AUTHORITY TO DRILL A WELL

(FORM AND AMENDED FORM)

CANADA

Exploratory ☒ Delineation ☐
Development ☐ Service ☐

AUTHORITY TO DRILL A WELL

APPLICATION

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

Well Name in Full: UCEL Liard K-02

Operator: Unocal Canada Exploration Limited — Drilling Program No.: N/A

Contractor: Cactus — Permit or Lease No.: EL 381

Drilling Rig or Unit: Rig #1 — Estimated Well Cost: $1,724,000

Location-Unit: K — Section: 02 — Grid Area: 60° 2', 123° 30'

Coordinates: Lat.: 60° 11' 33.848" — Long.: 123° 31' 10.238"

Area: Fort Liard — Field/Pool: N/A

Elevation-RT/KB: 379.3 m (ASL) — Seafloor: N/A (BRT)

Approx. Spud Date: December 05, 1996 — Estimated Days on Location: 22

Anticipated Total Depth: 1450. m — Target Horizon(s): Mattson & Flett

EVALUATION PROGRAM

Ten-metre sample intervals: None

Five-metre sample intervals: 1 Vial & 1 Bag to NEB, 1 Vial to UCEL from 425 m to TD

Canned sample intervals: None

Conventional cores at: Possible at top of Mattson & top Flett

Logs and Tests: Logs as per program. Tests dependent on logs.

CASING AND CEMENTING PROGRAM

O.D(mm)	Weight:(kg/m)	Grade:	Setting Depth Below Seafloor: (m)	Cementing Program (Volumes)
406	conductor			
244.4	53.57	J-55	425	Cement to surface
177.8	34.22	L-80	1400	Cement to 100 m
114.3	17.26	L-80	1370 - 1450	Cement full length

B.O.P. Equipment: 279 mm, 21 MPa; 2 x Pipe Rams, Blind Rams & Annular

Other Information: Contingent casing & cementing program:

Surface casing: Same as above.

Production casing:

139.7	23.07	J-55	1450	Cement to 100 m

Signed: [signature] Title: Sr. Drilling Engineer

Date: November 15, 1996 Company: Unocal Canada Management Limited

APPROVAL

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

Signed: [signature] Chief Conservation Officer

Date: December 5, 1996

File: 9211-U18-1-1, WID 1816

UWI 300K026020123300

Canada

WELL TERMINATION RECORD

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: UCEL OEI Liard K-02 Area: Liard Basin

Grid Area: 60° 21', 123° 30' Field/Pool: N/A

Permit or Lease No.: EL 381 Final Coordinates: Lat.: 60° 11' 33.848" Long: 123° 31' 10.238"

Drilling Unit: Cactus Rig #1 Elevations-RT/KB: 379.3 SF/GL: 374.5

Spud Date: Dec. 14, 1996 Rig Released: Jan. 20, 1997 Total Depth: 1657 m

CASING AND CEMENTING

O.D.:	Weight:	Grade:	Depth Set:	Cement and Additives:
244.5 mm	53.57 kg/m	J-55	427.6 m	28.5 T 0:1:0 "G" with 2% $CaCl_2$. 4.0 m^3 returns

PLUGGING PROGRAM

Approval of the following program was obtained by (person) Matthew Mount from (person) Andrew Graw by means of Telephone on January 18, 19 97

Type of Plug:	Interval:	Felt:	Cement and Additives:
Plug #1	1657 - 1567 m	1567 m	4.0 m^3 0:1:0 "G" with 0.3% CFL-3 & 0.2% SPC-2
Plug #2	1084 - 995 m	995 m	Same as plug #1.
Plug #3	474 - 425 m	425 m	4.7 m^3 (same slurry as #1 & #2)
Plug #4	15 - 0 m	N/A	2.0 m^3 (same slurry as #1, #2, &

Lost Circulation/Overpressure Zones: None.

Equipment left on Seafloor (Describe): N/A

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

Cores: Type: 159 mm x 89 mm Intervals: #1:1131 - 1149; #2:1162 -1181

#3: 1309 - 1327.5

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: Matthew Mount Title: Senior Drilling Engineer

Name: Matthew Mount Date: March 20, 1997

Acknowledged by: Jerry Baker Engineering Branch

Date: April 1/97

File: 9211-U18-1-1...WID 1826

UWI 300K026020123300

Well Status
Suspended ☐
Completed ☐
Abandoned ☒

Canada

FINAL WELL REPORT

N.E.B. COPY

W1D 1816

Unocal Canada Exploration Limited
4800, 150 - 6th Avenue S.W.
Calgary, Alberta T2P 2K9
(403) 268-0176
(403) 268-0144

FINAL WELL REPORT

FOR

UCEL LIARD
K-02, 60° 20', 123° 30'

9211-U18-1-1

NATIONAL ENERGY BOARD
FEB 19 1997

February 18, 1997
Submitted by: Penny Hogall

f:\word\1997\drilling\k02rep.doc

Unocal Canada Exploration Limited
Final Well Report For
UCEL Liard K-02, 60° 20', 123° 30'

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Unocal Canada Exploration Limited
Final Well Report For
UCEL Liard K-02, 60° 20', 123° 30'

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1. INTRODUCTION

1.1. Summary UCEL Liard K-02, 60° 20', 123° 30'

Unocal Canada Exploration Limited (operator) was awarded Exploration License EL381 at the April 9th, 1996 Call for Bids in the Southern NWT. Geological and seismic data suggested that hydrocarbons could be trapped in a Laramide-aged structure within the Pennsylvanian Mattson Formation.

UCEL contracted Cactus Drilling Limited (Cactus Drilling Rig #1) to drill a 1600 m Mattson Formation test at Shot Point 769 on seismic line FVZ-266. The well spud on December 14, 1996 and reached a TD of 1657 m in the Mississippian Flett Formation on January 12, 1997.

The well penetrated 616 m of very fine grained, generally tight Mattson sandstones, shales and siltstones in a position 200 m low to the original prognosis. Three 18 m cores were cut within the Mattson Formation and 20 sidewall cores were collected from the Mattson and elsewhere within the wellbore.

Initial encouraging gas and oil shows on the mud log encountered while drilling in the Mattson resulted in an extensive test program utilizing Schlumberger's MDT device and the running of 9 drillstem tests. Log interpretation suggested thin pay zones existed within the wellbore. However, MDT and drillstem tests across the most porous zones recovered only fresh water. Other zones in which hydrocarbons were encountered showed evidence of pressure depletion on the charts, suggestive of limited reservoir conditions. The well was abandoned on January 23, 1997.

1.2. Locality Map

See next page.

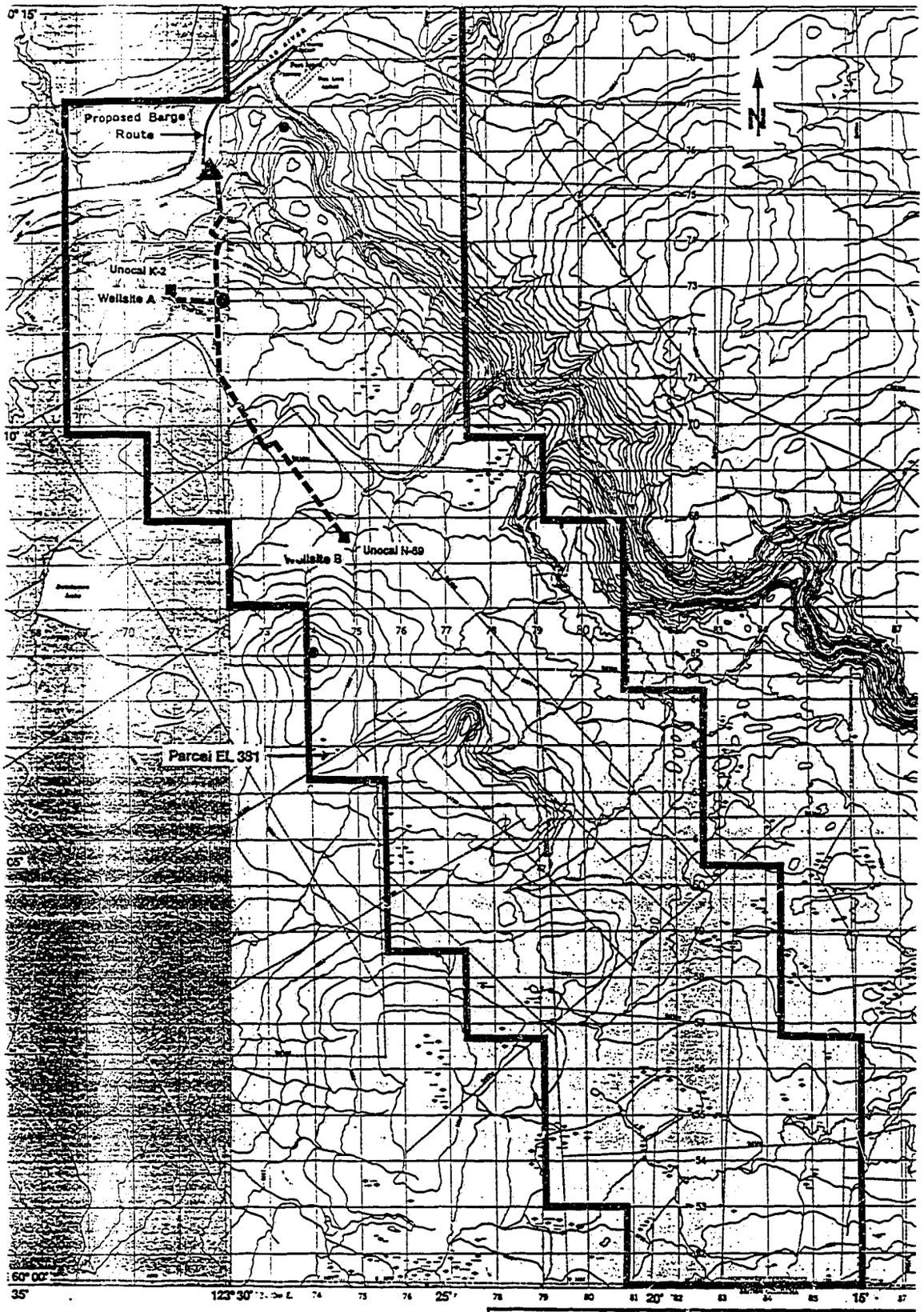


FIGURE 2 - UNOCAL CANADA EXPLORATION LIMITED
FORT LIARD EXPLORATORY SEISMIC AND DRILLING PROJECT
DEH CHO LAND CLAIM
FORT LIARD, NWT

2. GENERAL DATA

2.1. Well Name & Number & Exploration Agreement Number, Full Federal Designation with Unit, Section & Grid Area

UCEL Liard K-02, EL381, 60° 20', 123° 30'

2.2. Well Location

See Geological Report. Survey by Stuart Engineering and Surveying Limited. Shot Point 769 on seismic line FVZ-266

2.3. Unique Well Identifier

See Geological Report.

2.4. Operator & Drilling Contractor

Operator: Unocal Canada Exploration Limited
4800, 150 - 6th Avenue S.W.
Calgary, Alberta T2P 3Y7

Drilling Contractor: Cactus Drilling, A Division of Lynx Energy Services Corp.
#3200, 715 - 5 Avenue S.W.
Calgary, Alberta T2P 2X6

2.5. Drilling Unit

Not applicable.

2.6. Position Keeping

Not applicable.

2.7. Support Craft

Not applicable.

2.8. Drilling Unit Performance

Not applicable.

2.9. Drilling Fluid

See next page.

CONCORD DRILLING FLUIDS LTD.

WELL DATA RECAP & SUMMARY

OPERATOR	UNOCAL CANADA LTD.	SPUD IN DATE	96-12-14	MUD VANS ON LOCATION	NO
WELL NAME	UNOCAL K2-LIARD	DRILL OUT DATE	96-12-17		
LOCATION	N.W.T	T.D. DATE	97-01-13	HI - BOY ON LOCATION	NO
PROVINCE		RELEASE DATE	97-01-20		
CONTRACTOR	CACTUS DRLG RIG 1	TOTAL DEPTH m.	1657	PALLETS or TARPS USED	YES
CONCORD REP.		TOTAL # DAYS	38		

SURFACE HOLE INTERVAL

HOLE SIZE mm.	311		
INTERVAL m.	0-434		
CASING SIZE mm.	244.5		
MUD SYSTEM	GEL-CHEM.		
DRILLING HRS.	20 1/2	# BITS	2
REAMING HRS.	NIL	# DAYS	3
MUD COSTS	$2,344		

OPERATIONS

GRAVEL 166-169M.
GRAVEL 64-69M.
75-78M.
96-97M.
NO PROBLEMS RUNNING AND CEMENTING CASING VIS 60 SEC/L.

AVERAGE MUD COST / M. $35.40
TOTAL METRES 434 AVERAGE R.O.P. M. / HR. 14.71

INTERMEDIATE TOP HOLE INTERVAL

HOLE SIZE mm.	222		
INTERVAL m.	434-700		
CASING SIZE mm.	NA		
MUD SYSTEM	WATER		
DRILLING HRS.	18	# BITS	1
REAMING HRS.	NA	# DAYS	1
MUD COSTS	N/C		

OPERATIONS

WATER - CIRCULATING THROUGH RIG TANKS. NO ADDITIVES. CONSTANT
FRESH WATER DILUTION + CENTRIFUGE.

AVERAGE MUD COST / M. NIL
TOTAL METRES 266 AVERAGE R.O.P. M. / HR. 14.79

MAIN HOLE INTERVAL

HOLE SIZE mm.	222		
INTERVAL m.	700-1657		
CASING SIZE mm.			
MUD SYSTEM	GEL CHEM.		
DRILLING HRS.	350 1/4	# BITS	13
REAMING HRS.		# DAYS	34
MUD COSTS	$34,453.54		

OPERATIONS

MUDDED UP AT 700M - GEL/CHEM SYSTEM.
STARTED TO INCREASE MUD DENSITY AT 1100M TO CONTAIN PRESSURES.
INITIAL REQUIRED DENSITY 1080/Kg/M3. PRIOR TO REACHING
1300M. DENSITY HAD TO BE INCREASED WITH BARITE TO 1130 Kg/M3. BY
1341M A DENSITY OF 1150 Kg/M3 WAS REQUIRED TO
STABILIZE PRESSURES. THIS DENSITY WAS MAINTAINED
TO T.D. OF 1657M. CORED 1149M, CORED 1180M.
PENETRATION RATE VERY SLOW DUE TO HARD FORMATIONS.
HOLE CONDITION REMAINED EXCELLENT AT ALL TIMES.
LOGGED, RAN 8 DST'S. RAN ABANDONMENT PLUGS.

AVERAGE MUD COST / M. $38.00
TOTAL METRES 957 AVERAGE R.O.P. M. / HR. 2.73

SURVEY RECORD

DEPTHS	ANGLE
32	1/4
65	1/4
94	1/2
122	1/4
149	1/2
171	1/4
198	1
227	1
255	2
284	2
309	3
338	2 1/2
366	3
395	2 3/4
400	2 3/4
456	3
503	3
560	3 1/2
607	4
664	5
720	5
758	5
806	5
910	4 1/2
948	5
1082	5
1220	5 1/2
1306	5 1/2
1406	5 3/4
1514	5 3/4

PRODUCTS USED

BENTONITE NAT.	739	LIGNITE	28				
BARITE	959	DESCO	6				
CAUSTIC SODA	24	SAWDUST	60				
SODA ASH	7	DETERGENT L.	5				
CONCOR LOC	3						
DRISPAC	14						

PROBLEM / COST SUMMARY	DEPTHS	COSTS
LOST CIRCULATION (SURF)	NO	
LOST CIRCULATION (MAIN)	NO	
PRESSURES	YES	$22,057.00
H2S	NO	
MUD RINGS	NO	
ANHYDRITE	NO	
MUD BREAKERS	NO	
SLOUGHING HOLE	NO	

MUD COST SUMMARY	
INVOICED MUD COST (INC. TAXES)	$42,906.76
MUD COST / METRE (EXCL. TAXES)	$22.82
TRUCKING COST	$14,186.23
VAN / HIBOY RENTAL	NIL
SERVICE COSTS(RESTOCKING CHARGE)	$408.80
LAB COSTS	
TOTAL COSTS	$57,413.79

CONCORD FIELD REP.	ERNIE KUDRICK	PHONE #	250 - 774 - 1624
CONCORD SALES REP.	DAN ANDERSON	PHONE #	403 - 234 - 7771

DAILY PROGRESS

RECAPIA

DATE	MIDNIGHT DEPTHS FROM	TO	DRILLING HOURS
96-12-14	0	208	
96-12-15	208	427	
96-12-16	427	434	
96-12-17	434	700	
96-12-18	700	864	
96-12-19	864	933	
96-12-20	933	983	
96-12-21	983	1059	
96-12-22	1059	1112	
96-12-23	1112	1132	
96-12-24	1132	1132	CORING
96-12-25	1132	1132	CORING
96-12-26	1332	1162	CORING
96-12-27	1162	1178	
96-12-28	1178	1228	
96-12-29	1228	1272	
96-12-30	1272	1300	
96-12-31	1300	1334	
97-01-01	1334	1358	
97-01-02	1358	1389	
97-01-03	1389	1408	
97-01-04	1408	1444	
97-01-05	1444	1487	
97-01-06	1487	1534	
97-01-07	1534	1546	
97-01-08	1546	1572	
97-01-09	1572	1600	
97-01-10	1600	1624	
97-01-12	1624	1656	
97-01-13	1657 TD		

DATE	MIDNIGHT DEPTHS FROM	TO	DRILLING HOURS

BIT RECORD

Bit Number	Size mm.	Depth In m.	Depth Out m.	Meters Drilled	Bit Hours Hours	Total Accum. Hours	Avge Rate Of Penetration
1A	311	0	208	208	8	8	26
2A	311	208	434	226	21 1/2	29 1/2	7.67
1	222	434	864	430	25 1/4	54 3/4	17.03
2	222	864	953	89	22 3/4	77 1/2	3.9
3	222	953	1132	179	63	140 1/2	2.84
4	222	1149	REAM	0	6	146 1/2	0
5			1272	123	21 3/4	168 1/4	5.66
6	222	1272	1309	44	21 1/4	189 1/2	2.07
7	222	1334	1358	24	12 1/4	201 3/4	1.96
8	222	1358	1408	50	35 3/4	237 1/2	1.4
9	222	1408	1534	126	67 1/2	305	1.87
10	222	1534	1546	12	11 1/4	316 1/4	1.06
11	222	1546	1572	26	11 1/4	327 1/2	2.3
12	222	1572	1610	38	20 1/2	348	1.85
13	222	1610	1657	47	31 3/4	379 3/4	1.48

OTHER OPERATIONS SUMMARY

SOLIDS CONTROL / HOLE PROBLEMS / COSTS / PRODUCT BREAKAGE / TRUCKER COMMENTS / ETC.

2.10. Fishing Operations

Not applicable.

2.11. Well Kicks & Well Control Operations

Not applicable.

2.12. Formation Leak-Off Tests (FLOT)

Depth:	440 mKB
Fluid Density:	1040
Applied Pressure:	12200 kPa
Weight Equivalent:	3870 kg/m^3 (no leak off achieved)
Last Casing Depth:	434 mKB

2.13. Time Distribution

Submitted by Drilling Contractor as daily Tour Reports.

2.14. Deviation Survey

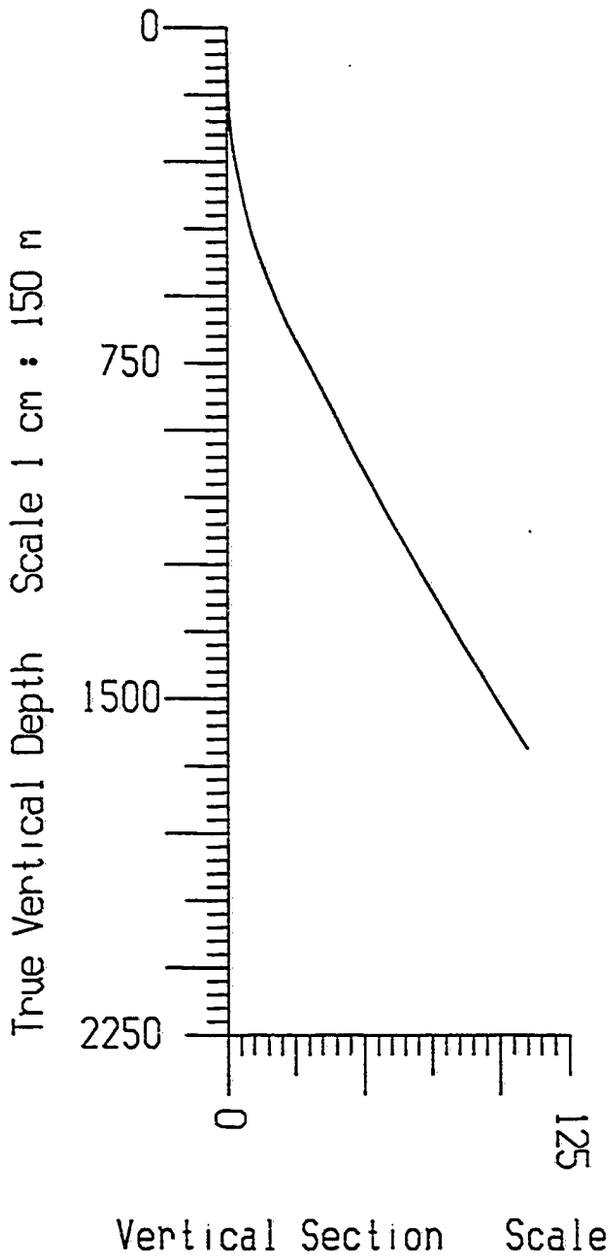
See next page.

UNOCAL 76

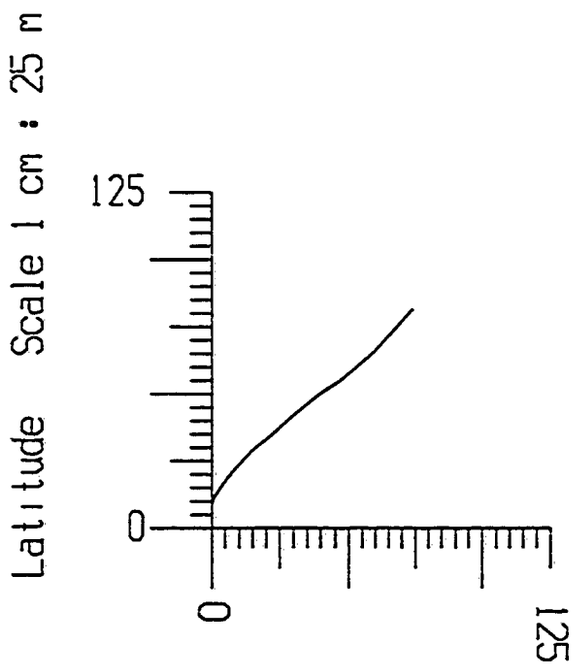
UNOCAL CANADA EXPLORATION LTD

UCEL ET AL K-02-60-20-123-30

AS DRILLED DIRECTIONAL SURVEY
ELEVATION & PLAN VIEWS



Vertical Section Scale 1 cm : 25 m



Departure Scale 1 cm : 25 m

PLANE OF VERT SECTn 42.22°
PLOT DATE 01-29-1997

TARGET DETAILS

No	TVD	Lat	Dep

WELL PROPOSAL

Sec	MD	TVD	VS	INC	DIR	LAT	DEP	TGT
1	0.0	0.0	0.0	0.0	0.00	0.0	0.0	

2.15. Abandonment Plugs

Plug #1: 1657 - 1567 mKB. Down at 1015 hrs., 97-01-20. Pumped 5.4 m^3 H_2O Preflush. Ran 4 m^3 0:1:0 G + 3% CFL-3 + .2% SPC-2 at 1901 kg/m^3 slurry. Displaced with 1 m^3 H_2O + 7.7 m^3 mud. Pulled 7 stands, circulated bottoms up. WOC. Ran in & felt top with rig at 1567 m with 9000 DaN.

Plug #2: 995 - 1084 mKB. Down at 1820 hrs., 97-01-20. Ran 5.4 m^3 H_2O Preflush, mixed & pumped 4 m^3 0:1:0 G + 3% CFL-3 + .2% SPC-2 at 1901 kg/m^3. Displaced with 1 m^3 H_2O + 4 m^3 mud.

Plug #3: 425 - 474 mKB. Ran 11 m^3 H_2O Preflush, mixed & pumped 4.7 m^3 1901 kg/m^3 slurry of 0:1:0 G + 3% CFL-3. Displaced with 2 m^3 H_2O. Pulled 7 stands. Broke circulation. No cement returns.

Plug #4: 5 - 15 mKB. Down at 1430 hrs., 97-01-21. Ran 1 m^3 H_2O Preflush, mixed & pumped 2 m^3 of the same cement for top plug.

2.16. Composite Well Record

See Bearspaw Logging Services' Mud Log Interpretation Report attached.

BEARSPAW LOGGING SERVICES (1986) LTD

MUD LOG INTERPRETATION REPORT
FOR THE WELL
UCEL LIARD K-02
60-20-123-30

START LOGGING DEPTH: 208m DATE: Dec.15,1996

FINAL TOTAL DEPTH: DATE:

K. B.: 379.3m

WELLSITE TECHNICIANS: Marc Hebert

BEARSPAW JOB NO.: 0108-531

CLIENT AFE/WORK ORDER:

THIS REPORT HAS BEEN SUBMITTED TO: Peter Cameron

DATE: Jan.21,1997

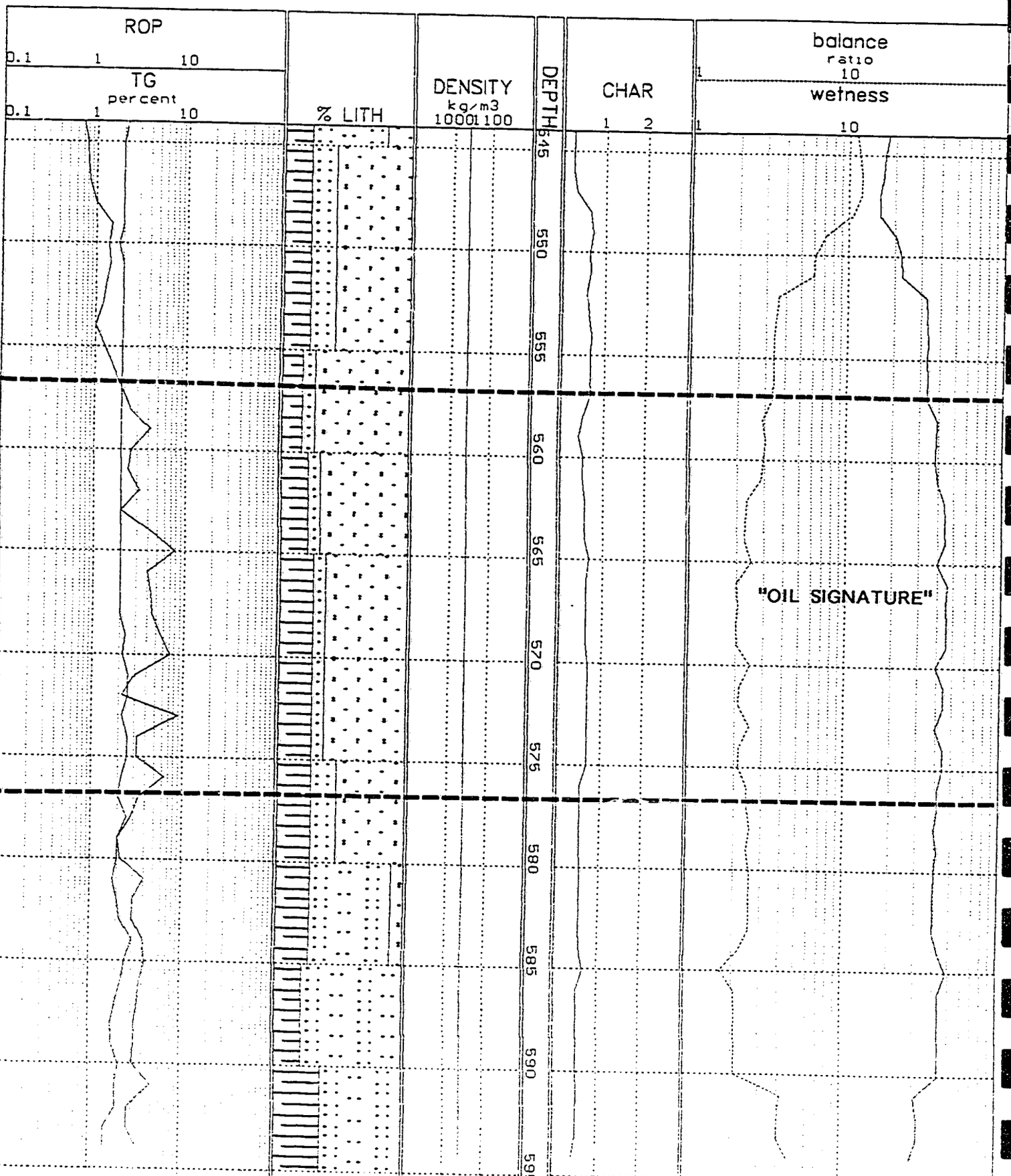
GAS SHOW #1....558m-578m

BEARSPAW LOGGING SERVICES LTD

WELLNAME: UCEL LIARD K-02 JOB #: 0108-531

LOCATION: 60-20-123-30 K. B.: 379.3 GAS COMPOSITION REPORT

UCEL LIARD K-02



INTERPRETATION REPORT
UCEL LIARD K-02
6-20-123-30W6

GAS SHOW #1

UNKNOWN

558m -578m

A POOR LIBERATED RESPONSE is recorded over the depth interval specified. The drilling rate is unchanged over the interval. The composition of the show is Methane (C1), Ethane (C2), Propane (C3), and both Butane components. The Gas Composition Report shows the zone to be a "OIL SIGNATURE". The samples from the wellbore are described as being a light brown very fine quatrzitic sandstone with visual of 6%-12%. The samples also show a weak yellow fluorescence with streamy milky cut. Drilling fluid density was recorded as 1040 kg/m3. Gas background recorded after drilling the interval were the same as readings before drilling the interval. This indicates no PRODUCED GAS to the wellbore after drill

SUMMARY: This zone has hydrocarbons with very poor reservoir characteristics. We rate this AS A POOR HYDROCARBON SHOW.

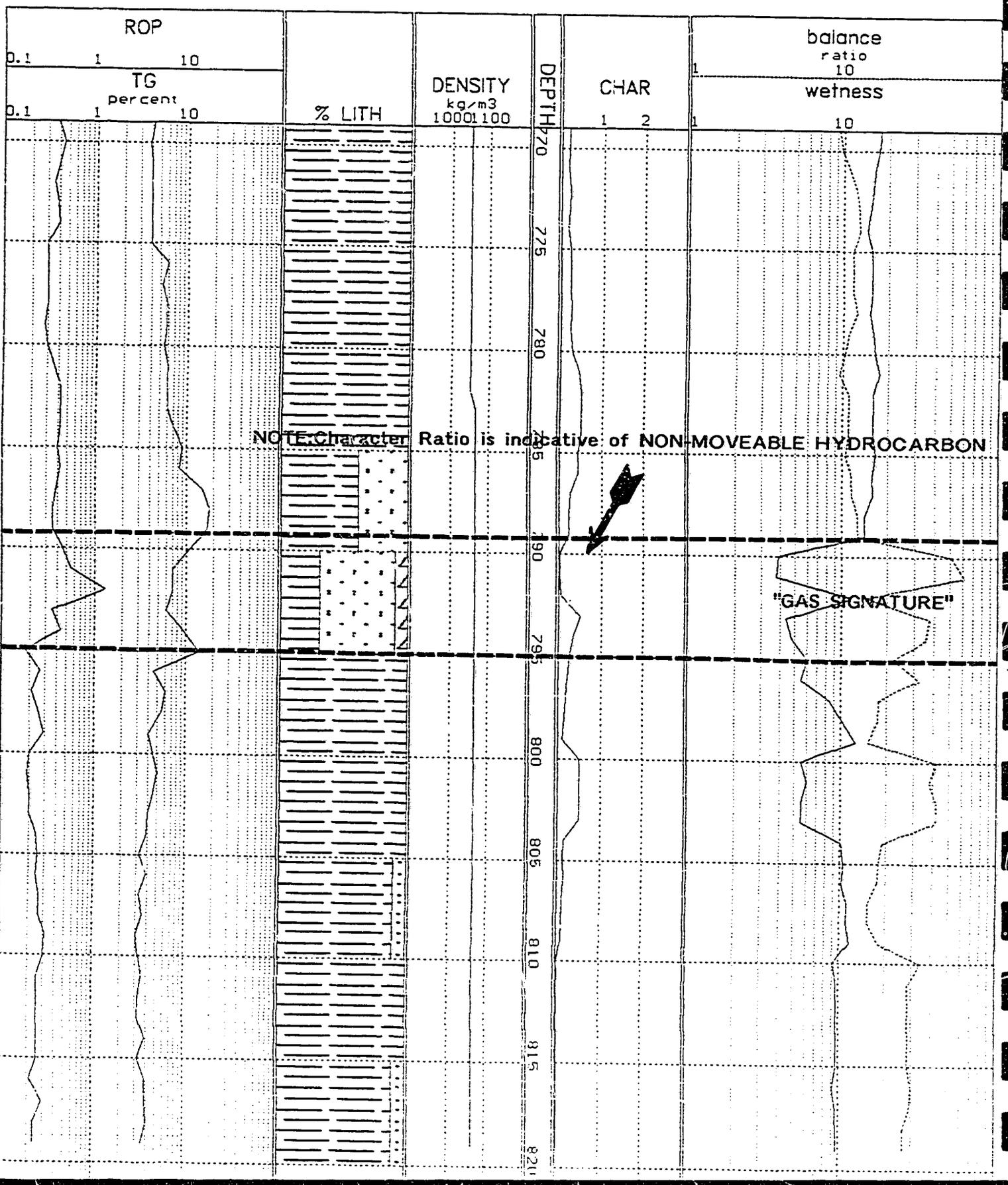
GAS SHOW #2....CHINKEH [790m-794m]

BEARSPAW LOGGING SERVICES LTD

WELLNAME: UCEL LIARD K-02 JOB #: 0108-531

LOCATION: 60-20-123-30 K. B.: 379.3 GAS COMPOSITION REPORT

UCEL LIARD K-02



INTERPRETATION REPORT
UCEL LIARD K-O2
6-20-123-30W6

GAS SHOW #2

CHINKEH

790m -795m A VERY POOR LIBERATED RESPONSE IS observed over the interval indicated. The Gas Composition Report shows the zone to have a "GAS SIGNATURE".

SUMMARY: We rate this to be a POOR HYDROCARBON SHOW.

