the time this report summary was prepared final survey data was not available.

For this reason, Winterhawk hereby gives notice that calculations contained herein do not reflect the corrected reference data, and should therefore be ammended accordingly.

Based on information that has recently come to our attention, well co-ordinates have been confirmed at

**Latitude** 67°-19'-58.28"

**Longitude** 123°-48'-27.94"

while ground level and kelly bushing elevations are established at

**Ground Level (G.L.)** 300.78 m

**Kelly Bushing (K.B.)** 305.12 m

Winterhawk

# FINAL WELL REPORT IZOK M-20

The information noted below complies with the "Section I - Summary of Well Data" requirements of the Canada Oil and Gas Lands Administration report format.

| | |
|---|---|
| WELL NAME | Forward Resources et al Izok M-20 |
| LESSEE | Esso Canada Resources Ltd., farm out to Forward Resources Ltd. |
| OPERATOR | Forward Resources Ltd.<br>#1220, 840 7th Ave. S.W.<br>Calgary, Alberta<br>T2P 3G2 |
| LOCATION | M-20 67-20-123-45 |
| CO-ORDINATES | 67° - 20' - 00" Latitude<br>123° - 48' - 16" Longitude |
| LEASE NO. | 3926 |
| DRILLING CONTRACTOR | Three Hundred Drilling Ltd.<br>"Mr. Ben" National 370 draworks |
| DRILLING AUTHORITY | No. 1017, issued 83-01-24 |
| CLASSIFICATION | New Field Exploratory (Northern) |
| ELEVATIONS | Ground 295.0 m<br>K.B. 299.2 m |
| SPUD DATE | 83-02-15 |
| COMPLETED DRILLING DATE | 83-03-29 |
| TOTAL DEPTH, PLUG BACK | 900 m T.D., 0 m P.B.T.D. |
| WELL STATUS | Dry and Abandoned |
| RIG RELEASED | 83-04-01 |
| HOLE SIZES | 444 mm to 35 m<br>311 mm to 505 m<br>215 mm to 590 m<br>156 mm to 900 m |
| CASING SIZES | 339 mm to 35 m<br>244 mm to 428 m<br>177 mm to 589 m |

Wintershall

# WELL SUMMARY

DATE 83-04-15

Well Forward et al Izok Location M-20

Elevations: KB 299.2 m GL 295 m CF 295.12 m

History: Spud Date 83 02 15 R.R. Date 83 04 01 TD 900 m

Status Plugged and abandoned Producing Zone(s) Nil

## A. DRILLING DETAILS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Hole Size | 444 mm | Depth | 35 m | Logs | None | | |
| Hole Size | 311.2 mm | Depth | 505 m | Logs | DIFL-SP Acoustic - GR, AC Cement Bond | | |
| Hole Size | 215.9 mm | Depth | 590 m | Logs | AC - Cement Bond | | |
| Hole Size | 155.6 mm | Depth | 900 m | Logs | DLL-GR, CN-CNL, AC GR | | |
| Casing Size | 339.7 mm | Grade | H40 | Depth | 35 m | Cement Vol. | 7.4 t Permafrost |
| Casing Size | 244.8 mm | Grade | H40 | Depth | 428 m | Cement Vol. | 1st stage 6.3 t G Neat<br>2nd stage 21.8 t Permafrost |
| Casing Size | | Grade | | Depth | | Cement Vol. | + 8% Gel |
| Liner Size | 177.8 | Grade | S95 | Depth | 589 m | Cement Vol. | 12.3 t G Neat |

DST No. ____ Int ____ Zone ____

DST No. ____ Int ____ Zone ____

DST No. ____ Int ____ Zone ____

DST No. ____ Int ____ Zone ____

DST No. ____ Int ____ Zone ____

Core No. 1 Int Sidewall Cores 886.5 - 773.25 m Zone 25 shots Rec. 22

Core No. ____ Int ____ Zone ____ Rec. ____

Core No. ____ Int ____ Zone ____ Rec. ____

Plug No. 1 Int 900 - 800 Cement Vol. 3.2 tonnes G Neat Felt N/A

Plug No. 2 Int 640 - 540 Cement Vol. 3.2 tonnes G Neat Felt N/A

Plug No. 3 Int 280 Baker Bridge Plug held pressure to 7,000 kPa

Plug No. 4 Int 50 - 0 Cement Vol. 2.0 tonnes Permafrost Felt N/A

## B. COMPLETION DETAILS

COMPLETION DATE: ____

Perforations: Int ____ Zone ____ Type ____

Int ____ Zone ____ Type ____

Int ____ Zone ____ Type ____

Stimulations: Formation ____

Tubing Details: ____

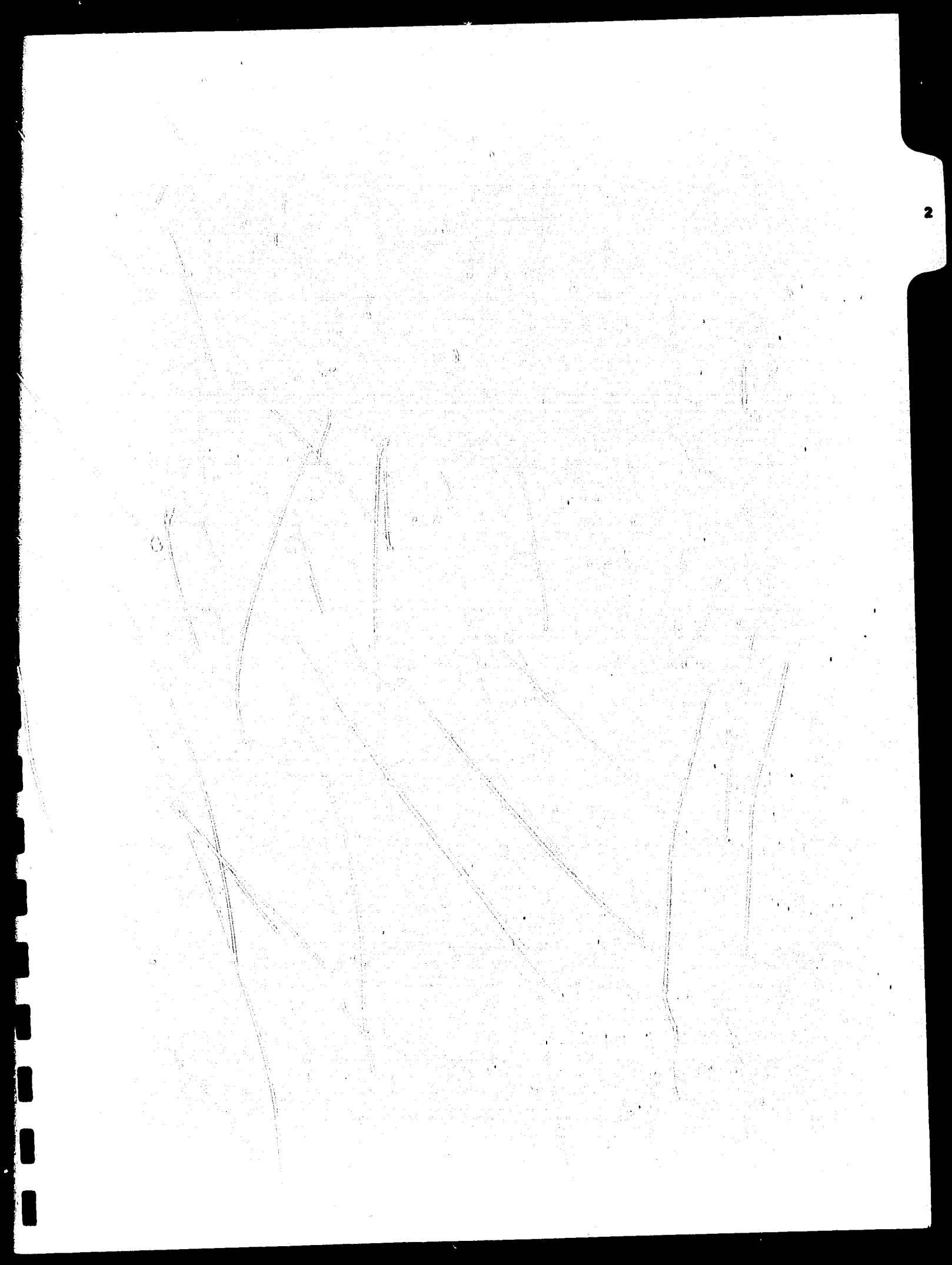
Anchor/Packer Details: ____

Pumping Equipment: ____

Remarks: Not required to feel plugs - pressure test Bridge Plug to 7,000 kPa.
Top job on 244.8 casing - 7.27 tonnes Permafrost.

See specific forms for more detail.

ENGINEER J. Aldridge



## SECTION II

## GEOLOGICAL SUMMARY

# FORWARD ET AL IZOK M-20

Lat. 67°19'57"N; Long. 123°48'20"W

## GEOLOGICAL REPORT

Alan J. Williams
Dawson-Long & Associates Ltd.

# FORMATION TOPS



## GEOLOGICAL MARKERS

Ground: 295.0 m K.B.: ~~299.2~~ 305.1 m

| Formation | Sample Top | Subsea (Sample) | Log Top | Subsea (Log) |
|---|---|---|---|---|
| Franklin Mtn. | | | 501 | -201.8 |
| Saline R. Upper | 547.5 | -248.3 | 548 | -248.8 |
| Saline R. Salt | 618 | -318.8 | 615 | -315.8 |
| Mt. Cap Upper | 718 | -418.8 | 720 | -420.8 |
| Mt. Cap Lower | 768.5 | -469.3 | 768 | -468.8 |
| Old Ft. Island | 838.5 | -539.3 | 839 | -539.8 |
| Shaler-PreCambrian | 848 | -548.8 | 849 | -549.8 |

CORED INTERVALS

CORE DESCRIPTIONS

SAMPLE DESCRIPTIONS



## SIDEWALL CORES

| CORE NO. | DEPTH | TARGET | DESCRIPTION |
|---|---|---|---|
| 1 | 886.5 | PreCambrian Shale | Light brown, pink, mottled green and red, microcrystalline, glauconitic dolomite, no porosity. |
| 2 | 886.5 | As above | As above. |
| 3 | 885.5 | As above | Medium grey, fissile, very dolomitic shale. |
| 4 | 885.5 | As above | No recovery. |
| 5 | 846.5 | Basal Old Fort Island Sandstone | Dolomite, in part pink, in part green, silty, cherty, tight. |
| 6 | 843.5 | Old Fort Island Sandstone | Dolomite, in part light brown, cryptocrystalline, in part clear, white, medium crystalline. |
| 7 | 843.5 | As above | Sandstone, white to light grey, very fine grained, subangular, well sorted, in part soft, good porosity, in part siliceous, poor porosity, no shows. |
| 8 | 839.5 | As above | Sandstone, red, soft, very fine grained, subangular, well sorted, in part silty, very argillaceous, tight. |
| 9 | 839.5 | As above | As above. |
| 10 | 837.5 | Coarse Basal Lower Mt. Cap Sandstone | Sandstone, white, very fine grained, soft, kaolinitic matrix, subangular, well sorted with 20% suspended medium to coarse grained, subangular quartz grains. No porosity or shows. |
| 11 | 837.5 | As above | As above. |
| 12 | 819 | Porous Mt. Cap Dolomite | Siltstone, medium grey, dolomitic, argillaceous. |
| 13 | 819 | As above | As above. |
| 14 | 816.75 | As above | Shale, very soft, fissile, silty, dolomitic. |
| 15 | 810.5 | Mt. Cap Bituminous Shale | Dark grey, fissile, dolomitic, in part silty shale. |

| CORE NO. | DEPTH | TARGET | DESCRIPTION |
|---|---|---|---|
| 16 | 809.5 | Coarse oil cut Mt. Cap Dolomite | Medium grey, argillaceous, dolomitic in part, soft siltstone. |
| 17 | 809.5 | As above | As above. |
| 18 | 807.5 | As above | Dark grey silty, tight dolomite. |
| 19 | 807.5 | As above | As above. |
| 20 | 796.75 | As above | No recovery. |
| 21 | 788.5 | Bituminous Mt. Cap Shale | Soft green, fissile, dolomitic shale. |
| 22 | 786.5 | As above | Green fissile, dolomitic shale. |
| 23 | 784.5 | As above | Green fissile, dolomitic shale. |
| 24 | 776.5 | As above | Soft, grey-green, dolomitic shale. |
| 25 | 773.25 | As above | Soft, fissile, dark grey-green, dolomitic shale. |

# SECTION III

## ENGINEERING SUMMARY

# DRILL STEM TESTS

Drill Stem Tests Were Not Run On Izok M-20



# CASING SUMMARY



Winterhawk — Precision Coring Services Ltd.

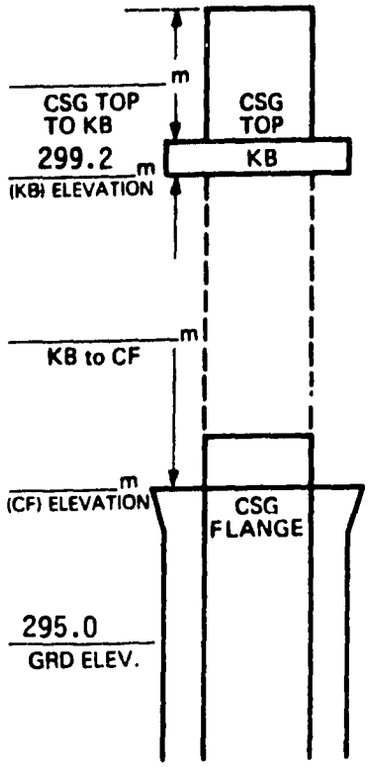
PAGE _____

# CASING SUMMARY Conductor Pipe

WELL Forward et al Izok LOCATION M-20 DATE 83 02 16

CONDUCTOR SIZE 339.7 mm KB 299.2 m KB to CF _____

(New) Used Inspected By: _____ Drifted To: _____ API diam.




| NO. | DESCRIPTION | MEASURED LENGTH | KB DEPTH |
|---|---|---|---|
| 3 | Ipsco H40- 71.43 kg/m | 36.08 | 35 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | Scratchers | | |
| | Centralizers | | |

| | | | |
|---|---|---|---|
| | Total String | 36.08 | |
| minus | KB to Csg Top (STICK UP) | | Cut-off Jt. Length |
| | Landed Depth KB | 35.0 | |
| | Hole Depth KB | 35.0 | |
| | Distance Csg Landed Off Bottom | on bottom | |

Cementing Company Halliburton

Wash - Type: water Volume 1 $m^3$

Cement Type - Lead Slurry Perma frost cement (7.4 tonnes) Volume: 5.48 $m^3$

Additives .1 % retarder Volume: _____

Cement Type - Tail Slurry _____ Volume: _____

Additives _____ Volume: _____

Cement Type - Above Stage Collar _____ Volume: _____

Additives _____ Volume: _____

Displacement Rate: Max. cement in place at 1655 hours 83 02 16 Avg. _____ (m3/min)

Calculated Cement Top(s) _____ KB _____ KB

Returns: Mud good m3 Cement 1.1 m3

String Wt. in a mud wt. of: _____ kg/m3 = _____ daN

Wt. set on Slips: _____ daN

Remarks: Mixed cement at 1880 kg/$m^3$ - 100% excess

Engineer: J. Aldridge

HALLIBURTON

# CEMENTING AND/OR SPECIAL TOOLS SERVICE REPORT

ATTACH TO INVOICE No. 35 527

HALLIBURTON DISTRICT: Frontier

JOB DATE: 1983 (YEAR) 02 (MONTH) 16 (DAY)

OWNER, OPERATOR OR HIS AGENT STATES THE WELL IS IN GOOD CONDITION FOR THE SERVICE JOB TO BE PERFORMED AND SUBMITS THE FOLLOWING DATA.

| CUSTOMER | FIELD OR AREA | WELL No. AND LEASE |
|---|---|---|
| Forward Resources Ltd. | Lac Maunoir | Forward et al Izok M-20 |

| CALLED OUT (DATE / TIME) | ON LOCATION (DATE / TIME) | JOB STARTED (DATE / TIME) | JOB COMPLETED (DATE / TIME) | PROVINCE | LSD | SEC | TWP | RANGE | MERIDIAN |
|---|---|---|---|---|---|---|---|---|---|
| | | | | N.W.T. | | | | | W |

**TYPE OF JOB** ✓: SURFACE ✓; INTERMEDIATE; PRODUCTION; LINER; SQUEEZE; PLUG; PUMP; PRESSURE TEST; OTHER

**WELL OR HOLE DATA**

HOLE DATA: HOLE SIZE 444.5 mm; TOTAL DEPTH 36.04 m; TYPE MUD Spud; VISC. ; DENSITY

CASING, TUBING OR LINER DATA: NEW ☒ USED ☐ — SIZE 339.7 mm; kg/m 71.43; GRADE ; DEPTH 36.04 m

SIZE mm; kg/m ; GRADE ; DEPTH m

PERFORATIONS: FROM m TO m FROM m TO m

FROM m TO m FROM m TO m

WASH FLUID TYPE: $H_2O$ VOL. 1.0 m³; DISPLACING FLUID TYPE: $H_2O$ VOL. 2.6 m³

TEMP DATA: MIXING WATER 20 °C; SLURRY 4 °C; DISPLACING FLUID 20 °C; RETURNS 4 °C

**PRODUCTS**

| EQUIPMENT | QUANTITY |
|---|---|
| BASKETS | |
| CENTRALIZERS | |
| CLAMPS | |
| FLOAT COLLAR | |
| FLOAT SHOE | |
| GUIDE SHOE | |
| INSERT FLOAT | |
| SCRATCHERS | |
| OTHER | |

## EQUIPMENT

**PACKER**: TYPE ; SIZE mm; DEPTH SET m; TAIL PIPE m

TOP PLUG TYPE ; BOTTOM PLUG TYPE

**CEMENT HEAD**: CONTINUOUS ☐ KNOCK OFF ☐ SWAGE ☒; OTHER

## CEMENT DATA

| TONNE | API CLASS | BRAND | BULK OR SACKED | CEMENT BLEND | ADDITIVES TYPE AND PERCENT | kg/m³ | m³/tonne |
|---|---|---|---|---|---|---|---|
| 7 | G | Halliburton | Sacked | Permafrost | Sodium Citrate as a | | |
| | | | | | retarder | 1880 | 0.4 |
| | | | | | | | |

HALLIBURTON OPERATOR: R. Cleary CUSTOMER REP.:

## TREATING LOG

| CHART POSITION | TIME | RATE m³/min | VOLUME m³ PUMPED | VOLUME m³ IN FORMATION | PRESSURE MPa TUBING | PRESSURE MPa CASING | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | | | | | Warm up pumps. |
| 1 | 16:36<br>16:40 | 0.317 | | | | 1 | Pump 1 m³ $H_2O$ ahead through mix equipment. |
| 2 | 16:40<br>16:50 | 0.714 | | | | 0 | Mix 7 tonnes cement. |
| 3 | 16:50<br>16:55 | 0.714 | | | | 0.655 | Displace through mix equipment. |
| 4 | | | | | | | Wash up. |
| 5 | | | | | | | Shut casing in until cement sets. |
| | | | | | | | |
| | | | | | | | |

HALLIBURTON

TICKET NO: 35 527

Forward Resources Ltd.
Forward et al Izok M-20
1983 02 16

Cement 339.7 mm conductor pipe.

Casing 339.7 mm 71.43 kg/m 444.5 mm O.H.
Annulus Volume 0.0646 $m^3/m$
Casing capacity 0.0820 $m^3/m$

Volume Slurry 36 M x 0.0646 $m^3/m$ = 2.3 $m^3$
SJ 4 M x 0.0820 $m^3/m$ = 0.328 $m^3$.
Total Slurry Req. 2.3 $m^3$ + 0.328 $m^3$ + 100% = 5.2 $m^3$

Cement Req. 5.2 $m^3$ ÷ 0.74 $m^3/t$ = 7.4 t

16:36 - 16:40 Pump 1 $m^3$ $H_2O$ ahead.

16:40 - 16:50 Mix 7.1 t cement (Permafrost) 178 sks.

16:50 - 16:55 Displace cement with 2.6 $m^3$ $H_2O$.

Approximately 1.1 $m^3$ slurry returns.

HALLIBURTON

FORM 915

HALLIBURTON

# CEMENTING AND/OR SPECIAL TOOLS SERVICE REPORT

ATTACH TO INVOICE No. 35 530

HALLIBURTON DISTRICT: Frontier

JOB DATE: 1983 (YEAR) 03 (MONTH) 13 (DAY)

OWNER, OPERATOR OR HIS AGENT STATES THE WELL IS IN GOOD CONDITION FOR THE SERVICE JOB TO BE PERFORMED AND SUBMITS THE FOLLOWING DATA.

| CUSTOMER | FIELD OR AREA | WELL No. AND LEASE |
|---|---|---|
| Frontier Resources Ltd. | Lac Maunoir | Forward et al Izok M-20 |

| CALLED OUT | ON LOCATION | JOB STARTED | JOB COMPLETED | PROVINCE | LSD | SEC | TWP | RANGE | MERIDIAN |
|---|---|---|---|---|---|---|---|---|---|
| - DATE TIME | DATE TIME | 83-03-13 DATE 17:00 TIME | 83-03-13 DATE 19:30 TIME | N.W.T. | | | | | W |

**TYPE OF JOB** ✓: SURFACE; INTERMEDIATE; PRODUCTION; LINER; SQUEEZE; PLUG; PUMP; PRESSURE TEST; OTHER ✓

**WELL OR HOLE DATA**

HOLE DATA: HOLE SIZE ____ mm; TOTAL DEPTH ____ m; TYPE MUD ____; VISC. ____; DENSITY ____

CASING, TUBING OR LINER DATA: NEW ☐ USED ☐ SIZE ____ mm kg/m ____ GRADE ____ DEPTH ____ m

SIZE ____ mm kg/m ____ GRADE ____ DEPTH ____ m

PERFORATIONS: FROM ____ m TO ____ m FROM ____ m TO ____ m

FROM ____ m TO ____ m FROM ____ m TO ____ m

WASH FLUID TYPE: ____ VOL. ____ m³ DISPLACING FLUID TYPE: ____ VOL. ____ m³

TEMP DATA: MIXING WATER ____ °C SLURRY ____ °C DISPLACING FLUID ____ °C RETURNS ____ °C

**PRODUCTS**

| EQUIPMENT | QUAN |
|---|---|
| BASKETS | |
| CENTRALIZERS | |
| CLAMPS | |
| FLOAT COLLAR | |
| FLOAT SHOE | |
| GUIDE SHOE | |
| INSERT FLOAT | |
| SCRATCHERS | |
| OTHER | |

## EQUIPMENT

**PACKER**

TYPE ____ SIZE ____ mm

DEPTH SET ____ m TAIL PIPE ____ m

TOP PLUG TYPE ____

BOTTOM PLUG TYPE ____

**CEMENT HEAD**

CONTINUOUS ☐ KNOCK OFF ☐ SWAGE ☐

OTHER ____

## CEMENT DATA

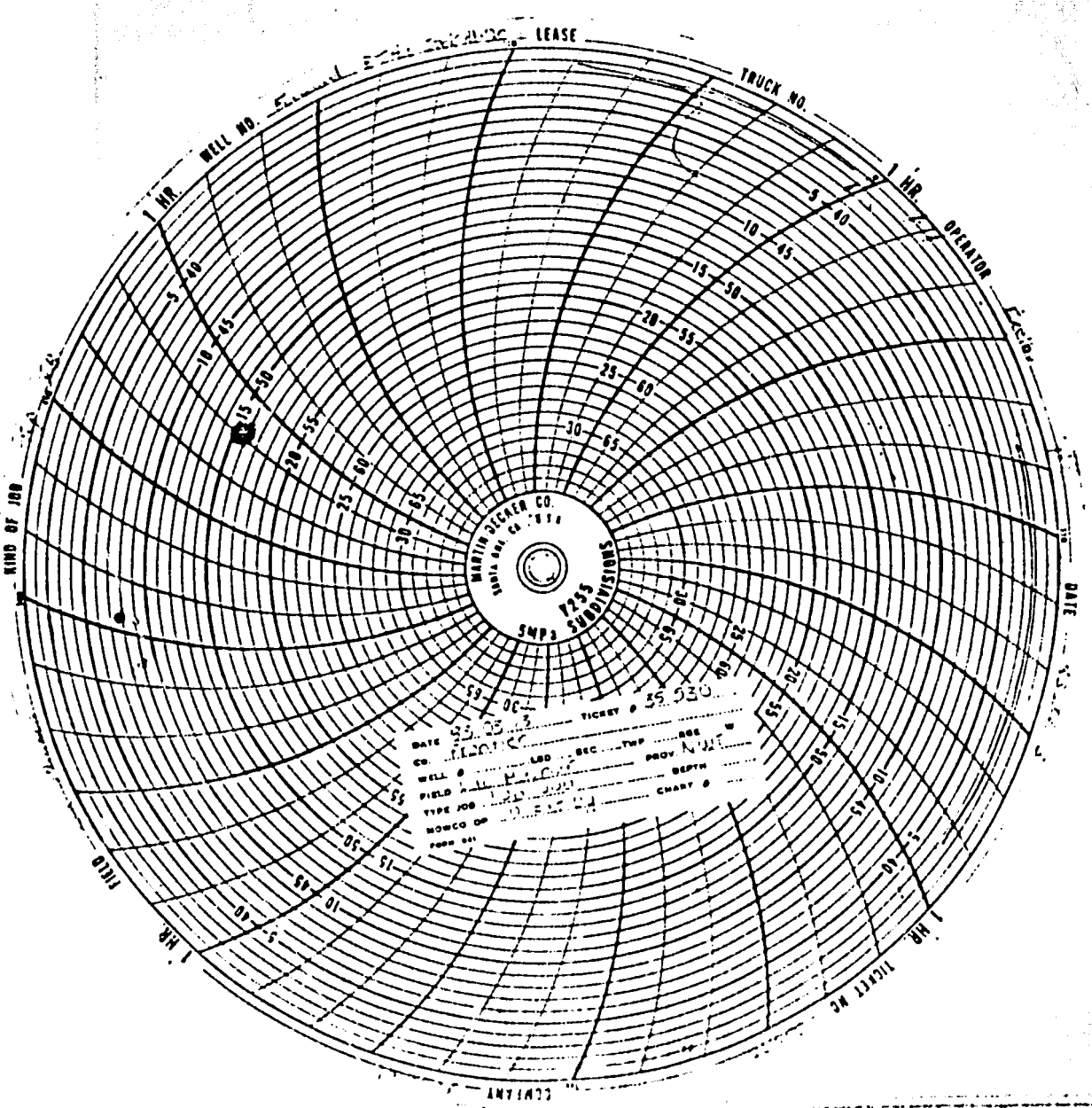
| TONNE | API CLASS | BRAND | BULK OR SACKED | CEMENT BLEND | ADDITIVES TYPE AND PERCENT | kg/m³ | m³/tonne |
|---|---|---|---|---|---|---|---|
| 14.4 | G | Inland | Sacked | Permafrost | | 1880 | 0.74 |
| | | | | | | | |
| | | | | | | | |

HALLIBURTON OPERATOR: D. Exelby CUSTOMER REP. ____

## TREATING LOG

| CHART POSITION | TIME | RATE m³/min | VOLUME m³ PUMPED | VOLUME m³ IN FORMATION | PRESSURE MPa TUBING | PRESSURE MPa CASING | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | Ran 7.5 m of 42 mm tubing down |
| | | | | | | | annulus of conductor barrel and hole. |
| 2 | | | | | | | Mixed 11.2 tonnes of permafrost |
| | | | | | | | cement down tubing. |
| 3 | | | | | | | Mixed 3.2 tonnes of permafrost cement |
| | | | | | | | into cellar. |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

FORM 157A


LEASE
TRUCK NO.
WELL NO.
1 HR.
OPERATOR
KIND OF JOB
DATE
FIELD
TICKET NO.
COUNTY
MARTIN DECKER CO.
SANTA ANA, CA. 9??
7255 SUBDIVISIONS
SMP#
DATE
TICKET #
CO.
LSD
SEC.
TWP
RGE
WELL #
PROV
FIELD
DEPTH
TYPE JOB
CHART #
HOWCO OP
FORM 511

Winterhawk — Precision Coiled Tubing Services Ltd.

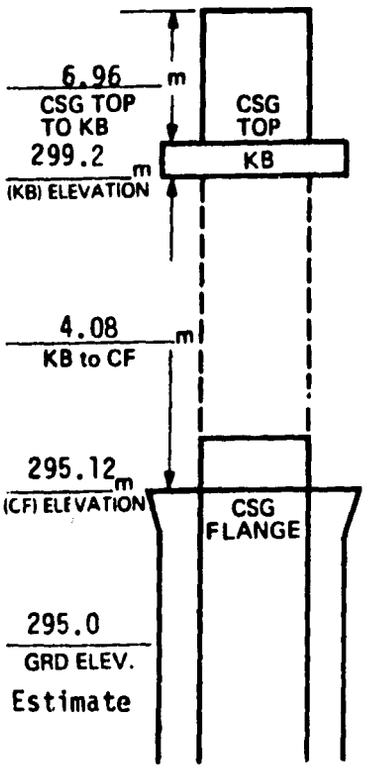
PAGE _____

# CASING SUMMARY

WELL Forward et al Izok LOCATION M-20 DATE 83-03-16

(SURF)INT/PROD/LINER SIZE 244.5 mm KB 299.2 m KB to CF 4.08 m

(New)/Used Inspected By: _____ Drifted To: _____ API diam.




| NO. | DESCRIPTION | MEASURED LENGTH | KB DEPTH |
|---|---|---|---|
| 1 | Baker 244.5 8 rd Guide Shoe | 0.39 | 426.83 |
| 1 | 244.5 mm - H40 - 48.11 kg/m Csg | 9.65 | |
| 1 | Baker Float Collar | 0.50 | 416.67 |
| 8 | 244.5 mm - H40 - 48.11 kg/m Csg | 92.93 | |
| 1 | Lynnes ECP C75 | 2.67 | 321.07 |
| 1 | 244.5 mm H40 48.11 kg/m Csg | 7.53 | |
| 1 | Halliburton DV Stage Collar | 1.20 | 312.34 |
| 28 | 244.5 mm H40 48.11 kg/m Csg | 319.30 | |
| | | | |
| 4 | Cement Baskets - 5, 19, 24, and 37 joint | | |
| 4 | Centralizers 1, 4, 10, and 36 joint | | |

| | | | |
|---|---|---|---|
| | Total String | 434.17 | |
| minus | KB to Csg Top (STICK UP) | 6.96 | Cut-off Jt. Length |
| | Landed Depth KB | 427.21 | |
| | Hole Depth KB | 505.00 | 3.205 |
| | Distance Csg Landed Off Bottom (due to fill) | 77.79 | |

Cementing Company Halliburton Services Ltd.

Wash - Type: Scavenger Slurry at 1600 kg/m$^3$ Volume 2 m$^3$

Cement Type - Lead Slurry Oilwell 'G' Volume: 6.3 tonnes

Additives _____ Volume: _____

Cement Type - Tail Slurry _____ Volume: _____

Additives _____ Volume: _____

Cement Type - Above Stage Collar Permafrost + 8% Gel Volume: 21.6 tonnes

Additives _____ Volume: _____

Displacement Rate: Max. _____ Avg. 0.56 (m3/min)

Calculated Cement Top(s) 350 m KB surface KB

Returns: Mud (foam) m3 Cement none m3

String Wt. in a mud wt. of: foam kg/m3 = 28,000 daN

Wt. set on Slips: landed on fill daN

Remarks: Casing landed on top of fill at 427.21 m KB.

Top Job - 200 sacks (7.2 tonnes) Permafrost Cement - filled top 9 m of Annulus only.

Engineer: R.L. Kelly

Winterhawk

# PIPE TALLY SHEET

PAGE _____ OF _____

WELL Forward et al Izok LOCATION M-20

SIZE 244.5 mm WT. 48.11 kg/m GRADE H40 COUPLING STC THRD 8rd

DATE 83 03 15

| JOINT | LENGTH | | JOINT | LENGTH | | JOINT | LENGTH | | JOINT | LENGTH | | JOINT | LENGTH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 9 | 52 | 11 | 12 | 03 | 21 | 12 | 08 | 31 | 11 | 72 | 41 | 12 | 04 |
| 2 | 12 | 08 | 12 | 11 | 93 | 22 | 10 | 30 | 32 | 12 | 05 | 42 | 12 | 04 |
| 3 | 12 | 04 | 13 | 11 | 40 | 23 | 12 | 08 | 33 | 12 | 01 | 43 | 12 | 10 |
| 4 | 11 | 95 | 14 | 12 | 00 | 24 | 11 | 18 | 34 | 12 | 04 | 44 | 12 | 07 |
| 5 | 12 | 01 | 15 | 9 | 65 | 25 | 11 | 64 | 35 | 12 | 01 | 45 | 12 | 07 |
| 6 | 11 | 94 | 16 | 8 | 95 | 26 | 12 | 07 | 36 | 12 | 02 | 46 | 12 | 07 |
| 7 | * 10 | 20 | 17 | 9 | 10 | 27 | 12 | 01 | 37 | 12 | 05 | 47 | 8 | 05 |
| 8 | 10 | 75 | 18 | 11 | 99 | 28 | 12 | 05 | 38 | 12 | 03 | 48 | 9 | 81 |
| 9 | 11 | 96 | 19 | 12 | 04 | 29 | 11 | 14 | 39 | 12 | 07 | 49 | 11 | 63 |
| 10 | 12 | 03 | 20 | 9 | 30 | 30 | 12 | 05 | 40 | 12 | 07 | 50 | 12 | 06 |
| A | 114 | 48 | B | 108 | 39 | C | 116 | 60 | D | 120 | 07 | E | 113 | 94 |
| 51 | 10 | 70 | 61 | | | 71 | | | 81 | | | 91 | | |
| 52 | 9 | 65 | 62 | | | 72 | | | 82 | | | 92 | | |
| 53 | 12 | 07 | 63 | | | 73 | | | 83 | | | 93 | | |
| 54 | 10 | 20 | 64 | | | 74 | | | 84 | | | 94 | | |
| 55 | 9 | 80 | 65 | | | 75 | | | 85 | | | 95 | | |
| 56 | 7 | 53 | 66 | | | 76 | | | 86 | | | 96 | | |
| 57 | 10 | 21 | 67 | | | 77 | | | 87 | | | 97 | | |
| 58 | | | 68 | | | 78 | | | 88 | | | 98 | | |
| 59 | | | 69 | | | 79 | | | 89 | | | 99 | | |
| 60 | | | 70 | | | 80 | | | 90 | | | 100 | | |
| F | 70 | 16 | G | | | H | | | I | | | J | | |

| | | | SUB TOTAL | |
|---|---|---|---|---|
| A | 114 | 48 | | |
| B | 108 | 39 | | |
| C | 116 | 60 | | |
| D | 120 | 07 | | |
| E | 113 | 94 | | |
| F | 70 | 16 | | |
| G | | | | |
| H | | | | |
| I | | | | |
| J | | | | |
| TOTAL | 643 | 64 | | |

Guide Shoe .39 m

Float Collar .50 m

Other ECP 2.67 m

DV 1.20 m

| | JOINTS | LENGTH |
|---|---|---|
| PAGE TOTAL | 57 | 643.63 |
| BROUGHT FWD | | |
| GRAND TOTAL | 57 | 643.63 |

JOINTS ON LOCATION 57

Remarks: Jt #1 Bad thread - replaces w/ jt #15

Jt #7 Pin end egged - replaces w/ jt #54

ENGINEER R.L. Kelly

NOTE: Use a new page for each casing type. Number joints in order of running. Indicate joints not run by * and do not include in total length.

HALLIBURTON

# CEMENTING AND/OR SPECIAL TOOLS SERVICE REPORT

ATTACH TO INVOICE No. 35 531

HALLIBURTON DISTRICT: Frontier

JOB DATE: 1983 (YEAR) 03 (MONTH) 15 (DAY)

OWNER, OPERATOR OR HIS AGENT STATES THE WELL IS IN GOOD CONDITION FOR THE SERVICE JOB TO BE PERFORMED AND SUBMITS THE FOLLOWING DATA.

| CUSTOMER | FIELD OR AREA | WELL No. AND LEASE |
|---|---|---|
| Forward Resources Ltd. | Lac Maunoir | Forward et al Izok M-20 |

| CALLED OUT (DATE / TIME) | ON LOCATION (DATE / TIME) | JOB STARTED (DATE / TIME) | JOB COMPLETED (DATE / TIME) | PROVINCE | LSD | SEC | TWP | RANGE | MERIDIAN |
|---|---|---|---|---|---|---|---|---|---|
| | | 83-03-15 / 19:00 | 83-03-16 / 08:40 | N.W.T. | | | | | W |

**TYPE OF JOB** ✓: SURFACE ✓; INTERMEDIATE; PRODUCTION; LINER; SQUEEZE; PLUG; PUMP; PRESSURE TEST; OTHER

**WELL OR HOLE DATA**

HOLE DATA: HOLE SIZE 311 mm; TOTAL DEPTH 505 m; TYPE MUD Air Drill; VISC. ; DENSITY

CASING, TUBING OR LINER DATA: NEW ☒ USED ☐ — SIZE 244 mm; kg/m 48.1; GRADE H-40; DEPTH 427.21 m

SIZE mm; kg/m ; GRADE ; DEPTH m

PERFORATIONS: FROM m TO m; FROM m TO m

FROM m TO m; FROM m TO m

WASH FLUID TYPE: VOL. m³; DISPLACING FLUID TYPE: VOL. m³

TEMP DATA: MIXING WATER °C; SLURRY °C; DISPLACING FLUID °C; RETURNS °C

**PRODUCTS**

| EQUIPMENT | CEMENT |
|---|---|
| BASKETS | |
| CENTRALIZERS | |
| CLAMPS | |
| FLOAT COLLAR | |
| FLOAT SHOE | |
| GUIDE SHOE | |
| INSERT FLOAT | |
| SCRATCHERS | |
| OTHER | |

## EQUIPMENT

**PACKER**
TYPE Lyons ECP SIZE 244 mm
DEPTH SET 323 m TAIL PIPE 432 m

TOP PLUG TYPE Multi-Stage Shut-Off Plug
BOTTOM PLUG TYPE Multi-Stage Bottom Plug

**CEMENT HEAD**
CONTINUOUS ☐ KNOCK OFF ☐ SWAGE ☒
OTHER

## CEMENT DATA

| TONNE | API CLASS | BRAND | BULK OR SACKED | CEMENT BLEND | ADDITIVES TYPE AND PERCENT | kg/m³ | m³/tonne |
|---|---|---|---|---|---|---|---|
| 8 | G | Inland | Sacked | Oilwell | Neat | 1895 | 0.76 |
| 21.6 | G | Inland | Sacked | Permafrost | 8% Gel | | 1.2 |
| | | | | | | | |

HALLIBURTON OPERATOR: D. Exelby CUSTOMER REP.:

## TREATING LOG

| CHART POSITION | TIME | RATE m³/min | VOLUME m³ PUMPED | VOLUME m³ IN FORMATION | PRESSURE MPa TUBING | PRESSURE MPa CASING | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | | | | | FIRST STAGE |
| A | 22:07 | | | | | | Start pumping Scavenger slurry. |
| B | 22:10 | 0.69 | 2 | | | 1 | Stop pumping Scavenger slurry. |
| B | 22:10 | | | | | 1 | Start pumping 1895 kg/m³ slurry. |
| C | 22:27 | 0.31 | 6.788 | | | 1 | Stop pumping 1895 kg/m³ slurry. |
| C | 22:27 | | ZERO COUNTERS | | | | Stop to release bottom plug. |
| D | 22:40 | | | | | | Start displacement of first stage. |
| E | 23:16 | 0.477 | 17.48 | | | 2 | Finish displacement of first stage. |
| | 23:17 | | 17.58 | | | 3 | Start to pump up Lyons ECP packer. |

FORM 157A

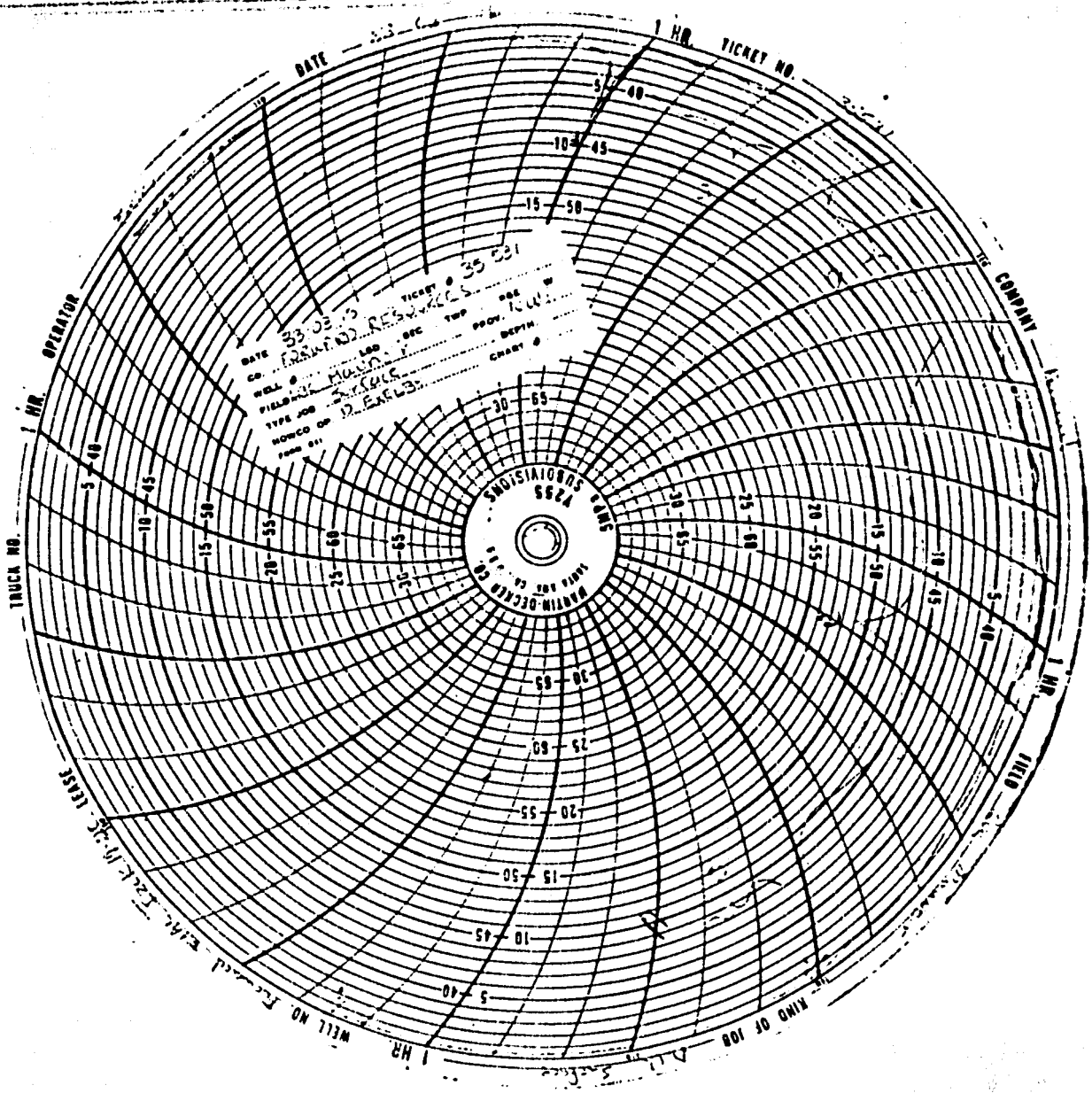
HALLIBURTON

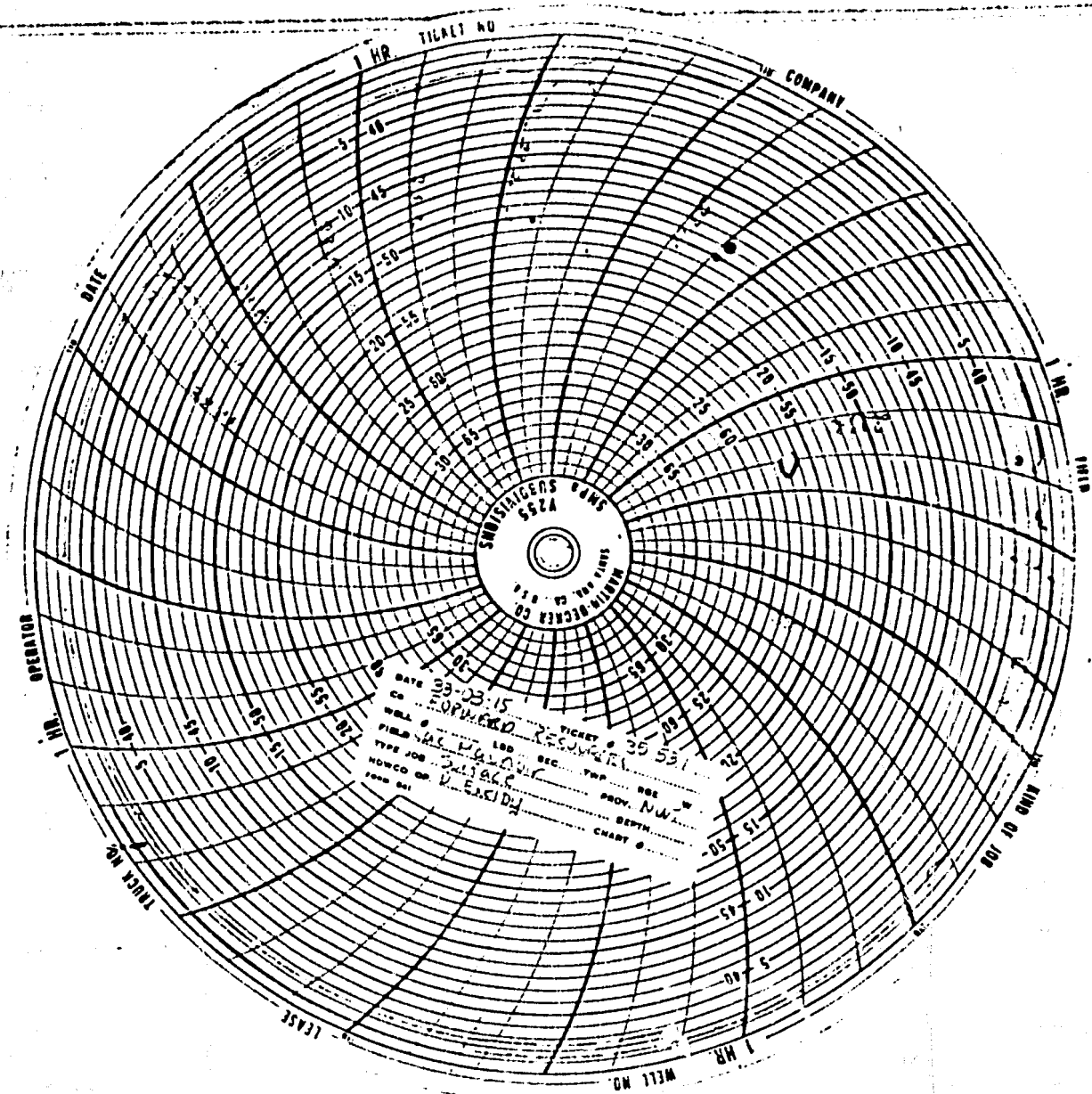
# TREATING LOG

INVOICE No. 35 531

| CHART POSITION | TIME | RATE $m^3$/min | VOLUME $m^3$ | | PRESSURE MPa | | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | PUMPED | IN FORMATION | TUBING | CASING | |
| | 23:18 | | 17.68 | | | 4 | Start to pump up Lyons ECP |
| | | | | | | | packer. |
| | 23:19 | | 17.78 | | | 5 | Start to pump up Lyons ECP |
| | | | | | | | packer. |
| F | 23:19 | | | | | | * At this point the pressure |
| | | | | | | | fell right off, and it appeared |
| | | | | | | | that the ECP packer had ruptured. |
| G | 23:40 | | ZERO COUNTERS | | | | Dropped Multi-Stage opening |
| | | | | | | | plug. |
| H | 23:54 | | 0.5 | | | 7 | Open Multi-Stage cementer. |
| H | 23:54 | | | | | 1 | Pump to circulate tool. |
| I | 23:56 | | 2 | | | 1 | Stop pumping. |
| | | | | | | | |
| | | | | | | | SECOND STAGE |
| A | 06:53 | 0.3 | 0.5 | | | 0 | Start pumping $H_2O$ wash. |
| B | 06:55 | 0.4 | 1.6 | | | 0 | Start pumping Scavenger slurry. |
| C | 07:00 | 0.5 | | | | 2 | Mix 2.6 tonnes Permfrost 8% gel. |
| D | 08:05 | | | | | 0 | Drop plug. |
| E | 08:17 | 0.5 | 12.9 | | | 2 | Displace. |
| F | 08:40 | | | | | 7 | Bump plug. |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Form 957


1 HR.
TICKET NO.
DATE
THE COMPANY
1 HR.
FIELD
KIND OF JOB
WELL NO. Farm Lease
1 HR.
TRUCK NO.
1 HR.
OPERATOR
MARTIN-DECKER CO.
SUBDIVISIONS
33-03-13
GRAND RESOURCES
HUGO
3 CRWS
12 EARLS


TICKET NO
1 HR
COMPANY
DATE
1 HR
KIND OF JOB
OPERATOR
1 HR.
TRUCK NO.
LEASE
WELL NO.
1 HR
MARTIN-DECKER CO.
SANTA ANA, CA. U.S.A.
SNOISTAIGENS SNAS
5524
99-03-15
FORWARD RESOURCES
35 591
NW
SWAB

HALLIBURTON

# CEMENTING AND/OR SPECIAL TOOLS SERVICE REPORT

ATTACH TO INVOICE No. 35 532

HALLIBURTON DISTRICT: Frontier

JOB DATE: 1983 (YEAR) 03 (MONTH) 16 (DAY)

OWNER, OPERATOR OR HIS AGENT STATES THE WELL IS IN GOOD CONDITION FOR THE SERVICE JOB TO BE PERFORMED AND SUBMITS THE FOLLOWING DATA.

| CUSTOMER | FIELD OR AREA | WELL No. AND LEASE |
|---|---|---|
| Forward Resources Ltd. | Lac Maunoir | Forward et al Izok M-20 |

| CALLED OUT (DATE / TIME) | ON LOCATION (DATE / TIME) | JOB STARTED (DATE / TIME) | JOB COMPLETED (DATE / TIME) | PROVINCE | LSD | SEC | TWP | RANGE | MERIDIAN |
|---|---|---|---|---|---|---|---|---|---|
| | | 22:05 | 23:10 | N.W.T. | | | | | W |

| TYPE OF JOB ✓ | |
|---|---|
| SURFACE | |
| INTERMEDIATE | |
| PRODUCTION | |
| LINER | |
| SQUEEZE | |
| PLUG | |
| PUMP | ✓ |
| PRESSURE TEST | |
| OTHER | |

**WELL OR HOLE DATA**

HOLE DATA: HOLE SIZE ____ mm; TOTAL DEPTH ____ m; TYPE MUD ____; VISC. ____; DENSITY ____

CASING, TUBING OR LINER DATA: NEW ☐ USED ☐ SIZE ____ mm kg/m ____ GRADE ____ DEPTH ____ m

SIZE ____ mm kg/m ____ GRADE ____ DEPTH ____ m

PERFORATIONS: FROM ____ m TO ____ m FROM ____ m TO ____ m

FROM ____ m TO ____ m FROM ____ m TO ____ m

WASH FLUID TYPE: $H_2O$ VOL. 0.4 $m^3$ DISPLACING FLUID TYPE: $H_2O$ VOL. ____ $m^3$

TEMP DATA: MIXING WATER ____ °C SLURRY ____ °C DISPLACING FLUID ____ °C RETURNS ____ °C

**PRODUCTS**

| EQUIPMENT | QUANTITY |
|---|---|
| BASKETS | |
| CENTRALIZERS | |
| CLAMPS | |
| FLOAT COLLAR | |
| FLOAT SHOE | |
| GUIDE SHOE | |
| INSERT FLOAT | |
| SCRATCHERS | |
| OTHER | |

## EQUIPMENT

**PACKER**

TYPE ____ SIZE ____ mm

DEPTH SET ____ m TAIL PIPE ____ m

TOP PLUG TYPE ____

BOTTOM PLUG TYPE ____

**CEMENT HEAD**

CONTINUOUS ☐ KNOCK OFF ☐ SWAGE ☐

OTHER ____

## CEMENT DATA

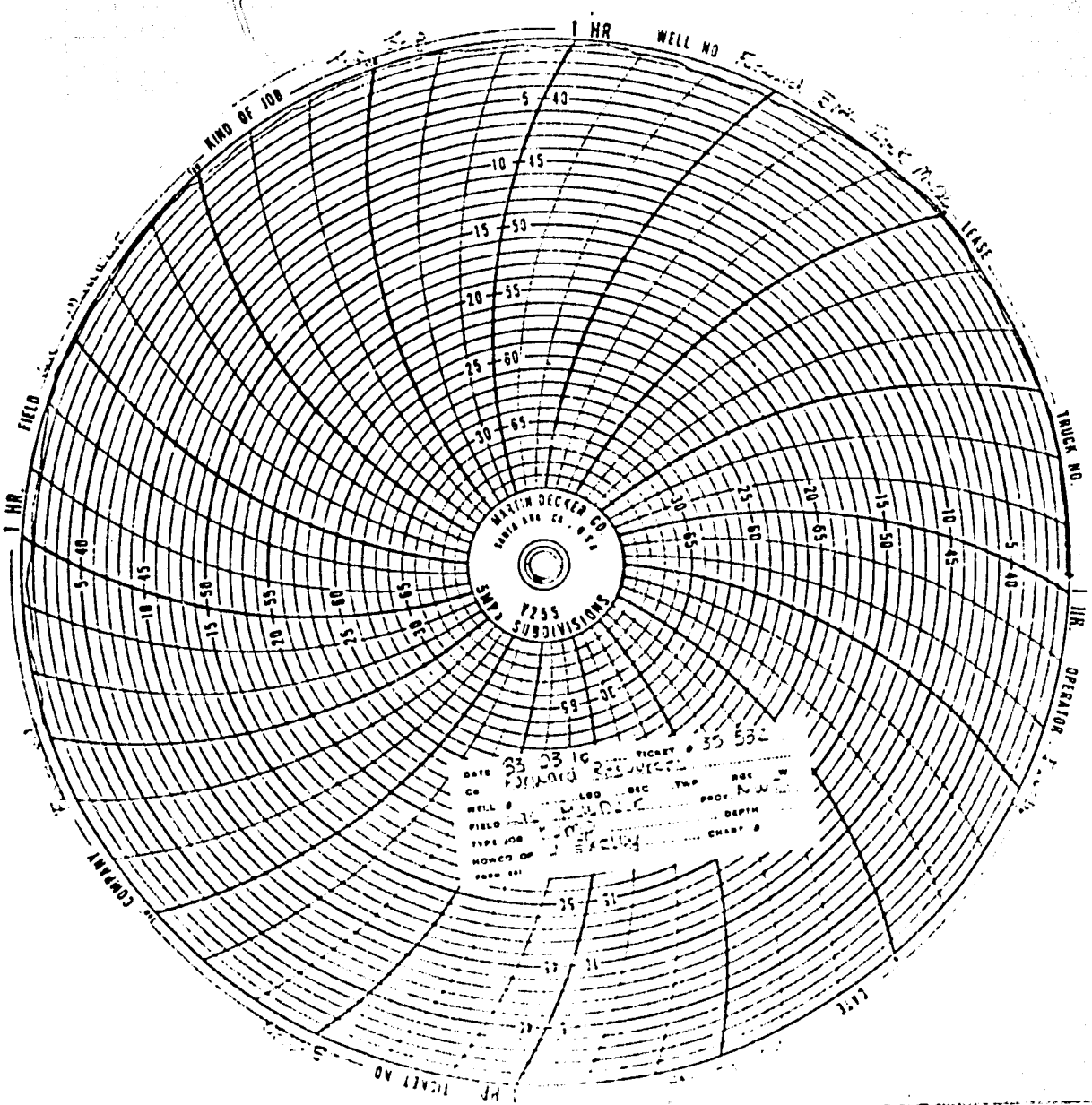
| TONNE | API CLASS | BRAND | BULK OR SACKED | CEMENT BRAND | ADDITIVES TYPE AND PERCENT | kg/m³ | m³/tonne |
|---|---|---|---|---|---|---|---|
| 7.2 | G | Inland | Sacked | Permafrost | | 1880 | 0.7[illegible] |
| | | | | | | | |
| | | | | | | | |

HALLIBURTON OPERATOR: D. Exelby CUSTOMER REP. ____

## TREATING LOG

| CHART POSITION | TIME | RATE m³/min | VOLUME m³ PUMPED | VOLUME m³ IN FORMATION | PRESSURE MPa TUBING | PRESSURE MPa CASING | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | | | | | Pump 0.3 $m^3$ $H_2O$ ahead to lear lines. |
| | | | | | | | Mix 5.4 tonnes Permafrost drop |
| | | | | | | | cement basket down casing. |
| | | | | | | | Mix 1.8 tonnes on top of cement |
| | | | | | | | basket. |
| | | | | | | | Wash up. |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

FORM 157A


1 HR
WELL NO
KIND OF JOB
LEASE
FIELD
TRUCK NO.
1 HR.
1 HR.
OPERATOR
COMPANY
TICKET NO
MARTIN DECKER CO
SUBDIVISIONS
TICKET
DATE
CO
WELL #
FIELD
TYPE JOB
DEPTH
CHART #

HALLIBURTON

# CEMENTING AND/OR SPECIAL TOOLS SERVICE REPORT

ATTACH TO INVOICE No. 35 533

HALLIBURTON DISTRICT: Frontier

JOB DATE: 1983 (YEAR) 03 (MONTH) 18 (DAY)

OWNER, OPERATOR OR HIS AGENT STATES THE WELL IS IN GOOD CONDITION FOR THE SERVICE JOB TO BE PERFORMED AND SUBMITS THE FOLLOWING DATA.

| CUSTOMER | FIELD OR AREA | WELL No. AND LEASE |
|---|---|---|
| Forward Resources Ltd. | Lac Maunoir | Forward et al Izok M-20 |

| CALLED OUT (DATE / TIME) | ON LOCATION (DATE / TIME) | JOB STARTED (DATE / TIME) | JOB COMPLETED (DATE / TIME) | PROVINCE | LSD | SEC | TWP | RANGE | MERIDIAN |
|---|---|---|---|---|---|---|---|---|---|
| | | | | N.W.T. | | | | | W |

| TYPE OF JOB ✓ | |
|---|---|
| SURFACE | |
| INTERMEDIATE | |
| PRODUCTION | |
| LINER | |
| SQUEEZE | |
| PLUG | |
| PUMP | |
| PRESSURE TEST | ✓ |
| OTHER | |

**WELL OR HOLE DATA**

HOLE DATA: HOLE SIZE ____ mm; TOTAL DEPTH ____ m; TYPE MUD ____; VISC. ____; DENSITY ____

CASING, TUBING OR LINER DATA: NEW ☐ USED ☐; SIZE ____ mm ____ kg/m; GRADE ____; DEPTH ____ m

SIZE ____ mm ____ kg/m; GRADE ____; DEPTH ____ m

PERFORATIONS: FROM ____ m TO ____ m FROM ____ m TO ____ m

FROM ____ m TO ____ m FROM ____ m TO ____ m

WASH FLUID TYPE: ____ VOL. ____ m³; DISPLACING FLUID TYPE: ____ VOL. ____ m³

TEMP DATA: MIXING WATER ____ °C; SLURRY ____ °C; DISPLACING FLUID ____ °C; RETURNS ____ °C

| PRODUCTS: EQUIPMENT | CLASS |
|---|---|
| BASKETS | |
| CENTRALIZERS | |
| CLAMPS | |
| FLOAT COLLAR | |
| FLOAT SHOE | |
| GUIDE SHOE | |
| INSERT FLOAT | |
| SCRATCHERS | |
| OTHER | |

## EQUIPMENT

**PACKER**

TYPE ____ SIZE ____ mm

DEPTH SET ____ m TAIL PIPE ____ m

TOP PLUG TYPE ____

BOTTOM PLUG TYPE ____

**CEMENT HEAD**

CONTINUOUS ☐ KNOCK OFF ☐ SWAGE ☐

OTHER ____

## CEMENT DATA

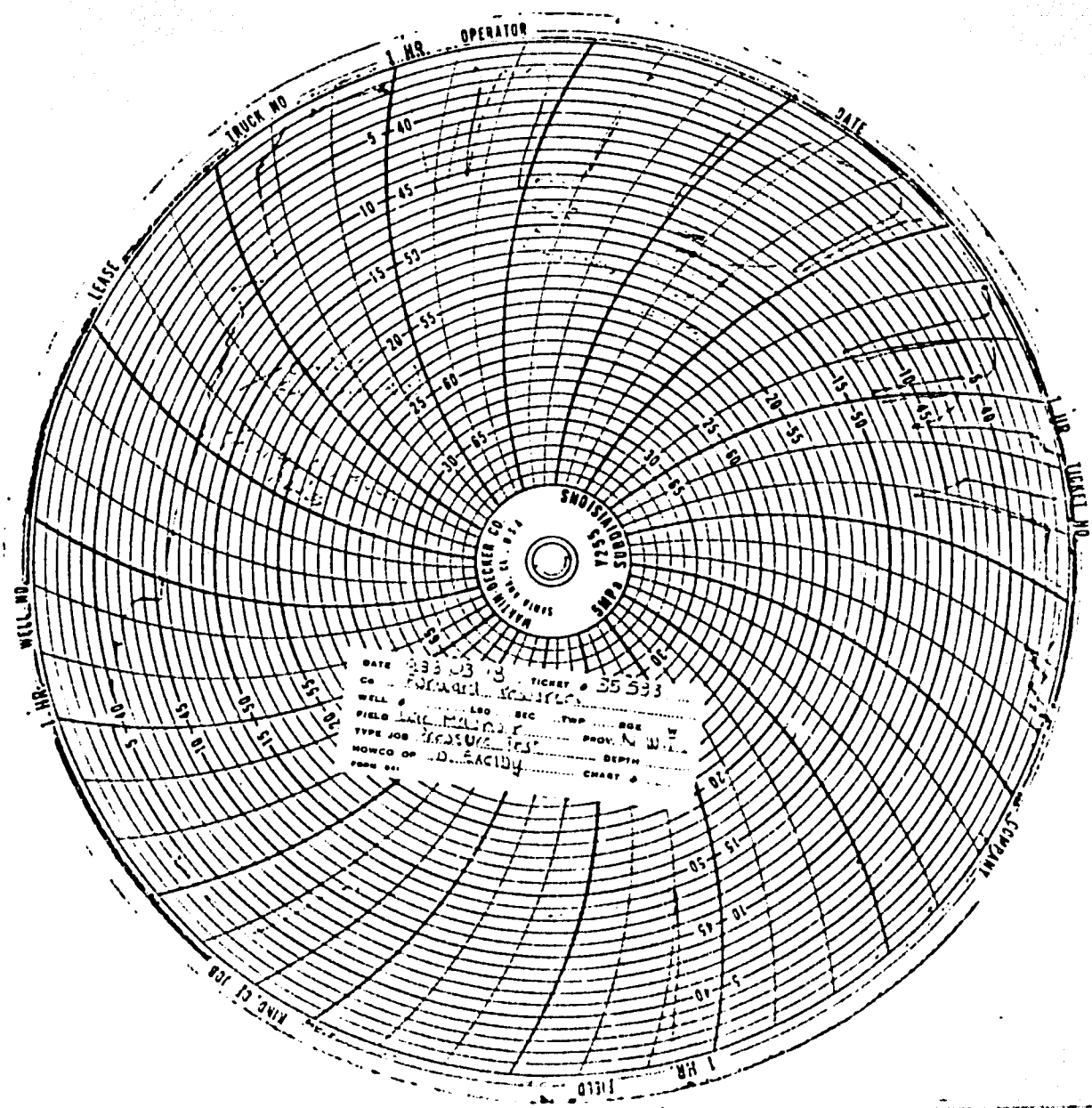
| TONNE | API CLASS | BRAND | BULK OR SACKED | CEMENT BLEND | ADDITIVES TYPE AND PERCENT | kg/m³ | m³/tonne |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

HALLIBURTON OPERATOR: D. Exelby CUSTOMER REP. ____

## TREATING LOG

| CHART POSITION | TIME | RATE m³/min | VOLUME m³ PUMPED | VOLUME m³ IN FORMATION | PRESSURE MPa TUBING | PRESSURE MPa CASING | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | | | | | Pressure test BOP's and manifold. |
| | | | | | | | No. 1 Kill valve. |
| | | | | | | | No. 2 Kill valve. |
| | | | | | | | HCR valve. |
| | | | | | | | Back up HCR valve. |
| | | | | | | | Manifold valves. |
| | | | | | | | Pipe rams. |
| | | | | | | | Hydril. |
| | | | | | | | Blind rams. |

FORM 157A


OPERATOR
1 HR.
TRUCK NO
DATE
LEASE
1 HR
TICKET NO
WELL NO
COMPANY
1 HR
KIND OF JOB
FIELD
SUBDIVISIONS
DATE
TICKET
Co
WELL #
LEG
SEC
TWP
RGE
FIELD
PROV.
TYPE JOB
DEPTH
HOWCO OP
CHART #
FORM 911

1 HR.
TICKET NO
COMPANY
DATE
FIELD
OPERATOR
TRUCK NO
LEASE
KIND OF JOB
WELL NO
MARTIN DECKER CO.
SUBDIVISIONS
7255

Winterhawk Petroleum Consulting Services Ltd.

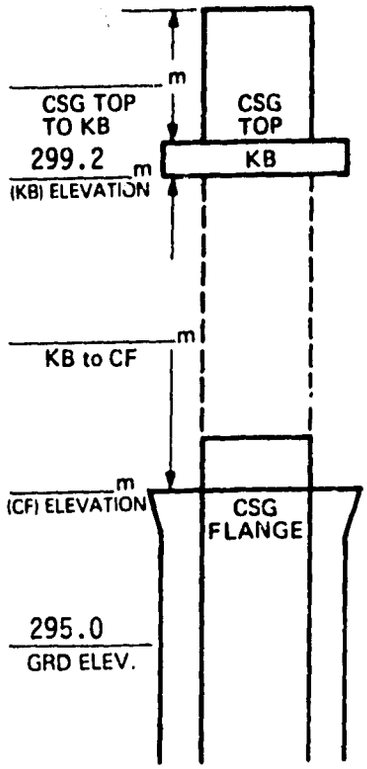
PAGE _____

# CASING SUMMARY

WELL Forward et al Izok LOCATION M-20 DATE 83 03 25

SURF/INT/PROD/(LINER) SIZE 177.8 mm KB 299.2 m KB to CF _____

(New)/Used Inspected By: Visually Drifted To: 159.41 mm API diam.




| NO. | DESCRIPTION | MEASURED LENGTH | KB DEPTH |
|---|---|---|---|
| 1 | BOT 7" 26# 8rd Type V guide | .55 | 589 |
| 1 | Nipple 7" 26# 8rd X 2 ft | .64 | |
| 1 | DL 7" 8rd Float collar | .43 | 586.7 |
| 1 | BOT Catcher sub | .29 | 587 |
| 1 | 177.8 mm, 38.69 kg/m LTC S95 | 10.52 | |
| 1 | BOT Type 2 Landing course | .33 | 576 |
| 24 | 177.8 mm, 38.69 kg/m LTC S95 | 277.22 | |
| 1 | BOT open hole packer | 1.94 | 293.01 |
| 1 | BOT Hyflo liner hanger | 1.70 | |
| 1 | BOT Screw Set Packer | 2.54 | |
| | Centralizers | | |

| | | | |
|---|---|---|---|
| | Total String | 296.16 | Cut-off Jt. Length |
| minus | KB to Csg Top (STICK UP) | | |
| | Landed Depth KB | 589 | |
| | Hole Depth KB | 590 | |
| | Distance Csg Landed Off Bottom | 1 | |

Cementing Company Halliburton Services

Wash - Type: Fresh water Volume 7.6 $m^3$

Cement Type - Lead Slurry Class G neat scavenger slurry Volume: 1.5 $m^3$ 12.3 tonnes

Additives _____ Volume: _____

Cement Type - Tail Slurry Class G neat ( 30% excess) Volume: 12.3 tonnes

Additives _____ Volume: _____

Cement Type - Above Stage Collar _____ Volume: _____

Additives _____ Volume: _____

Displacement 7.6 $m^3$ $H_2O$ Avg. _____ (m3/min)

Calculated Cement Top(s) _____ KB _____ KB

Returns: Mud NONE m3 Cement NONE m3

String Wt. in a mud wt. of: _____ kg/m3 = _____ daN

Wt. set on Slips: N/A daN Plug down @ 0522 - 83 03 25

Remarks: Top of liner @ 292.84 m KB

Bottom of liner @ 589.00 mKB

244.5 mm casing landed @ 428 m KB

Engineer: J. Aldridge

Winterhawk

# PIPE TALLY SHEET

PAGE _____ OF _____

WELL Forward et al Izok LOCATION M-20

SIZE 178 mm WT. 38.69 kg/m GRADE S 95 COUPLING LTC THRD 8rd

DATE _____

| JOINT | LENGTH | | JOINT | LENGTH | | JOINT | LENGTH | | JOINT | LENGTH | | JOINT | LENGTH | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10 | 52 | 11 | 12 | 78 | 21 | 11 | 99 | 31 | | | 41 | | |
| 2 | * 13 | 00 | 12 | 11 | 94 | 22 | * 8 | 46 | 32 | | | 42 | | |
| 3 | 12 | 04 | 13 | 8 | 15 | 23 | 12 | 04 | 33 | | | 43 | | |
| 4 | 11 | 75 | 14 | 12 | 95 | 24 | 12 | 63 | 34 | | | 44 | | |
| 5 | 9 | 91 | 15 | 11 | 52 | 25 | 12 | 02 | 35 | | | 45 | | |
| 6 | 8 | 96 | 16 | 12 | 09 | 26 | 11 | 54 | 36 | | | 46 | | |
| 7 | 11 | 40 | 17 | 11 | 27 | 27 | 11 | 70 | 37 | | | 47 | | |
| 8 | 11 | 70 | 18 | 11 | 62 | 28 | * 11 | 67 | 38 | | | 48 | | |
| 9 | 11 | 42 | 19 | 11 | 15 | 29 | * 11 | 79 | 39 | | | 49 | | |
| 10 | 11 | 87 | 20 | 12 | 78 | 30 | | | 40 | | | 50 | | |
| A | 112 | 57 | B | 116 | 25 | C | 103 | 84 | D | | | E | | |
| 51 | | | 61 | | | 71 | | | 81 | | | 91 | | |
| 52 | | | 62 | | | 72 | | | 82 | | | 92 | | |
| 53 | | | 63 | | | 73 | | | 83 | | | 93 | | |
| 54 | | | 64 | | | 74 | | | 84 | | | 94 | | |
| 55 | | | 65 | | | 75 | | | 85 | | | 95 | | |
| 56 | | | 66 | | | 76 | | | 86 | | | 96 | | |
| 57 | | | 67 | | | 77 | | | 87 | | | 97 | | |
| 58 | | | 68 | | | 78 | | | 88 | | | 98 | | |
| 59 | | | 69 | | | 79 | | | 89 | | | 99 | | |
| 60 | | | 70 | | | 80 | | | 90 | | | 100 | | |
| F | | | G | | | H | | | I | | | J | | |

| | | | SUB TOTAL | |
|---|---|---|---|---|
| A | 112 | 57 | | |
| B | 116 | 25 | 228 | 82 |
| C | 103 | 84 | 332 | 66 |
| D | | | | |
| E | | | | |
| F | | | | |
| G | | | | |
| H | | | | |
| I | | | | |
| J | | | | |
| TOTAL | 332 | 66 | | |

Shoe _____

Float Collar _____

Other _____

| | JOINTS | LENGTH |
|---|---|---|
| PAGE TOTAL | 29 | 332.66 |
| BROUGHT FWD | | |
| GRAND TOTAL | 29 | 332.66 |

JOINTS ON LOCATION _____

Remarks: * OUT

ENGINEER J. Aldridge

NOTE: Use a new page for each casing type. Number joints in order of running. Indicate joints not run by * and do not include in total length.

HALLIBURTON

# CEMENTING AND/OR SPECIAL TOOLS SERVICE REPORT

ATTACH TO INVOICE No. 35 536

HALLIBURTON DISTRICT: Frontier

JOB DATE: 1983 (YEAR) 03 (MONTH) 25 (DAY)

OWNER, OPERATOR OR HIS AGENT STATES THE WELL IS IN GOOD CONDITION FOR THE SERVICE JOB TO BE PERFORMED AND SUBMITS THE FOLLOWING DATA.

| CUSTOMER | FIELD OR AREA | WELL No. AND LEASE |
|---|---|---|
| Forward Resources Ltd. | Lac Maunoir | Forward et al Izok H-20 |

| CALLED OUT (DATE / TIME) | ON LOCATION (DATE / TIME) | JOB STARTED (DATE / TIME) | JOB COMPLETED (DATE / TIME) | PROVINCE | LSD | SEC | TWP | RANGE | MERIDIAN |
|---|---|---|---|---|---|---|---|---|---|
| | | | | N.W.T. | | | | | W |

**TYPE OF JOB** ✓

| | |
|---|---|
| SURFACE | |
| INTERMEDIATE | |
| PRODUCTION | |
| LINER | ✓ |
| SQUEEZE | |
| PLUG | |
| PUMP | |
| PRESSURE TEST | |
| OTHER | |

**WELL OR HOLE DATA**

HOLE DATA: HOLE SIZE 215 mm; TOTAL DEPTH 590 m; TYPE MUD Gel Chem; VISC. 60; DENSITY 1060

CASING, TUBING OR LINER DATA: NEW ☒ USED ☐ — SIZE 178 mm; kg/m 38.69; GRADE ____; DEPTH 589 m

SIZE ____ mm; kg/m ____; GRADE ____; DEPTH ____ m

PERFORATIONS: FROM ____ m TO ____ m; FROM ____ m TO ____ m

FROM ____ m TO ____ m; FROM ____ m TO ____ m

WASH FLUID TYPE: $H_2O$ VOL. 1 $m^3$; DISPLACING FLUID TYPE: $H_2O$ VOL. ____ $m^3$

TEMP DATA: MIXING WATER ____ °C; SLURRY ____ °C; DISPLACING FLUID ____ °C; RETURNS ____ °C

**PRODUCTS**

| EQUIPMENT | QUANTITY |
|---|---|
| BASKETS | |
| CENTRALIZERS | |
| CLAMPS | |
| FLOAT COLLAR | 1 |
| FLOAT SHOE | 1 |
| GUIDE SHOE | |
| INSERT FLOAT | |
| SCRATCHERS | |
| OTHER | |

## EQUIPMENT

**PACKER**

TYPE Liner SIZE 178 mm

DEPTH SET 328 m TAIL PIPE 264 m

TOP PLUG TYPE Liner Plug Set

BOTTOM PLUG TYPE ____

**CEMENT HEAD**

CONTINUOUS ☒ KNOCK OFF ☐ SWAGE ☐

OTHER ____

## CEMENT DATA

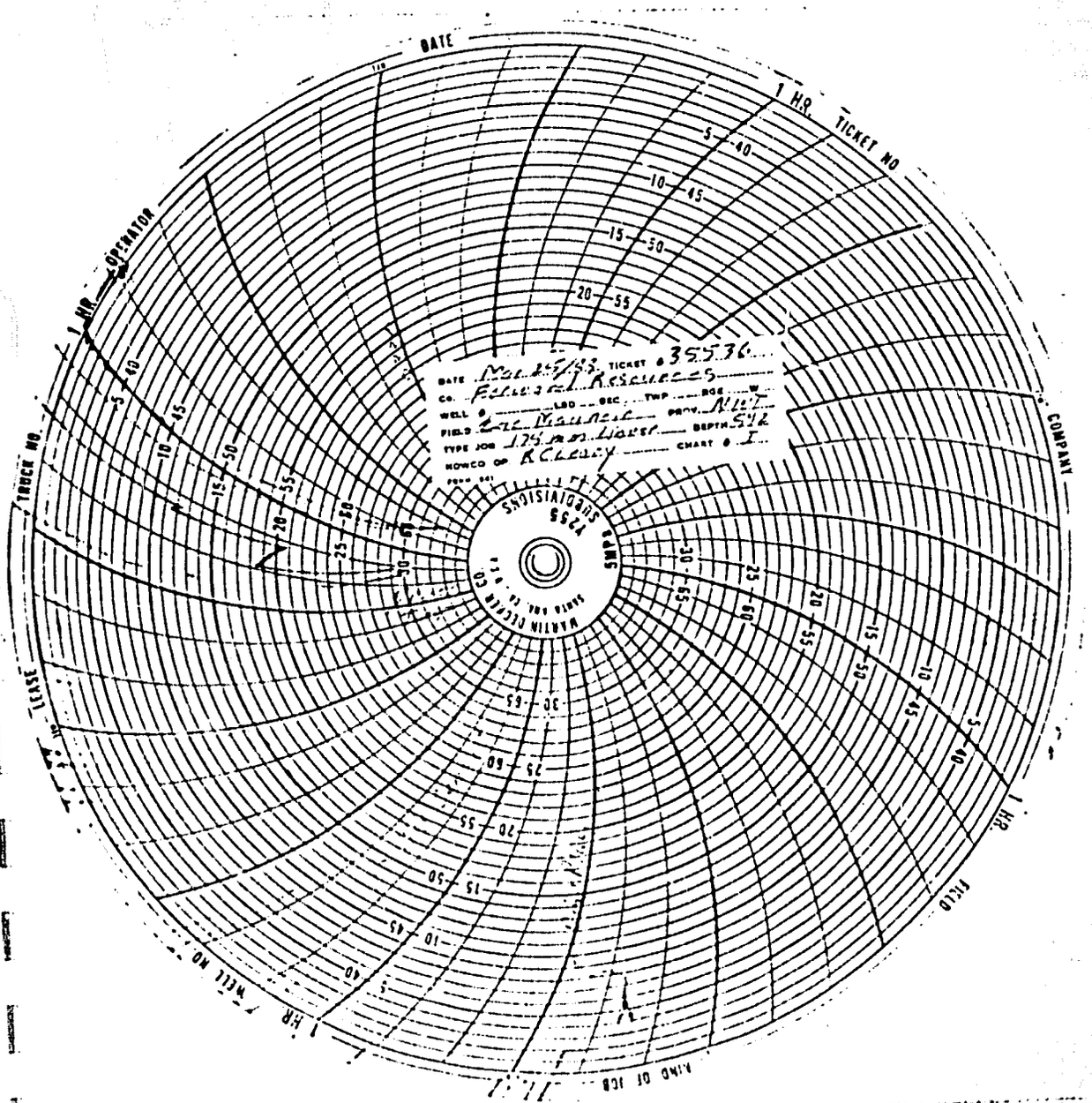
| TONNE | API CLASS | BRAND | BULK OR SACKED | CEMENT BLEND | ADDITIVES TYPE AND PERCENT | kg/m³ | m³/tonne |
|---|---|---|---|---|---|---|---|
| 12.5 | G | Inland | Sacks | Neat | | 1895 | 0.76 |
| | | | | | | | |
| | | | | | | | |

HALLIBURTON OPERATOR: R. Cleary CUSTOMER REP. ____

## TREATING LOG

| CHART POSITION | TIME | RATE m³/min | VOLUME m³ PUMPED | VOLUME m³ IN FORMATION | PRESSURE MPa TUBING | PRESSURE MPa CASING | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | | | | | Pump 1 m³ $H_2O$ ahead. |
| | | | | | | | Mix cement. |
| | | | | | | | Drop plug and displace with 7.6 m³ |
| | | | | | | | $H_2O$. |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

FORM 167A


DATE
1 HR.
TICKET NO
COMPANY
FIELD
1 HR
KIND OF JOB
1 HR
WELL NO
LEASE
TRUCK NO
OPERATOR
DATE Mar 24/83 TICKET # 35536
CO. Fellows Resources
WELL #
FIELD Erie Maumee PROV. Nwt
TYPE JOB 175 sx Lower DEPTH 542
NOWCO OP R Clegg CHART # 1
SUBDIVISIONS
SMPS
MARTIN DECKER

HALLIBURTON

# CEMENTING AND/OR SPECIAL TOOLS SERVICE REPORT

ATTACH TO INVOICE No 35 537

HALLIBURTON DISTRICT: Frontier

JOB DATE: 1983 (YEAR) 03 (MONTH) 27 (DAY)

OWNER, OPERATOR OR HIS AGENT STATES THE WELL IS IN GOOD CONDITION FOR THE SERVICE JOB TO BE PERFORMED AND SUBMITS THE FOLLOWING DATA.

| CUSTOMER | FIELD OR AREA | WELL No. AND LEASE |
|---|---|---|
| Forward Resources Ltd. | Lac Maunoir | Forward et al Izok M-20 |

| CALLED OUT (DATE / TIME) | ON LOCATION (DATE / TIME) | JOB STARTED (DATE / TIME) | JOB COMPLETED (DATE / TIME) | PROVINCE | LSD | SEC | TWP | RANGE | MERIDIAN |
|---|---|---|---|---|---|---|---|---|---|
| | | | | N.W.T. | | | | | W |

| TYPE OF JOB | ✓ |
|---|---|
| SURFACE | |
| INTERMEDIATE | |
| PRODUCTION | |
| LINER | |
| SQUEEZE | |
| PLUG | |
| PUMP | |
| PRESSURE TEST | |
| OTHER | ✓ |

**WELL OR HOLE DATA**

HOLE DATA: HOLE SIZE ____ mm; TOTAL DEPTH ____ m; TYPE MUD ____; VISC. ____; DENSITY ____

CASING, TUBING OR LINER DATA: NEW ☐ USED ☐; SIZE ____ mm kg/m ____ GRADE ____ DEPTH ____ m; SIZE ____ mm kg/m ____ GRADE ____ DEPTH ____ m

PERFORATIONS: FROM ____ m TO ____ m FROM ____ m TO ____ m; FROM ____ m TO ____ m FROM ____ m TO ____ m

WASH FLUID TYPE: ____ VOL. ____ m³; DISPLACING FLUID TYPE: ____ VOL. ____ m³

TEMP DATA: MIXING WATER ____ °C SLURRY ____ °C; DISPLACING FLUID ____ °C RETURNS ____ °C

**PRODUCTS**

| EQUIPMENT | TAKEN |
|---|---|
| BASKETS | |
| CENTRALIZERS | |
| CLAMPS | |
| FLOAT COLLAR | |
| FLOAT SHOE | |
| GUIDE SHOE | |
| INSERT FLOAT | |
| SCRATCHERS | |
| OTHER | |

## EQUIPMENT

**PACKER**

TYPE ____ SIZE ____ mm

DEPTH SET ____ m TAIL PIPE ____ m

TOP PLUG TYPE ____

BOTTOM PLUG TYPE ____

**CEMENT HEAD**

CONTINUOUS ☐ KNOCK OFF ☐ SWAGE ☐

OTHER ____

## CEMENT DATA

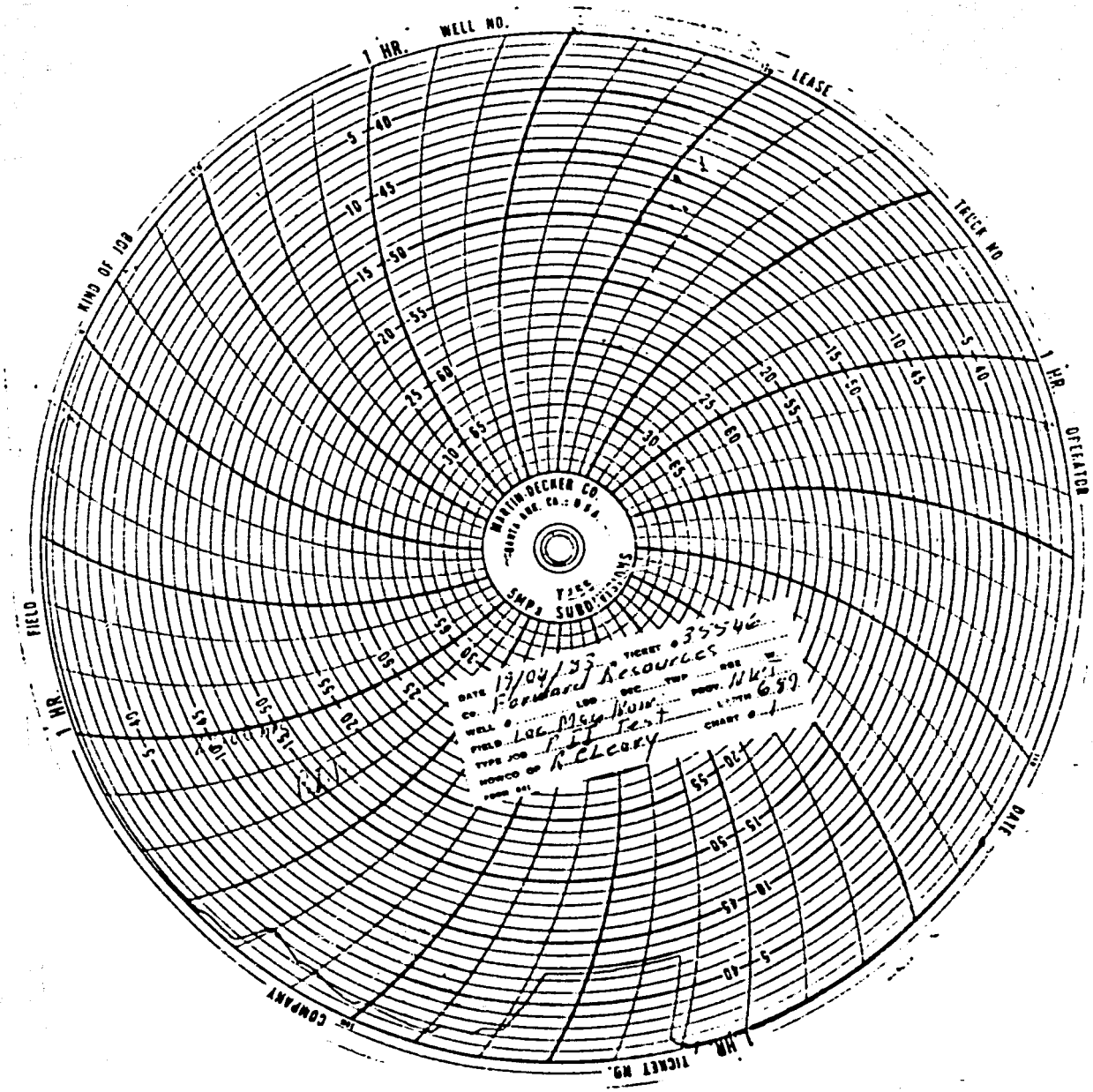
| TONNE | API CLASS | BRAND | BULK OR SACKED | CEMENT BLEND | ADDITIVES TYPE AND PERCENT | kg/m³ | m³/tonne |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

HALLIBURTON OPERATOR: R. Cleary CUSTOMER REP. ____

## TREATING LOG

| CHART POSITION | TIME | RATE m³/min | VOLUME m³ PUMPED | VOLUME m³ IN FORMATION | PRESSURE MPa TUBING | PRESSURE MPa CASING | REMARKS |
|---|---|---|---|---|---|---|---|
| | | | | | | | Perform pressure integrity test as |
| | | | | | | | per managers agreement. |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

FORM 157A


WELL NO.
LEASE
TRUCK NO
1 HR.
OPERATOR
DATE
HR
TICKET NO.
COMPANY
FIELD
1 HR.
KIND OF JOB
MARTIN-DECKER CO.
SMP's SUBDIVISIONS
DATE 12/04/85 TICKET 33546
CO. Forman Resources
WELL LOC Map Point
FIELD TYPE JOB Pit Test
CHART 1

# BIT RECORD



Winterhawk Petroleum Consulting Services Ltd.

