

AUTHORITY TO
DRILL A WELL

Exploratory ☐
Development ☐Delineation ☒
Service ☐

APPROVAL TO DRILL A WELL

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

Well Name: . PARA. ET. AL. FT. LIARD. I-46
Operator: . PARAMOUNT RESOURCES LTD. Drilling Program No.:
Contractor: . AKITA DRILLING LTD. Interest Identifier: . EL383
Drilling Rig or Unit: . . . 32 Estimated Well Cost: . \$3,500,000.00
Location-Unit: . I. Section: . 46 Grid Area: . 60° 10', 123° 15'
Coordinates: . Lat.: 60° 05' 32.474" Long.: 123° 22' 53.612"
Area: . FT. LIARD, NWT Field/Pool: . N/A
Elevation-KB/RT: 543.0 (ASL) GL/Seafloor: . 537.5
Approx. Spud Date: . NOVEMBER 15, 1999 Est. Days on Location: . 35
Anticipated Total Depth: . 2317 Target Horizons: . CHINKEH, MATTSON

EVALUATION PROGRAM

Ten-metre sample intervals
Five-metre sample intervals . SURFACE TO TOTAL DEPTH
Canned sample intervals . SURFACE TO TOTAL DEPTH
Conventional cores at . 18 m CORE IN MATTSON FORMATION
Logs and Tests . HDIL-GR, MAC-GR-CAL, ZDL-CNL-GR-PE-XY, CAL, HEX, DIP-CBIL-GR, MRIL-GR-CAL;
1 TEST IN FANTASQUE AND 2 TESTS IN MATTSON

CASING AND CEMENTING PROGRAM

O.D. (mm)	Weight (kg/m)	Grade	Setting Depth (m KB)	Cementing Program (m³)
244.5	53.57	J-55	500	21.83 m³ of 0:1:0 "G"
177.8	38.69	J-55	1530	10.76 m³ of 1:1:2 FILL 8.03 m³ of 0:1:0 "G"
114.3	17.36	J-55	2317	11.42 m³ of 0:1:0 "G"

B.O.P. Equipment: . 21 mPa CLASS. IV. STACK AND MANIFOLD WITH ONE (1) FLOW DIVERTER, ONE (1) ANNULAR PREVENTER, THREE (3) RAMS (1 DOUBLEGATE AND 1 SINGLE GATE) AND DOUBLE CHOKE MANIFOLD.

Other Information:

Signed:
Responsible Officer

Title: SR. DRILLING AND COMPLETIONS ENGINEER

Name: . WAYNE R. TOMM

Company: . PARAMOUNT RESOURCES LTD.

Date: . AUGUST 20, 1999

Phone: . (403) 290-3600

APPROVAL

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

Date: . Oct. 22/99
File: . 9211-P33-15-1-2
WID: . 1871, UWI 3001466010123150

Signed:
Chief Conservation Officer

WELL
TERMINATION
RECORD (with
attachment)



CANADA

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: Para et al Fort Liard I-46 Area: Fort Liard
Grid Area: 60°10'123°15' Field/Pool: N/A
Permit or Lease No.: EL381 Final Coordinates: Lat.: 60°05' 32.474" Long: 123°22' 53.612"
Drilling Unit: I-46 Elevations: RT/KB: 542.20 SF/GL: 537.20
Spud Date: November 12, 1999 Rig Released: January 15, 2000 Total Depth: 2055

CASING AND CEMENTING

O.D.:	Weight:	Grade:	Depth Set:	Cement and Additives:
244.5	53.6	J55	505	30 Tonnes 0:1:0"G"
177.8	38.6	J55	1545	13.2 Tonnes 1:1:2"G"
				11.0 Tonnes 0:1:0"G"
114.3	17.26	J55	2055	9.0 Tonnes 0:1:0"G"

PLUGGING PROGRAM

Approval of the following program was obtained by (person) N/A from
(person) by means of

on 19

Type of Plug:	Interval:	Fell:	Cement and Additives:

Lost Circulation/Overpressure Zones: none

Equipment left on Seafloor (Describe): N/A

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

Cores: Type: none Intervals:

Other Downhole Completion/Suspension Equipment: none

CERTIFICATION

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

Signed: *Wayne R. Tomm* P. Eng.

Name: Wayne R. Tomm

Title: Sr. Drilling and Completions Engineer

Date: April 5, 2000

Acknowledged by: *J. Baker*

Engineering Branch

Date: Apr 18/00

File: 9211-P33-15-2 WID 1871

UWI: 3001466010123150

Well Status
Suspended ☐
Completed ☐
Abandoned ☐

Canada

PARA ET AL FORT LIARD I-46

(Actual as of February 09, 2000)

ACTUAL TOPS (confirmed log tops mKB)		DEPTH	HOLE SIZES	CASING
			311mm	244.5 mm, 53.6 kg/m J-55 LT&C - cemented to surface O:1:O "G" plus additives
		505m		
SCATTER	879			
GARBUTT	1062		222mm 1545mKB	Hole size - 177.8 mm, 38.6 kg/m J-55 LT&C - cemented to surface
CHINKEH SAND *	1211			
Toad/Grayling	1223			
BELLOY	1310			
			1501m	Liner top
FANTASQUE **	1373			
MATTSON **	1499			
			Liner	114.7mm x 17.26 kg/m J-55 LT&C - cemented full length O:1:O "G" plus additives
TOTAL DEPTH	2055	2055	156mm	

FINAL
WELL
REPORT

N.E.B. COPY

FINAL WELL REPORT
PARAMOUNT RESOURCES LTD.
PARA ET AL FORT LIARD I-46

Grid # 60° 10', 123° 15'

DATE: August 3, 2001

COMPANY REPRESENTATIVES:
Wayne Tomm
Dave Block

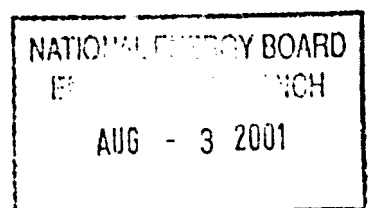


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A. INTRODUCTION

Paramount Resources Ltd. (Paramount) drilled a 2055 meter exploratory well spudded on November 12, 1999 and finishing on January 15, 2000 to evaluate hydrocarbon potential. The primary target was the Mattson formation at a depth of 1505 mKB. Secondary targets were the Chinkeh formation at 1242 mKB, the Fantasque formation at 1412 mKB, and the Flett formation at 2131 mKB.

The drilling contractor was Precision Drilling based out of Calgary, Alberta. Precision rig # 379 was used and is a land rig rated for 2400 m. The rig had a mud system capacity of 82.2 m³ and was equipped with a boiler.

The well was drilled on Exploration License No EL381 in which Paramount has a 33.34 % working interest. Operating License No 1871 was issued to Paramount on October 22, 1999.

The exact co-ordinates of the well are as follows:

Latitude: 60° 05' 32.474"
Longitude: 123° 22' 53.612"

Cancor Rathole Inc. drilled a 609 mm conductor hole to 12.2 meters. From surface to 7.6 meters was mostly a high plasticity clay and from 7.6 – 12.2 meters was a drier harder clay. A 406 mm, 0.375" wall thickness conductor pipe was set and cemented at 12.2 meters.

Precision #379 was moved onto the location between November 1 – 10, 1999. The diverter was nipped up, the rig was rigged up, and the well was spudded on November 12, 1999 at 14:00 hours. A 311 mm surface was drilled to 190 mKB. Lost circulation was encountered at 36 meters and 51 meters. Circulation was regained with high viscosity pills and sawdust. By 190 meters deviation problems were being encountered so a 222 mm pilot hole was drilled to 505 mKB. The pilot hole was reamed out to 311 mm to 505 mKB. A string of 244.5 mm, 53.6 kg/m, J-55, LT&C surface casing was run to 505 mKB. The casing was cemented with 30 t class 'G' cement plus 1% CaCl₂. There were good mud returns reported throughout the cement job with 3 m³ of cement returned to surface while cementing. The plug was bumped and the float held OK. The plug was down at 10:10 hours on November 21, 1999.

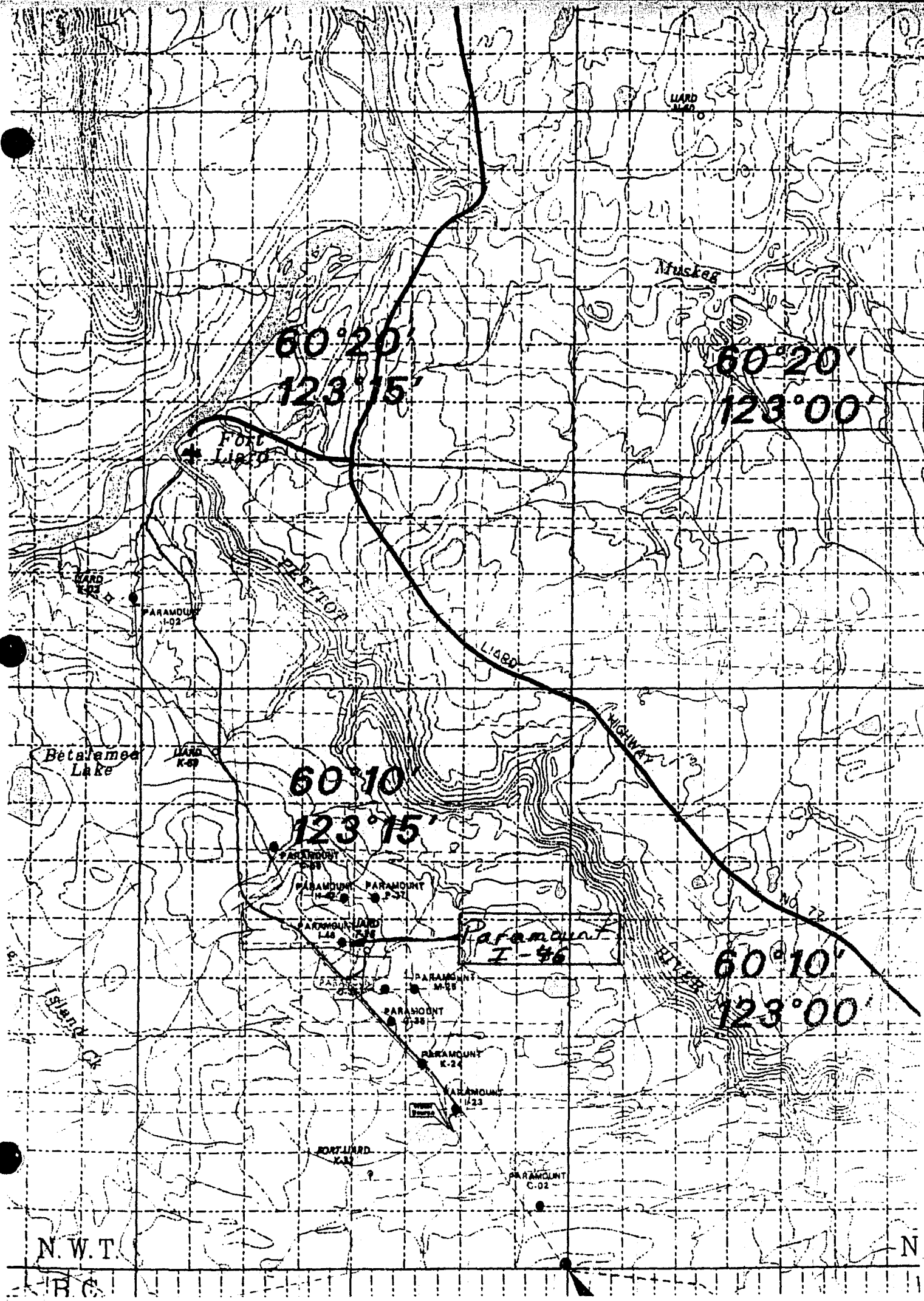
The casing and conductor were trimmed and the casing bowl was welded on. The BOP's were installed and function tested. The BOP's and manifold were pressure tested to 1500 kPa low pressure and 14000 kPa high pressure.

The float collar and shoe were drilled out on November 24, 1999 with a mud motor using an invert mud system. The 222 mm main hole was drilled ahead to 1545 with a combination of rotating and sliding to control deviation problems. There was some minor sloughing noted but any tight spots were easily reamed out. Baker Atlas ran induction, sonic, and density logs from bottom to surface casing. DST's were then run as follows: DST #1 across the Fantasque from 1365 – 1367 mKB, DST #2 across the Belloy from 1323 – 1343 mKB, DST #3 across the Belloy

from 1332 – 1352 mKB, and DST #4 from 1213 – 1227 mKB. . A string of 177.8 mm, 38.6 kg/m, J-55, LT&C intermediate casing was run to 1545 mKB. The casing was cemented with 13.2 t 1:1:2 'G' cement plus 0.5% T-10 and 11 t 0:1:0 'G' cement plus 0.8% NFL-2 and 1% A-11. There were no cement returns to surface while cementing. The plug was bumped with 16000 kPa and the float held OK. The plug was down at 16:44 hours on December 12, 1999.

The casing was cut off and the BOP's were nipped up again. A rotating BOP, flow line, and separation equipment were installed. All surface equipment was pressure tested to 1500 kPa low pressure and 21000 kPa high pressure. The float collar and shoe were drilled out and a leak off test performed. Leak off gradient found to be 15.6 kPa. A 156 mm hole was drilled with air to 1685 mKB. Made some gas 20 – 50 10^3 m^3 /day with up to 21 m^3 /hr of water. The well was then displaced to invert mud and drilling resumed. A drilling break was encountered at 1734.5 meters. Stopped drilling at 1740 meters and ran DST #5 across the Mattson from 1734.5 – 1740 mKB. Continued drilling to 2045 mKB with no major hole problems with a penetration rate from 1 – 2 m/hour. Baker Atlas ran induction, sonic, and density logs from bottom to intermediate casing. Baker Atlas also ran their formation multi-tester over various intervals from 1636.0 – 1991.5 mKB. DST #6 was run across the Mattson from 1785 – 1789 mKB and DST #7 was run across the Mattson from 1899 – 1903 mKB. A 114 mm, 17.26 kg/m, J-55, LT&C liner was run and cemented from 2055 – 1504 mKB.

Precision #379 was rigged out and released at 18:00 hours on January 15, 2000.



60°20'
123°15'

60°20'
123°00'

60°10'
123°15'

60°10'
123°00'

Paramount
I-46

N.W.T.
H.C.

N

B. GENERAL DATA

1. Well Name: Para et al Fort Liard I-46
Authority to Drill a Well No: 1871
Exploration Agreement Number: EL 381
Location Unit: I
Section: 46
Grid Area: 60° 10' N, 123° 15' W
Classification: Exploratory
2. Coordinates:
Latitude: 60° 05' 32.474"
Longitude: 123° 22' 53.612"
3. Unique Well Identifier: 300I466010123150
4. Operator: Paramount Resources Ltd.
5. Contractor: Precision Drilling
6. Drilling Unit: Precision Rig # 379, Land Rig
7. Position Keeping: N/A
8. Support Craft (Helicopter): N/A
9. Drilling Unit Performance: Good
10. Difficulties and Delays: Nothing major
11. Total Well Cost: \$5,925,000
12. Horizontal Deviated Wells Require Bottom Hole Co-ordinates:
Latitude: same as surface
Longitude: same as surface

C. SUMMARY OF DRILLING OPERATIONS

1. Elevations:
 - Ground: 537.2 m above sea level
 - KB: 542.2 m above sea level
 - KB to Casing Flange: 4.45 m
2. Total Depth:
 - FTD: 2055 mKB
 - PBTD: 2043.8 mKB
 - TVD: 2055 mKB
3. Date and Hour Spudded: November 12, 1999 at 14:00 hours
4. Date Drilling Completed: January 8, 2000
5. Date of Rig Release: January 15, 2000
6. Well status: Cased and Suspended
7. Hole Sizes and Depths:

Conductor Hole:	609 mm to 12.2 m
Surface Hole:	311 mm to 190 mKB
Intermediate Hole:	222 mm to 1545 mKB
Main Hole:	156 mm to 2055 mKB
8. Casing and Cementing Record:

Conductor Hole:	
Casing Size:	406 mm
Casing Weight:	96 kg/m
Casing Grade:	?
Casing Make:	?
Number of Joints:	?
Thread:	?
Depth Set:	12.2 m
Cut Height:	At Surface
Date Set:	November 5, 1999
Cement Volume:	?
Cement Type:	?
Additives:	?

Surface Hole:

Casing Size: 244.5 mm
Casing Weight: 53.6 kg/m
Casing Grade: J-55
Casing Make: Ipsco
Number of Joints: 39
Thread: LT&C
Depth Set: 505 m (KB)
Cut Height: At Surface
Date Set: November 21, 1999
Cement Volume: 30 Tonnes
Float Shoe Depth: 505 mKB
Float Collar Depth: 491.8 mKB
Cement Type: Class 'G'
Additives: 1% CaCl₂
Cement Top: Surface
Casing Bowl Size: 279 mm x 21 Mpa
Casing Bowl Make: ABB Vetco

Intermediate Hole:

Casing Size: 177.8 mm
Casing Weight: 38.6 kg/m
Casing Grade: J-55
Casing Make: Ipsco
Number of Joints: 118
Thread: LT&C
Depth Set: 1545 mKB
Cut Height: At Surface
Date Set: December 12, 1999
Cement Volume: 13.2 Tonnes
Cement Type: 1:1:2 Class 'G'
Additives: 0.5% T-10
Cement Volume: 11 Tonnes
Cement Type: 0:1:0 Class 'G'
Additives: 0.8% NFL-2 and 1% A-11
Float Shoe Depth: 1545 mKB
Float Collar Depth: 1532.7 mKB
Cement Top: 450m (calculated)
Casing Bowl Size: 229 mm X 21 Mpa
Casing Bowl Make: ABB Vetco

Main Hole:

Casing Size: 114.3 mm
Casing Weight: 17.26 kg/m
Casing Grade: J-55
Casing Make: Ipsco
Number of Joints: 42
Thread: LT&C
Depth Set: 2055 m KB
Cut Height: N/A
Date Set: January 14, 2000
Float Shoe Depth: 2055 mKB
Float Collar Depth: 2043.8 mKB
Cement Volume: 9 Tonnes
Cement Type: Class 'G'
Additives: 0.4% D-24 & 0.4% R-6 & 0.5% T-10 & 1.0%
Sepolite
Cement Top: 1504 mKB

9. Sidetracked Hole: N/A

10. Drilling Fluid:

Conductor Hole: Gel - Chemical
Properties: Not reported

Surface Hole: Gel - Chemical
Properties: Viscosity: 50 - 55 sec/L
Weight: 1130 kg/m³
PH: 9.0
Water loss: 6.5 cc
Solids:
Gels:
Filter Cake:
PV / YP:

Intermediate: Invert
Properties: Viscosity: 54 sec/L
Weight: 1000 kg/m³
PH: 7.0
Water loss: 5 cc
Solids:
Gels:
Filter Cake:
PV / YP:

Main:	Invert
Properties:	Viscosity: 64 sec/L
	Weight: 1035 kg/m ³
	PH: 7.0
	Water loss: 7 cc
	Solids:
	Gels:
	Filter Cake:
	PV / YP:

11. Fishing Operations: N/A
12. Well Kicks and Well Control Operations: N/A
13. Formation Leak Off Tests:

Depth:	505 m
Fluid Density:	1000 kg/m ³
Applied Pressure:	5600 kPa
Hydrostatic Pressure:	4954 kPa
Mud Weight Equivalent:	2130 kg/m ³
Casing setting depth:	505 mKB

The surface casing leak-off test was taken to a gradient of 20.9 kPa /m without breaking down the formation.

Depth:	1545 m
Fluid Density:	1005 kg/m ³
Applied Pressure:	8912 kPa
Hydrostatic Press.	15232 kPa
Mud Weight Equi.	1593 kg/m ³
Casing Setting Depth:	1545 mKB

The intermediate casing leak-off test was taken to a gradient of 15.6 kPa /m without breaking down the formation.

14. Time Distribution

Date	Hours	Activity
99/11/09	16.0	Move in / rig up
99/11/10	24.0	Move in / rig up
99/11/11	24.0	Move in / rig up
99/11/12	13.5	Move in / rig up

	0.25	Rig service
	0.25	Survey
	6.25	Drill
	0.25	Circulate
	2.0	Mix LCM
	1.0	Trip
	0.5	Safety meeting
99/11/13	0.5	Rig service
	1.25	Survey
	20.25	Drill
	0.25	Trip
	1.75	Clean screens
99/11/14	0.5	Rig service
	1.0	Survey
	18.75	Drill
	3.75	Trip
99/11/15	0.5	Rig service
	1.25	Survey
	22.25	Drill
99/11/16	0.5	Rig service
	1.5	Survey
	21.75	Drill
	0.25	Clean screens
99/11/17	0.75	Rig service
	1.75	Survey
	21.5	Drill
99/11/18	0.5	Rig service
	2.0	Survey
	15.5	Drill
	0.25	Safety meeting
	0.5	Circulate
	5.25	Trip
99/11/19	0.5	Rig service
	1.5	Survey
	19.5	Drill
	0.25	Circulate

	2.25	Work tight hole
99/11/20	0.25	Rig service
	0.75	Survey
	8.75	Drill
	1.0	Circulate
	6.75	Reaming
	6.0	Trip
	0.5	Rig repair
99/11/21	0.5	Rig service
	1.75	Circulate
	4.75	Nipple up BOP's
	0.5	Safety meeting
	1.0	Cement casin
	6.0	Wait on cement
	3.75	Run casing
	3.0	Trip
	2.75	Weld bowl
99/11/22	10.0	Pressure test BOP's
	3.0	Pick up BHA
	11.0	Nipple up BOP's
99/11/23	0.5	Rig service
	1.0	Survey
	9.5	Drill
	2.0	Leak off test
	3.0	Circulate
	0.75	Safety meeting
	5.25	Trip
	2.0	Drill out
99/11/24	0.75	Rig service
	3.0	Survey
	19.0	Drill
	0.25	Safety meeting
	1.0	Rig repair
99/11/25	0.75	Rig service
	0.75	Survey
	10.75	Drill

	1.25	Circulate
	6.0	Trip
	3.25	Ream
	1.25	Handle tools
99/11/26	0.75	Rig service
	2.75	Survey
	20.5	Drill
99/11/27	0.5	Rig service
	0.5	Survey
	7.25	Drill
	0.5	Circulate
	8.75	Trip
	5.0	Ream
99/11/28	0.75	Rig service
	0.75	Survey
	12.0	Drill
	0.25	Circulate
	0.25	Flow check
	8.25	Reaming
	1.75	Trip
99/11/29	0.5	Rig service
	0.75	Survey
	13.75	Drill
	0.75	Circulate
	0.75	Slip & cut drill line
	0.25	Safety meeting
	7.25	Trip
99/11/30	0.75	Rig service
	0.25	Survey
	19.0	Drill
	0.75	Circulate
	3.0	Trip
	0.25	Flow check
99/12/01	0.25	Rig service
	6.25	Trip
	13.75	Drill

	1.0	Circulate
	2.5	Handle tools
	0.25	BOP drill
99/12/02	1.0	Rig service
	0.25	Survey
	15.25	Drill
	0.5	Circulate
	0.25	Handle tools
	6.75	Trip
99/12/03	0.25	Rig service
	0.25	Survey
	16.5	Drill
	3.75	Trip
	3.25	Ream
99/12/04	0.75	Rig service
	0.25	Survey
	16.75	Drill
	5.25	Trip
99/12/05	0.5	Rig service
	0.5	Survey
	22.75	Drill
	0.25	BOP drill
99/12/06	0.25	Rig service
	0.5	Survey
	5.25	Drill
	3.0	Circulate
	4.25	Logging
	9.25	Trip
	1.5	Handle tools
99/12/07	9.5	DST
	3.5	Logging
	9.5	Trip
	7.5	Wait on orders
99/12/08	0.5	Rig service
	10.0	DST
	12.5	Trip

	0.75	Slip & cut drill line
	0.25	BOP drill
99/12/09	0.5	Rig service
	8.75	DST
	2.0	Circulate
	12.0	Trip
	0.25	Safety meeting
99/12/10	0.25	Rig service
	10.75	DST
	1.5	Fishing
	5.25	Wait on tools
	6.0	Trip
	0.25	Safety meeting
99/12/11	0.5	Rig service
	1.5	Circulate
	11.75	Trip
	10.25	Fishing
99/12/12	0.5	Rig service
	3.5	Circulate
	6.75	Run casing
	1.25	Fishing
	9.5	Trip
	0.25	Safety meeting
	0.75	Slip & cut drill line
99/12/13	0.25	Rig service
	3.75	Circulate
	9.5	Nipple up BOP's
	2.0	Cement casing
	6.25	Wait on cement
99/12/14	0.25	Rig service
	7.0	Pressure test BOP's
	8.0	Nipple up BOP's
	1.75	Drill out
	6.25	Trip
	0.25	BOP drill
99/12/15	2.25	Handle tools

	0.25	Flow check
	4.0	Circulate
	1.75	Drill out
	11.0	Trip
	4.0	Thaw lines
	0.75	Leak off test
99/12/16	0.5	Rig service
	0.5	Survey
	10.25	Drill
	0.75	Circulate
	0.25	Flow check
	9.0	Trip
	1.75	Handle tools
	1.0	Safety meeting
99/12/17	0.5	Rig service
	10.75	Drill
	3.25	Circulate
	0.25	Flow check
	7.75	Trip
	1.5	Flow well
99/12/18	0.75	Rig service
	6.75	Drill
	4.75	Circulate
	0.75	Slip & cut drill line
	7.5	Trip
	0.75	Handle tools
	2.75	Pressure up with notrogen
99/12/19	0.5	Rig service
	3.0	Drill
	2.25	Circulate
	2.75	Pressure up with notrogen
	1.25	Flow well
	1.0	Handle tools
	13.25	Trip
99/12/20	4.5	Drill
	16.25	Circulate

	0.25	Rig service
	0.5	Survey
	0.75	Trip
	1.75	Flow well
99/12/21	0.75	Rig service
	4.25	Drill
	0.75	Circulate
	1.0	Nipple up BOP
	14.75	Trip
	2.5	Flow well
99/12/22	0.5	Rig service
	23.25	Drill
	0.25	Flow check
99/12/23	0.25	Rig service
	16.75	Drill
	0.5	Survey
	1.25	Circulate
	0.25	Rig repair
	1.75	DST
	3.25	Trip
99/12/24	0.5	Rig service
	2.5	Circulate
	9.75	DST
	10.5	Trip
	0.75	Slip & cut drill line
99/12/25	0.75	Rig service
	1.25	Survey
	22.0	Drill
99/12/26	0.25	Rig service
	1.25	Survey
	19.0	Drill
	0.75	Circulate
	2.75	Trip
99/12/27	0.5	Rig service
	15.25	Drill
	0.25	Circulate

	8.0	Trip
99/12/28	0.5	Rig service
	20.0	Drill
	0.75	Ream
	2.75	Trip
99/12/29	0.25	Rig service
	0.75	Survey
	17.5	Drill
	0.75	Circulate
	4.5	Trip
	0.25	BOP drill
99/12/30	0.5	Rig service
	0.75	Survey
	15.5	Drill
	1.25	Circulate
	6.0	Trip
99/12/31	0.75	Rig service
	11.75	Drill
	0.25	Circulate
	11.0	Trip
	0.25	Rig repair
00/01/01	0.75	Rig service
	0.75	Survey
	22.25	Drill
	0.25	Circulate
00/01/02	0.5	Rig service
	23.5	Drill
00/01/03	0.5	Rig service
	0.5	Survey
	13.25	Drill
	0.75	Circulate
	7.75	Trip
	1.0	Slip & cut drill line
	0.25	BOP drill
00/01/04	0.75	Rig service
	23.25	Drill

00/01/05	0.5	Rig service
	13.5	Drill
	1.25	Circulate
	8.25	Trip
	0.5	Survey
00/01/06	0.75	Rig service
	16.25	Drill
	1.25	Circulate
	5.5	Trip
	0.25	BOP drill
00/01/07	0.5	Rig service
	9.75	Drill
	1.0	Circulate
	9.25	Trip
	1.5	Fishing
	1.75	Ream
	0.25	BOP drill
00/01/08	0.75	Rig service
	0.75	Survey
	8.75	Drill
	1.0	Circulate
	8.0	Logging
	4.75	Trip
00/01/09	0.25	Rig service
	23.75	Drill
00/01/10	0.5	Rig service
	0.25	Circulate
	5.5	Logging
	7.75	Trip
	8.5	DST
00/01/11	0.25	Rig service
	1.0	Circulate
	10.25	Trip
	12.5	DST
00/01/12	0.5	Rig service
	1.75	Circulate

	9.0	Trip
	1.0	DST
	11.75	Logging
00/01/13	0.5	Rig service
	2.75	Circulate
	8.25	Trip
	0.25	Cement casing
	6.5	Logging
	5.0	Run casing
	0.75	Rig up circulating head
	0.25	Safety meeting
00/01/14	12.0	Nipple up BOP
	0.75	Cement casing
	6.0	Trip
	4.5	Install wellhead
	0.75	Circulate
00/01/15		Rig released

Time Break Down by Activity:

<u>Activity</u>	<u>Hours</u>
Move in / rig up:	77.5
Drilling:	716.75
Surveying:	30.75
Mix LCM:	2.0
Circulating:	76.25
Running casing:	18.5
Cementing:	4.25
WOC:	12.25
Rig Service:	31.25
Rig Repair:	2.0
Tripping:	355.25
Reaming:	29.0
Wait on orders:	7.5
Safety meetings:	4.5
Clean screens:	2.0
Work tight hole:	2.25
Nipple up BOP's & flowlines:	49.0
Pressure test BOP's	17.0

Leak off tests:	2.75
Handle tools:	14.25
Flow checks:	3.0
Slip & cut drill line:	4.75
BOP drill:	2.0
Logging:	39.5
DST's:	72.5
Fishing:	14.75
Wait on tools:	5.25
Install wellhead:	4.5
Thaw linws:	4.0
Flow well:	5.5
Pressure up with notrogen:	5.5

15. Deviation Survey: See page 3 of the Geological Report and the Survey Listing in the Attachment Section.
16. Abandonment Plugs: N/A
17. Composite Well Record: See the copy of the atrip log in the Geological Report in the Attachment Section.
18. Completion Record: N/A

D: GEOLOGY

Geological Summary

Tops: See page 2 of the Geological Report in the Attachment Section.

Sample Descriptions: See page 94 of the Geological Report in the Attachment Section.

Total Depth: 2055 mKB

Coring Record: No coring done.

GAS DETECTION REPORT

A gas detector was utilized from the drill out of the conductor pipe to total depth. The gas detector readings are included on the composite geological log at the end of the geological Report in the Appendix Section.

Also included in the Attachment Section are Alpine's Flow Results recorded while drilling the main hole section in an underbalanced state.

DRILL STEM TESTS: See test reports the Attachment Section for details.

DST#1:	Fantasque	1365.0 - 1392.0 mKB
DST#2:	Belloy	1323.0 - 1325.0 mKB
DST#3:	Belloy	1332.0 - 1352.0 mKB
DST#4:	Belloy	1213.0 - 1227.0 mKB
DST#5:	Mattson	1734.5 - 1740.0 mKB
DST#6:	Mattson	1785.0 - 1789.0 mKB

WELL EVALUATION

The following logs were run:

High Definition Induction Log:	505 - 1543 mKB
Compensated Z-Denilog / Compensated Neutron Log:	505 - 1543 mKB
Multipole Array Acoustilog:	505 - 1532 mKB
Cement Volume Log:	505 - 1524 mKB

High Definition Induction Log:	1555 - 2044 mKB
Compensated Z-Denilog / Compensated Neutron Log:	1555 - 2044 mKB
Multipole Array Acoustilog:	1555 - 2034 mKB

Formation Multitester
Cement Volume Log:

1636 - 1992 mKB
1555 - 2054 mKB

GAS, OIL, & WATER ANALYSES: N/A

FORMATION STIMULATION: N/A

FORMATION AND TEST RESULTS: N/A

DETAILED TEST PRESSURE DATA READINGS: N/A

✓ E. ENVIRONMENTAL CONSIDERATIONS

There are no known outstanding environmental considerations on this well. The gel-chem mud system used on the surface hole was hauled and treated at a remote sump. The invert mud system used for the intermediate hole was re-used at another location. The main hole was drilled underbalanced with noitrogen as a carrying medium.

ATTACHMENTS

GEOLOGICAL REPORT

ON

**PARAMOUNT ET AL LIARD NWT I-46
I-46/60-10, 123-15**

FOR

PARAMOUNT RESOURCES LTD.

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November, 1999-January, 2000

**Gary Johannson, M. Sc.,
Wellsite Geologist**

DECOLLEMENT CONSULTING LTD.

WELL DATA SUMMARY

WELL NAME
UNIQUE WELL I.D.
SURFACE LOCATION
FIELD/REGION
OPERATOR

Paramount et al Liard NWT I-46

300I466010123150

I-46/60-10, 123-15

Fort Liard, NWT

Paramount Resources Ltd.

SITE DATA

SURFACE COORDINATES
BOTTOM HOLE COORDINATES
SEISMIC LOCATION
WELL CLASSIFICATION
AFE NUMBER
DRILLING CONTRACTOR

Lat: 60 deg. 05' 32.474" N Long: 123 deg. 22' 53.612" W

N/A

Exploratory

WELL LICENSE #

WID 1871

99N910008

Precision Drilling Rig #379

ELEVATIONS

GROUND LEVEL
KELLY BUSHING

537.20 (m)

542.20 (m)

DRILLING DATES

SPUD DATE
F.T.D. DATE
RIG RELEASE DATE

November 12, 1999

TIME 14:00 Hrs

January 8, 2000

TIME 09:00 Hrs

January 15, 2000

OLE SIZE & MUD TYPE

SURFACE
INTERMEDIATE
MAIN

311mm, Gel Chem.

222 mm, Carbo-TEQ L oil mud.

156mm, Nitrified Air to 1685m, Invert mud 1685m to TD.

CASING DATA

SURFACE
INTERMEDIATE
PRODUCTION

39 joints of 244.5mm, 53.6kg/m, J55-8Rd-LT&C set @ 505.4m KB

118 joints of 177.8mm, 38.6kg/m, J-55 LT&Cset @ 1545.0m KB.

n/a

GEOLOGICAL DATA

SAMPLE & GAS DETECTION
INTERVAL
CORES
LOGGING SUITE

Surface to T.D.

None

Intermediate hole: HDIL-MAC-CN-ZDL-GR-XYCAL

Main hole: 1) HDIL-MAC-GR-XYCAL;

2) ZDL-CN-GR-CAL; 3) FMT (2 Runs);

4) FMT (3 Runs)

DST #1: 1365-1392m; DST #2: 1323-1343m; DST #3: 1332-1352m;

DST #4: 1213-1227m; DST #5: 1734.5-1740m; DST #6: 1785-1789m

DST #7: 1899-1903m

DRILL STEM TESTS

WELL STATUS

Cased Gas Well

FORMATION TOPS

Paramount et al Liard NWT I-46

G.L.(m): 537.20 K.B.(m): 542.20

FORMATION	SAMPLE		High	PROGNOSIS			LOGS		Isopach
	MD(m)	SS(m)	Low (-)	MD(m)	SS(m)	Isopach	MD(m)	SS(m)	(m)
Dunvegan	n/a	542.2			542.2	178.7	n/a	542.2	162.5
Sully	162.5	379.7	15.2	178.7	363.5	55.0	n/a	n/a	40.1
Sikanni	202.6	339.6	31.1	233.7	308.5	155.0	n/a	n/a	152.4
Lepine	355.0	187.2	33.7	388.7	153.5	520.0	n/a	n/a	526.0
Scatter	881.0	-338.8	27.7	908.7	-366.5	125.0	880.3	-338.1	140.3
Garbutt	1022.0	-479.8	11.7	1033.7	-491.5	130.0	1020.6	-478.4	130.4
Garbutt Radioactive Zone	1154.0	-611.8	9.7	1163.7	-621.5	58.0	1151.0	-608.8	57.0
Chinkeh Siltstone	1212.0	-669.8	9.7	1221.7	-679.5	3.0	1208.0	-665.8	3.3
Chinkeh Sand**	1215.5	-673.3	9.4	1224.7	-682.5	13.5	1211.3	-669.1	11.3
Triassic	1228.2	-686.0	10.0	1238.2	-696.0	100.0	1222.6	-680.4	103.5
Belloy	1325.9	-783.7	12.3	1338.2	-796.0	120.0	1326.1	-783.9	47.2
Fantasque**	1374.8	-832.6	83.4	1458.2	-916.0	54.0	1373.3	-831.1	88.0
Kindle	1464.0	-921.8	n/a	not given	not given	n/a	1461.3	-919.1	37.4
Mattson*	1497.4	-955.2	14.8	1512.2	-970.0	653.5	1498.8	-956.6	555.6
in Mattson M9 Zone	2055.0	-1512.8	n/a	2317.0	-1774.8	n/a	2054.4	-1512.2	n/a

Primary Target Zone *

Secondary Target Zone **

DEVIATION SURVEYS

Paramount et al Liard NWT I-46

Surface Hole

<i>Depth</i>	<i>Inclination</i>
29.0	.50°
58.0	misrun
67.0	.13°
96.0	.50°
121.0	.88°
140.0	1.25°
159.0	.25°
178.0	1.25°
190.0	1.50°
218.0	.75°
248.0	1.00°
276.0	1.13°
294.0	1.00°
313.0	.75°
343.0	1.50°
360.0	1.50°
390.0	1.75°
418.0	1.25°
436.0	1.75°
464.0	1.50°
505.0	1.75°

Main Hole

<i>Depth</i>	<i>Inclination</i>	<i>Azimuth</i>
1586.0	2.50°	23.0°
1650.0	2.00°	23.0°
1760.0	8.00°	14.0°
1765.0	8.00°	14.0°
1798.0	10.00°	10.0°
1838.0	11.00°	1.0°
1866.0	10.25°	1.0°
1914.0	12.00°	1.0°
1957.0	13.50°	Totco
1996.0	15.25°	8.0°
2051.0	13.00°	?

Note: See attached directional surveys for intermediate hole.

December 6, 1999
10:37 am

Onscreen for Windows
Survey Calculation Program
29364

Customer: Paramount Resources Ltd.
WellName: Para Et Al Ft. Liard I-46
Location: 60-10-123-15

Vertical Section Calculated on: 0.0000
Survey Calculation Method: Minimum Curvature
FileName: C:\ONSWIN31\29364.SR3

#	Depth Meters	Inc Degree	Azimuth Degree	TVD Meters	North Meters	East Meters	Section Meters	Dogleg /30m	BldRate /30m	TmRate /30m	Subsec Meters
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	542.20
1	505.00	0.00	0.00	505.00	0.00	0.00	0.00	0.00	0.00	0.00	37.20
2	522.10	1.60	45.60	522.10	0.17	0.17	0.17	2.81	2.81	0.00	20.10
3	541.00	1.50	50.30	540.99	0.51	0.55	0.51	0.26	-0.16	7.46	1.21
4	559.40	1.60	50.90	559.38	0.83	0.93	0.83	0.17	0.16	0.98	-17.16
5	578.20	0.50	37.80	578.18	1.06	1.19	1.06	1.79	-1.76	-20.90	-35.96
6	596.80	0.40	214.20	596.78	1.07	1.20	1.07	1.45	-0.16	284.52	-54.56
7	616.20	0.20	222.40	616.18	0.99	1.14	0.99	0.32	-0.31	12.68	-73.96
8	634.80	0.10	146.70	634.78	0.95	1.13	0.95	0.32	-0.16	-122.10	-92.56
9	654.20	0.10	57.70	654.18	0.94	1.15	0.94	0.22	0.00	-137.63	-111.96
10	673.10	0.20	85.40	673.08	0.95	1.20	0.95	0.19	0.16	43.97	-130.86
11	691.60	0.20	39.50	691.58	0.98	1.25	0.98	0.25	0.00	-74.43	-149.36
12	711.70	0.40	49.90	711.68	1.05	1.33	1.05	0.31	0.30	15.52	-169.46
13	730.90	0.30	43.20	730.88	1.13	1.41	1.13	0.17	-0.16	-10.47	-188.66
14	750.20	0.30	43.00	750.18	1.21	1.48	1.21	0.00	0.00	-0.31	-207.96
15	769.80	0.30	24.00	769.78	1.29	1.54	1.29	0.15	0.00	-29.08	-227.56
16	789.20	0.50	39.40	789.18	1.40	1.61	1.40	0.35	0.31	23.81	-246.96
17	807.80	0.50	24.20	807.78	1.54	1.70	1.54	0.21	0.00	-24.52	-265.56
18	827.00	0.60	38.60	826.98	1.70	1.79	1.70	0.27	0.16	22.50	-284.76
19	846.20	0.50	48.00	846.18	1.83	1.92	1.83	0.21	-0.16	14.69	-303.96
20	875.40	0.60	30.70	875.37	2.05	2.09	2.05	0.20	0.10	-17.77	-333.17
21	894.40	0.50	20.20	894.37	2.21	2.17	2.21	0.22	-0.16	-16.58	-352.17
22	912.70	0.60	46.20	912.67	2.35	2.27	2.35	0.44	0.16	42.62	-370.47
23	931.30	0.60	22.80	931.27	2.51	2.38	2.51	0.39	0.00	-37.74	-389.07
24	950.20	0.40	41.40	950.17	2.65	2.46	2.65	0.40	-0.32	29.52	-407.97
25	968.40	0.50	52.60	968.37	2.75	2.56	2.75	0.22	0.16	18.46	-426.17
26	987.80	0.50	26.50	987.77	2.87	2.67	2.87	0.35	0.00	-40.36	-445.57
27	1007.10	0.60	43.30	1007.07	3.02	2.77	3.02	0.29	0.16	26.11	-464.87
28	1025.50	0.60	51.70	1025.47	3.15	2.92	3.15	0.14	0.00	13.70	-483.27
29	1045.40	0.00	37.40	1045.37	3.22	3.00	3.22	0.90	-0.90	0.00	-503.17
30	1064.30	0.20	33.50	1064.27	3.24	3.02	3.24	0.32	0.32	0.00	-522.07
31	1082.80	0.30	76.40	1082.77	3.28	3.08	3.28	0.33	0.16	69.57	-540.57
32	1101.20	0.40	60.60	1101.17	3.32	3.18	3.32	0.23	0.16	-25.76	-558.97
33	1120.20	0.40	25.40	1120.17	3.42	3.27	3.42	0.38	0.00	-55.58	-577.97

December 6, 1999
10:37 am

Onscreen for Windows
Survey Calculation Program
29364

Customer: Paramount Resources Ltd.
WellName: Para Et Al Ft. Liard I-46
Location: 60-10-123-15

Vertical Section Calculated on: 0.0000
Survey Calculation Method: Minimum Curvature
FileName: C:\ONSWIN31\29364.SR3

#	Depth Meters	Inc Degree	Azimuth Degree	TVD Meters	North Meters	East Meters	Section Meters	Dogleg /30m	BldRate /30m	TrnRate /30m	Subsea Meters
34	1148.10	0.40	22.70	1148.07	3.59	3.35	3.59	0.02	0.00	-2.90	-605.87
35	1167.00	0.50	54.20	1166.97	3.70	3.44	3.70	0.42	0.16	50.00	-624.77
36	1186.20	0.40	35.00	1186.16	3.81	3.55	3.81	0.28	-0.16	-30.00	-643.96
37	1204.10	0.50	34.30	1204.06	3.92	3.63	3.92	0.17	0.17	-1.17	-661.86
38	1223.10	0.60	32.60	1223.06	4.08	3.73	4.08	0.16	0.16	-2.68	-680.86
39	1252.20	0.50	41.00	1252.16	4.30	3.89	4.30	0.13	-0.10	8.66	-709.96
40	1281.60	0.80	39.70	1281.56	4.55	4.11	4.55	0.31	0.31	-1.33	-739.36
41	1298.80	1.30	41.80	1298.76	4.79	4.32	4.79	0.87	0.87	3.66	-756.56
42	1318.10	1.50	47.10	1318.05	5.13	4.65	5.13	0.37	0.31	8.24	-775.85
43	1337.40	2.40	45.90	1337.34	5.58	5.12	5.58	1.40	1.40	-1.87	-795.14
44	1356.80	2.90	56.50	1356.72	6.13	5.82	6.13	1.08	0.77	16.39	-814.52
45	1377.80	3.40	55.30	1377.69	6.78	6.78	6.78	0.72	0.71	-1.71	-835.49
46	1396.70	3.50	55.30	1396.55	7.43	7.71	7.43	0.16	0.16	0.00	-854.35
47	1416.00	2.90	52.70	1415.82	8.06	8.59	8.06	0.96	-0.93	-4.04	-873.62
48	1431.80	2.70	49.40	1431.60	8.54	9.19	8.54	0.49	-0.38	-6.27	-889.40
49	1451.40	3.10	48.50	1451.18	9.20	9.93	9.20	0.62	0.61	-1.38	-908.96
50	1472.60	2.90	47.60	1472.35	9.94	10.76	9.94	0.29	-0.28	-1.27	-930.15
51	1491.70	2.50	47.30	1491.43	10.55	11.42	10.55	0.63	-0.63	-0.47	-949.23
52	1511.10	2.60	46.40	1510.81	11.14	12.05	11.14	0.17	0.15	-1.39	-968.61
53	1530.60	2.80	46.30	1530.29	11.77	12.72	11.77	0.31	0.31	-0.15	-988.05
Ext	1545.00	2.80	46.30	1544.67	12.26	13.22	12.26	0.00	0.00	0.00	-1002.47

Closure is 18.0309 Meters on an azimuth of 47.1745

WELLSITE BIT RECORD

Paramount et al Liard NWT I-46

SPUD DATE: November 12, 1999

T.D. DATE: January 8, 2000

SURFACE CASING: 39 joints of 244.5mm, 53.6kg/m, J55-8Rd-LT&C set @ 505.4m KB

BIT #	1A	2A	3A	1Arr	2	3	4
SIZE (mm)	311	222	311	222	222	222	222
MAKE	Smith	Hughes	Hughes	Hughes	Smith	Smith	Hughes
TYPE	SDS	GT-1	GT-S1	GT-1	F15HP	F27I	GT-S30
SERIAL #	LR4795	H45ZM	G27ZH	H45ZM	LR5726	LR6603	H76ZJ
JETS	2x15.9/1x17.5	3x15.9	2x15.9	open	3x19.1	3x12.7	
DEPTH IN	0.00	190.00	190.00	506.00	849.00	1273.00	1360.00
DEPTH OUT	190.00	506.00	506.00	849.00	1273.00	1360.00	1393.00
METRES	190.00	316.00	316.00	344.00	424.00	87.00	33.00
HOURS	43.75	72.50	29.00	29.50	37.50	25.75	19.00
ACC. HRS.	43.75	116.25	145.25	174.75	212.25	238.00	257.00
ROP (m/hr)	4.34	4.36	10.90	11.66	11.31	3.39	1.73
FOB	3-6000	2-5000	3-5000	6-10000	6-9000	8-12000	10-14000
RPM	150-180	160-185	160-180	45-170	45-170	50-70	70-80
PP	2800-6400	2400-3000	2400-2800	5200-7400	7400-8500	5400-5700	7000
DEN	1010-1090	1090-1185	1105-1185	955-965	955-970	960-990	995-1010
VISCOSITY	54-68	49-55	49-52	52-60	51-58	51-56	55-57
MAX DEV.°	1.500°	1.750°	1.750°	1.600°	0.600°	2.900°	3.400°
Condition:	<i>T/B/G</i>	<i>T/B/G</i>	<i>T/B/G</i>	<i>T/B/G</i>	<i>T/B/G</i>	<i>T/B/G</i>	<i>T/B/G</i>
Condition:	<i>IR/ORD/L</i>	<i>IR/ORD/L</i>	<i>IR/ORD/L</i>	<i>IR/ORD/L</i>	<i>IR/ORD/L</i>	<i>IR/ORD/L</i>	<i>IR/ORD/L</i>
	2-2-WT-A	3-3-WT-A	2-2-WT-A	4-7-WT-A	2-4-WT-A	3-4-FC-A	3-3-WT-A
	<i>B/G/O/RP</i>	<i>B/G/O/RP</i>	<i>B/G/O/RP</i>	<i>B/G/O/RP</i>	<i>B/G/O/RP</i>	<i>B/G/O/RP</i>	<i>B/G/O/RP</i>
	2-IN-Dev	2-IN-CP	2-IN-CP	7-IN-TQ	7-IN-PR	6-IN-PR	3-IN-BHA
REMARKS	Surface hole	Surface pilot hole	Ream pilot hole	Intermediate hole	Intermediate hole	Intermediate hole	Intermediate hole

WELLSITE BIT RECORD #2

Paramount et al Liard NWT I-46

SPUD DATE: November 12, 1999

T.D. DATE: January 8, 2000

SURFACE CASING: 39 joints of 244.5mm, 53.6kg/m, J55-8Rd-LT&C set @ 505.4m KB

BIT #	5	6	7	1	2	3	4
SIZE (mm)	222mm	222mm	222mm	156mm	156mm	156mm	156mm
MAKE	Hughes	Hughes	Smith	Hughes	Drillmaster	Drillmaster	Drillmaster
TYPE	GTS-30	ATJS44G	F4	ATJ-4	Hammer-bit	Hammer-bit	Hammer-bit
SERIAL #	H75ZJ	H73ZJ	LT8998	E15ZD	9A349	9A350	9A354
JETS	3x15.9	3x17.5	3x17.5	Open	Open	Open	Open
DEPTH IN	1393.00	1437.00	1466.00	1545.00	1547.00	1597.00	1638.00
DEPTH OUT	1437.00	1466.00	1545.00	1547.00	1597.00	1638.00	1670.00
METRES	44.00	29.00	79.00	2.00	50.00	41.00	32.00
HOURS	29.00	16.50	44.75	3.00	9.75	11.25	7.75
ACC. HRS.	286.00	302.50	347.25	350.25	360.00	371.25	379.00
ROP (m/hr)	1.52	1.76	1.77	0.67	5.13	1.78	4.13
FOB	12-13000	8-12000	12-15000	-	6000	6000	3000
RPM	40-70	40-70	40-70	-	35	35	35
PP	8500-9600	8400-8900	8300-9000	-	Air: 100CFM	Air: 100CFM	Air: 100CFM
DEN	1010-1030	1010-1025	1030-1040	-	-	-	-
VISCOSITY	49-56	49-52	47-52	-	-	-	-
MAX DEV.°	3.500°	3.100°	2.900°	n/a	2.500°	2.000°	2.000°
Condition:	T/B/G	T/B/G	T/B/G	T/B/G	T/B/G	T/B/G	T/B/G
Condition:	IR/ORD/L	IR/ORD/L	IR/ORD/L	IR/ORD/L	IR/ORD/L	IR/ORD/L	IR/ORD/L
	3-8-UG-A	2-6-WT-G	4-4-WT-A		2-8-FC-A	2-8-FC-A	2-2-NO-A
	B/G/O/RP	B/G/O/RP	B/G/O/RP	B/G/O/RP	B/G/O/RP	B/G/O/RP	B/G/O/RP
	7-UG-PR	7-RG-PR	3-IN-CP		2-IN-PR	2-IN-PR	2-IN-PP
REMARKS	Intermediate hole	Intermediate hole	Intermediate hole	Air drill Main Hole	Air drill	Air drill	Air drill

WELLSITE BIT RECORD #3

Paramount et al Liard NWT I-46

SPUD DATE: November 12, 1999

T.D. DATE: January 8, 2000

SURFACE CASING: 39 joints of 244.5mm, 53.6kg/m, J55-8Rd-LT&C set @ 505.4m KB

BIT #	5	6	7	8	9	10	11
SIZE (mm)	156mm	156mm	156mm	156mm	156mm	156mm	156mm
MAKE	Drillmaster	Hughes	Reed	RBI	Hughes	Security	Smith
TYPE	Hammer-bit	STR-44CD	EHP62A	CH7DLRGSP	STR-44CD	HZM89F	XR50Y
SERIAL #	9A351	M06YL	KC5423	BW197B	U39YX	707637	LX4423
JETS	Open	Open	12.7/14.2/15.8	15.9/2x10.3	3x14.3	2x11.9/15.9	3x11.9
DEPTH IN	1670.00	1672.00	1687.00	1740.00	1802.00	1814.00	1851.00
DEPTH OUT	1672.00	1687.00	1740.00	1802.00	1814.00	1851.00	1874.00
METRES	2.00	15.00	53.00	62.00	12.00	37.00	23.00
HOURS	1.75	7.75	41.00	41.00	15.25	37.50	15.50
ACC. HRS.	380.75	388.50	429.50	470.50	485.75	523.25	538.75
ROP (m/hr)	1.14	1.94	1.29	1.51	0.79	0.99	1.48
FOB	2000	8000	14000	12000	12500	12500	12500
RPM	20-40	50-60	50-60	60-65	60-65	50-65	60-65
PP	Air: 100CFM	5000	4200	4200	4200	4600	5200
DEN	-	1020	1040	1035	1040	1035	1035
VISCOSITY	-	52	52	55	56	58	58
MAX DEV.°	n/a	6.000°	8.000°	10.000°	10.000°	11.000°	10.250°
Condition:	<i>T/B/G</i>	<i>T/B/G</i>	<i>T/B/G</i>	<i>T/B/G</i>	<i>T/B/G</i>	<i>T/B/G</i>	<i>T/B/G</i>
Condition:	<i>IR/OR/D/L</i>	<i>IR/OR/D/L</i>	<i>IR/OR/D/L</i>	<i>IR/OR/D/L</i>	<i>IR/OR/D/L</i>	<i>IR/OR/D/L</i>	<i>IR/OR/D/L</i>
	2-2-NO-A	2-2-WT-A	4-5-WT-A	4-4-WT-A	8-3-RG-A	5-4-WT-A	6-7-RG-A
	<i>B/G/O/RP</i>	<i>B/G/O/RP</i>	<i>B/G/O/RP</i>	<i>B/G/O/RP</i>	<i>B/G/O/RP</i>	<i>B/G/O/RP</i>	<i>B/G/O/RP</i>
	2-IN-PR	3-IN-PR	4-IN-PR	4-IN-HR	8-UG-PR	4-IN-PR	7-UG-PR
REMARKS	Air drill	Air drill	Invert mud	Invert mud	Invert mud	Invert mud	Invert mud

WELLSITE BIT RECORD #4

Paramount et al Liard NWT I-46

SPUD DATE: November 12, 1999

T.D. DATE: January 8, 2000

SURFACE CASING: 39 joints of 244.5mm, 53.6kg/m, J55-8Rd-LT&C set @ 505.4m KB

BIT #	12	13	14	15	16		
SIZE (mm)	156	156	156	156	156		
MAKE	Smith	RBI	RBI	Hughes	Smith		
TYPE	F570DD	C45LRGSP	C45LRGSP	STR50D	F7PS		
SERIAL #	LT7426	BP458B	BR868B	J34ZG	LT5656		
JETS	3x11.9	3x11.9	3x11.1	3x10.3	3x11.9		
DEPTH IN	1874.00	1888.00	1960.00	2006.00	2030.00		
DEPTH OUT	1888.00	1960.00	2006.00	2030.00	2055.00		
METRES	14.00	72.00	46.00	24.00	25.00		
HOURS	11.75	54.50	33.50	24.00	18.75		
ACC. HRS.	547.25	601.75	635.25	659.25	678.00		
ROP (m/hr)	1.19	1.32	1.37	1.00	1.33		
FOB	12500	14000	14000	14000	14500		
RPM	60-65	60-65	60-65	55-65	60-65		
PP	5200	5400	5500	5500	5500		
DEN	1035	1045	1035	1040	1035		
VISCOSITY	58	58	62	62	64		
MAX DEV.°	12.000°	13.000°	15.250°	15.000°	10.250°		
Condition:	T/B/G	T/B/G	T/B/G	T/B/G	T/B/G	T/B/G	T/B/G
Condition:	IR/ORD/L	IR/ORD/L	IR/ORD/L	IR/ORD/L	IR/ORD/L	IR/ORD/L	IR/ORD/L
	5-5-WT-A	6-6-WT-A	8-6-WT-A	8-8-BT-A	3-3-WT-A		
	B/G/O/RP	B/G/O/RP	B/G/O/RP	B/G/O/RP	B/G/O/RP	B/G/O/RP	B/G/O/RP
	4-IN-PR	6-IN-PR	6-IN-PR	8-IN-PR	4-IN-TD		
REMARKS	Invert mud	Invert mud	Invert mud	Invert mud	Invert mud		



PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 / 0
DST# 1

Baker Oil Tools

Formation: Fantasque
Interval - from: 1,365.00 to: 1,392.00 meters

Test Date: 1999-12-07
Test Type: Inflate Straddle

Recorder# K3 at 1,367.00 meters

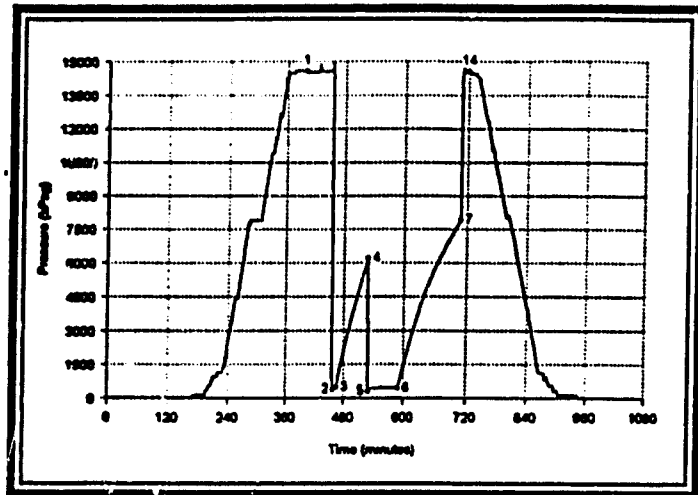
Blow Description:

PREFLOW: Weak air blow increasing to strong in 15 seconds then steady throughout. No gas to st. face.

FINAL FLOW: Strong air blow in 30 secs. Gas to surface in 2 mins - too small to measure - decreasing throughout.

Remarks:

Mechanically successful test. Results suggest very low permeability within the interval tested. The shut-ins were not extrapolated due to insufficient curve development.



Btm Hole Temperature @ FSI: 51.5 C

		Pressure (kPag)	Time (min)	Extrapolated Pressure (kPag)
1	Initial Hydrostatic	14575		
2	Start of 1st Flow	385		
3	End of 1st Flow	464	8.0	
4	End of 1st Shut-in	6196	61.5	
5	Start of 2nd Flow	280		
6	End of 2nd Flow	431	59.5	
7	End of 2nd Shut-in	7914	119.0	
14	Final Hydrostatic	14566		

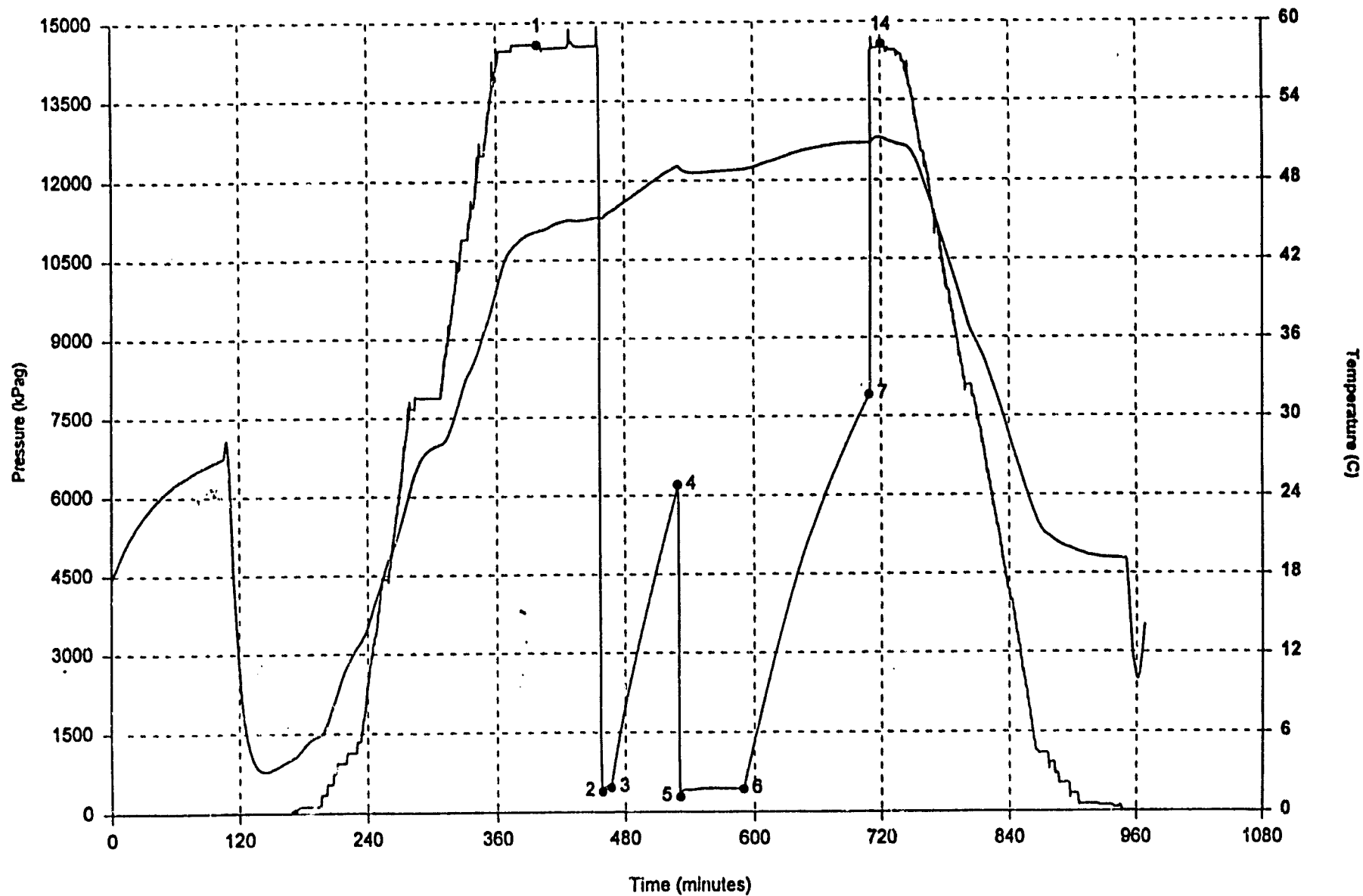
Liquid Recovery 40.00 meters

Recovery	Description
40.00 m	SLIGHTLY GASIFIED INVERT

PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 / 0
DST #: 1
Recorder: K3

Pressure (kPag) at Critical Points:

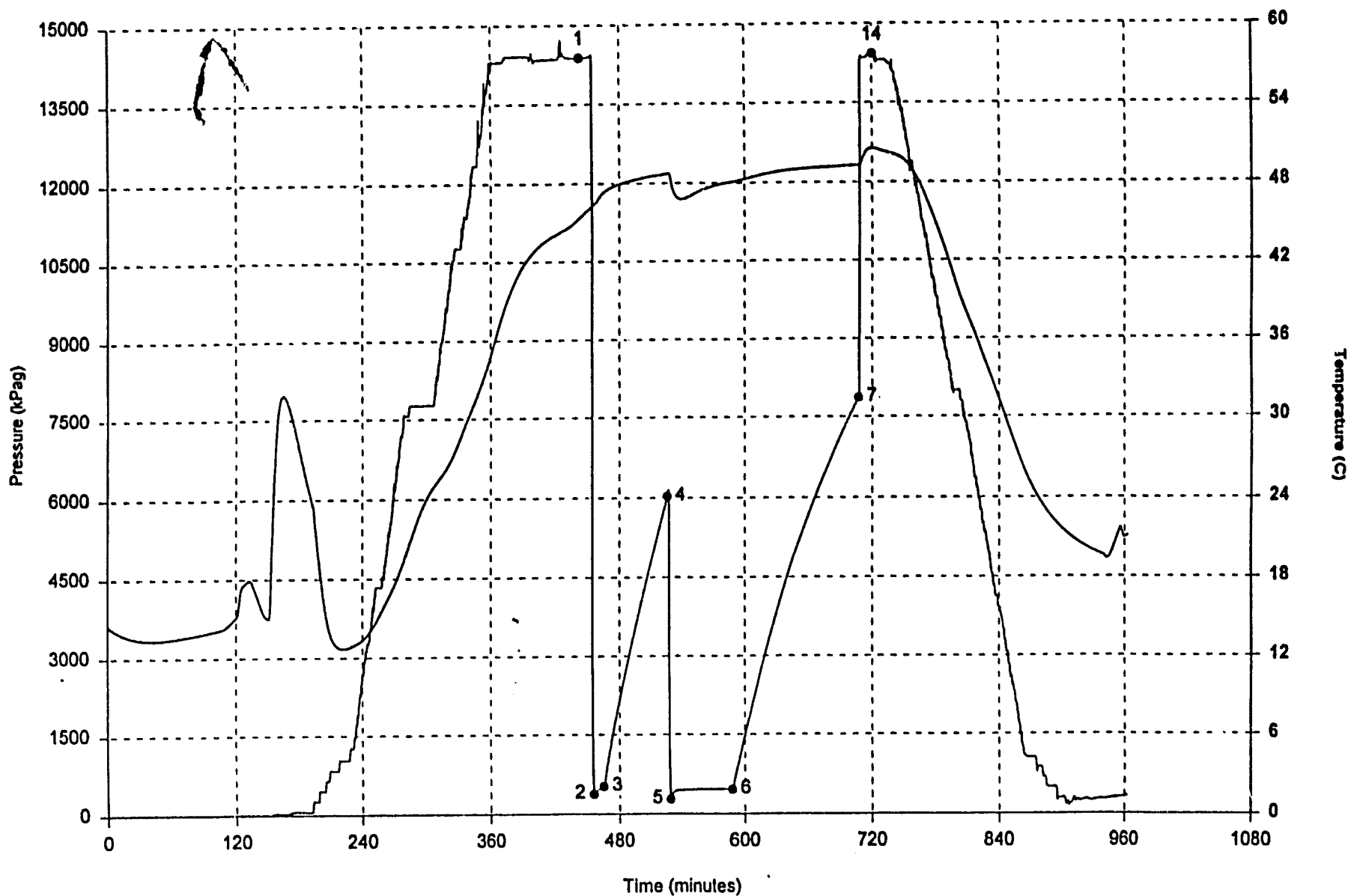
1: 14575	4: 6196	7: 7914
2: 385	5: 280	14: 14566
3: 464	6: 431	



PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 / 0
DST #: 1
Recorder: N37

Pressure (kPag) at Critical Points:
1: 14383 4: 6026 7: 7870
2: 373 5: 274 14: 14423
3: 521 6: 459

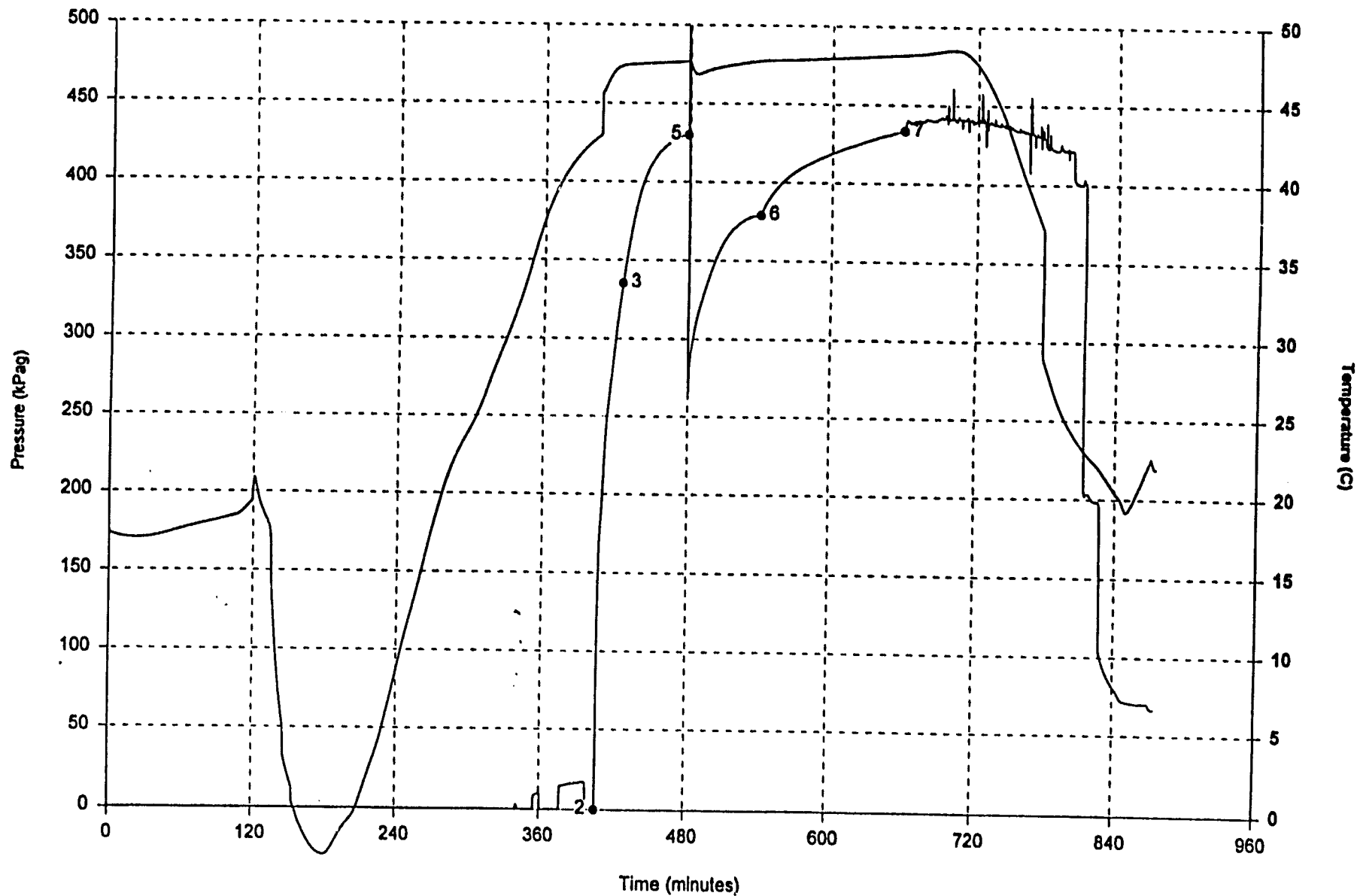
Above Interval



PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 / 0
DST #: 1
Recorder: N63

Pressure (kPag) at Critical Points:
2: 0 6: 379
3: 335 7: 434
5: 430

Recovery recorder



PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 /0
DST# 1

General Information:

Operator: Paramount Resources Ltd.
4000, 350 - 7th Avenue S.W.
Calgary Alberta T2P 3W5

Licence#: 1861
Tester: Pugh P
Ticket#: 809302

Reverse Circulated? N

KB Elevation: 542.20 meters
Ground Elevat'n: 537.20 meters
Total Depth: 1,545.00 meters

Mud Data:

Weight: 1060 kg/m3
Type: Invert
Viscosity: 51 s/l
Water Loss: 0.0 cc/s
Filter Cake: 0.0 mm

Hole Data:

Drilled Hole Size: 222 mm
Calipered Hole Size: 222 mm
Hole Condition at Test Time: Good
Conditioned prior to this test? N

Recorder Summary:

Recorder#	Type	Position	Capacity	Units	Depth	Comments
N63	ZI	Fluid Recovery	41400	kPag	1,352.00	Recovery recorder
N37	ZI	Inside	41400	kPag	1,356.00	Above interval
9487	K-3	Outside	20700	kPag	1,367.00	Loaded Incorrectly
K3	ZI	Outside	82700	kPag	1,367.00	

Distributions:

Reports Sent To: Wayne Tomm

Fluid Samples - no of: 4 Sent To: AGAT

Gas Bomb#	Sent To
11409/4004	AGAT
Bottom Hole Sampler#	Sent To
001	AGAT

PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 / 0
DST# 1

Tool Sequence:

Diagram	Description	Length
	Pump Out Sub	0.33 m
	Double Pin Sub	0.31 m
	Pump Out Sub	0.33 m
	Recorder Carrier	1.38 m
	Hydraulic Tool	1.50 m
	Bottom Hole Sampler	1.03 m
	Recorder Carrier	1.38 m
	Hydraulic Jars	2.22 m
	Safety Joint	0.65 m
	Inflate Pump	2.38 m
	Screen	1.16 m
	Packer Assembly	1.78 m
	Packer Stick Down	0.83 m
	Port Sub	0.42 m
	Recorder Carrier	2.02 m
	Spacing	4.00 m
	Cross Over Sub	0.30 m
	Drill Collar	18.66 m
	Cross Over Sub	0.30 m
	Packer Stick Up	0.43 m
	Packer Assembly	1.90 m
	Perforations	0.31 m
	Belly Spring	2.00 m

Tool String Length:	45.62 m
Drill Collar I.D.: 65 mm	93.25 m
Drill Pipe O.D.: 102 mm	1,264.45 m
Collar Pipe Total:	1,357.70 m
Stick Up:	7.15 m
Tool Above:	14.45 m
Interval Tested:	27.00 m
Bottom Hole Choke Size:	25.40 mm

PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 / 0
DST# 1
Recorder# N63

Build-up and Flow Curve Increments

Flow# 1

Shut-in# 1

Chart Label	Time (min)	Pressure (kPag)	Chart Label	Time (min)	Delta P (kPag)	Pressure (kPag)	Abscissa (T+dT)/dT	Used for Extrap
2	0.0	385	4	0.0		464		
	1.0	428		2.0	282	746	5.0000	
	2.0	475		4.0	532	995	3.0000	
	3.0	492		6.0	763	1226	2.3333	
	4.0	490		8.0	990	1454	2.0000	
	5.0	487		10.0	1204	1668	1.8000	
	6.0	481		12.0	1413	1877	1.6667	
	7.0	476		14.0	1612	2076	1.5714	
3	8.0	464		16.0	1807	2271	1.5000	
				18.0	2000	2463	1.4444	
				20.0	2188	2651	1.4000	
				22.0	2375	2838	1.3636	
				24.0	2559	3022	1.3333	
				26.0	2742	3205	1.3077	
				28.0	2919	3383	1.2857	
				30.0	3093	3557	1.2667	
				32.0	3266	3730	1.2500	
				34.0	3437	3900	1.2353	
				36.0	3617	4081	1.2222	
				38.0	3785	4249	1.2105	
				40.0	3962	4425	1.2000	
				42.0	4127	4590	1.1905	
				44.0	4292	4755	1.1818	
				46.0	4454	4917	1.1739	
				48.0	4621	5085	1.1667	
				50.0	4781	5245	1.1600	
				52.0	4939	5403	1.1538	
				54.0	5100	5563	1.1481	
				56.0	5254	5717	1.1429	
				58.0	5412	5875	1.1379	
				60.0	5572	6035	1.1333	
				61.5	5732	6196	1.1301	

Flow# 2

Shut-in# 2

Chart Label	Time (min)	Pressure (kPag)	Chart Label	Time (min)	Delta P (kPag)	Pressure (kPag)	Abscissa (T+dT)/dT	Used for Extrap
5	0.0	280		0.0		431		
	1.5	397		2.5	247	677	28.0000	
	3.0	412		5.0	468	899	14.5000	
	4.5	412		7.5	687	1117	10.0000	
	6.0	411		10.0	903	1334	7.7500	
				12.5	1118	1549	6.4000	

Note: Increment listing is filtered to include critical data only. Complete time/pressure data is available in electronic or printed format.

PARAMOUNT ET AL FORT LIARD I-46

00/ 60.050 / 123.220 / 0

DST# 1

Recorder# K3

Build-up and Flow Curve Increments

Flow# 2

Shut-in# 2

Chart Label	Time (min)	Pressure (kPag)	Chart Label	Time (min)	Delta P (kPag)	Pressure (kPag)	Abscissa (T+dT)/dT	Used for Extrap
6	7.5	411		15.0	1329	1760	5.5000	
	9.0	410		17.5	1539	1970	4.8571	
	10.5	413		20.0	1750	2181	4.3750	
	12.0	415		22.5	1952	2383	4.0000	
	13.5	419		25.0	2169	2599	3.7000	
	15.0	425		27.5	2369	2800	3.4545	
	16.5	426		30.0	2569	3000	3.2500	
	18.0	429		32.5	2759	3189	3.0769	
	19.5	433		35.0	2951	3381	2.9286	
	21.0	437		37.5	3135	3565	2.8000	
	22.5	439		40.0	3320	3751	2.6875	
	24.0	431		42.5	3500	3931	2.5882	
	25.5	440		45.0	3682	4113	2.5000	
	27.0	439		47.5	3854	4285	2.4211	
	28.5	441		50.0	4023	4454	2.3500	
	30.0	439		52.5	4185	4616	2.2857	
	31.5	438		55.0	4349	4780	2.2273	
	33.0	441		57.5	4500	4930	2.1739	
	34.5	441		60.0	4644	5075	2.1250	
	36.0	437		62.5	4792	5223	2.0800	
	37.5	431		65.0	4928	5359	2.0385	
	39.0	437		67.5	5072	5503	2.0000	
	40.5	437		70.0	5209	5639	1.9643	
	42.0	438		72.5	5341	5772	1.9310	
	43.5	437		75.0	5479	5910	1.9000	
	45.0	438		77.5	5608	6039	1.8710	
	46.5	436		80.0	5732	6163	1.8438	
	48.0	437		82.5	5859	6290	1.8182	
	49.5	439		85.0	5979	6410	1.7941	
	51.0	435		87.5	6091	6522	1.7714	
	52.5	434		90.0	6214	6644	1.7500	
	54.0	431		92.5	6331	6762	1.7297	
	55.5	437		95.0	6443	6874	1.7105	
	57.0	434		97.5	6560	6991	1.6923	
	58.5	433		100.0	6676	7107	1.6750	
	59.5	431		102.5	6788	7219	1.6585	
7				105.0	6893	7324	1.6429	
				107.5	7000	7431	1.6279	
				110.0	7112	7543	1.6136	
				112.5	7211	7642	1.6000	
				115.0	7319	7750	1.5870	
				117.5	7419	7849	1.5745	
				119.0	7483	7914	1.5672	

Note: Increment listing is filtered to include critical data only. Complete time/pressure data is available in electronic or printed format.

PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 /0
DST# 1
Recorder#K3

Build-up and Flow Curve Increments

Horner Extrapolation:

Note: Increment listing is filtered to include critical data only. Complete time/pressure data is available in electronic or printed format.

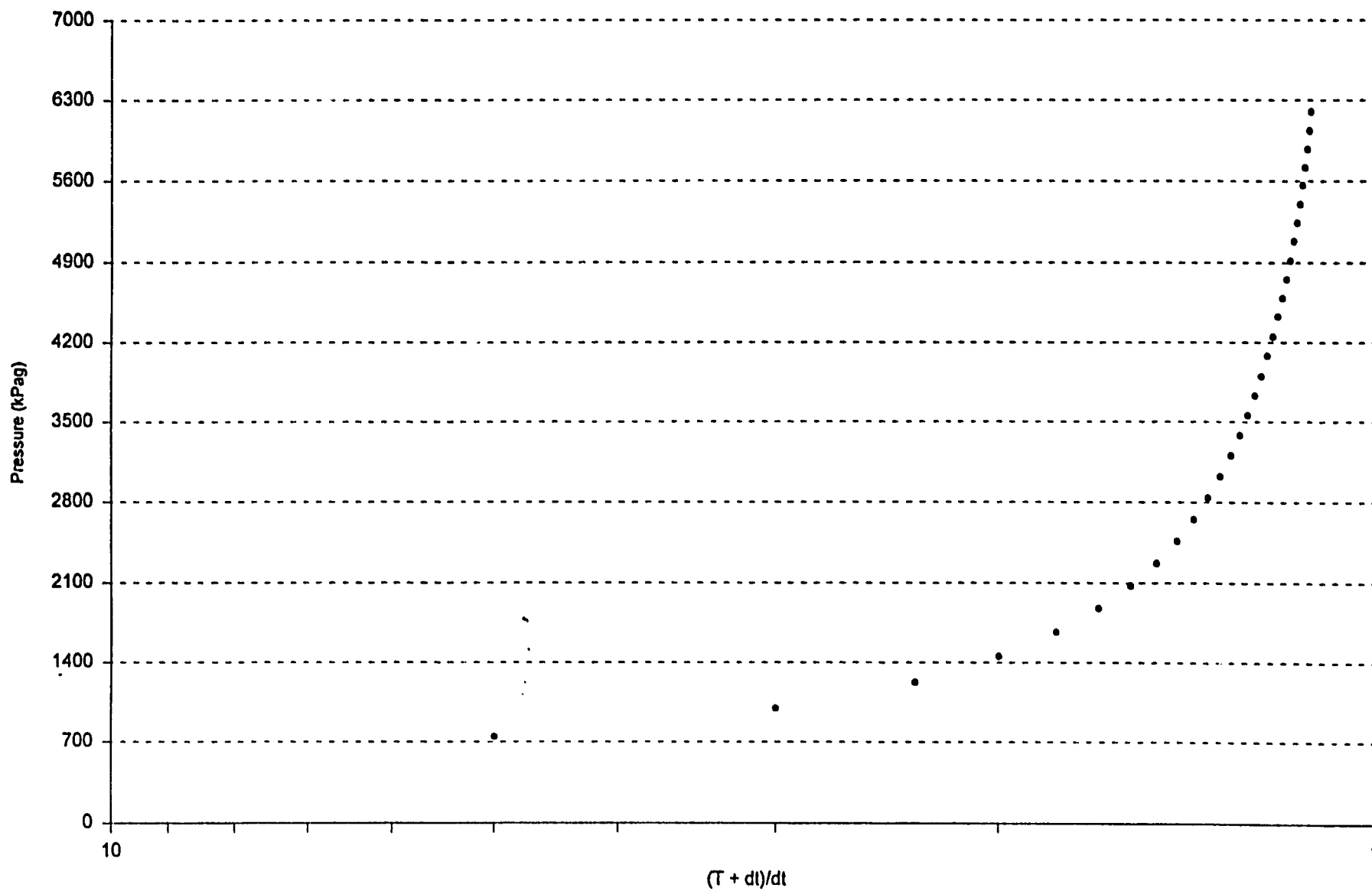
BAKER OIL TOOLS / LYNES DRILL STEM TESTING

Page: 9

PARAMOUNT ET AL FORT LIARD I-48
00/60.050 / 123.220 / 0
DST #: 1
Recorder: K3

Shut-In #1

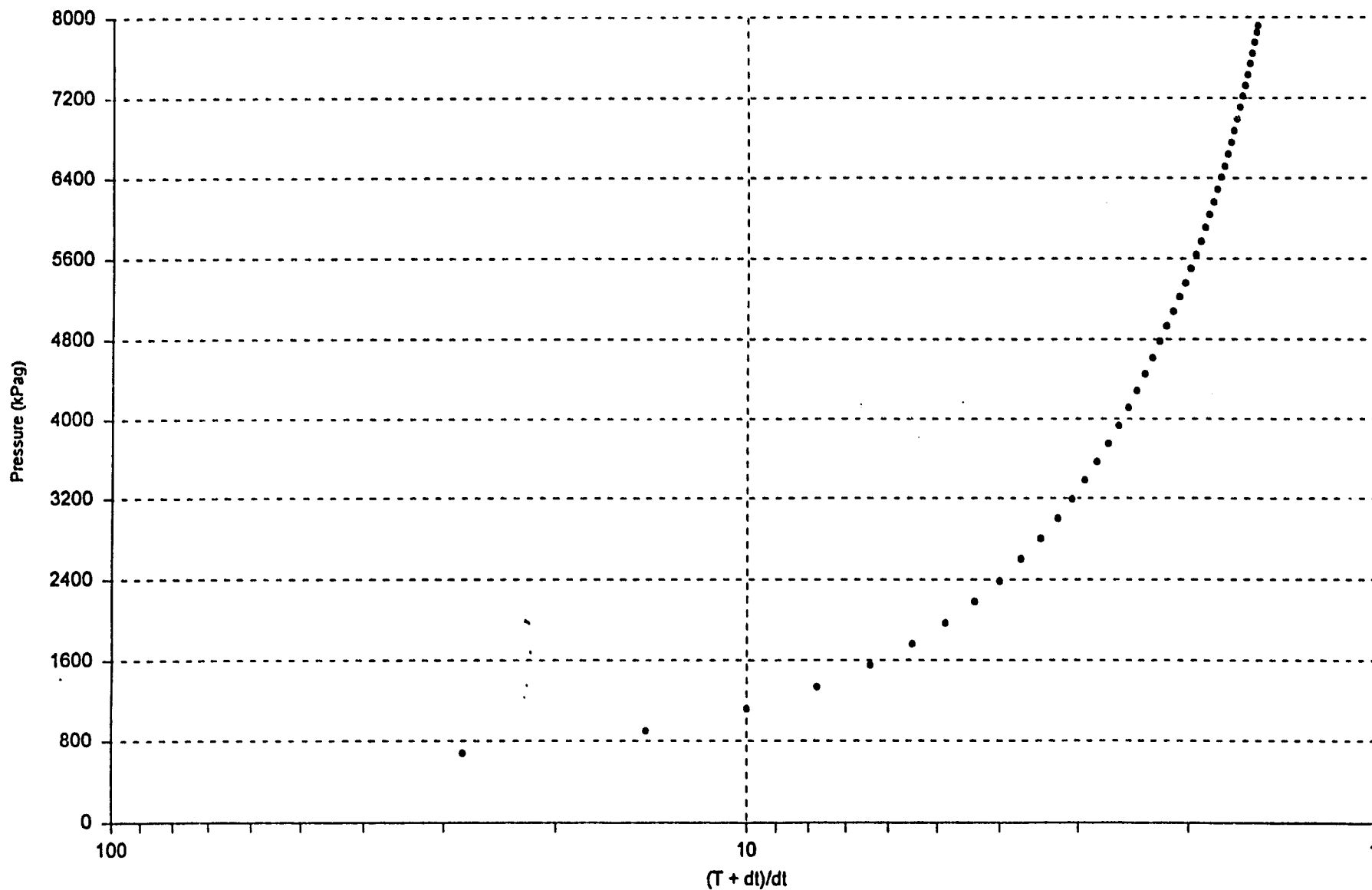
BAKER OIL TOOLS / LYNES DRILL STEM TESTING



PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 / 0
DST #: 1
Recorder: K3

Shut-in #2

BAKER OIL TOOLS / LYNES DRILL STEM TESTING



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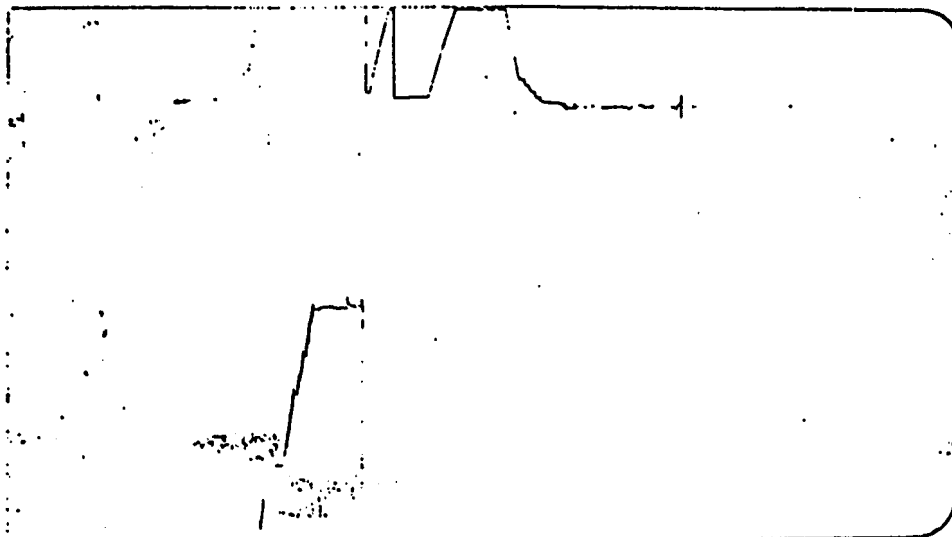
PARAMOUNT ET AL FORT LIARD I-46

00/ 60.050 / 123.220 /0
DST# 1

Recorder# 9487

Depth: 1,367.00 m
Location: Outside

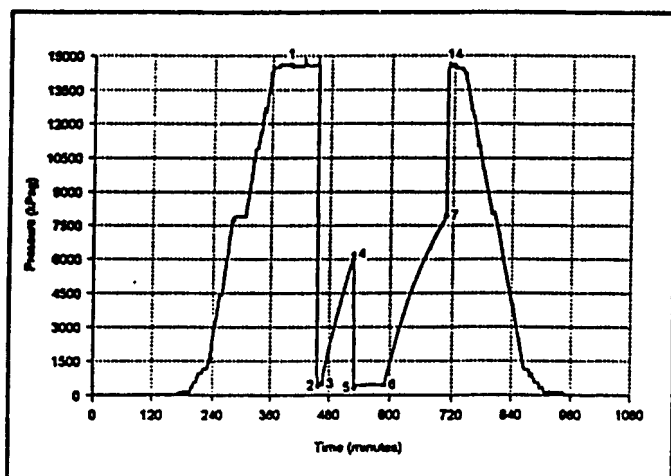
Recorder Type: K-3
Capacity: 30,700 kPag
Comments: Loaded Incorrectly



Recorder# K3

Depth: 1,367.00 m
Temperature: 51.5 C
Location: Outside

Recorder Type: ZI
Capacity: 82,700 kPag



		Pressure (kPag)	Time (min)
1	Initial Hydrostatic	14575	
2	Start of 1st Flow	385	
3	End of 1st Flow	464	8.0
4	End of 1st Shut-in	6196	61.5
5	Start of 2nd Flow	280	
6	End of 2nd Flow	431	59.5
7	End of 2nd Shut-in	7914	119.0
14	Final Hydrostatic	14566	

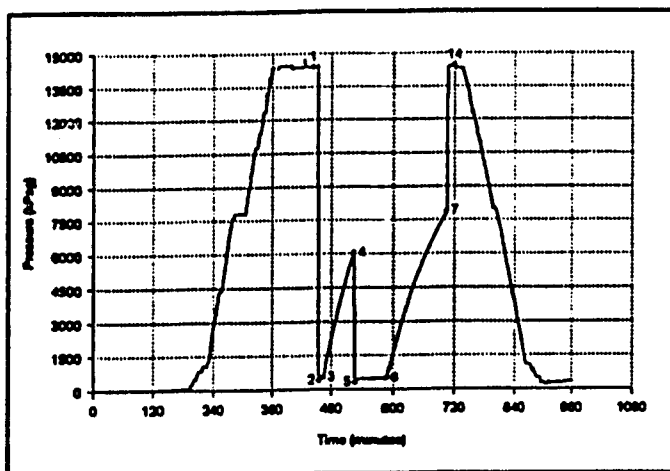
PARAMOUNT ET AL FORT LIARD I-46

00/ 60.050 / 123.220 / 0
DST# 1

Recorder# N37

Depth: 1,356.00 m
Temperature: 50.5 C
Location: Inside

Recorder Type: ZI
Capacity: 41,400 kPag
Comments: Above interval

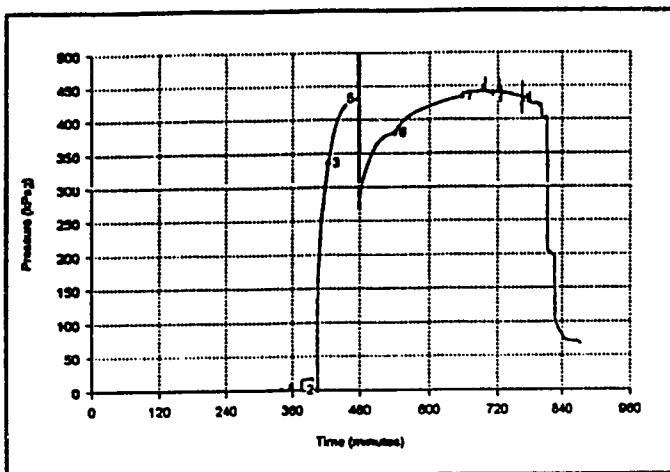


		Pressure (kPag)	Time (min)
1	Initial Hydrostatic	14383	
2	Start of 1st Flow	373	
3	End of 1st Flow	521	8.0
4	End of 1st Shut-in	6026	61.5
5	Start of 2nd Flow	274	
6	End of 2nd Flow	459	59.5
7	End of 2nd Shut-in	7870	119.0
14	Final Hydrostatic	14423	

Recorder# N63

Depth: 1,352.00 m
Temperature: 48.0 C
Location: Fluid Recovery

Recorder Type: ZI
Capacity: 41,400 kPag
Comments: Recovery recorder



		Pressure (kPag)	Time (min)
2	Start of 1st Flow	0	
3	End of 1st Flow	335	8.0
5	Start of 2nd Flow	430	
6	End of 2nd Flow	379	59.5
7	End of 2nd Shut-in	434	119.0

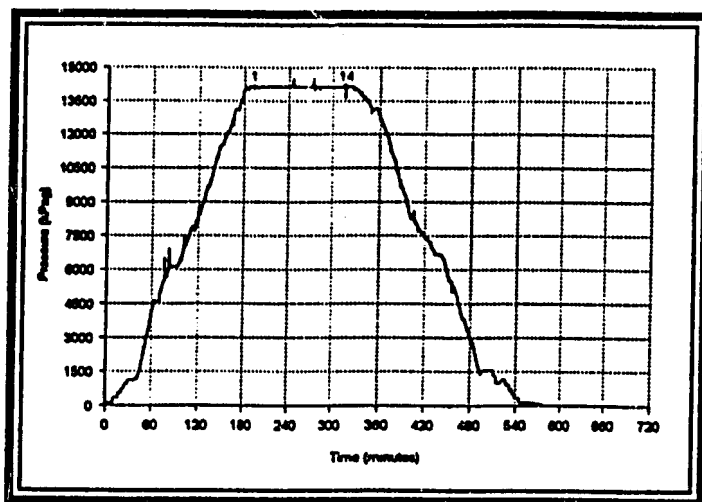
Baker Oil Tools

Formation: Belloy
Interval - from: 1,323.00 **to:** 1,343.00 meters

Test Date: 1999-12-08
Test Type : Inflate Straddle

Recorder# K3 at 1,325.00 meters

Blow Description:
 Misrun



Remarks:

Misrun - unable to maintain a stable packer seat.
 Packers kept skidding in the hole when weight was applied.

Btm Hole Temperature @ FSI: 45.8 C

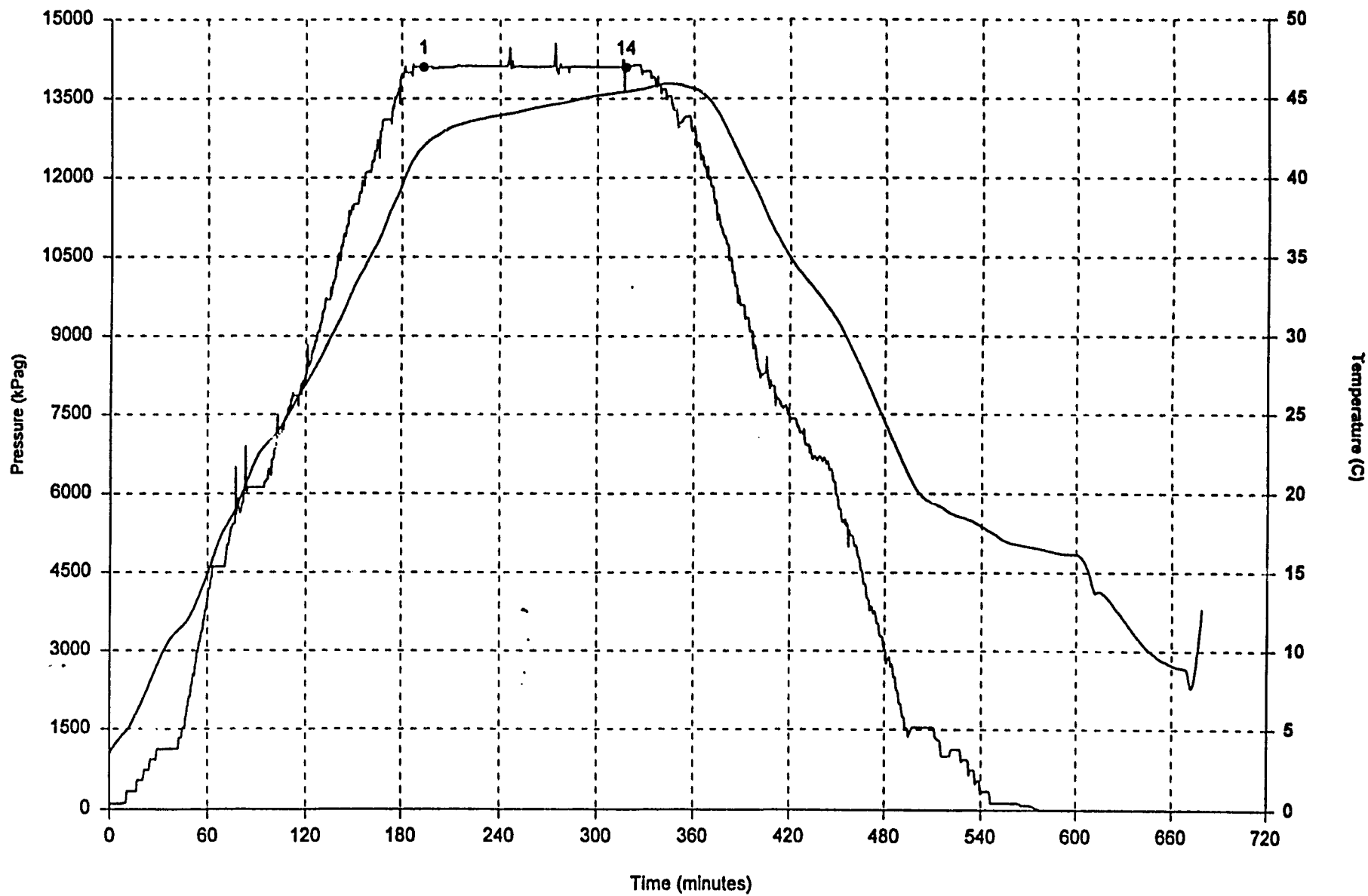
		Pressure (kPag)	Time (min)	Extrapolated Pressure (kPag)
1	Initial Hydrostatic	14100		
14	Final Hydrostatic	14089		

Liquid Recovery 0.00 meters

Recovery	Description
0.00 m	No fluid recovery
0.00 m	

PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 /0
DST #: 2
Recorder: K3

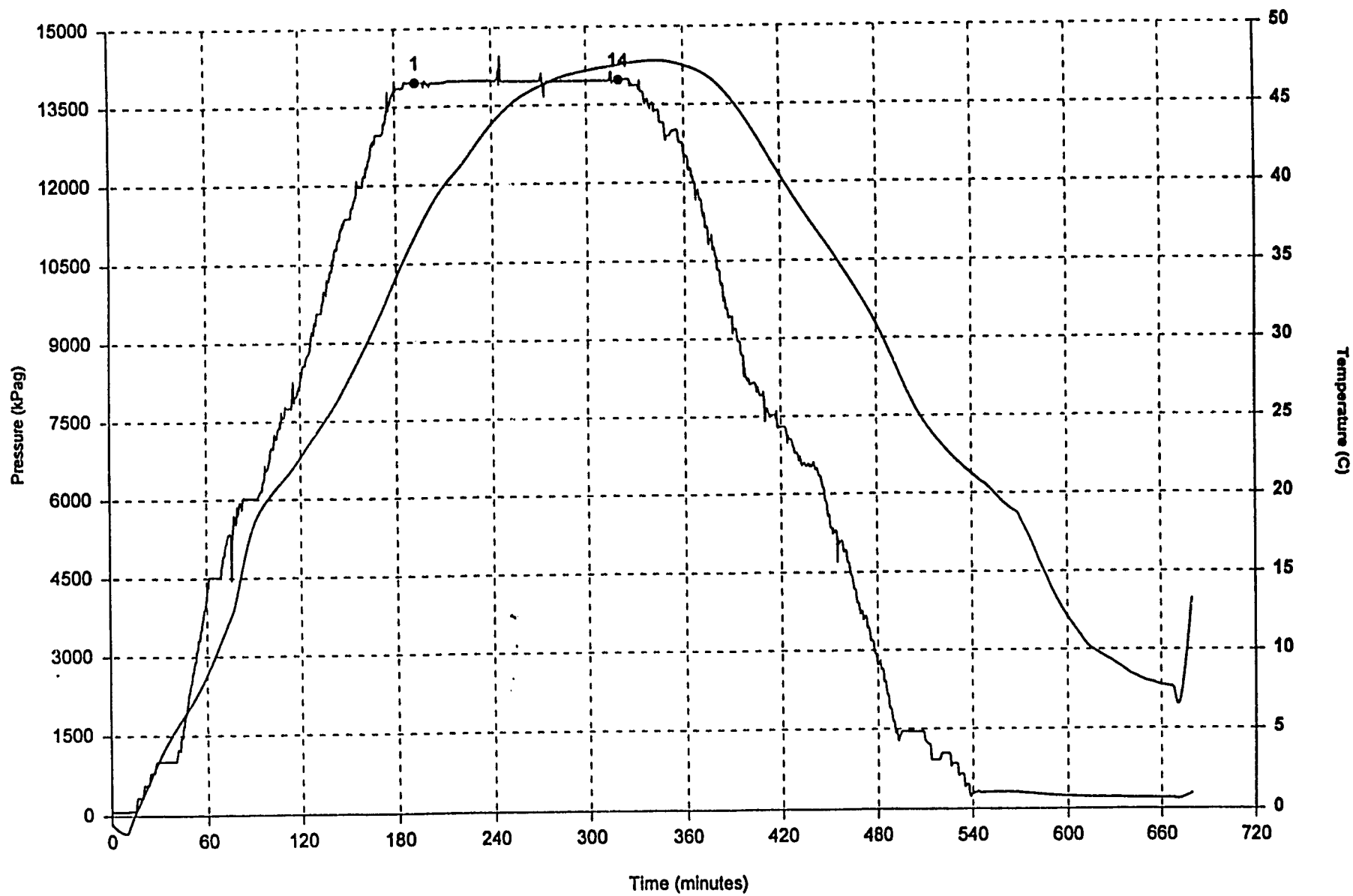
Pressure (kPag) at Critical Points:
1: 14100
14: 14089



PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 / 0
DST #: 2
Recorder: N37

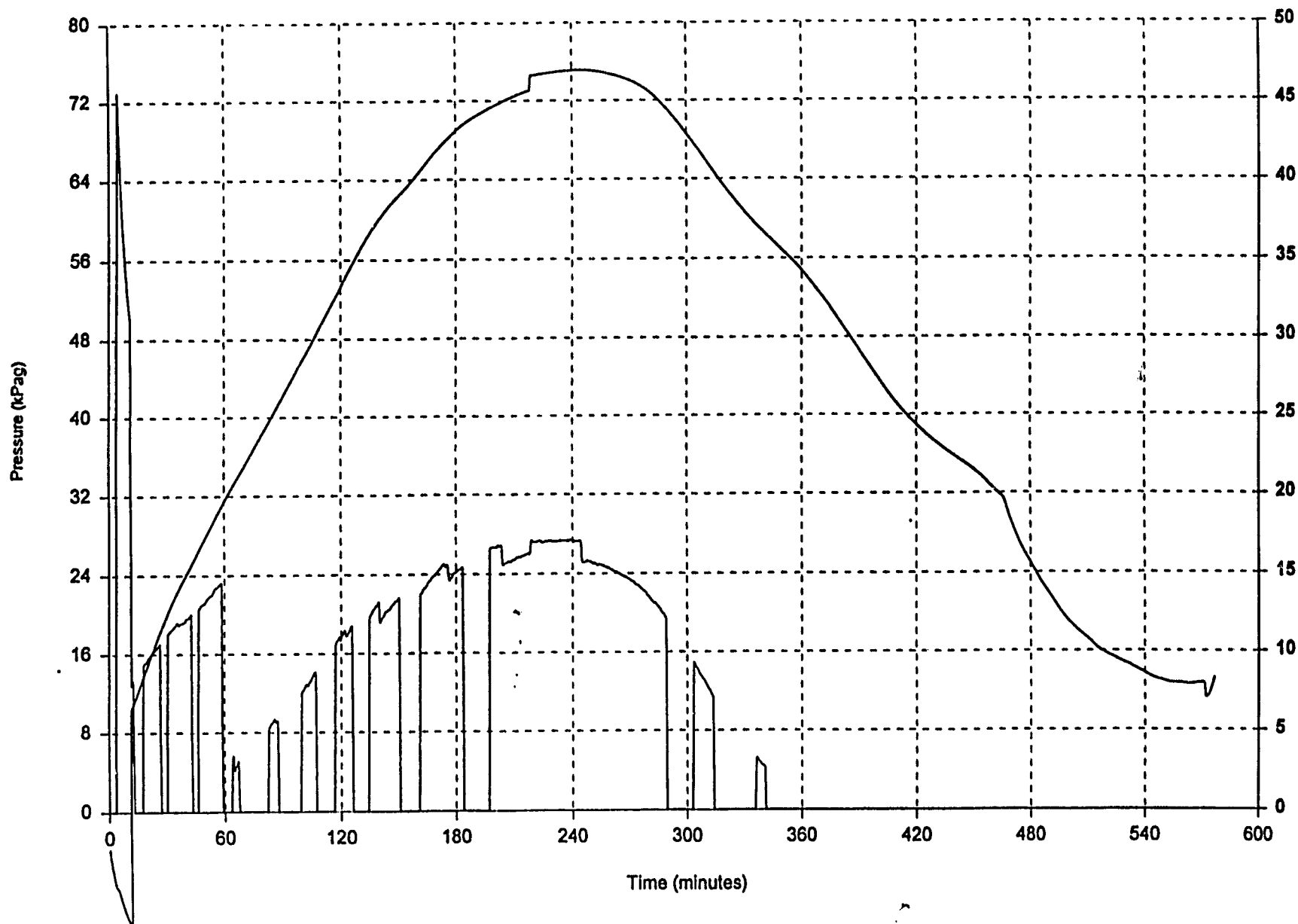
Pressure (kPag) at Critical Points:
1: 13955
14: 13968

Above Interval



PARAMOUNT ET AL FORT LIARD I-48
00/ 60.050 / 123.220 / 0
DST #: 2
Recorder: N63

Recovery Recorder



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PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 /0
DST# 2

General Information:

Operator: Paramount Resources Ltd.
4000, 350 - 7th Avenue S.W.
Calgary Alberta T2P 3W5

Licence#: 1861
Tester: Pugh P
Ticket#: 809303

Reverse Circulated? N

KB Elevation: 542.20 meters

Ground Elevat'n: 537.20 meters

Total Depth: 1,545.00 meters

Mud Data:

Weight: 1060 kg/m3
Type: Invert
Viscosity: 51 s/l
Water Loss: 0.0 cc/s
Filter Cake: 0.0 mm

Hole Data:

Drilled Hole Size: 222 mm
Calipered Hole Size: 222 mm
Hole Condition at Test Time: Good
Conditioned prior to this test? N

Recorder Summary:

Recorder#	Type	Position	Capacity	Units	Depth	Comments
1483	ZI	Inside	41400	kPag	1,310.00	Recovery Recorder Above Interval
N37	ZI	Inside	41400	kPag	1,314.00	
9487	K-3	Outside	20700	kPag	1,325.00	
K3	ZI	Outside	82700	kPag	1,325.00	

Distributions:

Reports Sent To: Wayne Tomm

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PARAMOUNT ET AL FORT LIARD I-46

00/ 60.050 / 123.220 /0
DST# 2

Tool Sequence:

Diagram	Description	Length
	Pump Out Sub	0.33 m
	Double Pin Sub	0.31 m
	Pump Out Sub	0.33 m
	Recorder Carrier	1.38 m
	Hydraulic Tool	1.50 m
	Bottom Hole Sampler	1.03 m
	Recorder Carrier	1.38 m
	Hydraulic Jars	2.22 m
	Safety Joint	0.65 m
	Inflate Pump	2.38 m
	Screen	1.16 m
	Packer Assembly	1.78 m
	Packer Stick Down	0.83 m
	Port Sub	0.42 m
	Recorder Carrier	2.02 m
	Spacing	6.60 m
	Cross Over Sub	0.30 m
	Drill Collar	9.13 m
	Cross Over Sub	0.30 m
	Packer Stick Up	0.43 m
	Packer Assembly	1.90 m
	Perforations	0.31 m
	Belly Spring	2.00 m

Tool String Length:	38.69 m
Drill Collar I.D.: 65 mm	93.25 m
Drill Pipe O.D.: 102 mm	1,217.96 m
Collar Pipe Total:	1,311.21 m
Stick Up:	2.66 m
Tool Above:	14.45 m
Interval Tested:	20.00 m
Bottom Hole Choke Size:	25.40 mm

- 29 -

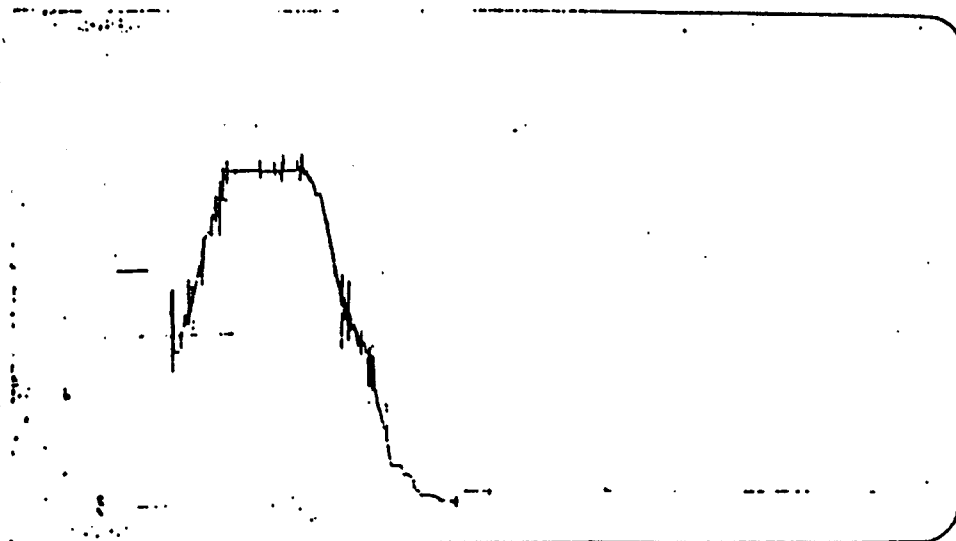
PARAMOUNT ET AL FORT LIARD I-46

00/ 60.050 / 123.220 / 0
DST# 2

Recorder# 9487

Depth: 1,325.00 m
Location: Outside

Recorder Type: K-3
Capacity: 20,700 kPag

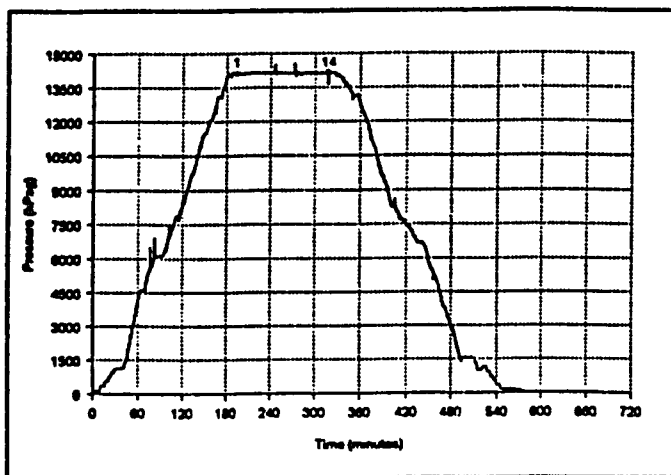


		Pressure (kPag)	Time (min)
1	Initial Hydrostatic	14059	
14	Final Hydrostatic	14045	

Recorder# K3

Depth: 1,325.00 m
Temperature: 45.8 C
Location: Outside

Recorder Type: ZI
Capacity: 82,700 kPag



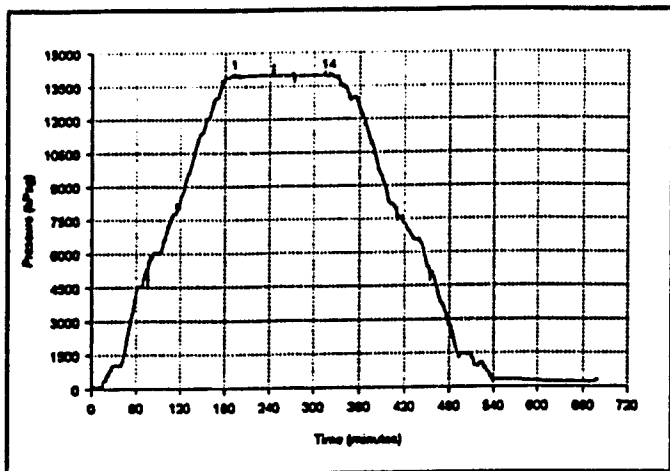
		Pressure (kPag)	Time (min)
1	Initial Hydrostatic	14100	
14	Final Hydrostatic	14089	

PARAMOUNT ET AL FORT LIARD I-46 00/ 60.050 / 123.220 / 0 DST# 2

Recorder# N37

Depth: 1,314.00 m
Temperature: 47.6 C
Location: Inside

Recorder Type: ZI
Capacity: 41,400 kPag
Comments: Above Interval

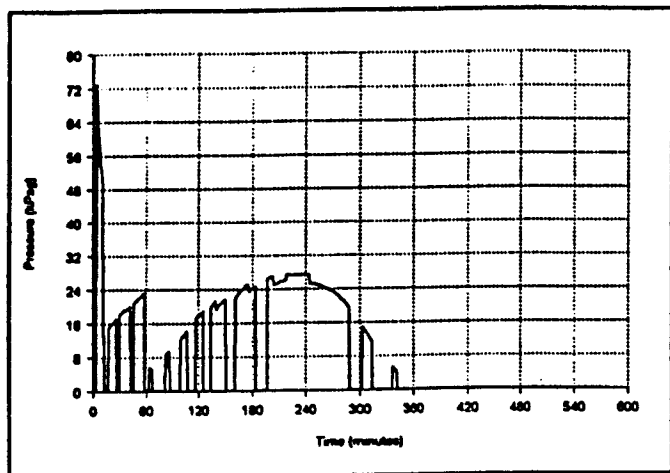


		Pressure (kPag)	Time (min)
1	Initial Hydrostatic	13955	
14	Final Hydrostatic	13968	

Recorder# N63

Depth: 1,310.00 m
Temperature: 47.0 C
Location: Inside

Recorder Type: ZI
Capacity: 41,400 kPag
Comments: Recovery Recorder





PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 /0
DST# 3

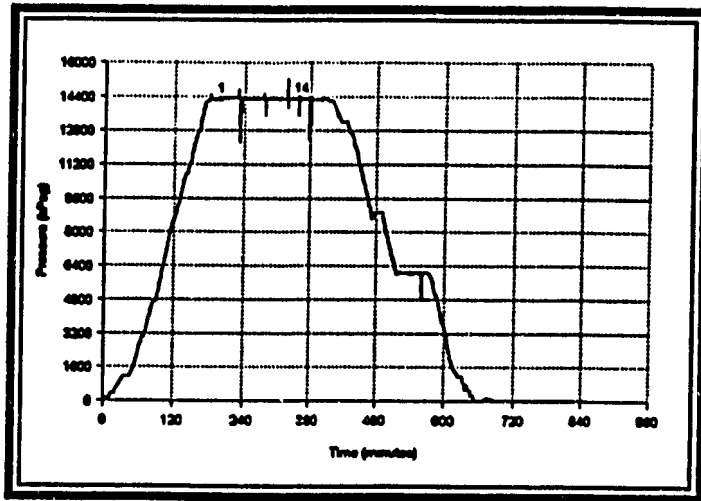
Baker Oil Tools

Formation: Belloy
Interval - from: 1,332.00 to: 1,352.00 meters

Test Date: 1999-12-09
Test Type: Inflate Straddle

Recorder# . K3 at 1,334.00 meters

Blow Description:
Misrun



Remarks:

Misrun - Unable to obtain a packer seat due to packers skidding when attempting to open tool.

Btm Hole Temperature @ FSI: 45.0 C

		Pressure (kPag)	Time (min)	Extrapolated Pressure (kPag)
1	Initial Hydrostatic	14268		
14	Final Hydrostatic	14268		

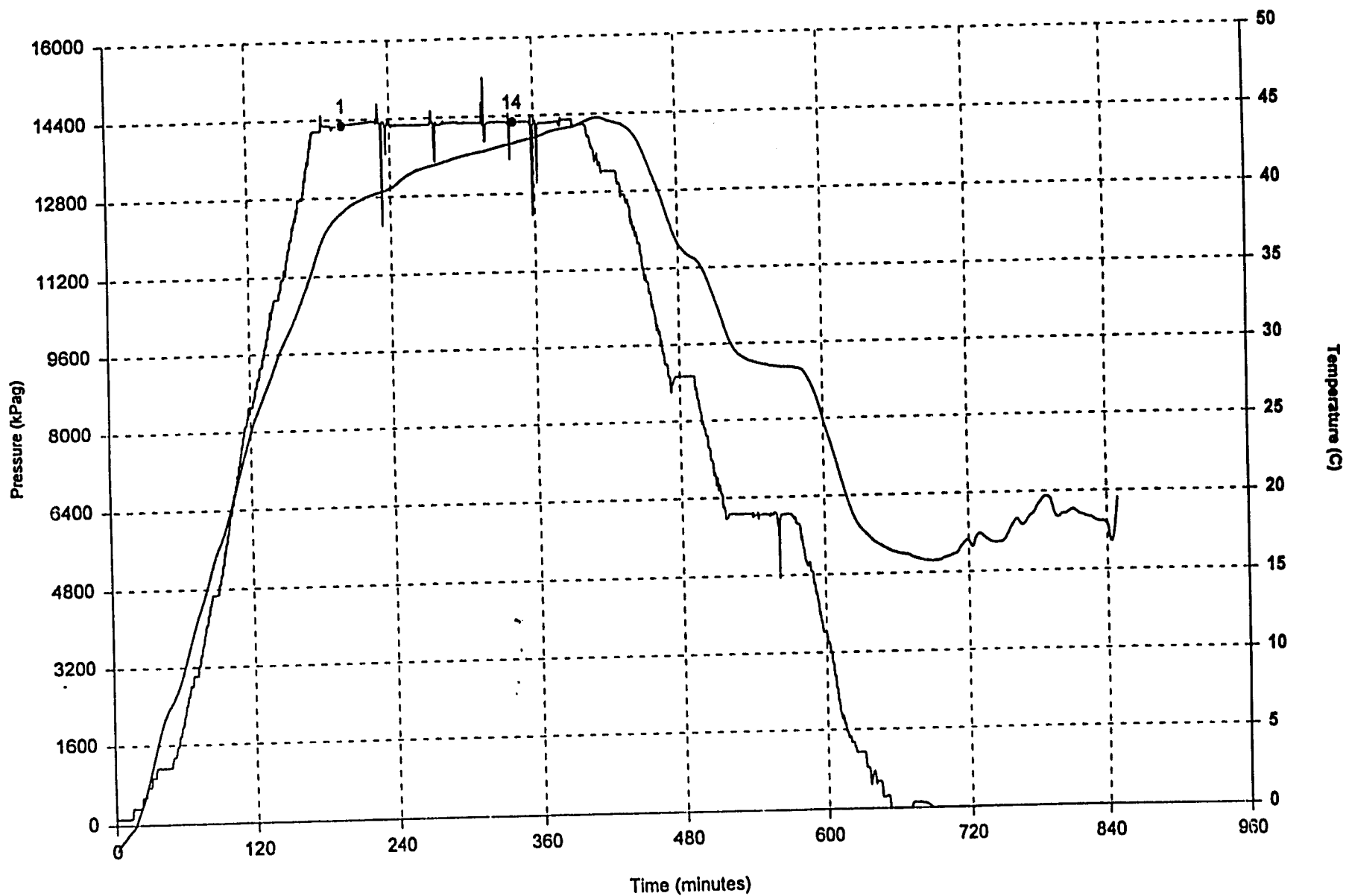
Liquid Recovery 0.00 meters

Recovery	Description
0.00 m	No fluid recovery



PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 / 0
DST #: 3
Recorder: K3

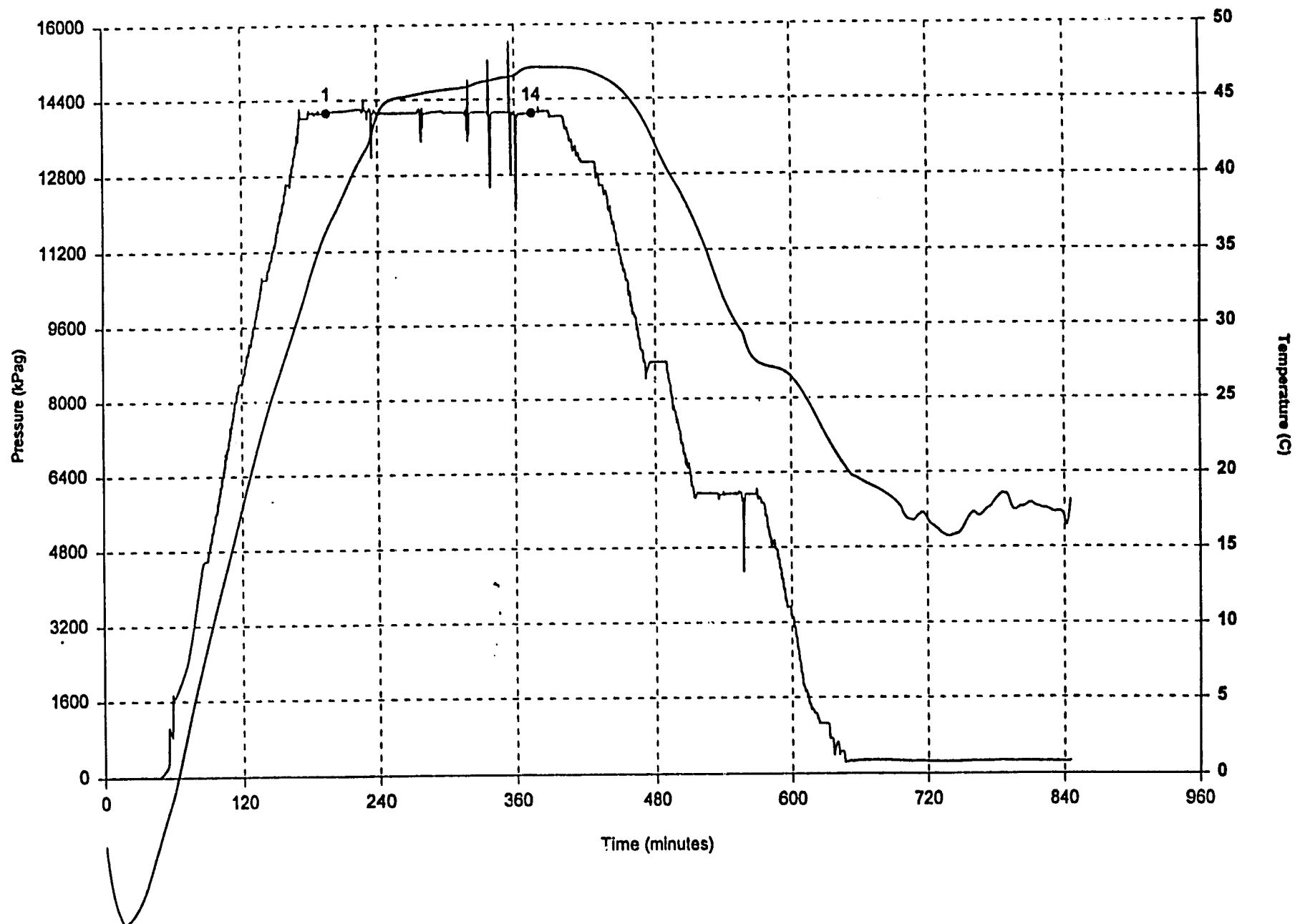
Pressure (kPag) at Critical Points:
1: 14268
14: 14268



PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 / 0
DST #: 3
Recorder: N37

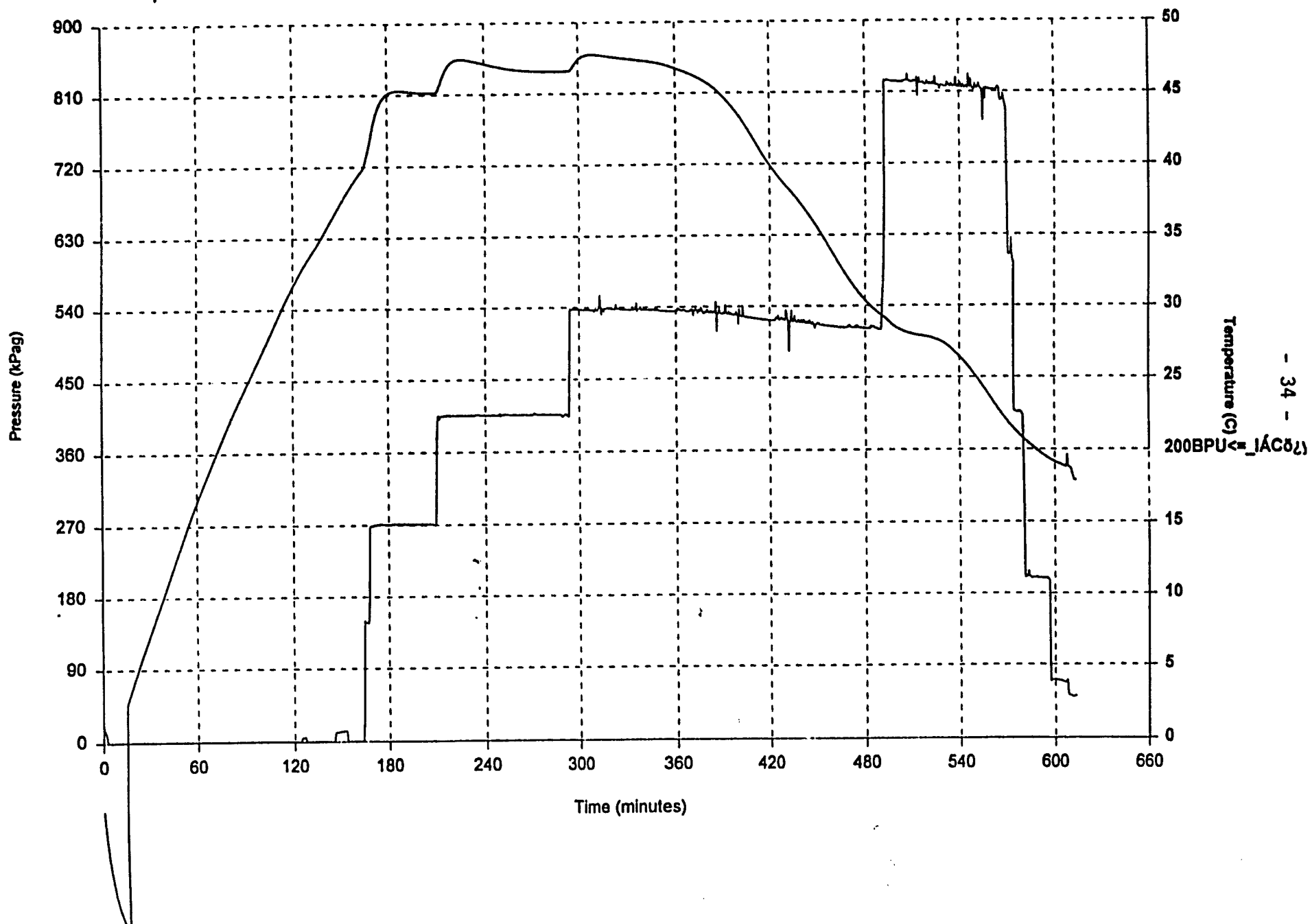
Pressure (kPag) at Critical Points:
1: 14116
14: 14093

Above Interval



PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 / 0
DST #: 3
Recorder: N63

Recovery Recorder



PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 /0
DST# 3

General Information:

Operator: Paramount Resources Ltd.
4000, 350 - 7th Avenue S.W.
Calgary Alberta T2P 3W5

Licence#: 1861
Tester: Puga P
Ticket#: 809304

Reverse Circulated? N

KB Elevation: 542.20 meters

Ground Elevat'n: 537.20 meters

Total Depth: 1,545.00 meters

Mud Data:

Weight: 1070 kg/m3
Type: Invert
Viscosity: 53 s/l
Water Loss: 0.0 cc/s
Filter Cake: 0.0 mm

Hole Data:

Drilled Hole Size: 222 mm
Calipered Hole Size: 222 mm
Hole Condition at Test Time: Good
Conditioned prior to this test? Y

Recorder Summary:

Recorder#	Type	Position	Capacity	Units	Depth	Comments
83	ZI	Inside	41400	kPag	1,319.00	Recovery Recorder
N37	ZI	Inside	41400	kPag	1,323.00	Above Interval
9487	K-3	Outside	20700	kPag	1,334.00	
K3	ZI	Outside	82700	kPag	1,334.00	

Distributions:

Reports Sent To: Wayne Tomm

PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 /0
DST# 3

Tool Sequence:

<i>Diagram</i>	<i>Description</i>	<i>Length</i>
	Pump Out Sub	0.33 m
	Double Pin Sub	0.31 m
	Pump Out Sub	0.33 m
	Recorder Carrier	1.38 m
	Hydraulic Tool	1.50 m
	Bottom Hole Sampler	1.03 m
	Recorder Carrier	1.38 m
	Hydraulic Jars	2.22 m
	Safety Joint	0.65 m
	Inflate Pump	2.38 m
	Screen	1.16 m
	Packer Assembly	1.78 m
	Packer Stick Down	0.83 m
	Port Sub	0.42 m
	Recorder Carrier	2.02 m
	Spacing	6.60 m
	Cross Over Sub	0.30 m
	Drill Collar	9.13 m
	Cross Over Sub	0.30 m
	Packer Stick Up	0.43 m
	Packer Assembly	1.90 m
	Perforations	0.31 m
	Belly Spring	2.00 m

Tool String Length: 38.69 m
 Drill Collar I.D.: 65 mm 93.25 m
 Drill Pipe O.D.: 102 mm 1,226.90 m
 Collar Pipe Total: 1,320.15 m
 Stick Up: 2.60 m
 Tool Above: 14.45 m
 Interval Tested: 20.00 m
 Bottom Hole Choke Size: 25.40 mm

DST#
Recorder#

Build-up and Flow Curve Increments

Flow#

Shut-in#

Horner Extrapolation:

Note. Increment listing is filtered to include critical data only. Complete time/pressure data is available in electronic or printed format.

Page:

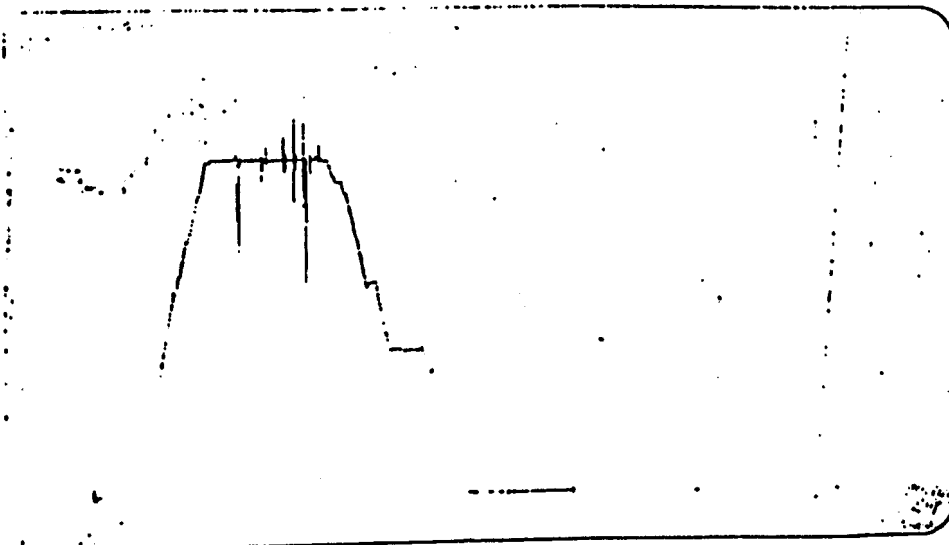
PARAMOUNT ET AL FORT LIARD I-46

00/ 60.050 / 123.220 / 0
DST# 3

Recorder# 9487

Depth: 1,334.00 m
Location: Outside

Recorder Type: K-3
Capacity: 20,700 kPag

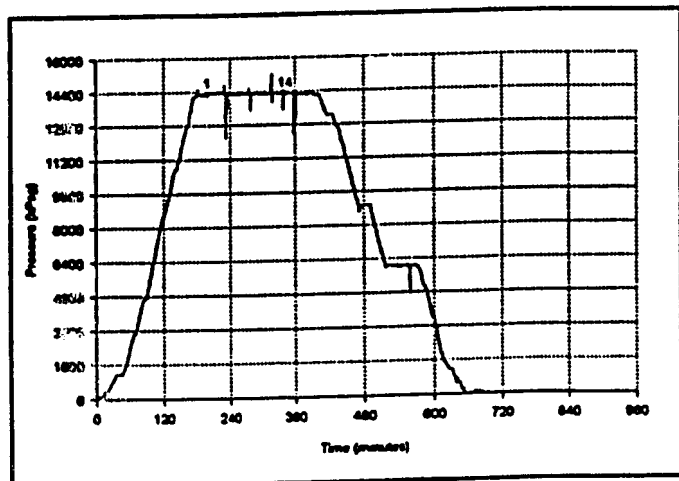


		Pressure (kPag)	Time (min)
1	Initial Hydrostatic	14233	
14	Final Hydrostatic	14233	

Recorder# K3

Depth: 1,334.00 m
Temperature: 45.0 C
Location: Outside

Recorder Type: ZI
Capacity: 82,700 kPag



		Pressure (kPag)	Time (min)
1	Initial Hydrostatic	14268	
14	Final Hydrostatic	14268	

PARAMOUNT ET AL FORT LIARD I-46

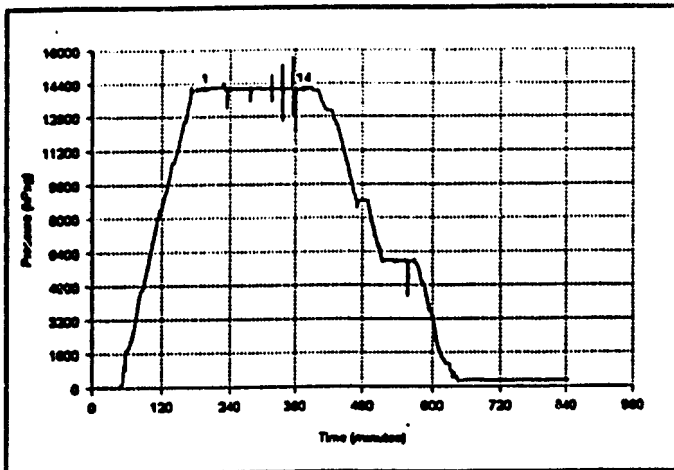
00/ 60.050 / 123.220 /0

DST# 3

Recorder# N37

Depth: 1,323.00 m
Temperature: 46.3 C
Location: Inside

Recorder Type: ZI
Capacity: 41,400 kPag
Comments: Above Interval

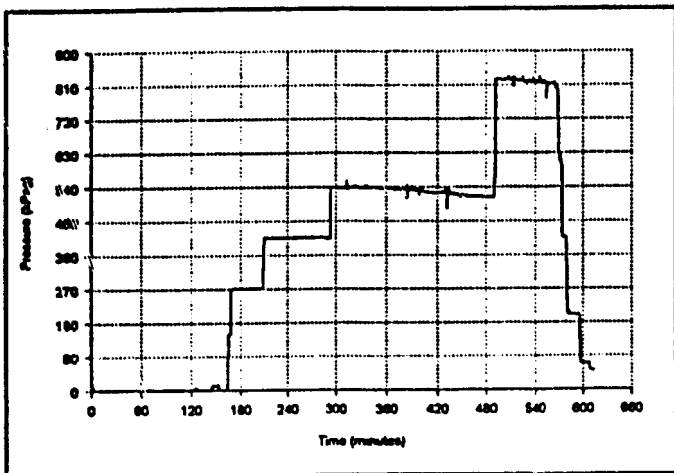


		Pressure (kPag)	Time (min)
1	Initial Hydrostatic	14116	
14	Final Hydrostatic	14093	

Recorder# N63

Depth: 1,319.00 m
Temperature: 46.6 C
Location: Inside

Recorder Type: ZI
Capacity: 41,400 kPag
Comments: Recovery Recorder





PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 /0
DST# 4

Baker Oil Tools

Formation: Belloy
Interval - from: 1,213.00 to: 1,227.00 meters

Test Date: 1999-12-10
Test Type: Inflate Straddle

Recorder# K3 at 1,215.00 meters

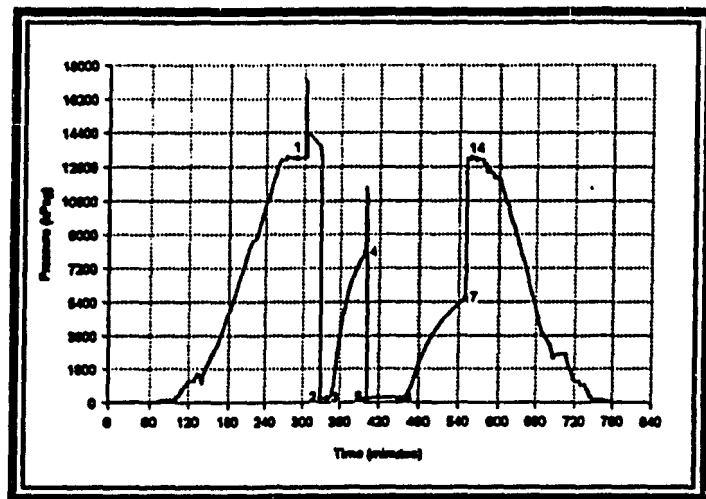
Blow Description:

PREFLOW: Weak air blow decreasing to very weak by the end of the flow. No gas to surface.

FINAL FLOW: Very weak air blow throughout. No gas to surface.

Remarks:

Mechanically successful test. Results suggest very low permeability within the interval tested. The shut-ins were not extrapolated due to insufficient curve development.



Btm Hole Temperature @ FSI: 42.9 C

	Pressure (kPag)	Time (min)	Extrapolated Pressure (kPag)
1 Initial Hydrostatic	13026		
2 Start of 1st Flow	200		
3 End of 1st Flow	194	11.0	
4 End of 1st Shut-in	8003	58.5	
5 Start of 2nd Flow	218		
6 End of 2nd Flow	187	50.5	
7 End of 2nd Shut-in	5575	99.0	
14 Final Hydrostatic	12959		

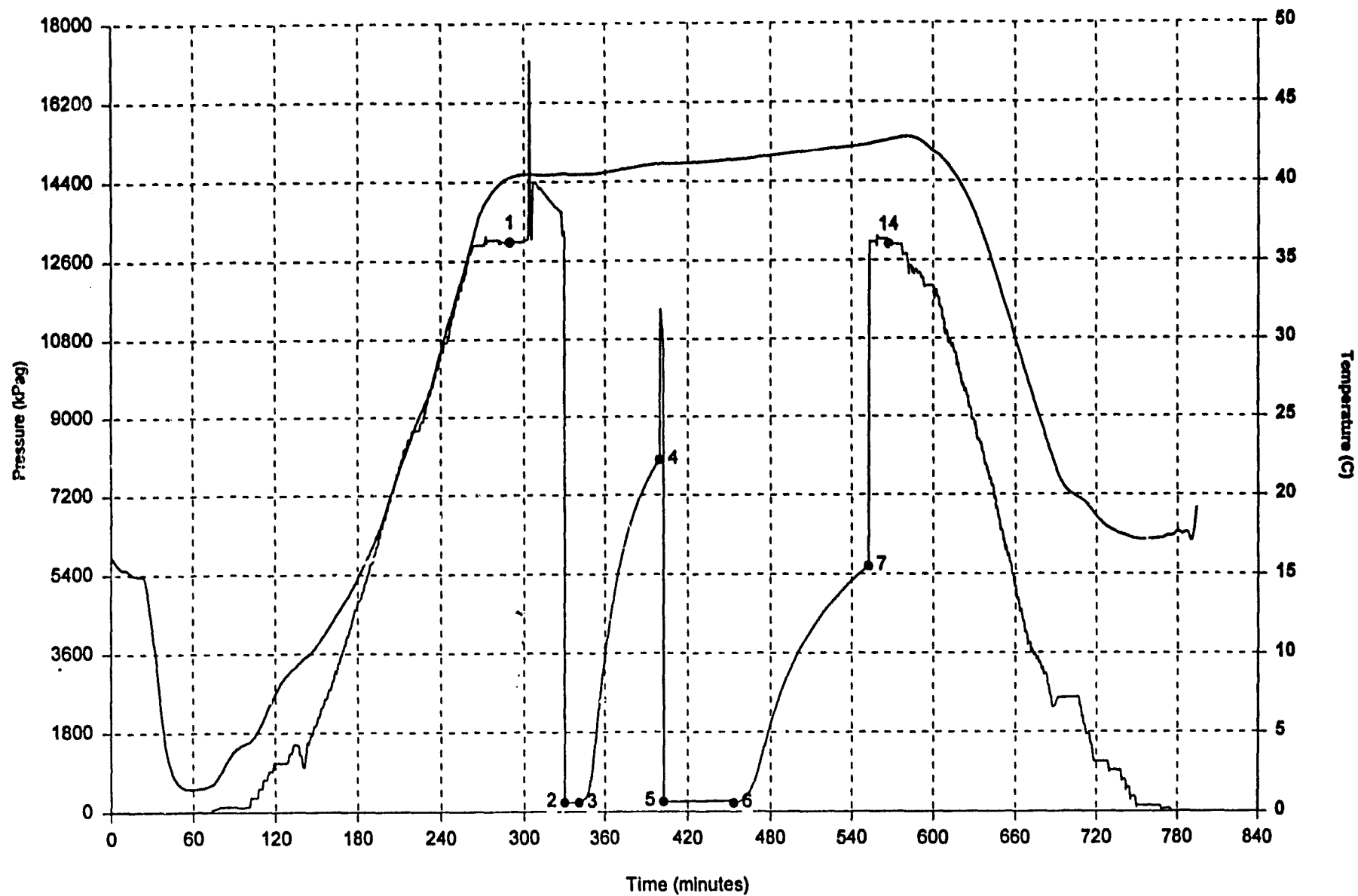
Liquid Recovery 2.00 meters

Recovery	Description
2.00 m	INVERT MUD

PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 / 0
DST #: 4
Recorder: K3

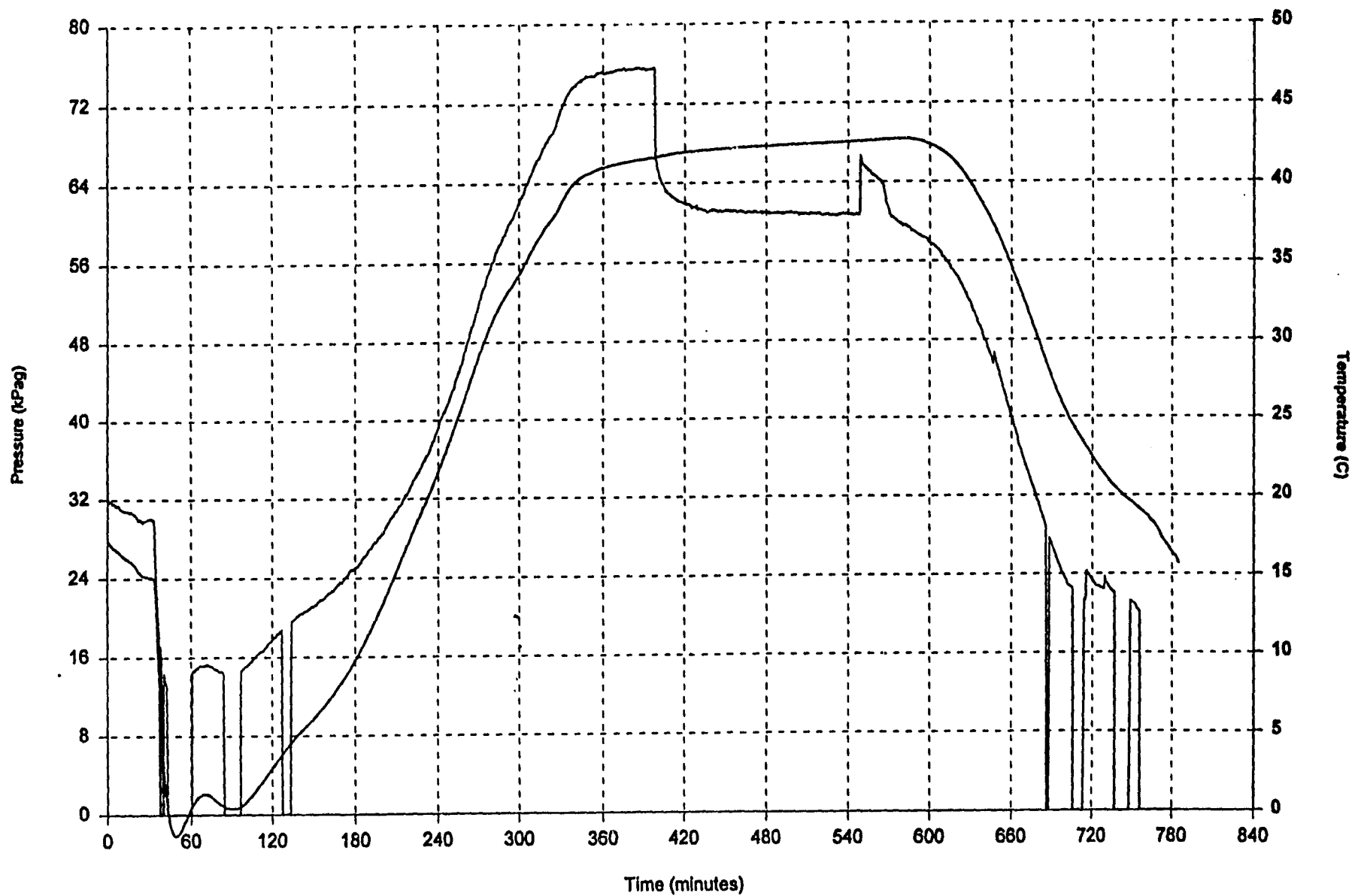
Pressure (kPag) at Critical Points:

1: 13026	4: 8003	7: 5575
2: 200	5: 218	14: 12959
3: 194	6: 187	



PARAMOUNT ET AL FORT LIARD I-48
 00/ 60.050 / 123.220 /0
 DST #: 4
 Recorder: N63

Recovery recorder - Recorder Malfunction

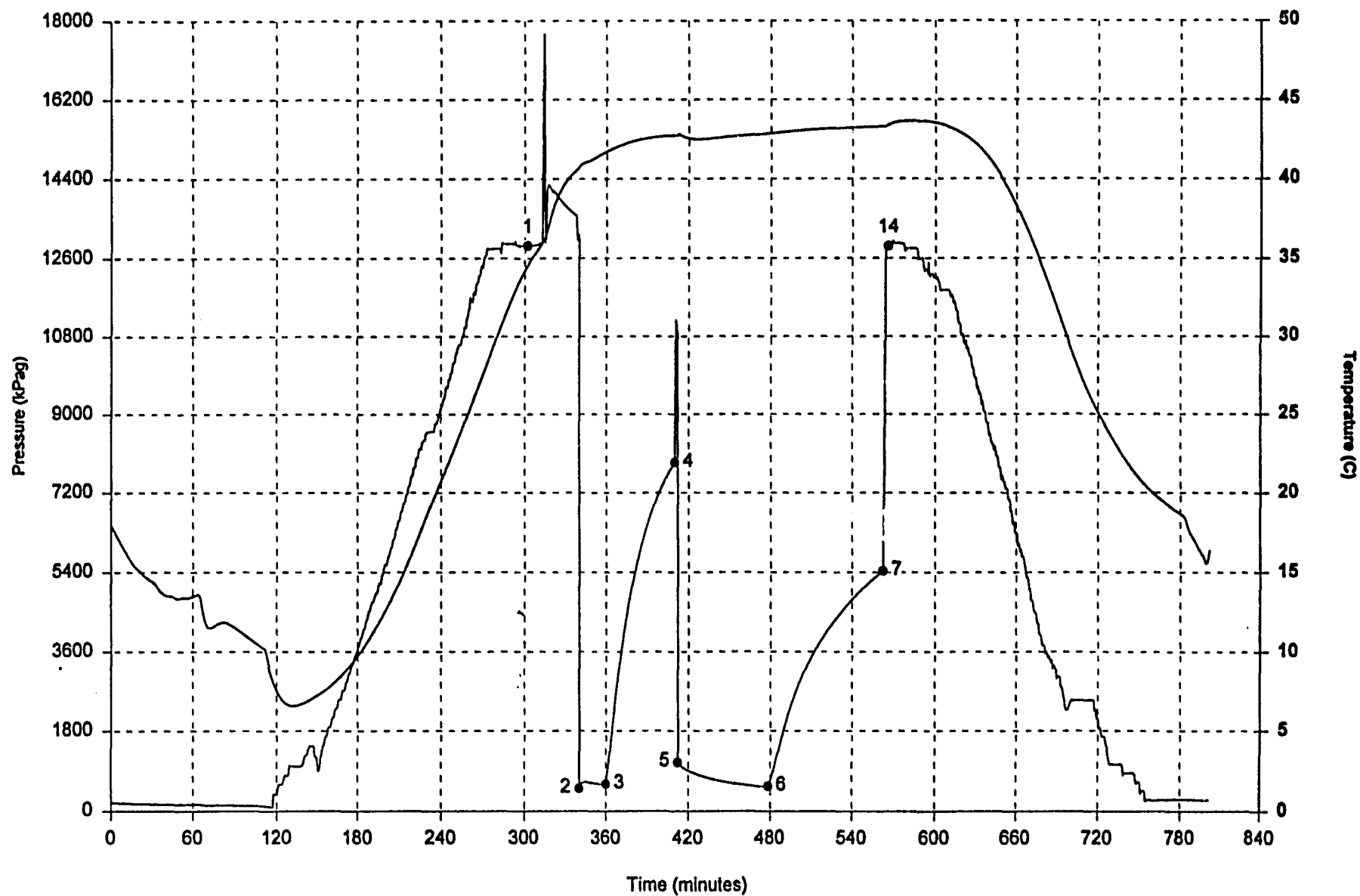


PARAMOUNT ET AL FORT LIARD I-46
00/60.050 / 123.220 / 0
DST #: 4
Recorder: N37

Pressure (kPag) at Critical Points:

1: 12884	4: 7885	7: 5432
2: 511	5: 1093	14: 12875
3: 603	6: 561	

Above Interval



PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 /0
DST# 4

General Information:

Operator: Paramount Resources Ltd.
 4000, 350 - 7th Avenue S.W.
 Calgary Alberta T2P 3W5

Licence#: 1861

Tester: Pugh P

Ticket#: 809305

Reverse Circulated? N

KB Elevation: 542.20 meters

Ground Elevat'n: 537.20 meters

Total Depth: 1,545.00 meters

Mud Data:

Weight: 1070 kg/m3

Type: Invert

Viscosity: 53 s/l

Water Loss: 0.0 cc/s

Filter Cake: 0.0 mm

Hole Data:

Drilled Hole Size: 222 mm

Calipered Hole Size: 222 mm

Hole Condition at Test Time: Good

Conditioned prior to this test? N

Recorder Summary:

Recorder#	Type	Position	Capacity	Units	Depth	Comments
N63	ZI	Fluid Recovery	41400	kPag	1,200.00	Recovery recorder - Recorder Malfunction Above interval
N37	ZI	Inside	41400	kPag	1,204.00	
9487	K-3	Outside	20700	kPag	1,215.00	
K3	ZI	Outside	82700	kPag	1,215.00	

Distributions:

Reports Sent To: Wayne Tomm

Fluid Samples - no of: 1 Sent To: AGAT

Bottom Hole Sampler#	Sent To
004	AGAT

PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 /0
DST# 4

Tool Sequence:

<i>Diagram</i>	<i>Description</i>	<i>Length</i>
	Pump Out Sub	0.33 m
	Double Pin Sub	0.31 m
	Pump Out Sub	0.33 m
	Recorder Carrier	1.38 m
	Hydraulic Tool	1.50 m
	Bottom Hole Sampler	1.03 m
	Recorder Carrier	1.38 m
	Hydraulic Jars	2.22 m
	Safety Joint	0.65 m
	Inflate Pump	2.38 m
	Screen	1.16 m
	Packer Assembly	1.78 m
	Packer Stick Down	0.83 m
	Port Sub	0.42 m
	Recorder Carrier	2.02 m
	Spacing	0.60 m
	Cross Over Sub	0.30 m
	Drill Collar	9.13 m
	Cross Over Sub	0.30 m
	Packer Stick Up	0.43 m
	Packer Assembly	1.90 m
	Perforations	0.60 m
	Belly Spring	2.00 m

Tool String Length: 32.98 m
 Drill Collar I.D.: 65 mm 93.25 m
 Drill Pipe O.D.: 102 mm 1,110.07 m
 Collar Pipe Total: 1,203.32 m
 Stick Up: 4.77 m
 Tool Above: 14.45 m
 Interval Tested: 14.00 m
 Bottom Hole Choke Size: 25.40 mm

PARAMOUNT ET AL FORT LIARD I-46

00/ 60.050 / 123.220 /0

DST# 4

Recorder#N37

Build-up and Flow Curve Increments

Flow# 1

Shut-in# 1

Chart Label	Time (min)	Pressure (kPag)	Chart Label	Time (min)	Delta P (kPag)	Pressure (kPag)	Abscissa (T+dT)/dT	Used for Extrap
2	0.0	200		0.0		194		
	1.0	201		1.5	24	218	8.3333	
	2.0	201		3.0	65	258	4.6667	
	3.0	202		4.5	105	299	3.4444	
	4.0	202		6.0	161	355	2.8333	
	5.0	202		7.5	319	513	2.4667	
	6.0	203		9.0	577	771	2.2222	
	7.0	203		10.5	941	1135	2.0476	
	8.0	203		12.0	1362	1556	1.9167	
	9.0	203		13.5	1811	2005	1.8148	
	10.0	204		15.0	2252	2446	1.7333	
3	11.0	194		16.5	2674	2868	1.6667	
				18.0	3073	3267	1.6111	
				19.5	3447	3641	1.5641	
				21.0	3784	3977	1.5238	
				22.5	4107	4301	1.4889	
				24.0	4402	4596	1.4583	
				25.5	4675	4869	1.4314	
				27.0	4931	5125	1.4074	
				28.5	5176	5370	1.3860	
				30.0	5395	5588	1.3667	
				31.5	5599	5793	1.3492	
				33.0	5796	5990	1.3333	
				34.5	5974	6168	1.3188	
				36.0	6150	6343	1.3056	
				37.5	6311	6505	1.2933	
				39.0	6463	6657	1.2821	
				40.5	6603	6797	1.2716	
				42.0	6732	6926	1.2619	
				43.5	6861	7055	1.2529	
				45.0	6982	7176	1.2444	
				46.5	7091	7285	1.2366	
				48.0	7200	7394	1.2292	
				49.5	7301	7494	1.2222	
				51.0	7398	7592	1.2157	
				52.5	7486	7679	1.2095	
				54.0	7576	7769	1.2037	
				55.5	7658	7851	1.1982	
				57.0	7741	7935	1.1930	
4				58.5	7810	8003	1.1880	

Note: Increment listing is filtered to include critical data only. Complete time/pressure data is available in electronic or printed format.

PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 /0
DST# 4
Recorder#N37

Build-up and Flow Curve Increments

Flow# 2

Shut-in# 2

Chart Label	Time (min)	Pressure (kPag)	Chart Label	Time (min)	Delta P (kPag)	Pressure (kPag)	Abscissa (T+dT)/dT	Used for Extrap
5	0.0	218		0.0		187		
	1.5	217		2.5	21	209	25.6000	
	3.0	218		5.0	53	240	13.3000	
	4.5	219		7.5	113	300	9.2000	
	6.0	219		10.0	195	383	7.1500	
	7.5	220		12.5	316	503	5.9200	
	9.0	221		15.0	497	685	5.1000	
	10.5	221		17.5	741	928	4.5143	
	12.0	221		20.0	1018	1206	4.0750	
	13.5	221		22.5	1300	1488	3.7333	
	15.0	222		25.0	1585	1773	3.4600	
	16.5	222		27.5	1850	2038	3.2364	
	18.0	223		30.0	2099	2286	3.0500	
	19.5	223		32.5	2330	2517	2.8923	
	21.0	224		35.0	2549	2737	2.7571	
	22.5	225		37.5	2750	2938	2.6400	
	24.0	225		40.0	2941	3128	2.5375	
	25.5	226		42.5	3110	3298	2.4471	
	27.0	226		45.0	3273	3460	2.3667	
	28.5	227		47.5	3426	3613	2.2947	
	30.0	227		50.0	3574	3762	2.2300	
	31.5	227		52.5	3706	3894	2.1714	
	33.0	228		55.0	3830	4018	2.1182	
	34.5	229		57.5	3957	4144	2.0696	
	36.0	230		60.0	4071	4258	2.0250	
	37.5	230		62.5	4175	4362	1.9840	
	39.0	230		65.0	4285	4472	1.9462	
	40.5	231		67.5	4385	4573	1.9111	
	42.0	231		70.0	4486	4673	1.8786	
	43.5	232		72.5	4573	4761	1.8483	
	45.0	232		75.0	4666	4853	1.8200	
	46.5	233		77.5	4750	4937	1.7935	
	48.0	233		80.0	4833	5020	1.7688	
	49.5	233		82.5	4908	5095	1.7455	
	50.5	187		85.0	4991	5178	1.7235	
6				87.5	5065	5252	1.7029	
				90.0	5142	5329	1.6833	
				92.5	5210	5397	1.6649	
				95.0	5277	5464	1.6474	
				97.5	5351	5538	1.6308	
			7	99.0	5387	5575	1.6212	

Note: Increment listing is filtered to include critical data only. Complete time/pressure data is available in electronic or printed format.

- 4/ -
PARAMOUNT ET AL FORT LIARD I-46

00/ 60.050 / 123.220 /0

DST# 4

Recorder# K3

Build-up and Flow Curve Increments

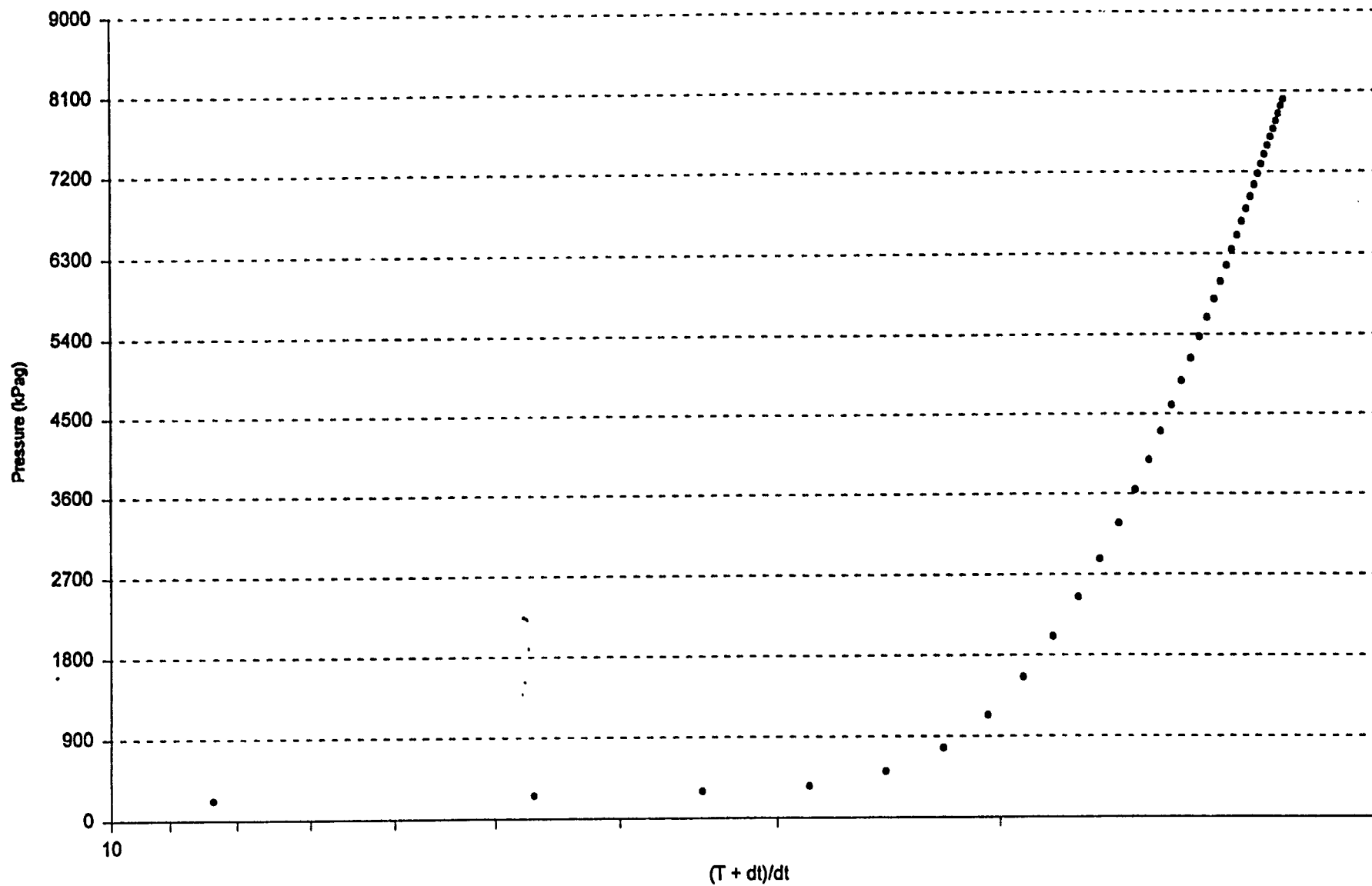
Horner Extrapolation:

Note. Increment listing is filtered to include critical data only. Complete time/pressure data is available in electronic or printed format.

PARAMOUNT ET AL FORT LIARD I-48
00/ 60.050 / 123.220 / 0
DST #: 4
Recorder: K3

Shut-In #1

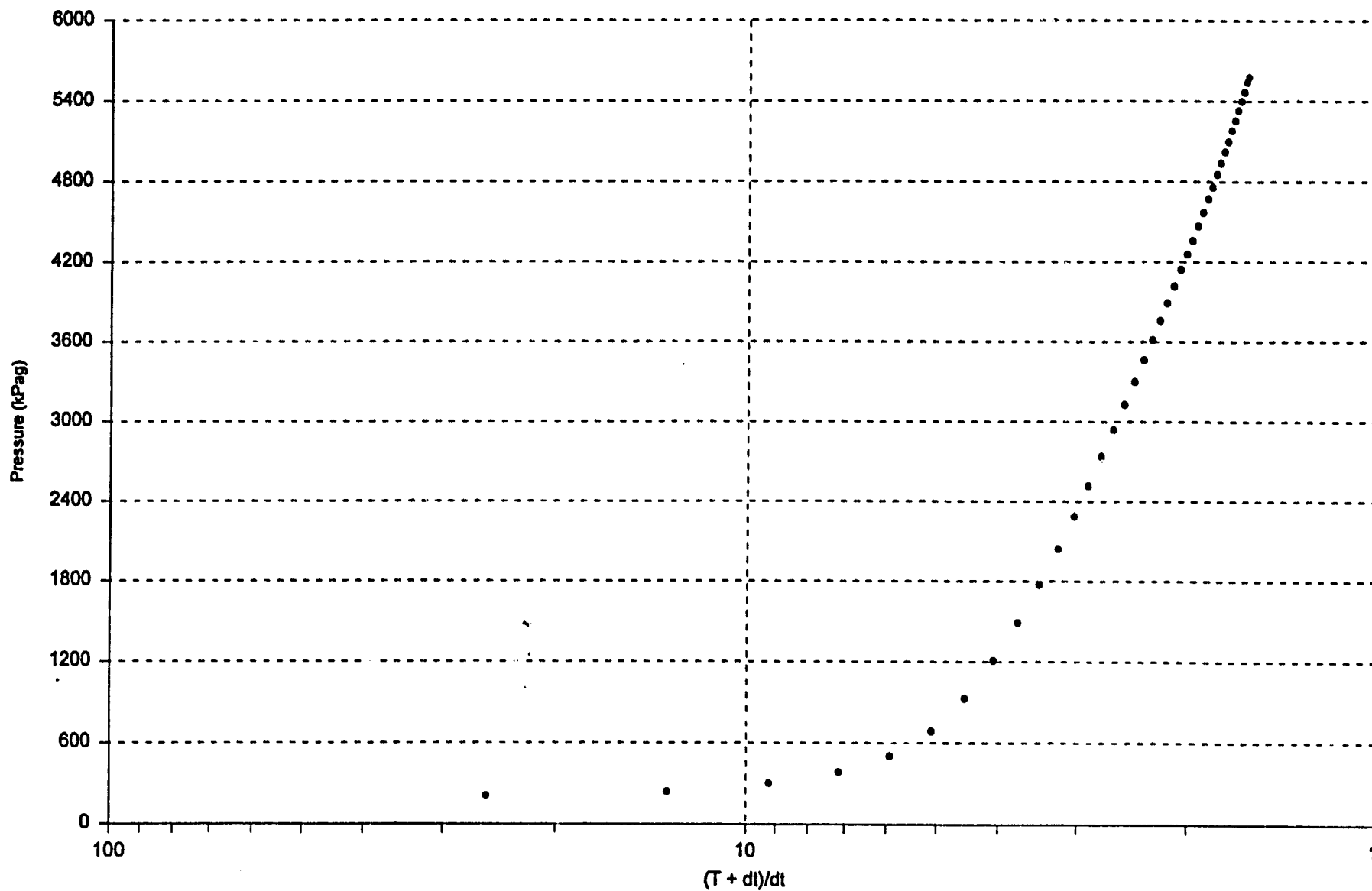
BAKER OIL TOOLS / LYNES DRILL STEM TESTING



PARAMOUNT ET AL FORT LIARD I-46
00/ 60.050 / 123.220 / 0
DST #. 4
Recorder: K3

Shut-in #2

BAKER OIL TOOLS / LYNES DRILL STEM TESTING



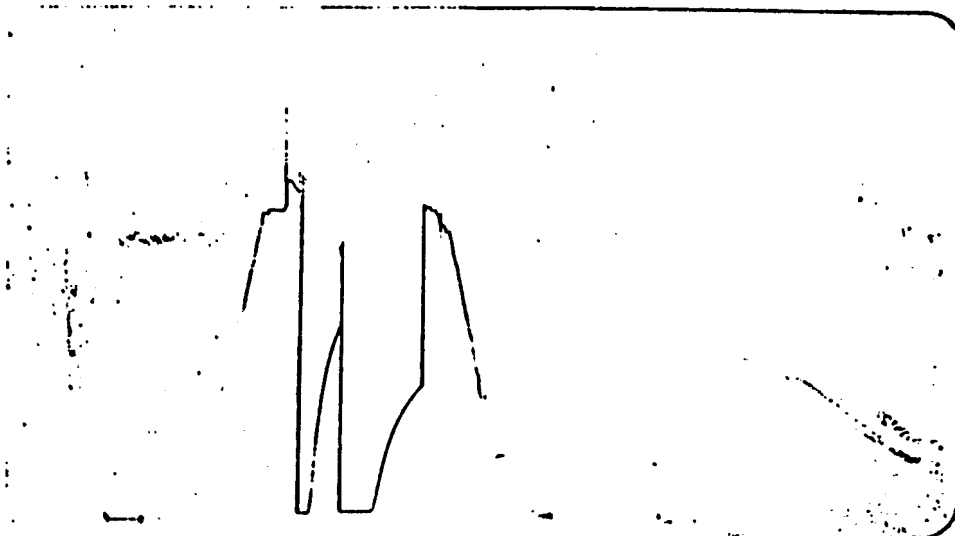
PARAMOUNT ET AL FORT LIARD I-46

00/ 60.050 / 123.220 / 0
DST# 4

Recorder# 9487

Depth: 1,215.00 m
Location: Outside

Recorder Type: K-3
Capacity: 20,700 kPag

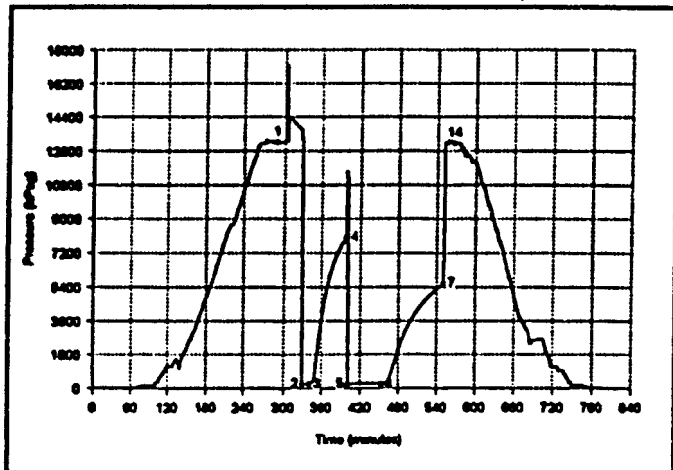


		Pressure (kPag)	Time (min)
1	Initial Hydrostatic	12990	
2	Start of 1st Flow	165	
3	End of 1st Flow	198	11.0
4	End of 1st Shut-in	7946	58.5
5	Start of 2nd Flow	207	
6	End of 2nd Flow	217	50.5
7	End of 2nd Shut-in	5528	99.0
14	Final Hydrostatic	13020	

Recorder# K3

Depth: 1,215.00 m
Temperature: 42.9 C
Location: Outside

Recorder Type: ZI
Capacity: 82,700 kPag



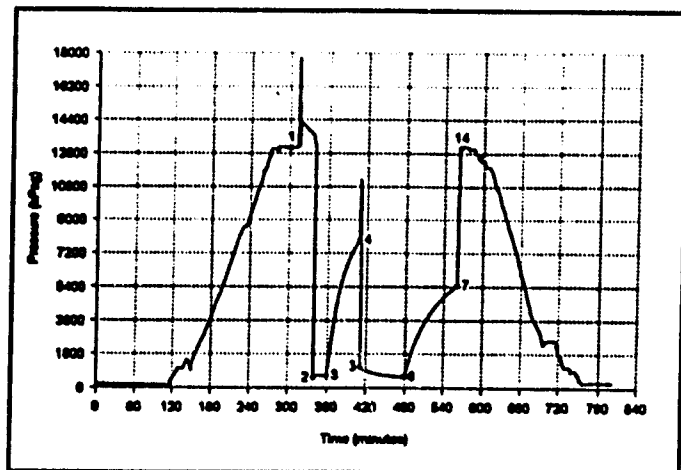
		Pressure (kPag)	Time (min)
1	Initial Hydrostatic	13026	
2	Start of 1st Flow	200	
3	End of 1st Flow	194	11.0
4	End of 1st Shut-in	8003	58.5
5	Start of 2nd Flow	218	
6	End of 2nd Flow	187	50.5
7	End of 2nd Shut-in	5575	99.0
14	Final Hydrostatic	12959	

PARAMOUNT ET AL FORT LIARD I-46 00/ 60.050 / 123.220 /0 DST# 4

Recorder# N37

Depth: 1,204.00 m
Temperature: 43.6 C
Location: Inside

Recorder Type: ZI
Capacity: 41,400 kPag
Comments: Above interval

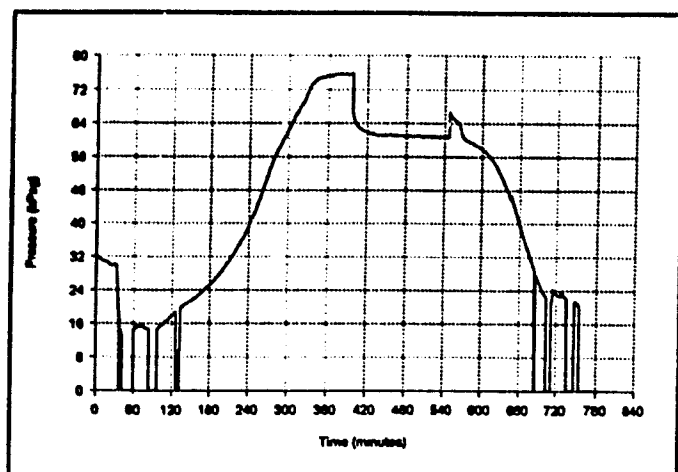


		Pressure (kPag)	Time (min)
1	Initial Hydrostatic	12884	
2	Start of 1st Flow	511	
3	End of 1st Flow	603	11.0
4	End of 1st Shut-in	7885	58.5
5	Start of 2nd Flow	1093	
6	End of 2nd Flow	561	50.5
7	End of 2nd Shut-in	5432	99.0
14	Final Hydrostatic	12875	

Recorder# N63

Depth: 1,200.00 m
Temperature: 42.5 C
Location: Fluid Recovery

Recorder Type: ZI
Capacity: 41,400 kPag
Comments: Recovery recorder - Recorder Malfunction



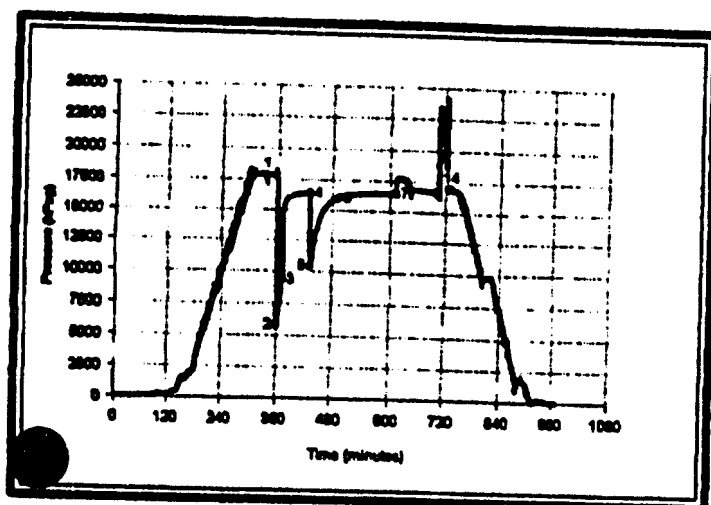


PARA ET AL FT. LIARD 146
60-05-123-22
DST# 5

Baker Oil Tools

Formation: MATTSON
Interval - from: 1734.5 to: 1740.0 m

Recorder# N42 at 1737.0 m



Test Date: 1999-12-24
Test Type: CONV. BOTTOM HOLE
Tester Name: J. PAUL PUGH
Drill Pipe O.D.: 102.00 mm
Drill Collar L.D.: 56.00 mm
Drill Collar Length: 169.30 m
Hole Size: 155.50 mm

Blow Description:

PREFLOW - STRONG AIR BLOW IMMED. REMAINING STRONG THROUGHOUT. NO GAS TO SURFACE. FINAL FLOW - STRONG BLOW IMMED. WITH GAS TO SURFACE IN 30 MINUTES. TOO SMALL TO MEASURE FOR REST OF FLOW PERIOD.

Remarks:

GOOD MECHANICAL TEST.

FRESH WATER AT .5 % SALT

Maximum Btm Hole Temperature @ FSI: 63.2 C

		Pressure (kPag)	Time (min)	Extrapolated Pressure (kPag)
1	Initial Hydrostatic	17793		
2	Start of 1st Flow	5808		
3	End of 1st Flow	9309	10.0	
4	End of 1st Shut-in	16417	60.0	
5	Start of 2nd Flow	10426		
6	End of 2nd Flow	16014	60.0	
7	End of 2nd Shut-in	16484	120.0	
14	Final Hydrostatic	16939		

Liquid Recovery of 1643.00 m

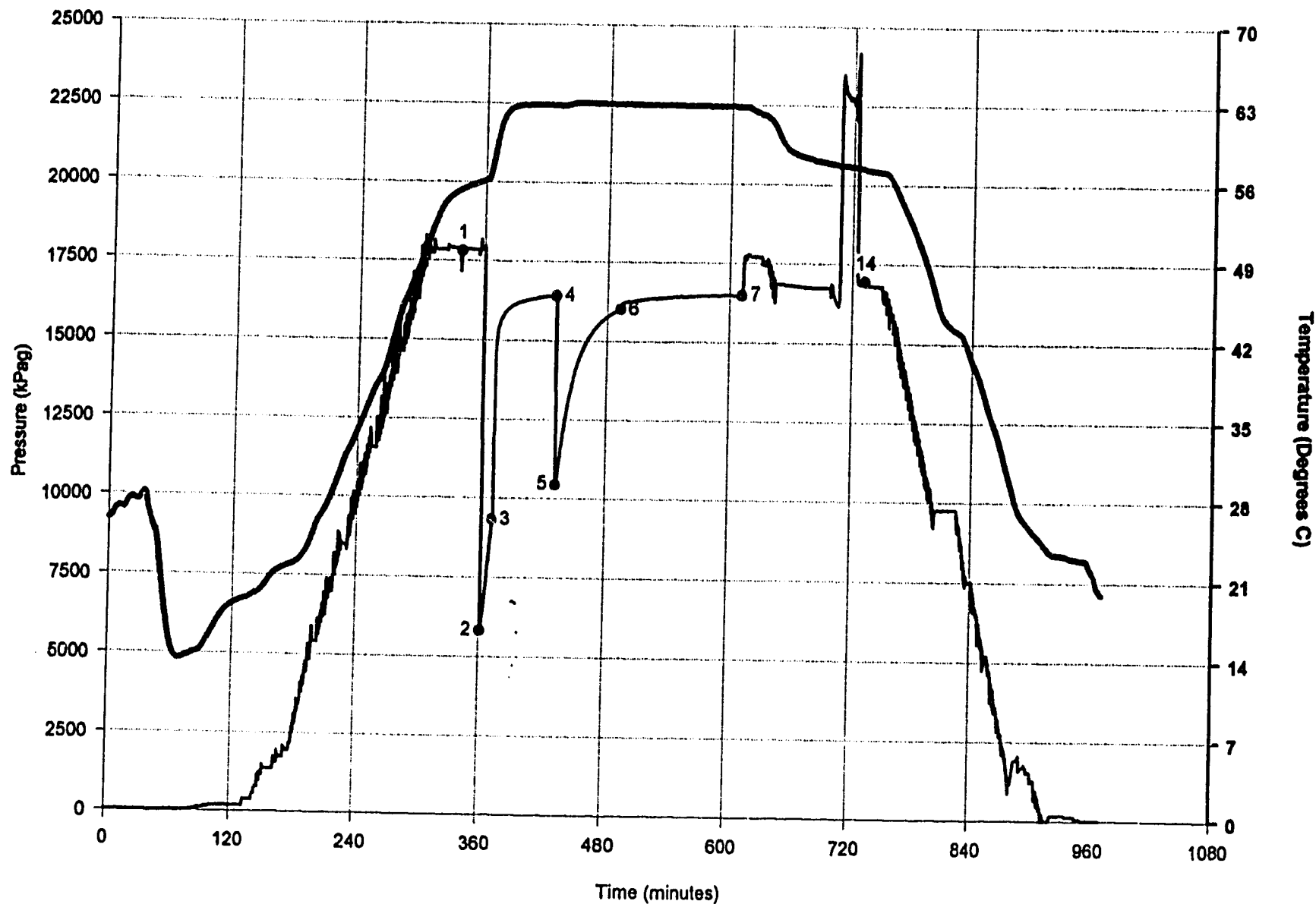
Test was reversed out.

Recovery	Description	Salinity
643.00 m	FRESH WATER	
1000.00 m	INVERT CUT FRESH WTR	
0.00 m	MUD TANK	

Baker Oil Tools Drill Stem Testing

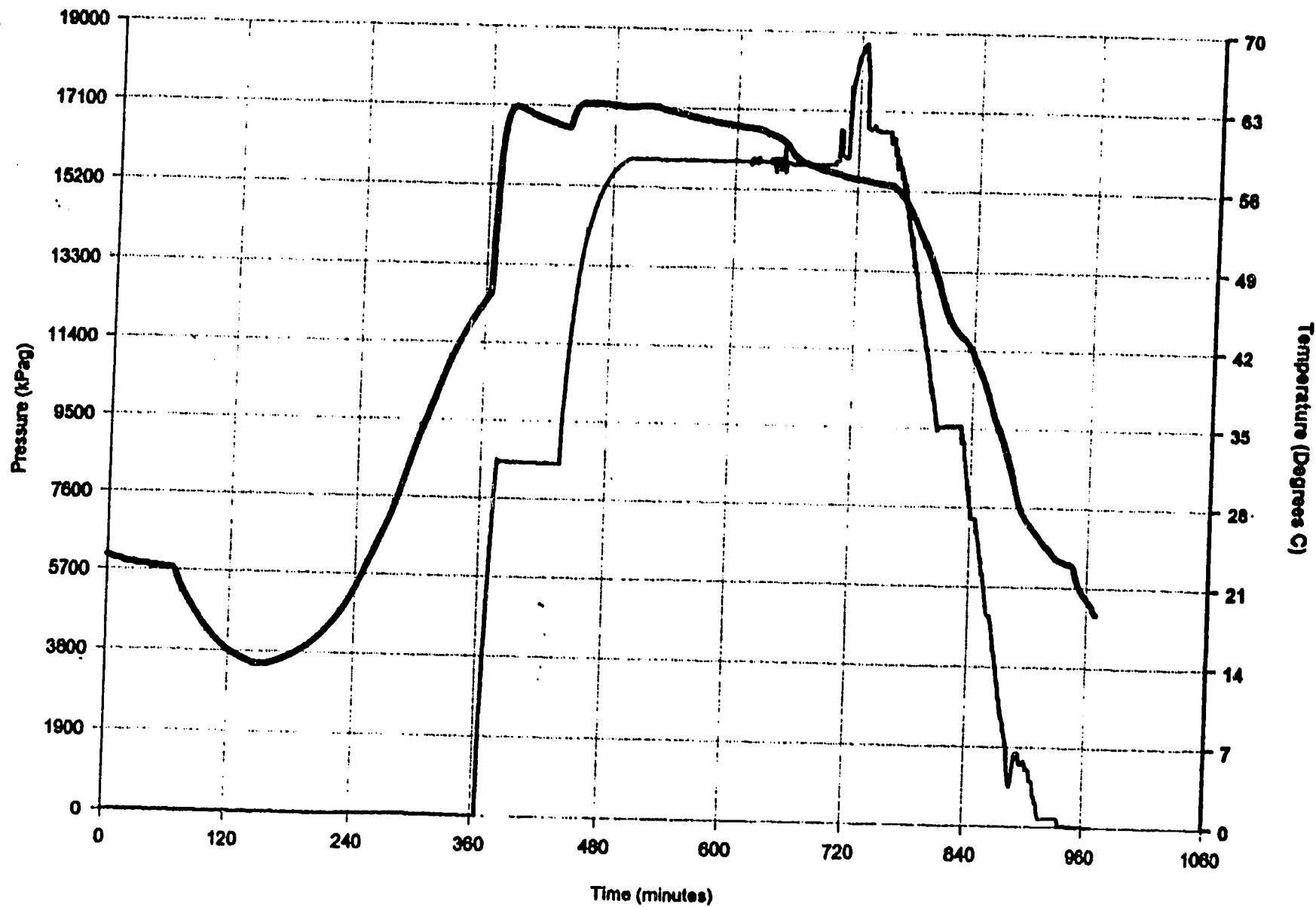
PARA ET AL FT. LIARD 146
60-05-123-22
DST #: 5
Recorder: N42

Pressure (kPag) at Critical Points:
1: 17793 4: 16417 7: 16484
2: 5808 5: 10426 14: 16939
3: 9309 6: 16014



Baker Oil Tools Drill Stem Testing

PARA ET AL FT. LIARD 146
60-05-123-22
DST #: 5
Recorder: V52



FIELD REPORT

[illegible]



TEST TOOL & PIPE RECORD

Baker Tools

Well Name: PARA ET AL ET. LI. Location: 60-05-123-22 Date 1999-12-24 Ticket # 809307

Interval Tested: from 1734.5 to 1740.0 Total Depth 1740.0 Test No. 5

CONVENTIONAL		DRILL COLLARS				DRILL PIPE				INFLATABLE	
Tool	Length	JOINT	LENGTH	JOINT	LENGTH	DRILL PIPE				Tool	Length
POS	0.33	1	18.93	11		1	19.37	11	19.37	21	19.35
XOS	0.30	2	18.78	12		2	19.03	12	18.74	22	19.01
POS	0.83	3	19.16	13		3	18.65	13	18.26	23	18.70
Car	1.38	4	18.91	14		4	19.41	14	19.05	24	19.06
RST	2.58	5	18.92	15		5	18.01	15	18.68	25	18.61
BHS	1.03	6	19.06	16		6	19.07	16	19.03	26	19.01
Hydr	1.50	7	18.58	17		7	18.32	17	19.43	27	19.37
Car	1.38	8	18.46	18		8	19.39	18	19.03	28	18.65
Jar	2.22	9	18.50	19		9	19.34	19	18.72	29	18.71
SJ	0.65	10		20		10	19.04	20	19.06	30	18.70
CPack	2.30	1st TOTAL	169.30	2nd TOTAL		3rd TOTAL	189.63	4th TOTAL	189.37	5th TOTAL	189.17
CPA	1.30	31	18.72	41	18.71	51	18.73	61	19.04	71	19.39
1734.5	Top Packer Seal Depth	32	19.02	42	18.70	52	19.08	62	18.33	72	18.72
CPSD	1.00	33	19.04	43	19.04	53	19.06	63	17.98	73	19.06
Perf	1.52	34	18.73	44	19.35	54	18.78	64	19.45	74	19.50
Car	2.05	35	19.32	45	19.03	55	18.36	65	19.07	75	18.45
		36	19.02	46	19.39	56	18.75	66	19.08	76	19.69
		37	19.33	47	19.38	57	19.39	67	18.74	77	19.49
		38	19.06	48	19.02	58	19.38	68	19.40	78	19.59
		39	19.42	49	19.01	59	19.06	69	18.67	79	19.09
		40	19.03	50	18.74	60	18.70	70	19.05	80	19.49
		6th TOTAL	190.69	7th TOTAL	190.37	8th TOTAL	189.29	9th TOTAL	188.81	10th TOTAL	192.47
		81	19.50	81		101					
		82	9.71	82		102					
		83	BOP .58	83		103					
		84	9.74	84		104					
		85		85		105					
		86		86		106					
		87		87		107					
		88		88		108					
		89		89		109					
		90		100		110					
		11th TOTAL	39.53	12th TOTAL		13th TOTAL					

BEFORE TEST IN DERRICK	
TOTAL DRILL COLLARS	18
TOTAL DRILL PIPE	162

TESTING			
DRILL COLLARS	IN	OUT	TOTAL
DRILL PIPE	18	0	18
	164	0	164

CONVENTIONAL PIPE TALLY		INFLATE PIPE TALLY	
BELOW BOTTOM PACKER SEAL		TOOL ABOVE INTERVAL	
BETWEEN PACKER SEALS	5.50	DRILL COLLARS	
TOOL ABOVE PACKER SEAL	15.80	DRILL PIPE	
DRILL COLLARS	169.30	TOTAL STRINGS ABOVE INTERVAL	
DRILL PIPE	1559.33	BOTTOM OF TOP PACKER SEAL DEPTH	
TOTAL STRING	1749.93	TOP SINGLE ABOVE TABLE	
TOTAL DEPTH	1740.00		
TOP SINGLE ABOVE TABLE	9.93		

TOOL	
21.30	
1st TOTAL	169.30
2nd TOTAL	
3rd TOTAL	189.63
4th TOTAL	189.37
5th TOTAL	189.17
6th TOTAL	190.69
7th TOTAL	190.37
8th TOTAL	189.29
9th TOTAL	188.81
10th TOTAL	192.47
11th TOTAL	39.53
12th TOTAL	
13th TOTAL	

PARAMOUNT RESOURCES LTD.

DRILL STEM TEST REPORT

WELL NAME: Para et al Ft. Liard

LOCATION: Pera et al Ft. Liard I - 46

DATE: Dec - 24 - 1999

TEST COMPANY: Baker Hughes

TESTER: J. Paul Pugh

HOLE SIZE: 155.6 mm

WELL DEPTH: 1740M

DRILL PIPE SIZE: 101mm

DST # 5

INTERVAL Top: 1734.5M

INTERVAL Base: 1740M

ZONE: M-3 Mattson

TYPE # Bottom Hole

PACKER O.D.: 140mm

<u>TIMES</u>		<u>PRESSURES</u>		<u>PRESSURES</u>	
PF	<u>10 Mins.</u>	IHP	<u>17793</u>	FFP	<u>16104</u>
ISI	<u>60 Mins.</u>	PF	<u>5808</u>	FSIP	<u>16484</u>
VO	<u>60 Mins.</u>	ISIP	<u>9309</u>	FHP	<u>16939</u>
FSI	<u>120 Mins.</u>	IFP	<u>10426</u>		

FLOW DESCRIPTION

FLOW: Very Strong Air Blow Immediately on Valve Open - Hose at Bottom of Water Pail at Start of Valve Open - Open Line to Flare Pit - No Gas to Surface - Blow Started to Decrease after 6 Mins of Valve Open - Shut in after 10 Mins.

VALVE OPEN: Very Strong Air Blow when Valve was Opened - Open Line to Flare Pit - Had Gas to Surface after 30 Mins. - Small 1M Lazy Flare - Too Small to Measure - Decreasing During Valve Open.

GAS FLOW RATES:

TIME	ORIFICE SIZE	BACK PRESSURE	RISER	RATE	NOTES
	(mm)	(kPa)	(mm)	(m3/d)	

RECOVERY:

1640M Water - Small Amount of Salinity - 2200 PPM

Dropped Bar for Pump out Sub and Reverse Circ out Recovery to Vacuum

Truck and Put Recovery in Slop Tank on Location to be sent to Disposal.

Broke Down and Layed Down Test Tools - Released Tester from Location - All Samples and Bottom Hole Sampler Taken by Tester for furtheance to AGAT Labs in Grande Prairie.

SAMPLES CAUGHT YES - 6 Samples

SENT TO: AGAT - Gr Prairie



PARAMOUNT ET AL FT. LIARD I-46

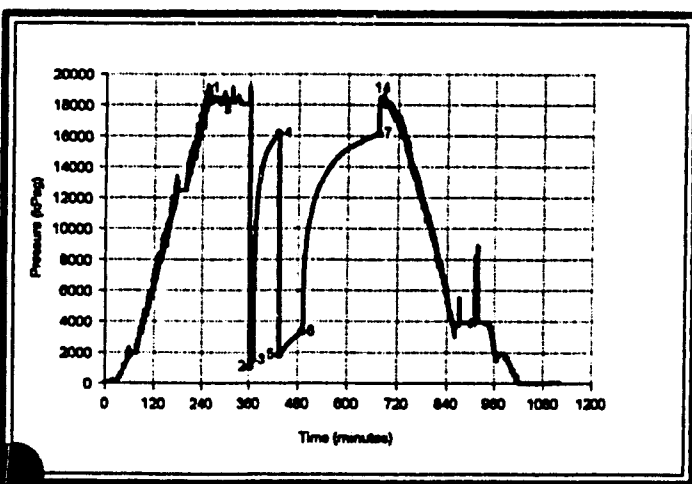
60-10 / 123-15

DST# 6

Baker Oil Tools

Formation: MATTSON
Interval - from: 1785.00 to: 1789.00 m

Recorder# N42 at 1787.00 m



Maximum Btm Hole Temperature @ FSI: 60.7 C

		Pressure (kPag)	Time (min)	Extrapolated Pressure (kPag)
1	Initial Hydrostatic	18324		
2	Start of 1st Flow	999		
3	End of 1st Flow	1444	7.5	
4	End of 1st Shut-in	16125	61.0	
5	Start of 2nd Flow	1787		
6	End of 2nd Flow	3293	56.5	
7	End of 2nd Shut-in	16113	180.5	
14	Final Hydrostatic	18299		

Liquid Recovery of 350.00 m

Test was reversed out.

Recovery	Description	Salinity
350.00 m	CLEAN SALT WATER	22000
0.00 m	MUDTANK SAMPLE	

Test Date: 2000-01-10
Test Type: INFLATE STRADDLE
Tester Name: SHELDON PRYSUNKA
Drill Pipe O.D.: 102.00 mm
Drill Collar I.D.: 53.00 mm
Drill Collar Length: 169.28 m
Hole Size: 156.00 mm

Blow Description:

PREFLOW - WEAK TO STRONG AIR BLOW IN 30 SECONDS. GAS TO SURFACE IN 2 MINUTES. BUILDING THROUGHOUT. SAMPLE TAKEN. AGAT 20075. FINAL FLOW - WEAK TO STRONG GAS BLOW IN 1.5 MIN. DEPLETING AT 35 MIN THROUGHOUT. SAMPLE TAKEN AGAT 21491

Remarks:

ON BOTTOM AT 14:45 HRS. PUMPED UP PACKERS FOR 30 MINUTES. CHECKED SEAT OK. OPENED TOOL AT 15:20 HRS. AT 35 MINUTES INTO THE MAINFLOW THE WELL STARTED TO DEplete. SURFACE RESULTS INDICATE AN INFLUX OF LIQUID. SUSPECT WATER DUE TO NO BREAKOUT DURING FINAL SHUTIN. REVERSED OUT AT FLUID. RECOVERED 350 M OF CLEAN SALT WATER WITH A SALINITY OF 22000 PPM. AT SURFACE FOUND BOTH PACKERS TORN AND HAD TO BE REPLACED.

Gas Measured with FLOOR MANIFOLD

Flow#	Time (min)	Surface Choke (n.m)	Surface Pressure (kPag)	Gas Rate (m3/day)
1	10	6.35	280	2 242
2	10	6.35	50	846
2	20	6.35	90	1 088
2	30	6.35	110	1 210
2	40	6.35	100	1 149
2	50	6.35	90	1 088
2	60	6.35	60	907

Baker Oil Tools

FIELD REPORT

TEST DATA TEST No. 6 LUS. TEST No. 6

FORMATION TESTED MATTSON T.D. 2055.00 m

INTERVAL TESTED: From 1785.00 m to 1789.00 m

TEST INTERVAL TESTED 4.00 m

TEST TYPE INFLATE STRADDLE RESET: YES ☐ NO ☒

CUSHION: YES ☐ NO ☒ TYPE _____ AMOUNT _____ m

STARTED IN HOLE @ 09:45 HRS. OPENED TOOL 15:20 HRS.

DATE & TIME OUT OF HOLE 2000-01-11 @ 02:45 HRS.

TEST TIMES:

PRE-FLOW 10 MIN. INITIAL SHUT-IN 60 MIN.

SECOND FLOW _____ MIN. SECOND SHUT-IN _____ MIN.

FINAL FLOW 60 MIN. FINAL SHUT-IN 180 MIN.

PRE-FLOW BLOW DESCRIPTION: WEAK TO STRONG AIR

BLOW IN 30 SECONDS. GAS TO SURFACE IN 2

MINUTES. BUILDING THROUGHOUT. SAMPLE

TAKEN. AGAT 20075.

FINAL FLOW BLOW DESCRIPTION: WEAK TO STRONG GAS

BLOW IN 1.5 MIN. DEPLETING AT 35 MIN

THROUGHOUT. SAMPLE TAKEN AGAT 21491

MECHANICAL RECORDERS					
No.	INSIDE ☐	No.	INSIDE ☒	No.	INSIDE ☒
20755	OUTSIDE ☒		OUTSIDE ☐		OUTSIDE ☐
DEPTH	1791.00 m	DEPTH	m	DEPTH	m
CLOCK	33615	CLOCK		CLOCK	
REC. SEC. #	6379	REC. SEC. #		REC. SEC. #	
No.	INSIDE ☐	No.	INSIDE ☐	No.	INSIDE ☐
	OUTSIDE ☐		OUTSIDE ☐		OUTSIDE ☐
DEPTH	m	DEPTH	m	DEPTH	m
CLOCK		CLOCK		CLOCK	
REC. SEC. #		REC. SEC. #		REC. SEC. #	

ELECTRONIC RECORDERS					
No. P99	INSIDE ☒ OUTSIDE ☐	No. R85	INSIDE ☒ OUTSIDE ☐	No. N42	INSIDE ☐ OUTSIDE ☒
DEPTH 1771.00 m		DEPTH 1776.00 m		DEPTH 1787.00 m	
TEMP.		TEMP.		TEMP. 60.7	
FILE pi46fr.dec		FILE pi46f.dec		FILE pi46ff.dec	

FIELD READINGS		REC. No. N42	
REC. No.		REC. No. N42	
DEFLECTION	PRESSURE kPa	DEFLECTION	PRESSURE kPa
1		1	18324.01
2		2	998.62
3		3	1443.56
4		4	16124.56
5		5	1786.76
6		6	3292.88
7		7	16113.42
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	
14		14	18298.97

REMARKS	SEQUENCE OF TEST EVENTS:
ON BOTTOM AT 14:45 HRS. PUMPED UP PACKERS FOR 30 MINUTES. CHECKED SEAT OK. OPENED TOOL AT 15:20 HRS. AT 35 MINUTES INTO THE MAINFLOW THE WELL STARTED TO DEplete. SURFACE RESULTS INDICATE AN INFUX OF LIQUID. SUSPECT WATER DUE TO NO BREAKOUT DURING FINAL SHUTIN. REVERSED OUT AT FLUID. RECOVERED 350 M OF CLEAN SALT WATER WITH A SALINITY OF 22000 PPM. AT SURFACE FOUND BOTH PACKERS TORN AND HAD TO BE REPLACED.	

GENERAL INFORMATION			
COMPANY	PARAMOUNT RESOURCES LTD.		
CONTACT IN CALGARY	PAUL PRICE		
CONTACT'S PHONE	403-290-3605 FAX		
WELL NAME	PARAMOUNT ET AL FT. LIARD I-46		
LOCATION	60-10 / 123-15		
K.B.	542.50	m GROUND ELEV	537.50 m
COMPANY REP	WILBERT CALLIHOO		
TESTER	SHELDON PRYSUNKA		
JAR No	209	HYDRAULIC TOOL No	123
UNIT #	35019	PUMP No	P462
CONTRACTOR	PRECISION DRLG.	RIG No	RIG 379
TICKET No	809343	DATE	2000-01-10

MUD & HOLE DATA

HOLE CONDITION @ TEST TIME:
EXCELLENT ☐ GOOD ☒ FAIR ☐ POOR ☐

WAS HOLE CONDITIONED PRIOR TO TEST: YES ☐ NO ☒

HOLE DEVIATION: YES ☒ NO ☐ AMOUNT 13 DEGREES

CALIPER LOG RUN PRIOR TO TEST: YES ☐ NO ☒

CALIPERED HOLE SIZE @ TEST DEPTH 156.00 MAX. mm

MUD TYPE _____ INVERT _____

WEIGHT 1035 kg/m³ VISCOSITY 60 WATER LOSS 0

FILTER CAKE 1 mm

DRILL PIPE SIZE: O.D. 102 mm I.D. 65 mm WEIGHT 20.84 kg/m

DRILL COLLARS: O.D. 120 mm I.D. 53 mm RUN 169.28 m

MAIN HOLE OR CASING SIZE 156.00 mm

BOTTOM HOLE OR CHOKE SIZE 25.400 mm

PACKER RUBBER SIZE: DIAM. in mm 139 LENGTH in m 1.78

RUBBER LEFT IN HOLE: YES ☐ NO ☒

TOP PACKER: SERIAL No BAKER HI-TEMP CONDITION 5

BTM PACKER: SERIAL No BAKER HI-TEMP CONDITION 5

GAS MEASUREMENTS		MEASURED WITH:	
SIDE STATIC	☐	CRITICAL FLOW PROVER	☐
FLOOR MANIFOLD	☒	ORIFICE WELL TESTER	☐
CLOSED CHAMBER	☐	OTHER	

[illegible]

RECOVERY		RECOVERY VERIFICATION SIGNATURE:	
TOTAL FLUID RECOVERED	350.00	m	CONSISTING OF:
350 m OF CLEAN SALT WATER		SALINITY	22000
m OF		SALINITY	
m OF		SALINITY	
0 m OF MUDTANK SAMPLE		SALINITY	
TEST WAS REVERSED OUT: YES ☒ NO ☐			
BTM. H. SAMPLER #	666	SENT TO AGAT	
GAS BOMB #	PF=20075/MF=21491	SENT TO AGAT	
No. OF FLUID SAMPLES TAKEN	7	SENT TO AGAT	



TEST TOOL & PIPE RECORD

Baker Oil Tools

Well Name: PARAMOUNT ET AL F Location: 60-10 / 123-15 Date: 2000-01-10 Ticket # 809343

Interval Tested: from 1785.00 to 1789.00 Total Depth 2055.00 Test No. 6

DRILL COLLARS

JOINT	LENGTH	JOINT	LENGTH
1	18.94	11	
2	19.17	12	
3	18.79	13	
4	18.91	14	
5	19.07	15	
6	18.92	16	
7	18.57	17	
8	18.40	18	
9	18.51	19	
10		20	
1st TOTAL	169.28	2nd TOTAL	
31	19.05	41	18.69
32	18.67	42	18.68
33	17.94	43	19.07
34	19.37	44	19.07
35	18.73	45	19.03
36	19.00	46	18.29
37	18.72	47	19.06
38	18.32	48	19.04
39	18.69	49	19.39
40	18.71	50	19.40
6th TOTAL	187.20	7th TOTAL	189.72
81	19.49	91	
82	19.47	92	
83	19.49	93	
84	19.52	94	
85	0.57	95	
86	0.80	96	
87	0.54	97	
88	0.48	98	
89	0.40	99	
90		100	
11th TOTAL	80.76	12th TOTAL	
13th TOTAL			

DRILL PIPE

1	19.08	11	19.04	21	18.71
2	19.08	12	19.03	22	18.71
3	19.37	13	18.98	23	18.74
4	18.72	14	19.09	24	19.37
5	19.01	15	19.35	25	19.40
6	19.02	16	18.72	26	19.40
7	19.06	17	19.36	27	19.12
8	19.04	18	19.09	28	19.40
9	19.05	19	19.06	29	19.40
10	18.71	20	18.36	30	19.02
3rd TOTAL	190.14	4th TOTAL	190.08	5th TOTAL	191.27
61	18.73	71	18.65	81	19.09
62	19.06	72	18.63	82	19.05
63	19.03	73	19.38	83	19.53
64	19.40	74	18.78	84	19.49
65	19.05	75	18.69	85	19.45
66	19.06	76	19.07	86	19.48
67	18.65	77	19.34	87	19.68
68	18.37	78	19.36	88	19.46
69	18.00	79	19.34	89	19.60
70	19.37	80	19.37	90	19.44
8th TOTAL	188.72	9th TOTAL	190.61	10th TOTAL	194.27

INFLATABLE

Tool	Length
POS	0.33
XOS	0.30
POS	0.83
Car	1.38
Hydr	1.50
BHS	1.03
Car	1.38
Jar	2.22
SJ	0.65
Pump	2.38
Scr	1.16
TPack	1.78
PSD	0.82
PS	0.42
Car	2.04
Spg	0.30
PSU	0.42
BPack	1.90
Car	0.00
Perf	0.30
BS	2.00

Top Packer Seal Depth

Blm Packer Seal Depth

Top Packer Seal Depth

Blm Packer Seal Depth

BEFORE TEST IN DERRICK

TOTAL DRILL COLLARS	18
TOTAL DRILL PIPE	194

TESTING

	IN	OUT	TOTAL
DRILL COLLARS	18	0	18
DRILL PIPE	168	26	194

CONVENTIONAL PIPE TALLY

BELOW BOTTOM PACKER SEAL	
BETWEEN PACKER SEALS	
TOOL ABOVE PACKER SEAL	
DRILL COLLARS	
DRILL PIPE	
TOTAL STRING	
TOTAL DEPTH	
TOP SINGLE ABOVE TABLE	

INFLATE PIPE TALLY

TOOL ABOVE INTERVAL	
14.94	
DRILL COLLARS	
DRILL PIPE	
TOTAL STRINGS ABOVE INTERVAL	
1786.99	
BOTTOM OF TOP PACKER SEAL DEPTH	
1785.00	
TOP SINGLE ABOVE TABLE	
1.99	

TOOL 14.94

1st TOTAL 169.28

2nd TOTAL

3rd TOTAL 190.14

4th TOTAL 190.08

5th TOTAL 191.27

6th TOTAL 187.20

7th TOTAL 189.72

8th TOTAL 188.72

9th TOTAL 190.61

10th TOTAL 194.27

11th TOTAL 80.76

12th TOTAL

13th TOTAL

1785.0

PSD

PS

Car

Spg

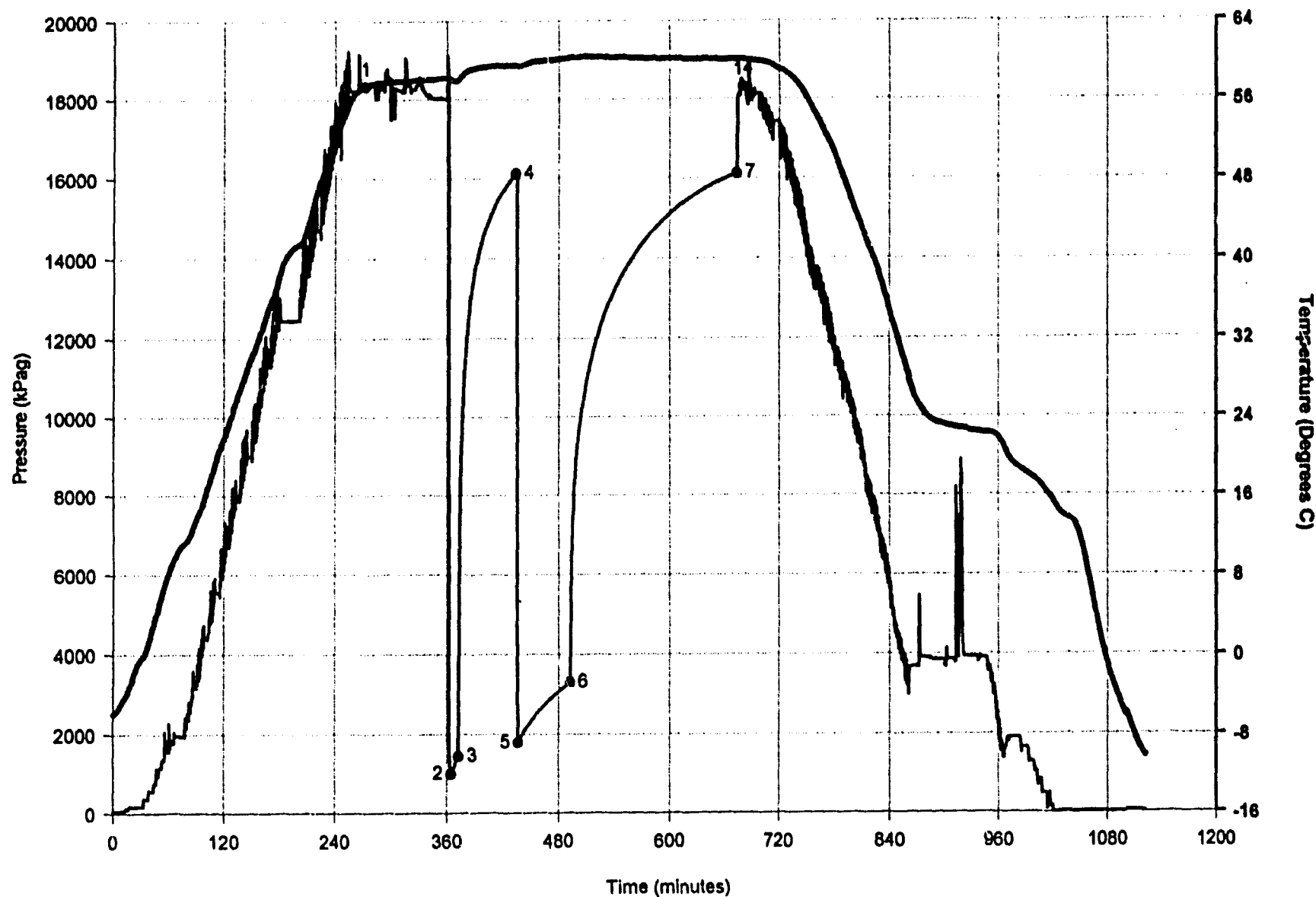
1789.0

BPack

Baker Oil Tools Drill Stem Testing

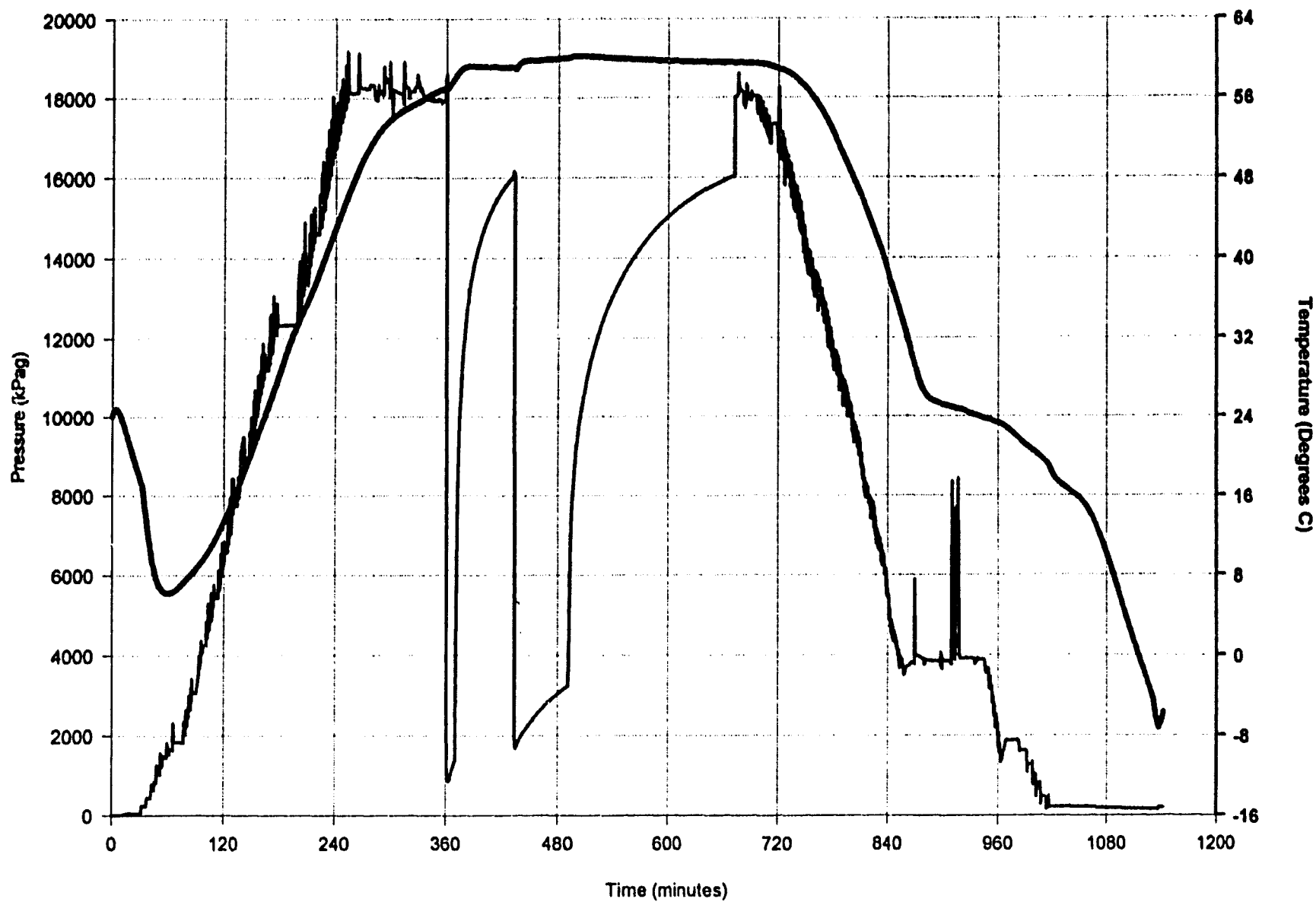
PARAMOUNT ET AL FT. LIARD I-46
60-10 / 123-15
DST #: 6
Recorder: N42

Pressure (kPag) at Critical Points:
1: 18324 4: 16125 7: 16113
2: 999 5: 1787 14: 18299
3: 1444 6: 3293



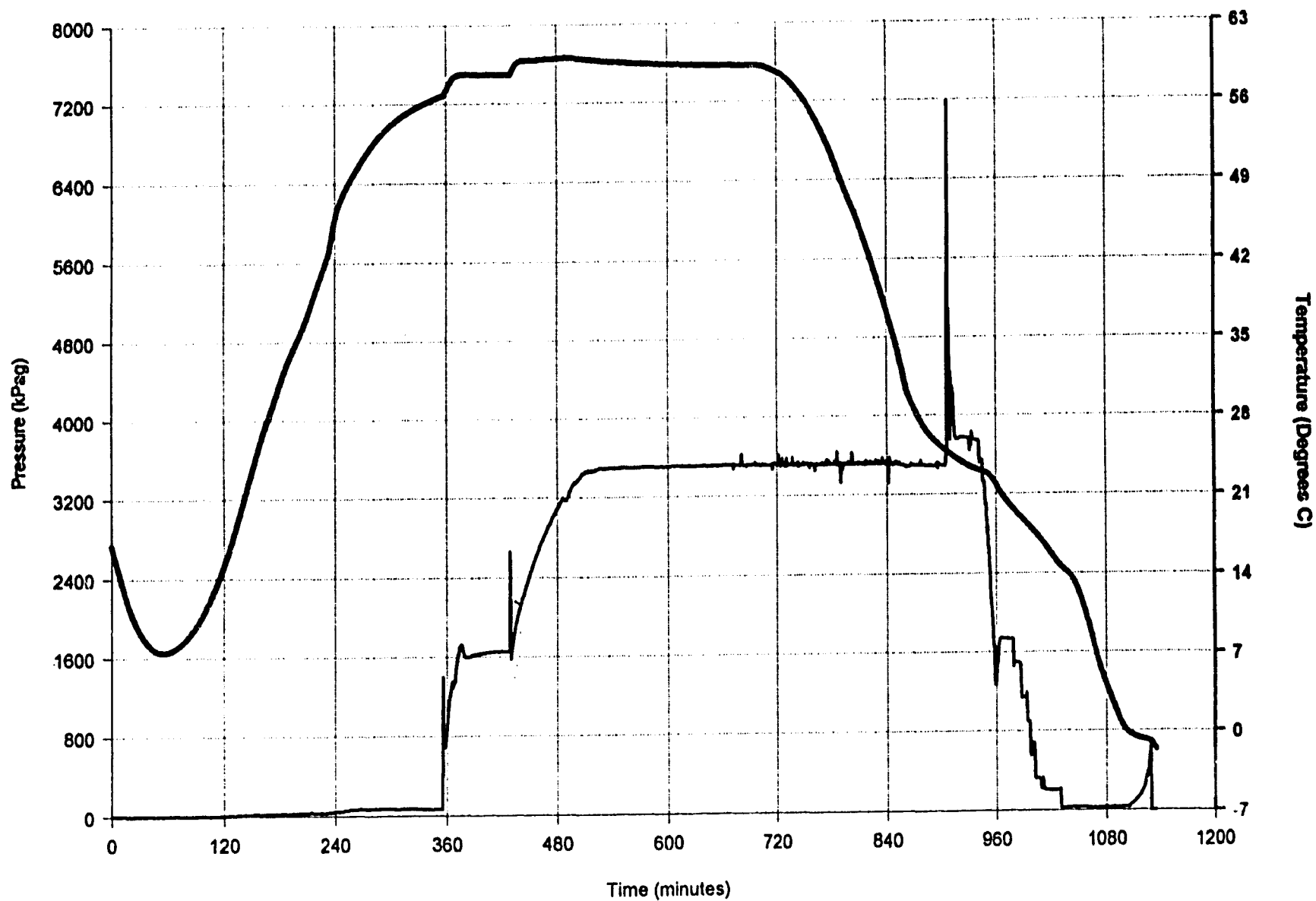
Baker Oil Tools Drill Stem Testing

PARAMOUNT ET AL FT. LIARD I-46
 80-10 / 123-15
 DST #: 6
 Recorder: R85



Baker Oil Tools Drill Stem Testing

PARAMOUNT ET AL FT. LIARD I-46
60-10 / 123-15
DST #: 6
Recorder: P99





PARAMOUNT ET AL FT. LIARD I-46

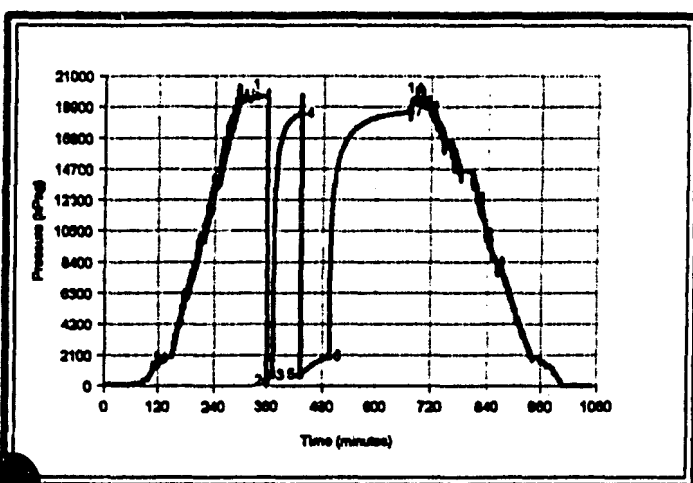
60-10 / 123-15

DST# 7

Baker Oil Tools

Formation: **MATTSON**
Interval - from: 1899.00 to: 1903.00 m

Recorder# **N42 at 1901.00 m**



Maximum Btm Hole Temperature @ FSI: 64.0 C

		Pressure (kPag)	Time (min)	Extrapolated Pressure (kPag)
1	Initial Hydrostatic	19551		
2	Start of 1st Flow	264		
3	End of 1st Flow	643	12.5	
4	End of 1st Shut-in	18412	58.5	
5	Start of 2nd Flow	693		
6	End of 2nd Flow	1954	61.0	
7	End of 2nd Shut-in	18539	179.5	
14	Final Hydrostatic	19344		

Liquid Recovery of 160.00 m

~~Test was reversed out~~

Recovery	Description	Salinity
40.00 m	WATER CUT INVERT	50000
120.00 m	SALT WATER	
0.00 m	MUDTANK SAMPLE	

Test Date: 2000-01-11
Test Type: INFLATE STRADDLE
Tester Name: SHELDON PRYSUNKA
Drill Pipe O.D.: 102.00 mm
Drill Collar I.D.: 53.00 mm
Drill Collar Length: 169.28 m
Hole Size: 156.00 mm

Blow Description:

PREFLOW - VERY WEAK TO WEAK AIR BLOW 10 CM IN PAIL AT 10 MINUTES. BUILDING THROUGHOUT. NO GAS TO SURFACE. FINAL FLOW - VERY WEAK TO WEAK 10 CM IN PAIL AT 25 MIN. STEADY THROUGHOUT. NO GAS TO SURFACE. PRESUME LIQUID INFLUX.

Remarks:

ON BOTTOM AT 10:30 HRS. PUMPED UP PACKERS FOR 30 MINUTES. CHECKED SEAT OK. OPENED TOOL AT 11:06 HRS. FIRST THREE STANDS OFF BOTTOM WERE VERY TIGHT. .40 M OF THE BOTTOM PACKER RUBBER STAYED IN THE HOLE.

Baker Oil Tools

FIELD REPORT

TEST DATA TEST No. 7 LUS. TEST No. 7
FORMATION TESTED MATTSON T.D. 2055.00 m
INTERVAL TESTED: From 1899.00 m to 1903.00 m
TOTAL INTERVAL TESTED 4.00 m
TEST TYPE INFLATE STRADDLE RESET: YES ☐ NO ☒
CUSHION: YES ☐ NO ☒ TYPE _____ AMOUNT _____ m
STARTED IN HOLE @ 06:30 HRS. OPENED TOOL 11:06 HRS.
DATE & TIME OUT OF HOLE 2000-01-11 @ 21:45 HRS.
TEST TIMES:
PRE-FLOW 10 MIN. INITIAL SHUT-IN 60 MIN.
SECOND FLOW _____ MIN. SECOND SHUT-IN _____ MIN.
FINAL FLOW 60 MIN. FINAL SHUT-IN 180 MIN.
PRE-FLOW BLOW DESCRIPTION: VERY WEAK TO WEAK AIR
BLOW 10 CM IN PAIL AT 10 MINUTES. BUILDING
THROUGHOUT. NO GAS TO SURFACE.
FINAL FLOW BLOW DESCRIPTION: VERY WEAK TO WEAK 10
CM IN PAIL AT 25 MIN. STEADY THROUGHTOUT.
NO GAS TO SURFACE. PRESUME LIQUID INFLUX.

MECHANICAL RECORDERS					
No.	INSIDE ☐	No.	INSIDE ☒	No.	INSIDE ☒
20755	OUTSIDE ☒		OUTSIDE ☐		OUTSIDE ☐
DEPTH 1905.00 m		DEPTH m		DEPTH m	
CLOCK 33615		CLOCK		CLOCK	
REC. SEC. # 6379		REC. SEC. #		REC. SEC. #	
No.	INSIDE ☐	No.	INSIDE ☐	No.	INSIDE ☐
	OUTSIDE ☐		OUTSIDE ☐		OUTSIDE ☐
DEPTH m		DEPTH m		DEPTH m	
CLOCK		CLOCK		CLOCK	
REC. SEC. #		REC. SEC. #		REC. SEC. #	

ELECTRONIC RECORDERS					
No. P99	INSIDE ☒ OUTSIDE ☐	No. R85	INSIDE ☒ OUTSIDE ☐	No. N42	INSIDE ☐ OUTSIDE ☒
DEPTH 1885.00 m		DEPTH 1890.00 m		DEPTH 1901.00 m	
TEMP.		TEMP.		TEMP. 64.0	
FILE pi46gr.dec		FILE pi46g.dec		FILE pi46gg.dec	

FIELD READINGS		REC. No. N42	
REC. No.		REC. No. N42	
DEFLECTION	PRESSURE kPa	DEFLECTION	PRESSURE kPa
1		1	19551.20
2		2	264.20
3		3	642.72
4		4	18411.77
5		5	693.44
6		6	1953.81
7		7	18539.29
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	
14		14	19344.38

REMARKS **SEQUENCE OF TEST EVENTS:**

ON BOTTOM AT 10:30 HRS. PUMPED UP PACKERS
FOR 30 MINUTES. CHECKED SEAT OK. OPENED
TOOL AT 11:06 HRS. FIRST THREE STANDS OFF
BOTTOM WERE VERY TIGHT. .40 M OF THE
BOTTOM PACKER RUBBER STAYED IN THE HOLE.

GENERAL INFORMATION

COMPANY PARAMOUNT RESOURCES LTD.
CONTACT IN CALGARY PAUL PRICE
CONTACT'S PHONE 403-290-3605 FAX
WELL NAME PARAMOUNT ET AL FT. LIARD I-46
LOCATION 60-10 / 123-15
K.B. 542.50 m GROUND ELEV 537.50 m
COMPANY REP WILBERT CALLIHOO
TESTER SHELDON PRYSUNKA
JAR No 209 HYDRAULIC TOOL No 123
UNIT # 35019 PUMP No P462
CONTRACTOR PRECISION DRLG. RIG No RIG 379
TICKET No 809344 DATE 2000-01-11

MUD & HOLE DATA

HOLE CONDITION @ TEST TIME:
EXCELLENT ☐ GOOD ☒ FAIR ☐ POOR ☐

WAS HOLE CONDITIONED PRIOR TO TEST: YES ☐ NO ☒

HOLE DEVIATION: YES ☒ NO ☐ AMOUNT 13 DEGREES

CALIPER LOG RUN PRIOR TO TEST: YES ☒ NO ☐

CALIPERED HOLE SIZE @ TEST DEPTH 156.00 MAX. mm

MUD TYPE _____ INVERT _____

WEIGHT 1035 kg/m³ VISCOSITY 60 WATER LOSS 0

FILTER CAKE 1 mm

DRILL PIPE SIZE: O.D. 102 mm I.D. 65 mm WEIGHT 20.84 kg/m

DRILL COLLARS: O.D. 120 mm I.D. 53 mm RUN 169.28 m

MAIN HOLE OR CASING SIZE 156.00 mm

BOTTOM HOLE OR CHOKE SIZE 25.400 mm

PACKER RUBBER SIZE: DIAM. IN mm 139 LENGTH IN m 1.78

RUBBER LEFT IN HOLE: YES ☐ NO ☒

TOP PACKER: SERIAL No BAKER HI-TEMP CONDITION 5

BTM PACKER: SERIAL No BAKER HI-TEMP CONDITION 2

GAS MEASUREMENTS		MEASURED WITH:	
SIDE STATIC	☐	CRITICAL FLOW PROVER	☐
FLOOR MANIFOLD	☒	ORIFICE WELL TESTER	☐
CLOSED CHAMBER	☐	OTHER	

[illegible]

RECOVERY		RECOVERY VERIFICATION SIGNATURE:	
TOTAL FLUID RECOVERED		160.00	m
CONSISTING OF:			
40 m OF WATER CUT	INVERT	SALINITY	
120 m OF SALT WATER		SALINITY	50000
m OF		SALINITY	
0 m OF MUDDTANK SAMPLE		SALINITY	
TEST WAS REVERSED OUT: YES ☒ NO ☐			
BTM. H. SAMPLER #		777	SENT TO AGAT
GAS FLOID #		NO GAS TO SURFACE	SENT TO AGAT
No. OF FLUID SAMPLES TAKEN		3	SENT TO AGAT



TEST TOOL & PIPE RECORD

Baker Oil Tools

Well Name: PARAMOUNT ET AL F... Location: 60-10 / 123-15 Date 2000-01-11 Ticket # 809344

Interval Tested: from 1899.00 to 1903.00 Total Depth 2055.00 Test No. 7

DRILL COLLARS

JOINT	LENGTH	JOINT	LENGTH
1	18.94	11	
2	19.17	12	
3	18.79	13	
4	18.91	14	
5	19.07	15	
6	18.92	16	
7	18.57	17	
8	18.40	18	
9	18.51	19	
10		20	
1st TOTAL	169.28	2nd TOTAL	
31	18.71	41	18.63
32	19.03	42	19.38
33	19.40	43	18.78
34	19.05	44	18.68
35	19.05	45	19.06
36	18.64	46	19.34
37	19.37	47	19.35
38	17.99	48	19.33
39	19.36	49	18.36
40	18.65	50	18.74
6th TOTAL	189.25	7th TOTAL	189.65
81	19.50	91	0.57
82	19.47	92	
83	19.49	93	
84	19.48	94	
85	19.49	95	
86	19.43	96	
87	19.48	97	
88	19.48	98	
89	19.52	99	
90	19.48	100	
11th TOTAL	194.82	12th TOTAL	0.57
13th TOTAL			

DRILL PIPE

1	19.08	11	19.04	21	19.04
2	19.08	12	19.03	22	18.98
3	19.39	13	19.07	23	19.08
4	18.72	14	18.28	24	19.35
5	19.01	15	19.05	25	18.72
6	19.02	16	19.04	26	19.37
7	19.06	17	19.39	27	19.09
8	19.04	18	19.40	28	19.06
9	19.06	19	18.73	29	18.36
10	18.71	20	19.06	30	18.72
3rd TOTAL	190.17	4th TOTAL	190.09	5th TOTAL	189.77
51	19.37	61	19.38	71	19.10
52	19.40	62	18.73	72	19.07
53	19.40	63	19.02	73	19.53
54	19.12	64	18.73	74	19.50
55	19.39	65	18.34	75	19.45
56	19.40	66	18.69	76	19.48
57	19.01	67	18.72	77	19.69
58	19.05	68	18.69	78	19.46
59	18.67	69	18.69	79	19.60
60	17.96	70	19.07	80	19.45
8th TOTAL	190.77	9th TOTAL	188.06	10th TOTAL	194.33

INFLATABLE

Tool	Length
POS	0.33
XOS	0.30
POS	0.83
Car	1.38
Hydr	1.50
BHS	1.03
Car	1.38
Jar	2.22
SJ	0.65
Pump	2.38
Scr	1.16
TPack	1.78
PSD	0.82
PS	0.42
Car	2.04
Spg	0.30
PSU	0.42
BPack	1.90
Car	0.00
Perf	0.30
BS	2.00

Top Packer Seal Depth

Bottom Packer Seal Depth

BEFORE TEST IN DERRICK

TOTAL DRILL COLLARS	18
TOTAL DRILL PIPE	194

TESTING

	IN	OUT	TOTAL
DRILL COLLARS	18	0	18
DRILL PIPE	180	14	194

CONVENTIONAL PIPE TALLY

BELOW BOTTOM PACKER SEAL
BETWEEN PACKER SEALS
TOOL ABOVE PACKER SEAL
DRILL COLLARS
DRILL PIPE
TOTAL STRING
TOTAL DEPTH
TOP SINGLE ABOVE TABLE

INFLATE PIPE TALLY

TOOL ABOVE INTERVAL
DRILL COLLARS
DRILL PIPE
TOTAL STRINGS ABOVE INTERVAL
BOTTOM OF TOP PACKER SEAL DEPTH
TOP SINGLE ABOVE TABLE

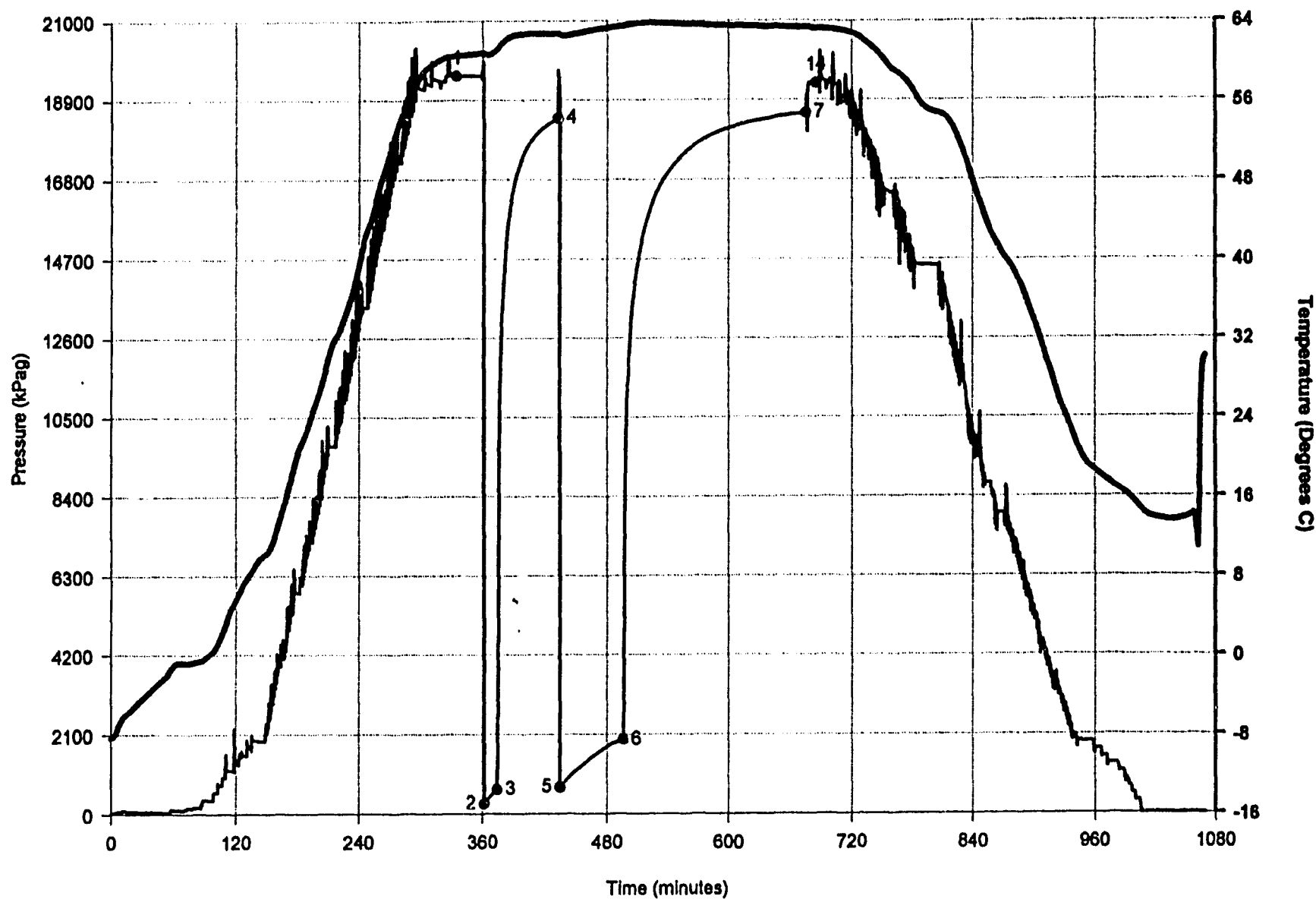
Tester Signature

Approved by Oil Co. Rep.

Baker Oil Tools Drill Stem Testing

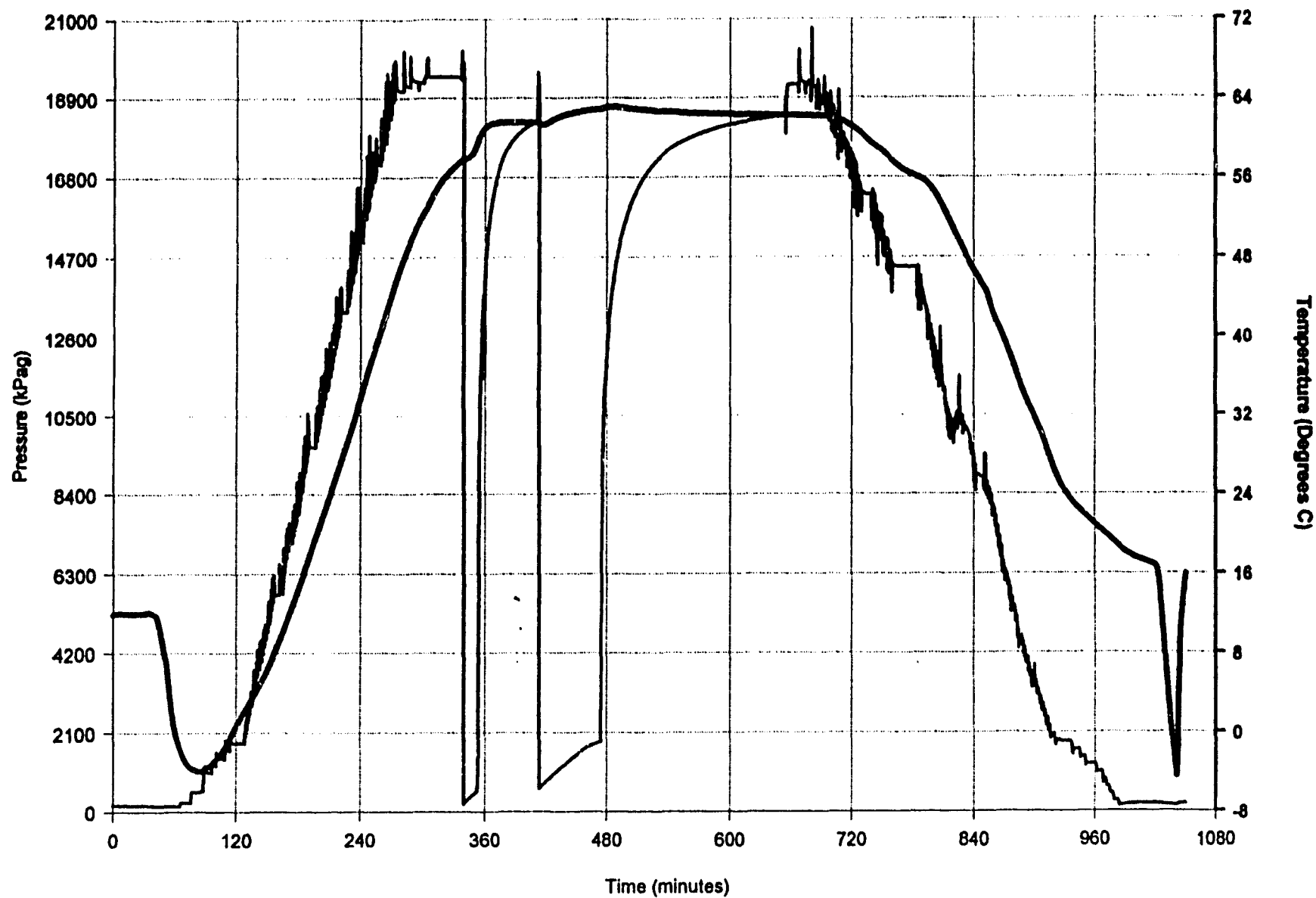
PARAMOUNT ET AL FT. LIARD I-46
60-10 / 123-15
DST #: 7
Recorder: N42

Pressure (kPag) at Critical Points:
1: 19551 4: 18412 7: 18539
2: 264 5: 693 14: 19344
3: 643 6: 1954



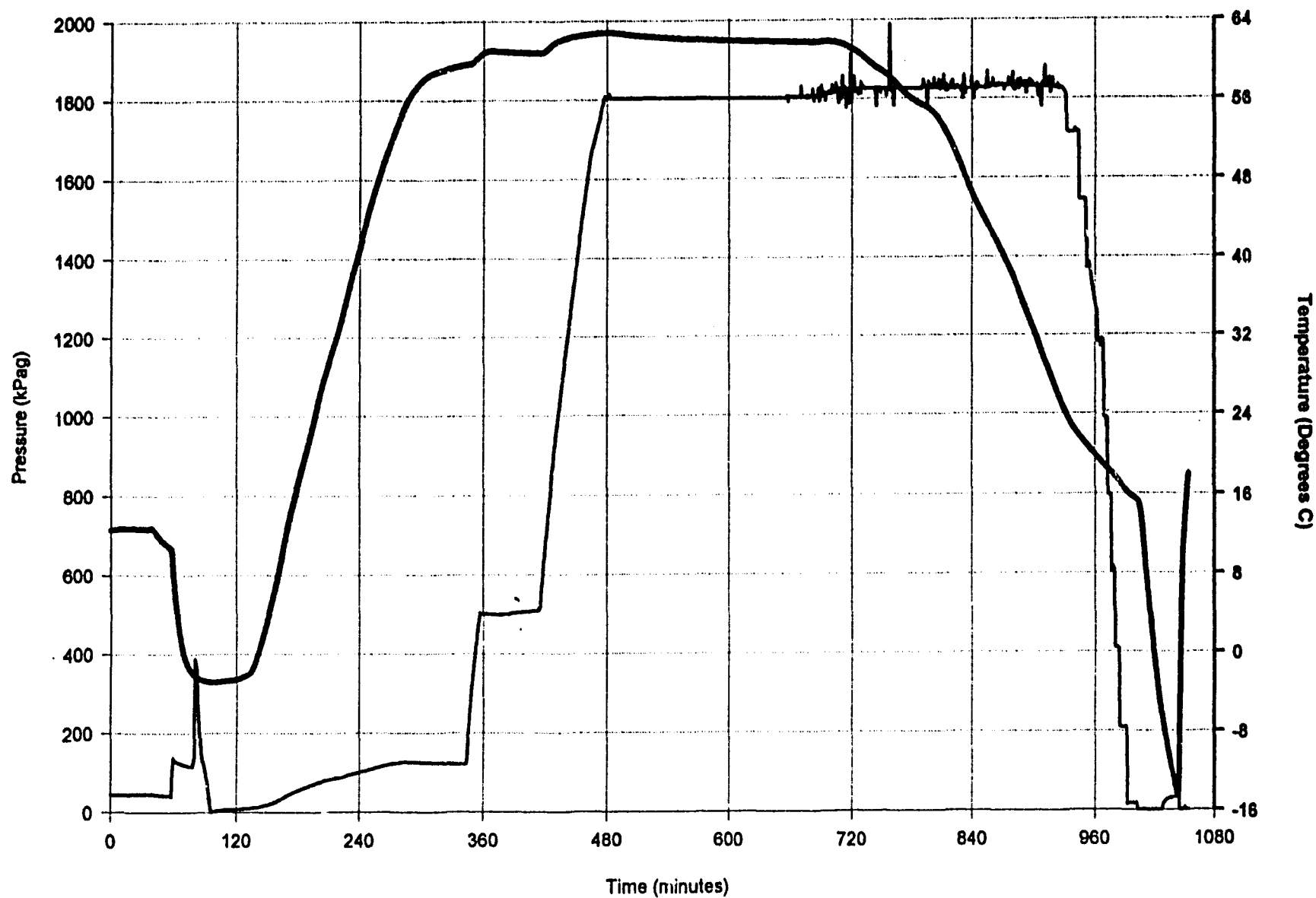
Baker Oil Tools Drill Stem Testing

PARAMOUNT ET AL FT. LIARD I-46
60-10 / 123-15
DST #: 7
Recorder: R85



Baker Oil Tools Drill Stem Testing

PARAMOUNT ET AL FT. LIARD I-48
60-10 / 123-15
DST #: 7
Recorder: P99



DAILY DRILLING SUMMARY

Paramount et al Liard NWT I-46

Date	Midnight		Drilling Hours	ROP (m/hr)	Mud Properties				Operations Summary
	Depth	Progress			Density	Vis	WL	pH	
11 Nov	0.0	0.0	0.00	n/a	-	-	-	-	Continue rig-up, rig to spud.
12 Nov	51.0	35.0	6.25	5.6	1010	65-68	-	11.0	Complete rig to spud, wait on fuel, spud well @ 14:00hrs, drill from 0-51m.
13 Nov	159.0	108.0	20.25	5.3	1050-1070	54-62	-	8.5-9.0	Drill 51m to 159m.
14 Nov	200.0	41.0	18.75	2.2	1090-1100	51-55	-	8.5	Drill 159m to 190m, trip for bit, RIH with 222mm bit, drill pilot hole from 190m to 200m.
15 Nov	298.0	98.0	22.25	4.4	1105-1150	51-52	-	8.5	Drill 222mm hole from 200m to 298m.
16 Nov	380.0	82.0	21.75	3.8	1130-1185	49-53	-	8.0-9.0	Drill 222mm hole from 298m to 380m.
17 Nov	479.0	99.0	21.50	4.6	1105-1130	50-52	-	8.5-9.0	Drill 222mm hole from 380m to 479m.
18 Nov	506.0	27.0	5.5	4.9	1130-1135	53-55	-	8.5-9.0	Drill from 479m to 506m (sfc. csg. TD), POOH sideways to ream pilot hole, lay down drill pipe, P.U. 311mm bit, RIH, ream 311mm hole from 190m to 333m.
19 Nov	506.0	0.0	0	0.0	1130	54	-	8.5	Ream 311mm hole from 333-343m, back-ream tight hole (2.5hrs), ream from 343m to 444m.
20 Nov	506.0	0.0	0.00	0.0	1145	142	-	8.5	Ream from 444m to 495m, back-ream & work through tight hole from 435m (3.5hrs), POOH, RIH & re-ream from 466m to 495m, ream 311mm hole from 495m to 506m, commence wiper trip.
21 Nov	506.0	0.0	0.00	0.0	-	-	-	-	Complete wiper trip, rig to & run 244.5mm casing, rig to & cement casing, WOC, weld casing bowl, P.U. & assemble BOP stack.
22 Nov	506.0	0.0	0.00	0.0	-	-	-	-	Complete n.u. BOPs, press. test BOPs, make up BHA for mud-motor, p.u. directional tools & RIH, pressure test pipe rams & annular preventer.
23 Nov	628.0	123.0	9.50	12.9	960	53	-	-	Lay down pipe, displace hole to invert mud, drillout cement, drill from 506-628m.
24 Nov	842.0	214.0	19.00	11.3	955-965	48-58	-	-	Drill from 628m to 842m.
25 Nov	968.0	126.0	10.75	11.7	955-965	54-59	-	-	Drill from 842m to 849m, POOH for bit, RIH, ream from 790m to 848m, drill from 849m to 968m.
26 Nov	1233.0	265.0	20.50	12.9	960-970	51-57	-	-	Drill from 968m to 1233m.
27 Nov	1273.0	40.0	7.25	5.5	965-970	55-57	-	-	Drill from 1233m to 1273m, POOH for bit, lay down dir. tools, RIH, ream from 635-705m (5hrs), RIH to 708m.
28 Nov	1338.0	65.0	12.00	5.4	960-965	51-55	-	-	Work tight hole & ream from 708-806m (5hrs), RIH to 1226m, ream hole to bottom (3.25hrs), drill from 1273-1338m.
29 Nov	1360.0	22.0	13.75	1.6	970-990	51-55	-	-	Drill from 1338-1360m, POOH for bit, commence RIH.
30 Nov	1393.0	33.0	19.00	1.7	995-1010	55-57	-	-	Complete RIH, drill 1360-1393m, commence POOH to P.U. directional tools.
01 Dec	1418.0	25.0	13.75	1.8	1010-1030	52-56	-	-	Complete POOH, P.U. directional tools, RIH, drill from 1393-1418m.