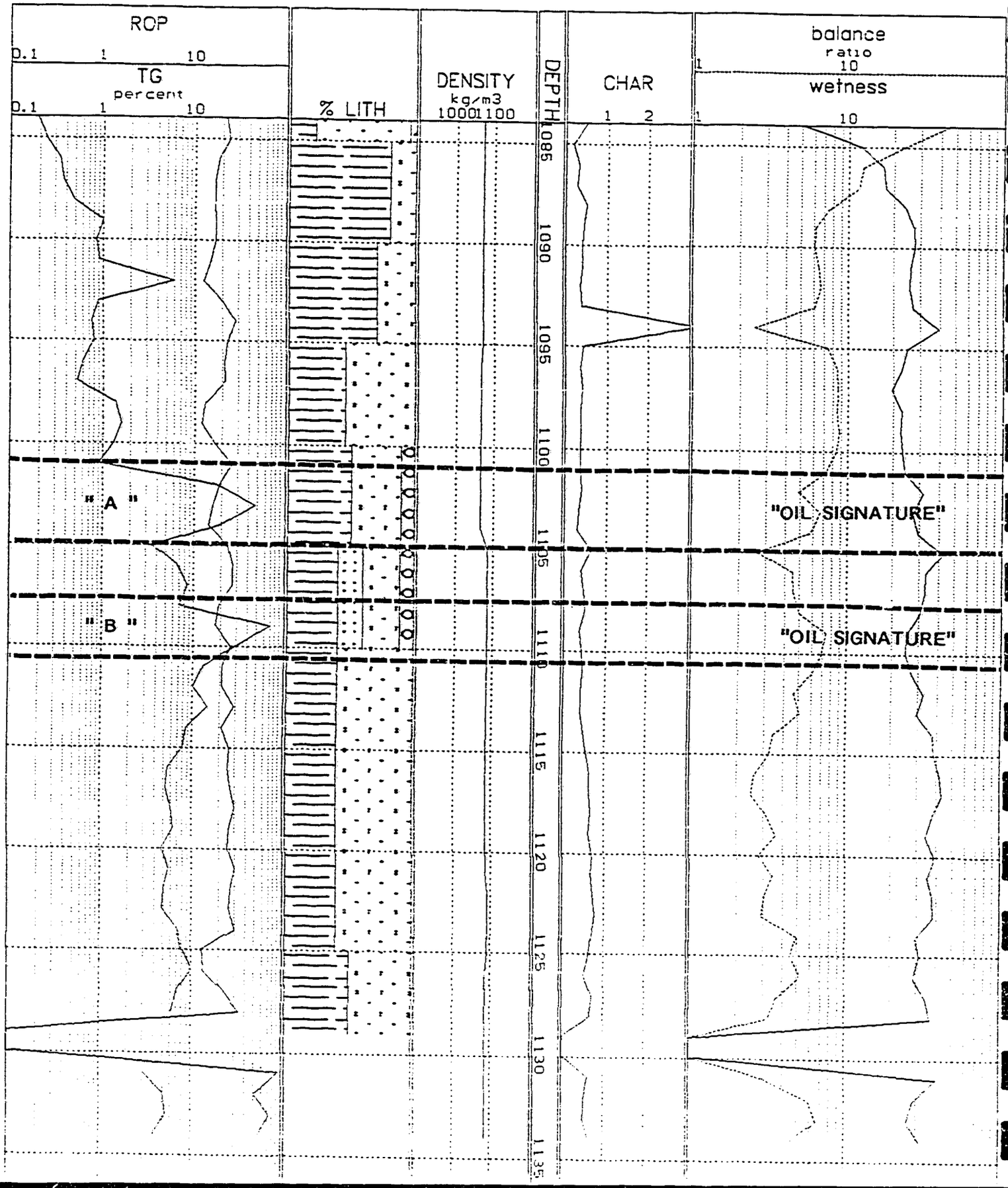
GAS SHOW #3....MATTSON

BEARSPAW LOGGING SERVICES LTD

WELLNAME: UCEL LIARD K-02 JOB #: 0108-531

LOCATION: 60-20-123-30 K. B.: 379.3 GAS COMPOSITION REPORT

UCEL LIAD K-02



INTERPRETATION REPORT
UCEL LIARD K-O2
6-30-123-30W6

GAS SHOW #3

MATTSON

1101m-1112m AN EXCELLENT LIBERATED HYDROCARBON SHOW is recorded over the depth interval specified. A 15 fold increase in hydrocarbons is recorded over the two intervals specified a "A" and "B". The background readings increase to 7%-8% after drilling the show from a previous background of less than 1%. This would confirm that hydrocarbons are being produced into the wellbore from this show. The Gas Composition Report indicates that both show have an "OIL SIGNATURE". The samples indicate that the show are a medium grey brown fine to coarse grain sandstone conglomerate with 8%-10% visual porosity. Good fluorescence and cut were also observed.

SUMMARY: This interval is OIL BEARING with no evidence of water. WE RATE THIS AS A VERY GOOD HYDROCARBON SHOW.

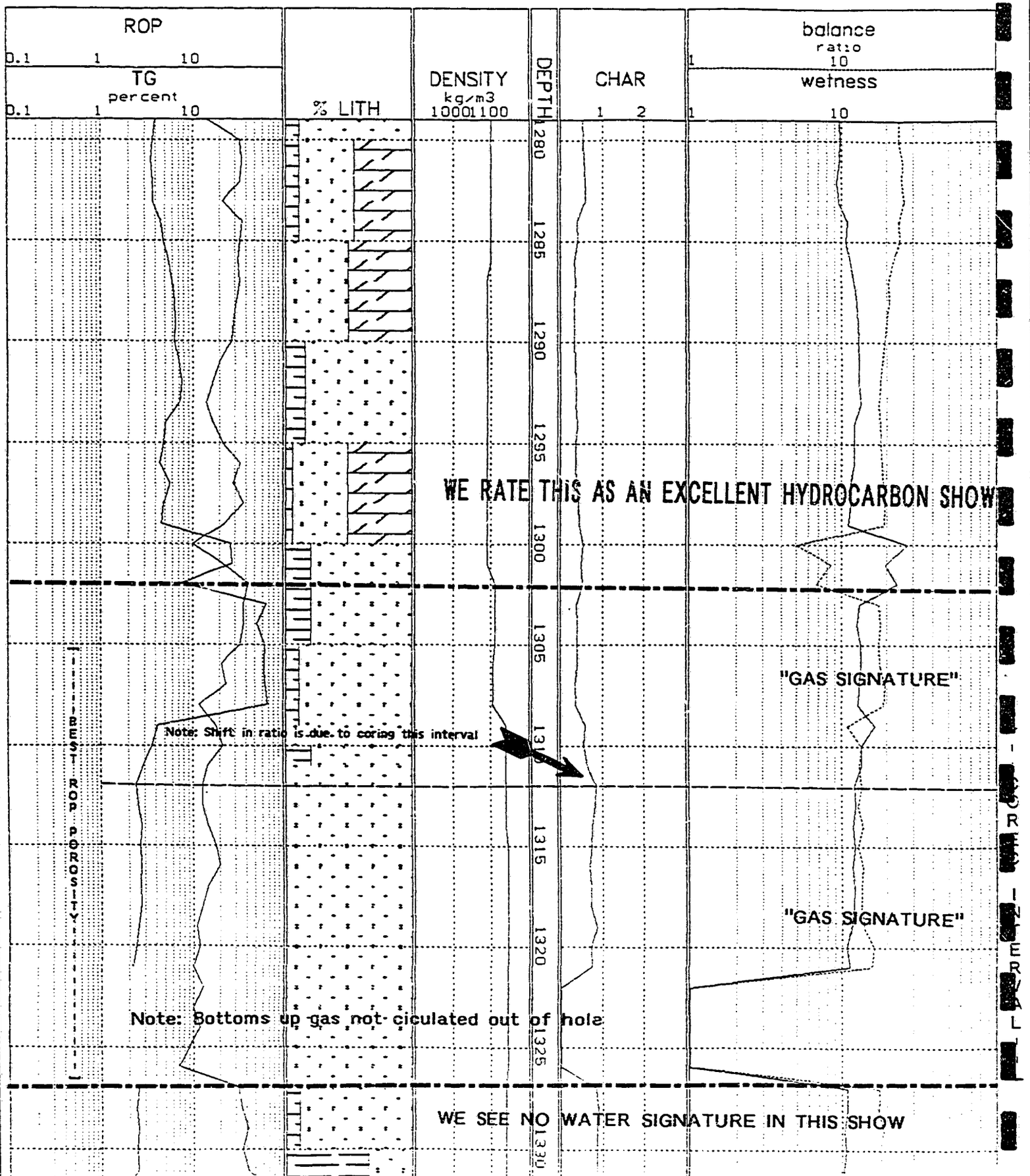
GAS SHOW #4....MATTSON

BEARSPAW LOGGING SERVICES LTD

WELLNAME: UCEL LIARD K-02 JOB #: 0108-531

LOCATION: 60-20-123-30 K. B.: 379.3 GAS COMPOSITION REPORT

UCEL LIARD K-02



INTERPRETATION REPORT
UCEL LIAR K-02
6-20-123-30W6

GAS SHOW #4

MATTSON

1303m- 1326m

AN EXCELLENT LIBERATED / PRODUCED SHOW is observed over the depth indicated. The magnitude of hydrocarbons recorded are good indication that the zone is very hydrocarbon rich. The Gas Composition Report indicates that the interval has a "GAS SIGNATURE" with no indication of water. Core #3 was cut from 1309.5m to 1327.75m and when we compare signatures above the core with cored information we see the signature is the same.("GAS") Drilling fluid density at the top of the interval was 1090 kg/m3 and was increased to 1145 kg/m3 at the bottom of the cored interval. This would translate to an over balanced wellbore. High values of trip gas were recorded even with the mud density as high as it is. This is a very good indicator that the formation pressure is very good. The samples indicate that the interval is a clear to buff very fine to medium grain sandstone. Visual porosity is estimated at 20% with fluorescence.

SUMMARY: It is our belief the this interval is "GAS BEARING" with excellent reservoir rock. We see no indication from our ratio analysis of any water associated. WE RATE THIS AS AN EXCELLENT HYDROCARBON SHOW.

INTERPRETATION REPORT
UCEL LIARD K-O2
6-20-123-30W6

INSTRUMENTATION USED

Manufactured by BASELINE INDUSTRIES, INC.
1030A Gas Chromatograph
1015A Total Hydrocarbon Analyzer

CALIBRATION STANDARDS

Instruments were routinely calibrated with laboratory quality test gas comprised of the following composition:

C1	(Methane)	- 0.998%
C2	(Ethane)	- 01.001
C3	(Propane)	- 0.998%
iC4	(iso-Butane)	- 1.001%
nC4	(Butane)	- 0.999%

Depths of instrument calibration for this well are:

#1.....203	#2.....435
#3.....865	#4.....955
#5.....1131	#6.....1149
#7.....1163	#8.....1180
#9.....1273	#10.....1309
#11.....1325	#12.....1335
#13.....1360	#14.....1407

Depths of CALCIUM CARBIDE wellbore calibration checks:

#1.... 546	#2.....942
#3.....1270	#4.....1385
#5.....	#6.....
#7.....	#8.....

INTERPRETATION REPORT
UCEL LIARD K-O2
6-20-123-30W6

DEFINITIONS

CALCIUM CARBIDE WELLBORE CALIBRATION: A quantity of the chemical calcium carbide is introduced into the mudstream. Calcium carbide, when in contact with water produces the gas acetylene, which is recorded by BEARSPAWS instrumentation. The magnitude of response gives us a quantitative measure of actual lag time along with the efficiency of the wellbore and gas extraction apparatus.

COAL GAS: Mud gas which is a product of drilling through a section of coal. The composition is predominately methane. A mud gas response from coal is usually of no economic significance.

CONNECTION GAS: Gas entering the wellbore caused by the swabbing effect of the drill string during a pipe connection.

TRIP GAS: Gas has entered the mudstream during a period of time when circulation of drilling fluid has ceased. Typically, a trip for bit is made causing hydrocarbons to be swabbed into the wellbore as the bit moves past a hydrocarbon bearing zone.

LIBERATED GAS: Mud gas which is a result of hydrocarbons being released into the mudstream from rock being penetrated.

PRODUCED GAS: Gas entering the wellbore due to a formation pressure in excess of the hydrostatic pressure.

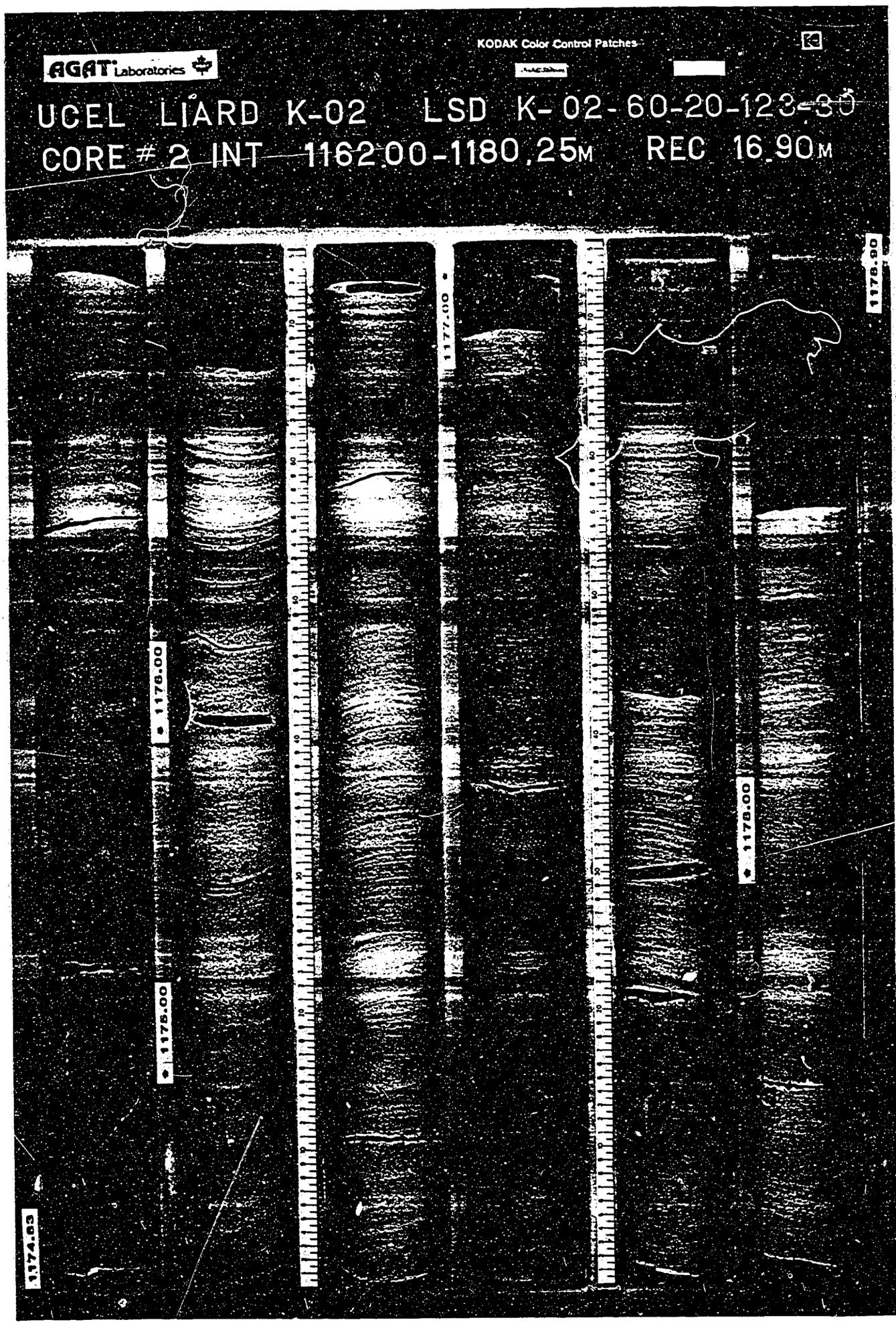
3. GEOLOGY

3.1. Drill Cuttings

Submitted to NEB January 23, 1997.

3.2. Cores (#1, #2 & #3)

See Geological Report.
See AGAT Core Analysis Report and Photos attached next pages


KODAK Color Control Patches
AGAT Laboratories
UCEL LIARD K-02 LSD K-02-60-20-123-30
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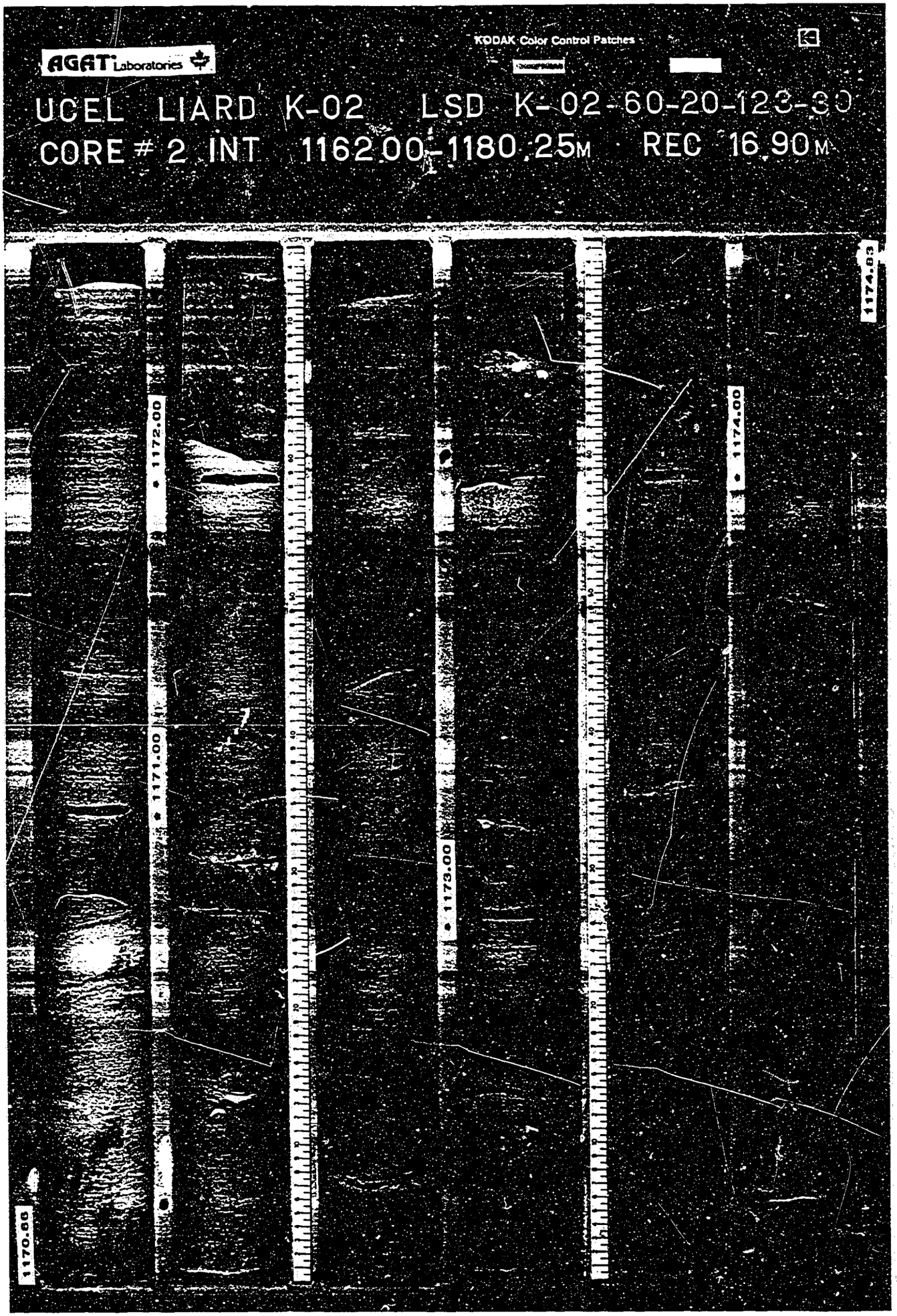
1178.00
1178.00
1178.00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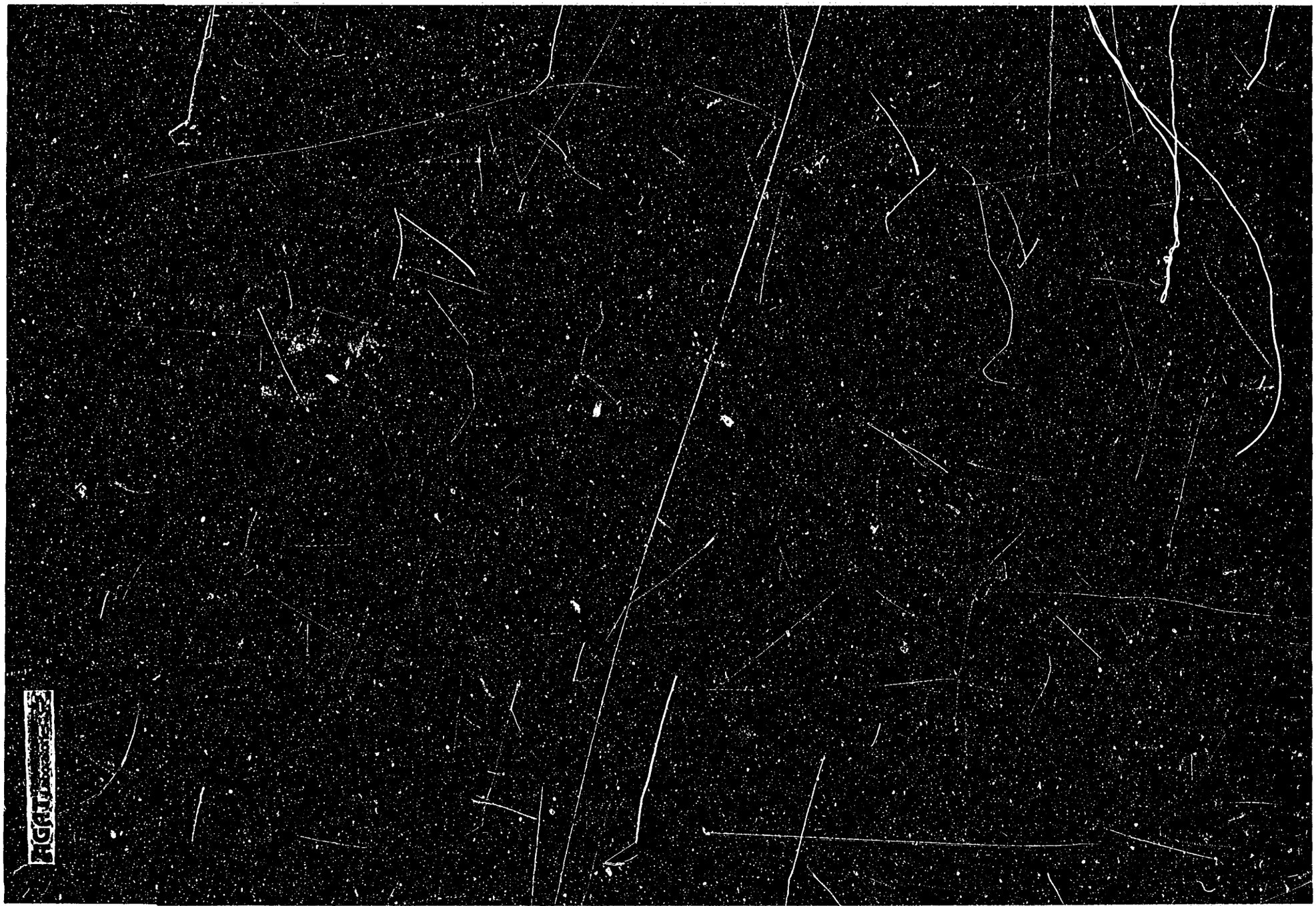

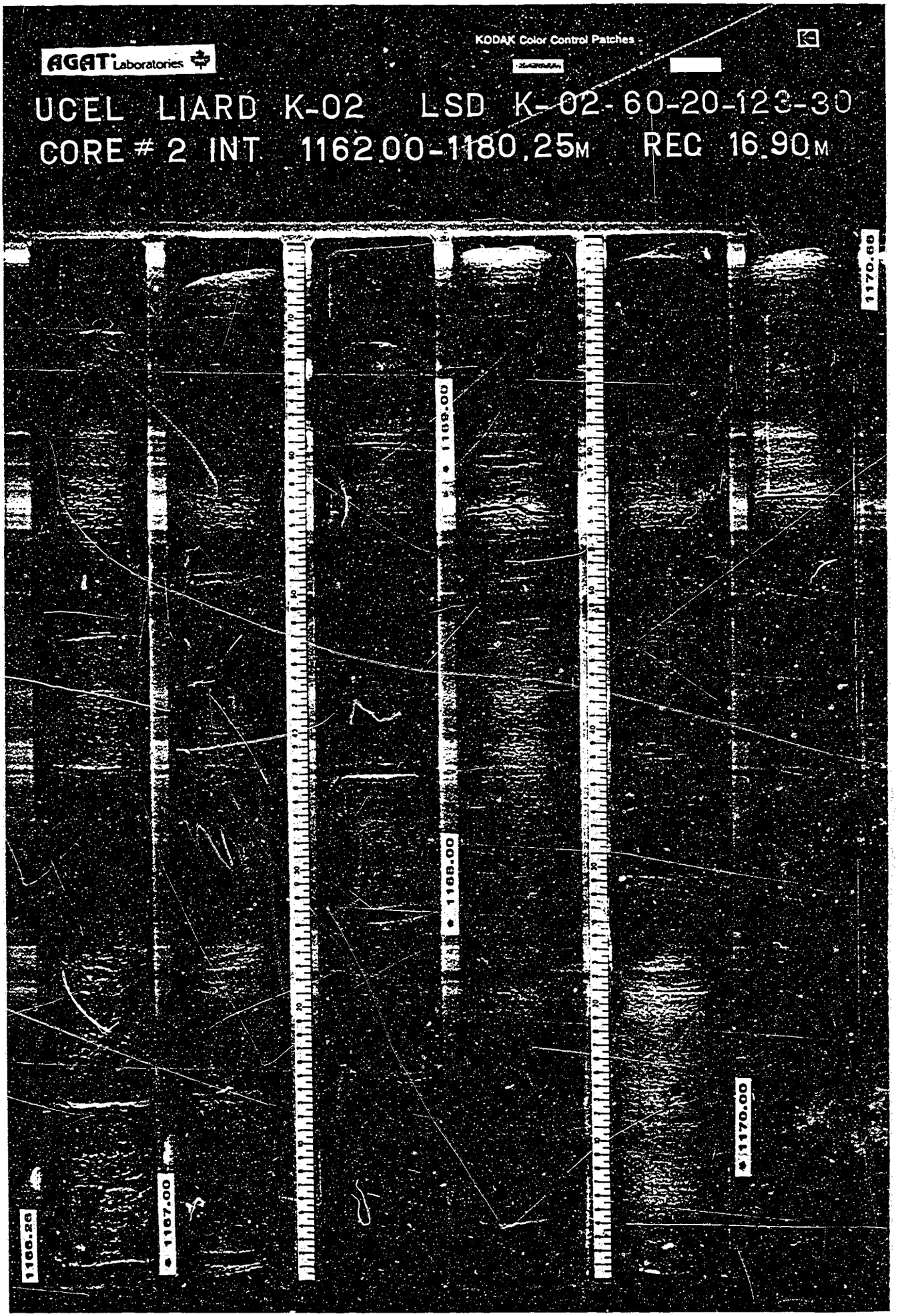
AGAT Laboratories
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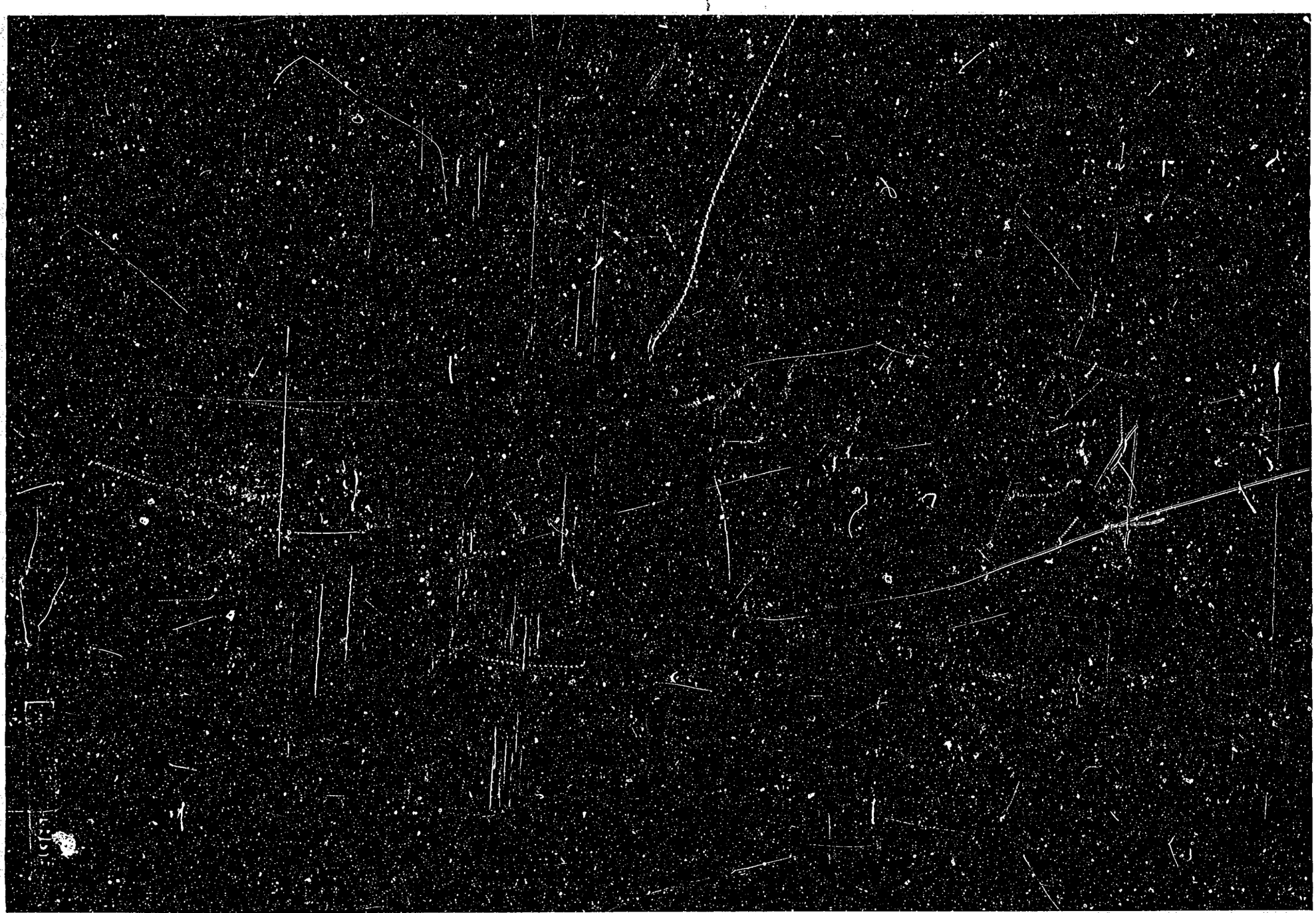

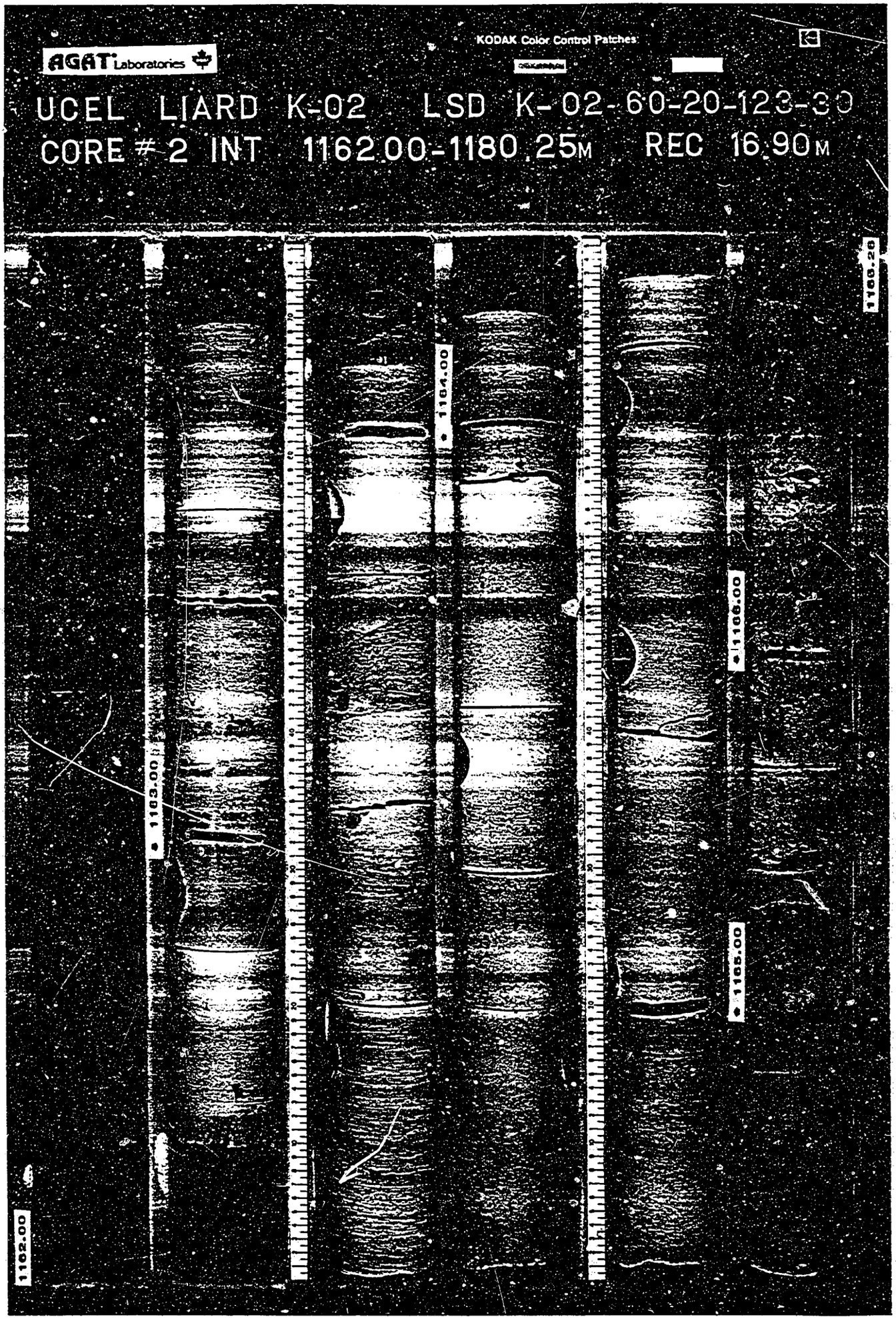
AGAT Laboratories
KODAK Color Control Patches
UCEL LIARD K-02 LSD K-02-60-20-123-30
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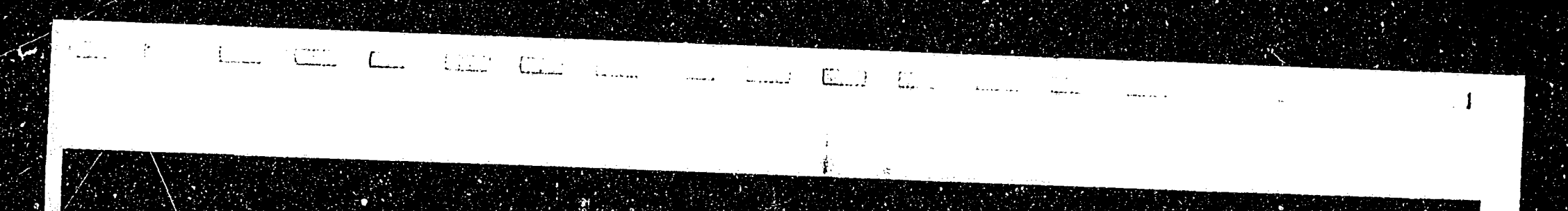