# BIT RECORD

WELL NAME Forward et al Izok LOCATION M-20

Contractor 300 Drilling Rig No. " Mr. Ben" Field Wildcat (NWT)

Spud Date 83 02 15 @ 2000 hours T.D. Date 83 03 29 Rig Release Date 83 04 01

| BIT NO. | SIZE mm | MAKE & TYPE | DEPTH OUT | METRES DRLD | ROT. HOURS | TOTAL HOURS | WEIGHT ON BIT – daN | BIT RPM | JETS - mm | | | PUMP PRESS (kPa or MPa) | PUMP OUT - PUT $m^3$/min | DULL COND. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 1 | 2 | 3 | | | T | B | G |
| 1B | 444.5 | HW OWV-J | 35 | 35 | 13 3/4 | 13 3/4 | 3000 | 100 | 14.3 | 14.3 | 14.3 | | .908 | 1 | 1 | I |
| | | | | RUN AND CEMENT 13 3/8 CONDUCTOR PIPE | | | | | | | | | | | | |
| 1A | 311.2 | SEC H77SG | 49 | 14 | 2 1/2 | 2 1/2 | 2-6000 | 80 | OPEN | | | | .908 | 6 | I | I |
| 2A | " | HW J33 | 72 | 23 | 9 | 11 1/2 | 1-2000 | 80-90 | 12.7 | 12.7 | 12.7 | AIR - 43 $m^3$/min w/7.6 | | 2 | 1 | I |
| 3A | " | SEC H77SG | 76 | 4 | 9 3/4 | 21 1/4 | 2000 | 85 | OPEN | | | " " | " | 7 | 2 | I |
| 4A | " | REED S21G | 80 | 4 | 7 1/4 | 28 1/2 | 6000 | 85 | 15.9 | 15.9 | 15.9 | " " | " | 8 | 1 | I |
| 2A-RR | " | HWJ33-RR | 102 | 22 | 11 3/4 | 40 1/4 | 10000 | 50 | 12.7 | 12.7 | 12.7 | " " | " Mist | 4 | 8 | I |
| 5A | " | HW J55R | 209 | 107 | 41 3/4 | 82 | 12000 | 50 | OPEN | | | " 46 $m^3$/min 12 L/min | | 3 | 3 | I |
| 6A | " | SEC M84F | 266 | 57 | 24 1/4 | 106 1/4 | 14-16000 | 50 | OPEN | | | " " | " | DROPPED | | |
| 7A | " | SEC M84F | 380 | 114 | 46 3/4 | 153 | 16000 | 55 | OPEN | | | " " | " | 2 | 2 | I |
| 8A | " | HW J33 | 424 | 44 | 30 | 183 | 16000 | 60 | 15.9 | 15.9 | 15.9 | 2000 | 1.060 | 1 | 1 | I |
| 8A RR | " | HW J33 | 480 | 56 | 31 1/4 | 214 1/4 | 16000 | 60 | 15.9 | 15.9 | 15.9 | 200 | 1.060 | 4 | 5 | I |
| 9A | " | HW J33 | 505 | 25 | 10 1/4 | 224 1/2 | 16000 | 60 | OPEN | | | AIR - FOAM | | 1 | 1 | 1/4 |
| 10A | " | HW J55R | 505 | REAM | 6 3/4 | | — | — | OPEN | | | AIR - FOAM | | | | |
| | | | | | | | | | | | | | | | | |
| 1 RR | 200 | HW JD7 | 552 | Ream 76m 47 | 11 1/2 28 | 28 | 13000 | 60 | OPEN | | | 3900 AIR - | MIST | 5 | 3 | I |
| 2 | 200 | HW JD7 | 585 | 33 | 7 1/4 | 35 1/4 | 13000 | | OPEN | | | AIR - | MIST | 2 | 2 | I |

REMARKS. Bit #1 (RR) was used to pilot rat hole.

Winterhawk Petroleum Consulting Services Ltd.

# BIT RECORD

WELL NAME Forward et al Izok LOCATION M-20

Contractor 300 Drilling Rig No. "Mr. Ben" Field Wildcat - N.W.T.

Spud Date 83-02-15 T.D. Date 83-03-29 Rig Release Date 83-04-01

| BIT NO. | SIZE mm | MAKE & TYPE | DEPTH OUT | METRES DRLD | ROT. HOURS | TOTAL HOURS | WEIGHT ON BIT – daN | BIT RPM | JETS - mm | | | PUMP PRESS kPa or MPa | PUMP OUT - PUT m3/min | DULL COND. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 1 | 2 | 3 | | | T | B | G |
| 3 | 215.9 | HW J55R | 590 | 5 Ream 80 m | 12 3/4<br>2 1/2 | 37 3/4 | 3-5000 | 50 | OPEN | | | 3000 | AIR | 1 | 6 | 1 |
| 1C | 155.6 | HW J33 | 852 | 262 | 22 | 22 | 6000 | 60 | OPEN | | | 1000 | AIR | 5 | 8 | I |
| 2C | 155.6 | HW J55 | 900 | 48 | 9 | 31 | 7000 | 70 | OPEN | | | 1000 | AIR | | | |

REMARKS Bit #3 Reamed 80 m 200 mm hole to 215.9 mm then drilled a further 5 m of 215.9 mm hole.

# MUD REPORT

Winterhawk

## DAILY MUD ADDITIVES

| | |
|---|---|
| February 12 | Gel 43 sx, Caustic 2 sx |
| February 13 | Gel 13 sx |
| February 14 | -- |
| February 15 | -- |
| February 16 | Gel 15 sx, Kwikseal 31 sx, Sawdust 108 sx, Permafrost Cement 7.4 tonnes |
| February 17 | -- |
| February 18 | 5-Gel 10 sx, 92-Gel 12 sx, Caustic 1 sx, 10 lit/min soap and water while air drilling |
| February 19 | Gel 30 sx, 10 lit/min soap and water while air drilling |
| February 20 | 12 lit/min soap and water while air drilling |
| February 21 | 12 lit/min soap and water while air drilling |
| February 22 | 12 lit/min soap and water while air drilling |
| February 23 | 12 lit/min soap and water while air drilling |
| February 24 | 16 lit/min soap and water while air drilling |
| February 25 | 16 lit/min soap and water while air drilling |
| February 26 | 12 lit/min soap and water while air drilling, Caustic 1 sx, Kwikseal 30 sx, Sawdust 164 sx |
| February 27 | Kwikseal 11 sx, Gel 69 sx, Caustic 3 sx |
| Februray 28 | Sawdust 292 sx, Caustic 4 sx, Gel 32 sx, Kwikseal 112 sx |
| March 1 | Sawdust 389 sx, Kwikseal 182 sx, Gel 48 sx, Caustic 3 sx, Lime 1 sx |
| March 2 | Sawdust 134 sx, Kwikseal 86 sx, Gel 98 sx, Caustic 2 sx, Lime 1 sx |
| March 3 | Sawdust 75 sx, Gel 50 sx, Kwikseal 21 sx, Caustic 1 sx |
| March 4 | Gel 80 sx, Sawdust 124 sx, Kwikseal 25 sx, Caustic 3 sx |
| March 5 | Gel 197 sx, Caustic 5 sx |
| March 6 | Gel 220 sx, Caustic 4 sx |
| March 7 | Gel 113 sx, Caustic 3 sx |

| | |
|---|---|
| March 8 | Water |
| March 9 | Gel 50 sx, Caustic 1 sx |
| March 10 | Water |
| March 11 | Duraplex V-7-H 4 sx |
| March 12 | -- |
| March 13 | -- |
| March 14 | -- |
| March 15 | -- |
| March 16 | -- |
| March 17 | -- |
| March 18 | -- |
| March 19 | -- |
| March 20 | V-7-H 3 sx |
| March 21 | V-7-H 6 sx |
| March 22 | V-7-H 12 sx |
| March 23 | V-7-H 8 sx, XC Polymer 6 sx |
| March 24 | -- |
| March 25 | -- |
| March 26 | -- |
| March 27 | -- |
| March 28 | Salt 100 sx |
| March 29 | Salt 300 sx, Gel 40 sx, Polymer 4 sx, Caustic 2 sx, Staflo 2 sx |
| March 30 | Gel 20 sx, Polymer 6 sx, Salt 95 sx, Staflo 2 sx, Soda Ash 1 sx, Caustic 1 sx |

# DEVIATION RECORD

Winterhawk

SURVEYS

| Depth (m) | Deviation (°) | |
|---|---|---|
| 35 | 1/4 | |
| 65 | 7 | ) |
| | | ) Tool malfunction |
| 74 | 7 3/4 | ) |
| 74 | 1/4 | |
| 83 | 1/4 | |
| 93 | 1/4 | |
| 102 | 1/4 | |
| 120 | 0 | |
| 153 | 1/4 | |
| 181 | 0 | |
| 209 | 1/2 | |
| 218 | 1/8 | |
| 237 | 1/8 | |
| 261 | 1/4 | |
| 290 | 1/8 | |
| 318 | 1/8 | |
| 371 | 0 | |
| 399 | 1/4 | |
| 594 | 1/4 | |

# ABANDONMENT REPORT



Winterhawk

# ABANDONMENT REPORT

DATE 83 04 01

Well Forward et al Izok Location M-20

## A. WELL DATA

KB Elevation _____ KB to CF 4.08 m FTD 900 m

| Hole Size | Hole Depth | Casing Size | Casing Depth | Cement Top(s) | Perfs |
|---|---|---|---|---|---|
| 444 mm | 35 | 339.7 | 35 | SFC | 0 |
| 311 mm | 505 | 244.8 | 428 | ? | 0 |
| 215.9 mm | 590 | 177.8 | 589 | ? | 0 |
| 155.6 mm | 900 | - | - | - | - |

## B. ABANDONMENT DATA

Fluid in Hole salt mud Abandonment Company Halliburton

Cementing Company Haliburton Gov't Official John Hamilton (Yellowknife)

| Plug | Interval | Formation | Cem Vol | Cem Type | Cem Wt. | Plug Down | Felt Plug Time | Felt Plug Depth |
|---|---|---|---|---|---|---|---|---|
| 1 | 900-800 | Fort Island | 3.2 tonnes | G neat | | 2340 | 83 03 | 31 |
| 2 | 640-540 | Saline River | 3.2 tonnes | G | | 0045 | 83 04 | 01 |
| 3 | 280 m | 9 5/8"casing | Baker | Bridge | Plug | (wireline set) | | |
| | | | Pressured | to 7000 kPa | held | OK. | | |
| 4 | 50-0 | 9 5/8"casing | 2 tonnes | Permafrost | | 0420 | 83 04 | 01 |
| | | | | | | | | |

Method of Feeling Plugs not required to feel.

Surface Casing Cut 83 04 01 Surface Plug 83 04 01 Plate Welded 83 04 01

## C. SALVAGE DATA

Casing Salvaged NONE

* Casing bowl cut off - sent to Norman Wells to machine casing stub out.

## D. REMARKS

Plate welded on top of casing with upright pipe attached with well name etc welded on as per COGLA regulations.

Crossbar at ground level also welded on.

ENGINEER J. Aldridge

# LOST CIRCULATION

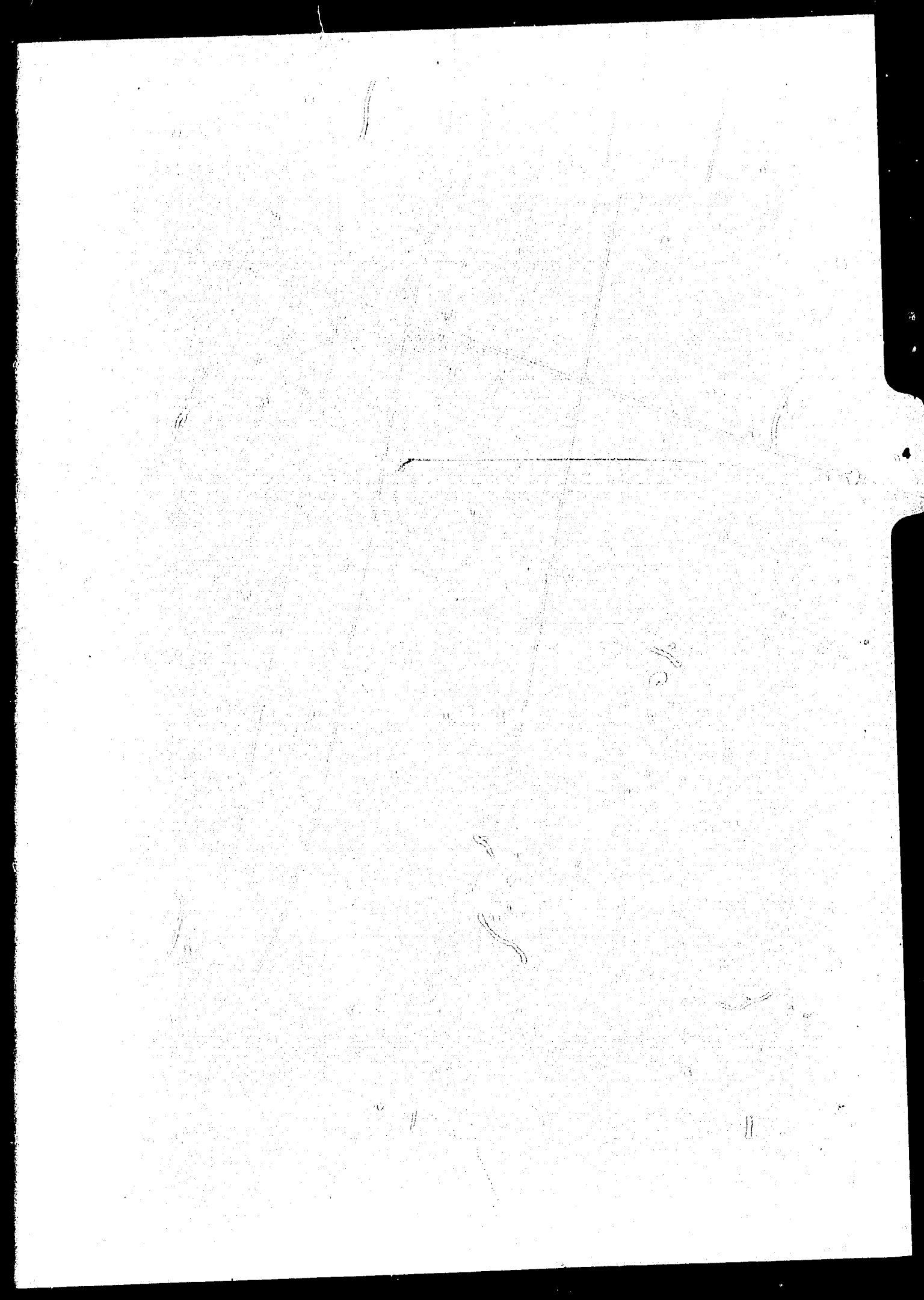
## LOST CIRCULATION - INTERMEDIATE HOLE

Listed below in table form are the encountered zones of lost circulation together with the corrective measures noted for each respective section.

### LOST CIRCULATION

| Formation | Depth (m) | Corrective Measure |
|---|---|---|
| Franklin Mtn. | 404 | Pump LCM |
| Franklin Mtn. | 424 | Pump 3 slugs LCM, repeat procedure, slug hole from top, build surface volume. |
| Franklin Mtn. | 432 - 443 | Pump LCM, washed to bottom, drill ahead blind. |
| Franklin Mtn. | 505 | Unload hole, with introduction of Durafoam system. |

As a brief overview, the intermediate hole was drilled with air from under the conductor, at 35 m, to approximately the 398 m mark. This was done in anticipation of porous dolomites throughout this section. At the 398 m mark the water influx from formations prohibited the continuance of air drilling. The hole was then displaced to mud and zones of lost circulation were subsequently noted. Once the Durafoam system was employed, lost circulation ceased to be a problem.



## SECTION IV

## LOGGING SUMMARY

**Dual Induction Focused Log** ✓
Run 1
March 7, 1983
455.3 m - 33 m

**Dual Laterolog**
Run 3
March 31, 1983 ✓
899.3 m - ~~2248.0~~ 588 m

**Acoustic Cement Bond Log**

| | |
|---|---|
| Run 1, 2, 3 | Run 1 |
| March 26, 1983 ✓ | March 19, 1983 ✓ |
| 581.5 m - 300.0 m | 423.3 m - surface |

**Acoustilog** ✓
Run 1, 2, 3
March 7, 9, 31, 1983
453.1 m - 33 m
468.1 m - 400 m
897.5 m - 588 m

**Densilog Neutron**
Run 3
March 31, 1983 ✓
899.3 m - 248 m

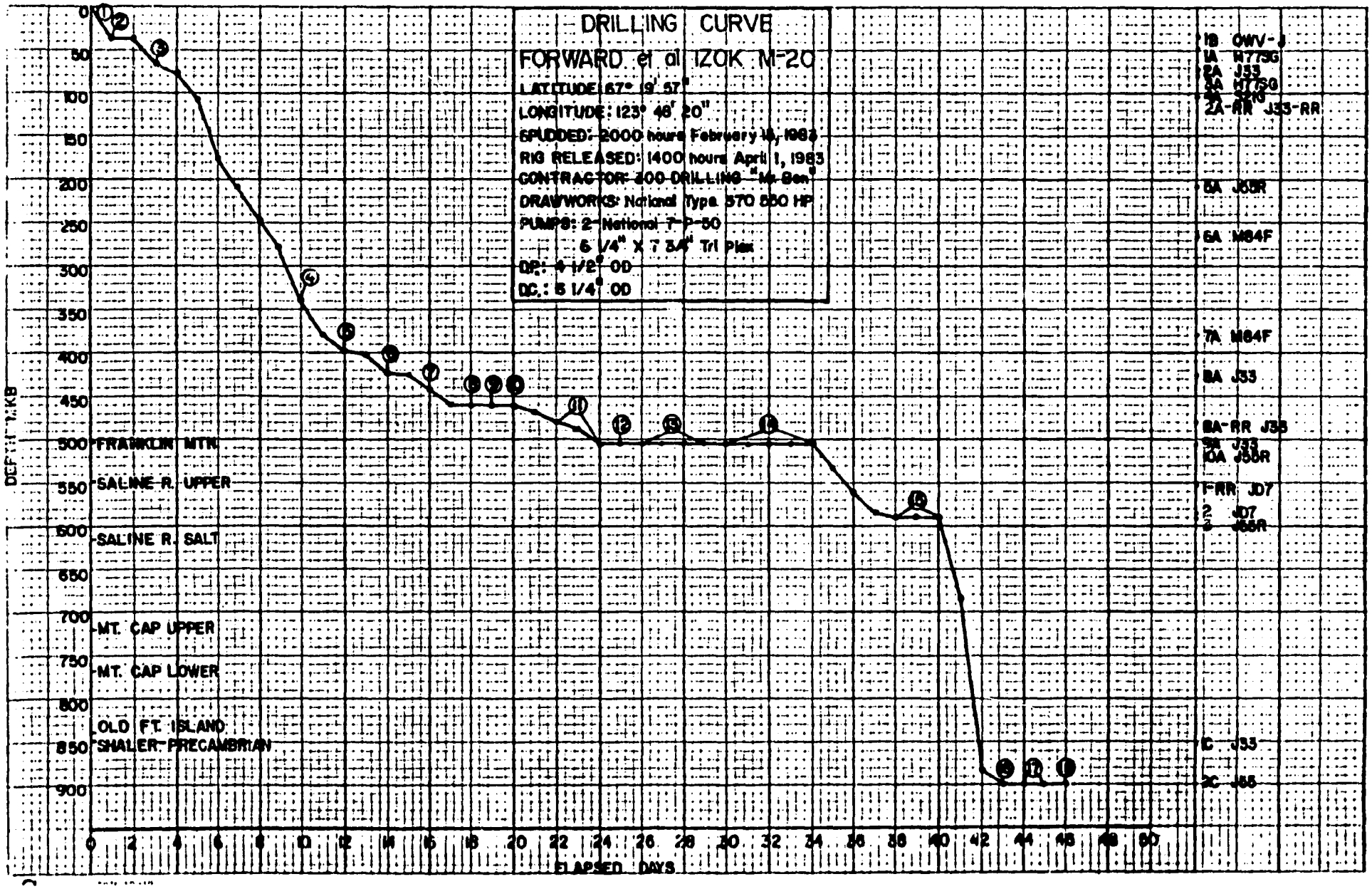
**Mud Log** ✓

**Lithology Log** ✓

## SECTION V

## DRILLING CURVE




DRILLING CURVE
FORWARD et al IZOK M-20
LATITUDE 67° 19' 57"
LONGITUDE: 123° 46' 20"
SPUDDED: 2000 hours February 18, 1983
RIG RELEASED: 1400 hours April 1, 1983
CONTRACTOR: 200 DRILLING "Mr. Ben"
DRAWWORKS: National Type 570 800 HP
PUMPS: 2-National 7-P-50
6 1/4" X 7 3/4" Tri Plex
DP.: 4 1/2" OD
DC.: 8 1/4" OD
DEPTH IN FT. KB
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
900
FRANKLIN MTN.
SALINE R. UPPER
SALINE R. SALT
MT. CAP UPPER
MT. CAP LOWER
OLD FT. ISLAND
SHALER-PRECAMBRIAN
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
ELAPSED DAYS
1B OWV-J
1A R77SG
2A J33
3A HT50
3B S2H5
2A-RR J33-RR
5A J55R
6A M84F
7A M84F
8A J33
8A-RR J55
9R J33
10A J55R
1-RR JD7
2 JD7
3 J55R
1C J33
2C J55

# DRILLING CURVE DATA

## FORWARD ET AL IZOK M-20

1 Well spudded February 15, 1983 at 2000 hours

2 Blew kelly and all mud lines, mix mud

3 Bearings seized on Grant head

4 Hole making water

5 Change hole to mud

6 Lost circulation

7 Drilling ahead blind

8 Plugged bit, wash and ream to bottom

9 Attempt to log, hit bridge

10 Log

11 Wait on water

12 Wait on water, unload hole

13 Conductor washed out, run small diameter pipe, attempt to cement, attempt to run casing, run 244.5 mm casing and WOC

14 Pump permafrost cement, repair leaks - all lines frozen, pressure test - repair choke and valve, log, ream with air and foam

15 Run 177.8 mm liner, WOC and pressure test, log

16 T.D. at 1115 hours March 29, 1983

17 Log and run plugs

18 Rig Release April 1, 1983 at 1400 hours

## SECTION VI

## DAILY DRILLING REPORTS

Winterhawk



# CHRONOLOGICAL HISTORY

WELL Forward et al Izok LOCATION M-20

ENGINEER J. Aldridge

| DATE | WORK DESCRIPTION |
|---|---|
| 83-01-31 | Worked on drawworks and light plant. Assembled crown section of derrick. Continued laying polyethrene, insulation and matting. Located all pins and braces to assemble derrick. Spotted substructure. Built berm around tank farm and installed liner. Laid 3 x 12 to spot tanks. Offloaded 18 joints 9-5/8" casing and 7 joints 13-3/8" casing. Further 4 loads (47 joints) of 9-5/8" casing en route to Izok. |
| 83-02-01 | Assembled derrick and strung drilling lines. Installed dog house and shaker tank (mud tank #1). Spotted 2 - 400 bbl tanks (fuel storage) in tank farm.<br>Weather: -62° C, Calm |
| 83-02-02 | Spotted #2 mud tank. Erect Norseman Shelter. Unloaded trucks, casing etc. Unable to pin derrick due to cold weather. 50% rigged up.<br>Weather: -70° C, Calm |
| 83-02-03 | Erecting Norseman Shelter. Will build Norseman Shelter 50' x 48' instead of 50' x 80' due to lack of space at rear of rig. 2 Halliburton. 2 Air Drilling Services, and 1 Norseman Shelter supervisor arrived today to rig up and check out their equipment. |
| 83-02-04 | Finished erecting Norseman Shelter (50' x 48'). Waited on truck convoy from Norman Wells. |
| 83-02-05 | Unloaded trucks. Started checking out Halliburton cementing unit. Repaired (welded) monkey board section of derrick. Repaired water truck (rear end). Unable to continue rig up today due to lack of trucks with gin poles and/or pickers. DC-3 arrived with: 1. Power Tong Unit. 2. 1 - 4" Fisher Pump and Hoses, 3. Bit Sub (7-5/8 reg) and Pick Up Sub for 9" Drill Collars. |

# CHRONOLOGICAL HISTORY

WELL Forward et al Izok LOCATION M-20

ENGINEER J. Aldridge

| DATE | WORK DESCRIPTION |
|---|---|
| 83-02-06 | Checked out Halliburton unit. Started 1 motor. Mounted drawworks on substructure. Completed assembling derrick, should pin tomorrow. Received 1 new John Deere heater on DC-3. Towed 1 Delta Commander in to Izok (motor problems). 1 Delta III down with broken walking beam. Had trouble with tubeless tires on 966 loader (popping beads). Bearspaw Mud Logging Unit arrived on location in rough shape. Tools missing from outside wall. Also supplies box had been opened. 50% rigged up.<br>Weather: -40° C, Calm. |
| 83-02-07 | Raised "A" legs. Pinned derrick. Pinned monkey board in place. Spotted cat walk. Spotted 2 pump houses. Spotted 2 boiler houses. Spotted air drilling unit. Spotted Halliburton Unit. Rigged up 75%. Fuel on location: diesel - 420 bbl, JP4 - 4 bbl, gasoline - 8 bbl. Started building new "Herc Strip" closer to rig. 5000' long x 165' wide. Ice is 40" deep.<br>Weather: -35° C, Sunny. |
| 83-02-08 | Started light plant and fired up boiler #1. Strung electricity cords for rig lights etc. Laid water, steam and fuel lines. Started rigging up floor pre-fabs. Completed rigging up and checking out Halliburton cementing unit. Start rigging up air drilling services equipment. Transferred fuel from 400 bbl tank at camp to tank farm. Moved 400 bbl tank from camp to tank farm. Broke tour today. 80% rigged up. Herc strip 90% ready. Worked on repairing motor in Commander #101. Land use people (C.O.G.L.A.) inspected location and camp area. All O.K.<br>Weather: -35° C, Clear, Wind, North at 5 mph. |

# CHRONOLOGICAL HISTORY

WELL Forward et al Izok LOCATION M-20

ENGINEER J. Aldridge

| DATE | WORK DESCRIPTION |
|---|---|
| 83-02-09 | Assembled low pressure mud system. Installed pump belts and hooked up pump suctions. Warmed up rig motors with Herman Nelson heater. Repaired (weld) one "A" leg. Started floor motors. Prepared to and raised derrick at 1800 hrs. Work on drawworks. Requires rotary seal. Rigged up floor prefabs and mud tank prefabs. Worked on hydraulic lines. 90% rigged up. Worked on herc. strip with drag. Ice 42" deep. |
| 83-02-10 | Rigged up mud tank prefabs. Rigged up standpipe. Worked on flowline. Installed stroke counters. Rigged up Totco recorder. Installed P.V.T. and RPM gauge (rotary table). Spotted pipe tubs and pipe racks. Dug flare pit. Installed BOP in rack in substructure. Spotted Bearspaw mud logging unit. Build berm around #3 tank in tank farm. Herc strip will be finished 83-01-11, 0800 a.m. 95% rigged up. Will not spud tomorrow due to having to wait on rotary seal (will be delivered Monday). Drill mouse hole and rat hole with air. Herc strip is 1.7 km at rig site: 5500' long, 180' wide. Ice 42" deep. |

**Camp Occupants:**

| | | | |
|---|---|---|---|
| 300 Drilling | 12 | Howco | 2 |
| Inter Air Drilling | 2 | Mottco | 2 |
| Safety Boss | 1 | Hofam | 3 |
| Comms | 2 | Quinn | 2 |
| Arctic 0 | 1 | Water Hauler | 1 |
| Arnco 966 op | 1 | Bald Headed Eagle of North | 1 |

**Total 30**

# CHRONOLOGICAL HISTORY

WELL Forward et al Izok LOCATION M-20

ENGINEER J. Aldridge

| DATE | WORK DESCRIPTION |
|---|---|
| 83-02-11 | Rigged up flare lines and degasser lines. Rigged up "make up" tong torque system. Steamed out mud system. Installed rotary seal in rotary table. Rigged up floor and picked up kelly. Rigged up Bearspaw Mud Logging Unit. Rigged up to drill mouse hole and rat hole with air. Started drilling mouse hole. Maintaining "Herc" strip with water truck and 966 loader pulling drag. Quinn D6 maintaining road to herc strip. Make up of lake water: Calcium - trace; Chlorides - 200 ppm. Will be 100 % rigged up when mouse hole and rat hole drilled.<br>Weather: - 30° C, Clear, Wind North at 5 kph |
| 83-02-12 | Drilled mouse hole with air - 16 hours. Drilling rat hole with air - 8 hours.* Maintaining road to herc strip with cat and water truck.<br>Weather: -27° C, Clear, Wind North at 5 kph |
| 83-02-13 | Drilling rat hole - 24 hours. Started drilling rat hole with 12-1/2" bit. Very slow progress so changed to drilling rat hole with 7-7/8" bit. (Piloting). Progress still slow.*<br>Weather: -10° C, 6 - 8" snow, Wind varies at 5 kph. |
| * | Note: Due to unavailability of Poor Boy rat hole digger or other means of rotating, rig floor tongs were used to rotate drill string to drill mouse hole and rat hole. |

Winterhawk

PAGE _____

## CHRONOLOGICAL HISTORY

WELL Forward et al Izok LOCATION M-20

ENGINEER J. Aldridge

| DATE | WORK DESCRIPTION |
|---|---|
| 83-02-14 | Finished piloting rathole (200 mm). Blew rat hole clean. Reamed pilot hole to 311.2 (2 m to go). Stockpiled drilling equipment and materials on location. Two D-6 cats maintained otter strip, road to herc strip and herc strip.<br>Weather: -45° C, Clear, Wind E at 5 mph. |
| 83-02-15 | Finished reaming 200 mm rat hole to 311.2 mm. D6 worked on otter strip and road to herc strip. Blade and drag herc strip. Quinn and Arctic Circle cats (D-7) was clearing access road to Anderson location. C.O.G.L.A. land use agency made inspection - all o.k. One Delta 3 down at location. One Delta 3 and one Commander was returning to Hare Indian River on fuel haul. Two high boys and one low boy with D-7 cat was returning to Norman Wells.<br>Note: Spudded in at 2000 hrs, 83-02-15. Losing circulation to sump through cracks in ground created by blasting sump.<br>Weater: -45° C, Clear, Wind N at 5 mph. |

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING
1983 02 16 2000
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 1 DEPTH 35 METRES LAST 24 HRS. 35 ROTATING HRS. 13.75

ACTIVITY AT REPORT TIME Wait on cement (conductor pipe)

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT

WT. 1040 VIS 47 WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | 444.5 | HW OWV-J | XV0789 | 3000 | 100 | 35 | 35 | 13.75 | 13.75 | 2.56 | 1 | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | 14.3 | 14.3 | 14.3 | 196 | 100 | 139.7 | .908 | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

1/4 °at 35 m _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

## MUD & CHEMICALS ADDED

Gel - 76 sxs _____

Caustic - 2 sxs _____

Quickseal - 20 sxs _____

Sawdust - 110 sxs _____

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit Sub | | | | |
| 2 DCs | | 229 | | |
| Crossover sub | | | | |
| 1 DC | | 158 | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 13.75 | 13.75 |
| 2. TRIPS | .75 | .75 |
| 3. RIG SERVICE | | |
| 4. DEVIATION SURVEY | | |
| 5. REAM & COND. HOLE | | |
| 6. MIX & COND. MUD | | |
| 7. CIRCULATING | | |
| 8. RIG REPAIR | | |
| 9. RUN CASING & CEMENT | 3.5 | 3.5 |
| 10. FISHING | | |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON | 3.0 | 3.0 |
| 15. NIPPLE UP & TEST BOP | | |
| 16. DRILLING OUT | | |
| 17. LOSS CIRC | 3.0 | 3.0 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | |
| 20. RIG UP - TEAR OUT | | |
| 21. | | |
| TOTALS | 24 | 24 |

## COSTS

DAILY

CUM.

SUPERVISOR J. Aldridge

PLEASE TURN OVER

OPERATIONS DETAILS: PERIOD ENDING 1983 02 16 0800
Year · Month · Day · Time

Spud 444.5 mm conductor hole. Drill to 16 m. Lost circulation to sump through cracks created by blasting sump. Mixed loss circulation material. Drill ahead to 35 m. Survey and pull out of hole. Rig to and run 3 joints, 339.7 mm casing, 36.08 m (Ipsco H-40, 71.43 kg/m). Cemented with 1 $m^3$ water ahead and 7.4 t perma frost 5.48 $m^3$ slurry volume at density of 1880 $kg/m^3$. 100% excess. Displaced with 2.62 $m^3$ water. Cement displaced at 1983-02-16 at 1655 hrs. Good returns throughout job. Approximately 1.1 $m^3$ cement returns. Landed casing at 35 m KB. WOC.

Personnel on location - 38

Geology 0 - 33 m Unconsolidated granite wash.

Spudded 2000 hours 83 02 15

WANT LIST:

WEATHER - 40° C Clear N@ 10 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
1983 02 17 2000
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 2 DEPTH 35 m METRES LAST 24 HRS. 0 ROTATING HRS. 3

ACTIVITY AT REPORT TIME Weld on air manifold from blooie line to shale shaker.

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. 1030 VIS 45 WL. ____ GELS ____ % SOLIDS ____ PV ____ YP ____ pH 9.5

% OIL ____ %SAND ____ CAKE ____ PPMCL ____ PPMCa ____

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL CONC T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 311.2 | H77SG | 940765 | 2 | 45 | Drill Out 3.52 m cement | | | | | IN | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Open | Open | Open | 196 | 75 | 139.7 | .908 | Drill | out cement. | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

Nil °at Nil ____ °at ____

____ °at ____ ____ °at ____

____ °at ____ ____ °at ____

____ °at ____ ____ °at ____

## MUD & CHEMICALS ADDED

Nil

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | | |
| Bit Sub | | | | |
| Drill Collars (2) | | 229 | | |
| Crossover Sub | | | | |
| Drill Collars (1) | | 158 | | |
| | | | | |
| | | | | |
| | | | | |

## COSTS

| | |
|---|---|
| DAILY | |
| CUM. | |

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 13.75 |
| 2. TRIPS | | .75 |
| 3. RIG SERVICE | | |
| 4. DEVIATION SURVEY | | |
| 5. REAM & COND. HOLE | | |
| 6. MIX & COND. MUD | | |
| 7. CIRCULATING | | |
| 8. RIG REPAIR | | |
| 9. RUN CASING & CEMENT | | 3.5 |
| 10. FISHING | | |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | 5 | 8 |
| 15. NIPPLE UP & AIR HEAD | 16 | 16 |
| 16. DRILLING OUT | 3 | 3 |
| 17. LOSS CIRC. | | 3 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | |
| 20. RIG UP - TEAR OUT | | |
| 21. | | |
| TOTALS | 24 | 48 |

PLEASE TURN OVER

OPERATIONS DETAILS: PERIOD ENDING 1983 02 17 2000
Year · Month · Day · Time

Wait on cement. Slack off, cut casing and weld on adapter flange. Install Grant 13-5/8" rotating head. Weld and install blooie line. Build air manifold to blooie line and shaker box. Run in hole. Break circulation and drill out cement from 31.48 mKB to 35 mKB with water. (Drilled .5 m new hole). Blew kelly and all mud lines. Dumped and cleaned shaker tank and suction tank. Continued welding on air manifold. Filled tanks with fresh water and started mixing drilling mud. When welding is finished on air manifold, will blow hole dry with air and attempt to air drill due to fracturing caused by blasting of sump.

Personnel on Location - 38.

WANT LIST:

WEATHER -37° C Clear N@ 5 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

1983 02 18 2000

Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 3 DEPTH 67 m METRES LAST 24 HRS. 32 ROTATING HRS. 8.75

ACTIVITY AT REPORT TIME Drill ahead - control drilling.

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. 1030 VIS 45 WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH 9

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL CONC T | DULL CONC B | DULL CONC G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 311.2 | Sec. H77SG | 940765 | 2/6 | 80 | 49 | 14 | 2.5 | 2.5 | 5.6 | 6 | 1 | [illegible] |
| 2 | 311.2 | HW J-33 | 72846 | 5/6 | 60/45 | IN | 18 | 6.25 | 6.25 | 2.9 | R | U | [illegible] |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| 2 | 12.7 | 12.7 | 12.7 | Air @ 43 $m^3$/minute. Mist ratio 7.6 L soap/2.4 L water/minute. | | | | | | | | |

## DEVIATION SURVEYS

7 °at 65 m (misrun) °at _____

°at _____ °at _____

°at _____ °at _____

°at _____ °at _____

## MUD & CHEMICALS ADDED

Gel - 22 sxs

Caustic - 1 sx

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | .28 | |
| Shock Sub | 71 | 229 | 4.58 | 1328 |
| Drill Collar (2) | 71 | 229 | 19.09 | 5536 |
| Crossover Sub | 71 | | .70 | |
| Drill Collars (4) | 60 | 158 | 37.29 | 5034 |
| | | | | |
| | | | | |
| | | | | |

## COSTS

DAILY

CUM.

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 8.75 | 22.5 |
| 2. TRIPS | 3.75 | 4.5 |
| 3. RIG SERVICE | .5 | .5 |
| 4. DEVIATION SURVEY | 3.25 | 3.25 |
| 5. REAM & COND. HOLE | | |
| 6. MIX & COND. MUD | | |
| 7. BLOW HOLE | 2 | 2 |
| 8. RIG REPAIR | | |
| 9. RUN CASING & CEMENT | | 3.5 |
| 10. FISHING | | |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | [illegible] |
| 15. NIPPLE UP AIR MANIFOLD | 5 | 21 |
| 16. DRILLING OUT | | [illegible] |
| 17. LOSS CIRC. | | [illegible] |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | |
| 20. RIG UP – TEAR OUT | | |
| 21. WORK TIGHT HOLE | .75 | .75 |
| TOTALS | 24 | [illegible] |

PLEASE TURN OVER

OPERATIONS DETAILS: PERIOD ENDING 1983 02 18 2000
Year · Month · Day · Time

Weld on air manifold. Blow hole dry. Drill with air. Work tight hole from 36 m to 42 metres. Mist drill. Tripped for bit. Picked up shock sub. Ran survey at 52 m - 7° (3 missruns). Drill ahead, survey at 65 m - 7°. Re-run survey 7°. Control drill with 2 daN bit weight and 65 RPM.

Personnel on location - 33.

Geological Description:

33 - 36 m Granite wash - unconsolidated.

36 - 42 m Very coarse to fine grained quartz sandstone partially cemented with Kaolinite and Siliceous cement - partially unconsolidated. Clear rounded quartz grains. Porosity to 25%.

42 - 66 m White to light gray chert shards, vuggy porosity 15%, some clear quartz crystals.

WANT LIST:

WEATHER -40° C. Clear N @ 10 ROAD Good & Improving

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING
1983-02-19 2000 hrs
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 4 DEPTH 77 METRES LAST 24 HRS. 10 ROTATING HRS. 16.25

ACTIVITY AT REPORT TIME Repairing Grant Rotating Head

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. 1030 VIS 45 WL. 11 GELS 5/20 % SOLIDS 0.032 PV 11 YP 6 pH 9

% OIL 0 %SAND 0.0020 CAKE 1.6 PPMCL 200 PPMCa 0.8

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 311.2 | J33 | 72846 | 1/2 | 90 | 72 | 23 | 2.75 | 9 | 2.6 | 2 | 1 | I |
| 3 | 311.2 | H77SG | 972283 | 2 | 85 | 76 | 4 | 9.75 | 9.75 | 0.41 | 7 | 2 | I |
| 4 | 311.2 | S21G | NX0799 | 2/6 | 85 | - | 1 | 3.75 | 3.75 | 0.27 | Inc. | | |

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 12.7 | 12.7 | 12.7 | Air 43 $m^3$/minute. Mist with 7.6 litres fluid/minute. | | | | | | | | |
| 3 | O P E N | | | | (10 litres soap to 2.4 $m^3$ water). | | | | | | | |
| 4 | 15.9 | 15.9 | 15.9 | | | | | | | | | |

1/8 °at 34 °at

1/4 °at 74 °at

°at °at

°at °at

## MUD & CHEMICALS ADDED

Gel - 30 sxs

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | 0.28 | |
| S.S. | 71 | 229 | 4.58 | 1328 |
| D.C. | 71 | 229 | 19.09 | 5536 |
| crossover | 71 | | 0.70 | |
| D.C. | 60 | 158 | 46.67 | 6300 |
| | | | | |
| | | | | |
| | | | | |

## COSTS

DAILY

CUM.

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 16.25 | 38.75 |
| 2. TRIPS | 2.75 | 7.25 |
| 3. RIG SERVICE | 0.75 | 1.25 |
| 4. DEVIATION SURVEY | 3.75 | 7 |
| 5. REAM & COND. HOLE | | |
| 6. MIX & COND. MUD | | |
| 7. CIRCULATING | | 2 |
| 8. RIG REPAIR | 0.50 | 0.50 |
| 9. RUN CASING & CEMENT | | 3.50 |
| 10. FISHING | | |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 8 |
| 15. NIPPLE UP & TEST BOP | | 21 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC. | | 3 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | |
| 20. RIG UP – TEAR OUT | | |
| 21. Tight Hole | | 0.75 |
| TOTALS | 24 | 96 |

PLEASE TURN OVER

OPERATIONS DETAILS: PERIOD ENDING 1983-02-19 2000 hrs
Year · Month · Day · Time

Air drill 311.2 mm hole. POOH to 34 m, survey, 4 misruns - good survey 1/8 degree. Finish out. Make up new bit, RIH, drill 311.2 mm hole, survey at 65 m 7-3/4 degrees misrun. Drill 311.2 m hole. POOH Bit #3 at 76 m. Make up Bit #4, RIH, drill 311.2 mm hole, survey at 74 m with new instruments, survey 1/4 degree. Work on Grant rotating head (bearings seized).

Personnel in camp same as Feb 18/83 - total 33.

Geological 66 to 77 m same as above.

WANT LIST:

WEATHER - 48 degrees C. Clear N @ 10 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
1983-02-20 2000 hrs
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 5 DEPTH 108 m METRES LAST 24 HRS. 31 ROTATING HRS. 18.25

ACTIVITY AT REPORT TIME Drilling Ahead

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION PIT:

WT. 1050 VIS 45 WL. 11 GELS 5/15 % SOLIDS 0.032 PV 10 YP 75 pH 8

% OIL Nil %SAND 0.0020 CAKE 1.6 PPMCL 200 PPMCa Nil

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL CONC. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4A | 311.2 | S21G | NXQ799 | 6 | 85 | 80 | 4 | 3.5 | 7.25 | 0.55 | 8 | 1 | I |
| 2A | 311.2 | | 72846 | 10 | 50 | 102 | 22 | 11.75 | 11.75 | 1.87 | 4 | 3 | I |
| 5 | 311.2 | J55R | 80558 | 10 | 50 | | 6 | 3 | 3 | 2 | | | |

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2A | 12.7 | 12.7 | 12.7 | 46 $m^3$/minute | Air Mist @ 12 litres/minute. | | | | | | | |
| 5 | OPEN | | | | | | | | | | | |

## DEVIATION SURVEYS

| | | | |
|---|---|---|---|
| ¼ ° at 83 | | ° at | |
| ¼ ° at 93 | | ° at | |
| ¼ ° at 102 | | ° at | |
| ° at | | ° at | |

## MUD & CHEMICALS ADDED

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | 0.28 | |
| SS | 71 | 229 | 4.58 | 1328 |
| DC 2 - 229 mm | 71 | 229 | 19.89 | 5536 |
| Crossover | 71 | | 0.70 | |
| DC 8 - 158 mm | 68 | 158 | | 10031 |
| | | | | |
| | | | | |
| | | | | |

## COSTS

| | |
|---|---|
| DAILY | |
| CUM. | |

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | C.M |
|---|---|---|
| 1. DRILLING | 18.25 | 57 |
| 2. TRIPS | 3.50 | 10.75 |
| 3. RIG SERVICE | 0.75 | 2 |
| 4. DEVIATION SURVEY | 1 | 8 |
| 5. REAM & COND. HOLE | 0.50 | 0.50 |
| 6. MIX & COND. MUD | | |
| 7. CIRCULATING | | 2 |
| 8. RIG REPAIR | | 0.5 |
| 9. RUN CASING & CEMENT | | 3.50 |
| 10. FISHING | | |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 8 |
| 15. NIPPLE UP & TEST BOP | | 21 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC. | | 3 |
| 18. LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | |
| 20 RIG UP – TEAR OUT | | |
| 21. Tight Hole | | 0.75 |
| TOTALS | 24 | 120 |

PLEASE TURN OVER

OPERATIONS DETAILS: PERIOD ENDING 1983-02-20 2000 hrs
Year · Month · Day · Time

Drill, trip for bit, drill, survey at 83 m - drill. Survey at 93 m - drill - survey at 102 m. Trip for bit (ream 4 m to bottom). Drill ahead at report time.

Personnel in camp same as Feb 19/83 - total 33.

Geology

0 - 36 m unconsolidated granite wash.

36 - 42 m coarse well rounded, partially unconsolidated sandstone, porosity to 30 PRCT - no show.

42 - 74 m - loose chert shards detrital zone.

Porosity to 20 PRCT - 0 no show.

74 - 108 m - dolomite very fine crystaline.

Trace porosity - interbedded chert - no show.

WANT LIST:

WEATHER - 25 degrees C. Clear N @ 10 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
1983- 02-21 2000 hrs
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 6 DEPTH 174 m METRES LAST 24 HRS. 66 ROTATING HRS. 22.75

ACTIVITY AT REPORT TIME Drill Ahead

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. 1050 VIS 45 WL. 11 GELS 5/12 % SOLIDS 0.032 PV 10 YP 7 pH 8

% OIL 0 %SAND 0.0020 CAKE 1.6 PPMCL 200 PPMCa Nil

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL CONC. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 311.2 | HW J55R | 88558 | 10/12 | 50 | Run | 72 | 22.75 | 25.75 | 2.8 | R | J | N |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | O P E N | | | 46 $m^3$ air/minute - 12 L/m Mist | | | | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

| | | | |
|---|---|---|---|
| 0 ° at 120 m | | ° at | |
| ¼ ° at 153 m | | ° at | |
| ° at | | ° at | |
| ° at | | ° at | |

## MUD & CHEMICALS ADDED

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | 0.28 | |
| SS | 71 | 229 | 4.58 | 1328 |
| 2 - 229 DC | 71 | 229 | 19.09 | 5536 |
| X/O | 71 | 158/229 | 0.70 | |
| 10 - 158 DC | 60 | 158 | 92.77 | 12523 |
| 1 jar | 60 | 158 | 4.21 | |
| 5 - 158 DC | 60 | 158 | 47.24 | 6377 |
| | | | | |

## COSTS

DAILY

CUM.

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 22.75 | 73.75 |
| 2. TRIPS | | 10.75 |
| 3. RIG SERVICE | 0.5 | 2.5 |
| 4. DEVIATION SURVEY | 0.75 | 3.75 |
| 5. REAM & COND. HOLE | | 0.5 |
| 6. MIX & COND. MUD | | |
| 7. CIRCULATING | | 2 |
| 8. RIG REPAIR | | 2.5 |
| 9. RUN CASING & CEMENT | | 3.5 |
| 10. FISHING | | |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | |
| 15. NIPPLE UP & Air Head | | 2 |
| 16. DRILLING OUT | | |
| 17. LOSS CIRC. | | |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | |
| 20 RIG UP - TEAR OUT | | |
| 21. Tight Hole | | .75 |
| TOTALS | 24 | 122 |

PLEASE TURN OVER

OPERATIONS DETAILS: PERIOD ENDING 83-02-21 2000 hrs
Year · Month · Day · Time

Drill - run wire line survey - drill ahead.

Personnel in camp - 33

Geological Report

108 - 174 m - fine to medium crystaline dolomite - euhedral quartz and calcite - vuggy porosity 5 to 15%.

Inferred - no shows.

WANT LIST:

WEATHER - 21 degrees C Winds N @ 5 MPH ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83 02 22 2000
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 7 DEPTH 209 METRES LAST 24 HRS. 35 ROTATING HRS. 16

ACTIVITY AT REPORT TIME RIH with Bit 6A

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. 1050 VIS 53 WL. 9.5 GELS 7/20 % SOLIDS .032 PV 15 YP 10 pH 8

% OIL 0 %SAND .0020 CAKE 1.6 PPMCL 200 PPMCa 0

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5A | 311.2 | J55R | 88558 | 12 | 50 | 209 | 107 | 16 | 41.75 | 2.56 | 3 | 3 | I |
| 6A | 311.2 | M54F | 149174 | 20 | 50 | Tripping In | | | | | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5A | open | | | 46 $m^3$ Air, 12L/min Mist | | | | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

0 °at 181 °at

1/2 °at 209 °at

°at °at

°at °at

## MUD & CHEMICALS ADDED

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | 0.28 | |
| SS | 71 | 229 | 4.58 | 1328 |
| 2 DC | 71 | 229 | 19.09 | 5536 |
| X-Over | 71 | 158/229 | .70 | |
| DC | 60 | 158 | 9.52 | 1285 |
| Jar | 60 | 158 | 4.21 | |
| DC | 60 | 158 | 180.01 | 18901 |
| 1-H-WT | | | 18.69 | |
| | | | | |

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 16 | 95.75 |
| 2. TRIPS | 2.75 | 13.50 |
| 3. RIG SERVICE | .25 | 2.75 |
| 4. DEVIATION SURVEY | .50 | 9.25 |
| 5. REAM & COND. HOLE | | .50 |
| 6. MIX & COND. MUD | | |
| 7. CIRCULATING | | 2 |
| 8. RIG REPAIR | | 0.5 |
| 9. RUN CASING & CEMENT | | 3.50 |
| 10. FISHING | | |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 8 |
| 15. NIPPLE UP & TEST BOP | 4.50 | 25.5 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC. | | 3 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | |
| 20. RIG UP · TEAR OUT | | |
| 21. Tight Hole | | 0.75 |
| TOTALS | 24 | 166 |

## COSTS

DAILY

CUM.

SUPERVISOR J. Aldridge

PLEASE TURN OVER

OPERATIONS DETAILS: PERIOD ENDING 83 02 22 2000
Year - Month - Day - Time

Drilled ahead - changed stripper rubber in rotating head. Survey @ 181 m.
Drill - survey @ 209 m - POH Bit #5. Change out rotating head - RIH Bit #6
at report time.

Personnel - 32

Geology Report
174 - 209 m Same as above.

WANT LIST:

WEATHER -20° Clear N @ 5 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83 02 23 2000
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 8 DEPTH 247 METRES LAST 24 HRS. 38 ROTATING HRS. 16.5

ACTIVITY AT REPORT TIME Cleaning To Bottom

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. 1050 VIS 51 WL. 9.5 GELS 7/20 % SOLIDS .032 PV 20 YP 10 pH 8

% OIL 0 %SAND .0020 CAKE 1.6 PPMCL 200' PPMCa 0

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6A | 311.2 | M84F | 149174 | 14 | 50 | | 38 | 16.5 | 16.5 | 2.30 | | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6A | OPEN | | | 46 $m^3$ | Air | | | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

1/8 ° at 218 ° at

1/8 ° at 237 ° at

° at ° at

° at ° at

## MUD & CHEMICALS ADDED

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | .28 | |
| SS | 71 | 229 | 4.58 | 1328 |
| DC 2 | 71 | 229 | 19.09 | 5536 |
| X-Over | 71 | 158/229 | .70 | |
| DC 1 | 60 | 158 | 9.52 | 1285 |
| Jar | 60 | 158 | 4.21 | |
| DC 15 | 60 | 158 | 140.01 | 18901 |
| 3-H-Wt. | | | 27.97 | |

## COSTS

DAILY

CUM.

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | C.M |
|---|---|---|
| 1. DRILLING | 16.5 | 1[illegible].25 |
| 2. TRIPS | 4.75 | [illegible].25 |
| 3. RIG SERVICE | .75 | [illegible].50 |
| 4 DEVIATION SURVEY | .75 | [illegible] |
| 5. REAM & COND. HOLE | 1.25 | [illegible].75 |
| 6. MIX & COND. MUD | | |
| 7. CIRCULATING | | 2 |
| 8. RIG REPAIR | | [illegible].5 |
| 9. RUN CASING & CEMENT | | [illegible].50 |
| 10. FISHING | | |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON | | [illegible] |
| 15. NIPPLE UP & TEST BOP | | [illegible].5 |
| 16. DRILLING OUT | | [illegible] |
| 17 LOSS CIRC. | | [illegible] |
| 18 LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | |
| 20 RIG UP · TEAR OUT | | |
| 21 Tight Hole | | .75 |
| TOTALS | 24 | [illegible] |

PLEASE TURN OVER

OPERATIONS DETAILS: PERIOD ENDING 83 02 23 2000
Year · Month · Day · Time

Finish running in with Bit #6 - drill - survey @ 218 m - drill - survey @ 237 m - POH plugged bit. Checked bit and RIH. Clean to bottom at report time.

GEOLOGY REPORT - 209 - 247

Dolomite, finely crystaline, vuggy porosity to 5 pct., minor chert zone, no shows.

WANT LIST:

WEATHER -21° Clear N @ 10 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83 02 24 2000
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 9 DEPTH 277 METRES LAST 24 HRS. 30 ROTATING HRS. 14.75

ACTIVITY AT REPORT TIME Drilling Ahead

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. 1050 VIS 48 WL. 95 GELS 5/18 % SOLIDS .032 PV 12 YP 8 pH 8

% OIL Nil %SAND .0020 CAKE 1.6 PPMCL 200 PPMCa 0

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL CONC T | DULL CONC E | DULL CONC G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6A | 311.2 | M84F | 149174 | 14/16 | 50 | 266 | 57 | 7.75 | 24.25 | 2.35 | Dropped | | |
| 7A | 311.2 | M84F | 149172 | 16 | 65 | - | 11 | 7 | 7 | 1.2 | Run | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6A | OPEN | | | 46 $m^3$ Air | 12L/min. Mist | | | | | | | |
| 7A | OPEN | | | same | | | | | | | | |

## DEVIATION SURVEYS

____ °at ____ ____ °at ____

____ °at ____ ____ °at ____

____ °at ____ ____ °at ____

____ °at ____ ____ °at ____

## MUD & CHEMICALS ADDED

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | .28 | |
| SS | 71 | 229 | 4.58 | 1328 |
| DC 2 | 71 | 229 | 19.09 | 5536 |
| X-Over | 71 | 158/229 | .70 | |
| Float Sub | | | .54 | |
| DC 10 | 60 | 158 | 92.77 | 12524 |
| Jar | 60 | 158 | 4.35 | |
| DC 6<br>3 Heavy Weight | 60 | 158 | 56.76<br>27.97 | 7663 |

## COSTS

DAILY

CUM.

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 14.75 | 12[illegible] |
| 2. TRIPS | | 13.25 |
| 3. RIG SERVICE | .50 | [illegible] |
| 4. DEVIATION SURVEY | | [illegible] |
| 5. REAM & COND. HOLE | 1.50 | 3.25 |
| 6. MIX & COND. MUD | | |
| 7. CIRCULATING | | 2 |
| 8. RIG REPAIR | | [illegible].5 |
| 9. RUN CASING & CEMENT | | 3.50 |
| 10. FISHING | 7.25 | 7.25 |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | [illegible] |
| 15. NIPPLE UP & TEST BOP | | 25.5 |
| 16. DRILLING OUT | | [illegible] |
| 17. LOSS CIRC. | | [illegible] |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | |
| 20. RIG UP - TEAR OUT | | |
| 21 Tight Hole | | [illegible].75 |
| TOTALS | 24 | 2[illegible] |

PLEASE TURN OVER

OPERATIONS DETAILS: PERIOD ENDING 83 02 24 2000
Year · Month · Day · Time

Drilled. Bit plugged while making connection. POH 1 stand. Jars fired while drill pipe in slips. Drill pipe dropped ± 20 m to 34 m off bottom. RIH and screwed into fish, chained out. Lay down jars - split in mandrel body - finish out - checked SS - appears ok. Make up new bit, RIH pick up and make up new jar. RIH and clean 12 m to bottom. Drilling ahead at report time.

Geological Summary 247 - 278 m
Dolomite, microcrystaline, argillaceous pyritic, minor chert, shale, tight
no shows, sandstone cavings.

WANT LIST:

WEATHER -19° C. Light Snow N @ 5 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING

83-02-25 2000 hrs
Year Month Day Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 10 DEPTH 341 m METRES LAST 24 HRS. 64 ROTATING HRS. 22.75

ACTIVITY AT REPORT TIME Drill Ahead

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT 1050 VIS 47 WL 9 GELS 5/20 % SOLIDS 0.032 PV 12 YP 7 pH 8

% OIL 0 %SAND 0.0025 CAKE 1.6 PPMCL 200 PPMCa 0

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7A | 311.2 | M84F | 149172 | 16 | 55 | RUN | 75 | 22.75 | 29.75 | 2.52 | INCOMPLETE | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO | JETS - mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7A | OPEN | | | | | | | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

| | | | |
|---|---|---|---|
| 1/4 ° at 261 m | | ° at | |
| 1/8 ° at 290 m | | ° at | |
| ° at | | ° at | |
| ° at | | ° at | |

## MUD & CHEMICALS ADDED

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | 0.28 | |
| Shock Sub | 71 | 229 | 4.58 | 1328 |
| 2 DC | 71 | 229 | 19.09 | 5536 |
| X/O Sub | 71 | 158/229 | 0.70 | |
| Float Sub | | | 0.54 | 12525 |
| 10 DC | 60 | 158 | 92.77 | |
| 1 - Jar | 60 | 158 | 4.35 | 7663 |
| 6 DC | 60 | 158 | 56.76 | |

3 - Heavy Weight COSTS 27.98

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 22.75 | 149.75 |
| 2. TRIPS | | 18.25 |
| 3. RIG SERVICE | 0.75 | 4.75 |
| 4. DEVIATION SURVEY | 0.5 | 10.5 |
| 5. REAM & COND. HOLE | | 3.25 |
| 6. MIX & COND. MUD | | |
| 7. CIRCULATING | | 2 |
| 8. RIG REPAIR | | 0.5 |
| 9. RUN CASING & CEMENT | | 3.5 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | |
| 12. Coring | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 8 |
| 15. NIPPLE UP & Air Head | | 25.5 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC. | | 3 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | |
| 20. RIG UP - TEAR OUT | | |
| 21. Tight Hole | | 0.75 |
| TOTALS | 24 | 240 |

PLEASE TURN OVER

OPERATIONS DETAILS: PERIOD ENDING 83-02-25 2000 hrs
Year · Month · Day · Time

Drill - survey - drill (hole is making 1 barrel water/min.) Survey at 290 m.

Personnel in camp - 33

Geological Summary:

276 - 339 m Dolomite Microcrystaline to very fine crystaline, partially medium to a coarsely crystaline, pyritic, trace chert partially argillaceous, trace shale, trace intercrystaline porosity, no shows, sandstone cavings.

WANT LIST:

WEATHER - 40 Degrees C Clear North Wind 5 mph ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING

83-02-26 2000 hrs
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 11 DEPTH 380 m METRES LAST 24 HRS. 39 ROTATING HRS. 17

ACTIVITY AT REPORT TIME Drill

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION PIT:

WT 1050 VIS 40 WL 9.5 GELS 3/12 % SOLIDS 0.032 PV 10 YP 5 pH 7.5

%OIL 0 %SAND 0.0025 CAKE 1.6 PPMCL 0200 PPMCa 0

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7A | 311.2 | M84F | 149172 | 16 | 55 | RUN | 114 | 17 | 46.75 | 2.44 | INCOMPLETE | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7A | OPEN | | | 48 $m^3$ Air + 12 litre/minute Mist | | | | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

°8 °at 318 m ____ °at ____

____ °at ____ ____ °at ____

____ °at ____ ____ °at ____

____ °at ____ ____ °at ____

## MUD & CHEMICALS ADDED

Caustic Soda - 1 sack

Sawdust - 164 sacks

Quickseal - 30 sacks

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | 0.28 | |
| Shock Sub | 71 | 229 | 4.58 | 1328 |
| 2 DC | 71 | 229 | 19.09 | 5536 |
| X/O Sub | 71 | 158/229 | 0.70 | |
| Float Sub | | | 0.54 | |
| 10 DC | 60 | 158 | 92.77 | 12524 |
| 1 - Jar | 60 | 158 | 4.35 | |
| 6 DC | 60 | 158 | 56.76 | 7663 |

Heavy Weights COSTS 27.97

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 17 | 166.75 |
| 2. TRIPS | | 18.25 |
| 3. RIG SERVICE | 0.5 | 5.25 |
| 4. DEVIATION SURVEY | | 10.5 |
| 5. REAM & COND. HOLE | 2 | 5.25 |
| 6. MIX & COND. MUD | | |
| 7. CIRCULATING | | 2 |
| 8. RIG REPAIR | | 0.5 |
| 9. RUN CASING & CEMENT | | 3.5 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 8 |
| 15. NIPPLE UP & TEST BOP | 4.5 | 30 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC. | | 3 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | |
| 20. RIG UP – TEAR OUT | | |
| 21 Tight Hole | | 0.75 |
| TOTALS | 24 | 264 |

OPERATIONS DETAILS: PERIOD ENDING 83-02-26 2000 hrs
Year - Month - Day - Time

Drill - run blooie line to sump-drill - survey at 318 m. Work on air head - rear to bottom - drill at report time - water increased from 1 Bbl per minute to 6 Bbl's per minute - will mud up.

Personnel in camp - 37 same as previous - add 2 Arnco
" 1 Midwest
" 1 Land USA

Geological Summary:
339 - 378 m
Dolomite - white - Light to dark brown - micro cyrstaline to very fine crystaline pyritic, trace light grey shale, sandstone.

WANT LIST:

WEATHER - 38 Degrees C North Wind at 5 mph ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
83-02-27 2000 hrs
Year · Month Day · Time

WELL NAME Forward et al Izok LOCATION M20

DAY 12 DEPTH 398 m METRES LAST 24 HRS. 18 ROTATING HRS. 12.25

ACTIVITY AT REPORT TIME Drill Ahead

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION PIT:

WT 1050 VIS 50 WL 14.5 GELS 4/14 % SOLIDS 0.032 PV 14 YP 6 pH 9.7

% OIL 0 %SAND 0.0025 CAKE 1/6 PPMCL 200 PPMCa 0

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7A | 311.2 | M84F | 149172 | 16 | 55 | 380 | 114 | 0 | 46.75 | 2.44 | 2 | 2 | 1 |
| 8A | 311.2 | J33 | 72848 | 18 | 60 | RUN | 18 | 12.25 | 12.25 | 1.47 | INCOMPLETE | | |

## CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | m3/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7A | | | | | | 152 (1) | | | | | | |
| 8A | 15.9 | 15.9 | 15.9 | 197 | 2/75 ea | 140 (2) | 1.576 | 24 | 28/43 | 44 | - | 2300 |

## DEVIATION SURVEYS

| | | | |
|---|---|---|---|
| 0 °at 371 m | | °at | |
| °at | | °at | |
| °at | | °at | |
| °at | | °at | |

## MUD & CHEMICALS ADDED

Quikseal - 11
Gel - 69
Caustic - 3

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | 0.28 | - |
| SS | 71 | 229 | 4.58 | 1328 |
| 2 DC | 71 | 229 | 19.09 | 5536 |
| X/O | 71 | 158/279 | 0.70 | - |
| 1 DC | 60 | 158 | 9.52 | 1285 |
| 1 - Jars | 60 | 158 | 4.21 | - |
| 15 DC | 60 | 158 | 140.01 | 18901 |
| 3 HWT | | 114 | 27.97 | |

## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 12.25 | 179 |
| 2. TRIPS | 7 | 25.25 |
| 3. RIG SERVICE | 0.5 | 5.75 |
| 4. DEVIATION SURVEY | 0.25 | 10.75 |
| 5. REAM & COND. HOLE | 0.5 | 5.75 |
| 6. MIX & COND. MUD | 0.5 | 0.50 |
| 7. CIRCULATING | | 2 |
| 8. RIG REPAIR | | 0.50 |
| 9. RUN CASING & CEMENT | | 3.5 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 8 |
| 15. NIPPLE UP & Air Head | 3 | 33 |
| 16. DRILLING OUT | | 3 |
| 17 LOSS CIRC. | | 3 |
| 18 LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | |
| 20 RIG UP - TEAR OUT | | |
| 21 | | 0.75 |
| TOTALS | 24 | 288 |

OPERATIONS DETAILS: PERIOD ENDING 83-02-27 2000 hrs

Year · Month · Day · Time

Displace 16 $m^3$ drilling mud - 70 $kg/m^3$ LCM on bottom. POH, make up new bit, RIH to 30 m. Fill hole from 35 m with drilling mud 70 $kg/m^3$ LCM. Change over air manifold to shale shaker. RIH, break circulation at 3 stand intervals. Ream to bottom 15 m fill. Ran wireline survey at 371 m. Drill using #1 pump at 80 spm (0.848 $m^3$/minute). Run 2 pumps after 4 hours - no losses. Circulate out LCM - drill ahead.

Personnel - 35

Geology 378 - 396 m Dolomite light grey brown.
Micro Crystaline to very fine crystaline
Tight in part slightly calcareous.
Shaley trace dark grey fissile micaceous shale.
Chert, sandstone and pyrite cavings - no shows.

WANT LIST:

WEATHER - 37 Degrees C Calm ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING

83-02-28 0800 hrs

Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 13 DEPTH 404 m METRES LAST 12 HRS. 6 ROTATING HRS. 5.25

ACTIVITY AT REPORT TIME Lost circulation at 404 m

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT 1050 VIS 50 WL. GELS % SOLIDS PV YP pH 9

% OIL %SAND CAKE PPMCL PPMCa

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8A | 311.2 | J33 | 72848 | 18 | 60 | RUN | 24 | 5.25 | 17.5 | 1.37 | INC | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8A | 15.9 | 15.9 | 15.9 | | 75 | 152/140 | 1.56 | 24 | 28 | 44 | | 2300 |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

## MUD & CHEMICALS ADDED

Sawdust - 292

Quikseal - 112

Caustic - 2

Lime - 2

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| same | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 5.25 | 184.25 |
| 2. TRIPS | | 25.25 |
| 3. RIG SERVICE | | 5.75 |
| 4. DEVIATION SURVEY | | 10.75 |
| 5. REAM & COND. HOLE | | 5.75 |
| 6. MIX & COND. MUD | | 0.50 |
| 7. CIRCULATING | | 2 |
| 8. RIG REPAIR | | 0.5 |
| 9. RUN CASING & CEMENT | | 3.5 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 8 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16. DRILLING OUT | | 3 |
| 17 LOSS CIRC. | 6.75 | 9.75 |
| 18. LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | |
| 20 RIG UP – TEAR OUT | | |
| 21 | | 0.75 |
| TOTALS | 12 | 300 |

OPERATIONS DETAILS: PERIOD ENDING 83-02-28 0800 hrs

Year · Month · Day · Time

Drill - lost circulation at 404 m. Mix and pump LCM - hole static at report time.

NOTE: Changed report time to 0800 hours from 2000 hours.

WANT LIST:

WEATHER - 45 Degrees C Wind N at 10 mph ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83 03 01 0800
Year Month Day Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 14 DEPTH 424 METRES LAST 24 HRS. 20 ROTATING HRS. 12.50

ACTIVITY AT REPORT TIME Lost Circulation at 424 m

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT 1020 VIS 50 WL. GELS % SOLIDS PV YP pH 9.5

% OIL %SAND CAKE PPMCL PPMCa

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8A | 311.2 | J33 | 72848 | 16 | 60 | | 44 | 12.50 | 30 | 1.47 | | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO | JETS - mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8A | 15.9 | 15.9 | 15.9 | 197 | 100 | 152 | 1.060 | 16 | 19/30 | | | 2000 |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

1¼ ° at 399 ° at

° at ° at

° at ° at

° at ° at

## MUD & CHEMICALS ADDED

| | | | |
|---|---|---|---|
| Gel | 23 | Lime | 1 |
| Caustic | 3 | | |
| Sawdust | 289 | | |
| QuikSeal | 138 | | |

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Same | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 12.50 | 196.75 |
| 2. TRIPS | | 25.25 |
| 3. RIG SERVICE | .75 | 6.50 |
| 4. DEVIATION SURVEY | .25 | 11 |
| 5. REAM & COND. HOLE | | 5.75 |
| 6. MIX & COND. MUD | | .50 |
| 7. CIRCULATING | | 2 |
| 8. RIG REPAIR | | 0.50 |
| 9. RUN CASING & CEMENT | | 3.50 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 8 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16 DRILLING OUT | | 3 |
| 17 LOSS CIRC | 10.50 | 20.25 |
| 18 LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | |
| 20 RIG UP TEAR OUT | | |
| 21 | | .75 |
| TOTALS | 24 | 324 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 01 0800
Year · Month · Day · Time

Drill, wireline survey, drill, lost circulation at 424 m. Mixed and pumped 3 LCM slugs 15 $m^3$ each. Regained circulation. Pumped for 10 minutes, lost complete returns. Mixed LCM slug at report time.

Geology:

396 - 417 m - Dolomite, micro-crystaline to very fine crystaline in part, argilaceous. tight SS and granite pebble cavings.

417 - 423 m - Dolomite as before and in part very fine to medium crystaline, calcareous inter crystaline and vuggy porosity 5 - 10% brown oil stained, yellow fluorescense, no cut. 0.55% gas in mud. Methane C1, trace ethane C2, and propane C3.

WANT LIST:

WEATHER -43° C. Clear 5 @ 3 mph ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83 03 02 0800

Year Month Day Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 15 DEPTH 424 m METRES LAST 24 HRS. 0 ROTATING HRS 0

ACTIVITY AT REPORT TIME Build volume in surface system.

DRILLING MUD PROPERTIES AT SHAKER SUCTION PIT:

WT. 1020 VIS 80 WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH 9

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8A | 311.2 | J33 | 72848 | - | - | 424 | 44 | - | 30 | 1.47 | 1 | 1 | I |
| | | | | | | | | | | | | | |

CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8A | 15.9 | 15.9 | 15.9 | 197 | - | 152 | | | | | | |
| | | | | | | | | | | | | |

DEVIATION SURVEYS

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

MUD & CHEMICALS ADDED

Sawdust - 284 sxs

Quickseal - 115 sxs

Gel - 125 sxs

Caustic - 4 sxs

BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| same | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 196.75 |
| 2. TRIPS | 1.5 | 26.75 |
| 3. RIG SERVICE | | 6.5 |
| 4 DEVIATION SURVEY | | 11 |
| 5. REAM & COND. HOLE | | 5.75 |
| 6. MIX & COND. MUD | | 0.5 |
| 7 CIRCULATING | | 2 |
| 8 RIG REPAIR | | 0.5 |
| 9. RUN CASING & CEMENT | | 3.5 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON | | 8 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16 DRILLING OUT | | 3 |
| 17 LOSS CIRC | 22.5 | 42.75 |
| 18 LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | |
| 20 RIG UP TEAR OUT | | |
| 21 | | 0.75 |
| TOTALS | 24 | 348 |

COSTS

DAILY

CUM.

SUPERVISOR J. Aldridge

OPERATIONS DETAILS: PERIOD ENDING 83 03 02 0800
Year · Month · Day · Time

Mix LCM - mix and pump 3 slugs - #1 - 15.39 $m^3$, #2 - 17 $m^3$, 3 - 17 $m^3$. POOH, slug hole from top, returns after 18 $m^3$. Lost 2 m in annalus after half hour - hole static at report time. Build surface volume. (on trip out - pipe dry 1st 5 stands).

WANT LIST:

WEATHER - 37 $^{o}$ C Calm ROAD Good

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83 03 03 0800

Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 16 DEPTH 443 METRES LAST 24 HRS. 19 ROTATING HRS. 12.5

ACTIVITY AT REPORT TIME Drilling Ahead Blind

DRILL BLIND w/ $H_2O$ DRILLING MUD PROPERTIES AT SHAKER SUCTION PIT:

WT _____ VIS _____ WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RRE4 | 311.2 | J33 | 72848 | 14 | 50 | | 19 | 12.5 | 12.5 | 1.52 | | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RRE4 | 15.9 | 15.9 | 15.9 | 197 | 50 | 152 | | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

## MUD & CHEMICALS ADDED

| | | | |
|---|---|---|---|
| Sawdust | 50 | | |
| QuickSeal | 15 | | |
| Gel | 8 | | |
| | | | |

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Same As Report | | | | |
| 13 | | | | |
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## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 12.50 | 209.25 |
| 2. TRIPS | 4 | 30.75 |
| 3. RIG SERVICE | .75 | 7.25 |
| 4. DEVIATION SURVEY | | 11 |
| 5. REAM & COND. HOLE | 3 | 8.75 |
| 6. MIX & COND. MUD | | .50 |
| 7. CIRCULATING | | 2 |
| 8. RIG REPAIR | | 0.50 |
| 9. RUN CASING & CEMENT | | 3.50 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 8 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC | 3.75 | 46.50 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | |
| 20. RIG UP TEAR OUT | | |
| 21 | | 0.75 |
| TOTALS | 24 | 372 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 03 0800
Year · Month · Day · Time

Mix LCM, hole took 5.4 $m^3$ in 3 hours. RIH, break circulation at 3 stand intervals. Washed to bottom. Lost complete returns when bit reached TD. Drilling ahead blind at report time.

Personnel - 37

Appears shale top @ 438 m - estimate surface casing TD @ 460 m.

WANT LIST:

WEATHER -35° C. Clear S @ 10 mph ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83-03-04 0800

Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 17 DEPTH 460 m METRES LAST 24 HRS. 17 ROTATING HRS. 5

ACTIVITY AT REPORT TIME POH - Plugged Bit

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. 1020 VIS 60 WL. ____ GELS ____ % SOLIDS ____ PV ____ YP ____ pH 9

% OIL ____ %SAND ____ CAKE ____ PPMCL ____ PPMCa ____

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8RR | 311.2 | HW J33 | 72848 | 14 | 50 | 460 | 36 | 5 | 17.5 | 2.06 | INCOMPLETE | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO | JETS - mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | OPEN | | | 197 | 50 | 152 | 0.530 | | | | | 200 |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

## MUD & CHEMICALS ADDED

Caustic - 3 sxs

Gel - 80 sxs

Sawdust - 196 sxs

Quickseal - 46 sxs

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| same | | | | |
| | | | | |
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## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 5 | 214.25 |
| 2. TRIPS | 8 | 38.75 |
| 3. RIG SERVICE | 0.75 | 8 |
| 4. DEVIATION SURVEY | | 11 |
| 5. REAM & COND. HOLE | | 8.75 |
| 6. MIX & COND. MUD | | 0.5 |
| 7. CIRCULATING | | 2 |
| 8. RIG REPAIR | | 0.50 |
| 9. RUN CASING & CEMENT | | 3.5 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 8 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16. DRILLING OUT | | 3 |
| 17 LOSS CIRC. | 10.25 | 56.75 |
| 18. LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | |
| 20 RIG UP - TEAR OUT | | |
| 21 | | 0.75 |
| TOTALS | 24 | 396 |

OPERATIONS DETAILS: PERIOD ENDING 83-03-04 0800
Year · Month · Day · Time

Drill blind with water. POH to 432, build volume and mix Gel & LCM. Displace 20 $m^3$ LCM @ 432 m. POH, plugged bit. RIH to 36 m and pumped 30 $m^3$ LCM - mix LCM - pump 4 $m^3$. Hole full and static. RIH 1 stand - lost circulation. Mix LCM and pump hole full. RIH, unable to break circulation. POH, plugged bit at report time.

WANT LIST:

WEATHER -33° C Clear, Wind S. @ 5 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
83 03 05 0800
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 18 DEPTH 460 METRES LAST 24 HRS. 0 ROTATING HRS. 0

ACTIVITY AT REPORT TIME Fill hole from top

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. 1030 VIS 60 WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH 9

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8RR | 311.2 | HW J33 | 72848 | Circulate and condition | | | | | | | I | N | C |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8RR | OPEN | | | 197 | 50 | 152 | .530 | | | | | 200 |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

## MUD & CHEMICALS ADDED

Gel 110 sx

Caustic 3

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
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## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 214.25 |
| 2. TRIPS | 10.50 | 49.25 |
| 3. RIG SERVICE | .50 | 8.50 |
| 4. DEVIATION SURVEY | | 11 |
| 5. REAM & COND. HOLE | .75 | 9.50 |
| 6. MIX & COND. MUD | 11.50 | 12 |
| 7. CIRCULATING | .75 | 2.75 |
| 8. RIG REPAIR | | 0.50 |
| 9. RUN CASING & CEMENT | | 3.50 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 8 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16. DRILLING OUT | | 3 |
| 17 LOSS CIRC. | | 56.75 |
| 18. LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | |
| 20 RIG UP – TEAR OUT | | |
| 21 | | 0.75 |
| TOTALS | 24 | 420 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 05 0800
Year · Month · Day · Time

POH, plugged bit. Mixed LCM. RIH and reamed to 430 m. Plugged bit, POH. Filled hole with 45 $m^3$, no returns. Cleaned tanks and mixed surface system. RIH to 421 m. Built 60 $m^3$ surface volume, washed and reamed to bottom. POH 1 stand. Built volume. RIH to bottom, no fill. POH, fill hole from 80 m at report time.

WANT LIST:

WEATHER -30° Clear Calm ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
83 03 06 0800
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 19 DEPTH 460 METRES LAST 24 HRS. _____ ROTATING HRS. _____

ACTIVITY AT REPORT TIME Circulating at 50 m

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

W 1030 VIS 90 WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH 9.5

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BARR | | J33 | Circulate and condition | | | | | | | | | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | m3/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BARR | OPEN | | | 197 | 50 | 152 | .530 | | | | | 200 |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

## MUD & CHEMICALS ADDED

Gel 237 sx

Caustic 6

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
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## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 214.25 |
| 2. TRIPS | 6.75 | 56 |
| 3. RIG SERVICE | .75 | 9.25 |
| 4. DEVIATION SURVEY | | 11 |
| 5. REAM & COND. HOLE | 4.25 | 13.75 |
| 6. MIX & COND MUD | 7.25 | 19.25 |
| 7. CIRCULATING | | 2.75 |
| 8. RIG REPAIR | | 0.50 |
| 9. RUN CASING & CEMENT | | 3.50 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | 5 | 5 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 8 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16. DRILLING OUT | | 3 |
| 17 LOSS CIRC. | | 56.75 |
| 18 LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | |
| 20. RIG UP – TEAR OUT | | |
| 21 | | 0.75 |
| TOTALS | 24 | 444 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 06 0800
Year · Month · Day · Time

Built surface volume to 60 $m^3$. Filled hole, returns after 48 $m^3$. RU loggers. Bridge at 46 m. RIH, reamed and washed 48 m to 100 m, no returns. Logged w/ Dresser. Bridged at 47 m. RIH and reamed at 47 m. Attempted to log, bridged again at 49 m. Mix 60 $m^3$ volume, RIH, 2 m fill on bottom. Built volume and displaced 16 $m^3$ Hi Vis on bottom, POH. Attempted to log, bridged at 47 m. RIH to 50 m, circulated with full returns.

WANT LIST:

WEATHER -35° Clear N @ 5 mph ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83 03 07 0800

Year Month Day Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 20 DEPTH 460 METRES LAST 24 HRS. _____ ROTATING HRS. _____

ACTIVITY AT REPORT TIME Condition hole to run casing

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT 1030 VIS 90 WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH 9.5

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8ARR | 311.2 | Hw J33 | 72848 | | Circulate and | condition | | | | | | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8ARR | OPEN | | | 197 | 50 | 152 | .530 | | | | | 200 |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

## MUD & CHEMICALS ADDED

| | | | |
|---|---|---|---|
| Gel | 183 m | | |
| Caustic | 3 | | |
| | | | |
| | | | |

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
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## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 214.25 |
| 2. TRIPS | 4.75 | 60.75 |
| 3. RIG SERVICE | .25 | 9.50 |
| 4. DEVIATION SURVEY | | 11 |
| 5. REAM & COND. HOLE | 1.25 | 15 |
| 6. MIX & COND. MUD | 2.25 | 21.50 |
| 7. CIRCULATING | 4.75 | 7.50 |
| 8. RIG REPAIR | | 0.50 |
| 9. RUN CASING & CEMENT | | 3.50 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | 10.75 | 15.75 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 8 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC. | | 56.75 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | |
| 20 RIG UP – TEAR OUT | | |
| 21 | | 0.75 |
| TOTALS | 24 | 468 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 07 0800

Year · Month · Day · Time

Reamed 37-61 m. Circulated at 61 m and mixed gel. POH. Logged with Dresser, bridged at 100 m. RIH and cleaned out at 133 m - 255 m, 455 m - 460 TD. POH to log. Rigged up and logged with DIFL and Acoustilog DIFL - 456 - 33 m BHC acoustilog 456 - 33 m.

WANT LIST:

WEATHER -29° C. Clear & Calm ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING

83-03-08 0800 hrs
Year Month Day Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 21 DEPTH 468 METRES LAST 24 HRS. 8 ROTATING HRS. 11.5

ACTIVITY AT REPORT TIME WO water. (Trucks Broke Down)

## DRILLING MUD PROPERTIES AT SHAKER SUCTION PIT.

WT _____ VIS _____ WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8ARR | 311.2 | HW J33 | | 16 | 60 | | 8 | 11.5 | 11.5 | 0.70 | R | U | N |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8ARR | 0 P | E N | | 197 | 50 | 152 | 0.53 | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

## MUD & CHEMICALS ADDED

Gel - 30 sxs

Caustic - 1 sk

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
| | | | | |
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## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 11.5 | 225.75 |
| 2. TRIPS | 3.5 | 64.25 |
| 3. RIG SERVICE | 0.5 | 10.00 |
| 4. DEVIATION SURVEY | | 11.00 |
| 5. REAM & COND. HOLE | 0.5 | 15.50 |
| 6 MIX & COND. MUD | 1.75 | 23.25 |
| 7. CIRCULATING | | 7.5 |
| 8. RIG REPAIR | | 0.50 |
| 9. RUN CASING & CEMENT | | 3.5 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 15.75 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | 6.25 | 14.25 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16 DRILLING OUT | | 3 |
| 17 LOSS CIRC. | | 56.75 |
| 18 LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | |
| 20 RIG UP TEAR OUT | | |
| 21 | | 0.75 |
| TOTALS | 24 | 492 |

OPERATIONS DETAILS: PERIOD ENDING 83-03-08 0800 hrs

Year · Month · Day · Time

RIH clean to bottom. Build volume, drill ahead blind with water, POH into conductor pipe.

WO water truck repairs

Keniston-Broken Spring

Bar K Flat Tire #104 Delta III

WANT LIST:

WEATHER -38° Clear & Calm ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING

83 03 09 0800

Year Month Day Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 23 DEPTH 480 METRES LAST 24 HRS. 12 ROTATING HRS. 4.50

ACTIVITY AT REPORT TIME Trip for Bit

Drill blind with water DRILLING MUD PROPERTIES AT SHAKER SUCTION PIT:

WT _____ VIS _____ WL _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

%OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BARR | 311.2 | J33 | 72848 | 16 | 60 | 480 | 100 | 4.5 | 63.5 | 1.57 | TRIP | | |
| | | | | | | | | | | | | | |

CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | m3/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BARR | OPEN | | | 197 | 50 | 152 | | | | | | 200 |
| | | | | | | | | | | | | |

DEVIATION SURVEYS

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

MUD & CHEMICALS ADDED

BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
| | | | | |
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TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 4.50 | 230.25 |
| 2. TRIPS | 1.50 | 65.75 |
| 3. RIG SERVICE | .50 | 10.50 |
| 4. DEVIATION SURVEY | | 11.00 |
| 5. REAM & COND. HOLE | .50 | 16.00 |
| 6. MIX & COND. MUD | | 23.25 |
| 7. CIRCULATING | | 7.5 |
| 8. RIG REPAIR | | 0.5 |
| 9. RUN CASING & CEMENT | | 3.5 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 15.75 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | 17 | 31.25 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16. DRILLING OUT | | 3 |
| 17 LOSS CIRC. | | 56.75 |
| 18 LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | |
| 20 RIG UP - TEAR OUT | | |
| 21 | | 0.75 |
| TOTALS | 24 | 516 |

COSTS

DAILY

CUM

SUPERVISOR R. Kelly

OPERATIONS DETAILS: PERIOD ENDING 83 03 09 0800
Year · Month · Day · Time

WO water. When tanks full, drilled ahead blind. Made wiper trip 478-389 m while waiting on water. Drilled blind to 480 m. Keniston broke down, (rear end came out), Delta 104 broke down (steady bearing came out). Only one bed truck working. (Mattco 533). Trip to check bit.