02 Dec	1437.0	19.0	15.25	1.2	1010	49-50	-	-	Drill 1418-1437m, POOH for bit, commence RIH.
03 Dec	1466.0	29.0	16.50	1.8	1010-1025	49-52	-	-	Complete RIH, ream from 1406-1437m (3.25hrs), commence POOH for bit.
04 Dec	1494.0	28.0	16.75	1.7	1030-1040	49-52	-	-	Complete POOH, RIH, drill from 1466-1494m.
05 Dec	1536.0	40.4	22.75	1.8	1040	47-48	-	-	Drill from 1494-1536m.
06 Dec	1545.0	9.0	5.25	1.6	1040-1060	48-51	-	-	Drill from 1536-1545m, POOH & lay down dir. tools, RIH to bottom & circulate, POOH, rig to & commence logging.
07 Dec	1545.0	0.0	0.00	-	-	-	-	-	Complete logging, WOO, rig to & commence DST #1.
08 Dec	1545.0	0.0	0.00	-	-	-	-	-	Complete DST #1, POOH, recover recorders, make up DST #2, RIH, misrun DST #2 (no seat), POOH & lay down test tool, commence RIH with bit.
09 Dec	1545.0	0.0	0.00	-	-	-	-	-	RIH with bit, circ. & cond. hole, POOH for test tool, make up DST #3, RIH misrun (no seat), POOH, commence WO test tools.
10 Dec	1545.0	0.0	0.00	-	-	-	-	-	WO test tools, make up DST #4, RIH, run DST #4, POOH & recover recorders, make up fishing tools & commence RIH.
11 Dec	1545.0	0.0	0.00	-	-	-	-	-	RIH with fishing tools, circ. & fish for belly spring, hoist fishing tools, WO fishing tools, RIH with fishing tools & fish, commence POOH with fishing tools.
12 Dec	1545.0	0.0	0.00	-	-	-	-	-	POOH with fishing tools, recover fish & lay down tools, RIH for clean-out trip, circulate, POOH, rig to & run int. csg.
13 Dec	1545.0	0.0	0.00	-	-	-	-	-	Circulate, rig to & cement casing, WOC, renipple up BOPs & air drilling equipment.
14 Dec	1545.0	0.0	0.00	-	-	-	-	-	Rig in air equip., nipple up underbalanced equip., press. test, nipple up airflow lines & valves, RIH, drill out cement to 1542m.
15 Dec	1547.0	2.0	3.00	0.7	-	-	-	-	Drill out cmt, drill 1545-1547m, run LOT, POOH to run string floats, RIH, displace to air, POOH for air-hammer, make up BHA.
16 Dec	1598.0	51.0	10.25	5.0	-	-	-	-	RIH, drill from 1547-1597m, POOH, RIH, drill 1597-98m.
17 Dec	1638.0	40.0	10.75	3.7	-	-	-	-	Drill 1598-1638m, blow out hole, POOH, RIH, circulate.
18 Dec	1669.0	31.0	6.75	4.6	-	-	-	-	Circulate, drill 1638-1639m, air hammer not working, run soap & diesel flush, POOH, change out hammer & jars, RIH, drill 1639-1650m, blow hole, run soap flush, drill 1650-1669m.
19 Dec	1672.0	3.0	2.25	1.3	-	-	-	-	Drill 1669-1670m, blow hole, POOH for bit, RIH, drill from 1670-1671m, circ. & work pipe, drill 1671-1672m, POOH to p.u. tri-cone bit, RIH.
20 Dec	1685.0	13.0	4.50	2.9	-	-	-	-	RIH, drill 1672-1683m, work string, circ. & cond. well (taking on fluid), drill 1683-1685m, displace hole to water & kill well, displace to invert, commence POOH.

21 Dec	1688.0	3.0	3.50	0.9	1020	53	-	-	POOH, rig out air equip., rig up flow nipple & line, RIH, drill 1685-1687m, POOH for bit, RIH, drill 1687-1688m.
22 Dec	1716.0	28.0	23.25	1.2	1035	51	-	-	Drill 1688-1716m.
23 Dec	1740.0	24.0	15.50	1.6	1035-1040	51-52	-	-	Drill 1716-1740m, POOH for DST, make up DST tool.
24 Dec	1740.0	0.0	0.00	0.0	1040	51	-	-	Make up DST tool, RIH, run DST, commence POOH, reverse circ. water out, POOH, lay down DST tool, RIH, slip & cut, circulate.
25 Dec	1777.0	37.0	22.00	1.7	1040-1050	53-62	-	-	Circulate, survey, drill 1740-1777m.
26 Dec	1802.0	25.0	19.00	1.3	1035-1055	54-56	-	-	Drill 1777-1802m, circulate, POOH for bit.
27 Dec	1814.5	12.5	15.25	0.8	1035-1040	55-57	-	-	POOH, drill 1802-1814.5m, POOH for bit, commence RIH.
28 Dec	1835.0	20.5	19.50	1.1	1025-1040	55-60	-	-	Complete RIH, ream 4m, drill 1814.5-
29 Dec	1852.0	17.0	17.50	1.0	1025-1030	55-58	-	-	Drill 1835-1852m, POOH for bit, start RIH.
30 Dec	1874.5	22.5	15.50	1.5	1040	57-58	-	-	RIH, drill 1852-1873m, work pipe (torquing up), drill 1873-1874.5m, POOH for bit.
31 Dec	1888.0	13.5	11.75	1.2	1035	60	-	-	POOH, RIH with bit, drill 1874.5-1888m, POOH for bit, RIH, commence drilling.
01 Jan	1922.0	34.0	22.25	1.5	1035-1045	58-62	-	-	Drill 1888-1921, survey, drill 1921-1922m.
02 Jan	1949.0	27.0	23.50	1.2	1035-1040	59-60	-	-	Drill 1922-1949m.
03 Jan	1967.0	18.0	13.25	1.4	1035	59	-	-	Drill 1949-1960, POOH for bit, RIH, drill 1960-1967m.
04 Jan	1999.0	32.0	22.00	1.5	1035-1040	58-60	-	-	Drill 1967-1999m.
05 Jan	2014.0	15.0	13.50	1.1	1035	59-62	-	-	Drill 1999-2006m, POOH for bit, RIH, drill 2006-2014m.
06 Jan	2030.0	16.0	16.00	1.0	1035-1040	62-63	-	-	Drill 2014-2030m, POOH for bit (missing pieces), make up mill, RIH with mill.
07 Jan	2045.0	15.0	9.00	1.7	1035-1040	62-65	-	-	RIH, mill to 2031m, POOH, RIH with bit, drill 2031-2045m.
08 Jan	2055.0	10.0	8.75	1.1	1035	60-63	-	-	Drill 2045-2055m (FTD @ 0900hrs), circulate, survey, strap out of hole, rig to & start logging Run #1 with Baker Hughes.
09 Jan	2055.0	0.0	n/a	n/a	-	-	-	-	Finish Run #1, log Run #2, log Run #3 (RFT #1), start logging Run #4 (RFT #2).
10 Jan	2055.0	0.0	n/a	n/a	-	-	-	-	Finish Run #4, rig out loggers, make up DST tool, RIH, run DST #6, POOH, reverse circulate.
11 Jan	2055.0	0.0	n/a	n/a	-	-	-	-	POOH, recover recorders, change packer, RIH, run DST #7, POOH, break down tool.
12 Jan	2055.0	0.0	n/a	n/a	-	-	-	-	Recover recorders, rig to & log Run #5 (RFT #3), POOH to check tool (seal leaking), rig out loggers, RIH for clean-out trip (WO new tool), POOH, rig to & log Run #6 (RFT #4).
13 Jan	2055.0	0.0	n/a	n/a	-	-	-	-	Log Run #7 (RFT #5), rig out loggers, geologist released.



DRILLING PARAMETERS RECORD

Job No. 0490-29364 Page 1 of 2Company Paramount Resources Ltd.Field Fort LiardWell Name & # Para Et Al Ft. Liard I-46/60-10-123-15

BHI Rep. _____

DRILLING DATA

Date	Depth From (m)	Depth To (m)	Drill Mode O/R	TFO	Drill Hrs.	Circ. Hrs.	Total Hrs.	WOB (x1000)	Rotary RPM	Rotary Torque (kft-lbs)	Flow Rate (lpm)	SPP (kpa)	Bit No.
23-NOV-99	505	573.6	R		5.75	3.42	9.17	7	45	0	1200	7000	1
23-NOV-99	573.6	580.8	O	130 L	0.92	0.17	1.08	5	0	0	1200	6500	1
23-NOV-99	580.8	631	R		2.58	0.17	2.75	7	45	0	1200	7000	1
24-NOV-99	631	660	R		1.33	0.08	1.42	8	45	140	1200	7000	1
24-NOV-99	660	669.4	R		1.58	0.17	1.75	8	45	140	1200	7000	1
24-NOV-99	669.4	688.5	R		1.33	0.17	1.50	8	45	140	1200	7500	1
24-NOV-99	688.5	707.2	R		1.75	0.08	1.83	8	45	140	1200	7500	1
24-NOV-99	707.2	726.5	R		1.83	0.17	2.00	7	45	140	1200	7500	1
24-NOV-99	726.5	745.9	R		1.92	0.08	2.00	7	45	140	1200	7500	1
24-NOV-99	745.9	765.1	R		1.92	0.17	2.08	7	45	140	1200	7500	1
24-NOV-99	765.1	784	R		2.00	0.08	2.08	7	45	140	1200	7500	1
24-NOV-99	784	803.7	R		1.75	0.17	1.92	7	45	140	1200	7500	1
24-NOV-99	803.7	822.7	R		1.83	0.08	1.92	7	45	140	1200	7500	1
24-NOV-99	822.7	842	R		1.92	0.17	2.08	7	45	140	1200	7500	1
25-NOV-99	842	849	R		0.75	0.75	1.50	7	45	350	1200	7500	1
25-NOV-99	849	861.3	R		0.42	3.75	4.17	10	40	80	1200	7500	2
25-NOV-99	861.3	890	R		1.42	0.08	1.50	10	40	80	1200	7500	2
25-NOV-99	890	909.2	R		1.50	0.17	1.67	10	40	80	1200	7500	2
25-NOV-99	909.2	927.9	R		1.00	0.08	1.08	10	40	80	1200	7500	2
25-NOV-99	927.9	946.5	R		1.50	0.17	1.67	10	40	80	1200	7500	2
25-NOV-99	946.5	965.2	R		1.58	0.08	1.67	10	40	80	1200	7500	2
25-NOV-99	965.2	967	R		0.17	0.00	0.17	10	40	80	1200	7500	2
26-NOV-99	967	983.8	R		1.25	0.08	1.33	10	40	80	1200	7500	2
26-NOV-99	983.8	1003.2	R		1.58	0.17	1.75	10	40	100	1200	7500	2
26-NOV-99	1003.2	1022	R		1.33	0.08	1.42	10	40	100	1200	7500	2
26-NOV-99	1022	1040.7	R		1.50	0.08	1.58	10	40	100	1200	7500	2
26-NOV-99	1040.7	1043.7	O	130 L	0.67	0.08	0.75	6	0	0	1200	7500	2
26-NOV-99	1043.7	1060.1	R		1.50	0.08	1.58	10	40	100	1200	7500	2
26-NOV-99	1060.1	1079.1	R		0.67	0.08	0.75	9	40	120	1200	8000	2
26-NOV-99	1079.1	1097.3	R		0.67	0.17	0.83	9	40	120	1200	8000	2
26-NOV-99	1097.3	1116.3	R		0.83	0.08	0.92	9	40	120	1200	8000	2
26-NOV-99	1116.3	1135	R		0.92	0.08	1.00	9	40	120	1200	8000	2
26-NOV-99	1135	1163.5	R		1.42	0.17	1.58	9	40	120	1200	8000	2
26-NOV-99	1163.5	1181.8	R		0.83	0.08	0.92	9	40	120	1200	8000	2
26-NOV-99	1181.8	1200.8	R		0.83	0.08	0.92	10	40	120	1200	8000	2
26-NOV-99	1200.8	1218.3	R		2.08	0.08	2.17	10	40	120	1200	8000	2
26-NOV-99	1218.3	1233	R		1.75	0.00	1.75	10	40	120	1200	8000	2
27-NOV-99	1233	1238.2	R		1.00	0.17	1.17	10	40	100	1200	7800	2



DRILLING PARAMETERS RECORD

Job No. 0490-29364 Page 2 of 2

Company Paramount Resources Ltd.

Field Fort Liard

Well Name & No. Para Et Al Ft. Liard I-46/60-10-123-15

BHI Rep.

DRILLING DATA

Date	Depth From (m)	Depth To (m)	Drill Mode O/R	TFO	Drill Hrs.	Circ. Hrs.	Total Hrs.	WOB (x1000)	Rotary RPM	Rotary Torque (kft-lbs)	Flow Rate (lpm)	SPP (kpa)	Bit No.
27-NOV-99	1238.2	1240.2	O	130 L	0.50	0.17	0.67	13	0	0	1200	7800	2
27-NOV-99	1240.2	1274	R		3.83	1.00	4.83	9	40	100	1200	7800	2
01-DEC-99	1393	1397	O	180	2.50	0.33	2.83	12	0	0	1350	9000	3
01-DEC-99	1397	1412.2	R		5.92	0.17	6.08	13	40	100	1350	9200	3
01-DEC-99	1412.2	1416	O	180	3.25	0.00	3.25	12	0	0	1350	9200	3
01-DEC-99	1416	1418	R		1.00	0.00	1.00	13	40	100	1350	9200	3
02-DEC-99	1418	1437	R		14.50	0.50	15.00	8	40	350	1390	9200	3
03-DEC-99	1437	1438.4	R		0.25	2.67	2.92	8	40	50	1390	9200	4
03-DEC-99	1438.4	1450.9	O	130 L	1.25	0.17	1.42	8	0	0	1390	9000	4
03-DEC-99	1450.9	1466	R		11.25	0.50	11.75	8	40	50	1390	9000	4
04-DEC-99	1466	1469.3	R		2.25	0.33	2.58	10	40	50	1390	9000	5
04-DEC-99	1469.3	1474.3	O	180	4.50	0.17	4.67	12	0	0	1390	9000	5
04-DEC-99	1474.3	1488.1	R		7.08	0.17	7.25	13	40	50	1390	8600	5
04-DEC-99	1488.1	1490.1	O	120 L	1.58	0.17	1.75	14	0	0	1390	8900	5
04-DEC-99	1490.1	1494	R		1.50	0.00	1.50	13	40	50	1390	8900	5
05-DEC-99	1494	1506.9	R		7.42	0.17	7.58	13	40	50	1390	8900	5
05-DEC-99	1506.9	1526.5	R		10.42	0.33	10.75	13	40	50	1390	8900	5
05-DEC-99	1526.5	1536	R		5.92	0.17	6.08	13	40	50	1390	8900	5
06-DEC-99	1536	1538.5	O	120 L	1.25	0.00	1.25	15	0	0	1390	8900	5
06-DEC-99	1538.5	1545	R		4.75	1.00	5.75	13	40	50	1390	8900	5

LOGGING REPORT

Depth (Driller's):	1545m	Date:	December 6, 1999
Depth (Strap):	1545.5m	Logging Company:	Baker Hughes
Depth (Logger's):	1545.5m	Logging Engineer:	Dave McCullough
Surface Casing (Driller's):	505.4m	Truck No:	6556
Intermediate Casing:	n/a	Hole Size:	222 mm

MUD DETAILS

Mud Type:	Invert	Weight:	1060
pH:	n/a	Viscosity:	51
Water Loss:	n/a	Salinity:	

OPERATIONS SUMMARY

Hole Condition:	Good
Circulation time after T.D.	One hour
Number of Wiper Trips:	One
Description of Wiper Trips:	TD to surface casing
Hours Logging:	7 hours
additional information	One run with stacked tools

LOGGING SEQUENCE:

Logs	Time Spent (hours)	Remarks
HDI' -MAC-CN-ZDL-GR-XYCAL	4.3	Recording time
	2.7	Rig up & rig out

Number of runs in hole:	Succeeded:	Failed:
1	1	0

REMARKS

Logging went smoothly with no problems.

LOGGING REPORT #2

Depth (Driller's):	2055m	Date:	January 9-11, 2000
Depth (Strap):	2054.8m	Logging Company:	Baker Hughes
Depth (Logger's):	2054.4m	Logging Engineer:	Tim Fisher
Surface Casing (Driller's):	505.4m	Truck No:	6544
Intermediate Casing:	1545.0m	Hole Size:	156 mm

MUD DETAILS

Mud Type:	Invert	Weight:	1035
pH:	n/a	Viscosity:	60
Water Loss:	n/a	Salinity:	

OPERATIONS SUMMARY

Hole Condition:	Good
Circulation time after T.D.	One hour
Number of Wiper Trips:	none
Description of Wiper Trips:	n/a
Hours Logging:	31.5
additional information	Hours logging includes rig up & rig out time

LOGGING SEQUENCE:

Logs	Time Spent (hours)	Remarks
HDIL-MAC-GR-XYCAL	8.75	Includes 2hrs lost time to repair XYCAL tool.
ZDL-CN-GR-CAL	7.25	
FMT	15.5	Two runs.

Number of runs in hole:	Succeeded:	Failed:
4	4	0

REMARKS

After initial problem with inconsistent opening & closing of XY calipers was solved, logging went smoothly.

LOGGING REPORT #3

Depth (Driller's):	2055m	Date:	January 12-13, 2000
Depth (Strap):	2054.8m	Logging Company:	Baker Hughes
Depth (Logger's):	2054.4m	Logging Engineer:	Cory Butler
Surface Casing (Driller's):	505.4m	Truck No:	6544
Intermediate Casing:	1545.0m	Hole Size:	156 mm

MUD DETAILS

Mud Type:	Invert	Weight:	n/a
pH:	n/a	Viscosity:	n/a
Water Loss:	n/a	Salinity:	

OPERATIONS SUMMARY

Hole Condition:	Good
Circulation time after T.D.	n/a
Number of Wiper Trips:	one
Description of Wiper Trips:	TD to intermediate casing
Hours Logging:	16.5
additional information	2 hours circulating on bottom on wiper trip

LOGGING SEQUENCE:

Logs	Time Spent (hours)	Remarks
FMT	5.5	Tool failed after third pressure point.
FMT	6	Includes one hour rig up & rig out time.
FMT	5	Includes one hour rig up & rig out time.

Number of runs in hole:	Succeeded:	Failed:
3	2	1

REMARKS

Failure of a seal on the FMT tool during Run #5 (FMT Run #3) aborted logging run. A cleanout trip was conducted while awaiting arrival of new tool. The final two runs went smoothly with no problems.
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FORMATION EVALUATIONS

PARAMOUNT ET AL LIARD NWT I-46 I-46-60-10-123-15

INTRODUCTION

The Paramount et al Liard I-46 well is located approximately 17 kilometres SSW of Fort Liard. This vertical exploration well was drilled as a step-out to the Paramount et al Liard F-36 discovery well. The well was spudded on November 12, 1999 by Precision Drilling Rig #379 @ 14:00 hours. A Datalog total gas detector was rigged up and running from surface to T.D. Samples were collected in 5 metre intervals from surface to F.T.D. The well reached F.T.D. at 2055 metres in sandstone and shale of the M9 Zone in the lower Mattson Formation on January 8, 2000 at 09:00 hours.

The primary zone of interest was the Mississippian Mattson Formation, a clastic succession representing 5 different depositional environments of near shore marine to coastal plain systems. There were multiple zones within the succession occurring primarily in the coastal dune complex. Secondary targets in the well were the basal Cretaceous Chinkeh Formation, the Permian Fantasque Formation, and the Mississippian Flett Formation. A decision was taken not to penetrate the Flett Formation due to a high-pressure water-charged fracture system encountered on the nearby Paramount O-35 well. All zones of interest were gas targets.

A number of operational difficulties were encountered during the drilling of this well. Problems with hole deviation on the 311mm surface section necessitated drilling with relatively low FOB, slowing the progress of the well. At 190m a decision was taken to come out of the hole to change bits to 222mm in order to drill pilot hole to surface casing TD @ 505 metres. Two days of reaming with the 311mm bit were required to complete the surface section which was completed on November 18. The intermediate section from 505-1273m was drilled with a mud-motor to ensure control of potential deviation problems and was completed with no problems on December 6. The casing was set ~46 metres into the Mattson Formation at 1545.0m.

One intermediate logging run was conducted by Baker Hughes commencing on December 6th and completed on December 7th, followed by 4 DST runs commencing on December 7 and completed on December 10. Logging operations went smoothly with no problems; however, problems were encountered on the last three DST runs. Due to the inability to get a adequate packer seat, no pressure data was obtained for the two runs in the Belloy Formation (i.e., DST #2 and 3). The loss of the belly spring from the DST tool on the final run necessitated a fishing operation. The spring was successfully recovered on the second attempt and intermediate casing was run and set at 1545.0 metres.

The main hole was drilled with an air-hammer using nitrified air. Numerous small problems caused significant delays in this phase of the well, as well as the relatively short life of the hammer-bits which made only 30-50 metres each. At 1672 metres a decision was taken to replace the air-hammer with a conventional tri-cone bit due to the increasing presence of fluid (condensate and water) in the hole. At ~1683 metres, the well took on significant water (i.e., 24 m3 in ~one hour) from a water-charged fractured shale unit, necessitating the re-introduction of an invert drilling fluid to the hole. The well was drilled to F.T.D. with this mud system. Prior to FTD, a successful bottom hole DST was run at a depth of 1740 metres in the M3 zone; however, the results showed the zone to be wet.

A significant portion of the middle and lower sections of the Mattson Formation proved to be very hard and resulted in extreme wear and short bit life. In particular, the section from ~1800-1890 metres required 4 bits, some of which were badly worn after as little as 12 metres of drilling. Problematically, the rocks in samples did not appear hard enough to produce such extreme wear.

Two conventional logging runs were conducted upon reaching FTD, commencing on January 8th and completed on January 9th, followed by five RFT logging runs; the first two were run on January 9th and 10th with a further three runs conducted on January 11th, 12th and 13th after Drill Stem Tests were completed. Two DSTs were run on January 10th and 11th; the first (i.e., DST #6) on the 1785-1789 metre interval of the M4 Zone on January 10 and the second (i.e., DST #7) on the 1899-1903 metre interval of the M6 Zone on January 11th. There were no significant problems encountered on the DST runs; however, an RFT tool failure on the first run after DSTs were completed required a new tool to be sent out. Thereafter, logging was completed with no further problems.

DUNVEGAN

An incomplete Dunvegan section, which is exposed at surface, comprises ~163m of sandstone with minor interbedded conglomerate and lesser shale and siltstone at this location. Two basic divisions are apparent; a lower division (i.e., ~70-162m) dominated by fine-grained sandstone with minor interbedded siltstone and shale, and an upper division of coarser clastics including pebbly to conglomeratic sandstone and fine pebble conglomerate which appears to form a coarsening-upward megasequence. Although there are a number of reservoir-quality intervals in both sections, these rocks are of no commercial interest due to their structural and stratigraphic position.

CONCLUSION: The Dunvegan Formation has no economic potential at this locality.

SULLY

The Sully Formation comprises 40 metres of siltstone with interbedded sandstone and shale at this locality; the shale is a minor component of the upper section but becomes common in the lower half of the section. Sample quality through this interval was generally poor. The siltstone was typically light to medium grey, quartzose with minor to locally common biotite, trace to minor carbonaceous specks and rare glauconite. The siltstone ranges from clean to variably argillaceous with minor very silty argillaceous laminations and stringers. The rocks are moderately to poorly indurated with siliceous cement and tight. There are no rocks of commercial interest in this formation.

The shale is typically dark grey, sub-platy and non-silty with traces of unusual framboidal pyrite micro-nodules in the basal unit. Traces of hard, dense siderite nodules or stringers were occasionally observed.

CONCLUSION: The Sully Formation has no economic potential at this locality.

KANNI

The Sikanni Formation comprises ~152 metres of sandstone with minor interbedded siltstone and shale. The sandstone is a predominantly homogeneous, very fine-grained rock with the exception of the upper ~18 metres, which comprises an atypical coarse-grained unit discussed below. The typical sandstone is a sublitharenite consisting of abundant frosted to clear quartz with minor amounts of dark lithic grains, carbonaceous specks and trace amounts of glauconite and mica. It is well-sorted to very well-sorted with variable trace to locally common amounts of silt and argillaceous material. Argillaceous to silty laminations are ubiquitous and often locally common; the laminations increase in the lower part of the section to locally abundant. These rocks are generally poorly to moderately indurated with cements dominated by common silica with traces of spotty kaolin. In the lower third of the section minor locally common streaky calcareous to occasionally dolomitic cements occur. The sandstone generally had no visible porosity. There were no hydrocarbon shows or gas response in this section.

The coarse-grained unit comprises an 18 metre coarsening-upward sequence of moderately to poorly sorted litharenite that grades from predominantly fine to medium grained sand in the lower section to fine to very coarse, gritty to slightly pebbly sand in the upper 8 metres. The upper sandstone is predominantly disaggregated in samples with minor consolidated cutting with spotty calcareous cement. Porosity is inferred to be good in this unit. Hydrocarbon shows were very poor, consisting of minor spotty dull to moderate yellow fluorescence without cut in the upper unit. Low formation pressures preclude economic potential in such a shallow unit although the upper coarse-grained unit possesses sufficient reservoir-quality and appears to have an adequate seal.

CONCLUSION: The Sikanni Formation has no economic potential at this locality.

LEPINE

The Lepine Formation comprises 525 metres of shale and siltstone at this locality. Three informal subdivisions are apparent; 1) an upper section ~122 metres thick consisting of shale, 2) a middle section ~117 metres thick consisting of siltstone with minor interbedded shale and sandstone, and 3) a thick lower section ~287 metres thick consisting of shale with minor interbedded siltstone. The upper shale is typically dark grey, firm, platy to sub-platy, fissile, variably silty in part, locally carbonaceous and contains trace amounts of fish scales. The siltstone is typically light to medium grey, very quartzose with trace to minor glauconite and dark lithic grains and rare to trace mica. The sandstone is very fine grained, silty and grades from the siltstone. The rocks are predominantly variably argillaceous with common to locally abundant silty argillaceous laminations and very thinly interbedded shale. The siltstone and sandstone are variably indurated, ranging from poorly to very well indurated; however, they are typically moderately indurated. The predominant cement is silica with trace to minor locally abundant streaky calcareous to occasionally dolomitic cement. The siltstone and sandstone are tight and without hydrocarbon shows. There are no rocks of economic interest in this formation.

CONCLUSION: The Lepine Formation has no economic potential at this locality.

SCATTER

The Scatter at this locality comprises ~141 metres of sandstone with minor interbedded shale and siltstone. The shales were typically dark grey, firm to very firm, sub-blocky to sub-platy, commonly variably silty grading to argillaceous siltstone in part, and generally slightly glauconitic. The siltstone and sandstone were typically quartzose, variably glauconitic, commonly variably argillaceous to locally clean, and generally tight with minor streaky poor porosity. These clastics had no significant hydrocarbon shows or gas response and are of no economic interest.

CONCLUSION: The Scatter Formation has no economic potential at this locality.

GARBUTT

The Garbutt at this locality comprises ~187 metres of shale with interbedded sandstone and minor siltstone. Two basic divisions are apparent at this locality; an upper ~50 metre section which is dominated by sandstone with interbedded shale and minor siltstone, and the rest of the formation which comprises shale.

The sandstone is very similar to the overlying basal Scatter sandstone and there is no clear lithological break between the two formations at this location. The sandstone is a light to medium brown, predominantly clean to variably argillaceous sublitharenite with abundant quartz, trace to minor glauconite and minor dark lithic grains. It is a well-sorted, very fine grained, variably silty sandstone that grades to sandy siltstone in part. There was predominantly no visible porosity in these rocks. Minor streaky poor porosity was occasionally observed. Hydrocarbon shows were generally very poor and consisted of minor to locally common very dull fluorescence with minor slow weak yellow green streaming cut. Slightly better shows were observed in the 1040-1062m interval where there was common to abundant uneven light brown oil staining, minor to locally common very dull fluorescence and minor to common slow, weak yellow to yellow green streaming cut. There were no significant gas shows in this section. Using purely lithological criteria, the upper sandstone section is more properly assigned to the Scatter Formation, as there is no real lithological distinction between basal Scatter sandstone and the upper Garbutt sandstone.

The shale was typically dark grey to black, platy to sub-platy, fissile and commonly brittle. The shale was slightly to moderately silty in part with minor siltstone laminations and locally variably carbonaceous. Rare varicoloured (i.e., white, tan, light grey and green) bentonite stringers were observed in the 15-20 metres overlying the Radioactive Zone. The shale through the Radioactive Zone is very similar to the overlying shale with the addition of a minor to locally common component of brownish black, platy, fissile, firm to soft, bituminous to phosphatic shale. Bentonite increases to a trace to locally minor occurrence and is dominantly white to cream coloured and slightly tuffaceous.

CONCLUSION: The Garbutt Formation has no economic potential.

CHINKEH

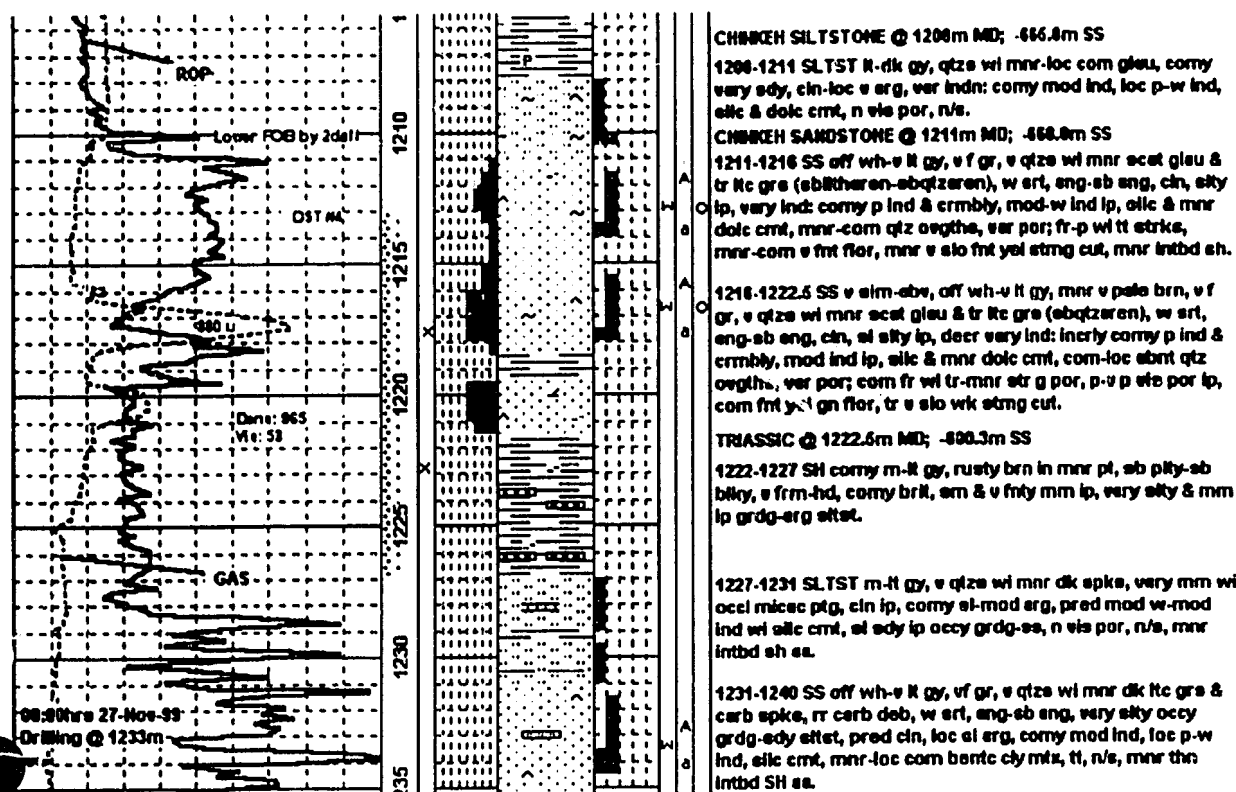


Figure 1. Strip-log section showing the Chinkeh Formation and upper section of the Triassic.

The Chinkeh Sand at this locality comprises ~11 metres of sandstone with minor interbedded shale. There is a thin Chinkeh Silt zone (i.e., ~3 metres) at the top of the section. The sandstone is typically off-white to very light grey, very fine-grained, clean and variably silty in part. The composition is quartzose with minor scattered glauconite and trace dark lithic grains, comprising sublitharenite to subquartzarenite. The rocks are variably indurated, ranging from typically poorly indurated and crumbly to moderately to locally well indurated. Cements consist of common siliceous and minor dolomitic cement. Subhedral quartz overgrowths are generally common and were observed to increase downsection. Visible porosity was variable in samples; typically fair to poor with tight streaks in the upper section increasing downsection to fair with streaky good porosity.

Hydrocarbon shows were poor and consisted of minor to common very faint fluorescence with minor very slow faint yellow streaming cut in the upper Chinkeh. Hydrocarbon shows decreased in the lower Chinkeh, consisting of common faint yellow green fluorescence with traces of very slow weak streaming cut. There was a gas show of 380 units above a background of ~80 units across <2 metres at 1216.5 metres, corresponding with the only crossover on logs.

CONCLUSION: The Chinkeh Sand has some fair to good reservoir-quality intervals at this locality, most notably in the basal 5 metres; however hydrocarbon shows were poor and gas response was minor and

TRIASSIC (TOAD/GRAYLING FORMATIONS)

The Triassic comprises ~104 metres of shale and generally minor interbedded sandstone. The sandstone occurs mainly in the upper section (i.e., 1227-1247m MD) and consists of off-white to light grey, very fine-grained, well-sorted, very quartzose sublitharenite to quartzolithic wacke. The sandstone is predominantly clean, typically moderately indurated with common siliceous cement and minor to locally common smectitic (i.e., swelling) clay matrix. The sandstone is commonly variably silty and grades to sandy siltstone in part. There was no visible porosity or hydrocarbon shows in these rocks.

The shales consist of two basic types; 1) medium to dark grey, and 2) maroon to rusty red. These two types appear to alternate in sections 10m to 20m thick with minor interbedded siltstone more common in the grey shale section. The grey shale is typically firm to hard, sub-fissile and variably silty with minor argillaceous siltstone laminations and stringers. This shale becomes slightly to moderately dolomitic in the lower section (i.e., ~1295-1314m). The maroon to red shale is typically firm to hard (becoming locally soft in the basal section), fissile and significantly less silty than the grey variety. This shale is non-dolomitic becoming slightly to moderately dolomitic in the lower section. A particular feature of note in the oxidized shale units is the variable content of 'bentonitic' clays (i.e., smectitic swelling clays) which increase downsection, as manifested by abundant red clay in the wash with a significant to major loss of sample volume.

Both these shales are thinly interbedded and interlaminated in minor part, most likely at the transitions between the two facies which appear to represent subaqueous (grey shale and minor siltstone) and periodically or wholly subaerial (oxidized shale) depositional environments.

CONCLUSION: The Triassic has no economic potential at this locality.

BELLOVY

The Belloy Formation comprises ~47 metres of interbedded chert, dolomite and sandstone. This is considerably thinner than the expected 120 metres of prognosed thickness. Three informal subdivisions can be made at this locality; 1) an upper division from ~1326-1340m consisting of predominantly chert with minor interbedded sandstone, 2) a middle division from ~1340-1357m comprised of argillaceous to cherty sandstone and minor interbedded chert, and 3) a lower division from ~1357-1374m consisting of cherty dolomite with interbedded chert and a basal sandstone unit.

The chert ranges in colour from very pale to dark brown and brownish grey. The chert is typically moderately to very glauconitic and commonly variably sandy to silty locally grading to cherty sandstone. The chert at the top of the section differs from the typical chert downsection by virtue of a common granular texture on cuttings, locally crumbly nature and a variable argillaceous content that locally grades to minor cherty glauconitic mudstone with trace pyritized spicules and worm burrows. Sponge spicules are generally a trace component except locally in the 1336-1340 metre interval. The chert is generally tight with trace to minor poor to rarely fair microvug to vug porosity. There is inferred local good fracture porosity in the upper section.

The sandstone consists of medium to dark grey, quartzose lithic wacke composed of common to abundant clear to varicoloured quartz, trace to minor lithic grains and common to locally abundant glauconite. Texturally, they range from moderately poorly sorted, very fine to medium grained sandstone in the upper section grading downsection into moderately sorted, very fine to fine grained rocks. The sandstone contains common to abundant silty argillaceous matrix and is typically poorly to moderately indurated with trace to minor dolomitic cement which increases downsection. Locally, the sandstone is variably silicified to cherty and grades to sandy chert. There is no visible porosity or hydrocarbon shows in these rocks.

The dolomite is typically dark grey to greyish brown, cryptocrystalline, hard, dense and commonly variably cherty grading to dolomitic chert in part. The dolomite commonly contains a variable silt component and is locally slightly to moderately calcareous with trace dolomitic limestone stringers. This rock is tight with some inferred local fair to good fracture porosity. There were no hydrocarbon shows in the dolomite.

The contact with the overlying Triassic rocks appears to be sheared as manifested by the presence of apparent shear fabrics. These include minor variably (locally pervasively) mylonitized cutting with common slickensides. The presence of chalky white mottled to anastomosing anhydritic to dolomitic 'stringers' with slickensides is also strongly suggestive of shear; however, these may be bit-generated textures.

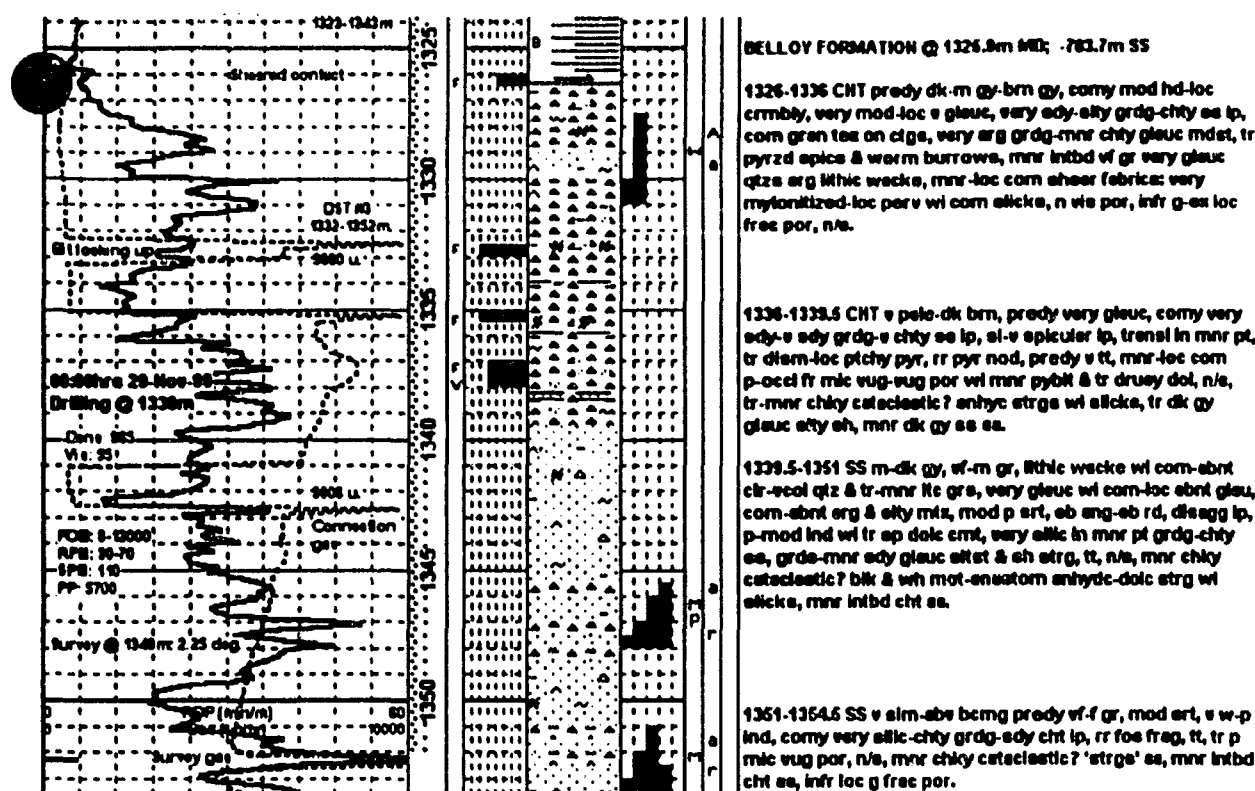


Figure 2. Strip-log section showing upper Belloy Formation. Note fracture gas shows.

There was an immediate increase in gas readings upon penetration of the formation to ~600 units from a background of 30-35 units. Although the Belloy was not considered a target, there were a number of apparently good gas shows in the Belloy that peaked out at 9880 units, which is the maximum reading possible on the Datalog Geologger 2 dilution units. Some of these reading are suspect due to the susceptibility of this unit to saturation of the gas sampling canister after an influx of gas. Two intervals in particular had good gas shows; specifically, between 1333-1340m in fractured chert, and 1360-1362m in fractured chert and dolomite. Both these intervals correspond to e-log intervals with pronounced gas effect but no crossover. Attempts at conducting a DST in two Belloy intervals (i.e., 1323-1343m and 1332-1352m) failed due to the inability to get an adequate packer seat.

CONCLUSION: There is some localized fair to good gas-bearing fracture porosity in the Belloy; however, there does not appear to be sufficient gas for commercial production. The Belloy has marginal to no economic potential at this location but is of potential economic interest in the area if fracture systems are sufficiently developed and gas-charged.

FANTASQUE

The Fantasque Formation consists of 88 metres of predominantly bedded chert with minor carbonate, shale, sandstone and conglomerate. The formation came in ~85 metres high to prognosis and was considerably thicker than anticipated.

The chert is variable with four basic types apparent. The first type (from ~1375-1410m) is generally light to medium brown, commonly translucent and typically slightly to moderately glauconitic. Sponge spicules are generally a trace component in this variety. The chert is also variably silty to sandy in minor part. Locally, the chert is slightly to moderately dolomitic with occasional cherty dolomite stringers. The second variety (from ~1410-1420m) is very pale to medium brown, translucent and commonly spicular to varying degrees. There are traces of glauconite and traces of phosphatic shale stringers. The third variety (from ~1420-1430m) is commonly medium to dark brown, sub-translucent to non-translucent and appears to be slightly argillaceous. The fourth and most common variety (from ~1420-1460m) is typically light grey to pale brown, translucent, and commonly pelletal to mottled. It is distinct by virtue of the common dark brown pellets and mottles which are ubiquitous. Locally, the chert is variably spicular in minor part. This chert shows the most evidence of hydrothermal silicification (discussed below) which increases downsection.

All varieties are typically very hard and dense except the 1388-1393m interval, where the chert is variably argillaceous and crumbly and locally grades to cherty glauconitic shale. Planar fracture surfaces are ubiquitous, though generally minor, throughout the section and are often lined with different varieties of quartz, discussed below. Locally, pyrite was also observed coating fracture surfaces. Porosity consists of localized fractures which are inferred to range from good to excellent to poor. There is rare to trace scattered poor moldic and microvug porosity.

The chert has numerous fractures throughout the section and there are a number of features related to the fractures that are worthy of note. Silica-saturated hydrothermal fluids have been pumped through the fracture systems in at least two stages. The first and primary episode of silica precipitation is manifested in the form of locally common finely laminated chalcedonic and milky quartz fracture linings and 'heals'. The chalcedony occasionally has a colloform habit. The second, apparently minor, stage takes the form of clear subhedral to euhedral quartz crystal linings that are often precipitated on top of chalcedonic or milky quartz fracture linings.

The chalcedonic and milky quartz become increasingly common downsection (i.e., 1440-1461m) where the chert shows evidence of variable degrees of hydrothermal silicification, manifested by the ubiquitous presence of random to localized chalcedonic to milky quartz mottles and 'blebs' in addition to the fracture heals, fillings and linings by the same material. The boundaries are typically diffuse, even with the obvious fracture-related fills, underlining the locally pervasive nature of the alteration.

Another unusual noteworthy occurrence is the presence of a monomictic chert pebble conglomerate in the basal part (i.e., 1455-1461m) of the Fantasque. The amount of conglomerate is difficult to ascertain, as finding unequivocal rounded pebble surfaces is difficult given the very brittle nature of the clasts and their small very angular fragment size; however, it may form a significant or even dominant component in that interval.

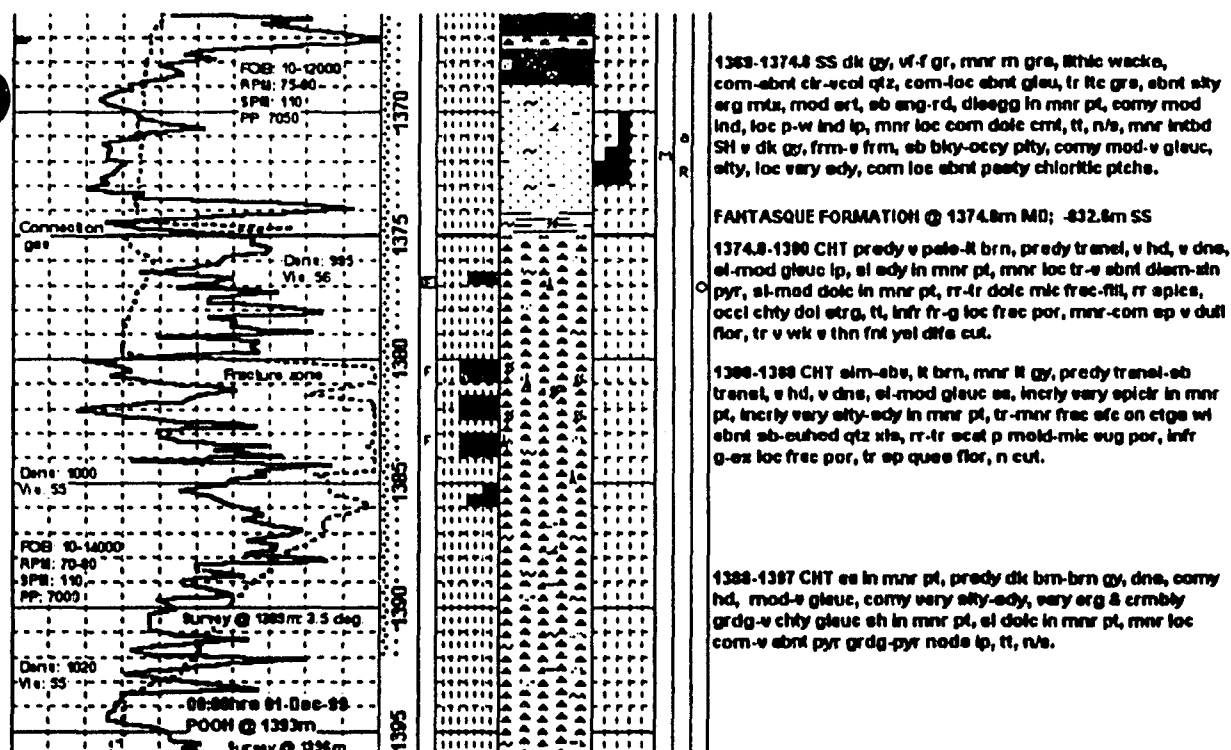


Figure 3. Strip-log section showing lower Belloy and upper Fantasque Formations. Note fracture zone in upper Fantasque with gas show.

Hydrocarbon shows were very poor and typically consisted of trace to minor spotty dull fluorescence with traces of questionable cut, excepting the uppermost interval, where there was minor to common dull fluorescence with trace very weak, very thin yellow diffuse cut. There were two apparently good gas shows in the section; the first immediately peaked at the maximum 9880 units (BGG ~3000-3500 units) upon penetration of the 1380-1386 metre interval and the second immediately peaked at the maximum 9880 units (BGG ~2000 +/- units) upon penetration of the 1411-1432 metre interval. In the latter case, the broad interval of maximum gas readings is an artifact of saturation of the gas sampling canister after the initial show at 1411 metres. Both these intervals show some gas effect but no gas crossover on logs.

CONCLUSION: The Fantasque at this locality has some fair to good localized fracture porosity and good gas response; however, log analysis in Calgary determined that there were no prospective DST intervals in the succession. The Fantasque has marginal economic potential at this location but is of economic interest in the area.

KINDLE

The Kindle Formation comprises 37 metres of siltstone with minor interbedded limestone at this locality. The siltstone is typically medium to dark brown, quartzose, and slightly to locally moderately argillaceous with trace argillaceous partings. The siltstone is generally very dolomitic locally grading to very silty dolostone. The rocks are generally well indurated and tight with abundant dolomitic and local patchy siliceous cements. Hydrocarbon shows consisted of generally common dull fluorescence and trace to minor very slow, very weak questionable cut. The minor interbedded limestone consists primarily of light brown, chalky soft marl stringers and trace amounts of dark brown, dense, cryptocrystalline, silty limestone.

CONCLUSION: The Kindle Formation has no reservoir-quality intervals and hence, no economic potential at this locality.

MATTSON

Approximately 556 metres of the Mattson Formation were penetrated at this locality; FTD was called in the lower part of the M9 Zone in the basal Mattson. Sample quality during the air drilling operation (i.e., 1547-1685m) was generally poor. In some intervals sample lithologies and their relative proportions are not representative of lithology as indicated by logs (in particular, the 1681-1688m interval, which was shale in samples and sandstone on logs). It should also be noted that the MOLE washer used to wash samples has screens too coarse to retain the very fine grained to silt fraction if it is disaggregated and hence, preferentially removes this fraction from many of the reservoir-quality sands, which tend to be variably disaggregated to friable, particularly the eolian sands.

The section was strongly sand-dominated with generally minor carbonate and shale. There are two basic types of sandstone in the Mattson succession that are generally representative of their respective environments; 1) very fine to fine grained quartzarenite to minor sublitharenite of shoreface affinity, 2) upper very fine to lower medium grained quartzarenite to sublitharenite of eolian origin. A third variable type of sandstone consists of very fine to medium grained quartzarenite to quartzose subwackes of transitional facies but are generally of no economic interest.

Shoreface Sandstone

The shoreface sandstone represents two different depositional controls in similar environments; 1) storm-reworked shoreface with associated minor carbonate interbeds, including occasional fine to coarse grained dolarenites of tempestite origin, and 2) wave-reworked shoreface, foreshore and backshore. The primary distinction between the two appears to be the presence or absence of minor carbonate interbeds.

The shoreface sandstone is a typically light brown to light grey, well-sorted quartzarenite with trace amounts of dark lithic grains which can occasionally be identified as chert. The quartz is predominantly clear and angular to sub-rounded. These sandstones are predominantly very fine to fine grained with the very fine grained fraction typically dominant. The sandstones are generally variably silty, ranging from trace to common, and locally grade to sandy siltstone in minor part. Argillaceous content is typically nil in these clean quartzarenites. Locally, the sandstone becomes slightly to moderately argillaceous and usually has argillaceous partings and laminae associated with it. Upsection (i.e., 1646-1673m), some quartzarenites have a trace to minor component of outsized (i.e., medium to fine) unusual blue, partly tripolitic chert grains and grade to sublitharenite. Locally, the sandstone becomes a sublitharenite with an added minor component of carbonate grains and skeletal debris.

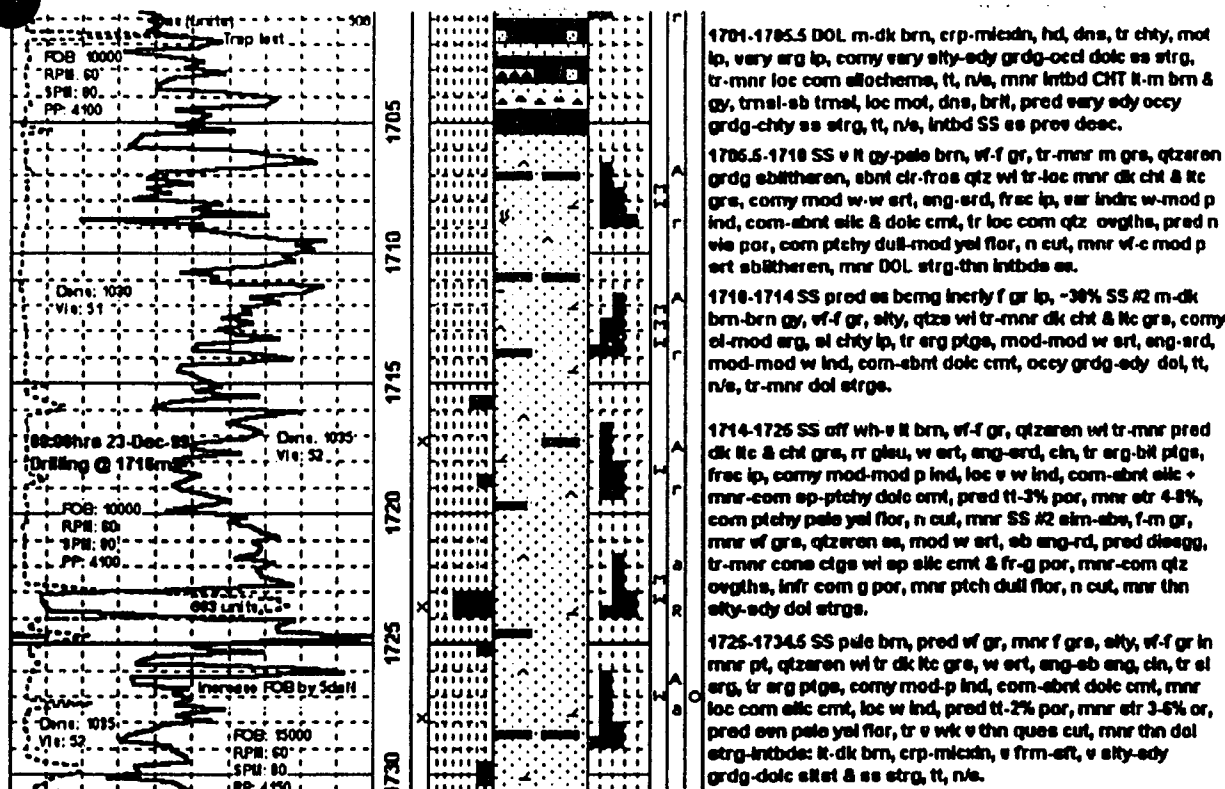


Figure 4. Striplog section showing typical Lithofacies #1 interval (shoreface) in the Mattson Formation. Note min gas show at 1723 metres.

The shoreface sandstone is variably indurated throughout the succession, ranging from moderately well to poorly indurated and friable to crumbly. Visible porosity was commonly poor (i.e., tight to 3%), even in some poorly indurated sandstone where matrix porosity is likely to be at least a few percent. Sections with poor to fair and occasionally good porosity was observed; however, this better porosity was a generally minor component. To some degree at least, porosity distribution appears to be of a streaky to patchy nature, given the variability of visible porosity in cutting of the same sandstone. Cements are generally of mixed dolomitic-siliceous type and locally wholly dolomitic. Shoreface sandstone with a larger fine-grained component (i.e., sub-dominant to occasionally dominant; e.g., 1764-1768m) is where most of the better porosity occurs and these quartzarenites tend to have common subhedral to euhedral quartz overgrowths. Good porosity was also observed in one thin (i.e., ~2m) tempestite @ 1685m. Permeability is estimated to be generally poor in most of this lithofacies, given the very fine-grained, silty nature of the sandstone and the typically common to abundant cements.

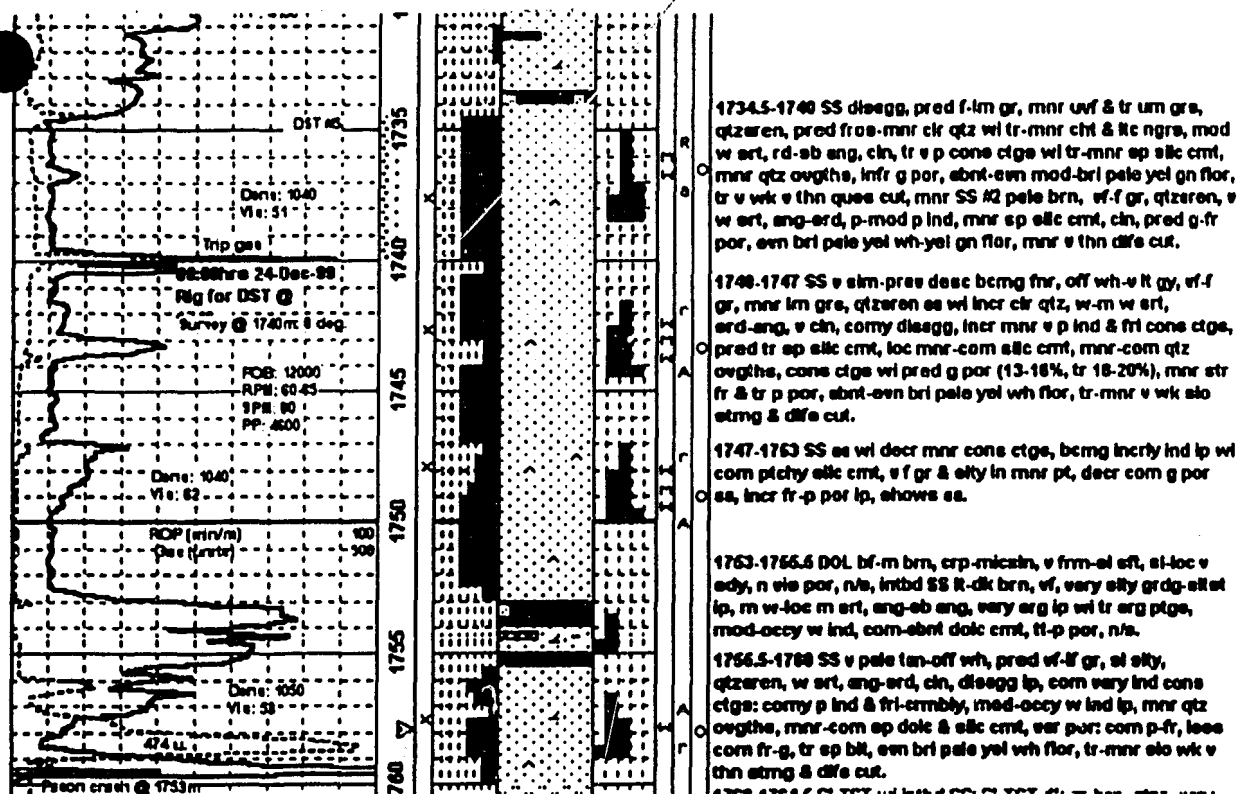


Figure 5. Striplog section showing typical Lithofacies #4 in the Mattson Formation. The eolian facies is overlain and underlain by shoreface sandstone and minor carbonate of Lithofacies #1.

Eolian Sandstone

Eolian sandstone can be usually distinguished from the shoreface quartzarenite by virtue of its coarser grain size and the presence of frosted quartz grains. The sandstone is typically very light grey to light brown, moderately well to moderately sorted with angular to rounded grains. A much greater degree of rounding than is seen in shoreface sandstone is apparent where grain surfaces have not been modified by quartz overgrowths. These sandstones tend to have less compositional maturity than shoreface sandstone due to a generally higher minor chert fraction. Compositionally, the sandstone consists of abundant quartz with a variably minor to common frosted component and trace to minor predominantly dark varicoloured chert and lithic grains, comprising quartzarenite to sublitharenite. These sandstones are typically very fine to lower medium grained with a fine median grain size. Trace to minor coarse grains are often present. The eolian sandstone tends to be poorly to very poorly indurated and very friable. They are commonly variably to wholly disaggregated in samples. Cements are generally minor and typically siliceous with a spotty to patchy distribution. Locally, patchy to streaky siliceous cement is common. Quartz overgrowths range from minor to common to locally abundant. Rare to trace interstitial pyrite was also commonly observed.

The best porosity in the Mattson appears to be largely lithofacies-dependant and typically confined to eolian deposits. Porosity was variable in the generally minor consolidated fraction and ranged from typically good to fair to locally poor. Porosity was inferred to be predominantly good in most eolian sandstone.

Stratigraphy and Lithofacies

Five separate lithofacies have been identified in the Mattson succession in this area; 1) storm-reworked shoreface, 2) muddy shoreface or lagoon and tidal flat, 3) wave-reworked shoreface, foreshore and backshore, 4) coastal dune complex, and 5) interdune swamp and paleosoil. All five of these lithofacies are clearly represented at this location. The Mattson Formation at the discovery site has nine separate pay zones (i.e., M1-M9 Zones) which can be broadly correlated with the succession here. Many of the upper pay zones correlate well with regard to log characteristics; however, the extent of the good porosity and gas-bearing reservoir strata are considerably reduced at this location. Some of the lower pay zones do not correlate particularly well on logs and it appears that there are substantial differences with regard to lithofacies and their stacking patterns.

Most of the Mattson succession consists of shallow-marine, predominantly shoreface deposits of Lithofacies #1 and Lithofacies #3 at this locality. There are five clearly eolian intervals in the Mattson at this locality with a further two or three intervals with mixed lithofacies (e.g., 1747-1758m: L1 and L4; 1909-1920m: L4 and L5). Due to the more distal nature of this location, it appears that eolian facies are less developed and sometimes thinner than those seen at the F-36 well. It seems reasonable to assume various degrees of reworking of both eolian and shoreface deposits during subsequent transgressions and regressions, making distinction between the two types sometimes unclear. The basal Mattson (i.e., ~2014-2055m) is dominated by terrestrial deposits of Lithofacies #5.

At least eight main T-R cycles are apparent within the succession. A number of smaller T-R cycles of shorter duration appear to be superimposed on some of the main cycles (e.g., within the primarily regressive 1747-1759m interval); however, these may represent lateral facies shifts within a relatively stable eustatic regime rather than bona fide T-R cycles.

Diagenesis

Some general diagenetic associations are apparent with regard to the different lithofacies and are as follows; 1) Siliceous cementation is wholly or strongly dominant in eolian and related depositional environments (i.e., transitional sandstone in interdune swamp and paleosol environments), 2) Dolomitic cementation appears to be largely confined to shoreface environments. Mixed siliceous-dolomitic cements appears to be more common in shoreface environments than purely dolomitic cements, indicating at least two stages of authigenic cementation.

Some of the very-fine to fine grained quartzarenite of apparent shoreface origin likely represents coastal plain environments for part of its depositional and diagenetic history, given the apparent frequency of relative transgressive/regressive episodes as manifested by the frequent lateral facies changes seen in the vertical section at this locality. Consequently, some of the shoreface sandstone has likely had a mixed marine-terrestrial early diagenetic history which may account for the different diagenetic associations observed downsection (i.e., 1975m onward), where sandstone of apparent shoreface origin is predominantly to wholly silica-cemented.

Common to locally abundant subhedral to euhedral quartz overgrowths are typically associated with the best porosity, primarily in eolian deposits. Traces of spotty kaolin were observed in predominantly terrestrial deposits. Pyrite cements and nodules are commonly associated with Lithofacies #5 (terrestrial) where it occurs in massive, crystalline and disseminated forms. The presence of unusual very bituminous claystone and coaly to bituminous shale is a typical co-association.

Hydrocarbon Shows and DST Results

Hydrocarbon shows were generally very poor, typically consisting of variably minor to abundant, patchy to even, dull to bright yellow to yellow white to yellow green fluorescence and trace to minor thin, faint yellow white diffuse to streaming cut to questionable or no cut. Exceptions to the above occur in three intervals, where shows are poor to marginally fair; 1) 1529-1533m: even light brown oil stain, even pale yellow fluorescence, common very thin yellow streaming to diffuse cut; 2) 1869-1881m: common patchy pale to light brown oil staining, abundant bright yellow to yellow white fluorescence, common fast, poor to fair, thin yellow white diffuse and minor streaming cut; 3) 1900-1910m: common spotty to patchy bitumen, common to abundant bright yellow green and pale yellow fluorescence, minor to common poor, thin, diffuse and streaming cut.

In the upper part of the section (i.e., 1545-1685m), the presence of condensate was noted during the air drilling operation. The first significant appearance of bitumen occurs at ~1850 metres where it is found as spotty to patchy pore coatings and fillings. The bitumen (and pyrobitumen) is present locally in trace to minor amounts throughout the remaining ~200 metres of section.

Numerous fair to good gas shows were recorded during the drilling of the Mattson; however, all of these were thin (i.e., 1-3 metres) with the exception of the 1785-1790m interval and the M1 Zone. The M1 Zone (probable fracture zone) initially came in at ~2.2 million ft³/day and gradually tapered off to 0.6 million ft³/day after ~three days, after which no flow data was available due to the termination of the air drilling operation. A DST (#6) was run on the 1785-1789m interval and produced a weak to strong air blow in 30 seconds with gas to surface in 2 minutes. The final flow had a weak to strong gas blow in 1.5 minutes but began depleting after 35 minutes. Liquid recovery was 350 metres of clean salt water (22000 ppm). Two other DSTs were run in the Mattson with poor results; 1) DST #5: strong air blow immediately with no gas to surface. The final flow had a strong blow immediately with gas to surface in 30 minutes, which was too small to measure. The liquid recovery was 643 metres of fresh water and 1000 metres of invert cut fresh water; 2) DST #7: very weak to weak air blow 10cm into pail at 10 minutes with no gas to surface. The final flow had a very weak to weak air blow 10cm into pail at 25 minutes with no gas to surface. The liquid recovery was 120 metres of salt water (50000 ppm) and 40 metres of water cut invert.

CONCLUSION: The Mattson has numerous fair to good reservoir-quality intervals at this locality and numerous fair to good gas responses; however, most of the significant reservoir intervals either appear wet on induction logs or lack significant gas crossover. DSTs #5 and #7 showed the M3 and M6 Zones (respectively) to be water-bearing. Despite these negative indicators, there are still significant gas-bearing intervals present of commercial interest. This formation has fair economic potential at this location and good to excellent potential in the region.

LITHOLOGICAL DESCRIPTIONS

PARAMOUNT ET AL LIARD NWT I-46 I-46-60-10-123-15

Surface Hole Section (311mm)

- 16-21 **SANDSTONE:** salt and pepper, predominantly fine to coarse grained, minor very fine and very coarse grains, trace pebble fragments, sublitharenite with abundant frosted to clear to locally ferruginous stained quartz and common dark to light varicolored lithic grains, moderately sorted, angular to subrounded to minor rounded, minor consolidated cuttings with common patchy kaolinitic and spotty siliceous cement, minor to common quartz overgrowths, **locally patchy ferruginous stain, infer good to streaky fair porosity, no shows.**
- 21-30 **CONGLOMERATE:** disaggregated, predominantly fine pebble, clast supported, polymict with abundant light to dark varicolored very siliceous to silicified predominantly aphanitic volcanic and metasedimentary clasts, common white to clear to occasionally varicolored quartz clasts, trace schistose metamorphic and sandstone clasts, rounded to sub angular, poorly sorted, matrix: very fine to coarse grained sandstone as above, trace spotty kaolinitic and siliceous cement on clasts, **trace patchy ferruginous stain, infer predominantly good to excellent porosity, no shows.**
- 30-35 **SANDSTONE:** orange to mottled orange white, fine to very coarse grained, pebbly, litharenite to sublitharenite with abundant quartz and common to abundant varicolored lithic grains to clasts as previously described, moderately poorly to moderately sorted, angular to rounded, commonly disaggregated in part, common poorly to moderately indurated consolidated cuttings with abundant limonitic cement &/or matrix, locally common to abundant patchy kaolin, minor hematitic stain and crusts on grains, **infer tight in part with streaky to patchy fair to good porosity, no shows.**
- **Note:** Samples 40m to 50m were of very poor quality.
- 35-40 **SANDSTONE and CONGLOMERATE:** predominantly as described from 16-30m, infer thinly interbedded with variable streaky fair to good porosity, minor interbedded **SANDSTONE:** #2 light to medium grey, salt and pepper, very fine grained, quartzolithic, variably silty and argillaceous with slightly bentonite matrix, slightly tuffaceous with common scattered mica, **tight, no shows**, trace siltstone stringers; medium to dark grey, very argillaceous, slightly sandy, poorly to moderately indurated, **tight, no shows**, grades to silty bentonitic shale in part.

40-50

SANDSTONE: predominantly as above, trace **SANDSTONE:** #2 as above, minor to common interbedded **SILTSTONE:** light grey to light brown, quartzose, predominantly variably argillaceous, minor scattered carbonaceous debris and mica, poorly to moderately indurated, grades to very silty shale in part, locally sandy occasionally grading to silty sandstone laminations, minor thin interbedded **SHALE:** light grey, firm, sub platy to sub blocky, sub fissile, commonly variably silty and micromicaceous, locally common carbonaceous specks, slightly bentonitic, sub waxy in part grading to claystone.

****Note:** Shaker bypassed from 50 to 75 metres. Samples of suspect quality.

50-65

SANDSTONE with interbedded SILTSTONE and minor SHALE:

SANDSTONE: unconsolidated to disaggregated, fine to coarse grained, minor very fine and very coarse grains, occasional pebble, litharenite grading to sublitharenite, abundant clear to frosted quartz with common varicolored lithic grains, minor rounded brown sideritic grains, moderately sorted, angular to subrounded, trace consolidated cuttings with spotty siliceous and kaolinitic cement, **infer good porosity, no shows;**

SILTSTONE: light to medium grey, quartzose, common scattered mica and carbonaceous specks, commonly variably argillaceous to locally clean, poorly indurated, **tight, no shows;**

SHALE: dark grey, firm, sub platy to sub blocky, predominantly variably silty, common scattered carbonaceous debris and occasional coaly partings and laminations, minor interbedded claystone.

65-70.5

SANDSTONE: off white, salt and pepper, very fine to medium grained, trace coarse grains, sublitharenite, abundant clear to frosted quartz and common varicolored lithic grains, trace mica, moderately to moderately well sorted, angular to sub angular, predominantly disaggregated, minor consolidated cuttings with common spotty to patchy kaolinitic cement, trace spotty siliceous cement and quartz overgrowths, **infer streaky fair to good porosity, no shows.**

70.5-75.5

SILTSTONE with interbedded CLAYSTONE:

SILTSTONE: light to medium grey, quartzose, common scattered mica, minor carbonaceous specks, poorly to moderately indurated with siliceous cement in part, commonly variably argillaceous, locally sandy grading to very fine sandstone stringers, **tight, no shows;**

CLAYSTONE: predominantly light grey, firm to locally soft, brittle in part, sub waxy, variably silty in part occasionally grading to argillaceous siltstone laminations, locally very carbonaceous to coaly, trace sideritic laminations.

75.5-80

SILTSTONE with minor interbedded SHALE:

SILTSTONE: medium brown to orange brown, quartzose, micaceous, minor carbonaceous specks, moderately to poorly indurated, predominantly variably argillaceous grading to silty shale in part, **common to abundant ferruginous stain, tight, no shows;**

SHALE: as above becoming increasingly micromicaceous, trace maroon claystone stringers.

80-84

SANDSTONE with interbedded SHALE:

SANDSTONE: very light grey to off white, salt and pepper, fine to medium grained, sublitharenite, abundant frosted to clear quartz with common varicolored lithic grains, rare glauconite, moderately to moderately well sorted, angular to subrounded, commonly disaggregated, minor consolidated cuttings with common to abundant patchy kaolin, minor locally common calcareous cement, **infer predominantly poor porosity, no shows;**

SHALE: light to medium grey, firm, sub blocky, predominantly very silty grading to argillaceous siltstone in part.

84-89.5

SANDSTONE with interbedded SILTSTONE and SHALE:

SANDSTONE: unconsolidated to disaggregated, fine to medium grained, minor very fine and coarse grains, trace very coarse grains, litharenite with abundant clear to frosted to occasionally varicolored quartz and common to abundant varicolored lithic grains, moderately sorted, angular to subrounded, trace consolidated cuttings with spotty to patchy kaolinitic and siliceous cement, minor quartz overgrowths, **infer streaky fair to good porosity, no shows;**

SHALE and SILTSTONE: similar to above.

89.5-95

SANDSTONE: off white to light grey, predominantly fine grained, minor very fine and medium grains, sublitharenite grading to litharenite, abundant frosted to clear quartz and common varicolored lithic grains, trace rounded brown sideritic grains, well sorted, angular to subrounded, disaggregated in part, common consolidated cuttings abundant tight calcareous cement, trace to minor spotty kaolin, **tight to streaky poor porosity, no shows.**

99-100

SANDSTONE: light to medium grey, very fine grained, quartzolithic, rare glauconite, commonly variably micaceous, well sorted, angular to sub angular, moderately to poorly indurated with locally common dolomitic cement, commonly variably silty grading to sandy siltstone in part, clean to locally argillaceous, tight to poor porosity, no shows.

100-106

SHALE/CLAYSTONE with minor interbedded SILTSTONE:

SHALE: dark grey, sub platy, firm, commonly variably silty and micromicaceous, common carbonaceous to coaly debris and partings, trace to minor coaly stringers, **CLAYSTONE:** light to medium grey, brown, sub blocky, smooth to locally silty, carbonaceous to coaly in part, **SILTSTONE:** as above.

106-110

SANDSTONE: off white, predominantly fine grained, minor very fine and medium grains, sublitharenite, abundant white to frosted to minor clear quartz with minor to common varicolored lithic grains, well sorted, angular to sub angular, disaggregated in minor part, moderately to moderately poorly indurated with abundant tight calcareous cement, tight, no shows, minor thin interbedded shale as above.

110-119

SANDSTONE with minor interbedded SHALE and SILTSTONE:

SANDSTONE: as above becoming predominantly fine to medium grained, becomes commonly disaggregated with decreasing minor to common consolidated cuttings as previously described, moderately well sorted, infer common tight to poor porosity with minor fair streaks, no shows;

SHALE and SILTSTONE: as previously described.

119-122.5

SHALE: medium grey, firm, brittle in part, sub blocky to blocky, predominantly silty and micromicaceous occasionally grading to argillaceous siltstone stringers to laminations, minor locally common carbonaceous debris and partings, trace hard brown sideritic stringers.

122.5-130

SANDSTONE: white, predominantly fine grained, minor lower medium and trace upper very fine grains, sublitharenite with abundant clear to frosted quartz and minor predominantly light varicolored lithic grains, tuffaceous texture with common biotite and spotty bentonitic clay matrix, well sorted, angular to subrounded, commonly disaggregated, minor to common consolidated cuttings with minor locally common calcareous cement, infer common poor porosity with minor fair to good streaks, no shows, minor pale blue white tuffaceous bentonite stringers, trace siltstone stringers.

130-145

SANDSTONE: white, salt and pepper, very fine to medium grained, litharenite grading to sublitharenite, abundant frosted to clear quartz with common dark to light varicolored lithic grains, trace sideritic grains and mica, moderately well sorted, angular to subrounded, predominantly disaggregated, minor consolidated cuttings with spotty kaolinitic and siliceous cement, minor locally common calcareous cement, trace quartz overgrowths, **infer fair to good porosity, no shows**, trace to minor interbedded **SILTSTONE:** medium grey, quartzose, micaceous, commonly variably argillaceous, trace scattered carbonaceous debris, minor shaly laminations.

145-155

SANDSTONE: similar to above, unconsolidated to disaggregated, salt and pepper, very fine to medium grained, litharenite grading to sublitharenite, abundant frosted to clear quartz with common varicolored lithic grains, trace biotite, rare glauconite, moderately well sorted, angular to subrounded, trace consolidated cuttings with spotty kaolin, minor calcareous cement, **infer good to streaky fair porosity, no shows**, minor interbedded **SILTSTONE:** medium grey, quartzolithic, scattered mica and carbonaceous specks, predominantly variably argillaceous, moderately indurated trace dolomitic cement, **tight, no shows**.

155-162.5

SANDSTONE: as previously described becoming increasingly consolidated in minor part with locally abundant tight calcareous cement and minor spotty kaolin, **infer porosity as above with minor tight to poor streaks, no shows**.

SULLY 162.5 m MD 379.7 m SS

162.5-172

SILTSTONE: light grey, minor medium grey, quartzose, minor to locally common biotite, trace to minor carbonaceous specks, rare glauconite, commonly clean to locally variably argillaceous, moderately to poorly indurated, siliceous cement in part, trace to minor carbonaceous parting, locally variably sandy grading to minor very fine sandstone laminations to stringers, **tight to poor porosity, no shows**, minor medium grey very silty shale stringers and laminations, trace to minor medium brown dense hard siderite nodules &/or stringers.

172-182

SILTSTONE: similar to above, light to medium grey, quartzose, minor to locally common biotite, trace to minor carbonaceous specks, rare glauconite, commonly variably argillaceous to locally clean, moderately to poorly indurated, siliceous cement in part, trace carbonaceous parting, locally variably sandy grading to minor very fine sandstone laminations to stringers, **tight, no shows**, minor medium grey very silty shale stringers and laminations, trace brown sandy sideritic laminations to stringers.

****Note:** Samples 185 and 190 are of poor quality.

12-190

SHALE with interbedded SILTSTONE:

SHALE: medium to dark grey, brown grey, firm, sub blocky to sub platy, micromicaceous, predominantly very silty grading to argillaceous siltstone in part, trace carbonaceous specks, **SILTSTONE:** as above.

190-197

SANDSTONE with interbedded SILTSTONE and SHALE:

SANDSTONE: disaggregated, very fine to medium grained, minor coarse to very coarse grains and pebble fragments, litharenite grading to sublitharenite, abundant white to frosted quartz with common varicolored lithic grains, rare to trace glauconite, moderately to moderately poorly sorted, angular to subrounded to occasionally rounded, trace consolidated cuttings with abundant tight calcareous cement, **infer tight to poor porosity in part, poor to fair porosity in part, no shows;**

SILTSTONE and SHALE: as above.

197-202.6

SHALE: dark grey, firm to locally hard, brittle in part, sub platy, fissile, predominantly smooth, locally slightly silty in minor part, trace framboidal pyrite micro-nodules, rare dark brown slightly dolomitic claystone laminations to stringers.

KANNI 202.6 m MD (339.6 m SS)

202.6-210

SANDSTONE: salt and pepper, fine to very coarse grained, gritty to slightly pebbly litharenite, abundant clear to frosted quartz with abundant predominantly dark grey to black chert grains, poorly sorted, angular to rounded, minor consolidated cuttings with common spotty to patchy calcareous cement, minor quartz overgrowths, fining down to similar to below, **infer predominantly good porosity**, rare spotty pyrobitumen? specks, **minor spotty dull to medium yellow fluorescence, no cut.**

210-220

SANDSTONE: similar to above becoming finer, fine to medium grained, minor coarse and trace very coarse grains, sublitharenite grading to litharenite, abundant frosted to clear quartz with common predominantly dark chert and lithic grains, rare glauconite, moderately sorted, angular to rounded, predominantly disaggregated, minor consolidated cuttings with common to abundant tight siliceous cement, minor spotty calcareous cement, trace interstitial pyrite, **infer variable porosity, common tight to poor with streaky fair porosity, no shows, minor thin interbedded SHALE:**

220-225

SANDSTONE: as above in part, predominantly very light grey to brown grey, very fine grained, sublitharenite with minor dark lithic grains and carbonaceous specks, trace glauconite, well sorted, angular to sub angular, variably silty in part occasionally grading to sandy siltstone laminations, commonly poorly indurated and crumbly with minor spotty siliceous cement, slightly argillaceous in part, **tight to poor porosity, no shows**, minor thin interbedded **SHALE:** medium to dark grey, firm to soft, variably silty and micromicaceous grading to siltstone laminations, trace hard brown sideritic stringers.

225-231

SANDSTONE: as above becoming increasingly variably argillaceous in minor part, increasing minor to common shaly and silty laminations, **tight, no shows**.

231-240

SANDSTONE with minor interbedded SHALE: .

SANDSTONE: similar to above, off white to very light grey, very fine grained, sublitharenite with minor dark lithic grains and carbonaceous specks, trace glauconite, well sorted, angular to sub angular, commonly moderately to poorly indurated with common siliceous cement, trace spotty kaolin, variably silty and argillaceous in part with locally common silty and shaly laminations, **predominantly tight to minor poor porosity, no shows**, minor thin interbedded **SHALE:** as above.

-250

SANDSTONE: as previously described, minor thin interbedded **SHALE:** as above.

250-261

SANDSTONE: similar to above, light to medium grey, very fine grained, sublitharenite with minor dark lithic grains and carbonaceous specks, rare to trace glauconite, well sorted, angular to sub angular, commonly moderately to poorly indurated with common siliceous cement, trace spotty kaolin, increasingly variably silty and argillaceous in part with locally common silty and shaly laminations, **predominantly tight to minor poor porosity, no shows**, minor thin interbedded **SHALE:** medium to dark grey, firm to soft, variably silty and micromicaceous.

261-269

SILTSTONE with minor interbedded SHALE and SANDSTONE:

SILTSTONE: light grey to brown grey, quartzose, commonly moderately indurated to moderately well indurated with siliceous cement, argillaceous in part with shaly laminations, commonly variably sandy grading to silty very fine sandstone in part, trace dolomitic stringers to laminations, **tight, no shows**;

SANDSTONE: similar to above but predominantly silty grading from siltstone;

SHALE: as above.

269-278

SANDSTONE: light grey, very pale brown in part, very fine grained, sublitharenite with minor dark lithic grains and carbonaceous specks, rare to trace glauconite, well sorted, angular to sub angular, commonly moderately well to locally moderately poorly indurated with predominantly siliceous cement, trace spotty dolomitic cement, clean to variably silty, locally argillaceous in part with minor silty and shaly laminations, **tight, no shows.**

278-290

SANDSTONE: very similar to above, light to medium grey, very fine grained, sublitharenite, abundant quartz with minor dark lithic grains and carbonaceous specks, trace mica, rare to trace glauconite, well sorted, angular to sub angular, moderately to poorly indurated with common siliceous cement, variably silty in part, minor to common argillaceous laminations and partings, rare carbonaceous parting, **tight, no shows.**

290-300

SANDSTONE: as previously described with decreasing argillaceous laminations.

300-312

SANDSTONE: very similar to above, light to medium grey, very fine grained, sublitharenite, abundant quartz with minor dark lithic grains and carbonaceous specks, trace mica, rare to trace glauconite, well sorted, angular to sub angular, poorly to moderately indurated with common siliceous cement, minor streaky calcareous cement, variably silty in part, minor to common argillaceous laminations and partings, rare carbonaceous parting, **tight, no shows.**

312-323

SANDSTONE: similar to above, light to medium grey, very fine grained, sublitharenite, abundant quartz with minor dark lithic grains and carbonaceous specks, trace mica, rare to trace glauconite, well sorted, angular to sub angular, induration increasing slightly, common siliceous cement, variably silty in part, minor to common argillaceous laminations and partings, rare carbonaceous parting, **tight, no shows.**

323-332

SANDSTONE: similar to above, light to medium grey, very fine grained, sublitharenite, abundant quartz with minor dark lithic grains and carbonaceous specks, trace mica, rare to trace glauconite, well sorted, angular to sub angular, slightly decreasing induration, common siliceous cement, minor streaky calcareous cement, variably silty in part, minor to common argillaceous laminations and partings, rare carbonaceous parting, **tight, no shows.**

332-336

SANDSTONE: as previously described with increasing common argillaceous and silty laminations, decreasing trace to minor streaky calcareous to dolomitic cement, **tight, no shows.**

336-341

SANDSTONE: as previously described with increasing minor to common calcareous cement, decreasingly indurated, common argillaceous and silty laminations as above, **tight, no shows.**

341-355

SANDSTONE with minor interbedded SHALE and SILTSTONE:

SANDSTONE: similar to above, light to medium grey, very fine grained, sublitharenite as above, increasing trace to locally minor carbonaceous specks and debris, trace mica, rare to trace glauconite, moderately to poorly indurated with common siliceous cement, minor to locally common spotty to patchy kaolin, trace spotty calcareous cement, increasingly silty in part grading to minor sandy siltstone laminations and stringers, increasingly argillaceous in part with common to abundant argillaceous laminations and partings, rare carbonaceous parting, **predominantly tight, no shows**; minor **SHALE:** stringers to thin interbeds, dark grey, firm, sub platy, predominantly silty and micromicaceous, locally sandy with silty and sandy laminations; **SILTSTONE:** very dark brown, hard, dense, very siliceous, quartzose with trace dark lithic grains and carbonaceous specks, **tight**.

LEPINE 355 m MD (187.2 m SS)

355-370

SHALE: dark grey, firm to locally hard, commonly brittle, commonly platy to sub platy, sub blocky in part, fissile to sub fissile, very slightly silty and faintly micromicaceous in part, commonly variably silty and micromicaceous with occasional silty laminations, trace to minor very fine sandstone stringers as above.

370-380

SHALE: very similar to above, dark grey, predominantly firm to locally hard, brittle in part, predominantly platy to sub platy, sub blocky in minor part, fissile to sub fissile, very slightly silty to non-silty and faintly micromicaceous in minor part, commonly variably silty and micromicaceous with occasional silty laminations, rare glauconite, rare fish scales, minor very fine sandstone stringers to very thin interbeds.

380-390

SHALE: dark grey to black, firm, locally soft to hard, occasionally brittle, platy to sub platy, sub blocky in minor part, fissile to sub fissile, commonly variably silty and micromicaceous, carbonaceous in part, rare fish scales, minor **SILTSTONE:** stringers to laminations, very quartzose with trace lithic grains and glauconite, well to very well indurated with abundant siliceous and trace to rare spotty dolomitic cement, locally sandy occasionally grading to very fine sandstone stringers, **tight**.

390-401

SHALE: dark grey, firm, platy to sub platy, brittle in part, fissile, predominantly faintly micromicaceous, locally silty in minor part, increasing trace fish scales, trace siltstone laminations as above.

401-405

SHALE: dark grey, minor black, firm, platy to sub platy, flaky in part, fissile, predominantly faintly micromicaceous, carbonaceous in minor part, variably silty in minor part, rare to trace fish scales.

405-420

SHALE: dark grey, firm to locally hard, commonly brittle, predominantly platy to sub platy, sub blocky in minor part, fissile to sub fissile, faintly to moderately micromicaceous, trace locally silty with occasional silty laminations, trace fish scales.

420-428

SANDSTONE: as previously described becoming increasingly silty in minor part.

428-435

SHALE: dark grey, firm to locally hard, sub blocky to sub platy, sub fissile in part, commonly variably silty and micromicaceous grading to minor argillaceous siltstone laminations, smooth and faintly micromicaceous in part, trace clean white quartzose siltstone to very fine sandstone stringers to laminations, trace medium to dark brown siliceous siltstone laminations to stringers.

435-440

SHALE: as previously described with increasing trace white quartzose siltstone to very fine sandstone stringers to laminations as above, rare fish scales.

440-445

SHALE: as previously described with decreasing trace siltstone to very fine sandstone stringers to laminations as above, minor black carbonaceous shale stringers.

445-458

SHALE: dark to medium grey, firm to very firm, brittle in part, predominantly platy to sub platy, sub blocky in minor part, fissile to sub fissile, predominantly faintly micromicaceous, locally variably silty in minor part, rare argillaceous slightly glauconitic siltstone laminations, trace hard dense sideritic laminations to nodules, rare to trace pyrite.

458-477

SHALE: dark grey, firm, brittle in part, predominantly sub platy to platy, minor sub blocky, fissile, commonly slightly to locally variably silty and micromicaceous, smooth and faintly micromicaceous in minor part, trace off white to light brown quartzose siltstone laminations, trace to minor medium grey argillaceous siltstone stringers to laminations as described below increasing down, rare to trace fish scales.

477-487

SILTSTONE with minor very thin interbedded SHALE:

SILTSTONE: light to medium grey, very quartzose with trace to minor glauconite and dark lithic grains, trace to rare mica, clean in minor part, predominantly variably argillaceous with common to abundant silty argillaceous laminations, moderately to moderately poorly indurated, predominantly siliceous cement with trace spotty calcareous to dolomitic cement, minor locally abundant streaky calcareous cement, **tight, no shows;** **SHALE:** dark grey, firm, sub blocky to sub platy, silty and micromicaceous with trace scattered glauconite, very slightly dolomitic in part, grades to argillaceous siltstone.

487-501

SILTSTONE: very similar to above, light to medium grey, grey brown, very quartzose as above with increasing minor to locally common glauconite, trace to minor dark lithic grains, rare mica, clean in part, commonly variably argillaceous with common silty argillaceous laminations and occasional stringers, variably indurated: commonly moderately indurated to locally poorly to well indurated, predominantly siliceous cement with trace spotty to locally minor dolomitic cement, decreasing trace to minor locally common to abundant streaky calcareous cement, **tight, no shows**, minor very thin interbedded **SHALE:** very dark grey, firm to very firm, predominantly brittle, platy to sub platy, fissile, commonly slightly silty and micromicaceous, locally very silty grading to argillaceous siltstone, very rare fish scales.

501-505

SILTSTONE: as previously described with increasing minor dark lithic grains and decreasing trace to minor glauconite, induration and cements as above with increasing minor locally common to abundant streaky calcareous to dolomitic cement, **tight, no shows**.

Intermediate Hole Section (222mm)

505-510

SILTSTONE: inferred lithology from above, sample ~98% cement.

520

SILTSTONE with interbedded SHALE:

SILTSTONE: light to medium grey, very quartzose with trace to minor to occasionally locally common glauconite, trace to minor dark lithic grains, rare to trace mica, clean in part, commonly variably argillaceous with common silty argillaceous laminations and occasional stringers, sandy in minor part grading to silty very fine sandstone, commonly moderately to poorly indurated with common siliceous cement, increasing minor to locally common to abundant streaky calcareous to dolomitic cement, **tight with trace streaky poor porosity, no shows;** **SHALE:** dark grey, firm, sub blocky to occasionally sub platy, very silty and micromicaceous grading to argillaceous siltstone, trace to minor glauconite.

520-528

SILTSTONE: as previously described becoming increasingly clean in part, induration decreasing to poorly to moderately, decreasing trace calcareous cement, trace bentonitic clay matrix, increasingly sandy in part grading to **SANDSTONE:** very light to light grey, very fine grained, silty, very quartzose with minor to locally common glauconite, trace to minor dark lithic grains, well sorted, angular to sub angular, moderately to poorly indurated with common siliceous cement and trace spotty calcareous cement, **tight to poor porosity, no shows**, minor **SHALE:** as above.

528-535

SANDSTONE with minor interbedded SILTSTONE:

SANDSTONE: light to medium grey, very fine grained, commonly variably silty grading to siltstone in part, very quartzose (sublitharenite) with minor glauconite, trace to minor lithic grains, well sorted, angular to sub angular, clean in part, variably argillaceous in part with minor to common silty argillaceous laminations, commonly poorly indurated and crumbly to friable, moderately indurated in part, predominantly common siliceous cement, minor spotty kaolin, trace locally common streaky calcareous cement, trace to minor quartz overgrowths, **predominantly tight, minor poor to occasionally fair porosity, no shows;** **SILTSTONE:** as above.

535-540

SANDSTONE with interbedded SILTSTONE:

SANDSTONE: as above, **SILTSTONE:** as previously described becoming increasingly variably argillaceous with common to abundant argillaceous laminations, moderately to poorly indurated with cements as above, **tight, no shows.**

540-550

SANDSTONE: as previously described, increasingly silty in part grading to siltstone, increasingly argillaceous in part with common silty argillaceous laminations, poorly indurated as above in part, moderately to moderately well indurated in part with predominantly siliceous cement, **predominantly tight, minor streaky poor to occasionally fair porosity, no shows, minor very thin SHALE: interbeds to stringers.**

550-560

SILTSTONE: medium to dark grey, quartzose with minor glauconite, predominantly argillaceous grading to very silty shale in part, sandy in part with minor silty very fine sandstone laminations and stringers, poorly to moderately indurated with siliceous cement, **tight, no shows.**

560-566

SILTSTONE: as previously described becoming increasingly clean and sandy in part grading to silty sandstone.

566-572

SANDSTONE with interbedded SILTSTONE:

SANDSTONE: as previously described with increasing induration; commonly moderately indurated, locally poorly to well indurated, predominantly siliceous cement with trace to locally minor spotty kaolin, **predominantly tight, no shows;** **SILTSTONE:** as above.

572-581

SHALE with interbedded SILTSTONE:

SHALE: very dark to dark grey, firm to locally hard, sub blocky to sub platy, sub fissile in part, predominantly variably silty and micromicaceous grading to argillaceous siltstone in part, carbonaceous in part; **SILTSTONE:** as previously described.

581-594

SANDSTONE with interbedded SILTSTONE:

SANDSTONE: very similar to previously described, light to medium grey, very fine grained, commonly variably silty grading to siltstone in part, very quartzose (sublitharenite) with minor to locally common glauconite, trace to minor lithic grains, well sorted, angular to sub angular, clean to variably argillaceous in part with minor to common silty argillaceous laminations, commonly moderately to moderately well indurated with predominantly siliceous cement, minor streaky calcareous to dolomitic cement, predominantly tight, no shows; **SILTSTONE:** as previously described, medium to dark grey, quartzose with minor glauconite, predominantly argillaceous to occasionally clean grading to very silty shale in part, sandy in part with minor silty very fine sandstone laminations and stringers, poorly to moderately indurated with siliceous cement, **tight, no shows.**

594-608

SHALE with minor interbedded SILTSTONE:

SHALE: dark grey to black, firm to hard, brittle in part, sub blocky to sub platy, fissile in part, commonly slightly silty and micromicaceous, very silty in part grading to argillaceous siltstone laminations and stringers, carbonaceous in part, trace glauconite, **SILTSTONE:** as previously described.

608-616

SILTSTONE: as previously described, medium to dark grey, quartzose with minor glauconite, predominantly argillaceous to occasionally clean grading to very silty shale in part, sandy in part with minor silty very fine sandstone laminations and stringers, poorly to moderately indurated with siliceous cement, **tight, no shows,** minor thin interbedded **SHALE:** as above.

616-625

SHALE: as previously described, dark grey to black, firm to hard, brittle in part, sub blocky to sub platy, fissile in part, commonly slightly silty and micromicaceous, very silty in part grading to argillaceous siltstone laminations and stringers, carbonaceous in part, trace glauconite, minor interbedded **SILTSTONE:** as above.

625-635

SHALE: as previously described.

635-648

SHALE: very similar to above, dark grey to black, firm to hard, brittle in part, sub blocky to sub platy, fissile in part, slightly silty in part, increasingly silty and micromicaceous in part, increasingly grading to argillaceous siltstone laminations and stringers, carbonaceous in part, trace glauconite, increasing minor interbedded argillaceous **SILTSTONE:** as above.

648-665

SHALE with interbedded SILTSTONE:

SHALE: dark grey, firm to hard, brittle in part, blocky to sub blocky, occasionally sub platy, fissile in minor part, predominantly silty and micromicaceous grading to argillaceous siltstone in part, trace to minor glauconite; **SILTSTONE:** similar to previously described, medium to dark grey, quartzose with minor glauconite, predominantly argillaceous to occasionally clean grading to very silty shale in part, locally sandy occasionally grading to silty sandstone laminations to stringers, poorly to moderately indurated with siliceous cement, **tight, no shows.**

665-682

SILTSTONE with interbedded SHALE:

SILTSTONE: similar to previously described, predominantly medium to dark grey, minor light grey, quartzose with minor glauconite and trace mica, predominantly variably argillaceous grading to silty shale in part, minor argillaceous laminations, locally clean and sandy grading to silty sandstone laminations to stringers, predominantly moderately to moderately well indurated with common siliceous cement, minor locally common streaky calcareous to dolomitic cement, **tight, no shows;** **SHALE:** as previously described grading from **SILTSTONE:**.

682-697

SHALE with minor interbedded SILTSTONE:

SHALE: dark grey to black, firm to hard, predominantly sub blocky to blocky, minor sub platy, sub fissile in minor part, carbonaceous in part, predominantly variably silty and micromicaceous grading to argillaceous siltstone in part, common silty laminations, trace glauconite, trace very fine sandstone laminations; **SILTSTONE:** as above.

697-704

SILTSTONE: similar to previously described, predominantly medium to dark grey, minor light grey, quartzose with trace to minor glauconite, predominantly variably argillaceous grading to silty shale in part, minor argillaceous laminations, clean in minor part, moderately to poorly indurated with common siliceous cement, minor streaky calcareous to dolomitic cement, **tight, no shows,** minor dark brown hard dense very dolomitic siltstone stringers, minor thin interbedded shale as above.

704-718

SHALE with minor interbedded SILTSTONE:

SHALE: dark grey to black, firm to hard, sub blocky to sub platy, sub fissile to fissile in part, carbonaceous in minor part, predominantly silty to very silty and micromicaceous grading to argillaceous siltstone in part, common silty laminations, trace to locally minor glauconite; **SILTSTONE:** as previously described without very dolomitic stringers.

718-743

SHALE with interbedded SILTSTONE:

SHALE: as previously described becoming increasingly silty and increasingly commonly grading to argillaceous siltstone; **SILTSTONE:** similar to previously described, predominantly dark grey, quartzose with trace to minor glauconite, predominantly variably argillaceous grading to silty shale in part, clean in minor part with minor argillaceous laminations, moderately to moderately well indurated with common siliceous cement, minor streaky calcareous to dolomitic cement, **tight, no shows**, rare to trace dark brown hard dense very dolomitic siltstone stringers.

743-758

SHALE with minor interbedded SILTSTONE:

SHALE: dark grey to black, firm to hard, sub blocky to sub platy, sub fissile to fissile in part, carbonaceous in minor part, predominantly silty to very silty and micromicaceous grading to argillaceous siltstone in part, common silty laminations, trace to locally minor glauconite; **SILTSTONE:** as previously described grading from **SHALE:** in part.

758-763

SHALE: as previously described with trace very fine sandstone laminations with siliceous and dolomitic cement.

763-775

SHALE with interbedded SILTSTONE:

SHALE: as previously described, dark grey to black, firm to hard, sub blocky to sub platy, sub fissile to fissile in part, carbonaceous in minor part, predominantly silty to very silty and micromicaceous increasingly grading to argillaceous siltstone in part, common silty laminations, trace to locally minor glauconite; **SILTSTONE:** as previously described grading from **SHALE:** in part, trace very fine sandstone laminations with siliceous and dolomitic cement.

775-785

SILTSTONE with minor interbedded SHALE:

SILTSTONE: similar to above, predominantly dark grey, quartzose with minor glauconite, predominantly argillaceous with common argillaceous laminations and stringers, occasionally clean and sandy grading to silty sandstone laminations, commonly moderately to moderately well indurated, poorly indurated in part, siliceous and minor streaky dolomitic to calcareous cement, **tight, no shows**; **SHALE:** as above.

785-795

SHALE with minor interbedded SILTSTONE:

SHALE: dark grey to black, firm to hard, brittle in part, sub platy to sub blocky, fissile in part, commonly slightly silty and increasingly carbonaceous in part, variably silty and micromicaceous in part grading to argillaceous siltstone, trace glauconite;

SILTSTONE: dark to light grey, very quartzose with minor glauconite, commonly variably argillaceous, clean and sandy in part grading to minor silty sandstone, poorly to moderately indurated with siliceous and dolomitic cement, **tight, no shows.**

795-810

SHALE: very similar to above, dark grey to black, firm to hard, brittle in part, sub platy to sub blocky, fissile in part, commonly carbonaceous, commonly variably silty and micromicaceous, grades to argillaceous siltstone in minor part, trace glauconite, decreasing minor very thin interbedded siltstone as above.

810-825

SHALE: similar to previously described, dark grey to black, firm to hard, brittle in part, sub platy to sub blocky, fissile in part, commonly carbonaceous, commonly variably silty and micromicaceous, grades to argillaceous siltstone in minor part, trace glauconite, trace dark brown hard dense siderite stringers to nodules.

825-835

SHALE: dark grey to black, firm to hard, brittle in part, sub platy to sub blocky, fissile in part, commonly carbonaceous, commonly variably silty and micromicaceous, increasingly grading to argillaceous siltstone in part, trace glauconite, trace medium grey hard very fine sandstone laminations, rare to trace disseminated and framboidal pyrite.

835-847

SHALE: as above with rare to trace hard dense dark brown grey very silty dolomite stringers, rare siderite laminations to nodules.

847-855

SHALE: predominantly dark grey, minor black, firm to hard, commonly brittle, platy to sub platy, fissile, minor sub blocky, commonly smooth and faintly micromicaceous, variably silty as above in part.

855-865

No samples caught.

865-881

SHALE: very similar to previously described, predominantly dark grey, minor black, firm to hard, commonly brittle, platy to sub platy, fissile, minor sub blocky, commonly smooth and faintly micromicaceous, increasingly variably silty grading to argillaceous and occasionally clean siltstone in part, trace glauconite, minor very thin interbedded **SANDSTONE:** light to medium grey, very fine grained, quartzose, hard, dense, moderately to well indurated with siliceous and dolomitic cement, **tight.**

SCATTER 881 m MD (-338.8 m SS)

881-886

SANDSTONE: light to medium grey, occasionally brown grey, very fine grained, quartzose with minor to common to locally abundant glauconite, minor dark lithic grains, well sorted, angular to sub angular, variably silty grading to sandy siltstone in part, commonly clean to variably argillaceous in part with trace to minor argillaceous laminations, occasional glauconitic lamination, commonly moderately indurated, locally poorly to well indurated, common streaky calcareous to dolomitic cement, minor to common streaky siliceous cement, **tight to streaky poor porosity, no shows;**

minor interbedded **SHALE:** firm to locally soft, sub platy, sub fissile, slightly silty and micromicaceous in part, very silty and glauconitic in part grading to siltstone in part.

886-893

SANDSTONE: similar to previously described with decreasing minor scattered glauconite and increasing minor dark lithic grains, trace mica, variable induration as above with common streaky siliceous and calcareous to dolomitic cement, **predominantly tight with minor streaky poor porosity, no shows,** minor very thin interbedded shale as above.

893-897

SANDSTONE: similar to previously described, light to medium grey, very fine grained, commonly variably silty grading to sandy siltstone in part, quartzose with minor glauconite, minor dark lithic grains, well sorted, angular, commonly clean to variably argillaceous with minor argillaceous laminations, minor silty laminations, commonly moderately to locally poorly indurated with siliceous cement, **predominantly tight, no shows.**

897-909

SANDSTONE: similar to previously described becoming decreasingly silty, predominantly clean, minor argillaceous laminations, moderately to poorly indurated with common siliceous cement and trace streaky dolomitic to calcareous cement, rare to trace interstitial pyrite, **tight with streaky poor porosity, no shows.**

909-926

SANDSTONE: light grey, very fine grained, quartzose with minor glauconite, minor dark lithic grains, well sorted, angular to sub angular, predominantly clean and variably silty, locally slightly to moderately argillaceous with minor argillaceous laminations, predominantly moderately indurated, locally well to poorly indurated, predominantly siliceous cement, trace dolomitic to calcareous cement, increasing trace to locally minor interstitial pyrite, **tight to streaky poor porosity, no shows.**

926-932

SANDSTONE: light to medium grey, grey brown, very fine grained, quartzose with minor glauconite, minor dark lithic grains, well sorted, angular to sub angular, predominantly clean and variably silty with minor silty laminations, increasingly argillaceous in minor part with minor argillaceous laminations, poorly to moderately indurated with abundant calcareous cement, **tight with minor streaky poor porosity, no shows**, trace dark brown dense cryptocrystalline limestone laminations to stringers.

932-940

SANDSTONE: light grey, very fine grained, quartzose with minor glauconite, minor dark lithic grains, well sorted, angular to sub angular, predominantly clean, locally slightly to moderately argillaceous with minor argillaceous laminations, predominantly moderately indurated with siliceous cement, minor streaky calcareous cement, **tight, no shows**.

940-955

SANDSTONE: light to medium grey, very fine grained, quartzose as above, well sorted, angular to sub angular, commonly moderately to very silty grading to sandy siltstone in part, commonly variably argillaceous with minor to locally common argillaceous laminations, moderately to poorly indurated with siliceous and minor calcareous cement, **tight, no shows**.

955-960

SANDSTONE: very similar to previously described becoming decreasingly argillaceous in minor part, decreasingly silty.

960-965

SANDSTONE: as previously described becoming increasingly argillaceous in part with increasing minor argillaceous laminations.

965-975

SANDSTONE: light to medium grey, very fine grained, quartzose as above, well sorted, angular to sub angular, commonly moderately to very silty grading to sandy siltstone in part, commonly variably argillaceous with minor to locally common argillaceous laminations, moderately to poorly indurated with siliceous and minor calcareous cement, **no visible porosity, no shows**.

975-981

SANDSTONE: similar to previously described becoming commonly argillaceous with increasing minor argillaceous laminations and stringers, increasingly grading to sandy siltstone in part.

995

SANDSTONE: as above in minor part, predominantly light to medium brown, light grey, very fine grained, quartzose with minor to locally common glauconite, trace to minor dark lithic grains, well sorted, angular to sub angular, predominantly variably silty grading to sandy siltstone in part, predominantly clean, variably argillaceous in part with minor to locally common argillaceous laminations and stringers, poorly to moderately indurated, friable in minor part, siliceous cement, trace calcareous cement, **predominantly no visible porosity, minor streaky poor to trace fair porosity, trace to minor spotty very dull fluorescence, rare to trace very weak questionable cut, rare micro fracture with fibrous calcareous fill and disseminated pyrite, trace pyrite nodules.**

995-1006

SANDSTONE: similar to above, predominantly light brown, very fine grained, quartzose with minor to locally common glauconite, trace to minor dark lithic grains, well sorted, angular to sub angular, predominantly variably silty grading to sandy siltstone in part, predominantly clean, variably argillaceous in part with minor to locally common argillaceous laminations and stringers, poorly to moderately indurated, siliceous cement, trace calcareous cement, **predominantly no visible porosity, minor streaky poor to very poor porosity, trace to minor spotty dull yellow gold fluorescence, trace to minor very weak very thin streaming cut, trace to minor thin interbedded SHALE:**

106-1015

SANDSTONE with interbedded SHALE:

SANDSTONE: similar to previously described, light to medium grey brown, quartzose as above, becomes increasingly argillaceous and silty grading to increasing sandy siltstone in part, common silty argillaceous laminations and stringers, increasing trace to minor pyrite nodules, commonly poorly indurated, moderately indurated in part, siliceous cement, **increasing minor spotty dull yellow gold fluorescence, rare to trace cut as above, predominantly no visible porosity; SHALE:** dark to very dark grey, firm to hard, sub blocky to sub platy, predominantly very silty commonly grading to argillaceous siltstone, slightly glauconitic in part.

1015-1022

SANDSTONE: similar to above, light to medium grey brown, brown grey, quartzose as above, variably silty grading to sandy siltstone in part, decreasingly variably argillaceous in minor part, increasing trace to minor pyrite nodules, commonly moderately to locally poorly indurated, siliceous cement, trace to minor calcareous cement, **predominantly no visible porosity, trace to minor streaky poor porosity, trace very dull fluorescence, no cut.**

ARBUTT 1022 m MD (-479.8 m SS)

1022-1036

SHALE with interbedded SANDSTONE:

SANDSTONE: as previously described commonly grading to siltstone, decreasing trace pyrite nodules, porosity and shows as previously described; **SHALE:** dark grey, firm, commonly brittle, sub platy, sub fissile, slightly silty and faintly micromicaceous in part.

1036-1040

SANDSTONE: as previously described becoming increasingly clean in major part, decreasingly silty grading to minor siltstone, moderately to poorly indurated with siliceous cement, predominantly no visible porosity, increasing minor very dull fluorescence, increasing minor slow yellow green streaming cut.

1040-1062

SANDSTONE: light brown, very fine grained, very quartzose with decreasing trace to minor glauconite, minor dark lithic grains, well sorted, angular to sub angular, predominantly variably silty grading to sandy siltstone in minor part, predominantly clean, locally slightly argillaceous with trace argillaceous laminations, commonly poorly to locally moderately indurated with siliceous cement, trace interstitial pyrite, predominantly no visible porosity, infer common streaky very poor to poor porosity, common to abundant uneven light brown oil stain, minor to locally common very dull fluorescence, minor to common slow weak yellow to yellow green streaming cut, minor very thin interbedded **SHALE:** as described below.

1062-1077

SHALE with interbedded SILTSTONE:

SILTSTONE: light to medium brown, brown grey, quartzose as above, sandy grading to silty **SANDSTONE:** in part, clean to variably argillaceous with minor to common argillaceous laminations, commonly moderately to locally moderately well indurated with siliceous cement, no visible porosity, trace very dull questionable fluorescence, trace very slow yellow green cut; **SHALE:** dark grey, commonly firm, locally soft to hard, sub blocky to sub platy, brittle in part, sub fissile to fissile in part, variably silty and micromicaceous in part with minor to locally common silty laminations, slightly silty and faintly micromicaceous in part.

1077-1085

SHALE: dark grey to occasionally black, firm to very firm, commonly brittle, sub platy to sub blocky, commonly sub fissile to fissile, commonly smooth and faintly micromicaceous, carbonaceous in minor part, slightly silty in part.

1085-1100

SHALE: similar to above, dark grey to minor black, firm to very firm, commonly brittle, platy to sub platy, fissile to sub fissile, predominantly smooth & very faintly micromicaceous, carbonaceous in minor part, locally slightly silty in minor part, trace silty laminations.

1100-1120

SHALE: very similar to above, dark grey to minor black, firm to very firm, commonly brittle, platy to sub platy, fissile to sub fissile, predominantly smooth & very faintly micromicaceous, increasingly carbonaceous in minor part, increasingly slightly to locally moderately silty in minor part, trace silty laminations.

1120-1130

SHALE: as previously described, dark grey to minor black, firm to very firm, commonly brittle, platy to sub platy, fissile to sub fissile, predominantly smooth & very faintly micromicaceous, carbonaceous in minor part, locally slightly silty in minor part, trace silty laminations.

1130-1138

SHALE: dark grey to black, commonly firm, locally hard to soft, commonly platy to sub platy, sub blocky in part, brittle in part, predominantly fissile, smooth and faintly micromicaceous in part, commonly slightly to locally moderately silty with minor siltstone laminations, variably carbonaceous in part, rare to trace dark brown dense cryptocrystalline limestone laminations to stringers, very rare white tuffaceous bentonite.

1138-1154

SHALE: dark grey to black, firm, commonly brittle, platy to sub platy, minor sub blocky, fissile, predominantly smooth, faintly micromicaceous in part, trace silty with laminations, carbonaceous in part, rare light grey to white to tan to green bentonite, tuffaceous in part.

GARBUTT RADIOACTIVE MARKER 1154 m MD (-611.8 m SS)

1154-1164

SHALE: very similar to above, dark grey to black, firm to locally hard, commonly brittle, platy to sub platy, occasionally sub blocky, fissile, predominantly smooth, slightly to moderately silty and faintly micromicaceous in minor part, increasingly commonly carbonaceous in part, trace scattered carbonaceous debris, increasing trace white to light grey to cream bentonite, tuffaceous in part.

1164-1168

SHALE: as above with increasing trace white to light grey to occasionally cream bentonite, predominantly very tuffaceous with common biotite and abundant crystal fragments grading to bentonitic sandstone.

1168-1173

SHALE: predominantly as above with minor very dark brown black firm to soft slightly bituminous to phosphatic **SHALE:**, decreasing trace predominantly light grey to white bentonite, slightly tuffaceous in part.

1173-1182

SHALE: as previously described with increasing minor white to cream to occasionally light grey bentonite, commonly slightly tuffaceous, occasionally very tuffaceous grading to bentonitic sandstone.

1182-1191

SHALE: dark grey in part, commonly brown black to black, firm, locally soft to occasionally hard, platy to sub platy, locally flaky, fissile to locally very fissile, commonly smooth, slightly silty in part, bituminous to phosphatic in minor part, trace pyrite nodules, decreasing trace cream to white bentonite.

1191-1203

SHALE: as previously described with rare to trace phosphatic debris.

1203-1208

SHALE: dark grey to black, firm to hard, sub blocky to sub platy, sub fissile in part, commonly very faintly micromicaceous, slightly silty in minor part, increasing trace pyrite nodules, trace locally common biotite, very rare slickensides?

CHINKEH SILTSTONE 1208.0 m MD (-665.8 m SS)

1208-1211

SILTSTONE: light to dark grey, quartzose with minor to locally common glauconite, commonly variably sandy, clean to locally very argillaceous, variable induration: commonly moderately indurated, locally poorly to well indurated, siliceous and dolomitic cement, no visible porosity, no shows.

CHINKEH SANDSTONE 1211 m MD (-668.8 m SS)

1211-1216

SANDSTONE: off white to very light grey, very fine grained, very quartzose with minor scattered glauconite and trace lithic grains (sublitharenite to subquartzarenite), well sorted, angular to sub angular, clean, silty in part, variably indurated: commonly poorly indurated and crumbly, moderately to well indurated in part, siliceous and minor dolomitic cement, minor to common quartz overgrowths, variable porosity; fair to poor with tight streaks, minor to common very faint fluorescence, minor very slow faint yellow streaming cut, minor interbedded shale.

1216-1222.5

SANDSTONE: very similar to above, off white to very light grey, minor very pale brown, very fine grained, very quartzose with minor scattered glauconite and trace lithic grains (subquartzarenite), well sorted, angular to sub angular, clean, slightly silty in part, decreasing variably indurated: increasingly commonly poorly indurated and crumbly, moderately indurated in part, siliceous and minor dolomitic cement, common to locally abundant quartz overgrowths, variable porosity; common fair with trace to minor streaky good porosity, poor to very poor visible porosity in part, common faint yellow green fluorescence, trace very slow weak streaming cut.

TRIASSIC 1222.5 m MD (-680.3 m SS)

1222-1227

SHALE: commonly medium to light grey, rusty brown in minor part, sub platy to sub blocky, very firm to hard, commonly brittle, smooth & very faintly micromicaceous in part, variably silty and micromicaceous in part grading to argillaceous siltstone.

1227-1231

SILTSTONE: medium to light grey, very quartzose with minor dark specks, variably micromicaceous with occasional micaceous parting, clean in part, commonly slightly to moderately argillaceous, predominantly moderately well to moderately indurated with siliceous cement, slightly sandy in part occasionally grading to sandstone, **no visible porosity, no shows, minor interbedded shale as above.**

1231-1240

SANDSTONE: off white to very light grey, very fine grained, very quartzose with minor dark lithic grains and carbonaceous specks, rare carbonaceous debris, well sorted, angular to sub angular, variably silty occasionally grading to sandy siltstone, predominantly clean, locally slightly argillaceous, commonly moderately indurated, locally poorly to well indurated, siliceous cement, minor to locally common bentonitic clay matrix, **tight, no shows, minor thin interbedded SHALE: as above.**

1240-1247

SANDSTONE: similar to above, light grey, minor pale orange red, very fine grained, very quartzose as above, well sorted, angular to sub angular, commonly clean to locally slightly argillaceous, commonly moderately well to well indurated, locally moderately poorly indurated, common siliceous cement, increasing minor to locally common smectitic clay matrix, trace spotty dolomitic cement, slightly silty in part, **tight, no shows, minor interbedded shale as below.**

1247-1258

SHALE: predominantly red brown with minor interbedded to interlaminated medium grey, firm to hard, predominantly brittle, sub platy to sub blocky, variably 'bentonitic' in part (abundant red clay in wash), commonly sub fissile to fissile, variably silty in minor part, trace medium grey quartzose argillaceous siltstone laminations.

1258-1266

SHALE: very similar to above becoming brown rusty red, minor interbedded and interlaminated medium grey shale as above, increasingly platy and fissile.

1266-1279

SHALE with interbedded SILTSTONE:

SHALE: medium to dark grey, firm to very firm, sub blocky to sub platy, minor platy, brittle in minor part, commonly sub fissile to fissile, slightly silty in minor part;

SILTSTONE: light to medium grey, blocky, very quartzose with minor dark specks, locally slightly micaceous, predominantly clean to slightly argillaceous, sandy in part grading to minor silty sandstone, commonly moderately to well indurated, locally poorly indurated in minor part, predominantly dolomitic cement, trace disseminated pyrite, **tight, no shows.**

1279-1284

SHALE: maroon to rusty red, platy to sub platy, fissile, firm to very firm, locally soft, occasionally brittle, predominantly smooth and faintly micromicaceous, locally slightly silty with occasional silty laminations, variably 'bentonitic' (abundant red clay in wash), slightly dolomitic in part, trace medium grey to grey brown interlaminated shale.

284-1295

SHALE: very similar to above, predominantly maroon to rusty red, increasingly medium brown to brown grey in minor part, increasingly micromicaceous in minor part, increasingly silty in part with minor siltstone laminations to stringers, commonly slightly to moderately dolomitic, variably 'bentonitic' as above, minor thin interbedded siltstone as above with increasing trace to locally minor carbonaceous debris.

1295-1314

SHALE with minor interbedded SILTSTONE:

SHALE: medium grey, minor interbedded to interlaminated red shale as above, sub blocky to sub platy, sub fissile to fissile, very firm to hard, brittle, smooth and faintly micromicaceous in part, variably silty and moderately to locally very micromicaceous in part occasionally grading to argillaceous siltstone laminations and stringers, slightly to moderately dolomitic in part; **SILTSTONE:** as previously described, light to medium grey, blocky, very quartzose with minor dark specks, locally slightly micaceous, predominantly clean to slightly argillaceous, sandy in part grading to minor silty sandstone, commonly moderately to well indurated, locally poorly indurated in minor part, predominantly dolomitic cement, tight, no shows

1314-1326

SHALE: rusty red to maroon, trace to minor medium brown and grey, occasionally mottled, commonly firm, locally soft to very firm, brittle in minor part, fissile, commonly smooth and faintly micromicaceous, locally slightly silty and moderately micromicaceous, occasional siltstone laminations and stringers, increasingly 'bentonitic' in part (very abundant red clay in wash), locally slightly dolomitic, rare slickensides at base.

BELLOY 1325.9 m MD (-783.7 m SS)

1326-1336

CHERT: predominantly dark to medium grey to brown grey, commonly moderately hard to locally crumbly, variably moderately to locally very glauconitic, sandy to silty grading to cherty sandstone in part, common granular texture on cuttings, variably argillaceous grading to minor cherty glauconitic mudstone, trace pyritized spicules and worm burrows, minor interbedded very fine grained variably glauconitic quartzose argillaceous lithic wacke, minor to locally common shear fabrics: variably mylonitized to locally pervasive with common slickensides, no visible porosity, infer good to excellent local fracture porosity, no shows.

1336-1339.5

CHERT: very pale to dark brown, predominantly variably glauconitic, commonly variably sandy to very sandy grading to very cherty sandstone in part, slightly to very spicular in part, translucent in minor part, trace disseminated to locally patchy pyrite, rare pyrite nodules, predominantly very tight, minor to locally common poor to occasional fair micro vug to vug porosity with minor pyrobitumen and trace drusy dolomite, no shows, trace to minor chalky cataclastic? anhydritic stringers with slickensides, trace dark grey glauconitic silty shale, minor dark grey sandstone as above.

1339.5-1351

SANDSTONE: medium to dark grey, very fine to medium grained, lithic wacke with common to abundant clear to varicolored quartz and trace to minor lithic grains, variably glauconitic with common to locally abundant glauconite, common to abundant argillaceous and silty matrix, moderately poorly sorted, sub angular to sub rounded, disaggregated in part, poorly to moderately indurated with trace spotty dolomitic cement, variably silicified in minor part grading to cherty sandstone, grades to minor sandy glauconitic siltstone and shale stringers, **tight, no shows, minor chalky cataclastic?** black and white mottled to anastomosing anhydritic to dolomitic stringers with slickensides, minor interbedded chert as above.

1351-1354.5

SANDSTONE: very similar to above becoming predominantly very fine to fine grained, commonly variably silicified to cherty grading to sandy chert in part, rare fossil fragment, **tight, trace poor micro vug porosity, no shows, minor chalky cataclastic?** 'stringers' as above, minor interbedded chert as above, infer locally good fracture porosity.

1354.5-1360

CHERT: dark brown to brown grey, dense, variably hard, moderately to very glauconitic, commonly variably dolomitic grading to cherty dolomite in part, commonly variably sandy grading to very cherty sandstone in part, trace to minor disseminated to locally abundant pyrite, **predominantly tight, trace poor micro vug to moldic porosity, no shows,** decreasing trace to minor dolomitic to anhydritic stringers as above.

1360-1369

DOLOMITE: dark grey to grey brown, cryptocrystalline to slightly microcrystalline, predominantly hard, dense, commonly silty, commonly variably cherty grading to dolomitic chert in part, locally variably sandy, locally slightly to moderately calcareous with trace to minor dolomitic limestone stringers, trace locally pyritic, minor light brown to grey brown marly limestone stringers; soft, chalky, variably dolomitic grading to calcareous dolomite, slightly mottled, slightly glauconitic, silty to sandy, trace slickensides, **tight, infer good local fracture porosity, no shows.**

1369-1374.8

SANDSTONE: dark grey, very fine to fine grained, minor medium grains, lithic wacke, common to abundant clear to varicolored quartz, common to locally abundant glauconite, trace lithic grains, abundant silty argillaceous matrix, moderately sorted, sub angular to rounded, disaggregated in minor part, commonly moderately indurated, locally poorly to well indurated in part, minor locally common dolomitic cement, **tight, no shows, minor interbedded** **SHALE:** very dark grey, firm to very firm, sub blocky to occasionally platy, commonly moderately to very glauconitic, silty, locally variably sandy, common locally abundant pesty chloritic patches.

TANTASQUE 1374.8 m MD (-832.6 m SS)

- 1374.8-1380 **CHERT:** predominantly very pale to light brown, predominantly translucent, very hard, very dense, slightly to moderately glauconitic in part, slightly sandy in minor part, minor local trace to very abundant disseminated to crystalline pyrite, slightly to moderately dolomitic in minor part, rare to trace dolomitic micro fracture fill, rare spicules, occasional cherty dolomite stringers, **tight, infer fair to good local fracture porosity, minor to common spotty very dull fluorescence, trace very weak very thin faint yellow diffuse cut.**
- 1380-1388 **CHERT:** similar to above, light brown, minor light grey, predominantly translucent to sub translucent, very hard, very dense, slightly to moderately glauconitic as above, increasingly variably spicular in minor part, increasingly variably silty to sandy in minor part, trace to minor fracture surfaces on cuttings with abundant sub to euhedral quartz crystals, rare to trace scattered poor moldic to micro vug porosity, **infer good to excellent local fracture porosity, trace spotty questionable fluorescence, no cut.**
- 1388-1397 **CHERT:** as above in minor part, predominantly dark brown to brown grey, dense, commonly hard, moderately to very glauconitic, commonly variably silty to sandy, variably argillaceous and crumbly grading to very cherty glauconitic shale in minor part, slightly dolomitic in minor part, minor locally common to very abundant pyrite grading to pyrite nodules in part, **tight, no shows.**
- 1397-1402.5 **CHERT:** light to medium brown, faintly mottled in part, commonly translucent, very hard and dense, commonly slightly to moderately glauconitic, trace sandy, rare to trace spicules, trace to minor dark grey silty glauconitic shale laminations to stringers, trace to minor fracture surface with common to abundant pyrite, rare micro fracture with pyrite fill, **infer local trace to minor fair to good fracture porosity, no shows.**
- 1402.5-1410 **CHERT:** very similar to above, decreasingly glauconitic, minor to common planar fracture surfaces on cuttings, minor fracture surfaces with cherty white dolomite or pyrobitumen residue, trace subhedral quartz, rare to trace scattered poor moldic to micro vug porosity, **infer minor fair to good fracture porosity, trace to minor spotty dull fluorescence, no cut, trace silty glauconitic to phosphatic shale laminations.**

1410-1418

CHERT: predominantly very pale to medium brown, minor off white and dark brown, faintly mottled in part, predominantly translucent, very hard and dense, commonly variably spicular, trace scattered glauconite, trace phosphatic shale laminations, common fractured cuttings including; minor to common planar clean fracture surfaces, minor to common fracture surfaces with abundant sub to euhedral clear quartz crystals, minor fracture surfaces with white chalcedonic layers, rare pyrobitumen residue, rare very coarse subhedral quartz crystals, **infer common good to excellent fracture porosity, minor spotty very dull fluorescence, trace questionable cut.**

1418-1425

CHERT: predominantly medium to dark brown to grey brown, minor light brown, translucent in part, predominantly very hard and dense, slightly 'argillaceous' and less indurated in part, trace glauconite, trace spicules, rare to trace dolomitic specks, fractured in part, trace to minor milky to chalcedonic quartz healed and lined fractures with patchy pyrite, rare to trace sub to euhedral clear crystalline quartz linings, trace disseminated pyrite, **infer trace local poor to fair fracture porosity, trace to minor very dull fluorescence, trace questionable cut.**

1425-1430

CHERT: predominantly dark brown, very hard and dense, non-translucent, trace disseminated pyrite, rare spicules, trace very faint worm burrows?, minor to common planar fracture surfaces, increasing minor milky to occasionally chalcedonic quartz fracture linings and heals, increasing trace to minor sub to euhedral clear crystalline quartz linings, minor light brown chalky silty to sandy slightly dolomitic cataclastic? siliceous stringers, **infer minor fair to good local fracture porosity, trace spotty very dull fluorescence, no cut.**

1430-1437

CHERT: as previously described with decreasing trace milky quartz fracture fill, rare sub to euhedral crystalline quartz linings, moderately to very fractured? (reduced cuttings size), **infer trace poor to fair fracture porosity, trace spotty very dull fluorescence, no cut.**

1437-1442

CHERT: commonly pale brown, minor medium to dark brown, commonly mottled, very hard and dense, predominantly translucent to sub translucent, variably spicular in minor part, trace slightly sandy, variably fractured in part with trace milky to occasionally chalcedonic quartz fracture heals, minor to common planar fracture surfaces with rare crystalline quartz linings, very rare pyrite micro-fracture fills, trace slightly dolomitic, **infer trace to minor poor to fair fracture porosity, no shows.**

1442-1450

CHERT: predominantly very light to light grey with common dark brown pellets and mottles, sub translucent, very hard and dense, commonly variably spicular, trace disseminated pyrite, rare to trace scattered dolomite rhombs, trace slightly sandy, fractured in part, increasing trace milky to chalcedonic quartz fracture heals and occasional linings, increasing trace clear anhedral to subhedral quartz fracture linings and fills, silicified in minor part with trace to minor chalcedonic to milky blebs and mottles, rare calcareous fracture fill, rare pyrobitumen residue, infer minor locally poor to fair fracture porosity, no shows.

1450-1456

CHERT: very similar to above becoming increasingly pelletal and locally mottled, minor medium to dark brown and grey mottled chert, increasing fractures, increasing minor to common chalcedonic to milky quartz fracture heals and occasional linings (rare colloform), increasing trace clear sub to euhedral crystalline quartz linings, increasingly silicified in minor part with chalcedonic to milky quartz blebs and mottles, rare calcareous fracture fill, increasing rare to trace pyrobituminous to bituminous residue, infer increasing minor fair to poor fracture porosity, minor spotty dull fluorescence, trace questionable cut, trace very fine grained silty quartzose sandstone with dolomitic cement.

1456-1464

CHERT with interbedded CONGLOMERATE:

CHERT: similar to above becoming increasingly varicolored: light to medium grey pelletal to mottled, dark grey brown to brown, commonly sub translucent, very hard and dense, increasingly fractured, variably silicified in part with minor to common milky to chalcedonic blebs to mottles and fracture fills, locally slightly to moderately sandy in minor part, increasing trace to minor crystalline quartz fracture and vug? linings, trace disseminated pyrite, rare pyrobitumen residue, infer minor to locally common fair to good fracture porosity, minor spotty dull fluorescence, trace very weak questionable cut; **CONGLOMERATE:** monomict chert pebbles same as bedded chert, trace dark grey brown argillaceous silty to sandy matrix with dolomitic cement, trace to minor subrounded to sub angular surfaces on chert fragments, infer poor? intergranular porosity.

KINDLE 1464.0m MD (-921.8 m SS)

1464-1466

SILTSTONE: light brown, quartzose, moderately firm to crumbly, sandy in part occasionally grading to silty sandstone, slightly argillaceous, very dolomitic occasionally grading to silty dolostone, occasional dolomite rhombs, no visible porosity, even dull fluorescence, minor very weak very slow blooming cut.

1466-1475

SILTSTONE: predominantly dark brown, minor light to medium brown, sub blocky, quartzose, slightly to moderately argillaceous, very dolomitic to locally variably calcareous grading to very silty dolostone in part, occasional dolomite rhombs, variably indurated: commonly moderately to very hard and brittle, minor to common poorly indurated and crumbly, trace light brown chalky slightly silty marl stringers, **no visible porosity, common very dull fluorescence, minor very slow very weak streaming and blooming cut.**

1475-1479

SILTSTONE: as previously described with increasing minor very thin interbedded marlstone; light brown, chalky to crumbly, slightly to moderately silty, faintly laminated in part, **no visible porosity, decreasing minor to common very dull fluorescence, decreasing trace to minor cut as above.**

1479-1486

SILTSTONE: dark to medium brown to occasionally brown grey, quartzose, decreasingly slightly to moderately dolomitic, locally slightly to moderately cherty, slightly to moderately argillaceous, trace argillaceous partings, trace slightly sandy, increasingly indurated in part, locally very well indurated, infer common siliceous cement, **no visible porosity, common very dull questionable fluorescence, trace questionable cut, trace marly stringers.**

1486-1490

SILTSTONE with minor interbedded LIMESTONE:

SILTSTONE: as previously described becoming locally very dolomitic to calcareous grading to silty calcareous dolomite, porosity and shows as above; **LIMESTONE:** very dark brown, cryptocrystalline to microcrystalline, firm to hard, dense, very argillaceous, commonly silty, variably dolomitic grading to calcareous dolomite in part, slightly cherty in part, **no visible porosity, common to abundant very dull fluorescence, minor to common slow yellow white streaming cut.**

1490-1497.4

SILTSTONE: dark brown to very dark brown grey, quartzose, slightly to locally moderately argillaceous, predominantly moderately to very calcareous to dolomitic grading to very silty dolomite in part, commonly moderately indurated, predominantly calcareous to dolomitic cement, minor locally common siliceous cement, **no visible porosity, decreasing shows as above.**

MATTSON 1497.4 m MD (-955.2 m SS)

1497.4-1506

SILTSTONE with interbedded SANDSTONE:

SILTSTONE: light brown, very quartzose with trace lithic grains, rare to trace glauconite, variably sandy in part, clean to slightly argillaceous, poorly indurated and crumbly with abundant calcareous to dolomitic cement, trace fossil fragments, occasionally very argillaceous grading to calcareous dark grey shale laminations, no visible porosity; **SANDSTONE:** very pale to medium brown, very fine grained, variably silty grading from siltstone above in part, quartzose with limestone? grains, well sorted, angular to sub angular, predominantly clean to slightly argillaceous, trace fossil fragments, poorly to moderately indurated with abundant calcareous cement, minor dull fluorescence, minor slow very thin light yellow green streaming to diffuse cut, minor white soft chalky limestone stringers.

1506-1510

SANDSTONE with interbedded SILTSTONE:

SANDSTONE: commonly light to medium brown, very fine grained, variably silty grading to sandy siltstone in part, quartzose (with recrystallized limestone? grains), rare to trace lithic grains, very rare glauconite, predominantly clean to slightly argillaceous, increasing trace to minor fossil fragments, commonly poorly indurated and crumbly with abundant calcareous cement, moderately to moderately well indurated in part with minor calcareous + siliceous cement, predominantly no visible porosity, trace poor porosity, minor patchy dead oil stain, minor spotty to patchy dull fluorescence, trace questionable cut; **SILTSTONE:** as above, minor chalky limestone as above.

1510-1515

SANDSTONE: off white to light grey, very fine grained, variably silty in part occasionally grading to siltstone, very quartzose (quartz arenite), with trace lithic grains and rare glauconite, very well sorted, angular to sub angular, predominantly very clean, occasionally slightly argillaceous, poorly to moderately indurated with siliceous and dolomitic cement, rare to trace interstitial pyrite, no visible porosity, trace to minor spotty dead oil stain, minor spotty dull fluorescence, trace questionable cut; trace to minor interbedded **SHALE:** as described below.

1515-1523

SANDSTONE with minor interbedded SHALE:

SANDSTONE: similar to previous description becoming predominantly white to very light grey, commonly poorly indurated and crumbly with common to abundant dolomitic to calcareous cement, moderately to moderately well indurated in part with locally common streaky to patchy siliceous + minor spotty dolomitic cement, **no visible porosity, minor to common spotty to patchy dull fluorescence, trace to minor slow very weak streaming to diffuse cut; **SHALE:** medium green grey, firm to hard, sub blocky to occasionally sub platy, predominantly non-silty, commonly slightly to moderately dolomitic, locally slightly silty to rarely sandy, trace disseminated pyrite, rare to trace pyrite nodules.**

1523-1529

SANDSTONE with minor interbedded DOLOMITE, LIMESTONE and SHALE:

SANDSTONE: as previously described, predominantly no visible porosity, trace poor porosity, even very pale fluorescence, trace very weak questionable cut;
DOLOMITE: buff brown to light grey, cryptocrystalline to microcrystalline, predominantly hard and brittle, commonly variably calcareous locally grading to dolomitic limestone, slightly to moderately cherty in minor part, **tight, no shows;**
LIMESTONE: dark to medium brown, silty to sandy, argillaceous in part, variably dolomitic grading to calcareous dolomite, **tight, no shows;** **SHALE:** dark grey to brown grey, sub platy to sub blocky, sub fissile, firm to very firm, slightly to moderately dolomitic.

1529-1533

SANDSTONE: as above in part, common **SANDSTONE:** #2: pale brown, very fine grained, slightly silty in part, quartz arenite with trace lithic grains and rare glauconite, very well sorted, angular to sub angular, very clean, predominantly poorly indurated and crumbly to friable, common calcareous to dolomitic cement, common quartz overgrowths, **variable common fair to streaky good porosity, poor porosity in part, even light brown oil stain, even pale yellow fluorescence, common very thin weak yellow streaming to diffuse cut, minor interbedded **SHALE:** and trace white chalky limestone stringers.**

1533-1540.5

SANDSTONE with interbedded SHALE:

SANDSTONE: white to very light grey, very fine grained, commonly variably silty, quartz arenite as above with increasing trace dark lithic grains, clean, moderately to poorly indurated with abundant calcareous to dolomitic cement, **no visible porosity, common pale yellow fluorescence, trace very weak questionable cut;** **SHALE:** dark grey, sub blocky to sub platy, very firm to hard, faintly micromicaceous in part, very dolomitic with occasional very argillaceous dolomite stringers; minor very dark grey brown argillaceous tight dolomitic siltstone stringers.

1540.5-1545

SANDSTONE: very similar to previous description becoming increasingly silty grading to siltstone in part, porosity and shows as above, minor interbedded shale as above.

MAIN HOLE SECTION (156mm): Air-drilled

1545-1547

No sample.

Note: Samples from 1550 to 1595m are unrepresentative spot samples.

1547-1555

SHALE: dark grey, very firm to hard, sub blocky to sub platy, sub fissile in part, predominantly slightly silty and micromicaceous, locally slightly sandy, moderately dolomitic, very thin interbedded **SANDSTONE:** off white to light grey, very fine grained, silty grading to siltstone, quartz arenite, trace dark lithic grains, rare glauconite, trace shale rip-up clasts, predominantly clean to locally variably argillaceous, minor argillaceous partings, well to very well indurated with abundant calcareous cement, trace locally common disseminated pyrite, no visible porosity, no shows.

1555-1563

SHALE with minor interbedded SANDSTONE:

SHALE: as previously described with rare to trace fossil fragments, rare patchy pyrite, locally very dolomitic to calcareous grading to very argillaceous limestone stringers; **SANDSTONE:** off white to light grey to occasionally light brown, very fine grained, silty grading to sandy siltstone in part, quartz arenite as above, well sorted, angular to sub angular, predominantly clean to locally slightly argillaceous, trace argillaceous partings, occasional shale rip-up clast, rare to trace fossil fragment, well indurated with very abundant calcareous cement, locally common quartz overgrowths, trace interstitial pyrite, predominantly no visible porosity, trace poor to rarely fair porosity, minor patchy pale yellow fluorescence, trace very weak questionable cut.

1563-1571

SANDSTONE with interbedded SHALE:

SANDSTONE: buff to light brown, very fine grained, variably silty, quartz arenite with increasing trace dark lithic grains, well sorted, angular to sub angular, predominantly clean, trace argillaceous partings, well indurated with very abundant calcareous cement to matrix locally grading to variably sandy tight limestone, minor coarse sparry recrystallized fossil fragments/allochems, minor locally common quartz overgrowths, trace interstitial pyrite, **predominantly no visible porosity, trace poor to rarely fair porosity, minor spotty yellow fluorescence, trace very weak slow thin streaming cut; **SHALE:** dark grey to black, firm to hard, sub platy to sub blocky, commonly sub fissile, slightly to moderately silty and micromicaceous, commonly variably carbonaceous to phosphatic, trace to locally minor pyrite, trace locally common pyritized worm burrows, slightly to moderately dolomitic to calcareous, rare ostracode.**

1571-1575

SHALE with minor interbedded SANDSTONE:

SHALE: as previously described becoming increasingly silty to sandy in part, increasing trace patchy to disseminated pyrite, minor argillaceous siltstone to sandstone laminations to stringers; **SANDSTONE:** as above in part, predominantly medium to light brown, very fine grained, trace fine grains, silty grading to sandy siltstone in part, very quartzose with trace dark lithic grains, well sorted, angular to sub angular, slightly argillaceous, well to very well indurated, common to abundant dolomitic to calcareous cement, trace locally common pyrite, **no visible porosity, no shows, trace fine to medium loose quartz and blue chert grains, infer minor streaky fair to good porosity.**

1575-1582

SHALE with minor interbedded SANDSTONE:

SHALE: as previously described, no worm burrows; **SANDSTONE:** as previously described increasingly grading to siltstone, increasing minor to locally abundant interstitial pyrite, no visible porosity, no shows.

1582-1590

SHALE with minor interbedded SANDSTONE:

SHALE: very dark grey to black, platy to sub platy, minor sub blocky, commonly fissile to sub fissile, very firm, commonly slightly silty and micromicaceous, locally very silty to sandy in minor part, variably phosphatic to carbonaceous, trace to minor disseminated to framboidal pyrite, trace fossil fragments, slightly dolomitic, trace medium green grey platy micromicaceous claystone stringers with trace pyritized worm burrows; **SANDSTONE:** medium to dark brown, very fine grained, trace fine grains, silty grading to siltstone in part, very quartzose as above, commonly slightly argillaceous with minor argillaceous partings, trace locally very argillaceous, rare to trace fossil debris, occasional shale rip-up clast, very well indurated with abundant calcareous to dolomitic cement, minor locally common to abundant interstitial pyrite, no visible porosity, no fluorescence, trace very weak slow thin streaming cut.

1590-1595

SHALE: as previously described with decreasing rare to trace green grey claystone as above, rare sideritic nodules to stringers, minor thin interbedded **SANDSTONE:** as above, trace fine to medium loose quartz and rare blue to dark grey chert grains.

1595-1600

SHALE with minor interbedded SANDSTONE:

SHALE: as previously described with trace ferruginous stringers, slightly to moderately dolomitic, trace pyrite nodules; **SANDSTONE:** as previously described in part, **SANDSTONE:** #2 off white to very pale brown, very fine grained, slightly silty, quartz arenite with trace dark lithic grains, well sorted, angular to sub angular, well indurated with common calcareous to dolomitic and siliceous cement, rare to trace interstitial pyrite, predominantly tight, minor poor to streaky fair porosity, trace very fine interstitial bitumen, minor to common pale yellow green fluorescence, minor thin slow weak yellow streaming and diffuse cut.

1600-1605

SHALE with minor interbedded SANDSTONE:

SHALE: mixed, predominantly as above becoming increasingly black, bituminous in part, increasing trace to minor oxidized ferruginous laminations to stringers, minor **SHALE:** #2 medium green grey, very firm, brittle in part, sub platy, predominantly smooth, trace locally sandy, sub waxy in part grading to claystone, rare to trace disseminated pyrite, non dolomitic; **SANDSTONE:** #2 as previously described.

1605-1614

SANDSTONE with interbedded SHALE:

SANDSTONE: similar to above, off white to very pale brown, very fine grained, slightly silty, quartz arenite with trace dark lithic grains, very well sorted, angular to sub angular, rare to trace fossil fragments, rare shale rip-up clasts, well indurated with siliceous and dolomitic cement, minor quartz overgrowths, trace interstitial pyrite, predominantly tight to 3% porosity, minor streaky 4 to 8% porosity, trace locally common spotty bitumen, common pale yellow fluorescence, minor thin slow weak streaming and diffuse cut; **SHALE:** medium green grey, medium to dark grey and brown grey, very firm, brittle in part, sub platy, predominantly smooth, increasingly locally sandy in minor part, sub waxy grading to claystone, increasing trace disseminated pyrite, trace pyrite nodules, non-dolomitic.

1614-1621

SANDSTONE with interbedded CLAYSTONE:

SANDSTONE: mixed, as above in part, commonly **SANDSTONE:** #2 disaggregated, very fine to upper fine grained, trace lower medium grains, quartz arenite, frosted to minor clear quartz with trace to minor dark grey to blue chert grains, moderately well sorted, sub angular to rounded, **infer good porosity, no shows, minor** **SANDSTONE:** #3 light grey green, very fine grained, silty grading to sandy siltstone in part, common to abundant green clay matrix, occasional claystone rip-up clasts, moderately indurated, trace spotty dolomitic cement, locally very pyritic, **tight, no shows, minor** interbedded **CLAYSTONE:** grading from shale as previously described.

1621-1625

SANDSTONE with minor interbedded CLAYSTONE:

SANDSTONE: disaggregated, predominantly upper fine to lower very fine grained, minor lower medium and trace upper medium grains, quartz arenite, frosted to clear quartz with trace lithic and chert grains, moderately well sorted, sub angular to rounded, very clean, rare to trace interstitial pyrite, **infer good porosity, no shows, minor** **SANDSTONE:** #3 as above; **CLAYSTONE:** as previously described, rare fossil fragment.

1625-1631

SANDSTONE: as previously described, disaggregated, predominantly upper fine to lower very fine grained, minor lower medium and trace upper medium grains, quartz arenite, frosted to clear quartz with trace lithic and chert grains, moderately well sorted, sub angular to rounded, very clean, rare to trace interstitial pyrite, **infer good porosity, no shows.**

1631-1638

SANDSTONE with minor interbedded CLAYSTONE:

SANDSTONE: predominantly as previously described, minor interbedded **SANDSTONE:** off white to very pale brown, very fine grained, slightly silty, quartz arenite with trace dark lithic grains, very well sorted, angular to sub angular, well indurated with siliceous and dolomitic cement, minor quartz overgrowths, trace interstitial pyrite, predominantly tight to 3% porosity, minor streaky 4 to 7% porosity, trace spotty bitumen, common pale yellow fluorescence, minor thin slow weak streaming and diffuse cut; **CLAYSTONE:** as previously described.

1638-1644

SHALE with interbedded SANDSTONE:

SHALE: black to brown black, firm to hard, sub platy to sub blocky, commonly sub fissile, bituminous, silty to locally sandy, minor argillaceous siltstone and sandstone laminations to stringers, faintly pyritic, slightly dolomitic to calcareous, minor claystone as above; **SANDSTONE:** white to very pale brown, very fine grained, slightly silty, quartz arenite, well sorted, angular to sub angular, very clean, moderately to poorly indurated, common dolomitic and siliceous cement, minor quartz overgrowths, tight to 3% porosity in part, common 4 to 8% porosity, common patchy dull to bright pale yellow to yellow green fluorescence, minor fast very thin diffuse cut, minor **SANDSTONE:** #2 disaggregated, fine to medium, clear to frosted to yellow quartz, trace chert grains, moderately sorted, rounded to sub angular, infer good porosity, no shows, trace light brown sandy tight wackestone.

1644-1650

SANDSTONE: mixed; predominantly **SANDSTONE:** #1 as above with increasing siliceous cement, increasing trace chert and lithic grains, slightly decreasing porosity and shows as above, **SANDSTONE:** #2 light grey to light brown, very fine to fine grained, trace medium grains, sublitharenite, clear to frosted quartz, trace to minor blue to dark grey chert, trace shale grains, locally slightly argillaceous, moderately to moderately well sorted, angular to subrounded, trace fossil fragment, well indurated, common to abundant dolomitic cement, predominantly tight to 4% porosity, questionable dull fluorescence, no cut; minor **SANDSTONE:** #3 disaggregated, fine to medium grained, trace to minor coarse quartz and blue chert grains, sublitharenite grading quartzarenite, moderately sorted, rounded to sub angular, infer good porosity, no shows, minor interbedded **SHALE:** as above.

1650-1660

SANDSTONE with minor interbedded SHALE:

SANDSTONE: white to very light grey, very fine grained, slightly silty, predominantly quartz arenite locally grading to sublitharenite, clear to frosted quartz, increasing trace to locally minor blue to dark grey to black chert, very rare glauconite, moderately well sorted, angular to sub angular quartz with rounded chert, trace fossil fragment, rare chert and tuff pebbles, well indurated with common dolomitic and siliceous cement, moderately indurated in part, predominantly tight to 3% porosity, minor 5 to 9% porosity, common patchy bright pale yellow green fluorescence, common fast very thin yellow diffuse and streaming cut; **SHALE:** similar to above, black to brown black to dark grey, very firm to hard, platy to sub blocky, brittle in part, bituminous to phosphatic, commonly silty to sandy grading to argillaceous siltstone and sandstone in part, commonly non-dolomitic to slightly dolomitic.

1660-1665

SANDSTONE: very similar to previous description, white to very light grey, very fine grained, trace fine and rare medium grains, slightly silty, quartz arenite, trace blue to black chert, very rare glauconite, moderately well sorted, angular to sub angular quartz with rounded chert, rare fossil fragment, clean, trace slightly argillaceous, trace argillaceous parting, predominantly well indurated with common siliceous and minor to common dolomitic cement, moderately indurated in part, minor locally common quartz overgrowths, trace interstitial pyrite, rare spotty kaolin, common tight to 4% porosity, increasing minor to common 5 to 10% porosity, minor patchy dull to bright pale yellow to yellow green fluorescence, trace very weak very thin questionable cut; minor interbedded **SHALE:** as above.

1665-1670

SANDSTONE: as previously described with increasing common siliceous and decreasing minor dolomitic cement, increasingly well to very well indurated, decreasing minor poor to fair porosity as above, decreasing trace to minor questionable shows as above.

1670-1675

CONGLOMERATE with interbedded SANDSTONE:

SANDSTONE: as above becoming increasingly silty grading to minor sandy siltstone, well indurated with abundant dolomitic cement, minor patchy siliceous cement, predominantly no visible porosity, questionable shows as above; **CONGLOMERATE:** fine pebble, oligomict becoming polymict, clast supported, moderately poorly sorted, rounded to subrounded, common rounded surfaces on cuttings, coarse to gritty matrix, predominantly intraformational sedimentary clasts (shale, claystone, siltstone, occasional sandstone and trace chert and tuff clasts), minor patchy to locally abundant crystalline pyrite and pyritized clasts, trace pyrite nodules, infer good porosity, no shows.

1675-1680

SANDSTONE with CONGLOMERATE:

SANDSTONE: as previously described; **CONGLOMERATE:** as previously described with rare very dark brown argillaceous silty to sandy matrix; minor interbedded **DOLOMITE:** buff to light grey, cryptocrystalline to microcrystalline, dense, hard, trace silty, tight.

Switch to Invert mud at 1685 metres

1680-1885

SHALE: mixed; predominantly dark grey to brown grey, very firm, brittle in part, blocky to sub platy, commonly fissile, variably silty and micromicaceous, smooth in part, trace siltstone to sandstone laminations, locally variably sandy, trace disseminated to crystalline pyrite, trace to minor pyrite nodules, common to abundant planar fracture surfaces with trace rust stain and striations, trace fossil fragments, sub waxy in minor part, predominantly non-dolomitic, 30% **SHALE:** #2 medium grey green, predominantly blocky, sub fissile, slightly silty, faintly pyritic, predominantly non dolomitic, commonly fractured as above, rare fossil fragment.

1685-1690.5

DOLOMITE with SANDSTONE:

DOLOMITE: light brown, light to medium grey, cryptocrystalline to microcrystalline, firm to hard, moderately dense, soft and slightly chalky in part, variably sandy to silty in minor part, tight, common to abundant dull to moderate fluorescence, trace questionable cut; **SANDSTONE:** off white to light brown, very fine to upper coarse, trace to minor very coarse grains, sublitharenite, abundant frosted to clear quartz with common varicolored lithic grains (limestone to dolomite, chert, volcanic?), moderately poorly sorted, predominantly disaggregated, minor poorly indurated and friable consolidated cuttings, minor to locally common dolomitic cement, minor spotty siliceous cement, minor to common quartz overgrowths, variable porosity; common good to fair, minor tight to poor, trace excellent, infer predominantly good to fair porosity, abundant pale yellow to yellow green fluorescence, minor weak very thin diffuse cut.

1690.5-1696

DOLOMITE: light brown to grey, cryptocrystalline to microcrystalline, predominantly firm to locally hard and brittle, slightly soft and chalky in part, trace to minor light grey to light brown slightly silty to sandy translucent chert stringers to nodules, no visible porosity, decreasing fluorescence as above, trace questionable cut, slightly to locally very sandy grading to 30% dolomitic **SANDSTONE:** predominantly fine to medium grained, minor coarse grains, very quartzose with minor chert and dolomite grains, moderately to moderately well sorted, sub angular to rounded, moderately to poorly indurated with common to abundant dolomitic cement, minor patchy siliceous cement, no visible porosity.

1696-1701

SANDSTONE: off white to pale brown, very fine grained, silty, trace fine grains, very quartzose with trace to minor chert and lithic grains, rare glauconite, clean, moderately well sorted, angular to subrounded, commonly poorly to moderately poorly indurated, common to abundant dolomitic cement, locally well to very well indurated with locally common to abundant siliceous cement, fractured in part, no visible porosity, abundant very pale yellow fluorescence, no cut, interbedded **DOLOMITE**: as above becoming increasingly sandy increasingly grading to dolomitic sandstone.

1701-1705.5

DOLOMITE: medium to dark brown, cryptocrystalline to microcrystalline, hard, dense, trace cherty, mottled in part, variably argillaceous in part, commonly variably silty to sandy grading to occasional dolomitic sandstone stringers, trace to minor locally common allochems, tight, no shows, minor interbedded **CHERT**: light to medium brown and grey, translucent to sub-translucent, locally mottled, dense, brittle, predominantly variably sandy occasionally grading to cherty sandstone stringers, tight, no shows, interbedded **SANDSTONE**: as previously described.

1705.5-1710

SANDSTONE: very light grey to pale brown, very fine to fine grained, trace to minor medium grains, quartz arenite grading sublitharenite, abundant clear to frosted quartz with trace to locally minor dark chert and lithic grains, commonly moderately well to well sorted, angular to subrounded, fractured in part, variable induration: well to moderately poorly indurated, common to abundant siliceous and dolomitic cement, trace locally common quartz overgrowths, predominantly no visible porosity, common patchy dull to moderate yellow fluorescence, no cut, minor very fine to coarse moderately poorly sorted sublitharenite, minor **DOLOMITE**: stringers to thin interbeds as above.

1710-1714

SANDSTONE: predominantly as above becoming increasingly fine grained in part, ~30% **SANDSTONE**: #2 medium to dark brown to brown grey, very fine to fine grained, silty, quartzose with trace to minor dark chert and lithic grains, commonly slightly to moderately argillaceous, slightly cherty in part, trace argillaceous partings, moderately to moderately well sorted, angular to subrounded, moderately to moderately well indurated, common to abundant dolomitic cement, occasionally grading to sandy dolomite, tight, no shows, trace to minor dolomite stringers.

1714-1725

SANDSTONE: off white to very light brown, very fine to fine grained, quartz arenite with trace to minor predominantly dark lithic and chert grains, rare glauconite, well sorted, angular to subrounded, clean, trace argillaceous to bituminous partings, fractured in part, commonly moderately to moderately poorly indurated, locally very well indurated, common to abundant siliceous + minor to common spotty to patchy dolomitic cement, **predominantly tight to 3% porosity, minor streaky 4 to 8%, common patchy pale yellow fluorescence, no cut, minor SANDSTONE: #2 similar to above, fine to medium grained, minor very fine grains, quartz arenite as above, moderately well sorted, sub angular to rounded, predominantly disaggregated, trace to minor consolidated cuttings with spotty siliceous cement and fair to good porosity, minor to common quartz overgrowths, infer common good porosity, minor patchy dull fluorescence, no cut, minor thin silty to sandy dolomite stringers.**

1725-1734.5

SANDSTONE: pale brown, predominantly very fine grained, minor fine grains, silty, very fine to fine grained in minor part, quartz arenite with trace dark lithic grains, well sorted, angular to sub angular, clean, trace slightly argillaceous, trace argillaceous partings, commonly moderately to poorly indurated, common to abundant dolomitic cement, minor locally common siliceous cement, locally well indurated, **predominantly tight to 2% porosity, minor streaky 3 to 6% porosity, predominantly even pale yellow fluorescence, trace very weak very thin questionable cut, minor thin dolomite stringers to interbeds: light to dark brown, cryptocrystalline to microcrystalline, very firm to soft, very silty to sandy grading to dolomitic siltstone and sandstone stringers, tight, no shows.**

1734.5-1740

SANDSTONE: disaggregated, predominantly fine to lower medium grained, minor upper very fine and trace upper medium grains, quartz arenite, predominantly frosted to minor clear quartz with trace to minor chert and lithic grains, moderately well sorted, rounded to sub angular, clean, trace very poorly consolidated cuttings with trace to minor spotty siliceous cement, minor quartz overgrowths, **infer good porosity, abundant to even moderate to bright pale yellow green fluorescence, trace very weak very thin questionable cut, minor SANDSTONE: #2 pale brown, very fine to fine grained, quartz arenite, very well sorted, angular to subrounded, poorly to moderately poorly indurated, minor spotty siliceous cement, clean, predominantly good to fair porosity, even bright pale yellow white to yellow green fluorescence, minor very thin diffuse cut.**

1740-1747

SANDSTONE: very similar to previous description becoming finer, off white to very light grey, very fine to fine grained, minor lower medium grains, quartzarenite as above with increasing clear quartz, well to moderately well sorted, subrounded to angular, very clean, commonly disaggregated, increasing minor very poorly indurated and friable consolidated cuttings, predominantly trace spotty siliceous cement, locally minor to common siliceous cement, minor to common quartz overgrowths, consolidated cuttings with predominantly good porosity (13-16%, trace 18-20%), minor streaky fair and trace poor porosity, abundant to even bright pale yellow white fluorescence, trace to minor very weak slow streaming and diffuse cut.

1747-1753

SANDSTONE: with decreasing minor consolidated cuttings, becoming increasingly indurated in part with common patchy siliceous cement, very fine grained and silty in minor part, decreasing common good porosity as above, increasing fair to poor porosity in part, shows as above.

1753-1755.5

DOLOMITE: buff to medium brown, cryptocrystalline to microcrystalline, very firm to slightly soft, slightly to locally very sandy, no visible porosity, no shows, interbedded **SANDSTONE:** light to dark brown, very fine, variably silty grading to siltstone in part, moderately well to locally moderately sorted, angular to sub angular, variably argillaceous in part with trace argillaceous partings, moderately to occasionally well indurated, common to abundant dolomitic cement, tight to poor porosity, no shows.

1755.5-1760

SANDSTONE: very pale tan to off white, predominantly very fine to lower fine grained, slightly silty, quartz arenite, well sorted, angular to subrounded, clean, disaggregated in part, common variably indurated consolidated cuttings: commonly poorly indurated and friable to crumbly, moderately to occasionally well indurated in part, minor quartz overgrowths, minor to common spotty dolomitic and siliceous cement, variable porosity: common poor to fair, less common fair to good, trace spotty bitumen, even bright pale yellow white fluorescence, trace to minor slow weak very thin streaming and diffuse cut.

1760-1764.5

SILTSTONE with interbedded SANDSTONE:

SILTSTONE: dark to medium brown, quartzose, variably firm to locally soft, moderately to very argillaceous, moderately to locally very dolomitic, occasional dolomite laminations, slightly sandy, tight to poor porosity, common patchy very dull fluorescence, trace very slow faint streaming cut, minor interbedded **SANDSTONE:** off white to very light grey, very fine, silty, quartz arenite, well sorted, angular to sub angular, clean, poorly indurated, locally moderately indurated, predominantly siliceous and trace spotty dolomitic cement, predominantly poor to streaky fair porosity, minor good streaks, fluorescence as above, trace questionable cut.

1764.5-1769

SANDSTONE: very light grey to pale tan, very fine to fine grained, slightly silty, quartz arenite, well sorted, angular to subrounded, clean, disaggregated in part, common variably indurated consolidated cuttings: common poorly to very poorly indurated and friable to crumbly, locally moderately to occasionally well indurated, minor to locally common spotty to patchy siliceous cement, **variable porosity:** common good, minor fair to poor, trace to minor tight to poor, even bright pale yellow white fluorescence, trace to minor very thin faint diffuse cut.

1769-1774

SANDSTONE: pale brown to minor medium brown, very fine grained, trace to minor fine grains, quartz arenite, commonly variably silty, well sorted, angular to subrounded, predominantly clean, locally slightly to moderately argillaceous in minor part, trace argillaceous partings and laminations, commonly moderately to moderately poorly indurated and crumbly, locally moderately well to well indurated, common siliceous and minor streaky dolomitic cement, **predominantly tight to 2% porosity,** minor streaky poor to trace fair porosity, trace spotty bitumen to pyrobitumen, abundant dull yellow to minor bright yellow white fluorescence, rare to trace slow thin streaming cut.

1774-1780

SANDSTONE: as previously described with slightly decreasing variable induration, predominantly siliceous and decreasing trace to minor streaky dolomitic cement, decreasing trace variably argillaceous sandstone as above, commonly variably silty as above occasionally grading to sandy siltstone stringers, **increasing variable porosity;** common tight to 3%, minor to common 4 to 7%, minor cuttings with common quartz overgrowths and fair to good porosity, shows as above.

1780-1785.5

SANDSTONE: mixed; as above in part, **SANDSTONE:** #2 light grey to very light brown, predominantly very fine to fine grained, minor to locally common varicolored rounded coarse to upper medium chert grains, trace chert pebble fragments, sublitharenite, moderately sorted, angular to rounded, clean, moderately to moderately well indurated with common siliceous and dolomitic cement, **tight,** minor very fine to coarse grained litharenite (chert and dolomite lithic grains) with common to abundant tight siliceous cement, interbedded **SILTSTONE:** dark to medium brown, quartzose with scattered chert grains, hard to firm, occasionally soft, variably argillaceous, very dolomitic grading to silty dolomite in part, **tight.**

1785.5-1790.5

SANDSTONE: disaggregated, lower fine to upper medium grained, minor very fine and trace lower to upper coarse grains, sublitharenite grading to quartz arenite, abundant frosted to minor clear quartz with minor predominantly dark varicolored chert, moderately sorted, rounded to sub angular, trace to minor consolidated cuttings with spotty to patchy siliceous cement, trace quartz overgrowths, infer predominantly good to fair porosity, common dull yellow to bright pale yellow white fluorescence, trace very faint questionable cut.

1790.5-1796

SANDSTONE: light grey, very fine grained, silty, rare to trace fine to medium chert grains, quartz arenite, well sorted, angular to sub angular, clean, predominantly moderately to moderately well indurated, common siliceous cement, minor to locally common streaky dolomitic cement, trace interstitial pyrite, predominantly no visible porosity, trace streaky poor porosity, trace spotty to patchy bitumen to pyrobitumen, **abundant variably dull to bright yellow to yellow green fluorescence**, trace very faint questionable cut, minor interbedded **SHALE:** black to brown black, firm, platy to sub blocky, fissile, bituminous, trace coaly debris, trace pyrite nodules.

1796-1802

SANDSTONE: light tan, very fine to fine grained, quartz arenite, commonly silty in part, clean, well sorted, angular to sub angular, moderately well to moderately indurated with common siliceous and spotty to patchy dolomitic cement, **minor poorly indurated cuttings with common quartz overgrowths and fair to good porosity, predominantly tight to 3% porosity, abundant pale yellow green to minor dull yellow fluorescence**, trace very faint questionable cut, minor interbedded medium to dark brown to grey **SANDSTONE:** very fine grained, silty grading to siltstone in part, variably argillaceous, minor argillaceous partings and laminations, poorly to moderately indurated, common to abundant dolomitic cement, **tight to poor porosity**, trace black shale.

1802-1809

SANDSTONE: very similar to above, light grey, very fine grained, silty, minor very fine to fine grained sandstone with occasional scattered medium to coarse chert and pebble fragments (poor to fair porosity in part), quartz arenite, well sorted, predominantly angular to sub angular, clean, commonly moderately to moderately well indurated with common siliceous and trace to minor dolomitic cement, **predominantly tight to 2% porosity, minor streaky poor porosity, abundant weak to moderate yellow to occasionally bright pale yellow green fluorescence**, trace **slow thin streaming cut**, minor very fine to medium grained moderately sorted dolomitic sublitharenite with common argillaceous partings, minor **DOLOMITE:** medium to dark brown to grey, cryptocrystalline, variably silty to sandy grading to dolomitic siltstone stringers, slightly to moderately argillaceous, trace to minor black platy bituminous **SHALE:** with trace pyritized worm burrows.

1809-1815

SANDSTONE with SILTSTONE, SHALE and DOLOMITE:

SANDSTONE: light grey, very fine grained, commonly very silty grading to sandy siltstone in part, quartz arenite, well sorted, angular to sub angular, clean, moderately to moderately well sorted, abundant siliceous cement, trace spotty dolomitic cement, **predominantly tight, trace poor porosity, even bright pale yellow white fluorescence**, minor faint very thin diffuse cut; **SHALE:** dark brown, platy to sub platy, variably hard to firm, soft and earthy to marly in part, moderately to very dolomitic with minor to common microcrystalline to very fine crystalline dolomite rhombs grading to silty argillaceous **DOLOMITE:** in part, variably silty commonly grading to argillaceous dolomitic **SILTSTONE:**, trace to minor chert stringers to nodules.

1815-1820

SANDSTONE: as previously described with very rare glauconite, increasing trace argillaceous partings and very fine laminations, decreasing minor patchy dull to occasionally bright yellow to yellow white fluorescence, trace questionable cut, trace medium to dark grey platy firm silty and micromicaceous **SHALE:**.

1820-1827

SANDSTONE: off white to light grey, very fine to fine grained, trace lower medium grains, slightly silty in part, quartz arenite, rare to trace coarse chert grains, well sorted, angular to rounded, clean, disaggregated in part, moderately poorly to moderately well indurated, common dolomitic and siliceous cement, minor to locally common quartz overgrowths, trace interstitial pyrite, commonly tight to 3% porosity, minor 5 to 9% porosity, trace good streaks, minor fluorescence as above, trace questionable cut.

1827-1835

SANDSTONE: light tan to light grey, predominantly very fine to fine grained, minor fine to very fine grained with trace lower medium grains, quartz arenite, commonly variably silty occasionally grading to sandy siltstone stringers, well sorted, angular to subrounded to occasionally rounded, clean, commonly moderately to moderately well indurated, locally poorly to very well indurated, common locally abundant dolomitic and minor locally common siliceous cement, trace quartz overgrowths, increasing trace interstitial pyrite, predominantly tight to 2% porosity, trace to minor streaky poor porosity, minor patchy dull to occasionally bright yellow to yellow white fluorescence, trace questionable cut, trace dark grey shale.

1835-1841

SANDSTONE: similar to above, off white to light grey, very fine to fine grained, rare to trace lower medium grains, quartz arenite, commonly variably silty, moderately well to well sorted, angular to subrounded to occasionally rounded, clean, moderately to moderately well indurated, poorly indurated and crumbly in minor part, decreasing common dolomitic and increasing minor to common siliceous cement, decreasing rare to trace interstitial pyrite, predominantly tight to 2% porosity, trace streaky poor porosity, minor patchy pale yellow white fluorescence, no cut.

1841-1848

DOLOMITE: light brown, dolarenite, commonly very fine to medium grained, medium to very coarse grained in part, abundant off white to light brown very angular to sub angular dolomite grains, trace to minor quartz grains becoming locally abundant occasionally grading to dolomitic sandstone, moderately to poorly sorted, trace scattered white chert and recrystallized fossil fragments, trace to minor dolomitic matrix to cement, moderately indurated, trace to locally minor pyrite, minor poor porosity, minor patchy dull to bright fluorescence, no cut; interbedded **SANDSTONE:** grading from above in part, light brown to light grey, very fine to fine grained, minor medium and trace coarse grains, very quartzose with minor to locally common dolomite grains, moderately sorted, moderately indurated, poorly indurated and crumbly in part, common to abundant dolomitic cement, predominantly no visible porosity, trace poor to rare fair porosity, trace spotty to patchy bitumen, minor dull fluorescence, no cut.

1848-1852

SANDSTONE: light grey, very fine grained, minor lower fine grains, variably silty, quartz arenite, well sorted, angular to subrounded, clean, trace argillaceous partings, commonly poorly to moderately indurated and crumbly, well indurated in part, predominantly siliceous + minor spotty dolomitic cement, trace quartz overgrowths, rare to trace spotty kaolin, **commonly tight to 2% porosity, minor streaky poor to fair porosity, minor patchy to spotty bitumen, abundant moderate to bright yellow white to yellow fluorescence, trace faint questionable cut.**

1852-1856

SANDSTONE: very similar to above, light tan to light grey, very fine to fine grained, slightly silty, quartz arenite, well sorted, angular to subrounded to occasionally rounded, clean, commonly poorly indurated and crumbly to friable, moderately indurated in part, minor to common siliceous and trace to minor spotty dolomitic cement, minor quartz overgrowths, **variable porosity: common 6 to 9%, less common 3 to 5%, even moderate pale yellow fluorescence, trace very faint questionable cut.**

1856-1861

SANDSTONE: light grey, very fine, minor to trace lower fine grains, variably silty, quartz arenite, well sorted, angular to subrounded, clean, trace slightly argillaceous, minor argillaceous partings, commonly moderately to moderately well indurated, poorly indurated and crumbly to friable in part, predominantly siliceous and trace to minor spotty dolomitic cement, **tight to 2% porosity, minor streaky poor to fair porosity, minor spotty to patchy bitumen, minor patchy moderate yellow fluorescence, trace faint questionable cut, trace black bituminous silty to sandy shale.**

1861-1864

SANDSTONE: light tan, very fine to fine, trace medium and coarse grains, quartzose with trace to locally common dolomite grains, grades to minor dolarenite, moderately well to moderately sorted, angular to rounded, moderately to poorly indurated and crumbly, common to abundant dolomitic cement, **predominantly no visible porosity, trace streaky poor porosity, trace spotty bitumen, abundant moderate to dull yellow fluorescence, no cut, trace shale.**

1864-1869

SANDSTONE: light grey to light tan, very fine grained, trace to locally minor lower fine grains, variably silty, predominantly quartz arenite, locally trace to minor dolomite grains, well to locally moderately well sorted, angular to rounded, clean, trace argillaceous partings, variable induration: common moderately to poorly indurated, crumbly in part, locally moderately well to well indurated, common dolomitic + minor spotty to patchy siliceous cement, **tight to 2% porosity, minor streaky poor to fair porosity, trace spotty bitumen, common patchy fluorescence as above, no cut.**

1869-1875

SANDSTONE: light brown to light grey, upper fine to upper very fine grained, trace to minor lower medium grains, quartz arenite with clear to frosted quartz, moderately well sorted, angular to rounded, very clean, disaggregated in part, friable, poorly to moderately indurated, well indurated in minor part, common spotty to patchy siliceous cement, common to locally abundant quartz overgrowths, **variable porosity: common 7 to 10% with minor good streaks, less common 3 to 6% with trace to minor tight streaks, trace spotty bitumen, common patchy pale to light brown oil stain, abundant bright yellow to yellow white fluorescence, fast poor to fair thin yellow white diffuse and minor streaming cut.**

1875-1881

SANDSTONE: very similar to above, very fine to lower fine grained, rare to trace lower medium grains, slightly to moderately silty in part, quartz arenite, well to moderately well sorted, angular to rounded, clean, rare argillaceous partings, disaggregated in minor part, commonly moderately to poorly indurated and crumbly to slightly friable, moderately well indurated in part, common dolomitic and siliceous cement, minor locally common quartz overgrowths, trace interstitial pyrite, **common 6 to 9% porosity with minor good streaks, minor to common 3 to 5% with trace tight streaks, decreasing trace spotty bitumen, common patchy faint to light brown oil stain, decreasing common to abundant fluorescence as above, decreasing poor very thin diffuse and streaming cut, trace black shale.**

1881-1885

SANDSTONE: light grey, very fine grained, trace to locally minor fine grains, variably silty, quartz arenite, well sorted, angular to rounded, minor disaggregated grains, clean, commonly moderately to moderately poorly indurated, crumbly in part, locally well indurated, common siliceous + variable trace to common spotty to patchy dolomitic cement, increasing trace to locally minor pyrite, **predominantly tight to 2% porosity, minor streaky poor to rare fair porosity, minor patchy dull to moderate pale yellow fluorescence, trace faint questionable cut.**

1885-1890

SANDSTONE: as previously described becoming increasingly silty in part grading to sandy siltstone, increasing common to locally abundant dolomitic and decreasing common to minor patchy siliceous cement, **increasing trace to minor spotty to patchy interstitial pyrite, porosity and shows as above, increasing trace dark grey to black bituminous shale, pyritic in part.**

1890-1894.5

SANDSTONE with interbedded DOLOMITE:

SANDSTONE: as above in part becoming decreasingly silty, very fine to fine grained and commonly disaggregated in part, moderately to moderately well sorted, rounded to angular, **infer common fair porosity, shows as above; DOLOMITE:** light to medium grey, cryptocrystalline, very firm to hard, slightly cherty in part, variably silty to sandy grading to very dolomitic siltstone and sandstone laminations to stringers, **tight.**

1894.5-1900

SANDSTONE: light grey, very fine grained, trace locally minor fine grains, variably silty occasionally grading to sandy siltstone, quartz arenite, well sorted, angular to subrounded, predominantly clean, locally slightly to moderately argillaceous with trace to minor argillaceous partings, commonly moderately to moderately well indurated, locally poorly to very well indurated, common to abundant siliceous + trace to minor spotty to patchy dolomitic cement, increasing minor to locally common patchy to spotty pyrite, **predominantly tight to 2% porosity, trace to minor streaky poor porosity, minor dull fluorescence, no cut, trace to minor** **SHALE:** light grey green, sub platy, moderately firm to soft, very micromicaceous, very silty to sandy commonly grading to variably argillaceous siltstone.

1900-1907

SANDSTONE: light grey, very fine to upper medium grained, quartz arenite with frosted to minor clear quartz, moderately sorted, rounded to sub angular, clean, predominantly disaggregated, minor poorly to very poorly indurated cuttings with spotty siliceous and dolomitic cement, increasing minor locally common patchy to spotty pyrite, trace spotty kaolin, **variable good to poor porosity in consolidated cuttings, infer predominantly good to fair porosity, common spotty to patchy bitumen, common patchy yellow green and pale yellow fluorescence, minor poor faint streaming and diffuse cut, trace to minor laminated to mottled soft marly to anhydritic stringers.**

1907-1910

SANDSTONE: light grey to faint brown, very fine to upper fine grained, slightly silty, quartz arenite with common to abundant frosted quartz, clean, moderately well sorted, rounded to angular, predominantly poorly indurated and friable, common dolomitic cement, decreasing minor spotty to patchy pyrite, predominantly variably fair porosity with locally good to poor streaks, trace spotty bitumen, **abundant to even bright pale yellow green fluorescence, common poor thin diffuse and streaming cut.**

1910-1916

SANDSTONE: light grey, very fine grained, moderately to very silty grading to siltstone in part, quartz arenite, angular to sub angular, commonly moderately well to very well indurated, common siliceous and minor dolomitic cement, common to locally abundant patchy to spotty pyrite cement, poorly indurated and crumbly in part, **predominantly tight to 3% porosity, minor streaky poor to fair porosity, trace to minor spotty bitumen, abundant pale yellow fluorescence, trace very faint cut as above, minor anhydritic stringers: white, common to abundant dark brown very fine mottles and laminations, chalky, soft, pyritic in part, trace very pyritic graphite laminations.**

1916-1921

SANDSTONE: light tan to light grey, very fine to fine grained, slightly silty in part, quartz arenite with predominantly clear quartz, well sorted, angular to rounded, disaggregated in part, poorly to moderately indurated, friable, siliceous cement, minor to common quartz overgrowths, **variable porosity:** common fair with minor good streaks, minor to common poor with trace tight streaks, trace spotty bitumen, **abundant bright yellow white fluorescence, trace faint questionable cut,** minor **SHALE:** black, platy, very firm to hard, brittle, fissile, carbonaceous to bituminous with common coaly debris and partings, minor claystone stringers.

1921-1927

SANDSTONE and SILTSTONE:

SANDSTONE: light brown, very fine grained, trace lower fine grains, silty, quartz arenite, moderately well sorted, angular to subrounded, trace argillaceous partings, moderately well to moderately poorly indurated, dolomitic and siliceous cement, **tight to poor porosity, even moderate light yellow fluorescence, no cut,** minor medium brown very fine to fine moderately sorted variably argillaceous sandstone with minor argillaceous partings and common dolomitic cement, **tight, interbedded**
SILTSTONE: medium to dark brown, firm to hard, locally soft and crumbly, quartzose, variably argillaceous, moderately to very dolomitic, **tight, minor** **SHALE:** similar to above becoming slightly pyritic in part, rare pyritized ostracode, minor marlstone light to medium grey with very fine white mottles and laminations, soft, chalky, trace claystone.

1927-1935

SANDSTONE: buff to tan, very fine grained, trace fine grains, silty grading to minor sandy siltstone, very quartzose, well sorted, angular to sub angular, predominantly poorly to moderately indurated with common to abundant dolomitic cement to matrix, grading to minor sandy dolomite, **well indurated in minor part with streaky tight siliceous cement, predominantly no visible porosity, trace streaky poor porosity, common dull to moderate yellow fluorescence, trace faint questionable cut,** trace to minor **DOLOMITE:** medium brown, cryptocrystalline, brittle, recrystallized dolomitized wackestone, **tight.**

1935-1941

SILTSTONE: light to medium grey, very quartzose, trace muscovite and dark specks, predominantly hard and dense, slightly to variably sandy occasionally grading to sandstone, common siliceous and dolomitic cement, slightly argillaceous in part, minor to common argillaceous to micaceous partings and laminations, minor to locally abundant pyrite, locally moderately indurated with trace to minor poor porosity, predominantly tight, trace spotty bitumen, **trace to minor dull fluorescence, no cut,** minor **SHALE:** black to black brown, platy, fissile, firm to soft, very micromicaceous, silty to slightly sandy in part, minor medium to very coarse occasionally graphitic pyrite nodules, minor **CLAYSTONE:** light to medium brown, very fine white to light grey mottles and laminations, very soft, bentonitic.

1941-1946

SHALE: black to brown black, sub platy to sub blocky, firm to hard, fissile, smooth and faintly micromicaceous in part, variably silty to slightly sandy in part occasionally grading to argillaceous siltstone laminations to stringers, trace to minor locally very micromicaceous, carbonaceous to bituminous in part, sub waxy in part grading to claystone, minor pyrite nodules, minor dark brown siderite nodules and stringers.

1946-1952

SILTSTONE: light brown, very quartzose, slightly to moderately sandy grading to silty sandstone in part, moderately well to moderately poorly indurated, abundant dolomitic cement to matrix, grades to minor silty to sandy dolomite, slightly argillaceous in minor part, trace argillaceous partings to laminations, minor dolomite allochems, **no visible porosity, common dull fluorescence, no cut;** interbedded **SANDSTONE:** light grey to light brown, very fine grained, silty grading to siltstone in part, quartz arenite, well sorted, angular to sub angular, commonly moderately to moderately well indurated, poorly indurated and crumbly in part, predominantly siliceous + minor spotty to streaky dolomitic cement, **common to abundant dull yellow to moderate yellow white fluorescence, trace faint questionable cut.**

1952-1954.5

SANDSTONE: light grey, lower fine to upper medium grained, trace silt and coarse grains, quartz arenite, frosted to clear quartz, moderately to moderately well sorted, rounded to angular, clean, predominantly disaggregated, minor poorly to well indurated cuttings with minor to locally abundant siliceous cement, **variable tight to good porosity in consolidated cuttings, infer common fair to good porosity, trace spotty bitumen, minor dull to bright fluorescence, trace faint questionable cut.**

1954.5-1960

SANDSTONE: light brown, very fine grained, trace lower fine grains, moderately silty grading to siltstone in part, quartz arenite, trace dolomite grains, well sorted, angular to sub angular, clean, locally slightly argillaceous, trace argillaceous partings and laminations, moderately well to moderately poorly indurated, common to abundant dolomitic cement, occasionally grades to sandy dolomite, **predominantly tight to 2% porosity, abundant dull yellow fluorescence, trace faint questionable cut,** minor **SANDSTONE: #2** very fine to fine grained, quartz arenite, well sorted, clean, poorly indurated, crumbly to friable, siliceous cement, minor quartz overgrowths, **common fair to trace streaky good porosity, tight to poor in part, trace to minor spotty bitumen, abundant dull to moderate fluorescence, trace to minor very poor faint diffuse cut.**

1960-1965

SANDSTONE: similar to above, light brown, very fine grained, trace to locally minor lower fine grains, variably silty grading to minor siltstone, quartz arenite, well sorted, angular to subrounded, clean, trace to minor argillaceous partings and laminations, moderately well to moderately poorly indurated, locally very well indurated, common to abundant siliceous cement, trace to minor quartz overgrowths, **tight to 2% porosity, minor streaky poor to fair porosity, trace spotty bitumen, abundant bright yellow white fluorescence, minor poor faint diffuse cut, trace black shale.**

1965-1974

SANDSTONE: light brown to light grey, predominantly very fine grained, trace locally minor lower fine grains, variably silty occasionally grading to sandy siltstone, quartz arenite, well sorted, angular to sub angular, predominantly clean, trace to minor slightly argillaceous, trace argillaceous partings, predominantly moderately to moderately well indurated, locally poorly to very well indurated, predominantly siliceous cement, trace to locally minor spotty to patchy dolomitic cement, trace locally common spotty to patchy kaolin, trace to minor quartz overgrowths, common poor (3 to 6%) porosity, tight to 2% in part, trace streaky fair porosity, common patchy to spotty to occasionally streaky bitumen to pyrobitumen, abundant to even dull yellow green fluorescence, trace very faint questionable cut, trace **SHALE:** black, platy, firm, micaceous, bituminous, commonly silty.

1974-1981

SANDSTONE: light to medium brown to brown grey, very fine grained, predominantly moderately to very silty commonly grading to sandy siltstone, quartz arenite, well sorted, angular to sub angular, increasingly slightly argillaceous in minor part, minor argillaceous partings, moderately well to poorly indurated and crumbly, siliceous + trace spotty dolomitic cement, trace spotty kaolin, predominantly no visible porosity, trace to minor streaky poor porosity, minor spotty to patchy pyrobitumen, fluorescence and cut as above.

1981-1986

SANDSTONE with interbedded SHALE:

SANDSTONE: light brown, very fine to fine grained, minor medium grains, quartz arenite, moderately well to moderately sorted, angular to rounded, predominantly clean, slightly to moderately argillaceous in minor part, increasing minor to locally common argillaceous to bituminous partings, disaggregated in part, commonly poorly indurated and friable to crumbly, moderately to moderately well indurated in part, common to locally abundant siliceous cement, common quartz overgrowths, common tight to 3% porosity, minor to common streaky fair to poor porosity in part, decreasing common to abundant fluorescence as above, cut as above, minor interbedded **SHALE:** black, platy, firm to soft, micromicaceous, bituminous, slightly to very silty occasionally grading to argillaceous siltstone stringers, minor dark brown soft chalky mottled in part bituminous? claystone, trace anhydritic stringers with dark brown mottles and laminations.

1986-1990

SANDSTONE with SHALE:

SANDSTONE: as previously described becoming slightly finer grained, increasingly silty in part, increasing minor to common argillaceous to bituminous partings, increasing minor interbedded **SHALE:** similar to above, black to very dark brown, platy to sub blocky, soft to firm, fissile, bituminous to very bituminous, micromicaceous, sub resinous, trace claystone as above, trace anhydritic stringers as above.

1990-1995

SANDSTONE: light brown, very fine to fine grained, trace lower medium grains, quartz arenite, predominantly clear quartz, moderately well sorted, angular to subrounded, occasionally rounded, slightly to moderately silty in part, clean, rare to trace argillaceous partings, disaggregated in part, moderately to well indurated in part, poorly indurated and friable to crumbly in part, common to locally abundant siliceous cement, minor locally common quartz overgrowths, trace spotty kaolin, **common tight to 3% porosity, less common 4 to 8% porosity, trace streaky good porosity, abundant dull yellow green fluorescence, minor poor very thin diffuse and streaming cut, trace shale stringers as above.**

1995-2000

SANDSTONE: very similar to above becoming finer, light tan, very fine to fine grained, rare lower medium grains, commonly variably silty, quartz arenite, moderately well sorted, angular to subrounded, predominantly clean. slightly to moderately argillaceous in minor part, trace argillaceous partings, disaggregated in minor part, moderately to well indurated in part, poorly indurated and friable to crumbly in part, common to abundant siliceous cement, minor quartz overgrowths, trace spotty kaolin, **common tight to 2% porosity, minor streaky 4 to 8% porosity, abundant dull to very dull yellow green fluorescence, trace very faint questionable cut, trace shale as above.**

2000-2005

SANDSTONE: predominantly as above, minor **SANDSTONE:** #2 light grey, fine to very fine grained, trace lower medium grains, quartz arenite, moderately well sorted, angular to subrounded, clean, commonly disaggregated, minor to common poorly to moderately well indurated consolidated cuttings, common spotty to patchy siliceous cement, common to abundant quartz overgrowths, rare to trace spotty kaolin, **common variable fair to good porosity in consolidated cuttings, minor poor to tight streaks, abundant dull to moderate yellow fluorescence, no cut.**

2005-2010

SANDSTONE: very similar to above becoming slightly coarser, light brown, very fine to fine grained, rare lower medium grains, slightly silty, quartz arenite, moderately well sorted, angular to subrounded, clean, trace argillaceous partings, disaggregated in part, moderately to well indurated in part, poorly indurated and friable to crumbly in part, common to abundant siliceous cement, minor to common quartz overgrowths, trace spotty kaolin, **common tight to 2% porosity, minor streaky 4 to 8% porosity, abundant dull to very dull yellow green fluorescence, trace very faint questionable cut.**

2010-2015

SANDSTONE: light tan, very fine to fine grained, trace lower medium grains, commonly slightly to moderately silty, moderately well sorted, angular to subrounded, clean, trace argillaceous partings, decreasingly disaggregated in minor part, variably moderately poorly to well indurated, common to locally abundant siliceous cement, rare to trace spotty dolomitic cement, minor quartz overgrowths, trace patchy pyrite, predominantly variably poor to tight porosity, minor streaky fair porosity, common dull yellow to trace bright yellow white fluorescence, no cut, trace black bituminous shale stringers.

2015-2019

SANDSTONE: light to medium brown, very fine, trace fine grains, silty, quartz arenite, well sorted, angular to sub angular, variably argillaceous in minor part, minor to common argillaceous partings, commonly moderately well to very well indurated, common to abundant siliceous cement, trace spotty kaolin, trace patchy pyrite, locally very fine to fine grained with common quartz overgrowths and fair porosity, minor to common dull fluorescence, trace faint questionable cut, minor interbedded **SHALE:** and **CLAYSTONE:** as described below.

2019-2022

CLAYSTONE: dark brown, very soft, very bituminous with common to abundant fair yellow green cut, variably pyritic in part, minor to locally common irregular to chaotic very fine anhydritic laminations and stringers, locally fissile with abundant carbonaceous to coaly material grading to **SHALE:** black, variably firm to soft, very fissile, very carbonaceous to coaly grading to shaly bituminous to sub-bituminous coal.

2022-2030

SANDSTONE with interbedded SHALE and CLAYSTONE:

SANDSTONE: variable: light to medium brown, very fine grained and silty grading to siltstone in part, very fine to fine with trace to minor lower medium grains in part, very quartzose, moderately to moderately well sorted, angular to subrounded, clean to variably argillaceous, common to abundant argillaceous partings, variably very well to moderately indurated, abundant to common siliceous cement, trace kaolin, locally moderately poorly indurated in part, trace locally common patchy pyrite, predominantly tight to 2% porosity, trace to minor streaky poor to rare fair porosity, minor to common very dull fluorescence, trace very faint cut, minor light brown very fine to fine grained sandstone, clean quartz arenite, well sorted, moderately poorly to moderately well indurated, common to abundant siliceous cement, common quartz overgrowths, streaky poor to fair porosity, abundant very dull fluorescence, trace very faint questionable cut; minor interbedded **CLAYSTONE:** and **SHALE:** as above.

2030-2036

SANDSTONE with interbedded SHALE and CLAYSTONE:

SANDSTONE: predominantly as above, minor to common medium brown, very fine to fine grained, trace lower medium grains, silty, very quartzose, moderately sorted, angular to rounded, predominantly slightly to moderately argillaceous, clean in part, common to abundant argillaceous partings, moderately well to moderately poorly indurated, common to abundant siliceous cement, trace spotty kaolin, trace spotty to patchy pyrite, trace to minor sandy pyrite nodules, **predominantly tight to 2% porosity, trace dull fluorescence, rare faint questionable cut;** **CLAYSTONE:** as above, increasing **SHALE:** as above commonly grading to bituminous coal.

2036-2039

SANDSTONE: light brown, very fine grained with trace lower fine grains, very fine to fine grained in minor part, variably silty occasionally grading to sandy siltstone, quartz arenite, well sorted, angular to subrounded, predominantly clean, minor argillaceous partings, moderately well to moderately poorly indurated, abundant to common siliceous cement, trace spotty kaolin, rare to trace spotty dolomitic cement, minor locally common quartz overgrowths, **commonly tight, minor to common streaky poor to fair porosity, abundant very dull fluorescence, no cut, trace shale as above.**

2039-2044

SANDSTONE: variable as previously described in part, predominantly very similar to above becoming slightly finer, increasingly silty in part grading to minor sandy siltstone, clean to locally variably argillaceous, increasing minor to common argillaceous partings, very well indurated in part, **decreasing predominantly tight porosity, minor streaky poor porosity, fluorescence and cut as above,** trace to minor coal stringers: black to brown black, soft to firm, bituminous, shaly in part grading to bituminous shale as above, trace bituminous claystone as above.

2044-2050

SANDSTONE: light brown, very fine grained, trace lower fine grains, variably silty, quartz arenite, well sorted, angular to sub angular, predominantly clean, trace slightly argillaceous, trace to minor argillaceous partings, variably indurated: moderately to moderately well in part, poorly to moderately poorly and crumbly to friable in part, common to abundant siliceous cement, trace spotty to patchy pyrite, rare to trace spotty kaolin, trace quartz overgrowths, **predominantly tight to 3% porosity, minor streaky poor to fair porosity, trace spotty bitumen, abundant to even dull yellow green fluorescence, trace faint diffuse cut, trace bituminous shale and coal as above.**

2050-2055

SANDSTONE: mixed: as above in part, variably brown to brown grey, predominantly very fine grained and variably silty, minor very fine to fine grained, very quartzose to quartz arenite, clean to variably argillaceous, minor very siliceous siltstone, variably poorly to very well indurated, common to abundant siliceous cement, trace spotty kaolin, trace pyrite, predominantly tight to 2%, minor streaky poor to fair porosity, common patchy dull fluorescence, trace questionable cut; interbedded **CLAYSTONE:** very bituminous with anhydritic laminations and mottles as above, minor bituminous **COAL:** grading to bituminous **SHALE:** as above, silty to sandy in part, minor to common sandy sideritic stringers to nodules.

Décollement Consulting Ltd.



Scale 1:240 (5"=100') Metric

Well Name: Paramount et al Liard NWT I-46
 Location: I-46 / 60-10, 123-15
 Licence Number: WID 1871
 Spud Date: 12-Nov-99 14:00hrs
 Surface Coordinates: Lat: 60 deg. 05' 32.474"
 Long: 123 deg. 22' 53.612"

Region: Ft. Liard
 Drilling Completed: 08-Jan-00 09:00hrs

Bottom Hole

Coordinates:

Ground Elevation (m): 537.2 K.B. Elevation (m): 542.2

Logged Interval (m): 20 To: 2055 Total Depth (m): 2055

Formation: Mattson

Type of Drilling Fluid: Gel chem/Invert/Nitrified Air/Invert

Printed by WellSight Log Viewer from WellSight Systems Inc. 1-800-447-1534 www.wellsight.com

OPERATOR

Company: Paramount Resources Ltd.
 Address: 4000 First Canadian Centre
 350 - 7th Avenue S.W.
 Calgary, Alberta T2P 3W5

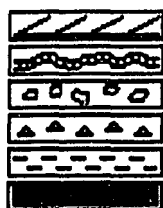
GEOLOGIST

Name: Gary Johansson
 Company: Decollement Consulting Ltd.
 Address: Suite 200, 1009 - 7th Avenue S.W.
 Calgary, Alberta T2P 1A6

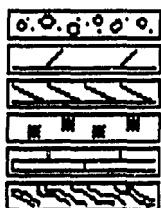
DSTs

DST #1: 1365-1392m; DST #2: 1323-1343m; DST #3: 1332-1352m
 DST #4: 1213-1227m; DST #5: 1734-1740m; DST #6: 1785-1789m
 DST #7: 1899-1903m

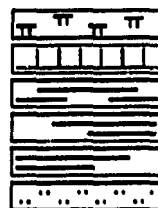
ROCK TYPES



Anhy
 Bent
 Brec
 Cht
 Clyst
 Coal



Congl
 Dol
 Gyp
 Igne
 Lmst
 Meta



Mrist
 Salt
 Shale
 Shcol
 Shgy
 Siltst



Ss
 Till
 Blank
 Nosample
 Siderite

ACCESSORIES

MINERAL



Anhy
 Arggrn



Sandy
 Silt
 Sil



Pelec
 Pellet
 Pisolite



fracture
 Fault
 thrust f

ACCESSORIES

MINERAL

Anhy
 Arggrn
 Arg
 Bent
 Bit
 Breclrag
 Calc
 Carb
 Chtdk
 Chtit
 Dol
 Feldspar
 Ferrpel
 Ferr
 Glau
 Gyp
 Hvymin
 Kaol
 Marl
 Minxi
 Nodule
 Phos
 Pyr
 Salt

Sandy
 Silt
 Sil
 Sulphur
 Tuff
 cht-nod
 bitumen
 Rhombs

FOSSIL

Algae
 Amph
 Belm
 Bioclst
 Brach
 Bryozoa
 Cephal
 Coral
 Crin
 Echin
 Fish
 Foram
 Fossil
 Gastro
 Oolite
 Ostra

Pelec
 Pellet
 Pisolite
 Plant
 Strom
 spics
 inoceram
 calcisph
 coral

STRINGER

Anhy
 Arg
 Bent
 Coal
 Dol
 Gyp
 Ls
 Mrst
 Sitstrg
 Ssstrg
 sidstrg
 clystrn
 hematite
 Gravel
 Slickens

fracture
 Fault
 thrust f
 Chert

TEXTURE

Boundst
 Chalky
 Cryxln
 Earthy
 Finexln
 Grainst
 Lithogr
 Microxln
 Mudst
 Packst
 Wackest
 cross la
 clmb-rip
 convlam
 hummk-xs
 wvy par
 xbed-trg
 Tab-plnr
 bloturb
 Arg lamn

OTHER SYMBOLS

POROSITY TYPE

Earthy
 Fenest
 Fracture
 Inter
 Moldic
 Organic
 Pinpoint
 Vuggy

SORTING

Well
 Moderate
 Poor

ROUNDING

Rounded
 Subrnd
 Subang
 Angular

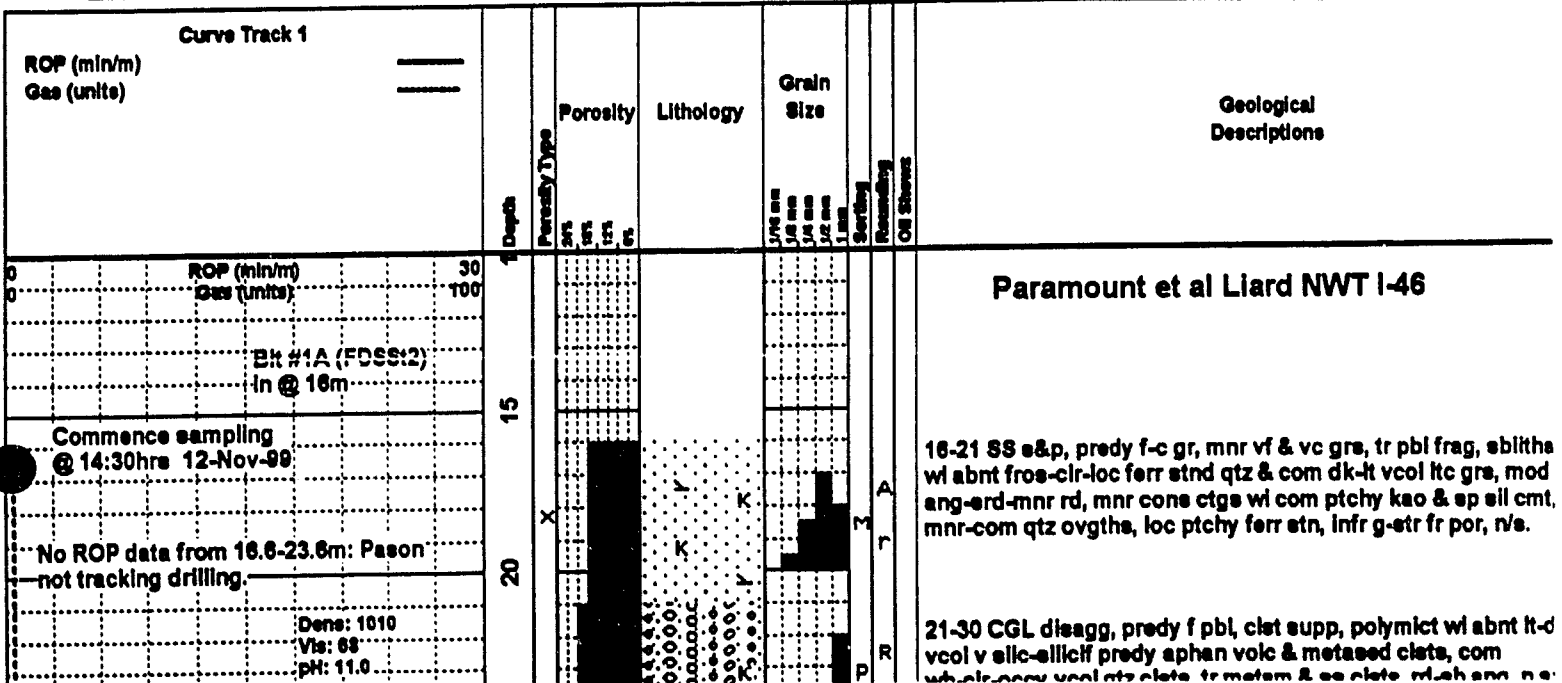
OIL SHOWS

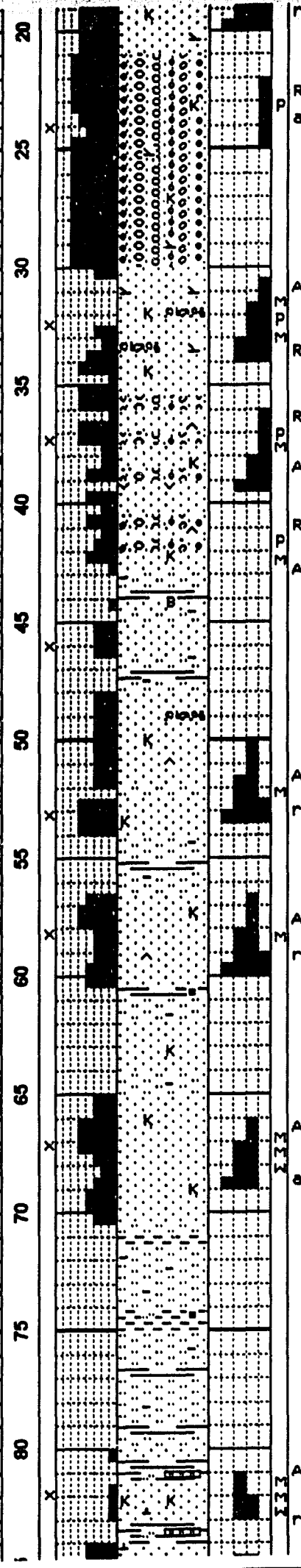
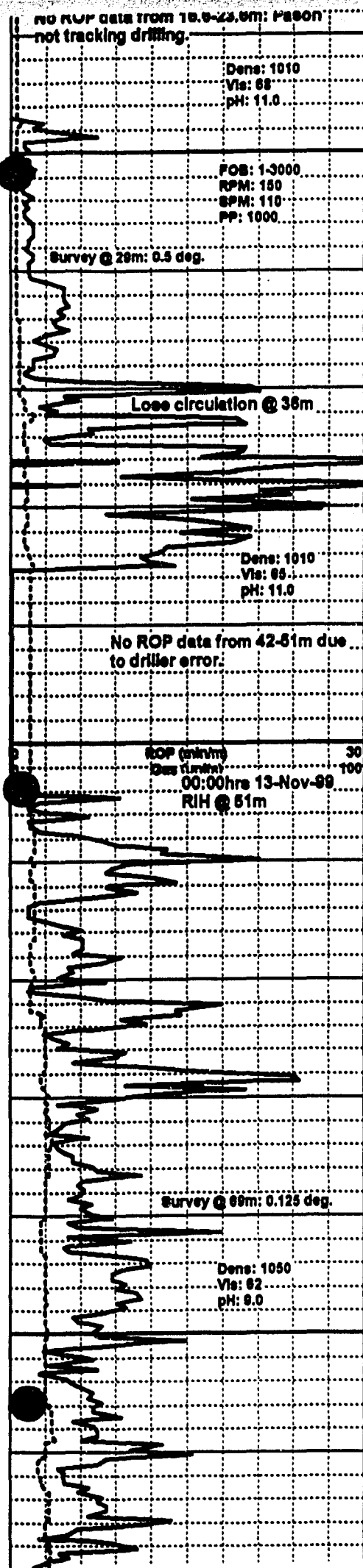
Even
 Spotted
 Ques
 Dead
 Vspotty

INTERVALS

None
 Core

Dst
 EVENTS
 Rft
 Sidewall
 Slide
 Casing





21-30 CGL disagg, predy f pbl, clst supp, polymict wl abnt lt vcol v silic-silicif predy aphan volc & metased clste, com wh-clr-occy vcol qtz clste, tr metam & ss clste, rd-ab ang, p s mtz: vf-c gr ss aa, tr ep kao & sil cmt on clste, tr ptchy ferr st Infr predy g-ex por, n/s.

30-35 SS orng-mot orng wh, f-vc gr, pbly, litharen-ab litharen abnt qtz & com-abnt vcol ltc gra-clste as prev desc, mod p-m ert, ang-rd, comy disagg lp, com p-mod ind cone ctge wl abnt limonitic cmt-mtz, loc com-abnt ptchy kaol, mnr hematitic stn crusts on gra, Infr tt lp wl str-ptchy fr-g por, n/s.

****Note: Samples 40-50 were of very poor quality.**

35-40 SS & CGL: predy as desc from 18-30m, Infr thnly Intbd var str fr-g por, mnr Intbd SS #2 lt-m gy, e&p, vf gr, qtzolitic, elty & arg wl el bent mtz, el tuffac wl com scat mica, tt, n/s, tr strg; m-dk gy, v arg, el edy, p-mod ind, tt, n/s, grde-elty bento lp.

40-50 SS predy aa, tr SS #2 aa, mnr-com Intbd SLTST; lt gy-lt qtzs, predy vary arg, mnr scat carb deb & mica, p-mod ind, gr elty sh lp, loc edy occy grd-g-elty ss lamn, mnr thn Intbd SH; lt frm, ab pty-ab biky, ab fls, comy vary elty & mm, loc com carb epke, el bento, ab wxy lp grd-g-elyt.

****Note: Shaker bypassed from 50-75m. Samples of suspect quality.**

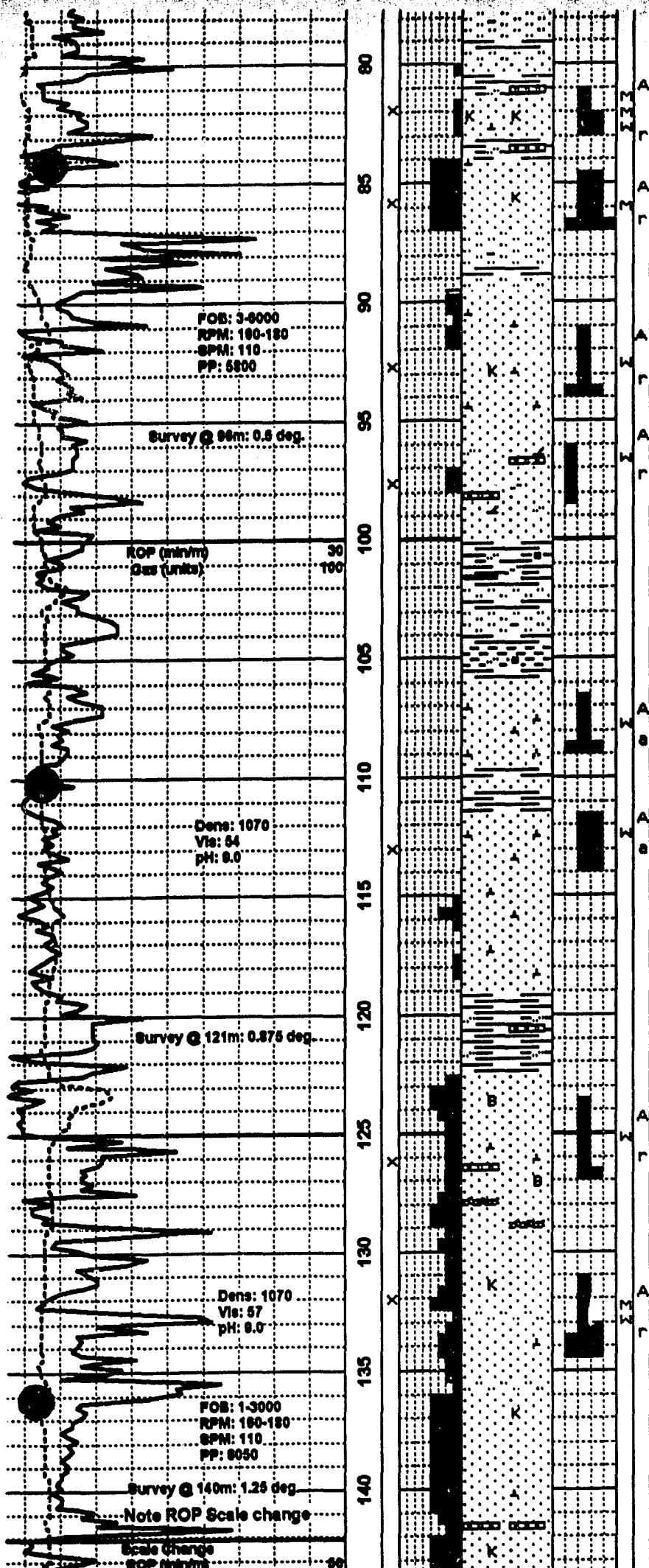
50-55 SS wl Intbd SLTST & mnr SH; SS unconc-disagg, f-c gr, mnr vf & vc gra, ocll pbl, litharen grd-g-elitharen, abnt clr-fro qtz wl com vcol ltc gra, mnr rd brn eldc gra, mody ert, ang-erd, cone ctge wl ep ell & kao cmt, Infr g por, n/s; SLTST lt-m gy, qt com scat mica & carb epke, comy vary arg-loc cin, p ind, tt, n/s SH dk gy, frm, ab pty-ab biky, predy vary elty, com scat carb d & ocll coaly ptge & lamn, mnr Intbd elyt.

55-70.5 SS off wh, e&p, vf-m gr, tr c gra, elitharen, abnt clr-fro qtz & com vcol ltc gra, tr mica, mod-mod w ert, ang-ab ang, pre disagg, mnr cone ctge wl com ep-ptchy kao cmt, tr ep silic cmt qtz ovgtse, Infr str fr-g por, n/s.

70.5-75.5 SLTST wl Intbd CLYST; SLTST lt-m gy, qtzs, com sca mica, mnr carb epke, p-mod ind wl silic cmt lp, comy vary arg, lo edy grd-g-vf ss strg, tt, n/s; CLYST predy lt gy, frm-loc sft, brt lp ab wxy, vary elty lp occy grd-g-arg eltet lamn, loc v carb-coaly, t eldc lamn.

75.5-80 SLTST wl mnr Intbd SH; SLTST m brn-orng brn, qtzs, micac, mnr carb epke, mod-p ind, predy vary arg grd-g-elty sh lp com-abnt ferr stn, tt, n/s; SH aa bcng Inctly mm, tr mar elyt stn.

80-84 SS wl Intbd SH; SS v lt gy-off wh, e&p, f-m gr, elitharen, abnt froe-clr qtz wl com vcol ltc gra, rr glau, mod-mod w ert, ang-erd, comy disagg, mnr cone ctge wl com-abnt ptchy kao, m loc com calc cmt, Infr pred p por, n/s; SH lt-m gy, frm, ab biky, predy v elty grd-g-arg eltet lp.



80-84 SS w/ Intbd SH; SS v lt gy-off wh, e&p, f-m gr, eblitharen, abnt froe-clr qtz w/ com vcol ltc gra, rr glau, mod-mod w art, ang-erd, comy disagg, mnr cone ctgs w/ com-abnt ptchy kao, mnr loc com calc cmt, infr pred p por, n/a; SH lt-m gy, frm, ab bkly, predy v elty grd-g arg eltet lp.

84-89.5 SS w/ Intbd SLTST & SH; SS uncone-disagg, f-m gr, mnr vf & c gra, tr vc gra, litharen w/ abnt clr-froe-occy vcol qtz & com-abnt vcol ltc gra, mod art, ang-erd, tr cone ctgs w/ sp-ptchy kao & elc cmt, mnr qtz ovghs, infr str fr-g por, n/a; SH & SLTST elm-abv.

89.5-95 SS off wh-lt gy, predy f gr, mnr vf & m gra, eblitharen grd-g-litharen, abnt froe-clr qtz & com vcol ltc gra, tr rd brn eldc gra, w art, ang-erd, disagg lp, com cone ctgs abnt tt calc cmt, tr-mnr sp kao, tt-str p por, n/a.

95-100 SS lt-m gy, vf gr, qtzolithic, rr glau, comy vary micac, w art, ang-ab ang, mod-p ind w/ loc com dolc cmt, comy vary elty grd-g-ady eltet lp, cin-loc arg, tt-p por, n/a.

100-106 SH/CLYST w/ mnr Intbd SLTST; SH dk gy, eb plty, frm, comy vary elty & mm, com carb-coaly deb & ptgs, tr-mnr coaly strg, CLYST lt-m gy, brn, ab bkly, sm-loc elty, carb-coaly lp, SLTST aa.

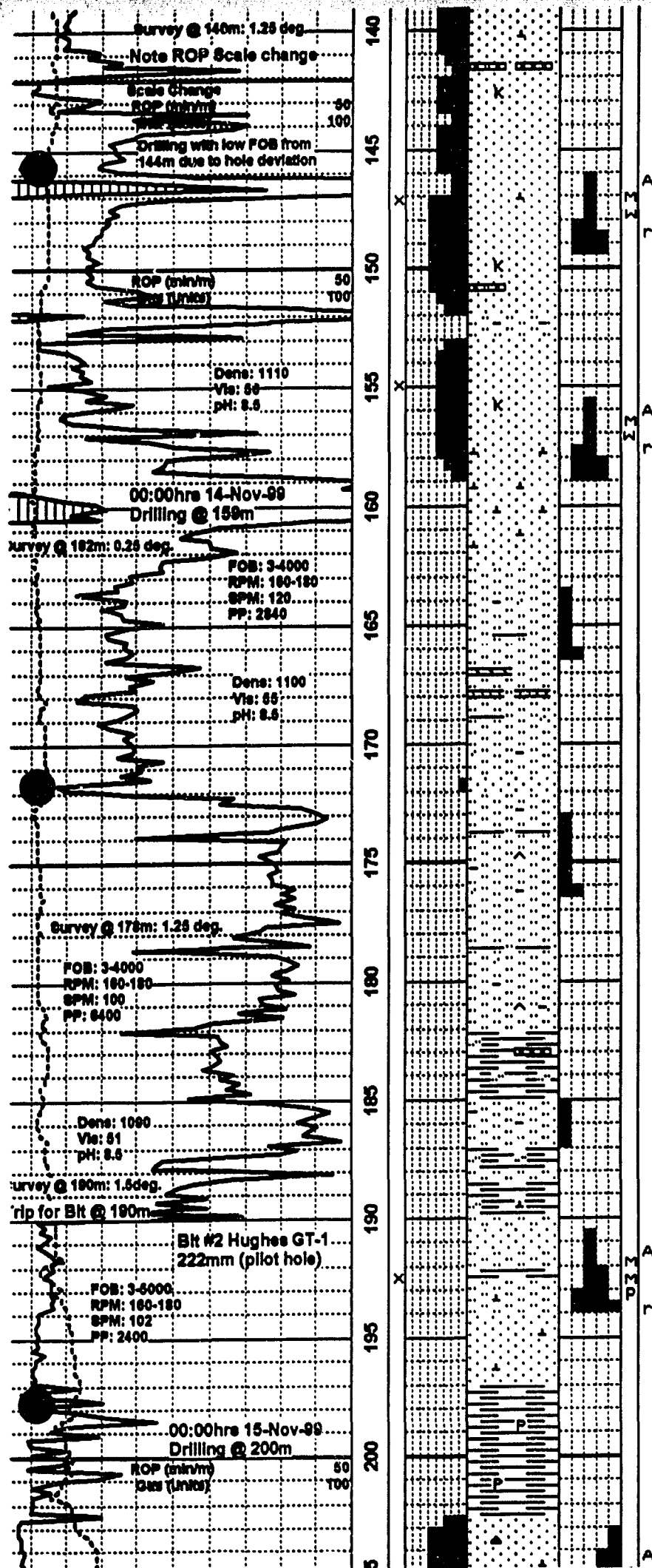
106-110 SS off wh, predy f gr, mnr vf & m gra, eblitharen, abnt wh-froe-mnr clr qtz w/ mnr-com vcol ltc gra, w art, ang-ab ang, disagg in mnr pt, mod-mod p ind w/ abnt tt calc cmt, tt, n/a, mnr thn Intbd sh aa.

110-119 SS w/ mnr Intbd SH & SLTST; SS aa bcmg predy f-m gr, bcme comy disagg w/ decr mnr-com cone ctgs aa prev desc, mod w art, infr com tt-p por w/ mnr fr stks, n/a; SH & SLTST aa prev desc.

119-122.5 SH m gy, frm, brit lp, ab bkly-bkly, predy elty & mm occy grd-g-arg eltet strg-lamn, mnr loc com carb deb & ptgs, tr hd brn eldc strg.

122.5-130 SS wh, predy f gr, mnr lm & tr uvf gra, eblitharen w/ abnt clr-froe qtz & mnr predy lt vcol ltc gra, tuffac tex w/ com blot & sp bentic cly mtz, w art, ang-erd, comy disagg, mnr-com cone ctgs w/ mnr loc com calc cmt, infr com p por w/ mnr fr-g stks, n/a, mnr pale blue wh tuffac bent strg, tr eltet strg.

130-145 SS wh, e&p, vf-m gr, litharen grd-g-ab litharen, abnt froe-clr qtz w/ com dk-lt vcol ltc gra, tr eldc gra & mica, mod w art, ang-erd, predy disagg, mnr cone ctgs w/ sp kao & elc cmt, mnr loc com calc cmt, tr qtz ovghs, infr fr-g por, n/a, tr-mnr Intbd SLTST m gy, qtz, micac, comy vary arg, tr scat carb deb, mnr shly lame.



145-155 SS alm-abv, unconc-disagg, a&p, vf-m gr, litharen grdg-ablitharen, abnt froe-clr qtz w/ com vcol ltc grs, tr blot, rr glau, mod w art, ang-ard, tr cone ctgs w/ sp kaol, mnr calc cmt, lnfr g-etr fr por, n/s, mnr lnfrd SLTST m gy, qtzolthlc, scat mica & carb epks, predy vary arg, mod lnd tr dolc cmt, tt, n/s.

155-162.5 SS as prev desc bcmg incrly cone in mnr pt w/ loc abnt tt calc cmt & mnr sp kaol, lnfr por ss w/ mnr tt-p etks, n/s.

SULLY FORMATION @ 162.6m MD; 379.7m SS

162.6-172 SLTST it gy, mnr m gy, qtzs, mnr-loc com blot, tr-mnr carb epks, rr glau, comy cln-loc vary arg, mod-p lnd, elic cmt lp, tr-mnr carb ptg, loc vary edy grdg-mnr vf ss lame-strg, tt-p por, n/s, mnr m gy v elty sh strg & lamn, tr-mnr m brn dne hd eld nod-strg.

172-182 SLTST alm-abv, lt-m gy, qtzs, mnr-loc com blot, tr-mnr carb epks, rr glau, comy vary arg-loc cln, mod-p lnd, elic cmt lp, tr carb ptg, loc vary edy grdg-mnr vf ss lame-strg, tt, n/s, mnr m gy v elty sh strg & lamn, tr brn edy eldc lame-strg.

**Note: Samples 185 & 190 are of poor quality.

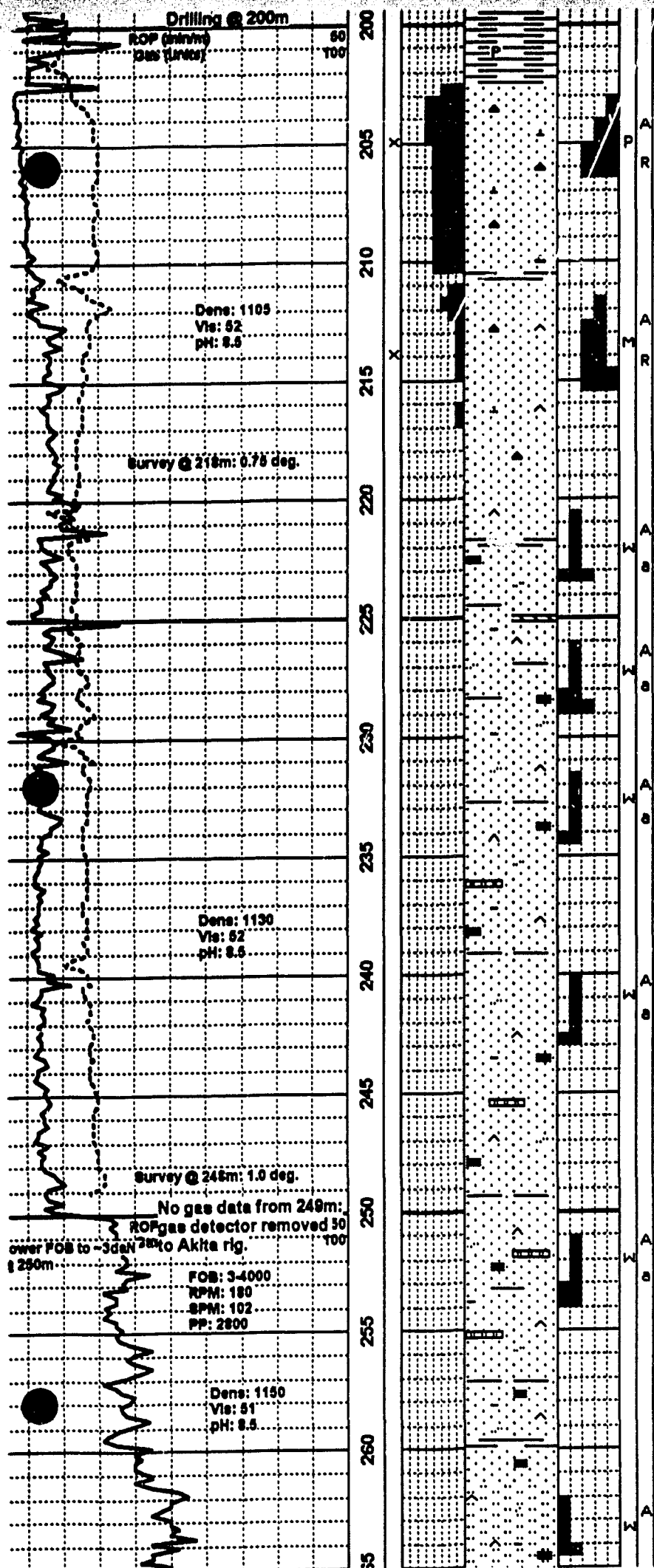
182-190 SH w/ lnfrd SLTST; SH m-dk gy, brn gy, frm, sb blk-eb pity, mm, predy v elty grdg-arg sltst lp, tr carb epks, SLTST aa.

190-197 SS w/ lnfrd SLTST & SH; SS disagg, vf-m gr, mnr c-vc grs & pbl frag, litharen grdg-ablitharen, abnt wh-froe qtz w/ com vcol ltc grs, rr-tr glau, mod-mod p art, ang-ard-occy rd, tr cone ctgs w/ abnt tt calc cmt, lnfr tt-p por lp, p-fr por lp, n/s; SLTST & SH aa.

197-202.6 SH dk gy, frm-loc hd, brit lp, sb pity, fls, predy sm, loc el elty in mnr pt, tr fram pyr mlc node, rr dk brn sl dolc chyt lame-strg.

SIKANNI FORMATION @ 202.6m MD; 339.6m SS

202.6-210 SS a&p, f-vc gr, gritty-el pblly litharen, abnt cln-froe qtz w/ abnt predy dk gy-blk cht grs, p art, ang-rd, disagg, mnr cons



SIKANNI FORMATION @ 202.6m MD; 339.6m SS

202.6-210 SS s&p, f-vc gr, gritty-el pbly litharen, abnt clr-froes qtz wi abnt predy dk gy-blk cht gra, p ert, ang-rd, disagg, mnr cons ctgs wi com ep-ptchy calc cmt, mnr qtz ovghs, fining down to sim-below, Infr predy g por, rr ep pyblt? spks, mnr ep dull-m yel flor, n cut.

210-220 SS sim-abv bcmg fnr, f-m gr, mnr c & tr vc gra, sblitharen grdg-litharen, abnt froe-clr qtz wi com predy dk cht & ltc gra, rr glau, mod ert, ang-rd, prady disagg, mnr cons ctgs wi com-abnt tt silc cmt, mnr ep calc cmt, tr intetl pyr, Infr var por: com tt-p wi str fr por, n/s, mnr thn Intbd SH.

220-225 SS aa lp, predy v lt gy-brn gy, vf gr, sblitharen wi mnr dk ltc gra & carb epks, tr glau, w ert, ang-ab ang, vary elty lp occy grdg-edy eltet lame, comy p ind & crmbly wi mnr ep silc cmt, el arg lp, tt-p por, n/s, mnr thn Intbd SH m-dk gy, frm-ett, vary elty & mm grdg-ettel lame, tr hd brn eldc strg.

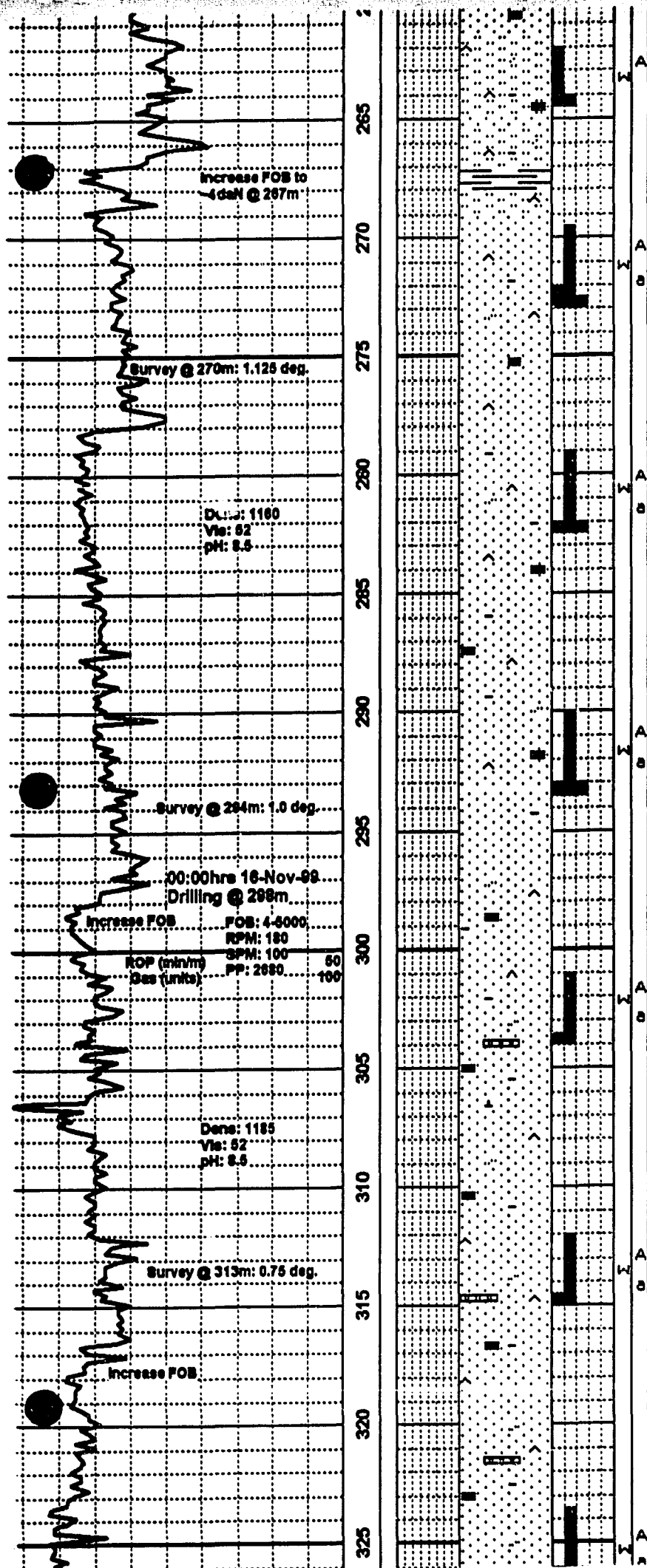
225-231 SS aa bcmg Incrly vary arg in mnr pt, incr mnr-com shly & elty lame, tt, n/s.

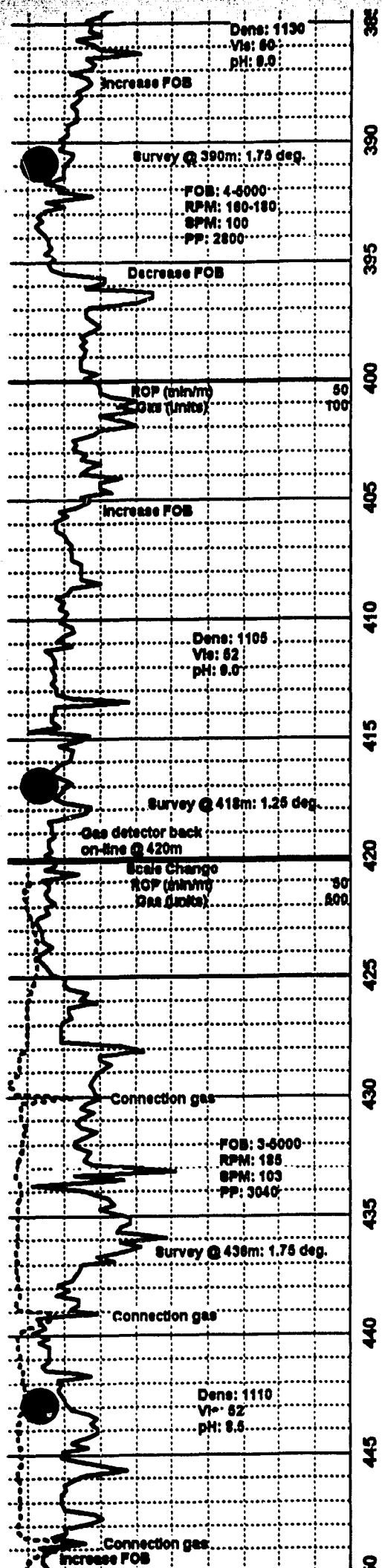
231-240 SS wi mnr Intbd SH; SS sim-abv, off wh-v lt gy, vf gr, sblitharen wi mnr dk ltc gra & carb epks, tr glau, w ert, ang-ab ang, comy mod-p ind wi com silc cmt, tr ep kaol, vary elty & arg lp wi loc com elty & shly lame, predy tt-mnr p por, n/s, mnr thn Intbd SH aa.

240-250 SS aa prev desc, mnr thn Intbd SH aa.

250-261 SS sim-abv, lt-m gy, vf gr, sblitharen wi mnr dk ltc gra & carb epks, rr-tr glau, w ert, ang-ab ang, comy mod-p ind wi com silc cmt, tr ep kaol, Incrly vary elty & arg lp wi loc com elty & shly lame, predy tt-mnr p por, n/s, mnr thn Intbd SH m-dk gy, frm-ett, vary elty & mm.

261-269 SLTST wi mnr Intbd SH & SS; SLTST lt gy-brn gy, qtzs, comy mod ind-mod w ind wi silc cmt, arg lp wi shly lame, comy vary edy grdg-elty v f ss lp, tr dolc strg-lame, tt, n/s; SS sim-abv but predy elty grdg from eltet; SH aa.





390-401 SH dk gy, frm, pty-ab pty, brit lp, fls, predy fnty mm, loc sity in mnrt pt, incr tr feh ec, tr eltet lame aa.

401-405 SH dk gy, mnrt blk, frm, pty-ab pty, flky lp, fls, predy fnty mm, carb in mnrt pt, vary sity in mnrt pt, rr-tr feh ec.

405-420 SH dk gy, frm-loc hd, comy brit, predy pty-ab pty, ab blk in mnrt pt, fls-ab fls, fnty-mod mm, tr loc sity w/ occl sity lame, tr feh ec.

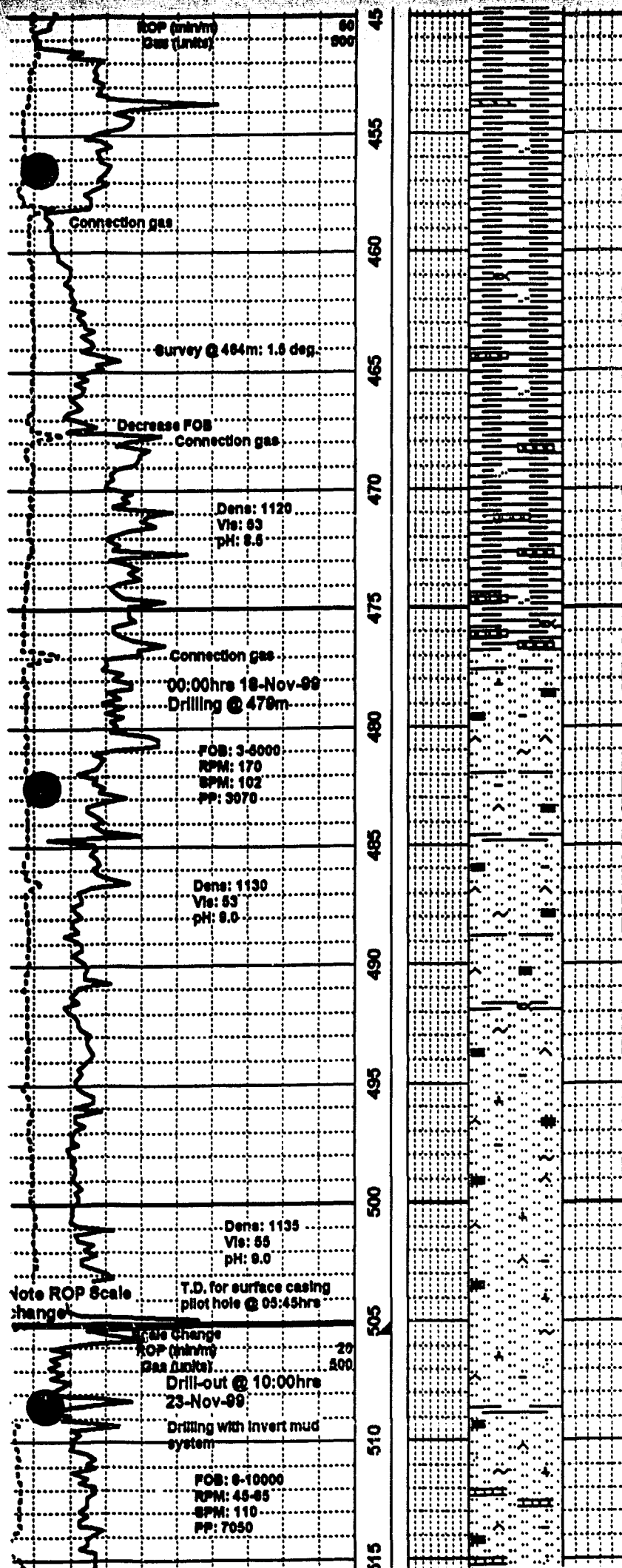
420-428 SS as prev desc bcmg incrly sity in mnrt pt.

428-435 SH dk gy, frm-loc hd, ab blk-eb pty, ab fls lp, comy vary sity & mm grdg-mnrt arg eltet lame, sm & fnty mm in pt, tr cin wh qtze eltet-vf as strg-lame, tr m-dk brn silc eltet lame-strg.

435-440 SH as prev desc w/ incr tr wh qtze eltet-vf as strg-lame aa, rr feh ec.

440-445 SH as prev desc w/ decr tr eltet-vf as strg-lame aa, mnrt blk carb sh strg.

445-458 SH dk-m gy, frm-v frm, brit lp, predy pty-ab pty, ab blk in mnrt pt, fls-ab fls, predy fnty mm, loc vary sity in mnrt pt, rr arg el glauc eltet lame, tr hd dens eldc lame-noda, rr-tr pyr.



458-477 SH dk gy, frm, brit lp, predy sb pty-pty, mnr sb bky, fls, comy el-loc vary sly & mm, sm & fnty mm in mnr pt, tr off wh-ht brn qtze shtet lame, tr-mnr m gy arg shtet strg-lame as desc below incr down, rr-tr fsh ec.

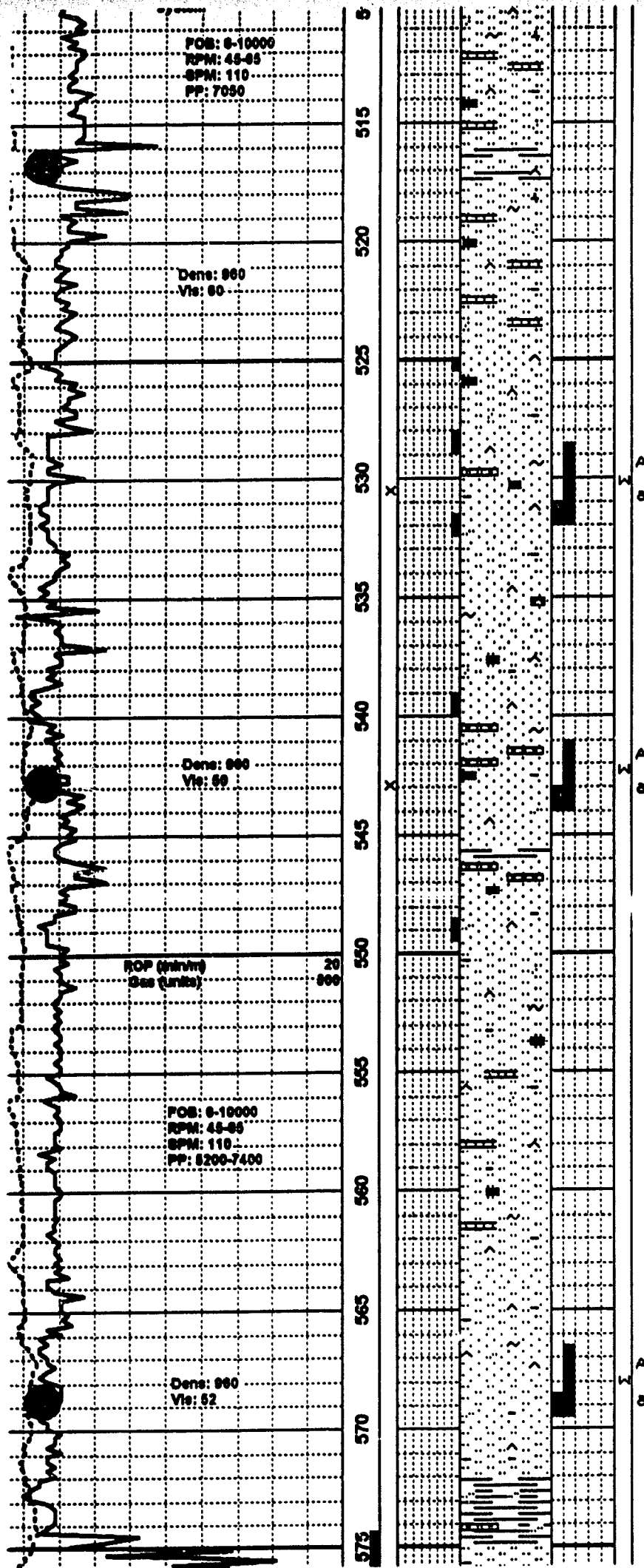
477-487 SLTST wl mnr v thn lntbd SH; SLTST k-m gy, v qtze wl tr-mnr glau & dk ltc gra, tr-rr mica, clin in mnr pt, predy vary arg wl com-abnt sly arg lame, mod-mod p ind, predy sly cmt wl tr ep calc-dolc cmt, mnr loc abnt str calc cmt, tt, n/s; SH dk gy, frm, sb bky-sb pty, sly & mm wl tr scat glau, v el dolc lp, grds-arg shtet.

487-501 SLTST v elm-abv, k-m gy, gy brn, v qtze aa wl incr mnr-loc com glau, tr-mnr dk ltc gra, rr mica, clin lp, comy vary arg wl com sly arg lame & ocll strg, vary ind: comy mod ind to loc p-w ind, predy sly cmt wl tr ep-loc mnr dolc cmt, decr tr-mnr loc com-abnt str calc cmt, tt, n/s, mnr v thn lntbd SH v dk gy, frm-v frm, predy brit, pty-sb pty, fls, comy el sly & mm, loc v sly grdg-arg shtet, v rr fsh ec.

501-505 SLTST as prev desc wl incr mnr dk ltc gra & decr tr-mnr glau, lndn & cmts aa wl incr mnr loc com-abnt str calc-dolc cmt, tt, n/s.