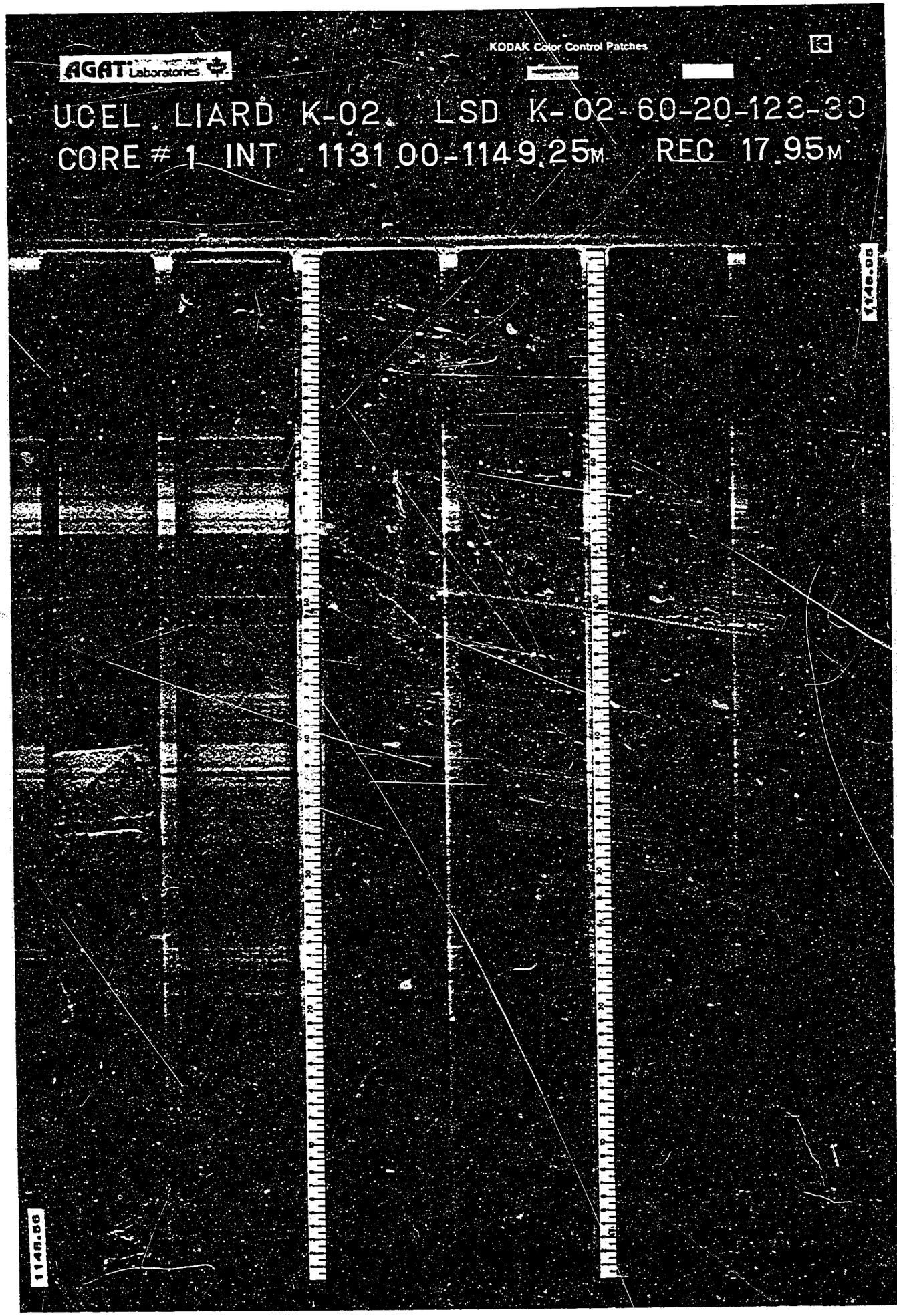
AGAT Laboratories
KODAK Color Control Patches
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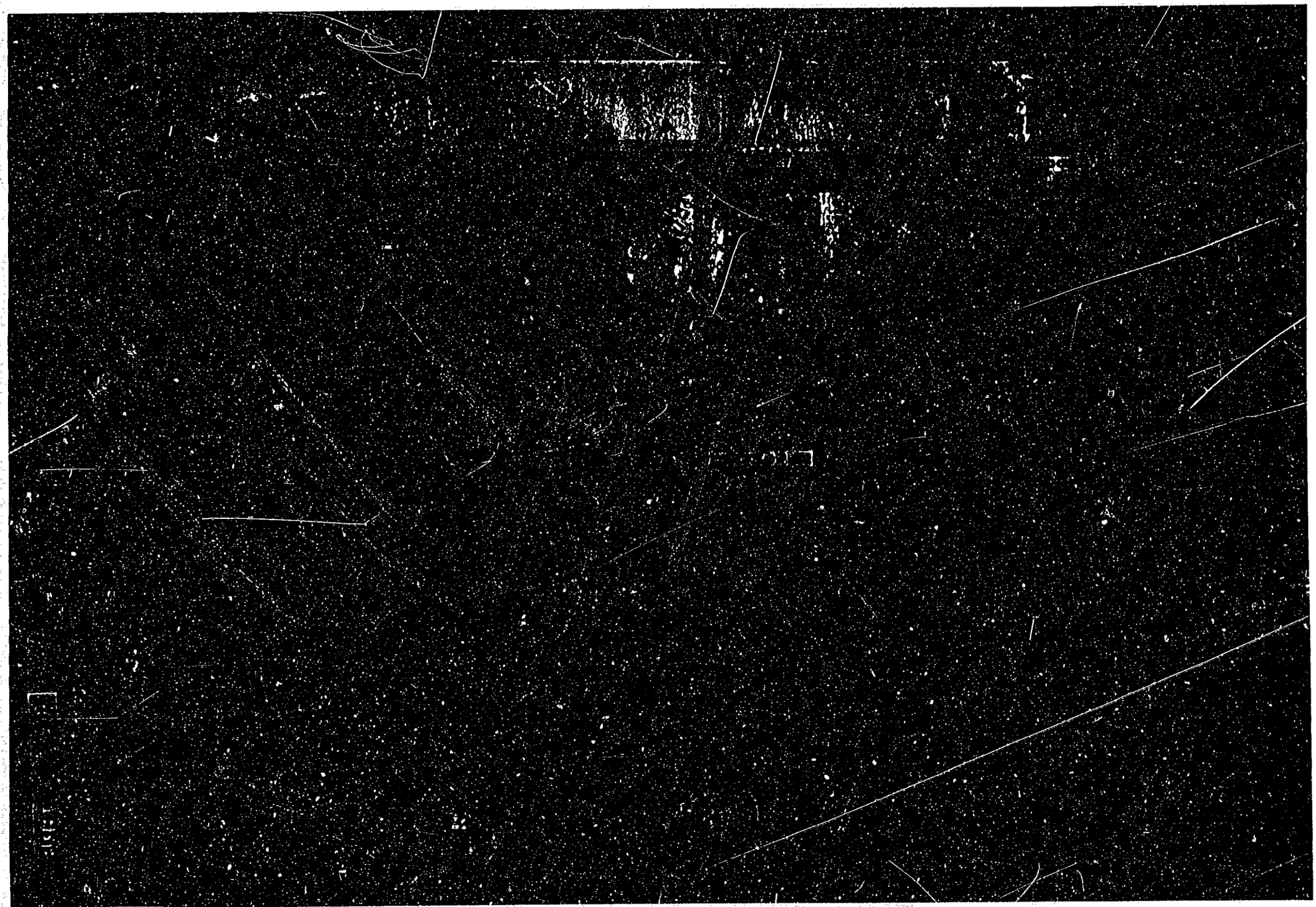

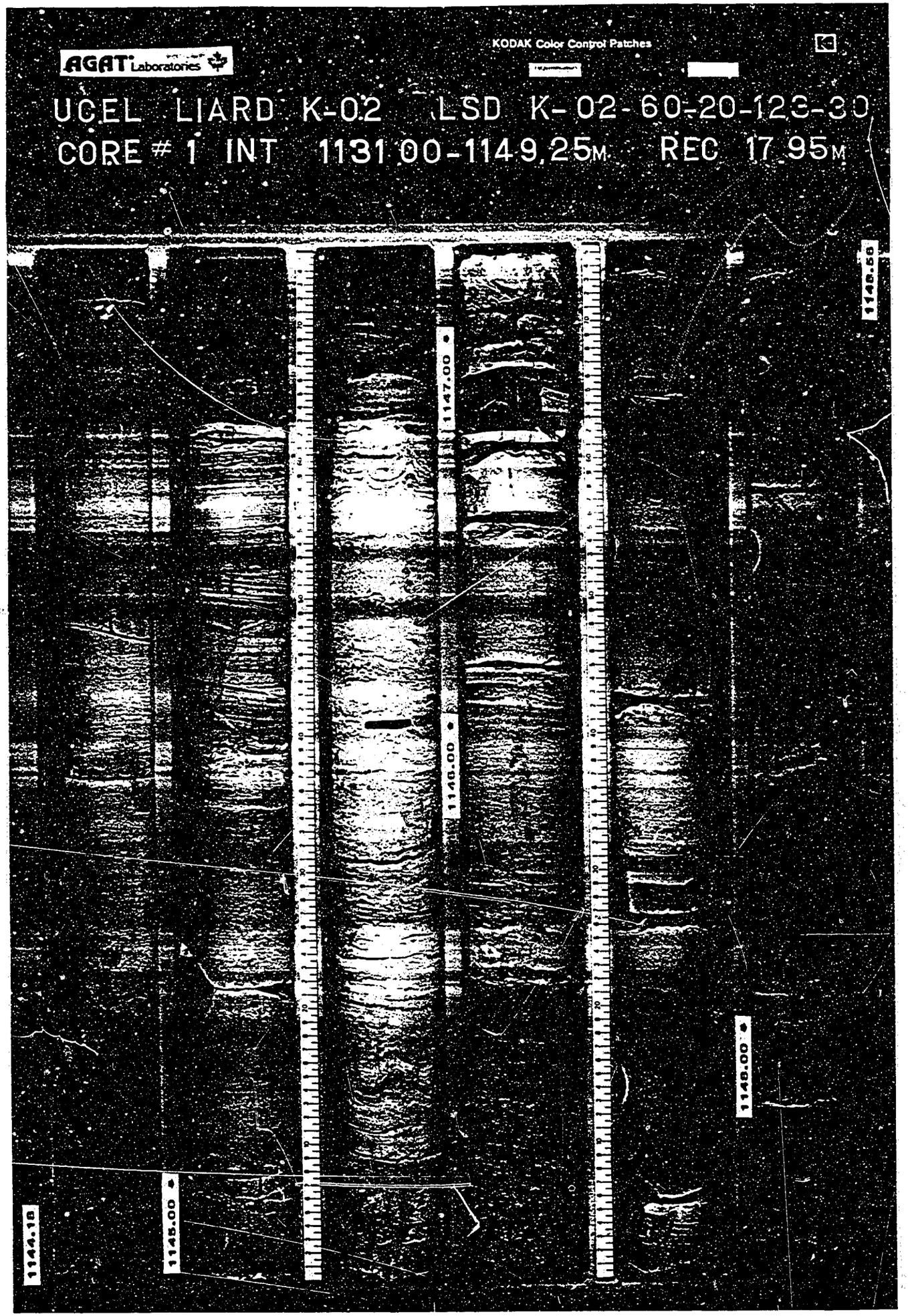
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KODAK Color Control Patches
UCEL LIARD K-02 LSD K-02-60-20-123-30
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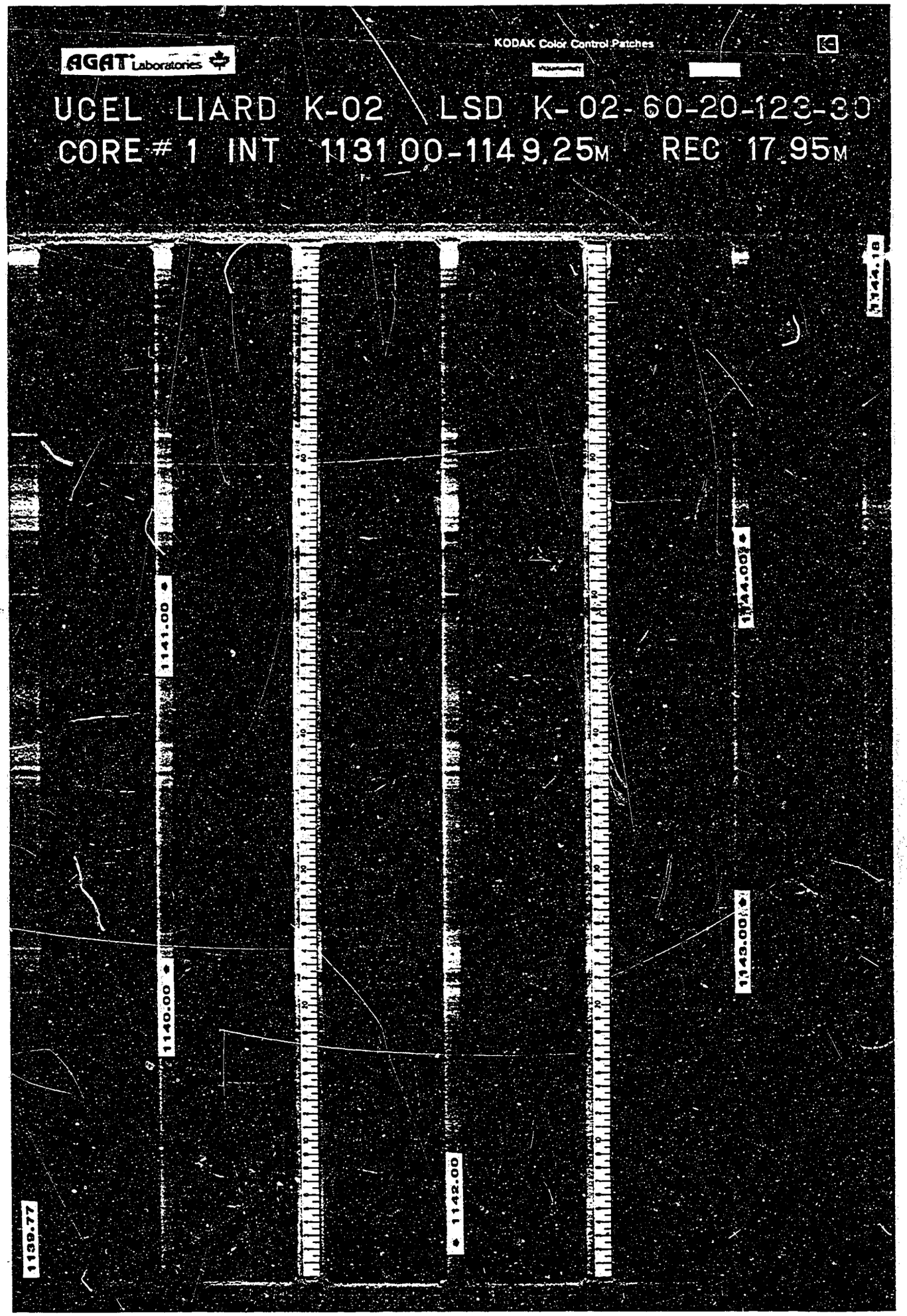
1145.00


AGAT Laboratories
KODAK Color Control Patches
UCEL LIARD K-02 \ LSD K-02-60-20-123-30
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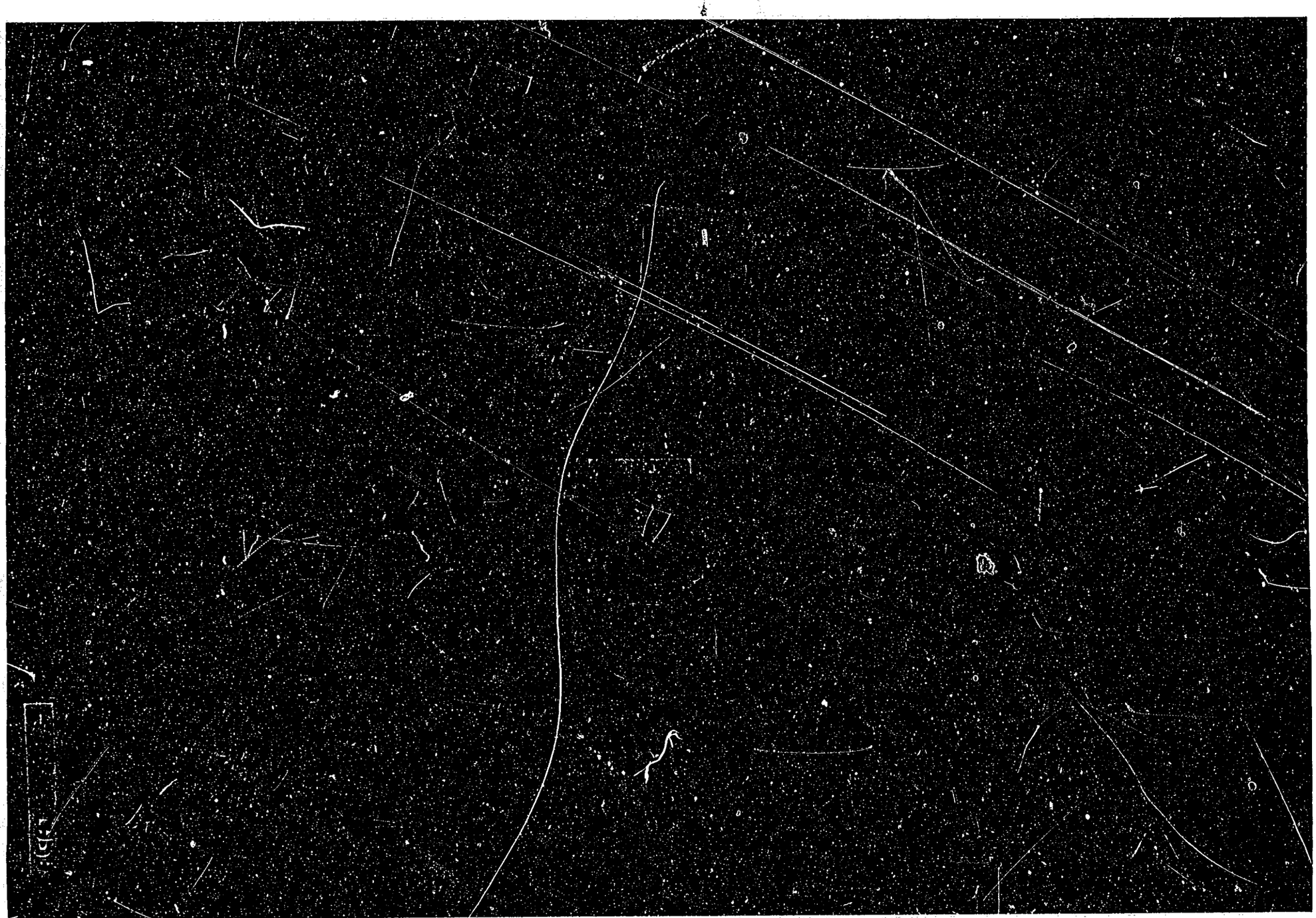

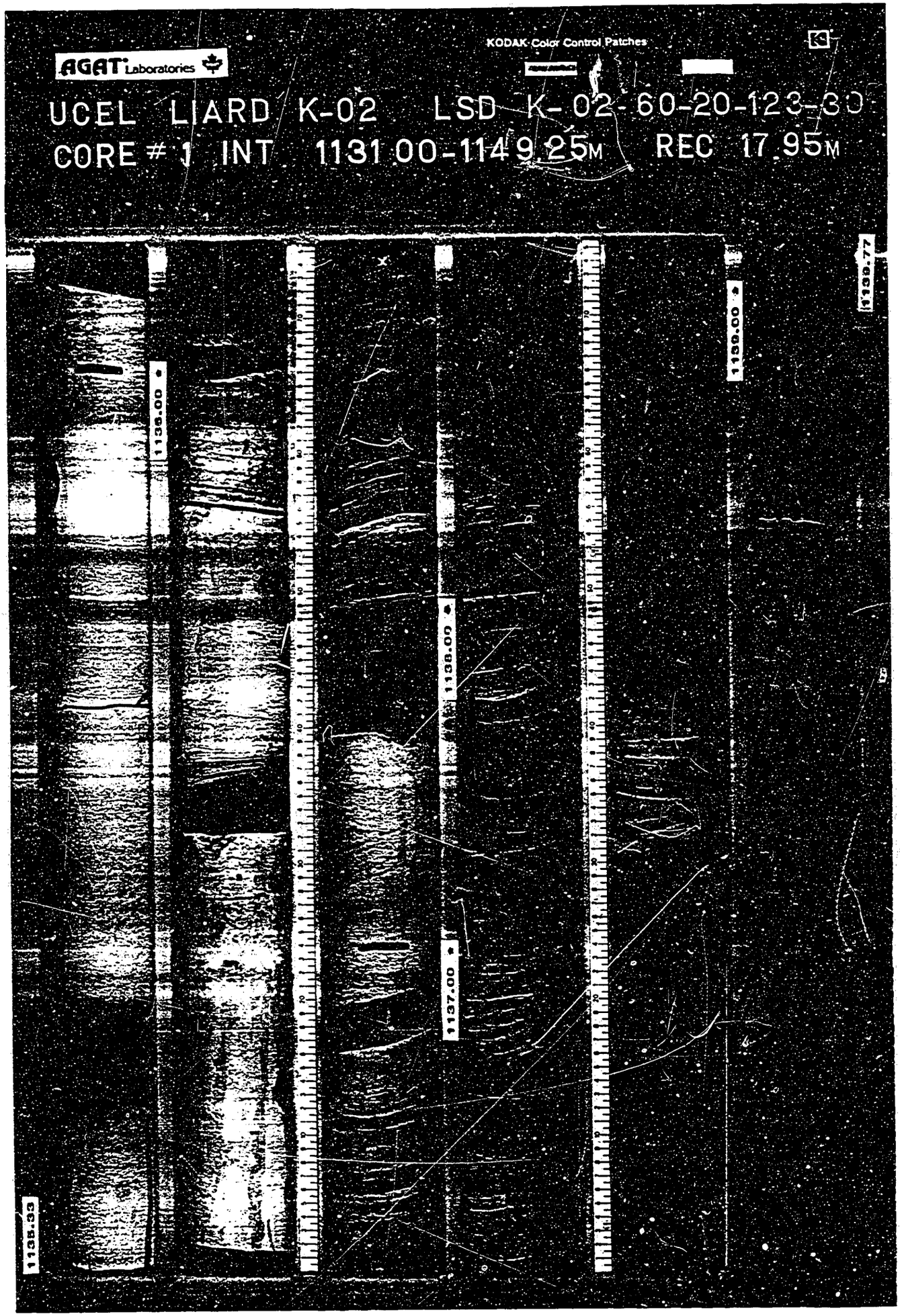
AGAT Laboratories
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1139.00
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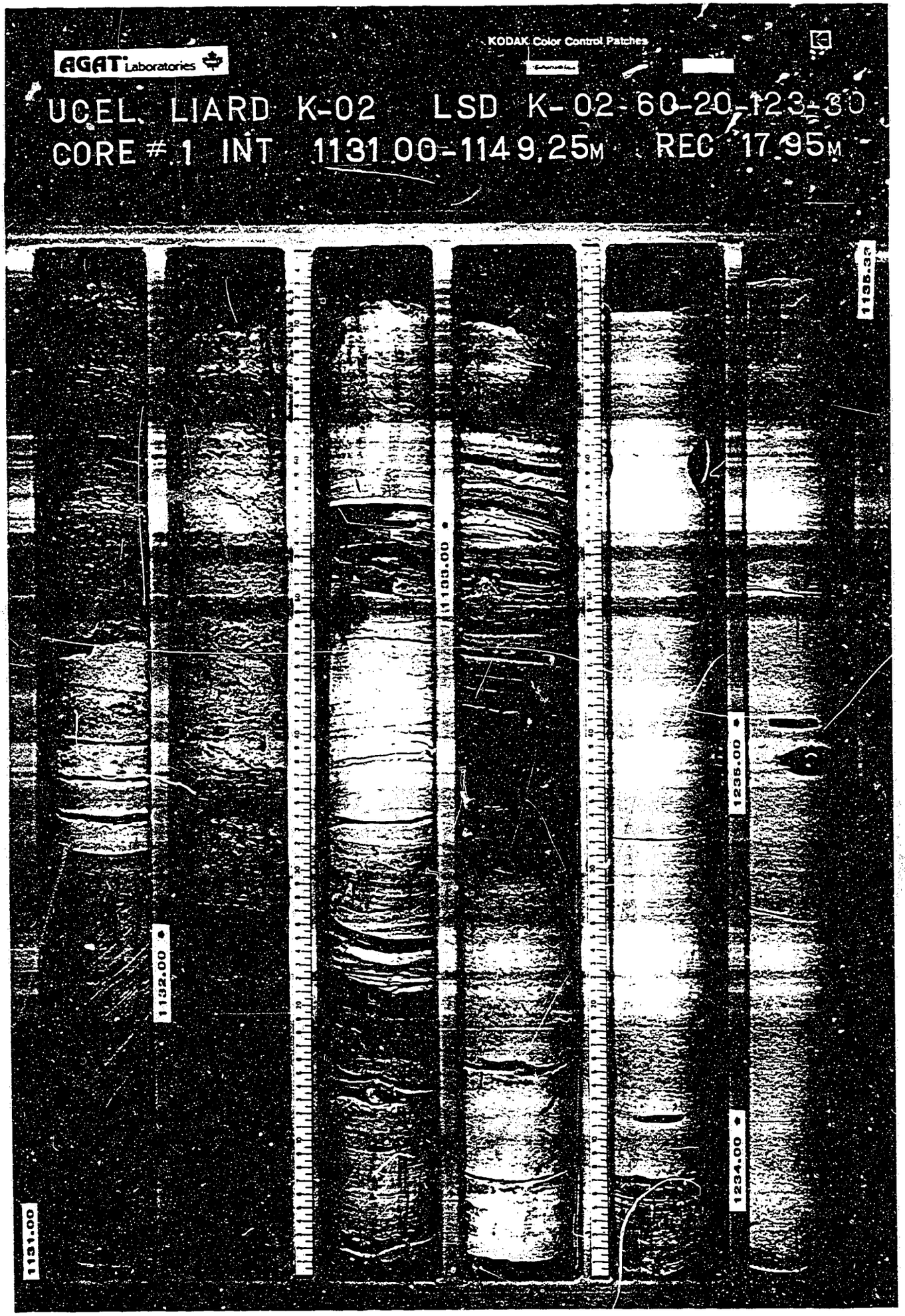
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UCEL LIARD K-02 LSD K-02-60-20-123-30
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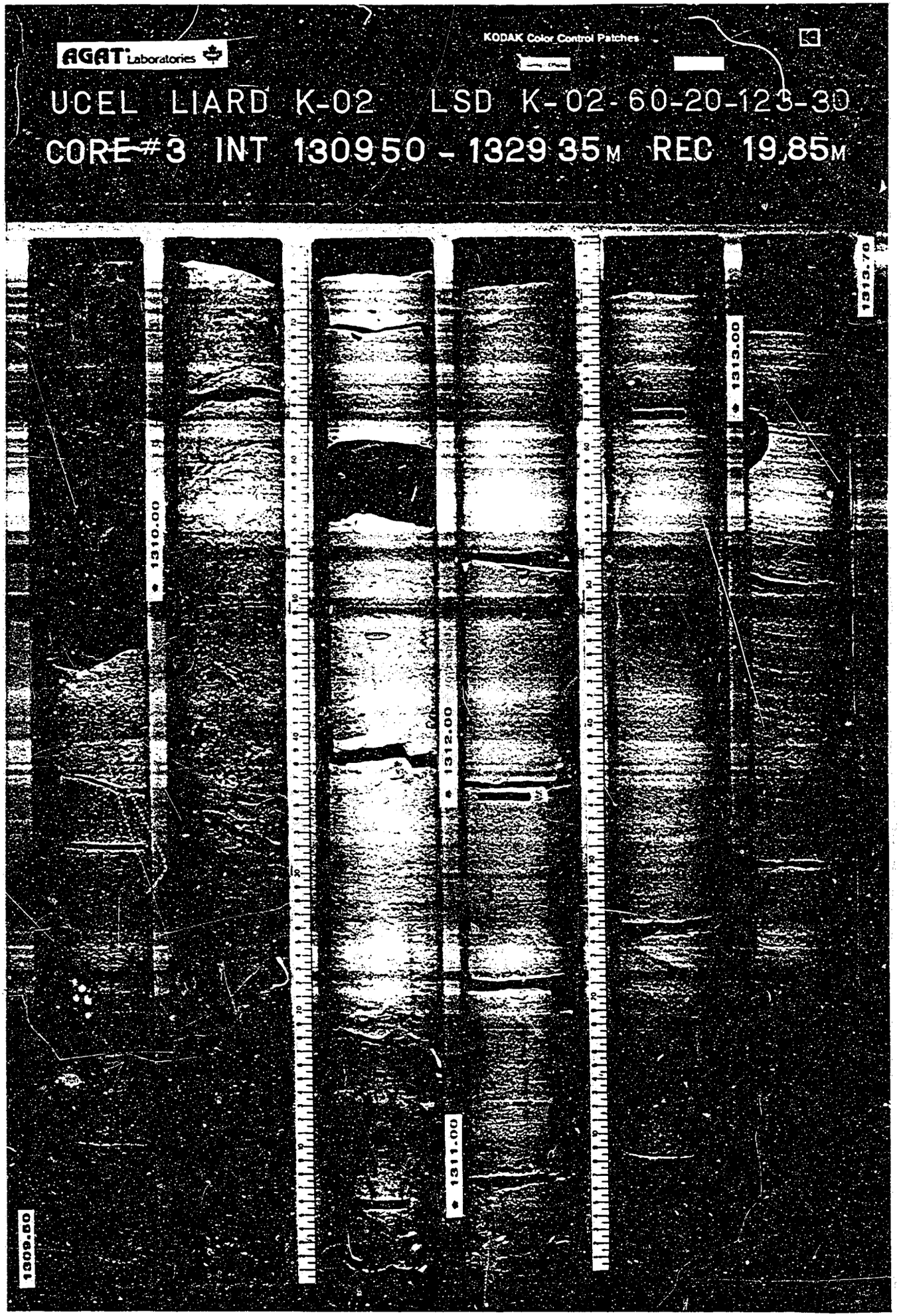
UCEL LIARD K-02

K-02-60-20-123-30

AGAT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CORE #3 INT 1309.50 - 1329.35M REC 19.85M
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1311.00
1312.00
1313.00
1313.70

AGAT Laboratories

KODAK Color Control Patches

UCEL / LIARD K-02 LSD K-02-60-20-123-30

CORE #3 INT 1309.50 - 1329.35M REC 19.85M

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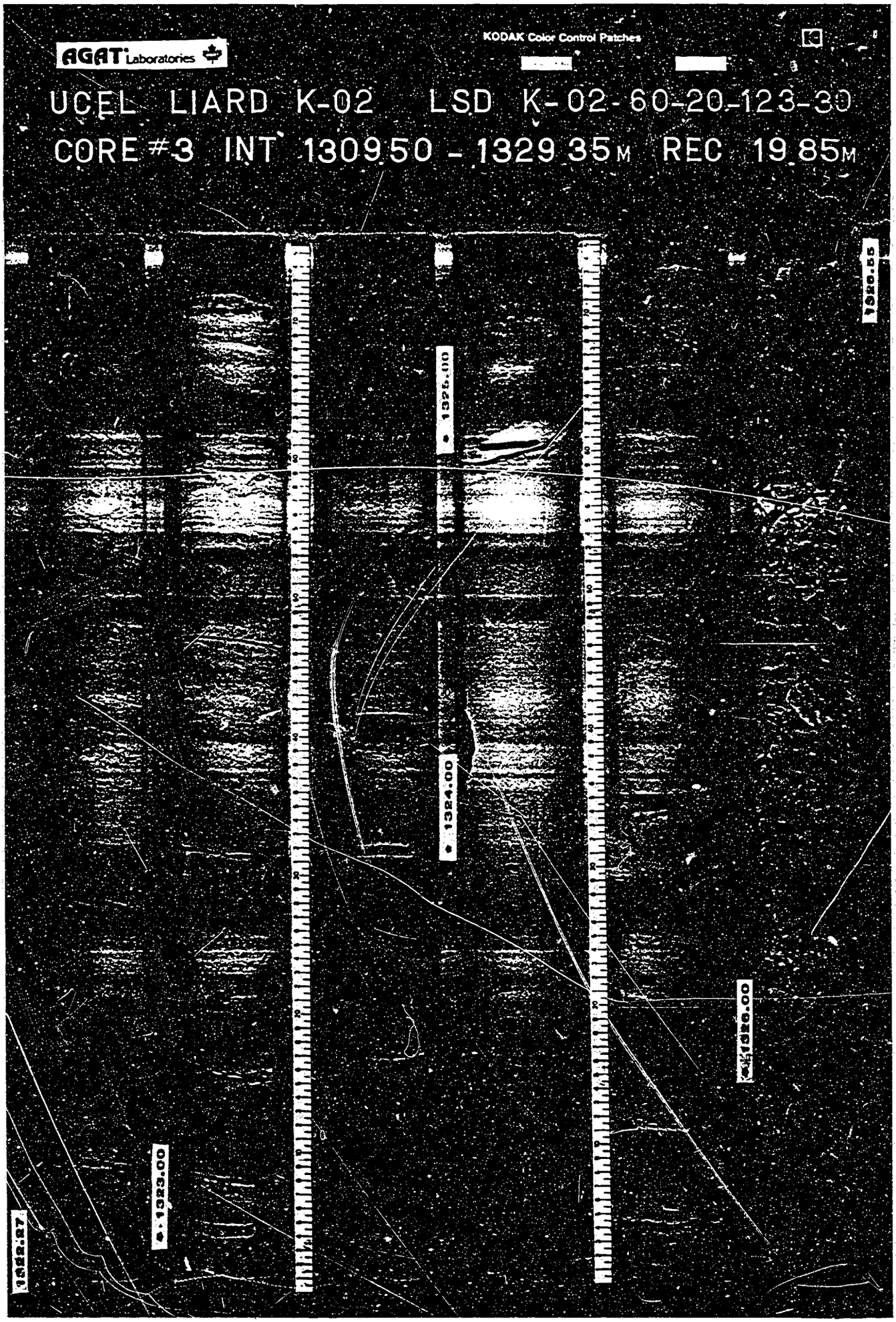
1315.00

1316.00

1317.00

1318.00

1318.07


AGAT Laboratories
KODAK Color Control Patches
UCEL LIARD K-02 LSD K-02-60-20-123-30
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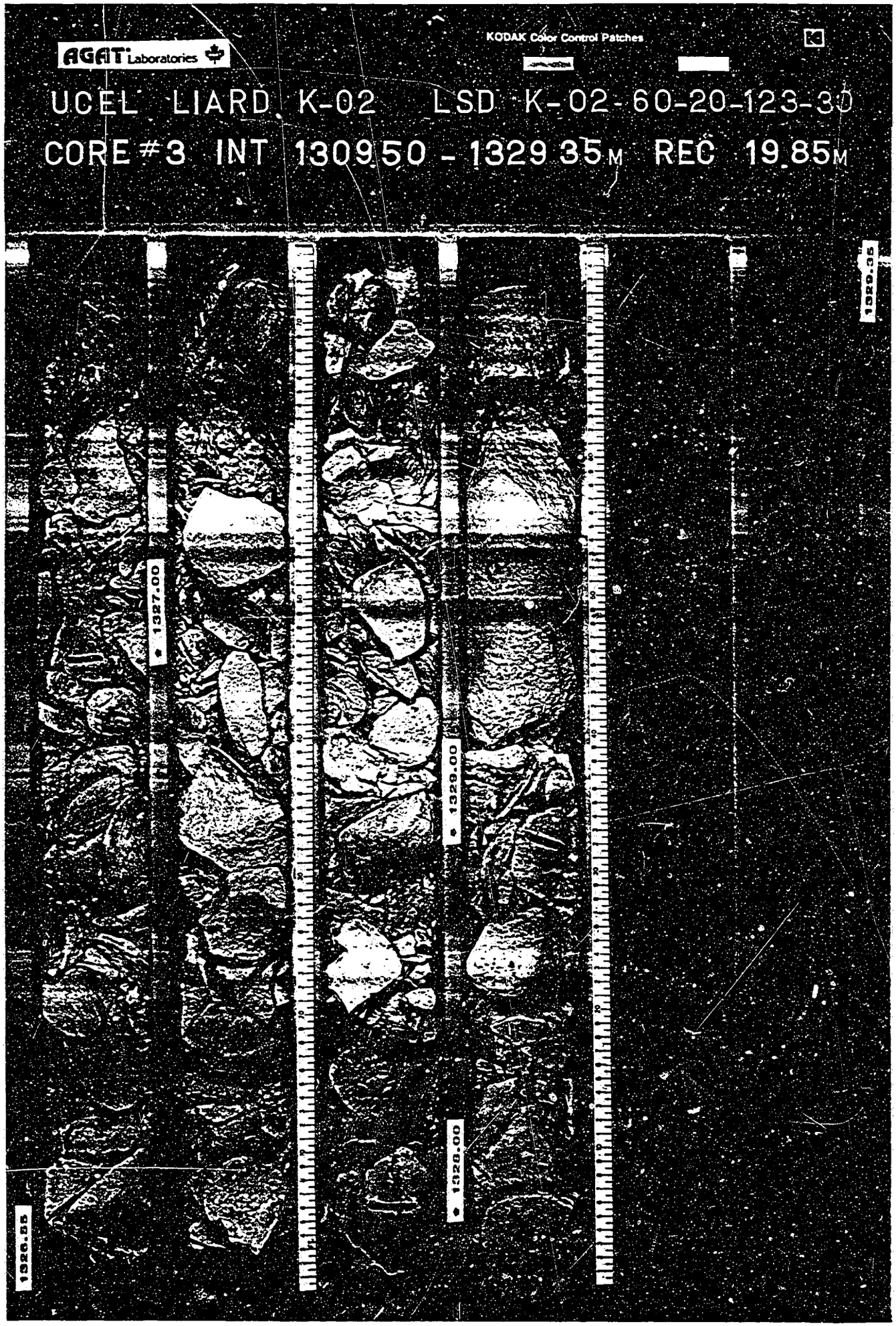
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KODAK Color Control Patches
UCEL LIARD K-02 LSD K-02-60-20-123-30
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1328.00
1329.35
1326.55

PRECEDING DOCUMENT(S) MAY BE OF POOR QUALITY

AGAT® Laboratories

FINAL CORE ANALYSIS REPORT

UCEL LIARD K-02

MATTSON FORMATION

K-02-60-20-123-30

Prepared for:

UNOCAL CANADA EXPLORATION LIMITED

RC6308

January 1997

"In Pursuit of Excellence"

· AIHA Accredited

· CAEAL Accredited

· Registered with APEGGA

CORE ANALYSIS DATA

UCEL LIARD K-02
K-02-60-20-123-30

COMPANY : UNOCAL CANADA EXPLORATION LIMITED
WELL NAME : UCEL LIARD K-02
LOCATION : K-02-60-20-123-30
FORMATION : MATTSON
DRILLING FLUID : WATER BASE MUD