WANT LIST:

WEATHER -32° Cloudy Calm ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING
83-03-10 0800 hrs
Year Month Day Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 23 DEPTH 487 m METRES LAST 24 HRS. 7 ROTATING HRS 3.25

ACTIVITY AT REPORT TIME Wait on water

Drill blind with water

DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT _____ VIS _____ WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8AR | 311.2 | J33 | 72848 | 16 | 60 | 480 | 100 | | 63.5 | 1.57 | 4 | 5 | 1 |
| 9 | 311.2 | J33 | 59012 | 16 | 60 | IN | 7 | 3.25 | 3.25 | 2.15 | - | - | - |

CIRCULATION RECORD

| BIT NO | JETS - mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8AR | OPEN | | | 197 | 50 | 152 | 0.530 | | | | | 200 |
| 9 | OPEN | | | | | | | | | | | |

DEVIATION SURVEYS

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

MUD & CHEMICALS ADDED

Gel - 50

Caustic - 1

BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | | |
| Bit sub | | | | |
| 2 DC | | 228 | | |
| X-O | | | | |
| 1 DC | | 158 | | |
| Jars | | | | |
| 15 DC | | 158 | | |
| 3 HW | | | 202.67 | |

COSTS

DAILY

CUM

SUPERVISOR B. Kelly

TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 3.25 | 233.50 |
| 2. TRIPS | 1.75 | 67.50 |
| 3. RIG SERVICE | 0.5 | 11.00 |
| 4. DEVIATION SURVEY | | 11.00 |
| 5. REAM & COND. HOLE | 0.5 | 16.50 |
| 6. MIX & COND. MUD | 3.5 | 26.75 |
| 7. CIRCULATING | | 7.50 |
| 8. RIG REPAIR | | 0.50 |
| 9. RUN CASING & CEMENT | | 3.50 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | 3.75 | 19.50 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | 10.75 | 42 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC | | 56.75 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | |
| 20. RIG UP - TEAR OUT | | |
| 21 | | 0.75 |
| TOTALS | 24 | 540 |

OPERATIONS DETAILS: PERIOD ENDING 73-03-10 0800 hrs
Year · Month · Day · Time

POH and change bit. WO water. Rig up to log and run Acoustilog GRN. 395 - 471 m. Mix mud to build volume. RIH to 474 m. Clean 6 m fill, drill ahead blind, and WO water.

WANT LIST:

WEATHER -28° Winds N 10 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING

83 03 11 0800

Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 24 DEPTH 505 METRES LAST 24 HRS. 18 ROTATING HRS. 7

ACTIVITY AT REPORT TIME WO Water/Rigging Up Air Drillers

Drill blind with water DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT.____ VIS____ WL.____ GELS____ % SOLIDS____ PV____ YP____ pH____

% OIL____ %SAND____ CAKE____ PPMCL____ PPMCa____

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9A | 311.2 | HW J-33 | 59012 | 16 | 60 | | 25 | 7 | 10.25 | 2.44 | INC | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9A | OPEN | | | 197 | 50 | 152 | .530 | | | OPEN | | 200 |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

## MUD & CHEMICALS ADDED

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
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## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 7 | 24[illegible].50 |
| 2. TRIPS | | 6[illegible].50 |
| 3. RIG SERVICE | .50 | 1[illegible].50 |
| 4. DEVIATION SURVEY | | 1[illegible].0 |
| 5. REAM & COND. HOLE | | 1[illegible].50 |
| 6. MIX & COND. MUD | | 2[illegible].75 |
| 7. CIRCULATING | | [illegible].50 |
| 8. RIG REPAIR | | 0.50 |
| 9. RUN CASING & CEMENT | | [illegible].50 |
| 10. FISHING | | [illegible].25 |
| 11 LOGGING | | 1[illegible].50 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON | 11 | [illegible] |
| 15. NIPPLE UP & TEST BOP | | [illegible] |
| 16 DRILLING OUT | | [illegible] |
| 17 LOSS CIRC. | | [illegible].75 |
| 18. LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | |
| 20 RIG UP TEAR OUT | | |
| 21. Thaw Kelly | 5.50 | [illegible].25 |
| TOTALS | | 56[illegible] |

## COSTS

DAILY

CUM.

SUPERVISOR R.Kelly

PLEASE TURN OVER

OPERATIONS DETAILS: PERIOD ENDING 83 03 11 0800
Year - Month - Day - Time

Lay down and thaw out stand pipe and kelly hose. Alternately drill ahead anc wait on water from 487 m to 505 m. Waiting on water at 0800 hours.

Engineer from Nova Mud Corp, foam drilling chemicals and 2 air drilling men arrived 83 03 11 at 0800 hours - Will be rigging up to Foam Drill.

WANT LIST:

WEATHER -30° Cloudy N @ 5 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Man and foam material arrived 0800 hours 83 03 11

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING
83 03 12 0800
Year Month Day Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 25 DEPTH 505 METRES LAST 24 HRS. - ROTATING HRS. -

ACTIVITY AT REPORT TIME Reaming and Cleaning at 478 m

DRILLING MUD PROPERTIES AT SHAKER SUCTION/PIT:
REAMING AND CLEANING TO BOTTOM WITH FOAM/AIR

WT. VIS WL. GELS % SOLIDS PV YP pH

% OIL %SAND CAKE PPMCL PPMCa

BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | 311.2 | J-33 | 59012 | 16 | 60 | CLEAN TO BTM | | | 10.25 | | | | |
| | | | | | | | | | | | | | |

CIRCULATION RECORD

| BIT NO. | JETS - mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | OPEN | | | CLEAN TO BOTTOM WITH FOAM/AIR | | | | | | | | |
| | | | | | | | | | | | | |

DEVIATION SURVEYS

° at ° at

° at ° at

° at ° at

° at ° at

MUD & CHEMICALS ADDED

Duraplex 4 sx

BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
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COSTS

DAILY

CUM

SUPERVISOR R. Kelly

TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 240.50 |
| 2. TRIPS | 1 | 68.50 |
| 3. RIG SERVICE | .50 | 12.00 |
| 4. DEVIATION SURVEY | | 11.00 |
| 5. REAM & COND. HOLE | 2.25 | 18.75 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | | 7.50 |
| 8. RIG REPAIR BLOOIE LINE | 2.50 | 3.00 |
| 9. RUN CASING & CEMENT | | 3.50 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 19.50 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | 1.75 | 54.75 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC | | 56.75 |
| 18. LAY DOWN DP & BOPS | | |
| 19 UNLOAD HOLE | 5.50 | 5.50 |
| 20 RIG UP AIR EQUIP. | 10.50 | 10.50 |
| 21 | | 6.25 |
| TOTALS | 24 | 588 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 12 0800
Year · Month · Day · Time

Wait on water. Rig to drill with air. Mix Duraplex. Unload hole. Change compressors to 2 stages. Trip out to 330 m, unload hole. Run in hole to 430 m (bridge). Unload hole. Blooie line jumped out of support when well headed up, (ice plug in blooie line) repair same. Continue unloading hole at 430 m. Ream to 478 m. Reaming at 0800 hours.

WANT LIST:

WEATHER -29° C Cloudy N @ 5 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
83 03 13 0800
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 26 DEPTH 505 METRES LAST 24 HRS. ROTATING HRS.

ACTIVITY AT REPORT TIME Attempting to Run 3.81 mm Pipe to Re-Cement Conductor

Air Foam

DRILLING MUD PROPERTIES AT SHAKER SUCTION/PIT:

WT. VIS WL. GELS % SOLIDS PV YP pH

% OIL %SAND CAKE PPMCL PPMCa

BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9A | 311.2 | J33 | 59012 | 16 | 60 | 505 | 25 | 10.25 | 10.25 | | 1 | 1 | 1/4 |
| 10A | 311.2 | J55R | 88583 | RUN IN HOLE | | CLEAN TO BOTTOM | | | | | | | |

CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL. | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9A | OPEN | | | 197 | 50 | 152 | .053 | | | | | 200 |
| 10A | OPEN | | CLEAN TO BOTTOM WITH AIR FOAM | | | | | | | | | |

DEVIATION SURVEYS

° at ° at

° at ° at

° at ° at

° at ° at

MUD & CHEMICALS ADDED

BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
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COSTS

DAILY

CUM.

SUPERVISOR R. Kelly

TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 240.50 |
| 2. TRIPS | 5.25 | 73.75 |
| 3. RIG SERVICE | .25 | 12.25 |
| 4. DEVIATION SURVEY | | 11.00 |
| 5. REAM & COND. HOLE | 1 | 19.75 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | | 7.50 |
| 8. RIG REPAIR | | 3 |
| 9. RUN CASING & CEMENT | | 3.50 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 19.50 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 54.75 |
| 15. NIPPLE UP & TEST BOP | | 33.50 |
| 16 DRILLING OUT | | 3 |
| 17. WORK ON CONDUCTOR | 8.50 | 65.25 |
| 18 LAY DOWN DP & BOPS | | |
| 19 UNLOAD HOLE | 4 | 9.50 |
| 20 RIG UP - TEAR OUT | | 10.50 |
| 21 THAW OUT LINES | 5 | 11.25 |
| TOTALS | 24 | 612 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 13 0800
Year · Month · Day · Time

Unload hole with air. Hoist out plugged drill pipe. RIH. Thaw out kelly hose and stand pipe. Ream 440 m - 460 m. Washed out around conductor pipe in cellar. Wait on small diameter pipe and cementers. POOH. Ran small diameter pipe to 11 m. Ran second small diameter pipe to 5 m. Work 3rd pipe down (outside conductor).

Air drillers pressured up to 1,000 Psi when Blooie line froze off. Fractured around conductor pipe.

WANT LIST:

WEATHER -26°C Cloudy Light Snow ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
83 03 14 0800
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 27 DEPTH 505 METRES LAST 24 HRS. _____ ROTATING HRS. _____

ACTIVITY AT REPORT TIME Attempt to Unload Hole with Air

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. _____ VIS _____ WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

%OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

## MUD & CHEMICALS ADDED

_____ _____

_____ _____

_____ _____

_____ _____

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
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## COSTS

DAILY

CUM

SUPERVISOR R. Kelly

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 240.50 |
| 2. TRIPS | | 73.75 |
| 3. RIG SERVICE | | 12.25 |
| 4. DEVIATION SURVEY | | 11.00 |
| 5. REAM & COND. HOLE | | 19.75 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | | 7.50 |
| 8. RIG REPAIR | | 3 |
| 9. RUN CASING & CEMENT | | 3.50 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 19.50 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | 9.50 | 64.25 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | 9.50 |
| 20. RIG UP – TEAR OUT | | 10.50 |
| 21. Run 1½" Pipe | 14.50 | 25.75 |
| TOTALS | 24 | 636 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 14 0800
Year · Month · Day · Time

Locate flow channels around conductor, worked 1 1/4" pipe down in 3 places (1-6 m) (2 - 4 m). Mix and pump 4 pallets perma frost cement into 6m pipe no returns Switch to 4 m pipe, mix and pump 2 pallets perma frost cement, obtain returns at end. Change to 2nd 4 m pipe, mix and pump 1 pallet perma frost cement, obtain returns at end. Pull 3 pipes out and bail cellar. Mix and pump 1 pallet permafrost cement to cellar area.. WOC to 0700 hours. RIH to 455 m, started to unload with 2800 kPa air, 400 PSI. Fluid washing up around cement in cellar. Mixed total of 14.4 tonnes of perma frost cement.

WANT LIST:

WEATHER -22° Cloudy and Calm ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83-03-15 0800

Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 28 DEPTH 505 m METRES LAST 24 HRS. ROTATING HRS.

ACTIVITY AT REPORT TIME Running 9-5/8" casing. (244.5 mm)

DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT VIS WL. GELS % SOLIDS PV YP pH

% OIL %SAND CAKE PPMCL PPMCa

BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1RR | 311.2 | J55R | 38583 | REAMED | | fill | | | | | 1 | 1 | IN |
| | | | | | | | | | | | | | |

CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | m3/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1RR | OPEN | | | REAMED FILL | | | | | | | | |
| | | | | | | | | | | | | |

DEVIATION SURVEYS

° at ° at

° at ° at

° at ° at

° at ° at

MUD & CHEMICALS ADDED

Gel - 23 sxs

BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
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TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 240.50 |
| 2. TRIPS | 1.5 | 75.25 |
| 3. RIG SERVICE | 0.25 | 12.50 |
| 4. DEVIATION SURVEY | | 11.00 |
| 5. REAM & COND. HOLE | | 19.75 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | | 7.50 |
| 8. RIG REPAIR | | 3 |
| 9. RUN CASING & CEMENT | 2 | 5.50 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 19.50 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | 12.5 | 76.75 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | 9.50 |
| 20 RIG UP - TEAR OUT | 6 | 16.5 |
| 21 Lay down 9" drill collars. | 1.75 | 27.50 |
| TOTALS | 24 | 660 |

COSTS

DAILY

CUM

SUPERVISOR R. Kelly

OPERATIONS DETAILS: PERIOD ENDING 83-03-15 0800 hrs
Year · Month · Day · Time

WOO. POH, lay down 9" collars, cleaned mud tanks, mixed gel water for cement job and strapped casing.

Make up ECP casing tool. Start running casing - trouble with threads on float collar. Change out float shoe and run guide shoe. Tack weld guide shoe and start in with casing.

WANT LIST:

WEATHER -35° Clear calm ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

1983 03 16 0800

Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 29 DEPTH 505 m METRES LAST 24 HRS. 0 ROTATING HRS. 0

ACTIVITY AT REPORT TIME Cementing second stage 9-5/8" casing

## DRILLING MUD PROPERTIES AT SHAKER SUCTION/PIT:

WT. _____ VIS _____ WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO | JETS – mm 1 | JETS – mm 2 | JETS – mm 3 | PUMP STROKE | PUMP SPM | PUMP LINER | PUMP $m^3$/min | ANN. VEL. DP | ANN. VEL. DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

## MUD & CHEMICALS ADDED

_____ _____

_____ _____

_____ _____

_____ _____

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
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## COSTS

DAILY

CUM

SUPERVISOR R.L. Kelly

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 240.5 |
| 2. TRIPS | | 75.25 |
| 3. RIG SERVICE | .25 | 12.75 |
| 4. DEVIATION SURVEY | | 11.00 |
| 5. REAM & COND. HOLE | | 19.75 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | 1.5 | 9.00 |
| 8. RIG REPAIR | | 3 |
| 9. RUN CASING & CEMENT | 16.5 | 22.00 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 19.5 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: CEMENT | 5.75 | 82.5 |
| 15. NIPPLE UP & TEST BOP | | 33 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | 9.5 |
| 20. RIG UP - TEAR OUT | | 16.5 |
| 21. | | 27.5 |
| TOTALS | 24 | 685 |

OPERATIONS DETAILS: PERIOD ENDING 1983 03 16 0800
Year · Month · Day · Time

Continued running casing (9-5/8"). Ran 38 joints, 434.11 m, 244.5 mm,48.11 kg/m, H-40 casing. Ran into bridge at 428 m KB. Workedcasing to attempt to get casing deeper. No success. Fill casing with water to add weight. No success. Cemented Stage 1, 428 - 315 m with 6.3 tonnes Oilwell Class "G" neat at 18.95 kg/$m^3$. Plug down at 23:16 hours, 1983-03-15.Inflated Lynnes E.C.P. with 5,000 kPa. Packer rubber ruptured and packer deflated as evidenced by rapid pressure drop. Dropped opening tool for 2nd Stage. D.V. tool open at 23:54 hrs, 1983-03-16 with 7000 kPa. Pumped 1.59 $m^3$ water to clear tool. Chased water with air and foam. Displaced hole to foam. Wait on cement 5-3/4 hours. Displaced water out of hole with foam. Mixed and pumped 600 sx perma frost cement with 8% gel at 12.2 pound/gallon. Total 21.8 tonnes cement (100% excess) Foam returns. Dropped closing plug and displaced with 12.9 $m^3$ water. Plug bumped 7000 kPa at 0840 hrs, 1983-03-16. Closed ports in D.V. Tool. No cement returns. Foam returns lessening just before plug bumped. Wait on cement.

WANT LIST:

WEATHER -35° C Clear & calm. ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING

83-03-17 0800

Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 30 DEPTH 505 METRES LAST 24 HRS. 0 ROTATING HRS. 0

ACTIVITY AT REPORT TIME Nipple up BOPs

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. _____ VIS _____ WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

## MUD & CHEMICALS ADDED

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
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## COSTS

DAILY

CUM

SUPERVISOR R.L. Kelly

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 240.50 |
| 2. TRIPS | | 75.25 |
| 3. RIG SERVICE | | 12.75 |
| 4. DEVIATION SURVEY | | 11.00 |
| 5. REAM & COND. HOLE | | 19.75 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | | 9.00 |
| 8. RIG REPAIR | | 3 |
| 9. RUN CASING & CEMENT | 4.25 | 26.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 19.50 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | 11.25 | 93.75 |
| 15. NIPPLE UP & TEST BOP | 1 | 34 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | 9.50 |
| 20 RIG UP - TEAR OUT | | 16.5 |
| 21 Cut Casing Weld on Bowl | 7.5 | 35 |
| TOTALS | 24 | 708 |

OPERATIONS DETAILS: PERIOD ENDING 83-03-17 0800 hrs

Year - Month - Day - Time

Finish displacing cement. Plug bumped and DV Tool shut at 0840 hrs, 83-03-16. 30C. Cut off conductor and clean cellar out. Run 15 m of 25.4 mm hose down casing annulus. Mix and pump 6.35 tonnes of permafrost cement. No returns. Drop cement basket on casing from surface to ± 9m. Mixed 0.54 tonnes of cement - got returns, but dropping. Inserted sawdust plug in top of casing annulas. Mixed and pumped 0.36 tonnes of permafrost cement. Cement holding at cellar level, cut off 244.5 mm casing, heat bowl and weld on to casing. Had trouble welding due to weld splattering. Nipple uo BOP's.

KB to Casing flange 4.08 m.

WANT LIST:

WEATHER -32° C Clear N@5 Km ROAD Good

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
83 03 18 0800
Year Month Day Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 31 DEPTH 505 METRES LAST 24 HRS. _____ ROTATING HRS. _____

ACTIVITY AT REPORT TIME Pressure Testing BOPs and Valves

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. _____ VIS _____ WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

## MUD & CHEMICALS ADDED

_____ _____

_____ _____

_____ _____

_____ _____

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
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## COSTS

DAILY

CUM

SUPERVISOR R. Kelly

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 240.50 |
| 2. TRIPS | | 75.25 |
| 3. RIG SERVICE | | 12.75 |
| 4. DEVIATION SURVEY | | 11.00 |
| 5. REAM & COND. HOLE | | 19.75 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | | 9.00 |
| 8 RIG REPAIR | | 3 |
| 9. RUN CASING & CEMENT | | 26.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 19.50 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 93.75 |
| 15. NIPPLE UP & TEST BOP | 18 | 52 |
| 16. DRILLING OUT | | 3 |
| 17. LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | 9.50 |
| 20 RIG UP - TEAR OUT | | 16.5 |
| 21 Thaw Lines | 6 | 41 |
| TOTALS | 24 | 732 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 18 0800
Year · Month · Day · Time

Nipple up BOPs. Install Grant rotating head. Make modifications to connections on Blooie line and choke line from HCR to manifold. Attempt to pressure test kill line, etc, found a few leaks, repaired same. Tested kill line, HCR, manifold, etc. to 1500 kPa to 10500 kPa-OK. All lines froze, delayed while thawing. Charged lines with diesel. Preparing to finish testing surface equipment.

WANT LIST:

WEATHER -29°C Clear & calm. ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING
83 03 19 0800
Year Month Day Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 32 DEPTH 505 METRES LAST 24 HRS. ROTATING HRS.

ACTIVITY AT REPORT TIME Drilling Out Float Collar and cement.

DRILLING MUD PROPERTIES AT SHAKER SUCTION PIT:

Water

WT. VIS WL. GELS % SOLIDS PV YP pH

% OIL %SAND CAKE PPMCL PPMCa

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1RR | 200 | JD7 | 86149 | 3 | 30 | DRILL DV PLUGS AND FLOAT COLLAR. | | | | | | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1RR | 7.9 | 7.9 | 8.7 | 197 | 75 | 152 | | | | | | 4500 |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

° at ° at

° at ° at

° at ° at

° at ° at

## MUD & CHEMICALS ADDED

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | | |
| Bit sub | | | | |
| 12 DC | | 158 | | |
| 3 HW DP | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 240.50 |
| 2. TRIPS | 3 | 78.25 |
| 3. RIG SERVICE | | 12.75 |
| 4. DEVIATION SURVEY | | 11.00 |
| 5. REAM & COND. HOLE | | 19.75 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | .25 | 9.25 |
| 8. RIG REPAIR | .75 | 3.75 |
| 9. RUN CASING & CEMENT | | 26.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 19.50 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 93.75 |
| 15. NIPPLE UP & TEST BOP | 9.50 | 61.50 |
| 16. DRILLING OUT | 10.50 | 13.50 |
| 17 LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | 9.50 |
| 20 RIG UP - TEAR OUT | | 16.5 |
| 21 | | 41 |
| TOTALS | 24 | 756 |

## COSTS

DAILY

CUM

SUPERVISOR R. Kelly

OPERATIONS DETAILS: PERIOD ENDING 83 03 19 0800
Year · Month · Day · Time

Pressure test kill line valves and check valves. HCR and blind rams OK. Manual choke line valve leaked, repaired same. All manifold checked - OK, low 1500 kPa to 10500 kPa. RIH with BH assembly and DP. Remove Grant head insert. PU kelly and break circulation Test upper and lower kelly cocks - OK. Test annular preventor and stabbing valve OK. Tag DV tool at 313.77 m KB. Drilled out same. Ran in and tagged FC 417.23 m. Drilling plug and float collar at 0800 hours.

WANT LIST:

WEATHER -30° Clear & calm. ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
83 03 20 0800
Year Month Day Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 33 DEPTH 505 METRES LAST 24 HRS. ROTATING HRS.

ACTIVITY AT REPORT TIME Thaw Out Frost Plug in Standpipe, Prepare To Drill Out

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. VIS WL. GELS % SOLIDS PV YP pH

%OIL %SAND CAKE PPMCL PPMCa

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | DRILL OUT | | | | | R | U | N |
| 13 | 200 | JD7 | 86149 | 2 | 30 | | | | | | | | |

## CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| 13 | 7.9 | 7.9 | 8.7 | 197 | 75 | 152 | .758 | | | | | 4500 |

## DEVIATION SURVEYS

° at ° at

° at ° at

° at ° at

° at ° at

## MUD & CHEMICALS ADDED

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | | |
| Bit sub | | | | |
| 3 DC | | 158 | | |
| 1 Jar | | | | |
| 13 DC | | 158 | | |
| 3 HW DP | | | | |
| | | | | |
| | | | | |

## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 240.50 |
| 2. TRIPS | 3.25 | 81.50 |
| 3. RIG SERVICE | | 12.75 |
| 4. DEVIATION SURVEY | | 11.00 |
| 5. REAM & COND. HOLE | | 19.75 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | | 9.25 |
| 8. RIG REPAIR | 1.75 | 5.5 |
| 9. RUN CASING & CEMENT | | 26.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | 8.25 | 27.75 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: Orders | 9.25 | 103 |
| 15. NIPPLE UP & TEST BOP | | 61.5 |
| 16. DRILLING OUT | 1.50 | 15 |
| 17. LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | 9.50 |
| 20. RIG UP - TEAR OUT | | 16.5 |
| 21 | | 41 |
| TOTALS | 24 | 780 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 20 0800
Year - Month - Day - Time

Drill out FC. No cement in shoe joint. Guide shoe at 428.10 m. Pressure casing to 5000 kPa, fed off. POH to run CBL. RU Dresser and log with CBL. Repaired and pressure tested kill line valves 1500 - 10500 kPa while logging. WOO. Make up BH assembly and RIH. Thaw frozen stand pipe at report time.

WANT LIST:

WEATHER -28° C Clear N at 5 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83 03 21 0800

Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 34 DEPTH 505 METRES LAST 24 HRS. _____ ROTATING HRS. _____

ACTIVITY AT REPORT TIME Reaming at 490 m

DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. _____ VIS _____ WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1E | 200 | JD7 | 86149 | 4 | 60 | CLEANING TO | BOTTOM | | | | | | |
| | | | | | | | | | | | | | |

CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | m3/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1E | OPEN | | | | AIR at | 1600 CFM | | FOAM AT | 13 GALLONS/MINUTE | | | |
| | | | | | | | | | | | | |

DEVIATION SURVEYS

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

MUD & CHEMICALS ADDED

V7H 3 sx

BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
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COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 240.50 |
| 2. TRIPS | 4.75 | 86.25 |
| 3. RIG SERVICE | .50 | 13.25 |
| 4. DEVIATION SURVEY | | 11.00 |
| 5. REAM & COND. HOLE | 9.75 | 29.50 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | | 9.25 |
| 8. RIG REPAIR | .50 | 6.00 |
| 9. RUN CASING & CEMENT | | 26.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 27.75 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 103 |
| 15. NIPPLE UP & TEST BOP | 6.50 | 68.00 |
| 16. DRILLING OUT | 1 | 16 |
| 17. LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | 9.50 |
| 20. RIG UP - TEAR OUT | | 16.5 |
| 21. Slip and Cut | 1 | 42 |
| TOTALS | 24 | 804 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 21 0800
Year · Month · Day · Time

Thaw kelly. Drill out guide shoe. Lost circulation at 429 m. Rigged up to air drill. Unload hole. Repair leaks in blooie line. Ream with air and foam. Plugged bit at 475 m. POH, slip and cut line. RIH to 475 m. Reaming at 490 m at report time.

WANT LIST:

WEATHER -28° C Clear & calm. ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83 03 22 0800

Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 35 DEPTH 533 METRES LAST 24 HRS. 28 ROTATING HRS. 18

ACTIVITY AT REPORT TIME Drilling Ahead

DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT: Air

WT. _____ VIS _____ WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1E | 200 | JD7 | 86149 | 13 | 60 | | 28 | 18 | 18 | 1.56 | | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1E | OPEN | | | 35 $m^3$ | Air DURAFOAM 60 L/minute | | | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

## MUD & CHEMICALS ADDED

V7H 9 sx

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
| | | | | |
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## COSTS

DAILY

CUM

SUPER. SOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 18 | 258.50 |
| 2. TRIPS | | 86.25 |
| 3. RIG SERVICE | .75 | 14 |
| 4. DEVIATION SURVEY | | 11 |
| 5. REAM & COND. HOLE | 5.25 | 34.75 |
| 6 MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | | 9.25 |
| 8. RIG REPAIR | | 6 |
| 9. RUN CASING & CEMENT | | 26.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 27.75 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON | | 103 |
| 15. NIPPLE UP & TEST BOP | | 68.00 |
| 16 DRILLING OUT | | 16 |
| 17 LOSS CIRC. | | 65.25 |
| 18 LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | 9.5 |
| 20 RIG UP - TEAR OUT | | 16.5 |
| 21 | | 42 |
| TOTALS | 24 | 828 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 22 0800
Year · Month · Day · Time

Reamed 490 - 505 m. Drilled 200 mm hole 505 - 508 m, hole sloughing on connections. Drilling ahead at report time. (Connections have been good).

Geology: 505 - 531 m

Light brown microcrystaline, tight dolomite in part, argillaceous, interbedded with medium gray cryptocrystaline, tight, argillaceous dolomite grading in part to very dolomitic shale, trace of gray green very dolomitic shale.

WANT LIST:

WEATHER -26° Clear N at 3 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83 03 23 0800

Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 36 DEPTH 563 METRES LAST 24 HRS. 30 ROTATING HRS. 12.50

ACTIVITY AT REPORT TIME Drilling Ahead

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. _____ VIS _____ WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 200 | JD7 | 86149 | 13 | 60 | 552 | 47 | 10 | 28 | 1.68 | 5 | 3 | I |
| 2 | 200 | JD7 | 86142 | 13 | 60 | | 11 | 2.5 | 2.5 | 4.40 | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | OPEN | | | 35 $m^3$ | AIR DURAFOAM at 60 L/minute | | | | | | | |
| 2 | OPEN | | | 35 $m^3$ | AIR DURAFOAM at 60 L/minute | | | | | | | |

## DEVIATION SURVEYS

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

_____ °at _____ _____ °at _____

## MUD & CHEMICALS ADDED

V7H 13 sx

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
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## COSTS

DAILY

C.M.

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 12.50 | 271 |
| 2. TRIPS | 6.75 | 93 |
| 3. RIG SERVICE | .75 | 14.75 |
| 4. DEVIATION SURVEY | | 11 |
| 5. REAM & COND. HOLE | | 34.75 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | 3 | 12.25 |
| 8. RIG REPAIR | | 6 |
| 9. RUN CASING & CEMENT | | 26.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 27.75 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 103 |
| 15. NIPPLE UP & TEST BOP | | 68 |
| 16 DRILLING OUT | | 16 |
| 17. LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | 9.5 |
| 20 RIG UP - TEAR OUT | | 16.5 |
| 21 HEAD SEAL | 1 | 43 |
| TOTALS | 24 | 852 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 23 0800
Year · Month · Day · Time

Drilled, POH Bit#1B at 552 m KB. RIH with Bit #2B Changed out jars. Break circulation and drill. Change stripper rubber in Grant head. Drilling ahead at report time.

Top of Saline River formation (Cambrian) at 548 m.

Geology: 534 - 548 m Dolomite in part tight, argillaceous in part clean silty interbedded with minor green dolomitic shale.

548 - 564 m Shale interbedded green and red dolomitic silty shales with Interbedded 1 - 2 m anhydrite stringers

WANT LIST:

WEATHER -28° Clear N at 10 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83-03-24 0800

Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 37 DEPTH 585 m METRES LAST 24 HRS. 22 ROTATING HRS. 4.75

ACTIVITY AT REPORT TIME Ream 200 mm pilot hole to 215.9 mm - reaming at 555 m.

DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

Air

WT.____ VIS____ WL.____ GELS____ % SOLIDS____ PV____ YP____ pH____

% OIL____ %SAND____ CAKE____ PPMCL____ PPMCa____

BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL CONC T | DULL CONC B | DULL CONC G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2B | 200 | HW JD7 | 86142 | 13 | 60 | 585 | 33 | 4.75 | 7.25 | 4.55 | 2 | 2 | I |
| 3B | 215.9 | HW J55R | 91621 | 2/4 | 60/80 | REAM PILOT HOLE | | | | | INCOMPLETE | | |

CIRCULATION RECORD

| BIT NO. | JETS - mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2B | OPEN | | | | 35 | | Air | Durafoam at 60 L/minute | | | | |
| 3B | OPEN | | | | 35 | | Air | XC Polymer at 45 L/minute | | | | |

DEVIATION SURVEYS

____ °at ____ ____ °at ____

____ °at ____ ____ °at ____

____ °at ____ ____ °at ____

____ °at ____ ____ °at ____

MUD & CHEMICALS ADDED

V7H 3 sxs

XC 6 sxs

BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| same | | | | |
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COSTS

DAILY

CUM.

SUPERVISOR J. Aldridge

TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 4.75 | 275.75 |
| 2. TRIPS | 4.5 | 97.50 |
| 3. RIG SERVICE | 0.5 | 15.25 |
| 4. DEVIATION SURVEY | | 11 |
| 5. REAM & COND. HOLE | 5 | 39.75 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | | 12.25 |
| 8. RIG REPAIR | | 6 |
| 9. RUN CASING & CEMENT | | 26.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 27.75 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 103 |
| 15. NIPPLE UP & TEST BOP | | 68 |
| 16. DRILLING OUT | 6 | 22 |
| 17. LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | 9.5 |
| 20. RIG UP - TEAR OUT | | 16.5 |
| 21. Clean Mist Tanks | 3.25 | 46.25 |
| TOTALS | 24 | 876 |

PLEASE TURN OVER

OPERATIONS DETAILS: PERIOD ENDING 83-03-24 0800
Year - Month - Day - Time

Drill to 585 m, clean out Mist tanks, POH - make up new bit, RIH, ream out DV Tool, Float Collar and Guide Shoe. RIH to 505, ream 505 - 555 - reaming at 555 @ 0800 hrs.

Geology

564 - 585 Interbedded red and green Dolomitic silty shales. Tight very fine chrystaline Dolomite and occasional Anhydrite.

WANT LIST:

WEATHER -27° C Clear and Calm ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
83 03 25 0800
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 38 DEPTH 590 METRES LAST 24 HRS. 5 ROTATING HRS. 2.50

ACTIVITY AT REPORT TIME Waiting On cement (177.8 mm liner)

Air

DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. VIS WL. GELS % SOLIDS PV YP pH

% OIL %SAND CAKE PPMCL PPMCa

BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3E | 215.9 | J55R | 91621 | 10 | 70 | 590 | 5 | 2.5 | 2.5 | 2 | 1 | 6 | I |
| | | | | | | | | | | | | | |

CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3E | OPEN | | 35 | $m^3$/min AIR XCPOLYMER | | | 45L/minute | | | | | |
| | | | | | | | | | | | | |

DEVIATION SURVEYS

° at ° at

° at ° at

° at ° at

° at ° at

MUD & CHEMICALS ADDED

BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
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COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 2.50 | 278.25 |
| 2. TRIPS | 2.75 | 100.25 |
| 3. RIG SERVICE | .75 | 16 |
| 4 DEVIATION SURVEY | | 11 |
| 5. REAM & COND. HOLE | 1.75 | 41.50 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | 1.75 | 14.00 |
| 8. RIG REPAIR | | 6 |
| 9. RUN CASING & CEMENT | 12 | 38.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 27.75 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: CEMENT | 2.50 | 105.50 |
| 15. NIPPLE UP & TEST BOP | | 68 |
| 16 DRILLING OUT | | 22 |
| 17 LOSS CIRC. | | 65.25 |
| 18 LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | 9.5 |
| 20 RIG UP – TEAR OUT | | 16.5 |
| 21 | | 46.25 |
| TOTALS | 24 | 900 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 25 0800
Year - Month - Day - Time

Reamed to 585 m. Drilled 585 - 590 m. Circulated sample at 590 m. Dummy trip to 505 m, no fill. Circulate. POH, pick up liner hanger and stand in derrick. Ran 25 joints 177.8 mm Ipsco LT&C 34.23 kg/m S95 casing. Cemented with 7.6 $m^3$ water ahead, 1.5 $m^3$ scavenger slurry, 12.3 T class G cement Neat. Displace with 7.6 $m^3$ water. Bumped plug with 6000 kPa (3000 kPa over circulating pressure). Plug down at 0522 hours 83 03 25. Liner landed at 589.0 m KB. Top of liner hanger at 291.31 m KB. Open hole packer at 293.01 m KB. Landing collar at 576 m, float collar at 586.71 m, shoe at 589 m KB. WOC.

Length of liner - 287.74 m.

WANT LIST:

WEATHER -30° C Calm & clear. ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
83 03 26 0800
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 39 DEPTH 590 METRES LAST 24 HRS. ROTATING HRS. .75

ACTIVITY AT REPORT TIME POOH To Run CBL

DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

Water

WT. VIS WL. GELS % SOLIDS PV YP pH

% OIL %SAND CAKE PPMCL PPMCa

BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1C | 155.6 | J33 | 91847 | 2/4 | 60 | 10 | DRILL OUT TO 585 m | | | | | | |
| | | | | | | | | | | | | | |

CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1C | OPEN | | | | | | | | | | | |
| | | | | | | | | | | | | |

DEVIATION SURVEYS

° at ° at

° at ° at

° at ° at

° at ° at

MUD & CHEMICALS ADDED

BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | .21 | |
| Bit Sub | | | .72 | |
| 15 Collars | | 119 | 141.33 | |
| | | | | |
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TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 278.25 |
| 2. TRIPS | 1.25 | 101.50 |
| 3. RIG SERVICE | | 16 |
| 4. DEVIATION SURVEY | | 11 |
| 5. REAM & COND. HOLE | | 41.50 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | .50 | 14.50 |
| 8. RIG REPAIR | | 6 |
| 9. RUN CASING & CEMENT | | 38.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 27.75 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON CEMENT | 21 | 126.50 |
| 15. NIPPLE UP & TEST BOP | | 68 |
| 16 DRILLING OUT | .75 | 22.75 |
| 17 LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | 9.50 |
| 20 RIG UP - TEAR OUT | | 16.50 |
| 21 PRESSURE TEST | .50 | 46.75 |
| TOTALS | 24 | 924 |

COSTS

DAILY

C.W.

SUPER. SOP J. Aldridge

OPERATIONS DETAILS: PERIOD ENDING 83 03 26 0800
Year - Month - Day - Time

WOC. Pressure test liner and pipe rams to 5000 kPa for 15 minutes, no bleed off. Drilled out landing collar at 576 m. Float collar at 586.71 m. Drilled cement to 585 m. Circulated 1/2 hour. POOH to run CBL.

WANT LIST:

WEATHER -35° C Clear S at 5 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING

83 03 27 0800

Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 40 DEPTH 590 m METRES LAST 24 HRS. 0 ROTATING HRS. 0

ACTIVITY AT REPORT TIME WOC, Rig to Run CBL

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. VIS WL. GELS % SOLIDS PV YP pH

% OIL %SAND CAKE PPMCL PPMCa

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | JETS – mm 2 | JETS – mm 3 | PUMP STROKE | PUMP SPM | PUMP LINER | PUMP $m^3$/min | ANN. VEL. DP | ANN. VEL. DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

## MUD & CHEMICALS ADDED

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
| | | | | |
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## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 278.25 |
| 2. TRIPS | | 101.50 |
| 3. RIG SERVICE | | 16 |
| 4. DEVIATION SURVEY | | 11 |
| 5. REAM & COND. HOLE | | 41.50 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | | 14.50 |
| 8. RIG REPAIR | | 6 |
| 9. RUN CASING & CEMENT | | 38.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | 7 | 34.75 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: CEMENT | 17 | 143.50 |
| 15. NIPPLE UP & TEST BOP | | 68 |
| 16. DRILLING OUT | | 22.75 |
| 17 LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | 9.5 |
| 20 RIG UP – TEAR OUT | | 16.5 |
| 21 | | 46.75 |
| TOTALS | 24 | 948 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 27 0800
Year · Month · Day · Time

After 28 hours, rigged up and ran CBL. No reading. WOC. Run #2 CBL.

First CBL 28 hours after plug down

Second CBL 40 hours after plug down

443 - 454 100% bond

454 - 503 84% bond

503 - 507 100% bond

507 - 585 60 - 65% bond

WANT LIST:

WEATHER -37° C Clear & calm ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
83 03 28 0800
Year · Month Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 41 DEPTH 681 METRES LAST 24 HRS. 91 ROTATING HRS. 7.75

ACTIVITY AT REPORT TIME Drilling Ahead

Air

DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. _____ VIS _____ WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 155.6 | J33 | 91847 | 6 | 60 | | 91 | 7.75 | 7.75 | 11.74 | | | |
| | | | | | | | | | | | | | |

CIRCULATION RECORD

| BIT NO | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | OPEN | | | 20 $m^3$ Air and | | 25 L/minute Ada | foam | | | | | |
| | | | | | | | | | | | | |

DEVIATION SURVEYS

| | | | |
|---|---|---|---|
| 1/4 ° at 594 | | ° at | |
| ° at | | ° at | |
| ° at | | ° at | |
| ° at | | ° at | |

MUD & CHEMICALS ADDED

BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| Bit | | | .18 | |
| Bit Sub | 60 | 119 | .81 | |
| SS | 39 | 119 | 4.38 | |
| 2-119 DC | 60 | 119 | 18.76 | |
| Jar | 60 | 119 | 4.39 | |
| 13-119 DC | 60 | 119 | 122.58 | |
| | | | | |
| | | | | |

TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 7.75 | 286 |
| 2. TRIPS | 5 | 106.50 |
| 3. RIG SERVICE | .50 | 16.50 |
| 4. DEVIATION SURVEY | .25 | 11.25 |
| 5. REAM & COND. HOLE | | 41.50 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | 2.50 | 17 |
| 8. RIG REPAIR | | 6 |
| 9. RUN CASING & CEMENT | | 38.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | 2.50 | 37.75 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: CEMENT | 3 | 146.5 |
| 15. NIPPLE UP & TEST BOP | | 68 |
| 16. DRILLING OUT | 2 | 24.75 |
| 17. LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | 9.5 |
| 20 RIG UP - TEAR OUT | | 16.50 |
| 21 LEAK OFF TEST | .50 | 47.25 |
| TOTALS | 24 | 972 |

COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

OPERATIONS DETAILS: PERIOD ENDING 83 03 28 0800
Year · Month · Day · Time

WOC. Ran Bond Log #3 443 - 454 100% bond after 50 hours.
454 - 500 88% bond
500 - 507 100% bond
507 - 575 65% bond
575 - TD 88% bond

Made up BHA, RIH and drill out float and shoe. Drilled ahead 3 m. Ran formation integrity test, leak off at 4600 kPa surface pressure. Gradient 17.57 kPa/m. Equivalent mud density 1790.7 kg/m$^3$. Drop survey, POH. Recovered survey. Checked bit, RIH to 293 m, unload hole. RIH to TD, unload hole. Drilling ahead at report time.

Geology 590 - 603 Interbedded dolomite and red and green dolomite shales with minor gypsum
603 - 618 Interbedded gypsum and red and green and grey shales
618 - 627 Very poor samples. SS medium to course grains unconsolidated rounded quartz and pyrite - wet
627 - 657 Poor sample quality, could indicate salt. No salt casts. Interbedded green shale and gypsum with minor dolomite with vuggy porosity and minor red shales.
657 - 678 Interbedded green dolomitic shales and gypsum.

ANDERSON - Blew sump and flarepit yesterday. Kitchen sump tomorrow.

WANT LIST:

WEATHER -38° C Clear N at 5 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING

83 03 29 0800
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 42 DEPTH 882 METRES LAST 24 HRS. 201 ROTATING HRS. 20.25

ACTIVITY AT REPORT TIME Drilling Ahead

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. 1185 VIS 35 WL. GELS % SOLIDS PV YP pH 8

% OIL %SAND CAKE PPMCL PPMCa

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1C | 155.6 | J33 | 91847 | 6 | 60 | 852 | 262 | 14.25 | 22 | 11.91 | 5 | 8 | I |
| 2C | 155.6 | J55 | TK506 | 5 | 70 | | 30 | 6 | 6 | 5 | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1C | OPEN | | | AIR 20 $m^3$/min. 25 L/m Adafoam | | | | | | | | |
| 2C | SAME AS ABOVE | | | | | | | | | | | |

## DEVIATION SURVEYS

1 7/8 °at 844 °at

°at °at

°at °at

°at °at

## MUD & CHEMICALS ADDED

Gel 40 sx

Salt 400

XC 4

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
| | | | | |
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## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 20.25 | 306.25 |
| 2. TRIPS | 2.25 | 108.75 |
| 3. RIG SERVICE | .75 | 17.25 |
| 4. DEVIATION SURVEY | .25 | 11.50 |
| 5. REAM & COND. HOLE | | 41.50 |
| 6. MIX & COND. MUD | | 26.75 |
| 7. CIRCULATING | .50 | 17.50 |
| 8. RIG REPAIR | | 6 |
| 9. RUN CASING & CEMENT | | 38.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 37.25 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 146.50 |
| 15. NIPPLE UP & TEST BOP | | 68 |
| 16. DRILLING OUT | | 24.75 |
| 17. LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | 9.5 |
| 20. RIG UP – TEAR OUT | | 16.5 |
| 21 | | 47.25 |
| TOTALS | 24 | 996 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 29 0300
Year · Month · Day · Time

Drilled, surveyed at 844 m. POH, made up new bit, RIH and drilled ahead.

| | | |
|---|---|---|
| TOPS: | Saline River Salt Member | 623 m questionable |
| | Mount Cap Upper | 727 m |
| | Mount Cap Lower | 778 m |
| | Old Fort Island | 838 m |
| | Shaler Group - Proterozoic | 848 m |

Geology: 678 - 702 - Interbedded green shale and gypsum

702 - 729 - Shale and gypsum, salt in samples probably bedded salts

729 - 777 - interbedded dark green dolomitic shales and dolomites with minor anhydrite

777 - 837 - black and brown shales, minor SS, very fine to fine grain glauconitic tight and light grey very micaceous shale, interbedded dolomite at 822 m a trace of dolomite with 2% intercrystaline porosity, slow cut, light yellow florescense

837 - 846 - SS in part very fine to fine grain white pink 0-5% intergranular porosity in part loose medium to part course grain frosted quartz no cut, no florescense 5-10% porosity.

846 - 879 - Light brown, red, pink, white in part argillaceous, cherty tight minor to medium grey dolomitic shale.

WANT LIST:

WEATHER -34° Clear & calm ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING
83 03 30 0800
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 43 DEPTH 900 TD METRES LAST 24 HRS. 8 ROTATING HRS. 3

ACTIVITY AT REPORT TIME Trip Out To Log

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. 1185 VIS 45 WL. 11 GELS ____ % SOLIDS ____ PV ____ YP ____ pH 9.5

% OIL ____ %SAND ____ CAKE ____ PPMCL ____ PPMCa ____

## BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2C | 155.6 | J55 | TK506 | 5 | 70 | 900 | 38 | 3 | 9 | 4.22 | 1 | 2 | I |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2C | OPEN | | | AIR | 22 $m^3$/min. | 25 L/m ada foam | | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

____ ° at ____ ____ ° at ____

## MUD & CHEMICALS ADDED

| | | | |
|---|---|---|---|
| Gel | 20 | Salt 95 | |
| XC | 4 | | |
| Caustic | 2 | | |
| Staflo | 2 | | |

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
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## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | 3 | 309.25 |
| 2. TRIPS | 5.25 | 114 |
| 3. RIG SERVICE | .75 | 18 |
| 4. DEVIATION SURVEY | | 11.50 |
| 5. Rc/ M & COND. HOLE | .50 | 42 |
| 6. MIX & COND. MUD | 7.50 | 34.25 |
| 7. CIRCULATING | | 17.50 |
| 8. RIG REPAIR | | 6 |
| 9. RUN CASING & CEMENT | | 38.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | 3 | 40.25 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | 1.25 | 147.75 |
| 15. NIPPLE UP & TEST BOP | | 68 |
| 16. DRILLING OUT | | 24.75 |
| 17. LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | |
| 19. PLUG & ABANDON | | 9.5 |
| 20. RIG UP TEAR OUT | | 16.5 |
| 21. DISPLACE | 2.75 | 50 |
| TOTALS | 24 | 1020 |

OPERATIONAL DETAILS: PERIOD ENDING 83 03 30 0800
Year · Month · Day · Time

Drill. Circulate BH sample at 900 m. Reached TD of 900 m at 1115 hours 83 03 29. WOO. Rigged out air drillers and displace to drilling fluid. POH to 580 m. Change over air manifold to shale shaker. Circulate and condition hole. RIH, 5 m loose fill on bottom. Circulate and condition hole. POH to log. Rigged up and logged. Hit bridge at 622 m. RIH, 1 m fill on bottom. Circulate and condition hole, dummy trip to casing, no fill on bottom. Circulate and condition hole. POH to log at report time. COGLA and Land Use check OK.

WANT LIST:

WEATHER -43° C Clear N at 5 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR PERIOD ENDING
83 03 31 0800
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 44 DEPTH 900 TD METRES LAST 24 HRS. ROTATING HRS.

ACTIVITY AT REPORT TIME Logging with Dresser Atlas

## DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. 1180 VIS 60 WL. 6 GELS 2/5 % SOLIDS 0.11 PV 17 YP 14 pH 9

%OIL NIL %SAND trace CAKE 2 firm PPMCL 320,000 PPMCa 240

## BIT RECORD

| BIT NO | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | DULL COND. B | DULL COND. G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | 155.6 | J55 | TK506 | CIRCULATING | | AND CONDITIONING HOLE. | | | | | | | |
| | | | | | | | | | | | | | |

## CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | OPEN | | | 197 | 60 | 140 | .546 | | | | | |
| | | | | | | | | | | | | |

## DEVIATION SURVEYS

2 °at 900 °at

°at °at

°at °at

°at °at

## MUD & CHEMICALS ADDED

| | | | |
|---|---|---|---|
| XC | 2 sx | Salt | 100 sx |
| Soda Ash | 1 | | |
| Staflo | 2 | | |
| Caustic | 1 | | |

## BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
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## COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

## TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 309.25 |
| 2. TRIPS | 3.50 | 117.50 |
| 3. RIG SERVICE | .50 | 18.50 |
| 4. DEVIATION SURVEY | | 11.50 |
| 5. REAM & COND. HOLE | 4.50 | 46.50 |
| 6. MIX & COND MUD | | 34.25 |
| 7. CIRCULATING | 2.50 | 20 |
| 8. RIG REPAIR | | 6 |
| 9. RUN CASING & CEMENT | | 38.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | 11.75 | 52 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON | | 147.75 |
| 15 NIPPLE UP & TEST BOP | | 68 |
| 16 DRILLING OUT | | 24.75 |
| 17 LOSS CIRC | | 65.25 |
| 18 LAY DOWN DP & BOPS | | |
| 19 PLUG & ABANDON | | 9.5 |
| 20 RIG UP - TEAR OUT | | 16.5 |
| 21 Clean to btm. | 1.25 | 51.25 |
| TOTALS | 24 | 1044 |

OPERATIONS DETAILS: PERIOD ENDING 83 03 31 0800
Year · Month · Day · Time

POH to log and logged with Dresser. Hit bridge at 622 m. RIH, reamed 604 - 640 m. RIH to bottom. Circulate and condition. 5 m fill on bottom. POH to log, rig up loggers and log. Run#1 - Acoustilog Sonic - TD to 596 m, Run #2 - Dual Laterolog electric TD to 588 m, Run #3 - CNL-FDC still being run.

WANT LIST:

WEATHER -24° Overcast N 10-15 ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
83 04 01 0800
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 45 DEPTH 900 METRES LAST 24 HRS. _____ ROTATING HRS. _____

ACTIVITY AT REPORT TIME Tear Out BOPs (Plug and Abandon)

DRILLING MUD PROPERTIES AT SHAKER/SUCTION PIT:

WT. _____ VIS _____ WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

DEVIATION SURVEYS

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

MUD & CHEMICALS ADDED

_____ _____

_____ _____

_____ _____

_____ _____

BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
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COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 309.25 |
| 2. TRIPS | 2 | 119.50 |
| 3. RIG SERVICE | .25 | 18.75 |
| 4. DEVIATION SURVEY | | 11.50 |
| 5. REAM & COND. HOLE | | 46.50 |
| 6. MIX & COND. MUD | | 34.25 |
| 7. CIRCULATING | .50 | 20.50 |
| 8 RIG REPAIR | | 6 |
| 9. RUN CASING & CEMENT | | 38.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | 11 | 63 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON | | 147.75 |
| 15 NIPPLE UP & TEST BOP | | 68 |
| 16 DRILLING OUT | | 24.75 |
| 17 LOSS CIRC | | 65.25 |
| 18 LAY DOWN DP & BOPS | 3 | 3 |
| 19 PLUG & ABANDON | 7.25 | 16.25 |
| 20 RIG UP TEAR OUT | | 16.50 |
| 21 | | 51.25 |
| TOTALS | 24 | 1068 |

OPERATIONS DETAILS: PERIOD ENDING 83 04 01 0800
Year · Month · Day · Time

Log with Dresser Run #3 CNL-FDC 900 - 248 m
#4 Velocity Survey (Century)
#5 Sidewall Core. 886.5 - 773.25 m - Shot 25 recovered 22.

RIH open end, circulate bottom up, abandon as per program. Tear out BOPs and clean mud tanks.

#1 - 800-900 m - 1 $m^3$ $H_2O$ ahead, 3.2 t Class G Neat. Displace with 0.29 $m^3$ $H_2O$, 2.6 $m^3$ drilling fluid. Plug down 83 03 31 2340 hrs.

#2 - 540-640 m - 1 $m^3$ $H_2O$ ahead, 3.2 t Class G Neat. Displace with 0.29 $m^3$ $H_2O$, 1.6 $m^3$ drilling fluid. Plug down 83 04 01 0045 hrs.

Ran gauge ring and junk basket. Set bridge plug at 280 m. Pressure test to 7000 kPa for 15 minutes. Held OK.

#3 - Surface - 50 m - 0.79 $m^3$ $H_2O$ ahead, 2 t Perma-frost 0.079 $m^3$ $H_2O$ Plug down 83 04 01 0420 hours.

WANT LIST:

WEATHER -24° C Overcast Calm ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)

Winterhawk

# DAILY DRILLING REPORT

FOR 24 HR. PERIOD ENDING
83-04-02 0800
Year · Month · Day · Time

WELL NAME Forward et al Izok LOCATION M-20

DAY 46 DEPTH _____ METRES LAST 24 HRS. _____ ROTATING HRS. _____

ACTIVITY AT REPORT TIME Rig Released - Tearing out to move to Anderson.

DRILLING MUD PROPERTIES AT SHAKER/SUCTION/PIT:

WT. _____ VIS _____ WL. _____ GELS _____ % SOLIDS _____ PV _____ YP _____ pH _____

% OIL _____ %SAND _____ CAKE _____ PPMCL _____ PPMCa _____

BIT RECORD

| BIT NO. | SIZE mm | MAKE & TYPE | SER. NO. | BIT WT. | BIT RPM | DEPTH OUT m | m DRLD | ROT. HOURS | CUM ROT HRS | m/HR | DULL COND. T | B | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

CIRCULATION RECORD

| BIT NO. | JETS – mm 1 | 2 | 3 | PUMP STROKE | SPM | LINER | $m^3$/min | ANN. VEL. DP | DC | JET VEL | H.H.P. | SURF PRESS kPa |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

DEVIATION SURVEYS

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

_____ ° at _____ _____ ° at _____

MUD & CHEMICALS ADDED

BOTTOM ASSEMBLY

| TOOL | ID mm | O.D. mm | LENGTH m | WEIGHT daN |
|---|---|---|---|---|
| | | | | |
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TIME ANALYSIS

| OPERATION | TODAY | CUM |
|---|---|---|
| 1. DRILLING | | 309.25 |
| 2. TRIPS | | 119.50 |
| 3. RIG SERVICE | | 18.75 |
| 4. DEVIATION SURVEY | | 11.5 |
| 5. REAM & COND. HOLE | | 46.50 |
| 6. MIX & COND. MUD | | 34.25 |
| 7. CIRCULATING | | 20.5 |
| 8. RIG REPAIR | | 6 |
| 9. RUN CASING & CEMENT | | 38.25 |
| 10. FISHING | | 7.25 |
| 11. LOGGING | | 63 |
| 12. CORING | | |
| 13. FORMATION TESTING | | |
| 14. WAITING ON: | | 147.75 |
| 15. NIPPLE UP & TEST BOP | | 68 |
| 16. DRILLING OUT | | 24.75 |
| 17. LOSS CIRC. | | 65.25 |
| 18. LAY DOWN DP & BOPS | | 3 |
| 19. PLUG & ABANDON | | 16.75 |
| 20. RIG UP · TEAR OUT | 24 | 40.5 |
| 21 | | 51.25 |
| TOTALS | 24 | 1092 |

COSTS

DAILY

CUM

SUPERVISOR J. Aldridge

OPERATIONS DETAILS: PERIOD ENDING 83-04-02 0800

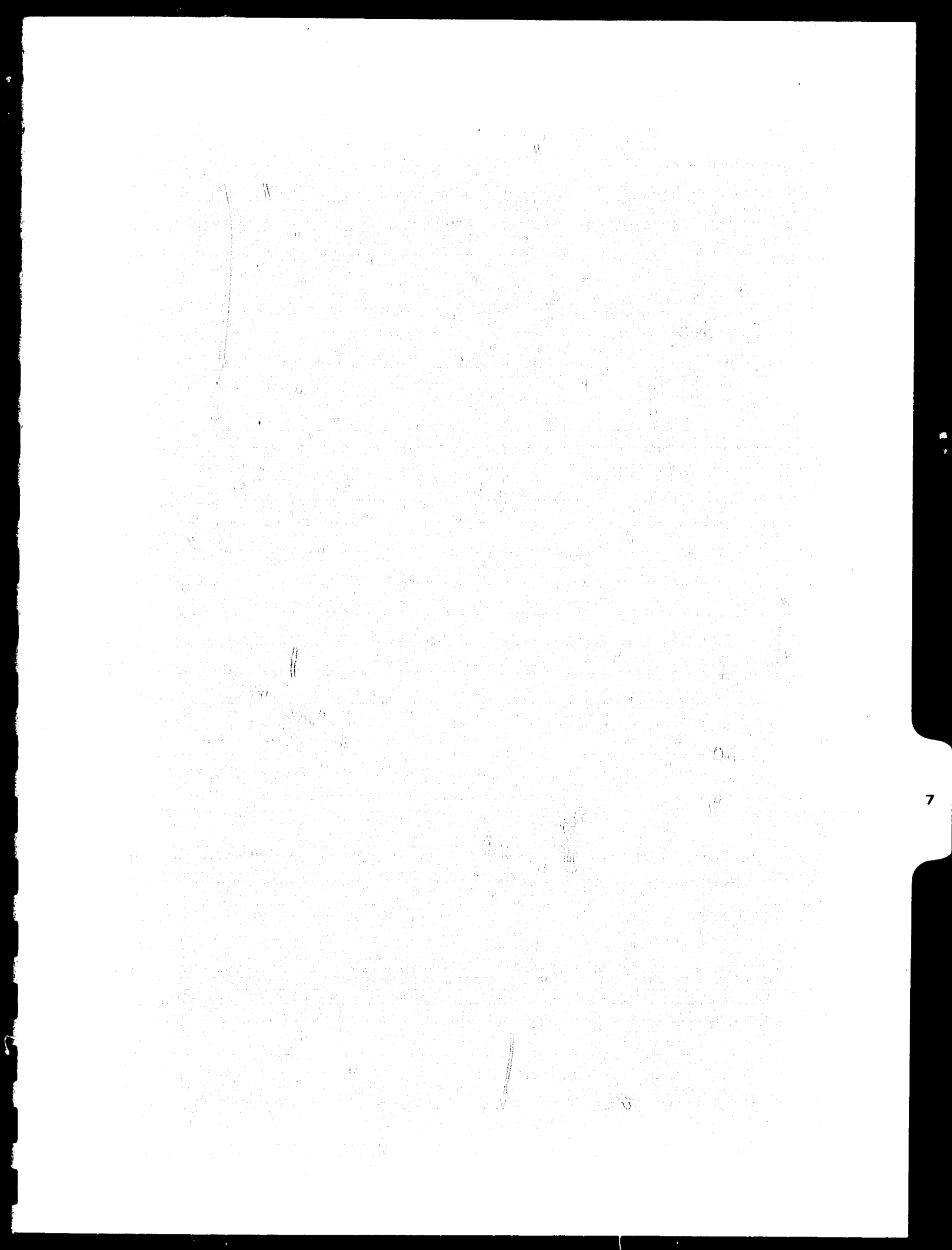
Year - Month - Day - Time

Tear out BOP and flare line - clean mud tanks. Rig released at 1400 hours, 83-04-01. Cut off casing 1 m below ground level . Weld on cap and marker. Tear out rig to move to Anderson location.

WANT LIST:

WEATHER -10 $^{o}$ C Clear & Calm ROAD

IN DETAIL: MOVEMENT OF PURCHASE & RENTAL ITEMS (WHERE, WHEN, HOW)



9211-F9-1-2

Confidential

# PALEONTOLOGICAL DETERMINATIONS

Winterhawk

## GEOLOGICAL SUMMARY

The well was spudded in a pleistocene glacial till consisting of impervious blue clay and rounded pebbles, cobbles and boulders of igneous, metamorphic and sedimentary origin. The majority of the pebbles originate in the nearby Canadian Shield. The till at this location is 36 meters thick and the bottom is marked by a pyritic zone. The entire unit is permafrosted.

### Franklin Mountain Formation @ 36 m

The Franklin Mountain formation is divided into three units. The top one, the "Cherty Unit" is marked by a partially silicified, mostly unconsolidated, coarse to very coarse grained, cherty sandstone. This varicolored sand is probably chert shards reworked by wave action. It is seven meters thick and is followed by a partially bedded chert zone consisting of varicolored chert, in part oolitic, with vuggy porosity and some dead oil staining. This zone is 31 meters thick and is probably a detrital zone with all carbonates weathered away. From 74 meters to around 130 meters, the crest is interbedded with fairly clean, very fine crystalline dolomite showing some intercrystalline calcite and porosity and minor vuggy porosity indicated by euhedral pyrite quartz and calcite crystals. The "Cyclic Unit" has only minor dead oil stain, no other shows.

The middle unit, the "Rythmic Unit" begins at about 130 meters and consists of cryptocrystalline to coarsely crystalline, occasionally very argillaceous dolomite. From 130 to 260 meters it is well karsted showing a great deal of vuggy porosity by the presence of euhedral quartz, dolomite, calcite and pyrite crystals, and by weathered dolomite and some unconsolidated fine to coarse grained sand indicating underground streams. From 260 meters to 400 meters, it is fairly tight with minor vuggy and intercrystalline porosity and minor dolomitic shales. From 400 to 425 meters it has more vuggy porosity and evidence of underground streams. The drilling was blind with no returns for the rest of the "Rhythmic Unit". There was brown oil stain in intercrystalline, dolomitic porosity at 418 to 421 meters but while it fluoresced, there was no oil cut with chlorothene.

The third "Cyclic Unit", came in at 501 meters (log top) and consists of a tight, argillaceous, cryptocrystalline to microcrystalline dolomite with frequent dolomitic shale interbeds. There were no shows or porosity in this unit.

### Saline River Upper Unit @ 547.5 m

The Saline River top is marked by a drilling break and the dramatic appearance of red, green, purple and red-brown, dolomitic shales. The upper unit consists of interbedded, varicolored shales and silts, all dolomitic, minor anhydrite and gypsum beds and some silty gypsiferous dolomite. The unit is very gypsiferous at the base. It resembles a paleosabka. There are no shows throughout the Saline River formation.

Saline River Salt Unit @ 618 m

The Saline River salt top is marked by a drilling break and unconsolidated sand which may have been suspended in salt. The samples throughout this section are well rounded, indicative of cavings, and are dusted with powdery dolomite, indicative of fine dolomitic laminations in bedded salt. There is very little salt in the samples as it is readily dissolved in the drilling fluid. There are minor gypsum, dolomite and shale beds throughout the unit and these all show salt casts with traces of undissolved clear and orange salt crystals in the holes. There are no shows in this unit.

Mount Cap Upper @ 720 m

The top is marked by a slowdown in the penetration rate and by the presence of fresh chips of interbedded, light and dark cryptocrystalline dolomite. It consists of interbedded grey to green, dolomitic shales and argillaceous, silty gypsiferous dolomite with minor anhydrite stringers. There are no areas of porosity or shows in this unit.

Mount Cap Lower @ 468.5 m

The top is marked by a drilling break and by dark grey-green dolomitic shales. The unit is mostly these green shales with minor dark brown-black, bituminous shales and silty dolomite with a trace of vuggy porosity and dark brown oil stain showing a very slow cut and pale yellow fluorescence. The unit becomes silty and sandy at the base with a coarse sand just above the next unit. There is some minor intergranular porosity but no shows in the sand.

Old Fort Island @ 838.5 m

The top is marked by a slowdown in the penetration rate and by the presence of white to pink, very fine to fine grained, partially dolomitic sandstone. The sand is siliceous in part and medium to coarse grained in part but shows evidence of low (5 to 8%) porosity. There are no shows in this unit.

PreCambrian - Proterozoic Shaler Group @ 848 m

The top is marked by a cherty unit showing a radical decrease in penetration rate. It consists of pink, red, orange, light brown, microcrystalline to cryptocrystalline tight dolomite with minor medium grey, argillaceous zones grading into rare fissile, dolomitic shales. There are no shows in this unit.

CONTRACTOR TO SEE AS ANNS
ACCOMPANIED BY
ACCOMPANIED BY REPORT [illegible]
[illegible]
[illegible] 83
RESOURCE MANAGEMENT
RESOURCE [illegible] CONTROL

BEARSPAW
LOGGING SERVICES LTD.

OPERATOR FORWARD RESOURSES LTD.

WELL FORWARC et al IZOK M-20

STATE or PROV. N.W.T.
LOCATION: Lsd. Sec. Twp. Rge. W.
Lat 67° 18' 37"
Long. 123° 48' 20"
ELEVATION K.B. 299.2 m.
DATE SPUDDED. 18-02-83 2000 hrs.
SCALE 1:200
TECHNICIANS KEVIN WHITTIER

MUD LEGEND

WT WEIGHT
V VISCOSITY
WL WATER LOSS
PC POTASH CHLORIDE
PH ALKALINITY
Rm MUD RESISTIVITY
Rmf FILTRATE RESISTIVITY

DRILLING LEGEND

NB NEW BIT
RB REGUN BIT
DB DIAMOND BIT
DCB DIAMOND CORE BIT
TB TUNGSTEN BIT
DS DEVIATION SURVEY
WOB WEIGHT ON BIT
RPM ROTATION
PP PUMP PRESSURE
SPM PUMP STROKES
LC LOST CIRCULATION
TG TRIP GAS
NR NO RETURNS

LITHOLOGY LEGEND

SANDSTONE
SILTSTONE
SHALE
CLAYSTONE
DOLOSILTE
LIMESTONE
ANHYDRITE
GYPSUM
SALT
COAL
BENTONITE
TUFF
GLACIAL TILL
METAMORPHIC
BRECCIA
CONGLOMERATE
CHERT

ENGINEERING LEGEND

CORE
RECOVERED
DST
CIRCULATION TEST
CT
WATER
OIL
GAS

GAS FROM MUD

TOTAL GAS
METHANE
ETHANE
PROPANE
I-BUTANE
BUTANE

0 1 3 10 30 100

PENETRATION RATE
min. /m

SCALE 1
0.3 3.0 10
SCALE 2
0.3 3.0 100

INTERP LITH.

PERCENT LITH.
0 50 100

DESCRIPTION

CONTRACTOR — 300 Drilling Rig 3 unit.
MUD: Bar. MUD
GRD. ELEV. 299m.
CSG: Cond. at 15m.
Surf. at 143m.
Inter. at 291.
Commenced logging at 0 m.

Bottom check.

Lost circulation 30 bbl mud.

C2

PLEISTOCENE TILL

SSS CGL gravel wash lt-gy,m-gy,red,org, silty, vf-fg,qtz,sil,wk lm pt,v hd.

SS CGL gravel wash, lt-m-gy,tan,red-brn,org, silty, sndy, vf-fg, m-m-c g, f-m sub,sil mtx,qtz,arthuclase,impure xln,glauc.

Lost circulation, 5 - 15 m.

SSS CGL gravel wash, wh,lt-gy,m-dk-gy,tan, red-brn, v sil, sndy slty sdy tan,qtz nucleus,plagioclase,impure,dissem calc mtx, tr muscovite.

SS & CGL grad qtz, tr sil frac,tr oil stain metc red

MT ANGLE FAU 35 m.

LC LOST CIRCULATION
TG TRIP GAS
NR NO RETURNS

● OIL
☼ GAS

GAS FROM MUD — TOTAL GAS, METHANE, ETHANE, PROPANE, ISO-BUTANE, BUTANE — 0 .1 .3 1.0 10 100

PENETRATION RATE mn./m — SCALE 1: .1 1.0 10 — SCALE 2: 1.0 10 100

CONTRACTOR: 300 Drilling, Mr Ben.
MUD: PH MUD
GRD ELEV: 295m.
CSG: Cond. at 36m.
Surf. at 450m.
Liner at: 589

Commence logging at 0m.

15 System check.

Lost circulation - no returns.

WT 1050
VIS 47
PH 6.0

02 F 3
RPM 80
SPM 2 100
PP 1000

T.G. - Hydrogen in cement.

Commence air drilling at 38m.

Line froze at bloole fitting.
Air mist at 46m

Mist 12 l/min.
Soap & Water.

CROMATOGRAPH.
BLENDER
ANALYSIS

Nil %

System check.

1 3 5 10

Line froze at bloole fitting.

Nil.

Mist 12 l/min.
Soap & Water.

Nil.

System check.

83 21

Nil.

Mist 12 l/min.
Soap & Water.

Nil

02

line froze

| DATE | BIT DATA | DEPTH | POROSITY | INTERP. LITH. | GRAIN SIZE | PERCENT LITH. 0 50 100 | FLUOR | CORES | DESCRIPTION | DST |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | | | | | | | PLEISTOCENE TILL. | |
| | | | | | | | | | SS& CGL gravel wash lt-gy,m-gy,red,org, silty, vf-fg,qtz,sil,vit in pt,v-hd. | |
| | | | | | | | | | SS-CGL.,grvl wsh,lt-mgy,tan,red-brn,org, silty,shly,vf fg,tr m-c g,f mxln,sil vit,qtzc,orthoclase,hnblnd xls,granite | |
| | | | | | | | | | Lost circulation.6-15m. | |
| | | | | | | | | | SS& CGL grvl wsh, wh,lt-gy,m-dk-gy,tan, red-brn,v col, shly silty sdy text,ort hoclase,plagioclase,hnblnd,diabase calc in pt,tr muscovite. | |
| | | | | | | | | | SS & CGL pred a a, tr vol brec,tr olivene meta sed. | |
| | | | | | | | | | MT. KINDLE FM. 38 m. | |
| | | | | | | | | | SS crm-gy,wh,lt-gy,pred fg,abnt m-cg, p cons,30% v w rnd qtz peb. | |
| | | | | | | | | | SS clr,smky gy,c g pebls,v w rnd, uncons,qtz peb.CHT wh lt-gy,smky, tr pyr,abnt w rnd qtz peb. | |
| | | | | | | | | | CHT wh,milky,vit in pt,v hd,hvy tr qtz frags. | |
| | | | | | | | | | CHT wh-lt-gy,crmy,20% rnd frac qtz frag,tr pyr. | |
| | | | | | | | | | CHT wh lt-gy,crm-gy,20% qtz part,tr pyr | |
| | | | | | | | | | CHT wh-lt-gy,tan,tr qtz,frags,v-hd. | |
| | | | | | | | | | DOL wh-crm-lt-gy,chty inpt,vf-f xln,calc, tr qtz frags. | |
| | | | | | | | | | CHT wh,dol inpt,v hd. DOL wh-crm-gy, f-c xln,chty inpt. | |
| | | | | | | | | | CHT wh lt-gy,crm-gy,v sl dol,occ grd to dol,tr qtz frags & peb,DOL lt-gy wh, bf-brn,vf-f xln,calc,mod hd,tr cht, tr qtz. LS wh,crm-gy,lt-gy-m gy,vf f xln,dol in pt,tr dol. | |
| | | | | | | | | | DOL lt-gy,crm-gy,tan-gy,vf-f xln,calc,my. | |
| | | | | | | | | | DOL wh,crm-gy,sl org inpt,lmy inpt,vf f xln,tr lc,tr calc xls,tr dis pyr nod. | |
| | | | | | | | | | DOL lt-gy,tan-gy,crm gy,vf-m xln,tr c xln,tr pyr | |
| | | | | | | | | | DOL lt-gy,tan-gy,crm-gy,vf-m xln,abnt pyr nod,tr ls,tr calc. | |
| | | | | | | | | | LS m gy-brn,vf-f xln,sl org inpt,med hd. | |
| | | | | | | | | | DOL lt-gy,tan,crm-gy,vf-c xln,lmy inpt, abnt calc xls,abnt pyr. LS m-gy-brn, dol in pt,vf-f xln,m-hd. DOL lt-gy, crm-gy,sl org in pt,chty in pt,tr pyr, 20% rnd & ong qtz frags,tr ss. | |
| | | | | | | | | | DOL wh crm-gy,vf-f xln,tr m-c xln,lmy in pt,tr ls. | |
| | | | | | | | | | DOL wh lt-gy,crm-gy vf-f xln,tr m-c xln, chty in pt. | |
| | | | | | | | | | DOL crm-lt-gy, wh bf gy, v sl org inpt,mic | |

NB 1A HW OWVJ
NB 2A HW J 3 3
NB 3A HW J 5 5 R
RR 2A HW J 3 3
RR 3A HW J 5 5 R
NB 4A HW J 5 5 R
NB 5A HW J 5 5 R

SEC-H 77SG
MET 9 3/4 - 8 21
REED-S 21-G
MET 4 HRS 7 1/2 - 7 2 1
MET 22
HRS 11 3/4
CON 4 4 1
F 10
RPM 45
AP 700 Kpa
VOL 46m³
F 10
RPM 50
AP 700
VOL 46m³

DS 1/4°
DS W4°
DS 0°
DS 1/4°

100
150

2

BLENDER

ANALYSIS

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Nil | 97% | System check | 83 19 02 | NB 3A | SEC-H 77 SG MET 6-3/4-6-2-1 | | | | |
| | | | | NB 4A | RE-U-S 21 G MET 18 HRS 7 1/4 7-2-1 | | | | |
| | | | 83 20 02 | RR 2A HW J 3 3 | MET 22 HRS 11 3/4 CON 4-4-1 | DS 1/4° | | | |
| Nil | | line froze at bloole fitting. | | | | | | | |
| | | Mist 12 l/min Soap & Water. | | NB 3A HW J 5 5 R | F 10 RPM 45 AP 700 Kpa VOL 46m³ | DS 1/4° | 100 | CHT | wh lt gy, tan, tr qtz, frags, v hd. |
| | | System check. | | | | DS 0° | | DOL | wh-crm-lt-gy, chty inpt, vf-f xln calc, tr qtz frags. |
| Nil. | | | 83 21 | | | | | CHT | wh, dol inpt, v hd. DOL wh-crm-gy, f-c xln, chty inpt. |
| | | | | | | | | CHT | wh lt gy, crm-gy, v sl dol, occ grd to dol, tr qtz frags & psb, DOL lt gy wh, bf-brn, vf-f xln, calc, mod hd, tr cht, tr qtz. LS wh, crm gy, lt-gy-m gy, vf f xln, dol inpt, tr dol. |
| | | Mist 12 l/min Soap & Water. | | | F 10 RPM 50 AP 700 VOL 46m³ | DS 1/4° | | DOL | lt-gy, crm-gy, tan-gy, vf-f xln, calc, my. |
| Nil. | | | 02 | | | | | DOL | wh, crm-gy, sl arg inpt, lmy inpt, vf f xln, tr is, tr calc xls, tr dis pyr nod. |
| | | | | | | | | DOL | lt-gy, tan-gy, crm gy, vf-m xln, tr c xln, tr pyr |
| | | System check. | 83 | | | DS 0° | | DOL | lt-gy, tan-gy, crm-gy, vf-m xln, abnt pyr nod, tr is, tr calc. |
| Nil. | | | 21 | | | | | LS | m gy-bm, vf-f xln, sl arg inpt, med hd. |
| | | Mist 12 l/min Soap & Water. | | | F 10 RPM 50 AP 700 VOL 46m³ | | | DOL | lt-gy, tan, crm-gy, vf-c xln, lmy inpt, abnt calc xls, abnt pyr. LS m-gy-bm, dol inpt, vf-f xln, m-hd. DOL lt-gy, crm-gy, sl arg inpt, chty inpt, tr pyr, 20% rnd & ang qtz frags, tr ss. |
| Nil. | | | | | | DS 1/4° | 150 | DOL | wh-crm-gy, vf-f xln, tr m-c xln, lmy inpt, tr is. |
| | | line froze. System check. | 02 | | | | | DOL | wh lt-gy, crm-gy vf-f xln, tr m-c xln, chty inpt. |
| | | Mist 12 l/min Soap & Water. | | | F 10 RPM 50 AP 700 VOL 46m³ | | | DOL | crm-lt-gy, wh bf gy, v sl arg inpt, mic vf xln, f xln inpt, tr calc xls, tr qtz frags, tr is. |
| Nil. | | | | | | DS 0° | | DOL | wh crm-gy, lt-gy, tr m-gy, arg inpt, occ lmy, med hd, tr calc xls, tr cht. |
| | | | 83 22 | | | | | DOL | wh crm bf-gy, vf-f-m xln, tr calc xls, tr pyr, tr ss. |
| | | | | | MET 107 HRS 41 3/4 CON 3-3-1 | | | DOL | bf-wh lt-gy, crm-gy, aphan, chty, abnt oct hdl pyr xls. |
| Nil. | | | 02 | | | | 200 | DOL | wh crm-gy, mic vf xln, occ f-c xln, med-hd, tr pyr, tr is. |
| | | Mist 12 l/min Soap & Water. | | | F 10-12 RPM 50 AP 800 Kpa VOL 46m³ | | | DOL | wh crm-gy, tr tan, f-c xln, lmy inpt, tr pyr tr is. |
| | | | | NB 6A S E C M 8 4 F | | | | DOL | crm tan, lt brn, lt-gy, sl arg inpt, vf-c xln, calc, tr is. |
| | | | | | | | | DOL | crm-lt-gy, bf-gy, v sl arg inpt, pred med-hd, sft inpt, mic vf xln, occ f xln. |
| | | line froze. System check. | 83 23 | | | DS 1/8° | | DOL | wh-crm-gy, vf-c xln, abnt oct hdyl pyr xls. |
| Nil. | | | | | | | | DOL | wh lt-gy, crm-gy, tr gn-gy, 30% v wrnd qtz. |
| | | | | | | | | DOL | lt-gy crm-gy, m-gy brn, arg, vf-f xln, hd-v hd, v sl lmy inpt, tr vug por, abnt w rnd qtz frags, tr ss, tr pyr. |
| | | | 02 | | | DS 1/8° | | DOL | crm gy lt-gy, tan arg, mic vf xln, tr sh, lmy inpt, tr is. |
| | | Mist 12 l/min Soap & Water. | | | F 12 RPM 55 AP 900 VOL 46m³ | | | DOL | lt-m gy, crm-gy, tan arg, mic vf xln, tr sh, tr md qtz, tr pyr. |
| Nil | | line froze. System check. | | | | | 250 | DOL | crm-gy lt-gy, tan arg inpt, lmy inpt, occ grd to is, tr pyr, LS crm-gy wh, vf-f xln, dol inpt. |
| | | | 83 24 | | MET 57 HRS 20 1/2 CON 3-3-1 | DS 1/4° | | DOL | lt-gy, crm-gy arg, f-c xln, tr sh, tr pyr, tr is, tr oolitic. |
| | | | | | | | | DOL | crm-gy, lt-m gy, m gy brn, tan, mic-m xln, arg, shly inpt tr pyr, tr cht. |
| | | | 02 | NB 7A S E C M 8 4 F | | | | SH | dk gy blk, mic mica, sl calc, med hd. |
| Nil. | | System check. | | | | | | | |
| | | Mist 12 l/min Soap & Water. | | | F 16 RPM 55 AP 1100 VOL 46m³ | | | DOL | crm-lt-gy, tan, brn, gy-gn, calc, mic vf xln, occ grd to is, abnt pyr, hvy tr is, tr sh, tr fg ss. |
| | | | | | | | | DOL | crm-lt-gy, tan lt-m brn, crp vf xln, |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Mist 12 l/min. Soap & Water. | F 10 12 RPM 50 AP 800 Kpa VOL 46 $m^3$ | NB 6A SEC M 84F | 83 23 | | DOL wh crm gy, vf-c xln, abnt octhdyl oyr xls. |
| line froze. | System check. | DS 1/8" | | | | DOL wh lt-gy, crm-gy, tr gn-gy, 30% v w rnd qtz. |
| Nil | | | | | | DOL lt-gy crm-gy, m-gy brn, arg, vf-f xln, hd-vhd, v sl imy in pt, tr vug por, abnt w rnd qtz frags, tr ss, tr pyr. |
| | | | | 02 | | DOL crm gy lt-gy, tan arg, mic vf xln, trsh, imy inpt, tr ls. |
| | Mist 12 l/min. Soap & Water. | DS 1/8" F 12 RPM 55 AP 900 VOL 46 $m^3$ | | | | DOL lt-m gy, crm-gy, tan arg, mic vf xln, tr sh, tr rnd qtz, tr pyr. |
| line froze. Nil | System check. | | | | 250 | DOL crm-gy lt-gy, tan arg inpt, imy inpt, occ grd to ls, tr pyr, LS crm-gy wh, vf-f xln, dol inpt. |
| | | | | | | DOL lt-gy, crm-gy arg, f-c xln, tr sh, tr pyr, tr ls, tr oolitic. |
| | | DS 1/4" MET 57 HRS 20 1/2 CON 3:3:1 | | 83 24 | | DOL crm-gy, lt-mgy, mgy brn, tan, mic-mr xln, arg, shly inpt tr pyr, tr cht. |
| | | | NB 7A SEC M 84F | | | SH dk gy blk, mic mica, sl calc, med hd. |
| Nil | System check. | | | 02 | | |
| | Mist 12 l/min. Soap & Water. | F 16 RPM 55 AP 1100 VOL 46 $m^3$ stk. | | | | DOL crm-lt-gy, tan, brn, gy-gn, calc, mic vf xln, occ grd to ls, abnt pyr, hvy tr ls, tr sh, tr fg ss. |
| | | DS 1/8" | | 83 25 | | DOL crm-lt-gy, tan lt-m brn, crp vf xln, imy inpt, tr ls, abnt pyr. |
| | | | | | | DOL crm-bf gy, lt-gy-gn, crp mic xln, tr f xln, tr silty, v sl tr gn mot-pos glauc. |
| | | | | | | DOL wh lt-gy, tan, aphan-vf xln, vlt in pt chty inpt, tr g por, tr cht. |
| Nil | | | | | | DOL lt-mgy, tan, lt-m brn, mic vf xln, pos tr glauc, hvy tr pyr, tr rnd qtz frags. |
| | | | | | 300 | DOL lt-m brn, gy brn, tan, mic vf xln, hvy tr pyr. |
| | System check. 12 l/min. Soap & Water. | F 16 RPM 55 AP 1100 VOL 46 $m^3$ | | 02 | | DOL lt-gy tan, lt-gy brn, lt-m brn, mic vf xln, tr sl arg, tr pyr, mod hd. |
| | | | | | | DOL lt-gy brn, lt-m brn, mic vf xln, tr pyr. |
| Nil | | | | | | DOL crm bf gy, tan, lt brn, aphan, mic xln, tr pyr, tr cht. |
| | | | | | | DOL crm lt-gy, lt-gy brn tan, sl arg, crp mic xln, med hd, tr pyr, tr sh. |
| | System check. | | | | | DOL wh-crm lt-gy, tan, aphan, mic xln, chty inpt, tr pyr, tr sh. |
| | | | | | | DOL lt-mgy, lt-m brn, tan, crp vf xln, arg tr f g ss, tr cgl, tr pyr, tr sh. |
| | | | | | | DOL crm-gy, lt-mgy, tan, lt-brn, arg inpt, mic vf xln, tr cht, hvy tr sh, tr pyr. |
| line froze. | | | | | | DOL crm, brn, tan, lt-gy, mic vf xln, aphan in pt, chty in pt, imy in pt, tr sh, tr ls. |
| Nil | | MET 114 HRS 48 3/4 CON 2:2 | | 83 26 | 350 | |
| line froze | | | | | | DOL crm-gy, lt-mgy, lt-m brn, mic vf xln, tr gd por, tr ls. |
| | | | | 02 | | CYCLIC ZONE 362m. |
| line froze | Mist 12 l/min. Soap & Water. | | NB 8A HW J 33 | 83 27 | | DOL tan, lt brn, crm gy, mic vf xln, imy in pt, tr ls, abnt pyr. |
| | System check. | F 16 RPM 60 AP 1200 VOL 48 $m^3$ | | | | DOL wh crm gy tan, aphan, crp-mic xln, imy, calc, occ grd to ls, abnt pyr. |
| | | | | | | DOL crm lt-gy, tan, crp mic xln, imy in pt, tr oct pyr xls. |
| Nil | Wat flow increased from 1165 barrels/min to 1/2 Mud up at 380m | | | | | DOL aa. |
| | | WT 1050 VIS 50 PH 9.0 WL 9.0 | | 02 | | No sample - lost circulation. |
| | | F 19 RPM 60 SPM 1 X 95 PP 2600 | | | | DOL pred aa, 90% cvgs, v ps. |
| | | | | | | DOL aa, 60% cvgs, v ps. |
| | | | | | | DOL wh, crm-gy, tan, mic vf xln, tr pyr. |
| | + CARBIDE CHECK. 1/2 unit. | | | | | DOL lt gy crm-gy, tan, lt-m brn, mic-vf xln, sl arg in pt, tr pyr, v sl tr sh. |
| | + CARBIDE LAG - 22 min. 1 unit. | DS 1/4" | | | 400 | DOL lt-m brn, tan, lt-gy, crp-mic xln, arg in pt, tr pyr, hvy tr dk gy sh. |
| | | | | 83 28 | | Lost circulation - no samples. |
| Shaker bypassed 405-411m. | | | | | | DOL tan, lt-gy, lt-brn, aphan, crp-mic xln, tr sh, tr pyr, tr red org mat, pos cht. |

Nil

System check.

line froze.

Nil

line froze

line froze — Mist 12 l/min Soap & Water

System check.

Nil — Wait 7 hrs. Increased from 1106 barrels/min to 1200 barrels/min

Mud up at 380m.

WT 1050
VIS 50
PH 9.0
WL 9cc

+ CARBIDE CHECK 1/2 unit.

+ CARBIDE LAG - 22 min. 1 unit.

Shaker bypassed 405-411m.

WT 1020
VIS 50
PH 9.5

Drill blind - 425-460 - no returns

Water

Drill blind - 460-479 - no returns.

Water

Drill blind - 480-506 no returns.

CROMATOGRAPH
BLENDER
ANALYSIS

C1 C2 C3 C4 C5

Resume air drilling with (polymer duratoam) 505

60 litres/min Duratoam.

From 505-990m. well flow 500-600 barrels per hour; subsequently intermittent freezing of gas; flows. Gas values are given from short intervals when lines were clear.

Shown as thus (-----).

MET 114
HRS 46 3/4
CON 2:2:

F 16
RPM 60
AP 1200
VOL 48 m³

F 16
RPM 60
SPM 1 X 95
PP 2600

DS 7AP

F 16
RPM 60
SPM 1 X 95
PP 2000

F 12-14
RPM 55-60
SPM 50
PP 200

MET 100
HRS 63 1/2
CON 4:5:1

F 16
RPM 60
SPM 40-50
PP 200

MET 23
HRS 10 3/4
CON 1:1:1/4

F 15
RPM 60
AP 5000 kpa

| | |
|---|---|
| DOL | crm bf gy, tan, lt brn, aphan, mic xln, tr pyr, tr cht. |
| DOL | crm lt-gy, lt-gy brn tan, sl arg, crp mic xln, med hd, tr pyr, tr sh. |
| DOL | wh crm lt-gy, tan, aphan, mic xln, chty inpt, tr pyr, tr sh. |
| DOL | lt-mgy, lt-m brn, tan, crp vf xln, arg tr f g ss, tr cgl, tr pyr, tr sh. |
| DOL | crm-gy, lt-mgy, tan, lt-brn, arg inpt, mic vf xln, tr cht, hvy tr sh, tr pyr. |
| DOL | crm, brn, tan, lt-gy, mic vf xln, aphan in pt, chty in pt, lmy in pt, tr sh, tr is. |
| DOL | crm-gy, lt-mgy, lt-m brn, mic vf xln, tr gd por, tr is. |
| | CYCLIC ZONE - 362m. |
| DOL | tan, lt brn, crm gy, mic vf xln, lmy in pt, tr is, abnt pyr. |
| DOL | wh crm gy tan, aphan, crp-mic xln, lmy, calc, occ grd to ls, abnt pyr. |
| DOL | crm lt-gy, tan, crp mic xln, lmy in pt, tr oct pyr xls. |
| DOL | aa. |
| | No sample - lost circulation. |
| DOL | pred aa, 90 % cvgs, v ps. |
| DOL | aa, 60 % cvgs, v ps. |
| DOL | wh, crm-gy, tan, mic vf xln, tr pyr. |
| DOL | lt gy crm-gy, tan, lt-m brn, mic vf xln, sl arg in pt, tr pyr, v sl tr sh. |
| DOL | lt-m brn, tan, lt-gy, crp-mic xln, arg in pt, tr pyr, hvy tr dk gy sh. |
| | Lost circulation - no samples. |
| DOL | tan, lt-gy, lt-brn, aphan, crp-mic xln, tr sh, tr pyr, tr red org mat, pos cht. |
| DOL | lt-gy, lt brn, tan, crp-mic xln, tr pyr. |
| LS | lt-mgy, tan, arg inpt, dol, mic vf xln. |
| DOL | lt-gy, vf-f xln, abnt f-m xln, calc, lmy sdy inpt, calc cmt inpt, yel flor, no cut. |
| | DRILL BLIND - 425-505 |
| | Log interpretation. 424-453m. |
| | No samples. |
| | No samples. |
| | No samples. |
| DOL | wh, crm-gy, tan, lt-mgy, crp-mic xln, v arg in pt, suc in pt, CHT wh, tan, crm, occ dol. |
| DOL | wh, lt gy, tan, mic xln, chty, hd. CHT wh, crm-gy, dol. |
| DOL | lt-gy, tan, crm-gy, arg, crp xln, chty, abnt pyr, tr yel flor, no cut. |
| DOL | lt-m-gy, crp-mic xln, v arg, vhd, tr pyr. |
| DOL | lt gy, tan, lt brn, arg, mic vf xln, hd. |
| DOL | tan, lt-gy, lt-brn, tr lt gy-gy, arg, mic xln, med-hd. |
| DOL | tan, lt-gy, lt-brn, v arg, mic xln, calc. |
| DOL | lt-gy, tan, lt-brn, arg, mic vf xln, med-hd |

Drill blind 460-479 no returns.