505-510 SLTST inferred lithology from abv, api ~98% cmt.

510-520 SLTST wl lntbd SH; SLTST k-m gy, v qtze wl tr-mnr-occy loc com glau, tr-mnr dk ltc gra, rr-tr mica, clin lp, comy vary arg wl com sly arg lame & ocll strg, sly in mnr pt grdg-sly v/s, comy mod-p ind wl com sly cmt, incr mnr-loc com-abnt str calc-dolc cmt, tt wl tr str p por, n/s; SH dk gy, frm, sb bky-occy sb pty, v sly & mm grdg-arg shtet, tr-mnr glau.



510-520 SLTST w/ intbd SH; SLTST k-m gy, v qtze w/ tr-mnr-occy loc com glau, tr-mnr dk ltc gra, rr-tr mica, clin lp, comy vary arg w/ com elty arg lama & occl strg, edy in mnr pt grdg-elty vf aa, comy mod-p ind w/ com silic cmt, incr mnr-loc com-abnt str calc-dolc cmt, tt w/ tr str p por, n/e; SH dk gy, frm, ab bkly-occy ab phty, v elty & mm grdg-arg eltet, tr-mnr glau.

520-528 SLTST as prev desc bcmg incrly clin in pt, indn decr to p-mod, decr tr calc cmt, tr bentic cly mtx, incrly edy in pt grdg-SS: v k-t gy, vf gr, elty, v qtze w/ mnr-loc com glau, tr-mnr dk ltc gra, w art, ang-ab ang, mod-p ind w/ com silic cmt & tr ap calc cmt, tt-por, n/e, mnr SH aa.

528-535 SS w/ mnr intbd SLTST; SS k-m gy, vf gr, comy vary elty grdg-eltet lp, v qtze (ablktharen) w/ mnr glau, tr-mnr ltc gra, w art, ang-ab ang, clin lp, vary arg lp w/ mnr-com elty arg lama, comy p ind & crmbly-fri, mod ind lp, predy com silic cmt, mnr ap kao, tr loc com str calc cmt, tr-mnr qtz ovgha, predy tt, mnr p-occy fr por, n/e; SLTST aa.

535-540 SS w/ intbd SLTST; SS aa, SLTST as prev desc bcmg incrly vary arg w/ com-abnt arg lama, mod-p ind w/ cmte aa, tt, n/e.

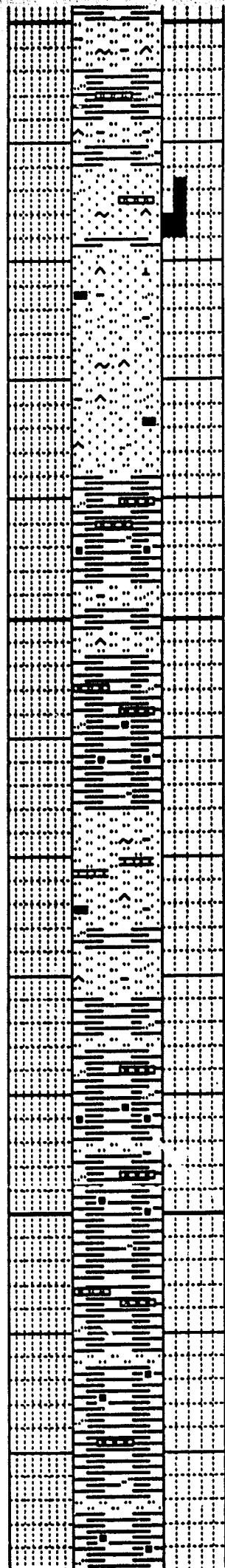
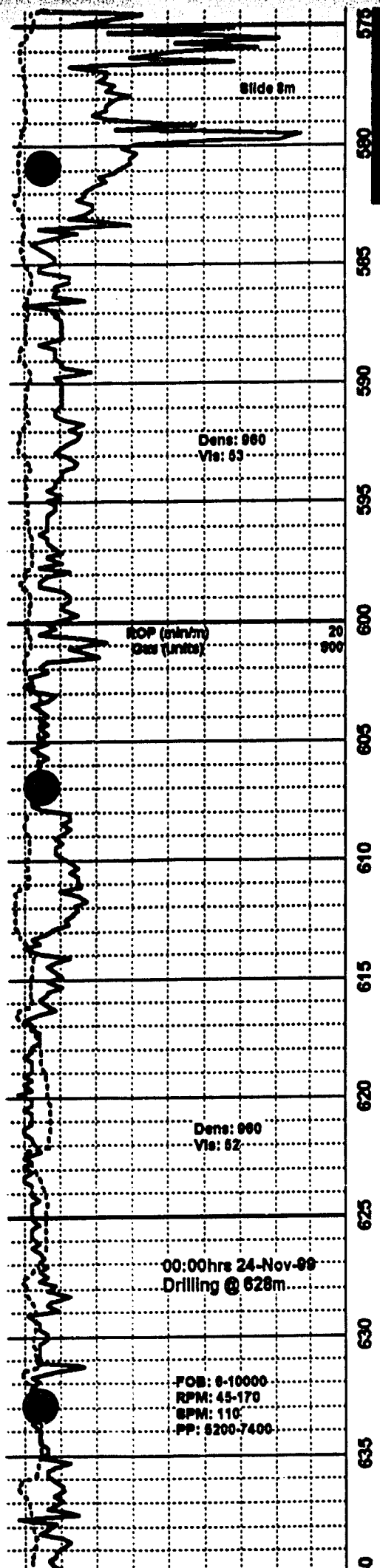
540-550 SS as prev desc, incrly elty lp grdg-eltet, incrly arg lp w/ com elty arg lama, p ind aa lp, mod-mod w ind lp w/ predy silic cmt, predy tt, mnr str p-occy fr por, n/e, mnr v thn SH intbde-strg.

550-560 SLTST m-dk gy, qtze w/ mnr glau, predy arg grdg-v elty sh lp, edy in pt w/ mnr elty vf aa lama & strg, p-mod ind w/ silic cmt, tt, n/e.

560-566 SLTST as prev desc bcmg incrly clin & edy lp grdg-elty aa.

566-572 SS w/ intbd SLTST; SS as prev desc w/ incr indn; comy mod ind, loc p-w ind, predy silic cmt w/ tr-loc mnr ap kao, predy tt, n/e; SLTST aa.

572-581 SH w/ intbd SLTST; SH v dk-dk gy, frm-loc hd, ab bkly-ab phty, ab fls lp, predy vary elty & mm grdg-arg eltet lp, carb lp; SLTST as prev desc.



A
a

581-594 SH w/ Intbd SLTST; SS v elm-prev desc, lt-m gy, vf gr, comy vary elty grd-g-eltet lp, v qtze (sbltharen) w/ mnr-loc com glau, tr-mnr ltc gra, w art, ang-ab ang, cin-vary arg lp w/ mnr-com elty arg lame, comy mod-mod w/ ind w/ prey elic cmt, mnr str calc-dolic cmt, prey tt, n/a; SLTST as prev desc, SLTST m-dk gy, qtze w/ mnr glau, prey arg-occy cin grd-g-v elty sh lp, edy in pt w/ mnr elty vf as lame & etrg, p-mod ind w/ elic cmt, tt, n/a.

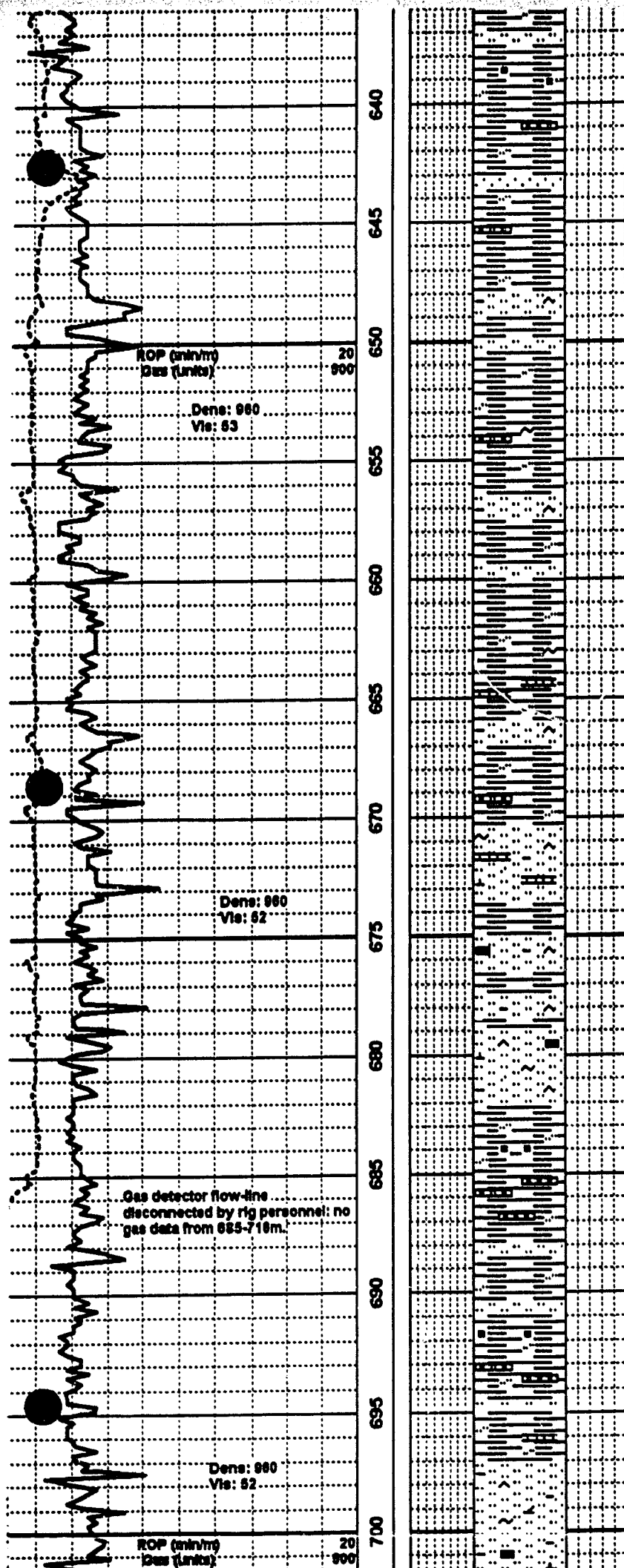
594-608 SH w/ mnr Intbd SLTST; SH dk gy-blk, frm-hd, brit lp, ab biky-ab pity, fis lp, comy el elty & mm, v elty lp grd-g-arg eltet lame & etrg, carb lp, tr glau, SLTST as prev desc.

608-616 SLTST as prev desc, m-dk gy, qtze w/ mnr glau, prey arg-occy cin grd-g-v elty sh lp, edy in pt w/ mnr elty vf as lame & etrg, p-mod ind w/ elic cmt, tt, n/a, mnr thn Intbd SH as.

616-625 SH as prev desc, dk gy-blk, frm-hd, brit lp, ab biky-ab pity, fis lp, comy el elty & mm, v elty lp grd-g-arg eltet lame & etrg, carb lp, tr glau, mnr Intbd SLTST as.

625-635 SH as prev desc.

635-648 SH v elm-abv, dk gy-blk, frm-hd, brit lp, ab biky-ab pity, fis lp, el elty lp, Incrly elty & mm lp, Incrly grd-g-arg eltet lame & etrg, carb lp, tr glau, Incr mnr Intbd arg SLTST as.



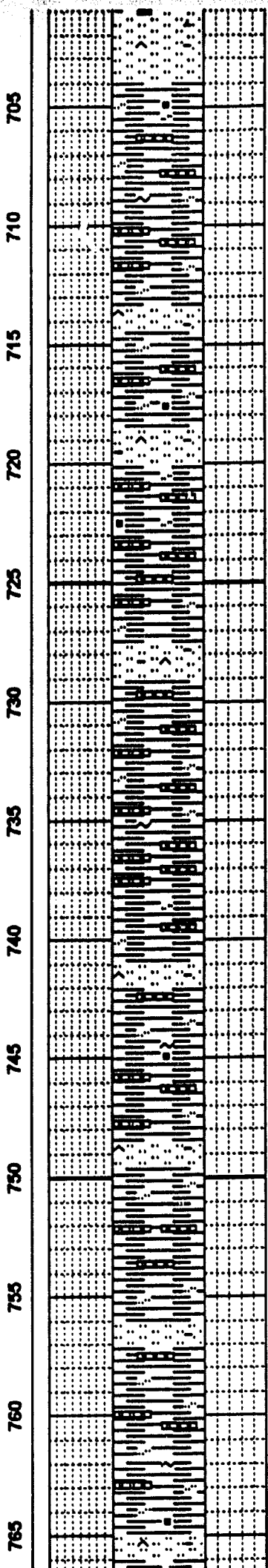
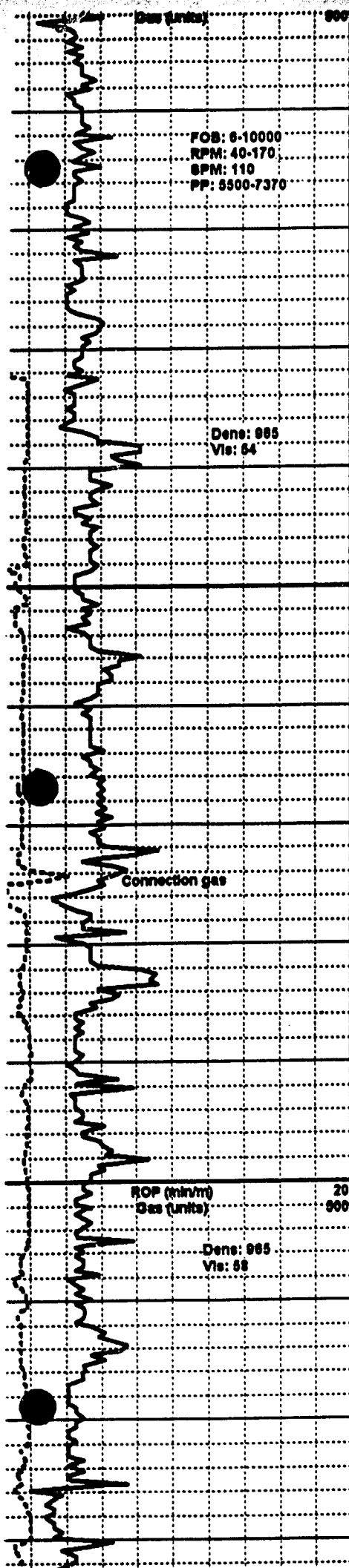
fls lp, sl elty lp, incrtly elty & mm lp, incrtly grdg-arg elstet lame & strg, carb lp, tr glau, incr mntr intbd arg SLTST aa.

648-665 SH w/ intbd SLTST; SH dk gy, frm-hd, brit lp, biky-ab biky, occy ab pty, fls in mntr pt, predy elty & mm grdg-arg elstet lp, tr-mnr glau; SLTST slm-prev desc, m-dk gy, qtze w/ mntr glau, predy arg-occy cin grdg-v elty sh lp, loc edy occy grdg-elty aa lame-strge, p-mod ind w/ elic cmt, tt, n/a.

665-682 SLTST w/ intbd SH; SLTST slm-prev desc, predy m-dk gy, mntr lt gy, qtze w/ mntr glau & tr mica, predy vary arg grdg-elty sh lp, mntr arg lame, loc cin & edy grdg-elty aa lame-strge, predy mod-mod w/ ind w/ com elic cmt, mntr loc com str calc-dolc cmt, tt, n/a; SH aa prev desc grdg from SLTST.

682-697 SH w/ mntr intbd SLTST; SH dk gy-blk, frm-hd, predy ab biky-biky, mntr ab pty, ab fls in mntr pt, carb lp, predy vary elty & mm grdg-arg elstet lp, com elty lame, tr glau, tr v f aa lame; SLTST aa.

697-704 SLTST slm-prev desc, predy m-dk gy, mntr lt gy, qtze w/ tr-mnr glau, predy vary arg grdg-elty sh lp, mntr arg lame, cin in mntr pt, mod-p ind w/ com elic cmt, mntr str calc-dolc cmt, tt, n/a, mntr dk brn hd dne v dolc elstet strg, mntr thn intbd sh aa.



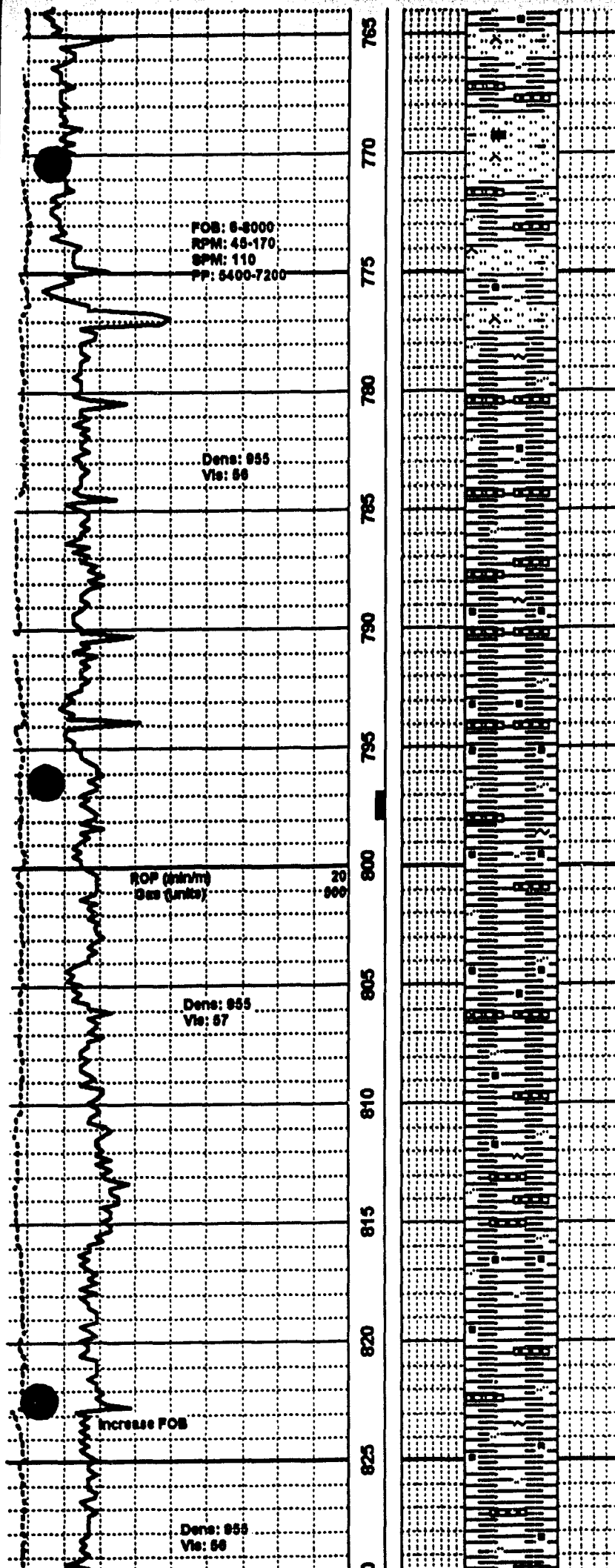
704-718 SH wi mnrr intbd SLTST; SH dk gy-blk, frm-hd, sb blkly-ab pty, sb fls-fls lp, carb in mnrr pt, predy slty-v slty & mm grdg-arg sltst lp, com slty lame, tr-loc mnrr glau; SLTST as prev desc w/o v dolc strgs.

719-743 SH wi intbd SLTST; SH as prev desc bcmg incry slty & incry comy grdg-arg sltst; SLTST elm-prev desc, predy dk gy, qtza wi tr-mnrr glau, predy vary arg grdg-slty sh lp, cln in mnrr pt wi mnrr arg lame, mod-mod w ind wi com silc cmt, mnrr str calc-dolc cmt, tt, n/s, rr-tr dk brn hd dne v dolc sltst strgs.

743-758 SH wi mnrr intbd SLTST; SH dk gy-blk, frm-hd, sb blkly-ab pty, sb fls-fls lp, carb in mnrr pt, predy slty-v slty & mm grdg-arg sltst lp, com slty lame, tr-loc mnrr glau; SLTST as prev desc grdg from SH lp.

758-763 SH as prev desc wi tr vf ss lame wi silc & dolc cmt.

763-775 SH wi intbd SLTST; SH as prev desc, dk gy-blk, frm-hd, sb blkly-ab pty, sb fls-fls lp, carb in mnrr pt, predy slty-v slty & mm incry grdg-arg sltst lp, com slty lame, tr-loc mnrr glau; SLTST as prev desc grdg from SH lp, tr vf ss lame wi silc & dolc cmt.



eb biky-ab pty, eb fie-fie lp, carb in mnr pt, predy ety-v ety & mm
 incry grd-g arg etet lp, com ety lame, tr-loc mnr glau; SLTST as
 prev desc grd-g from SH lp, tr vf as lame w/ silic & dolc cmt.

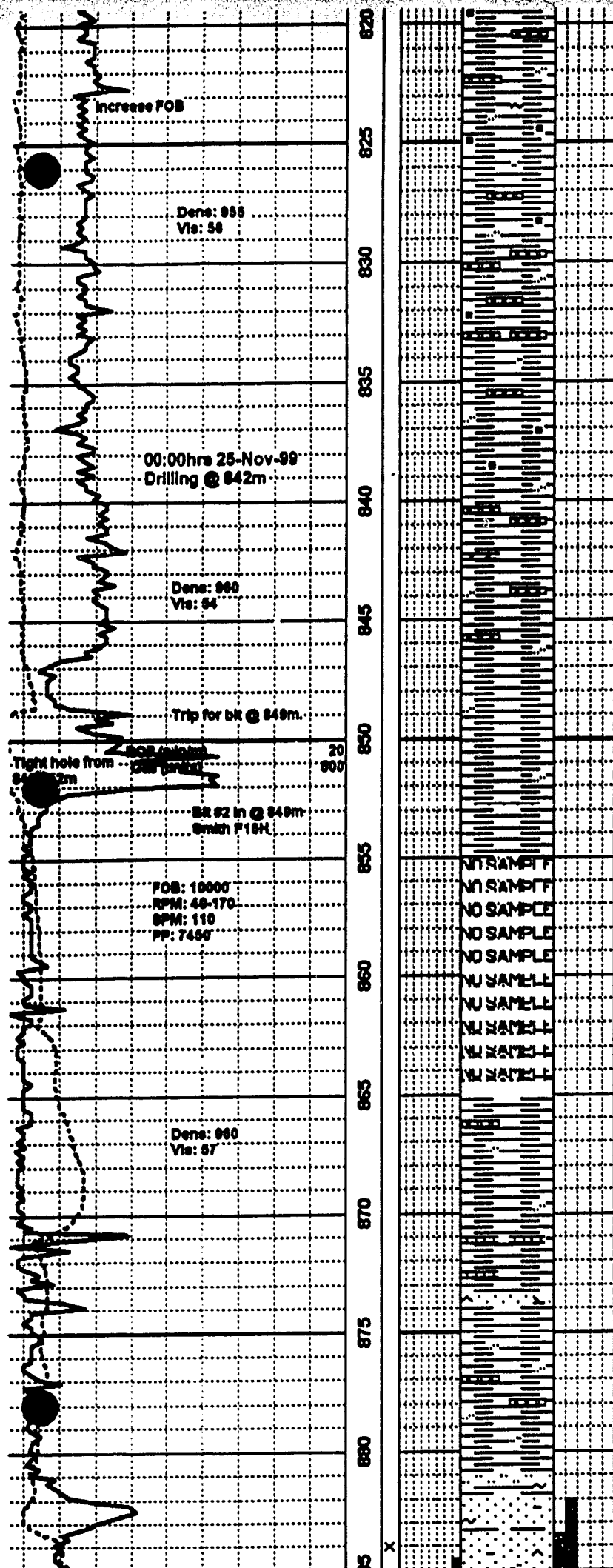
775-785 SLTST w/ mnr intbd SH; SLTST sim-abv, predy dk gy,
 qtze w/ mnr glau, predy arg w/ com arg lame & strg, occy cin &
 edy grd-g ety as lame, comy mod-mod w/ ind, p ind lp, silic & mnr
 str dolc-calc cmt, tt, n/s; SH as.

785-795 SH w/ mnr intbd SLTST; SH dk gy-blk, frm-hd, brlt lp, eb
 pty-ab biky, fie lp, comy el ety & incry carb lp, vary ety & mm lp
 grd-g arg etet, tr glau; SLTST dk-tt gy, v qtze w/ mnr glau, comy
 vary arg, cin & edy lp grd-g-mnr ety as, p-mod ind w/ silic & dolc
 cmt, tt, n/s.

795-810 SH v sim-abv, dk gy-blk, frm-hd, brlt lp, eb pty-ab biky,
 fie lp, comy carb, comy vary ety & mm, grde-arg etet in mnr pt, tr
 glau, decr mnr v thn intbd etet as.

810-825 SH sim-prev desc, dk gy-blk, frm-hd, brlt lp, eb pty-ab
 biky, fie lp, comy carb, comy vary ety & mm, grde-arg etet in mnr
 pt, tr glau, tr dk brn hd dne eld strg-nod.

825-835 SH dk gy-blk, frm-hd, brlt lp, eb pty-ab biky, fie lp, comy
 carb, comy vary ety & mm, incry grd-g arg etet lp, tr glau, tr m gy
 hd vf as lame, rr-tr diem & fram pyr.



825-835 SH dk gy-blk, frm-hd, brit lp, eb pty-ab blk, fls lp, comy carb, comy vary elty & mm, Incrly grdg-arg elstet lp, tr glau, tr m gy hd vf ss lame, rr-tr diem & fram pyr.

835-847 SH aa wl rr-tr hd dne dk brn gy v elty dol strg, rr eld lam-nod.

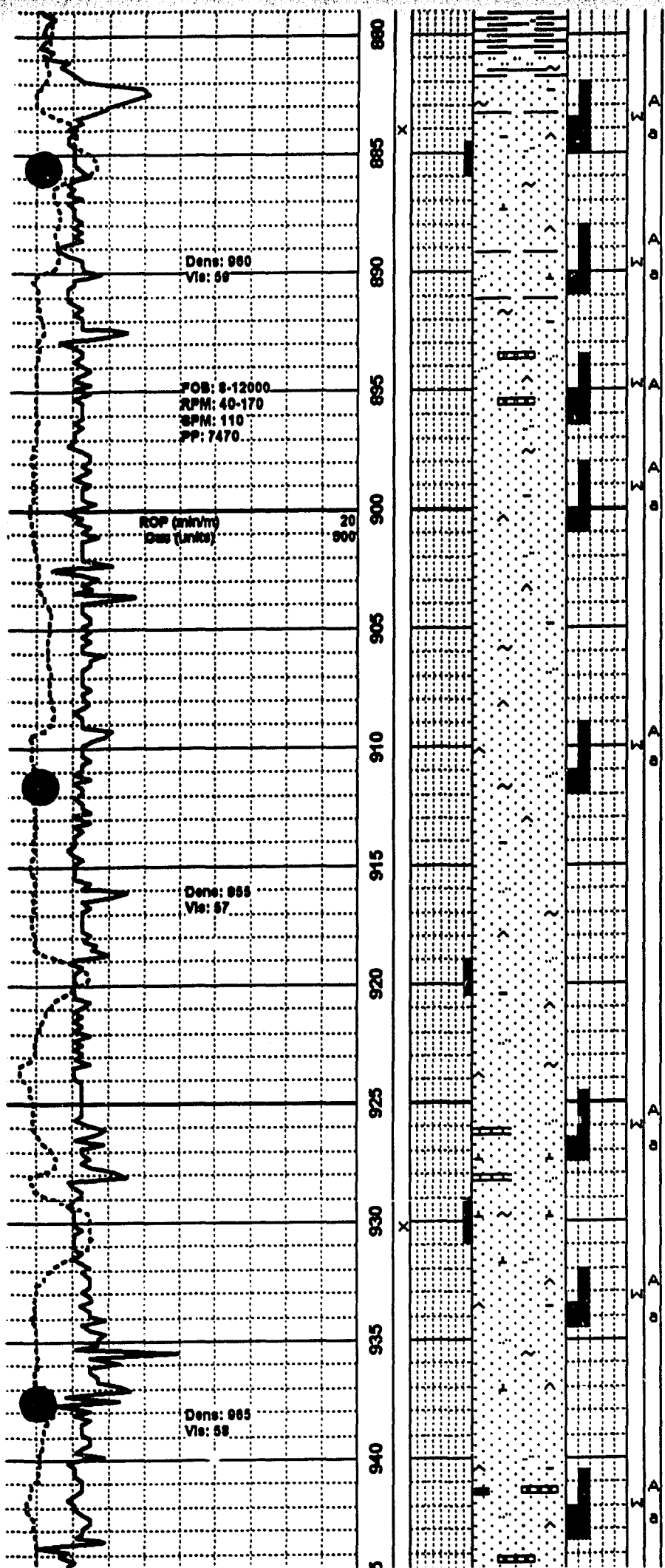
847-855 SH predy dk gy, mnr blk, frm-hd, comy brit, pty-ab pty, fls, mnr eb blk, comy sm & fnty mm, vary elty aa lp.

855-865 No samples caught.

865-881 SH v elm-prev desc, predy dk gy, mnr blk, frm-hd, comy brit, pty-ab pty, fls, mnr eb blk, comy sm & fnty mm, Incrly vary elty grdg-arg & occy clin elstet lp, tr glau, mnr v thn intbd SS; lt-m gy, vf gr, qtze, hd, dne, mod-w ind wl silc & dolc cmt, tt.

SCATTER FORMATION @ 881m MD; -338.8m SS

881-886 SS lt-m gy, occy brn gy, vf gr, qtze wl mnr-com-loc abnt glau, mnr dk ltc gra, w art, ang-ab ang, vary elty grdg-edy elstet lp, comy clin-vary arg lp wl tr-mnr arg lame, occi glauc lam, comy mod ind, loc p-w ind, com str calc-dolc cmt, mnr-com str silc cmt, tt-str p por, n/a; mnr intbd SH frm-loc sft, eb pty, eb fls, el elty & mm in waly & clay in arg. elstet lp.



SCATTER FORMATION @ 881m MD; -338.6m SS

881-886 SS lt-m gy, occy brn gy, vf gr, qtze w/ mnr-com-loc abnt glau, mnr dk ltc gra, w art, ang-ab ang, vary slty grdg-edy sltst lp, comy cin-vary arg lp w/ tr-mnr arg lame, occl glauc lam, comy mod ind, loc p-w ind, com str calc-dolc cmt, mnr-com str silc cmt, tt-str p por, n/a; mnr intbd SH fm-loc slt, ab ply, ab fls, sl slty & mm lp, v slty & glauc lp grdg-sltst lp.

886-893 SS slm-prev desc w/ decr mnr scat glau & incr mnr dk ltc gra, tr mica, vary lndn aa w/ com str silc & calc-dolc cmt, predy tt w/ mnr str p por, n/a, mnr v thn intbd sh aa.

893-897 SS slm-prev desc, lt-m gy, vf gr, comy var slty grdg-edy sltst lp, qtze w/ mnr glau, mnr dk ltc gra, w art, ang, comy cin-vary arg w/ mnr arg lame, mnr slty lame, comy mod-loc p ind w/ silc cmt, predy tt, n/a.

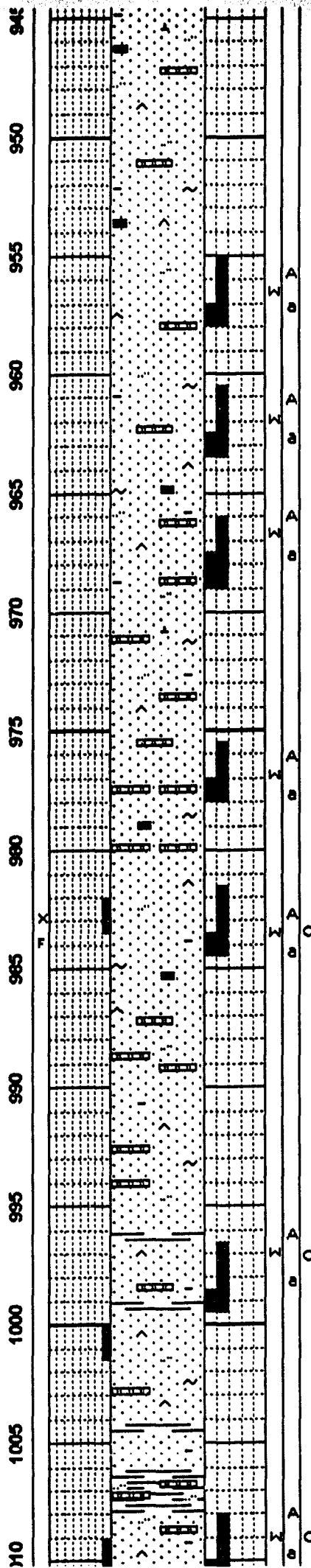
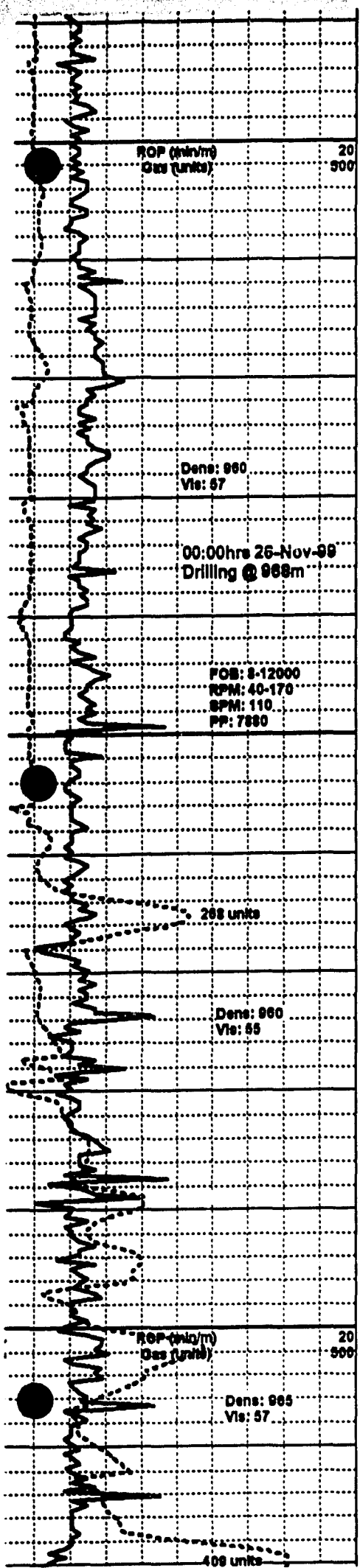
897-908 SS slm-prev desc bcmg decrly slty, predy cin, mnr arg lame, mod-p ind w/ com silc cmt & tr str dolc-calc cmt, rr-tr intsl pyr, tt w/ str p por, n/a.

908-926 SS lt gy, vf gr, qtze w/ mnr glau, mnr dk ltc gra, w art, ang-ab ang, predy cin & vary slty, loc sl-mod arg w/ mnr arg lame, predy mod ind, loc w-p ind, predy silc cmt, tr dolc-calc cmt, incr tr-loc mnr intsl pyr, tt-str p por, n/a.

926-932 SS lt-m gy, gy brn, vf gr, qtze w/ mnr glau, mnr dk ltc gra, w art, ang-ab ang, predy cin & vary slty w/ mnr slty lame, incrly arg in mnr pt w/ mnr arg lame, p-mod ind w/ abnt calc cmt, tt w/ mnr str p por, n/a, tr dk brn dne crpxl ls lame-strg.

932-940 SS lt gy, vf gr, qtze w/ mnr glau, mnr dk ltc gra, w art, ang-ab ang, predy cin, loc sl-mod arg w/ mnr arg lame, predy mod ind, predy silc cmt, mnr str calc cmt, predy tt, n/a.

940-955 SS lt-m gy, vf gr, qtze aa, w art, ang-ab ang, comy mod-v slty grdg-edy sltst lp, comy vary arg w/ mnr-loc com arg lame, mod-p ind w/ silc & mnr calc cmt, tt, n/a.



955-960 SS v alm-prev desc bcmg decrly arg in mnrt pt, decrly slty.

960-965 SS as prev desc bcmg incrly arg lp wl incr mnrt arg lame.

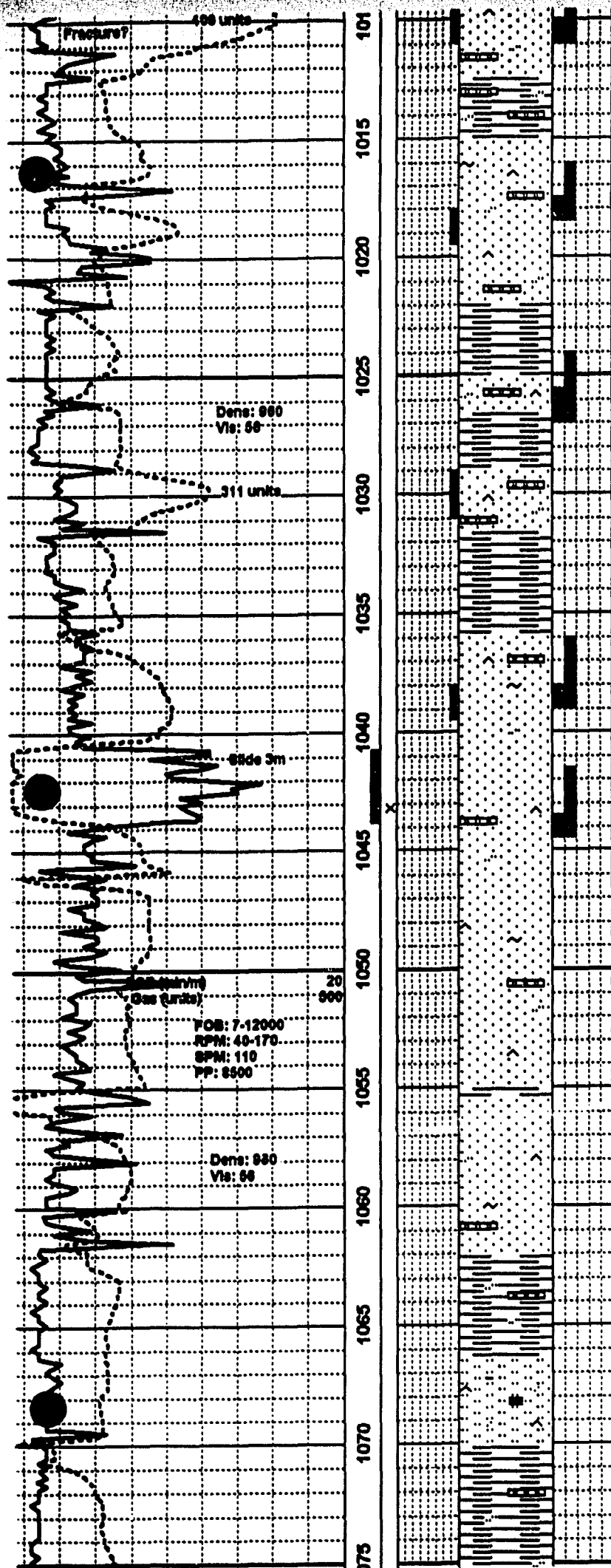
965-975 SS lt-m gy, vf gr, qtze aa, w art, ang-ab ang, comy mod-v slty grdg-edu sltst lp, comy vary arg wl mnrt-loc com arg lame, mod-p lnd wl slc & mnrt calc cmt, n vls por, n/a.

975-981 SS alm-prev desc bcmg comy arg wl incr mnrt arg lame & strge, incrly grdg-edu sltst lp.

981-995 SS as in mnrt pt, predy lt-m brn, lt gy, vf gr, qtze wl mnrt-loc com glau, tr-mnrt dk ltc grs, w art, ang-ab ang, predy vary slty grdg-edu sltst lp, pred cln, vary arg lp wl mnrt-loc com arg lame & strge, p-mod lnd, fri in mnrt pt, slc cmt, tr calc cmt, predy n vls por, mnrt str p-tr fr por, tr-mnrt ap v dull flor, rr-tr v wk ques cut, rr mic frac wl fib calc fill & diem pyr, tr pyr node.

995-1006 SS alm-abv, predy lt brn, vf gr, qtze wl mnrt-loc com glau, tr-mnrt dk ltc grs, w art, ang-ab ang, predy vary slty grdg-edu sltst lp, pred cln, vary arg lp wl mnrt-loc com arg lame & strge, p-mod lnd, slc cmt, tr calc cmt, predy n vls por, mnrt str p-v p por, tr-mnrt ap dull yel gld flor, tr-mnrt v wk v thn stmg cut, tr-mnrt thn lntbd SH.

1006-1016 SS wl lntbd SH; SS alm-prev desc, lt-m gy brn, qtze aa, bcms incrly arg & slty grdg-incr edu sltst lp, com slty arg lame & strge, incr tr-mnrt pyr node, comy p lnd, mod lnd lp, slc cmt, incr mnrt ap dull yel gld flor, rr-tr cut aa, predy n vls por; SH dk-v dk gy, frm-hd, ab blk-eb ply, predy v slty comy grdg-arg sltst, sl



gy, frm-hd, eb bkly-eb pity, predy v elty comy grd-g-arg elstet, el glauc lp.

1015-1022 SS alm-abv, lt-m gy brn, brn gy, qtze aa, vary elty grd-g-edy elstet lp, decr vary arg ln mnr pt, incr tr-mnr pyr node, comy mod-loc p ind, silc cmt, tr-mnr calc cmt, predy n vis por, tr-mnr str p por, tr v dull flor, n cut.

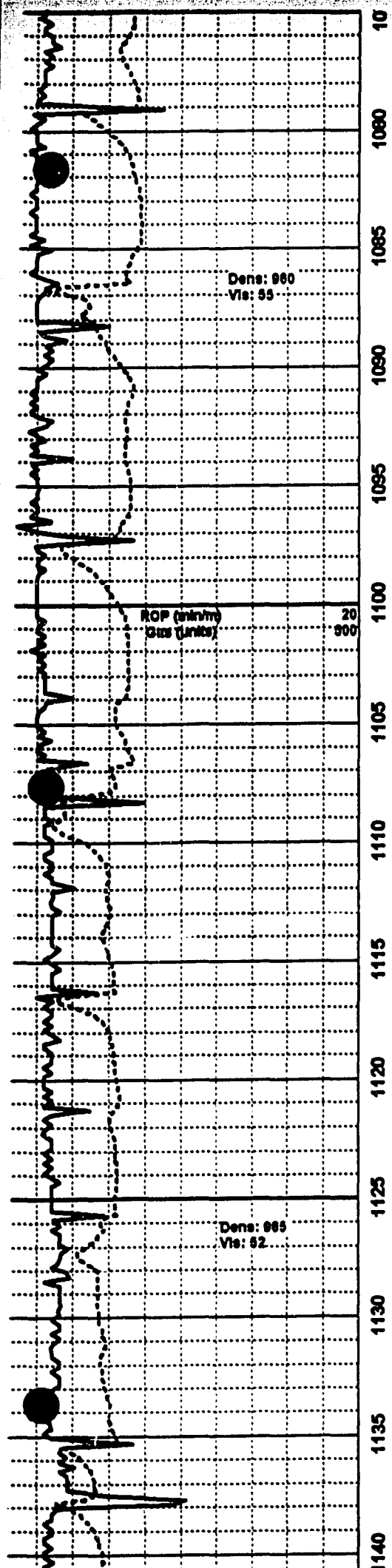
GARBUTT FORMATION @ 1022m MD; -479.8 m SS

1022-1036 SH wi intbd SS; SS as prev desc comy grd-g-elstet, decr tr pyr node, por & shows as prev desc; SH dk gy, frm, comy brlt, eb pity, eb fle, el elty & fnty mm lp.

1036-1040 SS as prev desc bcmg incry cin ln mjr pt, decry elty grd-g-mnr elstet, mod-p ind wi silc cmt, predy n vis por, incr mnr v dull flor, incr mnr slo yel gn etmg cut.

1040-1062 SS lt brn, vf gr, v qtze wi decr tr-mnr glau, mnr dk ltc gra, w art, ang-ab ang, predy vary elty grd-g-edy elstet ln mnr pt, pred cin, loc el arg wi tr arg lame, comy p-loc mod ind wi silc cmt, tr intetl pyr, predy n vis por, lnr com str v p-p por, com-abnt unevn lt brn o rtn, mnr-loc com v dull flor, mnr-com slo wk yel-yel gn etmg cut, mnr v thn intbd SH as desc below.

1062-1077 SH wi intbd SLTST; SLTST lt-m brn, brn gy, qtze aa, edy grd-g-elty SS lp, cin-vary arg wi mnr-com arg lame, comy mod-loc mod w ind wi silc cmt, n vis por, tr v dull ques flor, tr v slo yel gn cut; SH dk gy, comy frm, loc sft-hd, eb bkly-eb pity, brit lp, eb fle-fle lp, vary elty & mm lp wi mnr-loc com elty lame, el elty & fnty mm lp.



1077-1085 SH dk gy-occy blk, frm-v frm, comy brit, sb pty-ab blk, comy sb fls-fls, comy sm & fnty mm, carb in mnr pt, sl elty lp.

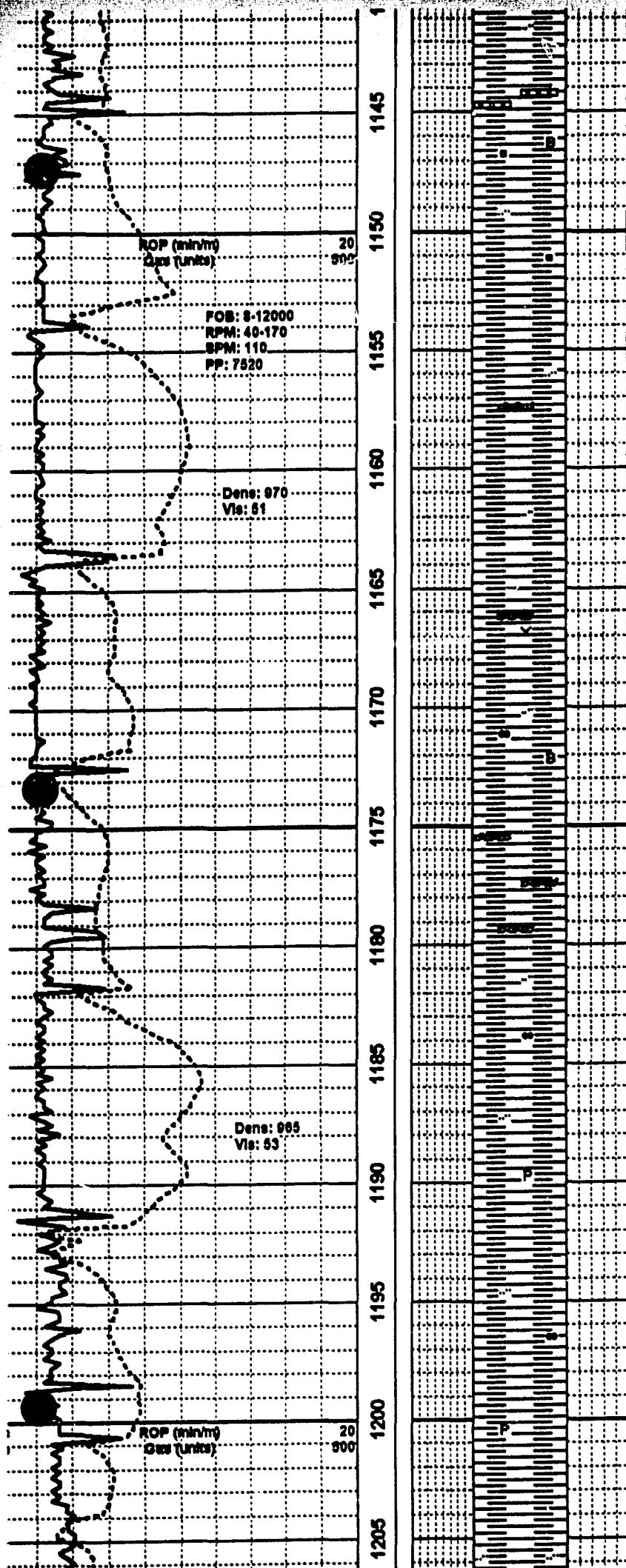
1085-1100 SH slm-abv, dk gy-mnr blk, frm-v frm, comy brit, pty-ab pty, fls-ab fls, predy sm & v fnty mm, carb in mnr pt, loc sl elty in mnr pt, tr elty lame.

1100-1120 SH v slm-abv, dk gy-mnr blk, frm-v frm, comy brit, pty-ab pty, fls-ab fls, predy sm & v fnty mm, incrly carb in mnr pt, incrly sl-loc mod elty in mnr pt, tr elty lame.

1120-1130 SH as prev desc, dk gy-mnr blk, frm-v frm, comy brit, pty-ab pty, fls-ab fls, predy sm & v fnty mm, carb in mnr pt, loc sl elty in mnr pt, tr elty lame.

1130-1138 SH dk gy-blk, comy frm, loc hd-est, comy pty-ab pty, sb blk lp, brit lp, predy fls, sm & fnty mm lp, comy sl-loc mod elty w/ mnr sltst lame, vary carb lp, rr-tr dk brn dns crpxl ls lam-estrg, v rr wh tuffac bent.

1138-1154 SH dk gy-blk, frm, comy brit, pty-ab pty, mnr sb blk, fls, predy sm, fnty mm lp, tr elty w/ lame, carb lp, rr lt gy-wh-tan-gn bent, tuffac lp.



GARBUTTI RADIOACTIVE MARKER @ 1154m MD; -311.8m SS

1154-1164 SH v elm-abv, dk gy-blk, frm-loc hd, comy brlt, pty-ab pty, occy ab blk, fls, predy sm, el-mod sity & fnty mm in mnrt pt, incry comy carb lp, tr scat carb deb, incr tr wh-lt gy-crm bent, tuffac lp.

1164-1168 SH aa wl incr tr wh-lt gy-occy crm bent, predy v tuffac wl com blot & abmt xtal frags grdg-bentc aa.

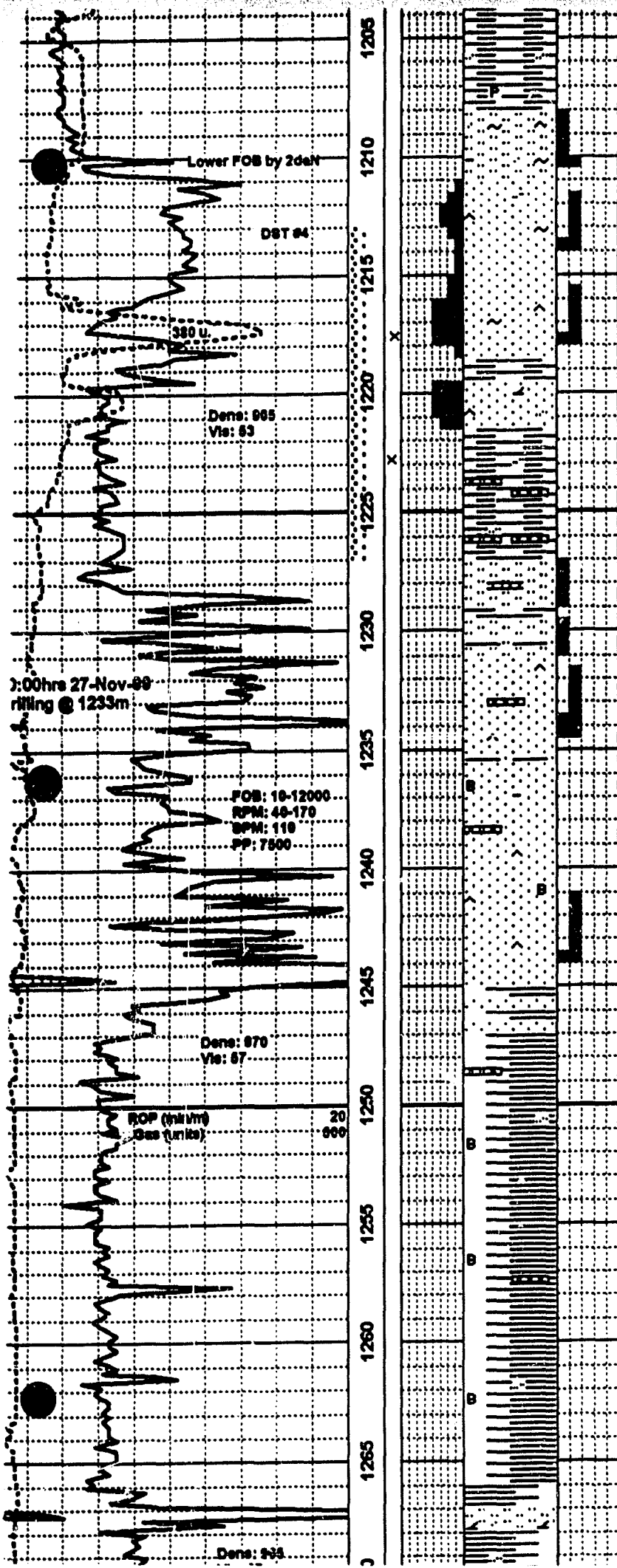
1168-1173 SH predy aa wl mnrt v dk brn blk frm-elt el blt-phos SH, decr tr predy lt gy-wh bent, el tuffac lp.

1173-1182 SH aa prev desc wl incr mnrt wh-crm-occy lt gy bent, comy el tuffac, occy v tuffac grdg-bentc aa.

1182-1191 SH dk gy lp, comy brn blk-blk, frm, loc aft-occy hd, pty-ab pty, loc flky, fls-loc v fls, comy sm, el sity lp, blt-phos in mnrt pt, tr pyr node, decr tr crm-wh bent.

1191-1203 SH aa prev desc wl rr-tr phos deb.

1203-1208 SH dk gy-blk, frm-hd, ab blk-eb pty, ab fls lp, comy v frnty mm, el sity in mnrt pt, incr tr pyr node, tr loc com blot, v rr elicks?



try mm, w shly in mnr pt, inc tr pyr neds, tr too com dnt, v tr slicks?

CHINKEH SILTSTONE @ 1208m MD; -665.8m SS
1208-1211 SLTST lt-dk gy, qtze w/ mnr-loc com glau, comy vary edy, cin-loc v arg, var indn: comy mod ind, loc p-w ind, silc & dolc cmt, n vis por, n/a.

CHINKEH SANDSTONE @ 1211m MD; -668.8m SS
1211-1216 SS off wh-v lt gy, v f gr, v qtze w/ mnr scat glau & tr hlc gra (abltaren-abqtaren), w art, ang-ab ang, cin, silty lp, vary ind: comy p ind & cmbly, mod-w ind lp, silc & mnr dolc cmt, mnr-com qtz ovgtse, var por; fr-p w/ tr strke, mnr-com v fnt flor, mnr v slo fnt yel stmg cut, mnr intbd sh.

1216-1222.5 SS v sim-abv, off wh-v lt gy, mnr v pale brn, v f gr, v qtze w/ mnr scat glau & tr hlc gra (abqtaren), w art, ang-ab ang, cin, silty lp, decr vary ind: incrlly comy p ind & cmbly, mod ind lp, silc & mnr dolc cmt, com-loc abnt qtz ovgtse, var por; com fr w/ tr-mnr str g por, p-v p vis por lp, com fnt yel gn flor, tr v slo wk stmg cut.

TRIASSIC @ 1222.5m MD; -680.3m SS
1222-1227 SH comy m-lt gy, rusty brn in mnr pt, ab pty-ab biky, v frm-hd, comy brt, sm & v fnty mm lp, vary silty & mm lp grd-g-arg sttet.

1227-1231 SLTST m-lt gy, v qtze w/ mnr dk epke, vary mm w/ occi micac ptg, cin lp, comy sil-mod arg, pred mod w-mod ind w/ silc cmt, sil edy lp occy grd-g-ss, n vis por, n/a, mnr intbd sh aa.

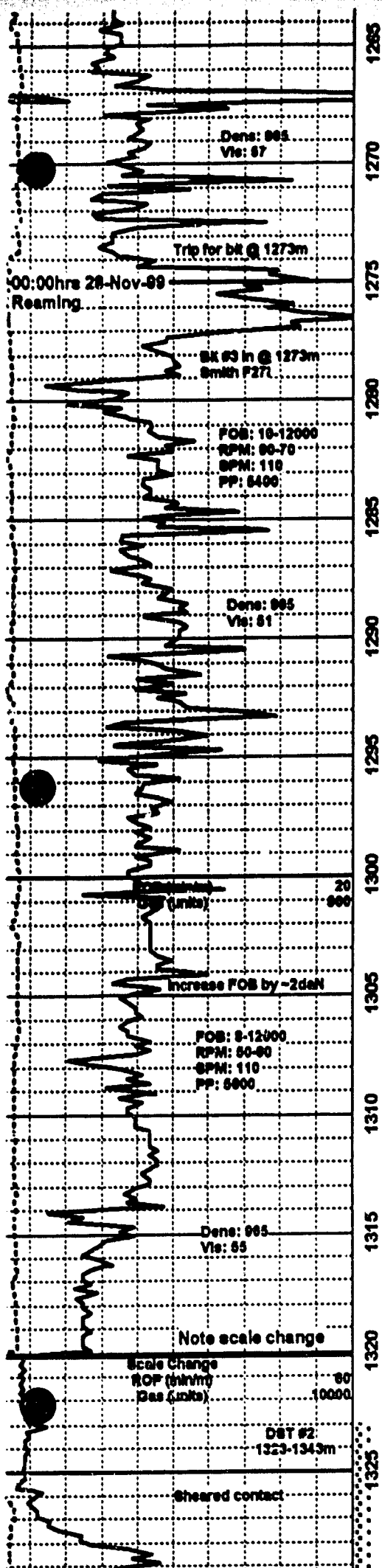
1231-1240 SS off wh-v lt gy, v f gr, v qtze w/ mnr dk hlc gra & carb epke, rr carb deb, w art, ang-ab ang, vary silty occy grd-g-edy sttet, pred cin, loc sil arg, comy mod ind, loc p-w ind, silc cmt, mnr-loc com bento cly mtx, tt, n/a, mnr thn intbd SH aa.

1240-1247 SS sil-abv, lt gy, mnr pale orng red, v f gr, v qtze aa, w art, ang-ab ang, comy cin-loc sil arg, comy mod w-w ind, loc mod p ind, com silc cmt, inc mnr-loc com smectitic cly mtx, tr sp dolc cmt, sil silty lp, tt, n/a, mnr intbd sh aa bel.

1247-1258 SH pred red brn w/ mnr intbd-interlam m gy, frm-hd, pred brt, ab pty-ab biky, vary 'bento' lp (abnt red cly in wash), comy ab fls-fls, vary silty in mnr pt, tr m gy qtze arg sttet lame.

1258-1266 SH v sil-abv bcmg brn rusty red, mnr intbd & interlamd m gy sh aa, incrlly pty & fls.

1266-1279 SH w/ intbd SLTST; SH m-dk gy, frm-v frm, ab biky-ab pty, mnr pty, brt in mnr pt, comy ab fls-fls, sil silty in mnr pt; SLTST lt-m gy, biky, v qtze w/ mnr dk epke, loc sil micac, predy cin-sil arg, edy lp grd-g-mnr silty ss, comy mod-w ind, loc p ind in mnr pt, pred dolc cmt, tr diam mnr tt n/a.



1266-1279 SH w/ intbd SLTST; SH m-dk gy, frm-v frm, eb biky-eb pty, mnr pty, brit in mnr pt, comy ab fls-fls, el slty in mnr pt; SLTST lt-m gy, biky, v qtze w/ mnr dk spks, loc el micac, predy clin-el arg, ady lp grdg-mnr slty ss, comy mod-w ind, loc p ind in mnr pt, pred dolc cmt, tr diem pyr, tt, n/s.

1279-1284 SH mar-rusty red, pty-eb pty, fls, frm-v frm, loc sft, occy brit, predy em & fnty mm, loc el slty w/ occl slty lame, vary 'bentic' (abnt red chy in wash), el dolc lp, tr m gy-gy brn interlamd sh.

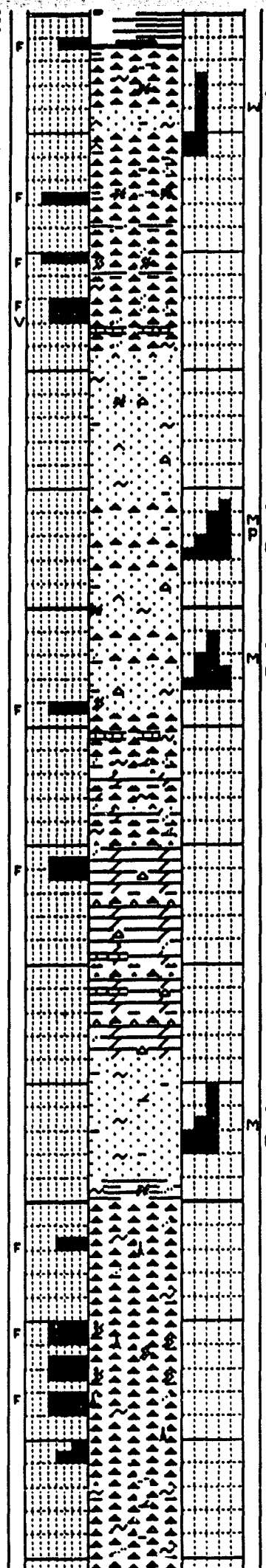
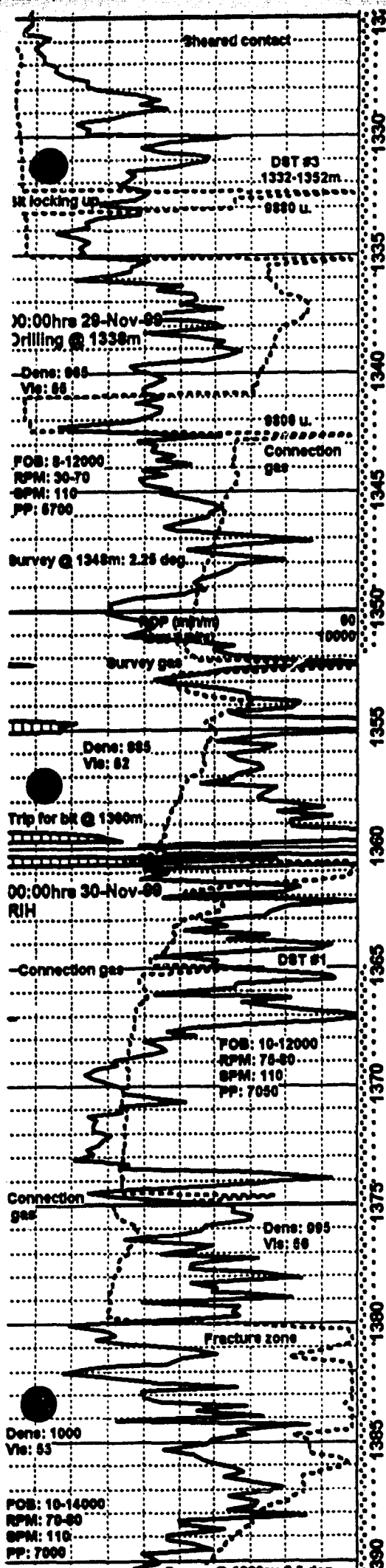
1284-1295 SH v slm-abv, predy mar-rusty red, incrly m brn-brn gy in mnr pt, incrly mm in mnr pt, incrly slty lp w/ mnr sltst lame-strgs, comy el-mod dolc, vary 'bentic' ss, mnr thn intbd sltst ss w/ incr tr-loc mnr carb deb.

1295-1314 SH w/ mnr intbd SLTST; SH m gy, mnr intbd-interlamd red sh ss, eb biky-eb pty, eb fls-fls, v frm-hd, brit, em & fnty mm lp, vary slty & mod-loc v mm lp occy grdg-arg sltst lame & strgs, el-mod dolc lp; SLTST as prev desc, lt-m gy, biky, v qtze w/ mnr dk spks, loc el micac, predy clin-el arg, ady lp grdg-mnr slty ss, comy mod-w ind, loc p ind in mnr pt, pred dolc cmt, tt, n/s

1314-1326 SH rusty red-mar, tr-mnr m brn & gy, occy mot, comy frm, loc sft-v frm, brit in mnr pt, fls, comy em & fnty mm, loc el slty & mod mm, occl sltst lame & strgs, incrly 'bentic' lp (v abnt red chy in wash, loc el dolc, rr slicks at base.

BELLOY FORMATION @ 1325.9m MD; -783.7m SS

1326-1338 CHT predy dk-m gy-brn gy, comy mod hd-loc cmbly, vary mod-loc v glauc, vary ady-slty grdg-chty ss lp, com gran tex on ctgs, vary arg grdg-mnr chty glauc mds, tr pyzrd spks & worm burrows, mnr intbd v or vary glauc ctgs am lithic wacks



BELLOY FORMATION @ 1328.9m MD; -753.7m SS

1326-1336 CHT predy dk-m gy-brn gy, comy mod hd-loc crmbly, vary mod-loc v glauc, vary ady-ely grd-g-hty ss lp, com gran tex on ctgs, vary arg grd-g-mnr chty glauc mdet, tr pyrzd apice & worm burrows, mnr intbd vf gr vary glauc qtzs arg lithic wacke, mnr-loc com shear fabrics: vary nylonitized-loc perv wl com slicks, n vis por, infr g-ex loc frac por, n/a.

1336-1339.5 CHT v pale-dk brn, predy vary glauc, comy vary ady-ely grd-g-v chty ss lp, sl-v epicular lp, transl in mnr pt, tr diam-loc pthy pyr, rr pyr nod, predy v tt, mnr-loc com p-occl fr mic vug-vug por wl mnr pybit & tr drusy dol, n/a, tr-mnr chky cataclastic? anhye strgs wl slicks, tr dk gy glauc ely sh, mnr dk gy ss aa.

1339.5-1351 SS m-dk gy, vf-m gr, lithic wacke wl com-abnt cl-r-vccl qtz & tr-mnr ktc gra, vary glauc wl com-loc abnt glau, com-abnt arg & ely mtz, mod p art, sb ang-ab rd, disagg lp, p-mod ind wl tr ap dolc cmt, vary silic in mnr pt grd-g-hty ss, grds-mnr ady glauc altet & sh strg, tt, n/a, mnr chky cataclastic? blk & wh mot-anastom anhydc-dolc strg wl slicks, mnr intbd cht aa.

1351-1354.5 SS v elm-abv bcmg predy vf-f gr, mod art, v w-p ind, comy vary silic-hty grd-g-hty cht lp, rr foe frag, tt, tr p mic vug por, n/a, mnr chky cataclastic? 'strgs' aa, mnr intbd cht aa, infr loc g frac por.

1354.5-1360 CHT dk brn-brn gy, dne, vary hd, mod-v glauc, comy vary dolc grd-g-hty dol lp, comy vary ady grd-g-v chty ss lp, tr-mnr diam-loc abnt pyr, predy tt, tr p mic vug-mold por, n/a, decr tr-mnr dolc-anhye strgs aa.

1360-1369 DOL dk gy-gy brn, crpxl-el micxl, predy hd, dne, comy ely, comy vary chty grd-g-dolc cht lp, loc vary ady, loc el-mod cak wl tr-mnr dolc ls strg, tr loc pyre, mnr lt brn-gy brn mrls ls strg; eft, chky, vary dolc grd-g-calc dol, el mot, el glau, ely-edy, tr slicks, tt, infr g loc frac por, n/a.

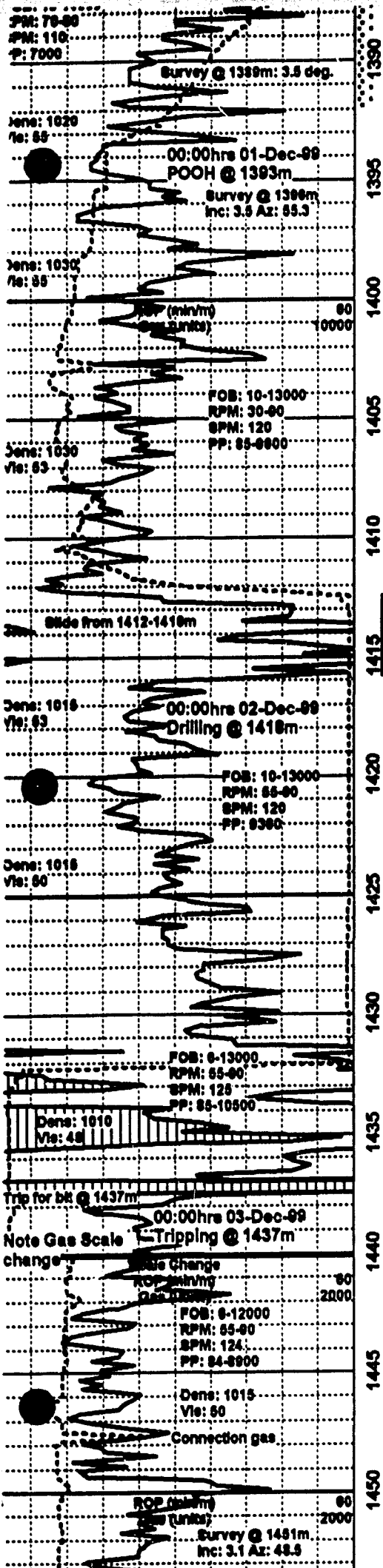
1369-1374.8 SS dk gy, vf-f gr, mnr m gra, lithic wacke, com-abnt cl-r-vccl qtz, com-loc abnt glau, tr ktc gra, abnt ely arg mtz, mod art, sb ang-rd, disagg in mnr pt, comy mod ind, loc p-w ind lp, mnr loc com dolc cmt, tt, n/a, mnr intbd SH v dk gy, frm-v frm, sb bky-occy pty, comy mod-v glauc, ely, loc vary ady, com loc abnt paesty chloritic pthcs.

FANTASQUE FORMATION @ 1374.8m MD; -832.6m SS

1374.8-1380 CHT predy v pale-lt brn, predy transl, v hd, v dne, el-mod glauc lp, el ady in mnr pt, mnr loc tr-v abnt diam-xln pyr, el-mod dolc in mnr pt, rr-tr dolc mic frac-fill, rr apice, occl chty dol strg, tt, infr fr-g loc frac por, mnr-com ap v dull flor, tr v wk v thn frt yel dffe cut.

1380-1388 CHT elm-abv, lt brn, mnr lt gy, predy transl-sb transl, v hd, v dne, el-mod glauc aa, incry vary epiclr in mnr pt, incry vary ely-edy in mnr pt, tr-mnr frac efc on ctgs wl abnt sb-euhed qtz xls, rr-tr scat p mold-mic vug por, infr g-ex loc frac por, tr ap ques flor, n cut.

1388-1397 CHT aa in mnr pt, predy dk brn-brn gy, dne, comy hd, mod-v glauc, comy vary ely-edy, vary arg & crmbly grd-g-v chty glauc sh in mnr pt, el dolc in mnr pt, mnr loc com-v abnt ovr



1388-1397 CHT as in mnrt pt, predy dk brn-brn gy, dne, comy hd, mod-v glauc, comy vary shy-edy, vary arg & cmbly grdg-v chty glauc sh in mnrt pt, el dolc in mnrt pt, mnrt loc com-v abnt pyr grdg-pyr node lp, tt, n/a.

1397-1402.5 CHT lt-m brn, fnty mot lp, comy transl, v hd & dne, comy el-mod glauc, tr shy, rr-tr epice, tr-mnr dk gy shy glauc sh lam-etr, tr-mnr frac efc wl com-abnt pyr, rr mic frac wl pyr fill, lnfr loc tr-mnr fr-g frac por, n/a.

1402.5-1410 CHT v alm-abv, decrly glauc, mnrt-com planar frac efc on ctge, mnrt frac efc wl chty wh dol or pyblt read, tr sb hed qtz, rr-tr scat p mold-mic vug por, lnfr mnrt fr-g frac por, tr-mnr sp dull flor, n cut, tr shy glauc-phos sh lam.

1410-1418 CHT predy v pale-m brn, mnrt off wh & dk brn, fnty mot lp, predy transl, v hd & dne, comy vary spiclr, tr scat glauc, tr phos sh lam, com frac ctge incl; mnrt-com planar cin frac efc, mnrt-com frac efc wl abnt sb-ehed qtz xls, mnrt frac efc wl wh chalcedonic layers, rr pyblt res, rr v c sbhed qtz xl, lnfr com g-ex frac por, mnrt sp v dull flor, tr ques cut.

Note: After initial gas show @ 1411m, maximum readings are an artifact of gas saturation in gas sampling canister. A pre-dilution was introduced to the system @ 1432m.

1418-1425 CHT predy m-dk brn-gy' brn, mnrt lt brn, transl lp, predy v hd & dne, el 'arg' & less ind lp, tr glauc, tr epice, rr-tr dolc epice, frac lp, tr-mnr milky-chalcedonic qtz healed & lined frac wl pchty pyr, rr-tr sb-ehed qtz xl linings, tr diam pyr, lnfr tr loc p-fr frac por, tr-mnr v dull flor, tr ques cut.

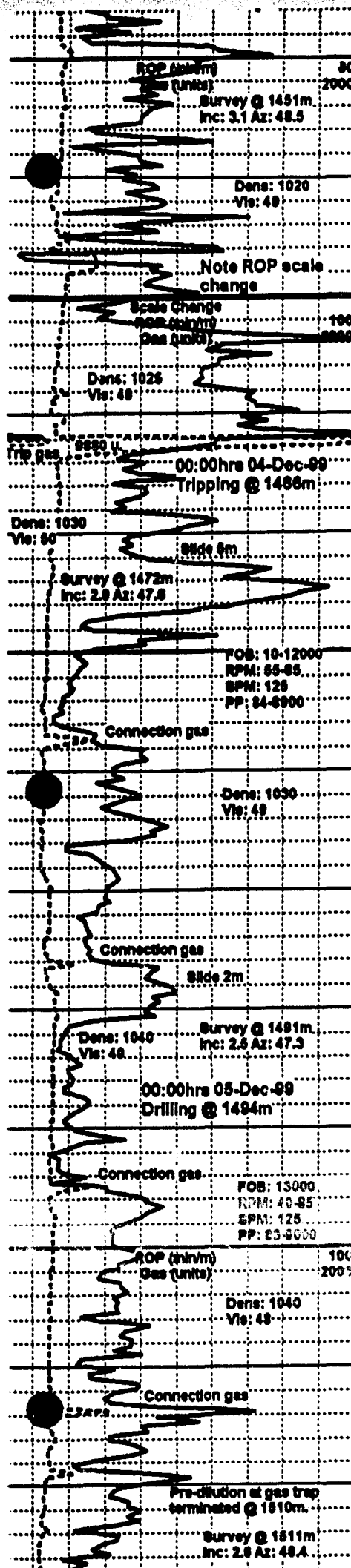
1425-1430 CHT predy dk brn, v hd & dne, non-transl, tr diam pyr, rr epice, tr v fnt worm burrows?, mnrt-com planar frac efc, lnfr mnrt milky-occy chalcedonic qtz frac linings & heals, lnfr tr-mnr sb-ehed qtz xl linings, mnrt lt brn chky shy-edy el dolc cataclastic? silc etrgs, lnfr mnrt fr-g loc frac por, tr sp v dull flor, n cut.

1430-1437 CHT as prev desc wl decr tr milky qtz frac fill, rr sb-ehed qtz xl linings, mod-v frac? (reduced ctge size), lnfr tr p-fr frac por, tr sp v dull flor, n cut.

1437-1442 CHT comy pale brn, mnrt m-dk brn, comy mot, v hd & dne, predy transl-sb transl, vary spiclr in mnrt pt, tr el shy, vary frac lp wl tr milky-occy chalc qtz frac heals, mnrt-com planar frac efc wl rr qtz xl linings, v rr pyr mic frac fill, tr el dolc, lnfr tr-mnr p-fr frac por, n/a.

1442-1450 CHT predy v lt-ht gy wl com dk brn pel & mote, sb transl, v hd & dne, comy vary spiclr, tr diam pyr, rr-tr scat dol rhombs, tr el shy, frac lp, lnfr tr milky-chalc qtz frac heals & occl linings, lnfr tr clt an-sbhed qtz frac linings & fills, silc in mnrt pt wl tr-mnr chalc-milky blebs & mote, rr calc frac fill, rr pyblt read, lnfr mnrt loc p-fr frac por, n/a.

1450-1458 CHT v alm-abv bcmg lnfrly pell & loc mot, mnrt m-dk brn & gy mot cht, lnfr frac, lnfr mnrt-com chalc-milky qtz frac heals & occl linings (rr botry), lnfr tr clt sb-ehed qtz xl linings, lnfrly silc in mnrt pt wl chalc-milky qtz blebs & mote, rr calc frac fill, lnfr rr-tr pyblt-blt read, lnfr lnfr mnrt fr-p frac por, mnrt sp dull flor, tr ques cut, tr v gr shy qtzs as wl dolc cmt.



1450-1458 CHT v elm-abv bcmg incrt peli & loc mot, mnr m-dk brn & gy mot cht, incrt frac, incrt mnr-com chalc-miky qtz frac heals & ocl linings (rr botry), incrt tr clr ab-euhed qtz xl linings, incrt silic in mnr pt w/ chalc-miky qtz blebs & mots, rr calc frac fill, incrt rr-tr pyblt-blt read, lnfr incrt mnr fr-p frac por, mnr sp dull flr, tr ques cut, tr vf gr elty qtzs ss w/ dolc cmt.

1458-1464 CHT w/ Intbd CGL; CHT elm-abv bcmg incrt vcol: lt-m gy peli-mot, dk gy brn-brn, comy ab transl, v hd & dne, incrt frac, vary silic lp w/ mnr-com miky-chalc blebs-mots & frac fills, loc el-mod edy in mnr pt, incrt tr-mnr xln qtz frac & vug? linings, tr diam pyr, rr pyblt read, lnfr mnr-loc com fr-g frac por, mnr sp dull flr, tr v wk ques cut; CGL monomict cht pble same as bedded cht, tr dk gy brn arg elty-eddy mtr w/ dolc cmt, tr-mnr ard-ab ang a/c on cht frage, lnfr p? Intgran por.

KINDLE FORMATION @ 1464m MD; -921.9m SS

1464-1466 SLTST lt brn, qtzs, mod frm-cmbly, edy lp occy grdg-elty ss, el arg, v dolc occy grdg-elty dolostone, ocl dol rhomb, n vis por, evn dull flr, mnr v wk v elo blmg cut.

1466-1475 SLTST predy dk brn, mnr lt-m brn, ab blk, qtzs, el-mod arg, v dolc-loc vary calc grdg-v elty dolostone lp, ocl dol rhomb, vary ind: comy mod-v hd & brlt, mnr-com p ind & cmbly, tr lt brn chky el elty marl strg, n vis por, com v dull flr, mnr v elo v wk stmg & blmg cut.

1475-1479 SLTST as prev desc w/ incrt mnr v thn Intbd MRL; lt brn, chky-cmbly, el-mod elty, fnty lamd lp, n vis por, decr mnr-com v dull flr, decr tr-mnr cut aa.

1479-1488 SLTST dk-m brn-occy brn gy, qtzs, decr el-mod dolc, loc el-mod chty, el-mod arg, tr arg ptgs, tr el edy, incrt ind lp, loc v w ind, lnfr com silc cmt, n vis por, com v dull ques flr, tr ques cut, tr mrlly strg.

1488-1490 SLTST w/ mnr Intbd LS; SLTST as prev desc bcmg loc v dolc-calc grdg-elty calc dol, por & shows aa; LS v dk brn, crp-micxl, frm-hd, dne, v arg, comy elty, vary dolc grdg-calc dol lp, el chty lp, n vis por, com-abnt v dull flr, mnr-com elo yel wh stmg cut.

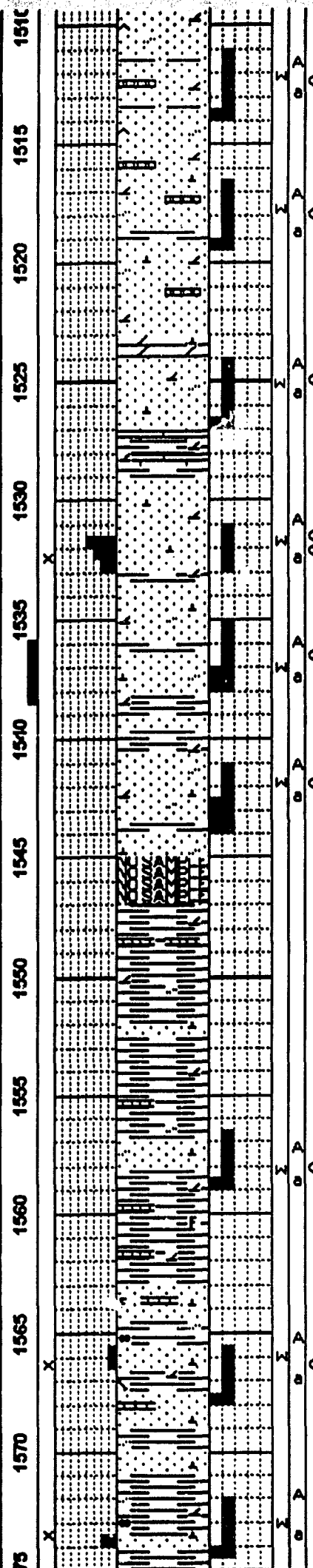
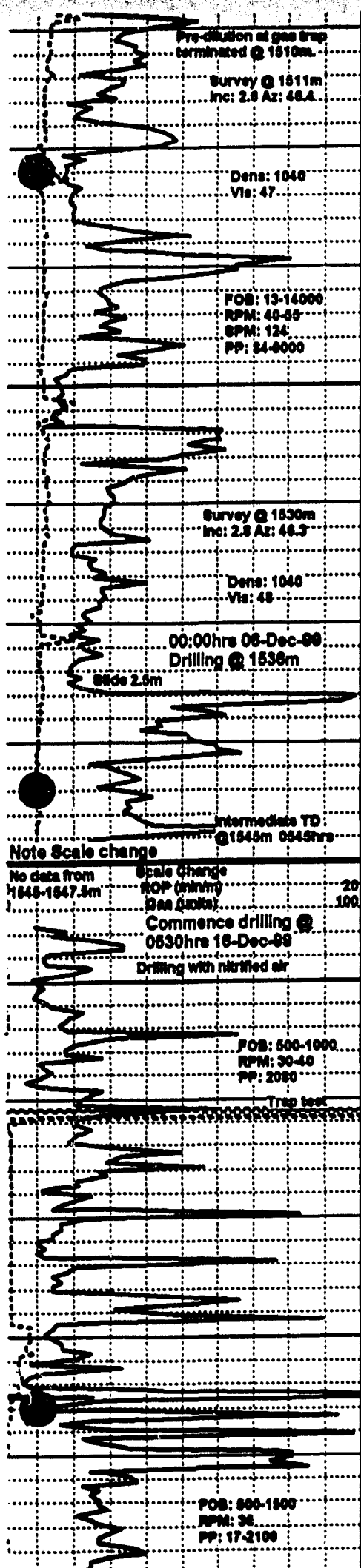
1490-1497.4 SLTST dk brn-v dk brn gy, qtzs, el-loc mod arg, predy mod-v calc-dolc grdg-v elty dol lp, comy mod ind, predy calc-dolc cmt, mnr loc com silc cmt, n vis por, decr shows aa.

MATTSON FORMATION @ 1497.4m MD; -955.2m SS

1497.4-1506 SLTST w/ Intbd SS; SLTST lt brn, v qtzs w/ tr ltc gra, rr-tr glau, vary edy lp, clin-el arg, p ind & cmbly w/ abnt calc-dolc cmt, tr loc frage, occy v arg grdg-calc gy sh lame, n vis por; SS v pale-m brn, vf gr, vary elty grdg from slt abv lp, qtzs w/ ltc gra, w art, ang-ab ang, predy clin-el arg, tr foe frage, p-mod ind w/ abnt calc cmt, mnr dull flr, mnr elo v thn lt yel gn stmg-dife cut, mnr wh eft chky ls strg.

1506-1510 SS w/ Intbd SLTST; SS comy lt-m brn, vf gr, vary elty grdg-eddy sltst lp, qtzs (w/ rex1 ls? gra), rr-tr ltc gra, v rr glau, predy clin-el arg, incrt tr-mnr foe frage, comy p ind & cmbly w/ abnt calc cmt, mod-mod w ind lp w/ mnr calc + silc cmt, predy n vis por, tr p por, mnr ptchy dd o etn, mnr sp-ptchy dull flr, tr ques cut; SLTST aa, mnr chky ls aa.

1510-1515 SS off wh-lt gy, vf gr, vary elty lp occy grdg-sltst, v qtzs (qtzaren), w/ tr ltc gra & rr glau, v w art, ang-ab ang, predy v clin, occy el arg, p-mod ind w/ silc & dolc cmt, rr-tr Intstl pyr, n vis por, tr-mnr sp dd o etn, mnr sp dull flr, tr ques cut; tr-mnr Intbd SH



1510-1515 SS off wh-lt gy, vf gr, vary slty ip occy grd-g-eltet, v qtz (qtzaren), wi tr ltc gra & rr glau, v w art, ang-ab ang, predy v cin, occy el arg, p-mod ind wi elic & dolc cmt, rr-tr intell pyr, n vie por, tr-mnr ep dd o etn, mnr ep dull flor, tr ques cut; tr-mnr intbd SH as desc below.

1515-1523 SS wi mnr intbd SH; SS slm-prev desc bcmg predy wh-v lt gy, comy p ind & crmbly wi com-abnt dolc-calc cmt, mod-mod w ind lp wi loc com str-ptchy elic + mnr ep dolc cmt, n vie por, mnr-com ep-ptchy dull flor, tr-mnr slo v wk etmg-dife cut; SH m gn gy, frm-hd, ab biky-occy ab pty, predy non-alty, comy el-mod dolc, loc el slty-rrly ady, tr diam pyr, rr-tr pyr nod.

1523-1529 SS wi mnr intbd DOL, LS & SH; SS as prev desc, predy n vie por, tr p por, evn v pale flor, tr v wk ques cut; DOL bf brn-lt gy, crp-micxl, predy hd & brlt, comy vary calc loc grd-g-dolc ls, el-mod chty in mnr pt, tt, n/a; LS dk-m brn, slty-ady, arg lp, vary dolc grd-g-calc dol, tt, n/a; SH dk gy-brn gy, ab pty-ab biky, ab fls, frm-v frm, el-mod dolc.

1529-1533 SS aa lp, com SS #2 pale brn, vf gr, el slty ip, qtzaren wi tr ltc gra & rr glau, v w art, ang-ab ang, v cin, predy p ind & crmbly-frt, com calc-dolc cmt, com qtz ovgtse, var com fr-str g por, p por lp, evn lt brn o etn, evn pale yel flor, com v thn wk yel etmg-dife cut, mnr intbd SH & tr wh chky ls etrg.

1533-1540.5 SS wi intbd SH; SS wh-v lt gy, vf gr, comy vary slty, qtzaren aa wi incr tr dk ltc gra, cin, mod-p ind wi abnt calc-dolc cmt, n vie por, com pale yel flor, tr v wk ques cut; SH dk gy, ab biky-ab pty, v frm-hd, fnty mm lp, v dolc wi ocll v arg dol etrg; mnr v dk gy brn arg tt dolc etet etrg.

1540.5-1545 SS v slm prev desc bcmg incrly slty grd-g-eltet lp, poi & shows aa, mnr intbd SH aa.

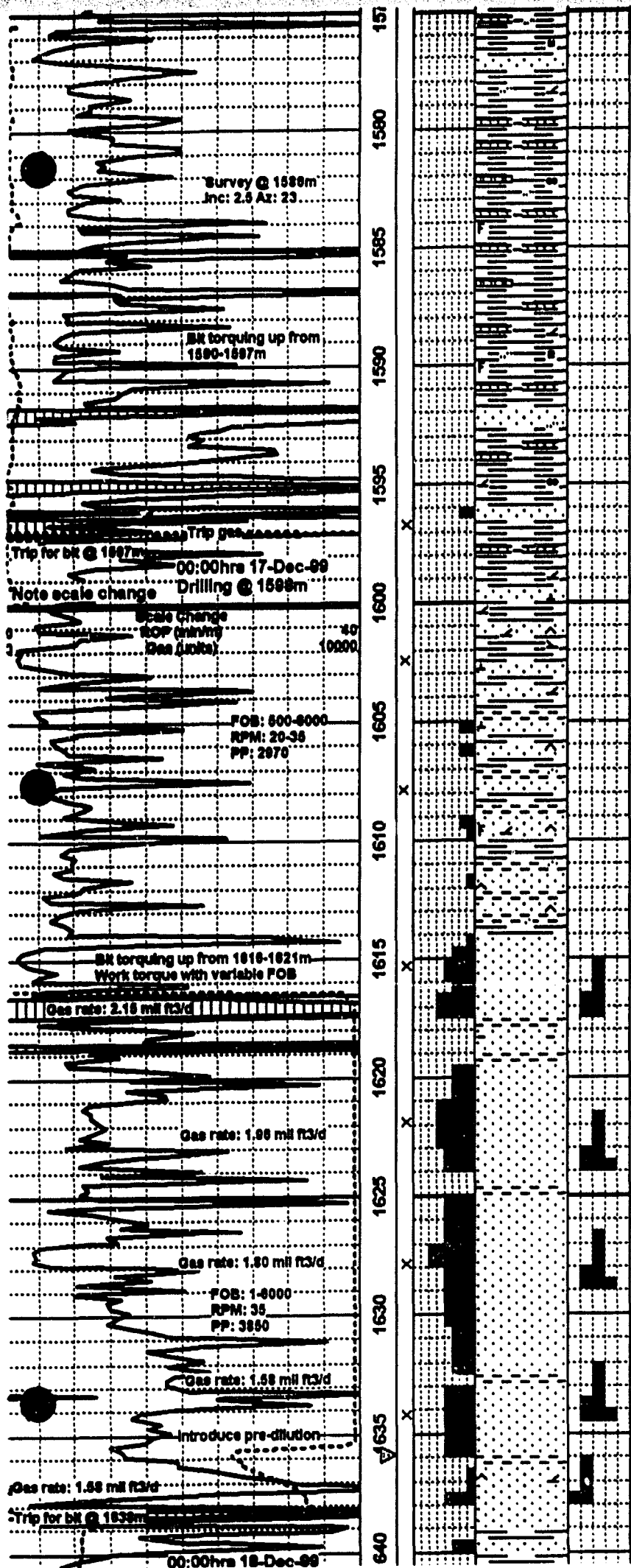
Note: Samples from 1550-1555m are unrepresentative spot sample.

1547-1555 SH dk gy, v frm-hd, ab biky-ab pty, ab fls lp, predy el slty & mm, loc el ady, mody dolc, v thn intbdd SS: off wh-lt gy, vf gr, slty grd-g-eltet, qtzaren, tr dk ltc gra, rr glau, tr sh rip-up clste, predy cin-loc vary arg, mnr arg ptgs, w-v w ind wi abnt calc cmt, tr loc com diam pyr, n vie por, n/a.

1555-1563 SH wi mnr intbd SS; SH as prev desc wi rr-tr fos frag, rr ptchy pyr, loc v dolc-calc grd-g-v arg ls etrg; SS off wh-lt gy-occy lt brn, vf gr, slty grd-g-ady etet lp, qtzaren aa, w art, ang-ab ang, predy cin-loc el arg, tr arg ptgs, ocll sh r.u. clst, rr-tr fos frag, w ind wi v abnt calc cmt, loc com qtz ovgtse, tr intell pyr, predy n vie por, tr p-rrly fr por, mnr ptchy pale yel flor, tr v wk ques cut.

1563-1571 SS wi intbd SH; SS bf-lt brn, vf gr, vary slty, qtzaren wi incr tr dk ltc gra, w art, ang-ab ang, predy cin, tr arg ptgs, w ind wi v abnt calc cmt-mtx locy grd-g-vary ady tt ls, mnr c sparry rex l fos frag/allochema, mnr loc com qtz ovgtse, tr intell pyr, predy n vie por, tr p-rrly fr por, mnr ep yel flor, tr v wk slo thn etmg cut; SH dk gy-bik, frm-hd, ab pty-ab biky, comy ab fls, el-mod slty & mm, comy vary carb-phosc, tr-loc mnr pyr, tr loc com pyrdz wm bur, el-mod dolc-calc, rr oet.

1571-1575 SH wi mnr intbd SS; SH as prev desc bcmg incrly slty-ady lp, incr tr ptchy-diam pyr, mnr arg etet-as lame-etrgs; SS aa lp, predy m-lt brn, vf gr, tr f gra, slty grd-g-ady etet lp, v qtz wi tr dk ltc gra, w art, ang-ab ang, el arg, w-v w ind, com-abnt dolc-calc cmt, tr loc com pyr, n vie por, n/a, tr f-m lss qtz & bi cht gra, infr mnr strky fr? por.



1575-1582 SH w/ mntr intbd SS; SH as prev desc, n worm burrows; SS as prev desc Incry grd-g-eltst, Incr mntr-loc abnt Intatl pyr, n via por, n/a.

1582-1590 SH w/ mntr intbd SS; SH v dk gy-blk, pity-ab pity, mntr eb blk, comy fls-ab fls, v frm, comy el alty & mm, loc v alty-ady li mntr pt, vary phos-carb, tr-mnr diam-frm pyr, tr fos frag, el dolc, tr m gn gy pity mm chyst etrg w/ tr pyrzd wm bur; SS m-dk brn, v/ gr, tr f gra, elty grd-g-eltst lp, v qtze aa, comy el arg w/ mntr arg ptgs, tr loc v arg, rr-tr fos deb, ocel sh r.u. clst, v w ind w/ abnt calc-dolc cmt, mntr loc com-abnt Intatl pyr, n via por, n flor, tr v wk slo thn etmg cut.

1590-1595 SH as prev desc w/ decr rr-tr gn gy chyst aa, rr eldc nod-etrg, mntr thn intbd SS aa, tr f-m lee qtz & rr bl-dk gy cht gra.

1595-1600 SH w/ mntr intbd SS; SH as prev desc w/ tr ferr etrg, el-mod dolc, tr pyr nod; SS as prev desc lp, SS #2 off wh-v pale brn, v/ gr, el alty, qtzaren w/ tr dk ltc gra, w art, ang-ab ang, w ind w/ com calc-dolc & silc cmt, rr-tr Intatl pyr, mntr p-etr fr por, tt lp, tr v/ Intatl blt, mntr-com pale yel gn flor, mntr thn slo wk yel etmg & dfa cut.

1600-1605 SH w/ mntr intbd SS; SH mixed, predy aa bcmg Incry blk, blt lp, Incr tr-mnr oxzd ferr lam-etrg, mntr SH #2 m gn gy, v frm, brt lp, eb pity, predy em, tr loc edy, eb wxy lp grd-g-chyst, rr-t diam pyr, non dolc; SS #2 as prev desc.

1605-1614 SS w/ intbd SH; SS elm-abv, off wh-v pale brn, v/ gr, el alty, qtzaren w/ tr dk ltc gra, v w art, ang-ab ang, rr-tr fos frag, rr sh r.u. clst, w ind w/ silc & dolc cmt, mntr qtz ovgrs, tr Intatl pyr, predy tt-3% por, mntr str 4-8% por, tr loc com ep blt, com pale yel flor, mntr thn slo wk etmg & dfa cut; SH m gn gy, m-dk gy & brn gy, v frm, brt lp, eb pity, predy em, Incry loc edy in mntr pt, eb wx grd-g-chyst, Incr tr diam pyr, tr pyr nod, non dolc.

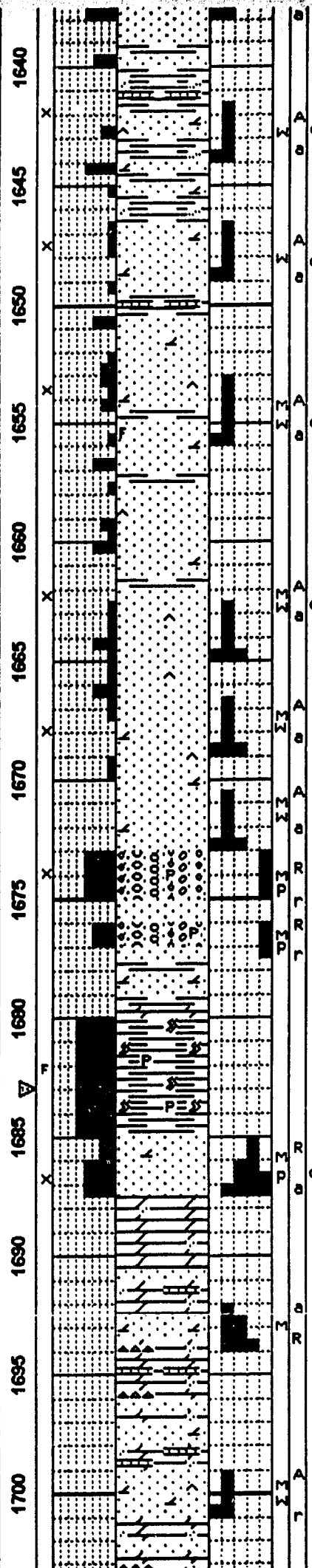
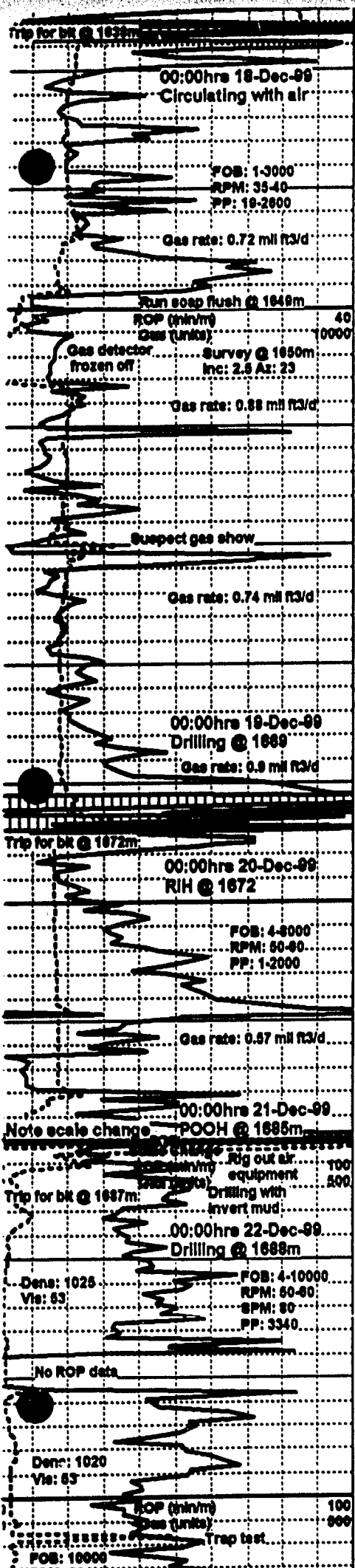
1614-1621 SS w/ intbd CLYST; SS mixed, aa lp, comy SS #2 disagg, v/ uf gr, tr lm gra, qtzaren, froe-mnr clt qtz w/ tr-mnr dk gy-bl cht gra, mod w art, eb ang-rd, Infr g por, n/a, mntr SS #3 lt gy gn, v/ gr, elty grd-g-ady skt lp, com-abnt gn cly mtr, ocel chyst r.t clst, mod Ind, tr ep dolc cmt, loc v pyrc, tt, n/a, Intbd CLYST grd-g from SH aa.

1621-1625 SS w/ mntr intbd CLYST; SS disagg, predy uf-lv/ gr, mntr lm & tr um gra, qtzaren, froe-clt qtz w/ tr ltc & cht gra, mod w art, eb ang-rd, v cln, rr-tr Intatl pyr, Infr g por, n/a, mntr SS #3 aa; CLYST as prev desc, rr fos frag.

1625-1631 SS as prev desc, disagg, predy uf-lv/ gr, mntr lm & tr um gra, qtzaren, froe-clt qtz w/ tr ltc & cht gra, mod w art, eb ang-rd, v cln, rr-tr Intatl pyr, Infr g por, n/a.

1631-1638 SS w/ mntr intbd CLYST; SS predy as prev desc, mntr Intbd SS off wh-v pale brn, v/ gr, el alty, qtzaren w/ tr dk ltc gra, v w art, ang-ab ang, w ind w/ silc & dolc cmt, mntr qtz ovgrs, tr Intatl pyr, predy tt-3% por, mntr str 4-7% por, tr ep blt, com pale ye flor, mntr thn slo wk etmg & dfa cut; CLYST as prev desc.

1638-1644 SH w/ intbd SS; SH blk-brn blk, frm-hd, eb pity-ab blk, comy eb fls, blt, alty-loc edy, mntr arg sktst & ss lame-strgs, fnty pyrc, el dolc-calc, mntr chyst aa; SS wh-v pale brn, v/ gr, el alty, qtzaren, w art, ang-ab ang, v cln, mod-p Ind, com dolc & silc cmt, mntr qtz ovgrs tt-3% por in com 4-8% por, com stchu dull-hd



comy sb fls, bit, elty-loc edy, mnr arg elstet & ss lame-strge, frty pyrc, el dolc-calc, mnr chyt aa; SS wh-v pale brn, vf gr, el elty, qtzaren, w art, ang-ab ang, v cin, mod-p ind, com dolc & elc cmt, mnr qtz ovgtse, tt-3% por ip, com 4-8% por, com ptchy dull-bri pale yel-yel gn flor, mnr fast v thn dffe cut, mnr SS #2 dleagg, f-m, clr-fros-yel qtz, tr cht gra, m art, rd-ab ang, lnfr g por, n/a, tr lt brn edy tt wkst.

1644-1650 SS mixed; pred SS #1 aa w/ lncr elc cmt, lncr tr cht & ltc gra, el decr por & shows aa, SS #2 lt gy-lt brn, vf-f gr, tr m gra, sb litharen, clr-fros qtz, tr-mnr bl-dk gy cht, tr sh gra, loc al arg, m-m w art, ang-ard, tr fcs frag, w ind, com-abnt dolc cmt, pred tt-4% por, quae dull flor, n cut; mnr SS #3 dleagg, f-m, tr-mnr c qtz & bl cht gra, sb litharen grdg qtz aren, m art, rd-ab ang, lnfr g por, n/a, mnr lntbd SH aa.

1650-1660 SS w/ mnr lntbd SH; SS wh-v lt gy, vf gr, el elty, pred qtzaren loc grdg-sblitharen, clr-fros qtz, lncr tr-loc mnr bl-dk gy-blk cht, v rr glau, mod w art, ang-ab ang qtz w/ rd cht, tr fcs frag, rr cht & tuff pbl, w ind w/ com dolc & elc cmt, mod ind ip, predy tt-3% por, mnr 5-9% por, com ptchy bri pale yel gn flor, com fast v thn yel dffe & stmg cut; SH elm-abv, blk-brn blk-dk gy, v frm-hd, pty-ab biky, brit ip, bit-phosc, comy elty-edy grdg-arg elstet & ss ip, comy non dolc-el dolc.

1660-1665 SS v elm prev desc, wh-v lt gy, vf gr, tr f & rr m gra, el elty, qtzaren, tr bl-blk cht, v rr glau, mod w art, ang-ab ang qtz w/ rd cht, rr fcs frag, cin, tr el arg, tr arg ptg, pred w ind w/ com elc & mnr-com dolc cmt, mod ind ip, mnr loc com qtz ovgtse, tr lntel pyr, rr sp kao, com tt-4% por, lncr mnr-com 5-10% por, mnr ptchy dull-bri pale yel-yel gn flor, tr v wk v thn quae cut; mnr lntbd SH aa.

1665-1670 SS as prev desc w/ lncr com elc & decr mnr dolc cmt, lncrly w-v w ind, decr mnr p-fr por aa, decr tr-mnr quae shows aa.

1670-1675 CGL w/ lntbd SS; SS aa bcmg lncrly elty grdg-mnr edy elstet, w ind w/ abnt dolc cmt, mnr ptchy elc cmt, pred n vie por, quae shows aa; CGL f pbl, oligomict bcmg polymict, clst supp, mod p art, rd-ard, com rd efce, c-gritty mtz, pred lnfratmatl sed clste (sh, chyt, elstet, occl ss & tr cht & tuff clste), mnr ptchy-loc abnt xln pyr & pyrdz clste, tr pyr nod, lnfr g por, n/a.

1675-1680 SS w/ CGL; SS as prev desc; CGL as prev desc w/ rr v dk brn arg elty-edy mtz; mnr lntbd DOL bf-lt gy, crpxl-micxl, dne, hd, tr sh.

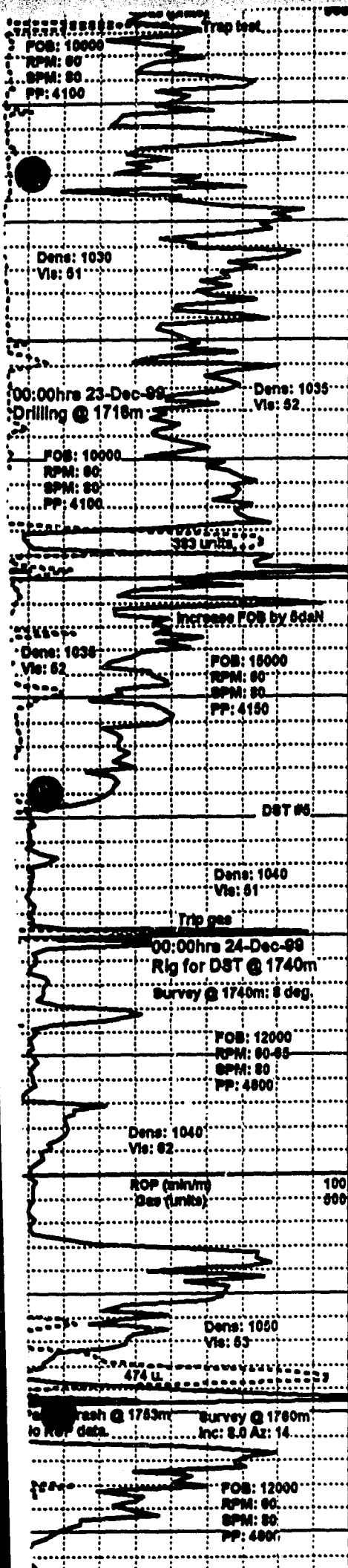
1680-1685 SH mixed; pred dk gy-brn gy, v frm, brit ip, biky-ab pty, comy fls, vary elty & mm, sm ip, tr elstet-ss lam, loc vary edy, tr diam-xln pyr, tr-mnr pyr nod, com-abnt planr frac efce w/ tr rust etn & strlss, tr fcs frag, sb wxy in mnr pt, predy non dolc, 30% SH #2 m gy gn, pred biky, sb fls, el elty, frty pyrc, pred non dolc, comy frac aa, rr fcs frag.

1685-1690.5 DOL w/ SS; DOL lt brn, lt-m gy, crp-micxl, frm-hd, mod dne, eft & el chky ip, vary edy-elty in mnr pt, tt, com-abnt dull-mod flor, tr quae cut; SS off wh-lt brn, vf-uc, tr-mnr vc gra, sb litharen, abnt fros-clr qtz w/ com vcol ltc gra (ls-dol, cht, volc?), m p art, pred dleagg, mnr p ind & fri cone ctgs, mnr-loc com dolc cmt, mnr sp elc cmt, mnr-com qtz ovgtse, var por; com g-fr, mnr tt-p, tr exc, lnfr pred g-fr, abnt pale yel-yel gn flor, mnr wk v thn dffe cut.

1690.5-1696 DOL lt brn-gy, crp-micxl, pred frm-loc hd & brit, el eft & chky ip, tr-mnr lt gy-lt brn el elty-edy tmsl cht strg-nod, n vie por, decr flor aa, tr quae cut, el-loc v edy grdg-30% dolc SS: pred-f-m gr, mnr c gra, v qtz w/ mnr cht & dol gra, mod-mod w art, sb ang-rd, mod-p ind w/ com-abnt dolc cmt, mnr ptchy elc cmt, n vie por.

1696-1701 SS off wh-pale brn, vf gr, elty, tr f gra, v qtz w/ tr-mnr cht & ltc gra, rr glau, cin, mod w art, ang-ard, comy p-mod p ind, com-abnt dolc cmt, loc w-v w ind w/ loc com-abnt elc cmt, frac ip, n vie por, abnt v pale yel flor, n cut, lntbd DOL aa bcmg lncrly edy lncrly grdg-dolc aa.

1701-1705.5 DOL m-dk brn, crp-micxl, hd, dne, tr chty, mot ip, vary arg ip, comy vary elty-edy grdg-occl dolc ss strg, tr-mnr loc com elstet-ss & n/a mnr lntbd CHT N m brn & v tmslsh



1701-1705.5 DOL m-dk brn, crp-micxln, hd, dns, tr chty, mot lp, vary arg lp, comy vary slty-edy grdg-occl dolc ss strg, tr-mnr loc com allochems, tt, n/a, mnr intbd CHT h-m brn & gy, trnel-ab trnel, loc mot, dns, brit, pred vary edy occy grdg-chty ss strg, tt, n/a, intbd SS as prev desc.

1705.5-1710 SS v lt gy-pale brn, vf-f gr, tr-mnr m gra, qtzaren grdg sbltharen, abnt clir-fros qtz wl tr-loc mnr dk cht & ltc gra, comy mod w-w ert, ang-erd, frac lp, var lndn: w-mod p lnd, com-abnt silc & dolc cmt, tr loc com qtz ovgtas, pred n vis por, com ptchy dull-mod yel flor, n cut, mnr vf-c mod p ert sbltharen, mnr DOL strg-thn intbds aa.

1710-1714 SS pred aa bcmg incry f gr lp, ~30% SS #2 m-dk brn-brn gy, vf-f gr, slty, qtz wl tr-mnr dk cht & ltc gra, comy el-mod arg, el chty lp, tr arg ptgs, mod-mod w ert, ang-erd, mod-mod w lnd, com-abnt dolc cmt, occy grdg-edy dol, tt, n/a, tr-mnr dol strgs.

1714-1725 SS off wh-v lt brn, vf-f gr, qtzaren wl tr-mnr pred dk ltc & cht gra, rr glau, w ert, ang-erd, clin, tr arg-bit ptgs, frac lp, comy mod-mod p lnd, loc v w lnd, com-abnt silc + mnr-com ap-ptchy dolc cmt, pred tt-3% por, mnr str 4-8%, com ptchy pale yel flor, n cut, mnr SS #2 alm-abv, f-m gr, mnr vf gra, qtzaren aa, mod w ert, ab ang-rd, pred dlsagg, tr-mnr cone ctgs wl sp silc cmt & fr-g por, mnr-com qtz ovgtas, lnd com g por, mnr ptch dull flor, n cut, mnr thn slty-edy dol strgs.

1725-1734.5 SS pale brn, pred vf gr, mnr f gra, slty, vf-f gr in mnr pt, qtzaren wl tr dk ltc gra, w ert, ang-ab ang, clin, tr el arg, tr arg ptgs, comy mod-p lnd, com-abnt dolc cmt, mnr loc com silc cmt, loc w lnd, pred tt-2% por, mnr str 3-6% or, pred evn pale yel flor, tr v wk v thn ques cut, mnr thn dol strg-intbds: lt-dk brn, crp-micxln, v frm-est, v slty-edy grdg-dolc sstet & ss strg, tt, n/a.

1734.5-1740 SS dlsagg, pred f-lm gr, mnr uvf & tr um gra, qtzaren, pred fros-mnr clir qtz wl tr-mnr cht & ltc ngra, mod w ert, rd-ab ang, clin, tr v p cone ctgs wl tr-mnr sp silc cmt, mnr qtz ovgtas, lnd g por, abnt-evn mod-bri pale yel gn flor, tr v wk v thn ques cut, mnr SS #2 pale brn, vf-f gr, qtzaren, v w ert, ang-erd, p-mod lnd, mnr sp silc cmt, clin, pred g-fr por, evn bri pale yel wh-yel gn flor, mnr v thn dls cut.

1740-1747 SS v alm-prev desc bcmg fmr, off wh-v lt gy, vf-f gr, mnr lm gra, qtzaren aa wl lndr clir qtz, w-m w ert, ard-ang, v clin, comy dlsagg, lndr mnr v p lnd & fri cone ctgs, pred tr sp silc cmt, loc mnr-com silc cmt, mnr-com qtz ovgtas, cone ctgs wl pred g por (13-16%, tr 18-20%), mnr str fr & tr p por, abnt-evn bri pale yel wh flor, tr-mnr v wk elo stmg & dls cut.

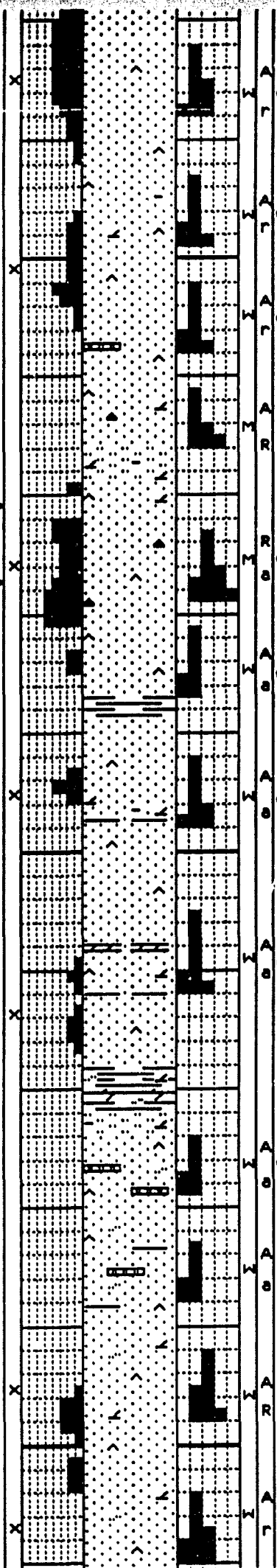
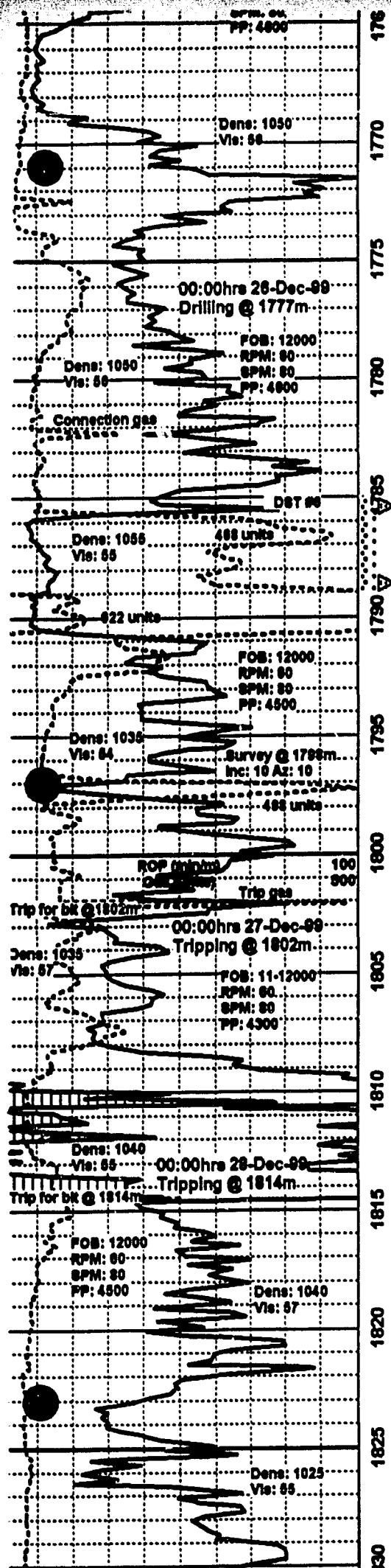
1747-1753 SS aa wl decr mnr cone ctgs, bcmg incry lnd lp wl com ptchy silc cmt, v f gr & slty in mnr pt, decr com g por aa, lnd fr-p por lp, shows aa.

1753-1755.5 DOL bf-m brn, crp-micxln, v frm-el sft, el-loc v ady, n vis por, n/a, intbd SS lt-dk brn, vf, vary slty grdg-sstet lp, m w-loc m ert, ang-ab ang, vary arg lp wl tr arg ptgs, mod-occy w lnd, com-abnt dolc cmt, tt-p por, n/a.

1755.5-1760 SS v pale tan-off wh, pred vf-lf gr, el slty, qtzaren, w ert, ang-erd, clin, dlsagg lp, com vary lnd cone ctgs: comy p lnd & fri-cmbly, mod-occy w lnd lp, mnr qtz ovgtas, mnr-com ap dolc & silc cmt, var por: com p-fr, less com fr-g, tr ap bit, evn bri pale yel wh flor, tr-mnr elo wk v thn stmg & dls cut.

1760-1764.5 SLTST wl intbd SS; SLTST dk-m brn, qtz, vary frm-loc sft, mod-v arg, mod-loc v dolc, occl dol lama, sl ady, tt-p por, com ptchy v dull flor, tr v elo fnt stmg cut, mnr intbd SS off wh-v lt gy, vf, slty, qtzaren, w ert, ang-ab ang, clin, pred p lnd, loc m lnd, pred silc & tr sp dolc cmt, pred p-str fr por, mnr g etks, flor aa, tr ques cut.

1764.5-1769 SS v lt gy-pale tan, vf-f gr, sl slty, qtzaren, w ert,



1764.5-1769.55 v lt gy-pale tan, vf-f gr, sl elty, qtzaren, w art, ang-erd, clin, disagg lp, com vary ind cone ctgr: com p-v p ind & fri-cmbly, loc mod-occy w ind, mnr-loc com sp-ptch silic cmt, var por: com g, mnr fr-p, tr-mnr tt-p, evn bri pale yel wh flor, tr-mnr v thin frnt dife cut.

1769-1774.55 pale brn-mnr m brn, vf gr, tr-mnr f gra, qtzaren, comy vary elty, w art, ang-erd, pred clin, loc el-mod arg in mnr pt, tr arg ptgs & lame, comy m-m p ind & cmbly, loc m w-w ind, com silic & mnr str dolc cmt, pred tt-2% por, mnr str p-tr fr por, tr ep bht-pybt, abnt dull yel-mnr bri yel wh flor, rr-tr slo thin stmg cut.

1774-1780.55 as prev desc w el decr var indn, pred silic & decr tr-mnr str dolc cmt, decr tr vary arg as aa, comy var elty aa ocgy grdg-edy elstet strg, incr var por: com tt-3%, mnr-com 4-7%, mnr ctgs w com qtz ovgtgs & fr-g por, shows aa.

1780-1785.55 mixed; aa lp, 55 #2 lt gy-v lt brn, pred vf-f gr, mnr-loc com vcol rd c-um cht gra, tr cht pbl, ebltharen, m art, ang-rd, clin, m-m w ind w com silic & dolc cmt, tt, mnr vf-c gr ltharen (cht & dol gra) w com-abnt tt silic cmt, lmbd SLTST dk-m brn, qtz w scat cht gra, hd-fm, ocgy sft, vary arg, v dolc grdg-elty dol lp, tt.

1785.5-1790.55 disagg, lf-um gr, mnr vf & tr l-uc gra, ebltharen grdg-qtzaren, abnt fros-mnr clt qtz w mnr pred dk vcol cht, mod art, rd-ab ang, tr-mnr cone ctgs w sp-ptchy silic cmt, tr qtz ovgtgs, lntf pred g-fr por, com dull yel-bri pale yel wh flor, tr v frnt ques cut.

1790.5-1796.55 lt gy, vf gr, elty, rr-tr f-m cht gra, qtzaren, w art, ang-ab ang, clin, pred mod-mod w ind, com silic cmt, mnr-loc com str dolc cmt, tr intetl pyr, pred n via por, tr str p por, tr sp-ptchy bht-pybt, abnt vary dull-bri yel-yel gn flor, tr v frnt ques cut, mnr lmbd SH blk-brn blk, frm, pty-ab biky, fle, bht, tr coaly deb, tr pyr nod.

1796-1802.55 lt tan, vf-f gr, qtzaren, comy elty lp, clin, w art, ang-ab ang, mod w-mod ind w com silic & sp-ptchy dolc cmt, mnr p ind ctgs w com qtz ovgtgs & fr-g por, predy tt-3% por, abnt pale yel gn-mnr dull yel flor, tr v frnt ques cut, mnr lmbd m-dk brn-gy 55 vf gr, elty grdg-elstet lp, vary arg, mnr arg ptgs & lame, p-mod ind, com-abnt dolc cmt, tt-p por, tr blk sh.

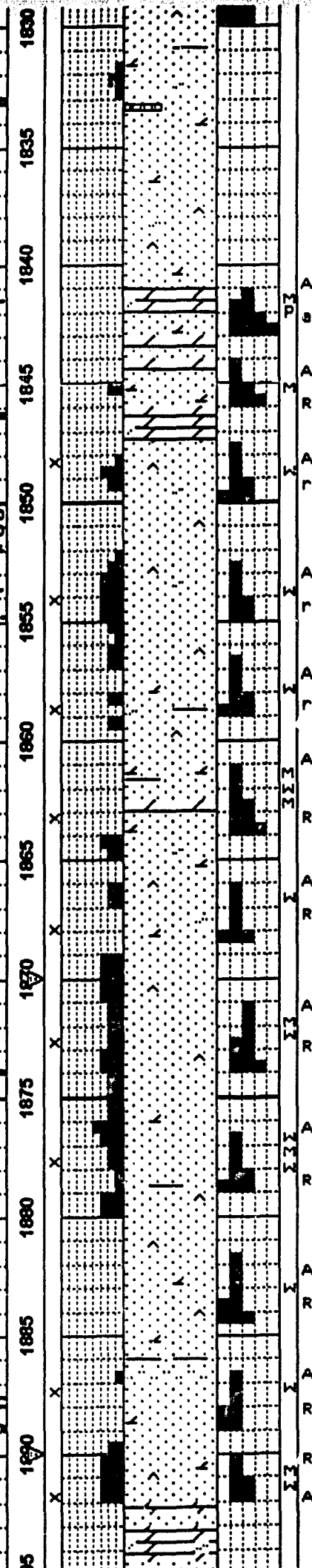
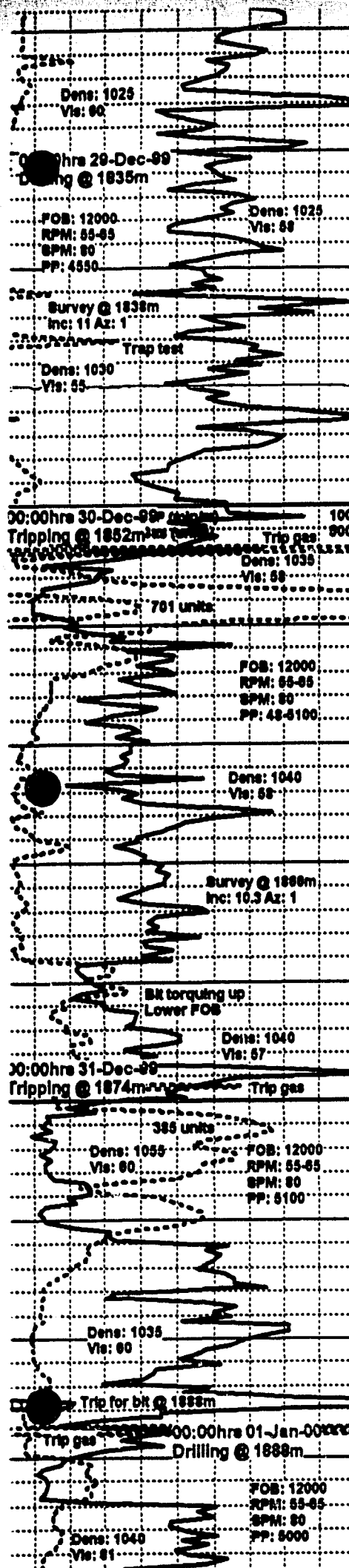
1802-1809.55 v elm-abv, lt gy, v f gr, elty, mnr vf-f w occl scat m-c cht & pbl frag (p-fr por lp), qtzaren, w art, pred ang-ab ang, clin, comy m-m w ind w com silic & tr-mnr dolc cmt, pred tt-2% por, mnr str p por, abnt wk-mod yel-occy bri pale yel gn flor, tr slo thin stmg cut, mnr vf-m gr m art dolc ebltharen w com arg ptgs, mnr DOL m-dk brn-gy, crpxl, vary elty-edy grdg-dolc elstet strg, el-mod arg, tr-mnr blk pty bht SH w tr pyrzd wm bur.

1809-1815.55 w SLTST, SH & DOL; 55 lt gy, vf gr, comy v elty grdg-edy elstet lp, qtzaren, w art, ang-ab ang, clin, m-m w art, abnt silic cmt, tr sp dolc cmt, pred tt, tr p por, evn bri pale yel wh flor, mnr frnt v thin dife cut; SH dk brn, pty-ab pty, vary hd-fm, sft & rthy-mrly lp, mod-v dolc w mnr-com mlc-v f xln dol rhmba grdg-elty arg DOL lp, vary elty comy grdg-arg dolc SLTST, tr-mnr cht strg-nod.

1815-1820.55 as prev desc w lrr glau, incr tr arg ptgs & v f lame, decr mnr ptchy dull-occy bri yel-yel wh flor, tr ques cut, tr m-dk gy pty frm elty & mm SH.

1820-1827.55 off wh-lt gy, vf-f gr, tr km gra, sl elty lp, qtzaren, rr-tr c cht gra, w art, ang-rd, clin, disagg lp, mod p-mod w ind, com dolc & silic cmt, mnr-loc com qtz ovgtgs, tr intetl pyr, comy tt-3% por, mnr 5-9% por, tr g strk, mnr flor aa, tr ques cut.

1827-1835.55 lt tan-lt gy, predy vf-f gr, mnr f-vf gr w tr km gra, qtzaren, comy vary elty ocgy grdg-edy elstet strg, w art, ang-erd-occy rd, clin, comy mod-mod w ind, loc p-v w ind, com loc abnt dolc & mnr loc com silic cmt, tr qtz ovgtgs, incr tr intetl pyr, predy tt-2% por, tr-mnr str p por, mnr ptchw dull-occy bri yel-yel



abnt dolc & mnr loc com sho cmt, tr qtz ovgrs, mnr tr intstl pyr, predy tt-2% por, tr-mnr str p por, mnr ptchy dull-occy bri yel-yel wh flor, tr ques cut, tr dk gy sh.

1835-1841 SS alm-abv, off wh-lt gy, vf-f gr, rr-tr lm gra, qtzaren, comy vary slty, mod w-w art, ang-ard-occy rd, cin, mod-mod w ind, p ind & cmbly in mnr pt, decr com dolc & incr mnr-com silc cmt, decr rr-tr intstl pyr, predy tt-2% por, tr str p por, mnr ptchy pale yel wh flor, n cut.

1841-1848 DOL lt brn, dolaren, comy vf-m gr, m-vc gr lp, abnt off wh-lt brn v ang-ab ang dol gra, tr-mnr qtz gra bcmg loc abnt ocgy grdg-dolc aa, m-p art, tr scat wh cht & rexil fos frage, tr-mnr dolc mtz-cmt, m ind, tr-loc mnr pyr, mnr p por, mnr ptchy dull-bri flor, n cut; intbd SS grdg from abv lp, lt brn-lt gy, vf-f gr, mnr m & tr c gra, v qtzs wl mnr-loc com dol gra, m art, m ind, p ind & cmbly lp, com-abnt dolc cmt, pred n vis por, tr p-r fr por, tr ap-ptchy bit, mnr dull flor, n cut.

1848-1852 SS lt gy, vf gr, mnr lf gra, vary slty, qtzaren, w art, ang-ard, cin, tr arg ptgs, comy p-mod ind & cmbly, w ind lp, predy silc + mnr ap dolc cmt, tr qtz ovgrs, rr-tr ap kaol, comy tt-2% por, mnr str p-fr por, mnr ptchy-ap bit, abnt mod-bri yel wh-yel flor, tr frnt ques cut.

1852-1856 SS v alm-abv, lt tan-lt gy, vf-f gr, sl slty, qtzaren, w art, ang-ard-occy rd, cin, comy p ind & cmbly-frl, mod ind lp, mnr-com silc & tr-mnr ap dolc cmt, mnr qtz ovgrs, var por: com 6-9%, less com 3-5%, evn mod pale yel flor, tr v frnt ques cut.

1856-1861 SS lt gy, vf, mnr-tr lf gra, vary slty, qtzaren, w art, ang-ard, cin, tr sl arg, mnr arg ptgs, comy m-m w ind, p ind & cmbly-frl lp, pred silc & tr-mnr ap dolc cmt, tt-2% por, mnr str p-fr por, mnr ap-ptchy bit, mnr ptchy mod yel flor, tr frnt ques cut, tr blk bit slty-edy sh.

1861-1864 SS lt tan, vf-f, tr m & c gra, qtzs wl tr-loc com dol gra, grds-mnr dolaren, m w-m art, ang-rd, m-p ind & cmbly, com-abnt dolc cmt, pred n vis por, tr str p por, tr ap bit, abnt mod-dull yel flor, n cut, tr sh.

1864-1866 SS lt gy-lt tan, vf gr, tr-loc mnr lf gra, vary slty, pred qtzaren, loc tr-mnr dol gra, w-loc m w art, ang-rd, cin, tr arg ptgs, var ind: com m-p ind, cmbly lp, loc m w-w ind, com dolc + mnr ap-ptchy silc cmt, tt-2% por, mnr str p-fr por, tr ap bit, com ptchy flor aa, n cut.

1866-1875 SS lt brn-lt gy, uf-uvf gr, tr-mnr lm gra, qtzaren wl clt-fros qtz, mod w art, ang-rd, v cin, disagg lp, fri, p-mod ind, w ind in mnr pt, com ap-ptchy silc cmt, com-loc abnt qtz ovgrs, var por: com 7-10% wl mnr g atks, less com 3-6% wl tr-mnr tt atks, tr ap bit, com ptchy pale-lt brn o str, abnt bri yel-yel wh flor, fast p-fr thn yel wh difs & mnr etmg cut.

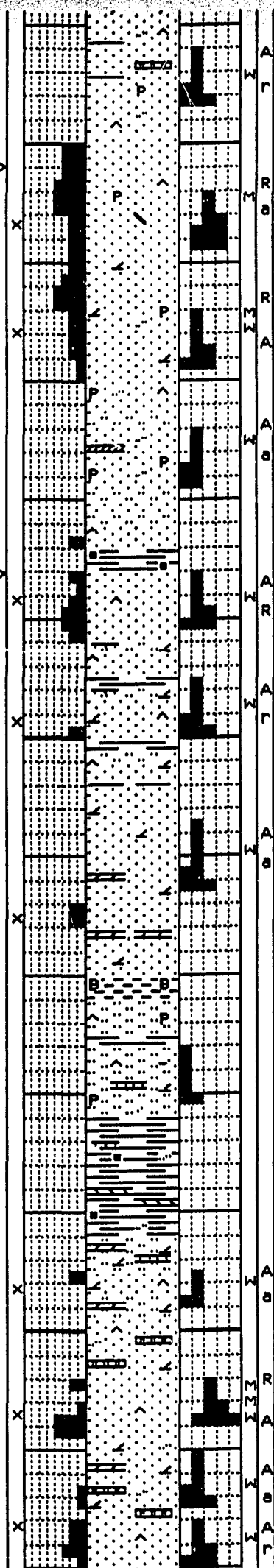
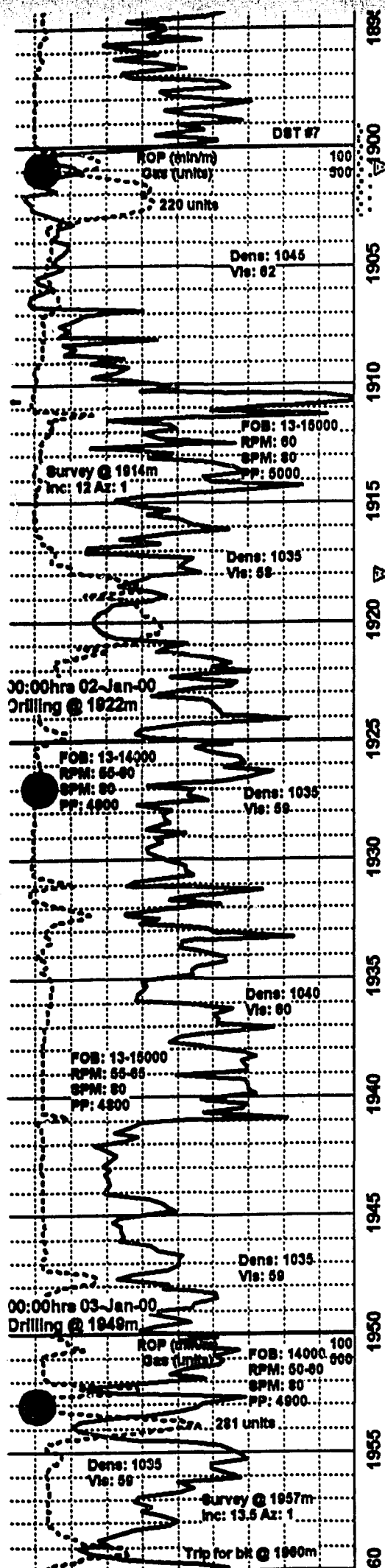
1875-1881 SS v alm-abv, vf-lf gr, rr-tr lm gra, sl-mod slty lp, qtzaren, w-m w art, ang-rd, cin, rr arg ptgs, disagg in mnr pt, comy m-p ind & cmbly-sl fri, m w ind lp, com dolc & silc cmt, mnr loc com qtz ovgrs, tr intstl pyr, com 6-9% por wl mnr g atks, mnr-com 3-5% wl tr tt atks, decr tr ap bit, com ptchy frnt-lt brn o str, decr com-abnt flor aa, decr p v thn difs & etmg cut, tr blk sh.

1881-1885 SS lt gy, vf gr, tr-loc mnr f gra, vary slty, qtzaren, w art, ang-rd, mnr disagg gra, cin, comy m-m p ind, cmbly lp, loc w ind, com silc + var tr-com ap-ptchy dolc cmt, incr tr-loc mnr pyr, pred tt-2% por, mnr str p-r fr por, mnr ptchy dull-mod pale yel flor, tr frnt ques cut.

1885-1890 SS aa prev desc bcmg incrly slty lp grdg-edy sltst, incr com-loc abnt dolc & decr com-mnr ptchy silc cmt, incr tr-mnr ap-ptchy intstl pyr, por & shows aa, incr tr dk gy-blk bit pyr lp sh.

1890-1894.5 SS wl intbd DOL; SS aa lp bcmg decrly slty, vf-f gr & comy disagg lp, m-m w art, rd-ang, infr com fr por, shows aa; DOL lt-m gy, crpxln, v frm-hd, sl chty lp, vary slty-edy grdg-v dolc sltst & aa lame-strg, tt.

1894.5-1900 SS lt gy, vf gr, tr loc mnr f gra, vary slty ocgy grdg-edy



stet, qtzaren, w art, ang-ard, pred cin, loc al-mod arg w tr-mnr arg ptgs, comy m-m w ind, loc p-v w ind, com-abnt silc + tr-mnr sp-ptch dolc cmt, incr mnr-loc com ptchy-ap pyr, pred tt-2% por, tr-mnr str p por, mnr cull flor, n cut, tr-mnr SH lt gy gn, eb pty, m frm-est, v mm, v shy-edy comy grdg-vary arg stet.

1900-1907 SS lt gy, vf-um gr, qtzaren w froe-mnr clt qtz, mod art, rd-ab ang, cin, pred disagg, mnr p-v p ind ctgs w sp silc & dolc cmt, incr mnr loc com ptchy-ap pyr, tr sp kaol, var g-p por in cone ctgs, infr pred g-fr por, com sp-ptchy blt, com ptchy yel gn & pale yel flor, mnr p fnt etmg & dife cut, tr-mnr lam-mot eft mrtly-anhydc strg.

1907-1910 SS lt gy-fnt brn, vf-uf gr, el shy, qtzaren w com-abnt froe qtz, cin, m w art, rd-ang, pred p ind & fri, com dolc cmt, decr mnr sp-ptch pyr, pred vary fr por w loc g-p etks, tr sp blt, abnt-evn bri pale yel gn flor, com p thn dife & etmg cut.

1910-1916 SS lt gy, vf gr, mod-v shy grdg-etst lp, qtzaren, ang-ab ang, comy m w-v w ind, com silc & mnr dolc cmt, com-loc abnt ptchy-ap pyr cmt, p ind & crmbly lp, pred tt-3% por, mnr str p-fr por, tr-mnr sp blt, abnt pale yel flor, tr v fnt cut aa, mnr anhydc strg: wh, com-abnt dk brn vf mote & lame, chky, eft, pyrc lp, tr v pyro graphite lame.

1916-1921 SS lt tan-lt gy, vf-f gr, el shy lp, qtzaren w pred clt qtz, w art, ang-rd, disagg lp, p-mod ind, fri, silc cmt, mnr-com qtz ovgtas, var por: com fr w mnr g etks, mnr-com p w tr tt etrke, tr sp blt, abnt bri yel wh flor, tr fnt quee cut, mnr SH blk, pty, v frm-hd, brit, fls, carb-blt w com coaly deb & ptgs, mnr chyt strg.

1921-1927 SS & SLTST; SS lt brn, vf gr, tr f gra, shy, qtzaren, m w art, ang-ard, tr arg ptgs, m w-m p ind, dolc & silc cmt, tt-p por, evn mod lt yel flor, n cut, mnr m brn vf-f m art vary arg es w mnr arg ptgs & com dolc cmt, tt, intbd SLTST m-dk brn, frm-hd, loc eft & crmbly, qtz, vary arg, mod-v dolc, tt, mnr SH skm-abv bcng el pyrc lp, rr pyrcd ost, mnr MARL lt-m gy w vf wh mote & lame, eft, chky, tr chyt.

1927-1935 SS bf-tan, vf gr, tr f gra, shy grdg-mnr shy etst, v qtz, w art, ang-ab ang, pred p-mod ind w com-abnt dolc cmt-mtx, grdg-mnr shy dol, w ind in mnr pt w str tt silc cmt, pred n vis por, tr str p por, com dull-mod yel flor, tr fnt quee cut, tr-mnr DOL m brn, crpxin, brit, rexl wkst, tt.

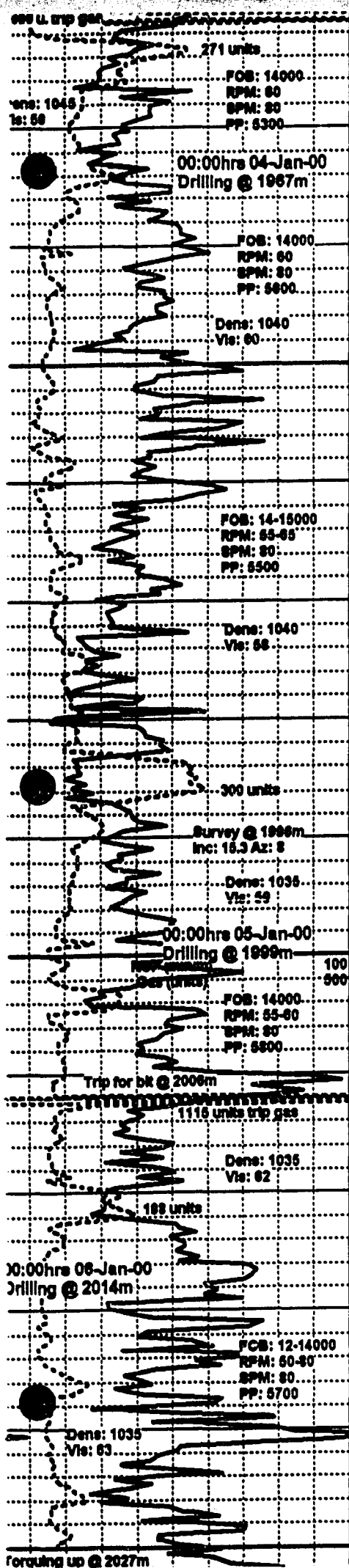
1935-1941 SLTST lt-m gy, v qtz, tr musc & dk epks, pred hd & dne, al-vary shy occy grdg-es, com silc & dolc cmt, el arg lp, mnr-com arg-misc ptgs & lame, mnr-loc abnt pyr, loc m ind w tr-mnr p por, pred tt, tr sp blt, tr-mnr dull flor, n cut, mnr SH blk-blk brn, pty, fls, frm-est, v mm, shy-el shy lp, mnr m-vc occy graphitic pyr node, mnr CLYST lt-m brn, vf wh-lt gy mote & lame, v eft, ber.c.

1941-1946 SH blk-brn blk, eb pty-ab bkly, frm-hd, fls, sm & fnty mm lp, vary shy-el shy lp occy grdg-arg etst lame-strgs, tr-mnr loc v mm, carb-blt lp, eb wxy lp grdg-chyt, mnr pyr node, mnr dk brn eid node & strgs.

1946-1952 SLTST lt brn, v qtz, al-mod shy grdg-elty es lp, m w-m p ind, abnt dolc cmt-mtx, grde-mnr shy-edy dol, el arg in mnr pt, tr arg ptgs-lame, mnr dol allochems, n vis por, com dull flor, n cut; intbd SS lt gy-lt brn, v f gra, shy grdg-etst lp, qtzaren, w art, ang-ab ang, comy m-m w ind, p ind & crmbly lp, pred silc + mnr sp-str dolc cmt, com-abnt dull yel-mod yel wh flor, tr fnt quee cut.

1952-1954.5 SS lt gy, lf-um gr, tr elt & c gra, qtzaren, froe-clt qtz, m-m w art, rd-ang, cin, pred disagg, mnr p-w ind ctgs w mnr-loc abnt silc cmt, var tt-g por in cone ctgs, infr com fr-g por, tr sp blt, mnr dull-bri flor, tr fnt quee cut.

1954.5-1960 SS lt brn, vf gr, tr f gra, mod shy grdg-etst lp, qtzaren, tr dol grs, w art, ang-ab ang, cin, loc el arg, tr arg ptgs & lame, m w-m p ind, com-abnt dolc cmt, occy grde-edy dol, pred tt-2% por, abnt dull yel flor, tr fnt quee cut, mnr SS #2 vf-f gr, qtzaren, w art, cin, p ind, crmbly-fri, silc cmt, mnr qtz ovgtas, com fr-tr str g por, tt-p lp, tr-mnr sp blt, abnt dull-mod flor, tr-mnr v p



1960-1965 SS silt-abv, lt brn, vf gr, tr-loc mnr lf gra, vary elty grdg-mnr siltet, qtzaren, w art, ang-erd, clin, tr-mnr arg ptge & lame, m w-m p ind, loc v w ind, com-abnt silic cmt, tr-mnr qtz ovgtas, tt-2% por, mnr str p-fr por, tr sp bit, abnt bri yel wh flor, mnr p fnt dife cut, tr blk sh.

1965-1974 SS lt brn-lt gy, pred vf gr, tr loc mnr lf gra, vary elty occy grdg-ady siltet, qtzaren, w art, ang-ab ang, pred clin, tr-mnr el arg, tr arg ptge, pred m-m w ind, loc p-v w ind, pred silic cmt, tr-loc mnr sp-ptch dolc cmt, tr loc com sp-ptchy kaol, tr-mnr qtz ovgtas, com p (3-8%) por, tt-2% lp, tr str fr por, com ptchy-sp-occy str bit-pybit, abnt-evn dull yel gn flor, tr v fnt ques cut, tr SH: blk, pity, frm, micac, bit, comy elty.

1974-1981 SS lt-m brn-brn gy, vf gr, pred mod-v elty comy grdg-ady siltet, qtzaren, w art, ang-ab ang, incrly el arg in mnr pt, mnr arg ptge, m w-p ind & cmbly, silic + tr sp dolc cmt, tr sp kaol, pred n vie por, tr-mnr str p por, mnr sp-ptch pybit, flor & cut aa.

1981-1986 SS w/Intbd SH; SS lt brn, vf-f gr, mnr m gra, qtzaren, m w-m art, ang-rd, pred clin, el-mod arg in mnr pt, incr mnr-loc com arg-bit ptge, disagg lp, comy p ind & fri-cmbly, m-m w ind lp, com-loc abnt silic cmt, com qtz ovgtas, com tt-3% por, mnr-com str fr-p por lp, decr com-abnt flor aa, cut aa, mnr Intbd SH blk, pity, frm-est, mm, bit, el-v elty occy grdg-arg siltet strg, mnr dk brn est chky mot lp bit? clyst, tr anhydc strg w/ dk brn mote & lame.

1986-1990 SS w/ SH; SS as prev desc bcmg el fnr gr, incrly elty lp, incr mnr-com arg-bit ptge, incr mnr Intbd SH silt-abv, blk-v dk brn, pity-ab blk, est-frm, fls, bit-v bit, mm, sb res, tr clyst aa, tr anhydc strg aa.

1990-1995 SS lt brn, vf-f gr, tr lm gra, qtzaren, pred clt qtz, m w art, ang-erd, occy rd, el-mod elty lp, clin, rr-tr arg ptge, disagg lp, m-w ind lp, p ind & fri-cmbly lp, com-loc abnt silic cmt, mnr loc com qtz ovgtas, tr sp kaol, com tt-3% por, less com 4-8% por, tr str g por, abnt dull yel gn flor, mnr p v thn dife & stmg cut, tr sh strg aa.

1995-2000 SS v silt-abv bcmg fnr, lt tan, vf-f gr, rr lm gra, comy vary elty, qtzaren, m w art, ang-erd, pred clin, el-mod arg in mnr pt, tr arg ptge, disagg in mnr pt, m-w ind lp, p ind & fri-cmbly lp, com-abnt silic cmt, mnr qtz ovgtas, tr sp kaol, com tt-2% por, mnr str 4-8% por, abnt dull-v dull yel gn flor, tr v fnt ques cut, tr sh aa.

2000-2005 SS pred aa, mnr SS #2 lt gy, f-vf gr, tr lm gra, qtzaren, m w art, ang-erd, clin, comy disagg, mnr-com p-m w ind cone ctgs, com sp-ptch silic cmt, com-abnt qtz ovgtas, rr-tr sp kaol, com var fr-g por in cone ctgs, mnr p-tt strks, abnt dull-mod yel flor, n cut.

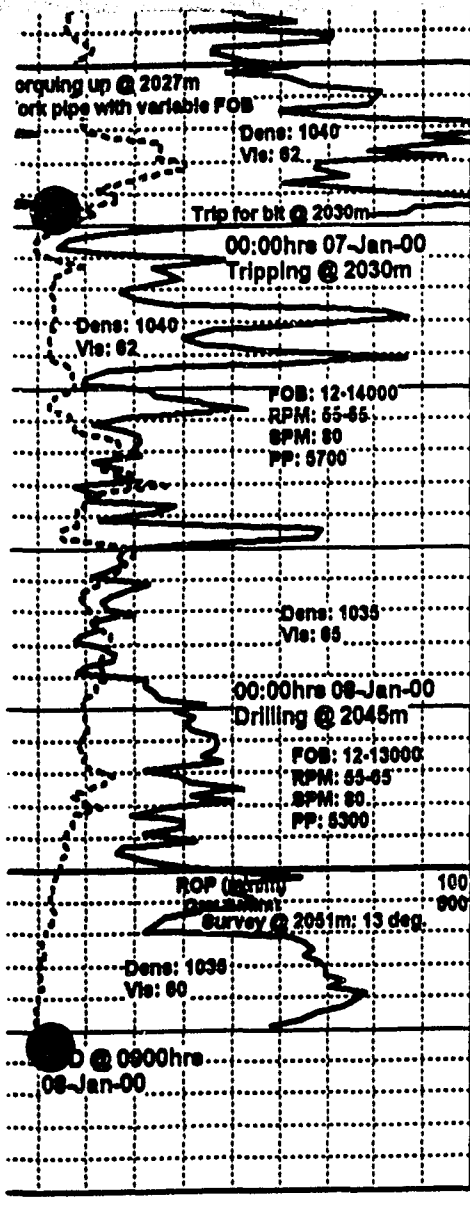
2005-2010 SS v silt-abv bcmg el cer, lt brn, vf-f gr, rr lm gra, el elty, qtzaren, m w art, ang-erd, clin, tr arg ptge, disagg lp, m-w ind lp, p ind & fri-cmbly lp, com-abnt silic cmt, mnr-com qtz ovgtas, tr sp kaol, com tt-2% por, mnr str 4-8% por, abnt dull-v dull yel gn flor, tr v fnt ques cut.

2010-2015 SS lt tan, vf-f gr, tr lm gra, comy el-mod elty, m w art, ang-erd, clin, tr arg ptge, decrly disagg in mnr pt, vary m p-w ind, com-loc abnt silic cmt, rr-tr sp dolc cmt, mnr qtz ovgtas, tr ptchy pyr, pred vary p-tt por, mnr str fr por, com dull yel-tr bri yel wh flor, n cut, tr blk bit sh strg.

2015-2019 SS lt-m brn, vf, tr f gra, elty, qtzaren, w art, ang-ab ang, vary arg in mnr pt, mnr-com arg ptge, comy m w-v w ind, com-abnt silic cmt, tr sp kaol, tr ptchy pyr, loc vf-f gr w/ com qtz ovgtas & fr por, mnr-com dull flor, tr fnt ques cut, mnr Intbd SH & CLYST as desc bel.

2019-2022 CLYST dk brn, v est, v bit w/ com-abnt fr cut, vary pyrc lp, mnr-loc com irreg-chaot vf anhydc lame & strg, loc fls w/ abnt carb-coaly mat grdg-SH blk, vary frm-est, v fls, v carb-coaly grdg-elhy bit-ab bit coal.

2022-2030 SS w/Intbd SH & CLYST; SS var: lt-m brn, vf gr & elty grdg-siltet lp, vf-f w/ tr-mnr lm gra lp, v qtz, m-m w art, ang-erd, clin-vary arg, com-abnt arg ptge, vary v w-m ind, abnt-com silic cmt, tr kao, loc m p ind lp, tr loc com ptchy pyr, pred tt-2% por, mnr-com p-m w ind, com sp-ptch silic cmt, com-abnt qtz ovgtas, rr-tr sp kaol, com var fr-g por in cone ctgs, mnr p-tt strks, abnt dull-mod yel flor, n cut.



grdg-ent ip, v-f w tr-mnr arg ptge, v qtz, mnt w art, ang-er, cin-vary arg, com-abnt arg ptge, vary v w-m ind, abnt-com silc cmt, tr kao, loc m p ind ip, tr loc com ptchy pyr, pred tt-2% por, tr-mnr str p-fr fr por, mnr-com v dull flor, tr v fnt cut, mnr lt brn vf-f aa, cin qtzaren, w art, m p-m w ind, com-abnt silc cmt, com qtz ovgtse, str p-fr por, abnt v dull flor, tr v fnt quee cut; mnr intbd CLYST & SH aa.

2030-2038 SS w/ intbd SH & CLYST; SS pred aa, mnr-com m brn, v-f gr, tr lm grs, slty, v qtz, m art, ang-rd, pred al-mod arg, cin lp, com-abnt arg ptge, m w-m p ind, com-abnt silc cmt, tr ep kao, tr ep-ptchy pyr, tr-mnr edy pyr node, pred tt-2% por, tr dull flor, rr fnt quee cut; CLYST aa, incr SH aa comy grdg-bit coal.

2038-2039 SS lt brn, vf gr w/ tr lf grs, vf-f gr in mnr pt, vary slty occy grdg-edy shet, qtzaren, w art, ang-rd, pred cin, mnr arg ptge, m w-m p ind, abnt-com silc cmt, tr ep kao, rr-tr ep dolc cmt, mnr loc com qtz ovgtse, comy tt, mnr-com str p-fr por, abnt v dull flor, n cut, tr sh aa.

2039-2044 SS var aa prev desc ip, pred v elm-abv bcmg al fmr, incrly slty lp grdg-mnr edy shet, cin-loc vary arg, incr mnr-com arg ptge, v w ind ip, decr pred tt por, mnr str p por, flor & cut aa, tr-mnr coal strg: blk-brn blk, sft-fm, bit, shly lp grdg-bit sh aa, tr bit clyst aa.

2044-2050 SS lt brn, vf gr, tr lf grs, vary slty, qtzaren, w art, ang-ab ang, pred cin, tr el arg, tr-mnr arg ptge, vary ind: m-m w lp, p-m p & cmbly-fri lp, com-abnt silc cmt, tr ep-ptchy pyr, rr-tr ep kao, tr qtz ovgtse, pred tt-3% por, mnr str p-fr por, tr ep bit, abnt-evn dull yel gn flor, tr fnt dffe cut, tr bit sh & coal aa.

2050-2055 SS mixed: aa lp, vary brn-brn gy, pred vf gr & vary slty, mnr vf-f gr, v qtz-qtzaren, cin-vary arg, mnr v silc shet, vary p-v w ind, com-abnt silc cmt, tr ep kao, tr pyr, pred tt-2%, mnr str p-fr por, com ptchy dull flor, tr quee cut; intbd CLYST v bit w anhydc lame & mote aa, mnr bit COAL grdg bit SH aa, slty-edy lp, mnr-com edy silc strge-node.

PARAMOUNT RESOURCES LTD.
FORT LIARD

I-46
SRFC.I-46
FORT LIARD
N.W.T. Canada

S U R V E Y L I S T I N G

by
Baker Hughes INTEQ

Your ref : PARAMOUNT FT. LIARD I-46
Our ref : svy10226
License :

Date printed : 29-Dec-1999
Date created : 24-Nov-1999
Last revised : 29-Dec-1999

Field is centred on 467869.990,6704591.610,-123.00000,N
Structure is centred on n60 5 32.156,w123 22 59.643,-123

Slot location is n60 5 32.156,w123 22 59.643
Slot Grid coordinates are N 6661748.463, E 478683.716
Slot local coordinates are 0.00 N 0.00 E

Projection type: mercator - UTM, Spheroid: NAD 83

Reference North is True North

PARAMOUNT RESOURCES LTD.
FORT LIARD, I-46
FORT LIARD, N.W.T. Canada

SURVEY LISTING Page 1
Your ref : PARAMOUNT FT. LIARD
Last revised : 29-Dec-1999

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert Depth	R E C T A N G U L A R C O O R D I N A T E S		Dogleg Deg/ 30m	Vert Sect
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	0.00
505.00	0.00	0.00	505.00	0.00 N	0.00 E	0.00	0.00
522.10	1.60	45.60	522.10	0.17 N	0.17 E	2.81	0.24
541.00	1.50	50.30	540.99	0.51 N	0.55 E	0.26	0.75
559.40	1.60	50.90	559.38	0.83 N	0.93 E	0.17	1.25
578.20	0.50	37.80	578.18	1.06 N	1.19 E	1.79	1.59
596.80	0.40	214.20	596.78	1.07 N	1.20 E	1.45	1.60
616.20	0.20	222.40	616.18	0.99 N	1.14 E	0.32	1.51
634.80	0.10	146.70	634.78	0.95 N	1.13 E	0.32	1.47
654.20	0.10	57.70	654.18	0.94 N	1.15 E	0.22	1.49
664.10	0.20	85.40	664.08	0.95 N	1.18 E	0.37	1.51
673.10	0.20	85.40	673.08	0.95 N	1.21 E	0.00	1.54
691.60	0.20	39.50	691.58	0.98 N	1.26 E	0.25	1.59
711.70	0.40	49.90	711.68	1.05 N	1.34 E	0.31	1.70
730.90	0.30	43.20	730.88	1.13 N	1.42 E	0.17	1.82
750.20	0.30	43.00	750.18	1.20 N	1.49 E	0.00	1.92
769.80	0.30	24.00	769.78	1.29 N	1.55 E	0.15	2.01
789.20	0.50	39.40	789.18	1.40 N	1.62 E	0.35	2.14
807.80	0.50	24.20	807.78	1.54 N	1.71 E	0.21	2.29
827.00	0.60	38.60	826.98	1.69 N	1.80 E	0.27	2.47
846.20	0.50	48.00	846.18	1.83 N	1.93 E	0.21	2.65
875.40	0.60	30.70	875.37	2.04 N	2.10 E	0.20	2.92
894.40	0.50	20.20	894.37	2.21 N	2.18 E	0.22	3.08
912.70	0.60	46.20	912.67	2.35 N	2.28 E	0.44	3.25
931.30	0.60	22.80	931.27	2.51 N	2.38 E	0.39	3.43

All data is in meters unless otherwise stated.
Coordinates from SRFC.I-46 and TVD from rotary table.
Bottom hole distance is 33.83 on azimuth 32.95 degrees from wellhead.
Vertical section is from wellhead on azimuth 51.10 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

PARAMOUNT RESOURCES LTD.
FORT LIARD, I-46
FORT LIARD, N.W.T. Canada

SURVEY LISTING Page 2
Your ref : PARAMOUNT FT. LIARD
Last revised : 29-Dec-1999

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert Depth	R E C T A N G U L A R C O O R D I N A T E S		Dogleg Deg/ 30m	Vert Sect
950.20	0.40	41.40	950.17	2.65 N	2.47 E	0.40	3.58
968.40	0.50	52.60	968.37	2.74 N	2.57 E	0.22	3.72
987.80	0.50	26.50	987.77	2.87 N	2.68 E	0.35	3.88
1007.10	0.60	43.30	1007.07	3.02 N	2.78 E	0.29	4.06
1025.50	0.60	51.70	1025.47	3.15 N	2.92 E	0.14	4.25
1045.40	0.00	37.40	1045.37	3.21 N	3.01 E	0.90	4.36
1064.30	0.20	33.50	1064.27	3.24 N	3.02 E	0.32	4.39
1082.80	0.30	76.40	1082.77	3.28 N	3.09 E	0.33	4.46
1101.20	0.40	60.60	1101.17	3.32 N	3.19 E	0.23	4.57
1120.20	0.40	25.40	1120.17	3.41 N	3.28 E	0.38	4.70
1148.10	0.40	22.70	1148.07	3.59 N	3.36 E	0.02	4.87
1167.00	0.50	54.20	1166.97	3.70 N	3.45 E	0.42	5.01
1186.20	0.40	35.00	1186.16	3.80 N	3.56 E	0.28	5.16
1204.10	0.50	34.30	1204.06	3.92 N	3.64 E	0.17	5.29
1223.10	0.60	32.60	1223.06	4.07 N	3.74 E	0.16	5.47
1252.20	0.50	41.00	1252.16	4.30 N	3.90 E	0.13	5.74
1281.60	0.80	39.70	1281.56	4.55 N	4.12 E	0.31	6.06
1298.80	1.30	41.80	1298.76	4.79 N	4.32 E	0.87	6.37
1318.10	1.50	47.10	1318.05	5.12 N	4.66 E	0.37	6.84
1337.40	2.40	45.90	1337.34	5.58 N	5.13 E	1.40	7.50
1356.80	2.90	56.50	1356.72	6.13 N	5.83 E	1.08	8.39
1377.80	3.40	55.30	1377.69	6.78 N	6.79 E	0.72	9.54
1396.70	3.50	55.30	1396.55	7.43 N	7.72 E	0.16	10.67
1416.00	2.90	52.70	1415.82	8.06 N	8.59 E	0.96	11.75
1431.80	2.70	49.40	1431.60	8.54 N	9.19 E	0.49	12.52

All data is in meters unless otherwise stated.
Coordinates from SRFC.I-46 and TVD from rotary table.
Bottom hole distance is 33.83 on azimuth 32.95 degrees from wellhead.
Vertical section is from wellhead on azimuth 51.10 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

PARAMOUNT RESOURCES LTD.
FORT LIARD, I-46
FORT LIARD, N.W.T. Canada

SURVEY LISTING Page 3
Your ref : PARAMOUNT FT. LIARD
Last revised : 29-Dec-1999

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert Depth	R E C T A N G U L A R C O O R D I N A T E S		Dogleg Deg/ 30m	Vert Sect
1451.40	3.10	48.50	1451.18	9.19 N	9.94 E	0.62	13.51
1472.60	2.90	47.60	1472.35	9.94 N	10.77 E	0.29	14.62
1491.70	2.50	47.30	1491.43	10.54 N	11.43 E	0.63	15.52
1511.10	2.60	46.40	1510.81	11.13 N	12.06 E	0.17	16.38
1530.60	2.80	46.30	1530.29	11.77 N	12.72 E	0.31	17.29
1586.00	2.50	23.00	1585.63	13.81 N	14.18 E	0.60	19.71
1650.00	2.00	23.00	1649.58	16.13 N	15.16 E	0.23	21.92
1760.00	8.00	14.00	1759.11	25.33 N	17.76 E	1.65	29.73
1780.00	10.00	10.00	1778.87	28.39 N	18.40 E	3.14	32.15

All data is in meters unless otherwise stated.
Coordinates from SRFC.I-46 and TVD from rotary table.
Bottom hole distance is 33.83 on azimuth 32.95 degrees from wellhead.
Vertical section is from wellhead on azimuth 51.10 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ



CUSTOMER: Paramount Resources Ltd.

WELL NAME: Para et al Fort Liard

LOCATION: I-46

START DATE: 13-Dec-99

FORMATION:

FILE NAME: J-4148.xls

CUSTOMER REP: W. Calihoo

SUPERVISORS: B. Tiedemann

TEST UNIT:

OPERATION: Underbalanced Drilling

Alpine Oil Services Corp.

ALPINE OIL SERVICES CORP.

Job No : 4148 Alpine Supervisor: BRENT TIEDEMANN

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/13	SPOT AND RIG UP EQUIPMENT. RIG UP ROTATING HEAD.														
99/12/14															
14:00:00	PRESSURE TEST FLOWLINE AND MANIFOLD TO 10,000 kPa.														
15:00:00	START TO RUN IN HOLE TO DRILL OUT CEMENT.														
22:00:00	START DRILLING OUT CEMENT.														
99/12/15															
2:38:00	START TO PULL OUT OF HOLE.														
6:08:00	OUT OF HOLE.														
6:39:00	RUN IN HOLE TO DISPLACE HOLE WITH NITROGEN.														
9:30:00	20 STANDS OFF BOTTOM. DIVERT FLOW LINE FROM SHAKER TO PRESSURE TANK.														
9:45:00	INSTALL BEARING ASSEMBLY IN ROTATING HEAD. PREPARE TO BLOW DOWN HOLE WITH NITROGEN.														
10:00:00	NITROGEN LINE FROZEN FROM STAND PIPE BACK.														
10:00:02	-0.53	-22.08	-0.05	0	0	0	0	0	0	0	0	0			
10:10:02	12.43	-22.08	0.05	0	0	0	0	0	0	0	0	0			
10:20:01	20.1	-22.09	-0.05	0	0	0	0	0	0	0	0	0			
10:30:01	25.99	-22.08	0.2	0	0	0	0	0	0	0	0	0			
10:40:01	28.93	-22.08	0.2	0	0	0	0	0	0	0	0	0			
10:50:01	28.93	-22.08	0.2	0	0	0	0	0	0	0	0	0			
11:00:01	28.93	-22.08	0.2	0	0	0	0	0	0	0	0	0			
11:10:01	27.17	-22.08	0.05	0	0	0	0	0	0	0	0	0			
11:20:01	25.99	-22.08	0.44	0	0	0	0	0	0	0	0	0			
11:30:01	18.33	-22.08	0.05	0	0	0	0	0	0	0	0	0			
11:40:01	14.2	-22.08	0.44	0	0	0	0	0	0	0	0	0			
11:50:01	15.97	-22.06	0.83	0	0	0	0	0	0	0	0	0			
12:00:01	20.68	-22.04	1.23	0	0	0	0	0	0	0	0	0			
12:10:01	14.2	-22.09	0.44	0	0	0	0	0	0	0	0	0			
12:20:01	11.26	-22.08	0.44	0	0	0	0	0	0	0	0	0			
12:25:00	START PUMPING NITROGEN TO DISPLACE HOLE.														
12:30:01	11.26	-22.08	0.2	0	0	0	-48.96	0	0	0	0	34			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
09/12/15															
12:40:01	9.49	-13.76	0.29	0	0	0	-48.96	0	0	0	0	34			
12:50:01	12.43	-11.71	0.29	0	0	0	-48.96	0	0	0	0	34			
12:54:00	WATER TO SURFACE.														
13:00:01	183.35	-2.6	9.87	3.84	0	3.84	-45.12	0	0	0	0	34			
13:10:01	76.07	-1.63	46.84	58.79	0	58.79	9.83	1.21	0	1.21	0	34			
13:20:01	53.69	-5.16	33.2	50.25	0	50.25	1.29	1.56	0	1.56	0	34			
13:21:00	STOP PUMPING NITROGEN. 13.45 m3 WATER RECOVERED. CONTINUE TO RUN IN HOLE.														
13:30:01	12.43	-8.11	2.01	0	0	0	0	1.63	0	1.63	0	0			
13:40:01	13.03	-12.42	1.33	0	0	0	0	1.63	0	1.63	0	0			
13:50:01	8.31	-16.48	0.93	0	0	0	0	1.63	0	1.63	0	0			
14:00:01	8.31	-19.49	0.93	0	0	0	0	1.63	0	1.63	0	0			
14:10:01	8.31	-21.76	0.93	0	0	0	0	1.63	0	1.63	0	0			
14:20:01	5.37	-22.08	0.93	0	0	0	0	1.66	0	1.66	0	0			
14:30:01	5.37	-22.08	1.92	0	0	0	0	1.68	0	1.68	0	0			
14:40:01	8.31	-22.05	-0.05	0	0	0	0	1.68	0	1.68	0	0			
14:50:01	-15.26	-22.08	-23.13	0	0	0	0	1.68	0	1.68	0	0			
14:53:00	ON BOTTOM. START PUMPING NITROGEN TO DISPLACE HOLE.														
15:00:01	-12.31	-22.09	-17.48	0	0	0	-48.96	1.7	0	1.7	0	34			
15:10:01	-5.25	-22.09	-9.28	0	0	0	-48.96	1.8	0	1.8	0	34			
15:20:01	7.13	-22.09	-1.62	0	0	0	-48.96	1.9	0	1.9	0	34			
15:30:02	6.54	-22.08	5.7	0	0	0	-48.96	2	0	2	0	34			
15:36:00	WATER TO SURFACE.														
15:40:01	113.17	-5.93	265.93	195.03	0	195.03	146.07	2.49	0	2.49	0	34			
15:50:01	120.27	0.11	76.06	82.33	0	82.33	33.37	3.54	0	3.54	0	34			
16:00:01	68.99	-2.54	41.83	55.16	0	55.16	6.2	3.96	0	3.96	0	34			
16:10:01	58.4	-4.57	40.95	54.18	0	54.18	5.22	4.34	0	4.34	0	34			
16:20:01	55.45	-6.4	40.95	53.47	0	53.47	4.51	4.71	0	4.71	0	34			
16:30:01	55.45	-7.8	40.46	52.23	0	52.23	3.27	5.08	0	5.08	0	34			
16:40:01	55.45	-8.78	38.5	52.44	0	52.44	3.48	5.45	0	5.45	0	34			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/15															
16:50:01	60.15	-9.3	35.69	47.6	0	47.6	-1.36	5.8	0	5.8	0	34			
17:00:00	TOTAL WATER RECOVERED - 22.0 m3. CONTINUE TO DRY HOLE.														
17:00:01	58.4	-9.39	34.81	48.14	0	48.14	-0.82	6.13	0	6.13	0	34			
17:10:01	53.69	-9.42	36.64	49.7	0	49.7	0.74	6.47	0	6.47	0	34			
17:20:01	60.15	-9.48	37.16	49.88	0	49.88	0.92	6.82	0	6.82	0	34			
17:30:01	55.45	-9.89	36.78	49.65	0	49.65	0.69	7.16	0	7.16	0	34			
17:40:01	52.5	-9.99	36.04	48.77	0	48.77	-0.19	7.5	0	7.5	0	34			
17:50:01	53.69	-10.2	34.43	47.43	0	47.43	-1.53	7.84	0	7.84	0	34			
18:00:01	58.4	-9.94	33.83	46.53	0	46.53	-2.43	8.16	0	8.16	0	34			
18:10:01	63.1	-10.29	32.01	44.77	0	44.77	-4.19	8.48	0	8.48	0	34			
18:20:01	52.5	-11.34	27.45	40.71	0	40.71	-8.25	8.77	0	8.77	0	34			
18:30:01	50.74	-12.14	27.8	40.76	0	40.76	-8.2	9.05	0	9.05	0	34			
18:31:00	STOP PUMPING NITROGEN. MONITOR FOR INFLOW.														
18:40:01	61.91	-13.57	4.17	0	0	0	0	9.13	0	9.13	0	0			
18:45:00	CLOSE ANNULUS. MONITOR BUILD UP.														
18:50:01	52.5	-16.01	1.67	0	0	0	0	9.13	0	9.13	0	0			
19:00:01	49.56	-18.24	1.18	0	0	0	0	9.13	0	9.13	0	0			
19:00:00	OPEN ANNULUS. WELL DEAD. PULL OUT OF HOLE.														
19:10:01	55.45	-20.04	1.18	0	0	0	0	9.13	0	9.13	0	0			
19:20:01	57.21	-20.06	1.57	0	0	0	0	9.13	0	9.13	0	0			
19:30:01	50.74	-20.08	1.03	0	0	0	0	9.13	0	9.13	0	0			
19:40:01	49.56	-20.09	1.18	0	0	0	0	9.13	0	9.13	0	0			
19:50:01	52.5	-20.08	0.69	0	0	0	0	9.16	0	9.16	0	0			
20:00:01	52.5	-20.09	0.44	0	0	0	0	9.24	0	9.24	0	0			
20:10:01	47.8	-20.09	0.79	0	0	0	0	9.29	0	9.29	0	0			
20:20:01	49.56	-20.08	1.18	0	0	0	0	9.3	0	9.3	0	0			
20:30:01	52.5	-20.08	1.42	0	0	0	0	9.3	0	9.3	0	0			
20:40:01	60.15	-20.06	1.82	0	0	0	0	9.3	0	9.3	0	0			
20:50:01	52.5	-20.07	1.42	0	0	0	0	9.3	0	9.3	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/15															
21:00:01	52.5	-20.09	1.18	0	0	0	0	9.3	0	9.3	0	0			
21:10:01	57.21	-20.09	1.33	0	0	0	0	9.3	0	9.3	0	0			
21:20:01	49.56	-20.08	1.18	0	0	0	0	9.3	0	9.3	0	0			
21:30:01	49.56	-20.06	0.93	0	0	0	0	9.3	0	9.3	0	0			
21:40:01	54.26	-20.08	1.33	0	0	0	0	9.3	0	9.3	0	0			
21:50:01	49.56	-20.09	0.93	0	0	0	0	9.3	0	9.3	0	0			
22:00:00	OUT OF HOLE.														
22:00:01	49.56	-20.09	0.93	0	0	0	0	9.3	0	9.3	0	0			
22:10:01	50.74	-20.08	0.79	0	0	0	0	9.3	0	9.3	0	0			
22:10:00	RUN IN HOLE WITH AIR HAMMER.														
22:20:01	52.5	-20.09	0.93	0	0	0	0	9.3	0	9.3	0	0			
22:30:01	49.56	-20.08	0.93	0	0	0	0	9.3	0	9.3	0	0			
22:40:01	47.8	-20.09	0.79	0	0	0	0	9.3	0	9.3	0	0			
22:50:01	49.56	-20.09	0.93	0	0	0	0	9.3	0	9.3	0	0			
23:00:01	49.56	-20.08	0.93	0	0	0	0	9.3	0	9.3	0	0			
23:10:01	49.56	-20.08	0.69	0	0	0	0	9.3	0	9.3	0	0			
23:20:01	52.5	-20.09	0.69	0	0	0	0	9.3	0	9.3	0	0			
23:30:01	52.5	-20.09	0.93	0	0	0	0	9.3	0	9.3	0	0			
23:40:01	61.91	-20.09	1.47	0	0	0	0	9.3	0	9.3	0	0			
23:50:01	52.5	-20.08	1.18	0	0	0	0	9.3	0	9.3	0	0			
0:00:01	57.21	-20.07	1.08	0	0	0	0	9.3	0	9.3	0	0			
0:10:03	52.5	-20.08	0.69	0	0	0	0	9.3	0	9.3	0	0			
0:20:03	50.74	-20.08	0.54	0	0	0	0	9.3	0	9.3	0	0			
0:30:03	50.74	-20.06	0.54	0	0	0	0	9.3	0	9.3	0	0			
0:40:03	52.5	-20.06	0.69	0	0	0	0	9.3	0	9.3	0	0			
0:50:03	53.69	-20.08	0.54	0	0	0	0	9.3	0	9.3	0	0			
1:00:03	60.15	-20.06	1.08	0	0	0	0	9.3	0	9.3	0	0			
1:10:03	50.74	-20.08	0.54	0	0	0	0	9.3	0	9.3	0	0			
1:20:03	52.5	-20.09	0.69	0	0	0	0	9.3	0	9.3	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/16															
1:30:03	50.74	-20.09	0.29	0	0	0	0	9.3	0	9.3	0	0			
1:40:03	52.5	-20.09	0.69	0	0	0	0	9.3	0	9.3	0	0			
1:50:03	54.26	-20.08	1.08	0	0	0	0	9.3	0	9.3	0	0			
2:00:03	54.26	-20.08	1.08	0	0	0	0	9.3	0	9.3	0	0			
2:10:03	52.5	-20.08	0.44	0	0	0	0	9.3	0	9.3	0	0			
2:20:03	49.56	-20.06	0.44	0	0	0	0	9.3	0	9.3	0	0			
2:30:03	54.26	-20.06	0.83	0	0	0	0	9.3	0	9.3	0	0			
2:40:03	52.5	-20.09	0.44	0	0	0	0	9.3	0	9.3	0	0			
2:50:03	47.8	-20.07	0.29	0	0	0	0	9.3	0	9.3	0	0			
3:00:03	52.5	-20.09	0.44	0	0	0	0	9.3	0	9.3	0	0			
3:10:03	52.5	-20.06	0.69	0	0	0	0	9.3	0	9.3	0	0			
3:20:03	47.8	-20.08	0.29	0	0	0	0	9.3	0	9.3	0	0			
3:21:00	BACK ON BOTTOM. INSTALL BEARING ASSEMBLY IN ROTATING HEAD.														
3:30:03	54.26	-20.05	1.08	0	0	0	0	9.3	0	9.3	0	0			
3:40:03	55.45	-20.07	0.44	0	0	0	0	9.3	0	9.3	0	0			
3:50:03	50.74	-20.09	0.29	0	0	0	0	9.3	0	9.3	0	0			
3:57:00	START PUMPING NITROGEN AT 36 m3/min.														
4:00:03	57.21	-20.06	14.83	22.65	0	22.65	-29.19	9.34	0	9.34	0	36			
4:10:03	53.69	-16.7	44.01	54.01	0	54.01	2.17	9.63	0	9.63	0	36			
4:15:00	HOLD SAFETY MEETING.														
4:20:03	58.4	-12.02	43.65	54.51	0	54.51	2.67	10.02	0	10.02	0	36			
4:30:03	61.34	-10.7	45.62	56.12	0	56.12	4.28	10.38	0	10.38	0	36			
4:40:03	63.1	-10.13	50.66	59.66	0	59.66	7.82	10.77	0	10.77	0	36			
4:50:03	58.4	-9.82	55.19	63.04	0	63.04	11.2	11.17	0	11.17	0	36			
4:50:00	RIG HOLD BOP DRILL.														
5:00:03	56.64	-9.66	47.44	57.76	0	57.76	5.92	11.58	0	11.58	0	36			
5:10:03	58.4	-9.54	50.04	58.42	0	58.42	6.58	11.97	0	11.97	0	36			
5:10:00	START DRILLING WITH AIR HAMMER.														
5:20:03	58.4	-9.39	6.33	0	0	0	-51.84	12.18	0	12.18	0	36			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/16															
5:30:03	58.4	-9.35	54.21	62.15	0	62.15	10.31	12.66	0	12.66	0	36			
5:40:03	61.34	-9.22	30.89	44.99	0	44.99	-6.85	13.01	0	13.01	0	36			
5:50:03	58.4	-9.08	42.67	54.34	0	54.34	2.5	13.39	0	13.39	0	36			
5:53:00	DROP 1550 m SAMPLE.														
6:00:03	61.34	-8.94	41.44	53.33	0	53.33	1.49	13.76	0	13.76	0	36			
6:10:00	DROP 1555 m SAMPLE.														
6:10:03	61.34	-8.73	49.54	60.61	0	60.61	8.77	14.1	0	14.1	0	36			
6:20:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
6:20:03	70.75	-8.4	67.49	72.59	0	72.59	72.59	14.59	0	14.59	0	0			
6:26:00	CONNECTION COMPLETE. START PUMPING NITROGEN.														
6:30:03	56.64	-8.19	20.43	33.88	0	33.88	-17.96	14.88	0	14.88	0	36			
6:40:03	70.75	-8.25	25.03	39.17	0	39.17	-12.67	15.2	0	15.2	0	36			
6:50:03	58.4	-8.6	28.68	43.05	0	43.05	-8.79	15.55	0	15.55	0	36			
7:00:03	67.8	-8.62	70.92	74.8	0	74.8	22.96	15.9	0	15.9	0	36			
7:10:03	66.04	-8.29	64.16	70.86	0	70.86	19.02	16.27	0	16.27	0	36			
7:15:00	DROP 1560 m SAMPLE.														
7:20:03	68.99	-7.92	59.99	67.21	0	67.21	15.37	16.65	0	16.65	0	36			
7:30:03	61.34	-7.39	51.26	61.38	0	61.38	9.54	17.06	0	17.06	0	36			
7:40:00	DROP 1565 m SAMPLE.														
7:40:03	64.29	-7.05	30.89	45.57	0	45.57	-6.27	17.45	0	17.45	0	36			
7:47:00	KELLY DOWN. WORK PIPE.														
7:49:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
7:50:03	67.23	-6.28	49.3	60.22	0	60.22	60.22	17.91	0	17.91	0	0			
7:54:00	CONNECTION COMPLETE. START PUMPING NITROGEN.														
8:00:03	61.34	-7.08	30.29	43.7	0	43.7	-8.14	17.96	0	17.96	0	36			
8:10:03	70.75	-7.65	25.73	39.17	0	39.17	-12.67	18.01	0	18.01	0	36			
8:20:03	47.8	-7.61	32.22	46.99	0	46.99	-4.85	18.28	0	18.28	0	36			
8:25:00	RETURNS COMING BACK WET. PICK UP OFF BOTTOM AND CIRCULATE.														
8:30:03	45.43	8.77	26.12	42.04	0	42.04	-9.8	18.66	0	18.66	0	36			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/16															
8:40:03	152.61	15.71	51.26	61.52	0	61.52	9.68	19.1	0	19.1	0	36			
8:50:03	154.34	4.61	46.24	57.85	0	57.85	6.01	19.51	0	19.51	0	36			
9:00:03	157.29	2.83	45.51	56.95	0	56.95	5.11	19.9	0	19.9	0	36			
9:10:03	156.77	2.74	45.23	56.94	0	56.94	5.1	20.3	0	20.3	0	36			
9:14:00	RETURNS DRYING UP. RESUME DRILLING.														
9:20:03	117.26	2.72	22.78	37.7	0	37.7	-14.14	20.63	0	20.63	0	36			
9:24:00	DROP 1570 m SAMPLE.														
9:30:03	192.63	2.41	43.79	55.08	0	55.08	3.24	20.97	0	20.97	0	36			
9:40:03	164.4	2.46	42.18	54.17	0	54.17	2.33	21.34	0	21.34	0	36			
9:50:04	168.56	2.9	54.81	63.7	0	63.7	11.86	21.75	0	21.75	0	36			
9:55:00	INCREASE NITROGEN INJECTION RATE TO 41 m3/min.														
10:00:00	DROP 1575 m SAMPLE.														
10:00:02	187.97	3.39	64.77	70.79	0	70.79	11.75	22.17	0	22.17	0	41			
10:02:00	KELLY DOWN. WORK PIPE.														
10:05:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
10:08:00	CONNECTION COMPLETE. START PUMPING NITROGEN.														
10:10:03	104.27	3.56	24.15	38.19	0	38.19	-20.85	22.63	0	22.63	0	41			
10:20:03	103.73	3.34	23.38	36.17	0	36.17	-22.87	22.9	0	22.9	0	41			
10:30:03	124.89	3.56	39.37	50.61	0	50.61	-8.43	23.23	0	23.23	0	41			
10:40:03	143.77	3.8	55.44	62.87	0	62.87	3.83	23.62	0	23.62	0	41			
10:43:00	DROP 1580 m SAMPLE.														
10:50:03	133.2	4.06	48.92	58.68	0	58.68	-0.36	24.07	0	24.07	0	41			
11:00:03	111.37	4.14	35.06	47.16	0	47.16	-11.88	24.44	0	24.44	0	41			
11:10:03	169.07	4.1	61.22	62.71	0	62.71	3.67	24.84	0	24.84	0	41			
11:15:00	KELLY DOWN. WORK PIPE.														
11:16:00	DROP 1585 m SAMPLE.														
11:20:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
11:20:03	142.04	4.24	63.9	62.36	0	62.36	62.36	25.26	0	25.26	0	0			
11:24:00	CONNECTION COMPLETE. START PUMPING NITROGEN.														

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/16															
11:30:03	99.58	4.23	31.38	39.56	0	39.56	-19.48	25.54	0	25.54	0	41			
11:40:03	99.58	3.74	28.92	36.55	0	36.55	-22.49	25.78	0	25.78	0	41			
11:50:03	139.09	3.56	54.81	55.76	0	55.76	-3.28	26.16	0	26.16	0	41			
12:00:03	120.2	3.43	40.95	45.94	0	45.94	-13.1	26.49	0	26.49	0	41			
12:08:00	DROP 1590 m SAMPLE.											41			
12:10:03	130.78	3.43	58.03	56.15	0	56.15	-2.89	26.87	0	26.87	0	41			
12:20:03	140.83	3.29	64.52	60.62	0	60.62	1.58	27.21	0	27.21	0	41			
12:30:03	131.99	3.36	48.56	51.07	0	51.07	-7.97	27.6	0	27.6	0	41			
12:40:03	114.31	3.35	43.16	46.46	0	46.46	-12.58	27.93	0	27.93	0	41			
12:50:03	134.93	3.34	55.93	55.1	0	55.1	-3.94	28.27	0	28.27	0	41			
13:00:03	138.41	3.33	58.16	55.98	0	55.98	-3.06	28.61	0	28.61	0	41			
13:06:00	KELLY DOWN. WORK PIPE. DROP 1595 m SAMPLE.														
13:08:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
13:10:03	131.99	3.37	61.08	58.12	0	58.12	58.12	29.03	0	29.03	0	0			
13:12:00	CONNECTION COMPLETE. START PUMPING NITROGEN.														
13:20:03	111.9	3.46	37.55	41.27	0	41.27	-17.77	29.29	0	29.29	0	41			
13:30:03	118.46	2.95	50.64	50.95	0	50.95	-8.09	29.58	0	29.58	0	41			
13:40:03	116.05	2.51	44.03	47.88	0	47.88	-11.16	29.95	0	29.95	0	41			
13:50:03	134.93	2.24	44.14	46.25	0	46.25	-12.79	30.24	0	30.24	0	41			
14:00:03	129.04	2.05	56.91	59.31	0	59.31	0.27	30.63	0	30.63	0	41			
14:10:03	129.04	1.94	44.39	50.85	0	50.85	-8.19	30.98	0	30.98	0	41			
14:20:03	130.25	1.86	52.11	57.19	0	57.19	-1.85	31.33	0	31.33	0	41			
14:24:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE. PULL OUT OF HOLE FOR BIT.														
14:30:03	62.47	1.88	13.31	17.6	0	17.6	17.6	31.66	0	31.66	0	0			
14:40:03	58.9	2.57	1.47	0	0	0	0	31.68	0	31.68	0	0			
14:50:03	49.5	3.59	0.93	0	0	0	0	31.68	0	31.68	0	0			
15:00:03	49.5	4.32	1.18	0	0	0	0	31.68	0	31.68	0	0			
15:10:03	49.5	4.88	0.93	0	0	0	0	31.68	0	31.68	0	0			
15:20:03	49.5	5.34	0.69	0	0	0	0	31.68	0	31.68	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/16																
15:30:03	51.25	5.61	0.83	0	0	0	0	31.76	0	31.76	0	0				
15:40:03	46.55	5.79	0.2	0	0	0	0	31.86	0	31.86	0	0				
15:50:03	54.2	5.93	0.83	0	0	0	0	31.96	0	31.96	0	0				
16:00:03	44.79	6.08	0.05	0	0	0	0	32.06	0	32.06	0	0				
16:10:03	10.32	6.2	0.29	0	0	0	0	32.1	0	32.1	0	0				
16:20:03	15.02	6.31	0.44	0	0	0	0	32.1	0	32.1	0	0				
16:30:03	15.02	6.4	0.69	0	0	0	0	32.1	0	32.1	0	0				
16:40:03	19.72	6.47	1.08	0	0	0	0	32.1	0	32.1	0	0				
16:50:03	15.02	6.56	0.93	0	0	0	0	32.1	0	32.1	0	0				
17:00:00	OUT OF HOLE.															
17:00:03	15.02	6.65	1.42	0	0	0	0	32.1	0	32.1	0	0				
17:10:03	12.08	6.87	1.42	0	0	0	0	32.1	0	32.1	0	0				
17:20:03	12.08	7.14	1.42	0	0	0	0	32.1	0	32.1	0	0				
17:30:03	15.02	7.34	1.18	0	0	0	0	32.1	0	32.1	0	0				
17:40:03	15.02	7.47	1.42	0	0	0	0	32.1	0	32.1	0	0				
17:50:03	15.02	7.6	1.18	0	0	0	0	32.1	0	32.1	0	0				
18:00:03	10.32	7.76	1.28	0	0	0	0	32.1	0	32.1	0	0				
18:10:03	12.08	7.88	1.18	0	0	0	0	32.1	0	32.1	0	0				
18:20:03	13.27	8.03	0.79	0	0	0	0	32.1	0	32.1	0	0				
18:30:03	15.02	8.16	0.93	0	0	0	0	32.1	0	32.1	0	0				
18:30:00	START TO RUN IN HOLE WITH NEW AIR HAMMER.															
18:40:03	12.08	8.3	0.93	0	0	0	0	32.1	0	32.1	0	0				
18:50:03	10.32	8.42	0.79	0	0	0	0	32.1	0	32.1	0	0				
19:00:03	13.27	8.57	0.79	0	0	0	0	32.1	0	32.1	0	0				
19:10:03	13.27	8.7	0.54	0	0	0	0	32.1	0	32.1	0	0				
19:20:03	13.27	8.83	0.54	0	0	0	0	32.1	0	32.1	0	0				
19:30:03	15.02	8.96	0.93	0	0	0	0	32.1	0	32.1	0	0				
19:40:03	15.02	9.12	0.69	0	0	0	0	32.1	0	32.1	0	0				
19:50:03	13.27	9.26	0.54	0	0	0	0	32.1	0	32.1	0	0				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/16															
20:00:03	13.27	9.38	0.54	0	0	0	0	32.1	0	32.1	0	0			
20:10:03	13.27	9.55	0.54	0	0	0	0	32.1	0	32.1	0	0			
20:20:03	15.02	9.7	0.44	0	0	0	0	32.1	0	32.1	0	0			
20:30:03	15.02	9.88	0.44	0	0	0	0	32.1	0	32.1	0	0			
20:40:03	13.27	10	0.29	0	0	0	0	32.1	0	32.1	0	0			
20:50:03	13.27	10.18	0.54	0	0	0	0	32.1	0	32.1	0	0			
21:00:03	13.27	10.27	0.29	0	0	0	0	32.1	0	32.1	0	0			
21:10:03	15.02	10.42	0.44	0	0	0	0	32.1	0	32.1	0	0			
21:20:03	15.02	10.55	0.2	0	0	0	0	32.1	0	32.1	0	0			
21:30:03	13.27	10.69	0.29	0	0	0	0	32.1	0	32.1	0	0			
21:30:00	BACK ON BOTTOM.														
21:40:19	15.02	10.83	0.44	0	0	0	0	32.1	0	32.1	0	0			
21:48:00	START TO RUN IN SURVEY.														
21:50:03	13.27	10.99	0.29	0	0	0	0	32.1	0	32.1	0	0			
22:00:03	12.08	11.11	-0.05	0	0	0	0	32.1	0	32.1	0	0			
22:10:03	16.21	11.25	0.05	0	0	0	0	32.1	0	32.1	0	0			
22:20:03	16.78	11.36	0.59	0	0	0	0	32.1	0	32.1	0	0			
22:30:03	10.32	11.44	-0.2	0	0	0	0	32.1	0	32.1	0	0			
22:40:03	15.02	11.54	0.2	0	0	0	0	32.1	0	32.1	0	0			
22:48:00	SURVEY COMPLETE. START PUMPING NITROGEN AT 37 m3/min.														
22:50:03	22.11	11.54	7.66	17.18	0	17.18	-36.1	32.11	0	32.11	0	37			
23:00:03	60.41	6.55	28.54	36.27	0	36.27	-17.01	32.32	0	32.32	0	37			
23:01:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE PRESSURE.														
23:05:00	CHANGE OUT BEARING ASSEMBLY ON ROTATING HEAD.														
23:10:03	24.42	6.12	0.74	0	0	0	0	32.48	0	32.48	0	0			
23:20:03	15.02	8.03	0.2	0	0	0	0	32.48	0	32.48	0	0			
23:25:00	START PUMPING NITROGEN.														
23:30:03	13.27	7.88	18.47	24.81	0	24.81	-28.47	32.56	0	32.56	0	37			
23:39:00	RESUME DRILLING.														

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/16															
23:40:03	53.32	5.94	45.86	48.16	0	48.16	-5.12	32.83	0	32.83	0	37			
23:50:03	59.21	5.51	36.04	42.06	0	42.06	-11.22	33.15	0	33.15	0	37			
99/12/17															
0:00:02	62.16	5.48	35.8	41.93	0	41.93	-11.35	33.45	0	33.45	0	37			
0:09:00	DROP 1600 m SAMPLE.														
0:10:02	62.16	5.78	48.56	50.11	0	50.11	-3.17	33.76	0	33.76	0	37			
0:20:02	99.25	5.45	31.76	39.05	0	39.05	-14.23	34.11	0	34.11	0	37			
0:30:02	172.39	5.83	47.69	49.75	0	49.75	-3.53	34.46	0	34.46	0	37			
0:37:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
0:40:02	291.96	6.35	46.11	49.08	0	49.08	49.08	34.77	0	34.77	0	0			
0:42:00	CONNECTION COMPLETE. START PUMPING NITROGEN.														
0:50:02	210.7	6.59	33.2	39.36	0	39.36	-13.92	35.03	0	35.03	0	37			
1:00:02	267.14	6.75	46.73	49.01	0	49.01	-4.27	35.34	0	35.34	0	37			
1:10:02	198.92	6.84	37.13	42.6	0	42.6	-10.68	35.63	0	35.63	0	37			
1:16:00	DROP 1605 m SAMPLE.														
1:20:02	241.88	7.08	36.53	42.6	0	42.6	-10.68	35.95	0	35.95	0	37			
1:30:02	265.45	7.5	56.91	55.95	0	55.95	2.67	36.28	0	36.28	0	37			
1:40:02	222.49	8	57.51	56.46	0	56.46	3.18	36.66	0	36.66	0	37			
1:50:02	189.33	8.42	48.59	50.95	0	50.95	-2.33	37	0	37	0	37			
2:00:02	139.98	8.76	41.8	45.87	0	45.87	-7.41	37.36	0	37.36	0	37			
2:08:00	DROP 1610 m SAMPLE.														
2:10:02	129.92	9.19	38.99	42.15	0	42.15	-11.13	37.71	0	37.71	0	37			
2:20:02	180.01	9.7	60.1	52.84	0	52.84	-0.44	38.03	0	38.03	0	37			
2:30:02	200.63	10.08	84.9	60.84	0	60.84	7.56	38.38	0	38.38	0	37			
2:40:02	156.44	10.38	55.93	44.45	0	44.45	-8.83	38.71	0	38.71	0	37			
2:47:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
2:50:02	116.92	10.21	52.87	43.39	0	43.39	43.39	39.07	0	39.07	0	0			
2:53:00	CONNECTION COMPLETE. START PUMPING NITROGEN.														
3:00:02	95.78	9.93	37.38	35.32	0	35.32	-17.96	39.27	0	39.27	0	37			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/17																
3:10:02	102.2	9.69	38.14	35.8	0	35.8	-17.48	39.55	0	39.55	0	37				
3:20:02	94.57	9.76	43.9	39.11	0	39.11	-14.17	39.85	0	39.85	0	37				
3:25:00	DROP 1615 m SAMPLE.															
3:30:00	BURNABLE GAS TO SURFACE.															
3:30:02	264.2	10.11	127.49	66.63	0	66.63	13.35	40.16	0	40.16	0	37				
3:40:02	372.78	10.43	205.34	113.82	0	113.82	60.54	40.86	0	40.86	0	37				
3:50:02	369.83	10.49	203.13	121.44	0	121.44	68.16	41.68	0	41.68	0	37				
4:00:02	359.72	10.68	186.05	138.99	0	138.99	85.71	42.66	0	42.66	0	37				
4:10:02	346.67	10.76	177.07	131.99	0	131.99	78.71	43.6	0	43.6	0	37				
4:20:02	333.21	10.7	161.5	125.35	0	125.35	72.07	44.49	0	44.49	0	37				
4:27:00	INCREASE NITROGEN INJECTION RATE TO 39.5 m3/min.															
4:30:02	336.15	10.78	161.25	123.68	0	123.68	66.8	45.36	0	45.36	0	39.5				
4:40:02	334.89	11.06	161.12	123.22	0	123.22	66.34	46.22	0	46.22	0	39.5				
4:50:02	290.27	11.06	161.39	123.97	0	123.97	67.09	47.08	0	47.08	0	39.5				
5:00:02	283.12	11.15	152.41	119.58	0	119.58	62.7	47.92	0	47.92	0	39.5				
5:10:02	283.12	11.07	151.19	118.94	0	118.94	62.06	48.75	0	48.75	0	39.5				
5:20:02	265.45	11.13	149.96	117.13	0	117.13	60.25	49.57	0	49.57	0	39.5				
5:22:00	DROP 1620 m SAMPLE.															
5:30:03	253.66	11.13	144.56	114.67	0	114.67	57.79	50.4	0	50.4	0	39.5				
5:40:02	249.01	11.13	143.46	114.71	0	114.71	57.83	51.19	0	51.19	0	39.5				
5:50:02	247.77	11.11	141.86	113.98	0	113.98	57.1	51.99	0	51.99	0	39.5				
6:00:02	247.77	11.18	141.86	114.04	0	114.04	57.16	52.77	0	52.77	0	39.5				
6:10:02	246.52	11.29	140.25	112.19	0	112.19	55.31	53.56	0	53.56	0	39.5				
6:20:02	218.31	11.39	119.27	101.08	0	101.08	44.2	54.31	0	54.31	0	39.5				
6:20:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
6:25:00	CONNECTION COMPLETE. START PUMPING NITROGEN.															
6:30:02	203.58	10.98	115.34	98.57	0	98.57	41.69	55.04	0	55.04	0	39.5				
6:40:02	221.25	11.22	128.35	105.39	0	105.39	48.51	55.75	0	55.75	0	39.5				
6:47:00	DROP 1625 m SAMPLE.															

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/17															
6:50:02	235.98	11.34	141.61	112.1	0	112.1	55.22	56.5	0	56.5	0	39.5			
7:00:02	227.15	11.42	135.72	109.52	0	109.52	52.64	57.26	0	57.26	0	39.5			
7:10:02	240.17	11.6	143.22	114.31	0	114.31	57.43	58.03	0	58.03	0	39.5			
7:20:02	235.98	11.68	128.6	105.97	0	105.97	49.09	58.78	0	58.78	0	39.5			
7:30:02	235.98	11.8	132.53	107.74	0	107.74	50.86	59.53	0	59.53	0	39.5			
7:40:03	231.33	11.89	130.69	104.87	0	104.87	47.99	60.28	0	60.28	0	39.5			
7:50:00	DROP 1630 m SAMPLE.														
7:50:02	237.22	11.98	132.66	105.83	0	105.83	48.95	61.01	0	61.01	0	39.5			
8:00:02	238.93	12.03	132.77	105.25	0	105.25	48.37	61.74	0	61.74	0	39.5			
8:10:02	233.04	11.98	131.55	104.73	0	104.73	47.85	62.47	0	62.47	0	39.5			
8:20:02	225.44	12.16	130.94	102.5	0	102.5	45.62	63.2	0	63.2	0	39.5			
8:30:02	228.38	12.29	130.94	102.98	0	102.98	46.1	63.92	0	63.92	0	39.5			
8:40:02	230.09	12.42	130.32	102.83	0	102.83	45.95	64.63	0	64.63	0	39.5			
8:50:02	225.91	12.59	130.68	102.75	0	102.75	45.87	65.34	0	65.34	0	39.5			
8:57:00	KELLY DOWN. WORK PIPE.														
9:00:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
9:00:02	207	12.67	112.15	93.04	0	93.04	36.16	66.04	0	66.04	0	39.5			
9:03:00	CONNECTION COMPLETE. START PUMPING NITROGEN.														
9:10:02	190.07	12.37	105.4	90.81	0	90.81	33.93	66.63	0	66.63	0	39.5			
9:20:02	224.2	12.06	125.9	101.39	0	101.39	44.51	67.29	0	67.29	0	39.5			
9:30:02	216.6	11.75	123.57	100.13	0	100.13	43.25	67.99	0	67.99	0	39.5			
9:40:02	224.2	11.68	126.14	100.4	0	100.4	43.52	68.69	0	68.69	0	39.5			
9:44:00	DROP 1635 m SAMPLE.														
9:50:02	220.02	11.71	125.53	99.95	0	99.95	43.07	69.39	0	69.39	0	39.5			
10:00:02	215.36	11.52	124.67	100.19	0	100.19	43.31	70.08	0	70.08	0	39.5			
10:10:02	212.41	11.43	124.18	99.36	0	99.36	42.48	70.77	0	70.77	0	39.5			
10:20:02	212.41	11.61	123.69	99.48	0	99.48	42.6	71.46	0	71.46	0	39.5			
10:30:02	212.41	11.75	123.69	99.28	0	99.28	42.4	72.15	0	72.15	0	39.5			
10:40:02	207.76	11.89	122.1	99.47	0	99.47	42.59	72.84	0	72.84	0	39.5			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/17																
10:50:02	206.52	12	120.01	99.3	0	99.3	42.42	73.53	0	73.53	0	39.5				
11:00:02	209.47	12.13	120.01	99.83	0	99.83	42.95	74.23	0	74.23	0	39.5				
11:05:00	STAND PIPE PRESSURING UP. LIFT OFF BOTTOM AND CIRCULATE.															
11:10:02	185.9	12.2	110.68	94.84	0	94.84	37.96	74.88	0	74.88	0	39.5				
11:20:02	199.4	12.32	119.14	99.35	0	99.35	42.47	75.55	0	75.55	0	39.5				
11:24:00	DECREASE NITROGEN INJECTION RATE TO 35 m3/min.															
11:30:02	193.02	12.63	115.71	97.03	0	97.03	46.63	76.24	0	76.24	0	35				
11:40:02	194.74	12.48	115.34	96.44	0	96.44	46.04	76.91	0	76.91	0	35				
11:50:02	188.85	12.45	124.43	100.88	0	100.88	50.48	77.58	0	77.58	0	35				
12:00:02	182.95	12.13	107.98	92.46	0	92.46	42.06	78.23	0	78.23	0	35				
12:10:02	187.62	11.12	107.85	92.41	0	92.41	42.01	78.87	0	78.87	0	35				
12:20:02	190.56	10.12	111.78	94.84	0	94.84	44.44	79.52	0	79.52	0	35				
12:22:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE. MONITOR FLOW.															
12:30:02	129.92	9.32	71.15	70.97	0	70.97	70.97	80.12	0	80.12	0	0				
12:40:02	98.04	8.82	45.89	52.66	0	52.66	52.66	80.56	0	80.56	0	0				
12:50:02	69.25	8.36	32.22	43.68	0	43.68	43.68	80.88	0	80.88	0	0				
12:55:00	PULL OUT OF HOLE FOR BIT.															
13:00:02	71	8.21	31.87	43.53	0	43.53	43.53	81.18	0	81.18	0	0				
13:10:02	66.31	8.32	33.94	45.85	0	45.85	45.85	81.5	0	81.5	0	0				
13:20:02	68.05	8.21	34.57	45.44	0	45.44	45.44	81.81	0	81.81	0	0				
13:30:02	69.8	8.25	34.71	44.41	0	44.41	44.41	82.12	0	82.12	0	0				
13:40:02	66.31	8.58	37.13	44.9	0	44.9	44.9	82.42	0	82.42	0	0				
13:50:02	69.25	9.33	38.85	40.8	0	40.8	40.8	82.72	0	82.72	0	0				
14:00:02	71	9.84	38.25	44.17	0	44.17	44.17	83	0	83	0	0				
14:10:02	71	10.15	38.99	39.97	0	39.97	39.97	83.29	0	83.29	0	0				
14:20:02	73.95	10.29	43.16	44.73	0	44.73	44.73	83.58	0	83.58	0	0				
14:30:02	72.2	10.29	48.18	41.8	0	41.8	41.8	83.88	0	83.88	0	0				
14:40:02	78.63	10.16	39.37	40.39	0	40.39	40.39	84.18	0	84.18	0	0				
14:50:02	73.95	10.03	50.04	42.92	0	42.92	42.92	84.48	0	84.48	0	0				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/17															
15:00:02	76.89	9.93	50.53	42.06	0	42.06	42.06	84.77	0	84.77	0	0			
15:10:02	76.89	9.93	58.63	41.96	0	41.96	41.96	85.07	0	85.07	0	0			
15:20:02	106.35	10	69.19	39.47	0	39.47	39.47	85.35	0	85.35	0	0			
15:30:02	124.03	10.01	26.96	40.15	0	40.15	40.15	85.62	0	85.62	0	0			
15:40:02	149.32	10.35	30.04	43.32	0	43.32	43.32	85.91	0	85.91	0	0			
15:50:02	129.92	10.27	28.18	40.83	0	40.83	40.83	86.2	0	86.2	0	0			
16:00:02	137.54	9.85	28.57	42.02	0	42.02	42.02	86.48	0	86.48	0	0			
16:09:00	BIT AT SURFACE. CLOSE BLIND RAMS.														
16:10:02	22.67	9.57	2.55	0	0	0	0	86.69	0	86.69	0	0			
16:13:00	DIVERT FLOW THROUGH HCR. REMOVE BEARING ASSEMBLY FROM ROTATING HEAD.														
16:20:02	63.36	11.67	34.18	42.99	0	42.99	42.99	87.06	0	87.06	0	0			
16:30:02	59.21	12.09	29.41	40.56	0	40.56	40.56	87.34	0	87.34	0	0			
16:40:02	54.52	12.35	29.27	41.53	0	41.53	41.53	87.62	0	87.62	0	0			
16:50:02	57.47	12.58	29.76	40.49	0	40.49	40.49	87.91	0	87.91	0	0			
17:00:02	59.21	12.67	30.15	40.61	0	40.61	40.61	88.19	0	88.19	0	0			
17:10:02	59.21	12.72	30.39	40.25	0	40.25	40.25	88.48	0	88.48	0	0			
17:20:02	60.96	12.72	30.53	38.29	0	38.29	38.29	88.76	0	88.76	0	0			
17:30:02	59.21	12.72	30.15	40.34	0	40.34	40.34	89.03	0	89.03	0	0			
17:35:00	START BACK IN HOLE WITH NEW AIR HAMMER.														
17:40:02	60.96	12.73	29.31	37.6	0	37.6	37.6	89.3	0	89.3	0	0			
17:50:02	56.27	12.71	29.41	38.38	0	38.38	38.38	89.58	0	89.58	0	0			
17:53:00	DIVERT FLOW THROUGH FLOW LINE. CLOSE HCR. CONTINUE TO RUN IN HOLE.														
18:00:02	56.27	0.11	28.18	37.2	0	37.2	37.2	89.82	0	89.82	0	0			
18:10:02	59.21	-3.31	30.15	36.53	0	36.53	36.53	90.08	0	90.08	0	0			
18:20:02	49.82	-3.98	28.39	37.55	0	37.55	37.55	90.34	0	90.34	0	0			
18:30:02	57.47	-2.98	29.27	36.99	0	36.99	36.99	90.59	0	90.59	0	0			
18:40:02	62.16	-1.98	28.68	36.61	0	36.61	36.61	90.85	0	90.85	0	0			
18:50:02	59.21	-3.81	27.45	35.63	0	35.63	35.63	91.1	0	91.1	0	0			
19:00:02	59.21	-6.29	27.94	35.56	0	35.56	35.56	91.35	0	91.35	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/17																
19:10:02	66.85	-7.69	28.82	36.23	0	36.23	36.23	91.6	0	91.6	0	0				
19:20:02	54.52	-8.21	28.04	35.65	0	35.65	35.65	91.85	0	91.85	0	0				
19:30:02	56.27	-8.33	28.43	35.93	0	35.93	35.93	92.1	0	92.1	0	0				
19:40:02	60.96	-8.19	28.82	36.05	0	36.05	36.05	92.35	0	92.35	0	0				
19:50:02	56.27	-7.92	27.69	35.5	0	35.5	35.5	92.6	0	92.6	0	0				
20:00:02	56.27	-5.86	27.94	35.89	0	35.89	35.89	92.85	0	92.85	0	0				
20:10:02	54.52	-6.56	27.55	35.52	0	35.52	35.52	93.09	0	93.09	0	0				
20:20:02	56.27	-7.67	27.69	35.39	0	35.39	35.39	93.34	0	93.34	0	0				
20:30:02	85.73	-7.66	45.13	47.9	0	47.9	47.9	93.56	0	93.56	0	0				
20:40:02	56.27	-6.83	27.69	35.73	0	35.73	35.73	93.83	0	93.83	0	0				
20:50:02	58.01	-7.02	27.34	35.14	0	35.14	35.14	94.07	0	94.07	0	0				
21:00:02	51.57	-7.69	26.57	34.75	0	34.75	34.75	94.32	0	94.32	0	0				
21:10:02	51.57	-7.95	26.57	34.91	0	34.91	34.91	94.56	0	94.56	0	0				
21:20:02	53.32	-7.91	26.71	34.98	0	34.98	34.98	94.8	0	94.8	0	0				
21:30:02	51.57	-8.25	26.82	35.04	0	35.04	35.04	95.05	0	95.05	0	0				
21:40:02	58.01	-8.71	27.1	35.04	0	35.04	35.04	95.29	0	95.29	0	0				
21:50:02	59.76	-9.03	27.24	34.97	0	34.97	34.97	95.53	0	95.53	0	0				
22:00:02	51.57	-9.45	26.57	34.62	0	34.62	34.62	95.77	0	95.77	0	0				
22:10:02	50.38	-8.52	26.22	34.38	0	34.38	34.38	96.01	0	96.01	0	0				
22:15:00	BACK ON BOTTOM. START TO RUN IN SURVEY.															
22:20:02	50.38	-6.45	25.98	34.45	0	34.45	34.45	96.25	0	96.25	0	0				
22:25:00	PICK UP KELLY.															
22:28:00	START PUMPING NITROGEN AT 36 m3/min.															
22:30:02	50.38	-4.8	25.73	34.45	0	34.45	-17.39	96.49	0	96.49	0	36				
22:40:02	92.83	-4.43	54.57	55.18	0	55.18	3.34	96.79	0	96.79	0	36				
22:43:00	STAND PIPE PRESSURING UP. STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.															
22:50:02	100.46	-4.15	60.84	58.78	0	58.78	58.78	97.21	0	97.21	0	0				
23:00:02	47.43	-2.53	25.98	31.19	0	31.19	31.19	97.5	0	97.5	0	0				
23:07:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.															

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/17															
23:10:02	53.32	-0.95	26.47	34.46	0	34.46	-17.38	97.75	0	97.75	0	36			
23:20:02	72.74	-2.54	38.39	43.46	0	43.46	-8.38	98.01	0	98.01	0	36			
23:30:02	177.06	-2.41	104.29	81.2	0	81.2	29.36	98.43	0	98.43	0	36			
23:34:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.														
23:40:02	144.65	-0.51	88.58	72.51	0	72.51	72.51	99	0	99	0	0			
23:43:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														
23:50:02	118.14	0.51	63.29	58.83	0	58.83	6.99	99.42	0	99.42	0	36			
99/12/18															
0:00:02	150.55	0.93	94.23	76.26	0	76.26	24.42	99.9	0	99.9	0	36			
0:10:02	144.65	0.97	100.86	80.26	0	80.26	28.42	100.45	0	100.45	0	36			
0:20:02	139.98	1.59	100.98	80.93	0	80.93	29.09	101.01	0	101.01	0	36			
0:24:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.														
0:29:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														
0:30:02	113.46	2.16	81.82	70.56	0	70.56	18.72	101.56	0	101.56	0	36			
0:40:02	112.25	2.1	79.99	70.48	0	70.48	18.64	102.03	0	102.03	0	36			
0:50:02	124.03	2.03	90.3	76.63	0	76.63	24.79	102.54	0	102.54	0	36			
1:00:02	128.19	1.87	93.37	78.63	0	78.63	26.79	103.08	0	103.08	0	36			
1:10:02	132.87	2.18	96.93	80.24	0	80.24	28.4	103.64	0	103.64	0	36			
1:16:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.														
1:20:02	128.71	2.75	90.92	76.56	0	76.56	76.56	104.19	0	104.19	0	0			
1:21:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														
1:30:02	107.56	3.4	76.67	69.21	0	69.21	17.37	104.67	0	104.67	0	36			
1:40:02	121.08	3.1	84.16	73.35	0	73.35	21.51	105.17	0	105.17	0	36			
1:50:02	134.6	2.78	94.11	78.72	0	78.72	26.88	105.7	0	105.7	0	36			
2:00:02	135.81	3.2	97.42	80.48	0	80.48	28.64	106.25	0	106.25	0	36			
2:10:02	135.81	3.69	96.93	80.19	0	80.19	28.35	106.81	0	106.81	0	36			
2:20:02	140.49	3.97	96.56	80	0	80	28.16	107.36	0	107.36	0	36			
2:30:02	134.08	4.31	97.79	80.58	0	80.58	28.74	107.92	0	107.92	0	36			
2:40:02	140.49	4.56	98.28	80.02	0	80.02	28.18	108.48	0	108.48	0	36			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3	
99/12/18																
2:50:02	134.08	4.78	96.8	79.38	0	79.38	27.54	109.03	0	109.03	0	36				
3:00:02	135.81	4.9	96.93	79.19	0	79.19	27.35	109.58	0	109.58	0	36				
3:10:02	135.81	4.84	97.17	79.08	0	79.08	27.24	110.13	0	110.13	0	36				
3:16:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.															
3:20:02	128.71	5.07	91.9	76.31	0	76.31	24.47	110.68	0	110.68	0	36				
3:22:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.															
3:30:02	104.62	5.21	73.72	66.24	0	66.24	14.4	111.14	0	111.14	0	36				
3:40:02	134.6	4.8	89.69	76.44	0	76.44	24.6	111.63	0	111.63	0	36				
3:50:02	129.92	4.79	91.77	78.75	0	78.75	26.91	112.18	0	112.18	0	36				
4:00:02	131.14	5.32	96.8	80.69	0	80.69	28.85	112.73	0	112.73	0	36				
4:01:00	INCREASE NITROGEN INJECTION RATE TO 40 m3/min.															
4:02:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE.															
4:05:00	START TO PULL OUT OF HOLE.															
4:10:02	97.51	5.59	66.24	64.74	0	64.74	64.74	113.27	0	113.27	0	0				
4:20:02	63.9	5.97	38.88	42.01	0	42.01	42.01	113.63	0	113.63	0	0				
4:30:02	48.63	6.22	27.8	32.06	0	32.06	32.06	113.89	0	113.89	0	0				
4:40:02	49.18	6.39	25.87	34.39	0	34.39	34.39	114.1	0	114.1	0	0				
4:50:02	44.48	6.59	25.48	29.83	0	29.83	29.83	114.35	0	114.35	0	0				
5:00:02	44.48	6.83	24.99	30.57	0	30.57	30.57	114.59	0	114.59	0	0				
5:10:02	47.43	6.66	25.73	35.5	0	35.5	35.5	114.82	0	114.82	0	0				
5:20:02	52.12	6.82	25.13	28.3	0	28.3	28.3	115.05	0	115.05	0	0				
5:30:02	44.48	7.17	24.26	33.95	0	33.95	33.95	115.28	0	115.28	0	0				
5:40:02	44.48	7.44	23.52	27.44	0	27.44	27.44	115.51	0	115.51	0	0				
5:50:02	44.48	7.87	23.27	36.06	0	36.06	36.06	115.74	0	115.74	0	0				
6:00:02	44.48	8.14	23.27	32.56	0	32.56	32.56	115.97	0	115.97	0	0				
6:10:02	44.48	8.34	23.27	34.97	0	34.97	34.97	116.2	0	116.2	0	0				
6:20:02	53.87	8.56	23.31	35.04	0	35.04	35.04	116.43	0	116.43	0	0				
6:30:02	44.48	8.79	22.78	33.77	0	33.77	33.77	116.66	0	116.66	0	0				
6:40:02	41.54	9.06	22.78	28.44	0	28.44	28.44	116.88	0	116.88	0	0				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/18															
6:50:02	44.48	9.54	22.29	35.87	0	35.87	35.87	117.11	0	117.11	0	0			
7:00:02	41.54	9.87	22.29	28.36	0	28.36	28.36	117.33	0	117.33	0	0			
7:10:02	44.48	10.09	22.05	32.18	0	32.18	32.18	117.55	0	117.55	0	0			
7:20:02	49.18	10.36	22.68	30.17	0	30.17	30.17	117.78	0	117.78	0	0			
7:30:02	53.87	10.64	23.07	36.41	0	36.41	36.41	118.01	0	118.01	0	0			
7:40:02	44.48	11.23	22.29	32.54	0	32.54	32.54	118.24	0	118.24	0	0			
7:50:02	39.79	11.79	21.66	28.92	0	28.92	28.92	118.47	0	118.47	0	0			
8:00:00	BIT AT SURFACE. OPEN HCR. CLOSE BLIND RAMS AND FLOW LINE. REMOVE BEARING ASSEMBLY FROM ROTATING HEAD.														
8:00:02	41.54	11.92	21.07	30.45	0	30.45	30.45	118.68	0	118.68	0	0			
8:10:02	46.23	12.17	22.19	34	0	34	34	118.9	0	118.9	0	0			
8:20:02	42.73	12.77	21.9	33.02	0	33.02	33.02	119.13	0	119.13	0	0			
8:30:02	44.48	13.33	21.8	29.33	0	29.33	29.33	119.37	0	119.37	0	0			
8:40:02	44.48	13.76	20.08	29.65	0	29.65	29.65	119.57	0	119.57	0	0			
8:50:02	39.79	13.82	19.2	33.21	0	33.21	33.21	119.78	0	119.78	0	0			
9:00:02	41.54	13.84	18.86	31.64	0	31.64	31.64	120	0	120	0	0			
9:10:00	INSTALL BEARING ASSEMBLY IN ROTATING HEAD. OPEN BLIND RAMS. START BACK IN HOLE WITH AIR HAMMER.														
9:10:02	39.79	13.82	21.41	34.43	0	34.43	34.43	120.22	0	120.22	0	0			
9:20:02	41.54	13.79	20.33	26.71	0	26.71	26.71	120.45	0	120.45	0	0			
9:30:04	44.48	13.7	20.57	34.64	0	34.64	34.64	120.68	0	120.68	0	0			
9:31:00	OPEN FLOW LINE. CLOSE HCR. CONTINUE TO RUN IN HOLE.														
9:40:02	41.54	4.6	18.61	26.14	0	26.14	26.14	120.88	0	120.88	0	0			
9:50:02	46.23	2.59	18.26	33.5	0	33.5	33.5	121.08	0	121.08	0	0			
10:00:00	SLIP AND CUT DRILL LINE.														
10:00:02	38.59	2.05	19.1	32.99	0	32.99	32.99	121.31	0	121.31	0	0			
10:10:02	44.48	2.81	19.84	34.28	0	34.28	34.28	121.54	0	121.54	0	0			
10:20:02	41.54	3.56	19.35	34.28	0	34.28	34.28	121.77	0	121.77	0	0			
10:30:02	38.59	4.12	19.35	33.18	0	33.18	33.18	122.01	0	122.01	0	0			
10:40:02	38.59	4.62	19.1	33	0	33	33	122.24	0	122.24	0	0			
10:50:02	38.59	5.05	18.61	32.63	0	32.63	32.63	122.47	0	122.47	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/18																
11:00:00	CONTINUE TO RUN IN HOLE.															
11:00:02	38.59	5.5	18.12	31.7	0	31.7	31.7	122.7	0	122.7	0	0				
11:10:02	39.79	5.31	16.99	25.59	0	25.59	25.59	122.91	0	122.91	0	0				
11:20:02	35.65	3.02	16.4	25.42	0	25.42	25.42	123.08	0	123.08	0	0				
11:30:02	41.54	0.75	18.61	32.56	0	32.56	32.56	123.3	0	123.3	0	0				
11:40:02	38.59	-1.01	18.61	30.47	0	30.47	30.47	123.53	0	123.53	0	0				
11:50:02	39.79	-2.16	19.2	32.82	0	32.82	32.82	123.75	0	123.75	0	0				
12:00:02	38.59	-2.51	19.1	31.03	0	31.03	31.03	123.98	0	123.98	0	0				
12:10:02	36.84	-2.77	18.71	29.16	0	29.16	29.16	124.2	0	124.2	0	0				
12:20:02	41.54	-2.85	19.1	32.46	0	32.46	32.46	124.43	0	124.43	0	0				
12:30:02	41.54	-1.15	18.61	33.44	0	33.44	33.44	124.66	0	124.66	0	0				
12:40:02	38.59	0.29	18.36	31.09	0	31.09	31.09	124.88	0	124.88	0	0				
12:50:02	39.79	-0.21	18.22	29.89	0	29.89	29.89	125.1	0	125.1	0	0				
13:00:02	41.54	-1.86	18.86	31.63	0	31.63	31.63	125.32	0	125.32	0	0				
13:10:02	38.59	-3.05	18.61	33.41	0	33.41	33.41	125.54	0	125.54	0	0				
13:20:02	36.84	-3.43	18.96	31.71	0	31.71	31.71	125.76	0	125.76	0	0				
13:30:02	41.54	-3.47	19.1	32.06	0	32.06	32.06	125.98	0	125.98	0	0				
13:40:02	41.54	-3.26	18.86	29.83	0	29.83	29.83	126.19	0	126.19	0	0				
13:45:00	ON BOTTOM. PICK UP KELLY AND PREPARE TO CIRCULATE.															
13:50:02	40.34	-2.57	18.51	32.66	0	32.66	32.66	126.41	0	126.41	0	0				
14:00:02	41.54	-1.03	17.87	31.87	0	31.87	31.87	126.63	0	126.63	0	0				
14:06:00	START PUMPING NITROGEN.															
14:10:02	50.38	0.34	25.24	37.67	0	37.67	-14.17	126.86	0	126.86	0	36				
14:20:02	112.25	0.45	78.52	68.19	0	68.19	16.35	127.26	0	127.26	0	36				
14:30:02	116.92	0.24	75.94	67.27	0	67.27	15.43	127.74	0	127.74	0	36				
14:40:02	93.36	0.06	55.33	55.88	0	55.88	4.04	128.18	0	128.18	0	36				
14:50:02	101.67	0.39	68.07	63.98	0	63.98	12.14	128.63	0	128.63	0	36				
15:00:02	119.87	0.82	76.68	69.02	0	69.02	17.18	129.09	0	129.09	0	36				
15:03:00	KELLY DOWN. WORK PIPE.															

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/18															
15:06:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
15:10:00	CONNECTION COMPLETE. START PUMPING NITROGEN.														
15:10:02	119.87	1.35	80.61	70.67	0	70.67	18.83	129.62	0	129.62	0	36			
15:20:02	88.68	1.8	57.4	56.67	0	56.67	4.83	129.99	0	129.99	0	36			
15:27:00	DROP 1640 m SAMPLE.														
15:30:02	112.25	1.63	73.6	67.41	0	67.41	15.57	130.43	0	130.43	0	36			
15:40:02	119.87	1.69	76.93	69.02	0	69.02	17.18	130.91	0	130.91	0	36			
15:50:02	119.87	1.83	77.17	69.59	0	69.59	17.75	131.39	0	131.39	0	36			
16:00:02	111.03	2.09	71.28	66.77	0	66.77	14.93	131.89	0	131.89	0	36			
16:10:02	112.25	2.37	74.83	69.49	0	69.49	17.65	132.37	0	132.37	0	36			
16:20:02	107.56	2.53	74.46	69.86	0	69.86	18.02	132.85	0	132.85	0	36			
16:22:00	DROP 1645 m SAMPLE. TRACE OF WATER IN SAMPLE.														
16:30:02	112.25	2.62	75.08	70.39	0	70.39	18.55	133.35	0	133.35	0	36			
16:40:02	116.92	2.71	77.42	72.02	0	72.02	20.18	133.84	0	133.84	0	36			
16:50:02	119.87	2.91	78.4	72.5	0	72.5	20.66	134.34	0	134.34	0	36			
17:00:02	112.25	3.07	78.27	72.52	0	72.52	20.68	134.85	0	134.85	0	36			
17:10:02	119.87	3.2	78.89	73.15	0	73.15	21.31	135.35	0	135.35	0	36			
17:20:02	115.19	3.38	79.5	73.67	0	73.67	21.83	135.86	0	135.86	0	36			
17:30:02	115.19	3.59	79.25	73.27	0	73.27	21.43	136.36	0	136.36	0	36			
17:34:00	KELLY DOWN. WORK PIPE.														
17:40:02	106.35	3.86	73.36	69.75	0	69.75	17.91	136.86	0	136.86	0	36			
17:50:02	115.19	4.15	80.97	73.73	0	73.73	21.89	137.36	0	137.36	0	36			
17:56:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
18:00:02	100.46	4.02	67.22	65.81	0	65.81	65.81	137.87	0	137.87	0	0			
18:10:03	47.43	4.37	26.47	34.87	0	34.87	34.87	138.2	0	138.2	0	0			
18:20:02	41.54	4.7	20.33	24.94	0	24.94	24.94	138.39	0	138.39	0	0			
18:30:02	41.54	4.93	20.33	31.66	0	31.66	31.66	138.6	0	138.6	0	0			
18:32:00	START PUMPING NITROGEN.														
18:40:02	97.51	4.69	69.68	63.27	0	63.27	11.43	138.9	0	138.9	0	36			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/18																
18:50:02	128.19	3.77	97.05	76.85	0	76.85	25.01	139.4	0	139.4	0	36				
18:51:00	INCREASE NITROGEN INJECTION RATE TO 40 m3/min.															
18:52:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.															
18:57:00	START PUMPING NITROGEN.															
19:00:02	62.16	3.77	38.74	46.91	0	46.91	-10.69	139.82	0	139.82	0	40				
19:10:02	126.98	3.64	91.53	75.94	0	75.94	18.34	140.27	0	140.27	0	40				
19:20:02	135.81	3.21	101.84	81.21	0	81.21	23.61	140.82	0	140.82	0	40				
19:23:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
19:30:02	66.85	3.07	39.13	44.44	0	44.44	44.44	141.32	0	141.32	0	0				
19:32:00	CONNECTION COMPLETE. START PUMPING NITROGEN. RESUME DRILLING.															
19:40:02	97.51	4.05	69.43	64.06	0	64.06	5.46	141.66	0	141.66	0	40				
19:50:02	125.76	3.91	87.73	74.99	0	74.99	17.39	142.13	0	142.13	0	40				
20:00:02	137.54	4.09	98.28	81.24	0	81.24	23.64	142.68	0	142.68	0	40				
20:10:02	141.71	4.29	104.54	85.4	0	85.4	27.8	143.26	0	143.26	0	40				
20:13:00	DROP 1650 m SAMPLE.															
20:20:02	132.87	4.62	95.46	81.11	0	81.11	23.51	143.84	0	143.84	0	40				
20:3 J2	132.87	4.98	95.7	82.21	0	82.21	24.61	144.4	0	144.4	0	40				
20:40:02	132.87	5.04	95.7	82.47	0	82.47	24.87	144.97	0	144.97	0	40				
20:50:02	144.65	4.86	101.59	86.75	0	86.75	29.15	145.55	0	145.55	0	40				
20:56:00	DROP 1655 m SAMPLE.															
21:00:02	129.92	4.8	89.56	79.75	0	79.75	22.15	146.12	0	146.12	0	40				
21:10:02	129.92	4.51	91.77	80.94	0	80.94	23.34	146.68	0	146.68	0	40				
21:20:02	137.54	4.34	94.11	82.39	0	82.39	24.79	147.25	0	147.25	0	40				
21:30:02	175.83	4.3	124.05	100.15	0	100.15	42.55	147.87	0	147.87	0	40				
21:32:00	DROP 1660 m SAMPLE.															
21:36:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
21:40:02	106.35	4.49	75.08	71.6	0	71.6	71.6	148.48	0	148.48	0	0				
21:44:00	CONNECTION COMPLETE. START PUMPING NITROGEN. RESUME DRILLING.															
21:50:02	88.68	4.57	58.87	59.79	0	59.79	2.19	148.83	0	148.83	0	40				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/18															
22:00:02	107.56	4.1	77.65	70.74	0	70.74	13.14	149.31	0	149.31	0	40			
22:10:02	98.72	2.92	68.81	66.53	0	66.53	8.93	149.8	0	149.8	0	40			
22:20:02	113.98	2.73	74.23	69.59	0	69.59	11.99	150.26	0	150.26	0	40			
22:30:02	129.92	2.54	89.32	78.58	0	78.58	20.98	150.78	0	150.78	0	40			
22:40:02	132.87	2.31	92.51	80.6	0	80.6	23	151.33	0	151.33	0	40			
22:50:02	137.54	2.21	93.62	80.87	0	80.87	23.27	151.9	0	151.9	0	40			
22:58:00	DROP 1665 m SAMPLE.														
23:00:02	140.49	2.37	97.05	82.83	0	82.83	25.23	152.47	0	152.47	0	40			
23:10:02	138.76	2.47	98.4	84.03	0	84.03	26.43	153.04	0	153.04	0	40			
23:20:02	132.87	2.64	95.7	82.74	0	82.74	25.14	153.62	0	153.62	0	40			
23:30:02	140.49	2.8	95.09	82.29	0	82.29	24.69	154.19	0	154.19	0	40			
23:40:02	137.54	2.95	94.35	82.4	0	82.4	24.8	154.76	0	154.76	0	40			
23:48:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
23:50:02	122.3	3.04	87.23	78.05	0	78.05	78.05	155.33	0	155.33	0	0			
23:56:00	CONNECTION COMPLETE. START PUMPING NITROGEN. RESUME DRILLING.														
99/12/19															
0:00:02	96.31	3.56	60.24	59.98	0	59.98	2.38	155.81	0	155.81	0	40			
0:10:02	118.14	3.63	82.44	74.3	0	74.3	16.7	156.28	0	156.28	0	40			
0:20:02	124.03	3.53	88.83	78.23	0	78.23	20.63	156.81	0	156.81	0	40			
0:30:02	122.81	3.46	85.27	76.13	0	76.13	18.53	157.33	0	157.33	0	40			
0:30:00	DROP 1670 m SAMPLE.														
0:35:00	STOP DRILLING. LIFT OFF BOTTOM AND CIRCULATE TO CLEAN UP HOLE.														
0:40:02	141.71	3.62	99.63	84.95	0	84.95	27.35	157.9	0	157.9	0	40			
0:50:02	132.87	3.72	94.47	82.51	0	82.51	24.91	158.48	0	158.48	0	40			
1:00:02	128.19	3.89	92.87	81.55	0	81.55	23.95	159.05	0	159.05	0	40			
1:10:02	132.87	3.85	93.49	81.93	0	81.93	24.33	159.62	0	159.62	0	40			
1:20:02	129.92	3.72	91.77	80.9	0	80.9	23.3	160.19	0	160.19	0	40			
1:30:02	140.49	3.61	92.88	81.3	0	81.3	23.7	160.74	0	160.74	0	40			
1:40:02	126.98	3.53	93.25	81.79	0	81.79	24.19	161.31	0	161.31	0	40			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3	
99/12/19																
1:42:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.															
1:50:02	82.78	4.01	52.49	55.69	0	55.69	-1.91	161.83	0	161.83	0	40				
1:51:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.															
2:00:02	87.47	4.6	56.06	56.15	0	56.15	-1.45	162.18	0	162.18	0	40				
2:10:02	112.25	3.45	78.02	69.61	0	69.61	12.01	162.61	0	162.61	0	40				
2:20:02	133.38	3.24	85.15	74.15	0	74.15	16.55	163.11	0	163.11	0	40				
2:30:02	143.43	3.5	78.64	70.9	0	70.9	13.3	163.61	0	163.61	0	40				
2:40:02	186.39	6.71	128.1	98.26	0	98.26	40.66	164.24	0	164.24	0	40				
2:50:02	200.63	6.53	150.7	107.12	0	107.12	49.52	164.9	0	164.9	0	40				
3:00:02	165.28	6.56	123.93	91.92	0	91.92	34.32	165.62	0	165.62	0	40				
3:10:02	101.67	6.06	72.98	64.54	0	64.54	6.94	166.18	0	166.18	0	40				
3:20:02	124.03	5.67	90.05	74.29	0	74.29	16.69	166.66	0	166.66	0	40				
3:30:02	151.77	5.93	119.4	89.26	0	89.26	31.66	167.33	0	167.33	0	40				
3:40:02	118.14	5.64	87.35	73.04	0	73.04	15.44	167.84	0	167.84	0	40				
3:50:02	217.07	5.9	167.75	112.72	0	112.72	55.12	168.48	0	168.48	0	40				
3:54:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE.															
3:58:00	START TO PULL OUT OF HOLE FOR NEW AIR HAMMER.															
4:00:02	82.78	6.1	55.93	52.65	0	52.65	52.65	169.1	0	169.1	0	0				
4:10:02	44.48	6.08	25.24	24.6	0	24.6	24.6	169.32	0	169.32	0	0				
4:20:02	41.54	6	23.03	22.16	0	22.16	22.16	169.53	0	169.53	0	0				
4:30:02	42.73	6.29	24.36	29.76	0	29.76	29.76	169.74	0	169.74	0	0				
4:40:02	41.54	6.5	22.78	31.92	0	31.92	31.92	169.95	0	169.95	0	0				
4:50:02	49.18	6.74	25.38	30.93	0	30.93	30.93	170.14	0	170.14	0	0				
5:00:02	47.43	7.25	25.73	31.4	0	31.4	31.4	170.33	0	170.33	0	0				
5:10:02	45.68	7.8	25.59	29.55	0	29.55	29.55	170.52	0	170.52	0	0				
5:20:02	50.38	8.26	25.98	29.8	0	29.8	29.8	170.71	0	170.71	0	0				
5:30:02	44.48	8.61	25.98	32.25	0	32.25	32.25	170.9	0	170.9	0	0				
5:40:02	44.48	8.94	25.24	22.65	0	22.65	22.65	171.11	0	171.11	0	0				
5:50:02	52.12	9.15	26.61	27.3	0	27.3	27.3	171.3	0	171.3	0	0				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/mln	Surf Vol m3	Gain/Loss m3	Cum +/- m3	
99/12/19																
6:00:02	47.43	9.64	25.98	27.52	0	27.52	27.52	171.49	0	171.49	0	0				
6:10:02	49.18	9.84	24.89	23.4	0	23.4	23.4	171.67	0	171.67	0	0				
6:20:02	42.73	10	25.83	29.33	0	29.33	29.33	171.87	0	171.87	0	0				
6:30:02	45.68	10.07	25.1	26.43	0	26.43	26.43	172.06	0	172.06	0	0				
6:40:02	44.48	10.25	25.24	22.93	0	22.93	22.93	172.24	0	172.24	0	0				
6:50:02	44.48	10.57	25.73	31.2	0	31.2	31.2	172.44	0	172.44	0	0				
7:00:02	47.43	10.9	25.24	24.66	0	24.66	24.66	172.64	0	172.64	0	0				
7:10:02	47.43	11.2	25.73	33.22	0	33.22	33.22	172.85	0	172.85	0	0				
7:20:02	44.48	11.57	24.99	31.54	0	31.54	31.54	173.05	0	173.05	0	0				
7:30:02	42.73	11.06	24.61	30.85	0	30.85	30.85	173.27	0	173.27	0	0				
7:38:00	BIT AT SURFACE. OPEN HCR. CLOSE BLIND RAMS AND FLOW LINE. REMOVE BEARING ASSEMBLY FROM ROTATING HEAD.															
7:40:02	36.84	9.49	24.11	19.91	0	19.91	19.91	173.47	0	173.47	0	0				
7:50:03	41.54	9.38	25.24	31.08	0	31.08	31.08	173.67	0	173.67	0	0				
8:00:02	44.48	10.07	24.99	30.09	0	30.09	30.09	173.89	0	173.89	0	0				
8:10:02	41.54	10.67	24.5	29.71	0	29.71	29.71	174.1	0	174.1	0	0				
8:20:02	41.54	11.14	24.26	30.96	0	30.96	30.96	174.31	0	174.31	0	0				
8:30:02	44.48	11.59	23.52	29.91	0	29.91	29.91	174.52	0	174.52	0	0				
8:40:02	39.79	11.99	23.13	30.06	0	30.06	30.06	174.73	0	174.73	0	0				
8:50:02	47.43	12.35	24.99	31.44	0	31.44	31.44	174.94	0	174.94	0	0				
9:00:02	44.48	12.68	21.8	29.65	0	29.65	29.65	175.12	0	175.12	0	0				
9:10:02	49.18	12.86	23.17	31.05	0	31.05	31.05	175.32	0	175.32	0	0				
9:15:00	INSTALL BEARING ASSEMBLY IN ROTATING HEAD. OPEN BLIND RAMS. START BACK IN HOLE WITH AIR HAMMER.															
9:20:02	44.48	12.85	23.03	31.07	0	31.07	31.07	175.53	0	175.53	0	0				
9:30:02	44.48	12.88	22.54	22.44	0	22.44	22.44	175.73	0	175.73	0	0				
9:40:00	OPEN FLOW LINE. CLOSE HCR. CONTINUE TO RUN IN HOLE.															
9:40:02	42.73	12.91	21.9	23.15	0	23.15	23.15	175.91	0	175.91	0	0				
9:50:02	44.48	5	21.56	22.27	0	22.27	22.27	176.09	0	176.09	0	0				
10:00:02	44.48	2.82	21.07	26.24	0	26.24	26.24	176.28	0	176.28	0	0				
99/12/19																

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3	
10:10:02	49.18	1.83	21.45	29.98	0	29.98	29.98	176.48	0	176.48	0	0				
10:20:02	41.54	1.02	20.57	28.39	0	28.39	28.39	176.68	0	176.68	0	0				
10:30:02	46.23	0.26	20.96	29.17	0	29.17	29.17	176.89	0	176.89	0	0				
10:40:02	46.23	-0.52	20.47	26.42	0	26.42	26.42	177.08	0	177.08	0	0				
10:50:02	43.29	-1.21	19.49	29.75	0	29.75	29.75	177.27	0	177.27	0	0				
11:00:00	SHIP 3.0 m3 SOLIDS AND WATER FROM PRESSURE TANK.															
11:00:02	41.54	-1.48	19.84	29.92	0	29.92	29.92	177.47	0	177.47	0	0				
11:10:02	41.54	-1.81	20.08	25.15	0	25.15	25.15	177.65	0	177.65	0	0				
11:20:02	38.59	-2.08	19.84	26.32	0	26.32	26.32	177.84	0	177.84	0	0				
11:30:02	38.59	-2.42	19.84	26.15	0	26.15	26.15	178.04	0	178.04	0	0				
11:40:02	38.59	-2.75	19.59	27.45	0	27.45	27.45	178.24	0	178.24	0	0				
11:50:02	45.04	-2.95	20.12	30.93	0	30.93	30.93	178.44	0	178.44	0	0				
12:00:02	38.59	-2.98	19.1	24.89	0	24.89	24.89	178.62	0	178.62	0	0				
12:10:02	34.45	-3.11	15.56	15.8	0	15.8	15.8	178.79	0	178.79	0	0				
12:18:00	ON BOTTOM. PICK UP KELLY AND PREPARE TO CIRCULATE.															
12:20:02	38.59	-2.8	18.36	27.9	0	27.9	27.9	178.95	0	178.95	0	0				
12:30:02	38.59	-1.5	19.35	28.1	0	28.1	28.1	179.15	0	179.15	0	0				
12:32:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.															
12:40:02	38.59	-0.09	19.59	19.6	0	19.6	-35.12	179.33	0	179.33	0	38				
12:50:02	145.87	1.31	103.43	73.25	0	73.25	18.53	179.66	0	179.66	0	38				
13:00:02	156.44	3.23	112.64	75.04	0	75.04	20.32	180.21	0	180.21	0	38				
13:10:02	156.44	3.5	114.11	73.89	0	73.89	19.17	180.72	0	180.72	0	38				
13:13:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DFILL PIPE.															
13:19:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.															
13:20:02	118.14	4.16	84.65	59.79	0	59.79	5.07	181.21	0	181.21	0	38				
13:30:02	138.76	5.46	105.77	68.65	0	68.65	13.93	181.64	0	181.64	0	38				
13:40:02	147.6	5.45	113.13	70.75	0	70.75	16.03	182.13	0	182.13	0	38				
13:50:02	135.81	5.13	102.33	65.99	0	65.99	11.27	182.61	0	182.61	0	38				
14:00:02	146.38	5.3	109.08	69.33	0	69.33	14.61	183.08	0	183.08	0	38				
14:10:02	150.55	5.6	113.62	72	0	72	17.28	183.57	0	183.57	0	38				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/m:n	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/19															
14:20:02	145.87	5.85	115.96	72.75	0	72.75	18.03	184.08	0	184.08	0	38			
14:30:02	151.77	6.02	117.43	73.55	0	73.55	18.83	184.57	0	184.57	0	38			
14:40:02	150.55	6.36	114.85	72.46	0	72.46	17.74	185.07	0	185.07	0	38			
14:50:02	144.65	6.8	111.9	71.73	0	71.73	17.01	185.57	0	185.57	0	38			
14:56:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.														
15:00:02	135.81	7.06	103.31	69.11	0	69.11	69.11	186.08	0	186.08	0	0			
15:01:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														
15:10:02	119.87	7.89	84.54	60.7	0	60.7	5.98	186.52	0	186.52	0	38			
15:20:02	129.92	7.74	98.16	68.9	0	68.9	14.18	186.96	0	186.96	0	38			
15:29:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.														
15:30:02	155.21	8.32	115.71	77.09	0	77.09	77.09	187.49	0	187.49	0	0			
15:35:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														
15:40:02	110.51	8.66	81.09	61.38	0	61.38	6.66	187.95	0	187.95	0	38			
15:50:02	132.87	8.26	99.14	71.46	0	71.46	16.74	188.38	0	188.38	0	38			
16:00:02	137.03	7.45	103.92	72.07	0	72.07	17.35	188.86	0	188.86	0	38			
16:10:02	149.32	7.12	109.33	74	0	74	19.28	189.37	0	189.37	0	38			
16:20:02	141.71	7.06	107.49	74.2	0	74.2	19.48	189.89	0	189.89	0	38			
16:30:02	139.98	7.16	109.33	75.52	0	75.52	20.8	190.4	0	190.4	0	38			
16:39:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE. START TO PULL OUT OF HOLE FOR BIT.														
16:40:02	164.05	7.27	124.05	82.97	0	82.97	82.97	190.96	0	190.96	0	0			
16:50:02	69.8	7.33	39.62	37.91	0	37.91	37.91	191.39	0	191.39	0	0			
17:00:02	47.98	7.42	20.61	19.37	0	19.37	19.37	191.58	0	191.58	0	0			
17:10:02	41.54	7.42	19.84	26.8	0	26.8	26.8	191.75	0	191.75	0	0			
17:20:02	44.48	7.84	20.57	26.08	0	26.08	26.08	191.92	0	191.92	0	0			
17:30:02	41.54	8.48	19.59	19.95	0	19.95	19.95	192.08	0	192.08	0	0			
17:40:02	38.59	9.04	19.35	18.96	0	18.96	18.96	192.25	0	192.25	0	0			
17:50:02	41.54	9.38	19.84	27.11	0	27.11	27.11	192.41	0	192.41	0	0			
18:00:02	41.54	9.52	19.35	27.48	0	27.48	27.48	192.58	0	192.58	0	0			
18:10:02	41.54	9.77	19.59	23.39	0	23.39	23.39	192.75	0	192.75	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/19															
18:20:02	42.73	10.11	20.92	25.95	0	25.95	25.95	192.92	0	192.92	0	0			
18:30:02	41.54	10.21	19.84	25.86	0	25.86	25.86	193.09	0	193.09	0	0			
18:40:02	38.59	10.01	19.59	24.34	0	24.34	24.34	193.26	0	193.26	0	0			
18:50:02	38.59	10.01	18.61	24.68	0	24.68	24.68	193.43	0	193.43	0	0			
19:00:02	36.84	10.25	18.22	26.28	0	26.28	26.28	193.6	0	193.6	0	0			
19:10:02	47.98	10.62	19.63	27.44	0	27.44	27.44	193.77	0	193.77	0	0			
19:20:02	41.54	11.04	19.84	24.69	0	24.69	24.69	193.96	0	193.96	0	0			
19:30:02	41.54	11.34	19.35	21.63	0	21.63	21.63	194.13	0	194.13	0	0			
19:40:02	41.54	11.78	20.57	23.21	0	23.21	23.21	194.31	0	194.31	0	0			
19:50:02	40.34	12.17	16.79	21.96	0	21.96	21.96	194.48	0	194.48	0	0			
20:00:02	39.79	12.56	20.92	24.52	0	24.52	24.52	194.65	0	194.65	0	0			
20:00:00	BIT AT SURFACE. OPEN HCR. CLOSE BLIND RAMS AND FLOW LINE. REMOVE BEARING ASSEMBLY FROM ROTATING HEAD.														
20:10:02	50.93	12.87	21.1	23.64	0	23.64	23.64	194.81	0	194.81	0	0			
20:20:02	41.54	13.22	19.59	24.82	0	24.82	24.82	194.98	0	194.98	0	0			
20:30:02	39.79	13.61	19.45	25.87	0	25.87	25.87	195.14	0	195.14	0	0			
20:40:02	35.65	13.98	19.1	26.42	0	26.42	26.42	195.31	0	195.31	0	0			
20:50:02	38.59	14.3	19.1	24.43	0	24.43	24.43	195.47	0	195.47	0	0			
21:00:02	41.54	14.63	19.59	26.4	0	26.4	26.4	195.64	0	195.64	0	0			
21:00:00	INSTALL BEARING ASSEMBLY IN ROTATING HEAD. OPEN BLIND RAMS. START BACK IN HOLE WITH BIT.														
21:10:02	44.48	14.91	22.05	23.08	0	23.08	23.08	195.79	0	195.79	0	0			
21:20:02	42.73	15.09	21.17	23.03	0	23.03	23.03	195.95	0	195.95	0	0			
21:30:02	36.84	15.16	18.47	20.97	0	20.97	20.97	196.11	0	196.11	0	0			
21:35:00	OPEN FLOW LINE. CLOSE HCR. CONTINUE TO RUN IN HOLE.														
21:40:02	39.79	11.02	20.19	22.45	0	22.45	22.45	196.26	0	196.26	0	0			
21:50:02	41.54	6	18.86	21.44	0	21.44	21.44	196.42	0	196.42	0	0			
22:00:02	38.59	5.02	17.87	21.03	0	21.03	21.03	196.56	0	196.56	0	0			
22:10:02	43.29	4.46	20.23	22.61	0	22.61	22.61	196.71	0	196.71	0	0			
22:20:02	39.79	4.03	19.45	22.32	0	22.32	22.32	196.87	0	196.87	0	0			
22:30:02	38.59	3.7	19.35	22.27	0	22.27	22.27	197.03	0	197.03	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/19															
22:40:02	38.59	3.57	19.1	22.03	0	22.03	22.03	197.18	0	197.18	0	0			
22:50:02	38.59	3.39	18.86	22.01	0	22.01	22.01	197.34	0	197.34	0	0			
23:00:02	41.54	3.02	20.33	23.1	0	23.1	23.1	197.49	0	197.49	0	0			
23:10:02	41.54	2.73	20.57	23.13	0	23.13	23.13	197.65	0	197.65	0	0			
23:20:02	41.54	2.66	20.33	23.3	0	23.3	23.3	197.82	0	197.82	0	0			
23:30:02	41.54	2.57	20.33	23.3	0	23.3	23.3	197.98	0	197.98	0	0			
23:35:00	SHUT IN HYDRIL.														
23:40:02	20.91	2.7	1.67	0	0	0	0	198.1	0	198.1	0	0			
23:50:02	15.02	5.36	-0.05	0	0	0	0	198.1	0	198.1	0	0			
23:55:00	OPEN HYDRIL.														
99/12/20															
0:00:02	44.48	2.36	23.27	25.31	0	25.31	25.31	198.45	0	198.45	0	0			
0:10:02	41.54	2.45	20.08	23.03	0	23.03	23.03	198.61	0	198.61	0	0			
0:20:02	41.54	2.42	20.08	23	0	23	23	198.77	0	198.77	0	0			
0:30:02	35.65	2.18	18.61	21.79	0	21.79	21.79	198.93	0	198.93	0	0			
0:40:02	41.54	2.14	19.59	22.3	0	22.3	22.3	199.08	0	199.08	0	0			
0:40:00	ON BOTTOM. RUN IN SURVEY TOOL.														
0:50:02	44.48	2.63	20.33	22.68	0	22.68	22.68	199.24	0	199.24	0	0			
1:00:02	41.54	3.41	20.08	22.54	0	22.54	22.54	199.4	0	199.4	0	0			
1:10:02	41.54	3.96	20.08	22.44	0	22.44	22.44	199.55	0	199.55	0	0			
1:10:00	SURVEY COMPLETE. PICK UP KELLY AND PREPARE TO CIRCULATE.														
1:18:00	START PUMPING NITROGEN AT 40.5 m3/min.														
1:20:02	41.54	4.34	20.08	22.43	0	22.43	-35.89	199.71	0	199.71	0	40.5			
1:30:02	147.6	4.25	103.56	67.43	0	67.43	9.11	199.98	0	199.98	0	40.5			
1:40:02	171.17	4.44	133.76	74.62	0	74.62	16.3	200.5	0	200.5	0	40.5			
1:41:00	RESUME DRILLING.														
1:50:02	180.01	5.46	139.4	78.61	0	78.61	20.29	201.03	0	201.03	0	40.5			
2:00:02	171.17	6.38	134.98	78.95	0	78.95	20.63	201.58	0	201.58	0	40.5			
2:10:02	165.28	7.06	132.28	76.7	0	76.7	18.38	202.12	0	202.12	0	40.5			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.