PAGE : 1
DATE : 97-01-28
W/O No : RC6308

ROUTINE CORE ANALYSIS

Sample	interval (m) Top	interval (m) Base	Rep Thick (m)	Sample Length (m)	Gas Permeability Kmax (mD)	Gas Permeability K90 (mD)	Gas Permeability Kv (mD)	Capacity Kmax mD·m	Porosity	Capacity Ø·m	Density (Kg/m³) Bulk	Density (Kg/m³) Grain	Residual Saturation Oil	Residual Saturation Water	Remarks
			CORE NO. 1 1131.00 - 1149.25		(CUT / RECEIVED = 18.25 / 17.95 m			TOTAL BOXES = 13)							
SP001P	1131.00	1132.32	1.32	-	0.01	-	-	0.01	0.005	0.007	2660	2680	0.000	0.110	ss:vfgr:calc
NA	1132.32	1133.96	1.64	-	-	-	-	-	-	-	-	-	-	-	sh:ss
SP002P	1133.96	1134.60	0.64	-	0.19	-	-	0.12	0.055	0.035	2510	2660	0.000	0.033	ss:vfgr:calc
SP003P	1134.60	1134.85	0.25	-	0.23	-	-	0.06	0.057	0.014	2510	2660	0.000	0.032	ss:vfgr:calc
SP004P	1134.85	1135.33	0.48	-	0.14	-	-	0.07	0.041	0.020	2550	2660	0.000	0.041	ss:vfgr:calc
SP005P	1135.33	1136.10	0.77	-	0.09	-	-	0.07	0.030	0.023	2590	2670	0.000	0.092	ss:vfgr:calc
SP006P	1136.10	1136.42	0.32	-	0.08	-	-	0.03	0.032	0.010	2580	2670	0.000	0.068	ss:vfgr:calc
NA	1136.42	1136.46	0.04	-	-	-	-	-	-	-	-	-	-	-	sh
006A	1136.46	1136.78	0.32	-	0.08	-	-	0.03	0.032	0.010	2580	2670	0.000	0.068	ss:vfgr:calc:ASTSP006P
NA	1136.78	1136.96	0.18	-	-	-	-	-	-	-	-	-	-	-	ss:sh
006B	1136.96	1137.16	0.20	-	0.08	-	-	0.02	0.032	0.006	2580	2670	0.000	0.068	ss:vfgr:calc:AST SP006P
NA	1137.16	1144.39	7.23	-	-	-	-	-	-	-	-	-	-	-	sh:ss
SP007P	1144.39	1144.92	0.53	-	0.18	-	-	0.10	0.062	0.033	2500	2670	0.000	0.259	ss:vfgr:calc
SP008P	1144.92	1146.27	1.35	-	0.19	-	-	0.26	0.065	0.088	2490	2670	0.000	0.214	ss:vfgr:calc
NA	1146.27	1146.56	0.29	-	-	-	-	-	-	-	-	-	-	-	sh:ss
SP009P	1146.56	1147.13	0.57	-	0.50	-	-	0.29	0.078	0.044	2450	2650	0.000	0.079	ss:vfgr
SP010P	1147.13	1147.45	0.32	-	0.87	-	-	0.28	0.080	0.026	2450	2660	0.000	0.025	ss:vfgr:dol
SP011P	1147.45	1147.87	0.42	-	1.07	-	-	0.45	0.081	0.034	2450	2660	0.000	0.021	ss:vfgr:dol
SP012P	1147.87	1148.22	0.35	-	2.28	-	-	0.80	0.079	0.028	2440	2650	0.049	0.084	ss:vfgr:dol

AGAT Laboratories

COMPANY : UNOCAL CANADA EXPLORATION LIMITED
WELL NAME : UCEL LIARD K-02
LOCATION : K-02-60-20-123-30
FORMATION : MATTSON
DRILLING FLUID : WATER BASE MUD

PAGE : 2
DATE : 97-01-28
W/O No : RC6308

ROUTINE CORE ANALYSIS

Sample	interval (m) Top	interval (m) Base	Rep Thick (m)	Sample Length (m)	Gas Permeability Kmax (mD)	Gas Permeability K90 (mD)	Gas Permeability Kv (mD)	Capacity Kmax mD·m	Porosity	Capacity Ø·m	Density (Kg/m³) Bulk	Density (Kg/m³) Grain	Residual Saturation Oil	Residual Saturation Water	Remarks
SP013P	1148.22	1148.56	0.34	-	2.49	-	-	0.85	0.077	0.026	2450	2630	0.072	0.102	ss:vfgr:dol
SP014P	1148.56	1148.95	0.39	-	0.86	-	-	0.34	0.082	0.032	2450	2670	0.000	0.187	ss:vfgr:dol
LC	1148.95	1149.25	0.30	-	-	-	-	-	-	-	-	-	-	-	Lost core
			CORE NO. 2 1162.00 - 1180.25		(CUT / RECEIVED = 18.25 / 16.90 m			TOTAL BOXES = 12)							
NA	1162.00	1162.77	0.77	-	-	-	-	-	-	-	-	-	-	-	sh
SP015P	1162.77	1163.20	0.43	-	0.23	-	-	0.10	0.073	0.031	2470	2660	0.029	0.103	ss:vfgr:pyr
SP016P	1163.20	1163.38	0.18	-	0.28	-	-	0.05	0.100	0.018	2410	2670	0.019	0.209	ss:vfgr:dol
SP017P	1163.38	1163.85	0.47	-	0.18	-	-	0.08	0.076	0.036	2460	2660	0.030	0.027	ss:vfgr:dol
SP018P	1163.85	1164.07	0.22	-	0.14	-	-	0.03	0.061	0.013	2500	2660	0.059	0.033	ss:vfgr:dol
NA	1164.07	1164.10	0.03	-	-	-	-	-	-	-	-	-	-	-	sh:ss
SP019P	1164.10	1164.40	0.30	-	0.30	-	-	0.09	0.086	0.026	2440	2660	0.037	0.104	ss:vfgr:dol
SP020P	1164.40	1164.62	0.22	-	0.46	-	-	0.10	0.083	0.018	2440	2660	0.015	0.023	ss:vfgr:dol
SP021P	1164.62	1164.86	0.24	-	0.62	-	-	0.15	0.093	0.022	2410	2660	0.021	0.132	ss:vfgr:dol
SP022P	1164.86	1165.18	0.32	-	0.79	-	-	0.25	0.085	0.027	2430	2660	0.063	0.036	ss:vfgr:dol
SP023P	1165.18	1165.36	0.18	-	0.66	-	-	0.12	0.080	0.014	2440	2660	0.078	0.023	ss:vfgr:dol
SP024P	1165.36	1165.69	0.33	-	0.71	-	-	0.23	0.078	0.026	2450	2660	0.098	0.096	ss:vfgr:dol
NA	1165.69	1166.47	0.78	-	-	-	-	-	-	-	-	-	-	-	sh:ss
SP025P	1166.47	1167.23	0.76	-	12.9	-	-	9.80	0.126	0.096	2340	2670	0.015	0.150	ss:vfgr:dol
SP026P	1167.23	1168.11	0.88	-	32.2	-	-	28.3	0.139	0.122	2290	2660	0.016	0.140	ss:vfgr:dol
SP027P	1168.11	1170.36	2.25	-	94.0	-	-	212.	0.156	0.351	2250	2660	0.010	0.243	ss:vfgr:dol
SP028P	1170.36	1171.35	0.99	-	1.64	-	-	1.62	0.094	0.093	2430	2680	0.037	0.189	ss:vf-fgr:dol

AGAT Laboratories

COMPANY : UNOCAL CANADA EXPLORATION LIMITED
WELL NAME : UCEL LIARD K-02
LOCATION : K-02-60-20-123-30
FORMATION : MATTSON
DRILLING FLUID : WATER BASE MUD

DATE : 97-01-28
W/O No : RC6308

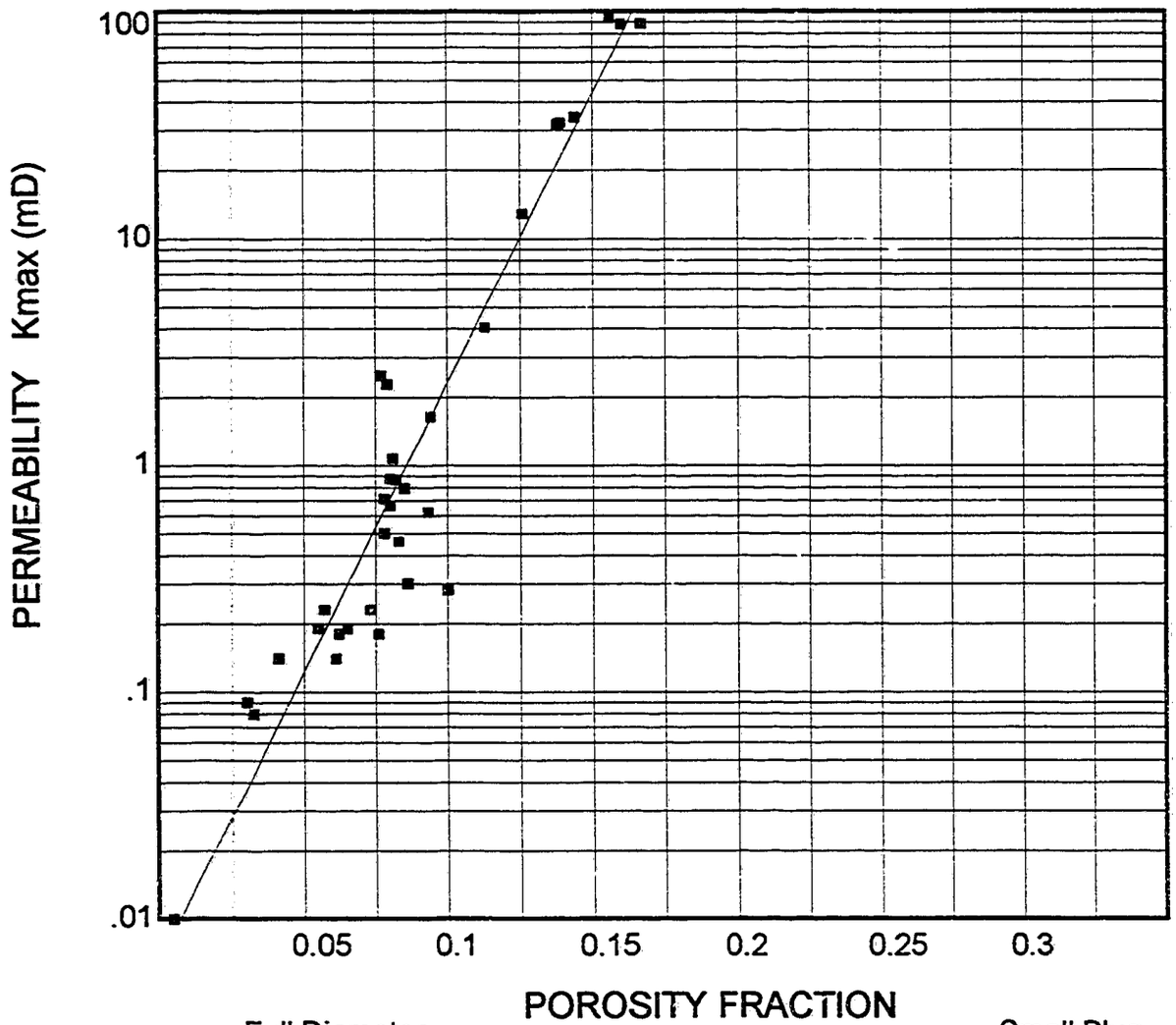
ROUTINE CORE ANALYSIS

Sample	interval (m) Top	interval (m) Base	Rep Thick (m)	Sample Length (m)	Gas Permeability Kmax (mD)	Gas Permeability K90 (mD)	Gas Permeability Kv (mD)	Capacity Kmax mD·m	Porosity	Capacity Ø·m	Density (Kg/m³) Bulk	Density (Kg/m³) Grain	Residual Saturation Oil	Residual Saturation Water	Remarks
SP029P	1171.35	1172.45	1.10	-	32.0	-	-	35.2	0.138	0.152	2300	2670	0.015	0.153	ss:vf-fgr:dol
SP030P	1172.45	1173.78	1.33	-	88.7	-	-	118.	0.167	0.222	2220	2670	0.012	0.231	ss:vf-fgr:dol
SP031P	1173.78	1174.52	0.74	-	88.1	-	-	65.2	0.160	0.118	2240	2670	0.010	0.161	ss:vf-fgr:dol
SP032P	1174.52	1176.69	2.17	-	4.06	-	-	8.81	0.113	0.245	2420	2720	0.021	0.170	ss:vf-fgr:dol
SP033P	1176.69	1178.90	2.21	-	34.4	-	-	76.0	0.144	0.318	2300	2690	0.015	0.158	ss:vf-fgr:dol
LC	1178.90	1180.25	1.35	-	-	-	-	-	-	-	-	-	-	-	Lost core

AGAT Laboratories

Company :	UNOCAL CANADA EXPLORATION LIMITED		
Location :	K-02-60-20-123-30	FIGURE :	1
Interval :	1131.00-1180.25m	W/O :	RC6308
Formation :	MATTSON	Date :	97-01-28

POROSITY-PERMEABILITY CORRELATION



× - Full Diameter ▪ - Small Plug

Equation of Line :	Log (Kmax) = -2.18 + 25.45* Porosity
Correlation Coefficient	r = 0.95

AGAT Laboratories

SAMPLE HANDLING

AGAT LABORATORIES CORE SERVICES

SAMPLE HANDLING AND ANALYSIS INFORMATION

Company : UNOCAL CANADA EXPLORATION LTD.
Well : UCEL LIARD K-02
Location : K-02-60-20-123-30

Coring Equipment : Diamond
Coring Fluid : Water Base Mud
Core Diameter : 0.09 m
Total Cored : 36.50 m
Total Recovered : 34.85 m

W/O Number : RC6308
Date : 97-01-28

HANDLING

Core Transported in : Boxes
Cutting Solution : Water
Cleaning Solvent : Toluene
Extraction : Vapour Phase
Cleaning Time : 6 hours
Drying Equipment : Conventional oven
Drying Time/Temp : 3 hours @ 108°C

ANALYSIS

Grain volume measured by Boyle's Law using helium
Bulk volume measured by calipering on right-cylindrical samples
Fluid saturations by retort on end pieces
Permeability measured on 38.1 mm diameter drilled plugs

REMARKS

PETROPHYSICAL PROPERTIES DETERMINED ON PARTIALLY EXTRACTED SAMPLES.
NO FURTHER ANALYSIS REQUIRED BY CLIENT.
FIVE (5) SETS OF COLOR/UV PHOTOS OF CORE.

AGAT Laboratories

ABBREVIATIONS

COMMON ABBREVIATIONS

abnt	Abundant
abv	Above
Alg	Algae (al)
alt	Altered (ing)
amor	Amorphous
Amph	Amphipora
ang	Angular
anhy	Anhydrite (ic)
app	Appear
apr	Apparent
aprox	Approximate (ly)
arg	Argillaceous
ark	Arkose (ic)
asph	Asphalt (ic)
AST	Assigned similar to (no actual sample taken)
apha	Aphanitic
bcm	Become (ing)
bd	Bed
bdd	Bedded
bdg	Bedding
Belm	Belemnites
bent	Bentonite (ic)
bf	Buff
biocl	Bioclastic
bioturb	Bioturbated
bit	Bitumen (inous)
bl	Blue (ish)
blk	Black
blky	Blocky
bnd	Band (ed)
Brac	Brachiopod
brec	Breccia (ted)
bri	Bright
brit	Brittle
brn	Brown
Bry	Bryozoa
bulb	Bulbous
bur	Burrowed
c	Coarse (ly)
calc	Calcite (areous)
carb	Carbonaceous
cbl	Cobble (64-256 mm)
Ceph	Cephalopod
cgl	Conglomerate
chk	Chalk (y)
chlor	Chlorite
cht	Chert
chty	Cherty
cl	Clastic
cln	Clean
clr	Clear
cly	Clay (ey)
com	Common
coq	Coquina
Cor	Coral
crbnt	Carbonate
Crin	Crinoid (al)
crm	Cream
crpxl	Cryptocrystalline
ctc	Contact
deb	Debris
decr	Decrease (ing)
desi	Desiccation
dism	Disseminated
dk	Dark (er)
dns	Dense (er)
dol	Dolomite (ic)
drsy	Drusy
dtrl	Detrital (us)
elg	Elongate
euhed	Euhedral
f	Fine (ly)
fau	Fauna
Fe	Iron-Ferruginous
Fe-mag	Feromagnesian
fenst	Fenestral
fis	Fissile
fl	Fill (ed)
fld	Feldspar (thic)
flk	Flake
flky	Flaky
flor	Fluorescence
flt	Fault (ed)
fltg	Floating
foram	Foraminifera
fos	Fossil (iferous)
fr	Fair
frac	Fracture (ed)
frag	Fragment (al)
fri	Friable
frmwk	Framework
fros	Frosted
g	Good
Gast	Gastropod
gl	Glass (y)
glau	Glauconite (ic)
gn	Green
gr	Grain (ed)
gran	Granular
grd	Grade (ed)
grnl	Granule (2-4 mm)
gy	Grey
gyp	Gypsum (iferous)

AGAT® Laboratories

COMMON ABBREVIATIONS (CONTINUED)

hd	Hard
hfrac	Horizontal Fracture
hi	High
hrtl	Horizontal
hvy	Heavy
hydc	Hydrocarbon
ig	Igneous
imbed	Imbedded
imp	Impression
incl	Included (sion)
incr	Increase
indst	Indistinct
intbd	Interbedded
intcl	Intraclast (s)
intfrag	Interfragmental
intgran	Intergranular
intlam	Interlaminated
intr	Intrusion (ive)
intv	Interval
intxl	Intercrystalline
ireg	Irregular
ird	Iridescent
intrsk	Intraskeletal
kao	Kaolin
lam	Laminated
lchd	Leached
len	Lentil (cular)
lith	Lithographic
lmy	Limy
lrg	Large (er)
ls	Limestone
lse	Loose
lstr	Lustre
lt	Light (er)
m	Medium
mar	Maroon
mas	Massive
mat	Material, matter
mica	Mica (ceous)
mic	Micro
mky	Milky
mnr	Minor
mnrl	Mineral (ized)
mnut	Minute
Mol	Mollusca
mot	Mottled
mrly	Marly
mtx	Matrix
n	No,none,non
nod	Nodule
num	Numerous
o	Oil
occ	Occasional
od	Odor
ool	Oolite (ic)
op	Opaque
org	Organic
orng	Orange
orth	Orthoclase
Ost	Ostracod
ovgth	Overgrowth
ox	Oxidized
p	Preliminary (as suffix)
pbl	Pebble (4-64 mm)
pel	Pellet
perm	permeability
pet	Petroleum (iferous)
phos	Phosphate (ic)
pk	Pink
plag	Plagioclase
plcy	Pelecypod
pl	Plant
plty	Platy
por	Porous (sity)
pos	Possible (ility)
p-p	Pin-Point
pred	Predominant (ly)
prim	Primary
prob	Probable (ly)
prom	Prominent (ly)
pt	Part (ly)
ptch	Patch (es)
ptg	Parting
purp	Purple
pyr	Pyrite (ic) (ized)
pyrbit	Pyrobitumen
qtz	Quartz
qtzc	Quartzitic
qtzs	Quartzose
rd	Round (ed)
repl	Replaced (ing) (ment)
rexl	Recrystallized
rmn	Remains (nant)
rr	Rare
rsns	Resinous
rthy	Earthy
s	Small
sa	Salt (y)
S	Sulphur
s&p	Salt & Pepper
sat	Saturated
sb	Sub

AGAT® Laboratories

COMMON ABBREVIATIONS (CONTINUED)

sc	Scales
scat	Scattered
sd	Sand (1/16 - 2mm)
sdy	Sandy
sec	Secondary
sed	Sediment (ary)
sft	Soft
sh	Shale
shad	Shadow
shy	Shaly
sid	Siderite (ic)
sil	Silica
sks	Slickensided
sl	Slight (ly)
sln	Solution
slt	Silt
sltst	Siltstone
slty	Silty
sm	Smooth
SP	Small Plug (as prefix)
sp	Spot (ted) (ty)
spec	Speck (led)
spl	Sample
srt	Sort (ed) (ing)
strg	Stringer
Strom	Stromatoporoid
stromlt	Stromatolite
struc	Structure
styl	Stylolite (ic)
suc	Sucrosic
sug	Sugary
sup	Supported
surf	Surface
sz	Size

tab	Tabular
tex	Texture
Tham	Thamnopora
thk	Thick
thn	Thin
thru	Throughout
tr	Trace
trnsl	Translucent
trnsp	Transparent
tt	Tight
tub	Tubular
uncons	Unconsolidated
unident	Unidentifiable
up	Upper
v	Very
var	Variable
vcol	Varicolored
vfrac	Vertical Fracture
vgt	Varigated
vn	Vein
vrtl	Vertical
vug	Vug (gy) (ular)
w	Well
wh	White
wk	Weak
wthrd	Weathered
wtr	Water
wvy	Wavy
wxy	Waxy
wsrt	Well sorted

xbd	Cross-bedded
xbdg	Cross-bedding
xl	Crystal (line)
xlam	Cross-laminated
yel	Yellow
zn	Zone
*	Broken core
/	With
>10000	Permeability over 10000 mD
<0.01	Permeability less than 0.01 mD
CC	Cracked Core
DR	Drilled
LC	Lost Core
RU	Rubble
mD	milliDarcy

AGAT® Laboratories

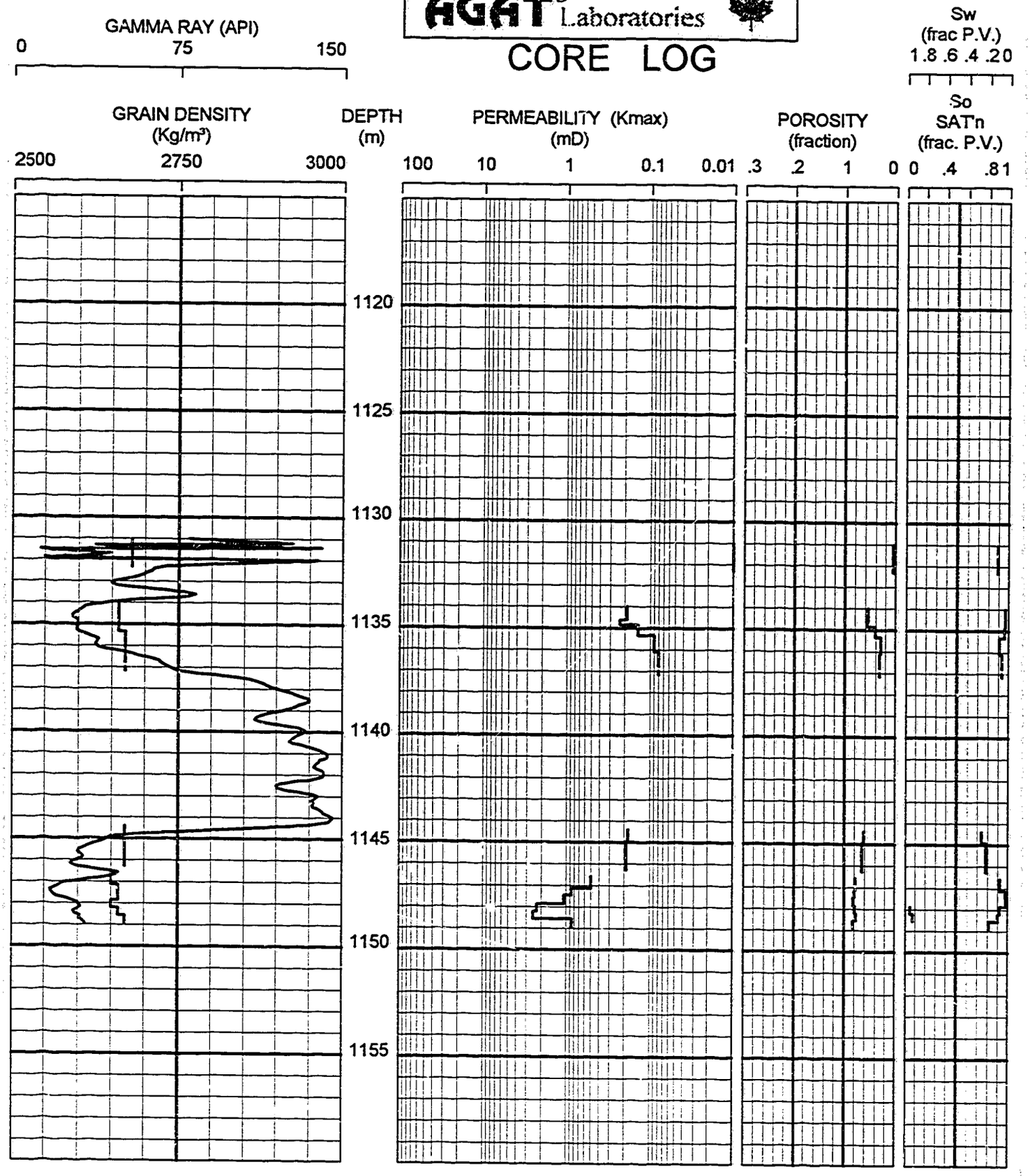
CORE LOG

Company : UNOCAL CANADA EXPLORATION LIMITED
Well Name : UCEL LIARD K-02
Field :
Location : K-02-60-20-123-30
Formation : MATTSON
W / O : RC6308

Recovery : 34.85m
Cored Interval : 1131.00-1180.25m
Drlg. Fld. : WATER BASE MUD
Elevation (KB) :

AGAT® Laboratories

CORE LOG



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AGAT Laboratories

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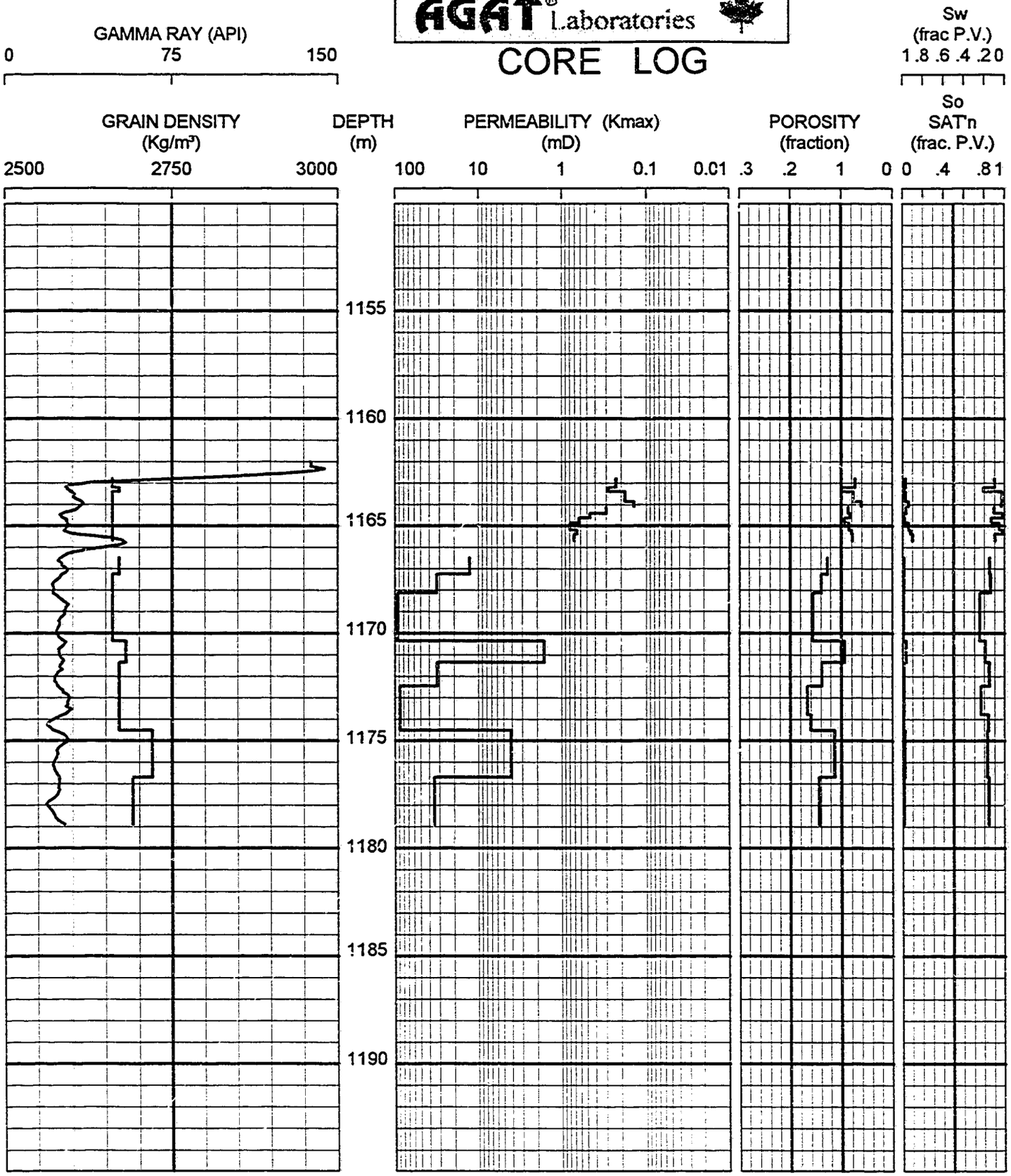


UCEL LIARD K-02

K-02-60-20-123-30

AGAT

AGAT® Laboratories

FINAL CORE ANALYSIS REPORT

UCEL LIARD K-02

MATTSON FORMATION

K-02-60-20-123-30

Prepared for:

UNOCAL CANADA EXPLORATION LIMITED

RC6319

January 1997

"In Pursuit of Excellence"

· AIHA Accredited

· CAEAL Accredited

· Registered with APEGGA

CORE ANALYSIS DATA

UCEL LIARD K-02
K-02-60-20-123-30

COMPANY : UNOCAL CANADA EXPLORATION LIMITED
WELL NAME : UCEL LIARD K-02
LOCATION : K-02-60-20-123-30
FORMATION : MATTSON
DRILLING FLUID : WATER BASE MUD

PAGE : 1
DATE : 97-01-28
W/O No : RC6319

ROUTINE CORE ANALYSIS

Sample	interval (m) Top	interval (m) Base	Rep Thick (m)	Sample Length (m)	Gas Permeability Kmax (mD)	Gas Permeability K90 (mD)	Gas Permeability Kv (mD)	Capacity Kmax mD·m	Porosity	Capacity Ø·m	Density (Kg/m³) Bulk	Density (Kg/m³) Grain	Residual Saturation Oil	Residual Saturation Water	Remarks
CORE NO. 3 1309.50 - 1329.35 (CUT / RECEIVED = 19.85 / 19.85 m TOTAL BOXES = 14)															
SP001P	1309.50	1309.78	0.28	-	0.17	-	-	0.05	0.033	0.009	2630	2720	trc	0.280	ss:vf-fgr:dol
SP002P	1309.78	1309.96	0.18	-	0.06	-	-	0.01	0.014	0.003	2690	2730	0.000	0.157	ss:vf-fgr:dol
NA	1309.96	1310.11	0.15	-	-	-	-	-	-	-	-	-	-	-	sh
SP003P	1310.11	1310.82	0.71	-	0.02	-	-	0.01	0.014	0.010	2700	2730	0.000	0.185	ss:vf-mgr:dol
SP004P	1310.82	1311.49	0.67	-	0.34	-	-	0.23	0.021	0.014	2650	2710	0.000	0.079	ss:vf-fgr
NA	1311.49	1311.54	0.05	-	-	-	-	-	-	-	-	-	-	-	sh
SP005P	1311.54	1311.72	0.18	-	11.2	-	-	2.02	0.089	0.016	2410	2650	0.000	0.090	ss:vf-fgr
SP006P	1311.72	1312.34	0.62	-	17.3	-	-	10.7	0.100	0.062	2380	2650	0.000	0.068	ss:vf-fgr
SP007P	1312.34	1312.71	0.37	-	23.7	-	-	8.77	0.109	0.040	2360	2650	.000	0.032	ss:vf-fgr
SP008P	1312.71	1312.96	0.25	-	0.19	-	-	0.05	0.014	0.004	2670	2710	0.000	0.179	ss:vf-fgr:dol:pyr
SP009P	1312.96	1313.76	0.80	-	20.3	-	-	16.2	0.102	0.082	2390	2660	0.000	0.082	ss:vf-mgf:pyr
SP010P	1313.76	1315.03	1.27	-	3.15	-	-	4.00	0.073	0.093	2460	2650	0.000	0.026	ss:vf-mgr:arglam:pyr
SP011P	1315.03	1315.32	0.29	-	338.	-	-	98.0	0.173	0.050	2190	2640	0.000	0.290	ss:vf-mgr
SP012P	1315.32	1316.02	0.70	-	16.9	-	-	11.8	0.086	0.060	2420	2650	0.000	0.022	ss:vf-mgr
012A	1316.02	1316.19	0.17	-	0.09	-	-	0.02	0.038	0.006	2550	2650	0.000	0.052	ss:vf-fgr:ASTSP013P
NA	1316.19	1316.20	0.01	-	-	-	-	-	-	-	-	-	-	-	sh
SP013P	1316.20	1316.98	0.78	-	0.09	-	-	0.07	0.038	0.030	2550	2650	0.000	0.052	ss:vf-fgr
SP014P	1316.98	1317.36	0.38	-	1.18	-	-	0.45	0.062	0.024	2490	2650	0.000	0.038	ss:vf-mgr
SP015P	1317.36	1317.64	0.28	-	0.81	-	-	0.23	0.067	0.019	2470	2650	0.000	0.061	ss:vf-fgr

AGAT Laboratories

COMPANY : UNOCAL CANADA EXPLORATION LIMITED
WELL NAME : UCEL LIARD K-02
LOCATION : K-02-60-20-123-30
FORMATION : MATTSON
DRILLING FLUID : WATER BASE MUD

DATE : 97-01-28
W/O No : RC6319

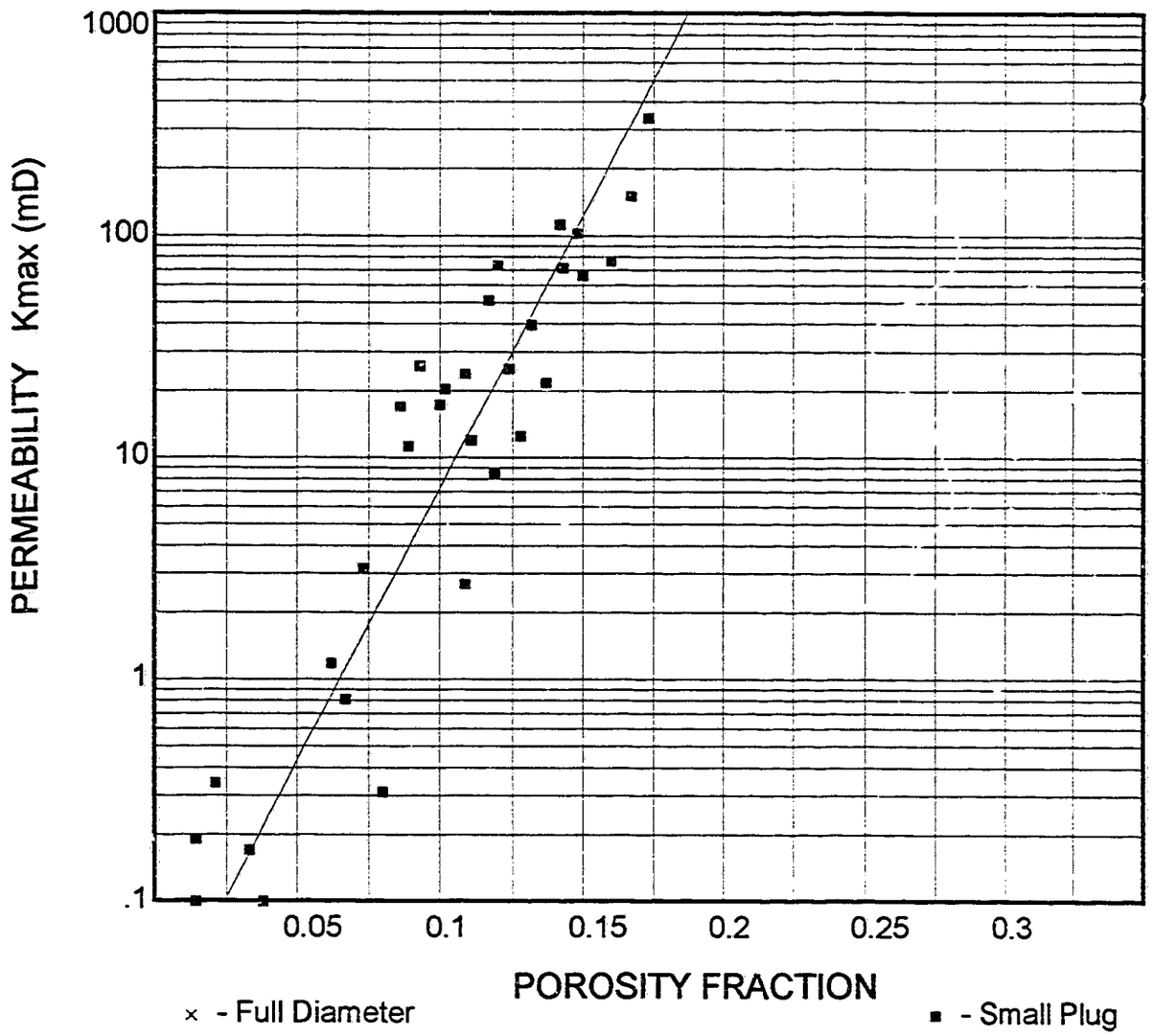
ROUTINE CORE ANALYSIS

Sample	interval (m) Top	interval (m) Base	Rep Thick (m)	Sample Length (m)	Gas Permeability Kmax (mD)	Gas Permeability K90 (mD)	Gas Permeability Kv (mD)	Capacity Kmax mD·m	Porosity	Capacity Ø·m	Density (Kg/m³) Bulk	Density (Kg/m³) Grain	Residual Saturation Oil	Residual Saturation Water	Remarks
SP016P	1317.64	1318.07	0.43	-	25.8	-	-	11.1	0.093	0.040	2400	2650	0.000	0.029	ss:vf-fgr
SP017P	1318.07	1318.37	0.30	-	51.0	-	-	15.3	0.117	0.035	2340	2650	0.000	0.125	ss:vf-fgr
SP018P	1318.37	1318.98	0.61	-	73.4	-	-	44.8	0.120	0.073	2330	2650	0.000	0.085	ss:vf-fgr
SP019P	1318.98	1319.42	0.44	-	39.5	-	-	17.4	0.132	0.058	2290	2650	0.000	0.080	ss:vf-fgr
SP020P	1319.42	1320.48	1.06	-	25.1	-	-	26.6	0.124	0.131	2320	2650	0.000	0.029	ss:vf-fgr
SP021P	1320.48	1320.89	0.41	-	11.9	-	-	4.88	0.111	0.046	2360	2650	0.000	0.096	ss:vf-fgr
SP022P	1320.89	1321.30	0.41	-	21.7	-	-	8.90	0.137	0.056	2280	2650	0.000	0.198	ss:vf-fgr
SP023P	1321.30	1322.35	1.05	-	112.	-	-	118.	0.142	0.149	2270	2650	0.000	0.060	ss:vf-fgr
SP024P	1322.35	1322.75	0.40	-	0.31	-	-	0.12	0.080	0.032	2440	2660	0.000	0.143	ss:vf-fgr
SP025P	1322.75	1323.56	0.81	-	150.	-	-	122.	0.167	0.135	2200	2640	0.000	0.157	ss:vf-fgr
SP026P	1323.56	1324.07	0.51	-	71.5	-	-	36.5	0.143	0.073	2270	2650	0.000	0.076	ss:vf-fgr
SP027P	1324.07	1324.54	0.47	-	102.	-	-	47.9	0.148	0.070	2250	2640	0.000	0.021	ss:vf-fgr
SP028P	1324.54	1324.98	0.44	-	8.47	-	-	3.73	0.119	0.052	2340	2650	0.000	0.017	ss:vf-fgr
SP029P	1324.98	1325.40	0.42	-	2.67	-	-	1.12	0.109	0.045	2370	2660	0.000	0.022	ss:vf-fgr
SP030P	1325.40	1327.00	1.60	-	12.5	-	-	20.0	0.128	0.205	2310	2650	0.000	0.046	ss:vf-fgr
SP031P	1327.00	1329.21	2.21	-	66.0	-	-	146.	0.150	0.332	2250	2640	0.000	0.078	ss:vf-fgr
SP032P	1329.21	1329.35	0.14	-	76.5	-	-	10.7	0.160	0.022	2220	2640	0.000	0.036	ss:vf-fgr

AGAT Laboratories

Company :	UNOCAL CANADA EXPLORATION LIMITED		
Location :	K-02-60-20-123-30	FIGURE :	1
Interval :	1309.50-1329.35m	W/O :	RC6319
Formation :	MATTSON	Date :	97-01-28

POROSITY-PERMEABILITY CORRELATION



× - Full Diameter ■ - Small Plug

Equation of Line :	Log (Kmax) = -1.59 + 24.51* Porosity
Correlation Coefficient	r = 0.94

AGAT® Laboratories

SAMPLE HANDLING

AGAT LABORATORIES CORE SERVICES

SAMPLE HANDLING AND ANALYSIS INFORMATION

Company : UNOCAL CANADA EXPLORATION LIMITED
Well : UCEL LIARD K-02
Location : K-02-60-20-123-30

Coring Equipment : Diamond
Coring Fluid : Water Base Mud
Core Diameter : 0.09 m
Total Cored : 19.85 m
Total Recovered : 19.85 m

W/O Number : RC6319
Date : 97-01-28

HANDLING

Core Transported in : Boxes
Cutting Solution : Water
Cleaning Solvent : Toluene
Extraction : Vapour Phase
Cleaning Time : 6 hours
Drying Equipment : Conventional oven
Drying Time/Temp : 3 hours @ 108°C

ANALYSIS

Grain volume measured by Boyle's Law using helium
Bulk volume measured by calipering on right-cylindrical samples
Fluid saturations by retort on end pieces
Permeability measured on 38.1 mm diameter drilled plugs

REMARKS

PETROPHYSICAL PROPERTIES DETERMINED ON PARTIALLY EXTRACTED SAMPLES.
NO FURTHER ANALYSIS REQUIRED BY CLIENT.
FIVE (5) SETS OF COLOR PHOTOS OF CORE.