Water

MET 100
HRS 63 1/2
CON 4:5:1

NB 9A HW J 3 3
F 16
RPM 60
GPM 40-50
PP 200

Drill blind 480-506 no returns.

CROMATOGRAPH BLENDER ANALYSIS

.1 3.8 %

Water

MET 25
HRS 10 3/4
CON 1:1:1/4

Resumed drilling with (polymer duratoam) 505

60 litres/min
Duratoam

NB IC HW J D 7
F 13
RPM 60
AP 5000 kpa

From 505-590m. well flow 300-600 barrels per hour, subsequently intermittent freezing of gas lines. Gas values printed from short intervals when lines were clear.

Shown as thus (-----).

MET 47
HRS 28
CON 5:3:1

NB 2C HW J D 7
F 13
RPM 60
AP 4500

35 L/min
Duratoam

MET 33
HRS 7 1/4
CON 2:2:1

NB 1D HW J 3 3
F 6
RPM 60
AP 1000

Insufficient sample for blender analysis 590-650m.

25 l/min
Duratoam

System check.

25 l/min
Duratoam

F 6
RPM 60
AP 1000

No samples.

No samples.

DOL wh,crm-gy,tan,lt-mgy,crp-mic xln, v arg inpt,suc ihpt,CHT wh,tan, crm,occ dol.

DOL wh,lt gy,tan,mic xln,chty,hd.CHT wh,crm-gy,dol.

DOL lt-gy,tan,crm-gy,arg,crp xln,chty, abnt pyr,tr yel flor,no cut.

DOL lt-m-gy,crp-mic xln,v org,vhd,tr pyr.

DOL ltgy,tan,lt brn,arg,mic vf xln,hd.

DOL tan,lt-gy,lt-brn,tr lt gy-gy,arg,mic xln,med-hd.

DOL tan,lt-gy,lt-brn,v arg,mic xln,calc.

DOL lt-gy,tan,lt-brn,arg,mic vf xln,medhd

DOL crm-gy,lt-gy,tan,wh,sl arg,crp mic xln,tr yel flor no cut.

SH gn-gy,red-brn,sl dol inpt,med-hd.

DOL crm,brn,tan,lt-gy,arg,med hd.

SALINE RIVER FM(SHALE)546m.

DOL crm,brn,lt-gy,tan,sl arg,crp-mic xln.

SH red,red-brn,gy-gn,lt-gn,sl dol inpt, calc,sb fis,sft-med hd. DOL crm-gy, lt-gy,tan,crp-mic xln,arg.SLTST red, brn,arg,dol.ANHY.

DOL aa.

SH red,red-brn,rse,gn,sl dol inpt,grd to dol inpt,sl fis.

DOL crm,lt-gy,lt-gn gy,crp-mic xln,arg.

SH gn,red,rse,brn,tan,sl dol inpt,occ grd to sh,fis,sft-med hd.

DOL crm,tan,lt-gy,sl arg,occ grd to sh,crp mic xln,occ inbd sh lam,med hd.

SH gn,fis,blky,dol,mic mica inpt.

GYP org,wh,lt brn,silty,dol,tr dol.SH red,gn, red,brn,gyp inpt,blky,sb fis.

SH fis,dol inpt,silty,gyp.Gyp org,red,wh clr,pos fr sa.

DOL dk gy,crp xln,v arg.GYP wh,lt-gy,tr dk-gy,silty.

SS clr,m-cg,occ vcg,rnd,qtz,uncons,fe st conc,pyr xls.

SH gn-rd,fis,tr anhy.

SALINE RIVER(SALT)623m.

No sample.

SS qtz,f-mg,rnd,uncons,pyr,magnetite.

DOL lt-brn,mic xln,crp xln,gyp inpt,silty, vu por.

Very poor samples from 623-723m, questionable interpretation.

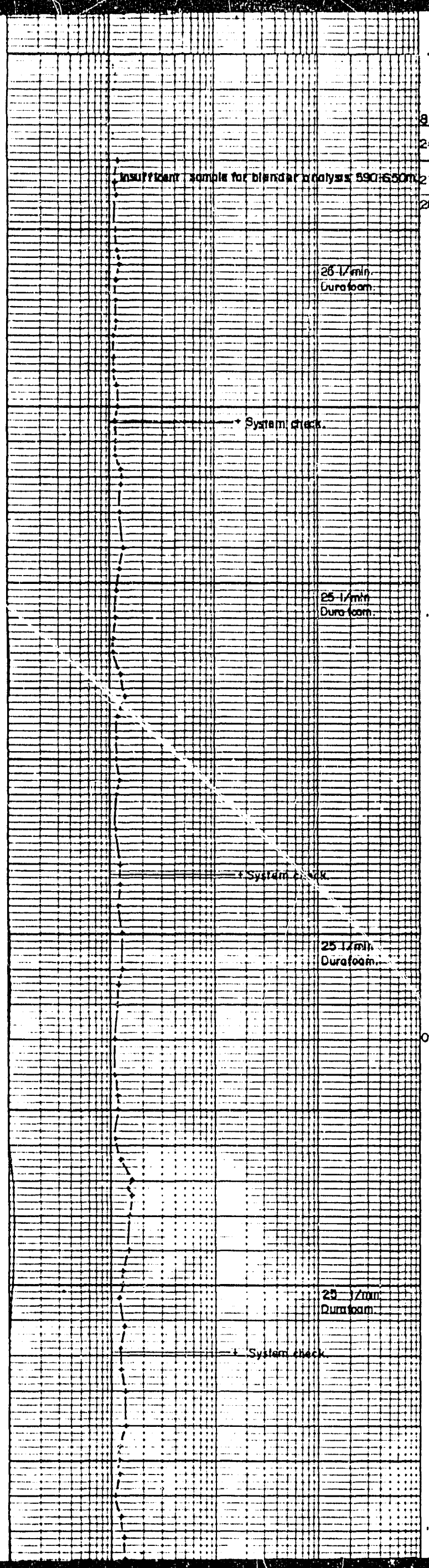
SH gn,intbd,tr sa,gyp inpt,dol inpt,tr pyr

Gyp lt-gy,lt brn,wh,sa inpt,arg.

SH gn,dol,gyp,sa cast,inbd sa,gyp.

DOL pred aa,tr vu por,sa casts,gyp.

SH gn,gyp,fis,dol,pos tr sa.




DOL oo.

SH red,red brn,rse,gn,sl dol inpt,grd to dol inpt,sl fis.

DOL crm,lt-gy,lt-gn gy,crp-mic xln,org.

SH gn,red,rse,brn,tan,sl dol inpt,occ grd to sh,fis,sft-med hd.

DOL crm,tan,lt-gy,sl arg,occ grd to sh,crp mic xln,occ inbd sh lam,med hd.

SH gn,fis,blky,dol,mic mica inpt.

GYP org,wh,lt brn,slty,dol,tr dol. SH red,gn, red,brn,gyp inpt,blky,sb fis.

SH fis,dol inpt,slty,gyp. Gyp org,red,wh clr,pos tr sa.

DOL dk gy,crp xln,v arg.GYP wh,lt-gy,tr dk-gy,slty.

SS clr,m-cg,occ vcg,rnd,qtz,uncons,fe st conc,pyr xls.

SH gn-rd,fis,tr anhy.

SAUNE RIVER(SALT)623m.

No sample.

SS qtz,f-mg,rnd,uncons,pyr,magnetite.

DOL lt-brn,mic xln,crp xln,gyp inpt,slty, vu por.

Very poor samples from 623-723m, questionable interpretation.

SH gn,intbd,tr sa,gyp inpt,dol inpt,tr pyr

Gyp lt-gy,lt brn,wh,sa inpt,arg.

SH gn,dol,gyp,sa cast,inbd sa,gyp.

DOL pred oo,tr vu por,sa casts,gyp.

SH gn,gyp,fis,dol,pos tr sa.

DOL lt-brn,mic xln,crp xln,gyp inpt,slty.

SH gn,dol,gyp,sa cast,inbd sa.

GYP lt-brn,org,clr,arg inpt,dol,sa cast.

SH lt-gy,red,gn,dol,blky,gyp,sa cast.

DOL lt-gy,crp xln,v arg,med-hd.

SH lt-gy,red,dol,blky,gyp.GYP,lt brn, org,arg,dol,sa cast.

DOL lt-gy,arg,crp-mic xln,tr sa cast.GYP arg,dol,sa cast. SH red,gn,dol,sa.

SH gn,m pu-gy,red,sa cast,tr anhy,tr sa, gyp.

DOL lt-cy,arg,crp-mic xln,sa cast,sa,gyp.

DOL lt-brn,dk-gy,int bd brn,crp xln,arg,tt.

MOUNT CAP FM(UPPER) 727m.

SH dk-gy,mic mica,v dol grd to arg dol inpt. DOL lt-m brn,crp xln,abnt vf-f xln,arg, int xln por inpt.

DOL lt-m brn,crp xln,f xln inpt,sl anhy,slty.

SH dk-gy,dol,fis,mic mica inpt.

DOL m brn,m gy-brn,tr lt brn,crp mic xln, v arg inpt,tt.

SH dk gn,gy-gn,dol,sb fiss,pyr in pt,tr mic mica.

DOL lt-gn,m-gy,mic vf-f xln,tr pyr.

SH m-gy gn,fis,blky,dol inpt,mic mica.

DOL lt brn,lt-gy,mic xln,gyp in pt,tt.

SH gn-gy,dk-gy,fis,sb fis,dol,mic mica.

DOL v dk brn,v arg,tr dd oil stn.

SH gn,wxy,mic mica,bit,fis.

SH dk-gy,gn,fis,mic mica,dol inpt,tr anhy.

MOUNT CAP FM(LOWER) 778m.

DOL dk brn,vf xln,arg,tt,tr euh qtz xls.

SH dk-gy-gn,fis,mic mica,dol inpt,bit

Duratoam

03

25 l/min
Duratoam

System check

25 l/min
Duratoam

System check

25 l/min.
Duratoam

System check

F 6
RPM 80
AP 1000

F 6
RPM 80
AP 1000

DS 1/4"

MET 262
HRS 22
CON 538

Scale 1

0 — 10 — 100

Scale 2

10 — 100

F 7
RPM 70
AP 1000

500

800

500

83
29 NB 2C HW J 55
03
83

| | |
|---|---|
| SH | gn,m pu·gy,red,sa cast,tr anhy,tr sa, gyp. |
| DOL | lt·gy,arg,crp·mic xln,sa cast,sa,gyp. |
| DOL | lt·brn,dk·gy,int bd brn,crp xln,arg,tt. |
| | MOUNT CAP FM (UPPER) 727m. |
| SH | dk·gy,mic mica,v dol grd to arg dol inpt. DOL lt·m brn,crp xln,abnt vf·f xln,arg, int xln por inpt. |
| DOL | lt·m brn,crp xln,f xln inpt,sl anhy,slty. |
| SH | dk·gy,dol,fis,mic mica inpt. |
| DOL | m brn,mgy·brn,tr lt brn,crp mic xln, v arg inpt,tt. |
| SH | dk gn,gy·gn,dol,sb fiss,pyr in pt,tr mic mica. |
| DOL | lt·gn,m·gy,mic vf·f xln,tr pyr. |
| SH | m·gy gn,fis,blky,dol inpt,mic mica. |
| DOL | lt brn,lt·gy,mic xln,gyp in pt,tt. |
| SH | gn·gy,dk·gy,fis,sb fis,dol,mic mica. |
| DOL | v dk brn,v arg,tr dd oil stn. |
| SH | gn,wxy,mic mica,bit,fis. |
| SH | dk·gy,gn,fis,mic mica,dol inpt,tr anhy. |
| | MOUNT CAP FM(LOWER) 778m. |
| DOL | dk brn,vf xln,arg,tt,tr euh qtz xls. |
| SH | dk·gy·gn,fis,mic mica,dol in pt,bit. |
| SS | gn,f·mg,pyr in pt,sil,dol,glauc qtz tt. |
| SH | dk·gy,fis,mic mica,dol,med·hd. |
| DOL | lt·gy·m brn,vf·c xln,arg in pt,slty in pt,tr dd oil stn,no flor no cut. |
| DOL | lt·gy,lt·m brn,vf·m xln,slty in pt,brn blk oil stn,tt,no vis por,yel flor,no cut |
| SH | gy·gn,fis,dol,mica,bit,grd to v arg dol. |
| DOL | m·brn,mic xln,arg,grd to dol sh. |
| SLTST | wh,lt·gy,glauc,v dol,anhy,tr vfg ss. |
| SH | dk·gy,fis,mic mica,tr bit.DOL lt·brn, f·m xln,tr dd oil stn. |
| SLTST | lt·gy,occ grd to vfg ss,dol. DOL lt·m brn,m xln,tr dd oil stn,no cut,no flor. |
| SH | dk·brn,fis, mic mica,slty,dol. |
| SS | lt·gy, vfg,mica,dol,slty in pt,tr glauc. |
| SS | wh,lt pk,vf·fg,sb ang,w srt,qtz,tr dk cht, intgr por,no flor. |
| SS | lt·pt, vf·fg,occ m·cg,slty,dol,sil, tr glauc,tr cht,qtz,mica,frstd in pt. |
| | PRECAMBRIAN 848m. |
| DOL | red,mic xln,tt,hd.CHT gn,lt·m brn,dol calc in pt. |
| DOL | lt·brn,org pk,lt·m gy,crp·mic xln. |
| SH | m·gy,fis,dol,mic mica. |
| DOL | wh,lt·brn,lt·m gy,arg,crp·mic xln,pyr. |
| DOL | lt·brn,red,org,crp·mic xln,tt, mot gy,arg inpt. |
| DOL | arg,lt·brn,lt·m gy,crp·mic xln,tr vf xln,tr glauc,tt,pyr. |
| DOL | lt·brn,pk,red,crp·mic xln,tr vf xln,tr glauc,tt,tr pyr. |

Drillers T.D 1110hrs 29/03/83

ENG Gerry Aldridge
Bob Kelly

GEO Al Williams

T.P. Collin Cottrel
Wayne Thompson

8

25 l/min
Durafoam

System check.

F 6
RPM 60
AP 1000

83

MET 262
HRS 22
CON 5981

Scale 1

0 10 100

83
29 NB
2C
HW
J
55

Scale 2

10 100

25 l/min.
Durafoam.

F 7
RPM 70
AP 1000

03

System check.

83

Drillers T.D. 1110 hrs 29/03/83

ENG. Barry Aldridge.
Bob Kelly.

GEO. AL Williams.

T.P. Collin Cottrel
Morley Thompson.

800

500

| | |
|---|---|
| SH | gn gy, dk gy, fis, sb fis, dol, mic mica. |
| DOL | v dk brn, v arg, tr dd oil stn. |
| SH | gn, wxy, mic mica, bit, fis. |
| SH | dk·gy, gn, fis, mic mica, dol inpt, tr anhy. |
| | MOUNT CAP FM (LOWER) 778m. |
| DOL | dk brn, vf xln, arg, ff, tr euh qtz xls. |
| SH | dk·gy·gn, fis, mic mica, dol in pt, bit. |
| SS | gn, f·mg, pyr in pt, sil, dol, glauc qtz ff. |
| SH | dk·gy, fis, mic mica, dol, med·hd. |
| DOL | lt·gy·m brn, vf·c xln, arg in pt, slty in pt, tr dd oil stn, no flor no cut. |
| DOL | lt·gy, lt·m brn, vf·m xln, slty in pt, brn blk oil stn, ff, no vis por, ysl flor, no cut |
| SH | gy·gn, fis, dol, mica, bit, grd to v arg dol. |
| DOL | m·brn, mic xln, arg, grd to dol sh. |
| SLTST | wh, lt·gy, glauc, v dol, anhy, tr vfg ss. |
| SH | dk·gy, fis, mic mica, tr bit. DOL lt·brn, f·m xln, tr dd oil stn. |
| SLTST | lt·gy, occ grd to vfg ss, dol. DOL lt·m brn, m xln, tr dd oil stn, no cut, no flor. |
| SH | dk·brn, fis, mic mica, slty, dol. |
| SS | lt·gy, vfg, mica, dol, slty in pt, tr glauc. |
| SS | wh, lt pk, vf·fg, sb ang, w srt, qtz, tr dk cht, intgr por, no flor. |
| SS | lt·pt, vf·fg, occ m·cg, slty, dol, sil, tr glauc, tr cht, qtz, mica, frstd in pt. |
| | PRECAMBRIAN 848m. |
| DOL | red, mic xln, ff, hd. CHT gn, lt·m brn, dol calc in pt. |
| DOL | lt·brn, org pk, lt·m gy, crp·mic xln. |
| SH | m·gy, fis, dol, mic mica. |
| DOL | wh, lt·brn, lt·m gy, arg, crp·mic xln, pyr. |
| DOL | lt·brn, red, org, crp·mic xln, ff, mot gy, arg in pt. |
| DOL | org, lt·brn, lt·m gy, crp·mic xln, tr vf xln, tr glauc, ff, pyr. |
| DOL | lt·brn, pk, red, crp·mic xln, tr v f xln, tr glauc, ff, tr pyr. |

9

CANADA OIL AND GAS LANDS
JAN 17 1983
ENGINEERING AND CONTROL BRANCH
TECHNIQUE ET DU CONTRÔLE

# DAWSON – LONG & ASSOCIATES LTD.

RESOURCE CONSULTANTS

WELL NAME: EDWARD ET AL I ZOK M-20 T.D. FORMATION: PROTEROZOIC: SHALER GROUP

LOCATION: LAT. 67°19'57" LONG. 123°48'20" UNIT M SEC. 20 GEOLOGIST: A.T. WILLIAMS

ELEVATION: K.B. 299.2M G.L. 295.0M SPUD DATE: FEB. 16, 1983 20:15 HRS

| FORMATION GAS IN UNITS (1 UNIT = 200 ppm) | DRILLING TIME IN MINS/1 METERS | SHOWS | POROSITY TYPE | POROSITY BAR PLOT | INTERVAL/TOPS | COLOURED STRIP LOG | CORES, DSTS, PERFS | PARTICLE SIZE | LITHOLOGY | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | SILT, MICRO, VF-FINE, MEDIUM, COARSE | %LIMESTONE, %DOLOMITE, %ANHYDRITE, %SHALE, %SILTSTONE, %SANDSTONE | |

CONDUCTOR PIPE 3 JTS 339.7 mm OD LANDED AT 36M
SURFACE 37 JTS 244. mm OD LANDED AT 468 M
INTERMEDIATE 25 JTS 177.8 mm OD LANDED AT 689 M

PP 1000 SPM 100 VIS 47 WL 60
BIT 1A · HW · OWVI
LOST CIRCULATION ZONE

RPM 100 WOB 300 daN

BIT 2A · SEC · RR · N7756
AIR DRILLING
43 m³/min @ 900 Kpa
10 l/min SOAP + WATER MIST

RPM 80 WOB 6-8000 daN

BIT 2A · HW · J33

BIT 3A · SEC · N7756

RPM 70-90 WOB 1-2000 daN

BIT 4A · SEC · S216
4Hm³/min @ 200 Kpa
12 l/min SOAP + WATER
BIT 5A · HW · J33

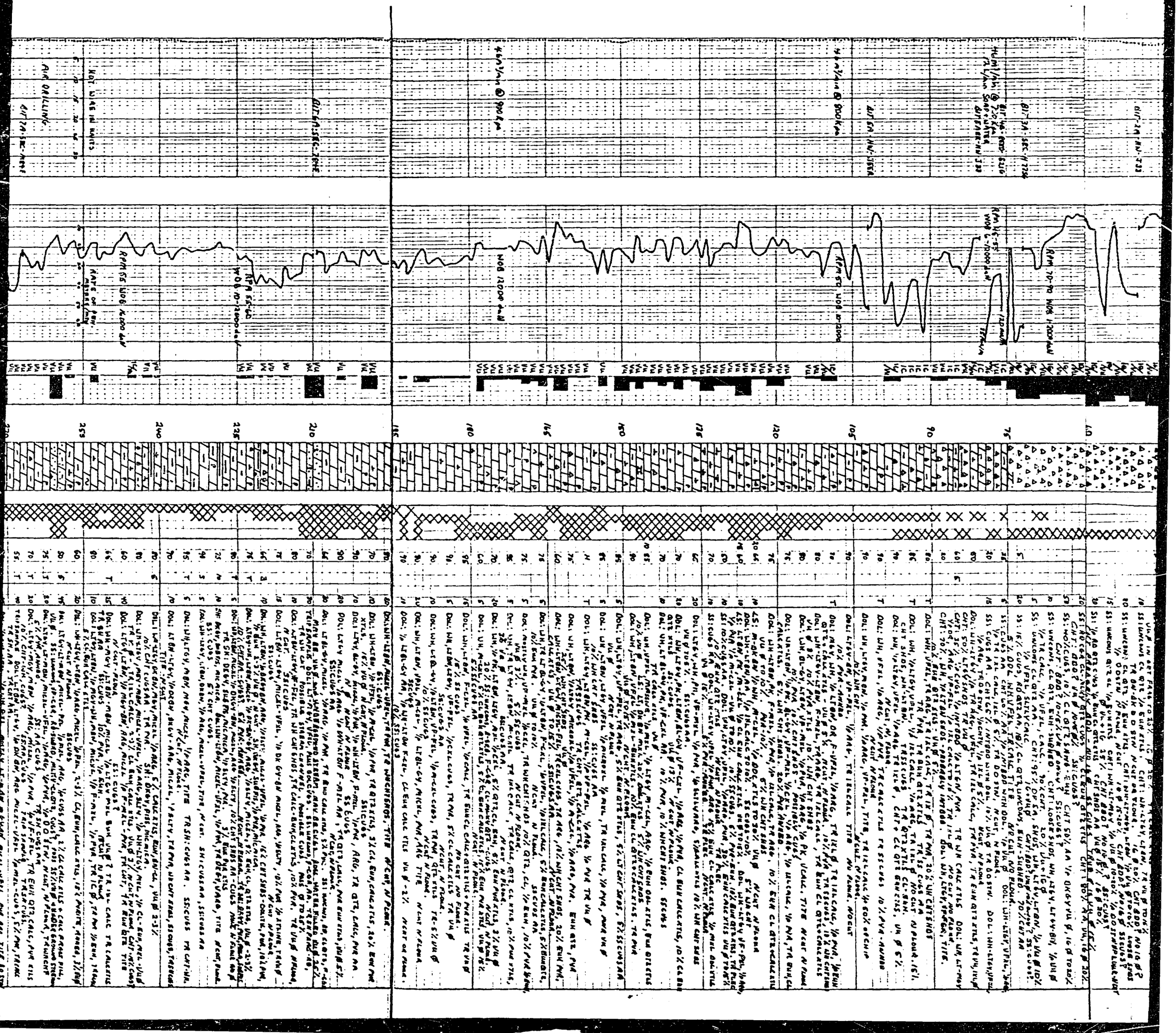
RPM 45-55 WOB 6-10000 daN
120 m/hr
38 m/hr

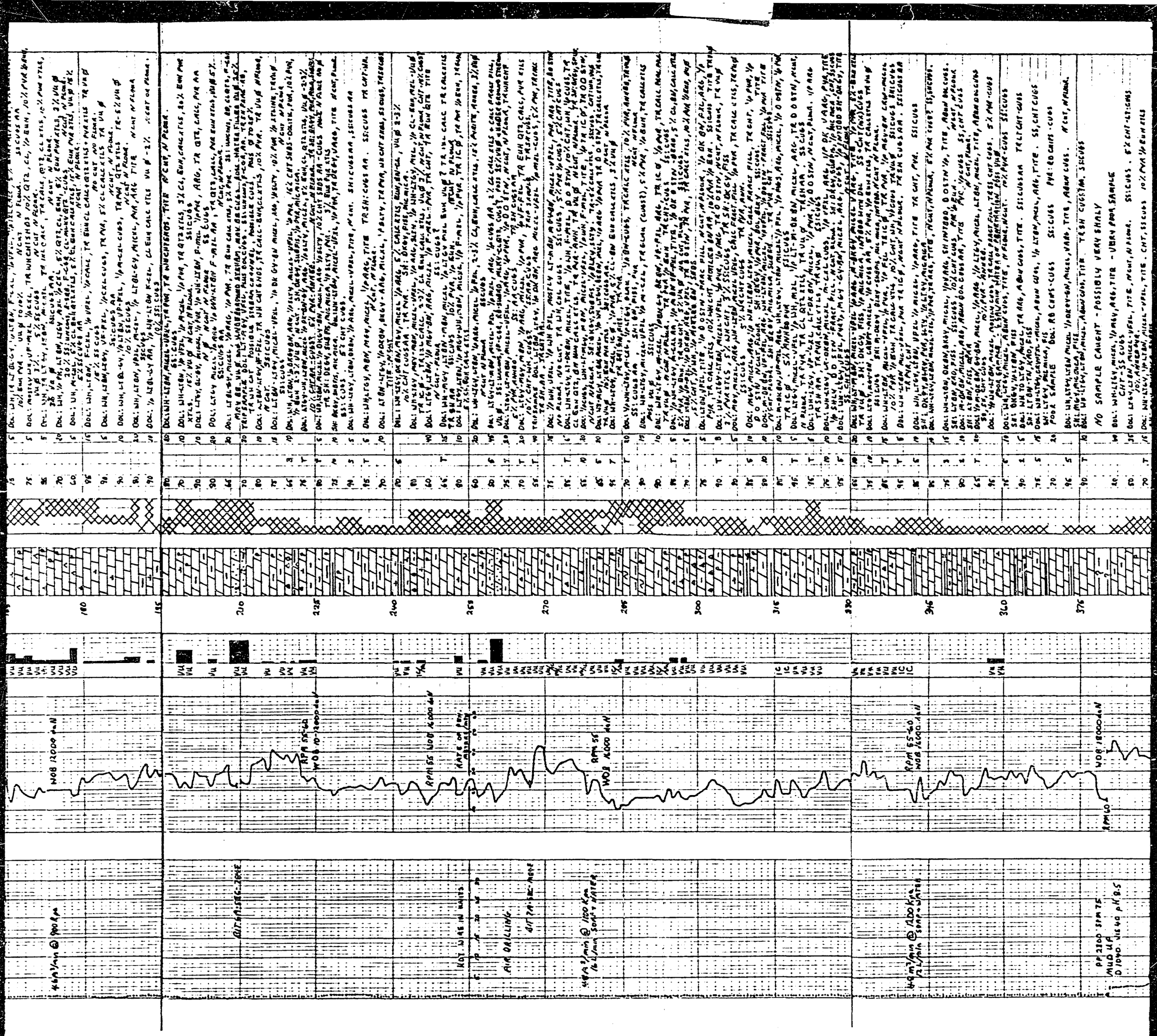
BIT 6A · HW · J55A

4½ m³/min @ 800 Kpa

RPM 50 WOB 10-20000

| | | | | |
|---|---|---|---|---|
| 0 | | | N | SS: 40%, UNCONS, F-CGR, ANG-RD, PSRT, QTZ, K-SPAR, RK FRAG. CONG: 60%, UNCONS, ANG-SRD, 5mm-VCGR, RK FRAG, MOSTLY GRAN., META, VOLC, MNR SOL, LS, SS, K-SPAR, QTZ. |
| | | | N | CONG: VCGR-CGRM, ANG-SRD, RK FRAG, MNR QTZ, PVR. RK FRAG MOSTLY GRANITE WITH METAMORPHICS AND SEDIMENTS, PRIMARILY SANDSTONE POROSITY ICE FILLED 30% 16 Ø OR TILL NO Ø |
| | | | | LOST CIRCULATION - NO SAMPLES TO SURFACE |
| | | | | PRESUMABLY ALL UNCONSOLIDATED GRANITIC CONGLOMERATE OR TILL |
| 15 | | | N | CONG: UNCONS, SAND-SRD, ½ FRAG PBLS, QTZ, CHT, SED, IGN, META RK FRAG MOSTLY ACID INTRUSIVE + QUARTZITE 30% 16 Ø - ICE FILLED OR TILL |
| | | | N | CONG: UNCONSOLIDATED, GRANITE WASH AS ABOVE OR TILL NO Ø 16 Ø 30% INFERRED - ICE FILLED |
| | | | N | CONG: 70% OF SA. AA. SS: VFGR-CGR, SAND-RD, PSRT, UNCONS, QTZ, CHT, DOL FRAG, K-SPAR, RK FRAG, 16 Ø TO 70% OR TILL NO Ø |
| | | | N | CONG: UNCONSOLIDATED GRANITE WASH, GRAN PBLS + PIECES OF PBLS INFRRED Ø 30% 16 OR TILL NO Ø |
| | | | N | CONG: 80% OF SA AA. SS: VF-CGR, UNCONS, SAND-RD, PSRT, QTZ, K-SPAR 16 Ø 30% PVR; 10% OF SA, EUH XTLS. OR TILL NO Ø |
| 30 | | | N | CONG: UNCONS, RD PBLS OF QTZITE, GRAN, GNEISS, SS, SH, LS, VOL RK FRAG 10% EUH PVR XTLS ICE FILLED 16 Ø 30% OR TILL - NO Ø |
| | | | 90 | CONG: UNCONS RD GRAN WASH AA 10% CEMENT 60% EUH PVR XTLS INFRRED 16 Ø 30% OR TILL - NO Ø |
| | | | 90 | SS: F-CGR ½ UNCONS SR-RD CLEAR QTZ ½ KAO-SIL MTX, TITB, QTZ + ANG CHT ½ 16 Ø TO 30% ½ TITB 10% WH CHT FRAG |
| | | | N | SS: UNCONS, SRD-RD, C-VCGR, CL-PK-ALKY QTZ ½ FROSTED ½ (5%) PVR CHT |
| | | | 10 | SS: CGR UNCONS RD-SANG ½ EUH HIGH Ø CHT FRAG 80% WH, LTGY LTBN ½ VU Ø 15% MOSTLY SIL OOLITES + PISOLITES SIL-CMTY CMT Ø 30% VU + IG |
| 45 | | | 15 | SS: CGR UNCONS, ½ RD ½ EUH CL QTZ XTLS CHT FRAG 80% WH-LTGY, LTBN, ½ OOLITIC VU Ø IN CHT FRAG TO 20% IG Ø 20% TR CALC XTLS CHT: GOOD? NO IG Ø? |
| | | | 10 | SS: UNCONS CL QTZ ½ EUH XTLS. CHT: WH-LTGY, LTBN, TR VU Ø TO 10% TR BN-BK D O STN' N CUT OR FLOUR. IG Ø 20% CHT GOOD? NO IG Ø? |
| | | | 20 | SS: UNCONS CL QTZ ½ EUH XTLS. CHT: WH-LT-MGY, LTBN ½ VU Ø TO 10% LOOSE SHDS ½ DOSTN N FLOUR, N CUT IG Ø 15-20% CHT GOOD? NO IG Ø SS CUGS? |
| | | | 15 | SS: UNCONS QTZ CL ½ EUH XTLS CHT: WH-LT-MGY ½ VU Ø 10-20% ½ DO STN N FLOUR-WEAK Ø VU + IG 25% CHT GOOD? NO IG Ø? SS: CUGS? |
| 60 | | | 20 | SS: ½ RD QTZ CUGS ½ EUH CL QTZ XTLS CHT SHDS AA VU Ø 15% IG Ø 20% CHT PROBABLY GOOD - NO IG Ø SS CUGS TRUE Ø IS VU Ø 15% |
| | | | 20 | SS: RD CGR CL-ALKY QTZ CUGS ½ CL EUH QTZ XTLS CHT: 80% AA, VU, IG Ø 20% CHT: GOOD? VU Ø 10-15% SS: CUGS? |
| | | | 50 | SS: NO% CUGS, 10% CL QTZ SAND-EUH CHT 50% AA ½ OMGY VU Ø, IG Ø TO 20% CHT: GOOD? 10-15% VU Ø ONLY? SS: CUGS? |
| | | | 10 | SS: UNCONS, CL QTZ, EUH-SUGHED. CHT: LOOSE SHDS, WH, LTGY, LTGY-BN, ½ VU Ø ½ TR CALC, ½ VFXL, CALC. 30% CHT. 20% VU + IG Ø |
| | | | 5 | SS: UNCONS CL QTZ AA. CHT: 95% OF SA, SHDS, WH, LTGY, LTBN, ½ VU Ø 10% ½ VFXL, SLTLY CALC IG + VU Ø CHT: GOOD? VU Ø 10% ONLY? SS: CUGS? |
| 75 | | | 20 | SS: 15% CUGS, RD QTZ AA, 10% CL QTZ UNCONS, EUH-SUGHED. 70% CHT AA 5% ODL WH VFXL TR CALC TITB NO CUT, NO FLOUR. |
| | | | 35 | 5 SS: CUGS AA CHT 60% AA ½ INTGOD WITH ODL. ½ VU Ø ODL: WH-LTGY, VFXL, ½ AAG, ½ TR IXL CALC, IXL Ø 5%, TR DO STN, N CUT, N FLOUR. |
| | | | 20 | 15 SS: CUGS AA. CHT 65% INTGOD WITH DOL 10% VU Ø TR DO STN. DOL: WH-LTGY, VFXL, ½ ARG, TR DO STN, ½ CHTY, ½ IXL Ø 5%. N CUT, N FLOUR |
| | | | 60 | DOL: WH-LTGY, ½ TR AAG, VFXL, TR IXL CALC, TR PVA, TR EUH QTZ XTLS, TR VU, IXL Ø |
| | | | 60 | 5 CHT: 50% LTGY SHDS TR VU Ø |
| | | | 20 | CHT: 35% ½ CUGS ½ INTGOD ½ LTGN, PVR. TR WH CALC XTLS DOL: WH, LT-MGY ½ OOL, AAG, VFXL, TR CALC, TITB NO CUT NO FLOUR. |
| | | | | CHT: 70%. WH, ½ LTBN SHDS - PROBABLY INTGOD. DOL: WH, LTGY, VFXGR, TITB. 10% EUH QTZ XTLS: VU Ø 5% |
| 90 | | | 80 | T DOL: WH, VFXL, TR AAG, TR IXL CALC, TR IX Ø, TR PVA, 20% WH CHT SHDS TR PVR, TR EUH QTZ XTLS TR SS CUGS AA |
| | | | 85 | T DOL: WH, ½ LTGY, VFXL, ½ IXL CALC, ½ AAG, TR IXL Ø NO CUT N FLOUR. 15% CHT SHDS, WH-LTBN. TR SS CUGS TR QTZ XTLS CL-EUH. |
| | | | 90 | DOL: WH, ½ LTGY, VFXL ½ AAG TR IXL Ø, CHT + CL QTZ GRN XTLS, VU Ø 5% N CUT, N FLOUR. |
| | | | 90 | T DOL: WH, VFXL, ½ AAG, ½ PVA, TR CALC XTLS TR SS CUGS 10% PVA-ANHBD N CUT N FLOUR |
| | | | 90 | DOL: WH, LTGY, MBN, ½ PVA, ½ AAG, VF-FXL, TITB, TR IXL CALC ½ 50% OOCHIP 10% WH CHT N CUT N FLOUR. |
| 105 | | | 90 | DOL: LTGY-BN, VF-FXL, ½ AAG, TR IXL CALC TITB NO FLOUR. NO CUT 10% PVA-ANHBD |
| | | | 70 | T DOL: MGY, WH, ½ LTBN, OR, F-VFXL, ½ AAG, TR IXL Ø, TR IXL CALC, ½ PVA, ½ EUH QTZ + CALC XTLS - VU Ø 5%. N CUT, N FLOUR. 10% PVA, TR SS CUGS, 15% WH CHT SHDS |
| | | | 80 | DOL: WH-LTGY-LTBN, F-MXL, TR AAG TR IXL CALC, TR EUH CL QTZ + CALC XTLS VU Ø 5% 10% PVA XTLS 10% WH CHT SHDS |
| | | | 80 | DOL: WH, BL-GY, LTGN, VF-MXL ½ PVA, ½ AAG, ½ PK, VCALC. TITB N CUT N FLOUR. 10% PVA, 10% CHT SHDS - POSSIBLY CUGS |
| | | | 75 | DOL: WH-LTBN, ½ PK, BL-GY, VF-MXL ½ CXL, ½ ARG, ½ IXL CALC, ½ PVA, TR EUH, CL CALC XTLS. 5% WH CHT SHDS. 20% PVA ANHBD |
| 120 | | | 75 | DOL: WH-LTBN, PK, F-MXL, ½ PVA, ½ IXL CALC, TR ARG. 10% EUH CL QTZ + CALC XTLS VU Ø TO 10%. PVA-10%., 5% WH CHT SHDS |
| | | | 20 65 | 10 LS: M-BK BN ½ WH, M-CXL, ½ DOL XTLS TO 30% VU Ø N CUT N FLOUR |
| | | | | DOL: WH-LTBN, AA, ½ IXL CALC TO 10%. SS CUGS - 10% 5% WH CHT |
| | | | 15 60 | 10 LS: LTBN, PK, M-CXL ½ CL EUH CALC XTLS VU Ø TO 15%. DOL WH-LTGY VF-FXL, ½ ARG, ½ PVA ½ M-CXL - VU Ø TO 10%. 10% SS CUGS. 5% PVA-EUH, 10% EUH QTZ XTLS, TR PLEC |
| | | | 50 | 10 SS: 10% CUGS AA. DOL: WH, LTGY, VFXL, ½ AAG, PVR, 30% EUH CALC XTLS VU Ø TO 15% 10% EUH QTZ XTLS N CUT N FLOUR TR PLEC |
| | | | 70 | 10 SS: CUGS AA DOL: WH-LTGY, VFXL ½ PVA, ARG 15% EUH CL CALC XTLS ½ MXL DOL XTLS VU Ø 15% 5% PVA-ANHBD TR PLEC N CUT, N FLOUR |
| 135 | | | 65 | 20 DOL: LTGY, WH, PK, VF-MXL ½ PVA, ½ SLTLY ARG, 5% CALC XTLS 10% WH CHT SHDS VU Ø TO 5%. SS: CUGS AA. |
| | | | 70 | 20 DOL: WH, LTGY, PK, LTBN, BL-GY, VF-CXL, ½ ARG, ½ PVA, CL EUH CALC XTLS, 10% CL EUH QTZ XTLS SS: CUGS VU Ø 15% N CUT N FLOUR. |
| | | | 70 | 10 DOL: WH, LT BL-GY, PK, VF-CXL AA. 10% PVA, 10% WH CHT SHDS. SS CUGS TR CALC XTLS VU Ø |




180
195
210
225
240
255
270
285
300
315
330
345
360
375
WOB 12000 daN
RPM 55
WOB 10-12000 daN
RPM 55 WOB 4000 daN
RATE OF PEN. 20 m/hr
RPM 55
WOB 4000 daN
RPM 55-60
WOB 12000 daN
WOB 18000 daN
RPM 60
AIR DRILLING
AIR DRILLING
WOB IN 46 IN UNITS
468 m³/min @ 1100 KPa
468 m³/min @ 1100 KPa
72 L/min SOAP + WATER
72 L/min SOAP + WATER
PP 2100 SPM 75
MUD UP
D 1040 VIS 40 pH 8.5

4.9 m³/min @ 1200 kPa
12 L/min SOAP-WATER

RPM 65-60
WOB 16000 daN

PP 2300 SPM 75
MUD UP
D 1090 VIS 40 pH 8.5

LOST CIRCULATION

SHACKER BYPASS

25% METHANE — 2% ETHANE
22.5% METHANE
2 1/2% ETHANE
0.2% PENTANE LOST CIRCULATION

DRILLING BLIND PP 2200 SPM 60 SPM 55
NO RETURNS
DRILLING WITH WATER

RPM 60 WOB 18000 daN
WOB 12-16000 daN
RPM 65/70

RPM 60 WOB 16000 daN F

RPM 45/50
RPM 50/60
WOB 12-16000
WOB 10-14000

RPM 60 WOB 16000

DRILLING WITH WATER NO RETURNS SPM 60-50

DRILLING BLIND WITH WATER NO RETURNS SPM 60-55

DRILLING AIR 5000 kPa
WITH Column Foam
RPM 60 WOB 13000 daN

| | | | | |
|---|---|---|---|---|
| 300 | 90 | T | 5 | TR VUG, N CHT, N FLOUR. TR PVR 1/2 BUN TR CHT-CUGS SS: CUGS |
| | 70 | | 5 | DOL: 1/2 WH-LTGY, M-CALAA, 1/2 MBN VF-FXL, TITE, 1/2 OK B STN - BRAD, 5% CH, BN, CALC XTLS 5% PVR, 1/2 BUN, TR WH CHT, 5% VUG, NO CHT, FLOUR SS: CUGS |
| | 75 | | 5 | DOL: MBN, VF-FXL, 1/2 DKBN ARG, VFXL TR B OSTN, TR PVR, TR CALC XTLS, 10% AA 1/2 BRN, SUB, 5% CHT, 1/2 WH, 1/2 MOTTLED BN / SHBS |
| | 75 | | 5 | DOL: LTGN, VFXL, TITE, 1/2 D OSTN - FRAC FILL, N CHT, N FLOUR, 1/2 OK BN, FXL, ARG, 1/2 PVR, TR CALC XTLS, 10% WH CHT, MOTTLED BN AA, 10% AA 1/2 BRN. SS: CUGS TITE TR VUG |
| | 90 | T | 8 | DOL: WH-LTGY-LTBN, MICXL-VFXL 1/2 PVR, 1/2 ARG, TR D OSTN, N CHT, N FLOUR, TR VUG 3% AA XTLS, 5% WH CHT, 3% SS: CUGS TR SH: DKGY, FISS |
| | 90 | | 5 | DOL: MGY, MICXL, ARG, WH-LTBN, MICXL VFXL, CALC FRACT. FILL 1/2 PVR, TR CALC XTLS, TR VUG SS: CUGS 5% WCHT CUGS TR PVR, ANH. |
| | 85 | 5 | 10 | DOL: MGY, MICXL, ARG, 1/2 WH-LTBN, LTGY, MICXL, CALC FRACT FILL, TR CHT, 1/2 PVR, 1/2 D O STN, N CHT, FLOUR. SH: DKGY, 1/2 PVR, DOL, BLKY. SS: CUGS. TITE |
| | 80 | 10 | 10 | DOL: M-DKBN, VF-FXL, ARG, WH-LTBN, MICXL, VAVFXL, 1/2 D OSTN - FRACT FXL, 1/2 PVA TITE N CHT - FLOUR. SH: DKGY, MICMICA, SUBFIS TR PVR, CHT SS: FAIR |
| 315 | 85 | | 10 | DOL: M-DKBN, VF-FXL, ARG, WH, LTGY, LTBN MICXL 1/2 FXL, 1/2 MGS, ARG, MICXL, 1/2 D OSTN, 1/2 PVR TR VUG. 5% ANHED PVR SS: CUGS |
| | 95 | T | 5 | DOL: LTGY, MICXL-VFXL 1/2 WH, MXL, 1/2 LT-M-DK BN MICXL, ARG, TR D OSTN, N CHT, N FLOUR. TR PVR, TR CL QTZ XTLS, TR VUG. TR SHAA. SS CUGS |
| | 95 | T | 5 | DOL: WH-LTGY, VF-CXL, LT-DK BN, MICXL, 1/2 PVR, 1/2 D O STN, N CHT, FLOUR. 1/2 ARG TR SHAA, TR PVR, CALC XTLS, TR VUG SS: CUGS |
| | 75 | 10 | 10 | DOL: WH-LTGY, LT-DKBN, MICXL, M-CXL CUGS, 1/2 VFXL, ARG, 1/2 DK, VAAG, PVR, TITE 1/2 SHLY, D O STN - FRACT FILL, N CHT, FLOUR. SH: DKGY, SUBFIS, 1/2 MIC MICA, CHT, SS CUGS |
| | 85 | 5 | 10 | DOL: WH-LTGY, VFXL, PVR 1/2, MGY-GY-BN, MICXL, ARG, CUGS, 1/2 INTBDD SH-DKGY, TITE SS, CHT CUGS N CHT, N FLOUR |
| 330 | 65 | 10 | 20 | DOL: WH, LT-MBN, MICXL-VFXL 1/2 ARG, M-DKGY MICXL VARG, TITE, 1/2 PVR, 5% - BRD XTL TR VUG. SH: DKGY, FISS, 1/2 MICMICA, INTBDD WITH DOL SS + CHT (NA) CUGS |
| | 75 | 10 | 15 | DOL: LTGY, MGY-BN, CRYPT-MICXL, 1/2 CUGS AA, 5% PVR, 1/2 BUN XTLS, TR CALC XTLS TR VUG SS: CUGS SH: M-DKGY, BLKY-SUBFIS, MIC MICA, INTBDD. N CHT N FLOUR. |
| | 85 | T | 15 | DOL: WH-LTBN, MICXL-VFXL, 1/2 PVR, 1/2 FXL TR CUGS, TR PVA, 1/2 MGY-BN CRYP-MICXL 10% PVR 1/2 BUN, TR CALC XTLS, 10% CHT, WH, 1/2 CUGS TR VUG SS: CUGS SH: CUGS |
| | 95 | T | 5 | DOL: WH-LTBN MIC-VFXL, PVR TR CUGS, N CHT N FLOUR. TR SH CUGS AA. SS: CUGS AA TR PVR, CHT |
| 345 | 85 | 5 | 10 | DOL: WH, LTGY, LTBN, VFXL 1/2 MICXL, 1/2 ARG, TITE TR CHT, PVR. SS: CUGS SH: DKGY, BLKY, PVR, SLTY, 1/2 LTGY, MICMICA |
| | 85 | | 10 | DOL: WH-LTGY, LTBN, MICXL-FXL, 1/2 PVR, TR ARG, TITE, N CHT, N FLOUR, 5% PVR CUGS. SS, SUCRO. |
| | 75 | 3 | 15 | DOL: WH-LTBN, DKBN, BKGY, MICXL, 1/2 VARG, SH INTBDD, D OSTN 1/2, TITE, ABUN DOL CUGS. SH: LTBN, KAO, FISS. SS: CUGS, 10% CHT CUGS PVR 1/2 BUN. AVGAT, N FLOUR |
| | 90 | 2 | 10 | DOL: M-DKBN, MICXL, ARG, ABUN DOL CUGS AA, TITE PVR, 1/2 CUGS SS, CHT CUGS SH: LTBN, FISS, KAA N CHT, FLOUR. |
| | 65 | T | 20 | DOL: 1/2 M-DK BN, GY-BN, MICXL, 1/2 ARG, 1/2 LTGY, MICXL, LTBN, MICXL, TITE, ABUN DOL CUGS SS, SH, CHT CUGS 10% PVR - ANHED. |
| | 95 | | | DOL: WH-LTBN, MICXL, MOSTLY CUGS, TR CALC FRACT FILL, TR SS, CHT CUGS. 5% PVR - CUGS POOR SAMPLE - LOSING MUD WATER OR PENETRATION RATE VERY |
| 360 | 75 | 5 | 10 | DOL: WH, LTGY, MICXL, ABUN CUGS, TITE, N FLOUR, N CHT. 10% PVR - CUGS SS: CUGS SH: DKGY, MLTBN, FISS |
| | 90 | 2 | 5 | DOL: WH TO LTGY, MICXL, TR AAG, ABUN CUGS, TITE. SS: CUGS AA TR LT CHT - CUGS SH: LTBN-TN, KAO, FISS |
| | 75 | 5 | 15 | DOL: WH-LTGY, CRYPTXL-MICXL, ABUN CUGS, 1/2 LTBN, MICXL, ARG, TITE. SS, CHT CUGS SH: LTGY, MIC MICA, FIS |
| | 70 | | 20 | POOR SAMPLE DOL: RD CHPS - CUGS SS: CUGS PYR: RD CHIPS - CUGS |
| | 95 | 5 | | DOL: WH, LTGY, LTBN MICXL 1/2 DKGY-BN, MICXL, VARG, TITE, ABUN CUGS. N CHT, N FLOUR. SH: MGY, MIC MICA, FISS |
| 375 | 90 | T | 10 | DOL: WH-LTGY, LTBN, MICXL, ABUN CUGS, TITE TR SH CUGS TR. SS: CUGS |
| | | | | NO SAMPLE CAUGHT : POSSIBLY VERY SHALY. |
| | 20 | | 60 | DOL: WH-LTGY, MICXL, 1/2 MGY, ARG, TITE - VERY POOR SAMPLE CHT - SS CUGS |
| | 50 | | 35 | DOL: LTGY, LTBN, MICXL-VFXL, TITE, N CHT, N FLOUR. SS: CUGS. 5% CHT - LT: GMS 10% ANHED PVR. |
| | 70 | T | 15 | DOL: WH-LTGY, 1/2 LTBN, MICXL-VFXL, TITE. CHT, SS CUGS 10% PVA 1/2 BUN XTLS SH: MGY, MIC MICA, SUBFIS |
| 390 | 85 | 5 | 10 | DOL: WH-LTBN, LTGY, MBN, MICXL-VFXL 1/2 SHLY 1/2 (20%) LMY, TITE SS: CUGS TR PVR. SH: DKGY, MIC MICA, FISS |
| | 90 | | 10 | DOL: 1/2 WH, VFXL 1/2 MBN, VFXL, 1/2 LTGY, MICXL, TR ARG 5% of Sa. 20% CALC, TIGHT, MICXL FLOUR TR PVR, BUN. TR WH CHT. SS: CUGS |
| | 85 | 10 | 5 | DOL: WH-LTGY, MICXL-VFXL, LTBN-DKGY-BN MICXL-VFXL ARG 1/2 VARG TITE. N FLOUR, N CHT SH: LTGY, SUBFIS, MICMICA, INTBDD. SS: CUGS PVR-CUGS ? |
| | 90 | 5 | 5 | DOL: 1/2 WH-LTBN-LTGY, MICXL-VFXL, 1/2 ARG, 1/2 MGY, MICXL, ARG, TITE, NO SHOWS. SH: DKGY, MICMICA, FISS 1/2 DOL. SS: CHT CUGS. |
| 405 | | | | LOST CIRCULATION |
| | | | | NO SAMPLES |
| | | | | PROBABLY DOLOMITE WITH VUGGY POROSITY |
| | 40 | | 50 | DOL: WH, LTGY, LTBN, MICXL-FXL, NO IC, ABUN CUGS, 10% PVR 1/2 BRN. SS: UNCONS, RD-SAB, 1/2 QTZ, CLOUDY, 1/2 CHT, PK, OR, RD-BN. VF-CGR, POOR UNDERGROUND STREAM - VUG 25% |
| | 15 | | 20 | DOL: 1/2 CUGS, 1/2 WH, LTGY, LTBN, MICXL-VFXL, ARG 1/2, 1/2 F-CXL CUGS NO IC |
| | 90 | | 60 | SS: AA 1/2 QTZ, 1/2 COLORED CHT, 5% PVR, ANHED. POOR. VUG, UNDERGROUND STREAM. |
| 420 | 20 75 | 5 | | DOL: MOSTLY CUGS, 1/2 WH, LT-MGY, LT-MBN, MICXL-MXL 1/2 ARG, N IC SS: UNCONS, RD-SUGRD, VF-CGR, QTZ, CL, MILKY, CHT, OR, RD, RD-BN, PK POOR VUG - UNDERGROUND STREAM |
| | 20 75 | T | | SH: M-DKGY, FISS, MICMICA. LS: WH-LTBN, VF-FXL, 1/2 DOL XTLS - 20% TITE. DOL: LT-MGY, LT-DKBN, 1/2 ARG, MICXL-VFXL, IC 5%. N CHT, N FLOUR. |
| | | | | LS: LTBN, VF-MXL, 1/2 DOL, 1/2 BUN XTLS IC 5 TO 10% BN OSTN, VR FLOUR, N CHT. PVR, SI, BUN |
| | | | | DOL: CUGS AA, 1/2 FXL, BUN XTLS, VUG, IC, BN OSTN, N CHT, FLOUR VR IC 10% DOL. |
| 426 | | | | THIN SHALE BED ON LOGS |
| | | | | TITE DOL ON LOGS — DRILLING |
| | | | | POROUS DOL ON LOGS — BLIND |
| | | | | TITE DOL, TITE DOL, TITE DOL, TITE DOL — FROM LOGGING — NO |
| | | | | THIN SHALE BED ON LOGS — CIRCULATION |
| | | | | POROUS DOL, POROUS DOL, POROUS DOL — FROM LOGGING — NO |
| | | | | TITE DOL, TITE DOL, POROUS DOL, TITE DOL, TITE DOL, TITE DOL, TITE DOL, TITE DOL — SAMPLES |
| | | | | TITE DOL, TITE DOL — INTERPRETATION |
| | | | | TITE DOL — FROM |
| | | | | TITE DOL INTPT FROM LOGS — LOGS |
| 465 | | | | SHALE BED |
| | | | | CHEATY - ROP AND LOGS |
| | | | | TITE DOL |
| | | | | SHALE |
| 480 | | | | TITE DOL |
| | | | | TITE DOL INTPT FROM LOGS |
| | | | | TITE DOL |
| 495 | | | | TITE DOL |
| | | | | SHALE FROM LOGS |
| | 75 | T | | DOL: 1/2 (20%) MBN, MICXL, ARG, TITE, MOSTLY MGY, CRYPTXL, VARG GRDG TO DOLSH. N CHT 20% CHT, WH, LTBN, 1/2 VUG TO 15% 1/2 D O STN & ALL CUGS FROM SURFACE |
| | 20 | T | T | DOL: MGY, CY-GN, CRYPTXL - MICXL, ARG TO VARG, 1/2 GRDG TO V DOL SH, 1/2 LTGY, MICXL, TITE. N CHT |

LOST CIRCULATION

SHACKER BYPASS

25% METHANE — 2% ETHANE

17.5% METHANE
2 3/4% ETHANE
0.2% PROPANE — LOST CIRCULATION

DRILLING BLIND — PP 200 — SPM 60
NO RETURNS — SPM 55-65

DRILLING WITH WATER

DRILLING WITH WATER — NO RETURNS — SPM 40-50

DRILLING BLIND WITH WATER — NO RETURNS — SPM 50-55

DRILLING WITH DURAFOAM AND MAKING 8 TO 10 BARRELS WATER — NO GAS RETURNS — AIR 5000 Kpa — 60 L/min FOAM

AIR 4500 Kpa

AIR 4300 Kpa — 35 L/min FOAM

AIR 3900 Kpa

AIR 2000 Kpa

PP 1000 — SPM 90 — DRLG WITH WATER

1 UNIT = 200 PPM
20 m³/min AIR 25 L/min FOAM

RPM 45/50 — WOB 12-16000
RPM 50/80 — WOB 10-14000

RPM 60 WOB 16000

RPM 60 WOB 13000 daN

RPM 60 WOB 6000 daN

WOB 3000 — RPM 65

WOB 3000 — RPM

SCALE CHANGE

MIN/M

405 — 420 — 435 — 450 — 465 — 480 — 495 — 510 — 525 — 540 — 555 — 570 — 585 — 600 — 615

SALINE R. 547.8M

SALT LOW

NO SAMPLES
PROBABLY DOLOMITE WITH VUGGY POROSITY
DOL: WH, LTGY, LT BN, MICAL - FYRL, NO IC Ø, ABUN CVGS, 10% FYR 1/P EHH. SS: UNCONS, AS-SAA, 1/P QTZ, CL-MLKY, 1/P CHT, PK, OR, RO BN. VF-CGR, POSS UNDERGROUND STREAM - VU Ø 25%
DOL: 1/P LCVGS, 1/P WH, LTGY, LTBN, MICEL-VFEL, ARG 1/P, 1/P F-CLCVGS NO IC Ø
SS: AA 1/P QTZ, 1/P COLORLESS CHT, 5% FYR, ANHED, FRS. VU Ø, UNDERGROUND STREAM.
DOL: ANSTY EVGS, 1/P WH, LT-MGY, LT-MBN, MICEL-MEL 1/P ARG, N IC Ø SS: UNCONS, RO-SUBRD, VF-CGR, QTZ, CL, MLKY, CHT, OR, RO, AS-BN, PK, POSS VU Ø - UNDERGROUND STREAM
SH: M-DKGY, FISS, MICACEOUS. LS: WH-LTBN, VF-FEL, 1/P DOL 2TLS-30% TITE. DOL: LT-MGY, LT-DKBR, 1/P ARG, MICEL-VFEL, IC Ø 5%. N CUT, N FLOUR.
LS: LTBN, VF-MEL, 1/P DOL, 1/P EUH XTLS IC Ø 5-10% BN O STN, VE FLOUR, N SHOT. FYR, SX EUH
DOL: CVGS AA, 1/P FEL, EUH XTLS, VU Ø, IC Ø, BN O STN, N CUT, FLOUR VE IC Ø 10% DO.

THIN SHALE BED ON LOGS
TITE DOL ON LOGS
POROUS DOL ON LOGS
TITE DOL } FROM LOGGING
TITE DOL
TITE DOL
TITE DOL
THIN SHALE BED ON LOGS
POROUS DOL } FROM LOGGING
POROUS DOL
POROUS DOL
TITE DOL
TITE DOL
POROUS DOL
TITE DOL
TITE DOL
TITE DOL
TITE DOL
TITE DOL
TITE DOL
TITE DOL
TITE DOL INTPT FROM LOGS

DRILLING BLIND NO CIRCULATION NO SAMPLES INTERPRETATION FROM LOGS

SHALE BED

CHEATY - ROP AND LOGS
TITE DOL
SHALE

TITE DOL

TITE DOL INTPT FROM LOGS

TITE DOL

TITE DOL

SHALE FROM LOGS

| | | | | |
|---|---|---|---|---|
| 25 | T | | | DOL: 1/P (20') MBN, MICYL, ARG, TITE, MOSTLY MGY, CRYPTEL, V ARG GRDG TO DOLSH. NCUT. 20% CHT, WH, LTBN, 1/P VUØ TO 5% 1/P B O STN & ALL CVGS FROM SURFACE |
| 70 | T | | T | DOL: MGY, GY-GN, CRYPTEL-MICEL, ARG TO VARG, 1/P GRDG TO V DOL SH, 1/P LT GY, ANCEL, TITE. NI CUT TRACE SS LCVGS, PYR CVGS. 30% CHT CVGS AA FROM SURFACE. BROKEN LOST CIRCULATION ZONES |
| 40 | 10 | | | DOL: MGY, MBN, CRYPT-MICEL, VARG, TITE, 1/P LTGY, MICEL, ARG, TITE, N CHT, N FLOUR. |
| 55 | | | T | SH: DKGY-GN, FISS, DOL, GRDG TO V ARG DOL. PYR, CHT CVGS |
| 80 | | | T | DOL: 1/P LTGY, MICEL, ARG, MOSTLY MBN, MGY, VARG, CRYMEL, TR LTBN, ANCEL, 3% VUØ-CHKY DOL-TITE, CHT, PYR, SS, GR WASH CVGS AA. |
| 70 | 20 | | | DOL: MGY, MGY-GN, MICEL-CRYPTEL, ARG, 1/P VARG GRDG TO V DOLSH, 1/P GY-GN VARG DOL, TITE CHT, SS, PYR CVGS AA. |
| H | | | | DOL: LTBN, MGY-GN, MICEL, 1/P ARG, 1/P MGY, GY-GN, CRYPTYL, VARG, TITE, GRDG TO SH: MGY, GY-GN, BLKY, 1/P SUBFIS, V DOL NO CVGS? PYR, CVGS? N CUT, N FLOUR. |
| H | | | | DOL: LTBN, MICEL, TITE, 1/P MGY, CRYPTYL, VARG, GRDG TO V DOL SH, TITE NO FLOURESCENCE OR CUT |
| H | T | | | DOL: MGY, CRYPTEL, ARG, 1/P VARG TITE |
| H | T | | | DOL: LTBN, MICEL, 1/P ARG, TITE SH: GY-GN, BLKY, V DOL TR PYR |
| H | T | | | DOL: MGY, CRYPTEL, VARG, 1/P GRDG TO V DOL SH TITE N CHT |
| H | | | | DOL: LTBN, MICEL, 1/P ARG, TITE N FLOUR |
| H | T | | | DOL: 1/P MGY-GN, MICEL, ARG, TITE, 1/P MGY, CRYPTEL, ARG 1/P VARG, TITE, N FLOUR SH: DKGY, SUBFISS, MICACEOUS V DOL CHT: BN, 1/P SLTY. |
| H | | | | DOL: LTGY-BN, MGY-GN, MBN, DKGY, CRYPTEL TO MICEL, 1/P ARG, 1/P VARG, TITE NO CVT NO FLOURESCENCE |
| H | T | | T | DOL: MGY, MICEL, VARG, 1/P GRDG TO V DOL GN, TITE, 1/P WH, LTBN, ABN MICEL TO VFEL CVGS WITH TR IC Ø - CVGS! PYR, CHT, SS, CALCITE CVGS!! |
| 90 | 10 | | | DOL: 1/P WH-LTGY, LTBN, MICEL-VFEL, TR IC Ø, 1/P MGY, MICEL, VARG, 1/P MGY-GN, CRYPTEL, VARG, GRDG TO SH: GY-GN, V DOL, BLKY. SH: DKGY, DOL, SUBFIS |
| 80 | 20 | | | SH: 1/P GN, SUBFIS, 1/P DKGY, FISS, V DOL. TR PYR-CVGS? |
| 60 | 40 | | T | DOL: WH-LTBN-LTGY, VFEL-MICEL, TITE, 1/P MGY, MICEL, ARG, TITE N CUT, N FLOUR. |
| 30 | 60 | 10 | T | DOL: WH-LTGY-LTBN, MICEL-VFEL TITE. TR SS CVGS |
| 30 | 60 | 10 | T | SH: 1/P RD, PK, RO-BN, SLTY, FISS, V DOL GRDG TO SLTY ARG DOL, 1/P GN, WXY SUBFIS - INTBDD |
| 30 | 60 | 10 | T | DOL: CVGS AA, 1/P LT BN - PK, VFEL, MICA, SLTY, TITE, GRDG TO SLTST: V DOL, PK, MICA, GLAU |
| 30 | 10 | 60 | | SH: 1/P RD, FISS, SLTY, 1/P GN, WXY, SUBFIS, V DOL, 1/P VFEL MICA, 1/P MI-GY CHERTS, DOL. TR SS CVGS |
| 30 | 10 | 60 | | SH: RD, MI-GY, DK, SLTY, SUBFIS-FIS, V DOL, GRDG TO DOL SLTST, 1/P GN, WXY, DOL, MICA. |
| 30 | 10 | 50 | 10 | DOL: WH-LTGY AA 1/P DK-LTBN, MICEL-VFEL, V SLTY, MICA. TITE. ANHYD 1. WH, APPARENT 1/P INTER CRYS. |
| 30 | 10 | 50 | 10 | SH: RD, GN, PK, DK-BN, 1/P WXY, 1/P SLTY, SUBFIS-FISS, 1/P MICACEOUS, DOL-V DOL. ANHYD 2 VUG, 5% GW NTLS |
| 30 | 10 | 50 | 20 | DOL: LTGY, LTBN, WH, DK, MICEL-VFEL 1/P ANH, 1/P MICA, TITE, 1/P SLTY-GLAU-MICA GRDG TO DOL SLTST |
| 30 | 10 | 50 | 20 | ANH: WH, ART GYP. DOL: LTGY, LTBN, DK, PK, VFEL-MICEL, 1/P SLTY, MICA, GRDG TO DOL SLTST - |
| 20 | 10 | 60 | 10 | T SH: RD, GN, PK, INTBDD, FIS-SUBFIS, 1/P SLTY, MICA, DOL-V DOL TITE - N CUT, N FLOUR. |
| 30 | T | 60 | 10 | ANHY: AA. SH: LTGN-GN, BN, PK, RD, DOL, 1/P SLTY, INTBDD, 1/P MICACEOUS. SS: CVGS DOL: LTGY, LTBN, |
| 10 | 5 | 75 | 10 | DK-PK, MICEL-VFEL, 1/P SLTY GRDG TO DOL SLTST. TITE, MOST, N FLOUR. |
| 30 | | 60 | 10 | SH: PK, SUBFIS, MICACEOUS, RD, SLTY GRDG TO SLTST, BLKY, 1/P FIS, MICA, GN, WXY, BLKY, 1/P MICA, FIS, DOL |
| 10 | 5 | 75 | 10 | SLTST: WH, PK, MICA, V DOL. DOL: LTBN, DK-PK, LTGY, MICEL-VFEL, V SLTY, 1/P MICA, TITE |
| | | | | SH: RD, FISS, 1/P SLTY, 1/P MICACEOUS, DOL, GN, WXY, SUBFIS, 1/P MICACEOUS, DOL, PK, FISS, MICA. ANHY: AA |
| | | | | DOL: MOSTLY CVGS AA. SLTST: WH, DK, 1/P MICA |
| 30 | | 30 | 40 | SH: GN-RD INTBDD. 1/P SLTY, DOL AA. SLTST: RD, V DOL, GRDG TO SLTY DOL. DOL: 1/P CVGS AA, 1/P SLTY. |
| | | | | SLTST: WH, V DOL GRDG TO SLTY DOL N CUT N FLOUR. |
| 20 | T | 60 | 20 | DOL: LTGY, PK, 1/P SLTY, MICEL, 1/P VFEL, TITE. SLTST: PK-RD, WH, LTGY, DOL-V DOL, 1/P VFEL MICA, |
| | | | | 1/P MICACEOUS. SH: 1/P GN, AA, MICA (VF-FEL), RD, FISS, 1/P SLTY, DOL, LTGY-PK, SLTY 1/P, DOL, MICACEOUS |
| 20 | T | 60 | 20 | DOL: LTBN, LT RO-BN, MGY, CRYPTEL-MICEL, 1/P SLTY 1/P ARG-VARG, TITE, 1/P CVGS. SLTST: PK, RO, DK, BF, |
| | | | | LT-MGY, V DOL, 1/P ARG 1/P VFEL MICA, GRDG TO SLTY ARG DOL. SH: RD, GN, LTGY, SLTY, DOL, MICA, SUBFIS |
| 10 | T | 70 | 20 | SH: GN, RD, DKBN, DK RD BN, 1/P SLTY, SUBFIS-FIS, MICACEOUS, MICA, INTBDD. SLTST: WH, GN, |
| 30 | | 65 | 5 | RD, 1/P ARG, DOL, 1/P MICA, ANHY. DOL: LTBN, RD, LTGY CRYPT-MICEL SLTY, ARG-VARG-TITE |
| | | | | DOL: 1/P CVGS, DK, MICEL, TITE. SLTST: DK, WH, DOL, 1/P MICA. SH: MGY, RD, GN, SLTY, V DOL, MICACEOUS, MICA, SUBFIS-FIS. N CUT, N FLOUR |
| 30 | | 70 | 10 | DOL: CVGS AND DK, SLTY, MICEL, TITE SLTST: DK + WH, MICA, DOL SH: RD, GN, PK, MGY, 1/P SLTY, DOL |
| | | | | 1/P MICACEOUS, SUBFIS-FIS N CUT, N FLOUR. |
| 30 | | 60 | 10 | DOL: MOSTLY CVGS. SLTST: DK, V DOL - V DOL 1/P ARG. SH: VARICOLORED AA, SLTY, DOL. |
| 25 | | 70 | T | SH: 1/P GN, WXY, 1/P MICA, 1/P RD, 1/P SLTY, SUBFIS, DOL, 1/P PK, BLKY, DOL. 5% CHT FRAGS. |
| | | | | DOL: WH-LTGY, GN, MICEL, V SLTY, GRDG TO DOL SLTST, TITE |
| 70 | | 30 | | DOL: LTGY, GY-GN, MICEL, 1/P ARG, 1/P MICA, 1/P SLTY, INTBDD WITH SH, TITE |
| | | | | SH: RD, SLTY, MICACEOUS, GN, WXY, 1/P MICACEOUS, DOL, SUBFIS, FRAGY, FIS, DOL, INTBDD. |
| 40 | 20 | 40 | | GYP: LT-MBN 4% SLTY, DOL. DOL: LTGY-BN, MBN, CRYPTEL-MICEL, 1/P VFEL, 1/P SLTY, ARG, GN, TITE |
| | | | | ANH: GN, 1/P PK, 1/P BLKY, DOL: RD, MICACEOUS, FIS, BY PK, RD, SH: GN, GY, V SLTY, NCUT N FLOUR. |
| 90 | 10 | | | GYP: GY, GN, WH, 1/P DOL, SLTY, ARG. SH: GN, DOL, BLKY-FIS, 1/P GYP INTBDD WITH DOL, TRACES |
| | | | | SH: GN, GR. DOL: LTGN, MGY, 1/P SLTY 1/P GYP, CRYPTIC TO FIL, TITE |
| 80 | 20 | | | DOL: AA, GYP: GY, WH, LTBN, 1/P DOL, ARG. SH: RD, GN, RD-BN, GY, DOL, GYP, BLKY, SUBFIS, |
| | | | | INTPT AS MOSTLY CVGS. SALT - ALL DISOLVED BY DRILLING FLUID. |
| TR | 10 | 90 | | SH: RD AND GN AA - CVGS. GYP: DK, WH, LTBN 1/P SLTY, DOL 1/P LCVGS. DOL AA |
| TR | 15 | 85 | | TR ANHYD, KARST TITE. INTPT: MOSTLY CVGS - SA - DISOLVED IN DRILLING FLUID |
| | 20 | 80 | | SH: AA MOSTLY CVGS GYP: AA 1/P CL SA: TR CUBIC XTLS |
| | | | | INTPT AS SA - DISOLVED IN DRILLING FLUID |
| 10 | 40 | 50 | | DOL: DKGY, CRYPTEL, VARG, TITE. SH: GN TO RBA AA, DKGY, FISS, 1/P SLTY, SOL. 1/P GYP. |
| | | | | GYP: DK, RD, CL, LTGN. TR ANHY. |
| 30 | | 80 | 20 | CHERT AA. SH: RD, GN, PK, FIS-SUBFIS 1/P GYP, DOL 1/P INTBDD WITH DOL |
| | | | | DOL: LTGY-GN, CRYPTEL-MICEL 1/P PEL, SLTY, GYP, TITE |
| 20 | 10 | 50 | 20 | SS: UNCONS, F-MGR, RD, QTZ, STAINED IN SA - INTERPRETATION VP SPL - SA: 1/P SUGY |
| | | | | DOL: VFEL, LTGN, 1/P IC CALC, 1/P IC-VUØ - SA-C - INTPT SH: RD-BN-CVGS |
| | | 70 | 30 | SH: RD-GN CVGS 1/P INTBDD WITH OIL SA. |
| | | | | SS: UNCONS, F-VCGR, SANG-RD, QTZ, STAINED FE CONC, PYR XTLS, INTPT IN SA |
| | | | N | NO RETURNS TO SURFACE INTPT AS SA |
| | | | | ROUND CHIPS - ALL CVGS INTPT AS SA |
| | | | | POOR SPL - ROUND CHIPS - CVGS - SA |

3

RETURNS

AIR 2900 kPa

RPM 67

RPM 60

AIR 2000 kPa

WOB 9000 daN

RPM 66

WOB 5000 daN

RPM 60 WOB 6000 daN

SCALE CHANGE

MW/M

AIR 2000 kPa

20 m³/min AIR 25L/min FOAM

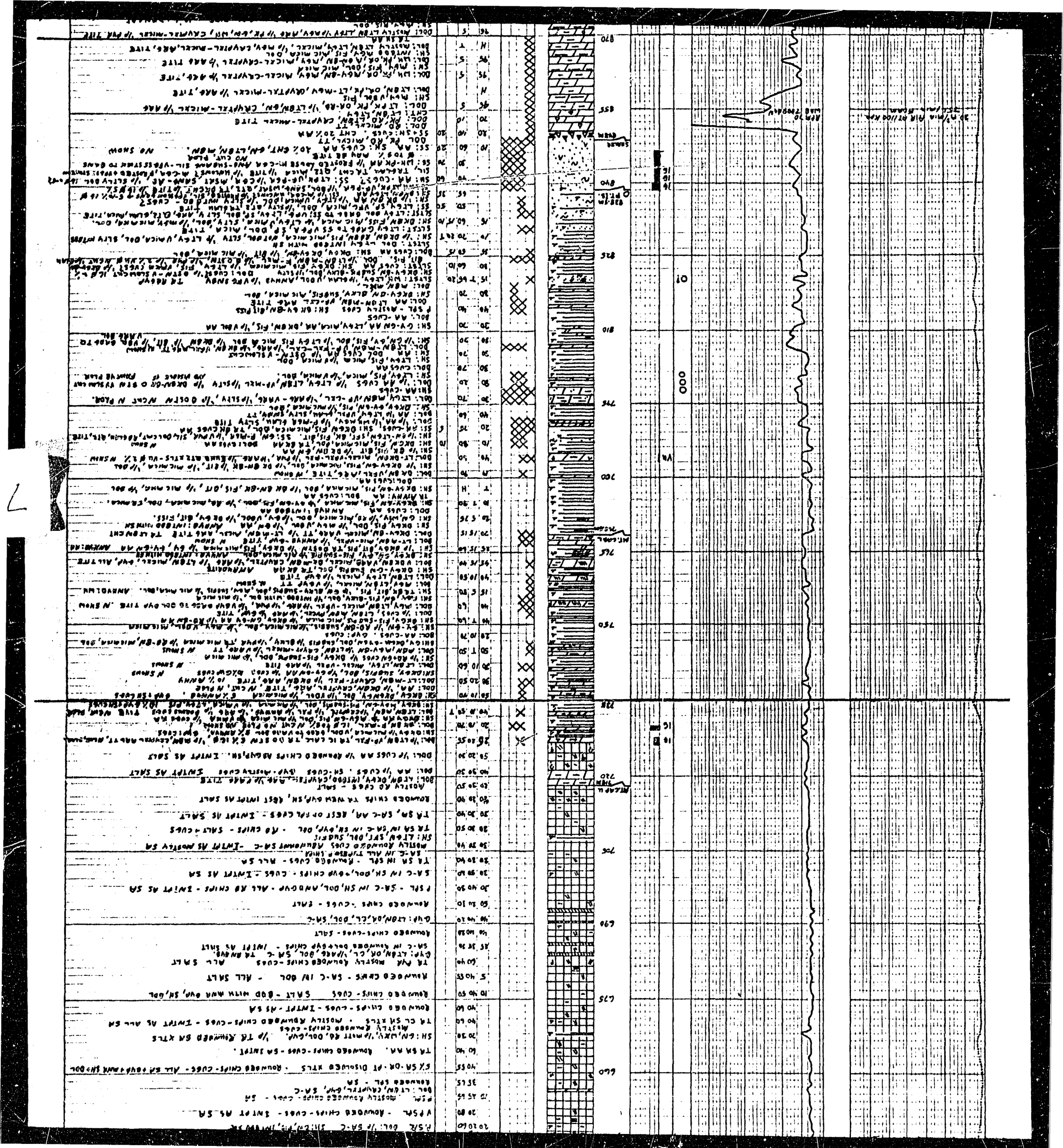
SUNLITE 200 PPM

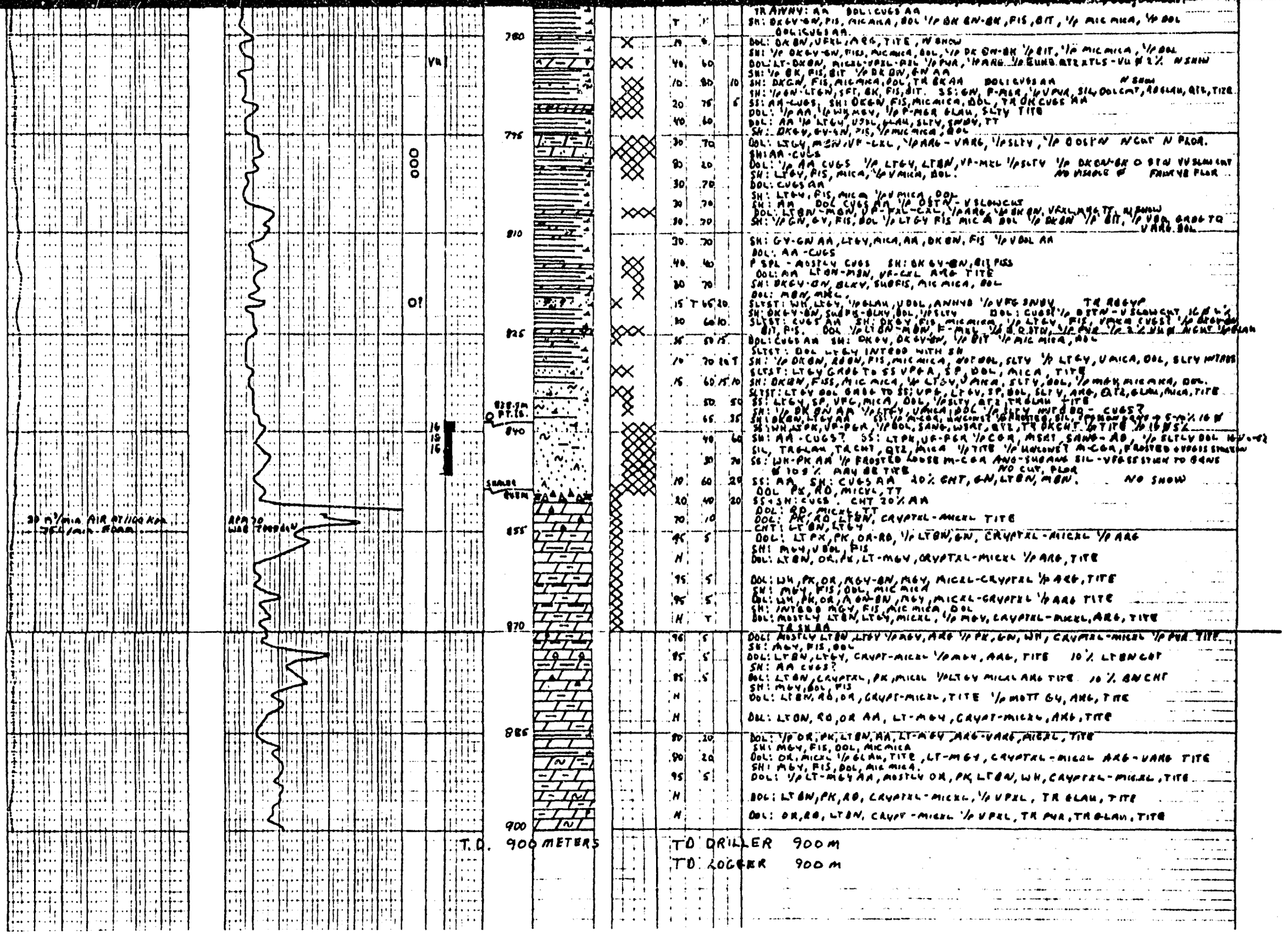
SALINE R. 541.0 M

SILVER SALT 616M

AT CAP U TITH 720

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 540 | | | | | | | DOL: LT GY-BN, MGY-BN, MBN, DK GY, CRYPTXL TO MICXL, 1/2 ARG, 1/2 V ARG, TITE NO CVG NO FLOW/SHOWS |
| | | | | | | | DOL: MGY, MICXL, VARG 1/2 GRDG TO V DOL SH, TITE 1/2 WH, LTBN, ABN MICXL TO VFXL CVGS WITH TR IC ϕ - CVGS! PVR, CONT SS, CALC XTL CVGS ?! |
| | | 90 | 10 | | | | DOL: 1/2 WH-LTGY, LTBN, MICXL-VFXL, TR IC ϕ, 1/2 MGY, MICXL, VARG, 1/2 MGY-GN, CRYPTXL VARG, GRDG TO SH: GY-GN, V DOL, BLKY. SH: DK GY, DOL, SUBFIS |
| | | 80 | 20 | | | | SH: 1/2 GN, SUBFIS, 1/2 DKGY, FIS, V DOL. TR PVR-CVGS ? |
| | | 60 | 40 | | | T | DOL: WH-LT BN-LTGY, VFXL-MICXL, TITE, 1/2 MGY, MICXL, ARG, TITE NCNT, N FLOW. |
| | | 30 | 60 | 10 | T | | DOL: WH-LTGY-LTBN, MICXL-VFXL TITE. TR SS CVGS SH: 1/2 RD, PK, CO-BN, SLTY, FISS, V DOL GRDG TO SLTY ARG DOL, 1/2 GN, WXY SUBFIS-INTBDD |
| | | 30 | 60 | 10 | T | | DOL: CVGS AA, 1/2 LTBN-PK, VFXL, MICA, SLTY, TITE, GRDG TO SLTST: V DOL, PK, MICA, GLAU |
| | | 20 | 10 | 60 | | | SH: 1/2 RD, FISS, SLTY, 1/2 GN, WXY, SUBFIS, V DOL, 1/2 V FXL MICA, 1/2 PK-GY SUBFIS, DOL. TR SS CVGS |
| | | | | | | | SH: RD, PK-GY, DK, SLTY, SUBFIS-FIS, V DOL, GRDG TO DOL SLTST, 1/2 GN, WXY, DOL, MICA. |
| 565 | | 30 | 10 | 50 | 10 | | DOL: WH-LTGY AA 1/2 DK-LTBN, MICXL-VFXL, V SLTY, MICA. TITE. ANHYD: WH, CRYPTXL, 1/2 AFTER ANH. |
| | | 30 | 10 | 50 | 10 | | SH: RD, GN, PK, DK-BN, 1/2 WXY, 1/2 SLTY, SUBFIS-FISS, 1/2 MICACEOUS, DOL-V DOL. ANHYD: WH, TR GN XTLS |
| | | 30 | 10 | 40 | 20 | | DOL: LTGY, LTBN, WH, DK, MICXL-VFXL 1/2 ANH, 1/2 MICA TITE, 1/2 SLTY-GLAU-MICA GRDG TO DOL SLTST |
| | | 20 | 10 | 60 | 10 | T | ANHYD: WH, ABT GYP. DOL: LTGY, LTBN, DK, PK, VFXL-MICXL, 1/2 SLTY, MICA, GRDG TO DOL SLTST SH: RD, GN, AN, INTBDD, FIS-SUBFIS, 1/2 SLTY, MICA, SOL-V DOL TITE-V CLAY, N FLOW. |
| | | 30 | T | 60 | 10 | | ANHYD AA. SH: LTGN-GN, GN, PU, RD, DOL, 1/2 SLTY, INTBDD, 1/2 MIC MICA. SS: CVGS DOL: LTBN, LTGN, DK-PK, MICXL-VFXL, 1/2 SLTY GRDG TO DOL SLTST. TITE, NCNT, N FLOW. |
| | | 10 | 5 | 25 | 10 | | SH: PU, SUBFIS, MIC MICA, RD, SLTY GRDG TO SLTST, BLKY, 1/2 FIS, MICA, GN, WXY. BLKY, 1/2 MICA, FIS, DOL SLTST: WH, PK, MICA, V DOL. DOL: LTBN, DK-PK, LTGY, MICXL-VFXL, V SLTY, 1/2 MICA TITE SH: RD, PK, V SLTY, 1/2 MIC MICA. DOL, GN, WXY, SUBFIS, V MIC MICA, DOL, PU, FISS, MIC ?. ANHYD: AA |
| 570 | | 30 | | 30 | 40 | | DOL: MOSTLY CVGS AA. SLTST: WH, DK, V DOL, 1/2 MICA |
| | | | | | | | SH: GN-RD, INTBDD, 1/2 SLTY, DOL AA. SLTST: RD, V DOL, GRDG TO SLTY DOL. DOL: MICXS AA, 1/2 V SLTY. SLTST: WH, V DOL GRDG TO SLTY DOL NCNT N FLOW. |
| | | 20 | T | 60 | 20 | | DOL: LTGY, PK, 1/2 SLTY, MICXL, 1/2 V FXL, TITE. SLTST: PK-RD, WH, LTGY, DOL-V DOL, 1/2 V FXL MICA, 1/2 MIC MICA. SH: 1/2 GN, AA, MICA (VF-FXL), RD, FISS, 1/2 SLTY, DOL, LT GN-PU, SLTY 1/2, DOL, MIC MICA. |
| | | 80 | T | 60 | 20 | | DOL: LTBN, LT RD-BN, MGY, CRYPTXL-MICXL, 1/2 SLTY 1/2 ARG-V ARG, TITE, 1/2 CVGS. SLTST: PK, RD, DK, BR, LT-MGY, V DOL, 1/2 ARG, 1/2 V FXL MICA, GRDG TO SLTY ARG DOL. SH: RD, GN, LTGY, SLTY, DOL, MICA, SUBFIS |
| | | 10 | T | 70 | 20 | | SH: GN, RD, DKBN, DK RD BN, 1/2 SLTY, SUBFIS-FIS, MIC MICA, MICA, INTBDD. SLTST: WH, DK, RD, 1/2 ARG, DOL, 1/2 MICA, ANHY. DOL: LTBN, RD, LTGY CRYPT-MICXL, SLTY, ARG-V ARG-TITE |
| | | 30 | | 65 | 5 | | DOL: 1/2 CVGS, DK, MICXL, TITE. SLTST: DK, WH, DOL, 1/2 MICA. SH: MGY, RD, GN, SLTY, V DOL, MICA, MICA. SUBFIS-FIS NCNT, N FLOW |
| 585 | | 20 | | 70 | 10 | | DOL: CVGS AA DK, SLTY, MICXL, TITE SLTST: DK-WH, MICA, DOL SH: RD, GN, PU, MGY, 1/2 SLTY, DOL 1/2 MIC MICA, SUBFIS-FIS NCNT, N FLOW. |
| | | 30 | | 60 | 10 | | DOL: MOSTLY CVGS. SLTST: DK, DOL-V DOL 1/2 ARG SH: VARICOLORED AA, SLTY, DOL. |
| | | 25 | | 70 | T | | SH: 1/2 GN, WXY, 1/2 MICA 1/2 RD, 1/2 SLTY, SUBFIS, DOL, 1/2 PU, BLKY, DOL. SLIGHT FRACCEL- DOL: WH-LTGY, GN, MICXL, SLTY, GRDG TO DOL SLTST, TITE |
| | | 70 | | 90 | | | DOL: LTGY, GY-GN, MICXL, 1/2 ARG, 1/2 MICA, 1/2 SLTY, INTBDD WITH SH, TITE |
| | | 40 | 20 | 40 | | | SH: RD, SLTY, MICACEA, GN, WXY, 1/2 MIC MICA, DOL, SUBFIS, TRACY, FIS, DOL, INTBDD. GYP: LT-MBN, 1/2 SLTY, DOL. DOL: LTGY-GN, N GN, CRYPTXL-MICXL, 1/2 V FXL, 1/2 SLTY, ARG, GN, TITE SH: GN 1/2 PK 1/2 BLKY, DOL: RD 1/2 MIC MICA, FIS-SUBFIS, GY, FIS, DOL SH: V GY, 1/2 SLTY, NCNT N FLOW. |
| | | 60 | 20 | 40 | | | GYP: DK, BN, WH, 1/2 DOL, SLTY, ARG. SH: GN, DOL, BLKY-PA, 1/2 CVGS INTBDD WITH DOL. TR ANHYD |
| | | TR | 20 | 80 | | | SH: GN, DK. DOL: LTBN, MGY, 1/2 SLTY 1/2 GYP, CRYPTXL TO FXL, TITE |
| | | TR | 15 | 85 | | | DOL: AA, GYP: DK, WH, LTBN, 1/2 DOL, ARG. SH: RD, GN, RD-BN, GY, DOL GYP, BLKY, SUBFIS, INTPT AS MOSTLY CVGS. SALT - ALL DISSOLVED BY DRILLING FLUID. |
| | | | 20 | 80 | | | SH: RD AND GN AA - CVGS. GYP: DK, WH, LTBN 1/2 SLTY, DOL 1/2 CVGS. DOL AA TR ANHYD, KARNITITE. INTPT: MOSTLY CVGS - SA - DISSOLVED IN DRILLING FLUID. |
| | | | | | | | SH: AA MOSTLY CVGS GYP: AA 1/2 FXL SA: TR CVGS XTLS INTPT AS SA - DISSOLVED IN DRILLING FLUID |
| | | 10 | 40 | 50 | | | DOL: DK GY, CRYPTXL, V ARG, TITE. SH: GN V RD AA, DK GY, FISS, 1/2 BLKY, DOL. 1/2 GYP. |
| 615 | | | | | | | GYP: DK, RD, DK, CL, LTBN. TR ANHY |
| SILVER SALT 616M | | 30 | | 80 | 50 | | GYP: AA. SH: RD, GN, RD, FIS-SUBFIS 1/2 GYP, DOL 1/2 INTBDD WITH DOL |
| | | 20 | 10 | 50 | 20 | | DOL: LTGY-GN, CRYPTXL-MICXL 1/2 FXL, SLTY, GYP, TITE |
| | | | | 70 | 30 | | SS: UNCONS, F-MGR, RD, QTZ, STAINED IN SA - INTERPRETATION VP SPL - SA: 1/2 SNOW DOL: V FXL, LTBN, VP IC CALC, 1/2 IC-VUG ϕ - SA-C - INTPT SH: RD TO GN-CVGS 1/2 INTBDD WITH OR SA. |
| | | | | H | | | SS: UNCONS, F-V COR, SAND-RD, QTZ, QTZ FRAG, FE CONC, PVR STNS, INTPT AS SA NO RETURNS TO SURFACE INTPT AS SA ROUND CHIPS - ALL CVGS INTPT AS SA POOR SPL - ROUND CHIPS - CVGS - SA |
| 620 | | | 10 | 30 | 60 | | P SPL SS: UNCONS, F-MGR, RD, QTZ, PVR - INTPT AS SNOW SA SH: RD CHIPS - CVGS |
| | | 30 | 30 | 40 | | | ROUNDED CHIPS - ALL CVGS INTPT AS SA |
| | | 10 | 20 | 70 | | | DOL: LT BN, MICXL-CRYPTXL, 1/2 GYP, 10% SA-C SH-GYP: ROUNDED CHIPS - SA |
| | | | | 40 | 60 | | P SPL - ROUNDED CHIPS - INTPT AS SA |
| | | | | 35 | 65 | | SH: RD, V GYP, DOL, FIS 1/2 GN INTBDD WITH OR SA TR SA POOR SPL |
| 645 | | | | 50 | 50 | | ROUNDED FRAG - ALL CVGS - INTPT AS SA |
| | | | 20 | 20 | 60 | | P SPL DOL: 1/2 SA-C SH: GN, FIS, INTBDD SA |
| | | | | 20 | 80 | | V P SPL - ROUNDED CHIPS - CVGS - INTPT AS SA |
| | | | 10 | 25 | 65 | | P SPL MOSTLY ROUNDED CHIPS - CVGS - SA |
| | | | | 35 | 65 | | DOL: LTBN, CRYPTXL, GYP, SA-C ROUNDED SPL - SA |
| 660 | | | | 40 | 55 | | 5% SA-OR-PT DISSOLVED XTLS - ROUNDED CHIPS - CVGS - ALL SA + GYP + ANH SH: DOL |
| | | | | 60 | 40 | | TR SA AA. ROUNDED CHIPS - CVGS - SA INTPT. |
| | | | | 70 | 30 | | SH: GN, WXY, 1/2 MOTT RD, DOL, GYP. 1/2 TR ROUNDED SA XTLS MOSTLY ROUNDED CHIPS - CVGS |
| | | | | 40 | 60 | | TR CL SA XTLS - MOSTLY ROUNDED CHIPS - CVGS - INTPT AS ALL SA |
| | | | | 40 | 60 | | ROUNDED CHIPS - CVGS - INTPT - AS SA |
| 675 | | | 10 | 40 | 50 | | ROUNDED CHIPS - CVGS SALT - BDD WITH ANH GYP, SH, DOL |
| | | | 5 | 40 | 55 | | ROUNDED CHPS - SA-C IN DOL - ALL SALT |
| | | | | 60 | 40 | | TR PVR MOSTLY ROUNDED CHIPS - CVGS ALL SALT |
| | | | 35 | 35 | 30 | | GYP: LTBN, DK, CL, 1/2 ARG, DOL, SA-C TR ANHYD. SA-C IN ROUNDED DOL + GYP CHIPS - INTPT AS SALT |
| | | | 40 | 40 | 20 | | ROUNDED CHIPS - CVGS - SALT |
| 690 | | | 40 | 40 | 20 | | GYP: LTBN, DK, CL, DOL, SA-C |
| | | | 50 | 20 | 30 | | ROUNDED CHIPS - CVGS - SALT |
| | | | 30 | 40 | 30 | | P SPL - SA-C IN SH, DOL, AND GYP - ALL 1/2 CHIPS - INTPT AS SA |
| | | | 30 | 30 | 40 | | SA-C IN SH, DOL, + GYP CHIPS - CVGS - INTPT AS SA |
| | | | 20 | 30 | 40 | | TR SA IN SPL - ROUNDED CVGS - ALL SA SA-C IN ALL TYPES OF CHIPS |
| 705 | | | 30 | 30 | 40 | | MOSTLY ROUNDED CVGS ABUNDANT SA-C - INTPT AS MOSTLY SA |
| | | | 20 | 30 | 50 | | SH: LTBN, SFT, DOL, SUBFIS TR SA IN SH C IN SH, GYP, DOL - RD CHIPS - SALT + CVGS |
| | | | 20 | 30 | 40 | | TR SA, SA-C AA, REST OF SPL CVGS - INTPT AS SALT |
| | | | 40 | 20 | 40 | | ROUNDED CHIPS TR NEW GYP, SH, REST INTPT AS SALT |
| AT CAP U TITH 720 | | | 20 | 30 | 50 | | MOSTLY RD CVGS - SALT |
| | | | 40 | 30 | 30 | | DOL: LTBN, DKGY, INTBDD, CRYPTXL, AAA 1/2 FAAA TITE DOL: AA 1/2 CVGS. SH-CVGS GYP-MOSTLY CVGS SNTPT AS SALT |
| | | | 50 | 20 | 30 | | DOL: 1/2 CVGS AA 1/2 ROUNDED CHIPS AS GYP, SH. INTPT AS SALT |
| | 10 | | 20 | 20 | 60 | X | DOL: 1/2 LTBN, VF-FXL, TR IC CALC, TR DOL STN 5% IGS, 1/2 MBN, CRYPTXL ARG TT, BLKY, DOL SH: GY 1/2 MIC MICA, V DOL, GRDG TO V ARG DOL 5% ANHYD, GYP IGS |
| | 10 | | 20 | 10 | 70 | X | DOL: DK BN, F-MXL, IC ϕ 100% N CNT NO FLOW NO SHOW SH: DK GY-RD TO MGY-GN, FIS, DOL 1/2 MIC MICA 1/2 V MICA 1/2 CVGS AA |
| | | T | 10 | 10 | 60 | T X | DOL: LTBN, MBN, 1/2 CRYPTXL 1/2 FXL 1/2 ANHYD, 1/2 ARG 1/2 DKGRNS CVGS TITE NCNT, N FLOW SH: DK GY, MGY-GN, FIS-SUBFIS, DOL, 1/2 MICA MICA 1/2 V MICA, LTBN, PK 10% GYP STRINGERS |
| 735 | | | 50 | 10 | 40 | X | SH: DK GY, DK GNLY, DOL, 1/2 V DOL, 1/2 MICACEA 5% ANHYD. GYP IN CVGS |
| | | | | | | X | DOL: AA, 1/2 DK GN, CRYPTXL, ARG, TITE, N CNT, N FLOW |
| | | | 30 | 20 | 50 | X | DOL: LT-MBN, CRYPT-FXL 1/2 DK BN, ARG, TITE 10% ANHY SH: DK GY, SUBFIS, DOL, 1/2 GY-GN AA 1/2 CVGS 5% GYP CVGS N SHOWS |
| | | | 30 | 10 | 60 | X | DOL: LT BN, LT GY, MICXL-V FXL 1/2 ARG TITE N SHOWS SH: 1/2 RD + GN CVGS 1/2 DK GY, FIS-SUBFIS, DOL, 1/2 MIC MICA |
| | | T | 50 | T | 50 | X | DOL: ABN, MGY-GN 1/2 LTBN, CRYPT-MICXL 1/2 V ARG, TT N SHOWS SH: GY, DK GN-GY GN, DOL, SUBFIS 1/2 BLKY, 1/2 PVA, TR MIC MICA 1/2 RD-BN, MICACEA, DOL |
| | | | 20 | 10 | 70 | | DOL: AA-CVGS. GYP: CVGS SH: GY-GN, 1/2 RD-GN, SUBFIS, 1/2 MIC MICA, DOL, 1/2 MGY, V DOL, MIC MICA |
| 750 | | | 40 | T | 60 | | SH: DK GY, FIS-SUBFIS, MIC MICA, 1/2 DK GY, GN-GY AA 1/2 RD-GN AA |