Customer Rep: WILBERT CALIHOO / GERRY SANDERS

Well Name: PARA et al FT LIARD

Well Location: I-46

Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/20															
2:20:02	171.17	7.64	136.46	77.43	0	77.43	19.11	202.66	0	202.66	0	40.5			
2:30:02	181.72	8.02	143.2	76.64	0	76.64	18.32	203.19	0	203.19	0	40.5			
2:34:00	DROP 1675 m SAMPLE.														
2:40:02	181.23	8.21	151.07	76.95	0	76.95	18.63	203.72	0	203.72	0	40.5			
2:50:02	194.74	8.25	161.74	74.07	0	74.07	15.75	204.25	0	204.25	0	40.5			
3:00:02	198.17	8.2	156.57	75.31	0	75.31	16.99	204.77	0	204.77	0	40.5			
3:10:02	224.2	8.22	189.24	75.23	0	75.23	16.91	205.29	0	205.29	0	40.5			
3:20:02	222.96	8.28	187.14	73.7	0	73.7	15.38	205.81	0	205.81	0	40.5			
3:30:02	203.58	8.29	168.13	84.94	0	84.94	26.62	206.34	0	206.34	0	40.5			
3:40:02	196.45	8.3	156.94	74.68	0	74.68	16.36	206.87	0	206.87	0	40.5			
3:50:02	169.45	8.38	136.34	74.33	0	74.33	16.01	207.4	0	207.4	0	40.5			
4:00:02	181.72	8.55	147.37	75.65	0	75.65	17.33	207.92	0	207.92	0	40.5			
4:01:00	STOP PUMPING NITROGEN.														
4:03:00	START PUMPING NITROGEN.														
4:05:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
4:09:00	START PUMPING NITROGEN.														
4:10:02	83.99	8.68	60.21	40.05	0	40.05	-18.27	208.37	0	208.37	0	40.5			
4:20:02	141.71	9.14	107.49	70.96	0	70.96	12.64	208.76	0	208.76	0	40.5			
4:30:02	147.6	8.9	112.4	73.97	0	73.97	15.65	209.27	0	209.27	0	40.5			
4:40:02	150.55	8.68	114.85	74.33	0	74.33	16.01	209.78	0	209.78	0	40.5			
4:45:00	DROP 1680 m SAMPLE.														
4:50:02	153.49	8.62	119.02	73.92	0	73.92	15.6	210.3	0	210.3	0	40.5			
5:00:02	162.33	8.57	129.09	72.89	0	72.89	14.57	210.81	0	210.81	0	40.5			
5:05:00	GETTING LITTLE RETURNS.														
5:10:02	46.23	8.84	25.13	12.18	0	12.18	-46.14	211.17	0	211.17	0	40.5			
5:15:00	STOP PUMPING NITROGEN. WORK PIPE.														
5:20:02	36.84	9.1	21.66	17.6	0	17.6	17.6	211.2	0	211.2	0	0			
5:30:02	80.37	9.5	56.44	0	0	0	0	211.26	0	211.26	0	0			
5:37:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/20															
5:40:02	82.78	16.16	49.54	30.88	0	30.88	-27.44	211.46	0	211.46	0	40.5			
5:43:00	STOP PUMPING NITROGEN. STAND PIPE PRESSURE BUILDING UP.														
5:47:00	START PUMPING NITROGEN.														
5:47:00	FLUID TO SURFACE.														
5:49:00	STOP PUMPING NITROGEN.														
5:50:02	162.33	17.65	113.38	21.4	0	21.4	21.4	211.53	0	211.53	0	0			
5:52:00	START PUMPING NITROGEN.														
6:00:02	253.66	23.23	106.26	51.61	0	51.61	-6.71	211.72	0	211.72	0	40.5	21	13	21
6:10:02	235.98	28.29	133.76	110.7	0	110.7	52.38	212.64	0	212.64	0	40.5			
6:20:02	87.47	27.23	35.2	46.81	0	46.81	-11.51	213.14	0	213.14	0	40.5			
6:30:02	200.63	29.04	105.03	96.01	0	96.01	37.69	213.63	0	213.63	0	40.5			
6:40:02	116.4	29.08	61.69	67.11	0	67.11	8.79	214.19	0	214.19	0	40.5			
6:50:02	141.71	29.81	80.48	78.87	0	78.87	20.55	214.67	0	214.67	0	40.5			
7:00:02	122.3	29.8	66.6	70.33	0	70.33	12.01	215.22	0	215.22	0	40.5	38.562	17.562	38.562
7:10:02	94.57	29.78	32.85	44.2	0	44.2	-14.12	215.62	0	215.62	0	40.5			
7:15:00	STOP PUMPING NITROGEN. BLEED DOWN STAND PIPE.														
7:20:00	CLOSE HYDRIL. OPEN HCR. CHANGE OUT BEARING ASSEMBLY IN ROTATING HEAD.														
7:20:02	129.92	33.15	58.14	61.8	0	61.8	61.8	216.05	0	216.05	0	0			
7:28:00	OPEN HYDRIL. CLOSE HCR. START PUMPING NITROGEN.														
7:30:02	29.75	32.3	8.54	3.47	0	3.47	-54.85	216.37	0	216.37	0	40.5			
7:40:02	23.86	30.46	5.11	0	0	0	-58.32	216.30	0	216.39	0	40.5			
7:50:02	35.65	30.5	7.32	7.74	0	7.74	-50.58	216.53	0	216.53	0	40.5			
8:00:02	390.46	35.91	274.59	181.54	0	181.54	123.22	216.89	0	216.89	0	40.5	54.13	15.568	54.13
8:10:02	148.82	34.75	95.82	88.22	0	88.22	29.9	217.74	0	217.74	0	40.5			
8:20:02	101.67	33.74	53.61	61.22	0	61.22	2.9	218.25	0	218.25	0	40.5			
8:30:02	125.76	33.96	71.28	73.21	0	73.21	14.89	218.7	0	218.7	0	40.5			
8:40:02	197.68	34.56	66.24	71.47	0	71.47	13.15	219.19	0	219.19	0	40.5			
8:40:02	DROP 1685m SAMPLE.														
8:50:02	141.71	34.62	74.34	75.46	0	75.46	17.14	219.72	0	219.72	0	40.5			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/20																
9:00:02	129.92	34.54	75.57	75.56	0	75.56	17.24	220.25	0	220.25	0	40.5	90.863	36.733	90.863	
9:10:02	164.05	35.75	80.36	78.85	0	78.85	20.53	220.7	0	220.7	0	40.5				
9:16:00	STOP PUMPING NITROGEN. BLOW DOWN FLOW LINE WITH NITROGEN.															
9:20:02	131.65	36.03	68.09	70.94	0	70.94	70.94	221.31	0	221.31	0	0				
9:24:00	CLOSE PIPE RAMS. OPEN HCR.															
9:30:02	20.91	33.33	2.65	0	0	0	0	221.53	0	221.53	0	0				
9:39:00	START PUMPING NITROGEN.															
9:40:02	26.81	29.84	5.6	13.17	0	13.17	-45.15	221.63	0	221.63	0	40.5				
9:50:02	82.11	33	16.83	27.68	0	27.68	-30.64	221.74	0	221.74	0	40.5				
9:57:00	FLUID INCREASE THIS HOUR DUE TO BLOWING OUT FLOWLINE AND RIG LINES.															
10:00:02	355.1	38.11	240.95	170.08	0	170.08	111.76	222.2	0	222.2	0	40.5	94.331	3.468	94.331	
10:02:00	BLEED DOWN STANDPIPE.															
10:10:02	20.91	36.29	3.63	0	0	0	0	222.8	0	222.8	0	0				
10:20:02	27.37	34.73	0	8.76	0	8.76	8.76	222.8	0	222.8	0	0				
10:23:00	START PUMPING INVERT. MAINTAIN 1000 kPa BACK PRESSURE ON ANNULUS AT RIG MANIFOLD.															
10:30:02	1000	33.19	3.98	7.93	0	7.93	7.93	222.87	0	222.87	0.76	0				
10:40:02	1000	31.59	4.86	0	0	0	0	222.93	0	222.93	0.76	0				
10:50:02	1000	29.05	13.21	24.17	0	24.17	24.17	223.02	0	223.02	0.76	0				
11:00:02	1000	28.03	10.55	20.25	0	20.25	20.25	223.17	0	223.17	0.76	0	107.207	12.876	107.207	
11:10:02	1000	27.61	8.54	1.93	0	1.93	1.93	223.27	0	223.27	0.76	0				
11:20:02	1000	27.06	9.77	3.49	0	3.49	3.49	223.35	0	223.35	0.76	0				
11:30:02	1000	26.5	10.75	12.76	0	12.76	12.76	223.41	0	223.41	0.76	0				
11:40:02	1000	26.07	-0.54	0	0	0	0	223.45	0	223.45	0.76	0				
11:50:02	1000	25.33	-1.42	8.26	0	8.26	0	223.51	0	223.51	0.76	0				
12:00:02	1000	24.53	-1.03	6.42	0	6.42	0	223.55	0	223.55	0.76	0	115.062	7.855	115.062	
12:01:00	STOP PUMPING INVERT. SHUT IN AT RIG MANIFOLD. FLOW CHECK.															
12:10:02	1000	23.92	0.2	3.88	0	3.88	0	223.63	0	223.63	0	0				
12:20:02	1000	23.71	-1.03	6.41	0	6.41	0	223.72	0	223.72	0	0				
12:30:02	1500	22.98	-1.18	0	0	0	0	223.76	0	223.76	0	0				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/20															
12:40:02	2100	22.29	2.26	10.24	0	10.24	0	223.82	0	223.82	0	0			
12:50:02	3000	21.8	-1.03	0	0	0	0	223.85	0	223.85	0	0			
13:00:02	3300	21.06	-0.79	0	0	0	0	223.88	0	223.88	0	0	117.136	2.074	117.136
13:10:02	3400	19.87	2.65	0	0	0	0	223.92	0	223.92	0	0			
13:20:02	3510	17.01	-0.39	2.44	0	2.44	0	223.95	0	223.95	0	0			
13:30:02	3650	17.27	-0.79	0	0	0	0	223.99	0	223.99	0	0			
13:40:02	3800	17.25	-0.15	11.94	0	11.94	0	224.03	0	224.03	0	0			
13:50:02	3900	17.03	-0.79	0	0	0	0	224.08	0	224.08	0	0			
14:00:02	4000	16.72	-0.79	13.91	0	13.91	0	224.13	0	224.13	0	0	117.43	0.294	117.43
14:10:02	4100	16.36	-0.44	4.13	0	4.13	0	224.18	0	224.18	0	0			
14:20:02	4200	16.02	2.75	0	0	0	0	224.27	0	224.27	0	0			
14:27:00	BLEED DOWN ANNULUS TO 3000 kPa.														
14:30:02	3000	15.45	-0.05	0	0	0	0	224.27	0	224.27	0	0			
14:40:02	3000	15.1	0.69	0	0	0	0	224.33	0	224.33	0	0			
14:50:02	3000	15.1	-0.05	0	0	0	0	224.33	0	224.33	0	0			
15:00:02	3000	15.3	-0.05	0	0	0	0	224.33	0	224.33	0	0	117.43	0	117.43
15:10:02	3000	15.63	57.91	0	0	0	0	224.33	0	224.33	0	0			
15:18:00	START PUMPING WATER TO FILL HOLE.														
15:20:02	1000	15.76	74.47	39.09	0	39.09	0	224.38	0	224.38	0.76	0			
15:30:02	1000	16.04	29.41	0	0	0	0	224.45	0	224.45	0.76	0			
15:40:02	1000	16.13	26.85	0	0	0	0	224.45	0	224.45	0.76	0			
15:50:02	1000	16.2	225.97	70.44	0	70.44	0	224.52	0	224.52	0.76	0			
16:00:02	1000	17.15	87.72	30.55	0	30.55	0	224.74	0	224.74	0.76	0	110.421	-7.009	110.421
16:10:02	1000	18.72	363.31	68.71	0	68.71	0	224.88	0	224.88	0.76	0			
16:20:02	1000	19.18	217.33	0	0	0	0	225.11	0	225.11	0.76	0			
16:25:00	STOP PUMPING FLUID. HOLE IS FULL. 13.0 m3 PRODUCED WATER USED TO FILL HOLE.														
16:30:02	0	19.16	151.81	0	0	0	0	225.15	0	225.15	0	0			
16:40:02	0	19.52	131.55	20.88	0	20.88	0	225.25	0	225.25	0	0			
16:50:02	0	20.04	121.48	16.36	0	16.36	0	225.38	0	225.38	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/20															
17:00:02	0	20.34	147.5	0	0	0	0	225.47	0	225.47	0	0	104.43	-5.991	104.43
17:10:02	0	20.75	138.78	0	0	0	0	225.47	0	225.47	0	0			
17:20:02	0	21.13	126.64	0	0	0	0	225.47	0	225.47	0	0			
17:30:02	0	21.27	114.85	0	0	0	0	225.49	0	225.49	0	0			
17:40:02	0	21.34	102.94	0	0	0	0	225.5	0	225.5	0	0			
17:50:02	0	21.33	91.28	0	0	0	0	225.51	0	225.51	0	0			
18:00:02	0	21.28	79.74	18.51	0	18.51	0	225.53	0	225.53	0	0	104.43	0	104.43
18:10:02	0	21.3	68.45	0	0	0	0	225.56	0	225.56	0	0			
18:20:02	0	21.14	55.93	19.01	0	19.01	0	225.67	0	225.67	0	0			
18:25:00	START PUMPING INVERT TO DISPLACE HOLE.														
18:30:02	1000	20.64	51.15	0	0	0	0	225.72	0	225.72	0.76	0			
18:38:00	STOP PUMPING INVERT. REPAIR RIG PUMP.														
18:40:02	1000	20.13	53.96	0	0	0	0	225.72	0	225.72	0	0			
18:45:00	RIG PUMP REPAIRED. START PUMPING INVERT.														
18:50:02	1000	19.71	50.64	0	0	0	0	225.73	0	225.73	0.76	0			
19:00:02	1000	19.32	53.23	0	0	0	0	225.73	0	225.73	0.76	0	107.968	3.538	107.968
19:10:02	1000	18.96	39.72	17.02	0	17.02	0	225.75	0	225.75	0.76	0			
19:20:02	1000	18.64	60.84	0	0	0	0	225.75	0	225.75	0.76	0			
19:30:02	1000	18.36	57.29	0	0	0	0	225.75	0	225.75	0.76	0			
19:40:02	1000	18.02	52.25	0	0	0	0	225.75	0	225.75	0.76	0			
19:41:00	INVERT AT SURFACE. STOP PUMPING INVERT. SHUT IN AT RIG MANIFOLD FOR FLOW CHECK.														
19:50:02	0	17.6	43.9	0	0	0	0	225.76	0	225.76	0	0			
20:00:02	0	17.14	43.79	0	0	0	0	225.76	0	225.76	0	0	133.966	25.998	133.966
20:05:00	OPEN ANNULUS TO SHAKER. RIG OUT FLOWLINE.														
20:10:02	0	16.71	43.16	0	0	0	0	225.76	0	225.76	0	0			
20:15:00	CIRCULATE OVER SHAKER.														
20:20:02	0	16.35	43.54	0	0	0	0	225.76	0	225.76	0	0			
20:30:02	0	16.04	43.16	0	0	0	0	225.76	0	225.76	0	0			
20:40:02	0	15.72	43.3	0	0	0	0	225.76	0	225.76	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/20																
20:50:02	0	15.48	42.92	0	0	0	0	225.76	0	225.76	0	0				
21:00:02	0	15.29	42.92	0	0	0	0	225.76	0	225.76	0	0	133.966	0	133.966	
22:45:00	START OUT OF HOLE WITH DRILL STRING.															
23:00:00	END OF DRILL AHEAD REPORT.															

OVERSIZED

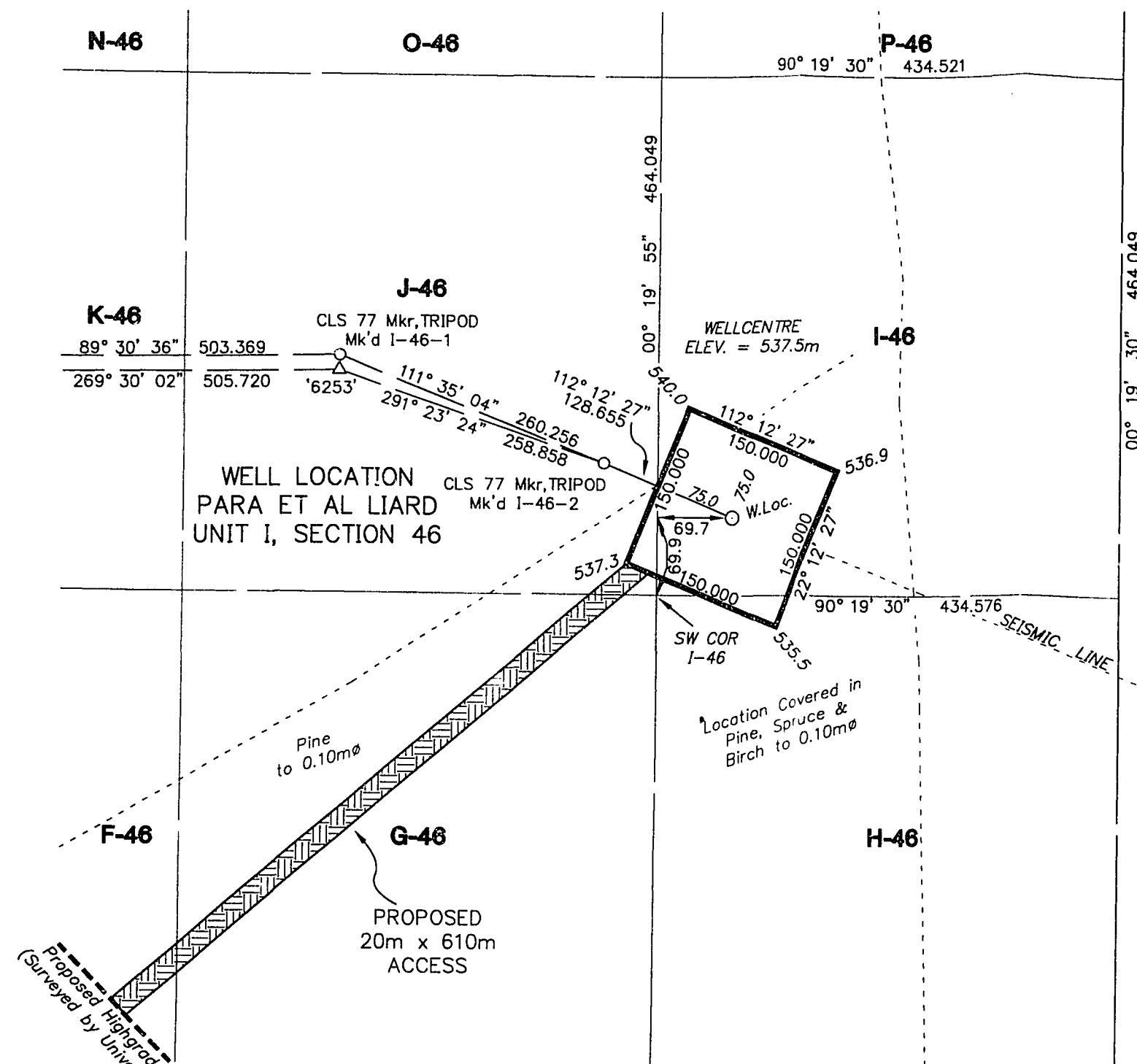
DOCUMENT

FILMED

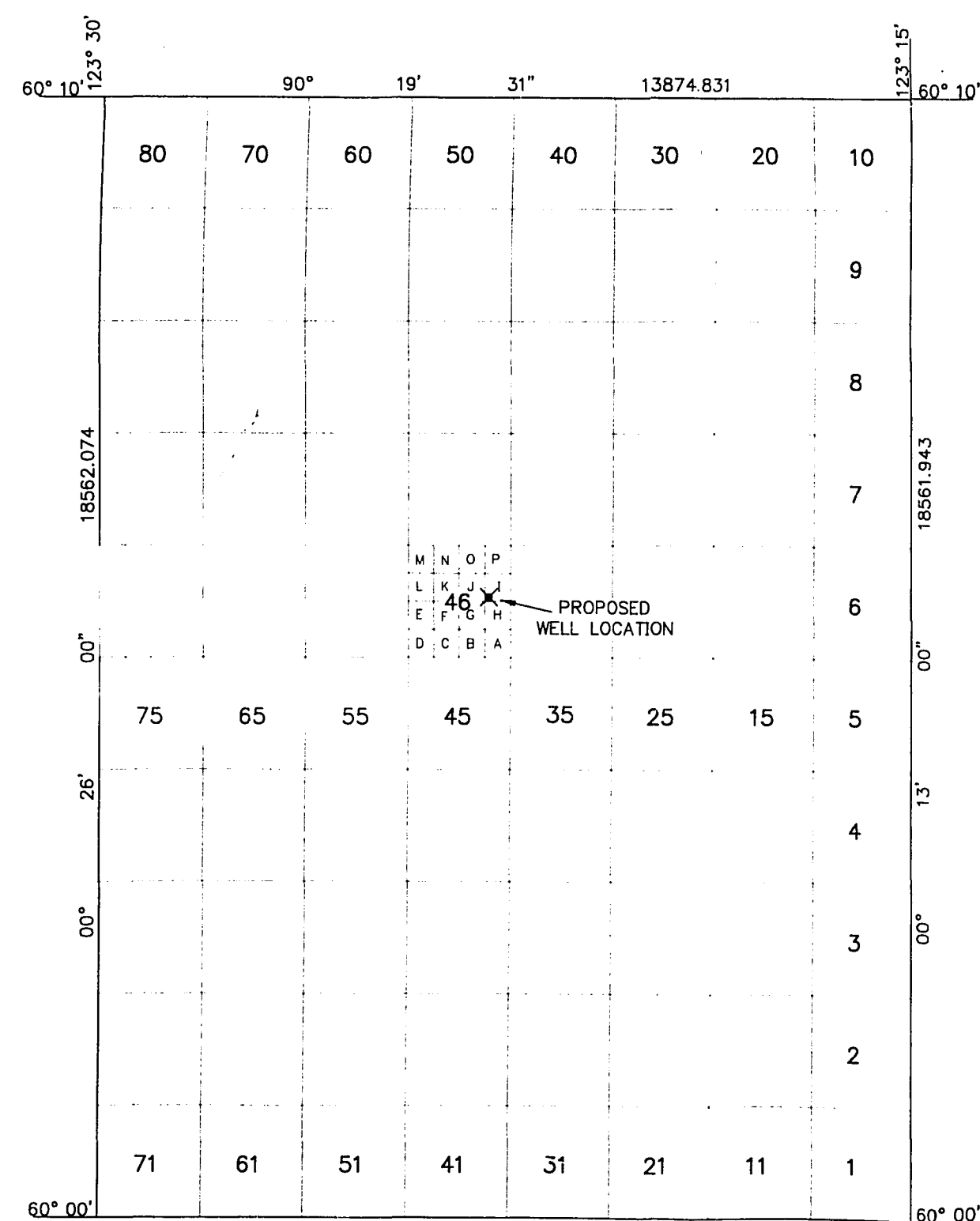
ON

35mm

GAS ANALYSIS



DETAIL 'A'
UNIT I, SECTION 46
SCALE 1:5,000

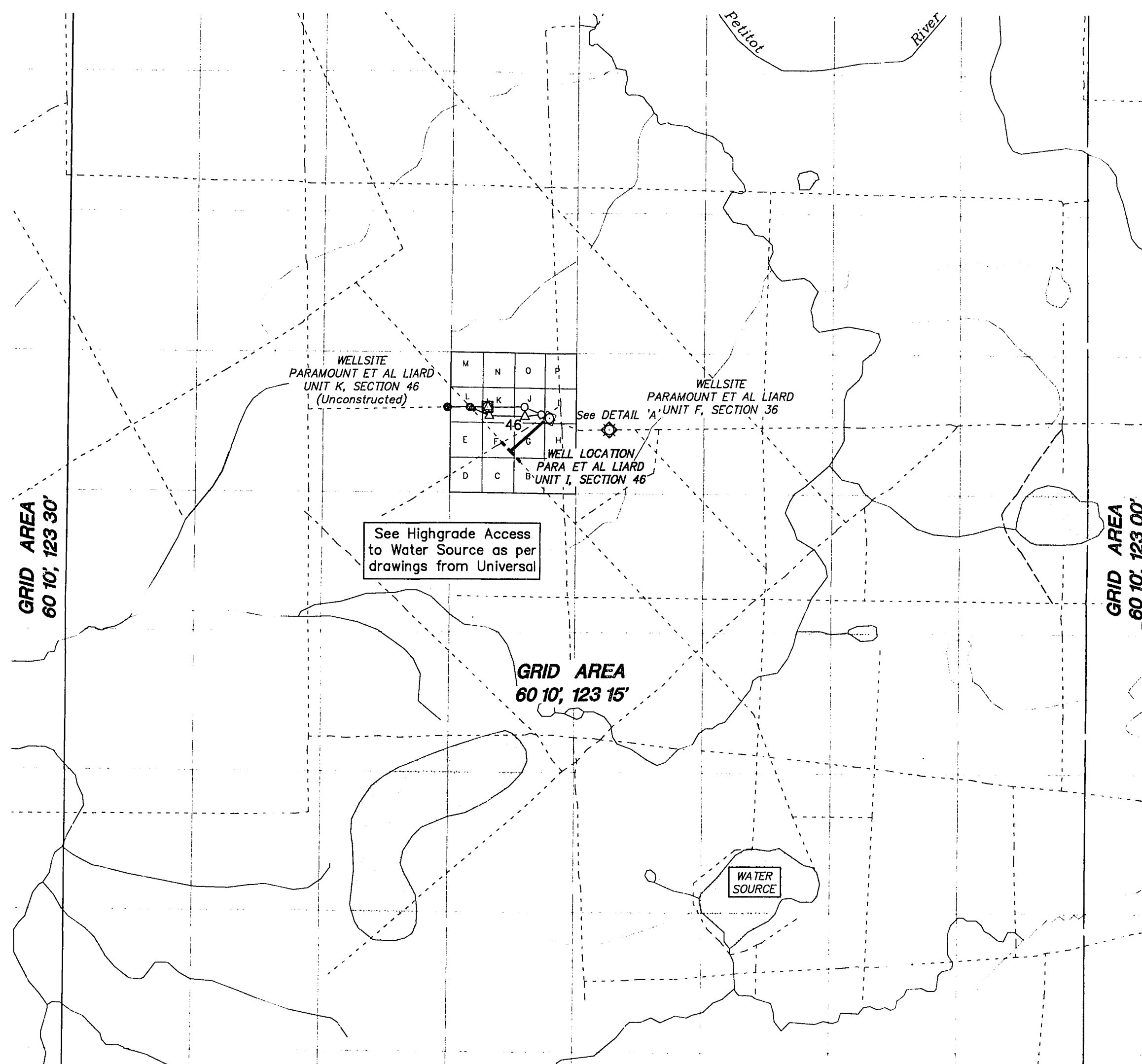
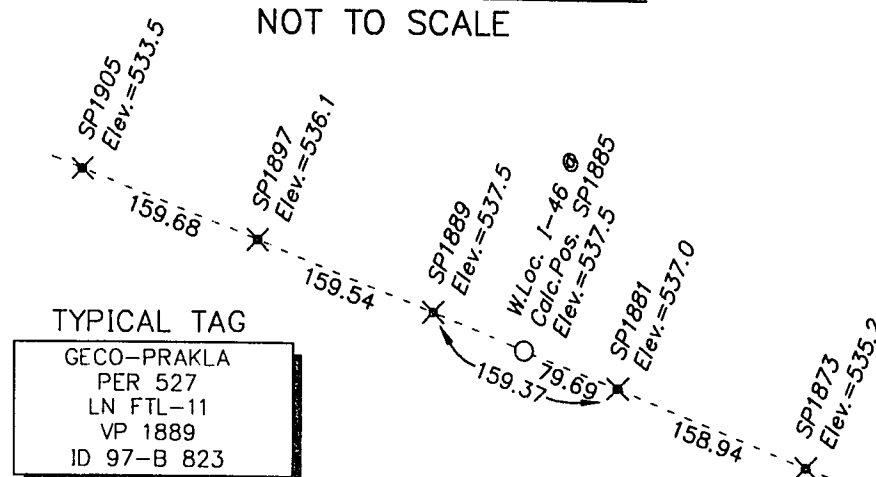


GRID AREA 60°10' 123°15'
SCALE 1:100,000

AREAS REQUIRED:

WELLSITE: 150mx150m = 2.25 ha.
ACCESS: 20mx610m = 1.22 ha.
CAMPSITE: 40mx60m = 0.24 ha.
TOTAL: 3.71 ha.

SHOT POINT DETAIL NOT TO SCALE



See Highgrade Access
to Water Source as per
drawings from Universal

GRID AREA
60°10' 123°15'

LEGEND

UTM coordinates are computed for Zone 10, central meridian 123° W. Bearings were derived from the bearing 89° 31' 25" computed between Fd. CLS 77 Wellsite Control Monuments L-46-1 Grid Area 60° 10', 123° 15' and L-46-2 Grid Area 60° 10', 123° 15' and are referred to the Meridian 123° W. Distances are expressed in metres and decimals thereof. Distances shown in traverse are measured distances reduced to the horizontal at general ground level. For the computation of coordinates measured distances have been reduced to the UTM plane by multiplying them by an average combined scale factor of 0.9995214. Coordinates were then adjusted to fit the control. Distances shown on grid area subdivisions are UTM plane. Authorized control monuments found • Monuments placed O Mr. denotes metal marker post 2.0m long placed 0.30m N. Elevations were derived from Geodetic of Canada Monument 'Petitot' Elev. = 218.241m Survey was completed prior to drilling; therefore well as drilled may not necessarily agree with proposed location.

I, R.O. Blackall, of the City of Fort St. John, British Columbia, Canada Lands Surveyor, make oath and say that I have in my own proper person, according to 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 knowledge and belief.
SO HELP ME GOD

Sworn before me at Fort St. John, this 06th day of July, 1999.
R.O. Blackall, CLS

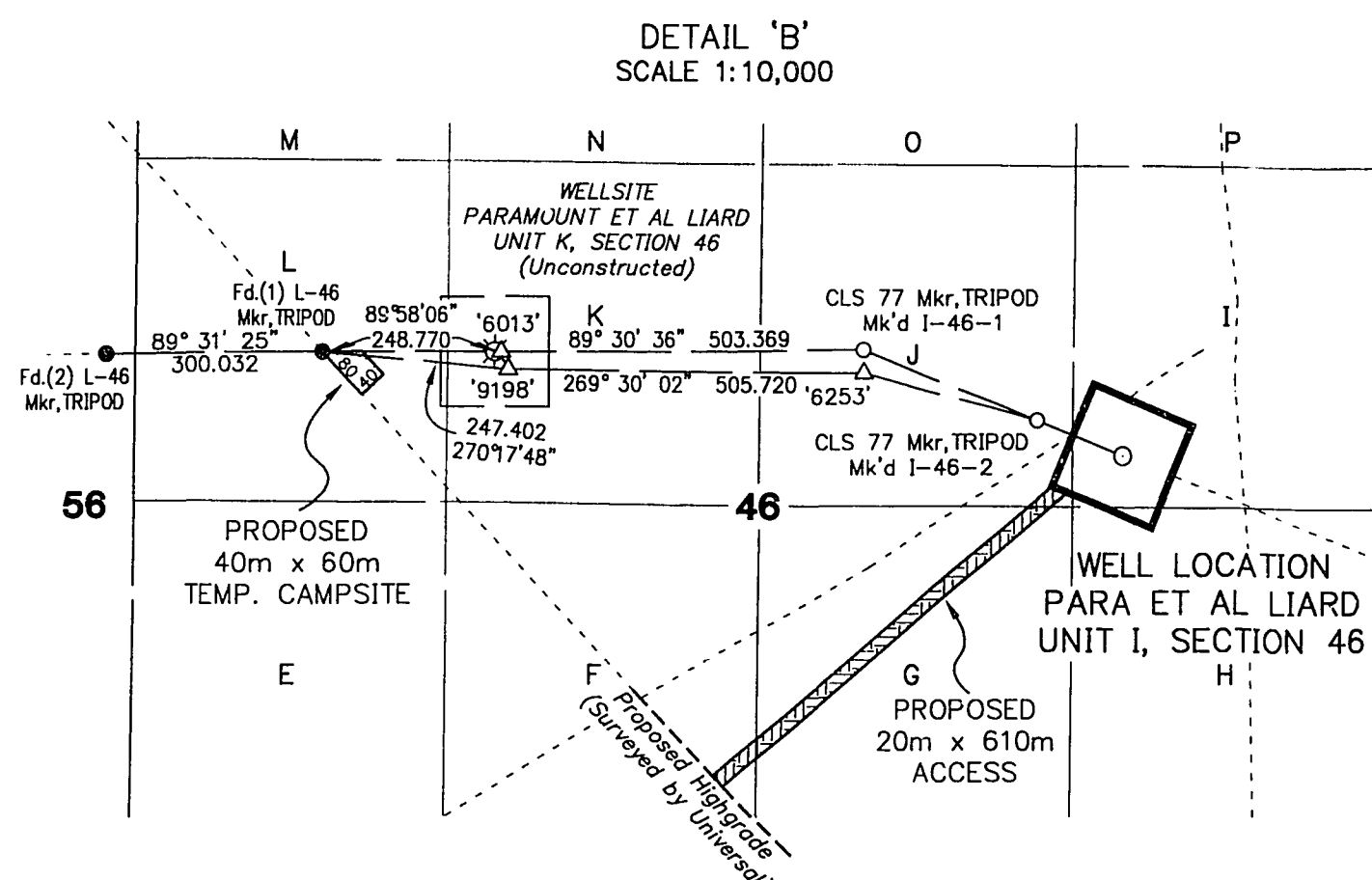
Caution M. Lat

THIS SURVEY WAS EXECUTED DURING THE PERIOD
JUNE 22nd TO JUNE 23rd, 1999. BY R.O. BLACKALL, CLS

PARAMOUNT RESOURCES LIMITED

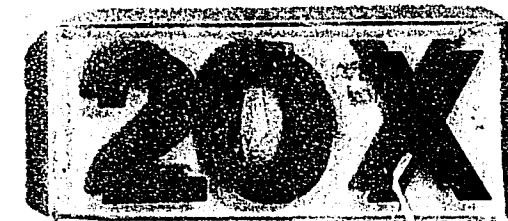
All coordinates shown are on 1927 North American Datum. They are based on values for Found Wellsite Monuments Fd.CLS(1) L-46 Grid Area 60° 10', 123° 15' and Fd.CLS(2) L-46 Grid Area 60° 10', 123° 15'.

GEOGRAPHIC AND UTM COORDINATES, (1927 NAD)				
Station	Latitude	Longitude(W)	Northings	Eastings
CONTROL MONUMENTS				
L-46-1	60°05'36.782"	123°24'05.680"	6661691.266	477663.419
L-46-2	60°05'36.642"	123°24'25.087"	6661688.773	477363.541
GRID AREA				
NE	60°10' 00"	123° 15' 00"	6669792.783	486125.259
NW	60°10' 00"	123° 30' 00"	6669871.559	472250.651
SE	60°00' 00"	123° 15' 00"	6651230.973	486055.060
SW	60°00' 00"	123° 30' 00"	6651310.016	472110.252
L-46, NE	60°05'45.214"	123°22'29.999"	6661943.459	479143.204
L-46, NW	60°05'45.214"	123°22'58.124"	6661945.924	478708.690
L-46, SW	60°05'30.214"	123°22'58.124"	6661481.882	478706.002
L-46, SE	60°05'30.214"	123°22'29.999"	6661479.417	479140.571
TRAVERSE STATIONS				
TH '6013'	60°05'36.835"	123°23'49.587"	6661691.405	477912.070
L-46-1	60°05'37.070"	123°23'17.027"	6661695.711	478415.180
L-46-2	60°05'34.023"	123°23'01.336"	6661600.018	478657.070
TH '6253'	60°05'37.028"	123°23'16.963"	6661694.384	478416.158
TH '9198'	60°05'36.788"	123°23'49.675"	6661689.983	477910.699
PROPOSED WELL				
L-46	60°05'32.474"	123°22'53.612"	6661551.415	478776.125



DETAIL 'B'
SCALE 1:10,000

REV.No.	DESCRIPTION	DATE
1	McELHANNEY LAND SURVEYS LTD. 10014 - 97th Ave., Suite 202 Fort St. John, British Columbia Phone: (250)787-0356, Fax: (250)787-0310	
DATE: 99/07/02 JOB No.: 3111-07261WS RT BRG		





Container Identification		Laboratory Number											
AGAT 18442		GF46887A											
Operator Name													
PARAMOUNT RESOURCES LTD.													
Unique Well Identifier	Well Name		Elevation										
Not Available	PARAMOUNT et al LIARD I-46		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; padding: 2px;">KB m</td> <td style="width:50%; padding: 2px;">GRD m</td> </tr> <tr> <td style="height: 20px;"></td> <td style="height: 20px;"></td> </tr> </table>	KB m	GRD m								
KB m	GRD m												
Field or Area	Pool or Zone	Sampler's Company											
LIARD	MATTSON	ATLAS WIRELINE SERVICES											
Test Type	Test No.	Test Recovery	Name of Sampler										
Test Interval or Perfs		Sampling Point	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:15%;">Separator</th> <th style="width:15%;">Reservoir</th> <th style="width:15%;">Source</th> <th style="width:15%;">Sampled</th> <th style="width:15%;">Received</th> </tr> <tr> <td style="height: 20px;"></td> <td style="height: 20px;"></td> <td style="height: 20px;"></td> <td style="height: 20px;"></td> <td style="height: 20px;"></td> </tr> </table>	Separator	Reservoir	Source	Sampled	Received					
Separator	Reservoir	Source	Sampled	Received									
1890.00 mKB		RFT TOOL	Pressure (kPa) 69 69 1 Temperature (°C) 21										
Date Sampled	Date Received	Date Reported	Analyst										
Jan 09, 2000	Jan 12, 2000	Jan 18, 2000	LQ										
Other Information													
TEST #6 VST #2 OF 4 NON-REP SAMPLE DUE TO EXCESSIVE AIR CONTAMINATION													

JAN 31 2000





Container Identification
AGAT 19021

Laboratory Number
GF46887B

Operator Name
PARAMOUNT RESOURCES LTD.

Unique Well Identifier	Well Name	Elevation
Not Available	PARAMOUNT et al LIARD I-46	KB m GRD m

Field or Area	Pool or Zone	Sampler's Company
LIARD	MATTSON	ATLAS WIRELINE SERVICES

Test Type	Test No.	Test Recovery	Name of Sampler

Test Interval or Perfs	Sampling Point	Separator	Reservoir	Source	Sampled	Received
1683.00 mKB	RFT TOOL			1034	1034	800
		Pressure (kPa)				
		Temperature (°C)				21

Date Sampled	Date Received	Date Reported	Analyst
Jan 10, 2000	Jan 12, 2000	Jan 18, 2000	LQ

Other Information
TEST #15 VST #3 OF 4

COMP	MOLE FRACTION		PETROLEUM LIQUID mL · m ³
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	
H ₂	TRACE	TRACE	
He	TRACE	TRACE	
N ₂	0.0476	0.0477	
CO ₂	0.0014	0.0000	
H ₂ S	0.0000	0.0000	
C ₁	0.9473	0.9486	
C ₂	0.0035	0.0035	
C ₃	0.0002	0.0002	0.7
IC ₄	0.0000	0.0000	0.0
NC ₄	0.0000	0.0000	0.0
IC ₅	0.0000	0.0000	0.0
NC ₅	0.0000	0.0000	0.0
C ₆	0.0000	0.0000	0.0
C ₇₊	0.0000	0.0000	0.0
Total	1.0000	1.0000	0.7

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free
36.04	36.09

RELATIVE DENSITY (CALCULATED)

Moisture Free	Moisture & Acid Gas Free
0.577	0.575

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4551	188.1	4547	187.9

RELATIVE MOLECULAR MASS

Total Gas	C ₇₊
16.7	0.0

VAPOUR PRESSURE (Pentanes +)

0.00 kPa

H₂S g/m³

0.00





Container Identification AGAT 19186		Laboratory Number GF46887C																
Operator Name PARAMOUNT RESOURCES LTD.																		
Unique Well Identifier Not Available	Well Name PARAMOUNT et al LIARD I-46		Elevation KB m GRD m															
Field or Area LIARD	Pool or Zone MATTSON	Sampler's Company ATLAS WIRELINE SERVICES																
Test Type	Test No.	Test Recovery	Name of Sampler															
Test Interval or Perfs 1788.50 mKB		Sampling Point RFT TOOL	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Separator</th> <th>Reservoir</th> <th>Source</th> <th>Sampled</th> <th>Received</th> </tr> <tr> <td></td> <td></td> <td>1276</td> <td>1276</td> <td>1100</td> </tr> <tr> <td colspan="3"></td> <td></td> <td>21</td> </tr> </table>	Separator	Reservoir	Source	Sampled	Received			1276	1276	1100					21
Separator	Reservoir	Source	Sampled	Received														
		1276	1276	1100														
				21														
Date Sampled Jan 10, 2000	Date Received Jan 12, 2000	Date Reported Jan 18, 2000	Analyst LQ															
Other Information TEST #13 VST #4 OF 4																		

COMP	MOLE FRACTION		PETROLEUM LIQUID mL • m ³
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	
H2	0.0001	0.0001	
He	0.0002	0.0002	
N2	0.0088	0.0088	
CO2	0.0035	0.0000	
H2S	0.0000	0.0000	
C1	0.9807	0.9842	
C2	0.0061	0.0061	
C3	0.0006	0.0006	2.2
IC4	TRACE	TRACE	TRACE
NC4	TRACE	TRACE	TRACE
IC5	0.0000	0.0000	0.0
NC5	0.0000	0.0000	0.0
C6	0.0000	0.0000	0.0
C7+	0.0000	0.0000	0.0
Total	1.0000	1.0000	2.2

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free
37.51	37.65

RELATIVE DENSITY (CALCULATED)

Moisture Free	Moisture & Acid Gas Free
0.564	0.561

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4603	191.1	4594	190.7

RELATIVE MOLECULAR MASS

Total Gas	C7+
16.3	0.0

VAPOUR PRESSURE (Pentanes +)

0.00 kPa

H₂S g/m³

0.00



AGAT[®]

Laboratories



N.E.B. COPY

Paul Price

REVISED

Replace old

GAS ANALYSIS

Container Identification AGAT 11409		Laboratory Number GG45959A																
Operator Name PARAMOUNT RESOURCES LTD.																		
Unique Well Identifier 60deg10'123deg15'	Well Name PARAMOUNT et al FT. LIARD I 46		Elevation KB m 542.20 GRD m 537.20															
Field or Area FORT LIARD	Pool or Zone FANTASQUE	Sampler's Company BAKER																
Test Type DST	Test No. 1	Test Recovery	Name of Sampler															
Test Interval or Perfs 1365.00-1392.00 mKB		Sampling Point MAIN FLOW	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>Separator</td> <td>Reservoir</td> <td>Source</td> <td>Sampled</td> <td>Received</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>50</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>21</td> </tr> </table>	Separator	Reservoir	Source	Sampled	Received					50					21
Separator	Reservoir	Source	Sampled	Received														
				50														
				21														
Date Sampled Dec 07, 1999	Date Received Dec 14, 1999	Date Reported Dec 30, 1999	Analyst PL															
Other Information																		

COMP	MOLE FRACTION		PETROLEUM LIQUID mL • m ³
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	
H ₂	TRACE	TRACE	
He	0.0001	0.0001	
N ₂	0.0207	0.0207	
CO ₂	0.0002	0.0000	
H ₂ S	0.0000	0.0000	
C ₁	0.9623	0.9625	
C ₂	0.0120	0.0120	
C ₃	0.0019	0.0019	7.0
IC ₄	0.0003	0.0003	1.3
NC ₄	0.0004	0.0004	1.7
IC ₅	0.0002	0.0002	1.0
NC ₅	0.0003	0.0003	1.5
C ₆	0.0009	0.0009	4.9
C ₇₊	0.0007	0.0007	4.4
Total	1.0000	1.0000	21.8

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free
37.80	37.81

RELATIVE DENSITY (CALCULATED)

Moisture Free	Moisture & Acid Gas Free
0.577	0.576

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4578	191.8	4577	191.7

RELATIVE MOLECULAR MASS

Total Gas	C ₇₊
16.7	104.2

VAPOUR PRESSURE (Pentanes +)

46.44 kPa

H₂S g/m³

0.00

ALBERTA ENERGY BOARD
ENERGY SERVICES DIVISION
JAN 21 2000



Container Identification AGAT 40040		Laboratory Number GG45959B																
Operator Name PARAMOUNT RESOURCES LTD.																		
Unique Well Identifier 60deg10'123deg15'	Well Name PARAMOUNT et al FT. LIARD I 46		Elevation KB m 542.20 GRD m 537.20															
Field or Area FORT LIARD	Pool or Zone FANTASQUE	Sampler's Company BAKER																
Test Type DST	Test No. 1	Test Recovery	Name of Sampler															
Test Interval or Perfs 1365.00-1392.00 mKB		Sampling Point MAIN FLOW	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Separator</th> <th>Reservoir</th> <th>Source</th> <th>Sampled</th> <th>Received</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>21</td> </tr> </table>	Separator	Reservoir	Source	Sampled	Received					1					21
Separator	Reservoir	Source	Sampled	Received														
				1														
				21														
Date Sampled Dec 07, 1999	Date Received Dec 14, 1999	Date Reported Jan 04, 2000	Analyst PL															
Other Information																		

COMP	MOLE FRACTION		PETROLEUM LIQUID mL • m³
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	
H2	0.0001	0.0001	
He	0.0001	0.0001	
N2	0.0045	0.0045	
CO2	0.0000	0.0000	
H2S	0.0000	0.0000	
C1	0.9754	0.9754	
C2	0.0153	0.0153	
C3	0.0025	0.0025	9.2
IC4	0.0003	0.0003	1.3
NC4	0.0002	0.0002	0.8
IC5	0.0001	0.0001	0.5
NC5	0.0001	0.0001	0.5
C6	0.0006	0.0006	3.3
C7+	0.0008	0.0008	5.2
Total	1.0000	1.0000	20.8

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free
38.48	38.48

RELATIVE DENSITY (CALCULATED)

Moisture Free	Moisture & Acid Gas Free
0.571	0.571

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4598	193.1	4598	193.1

RELATIVE MOLECULAR MASS

Total Gas	C7+
16.5	107.2

VAPOUR PRESSURE (Pentanes +)

32.07 kPa

H₂S g/m³

0.00





Container Identification AGAT 40029		Laboratory Number GG45959C																
Operator Name PARAMOUNT RESOURCES LTD.																		
Unique Well Identifier 60deg10'123deg15'	Well Name PARAMOUNT et al FT. LIARD I 46		Elevation KB m 542.20 GRD m 537.20															
Field or Area FORT LIARD	Pool or Zone FANTASQUE	Sampler's Company BAKER																
Test Type DST	Test No. 1	Test Recovery	Name of Sampler															
Test Interval or Perfs 1365.00-1392.00 mKB		Sampling Point MAIN FLOW	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Separator</th> <th>Reservoir</th> <th>Source</th> <th>Sampled</th> <th>Received</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>21</td> </tr> </table>	Separator	Reservoir	Source	Sampled	Received					1					21
Separator	Reservoir	Source	Sampled	Received														
				1														
				21														
Date Sampled Dec 07, 1999	Date Received Dec 14, 1999	Date Reported Jan 04, 2000	Analyst PL															
Other Information																		

COMP	MOLE FRACTION		PETROLEUM LIQUID mL • m ³
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	
H2	0.0001	0.0001	
He	TRACE	TRACE	
N2	0.0008	0.0008	
CO2	0.0003	0.0000	
H2S	0.0000	0.0000	
C1	0.9590	0.9593	
C2	0.0261	0.0261	
C3	0.0054	0.0054	19.8
IC4	0.0008	0.0008	3.5
NC4	0.0016	0.0016	6.7
IC5	0.0009	0.0009	4.4
NC5	0.0014	0.0014	6.8
C6	0.0019	0.0019	10.4
C7+	0.0017	0.0017	10.8
Total	1.0000	1.0000	62.4

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free
39.82	39.83

RELATIVE DENSITY (CALCULATED)

Moisture Free	Moisture & Acid Gas Free
0.590	0.590

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4598	196.9	4597	196.8

RELATIVE MOLECULAR MASS

Total Gas	C7+
17.1	104.3

VAPOUR PRESSURE (Pentanes +)

60 58 kPa

H₂S g/m³

0.00





Container Identification

AGAT 21183

Laboratory Number

GG45959D

Operator Name

PARAMOUNT RESOURCES LTD.

Unique Well Identifier

60deg10'123deg15'

Well Name

PARAMOUNT et al FT. LIARD I 46

Elevation

KB m 542.20 GRD m 537.20

Field or Area

FORT LIARD

Pool or Zone

FANTASQUE

Sampler's Company

BAKER

Test Type

DST

Test No.

1

Test Recovery

Name of Sampler

Test Interval or Perfs

1355.00-1392.00

mKB

Sampling Point

MAIN FLOW

Pressure (kPa)

Temperature (°C)

Separator Reservoir Source Sampled Received

50

21

Date Sampled

Dec 07, 1999

Date Received

Dec 14, 1999

Date Reported

Jan 04, 2000

Analyst

PL

Other Information

COMP	MOLE FRACTION		PETROLEUM LIQUID mL • m³
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	
H2	0.0010	0.0010	
He	0.0001	0.0001	
N2	0.0088	0.0088	
CO2	0.0000	0.0000	
H2S	0.0000	0.0000	
C1	0.9366	0.9366	
C2	0.0408	0.0408	
C3	0.0077	0.0077	28.3
IC4	0.0011	0.0011	4.8
NC4	0.0008	0.0008	3.4
IC5	0.0002	0.0002	1.0
NC5	0.0002	0.0002	1.0
C6	0.0012	0.0012	6.6
C7+	0.0015	0.0015	9.4
Total	1.0000	1.0000	54.5

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free
39.66	39.66

RELATIVE DENSITY (CALCULATED)

Moisture Free	Moisture & Acid Gas Free
0.595	0.595

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4591	197.3	4591	197.3

RELATIVE MOLECULAR MASS

Total Gas	C7+
17.2	103.0

VAPOUR PRESSURE (Pentanes +)

33.94 kPa

H2S g/m³

0.00



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AGAT[®] Laboratories



GAS ANALYSIS

Container Identification
AGAT 20698

Laboratory Number
GF63506A

Operator Name
PARAMOUNT RESOURCES LTD.

Unique Well Identifier	Well Name	Elevation	
NOT AVAILABLE	PARAMOUNT et al FT LIARD 1-46	KB m	GRD m

Field or Area	Pool or Zone	Sampler's Company
FORT LIARD	MATTSON SAND	SOLID PRODUCTION SERVICES

Test Type	Test No.	Test Recovery	Name of Sampler
		LATITUDE 60 deg 10' LONGITUDE 123 deg 15'	

Test Interval or Perfs	Sampling Point	Separator	Reservoir	Source	Sampled	Received
	PRESSURE TANK	Pressure (kPa)		585	585	1400
		Temperature (°C)		-16	-16	21

Date Sampled	Date Received	Date Reported	Analyst
Jan 04, 2001	Jan 09, 2001	Jan 12, 2001	PL

Other Information

COMP	MOLE FRACTION		PETROLEUM LIQUID mL · m ³
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	
H ₂	0.0002	0.0002	
He	0.0001	0.0001	
N ₂	0.0189	0.0190	
CO ₂	0.0070	0.0000	
H ₂ S	0.0000	0.0000	
C ₁	0.9033	0.9098	
C ₂	0.0407	0.0410	
C ₃	0.0187	0.0188	68.7
IC ₄	0.0025	0.0025	10.9
NC ₄	0.0061	0.0061	25.7
IC ₅	0.0011	0.0011	5.4
NC ₅	0.0011	0.0011	5.3
C ₆	0.0003	0.0003	1.6
C ₇₊	TRACE	TRACE	TRACE
Total	1.0000	1.0000	117.6

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free
40.04	40.31

RELATIVE DENSITY (CALCULATED)

Moisture Free	Moisture & Acid Gas Free
0.624	0.617

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4594	200.8	4574	200.0

RELATIVE MOLECULAR MASS

Total Gas	C ₇₊
18.1	100.2

VAPOUR PRESSURE
(Pentanes +)

113.37 kPa

H₂S g/m³

0.00



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AGAT[®] Laboratories

GAS ANALYSIS

Container Identification
AGAT 70

Laboratory Number
GE63639A

Operator Name
PARAMOUNT RESOURCES LTD.

Unique Well Identifier	Well Name	Elevation
NOT AVAILABLE	PARA et al FT. LIARD I-46	KB m GRD m

Field or Area	Pool or Zone	Sampler's Company
FORT LIARD	MATTSON SAND	SAME

Test Type	Test No.	Test Recovery	Name of Sampler

Test Interval or Perfs	Sampling Point	Separator	Reservoir	Source	Sampled	Received
	METER RUN	Pressure (kPa)		207	207	220
		Temperature (°C)		-10	-10	21

Date Sampled	Date Received	Date Reported	Analyst
Jan 05, 2001	Jan 11, 2001	Jan 16, 2001	LQ

Other Information

COMP	MOLE FRACTION		PETROLEUM LIQUID mL • m ³
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	
H ₂	TRACE	TRACE	
He	0.0001	0.0001	
N ₂	0.0032	0.0032	
CO ₂	0.0096	0.0000	
H ₂ S	0.0000	0.0000	
C ₁	0.8989	0.9078	
C ₂	0.0429	0.0433	
C ₃	0.0220	0.0222	80.8
IC ₄	0.0034	0.0034	14.8
NC ₄	0.0095	0.0096	40.0
IC ₅	0.0028	0.0028	13.7
NC ₅	0.0037	0.0037	17.9
C ₆	0.0024	0.0024	13.2
C ₇₊	0.0015	0.0015	9.3
Total	1.0000	1.0000	189.7

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free
42.20	42.59

RELATIVE DENSITY (CALCULATED)

Moisture Free	Moisture & Acid Gas Free
0.648	0.639

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4605	206.3	4578	205.3

RELATIVE MOLECULAR MASS

Total Gas	C ₇₊
18.8	101.1

VAPOUR PRESSURE
(Pentanes +)

85.58 kPa

H₂ S g/m³

0.00





GAS ANALYSIS

Container Identification AGAT 70		Laboratory Number GE63639A																
Operator Name PARAMOUNT RESOURCES LTD.																		
Unique Well Identifier NOT AVAILABLE	Well Name PARA et al FT. LIARD I-46		Elevation KB m GRD m															
Field or Area FORT LIARD	Pool or Zone MATTSON SAND	Sampler's Company SAME																
Test Type	Test No.	Test Recovery	Name of Sampler															
Test Interval or Perfs		Sampling Point METER RUN	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Separator</th> <th>Reservoir</th> <th>Source</th> <th>Sampled</th> <th>Received</th> </tr> <tr> <td>Pressure (kPa)</td> <td></td> <td>207</td> <td>207</td> <td>220</td> </tr> <tr> <td>Temperature (°C)</td> <td></td> <td>-10</td> <td>-10</td> <td>21</td> </tr> </table>	Separator	Reservoir	Source	Sampled	Received	Pressure (kPa)		207	207	220	Temperature (°C)		-10	-10	21
Separator	Reservoir	Source	Sampled	Received														
Pressure (kPa)		207	207	220														
Temperature (°C)		-10	-10	21														
Date Sampled Jan 05, 2001	Date Received Jan 11, 2001	Date Reported Jan 16, 2001	Analyst LQ															
Other Information																		

COMP	MOLE FRACTION		PETROLEUM LIQUID mL • m ³
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	
H2	TRACE	TRACE	
He	0.0001	0.0001	
N2	0.0032	0.0032	
CO2	0.0096	0.0000	
H2S	0.0000	0.0000	
C1	0.8989	0.9078	
C2	0.0429	0.0433	
C3	0.0220	0.0222	80.8
IC4	0.0034	0.0034	14.8
NC4	0.0095	0.0096	40.0
IC5	0.0028	0.0028	13.7
NC5	0.0037	0.0037	17.9
C6	0.0024	0.0024	13.2
C7+	0.0015	0.0015	9.3
Total	1.0000	1.0000	189.7

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free
42.20	42.59

RELATIVE DENSITY (CALCULATED)

Moisture Free	Moisture & Acid Gas Free
0.648	0.639

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4605	206.3	4578	205.3

RELATIVE MOLECULAR MASS

Total Gas	C7+
18.8	101.1

VAPOUR PRESSURE
(Pentanes +)

85.58 kPa

H₂S g/m³

0.00





Container Identification
AGAT 21239

Laboratory Number
GG64752B

Operator Name
PARAMOUNT RESOURCES LTD.

Unique Well Identifier	Well Name	Elevation
NOT AVAILABLE	PARA et al FORT LIARD I-46	KB m 542.20 GRD m 537.20

Field or Area	Pool or Zone	Sampler's Company
FORT LIARD	MATTSON	SOLID PRODUCTION SERVICES

Test Type	Test No.	Test Recovery	Name of Sampler

Test Interval or Perfs	Sampling Point	Separator	Reservoir	Source	Sampled	Received
	METER RUN	Pressure (kPa)		700	700	800
		Temperature (°C)		3	3	21

Date Sampled	Date Received	Date Reported	Analyst
Jan 17, 2001	Jan 30, 2001	Feb 12, 2001	BN

Other Information
FORMATION: UPPER MATTSON

COMP	MOLE FRACTION		PETROLEUM LIQUID mL · m ³
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	
H ₂	0.0013	0.0013	
He	0.0001	0.0001	
N ₂	0.0037	0.0037	
CO ₂	0.0095	0.0000	
H ₂ S	0.0000	0.0000	
C ₁	0.8962	0.9050	
C ₂	0.0434	0.0438	
C ₃	0.0223	0.0225	81.9
IC ₄	0.0035	0.0035	15.3
NC ₄	0.0100	0.0101	42.1
IC ₅	0.0029	0.0029	14.2
NC ₅	0.0038	0.0038	18.4
C ₆	0.0019	0.0019	10.4
C ₇₊	0.0014	0.0014	8.8
Total	1.0000	1.0000	191.1

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free
42.17	42.55

RELATIVE DENSITY (CALCULATED)

Moisture Free	Moisture & Acid Gas Free
0.648	0.639

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4600	206.2	4573	205.2

RELATIVE MOLECULAR MASS

Total Gas	C ₇₊
18.8	102.2

VAPOUR
PRESSURE

89.60 kPa

H₂S g/m³

0.00



WATER ANALYSIS



NEB

Container Identification
PB 1A

Laboratory Number
WG46433A

Operator Name
PARAMOUNT RESOURCES LTD.

Unique Well Identifier	Well Name	Elevation
60DEG05'123DEG22'	PARA ET AL FORT LIARD I-46	KB m 542.50 GRD m 537.50

Field or Area	Pool or Zone	Sampler's Company
LIARD	MATTSON	BAKER

Test Type	Test No.	Test Recovery	Name of Sampler
DST	5		

Test Interval or Perfs	Sampling Point	Separator	Reservoir	Source	Sampled	Received
1734.50-1740.00	BOTTOM HOLE SAMPLER					
mKB		Pressure (kPa)				
		Temperature (°C)				

Date Sampled	Date Received	Date Reported	Analyst
Dec 24, 1999	Dec 30, 1999	Jan 10, 2000	LN

Other Information

Cations

ION	mg/L	Mass Fraction	mmol/L
Na	915.0	0.310	39.8
K	7.1	0.002	0.2
Ca	19.5	0.007	0.5
Mg	2.4	0.001	0.1
Fe	0.3	Trace	Trace

Anions

ION	mg/L	Mass Fraction	mmol/L
Cl	991.0	0.336	28.0
HCO ₃	884.5	0.300	14.5
SO ₄	133.0	0.045	1.4
CO ₃	NII	NII	NII
OH	NII	NII	NII

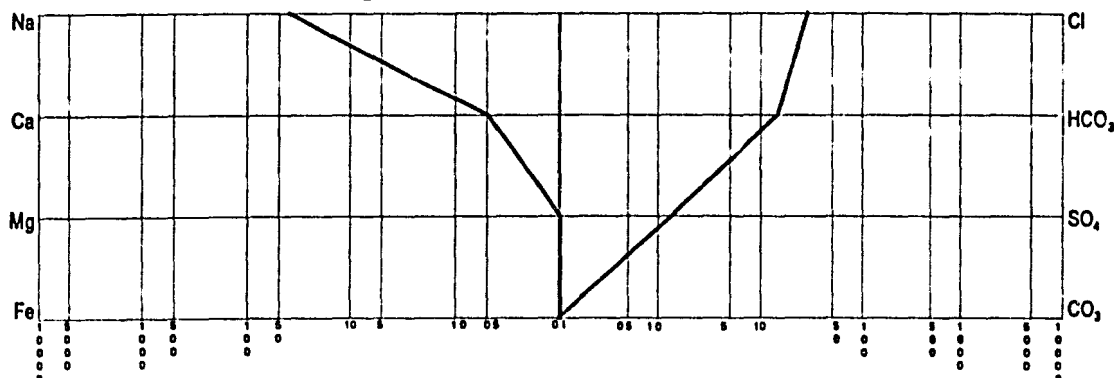
Other Measurements

Measurement	Value
Total Dissolved Solids (Calculated) mg/L	2952
Observed pH	8.22
H ₂ S (25°C) mg/L	N/D
Relative Density (25°C)	1.003
Resistivity / OHM-m (25°C)	2.500
Salinity %	0.18

Total Cations 41.2

Total Anions 45.2

Logarithmic Pattern mmol/L





Container Identification PB 3B		Laboratory Number WG46433B											
Operator Name PARAMOUNT RESOURCES LTD.													
Unique Well Identifier 60DEG05'123DEG22'	Well Name PARA ET AL FORT LIARD I-46		Elevation KB m 542.50 GRD m 537.50										
Field or Area LIARD	Pool or Zone MATTSON	Sampler's Company BAKER											
Test Type DST	Test No. 5	Test Recovery	Name of Sampler										
Test Interval or Perfs 1734.50-1740.00 mKB		Sampling Point TOP	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Separator</th> <th>Reservoir</th> <th>Source</th> <th>Sampled</th> <th>Received</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	Separator	Reservoir	Source	Sampled	Received					
Separator	Reservoir	Source	Sampled	Received									
Date Sampled Dec 24, 1999	Date Received Dec 30, 1999	Date Reported Jan 10, 2000	Analyst LN										
Other Information													

Cations

ION	mg/L	Mass Fraction	mmol/L
Na	1270.0	0.205	55.2
K	73.0	0.012	1.9
Ca	1130.0	0.182	28.2
Mg	0.8	Trace	Trace
Fe	Trace	Trace	Trace

Anions

ION	mg/L	Mass Fraction	mmol/L
Cl	3499.0	0.564	98.7
HCO ₃	Nil	Nil	Nil
SO ₄	126.0	0.020	1.3
CO ₃	105.0	0.017	1.7
OH	4.3	0.001	0.2

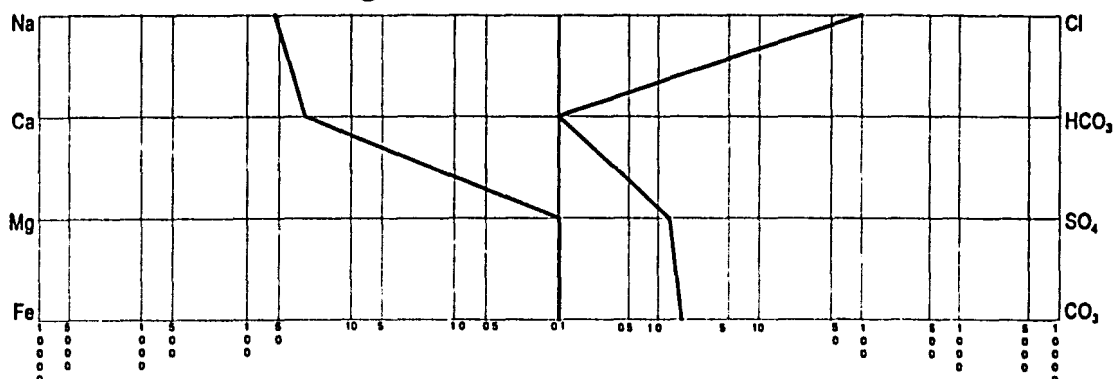
Other Measurements

Measurement	Value
Total Dissolved Solids (Calculated) mg/L	6208
Observed pH	10.47
H ₂ S (25°C) mg/L	N/D
Relative Density (25°C)	1.004
Resistivity / OHM-m (25°C)	0.944
Salinity ‰	0.63

Total Cations 113.5

Total Anions 103.3

Logarithmic Pattern mmol/L





Container Identification
PB 4C

Laboratory Number
WG46433C

Operator Name
PARAMOUNT RESOURCES LTD.

Unique Well Identifier	Well Name	Elevation
60DEG05'123DEG22'	PARA ET AL FORT LIARD I-46	KB m 542.50 GRD m 537.50

Field or Area	Pool or Zone	Sampler's Company
LIARD	MATTSON	BAKER

Test Type	Test No.	Test Recovery	Name of Sampler
DST	5		

Test Interval or Perfs	Sampling Point	Separator	Reservoir	Source	Sampled	Received
1734.60-1740.00	2					
mKB		Pressure (kPa)				
		Temperature (°C)				

Date Sampled	Date Received	Date Reported	Analyst
Dec 24, 1999	Dec 30, 1999	Jan 10, 2000	LN

Other Information

Cations

ION	mg/L	Mass Fraction	mmol/L
Na	910.0	0.338	39.6
K	21.9	0.008	0.6
Ca	15.6	0.006	0.4
Mg	2.6	0.001	0.1
Fe	0.1	Trace	Trace

Anions

ION	mg/L	Mass Fraction	mmol/L
Cl	896.0	0.333	25.3
HCO ₃	732.0	0.272	12.0
SO ₄	111.5	0.041	1.2
CO ₃	Nil	Nil	Nil
OH	Nil	Nil	Nil

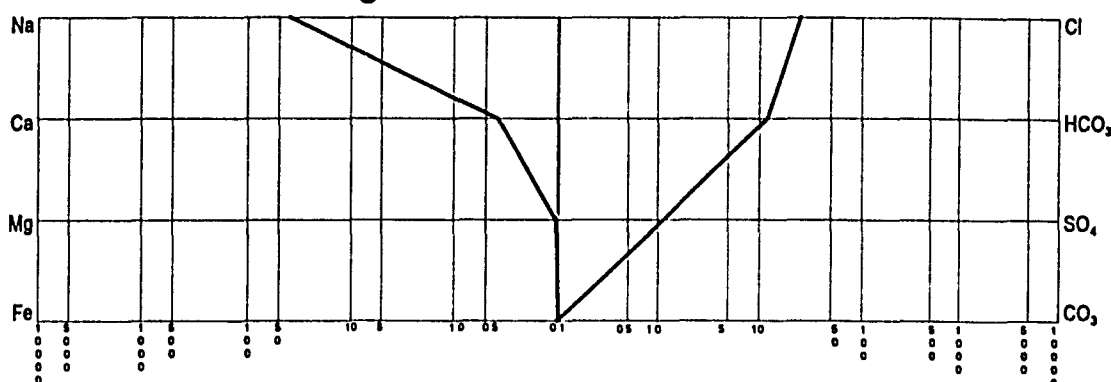
Other Measurements

Measurement	Value
Total Dissolved Solids (Calculated) mg/L	2689
Observed pH	7.90
H ₂ S (25°C) mg/L	N/D
Relative Density (25°C)	1.001
Resistivity / OHM-m (25°C)	2.440
Salinity %	0.16

Total Cations **41.1**

Total Anions **39.6**

Logarithmic Pattern mmol/L





Container Identification
PB 6E

Laboratory Number
WG46433E

Operator Name
PARAMOUNT RESOURCES LTD.

Unique Well Identifier
60DEG05'123DEG22'

Well Name
PARA ET AL FORT LIARD I-46

Elevation
KB m 542.50 GRD m 537.50

Field or Area
LIARD

Pool or Zone
MATTSON

Sampler's Company
BAKER

Test Type
DST

Test No.
5

Test Recovery

Name of Sampler

Test Interval or Perfs
1734.50-1740.00
mKB

Sampling Point
4

Pressure (kPa)

Temperature (°C)

Separator

Reservoir

Source

Sampled

Received

Date Sampled
Dec 24, 1999

Date Received
Dec 30, 1999

Date Reported
Jan 10, 2000

Analyst
LN

Other Information

Cations

ION	mg/L	Mass Fraction	mmol/L
Na	870.0	0.321	37.8
K	7.9	0.003	0.2
Ca	32.7	0.012	0.8
Mg	2.9	0.001	0.1
Fe	0.1	Trace	Trace

Anions

ION	mg/L	Mass Fraction	mmol/L
Cl	802.0	0.296	22.6
HCO ₃	884.5	0.326	14.5
SO ₄	113.5	0.042	1.2
CO ₃	NII	NII	NII
OH	NII	NII	NII

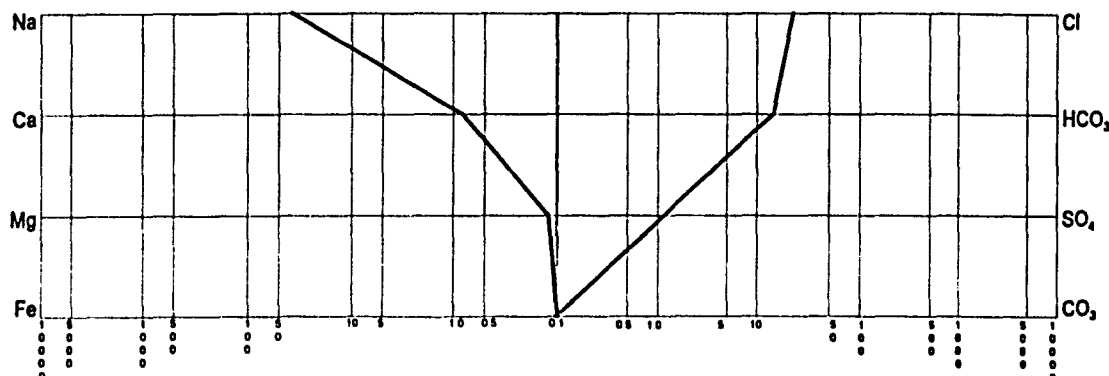
Other Measurements

Measurement	Value
Total Dissolved Solids (Calculated) mg/L	2713
Observed pH	7.91
H ₂ S (25°C) mg/L	N/D
Relative Density (25°C)	1.000
Resistivity / OHM-m (25°C)	2.560
Salinity ‰	0.14

Total Cations 39.9

Total Anions 39.5

Logarithmic Pattern mmol/L





Container Identification
PB 8G

Laboratory Number
WG46433G

Operator Name
PARAMOUNT RESOURCES LTD.

Unique Well Identifier	Well Name	Elevation
60DEG05'123DEG22'	PARA ET AL FORT LIARD I-46	KB m 542.50 GRD m 537.50

Field or Area	Pool or Zone	Sampler's Company
LIARD	MATTSON	BAKER

Test Type	Test No.	Test Recovery	Name of Sampler
DST	5		

Test Interval or Perfs	Sampling Point	Separator	Reservoir	Source	Sampled	Received
1734.50-1740.00	BOTTOM					
mKB		Pressure (kPa)	Temperature (°C)			

Date Sampled	Date Received	Date Reported	Analyst
Dec 24, 1999	Dec 30, 1999	Jan 10, 2000	LN

Other Information

Cations

ION	mg/L	Mass Fraction	mmol/L
Na	1287.0	0.214	56.0
K	77.8	0.013	2.0
Ca	842.0	0.140	21.0
Mg	2.1	Trace	0.1
Fe	Trace	Trace	Trace

Anions

ION	mg/L	Mass Fraction	mmol/L
Cl	3499.0	0.581	98.7
HCO ₃	152.5	0.025	2.5
SO ₄	161.0	0.027	1.7
CO ₃	Nil	Nil	Nil
OH	Nil	Nil	Nil

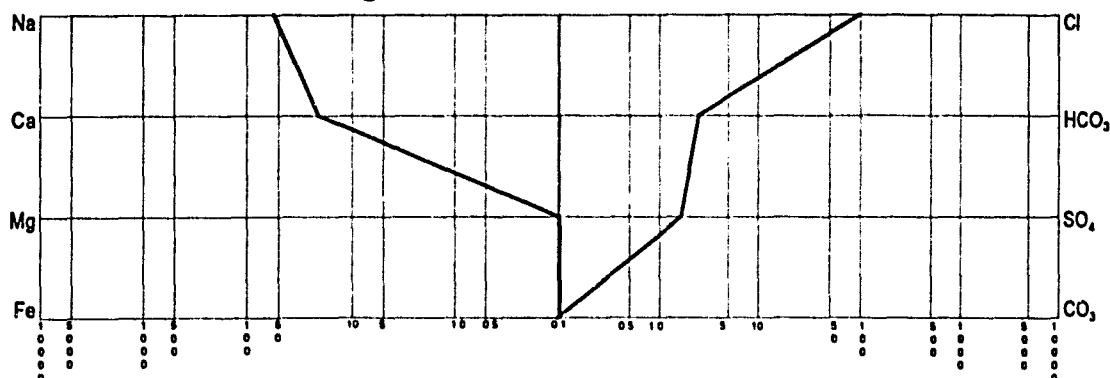
Other Measurements

Measurement	Value
Mud Filtrate Loss mL	7.00
Total Dissolved Solids (Calculated) mg/L	6021
Observed pH	7.00
H ₂ S (25°C) mg/L	N/D
Relative Density (25°C)	1.007
Resistivity / OHM-m (25°C)	0.919
Salinity ‰	0.63

Total Cations 100.2

Total Anions 104.5

Logarithmic Pattern mmol/L





Container Identification V 5000		Laboratory Number GG46433A																
Operator Name PARAMOUNT RESOURCES LTD.																		
Unique Well Identifier 60DEG05'123DEG22'	Well Name PARA et al FORT LIARD I-46		Elevation KB m 542.50 GRD m 537.50															
Field or Area FORT LIARD	Pool or Zone MATTSON	Sampler's Company BAKER																
Test Type DST	Test No. 5	Test Recovery	Name of Sampler															
Test Interval or Perfs 1734.50-1740.00 mKB		Sampling Point MAIN FLOW	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Separator</th> <th>Reservoir</th> <th>Source</th> <th>Sampled</th> <th>Received</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>20</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>21</td> </tr> </table>	Separator	Reservoir	Source	Sampled	Received					20					21
Separator	Reservoir	Source	Sampled	Received														
				20														
				21														
Date Sampled Dec 24, 1999	Date Received Dec 30, 1999	Date Reported Jan 10, 2000	Analyst BN															
Other Information																		

COMP	MOLE FRACTION		PETROLEUM LIQUID mL • m ³
	AIR FREE AS RECEIVED	AIR FREE ACID GAS FREE	
H2	0.0002	0.0002	
He	0.0003	0.0003	
N2	0.0301	0.0301	
CO2	0.0005	0.0000	
H2S	0.0000	0.0000	
C1	0.9627	0.9632	
C2	0.0059	0.0059	
C3	0.0003	0.0003	1.1
IC4	0.0000	0.0000	0.0
NC4	0.0000	0.0000	0.0
IC5	0.0000	0.0000	0.0
NC5	0.0000	0.0000	0.0
C6	0.0000	0.0000	0.0
C7+	0.0000	0.0000	0.0
Total	1.0000	1.0000	1.1

GROSS HEATING VALUE MJ/m³
15° C AND 101.325 kPa

Air Free As Received	Moisture & Acid Gas Free
36.79	36.81

RELATIVE DENSITY (CALCULATED)

Moisture Free	Moisture & Acid Gas Free
0.570	0.569

PSEUDO CRITICAL PROPERTIES (CALCULATED)

As Sampled		Acid Gas Free	
pPc (abs) kPa	pTc K	pPc (abs) kPa	pTc K
4569	189.3	4567	189.3

RELATIVE MOLECULAR MASS

Total Gas	C7+
16.5	0.0

VAPOUR PRESSURE (Pentanes +)

0.00 kPa

H₂S g/m³

0.00



AGAT® Laboratories



DST TOOL INFORMATION

AGAT W/O #: 99G46433
COMPANY NAME: PARAMOUNT RESOURCES LTD.
LOCATION: 60-05-123-22

RESULTS

D.S.T. #: 5
B.H.S. #: 303
OPENING PRESSURE: 345 kPa
RECOVERY : 1 Litre H₂O



Container Identification
PB 1A

Previous Number	Laboratory Number
WG63334B	WG63334A

Operator Name
PARAMOUNT RESOURCES LTD.

Unique Well Identifier	Well Name	Elevation
I-46	PARA ET AL FT. LIARD	KB m GRD m

Field or Area	Pool or Zone	Sampler's Company
FT. LIARD	MATTSON SAND	SOLID PRODUCTION SERVICES

Test Type	Test No.	Test Recovery	Name of Sampler

Test Interval or Perfs	Sampling Point	Separator	Reservoir	Source	Sampled	Received
	FRAC MANIFOLD					
		Pressure (kPa)				
		Temperature (°C)				

Date Sampled	Date Received	Date Reported	Analyst
Dec 31, 2000	Jan 04, 2001	Jan 11, 2001	LN

Other Information
FIRST FLUID TO SURFACE @ 600m

Cations

ION	mg/L	Mass Fraction	mmol/L
Na	4410.0	0.313	191.8
K	485.0	0.034	12.4
Ca	147.0	0.010	3.7
Mg	19.6	0.001	0.8
Fe	39.0	0.003	0.7

Anions

ION	mg/L	Mass Fraction	mmol/L
Cl	6652.0	0.471	187.6
HCO ₃	1733.6	0.123	28.4
SO ₄	622.0	0.044	6.5
CO ₃	Nil	Nil	Nil
OH	Nil	Nil	Nil

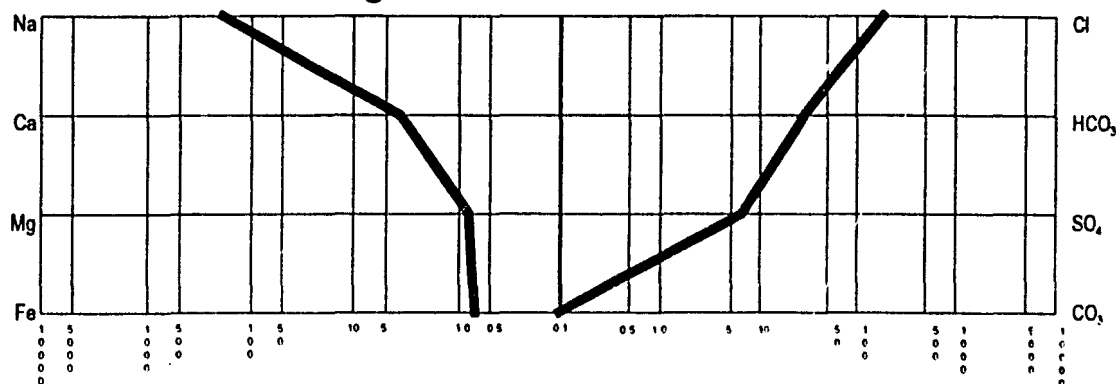
Other Measurements

Measurement	Value
Total Dissolved Solids (Calculated) mg/L	14108
Observed pH	7.65
H ₂ S (25°C) mg/L	N/D
Relative Density (25°C)	1.011
Resistivity / OHM-m (25°C)	0.518
Salinity %	1.19

Total Cations 214.6

Total Anions 229.0

Logarithmic Pattern mmol/L



JAN 31 2001





Container Identification
PB 2B

Previous Number	Laboratory Number
WG63334A	WG63334B

Operator Name
PARAMOUNT RESOURCES LTD.

Unique Well Identifier	Well Name	Elevation
I-46	PARA ET AL FT. LIARD	KB m GRD m

Field or Area	Pool or Zone	Sampler's Company
FT. LIARD	MATTSON SAND	SOLID PRODUCTION SERVICES

Test Type	Test No.	Test Recovery	Name of Sampler

Test Interval or Perfs	Sampling Point	Separator	Reservoir	Source	Sampled	Received
	FRAC MANIFOLD					
		Pressure (kPa)				
		Temperature (°C)				

Date Sampled	Date Received	Date Reported	Analyst
Dec 31, 2000	Jan 04, 2001	Jan 11, 2001	LN

Other Information
2ND FLUID; 1000m

Cations

ION	mg/L	Mass Fraction	mmol/L
Na	4910.0	0.322	213.6
K	463.0	0.030	11.8
Ca	160.0	0.011	4.0
Mg	20.7	0.001	0.9
Fe	40.5	0.003	0.7

Anions

ION	mg/L	Mass Fraction	mmol/L
Cl	7145.0	0.469	201.5
HCO ₃	1703.7	0.112	27.9
SO ₄	793.0	0.052	8.3
CO ₃	Nil	Nil	Nil
OH	Nil	Nil	Nil

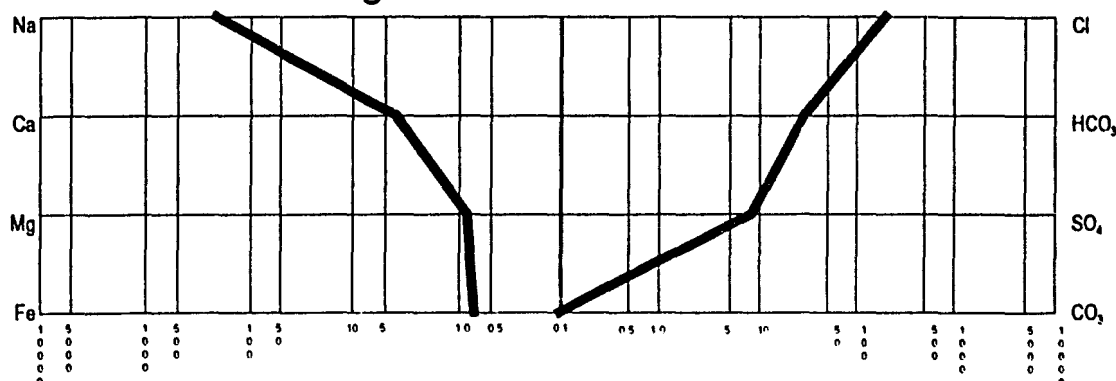
Other Measurements

Measurement	Value
Total Dissolved Solids (Calculated) mg/L	15235
Observed pH	7.69
H ₂ S (25°C) mg/L	N/D
Relative Density (25°C)	1.015
Resistivity / OHM-m (25°C)	0.500
Salinity %	1.27

Total Cations 236.6

Total Anions 246.0

Logarithmic Pattern mmol/L





Container Identification
PB 3C

Previous Number	Laboratory Number
WG63334A	WG63334C

Operator Name
PARAMOUNT RESOURCES LTD.

Unique Well Identifier	Well Name	Elevation
I-46	PARA ET AL FT. LIARD	KB m GRD m

Field or Area	Pool or Zone	Sampler's Company
FT. LIARD	MATTSON SAND	SOLID PRODUCTION SERVICES

Test Type	Test No.	Test Recovery	Name of Sampler

Test Interval or Perfs	Sampling Point	Separator	Reservoir	Source	Sampled	Received
	FRAC MANIFOLD	Pressure (kPa)				
		Temperature (°C)				

Date Sampled	Date Received	Date Reported	Analyst
Dec 31, 2000	Jan 04, 2001	Jan 11, 2001	LN

Other Information
3RD FLUID; 1500m

Cations

ION	mg/L	Mass Fraction	mmol/L
Na	5020.0	0.326	218.4
K	416.0	0.027	10.6
Ca	183.0	0.012	4.6
Mg	23.4	0.002	1.0
Fe	23.4	0.002	0.4

Anions

ION	mg/L	Mass Fraction	mmol/L
Cl	7784.0	0.506	219.6
HCO ₃	1658.9	0.108	27.2
SO ₄	288.0	0.019	3.0
CO ₃	NII	NII	NII
OH	NII	NII	NII

Other Measurements

Measurement	Value
Total Dissolved Solids (Calculated) mg/L	15396
Observed pH	7.88
H ₂ S (25°C) mg/L	N/D
Relative Density (25°C)	1.012
Resistivity / OHM-m (25°C)	0.463
Salinity %	1.39

Total Cations 240.9

Total Anions 252.7

Logarithmic Pattern mmol/L





Container Identification
PB 4D

Previous Number	Laboratory Number
WG63334A	WG63334D

Operator Name
PARAMOUNT RESOURCES LTD.

Unique Well Identifier	Well Name	Elevation
I-46	PARA ET AL FT. LIARD	KB m GRD m

Field or Area	Pool or Zone	Sampler's Company
FT. LIARD	MATTSON SAND	SOLID PRODUCTION SERVICES

Test Type	Test No.	Test Recovery	Name of Sampler

Test Interval or Perfs	Sampling Point	Separator	Reservoir	Source	Sampled	Received
	FRAC MANIFOLD	Pressure (kPa)				
		Temperature (°C)				

Date Sampled	Date Received	Date Reported	Analyst
Dec 31, 2000	Jan 04, 2001	Jan 11, 2001	LN

Other Information
4TH FLUID; 1635m

Cations

ION	mg/L	Mass Fraction	mmol/L
Na	5590.0	0.342	243.2
K	427.0	0.026	10.9
Ca	163.0	0.010	4.1
Mg	24.5	0.001	1.0
Fe	21.3	0.001	0.4

Anions

ION	mg/L	Mass Fraction	mmol/L
Cl	7784.0	0.476	219.6
HCO ₃	1718.7	0.105	28.2
SO ₄	622.0	0.038	6.5
CO ₃	NII	NII	NII
OH	NII	NII	NII

Other Measurements

Measurement	Value
Total Dissolved Solids (Calculated) mg/L	16350
Observed pH	7.96
H ₂ S (25°C) mg/L	N/D
Relative Density (25°C)	1.012
Resistivity / OHM·m (25°C)	0.448
Salinity %	1.39

Total Cations 265.0

Total Anions 260.7

Logarithmic Pattern mmol/L





Container Identification
PB 5E

Previous Number
WG63334A

Laboratory Number
WG63334E

Operator Name
PARAMOUNT RESOURCES LTD.

Unique Well Identifier	Well Name	Elevation
I-46	PARA ET AL FT. LIARD	KB m GRD m

Field or Area	Pool or Zone	Sampler's Company
FT. LIARD	MATTSON SAND	SOLID PRODUCTION SERVICES

Test Type	Test No.	Test Recovery	Name of Sampler

Test Interval or Perfs	Sampling Point	Separator	Reservoir	Source	Sampled	Received
	FRAC MANIFOLD					
		Pressure (kPa)				
		Temperature (°C)				

Date Sampled	Date Received	Date Reported	Analyst
Dec 31, 2000	Jan 04, 2001	Jan 11, 2001	LN

Other Information
LAST FLUID; 1900m

Cations

ION	mg/L	Mass Fraction	mmol/L
Na	2317.0	0.067	100.8
K	420.0	0.012	10.7
Ca	9650.0	0.281	240.8
Mg	17.1	Trace	0.7
Fe	25.8	0.001	0.5

Anions

ION	mg/L	Mass Fraction	mmol/L
Cl	21435.0	0.624	604.6
HCO ₃	209.2	0.006	3.4
SO ₄	287.0	0.008	3.0
CO ₃	NII	NII	NII
OH	NII	NII	NII

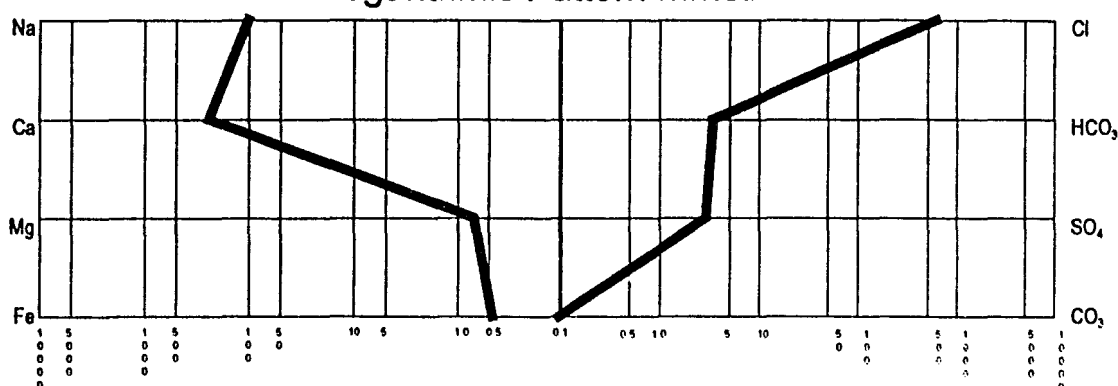
Other Measurements

Measurement	Value
Total Dissolved Solids (Calculated) mg/L	34361
Observed pH	6.51
H ₂ S (25°C) mg/L	N/D
Relative Density (25°C)	1.026
Resistivity / OHM-m (25°C)	0.217
Salinity %	3.77

Total Cations 595.4

Total Anions 614.0

Logarithmic Pattern mmol/L



OIL ANALYSIS



OIL ANALYSIS

Container Identification PB-5		Laboratory Number OG64752B		
Operator Name PARAMOUNT RESOURCES LTD.				
Unique Well Identifier NOT AVAILABLE	Well Name PARA et al FORT LIARD I-46		Elevation KB m 542.20 GRD m 537.20	
Field or Area FORT LIARD	Pool or Zone CHINKEH	Sampler's Company SOLID PRODUCTION SERVICES		
Test Type	Test No.	Test Recovery		Name of Sampler
Test Interval or Perfs 1217.00-1222.00 mKB		Sampling Point WELLHEAD	Separator	Reservoir
		Pressure (kPa)	Source	Sampled
		Temperature (°C)		Received
Date Sampled Jan 14, 2001	Date Received Jan 30, 2001	Date Reported Feb 12, 2001	Analyst H,J,D	
Other Information FORMATION: CHINKEH SAND				

Sample Properties

Colour of Clean Oil Dk. Brown	Colour Number ASTM D-1500 D-8 A.S.T.M.
----------------------------------	---

B.S. & W. (Volume Fraction)

Water	Sediment	Total
0.200	0.001	0.201

Free Water 74 vol %

Density - After Cleaning

API Gravity @ 15°C 31.30

Relative	Absolute kg/m³
0.8692	868.4

Total Sulphur Mass Fraction	Pour Point / °C (A.S.T.M. D-97)
0.00281	15

Viscosity

Temp °C	Absolute mPa·s	Kinematic mm²·s⁻¹
25	21.90	25.40
38	10.22	11.97
50	7.19	8.49

Distillation

Volume Fraction	Temp / °C
0.05	145.7
0.10	167.9
0.15	195.2
0.20	223.6
0.25	251.9
0.30	281.2
0.35	306.5
0.40	330.8
0.45	352.0
F.B.P.	354.0

Method
A.S.T.M. - D86*

Initial Boiling Point
102.2

Absolute Barometric Pressure (kPa)
88.7

Room Temp (°C)
21.0

Characterization Factor
12.0

200 °C Naphtha	275 °C Kerosene	350 °C Light Gas Oil
0.16	0.29	0.44

Recovered	Residue	Distillation Loss
0.50	0.50	0.00

Remarks:

BS&W performed on oil portion only. The distillation temperatures have been corrected to 101.3 kPa (abs).



STATIC GRADIENT REPORT

N.E.E. COPY

**PARAMOUNT RESOURCES LTD.
PARA ET AL FT. LIARD I 46
Static Gradient
Mar 15/2001**

**Test Completed By
Solid Production Services
505 - 19th Ave
Nisku, Alberta
T9E-7V9
(780) 955-7525**

GENERAL INFORMATION

Client Information:

Company: Paramount Resources Ltd.

Contact:

Phone: Fax: e-mail:

Site Information:

Contact:

Phone: Fax: e-mail:

Well Information:

Name: Para et al Ft. Liard I 46

Operator:

Location-Downhole: Para et al Ft. Liard I 46

Location-Surface:

Test Information:

Company: Solid Production Services Ltd.

Representative:

Supervisor:

Test Type: Static Gradient Job Number: 0103126

Test Unit:

Start Date: 2001/03/15 Start Time: 15:40:00

End Date: 2001/03/15 End Time: 17:00:00

Report Date: 2001/03/19 Prepared By: Ella Berscheid

Remarks: Qualified By:

WELL INFORMATION

Well Name : Para et al Ft. Liard I 46

Well Operator :

Well Location : Para et al Ft. Liard I 46

Location-Surface :

Field : Ft. Liard

Well Type : Vertical

Pool :

Formation : Mattson Sand

Perforation Type :

Producing Through : Tubing

Size

60.30 mm

Pool Datum

m

CF

Elevation Referenced From

542.20 m

KB

Datum Depth

m

CF

Elevation Referenced To

537.20 m

GL

Offset

5.00 m

Production Intervals

Production Interval & MPP Reference To : KB

MPP Pressure Reference : None

	From - m	To - m	Depth - m	Pressure - kPa
1.	1616.00	1619.00	1.	1617.50
2.			2.	
3.			3.	
4.			4.	
5.			5.	
6.			6.	
7.			7.	
8.			8.	
9.			9.	
10.			10.	
11.			11.	
12.			12.	

Remarks :

Paramount Resources Ltd.
 Para et al Ft. Liard I 46
 Start Test Date: 2001/03/15
 Final Test Date: 2001/03/15

Static Gradient Top gauge 71045

Para et al Ft. Liard I 46
 Formation: Mattson Sand

Job Number: 0103126

Top

Gauge Serial Number	71045	Gauge Type	ss2500
Gauge Manufacturer	Spartek	Maximum Recorder Range	20685.00 kPa
Run Depth	1612.50000 m	Date of Last Calibration	2000/06/26
Gauge Start Date	2001/03/15 15:40:00	Gauge Stop Date	2001/03/15 17:00:00
Date Gauge On Bottom	2001/03/15 16:38:00	Date Gauge Off Bottom	2001/03/15 16:48:00

Test Data

Test/Prod Interval Top KB (TVD)	1616.00000 m	Base KB (TVD)	1619.00000 m
Pool Datum	m	Datum Depth	m
Tubing Pressure Initial	11854.00 kPa(a)	Final	kPa(a)
Casing Pressure Initial	5038.00 kPa(a)	Final	kPa(a)
Start Test Date	2001/03/15 15:40:00	Time Well Shut-In	

Depth m	Time hh:mm:ss	Duration min	Pressure kPa(a)	Gradient kPa/m	Temp. °C	Gradient °C/m
4.50	15:50:58	10.97	11842.22		7.37	
304.50	15:58:57	8.00	12254.04	1.373	7.71	0.001
604.50	16:06:57	8.00	12648.50	1.315	17.77	0.034
904.50	16:14:58	8.00	13043.23	1.316	28.99	0.037
1204.50	16:22:57	8.00	13434.72	1.305	41.40	0.041
1504.50	16:29:58	7.00	14404.60	3.233	52.28	0.036
1604.50	16:35:58	6.00	15155.97	7.514	57.94	0.057
1612.50	16:46:28	10.50	15226.37	8.799	59.90	0.245

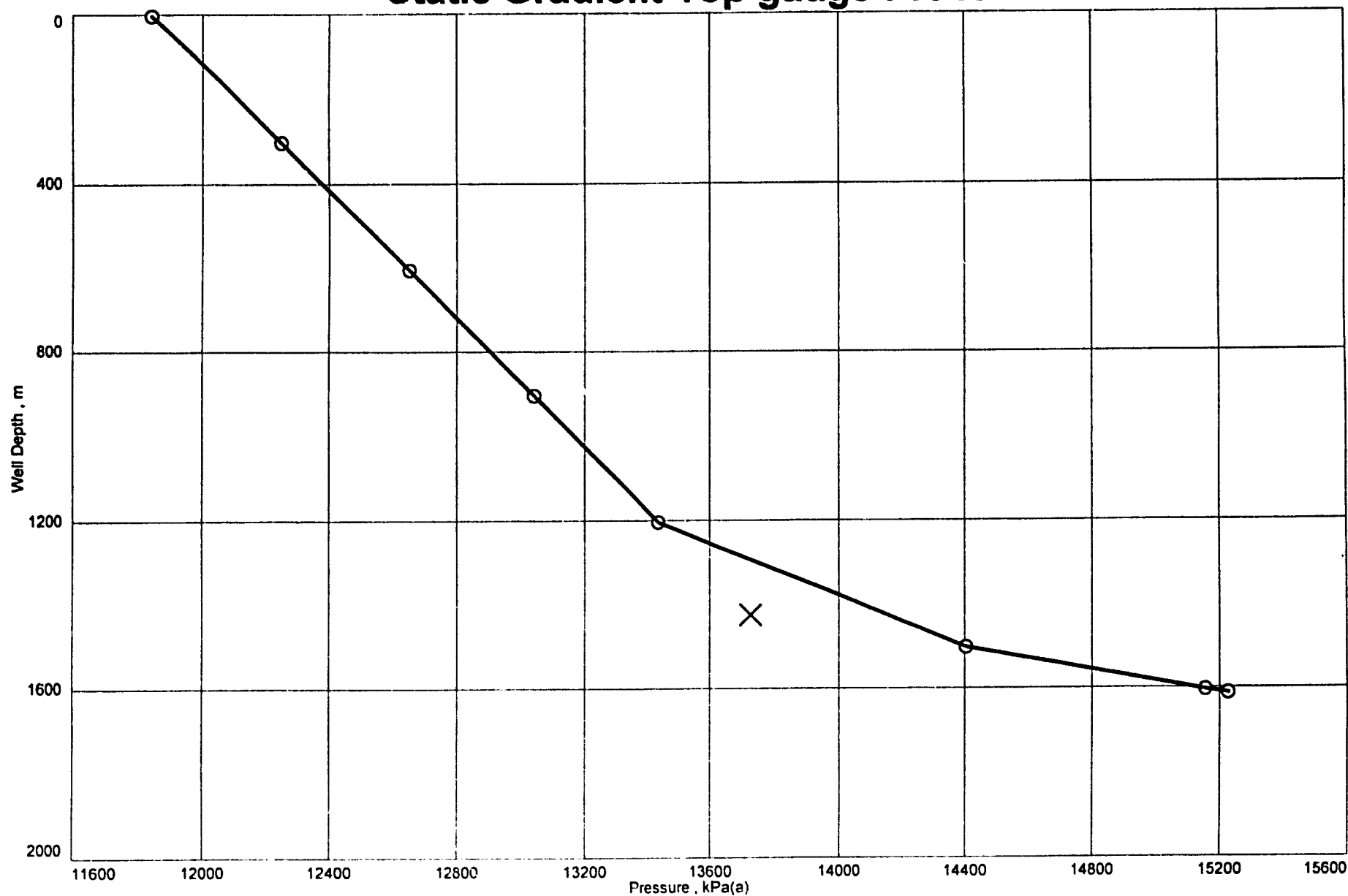
Results

Gas Gradient	1.305 kPa/m	Gas/Liquid Interface	1427.32 m	13725.50 kPa(a)
Liquid Gradient	8.799 kPa/m	Well Datum (MPP)	1617.50 m	15270.36 kPa(a)

Paramount Resources Ltd.
Para et al Ft. Liard I 46
Start Test Date: 2001/03/15
Final Test Date: 2001/03/15

Para et al Ft. Liard I 46
Formation: Mattson Sand
Job Number: 0103126

Static Gradient-Top gauge 71045



Paramount Resources Ltd.
 Para et al Ft. Liard I 46
 Start Test Date: 2001/03/15
 Final Test Date: 2001/03/15

Static Gradient Bottom gauge 71042

Para et al Ft. Liard I 46
 Formation: Mattson Sand

Job Number: 0103126

Bottom

Gauge Serial Number	71042	Gauge Type	ss2500
Gauge Manufacturer	Spartek	Maximum Recorder Range	20685.00 kPa
Run Depth	1613.00000 m	Date of Last Calibration	2000/05/17
Gauge Start Date	2001/03/15 15:40:00	Gauge Stop Date	2001/03/15 17:00:00
Date Gauge On Bottom	2001/03/15 16:38:00	Date Gauge Off Bottom	2001/03/15 16:48:00

Test Data

Test/Prod Interval Top KB (TVD)	1616.00000 m	Base KB (TVD)	1619.00000 m
Pool Datum	m	Datum Depth	m
Tubing Pressure Initial	11854.00 kPa(a) Final		kPa(a)
Casing Pressure Initial	5038.00 kPa(a) Final		kPa(a)
Start Test Date	2001/03/15 15:40:00	Time Well Shut-In	

Depth m	Time hh:mm:ss	Duration min	Pressure kPa(a)	Gradient kPa/m	Temp. °C	Gradient °C/m
5.00	15:51:57	11.95	11850.21		3.38	
305.00	15:58:57	7.00	12263.19	1.377	7.17	0.013
605.00	16:06:57	8.00	12660.86	1.326	18.19	0.037
905.00	16:14:58	8.00	13056.90	1.320	29.57	0.038
1205.00	16:22:57	8.00	13449.98	1.310	41.88	0.041
1505.00	16:29:58	7.00	14425.30	3.251	52.50	0.035
1605.00	16:35:58	6.00	15180.27	7.550	57.98	0.055
1613.00	16:46:28	10.50	15250.60	8.791	59.83	0.231

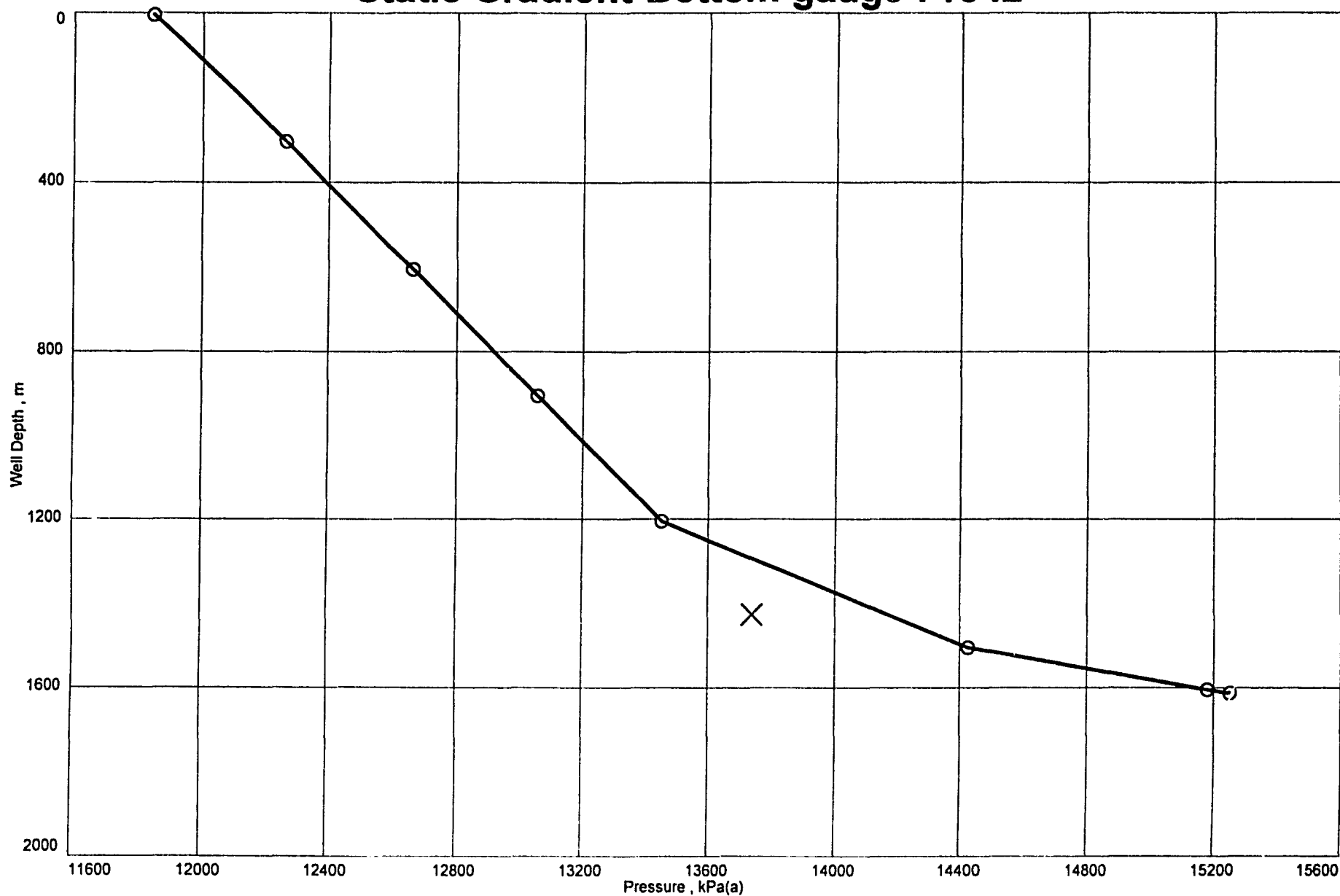
Results

Gas Gradient	1.310 kPa/m	Gas/Liquid Interface	1427.16 m	13741.01 kPa(a)
Liquid Gradient	8.791 kPa/m	Well Datum (MPP)	1617.50 m	15290.16 kPa(a)

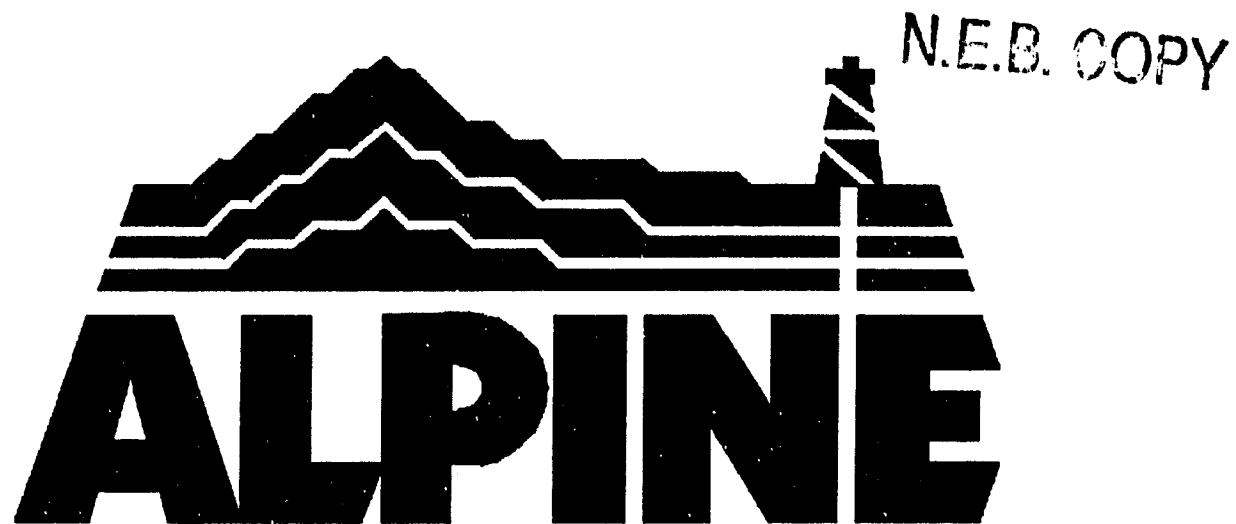
Paramount Resources Ltd.
Para et al Ft. Liard I 46
Start Test Date: 2001/03/15
Final Test Date: 2001/03/15

Para et al Ft. Liard I 46
Formation: Mattson Sand
Job Number: 0103126

Static Gradient-Bottom gauge 71042



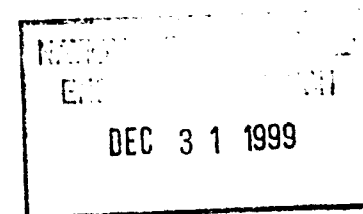
**ALPINE
SWABBING
REPORT**



CUSTOMER: Paramount Resources Ltd.
WELL NAME: Para et al Fort Liard
LOCATION: I-46
START DATE: 13-Dec-99
FORMATION:

FILE NAME: J-4148.xls
CUSTOMER REP: W. Calihoo
SUPERVISORS: B. Tiedemann
TEST UNIT:
OPERATION: Underbalanced Drilling

Alpine Oil Services Corp.



ALPINE OIL SERVICES CORP.

Job No : 4148 Alpine Supervisor: BRENT TIEDEMANN															
Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/13	SPOT AND RIG UP EQUIPMENT. RIG UP ROTATING HEAD.														
99/12/14															
14:00:00	PRESSURE TEST FLOWLINE AND MANIFOLD TO 10,000 kPa.														
15:00:00	START TO RUN IN HOLE TO DRILL OUT CEMENT.														
22:00:00	START DRILLING OUT CEMENT.														
99/12/15															
2:38:00	START TO PULL OUT OF HOLE.														
6:08:00	OUT OF HOLE.														
6:39:00	RUN IN HOLE TO DISPLACE HOLE WITH NITROGEN.														
9:30:00	20 STANDS OFF BOTTOM. DIVERT FLOW LINE FROM SHAKER TO PRESSURE TANK.														
9:45:00	INSTALL BEARING ASSEMBLY IN ROTATING HEAD. PREPARE TO BLOW DOWN HOLE WITH NITROGEN.														
10:00:00	NITROGEN LINE FROZEN FROM STAND PIPE BACK.														
10:00:02	-0.53	-22.08	-0.05	0	0	0	0	0	0	0	0	0			
10:10:02	12.43	-22.08	0.05	0	0	0	0	0	0	0	0	0			
10:20:01	20.1	-22.09	-0.05	0	0	0	0	0	0	0	0	0			
10:30:01	25.99	-22.08	0.2	0	0	0	0	0	0	0	0	0			
10:40:01	28.93	-22.08	0.2	0	0	0	0	0	0	0	0	0			
10:50:01	28.93	-22.08	0.2	0	0	0	0	0	0	0	0	0			
11:00:01	28.93	-22.08	0.2	0	0	0	0	0	0	0	0	0			
11:10:01	27.17	-22.08	0.05	0	0	0	0	0	0	0	0	0			
11:20:01	25.99	-22.08	0.44	0	0	0	0	0	0	0	0	0			
11:30:01	18.33	-22.08	0.05	0	0	0	0	0	0	0	0	0			
11:40:01	14.2	-22.08	0.44	0	0	0	0	0	0	0	0	0			
11:50:01	15.97	-22.06	0.83	0	0	0	0	0	0	0	0	0			
12:00:01	20.68	-22.04	1.23	0	0	0	0	0	0	0	0	0			
12:10:01	14.2	-22.09	0.44	0	0	0	0	0	0	0	0	0			
12:20:01	11.26	-22.08	0.44	0	0	0	0	0	0	0	0	0			
12:25:00	START PUMPING NITROGEN TO DISPLACE HOLE.														
12:30:01	11.26	-22.08	0.2	0	0	0	-48.96	0	0	0	0	34			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/15																
12:40:01	9.49	-13.76	0.29	0	0	0	-48.96	0	0	0	0	34				
12:50:01	12.43	-11.71	0.29	0	0	0	-48.96	0	0	0	0	34				
12:54:00	WATER TO SURFACE.															
13:00:01	183.35	-2.6	9.87	3.84	0	3.84	-45.12	0	0	0	0	34				
13:10:01	76.07	-1.63	46.84	58.79	0	58.79	9.83	1.21	0	1.21	0	34				
13:20:01	53.69	-5.16	33.2	50.25	0	50.25	1.29	1.56	0	1.56	0	34				
13:21:00	STOP PUMPING NITROGEN. 13.45 m3 WATER RECOVERED. CONTINUE TO RUN IN HOLE.															
13:30:01	12.43	-8.11	2.01	0	0	0	0	1.63	0	1.63	0	0				
13:40:01	13.03	-12.42	1.33	0	0	0	0	1.63	0	1.63	0	0				
13:50:01	8.31	-16.48	0.93	0	0	0	0	1.63	0	1.63	0	0				
14:00:01	8.31	-19.49	0.93	0	0	0	0	1.63	0	1.63	0	0				
14:10:01	8.31	-21.76	0.93	0	0	0	0	1.63	0	1.63	0	0				
14:20:01	5.37	-22.08	0.93	0	0	0	0	1.66	0	1.66	0	0				
14:30:01	5.37	-22.08	1.92	0	0	0	0	1.68	0	1.68	0	0				
14:40:01	8.31	-22.05	-0.05	0	0	0	0	1.68	0	1.68	0	0				
14:50:01	-15.26	-22.08	-23.13	0	0	0	0	1.68	0	1.68	0	0				
14:53:00	ON BOTTOM. START PUMPING NITROGEN TO DISPLACE HOLE.															
15:00:01	-12.31	-22.09	-17.48	0	0	0	-48.96	1.7	0	1.7	0	34				
15:10:01	-5.25	-22.09	-9.28	0	0	0	-48.96	1.8	0	1.8	0	34				
15:20:01	7.13	-22.09	-1.62	0	0	0	-48.96	1.9	0	1.9	0	34				
15:30:02	6.54	-22.08	5.7	0	0	0	-48.96	2	0	2	0	34				
15:36:00	WATER TO SURFACE.															
15:40:01	113.17	-5.93	265.93	195.03	0	195.03	146.07	2.49	0	2.49	0	34				
15:50:01	120.27	0.11	76.06	82.33	0	82.33	33.37	3.54	0	3.54	0	34				
16:00:01	68.99	-2.54	41.83	55.16	0	55.16	6.2	3.96	0	3.96	0	34				
16:10:01	58.4	-4.57	40.95	54.18	0	54.18	5.22	4.34	0	4.34	0	34				
16:20:01	55.45	-6.4	40.95	53.47	0	53.47	4.51	4.71	0	4.71	0	34				
16:30:01	55.45	-7.8	40.46	52.23	0	52.23	3.27	5.08	0	5.08	0	34				
16:40:01	55.45	-8.78	38.5	52.44	0	52.44	3.48	5.45	0	5.45	0	34				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/15																
16:50:01	60.15	-9.3	35.69	47.6	0	47.6	-1.36	5.8	0	5.8	0	34				
17:00:00	TOTAL WATER RECOVERED - 22.0 m3. CONTINUE TO DRY HOLE.															
17:00:01	58.4	-9.39	34.81	48.14	0	48.14	-0.82	6.13	0	6.13	0	34				
17:10:01	53.69	-9.42	36.64	49.7	0	49.7	0.74	6.47	0	6.47	0	34				
17:20:01	60.15	-9.48	37.16	49.88	0	49.88	0.92	6.82	0	6.82	0	34				
17:30:01	55.45	-9.89	36.78	49.65	0	49.65	0.69	7.16	0	7.16	0	34				
17:40:01	52.5	-9.99	36.04	48.77	0	48.77	-0.19	7.5	0	7.5	0	34				
17:50:01	53.69	-10.2	34.43	47.43	0	47.43	-1.53	7.84	0	7.84	0	34				
18:00:01	58.4	-9.94	33.83	46.53	0	46.53	-2.43	8.16	0	8.16	0	34				
18:10:01	63.1	-10.29	32.01	44.77	0	44.77	-4.19	8.48	0	8.48	0	34				
18:20:01	52.5	-11.34	27.45	40.71	0	40.71	-8.25	8.77	0	8.77	0	34				
18:30:01	50.74	-12.14	27.8	40.76	0	40.76	-8.2	9.05	0	9.05	0	34				
18:31:00	STOP PUMPING NITROGEN. MONITOR FOR INFLOW.															
18:40:01	61.91	-13.57	4.17	0	0	0	0	9.13	0	9.13	0	0				
18:45:00	CLOSE ANNULUS. MONITOR BUILD UP.															
18:50:01	52.5	-16.01	1.67	0	0	0	0	9.13	0	9.13	0	0				
19:00:01	49.56	-18.24	1.18	0	0	0	0	9.13	0	9.13	0	0				
19:00:00	OPEN ANNULUS. WELL DEAD. PULL OUT OF HOLE.															
19:10:01	55.45	-20.04	1.18	0	0	0	0	9.13	0	9.13	0	0				
19:20:01	57.21	-20.06	1.57	0	0	0	0	9.13	0	9.13	0	0				
19:30:01	50.74	-20.08	1.03	0	0	0	0	9.13	0	9.13	0	0				
19:40:01	49.56	-20.09	1.18	0	0	0	0	9.13	0	9.13	0	0				
19:50:01	52.5	-20.08	0.69	0	0	0	0	9.16	0	9.16	0	0				
20:00:01	52.5	-20.09	0.44	0	0	0	0	9.24	0	9.24	0	0				
20:10:01	47.8	-20.09	0.79	0	0	0	0	9.29	0	9.29	0	0				
20:20:01	49.56	-20.08	1.18	0	0	0	0	9.3	0	9.3	0	0				
20:30:01	52.5	-20.08	1.42	0	0	0	0	9.3	0	9.3	0	0				
20:40:01	60.15	-20.06	1.82	0	0	0	0	9.3	0	9.3	0	0				
20:50:01	52.5	-20.07	1.42	0	0	0	0	9.3	0	9.3	0	0				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/15															
21:00:01	52.5	-20.09	1.18	0	0	0	0	9.3	0	9.3	0	0			
21:10:01	57.21	-20.09	1.33	0	0	0	0	9.3	0	9.3	0	0			
21:20:01	49.56	-20.08	1.18	0	0	0	0	9.3	0	9.3	0	0			
21:30:01	49.56	-20.06	0.93	0	0	0	0	9.3	0	9.3	0	0			
21:40:01	54.26	-20.08	1.33	0	0	0	0	9.3	0	9.3	0	0			
21:50:01	49.56	-20.09	0.93	0	0	0	0	9.3	0	9.3	0	0			
22:00:00	OUT OF HOLE.														
22:00:01	49.56	-20.09	0.93	0	0	0	0	9.3	0	9.3	0	0			
22:10:01	50.74	-20.08	0.79	0	0	0	0	9.3	0	9.3	0	0			
22:10:00	RUN IN HOLE WITH AIR HAMMER.														
22:20:01	52.5	-20.09	0.93	0	0	0	0	9.3	0	9.3	0	0			
22:30:01	49.56	-20.08	0.93	0	0	0	0	9.3	0	9.3	0	0			
22:40:01	47.8	-20.09	0.79	0	0	0	0	9.3	0	9.3	0	0			
22:50:01	49.56	-20.09	0.93	0	0	0	0	9.3	0	9.3	0	0			
23:00:01	49.56	-20.09	0.93	0	0	0	0	9.3	0	9.3	0	0			
23:10:01	49.56	-20.08	0.69	0	0	0	0	9.3	0	9.3	0	0			
23:20:01	52.5	-20.09	0.69	0	0	0	0	9.3	0	9.3	0	0			
23:30:01	52.5	-20.09	0.93	0	0	0	0	9.3	0	9.3	0	0			
23:40:01	61.91	-20.09	1.47	0	0	0	0	9.3	0	9.3	0	0			
23:50:01	52.5	-20.08	1.18	0	0	0	0	9.3	0	9.3	0	0			
0:00:01	57.21	-20.07	1.08	0	0	0	0	9.3	0	9.3	0	0			
0:10:03	52.5	-20.08	0.69	0	0	0	0	9.3	0	9.3	0	0			
0:20:03	50.74	-20.08	0.54	0	0	0	0	9.3	0	9.3	0	0			
0:30:03	50.74	-20.06	0.54	0	0	0	0	9.3	0	9.3	0	0			
0:40:03	52.5	-20.06	0.69	0	0	0	0	9.3	0	9.3	0	0			
0:50:03	53.69	-20.08	0.54	0	0	0	0	9.3	0	9.3	0	0			
1:00:03	60.15	-20.06	1.08	0	0	0	0	9.3	0	9.3	0	0			
1:10:03	50.74	-20.08	0.54	0	0	0	0	9.3	0	9.3	0	0			
1:20:03	52.5	-20.09	0.69	0	0	0	0	9.3	0	9.3	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3	
99/12/16																
1:30:03	50.74	-20.09	0.29	0	0	0	0	9.3	0	9.3	0	0				
1:40:03	52.5	-20.09	0.69	0	0	0	0	9.3	0	9.3	0	0				
1:50:03	54.26	-20.08	1.08	0	0	0	0	9.3	0	9.3	0	0				
2:00:03	54.26	-20.08	1.08	0	0	0	0	9.3	0	9.3	0	0				
2:10:03	52.5	-20.08	0.44	0	0	0	0	9.3	0	9.3	0	0				
2:20:03	49.56	-20.06	0.44	0	0	0	0	9.3	0	9.3	0	0				
2:30:03	54.26	-20.06	0.83	0	0	0	0	9.3	0	9.3	0	0				
2:40:03	52.5	-20.09	0.44	0	0	0	0	9.3	0	9.3	0	0				
2:50:03	47.8	-20.07	0.29	0	0	0	0	9.3	0	9.3	0	0				
3:00:03	52.5	-20.09	0.44	0	0	0	0	9.3	0	9.3	0	0				
3:10:03	52.5	-20.06	0.69	0	0	0	0	9.3	0	9.3	0	0				
3:20:03	47.8	-20.08	0.29	0	0	0	0	9.3	0	9.3	0	0				
3:21:00	BACK ON BOTTOM. INSTALL BEARING ASSEMBLY IN ROTATING HEAD.															
3:30:03	54.26	-20.05	1.08	0	0	0	0	9.3	0	9.3	0	0				
3:40:03	55.45	-20.07	0.44	0	0	0	0	9.3	0	9.3	0	0				
3:50:03	50.74	-20.09	0.29	0	0	0	0	9.3	0	9.3	0	0				
3:57:00	START PUMPING NITROGEN AT 36 m3/min.															
4:00:03	57.21	-20.06	14.83	22.65	0	22.65	-29.19	9.34	0	9.34	0	36				
4:10:03	53.69	-16.7	44.01	54.01	0	54.01	2.17	9.63	0	9.63	0	36				
4:15:00	HOLD SAFETY MEETING.															
4:20:03	58.4	-12.02	43.65	54.51	0	54.51	2.67	10.02	0	10.02	0	36				
4:30:03	61.34	-10.7	45.62	56.12	0	56.12	4.28	10.38	0	10.38	0	36				
4:40:03	63.1	-10.13	50.66	59.66	0	59.66	7.82	10.77	0	10.77	0	36				
4:50:03	58.4	-9.82	55.19	63.04	0	63.04	11.2	11.17	0	11.17	0	36				
4:50:00	RIG HOLD BOP DRILL.															
5:00:03	56.64	-9.66	47.44	57.76	0	57.76	5.92	11.58	0	11.58	0	36				
5:10:03	58.4	-9.54	50.04	58.42	0	58.42	6.58	11.97	0	11.97	0	36				
5:10:00	START DRILLING WITH AIR HAMMER.															
5:20:03	59.4	-9.39	6.33	0	0	0	-51.84	12.18	0	12.18	0	36				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/16																
5:30:03	58.4	-9.35	54.21	62.15	0	62.15	10.31	12.66	0	12.66	0	36				
5:40:03	61.34	-9.22	30.89	44.99	0	44.99	-6.85	13.01	0	13.01	0	36				
5:50:03	58.4	-9.08	42.67	54.34	0	54.34	2.5	13.39	0	13.39	0	36				
5:53:00	DROP 1550 m SAMPLE.															
6:00:03	61.34	-8.94	41.44	53.33	0	53.33	1.49	13.76	0	13.76	0	36				
6:10:00	DROP 1555 m SAMPLE.															
6:10:03	61.34	-8.73	49.54	60.61	0	60.61	8.77	14.1	0	14.1	0	36				
6:20:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
6:20:03	70.75	-8.4	67.49	72.59	0	72.59	72.59	14.59	0	14.59	0	0				
6:26:00	CONNECTION COMPLETE. START PUMPING NITROGEN.															
6:30:03	56.64	-8.19	20.43	33.88	0	33.88	-17.96	14.88	0	14.88	0	36				
6:40:03	70.75	-8.25	25.03	39.17	0	39.17	-12.67	15.2	0	15.2	0	36				
6:50:03	58.4	-8.6	28.68	43.05	0	43.05	-8.79	15.55	0	15.55	0	36				
7:00:03	67.8	-8.62	70.92	74.8	0	74.8	22.96	15.9	0	15.9	0	36				
7:10:03	66.04	-8.29	64.16	70.86	0	70.86	19.02	16.27	0	16.27	0	36				
7:15:00	DROP 1560 m SAMPLE.															
7:20:03	68.99	-7.92	59.99	67.21	0	67.21	15.37	16.65	0	16.65	0	36				
7:30:03	61.34	-7.39	51.26	61.38	0	61.38	9.54	17.06	0	17.06	0	36				
7:40:00	DROP 1565 m SAMPLE.															
7:40:03	64.29	-7.05	30.89	45.57	0	45.57	-6.27	17.45	0	17.45	0	36				
7:47:00	KELLY DOWN. WORK PIPE.															
7:49:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
7:50:03	67.23	-6.28	49.3	60.22	0	60.22	60.22	17.91	0	17.91	0	0				
7:54:00	CONNECTION COMPLETE. START PUMPING NITROGEN.															
8:00:03	61.34	-7.08	30.29	43.7	0	43.7	-8.14	17.96	0	17.96	0	36				
8:10:03	70.75	-7.65	25.73	39.17	0	39.17	-12.67	18.01	0	18.01	0	36				
8:20:03	47.8	-7.61	32.22	46.99	0	46.99	-4.85	18.28	0	18.28	0	36				
8:25:00	RETURNS COMING BACK WET. PICK UP OFF BOTTOM AND CIRCULATE.															
8:30:03	45.43	8.77	26.12	42.04	0	42.04	-9.8	18.66	0	18.66	0	36				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/16															
8:40:03	152.61	15.71	51.26	61.52	0	61.52	9.68	19.1	0	19.1	0	36			
8:50:03	154.34	4.61	46.24	57.85	0	57.85	6.01	19.51	0	19.51	0	36			
9:00:03	157.29	2.83	45.51	56.95	0	56.95	5.11	19.9	0	19.9	0	36			
9:10:03	156.77	2.74	45.23	56.94	0	56.94	5.1	20.3	0	20.3	0	36			
9:14:00	RETURNS DRYING UP. RESUME DRILLING.														
9:20:03	117.26	2.72	22.78	37.7	0	37.7	-14.14	20.63	0	20.63	0	36			
9:24:00	DROP 1570 m SAMPLE.														
9:30:03	192.63	2.41	43.79	55.08	0	55.08	3.24	20.97	0	20.97	0	36			
9:40:03	164.4	2.46	42.18	54.17	0	54.17	2.33	21.34	0	21.34	0	36			
9:50:04	168.56	2.9	54.81	63.7	0	63.7	11.86	21.75	0	21.75	0	36			
9:55:00	INCREASE NITROGEN INJECTION RATE TO 41 m3/min.														
10:00:00	DROP 1575 m SAMPLE.														
10:00:02	187.97	3.39	64.77	70.79	0	70.79	11.75	22.17	0	22.17	0	41			
10:02:00	KELLY DOWN. WORK PIPE.														
10:05:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
10:08:00	CONNECTION COMPLETE. START PUMPING NITROGEN.														
10:10:03	104.27	3.56	24.15	38.19	0	38.19	-20.85	22.63	0	22.63	0	41			
10:20:03	103.73	3.34	23.38	36.17	0	36.17	-22.87	22.9	0	22.9	0	41			
10:30:03	124.89	3.56	39.37	50.61	0	50.61	-8.43	23.23	0	23.23	0	41			
10:40:03	143.77	3.8	55.44	62.87	0	62.87	3.83	23.62	0	23.62	0	41			
10:43:00	DROP 1580 m SAMPLE.														
10:50:03	133.2	4.06	48.92	58.68	0	58.68	-0.36	24.07	0	24.07	0	41			
11:00:03	111.37	4.14	35.06	47.16	0	47.16	-11.88	24.44	0	24.44	0	41			
11:10:03	169.07	4.1	61.22	62.71	0	62.71	3.67	24.84	0	24.84	0	41			
11:15:00	KELLY DOWN. WORK PIPE.														
11:16:00	DROP 1585 m SAMPLE.														
11:20:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
11:20:03	142.04	4.24	63.9	62.36	0	62.36	62.36	25.26	0	25.26	0	0			
11:24:00	CONNECTION COMPLETE. START PUMPING NITROGEN.														

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/16																
11:30:03	99.58	4.23	31.38	39.56	0	39.56	-19.48	25.54	0	25.54	0	41				
11:40:03	99.58	3.74	28.92	36.55	0	36.55	-22.49	25.78	0	25.78	0	41				
11:50:03	139.09	3.56	54.81	55.76	0	55.76	-3.28	26.16	0	26.16	0	41				
12:00:03	120.2	3.43	40.95	45.94	0	45.94	-13.1	26.49	0	26.49	0	41				
12:08:00	DROP 1590 m SAMPLE.															
12:10:03	130.78	3.43	58.03	56.15	0	56.15	-2.89	26.87	0	26.87	0	41				
12:20:03	140.83	3.29	64.52	60.62	0	60.62	1.58	27.21	0	27.21	0	41				
12:30:03	131.99	3.36	48.56	51.07	0	51.07	-7.97	27.6	0	27.6	0	41				
12:40:03	114.31	3.35	43.16	46.46	0	46.46	-12.58	27.93	0	27.93	0	41				
12:50:03	134.93	3.34	55.93	55.1	0	55.1	-3.94	28.27	0	28.27	0	41				
13:00:03	138.41	3.33	58.16	55.98	0	55.98	-3.06	28.61	0	28.61	0	41				
13:06:00	KELLY DOWN. WORK PIPE. DROP 1595 m SAMPLE.															
13:08:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
13:10:03	131.99	3.37	61.08	58.12	0	58.12	58.12	29.03	0	29.03	0	0				
13:12:00	CONNECTION COMPLETE. START PUMPING NITROGEN.															
13:20:03	111.9	3.46	37.55	41.27	0	41.27	-17.77	29.29	0	29.29	0	41				
13:30:03	118.46	2.95	50.64	50.95	0	50.95	-8.09	29.58	0	29.58	0	41				
13:40:03	116.05	2.51	44.03	47.88	0	47.88	-11.16	29.95	0	29.95	0	41				
13:50:03	134.93	2.24	44.14	46.25	0	46.25	-12.79	30.24	0	30.24	0	41				
14:00:03	129.04	2.05	56.91	59.31	0	59.31	0.27	30.63	0	30.63	0	41				
14:10:03	129.04	1.94	44.39	50.85	0	50.85	-8.19	30.98	0	30.98	0	41				
14:20:03	130.25	1.86	52.11	57.19	0	57.19	-1.85	31.33	0	31.33	0	41				
14:24:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE. PULL OUT OF HOLE FOR BIT.															
14:30:03	62.47	1.88	13.31	17.6	0	17.6	17.6	31.66	0	31.66	0	0				
14:40:03	58.9	2.57	1.47	0	0	0	0	31.68	0	31.68	0	0				
14:50:03	49.5	3.59	0.93	0	0	0	0	31.68	0	31.68	0	0				
15:00:03	49.5	4.32	1.18	0	0	0	0	31.68	0	31.68	0	0				
15:10:03	49.5	4.88	0.93	0	0	0	0	31.68	0	31.68	0	0				
15:20:03	49.5	5.34	0.39	0	0	0	0	31.68	0	31.68	0	0				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/16															
15:30:03	51.25	5.61	0.83	0	0	0	0	31.76	0	31.76	0	0			
15:40:03	46.55	5.79	0.2	0	0	0	0	31.86	0	31.86	0	0			
15:50:03	54.2	5.93	0.83	0	0	0	0	31.96	0	31.96	0	0			
16:00:03	44.79	6.08	0.05	0	0	0	0	32.06	0	32.06	0	0			
16:10:03	10.32	6.2	0.29	0	0	0	0	32.1	0	32.1	0	0			
16:20:03	15.02	6.31	0.44	0	0	0	0	32.1	0	32.1	0	0			
16:30:03	15.02	6.4	0.69	0	0	0	0	32.1	0	32.1	0	0			
16:40:03	19.72	6.47	1.08	0	0	0	0	32.1	0	32.1	0	0			
16:50:03	15.02	6.56	0.93	0	0	0	0	32.1	0	32.1	0	0			
17:00:00	OUT OF HOLE.														
17:00:03	15.02	6.65	1.42	0	0	0	0	32.1	0	32.1	0	0			
17:10:03	12.08	6.87	1.42	0	0	0	0	32.1	0	32.1	0	0			
17:20:03	12.08	7.14	1.42	0	0	0	0	32.1	0	32.1	0	0			
17:30:03	15.02	7.34	1.18	0	0	0	0	32.1	0	32.1	0	0			
17:40:03	15.02	7.47	1.42	0	0	0	0	32.1	0	32.1	0	0			
17:50:03	15.02	7.6	1.18	0	0	0	0	32.1	0	32.1	0	0			
18:00:03	10.32	7.76	1.28	0	0	0	0	32.1	0	32.1	0	0			
18:10:03	12.08	7.88	1.18	0	0	0	0	32.1	0	32.1	0	0			
18:20:03	13.27	8.03	0.79	0	0	0	0	32.1	0	32.1	0	0			
18:30:03	15.02	8.16	0.93	0	0	0	0	32.1	0	32.1	0	0			
18:30:00	START TO RUN IN HOLE WITH NEW AIR HAMMER.														
18:40:03	12.08	8.3	0.93	0	0	0	0	32.1	0	32.1	0	0			
18:50:03	10.32	8.42	0.79	0	0	0	0	32.1	0	32.1	0	0			
19:00:03	13.27	8.57	0.79	0	0	0	0	32.1	0	32.1	0	0			
19:10:03	13.27	8.7	0.54	0	0	0	0	32.1	0	32.1	0	0			
19:20:03	13.27	8.83	0.54	0	0	0	0	32.1	0	32.1	0	0			
19:30:03	15.02	8.96	0.93	0	0	0	0	32.1	0	32.1	0	0			
19:40:03	15.02	9.12	0.69	0	0	0	0	32.1	0	32.1	0	0			
19:50:03	13.27	9.26	0.54	0	0	0	0	32.1	0	32.1	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/16															
20:00:03	13.27	9.38	0.54	0	0	0	0	32.1	0	32.1	0	0			
20:10:03	13.27	9.55	0.54	0	0	0	0	32.1	0	32.1	0	0			
20:20:03	15.02	9.7	0.44	0	0	0	0	32.1	0	32.1	0	0			
20:30:03	15.02	9.88	0.44	0	0	0	0	32.1	0	32.1	0	0			
20:40:03	13.27	10	0.29	0	0	0	0	32.1	0	32.1	0	0			
20:50:03	13.27	10.18	0.54	0	0	0	0	32.1	0	32.1	0	0			
21:00:03	13.27	10.27	0.29	0	0	0	0	32.1	0	32.1	0	0			
21:10:03	15.02	10.42	0.44	0	0	0	0	32.1	0	32.1	0	0			
21:20:03	15.02	10.55	0.2	0	0	0	0	32.1	0	32.1	0	0			
21:30:03	13.27	10.69	0.29	0	0	0	0	32.1	0	32.1	0	0			
21:30:00	BACK ON BOTTOM.														
21:40:19	15.02	10.83	0.44	0	0	0	0	32.1	0	32.1	0	0			
21:48:00	START TO RUN IN SURVEY.														
21:50:03	13.27	10.99	0.29	0	0	0	0	32.1	0	32.1	0	0			
22:00:03	12.08	11.11	-0.05	0	0	0	0	32.1	0	32.1	0	0			
22:10:03	16.21	11.25	0.05	0	0	0	0	32.1	0	32.1	0	0			
22:20:03	16.78	11.36	0.59	0	0	0	0	32.1	0	32.1	0	0			
22:30:03	10.32	11.44	-0.2	0	0	0	0	32.1	0	32.1	0	0			
22:40:03	15.02	11.54	0.2	0	0	0	0	32.1	0	32.1	0	0			
22:48:00	SURVEY COMPLETE. START PUMPING NITROGEN AT 37 m3/min.														
22:50:03	22.11	11.54	7.66	17.18	0	17.18	-36.1	32.11	0	32.11	0	37			
23:00:03	60.41	6.55	28.54	36.27	0	36.27	-17.01	32.32	0	32.32	0	37			
23:01:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE PRESSURE.														
23:05:00	CHANGE OUT BEARING ASSEMBLY ON ROTATING HEAD.														
23:10:03	24.42	6.12	0.74	0	0	0	0	32.48	0	32.48	0	0			
23:20:03	15.02	8.03	0.2	0	0	0	0	32.48	0	32.48	0	0			
23:25:00	START PUMPING NITROGEN.														
23:30:03	13.27	7.88	18.47	24.81	0	24.81	-28.47	32.56	0	32.56	0	37			
23:39:00	RESUME DRILLING.														

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/16																
23:40:03	53.32	5.94	45.86	48.16	0	48.16	-5.12	32.83	0	32.83	0	37				
23:50:03	59.21	5.51	36.04	42.06	0	42.06	-11.22	33.15	0	33.15	0	37				
99/12/17																
0:00:02	62.16	5.48	35.8	41.93	0	41.93	-11.35	33.45	0	33.45	0	37				
0:09:00	DROP 1600 m SAMPLE.															
0:10:02	62.16	5.78	48.56	50.11	0	50.11	-3.17	33.76	0	33.76	0	37				
0:20:02	99.25	5.45	31.76	39.05	0	39.05	-14.23	34.11	0	34.11	0	37				
0:30:02	172.39	5.83	47.69	49.75	0	49.75	-3.53	34.46	0	34.46	0	37				
0:37:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
0:40:02	291.96	6.35	46.11	49.08	0	49.08	49.08	34.77	0	34.77	0	0				
0:42:00	CONNECTION COMPLETE. START PUMPING NITROGEN.															
0:50:02	210.7	6.59	33.2	39.36	0	39.36	-13.92	35.03	0	35.03	0	37				
1:00:02	267.14	6.75	46.73	49.01	0	49.01	-4.27	35.34	0	35.34	0	37				
1:10:02	198.92	6.84	37.13	42.6	0	42.6	-10.68	35.63	0	35.63	0	37				
1:16:00	DROP 1605 m SAMPLE.															
1:20:02	241.88	7.08	36.53	42.6	0	42.6	-10.68	35.95	0	35.95	0	37				
1:30:02	255.45	7.5	56.91	55.95	0	55.95	2.67	36.28	0	36.28	0	37				
1:40:02	222.49	8	57.51	56.46	0	56.46	3.18	36.66	0	36.66	0	37				
1:50:02	189.33	8.42	48.59	50.95	0	50.95	-2.33	37	0	37	0	37				
2:00:02	139.98	8.76	41.8	45.87	0	45.87	-7.41	37.36	0	37.36	0	37				
2:08:00	DROP 1610 m SAMPLE.															
2:10:02	129.92	9.19	38.99	42.15	0	42.15	-11.13	37.71	0	37.71	0	37				
2:20:02	180.01	9.7	60.1	52.84	0	52.84	-0.44	38.03	0	38.03	0	37				
2:30:02	200.63	10.08	84.9	60.84	0	60.84	7.56	38.38	0	38.38	0	37				
2:40:02	156.44	10.38	55.93	44.45	0	44.45	-8.83	38.71	0	38.71	0	37				
2:47:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
2:50:02	116.92	10.21	52.87	43.39	0	43.39	43.39	39.07	0	39.07	0	0				
2:53:00	CONNECTION COMPLETE. START PUMPING NITROGEN.															
3:00:02	95.78	9.93	37.38	35.32	0	35.32	-17.96	39.27	0	39.27	0	37				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/17																
3:10:02	102.2	9.69	38.14	35.8	0	35.8	-17.48	39.55	0	39.55	0	37				
3:20:02	94.57	9.76	43.9	39.11	0	39.11	-14.17	39.85	0	39.85	0	37				
3:25:00	DROP 1615 m SAMPLE.															
3:30:00	BURNABLE GAS TO SURFACE.															
3:30:02	264.2	10.11	127.49	66.63	0	66.63	13.35	40.16	0	40.16	0	37				
3:40:02	372.78	10.43	205.34	113.82	0	113.82	60.54	40.86	0	40.86	0	37				
3:50:02	369.83	10.49	203.13	121.44	0	121.44	68.16	41.68	0	41.68	0	37				
4:00:02	359.72	10.68	186.05	138.99	0	138.99	85.71	42.66	0	42.66	0	37				
4:10:02	346.67	10.76	177.07	131.99	0	131.99	78.71	43.6	0	43.6	0	37				
4:20:02	333.21	10.7	161.5	125.35	0	125.35	72.07	44.49	0	44.49	0	37				
4:27:00	INCREASE NITROGEN INJECTION RATE TO 39.5 m3/min.															
4:30:02	336.15	10.78	161.25	123.68	0	123.68	66.8	45.36	0	45.36	0	39.5				
4:40:02	334.89	11.06	161.12	123.22	0	123.22	66.34	46.22	0	46.22	0	39.5				
4:50:02	290.27	11.06	161.39	123.97	0	123.97	67.09	47.08	0	47.08	0	39.5				
5:00:02	283.12	11.15	152.41	119.58	0	119.58	62.7	47.92	0	47.92	0	39.5				
5:10:02	283.12	11.07	151.19	118.94	0	118.94	62.06	48.75	0	48.75	0	39.5				
5:20:02	265.45	11.13	149.96	117.13	0	117.13	60.25	49.57	0	49.57	0	39.5				
5:22:00	DROP 1620 m SAMPLE.															
5:30:03	253.66	11.13	144.56	114.67	0	114.67	57.79	50.4	0	50.4	0	39.5				
5:40:02	249.01	11.13	143.46	114.71	0	114.71	57.83	51.19	0	51.19	0	39.5				
5:50:02	247.77	11.11	141.86	113.98	0	113.98	57.1	51.99	0	51.99	0	39.5				
6:00:02	247.77	11.18	141.86	114.04	0	114.04	57.16	52.77	0	52.77	0	39.5				
6:10:02	246.52	11.29	140.25	112.19	0	112.19	55.31	53.56	0	53.56	0	39.5				
6:20:02	218.31	11.39	119.27	101.08	0	101.08	44.2	54.31	0	54.31	0	39.5				
6:20:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
6:25:00	CONNECTION COMPLETE. START PUMPING NITROGEN.															
6:30:02	203.58	10.98	115.34	98.57	0	98.57	41.69	55.04	0	55.04	0	39.5				
6:40:02	221.25	11.22	128.35	105.39	0	105.39	48.51	55.75	0	55.75	0	39.5				
6:47:00	DROP 1625 m SAMPLE.															

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/17															
6:50:02	235.98	11.34	141.61	112.1	0	112.1	55.22	56.5	0	56.5	0	39.5			
7:00:02	227.15	11.42	135.72	109.52	0	109.52	52.64	57.26	0	57.26	0	39.5			
7:10:02	240.17	11.6	143.22	114.31	0	114.31	57.43	58.03	0	58.03	0	39.5			
7:20:02	235.98	11.68	128.6	105.97	0	105.97	49.09	58.78	0	58.78	0	39.5			
7:30:02	235.98	11.8	132.53	107.74	0	107.74	50.86	59.53	0	59.53	0	39.5			
7:40:03	231.33	11.89	130.69	104.87	0	104.87	47.99	60.28	0	60.28	0	39.5			
7:50:00	DROP 1630 m SAMPLE.														
7:50:02	237.22	11.98	132.66	105.83	0	105.83	48.95	61.01	0	61.01	0	39.5			
8:00:02	238.93	12.03	132.77	105.25	0	105.25	48.37	61.74	0	61.74	0	39.5			
8:10:02	233.04	11.98	131.55	104.73	0	104.73	47.85	62.47	0	62.47	0	39.5			
8:20:02	225.44	12.16	130.94	102.5	0	102.5	45.62	63.2	0	63.2	0	39.5			
8:30:02	228.38	12.29	130.94	102.98	0	102.98	46.1	63.92	0	63.92	0	39.5			
8:40:02	230.09	12.42	130.32	102.83	0	102.83	45.95	64.63	0	64.63	0	39.5			
8:50:02	225.91	12.59	130.68	102.75	0	102.75	45.87	65.34	0	65.34	0	39.5			
8:57:00	KELLY DOWN. WORK PIPE.														
9:00:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
9:00:02	207	12.67	112.15	93.04	0	93.04	36.16	66.04	0	66.04	0	39.5			
9:03:00	CONNECTION COMPLETE. START PUMPING NITROGEN.														
9:10:02	190.07	12.37	105.4	90.81	0	90.81	33.93	66.63	0	66.63	0	39.5			
9:20:02	224.2	12.06	125.9	101.39	0	101.39	44.51	67.29	0	67.29	0	39.5			
9:30:02	216.6	11.75	123.57	100.13	0	100.13	43.25	67.99	0	67.99	0	39.5			
9:40:02	224.2	11.68	126.14	100.4	0	100.4	43.52	68.69	0	68.69	0	39.5			
9:44:00	DROP 1635 m SAMPLE.														
9:50:02	220.02	11.71	125.53	99.95	0	99.95	43.07	69.39	0	69.39	0	39.5			
10:00:02	215.36	11.52	124.67	100.19	0	100.19	43.31	70.08	0	70.08	0	39.5			
10:10:02	212.41	11.43	124.18	99.36	0	99.36	42.48	70.77	0	70.77	0	39.5			
10:20:02	212.41	11.61	123.69	99.48	0	99.48	42.6	71.46	0	71.46	0	39.5			
10:30:02	212.41	11.75	123.69	99.28	0	99.28	42.4	72.15	0	72.15	0	39.5			
10:40:02	207.76	11.89	122.1	99.47	0	99.47	42.59	72.84	0	72.84	0	39.5			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/17																
10:50:02	206.52	12	120.01	99.3	0	99.3	42.42	73.53	0	73.53	0	39.5				
11:00:02	209.47	12.13	120.01	99.83	0	99.83	42.95	74.23	0	74.23	0	39.5				
11:05:00	STAND PIPE PRESSURING UP. LIFT OFF BOTTOM AND CIRCULATE.															
11:10:02	185.9	12.2	110.68	94.84	0	94.84	37.96	74.88	0	74.88	0	39.5				
11:20:02	199.4	12.32	119.14	99.35	0	99.35	42.47	75.55	0	75.55	0	39.5				
11:24:00	DECREASE NITROGEN INJECTION RATE TO 35 m3/min.															
11:30:02	193.02	12.63	115.71	97.03	0	97.03	46.63	76.24	0	76.24	0	35				
11:40:02	194.74	12.48	115.34	96.44	0	96.44	46.04	76.91	0	76.91	0	35				
11:50:02	188.85	12.45	124.43	100.88	0	100.88	50.48	77.58	0	77.58	0	35				
12:00:02	182.95	12.13	107.98	92.46	0	92.46	42.06	78.23	0	78.23	0	35				
12:10:02	187.62	11.12	107.85	92.41	0	92.41	42.01	78.87	0	78.87	0	35				
12:20:02	190.56	10.12	111.78	94.84	0	94.84	44.44	79.52	0	79.52	0	35				
12:22:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE. MONITOR FLOW.															
12:30:02	129.92	9.32	71.15	70.97	0	70.97	70.97	80.12	0	80.12	0	0				
12:40:02	98.04	8.82	45.89	52.66	0	52.66	52.66	80.56	0	80.56	0	0				
12:50:02	69.25	8.36	32.22	43.68	0	43.68	43.68	80.88	0	80.88	0	0				
12:55:00	PULL OUT OF HOLE FOR BIT.															
13:00:02	71	8.21	31.87	43.53	0	43.53	43.53	81.18	0	81.18	0	0				
13:10:02	66.31	8.32	33.94	45.85	0	45.85	45.85	81.5	0	81.5	0	0				
13:20:02	68.05	8.21	34.57	45.44	0	45.44	45.44	81.81	0	81.81	0	0				
13:30:02	69.8	8.25	34.71	44.41	0	44.41	44.41	82.12	0	82.12	0	0				
13:40:02	66.31	8.58	37.13	44.9	0	44.9	44.9	82.42	0	82.42	0	0				
13:50:02	69.25	9.33	38.85	40.8	0	40.8	40.8	82.72	0	82.72	0	0				
14:00:02	71	9.84	38.25	44.17	0	44.17	44.17	83	0	83	0	0				
14:10:02	71	10.15	38.99	39.97	0	39.97	39.97	83.29	0	83.29	0	0				
14:20:02	73.95	10.29	43.16	44.73	0	44.73	44.73	83.58	0	83.58	0	0				
14:30:02	72.2	10.29	48.18	41.8	0	41.8	41.8	83.88	0	83.88	0	0				
14:40:02	78.63	10.16	39.37	40.39	0	40.39	40.39	84.18	0	84.18	0	0				
14:50:02	73.95	10.03	50.04	42.92	0	42.92	42.92	84.48	0	84.48	0	0				

ALPINE OIL SERVICES CORP.,

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/17															
15:00:02	76.89	9.93	50.53	42.06	0	42.06	42.06	84.77	0	84.77	0	0			
15:10:02	76.89	9.93	58.63	41.96	0	41.96	41.96	85.07	0	85.07	0	0			
15:20:02	106.35	10	69.19	39.47	0	39.47	39.47	85.35	0	85.35	0	0			
15:30:02	124.03	10.01	26.96	40.15	0	40.15	40.15	85.62	0	85.62	0	0			
15:40:02	149.32	10.35	30.04	43.32	0	43.32	43.32	85.91	0	85.91	0	0			
15:50:02	129.92	10.27	28.18	40.83	0	40.83	40.83	86.2	0	86.2	0	0			
16:00:02	137.54	9.85	28.57	42.02	0	42.02	42.02	86.48	0	86.48	0	0			
16:09:00	BIT AT SURFACE. CLOSE BLIND RAMS.														
16:10:02	22.67	9.57	2.55	0	0	0	0	86.69	0	86.69	0	0			
16:13:00	DIVERT FLOW THROUGH HCR. REMOVE BEARING ASSEMBLY FROM ROTATING HEAD.														
16:20:02	63.36	11.67	34.18	42.99	0	42.99	42.99	87.06	0	87.06	0	0			
16:30:02	59.21	12.09	29.41	40.56	0	40.56	40.56	87.34	0	87.34	0	0			
16:40:02	54.52	12.35	29.27	41.53	0	41.53	41.53	87.62	0	87.62	0	0			
16:50:02	57.47	12.58	29.76	40.49	0	40.49	40.49	87.91	0	87.91	0	0			
17:00:02	59.21	12.67	30.15	40.61	0	40.61	40.61	88.19	0	88.19	0	0			
17:10:02	59.21	12.72	30.39	40.25	0	40.25	40.25	88.48	0	88.48	0	0			
17:20:02	60.96	12.72	30.53	38.29	0	38.29	38.29	88.76	0	88.76	0	0			
17:30:02	59.21	12.72	30.15	40.34	0	40.34	40.34	89.03	0	89.03	0	0			
17:35:00	START BACK IN HOLE WITH NEW AIR HAMMER.														
17:40:02	60.96	12.73	29.31	37.6	0	37.6	37.6	89.3	0	89.3	0	0			
17:50:02	56.27	12.71	29.41	38.33	0	38.38	38.38	89.58	0	89.58	0	0			
17:53:00	DIVERT FLOW THROUGH FLOW LINE. CLOSE HCR. CONTINUE TO RUN IN HOLE.														
18:00:02	56.27	0.11	28.18	37.2	0	37.2	37.2	89.82	0	89.82	0	0			
18:10:02	59.21	-3.31	30.15	36.53	0	36.53	36.53	90.08	0	90.08	0	0			
18:20:02	49.82	-3.98	28.39	37.55	0	37.55	37.55	90.34	0	90.34	0	0			
18:30:02	57.47	-2.98	29.27	36.99	0	36.99	36.99	90.59	0	90.59	0	0			
18:40:02	62.16	-1.98	28.68	36.61	0	36.61	36.61	90.85	0	90.85	0	0			
18:50:02	59.21	-3.81	27.45	35.63	0	35.63	35.63	91.1	0	91.1	0	0			
19:00:02	59.21	-6.29	27.94	35.56	0	35.56	35.56	91.35	0	91.35	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/17																
19:10:02	66.85	-7.69	28.82	36.23	0	36.23	36.23	91.6	0	91.6	0	0				
19:20:02	54.52	-8.21	28.04	35.65	0	35.65	35.65	91.85	0	91.85	0	0				
19:30:02	56.27	-8.33	28.43	35.93	0	35.93	35.93	92.1	0	92.1	0	0				
19:40:02	60.96	-8.19	28.82	36.05	0	36.05	36.05	92.35	0	92.35	0	0				
19:50:02	56.27	-7.92	27.69	35.5	0	35.5	35.5	92.6	0	92.6	0	0				
20:00:02	56.27	-5.86	27.94	35.89	0	35.89	35.89	92.85	0	92.85	0	0				
20:10:02	54.52	-6.56	27.55	35.52	0	35.52	35.52	93.09	0	93.09	0	0				
20:20:02	56.27	-7.67	27.69	35.39	0	35.39	35.39	93.34	0	93.34	0	0				
20:30:02	85.73	-7.66	45.13	47.9	0	47.9	47.9	93.56	0	93.56	0	0				
20:40:02	56.27	-6.83	27.69	35.73	0	35.73	35.73	93.83	0	93.83	0	0				
20:50:02	58.01	-7.02	27.34	35.14	0	35.14	35.14	94.07	0	94.07	0	0				
21:00:02	51.57	-7.69	26.57	34.75	0	34.75	34.75	94.32	0	94.32	0	0				
21:10:02	51.57	-7.95	26.57	34.91	0	34.91	34.91	94.56	0	94.56	0	0				
21:20:02	53.32	-7.91	26.71	34.98	0	34.98	34.98	94.8	0	94.8	0	0				
21:30:02	51.57	-8.25	26.82	35.04	0	35.04	35.04	95.05	0	95.05	0	0				
21:40:02	58.01	-8.71	27.1	35.04	0	35.04	35.04	95.29	0	95.29	0	0				
21:50:02	59.76	-9.03	27.24	34.97	0	34.97	34.97	95.53	0	95.53	0	0				
22:00:02	51.57	-9.45	26.57	34.62	0	34.62	34.62	95.77	0	95.77	0	0				
22:10:02	50.38	-8.52	26.22	34.38	0	34.38	34.38	96.01	0	96.01	0	0				
22:15:00	BACK ON BOTTOM. START TO RUN IN SURVEY.															
22:20:02	50.38	-6.45	25.98	34.45	0	34.45	34.45	96.25	0	96.25	0	0				
22:25:00	PICK UP KELLY.															
22:28:00	START PUMPING NITROGEN AT 36 m3/min.															
22:30:02	50.38	-4.8	25.73	34.45	0	34.45	-17.39	96.49	0	96.49	0	36				
22:40:02	92.83	-4.43	54.57	55.18	0	55.18	3.34	96.79	0	96.79	0	36				
22:43:00	STAND PIPE PRESSURING UP. STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.															
22:50:02	100.46	-4.15	60.84	58.78	0	58.78	58.78	97.21	0	97.21	0	0				
23:00:02	47.43	-2.53	25.98	31.19	0	31.19	31.19	97.5	0	97.5	0	0				
23:07:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.															

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/17															
23:10:02	53.32	-0.95	26.47	34.46	0	34.46	-17.38	97.75	0	97.75	0	36			
23:20:02	72.74	-2.54	38.39	43.46	0	43.46	-8.38	98.01	0	98.01	0	36			
23:30:02	177.06	-2.41	104.29	81.2	0	81.2	29.36	98.43	0	98.43	0	36			
23:34:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.														
23:40:02	144.65	-0.51	88.58	72.51	0	72.51	72.51	99	0	99	0	0			
23:43:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														
23:50:02	118.14	0.51	63.29	58.83	0	58.83	6.99	99.42	0	99.42	0	36			
99/12/18															
0:00:02	150.55	0.93	94.23	76.26	0	76.26	24.42	99.9	0	99.9	0	36			
0:10:02	144.65	0.97	100.86	80.26	0	80.26	28.42	100.45	0	100.45	0	36			
0:20:02	139.98	1.59	100.98	80.93	0	80.93	29.09	101.01	0	101.01	0	36			
0:24:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.														
0:29:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														
0:30:02	113.46	2.16	81.82	70.56	0	70.56	18.72	101.56	0	101.56	0	36			
0:40:02	112.25	2.1	79.99	70.48	0	70.48	18.64	102.03	0	102.03	0	36			
0:50:02	124.03	2.03	90.3	76.63	0	76.63	24.79	102.54	0	102.54	0	36			
1:00:02	128.19	1.87	93.37	78.63	0	78.63	26.79	103.08	0	103.08	0	36			
1:10:02	132.87	2.18	96.93	80.24	0	80.24	28.4	103.64	0	103.64	0	36			
1:16:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.														
1:20:02	128.71	2.75	90.92	76.56	0	76.56	76.56	104.19	0	104.19	0	0			
1:21:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														
1:30:02	107.56	3.4	76.67	69.21	0	69.21	17.37	104.67	0	104.67	0	36			
1:40:02	121.08	3.1	84.16	73.35	0	73.35	21.51	105.17	0	105.17	0	36			
1:50:02	134.6	2.78	94.11	78.72	0	78.72	26.88	105.7	0	105.7	0	36			
2:00:02	135.81	3.2	97.42	80.48	0	80.48	28.64	106.25	0	106.25	0	36			
2:10:02	135.81	3.69	96.93	80.19	0	80.19	28.35	106.81	0	106.81	0	36			
2:20:02	140.49	3.97	96.56	80	0	80	28.16	107.36	0	107.36	0	36			
2:30:02	134.08	4.31	97.79	80.58	0	80.58	28.74	107.92	0	107.92	0	36			
2:40:02	140.49	4.56	98.28	80.02	0	80.02	28.18	108.48	0	108.48	0	36			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/18															
2:50:02	134.08	4.78	96.8	79.38	0	79.38	27.54	109.03	0	109.03	0	36			
3:00:02	135.81	4.9	96.93	79.19	0	79.19	27.35	109.58	0	109.58	0	36			
3:10:02	135.81	4.84	97.17	79.08	0	79.08	27.24	110.13	0	110.13	0	36			
3:16:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.														
3:20:02	128.71	5.07	91.9	76.31	0	76.31	24.47	110.68	0	110.68	0	36			
3:22:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														
3:30:02	104.62	5.21	73.72	66.24	0	66.24	14.4	111.14	0	111.14	0	36			
3:40:02	134.6	4.8	89.69	76.44	0	76.44	24.6	111.63	0	111.63	0	36			
3:50:02	129.92	4.79	91.77	78.75	0	78.75	26.91	112.18	0	112.18	0	36			
4:00:02	131.14	5.32	96.8	80.69	0	80.69	28.85	112.73	0	112.73	0	36			
4:01:00	INCREASE NITROGEN INJECTION RATE TO 40 m3/min.														
4:02:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE.														
4:05:00	START TO PULL OUT OF HOLE.														
4:10:02	97.51	5.59	66.24	64.74	0	64.74	64.74	113.27	0	113.27	0	0			
4:20:02	63.9	5.97	38.88	42.01	0	42.01	42.01	113.63	0	113.63	0	0			
4:30:02	48.63	6.22	27.8	32.06	0	32.06	32.06	113.89	0	113.89	0	0			
4:40:02	49.18	6.39	25.87	34.39	0	34.39	34.39	114.1	0	114.1	0	0			
4:50:02	44.48	6.59	25.48	29.83	0	29.83	29.83	114.35	0	114.35	0	0			
5:00:02	44.48	6.83	24.99	30.57	0	30.57	30.57	114.59	0	114.59	0	0			
5:10:02	47.43	6.66	25.73	35.5	0	35.5	35.5	114.82	0	114.82	0	0			
5:20:02	52.12	6.82	25.13	28.3	0	28.3	28.3	115.05	0	115.05	0	0			
5:30:02	44.48	7.17	24.26	33.95	0	33.95	33.95	115.28	0	115.28	0	0			
5:40:02	44.48	7.44	23.52	27.44	0	27.44	27.44	115.51	0	115.51	0	0			
5:50:02	44.48	7.87	23.27	36.06	0	36.06	36.06	115.74	0	115.74	0	0			
6:00:02	44.48	8.14	23.27	32.56	0	32.56	32.56	115.97	0	115.97	0	0			
6:10:02	44.48	8.34	23.27	34.97	0	34.97	34.97	116.2	0	116.2	0	0			
6:20:02	53.87	8.56	23.31	35.04	0	35.04	35.04	116.43	0	116.43	0	0			
6:30:02	44.48	8.79	22.78	33.77	0	33.77	33.77	116.66	0	116.66	0	0			
6:40:02	41.54	9.06	22.78	28.44	0	28.44	28.44	116.88	0	116.88	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/18															
6:50:02	44.48	9.54	22.29	35.87	0	35.87	35.87	117.11	0	117.11	0	0			
7:00:02	41.54	9.87	22.29	28.36	0	28.36	28.36	117.33	0	117.33	0	0			
7:10:02	44.48	10.09	22.05	32.18	0	32.18	32.18	117.55	0	117.55	0	0			
7:20:02	49.18	10.36	22.68	30.17	0	30.17	30.17	117.78	0	117.78	0	0			
7:30:02	53.87	10.64	23.07	36.41	0	36.41	36.41	118.01	0	118.01	0	0			
7:40:02	44.48	11.23	22.29	32.54	0	32.54	32.54	118.24	0	118.24	0	0			
7:50:02	39.79	11.79	21.66	28.92	0	28.92	28.92	118.47	0	118.47	0	0			
8:00:00	BIT AT SURFACE. OPEN HCR. CLOSE BLIND RAMS AND FLOW LINE. REMOVE BEARING ASSEMBLY FROM ROTATING HEAD.														
8:00:02	41.54	11.92	21.07	30.45	0	30.45	30.45	118.68	0	118.68	0	0			
8:10:02	46.23	12.17	22.19	34	0	34	34	118.9	0	118.9	0	0			
8:20:02	42.73	12.77	21.9	33.02	0	33.02	33.02	119.13	0	119.13	0	0			
8:30:02	44.48	13.33	21.8	29.33	0	29.33	29.33	119.37	0	119.37	0	0			
8:40:02	44.48	13.76	20.08	29.65	0	29.65	29.65	119.57	0	119.57	0	0			
8:50:02	39.79	13.82	19.2	33.21	0	33.21	33.21	119.78	0	119.78	0	0			
9:00:02	41.54	13.84	18.86	31.64	0	31.64	31.64	120	0	120	0	0			
9:10:00	INSTALL BEARING ASSEMBLY IN ROTATING HEAD. OPEN BLIND RAMS. START BACK IN HOLE WITH AIR HAMMER.														
9:10:02	39.79	13.82	21.41	34.43	0	34.43	34.43	120.22	0	120.22	0	0			
9:20:02	41.54	13.79	20.33	26.71	0	26.71	26.71	120.45	0	120.45	0	0			
9:30:04	44.48	13.7	20.57	34.64	0	34.64	34.64	120.68	0	120.68	0	0			
9:31:00	OPEN FLOW LINE. CLOSE HCR. CONTINUE TO RUN IN HOLE.														
9:40:02	41.54	4.6	18.61	26.14	0	26.14	26.14	120.88	0	120.88	0	0			
9:50:02	46.23	2.59	18.26	33.5	0	33.5	33.5	121.08	0	121.08	0	0			
10:00:00	SLIP AND CUT DRILL LINE.														
10:00:02	38.59	2.05	19.1	32.99	0	32.99	32.99	121.31	0	121.31	0	0			
10:10:02	44.48	2.81	19.84	34.28	0	34.28	34.28	121.54	0	121.54	0	0			
10:20:02	41.54	3.56	19.35	34.28	0	34.28	34.28	121.77	0	121.77	0	0			
10:30:02	38.59	4.12	19.35	33.18	0	33.18	33.18	122.01	0	122.01	0	0			
10:40:02	38.59	4.62	19.1	33	0	33	33	122.24	0	122.24	0	0			
10:50:02	38.59	5.05	18.61	32.63	0	32.63	32.63	122.47	0	122.47	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/18																
11:00:00	CONTINUE TO RUN IN HOLE.															
11:00:02	38.59	5.5	18.12	31.7	0	31.7	31.7	122.7	0	122.7	0	0				
11:10:02	39.79	5.31	16.99	25.59	0	25.59	25.59	122.91	0	122.91	0	0				
11:20:02	35.65	3.02	16.4	25.42	0	25.42	25.42	123.08	0	123.08	0	0				
11:30:02	41.54	0.75	18.61	32.56	0	32.56	32.56	123.3	0	123.3	0	0				
11:40:02	38.59	-1.01	18.61	30.47	0	30.47	30.47	123.53	0	123.53	0	0				
11:50:02	39.79	-2.16	19.2	32.82	0	32.82	32.82	123.75	0	123.75	0	0				
12:00:02	38.59	-2.51	19.1	31.03	0	31.03	31.03	123.98	0	123.98	0	0				
12:10:02	36.84	-2.77	18.71	29.16	0	29.16	29.16	124.2	0	124.2	0	0				
12:20:02	41.54	-2.85	19.1	32.46	0	32.46	32.46	124.43	0	124.43	0	0				
12:30:02	41.54	-1.15	18.61	33.44	0	33.44	33.44	124.66	0	124.66	0	0				
12:40:02	38.59	0.29	18.36	31.09	0	31.09	31.09	124.88	0	124.88	0	0				
12:50:02	39.79	-0.21	18.22	29.89	0	29.89	29.89	125.1	0	125.1	0	0				
13:00:02	41.54	-1.86	18.86	31.63	0	31.63	31.63	125.32	0	125.32	0	0				
13:10:02	38.59	-3.05	18.61	33.41	0	33.41	33.41	125.54	0	125.54	0	0				
13:20:02	36.84	-3.43	18.96	31.71	0	31.71	31.71	125.76	0	125.76	0	0				
13:30:02	41.54	-3.47	19.1	32.06	0	32.06	32.06	125.98	0	125.98	0	0				
13:40:02	41.54	-3.26	18.86	29.83	0	29.83	29.83	126.19	0	126.19	0	0				
13:45:00	ON BOTTOM. PICK UP KELLY AND PREPARE TO CIRCULATE.															
13:50:02	40.34	-2.57	18.51	32.66	0	32.66	32.66	126.41	0	126.41	0	0				
14:00:02	41.54	-1.03	17.87	31.87	0	31.87	31.87	126.63	0	126.63	0	0				
14:06:00	START PUMPING NITROGEN.															
14:10:02	50.38	0.34	25.24	37.67	0	37.67	-14.17	126.86	0	126.86	0	36				
14:20:02	112.25	0.45	78.52	68.19	0	68.19	16.35	127.26	0	127.26	0	36				
14:30:02	116.92	0.24	75.94	67.27	0	67.27	15.43	127.74	0	127.74	0	36				
14:40:02	93.36	0.06	55.33	55.88	0	55.88	4.04	128.18	0	128.18	0	36				
14:50:02	101.67	0.39	68.07	63.98	0	63.98	12.14	128.63	0	128.63	0	36				
15:00:02	119.87	0.82	76.68	69.02	0	69.02	17.18	129.09	0	129.09	0	36				
15:03:00	KELLY DOWN. WORK PIPE.															

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3	
99/12/18																
15:06:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
15:10:00	CONNECTION COMPLETE. START PUMPING NITROGEN.															
15:10:02	119.87	1.35	80.61	70.67	0	70.67	18.83	129.62	0	129.62	0	36				
15:20:02	88.68	1.8	57.4	56.67	0	56.67	4.83	129.99	0	129.99	0	36				
15:27:00	DROP 1640 m SAMPLE.															
15:30:02	112.25	1.63	73.6	67.41	0	67.41	15.57	130.43	0	130.43	0	36				
15:40:02	119.87	1.69	76.93	69.02	0	69.02	17.18	130.91	0	130.91	0	36				
15:50:02	119.87	1.83	77.17	69.59	0	69.59	17.75	131.39	0	131.39	0	36				
16:00:02	111.03	2.09	71.28	66.77	0	66.77	14.93	131.89	0	131.89	0	36				
16:10:02	112.25	2.37	74.83	69.49	0	69.49	17.65	132.37	0	132.37	0	36				
16:20:02	107.56	2.53	74.46	69.86	0	69.86	18.02	132.85	0	132.85	0	36				
16:22:00	DROP 1645 m SAMPLE. TRACE OF WATER IN SAMPLE.															
16:30:02	112.25	2.62	75.08	70.39	0	70.39	18.55	133.35	0	133.35	0	36				
16:40:02	116.92	2.71	77.42	72.02	0	72.02	20.18	133.84	0	133.84	0	36				
16:50:02	119.87	2.91	78.4	72.5	0	72.5	20.66	134.34	0	134.34	0	36				
17:00:02	112.25	3.07	78.27	72.52	0	72.52	20.68	134.85	0	134.85	0	36				
17:10:02	119.87	3.2	78.89	73.15	0	73.15	21.31	135.35	0	135.35	0	36				
17:20:02	115.19	3.38	79.5	73.67	0	73.67	21.83	135.86	0	135.86	0	36				
17:30:02	115.19	3.59	79.25	73.27	0	73.27	21.43	136.36	0	136.36	0	36				
17:34:00	KELLY DOWN. WORK PIPE.															
17:40:02	106.35	3.86	73.36	69.75	0	69.75	17.91	136.86	0	136.86	0	36				
17:50:02	115.19	4.15	80.97	73.73	0	73.73	21.89	137.36	0	137.36	0	36				
17:56:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
18:00:02	100.46	4.02	67.22	65.81	0	65.81	65.81	137.87	0	137.87	0	0				
18:10:03	47.43	4.37	26.47	34.87	0	34.87	34.87	138.2	0	138.2	0	0				
18:20:02	41.54	4.7	20.33	24.94	0	24.94	24.94	138.39	0	138.39	0	0				
18:30:02	41.54	4.93	20.33	31.66	0	31.66	31.66	138.6	0	138.6	0	0				
18:32:00	START PUMPING NITROGEN.															
18:40:02	97.51	4.69	69.68	63.27	0	63.27	11.43	138.9	0	138.9	0	36				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/18																
18:50:02	128.19	3.77	97.05	76.85	0	76.85	25.01	139.4	0	139.4	0	36				
18:51:00	INCREASE NITROGEN INJECTION RATE TO 40 m3/min.															
18:52:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.															
18:57:00	START PUMPING NITROGEN.															
19:00:02	62.16	3.77	38.74	46.91	0	46.91	-10.69	139.82	0	139.82	0	40				
19:10:02	126.98	3.64	91.53	75.94	0	75.94	18.34	140.27	0	140.27	0	40				
19:20:02	135.81	3.21	101.84	81.21	0	81.21	23.61	140.82	0	140.82	0	40				
19:23:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
19:30:02	66.85	3.07	39.13	44.44	0	44.44	44.44	141.32	0	141.32	0	0				
19:32:00	CONNECTION COMPLETE. START PUMPING NITROGEN. RESUME DRILLING.															
19:40:02	97.51	4.05	69.43	64.06	0	64.06	6.46	141.66	0	141.66	0	40				
19:50:02	125.76	3.91	87.73	74.99	0	74.99	17.39	142.13	0	142.13	0	40				
20:00:02	137.54	4.09	98.28	81.24	0	81.24	23.64	142.68	0	142.68	0	40				
20:10:02	141.71	4.29	104.54	85.4	0	85.4	27.8	143.26	0	143.26	0	40				
20:13:00	DROP 1650 m SAMPLE.															
20:20:02	132.87	4.62	95.46	81.11	0	81.11	23.51	143.84	0	143.84	0	40				
20:30:02	132.87	4.98	95.7	82.21	0	82.21	24.61	144.4	0	144.4	0	40				
20:40:02	132.87	5.04	95.7	82.47	0	82.47	24.87	144.97	0	144.97	0	40				
20:50:02	144.65	4.86	101.59	86.75	0	86.75	29.15	145.55	0	145.55	0	40				
20:56:00	DROP 1655 m SAMPLE.															
21:00:02	129.92	4.8	89.56	79.75	0	79.75	22.15	146.12	0	146.12	0	40				
21:10:02	129.92	4.51	91.77	80.94	0	80.94	23.34	146.68	0	146.68	0	40				
21:20:02	137.54	4.34	94.11	82.39	0	82.39	24.79	147.25	0	147.25	0	40				
21:30:02	175.83	4.3	124.05	100.15	0	100.15	42.55	147.87	0	147.87	0	40				
21:32:00	DROP 1660 m SAMPLE.															
21:36:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
21:40:02	106.35	4.49	75.08	71.6	0	71.6	71.6	148.48	0	148.48	0	0				
21:44:00	CONNECTION COMPLETE. START PUMPING NTROGEN. RESUME DRILLING.															
21:50:02	88.68	4.57	58.87	59.79	0	59.79	2.19	148.83	0	148.83	0	40				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
99/12/18															
22:00:02	107.56	4.1	77.65	70.74	0	70.74	13.14	149.31	0	149.31	0	40			
22:10:02	98.72	2.92	68.81	66.53	0	66.53	8.93	149.8	0	149.8	0	40			
22:20:02	113.98	2.73	74.23	69.59	0	69.59	11.99	150.26	0	150.26	0	40			
22:30:02	129.92	2.54	89.32	78.58	0	78.58	20.98	150.78	0	150.78	0	40			
22:40:02	132.87	2.31	92.51	80.6	0	80.6	23	151.33	0	151.33	0	40			
22:50:02	137.54	2.21	93.62	80.87	0	80.87	23.27	151.9	0	151.9	0	40			
22:58:00	DROP 1665 m SAMPLE.														
23:00:02	140.49	2.37	97.05	82.83	0	82.83	25.23	152.47	0	152.47	0	40			
23:10:02	138.76	2.47	98.4	84.03	0	84.03	26.43	153.04	0	153.04	0	40			
23:20:02	132.87	2.64	95.7	82.74	0	82.74	25.14	153.62	0	153.62	0	40			
23:30:02	140.49	2.8	95.09	82.29	0	82.29	24.69	154.19	0	154.19	0	40			
23:40:02	137.54	2.95	94.35	82.4	0	82.4	24.8	154.76	0	154.76	0	40			
23:48:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.														
23:50:02	122.3	3.04	87.23	78.05	0	78.05	78.05	155.33	0	155.33	0	0			
23:56:00	CONNECTION COMPLETE. START PUMPING NITROGEN. RESUME DRILLING.														
99/12/19															
0:00:02	96.31	3.56	60.24	59.98	0	59.98	2.38	155.81	0	155.81	0	40			
0:10:02	118.14	3.63	82.44	74.3	0	74.3	16.7	156.28	0	156.28	0	40			
0:20:02	124.03	3.53	88.83	78.23	0	78.23	20.63	156.81	0	156.81	0	40			
0:30:02	122.81	3.46	85.27	76.13	0	76.13	18.53	157.33	0	157.33	0	40			
0:30:00	DROP 1670 m SAMPLE.														
0:35:00	STOP DRILLING. LIFT OFF BOTTOM AND CIRCULATE TO CLEAN UP HOLE.														
0:40:02	141.71	3.62	99.63	84.95	0	84.95	27.35	157.9	0	157.9	0	40			
0:50:02	132.87	3.72	94.47	82.51	0	82.51	24.91	158.48	0	158.48	0	40			
1:00:02	128.19	3.89	92.87	81.55	0	81.55	23.95	159.05	0	159.05	0	40			
1:10:02	132.87	3.85	93.49	81.93	0	81.93	24.33	159.62	0	159.62	0	40			
1:20:02	129.92	3.72	91.77	80.9	0	80.9	23.3	160.19	0	160.19	0	40			
1:30:02	140.49	3.61	92.88	81.3	0	81.3	23.7	160.74	0	160.74	0	40			
1:40:02	126.98	3.53	93.25	81.79	0	81.79	24.19	161.31	0	161.31	0	40			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/19																
1:42:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.															
1:50:02	82.78	4.01	52.49	55.69	0	55.69	-1.91	161.83	0	161.83	0	40				
1:51:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.															
2:00:02	87.47	4.6	56.06	56.15	0	56.15	-1.45	162.18	0	162.18	0	40				
2:10:02	112.25	3.45	78.02	69.61	0	69.61	12.01	162.61	0	162.61	0	40				
2:20:02	133.38	3.24	85.15	74.15	0	74.15	16.55	163.11	0	163.11	0	40				
2:30:02	143.43	3.5	78.64	70.9	0	70.9	13.3	163.61	0	163.61	0	40				
2:40:02	186.39	6.71	128.1	98.26	0	98.26	40.66	164.24	0	164.24	0	40				
2:50:02	200.63	6.53	150.7	107.12	0	107.12	49.52	164.9	0	164.9	0	40				
3:00:02	165.28	6.56	123.93	91.92	0	91.92	34.32	165.62	0	165.62	0	40				
3:10:02	101.67	6.06	72.98	64.54	0	64.54	6.94	166.18	0	166.18	0	40				
3:20:02	124.03	5.67	90.05	74.29	0	74.29	16.69	166.66	0	166.66	0	40				
3:30:02	151.77	5.93	119.4	89.26	0	89.26	31.66	167.33	0	167.33	0	40				
3:40:02	118.14	5.64	87.35	73.04	0	73.04	15.44	167.84	0	167.84	0	40				
3:50:02	217.07	5.9	167.75	112.72	0	112.72	55.12	168.48	0	168.48	0	40				
3:54:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE.															
3:58:00	START TO PULL OUT OF HOLE FOR NEW AIR HAMMER.															
4:00:02	82.78	6.1	55.93	52.65	0	52.65	52.65	169.1	0	169.1	0	0				
4:10:02	44.48	6.08	25.24	24.6	0	24.6	24.6	169.32	0	169.32	0	0				
4:20:02	41.54	6	23.03	22.16	0	22.16	22.16	169.53	0	169.53	0	0				
4:30:02	42.73	6.29	24.36	29.76	0	29.76	29.76	169.74	0	169.74	0	0				
4:40:02	41.54	6.5	22.78	31.92	0	31.92	31.92	169.95	0	169.95	0	0				
4:50:02	49.18	6.74	25.38	30.93	0	30.93	30.93	170.14	0	170.14	0	0				
5:00:02	47.43	7.25	25.73	31.4	0	31.4	31.4	170.33	0	170.33	0	0				
5:10:02	45.68	7.8	25.59	29.55	0	29.55	29.55	170.52	0	170.52	0	0				
5:20:02	50.38	8.26	25.98	29.8	0	29.8	29.8	170.71	0	170.71	0	0				
5:30:02	44.48	8.61	25.98	32.25	0	32.25	32.25	170.9	0	170.9	0	0				
5:40:02	44.48	8.94	25.24	22.65	0	22.65	22.65	171.11	0	171.11	0	0				
5:50:02	52.12	9.15	26.61	27.3	0	27.3	27.3	171.3	0	171.3	0	0				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/19																
6:00:02	47.43	9.64	25.98	27.52	0	27.52	27.52	171.49	0	171.49	0	0				
6:10:02	49.18	9.84	24.89	23.4	0	23.4	23.4	171.67	0	171.67	0	0				
6:20:02	42.73	10	25.83	29.33	0	29.33	29.33	171.87	0	171.87	0	0				
6:30:02	45.68	10.07	25.1	26.43	0	26.43	26.43	172.06	0	172.06	0	0				
6:40:02	44.48	10.25	25.24	22.93	0	22.93	22.93	172.24	0	172.24	0	0				
6:50:02	44.48	10.57	25.73	31.2	0	31.2	31.2	172.44	0	172.44	0	0				
7:00:02	47.43	10.9	25.24	24.66	0	24.66	24.66	172.64	0	172.64	0	0				
7:10:02	47.43	11.2	25.73	33.22	0	33.22	33.22	172.85	0	172.85	0	0				
7:20:02	44.48	11.57	24.99	31.54	0	31.54	31.54	173.05	0	173.05	0	0				
7:30:02	42.73	11.06	24.61	30.85	0	30.85	30.85	173.27	0	173.27	0	0				
7:38:00	BIT AT SURFACE. OPEN HCR. CLOSE BLIND RAMS AND FLOW LINE. REMOVE BEARING ASSEMBLY FROM ROTATING HEAD.															
7:40:02	36.84	9.49	24.11	19.91	0	19.91	19.91	173.47	0	173.47	0	0				
7:50:03	41.54	9.38	25.24	31.08	0	31.08	31.08	173.67	0	173.67	0	0				
8:00:02	44.48	10.07	24.99	30.09	0	30.09	30.09	173.89	0	173.89	0	0				
8:10:02	41.54	10.67	24.5	29.71	0	29.71	29.71	174.1	0	174.1	0	0				
8:20:02	41.54	11.14	24.26	30.96	0	30.96	30.96	174.31	0	174.31	0	0				
8:30:02	44.48	11.59	23.52	29.91	0	29.91	29.91	174.52	0	174.52	0	0				
8:40:02	39.79	11.99	23.13	30.06	0	30.06	30.06	174.73	0	174.73	0	0				
8:50:02	47.43	12.35	24.99	31.44	0	31.44	31.44	174.94	0	174.94	0	0				
9:00:02	44.48	12.68	21.8	29.65	0	29.65	29.65	175.12	0	175.12	0	0				
9:10:02	49.18	12.86	23.17	31.05	0	31.05	31.05	175.32	0	175.32	0	0				
9:15:00	INSTALL BEARING ASSEMBLY IN ROTATING HEAD. OPEN BLIND RAMS. START BACK IN HOLE WITH AIR HAMMER.															
9:20:02	44.48	12.85	23.03	31.07	0	31.07	31.07	175.53	0	175.53	0	0				
9:30:02	44.48	12.88	22.54	22.44	0	22.44	22.44	175.73	0	175.73	0	0				
9:40:00	OPEN FLOW LINE. CLOSE HCR. CONTINUE TO RUN IN HOLE.															
9:40:02	42.73	12.91	21.9	23.15	0	23.15	23.15	175.91	0	175.91	0	0				
9:50:02	44.48	5	21.56	22.27	0	22.27	22.27	176.09	0	176.09	0	0				
10:00:02	44.48	2.82	21.07	26.24	0	26.24	26.24	176.28	0	176.28	0	0				
99/12/19																

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3
10:10:02	49.18	1.83	21.45	29.98	0	29.98	29.98	176.48	0	176.48	0	0			
10:20:02	41.54	1.02	20.57	28.39	0	28.39	28.39	176.68	0	176.68	0	0			
10:30:02	46.23	0.26	20.96	29.17	0	29.17	29.17	176.89	0	176.89	0	0			
10:40:02	46.23	-0.52	20.47	26.42	0	26.42	26.42	177.08	0	177.08	0	0			
10:50:02	43.29	-1.21	19.49	29.75	0	29.75	29.75	177.27	0	177.27	0	0			
11:00:00	SHIP 3.0 m3 SOLIDS AND WATER FROM PRESSURE TANK.														
11:00:02	41.54	-1.48	19.84	29.92	0	29.92	29.92	177.47	0	177.47	0	0			
11:10:02	41.54	-1.81	20.08	25.15	0	25.15	25.15	177.65	0	177.65	0	0			
11:20:02	38.59	-2.08	19.84	26.32	0	26.32	26.32	177.84	0	177.84	0	0			
11:30:02	38.59	-2.42	19.84	26.15	0	26.15	26.15	178.04	0	178.04	0	0			
11:40:02	38.59	-2.75	19.59	27.45	0	27.45	27.45	178.24	0	178.24	0	0			
11:50:02	45.04	-2.95	20.12	30.93	0	30.93	30.93	178.44	0	178.44	0	0			
12:00:02	38.59	-2.98	19.1	24.89	0	24.89	24.89	178.62	0	178.62	0	0			
12:10:02	34.45	-3.11	15.56	15.8	0	15.8	15.8	178.79	0	178.79	0	0			
12:18:00	ON BOTTOM. PICK UP KELLY AND PREPARE TO CIRCULATE.														
12:20:02	38.59	-2.8	18.36	27.9	0	27.9	27.9	178.95	0	178.95	0	0			
12:30:02	38.59	-1.5	19.35	28.1	0	28.1	28.1	179.15	0	179.15	0	0			
12:32:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														
12:40:02	38.59	-0.09	19.59	19.6	0	19.6	-35.12	179.33	0	179.33	0	38			
12:50:02	145.87	1.31	103.43	73.25	0	73.25	18.53	179.66	0	179.66	0	38			
13:00:02	156.44	3.23	112.64	75.04	0	75.04	20.32	180.21	0	180.21	0	38			
13:10:02	156.44	3.5	114.11	73.89	0	73.89	19.17	180.72	0	180.72	0	38			
13:13:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.														
13:19:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														
13:20:02	118.14	4.16	84.65	59.79	0	59.79	5.07	181.21	0	181.21	0	38			
13:30:02	138.76	5.46	105.77	68.65	0	68.65	13.93	181.64	0	181.64	0	38			
13:40:02	147.6	5.45	113.13	70.75	0	70.75	16.03	182.13	0	182.13	0	38			
13:50:02	135.81	5.13	102.33	65.99	0	65.99	11.27	182.61	0	182.61	0	38			
14:00:02	146.38	5.3	109.08	69.33	0	69.33	14.61	183.08	0	183.08	0	38			
14:10:02	150.55	5.6	113.62	72	0	72	17.28	183.57	0	183.57	0	38			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/19															
14:20:02	145.87	5.85	115.96	72.75	0	72.75	18.03	184.08	0	184.08	0	38			
14:30:02	151.77	6.02	117.43	73.55	0	73.55	18.83	184.57	0	184.57	0	38			
14:40:02	150.55	6.36	114.85	72.46	0	72.46	17.74	185.07	0	185.07	0	38			
14:50:02	144.65	6.8	111.9	71.73	0	71.73	17.01	185.57	0	185.57	0	38			
14:56:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.														
15:00:02	135.81	7.06	103.31	69.11	0	69.11	69.11	186.08	0	186.08	0	0			
15:01:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														
15:10:02	119.87	7.89	84.54	60.7	0	60.7	5.98	186.52	0	186.52	0	38			
15:20:02	129.92	7.74	98.16	68.9	0	68.9	14.18	186.96	0	186.96	0	38			
15:29:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO POUR SOAPY WATER DOWN DRILL PIPE.														
15:30:02	155.21	8.32	115.71	77.09	0	77.09	77.09	187.49	0	187.49	0	0			
15:35:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.														
15:40:02	110.51	8.66	81.09	61.38	0	61.38	6.66	187.95	0	187.95	0	38			
15:50:02	132.87	8.26	99.14	71.46	0	71.46	16.74	188.38	0	188.38	0	38			
16:00:02	137.03	7.45	103.92	72.07	0	72.07	17.35	188.86	0	188.86	0	38			
16:10:02	149.32	7.12	109.33	74	0	74	19.28	189.37	0	189.37	0	38			
16:20:02	141.71	7.06	107.49	74.2	0	74.2	19.48	189.89	0	189.89	0	38			
16:30:02	139.98	7.16	109.33	75.52	0	75.52	20.8	190.4	0	190.4	0	38			
16:39:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE. START TO PULL OUT OF HOLE FOR BIT.														
16:40:02	164.05	7.27	124.05	82.97	0	82.97	82.97	190.96	0	190.96	0	0			
16:50:02	69.8	7.33	39.62	37.91	0	37.91	37.91	191.39	0	191.39	0	0			
17:00:02	47.98	7.42	20.61	19.37	0	19.37	19.37	191.58	0	191.58	0	0			
17:10:02	41.54	7.42	19.84	26.8	0	26.8	26.8	191.75	0	191.75	0	0			
17:20:02	44.48	7.84	20.57	26.08	0	26.08	26.08	191.92	0	191.92	0	0			
17:30:02	41.54	8.48	19.59	19.95	0	19.95	19.95	192.08	0	192.08	0	0			
17:40:02	38.59	9.04	19.35	18.96	0	18.96	18.96	192.25	0	192.25	0	0			
17:50:02	41.54	9.38	19.84	27.11	0	27.11	27.11	192.41	0	192.41	0	0			
18:00:02	41.54	9.52	19.35	27.48	0	27.48	27.48	192.58	0	192.58	0	0			
18:10:02	41.54	9.77	19.59	23.39	0	23.39	23.39	192.75	0	192.75	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/19																
18:20:02	42.73	10.11	20.92	25.95	0	25.95	25.95	192.92	0	192.92	0	0				
18:30:02	41.54	10.21	19.84	25.86	0	25.86	25.86	193.09	0	193.09	0	0				
18:40:02	38.59	10.01	19.59	24.34	0	24.34	24.34	193.26	0	193.26	0	0				
18:50:02	38.59	10.01	18.61	24.68	0	24.68	24.68	193.43	0	193.43	0	0				
19:00:02	36.84	10.25	18.22	26.28	0	26.28	26.28	193.6	0	193.6	0	0				
19:10:02	47.98	10.62	19.63	27.44	0	27.44	27.44	193.77	0	193.77	0	0				
19:20:02	41.54	11.04	19.84	24.69	0	24.69	24.69	193.96	0	193.96	0	0				
19:30:02	41.54	11.34	19.35	21.63	0	21.63	21.63	194.13	0	194.13	0	0				
19:40:02	41.54	11.78	20.57	23.21	0	23.21	23.21	194.31	0	194.31	0	0				
19:50:02	40.34	12.17	16.79	21.96	0	21.96	21.96	194.48	0	194.48	0	0				
20:00:02	39.79	12.56	20.92	24.52	0	24.52	24.52	194.65	0	194.65	0	0				
20:00:00	BIT AT SURFACE. OPEN HCR. CLOSE BLIND RAMS AND FLOW LINE. REMOVE BEARING ASSEMBLY FROM ROTATING HEAD.															
20:10:02	50.93	12.87	21.1	23.64	0	23.64	23.64	194.81	0	194.81	0	0				
20:20:02	41.54	13.22	19.59	24.82	0	24.82	24.82	194.98	0	194.98	0	0				
20:30:02	39.79	13.61	19.45	25.87	0	25.87	25.87	195.14	0	195.14	0	0				
20:40:02	35.65	13.98	19.1	26.42	0	26.42	26.42	195.31	0	195.31	0	0				
20:50:02	38.59	14.3	19.1	24.43	0	24.43	24.43	195.47	0	195.47	0	0				
21:00:02	41.54	14.63	19.59	26.4	0	26.4	26.4	195.64	0	195.64	0	0				
21:00:00	INSTALL BEARING ASSEMBLY IN ROTATING HEAD. OPEN BLIND RAMS. START BACK IN HOLE WITH BIT.															
21:10:02	44.48	14.91	22.05	23.08	0	23.08	23.08	195.79	0	195.79	0	0				
21:20:02	42.73	15.09	21.17	23.03	0	23.03	23.03	195.95	0	195.95	0	0				
21:30:02	36.84	15.16	18.47	20.97	0	20.97	20.97	196.11	0	196.11	0	0				
21:35:00	OPEN FLOW LINE. CLOSE HCR. CONTINUE TO RUN IN HOLE.															
21:40:02	39.79	11.02	20.19	22.45	0	22.45	22.45	196.26	0	196.26	0	0				
21:50:02	41.54	6	18.86	21.44	0	21.44	21.44	196.42	0	196.42	0	0				
22:00:02	38.59	5.02	17.87	21.03	0	21.03	21.03	196.56	0	196.56	0	0				
22:10:02	43.29	4.46	20.23	22.61	0	22.61	22.61	196.71	0	196.71	0	0				
22:20:02	39.79	4.03	19.45	22.32	0	22.32	22.32	196.87	0	196.87	0	0				
22:30:02	38.59	3.7	19.35	22.27	0	22.27	22.27	197.03	0	197.03	0	0				

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/19															
22:40:02	38.59	3.57	19.1	22.03	0	22.03	22.03	197.18	0	197.18	0	0			
22:50:02	38.59	3.39	18.86	22.01	0	22.01	22.01	197.34	0	197.34	0	0			
23:00:02	41.54	3.02	20.33	23.1	0	23.1	23.1	197.49	0	197.49	0	0			
23:10:02	41.54	2.73	20.57	23.13	0	23.13	23.13	197.65	0	197.65	0	0			
23:20:02	41.54	2.66	20.33	23.3	0	23.3	23.3	197.82	0	197.82	0	0			
23:30:02	41.54	2.57	20.33	23.3	0	23.3	23.3	197.98	0	197.98	0	0			
23:35:00	SHUT IN HYDRIL.														
23:40:02	20.91	2.7	1.67	0	0	0	0	198.1	0	198.1	0	0			
23:50:02	15.02	5.36	-0.05	0	0	0	0	198.1	0	198.1	0	0			
23:55:00	OPEN HYDRIL.														
99/12/20															
0:00:02	44.48	2.36	23.27	25.31	0	25.31	25.31	198.45	0	198.45	0	0			
0:10:02	41.54	2.45	20.08	23.03	0	23.03	23.03	198.61	0	198.61	0	0			
0:20:02	41.54	2.42	20.08	23	0	23	23	198.77	0	198.77	0	0			
0:30:02	35.65	2.18	18.61	21.79	0	21.79	21.79	198.93	0	198.93	0	0			
0:40:02	41.54	2.14	19.59	22.3	0	22.3	22.3	199.08	0	199.08	0	0			
0:40:00	ON BOTTOM. RUN IN SURVEY TOOL.														
0:50:02	44.48	2.63	20.33	22.68	0	22.68	22.68	199.24	0	199.24	0	0			
1:00:02	41.54	3.41	20.08	22.54	0	22.54	22.54	199.4	0	199.4	0	0			
1:10:02	41.54	3.96	20.08	22.44	0	22.44	22.44	199.55	0	199.55	0	0			
1:10:00	SURVEY COMPLETE. PICK UP KELLY AND PREPARE TO CIRCULATE.														
1:18:00	START PUMPING NITROGEN AT 40.5 m3/min.														
1:20:02	41.54	4.34	20.08	22.43	0	22.43	-35.89	199.71	0	199.71	0	40.5			
1:30:02	147.6	4.25	103.56	67.43	0	67.43	9.11	199.98	0	199.98	0	40.5			
1:40:02	171.17	4.44	133.76	74.62	0	74.62	16.3	200.5	0	200.5	0	40.5			
1:41:00	RESUME DRILLING.														
1:50:02	180.01	5.46	139.4	78.61	0	78.61	20.29	201.03	0	201.03	0	40.5			
2:00:02	171.17	6.38	134.98	78.95		78.95	20.63	201.58	0	201.58	0	40.5			
2:10:02	165.28	7.06	132.28	76.7	0	76.7	18.38	202.12	0	202.12	0	40.5			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time yy/mm/dd	Ann Press kPa	Ann Temp C	Static kPa	Gas Rate 1 10^3m3/d	Gas Rate 2 10^3m3/d	Total Gas 10^3m3/d	Net Gas 10^3m3/d	Cum Gas 1 10^3m3	Cum Gas 2 10^3m3	Total Gas 10^3m3	Fluid Inj. l/min	N2 Inj. m3/min	Surf Vol m3	Gain/Loss m3	Cum +/- m3	
99/12/20																
2:20:02	171.17	7.64	136.46	77.43	0	77.43	19.11	202.66	0	202.66	0	40.5				
2:30:02	181.72	8.02	143.2	76.64	0	76.64	18.32	203.19	0	203.19	0	40.5				
2:34:00	DROP 1675 m SAMPLE.															
2:40:02	181.23	8.21	151.07	76.95	0	76.95	18.63	203.72	0	203.72	0	40.5				
2:50:02	194.74	8.25	161.74	74.07	0	74.07	15.75	204.25	0	204.25	0	40.5				
3:00:02	198.17	8.2	156.57	75.31	0	75.31	16.99	204.77	0	204.77	0	40.5				
3:10:02	224.2	8.22	189.24	75.23	0	75.23	16.91	205.29	0	205.29	0	40.5				
3:20:02	222.96	8.28	187.14	73.7	0	73.7	15.38	205.81	0	205.81	0	40.5				
3:30:02	203.58	8.29	168.13	84.94	0	84.94	26.62	206.34	0	206.34	0	40.5				
3:40:02	196.45	8.3	156.94	74.68	0	74.68	16.36	206.87	0	206.87	0	40.5				
3:50:02	169.45	8.38	136.34	74.33	0	74.33	16.01	207.4	0	207.4	0	40.5				
4:00:02	181.72	8.55	147.37	75.65	0	75.65	17.33	207.92	0	207.92	0	40.5				
4:01:00	STOP PUMPING NITROGEN.															
4:03:00	START PUMPING NITROGEN.															
4:05:00	STOP PUMPING NITROGEN. BLEED OFF STAND PIPE TO MAKE CONNECTION.															
4:09:00	START PUMPING NITROGEN.															
4:10:02	83.99	8.68	60.21	40.05	0	40.05	-18.27	208.37	0	208.37	0	40.5				
4:20:02	141.71	9.14	107.49	70.96	0	70.96	12.64	208.76	0	208.76	0	40.5				
4:30:02	147.6	8.9	112.4	73.97	0	73.97	15.65	209.27	0	209.27	0	40.5				
4:40:02	150.55	8.68	114.85	74.33	0	74.33	16.01	209.78	0	209.78	0	40.5				
4:45:00	DROP 1680 m SAMPLE.															
4:50:02	153.49	8.62	119.02	73.92	0	73.92	15.6	210.3	0	210.3	0	40.5				
5:00:02	162.33	8.57	129.09	72.89	0	72.89	14.57	210.81	0	210.81	0	40.5				
5:05:00	GETTING LITTLE RETURNS.															
5:10:02	46.23	8.84	25.13	12.18	0	12.18	-46.14	211.17	0	211.17	0	40.5				
5:15:00	STOP PUMPING NITROGEN. WORK PIPE.															
5:20:02	36.84	9.1	21.66	17.6	0	17.6	17.6	211.2	0	211.2	0	0				
5:30:02	80.37	9.5	56.44	0	0	0	0	211.26	0	211.26	0	0				
5:37:00	START PUMPING NITROGEN. CIRCULATE TO CLEAN UP HOLE.															

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Voi	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m ³	m3	m3
99/12/20															
5:40:02	82.78	16.16	49.54	30.88	0	30.88	-27.44	211.46	0	211.46	0	40.5			
5:43:00	STOP PUMPING NITROGEN. STAND PIPE PRESSURE BUILDING UP.														
5:47:00	START PUMPING NIYROGEN.														
5:47:00	FLUID TO SURFACE.														
5:49:00	STOP PUMPING NITROGEN.														
5:50:02	162.33	17.65	113.38	21.4	0	21.4	21.4	211.53	0	211.53	0	0			
5:52:00	START PUMPING NITROGEN.														
6:00:02	253.66	23.23	106.26	51.61	0	51.61	-6.71	211.72	0	211.72	0	40.5	21	13	21
6:10:02	235.98	28.29	133.76	110.7	0	110.7	52.38	212.64	0	212.64	0	40.5			
6:20:02	87.47	27.23	35.2	46.81	0	46.81	-11.51	213.14	0	213.14	0	40.5			
6:30:02	200.63	29.04	105.03	96.01	0	96.01	37.69	213.63	0	213.63	0	40.5			
6:40:02	116.4	29.08	61.69	67.11	0	67.11	8.79	214.19	0	214.19	0	40.5			
6:50:02	141.71	29.81	80.48	78.87	0	78.87	20.55	214.67	0	214.67	0	40.5			
7:00:02	122.3	29.8	66.6	70.33	0	70.33	12.01	215.22	0	215.22	0	40.5	38.562	17.562	38.562
7:10:02	94.57	29.78	32.85	44.2	0	44.2	-14.12	215.62	0	215.62	0	40.5			
7:15:00	STOP PUMPING NITROGEN. BLEED DOWN STAND PIPE.														
7:20:00	CLOSE HYDRIL. OPEN HCR. CHANGE OUT BEARING ASSEMBLY IN ROTATING HEAD.														
7:20:02	129.92	33.15	58.14	61.8	0	61.8	61.8	216.05	0	216.05	0	0			
7:28:00	OPEN HYDRIL. CLOSE HCR. START PUMPING NITROGEN.														
7:30:02	29.75	32.3	8.54	3.47	0	3.47	-54.85	216.37	0	216.37	0	40.5			
7:40:02	23.86	30.46	5.11	0	0	0	-58.32	216.39	0	216.39	0	40.5			
7:50:02	35.65	30.5	7.32	7.74	0	7.74	-50.58	216.53	0	216.53	0	40.5			
8:00:02	390.46	35.91	274.59	181.54	0	181.54	123.22	216.89	0	216.89	0	40.5	54.13	15.568	54.13
8:10:02	148.82	34.75	95.82	88.22	0	88.22	29.9	217.74	0	217.74	0	40.5			
8:20:02	101.67	33.74	53.61	61.22	0	61.22	2.9	218.25	0	218.25	0	40.5			
8:30:02	125.76	33.96	71.28	73.21	0	73.21	14.89	218.7	0	218.7	0	40.5			
8:40:02	197.68	34.56	66.24	71.47	0	71.47	13.15	219.19	0	219.19	0	40.5			
8:40:02	DROP 1685m SAMPLE.														
8:50:02	141.71	34.62	74.34	75.46	0	75.46	17.14	219.72	0	219.72	0	40.5			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/20															
9:00:02	129.92	34.54	75.57	75.56	0	75.56	17.24	220.25	0	220.25	0	40.5	90.863	36.733	90.863
9:10:02	164.05	35.75	80.36	78.85	0	78.85	20.53	220.7	0	220.7	0	40.5			
9:16:00	STOP PUMPING NITROGEN. BLOW DOWN FLOW LINE WITH NITROGEN.														
9:20:02	131.65	36.03	68.09	70.94	0	70.94	70.94	221.31	0	221.31	0	0			
9:24:00	CLOSE PIPE RAMS. OPEN HCR.														
9:30:02	20.91	33.33	2.65	0	0	0	0	221.53	0	221.53	0	0			
9:39:00	START PUMPING NITROGEN.														
9:40:02	26.81	29.84	5.6	13.17	0	13.17	-45.15	221.63	0	221.63	0	40.5			
9:50:02	82.11	33	16.83	27.68	0	27.68	-30.64	221.74	0	221.74	0	40.5			
9:57:00	FLUID INCREASE THIS HOUR DUE TO BLOWING OUT FLOWLINE AND RIG LINES.														
10:00:02	355.1	38.11	240.95	170.08	0	170.08	111.76	222.2	0	222.2	0	40.5	94.331	3.468	94.331
10:02:00	BLEED DOWN STANDPIPE.														
10:10:02	20.91	36.29	3.63	0	0	0	0	222.8	0	222.8	0	0			
10:20:02	27.37	34.73	0	8.76	0	8.76	8.76	222.8	0	222.8	0	0			
10:23:00	START PUMPING INVERT. MAINTAIN 1000 kPa BACK PRESSURE ON ANNULUS AT RIG MANIFOLD.														
10:30:02	1000	33.19	3.98	7.93	0	7.93	7.93	222.87	0	222.87	0.76	0			
10:40:02	1000	31.59	4.86	0	0	0	0	222.93	0	222.93	0.76	0			
10:50:02	1000	29.05	13.21	24.17	0	24.17	24.17	223.02	0	223.02	0.76	0			
11:00:02	1000	28.03	10.55	20.25	0	20.25	20.25	223.17	0	223.17	0.76	0	107.207	12.876	107.207
11:10:02	1000	27.61	8.54	1.93	0	1.93	1.93	223.27	0	223.27	0.76	0			
11:20:02	1000	27.06	9.77	3.49	0	3.49	3.49	223.35	0	223.35	0.76	0			
11:30:02	1000	26.5	10.75	12.76	0	12.76	12.76	223.41	0	223.41	0.76	0			
11:40:02	1000	26.07	-0.54	0	0	0	0	223.45	0	223.45	0.76	0			
11:50:02	1000	25.33	-1.42	8.26	0	8.26	0	223.51	0	223.51	0.76	0			
12:00:02	1000	24.53	-1.03	6.42	0	6.42	0	223.55	0	223.55	0.76	0	115.062	7.855	115.062
12:01:00	STOP PUMPING INVERT. SHUT IN AT RIG MANIFOLD. FLOW CHECK.														
12:10:02	1000	23.92	0.2	3.88	0	3.88	0	223.63	0	223.63	0	0			
12:20:02	1200	23.71	-1.03	6.41	0	6.41	0	223.72	0	223.72	0	0			
12:30:02	1500	22.98	-1.18	0	0	0	0	223.76	0	223.76	0	0			

ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.																
Customer Rep: WILBERT CALIHOO / GERRY SANDERS																
Well Name: PARA et al FT LIARD																
Well Location: I-46																
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-	
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3	
99/12/20																
12:40:02	2100	22.29	2.26	10.24	0	10.24	0	223.82	0	223.82	0	0				
12:50:02	3000	21.8	-1.03	0	0	0	0	223.85	0	223.85	0	0				
13:00:02	3300	21.06	-0.79	0	0	0	0	223.88	0	223.88	0	0	117.136	2.074	117.136	
13:10:02	3400	19.87	2.65	0	0	0	0	223.92	0	223.92	0	0				
13:20:02	3510	17.01	-0.39	2.44	0	2.44	0	223.95	0	223.95	0	0				
13:30:02	3650	17.27	-0.79	0	0	0	0	223.99	0	223.99	0	0				
13:40:02	3800	17.25	-0.15	11.94	0	11.94	0	224.03	0	224.03	0	0				
13:50:02	3900	17.03	-0.79	0	0	0	0	224.08	0	224.08	0	0				
14:00:02	4000	16.72	-0.79	13.91	0	13.91	0	224.13	0	224.13	0	0	117.43	0.294	117.43	
14:10:02	4100	16.36	-0.44	4.13	0	4.13	0	224.18	0	224.18	0	0				
14:20:02	4200	16.02	2.75	0	0	0	0	224.27	0	224.27	0	0				
14:27:00	BLEED DOWN ANNULUS TO 3000 kPa.															
14:30:02	3000	15.45	-0.05	0	0	0	0	224.27	0	224.27	0	0				
14:40:02	3000	15.1	0.69	0	0	0	0	224.33	0	224.33	0	0				
14:50:02	3000	15.1	-0.05	0	0	0	0	224.33	0	224.33	0	0				
15:00:02	3000	15.3	-0.05	0	0	0	0	224.33	0	224.33	0	0	117.43	0	117.43	
15:10:02	3000	15.63	57.91	0	0	0	0	224.33	0	224.33	0	0				
15:18:00	START PUMPING WATER TO FILL HOLE.															
15:20:02	1000	15.76	74.47	39.09	0	39.09	0	224.38	0	224.38	0.76	0				
15:30:02	1000	16.04	29.41	0	0	0	0	224.45	0	224.45	0.76	0				
15:40:02	1000	16.13	26.85	0	0	0	0	224.45	0	224.45	0.76	0				
15:50:02	1000	16.2	225.97	70.44	0	70.44	0	224.52	0	224.52	0.76	0				
16:00:02	1000	17.15	87.72	30.55	0	30.55	0	224.74	0	224.74	0.76	0	110.421	-7.009	110.421	
16:10:02	1000	18.72	363.31	68.71	0	68.71	0	224.88	0	224.88	0.76	0				
16:20:02	1000	19.18	217.33	0	0	0	0	225.11	0	225.11	0.76	0				
16:25:00	STOP PUMPING FLUID. HOLE IS FULL. 13.0 m3 PRODUCED WATER USED TO FILL HOLE.															
16:30:02	0	19.16	151.81	0	0	0	0	225.15	0	225.15	0	0				
16:40:02	0	19.52	131.55	20.88	0	20.88	0	225.25	0	225.25	0	0				
16:50:02	0	20.04	121.48	16.36	0	16.36	0	225.38	0	225.38	0	0				

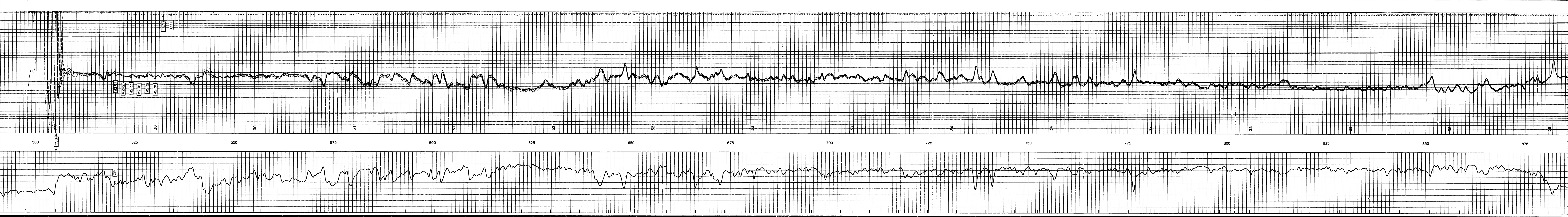
ALPINE OIL SERVICES CORP.

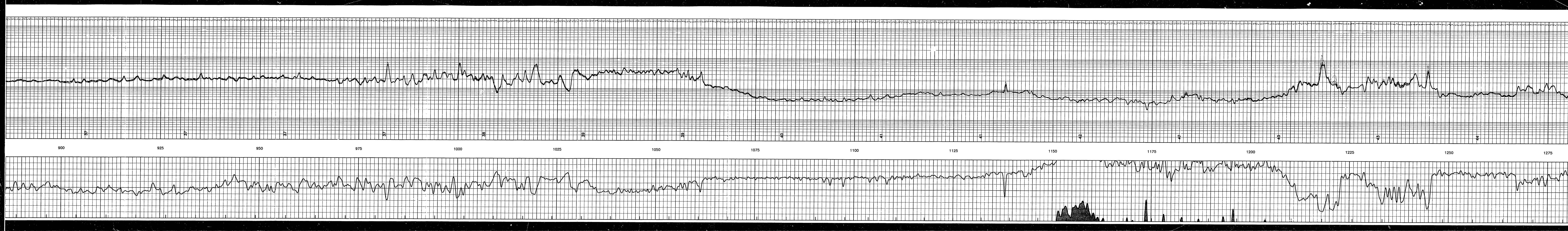
Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/20															
17:00:02	0	20.34	147.5	0	0	0	0	225.47	0	225.47	0	0	104.43	-5.991	104.43
17:10:02	0	20.75	138.78	0	0	0	0	225.47	0	225.47	0	0			
17:20:02	0	21.13	126.64	0	0	0	0	225.47	0	225.47	0	0			
17:30:02	0	21.27	114.85	0	0	0	0	225.49	0	225.49	0	0			
17:40:02	0	21.34	102.94	0	0	0	0	225.5	0	225.5	0	0			
17:50:02	0	21.33	91.28	0	0	0	0	225.51	0	225.51	0	0			
18:00:02	0	21.28	79.74	18.51	0	18.51	0	225.53	0	225.53	0	0	104.43	0	104.43
18:10:02	0	21.3	68.45	0	0	0	0	225.56	0	225.56	0	0			
18:20:02	0	21.14	55.93	19.01	0	19.01	0	225.67	0	225.67	0	0			
18:25:00	START PUMPING INVERT TO DISPLACE HOLE.														
18:30:02	1000	20.64	51.15	0	0	0	0	225.72	0	225.72	0.76	0			
18:38:00	STOP PUMPING INVERT. REPAIR RIG PUMP.														
18:40:02	1000	20.13	53.96	0	0	0	0	225.72	0	225.72	0	0			
18:45:00	RIG PUMP REPAIRED. START PUMPING INVERT.														
18:50:02	1000	19.71	50.64	0	0	0	0	225.73	0	225.73	0.76	0			
19:00:02	1000	19.32	53.23	0	0	0	0	225.73	0	225.73	0.76	0	107.968	3.538	107.968
19:10:02	1000	18.96	39.72	17.02	0	17.02	0	225.75	0	225.75	0.76	0			
19:20:02	1000	18.64	60.84	0	0	0	0	225.75	0	225.75	0.76	0			
19:30:02	1000	18.36	57.29	0	0	0	0	225.75	0	225.75	0.76	0			
19:40:02	1000	18.02	52.25	0	0	0	0	225.75	0	225.75	0.76	0			
19:41:00	INVERT AT SURFACE. STOP PUMPING INVERT. SHUT IN AT RIG MANIFOLD FOR FLOW CHECK.														
19:50:02	0	17.6	43.9	0	0	0	0	225.76	0	225.76	0	0			
20:00:02	0	17.14	43.79	0	0	0	0	225.76	0	225.76	0	0	133.966	25.998	133.966
20:05:00	OPEN ANNULUS TO SHAKER. RIG OUT FLOWLINE.														
20:10:02	0	16.71	43.16	0	0	0	0	225.76	0	225.76	0	0			
20:15:00	CIRCULATE OVER SHAKER.														
20:20:02	0	16.35	43.54	0	0	0	0	225.76	0	225.76	0	0			
20:30:02	0	16.04	43.16	0	0	0	0	225.76	0	225.76	0	0			
20:40:02	0	15.72	43.3	0	0	0	0	225.76	0	225.76	0	0			

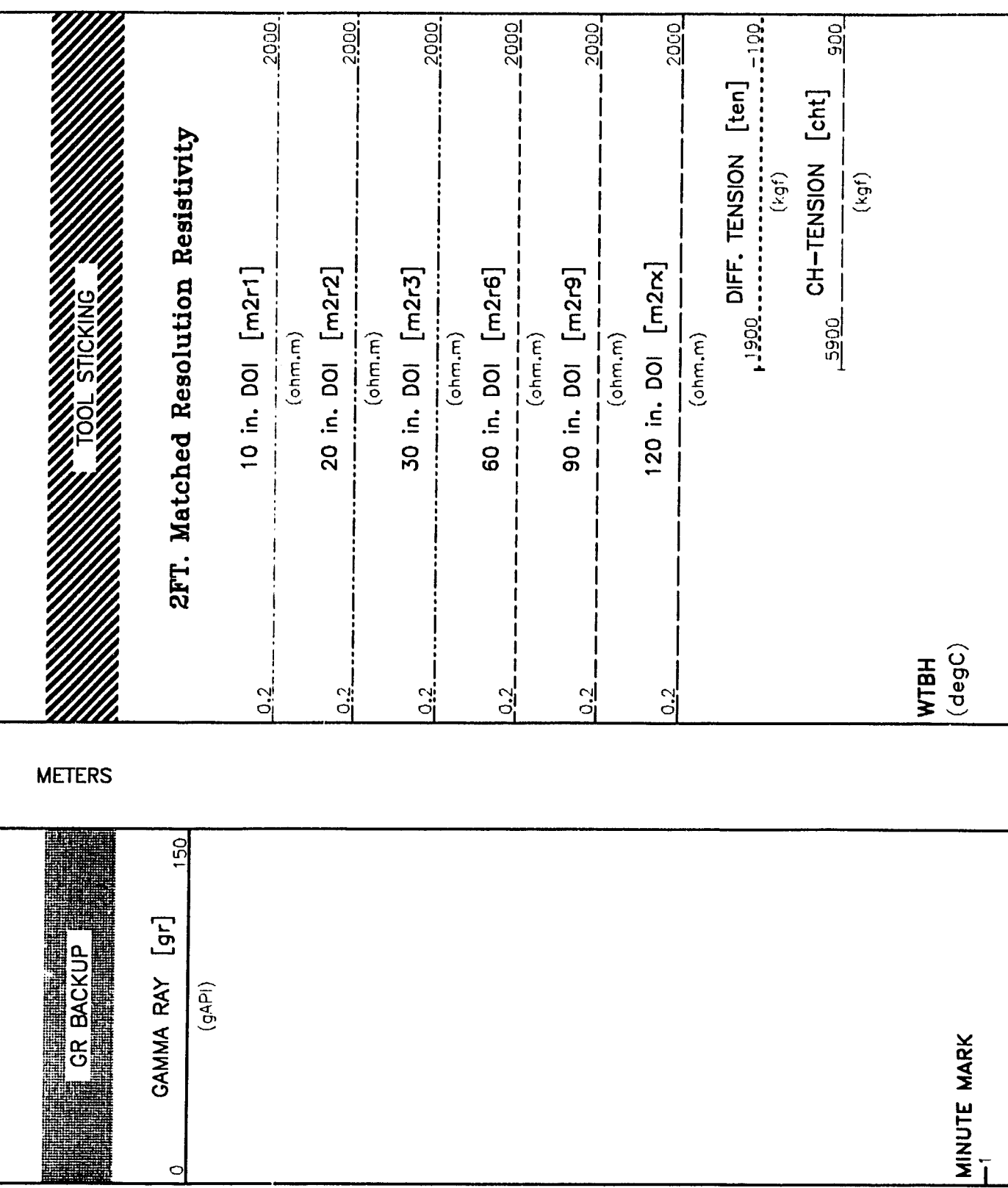
ALPINE OIL SERVICES CORP.

Customer: PARAMOUNT RESOURCES LTD.															
Customer Rep: WILBERT CALIHOO / GERRY SANDERS															
Well Name: PARA et al FT LIARD															
Well Location: I-46															
Date/Time	Ann Press	Ann Temp	Static	Gas Rate 1	Gas Rate 2	Total Gas	Net Gas	Cum Gas 1	Cum Gas 2	Total Gas	Fluid Inj.	N2 Inj.	Surf Vol	Gain/Loss	Cum +/-
yy/mm/dd	kPa	C	kPa	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3/d	10^3m3	10^3m3	10^3m3	l/min	m3/min	m3	m3	m3
99/12/20															
20:50:02	0	15.48	42.92	0	0	0	0	225.76	0	225.76	0	0			
21:00:02	0	15.29	42.92	0	0	0	0	225.76	0	225.76	0	0	133.966	0	133.966
22:45:00	START OUT OF HOLE WITH DRILL STRING.														
23:00:00	END OF DRILL AHEAD REPORT.														