AGAT Laboratories

ABBREVIATIONS

COMMON ABBREVIATIONS

abnt	Abundant
abv	Above
Alg	Algae (al)
alt	Altered (ing)
amor	Amorphous
Amph	Amphipora
ang	Angular
anhy	Anhydrite (ic)
app	Appear
apr	Apparent
aprox	Approximate (ly)
arg	Argillaceous
ark	Arkose (ic)
asph	Asphalt (ic)
AST	Assigned similar to (no actual sample taken)
apha	Aphanitic
bcm	Become (ing)
bd	Bed
bdd	Bedded
bdg	Bedding
Belm	Belemnites
bent	Bentonite (ic)
bf	Buff
biocl	Bioclastic
bioturb	Bioturbated
bit	Bitumen (inous)
bl	Blue (ish)
blk	Black
blky	Blocky
bnd	Band (ed)
Brac	Brachiopod
brec	Breccia (ted)
bri	Bright
brit	Brittle
brn	Brown
Bry	Bryozoa
bulb	Bulbous
bur	Burrowed
c	Coarse (ly)
calc	Calcite (areous)
carb	Carbonaceous
cbl	Cobble (64-256 mm)
Ceph	Cephalopod
cgl	Conglomerate
chk	Chalk (y)
chlor	Chlorite
cht	Chert
chty	Cherty
cl	Clastic
cln	Clean
clr	Clear
cly	Clay (ey)
com	Common
coq	Coquina
Cor	Coral
crbnt	Carbonate
Crin	Crinoid (al)
crm	Cream
crpxl	Cryptocrystalline
ctc	Contact
deb	Debris
decr	Decrease (ing)
desi	Desiccation
dism	Disseminated
dk	Dark (er)
dns	Dense (er)
dol	Dolomite (ic)
drsy	Drusy
dtrl	Detrital (us)
elg	Elongate
euhed	Euhedral
f	Fine (ly)
fau	Fauna
Fe	Iron-Ferruginous
Fe-mag	Feromagnesian
fenst	Fenestral
fis	Fissile
fl	Fill (ed)
fld	Feldspar (thic)
flk	Flake
flky	Flaky
flor	Fluorescence
flt	Fault (ed)
fltg	Floating
foram	Foraminifera
fos	Fossil (iferous)
fr	Fair
frac	Fracture (ed)
frag	Fragment (al)
fri	Friable
frmwk	Framework
fros	Frosted
g	Good
Gast	Gastropod
gl	Glass (y)
glau	Glauconite (ic)
gn	Green
gr	Grain (ed)
gran	Granular
grd	Grade (ed)
grnl	Granule (2-4 mm)
gy	Grey
gyp	Gypsum (iferous)

AGAT® Laboratories

COMMON ABBREVIATIONS (CONTINUED)

hd	Hard
hfrac	Horizontal Fracture
hi	High
hrtl	Horizontal
hvy	Heavy
hydc	Hydrocarbon
ig	Igneous
imbed	Imbedded
imp	Impression
incl	Included (sion)
incr	Increase
indst	Indistinct
intbd	Interbedded
intcl	Intraclast (s)
intfrag	Interfragmental
intgran	Intergranular
intlam	Interlaminated
intr	Intrusion (ive)
intv	Interval
intxl	Intercrystalline
ireg	Irregular
ird	Iridescent
intrsk	Intraskeletal
kao	Kaolin
lam	Laminated
lchd	Leached
len	Lentil (cular)
lith	Lithographic
lmy	Limy
lrg	Large (er)
ls	Limestone
lse	Loose
lstr	Lustre
lt	Light (er)
m	Medium
mar	Maroon
mas	Massive
mat	Material, matter
mica	Mica (ceous)
mic	Micro
mky	Milky
mnr	Minor
mnrl	Mineral (ized)
mnut	Minute
Mol	Mollusca
mot	Mottled
mrly	Marly
mtx	Matrix
n	No,none,non
nod	Nodule
num	Numerous
o	Oil
occ	Occasional
od	Odor
ool	Oolite (ic)
op	Opaque
org	Organic
orng	Orange
orth	Orthoclase
Ost	Ostracod
ovgth	Overgrowth
ox	Oxidized
p	Preliminary (as suffix)
pbl	Pebble (4-64 mm)
pel	Pellet
perm	permeability
pet	Petroleum (iferous)
phos	Phosphate (ic)
pk	Pink
plag	Plagioclase
plcy	Pelecypod
pl	Plant
plty	Platy
por	Porous (sity)
pos	Possible (ility)
p-p	Pin-Point
pred	Predominant (ly)
prim	Primary
prob	Probable (ly)
prom	Prominent (ly)
pt	Part (ly)
ptch	Patch (es)
ptg	Parting
purp	Purple
pyr	Pyrite (ic) (ized)
pyrbit	Pyrobitumen
qtz	Quartz
qtzc	Quartzitic
qtzs	Quartzose
rd	Round (ed)
repl	Replaced (ing) (ment)
rexl	Recrystallized
rmn	Remains (nant)
rr	Rare
rsns	Resinous
rthy	Earthy
s	Small
sa	Salt (y)
S	Sulphur
s&p	Salt & Pepper
sat	Saturated
sb	Sub

AGAT® Laboratories

COMMON ABBREVIATIONS (CONTINUED)

sc	Scales
scat	Scattered
sd	Sand (1/16 - 2mm)
sdy	Sandy
sec	Secondary
sed	Sediment (ary)
sft	Soft
sh	Shale
shad	Shadow
shy	Shaly
sid	Siderite (ic)
sil	Silica
sks	Slickensided
sl	Slight (ly)
sln	Solution
slt	Silt
sltst	Siltstone
slty	Silty
sm	Smooth
SP	Small Plug (as prefix)
sp	Spot (ted) (ty)
spec	Speck (led)
spl	Sample
srt	Sort (ed) (ing)
strg	Stringer
Strom	Stromatoporoid
stromlt	Stromatolite
struc	Structure
styl	Stylolite (ic)
suc	Sucrosic
sug	Sugary
sup	Supported
surf	Surface
sz	Size

tab	Tabular
tex	Texture
Tham	Thamnopora
thk	Thick
thn	Thin
thru	Throughout
tr	Trace
trnsl	Translucent
trnsp	Transparent
tt	Tight
tub	Tubular
uncons	Unconsolidated
unident	Unidentifiable
up	Upper
v	Very
var	Variable
vcol	Varicolored
vfrac	Vertical Fracture
vgt	Varigated
vn	Vein
vrtl	Vertical
vug	Vug (gy) (ular)
w	Well
wh	White
wk	Weak
wthrd	Weathered
wtr	Water
wvy	Wavy
wxy	Waxy
wsrt	Well sorted

xbd	Cross-bedded
xbdg	Cross-bedding
xi	Crystal (line)
xlam	Cross-laminated
yel	Yellow
zn	Zone
*	Broken core
/	With
>10000	Permeability over 10000 mD
<0.01	Permeability less than 0.01 mD
CC	Cracked Core
DR	Drilled
LC	Lost Core
RU	Rubble
mD	milliDarcy

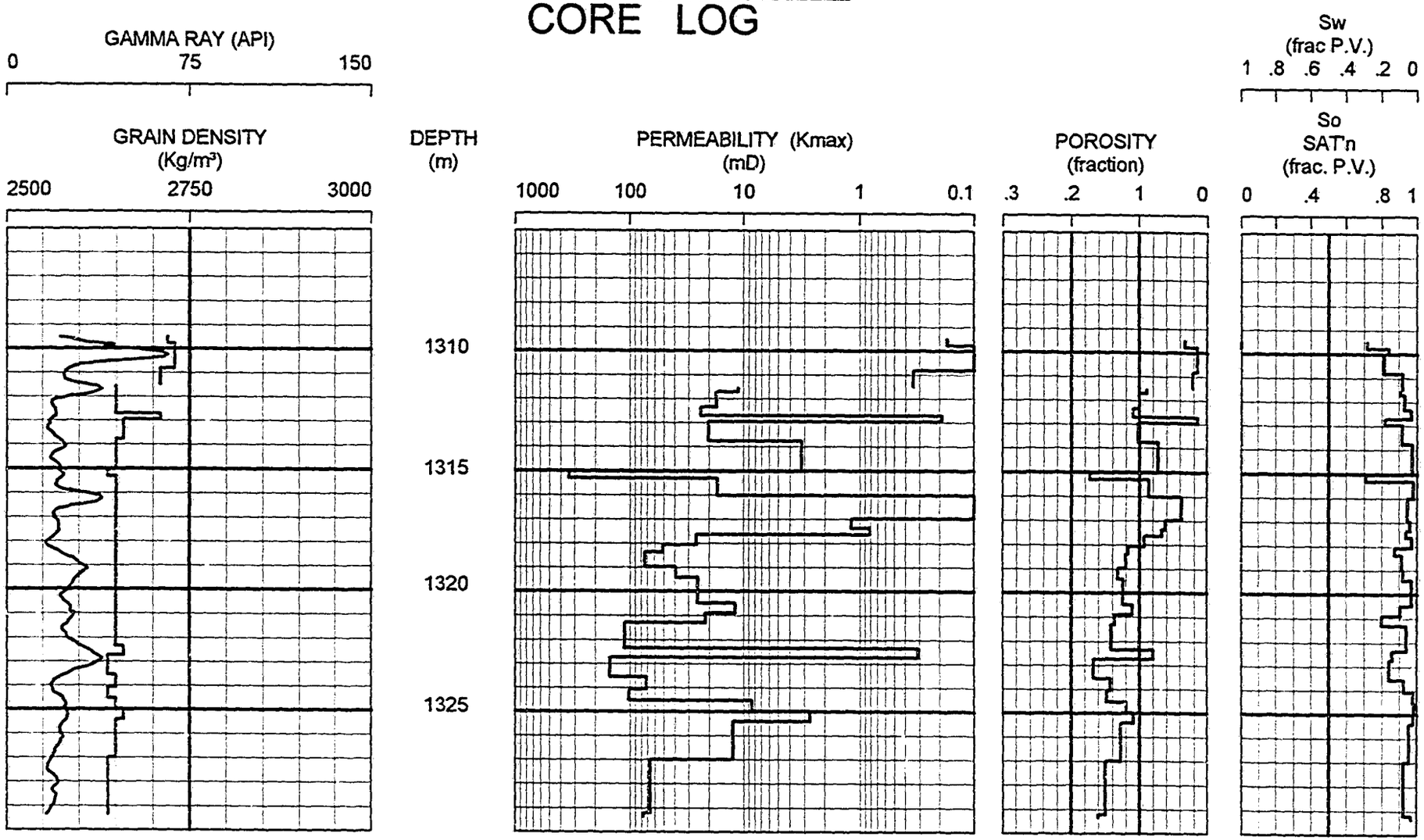
CORE LOG

Company : UNOCAL CANADA EXPLORATION LIMITED
Well Name : UCEL LIARD K-02
Field :
Location : K-02-60-20-123-30
Formation : MATTSON
W / O : RC6319

Recovery : 19.85m
Cored Interval : 1309.50-1329.35m
Drlg. Fld. : WATER BASE MUD
Elevation (KB) :

AGAT Laboratories

CORE LOG



3.3. **Lithology**

See Geological Report.

3.4. **Stratigraphic Column**

See Geological Report.

3.5. **Biostratigraphic Data**

Not applicable.

4. WELL EVALUATION

4.1. Openhole Logs

Submitted to NEB January 21 and January 30, 1997.

4.2. Other Logs

Submitted to NEB January 21 and January 30, 1997.

4.3. Synthetic Seismograms, Velocity Surveys, Vertical Seismic Profiles

4.3.1. Synthetic Seismogram - see next page. (removed - confidential till Jan 20, 2002

4.3.2. Velocity Surveys - Not applicable.

4.3.3. Vertical Seismic Profiles - Not applicable.

4.4. **Formation Stimulation**

Not applicable.

4.5. **Formation & Production Test Results (DST #1, #2, #3, #4, #5, #6, #7 & #8)**

Submitted to NEB January 29, 1997.

4.6. **Detailed Test Pressure Data Readings**

Not applicable.

4.7. **Environmental Well Report**

To be submitted upon completion of reclamation scheduled to be complete prior to break-up 1997.

4.8. **Appendices to Well History Report**

4.8.1. **Oil, Gas & Water Analyses**

Submitted to NEB as received.

4.8.2. **Reservoir Engineering Data on Cores & Cuttings, Porosity, Permeability, Fluid Saturation, Density Measurements, etc.**

See 3.2 of this report.

4.8.3. **Photographic Record of Core Under Natural & Ultra-Violet Light**

See 3.2 of this report..

4.8.4. **Details of Formation & Production Testing**

Not applicable.

4.8.5. **Petrological Reports**

See Geological Report.

4.8.6. **Paleontological Reports**

Not applicable.

4.8.7. **Palynological Reports**

Not applicable.

4.8.8. **Geochemical Reports**

See Geological Report.

4.8.9. **Age Determinations (K/Ar, etc.)**

Not applicable.

4.8.10. **Process Combination of Well Logs**

See 4.1 & 4.2 of this report.

4.8.11. **Deviation & Drift Records**

See 2.14 of this report.

4.8.12. **Gas Detector Log or Mud Logging Records**

See Geological Report.

4.8.13. **Completion Data ...**

Not applicable.

4.8.14. **Composite Well Record**

See 2.16 of this report.

4.8.15. **Final Survey Plan**

See 2.14 of this report.

4.8.16. **Mud Logger's Report**

See 2.16 of this report.

5. OTHER

5.1. Fluid Sample Report

See next pages.

UNOCAL CANADA EXPLORATION LTD.
UCEL LIARD k-02-60-20-123-30

FLUID SAMPLE REPORT

Prepared by

AGAT Laboratories

3700 - 21st Street N.E.
Calgary, Alberta
T2E 6V6

February 10, 1997
Work Order P1397

AGAT

FLUID SAMPLE SUMMARY TABLE

UNOCAL LIARD k-02-20-123-30

SAMPLE ID	SAMPLE POINT	SAMPLE DESCRIPTION	ANALYSES CONDUCTED	CONTAINER ID	GAS ANALYSIS
FIRST SET OF SAMPLES - Work Order 97C 4369					
2 3/4 Gallon MDT Tool		Opening Pressure 7584kPag, 6 1/2 L Mud/Water and small volume of gas	Routine Water Gas Analysis	PB 7G	98% Air - 2% Gas, Gas analysis attached
1 Gallon MDT Tool		Opening Pressure 2137kPag, 3 1/2 L Mud/Water and small volume of gas	Routine Water Gas Analysis	PB 6F	90% Air - 10% Gas, Gas analysis attached
450cc MDT Tool #3	Mud Column	Opening Pressure <100kPag, 450cc Mud/Water	Routine Water	PB 4D	
450cc MDT Tool #4		Opening Pressure <100kPag, 350cc Mud/Water	Routine Water	PB 5E	
DST #1 Top		1 L Oil/Water	Routine Water	PB 1A	
DST #1 - Middle of Recovery		500cc Cylinder of Gas	Gas Analysis		
DST #2 Top		1 L Oil/Water	Routine Water	PB 3C	
DST #4 Top		1 L Oil	Routine Oil	PB #2	
Work Order 97C 4420					
MID (DST #6?)		1 L Oil/Water	Routine Water	PB3B	
MID (DST #6?)		1 L Oil/Water	N/A		
TOP (DST #6?)		1 L Oil/Water	Routine Oil	PB#1	
SECOND SET OF SAMPLES - Work Order 97C 4375					
DST #6 SAMPLE #1	Top of Recover	1 L Mud/Water	Routine Water	PB1A	
DST #6 SAMPLE #2	300 m above tool	1 L Mud/Water	Routine Water	PB2B	
DST #6 SAMPLE #3	250 m above tool	1 L Mud/Water	Routine Water	PB3C	
DST #6 SAMPLE #4	150 m above tool	1 L Mud/Water	Routine Water	PB4D	
DST #6 SAMPLE #5	100 m above tool	1 L Mud/Water	Routine Water	PB5E	
DST #6 SAMPLE #6	50 m above tool	1 L Mud/Water	Routine Water	PB6F	
DST #6 SAMPLE #7	Top of test tool	1 L Mud/Water	Routine Water	PB7G	
DST #6 V5593	End of Preflow	500cc Gas Cylinder	Gas Analysis	CORE V5593	
DST#6 V5427	Main Flow Period	500cc Gas Cylinder	Gas Analysis	CORE V5427	

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PS 1A

LABORATORY NUMBER: W3698A

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UCEL LIARD K-02 60-20-123-30

ELEVATIONS: KB m / GRD m

FIELD OR AREA:

POOL OR ZONE:

NAME OF SAMPLER:

COMPANY: SAME

TEST TYPE / NO

TEST RECOVERY

SAMPLING POINT

AMT & TYPE OF CUSHION

MUD RESISTIVITY Ω m @ 25° C

TEST INTERVAL OR PERFS

TYPE OF PRODUCTION: PUMPING / FLOWING / GAS LIFT / SWAB

PRODUCTION RATES: WATER m³/d / OIL m³/d / GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE °C						

DATE SAMPLED (Y-M-D):

DATE RECEIVED (Y-M-D): 97-01-02

DATE REPORTED (Y-M-D): 97-01-08

ANALYST: LN NCO

OTHER INFORMATION: 1320.5m

ION	mg/L	MASS FRACTION	mmol/L
Na	782.0	0.322	34.0
K	10.0	0.004	0.3
Ca	14.3	0.006	0.4
Mg	4.2	0.002	0.2
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	2.4	0.001	TRC+

ION	mg/L	MASS FRACTION	mmol/L
Cl	195.0	0.080	5.5
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	823.0	0.339	13.5
SO_4	540.0	0.222	5.6
CO_3	60.0	0.025	1.0
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C	EVAPORATED AT 180° C
AT IGNITION	**CALCULATED**
	2430.0

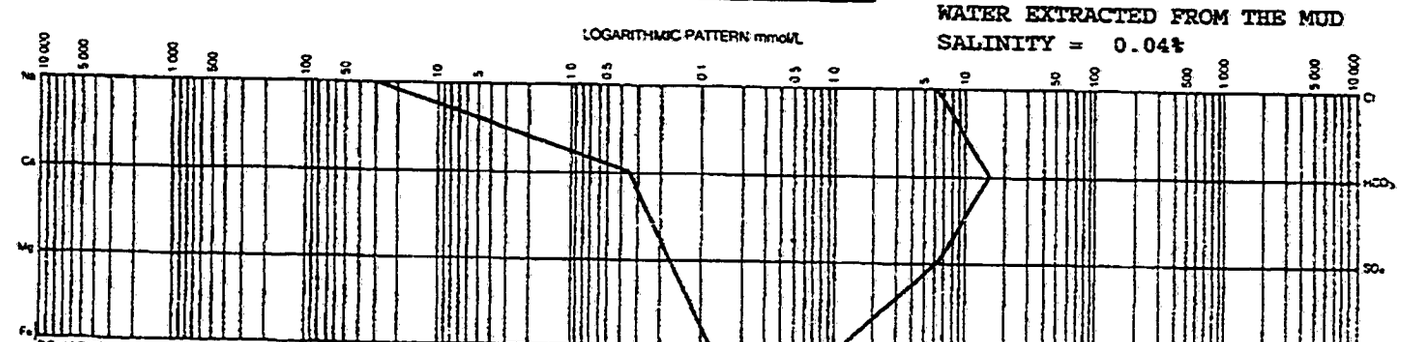
RELATIVE DENSITY	REFRACTIVE INDEX
0.998 @ 25°C	N.A. @ 25°C

OBSERVED pH	RESISTIVITY/OHM-m
8.96 @ 25°C	3.00 @ 25°C

THE '30 MINUTE' API MUD FILTRATE LOSS IS 9 mL. THE ABOVE RESULTS PERTAIN TO THE WATER EXTRACTED FROM THE MUD

SALINITY = 0.04%

LOGARITHMIC PATTERN mmol/L



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 1A

LABORATORY NUMBER: W3698A

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UCEL LIARD K-02 60-20-123-30

ELEVATIONS KB m: GRD m:

FIELD OR AREA:

POOL OR ZONE:

NAME OF SAMPLER:

COMPANY: SAME

TEST TYPE:

NO:

TEST RECOVERY:

SAMPLING POINT:

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25°C:

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE °C						

DATE SAMPLED (Y-M-D):

DATE RECEIVED (Y-M-D): 97-01-02

DATE REPORTED (Y-M-D): 97-01-08

ANALYST: LN NCO

OTHER INFORMATION: 1320.5m

ION	mg/L	MASS FRACTION	mmol/L
Na	782.0	0.322	34.0
K	10.0	0.004	0.3
Ca	14.3	0.006	0.4
Mg	4.2	0.002	0.2
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	2.4	0.001	TRC+

ION	mg/L	MASS FRACTION	mmol/L
Cl	195.0	0.080	5.5
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	823.0	0.339	13.5
SO_4	540.0	0.222	5.6
CO_3	60.0	0.025	1.0
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 2430.0

RELATIVE DENSITY: 0.998 @ 25°C

REFRACTIVE INDEX: N.A. @ 25°C

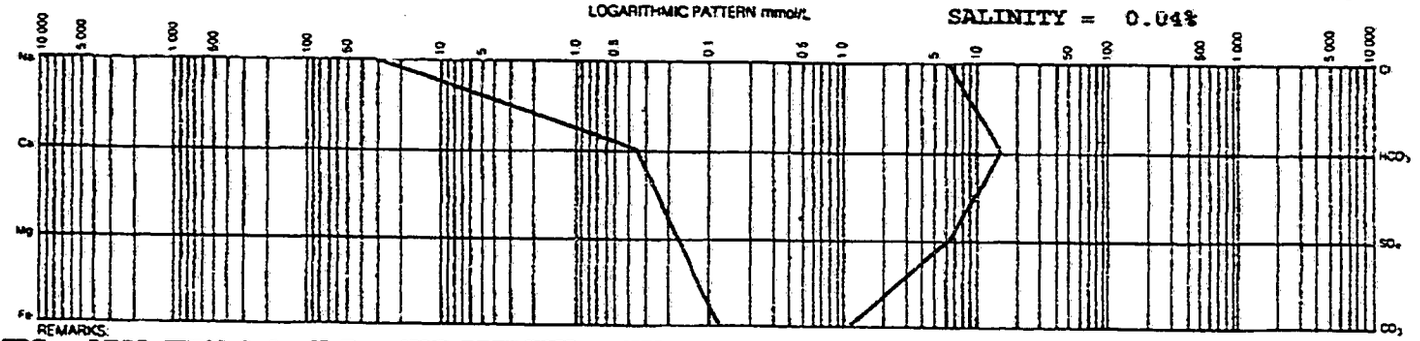
OBSERVED pH: 8.96 @ 25°C

RESISTIVITY/OHM-m: 3.00 @ 25°C

THE '30 MINUTE' API MUD FILTRATE LOSS IS 9 mL. THE ABOVE RESULTS PERTAIN TO THE WATER EXTRACTED FROM THE MUD

SALINITY = 0.04%

LOGARITHMIC PATTERN mmol/L



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 1A

LABORATORY NUMBER: W3698A

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UCEL LIARD K-02 60-20-123-30

ELEVATIONS KB m: GRD m:

FIELD OR AREA:

POOL OR ZONE:

NAME OF SAMPLER:

COMPANY: SAME

TEST TYPE: NO:

TEST RECOVERY:

SAMPLING POINT:

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25° C:

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE °C						

DATE SAMPLED (Y-M-D)	DATE RECEIVED (Y-M-D)	DATE REPORTED (Y-M-D)	ANALYST	OTHER INFORMATION
	97-01-02	97-01-08	LN NCO	1320.5m

ION	mg/L	MASS FRACTION	mmol/L
Na	782.0	0.322	34.0
K	10.0	0.004	0.3
Ca	14.3	0.006	0.4
Mg	4.2	0.002	0.2
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	2.4	0.001	TRC+

ION	mg/L	MASS FRACTION	mmol/L
Cl	195.0	0.080	5.5
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	823.0	0.339	13.5
SO_4	540.0	0.222	5.6
CO_3	60.0	0.025	1.0
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C	EVAPORATED AT 180° C
AT IGNITION	CALCULATED
	2430.0

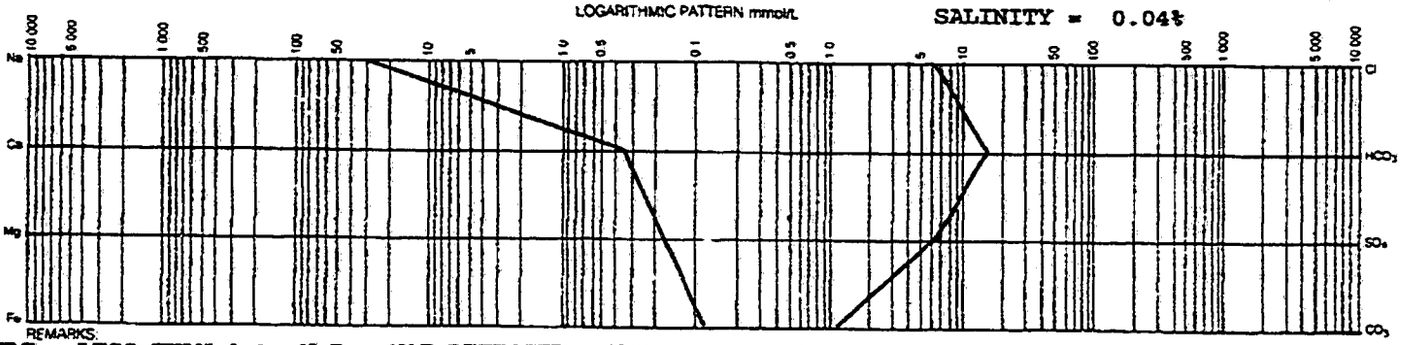
RELATIVE DENSITY	REFRACTIVE INDEX
0.998 @ 25° C	N.A. @ 25° C

OBSERVED pH	RESISTIVITY OHM-m
8.96 @ 25° C	3.00 @ 25° C

THE '30 MINUTE' API MUD FILTRATE LOSS IS 9 mL. THE ABOVE RESULTS PERTAIN TO THE WATER EXTRACTED FROM THE MUD

SALINITY = 0.04%

LOGARITHMIC PATTERN mmol/L



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 7G

LABORATORY NUMBER: W4369G

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME:

ELEVATIONS KB m: GRD m:

FIELD OR AREA:

POOL OR ZONE:

NAME OF SAMPLER:

COMPANY: SAME

TEST TYPE:

NO:

TEST RECOVERY:

SAMPLING POINT:

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25° C

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D)	DATE RECEIVED (Y-M-D)	DATE REPORTED (Y-M-D)	ANALYST	OTHER INFORMATION
	97-01-20	97-01-22	LN NCO	2 1/4 GAL MDT

ION	mg/L	MASS FRACTION	mmol/L
Na	554.0	0.310	24.1
K	8.3	0.005	0.2
Ca	17.4	0.010	0.4
Mg	4.0	0.002	0.2
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	4.4	0.002	0.1

ION	mg/L	MASS FRACTION	mmol/L
Cl	112.0	0.063	3.2
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	595.0	0.333	9.7
SO_4	456.0	0.255	4.8
CO_3	37.5	0.021	0.6
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

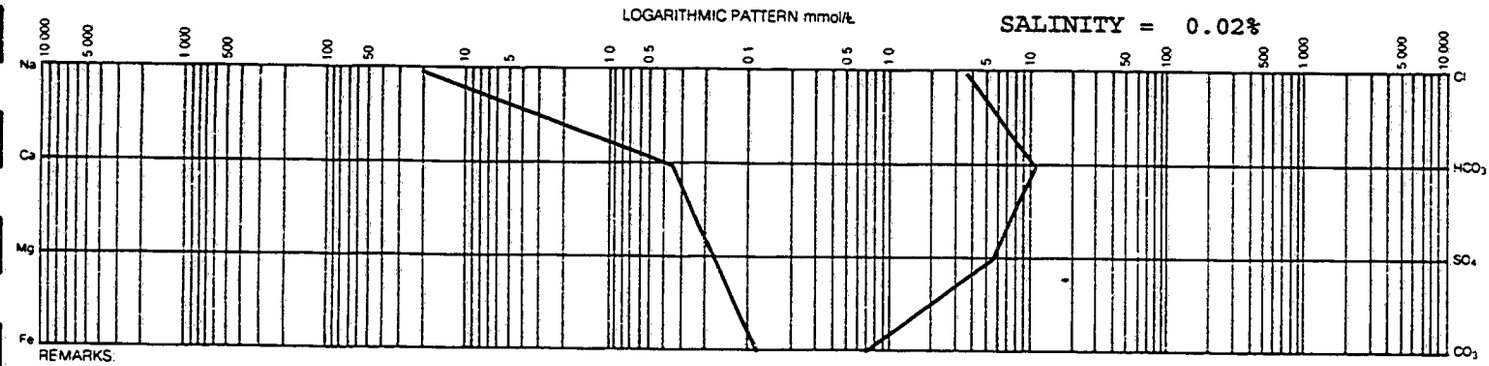
DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C	EVAPORATED AT 180° C
AT IGNITION	**CALCULATED**
-	1790.0

RELATIVE DENSITY	REFRACTIVE INDEX
0.995 @ 25° C	N.A. @ 25° C
OBSERVED pH	**RESISTIVITY/OHM •m**
8.91 @ 25° C	4.10 @ 25° C

LOGARITHMIC PATTERN mmol/L

SALINITY = 0.02%



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT® Laboratories

GAS ANALYSIS

CONTAINER IDENTIFICATION: CYL.#1

LABORATORY NUMBER: GP1520A

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER: 02-60-20-123-3

WELL NAME:

ELEVATIONS KB m: 379.3 GRD m:

FIELD OR AREA:

POOL OR ZONE:

NAME OF SAMPLER:

COMPANY:

TEST TYPE: NO:

TEST RECOVERY: GAS ANALYSIS OF CYL. #1 FROM 2 3/4 TOOL

TEST INTERVAL OR PERFS:

SAMPLING POINT:

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE °C						

DATE SAMPLED (Y-M-D): 97-01-16

DATE RECEIVED (Y-M-D): 97-01-21

DATE REPORTED (Y-M-D): 97-01-23

ANALYST: NCO

OTHER INFORMATION:

COMP	MOLE FRACTION AIR FREE AS RECEIVED	MOLE FRACTION AIR FREE ACID GAS FREE	PETROLEUM LIQUID CONTENT mL • m⁻³
H_2	0.0000	0.0000	
He	0.0000	0.0000	
N_2	0.3579	0.4462	
CO_2	0.1976	0.0000	
H_2S	0.0000	0.0000	
C_1	0.3310	0.4125	
C_2	0.0409	0.0509	
C_3	0.0283	0.0352	104.1
IC_4	0.0000	0.0000	0.0
NC_4	0.0175	0.0218	73.6
IC_5	0.0092	0.0114	44.9
NC_5	0.0133	0.0166	64.3
C_6	0.0043	0.0054	23.7
C_7 +	0.0000	0.0000	0.0
C_8			
C_9			
C_{10} +			
TOTAL	1.0000	1.0000	310.6

GROSS HEATING VALUE MJm⁻³ 15° C AND 101.325 kPa

MOISTURE AND ACID GAS FREE: 30.09

AIR FREE AS RECEIVED: 24.15

VAPOUR PRESSURE PENTANES PLUS: 107.1 kPa

RELATIVE DENSITY

MOISTURE FREE AS SAMPLED — MEASURED: CALCULATED: 1.019

MOISTURE AND ACID GAS FREE — MEASURED: CALCULATED: 0.896

PSEUDO CRITICAL PROPERTIES (CALCULATED)

AS SAMPLED — pPc (abs): 4675 kPa; pTc: 211.3 K

ACID GAS FREE — pPc (abs): 4008 kPa; pTc: 188.5 K

RELATIVE MOLECULAR MASS

TOTAL GAS: 29.5

C_{7+}: 0.0

H_2S g/m³: 0.00

REMARKS:

EXCEED NORMAL LIMITS : N2 ,CO2,nC5

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 6F

LABORATORY NUMBER: W4369F

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UNOCAL K02-60-20-123-30

ELEVATIONS: KB m 379.3 GRD m 374.5

FIELD OR AREA:

POOL OR ZONE:

NAME OF SAMPLER •:

COMPANY: SAME

TEST TYPE:

NO:

TEST RECOVERY:

SAMPLING POINT:

AMT & TYPE OF CUSHION:

MUD RESISTIVITY/ Ω m @ 25° C

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D):