VR
000
0?
760
775
810
825
840
855
870
885
900
T.D. 900 METERS
TRANVY: AA DOL: CUGS AA
SH: DK GY-GN, FIS, MIC MICA, DOL 1/2 DK GN-BK, FIS, BIT, 1/2 MIC MICA, 1/2 DOL
DOL: CUGS AA.
DOL: DK BN, VFEL, ARG, TITE, N SHOW
SH: 1/2 DKGY-GN, FIS, MIC MICA, DOL, 1/2 DK GN-BK 1/2 BIT, 1/2 MIC MICA, 1/2 DOL
DOL: LT-DK BN, MICEL-VFEL-ARL 1/2 PVR, 1/2 ARG 1/2 SUBRD QTZ GRNS - VU # 2% N SHW
SH: 1/2 BK, FIS, BIT 1/2 DK BN, GN AA
SH: DKGN, FIS, MIC MICA, DOL, TR BK AA DOL: CUGS AA N SHW
SH: 1/2 GN-LTGN, SFT, BK, FIS, BIT. SS: GN, P-MOR 1/2 VPVR, SIL, DOL CMT, ROUGH, QTZ, TITE
SS: AA-CUGS, SH: DKGN FIS, MIC MICA, DOL, TR DK CUGS AA
DOL: 1/2 AA 1/2 WH-MGY, 1/2 P-MOR GLAU, SLTY TITE
DOL: AA 1/2 LTGY, VFEL, GLAU, SLTY, SNDY, TT
SH: DKGY, GY-GN, FIS, 1/2 MIC MICA, DOL
DOL: LTGY, MSN, VF-CEL, 1/2 ARG - VARG, 1/2 SLTY, 1/2 DOLSTN N CHT N FLOR.
SH: AA-CUGS
DOL: 1/2 AA CUGS 1/2 LTGY, LTBN, VF-MEL 1/2 SLTY 1/2 DKGN-BK DOLSTN VSLOW CUT
SH: LTGY, FIS, MICA, 1/2 V MICA, DOL. NO VISIBLE POR FAINT VE FLOR
DOL: CUGS AA
SH: LTGY, FIS, MICA 1/2 V MICA, DOL
SH: AA DOL CUGS AA 1/2 DOLSTN - V SLOW CUT
DOL: LTBN-MBN, VF-FXL-CXL, 1/2 ARG, 1/2 BKBN, VFEL, MOTT, N SHOW
SH: 1/2 GN, GY, FIS, DOL 1/2 LTGY FIS MICA DOL 1/2 DKGN 1/2 BIT, 1/2 VPR, GRDG TO VARG. DOL
SH: GY-GN AA, LTGY, MICA, AA, DK BN, FIS 1/2 V DOL AA
DOL: AA-CUGS
P SPL - MOSTLY CUGS SH: BK GY-GN, BIT FISS
DOL: AA LTBN-MBN, VF-CXL ARG TITE
SH: DKGY-GN, BLKY, SUBFIS, MIC MICA, DOL
DOL: MBN, MXL,
SLTST: WK, LTGY, 1/2 GLAU, V DOL, ANHYD 1/2 VFG SNDY TR RDGYP
SH: DKGY-GN, SUBFIS-BLKY, DOL, 1/2 SLTY DOL: CUGS 1/2 DOLSTN - V SLOW CUT
SLTST: CUGS AA SH: DKGY FIS, MIC MICA, 1/2 LTGY, FIS, VARG CUGS 1/2 DOLSTN
BIT, FIS. DOL 1/2 LTBN-MBN, F-MXL, 1/2 DOLSTN, 1/2 PVR, 1/2 2% VUG # NCHT, GLAU
DOL: CUGS AA SH: DKGY, DKGY-GN, 1/2 BIT 1/2 MIC MICA, DOL
SLTST: DOL LTGY INTBDD WITH SH
SH: 1/2 DKGN, RDGN, FIS, MIC MICA, NOT DOL, SLTY 1/2 LTGY, V MICA, DOL, SLTY INTBDS
SLTST: LTGY GRDG TO SS VFG A, SP, DOL, MICA, TITE
SH: DKBN, FISS, MIC MICA, 1/2 LTGY, V ARG, SLTY, DOL, 1/2 MOT MICACEOUS, DOL.
SLTST: LTGY DOL GRDG TO SS: VFG, LTGY, SP, DOL, SLTY, ARG, QTZ, GLAU, MICA, TITE
SS: LTGY, SP, VFG, MICA, DOL, 1/2 SLTY QTZ TR GLAU TITE
SH: 1/2 DK GN AA 1/2 LTGY, V MICA DOL 1/2 SLTY INTBDD - CUGS?
SH: DKGN, LTGY AA SS: 1/2 M-COA, UNCONSOL GRNS SIL, TR NON FROSTED TO 5-10% 16 W
SS: WH-ASPK, VF-PGR, 1/2 DOL, SANG, W SRT, QTZ, TR DKCHT, TR TITE 10 16 W SL
SH: AA-CUGS? SS: LTPK, VF-PGR 1/2 COA, MSRT SANG-AD, 1/2 SLTY DOL 10-15%
SIL, TR GLAU, TR CHT, QTZ, MICA 1/2 TITE 1/2 UNCONSOL M-COA, FROSTED 4 FOLD STAIN
SS: WH-PK AA 1/2 FROSTED LOOSE M-COA ANG-SUBANG SIL - V PGR STAIN TO 8 ANG
@ 10% MAY BE TITE NO CUT, FLOR
SS: AA SH: CUGS AA 20% CHT, GN, LTBN, MBN. NO SHOW
DOL PK, RD, MICEL, TT
SS + SH: CUGS, CHT 20% AA
DOL: RD, MICEL TT
DOL: PK, RD, LTBN, CRYPTXL-MICEL TITE
CHT: LTBN, LTGY
DOL: LT PK, PK, OR-RD, 1/2 LTBN, GN, CRYPTXL-MICEL 1/2 ARG
SH: MGY, V BDL, FIS
DOL: LTBN, OR, PK, LT-MGY, CRYPTXL-MICEL 1/2 ARG, TITE
DOL: WH, PK, OR, MGY-BN, MGY, MICEL-CRYPTXL 1/2 ARG, TITE
SH: MGY, FIS, DOL, MIC MICA
DOL: WH, PK, OR, A BN-BN, MGY, MICEL-CRYPTXL 1/2 ARG TITE
SH: INTBDD MGY, FIS, MIC MICA, DOL
DOL: MOSTLY LTBN, LTGY, MICEL, 1/2 MGY, CRYPTXL-MICEL, ARG, TITE
TR SH AA
DOL: MOSTLY LTBN, LTGY 1/2 MGY, ARG 1/2 PK, GN, WH, CRYPTXL-MICEL 1/2 PVR TITE
SH: MGY, FIS, DOL
DOL: LTBN, LTGY, CRYPT-MICEL 1/2 MGY, ARG, TITE 10% LTBN CHT
SH: AA CUGS?
DOL: LTBN, CRYPTXL, PK, MICEL 1/2 LTGY MICEL ARG TITE 10% BN CHT
SH: MGY, BDL, FIS
DOL: LTBN, RD, OR, CRYPT-MICEL, TITE 1/2 MOTT GY, ARG, TITE
DOL: LTBN, RD, OR AA, LT-MGY, CRYPT-MICEL, ARG, TITE
DOL: 1/2 OR, PK, LTBN, AA, LT-MGY, ARG-VARG, MICEL, TITE
SH: MGY, FIS, DOL, MIC MICA
DOL: OR, MICEL 1/2 GLAU, TITE, LT-MGY, CRYPTXL-MICEL ARG-VARG TITE
SH: MGY, FIS, DOL, MIC MICA.
DOL: 1/2 LT-MGY AA, MOSTLY OR, PK, LTBN, WH, CRYPTXL-MICEL, TITE
DOL: LTBN, PK, RD, CRYPTXL-MICEL, 1/2 VPXL, TR GLAU, TITE
DOL: OR, RD, LTBN, CRYPT-MICEL 1/2 VPXL, TR PVR, TR GLAU, TITE
TD DRILLER 900 M
TD LOGGER 900 M
20 M³/MIN AIR AT 1100 KPA
35 L/MIN FOAM
APPROX WATER TABLE
8 of 8

Dresser Atlas

DRESSER

# ACOUSTIC CEMENT BOND LOG

FILE NO. 8302-R

COMPANY FORWARD RESOURCES LIMITED

WELL FORWARD ET AL, 12KK M 20

FIELD WILDCAT

PROVINCE NORTH WEST TERRITORIES

LOCATION:
UNIT M SECTION 20 GRID 67°
20', 123° 45',

Other Services

Permanent Datum GROUND LEVEL Elev. 295.0M
Log Measured from KELLY BUSHING 4.2 M. Above Permanent Datum
Drilling Measured from KELLY BUSHING

Elevations:
KB 299.2M
DF
GL 295.0M

| | | | |
|---|---|---|---|
| Date | MAR. 26/83 | | |
| Run No. | ONE&TWO&THREE | | |
| Type Log | CBL-VDL-GR | CANADA OIL AND GAS LANDS ADMINISTRATION CALGARY, ALBERTA | |
| Depth-Driller | 585.0M | | |
| Depth-Logger | 583.0M | ADMINISTRATION CALGARY, ALBERTA | |
| Bottom Logged Interval | 581.5M | OIL AND GAS LANDS ADMINISTRATION CANADA | |
| Top Logged Interval | 300.0M | | |
| Type Fluid in Hole | WATER | [illegible] 1983 | |
| Salinity Ppm Cl. | N/A | | |
| Density kg/m³ | N/A | ENGINEERING AND CONTROL BRANCH | |
| Level | FULL | | |
| Max. Rec. Temp. Deg. C | N/A | TECHNIQUE ET CONTROLE | |
| Opr. Rig Time | 6.5 HRS. | | |
| Recorded By | HASIUK | | |
| Witnessed By | ALDRIGE | | |

| Run No. | Bore Hole Record Bit | From | To | Casing Record Size | Wgt. | From | To |
|---|---|---|---|---|---|---|---|
| | | | 339.7 | 339.7 | 71.4 | SURF. | 33.0 |
| | | | 244.5 | 244.5 | 48.1 | SURF. | 432.0 |
| | | | 177.8 | 177.8 | --- | 303.0 | 585.0 |

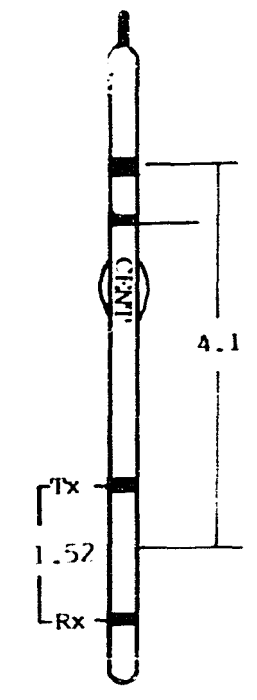
FOLD HERE

| Gamma Ray — Equipment Data | | | | Cement Bond Log — Equipment Data | | | |
|---|---|---|---|---|---|---|---|
| Run No. | TWO | THREE | | Run No. | TWO | THREE | |
| Tool Model No. | 2402 | 2402 | | Log Type | CBL | CBL | |
| Diam. | 93mm | 93mm | | Tool Model No. | 1415 | 1415 | |
| Detect. Model No. | D6G4 | D6G4 | | Diam. | 89mm | 89mm | |
| Type | SCINT. | SCINT. | | Standoff Size | CENT. | CENT. | |
| Length | 15.2cm | 15.2cm | | T-R Spacing | 5' | 5' | |
| Dist. to N. Source | N/A | N/A | | C.B.L. Settings | | | |
| | | | | CBL Gain | 120 | | |
| General | | | | Z Gain | S.POT | | |
| Hoist Truck No. | HSL 1407 | | | Sensitivity | 38 | | |
| Inst. Truck No. | CBL | GR | | Gate | POT | | |
| Tool Serial No. | 19000 | 40185 | | Position | 506 | | |

Logging Data

| General | | | | Gamma Ray | | | |
|---|---|---|---|---|---|---|---|
| Run No. | Depths From | Depths To | Speed M/Min. | T.C. Sec. | Sens. Settings | Zero Div. L or R | API G.R. Units Per Log Div. |
| 1 | 585.0 | 300.0 | 9 | 2 | 350 | 0 | 12 |
| 2 | 585.0 | 300.0 | 9 | 2 | 350 | 0 | 12 |
| 3 | 585.0 | 300.0 | 9 | 2 | 350 | 0 | 12 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

INSTRUMENT DATA




Instrument Dia. 89mm

PRIMARY CEMENTING DATA

| CSG. RECORD | Surface | Protection | Production | Liner |
|---|---|---|---|---|
| Type Cement | CLASS G | | | |
| Vol. of Cement | -- | | | |
| Additive | -- | | | |
| % Additive | -- | | | |
| Retarder | -- | | | |
| % Retarder | -- | | | |
| Slurry Wt. | 1895 | | | |
| Water Loss | -- | | | |
| Drlg. Mud Type | CLASS G | | | |
| Drlg. Mud Wt. | | | | |

PRIMARY CEMENTING PROCEDURE

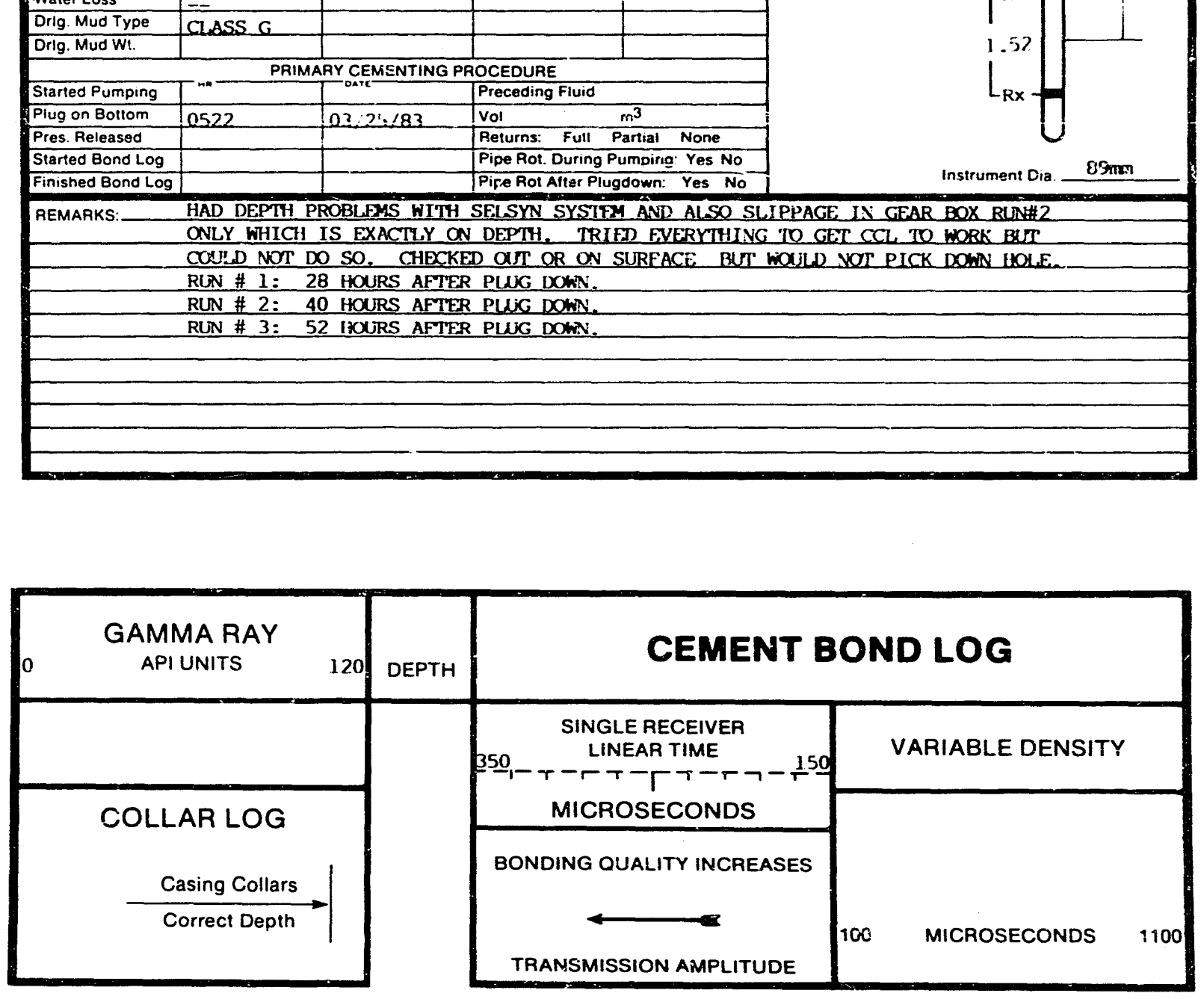
| | HR | DATE | | |
|---|---|---|---|---|
| Started Pumping | | | Preceding Fluid | |
| Plug on Bottom | 0522 | 03/25/83 | Vol | m³ |
| Pres. Released | | | Returns: Full Partial None | |
| Started Bond Log | | | Pipe Rot. During Pumping: Yes No | |
| Finished Bond Log | | | Pipe Rot After Plugdown: Yes No | |

REMARKS: HAD DEPTH PROBLEMS WITH SELSYN SYSTEM AND ALSO SLIPPAGE IN GEAR BOX RUN#2 ONLY WHICH IS EXACTLY ON DEPTH. TRIED EVERYTHING TO GET CCL TO WORK BUT COULD NOT DO SO. CHECKED OUT OR ON SURFACE BUT WOULD NOT PICK DOWN HOLE.
RUN # 1: 28 HOURS AFTER PLUG DOWN.
RUN # 2: 40 HOURS AFTER PLUG DOWN.
RUN # 3: 52 HOURS AFTER PLUG DOWN.

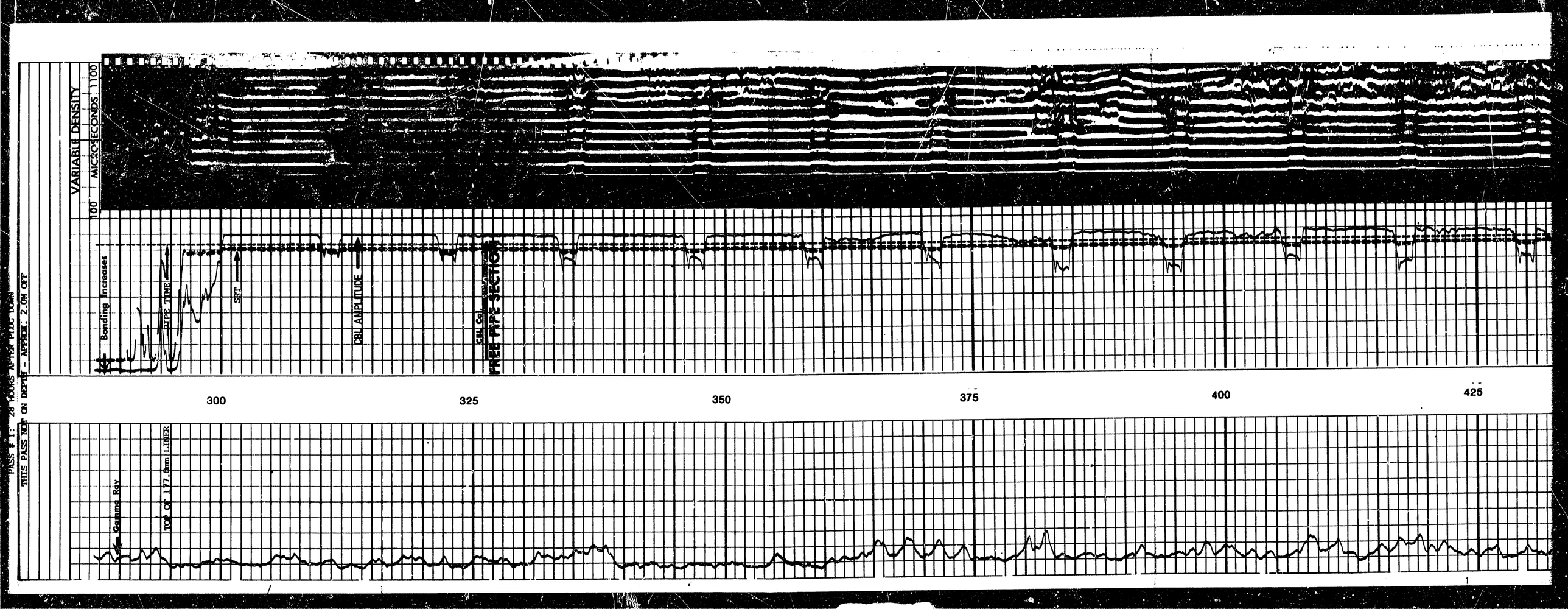
| GAMMA RAY 0 API UNITS 120 | DEPTH | CEMENT BOND LOG | |
|---|---|---|---|
| | | SINGLE RECEIVER LINEAR TIME 350 — 150 MICROSECONDS | VARIABLE DENSITY |
| COLLAR LOG Casing Collars → Correct Depth \| | | BONDING QUALITY INCREASES ← TRANSMISSION AMPLITUDE | 100 MICROSECONDS 1100 |

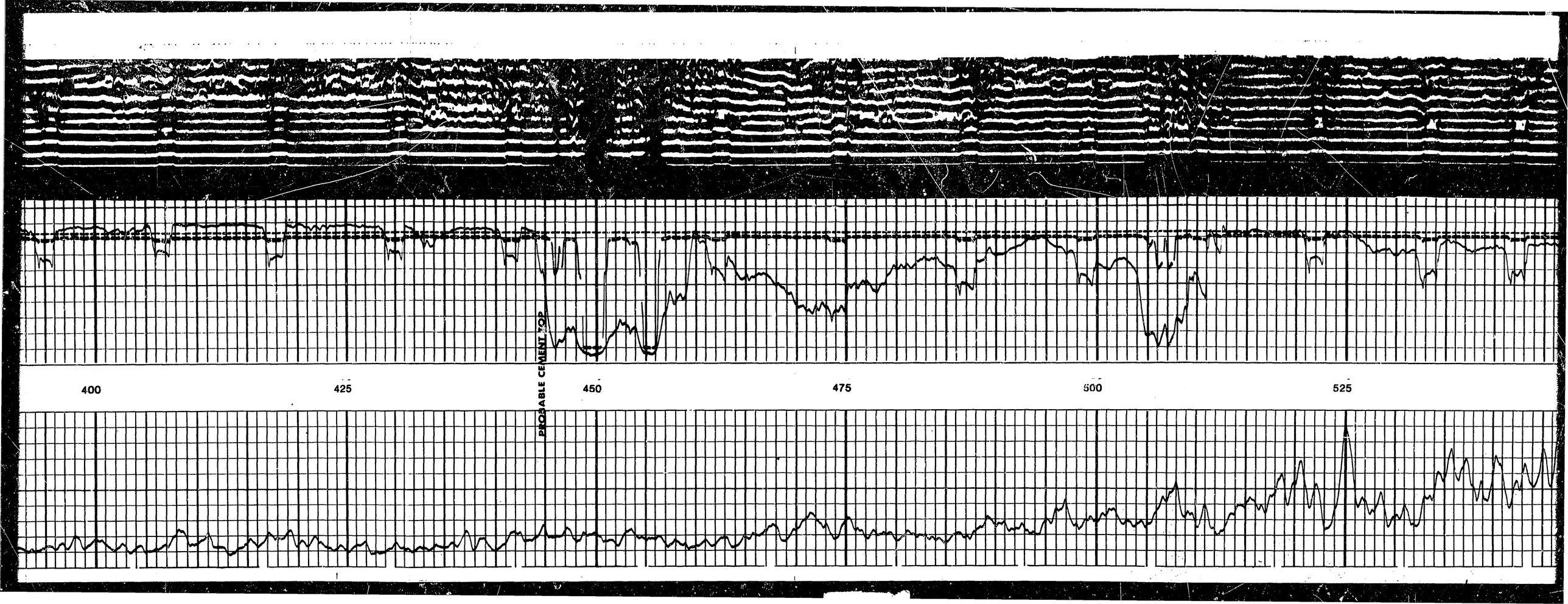
PASS # 1: 28 HOURS AFTER PLUG DOWN

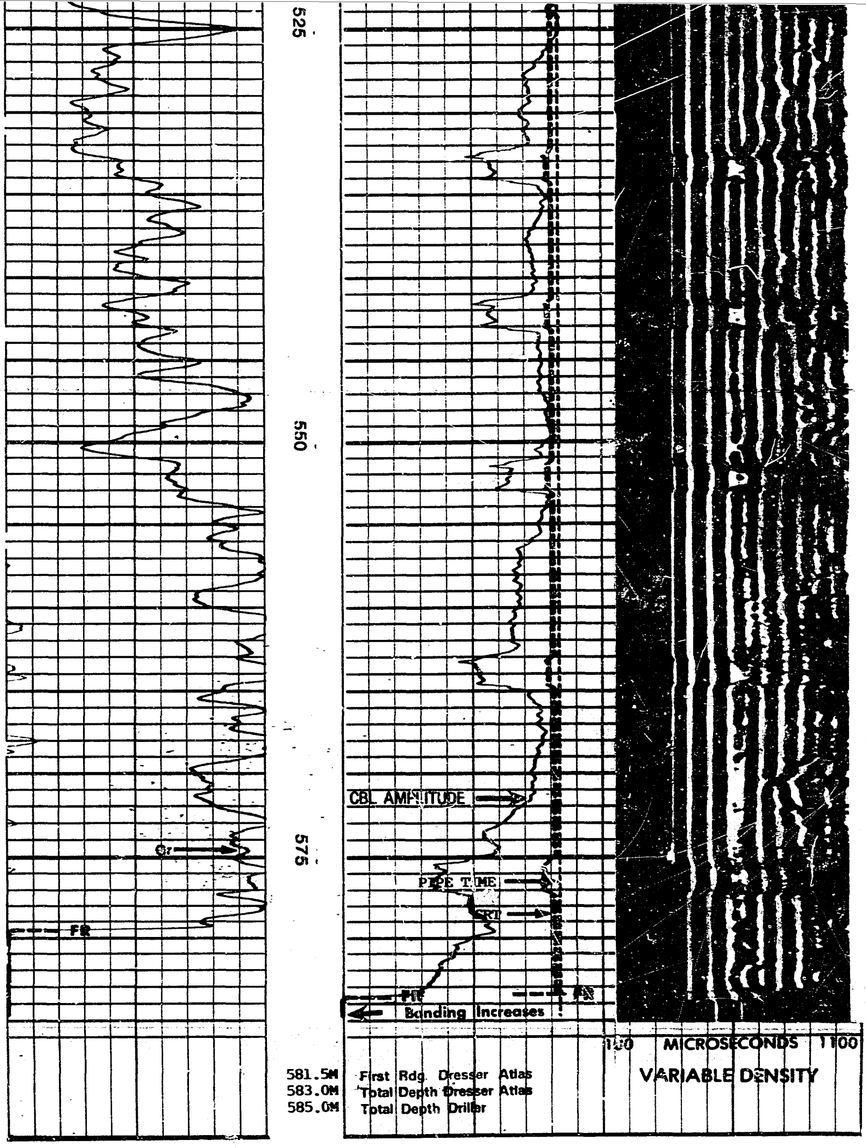
THIS PASS NOT ON DEPTH - APPROX. 2.0M OFF



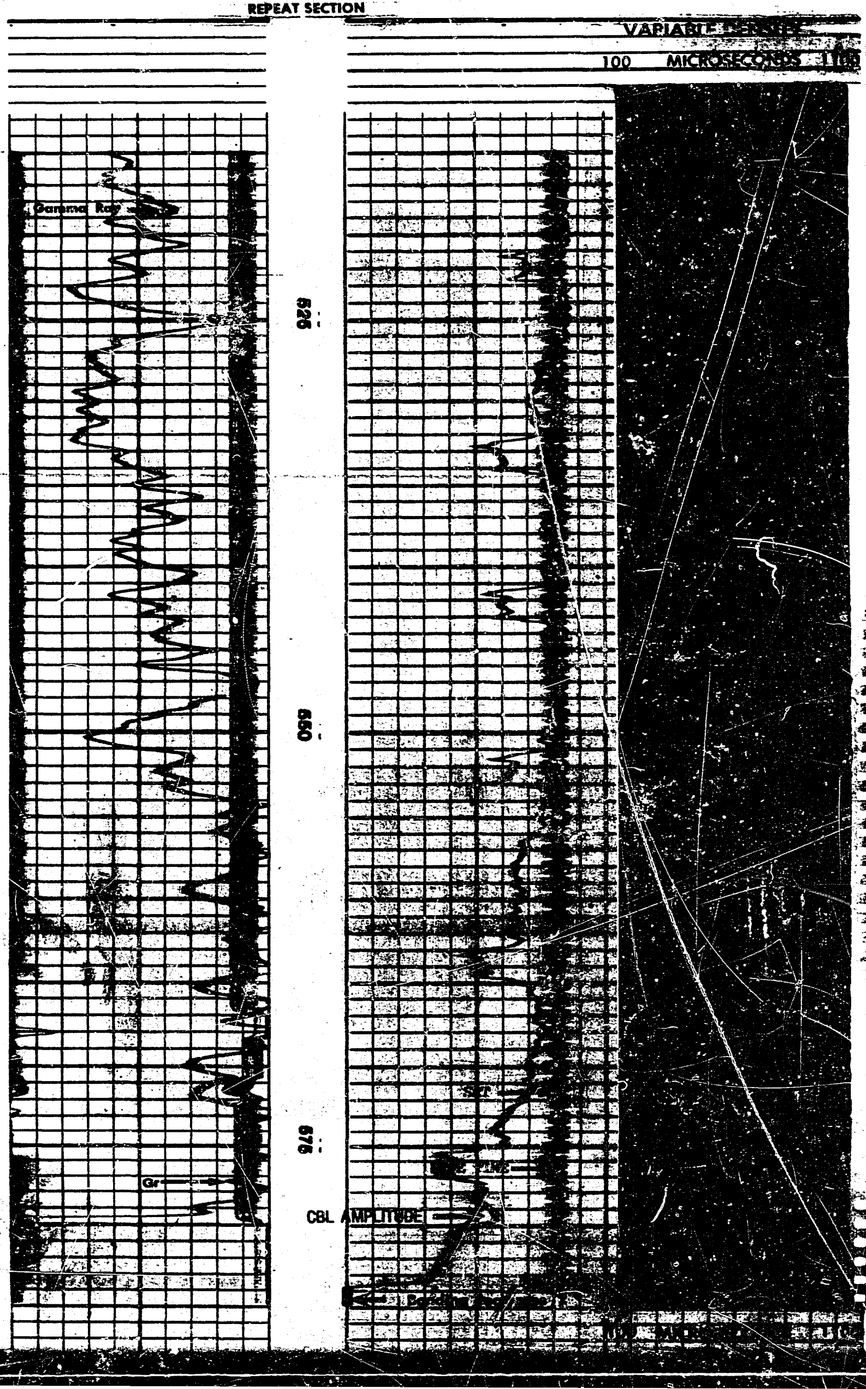

D250 - Kodiak
A160 - Alberni

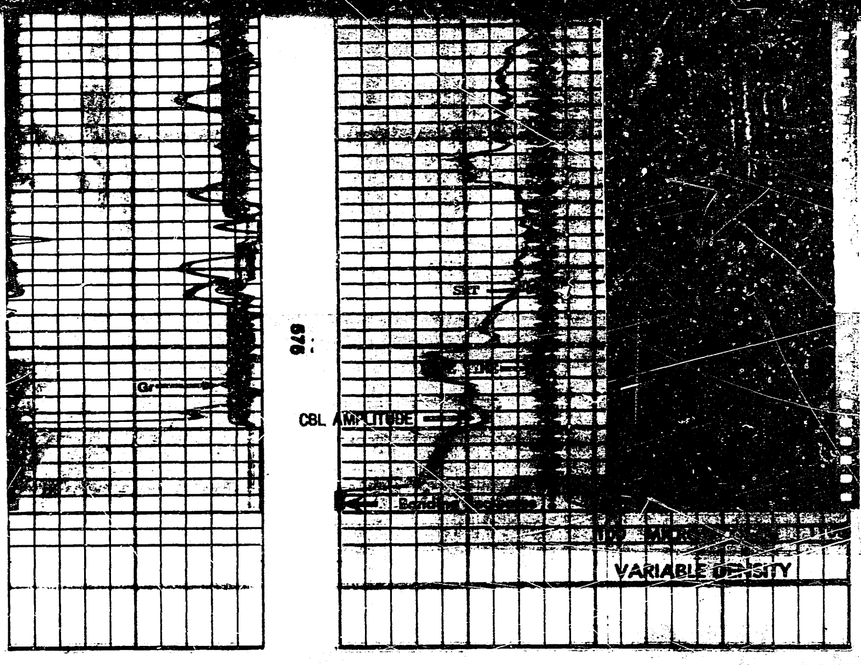

VARIABLE DENSITY
100 MICROSECONDS 1100
Bonding Increases
PIPE TIME
SPT
CBL AMPLITUDE
CBL Cal
FREE PIPE SECTION
300
325
350
375
400
425
PASS # 1:
THIS PASS NOT ON DEPTH - APPROX. 2.0M OFF
Gamma Ray
TOP OF 177.8mm LINER


400
425
PROBABLE CEMENT TOP
450
475
500
525

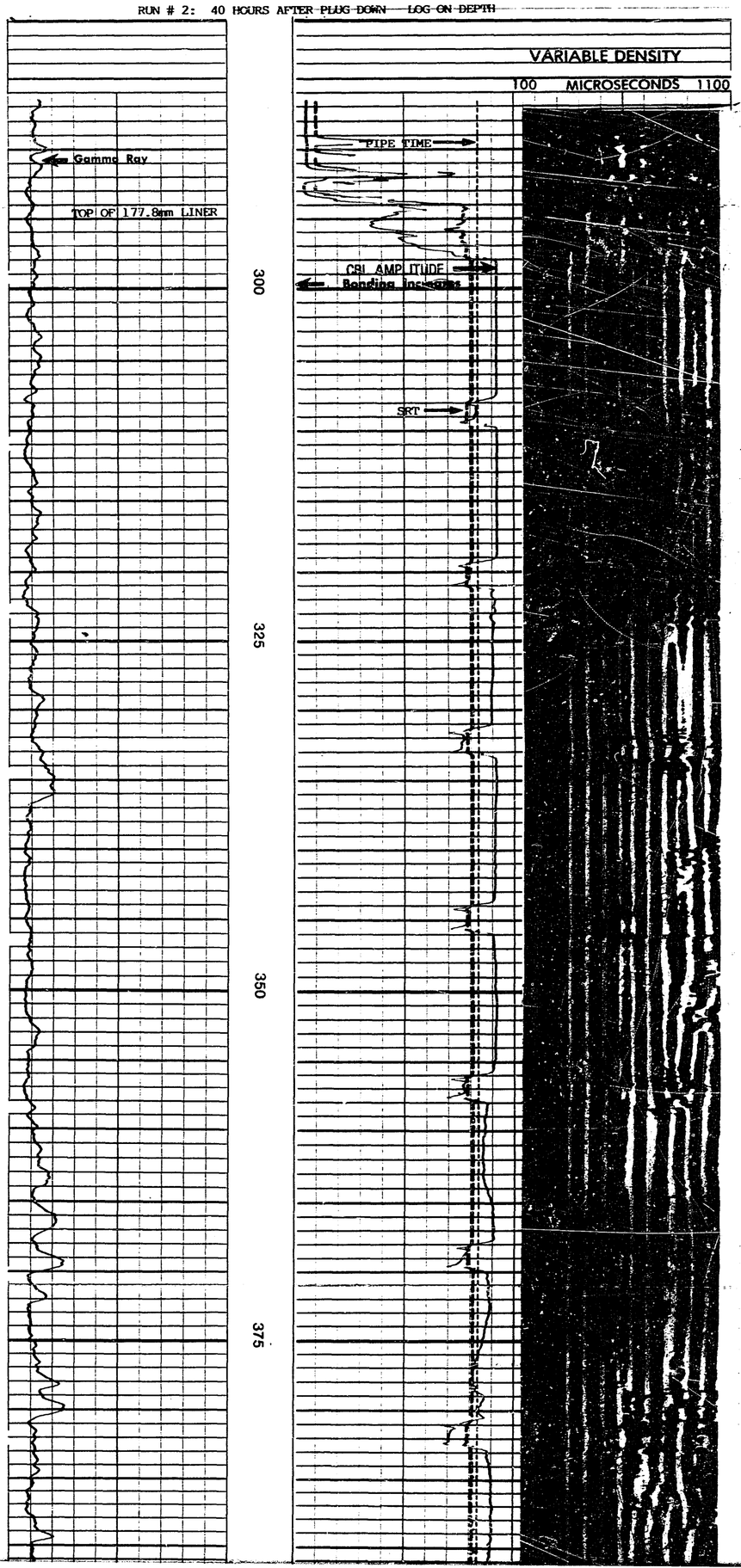


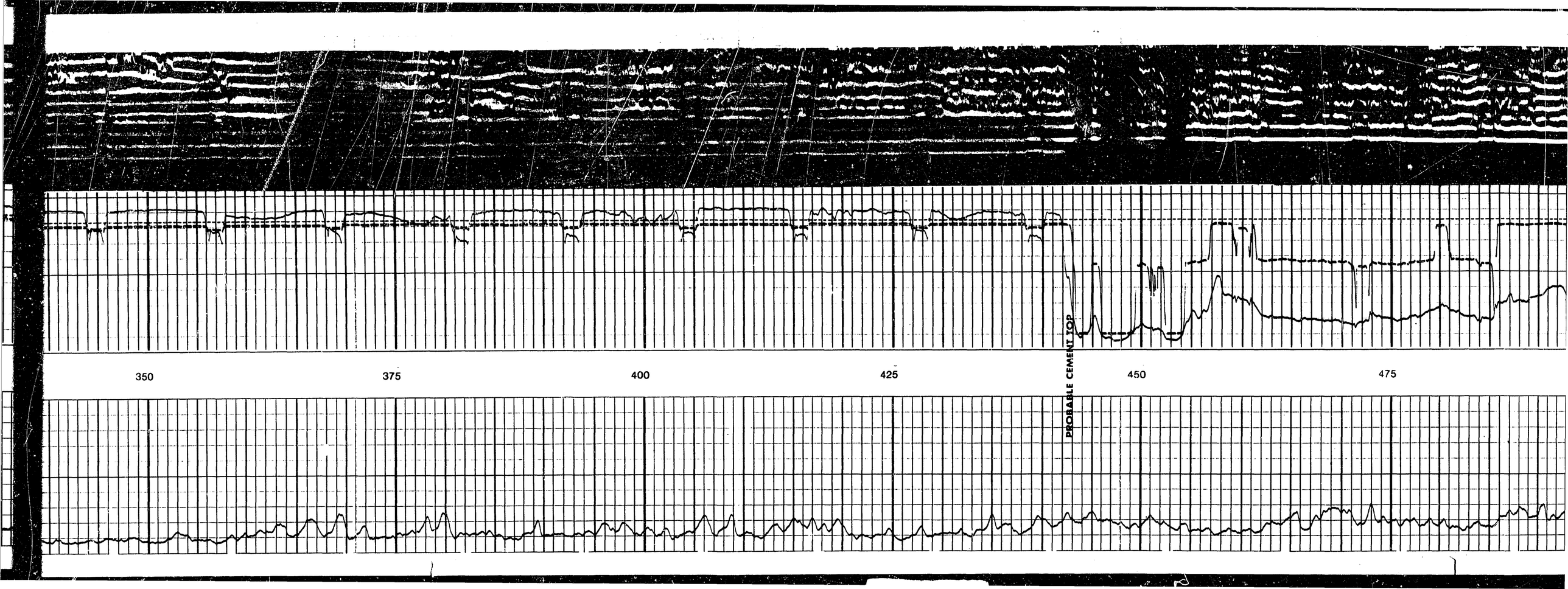

REPEAT SECTION






RUN # 2: 40 HOURS AFTER PLUG DOWN LOG ON DEPTH




350
375
400
425
PROBABLE CEMENT TOP
450
475

475

500

525

550

575

CBL AMPLITUDE →

Gr →

FR

PIPE TIME →

SRT →

FR FR

← Bonding Increases

100 MICROSECONDS 1100

VARIABLE DENSITY

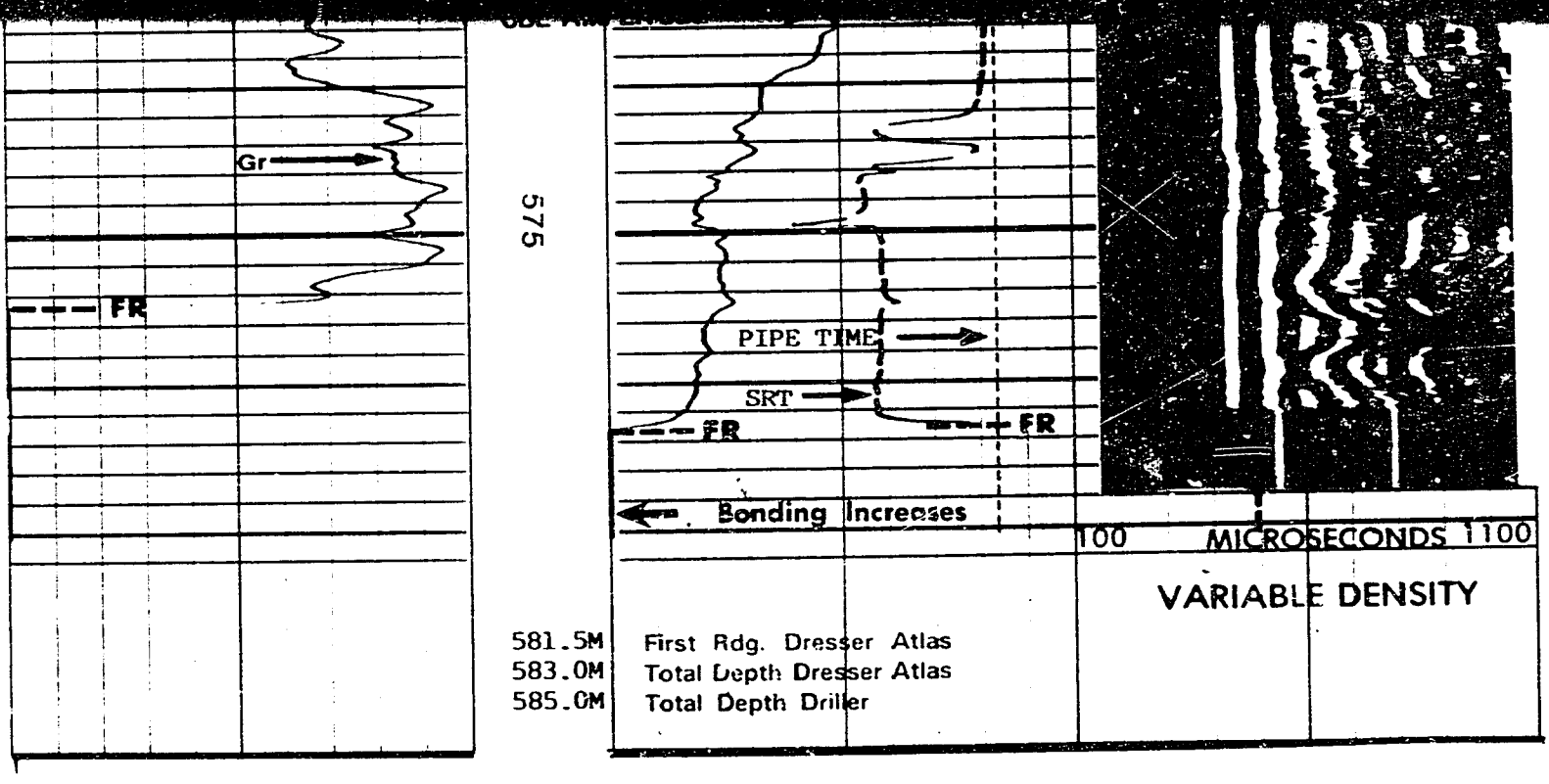
581.5M First Rdg. Dresser Atlas
583.0M Total Depth Dresser Atlas
585.0M Total Depth Driller

RUN # 3: 52 HOURS AFTER PLUG DOWN LOG 0.5M OFF DEPTH

← Gamma Ray

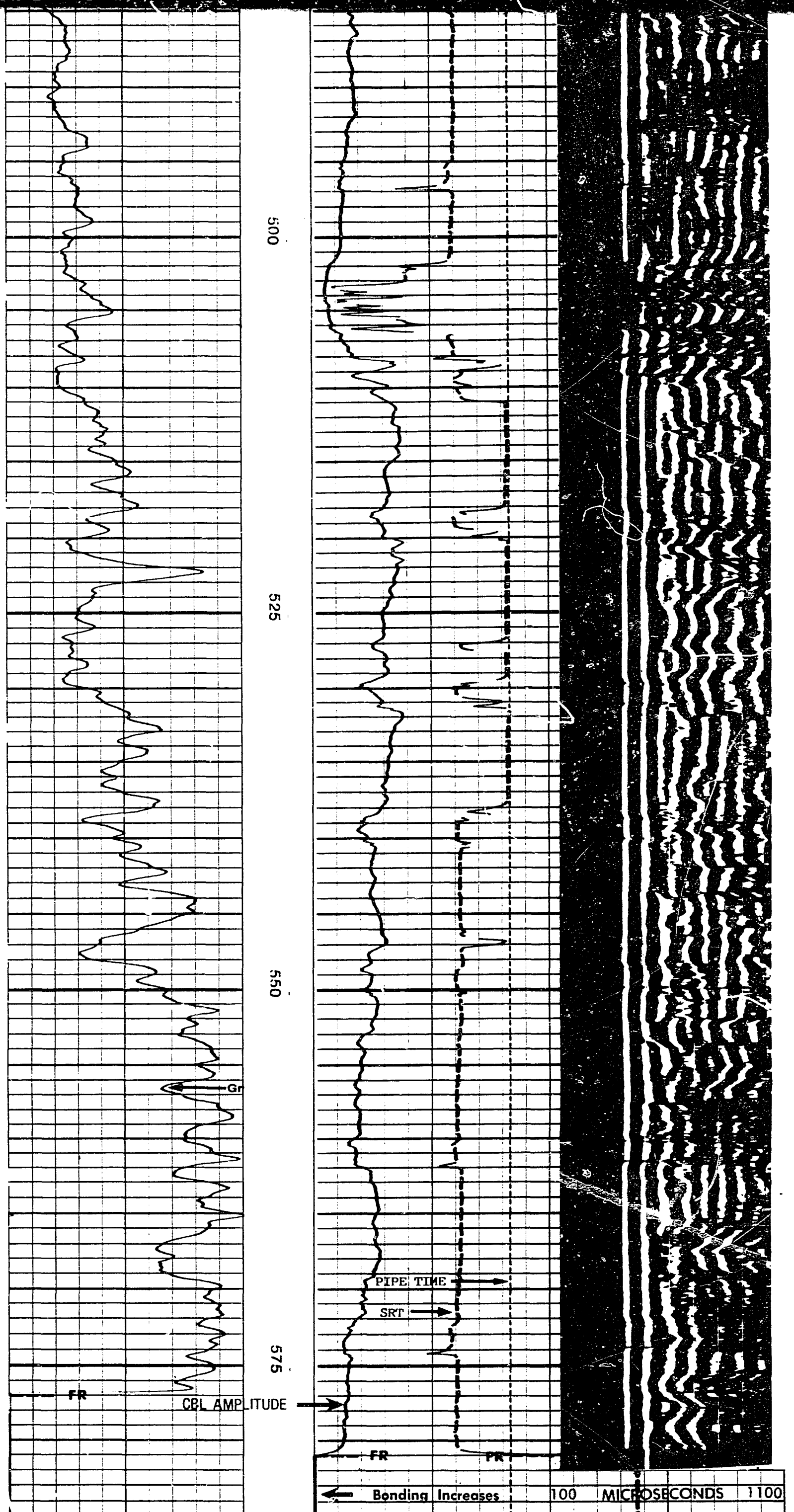
VARIABLE DENSITY

100 MICROSECONDS 1100




RUN # 3: 52 HOURS AFTER PLUG DOWN LOG 0.5M OFF DEPTH


375
400
425
PROBABLE CEMENT TOP
450
475
500
525




Casing Collars
Correct Depth

COLLAR LOG

BONDING QUALITY INCREASES

TRANSMISSION AMPLITUDE

MICROSECONDS

350 150

SINGLE RECEIVER
LINEAR TIME

100 MICROSECONDS 1100

VARIABLE DENSITY

GAMMA RAY

0 API UNITS 120

DEPTH

# CEMENT BOND LOG

| | | | | |
|---|---|---|---|---|
| COMPANY | FORWARD RESOURCES LIMITED | LOG | FR | 581.5 M. |
| | | LOG | TD | 583.0 M. |
| | | DRLR | TD | 585.0 M. |
| WELL | FORWARD ET AL IZOK M-20 | | | |
| FIELD | WILDCAT | PD | ELEV. | 295.0 M. |
| | | KB | ELEV. | 299.2 M. |
| PROVINCE | NORTH WEST TERRITORIES | GL | ELEV. | 295.0 M. |

Dresser Atlas

DRESSER

D251

| | | |
|---|---|---|
| Casing Collars → Correct Depth<br>COLLAR LOG | | TRANSMISSION AMPLITUDE<br>MICROSECONDS<br>350 — 150<br>SINGLE RECEIVER LINEAR TIME |
| | | 100 MICROSECONDS 1100<br>VARIABLE DENSITY |
| GAMMA RAY<br>0 API UNITS 120 | DEPTH | **CEMENT BOND LOG** |

| | | | |
|---|---|---|---|
| COMPANY | FORWARD RESOURCES LIMITED | LOG FR | 581.5 M. |
| | | LOG TD | 583.0 M. |
| | | DRLR TD | 585.0 M. |
| WELL | FORWARD ET AL IZOK M-20 | | |
| FIELD | WILDCAT | PD ELEV. | 295.0 M. |
| | | KB ELEV. | 299.2 M. |
| PROVINCE | NORTH WEST TERRITORIES | GL ELEV. | 295.0 M. |

Dresser Atlas | DRESSER

D251

# CALIBRATION

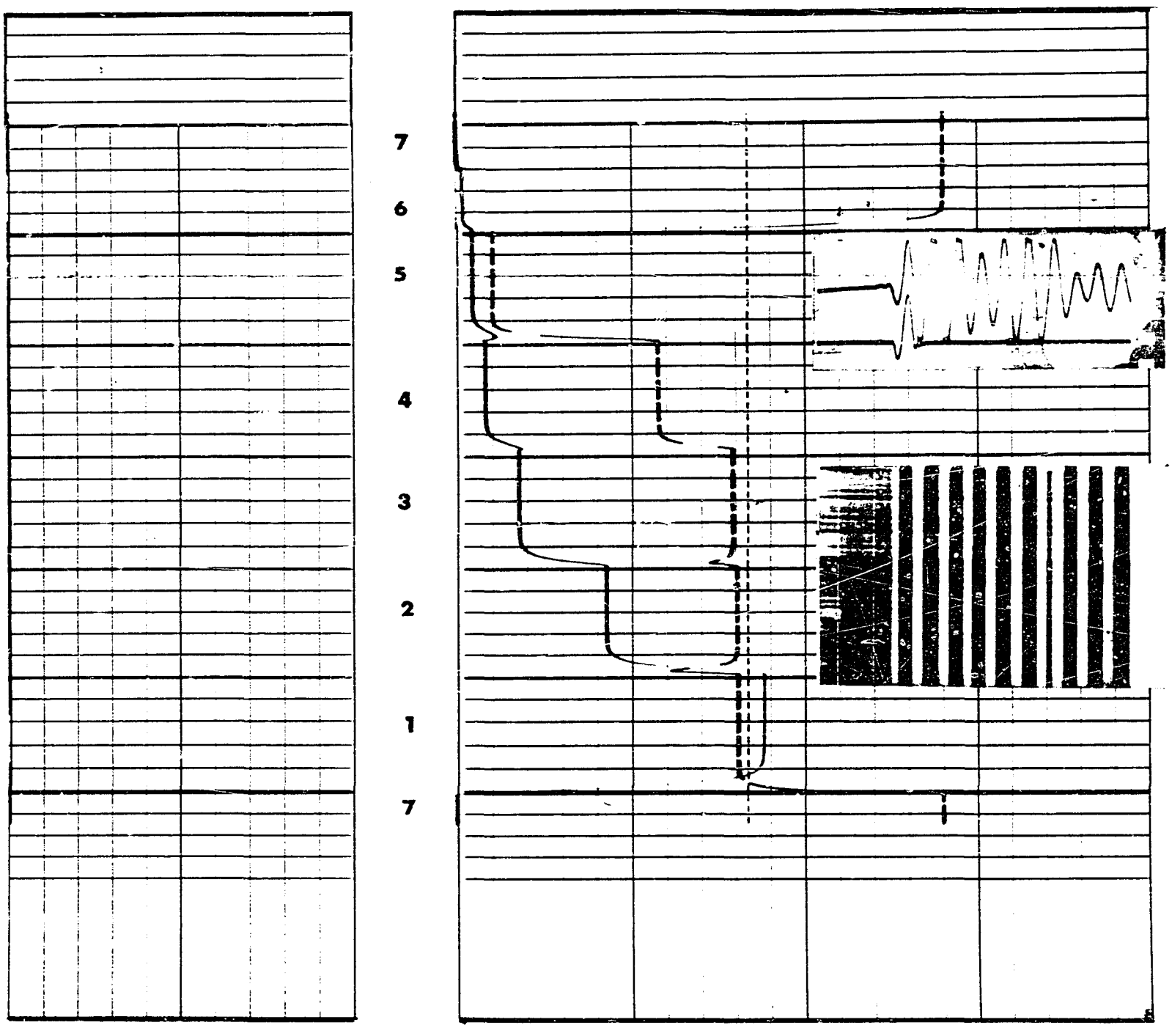
## ACOUSTIC CEMENT BOND LOG

PERCENTAGE OF FREE CASING SIGNAL:

1. 100%
2. 40%
3. 16%
4. 6.4%
5. 2.5%
6. 1%
7. MECHANICAL ZERO

CALIBRATION AT 327.0 M

D1145




# CALIBRATION

## GAMMA RAY

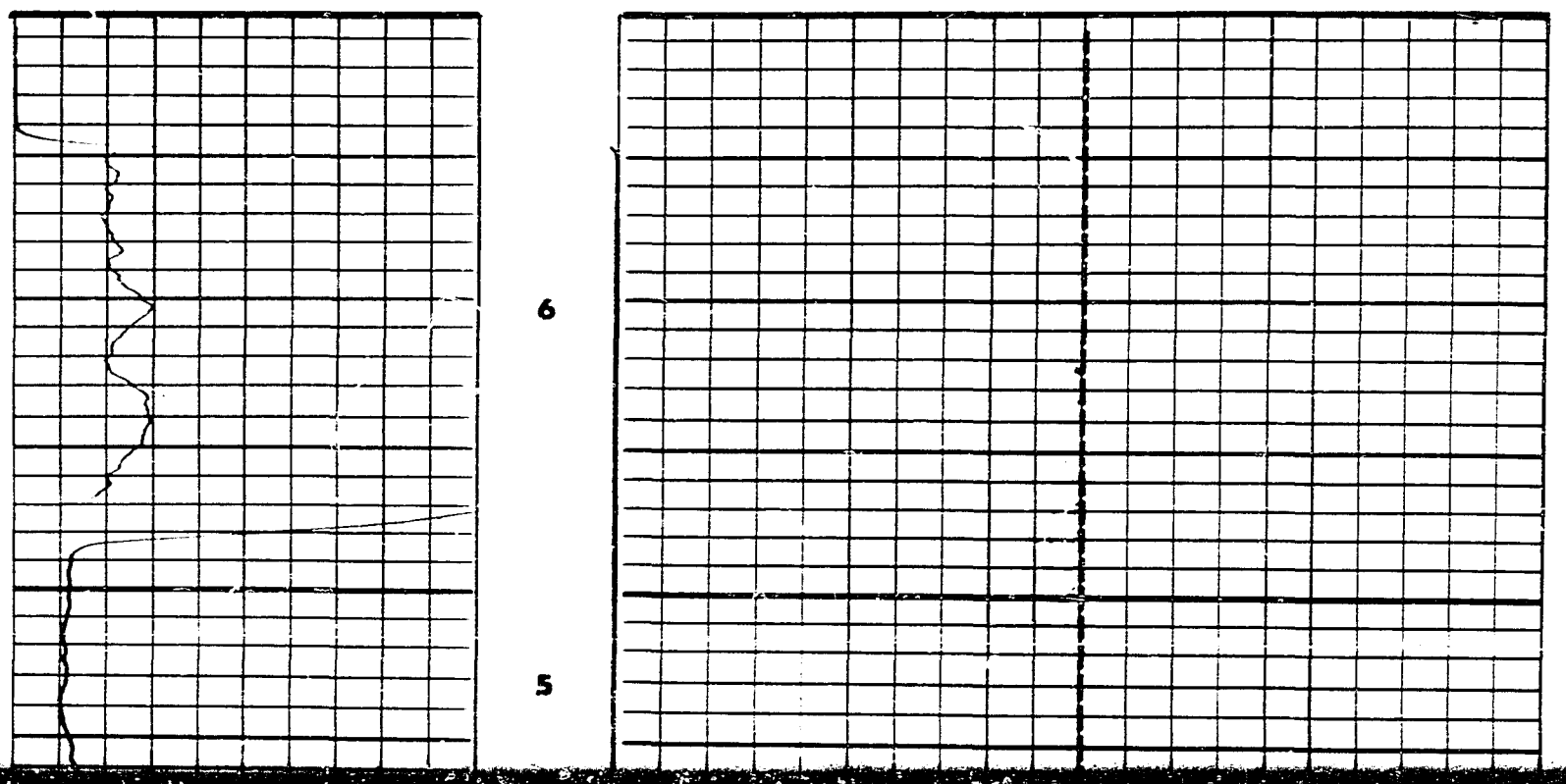
1. MECHANICAL ZERO
2. PANEL—LOW
3. PANEL—HIGH
4. COUNT RATE METER
5. BACKGROUND READING
6. GAMMA RAY—HIGH

G R LOG CALIBRATION

| | |
|---|---|
| A.P.I. UNITS OF CALIB. STD. | 185 |
| SENSITIVITY READING | 250 |
| MULTIPLIER | 0 |
| ZERO SUPPRESSION | 0 |
| TIME CONSTANT | 2 |
| MEASURED CHART DIVISIONS | 11.0 |

D1143

CALIBRATION BEFORE SURVEY

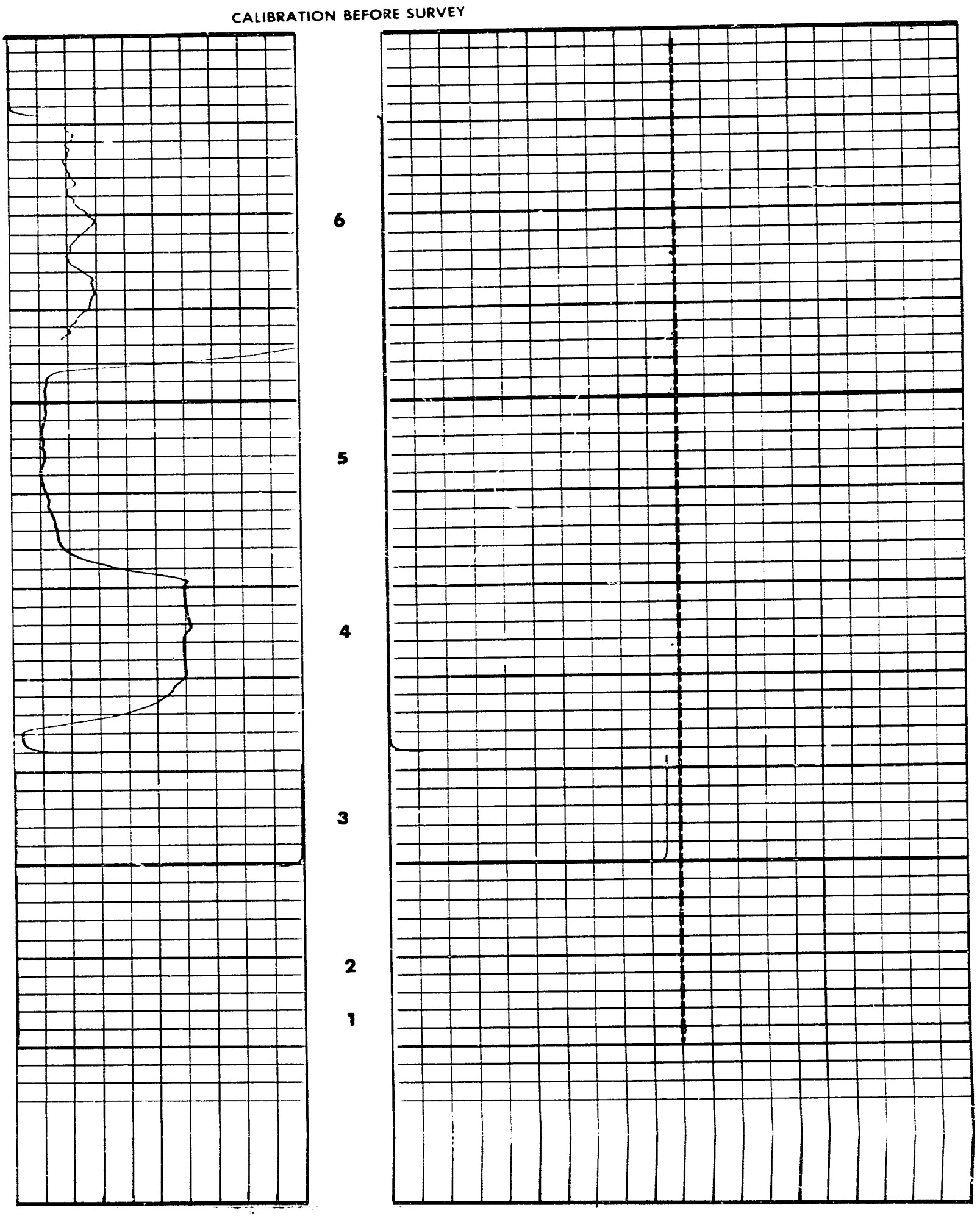


## G R LOG CALIBRATION

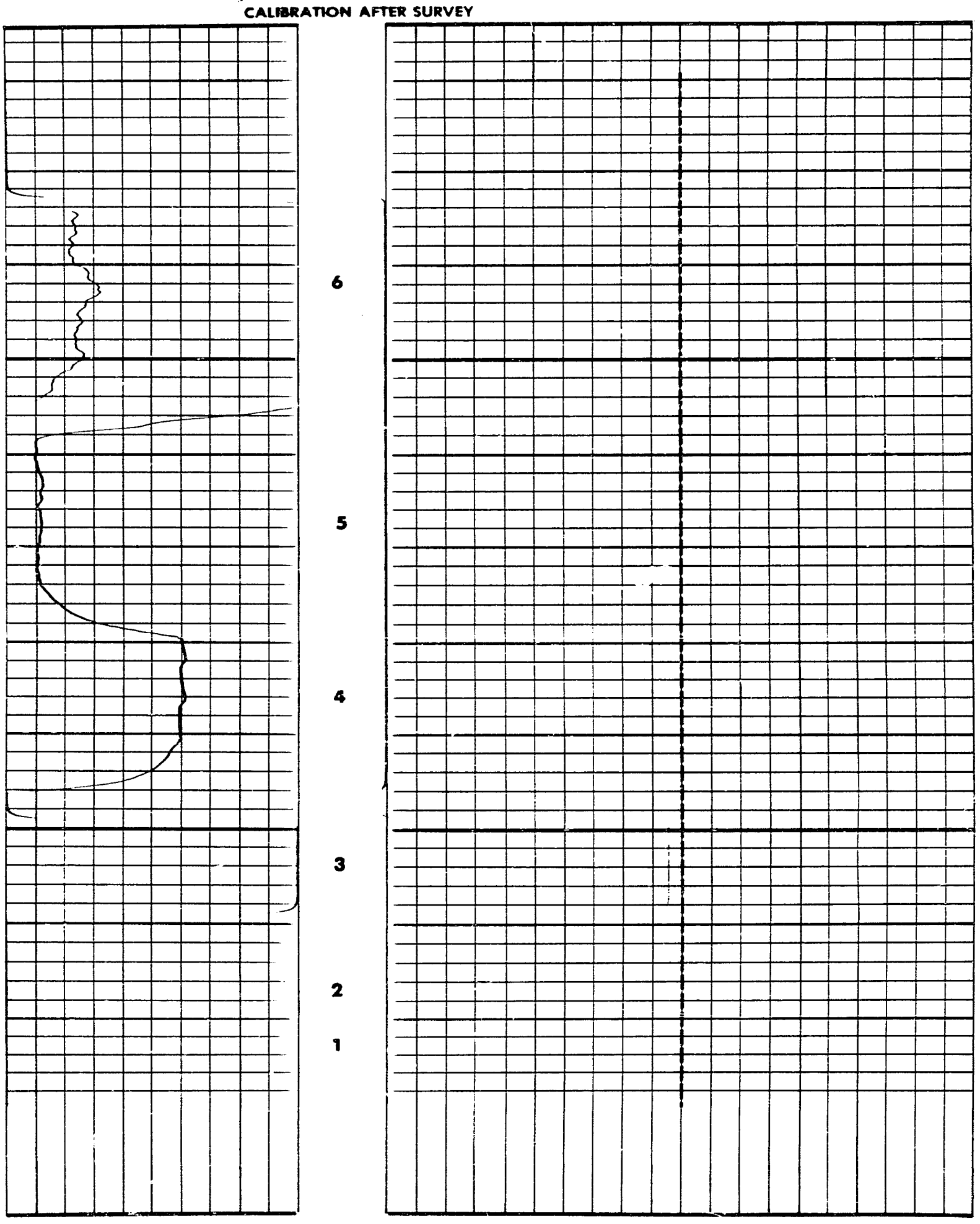
1. MECHANICAL ZERO
2. PANEL—LOW
3. PANEL—HIGH
4. COUNT RATE METER
5. BACKGROUND READING
6. GAMMA RAY—HIGH

| | |
|---|---|
| A.P.I. UNITS OF CALIB. STD. | 185 |
| SENSITIVITY READING | 250 |
| MULTIPLIER | 0 |
| ZERO SUPPRESSION | 0 |
| TIME CONSTANT | 2 |
| MEASURED CHART DIVISIONS | 11.0 |

CALIBRATION BEFORE SURVEY




CALIBRATION AFTER SURVEY



Dresser Atlas

DRESSER

COMPENSATED

COMPENSATED

# Densilog Neutron

FILE NO.

COMPANY FORWARD RESOURCES LIMITED

WELL FORWARD ET AL IZOK M-20

FIELD WILDCAT

PROVINCE N.W.T.

LOCATION:

UNIT M SECTION 20

GRID 67° 20' 123° 45'

LSD SEC TWP RGE

Other Services
DLL
BHC-AL
CORES

Elevations
KB 299.2
DF
GL 295.0

| | | | |
|---|---|---|---|
| Permanent Datum | GROUND LEVEL | Elev 295.0 | |
| Log Measured from | KELLY BUSHING | 4.2 M Above Permanent Datum | |
| Drilling Measured from | KELLY BUSHING | | |
| Date | 31 MARCH 83 | | |
| Run No | THREE | | |
| Depth—Driller | 900.0 | | |
| Depth—Logger | 900.0 | | |
| Bottom Logged Interval | 899.3 | | |
| Top Logged Interval | 248.0 | | |
| Casing—Driller | 178mm @ 589.0 | @ | @ |
| Casing—Logger | 588.0 | @ | @ |
| Bit Size | 155mm | | |
| Type Fluid in Hole | GEL CHEM | | |
| Density and Viscosity | N/A 65 | | |
| pH and Fluid Loss | 9.0 8.0 cm³ | cm³ | cm³ |
| Source of Sample | FLOWLINE | | |
| Rm @ Meas Temp | .04 @ 16 °C | @ °C | @ °C |
| Rmf @ Meas Temp | .039 @ 16 °C | @ °C | @ °C |
| Rmc @ Meas Temp | .045 @ 16 °C | @ °C | @ °C |
| Source of Rmf and Rmc | MEAS MEAS | | |
| Rm @ BHT | .037 @ 19 °C | @ °C | @ °C |
| Time Since Circ | 9 HOURS | | |
| Max. Rec. Temp. Deg.C | 19 °C | °C | °C |
| Equip. No. and Location | 1407 EDM | | |
| Recorded By | ADAMOWSKI | | |
| Witnessed By | ALDRIDGE | | |

CANADA OIL AND GAS LANDS ADMINISTRATION DU PÉTROLE ET DU GAZ DES TERRES DU CANADA

JUN 7 1983

ENGINEERING AND CONTROL BRANCH TECHNIQUE ET CONTRÔLE

Form No. D104

FOLD HERE

Remarks

LOG TAPED
605 TO 248 CN ø IS CORRECTED FOR CASING.