**RESISTIVITY/
CONDUCTIVITY**







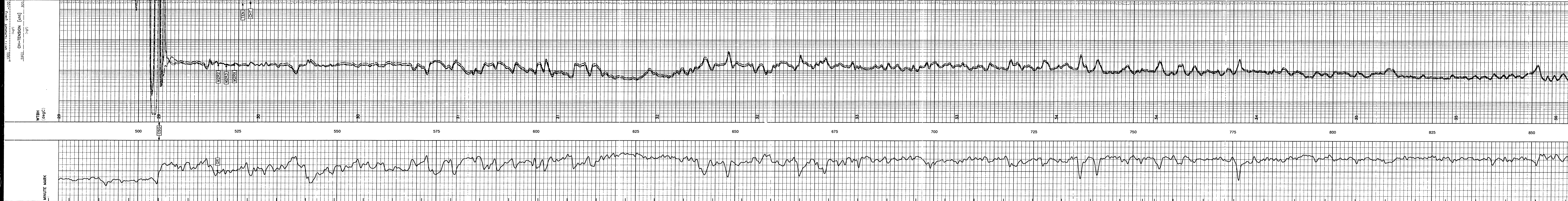
MAIN PASS - 3 CURVE PRESENTATION

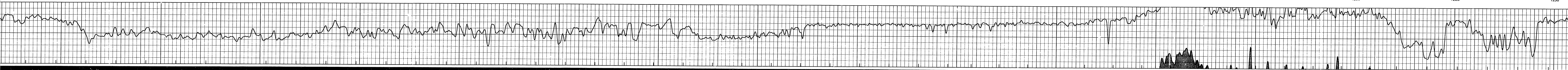
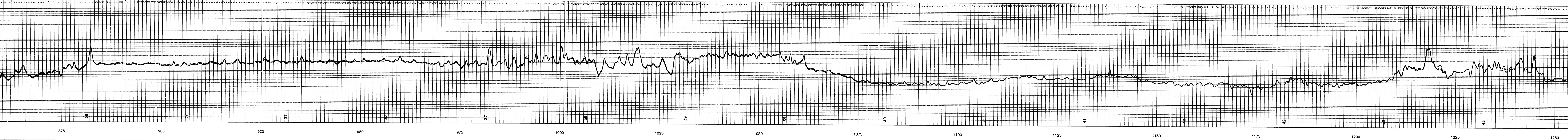
FILE: /data/pass/para-45/e79b06.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 476.402 m BOTTOM DEPTH: 1548.613 m

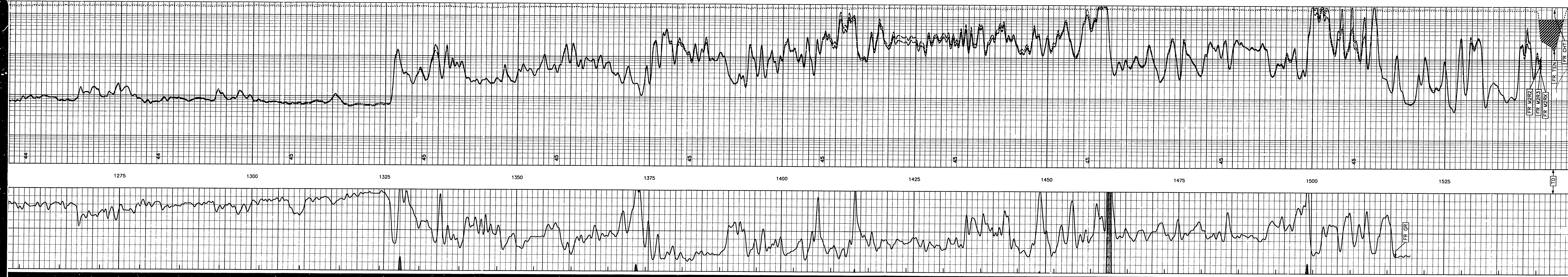
CURVE MEASURE POINT OFFSET					
CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)
cht	-0.00	m2/2	2.59	m2/r	2.59
gr	29.57	m2/3	2.59	tan	-0.00

Presentation : /data/pass/para-46/hall5-mah.pdf
 Data File : F1 : cpi:/data/pass/para-46/a77906.tif
 Company : PARAMOUNT RESOURCES LTD.
 Project : PARS ET AL FI. LAND 1-46 60 10', 123 15'
 Field :









MEASUREMENT TYPE		PARAMETER	VALUE	UNITS
CHT	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
HDL	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
TENSION	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r

MEASUREMENT TYPE		PARAMETER	VALUE	UNITS
CHT	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
HDL	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
TENSION	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r

MEASUREMENT TYPE		PARAMETER	VALUE	UNITS
CHT	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
HDL	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
TENSION	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r

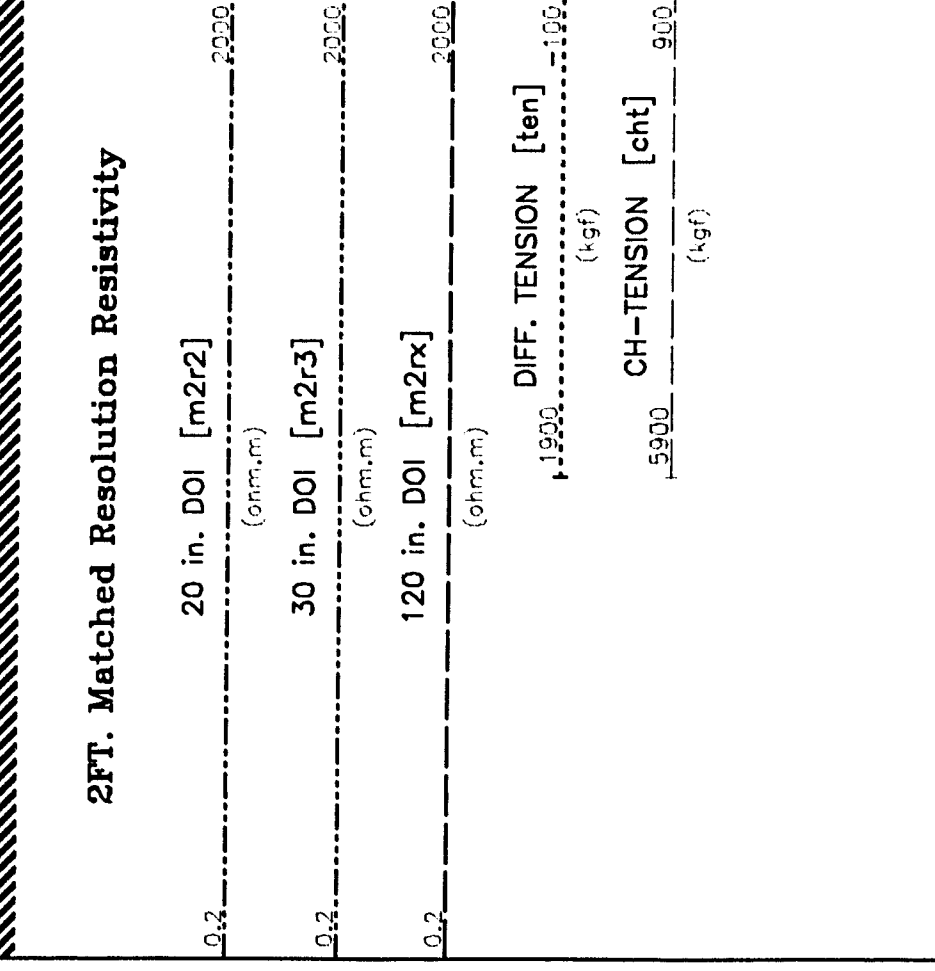
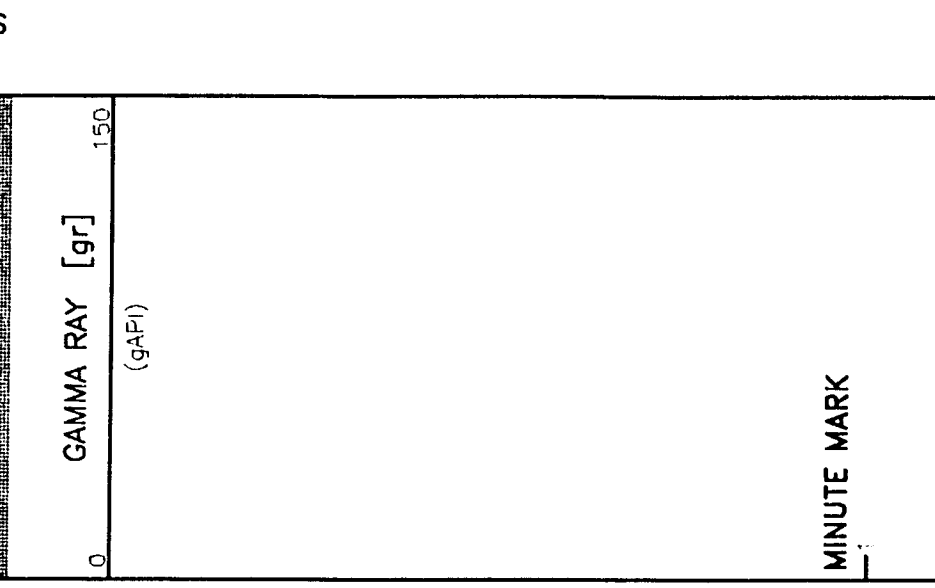
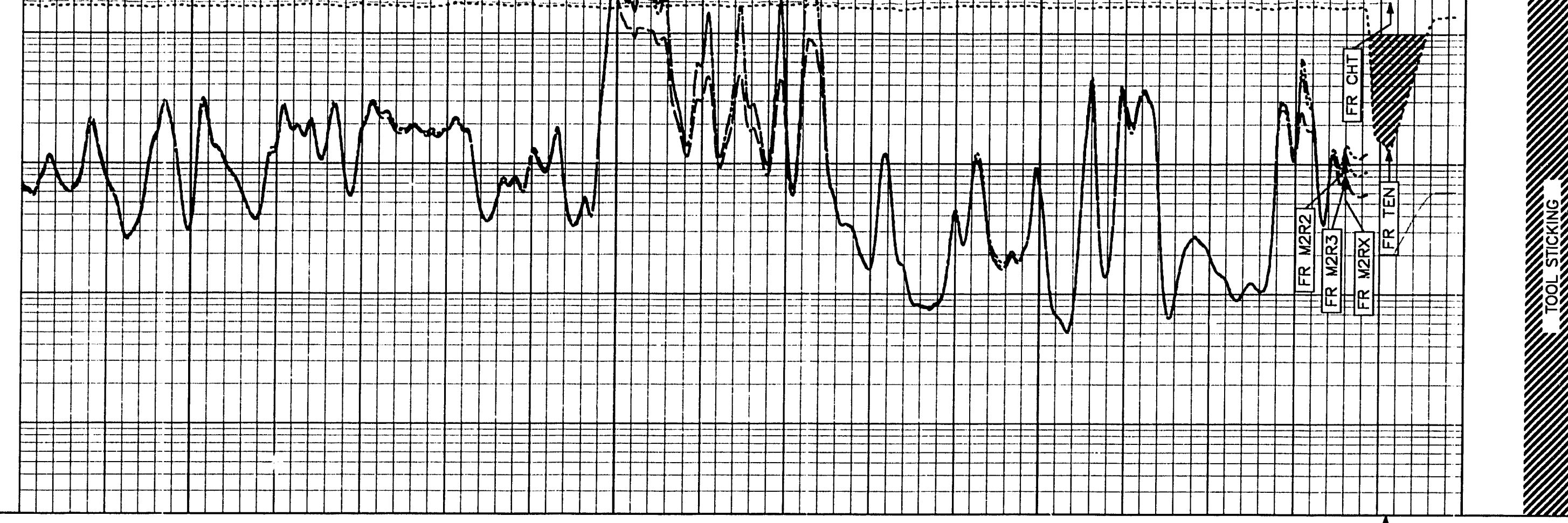
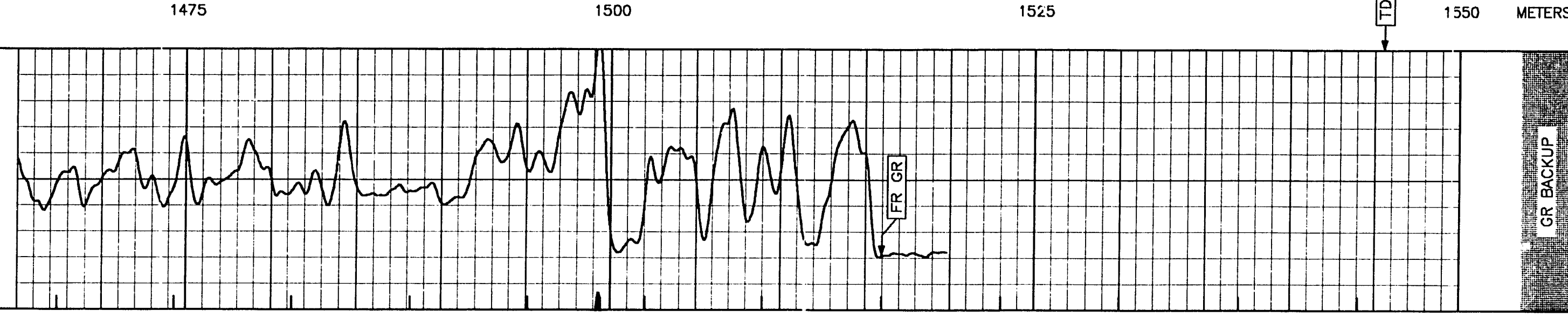
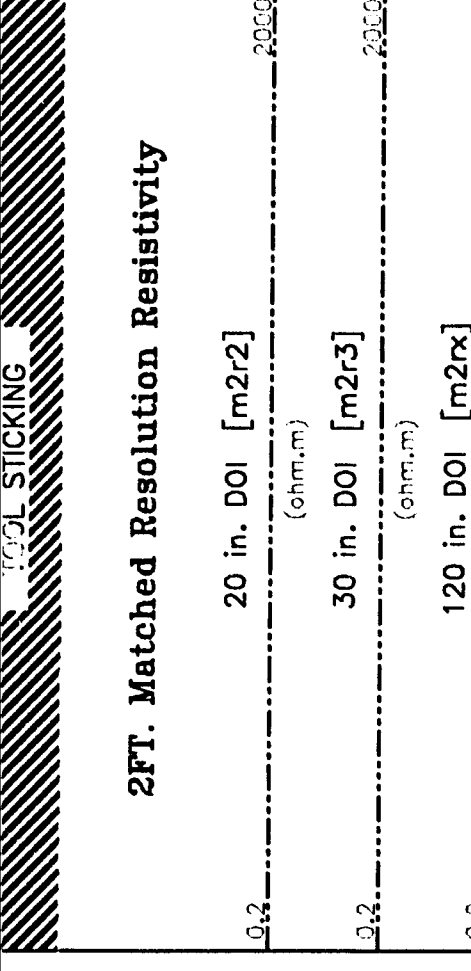
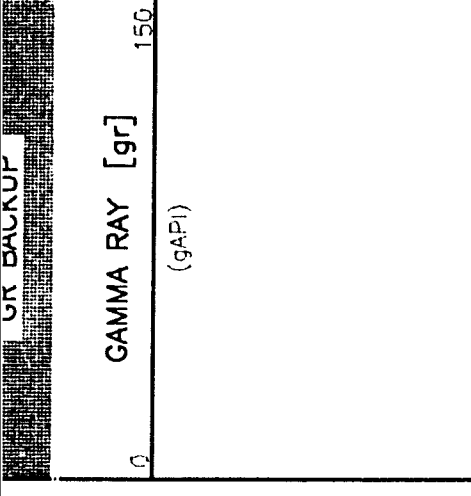
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CHT	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
HDL	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
TENSION	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r

Releases: 3.2 Jul 06, 1999 Fileview 2.36 Plot 3.0 Tue Dec 7 03:49:49 1999
Perp /min/47 Pdf.Cpp /min/13

MEASUREMENT TYPE		PARAMETER	VALUE	UNITS
CHT	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
HDL	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
TENSION	GR	GR BACKUP	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r
	GR	GR GR	150	g/r

Releases: 3.2 Jul 06, 1999 Fileview 2.36 Plot 3.0 Tue Dec 7 03:49:49 1999
Perp /min/47 Pdf.Cpp /min/13

TERS



REPEAT PASS - 6 CURVE PRESENTATION

Release: 3.2 Jul 06, 1999 Fileview 2.36 Plot 3.0 Tue Dec 7 03:51:03 1999
Perp / main/47 Pdf. Opp / main/13

PARAMETER AND FILTER SUMMARY REPORT	
SYMMETRIC FILTER	
MEASUREMENT TYPE	PARAMETER
GR	FILTER ()
HOIL	HOIL 2 FT RES
TENSION	FILTER ()
BOREHOLE & CEMENT	
MEASUREMENT TYPE	PARAMETER
X-Y CALIPER	X-Y Caliper
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (msh*)
BOREHOLE CORR DIAMETER	FIXED DIAMETER (msh*)
BOREHOLE CORR DIAMETER	RMSD SOURCE (HOIL)
MID VALUES	MID SAMPLE TEMP
	MID SAMPLE RES
	MID SAMPLE TEMP
	TEMP GRADIENT
HD/LI PROCESSING	
MEASUREMENT TYPE	PARAMETER
HOIL TEMPERATURE CORRECTION	TEMP CORR SOURCE
ADAPTIVE RUMERHILL CORRECTION	ABC PROCESSING
	ABC TO CALCULATE
	STANDOFF
	TOOL POSITION
	RMSD MULTIPLIER

CURVE MEASURE POINT OFFSET	
CURVE	OFFSET (m)
CH1	-0.00
GR	29.57
m2r1	2.59
m2r2	2.59
m2r3	2.59
m2r6	2.59
m2r9	2.59
m2rx	2.59
ten	-0.00

GR BACKUP

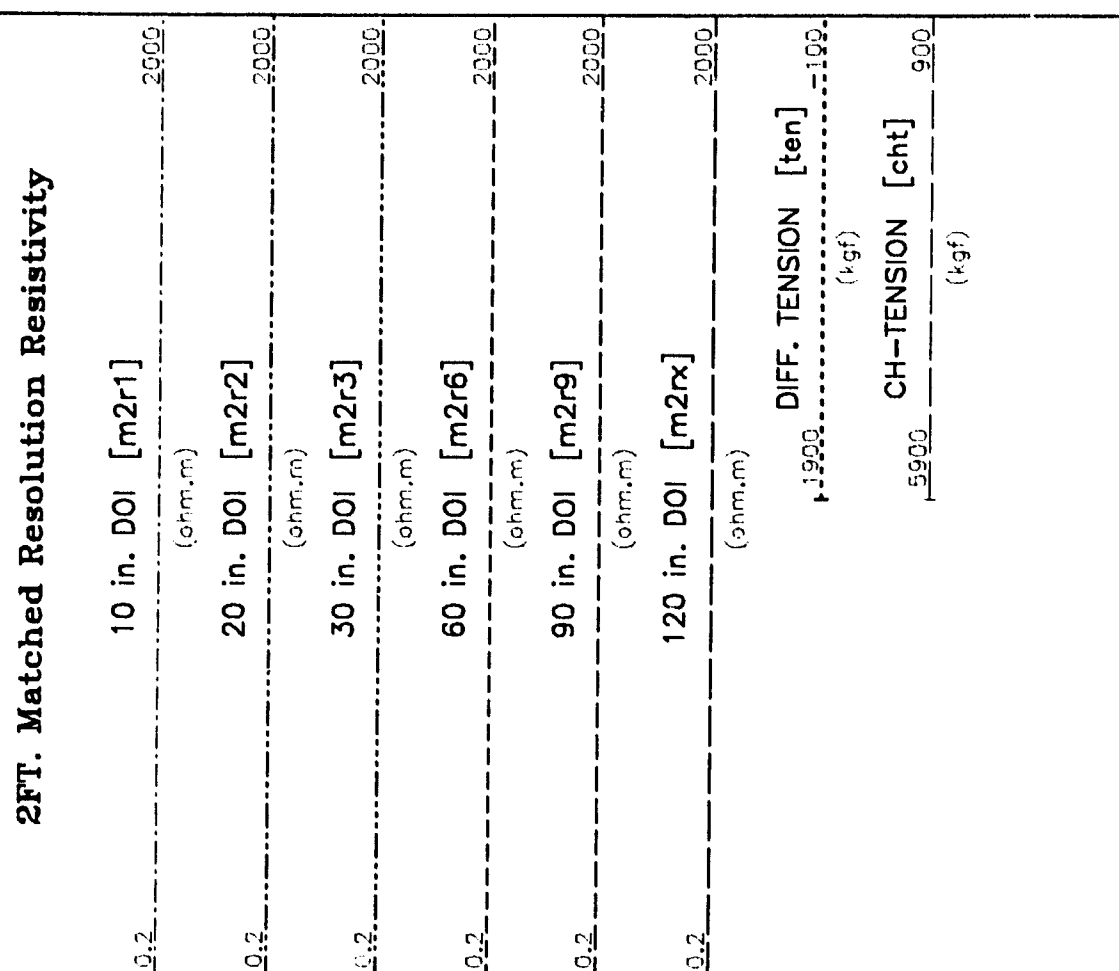
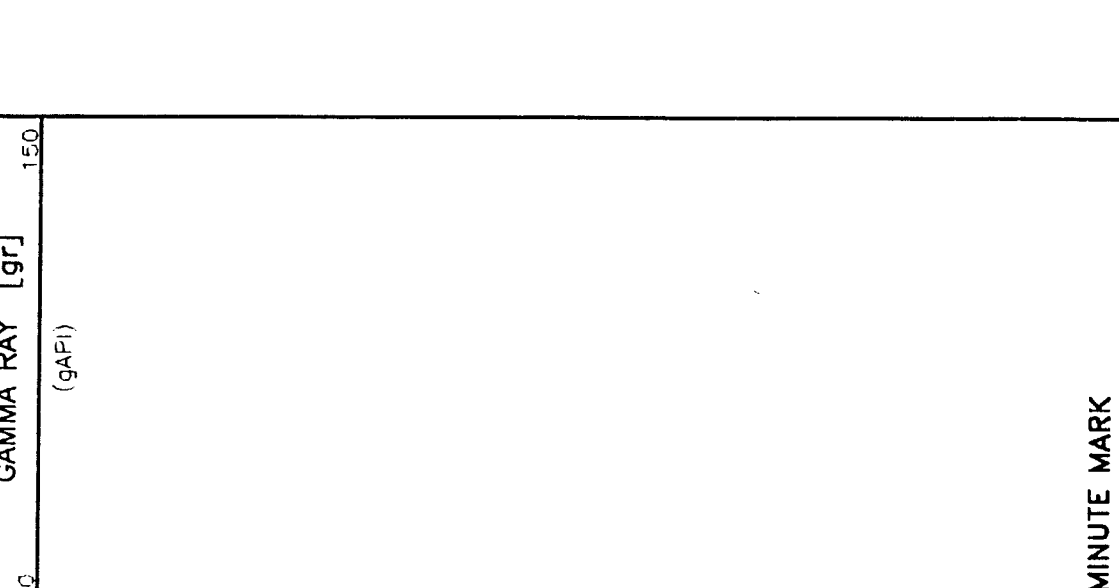
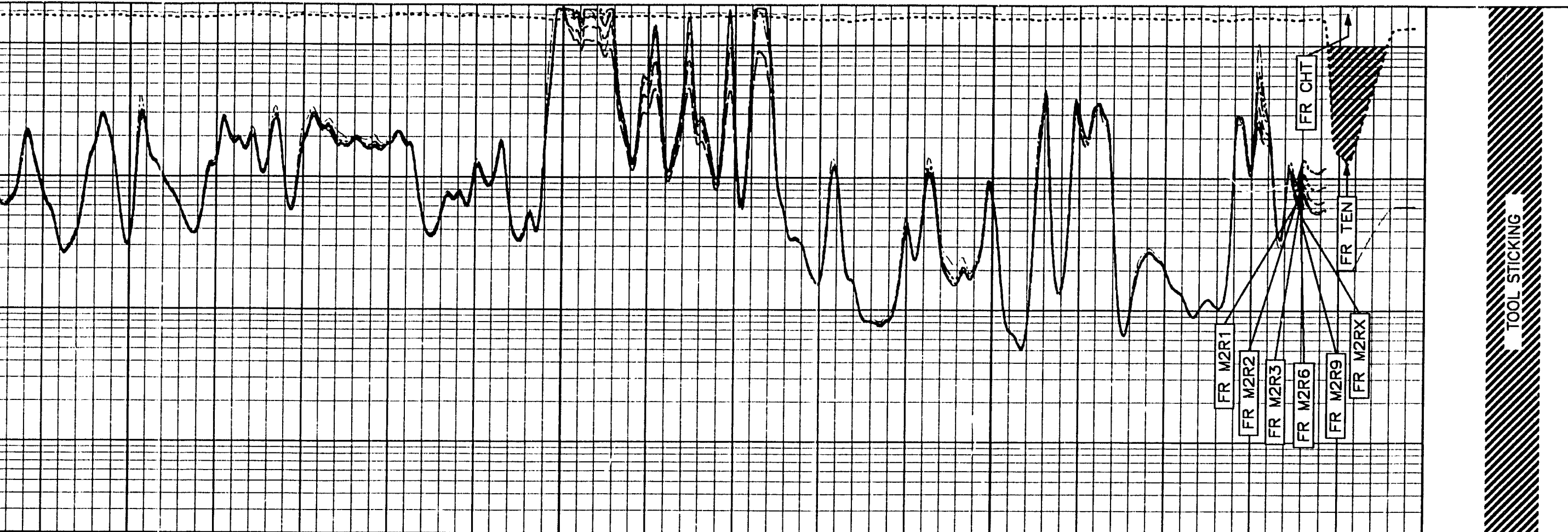
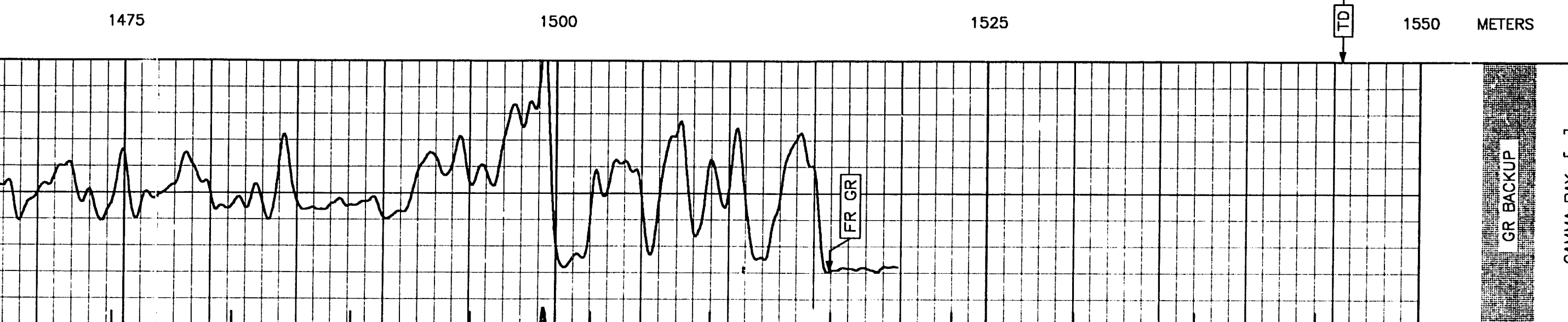
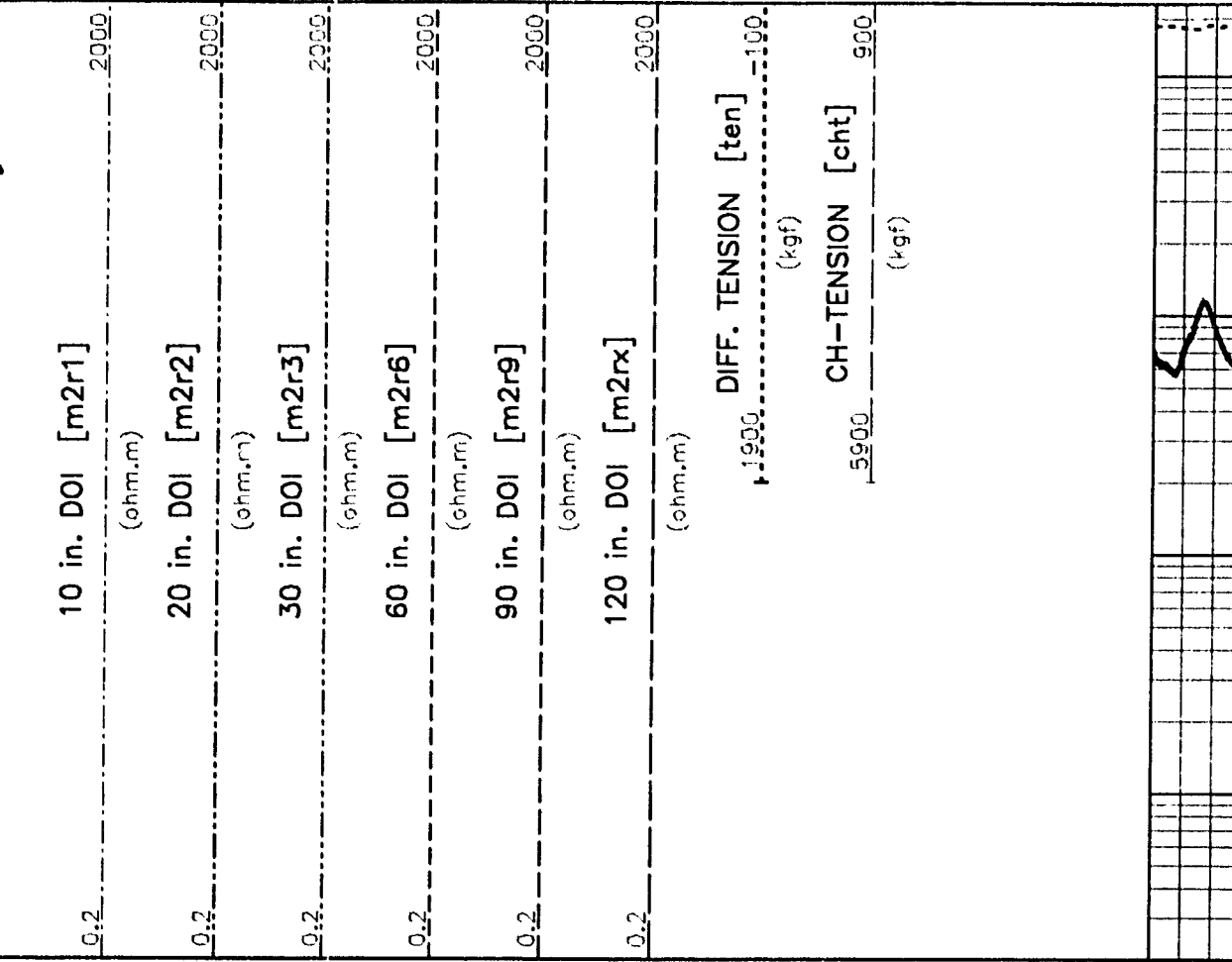
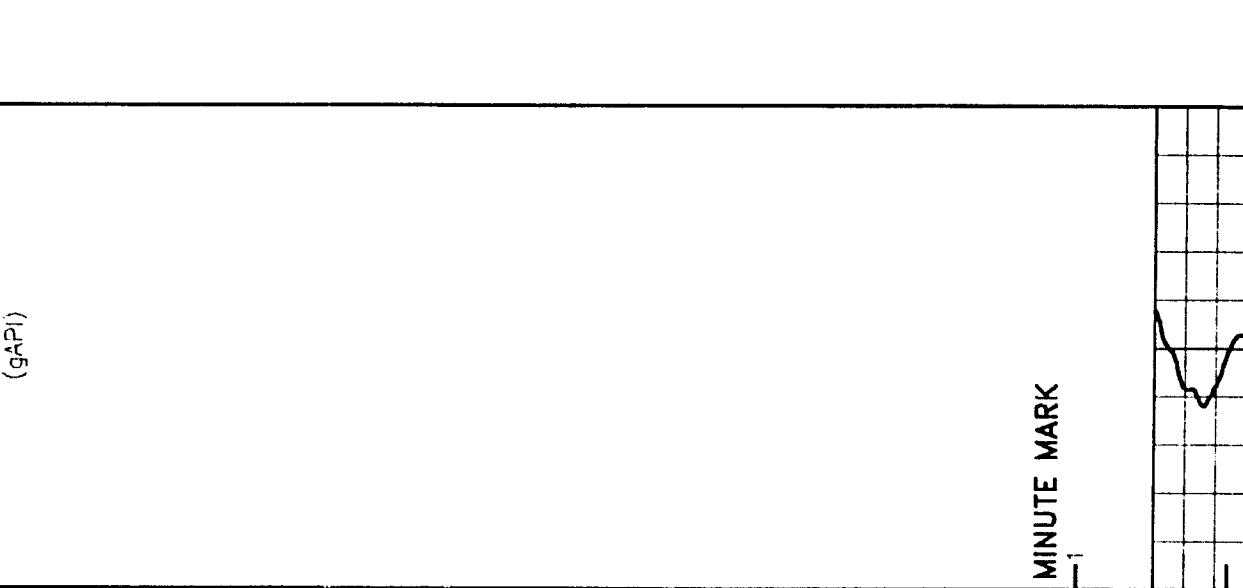
GAMMA RAY [gr] (gAPI)

MINUTE MARK

GR BACKUP

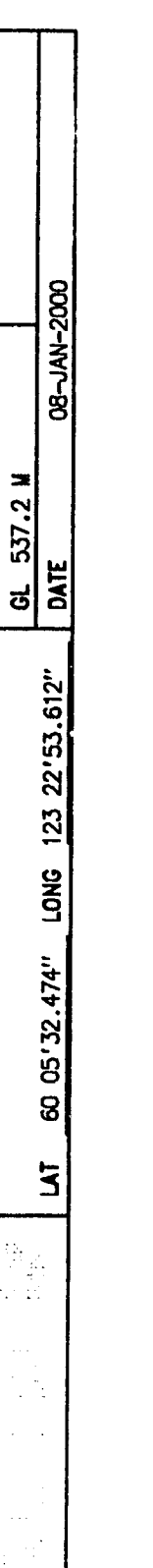
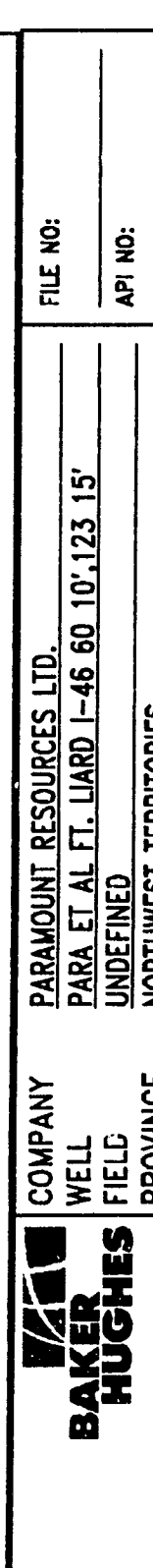
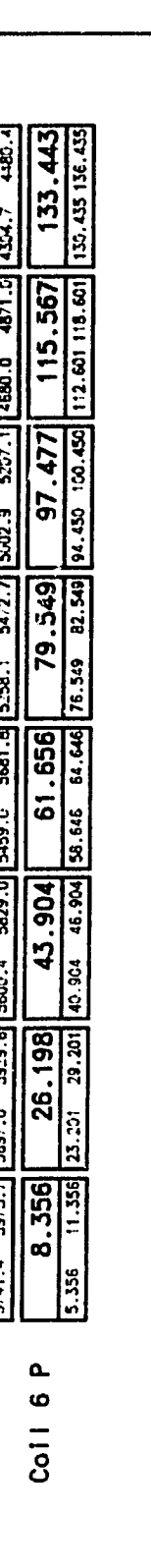
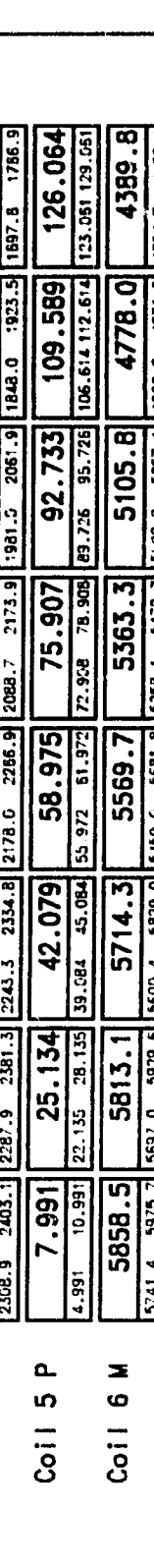
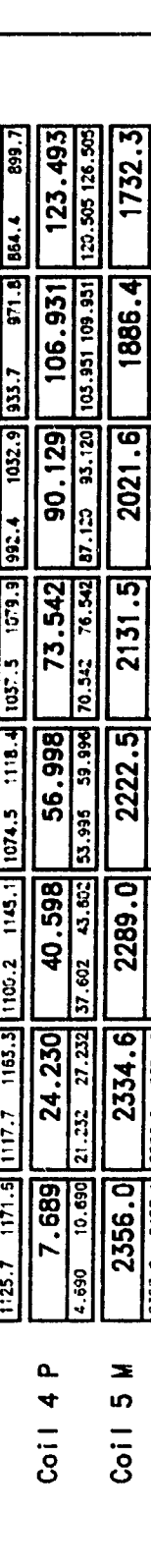
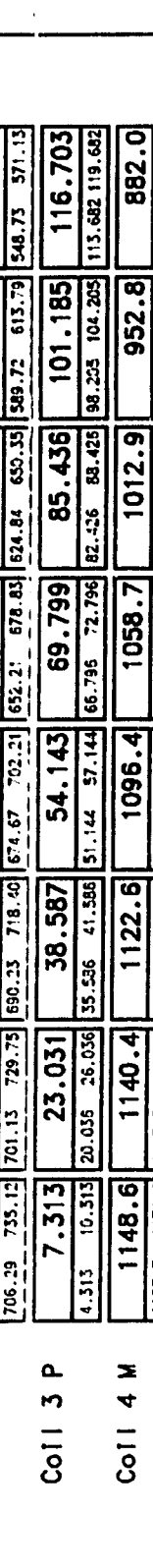
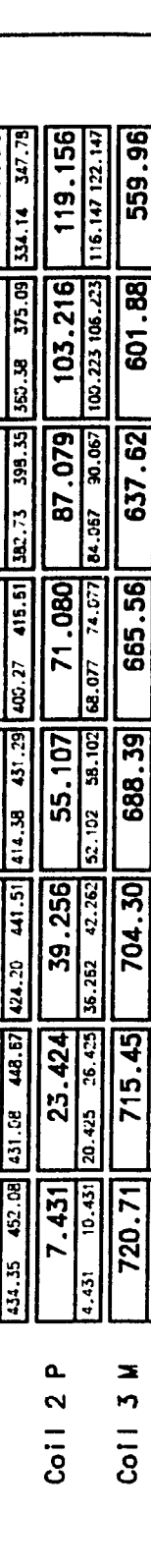
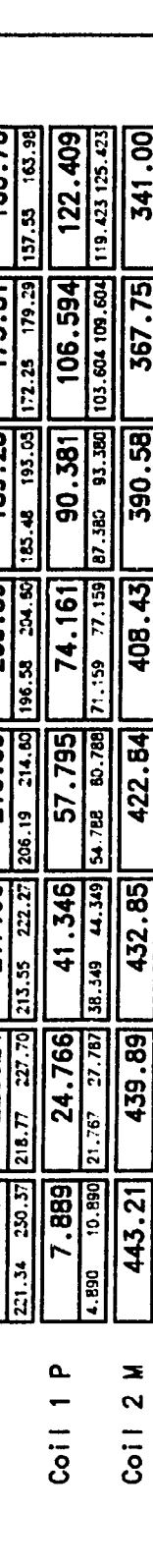
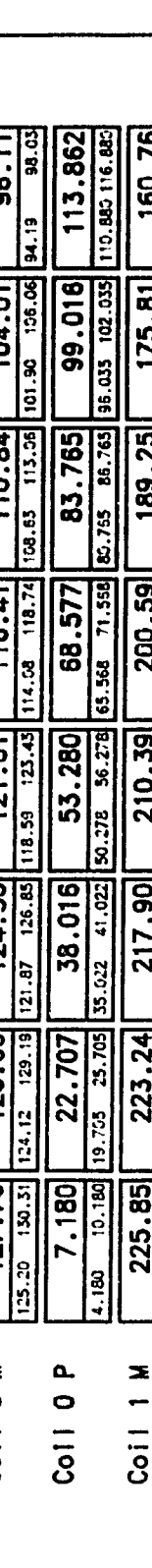
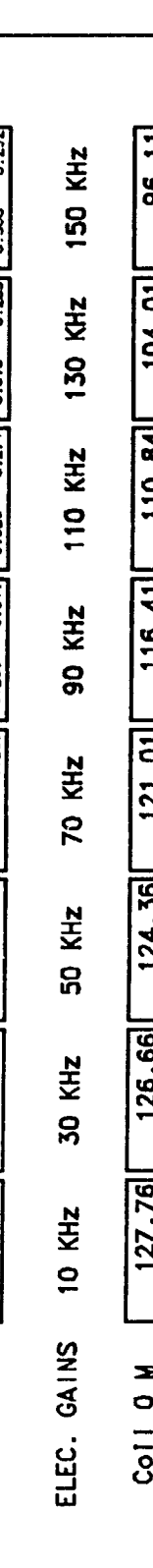
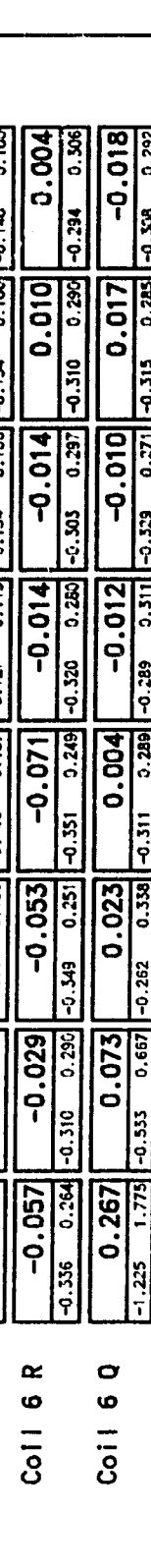
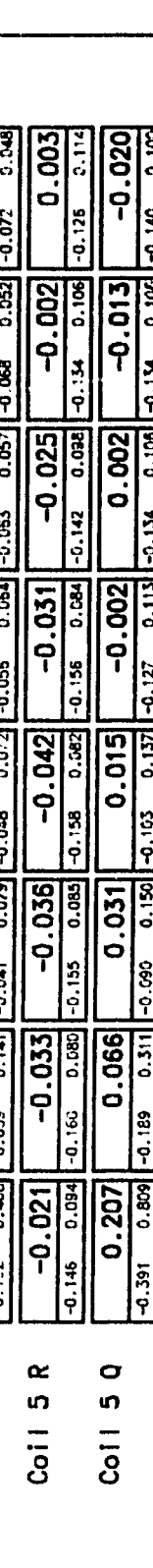
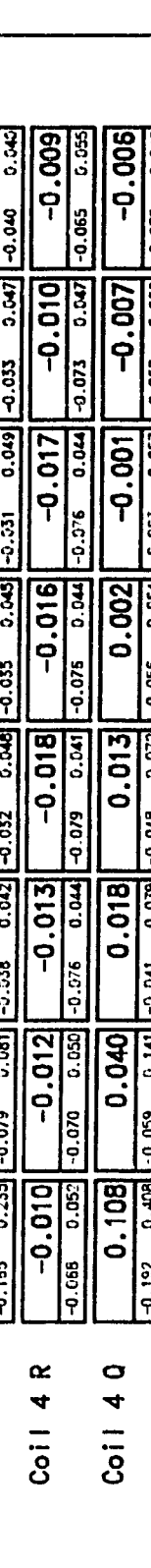
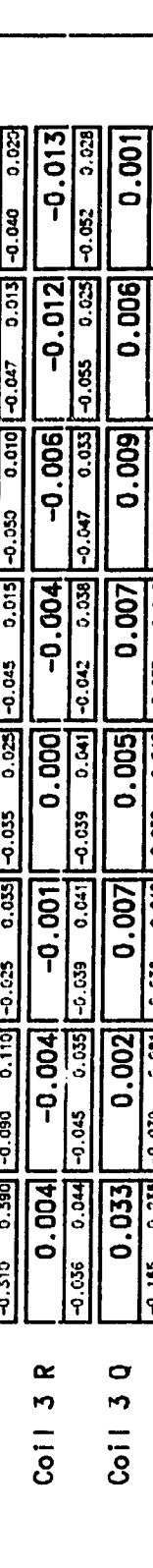
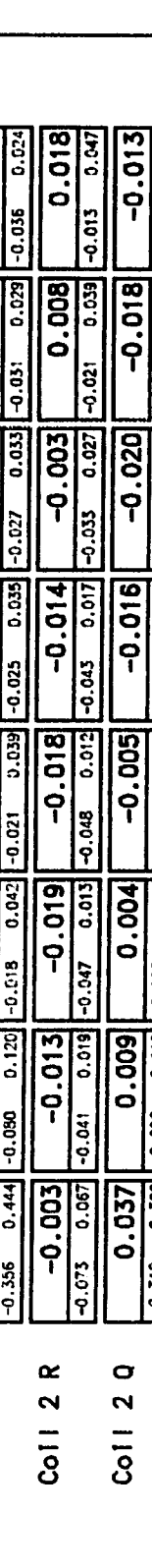
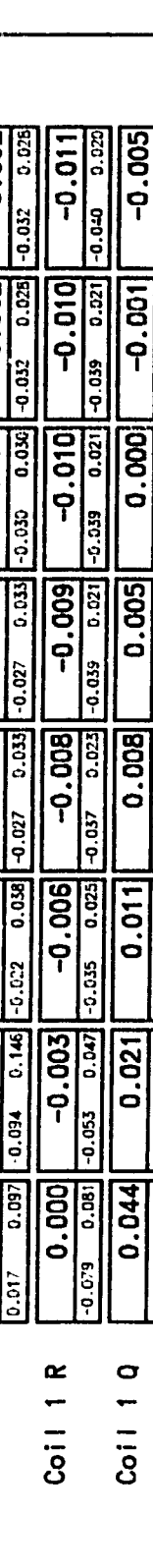
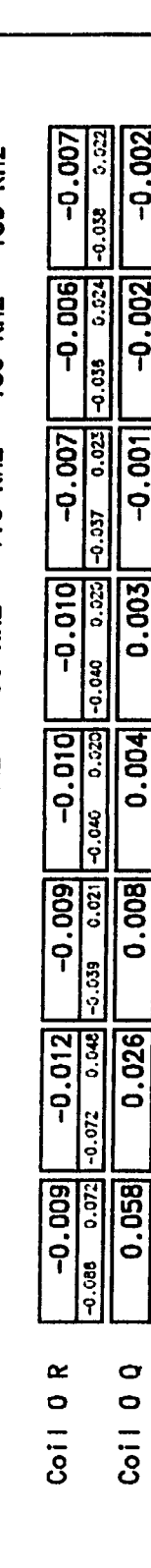
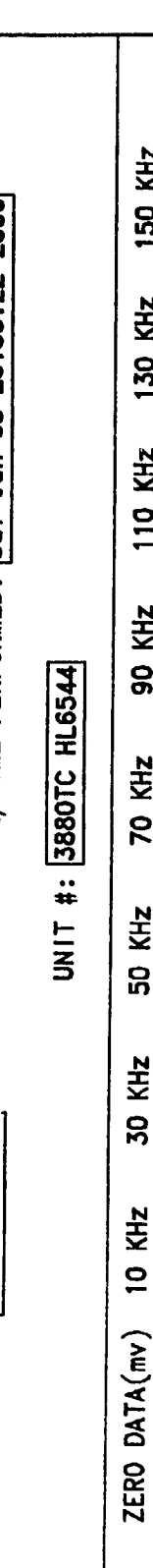
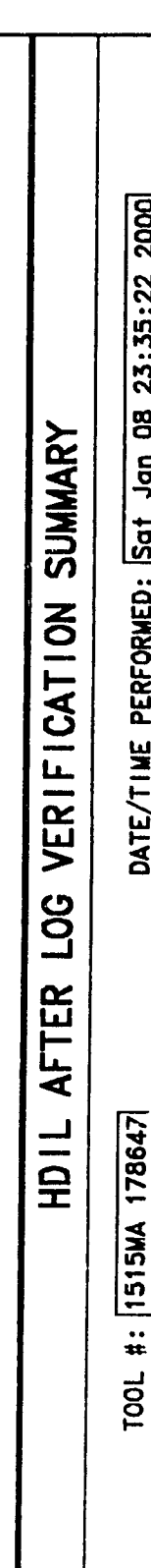
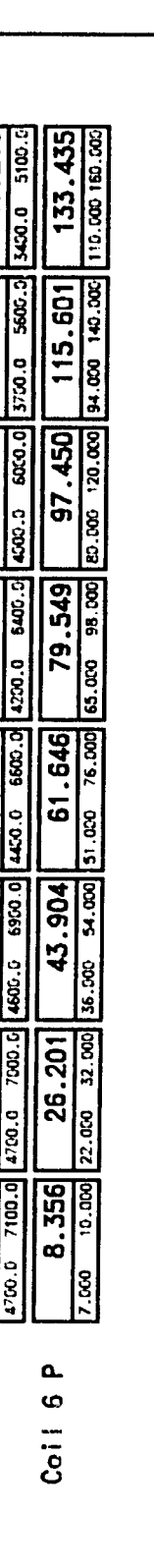
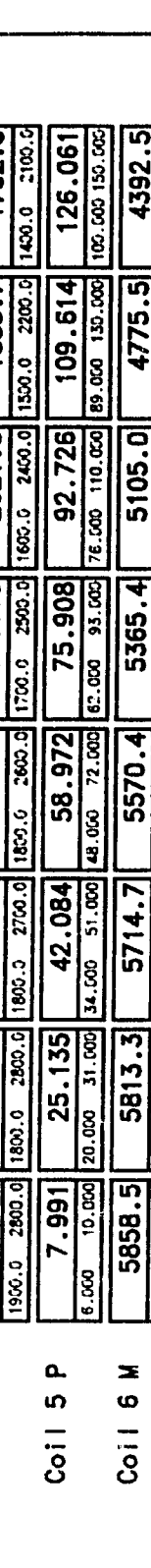
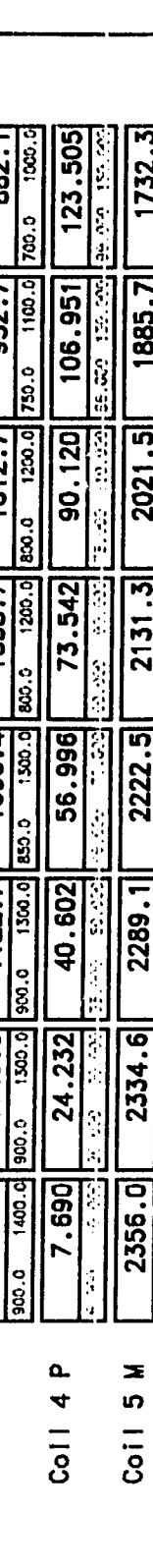
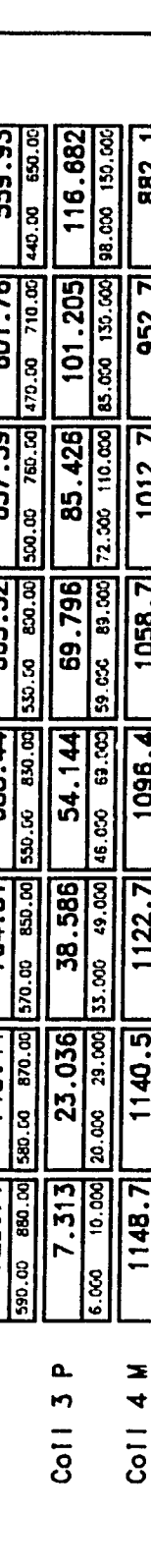
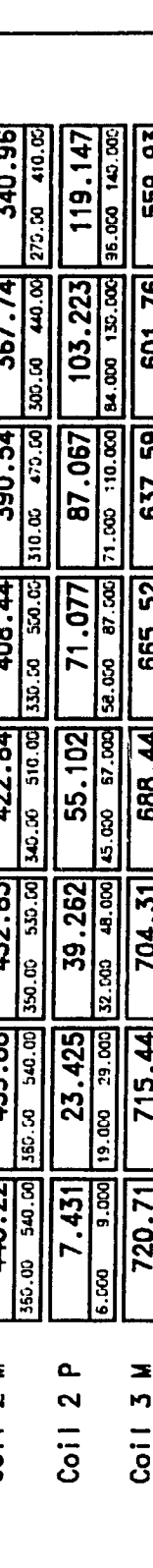
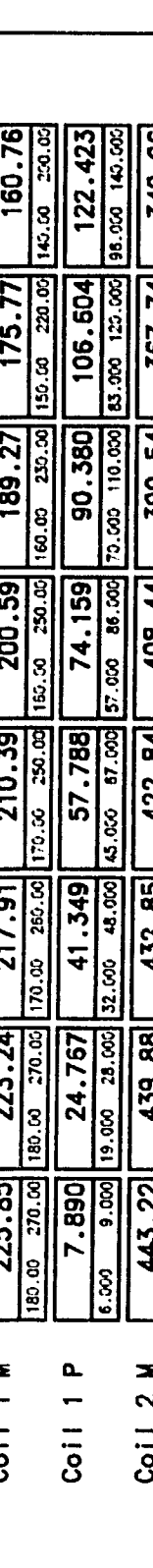
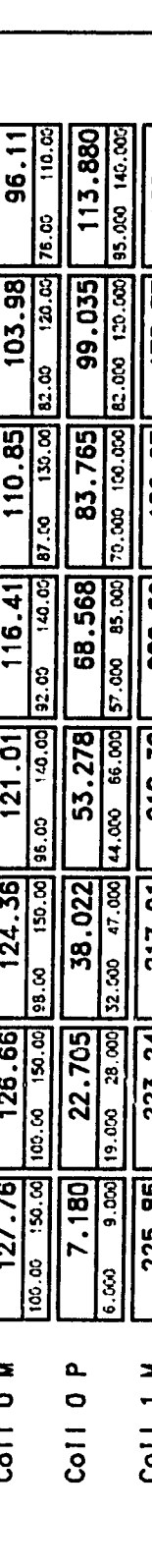
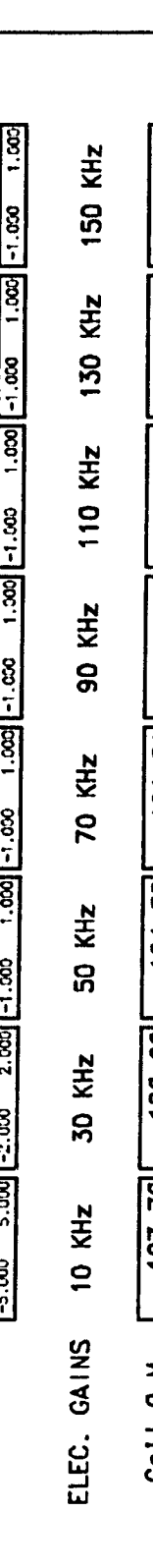
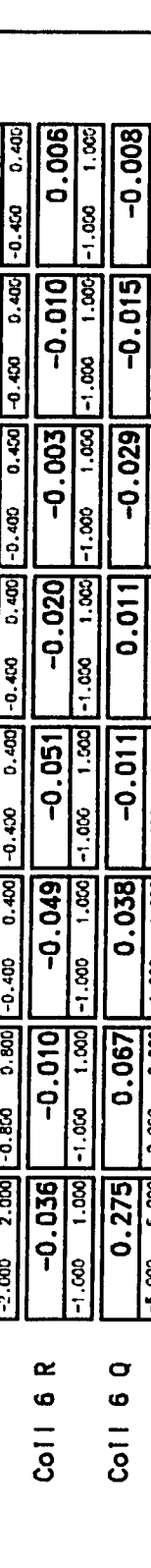
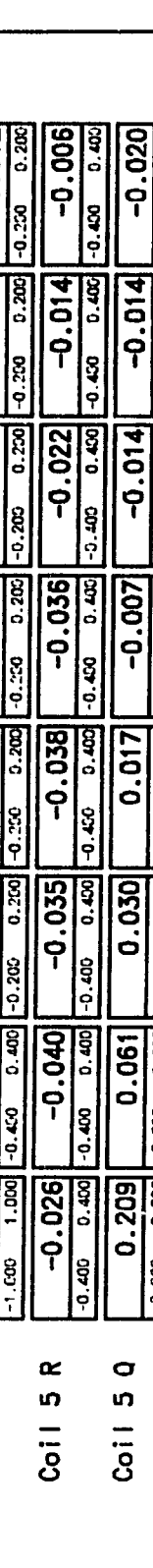
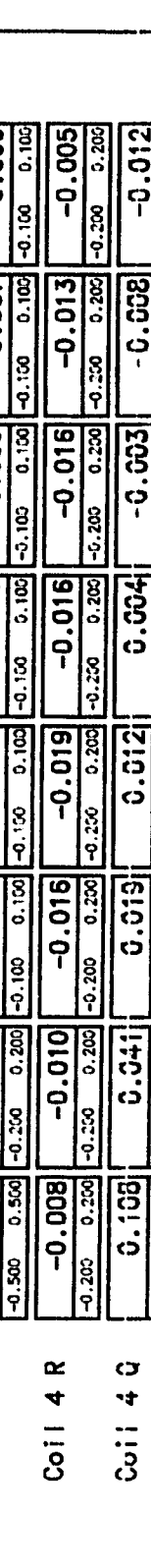
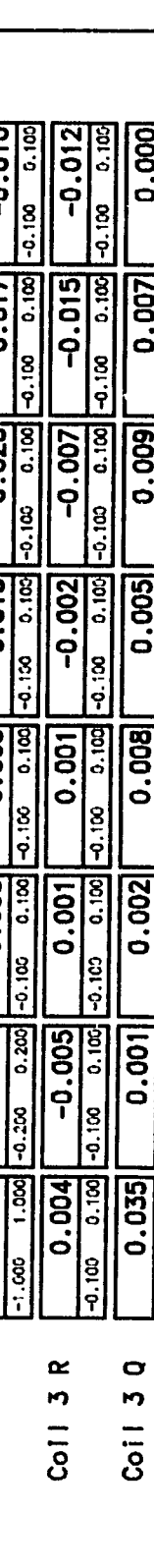
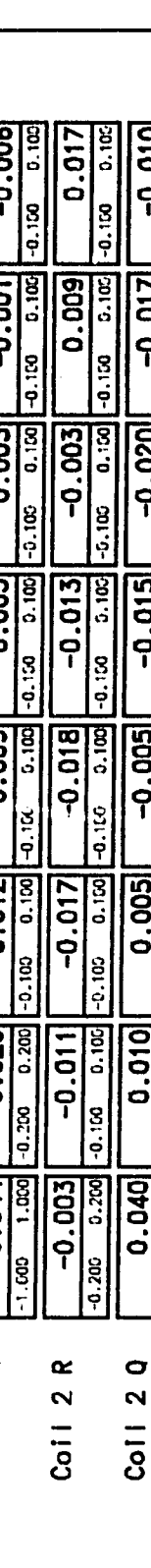
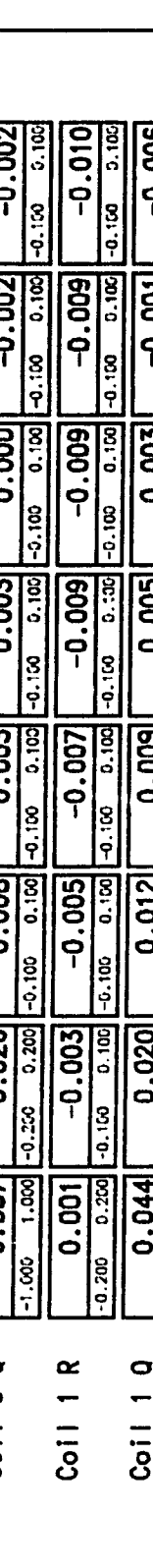
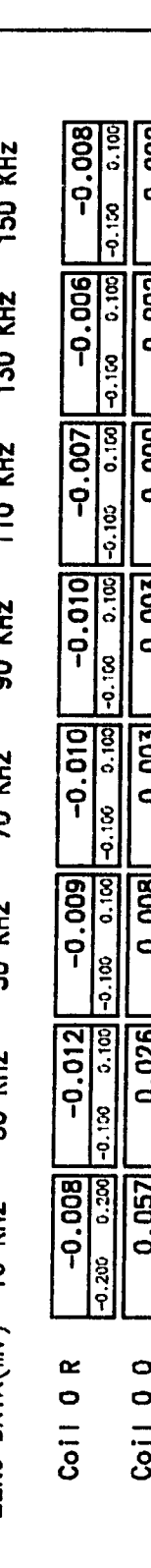
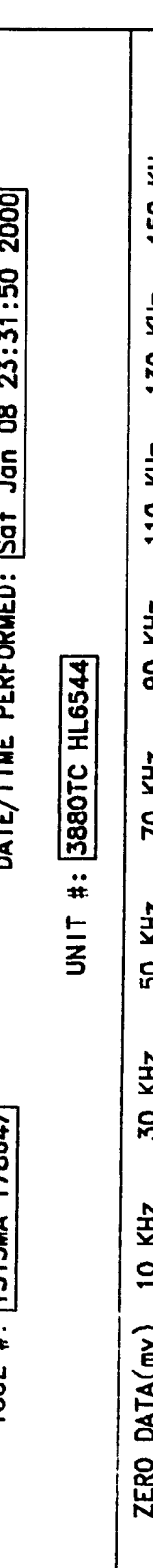
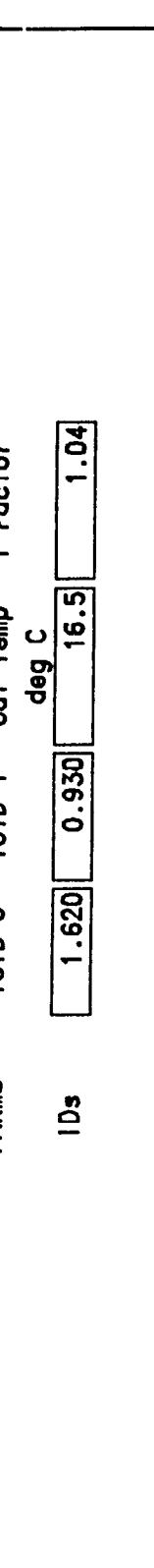
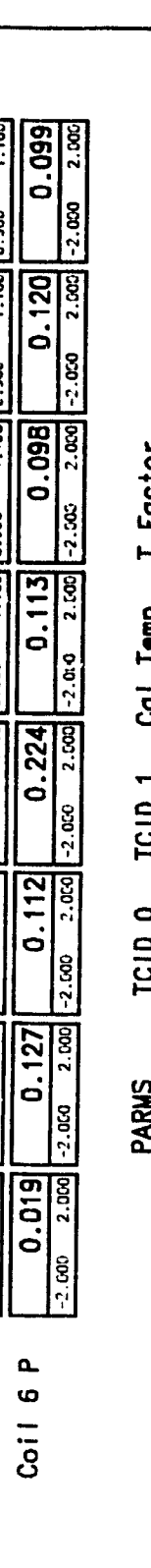
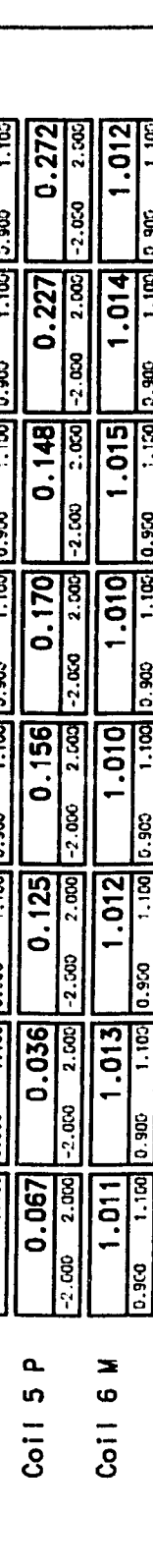
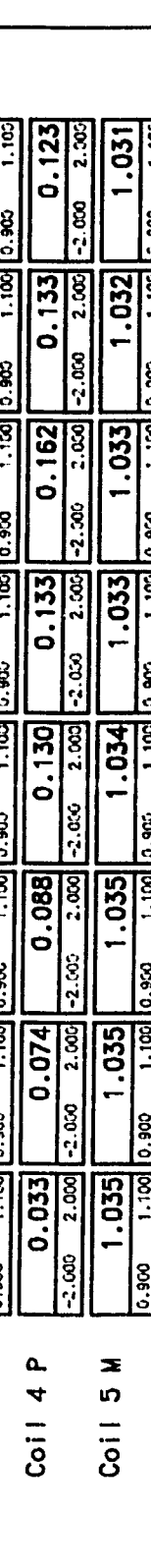
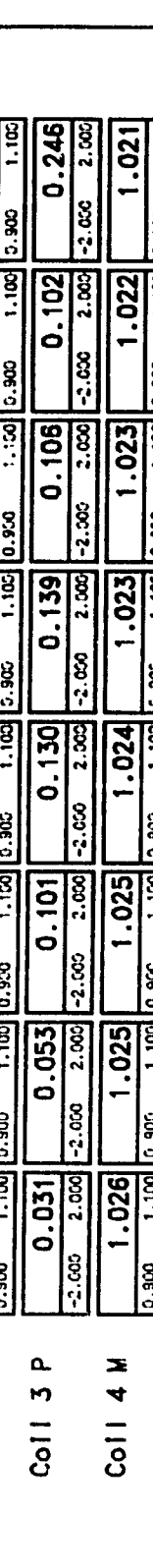
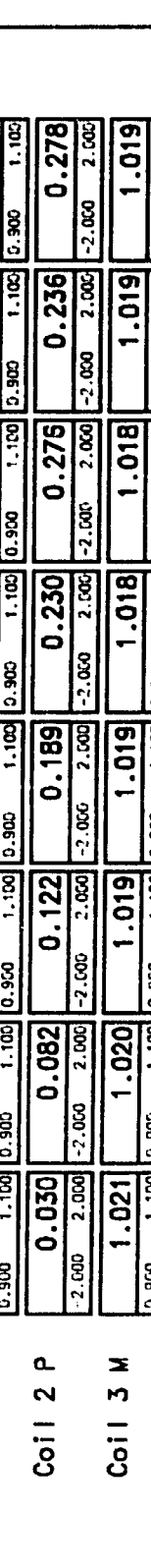
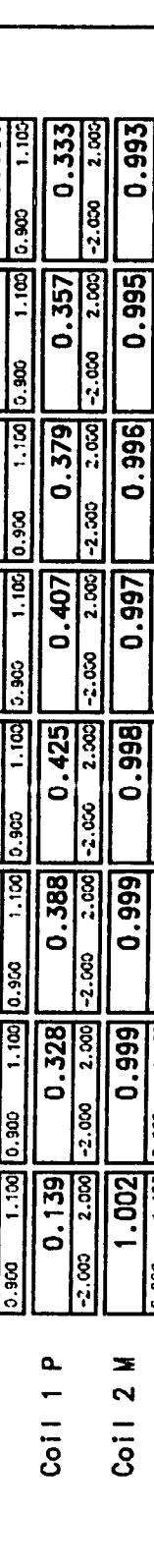
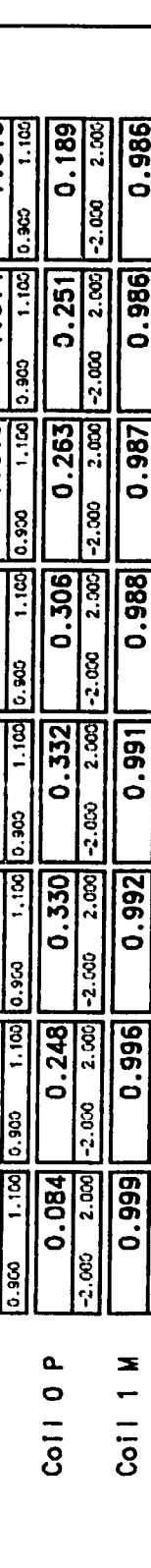
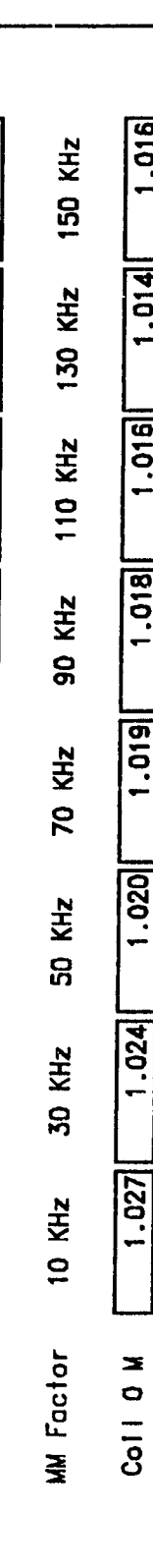
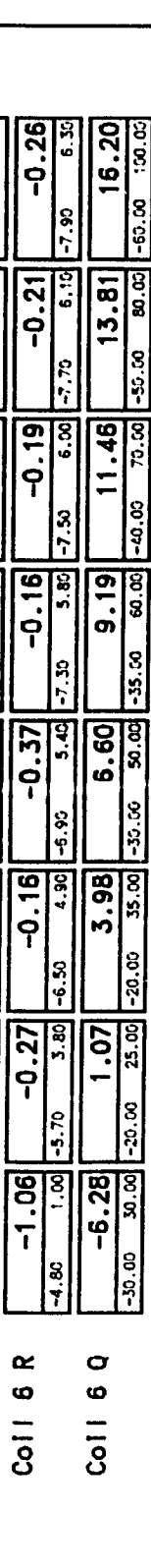
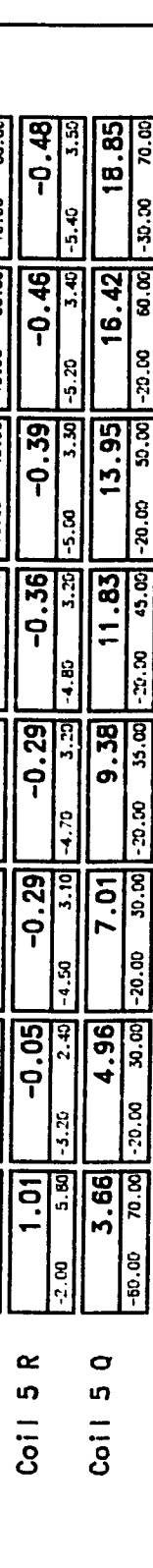
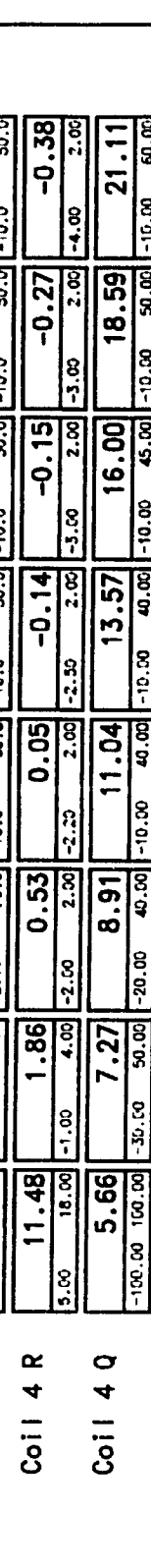
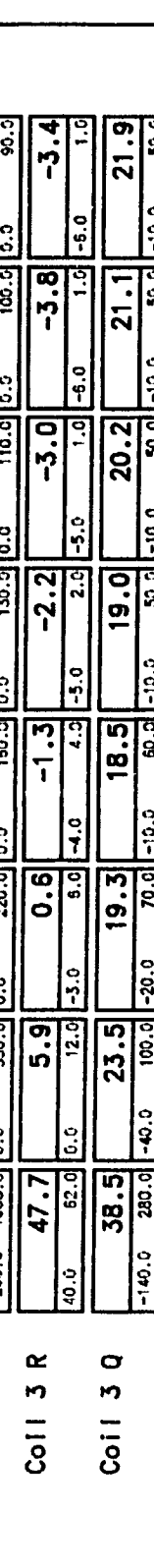
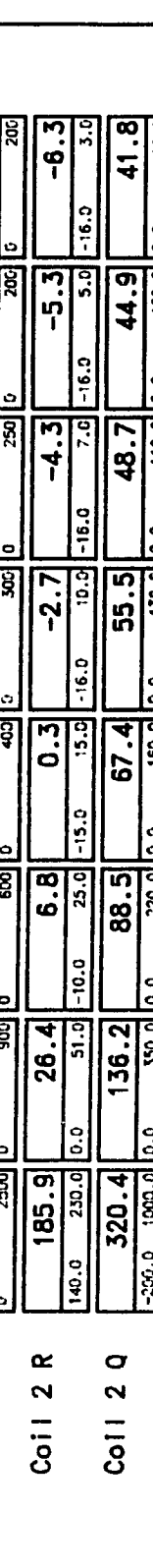
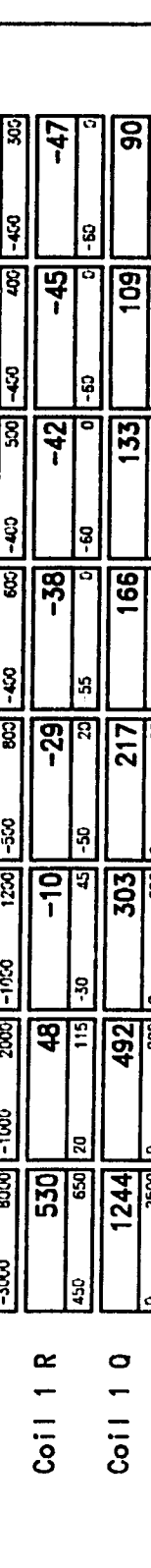
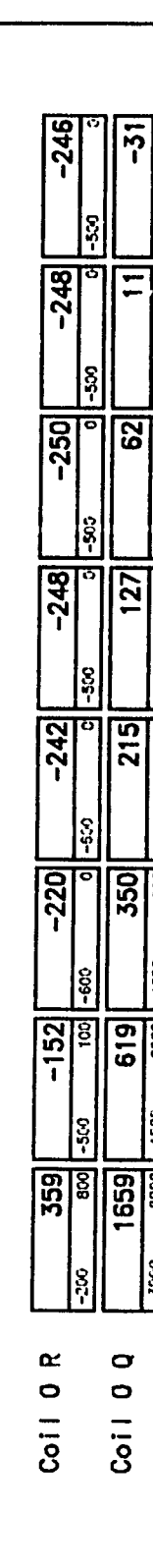
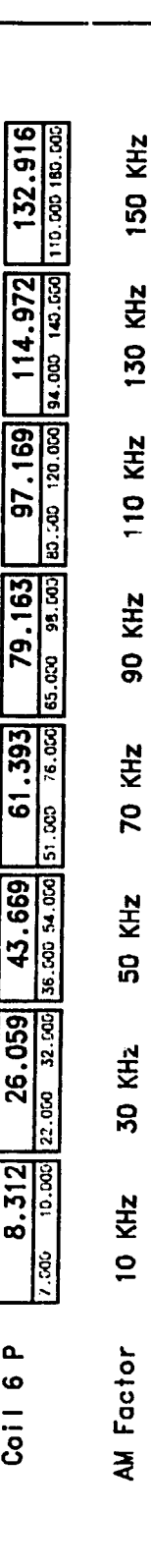
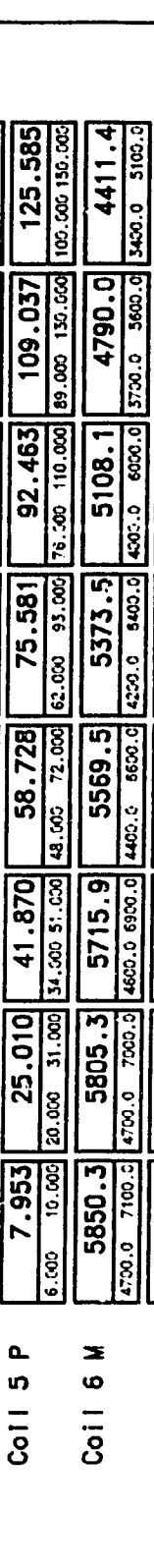
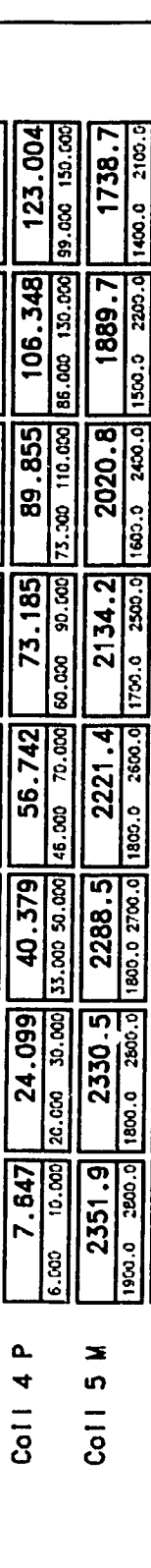
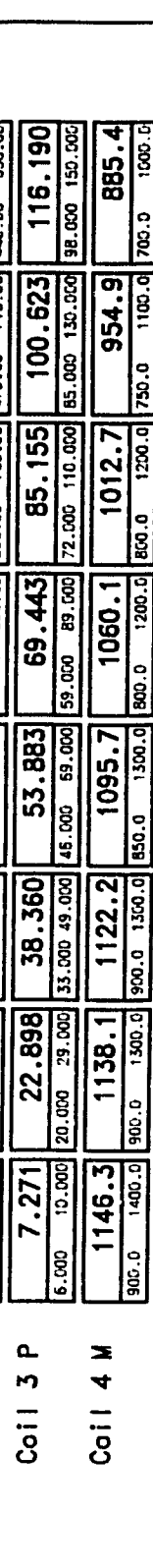
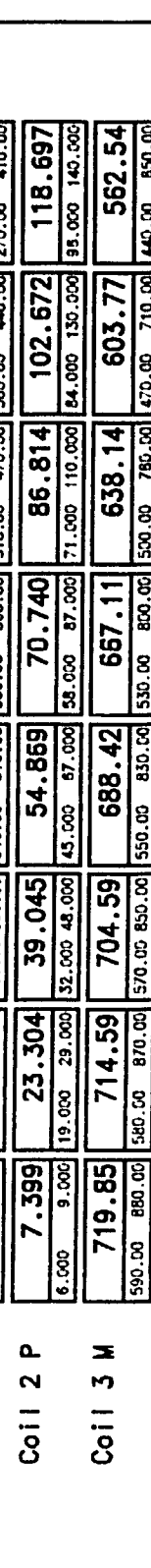
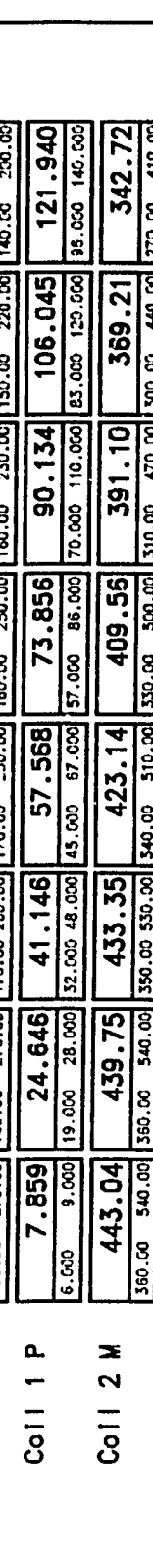
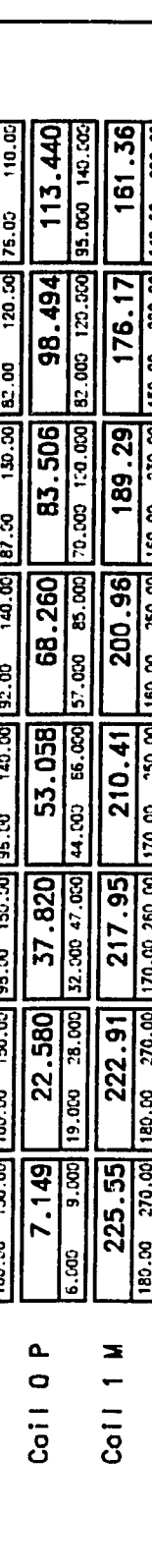
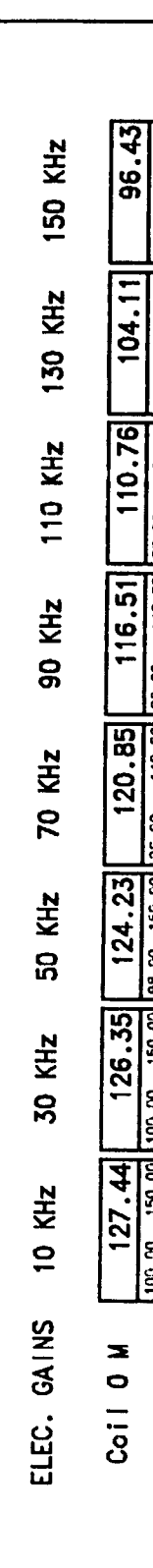
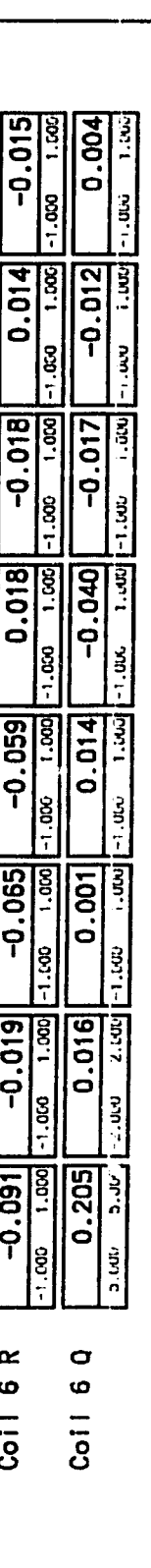
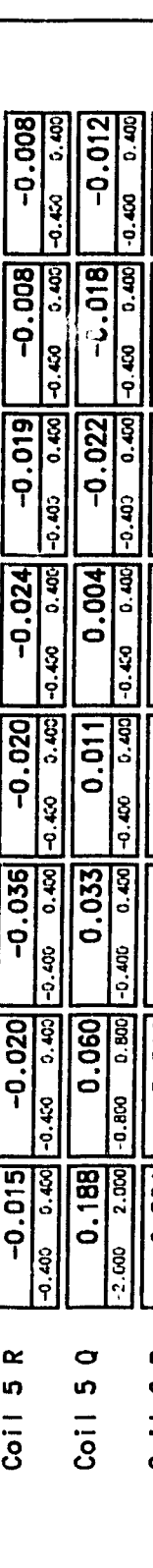
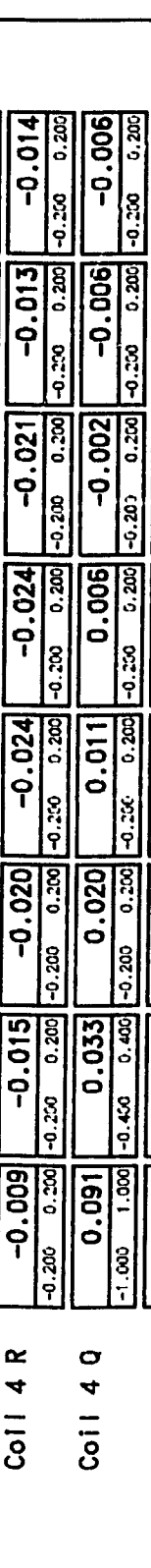
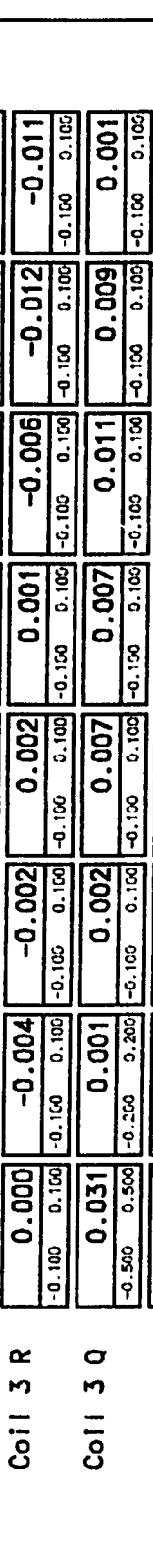
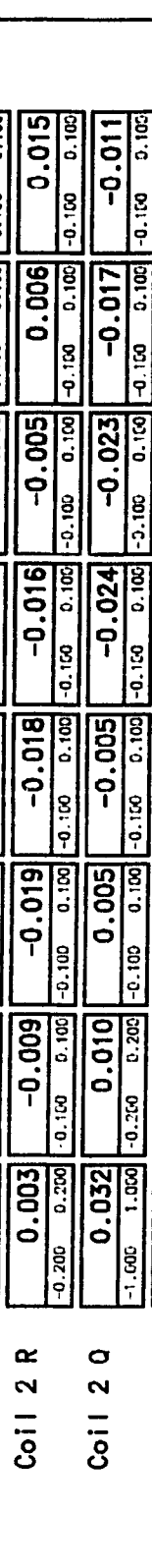
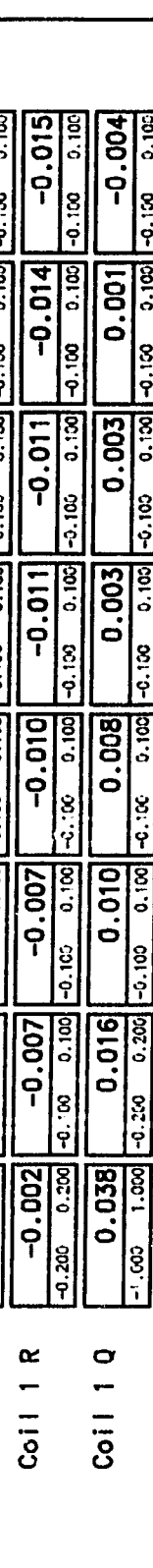
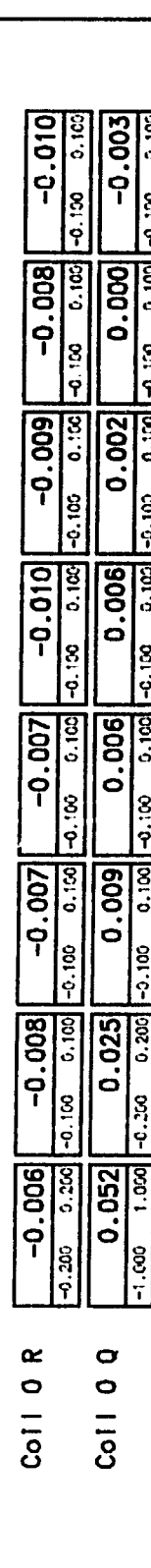
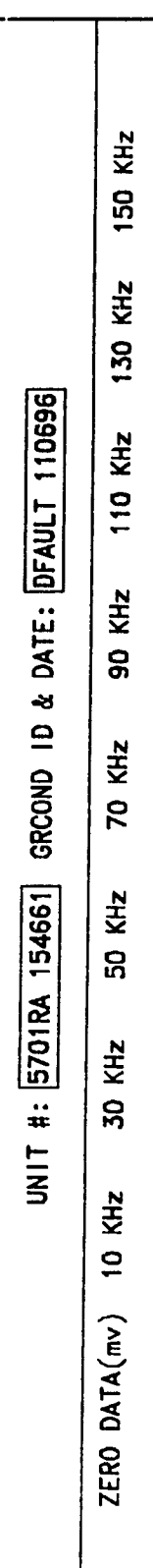
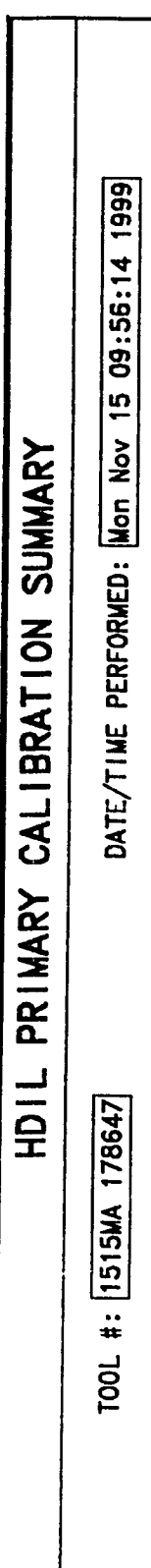
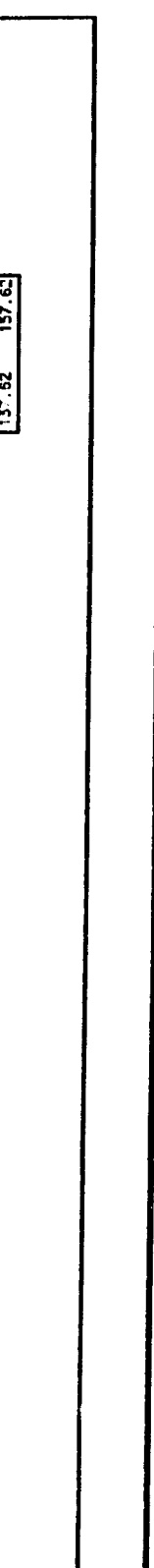
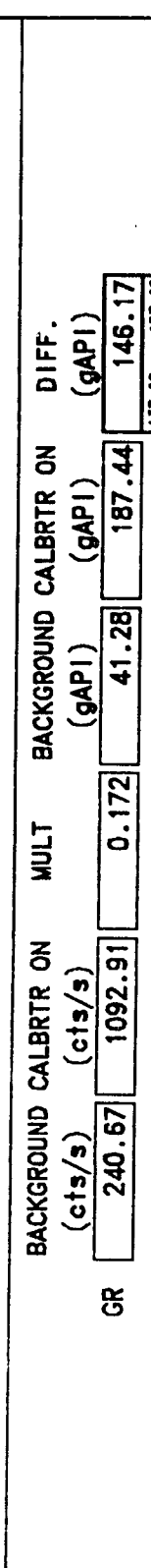
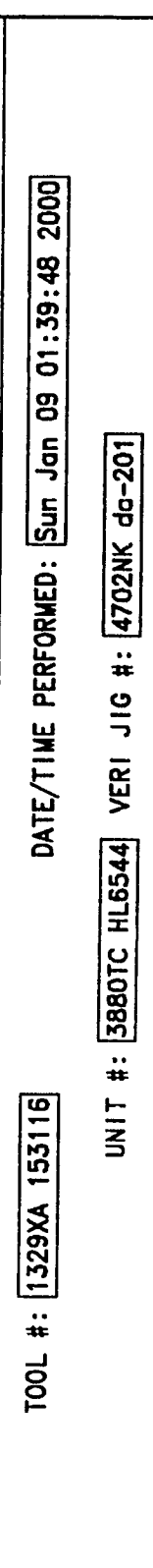
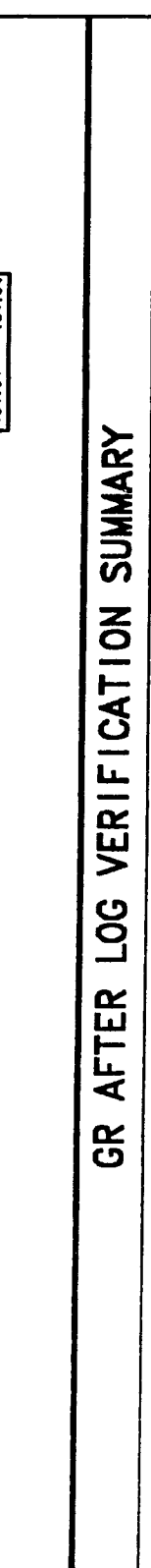
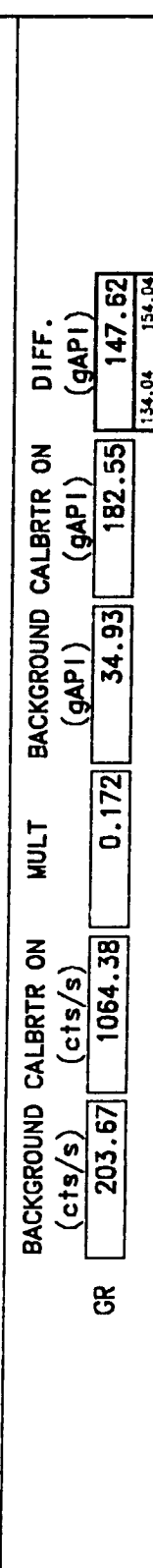
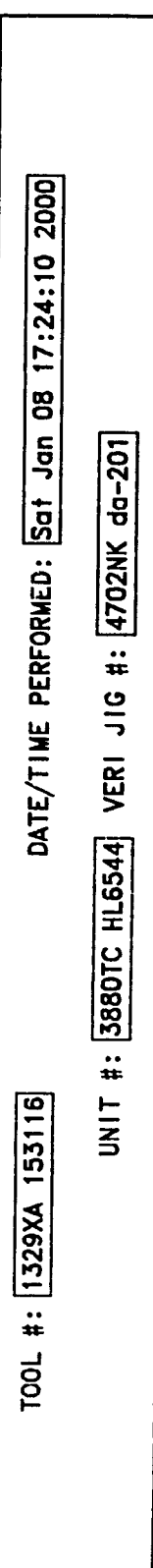
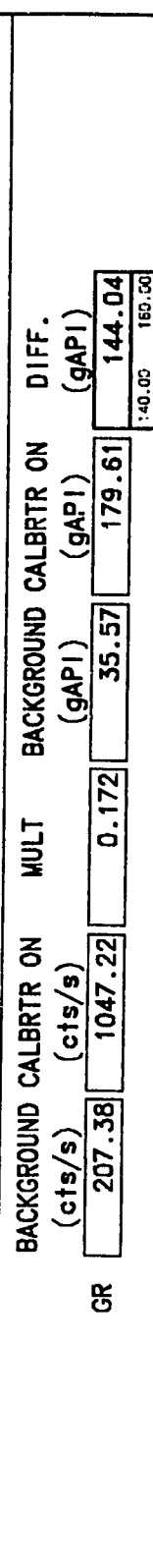
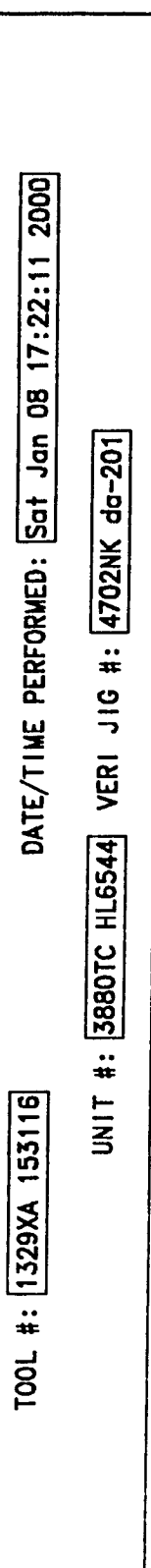
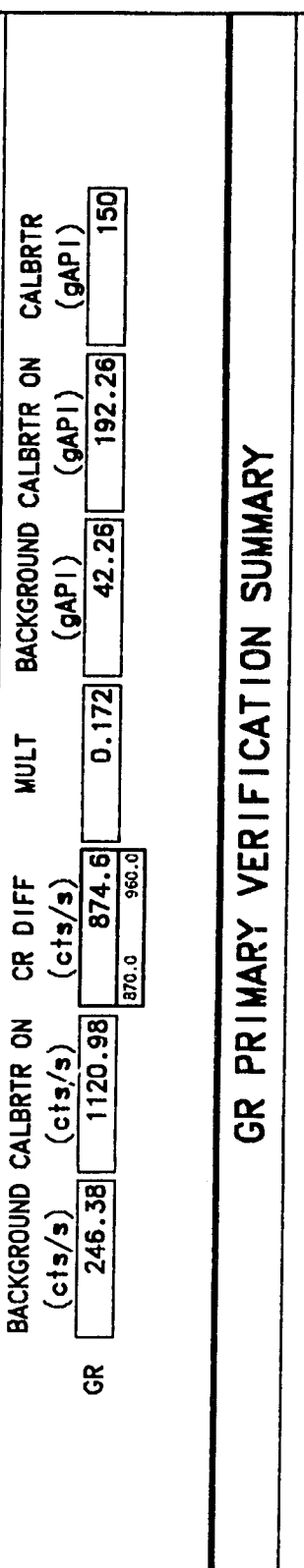
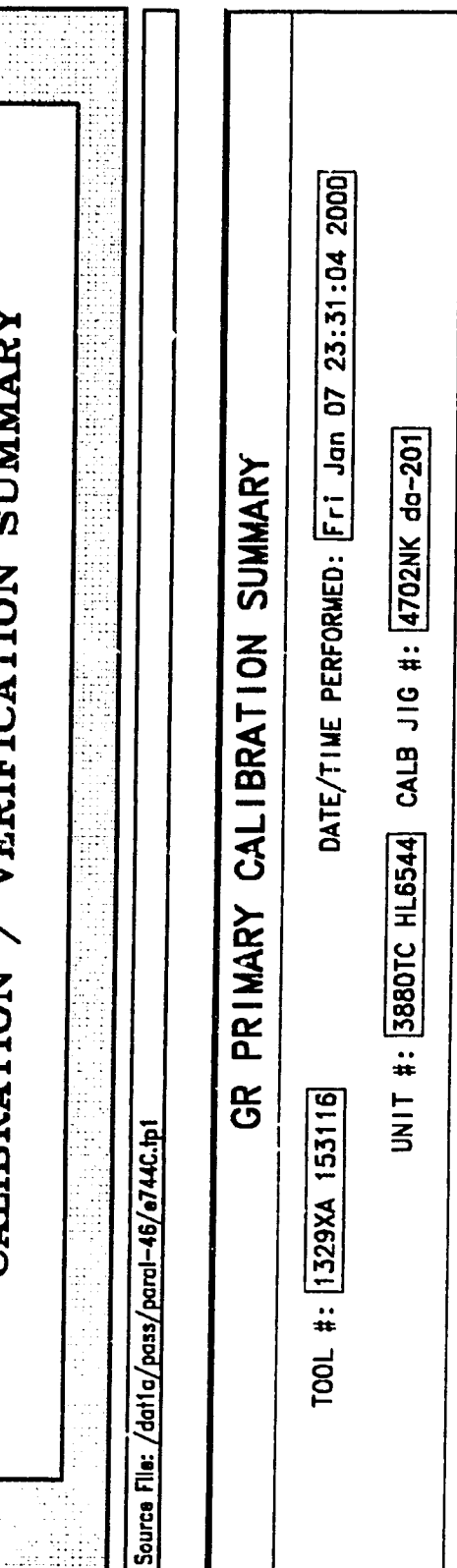
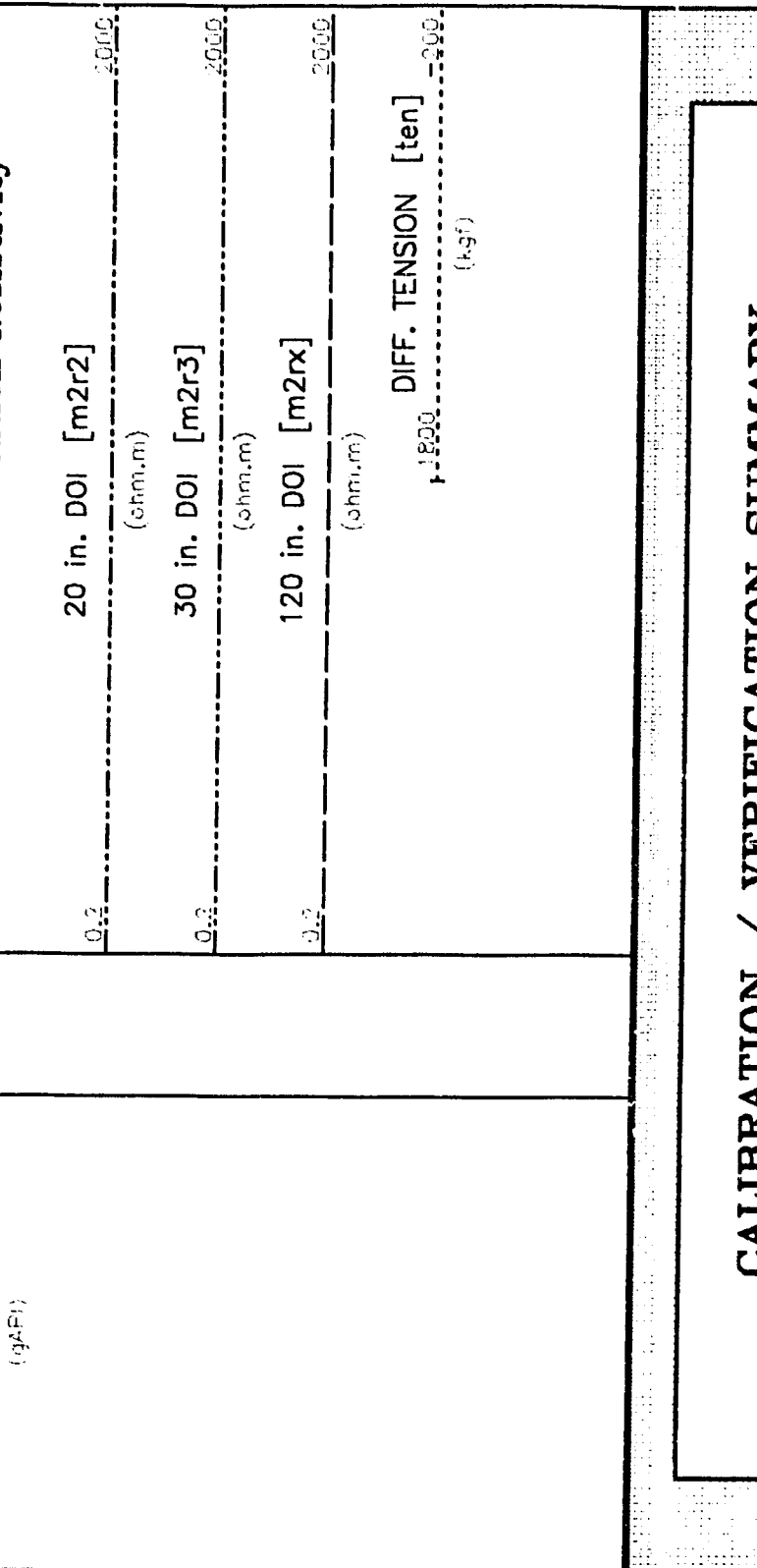
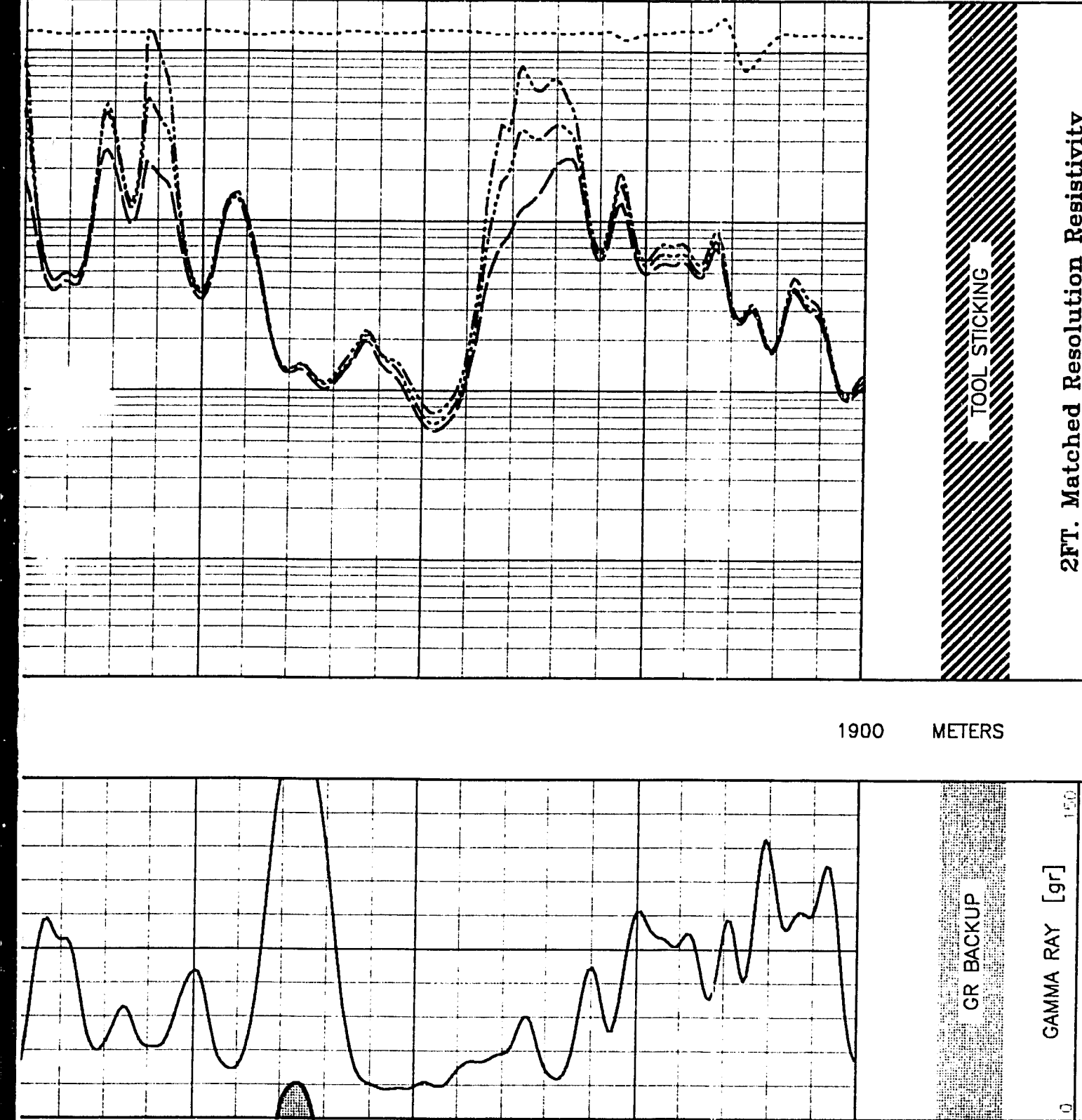
GAMMA RAY [gr] (gAPI)

MINUTE MARK



CALIBRATION / VERIFICATION SUMMARY

CALIBRATION / VERIFICATION SUMMARY



Measure Point: 423.3 cm: SP UP
Measure Point: 226.8 cm: XMR UP

XMR UP: 8.21 m

SUM ADAPTER: 3910VA
Series : 3910VA
Diameter : 8.6 cm
Weight : 50.0 kg
Length : 104.5 cm

WICKLE JOINT: 3921VA
Series : 3921VA
Diameter : 8.6 cm
Weight : 51.1 kg
Length : 73.7 cm

FOUR ARM CALIPER: 4203VA
Series : 4203VA
Diameter : 10.4 cm
Weight : 108.3 kg
Length : 350.5 cm
Measure Point: 177.8 cm: C13 / C24 UP

TOTAL LENGTH: 34.48 m
WEIGHT: 108.3 kg
MAX DIAMETER: 10.2 cm

C13 / C24 UP: 0.18 m
-0.00 m

TRUE VERTICAL DEPTH LOG

Release: 3.2 Jul 06, 1999 Fileview 2.36 Plot 3.0 Wed Jan 12 20:15:39 2000
Poplit /main/47 Pdf_Cpp /main/13

PARAMETER AND FILTER SUMMARY REPORT

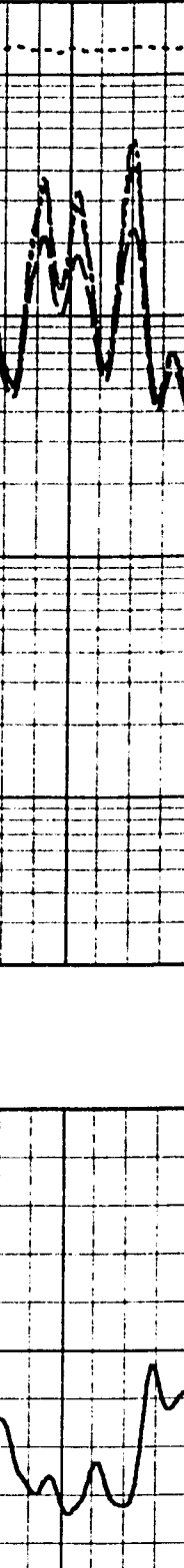
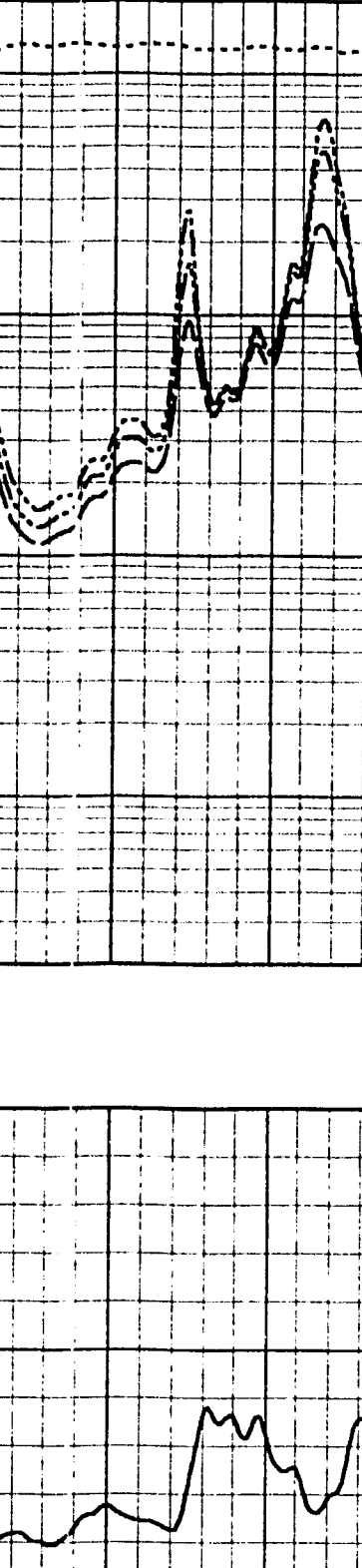
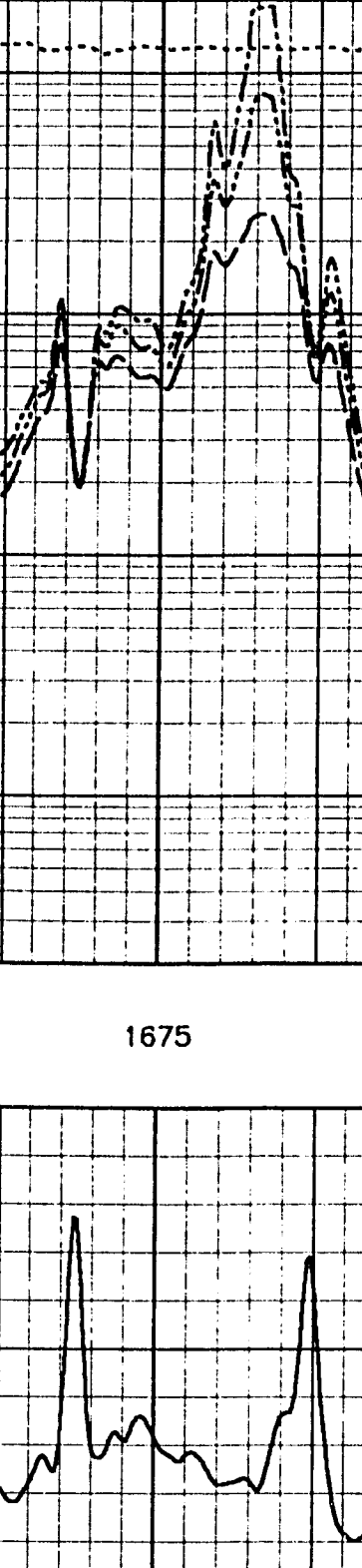
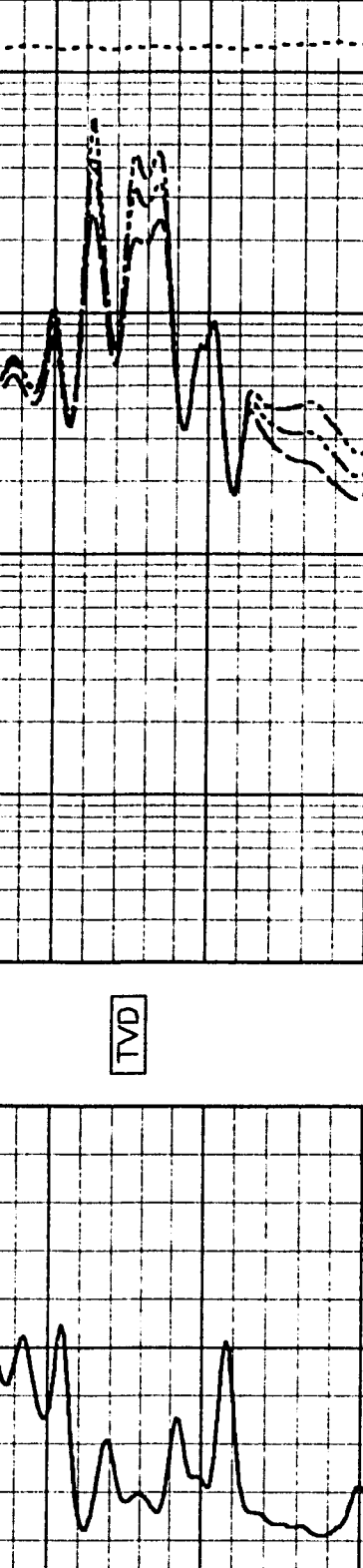
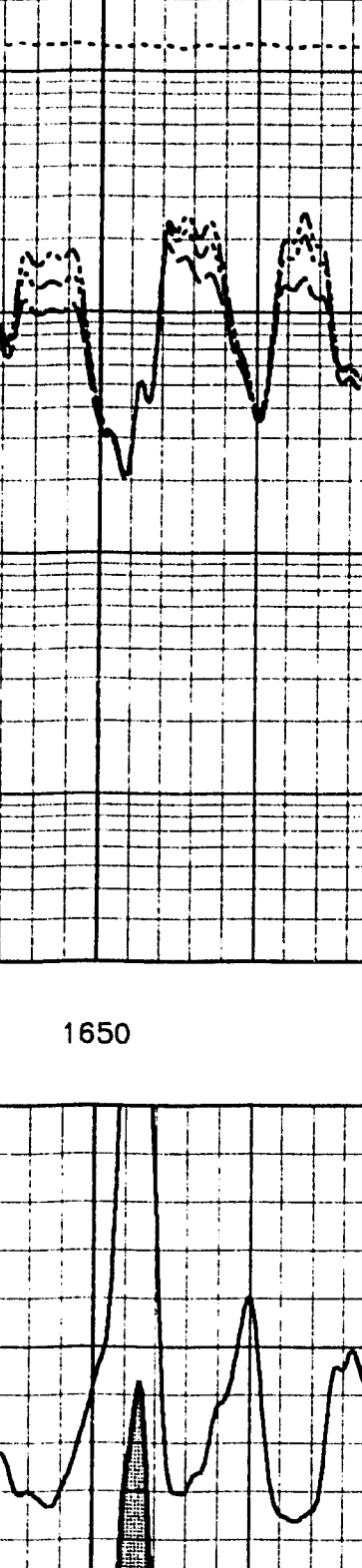
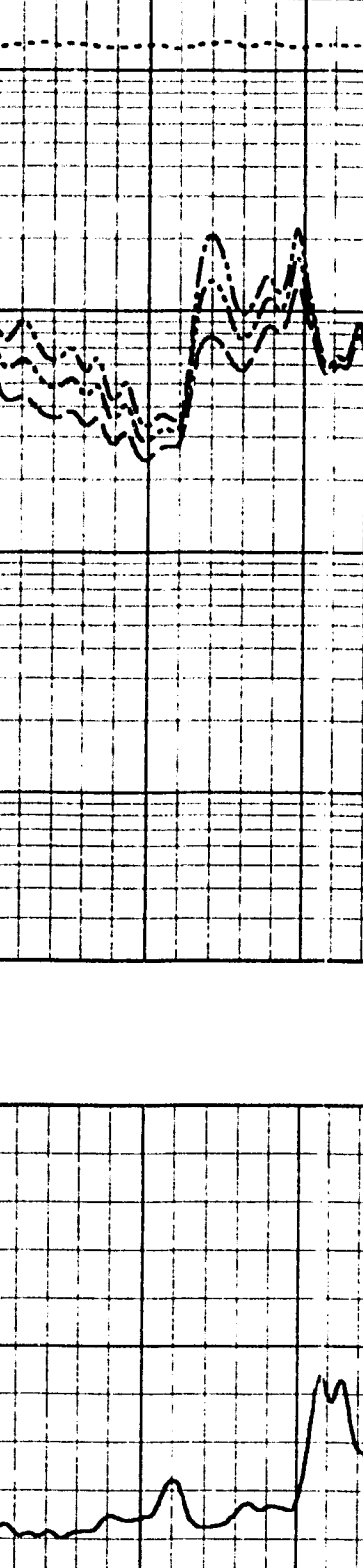
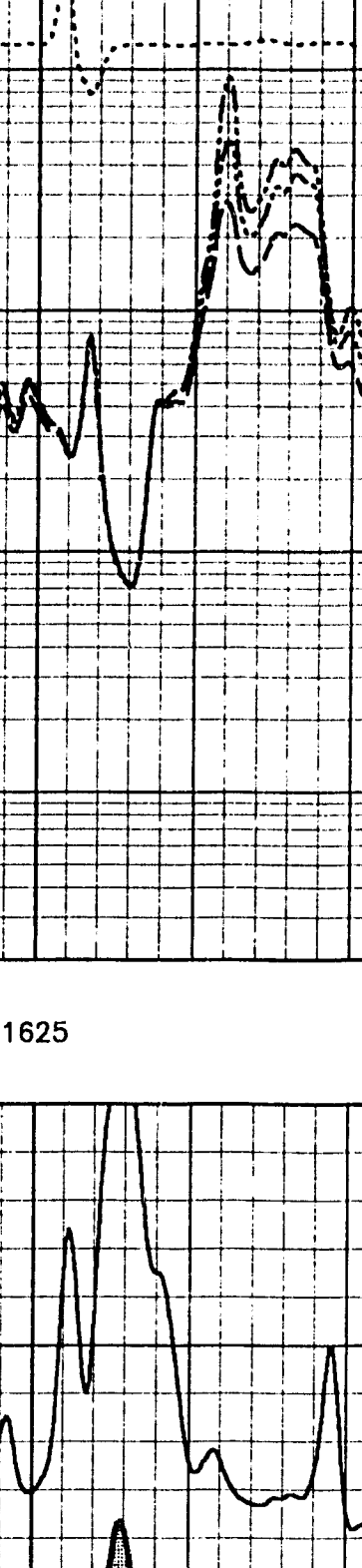
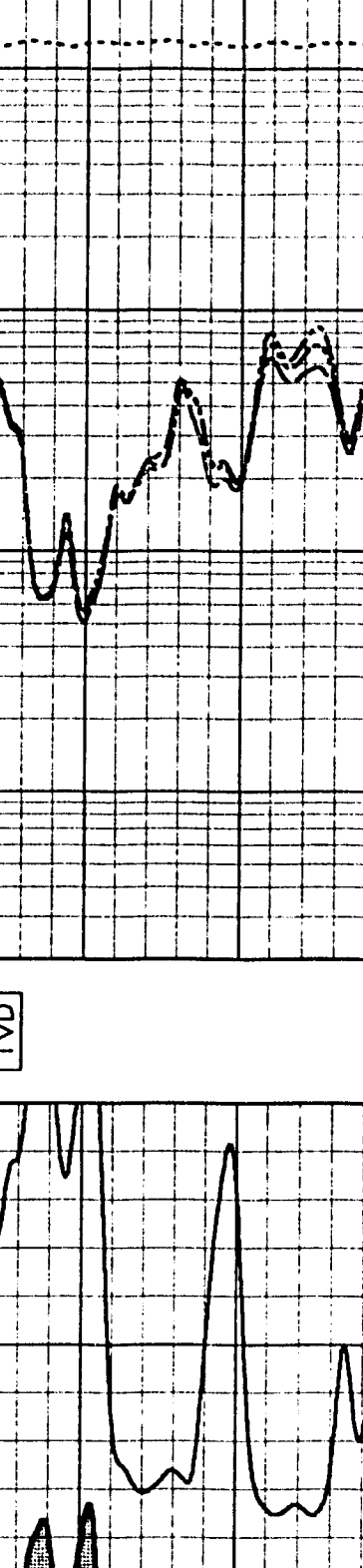
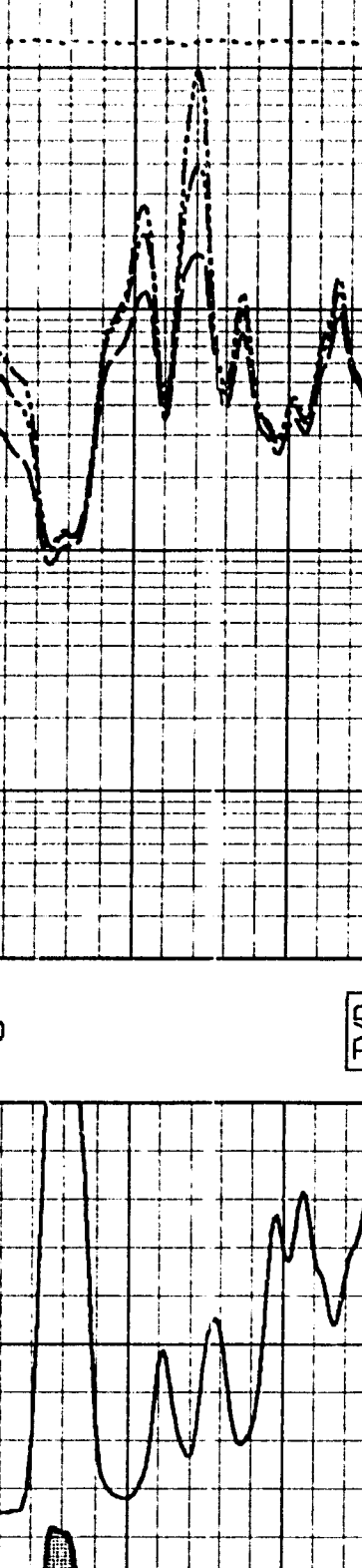
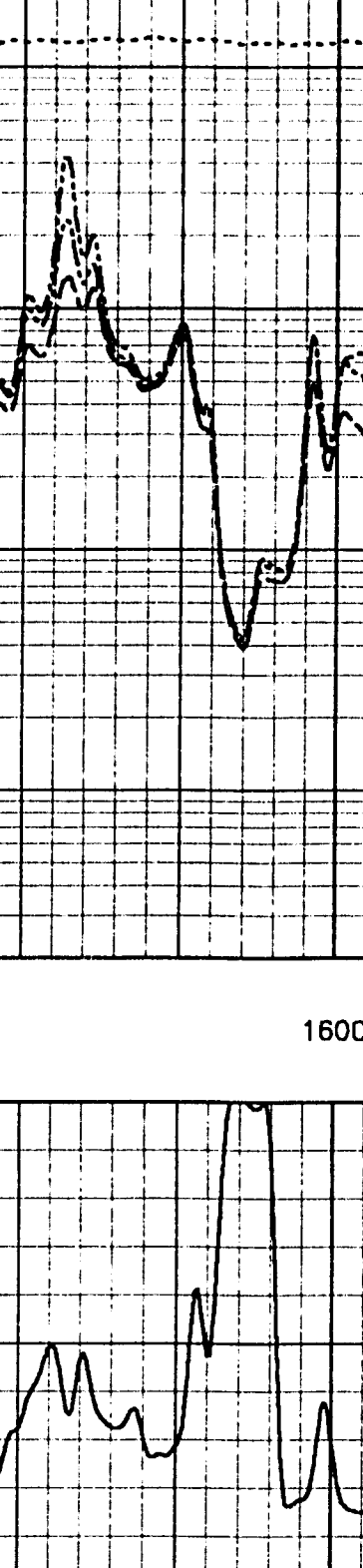
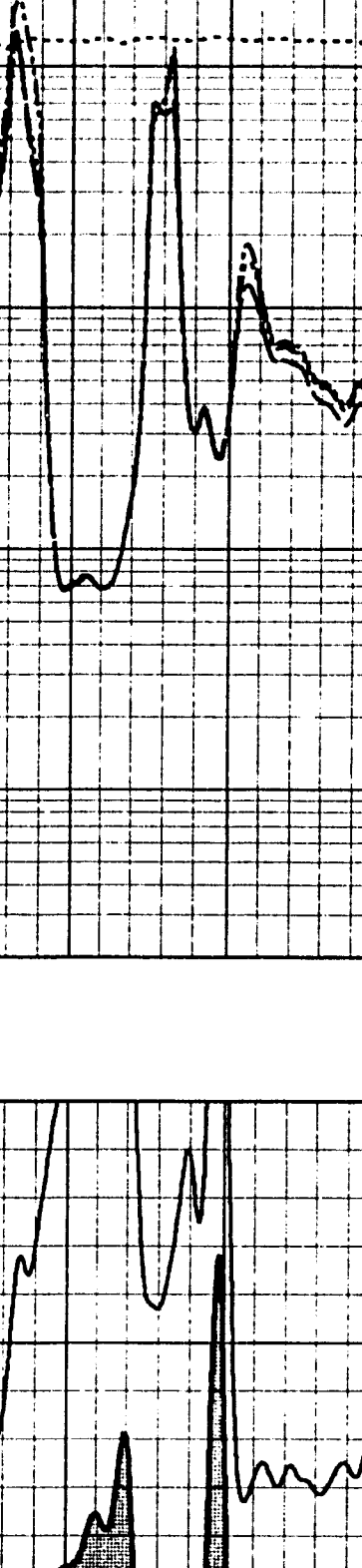
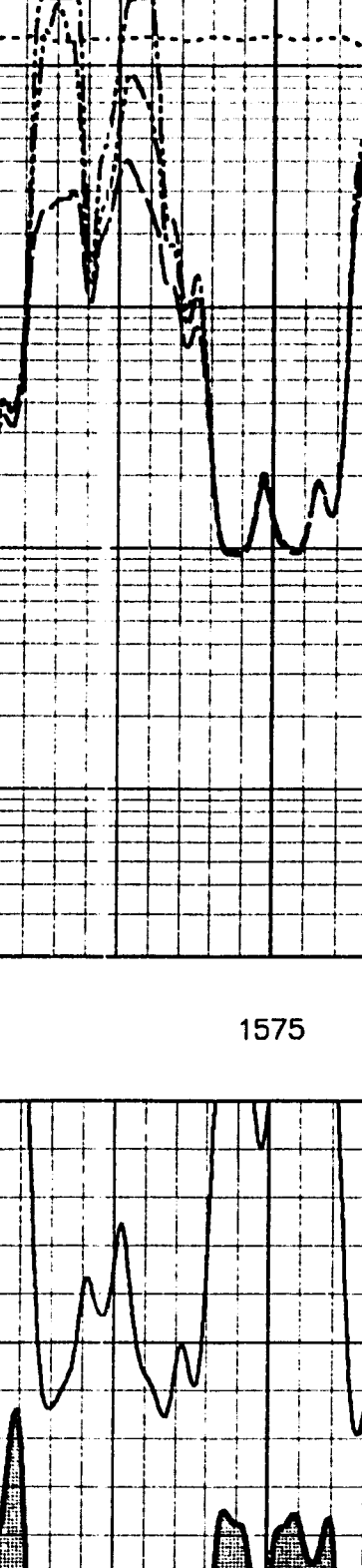
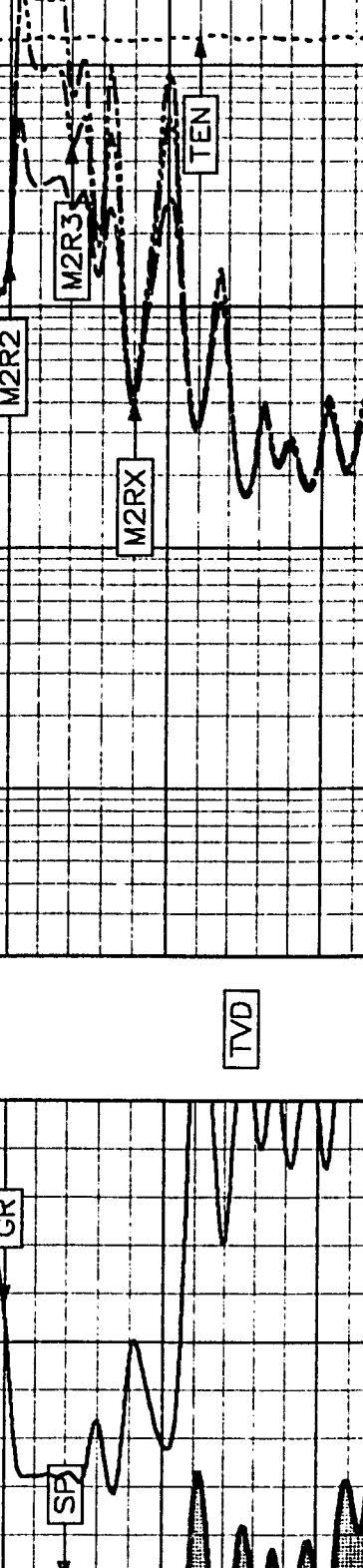
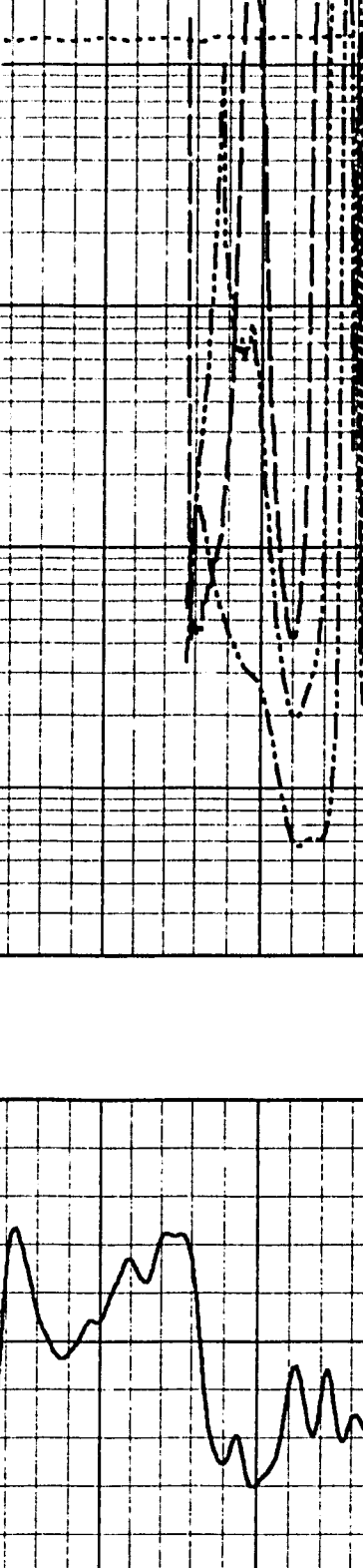
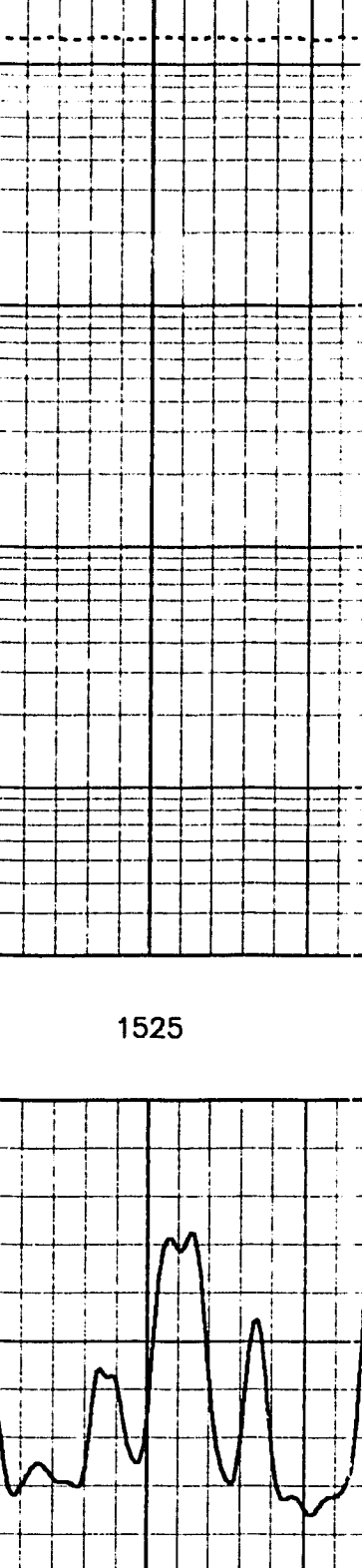
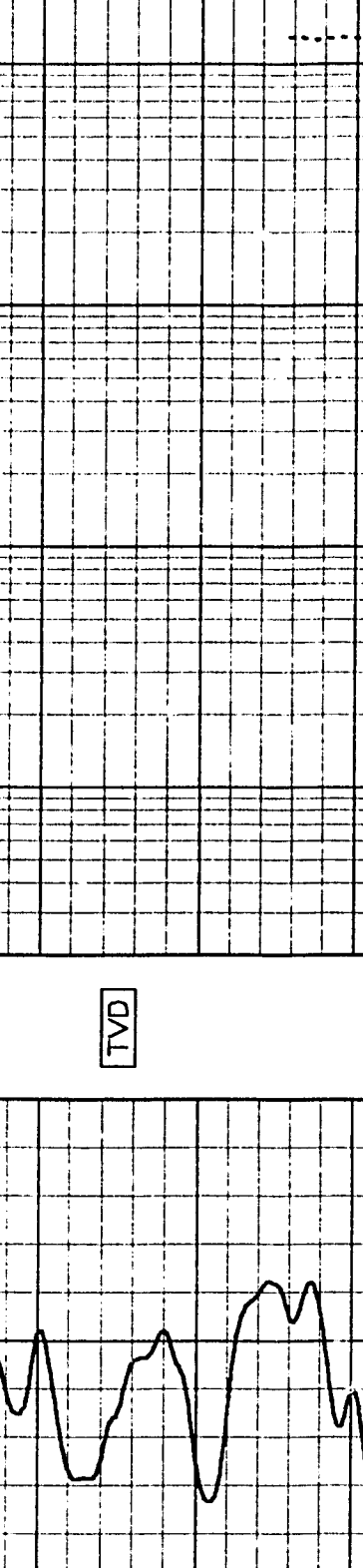
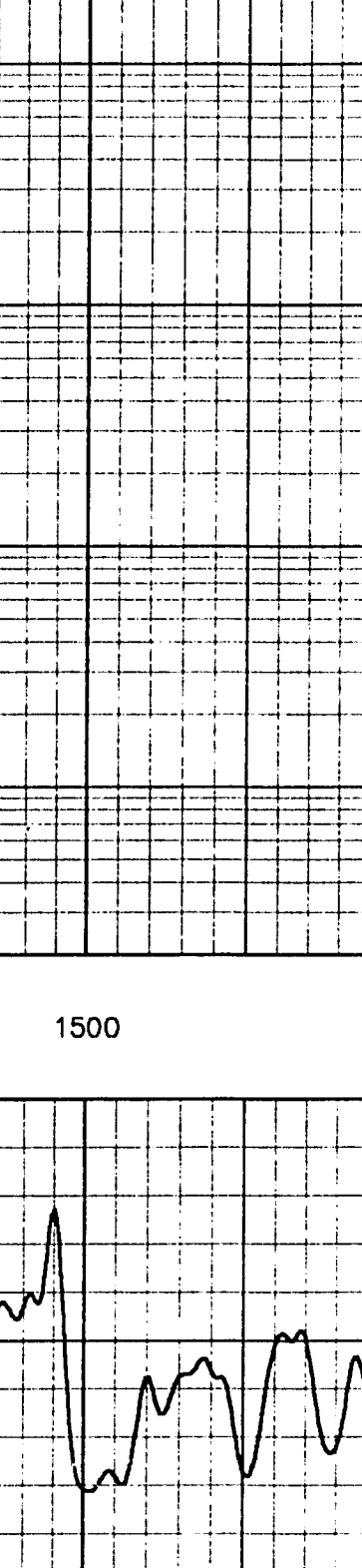
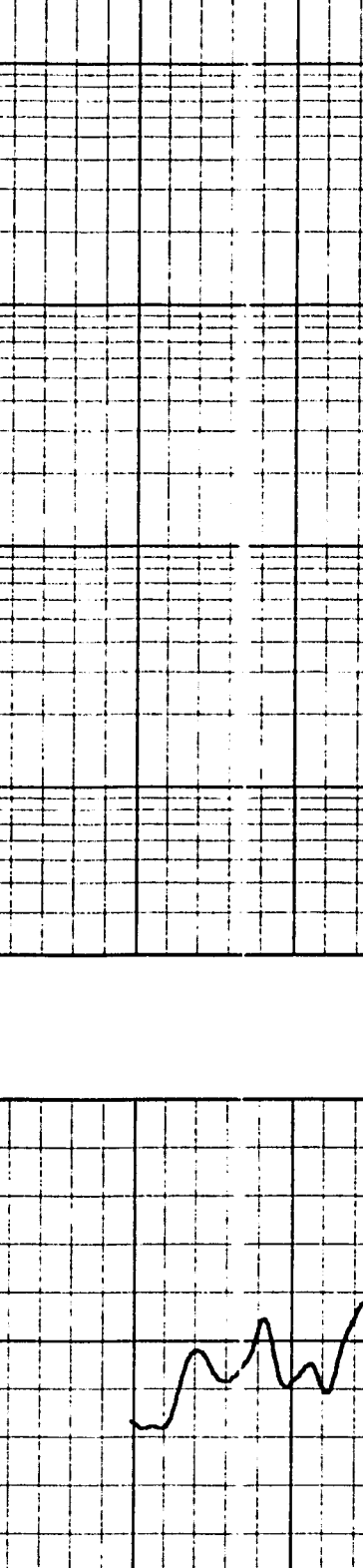
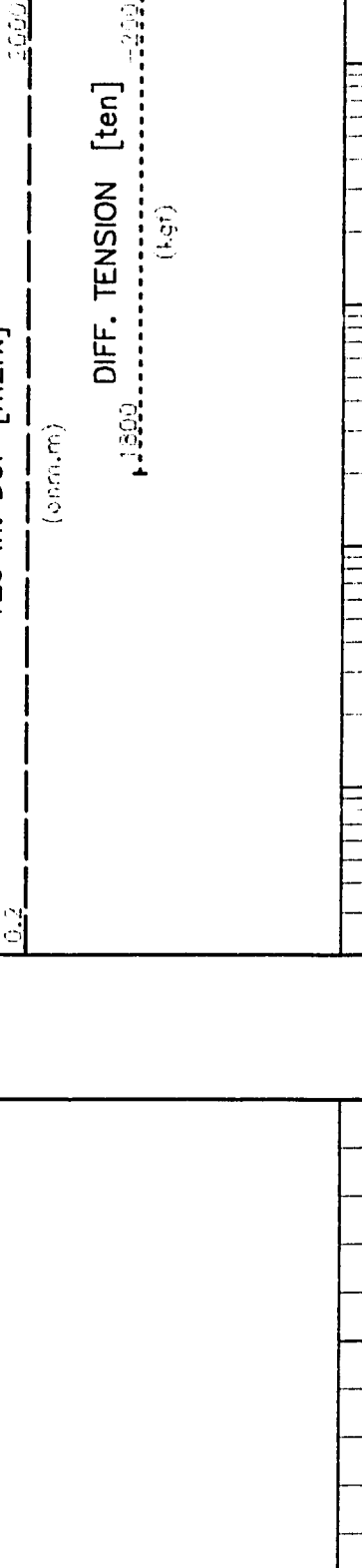
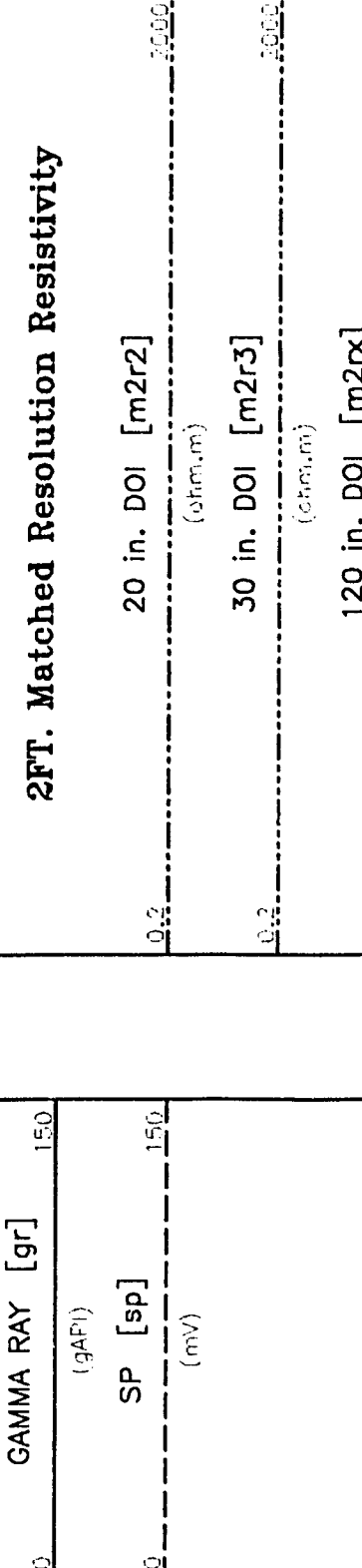
SYMMETRIC FILTER				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
GR HDIL 4CAL	FILTER ()	medium (1)	OFF	TOP BOTTOM
	HDIL 2 FT RES	136.000	mm	" "
	FILTER ()	light (2)	" "	" "
	FILTER ()	light (2)	" "	" "
SP-SPDH TENSION	FILTER ()	medium (1)	" "	" "
	FILTER ()	medium (1)	" "	" "
	FILTER ()	medium (1)	" "	" "
	FILTER ()	medium (1)	" "	" "

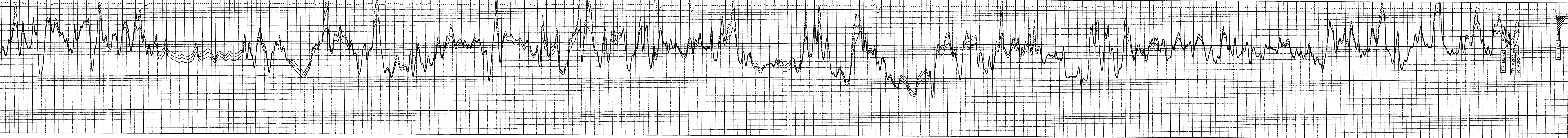
BOREHOLE & CEMENT				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
X-Y CALIPER BIT SIZE BOREHOLE CORR DIAMETER BOREHOLE CORR DIAMETER MUD VALUES SOURCE MUD VALUES	X-Y Caliper	Average	mm	TOP BOTTOM
	BIT SIZE	136.000	mm	" "
	CALIPER/FIXED DIA. (mm)	USE CALIPER	mm	" "
	FIXED DIAMETER (mm)	136.000	mm	" "
	MUD SOURCE (HDIL)	OIL BASE MUD	degC	" "
	MUD SAMPLE TEMP	25.0	degC	" "
	MUD REFERENCE TEMP	10.0	degC	" "
HDIL PROCESSING	TEMP CORR SOURCE	2.430	degC/m	" "
	ADAPTIVE BOREHOLE CORRECTION	STANDARD	mm	TOP BOTTOM

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
HDIL m2r2	TEMP CORR SOURCE	STANDARD	mm	TOP BOTTOM
	ADAPTIVE BOREHOLE CORRECTION	STANDARD	mm	" "

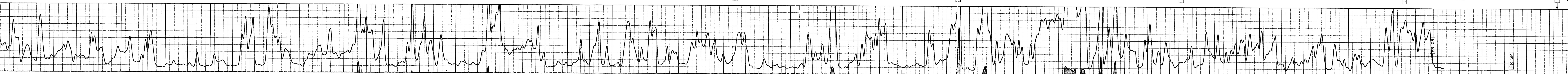
CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)
9T	27.89	m2r3	8.23	SP	10.21
m2r2	8.23	m2rx	8.23	1m	-0.00

Prescription : /data/pass/parol-46/744033.pdf
Data File : f1 : spdz/cali/c/pass/parol-46/744033v.th
Company : PARAMOUNT RESOURCES LTD.
Well : PARA ET AL FT. LIND I-46
Field : UNDETHED
Interval : 1483.97 - 2049.02 Meters
Oct : 67446





1700 1725 1750 1775 1800 1825 1850 1875 1900 1925 1950 1975 2000 2025 2050



2FT. Matched Resolution Resistivity

TOOL STICKING

20 in. DOI [m2r2]

30 in. DOI [m2r3]

120 in. DOI [m2rx]

FR TEN

DIFF. TENSION [ten]

GR BACKUP

GAMMA RAY [gr]

SP [sp]

FR SP

TRUE VERTICAL DEPTH DATA

tvd	angle
0.00	0.0
1545.0	2.8
1586.0	2.50
1650.0	2.00
1760.0	8.00
1765.0	8.00
1798.0	10.00
1838.0	11.00
1836.0	10.25
1914.0	12.00
1957.0	13.50
1996.0	15.25
2051.0	13.00



COMPANY	PARAMOUNT RESOURCES LTD.
WELL	PARA ET AL FT. LIARD I-46 60 10',123 15'
FIELD	UNDEFINED
PROVINCE	NORTHWEST TERRITORIES

FILE NO:

API NO:

Baker Atlas

LOCATION:

LIC #: 1871

ELEVATIONS:

KB 542.2 M

DF

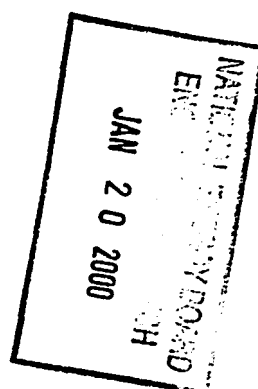
GL 537.2 M

3001466010123150

LAT 60 05'32.474" LONG 123 22'53.612"

DATE

08-JAN-2000



SONIC

2FT. DELTA-T (SURFACE PICKS) [dt24.s] (us/m)

DIFF. TENSION [ten] (kgf)

CH-TENSION [cht] (kgf)

WTHH (degC)

BVOL (mm)

TT (mm)

MINUTE MARK

1 100

MAIN PASS - 100-300 DELTA T SCALE

Release:3.2 Jul 05, 1999 Fileview 2.36 Plot 3.0 Tue Dec 7 03:39:18 1999

PARAMETER AND FILTER SUMMARY REPORT

FILE: /data/pass/pass/46/477906.prm

LOGGING DEPTH: 476.402 m BOTTOM DEPTH: 1548.613 m

MEASUREMENT TYPE

SYMMETRIC FILTER VALUE

PARAMETER

UNIT

INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

BOREHOLE & CEMENT VALUE

PARAMETER

UNIT

INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC POROSITY VALUE

PARAMETER

UNIT

INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC PICK CONTROL VALUE

PARAMETER

UNIT

INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC WAVEFORM FILTER VALUE

PARAMETER

UNIT

INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC QUALITY CONTROL VALUE

PARAMETER

UNIT

INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC WAVEFORM FILTER VALUE

PARAMETER

UNIT

INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC WAVEFORM FILTER VALUE

PARAMETER

UNIT

INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC WAVEFORM FILTER VALUE

PARAMETER

UNIT

INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC WAVEFORM FILTER VALUE

PARAMETER

UNIT

INTERVAL (m)

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MEASUREMENT TYPE

ACOUSTIC WAVEFORM FILTER VALUE

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INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC WAVEFORM FILTER VALUE

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UNIT

INTERVAL (m)

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ACOUSTIC WAVEFORM FILTER VALUE

PARAMETER

UNIT

INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC WAVEFORM FILTER VALUE

PARAMETER

UNIT

INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC WAVEFORM FILTER VALUE

PARAMETER

UNIT

INTERVAL (m)

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MEASUREMENT TYPE

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TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC WAVEFORM FILTER VALUE

PARAMETER

UNIT

INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC WAVEFORM FILTER VALUE

PARAMETER

UNIT

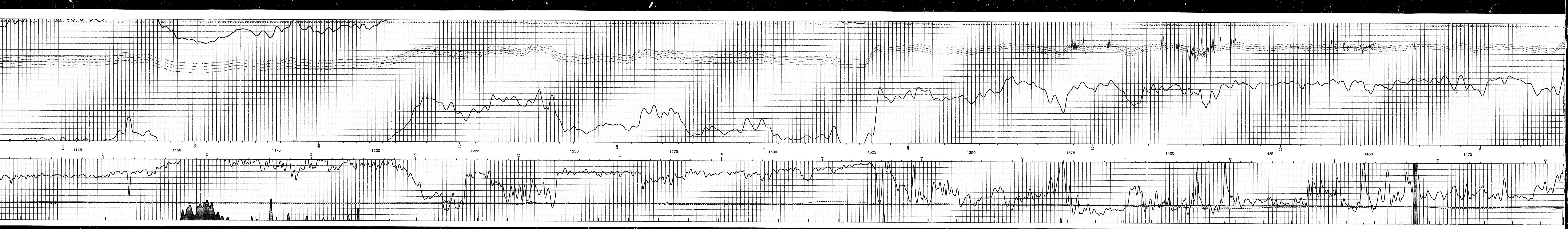
INTERVAL (m)

TOP BOTTOM

MEASUREMENT TYPE

ACOUSTIC WAVEFORM FILTER VALUE





Measure Point: 423.3 cm: SP UP
Measure Point: 226.8 cm: XMR UP

XMR UP: 8.21 m

SUM ADAPTER
Series : 3510A
Weight : 57.1 kg
Diameter : 8.6 cm
Length : 50.0 kg

WICKLE JOINT
Series : 3921A
Weight : 10.2 kg
Diameter : 8.6 cm
Length : 73.7 cm

FOUR ARM CALIPER
Series : 4203A
Weight : 108.3 kg
Diameter : 10.4 cm
Length : 35.5 cm

Measure Point: 177.8 cm: C13 / C24 UP

TRUE VERTICAL DEPTH LOG

C13 / C24 UP: 0.18 m

-0.00 m

TOTAL LENGTH: 34.48 m
WEIGHT: 10.2 kg
MAX DIAMETER: 10.2 cm

TRUE VERTICAL DEPTH LOG

Release: 3.2 Jul 06, 1999 Fileview 2.36 Poplit /main/47 Colot 3.0 Pdf_Cpp /main/13 Wed Jan 12 20:15:39 2000

PARAMETER AND FILTER SUMMARY REPORT

FILE: /data/pass/parol-46/6746033.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 1517.075 m BOTTOM DEPTH: 2056.486 m

SYMMETRIC FILTER	
MEASUREMENT TYPE	PARAMETER
GR	FILTER ()
HDIL	HDIL 2 FT RES
4CAL	FILTER ()
	FILTER ()
	FILTER ()
	FILTER ()
	FILTER ()
SP-SPDH	FILTER ()
TENSION	FILTER ()

BOREHOLE & CEMENT	
MEASUREMENT TYPE	PARAMETER
X-Y CALIPER	X-Y Caliper
BIT SIZE	BIT SIZE
BOREHOLE CORR DIAMETER	CALIPER/FIXED DIA. (mm)
BOREHOLE CORR DIAMETER	FIXED DIAMETER (mm)
MUD VALUES SOURCE	MUD SOURCE (HDIL)
MUD VALUES	MUD SAMPLE TEMP
	MUD SAMPLE RES
	MUD REFERENCE TEMP
	TEMP GRADIENT

HDIL PROCESSING	
MEASUREMENT TYPE	PARAMETER
HDIL TEMPERATURE CORRECTION	TEMP CORR SOURCE
ADAPTIVE BOREHOLE CORRECTION	ABC IS CALCULATE
	STANDARD
	TOOL POSITION
	Read MULTIPLIER

CURVE MEASURE POINT OFFSET	
CURVE	OFFSET (m)
9T	27.89
m2r2	8.23
m2rx	8.23
SP	1m
10.21	-0.00

Presanction : /data/pass/parol-46/6746033.prm
Data File : f1 : spdz/cali/pass/parol-46/6746033.prm
Company : PARAMOUNT RESOURCES LTD.
Well : PARA ET AL FT. LIARD I-46
Field : UNDEFINED
Interval : 1483.97 - 2049.02 Meters
Oct : 67446

GR BACKUP	
GAMMA RAY [gr]	150
SP [sp]	150
(mV)	

2FT. Matched Resolution Resistivity	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

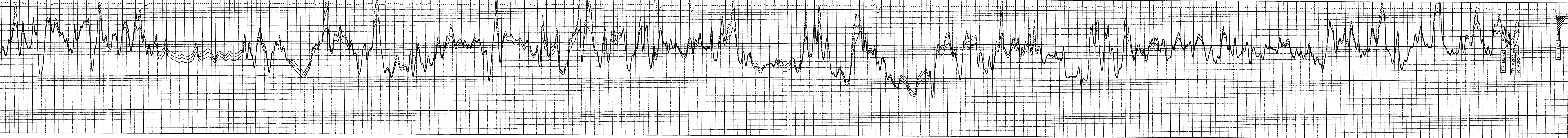
TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

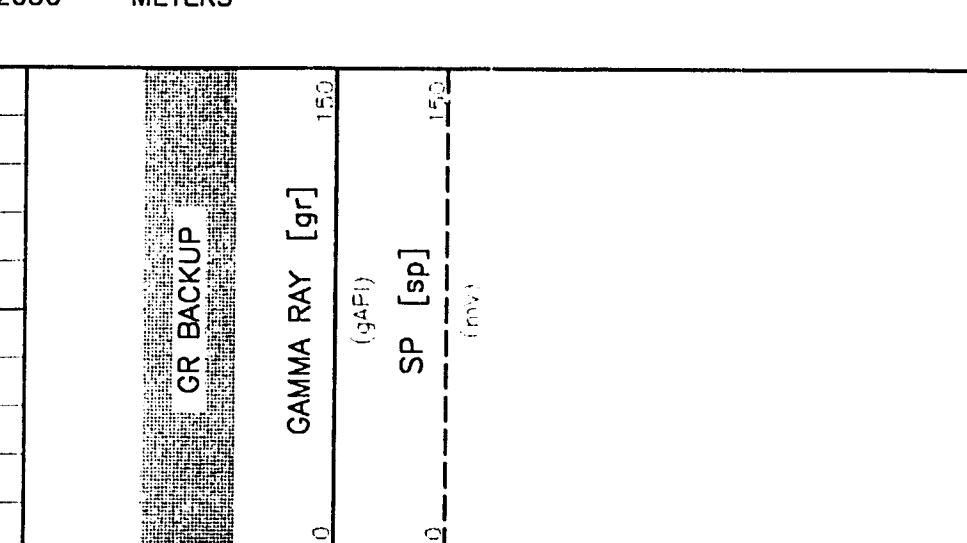
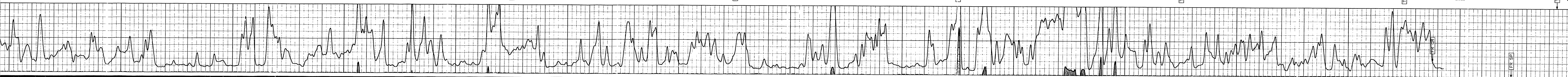
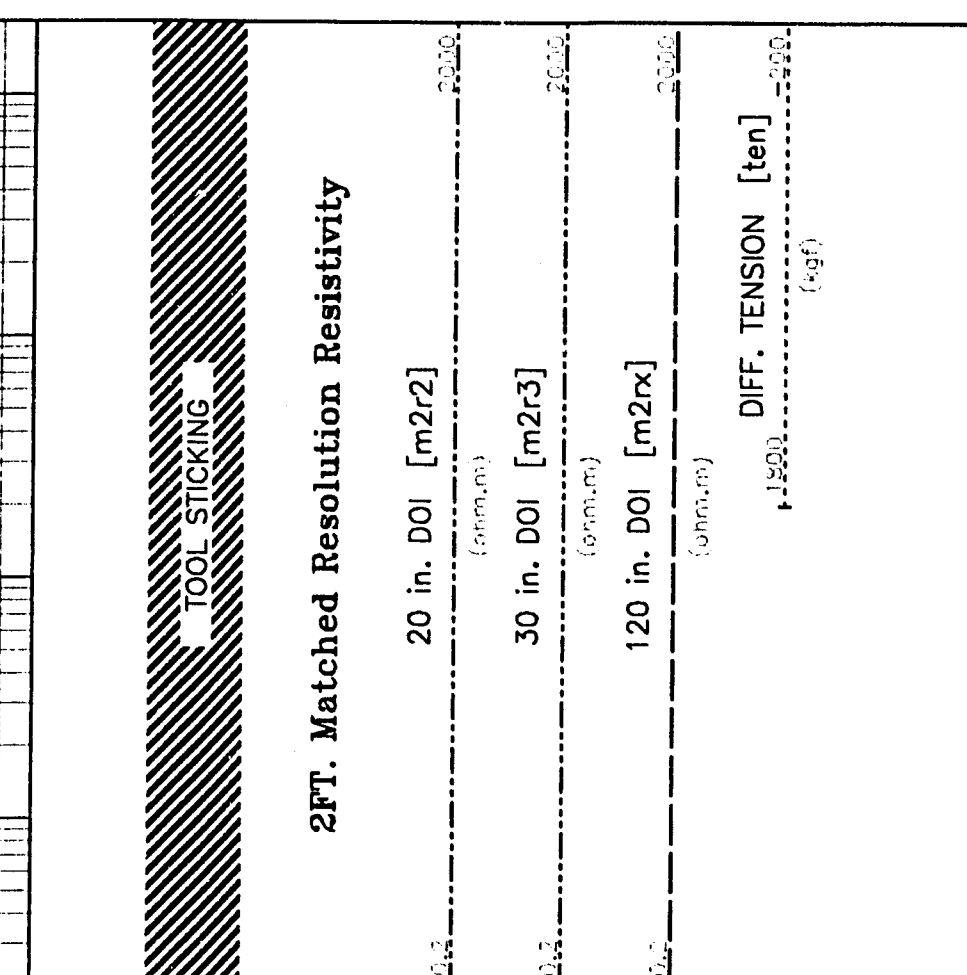
TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	

TOOL STICKING	
20 in. DOI [m2r2]	10.21
30 in. DOI [m2r3]	-0.00
120 in. DOI [m2rx]	1m
(ohm.m)	
(ohm.m)	
(ohm.m)	
DIFF. TENSION [ten]	1.97
(ten)	



1700 TVD 1725 1750 TVD 1775 1800 TVD 1825 1850 TVD 1875 1900 TVD 1925 1950 TVD 1975 2000 TVD 2025 TVD 2050 TD METERS



TRUE VERTICAL DEPTH DATA

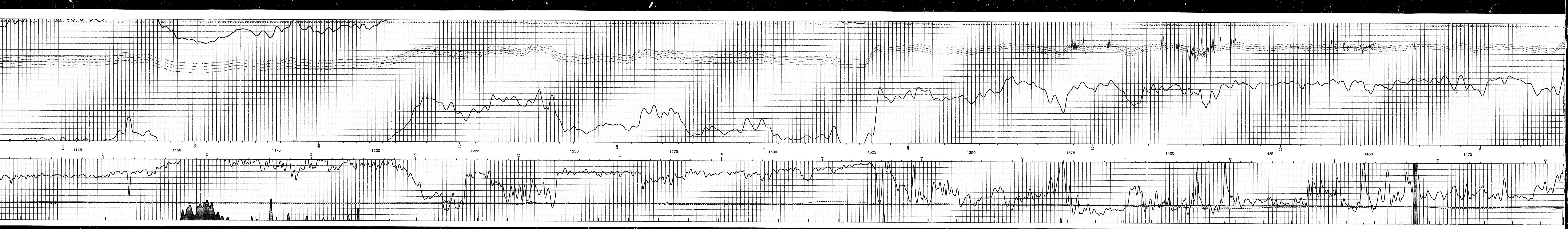
tvd	angle
0.00	0.0
1545.0	2.8
1586.0	2.50
1650.0	2.00
1760.0	8.00
1765.0	8.00
1798.0	10.00
1838.0	11.00
1836.0	10.25
1914.0	12.00
1957.0	13.50
1996.0	15.25
2051.0	13.00

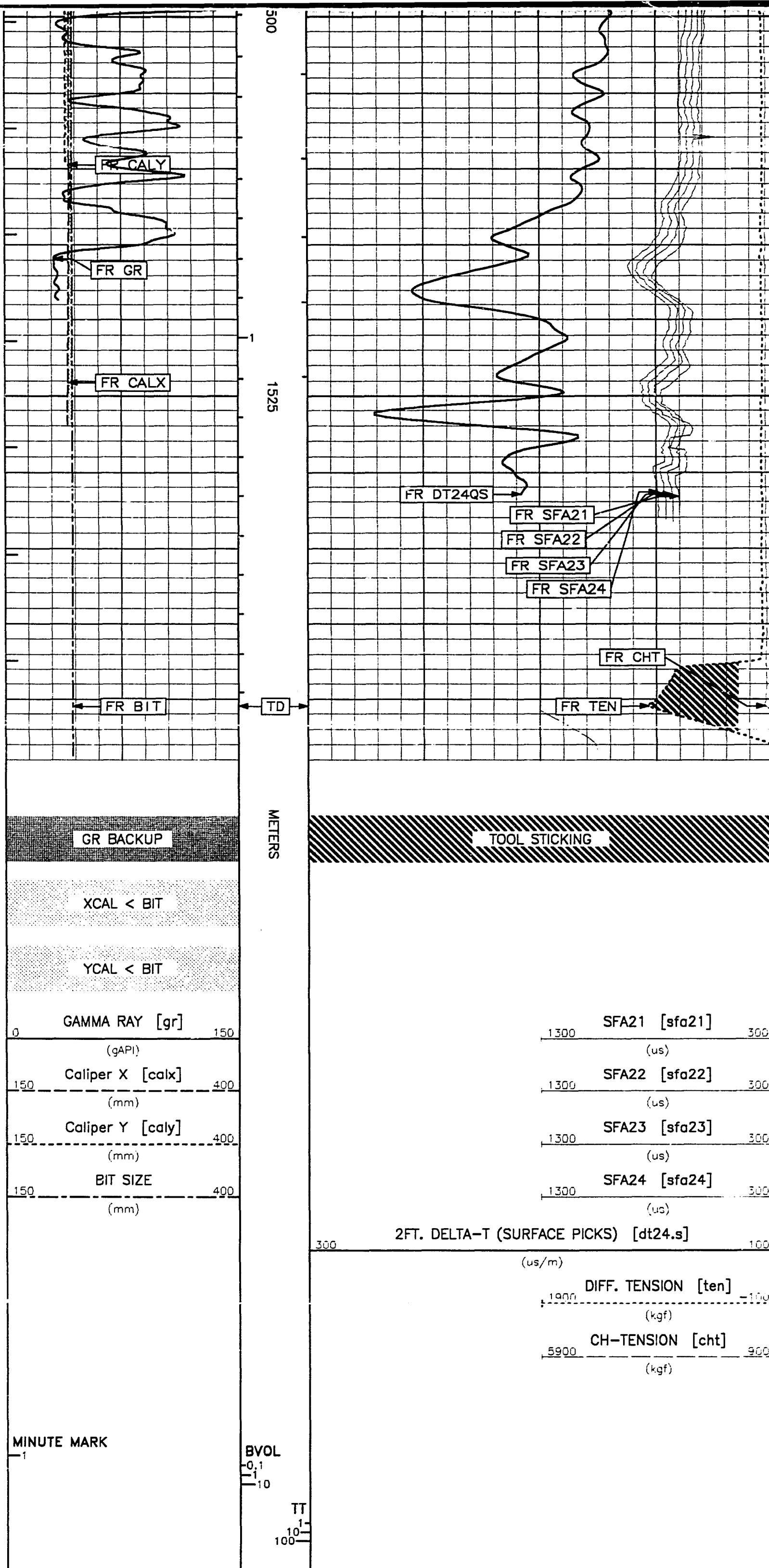
 Baker Atlas	COMPANY	PARAMOUNT RESOURCES LTD.		FILE NO:
	WELL	PARA ET AL FT. LIARD I-46 60 10',123 15'		
	FIELD	UNDEFINED		API NO:
	PROVINCE	NORTHWEST TERRITORIES		
	LOCATION:	ELEVATIONS:	3001466010123150	
	LIC #: 1871	KB 542.2 M		
		DF		
		GL 537.2 M		
	LAT 60 05'32.474" LONG 123 22'53.612"	DATE	08-JAN-2000	

PARAMOUNT RESOURCES LTD.
ENCLOSURE
JAN 20 2000
CH

SONIC



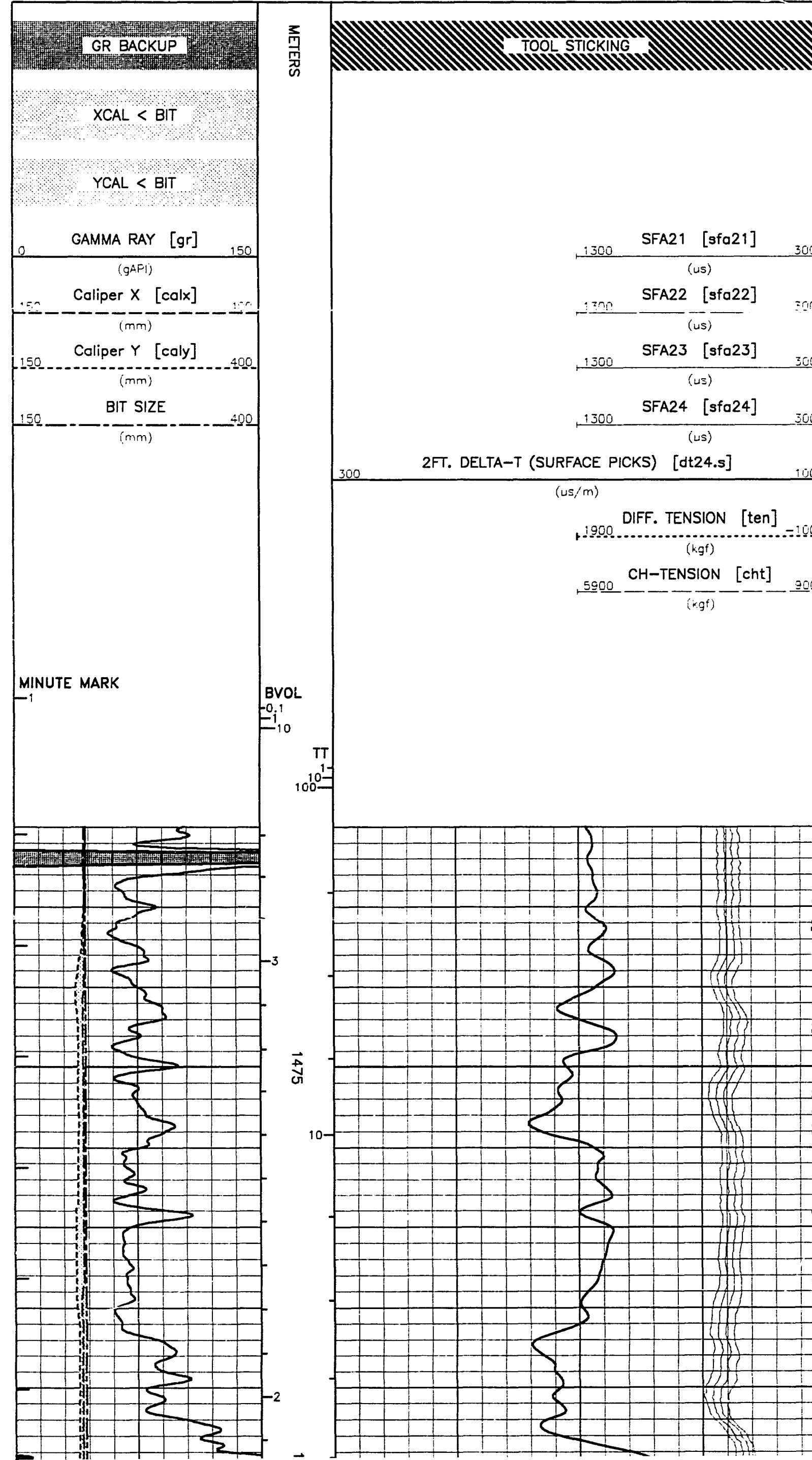


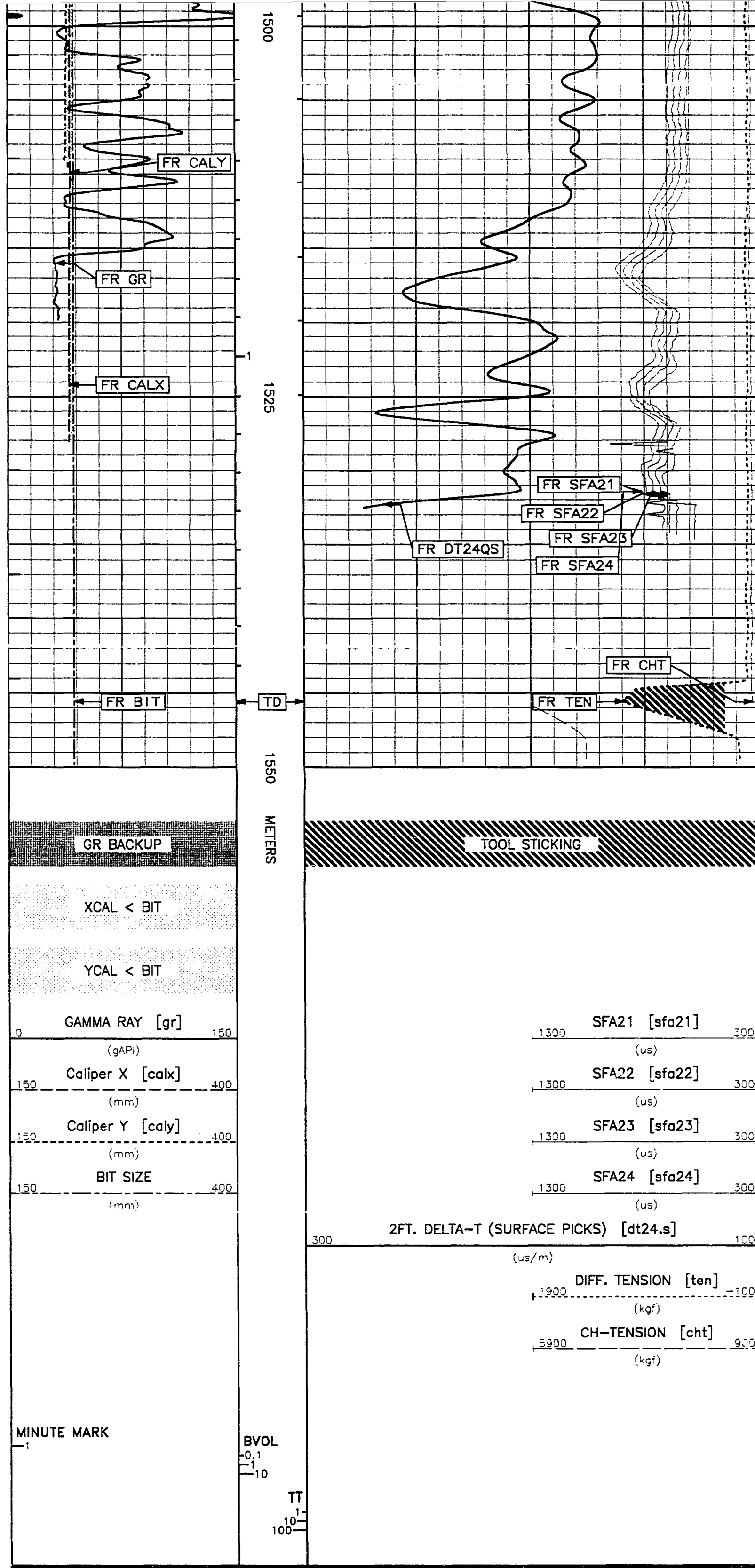


REPEAT PASS - 100-300 DELTA T SCALE

Release:3.2 Jul 06, 1999 Fileview 2.36 Cplot 3.0 Tue Dec 7 00:29:54 1999
Pcrplt /main/47 Pdf_Cpp /main/13

PARAMETER AND FILTER SUMMARY REPORT							
FILE: /data/pass/para1-46/e779b03.prm LOGGING MODE: DEPTH DIRECTION: UP TOP DEPTH: 1222.858 m BOTTOM DEPTH: 1549.908 m							
SYMMETRIC FILTER							
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)			
X AXIS CALIPER	FILTER ()	light (2)		TOP	BOTTOM		
CHT	FILTER ()	medium (1)		"	"		
GR	FILTER ()	medium (1)		"	"		
CALIPER	FILTER ()	light (2)		"	"		
TENSION	FILTER ()	medium (1)		"	"		
BOREHOLE & CEMENT							
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)			
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	177.800	mm	TOP	BOTTOM		
X-Y CALIPER	X-Y Caliper	Average		"	"		
BIT SIZE	BIT SIZE	222.000	mm	"	"		
ACOUSTIC POROSITY							
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)			
DELTA T CURVE SELECTION	CURVE SELECTION	first arrival		TOP	BOTTOM		
ACOUSTIC PICK CONTROL							
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)			
DELTA-T REJECTION RANGE	REJECTION DTmin	131	us/m	TOP	BOTTOM		
	REJECTION DTmax	591	us/m	"	"		
FIRST ARRIVAL PICK (SUB #7,6)	SEARCH START OFFSET (sfa21*)	0	us	"	"		
	SEARCH START OFFSET (sfa22*)	0	us	"	"		
	SEARCH START OFFSET (sfa23*)	0	us	"	"		
	SEARCH START OFFSET (sfa24*)	0	us	"	"		
	SEARCH WINDOW LENGTH	561	us	"	"		
	THRESHOLD FACTOR	0.30		"	"		
	THRESHOLD MINIMUM (sfa21*)	35		"	"		
	THRESHOLD MINIMUM (sfa22*)	35		"	"		
	THRESHOLD MINIMUM (sfa23*)	35		"	"		
	THRESHOLD MINIMUM (sfa24*)	35		"	"		
	E3 THRESHOLD	OFF		"	"		
ACOUSTIC QUALITY CONTROL							
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)			
CYCLE SKIP LIMIT	CYCLE SKIP LIMIT	100	us	TOP	BOTTOM		
ACOUSTIC WAVEFORM FILTER							
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)			
WAVEFORM FILTER - DELTA T	SURFACE WAVE FILTER	ON		TOP	BOTTOM		
	LOW FREQ CUTOFF	5000	Hz	"	"		
	HIGH FREQ CUTOFF	20000	Hz	"	"		
CURVE MEASURE POINT OFFSET							
CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)
bit	-0.00	cht	-0.00	sfa21	13.87	sfa24	14.17
calx	21.41	dt24qs	13.26	sfa22	14.02	ten	-0.00
caly	35.74	gr	29.57	sfa23	14.02		
Presentation : /data/pass/para1-46/mac-rap.pdf Data File : F1 : cpu1:/data/pass/para1-46/e779b03.xtf Company : PARAMOUNT RESOURCES LTD. Well : PARA ET AL FT. LIARD I-46 60 10', 123 15' Field : UNDEFINED Interval : 1187.35 - 1549.91 Meters Cot : e779b							





CALIBRATION / VERIFICATION SUMMARY

Source File: /data/pass/para-46/a779b.jp1

CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 4209XM 055717 DATE/TIME PERFORMED: Thu Nov 18 08:26:52 1999
UNIT #: 3880TB 006556

	SMALL RING (mV)	LARGE RING (mV)	MULT	ADD	SMALL RING (mm)	LARGE RING (mm)
CALIPER	2961.0	8222.2	0.03379	77.73720	177.800	355.600

GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1329XA 167513 DATE/TIME PERFORMED: Fri Oct 01 17:01:07 1999
UNIT #: 5701RA 154661 CALB JIG #: 4702NK OWA724

	BACKGROUND (cts/s)	CALBTR ON (cts/s)	CR DIFF (cts/s)	MULT	BACKGROUND (gAPI)	CALBTR ON (gAPI)	CALBTR (gAPI)
GR	205.64	1109.73	904.1	0.166	34.12	184.12	150
			870.0 960.0				

GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1329XA 167513 DATE/TIME PERFORMED: Fri Oct 01 17:05:43 1999
UNIT #: 5701RA 154661 VERI JIG #: 4702NK OWA724

	BACKGROUND (cts/s)	CALBTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBTR ON (gAPI)	DIFF. (gAPI)
GR	209.11	1101.38	0.166	34.69	182.73	148.04
						140.00 150.00

GR BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1329XA 167513 DATE/TIME PERFORMED: Mon Dec 06 15:12:33 1999
UNIT #: 3880TB 006556 VERI JIG #: 4702NK OWA724

	BACKGROUND (cts/s)	CALBTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBTR ON (gAPI)	DIFF. (gAPI)
GR	254.76	1170.67	0.166	42.27	194.23	151.96
						138.04 158.04

GR AFTER LOG VERIFICATION SUMMARY

TOOL #: 1329XA 167513 DATE/TIME PERFORMED: Tue Dec 07 02:38:52 1999
UNIT #: 3880TB 006556 VERI JIG #: 4702NK OWA724

	BACKGROUND (cts/s)	CALBTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBTR ON (gAPI)	DIFF. (gAPI)
GR	299.36	1193.04	0.166	49.67	197.94	148.27
						141.96 161.96

CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2228MA 150462 DATE/TIME PERFORMED: Wed Sep 29 15:05:13 1999
UNIT #: 3880TB 006556

	SMALL RING (raw)	LARGE RING (raw)	MULT	ADD	SMALL RING (mm)	LARGE RING (mm)
CALIPER	1940.2	3205.2	0.16063	-133.85898	177.800	381.000

CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2228MA 150462 DATE/TIME PERFORMED: Mon Dec 06 21:31:37 1999
UNIT #: 3880TB 006556

	I.D. (raw)	MULT	ADD	I.D. (mm)
CALIPER	2280.8	0.16063	-139.77039	226.600

CAL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2228MA 150462 DATE/TIME PERFORMED: Tue Dec 07 02:18:49 1999
UNIT #: 3880TB 006556

	I.D. (raw)	MULT	ADD	I.D. (mm)
CALIPER	2279.7	0.16063	-139.77039	226.423
				213.900 239.300



Baker Atlas

COMPANY: PARAMOUNT RESOURCES LTD.
WELL: PARA ET AL FT. LIARD I-46 60 10',123 15'
FIELD: UNDEFINED
PROVINCE: NORTHWEST TERRITORIES

LOCATION: LICENCE: WID #1871
LAT 60 05' 32.474" LONG 123 22'53.612"

ELEVATIONS:
KB 542.2 M
DF 537.2 M
DATE 06-DEC-99

FILE NO:

API NO:

UWI:

3001466010123150

1871



PERMANENT DATUM	G.L. _____	ELEVATION	537.2 M	KB	542.2 M
LOG MEASURED FROM	K.B. _____	5.0 M	ABOVE P.D.	DF	
DRILL MEAS. FROM	KELLY BUSHING			GL	537.2 M

DATE		08-JAN-2000			
RUN	TRIP	1	1		
SERVICE ORDER		974644			
DEPTH DRILLER		2055.0 M			
DEPTH LOGGER		2054.4 M			
BOTTOM LOGGED INTERVAL		2033.5 M			
TOP LOGGED INTERVAL		1544.5 M			
CASING-DRILLER		177.8 MM	Ø1545.0 M		⑨
CASING LOGGER		1544.5 M			
BIT SIZE		156.0 MM			
TYPE OF FLUID IN HOLE		INVERT			
DENSITY	VISCOSITY	1035.0 G/L	60.0 S		
PH	FLUIDLOSS	N/A	N/A		
SOURCE OF SAMPLE		FLOWLINE			
RM AT MEAS. TEMP.		N/A	⑨N/A		⑨
RMF AT MEAS. TEMP.		N/A	⑨N/A		⑨
RMC AT MEAS. TEMP.		N/A	⑨N/A		⑨
SOURCE OF RMF	RMC	NO SAMPLE	NO SAMPLE		
RM AT BHT		N/A	⑨N/A		⑨
TIME SINCE CIRCULATION		11.5 HRS			
MAX. RECORDED TEMP.		59.2 DEGC			
EQUIP. NO.	LOCATION	HL 6544	G. PRAIRIE		
RECORDED BY		T. FISHER / J. BLANCO			
WITNESSED BY		GARY JOHANNSON			

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

REMARKS

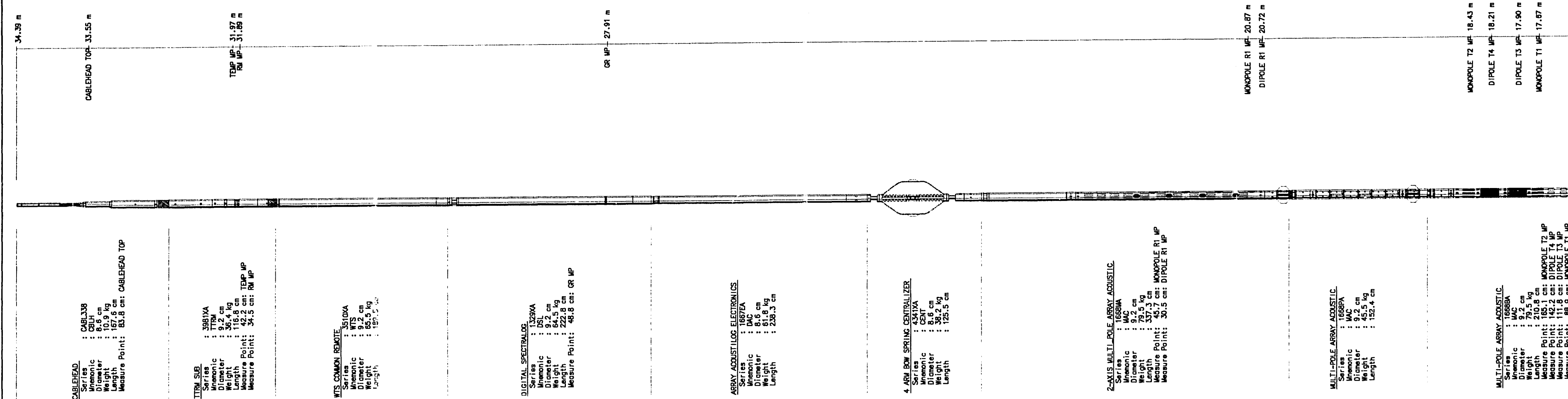
RUN 1 TRIP 1 : TIME STOPPED CIRCULATION: 10:00, 09-JAN-99
 - PRESENTED DELTA T 500-100 USEC/W OVER UPPER PRESENTATION
 - PRESENTED DELTA T 300-100 USEC/W OVER MAIN PASS AND REPEAT PASS

CREW: T FISHER / J BLANCO / O PINTO / R EISICK

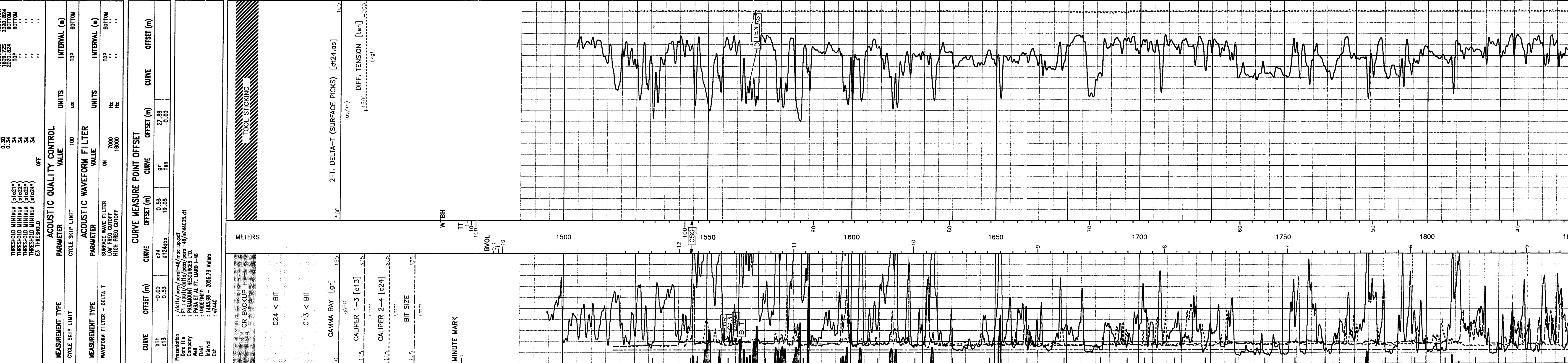
EQUIPMENT DATA					
RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	TRM	3981YA	180401	FREE
1	1	COMM REMOT	3514XB	78174	TELEMETRY
1	1	DGR	1329XA	153116	FREE
1	1	MAC ELEC	1697FA	153337	FREE
1	1	CENT	4341YA	173381	CENTRALIZER
1	1	MAC	1688MA	118565	CENTRALIZED
1	1	MAC	1688PA	189292	CENTRALIZED
1	1	MAC	1688BA	153828	CENTRALIZED
1	1	MAC	1688FA	1540006	CENTRALIZED
1	1	CENT	4341YA		CENTRALIZER
1	1	HDL	1515EX/1515WA	177896/178647	3R MM STANDOFF
1	1	SLAW ADAPT	3516XA	153448	TELEMETRY

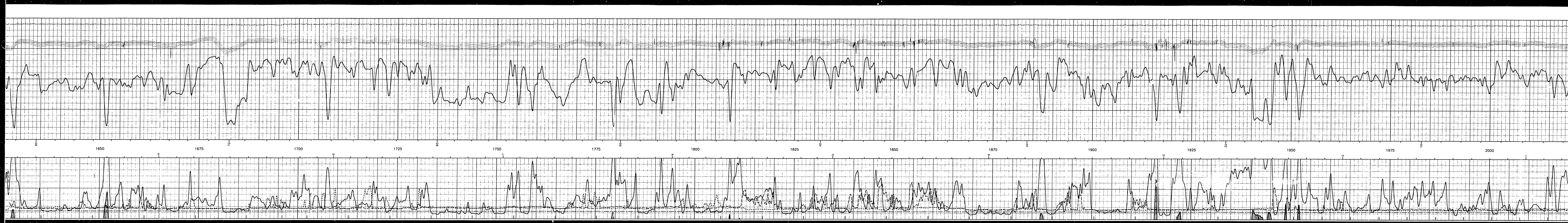
INSTRUMENT CONFIGURATION

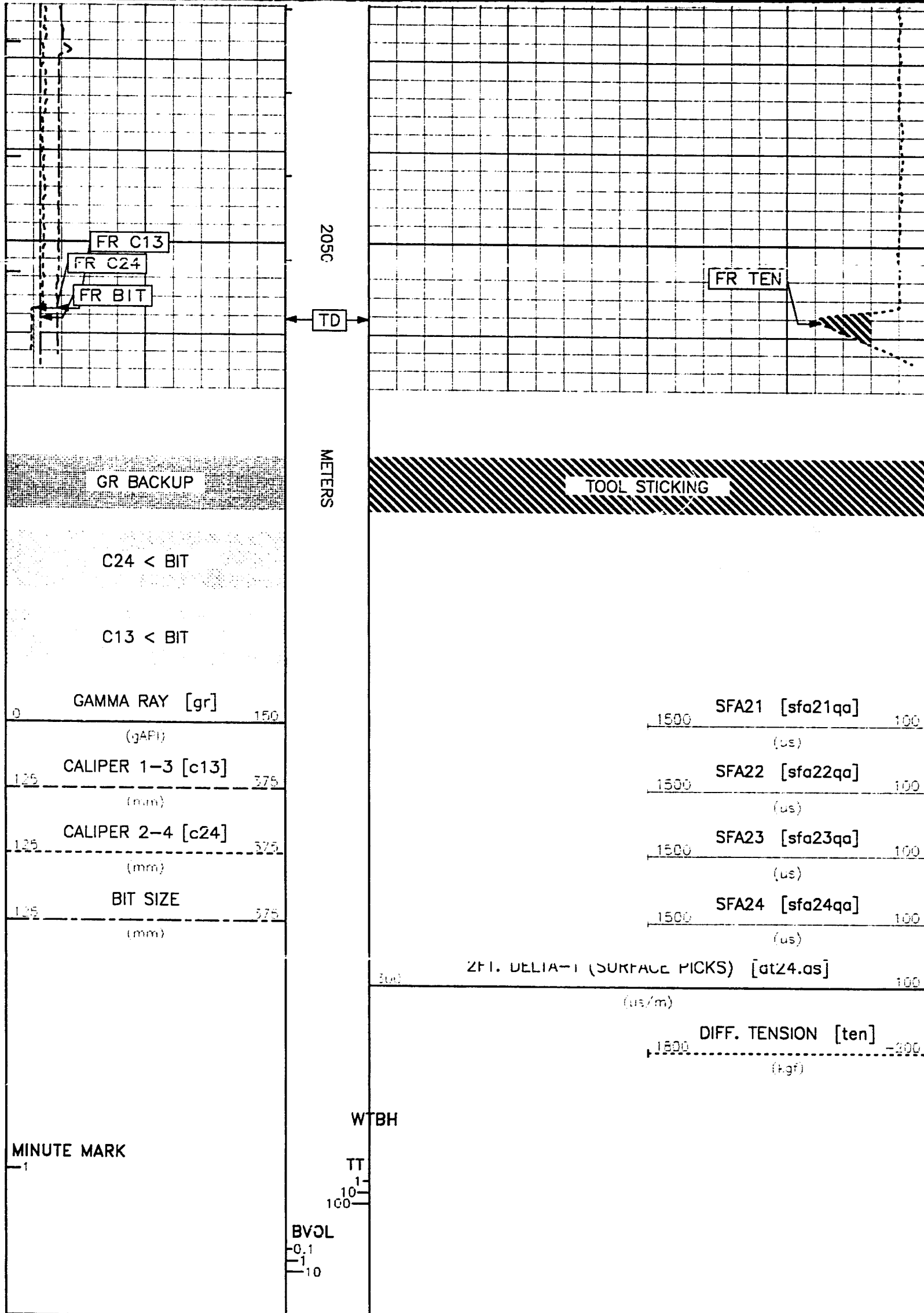
Source File: /Applications/Xcode.app/Contents/Resources/Localization/en.lproj/Localizable.strings



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187	us	188	us	189	us	190	us	191	us	192	us	193	us	194	us	195	us	196	us	197	us	198	us	199	us	200	us	201	us	202	us	203	us	204	us	205	us	206	us	207	us	208	us	209	us	210	us	211	us	212	us	213	us	214	us	215	us	216	us	217	us	218	us	219	us	220	us	221	us	222	us	223	us	224	us	225	us	226	us	227	us	228	us	229	us	230	us	231	us	232	us	233	us	234	us	235	us	236	us	237	us	238	us	239	us	240	us	241	us	242	us	243	us	244	us	245	us	246	us	247	us	248	us	249	us	250	us	251	us	252	us	253	us	254	us	255	us	256	us	257	us	258	us	259	us	260	us	261	us	262	us	263	us	264	us	265	us	266	us	267	us	268	us	269	us	270	us	271	us	272	us	273	us	274	us	275	us	276	us	277	us	278	us	279	us	280	us	281	us	282	us	283	us	284	us	285	us	286	us	287	us	288	us	289	us	290	us	291	us	292	us	293	us	294	us	295	us	296	us	297	us	298	us	299	us	300	us	301	us	302	us	303	us	304	us	305	us	306	us	307	us	308	us	309	us	310	us	311	us	312	us	313	us	314	us	315	us	316	us	317	us	318	us	319	us	320	us	321	us	322	us	323	us	324	us	325	us	326	us	327	us	328	us	329	us	330	us	331	us	332	us	333	us	334	us	335	us	336	us	337	us	338	us	339	us	340	us	341	us	342	us	343	us	344	us	345	us	346	us	347	us	348	us	349	us	350	us	351	us	352	us	353	us	354	us	355	us	356	us	357	us	358	us	359	us	360	us	361	us	362	us	363	us	364	us	365	us	366	us	367	us	368	us	369	us	370	us	371	us	372	us	373	us	374	us	375	us	376	us	377	us	378	us	379	us	380	us	381	us	382	us	383	us	384	us	385	us	386	us	387	us	388	us	389	us	390	us	391	us	392	us	393	us	394	us	395	us	396	us	397	us	398	us	399	us	400	us	401	us	402	us	403	us	404	us	405	us	406	us	407	us	408	us	409	us	410	us	411	us	412	us	413	us	414	us	415	us	416	us	417	us	418	us	419	us	420	us	421	us	422	us	423	us	424	us	425	us	426	us	427	us	428	us	429	us	430	us	431	us	432	us	433	us	434	us	435	us	436	us	437	us	438	us	439	us	440	us	441	us	442	us	443	us	444	us	445	us	446	us	447	us	448	us	449	us	450	us	451	us	452	us	453	us	454	us	455	us	456	us	457	us	458	us	459	us	460	us	461	us	462	us	463	us	464	us	465	us	466	us	467	us	468	us	469	us	470	us	471	us	472	us	473	us	474	us	475	us	476	us	477	us	478	us	479	us	480	us	481	us	482	us	483	us	484	us	485	us	486	us	487	us	488	us	489	us	490	us	491	us	492	us	493	us	494	us	495	us	496	us	497	us	498	us	499	us	500	us	501	us	502	us	503	us	504	us	505	us	506	us	507	us	508	us	509	us	510	us	511	us	512	us	513	us	514	us	515	us	516	us	517	us	518	us	519	us	520	us	521	us	522	us	523	us	524	us	525	us	526	us	527	us	528	us	529	us	530	us	531	us	532	us	533	us	534	us	535	us	536	us	537	us	538	us	539	us	540	us	541	us	542	us	543	us	544	us	545	us	546	us	547	us	548	us	549	us	550	us	551	us	552	us	553	us	554	us	555	us	556	us	557	us	558	us	559	us	560	us	561	us	562	us	563	us	564	us	565	us	566	us	567	us	568	us	569	us	570	us	571	us	572	us	573	us	574	us	575	us	576	us	577	us	578	us	579	us	580	us	581	us	582	us	583	us	584	us	585	us	586	us	587	us	588	us	589	us	590	us	591	us	592	us	593	us	594	us	595	us	596	us	597	us	598	us	599	us	600	us	601	us	602	us

[illegible]





 Baker Atlas	COMPANY WELL FIELD PROVINCE		PARAMOUNT RESOURCES LTD. PARA ET AL FT. LIARD I-46 60 10',123 15' UNDEFINED NORTHWEST TERRITORIES	FILE NO: API NO:
	LOCATION: LIC #: 1871 LAT 60 05'32.474" LONG 123 22'53.612"		ELEVATIONS: KB 542.2 M DF GL 537.2 M DATE 08-JAN-2000	3001466010123150



Baker Atlas

FILE NO: COMPANY: PARAMOUNT RESOURCES LTD.
API NO: WELL: PARA ET AL FT. LIARD I-46 60 10'123 15'
PROVINCE: NORTHWEST TERRITORIES

Ver 3.68 LOCATION: LAT 60.05'32.474" LONG 123.22'53.612"
3001466010123150 OTHER SERVICES: HDIL-CR, ZDL-CN-CR-CAL, FWI, TVD, CVL

PERMANENT DATUM: G.L. ELEVATION 537.2 M
LOG MEASURED FROM: K.B. 5.0 M ABOVE P.D.
DRILL. MEAS. FROM: KELLY BUSHING

DATE		08-JAN-2000			
RUN	TRIP	1	1		
SERVICE ORDER		974644			
DEPTH DRILLER		2055.0 M			
DEPTH LOGGER		2054.4 M			
BOTTOM LOGGED INTERVAL		2033.5 M			
TOP LOGGED INTERVAL		1544.5 M			
CASING-DRILLER		177.8 MM	⊙1545.0 M		⊙
CASING LOGGER		1544.5 M			
BIT SIZE		156.0 MM			
TYPE OF FLUID IN HOLE		INVERT			
DENSITY	VISCOSITY	1035.0 G/L	60.0 S		
PH	FLUIDLOSS	N/A	N/A		
SOURCE OF SAMPLE		FLOWLINE			
RM AT MEAS. TEMP.		N/A	⊙N/A		⊙
RMF AT MEAS. TEMP.		N/A	⊙N/A		⊙
RMC AT MEAS. TEMP.		N/A	⊙N/A		⊙
SOURCE OF RMF	RMC	NO SAMPLE	NO SAMPLE		
RM AT BHT		N/A	⊙N/A		⊙
TIME SINCE CIRCULATION		11.5 HRS			
MAX. RECORDED TEMP.		59.2 DEGC			
EQUIP. NO.	LOCATION	HL 6544	G. PRAIRIE		
RECORDED BY		T. FISHER / J. BLANCO			
WITNESSED BY		GARY JOHANSSON			

N.E.B. COPY 1871

TRUE VERTICAL DEPTH
MULTIPOLE ARRAY ACOUSTIC LOG
GAMMA RAY LOG
4-ARM CALIPER LOG

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

REMARKS

RUN 1 TRIP 1: TIME STOPPED CIRCULATION: 10:00, 09-JAN-99
- PRESENTED DELTA T 500-100 USEC/M OVER UPPER PRESENTATION
- PRESENTED DELTA T 300-100 USEC/M OVER MAIN PASS AND REPEAT PASS
- MAXIMUM DEVIATION = 15.25 DEGREES

CREW: T. FISHER / J. BLANCO / O. PINTO / B. FUSICK

RUN	TRIP	TOOL	SERIES NO.	POSITION
1	1	TRM	180401	FREE
1	1	COIL REMOT	178174	TELEMETRY
1	1	MAC ELECT	153116	FREE
1	1	CENT	153337	FREE
1	1	MAC	173381	CENTRALIZER
1	1	MAC	118555	CENTRALIZED
1	1	MAC	189292	CENTRALIZED
1	1	MAC	153828	CENTRALIZED
1	1	MAC	1540006	CENTRALIZED
1	1	HDIL	177886/178647	CENTRALIZER
1	1	SLAM ADAPT	153448	38 MM STANDARD
1	1	4 CAL	42033A	TELEMETRY
1	1		050358	PARA ET AL

INSTRUMENT CONFIGURATION

CABLEHEAD
Series : CABL338
Diameter : 8.6 cm
Weight : 15.5 kg
Length : 167.8 cm
Measure Point: 83.8 cm: CABLEHEAD TOP

TRM SUB
Series : 3881VA
Diameter : 9.2 cm
Weight : 36.4 kg
Length : 111.5 cm
Measure Point: 42.5 cm: TOP UP
Measure Point: 34.5 cm: RM UP

WTS COMMON REMOTE
Series : 351COA
Diameter : 9.2 cm
Weight : 65.5 kg
Length : 105.5 cm

DIGITAL SPECTRUM LOG
Series : 15328A
Diameter : 9.2 cm
Weight : 64.5 kg
Length : 122.8 cm
Measure Point: 45.8 cm: CR MP

ARRAY ACOUSTIC LOG ELECTRONICS
Series : 1688PA
Diameter : 8.6 cm
Weight : 61.8 kg
Length : 238.3 cm

4 ARM BOW SPRING CENTRALIZER
Series : 4341VA
Diameter : 9.2 cm
Weight : 56.2 kg
Length : 125.5 cm

2-AXIS MULTI-POLE ARRAY ACOUSTIC
Series : 1688PA
Diameter : 9.2 cm
Weight : 79.5 kg
Length : 142.2 cm
Measure Point: 45.7 cm: MONOPOLE R1 UP
Measure Point: 30.5 cm: DIPOLE R1 UP

MULTI-POLE ARRAY ACOUSTIC
Series : 1688PA
Diameter : 9.2 cm
Weight : 45.2 kg
Length : 152.4 cm

MULTI-POLE ARRAY ACOUSTIC
Series : 1688PA
Diameter : 9.2 cm
Weight : 79.5 kg
Length : 142.2 cm
Measure Point: 111.8 cm: MONOPOLE T2 UP
Measure Point: 88.9 cm: DIPOLE T4 UP
Measure Point: 30.5 cm: DIPOLE T1 UP

MULTI-POLE ARRAY ACOUSTIC
Series : 1688PA
Diameter : 9.2 cm
Weight : 45.2 kg
Length : 152.4 cm

4 ARM BOW SPRING CENTRALIZER
Series : 4341VA
Diameter : 9.2 cm
Weight : 56.2 kg
Length : 125.5 cm

HIGH DEFINITION INDUCTION TOOL
Series : 1518XA
Diameter : 9.2 cm
Weight : 200.5 kg
Length : 827.0 cm
Measure Point: 220.8 cm: SP UP
Measure Point: 220.8 cm: XMTL UP

SLAM ADAPTER
Series : 3518XA
Diameter : 8.6 cm
Weight : 56.2 kg
Length : 105.5 cm

KNUCKLE JOINT
Series : 3921NA
Diameter : 9.2 cm
Weight : 61.8 kg
Length : 73.7 cm

FOUR ARM CALIPER

CABLEHEAD TOP: 33.55 m

TRM UP: 31.87 m
RM UP: 31.88 m

CR MP: 27.91 m

MONOPOLE R1 UP: 20.87 m
DIPOLE R1 UP: 20.72 m

MONOPOLE T2 UP: 18.43 m
DIPOLE T4 UP: 18.21 m

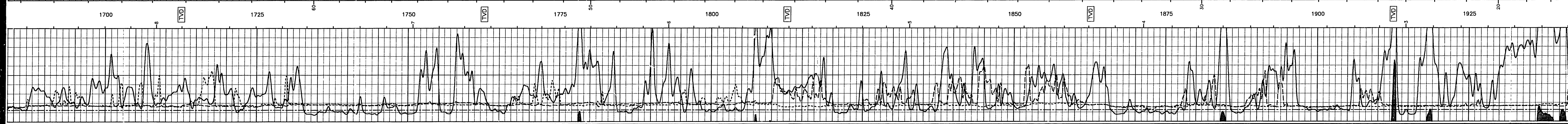
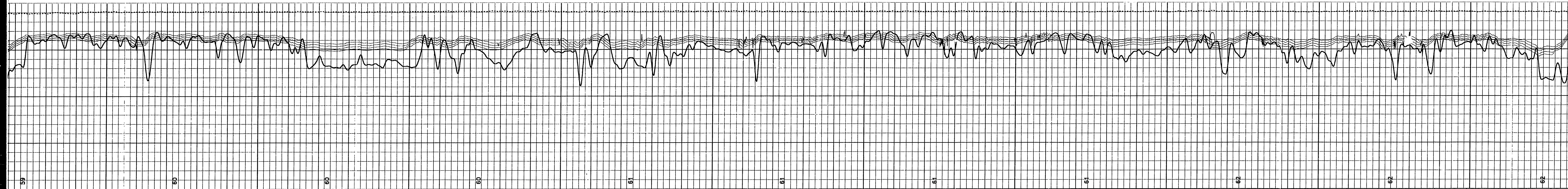
DIPOLE T3 UP: 17.90 m
MONOPOLE T1 UP: 17.67 m

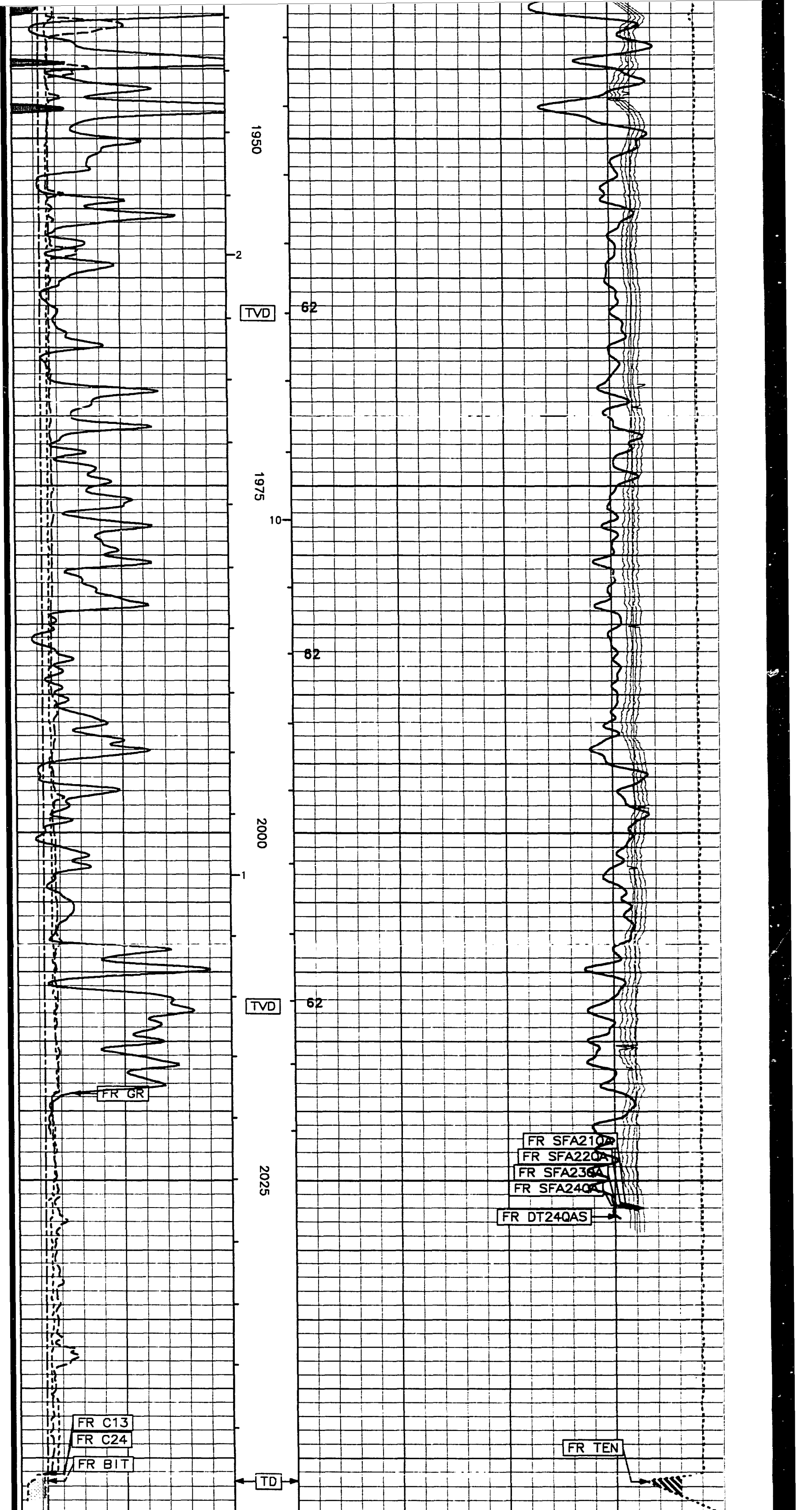
SP UP: 10.18 m

XMTL UP: 6.21 m

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235	1948,074	US		1948,074	US
236	1948,075	US		1948,075	US
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238	1948,077	US		1948,077	US
239	1948,078	US		1948,078	US
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245	1948,084	US		1948,084	US
246	1948,085	US		1948,085	US
247	1948,086	US		1948,086	US
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287	1948,126	US		1948,126	US
288	1948,127	US		1948,127	US
289	1948,128	US		1948,128	US
290	1948,129	US		1948,129	US
291	1948,130	US		1948,130	US
292	1948,131	US		1948,131	US
293	1948,132	US		1948,132	US
294	1948,133	US		1948,133	US
295	1948,134	US		1948,134	US
296	1948,135	US		1948,135	US
297	1948,136	US		1948,136	US
298	1948,137	US		1948,137	US
299	1948,138	US		1948,138	US
300	1948,139	US		1948,139	US
301	1948,140	US		1948,140	US
302	1948,141	US		1948,141	US
303	1948,142	US		1948,142	US
304	1948,143	US		1948,143	US
305	1948,144	US		1948,144	US
306	1948,145	US		1948,145	US
307	1948,146	US		1948,146	US
308					







GR BACKUP		TOOL STICKING	
C24 < BIT			
C13 < BIT			
GAMMA RAY [gr]		SFA21 [sfa21qa]	
(gAPI)		(us)	
CALIPER 1-3 [c13]		SFA22 [sfa22qa]	
(mm)		(us)	
CALIPER 2-4 [c24]		SFA23 [sfa23qa]	
(mm)		(us)	
BIT SIZE		SFA24 [sfa24qa]	
(mm)		(us)	
		2FT. DELTA-T (SURFACE PICKS) [dt24.as]	
		(us/m)	
		DIFF. TENSION [ten]	
		(kgf)	
MINUTE MARK		WTBH (degC)	
		TT	
		BVOL	

TRUE VERTICAL DEPTH DATA

tvd	angle
0.00	0.0
1545.0	2.8
1588.0	2.50
1650.0	2.00
1760.0	8.00
1765.0	8.00
1798.0	10.00
1838.0	11.00
1866.0	10.25
1914.0	12.00
1957.0	13.50
1996.0	15.25
2051.0	13.00

 Baker Atlas	COMPANY WELL FIELD PROVINCE	PARAMOUNT RESOURCES LTD. PARA ET AL FT. LIARD I-46 60 10'123 15' UNDEFINED NORTHWEST TERRITORIES	FILE NO: API NO:
	LOCATION: LIC #: 1871 LAT 60 05'32.474" LONG 123 22'53.612"	ELEVATIONS: KB 542.2 M DF GL 537.2 M DATE 08-JAN-2000	3001466010123150

1000 2 0 2000

DENSITY

COMPENSATED Z-DENSLOGSM
COMPENSATED NEUTRON LOG
GAMMA RAY LOG
X-Y CALIPER LOG

Baker Atlas

FILE NO:	COMPANY			PARAMOUNT RESOURCES LTD.
	WELL			PARA ET AL FT. LARD I-46 60 10' 123 15'
API NO:	FIELD			UNDEFINED
	PROVINCE			NORTHWEST TERRITORIES
Ver 3.68	LOCATION:			OTHER SERVICES
LWI: 3001466010123150	LICENCE: WID #1871			HDL-CR MAC-CR-XYCAL C/L
	LAT 60 05' 32.474"	LONG 123 22'53.612"		
PERMANENT DATUM	GL	ELEVATION	ELEVATIONS:	
LOG MEASURED FROM	KB	5.0 M	ABOVE P.D.	KB 542.2 M DF GL 537.2 M
DRILL MEAS. FROM	KELLY BUSHING			
DATE	06-DEC-99			
RUN	TRIP	1	1	
SERVICE ORDER	976858			
DEPTH DRILLER	1545.0 M			
DEPTH LOGGER	1545.5 M			
BOTTOM LOGGED INTERVAL	1524.1 M			
TOP LOGGED INTERVAL	505.2 M			
CASING-DRILLER	244.5 MM		Ø505.4 M	
CASING LOGGER	505.2 M			
BIT SIZE	222.0 MM			
TYPE OF FLUID IN HOLE	INERT			
DENSITY	VISCOSITY	1060 G/L	51 S	
PH	FLUIDLOSS	N/A	N/A	
SOURCE OF SAMPLE	NO SAMPLE			
RM AT MEAS. TEMP.	N/A		ØN/A	
RM AT MEAS. TEMP.	N/A		ØN/A	
RM AT MEAS. TEMP.	N/A		ØN/A	
SOURCE OF RMF	RMF	NO SAMPLE		NO SAMPLE
RM AT BHT	N/A		ØN/A	
TIME SINCE CIRCULATION	8.0 HOURS			
MAX. RECORDED TEMP.	45 DEGC			
EQUIP. NO.	LOCATION	6556	NISKU	
RECORDED BY	D. MCCULLOUGH			
WITNESSED BY	G. JOHANSON			

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

BOREHOLE RECORD

BIT SIZE	FROM	TO
222.0 MM	505.4 M	1545.0 M

CASING RECORD

SIZE	WEIGHT	GRADE	FROM	TO
244.5 MM	53.57 KG/M	J-55	0 M	505.4 M

REMARKS

RUN 1 TRIP 1: TIME STOPPED DRILLING: 0530 06-DEC-99
TIME STOPPED CIRCULATING: 1545 06-DEC-99
HDL-MAC-CN-ZDL RECORDED IN COMBINATION.
INTEGRATED VOLUME TICKS IN 0.1, 1.0, 10.0 CUBIC METERS.
INTEGRATED VOLUMES CALCULATED FROM YCAL-ZDL CALIPERS.
CNC IS AVERAGE CALIPER CORRECTED.
DOLOMITE MATRIX USED: 2.86 G/CC.
HIRES PASSES PRESENTED ABOVE CAL/VER SECTION
LIMESTONE/DOLOMITE PLAYBACKS PRESENTED ABOVE HIRES PASSES.
ALL PRESENTATIONS AND SCALES AS PER CUSTOMER REQUEST.
CREW: D. COMEAU, A. WESENBERG, C. SAULOU.

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	SWIVEL	3944XB	038120	N/A
1	1	YCAL	4209XA	055717	Y-AXIS
1	1	COMR	3510XA	153396	N/A
1	1	GR	1329XA	152191	FREE
1	1	KNUC	3923XA	168286	KNUCKLE JOINT
1	1	CN	2446XA	173080	DECENTRALIZED
1	1	ZDLE	2228EA	150427	N/A
1	1	ZDLM	2228MA	150462	X-AXIS
1	1	MAC E	1687EA	152466	N/A
1	1	MAC M	1668MA	154143	CENTRALIZED
1	1	MAC I	1668IA	149237	ISO SUB
1	1	MAC T	1678BA	146774	CENTRALIZED
1	1	MAC TE	1668FA	172688	CENTRALIZED
1	1	CENT	4341XA	168349	CENTRALIZER
1	1	HDL E	1515EA	178563	N/A
1	1	HDL M	1515MA	178571	38 MM STAND OFF

INSTRUMENT CONFIGURATION

Source File: /data/pass/para-46/zdl-tdg

CABLEHEAD

Series : CABL338
Mnemonic : CBLH
Diameter : 8.6 cm
Weight : 10.9 kg
Length : 167.6 cm
Measure Point: 83.8 cm: CABLEHEAD TOP

SWIVEL

Series : 3944XB
Mnemonic : SWVL
Diameter : 8.6 cm
Weight : 29.5 kg
Length : 101.6 cm

Y-CALIPER

Series : 4209XA
Mnemonic : CAL
Diameter : 10.8 cm
Weight : 62.7 kg
Length : 222.2 cm
Measure Point: 134.1 cm: CALY MP

TTRM SUB

Series : 3981XA
Mnemonic : TTRM
Diameter : 9.2 cm
Weight : 36.4 kg
Length : 118.8 cm
Measure Point: 42.2 cm: TEMP MP
Measure Point: 34.5 cm: RM MP

WTS COMMON REMOTE

Series : 3510XA
Mnemonic : WTS
Diameter : 9.2 cm
Weight : 65.5 kg
Length : 189.5 cm

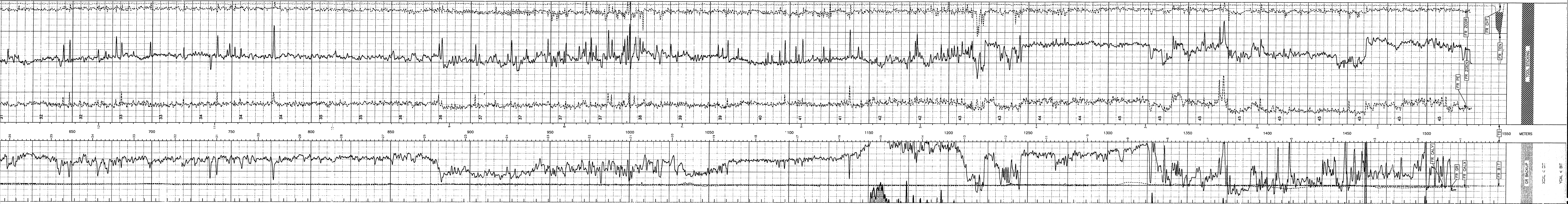
DIGITAL SPECTRALOG

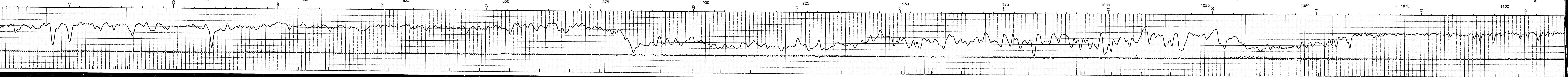
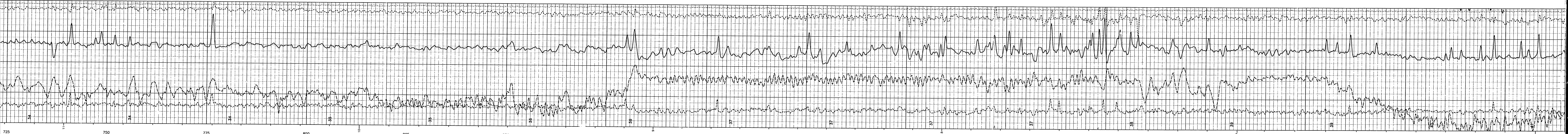
Series : 1329XA
Mnemonic : DSL
Diameter : 9.2 cm
Weight : 64.5 kg
Length : 222.8 cm
Measure Point: 48.8 cm: GR MP

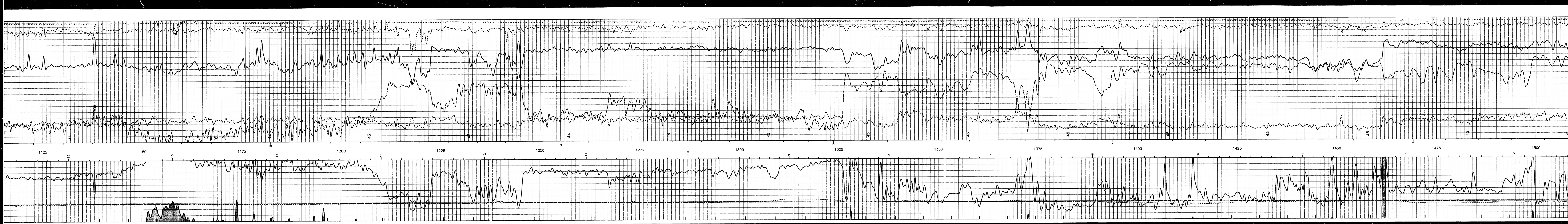
39.10 m
CABLEHEAD TOP- 38.26 m

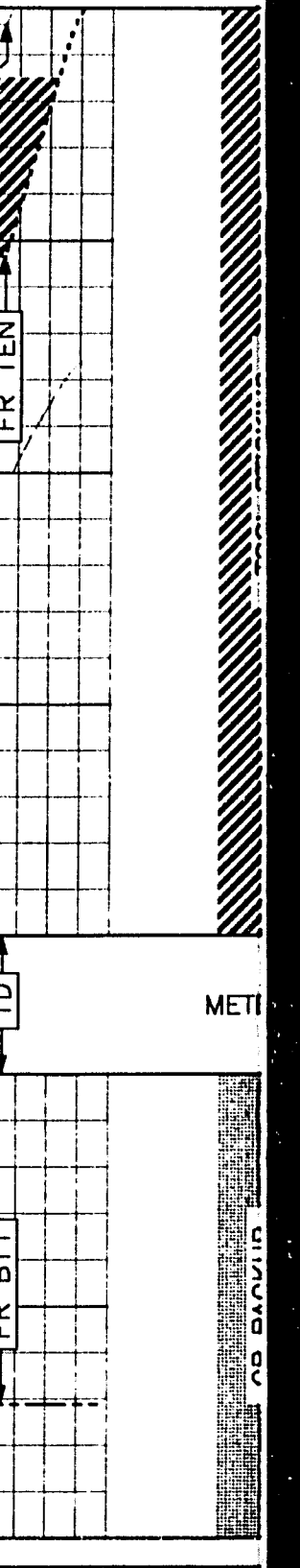
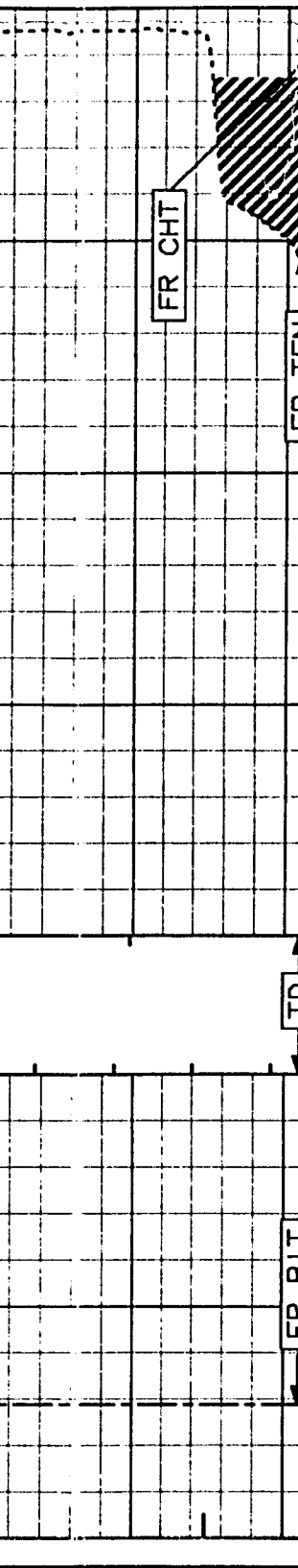
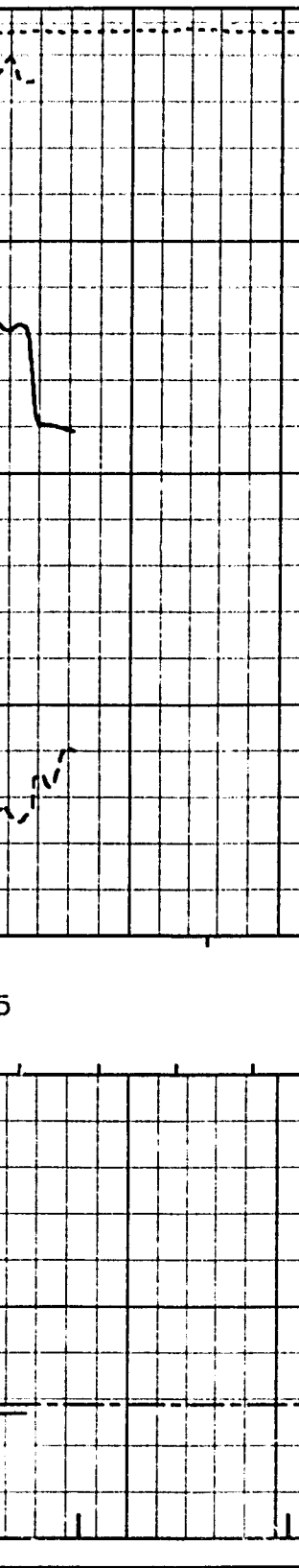
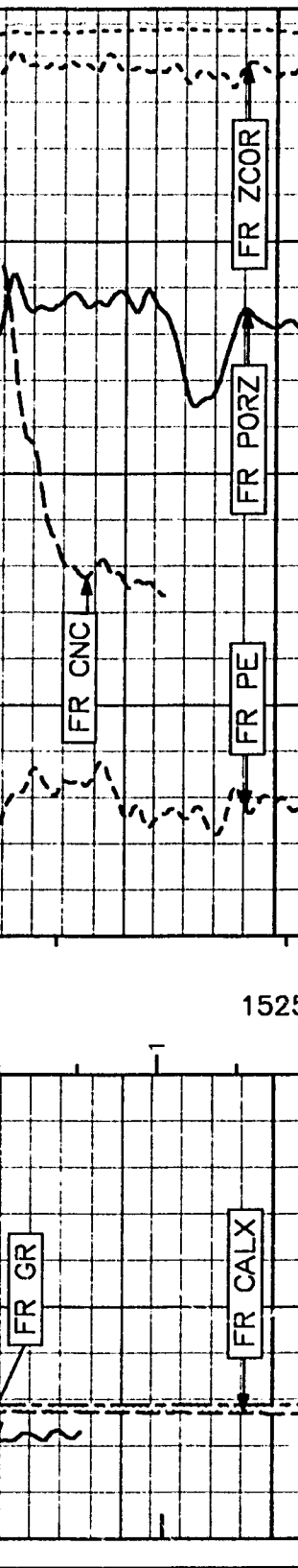
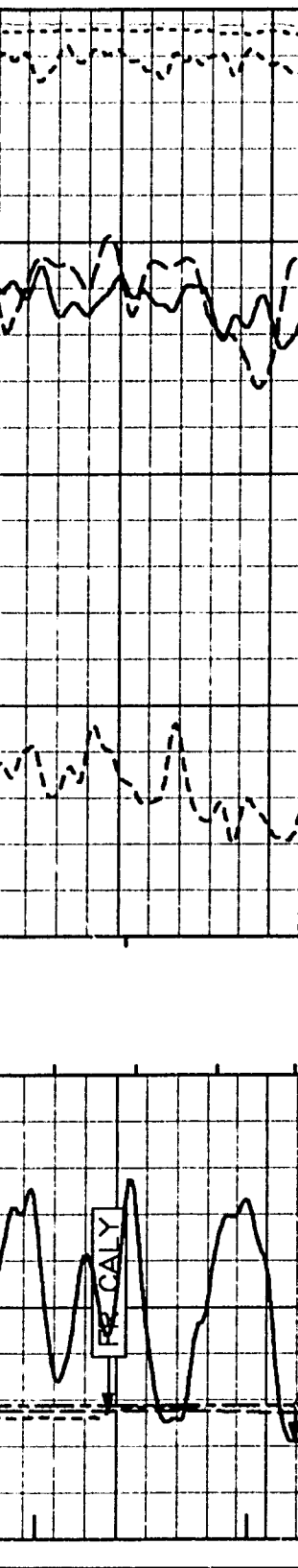
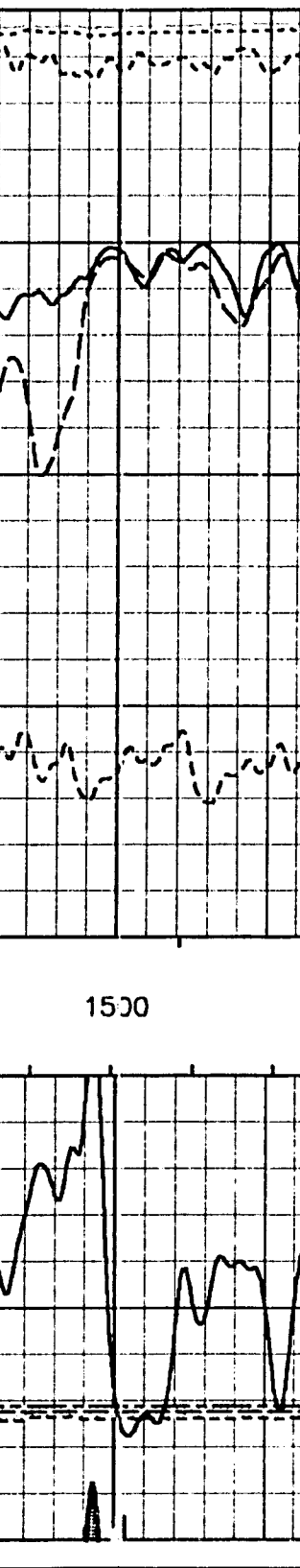
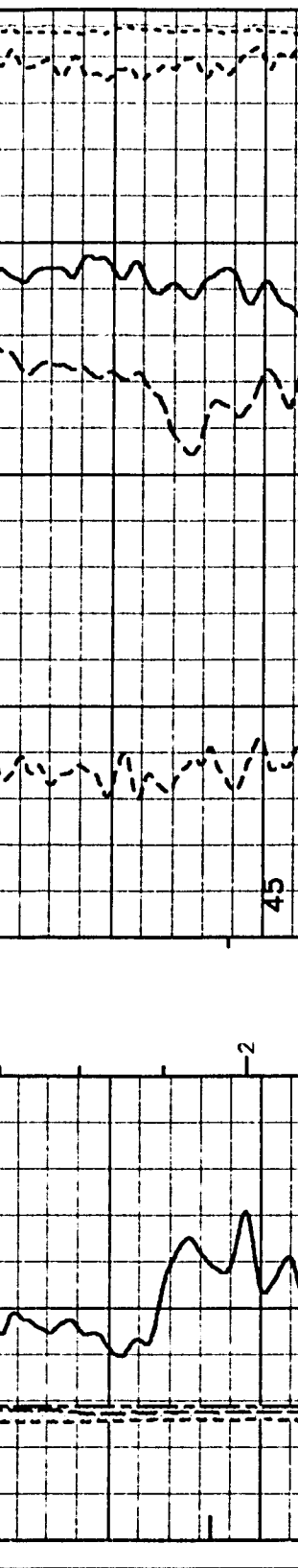
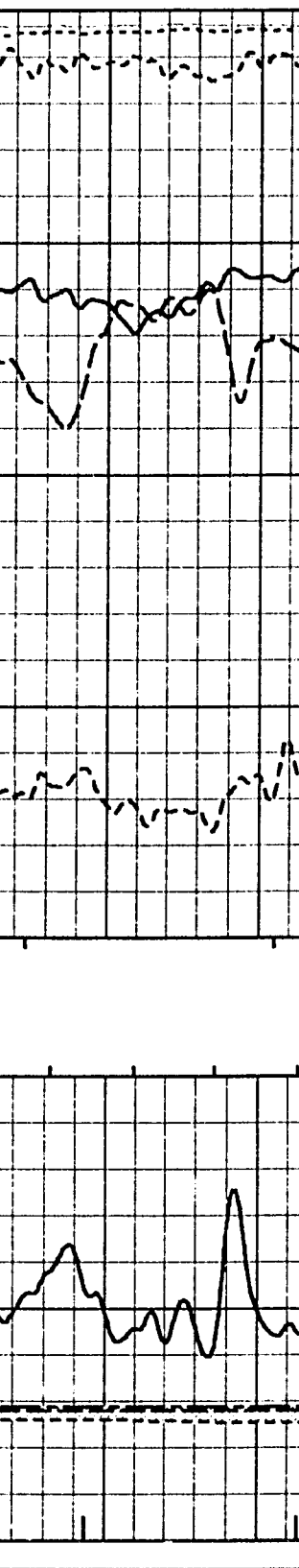
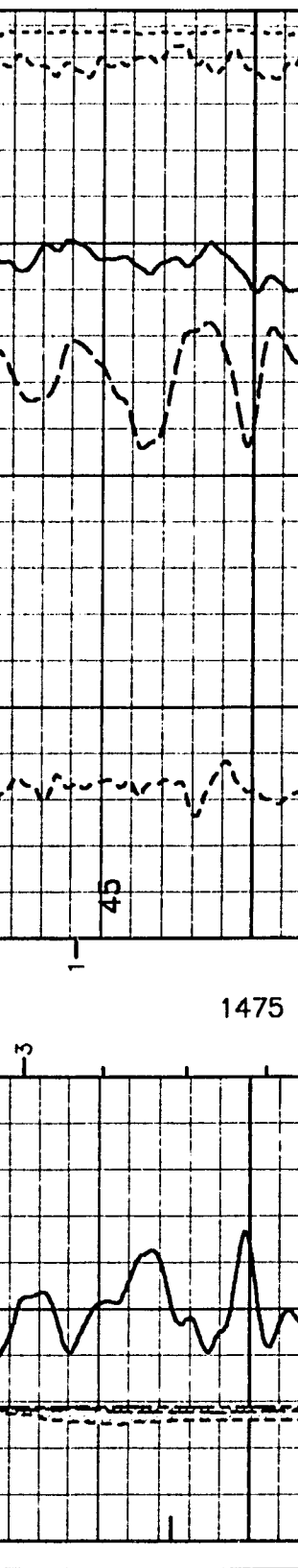
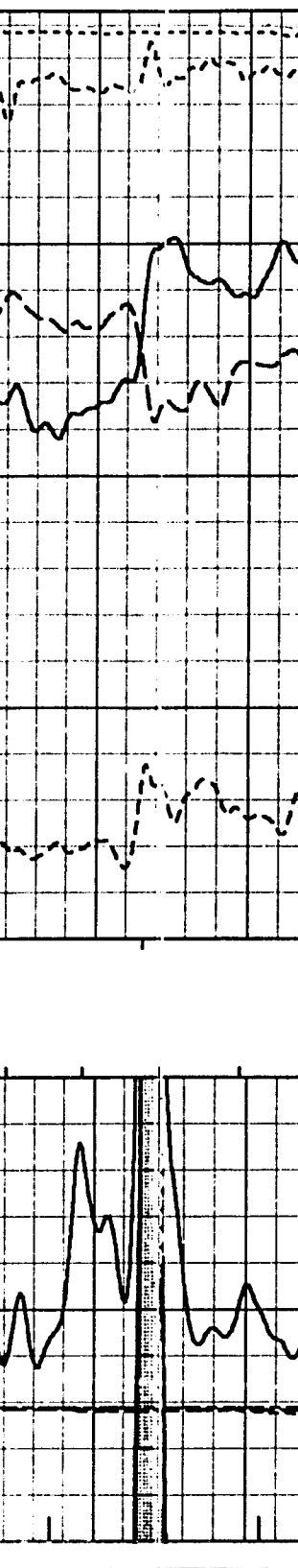
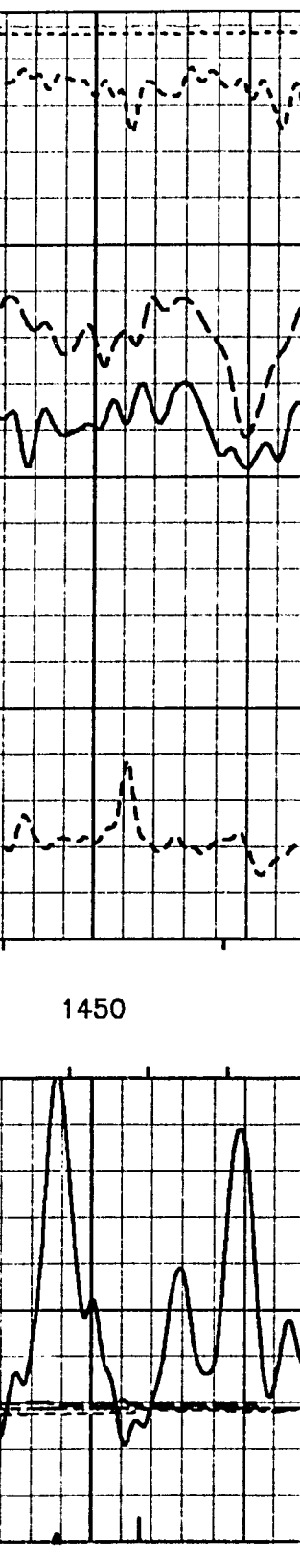
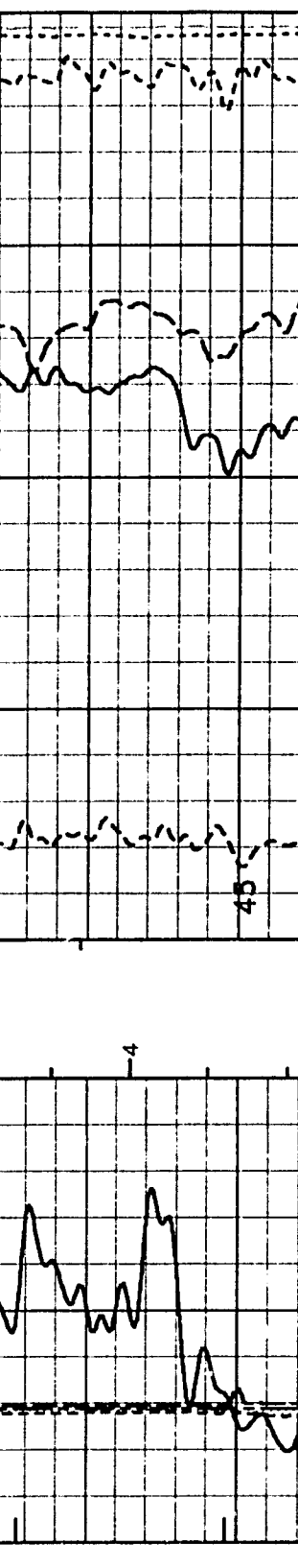
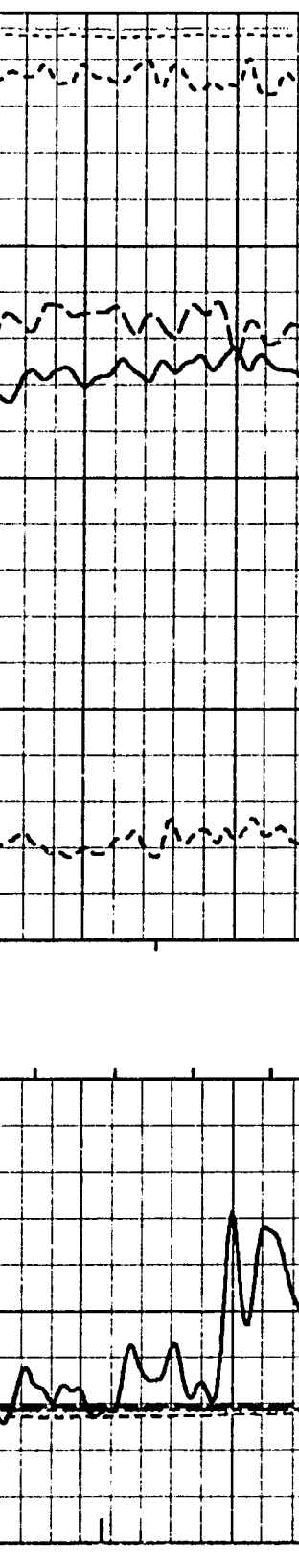
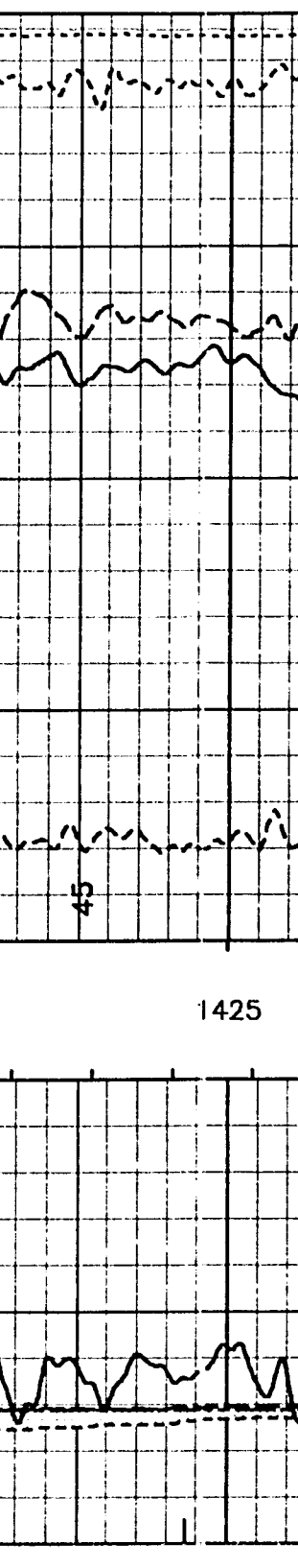
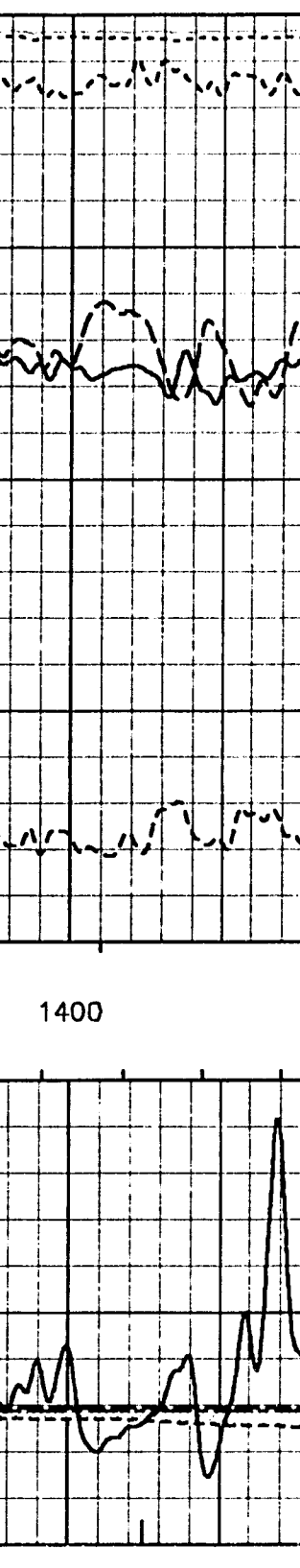
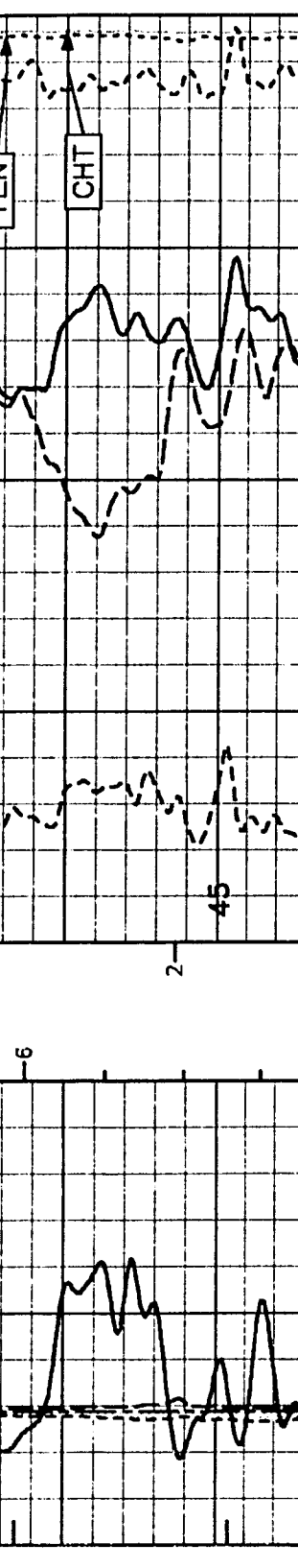
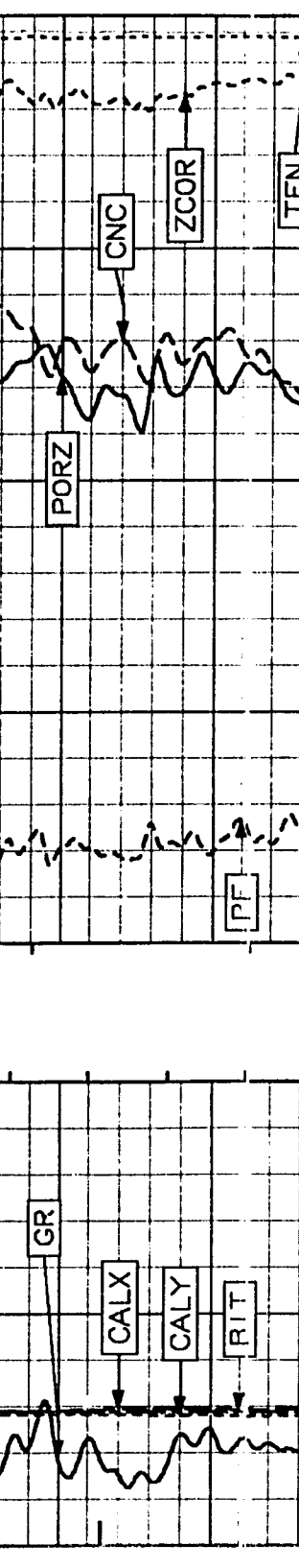
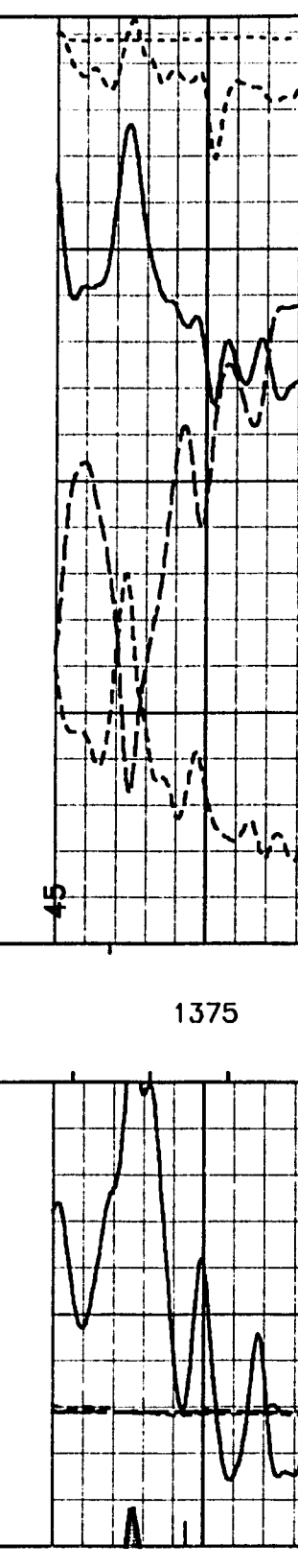
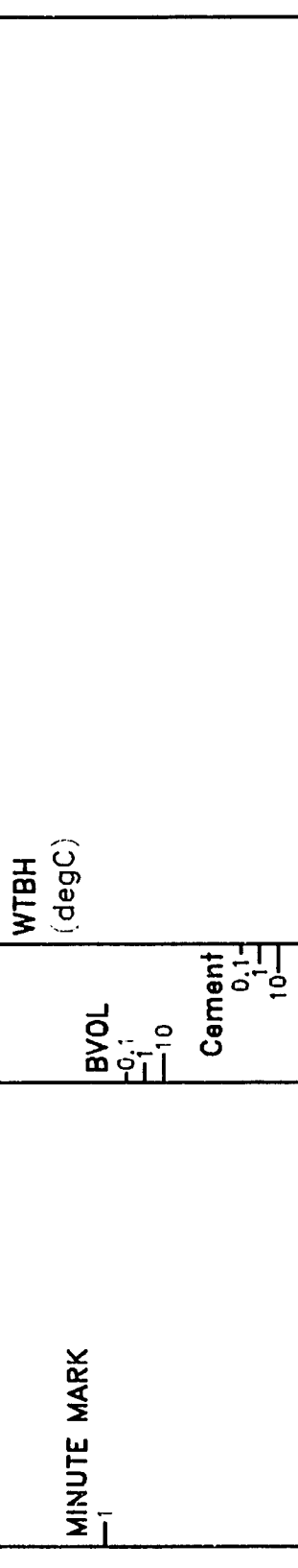
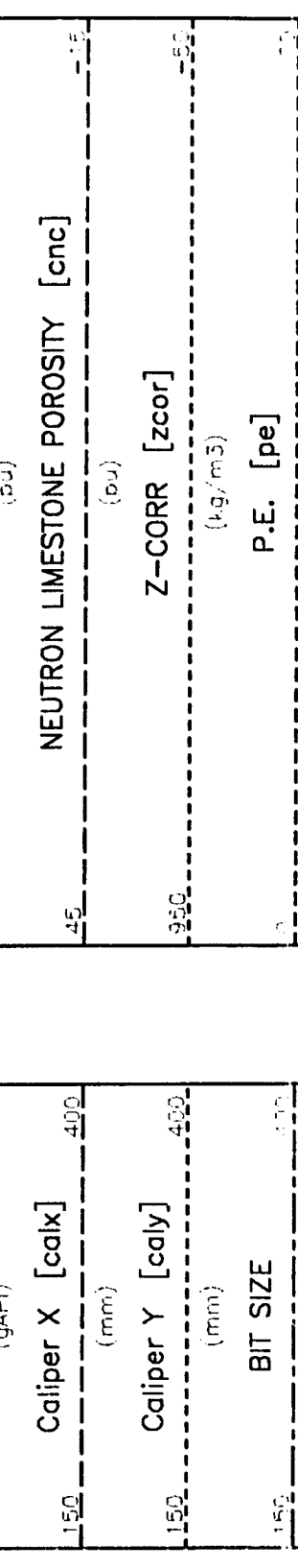
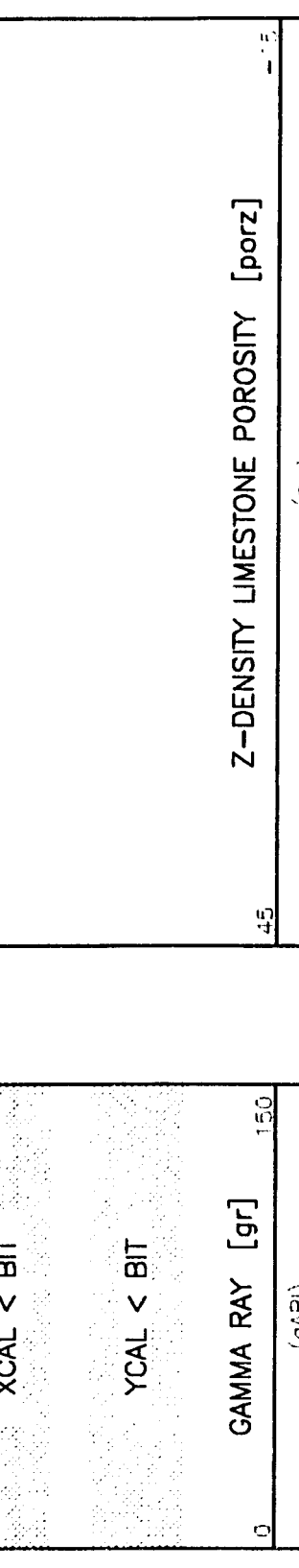
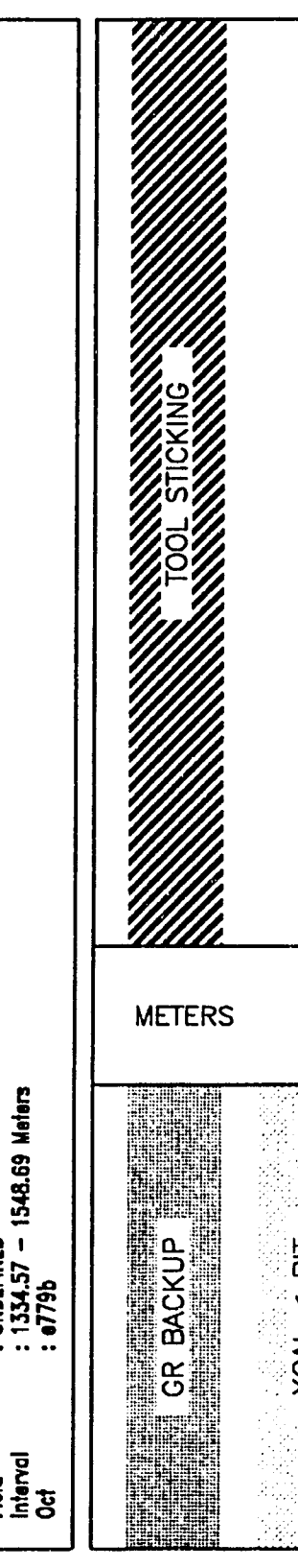
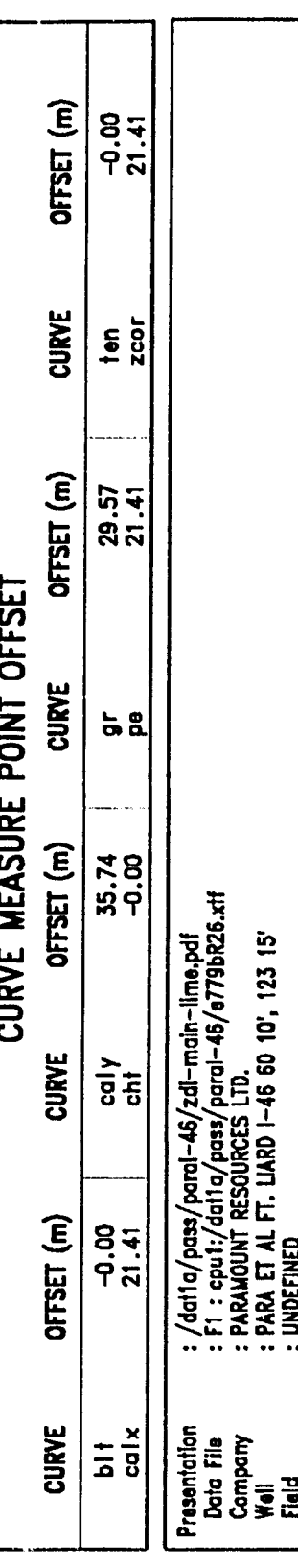
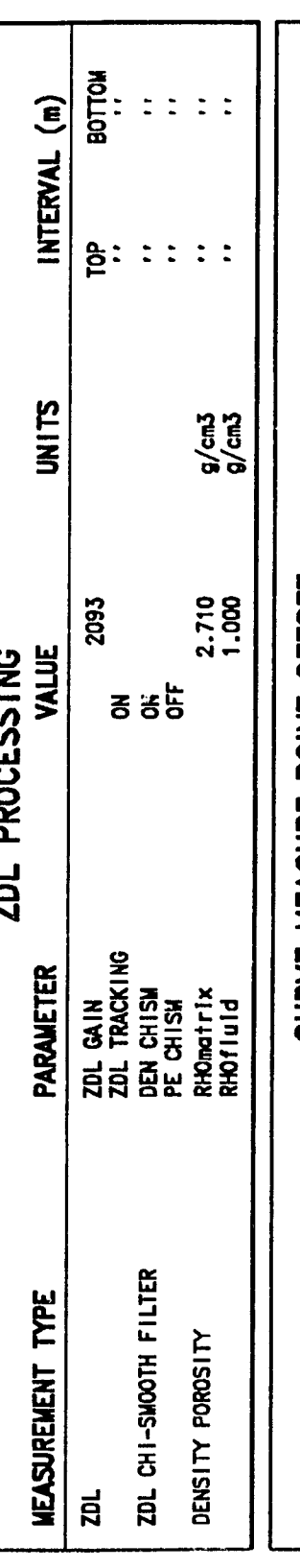
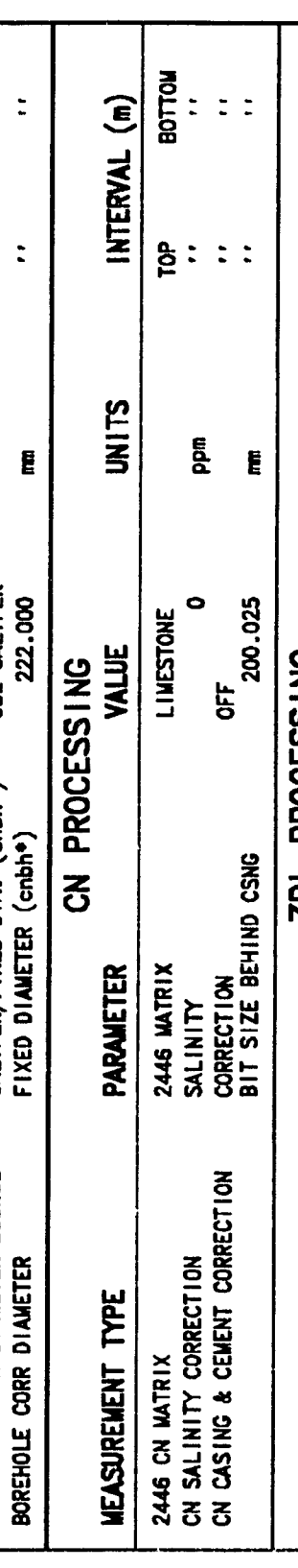
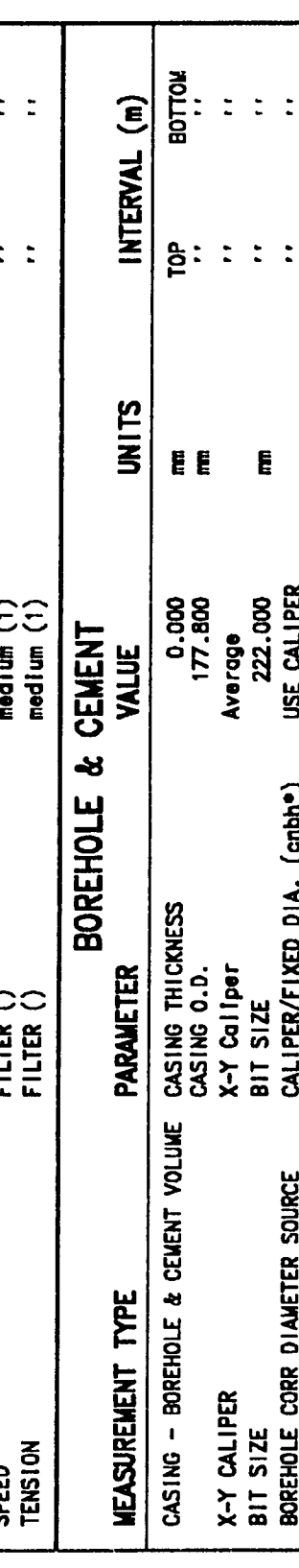
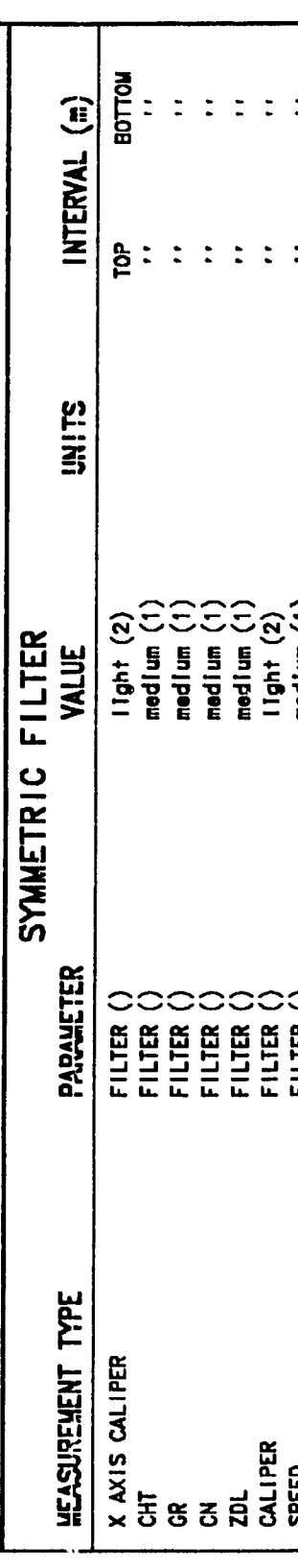
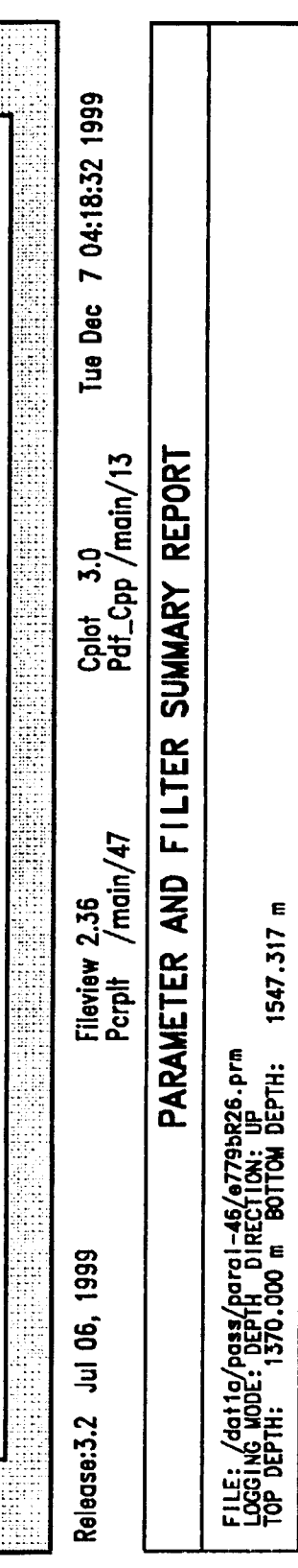
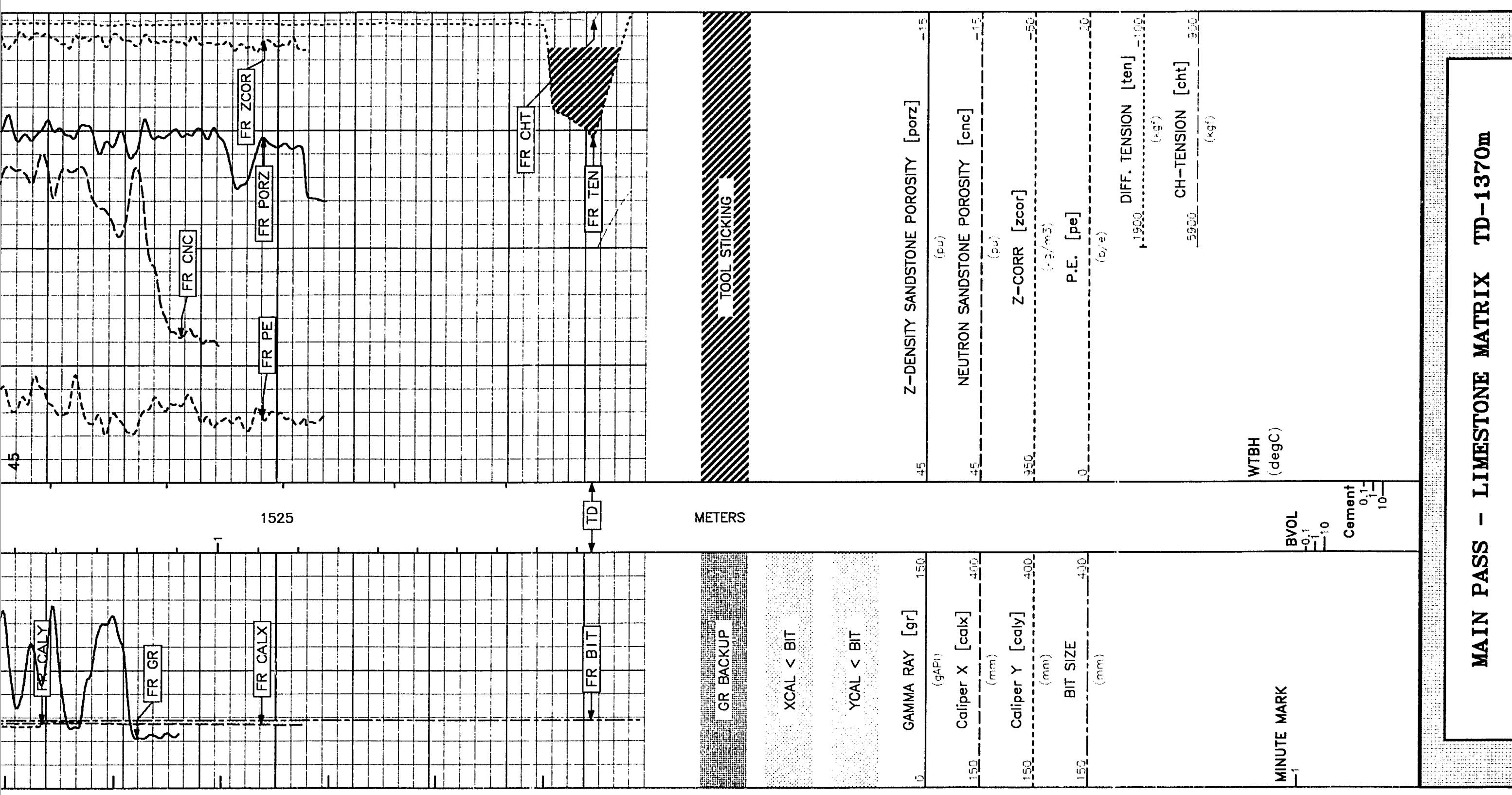
CALY MP- 35.53 m

TEMP MP- 33.44 m
RM MP- 33.36 m









Release: 3.2 Jul 06, 1999
Fileview 2.36
Perplot /min/47
Cplot 3.0
Pdf_Cpp /min/13
Tue Dec 7 04:18:32 1999

PARAMETER AND FILTER SUMMARY REPORT
FILE: /data1/param/param-46/zd-matrix-limestone-td-1370m
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 1370.000 m BOTTOM DEPTH: 1547.317 m

MEASUREMENT TYPE	PARAMETER	UNIT	VALUE
X AXIS CALIPER	FILTER (1)	mm	0.000
GR	FILTER (2)	mm	177.800
CN	medium (1)	mm	Average
ZDL	medium (2)	mm	222.000
CALIPER	medium (3)	mm	USE CALIPER
SPEED	medium (4)	mm	222.000
TENSION	medium (5)	mm	222.000

MEASUREMENT TYPE	PARAMETER	UNIT	VALUE
CASING - BOREHOLE & CEMENT VOLUME	CASING THICKNESS	mm	0.000
X-Y CALIPER	CASING O.D.	mm	177.800
BIT SIZE	X-Y Caliper	mm	Average
BOREHOLE CORR DIAMETER SOURCE	BIT SIZE	mm	222.000
BOREHOLE CORR DIAMETER	CALIPER/FIXED D.I.A. (cmh*)	mm	USE CALIPER
	FIXED DIAMETER (cmh*)	mm	222.000

MEASUREMENT TYPE	PARAMETER	UNIT	VALUE
2446 CN MATRIX	2446 MATRIX	ppm	0
CN SALINITY CORRECTION	SALINITY	ppm	0
CN CASING & CEMENT CORRECTION	CORRECTION	mm	200.025
	BIT SIZE BEHIND CSNG	mm	200.025

MEASUREMENT TYPE	PARAMETER	UNIT	VALUE
ZDL	ZDL GAIN	mm	2093
ZDL CHI-SMOOTH FILTER	ZDL TRACKING	mm	ON
DENSITY POROSITY	PE CRISM	mm	ON
	RODENTRIX	mm	OFF
	RODENTRIX	mm	2.710
	RODENTRIX	mm	1.000

MEASUREMENT TYPE	PARAMETER	UNIT	VALUE
ZDL	ZDL GAIN	mm	2093
ZDL CHI-SMOOTH FILTER	ZDL TRACKING	mm	ON
DENSITY POROSITY	PE CRISM	mm	ON
	RODENTRIX	mm	OFF
	RODENTRIX	mm	2.710
	RODENTRIX	mm	1.000

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ZDL CHI-SMOOTH FILTER	ZDL TRACKING	mm	ON
DENSITY POROSITY	PE CRISM	mm	ON
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ZDL CHI-SMOOTH FILTER	ZDL TRACKING	mm	ON
DENSITY POROSITY	PE CRISM	mm	ON
	RODENTRIX	mm	OFF
	RODENTRIX	mm	2.710
	RODENTRIX	mm	1.000

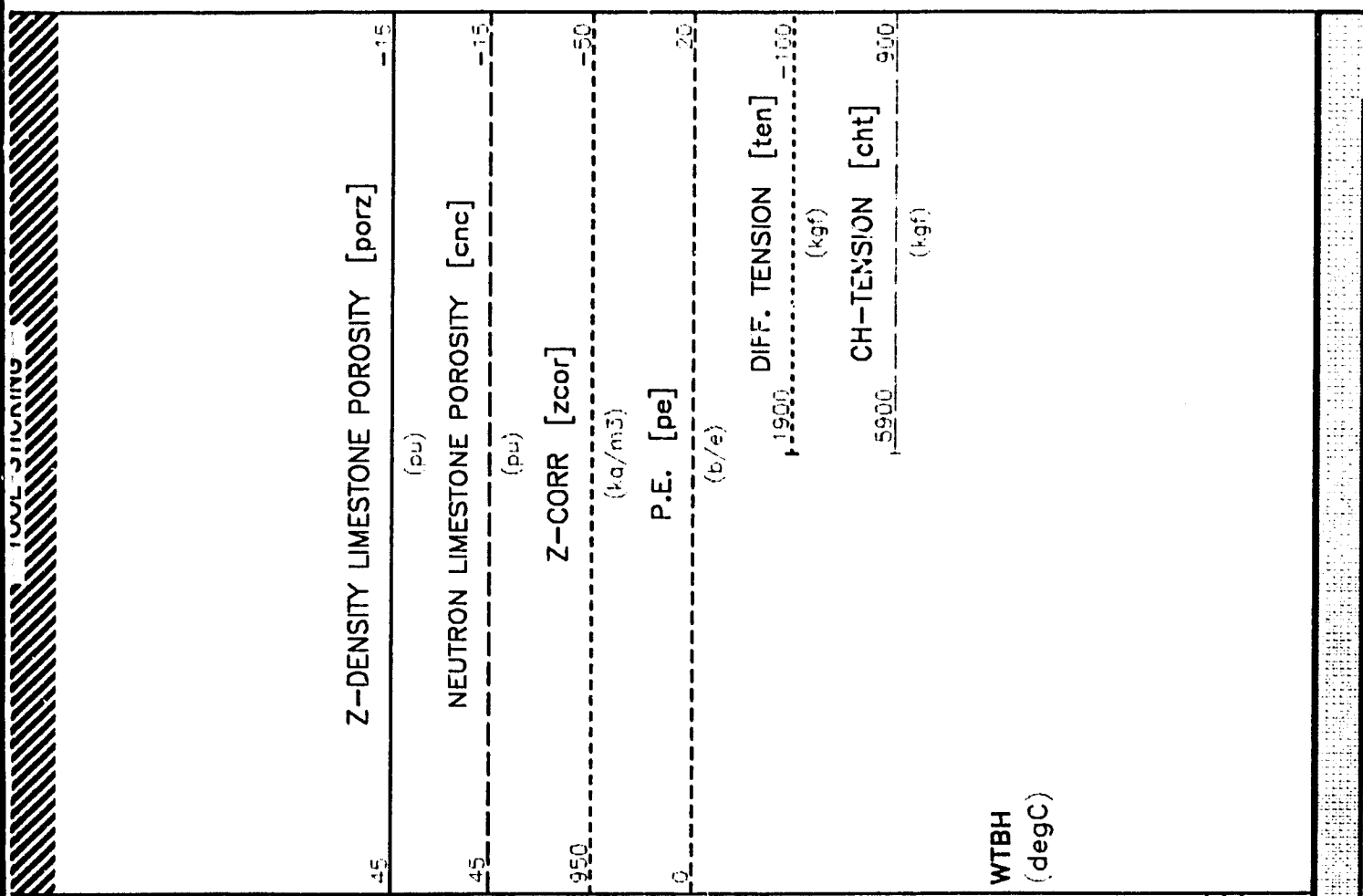
MEASUREMENT TYPE	PARAMETER	UNIT	VALUE
ZDL	ZDL GAIN	mm	2093
ZDL CHI-SMOOTH FILTER	ZDL TRACKING	mm	ON
DENSITY POROSITY	PE CRISM	mm	ON
	RODENTRIX	mm	OFF
	RODENTRIX	mm	2.710
	RODENTRIX	mm	1.000

MEASUREMENT TYPE	PARAMETER	UNIT	VALUE
ZDL	ZDL GAIN	mm	2093
ZDL CHI-SMOOTH FILTER	ZDL TRACKING	mm	ON
DENSITY POROSITY	PE CRISM	mm	ON
	RODENTRIX	mm	OFF
	RODENTRIX	mm	2.710
	RODENTRIX	mm	1.000

MEASUREMENT TYPE	PARAMETER	UNIT	VALUE
ZDL	ZDL GAIN	mm	2093
ZDL CHI-SMOOTH FILTER	ZDL TRACKING	mm	ON
DENSITY POROSITY	PE CRISM	mm	ON
	RODENTRIX	mm	OFF
	RODENTRIX	mm	2.710
	RODENTRIX	mm	1.000

MEASUREMENT TYPE	PARAMETER	UNIT	VALUE
ZDL	ZDL GAIN	mm	2093
ZDL CHI-SMOOTH FILTER	ZDL TRACKING	mm	ON
DENSITY POROSITY	PE CRISM	mm	ON
	RODENTRIX	mm	OFF
	RODENTRIX	mm	2.710
	RODENTRIX	mm	1.000

MEASUREMENT TYPE	PARAMETER	UNIT	VALUE
ZDL	ZDL GAIN	mm	2093
ZDL CHI-SMOOTH FILTER	ZDL TRACKING	mm	ON
DENSITY POROSITY	PE CRISM	mm	ON
	RODENTRIX	mm	OFF
	RODENTRIX	mm	2.710
	RODENTRIX	mm	1.000



PARAMETER AND FILTER SUMMARY REPORT	
Perfilt /main/47	Pdf_Cpp /main/13
filterw 4.00	cpur 3.0
100, 1000	lue DEC /

TYPE	SYMMETRIC FILTER		INTERVAL (m)
	PARAMETER	VALUE	
	FILTER (1)	light (2)	TOP
	FILTER (2)	—	BOTTOM

ROBEVAL E & CEMENT	
FILTER ()	light (2)
FILTER ()	medium (1)
FILTER ()	medium (1)

X-Y Caliper		Average	
BIT SIZE	222.000		
CALIPER/FIXED DIA. (cnbth*)		USE CALIPER	
FIXED DIAMETER (cnbth*)	272.000		

TOP	BOTTOM	DOLOMITE	2446 MATRIX	CORRECTION	DOLOMITE	TOP	BOTTOM
0	0	0	SALINITY	ppm	0	0	0
OFF	OFF	OFF	CORRECTION	ppm	OFF	OFF	OFF
200.025	200.025	200.025	BIT SIZE BEHIND CSNG	mm	200.025	200.025	200.025

Filter	2057	TOP	BOTTOM
ZDL GAIN	ON	"	"
ZDL TRACKING	ON	"	"
DEN CHISM	ON	"	"
PE CHISM	OFF	"	"
RHOmetry	2.860	"	"

CURVE		CURVE		CURVE	
OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE
-0.00	caly	35.74	gr	29.57	ten
21.41	cht	-0.00	pe	21.41	zcor

: UNDEFINED
 t: 1334.57 - 1548.69 Meters
 : e779b

AL < BIT

X-RAY [gr]	Z-DENSITY DOLOMITE POROSITY [porz]
150	45

r	γ [cady]	(mm)	Z-CORR [zcor]	(pu)
0.00	0.00	0.00	0.00	0.00
0.01	0.01	0.01	0.01	0.01
0.02	0.02	0.02	0.02	0.02
0.03	0.03	0.03	0.03	0.03
0.04	0.04	0.04	0.04	0.04
0.05	0.05	0.05	0.05	0.05
0.06	0.06	0.06	0.06	0.06
0.07	0.07	0.07	0.07	0.07
0.08	0.08	0.08	0.08	0.08
0.09	0.09	0.09	0.09	0.09
0.10	0.10	0.10	0.10	0.10
0.11	0.11	0.11	0.11	0.11
0.12	0.12	0.12	0.12	0.12
0.13	0.13	0.13	0.13	0.13
0.14	0.14	0.14	0.14	0.14
0.15	0.15	0.15	0.15	0.15
0.16	0.16	0.16	0.16	0.16
0.17	0.17	0.17	0.17	0.17
0.18	0.18	0.18	0.18	0.18
0.19	0.19	0.19	0.19	0.19
0.20	0.20	0.20	0.20	0.20
0.21	0.21	0.21	0.21	0.21
0.22	0.22	0.22	0.22	0.22
0.23	0.23	0.23	0.23	0.23
0.24	0.24	0.24	0.24	0.24
0.25	0.25	0.25	0.25	0.25
0.26	0.26	0.26	0.26	0.26
0.27	0.27	0.27	0.27	0.27
0.28	0.28	0.28	0.28	0.28
0.29	0.29	0.29	0.29	0.29
0.30	0.30	0.30	0.30	0.30
0.31	0.31	0.31	0.31	0.31
0.32	0.32	0.32	0.32	0.32
0.33	0.33	0.33	0.33	0.33
0.34	0.34	0.34	0.34	0.34
0.35	0.35	0.35	0.35	0.35
0.36	0.36	0.36	0.36	0.36
0.37	0.37	0.37	0.37	0.37
0.38	0.38	0.38	0.38	0.38
0.39	0.39	0.39	0.39	0.39
0.40	0.40	0.40	0.40	0.40
0.41	0.41	0.41	0.41	0.41
0.42	0.42	0.42	0.42	0.42
0.43	0.43	0.43	0.43	0.43
0.44	0.44	0.44	0.44	0.44
0.45	0.45	0.45	0.45	0.45
0.46	0.46	0.46	0.46	0.46
0.47	0.47	0.47	0.47	0.47
0.48	0.48	0.48	0.48	0.48
0.49	0.49	0.49	0.49	0.49
0.50	0.50	0.50	0.50	0.50
0.51	0.51	0.51	0.51	0.51
0.52	0.52	0.52	0.52	0.52
0.53	0.53	0.53	0.53	0.53
0.54	0.54	0.54	0.54	0.54
0.55	0.55	0.55	0.55	0.55
0.56	0.56	0.56	0.56	0.56
0.57	0.57	0.57	0.57	0.57
0.58	0.58	0.58	0.58	0.58
0.59	0.59	0.59	0.59	0.59
0.60	0.60	0.60	0.60	0.60
0.61	0.61	0.61	0.61	0.61
0.62	0.62	0.62	0.62	0.62
0.63	0.63	0.63	0.63	0.63
0.64	0.64	0.64	0.64	0.64
0.65	0.65	0.65	0.65	0.65
0.66	0.66	0.66	0.66	0.66
0.67	0.67	0.67	0.67	0.67
0.68	0.68	0.68	0.68	0.68
0.69	0.69	0.69	0.69	0.69
0.70	0.70	0.70		

DIFF. TENSION [ten]
1500
(kgf)

WTBH (degC)

Concrete Type	Cement Percentage (%)
Cemento	100
Cemento e sabbia	10
Cemento e ghiaia	10
Cemento e macerie	10

A hand-drawn graph on grid paper. The vertical axis (y-axis) is labeled 'TENS' and 'UNITS'. The horizontal axis (x-axis) is labeled 'TENS' and 'UNITS'. A line is drawn across the grid, showing a fluctuating pattern. The line starts at a low point, rises to a peak, falls to a trough, rises to another peak, and then fluctuates at a lower level. The line is drawn with a pen or marker.