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-22

ANALYST: LN NCO

OTHER INFORMATION: 1 GAL MDT

ION	mg/L	MASS FRACTION	mmol/L
Na	487.0	0.320	21.2
K	5.6	0.004	0.1
Ca	10.8	0.007	0.3
Mg	2.2	0.001	0.1
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	2.5	0.002	TRC+

ION	mg/L	MASS FRACTION	mmol/L
Cl	136.0	0.089	3.8
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	519.0	0.341	8.5
SO_4	330.0	0.217	3.4
CO_3	30.0	0.020	0.5
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 1520.0

RELATIVE DENSITY: 0.995@ 25° C

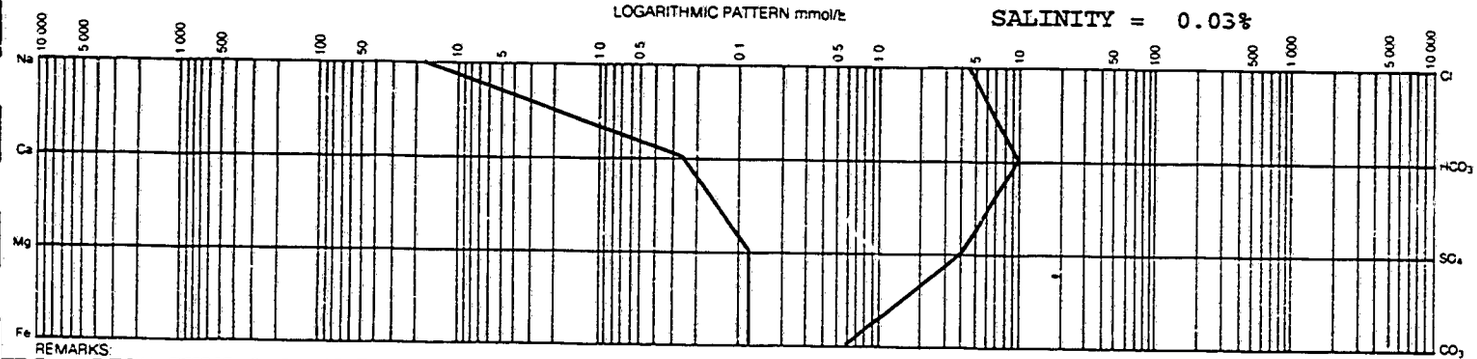
REFRACTIVE INDEX: N.A.@ 25° C

OBSERVED pH: 8.86@ 25° C

RESISTIVITY/OHM •m: 4.70@ 25° C

LOGARITHMIC PATTERN mmol/L

SALINITY = 0.03%



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT® Laboratories

GAS ANALYSIS

CONTAINER IDENTIFICATION: 1 GAL MDT

LABORATORY NUMBER: GP1520C

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER: 02-60-20-123-3

WELL NAME:

ELEVATIONS KB m: 379.3 GRD m:

FIELD OR AREA:

POOL OR ZONE:

NAME OF SAMPLER:

COMPANY:

TEST TYPE: NO:

TEST RECOVERY: GAS ANALYSIS OF 1 GAL. MDT

TEST INTERVAL OR PERFS:

SAMPLING POINT:

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE °C						

DATE SAMPLED (Y-M-D): 97-01-16

DATE RECEIVED (Y-M-D): 97-01-21

DATE REPORTED (Y-M-D): 97-01-23

ANALYST: NCO

OTHER INFORMATION:

COMP	MOLE FRACTION AIR FREE AS RECEIVED	MOLE FRACTION AIR FREE ACID GAS FREE	PETROLEUM LIQUID CONTENT mL • m⁻³
H_2	0.0008	0.0009	
He	0.0002	0.0002	
N_2	0.6701	0.6906	
CO_2	0.0298	0.0000	
H_2S	0.0000	0.0000	
C_1	0.2544	0.2622	
C_2	0.0157	0.0162	
C_3	0.0113	0.0117	41.8
iC_4	0.0039	0.0040	16.9
nC_4	0.0075	0.0078	31.8
iC_5	0.0023	0.0024	11.4
nC_5	0.0023	0.0023	11.0
C_6	0.0017	0.0017	9.1
C_7 +	0.0000	0.0000	0.0
C_8			
C_9			
C_{10}+			
TOTAL	1.0000	1.0000	122.0

GROSS HEATING VALUE MJm⁻³ 15° C AND 101.325 kPa

MOISTURE AND ACID GAS FREE: 14.51

AIR FREE AS RECEIVED: 14.08

VAPOUR PRESSURE PENTANES PLUS: 100.5 kPa

RELATIVE DENSITY

MOISTURE FREE AS SAMPLED — MEASURED: | CALCULATED: 0.907

MOISTURE AND ACID GAS FREE — MEASURED: | CALCULATED: 0.888

PSEUDO CRITICAL PROPERTIES (CALCULATED)

	AS SAMPLED		ACID GAS FREE	
	pPc (abs)	pTc	pPc (abs)	pTc
	3858 kPa	158.8 K	3750 kPa	154.3 K

RELATIVE MOLECULAR MASS

TOTAL GAS: 26.3 C_7+: 0.0

H_2S g/m³: 0.00

REMARKS:

EXCEED NORMAL LIMITS : N2

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 4D

LABORATORY NUMBER: W4369D

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UNOCAL K02-60-20-123-30

ELEVATIONS KB m: 379.3 GRD m: 374.5

FIELD OR AREA:

POOL OR ZONE:

NAME OF SAMPLER:

COMPANY: SAME

TEST TYPE:

NO:

TEST RECOVERY:

SAMPLING POINT:

AMT & TYPE OF CUSHION:

MUD RESISTIVITY/Ω m @ 25° C:

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE °C						

DATE SAMPLED (Y-M-D):

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-22

ANALYST: LN NCO

OTHER INFORMATION: SMALL BOTTOM TOOL

ION	mg/L	MASS FRACTION	mmol/L
Na	378.0	0.309	16.4
K	8.9	0.007	0.2
Ca	14.7	0.012	0.4
Mg	3.9	0.003	0.2
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	6.8	0.006	0.1

ION	mg/L	MASS FRACTION	mmol/L
Cl	138.0	0.113	3.9
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	412.0	0.337	6.7
SO_4	239.0	0.195	2.5
CO_3	22.5	0.018	0.4
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 1220.0

RELATIVE DENSITY: 1.000 @ 25° C

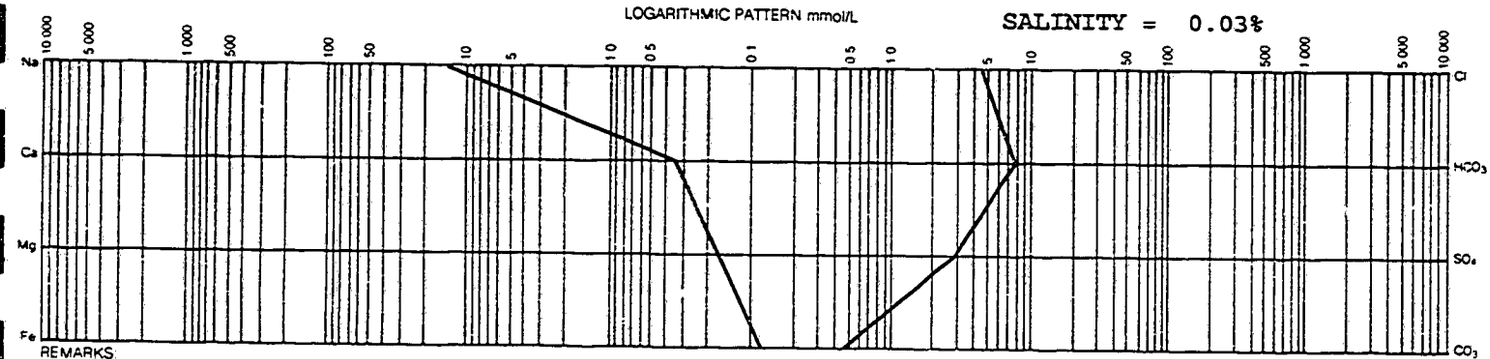
REFRACTIVE INDEX: N.A. @ 25° C

OBSERVED pH: 8.81 @ 25° C

RESISTIVITY/OHM-m: 5.70 @ 25° C

LOGARITHMIC PATTERN mmol/L

SALINITY = 0.03%



REMARKS

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 5E

LABORATORY NUMBER: W4369E

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME:

ELEVATIONS KB m: GRD m:

FIELD OR AREA:

POOL OR ZONE:

NAME OF SAMPLER:

COMPANY: SAME

TEST TYPE:

NO:

TEST RECOVERY:

SAMPLING POINT:

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25° C:

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D):

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-22

ANALYST: LN NCO

OTHER INFORMATION: SMALL MOT TOOL 4

ION	mg/L	MASS FRACTION	mmol/L
Na	840.0	0.336	36.5
K	6.4	0.003	0.2
Ca	16.8	0.007	0.4
Mg	2.0	0.001	0.1
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	2.6	0.001	TRC+

ION	mg/L	MASS FRACTION	mmol/L
Cl	144.0	0.058	4.1
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	824.0	0.329	13.5
SO_4	636.0	0.254	6.6
CO_3	30.0	0.012	0.5
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C	EVAPORATED AT 180° C
AT IGNITION	CALCULATED
	2500.0

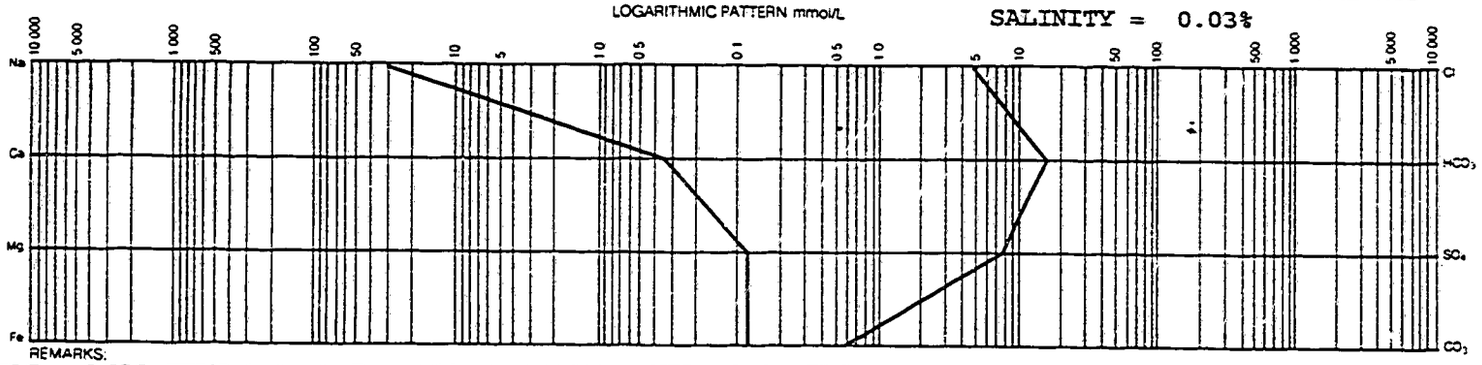
RELATIVE DENSITY	REFRACTIVE INDEX
0.997 @ 25° C	N.A. @ 25° C

OBSERVED pH	RESISTIVITY/OHM-m
8.67 @ 25° C	3.30 @ 25° C

THE '30 MINUTE' API MUD FILTRATE LOSS IS 11 mL. THE ABOVE RESULTS PERTAIN TO THE WATER EXTRACTED FROM THE MUD

SALINITY = 0.03%

LOGARITHMIC PATTERN mmol/L



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

THE IONIC BALANCE FOR THIS WATER EXCEEDS 10%, HOWEVER THE ANALYSIS HAS BEEN CONFIRMED. THE IMBALANCE IS CAUSED BY ANIONS NOT ANALYZED IN THE ROUTINE ANALYSIS.

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 1A

LABORATORY NUMBER: W4369A

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UNOCAL K 02-60-20-123-30

ELEVATIONS KB m: 379.3 GRD m: 374.50

FIELD OR AREA:

POOL OR ZONE: MATTSON

NAME OF SAMPLER:

COMPANY: SAME

TEST TYPE: DST NO: 1

TEST RECOVERY:

SAMPLING POINT: TOP OF RECOVERY

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25° C:

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE °C						

DATE SAMPLED (Y-M-D): 97-01-16

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-22

ANALYST: LN NCO

OTHER INFORMATION: 100m ABOVE TOOL

ION	mg/L	MASS FRACTION	mmol/L
Na	725.0	0.315	31.5
K	7.1	0.003	0.2
Ca	14.6	0.006	0.4
Mg	2.3	0.001	0.1
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	2.5	0.001	TRC+

ION	mg/L	MASS FRACTION	mmol/L
Cl	135.0	0.059	3.8
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	763.0	0.332	12.5
SO_4	604.0	0.263	6.3
CO_3	45.0	0.020	0.8
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 2300.0

RELATIVE DENSITY: 0.996 @ 25° C

REFRACTIVE INDEX: N.A. @ 25° C

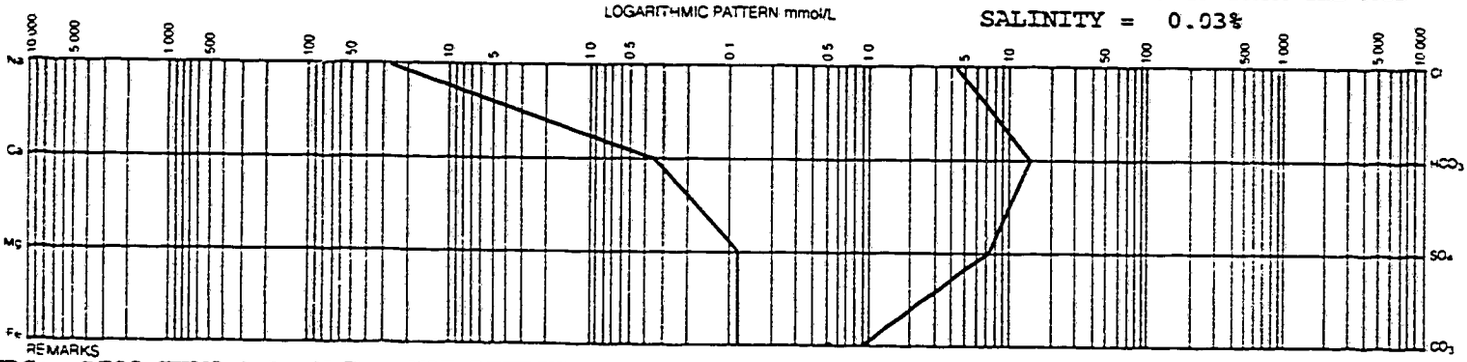
OBSERVED pH: 8.86 @ 25° C

RESISTIVITY/OHM-m: 2.90 @ 25° C

THE '30 MINUTE' API MUD FILTRATE LOSS IS 11 mL. THE ABOVE RESULTS PERTAIN TO THE WATER EXTRACTED FROM THE MUD

SALINITY = 0.03%

LOGARITHMIC PATTERN mmol/L



REMARKS

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT® Laboratories

GAS ANALYSIS

CONTAINER IDENTIFICATION:

LABORATORY NUMBER: GP1520

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER: 02-60-20-123-3

WELL NAME:

ELEVATIONS KB m: 379.3 GRD m:

FIELD OR AREA:

POOL OR ZONE:

NAME OF SAMPLER: DSI

COMPANY:

TEST TYPE:

NO:

TEST RECOVERY: GAS ANALYSIS OF DRILL PIPE

TEST INTERVAL OR PERFS:

SAMPLING POINT:

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE °C						

DATE SAMPLED (Y-M-D): 97-01-16

DATE RECEIVED (Y-M-D): 96-01-21

DATE REPORTED (Y-M-D): 97-01-23

ANALYST: NCO

OTHER INFORMATION:

COMP	MOLE FRACTION AIR FREE AS RECEIVED	MOLE FRACTION AIR FREE ACID GAS FREE	PETROLEUM LIQUID CONTENT mL • m⁻³
H_2	0.0000	0.0000	
He	0.0001	0.0001	
N_2	0.0165	0.0165	
CO_2	0.0000	0.0000	
H_2S	0.0000	0.0000	
C_1	0.8493	0.8493	
C_2	0.0834	0.0834	
C_3	0.0359	0.0359	132.2
iC_4	0.0026	0.0026	11.3
NC_4	0.0086	0.0086	36.1
iC_5	0.0012	0.0012	6.1
NC_5	0.0016	0.0016	7.7
C_6	0.0008	0.0008	4.6
C_{7+}	0.0000	0.0000	0.0
C_8			
C_9			
C_{10+}			
TOTAL	1.0000	1.0000	198.0

GROSS HEATING VALUE MJm⁻³ 15° C AND 101.325 kPa

MOISTURE AND ACID GAS FREE: 42.96

AIR FREE AS RECEIVED: 42.96

VAPOUR PRESSURE PENTANES PLUS: 102.0 kPa

RELATIVE DENSITY

MOISTURE FREE AS SAMPLED — MEASURED: CALCULATED: 0.660

MOISTURE AND ACID GAS FREE — MEASURED: CALCULATED: 0.660

PSEUDO CRITICAL PROPERTIES (CALCULATED)

AS SAMPLED — pPc (abs): 4580 kPa pTc: 209.1 K

ACID GAS FREE — pPc (abs): 4580 kPa pTc: 209.1 K

RELATIVE MOLECULAR MASS

TOTAL GAS: 19.1 C_{7+}: 0.0

H_2S g/m³: 0.00

REMARKS:

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 3C

LABORATORY NUMBER: W4369C

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UNOCAL K 02-60-20-123-30

ELEVATIONS KB m: 379.30 GRD m: 374.50

FIELD OR AREA:

POOL OR ZONE: MATTSON

NAME OF SAMPLER:

COMPANY: SAME

TEST TYPE: DST NO: 2

TEST RECOVERY:

SAMPLING POINT: TOP OF TEST TOOL

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25° C

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 97-01-16

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-22

ANALYST: LN NCO

OTHER INFORMATION:

ION	mg/L	MASS FRACTION	mmol/L
Na	820.0	0.263	35.7
K	141.0	0.045	3.6
Ca	38.5	0.012	1.0
Mg	62.6	0.020	2.6
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	210.0	0.067	3.8

ION	mg/L	MASS FRACTION	mmol/L
Cl	200.0	0.064	5.7
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	946.0	0.304	15.5
SO_4	604.0	0.194	6.3
CO_3	90.0	0.029	1.5
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 3110.0

RELATIVE DENSITY: 1.000 @ 25° C

REFRACTIVE INDEX: N.A. @ 25° C

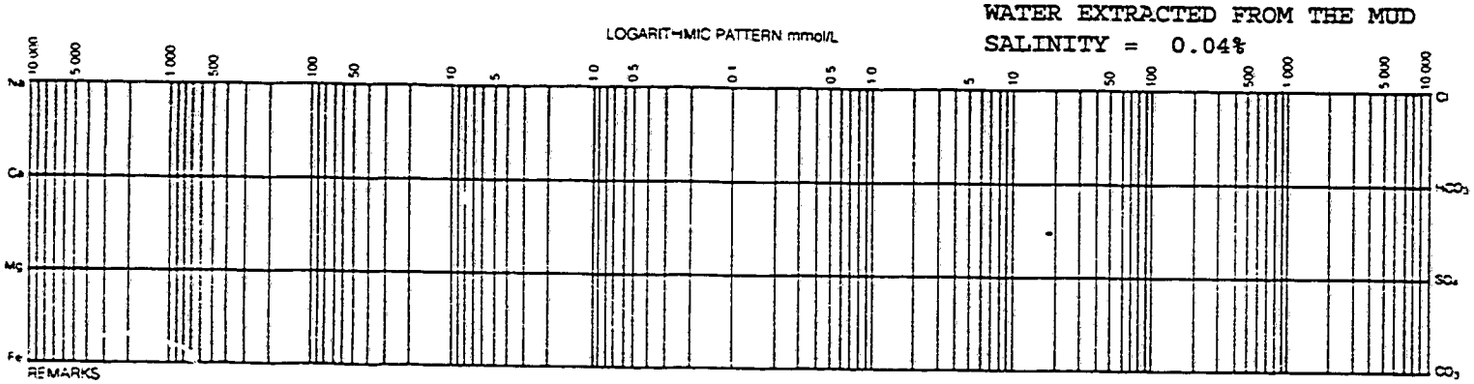
OBSERVED pH: 8.59 @ 25° C

RESISTIVITY Ohm-m: 2.70 @ 25° C

THE '30 MINUTE' API MUD FILTRATE LOSS IS 6 mL. THE ABOVE RESULTS PERTAIN TO THE WATER EXTRACTED FROM THE MUD

SALINITY = 0.04%

LOGARITHMIC PATTERN mmol/L



REMARKS

CATION AND ANION TOTALS DIFFER BY 37.90 ANION SUM = 36.7 CATION SUM = 53.9

AGAT® Laboratories

OIL ANALYSIS

CONTAINER IDENTIFICATION: PB#2

LABORATORY NUMBER: 04369B

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UNOCAL K 02-60-20-123-30

ELEVATIONS KB m: 379.30 GRD m: 374.50

FIELD OR AREA:

POOL OR ZONE: MATTSON

NAME OF SAMPLER:

COMPANY: SAME

TEST TYPE: DST NO: 4

TEST RECOVERY:

SAMPLING POINT: TOP OF RECOVERY

AMT & TYPE OF CUSHION:

MUD RESISTIVITY/ Ω m @25° C

TEST INTERVAL OR PERFS:

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 97-01-16

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-22

ANALYST: BRK NCO

OTHER INFORMATION:

SAMPLE PROPERTIES

B.S. & W. (VOLUME FRACTION)

COLOUR OF CLEAN OIL	WATER	SEDIMENT	TOTAL
DARK BROWN	TRACE	TRACE	TRACE

COLOUR NUMBER ASTM D-1500: D8 A.S.T.M.

DENSITY

RELATIVE		ABSOLUTE kg*m^{-3}	
AS RECEIVED	AFTER CLEANING	AS RECEIVED	AFTER CLEANING
	0.8513		850.5

API GRAVITY @ 15° C: 34.72

TOTAL SULPHUR (MASS FRACTION)	TOTAL SALT g*m^{-3}	POUR POINT / ° C U.S.B.M.	A.S.T.M.
0.00283			0

RVP/kPa	CARBON RESIDUE (MASS FRACTION) CONRADSON	RAMSBOTTOM

VISCOSITY

TEMP / °C	ABSOLUTE/mPa*s	KINEMATIC/mm^2*s^{-1}
25	10.95	12.97
38	6.95	8.31
50	4.96	5.99

DISTILLATION

VOLUME FRACTION	TEMP. / °C
0.05	111.3
0.10	144.7
0.15	181.1
0.20	220.6
0.25	261.0
0.30	289.3
0.35	316.6
0.40	341.9
0.45	360.1
0.50	
0.55	
0.60	
0.65	
0.70	
0.75	
0.80	
0.85	
0.90	
0.95	
1.00	
F.B.P	362.1
CRACKED	

METHOD: A.S.T.M.-D86*

INITIAL BOILING POINT: 65.8

ABS BAROM PRESS/kPa: 88.7

ROOM TEMP./°C: 22.0

DISTILLATION SUMMARY (VOLUME FRACTION)

200° C NAPHTHA	275° C KEROSENE	350° C LIGHT GAS OIL
.18	.27	.42

RECOVERED	RESIDUE	DISTILLATION LOSS
.47	.51	.02

CHARACTERIZATION FACTOR: 12.1

REMARKS: * THE DISTILLATION TEMPERATURES HAVE BEEN CORRECTED TO 101.3 KPA(ABS).

SAMPLE CONTAINS 11.6% FREE SEDIMENT BY VOLUME.

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 3B

LABORATORY NUMBER: W4420B

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME:

ELEVATIONS KB m: GRD m:

FIELD OR AREA:

POOL OR ZONE:

NAME OF SAMPLER:

COMPANY: SAME

TEST TYPE: DST

NO: 6

TEST RECOVERY:

SAMPLING POINT: MIDDLE

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25° C:

TEST INTERVAL OR PERFS:

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D):

DATE RECEIVED (Y-M-D): 97-01-21

DATE REPORTED (Y-M-D): 97-01-29

ANALYST: LN NCO

OTHER INFORMATION:

ION	mg/L	MASS FRACTION	mmol/L
Na	994.0	0.291	43.2
K	114.0	0.033	2.9
Ca	57.6	0.017	1.4
Mg	143.0	0.042	5.9
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	260.0	0.076	4.7

ION	mg/L	MASS FRACTION	mmol/L
Cl	153.0	0.045	4.3
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	1060.0	0.310	17.3
SO_4	553.0	0.162	5.8
CO_3	81.0	0.024	1.4
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 3420.0

RELATIVE DENSITY: 1.000 @ 25° C

REFRACTIVE INDEX: N.A. @ 25° C

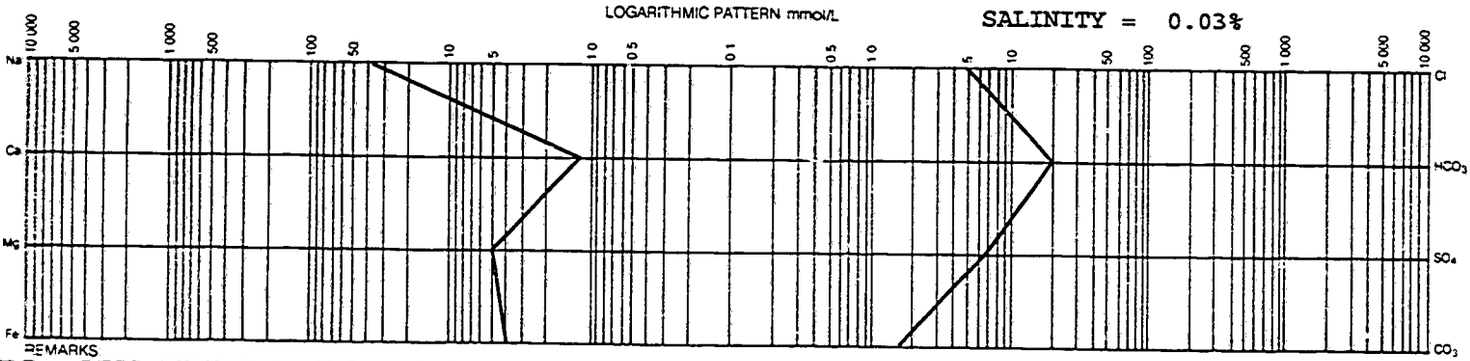
OBSERVED pH: 9.02 @ 25° C

RESISTIVITY OHM •m: 3.17 @ 25° C

THE IONIC BALANCE FOR THIS WATER EXCEEDS 10%. THE IMBALANCE IS CAUSED BY ** ANIONS ** NOT ANALYZED

SALINITY = 0.03%

LOGARITHMIC PATTERN mmol/L



REMARKS

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT® Laboratories

OIL ANALYSIS

CONTAINER IDENTIFICATION: PB #1

LABORATORY NUMBER: 04420A

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME:

ELEVATIONS KB m: GRD m:

FIELD OR AREA:

POOL OR ZONE:

NAME OF SAMPLER:

COMPANY: SAME

TEST TYPE:

NO:

TEST RECOVERY:

SAMPLING POINT: TOP

AMT & TYPE OF CUSHION:

MUD RESISTIVITY/ Ω m @25° C:

TEST INTERVAL OR PERFS:

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D):

DATE RECEIVED (Y-M-D): 97-01-21

DATE REPORTED (Y-M-D): 97-01-23

ANALYST: KBR NCO

OTHER INFORMATION:

SAMPLE PROPERTIES

B.S. & W. (VOLUME FRACTION)

COLOUR OF CLEAN OIL	WATER	SEDIMENT	TOTAL
DARK BROWN	TRACE	TRACE	TRACE

COLOUR NUMBER ASTM D-1500: D8 A.S.T.M.

DENSITY

RELATIVE		ABSOLUTE g/kg*m^{-3}	
AS RECEIVED	AFTER CLEANING	AS RECEIVED	AFTER CLEANING
	0.8543		853.5

API GRAVITY @ 15° C: 34.14

TOTAL SULPHUR (MASS FRACTION): 0.00282

TOTAL SALT g*m^{-3}:

POUR POINT / ° C

U.S.B.M.	A.S.T.M.
	3

RVP/kPa:

CARBON RESIDUE (MASS FRACTION)

CONRADSON	RAMSBOTTOM

VISCOSITY		
TEMP / °C	ABSOLUTE/mPa*s	KINEMATIC/mm^2*s^{-1}
25	21.16	24.98
38	13.05	15.56
50	8.84	10.63

DISTILLATION

VOLUME FRACTION	TEMP / °C
0.05	104.4
0.10	139.8
0.15	176.3
0.20	212.7
0.25	251.1
0.30	281.5
0.35	309.8
0.40	338.2
0.45	365.5
0.50	
0.55	
0.60	
0.65	
0.70	
0.75	
0.80	
0.85	
0.90	
0.95	
1.00	
F.B.P	367.5
CRACKED	

METHOD: A.S.T.M.-D86*

INITIAL BOILING POINT: 66.0

ABS BAROM PRESS/kPa: 88.2

ROOM TEMP./°C: 21.0

DISTILLATION SUMMARY (VOLUME FRACTION)

200° C NAPHTHA	275° C KEROSENE	350° C LIGHT GAS OIL
.18	.28	.42

RECOVERED	RESIDUE	DISTILLATION LOSS
.47	.51	.02

CHARACTERIZATION FACTOR: 12.5

REMARKS: * THE DISTILLATION TEMPERATURES HAVE BEEN CORRECTED TO 101.3 KPA(ABS). SAMPLE CONTAINS 44.7% FREE WATER BY VOLUME.

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 1A

LABORATORY NUMBER: W4375A

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UCEL LIARD d-02-60-20-123-30

ELEVATIONS KB m: 379.3 GRD m: 374.5

FIELD OR AREA:

POOL OR ZONE: MATTSON

NAME OF SAMPLER:

COMPANY: DOWNHOLE SYSTEM

TEST TYPE: DST NO: 6

TEST RECOVERY:

SAMPLING POINT: TOP OF RECOVERY

AMT & TYPE OF CUSHION:

MUD RESISTIVITY/ Ω m @ 25° C

TEST INTERVAL OR PERFS: 1299.0-1329.6 mKB

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 97-01-17

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-24

ANALYST: LN NCO

OTHER INFORMATION:

ION	mg/L	MASS FRACTION	mmol/L
Na	782.0	0.315	34.0
K	6.5	0.003	0.2
Ca	17.7	0.007	0.4
Mg	3.3	0.001	0.1
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	5.3	0.002	0.1

ION	mg/L	MASS FRACTION	mmol/L
Cl	143.0	0.058	4.0
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	915.0	0.368	15.0
SO_4	582.0	0.234	6.1
CO_3	30.0	0.012	0.5
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 2480.0

RELATIVE DENSITY: 0.997 @ 25° C

REFRACTIVE INDEX: N.A. @ 25° C

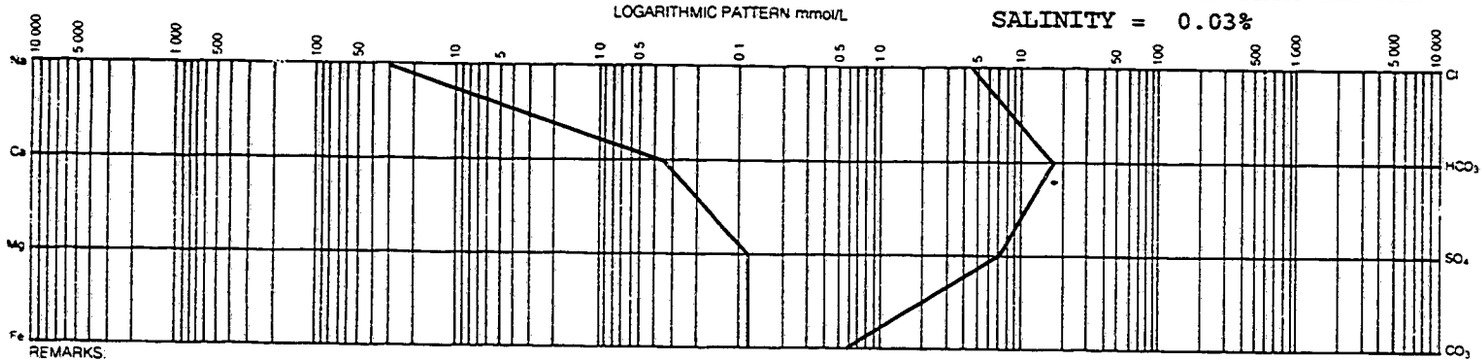
OBSERVED pH: 8.50 @ 25° C

RESISTIVITY/OHM-m: 3.13 @ 25° C

THE '30 MINUTE' API MUD FILTRATE LOSS IS 6 mL. THE ABOVE RESULTS PERTAIN TO THE WATER EXTRACTED FROM THE MUD

SALINITY = 0.03%

LOGARITHMIC PATTERN mmol/L



REMARKS:

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 2B

LABORATORY NUMBER: W4375B

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UCEL LIARD d-02-60-20-123-30

ELEVATIONS KB m: 379.3 GRD m: 374.5

FIELD OR AREA:

POOL OR ZONE: MATTSON

NAME OF SAMPLER:

COMPANY: DOWNHOLE SYSTEM

TEST TYPE: DST NO: 6

TEST RECOVERY:

SAMPLING POINT: ABOVE TOOL

AMT & TYPE OF CUSHION:

MUD RESISTIVITY/Ω m @ 25° C

TEST INTERVAL OR PERFS: 1299.0-1329.6 mKB

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 97-01-17

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-24

ANALYST: LN . NCO

OTHER INFORMATION: 300m ABOVE TOOL

ION	mg/L	MASS FRACTION	mmol/L
Na	836.0	0.309	36.4
K	141.0	0.052	3.6
Ca	19.2	0.007	0.5
Mg	3.6	0.001	0.1
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	3.6	0.001	0.1

ION	mg/L	MASS FRACTION	mmol/L
Cl	140.0	0.052	4.0
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	801.0	0.297	13.1
SO_4	727.0	0.269	7.6
CO_3	30.0	0.011	0.5
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C	EVAPORATED AT 180° C
AT IGNITION	**CALCULATED**
	2700.0

RELATIVE DENSITY: 0.997 @ 25° C

REFRACTIVE INDEX: N.A. @ 25° C

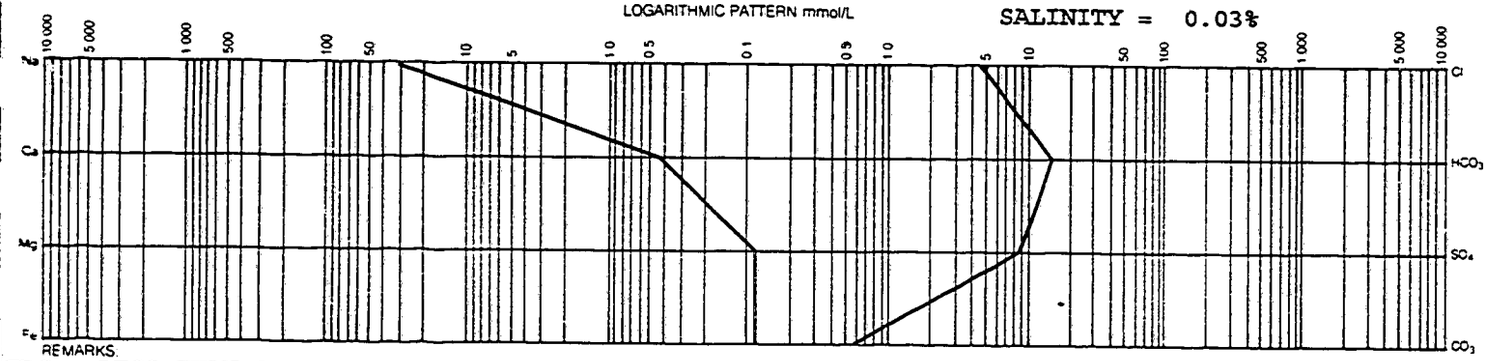
OBSERVED pH: 8.66 @ 25° C

RESISTIVITY/OHM-m: 2.66 @ 25° C

THE '30 MINUTE' API MUD FILTRATE LOSS IS 7 mL. THE ABOVE RESULTS PERTAIN TO THE WATER EXTRACTED FROM THE MUD

SALINITY = 0.03%

LOGARITHMIC PATTERN mmol/L



REMARKS

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

THE IONIC BALANCE FOR THIS WATER EXCEEDS 10%, HOWEVER THE ANALYSIS HAS BEEN CONFIRMED. THE IMBALANCE IS CAUSED BY ANIONS NOT ANALYZED IN THE ROUTINE ANALYSIS.