## Equipment Data

| | Gamma Ray | | Compensated Densilog | | | Compensated Neutron | |
|---|---|---|---|---|---|---|---|
| Run No | THREE | | Run No | THREE | | THREE | |
| Tool Model No | 1308 | | Tool Model No. | 2212 | | 2420 | |
| Serial No | 44047 | | Serial No. | 47346 | | 56088 | |
| Diam | 86mm | | Diam. | 124mm | | 96mm | |
| Detect Model No | D7G3 | | Computer Model No. | 3457 | | 3457 | |
| Type | SCINT. | | Serial No. | 37071 | | 37071 | |
| Length | 150mm | | Source Model No | S3T20 | | S17S20 | |
| Dist to Source | 1.8 M | | Serial No | 592 | | 48490 | |
| General | | | | | | | |
| Hoist Truck No | | | | | | | |
| Auxiliary Equipment | | | | | | | |

## Logging Data

General / Compensated Densilog / Gamma Ray

| Run No | Depths From | Depths To | Speed M/Min. | T C Sec | Density Scale | Correction Scale | Porosity Scale Data | T.C Sec | Sens Settings | Zero Div L or R | API G R Units/Div |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 900.0 | 588.0 | REC. | CCTC | 2000,3000 | -500,500 | -15,45% SS | 2 | 354 | 0 | 15 |

General / Compensated Neutron

| Run No | Depths From | Depths To | Speed M/Min. | T C SS | T C LS | Sens. SS | Sens. LS | Porosity Zero | Porosity Units/Div. | Porosity Scale |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 900.0 | 588.0 | REC. | 3 | 3 | 112 | 123 | .R15 | 3% | SS |
| 3 | 605.0 | 248.0 | REC. | 3 | 3 | 112 | 123 | R15 | 3% | SS |

| GAMMA RAY & CALIPER | DEPTH | BULK DENSITY kg/m³ |
|---|---|---|
| 0 API UNITS 150 | | -500 CORRECTION 500 |
| HOLE SIZE - mm 125 375 | | 2,000 2,500 3,000 |

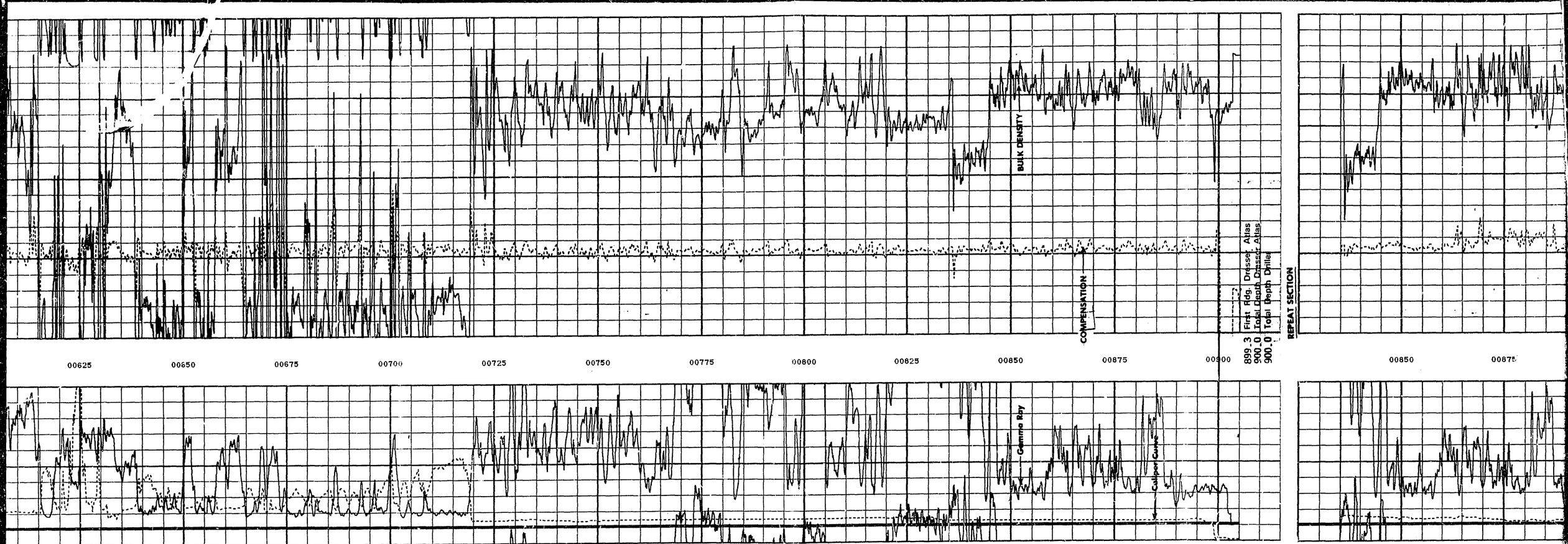
Casing

00600

00625

00650

00675


BULK DENSITY
COMPENSATION
First Rdg. Drasser Atlas
Total Depth Drasser Atlas
Total Depth Driller
899.3
900.0
900.0
REPEAT SECTION
00625
00650
00675
00700
00725
00750
00775
00800
00825
00850
00875
00900
00850
00875
Gamma Ray
Caliper Curve

899.3 First Rdg. Dresser Atlas
900.0 Total Depth Dresser Atlas
900.0 Total Depth Driller

**REPEAT SECTION**

00850
00875
00900

125 — HOLE SIZE - mm — 375

0 — API UNITS — 150

**GAMMA RAY & CALIPER**

DEPTH

2,000 — 2,500 — 3,000

-500 — CORRECTION — 500

**BULK DENSITY kg/m³**

**GAMMA RAY & CALIPER**

DEPTH

SANDSTONE **POROSITY %**

API UNITS
0 — 150

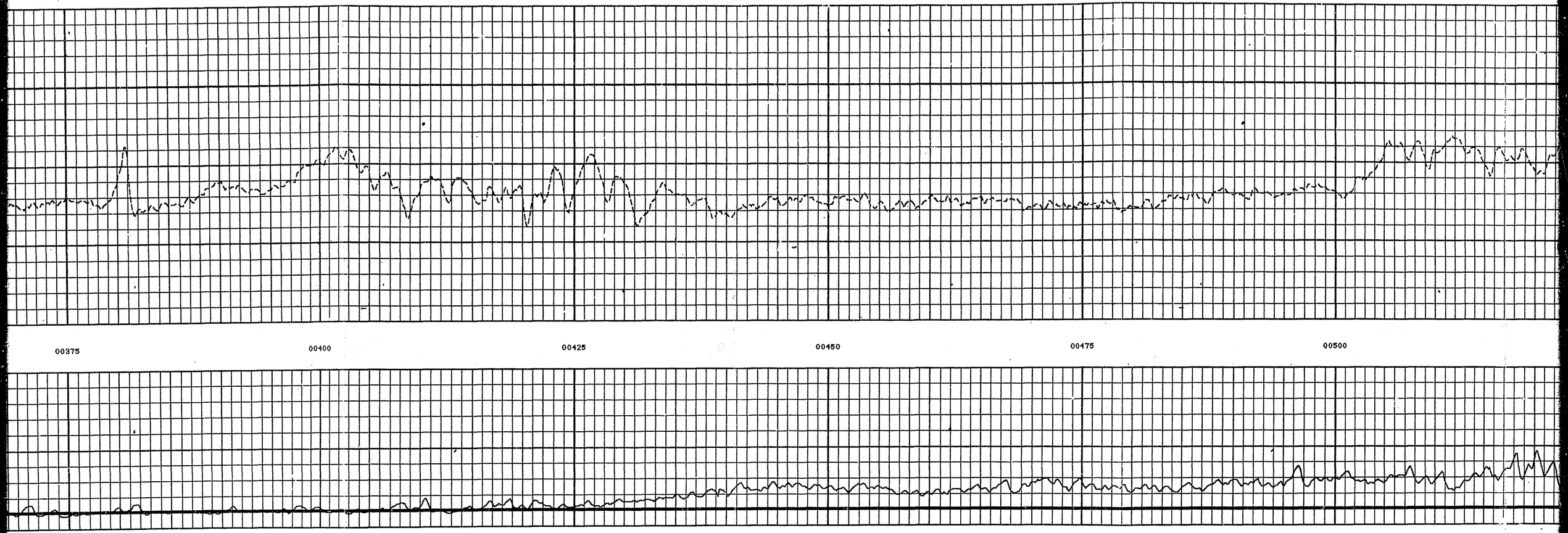
HOLE SIZE - mm
125 — 375

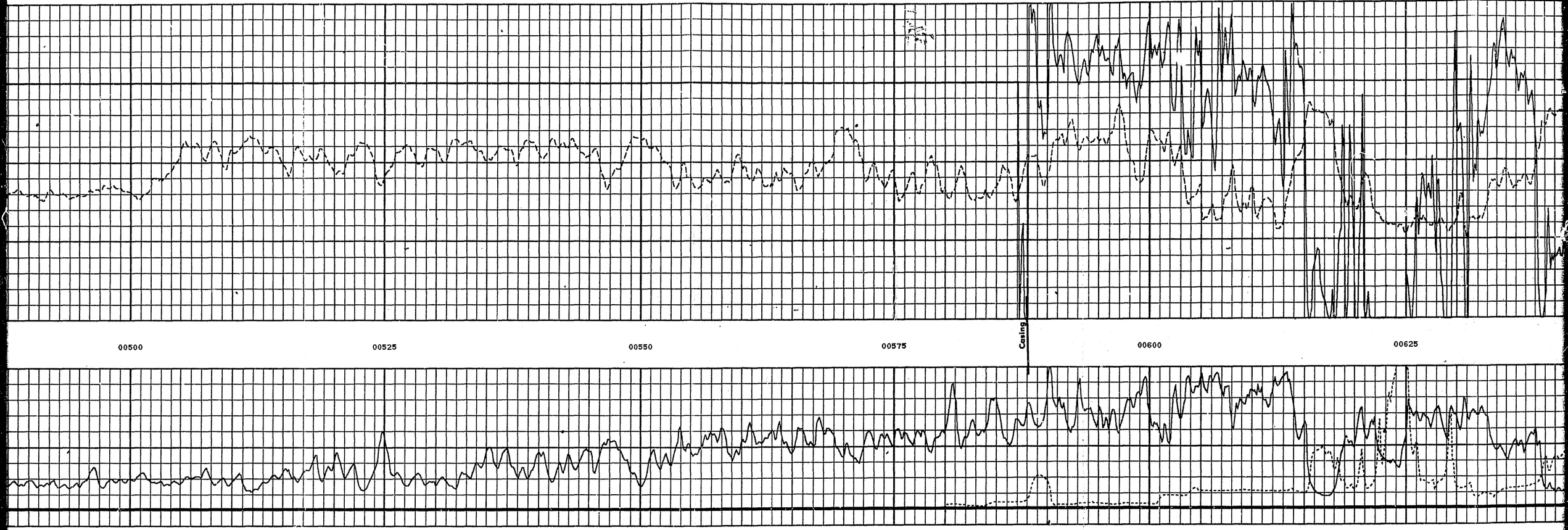
COMPENSATED DENSITY POROSITY
45 — 15 — -15

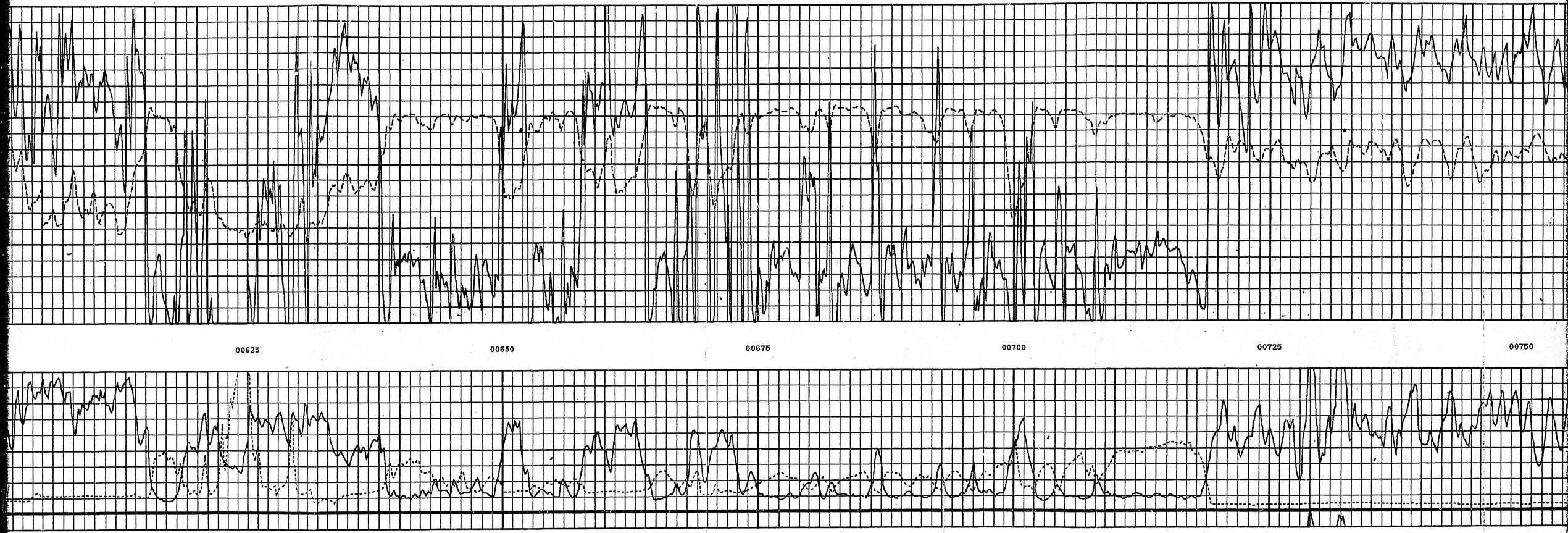
COMPENSATED NEUTRON POROSITY
45 — 15 — -15

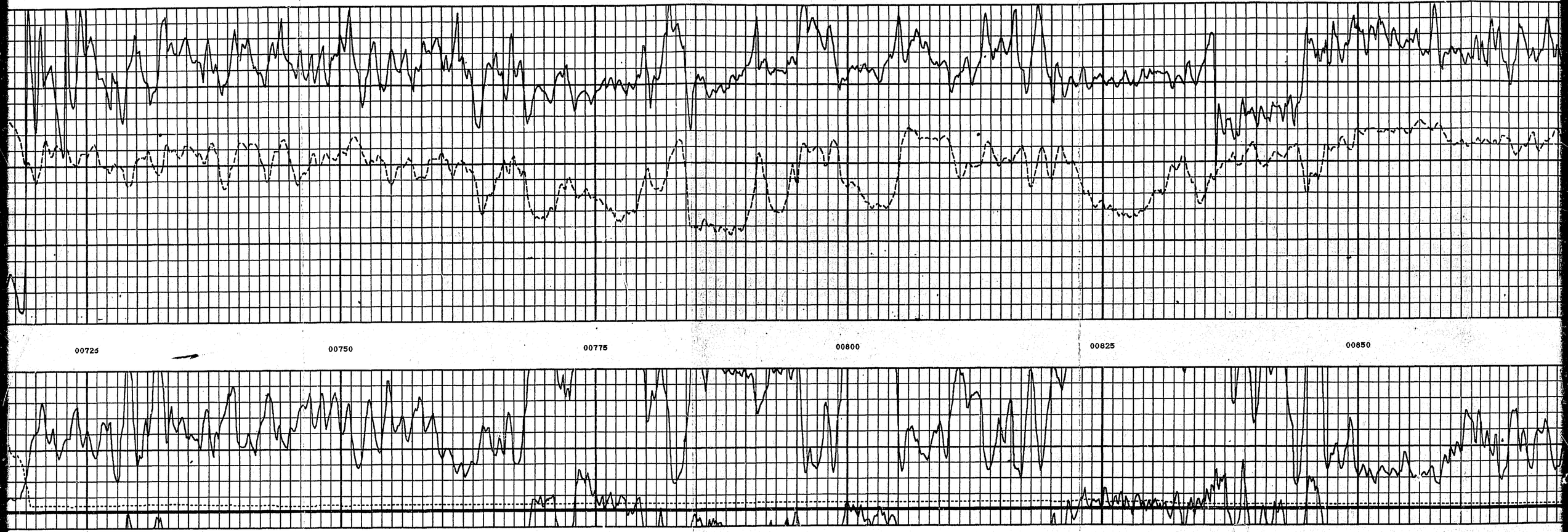
00250
00275

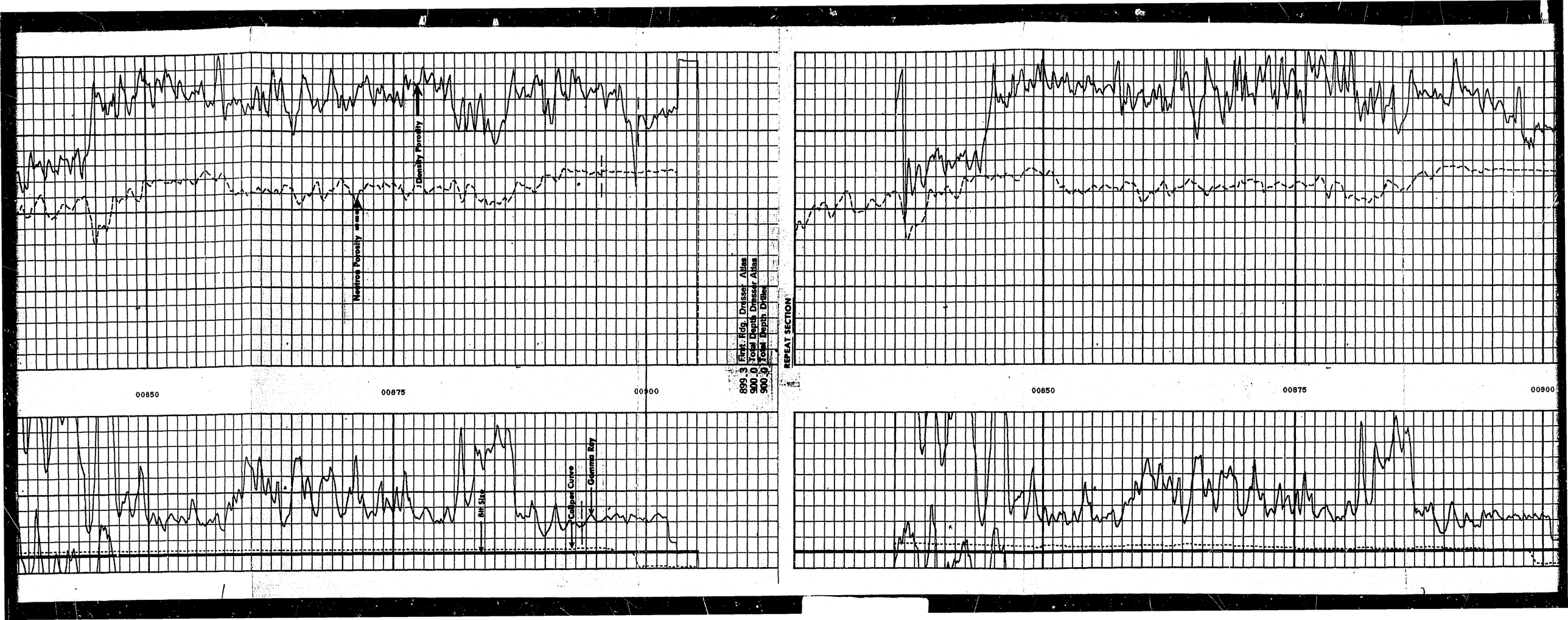

00275
00300
00325
00350
00375
00400


00375
00400
00425
00450
00475
00500


00500
00525
00550
00575
Casing
00600
00625


00625
00650
00675
00700
00725
00750


00725
00750
00775
00800
00825
00850


Neutron Porosity
Density Porosity
00850
00875
00900
899.3 Frst. Rdg. Dresser Atlas
900.0 Total Depth Dresser Atlas
900.0 Total Depth Driller
REPEAT SECTION
00850
00875
00900
Bit Size
Caliper Curve
Gamma Ray

899.3 First Rdg. Dresser Atlas
900.0 Total Depth Dresser Atlas
900.0 Total Depth Driller

REPEAT SECTION

00850

00875

00900

| | | |
|---|---|---|
| 125 HOLE SIZE - mm 375 | | 45 COMPENSATED NEUTRON POROSITY -15 |
| 0 API UNITS 150 | | 45 COMPENSATED DENSITY POROSITY -15 |
| **GAMMA RAY & CALIPER** | DEPTH | SANDSTONE **POROSITY %** |

COMPANY FORWARD RESOURCES LIMITED

WELL FORWARD ET AL IZOK M-20

FIELD WILDCAT

PROVINCE N.W.T.

LOG FR 899.3 M.
LOG TD 900.0 M.
DRLR TD 900.0 M.
RM = .037 @ 19 C° BHT
RMF = .039 @ 16 C°
RMC = .045 @ 16 C°
PD ELEV. 295.0 M.
KB ELEV. 299.2 M.
GL ELEV. 295.0 M.

Dresser Atlas | DRESSER

Form No. D105

Dresser Atlas

DRESSER

# Dual Induction Focused Log

FILE NO.

COMPANY FORWARD RESOURCES LIMITED

WELL FORWARD ET AL IZOK M-20

FIELD WILDCAT

PROVINCE N.W.T.

LOCATION:
UNIT M SECTION 20
GRID 67° 20' 123° 45'
LSD ____ SEC ____ TWP ____ RGE ____

Other Services
BHC-AL

Permanent Datum GROUND LEVEL Elev. 295 M
Log Measured from KELLY BUSHING 4.2 M. Above Permanent Datum
Drilling Measured from KELLY BUSHING

Elevations:
KB 299.2 M
DF ____
GL 295 M

| | | | | |
|---|---|---|---|---|
| Date | 7 MARCH 83 | | | |
| Run No. | ONE | | | |
| Depth—Driller | 460 M | | | |
| Depth—Logger | 456 M | | | |
| Bottom Logged Interval | 455.3 M | | | |
| Top Logged Interval | 33 M | | | |
| Casing—Driller | 35 M | | | |
| Casing—Logger | 33 M | | | |
| Bit Size | 311mm | | | |
| Type Fluid in Hole | GEL CHEM | | | |
| Density and Viscosity | 1030 165 | | | |
| pH and Fluid Loss | 85 N/Acm³ | cm³ | cm³ | cm³ |
| Source of Sample | FLOWLINE | | | |
| Rm @ Meas. Temp. | N/A @ - °C | @ °C | @ °C | @ °C |
| Rmf @ Meas. Temp. | N/A @ - °C | @ °C | @ °C | @ °C |
| Rmc @ Meas. Temp. | N/A @ - °C | @ °C | @ °C | @ °C |
| Source of Rmf and Rmc | - - | | | |
| Rm @ BHT | N/A @ - °C | @ °C | @ °C | @ °C |
| Time Since Circ. | 8 HOURS | | | |
| Max. Rec. Temp. Deg. C. | N/A °C | °C | °C | °C |
| Equip. No. and Location | 1407 EDM | | | |
| Recorded By | D. MURRAY | | | |
| Witnessed By | A. WILLIAMS | | | |

CANADA OIL AND GAS LANDS ADMINISTRATION
ENGINEERING AND CONSTRUCTION BRANCH
TECHNIQUE ET DU CONTROLE

FOLD HERE

REMARKS

Scale Changes

| Changes in Mud Type or Additional Samples | Type Log | Depth | Scale Up Hole | Scale Down Hole |
|---|---|---|---|---|
| | | | | |

Equipment Data

| Run No. | Tool Type | Pad Type | Tool Position | Other |
|---|---|---|---|---|
| ONE | 1503 #41962 | - | 38mm S.O. | - |

Changes in Mud Type or Additional Samples

| Date | Sample No. | Depth-Driller | Type Fluid in Hole | Dens. | Visc. | pH | Fluid Loss | Source of Sample | Rm @ Meas. Temp. | Rmf @ Meas. Temp. | Rmc @ Meas. Temp. | Source Rmf Rmc | Rm @ BHT | Rmf @ BHT | Rmc @ BHT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | cm³ | | cm³ | | @ °C | @ °C | @ °C | | @ °C | @ °C | @ °C |
| | | | | | | | | | | | | | | | |

D550

CONDUCTIVITY mS/m

INDUCTION CONDUCTIVITY 1m SPACING
0
500
1000

RESISTIVITY Ohm metres

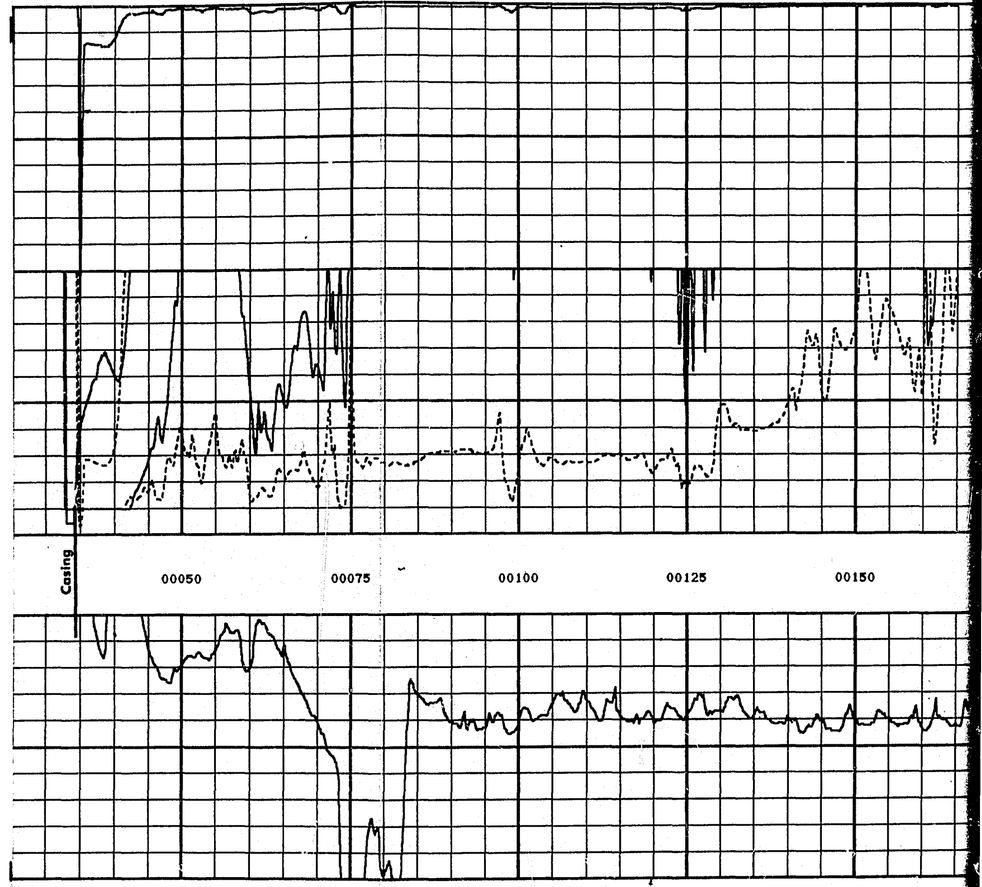
SHALLOW FOCUSED LOG
50
500
0

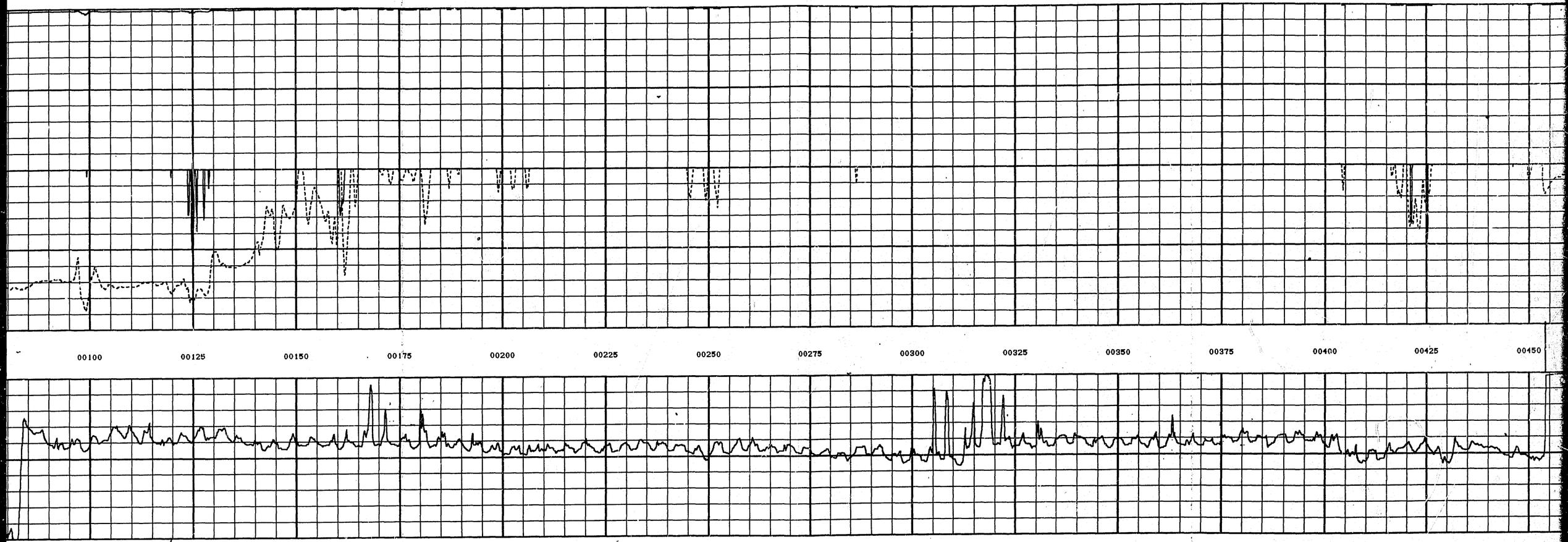
INDUCTION RESISTIVITY 1m SPACING
50
500
0

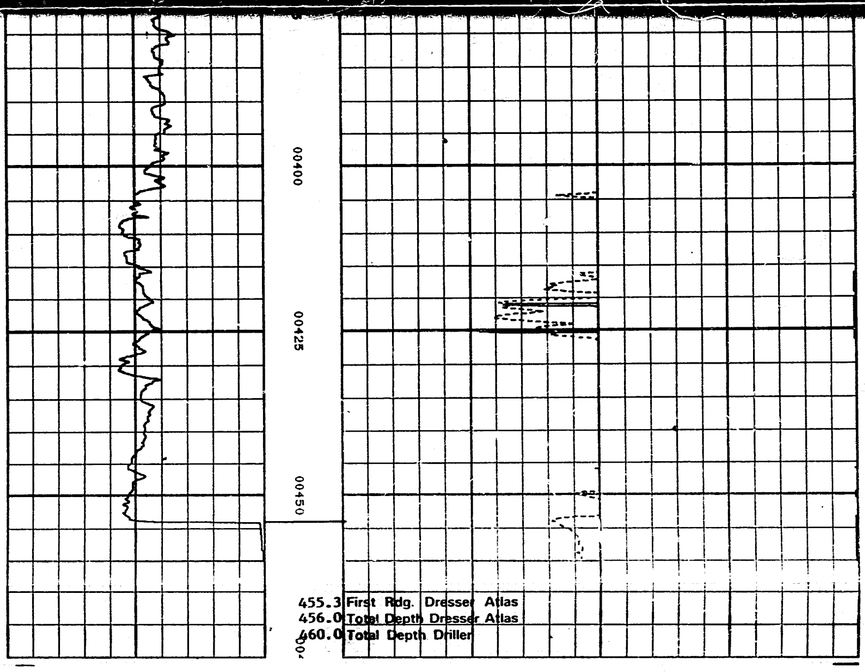
DEPTH

SPONTANEOUS POTENTIAL Millivolts

+ 1/20 −

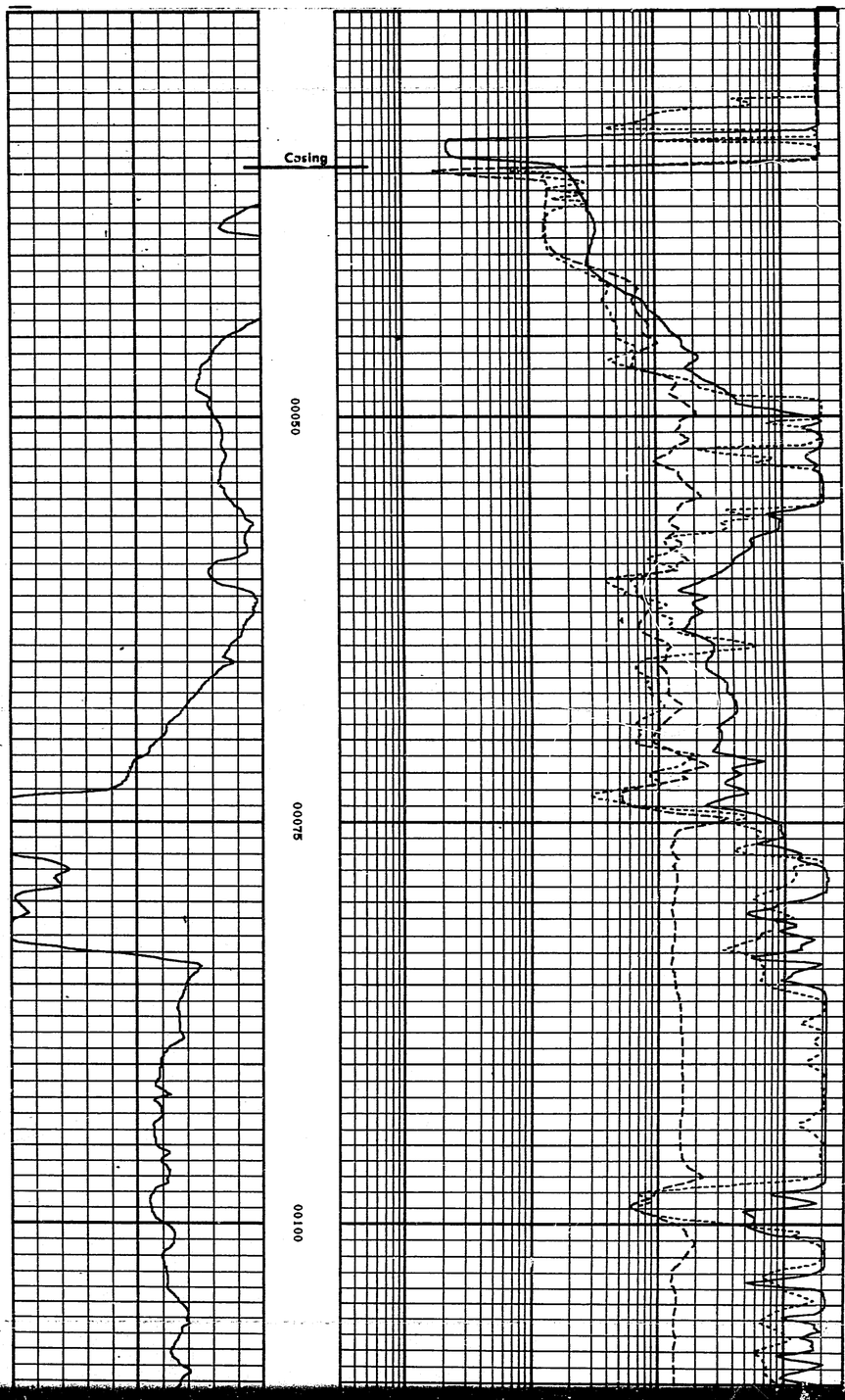


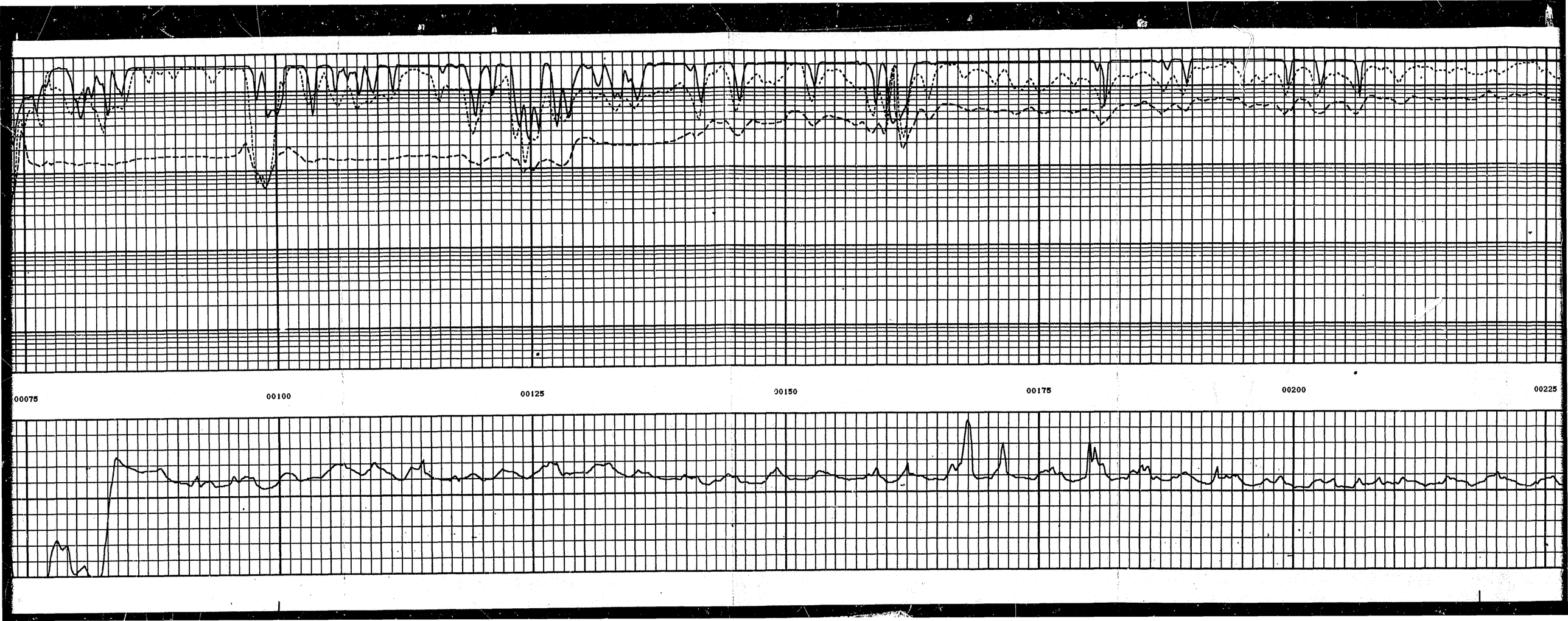

00100
00125
00150
00175
00200
00225
00250
00275
00300
00325
00350
00375
00400
00425
00450

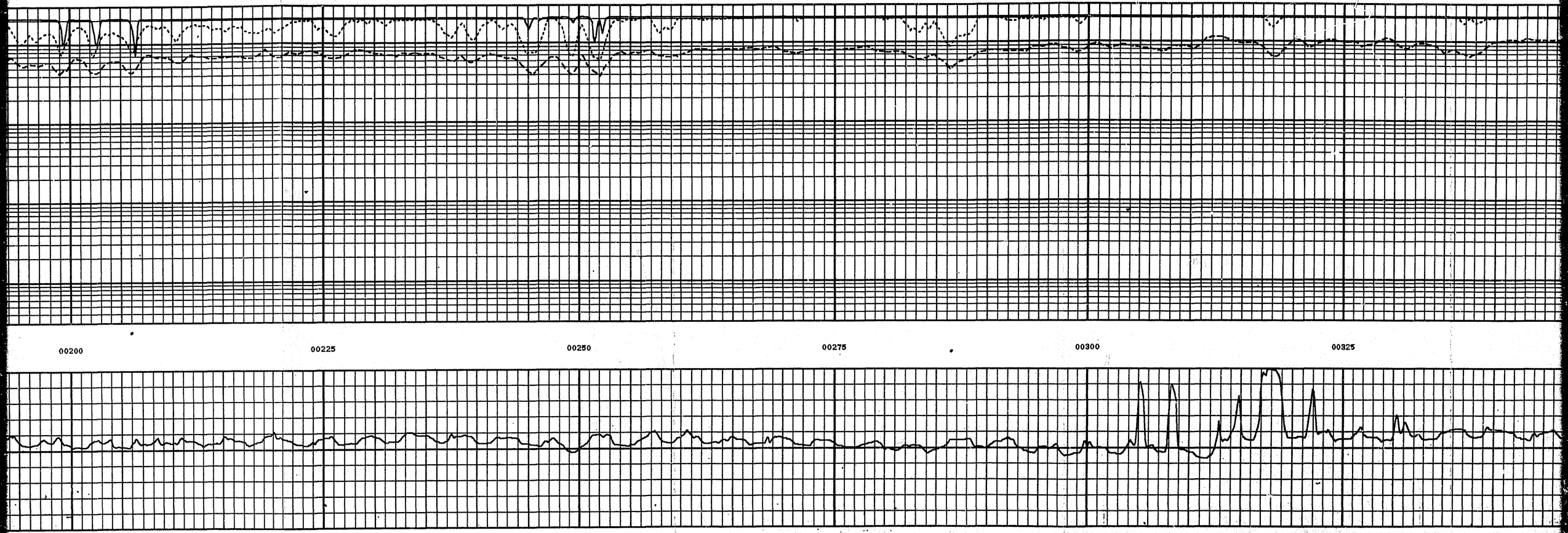


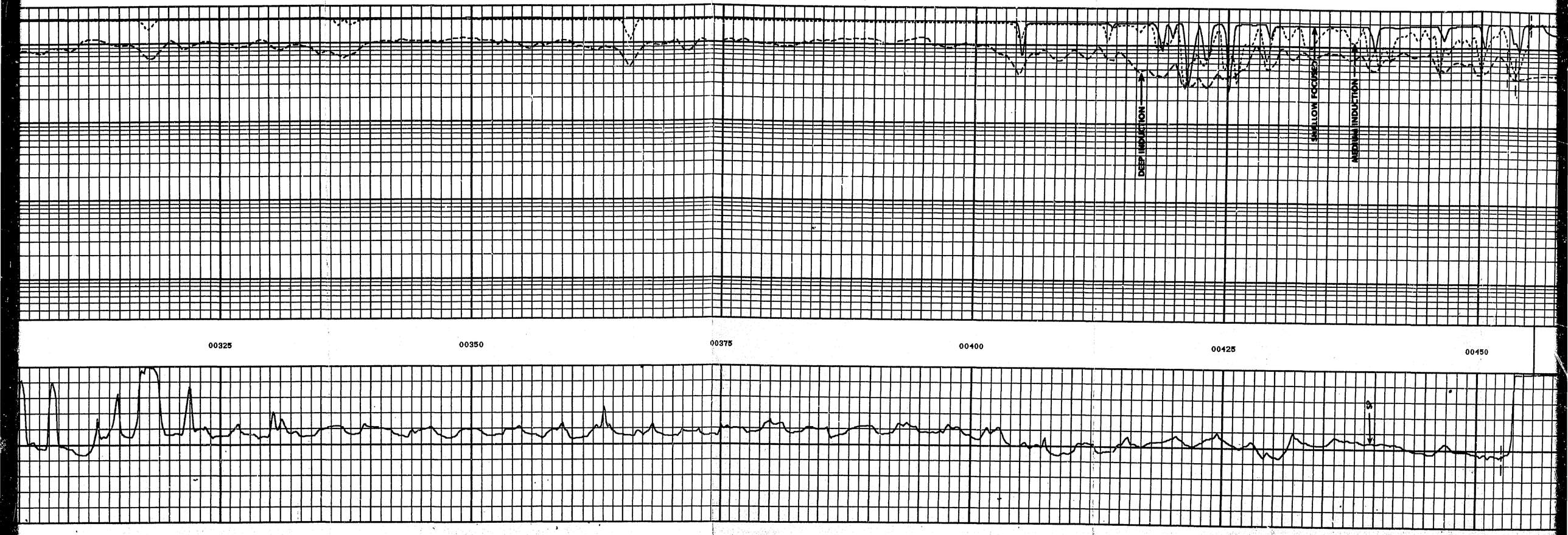

455.3 First Rdg. Dresser Atlas
456.0 Total Depth Dresser Atlas
460.0 Total Depth Driller

| SPONTANEOUS POTENTIAL<br>Millivolts | DEPTH | RESISTIVITY<br>Ohm metres |
|---|---|---|
| – →\|20\|← + | | SHALLOW FOCUSED LOG<br>.3 1.0 10 100 1000 |
| | | MEDIUM INDUCTION LOG<br>.3 1.0 10 100 1000 |
| | | DEEP INDUCTION LOG<br>.3 1.0 10 100 1000 |




00075
00100
00125
00150
00175
00200
00225


00200
00225
00250
00275
00300
00325


DEEP INDUCTION
SHALLOW FOCUSED
MEDIUM INDUCTION
00325
00350
00375
00400
00425
00450

SHALLOW FOCUSED

MEDIUM INDUCTION

455.3 First Rig Dresser Atlas
456.0 Total Depth Dresser Atlas
460.0 Total Depth Driller

REPEAT SECTION

00425 00450 00400 00425 00450

DEEP INDUCTION LOG

.3 1.0 10 100 1000

MEDIUM INDUCTION LOG

.3 1.0 10 100 1000

SP

REPEAT SECTION

-20 +

REPEAT SECTION

00400

00425

00450

REPEAT SECTION

| SPONTANEOUS POTENTIAL<br>Millivolts | DEPTH | RESISTIVITY<br>Ohm metres |
|---|---|---|
| – 20 + | | .3 1.0 10 100 1000<br>DEEP INDUCTION LOG |
| | | .3 1.0 10 100 1000<br>MEDIUM INDUCTION LOG |
| | | .3 1.0 10 100 1000<br>SHALLOW FOCUSED LOG |

COMPANY FORWARD RESOURCES LIMITED

WELL FORWARD ET AL IZOK M-20

FIELD WILDCAT

PROVINCE N.W.T.

LOG FR 455.3 M.
LOG TD 456.0 M.
DRLR TD 460 M.
RM = N/A@ – C° BHT
RMF = N/A@ – C°
RMC = N/A@ – C°
PD ELEV. 295 M.
KB ELEV. 299.2 M.
GL ELEV. 295 M.

Dresser Atlas DRESSER

D1127

Dresser Atlas

DRESSER

# Dual Laterolog

FILE NO.

COMPANY FORWARD RESOURCES LIMITED

WELL FORWARD ET AL IZOK M-20

FIELD WILDCAT

PROV. N.W.T.

LOCATION: UNIT M SECTION 20

GRID 67° 20' 123° 45'

LSD ____ SEC ____ TWP ____ RGE ____

Other Services
BHC-AL
CN-CDL
CORES

Permanent Datum GROUND LEVEL Elev. 295.0
Log Measured from KELLY BUSHING 4.2 M. Above Permanent Datum
Drilling Measured from KELLY BUSHING

Elevations:
KB 299.2
DF
GL 295.0

| | | | | | |
|---|---|---|---|---|---|
| Date | 31 MARCH 83 | | | | |
| Run No. | THREE | | | | |
| Depth—Driller | 900.0 | | | | |
| Depth—Logger | 900.0 | | | | |
| Bottom Logged Interval | 899.4 | | | | |
| Top Logged Interval | 588.0 | | | | |
| Casing—Driller | 178mm @ 589.0 | @ | @ | @ | |
| Casing—Logger | 588.0 | | | | |
| Bit Size | 155mm | | | | |
| Type Fluid in Hole | GEL CHEM | | | | |
| Density and Viscosity | N/A 65 | | | | |
| pH and Fluid Loss | 9.0 8.0 cm³ | | cm³ | cm³ | cm³ |
| Source of Sample | FLOWLINE | | | | |
| Rm @ Meas. Temp. | .04 @ 16 °C | @ °C | @ °C | @ °C | |
| Rmf @ Meas. Temp. | .039 @ 16 °C | @ °C | @ °C | @ °C | |
| Rmc @ Meas. Temp. | .045 @ 16 °C | @ °C | @ °C | @ °C | |
| Source of Rmf and Rmc | MEAS MEAS | | | | |
| Rm @ BHT | .037 @ 19 °C | @ °C | @ °C | @ °C | |
| Time Since Circ. | 5 HOURS | | | | |
| Max. Rec. Temp. Deg. C. | 19 °C | | °C | °C | °C |
| Equip. No. and Location | 1407 EDM | | | | |
| Recorded By | ADAMOWSKI | | | | |
| Witnessed By | ALDRIDGE | | | | |

CANADA OIL AND GAS LANDS ADMINISTRATION
JUN 7 1983
MONITORING AND CONTROL

D1101

FOLD HERE

THIS HEADING AND LOG CONFORMS TO API RECOMMENDED STANDARD PRACTICE RP-31

REMARKS LOG TAPED

Scale Changes: Scale Up Hole / Scale Down Hole

| Changes in Mud Type or Additional Samples | Type Log | Depth | Equipment Data: Run No. | Tool Type | Pad Type | Tool Position | Other |
|---|---|---|---|---|---|---|---|
| Date | | | | | | | |
| Sample No. | | | | | | | |
| Depth-Driller | | | | | | | |
| Type Fluid in Hole | | | THREE | 1229 #57384 | - | FREE | - |
| Dens. / Visc. cm³ | | | | 1309 #37455 | - | FREE | - |
| pH / Fluid Loss cm³ | | | | | | | |
| Source of Sample | | | | | | | |
| Rm @ Meas. Temp. @ °C | | | @ °C | | | | |
| Rmf @ Meas. Temp. @ °C | | | @ °C | | | | |
| Rmc @ Meas. Temp. @ °C | | | @ °C | | | | |
| Source Rmf / Rmc | | | | | | | |
| Rm @ BHT @ °C | | | @ °C | | | | |
| Rmf @ BHT @ °C | | | @ °C | | | | |
| Rmc @ BHT @ °C | | | @ °C | | | | |

BEAM WIDTH 154 mm

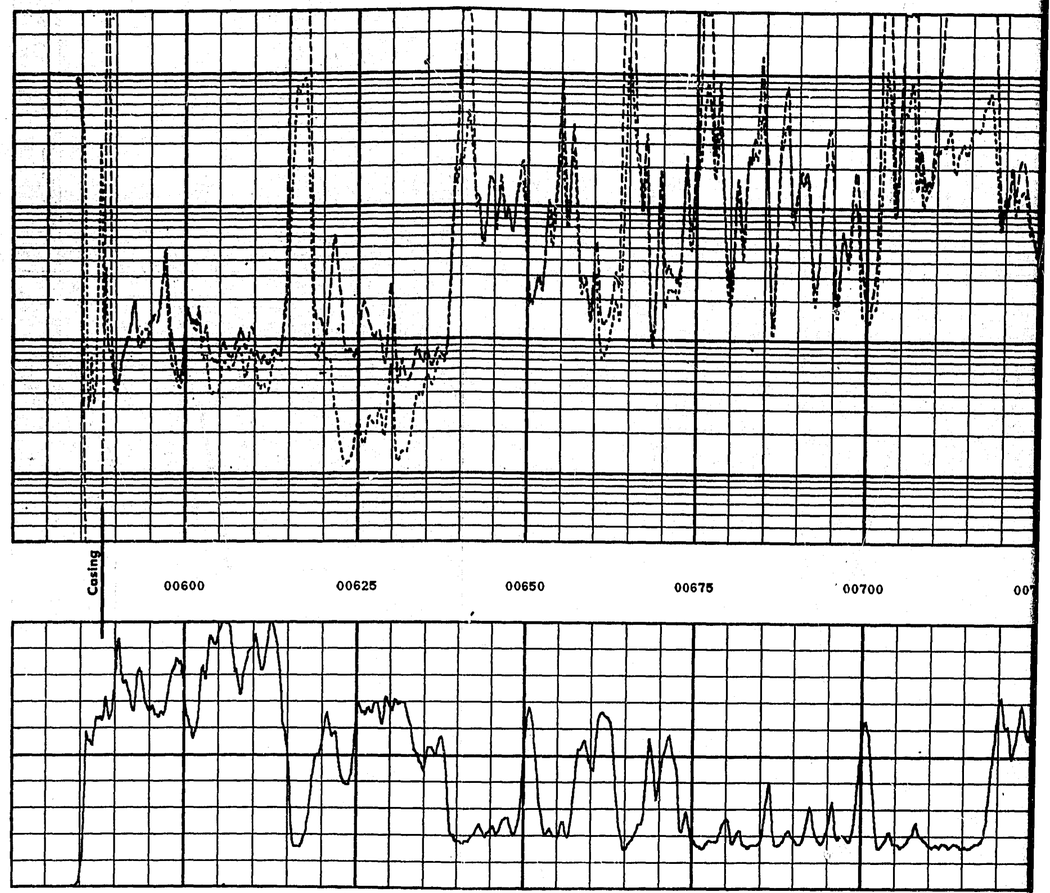
RESISTIVITY
Ohm metres

SHALLOW LATEROLOG: .3 1.0 10 100 1000
DEEP LATEROLOG: .3 1.0 10 100 1000

DEPTH

DETECTOR TYPE SCINT
DETECTOR LENGTH 300 mm

GAMMA RAY
API UNITS: 0 150



899.4 First Reg. Dresser Atlas
900.0 Total Depth Dresser Atlas
900.0 Total Depth Driller

DETECTOR TYPE SCINT
DETECTOR LENGTH 300 mm

BEAM WIDTH 154 mm

## GAMMA RAY

0 API UNITS 150

DEPTH

00650
00675
00700
00725
00750
00775
00800
00825
00850
00875
00900

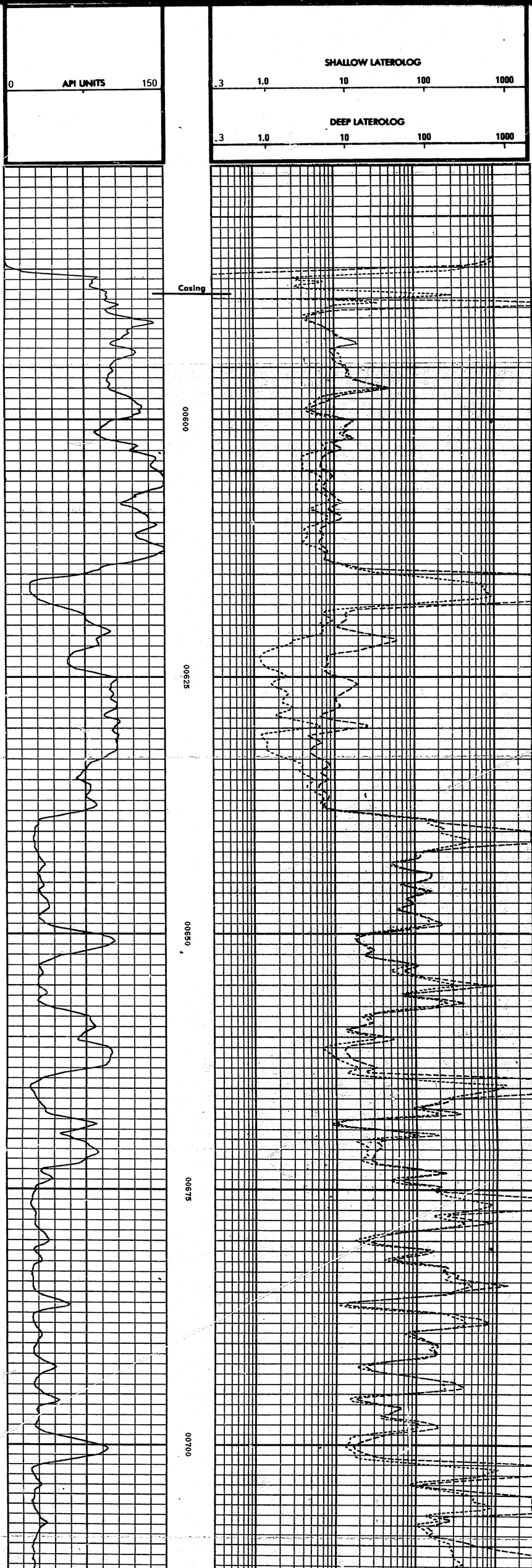
## RESISTIVITY

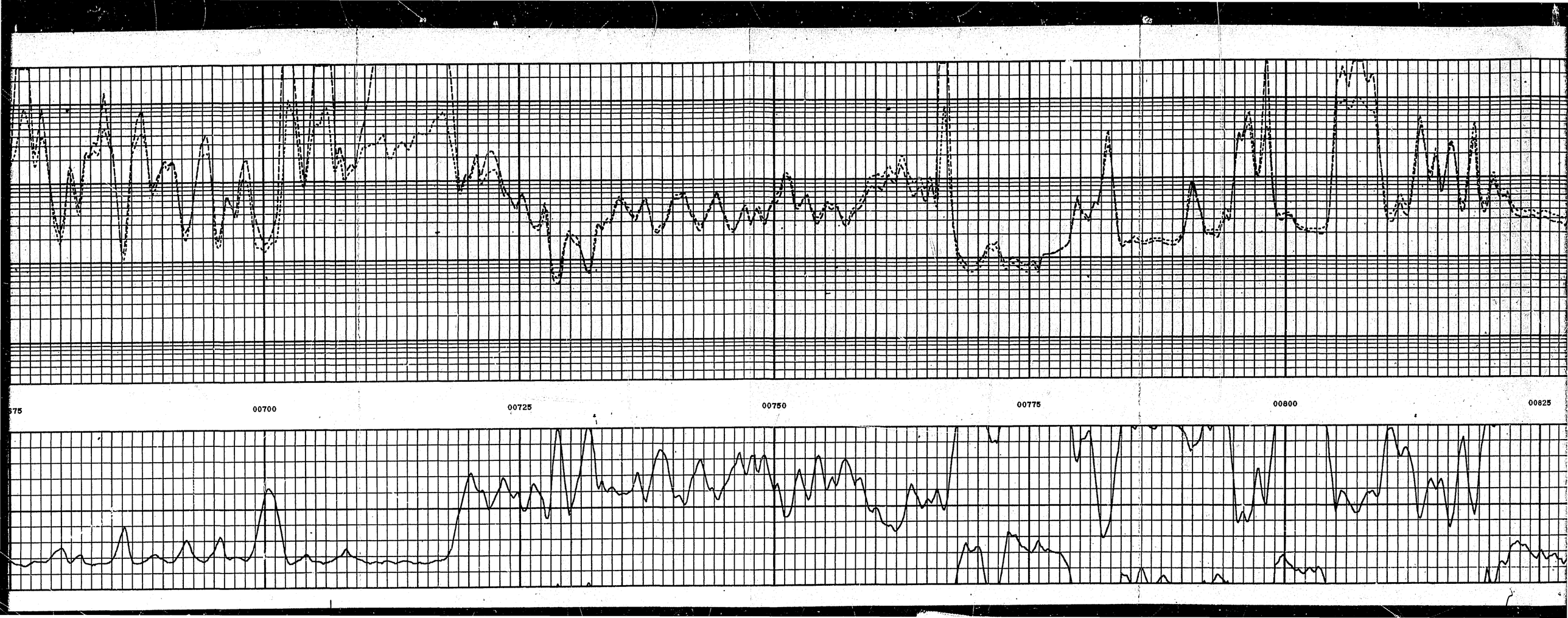
Ohm metres

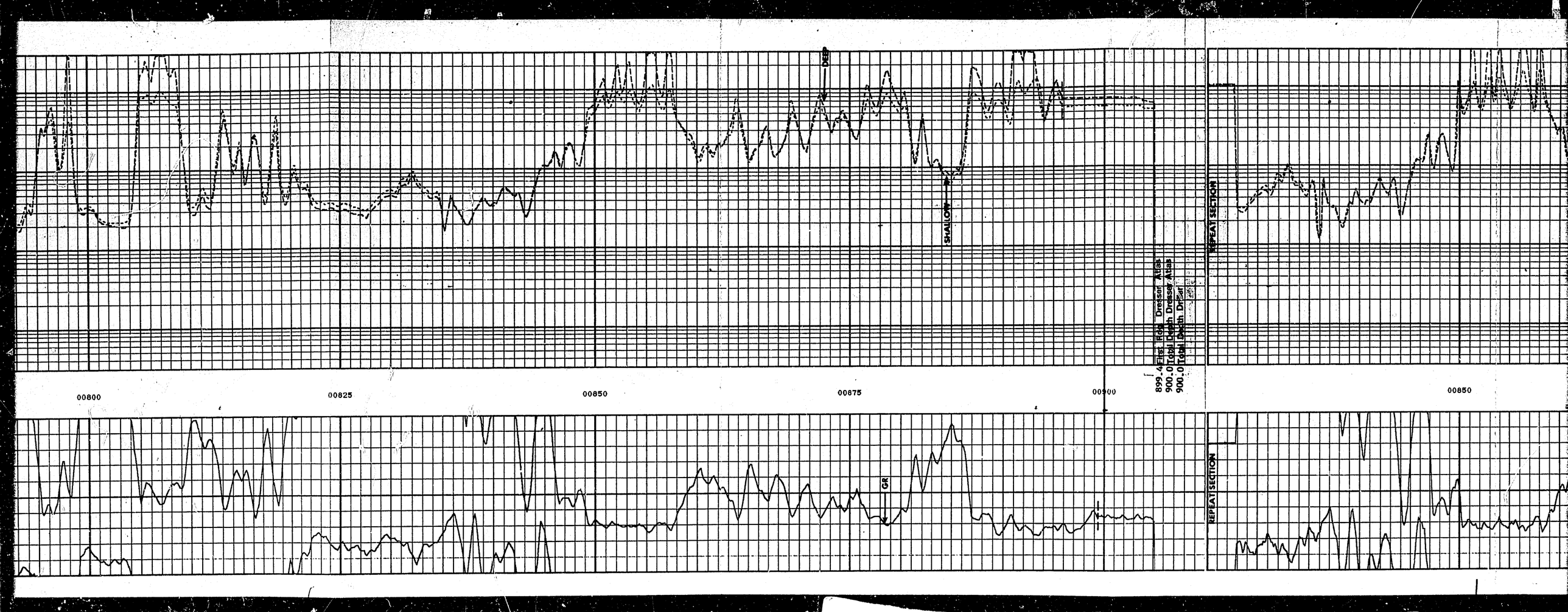
SHALLOW LATEROLOG
.3 1.0 10 100 1000

DEEP LATEROLOG
.3 1.0 10 100 1000

Casing


0
API UNITS
150
SHALLOW LATEROLOG
.3
1.0
10
100
1000
DEEP LATEROLOG
.3
1.0
10
100
1000
Casing
00600
00625
00650
00675
00700


675
00700
00725
00750
00775
00800
00825


DEEP
SHALLOW
GR
REPEAT SECTION
REPEAT SECTION
899.-4 First Reading Dresser Atlas
900.-0 Total Depth Dresser Atlas
900.-0 Total Depth Driller
00800
00825
00850
00875
00900
00850

REPEAT SECTION

REPEAT SECTION

00850

00875

00900

| | | |
|---|---|---|
| .3 1.0 10 100 1000 DEEP LATEROLOG | | |
| 0 API UNITS 150 | | .3 1.0 10 100 1000 SHALLOW LATEROLOG |
| **GAMMA RAY** | **DEPTH** | **RESISTIVITY** Ohm metres |

| | | | |
|---|---|---|---|
| **Company** | FORWARD RESOURCES LIMITED | **Drillers T.D.** | 900.0 |
| **Well** | FORWARD ET AL IZOK M-20 | **Log F.R.** | 899.3 |
| **Field** | WILDCAT | **Log T.D.** | 900.0 |
| **Prov.** | N.W.T. | **Elevations:** | |
| | | **K.B.** 299.2 **D.F.** | **G.L.** 295.0 |

Dresser Atlas

DRESSER

# BHC Acoustilog®

FILE NO.

COMPANY FORWARD RESOURCES LIMITED

WELL FORWARD ET AL IZOK M-20

FIELD WILDCAT

PROVINCE N.W.T.

LOCATION: UNIT M SECTION 20

GRID 67° 20' 123° 45'

LSD ____ SEC ____ TWP ____ RGE ____

Other Services:
DIFL
DLL
CN-CDL

Permanent Datum GROUND LEVEL Elev. 295 M

Log Measured from KELLY BUSHING 4.2 M Above Permanent Datum

Drilling Measured from KELLY BUSHING

Elevations:
KB 299.2 M
DF ____
GL 295 M

| | | | |
|---|---|---|---|
| Date | 7 MARCH 83 | 9 MARCH 83 | 31 MARCH 83 |
| Run No. | ONE | TWO | THREE |
| Depth—Driller | 460 M | 479.6 | 900.0 |
| Depth—Logger | 456.0 M | 471.0 | 900.0 |
| Bottom Logged Interval | 453.1 M | 468.1 | 897.5 |
| Top Logged Interval | 33 M | 400 M | 588.0 |
| Casing—Driller | 35 M | 35 M | 178mm @ 589.0 |
| Casing—Logger | 33 M | 33 M | 588.0 |
| BH Size | 311mm | 311mm | 155mm |
| Type Fluid in Hole | GEL CHEM | GEL CHEM | GEL CHEM |
| Density and Viscosity | 1030 \| 165 | N/A \| N/A | N/A \| 65 |
| pH and Fluid Loss | 85 \| - cm³ | N/A \| N/A cm³ | 9.0 \| 8.0 cm³ |
| Source of Sample | FLOWLINE | - | FLOWLINE |
| Rm @ Meas. Temp. | N/A @ - °C | - @ - °C | .04 @ 16 °C |
| Rmf @ Meas. Temp. | N/A @ - °C | - @ - °C | .039 @ 16 °C |
| Rmc @ Meas. Temp. | N/A @ - °C | - @ - °C | .045 @ 16 °C |
| Source of Rmf and Rmc | - \| - | - \| - | MEAS \| MEAS |
| Rm @ BHT | N/A @ - °C | - @ - °C | .037 @ 19 °C |
| Time Since Circ. | 5 HOURS | 5 HOURS | 1.5 HOURS |
| Max. Rec. Temp. Deg. C. | N/A °C | - °C | 19 °C |
| Equip. No. and Location | 1407 \| EDM | 1407 \| EDM | 1407 \| EDM |
| Recorded By | D. MURRAY | D. MURRAY | ADAMOWSKI |
| Witnessed By | A. WILLIAMS | A. WILLIAMS | ALDRIDGE |

FOLD HERE

THIS READING AND LOG CONFORMS TO API RECOMMENDED STANDARD PRACTICE RP-31

REMARKS. BOREHOLE VOLUME - SMALL SPIKE - 1 INTEGRATED TRAVEL TIME 1.0 m/s PER TICK
ACOUSTIC SIGNAL FROM 100 M to 95 M, AND FROM 80M TO CONDUCTOR
PIPE WAS VERY WEAK, CAUSING EXTREME CYCLE SKIPPING.

Scale Changes

| | Type Log | Depth | Scale Up Hole | Scale Down Hole |
|---|---|---|---|---|
| Run No. | ONE | TWO | | |
| Tool Model No. | 1308 | 1308 | CALIPER | 575 |
| Serial No. | 37455 | 37455 | 250-500 | 125-375 |
| Diam. | 85mm | 85mm | | |
| Detect. Model No. | D/G2 | D/G3 | | |
| Type | SCINT. | SCINT. | | |
| Length | 152mm | 152mm | | |

Gamma Ray — Equipment Data

| Depths From | Depths To | Speed M/Min | T.C. Sec. | Sens. Settings | Zero Div. L or R | API G.R. Units Per Log Div. |
|---|---|---|---|---|---|---|
| 453.0 | 33.0 | REC. | 2 | 405 | 0 | 15 |
| RUN TWO | | | | | | |
| 468 | 400 | REC. | 2 | 405 | 0 | 15 |
| RUN THREE | | | | | | |
| 900.0 | 588.0 | REC. | 2 | 410 | 0 | 15 |

Equipment Data

| Run No. | Tool Type | Pad Type | Tool Position |
|---|---|---|---|
| ONE | 1940 #42357 | 3-ARM | - |
| ONE | 1308 #37455 | - | CENT. |
| ONE | 1607 #51697 | - | CENT. |

D150

ACOUSTILOG
$T_{1-2}R_{1-2}R_{2-1}T_2$

DEPTH

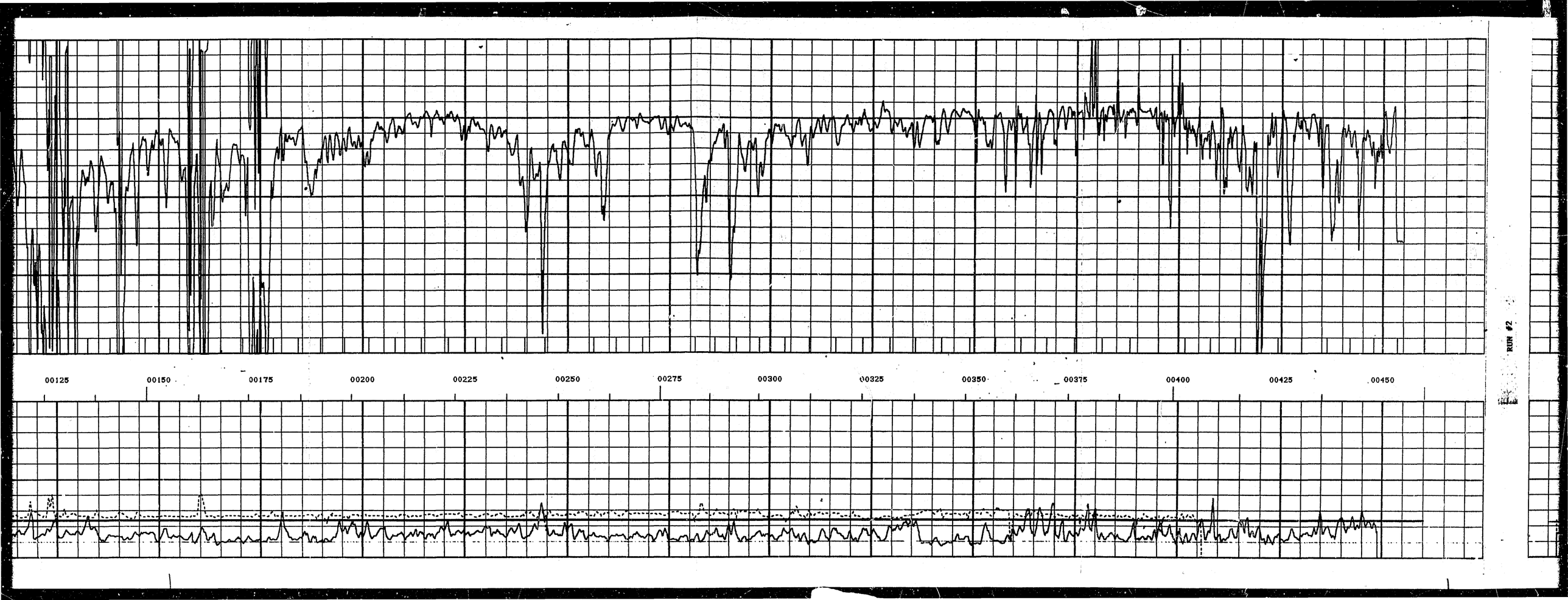
SPECIFIC ACOUSTIC TIME
Micro Seconds Per Metre
100 200 300

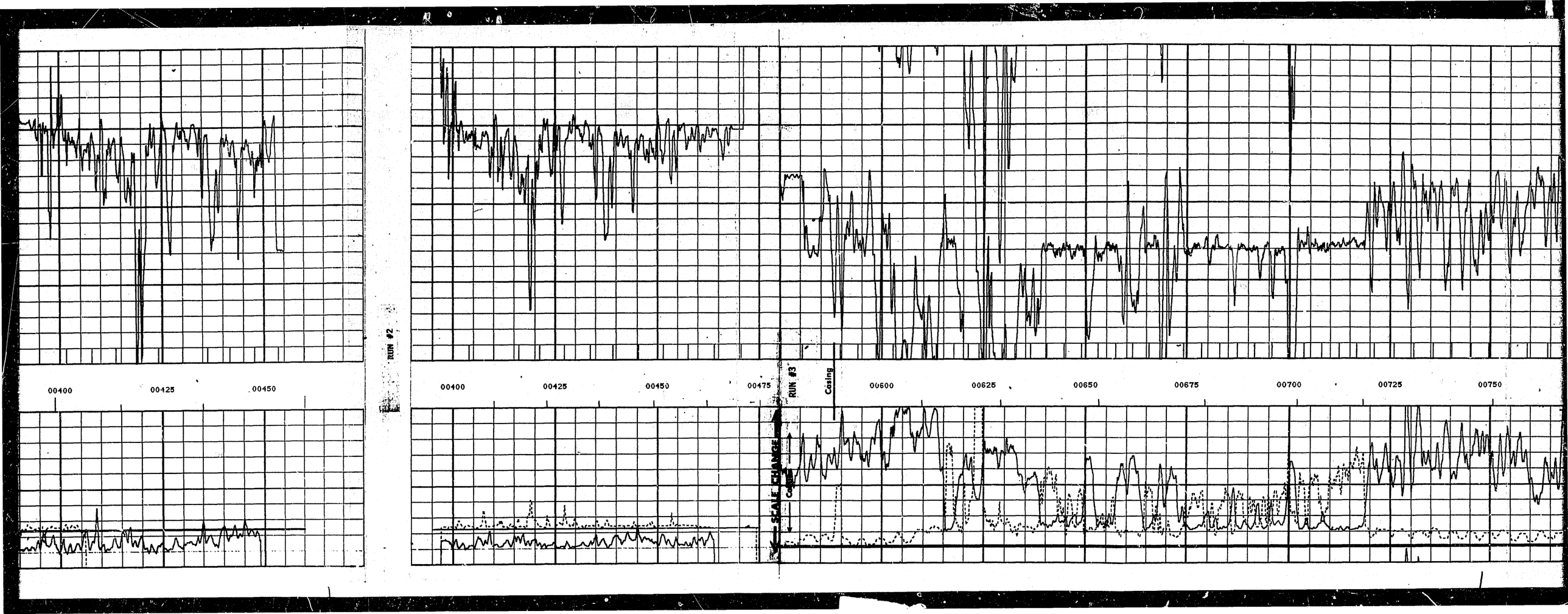
GAMMA RAY & CALIPER
HOLE SIZE - mm 250 500
API UNITS 0 150

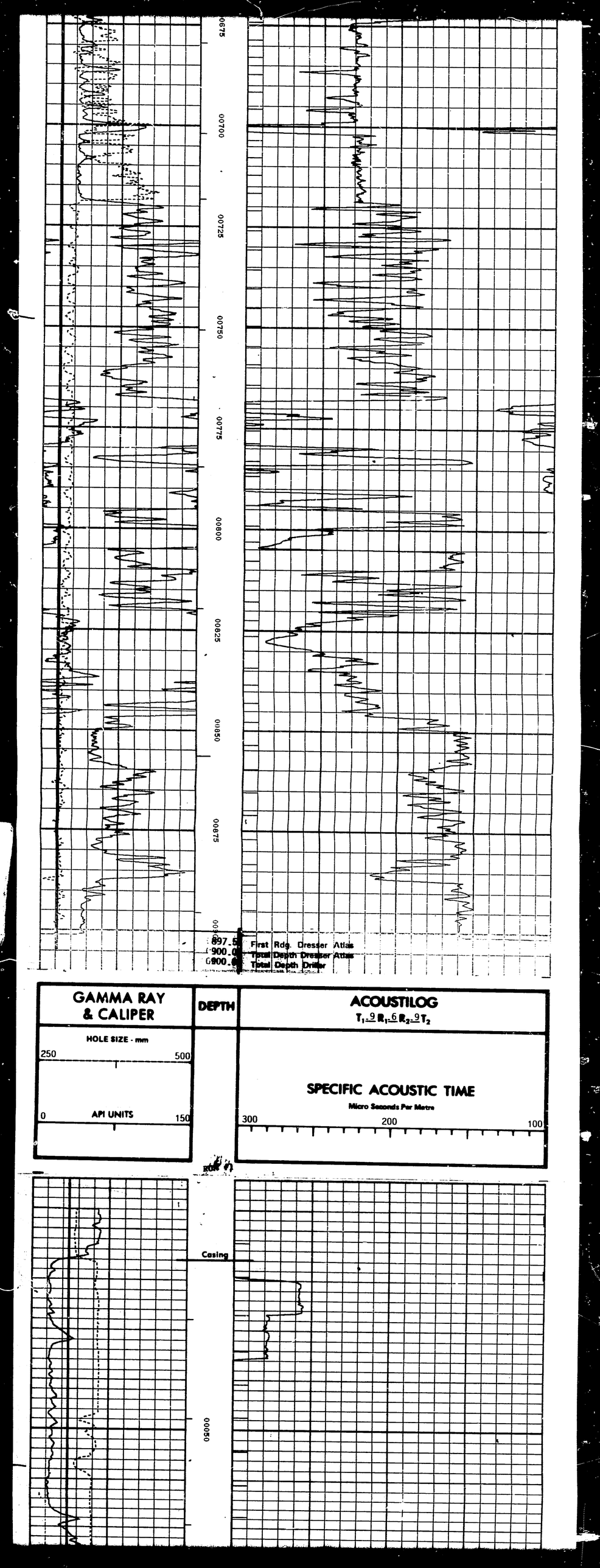
RUN #1

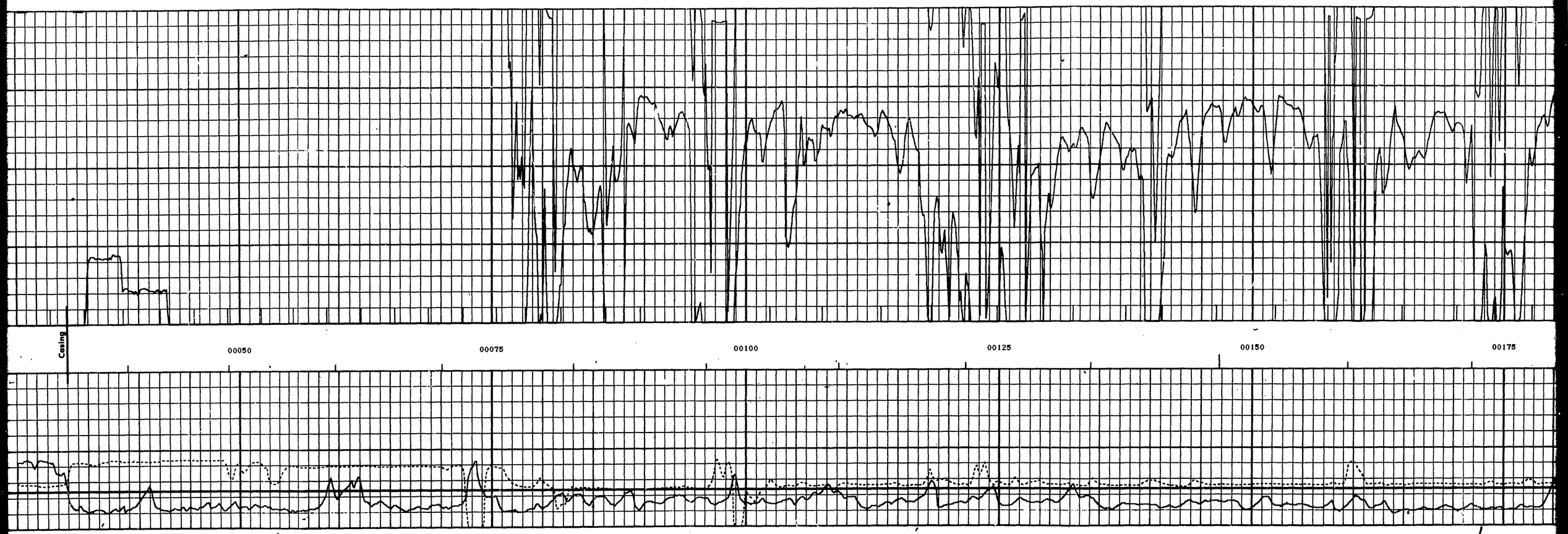
Casing

00050 00075 00100 00125 00150 00175

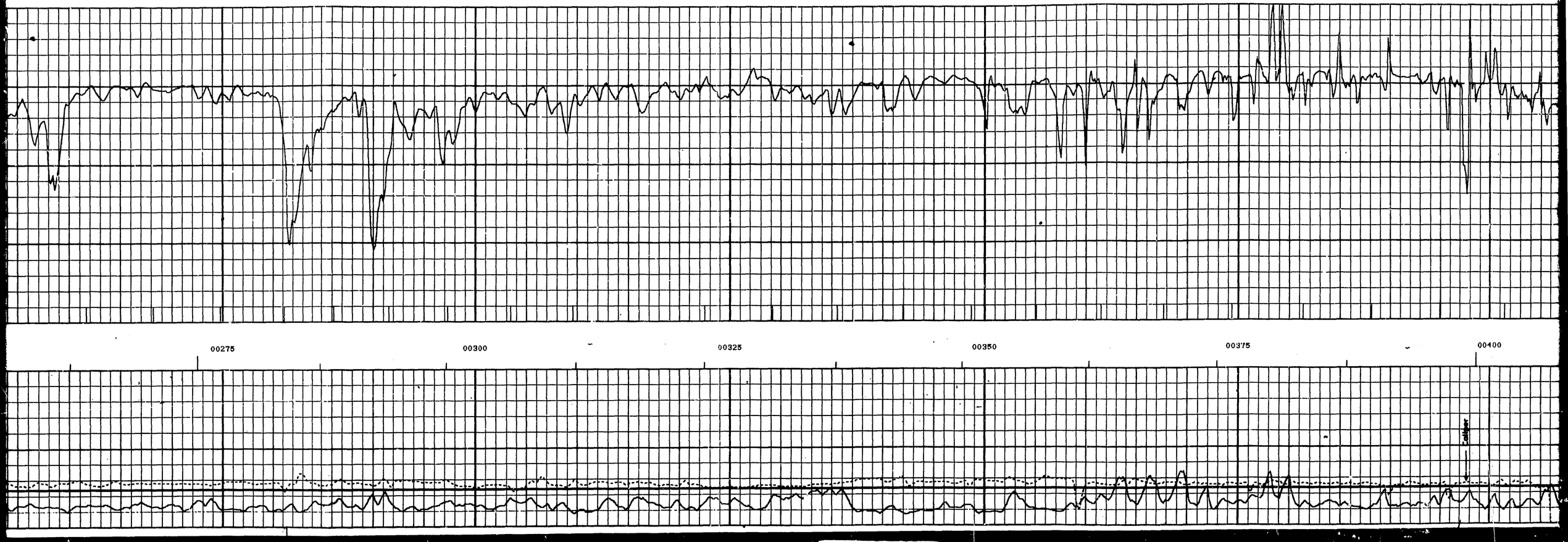

00125
00150
00175
00200
00225
00250
00275
00300
00325
00350
00375
00400
00425
00450
RUN #2

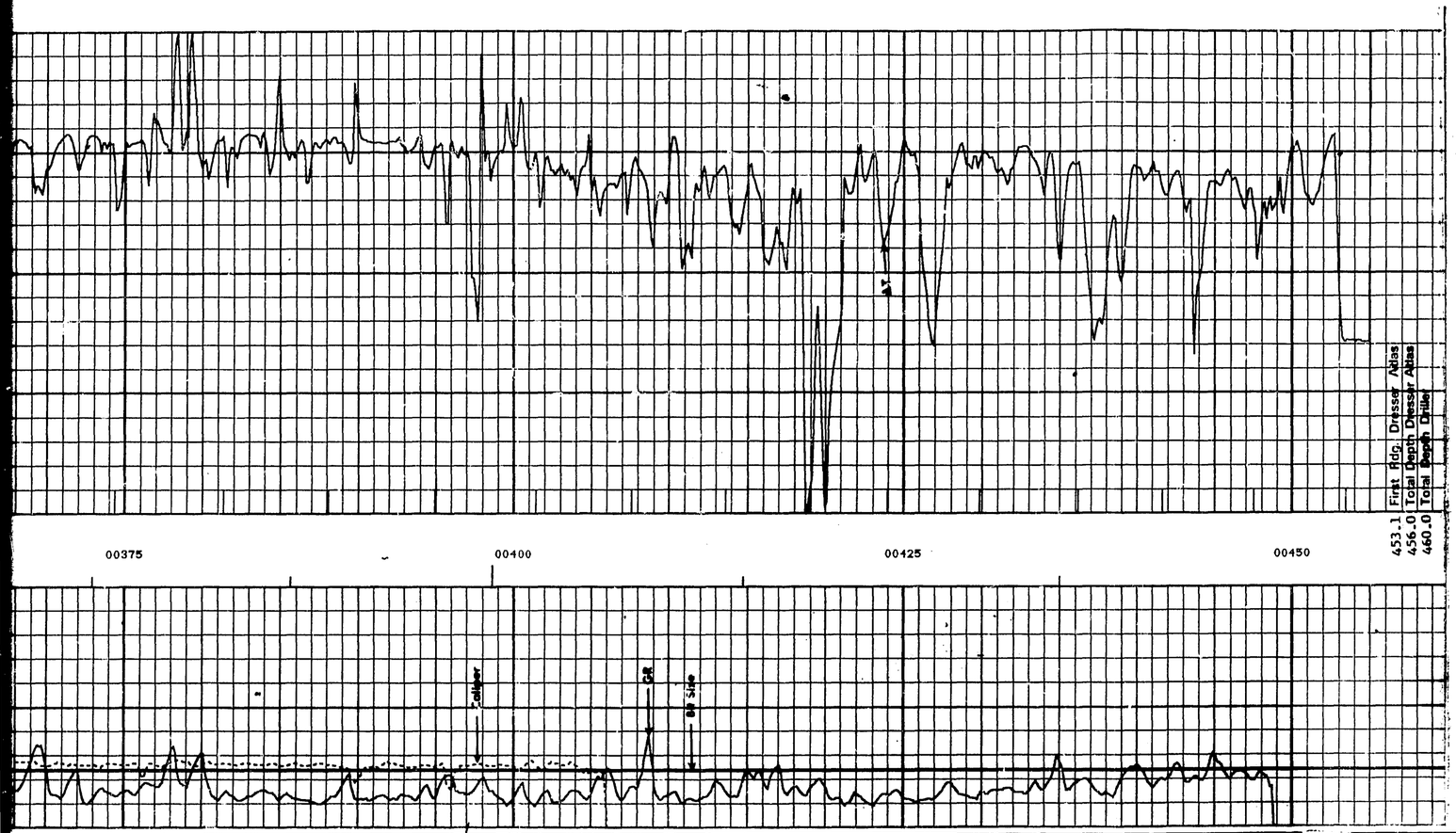

00400
00425
00450
RUN #2
00400
00425
00450
00475
RUN #3
Casing
00600
00625
00650
00675
00700
00725
00750
SCALE CHANGE
Casing


00675
00700
00725
00750
00775
00800
00825
00850
00875
00900
897.5 First Rdg. Dresser Atlas
900.0 Total Depth Dresser Atlas
900.6 Total Depth Driller
GAMMA RAY & CALIPER
HOLE SIZE - mm
250
500
0
API UNITS
150
DEPTH
ACOUSTILOG
T1-9 R1-6 R2-9 T2
SPECIFIC ACOUSTIC TIME
Micro Seconds Per Metre
300
200
100
Casing
00050

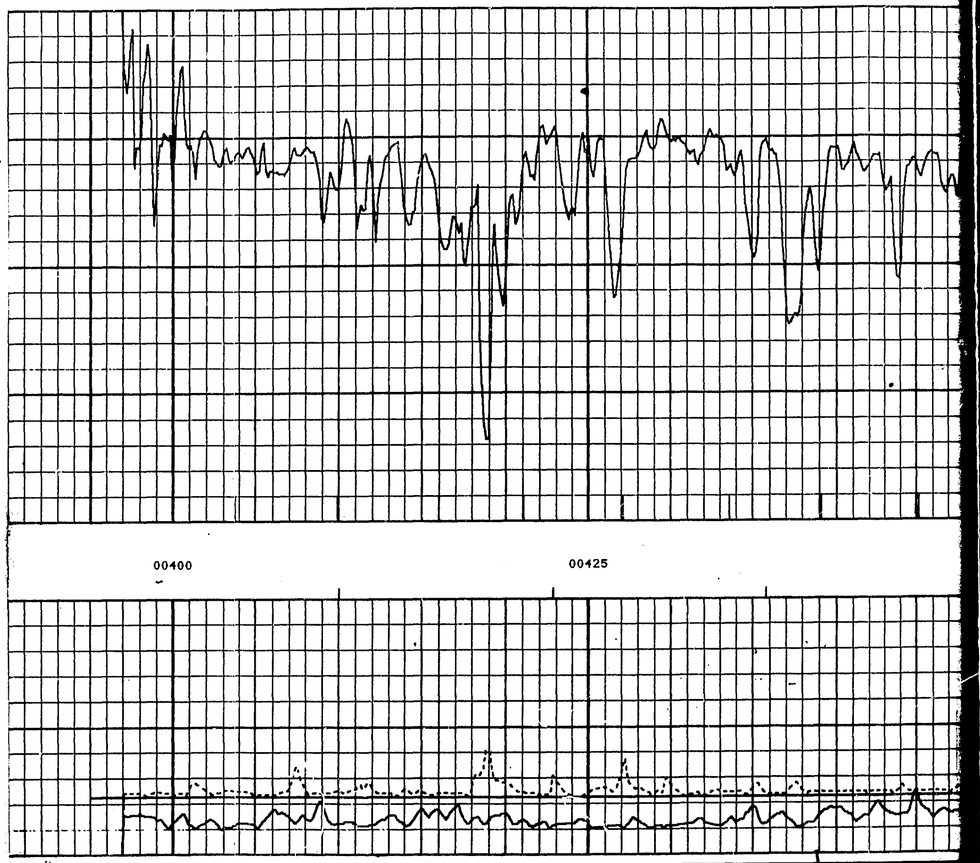

Casing
00050
00075
00100
00125
00150
00175

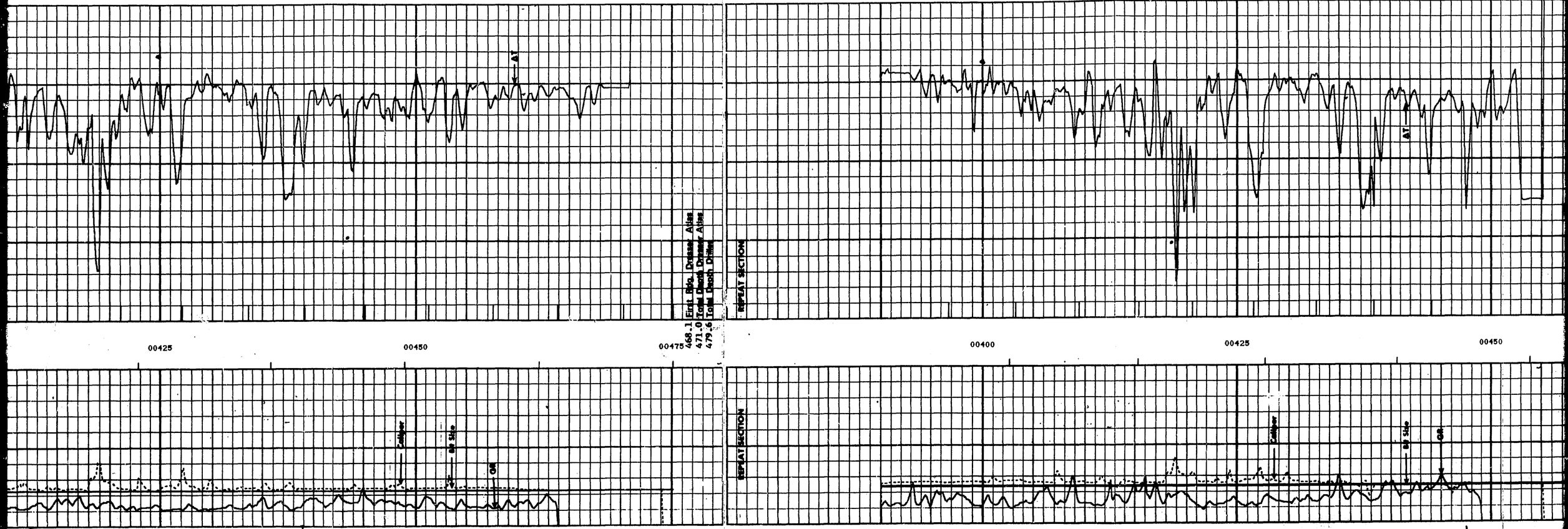

00150
00175
00200
00225
00250
00275

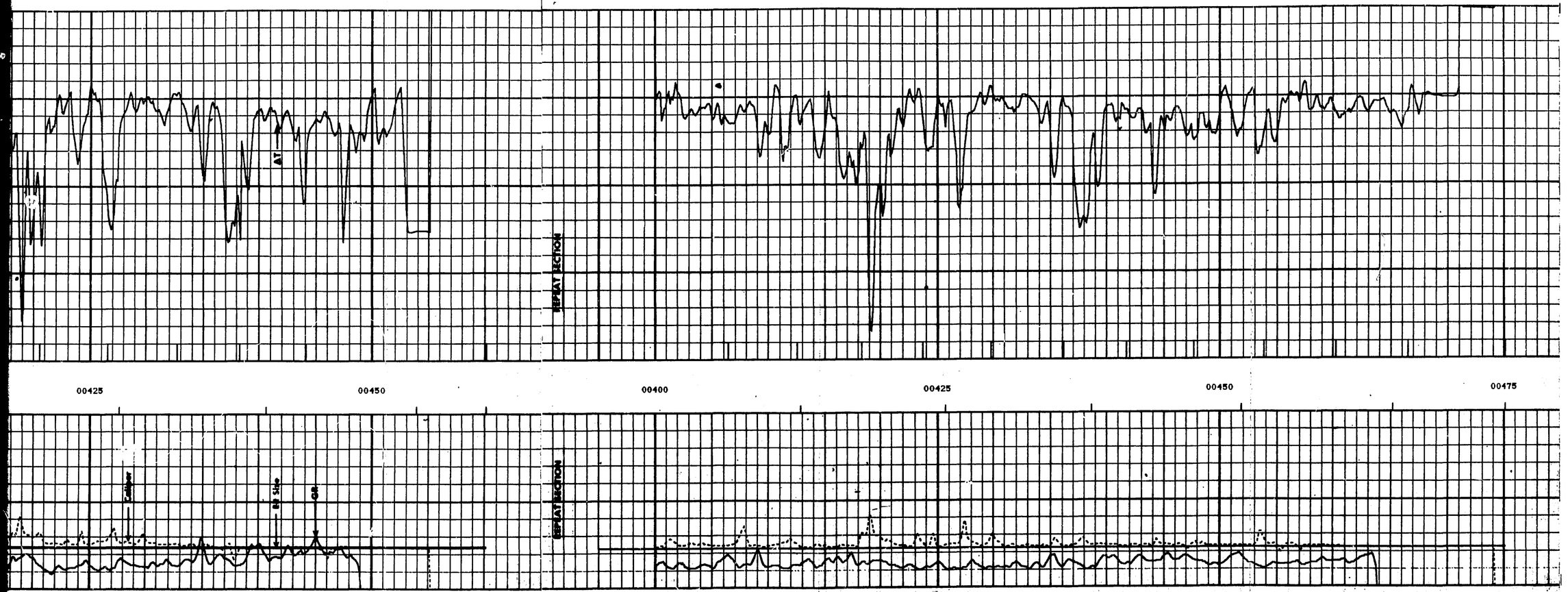

00275
00300
00325
00350
00375
00400
Caliper


00375
00400
00425
00450
453.1 First Rdg. Dresser Atlas
456.0 Total Depth Dresser Atlas
460.0 Total Depth Driller
Caliper
GR
Bit Size