500

[illegible]

FR CHT



RAY [ar]
Z-DENSITY POLYMERIZABILITY [ar]

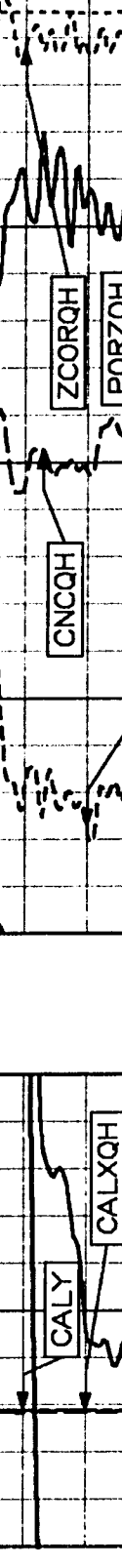
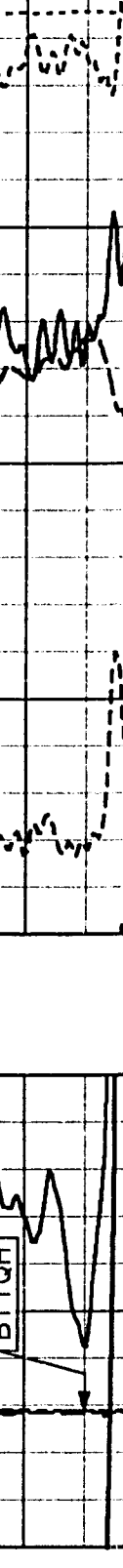
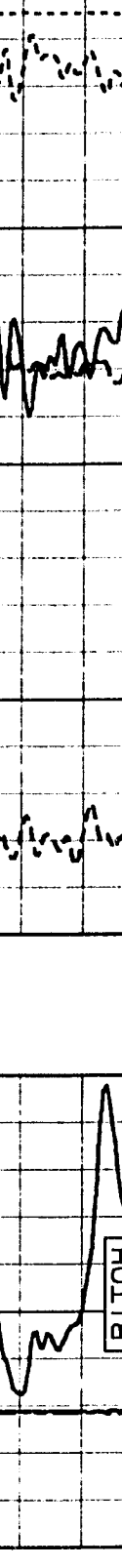
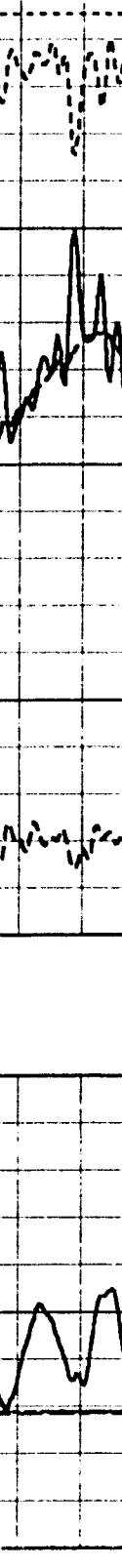
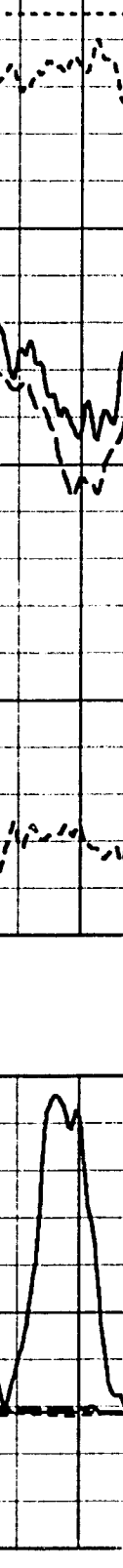
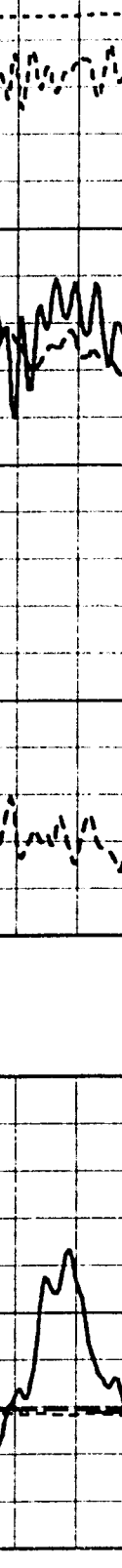
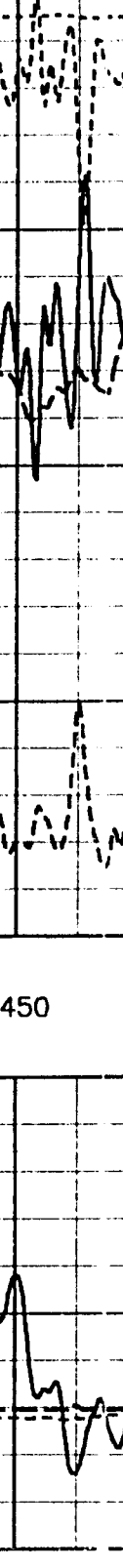
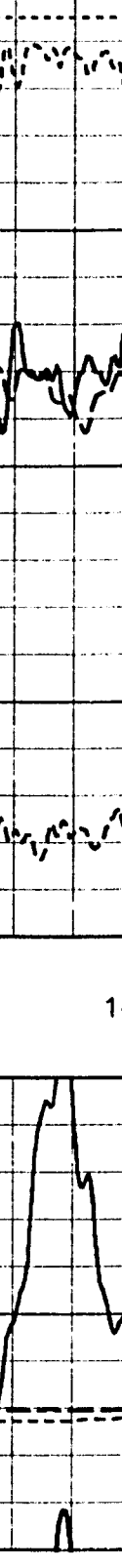
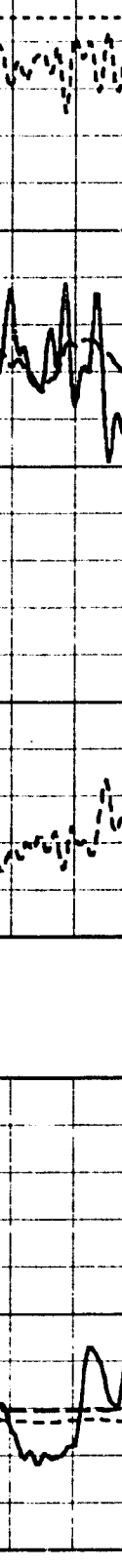
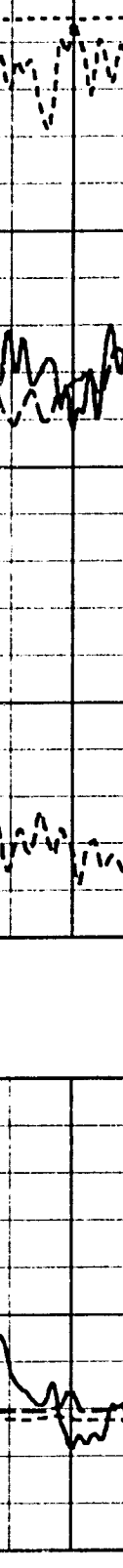
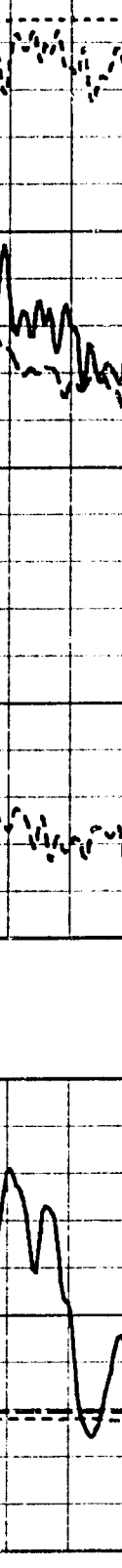
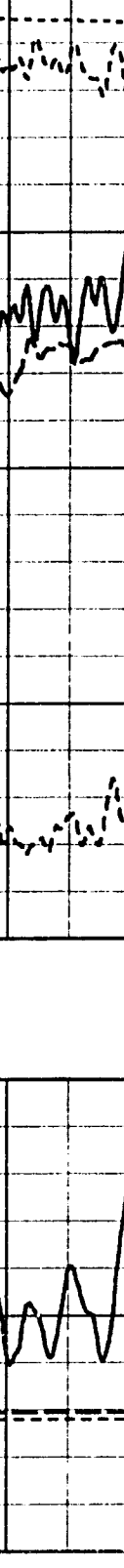
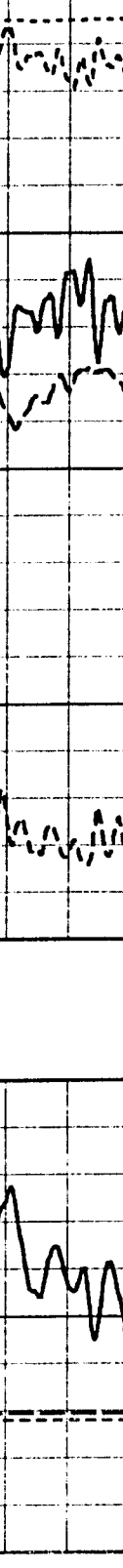
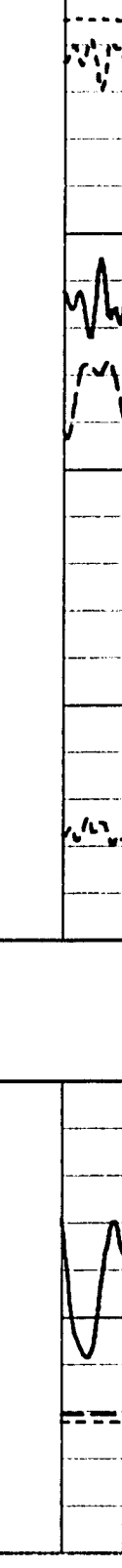
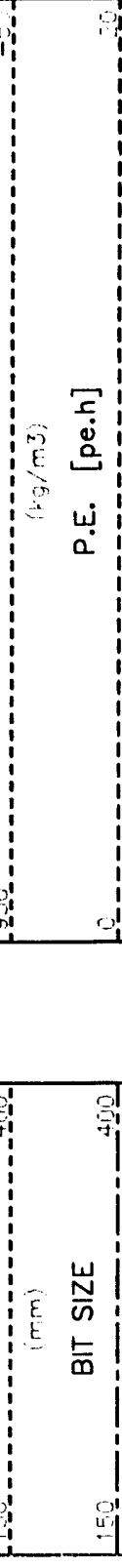
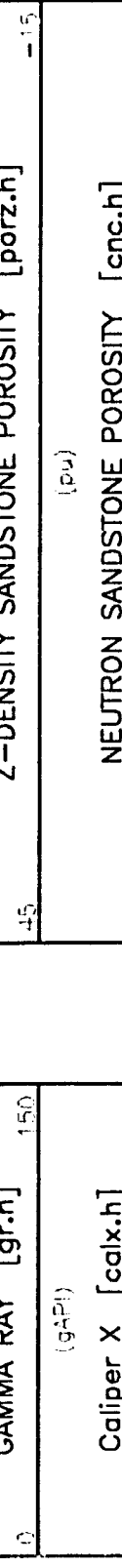
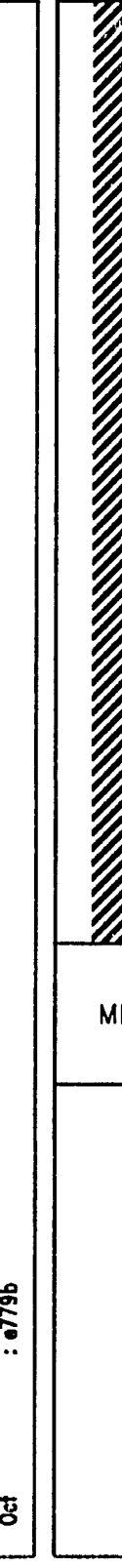
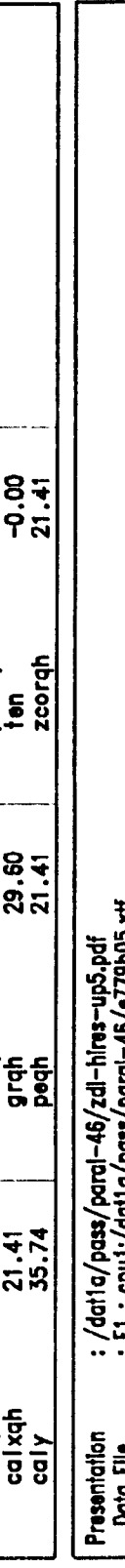
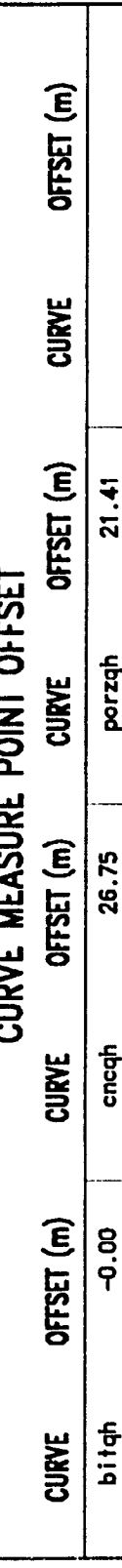
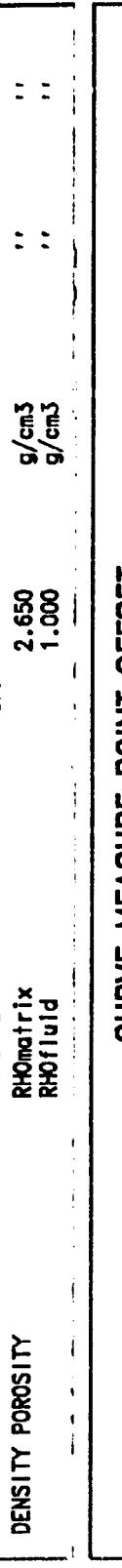
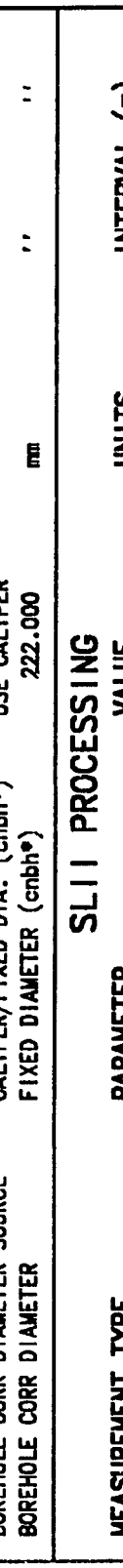
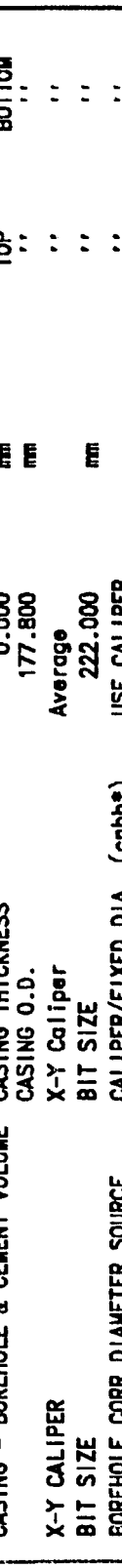
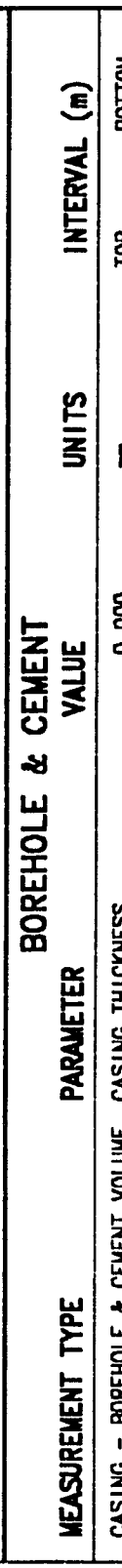
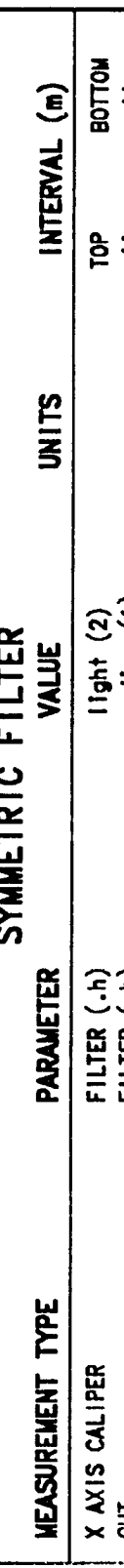
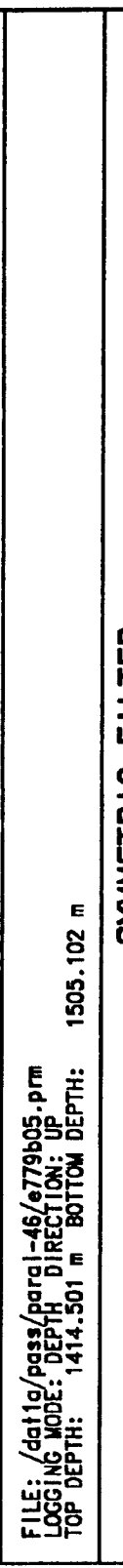
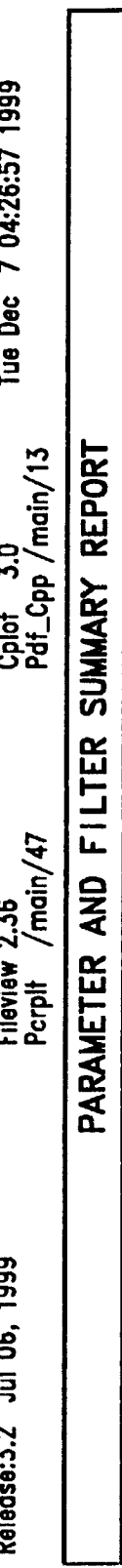
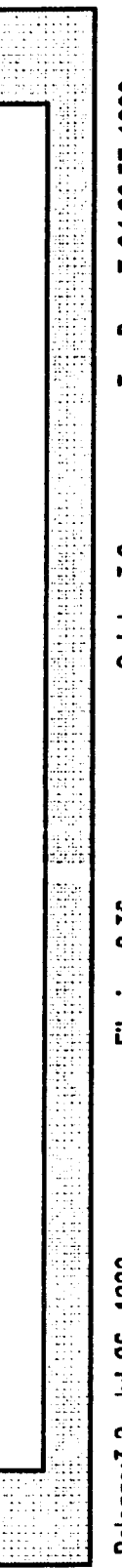
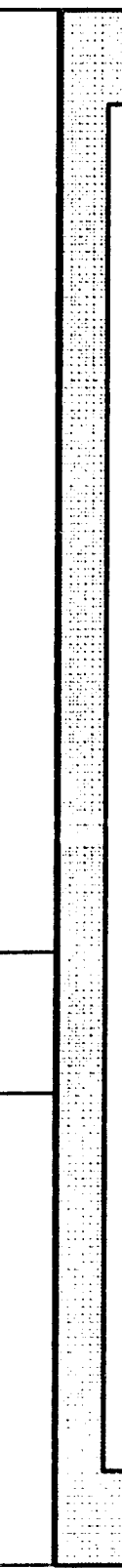
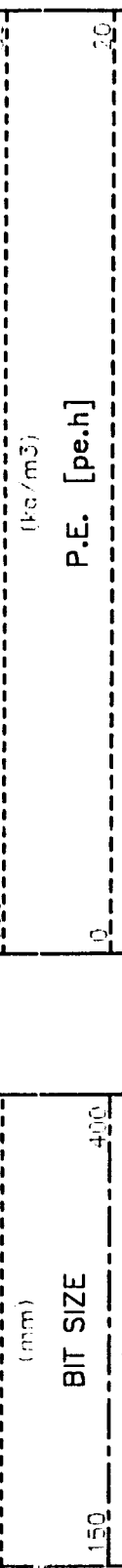
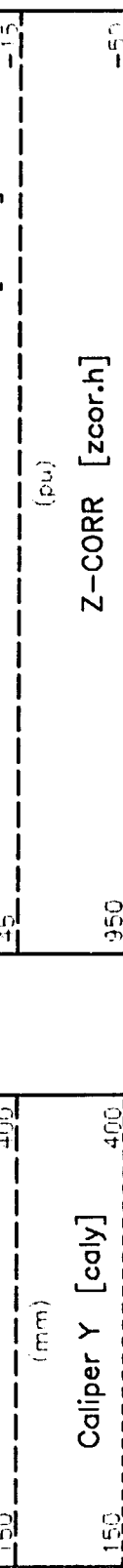
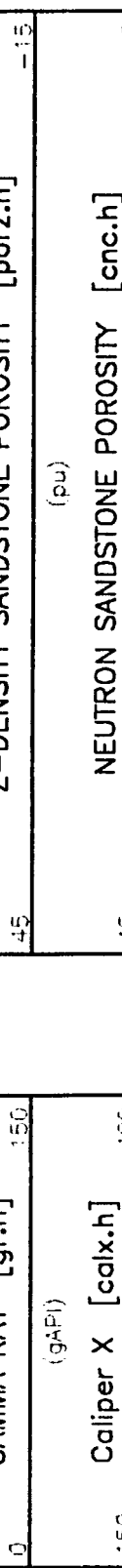
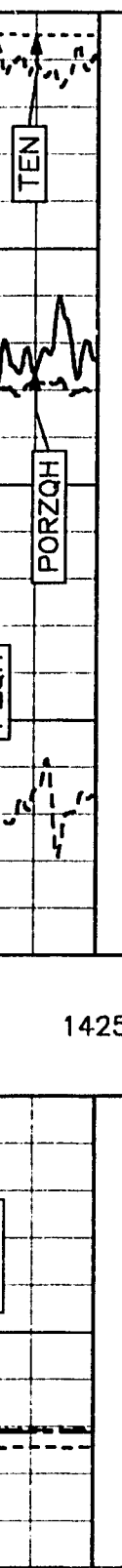
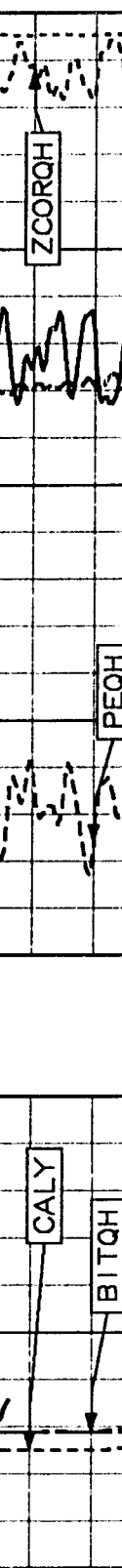
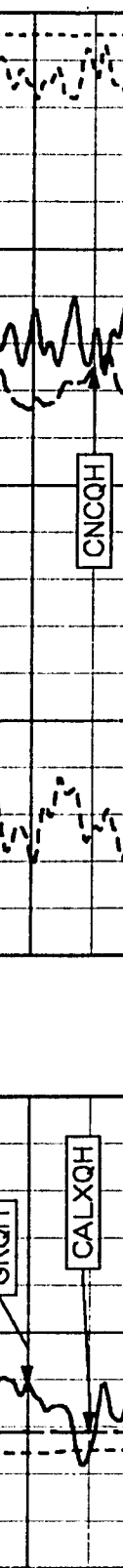
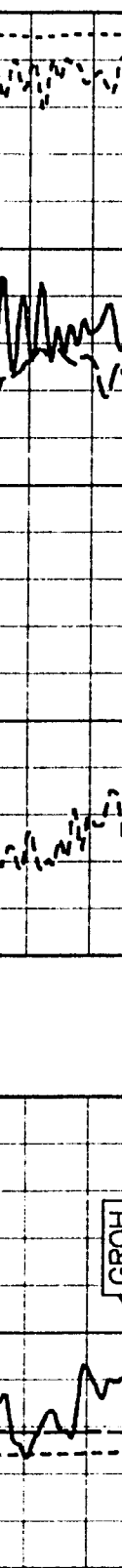
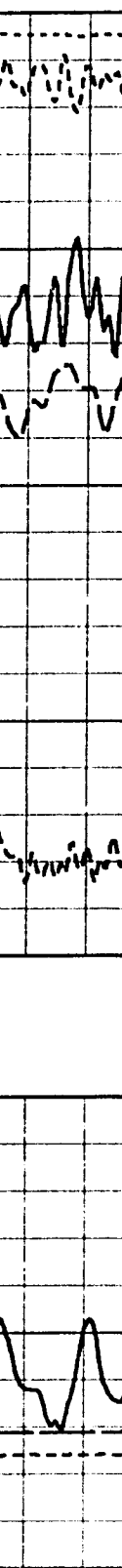
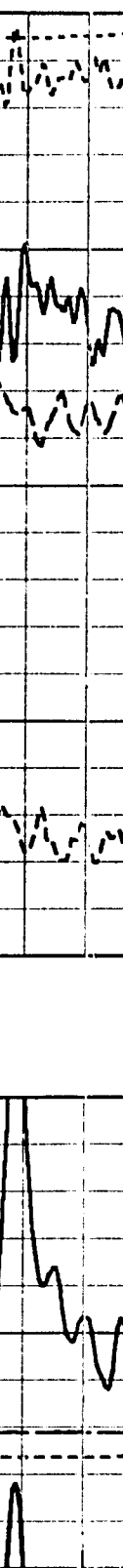
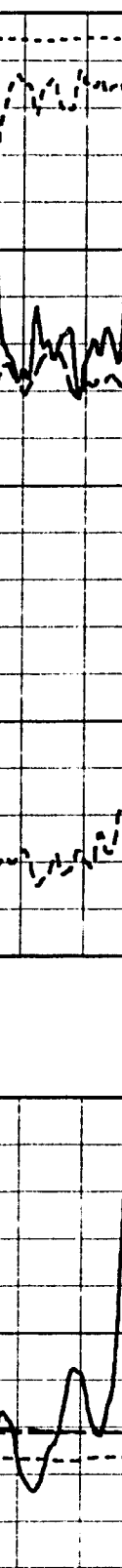
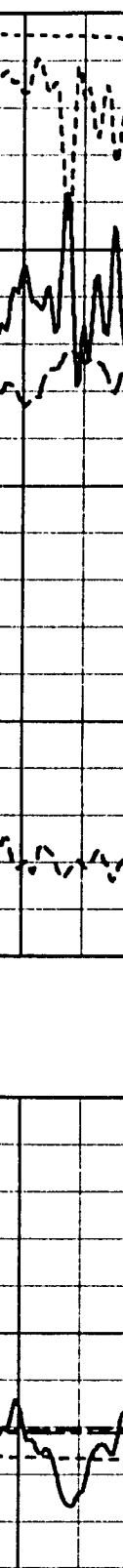
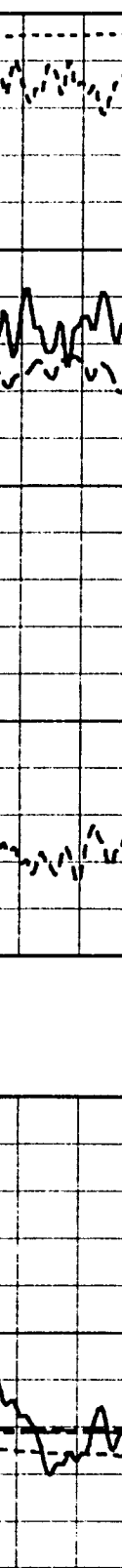
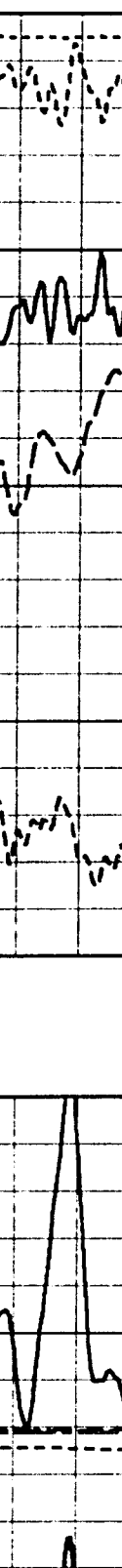
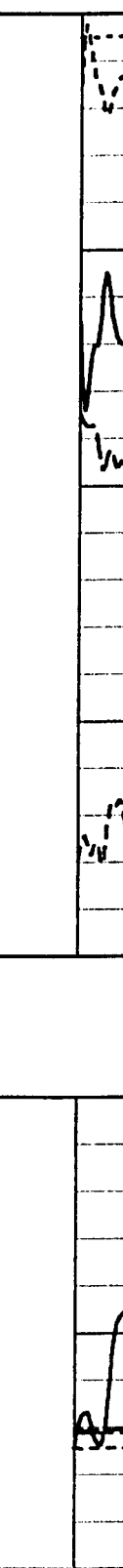
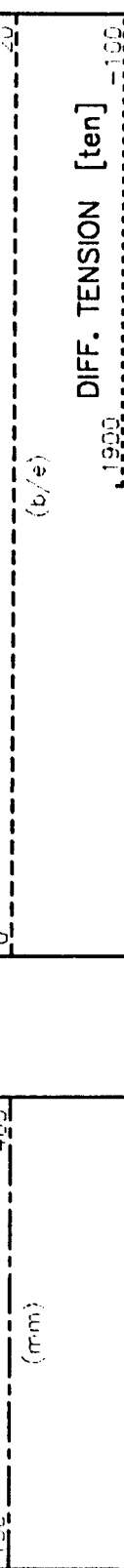
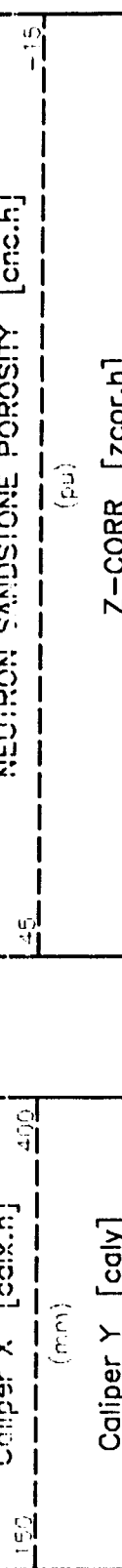
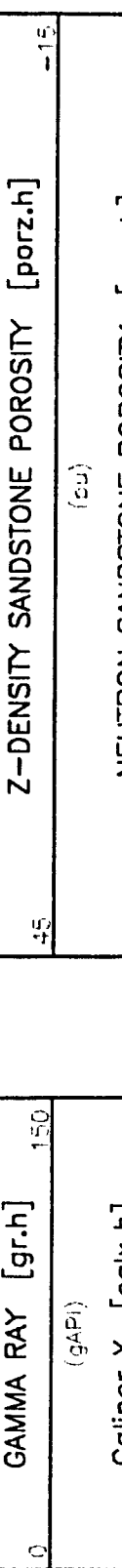
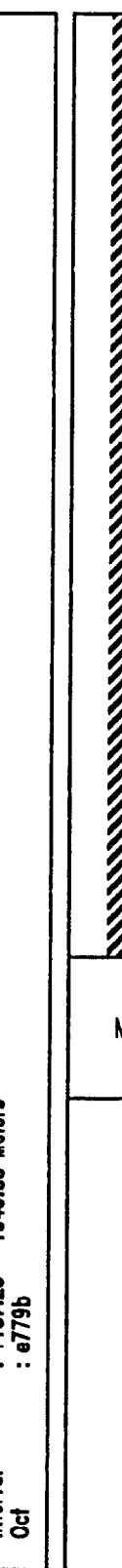
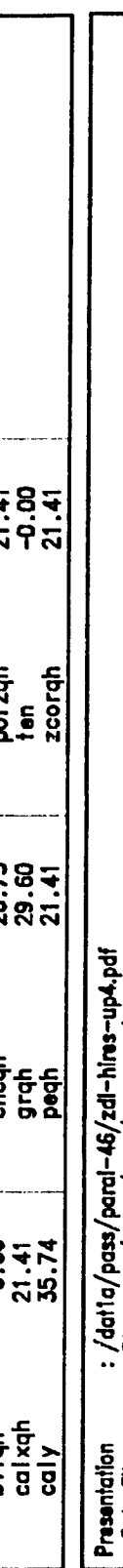
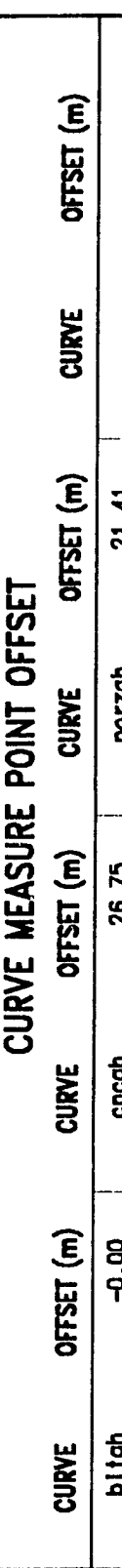
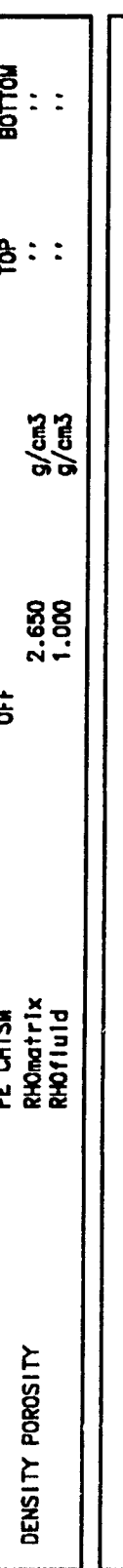
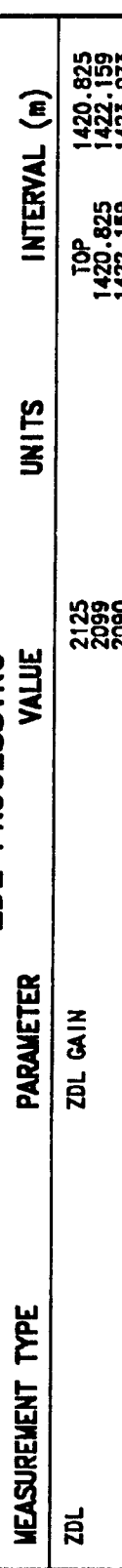
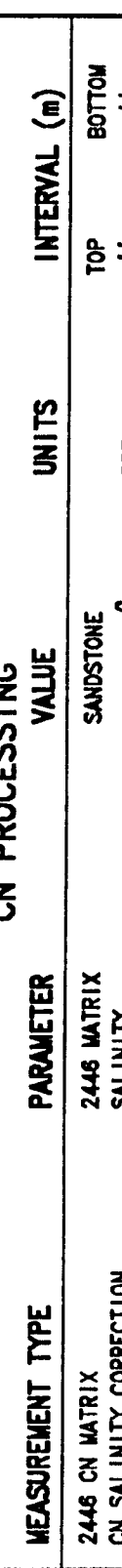
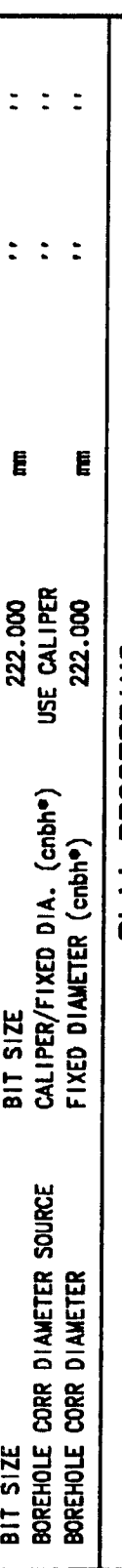
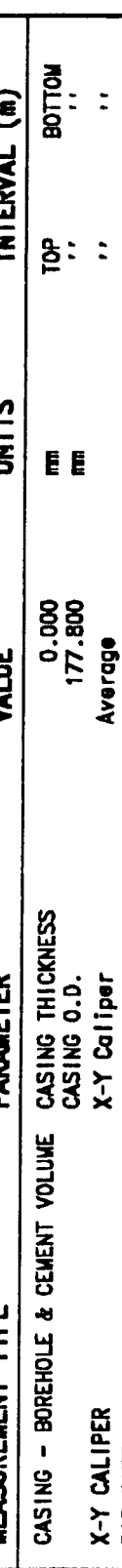
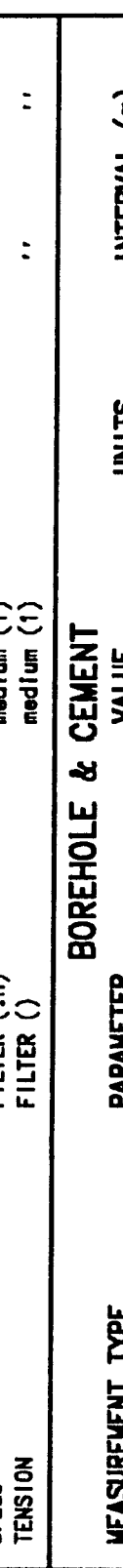
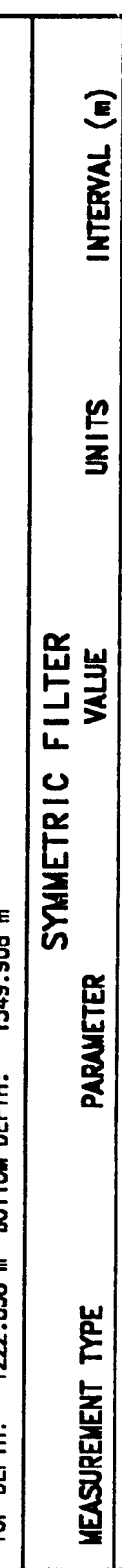
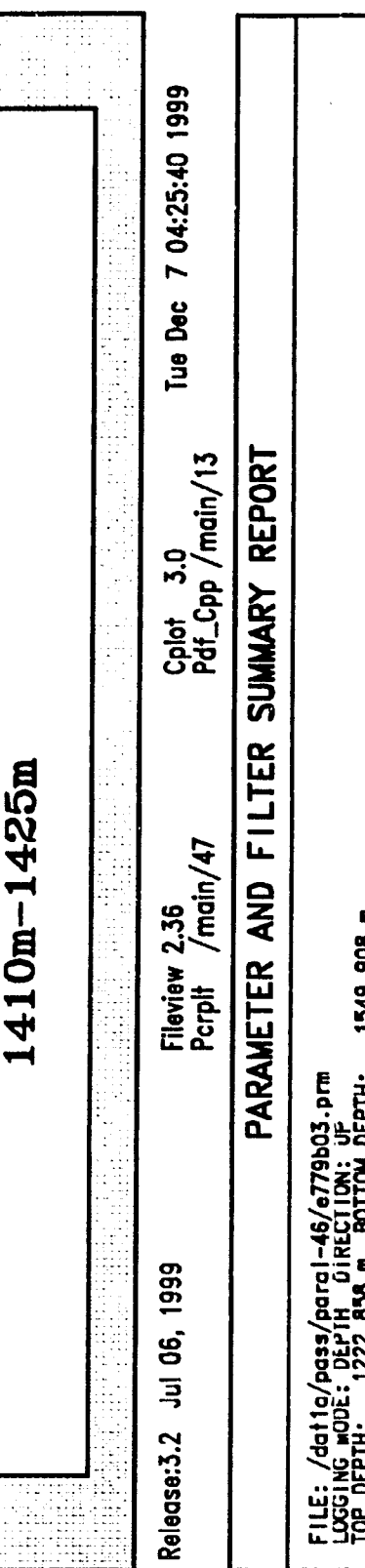
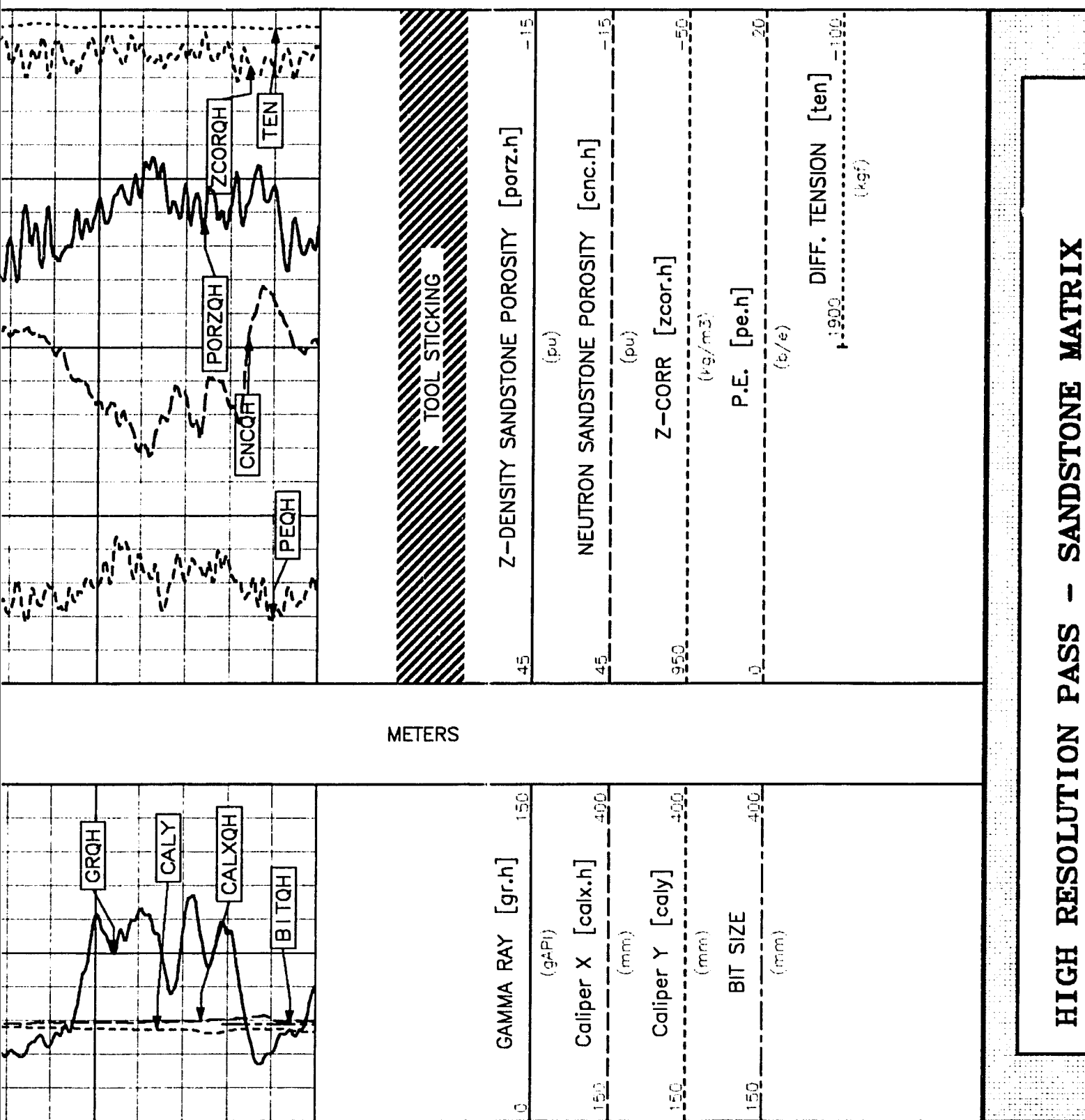
er Y [cally]	(mm)	Z-CORR [zcor]	(z)
400	400	950	15

(mm)	($\frac{z}{a}$)	DIFF. TENSION [ten]	($\frac{z}{a}$)
1.550	1.550	1.550	1.550

WTBH

Cement
0.1—
1—
10—

[illegible]



METERS	GAMMA RAY [gr.h]	150
	Caliper X [calx.h]	150
	Caliper Y [caly]	150
	BIT SIZE	150

TOOL STICKING	-15
Z-DENSITY SANDSTONE POROSITY [porz.h]	-15
NEUTRON SANDSTONE POROSITY [enc.h]	-15
Z-CORR [zcor.h]	-15
P.E. [pe.h]	-15
DIFF. TENSION [ten]	-15

HIGH RESOLUTION PASS - LIMESTONE MATRIX
1370m-1390m

Release:3.2 Jul 06, 1999	Fileview 2.36	Colort 3.0	Tue Dec 7 04:56:02 1999
Poplit /main/47	Poplit /main/47	Poplit /main/13	

PARAMETER AND FILTER SUMMARY REPORT

FILE: /data/pass/paral-46/6779823.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 1350.073 m BOTTOM DEPTH: 1347.622 m

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
------------------	-----------	-------	-------	--------------

X AXIS CALIPER	FILTER (-h)	light (2)		TOP
	FILTER (-h)	medium (1)		BOTTOM
	FILTER (-h)	light (2)		
	FILTER (-h)	medium (1)		
ZDL	FILTER (-h)	light (2)		TOP
	FILTER (-h)	medium (1)		BOTTOM
	FILTER (-h)	light (2)		
	FILTER (-h)	medium (1)		
TENSION	FILTER (-h)	light (2)		TOP
	FILTER (-h)	medium (1)		BOTTOM
	FILTER (-h)	light (2)		
	FILTER (-h)	medium (1)		

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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CASEING - BOREHOLE & CEMENT	CASING THICKNESS	0.000	mm	TOP
	CASING O.D.	177.800	mm	BOTTOM
	Average	222.000	mm	
	BIT SIZE	222.000	mm	
X-Y CALIPER	BOREHOLE CORR DIAMETER SOURCE	222.000	mm	TOP
	BOREHOLE CORR DIAMETER	222.000	mm	BOTTOM
	BOREHOLE CORR DIAMETER	222.000	mm	
	BOREHOLE CORR DIAMETER	222.000	mm	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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SLII PROCESSING METHOD	PROCESSING SELECT	USE SL-II PROC.		TOP
	OPEN/CASED HOLE	OPEN HOLE		BOTTOM
	AUTO GAIN	AUTO GAIN ON		
	ENERGY RANGE	ENER (-15-3.0)MeV		
SLII AUTO GAIN	PROCESSING SELECT	USE SL-II PROC.		TOP
	OPEN/CASED HOLE	OPEN HOLE		BOTTOM
	AUTO GAIN	AUTO GAIN ON		
	ENERGY RANGE	ENER (-15-3.0)MeV		

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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2446 ON MATRIX	2446 MATRIX	LIMESTONE		TOP
	CORRECTION	OFF		BOTTOM
	CORRECTION	OFF		
	CORRECTION	OFF		
CN CASING & CEMENT CORRECTION	2446 MATRIX	LIMESTONE		TOP
	CORRECTION	OFF		BOTTOM
	CORRECTION	OFF		
	CORRECTION	OFF		

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
------------------	-----------	-------	-------	--------------

ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
------------------	-----------	-------	-------	--------------

ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
------------------	-----------	-------	-------	--------------

ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
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	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
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	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
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	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
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DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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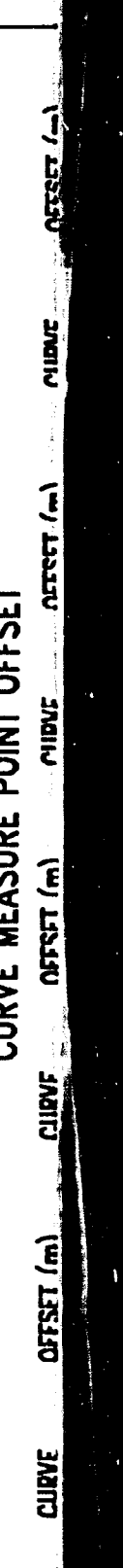
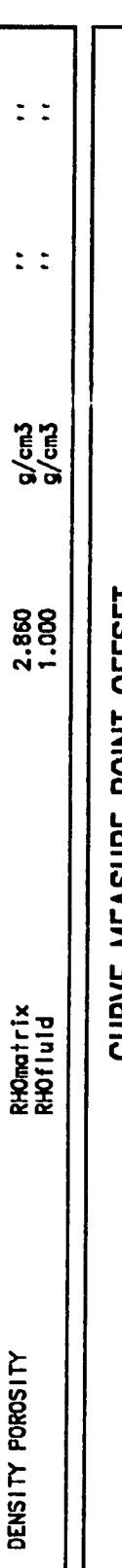
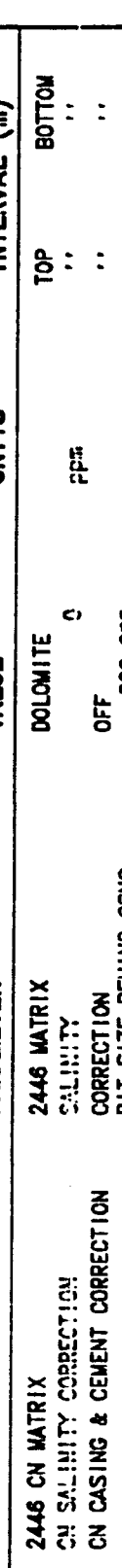
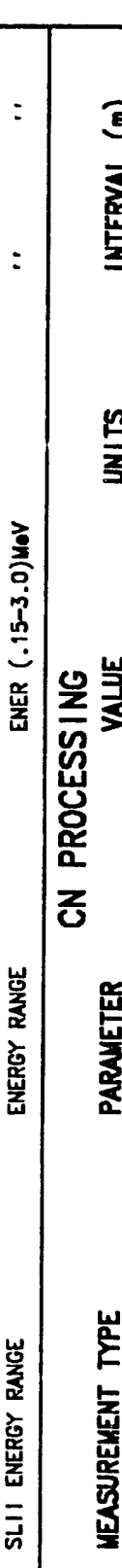
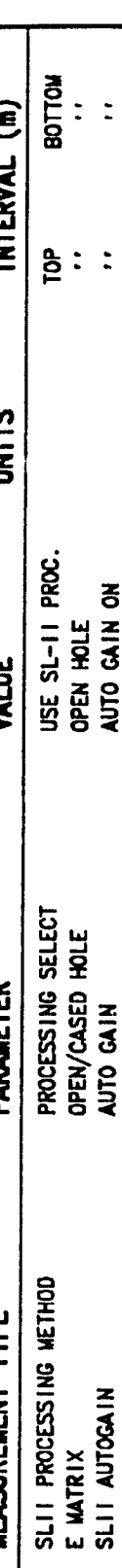
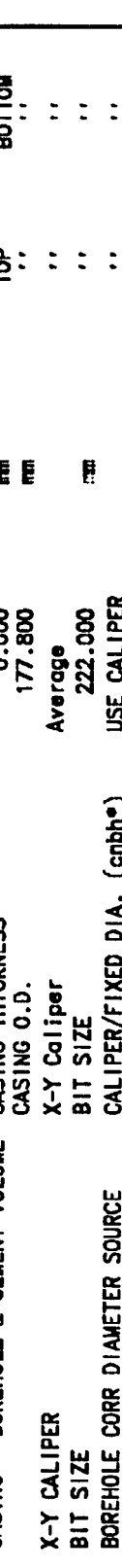
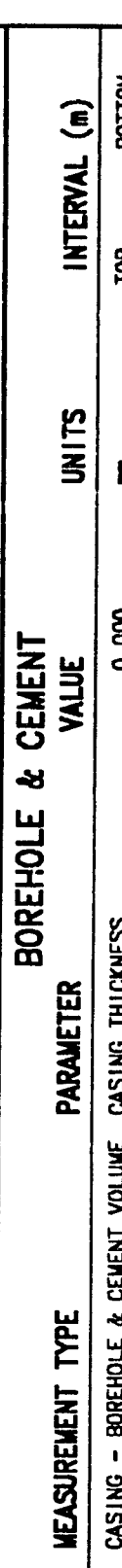
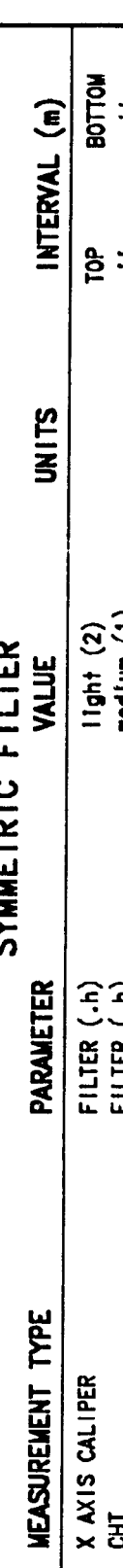
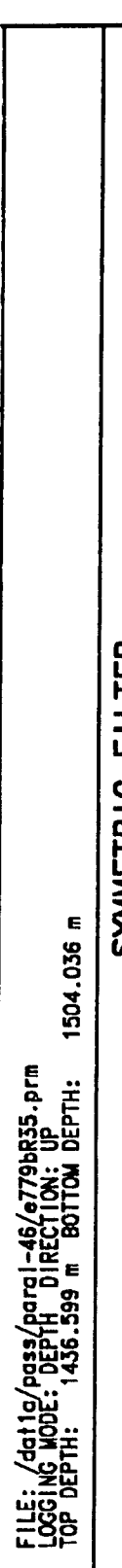
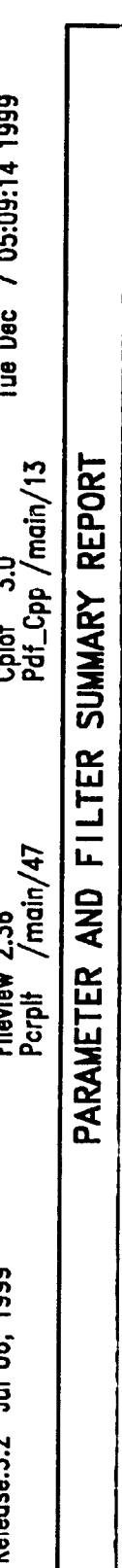
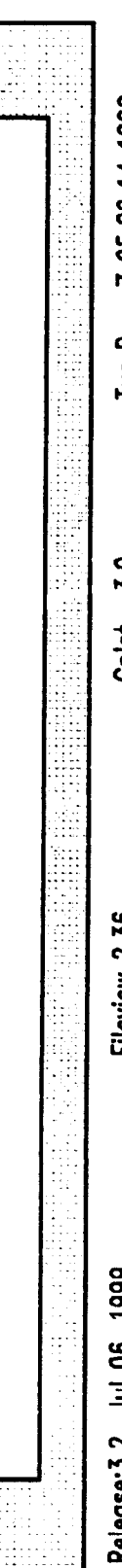
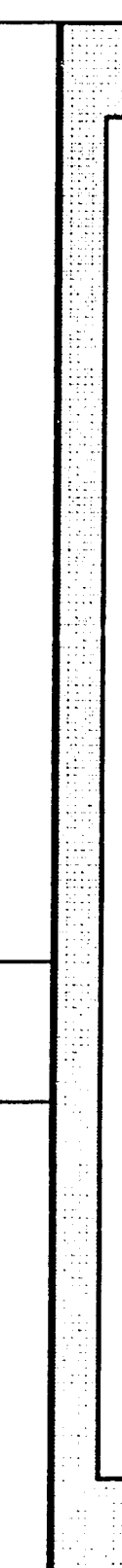
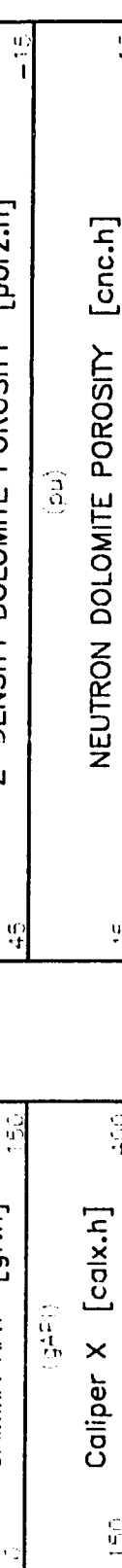
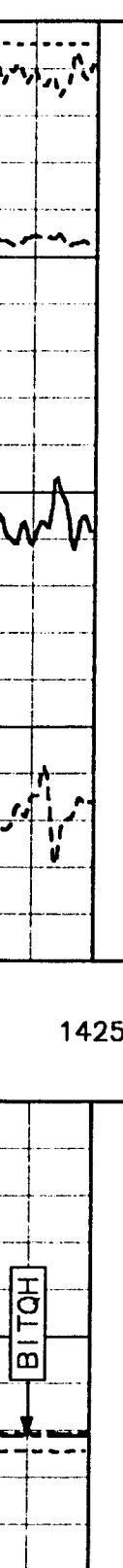
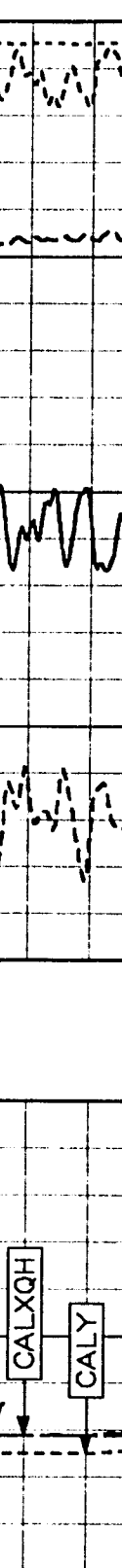
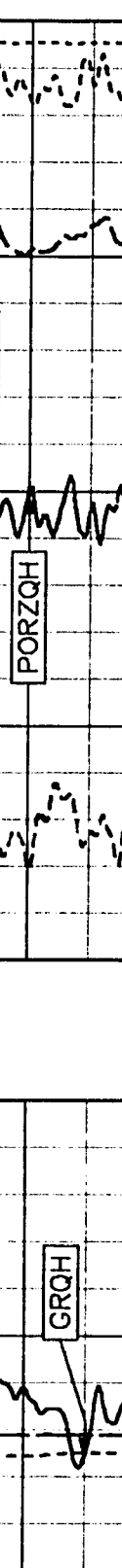
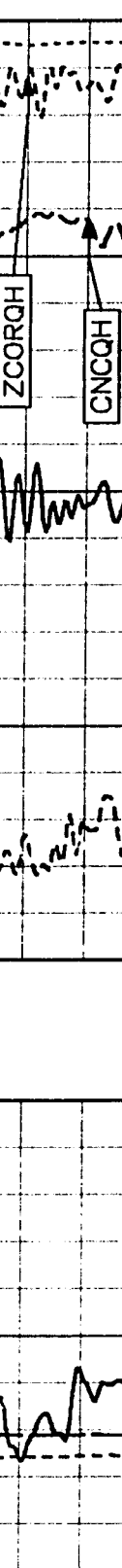
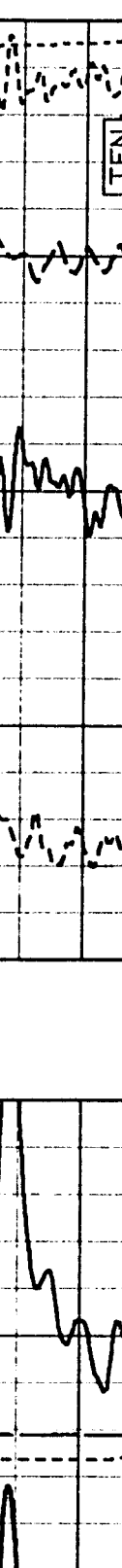
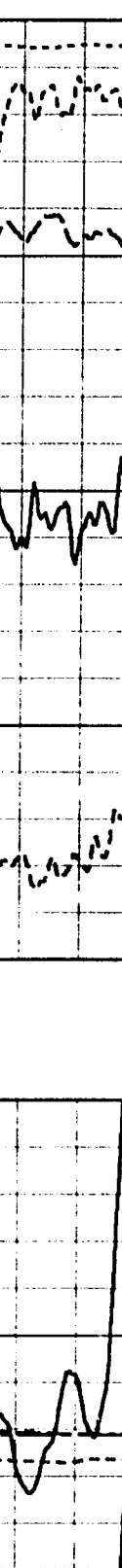
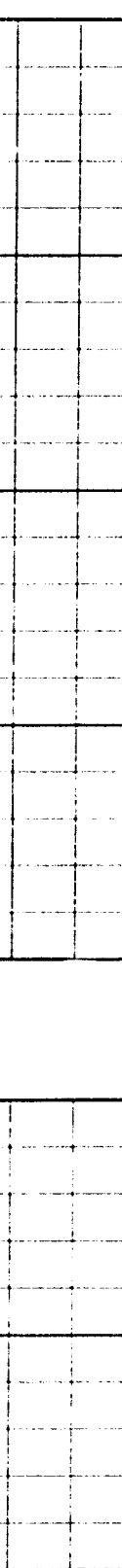
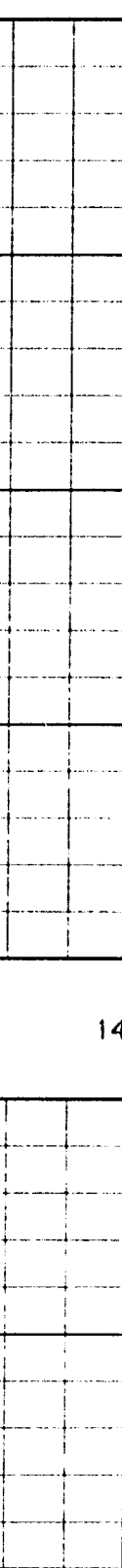
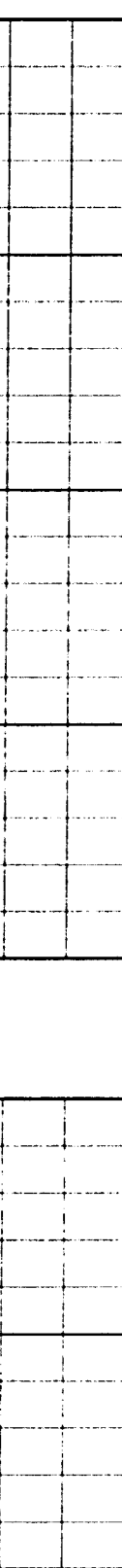
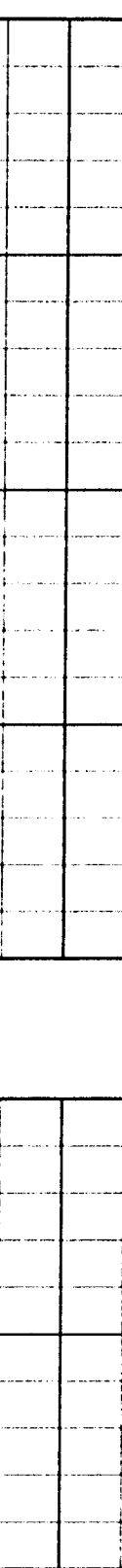
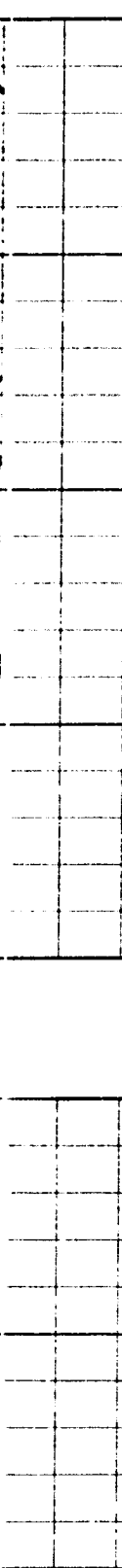
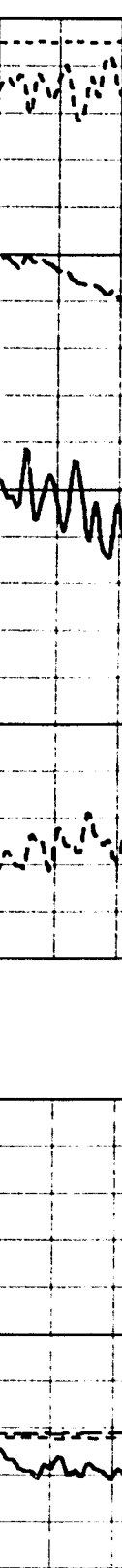
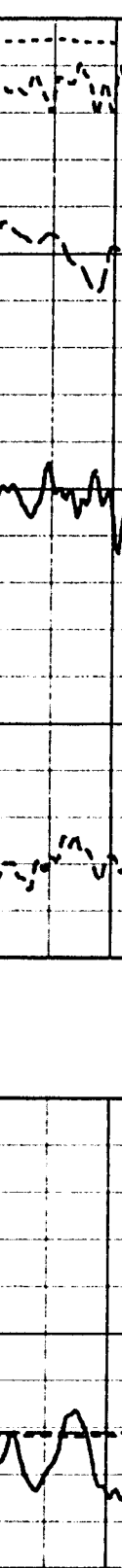
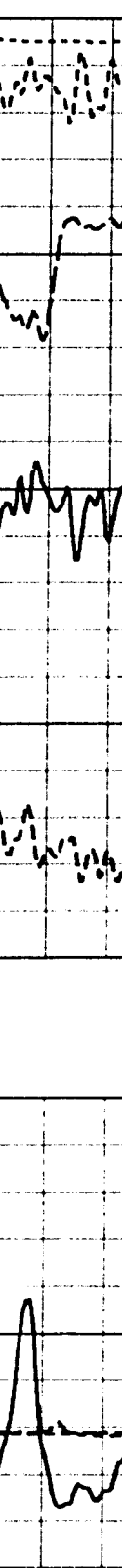
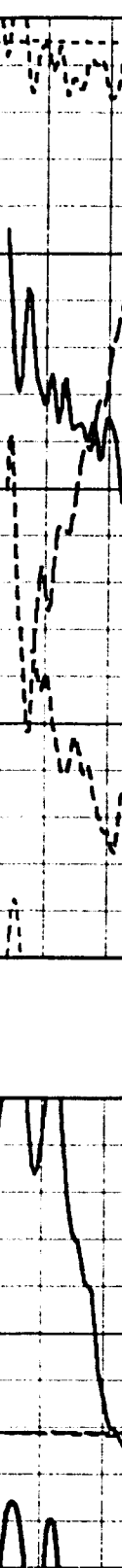
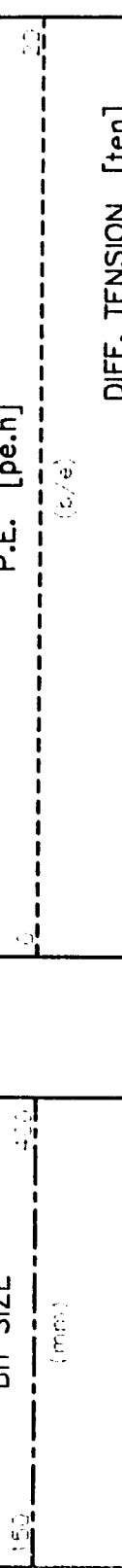
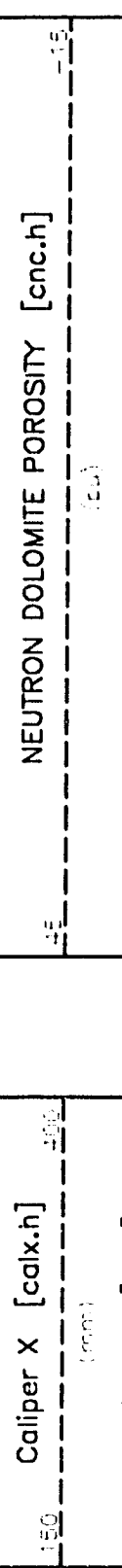
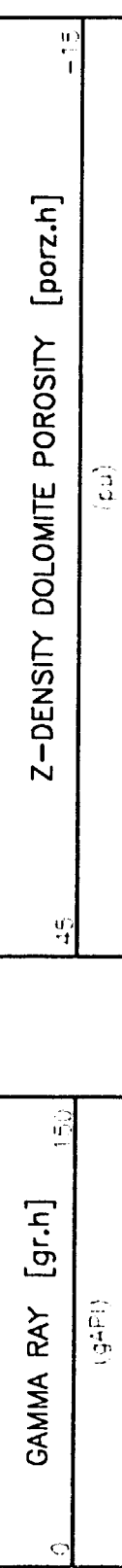
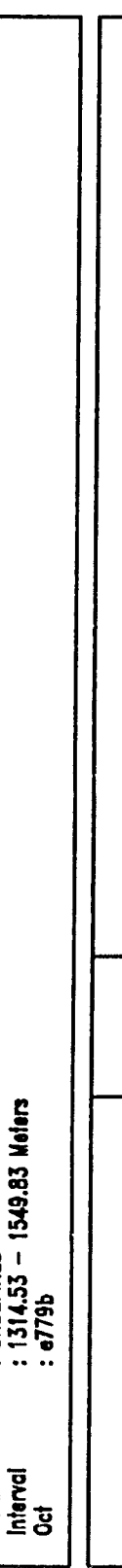
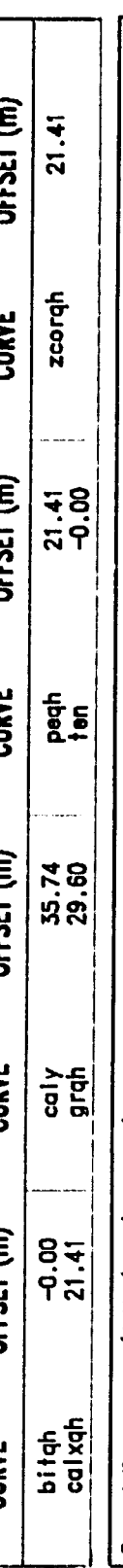
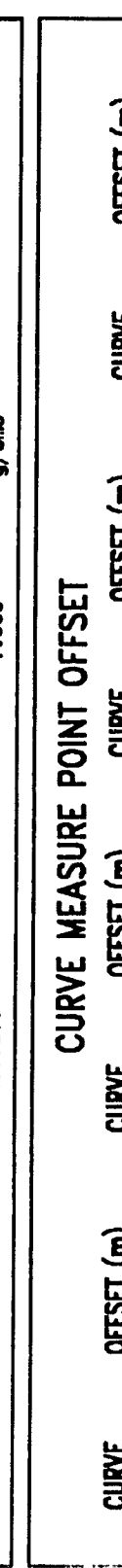
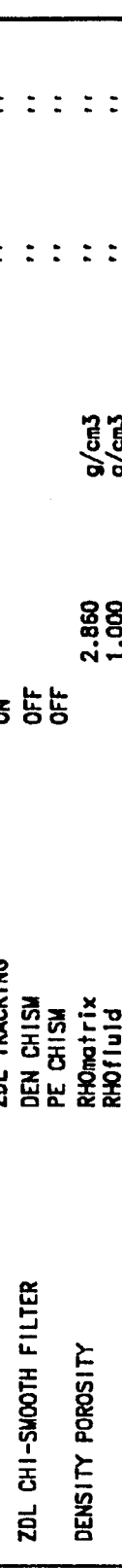
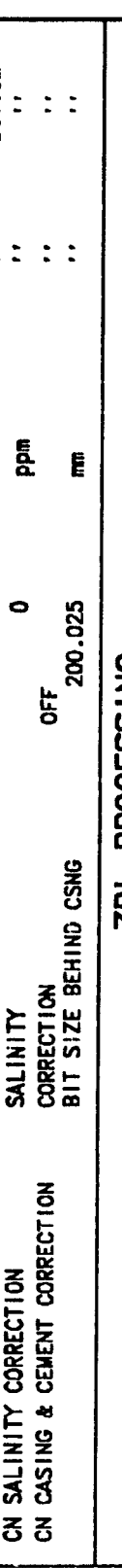
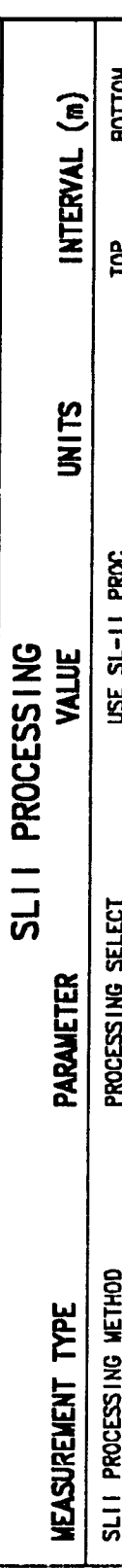
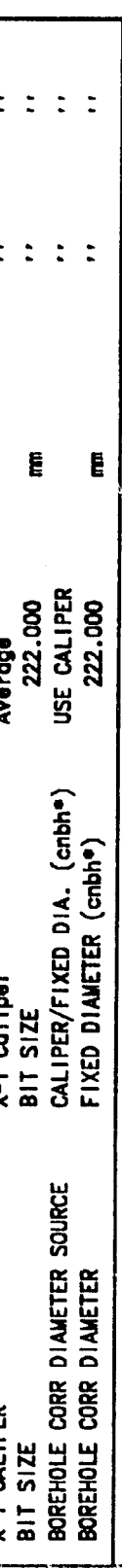
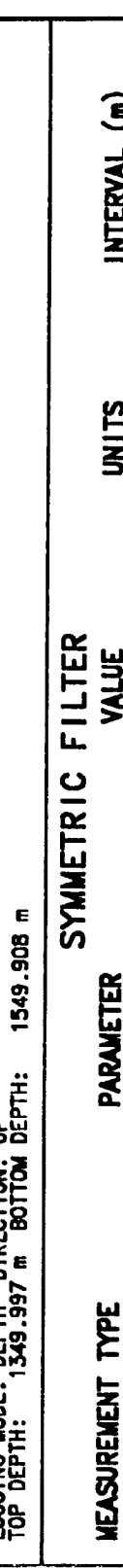
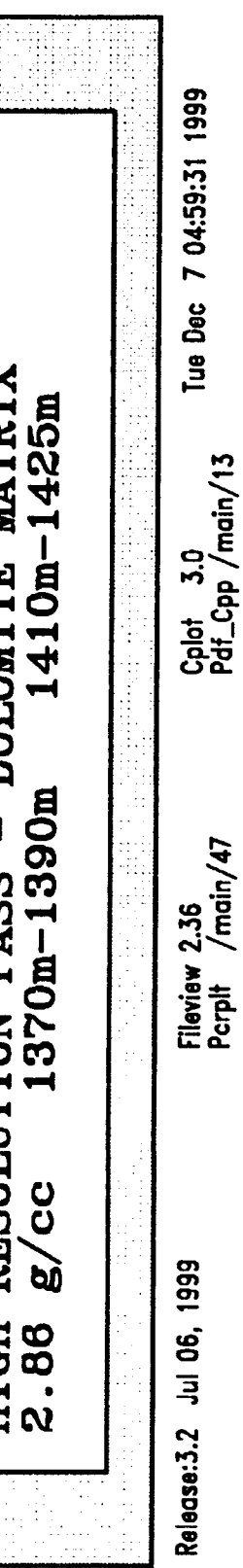
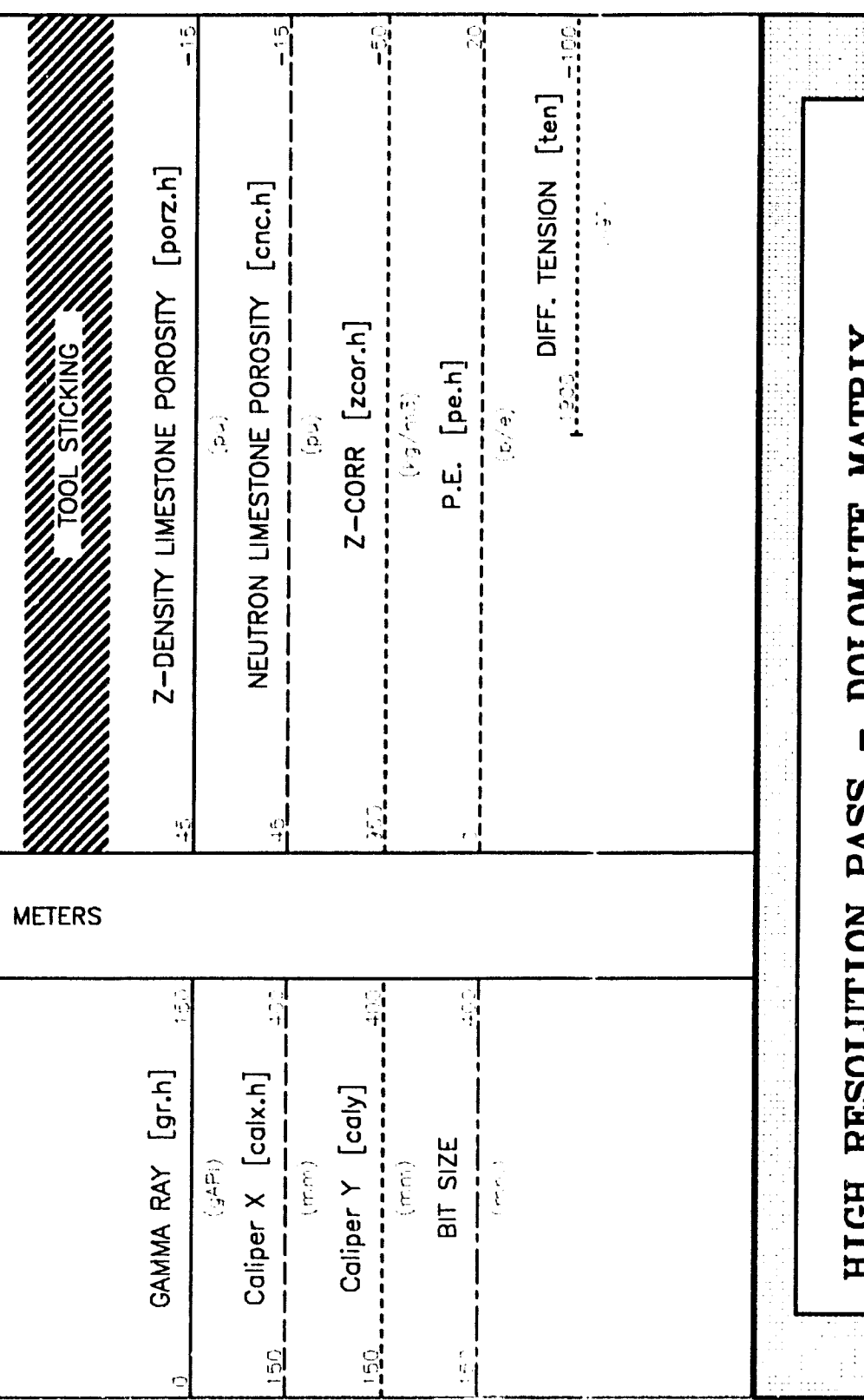
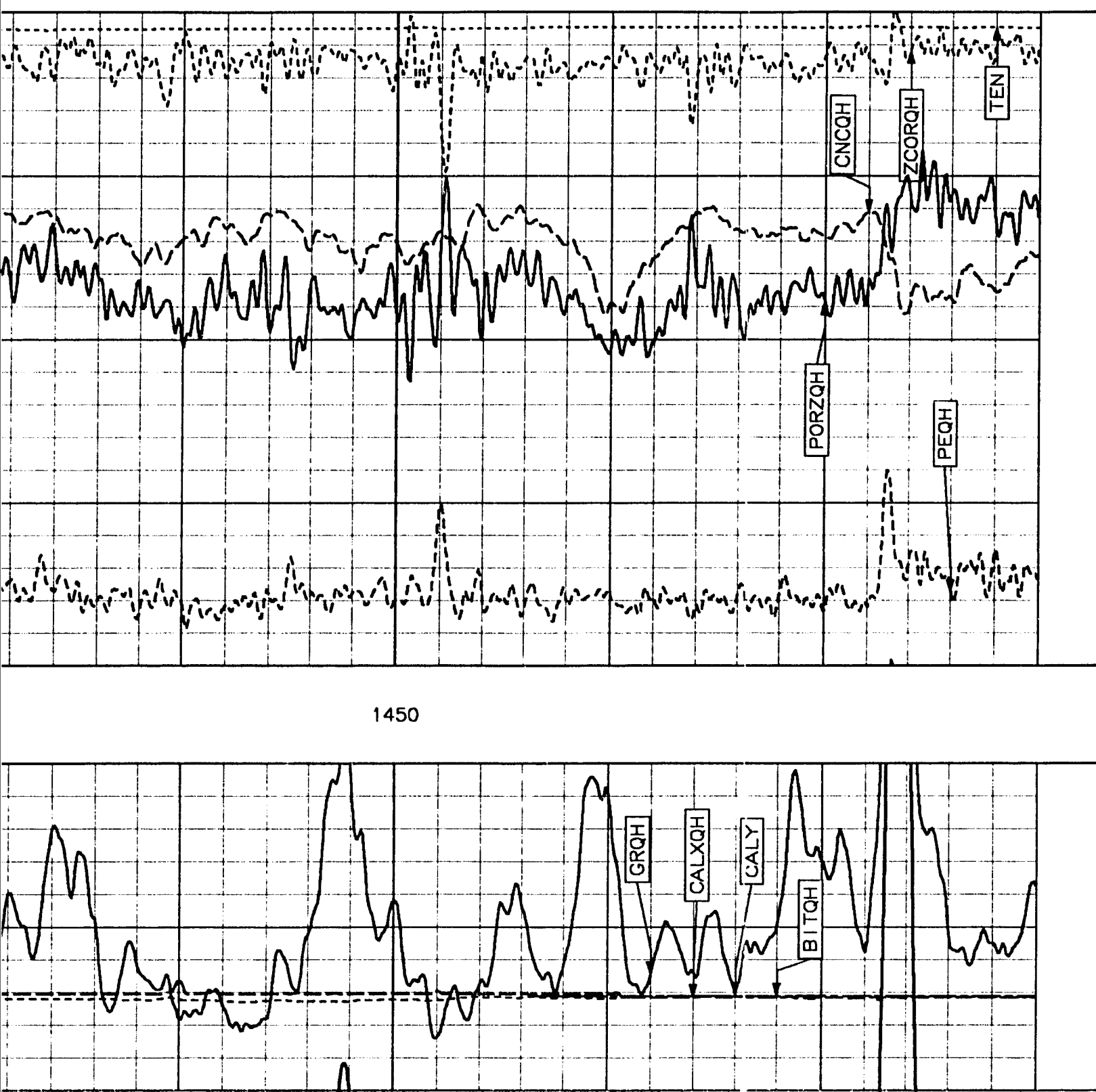
ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

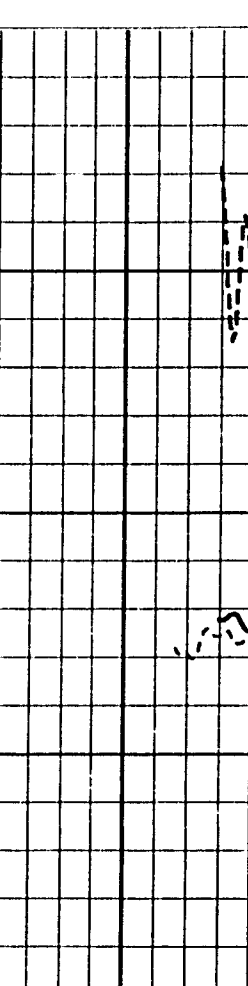
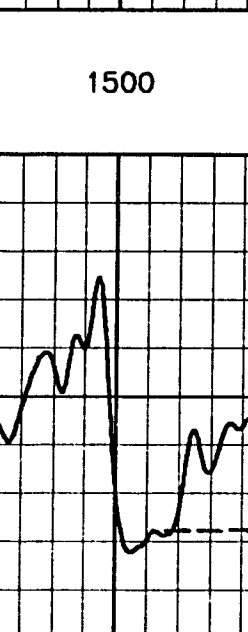
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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ZDL	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
ZDL CHI-SMOOTH FILTER	ZDL CALV	2337		TOP
	ZDL TRACKING	ON		BOTTOM
	DEN CHISM	OFF		
	PE CHISM	OFF		
DENSITY POROSITY	RHOmrix	2.710	g/cm3	TOP
	RHOfluid	1.000	g/cm3	BOTTOM
	RHOmrix	2.710	g/cm3	
	RHOfluid	1.000	g/cm3	

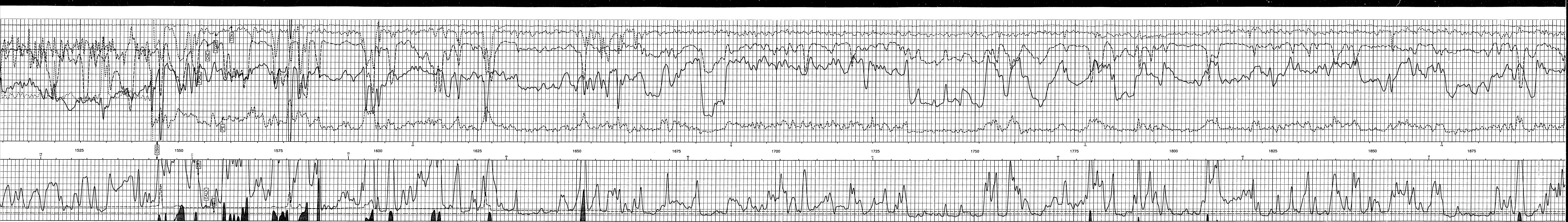
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)
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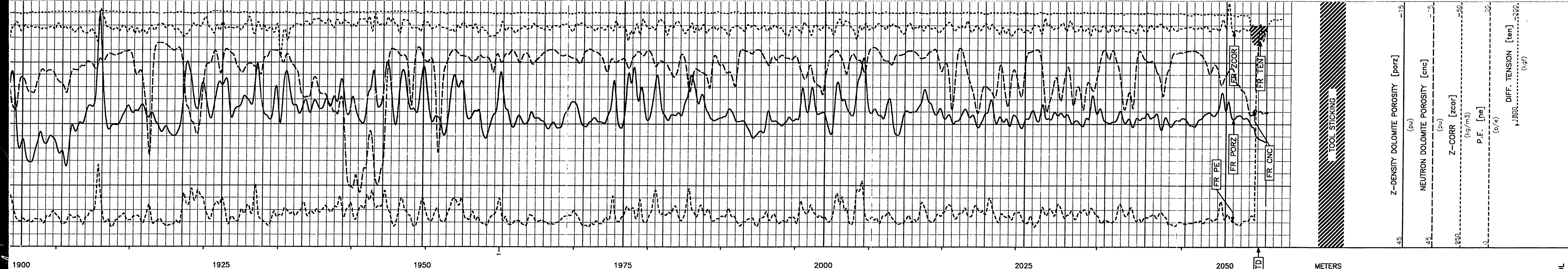
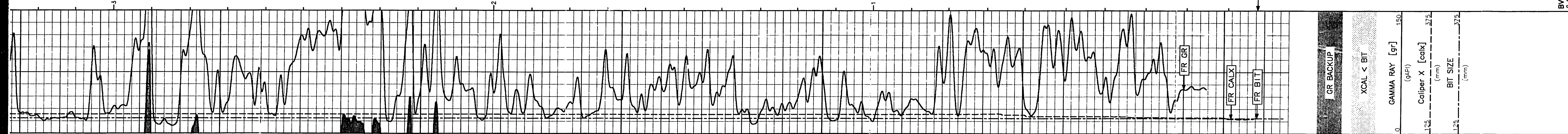
SYMMETRIC FILTER				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (n)
X AXIS CALLIPER OHT OR	FILTER (h)	light (2)		TOP
	FILTER (h)	medium (1)		"
	FILTER (h)	light (2)		"
				BOTTOM





1500





GR BACKUP
XCAL < BIT

TOOL STICKING

GAMMA RAY [gr]
(gAPI)

Z-DENSITY DOLOMITE POROSITY [porz]
(pu)

Caliper X [calx]
(mm)

NEUTRON DOLOMITE POROSITY [ene]
(pu)

BIT SIZE
(mm)

Z-CORR [zcor]
(kg/m3)

BIT SIZE
(mm)

P.E. [pe]
(g/e)

BIT SIZE
(mm)

DIFF. TENSION [ten]
(kg)

BIT SIZE
(mm)

DIFF. TENSION [ten]
(kg)

BIT SIZE
(mm)

DIFF. TENSION [ten]
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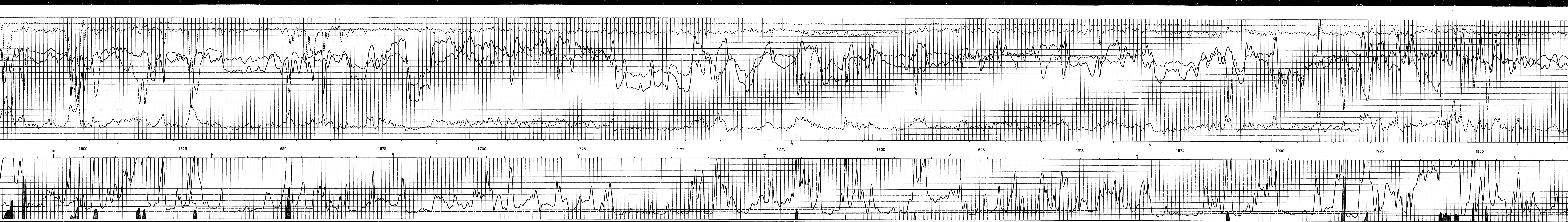
DIFF. TENSION [ten]
(kg)

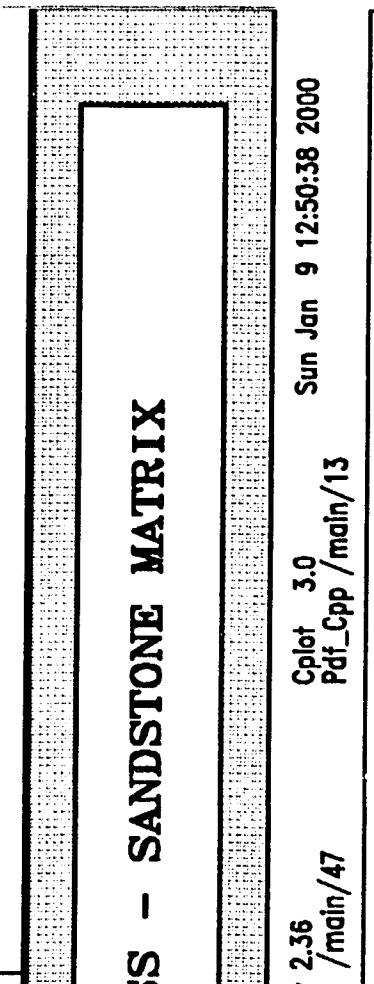
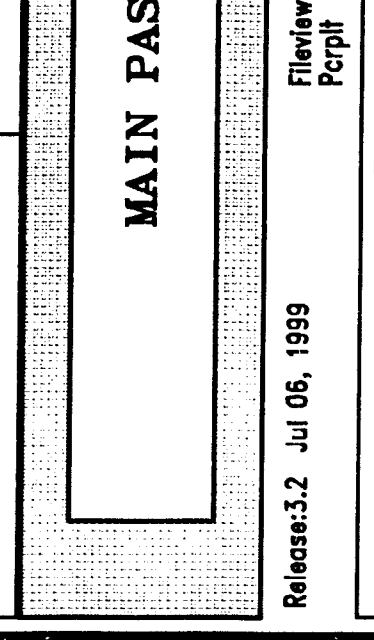
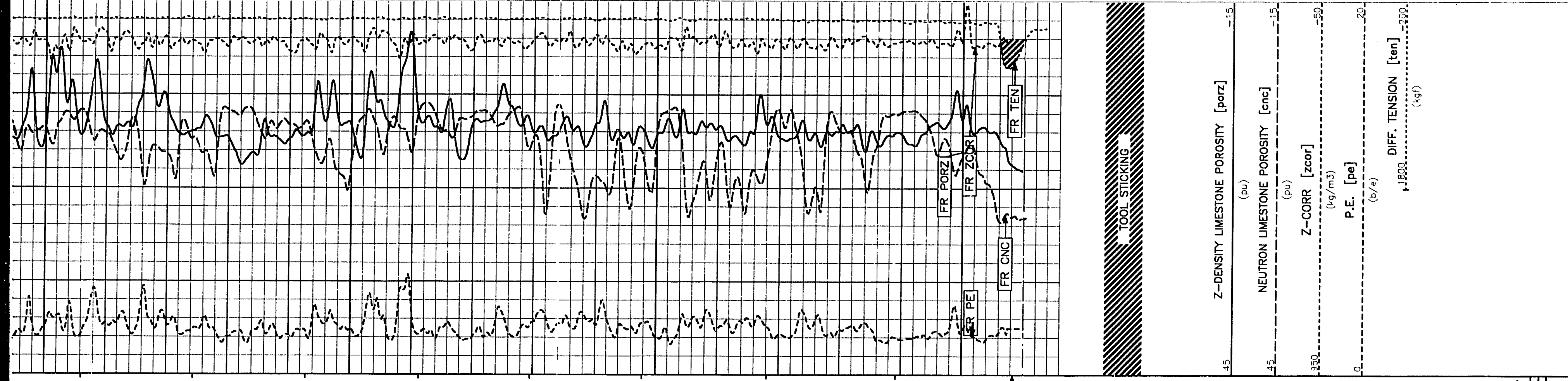
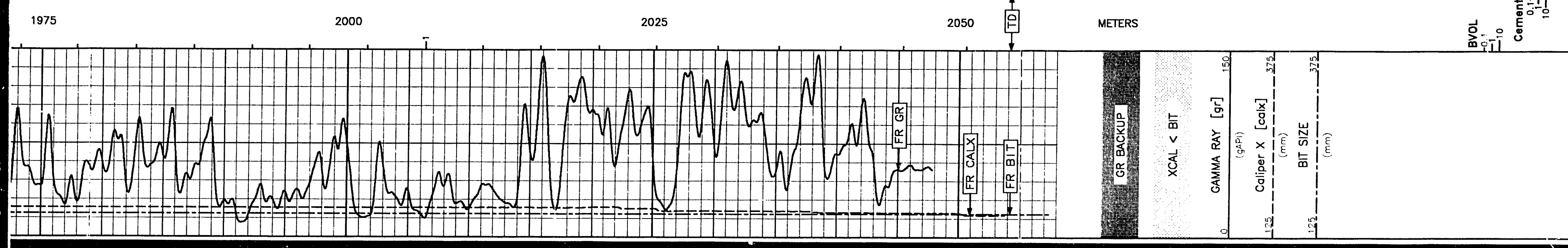
BIT SIZE
(mm)

DIFF. TENSION [ten]
(kg)

BIT SIZE
(mm)

DIFF. TENSION [ten]
(kg)





Release: 3.2 Jul 06, 1999

Fileview 2.35 Colset 3.0 Sun Jan 9 12:50:38 2000
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MAIN PASS - SANDSTONE MATRIX

PARAMETER AND FILTER SUMMARY REPORT

MEASUREMENT TYPE	PARAMETER	SYMMETRIC FILTER	VALUE	UNITS	INTERVAL (m)
X AXIS CALIPER	GR	Light (2)	0.000	mm	TOP
	CN	Light (2)	114.000	mm	TOP
	ZDL	Light (2)	156.000	mm	TOP
	SPEED	medium (1)	USE CALIPER		TOP
	TENSION	medium (1)	156.000		TOP
		medium (1)			TOP
MEASUREMENT TYPE	CASING - BOREHOLE & CEMENT				
	CASING THICKNESS		0.000	mm	TOP
	CASING O.D.		114.000	mm	TOP
	BIT SIZE		156.000	mm	TOP
MEASUREMENT TYPE	2446 CN MATRIX				
	CN SALINITY CORRECTION		0.000	ppm	TOP
	CN CASING & CEMENT CORRECTION		0.000	mm	TOP
	BIT SIZE BEHIND CSING		200.025	mm	TOP
MEASUREMENT TYPE	ZDL CHI-SMOOTH FILTER				
	ZDL		OFF		TOP
	ZDL GAIN		2094		TOP
	ZDL TRACKING		ON		TOP

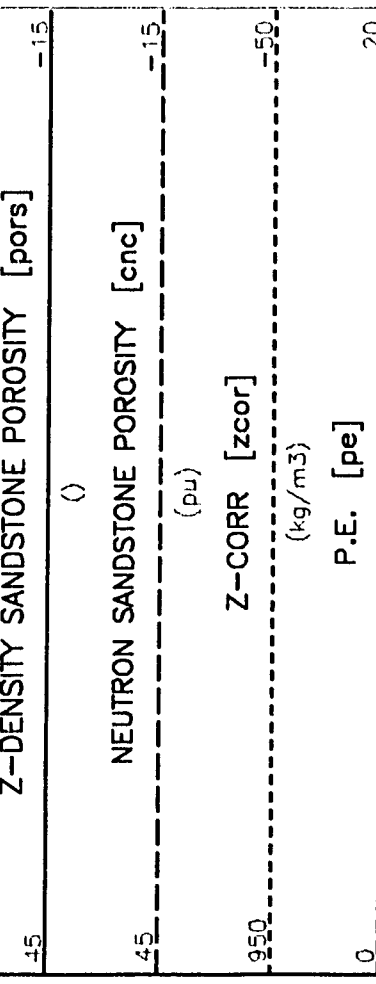
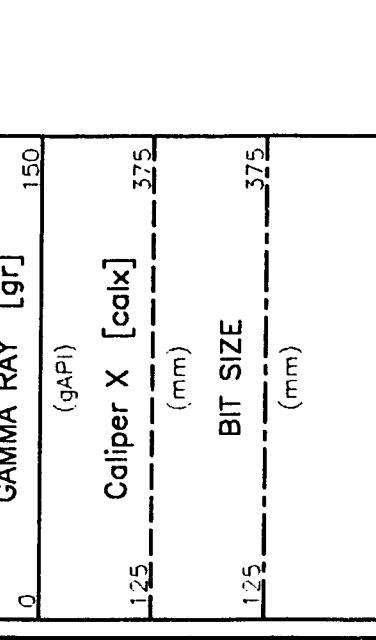
MEASUREMENT TYPE	PARAMETER	BOREHOLE & CEMENT	VALUE	UNITS	INTERVAL (m)
CASING - BOREHOLE & CEMENT	CASING THICKNESS		0.000	mm	TOP
	CASING O.D.		114.000	mm	TOP
	BIT SIZE		156.000	mm	TOP
	CALIPER/FIXED D.I.A. (cmh*)		USE CALIPER		TOP
CN PROCESSING	2446 CN MATRIX				
	CN SALINITY CORRECTION		0.000	ppm	TOP
	CN CASING & CEMENT CORRECTION		0.000	mm	TOP
	BIT SIZE BEHIND CSING		200.025	mm	TOP
ZDL PROCESSING	ZDL CHI-SMOOTH FILTER				
	ZDL		OFF		TOP
	ZDL GAIN		2094		TOP
	ZDL TRACKING		ON		TOP

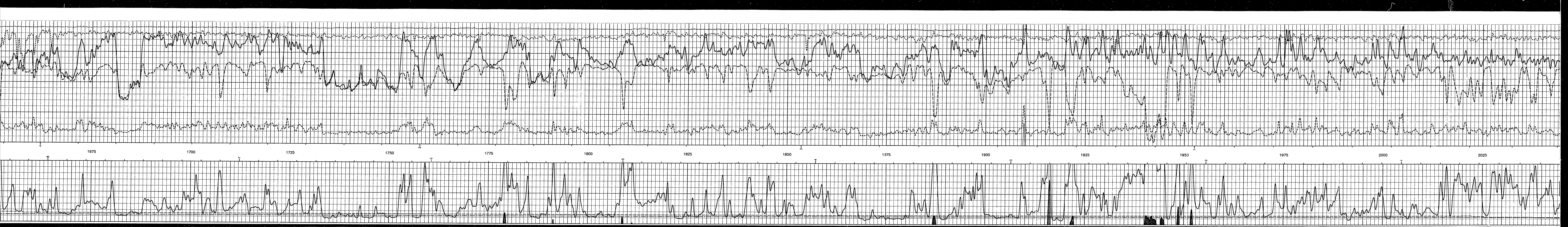
CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)
bit	-0.00	enc	0.09	pe	3.28
calx	3.28	gr	9.14	por	0.00

CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)
bit	-0.00	enc	0.09	pe	3.28
calx	3.28	gr	9.14	por	0.00

Presentation
Data File : /data/pass/para1-46/771006.pdf
Company : F1 : cp22/data/pass/para1-46/771006.pdf
Field : PARAMOUNT RESOURCES LTD.
Interval : UNCORRECTED
Ct : 1491.54 - 2057.48 Meters
Ct : 7714

Presentation
Data File : /data/pass/para1-46/771006.pdf
Company : F1 : cp22/data/pass/para1-46/771006.pdf
Field : PARAMOUNT RESOURCES LTD.
Interval : UNCORRECTED
Ct : 1491.54 - 2057.48 Meters
Ct : 7714







Release:3.2 Jul 06, 1999 Fileview 2.36 Plot 3.0 Sun Jan 9 13:16:44 2000
Perpfit /min/47 Pdf_Cpp /min/13

PARAMETER AND FILTER SUMMARY REPORT

FILE: /data/param/1770-1720/1770-1720.qrm
LOGGING MODE: 1770-1720.qrm
TOP DEPTH: 1580.942 m BOTTOM DEPTH: 1924.964 m

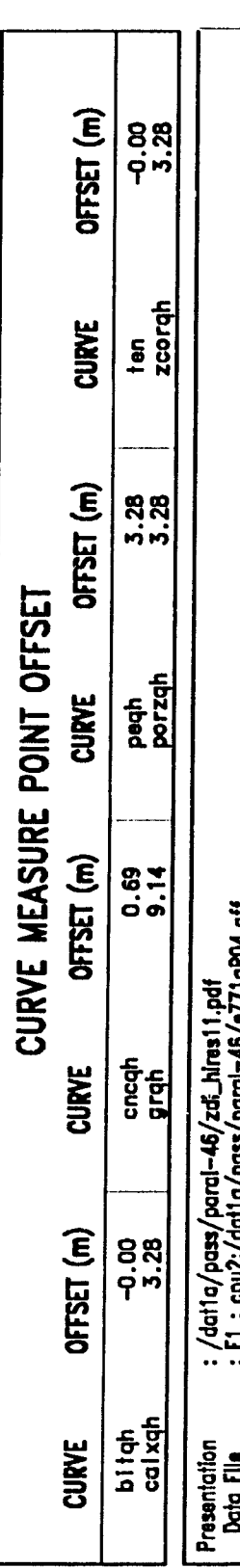
MEASUREMENT TYPE	PARAMETER	SYMMETRIC FILTER VALUE	INTERVAL (m)
X AXIS CALIPER	FILTER (1)	Light (2)	TOP
OR	FILTER (2)	Light (2)	BOTTOM
SL-11	FILTER (1)	Light (2)	TOP
CN	FILTER (2)	Light (2)	BOTTOM
ZDL	FILTER (1)	Light (2)	TOP
SPEED	FILTER (2)	Light (2)	BOTTOM
TENSION	FILTER (1)	Light (2)	TOP
	FILTER (2)	Light (2)	BOTTOM

MEASUREMENT TYPE	PARAMETER	BOREHOLE & CEMENT VALUE	INTERVAL (m)
CASING - BOREHOLE & CEMENT	CASING THICKNESS	0.000	TOP
BIT SIZE	BIT SIZE	14.300	BOTTOM
BOREHOLE CORR DIAMETER	BOREHOLE CORR DIAMETER	156.000	TOP
BOREHOLE CORR DIAMETER	BOREHOLE CORR DIAMETER	156.000	BOTTOM

MEASUREMENT TYPE	PARAMETER	SL-11 PROCESSING VALUE	INTERVAL (m)
SL-11 PROCESSING METHOD	PROCESSING SELECT	USE SL-11 PROC.	TOP
SL-11 AUTOGAIN	OPEN/CLOSED HOLE	OPEN HOLE	BOTTOM
SL-11 ENERGY RANGE	AUTO GAIN ON	AUTO GAIN ON	TOP
	ENERG RANGE	ENERG (1.15-3.0)kev	BOTTOM

MEASUREMENT TYPE	PARAMETER	CN PROCESSING VALUE	INTERVAL (m)
2446 CN MATRIX	2446 MATRIX	DOLOMITE 0	TOP
CN SALINITY CORRECTION	SALINITY	OFF	BOTTOM
CN CASING & CEMENT CORRECTION	BIT SIZE BEHIND CSBG	200.025	TOP

MEASUREMENT TYPE	PARAMETER	ZDL PROCESSING VALUE	INTERVAL (m)
ZDL CH-SMOOTH FILTER	DEN CHISM	ON	TOP
DENSITY POROSITY	PE CHISM	OFF	BOTTOM
ZDL	RHOmatrix	2.860	TOP
	RHOfluid	1.000	BOTTOM
	ZDL GAIN	2035	TOP
	ZDL TRACKING	ON	BOTTOM



Release:3.2 Jul 06, 1999 Fileview 2.36 Plot 3.0 Sun Jan 9 13:15:14 2000
Perpfit /min/47 Pdf_Cpp /min/13

PARAMETER AND FILTER SUMMARY REPORT

FILE: /data/param/1770-1720/1770-1720.qrm
LOGGING MODE: 1770-1720.qrm
TOP DEPTH: 1580.942 m BOTTOM DEPTH: 1924.964 m

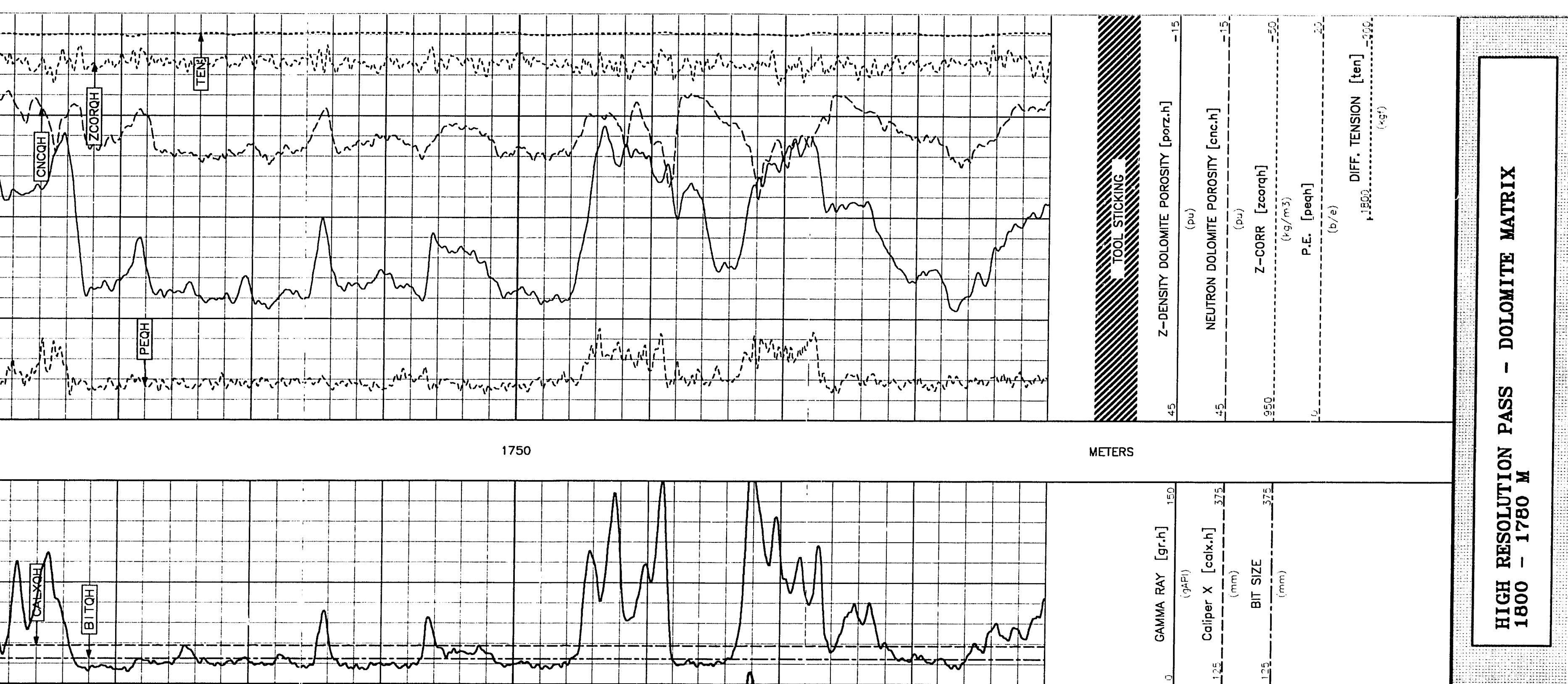
MEASUREMENT TYPE	PARAMETER	SYMMETRIC FILTER VALUE	INTERVAL (m)
X AXIS CALIPER	FILTER (1)	Light (2)	TOP
OR	FILTER (2)	Light (2)	BOTTOM
SL-11	FILTER (1)	Light (2)	TOP
CN	FILTER (2)	Light (2)	BOTTOM
ZDL	FILTER (1)	Light (2)	TOP
SPEED	FILTER (2)	Light (2)	BOTTOM
TENSION	FILTER (1)	Light (2)	TOP
	FILTER (2)	Light (2)	BOTTOM

MEASUREMENT TYPE	PARAMETER	BOREHOLE & CEMENT VALUE	INTERVAL (m)
CASING - BOREHOLE & CEMENT	CASING THICKNESS	0.000	TOP
BIT SIZE	BIT SIZE	14.300	BOTTOM
BOREHOLE CORR DIAMETER	BOREHOLE CORR DIAMETER	156.000	TOP
BOREHOLE CORR DIAMETER	BOREHOLE CORR DIAMETER	156.000	BOTTOM

MEASUREMENT TYPE	PARAMETER	SL-11 PROCESSING VALUE	INTERVAL (m)
SL-11 PROCESSING METHOD	PROCESSING SELECT	USE SL-11 PROC.	TOP
SL-11 AUTOGAIN	OPEN/CLOSED HOLE	OPEN HOLE	BOTTOM
SL-11 ENERGY RANGE	AUTO GAIN ON	AUTO GAIN ON	TOP
	ENERG RANGE	ENERG (1.15-3.0)kev	BOTTOM

MEASUREMENT TYPE	PARAMETER	CN PROCESSING VALUE	INTERVAL (m)
2446 CN MATRIX	2446 MATRIX	DOLOMITE 0	TOP
CN SALINITY CORRECTION	SALINITY	OFF	BOTTOM
CN CASING & CEMENT CORRECTION	BIT SIZE BEHIND CSBG	200.025	TOP

MEASUREMENT TYPE	PARAMETER	ZDL PROCESSING VALUE	INTERVAL (m)
ZDL CH-SMOOTH FILTER	DEN CHISM	ON	TOP
DENSITY POROSITY	PE CHISM	OFF	BOTTOM
ZDL	RHOmatrix	2.860	TOP
	RHOfluid	1.000	BOTTOM
	ZDL GAIN	2035	TOP
	ZDL TRACKING	ON	BOTTOM



Release:3.2 Jul 06, 1999 Fileview 2.36 Plot 3.0 Sun Jan 9 13:15:14 2000
Perpfit /min/47 Pdf_Cpp /min/13

PARAMETER AND FILTER SUMMARY REPORT

FILE: /data/param/1770-1720/1770-1720.qrm
LOGGING MODE: 1770-1720.qrm
TOP DEPTH: 1580.942 m BOTTOM DEPTH: 1924.964 m

MEASUREMENT TYPE	PARAMETER	SYMMETRIC FILTER VALUE	INTERVAL (m)
X AXIS CALIPER	FILTER (1)	Light (2)	TOP
OR	FILTER (2)	Light (2)	BOTTOM
SL-11	FILTER (1)	Light (2)	TOP
CN	FILTER (2)	Light (2)	BOTTOM
ZDL	FILTER (1)	Light (2)	TOP
SPEED	FILTER (2)	Light (2)	BOTTOM
TENSION	FILTER (1)	Light (2)	TOP
	FILTER (2)	Light (2)	BOTTOM

MEASUREMENT TYPE	PARAMETER	BOREHOLE & CEMENT VALUE	INTERVAL (m)
CASING - BOREHOLE & CEMENT	CASING THICKNESS	0.000	TOP
BIT SIZE	BIT SIZE	14.300	BOTTOM
BOREHOLE CORR DIAMETER	BOREHOLE CORR DIAMETER	156.000	TOP
BOREHOLE CORR DIAMETER	BOREHOLE CORR DIAMETER	156.000	BOTTOM

MEASUREMENT TYPE	PARAMETER	SL-11 PROCESSING VALUE	INTERVAL (m)
SL-11 PROCESSING METHOD	PROCESSING SELECT	USE SL-11 PROC.	TOP
SL-11 AUTOGAIN	OPEN/CLOSED HOLE	OPEN HOLE	BOTTOM
SL-11 ENERGY RANGE	AUTO GAIN ON	AUTO GAIN ON	TOP
	ENERG RANGE	ENERG (1.15-3.0)kev	BOTTOM

MEASUREMENT TYPE	PARAMETER	CN PROCESSING VALUE	INTERVAL (m)
2446 CN MATRIX	2446 MATRIX	DOLOMITE 0	TOP
CN SALINITY CORRECTION	SALINITY	OFF	BOTTOM
CN CASING & CEMENT CORRECTION	BIT SIZE BEHIND CSBG	200.025	TOP

MEASUREMENT TYPE	PARAMETER	ZDL PROCESSING VALUE	INTERVAL (m)
ZDL CH-SMOOTH FILTER	DEN CHISM	ON	TOP
DENSITY POROSITY	PE CHISM	OFF	BOTTOM
ZDL	RHOmatrix	2.860	TOP
	RHOfluid	1.000	BOTTOM
	ZDL GAIN	2035	TOP
	ZDL TRACKING	ON	BOTTOM

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1640 - 1800M

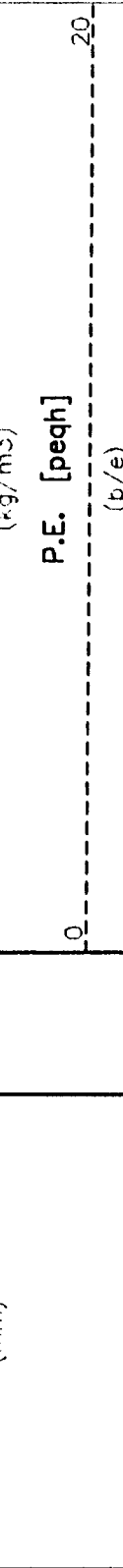
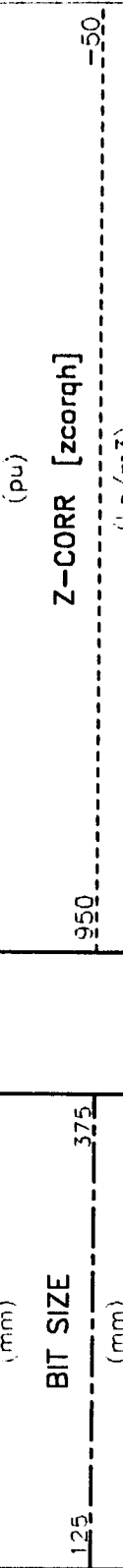
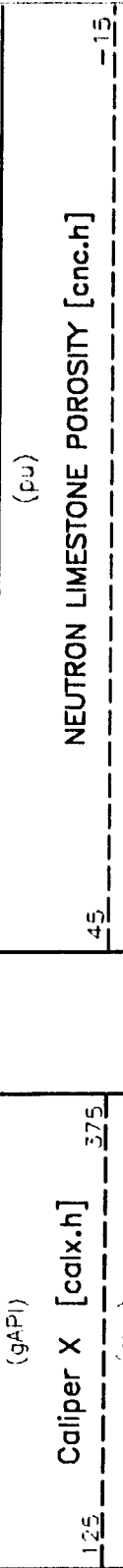
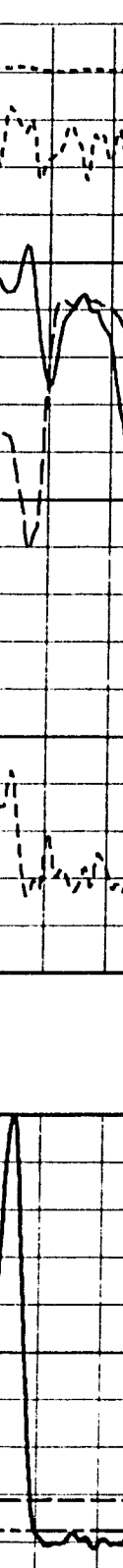
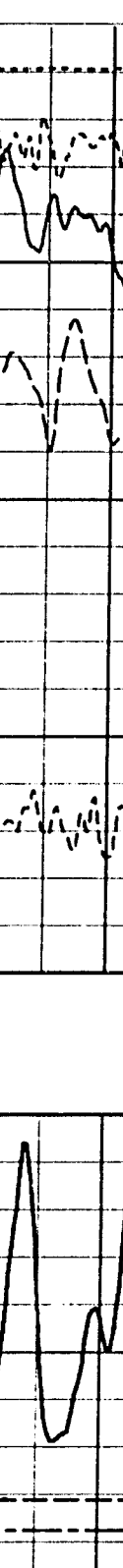
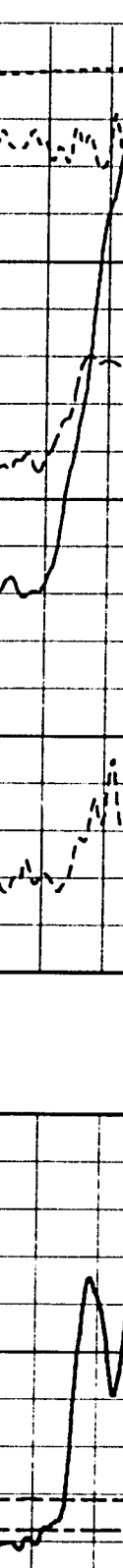
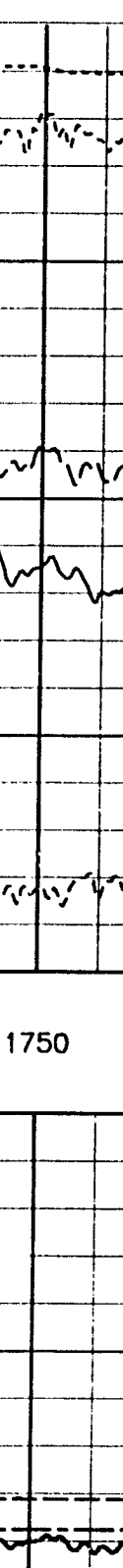
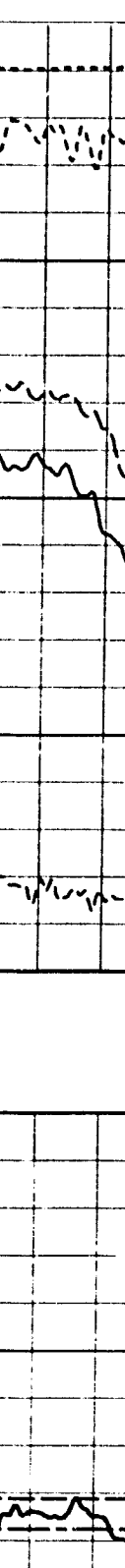
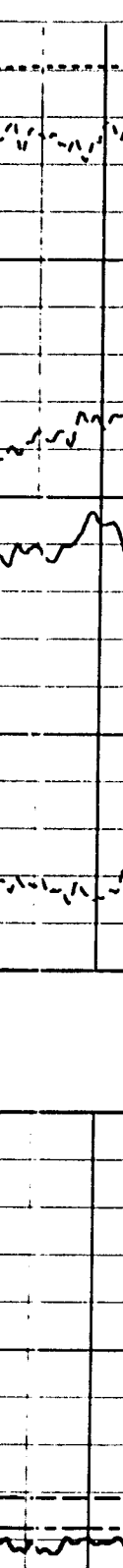
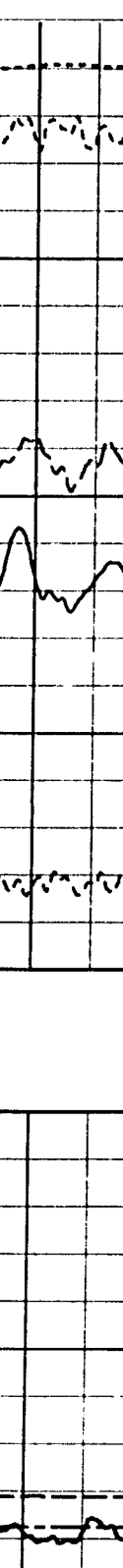
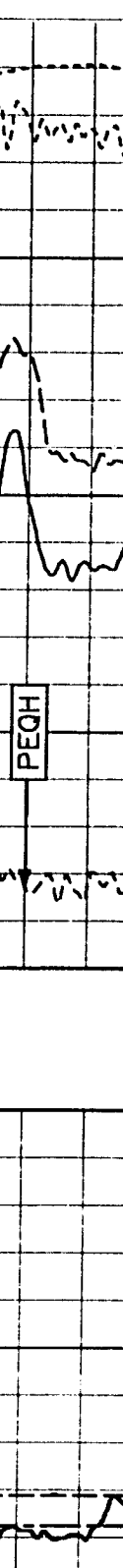
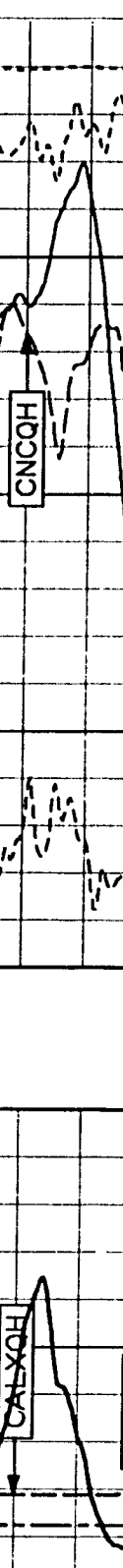
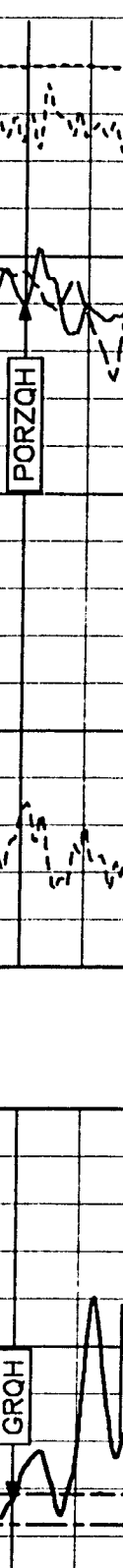
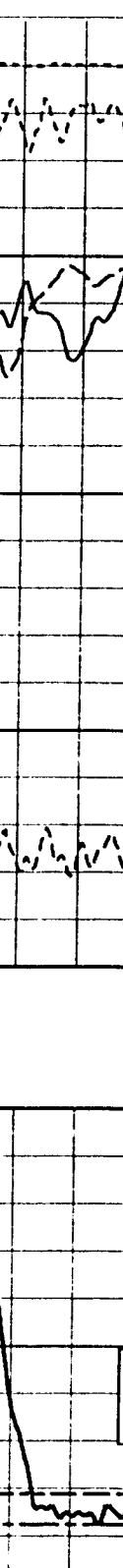
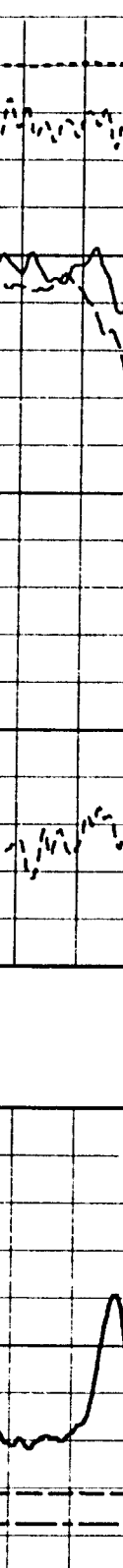
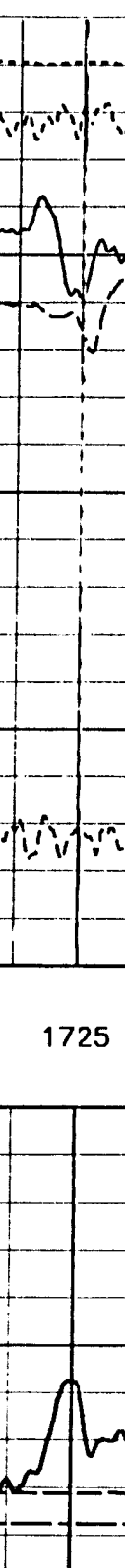
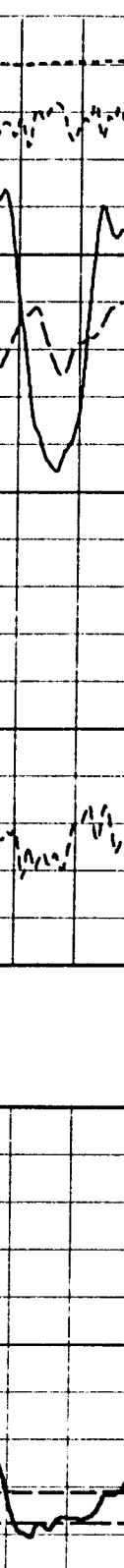
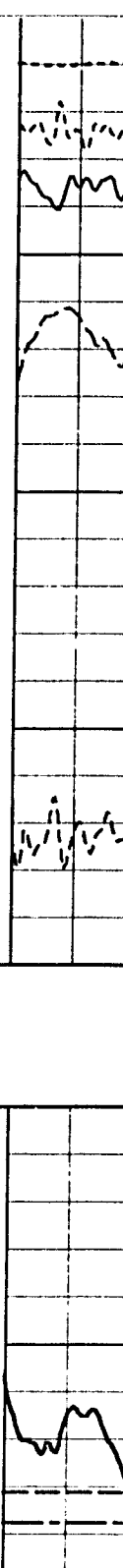
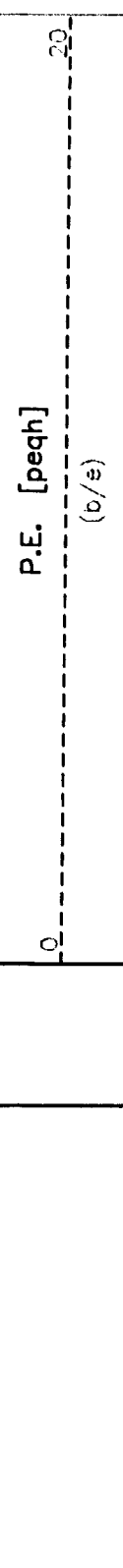
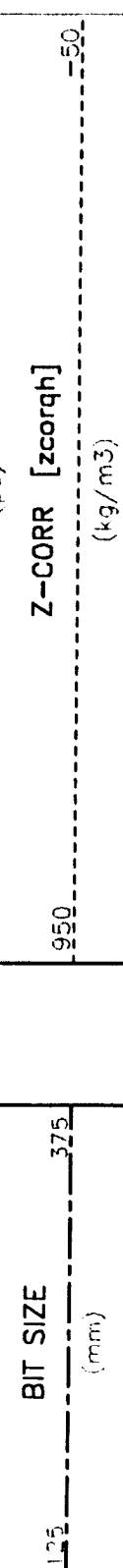
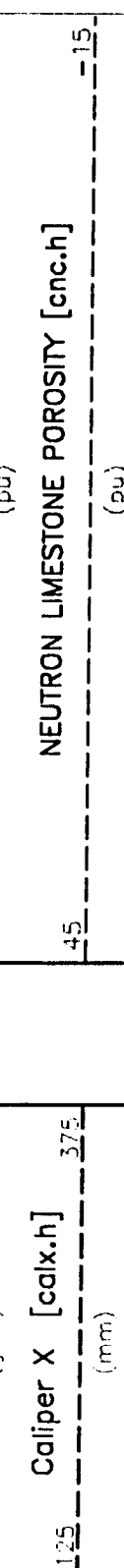
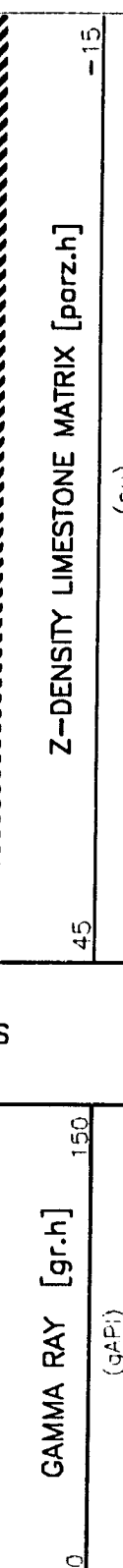
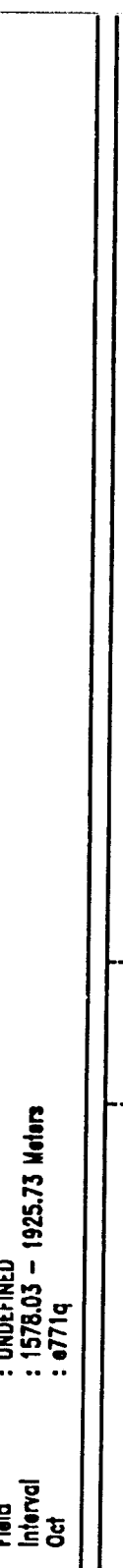
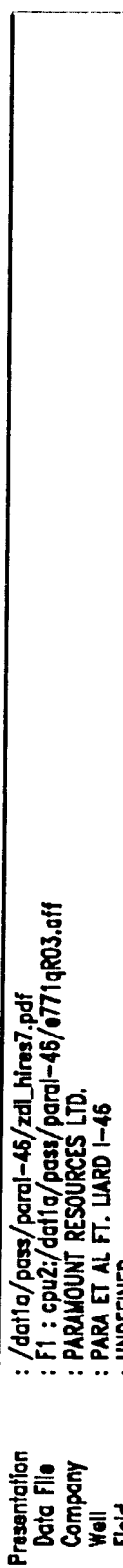
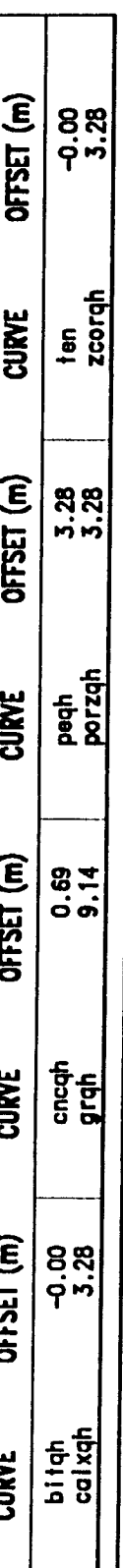
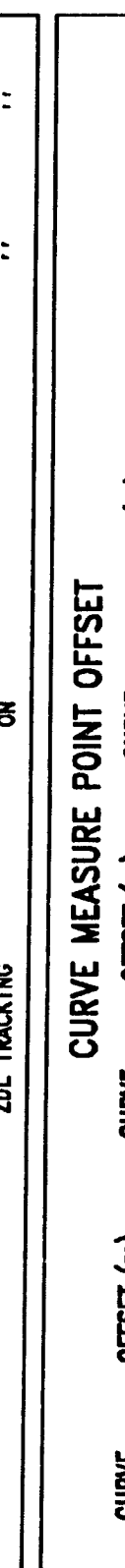
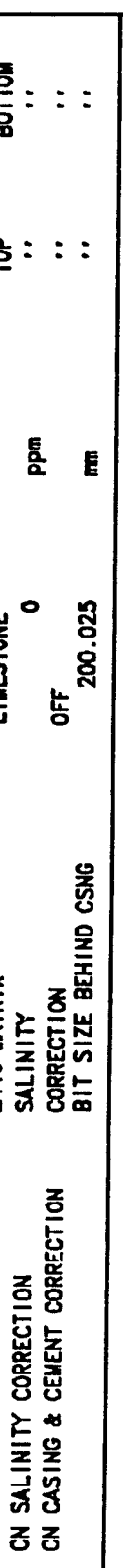
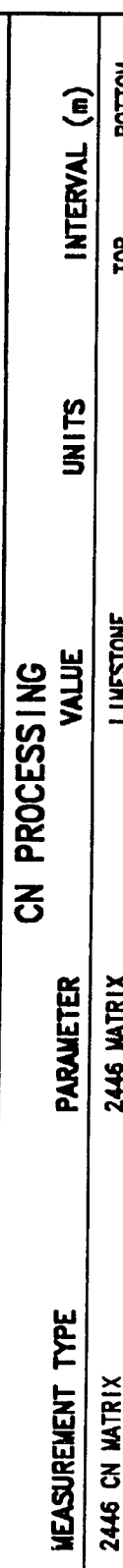
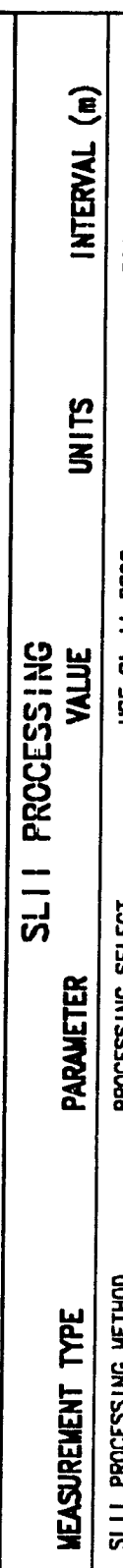
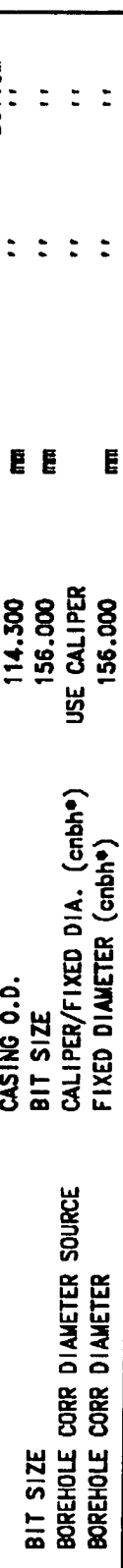
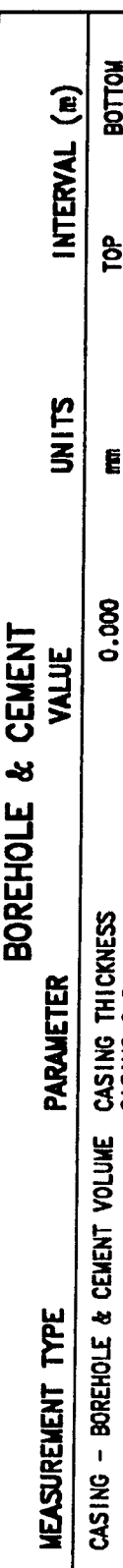
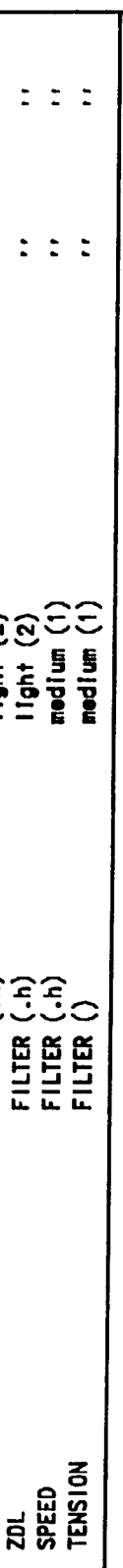
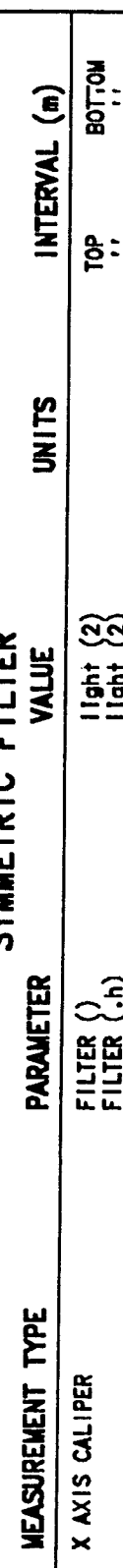
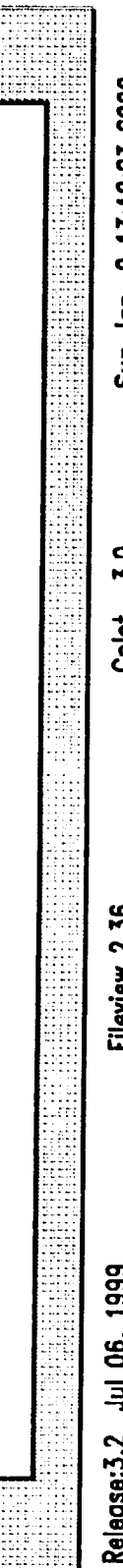
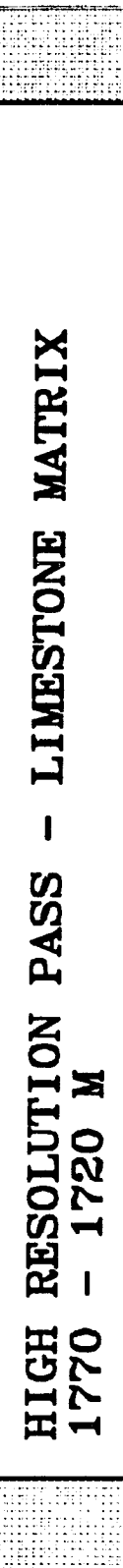
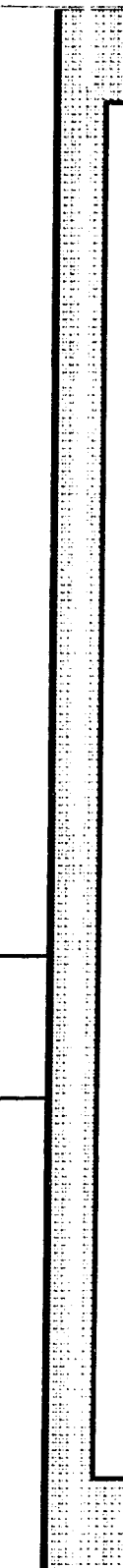
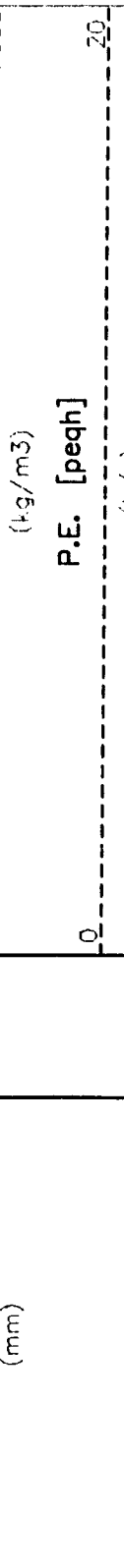
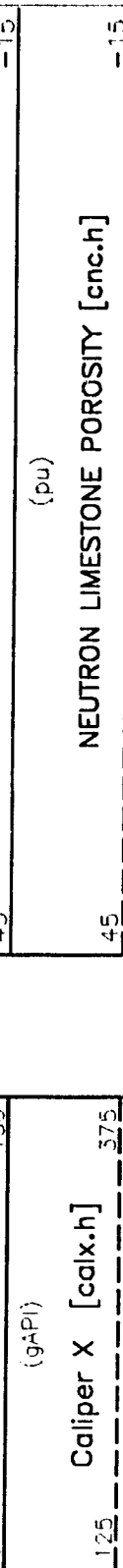
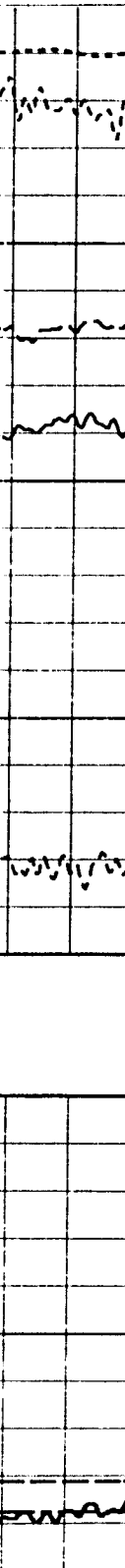
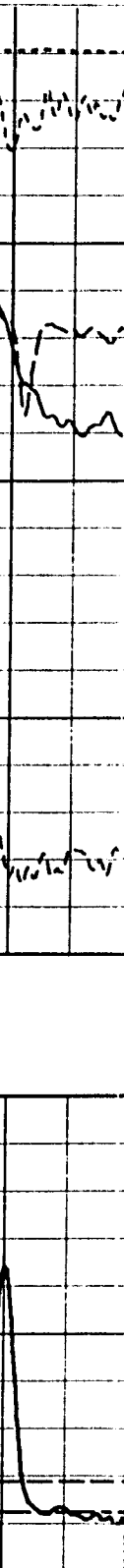
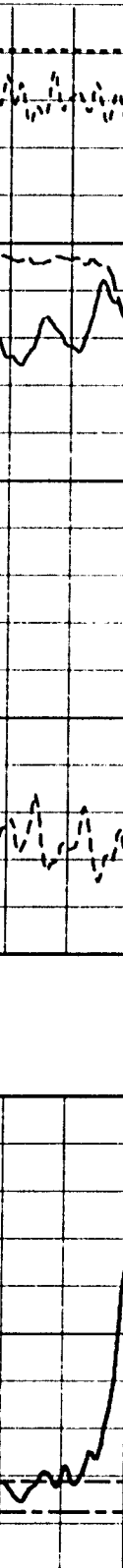
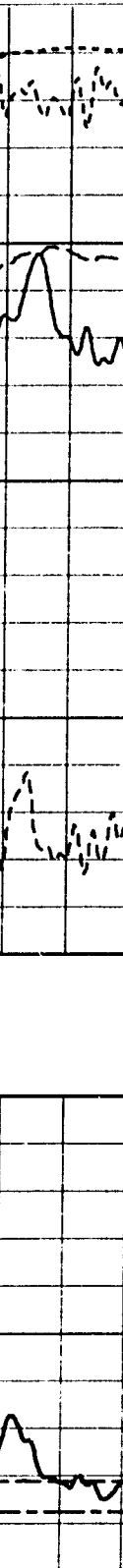
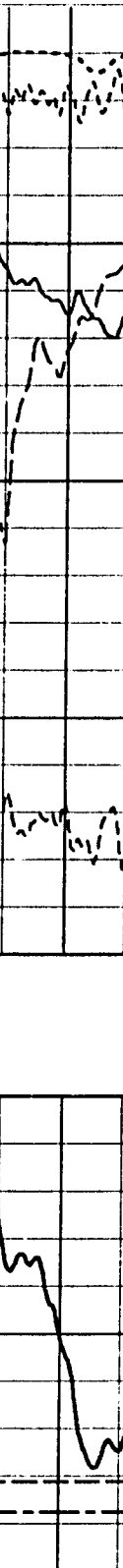
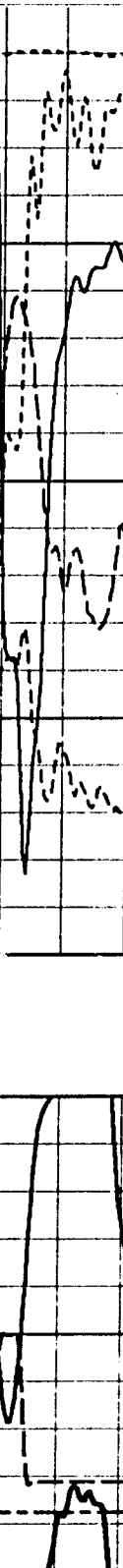
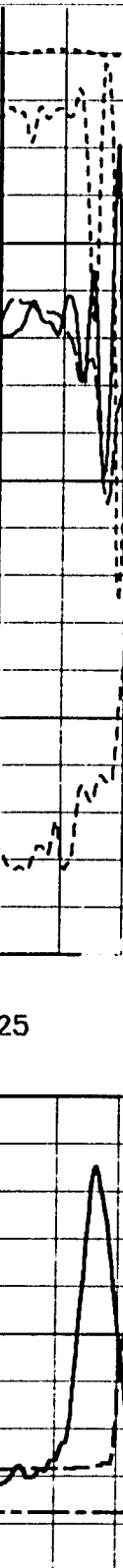
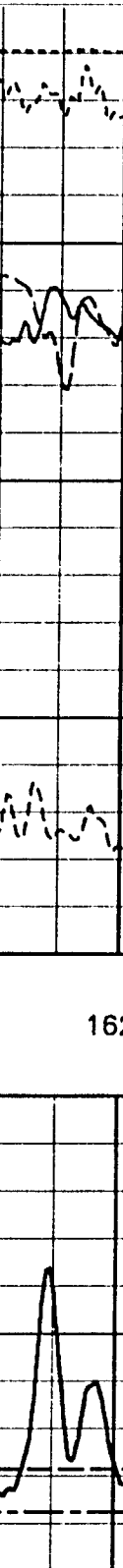
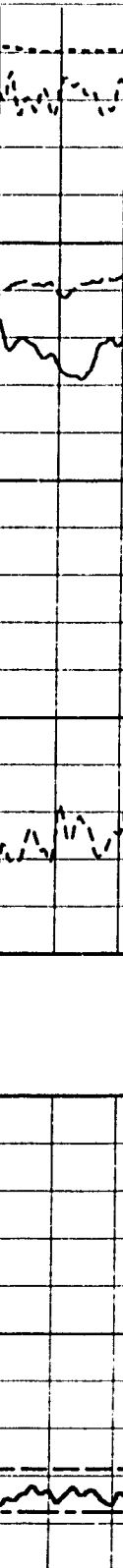
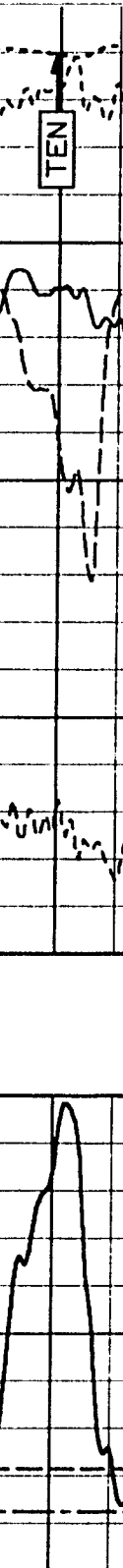
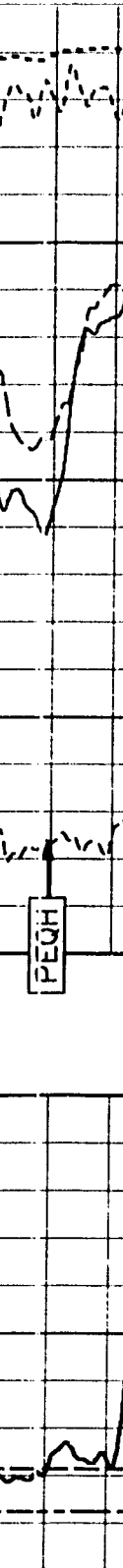
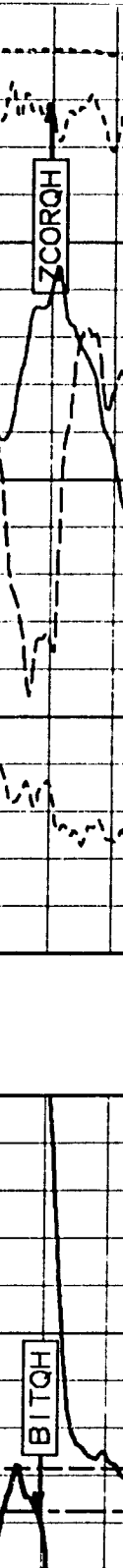
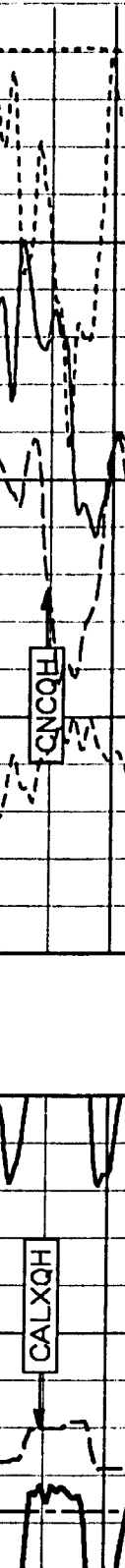
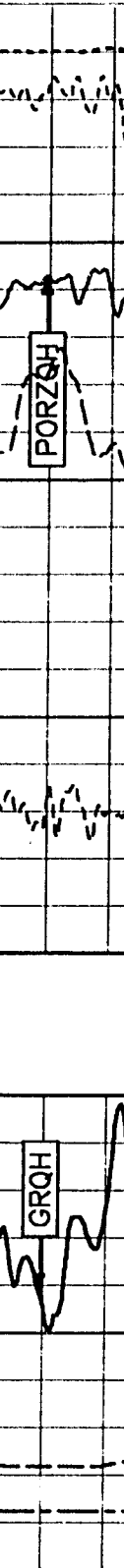
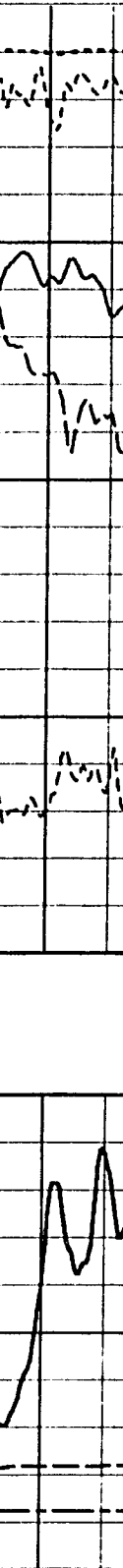
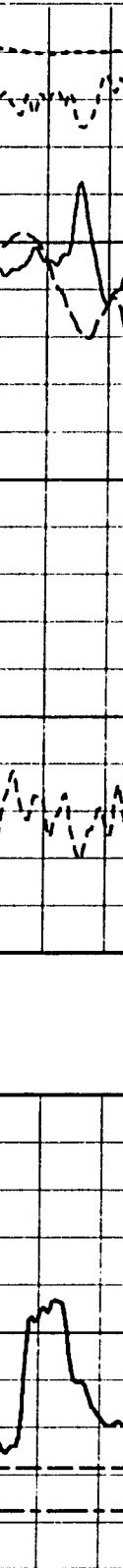
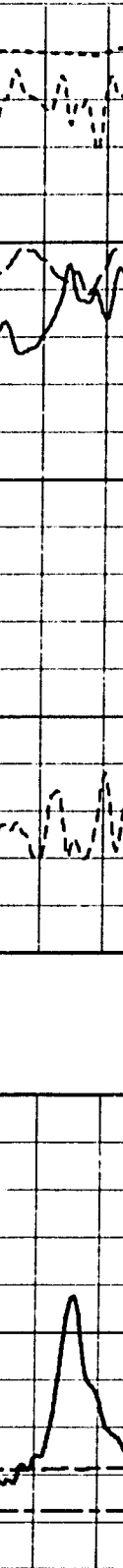
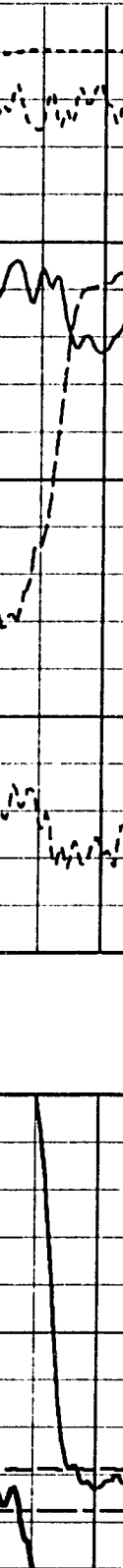
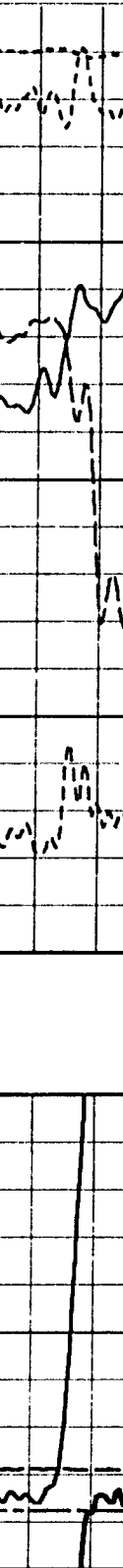
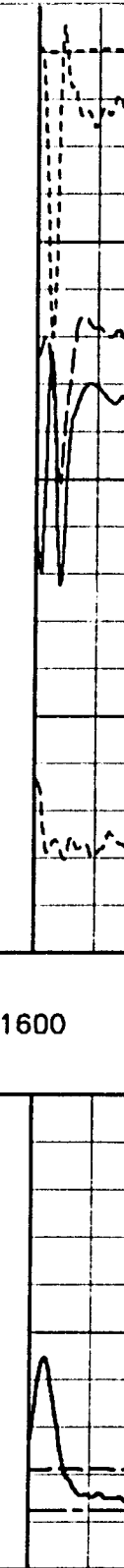
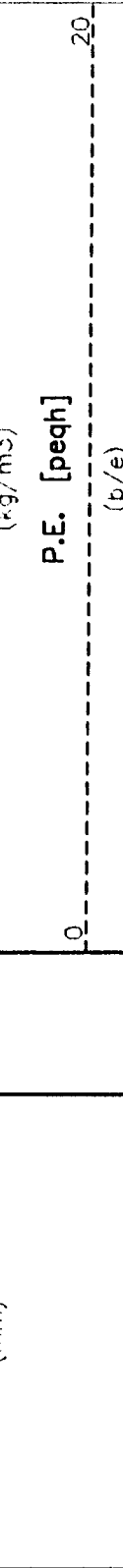
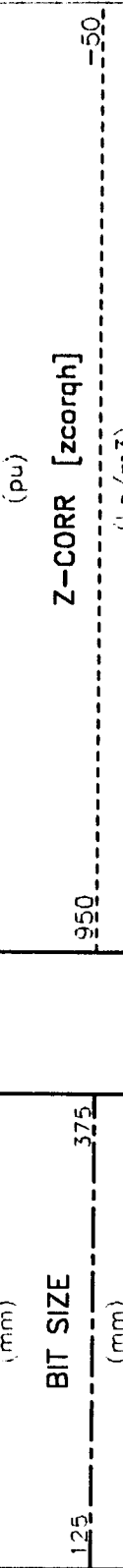
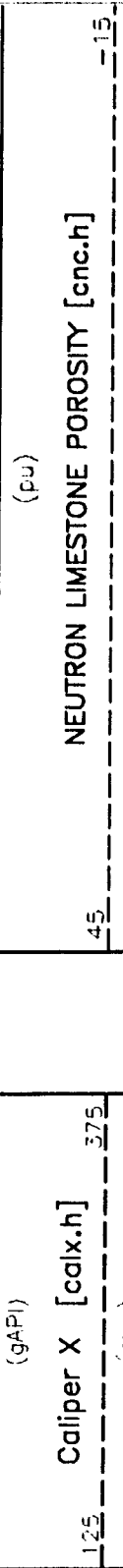
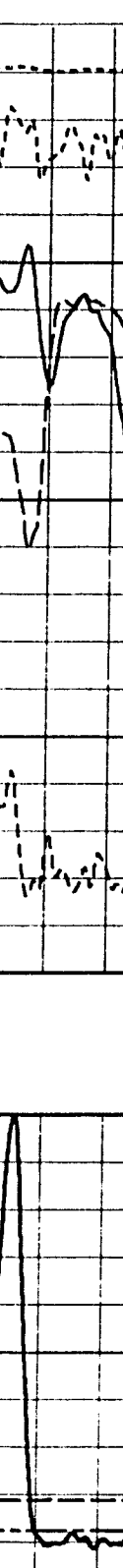
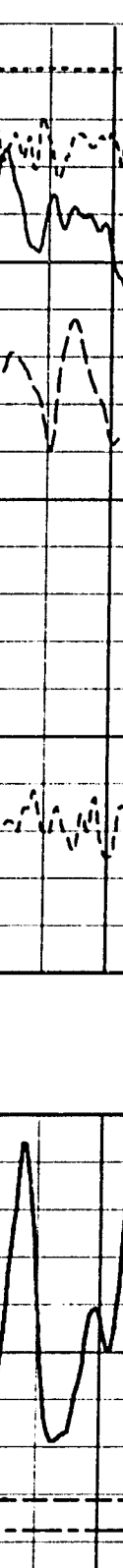
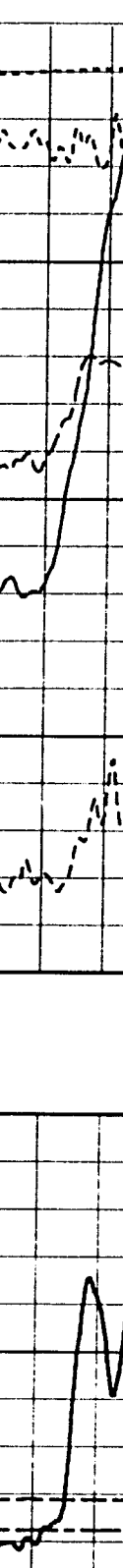
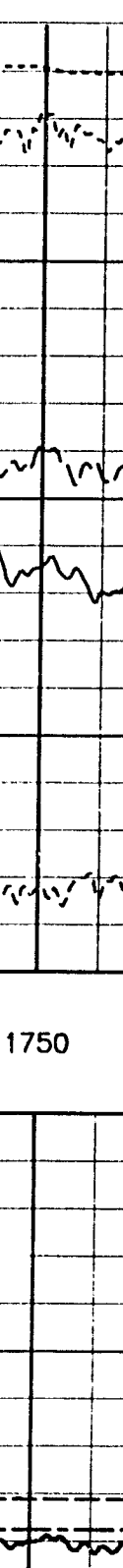
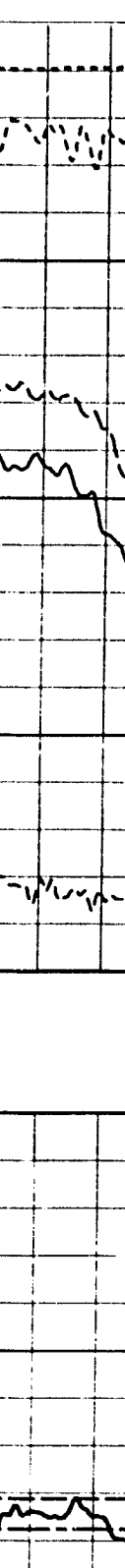
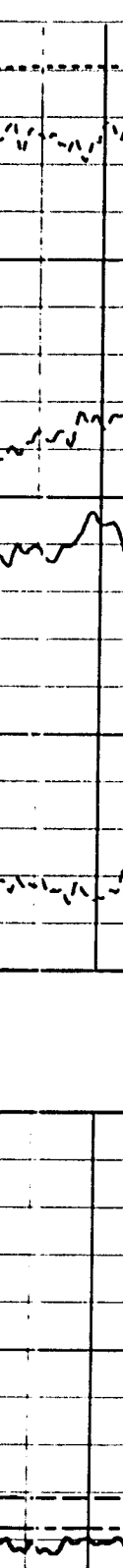
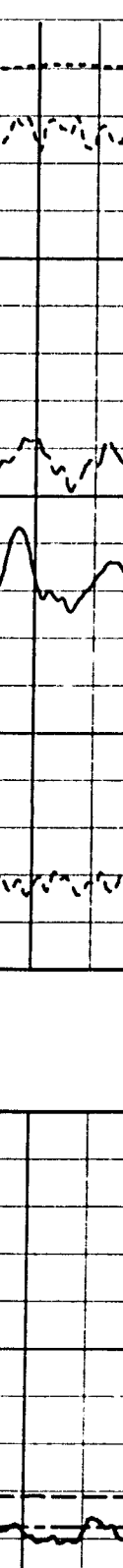
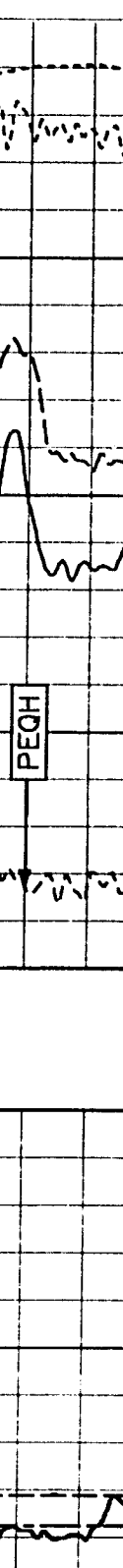
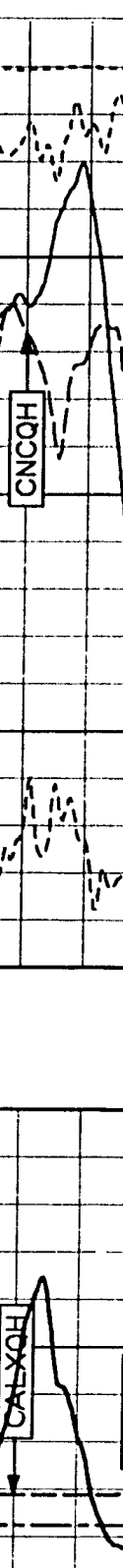
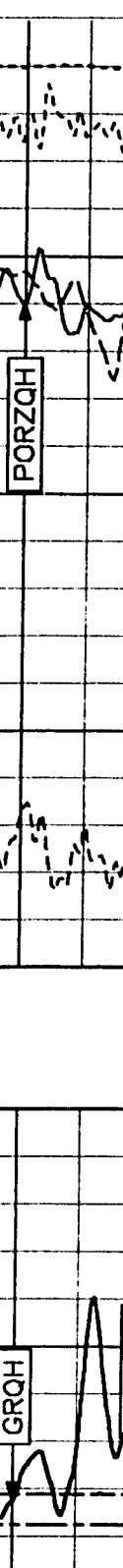
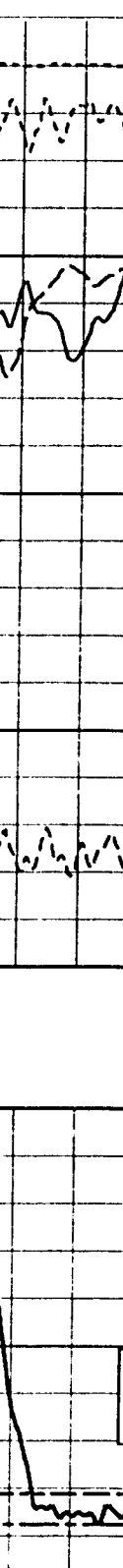
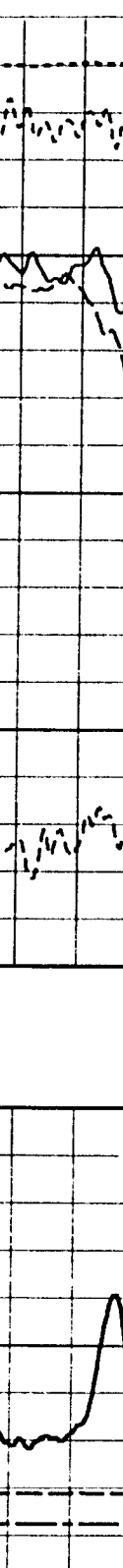
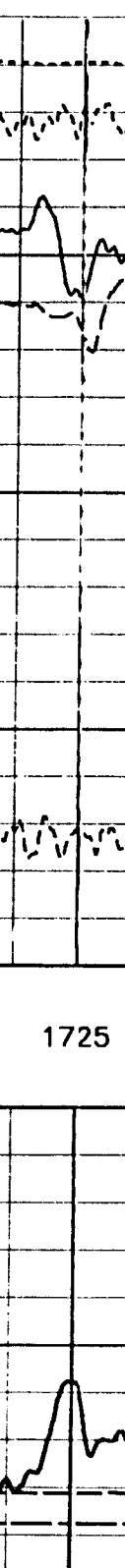
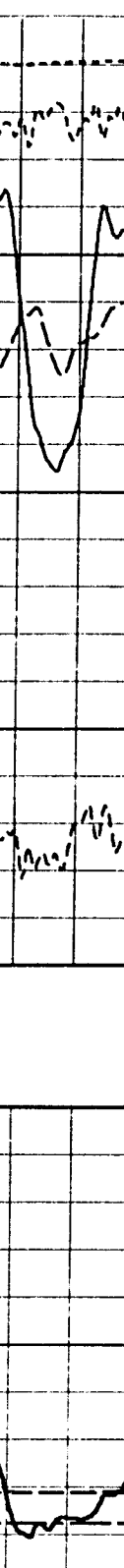
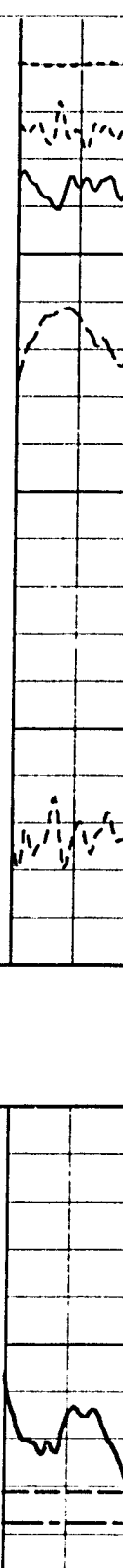
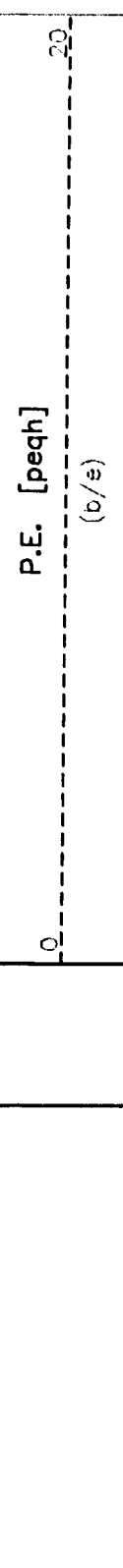
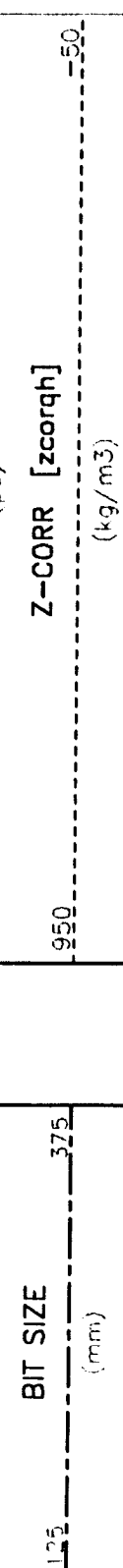
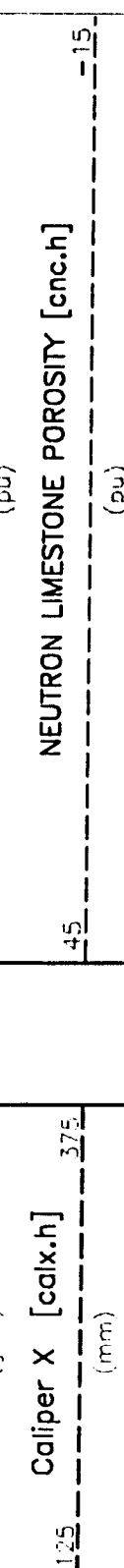
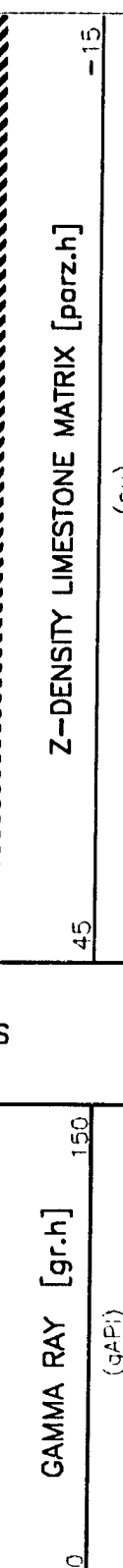
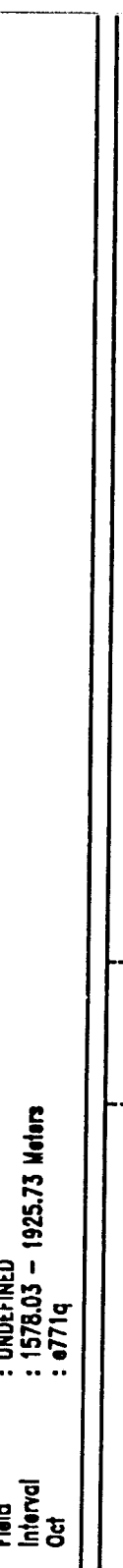
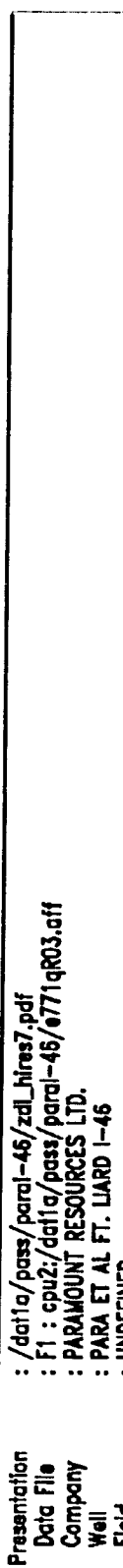
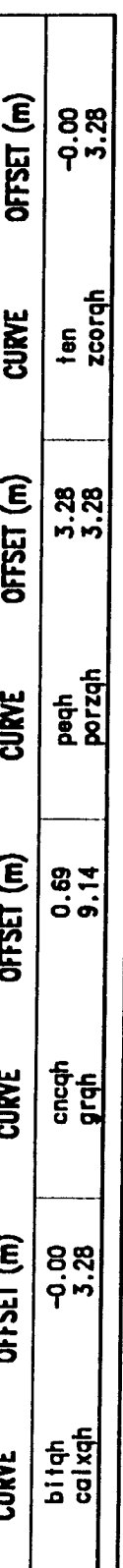
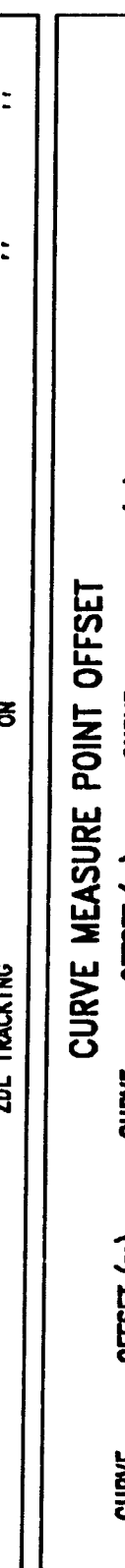
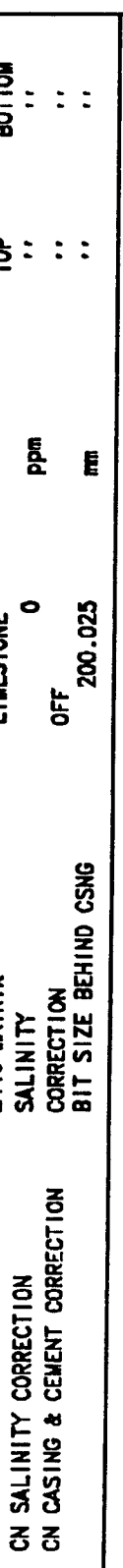
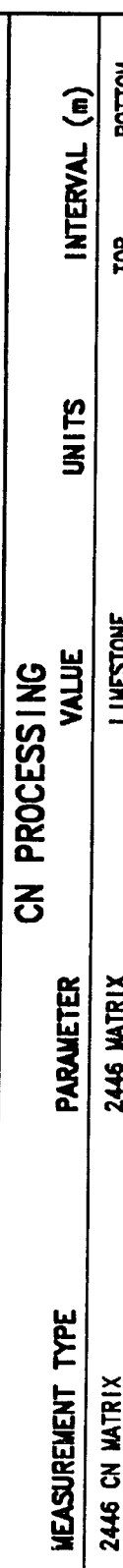
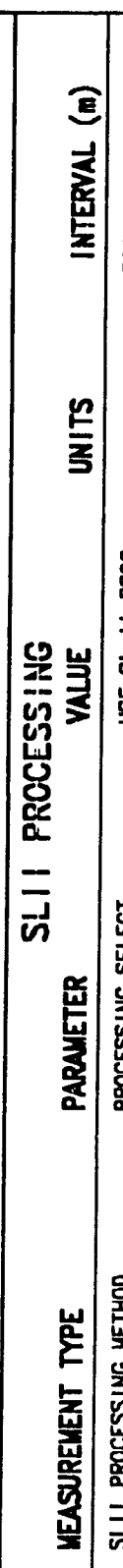
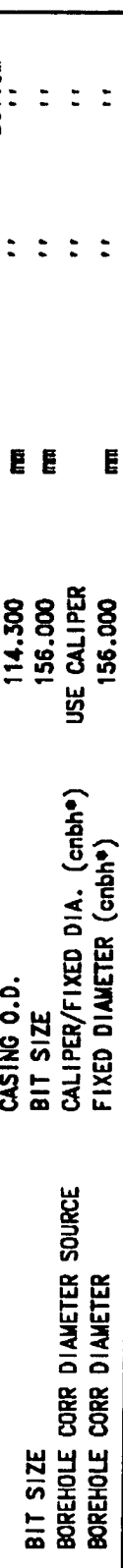
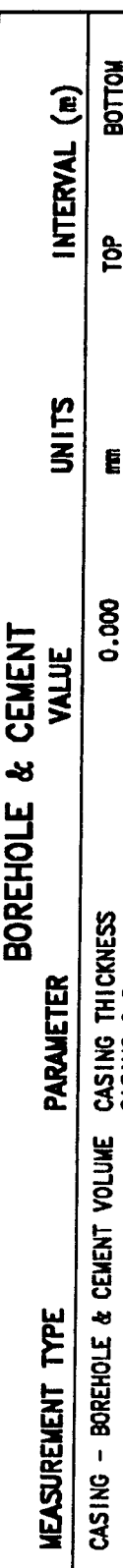
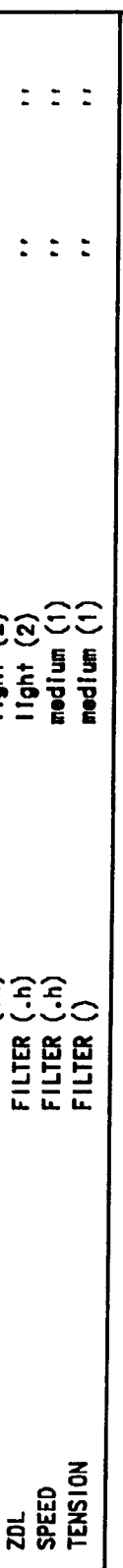
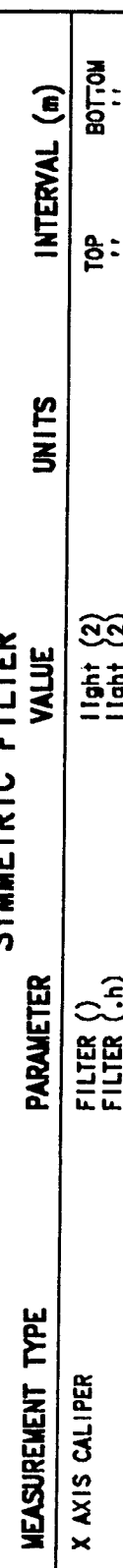
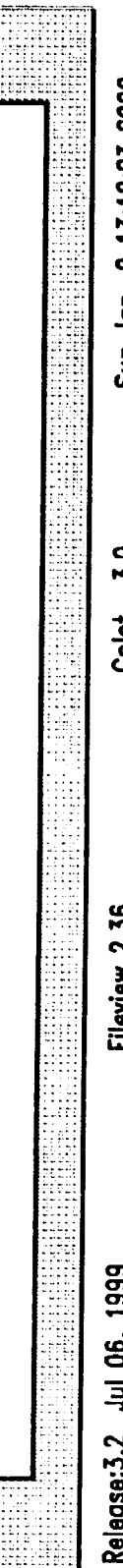
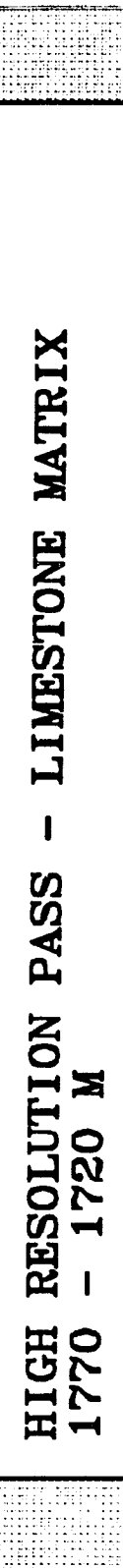
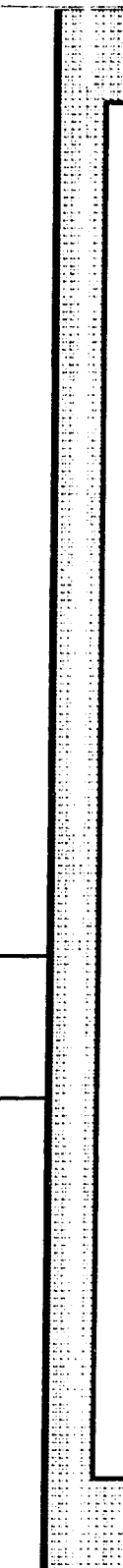
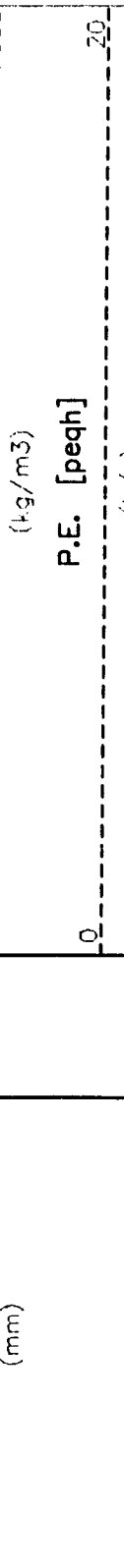
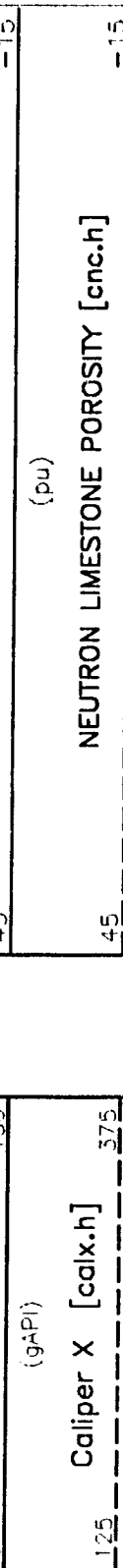
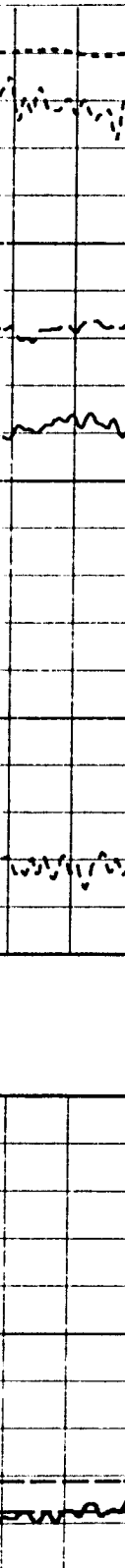
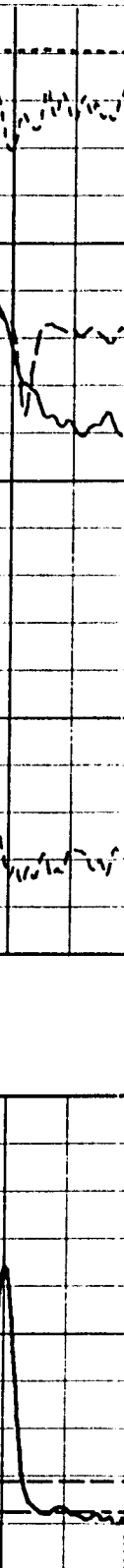
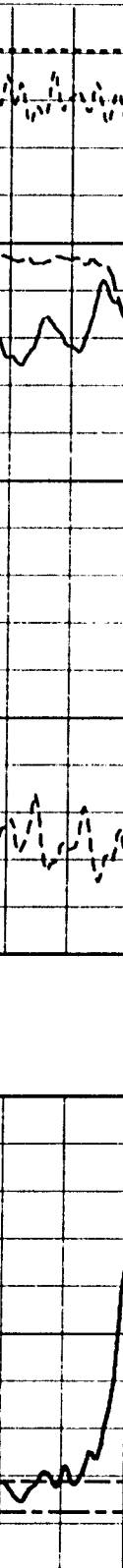
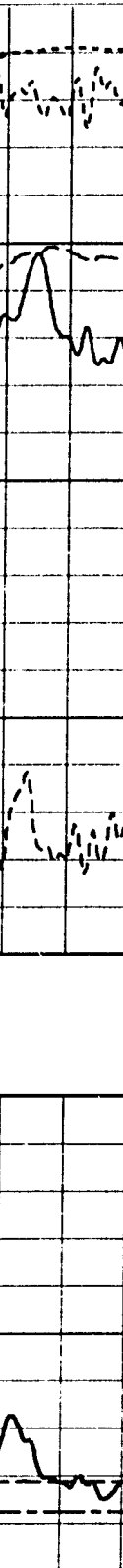
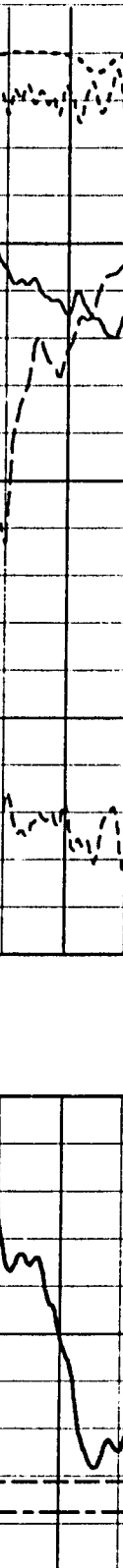
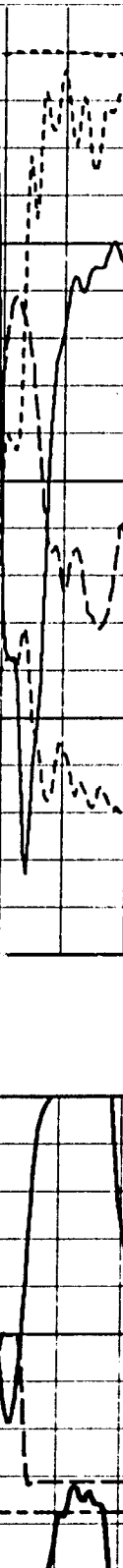
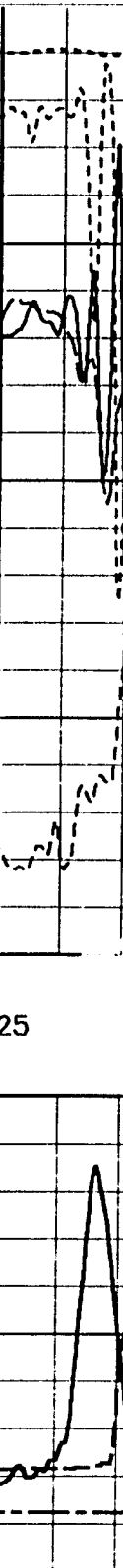
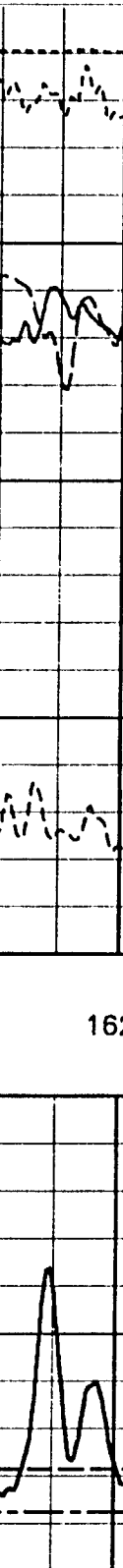
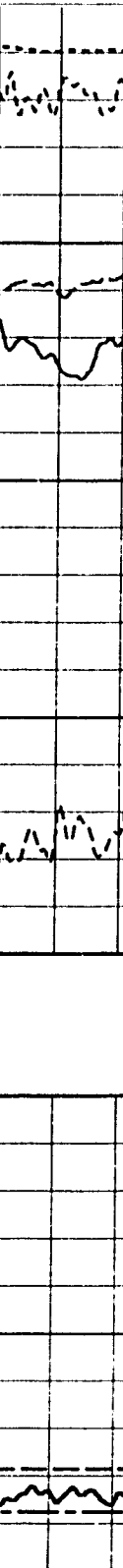
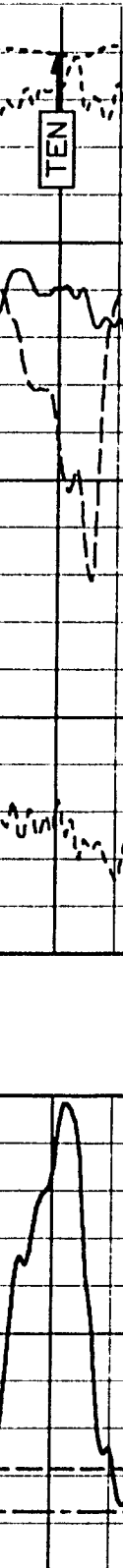
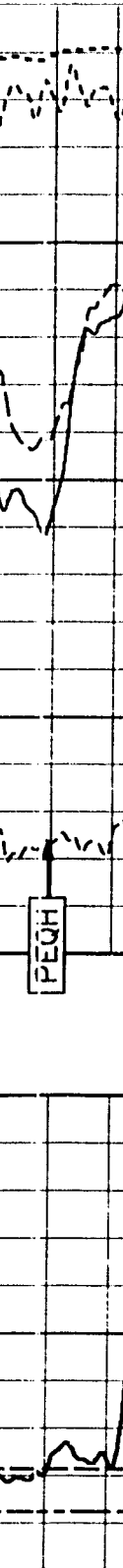
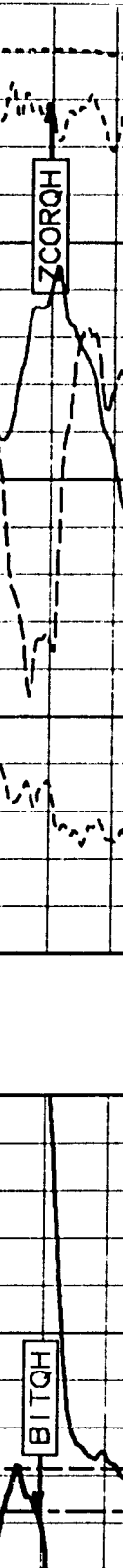
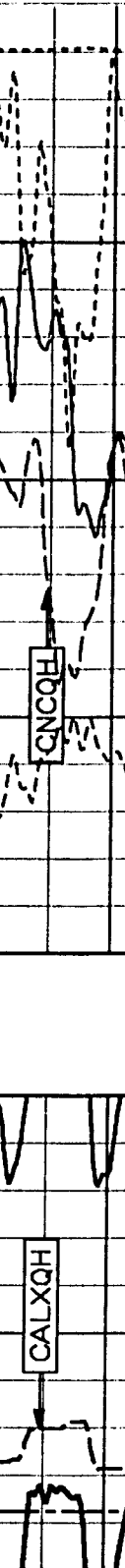
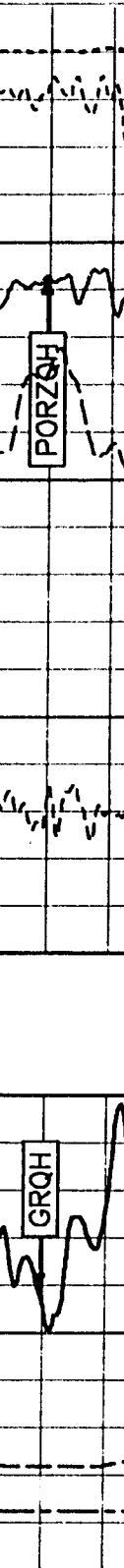
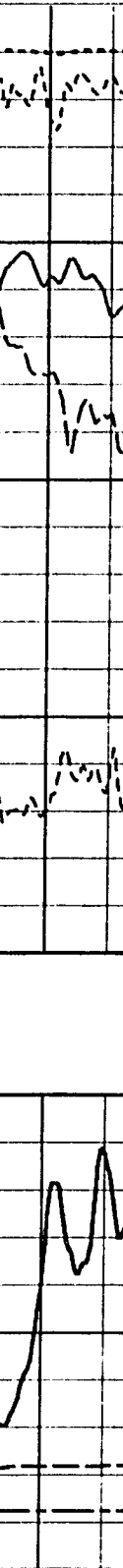
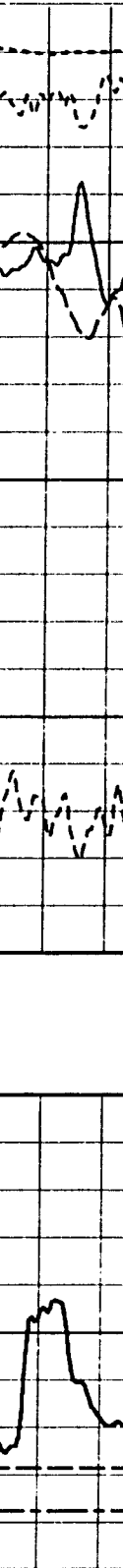
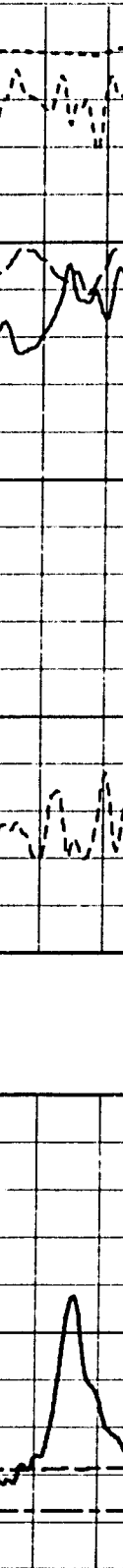
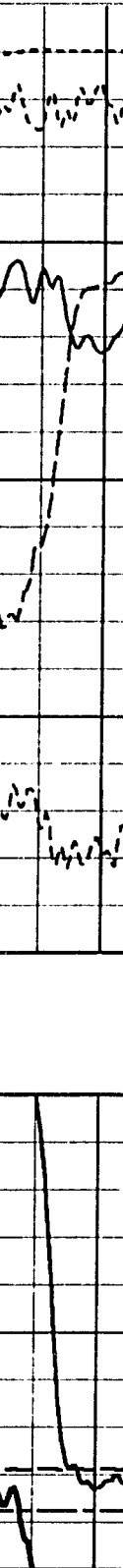
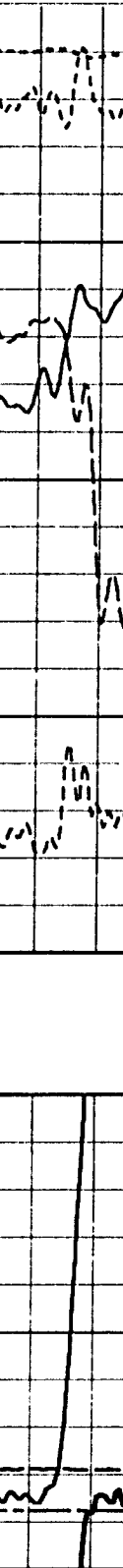
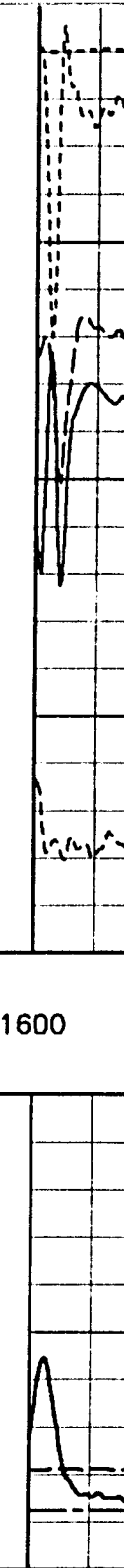
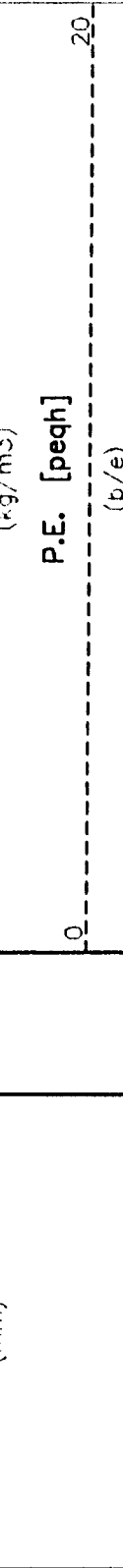
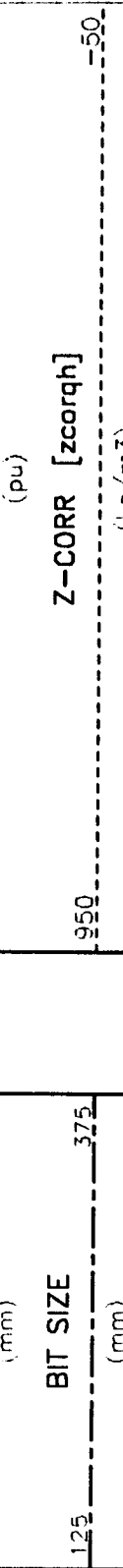
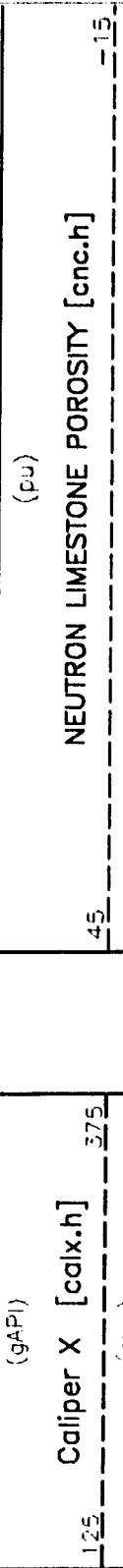
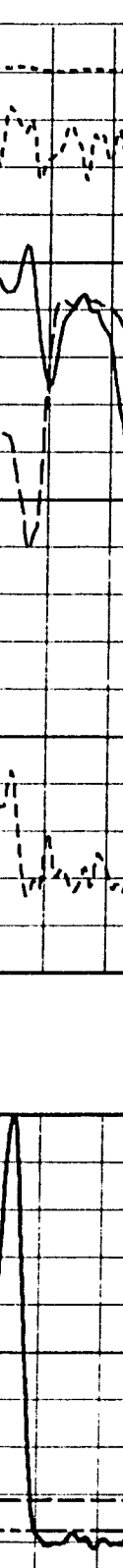
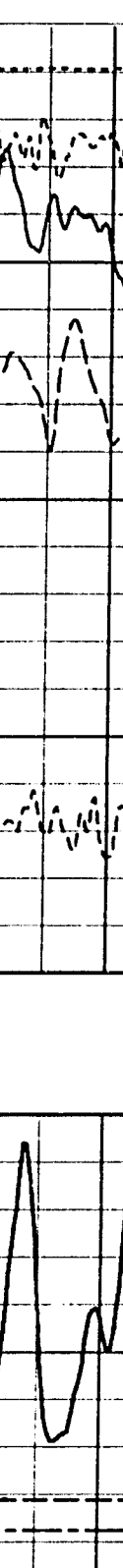
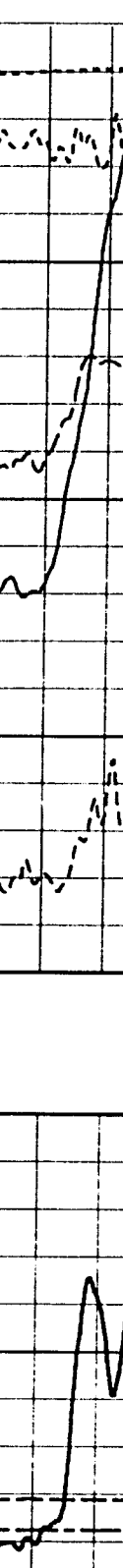
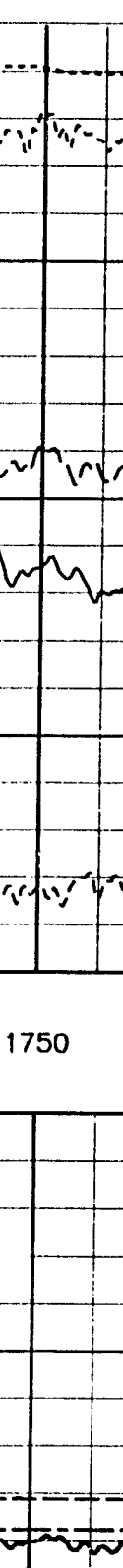
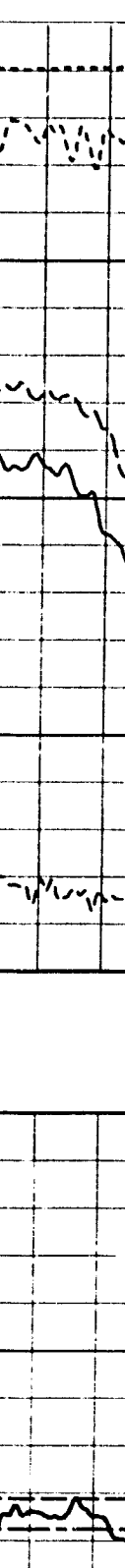
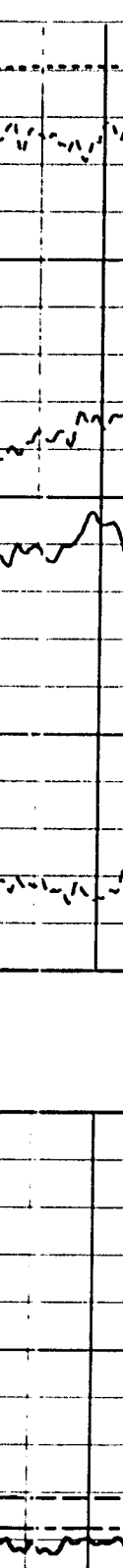
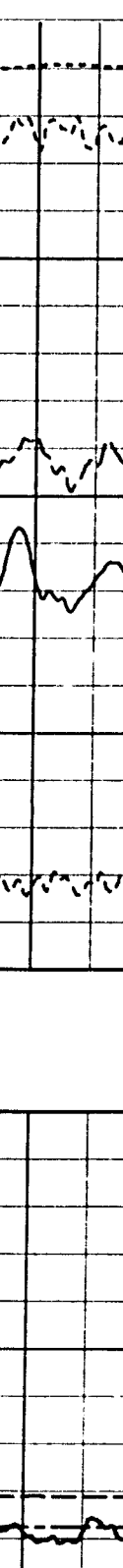
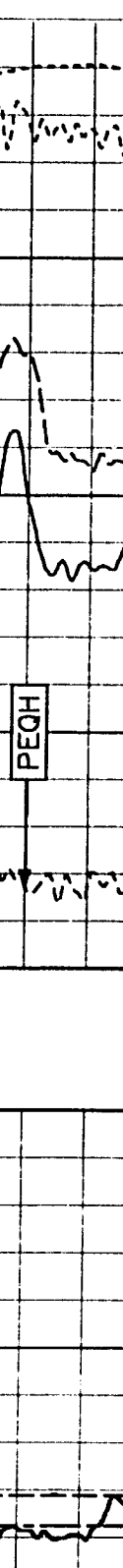
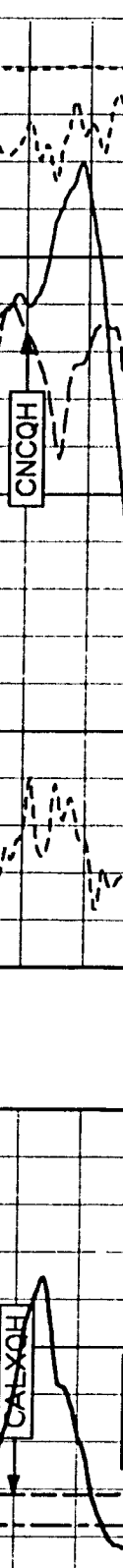
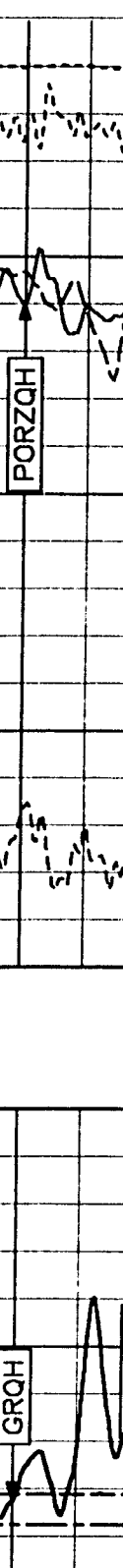
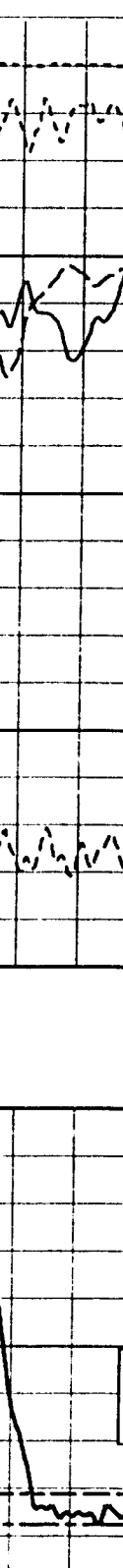
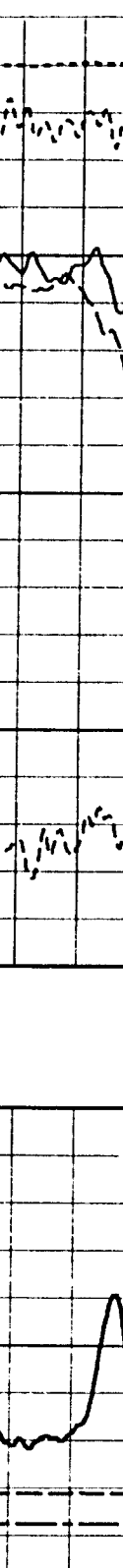
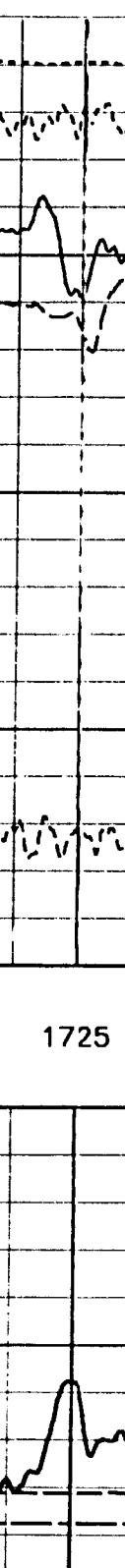
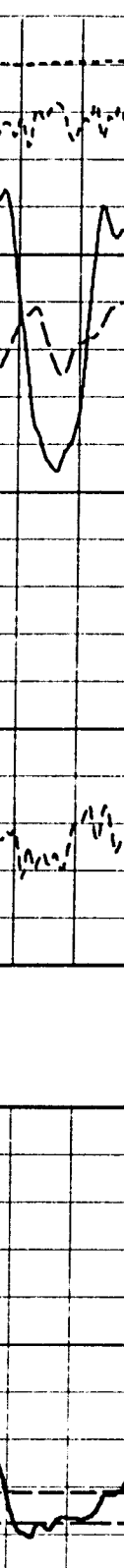
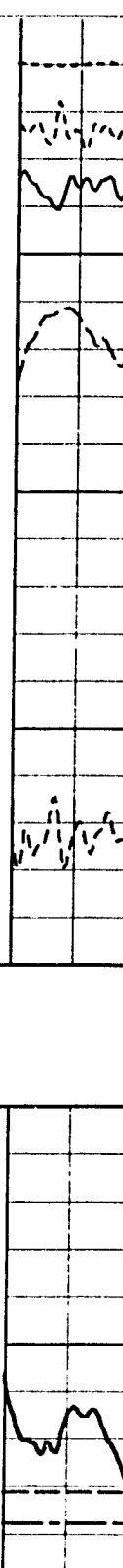
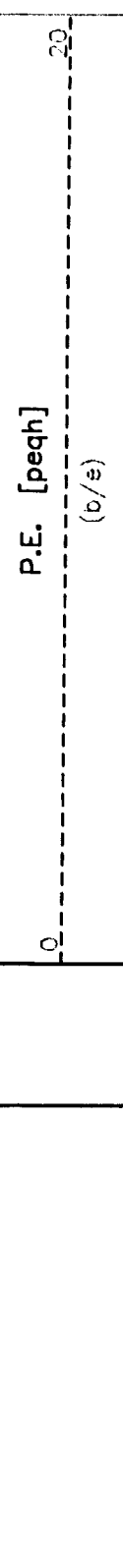
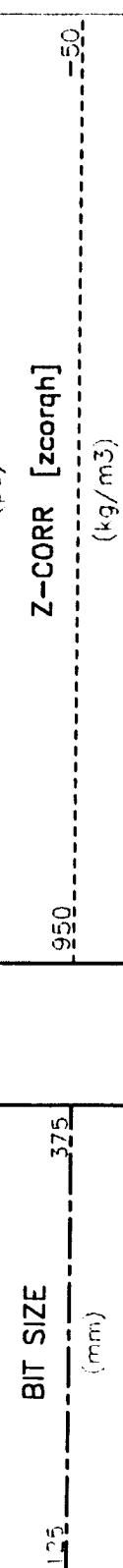
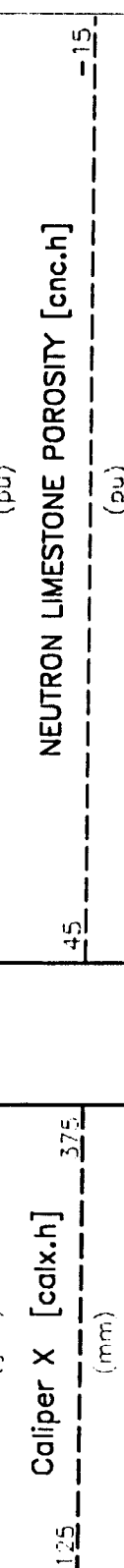
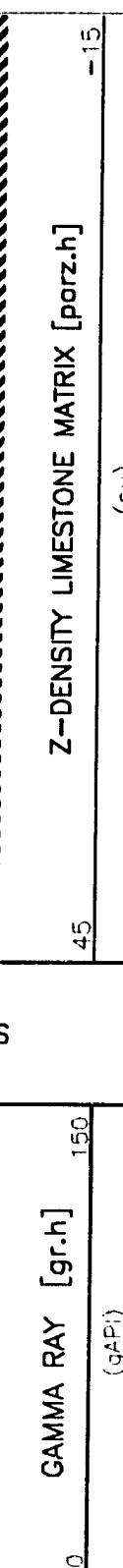
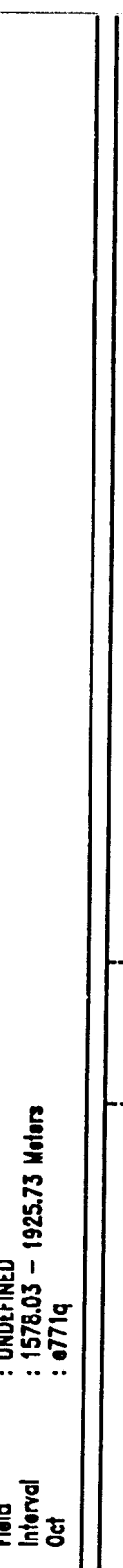
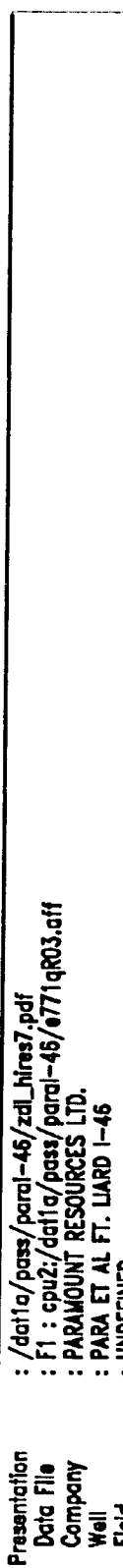
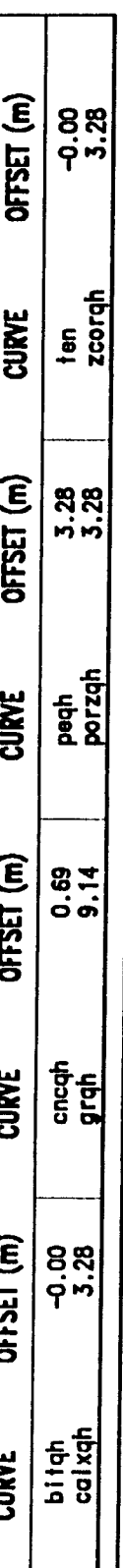
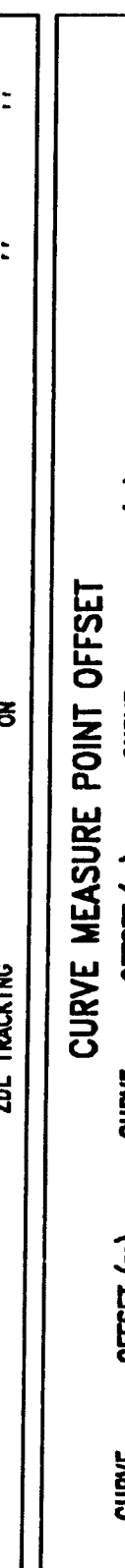
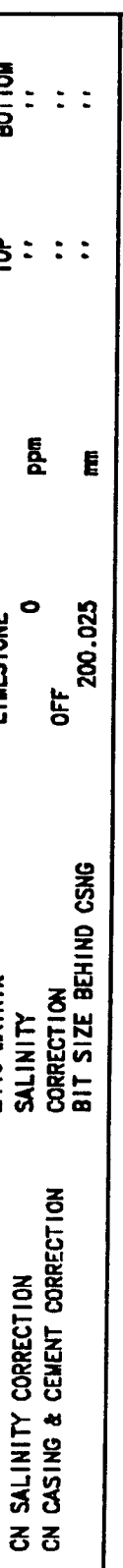
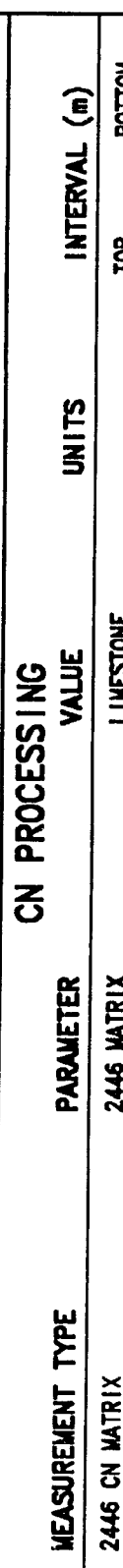
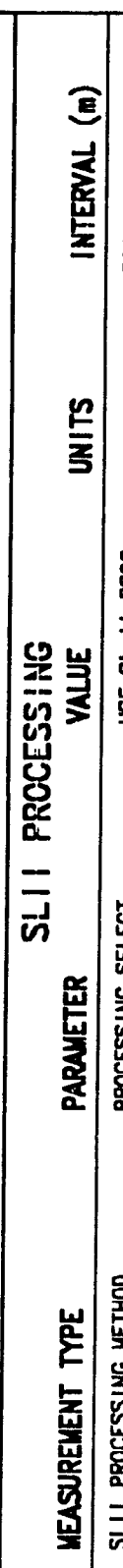
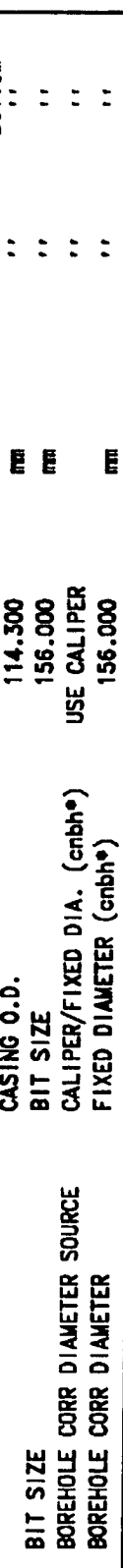
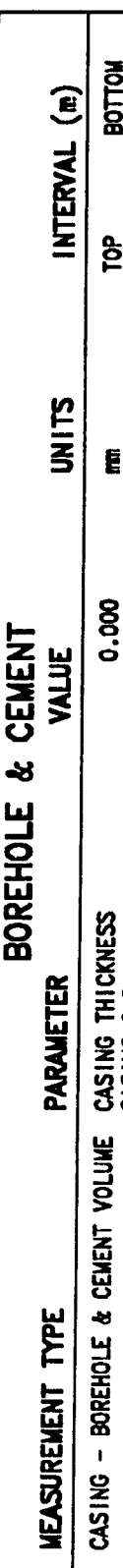
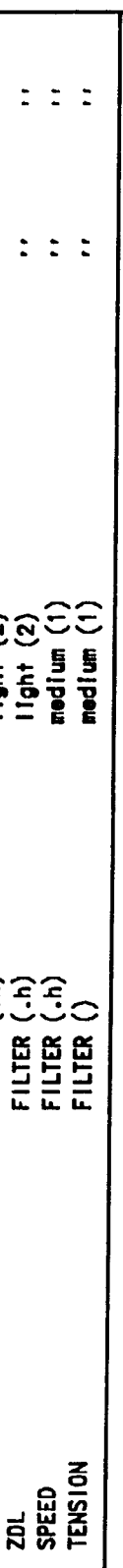
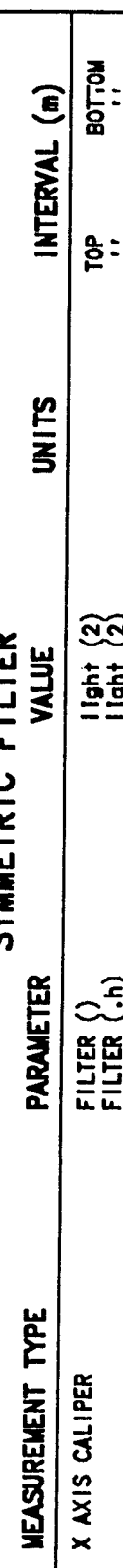
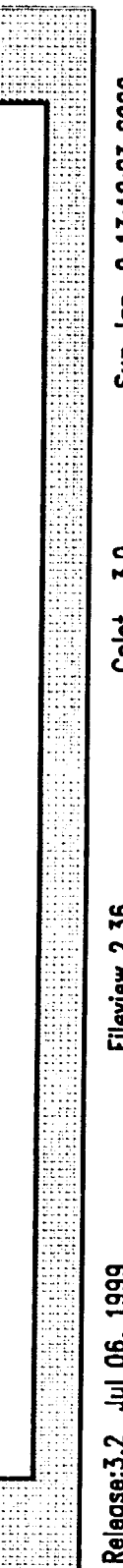
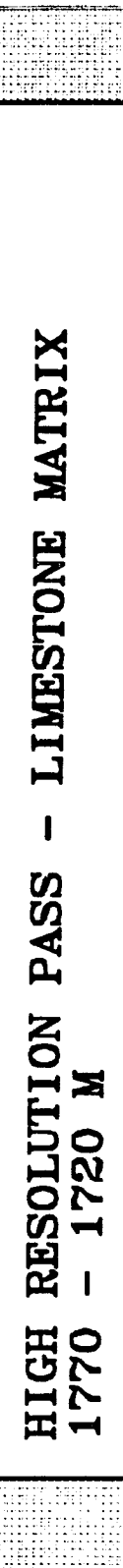
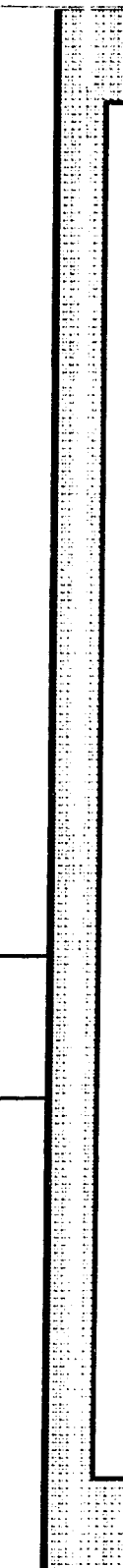
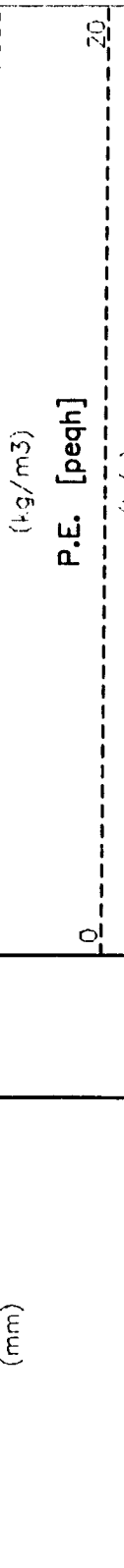
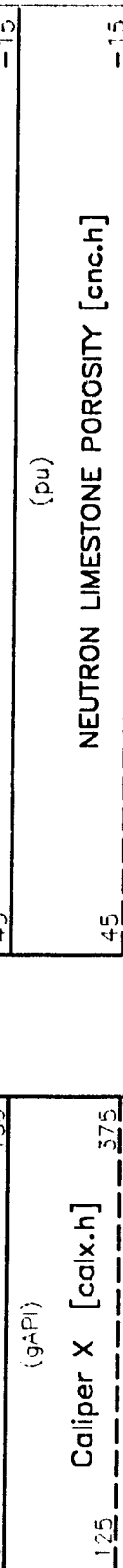
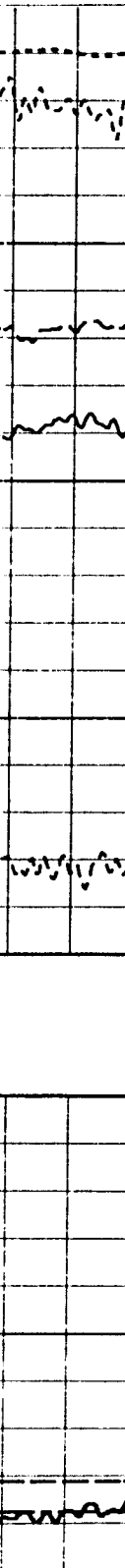
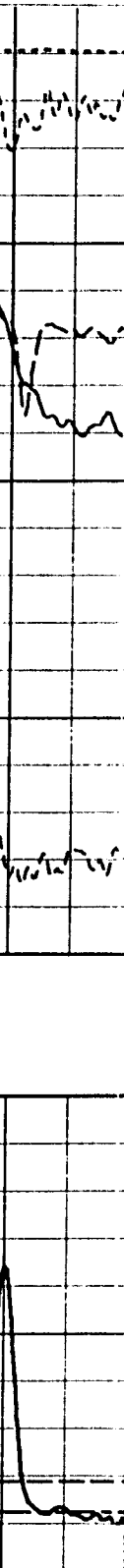
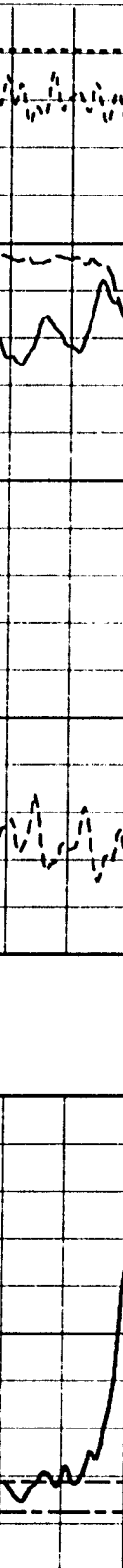
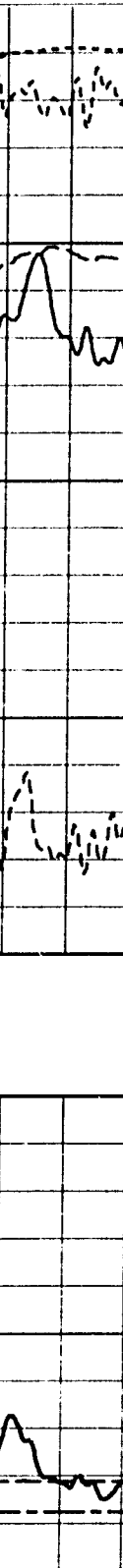
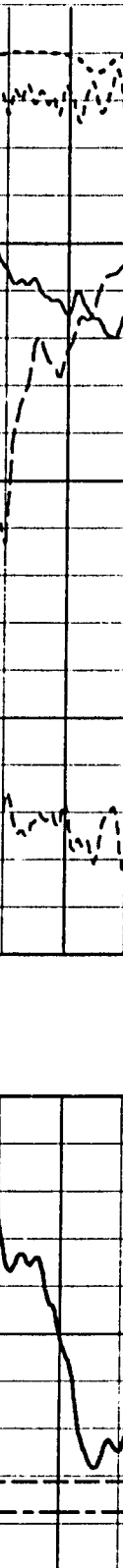
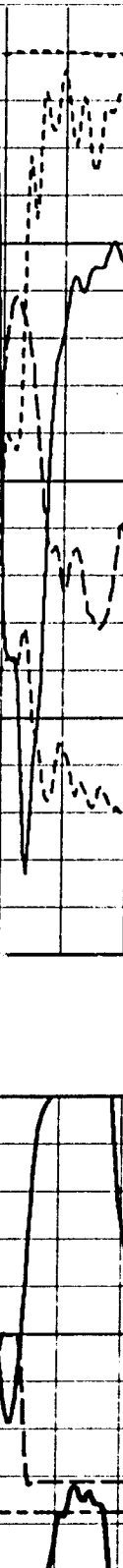
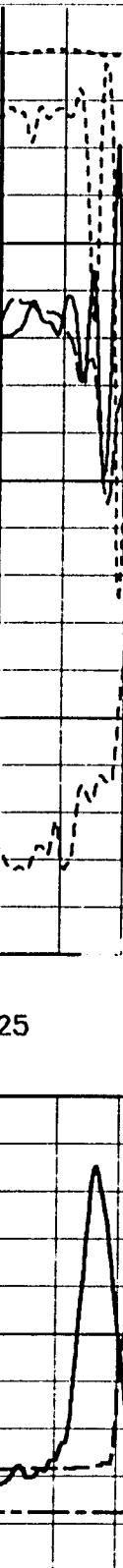
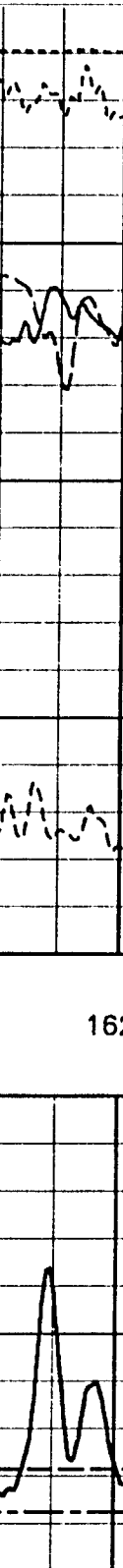
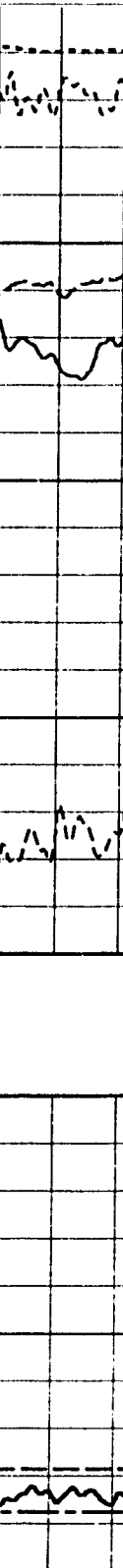
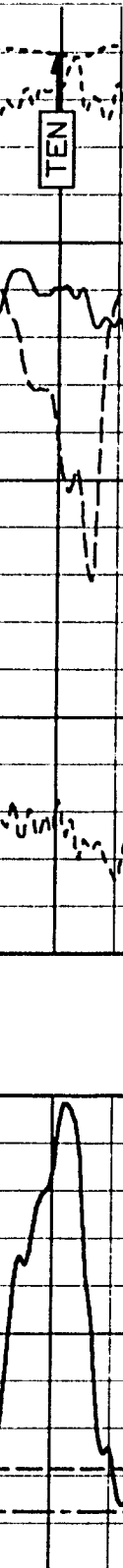
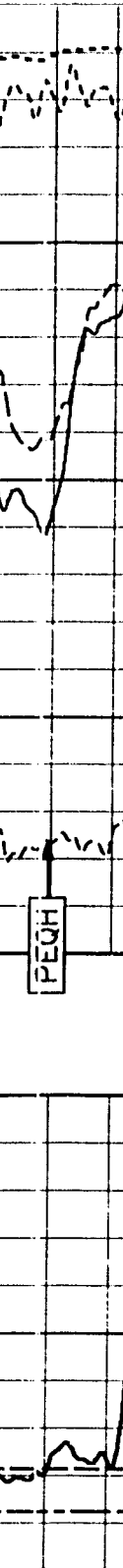
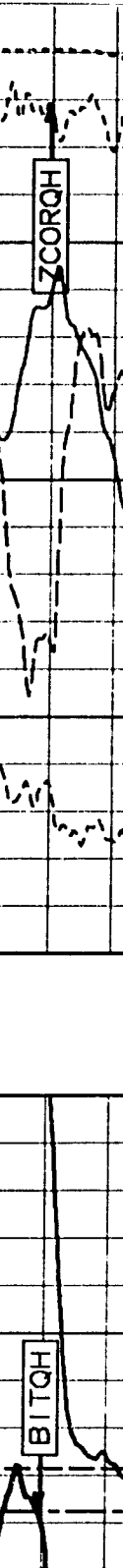
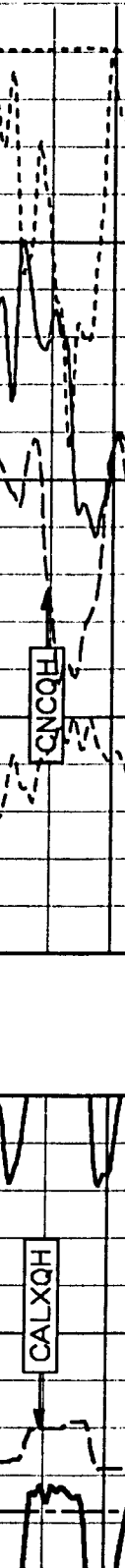
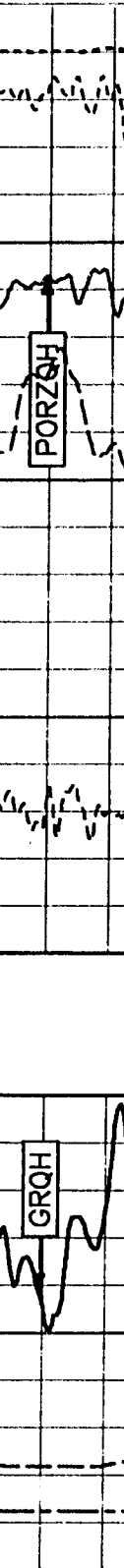
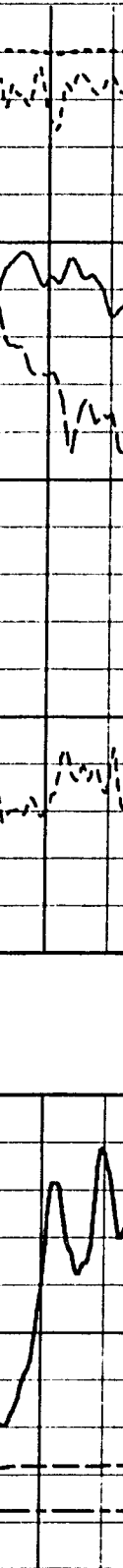
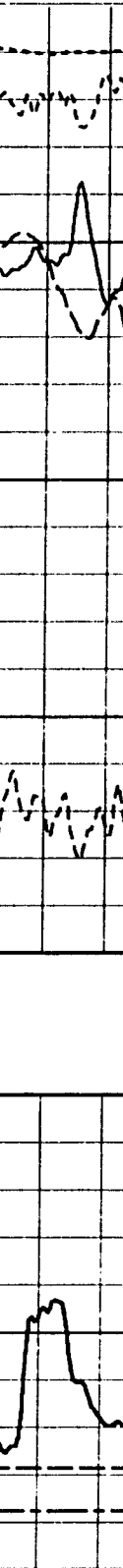
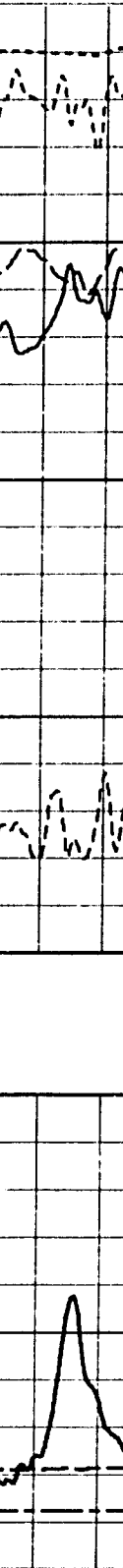
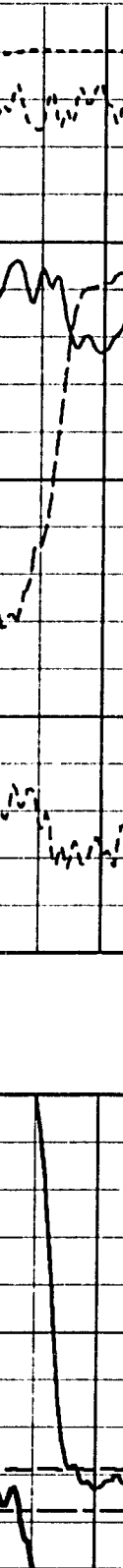
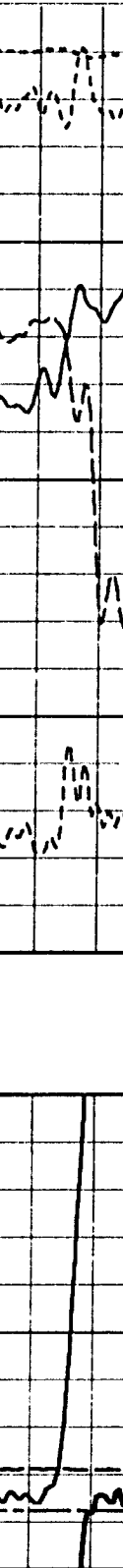
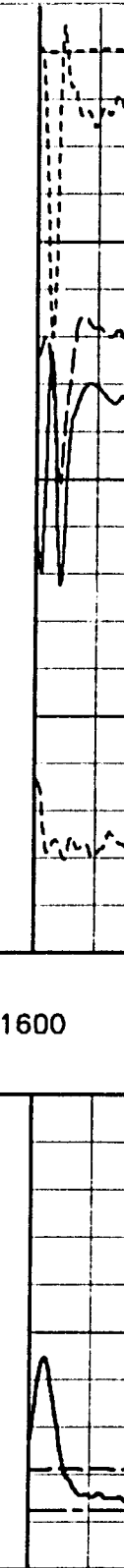
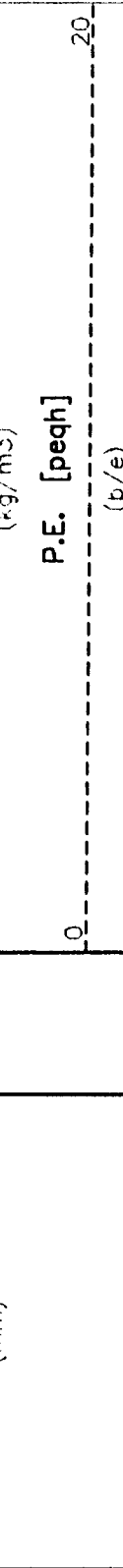
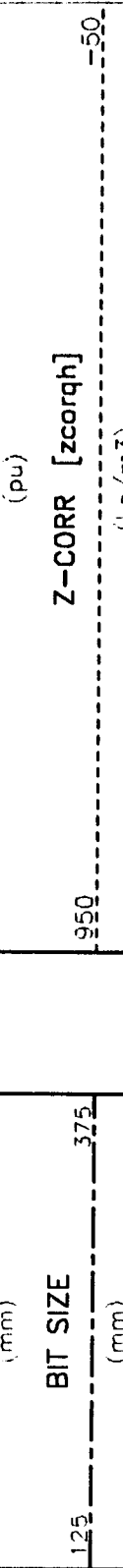
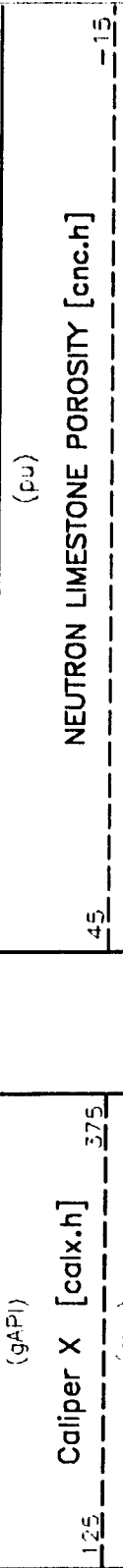
HIGH RESOLUTION PASS - LIMESTONE MATRIX