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 3C

LABORATORY NUMBER: W4375C

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UCEL LIARD d-02-60-20-123-30

ELEVATIONS KB m: 379.3 GRD m: 374.5

FIELD OR AREA:

POOL OR ZONE: MATTSON

NAME OF SAMPLER:

COMPANY: DOWNHOLE SYSTEM

TEST TYPE: DST NO: 6

TEST RECOVERY:

SAMPLING POINT: ABOVE TOOL

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25° C

TEST INTERVAL OR PERFS: 1299.0-1329.6 mKB

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 97-01-17

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-24

ANALYST: LN NCO

OTHER INFORMATION: 250m ABOVE TOOL

ION	mg/L	MASS FRACTION	mmol/L
Na	798.0	0.319	34.7
K	6.0	0.002	0.2
Ca	18.3	0.007	0.5
Mg	3.3	0.001	0.1
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	3.1	0.001	0.1

ION	mg/L	MASS FRACTION	mmol/L
Cl	276.0	0.110	7.8
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	885.0	0.354	14.5
SO_4	497.0	0.199	5.2
CO_3	15.0	0.006	0.3
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

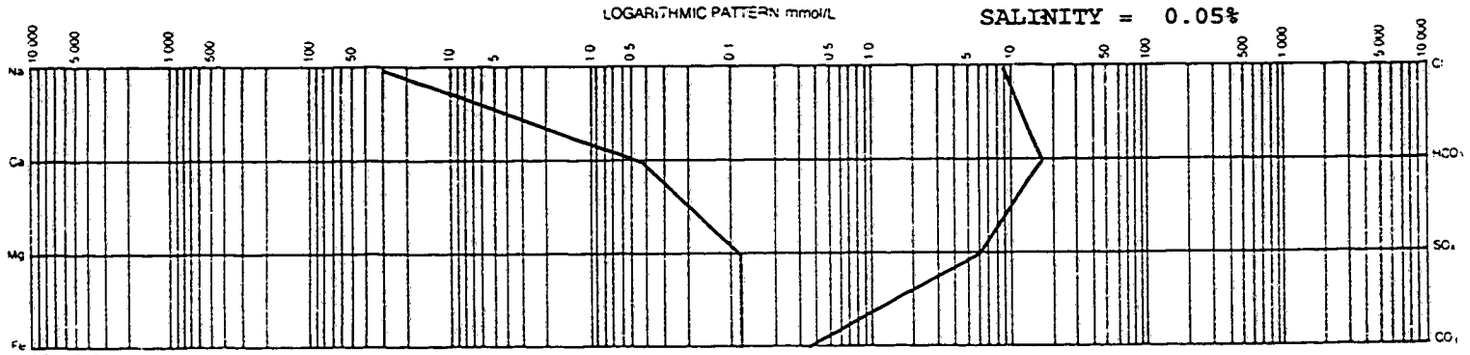
EVAPORATED AT 110° C	EVAPORATED AT 180° C
AT IGNITION	**CALCULATED**
	2500.0

RELATIVE DENSITY	REFRACTIVE INDEX
0.997 @ 25° C	N.A. @ 25° C
OBSERVED pH	**RESISTIVITY OHM-m**
8.40 @ 25° C	2.54 @ 25° C

THE '30 MINUTE' API MUD FILTRATE LOSS IS 6 mL. THE ABOVE RESULTS PERTAIN TO THE WATER EXTRACTED FROM THE MUD

SALINITY = 0.05%

LOGARITHMIC PATTERN mmol/L



REMARKS

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 4D

LABORATORY NUMBER: W4375D

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UCEL LIARD d-02-60-20-123-30

ELEVATIONS KB m: 379.3 GRD m: 374.5

FIELD OR AREA:

POOL OR ZONE: MATTSON

NAME OF SAMPLER:

COMPANY: DOWNHOLE SYSTEM

TEST TYPE: DST NO: 6

TEST RECOVERY:

SAMPLING POINT: ABOVE TOOL

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25° C:

TEST INTERVAL OR PERFS: 1299.0-1329.6 mKB

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 97-01-17

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-24

ANALYST: LN NCO

OTHER INFORMATION: 150m ABOVE TOOL

ION	mg/L	MASS FRACTION	mmol/L
Na	725.0	0.307	31.5
K	13.1	0.006	0.3
Ca	18.2	0.008	0.5
Mg	2.5	0.001	0.1
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	2.7	0.001	TRC+

ION	mg/L	MASS FRACTION	mmol/L
Cl	111.0	0.047	3.1
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	946.0	0.401	15.5
SO_4	526.0	0.223	5.5
CO_3	15.0	0.006	0.3
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C	EVAPORATED AT 180° C
AT IGNITION	CALCULATED
	2360.0

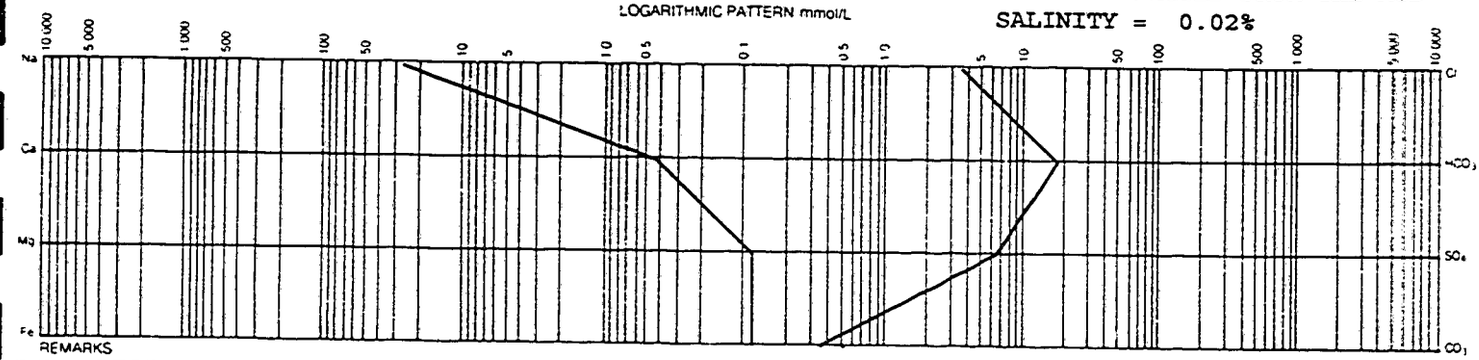
RELATIVE DENSITY	REFRACTIVE INDEX
0.997 @ 25° C	N.A. @ 25° C

OBSERVED pH	RESISTIVITY/OHM-m
8.49 @ 25° C	3.44 @ 25° C

THE '30 MINUTE' API MUD FILTRATE LOSS IS 11 mL. THE ABOVE RESULTS PERTAIN TO THE WATER EXTRACTED FROM THE MUD

SALINITY = 0.02%

LOGARITHMIC PATTERN mmol/L



REMARKS

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 5E

LABORATORY NUMBER: W4375E

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UCEL LIARD d-02-60-20-123-30

ELEVATIONS KB m: 379.3 GRD m: 374.5

FIELD OR AREA:

POOL OR ZONE: MATTSON

NAME OF SAMPLER:

COMPANY: DOWNHOLE SYSTEM

TEST TYPE: DST NO: 6

TEST RECOVERY:

SAMPLING POINT: ABOVE TOOL

AMT & TYPE OF CUSHION:

MUD RESISTIVITY Ω m @ 25° C:

TEST INTERVAL OR PERFS: 1299.0-1329.6 mKB

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10³ m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 97-01-17

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-24

ANALYST: LN NCO

OTHER INFORMATION: 100m ABOVE TOOL

ION	mg/L	MASS FRACTION	mmol/L
Na	684.0	0.309	29.8
K	9.0	0.004	0.2
Ca	14.1	0.006	0.4
Mg	3.2	0.001	0.1
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	2.4	0.001	TRC+

ION	mg/L	MASS FRACTION	mmol/L
Cl	118.0	0.053	3.3
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	855.0	0.387	14.0
SO_4	515.0	0.233	5.4
CO_3	11.0	0.005	0.2
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 2210.0

RELATIVE DENSITY: 0.997 @ 25° C

REFRACTIVE INDEX: N.A. @ 25° C

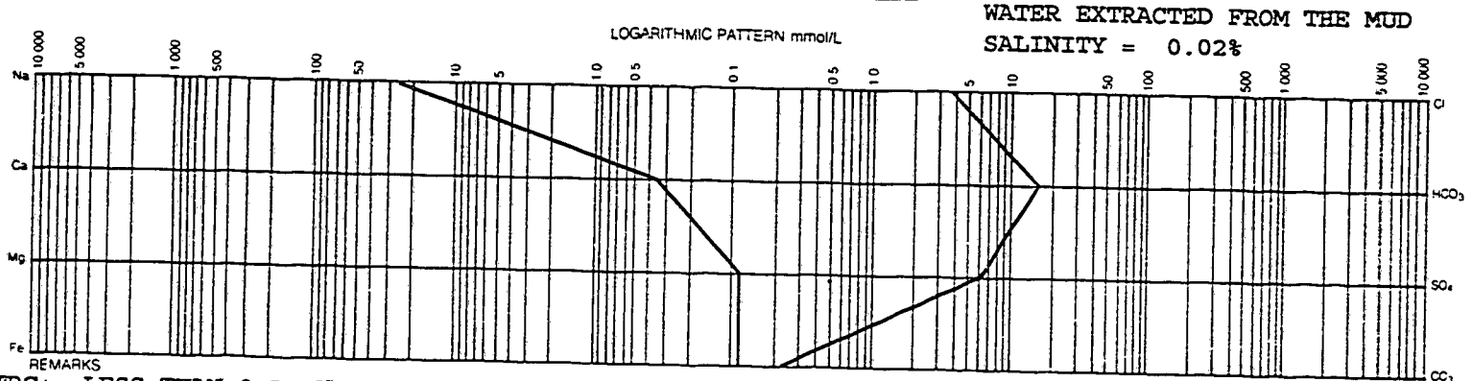
OBSERVED pH: 8.41 @ 25° C

RESISTIVITY/OHM·m: 3.65 @ 25° C

THE '30 MINUTE' API MUD FILTRATE LOSS IS 14 mL. THE ABOVE RESULTS PERTAIN TO THE WATER EXTRACTED FROM THE MUD

SALINITY = 0.02%

LOGARITHMIC PATTERN mmol/L



REMARKS

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 6F

LABORATORY NUMBER: W4375F

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UCEL LIARD d-02-60-20-123-30

ELEVATIONS KB m: 379.3 GRD m: 374.5

FIELD OR AREA:

POOL OR ZONE: MATTSON

NAME OF SAMPLER:

COMPANY: DOWNHOLE SYSTEM

TEST TYPE: DST NO: 6

TEST RECOVERY:

SAMPLING POINT: ABOVE TOOL

AMT & TYPE OF CUSHION:

MUD RESISTIVITY/Ω m @ 25° C

TEST INTERVAL OR PERFS: 1299.0-1329.6 mKB

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10^3 m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 97-01-17

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-24

ANALYST: LN NCO

OTHER INFORMATION: 50m ABOVE TOOL

ION	mg/L	MASS FRACTION	mmol/L
Na	751.0	0.276	32.7
K	87.4	0.032	2.2
Ca	23.9	0.009	0.6
Mg	41.0	0.015	1.7
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	133.0	0.049	2.4

ION	mg/L	MASS FRACTION	mmol/L
Cl	211.0	0.077	5.9
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	939.0	0.345	15.4
SO_4	519.0	0.191	5.4
CO_3	18.0	0.007	0.3
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 2720.0

RELATIVE DENSITY: 0.997 @ 25° C

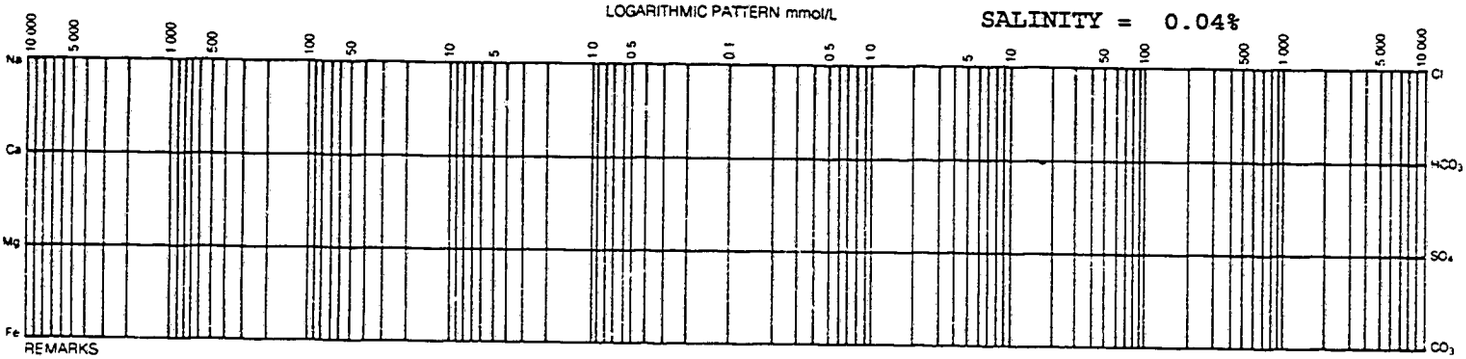
REFRACTIVE INDEX: N.A. @ 25° C

OBSERVED pH: 8.35 @ 25° C

RESISTIVITY/OHM-m: 3.31 @ 25° C

LOGARITHMIC PATTERN mmol/L

SALINITY = 0.04%



REMARKS

CATION AND ANION TOTALS DIFFER BY 29.89 ANION SUM = 32.8 CATION SUM = 44.3

AGAT® Laboratories

WATER ANALYSIS

CONTAINER IDENTIFICATION: PB 7G

LABORATORY NUMBER: W4375G

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UCEL LIARD d-02-60-20-123-30

ELEVATIONS KB m: 379.3 GRD m: 374.5

FIELD OR AREA:

POOL OR ZONE: MATTSON

NAME OF SAMPLER:

COMPANY: DOWNHOLE SYSTEM

TEST TYPE: DST NO: 6

TEST RECOVERY:

SAMPLING POINT: TOP OF TEST TOOL

AMT & TYPE OF CUSHION:

MUD RESISTIVITY/Ω m @ 25° C:

TEST INTERVAL OR PERFS: 1299.0-1329.6 mKB

TYPE OF PRODUCTION: PUMPING | FLOWING | GAS LIFT | SWAB

PRODUCTION RATES: WATER m³/d | OIL m³/d | GAS 10^3 m³/d

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 97-01-17

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-24

ANALYST: LN NCO

OTHER INFORMATION:

ION	mg/L	MASS FRACTION	mmol/L
Na	683.0	0.299	29.7
K	44.6	0.020	1.1
Ca	19.0	0.008	0.5
Mg	30.1	0.013	1.2
Ba	N.A.	N.A.	N.A.
Sr	N.A.	N.A.	N.A.
Fe	94.2	0.041	1.7

ION	mg/L	MASS FRACTION	mmol/L
Cl	140.0	0.061	4.0
Br	N.A.	N.A.	N.A.
I	N.A.	N.A.	N.A.
HCO_3	801.0	0.350	13.1
SO_4	452.0	0.198	4.7
CO_3	22.5	0.010	0.4
OH	NIL	NIL	NIL
H_2S	N.D.	N.D.	N.D.

DISSOLVED TOTAL SOLIDS mg/L

EVAPORATED AT 110° C:

EVAPORATED AT 180° C:

AT IGNITION:

CALCULATED: 2290.0

RELATIVE DENSITY: 0.997 @ 25° C

REFRACTIVE INDEX: N.A. @ 25° C

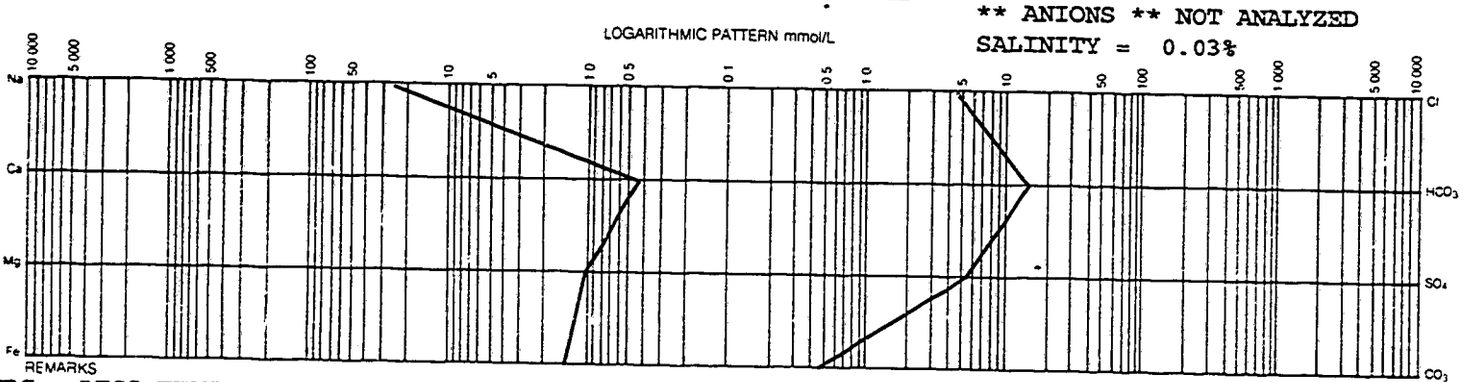
OBSERVED pH: 8.51 @ 25° C

RESISTIVITY/OHM-m: 3.72 @ 25° C

THE IONIC BALANCE FOR THIS WATER EXCEEDS 10%. THE IMBALANCE IS CAUSED BY ** ANIONS ** NOT ANALYZED

SALINITY = 0.03%

LOGARITHMIC PATTERN mmol/L



REMARKS

TRC+= LESS THAN 0.1 N.D.= NOT DETECTED NIL= 0.0 TRC*= LESS THAN 0.001 N.A.= NOT ANALYZED

AGAT® Laboratories

GAS ANALYSIS

CONTAINER IDENTIFICATION: CORE V5593

LABORATORY NUMBER: G4375A

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UCEL LIARD k-02-60-20-123-30

ELEVATIONS KB m: 379.3 GRD m: 374.5

FIELD OR AREA: LIARD

POOL OR ZONE: MATTSON

NAME OF SAMPLER:

COMPANY: DOWNHOLE SYSTEM

TEST TYPE: DST NO: 6

TEST RECOVERY:

TEST INTERVAL OR PERFS: 1299.0-1329.6 mKB

SAMPLING POINT: END OF FLOW

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						160
TEMPERATURE °C						22

DATE SAMPLED (Y-M-D): 97-01-17 DATE RECEIVED (Y-M-D): 97-01-20 DATE REPORTED (Y-M-D): 97-01-23 ANALYST: GE NCO OTHER INFORMATION: END OF PREFLOW

COMP	MOLE FRACTION AIR FREE AS RECEIVED	MOLE FRACTION AIR FREE ACID GAS FREE	PETROLEUM LIQUID CONTENT mL • m³
H_2	TRACE	TRACE	
He	TRACE	TRACE	
N_2	0.0134	0.0134	
CO_2	0.0002	0.0000	
H_2S	0.0000	0.0000	
C_1	0.7920	0.7922	
C_2	0.0901	0.0901	
C_3	0.0580	0.0580	213.4
IC_4	0.0079	0.0079	34.4
NC_4	0.0210	0.0210	88.5
IC_5	0.0046	0.0046	22.5
NC_5	0.0057	0.0057	27.7
C_6	0.0034	0.0034	18.7
C_7 +	0.0037	0.0037	23.7
C_8			
C_9			
C_{10} +			
TOTAL	1.0000	1.0000	428.9

GROSS HEATING VALUE MJ/m³ 15° C AND 101.325 kPa

MOISTURE AND ACID GAS FREE	AIR FREE AS RECEIVED	VAPOUR PRESSURE PENTANES PLUS
47.91	47.90	81.0 kPa

RELATIVE DENSITY

MOISTURE FREE AS SAMPLED		MOISTURE AND ACID GAS FREE	
MEASURED	CALCULATED	MEASURED	CALCULATED
	0.741		0.741

PSEUDO CRITICAL PROPERTIES (CALCULATED)

AS SAMPLED		ACID GAS FREE	
pPc (abs)	pTc	pPc (abs)	pTc
4545 kPa	222.3 K	4545 kPa	222.3 K

RELATIVE MOLECULAR MASS

TOTAL GAS	C_{7+}
21.5	104.2

H_2S g/m³: 0.00

REMARKS:

AGAT® Laboratories

GAS ANALYSIS

CONTAINER IDENTIFICATION: CORE V5427

LABORATORY NUMBER: G4375B

OPERATOR NAME: UNOCAL CANADA LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: UCEL LIARD k-02-60-20-123-30

ELEVATIONS KB m: 379.3 GRD m: 374.5

FIELD OR AREA: LIARD

POOL OR ZONE: MATTSON

NAME OF SAMPLER:

COMPANY: DOWNHOLE SYSTEM

TEST TYPE: DST NO: 6

TEST RECOVERY:

TEST INTERVAL OR PERFS: 1299.0-1329.6 mKB

SAMPLING POINT: MAIN FLOW

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						40
TEMPERATURE °C						22

DATE SAMPLED (Y-M-D): 97-01-17

DATE RECEIVED (Y-M-D): 97-01-20

DATE REPORTED (Y-M-D): 97-01-23

ANALYST: GE NCO

OTHER INFORMATION:

COMP.	MOLE FRACTION AIR FREE AS RECEIVED	MOLE FRACTION AIR FREE ACID GAS FREE	PETROLEUM LIQUID CONTENT mL • m⁻³
H_2	TRACE	TRACE	
He	TRACE	TRACE	
N_2	0.0141	0.0141	
CO_2	0.0002	0.0000	
H_2S	0.0000	0.0000	
C_1	0.8097	0.8099	
C_2	0.0863	0.0863	
C_3	0.0504	0.0504	185.5
IC_4	0.0063	0.0063	27.7
NC_4	0.0167	0.0167	70.6
IC_5	0.0037	0.0037	18.3
NC_5	0.0048	0.0048	23.1
C_6	0.0034	0.0034	18.7
C_{7+}	0.0044	0.0044	27.9
C_8			
C_9			
C_{10+}			
TOTAL	1.0000	1.0000	371.8

GROSS HEATING VALUE MJ•m⁻³ 15° C AND 101.325 kPa

MOISTURE AND ACID GAS FREE: 46.76

AIR FREE AS RECEIVED: 46.75

VAPOUR PRESSURE PENTANES PLUS: 73.3 kPa

RELATIVE DENSITY

MOISTURE FREE AS SAMPLED — MEASURED: CALCULATED: 0.722

MOISTURE AND ACID GAS FREE — MEASURED: CALCULATED: 0.722

PSEUDO CRITICAL PROPERTIES (CALCULATED)

AS SAMPLED — pPc (abs): 4552 kPa pTc: 218.9 K

ACID GAS FREE — pPc (abs): 4551 kPa pTc: 218.9 K

RELATIVE MOLECULAR MASS

TOTAL GAS: 20.9 C_{7+}: 104.0

H_2S g/m³: 0.00

REMARKS:

WELL HISTORY – DRILLING OPERATIONS

UNOCAL

Unocal Canada

Well History Report

(DRILLING OPERATIONS)

UNOCAL

Well Name:	Liard K-02-60-20-123-30-	Page: 1

12/10/96

ISSUED WORK PERMIT TO MULLEN TRUCKING. HELD SAFETY MEETING WITH RIG CREWS AND TRUCKERS. TEAR OUT AND LOAD OUT AND MOVE RIG FROM DRAYTON VALLEY.

12/11/96

WAIT ON DAYLIGHT. UNLOAD LOADS AS THEY ARRIVE. HAD TO PULL TRUCKS ON HILLS. GOT GRADER TO GRADE HILLS BARE SO SOME TRUCKS CAN MAKE IT. 15 LOADS ON LOCATION THE REST SHOULD BE IN THIS MORNING.

12/12/96

WAIT ON DAYLIHT. ISSUED WORK PERMIT TO MULLEN TRUCKING.HELD SAFETY MEETING WITH RIG CREW AND TRUCKERS. TOWING LOADS UP HILLS WITH CAT. RIG UP WITH TRUCKS. LAYED MATTING ,ASSEMBLED & SPOTTED SUB. SPOTTED MUD TANKS. ASSEMBLE DERRICK & DRAWORKS. SHUT DOWN FOR NIGHT. SHOULD HAVE TRUCKS RELEASED BY NOON TOMORROW.

12/13/96

WAIT ON DAYLIGHT.HELD SAFETY MEETING PRIOR TO RIG UP. RIG UP WITH TRUCKS. RELEASE TRUCKS @ 15:30 HOURS. RAISE DERRICK @ 16:00 HOURS. GENERAL RIG UP.SHUT DOWN FOR NIGHT.
SHOULD SPUD BY 20:00 HOURS.
RIG MOVE WENT WELL, ALL SUPPORT EQUIP. ON LOCATION.
DRILLED WATER WELL TO 420 Ft. PRODUCED 6 GPM EXTREMELY BROWN WATER. IRON CONTENT WAS 10.3 Mg/Ltr. PH 8.7. HARDNESS 47 GRAINS. TDS 2800 PPM.
NOT FIT FOR HUMAN CONSUMPTION. ABANDON WELL. RELEASED WATER WELL DRILLERS.

12/14/96

WAIT ON DAYLIGHT. HELD PRESPUD MEETING WITH CREWS. GENERAL RIG UP. RIG TO SPUD. SHOULD BE SPUDDED BY 11:00 HOURS.

12/15/96

RIG TO SPUD. SPUD @ 10:00 HRS 96/12/14. DRILL AHEAD,SURVEYS,RIG SERVICE. TRIP FOR BIT. ATTEMPTED TO RUN SINGLE SHOT SURVYS 3 TIMES EQUIPMENT FAILURE. SURVEY WITH TOTCO. GRAVEL 64m-69m, 75m-78m, 96m-97m, 166m-169m.
KB-GL 4.80m.

12/16/96

DRILL AHEAD, FAN FOR DIVIATION, RIG SERVICE & FUNCTION DIVERTER 14 SEC.

12/17/96

CIRC. WIPER TRIP, MEASURE OUT SLM 427.57 BOARD 427.22 DIFF .35.
DRILL TO 434.00 m. CIRC. TRIP OUT & RUN DIRECTIONAL SURVEYS. LAY DOWN 2 X 222 mm DC'S.
RIG TO & RUN 33 JTS, 53.57 Kg/m, J55, LT&C, NEW PRUDENTIAL CSG.
LANDED @ 434.00 m.
CEMENTED WITH 28.5 TONNE 0-1-0 "G" 2.0 CaCL2. 4.0 m3 GOOD CEMENT RETURNS.
RIG OUT DIVERTER, CUT OFF CONDUCTOR, WELD ON BOWL. PRESSURE TEST WELD TO 7000 KPa FOR 10 MINS OK. NIPPLE UP BOP'S.
RKB TO CB 4.74m

12/18/96

NIPPLE UP BOP'S. PRESSURE TEST BLIND RAMS, HCR, MANIFOLD, STACK VALVES LOW 1700 HIGH 17000 KPA OK. PICK UP 3 X 197mm DC'S, RUN IN WITH BIT # 1. PRESSURE TEST ANNULAR LOW 1700 HIGH 10000 KPA OK.PIPE RAMS, SUBS, LOW 1700 HIGH 17000 KPA OK. FUNCTION TEST ACCUMULATOR FROM REMOTE. RIG IN FLARE LINES & STAKE DOWN. HOLD PREDRILL SAFETY MEETING WITH CREW. DRILL OUT FLOAT,CEMENT & SHOE. DRILL TO 440m.HELD BOP DRILL WITH CREW WELL SECURE IN 65 SEC. CIRC

RUN FORMATION INTEGRITY TEST,SURFACE APPLIED PRESSURE OF 12200 KPA, GRADIENT 37.92 KPA/M (NO LEAKOFF). CIRC & WAIT ON STABBING VALVE. DRILL AHEAD, SURVEYS.
NEB RIG INSPECTION.(WRITTEN UP ON MINOR INFRACTIONS)
HELD BOP DRILL WITH BOTH CREWS.
HELD CAMP FIRE DRILLS WITH BOTH CREWS & CAMP STAFF.
GAS:BG 110-200 UNITS, LIBERATED GAS 200-800 UNITS.

12/19/96

DRILL AHEAD, CONTROL DRILL FOR DIVIATION, RUN DIRECTIONAL SURVEYS, RIG SERVICES, FUNCTION BOP'S & REMOTE CHOKE. CIRC UP SAMPLE PRIOR TO BIT TRIP.
DEEPEN FLARE PIT & RAISE BACK WALL,INSTALL HEARING PROTECTION SIGN ON GENERATOR BUILDING,GROUND CAMP GENERATOR & ENSURE EMERGENCY LIGHTS IN CAMP ARE FUNCTIONING.

12/20/96

CIRC UP BTM HOLE SAMPLE,RIG SERVICES, FUNCTION BOP'S & REMOTE CHOKE. ROUND TRIP BIT # 1. HOLE GOOD. STRAP OUT CORRECTION TO DP +1.23m MADE. CLEAN 2m OF FILL TO BTM. DRILL AHEAD, DIRECTIONAL SURVEYS, HOLD BOP DRILL WITH NEW CREW & UNOCAL SAFETY GUIDELINES COVERAGE. WELL SECURE IN 70 SEC.
DRILL AHEAD, PVT @ 2300 HRS IS 70m3.
HOLE FILL CACL 5.63m3, ACT 6.31m3 DIFF +.68m3
STRAP 865.23m, BOARD 864.00m, DIFF +1.23m. MAKE CORR TO DP.

12/21/96

DRILLING AHEAD TO 955M. RIG SERVICES, FUNCTION BOP'S & REMOTE CHOKE. CIRC SAMPLE, ROUND TRIP BIT # 2, REPAIR RIG, SLIP & CUT, ADJUST BRAKES.
WASH FROM 872m TO 910m. REAM UNDER GAUGE HOLE FROM 910m TO 955m. DRILL TO 983m, FLOW CHECK ON CONNECTIONS.
HOLE FILL CALC 5.8m3, ACT 6.45, DIFF +.65

12/22/96

DRILLING AHEAD, PREFORM RIG SERVICES, BOP & REMOTE CHOKE CHECKS & RUN A SURVEY.
PVT @ 2400 HRS 64.8m3. MACP 11860 KPA.
PLACED 4 SCBA UNITS IN CAMP,INSTALL EYE WASH STATION IN # 2 PUMP & REPLACE WASH BOTTLE IN MIXING SHACK. ATTACH CERTIFICATION TAGS TO THE FIRE EXTINGUISHERS IN CAMP. THESE STEPS WHERE TAKEN TO COMPLY WITH NEB REGULATIONS.

12/23/96

DRILL AHEAD, PREFORM RIG SERVICES & BOP & REMOTE CHOKE CHECKS. RUN SURVEYS, CIRC SAMPLE FOR GEOLOGIST @ 1102-1103m, 1105m, 1109-1110m.
PVT @ 2400 HRS 63.6m3
MACP 11774 KPA. GAS & OIL CUT MUD EXPERIENCED AT SHAKER @ 1102-1103m.
SHUT OFF CENTIFUDGES @ 18:30 HRS & MIX 65 SACKS OF BARITE TO INCREASE DENSITY TO 1085 Kg/m3.

12/24/96

DRILL AHEAD, CIRCULATING SAMPLES FOR GEOLOGIST TO DETERMINE CORE POINT.
RIG SERVICES, FUNCTION REMOTE CHOKE & ANNULAR 11 SEC. GEOLOGIST CONFIRMED CORE POINT @ 1131m. WIPERED HOLE 10 STDS, HOLE GOOD, HOIST TO CORE SLM OUT. SLM 1131.10m, TALLY 1131.00m, DIFF .10m NO CHANGE. HELD SAFETY MEETING W/ CREW & CORE MAN. RUN IN W/ BBLS BREAKING CIRC, FLOW CHECK OK. DROP BALL CUT CORE # 1. MACP 11774 KPA. PVT @ 2400 HRS 56m3.
HOLE FILL CALC 6.27m3, ACT 8.06m3, DIFF +1.79.

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12/25/96
CUT 159mm X 89mm CORE, RIG SERVICES, FUNCTION REMOTE CHOKE & ANNULAR 11 SEC. HOIST OUT CORE # 1 & RECOVER, SERVICE & LAY DOWN BBLS. HOLE FILL CALC 5.65m3, ACT 6.75m3, DIFF +1.1m3. PVT @ 2400 HRS 55.8m3.

12/26/96
RECOVER CORE # 1 TO GEOLOGIST TRAILER FOR INSPECTION & SHIPPING. FINISH SERVICE ON BBLS & LAY DOWN SAME. MU/BHA # 2,RIH. CLEAN BRIDGE @ 1084-1090m WASH TO 1115m,REAM UNDER GAUGE HOLE 1115-1131m. REAM RAT HOLE 1131-1149m. DRILL 222mm HOLE, 1149-1162, CIRC SAMPLE FOR GEOLOGIST, DETERMINE CORE POINT # 2. CIRC & CONDITION HOLE, HOIST TO CORE. PICK UP & M/U BBLS & BHA. HOLE FILL CACLC 6.47m3, ACT 7.61m3, DIFF +1.14m3.

12/27/96
RUN IN HOLE TO 1000m, BREAK CIRC, RIG SERVICES, FUNCTION REMOTE CHOKE & ANNULAR 10 SEC.CUT CORE # 2, TRIP OUT. RECOVER 17M & BOX, SERVICE & LAY DOWN BBLS.
M/U BHA, RIH TO DP, FLOW CHECK, SLIP & CUT DRLG LINE,FINISH IN TO 1000m,BREAK CIRC,BTMS UP,FINISH IN TO 1130m. WASH TO 1162m, REAM RAT HOLE F/ 1162-1178m. HOLE FILL CALC 5.73m3 ACT 7.17m3 DIFF +1.44m3
MACP 11860 KPA, PVT 60.1m3

12/28/96
REAM RAT HOLE F/1178-1180m. DRILL 222mm HOLE 1180m-1227m, RIG SERVICES, FUNTION REMOTE CHOKE & ANNULAR 10 SEC. HELD BOP DRILL W/ NEW CREW, WELL SECURE IN 60 SEC. CIRC BTMS UP SAMPLES FOR GEOLOGISTS & INTERPRET FOR POSSIBLE CORE. MACP 11860 KPA, PVT @ 2300 HRS 67.1m3
NOTE: BOILER CERTIFICATIONS HAVE BEEN FORWORDED TO THE N.E.B. IN CALGARY & HAVE BEEN POSTED IN THE BOILERS ON LOCATION.

12/29/96
FINISH CIRCULATING SAMPLE FOR GEOLOGIST, WAIT TO INTERPRET. DRILL AHEAD F/ 1227-1272m. RIG SERVICE FUNCTION BOP'S & REMOTE CHOKE OK. RUN SURVEYS. WHILE CIRCULATING A SAMPLE PRIOR TO BIT TRIP A 4-5% FLOW INCREASE WAS MONITORED ON THE FLOW LINE MONITOR. CONDUCTED A 15 MIN FLOW CHECK, A SMALL CONTINUOUS FLOW WAS OBSERVED. ON BTMS UP OIL WAS NOTED ON SHAKER, ALSO 5100 GAS UNITS REGISTERED. A DENSITY INCREASE OF 20 Kg/m3 WAS MIXED TO RAISE DENSITY FROM 1080 TO 1100 Kg/m3 PRIOR TO THE BIT TRIP.

12/30/96
FINISH MIXING BARITE, INCREASE MUD DENSITY TO 1100 kg/m3. FLOW CHECK - WELL STATIC. ROUND TRIP BIT #5, BREAK CIRC AT 1000m THEN RUN IN TO 1249m & WASH TO 1267m. CLEAN 5m TO BOTTOM FROM 1267 TO 1272m. DRILL TO 1280m, CIRC SAMPLE FOR GEOLOGIST. DRILL AHEAD TO 1300m. MACP-11774 Kpa. PVT @ 2400 HRS 63.8m3.

12/31/96
PERFORM 3 RIG SERVICES, ANNULAR & REMOTE CHOKE CHECKS DAILY & RECORD. DRILL F/1300 TO 1302m (1/2m DRILLING BREAK) CIRC SAMPLE FOR GEOLOGIST. OBSERVE 4-5% FLOW INCREASE, RAISE DENSITY 20Kg/m3 TO 1115Kg/m3. FLOW CHECK - WELL STATIC. DRILL 1302 - 1309m (DRILLING BREAK 1.5m) FLOW CHECK - WELL FLOWING. CIRC SAMPLE & MIX BARITE TO INCREASE DENSITY TO 1125Kg/m3. FLOW CHECK- WELL STATIC. WIPER TRIP 10 STDS - HOLE GOOD. ANNULAS GASSIFIED ON BTMS UP & OIL SHOW AT THE SHAKER. CIRC INCREASE MUD DENSITY TO 1150Kg/m3. FLOW CHECK OK. POOH TO CUT CORE #3. P/U & M/U CORE BBLS. RIH & CIRC BTMS UP, DROP BALL & CUT CORE #3. HOLE FILL CACL 6.75m3 ACT 7.56m3 DIFF +.81m3

1/1/97
PERFORM 3 RIG SERVICES, ANNULAR & REMOTE CHOKE CHECKS DAILY & RECORD. CUT CORE #3 - 18m. POOH, RECOVER & BOX CORE, SERVICE & LAY DOWN BBLS. RIH W/BIT 6RR. REAM RAT HOLE. DRILL AHEAD. HOLE GOOD ON TRIP IN WITH BBLS, WASH TO BTM, NO FILL. HOLE FILL CALC 6.18m/3 ACT 6.94m/3 DIFF +.76m/3. PVT 62.6m3, MACP 11519.