RUN #2


00400
00425


AT
First Bkg. Drpsd. Alias
468.1
471.0 Total Depth Drmdr Alias
479.6 Total Depth Drlstr
00425
00450
00475
REPEAT SECTION
00400
00425
00450
Caliper
Bit Size
GR
REPEAT SECTION
Caliper
Bit Size
GR

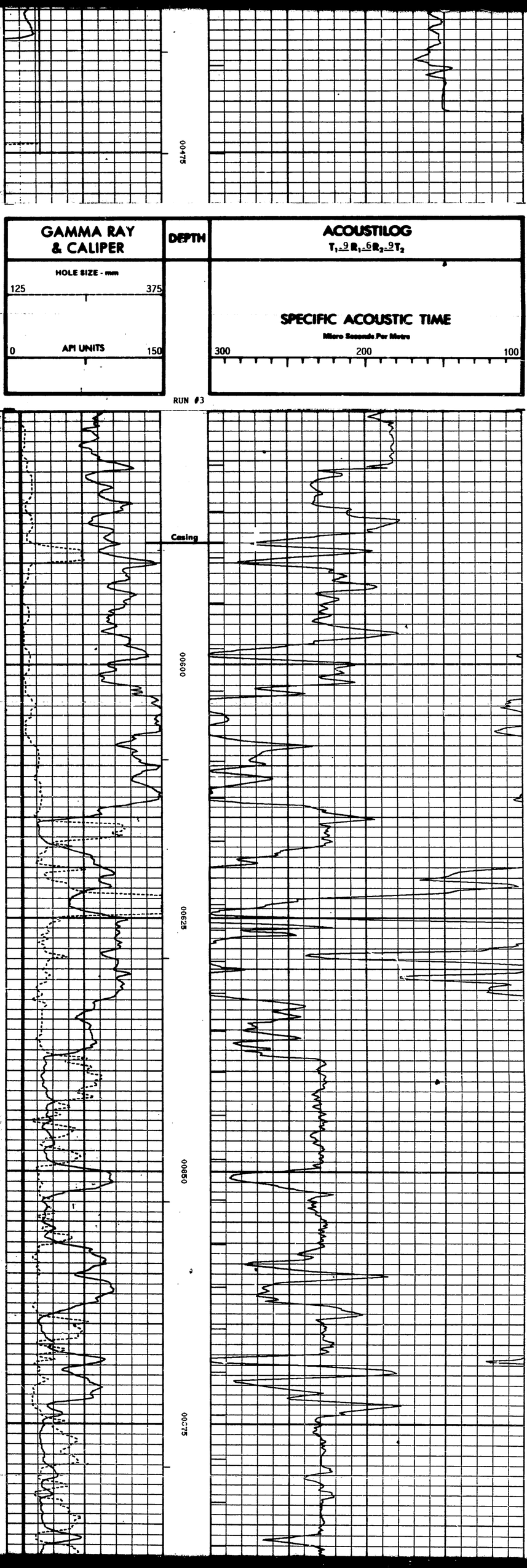



ACOUSTILOG
$T_1$-$R_1$-$R_2$-$T_2$

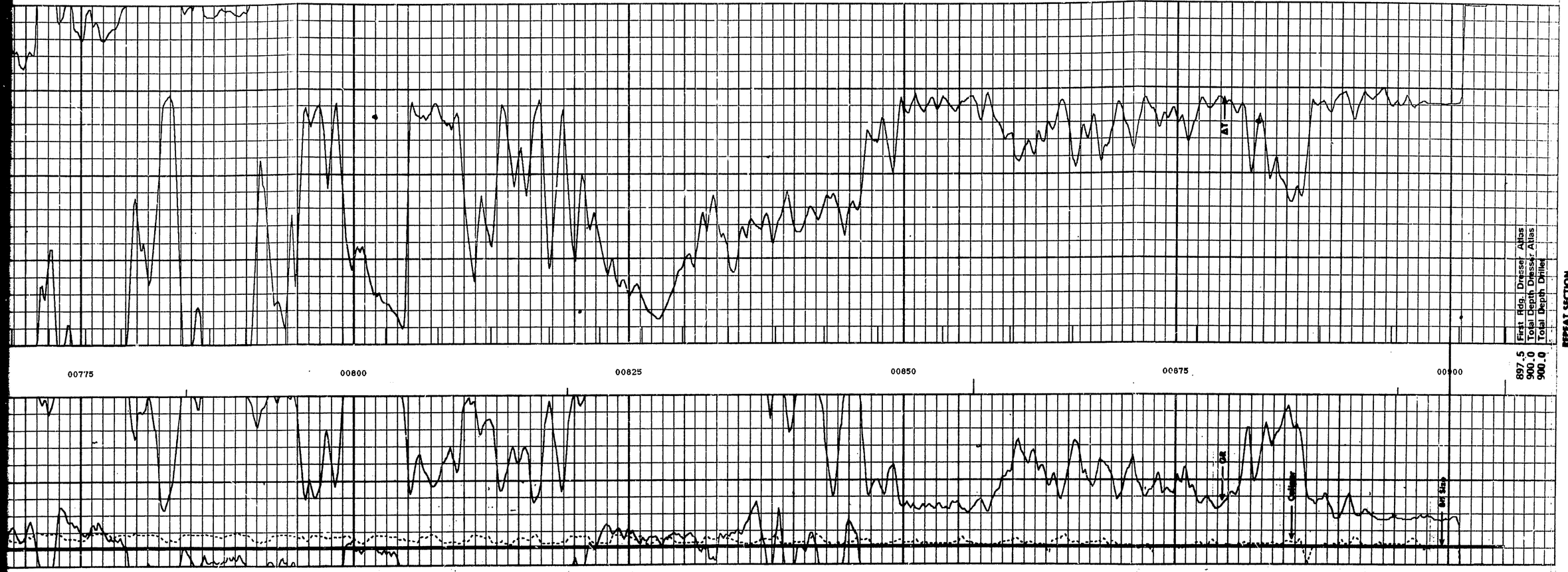
SPECIFIC ACOUSTIC TIME
Micro Seconds Per Metre
100
200
300

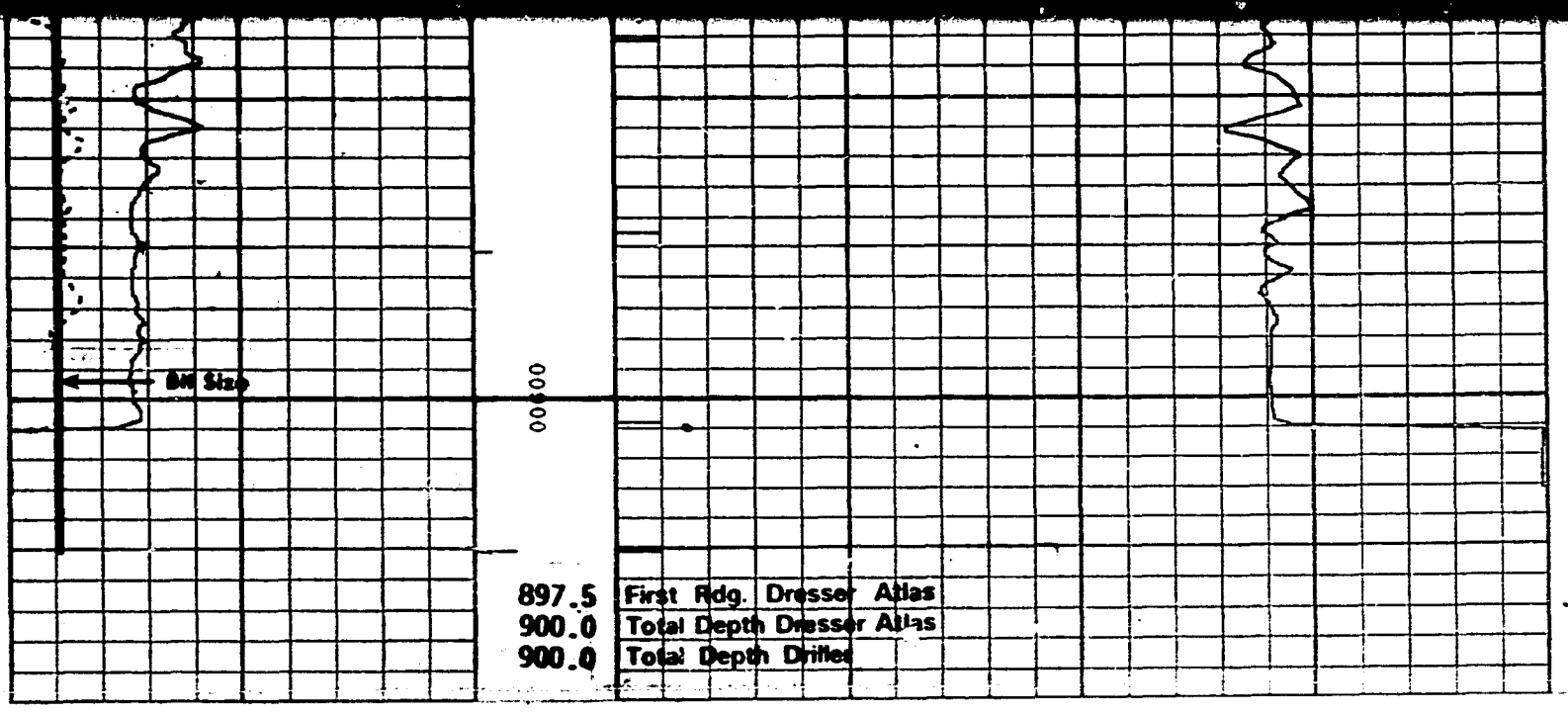
DEPTH

GAMMA RAY & CALIPER
HOLE SIZE - mm
125
375
API UNITS
0
150

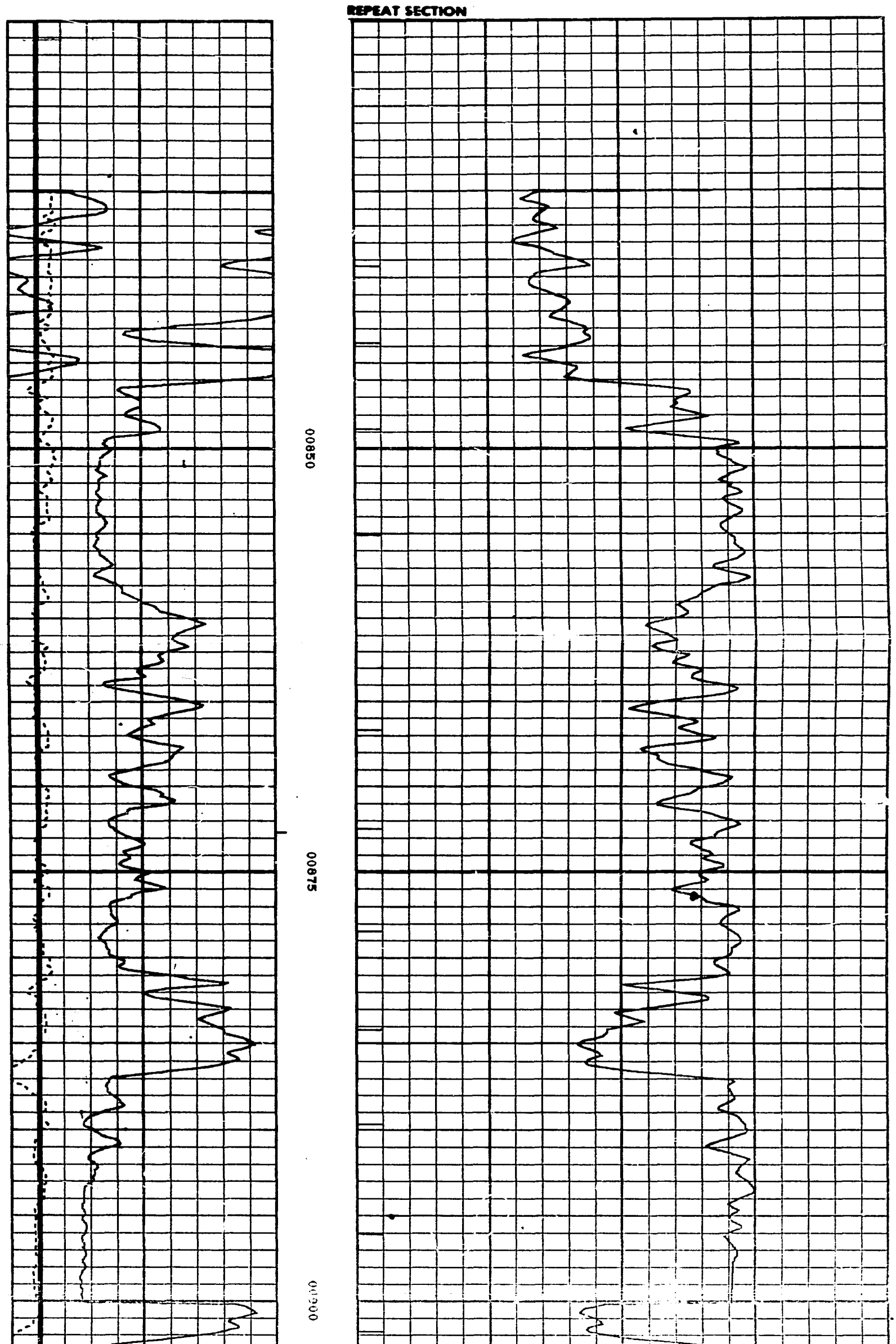

GAMMA RAY & CALIPER
DEPTH
ACOUSTILOG
$T_1$-$^9R_1$-$^6R_2$-$^9T_2$
HOLE SIZE - mm
125
375
API UNITS
0
150
SPECIFIC ACOUSTIC TIME
Micro Seconds Per Metre
300
200
100
RUN #3
Casing
00475
00600
00625
00650
00675


50
00675
00700
00725
00750
00775
00800


ΔT
00775
00800
00825
00850
00875
00900
First Rdg. Dresser Atlas 897.5
Total Depth Dresser Atlas 900.0
Total Depth Driller 900.0
REPEAT SECTION
GR
Caliper
Bit Size




REPEAT SECTION




0 API UNITS 150

125 HOLE SIZE - mm 375

300 200 100

Micro Seconds Per Metre

**SPECIFIC ACOUSTIC TIME**

**GAMMA RAY & CALIPER**

**DEPTH**

**ACOUSTILOG**

$T_1$-9 $R_1$-6 $R_2$-9 $T_2$

COMPANY FORWARD RESOURCES LIMITED

WELL FORWARD ET AL IZOK M-20

FIELD WILDCAT

PROVINCE N.W.T.

LOG FR [illegible] M.
LOG TD 900 M.
DRLR TD 900 M.
RM = .037 @ [illegible] C° BHT
RMF = .039 @ [illegible] C°
RMC = [illegible] @ [illegible] C°
PD ELEV. [illegible] M.
RB ELEV. [illegible] M.
GL ELEV. [illegible] M.

Dresser Atlas DRESSER

D1126

Dresser Atlas

DRESSER

# ACOUSTIC CEMENT BOND LOG

FILE NO. 8305-R

COMPANY FORWARD RESOURCES LTD.

WELL FORWARD ET AL ETAH M-20

FIELD WILDCAT

PROVINCE NORTH WEST TERRITORIES

LOCATION: UNIT M SECTION 20 GRID 670 20, 120 45,

Other Services

Permanent Datum GROUND LEVEL Elev. 295.0M

Log Measured from KELLY BUSHING 4.2 M. Above Permanent Datum

Drilling Measured from KELLY BUSHING

Elevations: KB 300.2M DF GL 295.0M

| | |
|---|---|
| Date | MARCH 19/83 |
| Run No. | ONE |
| Type Log | CBL/GR |
| Depth-Driller | 428.0M |
| Depth-Logger | 426.0M |
| Bottom Logged Interval | 423.3M |
| Top Logged Interval | SURF. |
| Type Fluid in Hole | WATER |
| Salinity Ppm Cl. | NA |
| Density kg/m³ | NA |
| Level | FULL |
| Max. Rec. Temp. Deg. C | NA |
| Oper. Rig Time | 7.0 HRS. |
| Recorded By | FRANCHUK |
| Witnessed By | KELLY |

CANADA OIL AND GAS LANDS ADMINISTRATION

GAZ DES TERRES DU CANADA

NG-AERING AND CONTROL

Bore Hole Record

| Run No. | Bit | From | To |
|---|---|---|---|
| ONE | 311 | SURF. | 479.6 |

Casing Record

| From | To | Size | Wgt. |
|---|---|---|---|
| SURF. | 33 | 339.7 | 71.4 |
| SURF. | 432 | 244.5 | 48.1 |

FOLD HERE

| Gamma Ray — Equipment Data | | | | Cement Bond Log — Equipment Data | | | |
|---|---|---|---|---|---|---|---|
| Run No. | ONE | | | Run No. | ONE | | |
| Tool Model No. | 2402 | | | Log Type | CBL | | |
| Diam. | 92mm | | | Tool Model No. | 1415 | | |
| Detect. Model No. | D6G4 | | | Diam. | 89mm | | |
| Type | SCINT | | | Standoff Size | CENT | | |
| Length | 15.2M | | | T-R Spacing | 1.52M | | |
| Dist. to N. Source | NA | | | C.B.L. Settings | | | |
| | | | | CBL Gain | 64 | | |
| General | | | | Z Gain | 40% | | |
| Hoist Truck No. | HSL1407 | | | Sensitivity | 110 | | |
| Inst. Truck No. | HSL1407 | | | Gate | 50MSEC | | |
| Tool Serial No. | | | | Position | 500 | | |

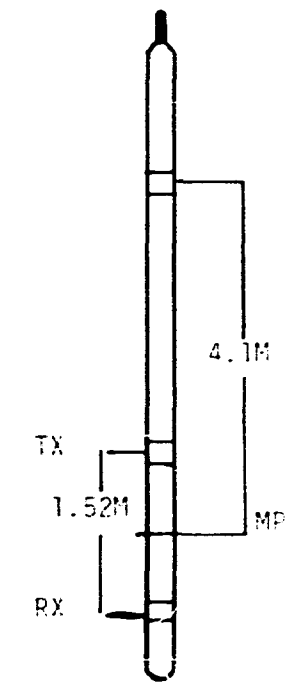
## Logging Data

### General

### Gamma Ray

| Run No. | Depths From | Depths To | Speed M/Min. | T.C. Sec. | Sens. Settings | Zero Div. L or R | API G.R. Units Per Log Div. |
|---|---|---|---|---|---|---|---|
| ONE | 423 | SURF. | REC | 2 | 551 | 0 | 12 |

INSTRUMENT DATA




Instrument Dia 89

## PRIMARY CEMENTING DATA

| CSG. RECORD | Surface (1) | SURFACE (2) | Production | Liner |
|---|---|---|---|---|
| Type Cement | O.W.G NEAT | PERMA-FROST | | |
| Vol. of Cement | 6.3 TONN | 21.6 TONN | | |
| Additive | NONE | GEL | | |
| % Additive | NONE | 890 | | |
| Retarder | NONE | NONE | | |
| % Retarder | NONE | NONE | | |
| Slurry Wt. | 1880 KgM³ | 12.2 LBS/GAL | | |
| Water Loss | - | - | | |
| Drlg. Mud Type | AIR DRILLED | | | |
| Drlg. Mud Wt. | AIR DRILLED | | | |

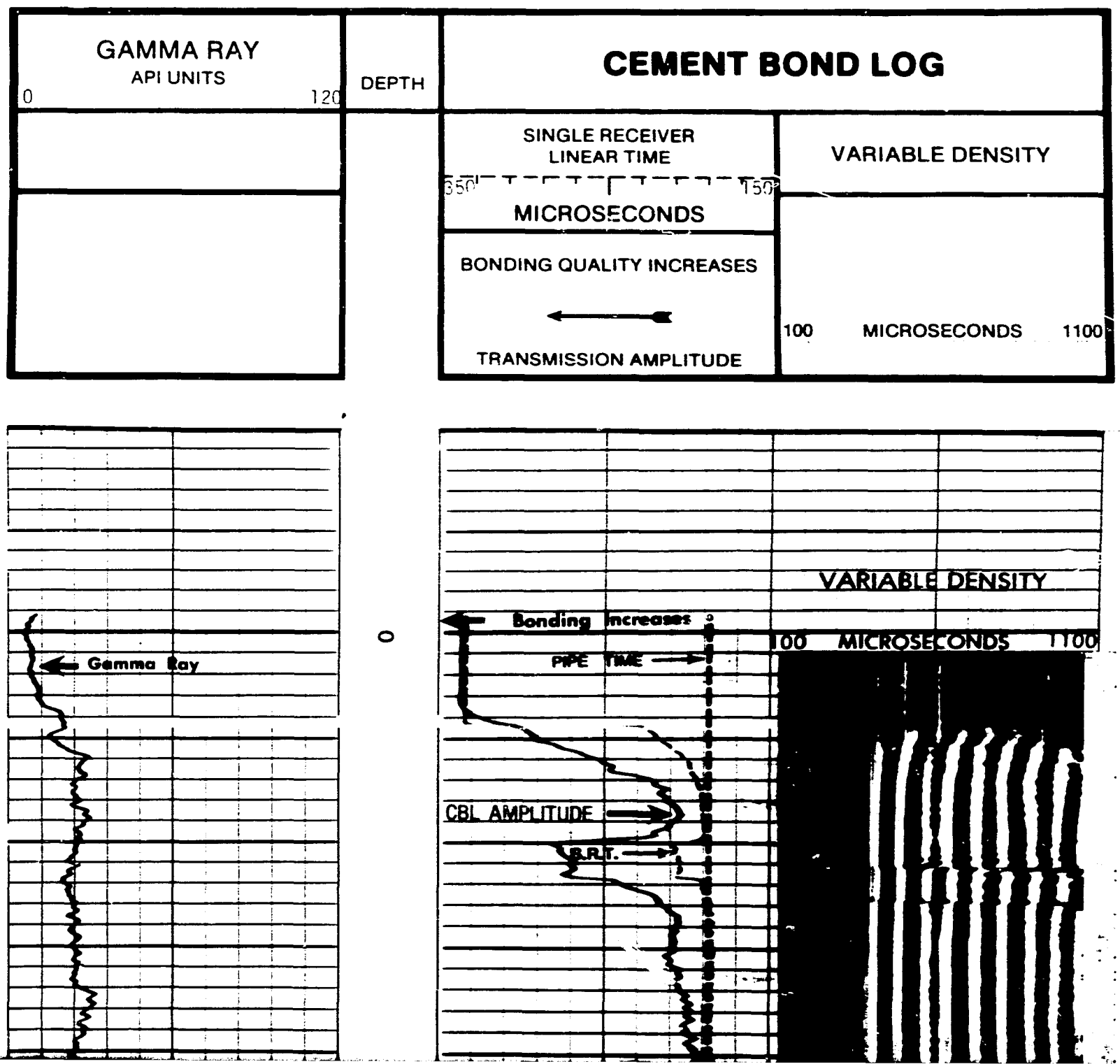
## PRIMARY CEMENTING PROCEDURE

| | (1) | (2) | |
|---|---|---|---|
| Started Pumping | 2207 MAR 16 | 0653 MAR 17 | Preceding Fluid SCAVENGER |
| Plug on Bottom | 2317 MAR 16 | 0840 MAR 17 | Vol m³ |
| Pres. Released | | | Returns: Full Partial None |
| Started Bond Log | | | Pipe Rot. During Pumping: No |
| Finished Bond Log | | | Pipe Rot After Plugdown: No |

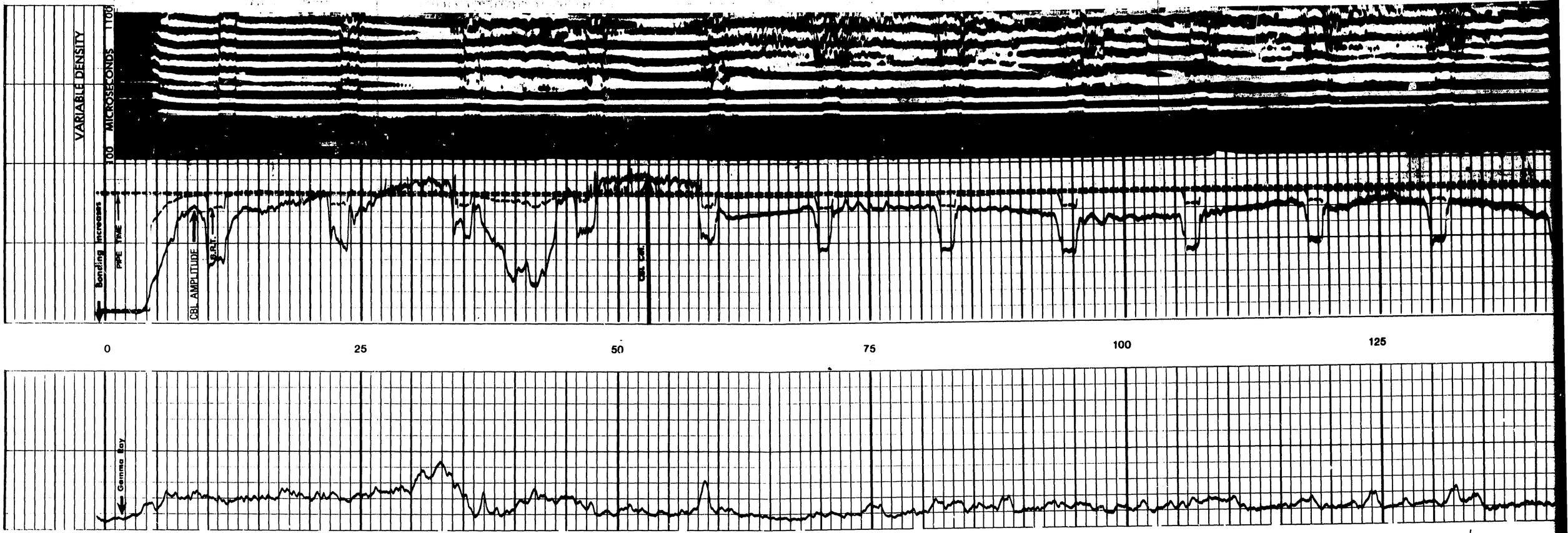
REMARKS

A STAGE CEMENT JOB D.V. TOOL @313M

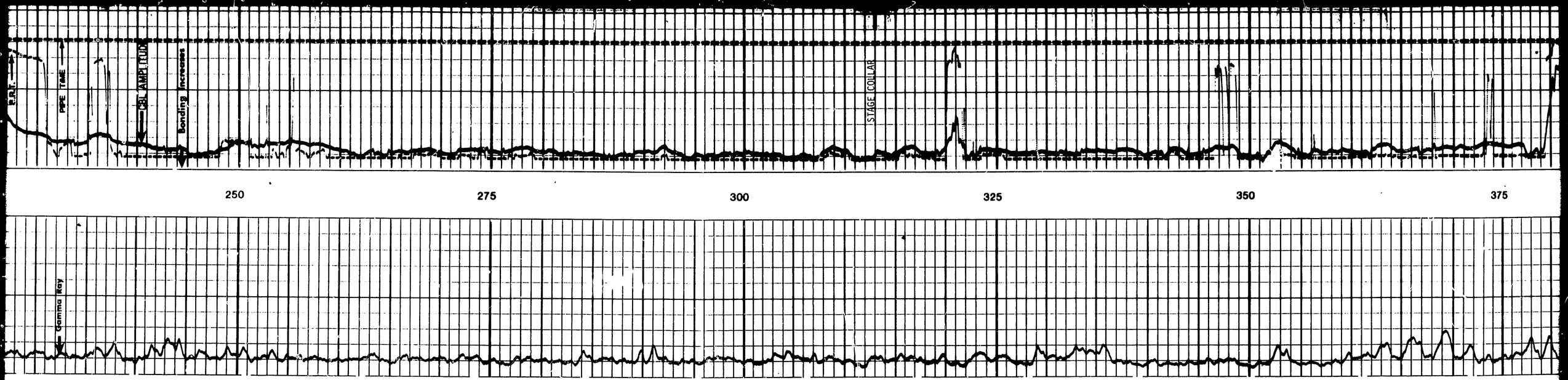
CORRELATED TO AC DATED MARCH 7/83

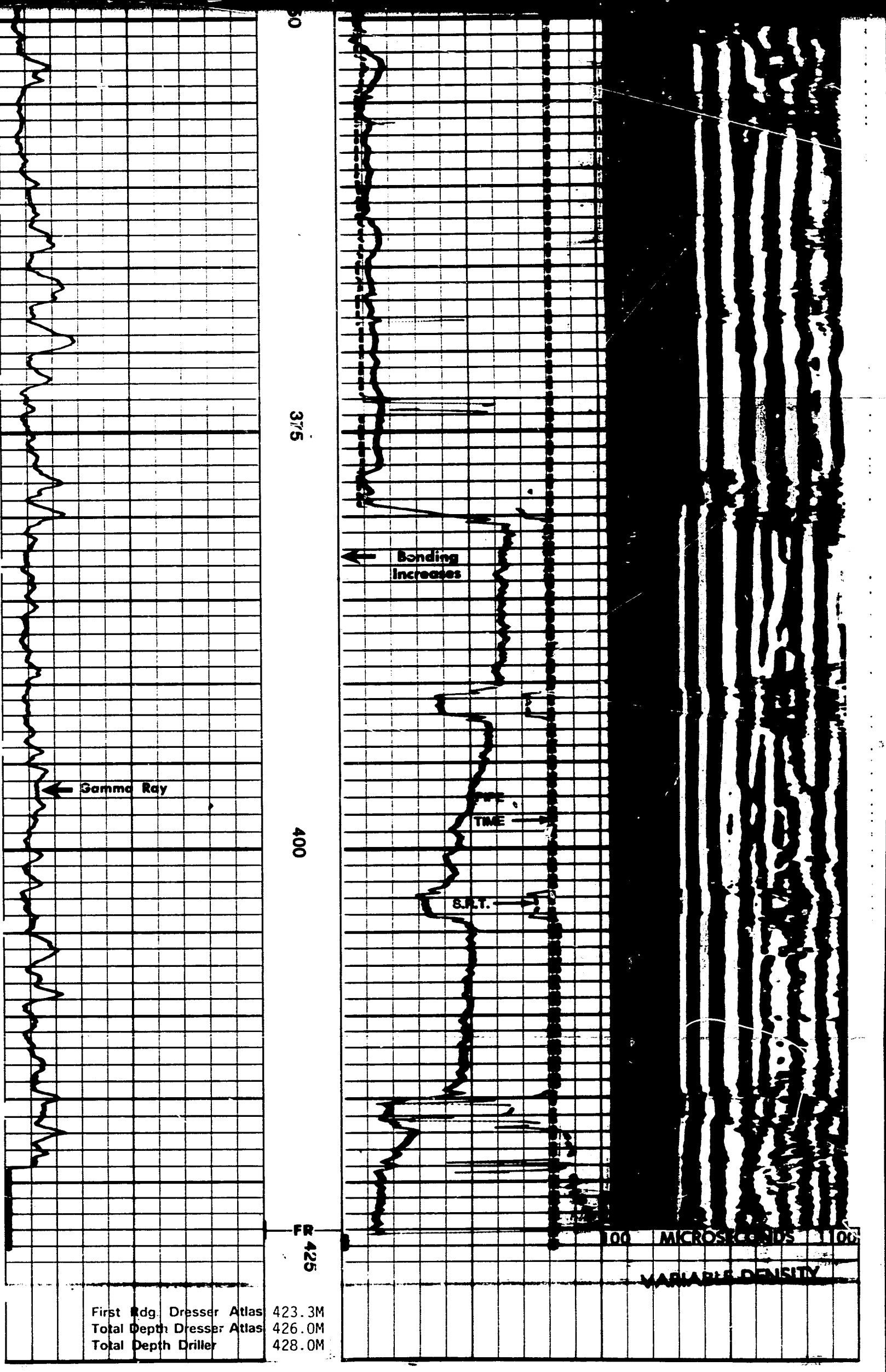



D250 - Kodacel
A190 - Abanene

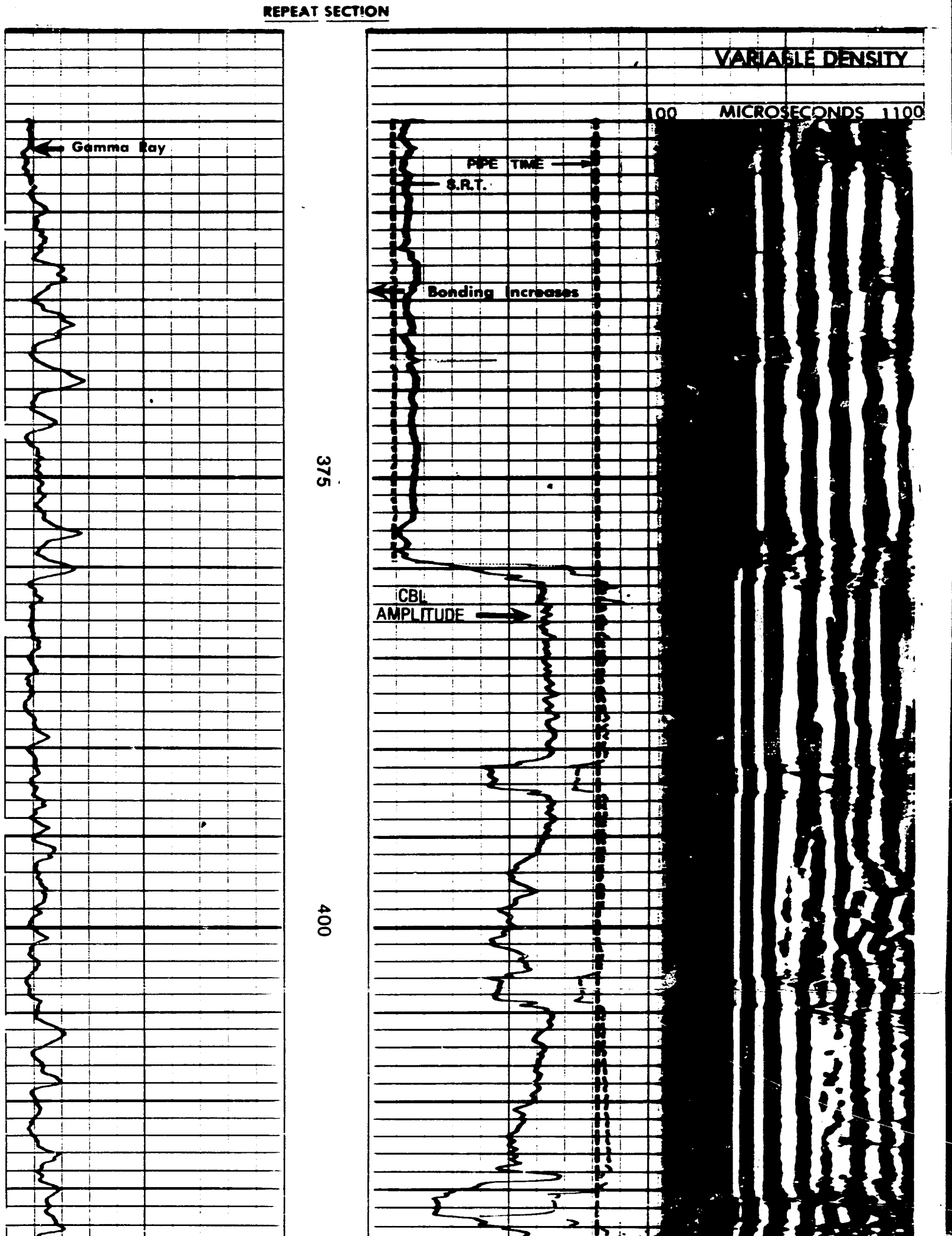

VARIABLE DENSITY
100 MICROSECONDS 1100
Bonding increases
PIPE TIME
CBL AMPLITUDE
S.P.T.
CBL CAL.
0
25
50
75
100
125
Gamma Ray

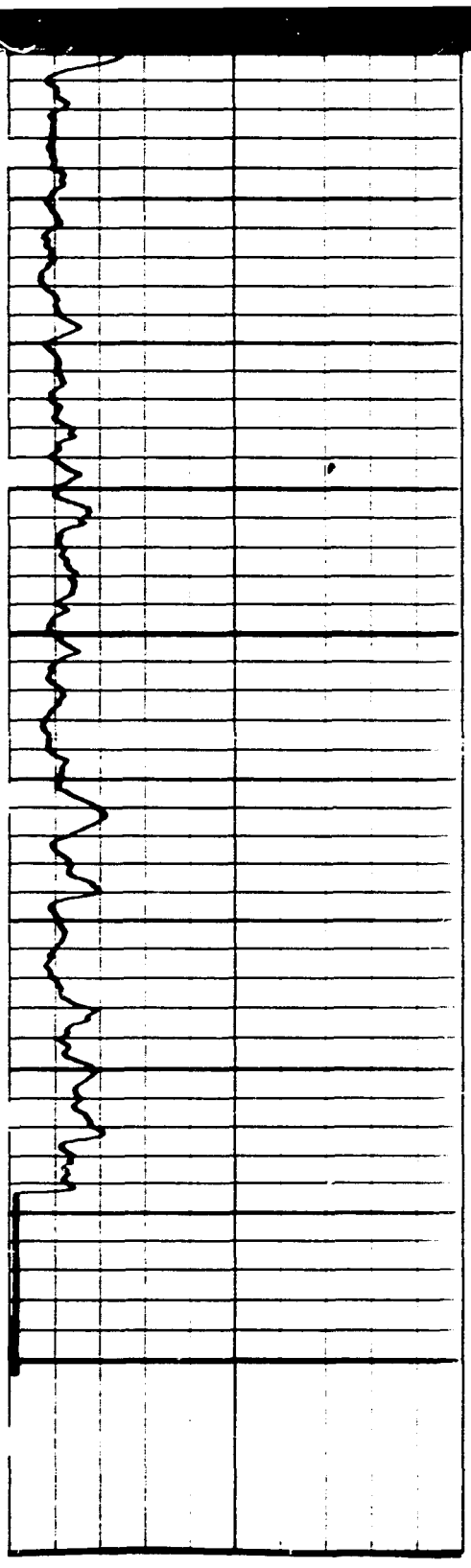

S.R.T.
PIPE TIME
CBL AMPLITUDE
Bonding Increases
125
150
175
200
225
250
Gamma Ray


E.P.F.
PIPE TIME
CBL AMPLITUDE
Bonding increases
STAGE COLLAR
250
275
300
325
350
375
Gamma Ray



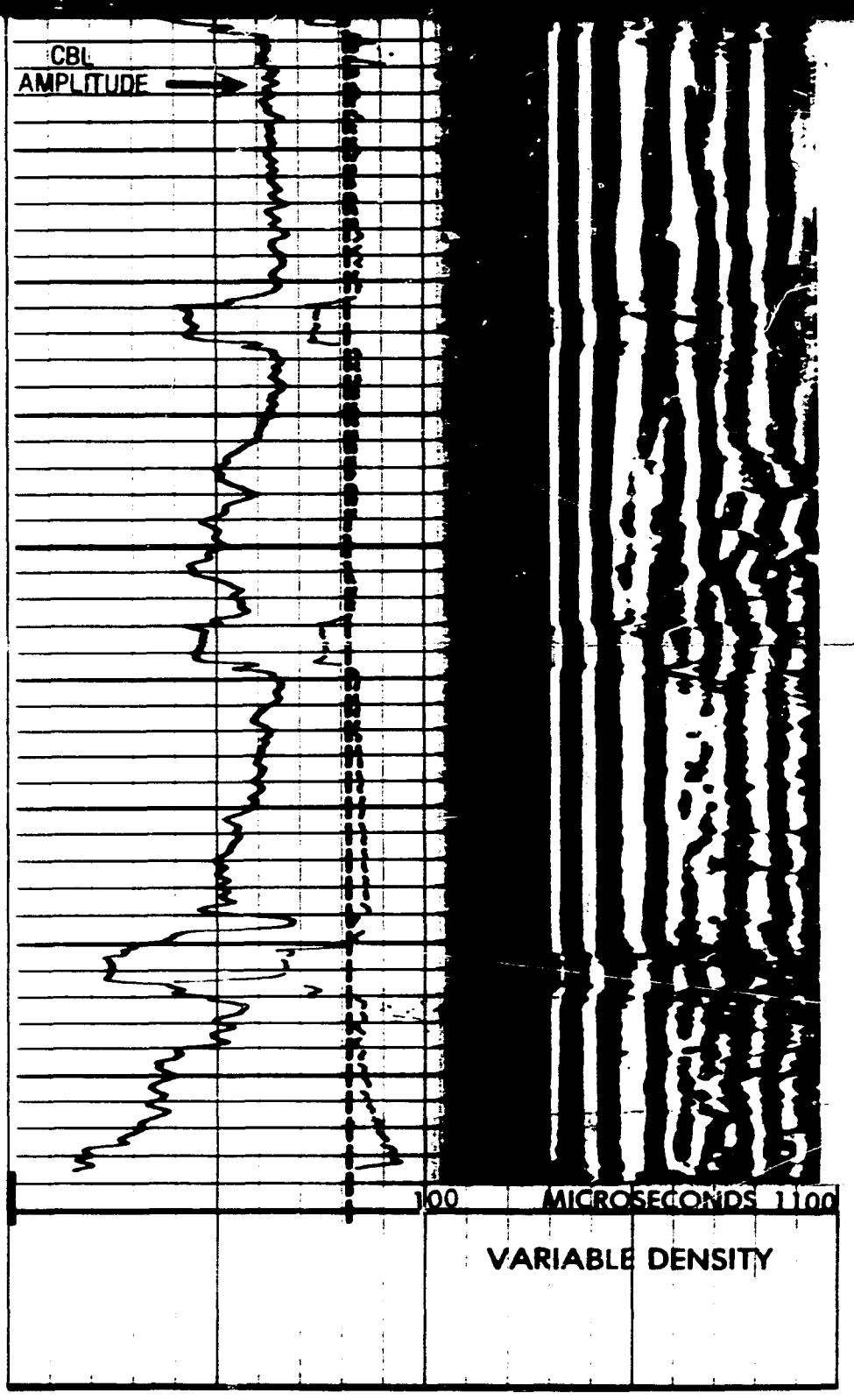

REPEAT SECTION





400

425




| | | | |
|---|---|---|---|
| | BONDING QUALITY INCREASES ← TRANSMISSION AMPLITUDE | MICROSECONDS 350 150 | 100 MICROSECONDS 1100 |
| | SINGLE RECEIVER LINEAR TIME | | VARIABLE DENSITY |
| GAMMA RAY API UNITS 0 120 | DEPTH | **CEMENT BOND LOG** | |

| | | | |
|---|---|---|---|
| COMPANY | FORWARD RESOURCES LTD. | LOG FR | 423.3 M. |
| | | LOG TD | 426.0 M. |
| | | DRLR TD | 428.0 M. |
| WELL | FORWARD ET AL IZOK M-20 | | |
| FIELD | WILDCAT | PD ELEV. | 295.0 M. |
| | | KB ELEV. | 299.2 M. |
| PROVINCE | NORTH WEST TERRITORIES | GL ELEV. | 295.0 M. |

Dresser Atlas | DRESSER

D251

# CALIBRATION

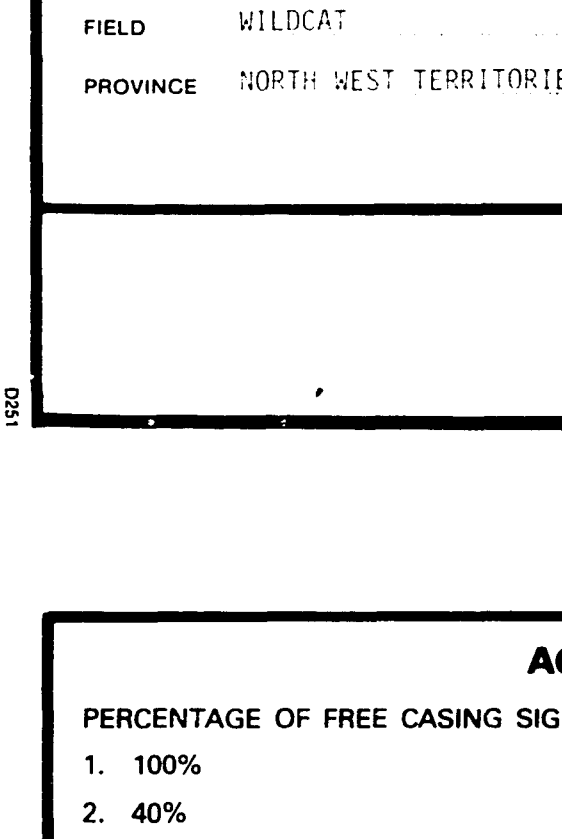
## ACOUSTIC CEMENT BOND LOG

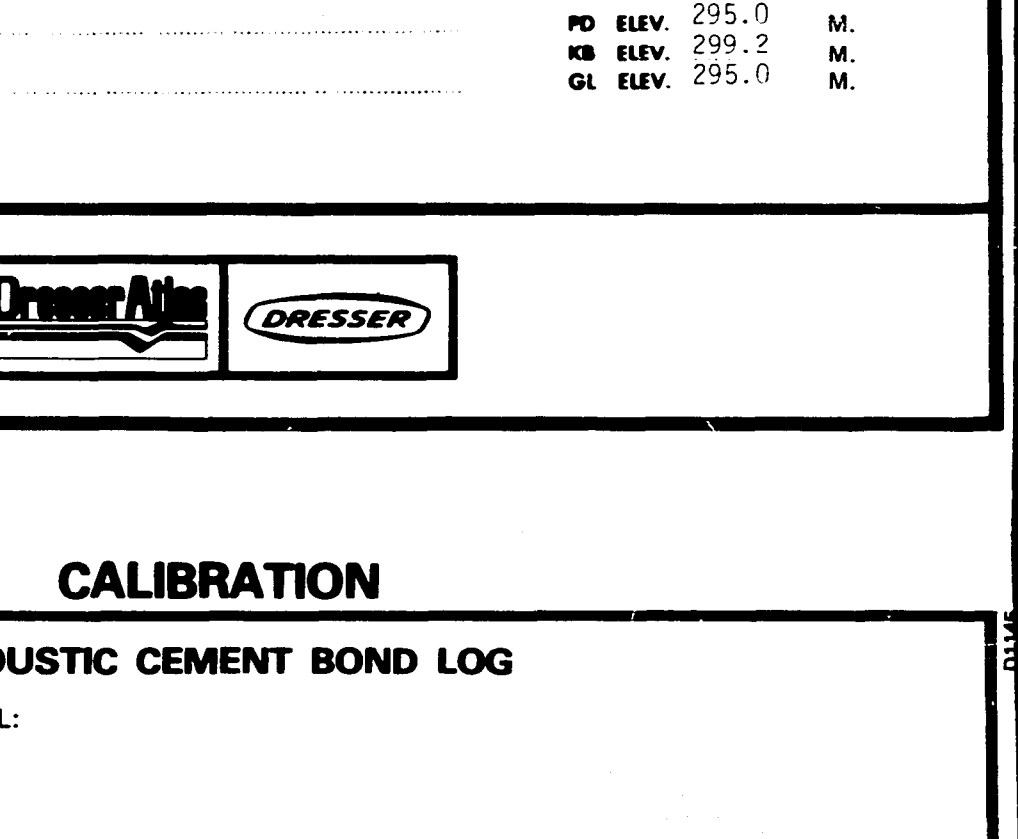
PERCENTAGE OF FREE CASING SIGNAL:

1. 100%
2. 40%
3. 16%
4. 6.4%
5. 2.5%
6. 1%
7. MECHANICAL ZERO

CALIBRATION AT 53.0 M

FREE PIPE SECTION



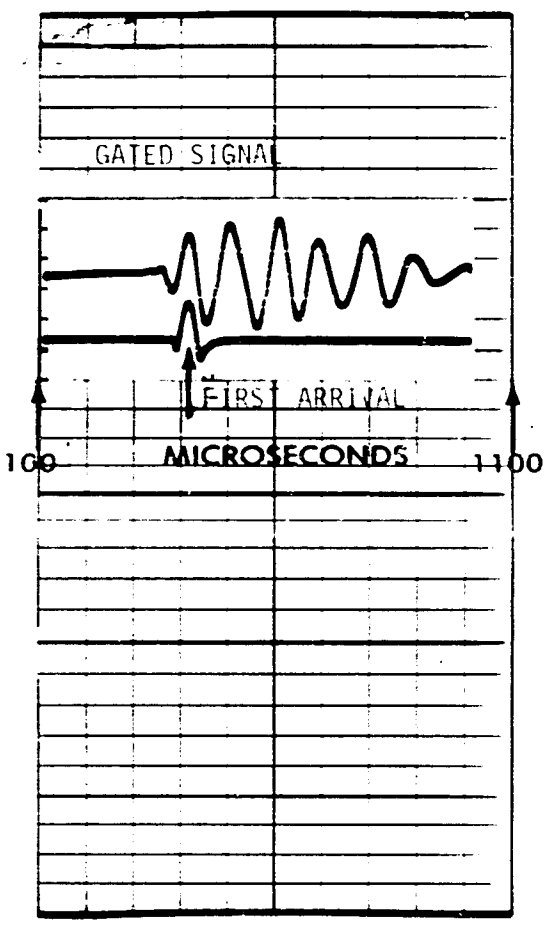



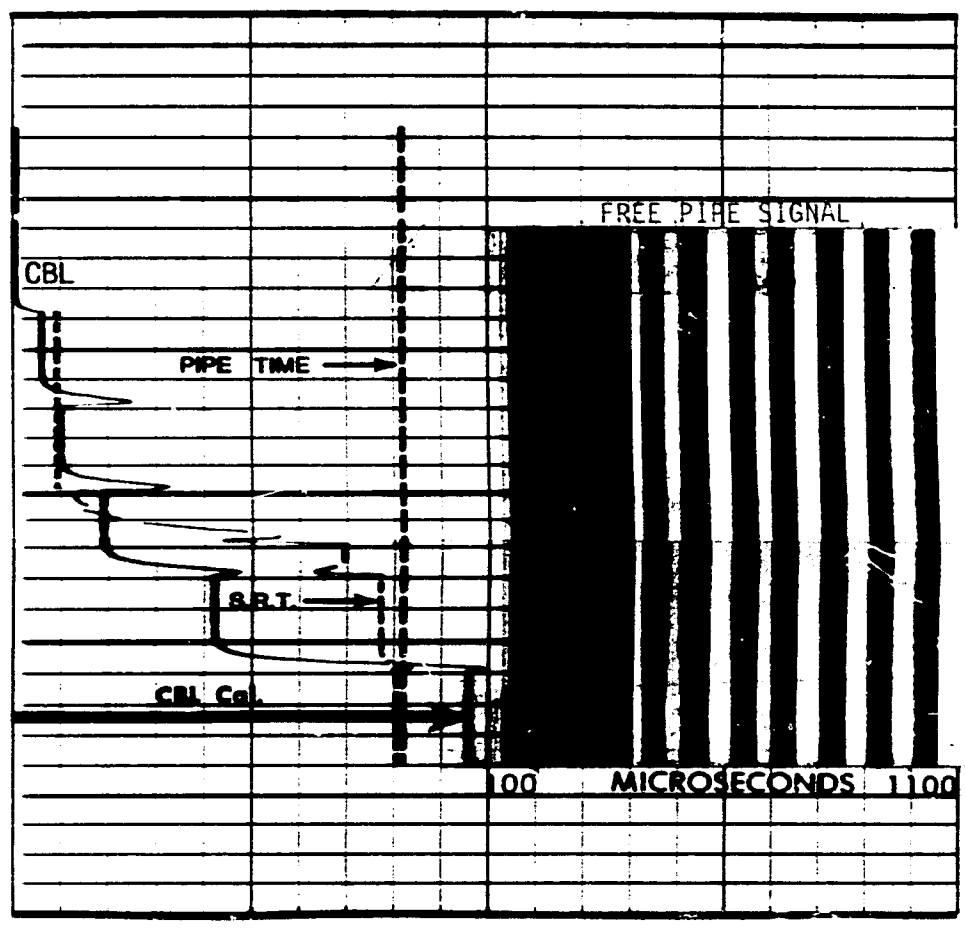

# CALIBRATION

4. 6.4%
5. 2.5%
6. 1%
7. MECHANICAL ZERO

CALIBRATION AT 53.0 M

FREE PIPE SECTION




# CALIBRATION

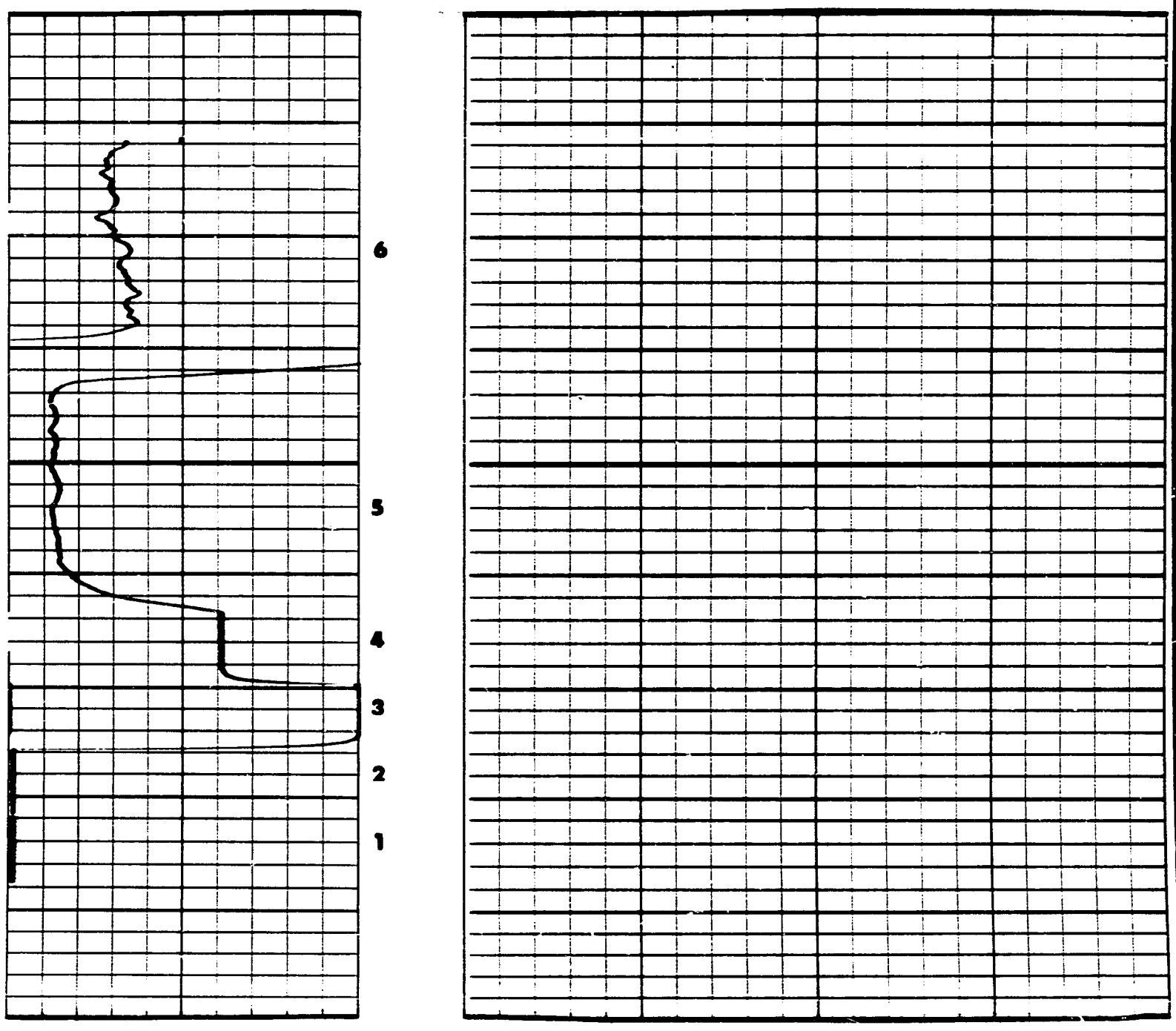
## GAMMA RAY

1. MECHANICAL ZERO
2. PANEL—LOW
3. PANEL—HIGH
4. COUNT RATE METER
5. BACKGROUND READING
6. GAMMA RAY—HIGH

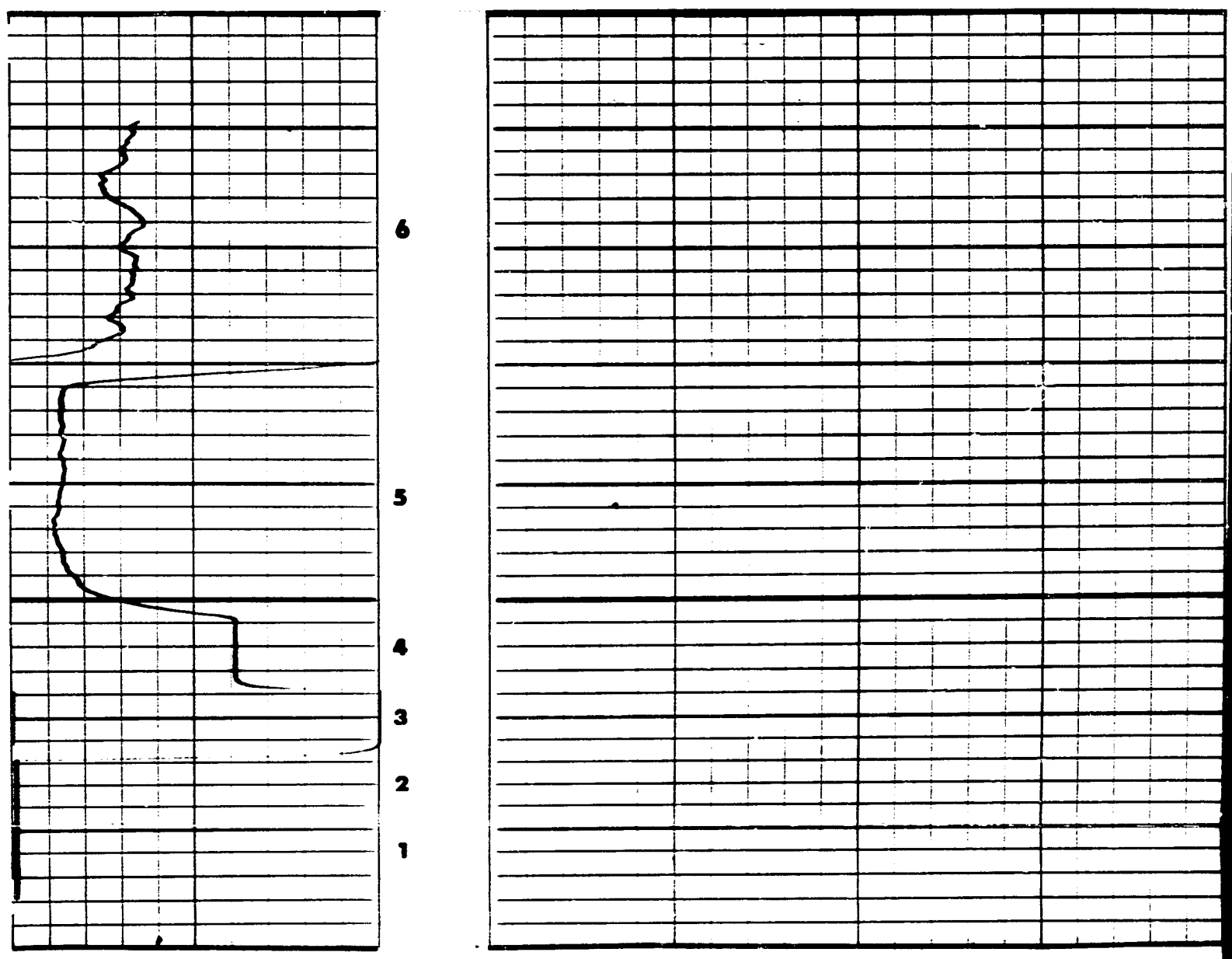
**G. R LOG CALIBRATION**

| | |
|---|---|
| A.P.I. UNITS OF CALIB. STD. | 185 |
| SENSITIVITY READING | 500 |
| MULTIPLIER | X 2 |
| ZERO SUPPRESSION | 0 |
| TIME CONSTANT | 2 |
| MEASURED CHART DIVISIONS | 14 |

CALIBRATION BEFORE SURVEY




CALIBRATION AFTER SURVEY



Dresser Atlas

DRESSER

COMPENSATED **Densilog**

COMPENSATED **Neutron**

FILE NO.

RE-PLOTTED LOG

COMPANY FORWARD RESOURCES LIMITED

WELL FORWARD LT AL IZOK M-20

FIELD WILDCAT

PROVINCE N.W.T.

LOCATION: UNIT M SECTION 20
GRID 67° 20' 123° 45'

LSD ___ SEC ___ TWP ___ RGE ___

Other Services
DLL
BHC-AL
CORES

Permanent Datum GROUND LEVEL Elev 295.0
Log Measured from KELLY BUSHING 4.2 M Above Permanent Datum
Drilling Measured from KELLY BUSHING

Elevations
KB 299.2
DF
GL 295.0

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 31 MARCH 83 | | | | | | | | | | | |
| Run No | THREE | | | | | | | | | | | |
| Depth—Driller | 900.0 | | | | | | | | | | | |
| Depth—Logger | 900.0 | | | | | | | | | | | |
| Bottom Logged Interval | 899.3 | | | | | | | | | | | |
| Top Logged Interval | 248.0 | | | | | | | | | | | |
| Casing—Driller | 178mm @ 589.0 | @ | | @ | | @ | | | | | | |
| Casing—Logger | 588.0 | | | | | | | | | | | |
| Bit Size | 155mm | | | | | | | | | | | |
| Type Fluid in Hole | GEL CHEM | | | | | | | | | | | |
| Density and Viscosity | N/A 65 | | | | | | | | | | | |
| pH and Fluid Loss | 9.0 8.0 cm³ | | cm³ | | cm³ | | | cm³ | | | | |
| Source of Sample | FLOWLINE | | | | | | | | | | | |
| Rm @ Meas. Temp. | .04 @ 16 °C | @ | °C | @ | °C | @ | °C | | | | | |
| Rmf @ Meas. Temp | .039 @ 16 °C | @ | °C | @ | °C | @ | °C | | | | | |
| Rmc @ Meas. Temp | .045 @ 16 °C | @ | °C | @ | °C | @ | °C | | | | | |
| Source of Rmf and Rmc | MEAS MEAS | | | | | | | | | | | |
| Rm @ BHT | .037 @ 19 °C | @ | °C | @ | °C | @ | °C | | | | | |
| Time Since Circ. | 9 HOURS | | | | | | | | | | | |
| Max. Rec. Temp. Deg.C | 19 °C | | °C | | °C | | | °C | | | | |
| Equip. No. and Location | 1407 EDM | | | | | | | | | | | |
| Recorded By | ADAMOWSKI | | | | | | | | | | | |
| Witnessed By | ALDRIDGE | | | | | | | | | | | |

FOLD HERE

CANADA OIL AND GAS LANDS ADMINISTRATION
ADMINISTRATION DU PÉTROLE ET DU GAZ DES TERRES DU CANADA
JUIN 16 1983
ENGINEERING AND CONTROL BRANCH
TECHNIQUE ET DU CONTRÔLE

Remarks: LOG TAPED
605 TO 248 CN ø IS CORRECTED FOR CASING

Equipment Data

| | Gamma Ray | Compensated Densilog | Compensated Neutron |
|---|---|---|---|
| Run No | THREE | THREE | THREE |
| Tool Model No | 1308 | 2212 | 2420 |
| Serial No | 44047 | 47346 | 56088 |
| Diam | 86mm | 124mm | 96mm |
| Detect Model No | D7G3 | 3457 | 3457 |
| Type | SCINT. | 37071 | 37071 |
| Length | 150mm | S3120 | S17S20 |
| Dist to Source | 1.8 M | 592 | 48490 |

General

| | |
|---|---|
| Hoist Truck No | |
| Auxiliary Equipment | |

Logging Data

| Run No | General Depths From | To | Speed M/Min. | Compensated Densilog T C Sec | Density Scale | Correction Scale | Porosity Scale Data | Gamma Ray T.C Sec | Sens Settings | Zero Div L or R | API G R Units/Div |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 900.0 | 588.0 | REC. | CCTC | 2000 3000 | -500 500 | -15 45% SS | 2 | 354 | 0 | 15 |

| Run No | General Depths From | To | Speed M/Min. | Compensated Neutron T C SS | LS | Sens SS | LS | Porosity Zero | Limestone Dev | Scale |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 900.0 | 588.0 | REC. | 3 | 3 | 112 | 123 | R15 | 3% | SS |
| 3 | 605.0 | 248.0 | REC. | 3 | 3 | 112 | 123 | R15 | 3% | SS |

**GAMMA RAY & CALIPER**
0 API UNITS 150

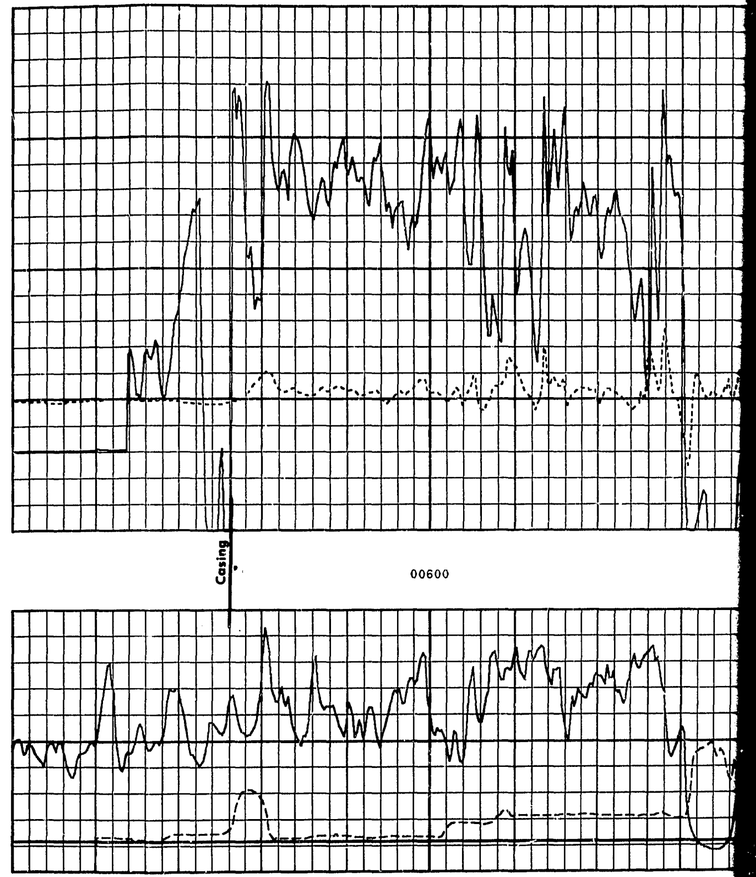
DEPTH

**BULK DENSITY kg/m³**
-500 CORRECTION 500
2,000 2,500 3,000

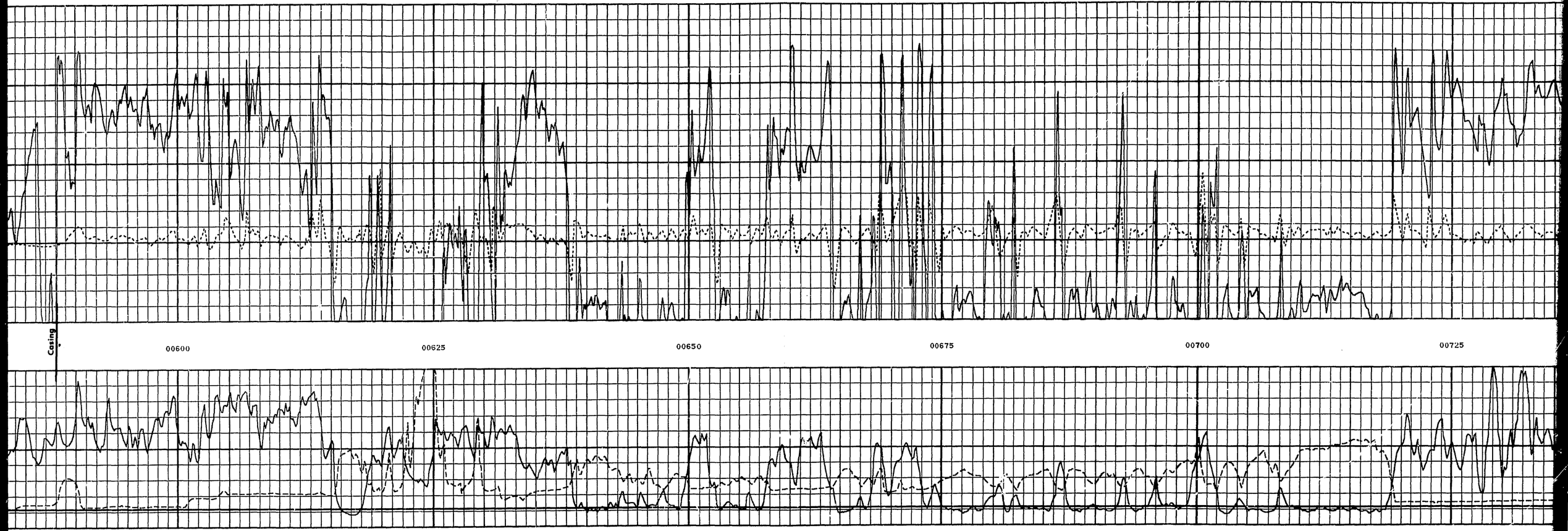
HOLE SIZE - mm
125 375

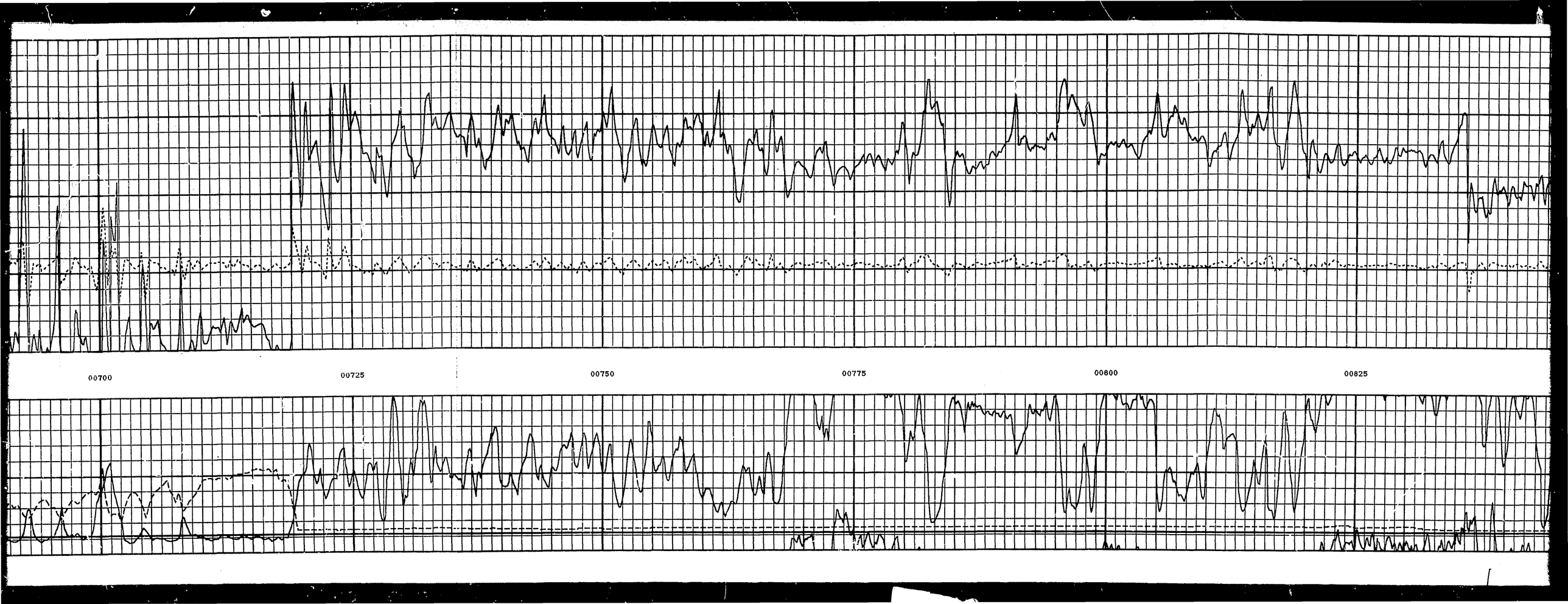
FORWARD RESOURCES LTD.
FORWARD ET AL IZOK M-20

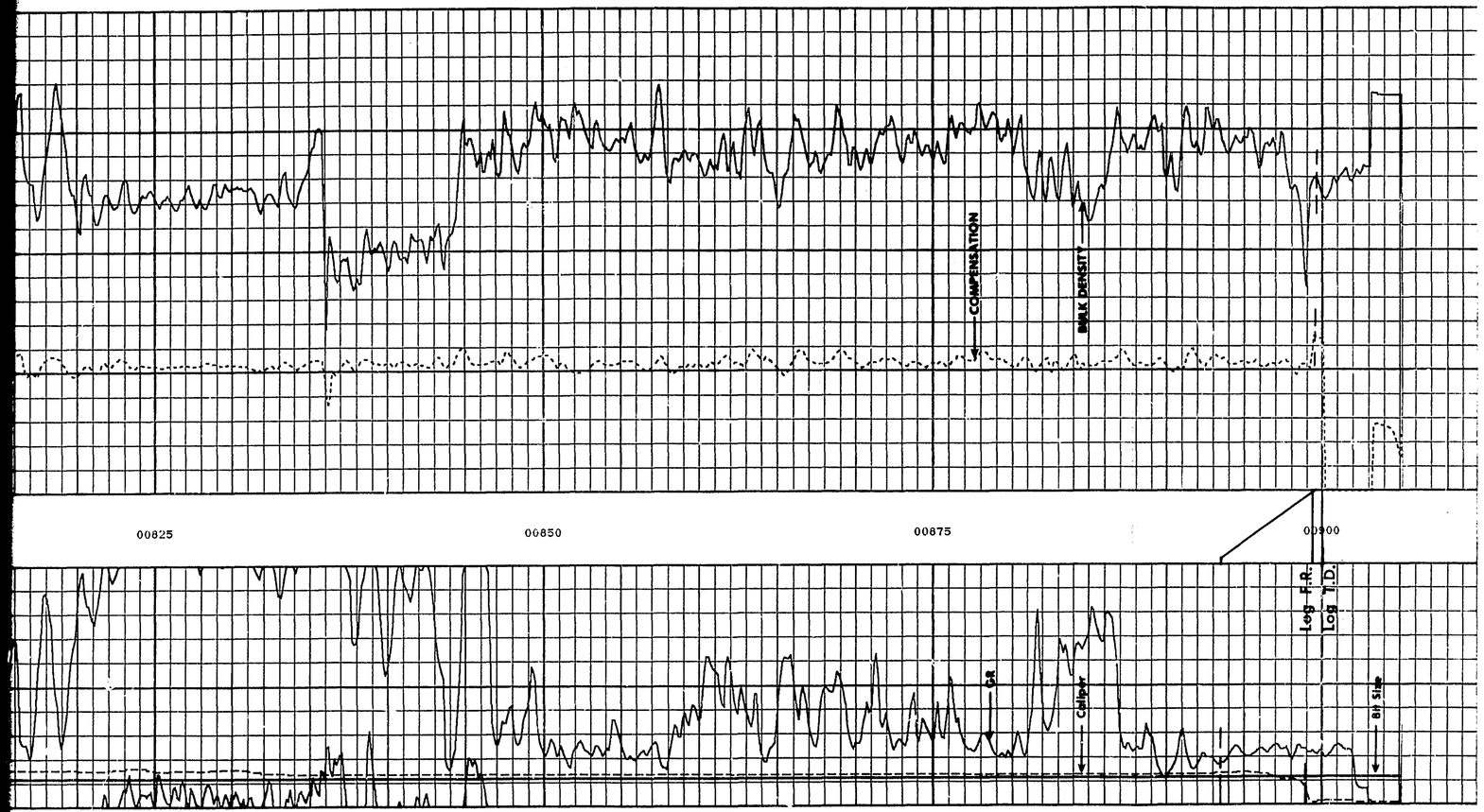
E.I.T. CCC# 2545 RUN THREE
WILDCAT, N.W.T.




Form No. D104

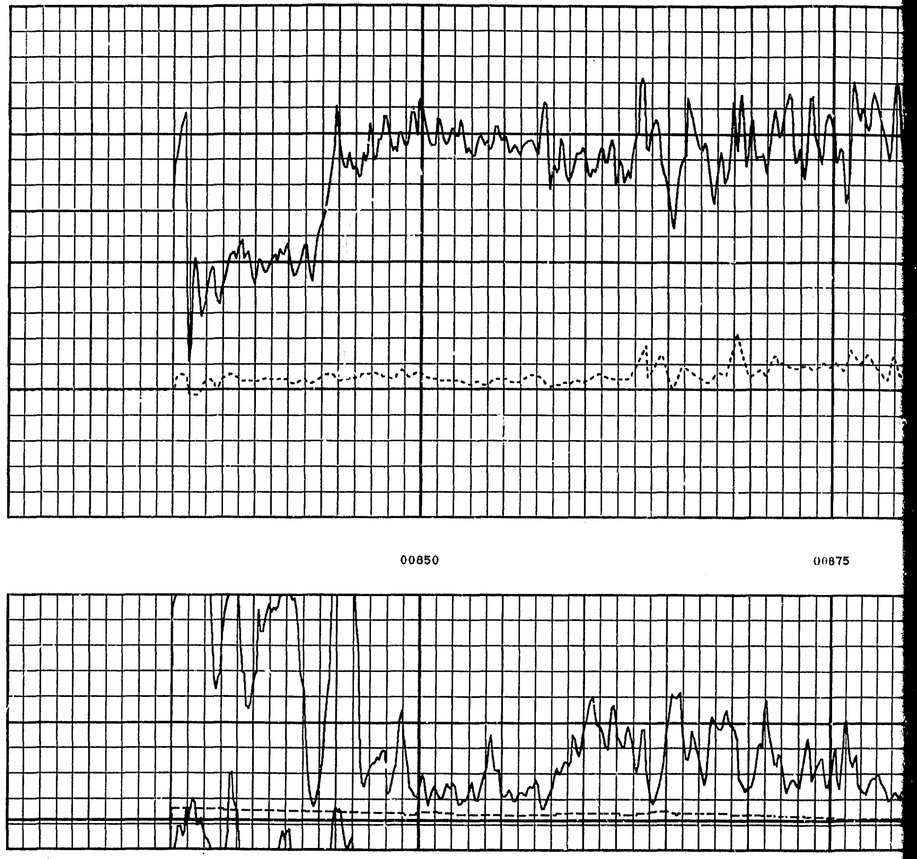

Casing
00600
00625
00650
00675
00700
00725


00700
00725
00750
00775
00800
00825




BIT CCC# 2546 RUN THREE
WILDCAT. N.W. -

**REPEAT SECTION**




FORWARD RESOURCES LTD.
FORWARD ET AL IZOK M-20

00850

00875

00900

| | | |
|---|---|---|
| 125 — HOLE SIZE - mm — 375<br>0 — API UNITS — 150 | | 2,000 — 2,500 — 3,000<br>-500 — CORRECTION — 500 |
| **GAMMA RAY & CALIPER** | **DEPTH** | **BULK DENSITY kg/m³** |
| **GAMMA RAY & CALIPER** | **DEPTH** | SANDSTONE **POROSITY %** |
| API UNITS<br>0 — 150<br>HOLE SIZE - mm<br>125 — 375 | | COMPENSATED DENSITY POROSITY<br>45 — 15 — -15<br>COMPENSATED NEUTRON POROSITY<br>45 — 15 — -15 |

FORWARD RESOURCES LTD.

FORWARD ET AL IZOK M-28

E.T. CCC# 2546 RUN THREE

WILDCAT. N.W.T.

00250

HOLE SIZE - mm

125 375

COMPENSATED NEUTRON POROSITY

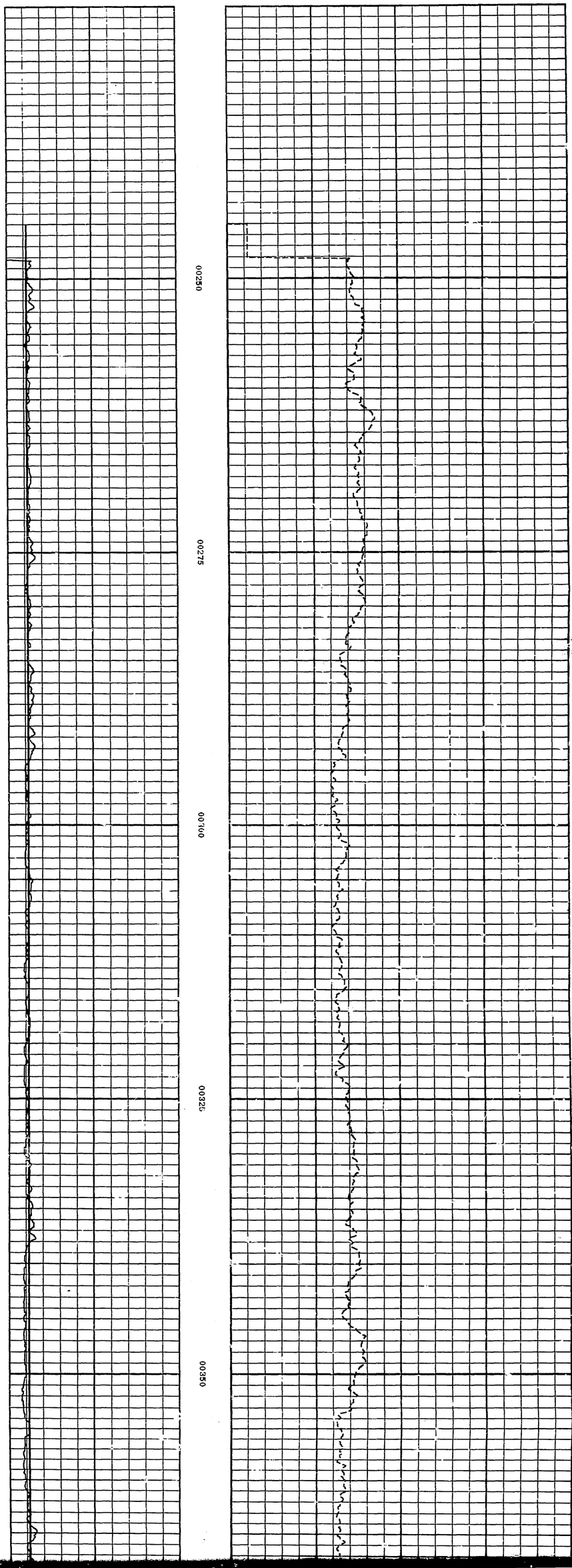
45 15 -15

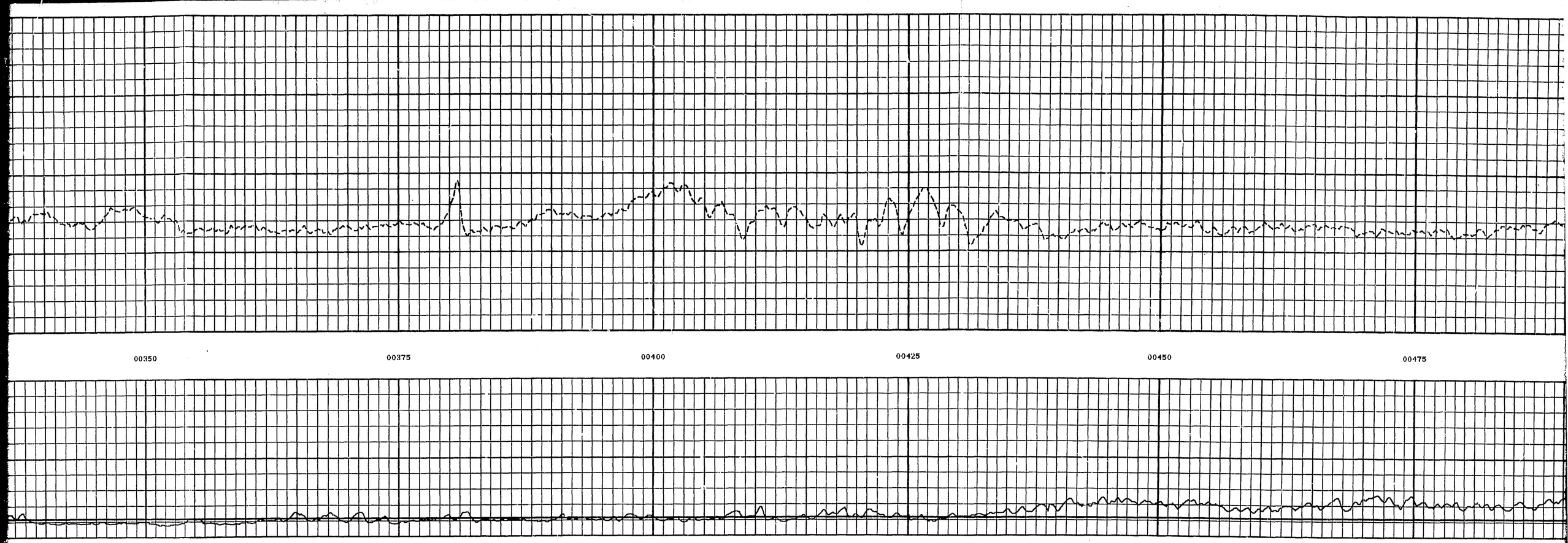
FORWARD RESOURCES LTD.