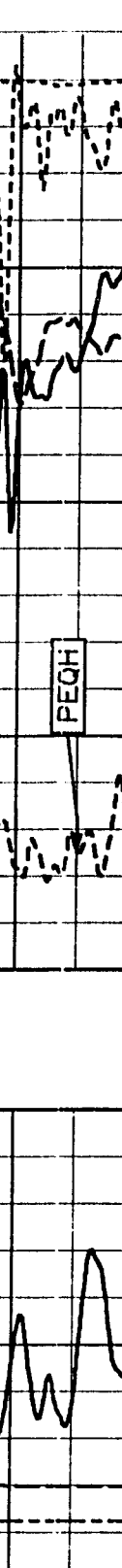
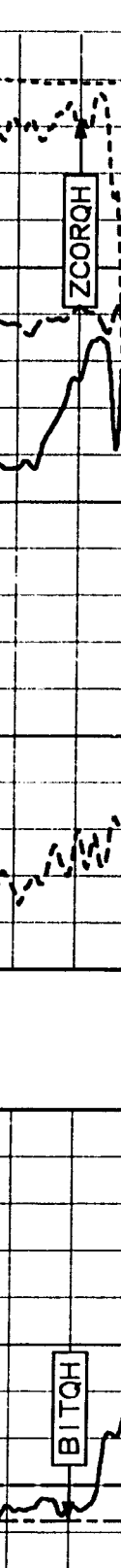
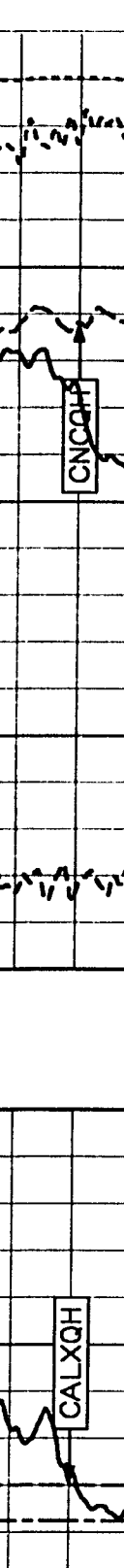
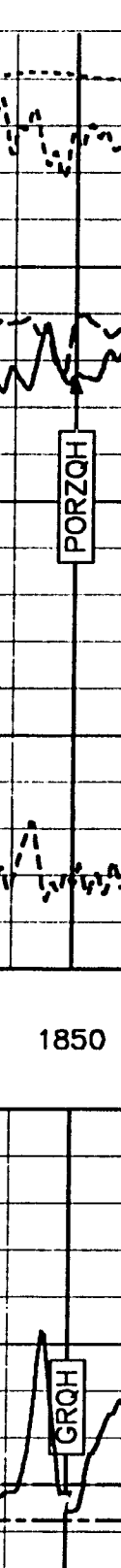
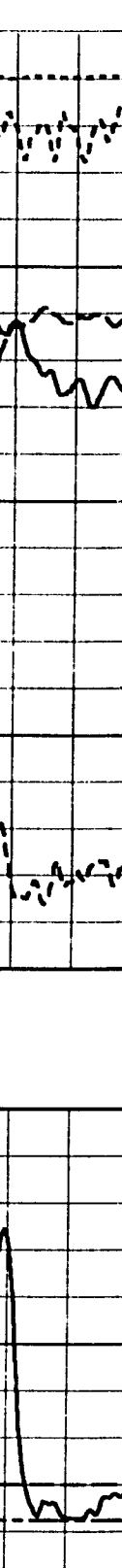
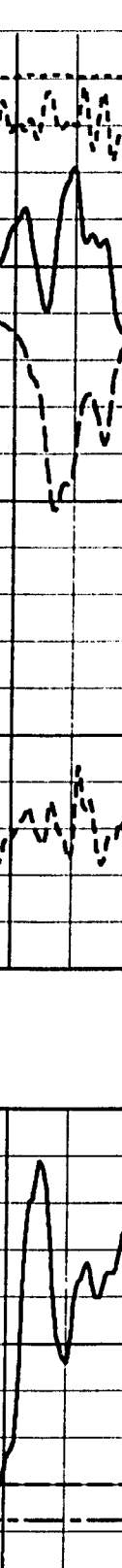
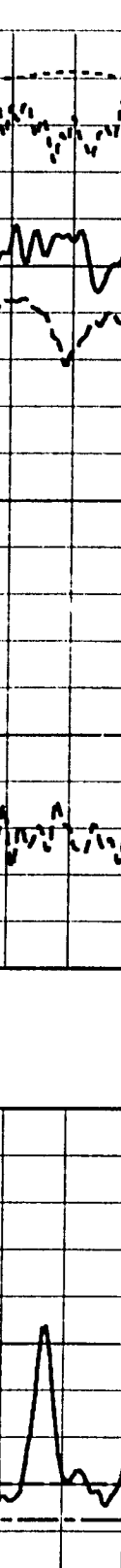
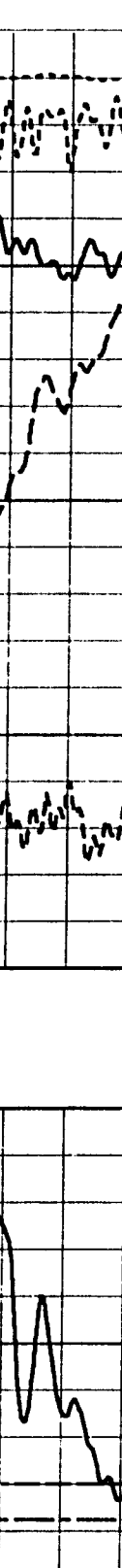
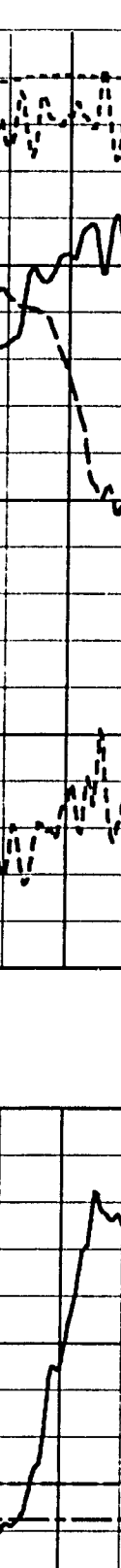
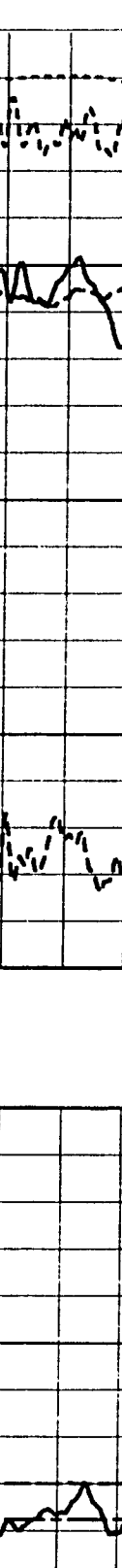
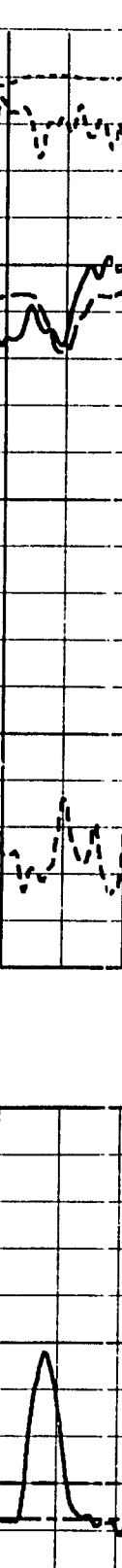
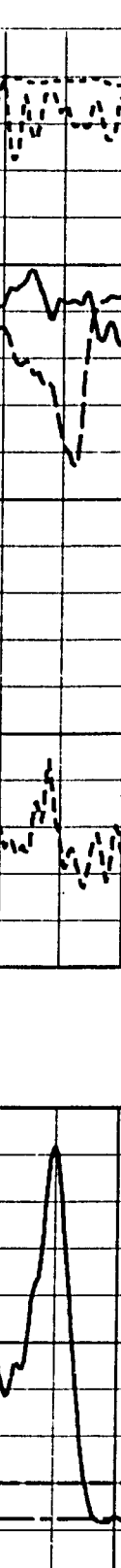
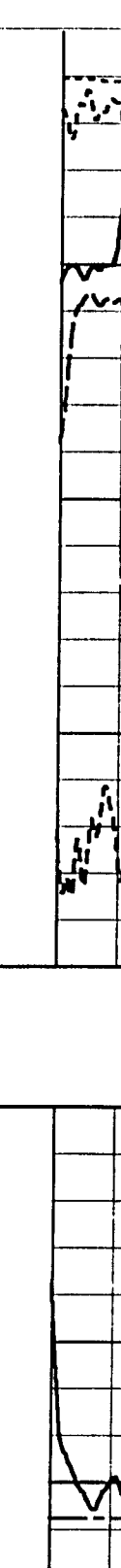
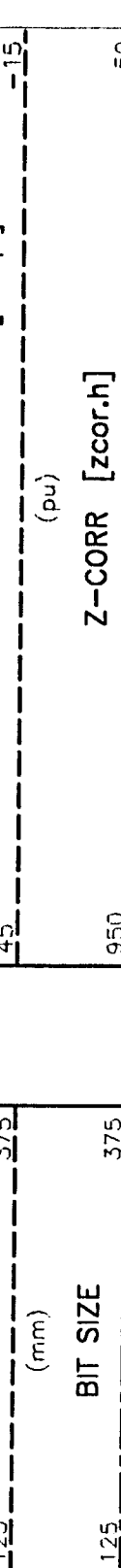
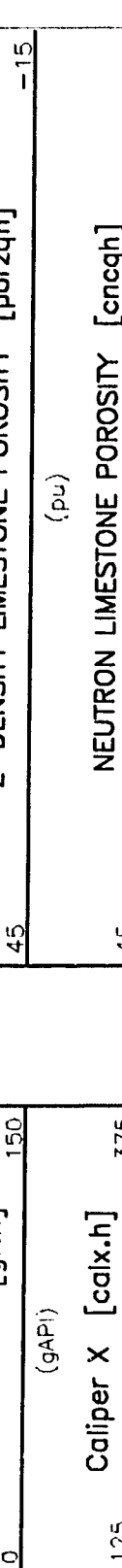
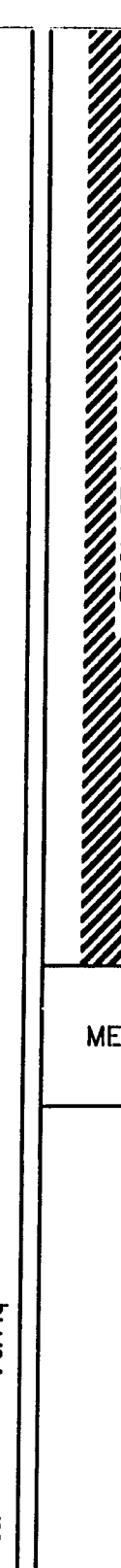
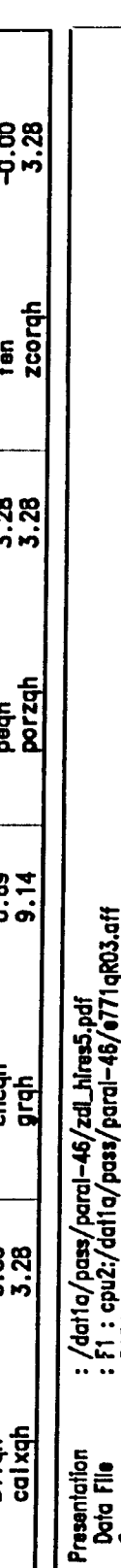
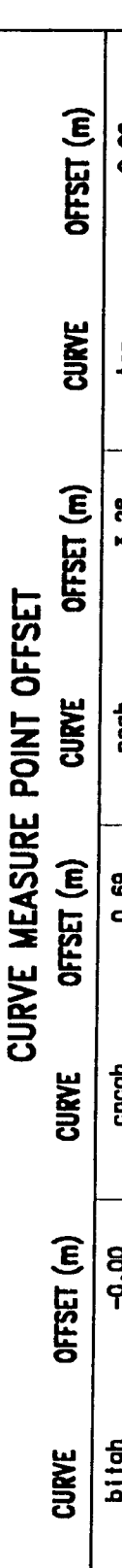
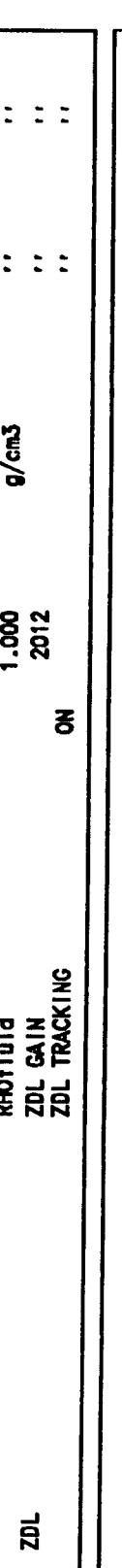
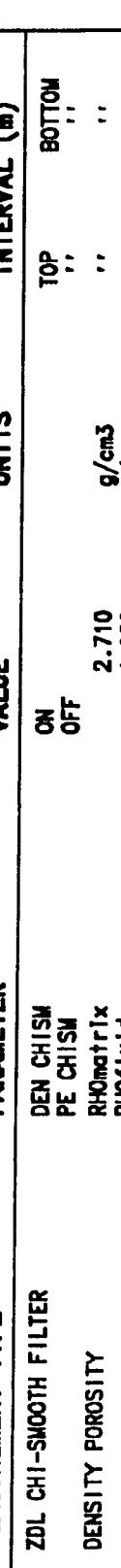
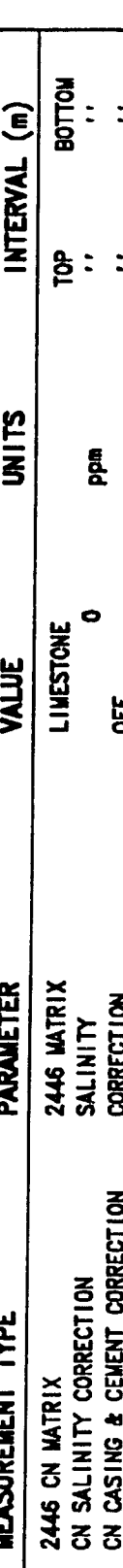
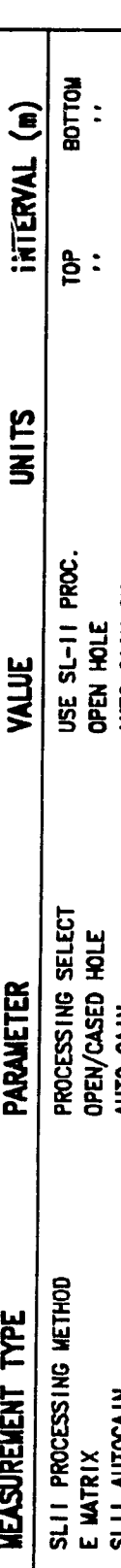
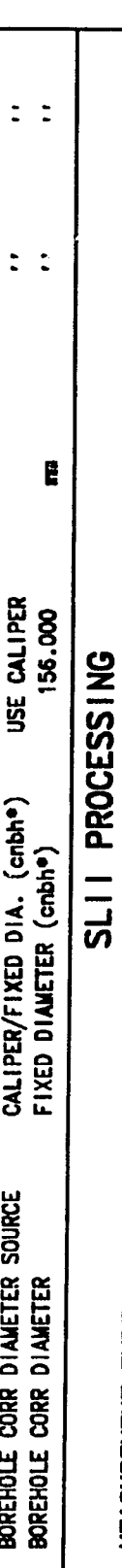
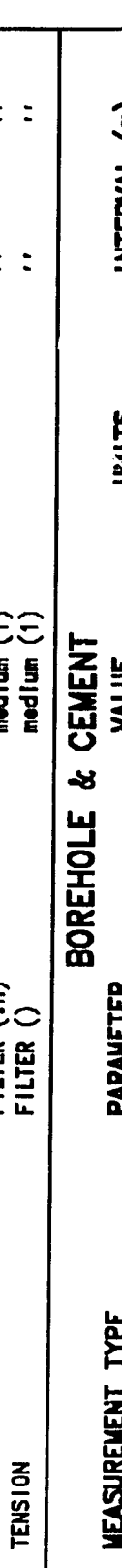
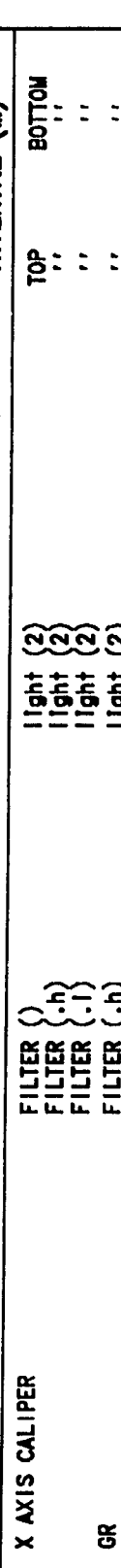
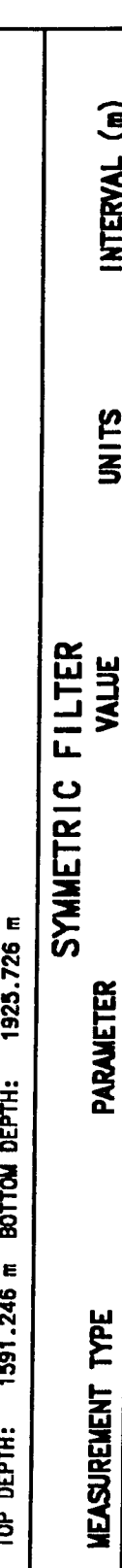
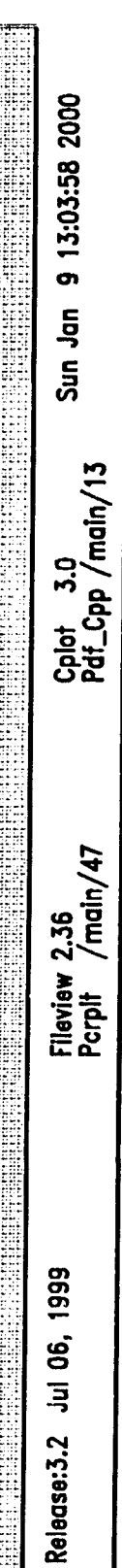
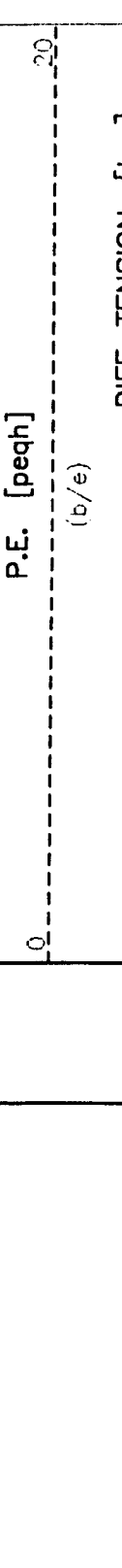
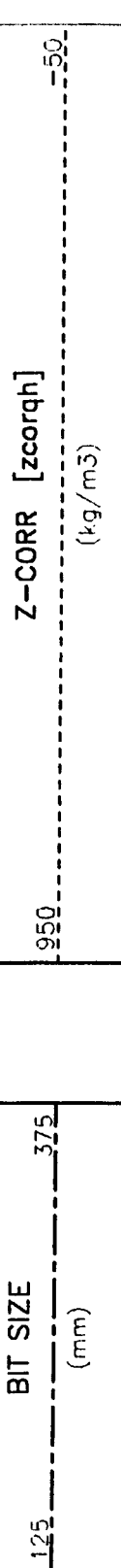
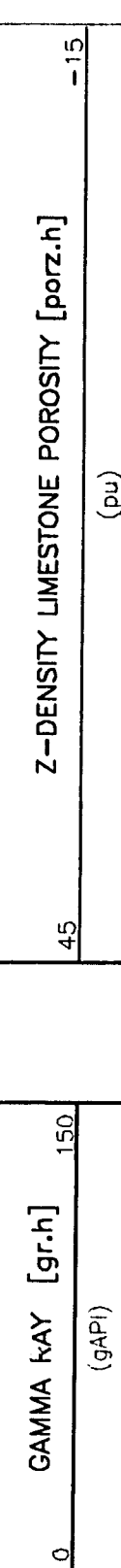
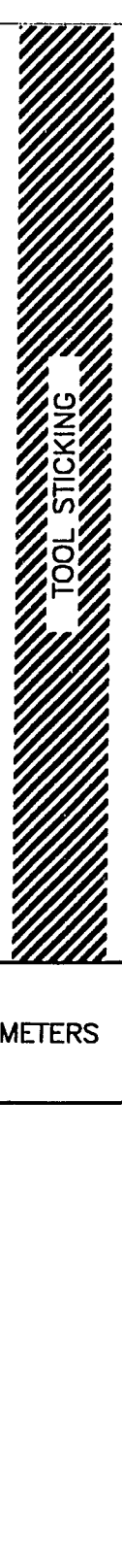
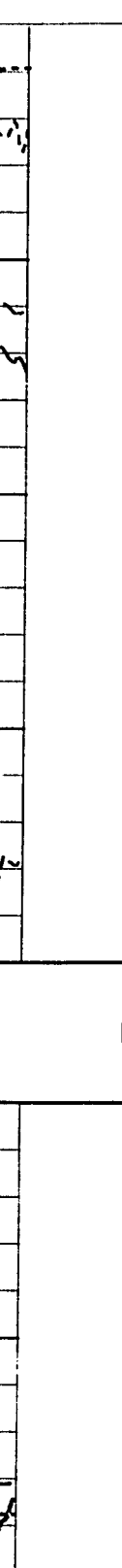
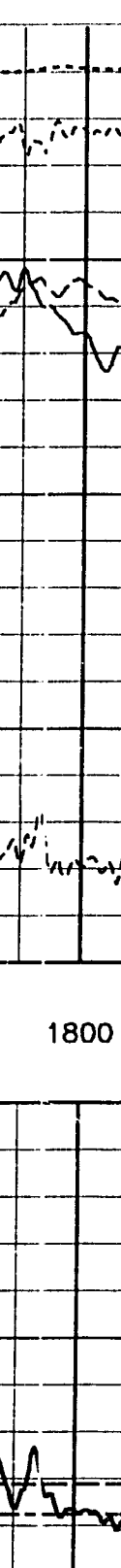
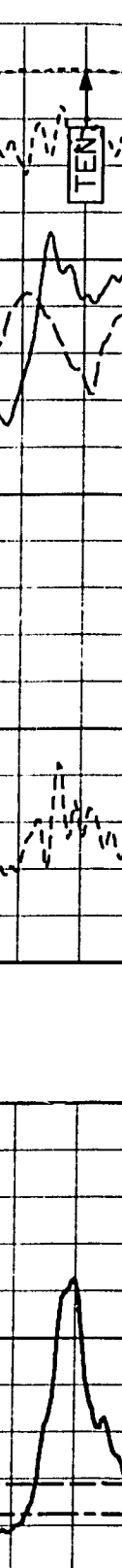
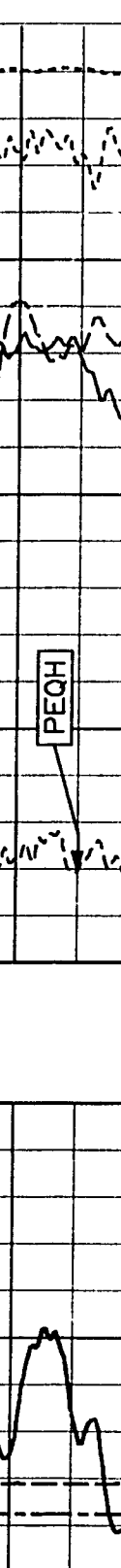
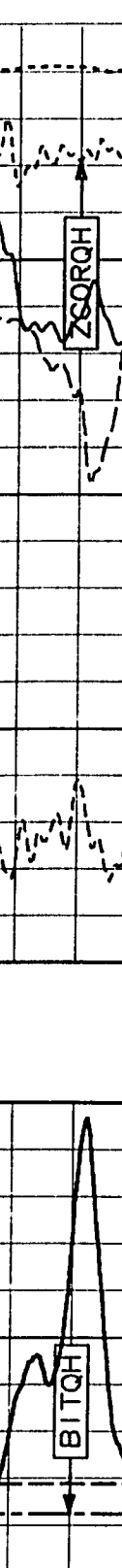
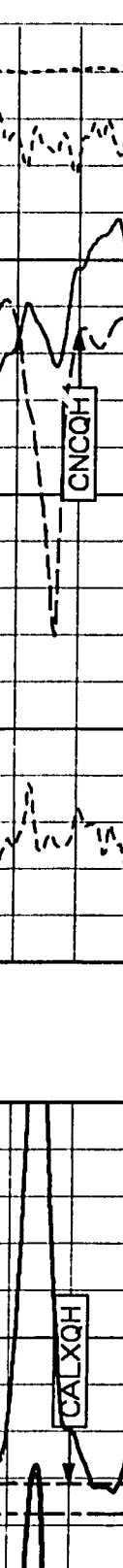
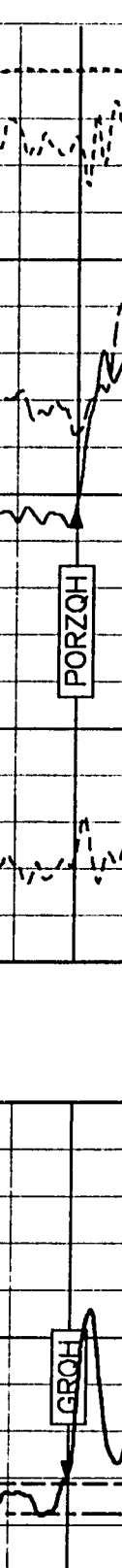
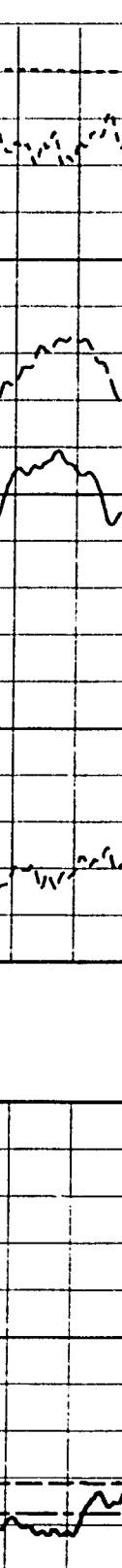
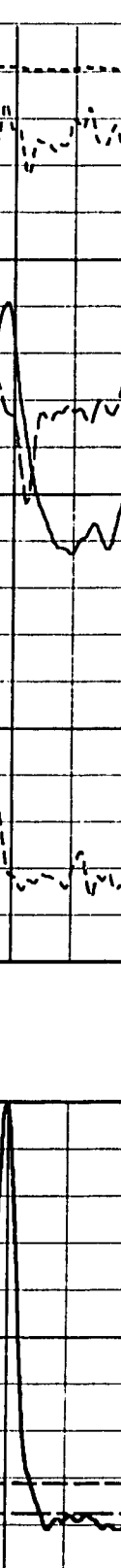
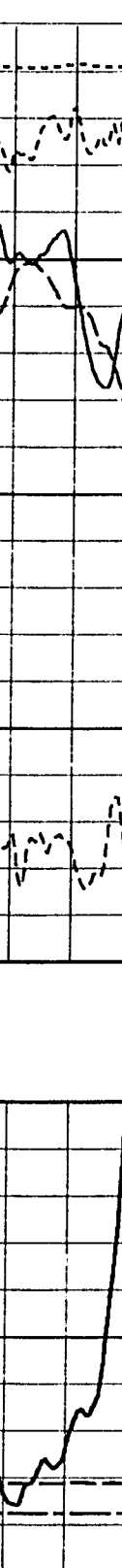
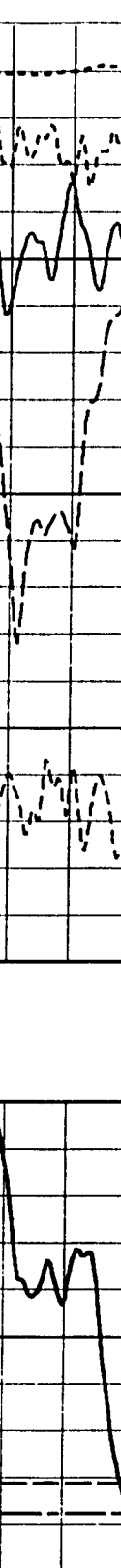
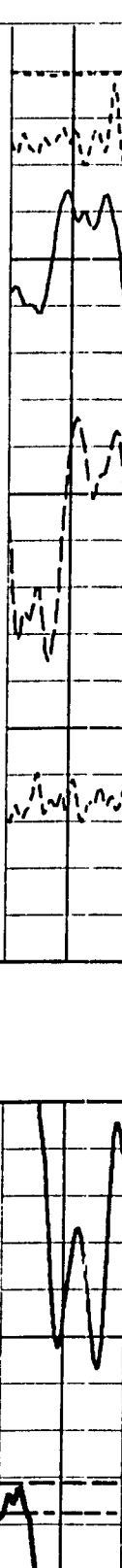
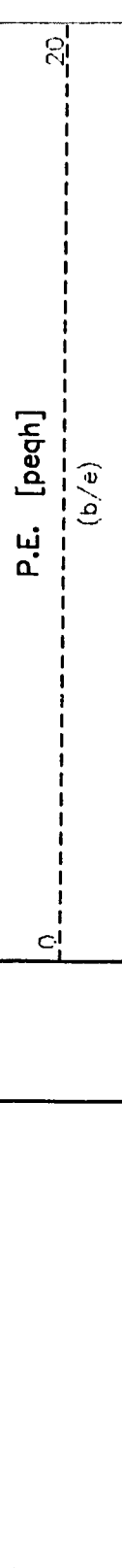
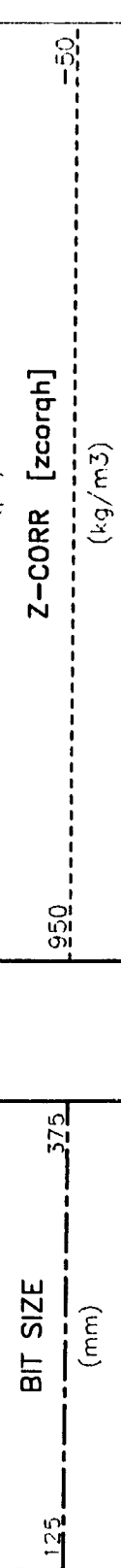
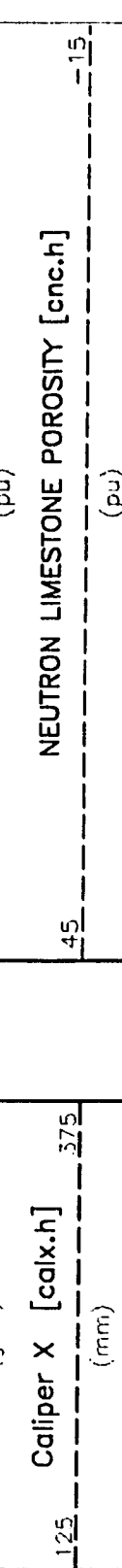
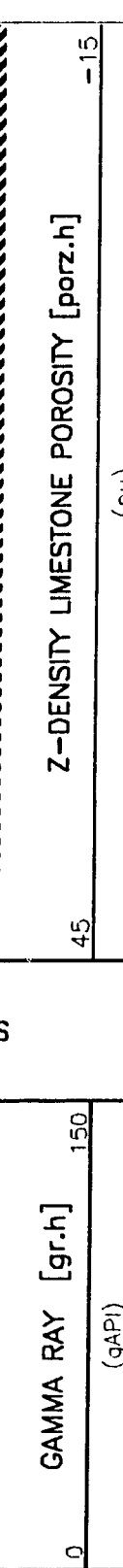
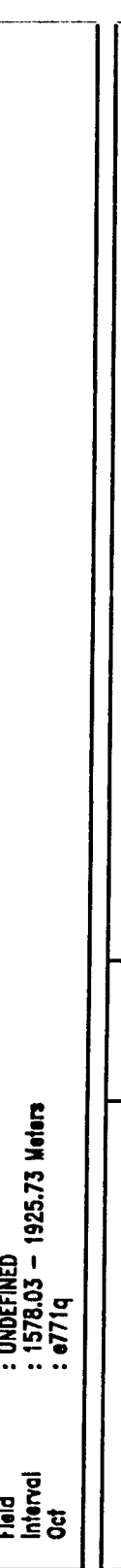
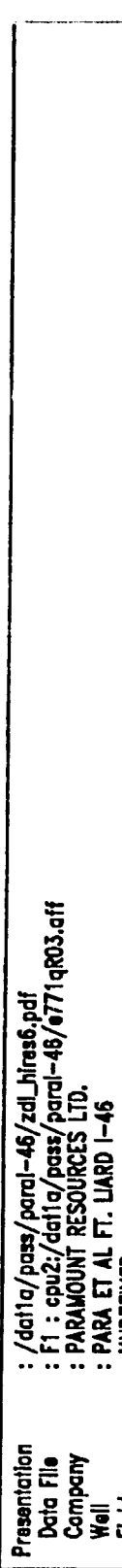
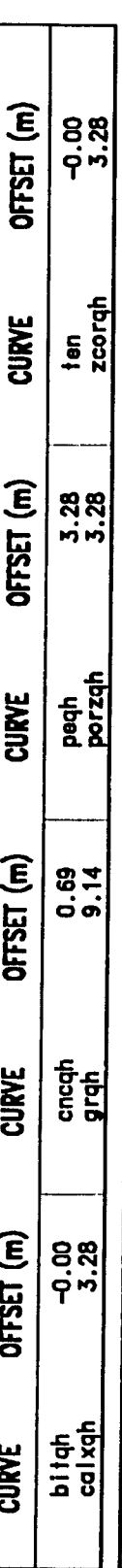
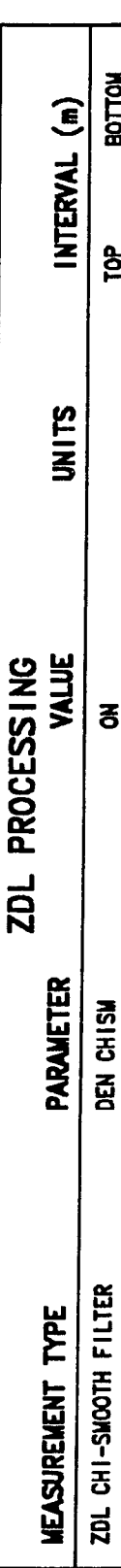
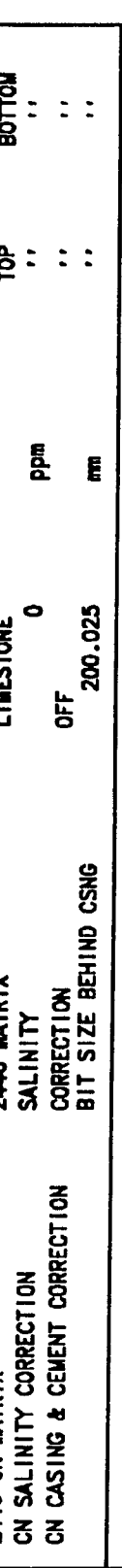
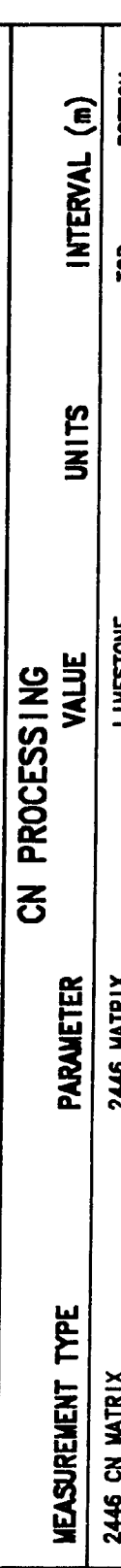
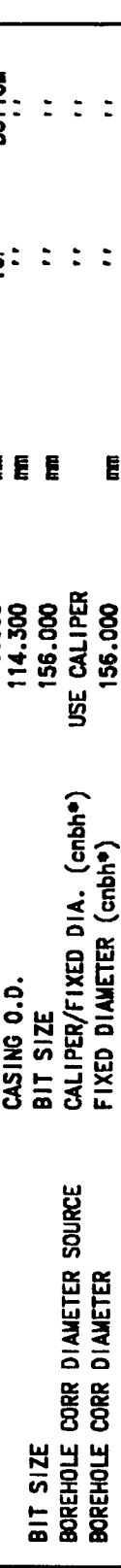
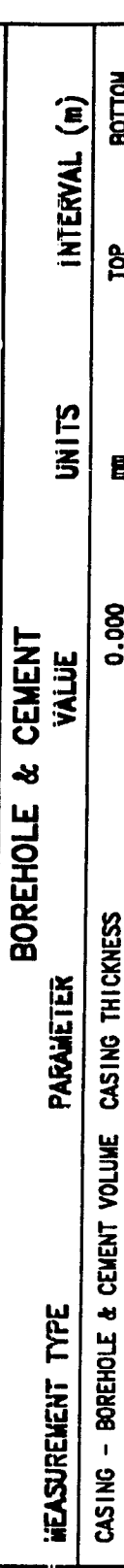
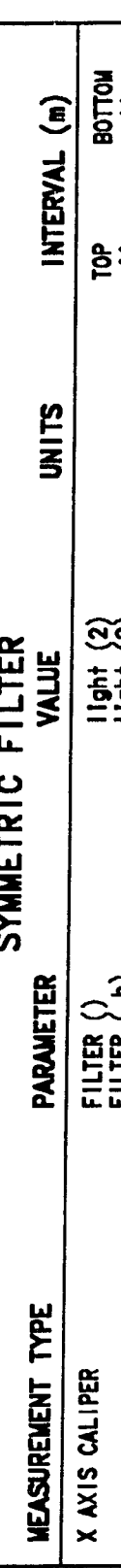
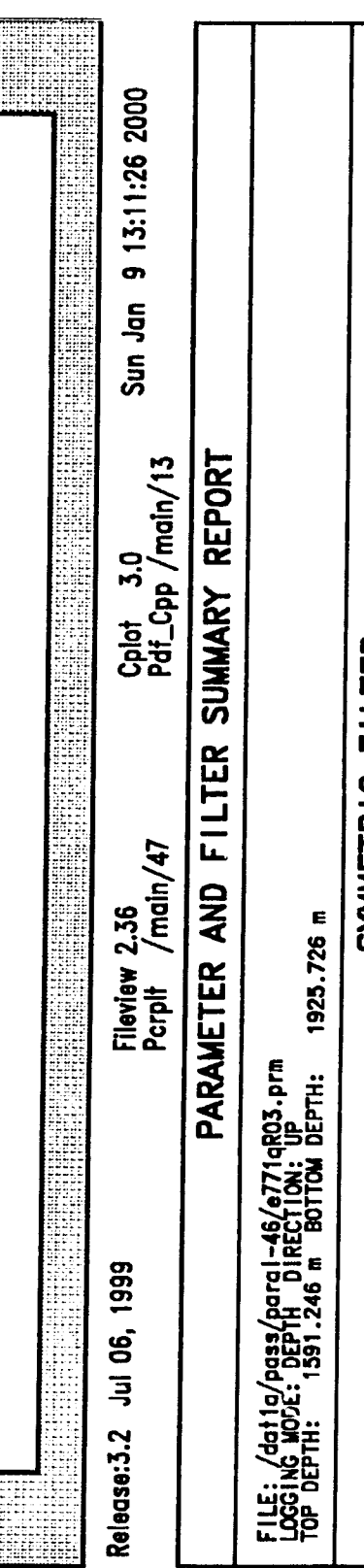
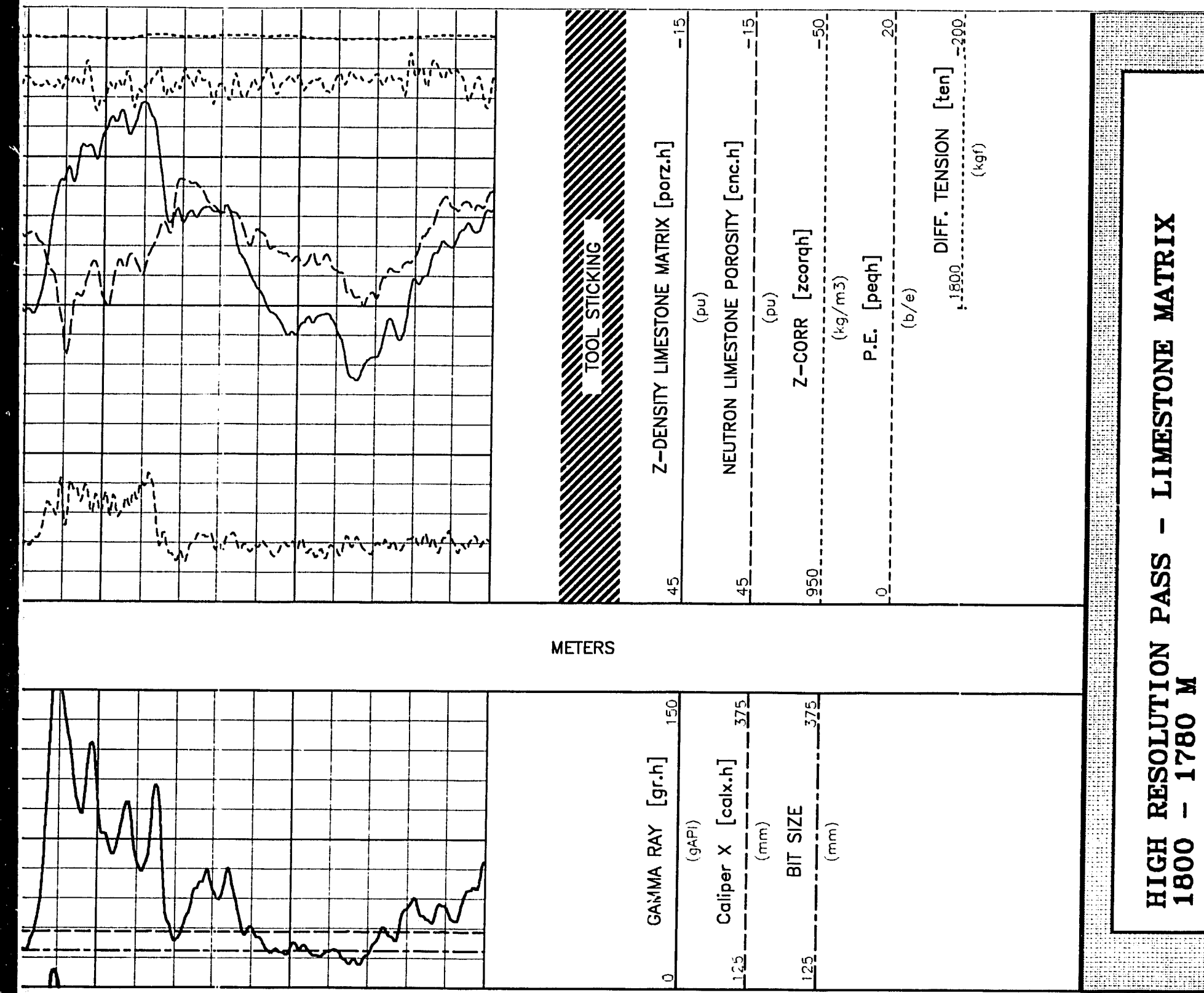
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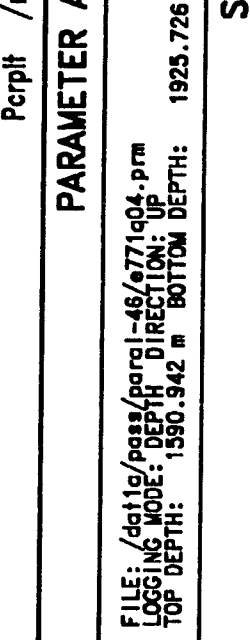
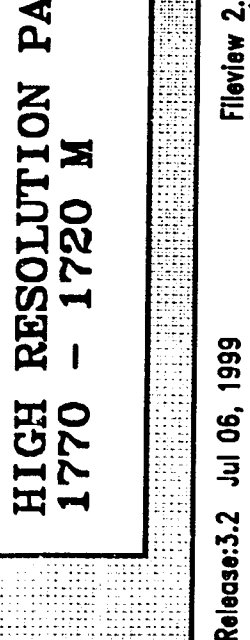
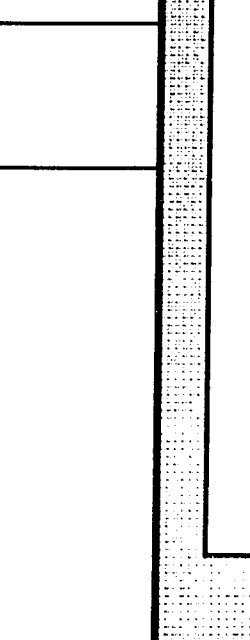
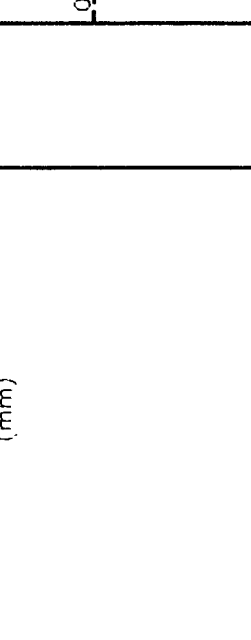
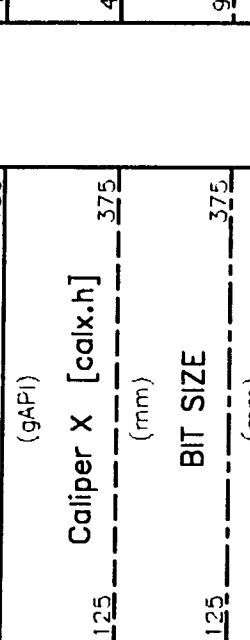
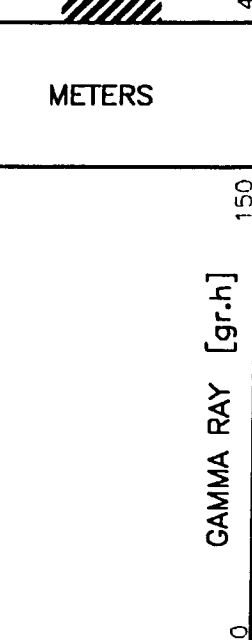
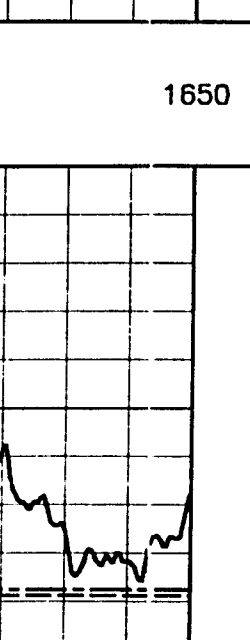
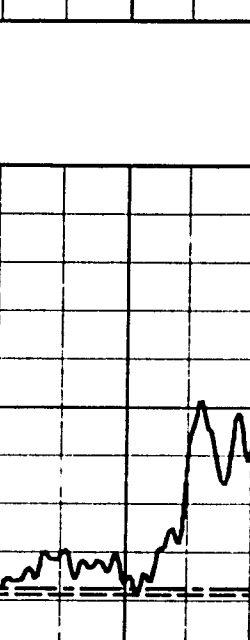
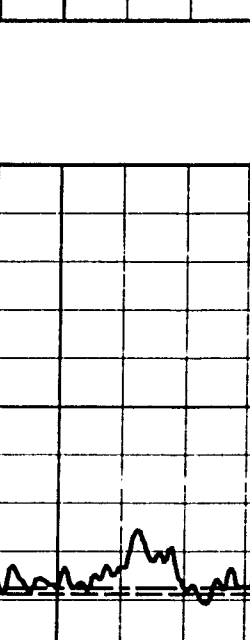
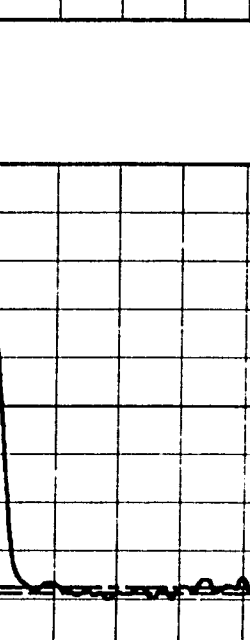
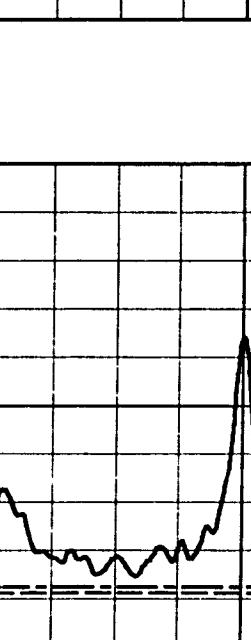
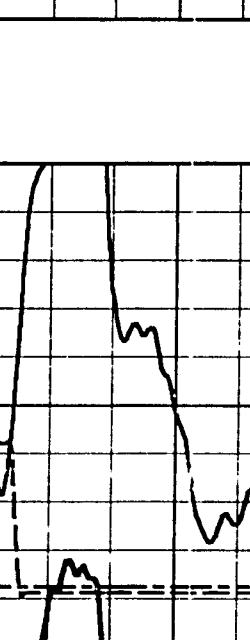
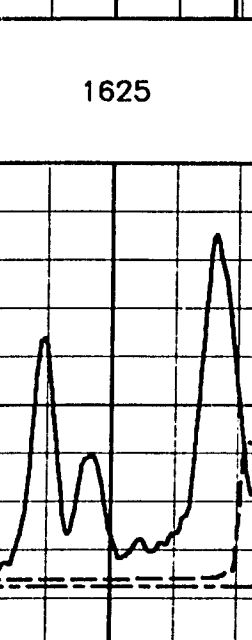
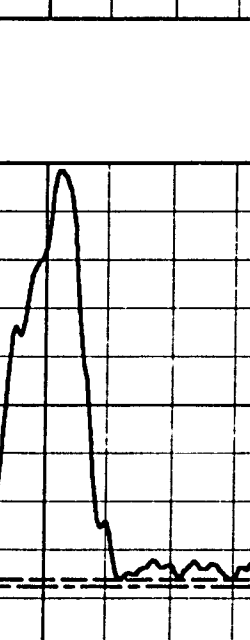
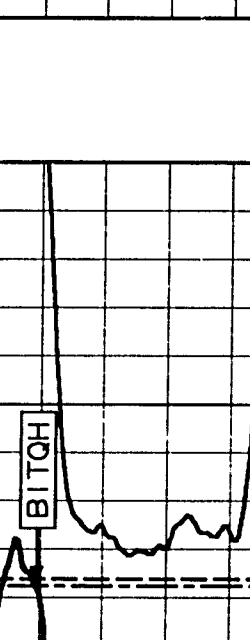
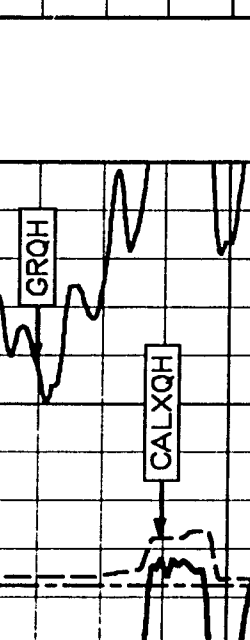
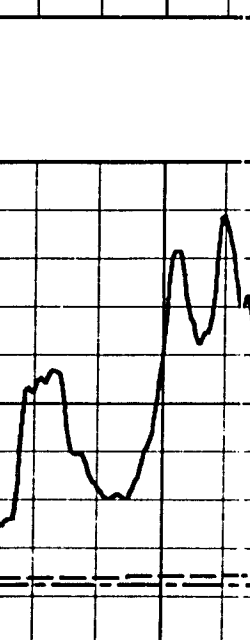
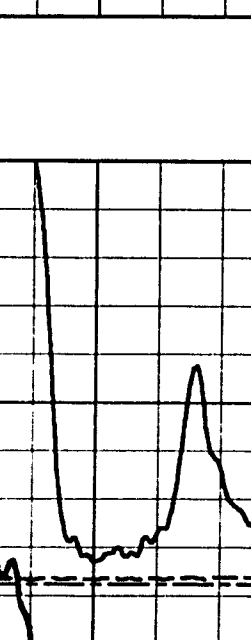
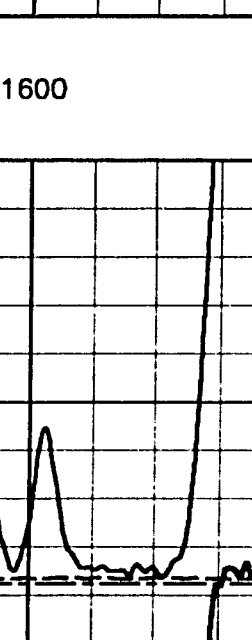
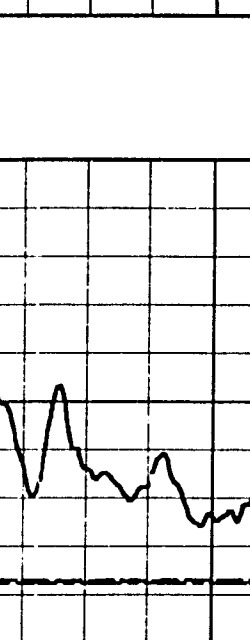
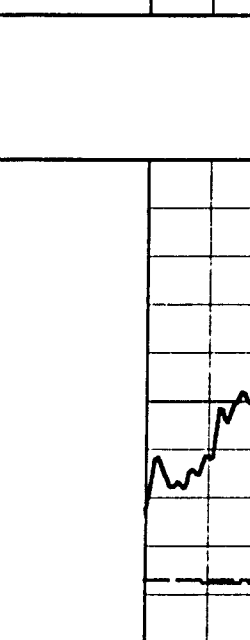
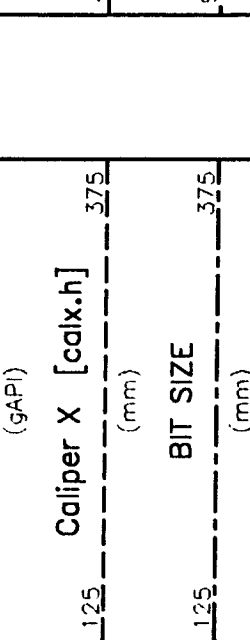
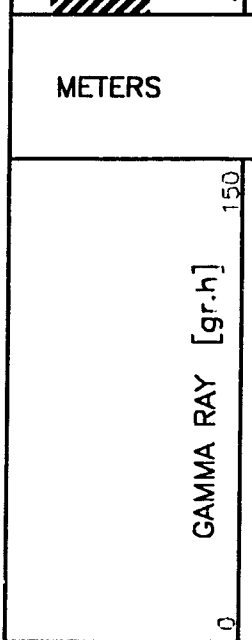
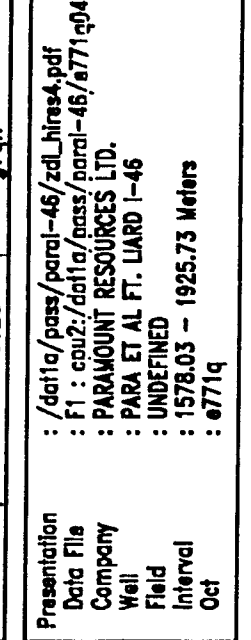
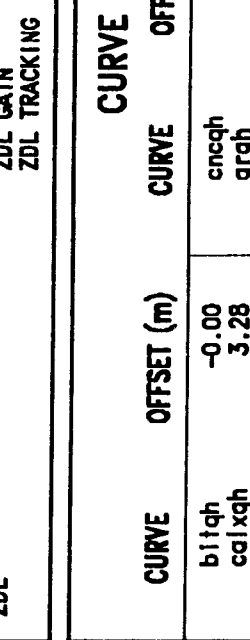
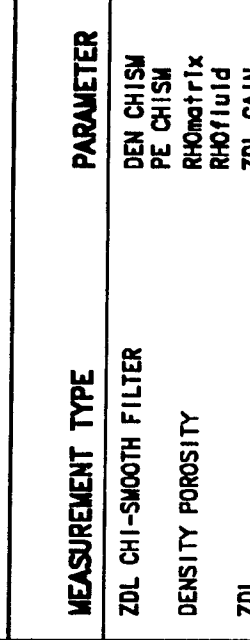
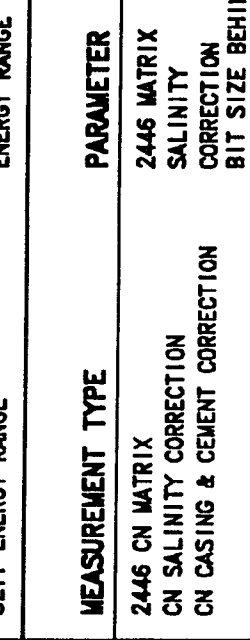
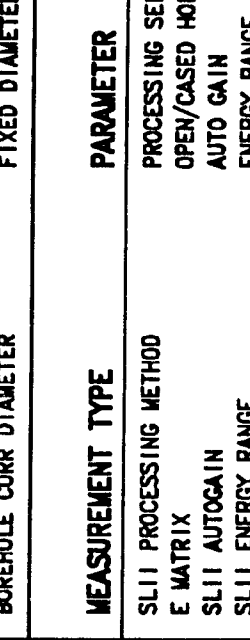
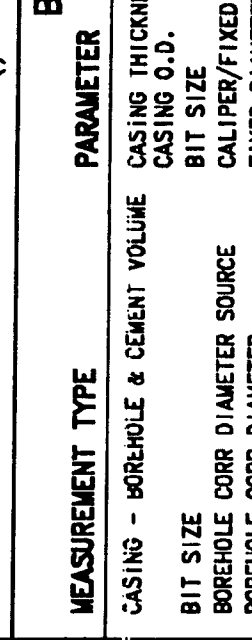
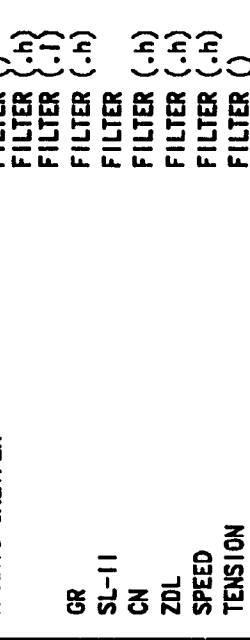
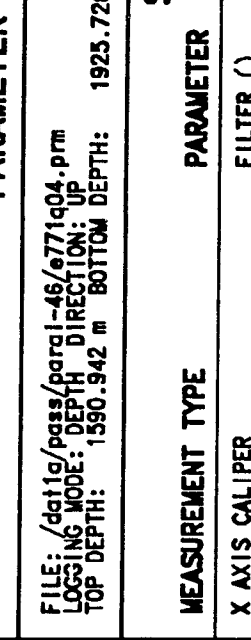
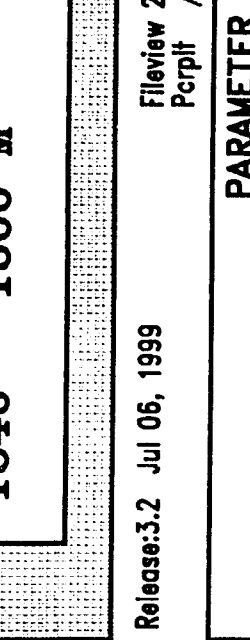
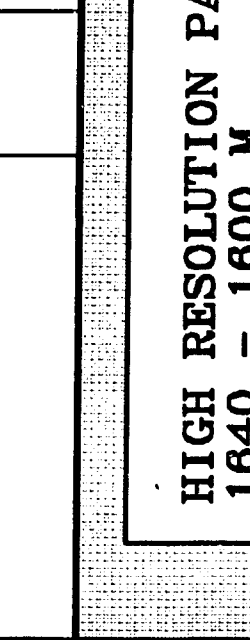
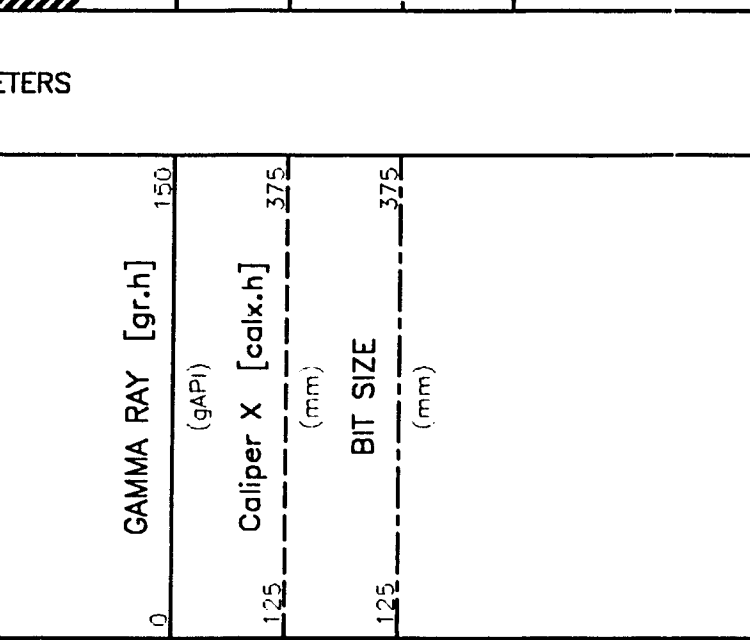
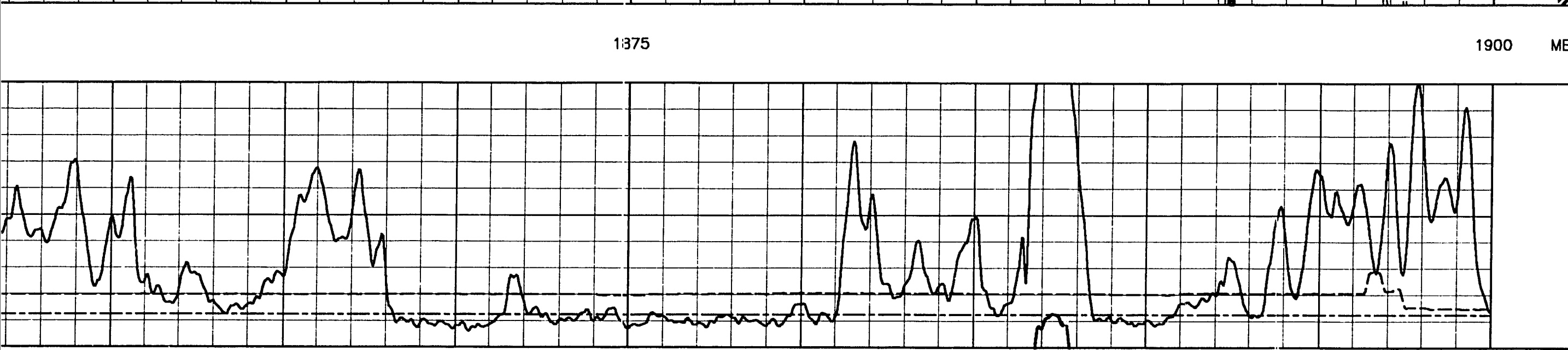
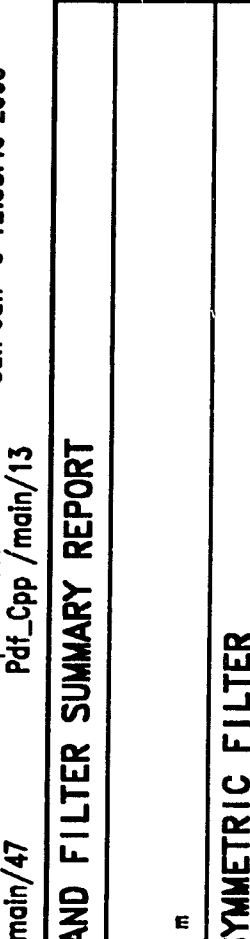
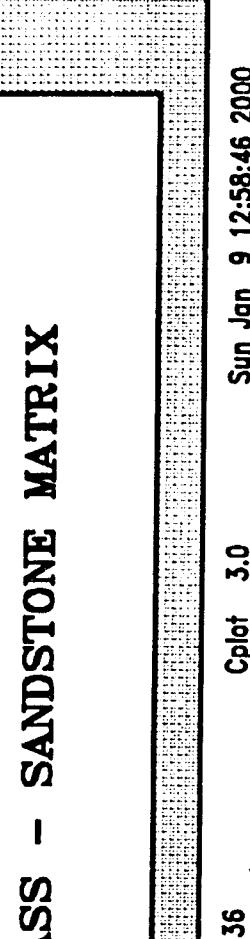
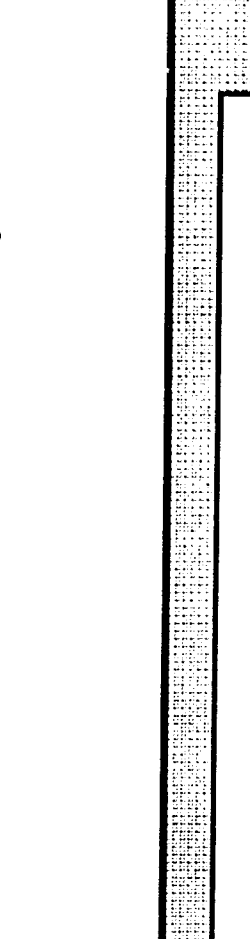
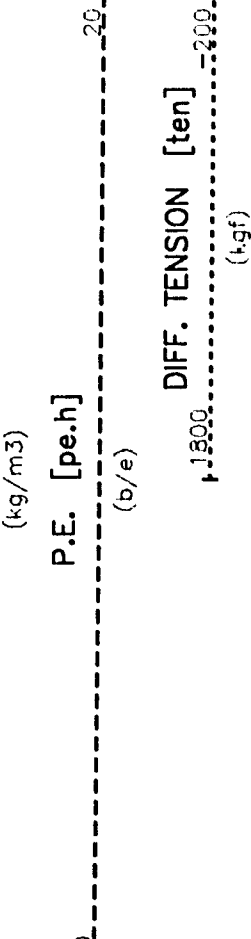
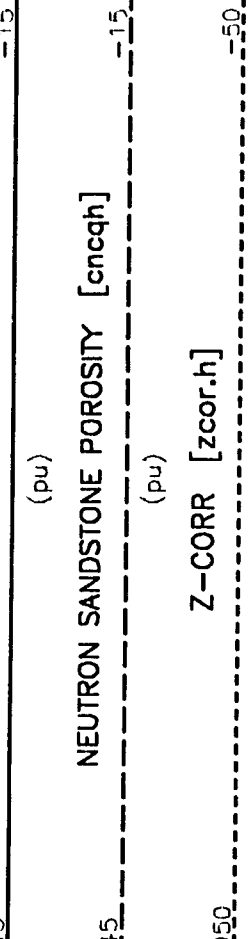
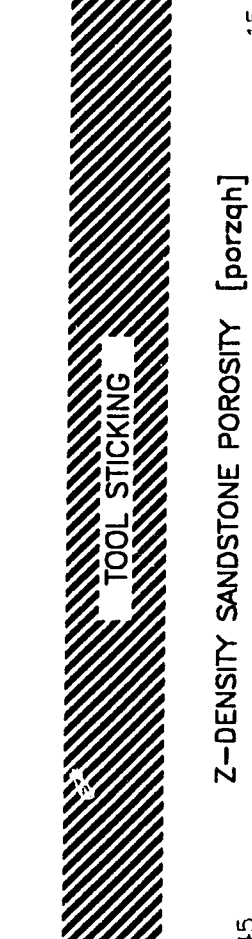
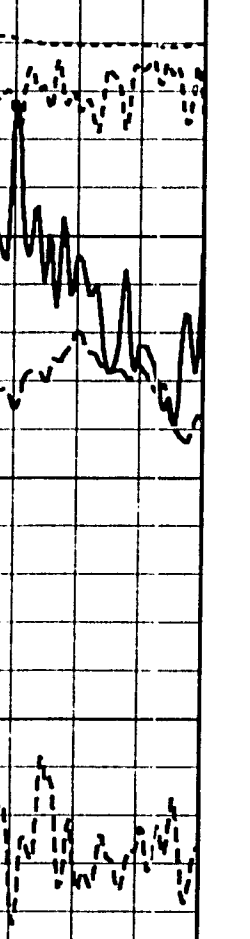
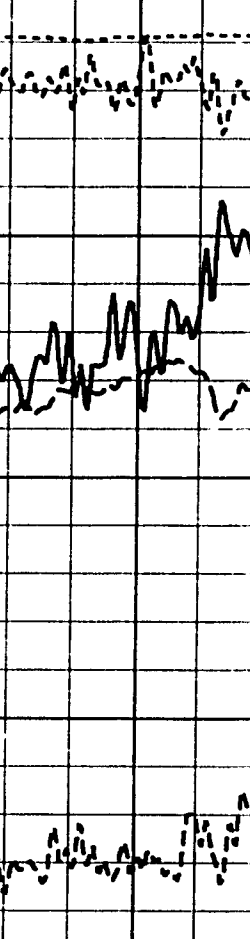
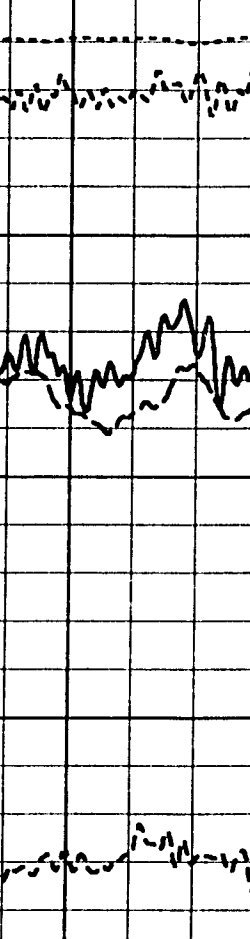
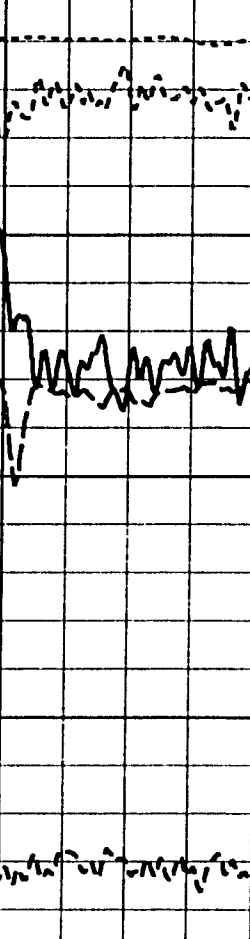
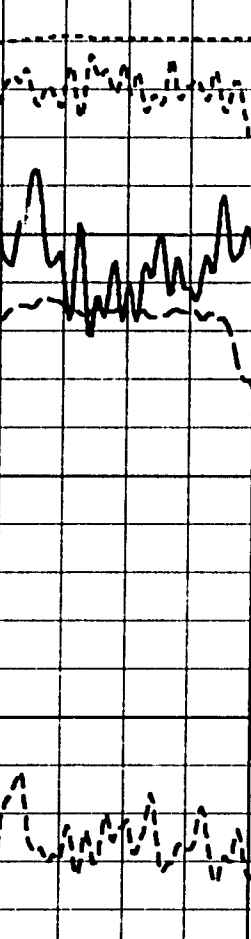
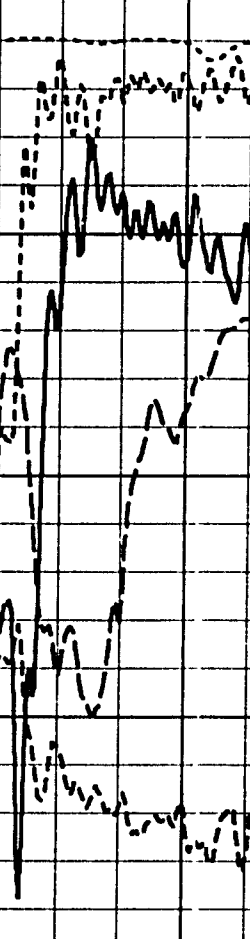
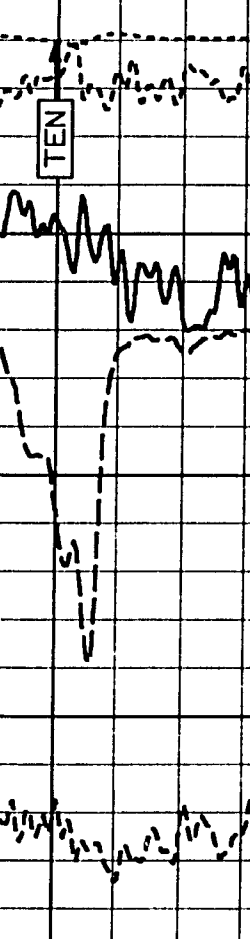
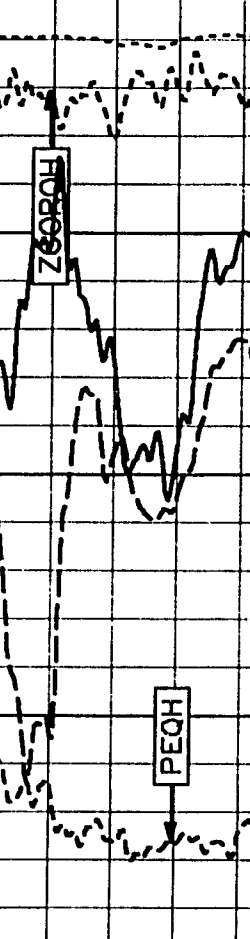
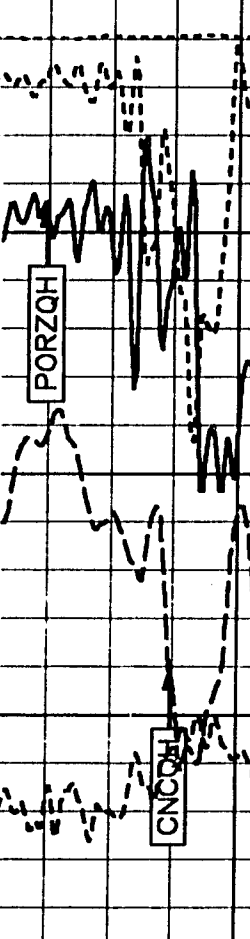
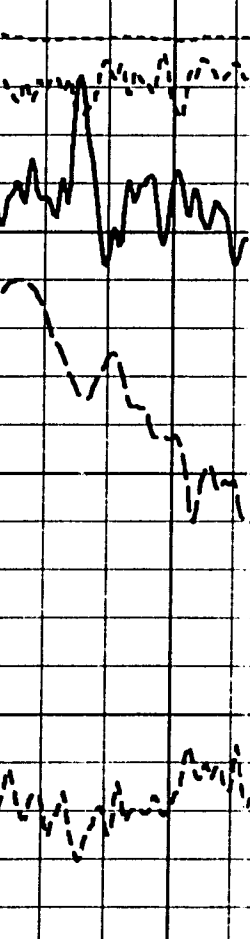
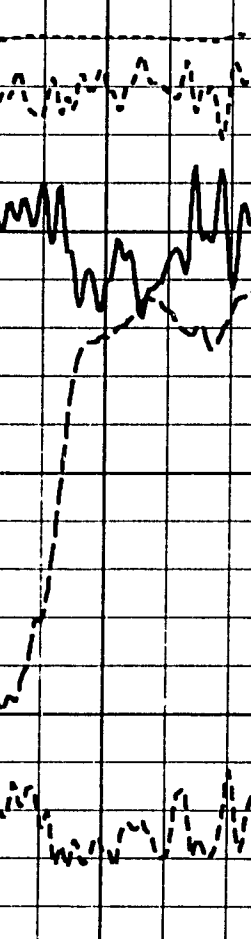
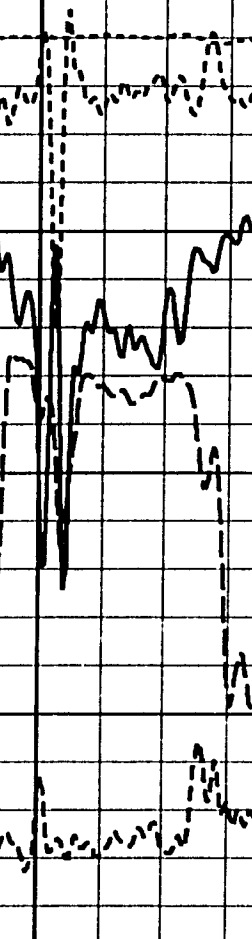
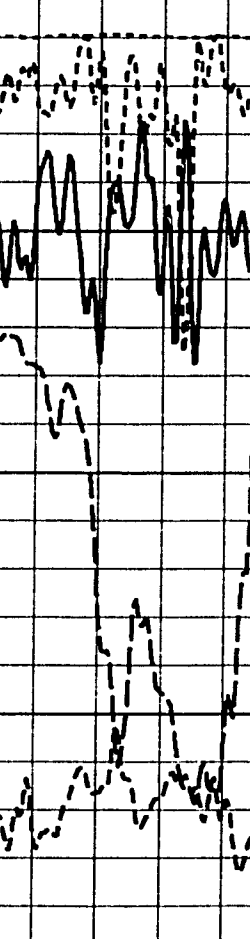
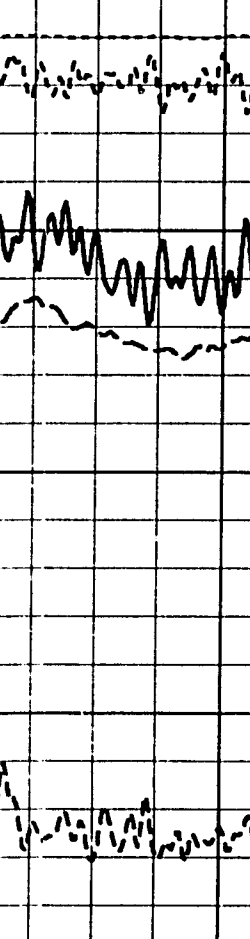
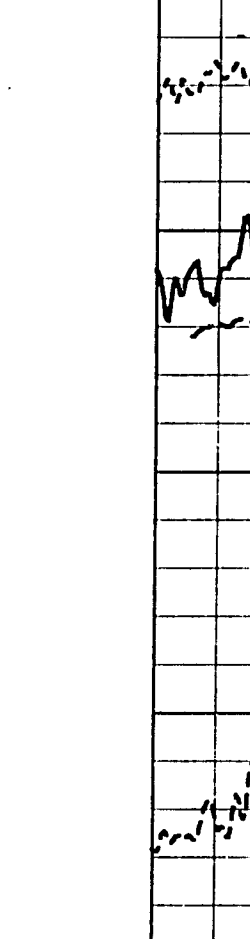
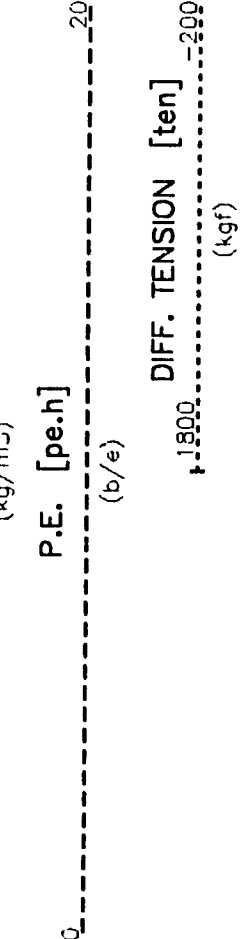
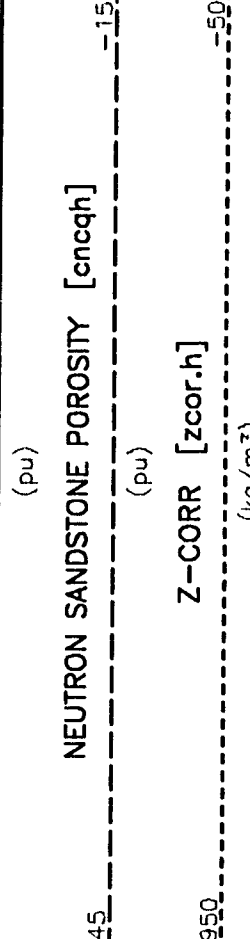
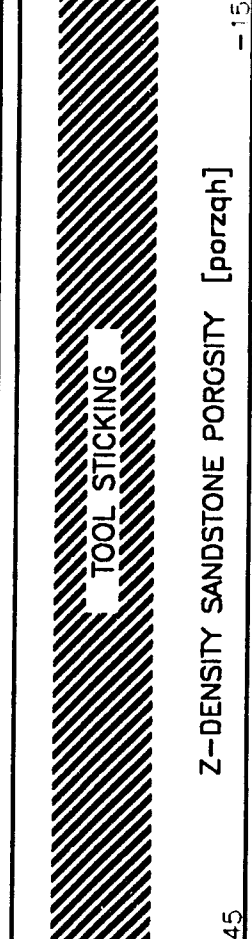
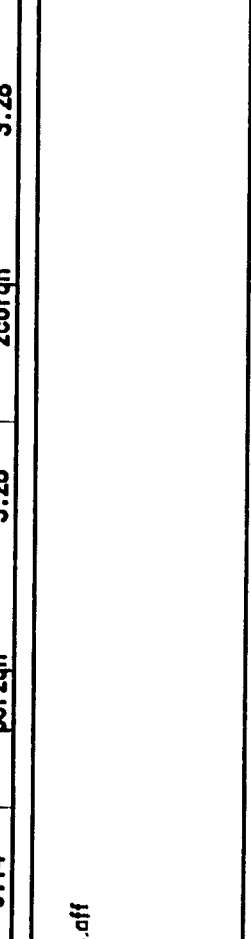
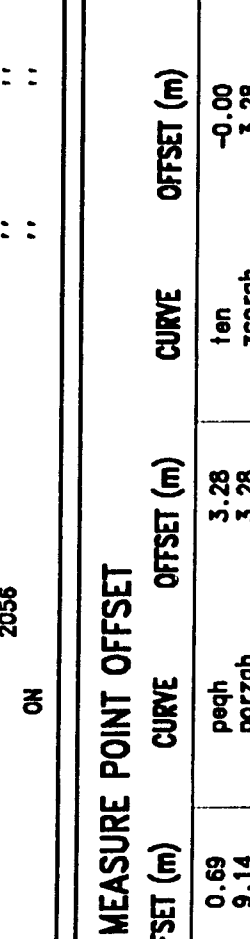
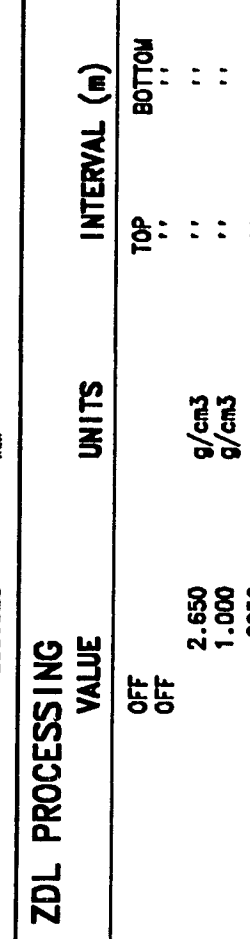
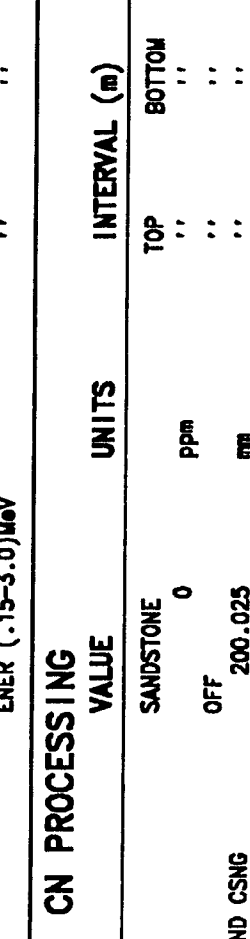
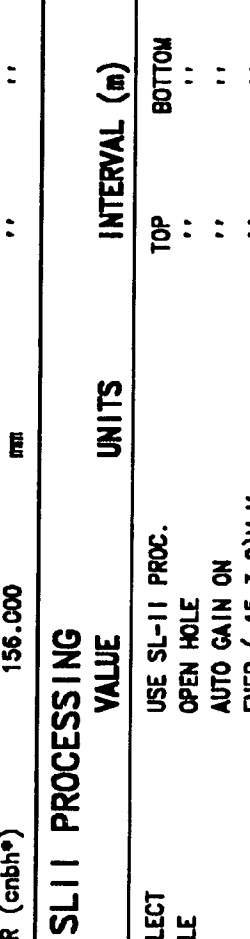
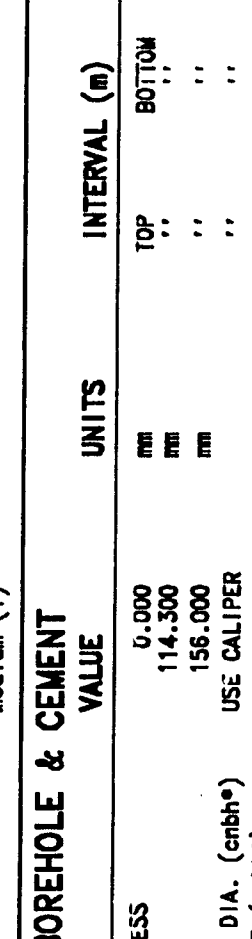
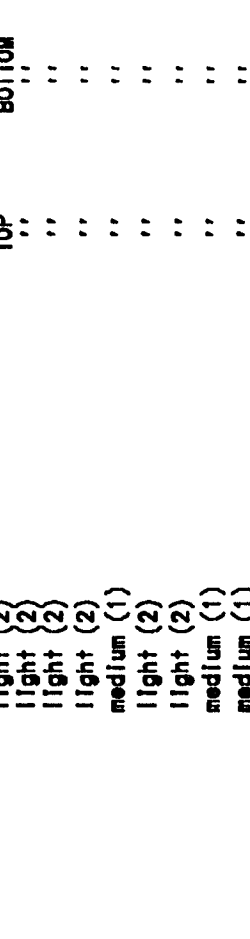
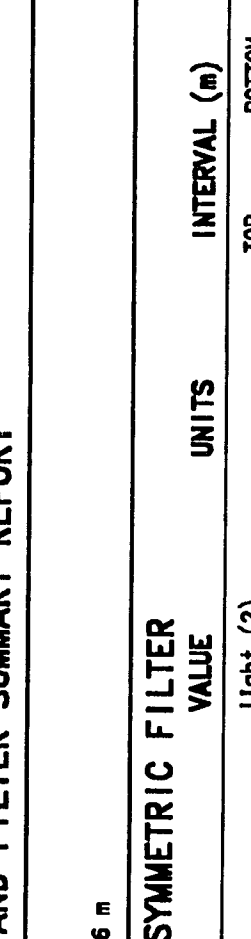
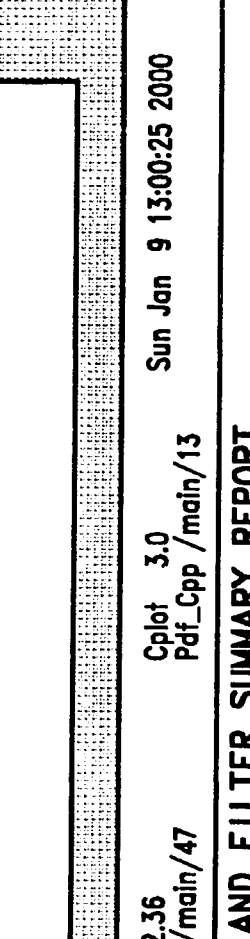
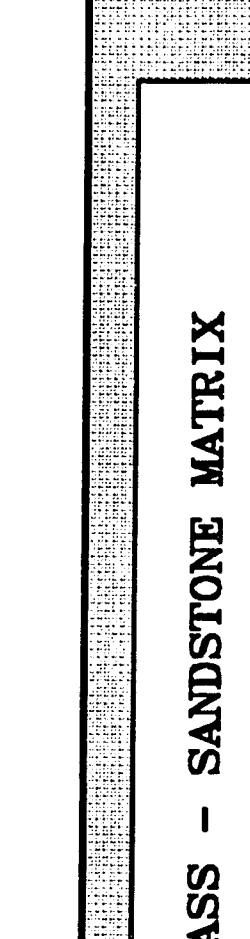
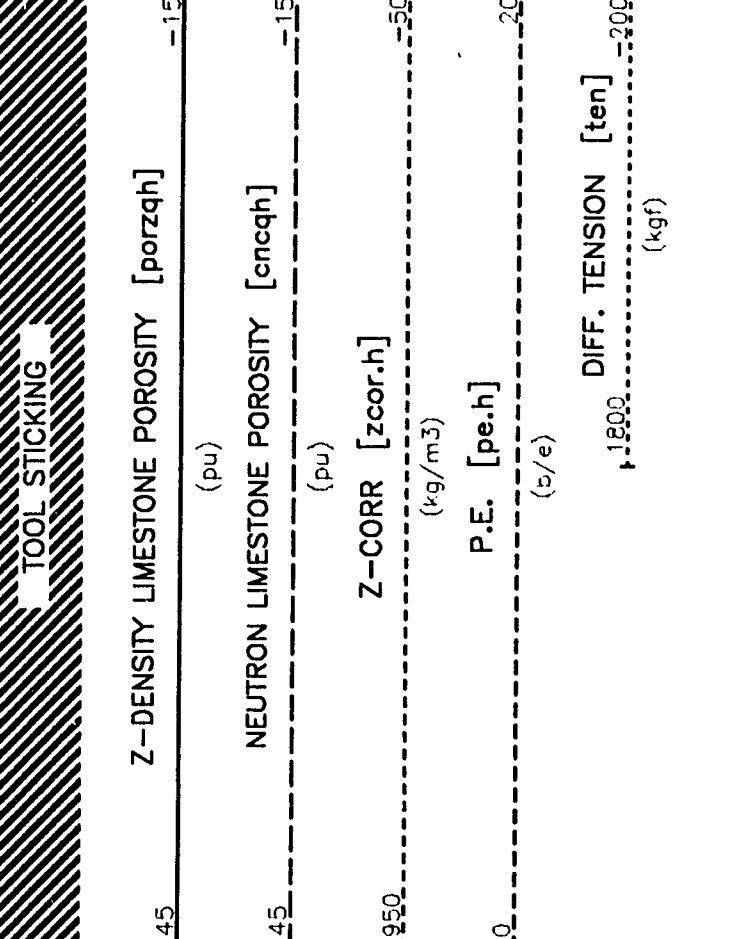
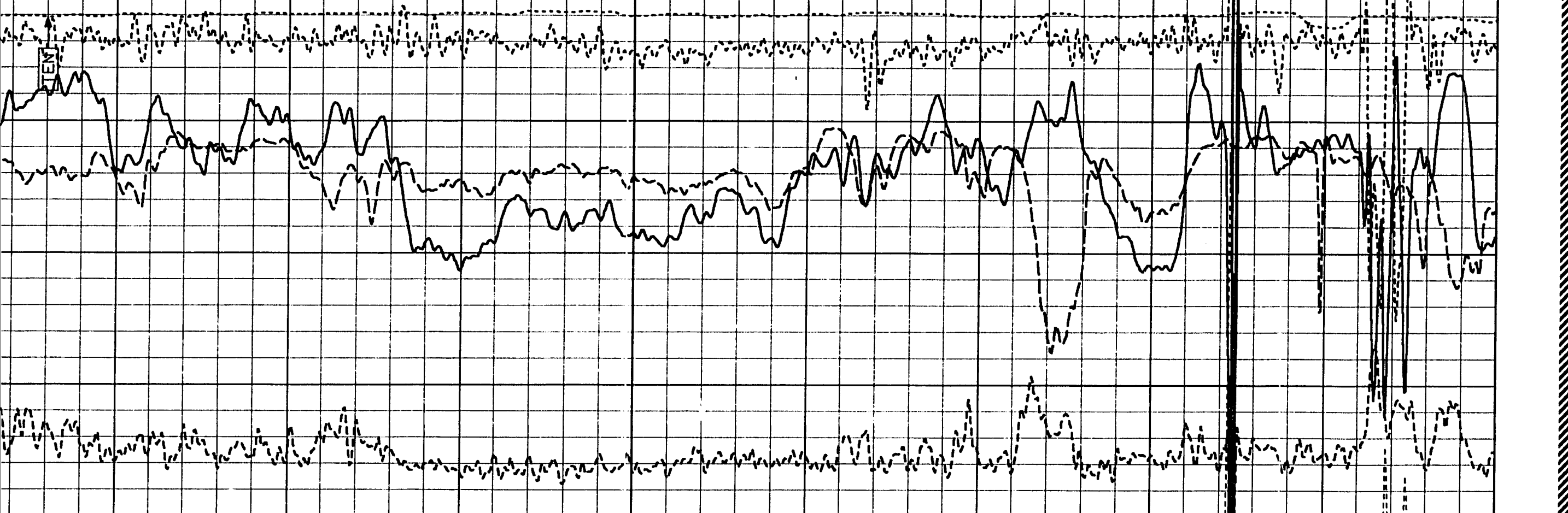
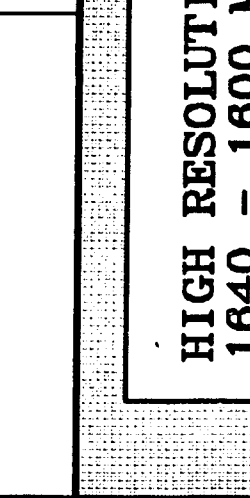
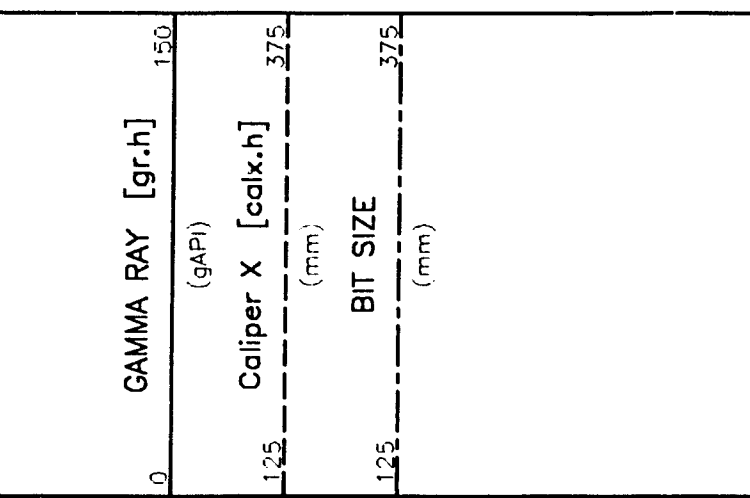
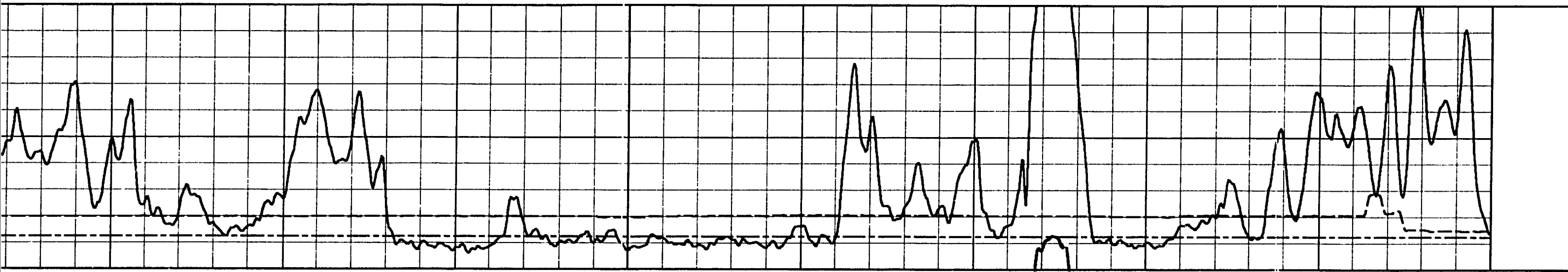
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	FILTER (h)	Light (2)	BOTTOM
	FILTER (h)	Light (2)	TOP
	FILTER (h)	Light (2)	BOTTOM
	FILTER (h)	Light (2)	TOP
GR	SL-II	medium (1)	TOP
ON	SL-II	medium (1)	BOTTOM
ZDL	SL-II	medium (1)	TOP
SPEED	SL-II	medium (1)	BOTTOM
TENSION	SL-II	medium (1)	TOP
	SL-II	medium (1)	BOTTOM
BOREHOLE & CEMENT			
MEASUREMENT TYPE	PARAMETER	VALUE	INTERVAL (m)
CASING - BOREHOLE & CEMENT	CASING THICKNESS	0.000	TOP
	CASING O.D.	114.300	BOTTOM
	BIT SIZE	156.000	TOP
	USE CALIPER	USE CALIPER	BOTTOM
BOREHOLE CORR DIAMETER SOURCE	CALIPER/FIXED DIA. (cmh*)	USE CALIPER	TOP
	FIXED DIAMETER (cmh*)	156.000	BOTTOM
SLII PROCESSING			
MEASUREMENT TYPE	PARAMETER	VALUE	INTERVAL (m)
SLII PROCESSING METHOD	PROCESSING SELECT	USE SL-II PROC.	TOP
	OPEN/CASED HOLE	OPEN HOLE	BOTTOM
	AUTO GAIN	AUTO GAIN ON	TOP
	ENERGY RANGE	ENER (.15-3.0)MeV	BOTTOM
CN PROCESSING			
MEASUREMENT TYPE	PARAMETER	VALUE	INTERVAL (m)
2446 CN MATRIX	2446 MATRIX	LIMESTONE	TOP
	SALINITY	0	BOTTOM
	CORRECTION	OFF	TOP
	BIT SIZE BEHIND CSN.	200.025	BOTTOM
ZDL PROCESSING			
MEASUREMENT TYPE	PARAMETER	VALUE	INTERVAL (m)
ZDL CHI-SMOOTH FILTER	DEN CHISM	ON	TOP
	PE CHISM	OFF	BOTTOM
	RHO CHISM	2.710	TOP
	RHO FLUID	1.000	BOTTOM
DENSITY POROSITY	ZDL GAIN	2012	TOP
ZDL	ZDL TRACKING	ON	BOTTOM

CURVE MEASURE POINT OFFSET			
CURVE	OFFSET (m)	CURVE	OFFSET (m)
bltch	-0.00	cnch	0.69
calxh	3.28	grch	9.14
		pech	3.28
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		ten	-0.00
		zcorch	3.28

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Company : PARAMOUNT RESOURCES LTD.
Well : UNDEFINED
Field : UNDEFINED
Interval : 1578.03 - 1925.73 Meters
Cot : 471q







GR	FILTER (-h)
SL-11	FILTER (-f)
CN	FILTER (-h)
ZDL	FILTER (-h)
SPEED	FILTER (-h)
TENSION	FILTER (-)

MEASUREMENT TYPE	PARAMETER TYPE
CASING - BOREHOLE & CEMENT VOLUME	CASING THICKNESS
BIT SIZE	CASING O.D.
BOREHOLE CORR DIAMETER SOURCE	BIT SIZE
BOREHOLE CORR DIAMETER	CAL/PER/TY/IN
	FIXED DIAMETER
MEASUREMENT TYPE	PARAMETER TYPE
SLI I PROCESSING METHOD	PROCESSING
E MATRIX	OPEN/CASED
SLI I AUTOGAIN	AUTO GAIN
SLI I ENERGY RANGE	ENERGY RANGE
MEASUREMENT TYPE	PARAMETER TYPE
2446 CN MATRIX	2446 MATRIX
CN SALINITY CORRECTION	SALINITY
CN CASING & CEMENT CORRECTION	CORRECTION
	BIT SIZE RE
MEASUREMENT TYPE	PARAMETER TYPE
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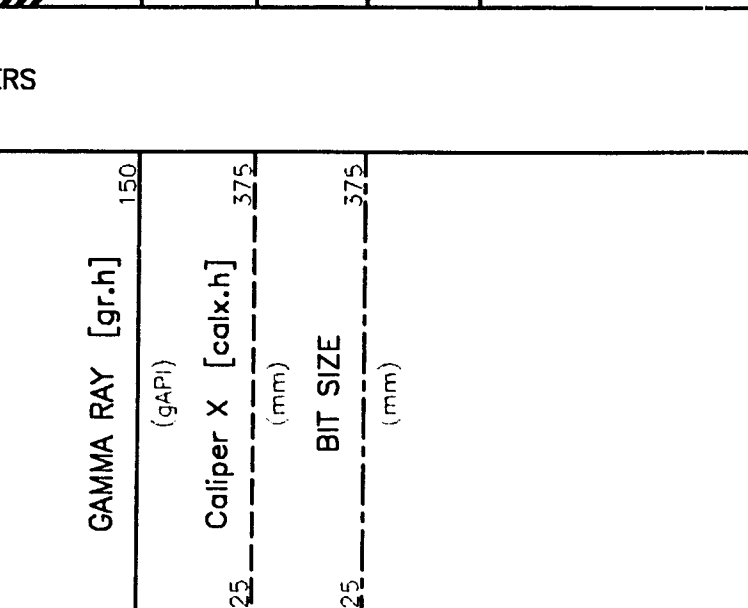
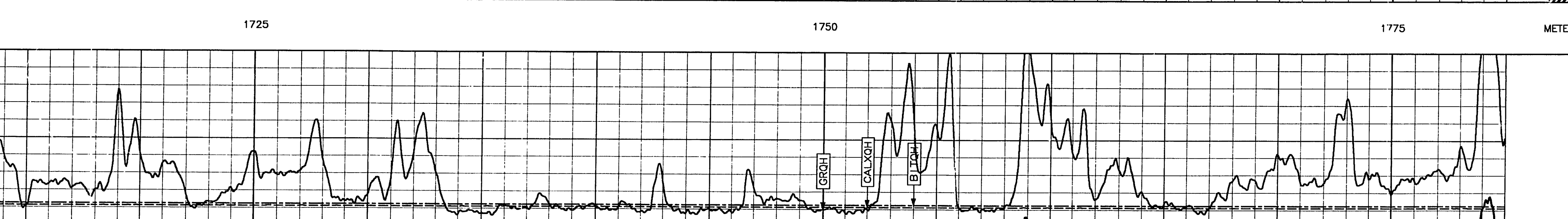
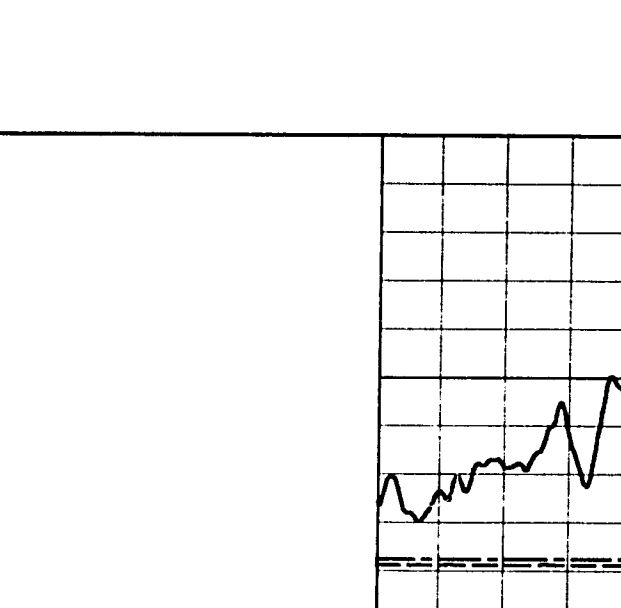
CURV

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calch	3.28	grch

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Company	: PARAMOUNT RESOURCES LTD.
Field	: 9324 EL FT. LARD 146
Well	: UNDEFINED
Fluid	: UNDEFINED
Interval	: 1578.03 ~ 1925.73 Meters
Cut	: 4771q

GAMMA RAY [gr.h]	METERS
0	0
150	150

1.25	Caliper X [calc.h]	375
	(mm)	
1.25	BIT SIZE	375
	(mm)	



HIGH RESOLUTION PASS - SANDSTONE MATRIX 1800 - 1780 M

Sun Jan 9 12:59:21 2000

PARAMETER AND FILTER SUMMARY REPORT

NEWLW ZSS PERPLT /main/47	Cplar 3.0 Pdf_Cpp /main/13	
------------------------------	-------------------------------	--

MEASUREMENT	TYPE	PARAMETER
K	AXIS CALIPER	FILTER ()
		FILTER (h)
		FILTER (f)
		FILTER (h)
		FILTER (f)
		FILTER (h)
		FILTER (f)

	MEASUREMENT TYPE	PARAMETER
ZOL	CASING - BOREHOLE & CEMENT VOLUME	CASING THICKNESS CASING O.D.
SPEED	BIT SIZE	BIT SIZE
TENSION	BOREHOLE CORR DIAMETER SOURCE	CALPIPE/FIXED FIXED DIAMETER
	BOREHOLE CORR DIAMETER	

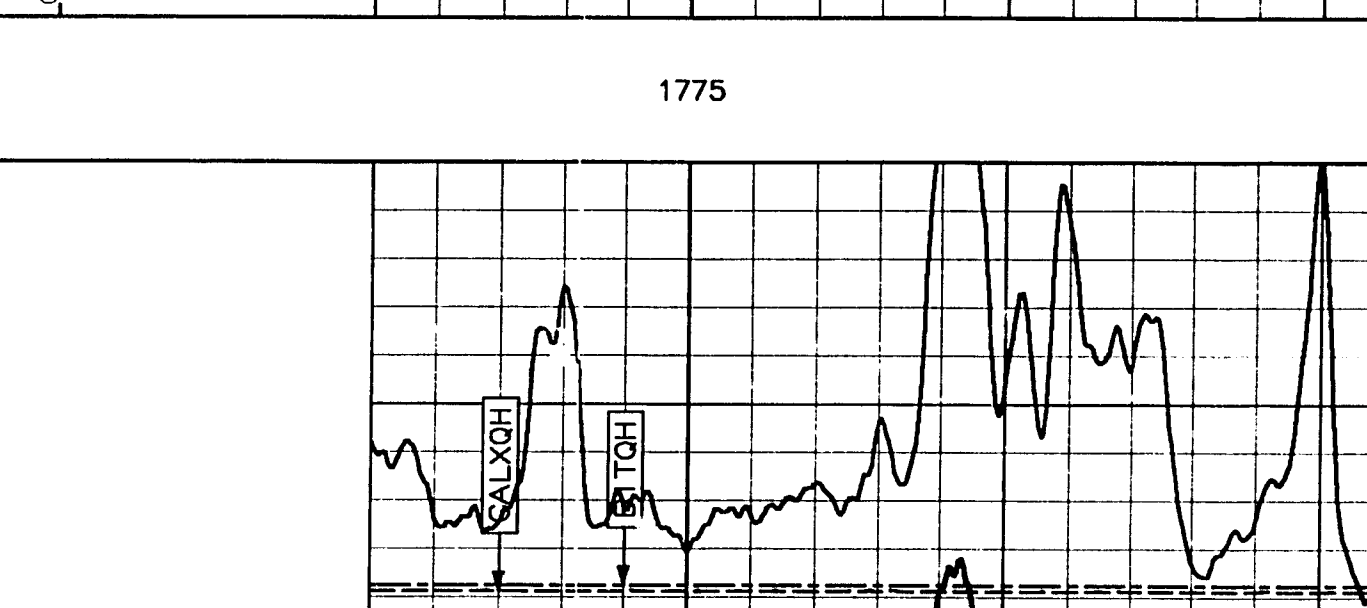
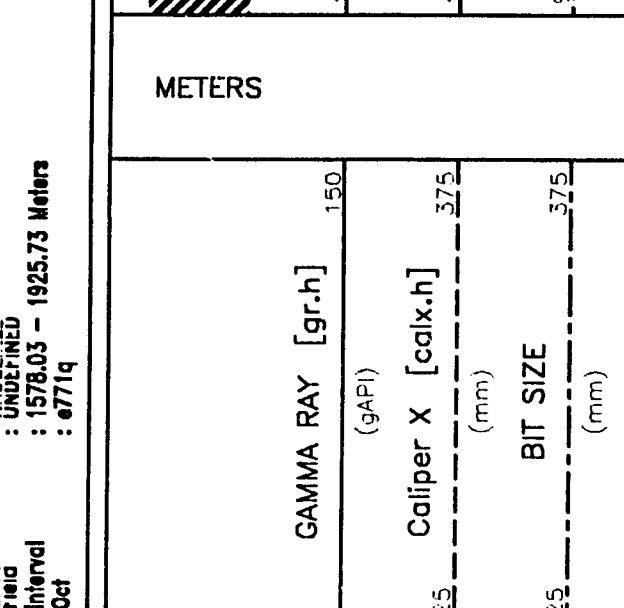
MEASUREMENT TYPE	PARAMETER
BLI1 PROCESSING METHOD	PROCESSING SE
C MATRIX	OPEN/CASED HO
BLI1 AUTO GAIN	AUTO GAIN
BLI1 ENERGY RANGE	ENERGY RANGE

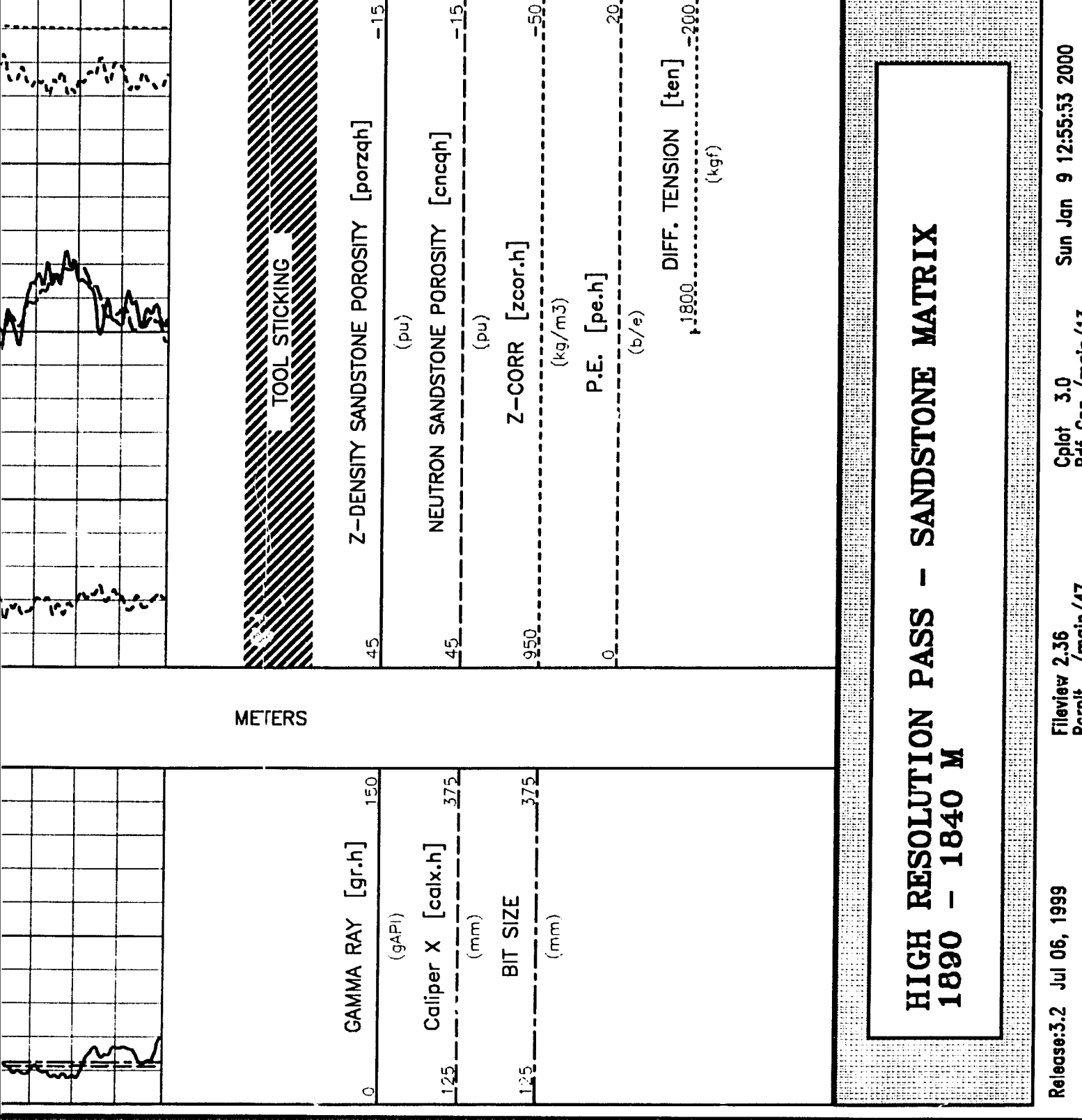
MEASUREMENT TYPE	PARAMETER
2446 CN MATRIX	2446 MATRIX

MEASUREMENT TYPE	PARAMETER
CONCRETE SALINITY CORRECTION	DEN CH5M
CONCRETE CASING & CEMENT CORRECTION	PE CH5M
	RHOCH5M
	RHOCH5M
	ZDZ CH5M
	ZDZ CH5M

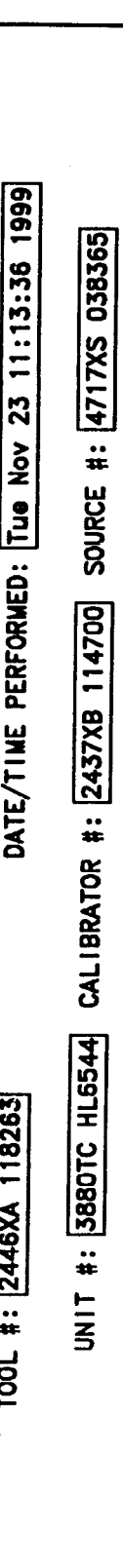
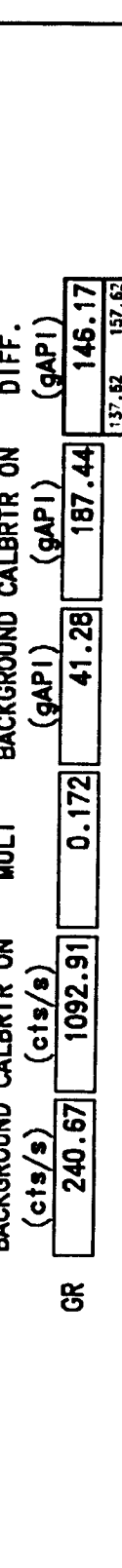
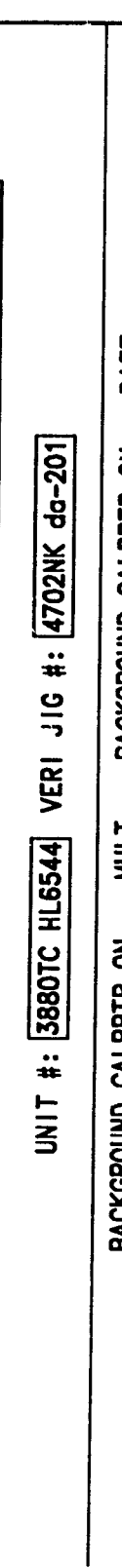
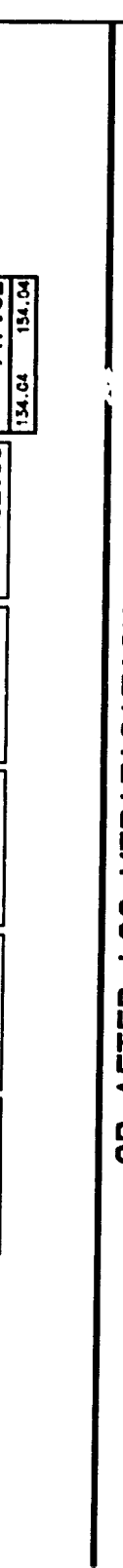
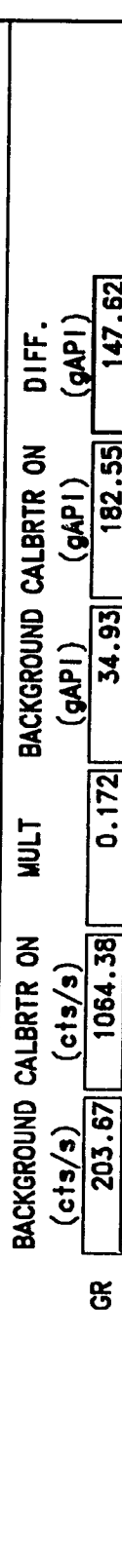
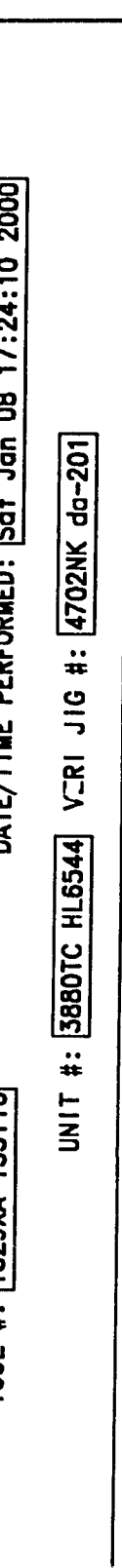
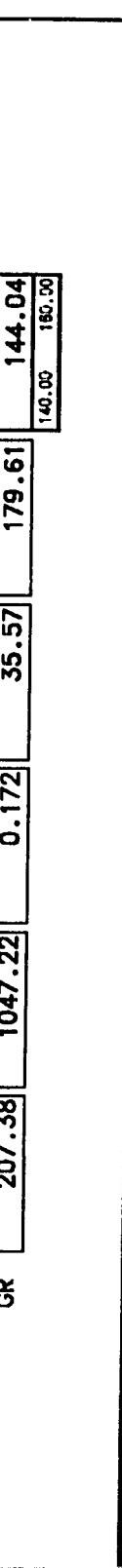
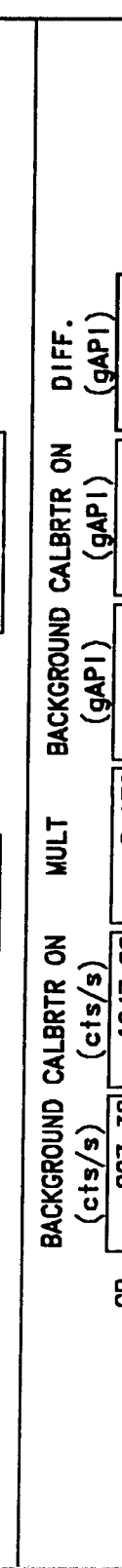
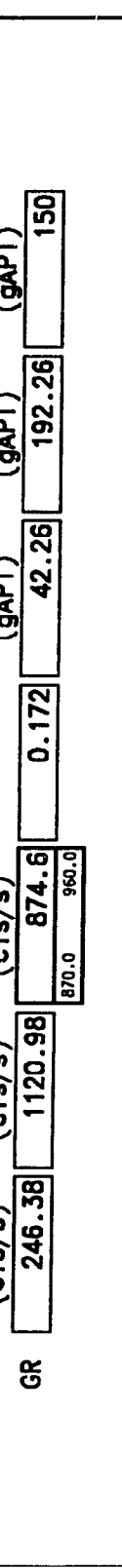
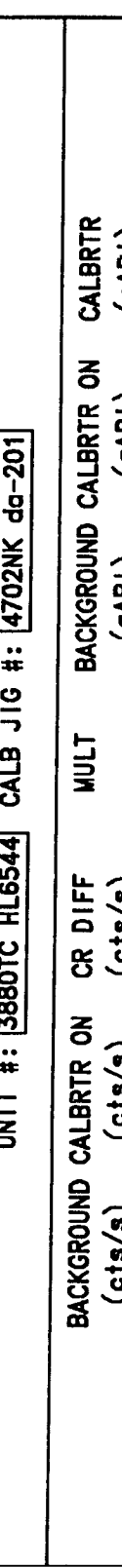
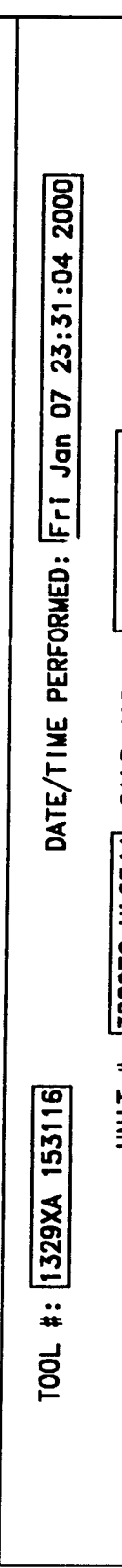
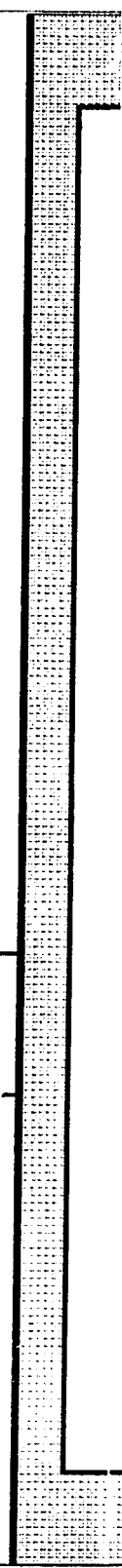
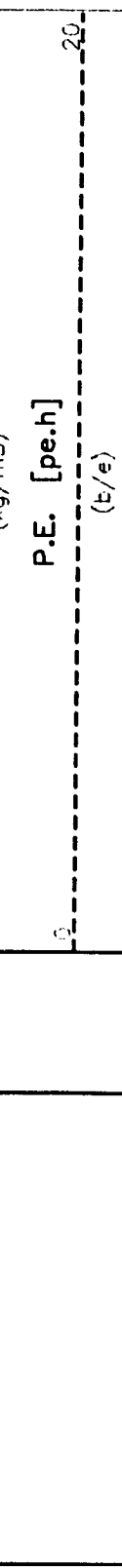
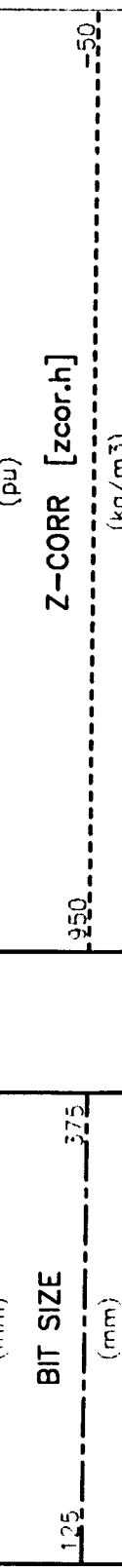
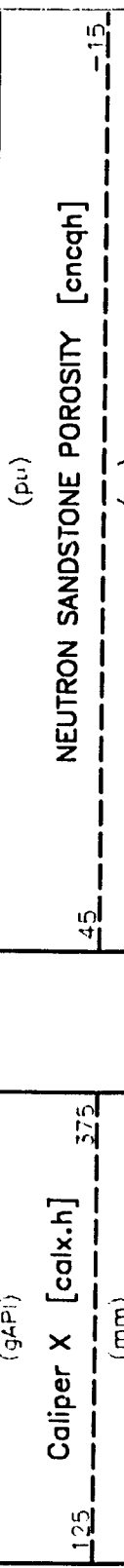
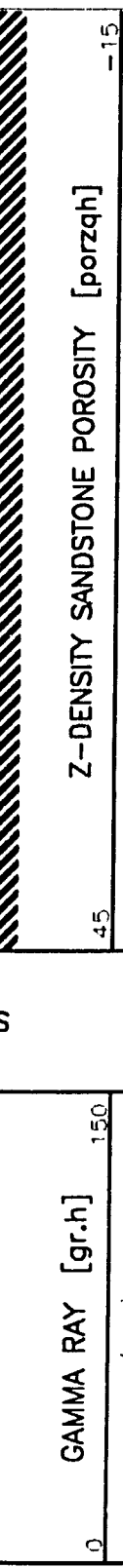
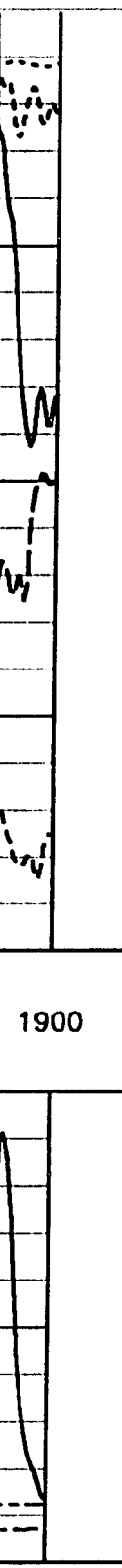
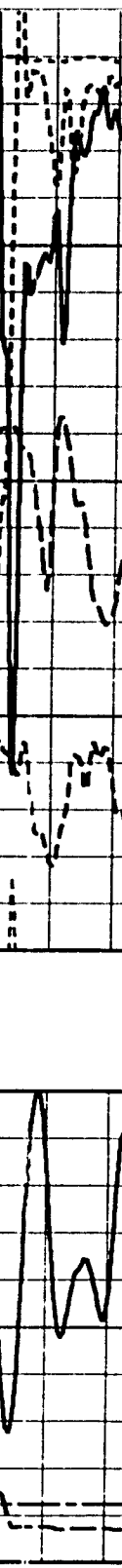
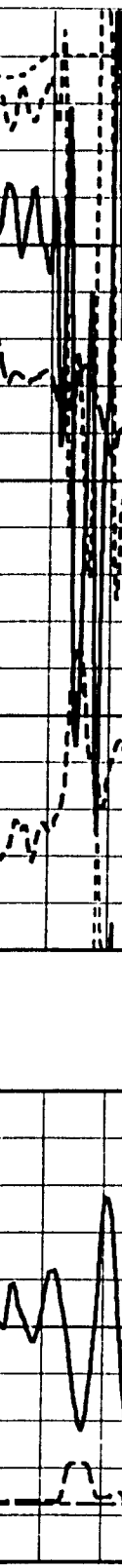
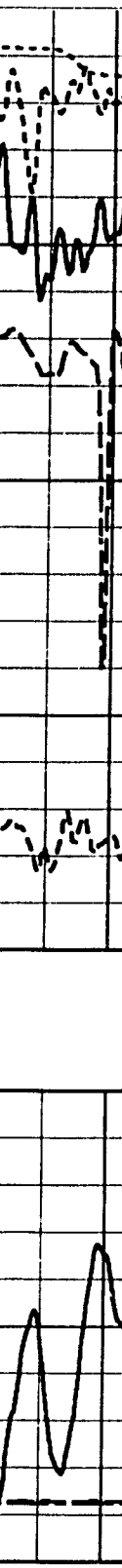
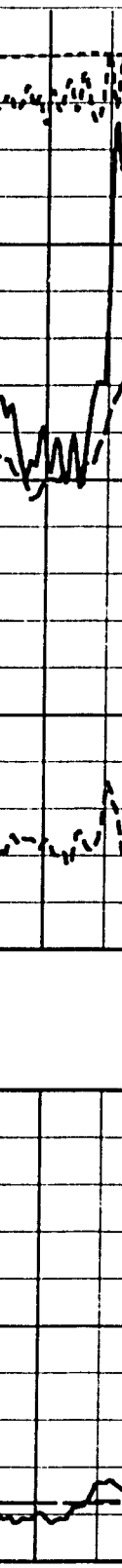
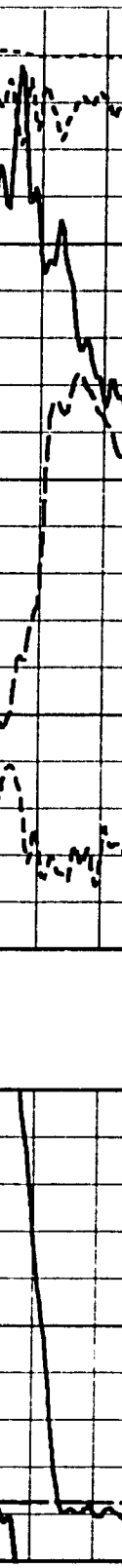
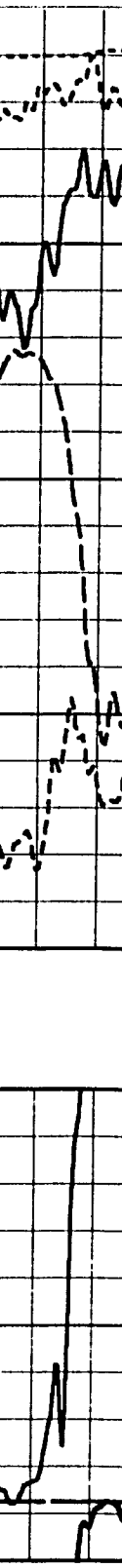
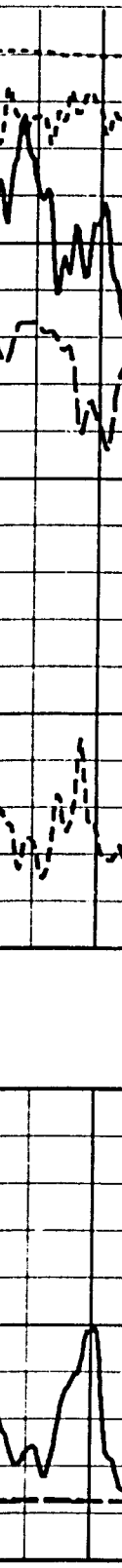
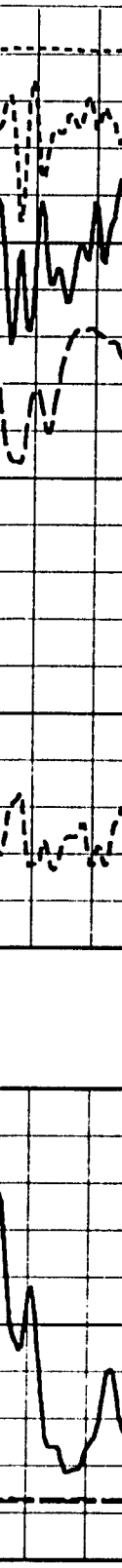
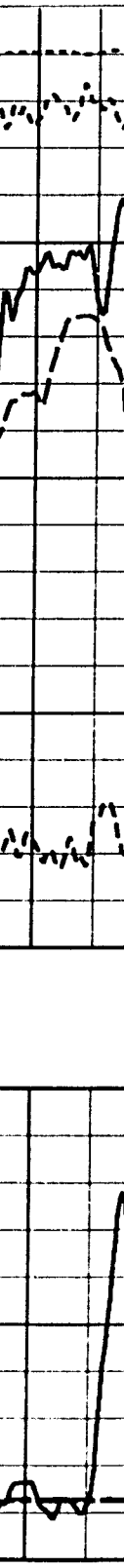
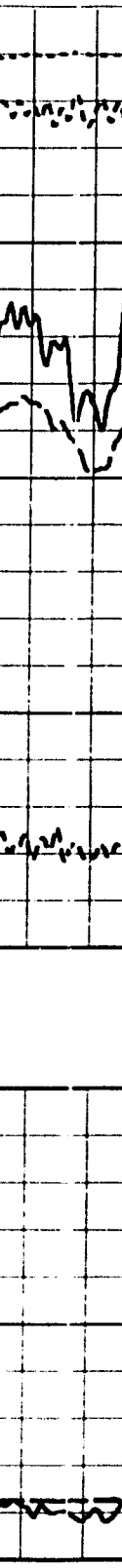
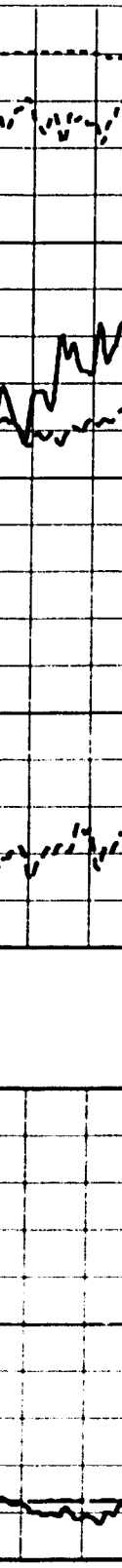
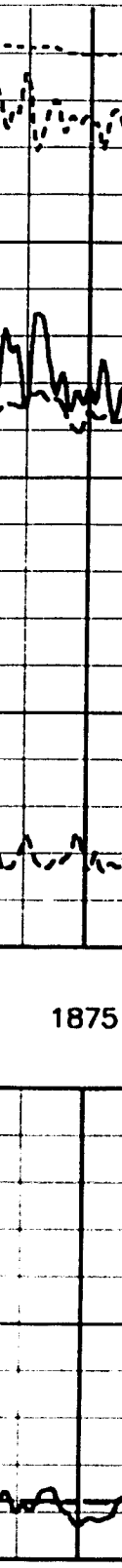
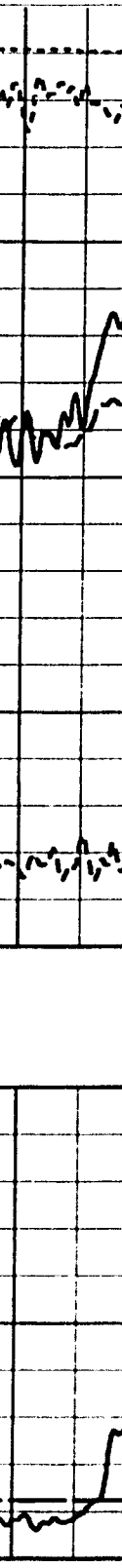
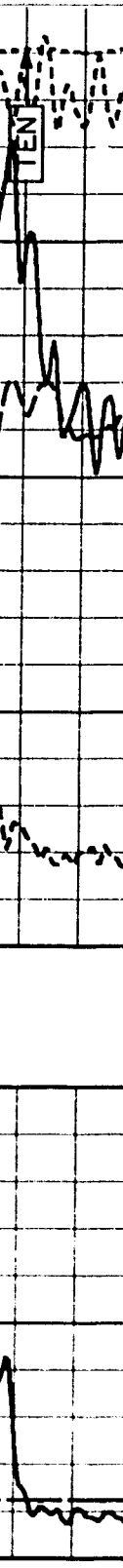
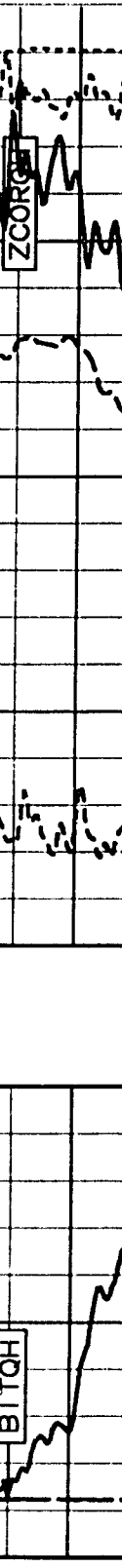
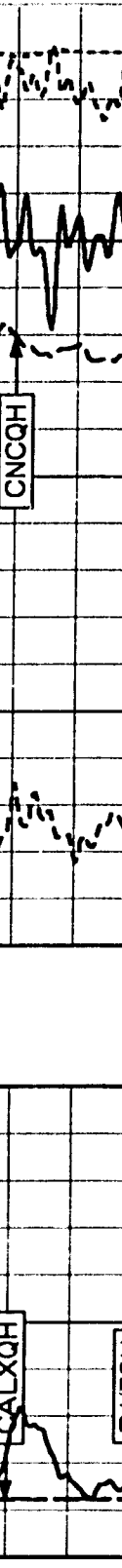
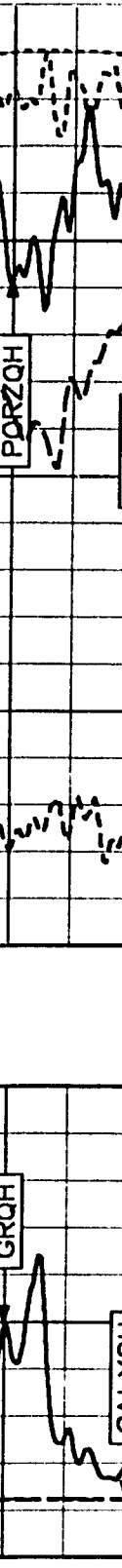
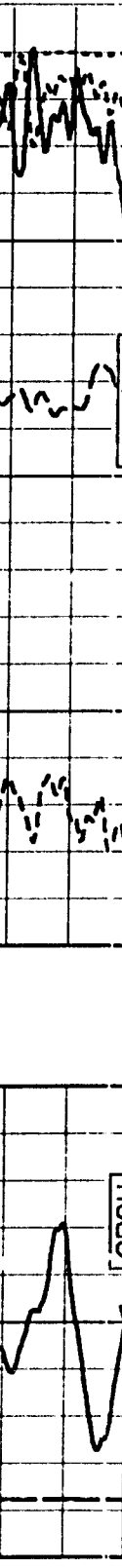
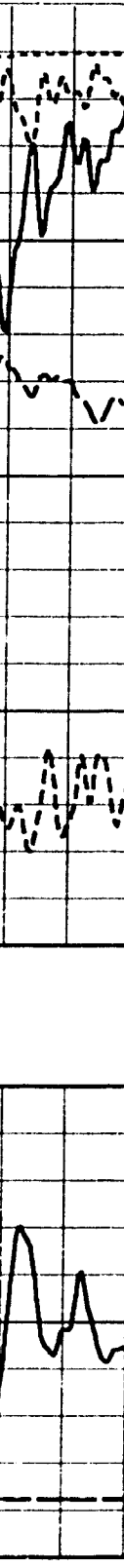
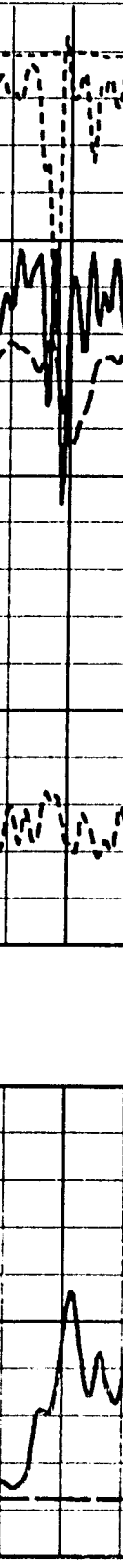
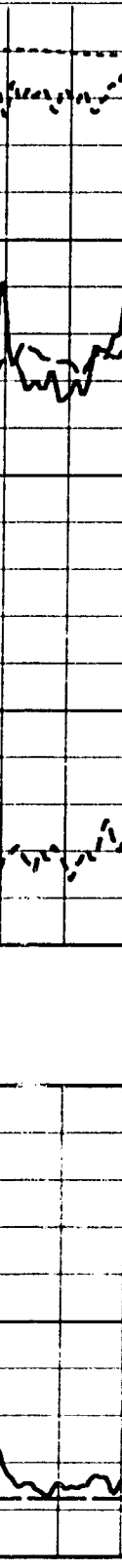
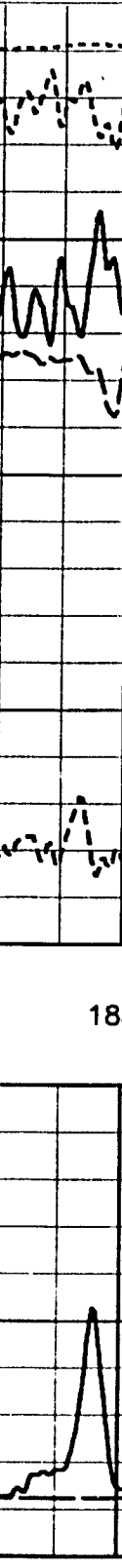
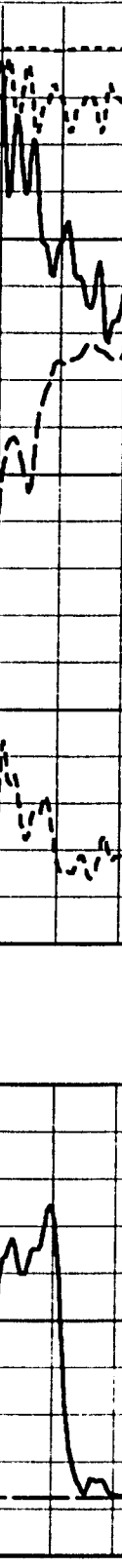
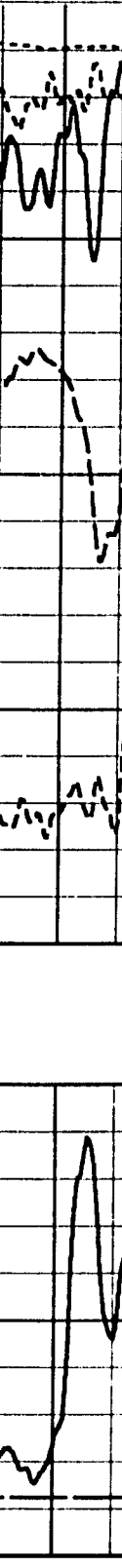
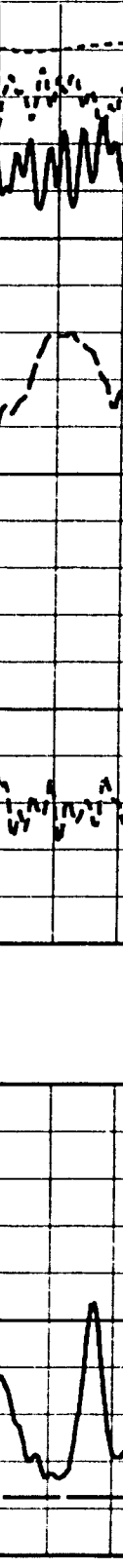
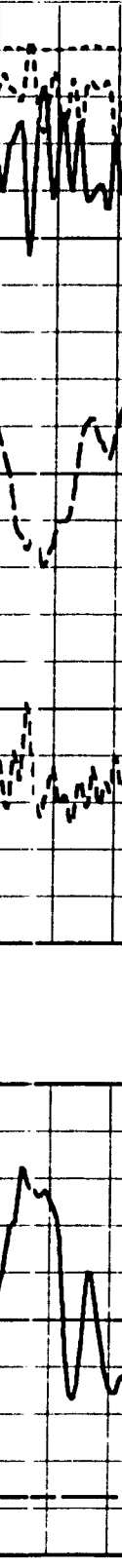
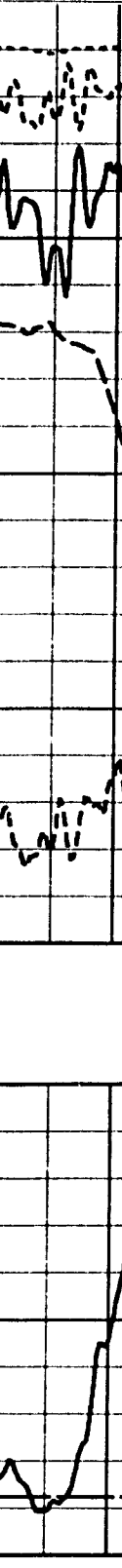
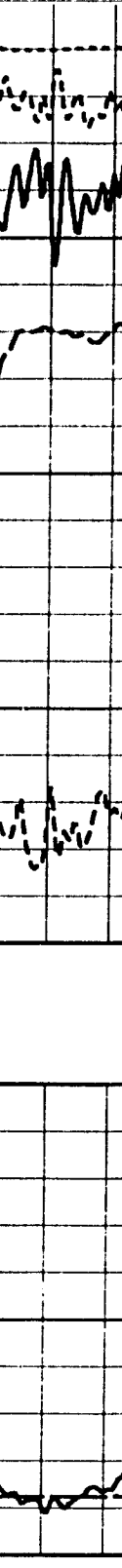
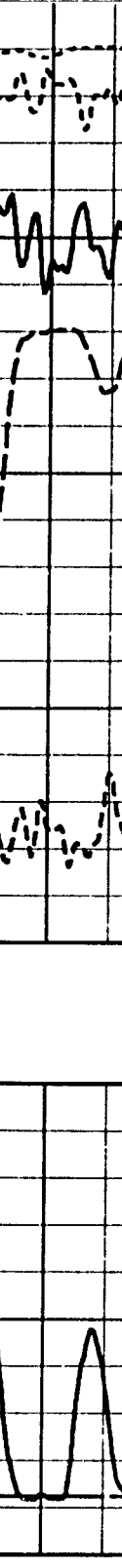
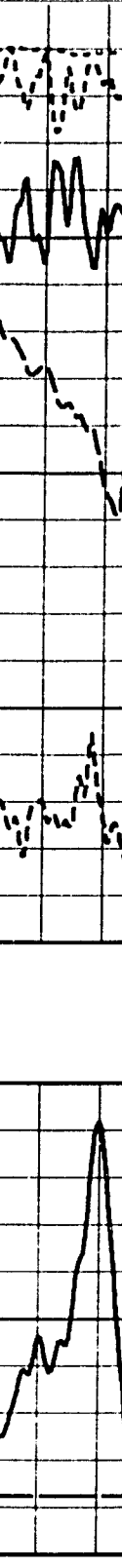
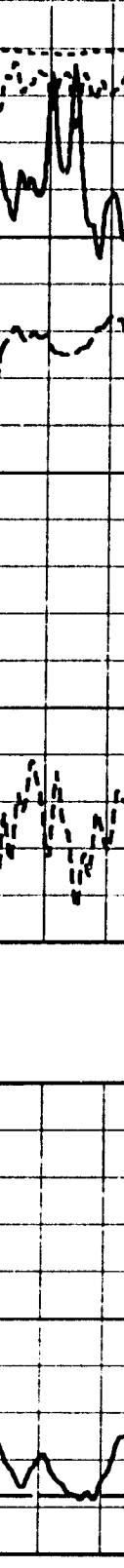
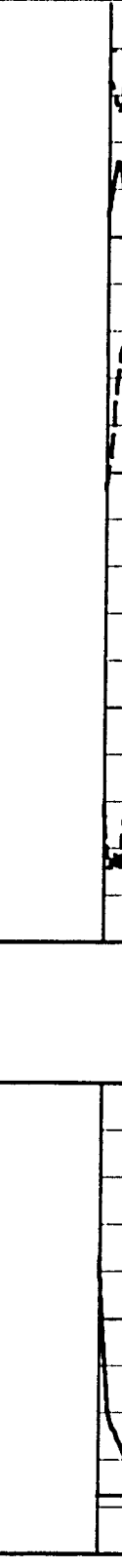
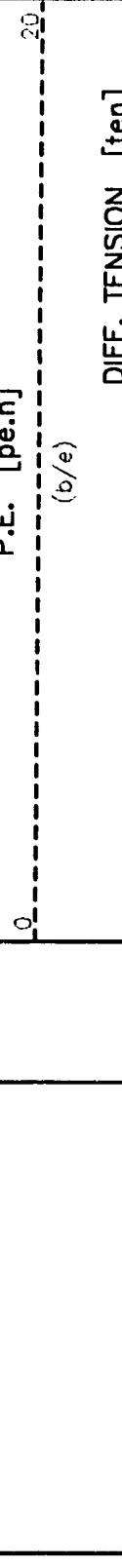
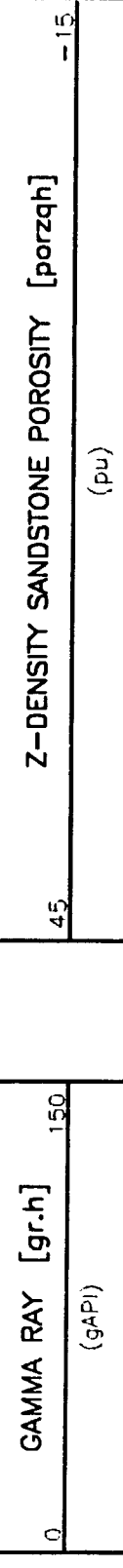
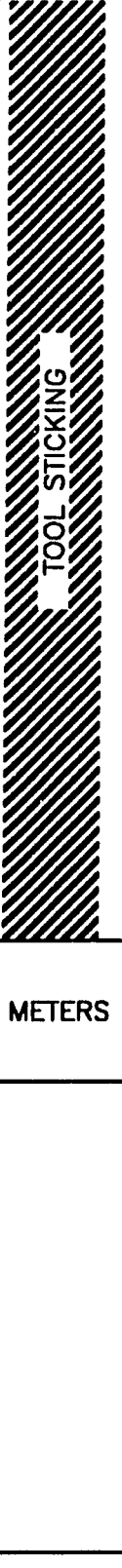
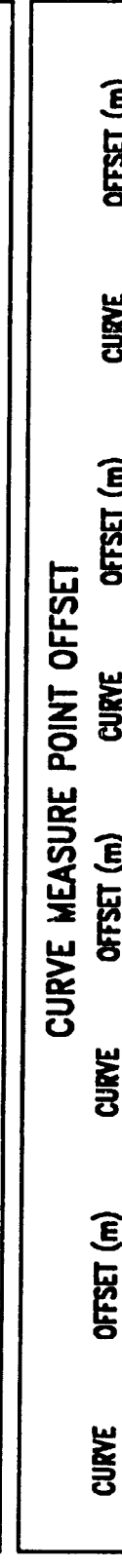
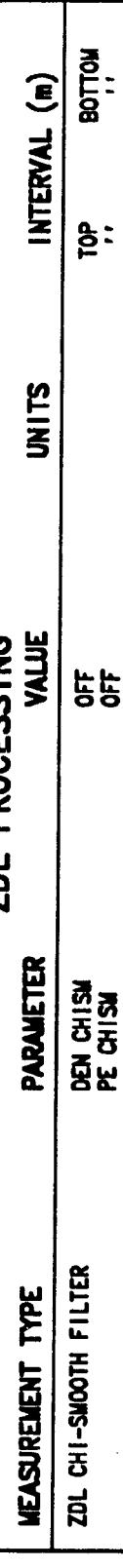
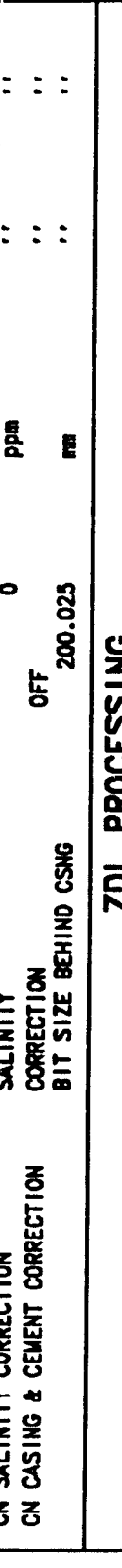
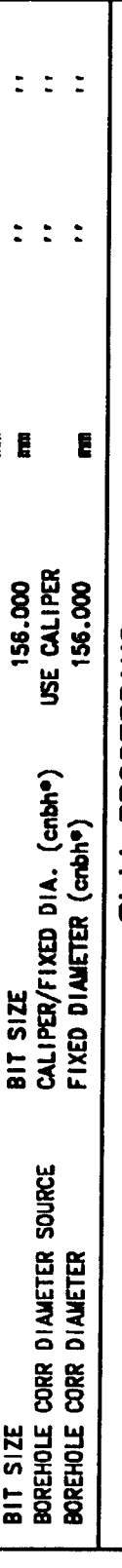
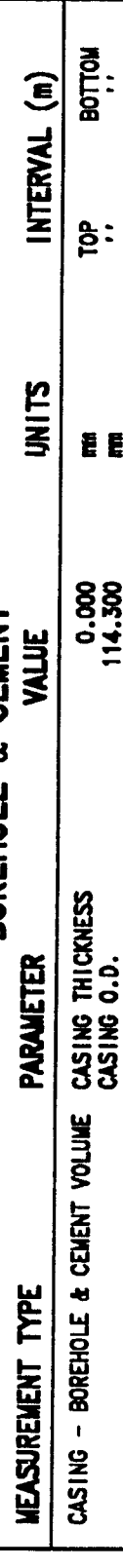
CURVE			
CURVE	OFFSET (m)	CURVE	OFFSET
bl/cph	-0.00	crnch	
cd/cph	3.28	grph	

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 : F1 : cph2:/data/c/pass/para/48/a771q040
 : : PARAMOUNT RESOURCES LTD.
 : PARA ET AL FT. LARD 1-46
 : /mail





HIGH RESOLUTION PASS - SANDSTONE MATRIX
1890 - 1840 M



LSN	694.56	706.34	SSN/LSN	SSN/LSN	FACTOR	(pu)
SSN	1828.38	1897.78				
RATIO		2.68679	2.75100	1.02390		
CN				0.97000	1.07000	
					21.358	

CN PRIMARY VERIFICATION SUMMARY

TOOL #: 2446XA 118263 DATE/TIME PERFORMED: Tue Nov 23 11:53:20 1999

UNIT #: 3880TC HL6544 ICE BLOCK #: 4717ND 038365

MEASURED	DEADTM	CORR	DTC	CORRECTION	DTC CORR	POROSITY
LSN	CPS	CPS	SSN/LSN	FACTOR	SSN/LSN	(pu)
	984.30	1008.14				
SSN	1695.96	1755.53				
RATIO		1.74137	1.02390	1.78457		
CN					8.920	

CN BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2446XA 118263 DATE/TIME PERFORMED: Sun Jan 09 04:18:27 2000

UNIT #: 3880TC HL6544 ICE BLOCK #: 4717ND 038365

MEASURED	DEADTM	CORR	DTC	CORRECTION	DTC CORR	POROSITY
LSN	CPS	CPS	SSN/LSN	FACTOR	SSN/LSN	(pu)
	894.92	914.58				
SSN	1643.98	1699.91				
RATIO		1.85867	1.02390	1.90449		
CN					10.336	
					6.920	10.920

CN AFTER LOG VERIFICATION SUMMARY

TOOL #: 2446XA 118263 DATE/TIME PERFORMED: Sun Jan 09 09:11:46 2000

UNIT #: 3880TC HL6544 ICE BLOCK #: 4717ND 038365

MEASURED	DEADTM	CORR	DTC	CORRECTION	DTC CORR	POROSITY
LSN	CPS	CPS	SSN/LSN	FACTOR	SSN/LSN	(pu)
	896.56	916.29				
SSN	1647.00	1703.13				
RATIO		1.85872	1.02390	1.90500		
CN					10.343	
					8.336	12.336

CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2228MA 153016 DATE/TIME PERFORMED: Tue Jan 04 15:21:28 2000

UNIT #: 3880TA HL6591

SMALL RING	LARGE RING	MULT	ADD	SMALL RING	LARGE RING
(row)	(row)			(mm)	(mm)
CALIPER	1807.5	2471.8	0.15324	-73.98854	203.000
					304.800

CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2228MA 153016 DATE/TIME PERFORMED: Sun Jan 09 07:19:59 2000

UNIT #: 3880TC HL6544

I.D.	MULT	ADD	I.D.
(row)			(mm)
CALIPER	1525.8	0.15324	-72.81971
			161.000

CAL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2228MA 153016 DATE/TIME PERFORMED: Sun Jan 09 07:20:22 2000

UNIT #: 3880TC HL6544

I.D.	MULT	ADD	I.D.
(row)			(mm)
CALIPER	1525.8	0.15324	-72.81971
			161.000
			148.300
			173.700

ZDL PRIMARY CALIBRATION SUMMARY

TOOL #: 2228MA 153016 DATE/TIME PERFORMED: Tue Jan 04 15:10:29 2000

UNIT #: 3880TA HL6591 CALB. BLOCK SET: 2225XA 150514 CS SOURCE #: 4703NT 000796

SSD-NDTC	HRD1-NDTC	HRD2-NDTC	SHR	DEN	CORR	PE
(cts/s)	(cts/s)	(cts/s)		(kg/m3)	(kg/m3)	(b/e)
MG BLOCK (LO PE)	10367.0	4243.1	5019.3	0.721	1687.000	7.000
				0.635	0.725	2.293
AL BLOCK	5099.2	423.0	530.9		2686.000	-13.000
AL+SHIM (CORR)	7096.5	733.5	890.6		2601.000	166.000
MG+SHIM (HI PE)		2046.6	2561.5	0.297		10.580
				0.270	0.310	
RATIO MG/AL	2.03	10.03	9.45			
	1.97	2.07	9.20	10.40	8.75	9.75

BACKGROUND	CS PEAK	AM PEAK
(cts/s)	CHANNEL #	CHANNEL #
1196.1	231.1	23.9
225.0	235.0	21.0
		25.0

ZDL PRIMARY VERIFICATION SUMMARY

TOOL #: 2228MA 153016 DATE/TIME PERFORMED: Tue Jan 04 15:18:11 2000

UNIT #: 3880TA HL6591 VERI. JIG #: 4704NA 119127

SSD-NDTC	HRD1-NDTC	HRD2-NDTC	SHR	DEN	CORR	PE
(cts/s)	(cts/s)	(cts/s)		(kg/m3)	(kg/m3)	(b/e)
FIELD BLOCK	10004.4	2171.1	5156.1	0.189	1846.899	49.267
						16.111

ZDL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2228MA 153016 DATE/TIME PERFORMED: Sun Jan 09 03:23:22 2000

UNIT #: 3880TC HL6544 VERI. JIG #: 4704NA 119127

SSD-NDTC	HRD1-NDTC	HRD2-NDTC	SHR	DEN	CORR	PE
(cts/s)	(cts/s)	(cts/s)		(kg/m3)	(kg/m3)	(b/e)
FIELD BLOCK	9690.2	2141.8	5127.0	0.186	1821.433	20.135
				0.169	0.209	1821.899
						24.267
						74.267

ZDL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2228MA 153016 DATE/TIME PERFORMED: Sun Jan 09 03:23:28 2000

UNIT #: 3880TC HL6544 VERI. JIG #: 4704NA 119127

SSD-NDTC	HRD1-NDTC	HRD2-NDTC	SHR	DEN	CORR	PE
(cts/s)	(cts/s)	(cts/s)		(kg/m3)	(kg/m3)	(b/e)
FIELD BLOCK	9980.5	2155.4	5111.4	0.189	1850.791	49.417
				0.168	0.206	1798.433
						1846.433
						-4.885
						45.135



Baker Atlas

COMPANY: PARAMOUNT RESOURCES LTD.
WELL: PARA ET AL FT. LIARD I-46 60 10'123 15'
FIELD: UNDEFINED
PROVINCE: NORTHWEST TERRITORIES

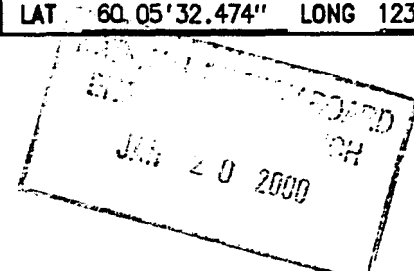
LOCATION:
LIC #: 1871
LAT: 60.05'32.474" LONG 123.22'53.612"

ELEVATIONS:
KB 542.2 M
DF
GL 537.2 M
DATE: 08-JAN-2000

FILE NO:

API NO:

3001466010123150



CABLEHEAD TOP 48 9.5"

CABLEHEAD
Series : CBL338
Diameter : 3.53"
Measure Point : 02'05.00" CABLEHEAD TOP

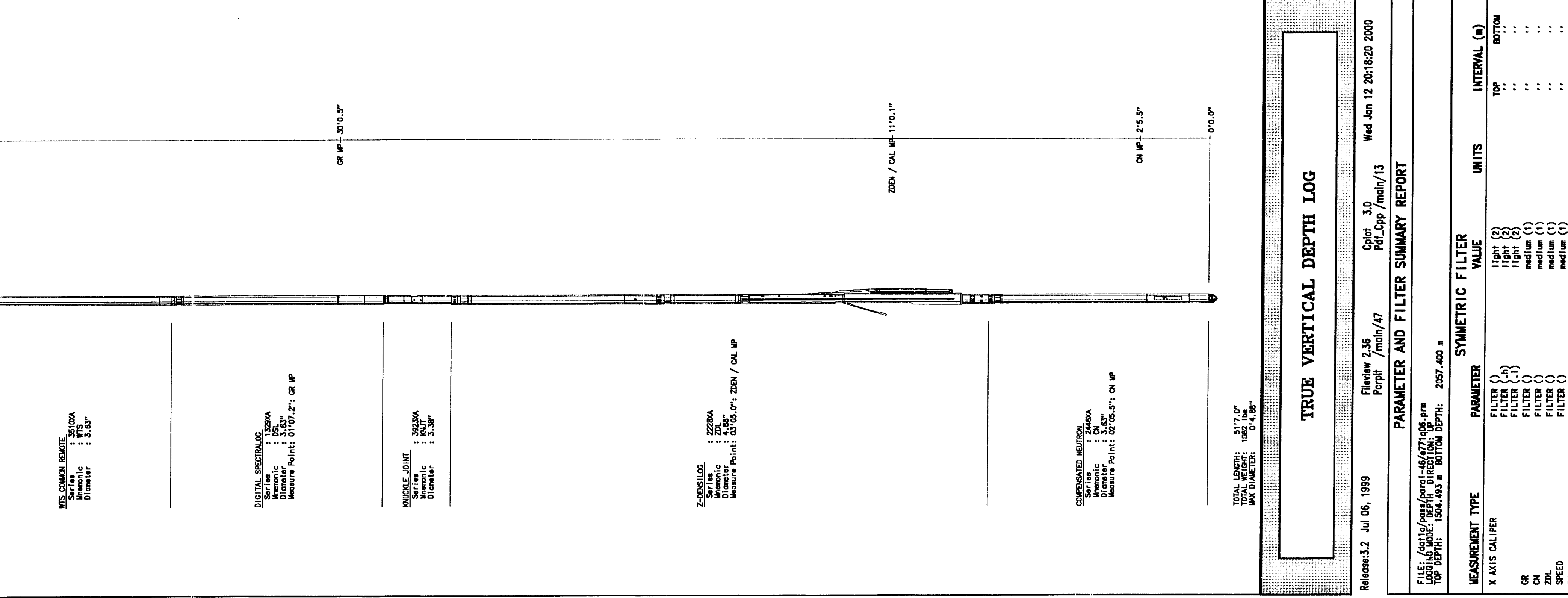
ITEM SUB
Series : 338WA
Diameter : 3.53"
Measure Point : 01'01.6" TOP UP

CABLEHEAD TOP 48 9.5"

CABLEHEAD
Series : CBL338
Diameter : 3.53"
Measure Point : 02'05.00" CABLEHEAD TOP

ITEM SUB
Series : 338WA
Diameter : 3.53"
Measure Point : 01'01.6" TOP UP

981XA
TRM
: 63"
1'04.6": TEMP MP
1'01.6": RM MP



BIT SIZE	CALIPER/FIXED DIA. (cnbth°)	USE CALIPER
156.000		156.000
	FIXED DIAMETER (cnbth°)	

ON PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (n)
2446 CH MATRIX	2446 MATRIX	SANDSTONE		TOP
CH SALINITY CORRECTION	SALINITY	0	ppm	BOTTOM
CH CASING & CEMENT CORRECTION	CORRECTION	OFF		

MEASUREMENT TYPE		PARAMETER	ZDL PROCESSING		UNITS	INTERVAL (m)
ZDL	CHI-SMOOTH FILTER	PE CH SM	ZDL CORR	ZDL TRACKING	OFF	2094
					ON	

CURVE MEASURE POINT OFFSET						
CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE
b11	-0.00	cnc	0.09	pe	3.28	ten
calx	3.28	gr	5.14	pora	0.00	zcor

Presentation : /a/c1/c/pora/pora-46/_zdl_msh.pdf
 Data file : /a/c2/c/calx/calx-46/_zdl_msh.pdf
 Well : PORA ET AL FT. LIND 7-46
 Field : UNDEFINED
 Interval : 191.23 - 2049.93 Meters
 Cor : 46714

GR BACKLIP

XCAL < BIT

GAMMA RAY [gr]

(gAPI)

Caliper X [calx]

(mm)

BIT SIZE

(mm)

TOOL STICKING

Z-DENSITY SANDSTONE POROSITY [pora]

NEUTRON SANDSTONE POROSITY [cnc]

Z-CORR [zcor]

P.E. [pe]

DIFF. TENSION [ten]

0

(pu)

(g/m³)

(g/g)

(kgf)

BVOL

Cement

1500

1525

1550

GR

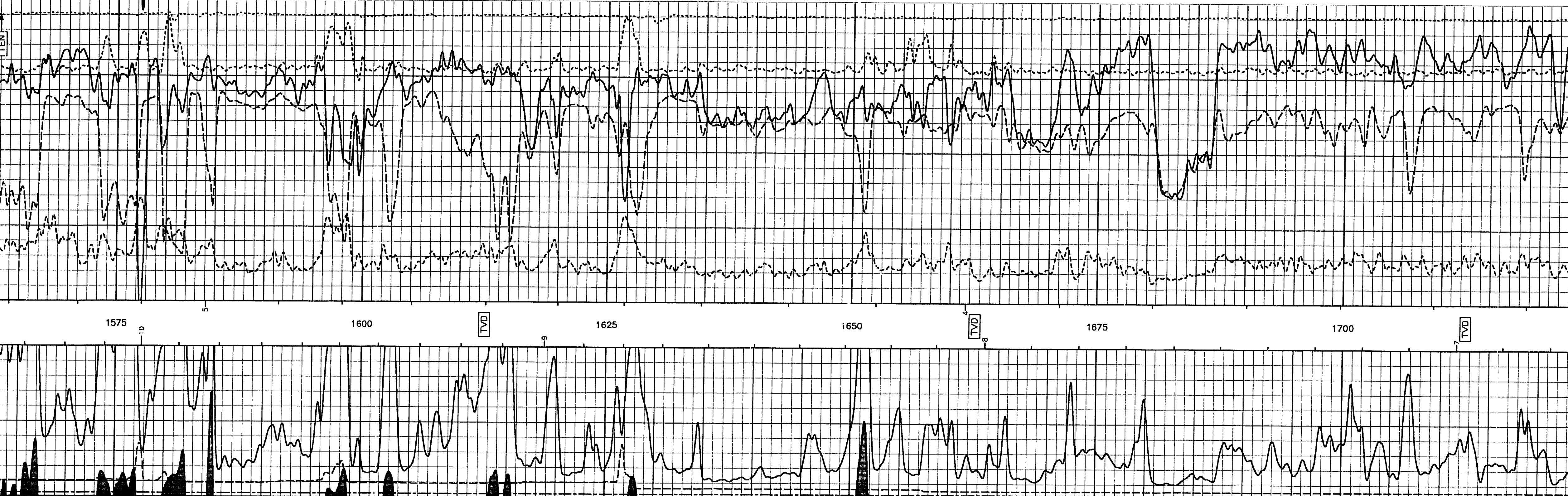
XCAL

BIT

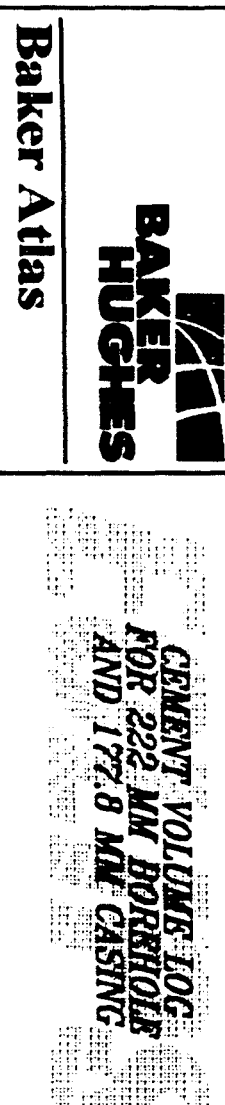
1500

1525

1550



MISCELLANEOUS



FILE NO:	COMPANY	PARAMOUNT RESOURCES LTD.
API NO:	WELL	PARA ET AL FT. LIARD I-46 60 10' 123 15'
	FIELD	UNDEFINED
	PROVINCE	NORTHWEST TERRITORIES
Ver 3.68	LOCATION:	OTHER SERVICES
UMI:	LICENCE: WID #1871	CH-ZDL-CR-XCAL
3001466010123150	LAT 60 05' 32.474" LONG 123 22' 53.612"	H01L-CR
		MAC-CR-XCAL
PERMANENT DATUM	CL	ELEVATION
LOG MEASURED FROM	KB	ABOVE P.D.
DRILL MEAS. FROM	KELLY BISHING	CL
DATE	06-DEC-99	
RUN	TRIP	1
SERVICE ORDER	978858	
DEPTH DRILLER	1545.0 M	
DEPTH LOGGER	1545.5 M	
BOTTOM LOGGED INTERVAL	1524.1 M	
TOP LOGGED INTERVAL	505.2 M	
CASING-DRILLER	244.5 MM	0505.4 M
CASING LOGGER	505.2 M	
BIT SIZE	222.0 MM	
TYPE OF FLUID IN HOLE	INVERT	51 S
DENSITY	1060 G/L	N/A
PH	N/A	
SOURCE OF SAMPLE	NO SAMPLE	
RM AT MEAS. TEMP.	N/A	0N/A
RM AT MEAS. TEMP.	N/A	0N/A
RMC AT MEAS. TEMP.	N/A	0N/A
SOURCE OF RMC	NO SAMPLE	
RM AT BHT	N/A	0N/A
TIME SINCE CIRCULATION	8.0 HOURS	
MAX. RECORDED TEMP.	45 DEGC	
EQUIP. NO.	LOCATION	NISCU
RECORDED BY	D. MCQUILLON	
WITNESSED BY	G. JOHANSON	

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

BOREHOLE RECORD			CASING RECORD				
BIT SIZE	FROM	TO	SIZE	WEIGHT	GRADE	FROM	TO
222.0 MM	505.4 M	1545.0 M	244.5 MM	53.97 KG/M	J-55	0 M	505.4 M

REMARKS

RUN 1 TRIP 1: TIME STOPPED DRILLING: 0530 06-DEC-99
TIME STOPPED CIRCULATING: 1545 06-DEC-99
H01L-MAC-CN-ZDL RECORDED IN COMBINATION.
INTEGRATED VOLUME TICKS IN 0.1, 1.0, 10.0 CUBIC METERS.
INTEGRATED VOLUMES CALCULATED FROM YCAL-ZDL CALIPERS.
ALL PRESENTATIONS AND SCALES AS PER CUSTOMER REQUEST.
CREW: D. COMEAU, A. WESTERBERG, C. SAULOU.

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION
1	1	SWIVEL	3944XB	038120	N/A
1	1	YCAL	4209XA	055717	Y-AXIS
1	1	COMR	3510XA	153396	N/A
1	1	GR	1329XA	152191	FREE
1	1	KNUC	3923XA	168286	KNUCKLE JOINT
1	1	CN	2446XA	173080	DECENTRALIZED
1	1	ZDLE	2228EA	150427	N/A
1	1	ZDLM	2228MA	150452	X-AXIS
1	1	MAC E	1667EA	152466	N/A
1	1	MAC M	1668MA	154143	CENTRALIZED
1	1	MAC I	1668PA	145237	ISO SUB
1	1	MAC T	1678PA	146774	CENTRALIZED
1	1	MAC TE	1668FA	172688	CENTRALIZED
1	1	CENT	4341XA	168349	CENTRALIZER
1	1	H01L	1515EA	178563	N/A
1	1	H01M	1515MA	178571	38 MM STAND OFF

CEMENT VOLUME LOG FOR 177.8 MM CASING

Release:3.2 Jul 06, 1999

Fileview 2.36

Cplot 3.0

Tue Dec 7 06:02:54 1999

Pcrplt /main/47

Pdf_Cpp /main/13

PARAMETER AND FILTER SUMMARY REPORT

FILE: /data/pass/para1-46/e779b06.prm

LOGGING MODE: DEPTH DIRECTION: UP

TOP DEPTH: 476.402 m BOTTOM DEPTH: 1548.613 m

SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
X AXIS CALIPER	FILTER ()	light (2)		TOP	BOTTOM
GR	FILTER ()	medium (1)		"	"
CALIPER	FILTER ()	light (2)		"	"
TENSION	FILTER ()	medium (1)		"	"

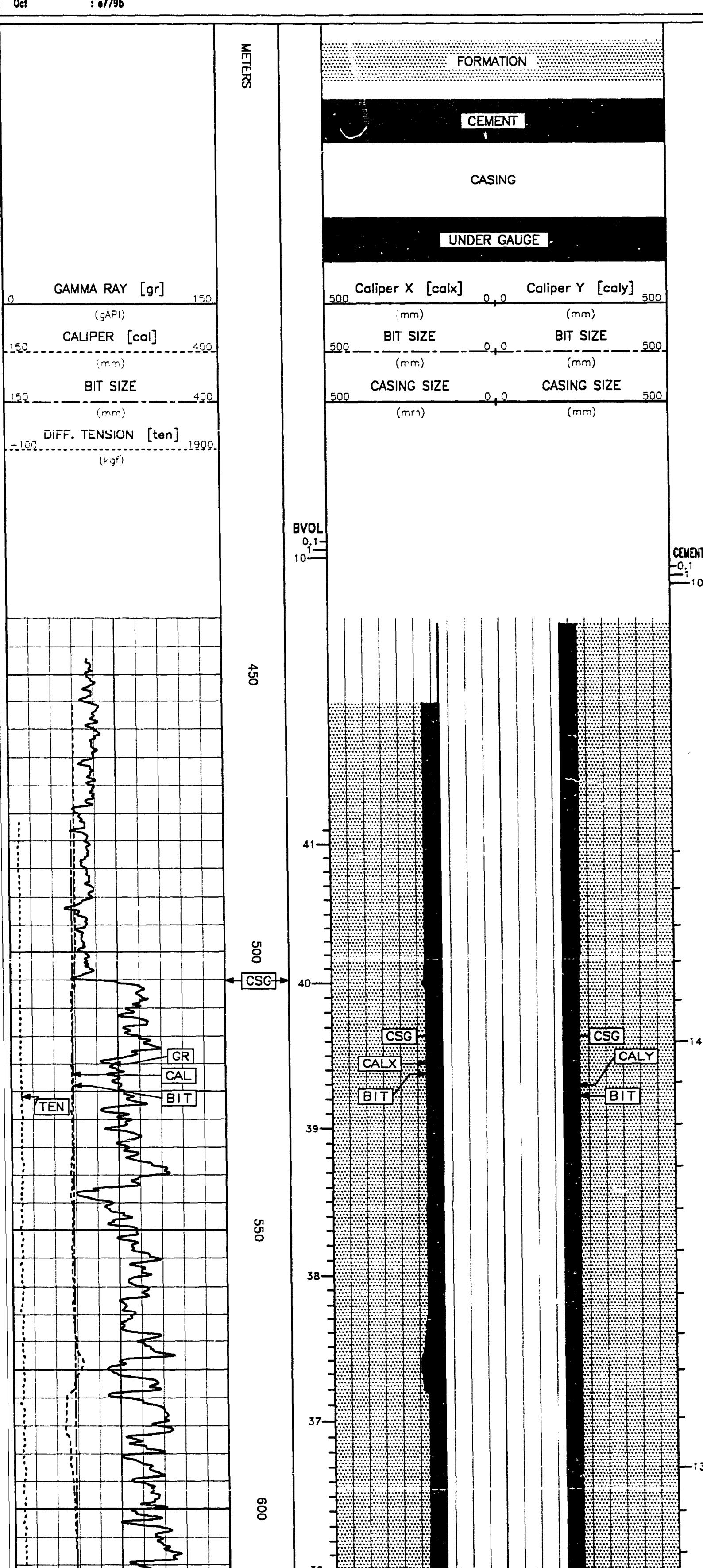
BOREHOLE & CEMENT

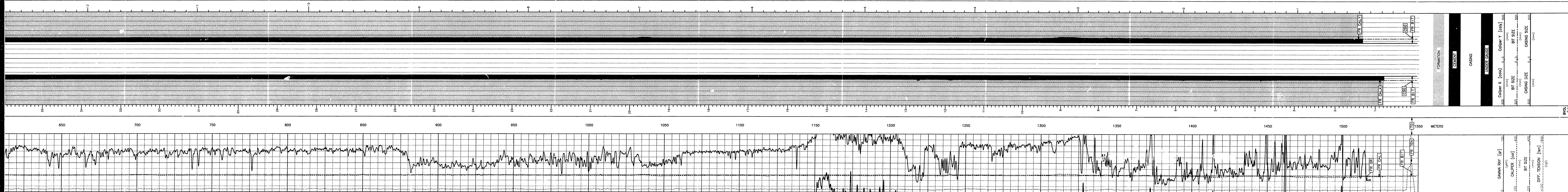
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (m)	
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	177.800	mm	TOP	BOTTOM
X-Y CALIPER	X-Y Caliper	Average		"	"
BIT SIZE	BIT SIZE	222.000	mm	"	"

CURVE MEASURE POINT OFFSET

CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)	CURVE	OFFSET (m)
bit	-0.00	calx	21.41	gr	29.57		
cal	21.34	caly	35.74	ten	-0.00		

Presentation : /data/pass/para1-46/cvl.pdf
Data File : F1 : cpu1:/data/pass/para1-46/e779b06.xtf
Company : PARAMOUNT RESOURCES LTD.
Well : PARA ET AL FT. LIARD I-46 60 10' 123 15'
Field : UNDEFINED
Interval : 440.89 - 1548.69 Meters
Oct : e779b





Baker Atlas	COMPANY		PARAMOUNT RESOURCES LTD.	FILE NO:	
	WELL		PARA ET AL. ET. LARD L-66 10' 123 15'	API NO:	
	FIELD		UNDEFINED		
Baker Hughes	PROVINCE		NORTHWEST TERRITORIES	ELEVATIONS:	
	LOCATION:			KB	DF
	LICENCE: WID #1871			UM:	3001466010123150
LAT 60 05' 32.474" N		LONG 123 22' 53.612" W		DATE	
				06-DEC-99	

CEMENT		CEMENT	
Casing		Casing	
Under Gauge		Under Gauge	
Caliper X [calx] (mm)		Caliper Y [caly] (mm)	
BIT SIZE (mm)		BIT SIZE (mm)	
Casing Size (mm)		Casing Size (mm)	
BOL		CEMENT	



Baker Atlas

CEMENT VOLUME LOG FOR 156 MM BOREHOLE AND 114.3 MM CASING

FILE NO:	COMPANY	PARAMOUNT RESOURCES LTD.
	WELL	PARA ET AL FT. LIARD I-46 60 10',123 15'
API NO:	FIELD	UNDEFINED
	PROVINCE	NORTHWEST TERRITORIES

Ver 3.68 3001466010123150	LOCATION: LIC #: 1871 LAT 60 05'32.474" LONG 123 22'53.612"	OTHER SERVICES HDIL-GR ZDL-CN-GR-CAL FMT TVD MAC-GR-4CAL
------------------------------	---	---

PERMANENT DATUM	G.L.	ELEVATION	537.2 M	ELEVATIONS:
LOG MEASURED FROM	K.B.	5.0 M	ABOVE P.D.	KB 542.2 M
DRILL. MEAS. FROM	KELLY BUSHING			DL 537.2 M

DATE		08-JAN-2000		
RUN	TRIP	1	1	
SERVICE ORDER		974644		
DEPTH DRILLER		2055.0 M		
DEPTH LOGGER		2054.4 M		
BOTTOM LOGGED INTERVAL		2054.2 M		
TOP LOGGED INTERVAL		1544.5 M		
CASING-DRILLER		177.8 MM	Ø 1545.0 M	Ø
CASING LOGGER		1544.5 M		
BIT SIZE		156.0 MM		
TYPE OF FLUID IN HOLE		INVERT		
DENSITY	VISCOSITY	1035.0 G/L	60.0 S	
PH	FLUIDLOSS	N/A	N/A	
SOURCE OF SAMPLE		FLOWLINE		
RM AT MEAS. TEMP.		N/A	Ø N/A	Ø
RMF AT MEAS. TEMP.		N/A	Ø N/A	Ø
RMC AT MEAS. TEMP.		N/A	Ø N/A	Ø
SOURCE OF RMF	RMC	NO SAMPLE	NO SAMPLE	
RM AT BHT		N/A	Ø N/A	Ø
TIME SINCE CIRCULATION		11.5 HRS		
MAX. RECORDED TEMP.		59.2 DECC		
EQUIP. NO.	LOCATION	HL 6544	G. PRAIRIE	
RECORDED BY		T. FISHER / J. BLANCO		
WITNESSED BY		GARY JOHANSSON		

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT, BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

REMARKS

RUN 1 TRIP 1 : TIME STOPPED CIRCULATION: 10:00, 09-JAN-99

- LEFT TICKS = BOREHOLE VOLUME
- RIGHT TICKS = ANNULAR VOLUME
- SMALL TICKS = 0.1 M3
- CALIPER CURVES TAKEN FROM MAC-HDL-QR-40A

CREW: T. FISHER / J. BLANCO / O. PINTO / B. FUSICK

IPMENT DATA

ITEM	QTY	UNIT	DESCRIPTION	PRICE	TOTAL	REMARKS
1	1	TRM	39811A	180401		FREE
1	1	COMM REMOT	35144B	178174		TELEMETRY
1	1	DGR	1329VA	153116		FREE
1	1	MAC ELEC	1667EA	153337		FREE
1	1	CENT	4341YA	173351		CENTRALIZER
1	1	MAC	1658MA	116855		CENTRALIZED
1	1	MAC	1668PA	189732		CENTRALIZED
1	1	MAC	1668PA	153828		CENTRALIZED
1	1	MAC	1667EA	1540006		CENTRALIZED
1	1	MAC	1667EA	177696/178847		CENTRALIZED
1	1	HOI	15155A/15155MA	153448		38 CENTRALIZED
1	1	SIAM ADAPT	3516EA	052959		TELEMETRY
1	1	4 CAL	4201VA			POWER 4-CAL

CEMENT VOLUME LOG FOR 114.3 MM CASING

Sun Jan 9 04:52:18 2000

Fileview 2.36
Perflt /main/47

Release:3.2 Jul 06, 1999

Sun Jan 9 04:52:18 2000

PARAMETER AND FILTER SUMMARY REPORT

FILE: /dat1g/pass/paral-46/e744c03.prm
LOGGING MODE: DEPTH DIRECTION: UP
TOP DEPTH: 1517.675 m BOTTOM DEPTH: 2056.486 m

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (in)
GR 4CAL	FILTER ()	med lum (1)		TOP
	FILTER ()	light (2)		BOTTOM
	FILTER (h)	light (2)		"
	FILTER (.1)	light (2)		"
TENSION	FILTER ()	med lum (1)		"
				"
BOREHOLE & CEMENT				
MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (in)
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	117.000		TOP
X-Y CALIPER	X-Y Caliper	Average		"
BIT SIZE	BIT SIZE	156.000	mm	"

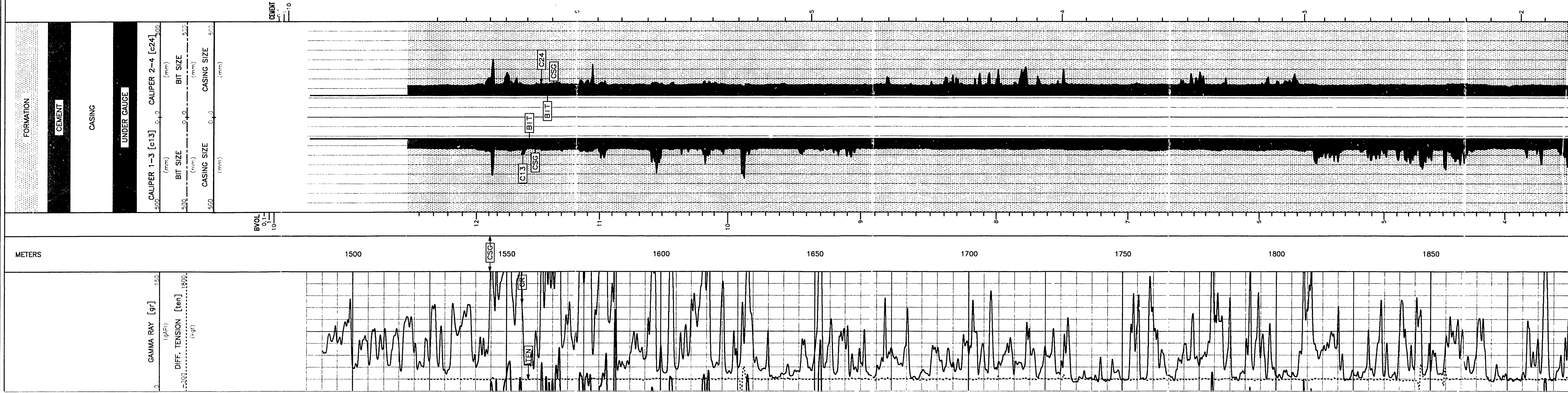
CURVE MEASURE POINT OFFSET

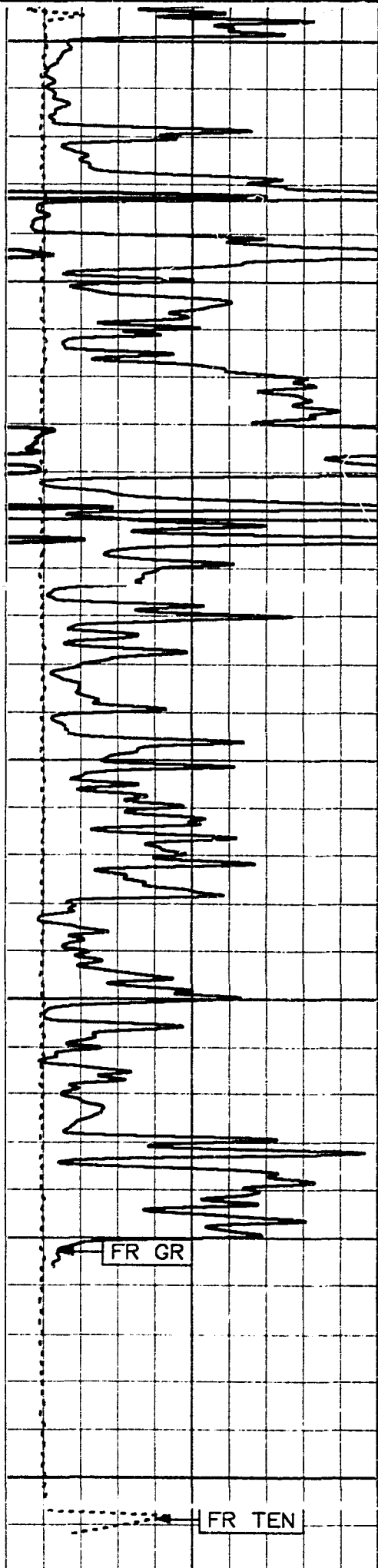
CURVE MEASURE POINT OFFSET							
CURVE		OFFSET (m)		CURVE		OFFSET (m)	
c13	0.53	c24	0.53	gr	27.89	ten	-0.00

```

Presentation      : /dat1a/pass/paral-46/cv_main.pdf
Data File         : F1 : cpu2:/dat1a/pass/paral-46/e744C03.xff
Company           : PARAMOUNT RESOURCES LTD.
Well              : PARA ET AL FT. LIARD 1-46

```





1900

1950

2000

2050

METERS

GAMMA RAY [gr] 150
(GAPI)
DIFF. TENSION [ten] 1800
(kgf)

3

2

1

FR C13

CSG

FR BIT

FR BIT

FR C24

CSG

FORMATION

CEMENT

CASING

UNDER GAUGE

CALIPER 1-3 [c13] 500 0.0 500
(mm) (mm)
BIT SIZE 500 0.0 500
(mm) (mm)
CASING SIZE 500 0.0 500
(mm) (mm)

BVOL

0.1

1

10

CEMENT

0.1

1

10

**BAKER
HUGHES**COMPANY
WELL
FIELD
PROVINCEPARAMOUNT RESOURCES LTD.
PARA ET AL FT. LIARD I-46 60 10' 123 15'
UNDEFINED
NORTHWEST TERRITORIES

FILE NO:

API NO:

Baker Atlas

LOCATION:

LIC #: 1871

ELEVATIONS:

KB 542.2 M

DF

GL 537.2 M

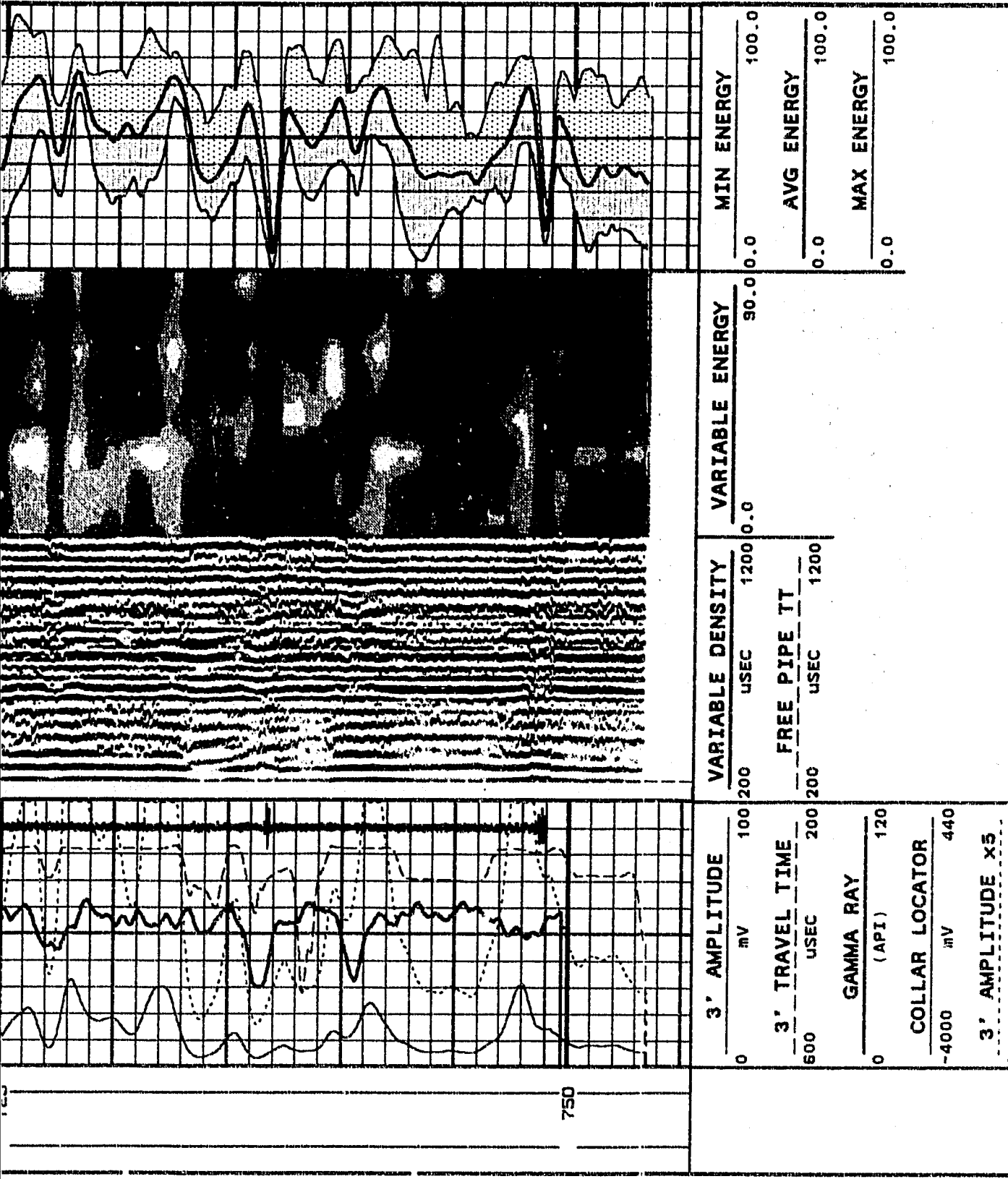
3001466010123150

LAT 60 05'32.474" LONG 123 22'53.612"

DATE

08-JAN-2000

NATIONAL ARCHIVE
EX-100
JAN 20 2000



MIN ENERGY 100.0
AVG ENERGY 100.0
MAX ENERGY 100.0

VARIABLE ENERGY 90.0
VARIABLE DENSITY 1200
FREE PIPE TT 1200

3' AMPLITUDE 100
3' TRAVEL TIME 600
3' AMPLITUDE x5 20

GAMMA RAY (API) 120
COLLAR LOCATOR 440

START DEPTH: 755.8 METERS
RECOMPUTED DATE: 12/21/2000
DIRECTION: UP
TIME: 07:15
MODE: ORIGINAL

11819SBT9

CEMENT TOP

V.05.10.99

VERSION: 1.64

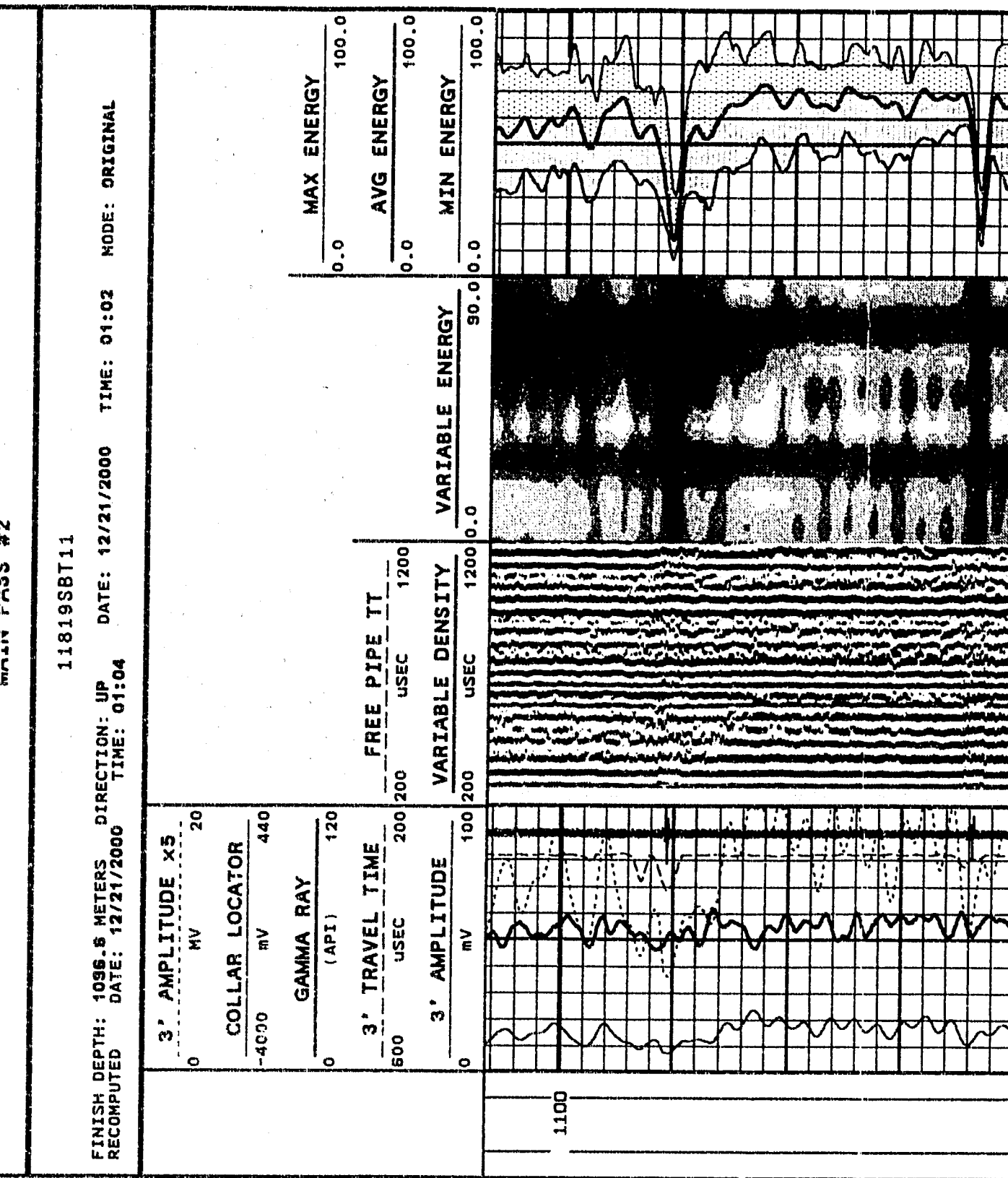
REMARKS
NOTE: THIS MAIN PASS #2 HAS BEEN LOGGED AT 0 WPA. THIS PASS HAS LOGGED IN 177.8mm CASING AND HAS DEPTH CORRECTED TO THE UPPER ZONE FROM 1217.0-1222.0 M.K.B.

V.05.10.99

MAIN PASS #2

11819SBT11

FINISH DEPTH: 1098.8 METERS
RECOMPUTED DATE: 12/21/2000
DIRECTION: UP
TIME: 01:04
MODE: ORIGINAL



MAX ENERGY 100.0
AVG ENERGY 100.0
MIN ENERGY 100.0

VARIABLE ENERGY 90.0
VARIABLE DENSITY 1200
FREE PIPE TT 1200

3' AMPLITUDE 100
3' TRAVEL TIME 600
3' AMPLITUDE x5 20

GAMMA RAY (API) 120
COLLAR LOCATOR 440

START DEPTH: 1098.8 METERS
RECOMPUTED DATE: 12/21/2000
DIRECTION: UP
TIME: 01:04
MODE: ORIGINAL

11819SBT9

CEMENT TOP

V.05.10.99

VERSION: 1.64

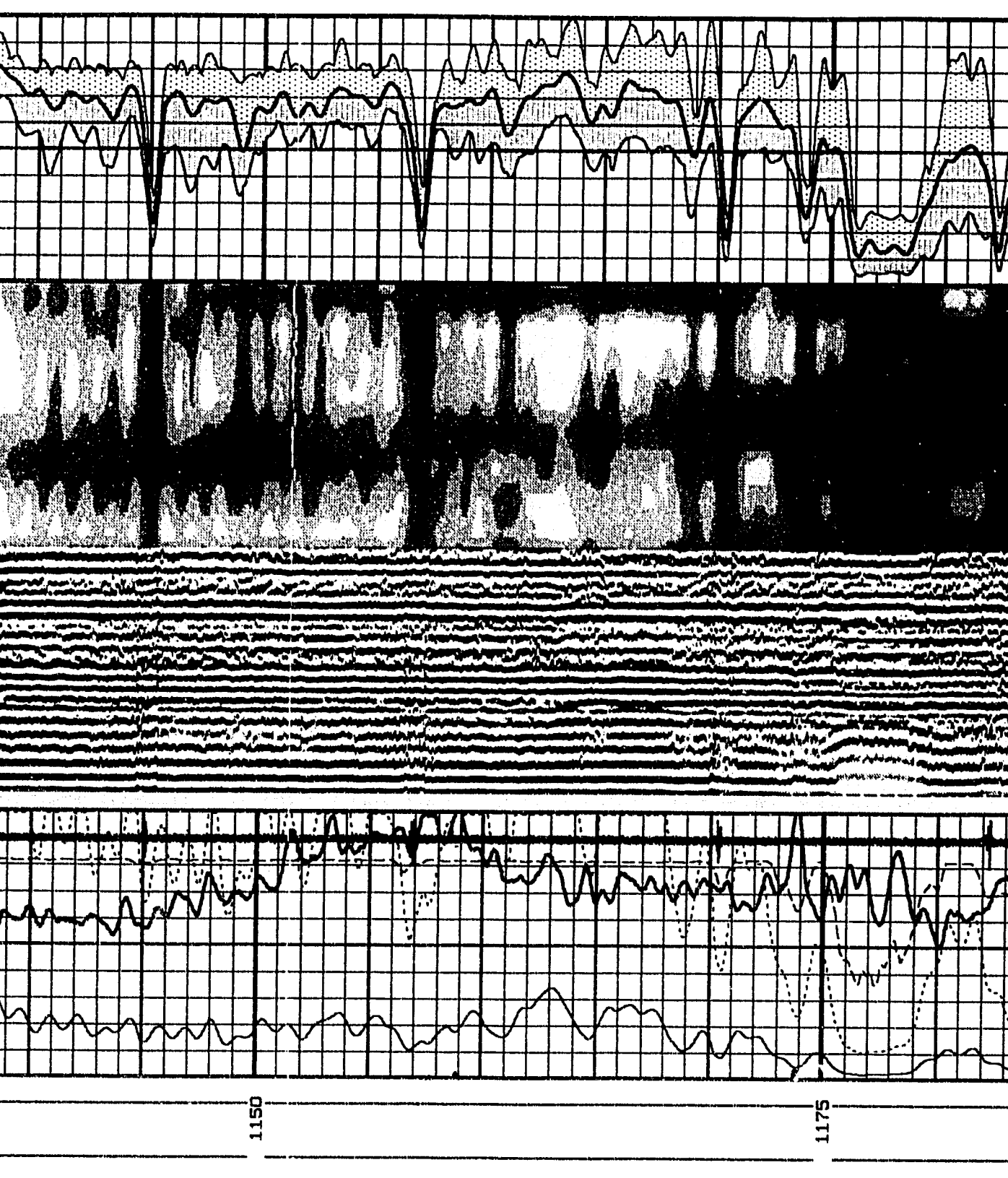
REMARKS
NOTE: THIS MAIN PASS #2 HAS BEEN LOGGED AT 0 WPA. THIS PASS HAS LOGGED IN 177.8mm CASING AND HAS DEPTH CORRECTED TO THE UPPER ZONE FROM 1217.0-1222.0 M.K.B.

V.05.10.99

MAIN PASS #2

11819SBT11

FINISH DEPTH: 1098.8 METERS
RECOMPUTED DATE: 12/21/2000
DIRECTION: UP
TIME: 01:04
MODE: ORIGINAL



MAX ENERGY 100.0
AVG ENERGY 100.0
MIN ENERGY 100.0

VARIABLE ENERGY 90.0
VARIABLE DENSITY 1200
FREE PIPE TT 1200

3' AMPLITUDE 100
3' TRAVEL TIME 600
3' AMPLITUDE x5 20

GAMMA RAY (API) 120
COLLAR LOCATOR 440

START DEPTH: 1098.8 METERS
RECOMPUTED DATE: 12/21/2000
DIRECTION: UP
TIME: 01:04
MODE: ORIGINAL

11819SBT9

CEMENT TOP

V.05.10.99

VERSION: 1.64

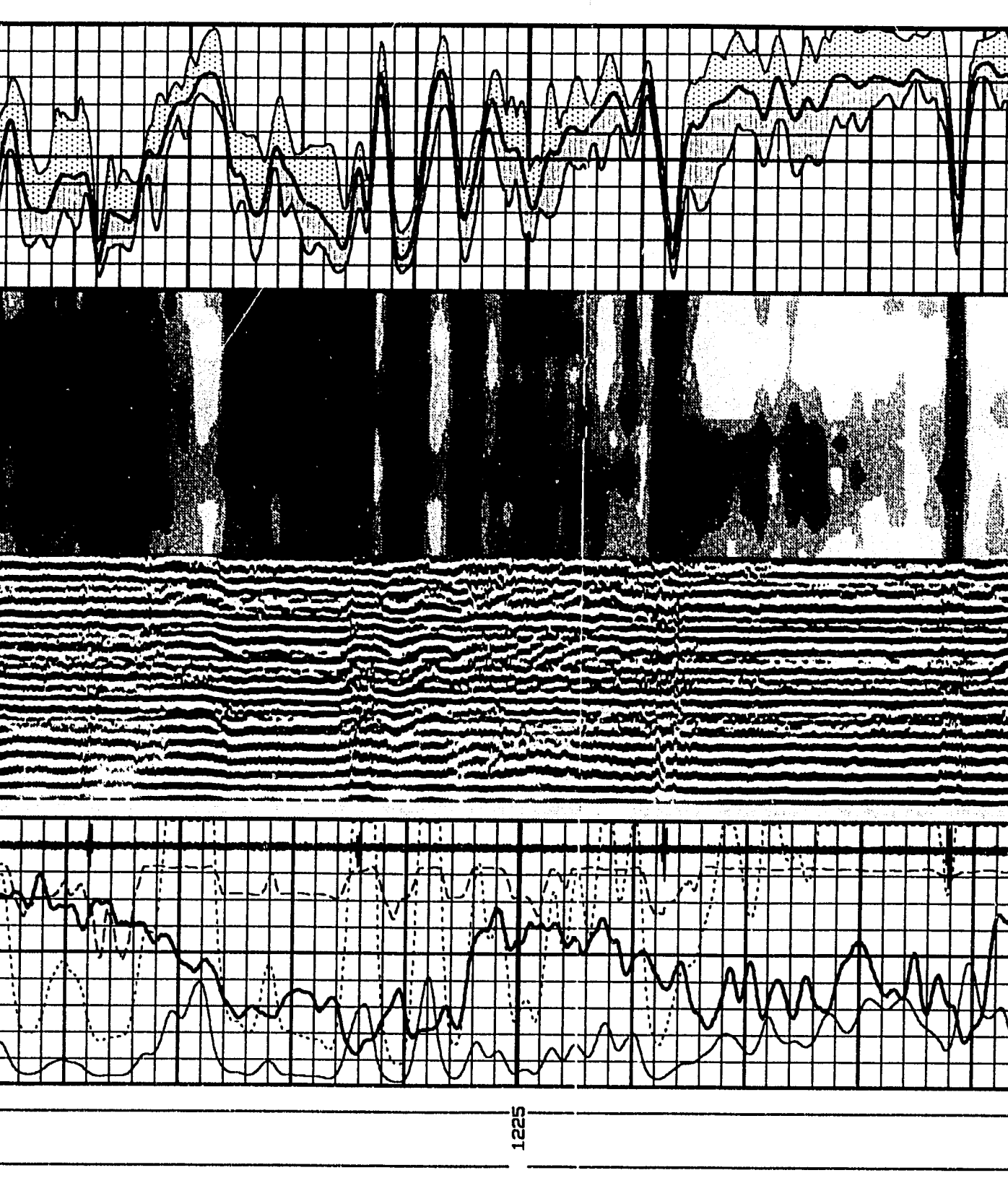
REMARKS
NOTE: THIS MAIN PASS #2 HAS BEEN LOGGED AT 0 WPA. THIS PASS HAS LOGGED IN 177.8mm CASING AND HAS DEPTH CORRECTED TO THE UPPER ZONE FROM 1217.0-1222.0 M.K.B.

V.05.10.99

MAIN PASS #2

11819SBT11

FINISH DEPTH: 1098.8 METERS
RECOMPUTED DATE: 12/21/2000
DIRECTION: UP
TIME: 01:04
MODE: ORIGINAL



MAX ENERGY 100.0
AVG ENERGY 100.0
MIN ENERGY 100.0

VARIABLE ENERGY 90.0
VARIABLE DENSITY 1200
FREE PIPE TT 1200

3' AMPLITUDE 100
3' TRAVEL TIME 600
3' AMPLITUDE x5 20

GAMMA RAY (API) 120
COLLAR LOCATOR 440

START DEPTH: 1098.8 METERS
RECOMPUTED DATE: 12/21/2000
DIRECTION: UP
TIME: 01:04
MODE: ORIGINAL

11819SBT9

CEMENT TOP

V.05.10.99

VERSION: 1.64

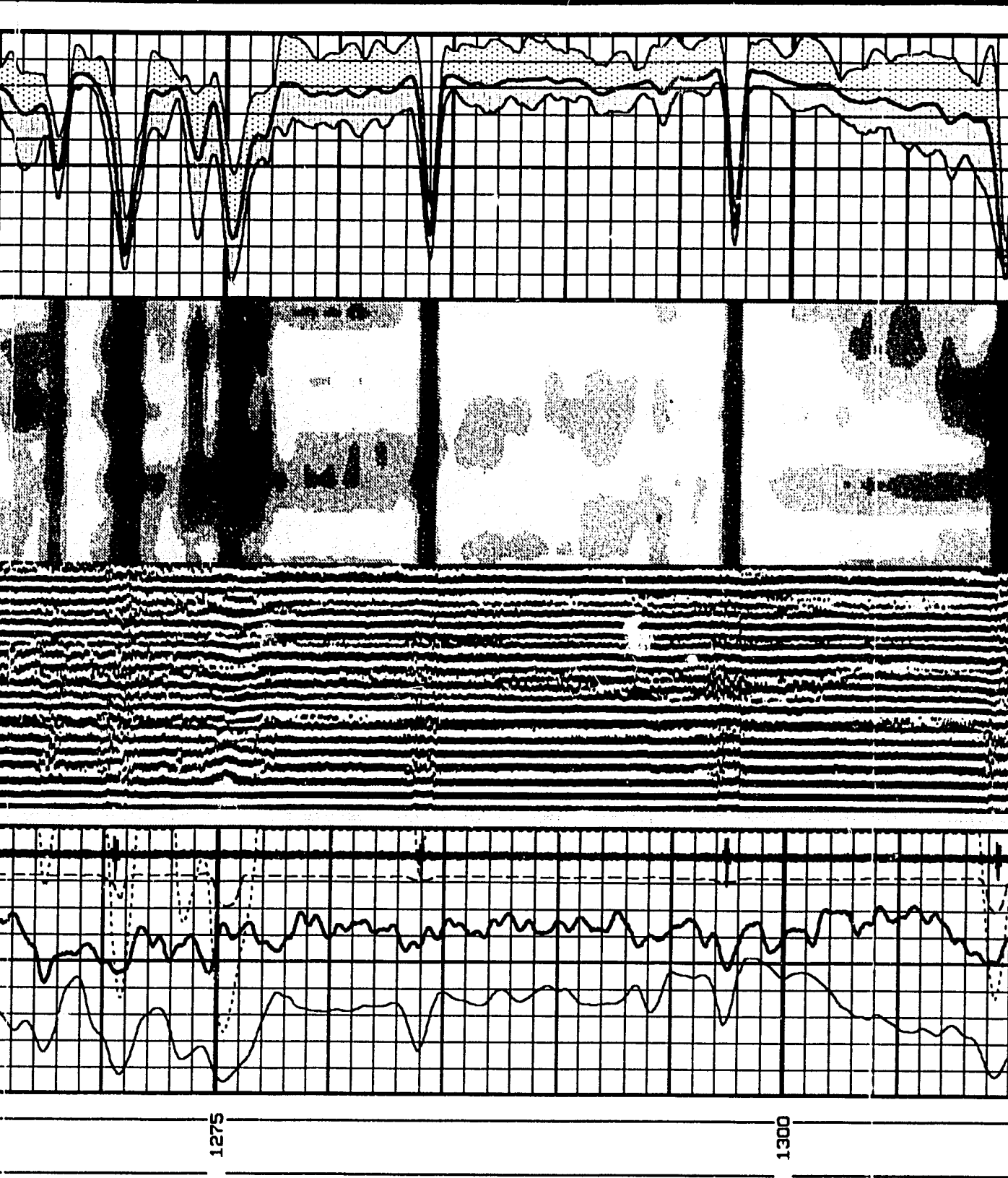
REMARKS
NOTE: THIS MAIN PASS #2 HAS BEEN LOGGED AT 0 WPA. THIS PASS HAS LOGGED IN 177.8mm CASING AND HAS DEPTH CORRECTED TO THE UPPER ZONE FROM 1217.0-1222.0 M.K.B.

V.05.10.99

MAIN PASS #2

11819SBT11

FINISH DEPTH: 1098.8 METERS
RECOMPUTED DATE: 12/21/2000
DIRECTION: UP
TIME: 01:04
MODE: ORIGINAL



MAX ENERGY 100.0
AVG ENERGY 100.0
MIN ENERGY 100.0

VARIABLE ENERGY 90.0
VARIABLE DENSITY 1200
FREE PIPE TT 1200

3' AMPLITUDE 100
3' TRAVEL TIME 600
3' AMPLITUDE x5 20

GAMMA RAY (API) 120
COLLAR LOCATOR 440

START DEPTH: 1098.8 METERS
RECOMPUTED DATE: 12/21/2000
DIRECTION: UP
TIME: 01:04
MODE: ORIGINAL

11819SBT9

CEMENT TOP

V.05.10.99

VERSION: 1.64

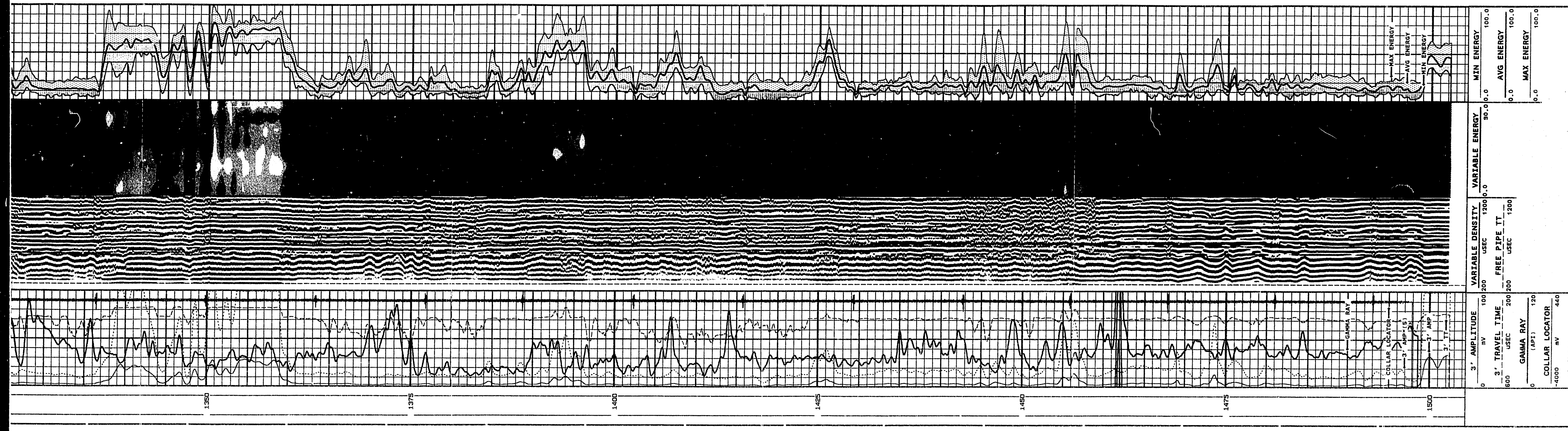
REMARKS
NOTE: THIS MAIN PASS #2 HAS BEEN LOGGED AT 0 WPA. THIS PASS HAS LOGGED IN 177.8mm CASING AND HAS DEPTH CORRECTED TO THE UPPER ZONE FROM 1217.0-1222.0 M.K.B.

V.05.10.99

MAIN PASS #2

11819SBT11

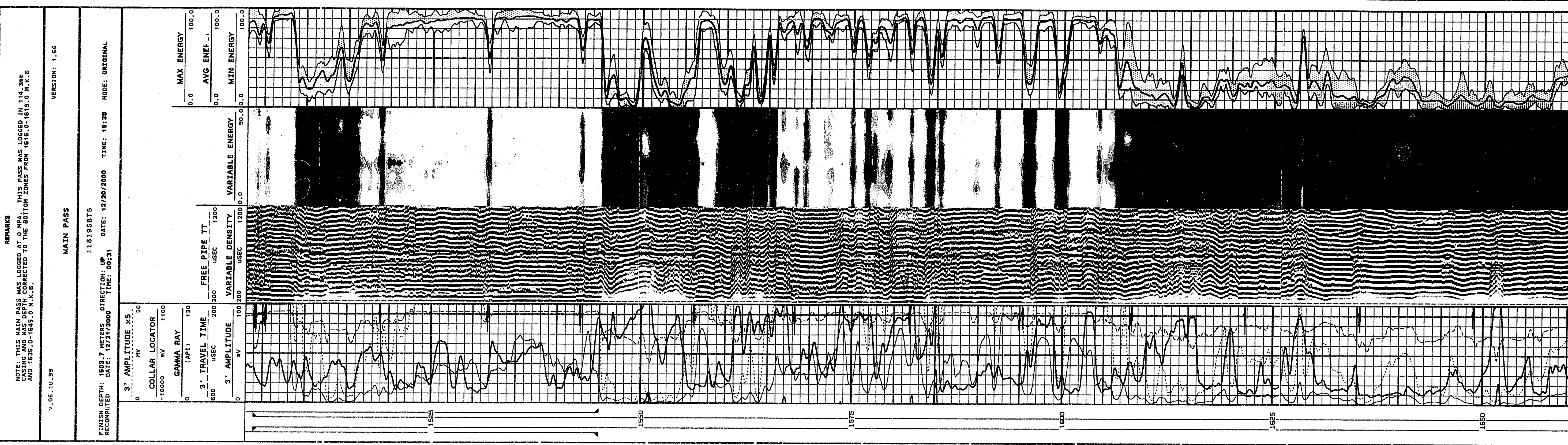
FINISH DEPTH: 1098.8 METERS
RECOMPUTED DATE: 12/21/2000
DIRECTION: UP
TIME: 01:04
MODE: ORIGINAL

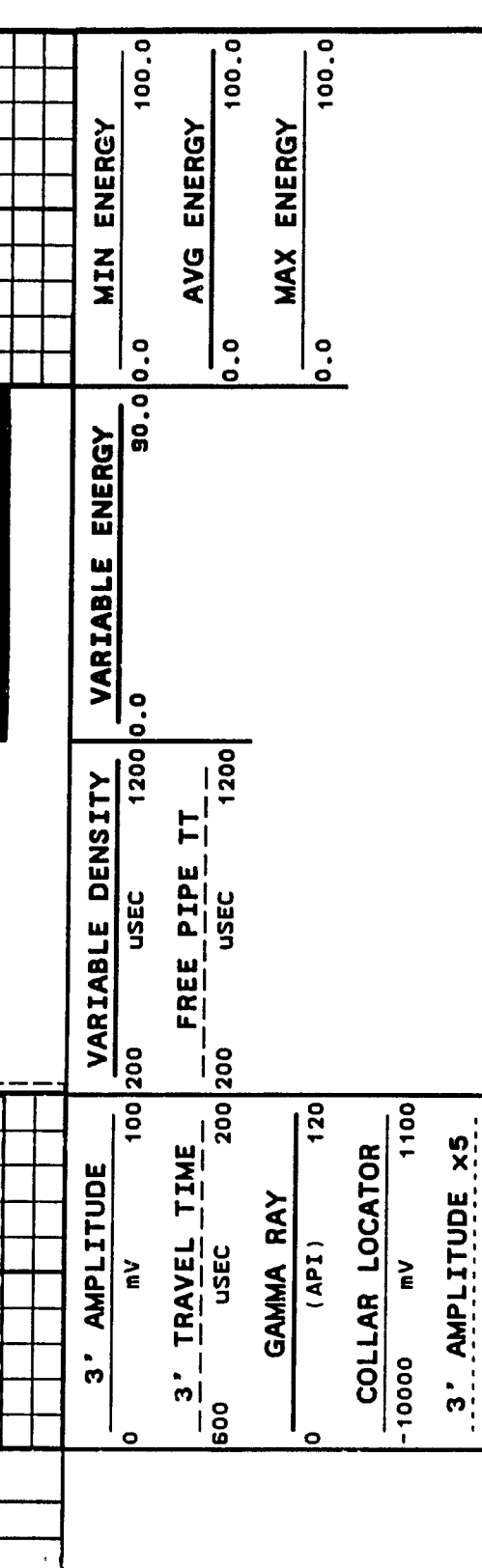
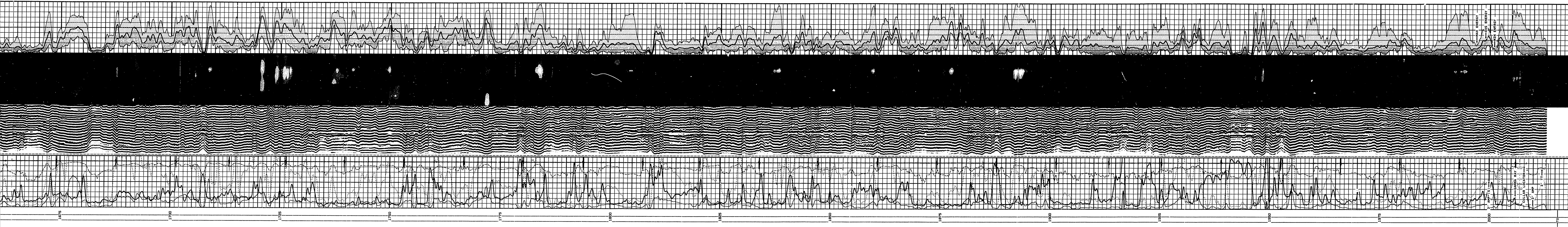


REMARKS
NOTE: THIS MAIN PASS WAS LOGGED AT 0 WPA. THIS PASS WAS LOGGED IN 114.3m
CASTING AND WAS DEPTH CORRECTED TO THE BOTTOM ZONES FROM 1616.0-1619.0 M.K.B.
AND 1635.0-1645.0 M.K.B.

MAIN PASS
11819SBT5
FINISH DEPTH: 1503.7 METERS
RECOMPUTED DATE: 12/21/2000
DIRECTION: UP
DATE: 12/20/2000
TIME: 18:39
MODE: ORIGINAL

VERSION: 1.84





START DEPTH: 2015.8 METERS DIRECTION: UP DATE: 12/20/2000 TIME: 17:58 MODE: ORIGINAL
RECOMPUTED DATE: 12/21/2000 TIME: 00:13

1181958T5

MAIN PASS

VERSION: 1.64

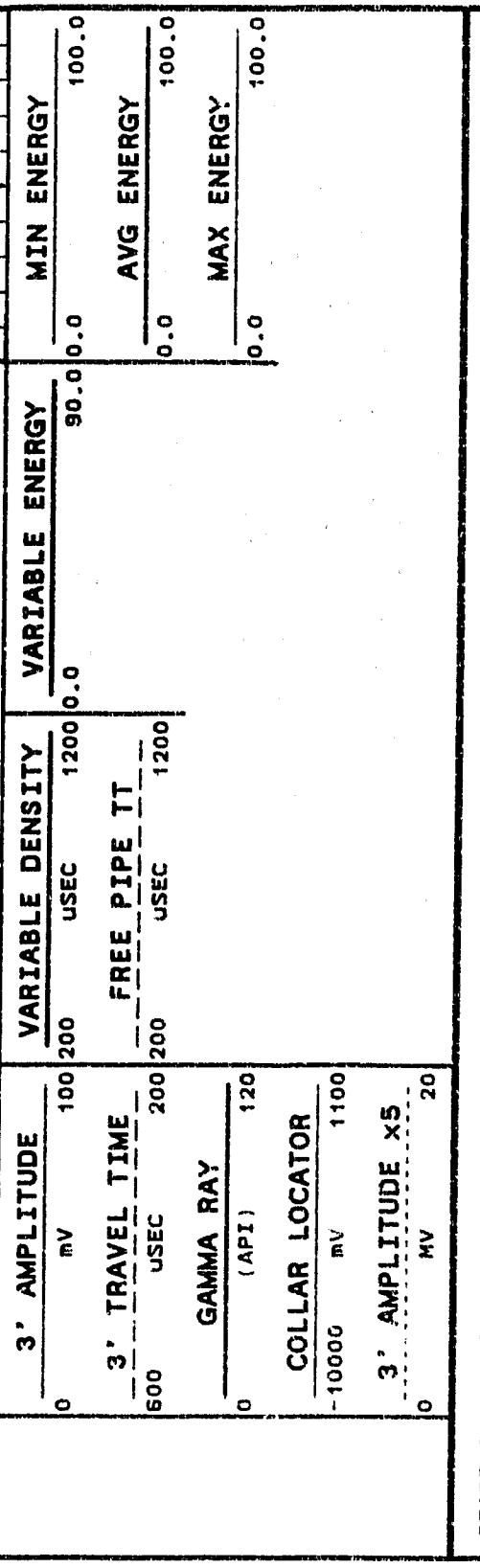
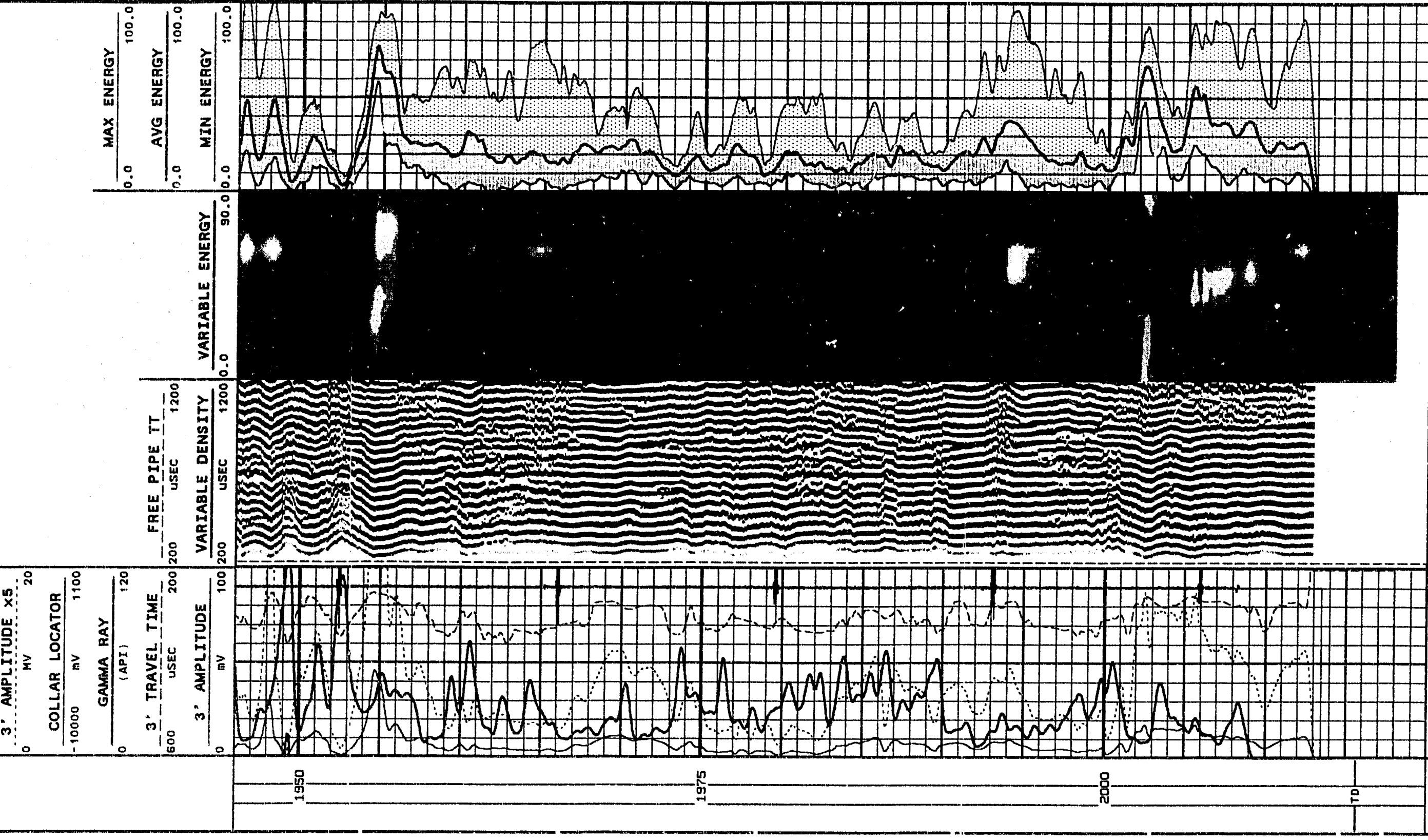
REPEAT PASS LOGGED AT 0 WPA.