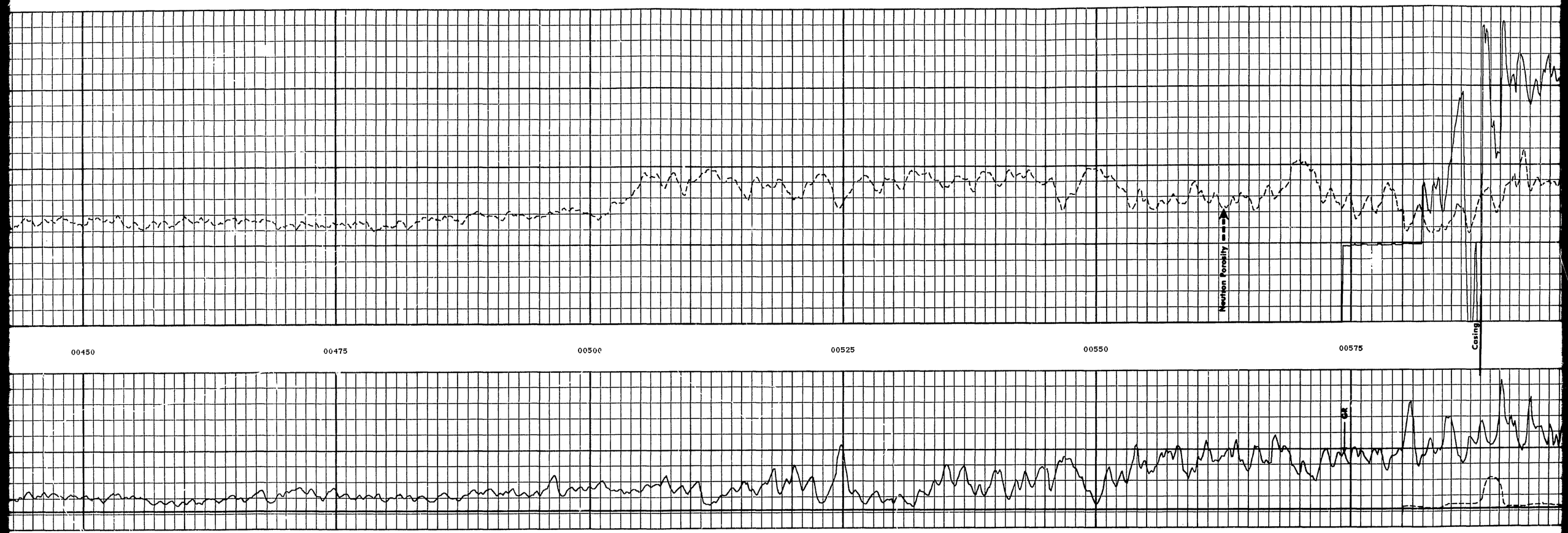
FORWARD ET AL IZOK M-20

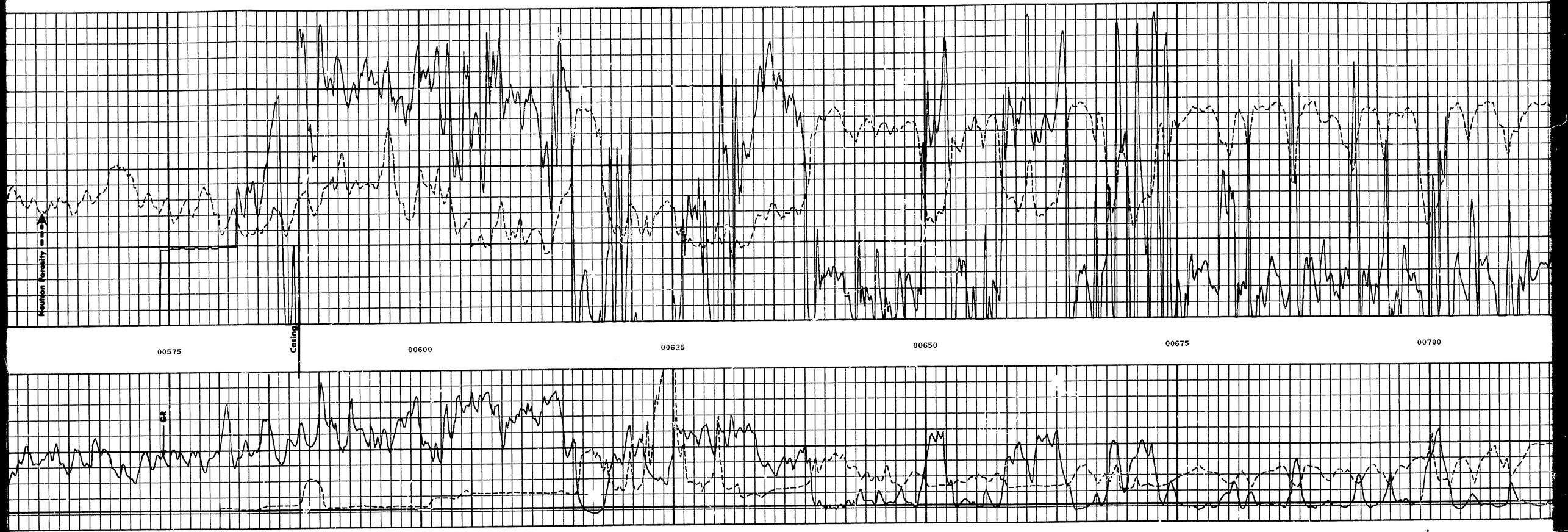
BIT CCC# 2546 RUN THREE

WILDCAT, N.W.T.

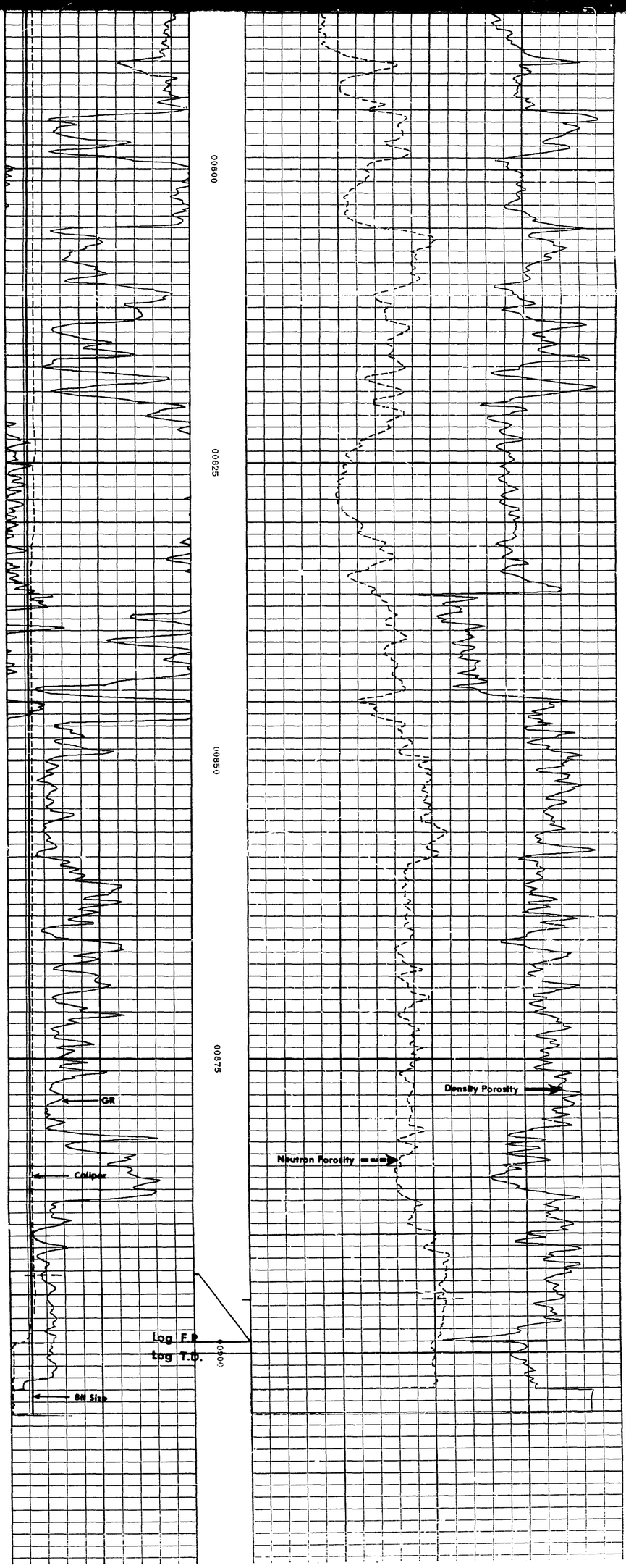



00350
00375
00400
00425
00450
00475


Neutron Porosity
Casing
GR
00450
00475
00500
00525
00550
00575


Neutron Porosity
00575
Casing
00600
00625
00650
00675
00700
GR


00675
00700
00725
00750
00775
00800



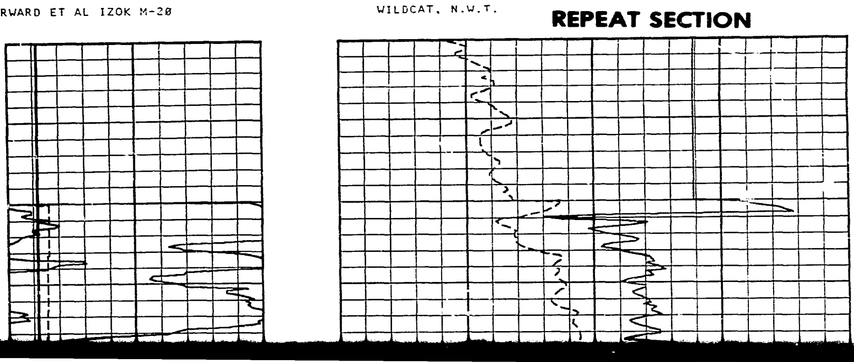

FORWARD RESOURCES LTD.

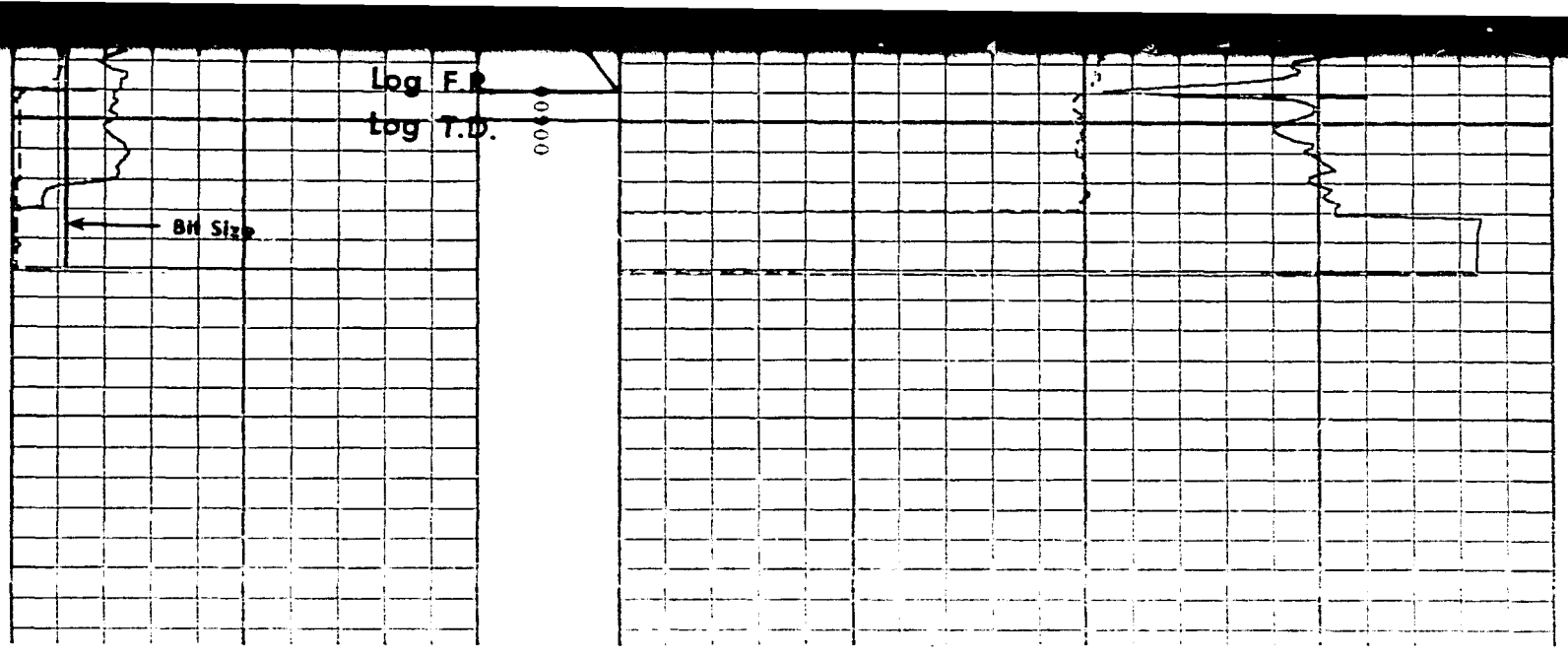
FORWARD ET AL IZOK M-20

BIT CCC# 2546 RUN THREE

WILDCAT, N.W.T.

**REPEAT SECTION**





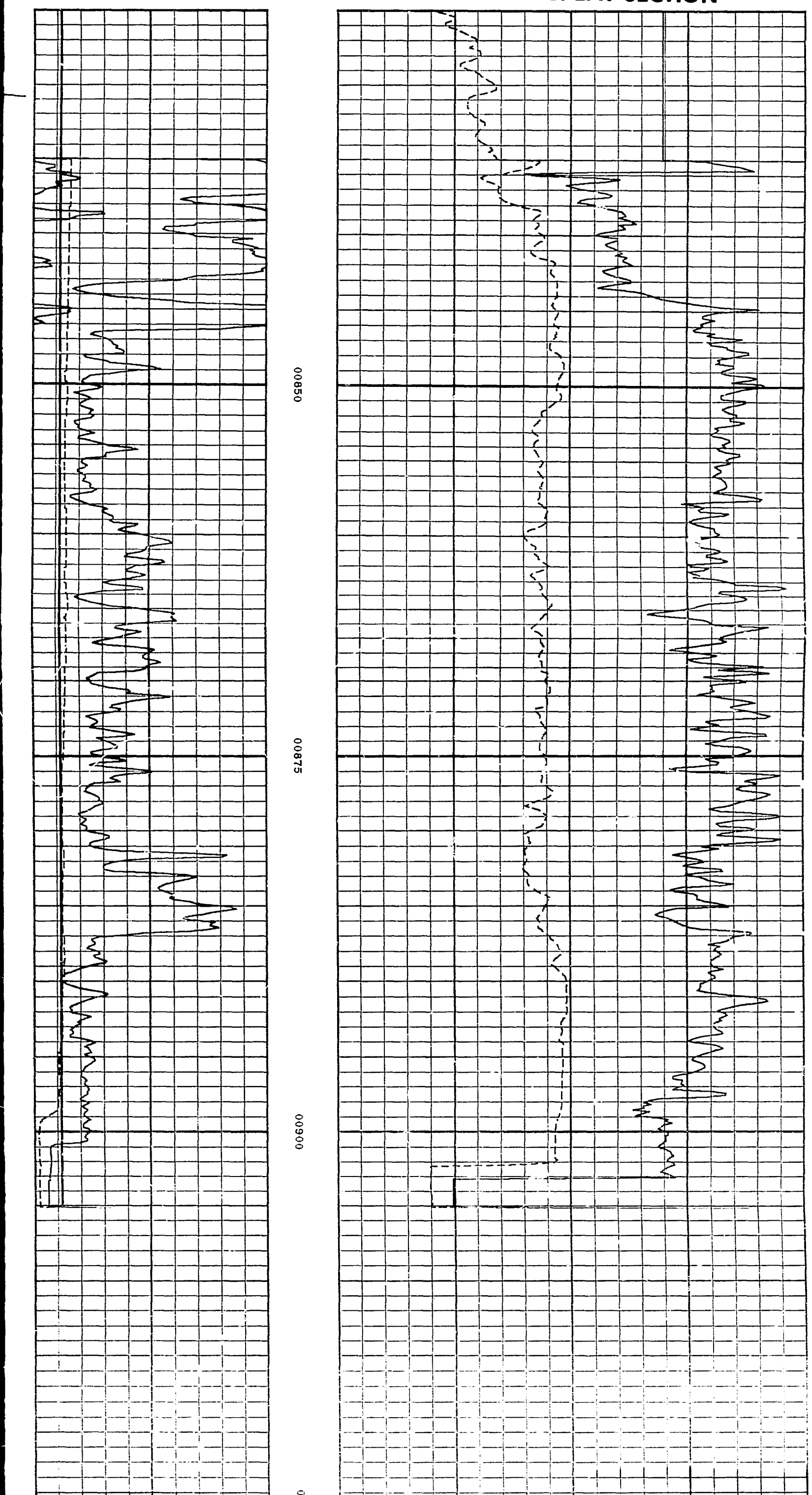

FORWARD RESOURCES LTD.

FORWARD ET AL IZOK M-20

BIT CCC# 2546 RUN THREE

WILDCAT, N.W.T.

**REPEAT SECTION**



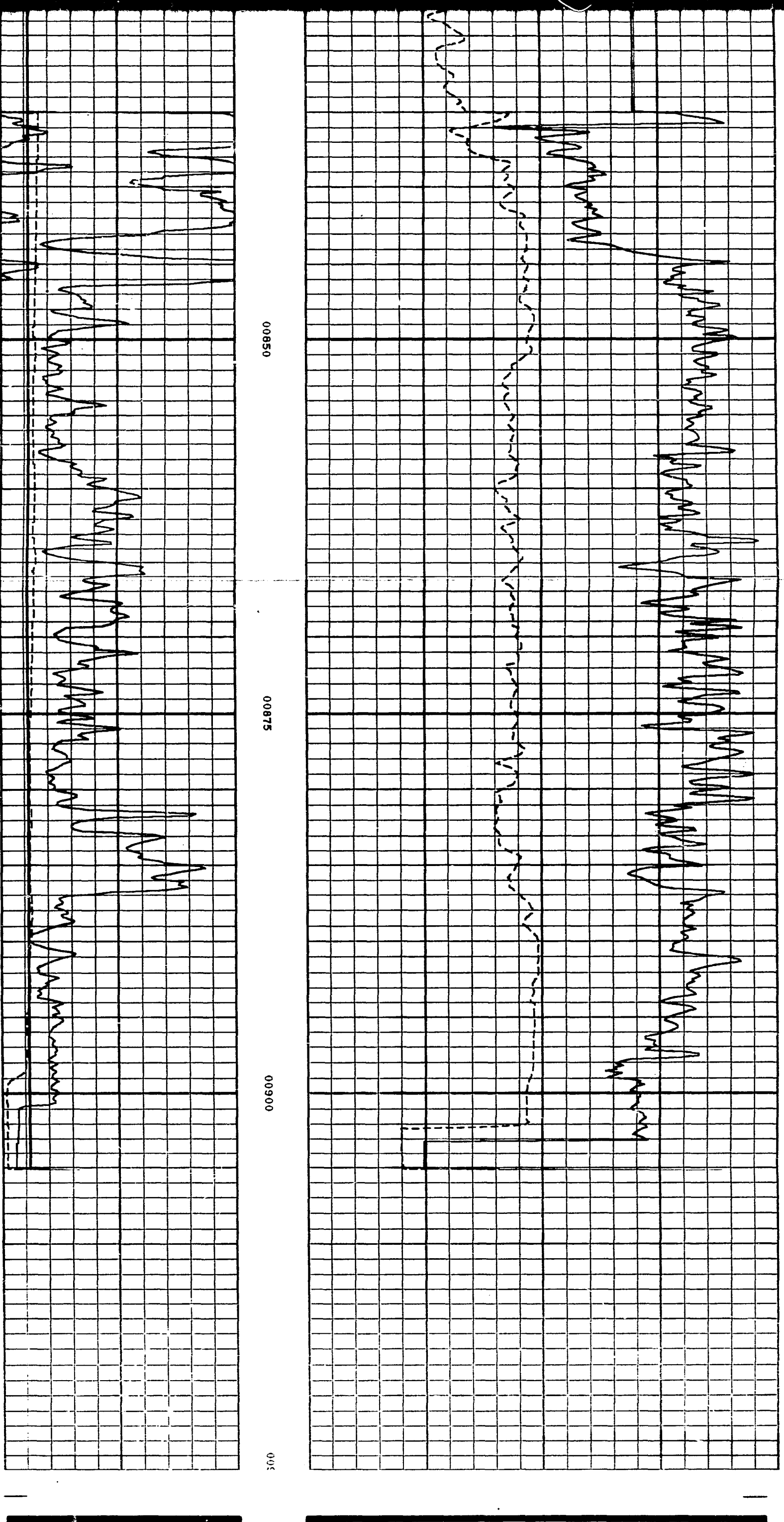

| 150 HOLE SIZE - mm 400 | 45 COMPENSATED NEUTRON POROSITY 15 -15 |
|---|---|
| 0 API UNITS 150 | 45 COMPENSATED DENSITY POROSITY 15 -15 |
| **GAMMA RAY & CALIPER** | DEPTH — SANDSTONE — **POROSITY %** $D_B$ = 2650 kg/m$^3$ |

COMPANY FORWARD RESOURCES LIMITED

WELL FORWARD ET AL ANDERSON C-51

WILDCAT

LOG FR 1014.0 M.
LOG TD 1012.0 M.
DRLR TD 1011.4 M.
RM = .068 @ 16 C° BHT
RMF = .06 @ 16 C°
RMC = .08 @ 16 C°




| 150 HOLE SIZE - mm 400 | | 45 COMPENSATED NEUTRON POROSITY -15 |
|---|---|---|
| 0 API UNITS 150 | | 45 COMPENSATED DENSITY POROSITY -15 |
| **GAMMA RAY & CALIPER** | DEPTH | SANDSTONE **POROSITY %** $D_B$ = 2650 kg/m$^3$ |

| | | | |
|---|---|---|---|
| COMPANY | FORWARD RESOURCES LIMITED | LOG FR | 1014.0 M. |
| | | LOG TD | 1012.0 M. |
| | | DRLR TD | 1011.4 M. |
| WELL | FORWARD ET AL ANDERSON C-51 | RM = .068 @ 16 C° | BHT |
| | | RMF = .06 @ 16 C° | |
| FIELD | WILDCAT | RMC = .08 @ 16 C° | |
| PROVINCE | N.W.T. | PD ELEV. 298.0 M. | |
| | | KB ELEV. 302.2 M. | |
| | | GL ELEV. 298.0 M. | |

Dresser Atlas DRESSER

Form No. D106

# SEISMIC REFERENCE SERVICE
## Geophysical Log

CENTURY GEOPHYSICAL CORP OF CANADA
Calgary, Alberta

INT Wildcat Forward et al Izok M-20 Forward Resources Ltd.
PROVINCE
FIELD
WELL
COMPANY

COMPANY Forward Resources Ltd.

WELL Forward et al Izok M-20

G211-F91-1-2

FIELD Wildcat

PROVINCE NWT

LOCATION 67°20'N 123° 45'W

Other Services

Permanent Datum GL Elev. 295.0 m
Log Measured From KB 4.2 m Above Perm Datum

ELEV KB 299.2 m
GL 295.0 m

| SEISMIC DATA (By Century Geophysical Corp of Canada) | |
|---|---|
| Seismic Datum | 275.0 |
| Difference Between Seismic and Sonic Datum | 24.2 |
| Amplifiers: | DFS III set 2 |
| WELL GEOPHONE | |
| Make | SIE #3 |
| Type | Wall-locking |
| Filter | |
| SURFACE SPREAD | |
| Surface Geophone Stations | 1 |
| Geophones per Station | 1 |
| Reflection Filters | |
| Recording Time | 1 Hr. 30 mins. |
| Crew No | 1 |
| Truck No | Portable |
| Operator | LaCroix |
| Survey No | 2739 |

| SONIC DATA | | SONIC DATA | | SONIC DATA | |
|---|---|---|---|---|---|
| Sonic Run No | One | | Two | | Three |
| Date | 83-03-07 | | 83-03-09 | | 83-03-31 |
| First Reading | 453.1 | m | 468.1 | m | 897.5 m |
| Last Reading | 33.0 | m | 400.0 | m | 588.0 m |
| Metres Measured | 420.1 | m | 68.1 | m | 309.5 m |
| Depth Reached | 456.0 | m | 471.0 | m | 900.0 m |
| Bottom Driller | 460.0 | m | 479.6 | m | 900.0 m |
| Csg. Logger | 33.0 | m | 33.0 | m | 588.0 m |
| Csg. Driller | 35.0 | m | 35.0 | m | 589.0 m |

Sonic Span and Spacing Used

T R R

T R R R R T

| | | | | | |
|---|---|---|---|---|---|
| Bit Size | 311 | mm | 311 | mm | 155 mm |
| Span | | | | | |
| Logging Co | Dresser | | Dresser | | Dresser |
| Truck No | 1407 | | 1407 | | 1407 |
| Recorded By | Murray | | Murray | | Adamowski |
| Witness | Williams | | Williams | | Aldridge |

REMARKS

For correct sonic log readings from:
133 m to 445 m add 8.0 μsec/m.
445 m to 900 m add 3.3 μsec/m.

Four surface reference geophones were layed out over the lease a vehicle ran over the spread cable causing three geophones to go dead.

A straight line was digitized at 170μsec/m... from 450 m to 555 m.

THIS IS AN UNCORRECTED LOG

INTERVAL VELOCITY (m per sec.)
9000 8000 7000 6000 5000 4000 3000 2000

INTERVAL TRANSIT TIME (microseconds per metre)
100 200 300 400 500

VELOCITY (metres per second) = 1,000,000 / INTERVAL TRANSIT TIME
RELATIVE TRAVEL TIME
090 080 070 060 050 040 030 020 010

For correct sonic readings add 80 μsec/m.

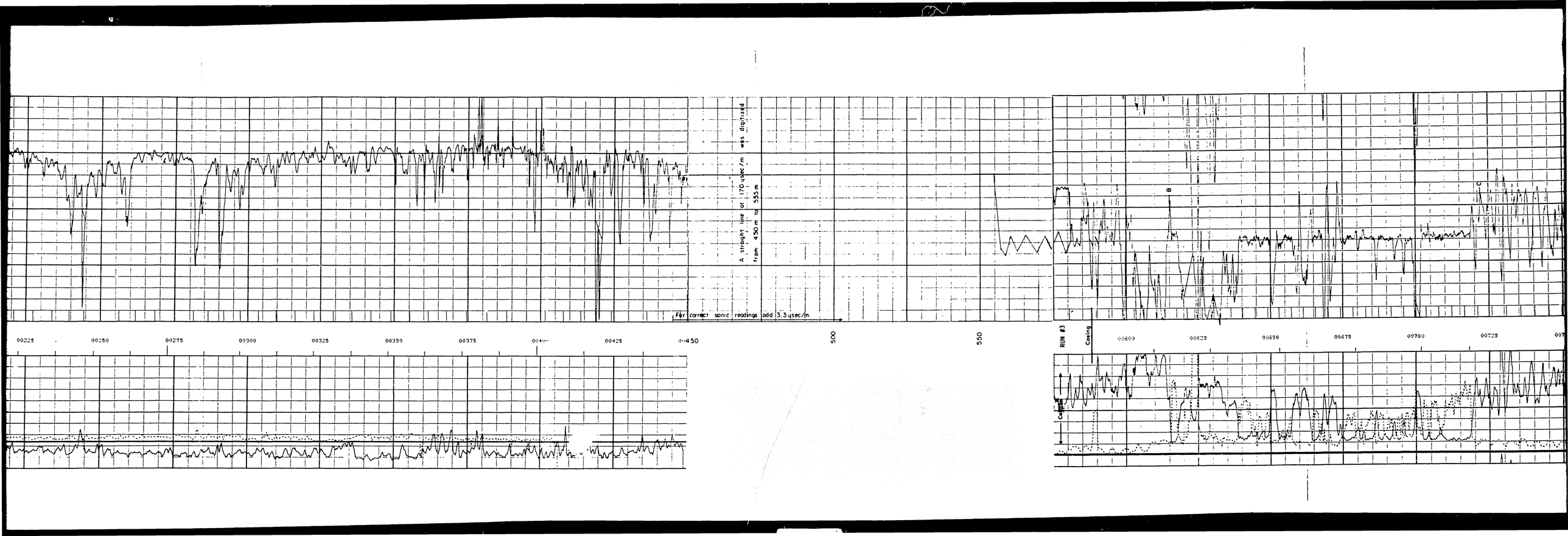
DEPTH BELOW K.B.

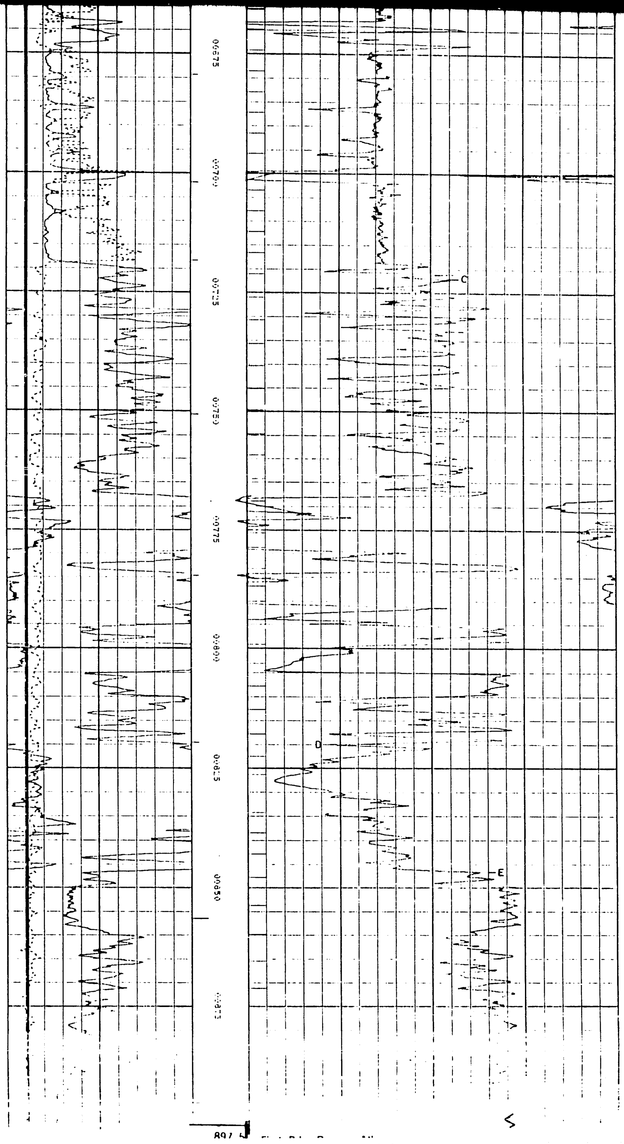
Casing

00050 00075 00100 00125 00150 00175 00200 00225 00250 00275 00300

GAMMA RAY API UNITS
TC div to left
Zero
150 300

CALIPER hole diameter in mm
500 250


A straight line at 170 usec/m was digitized from 450 m to 555 m
For correct sonic readings add 3.3 usec/m
450
500
550
RUN #3
Casing
B
C
00225
00250
00275
00300
00325
00350
00375
00425
00600
00625
00650
00675
00700
00725

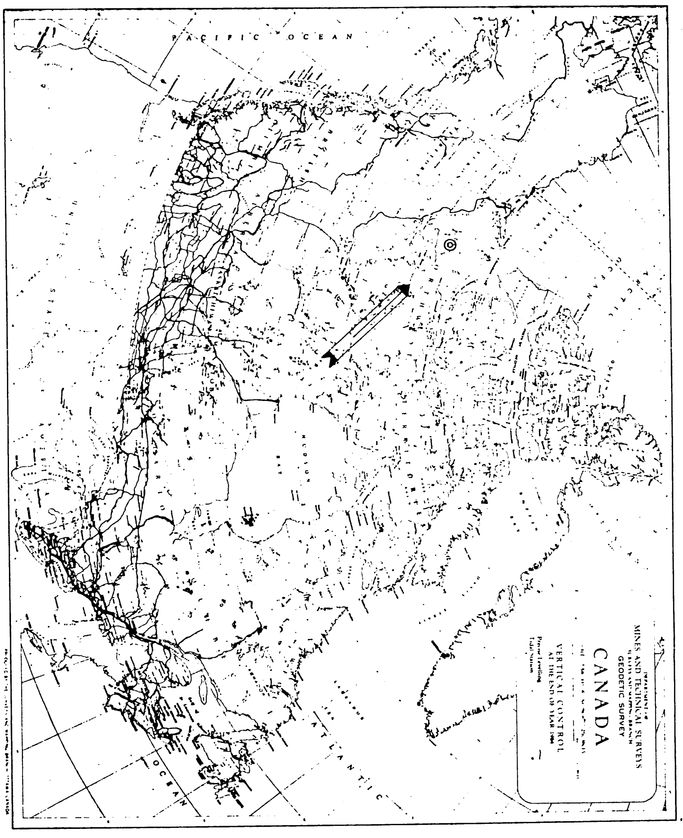



WHERE: "DGM" IS MEASURED DEPTH BELOW K.B., "TVD" IS THE TRUE VERTICAL DEPTH BELOW K.B., AND "TL" REPRESENTS THE ADJUSTED INTEGRATED SONIC TIME BELOW SEISMIC DATUM

| FORMATION | SYMBOL | DGM | TVD | 2TL | FORMATION | SYMBOL | DGM | TVD | 2TL |
|---|---|---|---|---|---|---|---|---|---|
| TOP MANNING | A | 80.0 | | .0264 | L. MOUNT CAP | D | 820.0 | | .3186 |
| TOP SALT | B | 615.0 | | .2224 | PRECAMBRIAN | E | 847.0 | | .3314 |
| MOUNT CAP | C | 722.0 | | .2742 | | | | | |

| ADJUSTED INTEGRATED TIME BELOW 275.0 METRE DATUM | DEPTH BELOW K.B. 299.2 METRES | UNADJUSTED INTEGRATED TIME BELOW 275.0 METRE DATUM | AVERAGE VELOCITY BELOW 275.0 METRE DATUM | INTERVAL VELOCITY OVER PRECEDING MILLISECOND | REFLECTION COFFFICIENT (V2-V1)/(V2+V1) |
|---|---|---|---|---|---|
| .0130 | 79.0 | .0130 | 4215.4 | N/A | N/A |
| .0140 | 83.8 | .0140 | 4257.6 | 4806.4 | .0200 |
| .0150 | 88.8 | .0150 | 4307.3 | 5002.5 | .0745 |
| .0160 | 94.6 | .0160 | 4401.0 | 5807.5 | -.0754 |
| .0170 | 99.6 | .0170 | 4435.9 | 4993.3 | .0477 |
| .0180 | 105.1 | .0180 | 4494.6 | 5493.0 | .0202 |
| .0190 | 110.8 | .0190 | 4559.1 | 5719.6 | -.0185 |
| .0200 | 116.3 | .0200 | 4606.7 | 5511.6 | -.1195 |
| .0210 | 120.7 | .0210 | 4591.8 | 4335.1 | .0109 |
| .0220 | 125.1 | .0220 | 4586.4 | 4430.9 | .0264 |
| .0230 | 129.8 | .0230 | 4590.1 | 4671.5 | .0529 |
| .0240 | 135.0 | .0240 | 4615.2 | 5193.3 | -.0386 |
| .0250 | 139.8 | .0249 | 4622.9 | 4807.1 | .0265 |
| .0260 | 144.8 | .0259 | 4640.0 | 5068.8 | .0594 |
| .0270 | 150.6 | .0269 | 4679.6 | 5709.2 | -.0229 |
| .0280 | 156.0 | .0278 | 4707.3 | 5454.1 | -.0824 |
| .0290 | 160.6 | .0288 | 4704.4 | 4623.7 | .0320 |
| .0300 | 165.6 | .0297 | 4711.9 | 4929.8 | .0361 |
| .0310 | 170.9 | .0307 | 4730.8 | 5298.7 | -.0784 |
| .0320 | 175.4 | .0317 | 4724.5 | 4528.0 | .0676 |
| .0330 | 180.6 | .0326 | 4738.4 | 5184.6 | .0411 |
| .0340 | 186.2 | .0336 | 4764.6 | 5629.3 | -.0181 |
| .0350 | 191.6 | .0345 | 4783.6 | 5429.4 | .0303 |
| .0360 | 197.4 | .0355 | 4811.0 | 5768.3 | -.0040 |
| .0370 | 203.1 | .0364 | 4835.6 | 5722.7 | .0262 |
| .0380 | 209.2 | .0374 | 4867.1 | 6030.6 | .0208 |
| .0390 | 215.4 | .0383 | 4903.5 | 6286.4 | .0031 |
| .0400 | 221.8 | .0393 | 4939.0 | 6325.6 | -.0181 |
| .0410 | 227.9 | .0402 | 4967.4 | 6101.1 | -.0137 |
| .0420 | 233.8 | .0412 | 4990.4 | 5936.3 | -.0538 |
| .0430 | 239.1 | .0422 | 4998.3 | 5330.0 | -.0223 |
| .0440 | 244.2 | .0431 | 5000.6 | 5097.6 | .0351 |
| .0450 | 249.7 | .0441 | 5011.0 | 5468.4 | .0312 |
| .0460 | 255.5 | .0450 | 5028.6 | 5820.9 | -.0253 |
| .0470 | 261.0 | .0460 | 5039.3 | 5533.1 | .0601 |
| .0480 | 267.3 | .0469 | 5064.4 | 6240.7 | -.0010 |
| .0490 | 273.5 | .0479 | 5088.1 | 6228.3 | -.0083 |
| .0500 | 279.6 | .0488 | 5108.9 | 6125.5 | -.1148 |
| .0510 | 284.5 | .0498 | 5104.1 | 4864.4 | .0562 |
| .0520 | 290.0 | .0507 | 5110.6 | 5443.6 | .0035 |
| .0530 | 295.4 | .0517 | 5117.6 | 5482.1 | .0220 |
| .0540 | 301.2 | .0527 | 5128.9 | 5729.3 | .0181 |
| .0550 | 307.1 | .0536 | 5143.7 | 5940.3 | .0082 |
| .0560 | 313.1 | .0546 | 5159.7 | 6038.2 | .0055 |
| .0570 | 319.2 | .0555 | 5176.2 | 6105.3 | .0084 |
| .0580 | 325.5 | .0565 | 5194.1 | 6209.1 | .0053 |
| .0590 | 331.7 | .0574 | 5212.4 | 6274.9 | -.0142 |
| .0600 | 337.8 | .0584 | 5227.2 | 6099.1 | .0107 |
| .0610 | 344.1 | .0593 | 5243.6 | 6231.1 | .0108 |
| .0620 | 350.4 | .0603 | 5261.7 | 6366.6 | -.0237 |
| .0630 | 356.5 | .0612 | 5274.6 | 6072.3 | .0020 |
| .0640 | 362.6 | .0622 | 5287.4 | 6097.1 | .0050 |
| .0650 | 368.8 | .0631 | 5300.8 | 6157.7 | .0202 |
| .0660 | 375.2 | .0641 | 5317.7 | 6411.4 | .0055 |
| .0670 | 381.6 | .0650 | 5335.0 | 6481.9 | -.0000 |
| .0680 | 388.1 | .0660 | 5351.9 | 6481.5 | -.0039 |
| .0690 | 394.6 | .0669 | 5367.5 | 6431.3 | -.0075 |
| .0700 | 400.9 | .0679 | 5381.4 | 6335.9 | -.0296 |
| .0710 | 406.9 | .0688 | 5389.7 | 5971.5 | -.0147 |
| .0720 | 412.7 | .0698 | 5395.4 | 5798.8 | -.0354 |
| .0730 | 418.1 | .0707 | 5395.5 | 5402.2 | -.0116 |
| .0740 | 423.3 | .0717 | 5393.9 | 5278.1 | .0507 |
| .0750 | 429.2 | .0726 | 5399.8 | 5841.5 | .0183 |
| .0760 | 435.2 | .0736 | 5408.5 | 6059.0 | -.0622 |
| .0770 | 440.6 | .0745 | 5407.7 | 5348.9 | .0327 |
| .0780 | 446.3 | .0755 | 5411.6 | 5710.4 | .0049 |
| .0790 | 452.1 | .0765 | 5416.1 | 5766.7 | .0003 |
| .0800 | 457.8 | .0775 | 5420.5 | 5770.3 | .0000 |
| .0810 | 463.6 | .0784 | 5424.9 | 5770.6 | -.0000 |
| .0820 | 469.4 | .0794 | 5429.1 | 5770.5 | .0000 |
| .0830 | 475.2 | .0804 | 5433.2 | 5770.6 | .0000 |
| .0840 | 480.9 | .0814 | 5437.2 | 5770.7 | -.0000 |
| .0850 | 486.7 | .0824 | 5441.1 | 5770.6 | -.0000 |
| .0860 | 492.5 | .0833 | 5445.0 | 5770.5 | .0000 |
| .0870 | 498.2 | .0843 | 5448.7 | 5770.6 | -.0000 |
| .0880 | 504.0 | .0853 | 5452.4 | 5770.5 | -.0000 |
| .0890 | 509.8 | .0863 | 5455.9 | 5770.4 | .0000 |
| .0900 | 515.5 | .0873 | 5459.4 | 5770.5 | .0000 |
| .0910 | 521.3 | .0882 | 5462.8 | 5770.5 | .0000 |
| .0920 | 527.1 | .0892 | 5466.2 | 5770.5 | .0000 |
| .0930 | 532.9 | .0902 | 5469.5 | 5770.8 | -.0000 |
| .0940 | 538.6 | .0912 | 5472.7 | 5770.5 | .0000 |

| | | | | | |
|---|---|---|---|---|---|
| .0650 | 368.8 | .0631 | 5300.8 | 6157.7 | .0208 |
| .0660 | 375.2 | .0641 | 5317.7 | 6411.4 | .0055 |
| .0670 | 381.6 | .0650 | 5335.0 | 6481.9 | -.0000 |
| .0680 | 388.1 | .0660 | 5351.9 | 6481.5 | -.0039 |
| .0690 | 394.6 | .0669 | 5367.5 | 6431.3 | -.0075 |
| .0700 | 400.9 | .0679 | 5381.4 | 6335.9 | -.0296 |
| .0710 | 406.9 | .0688 | 5389.7 | 5971.5 | -.0147 |
| .0720 | 412.7 | .0698 | 5395.4 | 5798.8 | -.0354 |
| .0730 | 418.1 | .0707 | 5395.5 | 5402.2 | -.0116 |
| .0740 | 423.3 | .0717 | 5393.9 | 5278.1 | .0507 |
| .0750 | 429.2 | .0726 | 5399.8 | 5841.5 | .0183 |
| .0760 | 435.2 | .0736 | 5408.5 | 6059.0 | -.0022 |
| .0770 | 440.6 | .0745 | 5407.7 | 5348.9 | .0327 |
| .0780 | 446.3 | .0755 | 5411.6 | 5710.4 | .0049 |
| .0790 | 452.1 | .0765 | 5416.1 | 5766.7 | .0003 |
| .0800 | 457.8 | .0775 | 5420.5 | 5770.3 | .0000 |
| .0810 | 463.6 | .0784 | 5424.9 | 5770.6 | -.0000 |
| .0820 | 469.4 | .0794 | 5429.1 | 5770.5 | .0000 |
| .0830 | 475.2 | .0804 | 5433.2 | 5770.6 | .0000 |
| .0840 | 480.9 | .0814 | 5437.2 | 5770.7 | -.0000 |
| .0850 | 486.7 | .0824 | 5441.1 | 5770.6 | -.0000 |
| .0860 | 492.5 | .0833 | 5445.0 | 5770.5 | .0000 |
| .0870 | 498.2 | .0843 | 5448.7 | 5770.6 | -.0000 |
| .0880 | 504.0 | .0853 | 5452.4 | 5770.5 | -.0000 |
| .0890 | 509.8 | .0863 | 5455.9 | 5770.4 | .0000 |
| .0900 | 515.5 | .0873 | 5459.4 | 5770.5 | .0000 |
| .0910 | 521.3 | .0882 | 5462.8 | 5770.5 | .0000 |
| .0920 | 527.1 | .0892 | 5466.2 | 5770.5 | .0000 |
| .0930 | 532.9 | .0902 | 5469.5 | 5770.8 | -.0000 |
| .0940 | 538.6 | .0912 | 5472.7 | 5770.5 | .0000 |
| .0950 | 544.4 | .0922 | 5475.8 | 5770.6 | -.0000 |
| .0960 | 550.2 | .0932 | 5478.9 | 5770.5 | -.0137 |
| .0970 | 555.6 | .0941 | 5478.0 | 5194.8 | -.1220 |
| .0980 | 559.8 | .0951 | 5465.2 | 4221.2 | .0024 |
| .0990 | 564.0 | .0961 | 5452.8 | 4241.7 | .0064 |
| .1000 | 568.3 | .0971 | 5441.3 | 4296.8 | -.0002 |
| .1010 | 572.6 | .0981 | 5429.9 | 4294.9 | .0045 |
| .1020 | 577.0 | .0991 | 5419.2 | 4334.1 | -.0068 |
| .1030 | 581.2 | .1001 | 5408.1 | 4275.5 | .0270 |
| .1040 | 585.7 | .1010 | 5399.5 | 4513.1 | -.0230 |
| .1050 | 590.1 | .1020 | 5389.1 | 4309.8 | .0270 |
| .1060 | 594.6 | .1030 | 5381.2 | 4549.1 | -.0279 |
| .1070 | 598.9 | .1040 | 5371.1 | 4301.9 | -.0164 |
| .1080 | 603.1 | .1050 | 5359.9 | 4163.0 | -.0985 |
| .1090 | 606.5 | .1060 | 5342.2 | 3430.2 | .0351 |
| .1100 | 610.2 | .1070 | 5327.1 | 3679.9 | .0053 |
| .1110 | 613.9 | .1079 | 5312.6 | 3719.5 | .0678 |
| .1120 | 617.2 | .1089 | 5303.2 | 4260.4 | -.0567 |
| .1130 | 622.0 | .1099 | 5289.9 | 3803.3 | -.0010 |
| .1140 | 625.8 | .1109 | 5276.8 | 3795.7 | -.0459 |
| .1150 | 629.2 | .1119 | 5261.0 | 3462.8 | .0107 |
| .1160 | 632.8 | .1129 | 5246.2 | 3537.8 | .0368 |
| .1170 | 636.6 | .1139 | 5233.9 | 3808.1 | .0384 |
| .1180 | 640.7 | .1149 | 5224.4 | 4112.3 | .0205 |
| .1190 | 645.0 | .1158 | 5216.5 | 4284.2 | -.0081 |
| .1200 | 649.2 | .1168 | 5208.1 | 4215.5 | -.0209 |
| .1210 | 653.2 | .1178 | 5198.5 | 4042.5 | .0268 |
| .1220 | 657.5 | .1188 | 5190.9 | 4265.4 | -.0267 |
| .1230 | 661.5 | .1198 | 5181.5 | 4043.3 | .0322 |
| .1240 | 665.8 | .1208 | 5174.5 | 4312.6 | -.0184 |
| .1250 | 670.0 | .1218 | 5166.4 | 4156.6 | .0296 |
| .1260 | 674.4 | .1227 | 5160.4 | 4410.4 | -.0113 |
| .1270 | 678.7 | .1237 | 5153.7 | 4312.3 | .0005 |
| .1280 | 683.0 | .1247 | 5147.2 | 4316.9 | -.0097 |
| .1290 | 687.3 | .1257 | 5140.1 | 4234.0 | .0033 |
| .1300 | 691.5 | .1267 | 5131.3 | 4261.8 | -.0078 |
| .1310 | 695.7 | .1277 | 5126.2 | 4196.3 | -.0332 |
| .1320 | 699.7 | .1287 | 5117.1 | 3926.8 | .0317 |
| .1330 | 703.8 | .1296 | 5110.1 | 4184.2 | .0160 |
| .1340 | 708.2 | .1306 | 5104.2 | 4320.2 | .0018 |
| .1350 | 712.5 | .1316 | 5098.5 | 4335.8 | .0024 |
| .1360 | 716.9 | .1326 | 5093.0 | 4356.4 | .0298 |
| .1370 | 721.5 | .1336 | 5089.6 | 4624.0 | .0203 |
| .1380 | 726.3 | .1346 | 5087.6 | 4815.3 | .0070 |
| .1390 | 731.2 | .1356 | 5086.2 | 4882.8 | .0034 |
| .1400 | 736.1 | .1365 | 5084.9 | 4915.8 | -.0165 |
| .1410 | 740.8 | .1375 | 5082.6 | 4756.1 | -.0228 |
| .1420 | 745.4 | .1385 | 5078.8 | 4540.1 | -.0027 |
| .1430 | 749.9 | .1395 | 5075.0 | 4537.7 | .0339 |
| .1440 | 754.8 | .1405 | 5073.5 | 4856.0 | -.0100 |
| .1450 | 759.5 | .1415 | 5071.3 | 4759.5 | .0313 |
| .1460 | 764.6 | .1424 | 5071.3 | 5066.9 | -.0953 |
| .1470 | 768.8 | .1434 | 5065.3 | 4185.3 | -.0739 |
| .1480 | 772.4 | .1444 | 5055.4 | 3609.4 | -.0653 |
| .1490 | 775.6 | .1454 | 5042.8 | 3166.8 | .0192 |
| .1500 | 778.9 | .1464 | 5031.1 | 3291.0 | .1729 |
| .1510 | 783.5 | .1474 | 5028.7 | 4666.6 | -.1631 |
| .1520 | 786.9 | .1484 | 5017.7 | 3357.9 | .0422 |
| .1530 | 790.5 | .1494 | 5008.8 | 3653.4 | .0509 |
| .1540 | 794.6 | .1503 | 5002.5 | 4045.5 | .1112 |
| .1550 | 799.6 | .1513 | 5002.9 | 5058.1 | -.1593 |
| .1560 | 803.4 | .1523 | 4994.6 | 3706.2 | .2074 |
| .1570 | 809.0 | .1533 | 4998.7 | 5646.2 | -.0961 |
| .1580 | 813.7 | .1543 | 4996.5 | 4656.4 | .0455 |
| .1590 | 818.8 | .1553 | 4997.2 | 5100.2 | -.0944 |
| .1600 | 823.0 | .1563 | 4992.3 | 4220.1 | -.0736 |
| .1610 | 826.6 | .1572 | 4984.0 | 3841.4 | .0310 |
| .1620 | 830.5 | .1582 | 4977.1 | 3874.5 | .0457 |
| .1630 | 834.7 | .1592 | 4972.6 | 4245.2 | .0146 |
| .1640 | 839.1 | .1602 | 4968.9 | 4371.0 | .0086 |
| .1650 | 843.6 | .1612 | 4965.8 | 4446.7 | .0773 |
| .1660 | 848.7 | .1622 | 4967.1 | 5191.5 | .0855 |
| .1670 | 854.9 | .1632 | 4974.3 | 6162.1 | -.0372 |
| .1680 | 860.6 | .1641 | 4978.7 | 5719.6 | -.0073 |
| .1690 | 866.3 | .1651 | 4982.6 | 5637.2 | .0147 |
| .1700 | 872.1 | .1661 | 4987.5 | 5805.4 | .0132 |
| .1710 | 878.0 | .1671 | 4993.2 | 5960.8 | -.0386 |
| .1720 | 883.5 | .1681 | 4996.2 | 5517.5 | -.0002 |
| .1730 | 889.1 | .1690 | 4999.2 | 5515.8 | .0637 |
| .1740 | 895.3 | .1700 | 5006.5 | 6265.6 | -.0092 |
| .1748 | 900.0 | .1708 | 5011.5 | 6151.4 | |




# SHOOTING PLAN

JOB #: 2739

FORWARD ET AL IZUK M-20 67° 20' 123° 45'

SCALE: 1 CM = 12.50 METRES

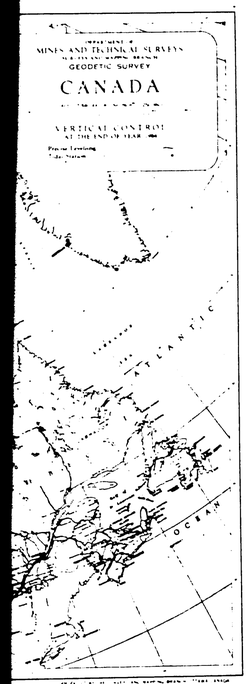
THE MAGNETIC NORTH DECLINATION IS 39°E

WELL SURVEYED ◎

SHOT POINT ○

GEOPHONE ×

TIN




# SHOOTING PLAN

JOB #: 2739

WELL SURVEYED ⊙

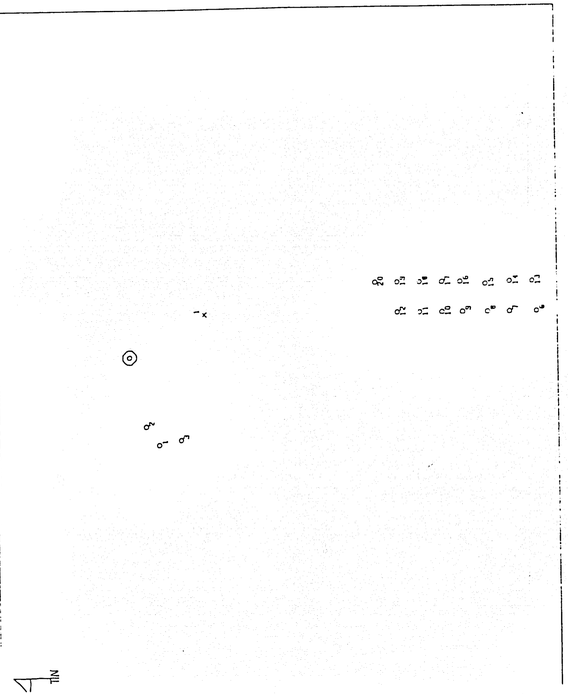
SHOT POINT ×

GEOPHONE ○

FORWARD ET AL IZOK M-20 67° 20' 123° 45'

SCALE: 1 CM = 12.5m METRES

THE MAGNETIC NORTH DECLINATION IS 39° E




CENTURY GEOPHYSICAL CORPORATION OF CANADA
SEISMIC REFFRENCE SERVICE

SHOT HOLE IDENTIFICATION JOB NUMBER: 2739

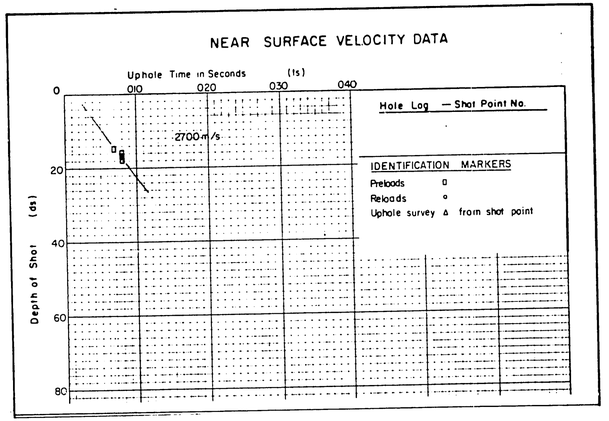
WELL NAME & LOCATION: FORWARD ET AL IZOK M-20 67° 20' 123° 45'

DATUM: 275.0 CORRECTION VELOCITY: 2700 M/SEC

| REC# | SHOT HOLE # | SHOT SEQUENCE | ELEVATION | DEPTH OF CHARGE TOP - BOTTOM | | UPHOLE | REMARKS |
|---|---|---|---|---|---|---|---|
| 30 | 1 | A | 294.7 | 8.8 | 9.1 | .004 | |
| 31 | 2 | A | 294.8 | 8.8 | 9.1 | .006 | |
| 32 | 3 | A | 295.0 | 8.8 | 9.1 | .006 | |
| 11 | 20 | A | 291.8 | 16.5 | 18.3 | .008 | |
| 12 | 19 | A | 291.8 | 16.5 | 18.3 | .008 | |
| 13 | 12 | A | 291.3 | 16.5 | 18.3 | .008 | |
| 14 | 11 | A | 291.3 | 17.1 | 18.3 | .008 | |
| 15 | 10 | A | 291.8 | 17.1 | 18.3 | .008 | |
| 16 | 17 | A | 291.8 | 17.7 | 18.3 | .008 | |
| 17 | 16 | A | 291.8 | 14.6 | 15.2 | .007 | |
| 20 | 15 | A | 291.8 | 14.6 | 15.2 | .007 | |
| 21 | 10 | A | 291.3 | 17.7 | 18.3 | .008 | |
| 22 | 9 | A | 291.3 | 14.6 | 15.2 | .007 | |
| 23 | 8 | A | 291.3 | 14.6 | 15.2 | .007 | |
| 24 | 7 | A | 291.3 | 14.9 | 15.2 | .007 | |
| 25 | 6 | A | 291.3 | 14.9 | 15.2 | .007 | |
| 26 | 14 | A | 291.8 | 14.9 | 15.2 | .007 | |
| 27 | 13 | A | 291.8 | 14.9 | 15.2 | .007 | |

Shot hole numbers 4 8 5 could not be found

## NEAR SURFACE VELOCITY DATA




CENTURY GEOPHYS

SEISMIC

SURVEY# 2739 COMPUTATION SHEET

| | KH ELEV# | 299.2 | DMO# | 24.2 | DATUM ELEV# | 275.0 | COR |
|---|---|---|---|---|---|---|---|
| REC# | DGM | OGM | DGO | TS | TR | ELEV | OS M.O |
| 32 | 12.0 | 12.0 | -12.2 | .006 | .020 | 295.0 | 9.1 |
| 31 | 22.0 | 22.0 | -2.2 | .006 | .020 | 294.8 | 9.1 |
| 30 | 32.0 | 32.0 | 7.8 | .004 | .020 | 294.7 | 9.1 |
| 27 | 32.0 | 32.0 | 7.8 | .007 | .055 | 291.8 | 15.2 |
| 25 | 133.0 | 133.0 | 108.8 | .007 | .055 | 291.3 | 15.2 |
| 24 | 133.0 | 133.0 | 108.8 | .007 | .053 | 291.8 | 15.2 |
| 24 | 237.0 | 237.0 | 212.8 | .007 | .053 | 291.3 | 15.2 |
| 23 | 341.0 | 341.0 | 316.8 | .007 | .050 | 291.3 | 15.2 |
| 22 | 445.0 | 445.0 | 420.8 | .007 | .048 | 291.3 | 15.2 |
| 21 | 549.0 | 549.0 | 524.8 | .008 | .043 | 291.3 | 18.3 |
| 20 | 590.0 | 590.0 | 565.8 | .007 | .050 | 291.8 | 15.2 |
| 17 | 639.0 | 639.0 | 614.8 | .007 | .045 | 291.8 | 15.2 |
| 15 | 719.0 | 719.0 | 694.8 | .008 | .040 | 291.8 | 18.3 |
| 16 | 719.0 | 719.0 | 694.8 | .008 | .043 | 291.8 | 18.3 |
| 14 | 839.0 | 839.0 | 814.8 | .008 | .038 | 291.3 | 18.3 |
| 12 | 849.0 | 849.0 | 824.8 | .008 | .036 | 291.8 | 18.3 |
| 13 | 849.0 | 849.0 | 824.8 | .008 | .035 | 291.3 | 18.3 |
| 11 | 890.0 | 890.0 | 865.8 | .008 | .033 | 291.8 | 18.3 |

CENTURY GEOPHYSICAL CORPORATION OF CANADA

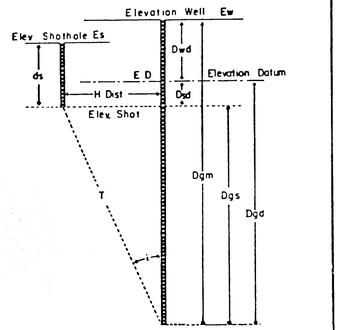
SEISMIC REFERENCE SERVICE

SURVEY# 2739 COMPUTATION SHEET FOR FORWARD ET AL IZOK M-20 67°20' 123°45'

KB ELEV= 299.2 DMD= 24.2 DATUM ELEV= 275.0 CORR. VEL 2703 M/S CGS DEPTH= 589.0 TOTAL DEPTH= 900.0 DATE SHOT: 83/03/31

| SEC# | DGM | DGM | DGD | TS | TR | ELEV | DS | H.DIST | DSD | DGS | T | GR | TGS | DSD/VE | ATGD | VA | DDGD | DTGD | VI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | 12.0 | 12.0 | -12.2 | .006 | 020 | 295.0 | 9.1 | 42.0 | 10.9 | -1.3 | N.G. | | | | | | | | |
| 31 | 22.0 | 22.0 | -2.2 | .006 | 020 | 294.8 | 9.1 | 31.0 | 10.7 | 8.5 | N.G. | | | | | | | | |
| 30 | 32.0 | 32.0 | 7.8 | .004 | 020 | 294.7 | 9.1 | 40.0 | 10.6 | 18.4 | N.G. | | | | | | | | |
| 27 | 32.0 | 32.0 | 7.9 | .007 | 055 | 291.4 | 15.2 | 142.0 | 1.2 | 9.0 | N.G. | | | .0004 | | | | | |
| 25 | 133.0 | 133.0 | 108.8 | .007 | 055 | 291.3 | 15.2 | 183.0 | 1.1 | 109.9 | .046 | P | .0237 | .0004 | | | | | |
| 24 | 133.0 | 133.0 | 108.8 | .007 | 053 | 291.4 | 15.2 | 172.0 | 1.2 | 110.0 | .045 | F | .0242 | .0004 | .0236 | 8620. | 104.0 | .0190 | 5474. |
| 24 | 237.0 | 237.0 | 212.8 | .007 | 053 | 291.3 | 15.2 | 171.0 | 1.1 | 213.9 | .055 | G | .0430 | .0004 | .0426 | 4995. | 104.0 | .0177 | 5876. |
| 23 | 341.0 | 341.0 | 316.8 | .007 | 050 | 291.3 | 15.2 | 161.0 | 1.1 | 317.9 | .068 | G | .0607 | .0004 | .0603 | 5254. | 104.0 | .0175 | 5943. |
| 22 | 445.0 | 445.0 | 420.8 | .007 | 044 | 291.3 | 15.2 | 150.0 | 1.1 | 421.9 | .083 | G | .0782 | .0004 | .0778 | 5409. | 104.0 | .0175 | 5943. |
| 21 | 549.0 | 549.0 | 524.8 | .008 | 043 | 291.3 | 18.3 | 141.0 | -2.0 | 522.8 | .098 | G | .0946 | -.0007 | .0953 | 5507. | 41.0 | .0092 | 4457. |
| 20 | 590.0 | 590.0 | 565.8 | .007 | 050 | 291.4 | 15.2 | 161.0 | 1.2 | 567.0 | .109 | G | .1049 | .0004 | .1045 | 5414. | 49.0 | .0136 | 3603. |
| 17 | 639.0 | 639.0 | 614.8 | .007 | 045 | 291.4 | 15.2 | 151.0 | 1.2 | 616.0 | .122 | G | .1185 | .0004 | .1181 | 5206. | | | |
| 15 | 719.0 | 719.0 | 694.8 | .008 | 040 | 291.4 | 18.3 | 134.0 | -1.9 | 692.9 | .138 | G | .1355 | -.0007 | | | 80.0 | .0179 | 4469. |
| 16 | 719.0 | 719.0 | 694.8 | .008 | 043 | 291.4 | 18.3 | 122.0 | -1.9 | 692.9 | .138 | G | .1351 | -.0007 | .1360 | 5109. | 120.0 | .0276 | 4348. |
| 14 | 839.0 | 839.0 | 814.8 | .008 | 038 | 291.3 | 18.3 | 131.0 | -2.0 | 812.8 | .165 | G | .1629 | -.0007 | .1636 | 4980. | | | |
| 12 | 849.0 | 849.0 | 824.8 | .008 | 036 | 291.4 | 18.3 | 124.0 | -1.9 | 822.9 | .167 | G | .1651 | -.0007 | | | 10.0 | .0023 | 4348. |
| 13 | 849.0 | 849.0 | 824.8 | .008 | 035 | 291.3 | 18.3 | 121.0 | -2.0 | 822.8 | .167 | G | .1652 | -.0007 | .1659 | 4973. | 41.0 | .0083 | 4940. |
| 11 | 890.0 | 890.0 | 865.8 | .008 | 033 | 291.4 | 18.3 | 114.0 | -1.9 | 863.9 | .175 | G | .1735 | -.0007 | .1742 | 4970. | | | |

## CROSS-SECTION AND DEFINITION OF TERMS

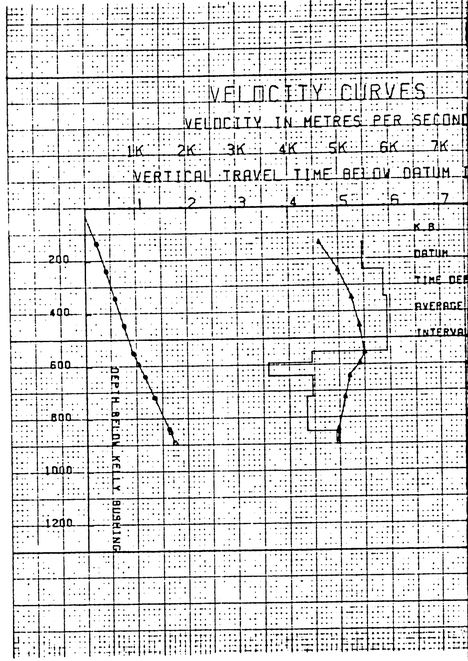



Dgm = Geophone depth below well elevation
Dwd = Difference between well elevation and elevation datum = Ew - ED
Dgd = Geophone depth below elevation datum = Dgm - Dwd
ts = Uphole time at shothole
tR = Refraction time from reference geophone
ds = Depth of shot
H Dist = Horizontal distance from well to shothole
Dsd = Difference between shot elevation and elevation datum = Es - ds - ED
Dgs = Geophone depth below shot elevation = Dgd + Dsd
cos i = $Dgs/\sqrt{Hdist^2 + Dgs^2}$
T = Observed travel time from shot to well geophone
Gr = Quality grade of well geophone "break"
Tgs = Travel time for Dgs distance = T cos i
Dsd/ve = Time correction from shot to elevation datum
Tgd = Travel time for Dgd distance = Tgs - Dsd/ve
va = Average velocity = Dgd/Tgd
DDgd = Interval distance = $Dgd_n - Dgd_{n-1}$
DTgd = Interval time for DDgd distance = $Tgd_n - Tgd_{n-1}$
vi = Interval velocity = DDgs/DTgd
ED = Elevation of reference datum
ve = Elevation correction velocity

## GEOLOGICAL TOPS

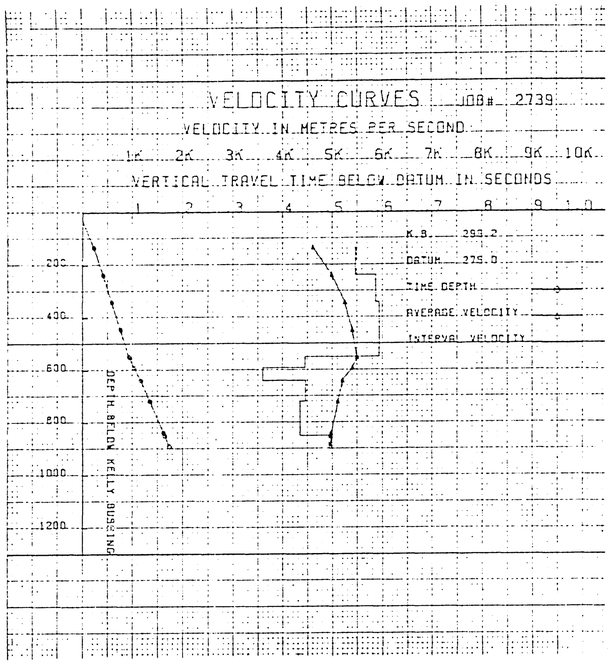
*-ENTRY "DGM" IS MEASURED DEPTH BELOW K.B., "TVD" IS THE TRUE VERTICAL DEPTH BELOW K.B., AND "TL" REPRESENTS THE ADJUSTED INTEGRATED SONIC TIME BELOW SEISMIC DATUM

| FORMATION | SYMBOL | DGM | TVD | 2TL | FORMATION | SYMBOL | DGM | TVD | 2TL |
|---|---|---|---|---|---|---|---|---|---|
| TOP WINNING | A | 80.0 | | .0264 | L. MOUNT CAP | D | 820.0 | | .3186 |
| T P SALT | B | 615.0 | | .2224 | PRECAMBRIAN | E | 847.0 | | .3314 |
| MOUNT CAP | C | 722.0 | | .2742 | | | | | |



VERTICAL DEPTH BELOW K.B.,
BELOW SEISMIC DATUM

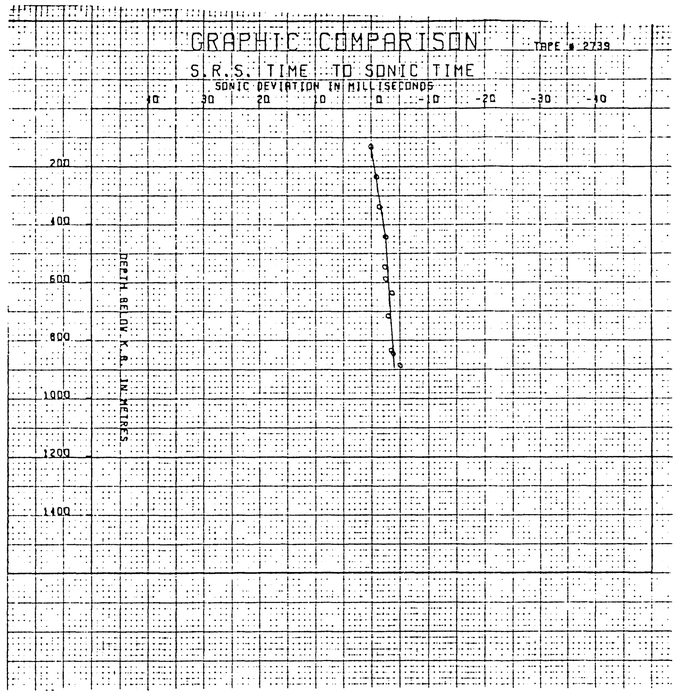
| MBOL | DGM | TVD | 2TL |
|---|---|---|---|
| D | 820.0 | | .3186 |
| E | 847.0 | | .3314 |




CENTURY GEOPHYSICAL
SEISMIC REFERENCE SERVICE

TIME COMPARISON

| DEPTH BELOW LOG DATUM | DEPTH BELOW SEISMIC DATUM | SEISMIC VERTICAL TIME | UNADJUSTED (SONIC)- (SEISMIC) | UNADJUSTED SONIC LOG VERTICAL TIME | UNADJUSTED SONIC LOG AVERAGE VELOCITY | ADJUSTED (SONIC)- (SEISMIC) | ADJUSTED SONIC LOG VERTICAL TIME | ADJUSTED SONIC LOG AVERAGE VELOCITY | SONIC LOG INTERVAL DEPTH | UNADJUSTED SONIC LOG INTERVAL TIME | UNADJUSTED SONIC LOG INTERVAL VELOCITY | ADJUSTED SONIC LOG INTERVAL TIME | ADJUSTED SONIC LOG INTERVAL VELOCITY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 133.0 | 108.8 | .0236 | .0000 | .0236 | 4610.2 | .0000 | .0236 | 4610.2 | | | | | |
| 237.0 | 212.8 | .0426 | -.0009 | .0417 | 5103.1 | .0000 | .0426 | 4995.3 | 104.0 | .0181 | 5745.9 | .0190 | 5473.7 |
| 341.0 | 316.8 | .0603 | -.0014 | .0589 | 5378.6 | .0002 | .0605 | 5236.4 | 104.0 | .0172 | 6046.5 | .0179 | 5810.1 |
| 445.0 | 420.8 | .0778 | -.0025 | .0753 | 5588.3 | .0000 | .0778 | 5408.7 | 104.0 | .0164 | 6341.5 | .0173 | 6011.6 |
| 549.0 | 524.8 | .0953 | -.0023 | .0930 | 5643.0 | .0005 | .0958 | 5478.1 | 104.0 | .0177 | 5875.7 | .0180 | 5777.8 |
| 590.0 | 565.8 | .1045 | -.0025 | .1020 | 5547.1 | .0005 | .1050 | 5388.6 | 41.0 | .0090 | 4555.6 | .0092 | 4456.5 |
| 639.0 | 614.8 | .1181 | -.0036 | .1145 | 5369.4 | -.0005 | .1176 | 5227.9 | 49.0 | .0125 | 3920.0 | .0126 | 3888.9 |
| 719.0 | 694.8 | .1360 | -.0029 | .1331 | 5220.1 | .0005 | .1365 | 5090.1 | 80.0 | .0186 | 4301.1 | .0189 | 4232.8 |
| 839.0 | 814.8 | .1636 | -.0034 | .1602 | 5086.1 | .0004 | .1640 | 4968.3 | 120.0 | .0271 | 4428.0 | .0275 | 4363.6 |
| 849.0 | 824.8 | .1659 | -.0037 | .1622 | 5085.1 | .0001 | .1660 | 4968.7 | 10.0 | .0020 | 5000.0 | .0020 | 5000.0 |
| 890.0 | 865.8 | .1742 | -.0050 | .1692 | 5117.0 | -.0010 | .1732 | 4998.9 | 41.0 | .0070 | 5857.1 | .0072 | 5694.5 |




VELOCITY RECORDS

Trace Arrangement

| | |
|---|---|
| Trace 1 | Wall-l |
| Trace 2 | Tire B and Re |
| Trace 3 | Intern |
| Traces 4-5 | Blank |
| Trace 6 | Refere |
| Traces 7-8 | Blank |
| Trace 9 | Uphole (Picke |
| Trace 10 | Record |

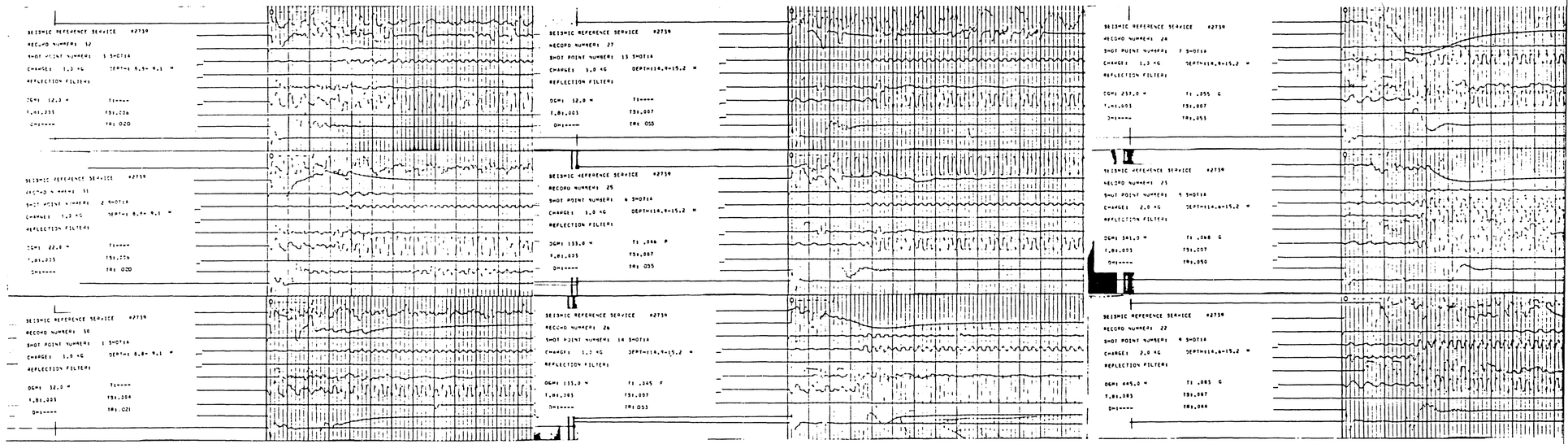
TAPE # 2739

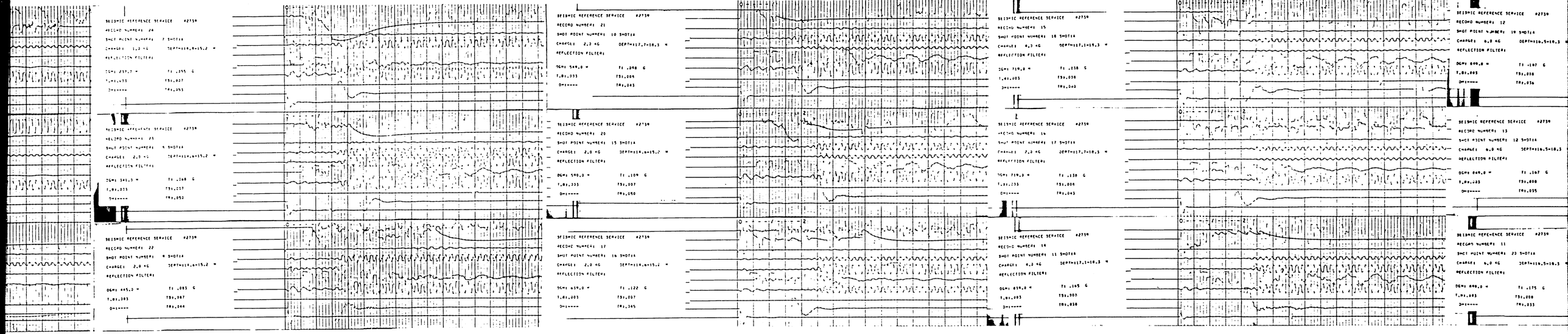
-20 -30 -40

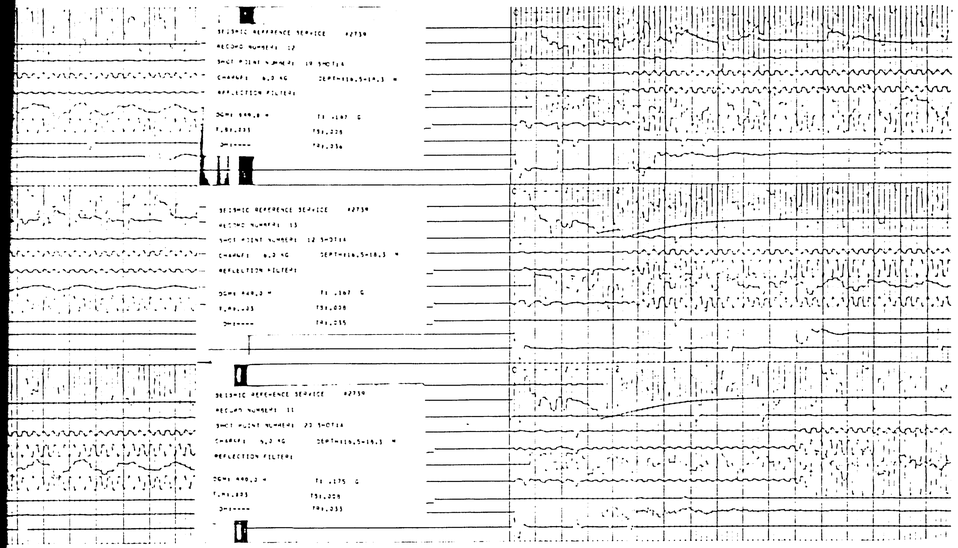
VELOCITY RECORDS

Trace Arrangements

| | |
|---|---|
| Trace 1 | Well-locking Well Geophone |
| Trace 2 | Time Break for Well Geophone and Reference Geophone |
| Trace 3 | Internal Time Break |
| Traces 4-5 | Blank |
| Trace 6 | Reference Geophone |
| Traces 7-8 | Blank |
| Trace 9 | Uphole Time (Picked from Trace 3) |
| Trace 10 | Recorded Time Break |




SEISMIC REFERENCE SERVICE #2739
RECORD NUMBER: 24
SHOT POINT NUMBERS: 7 SHOTS#
CHARGES: 1.0 KG DEPTHS=16.0-15.2 M
REFLECTION FILTERS:
SEISMIC REFERENCE SERVICE #2739
RECORD NUMBER: 23
SHOT POINT NUMBERS: 9 SHOTS#
CHARGES: 2.0 KG DEPTHS=16.0-15.2 M
REFLECTION FILTERS:
SEISMIC REFERENCE SERVICE #2739
RECORD NUMBER: 22
SHOT POINT NUMBERS: 9 SHOTS#
CHARGES: 2.0 KG DEPTHS=16.0-15.2 M
REFLECTION FILTERS:
SEISMIC REFERENCE SERVICE #2739
RECORD NUMBER: 21
SHOT POINT NUMBERS: 10 SHOTS#
CHARGES: 2.0 KG DEPTHS=17.7-16.3 M
REFLECTION FILTERS:
SEISMIC REFERENCE SERVICE #2739
RECORD NUMBER: 20
SHOT POINT NUMBERS: 15 SHOTS#
CHARGES: 2.0 KG DEPTHS=16.0-15.2 M
REFLECTION FILTERS:
SEISMIC REFERENCE SERVICE #2739
RECORD NUMBER: 17
SHOT POINT NUMBERS: 16 SHOTS#
CHARGES: 2.0 KG DEPTHS=16.0-15.2 M
REFLECTION FILTERS:
SEISMIC REFERENCE SERVICE #2739
RECORD NUMBER: 15
SHOT POINT NUMBERS: 18 SHOTS#
CHARGES: 2.0 KG DEPTHS=17.1-16.3 M
REFLECTION FILTERS:
SEISMIC REFERENCE SERVICE #2739
RECORD NUMBER: 14
SHOT POINT NUMBERS: 17 SHOTS#
CHARGES: 2.0 KG DEPTHS=17.7-16.3 M
REFLECTION FILTERS:
SEISMIC REFERENCE SERVICE #2739
RECORD NUMBER: 13
SHOT POINT NUMBERS: 11 SHOTS#
CHARGES: 2.0 KG DEPTHS=17.1-16.3 M
REFLECTION FILTERS:
SEISMIC REFERENCE SERVICE #2739
RECORD NUMBER: 12
SHOT POINT NUMBERS: 19 SHOTS#
CHARGES: 2.0 KG DEPTHS=16.5-16.3
REFLECTION FILTERS:
SEISMIC REFERENCE SERVICE #2739
RECORD NUMBER: 11
SHOT POINT NUMBERS: 23 SHOTS#
CHARGES: 2.0 KG DEPTHS=16.5-16.3
REFLECTION FILTERS:




NORMAL MOVEOUT DETERMINATION FOR JOB# 2739

N.M.O= SQRT(TO*TO+(X*X)/(V*V))=TO

WHERE:TO= TWO WAY TIME BELOW 295.0 METRE DATUM
X= SPREAD DISTANCE AND V = AVERAGE VELOCITY

| TIME | SPREAD DISTANCES | | | | |
|---|---|---|---|---|---|
| | 200. | 400. | 800. | 1200. | 1600. |
| .200 | .0037 | .0143 | .0525 | .1056 | .1674 |
| .300 | .0027 | .0108 | .0413 | .0868 | .1427 |

GEOLOGICAL TOPS

WHERE: "DGM" IS MEASURED DEPTH BELOW K.B., "TVD" IS THE TRUE VERTICAL DEPTH BELOW K.B., AND "TL" REPRESENTS THE ADJUSTED INTEGRATED SONIC TIME BELOW SEISMIC DATUM

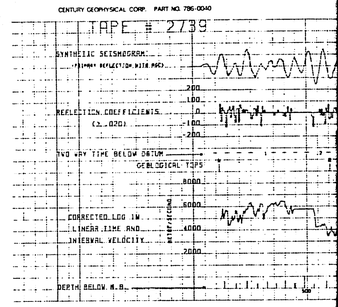
| FORMATION | SYMBOL | DGM | TVD | 2TL | FORMATION | SYMBOL | DGM | TVD | 2TL |
|---|---|---|---|---|---|---|---|---|---|
| TOP RONNING | A | 80.0 | | .0264 | L. MOUNT CAP | D | 820.0 | | .3186 |
| TOP SALT | B | 615.0 | | .2224 | PRECAMBRIAN | E | 847.0 | | .3314 |
| MOUNT CAP | C | 722.0 | | .2742 | | | | | |

Synthetic Seismogram Input Wavelet

Wavelet

Wavelet Frequency (Peak to Peak)

From Start to Time Zero = 33 ms



RMAL MOVEOUT DETERMINATION FOR JOB# 2739

N,M,O= SQRT(TO*TO+(X*X)/(V*V))+TO

TO= TWO WAY TIME BELOW 295.0 METRE DATUM
X= SPREAD DISTANCE AND V = AVERAGE VELOCITY

SPREAD DISTANCES

| 200. | 400. | 800. | 1200. | 1600. |
|---|---|---|---|---|
| .0037 | .0143 | .0525 | .1056 | .1674 |
| .0027 | .0108 | .0413 | .0868 | .1427 |

## GEOLOGICAL TOPS

WHERE: "DGM" IS MEASURED DEPTH BELOW K.B., "TVD" IS THE TRUE VERTICAL DEPTH BELOW K.B., AND "TL" REPRESENTS THE ADJUSTED INTEGRATED SONIC TIME BELOW SEISMIC DATUM

| FORMATION | SYMBOL | DGM | TVD | 2TL | FORMATION | SYMBOL | DGM | TVD | 2TL |
|---|---|---|---|---|---|---|---|---|---|
| TOP MONNING | A | 80.0 | | .0264 | L. MOUNT CAP | D | 820.0 | | .3186 |
| TOP SALT | B | 615.0 | | .2224 | PRECAMBRIAN | E | 847.0 | | .3314 |
| MOUNT CAP | C | 722.0 | | .2742 | | | | | |