REPEAT SECTION

VERSION: 1.64

11819SBT4

FINISH DEPTH: 1948.8 METERS DIRECTION: UP DATE: 12/20/2000 TIME: 17:38 MODE: ORIGINAL
RECOMPUTED DATE: 12/21/2000 TIME: 07:34



START DEPTH: 2015.9 METERS DIRECTION: UP DATE: 12/20/2000 TIME: 17:30 MODE: ORIGINAL
RECOMPUTED DATE: 12/21/2000 TIME: 07:31

11819SBT4

V.05.10.99

REPEAT SECTION

VERSION: 1.64

REMARKS

NOTE: THIS MAIN PRESSURE PASS #2, WAS LOGGED AT 7.0 MPA. THIS LOG WAS
DEPTH CORRECTED FOR THE UPPER ZONE FROM 1217.0-1222.0 M.K.B.

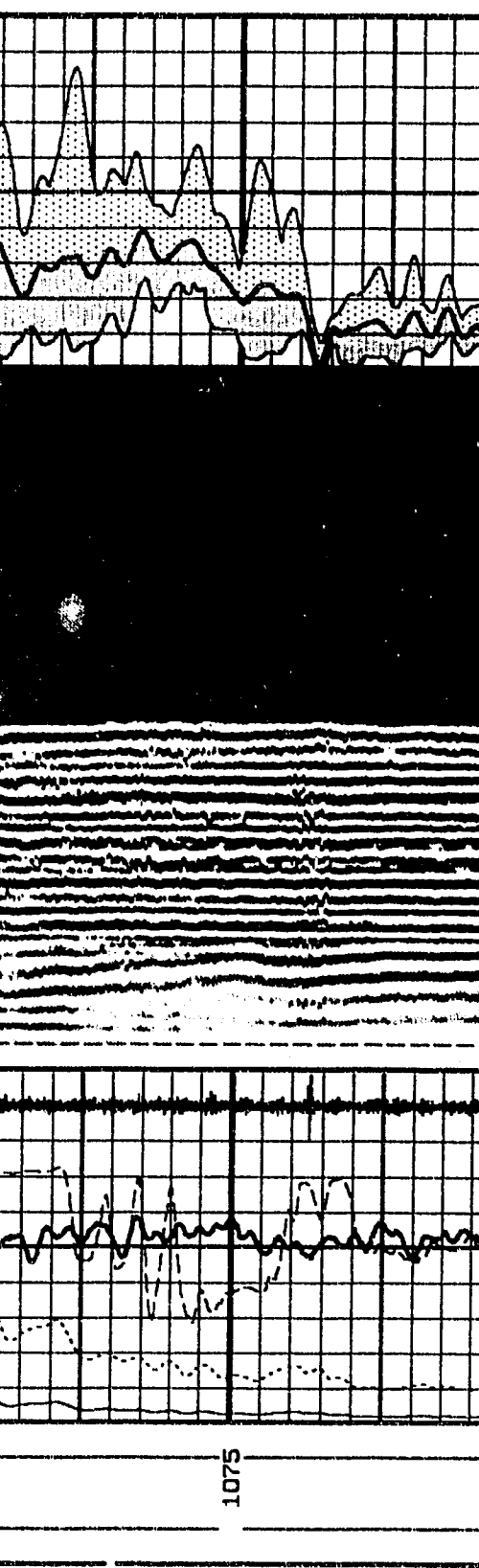
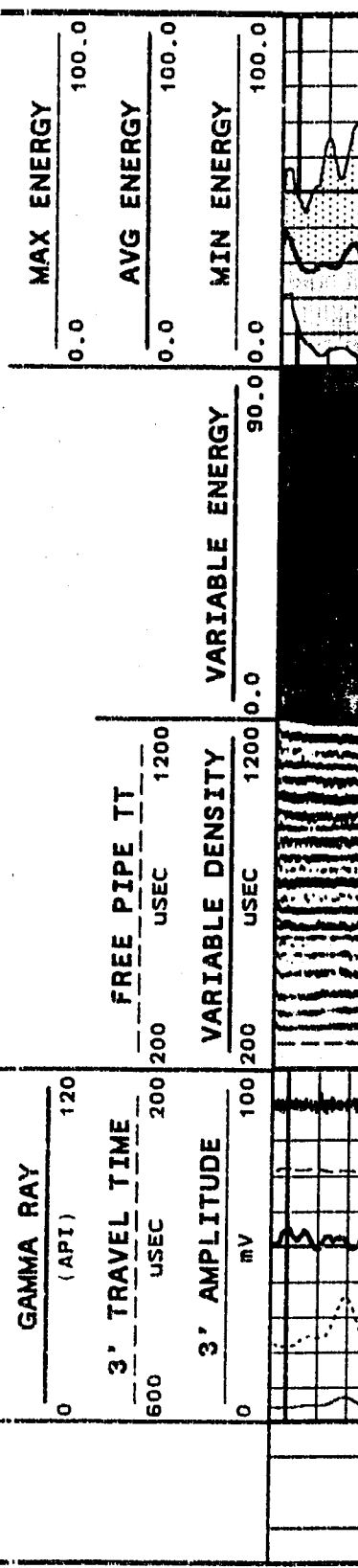
V.05.10.99

PRESSURE #2

VERSION: 1.64

FINISH DEPTH: 1084.5 METERS DIRECTION: UP DATE: 12/20/2000 TIME: 23:48 MODE: ORIGINAL

11819SBT10



START DEPTH: 1215.9 METERS DIRECTION: UP DATE: 12/20/2000 TIME: 23:48 MODE: ORIGINAL
RECOMPUTED DATE: 12/21/2000 TIME: 07:31

11819SBT10

V.05.10.99

REPEAT SECTION

VERSION: 1.64

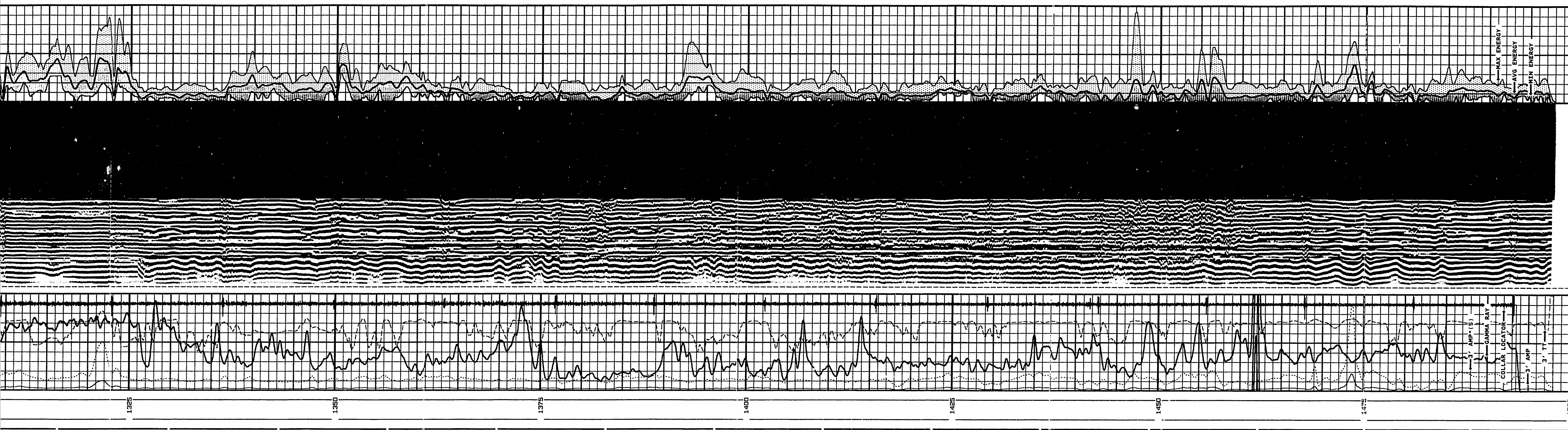
REMARKS

NOTE: THIS MAIN PRESSURE PASS #2, WAS LOGGED AT 7.0 MPA. THIS LOG WAS
DEPTH CORRECTED FOR THE UPPER ZONE FROM 1217.0-1222.0 M.K.B.

V.05.10.99

PRESSURE #2

VERSION: 1.64



3' AMPLITUDE
mV 100 200 300 400 500 600
3' TRAVEL TIME
USEC 200 400 600
3' IT
USEC 200 400 600

VARIABLE DENSITY
USEC 200 400 600
FREE PIPE IT
USEC 200 400 600

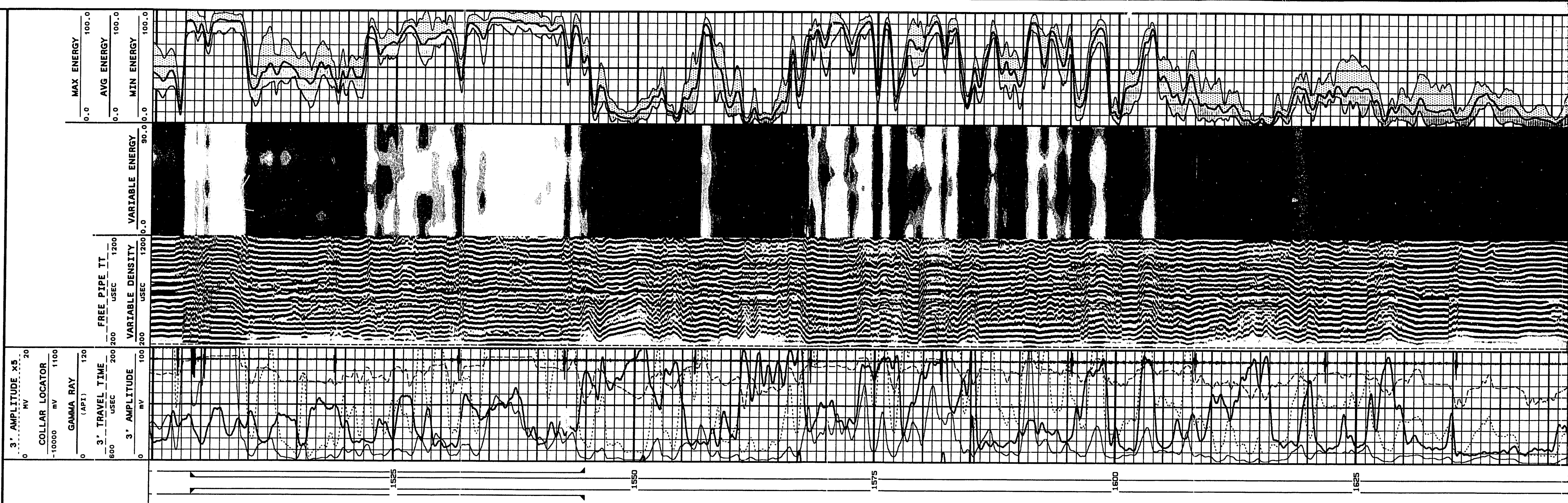
VARIABLE ENERGY
0.0 50.0 100.0
MIN ENERGY
0.0 50.0 100.0
AVG ENERGY
0.0 50.0 100.0
MAX ENERGY
0.0 50.0 100.0

START DEPTH: 1500.0 METERS DIRECTION: UP DATE: 12/20/2000 TIME: 23:32 MODE: ORIGINAL
11819SBT10
PRESSURE #2
VERSION: 1.64

REMARKS
NOTE: THIS MAIN PRESSURE PASS #1, WAS LOGGED AT 7.0 MPa. THIS LOG WAS
DEPTH CORRECTED FOR THE BOTTOM TWO ZONES FROM 1616.0-1619.0 M.K.B. TO
1635.0-1645.0 M.K.B.

V.05.10.99
PRESSURE #1
VERSION: 1.64

FINISH DEPTH: 1488.9 METERS DIRECTION: UP DATE: 12/20/2000 TIME: 21:05 MODE: ORIGINAL
11819SBT7
RECORDED DATE: 12/20/2000 TIME: 23:16



3' AMPLITUDE X5
mV 100 200 300 400 500 600
3' TRAVEL TIME
USEC 200 400 600
3' IT
USEC 200 400 600

VARIABLE DENSITY
USEC 200 400 600
FREE PIPE IT
USEC 200 400 600

VARIABLE ENERGY
0.0 50.0 100.0
MIN ENERGY
0.0 50.0 100.0
AVG ENERGY
0.0 50.0 100.0
MAX ENERGY
0.0 50.0 100.0

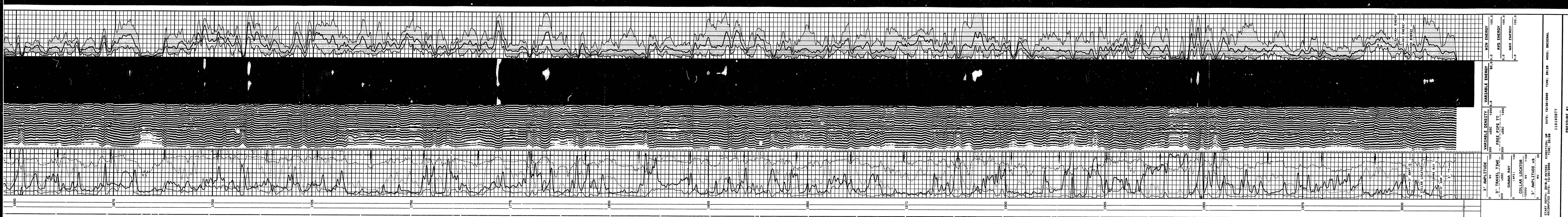
START DEPTH: 1500.0 METERS DIRECTION: UP DATE: 12/20/2000 TIME: 21:05 MODE: ORIGINAL
11819SBT7
RECORDED DATE: 12/20/2000 TIME: 23:16

3' AMPLITUDE
mV 100 200 300 400 500 600
3' TRAVEL TIME
USEC 200 400 600
3' IT
USEC 200 400 600

VARIABLE DENSITY
USEC 200 400 600
FREE PIPE IT
USEC 200 400 600

VARIABLE ENERGY
0.0 50.0 100.0
MIN ENERGY
0.0 50.0 100.0
AVG ENERGY
0.0 50.0 100.0
MAX ENERGY
0.0 50.0 100.0

START DEPTH: 1500.0 METERS DIRECTION: UP DATE: 12/20/2000 TIME: 21:05 MODE: ORIGINAL
11819SBT7
RECORDED DATE: 12/20/2000 TIME: 23:16



START DEPTH: 2016.0 METERS DIRECTION: UP DATE: 12/20/2000 TIME: 20:23 MODE: ORIGINAL
RECORDED DATE: 12/20/2000 TIME: 22:55

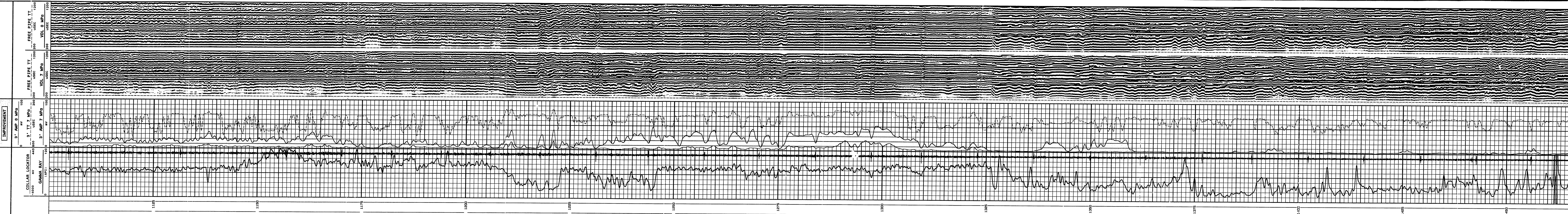
118195877

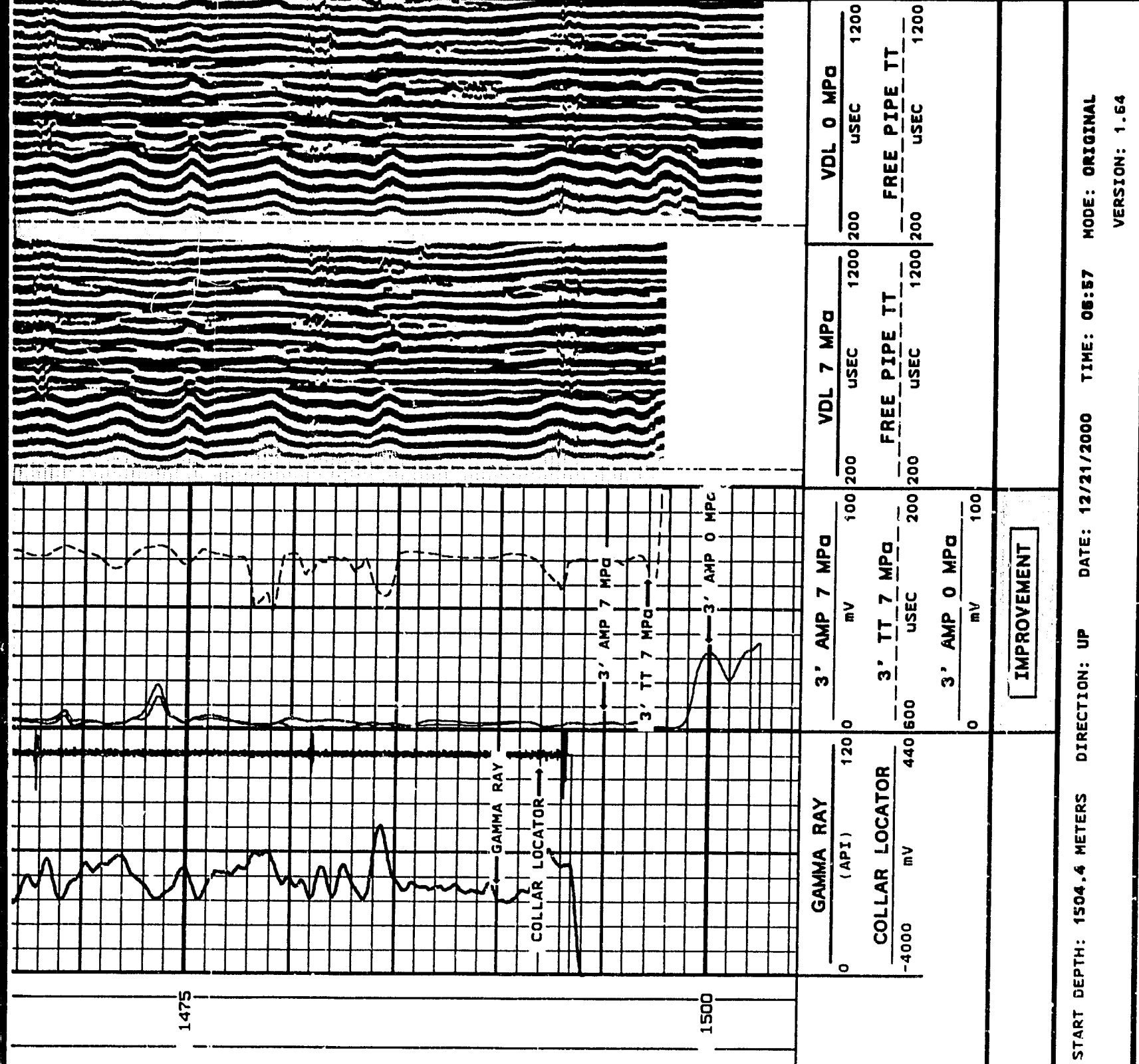
PRESSURE #1

REMARKS
NOTE: THIS IS A MERGED PASS CONSISTING OF BOTH THE MAIN PASS #2 AND PRESSURE PASS #2 OF THE UPPER ZONE. THE PRESSURE PASS WAS LOGGED AT 7.0 MPa. THE GREY SHADING IMPROVEMENT BETWEEN THE PRESSURE PASS AND THE MAIN PASS

FINISH DEPTH: 1101.3 METERS DIRECTION: UP DATE: 12/31/2000 TIME: 07:03 MODE: ORIGINAL

VERSION: 1.64



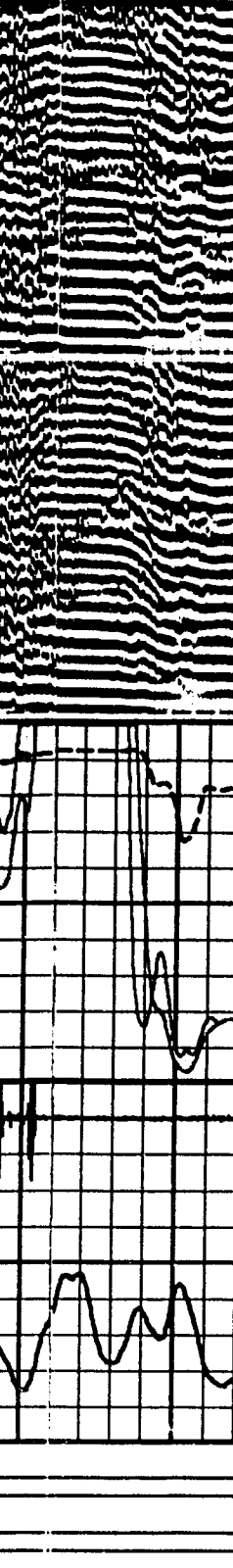


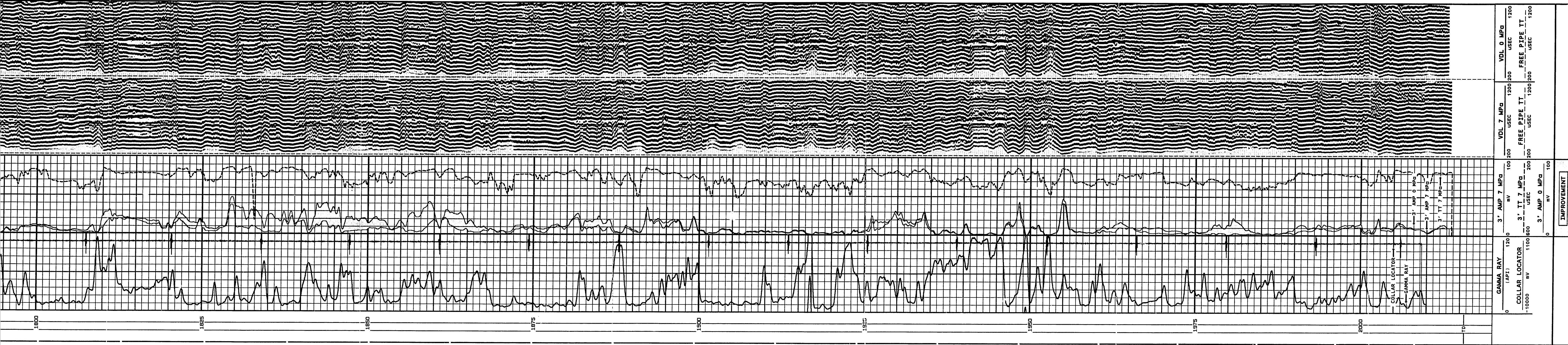
START DEPTH: 1504.4 METERS DIRECTION: UP DATE: 12/21/2000 TIME: 08:57 MODE: ORIGINAL VERSION: 1.64

REMARKS: NOTE: THIS IS A MERGED PASS CONSISTING OF BOTH THE MAIN PASS AND PRESSURE PASS. THE PRESSURE PASS HAS LOGGED AT 7.0 MPa. THE GREY SHADING SHOWS IMPROVEMENT BETWEEN THE PRESSURE PASS AND THE MAIN PASS.

FINISH DEPTH: 1501.0 METERS DIRECTION: UP DATE: 12/21/2000 TIME: 08:32 MODE: ORIGINAL VERSION: 1.64

IMPROVEMENT: 3' AMP 0 MPa 3' TT 7 MPa 3' AMP 7 MPa 3' TT 7 MPa





GAMMA RAY (API)	1200	3' AMP 7 MPa mV	100	200	VDL 7 MPa USEC	1200	200	VDL 0 MPa USEC	1200
COLLAR LOCATOR	-10000	3' TT 7 MPa USEC	600	200	FREE PIPE TT	1200	200	FREE PIPE TT	1200
		3' AMP 0 MPa mV	0	100					

IMPROVEMENT

START DEPTH: 2020.0 METERS DIRECTION: UP DATE: 12/21/2000 TIME: 08:25 MODE: ORIGINAL VERSION: 1.64

CS400 12/21/00 07:53:18 Ver. 1.64 Service: SBTGRCLL JOB: 11819

** Calibration Mode Select **

Cal Results

SECTOR	AMP	#	CAL	Use For	Standard	Measured	Description
3' AMPLITUDE	DEFINE			Log	90.0	82.0	177.8mm CAL 0
CAL PULSE	BEFORE			Log	90.0	296.4	177.8mm CAL 1
5' AMPLITUDE	DEFINE			Log	62.0	5.0	177.8mm CAL 0
SPARE	BEFORE			Log	81.0	340.0	177.8mm CAL 1
SECTOR AMP #1 CAL	DEFINE			Log	90.0	132.4	ZERO PIPE
SECTOR AMP #2 CAL	DEFINE			Log	90.0	185.2	ZERO PIPE
SECTOR AMP #3 CAL	DEFINE			Log	62.0	0.5	177.8mm CAL 0
SECTOR AMP #4 CAL	DEFINE			Log	72.0	869.7	177.8mm CAL 1
				Log	90.0	6.8	ZERO PIPE
				Log	90.0	9.4	ZERO PIPE
				Log	90.0	105.0	177.8mm CAL 0
				Log	90.0	446.8	177.8mm CAL 1
				Log	90.0	122.0	177.8mm CAL 0
				Log	90.0	459.2	177.8mm CAL 1
				Log	90.0	11.0	177.8mm CAL 0
				Log	90.0	297.2	177.8mm CAL 1
				Log	90.0	49.0	177.8mm CAL 0
				Log	90.0	442.0	177.8mm CAL 1

CS400 12/21/00 07:53:03 Ver. 1.64 Service: SBTGRCLL JOB: 11819

** Calibration Mode Select **

Cal Results

SECTOR	AMP	#	CAL	Use For	Standard	Measured	Description
3' AMPLITUDE	BEFORE			Log	90.0	45.1	114.3mm CAL 0
CAL PULSE	BEFORE			Log	90.0	642.1	114.3mm CAL 1
5' AMPLITUDE	BEFORE			Log	81.0	1.0	114.3mm CAL 0
SPARE	BEFORE			Log	81.0	475.2	114.3mm CAL 1
SECTOR AMP #1 CAL	BEFORE			Log	90.0	133.4	ZERO PIPE
SECTOR AMP #2 CAL	BEFORE			Log	90.0	155.2	ZERO PIPE
SECTOR AMP #3 CAL	BEFORE			Log	81.0	-0.7	114.3mm CAL 0
SECTOR AMP #4 CAL	BEFORE			Log	72.0	103.5	114.3mm CAL 1
				Log	90.0	5.8	ZERO PIPE
				Log	90.0	9.4	ZERO PIPE
				Log	90.0	34.5	114.3mm CAL 0
				Log	90.0	600.1	114.3mm CAL 1
				Log	90.0	42.1	114.3mm CAL 0
				Log	90.0	642.3	114.3mm CAL 1
				Log	90.0	31.0	114.3mm CAL 0
				Log	90.0	648.2	114.3mm CAL 1
				Log	90.0	31.0	114.3mm CAL 0
				Log	90.0	630.2	114.3mm CAL 1

CS400 12/21/00 07:53:03 Ver. 1.64 Service: SBTGRCLL JOB: 11819

** Calibration Mode Select **

Cal Results

SECTOR	AMP	#	CAL	Use For	Standard	Measured	Description
3' AMPLITUDE	BEFORE			Log	90.0	32.0	114.3mm CAL 0
CAL PULSE	BEFORE			Log	90.0	576.1	114.3mm CAL 1
5' AMPLITUDE	BEFORE			Log	90.0	33.2	114.3mm CAL 0
SPARE	BEFORE			Log	90.0	570.2	114.3mm CAL 1
SECTOR AMP #1 CAL	BEFORE			Log	90.0	32.6	114.3mm CAL 0
SECTOR AMP #2 CAL	BEFORE			Log	90.0	580.3	114.3mm CAL 1
SECTOR AMP #3 CAL	BEFORE			Log	90.0	50.0	GR Background Cal
SECTOR AMP #4 CAL	BEFORE			Log	120.0	370.1	GR API Cal 1

CS400 12/21/00 07:53:03 Ver. 1.64 Service: SBTGRCLL JOB: 11819

** Calibration Mode Select **

Cal Results

SECTOR	AMP	#	CAL	Use For	Standard	Measured	Description
3' AMPLITUDE	BEFORE			Log	90.0	32.0	114.3mm CAL 0
CAL PULSE	BEFORE			Log	90.0	576.1	114.3mm CAL 1
5' AMPLITUDE	BEFORE			Log	90.0	33.2	114.3mm CAL 0
SPARE	BEFORE			Log	90.0	570.2	114.3mm CAL 1
SECTOR AMP #1 CAL	BEFORE			Log	90.0	32.6	114.3mm CAL 0
SECTOR AMP #2 CAL	BEFORE			Log	90.0	580.3	114.3mm CAL 1
SECTOR AMP #3 CAL	BEFORE			Log	90.0	50.0	GR Background Cal
SECTOR AMP #4 CAL	BEFORE			Log	120.0	370.1	GR API Cal 1

CS400 12/21/00 07:53:03 Ver. 1.64 Service: SBTGRCLL JOB: 11819

** Calibration Mode Select **

Cal Results

SECTOR	AMP	#	CAL	Use For	Standard	Measured	Description
3' AMPLITUDE	BEFORE			Log	90.0	32.0	114.3mm CAL 0
CAL PULSE	BEFORE			Log	90.0	576.1	114.3mm CAL 1
5' AMPLITUDE	BEFORE			Log	90.0	33.2	114.3mm CAL 0
SPARE	BEFORE			Log	90.0	570.2	114.3mm CAL 1
SECTOR AMP #1 CAL	BEFORE			Log	90.0	32.6	114.3mm CAL 0
SECTOR AMP #2 CAL	BEFORE			Log	90.0	580.3	114.3mm CAL 1
SECTOR AMP #3 CAL	BEFORE			Log	90.0	50.0	GR Background Cal
SECTOR AMP #4 CAL	BEFORE			Log	120.0	370.1	GR API Cal 1

CS400 12/21/00 07:53:03 Ver. 1.64 Service: SBTGRCLL JOB: 11819

** Calibration Mode Select **

Cal Results

SECTOR	AMP	#	CAL	Use For	Standard	Measured	Description
3' AMPLITUDE	BEFORE			Log	90.0	32.0	114.3mm CAL 0
CAL PULSE	BEFORE			Log	90.0	576.1	114.3mm CAL 1
5' AMPLITUDE	BEFORE			Log	90.0	33.2	114.3mm CAL 0
SPARE	BEFORE			Log	90.0	570.2	114.3mm CAL 1
SECTOR AMP #1 CAL	BEFORE			Log	90.0	32.6	114.3mm CAL 0
SECTOR AMP #2 CAL	BEFORE			Log	90.0	580.3	114.3mm CAL 1
SECTOR AMP #3 CAL	BEFORE			Log	90.0	50.0	GR Background Cal
SECTOR AMP #4 CAL	BEFORE			Log	120.0	370.1	GR API Cal 1

CS400 12/21/00 07:53:03 Ver. 1.64 Service: SBTGRCLL JOB: 11819

** Calibration Mode Select **

Cal Results

SECTOR	AMP	#	CAL	Use For	Standard	Measured	Description
3' AMPLITUDE	BEFORE			Log	90.0	32.0	114.3mm CAL 0
CAL PULSE	BEFORE			Log	90.0	576.1	114.3mm CAL 1
5' AMPLITUDE	BEFORE			Log	90.0	33.2	114.3mm CAL 0
SPARE	BEFORE			Log	90.0	570.2	114.3mm CAL 1
SECTOR AMP #1 CAL	BEFORE			Log	90.0	32.6	114.3mm CAL 0
SECTOR AMP #2 CAL	BEFORE			Log	90.0	580.3	114.3mm CAL 1
SECTOR AMP #3 CAL	BEFORE			Log	90.0	50.0	GR Background Cal
SECTOR AMP #4 CAL	BEFORE			Log	120.0	370.1	GR API Cal 1

Slim Hole Gamma Ray

Weight 34.0 Kg
Length 1.38 m
Max. Diameter 69.9 mm

Slim Hole Centralizer

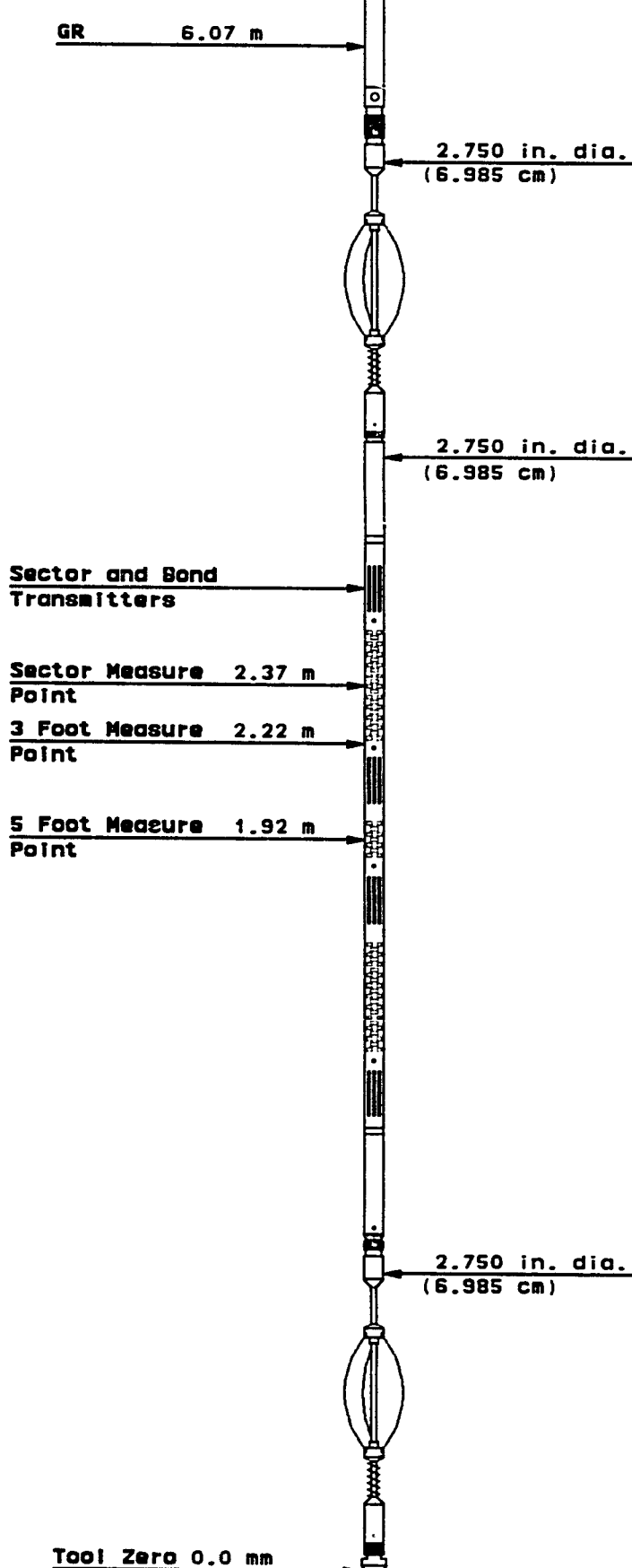
Weight 5.0 Kg
Length 0.94 m
Max. Diameter 69.9 mm

Sector Bond

Weight 40.8 Kg
Length 3.14 m
Max. Diameter 69.9 mm

Slim Hole Centralizer

Weight 5.0 Kg
Length 0.94 m
Max. Diameter 69.9 mm



COMPANY PARAMOUNT RESOURCES LTD.

WELL PARA ET AL FT. LIARD I-46 60 10', 123 15'

FIELD UNDEFINED PROVINCE N.W.T.

COMPUTALOG

N.E.B. COPY

COMPUTALOG
COLLAR LOG

PROVINCE NORTHWEST TERRITORIES
FIELD UNDEFINED
WELL PARA et al FT. LIARD
I-46 60 10', 123 15'
COMPANY PARAMOUNT RESOURCES LTD.

COMPANY PARAMOUNT RESOURCES LTD.
WELL PARA et al FT. LIARD
I-46 60 10', 123 15'
FIELD UNDEFINED
PROVINCE NORTHWEST TERRITORIES

LOCATION I-46 60 10', 123 15'
Perm. Datum GROUND LEVEL Elev. 537.20
Log measured from K.B. 5.00 m above
Permanent Datum.
G.L. 537.20
ELEV. K.B. 542.20
CBF

UNIT 3001466010123150
Licence 1871

Other Services:
BRIDGE PLUG
DUMP BAIL CEMENT
ELEV. K.B. 542.20
G.L. 537.20
CBF

Date JANUARY 3/2001
Run No. ONE
Type Log CCL
Depth-Driller 2055.0
Depth-Logger NOT TAGGED
Btm. Log Inter 1631.0
Top Log Inter 1552.6
Fluid in Hole 3% KCL
Fluid Level FULL
Bit Size (mm) 156.00mm
Gun Type
Gun Size
Tubing/Casing Record
Unit # 4020
Location FT. ST. JOHN
Recorded By B. WEBB
Witnessed By A. IRONSIDE

Shot Density
No. of Shots
Perf. Interval
From To

Gun Type
Gun Size
Tubing/Casing Record
Size mm Wt. Kg/m From To
244.5 53.6 SURFACE 505.0
177.8 38.6 SURFACE 1545.0
114.3 17.3 1501.0 2055.0

Collar Location
Casing Tubing
Service Type Size Depth
Bridge Plug PERMANENT 114.3 1633.0
Produc. Packer
Cement Retainer
Cement CLASS "G" 1625.0

Tubing Bottom Junk Basket Type
Seating Nipple Gauge Ring Size

CS400

COLLAR LOG

FOLD

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCE FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES, OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS, EMPLOYEES, OR SUBCONTRACTORS. THESE INTERPRETATIONS ARE ALSO SUBJECT TO OUR GENERAL TERMS AND CONDITIONS SET OUT IN OUR CURRENT PRICE SCHEDULE.

REMARKS
LOG CORRELATED TO COMPUTALOG SECTOR BOND LOG DATED DECEMBER 20, 2000.Service Order # 10011861
BHT 64.2 °C

Prints: 14

EQUIPMENT DATA

Run No. Tool Type Tool No. Other

ONE SETTING TOOL SET BAKER PERMANENT BRIDGE PLUG @ 1633.0 mkb.

TWO DUMP BAILER DUMP 8 LINEAR METRES CLASS "G" CEMENT ON PLUG.

Date 02/01/01

Type PERMANENT

Model MS

Size 114.3

Depth 1633.0

Make BAKER

Overall Length 2.9 m

CCL to Packing Element 2.7 m

FINISH DEPTH: 1552.6 METERS DIRECTION: UP DATE: 01/03/2001 TIME: 13:58 MODE: ORIGINAL

VERSION: 1.64

CCL BEFORE

-1000 mV 1000

CCL BEFORE

-1000 mV 1000

CCL BEFORE

-1000 mV 1000

CCL BEFORE

-1000 mV 1000

Baker Hughes		FORMATION MULTI-TESTER GAMMA RAY LOG	
FILE NO:	COMPANY	PARAMOUNT RESOURCES LTD.	
API NO:	WELL	PARA ET AL FT. LIARD I-46 60 10',123 15'	
	FIELD	UNDEFINED	
	PROVINCE	NORTHWEST TERRITORIES	
Ver 3.68 3001466010123150	LOCATION:	LAT 60 05'32.474" LONG 123 22'53.612"	
	LIC #: 1871	OTHER SERVICES MAC-GR-4CAL ZOL-CN-GR-CAL HDL-GR LOGSTAR C/L	
PERMANENT DATUM	G.L.	ELEVATION	537.2 M
LOG MEASURED FROM	K.B.	5.0 M	ABOVE P.D.
DRILL MEAS. FROM	KELLY BUSHING		
	ELEVATIONS:		
	K.B.	542.2 M	
	G.L.	537.2 M	
DATE	09-JAN-2000		
RUN	TRIP	1	1
SERVICE ORDER	974644		
DEPTH DRILLER	2055.0 M		
DEPTH LOGGER	NOT RECORDED		
BOTTOM LOGGED INTERVAL	1991.5 M		
TOP LOGGED INTERVAL	1636.0 M		
CASING-DRILLER	177.8 MM	1545.0 M	
CASING LOGGER	NOT RECORDED		
BIT SIZE	156.0 MM		
TYPE OF FLUID IN HOLE	INVERT		
DENSITY	1035.0 G/L	60.0 S	
PH	FLUIDLOSS	N/A	
SOURCE OF SAMPLE	FLOWLINE		
RM AT MEAS. TEMP.	N/A	N/A	
RMC AT MEAS. TEMP.	N/A	N/A	
SOURCE OF RMF	NO SAMPLE	NO SAMPLE	
RM AT JHT	N/A	N/A	
TIME SINCE CIRCULATION	27 HRS		
MAX. RECORDED TEMP.	59.2 DEGC		
EQUIP. NO.	HL 6544	G. PRAIRIE	
RECORDED BY	BARSS/FISHER/BLANCO		
WITNESSED BY	GARY JOHANSSON		

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT, BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

REMARKS

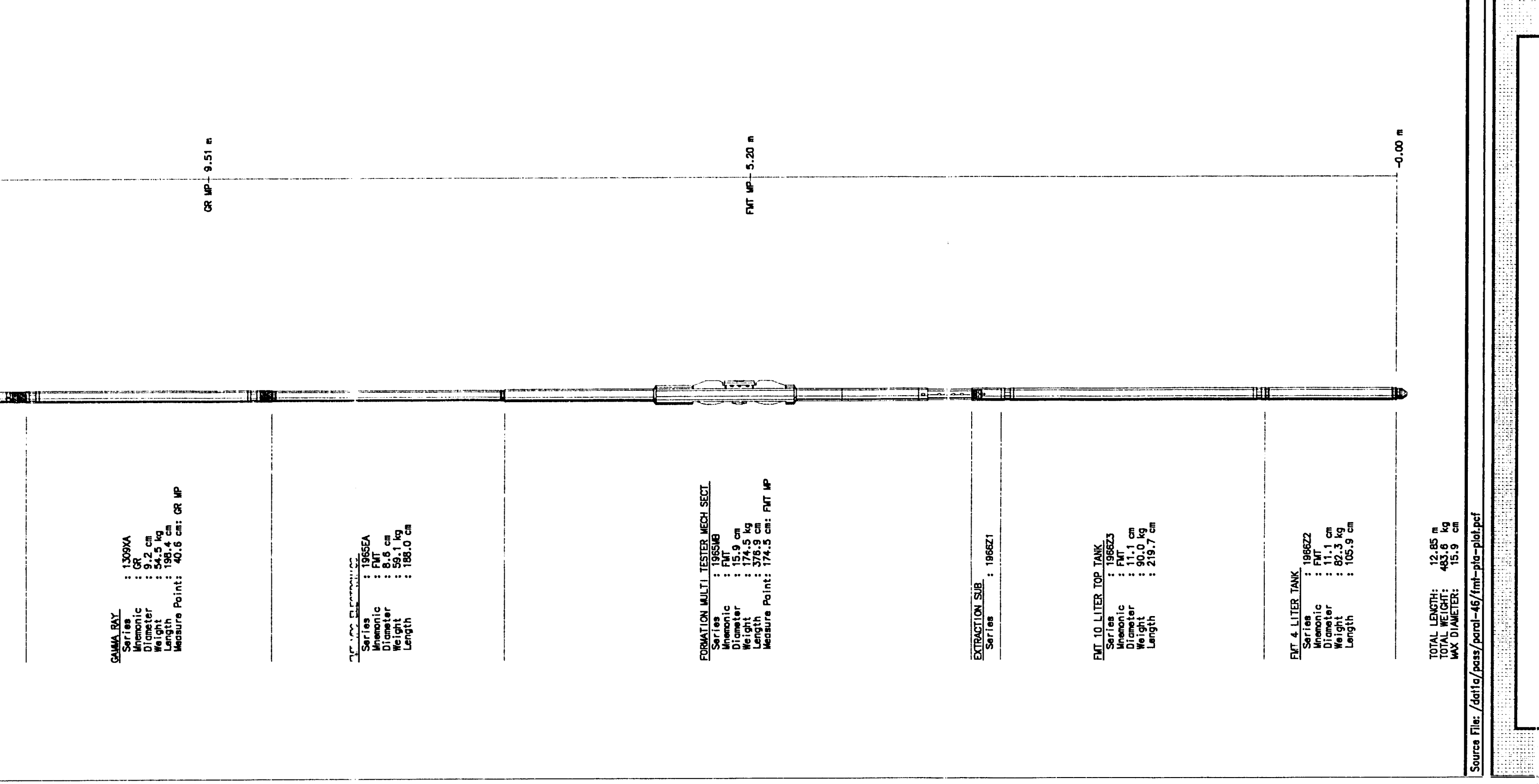
RUN 1 TRIP 1 : TIME STOPPED CIRCULATION: 10:00, 08-JAN-99
FLUID VISCOSITY ASSUMED TO BE 0.5 CP. PLUGS NOT CORRECTED FOR TVD.
ALL DEPTHS ARE MEASURED DEPTH. PLUGS NOT CORRECTED FOR TVD.
TEN LITRE LOWER TANK OPENED AT 1860.0 M. TANK CLOSED AFTER 3 HOURS BY REQUEST.
TEN LITRE LOWER TANK OPENED AT 1785.5 M. TANK CLOSED AFTER 3 HOURS BY REQUEST.
TEN LITRE LOWER TANK OPENED AT 1669.0 M. PANEL PROBLEMS, HAD TO OPEN AND
CLOSE TOOL DURING SAMPLE.
FOUR LITRE UPPER TANK OPEN AT 1636.4 M., NO GAIN ON FILL AFTER 1 HOUR,
ABORT SAMPLE.
FOUR LITRE LOWER TANK OPEN AT 1918.6 M., NO GAIN ON FILL AFTER 2 HOURS,
ABORT SAMPLE.
TEN LITRE UPPER TANK OPEN AT 1766.5 M. - GOOD SAMPLE.

CREW: T. FISHER / J. BLANCO / O. PINTO / B. FUSICK

EQUIPMENT DATA			
RUN	TRIP	TOOL	POSITION
1	1	GR	GR
1	1	FM	FM
SERIES NO. 1309VA			
SERIES NO. 1965ZA/1965VA			
SERIES NO. 07135/07157			

INSTRUMENT CONFIGURATION

Source File: /data/pas/pasr-46/fm-pla-pla-log



Source File: /data/pas/pasr-46/fm-pla-pla-log

Meta File: pla-e007c01.apl.meta

PRESSURE SUMMARY REPORT - TRIP [41]

Meta File: pla-e007c01.apl.meta

Meta File: pla-e007c01.apl.meta

Meta File: pla-e007c01.apl.meta

Meta File: pla-e007c01.apl.meta

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Meta File: pla-e007c01.apl.meta

Meta File: pla-e007c01.apl.meta

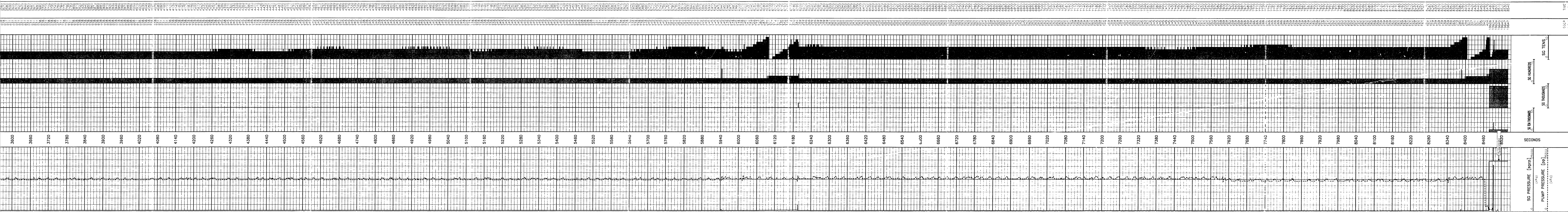
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Meta File: pla-e007c01.apl.meta

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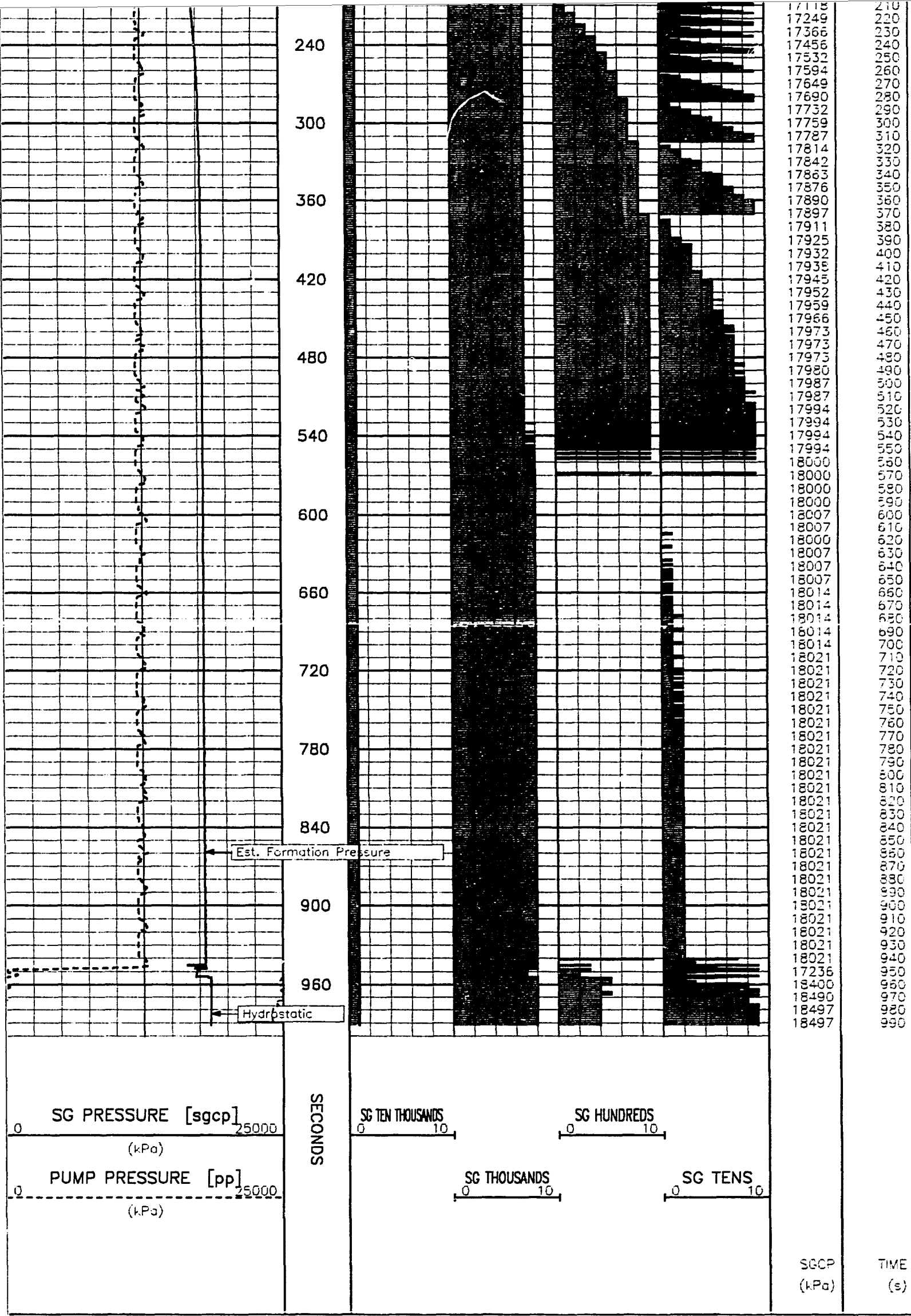
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Meta File: pla-e007c01.apl.meta



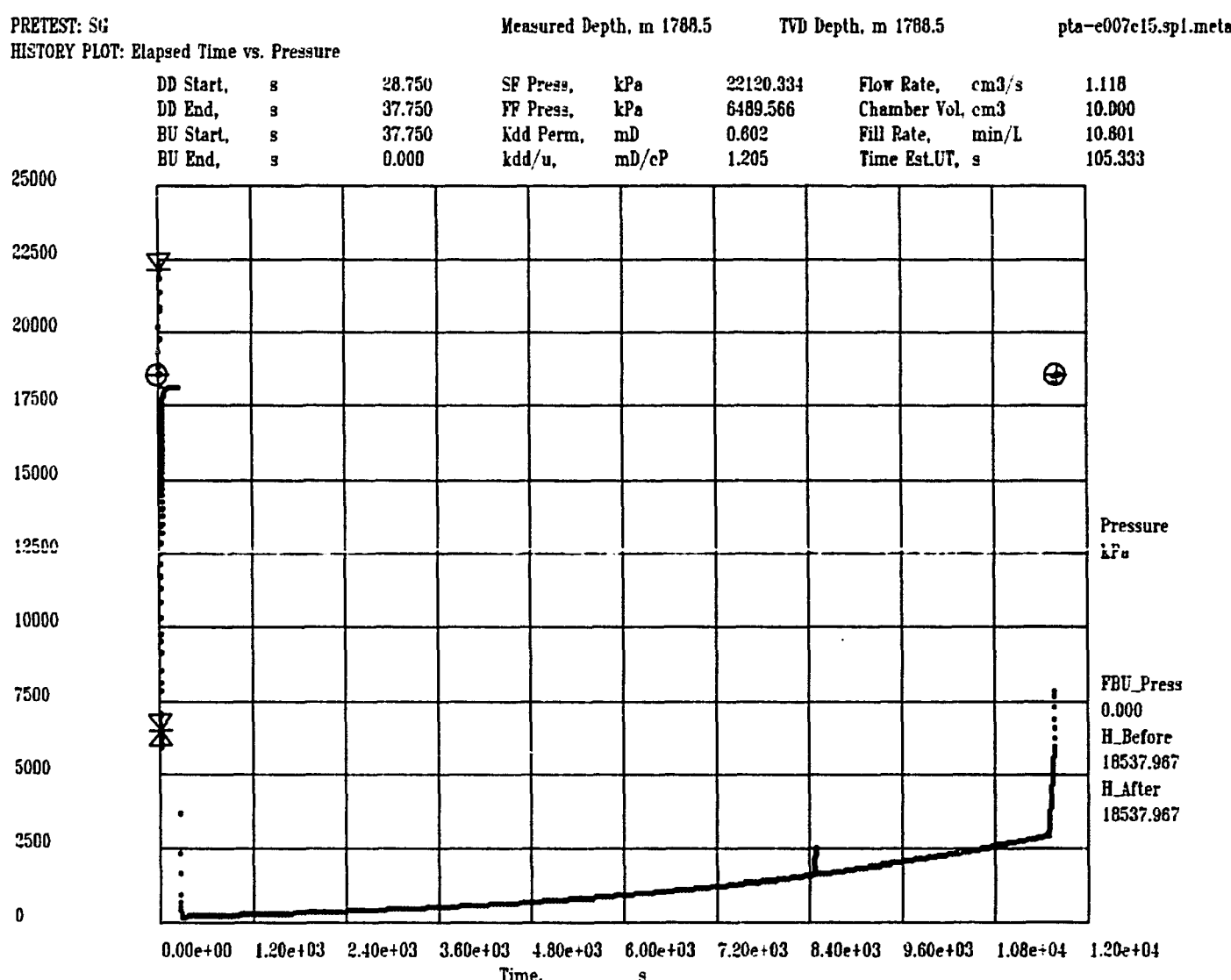
Pressure Test - Measured Depth 1890.0 m
TVD Depth 1890.0 m

Meta File: ptn-e007e07.sp1.mela



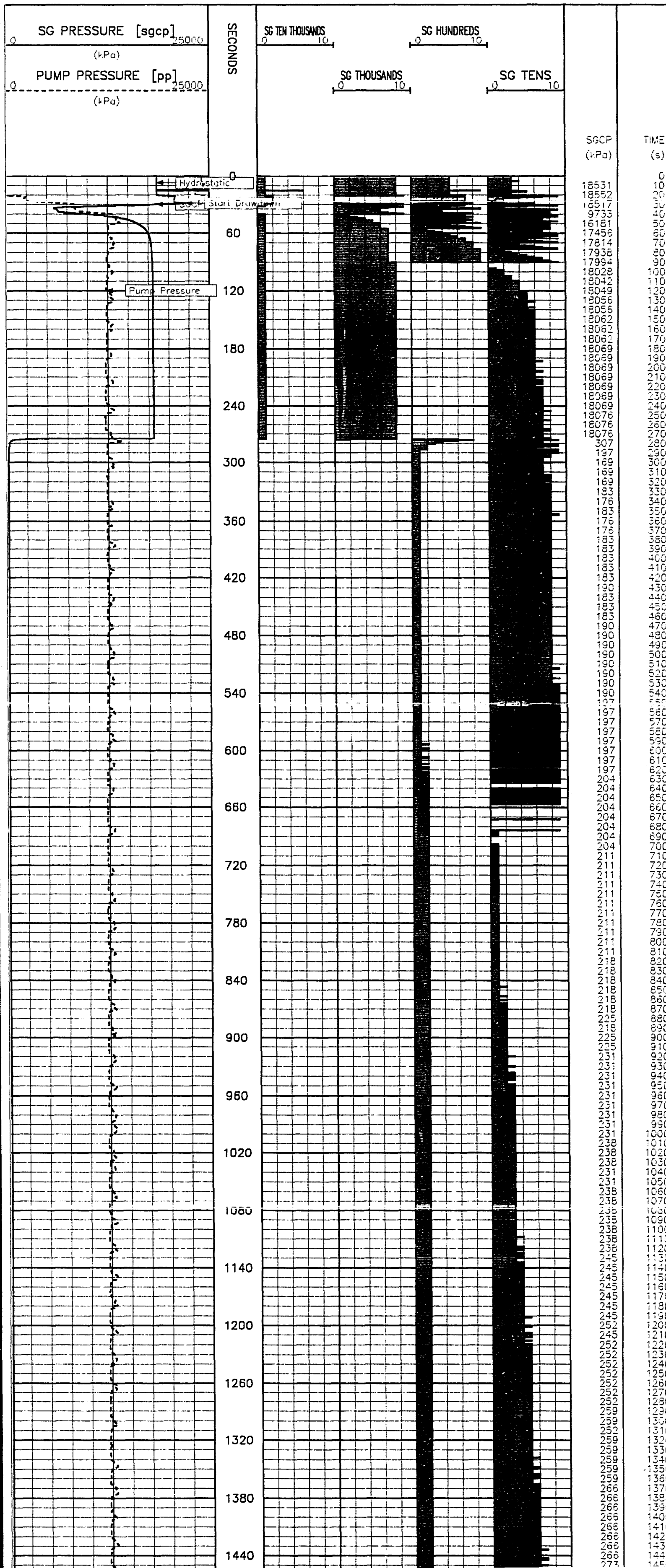
PRESSURE TEST - Measured Depth 1788.5 m **TVD Depth 1788.5 m**

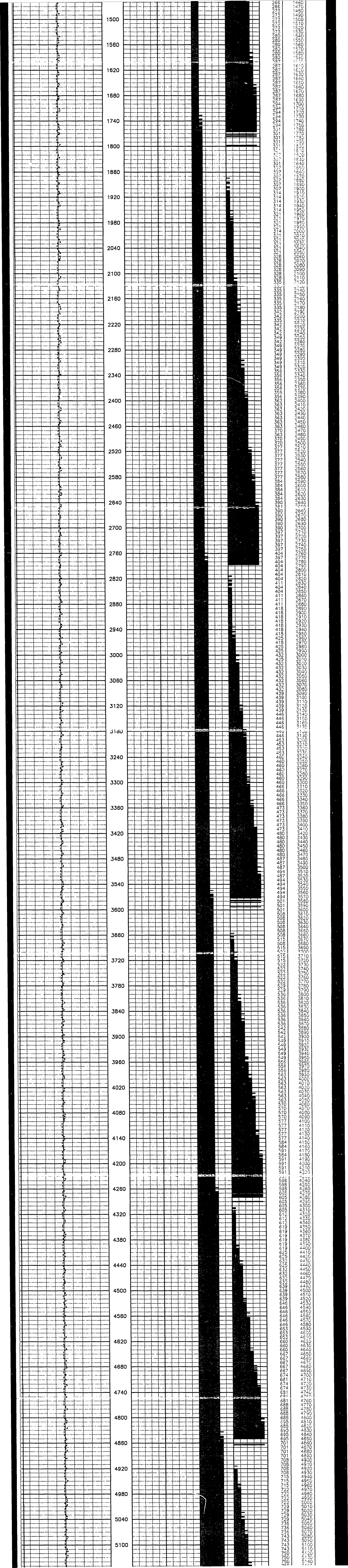
Meta File: pta-e007c15.sp1.meta

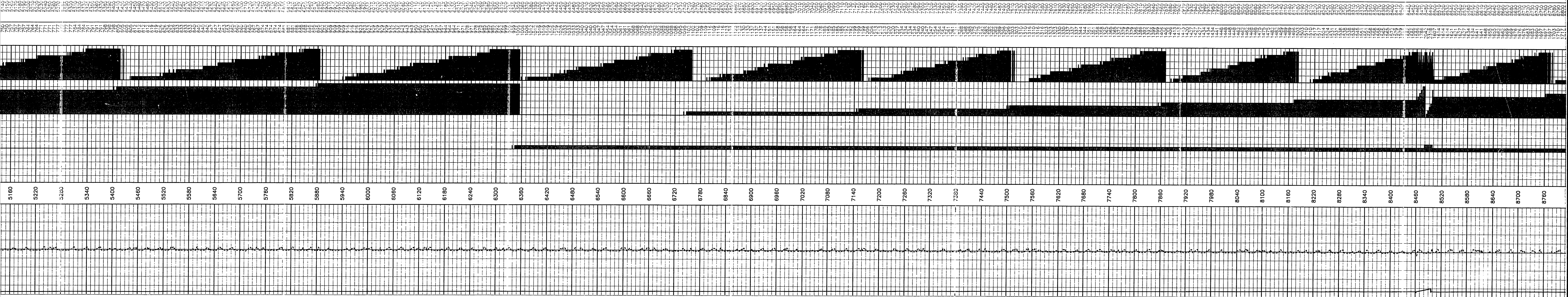


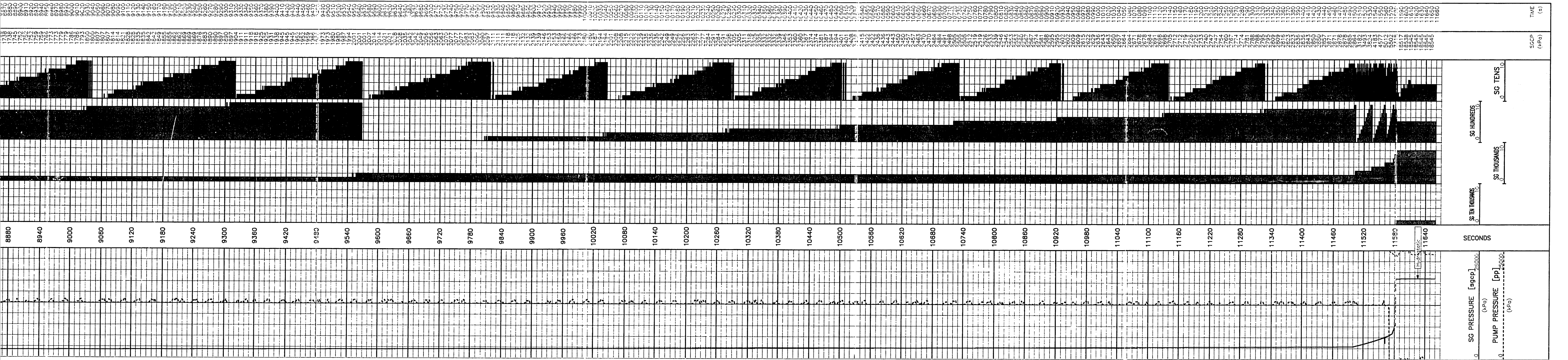
Data File : e007c15.aff

Presentation: fmtsg4-sg.log

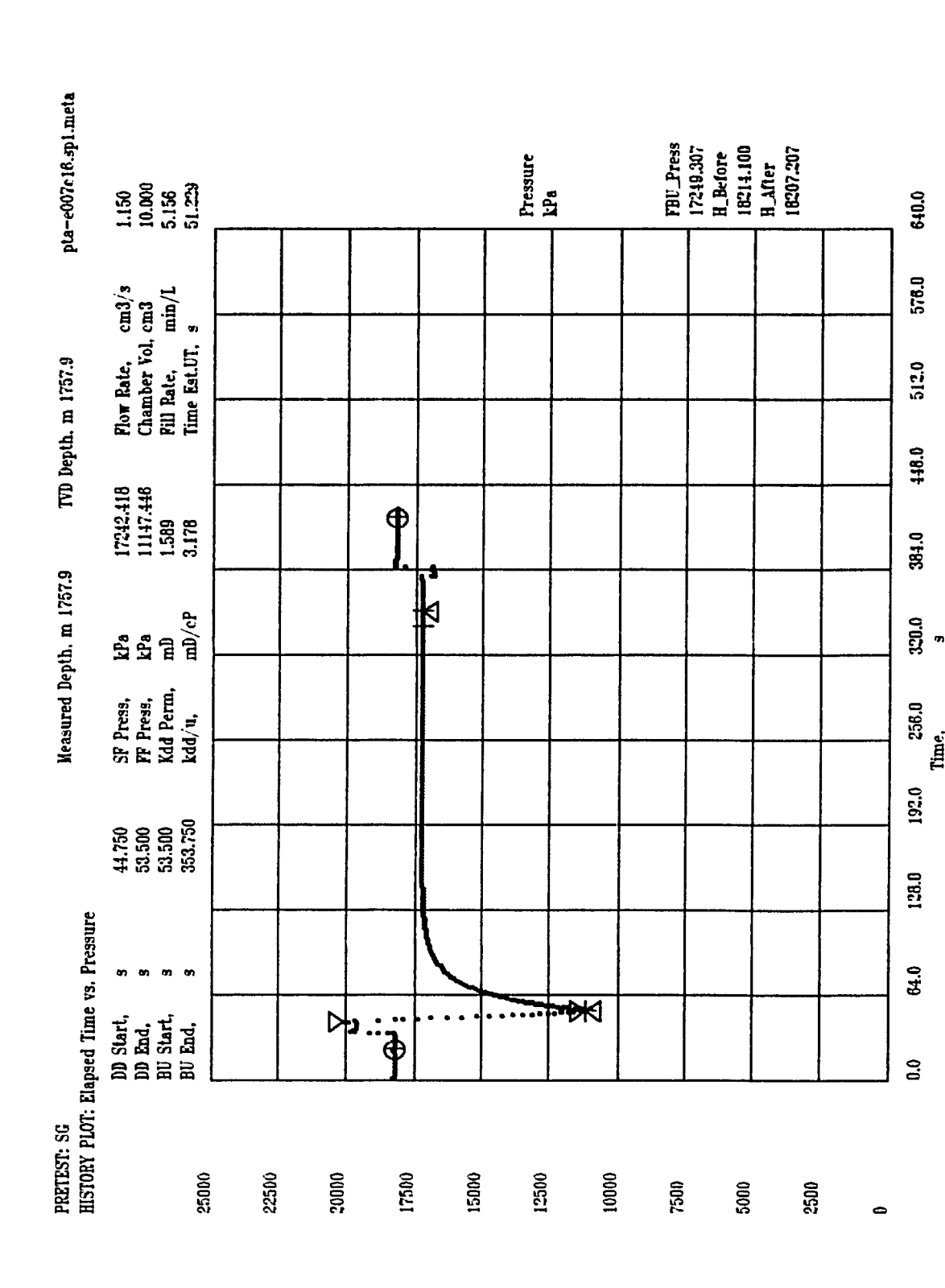




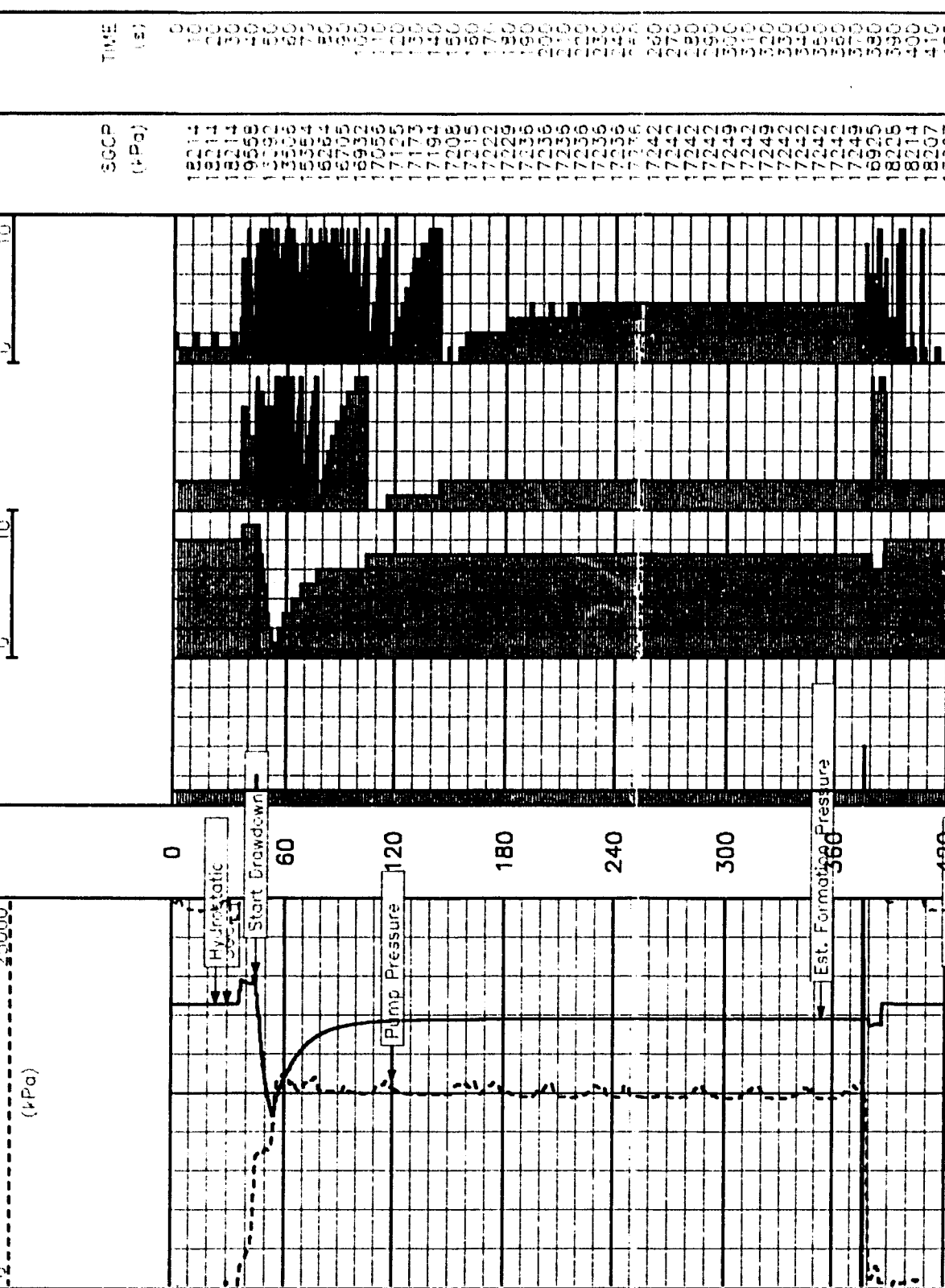




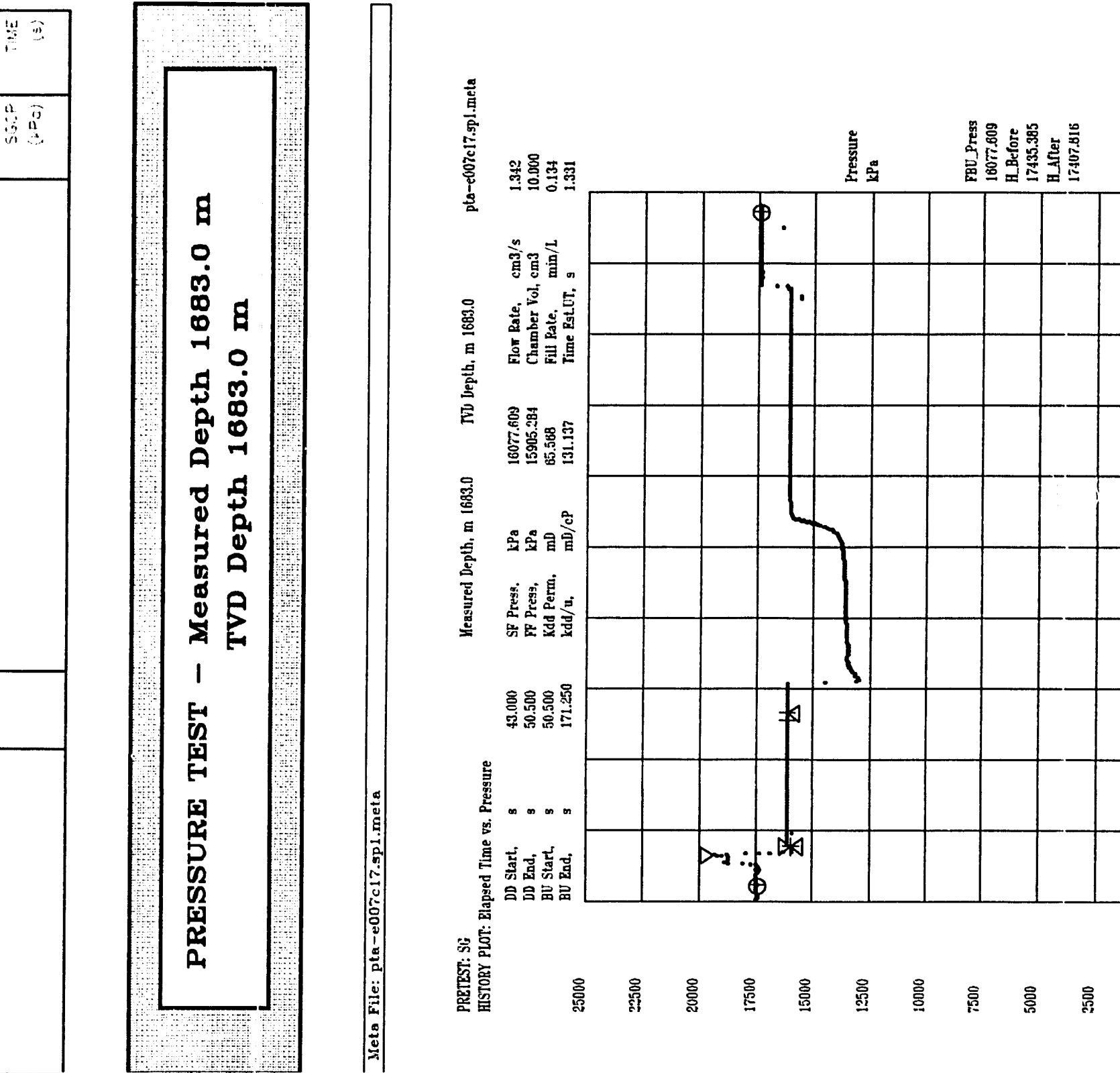
PRESSURE TEST - Measured Depth 1757.9 m
TVD Depth 1757.9 m

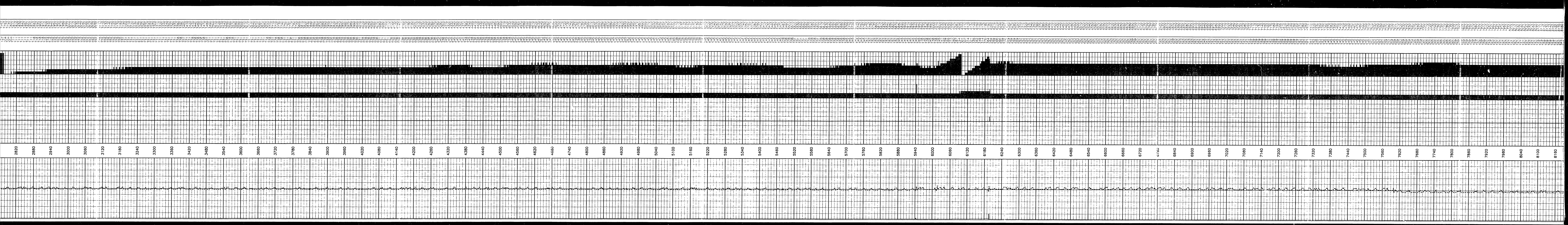


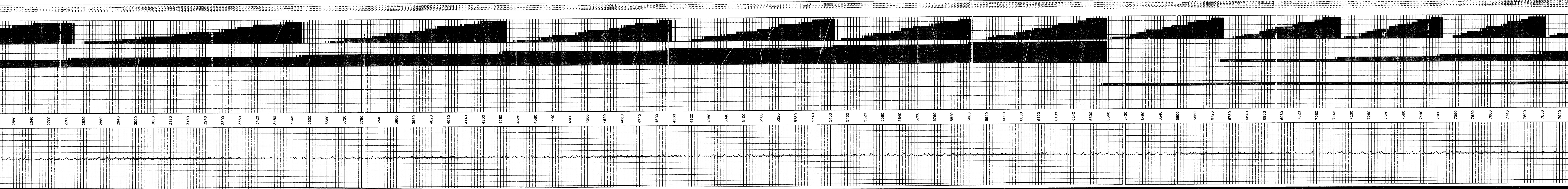
PRESSURE TEST - Measured Depth 1683.0 m
TVD Depth 1683.0 m

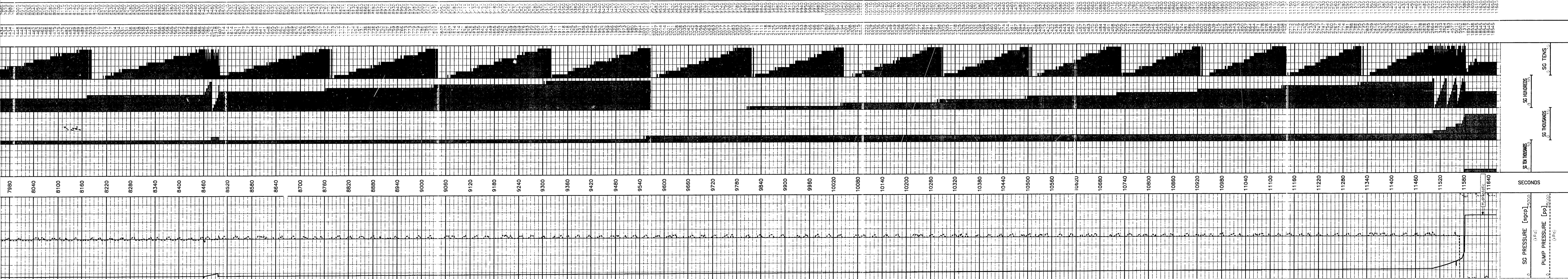
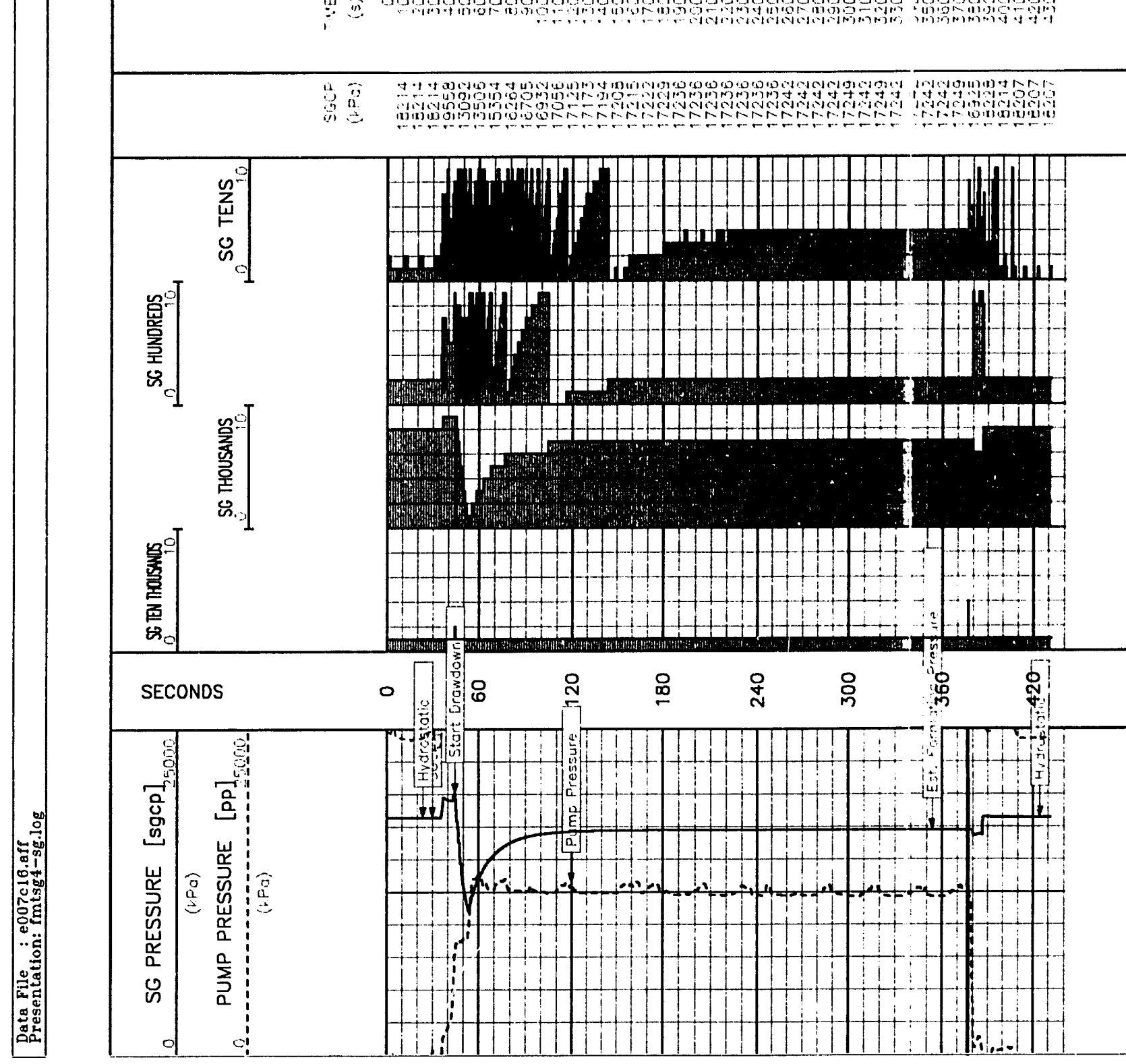
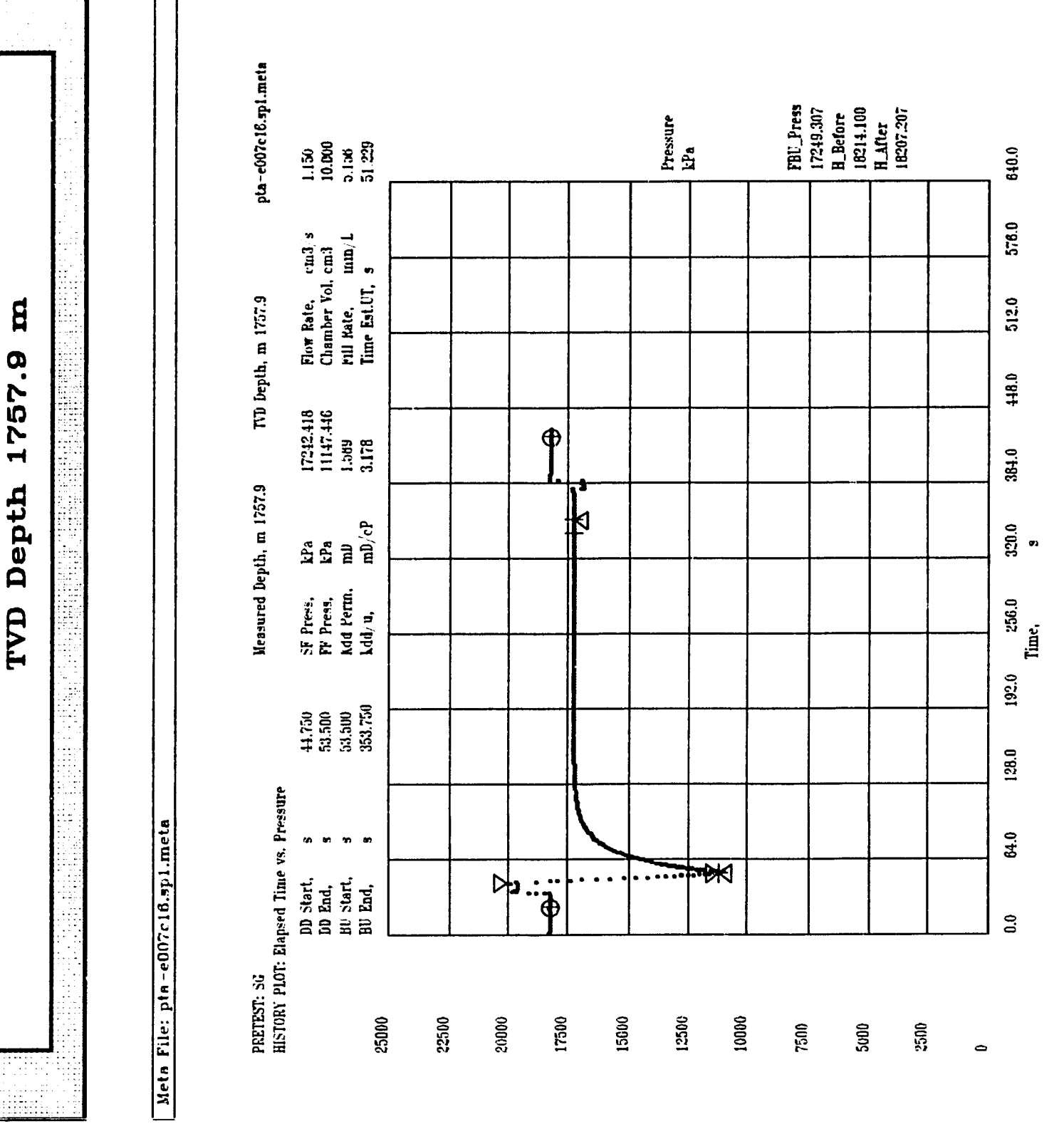


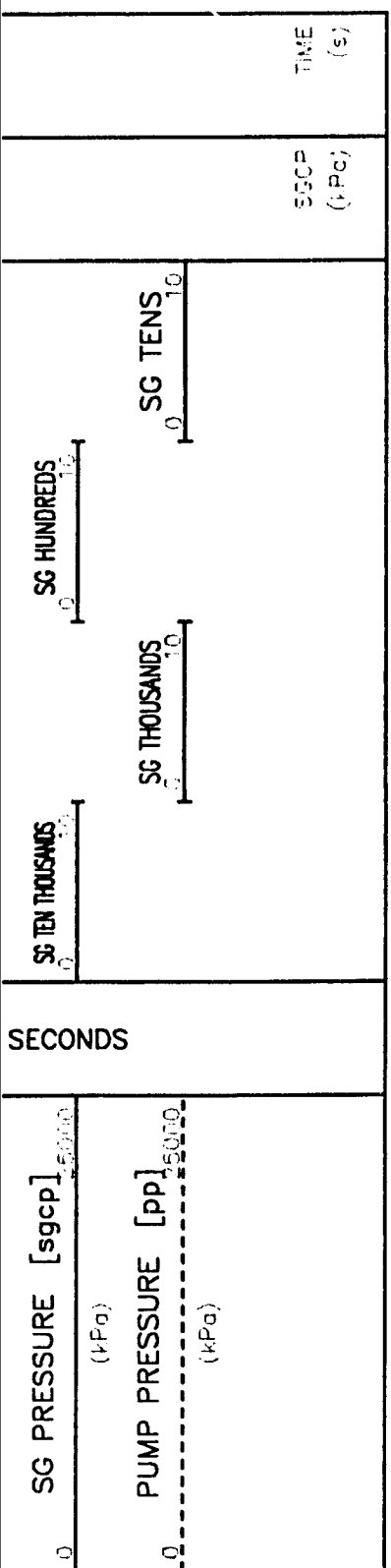
PRESSURE TEST - Measured Depth 1883.0 m
TVD Depth 1883.0 m







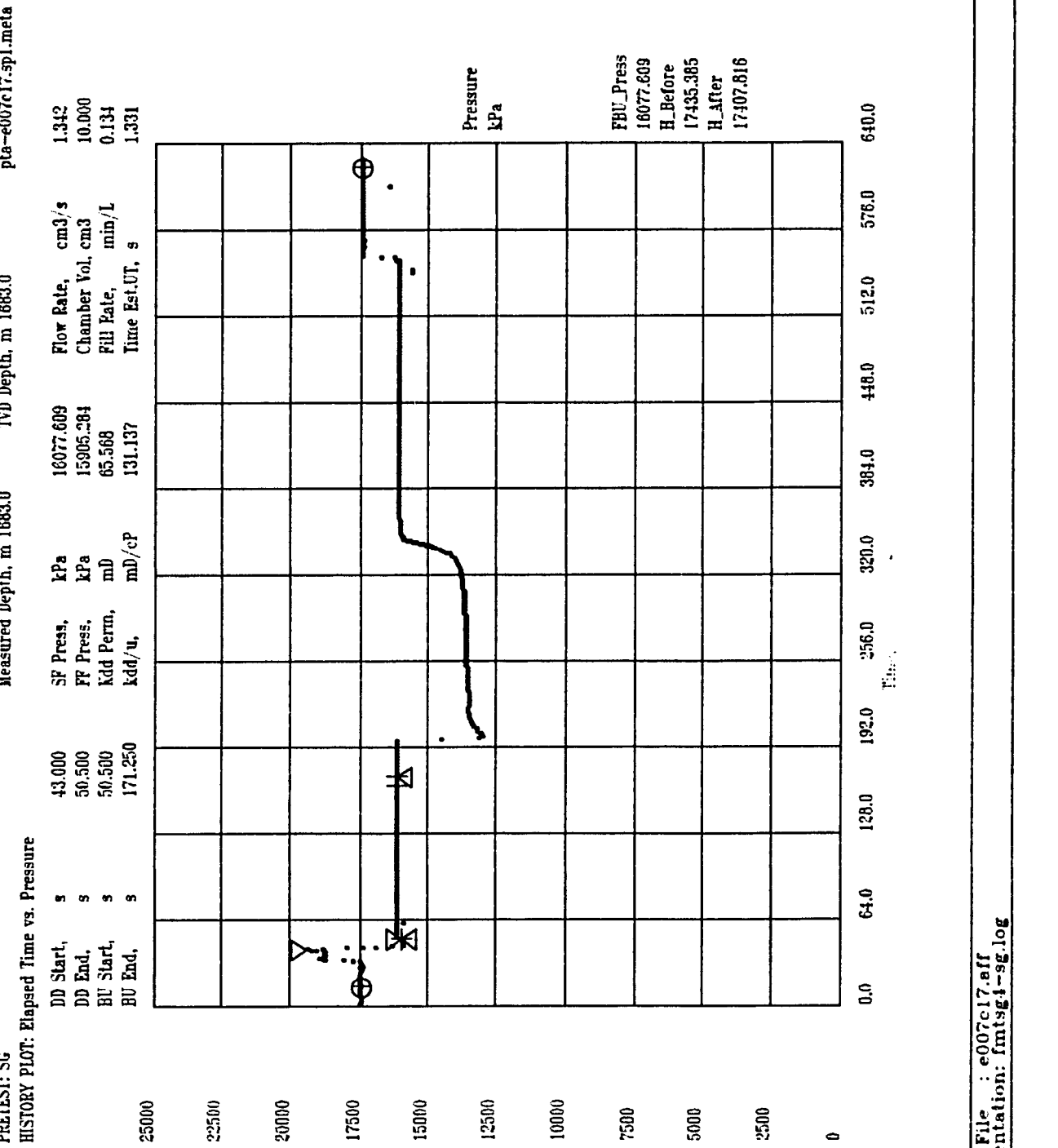
[illegible]



PRESSURE TEST - Measured Depth 1683.0 m

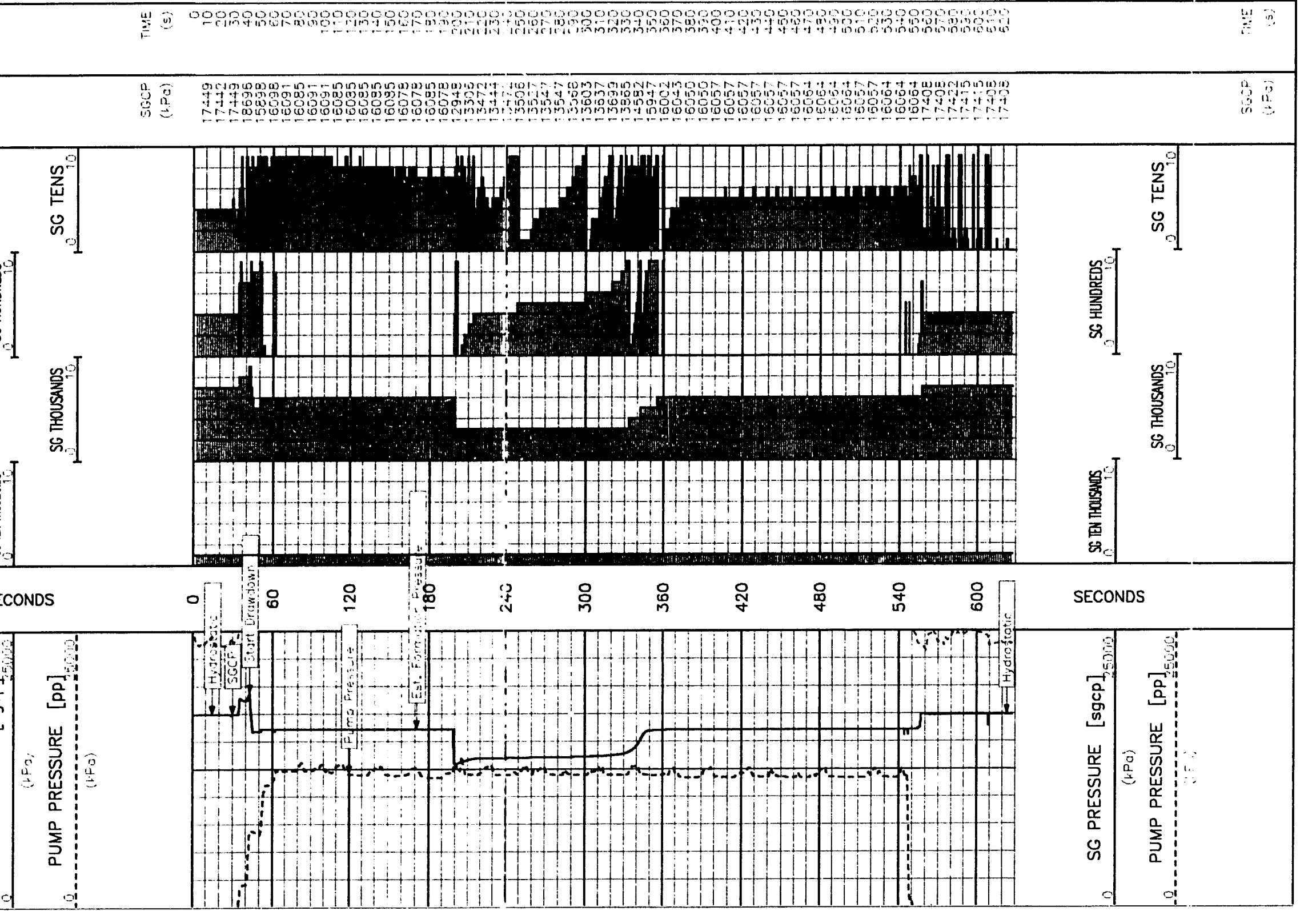
TVD Depth 1683.0 m

Meta File: pla-e007c17.apl.meta



Data File: e007c17.apl

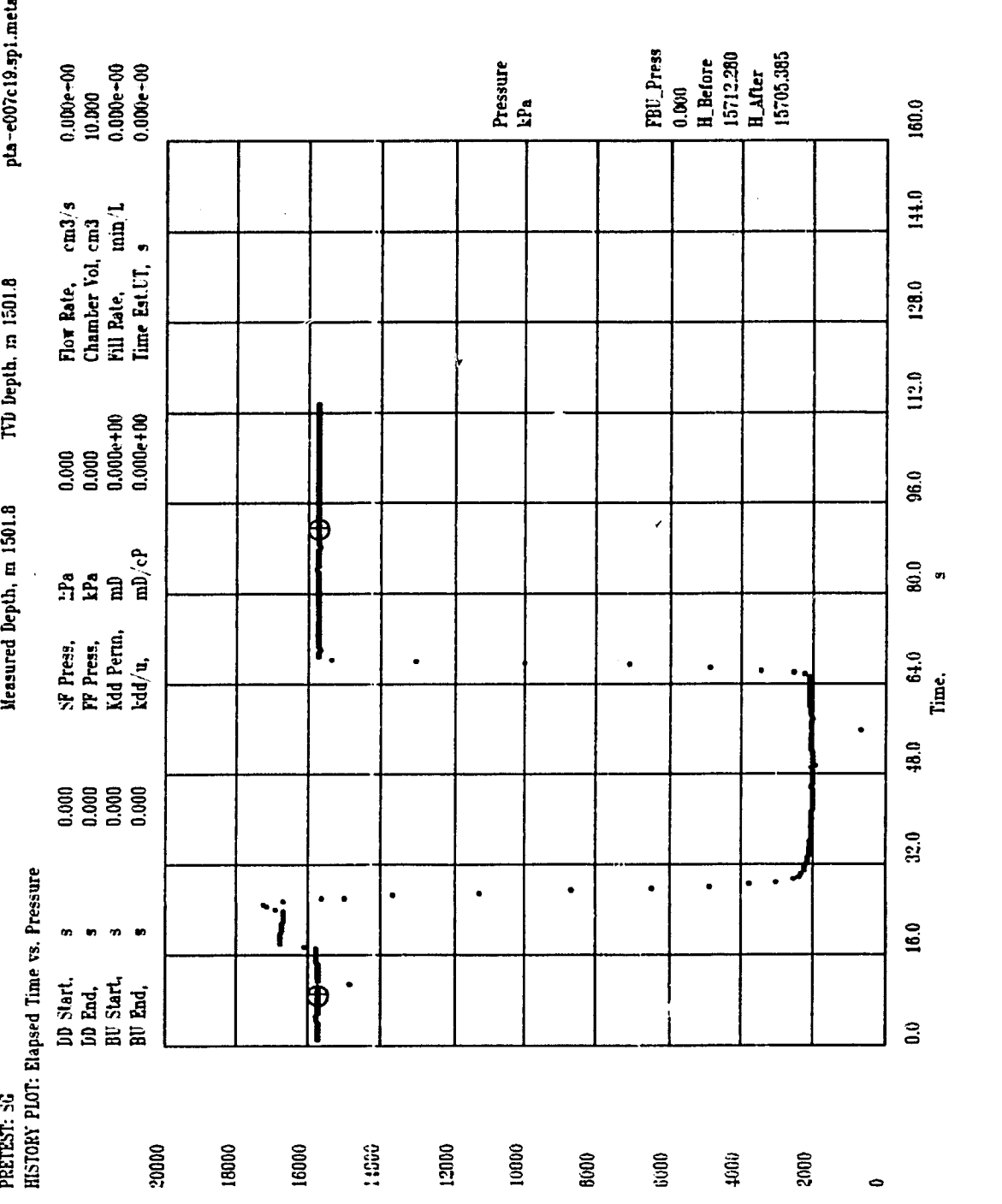
Presentation: fmsgd-sg-log



PRESSURE TEST - Measured Depth 1501.8 m

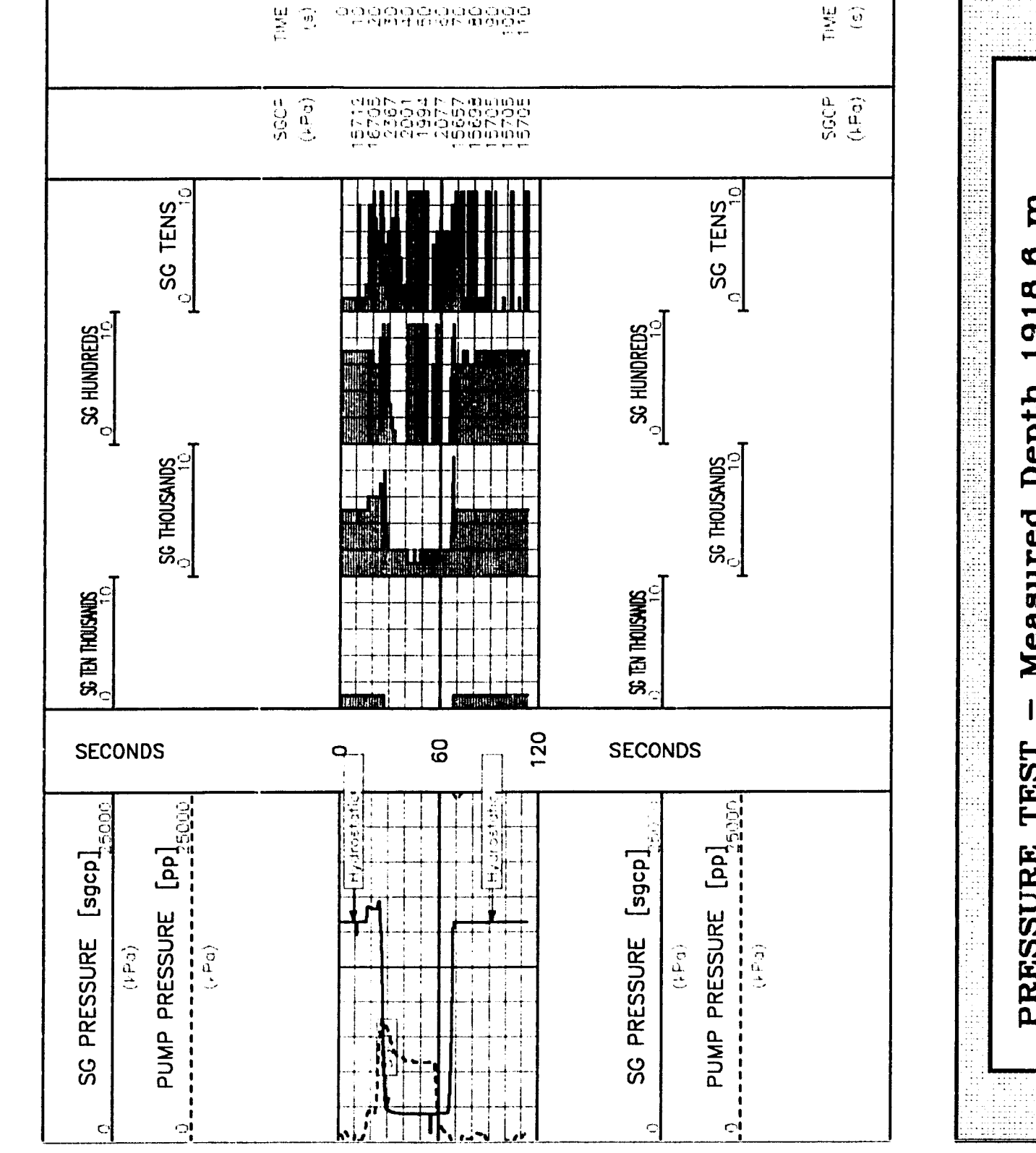
TVD Depth 1501.8 m

Meta File: pla-e007c19.apl.meta



Data File: e007c19.apl

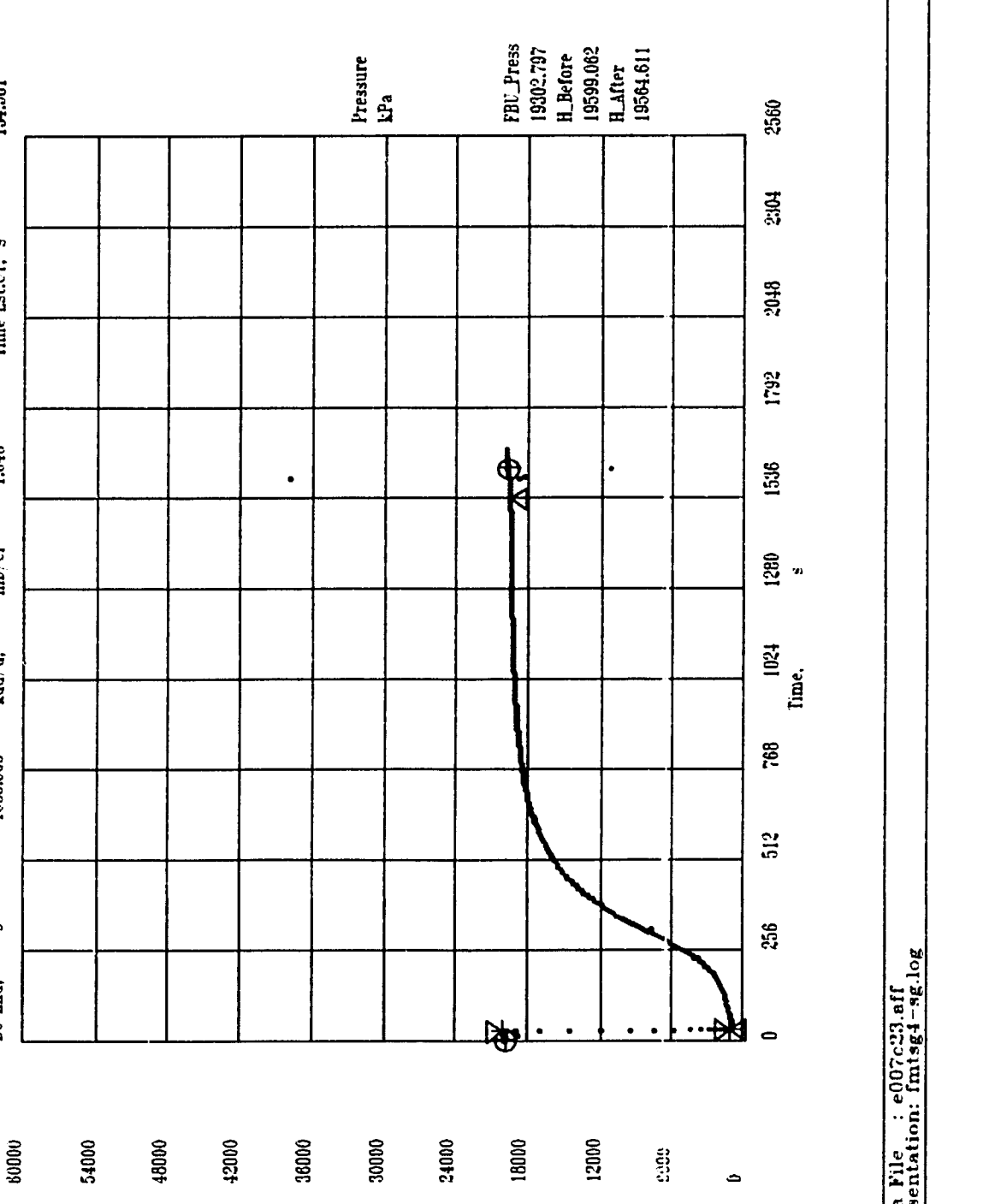
Presentation: fmsgd-sg-log



PRESSURE TEST - Measured Depth 1918.6 m

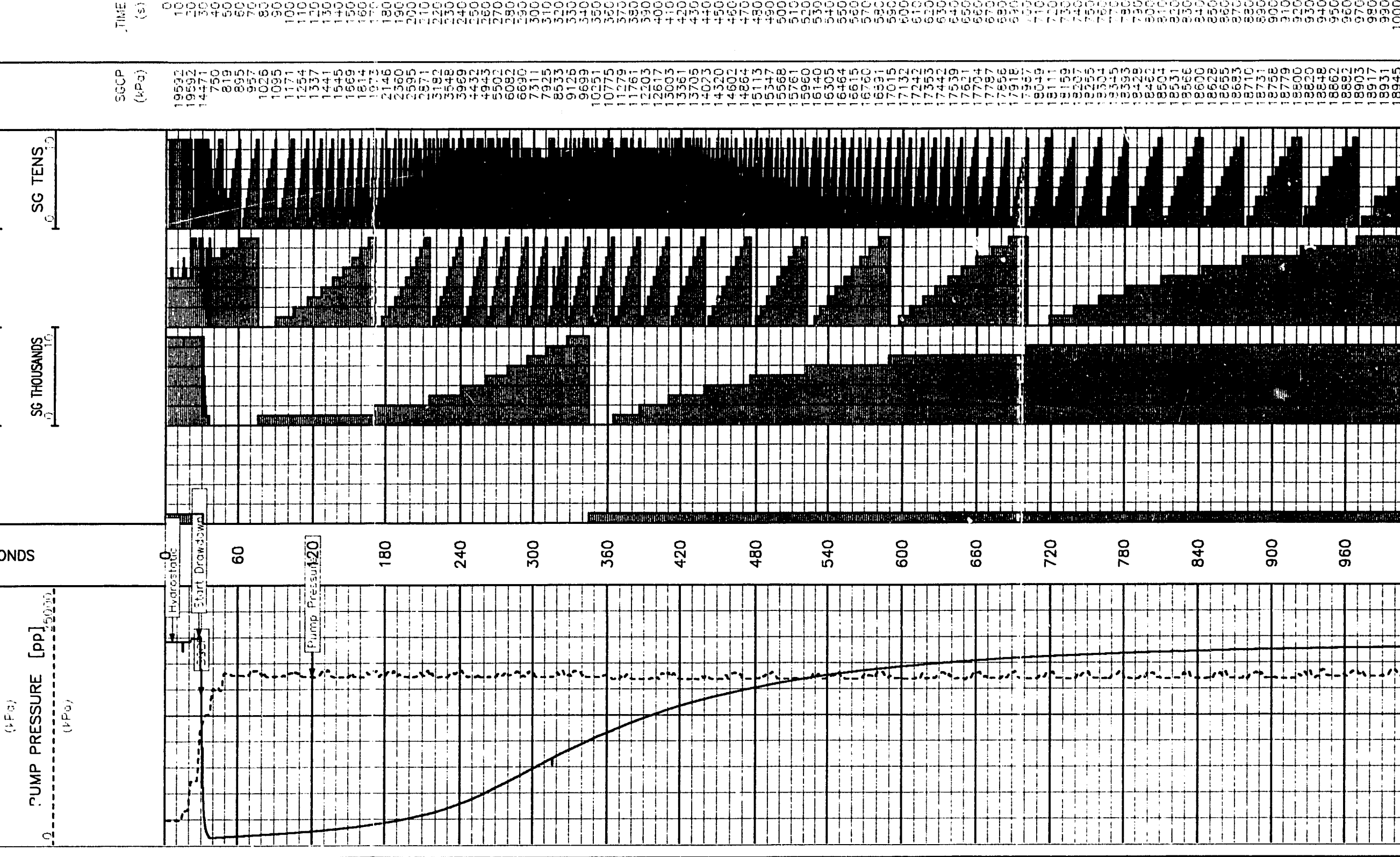
TVD Depth 1918.6 m

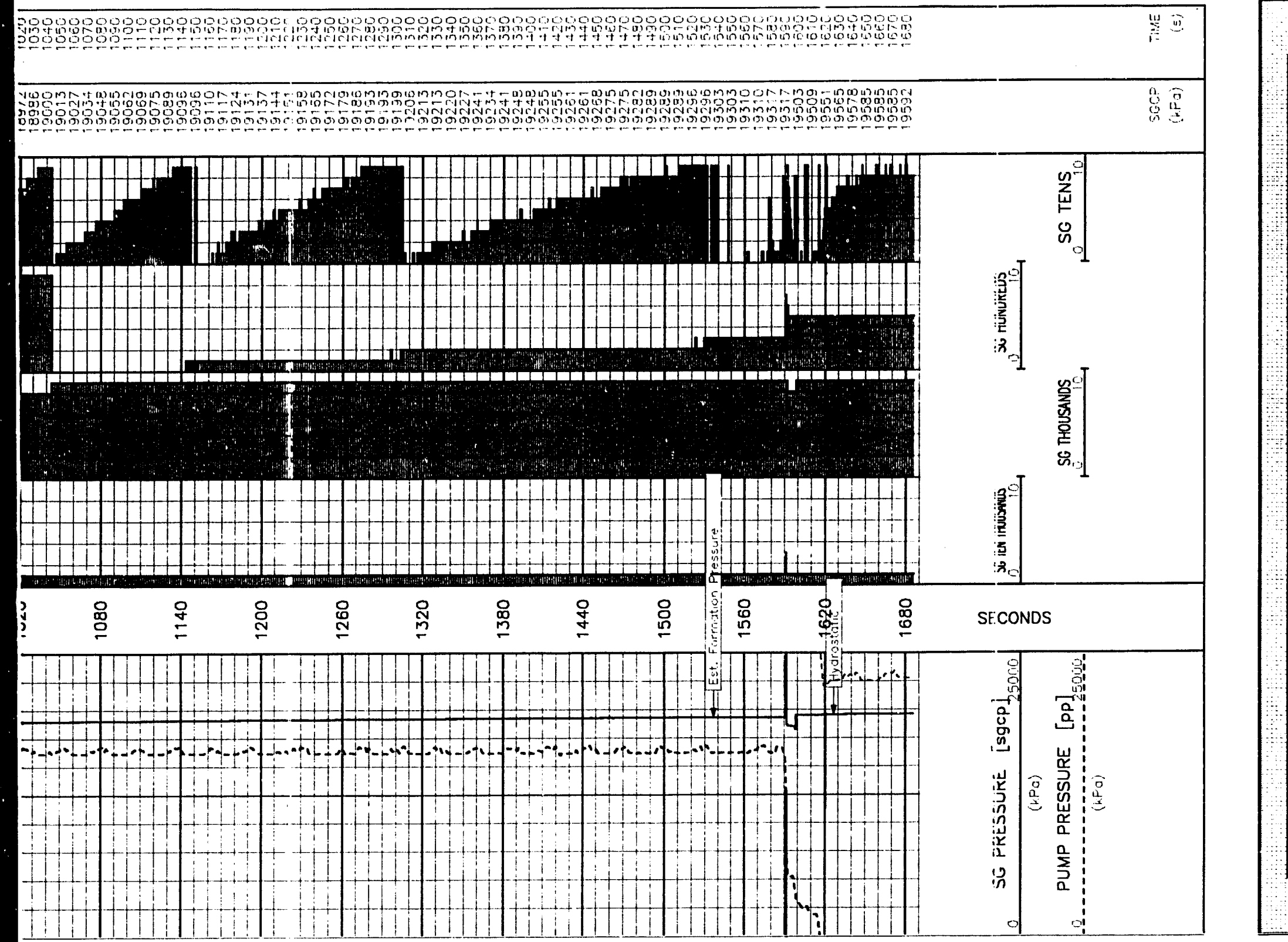
Meta File: pla-e007c23.apl.meta



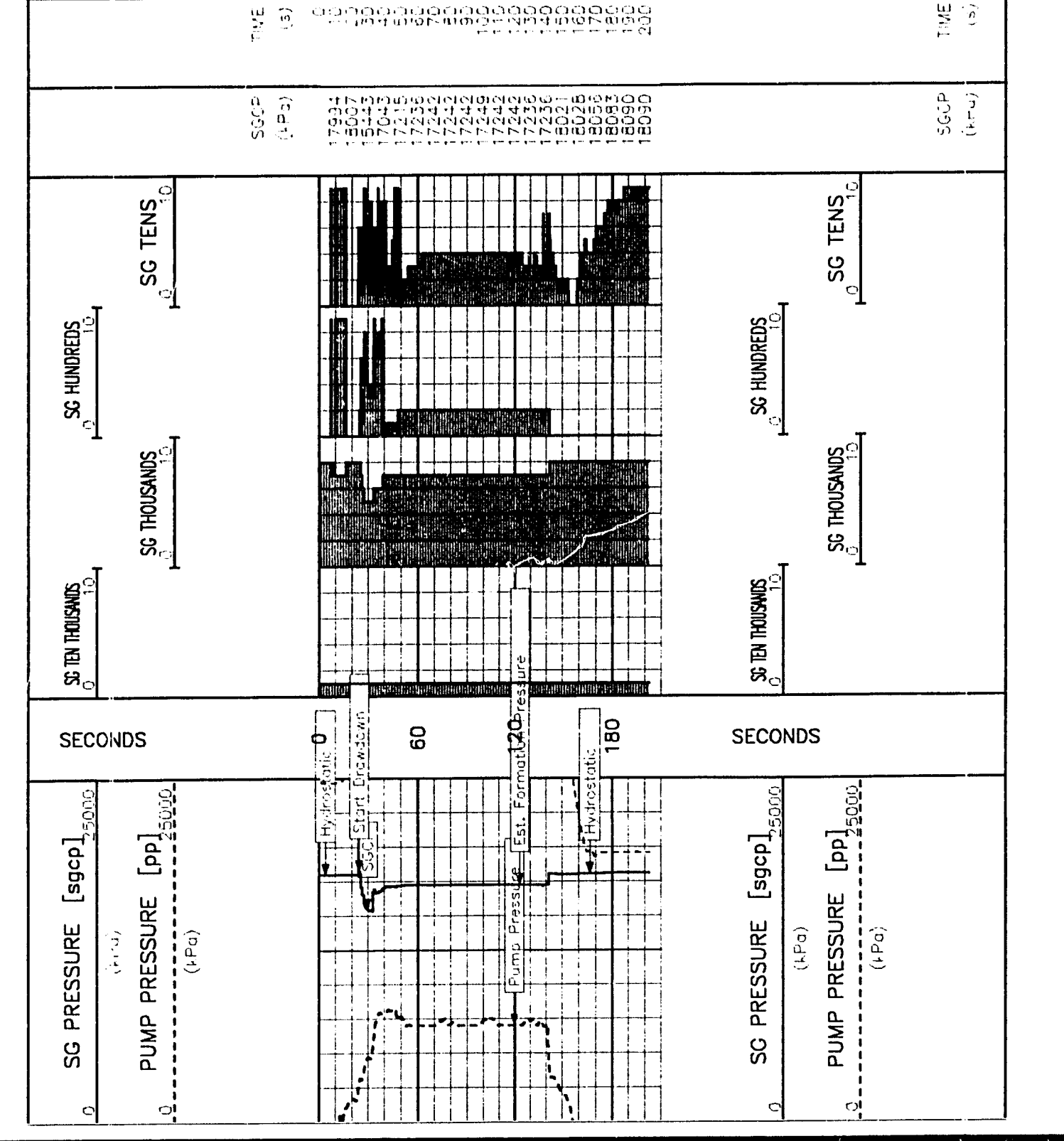
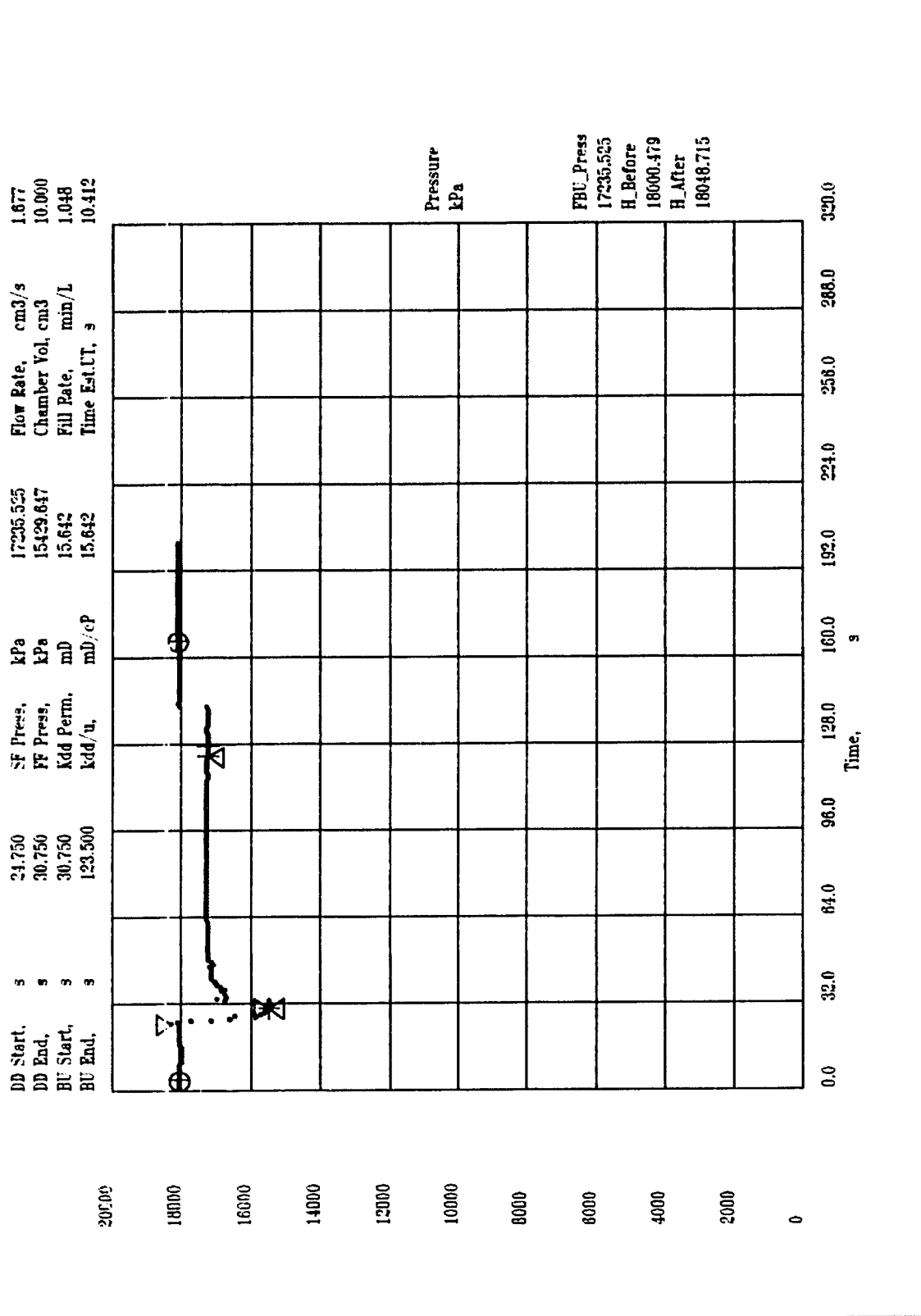
Data File: e007c23.apl

Presentation: fmsgd-sg-log

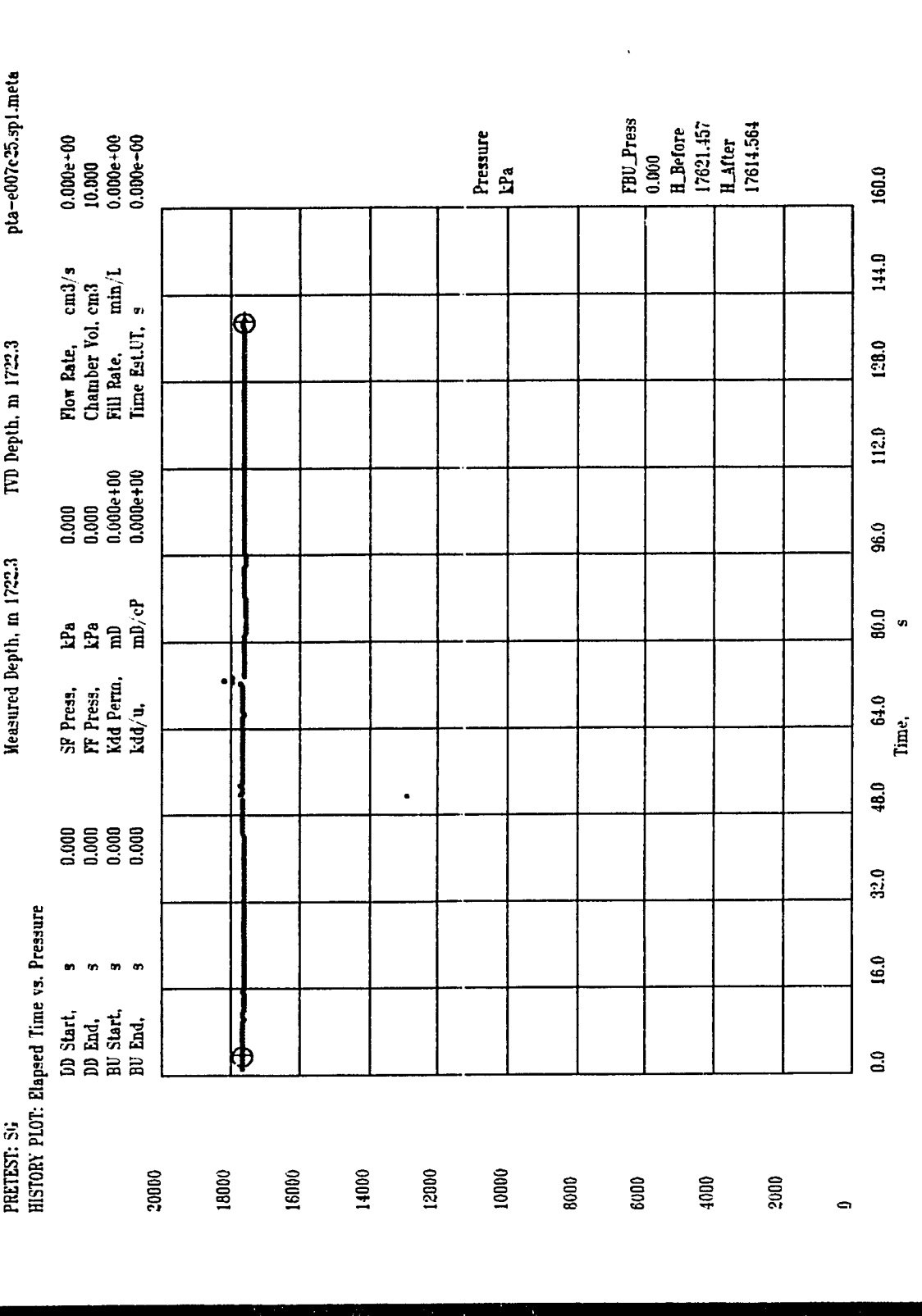




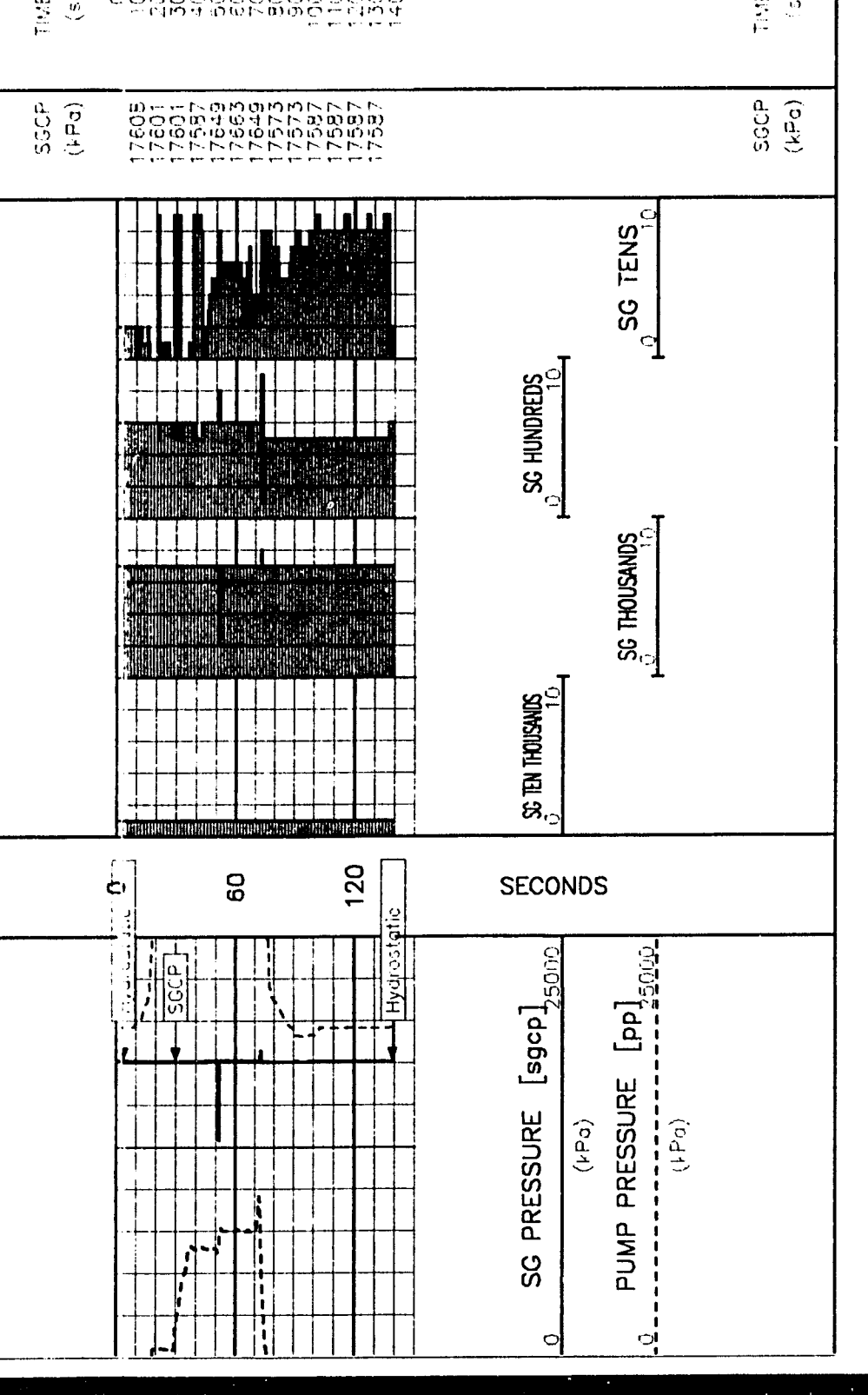
Meta File: pta-e007c24.sp1.mef



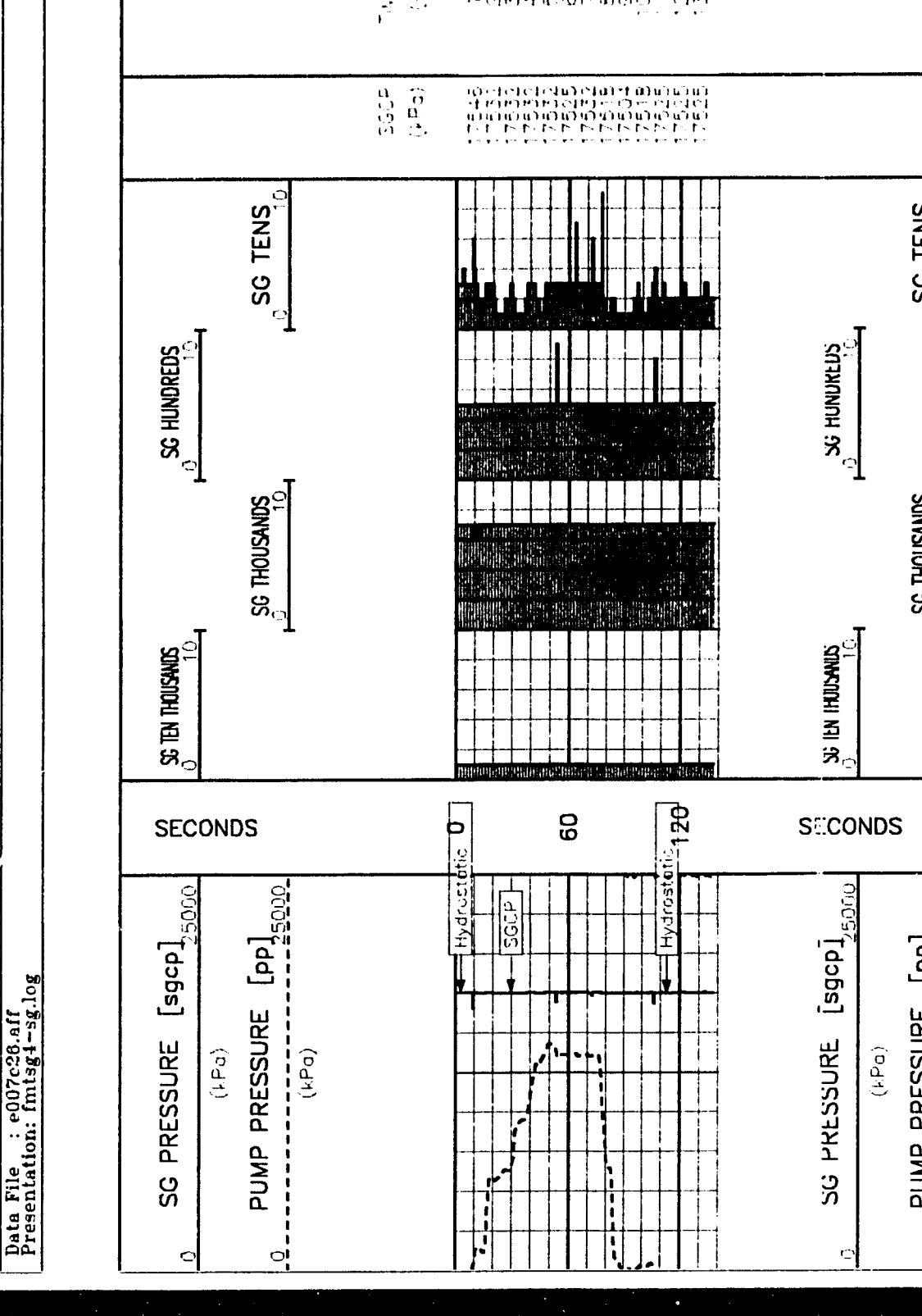
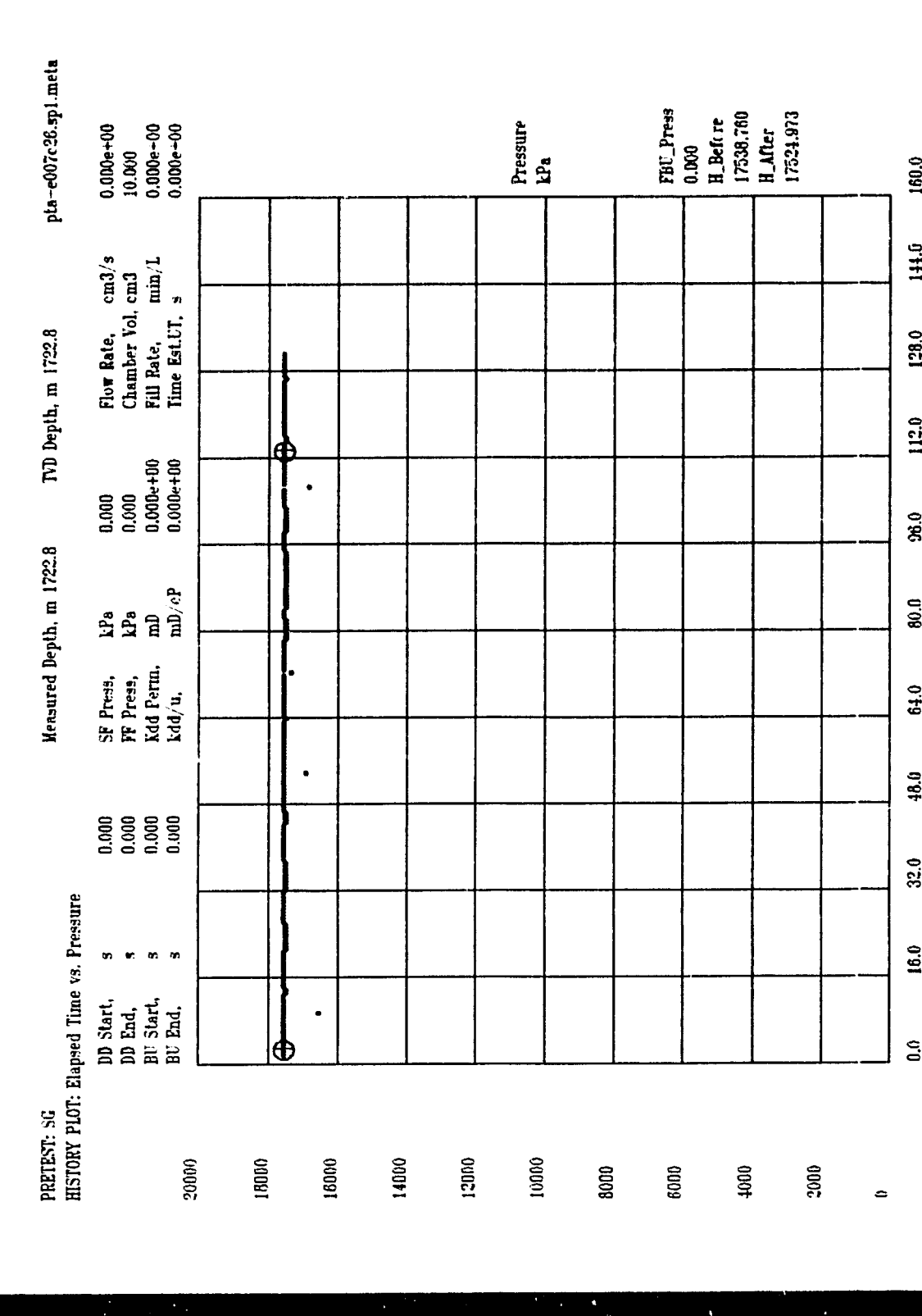
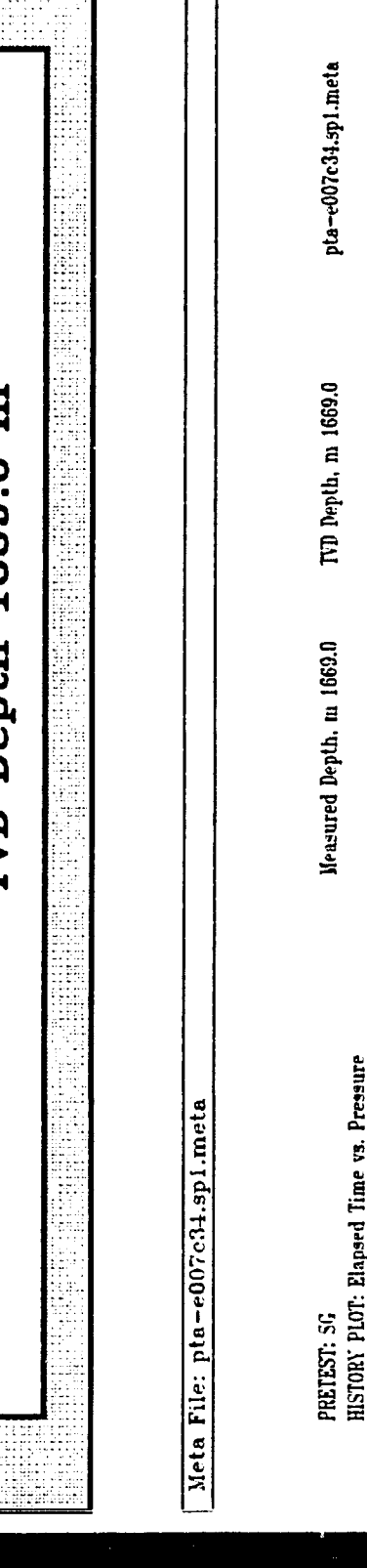
TVD Depth 1722.3 m

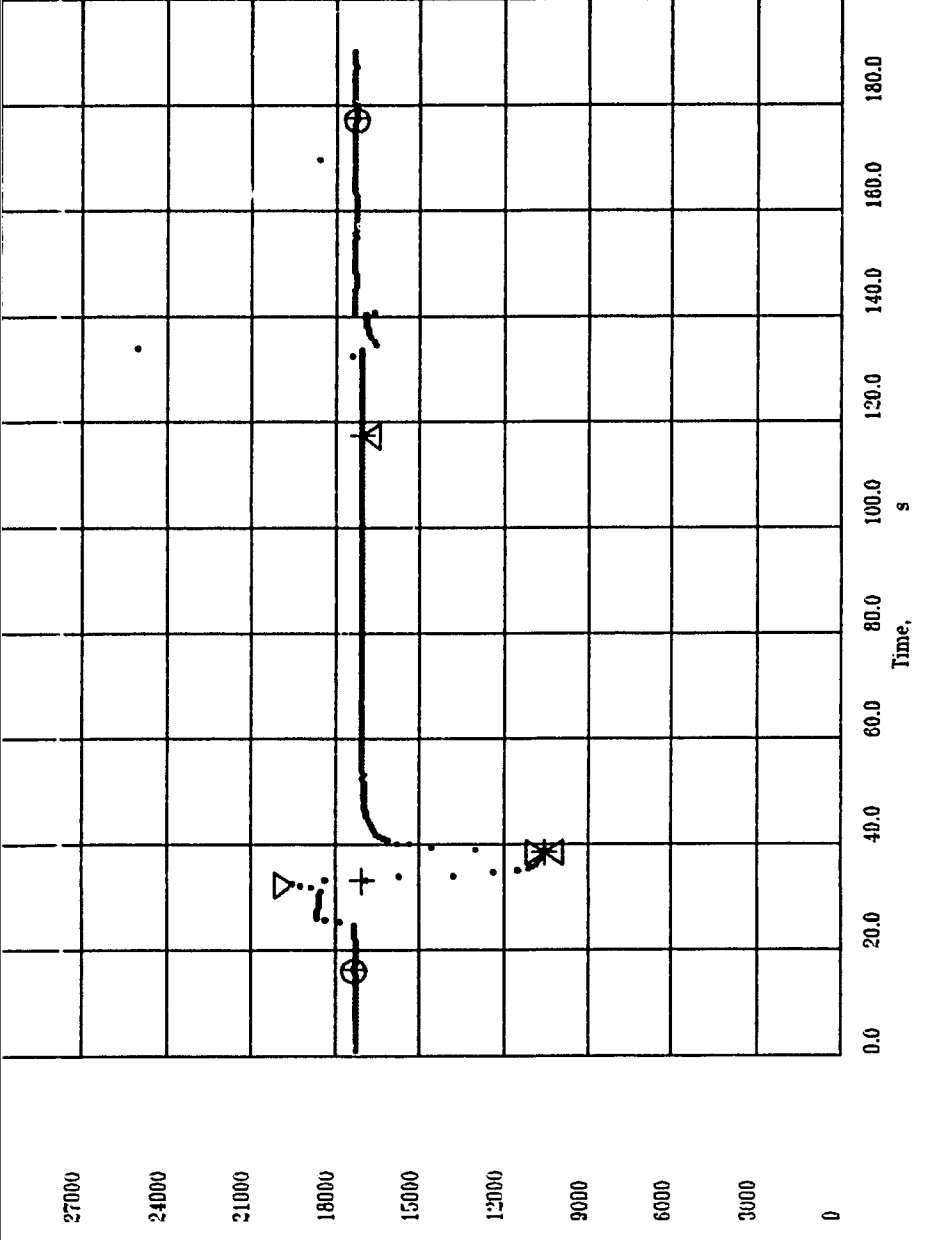


0	SG PRESSURE [sgp] (Pa)	SECOND	SG TEN THOUSANDS 0 10	SG HUNDREDS 0 10	
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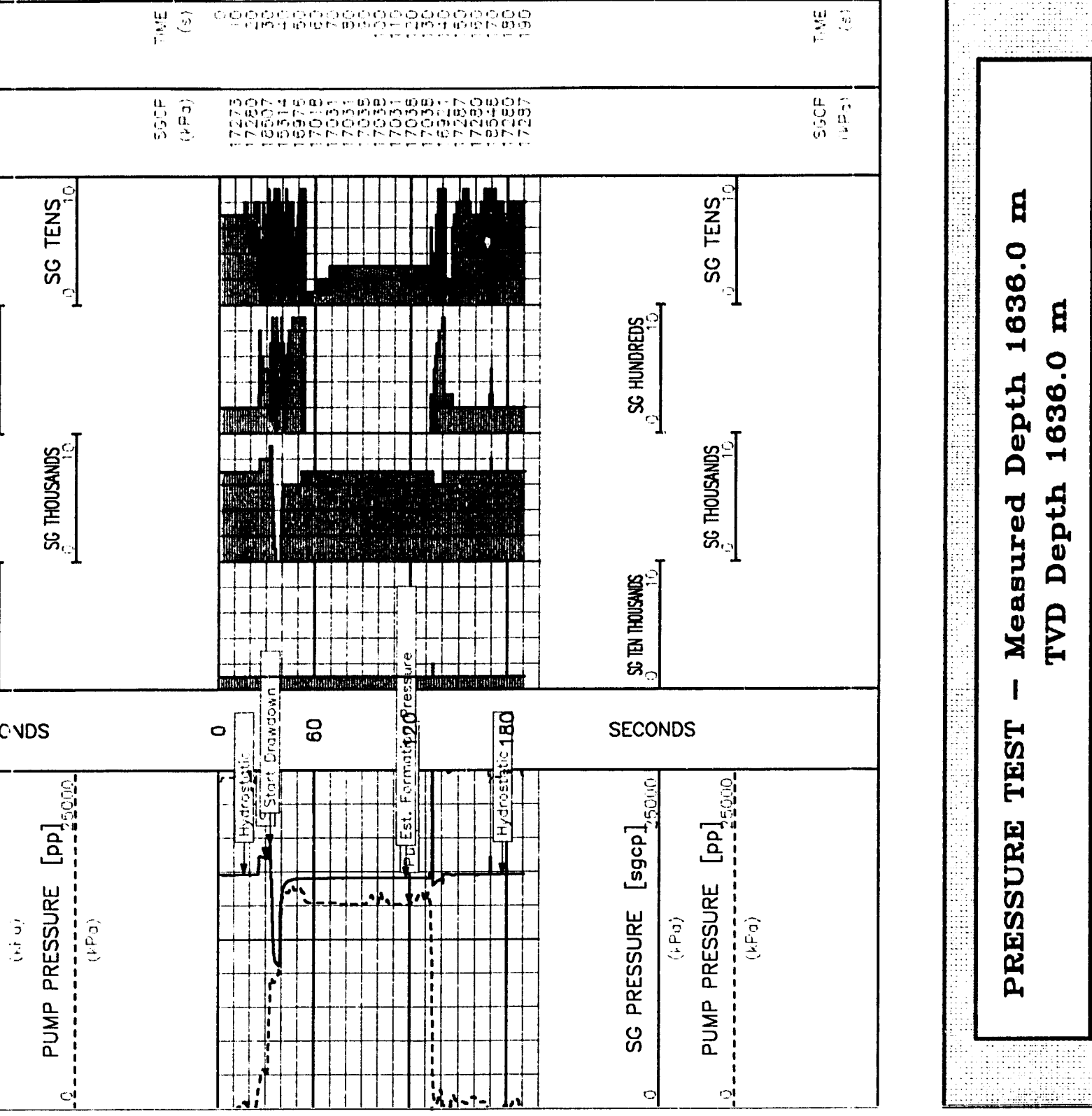


**PRESSURE TEST -- Measured Depth 1722.8 m
TVD Depth 1722.8 m**

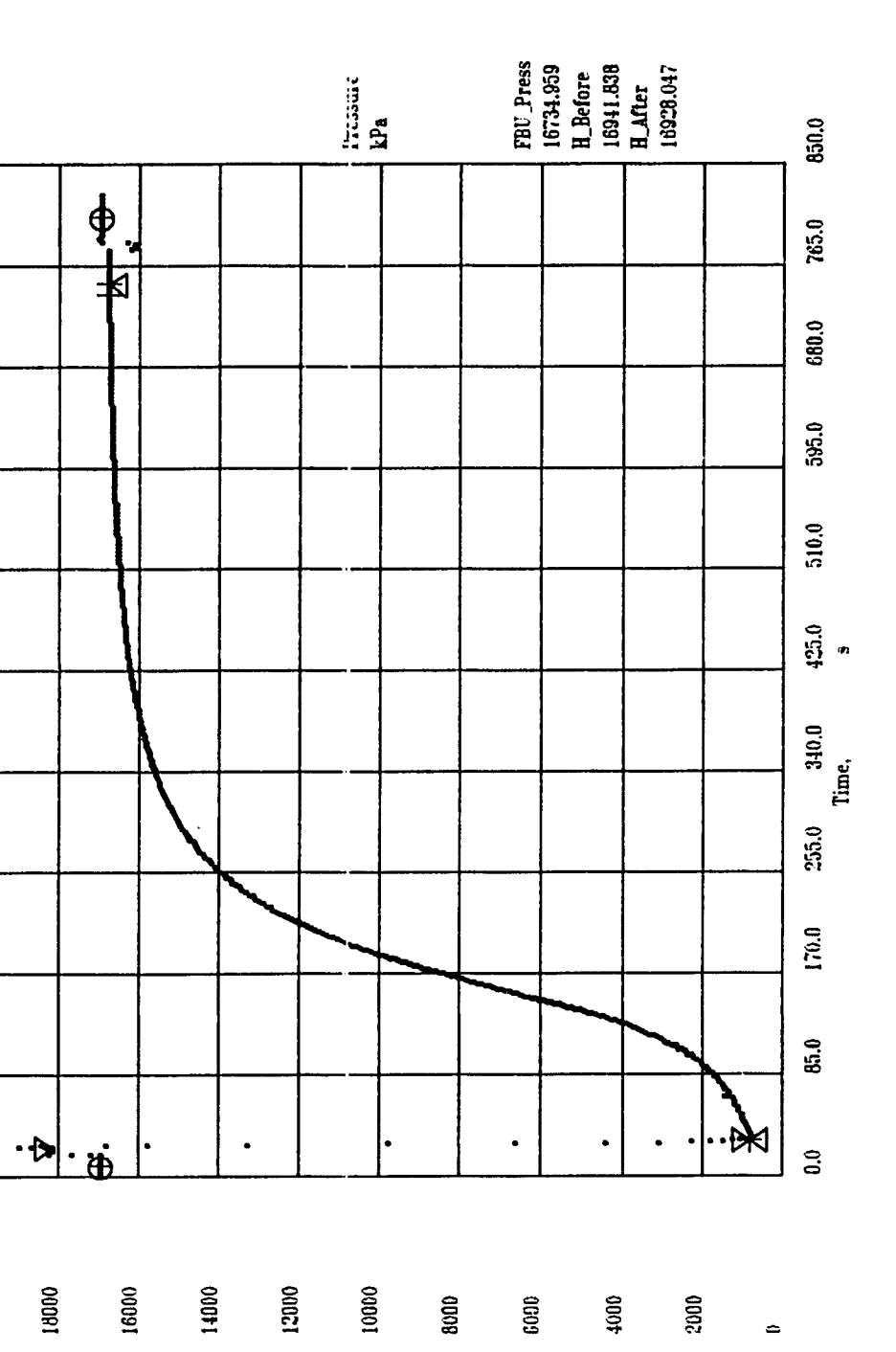
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Data File: e007c37.aff
Presentation: Intsig.sg



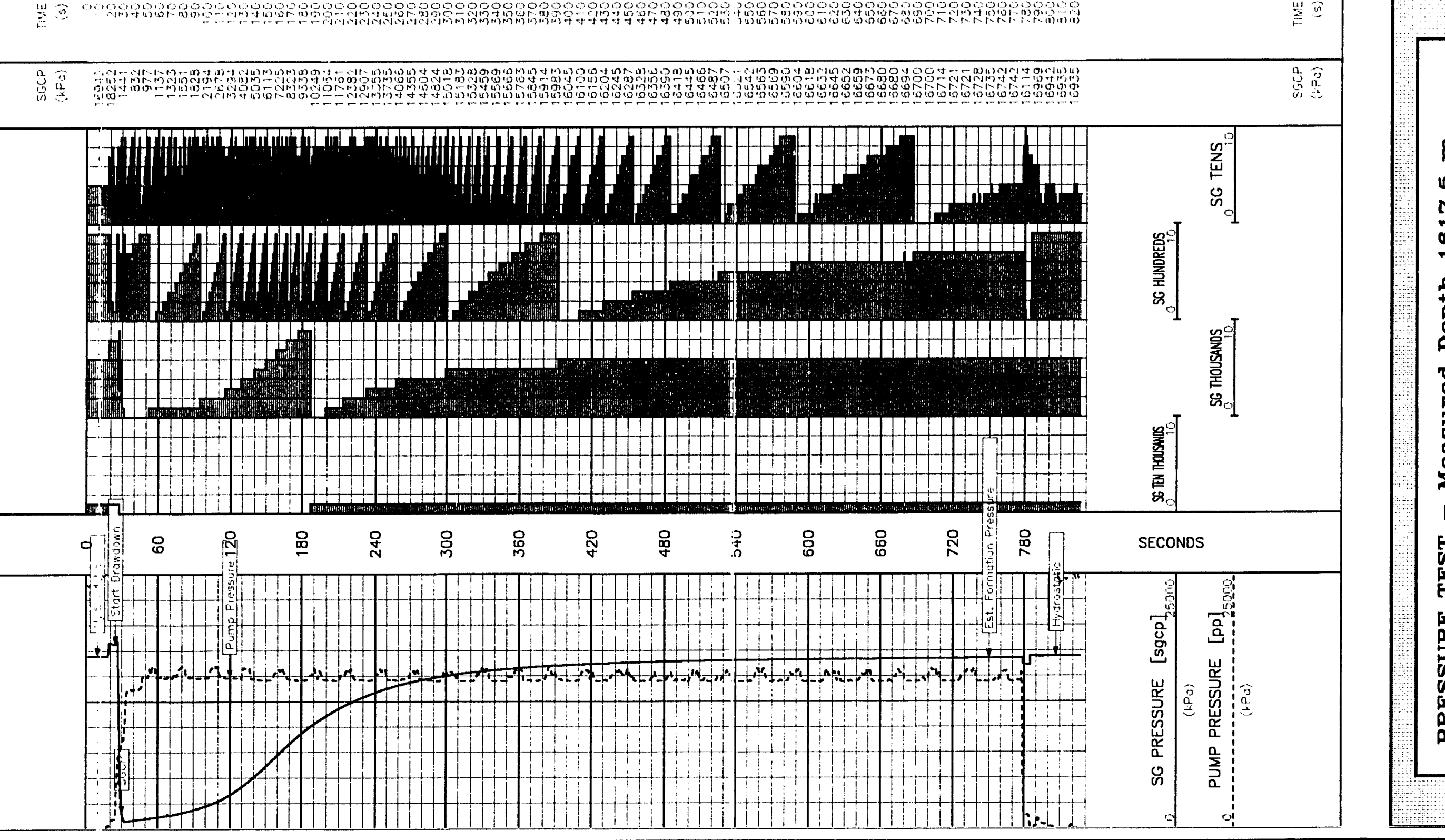
PRESSURE TEST - Measured Depth 1636.0 m TVD Depth 1636.0 m



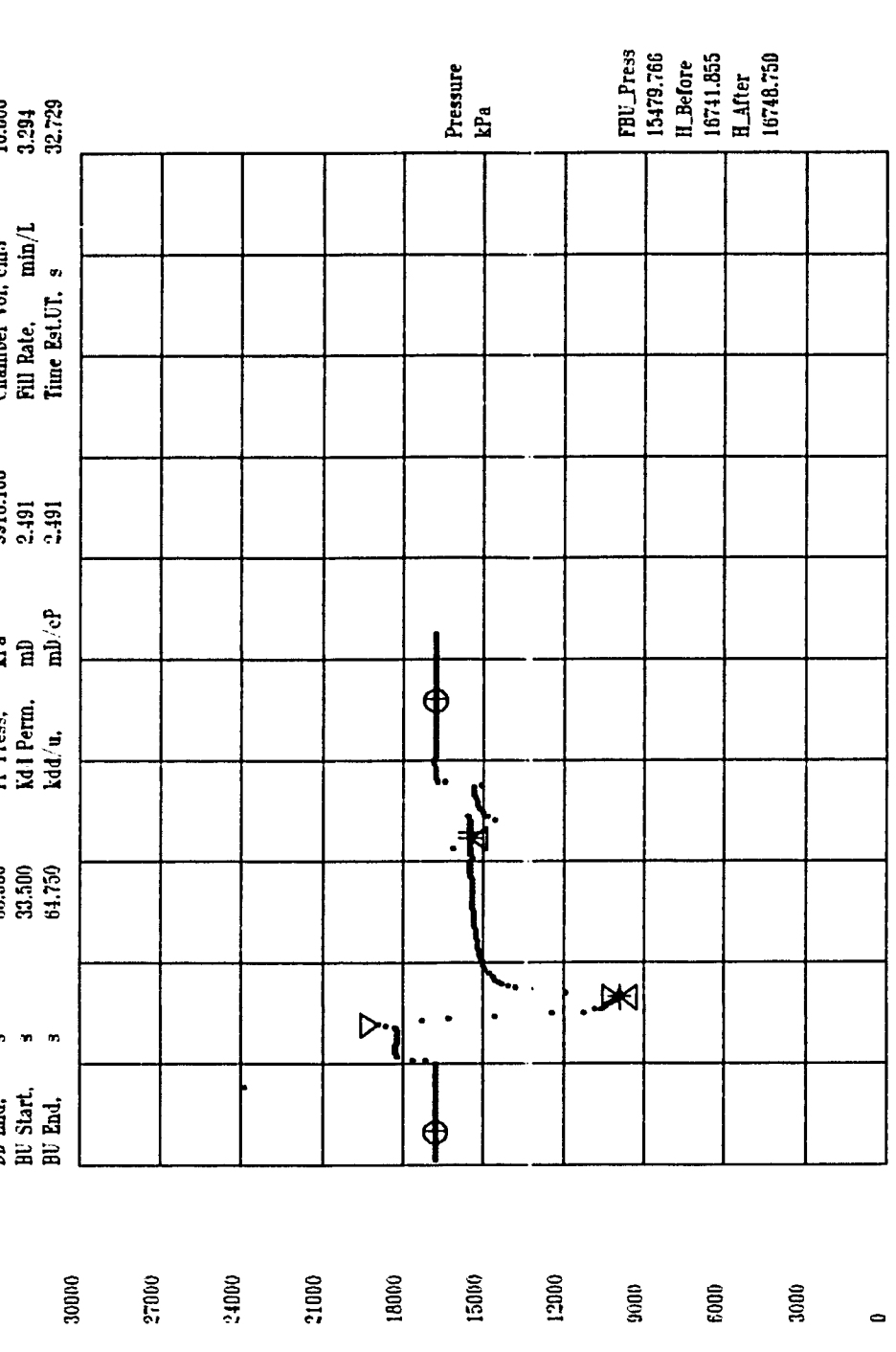
PRETEST: SG
HISTORY PLOT: Elapsed Time vs. Pressure

Measured Depth: m 1636.0
TVD Depth: m 1636.0
Flow Rate: cm³/s 1.000
Chamber Vol: cm³ 10.000
Fill Rate: mm/L 3.144
Time Elut: s 31.256

Data File: e007c38.aff
Presentation: Intsig.sg



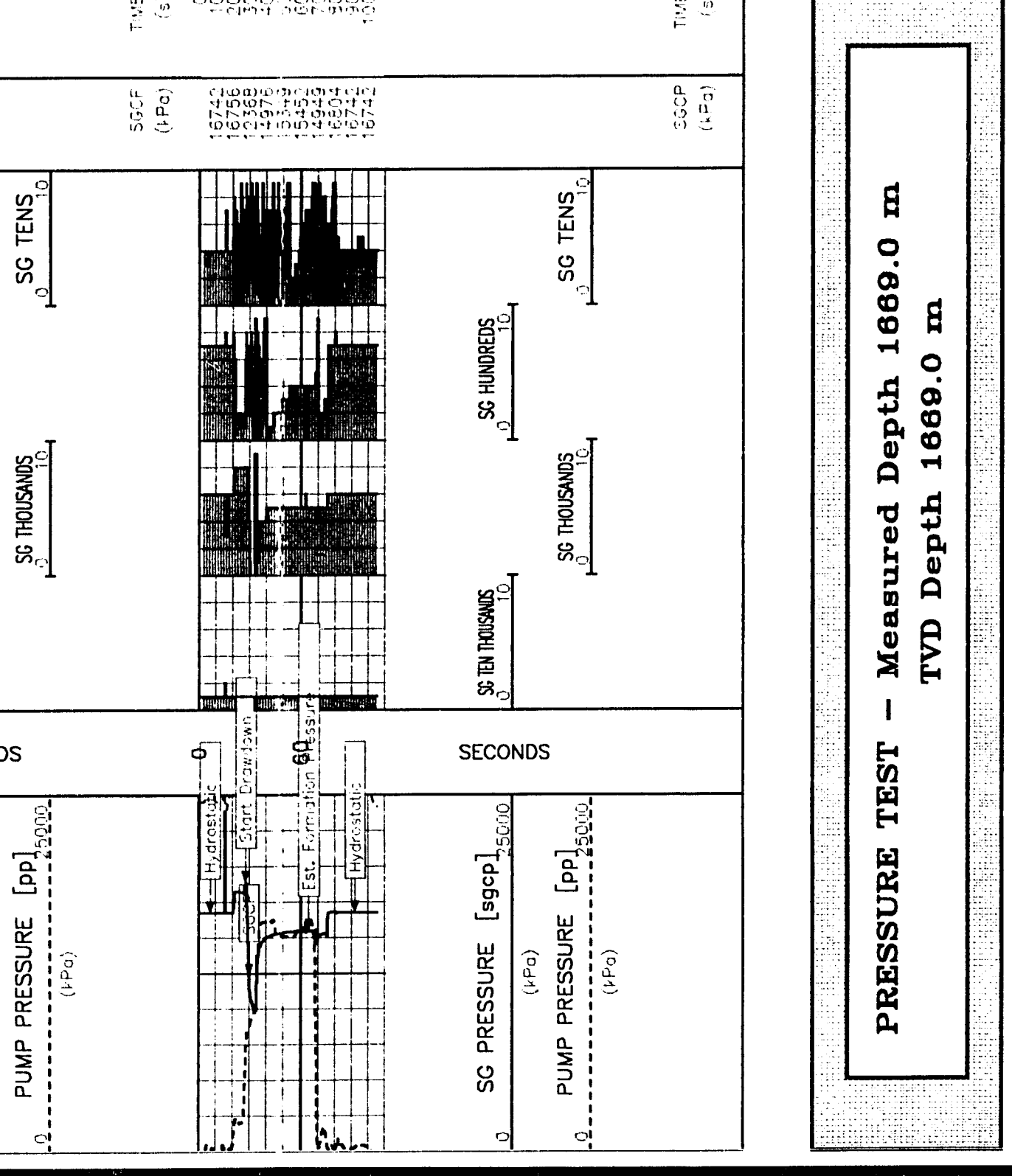
PRESSURE TEST - Measured Depth 1617.5 m TVD Depth 1617.5 m



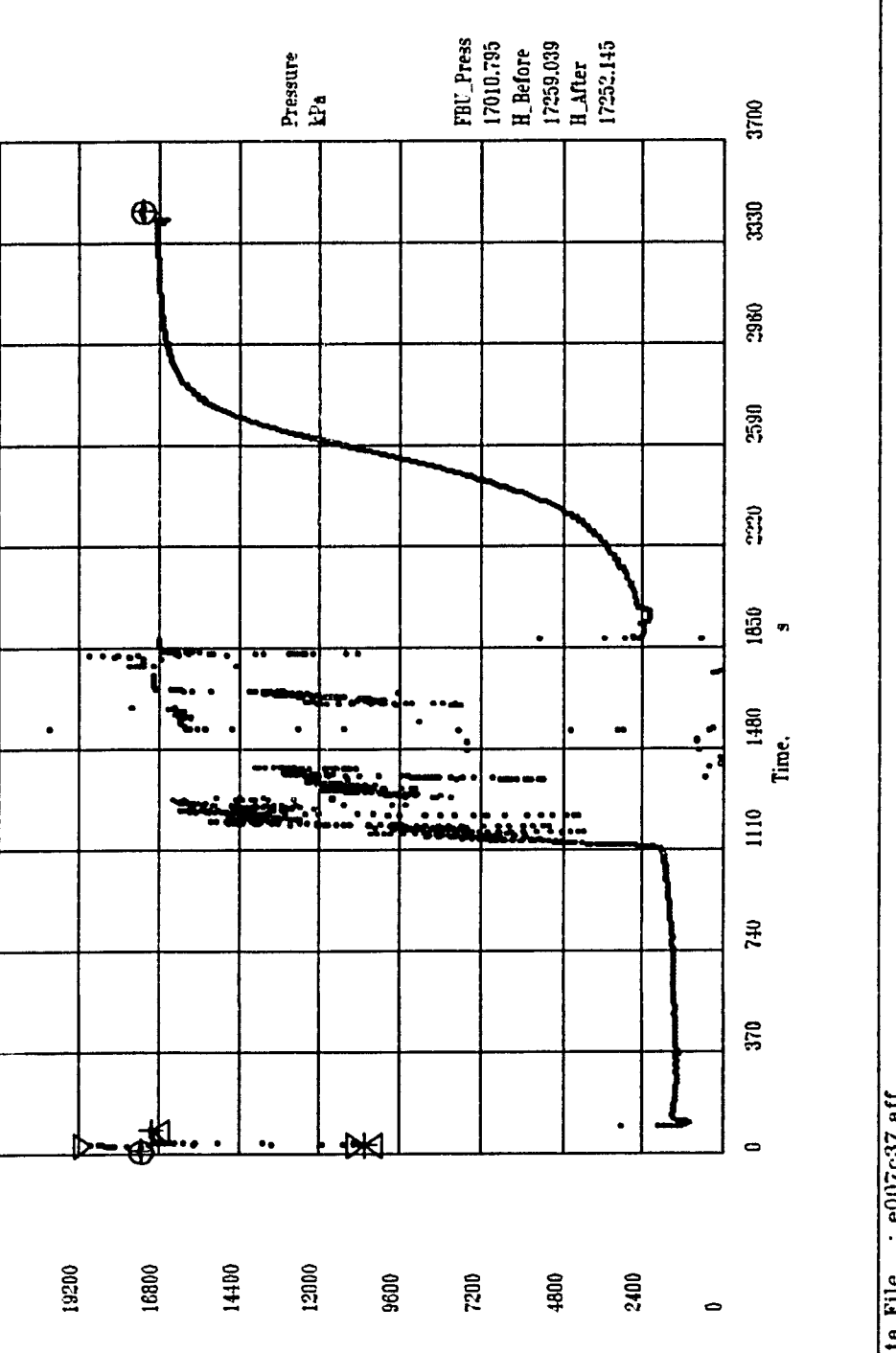
PRETEST: SG
HISTORY PLOT: Elapsed Time vs. Pressure

Measured Depth: m 1689.0
TVD Depth: m 1689.0
Flow Rate: cm³/s 2.013
Chamber Vol: cm³ 10.000
Fill Rate: mm/L 3.144
Time Elut: s 31.256

Data File: e007c39.aff
Presentation: Intsig.sg



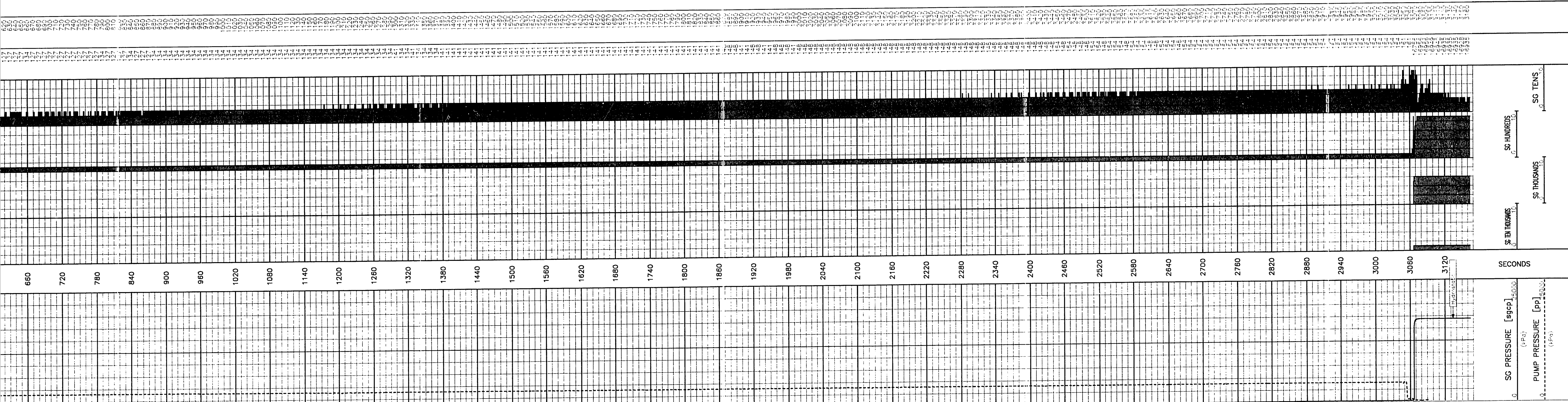
PRESSURE TEST - Measured Depth 1689.0 m TVD Depth 1689.0 m



PRETEST: SG
HISTORY PLOT: Elapsed Time vs. Pressure

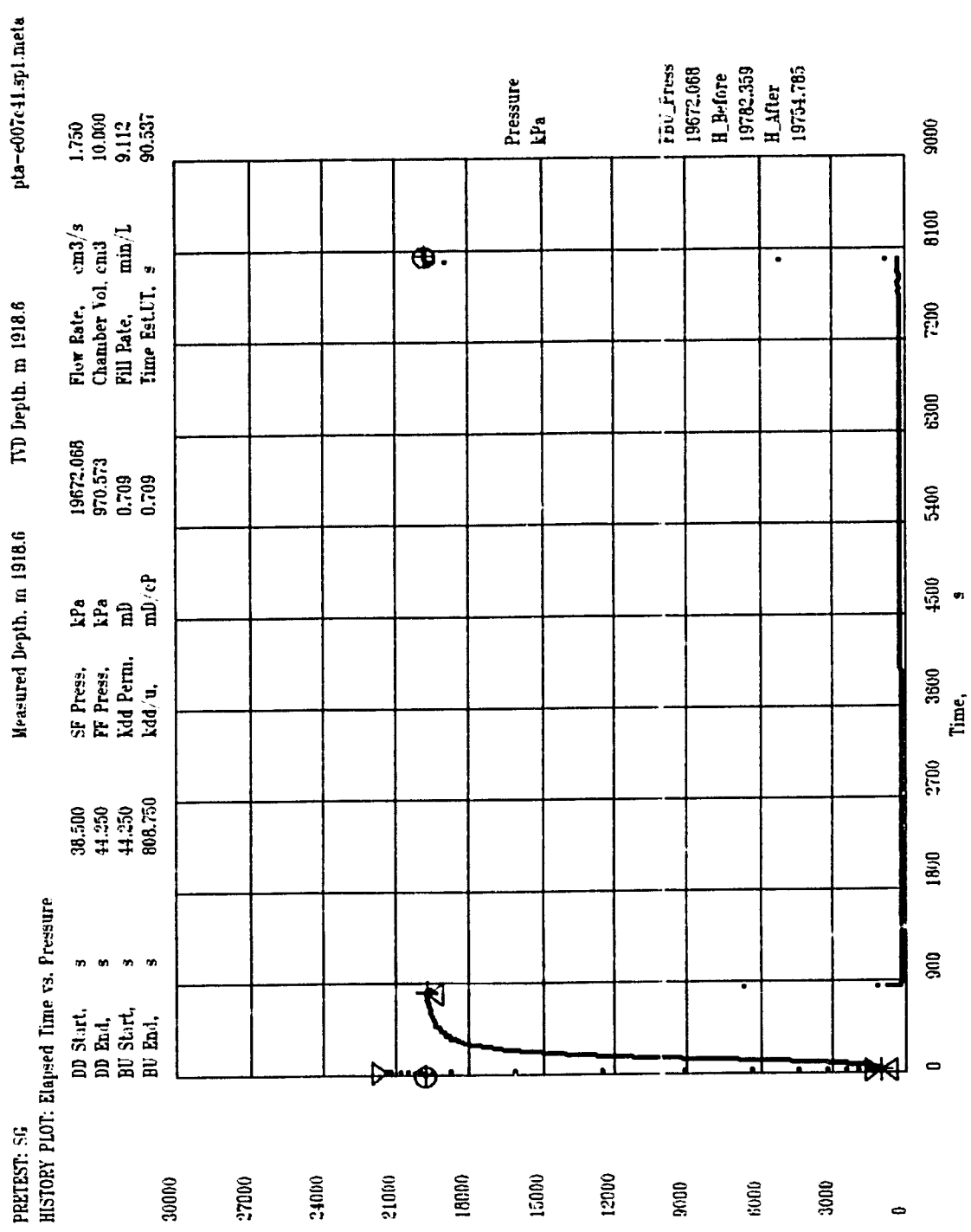
Measured Depth: m 1725.145
TVD Depth: m 1725.145
Flow Rate: cm³/s 2.013
Chamber Vol: cm³ 10.000
Fill Rate: mm/L 3.144
Time Elut: s 31.256

Data File: e007c40.aff
Presentation: Intsig.sg



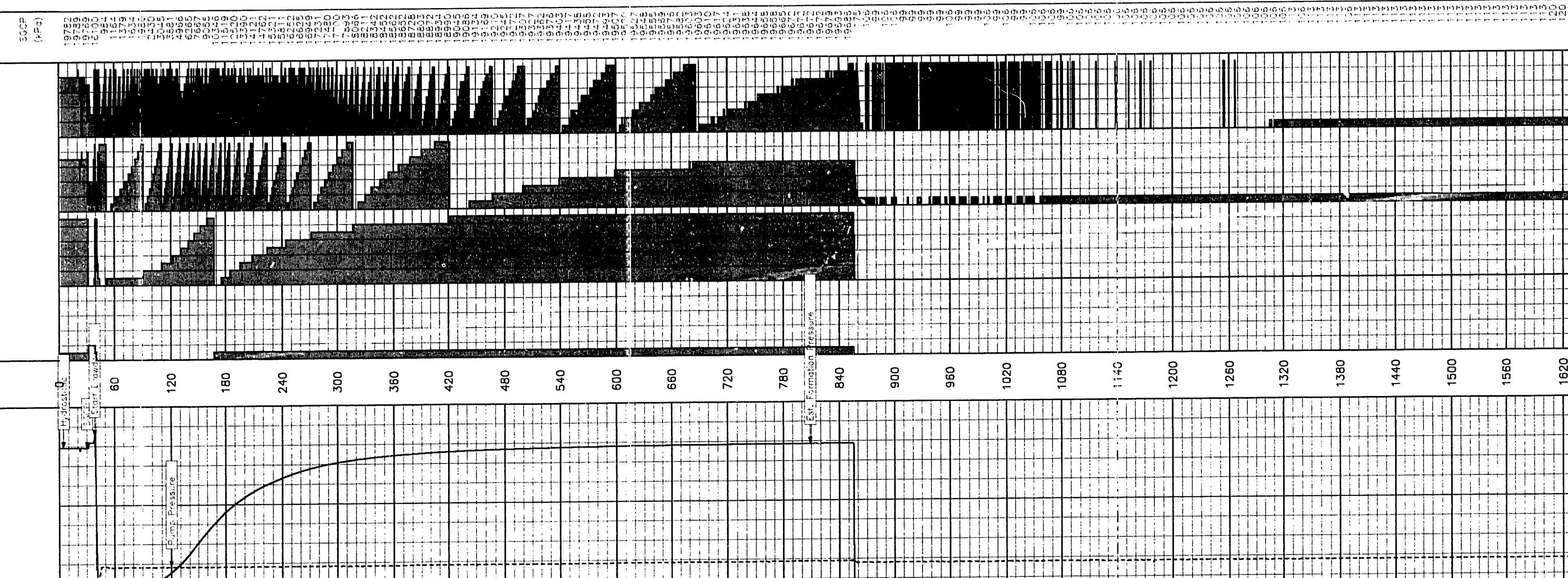
PRESSURE TEST - Measured Depth 1918.6 m
TVD Depth 1918.6 m

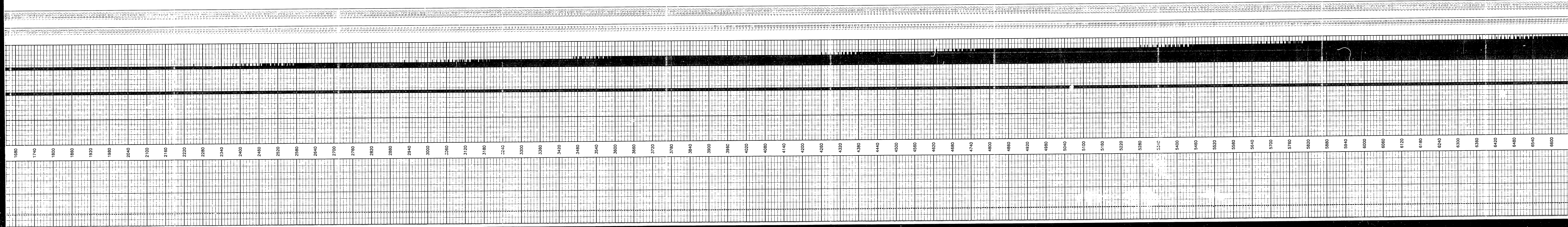
Meta File: pla-e007c11apl1.mta



PRESSURE TEST - Measured Depth 1918.6 m
TVD Depth 1918.6 m

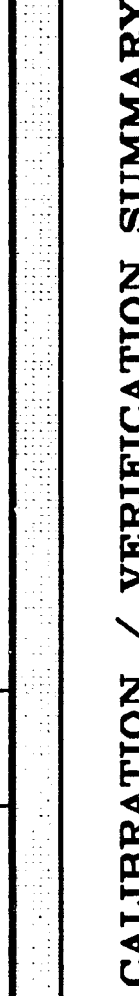
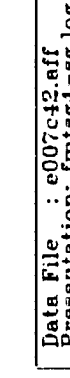
Meta File: pla-e007c11apl1.mta







PRETEST: S1		HISTORY PLOT: Elapsed Time vs. Pressure		Measured Depth, m	1766.5	1770 Depth, m	1766.5	pda=007c42-ap1.mda
DO Start,	s	24.000	SP Press,	kPa	17086.648	Flow Rate,	cm ³ /s	1.830
DO End,	s	33.500	PF Press,	kPa	15272.844	Chamber Vol,	cm ³	10.000
BO Start,	s	33.500	Kid Perm,	md	7.038	Filt Rate,	mm/L	0.973



GR PRIMARY CALIBRATION SUMMARY

TOOL #:	1309XA	049Z39
DATE/ TIME	PERFORMED:	WED DEC 13 13:26:41 1995

BACKGND CALBTR ON	CR DIFF	MULT	BACKGND CALBTR ON	CALBTR

GR	44.33	ZZU.71	185.0	242.0	U.850	37.70	187.70	150
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GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1309XA 049239

DATE/TIME PERFORMED: Wed Dec 15 15:28:52 1999

	BACKGROUND CALBRTR ON	MULT	BACKGROUND CALBRTR ON	DIFF.
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GR	43.19	218.86	0.850	36.73	186.13	149.40	140.00	180.00
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GR BEFORE LOG VERIFICATION SUMMARY

NOT DONE

NOT DONE

GAUGE #: 2172SG 3543335 DATE/TIME PERFORMED: Thu Aug 19 15:28:35 1998

UNIT #: 3880TB 006558 FWT ELECTRONICS #: 1965EA 071335

0 5.175680E+01 1.006940E+00 -5.773070E-07 1.177470E-11

1	-1.235370E+00	-2.157290E-04	2.114550E-08	-2.139510E-13
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3

4 2.051880E-08 8.317170E-12 -2.328520E-16 -6.186050E-20

Coef	Test
150.0	-5.656849E+00
	9.975711E-01
	7.261007E-07
	-3.569562E-11

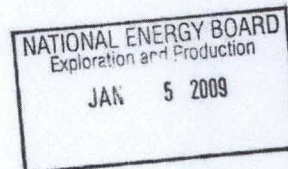
ELECTRONICS

ZERO (psi) -73.0

BAKER
WELL
COMBINI
PARAMOUNT RESOURCES LTD.
PARA ET AL FT. LIARD 1-46 60 10', 123 15'

Atlas	LOCATION:	ELEVATIONS:	3001466
	NORTHWEST TERRITORIES		
PROVINCE			

DF	GL	537.2 M
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APPROVAL TO ALTER CONDITION OF A WELL

This application is to be submitted to the Chief Conservation Officer at least 45 days before commencement of operations.

Well Name:	Para Et Al Fort Liard I-46		
Operator:	Paramount Resources Ltd.	Well ID:	1871
Operating License No.:	1221	Depth:	1449.0m
Contractor:	Concord Well Servicing Ltd.	Drilling Rig or Unit:	RIG #41
Area:	Fort Liard, Nwt	Grid:	60-10-123-15
Coordinates:	Surface Lat.: 60°5'32.4"	Long.:	123°22'53.6"
(NAD 27)	Bottom Hole Lat: 60°5'32.4"	Long.:	123°22'53.6"
Date ADW issued:	22/Oct/1999	Date of last Operation:	10/Jan/2003
Elevation-KB/RT:	542.5m	GL / Seafloor:	537.5m
Approx. Spud Date:	19/Jan/2009	Est. Days on Location:	3

TYPE OF OPERATION

To suspend the well by setting bridge plugs above existing open perforations.

SUMMARY OF PROPOSED OPERATIONS

(See the attached detailed workover program)

Install BOP's.
Unset the packer. Displace wellbore to inhibited water. Pull and stand the tubing.
Wireline set a bridge plug at 1695 mKB.
Re-run the tubing with a test packer on bottom.
Pressure test the bridge plug. Pull tubing.
Dump ball cement onto the bridge plug.
Wireline set a bridge plug at 1210 mKB.
Pressure test the bridge plug and casing. Dump ball cement onto the bridge plug.
Remove the BOP's and install the wellhead.

Signed:	<u>Dave Block</u>	Title:	Engineering Consultant
	Responsible Officer		
Name:	Dave Block	Operator:	Paramount Resources Ltd.
Date:	Dec 18, 2008	Phone:	(403)206-3834

NEB USE ONLY

An approved copy of this notice is to be posted at each drillsite. This operation is authorized under Section 5.(1)(b) of the Canada Oil and Gas Operations Act (O-7) and is subject to the terms and conditions attached to this authorization.

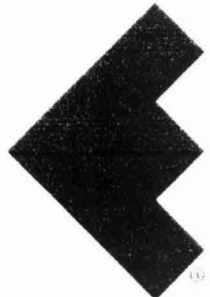
Well Status Before Operation:

Suspended	☐
Completed	☐
Abandoned	☐

Date:	21 Jan 09
File:	- - -
WID:	1871
UWI:	3001466010123152

Signed: [Signature]
Chief Conservation Officer

Canada



NEB COPY
COLLAR LOG

PROVINCE NORTHWEST TERRITORIES FIELD FORT LIARD WELL PARA ET AL FORT LIARD I-46 COMPANY PARAMOUNT RESOURCES LTD.		COMPANY PARAMOUNT RESOURCES LTD. WELL PARA ET AL FORT LIARD I-46 FIELD FORT LIARD PROVINCE NORTHWEST TERRITORIES		LOCATION 3001466010123152 Perm. Datum Ground Level Elev. 537.50 Log measured from K.B. 5.00 m above Permanent Datum. Elev. K.B. 542.50 G.L. 537.50 Other Services: UMI 3001466010123152 Licence 1221	
Date FEBRUARY 22, 2009	Service Order 10205912	Run No. ONE	BHT N/A °C	Depth-Driller 2008.0	Depth-Logger 80.0
Btm. Log Inter. 75.0	Top Log Inter. 25.0	Fluid in Hole FRESH WATER	Gun Size	Gun Type	Tubing/Casing Record
Fluid Level 0.0	Bit Size (mm) N/A	Unit # 14172	Location EDMONTON	Recorded By BEAU NYCHKA	Witnessed By AL IRONSIDE
Service Type ALPHA 10K PERMANENT		Size 177.8 mm		Depth 50.0 m	
Bridge Plug		Prod. Packer		Cement Retainer	
Cement		Tubing Bottom		Junk Basket Type	
Seating Nipple		Gauge Ring Size			

All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretation or recommendation and we shall not be liable or responsible for any loss, cost, damages or expenses incurred or sustained by anyone resulting from any interpretation or recommendation made by any of our employees or agents.

REMARKS Rig: FORMULA POWELL #2521 Service Order # 10205912
LOG CORRELATED TO KB ONLY
IN ORDER TO BYPASS SOFTWARE SAFETY SWITCHES, EXACTLY 100m WAS ADDED TO COMPUTER DEPTH.
BRIDGE PLUG SET AT 50.0m AS REQUIRED BY BOARD.

WELL LOGGED AS PER CUSTOMER REQUEST

EQUIPMENT DATA			
Run No.	Tool Type	Tool No.	Other
ONE	CCLT	CYTHERIA	SET BRIDGE PLUG

Date 22-FEB-2009

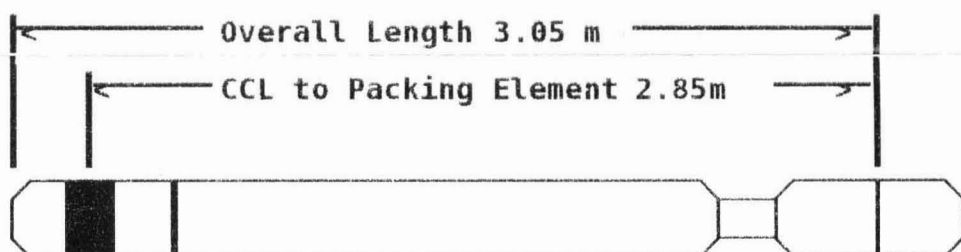
Type PERMANENT

Model ALPHA 10k

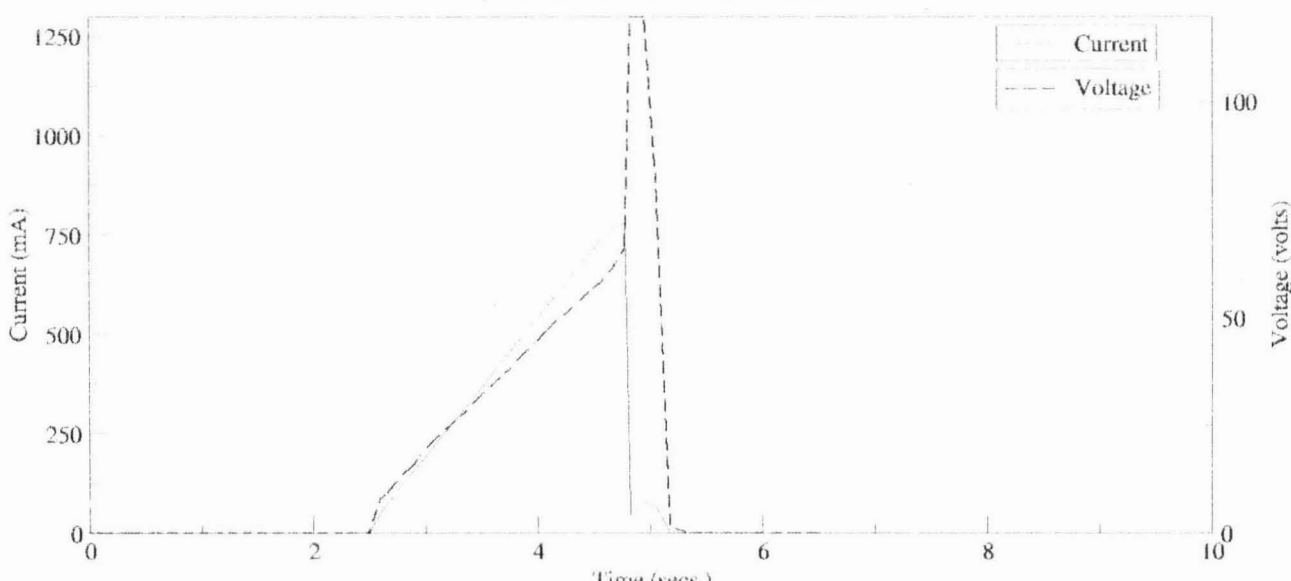
Size 177.8 mm

Depth 50.0 m

Make WEATHERFORD



Shot V-I Characteristics
Top shot at 150.02m 02/22/09 20:06:57



Release SHOOT and ARM switches

Power supply is ramping down
Follow SAFETY MANUAL Procedures for Shooting

Sun Feb 22 20:07:00 2009

Job # 10205912

REMARKS

BRIDGE PLUG SET AT 50m, AS REQUESTED
IN ORDER TO BYPASS SOFTWARE SAFETY SWITCHES, ADDED EXACTLY 100.0m
PRIOR TO POSITIONING PASS AS SHOWN BELOW.
COLLARS VERIFIED TO MATCH UNMODIFIED CORRELATION PASS.

DEPTH SCALE: 1:240

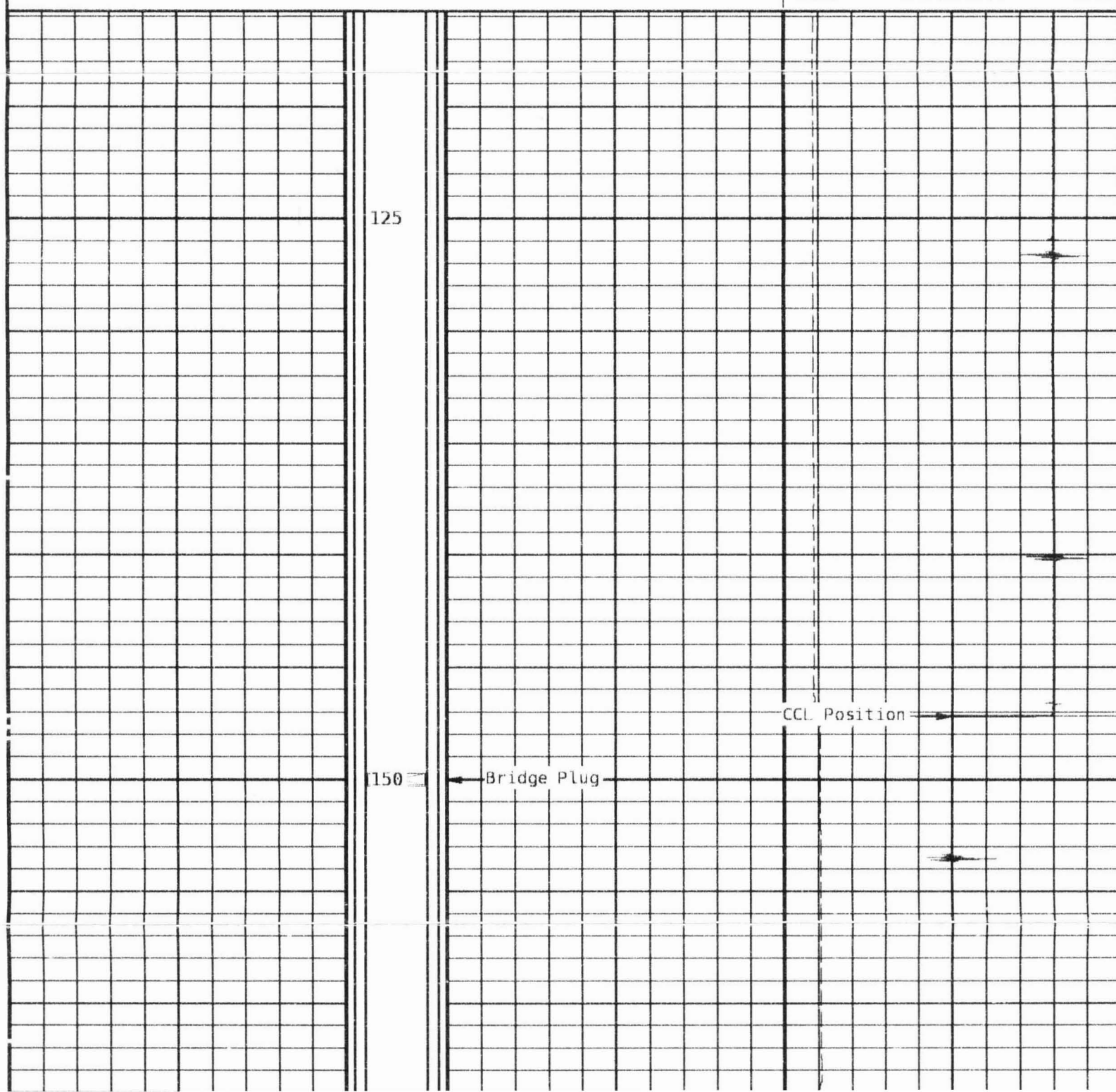
VERSION: 80214133R

MAIN PASS

10205912 BPMAIN

FINISH DEPTH: 115.8 Meters DIRECTION: UP DATE: 02/22/2009 TIME: 20:12 MODE: TRACE PLAYBACK

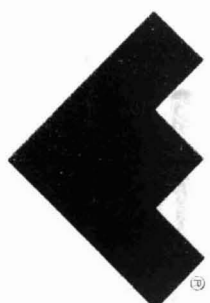
TENSION		
0	Pounds	5000
CCL TO POSITION		
-3000	Millivolts	3000



Final Operational/Workover Report
Well Suspension
Para et al Fort Liard I-46
Well ID #: 1871
UWI: 300I466010123152

On February 3, 2009 Paramount Resources Ltd. moved Concord Well Servicing rig # 84 onto Para et al Fort Liard I-46 to perform a workover operation to suspend the well as per section 218 of the Canada Oil and Gas Drilling Regulations. Service rig operations were completed on February 9, 2009 and the final wireline work was completed on February 22, 2009. A chronological summary of the operations follows.

- 3/2/2009:** Moved on and rigged up service rig.
- 4/2/2009:** Finished rigging up. Attempted to kill well down annulus but could not establish circulation. Rigged in slickline unit to check for sliding sleeve. None found.
- 5/2/2009:** Used slickline to cut hole in tubing at 1598 mKB. Circulated and killed well. Removed the wellhead and installed the BOP's. Unset packer. Pulled tubing and recovered all downhole equipment. Filled hole with inhibited fluid.
- 6/2/2009:** Ran gauge rings into the hole. Largest that would pass liner top was 90.25 mm.
- 7/2/2009:** Ran in hole with 97.38 mm tapered mill on tubing. Worked mill past liner top. Ran 96.7 mm gauge ring and worked past liner top. Ran and set permanent bridge plug at 1604 mKB. Ran test packer in on tubing. Couldn't get pressure test on the test packer.
- 8/2/2009:** Pulled packer from hole. Inspected tubing and found pitting. Re-ran packer on new tubing. Set test packer at 1234 mKB. Pressure tested the packer and bridge plug to 14 MPa for 15 minutes. Pulled and recovered the test packer. Dump bailed 6 linear meters of cement onto the bridge plug at 1604 mKB. Ran and set bridge plug at 1210 mKB.
- 9/2/2009:** Pressure tested the bridge plug to 14 MPa for 15 minutes. Dump bailed 6 linear meters of cement onto the bridge plug. Laid down tubing. Rigged out service rig.
- 22/2/2009:** Ran and set a permanent bridge plug at 50 mKB.



NEBCOPY

SET PLUG LOG
** WIRELINE DEPTH ONLY **

PROVINCE NORTHWEST TERRITORIES FIELD FORT LIARD WELL PARA ET AL FORT LIARD I-46 COMPANY PARAMOUNT RESOURCES INC.		COMPANY PARAMOUNT RESOURCES INC. WELL PARA ET AL FORT LIARD I-46 FIELD FORT LIARD PROVINCE NORTHWEST TERRITORIES	
LSD 02 Sec. 34 Twp. 086 Rge. 13W6 Perm. Datum Ground Level Elev. 537.50 Log measured from K.B. 5.00 m above Permanent Datum. UWI 3001466010123150 Licence 1221		Other Services: G-RING CEMENT ELEV. K.B. 542.50 G.L. 537.50	
Date 07-FEB-2008	Service Order 10190161	Shot Density	No. of Shots
Run No. 001	001		
BHT 60°C			
Depth-Driller 2008.0			
Depth-Logger 1616.0			
Btm. Log Inter. 1613.3			
Top Log Inter. 1535.0			
Fluid in Hole INHIBITED WATER			
Fluid level 125 m			
Bit Size (mm) 222.0			
Unit # 14187			
Location FORT ST. JOHN, BC			
Recorded By T. PROGAS			
Witnessed By AL IRONSIDE			
Other Services			
Service Type	Size	Depth	
Bridge Plug WEATHERFORD ALPHA	114.3	1604.0	
Product Packer			
Cement Retainer			
Cement			
Tubing Bottom Junk Basket Type TIAN			
Seating Nipple Gauge Ring Size 96.3 mm			

All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretation or recommendation and we shall not be liable or responsible for any loss, cost, damages or expenses incurred or sustained by anyone resulting from any interpretation or recommendation made by any of our employees or agents.

REMARKS Rig: CONCORD #84 Service Order # 10190161
LOG CORRELATED TO LINER TOP ONLY
*** WIRELINE DEPTH ONLY ***
NO CORRELATION LOGS AVAILABLE
LOGGED AS PER CUSTOMER REQUEST

EQUIPMENT DATA

Run No.	Tool Type	Tool No.	Other
ONE	CCS-DA	14187	JUNK BASKET/GUAGE RING 96.3 mm
TWO	BST-10	14187	SET PLUG @ 1604.0 m WIRELINE DEPTH ONLY
THREE	D-BAIL	14187	DUMP BAIL CEMENT 1596.0-1604.0 m

Date 07-FEB-2008

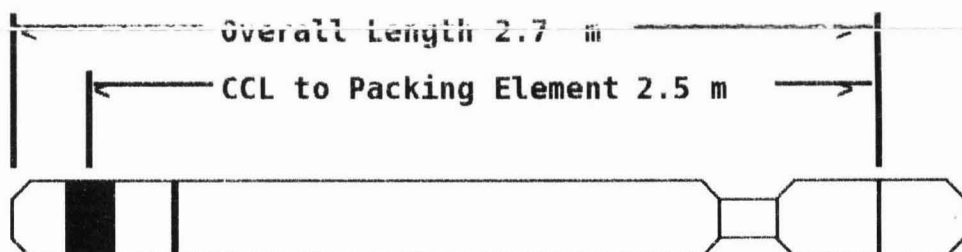
Type PERMANENT

Model DB-10

Size 114.3 mm

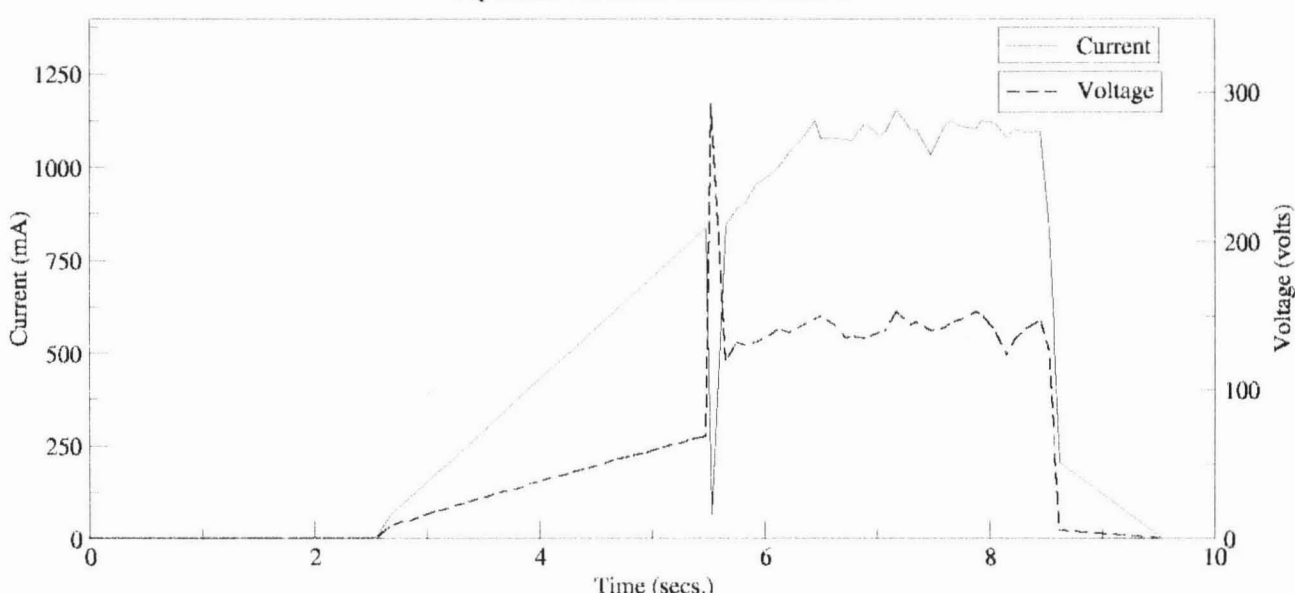
Depth 1604.0

Make WEATHERFORD



Shot V-I Characteristics

Top shot at 1604.00m 02/07/09 17:55:43



Hold the SHOOT and ARM switches

Shooting

Power supply is ramping down

Follow SAFETY MANUAL Procedures for Shooting

Sat Feb 7 17:55:44 2009

Job # 10190161

REMARKS

SET PLUG @ 1604.0 m

WIRELINE DEPTH ONLY

CORRELATED TO G-RING PASS

DEPTH SCALE: 1:240

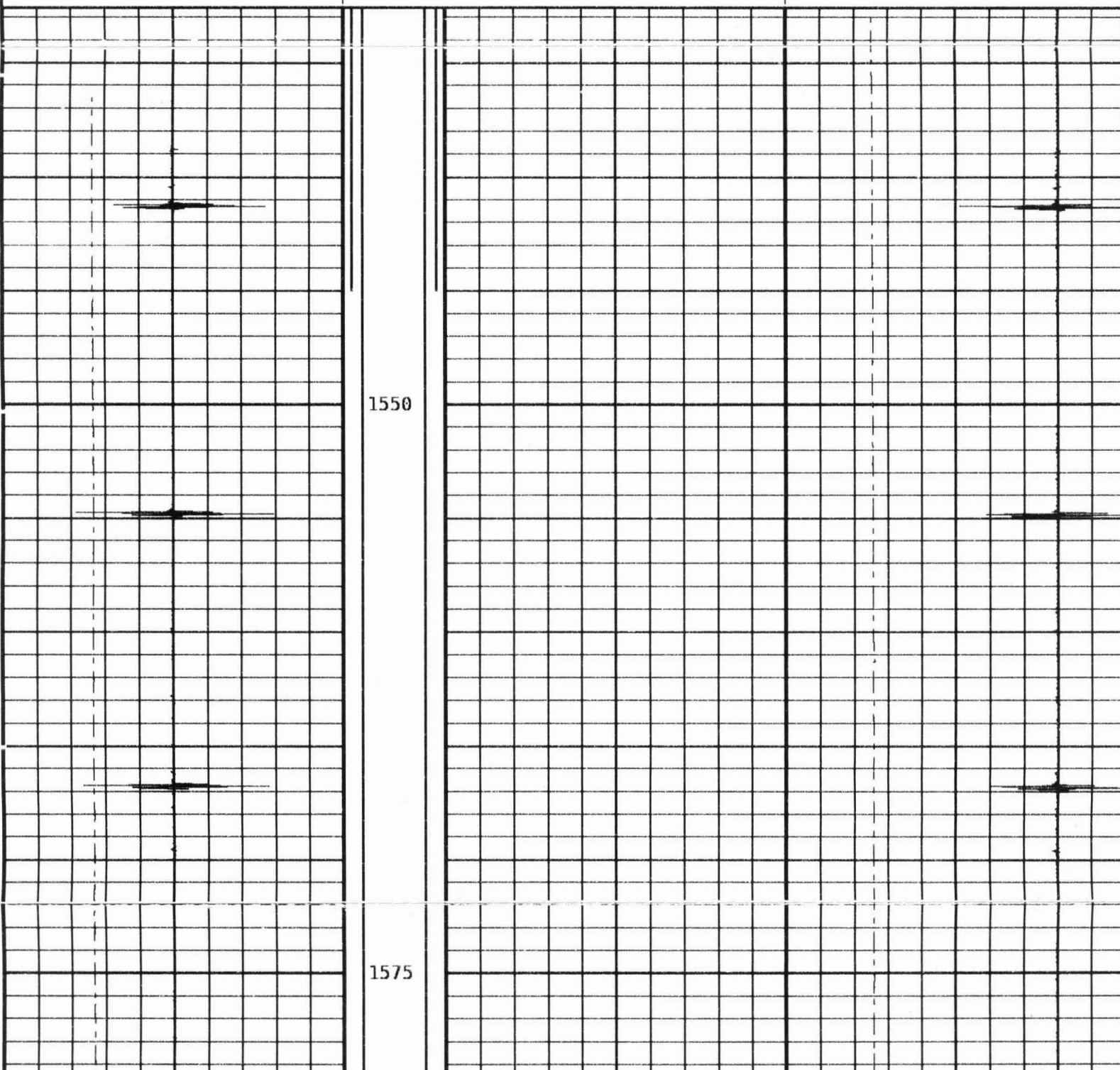
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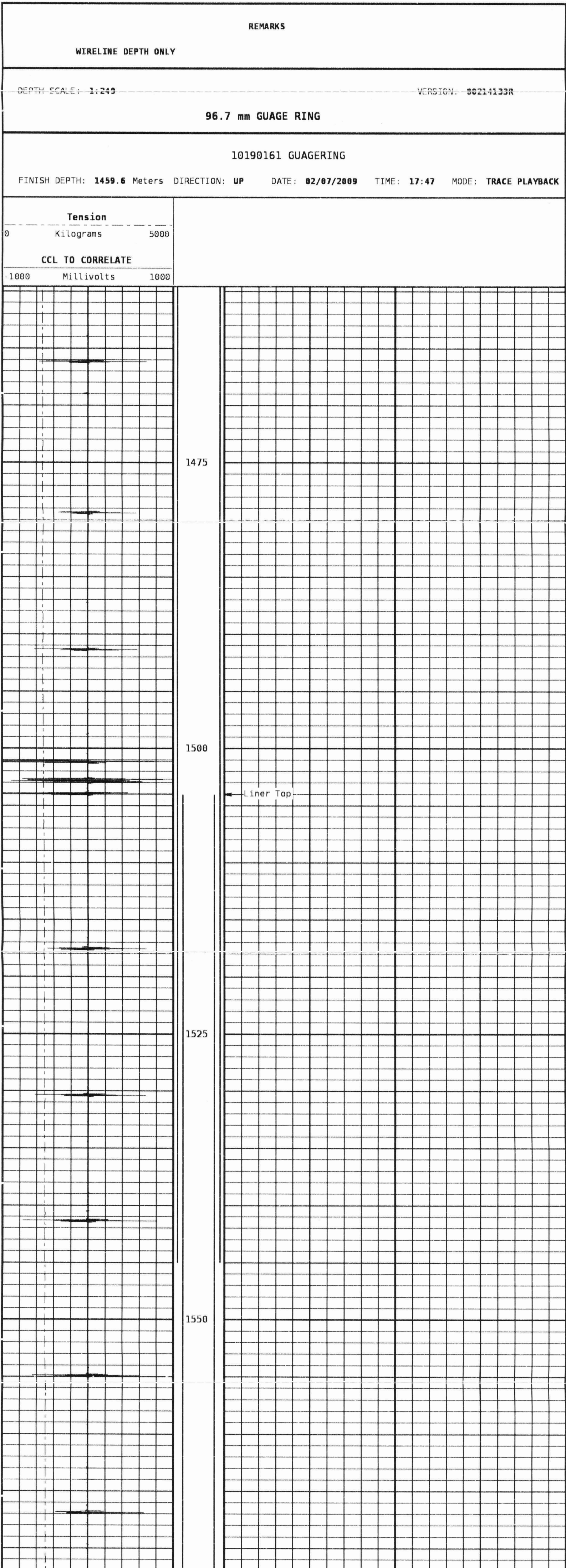
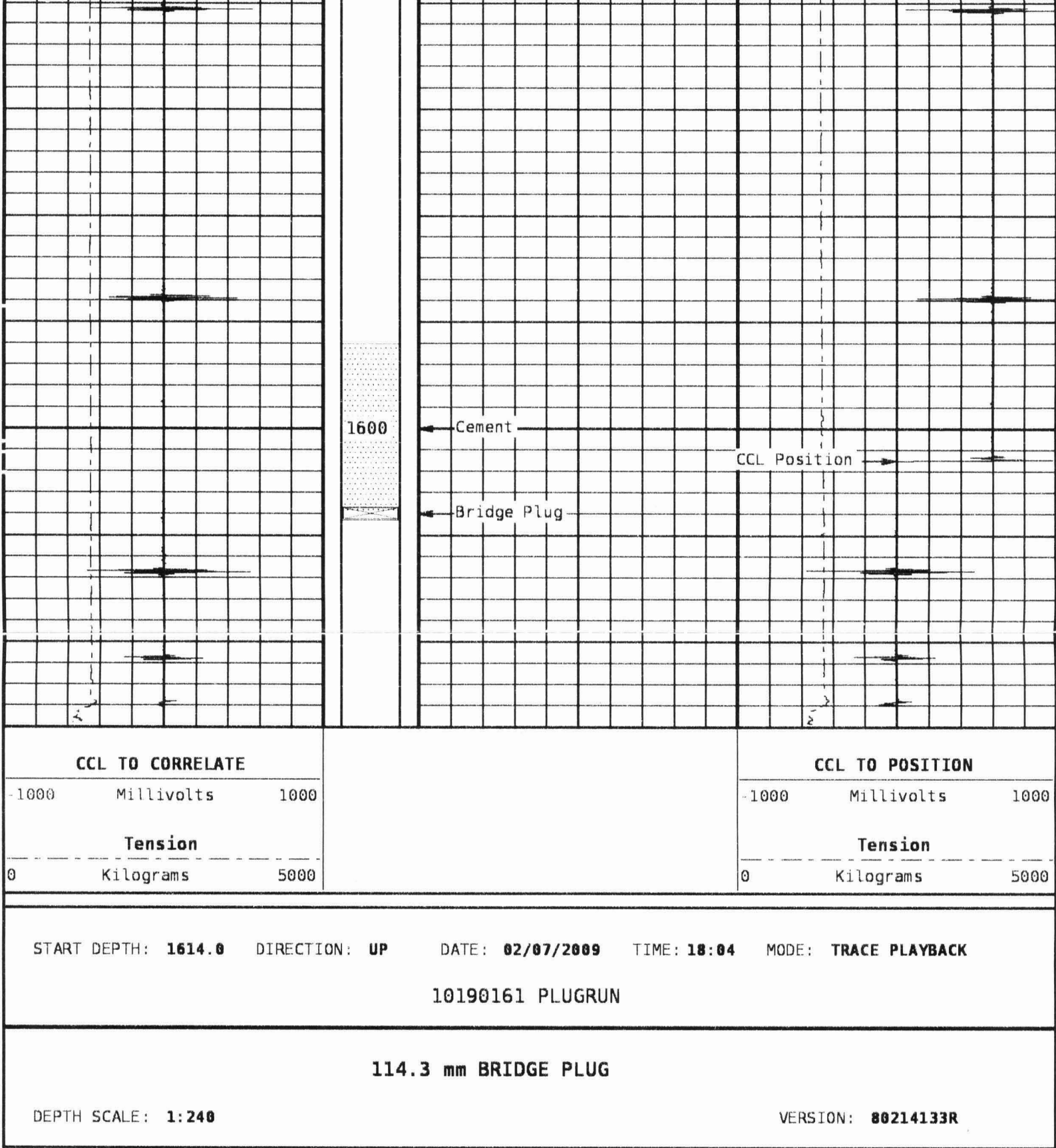
114.3 mm BRIDGE PLUG

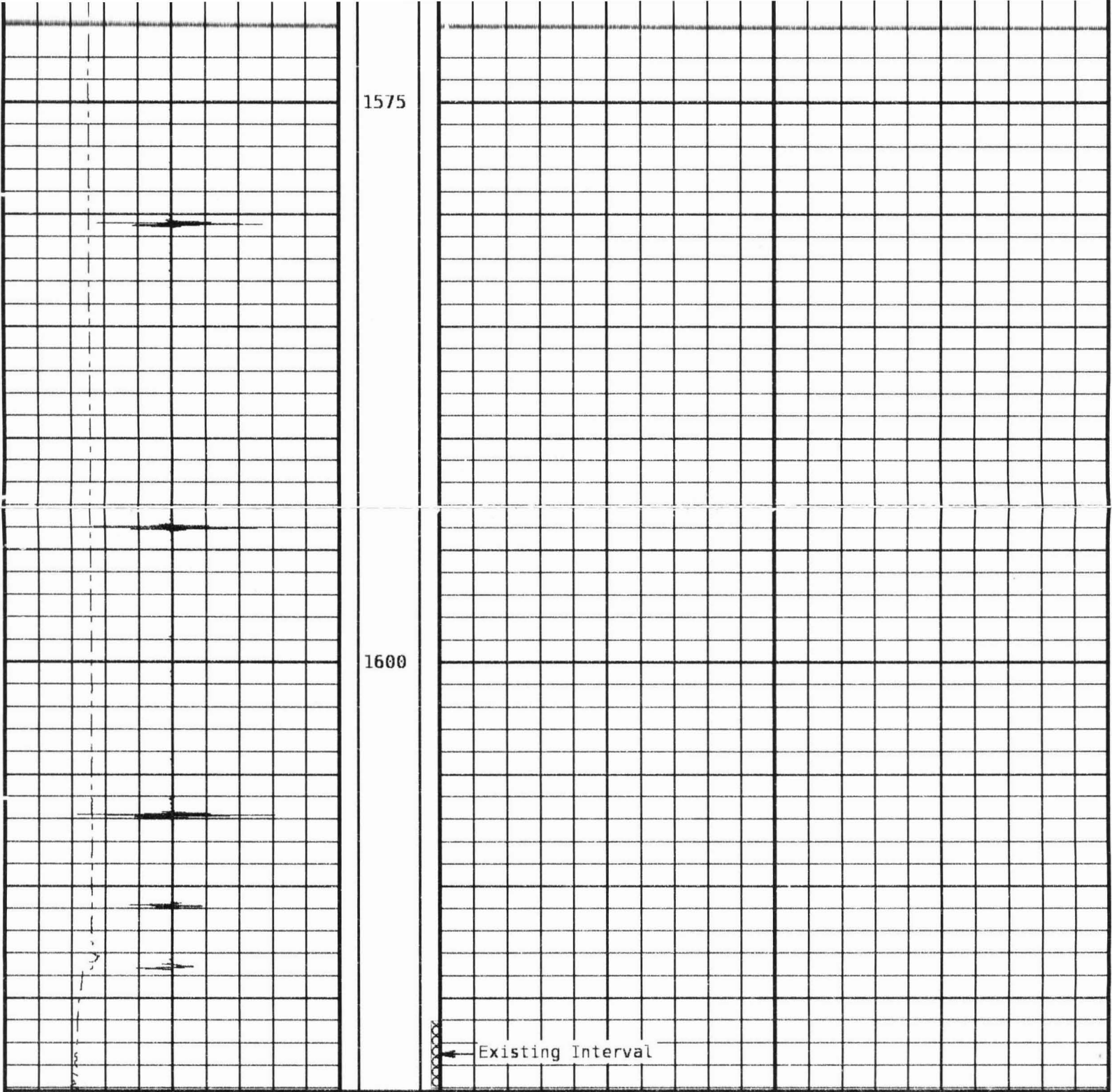
10190161 PLUGRUN

FINISH DEPTH: 1532.6 Meters DIRECTION: UP DATE: 02/07/2009 TIME: 18:04 MODE: TRACE PLAYBACK

Tension	Tension
0 Kilograms 5000	0 Kilograms 5000
CCL TO CORRELATE	CCL TO POSITION
-1000 Millivolts 1000	-1000 Millivolts 1000







CCL TO CORRELATE		
-1000	Millivolts	1000
Tension		
0	Kilograms	5000

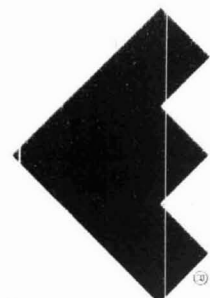
START DEPTH: 1619.1	DIRECTION: UP	DATE: 02/07/2009	TIME: 17:47	MODE: TRACE PLAYBACK
10190161 GUAGERING				
96.7 mm GUAGE RING				
DEPTH SCALE: 1:240	VERSION: 80214133R			

COMPANY PARAMOUNT RESOURCES INC.		 Weatherford®
WELL	PARA ET AL FORT LIARD I-46	
FIELD	FORT LIARD	
PROVINCE NORTHWEST TERRITORIES		



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C-SP001-10190161-PARAMOUNT_PLUG_I-46



NEBCOPY

SET PLUG LOG
** WIRELINE DEPTH ONLY **

PROVINCE NORTHWEST TERRITORIES FIELD FORT LIARD WELL PARA ET AL FORT LIARD I-46 COMPANY PARAMOUNT RESOURCES INC.		COMPANY PARAMOUNT RESOURCES INC. WELL PARA ET AL FORT LIARD I-46 FIELD FORT LIARD PROVINCE NORTHWEST TERRITORIES		LSD 02 Sec. 34 Twp. 086 Rge. 13M6 Perm. Datum Ground level Elev. 537.50 Log measured from K.B. , 5.00 m above Permanent Datum. Cement X 2 Elev. K.B. 542.50 G.L. 537.50 Licence 1221	
Date 08-FEB-2009	Service Order 10190161	Run No. ONE	Shot Density	No. of Shots	Perf. Interval From To
BHT 60°C		Depth-Driller 2008.0			
Depth-Logger 1240.0		Btm. Log Inter. 1240.0			
Top Log Inter. 1180.0		Fluid in Hole INHIBITED WATER			
Fluid Level SURFACE		Gun Size			
Fluid Level SURFACE		Tubing/Casing Record			
Bit Size (mm) 222.0		Size mm Wt. Kg/m			From To
Unit # 14187		244.5	53.60	SURFACE	505.0
Location FORT ST. JOHN, BC		177.8	38.60	SURFACE	1545.0
Recorded By T. PROGAS		114.3	17.26	1504.0	2055.0
Witnessed By AL IRONSIDE					
Other Services					
Service Type	Size	Depth			
Bridge Plug WEATHERFORD ALPHA	177.8	1210.0			
Prod. Packer					
Cement Retainer					
Cement CLASS G	6 METERS	1204.0			
Tubing Bottom	Junk Basket Type	-1210.0			
Seating Nipple	Gauge Ring Size				

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REMARKS Rig: CONCORD #84 Service Order # 10190161
CORRELATED TO WEATHERFORD SET PLUG LOG DATED 7-FEB-2009
*** WIRELINE DEPTH ONLY ***
TAGGED LINER TOP AS A DEPTH REFERENCE AS WELL
NO CORRELATION LOGS AVAILABLE
LOGGED AS PER CUSTOMER REQUEST

EQUIPMENT DATA			
Run No.	Tool Type	Tool No.	Other
ONE	BST-20	14187	SET BRIDGE PLUG @ 1210.0 m WIRELINE DEPTH ONLY
TWO	D-BAIL	14187	DUMP BAIL CEMENT
THREE	D-BAIL	14187	DUMP BAIL CEMENT

Date 08-FEB-2009

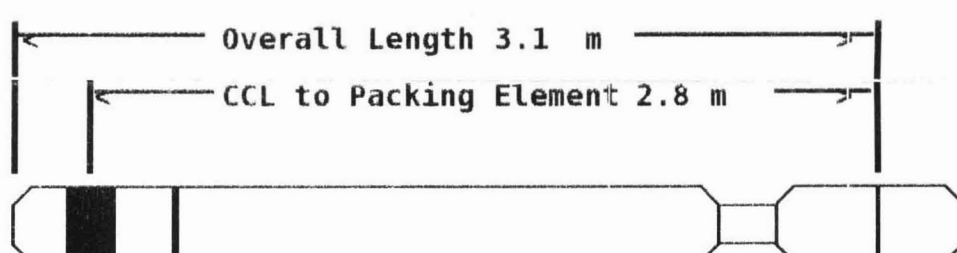
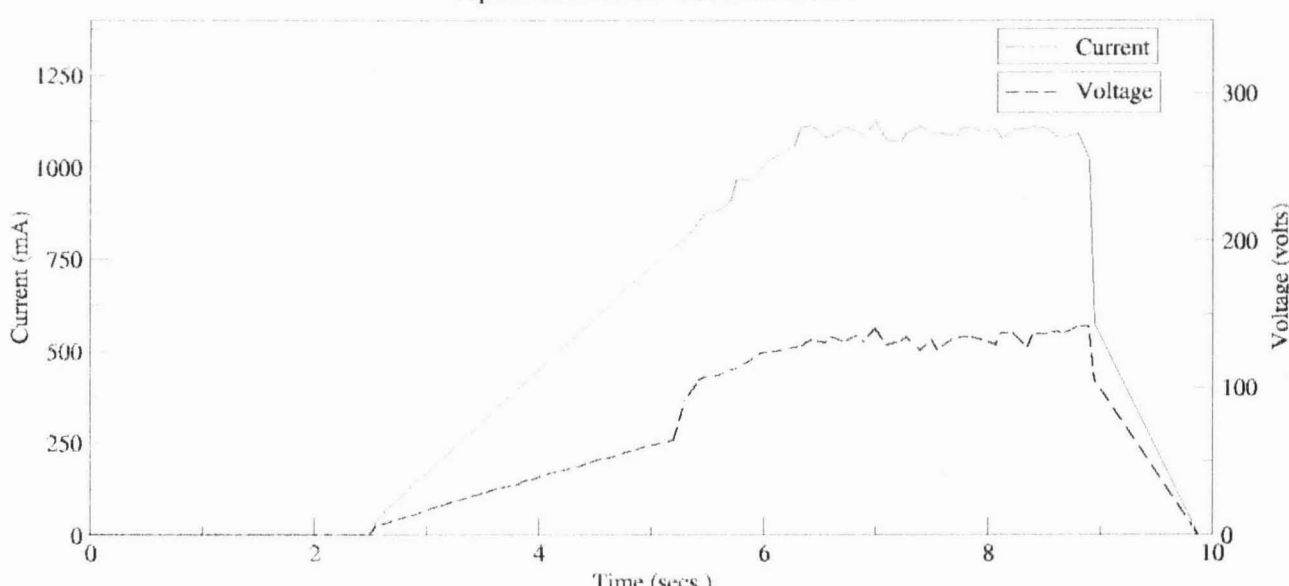
Type PERMANENT

Model ALPHA DB-10

Size 177.8

Depth 1210.0 m

Make WEATHERFORD

Shot V-I Characteristics
Top shot at 1210.00m 02/08/09 21:39:04

Gun Complete.

Follow SAFETY MANUAL Procedures for Shooting

Syst. File: R 71-00-11 70000

Job # 10190162

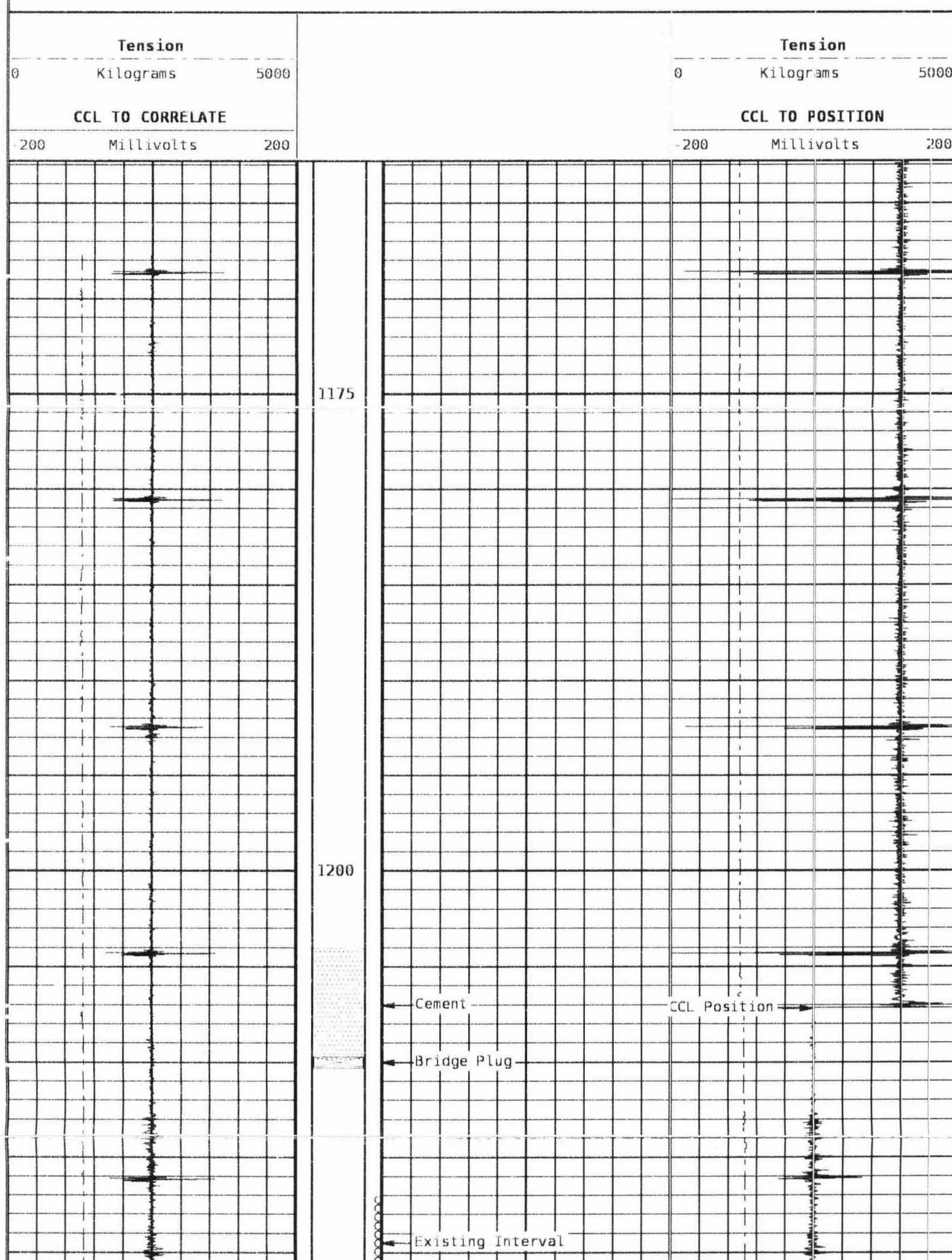
DEPTH SCALE: 1:240

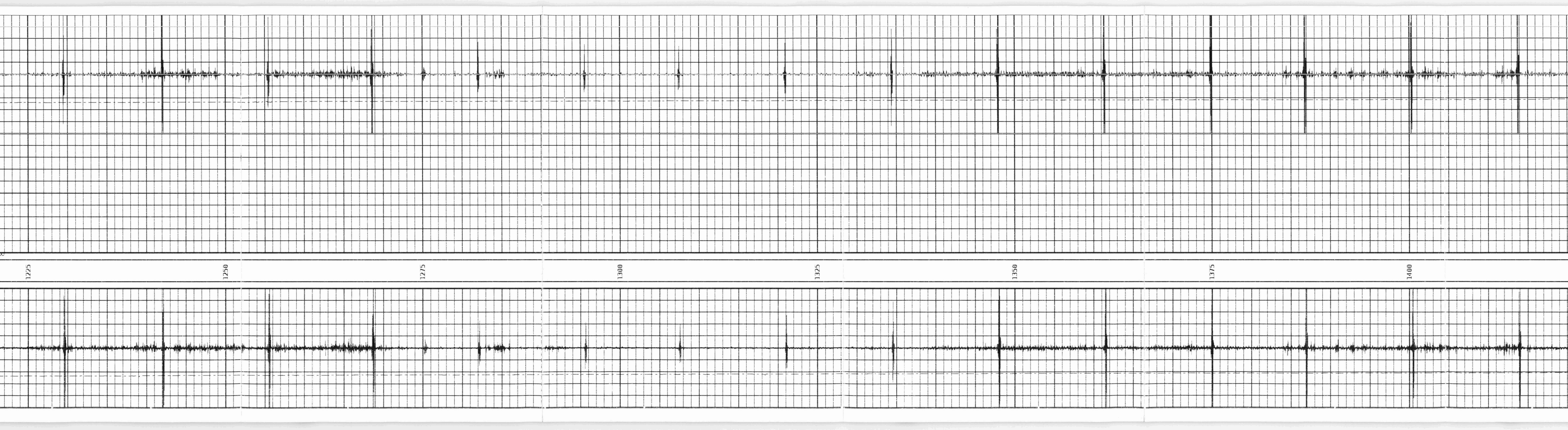
VERSION: 89214133R

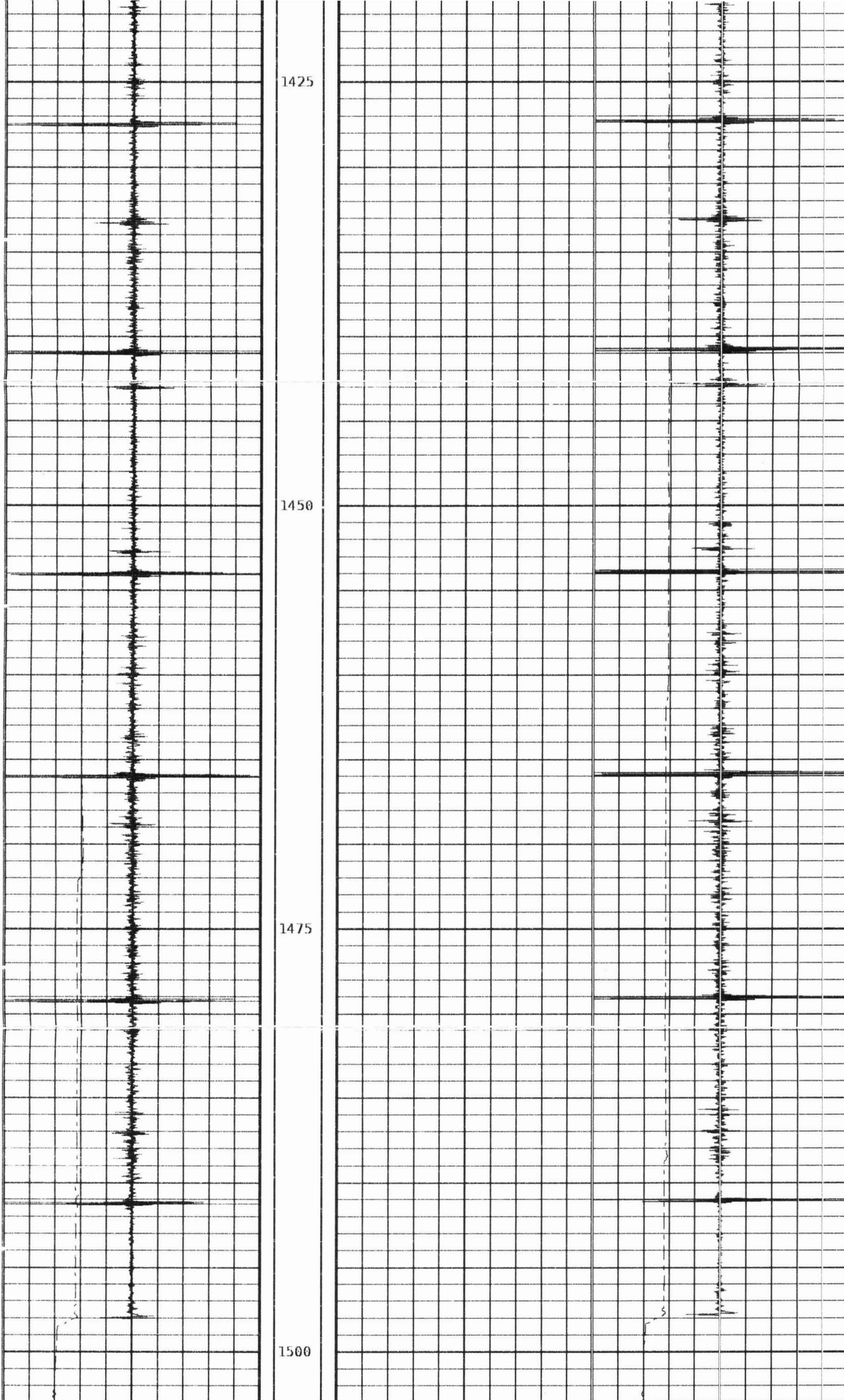
177.8 mm BRIDGE PLUG

10190162 PLUGRUN

FINISH DEPTH: 1162.9 Meters DIRECTION: UP DATE: 02/08/2009 TIME: 21:44 MODE: TRACE PLAYBACK







CCL TO CORRELATE			CCL TO POSITION		
-200	Millivolts	200	-200	Millivolts	200
Tension			Tension		
0	Kilograms	5000	0	Kilograms	5000

START DEPTH: 1503.0 DIRECTION: UP DATE: 02/08/2009 TIME: 21:44 MODE: TRACE PLAYBACK
10190162 PLUGRUN

177.6 mm BRIDGE PLUG
DEPTH SCALE: 1:240 VERSION: 80214133R

COMPANY PARAMOUNT RESOURCES INC.

WELL PARA ET AL FORT LIARD I-46

FIELD FORT LIARD PROVINCE NORTHWEST TERRITORIES


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C-SP001-10190162-PARAMOUNT_PLUG_I-46



WELL TERMINATION RECORD

This record is submitted in compliance with Section 184(1) of the Canada Oil and Gas Drilling Regulations (SOR/79-82).

Well Name	Para et al Fort Liard I-46		
Well ID	1871	Operator	Paramount Resources Ltd.
Current Well Status	Suspended	Interest Identifier	Production Licence 008
Location	Unit I	Section 46	Grid 60 deg 10' N, 123 deg 15' W
Coordinates	Surface	Lat 60 ° 5 ' 32.4 "	Long 123 ° 22 ' 53.6 "
(NAD 27)	Bottom Hole	Lat 60 ° 5 ' 32.4 "	Long 123 ° 22 ' 53.6 "
Region	NWT Mainland		
Target Formation	Chinkeh	Field/Pool	/
Strike Area:	Fort Liard	Total Depth	2055m KB
Elevation KB/RT	542.5 m	Ground Level / Seafloor	537.5 m
Spud Date	3-Feb-09	Rig Release Date	9-Feb-09

CASING AND CEMENTING PROGRAM

O.D. (mm)	Weight (kg/m)	Grade	Setting Depth (m KB)	Cementing (m³)

PLUGGING PROGRAM

Type of Plug	Interval (m KB)	Felt	Depth (m KB)	Cement (m³)
Select	-	Select		
Select	-	Select		
Select	-	Select		
Select	-	Select		
Select	-	Select		

Lost Circulation/Overpressure Zones

Equipment Left on Seafloor (Describe)

Provision for Re-entry (Describe and attach sketch)

CORE

Type	Interval (m KB)	Number of Plugs Cut	Core Length Recovered
Select	-		
Select	-		
Select	-		

Other Downhole Completion/Suspension See attached downhole diagram

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

Signed	<u>Dave R</u>	Date	21/07/2009
	Responsible Officer of Company	Operator	Paramount Resources Ltd.
Name	Dave Block	Telephone	(403) 206-3834 Ext
Job Title	Drilling Consultant	E-Mail	dave.block@paramountres.com

NEB USE ONLY

Signed	<u>pdw</u>	WID	1871
	Chief Conservation Officer	UWI	300J466010123152
Date	31 Jul 09		

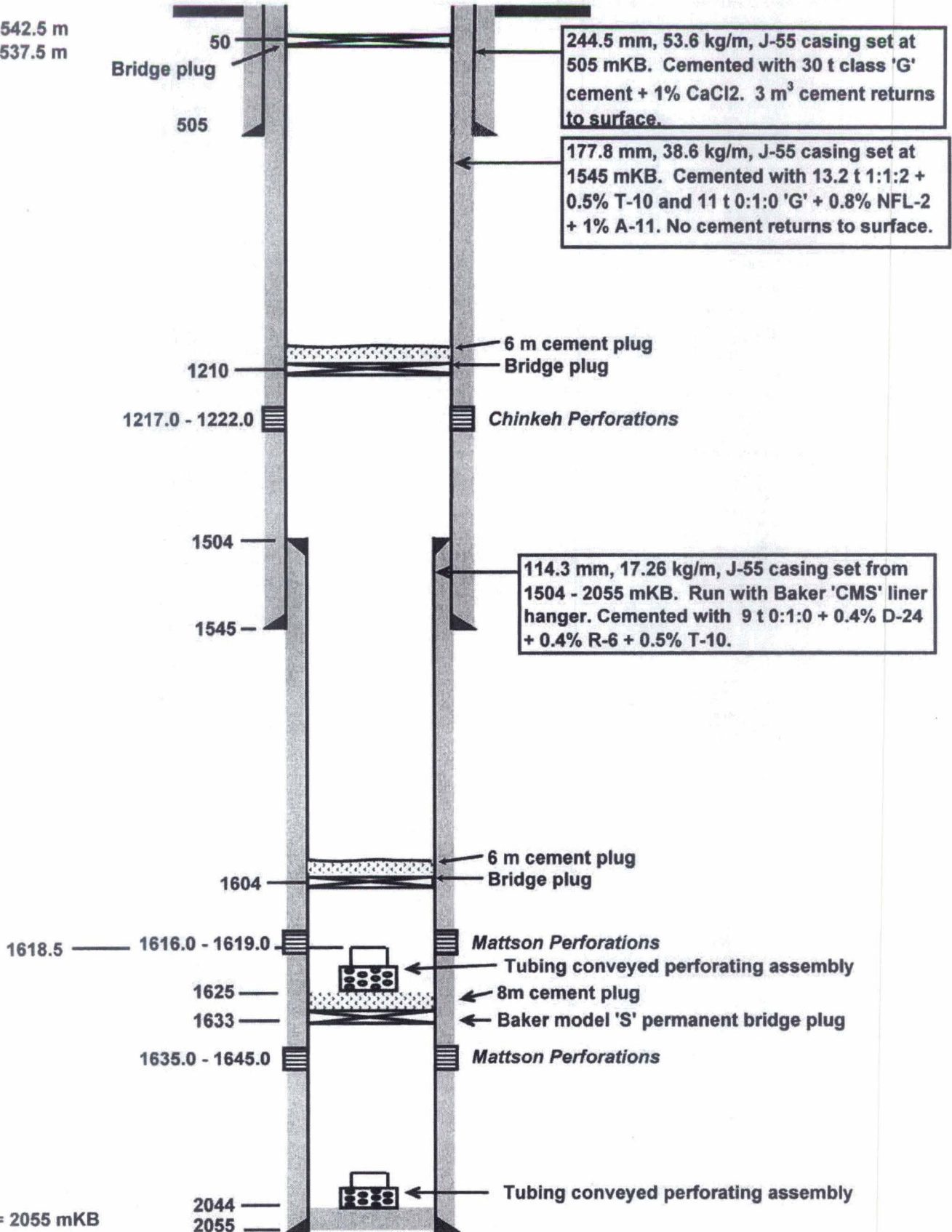
PARA ET AL FT LIARD I-46

60° 10' N, 123° 15' W

WID: 1871

Bottom Hole Diagram (as of Feb 22, 2009)

KB: 542.5 m
GL: 537.5 m



TD = 2055 mKB

WID	1871	
Well Name	Para et al Fort Liard I-46	
Company	Paramount Resources Ltd.	
UWI	300I466010123152	
Data List		
	1 Approval to Alter Condition of a Well approved 21 Jan 2009	
	2 Final Operational Workover Report dated 3 Feb to 22 Feb 2009	
	3 Well Termination Record and Wellbore Diagram approved 31 Jul 2009	
Logs List		
	1 Collar Log logged 22 Feb 2009	
	2 Set Plug Log logged 7 Feb 2009	
	3 Set Plug Log logged 8 Feb 2009	