1/2/97
HOIST BIT #6RR, CHECK BLIND RAMS - OK. FILL HOLE & FLOW CHECK - OK. RIH BIT #7 TO 766m, BREAK CIRC, RIH, WASH TO BTM 1319 - 1334m, NO FILL. DRILL AHEAD 1334 - 1358m. BIT QUIT DRILLING, CIRC, FINISH MIXING MUD & PILL. TRIP OUT BIT #7, CHANGE BITS, RIH W/BIT #8. SURVEY, RIG SERVICES & BOP CHECKS TOURLY. PVT 66.9m3, MACP 11519KPA. HOLE FILL CALC 7.02m3, ACT 7.83m3, DIFF +.81m3

1/3/97
RIH TO 777m, BREAK CIRC. RUN IN TO 1334m & WASHED TO 1355m. FLOW CHECK - OK. CIRCULATE OUT TRIP GAS @ REDUCED PUMP RATE WHEN BTMS UP SURFACED. REAM 3m TO BOTTOM. WORK JUNK SUB. DRILL AHEAD. PERFORM RIG SERVICES, BOP & REMOTE CHOKE FUNCTIONS - OK.

1/4/97
DRILL AHEAD. RIG SERVICE & CHECK BOP'S.HOLD BOP DRILL WITH NEW DRILLER & CREW, WELL SECURED 90 SEC. ROUND TRIP BIT #8.SLIP & CUT DRILLING LINE. BREAK CIRC @ 1200m & CIRC BTMS UP. FINISH RUNNING IN TO 1400m - WASH TO BTM.NO FILL. HOLE FILL CALC:7.12m3, ACT:8.65m3, DIFF+1.5m3. PVT @ 2400 HRS 60.8m3. MACP-11519 KPA.

1/5/97
DRILL AHEAD WITH BIT #9. RIG SERVICES & BOP CHECKS TOURLY. HELD BOP DRILL W/ CREW-WELL SECURE IN 2 MINUTES. DRESSED, DRIFTED & TALLIED INTERMEDIATE CASING. JOINTS ON LOCATION ARE 157 @ TOTAL LENGTH OF 1840.88m WITHOUT THREADS. INSPECTED WELL HEAD COMPONENTS & BALANCED TO TUNDRA INVOICE.

1/6/97
DRILL AHEAD,PREFORM 3 RIG SERVICES, BOP & REMOTE CHOKE CHECKS DAYLY & RECORD. RENEW PUMP DRIVE CHAIN. CHANGE HEADS & LINRS IN #2 PUMP TO 140mm, RUN ON HOLE-9300 KPA @ 65 SPM. PVT @ 23:30 HRS-65.7m3, MACP 11519 KPA.

1/7/97
DRILL AHEAD,PREFORM 3 RIG SERVICES, BOP CHECKS & REMOTE CHOKE FUNCTIONS.POOH W/ BIT # 9. PVT @ 2400 HRS 63.2m3, MACP 11519KPA.

1/8/97
PREFORM 3 RIG SERVICES & BOP & REMOTE CHOKE FUNCTIONS. ROUND TRIP BIT #9, ADJUST BANG-LO, WASH 9m TO BTM-NO FILL. DRILL AHEAD TO 1546m, WASHED OUT STANDPIPE, POOH, CHANGE BITS, RI W/DC'S & ONE STD PIPE-INSTALL STABBING OPEN VALVE & SHUT HYDRILL. DO RIG REPAIRS. RIH W/ BIT # 11, BREAK CIRC @ 1200m & CIRC BTMS UP.

1/9/97
CONDUCT 3 RIG SERVICES, REMOTE CHOKE & BOP CHECKS PER DAY. RUN IN WITH BIT #11 TO 450m, REPAIR STAND PIPE WITH WELDER, FINISH TO BTM, WORK JUNK SUB & DRILL AHEAD, SURVEY @ 1555m, DRILL AHEAD TO 1572m, BIT TORQUED UP,POOH BIT # 11. HOLE FILL CALC:7.55m3, ACT:8.66m3, DIFF:1.11m3.

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1/10/97 RIG SERVICE & CHECK BOP'S & REMOTE CHOKE TOURLY. FINISH TRIP OUT W/ BIT # 11, CHECK BLIND RAMS OK, RIH TO 1200m,CIRC BTMS UP, RIH TO 1544m, WASH TO 1570m, REAM TO BTM TO 1572m & WORK JUNK SUB. DRILL AHEAD. HOLE FILL CALC:7.70m3, ACT:8.96m3, DIFF +1.26m3. PVT @ 2200 HRS 60.9m3, MACP 11519 KPA.

1/11/97 PREFORM 3 RIG SERVICES & BOP CHECKS & REMOTE CHOKE FUNCTIONS PER DAY. DRILL TO 1610m, LOSS PP, TRIP OUT WET F/ WASH. X/OUT SS & 1 CRACKED DC. RIH, CIRC BTMS UP @ 1155m , WASH TO BTM-NO FILL. DRILL AHEAD. HOLE FILL CALC:7.7m3, ACT:9.35m3, DIFF:+1.65m3. FUNCTION BLIND RAMS, OK. X/OUT WORKING SINGLE.

1/12/97 PREFORM 3 RIG SERVICES, BOP & REMOTE CHOKE CHECKS PER DAY. DRILL AHEAD TO 1656m. FLETT FORMATION TOP CALLED @ 1654 MKB.PVT@ 1656m 65.1m3.MACP 11519 KPA.

1/13/97 RIG SERVICE, FUNCTION REMOTE CHOKE & HYDRIL OK. DRILL TO 1657m, CONFIRM TOP OF THE FLETT FORMATION. WIPER TRIP 17 STDS-NO FILL-NO FLOW INCREASE ON BTMS UP.TRIP GAS WAS 325 UNITS. CIRC & CONDITION HOLE & HOIST TO LOG,SLM OUT.SLIP & CUT DRILLING LINE,ADJUST BRAKES & CHECK LINKAGE. 0800 HRS R/U SCHLUMBERGER & LOG. RIH W/ TOOLS @ 1000 HRS, TAG BTM @ 1656m @1045 HRS. HOLE IN GOOD SHAPE. HOLE FILL CALC:8m3, ACT:9.07m3, DIFF:-1.07m3. SLM 1659.08m, TALLY 1657.00m ,2.08m DIFF. MONITOR ANNULAS WHILE LOGGING.

1/14/97 LOG & CUT SIDEWALL CORES W/ SCHLUMBERGER . SEE LOGGING & SIDEWALL CORING EVENT FOR DETAILS. RIH F/ CLEAN OUT TRIP,3m FILL & CONDITION MUD. HOIST TO RUN MDT LOG. SLM OUT. STRAP 1657.33, TALLY 1657.00, NO CHANGE. BTMS UP @ SHAKER SAW A SLIGHT SHOW OF OIL & SLIGHTLY GASIFIED DRILLING MUD.

1/15/97 FINISH OUT TO LOG. RIG SERVICE,CHECK BOP'S & REMOTE CHOKE OK. R/U & RUN MDT LOG & R/D TOOLS & LOAD OUT. RIH FOR A CLEAN OUT TRIP & CONDITION MUD. HOLE FILL CALC:8.01m3, ACT:9.02m3, DIFF:+1.01m3.

1/16/97 FINISH RIH F/ CLEAN OUT TRIP, CIRC & CONDITION MUD. RIG SERVICE, CHECK REMOTE CHOKE & BOP'S OK.SURVEY. POOH & LAY DOWN PIN-UP DC'S. SAFETY MEETING W/ DST TESTER & CREW PRIOR TO P/U & M/U TOOLS. RIH W/ DST #1 & SET DEPTH W/ GAMMA RAY

DST #1: INTERVAL 1488.8m-1506.5m. IHP:17086KPA,FHP:17030KPA,5 MINUTE IPF:1135 & FPF:2756KPA,30 MINUTE ISI:16535KPA.CALC:240m WATER RECOVERY.

DST #2: INTERVAL 1159-1177m .5 MINUTE IPF:2564KPA, FPF:2886KPA,30MINUTE ISI:12691KPA,30 MINUTE IF:2908KPA,FF:4131KPA,30 MINUTE FSI:12635KPA,IHP:13340KPA,FHP:13307KPA.CALC:170m WATER RECOVERY.

INTERVAL 1112.5-1130.5m & RUN DST #3 RESET.5 MINUTE IPF:4143KPA,FPF:4127KPA, ISI:12055KPA,IF:4566KPA,FF:5338KPA,FSI10813KPA,IHP:12628KPA,FHP:12568KPA. CALCULATED 127M OF FLUID RECOVERY (POSSIBLY OIL OR WATER).

1/17/97 PULL UP TO DST # 4 INTERVAL 1097.0m-1114.7mKB MATTSON ZONE. TEST.RIG SERVICE, CHECK BOP'S OK.POOH,REVERSE OUT PARTIAL OIL & OIL CUT DRILL MUD.SERVICE & X/O INTERVAL,RIH W/DST # 5,BLOW PACKER ON PREFLON,POOH & REPLACE RUBBER.

DST # 4:IHP-12628KPA, IPF-4224KPA, FPF-4449KPA, ISI-12055KPA, IF-4566KPA FF-5338KPA, FSI-10813KPA, FHP-12568KPA. CALCULATED 127m OF OIL & INTERVAL MUD. OBSERVED RECOVERY 100m OF 26 API OIL & 420m OF MUD CUT WATER FROM DST# 1,2&3.

DST #4 TRIP CALC:9.65m3,ACT:11.48m3, DIFF:+1.83m3.
DST #5 TRIP CALC:13.24m3,ACT:14.34m3,DIFF:+1.10m3.

1/18/97 PREFORM 3 RIG SERVICES & BOP FUNCTIONS PER DAY.
RUN DST #6, 1299-1329.5mKB.IHP:14678KPA, FHP:14811KPA, IPF:1289KPA, FPF:1325KPA, ISI:14684KPA,IF:1849KPA,FF:4043KPA, FSI:14325KPA. POOH, X/O INTERVAL, SERVICE TOOL,
RIH DST #7,INTERVAL1043-1064mKB,PLUGGED FLOW VALVE. MISRUN.POOH,UNPLUG FLOW VALVE & SERVICE TOOL.
DST #6 TRIP CALC:12.11m3, ACT:13.03m3, DIFF:+.92m3
DST #7 TRIP CALC:10.59m3, ACT:12.18m3, DIFF:+1.28m3

1/19/97 PREFORM 3 RIG SERVICES & BOP CHECKS PER DAY. UNPLUG FLOW VALVE & SERVICE TOOL FROM DST #7. RIH, CHECK PIPE F/ AIR BLOW,TOOL LEAKING,POOH & REPAIR LOOSE PACKER MANDREL.
RIH & RUN DST #8,TERMINATE AFTER ISI.
POOH & BREAK DOWN TOOLS & LOAD OUT. M/U BHA & RIH TO DP. SLIP & CUT .RIH F/ CLEAN OUT TRIP PRIOR TO RUNNING CEMENT PLUGS.BREAK CIRC @1200m,MUD VERY GASIFIED,CLEAN BRIDGE @1450m,WASH TO BTM,1637-1657m, NO FILL.
DST #8 TRIP CALC:11.14M3, ACT:12.5m3, DIFF:+1.36m3
DST #8 INTERVAL 1043-1064mKB,IHP:11940KPA, FHP:11912KPA, 5 MINUTE IPF:475KPA, FPF:548KPA, 118 MINUTE ISI:1552KPA. RECOVERY @ 30m SLIGHTLY OIL STAINED DRILLING FLIUD.

1/20/97 RIG SERVICE & BOP CHECKS.CIRC & CONDITION HOLE,POOH & LAY DOWN DC'S. RIH & PICK UP 19 SINGLES. CIRC,

RUN PLUG #1, DOWN @ 10:15 AM. PUMP 5.4m3 H20 PREFLUSH. RUN 4m3 OF 0:1:0"G"+.3%CFL-3 +.2%SPC-2 @ 1901 Kg/m3 SLURRY .DISPLACE W/1m3 H20+7.7m3 MUD. PULL 7 STDS,CIRC BTMS UP. WOC, RI & FEEL TOP W/RIG-1567M, W/9000 DaN.

RUN PLUG #2,DOWN @18:20 PM.RAN 5.4m3 H20 PREFLUSH,MIX & PUMP 4m3 OF 0:1:0"G"+.3%CFL-3+.2%SPC-2 @ 1901 Kg/m3,DISPLACE W/1m3 H20+4m3 MUD.

PULL 7 STDS,CIRC BTMS UP.LAY DOWN DRILL PIPE. RAN IN W/DP & FELT TOP OF PLUG @ 995m W/9000DaN @ 0200 HRS.
CLEAN OUT TRIP CALC:7.22m3,ACT:9.07m3,DIFF:+1.85m3

Well Name:	Liard K-02-60-20-123-30	Page: 4

1/21/97

PLUG DEPTHS:#1 1657-1567mKB. #2 995-[illegible]mKB. #3 425-474mKB. #4 5-15mKB.
RIR SERVICES & BOP FUNCTIONS. RUN PLUGS #3 & #4,FEEL W/DRILL PIPE.

FOR PLUG #3 RAN 11m3 H20 PREFLUSH,MIX & PUMP 4.7m3 OF 1901Kg/m3 SLURRY OF 0:1:0 "G"+.3%CFL-3.DISPLACE W/2m3 H20,PULL 7 STDS BREAK CIRC, NO CEMENT RETURNS.

PLUG #4,RAN 1m3 H20 PREFLUSH,MIX & PUMP 2m3 OF THE SAME CEMENT FOR TOP PLUG.
PLUG DOWN @ 14:30 HRS. TEAR OUT BOP'S & LINES,CLEAN TANKS.

RELEASE RIG @ 2000 HRS 01/20/97

1/22/97

RETURN RENTAL EQUIPMENT & CUT OFF CSG BOWL,WELD ON CAP 1m BELOW GR.LEVEL.
CALL OUT PETRO CANADA FUEL TRUCK & RETURN 10,173 LITRES OF DIESEL FOR CREDIT.
NOTE: BEAVER ENTERPRISES TO RETURN CR PAY FOR 900 LITRES OF DIESEL FUEL THEY BORROWED.
DC INSPECTION DONE BY PREMIUM OILFIELD INSPECTION SERVICES LTD.FOUND 4 CRACKED ZIP GROOVES & 1 CRACKED PIN END ON 158 MM DC'S.

1/23/97

NOTE:KELLY & DAMAGED DC'S ARE GOING TO PEACOCK INC. FT.ST.JOHN. THE KELLY WAS STAIGHT THROUGH-OUT THE HOLE & WAS BENT WHEN THE SWIVEL & KELLY WAS LAID DOWN AS ONE UNIT ON RIG OUT.
CAMP RELEASED @ 2400 HRS 01/23/97.

SANJEL CEMENTING REPORT

SANJEL CEMENTERS LTD.

N.E.B. COPY

DATE: January 20, 1997

TICKET NO.: 48314 Page 1 of 2

COMPANY REPRESENTATIVE: Doug

SANJEL REPRESENTATIVE: Mike Mullaly

Customer Name	Unocal Canada Ltd.	Contractor	Cactus #1
Address	P. O. Box 999	Well Name	KO2 Liard
	48th Fl. 150 - 6th Avenue S.W.	Location No.	KO2
City	Calgary, Alberta T2P 3Y7	Type of Job	Abandonment Plugs

Drill Pipe:							
	Size	101.6 mm	Density	20.83 kg/m	Depth	1656	m
	Size	– mm	Density	– kg/m	Depth	–	m
	Size	– mm	Density	– kg/m	Depth	–	m

Cement Data:

1) 5.3 tonnes OWG

Additives 0.35% CFL-3

Slurry Volume 4.0 m^3 Density 1901 kg/m^3

2) 5.3 tonnes OWG

Additives 0.35% CFL-3

Slurry Volume 4.0 m^3 Density 1901 kg/m^3

Cement Data:

3) 5.7 tonnes OWG

Additives 0.35% CFL-3

Slurry Volume 4.7 m^3 Density 1901 kg/m^3

Description	Time	Rate m^3/min	Pressure kPa Tubing	Pressure kPa Annular	m^3 Fluid Pumped	Total m^3 Displacement	Remarks
Plug 1 (1656 m - 1577 m)							
Start Preflush	9:59	0.8			5.4		H_2O
Start Mix	10:06	0.8	3000				
Finish Mix	10:12	0.8	2000		4.0		Slurry @ 1901 kg/m^3
Start Displace	10:12	0.7	500				
Finish Displace	10:22	0.7	1000			7.7	1.0 m^3 H_2O & 6.7 m^3 Mud
Wait 6 hours Between Plugs and Tag with Drill Pipe							
Plug 2 (1080 m - 1000 m)							
Start Preflush	17:11	0.8	2000		5.4		H_2O
Start Mix	17:17	0.8	2000				
Finish Mix	17:22	0.8	2000		4.0		Slurry @ 1901 kg/m^3
Start Displace	17:22	0.7	500				
Finish Displace	17:26	0.7	500			5.6	1.0 m^3 H_2O & 4.6 m^3 Mud
Wait 6 hours After Plug and Tag with Drill Pipe							

SANJEL CEMENTERS LTD

DATE: January 20, 1997

TICKET NO.: 48314 Page 2 of 2

COMPANY REPRESENTATIVE: Doug

SANJEL REPRESENTATIVE: Mike Mullaly

Customer Name	Unocal Canada Ltd.	Contractor	Cactus #1
Address	P. O. Box 999	Well Name	KO2 Liard
City	48th Fl. 150 - 6th Avenue S.W.	Location No.	KO2
Type of Job	Abandonment Plugs		

Drill Pipe:	Size	101.6 mm	Density	20.83 kg/m	Depth	1656 m
	Size	– mm	Density	– kg/m	Depth	– m
	Size	– mm	Density	– kg/m	Depth	– m

Cement Data:

1) 5.3 tonnes OWG

Additives 0.35% CFL-3

Slurry Volume 4.0 m^3 Density 1901 kg/m^3

2) 5.3 tonnes OWG

Additives 0.35% CFL-3

Slurry Volume 4.0 m^3 Density 1901 kg/m^3

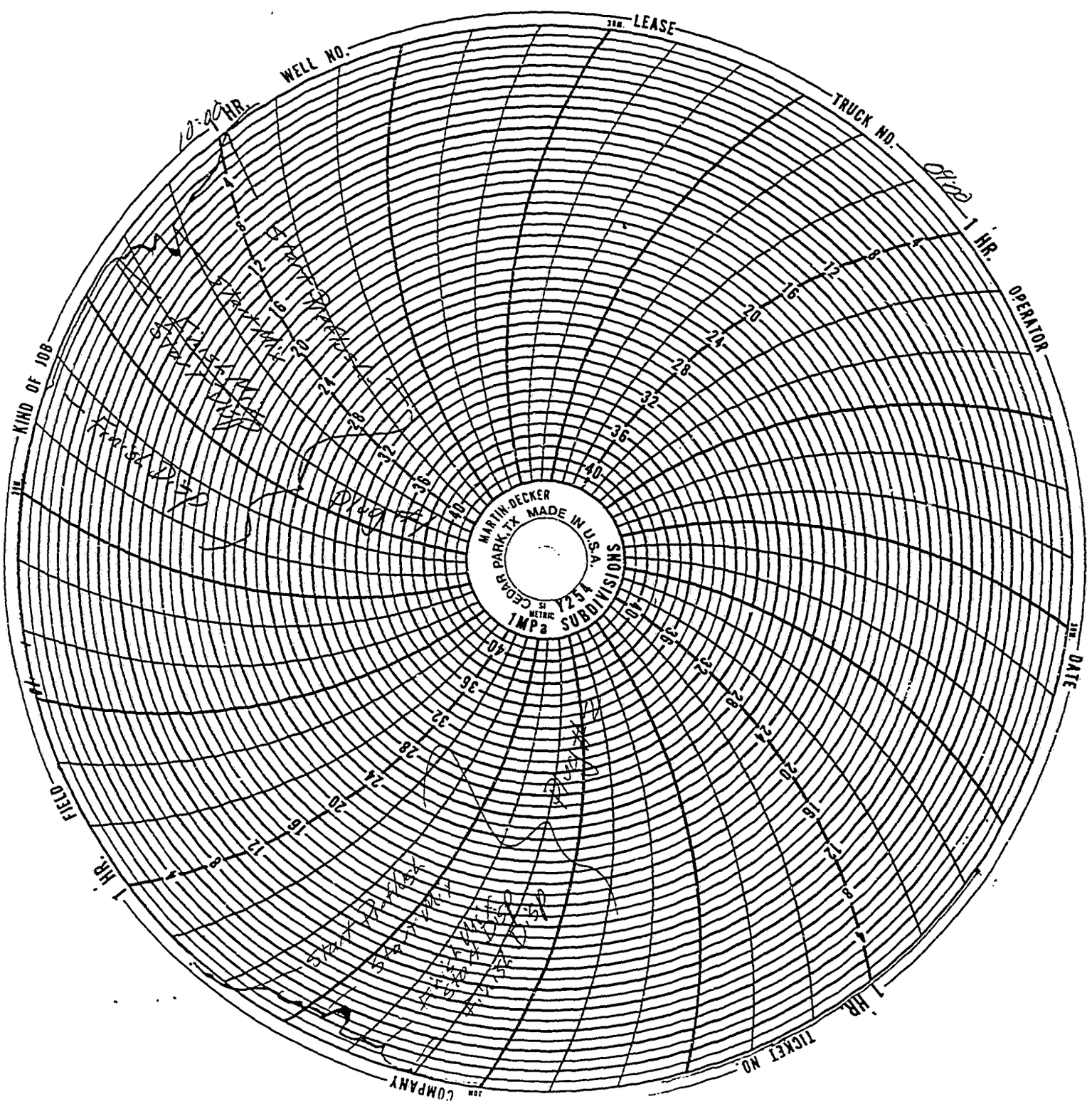
Cement Data:

3) 5.7 tonnes OWG

Additives 0.35% CFL-3

Slurry Volume 4.7 m^3 Density 1901 kg/m^3

Description	Time	Rate m^3/min	Pressure kPa Tubing	Pressure kPa Annular	m^3 Fluid Pumped	Total m^3 Displacement	Remarks
Plug 3 (474 m - 394 m)							
Start Preflush	4:12	0.8	1000		11.0		H_2O
Start Mix	4:25	0.8	2000				
Finish Mix	4:29	0.8	2000		4.7		Slurry @ 1901 kg/m^3
Start Displace	4:29	0.8					
Finish Displace	4:31	0.8				2.0	H_2O
Cement Top of Well and Rat Hole with 2.0 m^3 Cement							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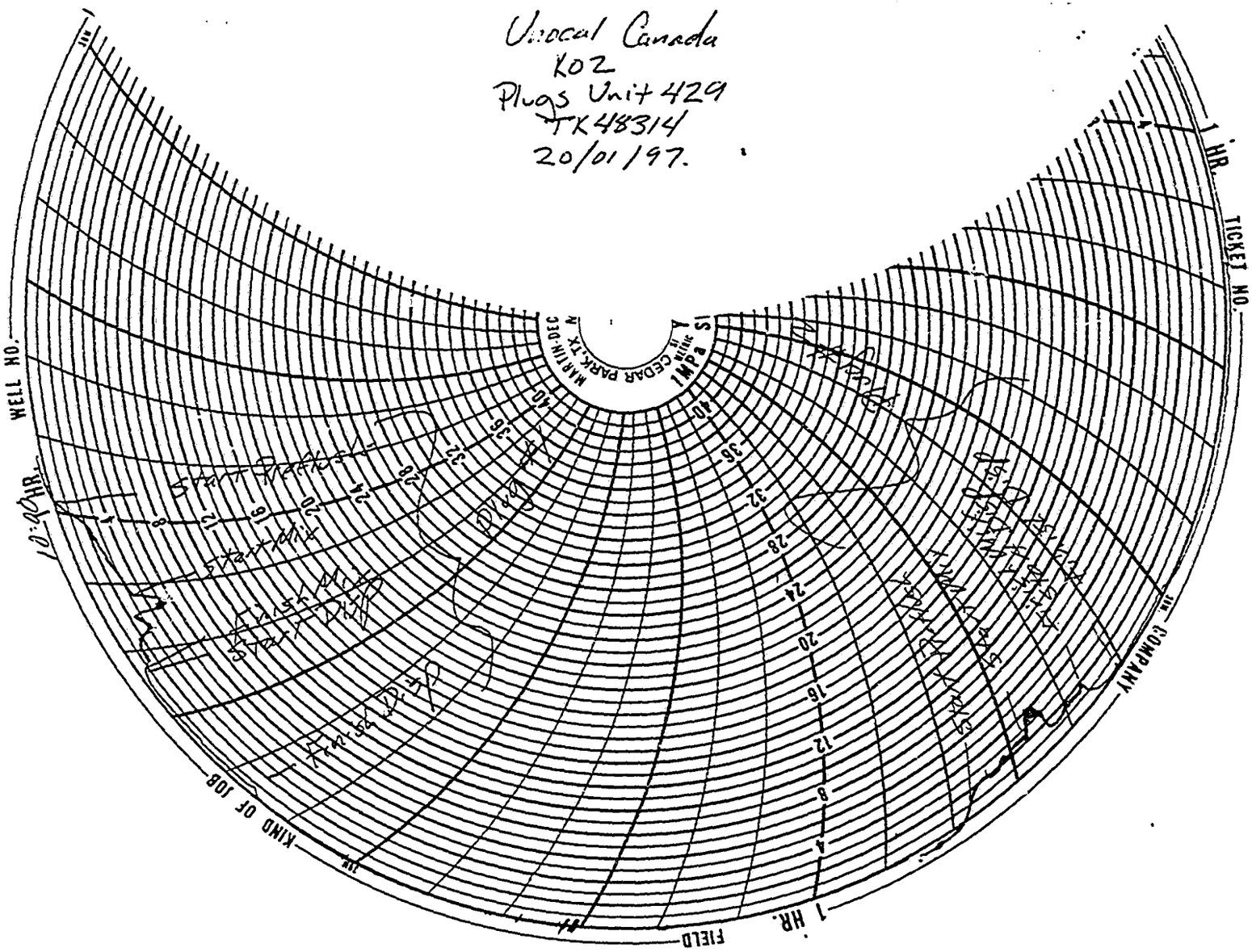
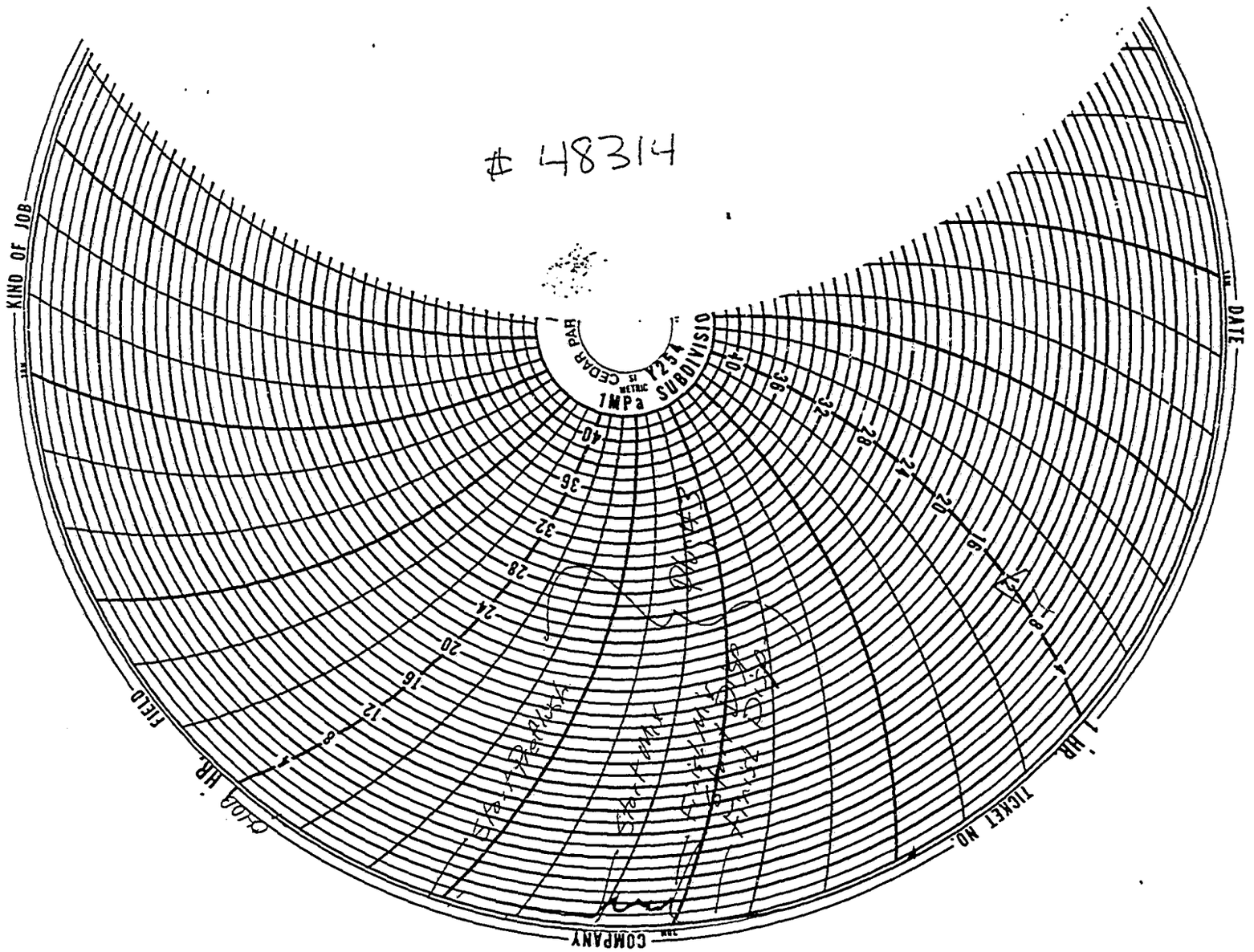
WELL NO.
10-90 HR.
TRUCK NO.
1 HR.
OPERATOR
KIND OF JOB
DATE
FIELD
1 HR.
TICKET NO.
COMPANY
MARTIN-DECKER
CEDAR PARK, TX MADE IN U.S.A.
Y254
SI METRIC
1MPa
SUBDIVISIONS

Unocal Canada
KOZ
Plugs Unit 429
TK48314
20/01/97.



FIELD
KIND OF JOB
WELL NO.
LEASE
TRUCK NO.
OPERATION
DATE
TICKET NO.
COMPANY
HR.
MARTIN-DECKER
CEDAR PARK, TX
MADE IN U.S.A.
A254
SUBDIVISIONS


KIND OF JOB
DATE
SUBDIVISIO
Y234
CEDAR PAR
SI METRIC
1MPa
40
36
32
28
24
20
16
12
8
4
40
36
32
28
24
20
16
12
8
4
1 HR.
TICKET NO.
COMPANY
FIELD
CHOA HR.

48314

FINAL CORE ANALYSIS (SIDEWALL)

N.E.B. COPY

AGAT® Laboratories

FINAL CORE ANALYSIS REPORT
(SIDEWALL)
UCEL LIARD K-02

K-02-60-20-123-30

9211-418-1-1, WID 1816

Prepared for:

UNOCAL CANADA EXPLORATION LIMITED

RC6371

February 1997

"In Pursuit of Excellence"

· AIHA Accredited

· CAEAL Accredited

· Registered with APEGGA

NATIONAL ENERGY BOARD
ENGINEERING BRANCH
FEB 2 5 1997

CORE ANALYSIS DATA

UCEL LIARD K-02
K-02-60-20-123-30

COMPANY : UNOCAL CANADA EXPLORATION LTD.
WELL NAME : UCEL LIARD K-02
LOCATION : K-02-60-20-123-30
FORMATION :
DRILLING FLUID : WATER BASE MUD

PAGE : 1
DATE : 97-02-14
W/O No : RC6371

CORE ANALYSIS - SIDEWALL REPORT

Sample	interval (m) Top	Base	Rep Thick (m)	Sample Length (m)	Gas Permeability Kmax (mD)		K90 (mD)	Kv (mD)	Capacity Kmax mD·m	Porosity	Capacity Ø·m	Density (Kg/m³) Bulk	Grain	Residual Saturation Oil	Water	Remarks
SP001P	1475.00	-	-	-	0.91		-	-	-	0.076	-	2440	2640	-	-	ss:vf-fgr:pyr
SP002P	1475.50	-	-	-	9.62		-	-	-	0.139	-	2290	2660	-	-	ss:vf-fgr:pyr
SP003P	1495.30	-	-	-	24.5		-	-	-	0.209	-	2150	2720	-	-	ss:vf-fgr:pyr
SP004P	1336.00	-	-	-	13.9		-	-	-	0.131	-	2310	2660	-	-	ss:vf-fgr:pyr
SP005P	1308.50	-	-	-	5.84		-	-	-	0.106	-	2390	2670	-	-	ss:vf-fgr:pyr
SP006P	1300.50	-	-	-	8.16		-	-	-	0.117	-	2360	2670	-	-	ss:vf-fgr:pyr
SP007P	1255.70	-	-	-	208.		-	-	-	0.195	-	2140	2660	-	-	ss:vf-mgr:pyr
SP008P	1229.00	-	-	-	0.29		-	-	-	0.097	-	2470	2730	-	-	ss:vf-fgr:dol:pyr
SP008PA	1225.50	-	-	-	3.87		-	-	-	0.110	-	2380	2670	-	-	ss:vf-mgr:pyr
SP009P	1223.00	-	-	-	3.95		-	-	-	0.104	-	2380	2660	-	-	ss:vf-fgr:calc
SP010P	1217.50	-	-	-	0.40		-	-	-	0.069	-	2500	2680	-	-	ss:vf-fgr:calc
SP011P	1217.30	-	-	-	0.10		-	-	-	0.046	-	2540	2660	-	-	ss:vf-fgr:calc
SP012P	1160.60	-	-	-	44.2	*	-	-	-	0.015	-	2610	2650	-	-	sltst:arg:pyr:frac
SP013P	1157.10	-	-	-	0.10		-	-	-	0.066	-	2500	2680	-	-	ss:vf-fgr:calc:pyr
SP014P	1154.50	-	-	-	0.10		-	-	-	0.061	-	2500	2670	-	-	ss:vf-fgr:calc:pyr
SP015P	1126.50	-	-	-	0.93		-	-	-	0.106	-	2410	2690	-	-	ss:vf-fgr:arg lam:calc:pyr
SP016P	1114.50	-	-	-	0.09		-	-	-	0.060	-	2530	2690	-	-	ss:vf-fgr:calc:pyr
SP017P	1110.50	-	-	-	0.17	*	-	-	-	0.006	-	2550	2560	-	-	sltst:arg:pyr:frac
SP018P	1107.10	-	-	-	0.03		-	-	-	0.019	-	2660	2720	-	-	ss:vf-fgr:calc:pyr
SP019P	1102.00	-	-	-	0.12		-	-	-	0.039	-	2620	2730	-	-	ss:vf-fgr:arg lam:calc:pyr:frac
SP020P	1101.50	-	-	-	0.04		-	-	-	0.025	-	2630	2700	-	-	ss:vfgr:arg:dol

* - affected by fracture or crack as mentioned in remarks

AGAT Laboratories

COMPANY : UNOCAL CANADA EXPLORATION LTD.
WELL NAME : UCEL LIARD K-02
LOCATION : K-02-60-20-123-30
FORMATION :
DRILLING FLUID : WATER BASE MUD

PAGE : 2
DATE : 97-02-14
W/O No : RC6371

CORE ANALYSIS - SIDEWALL REPORT

Sample	interval (m) Top	interval (m) Base	Rep Thick (m)	Sample Length (m)	Gas Permeability Kmax (mD)	Gas Permeability K90 (mD)	Gas Permeability Kv (mD)	Capacity Kmax mD·m	Porosity	Capacity Ø·m	Density (Kg/m³) Bulk	Density (Kg/m³) Grain	Residual Saturation Oil	Residual Saturation Water	Remarks
SP021P	968.50	-	-	-	0.05	-	-	-	0.006	-	2500	2520	-	-	cht:frac
SP21PA	571.50	-	-	-	-	-	-	-	-	-	-	-	-	-	insufficient sample

AGAT Laboratories

SAMPLE HANDLING

AGAT LABORATORIES CORE SERVICES

SAMPLE HANDLING AND ANALYSIS INFORMATION

Company : UNOCAL CANADA EXPLORATION LTD.
Well : UCEL LIARD K-02
Location : K-02-60-20-123-30

Coring Equipment : Diamond
Coring Fluid : Water Base Mud
Core Diameter : NA
Total Cored : NA
Total Recovered : NA

W/O Number : RC6371
Date : 97-02-14

HANDLING

Core Transported in : Boxes
Cleaning Solvent : Toluene
Extraction : Vapour Phase
Cleaning Time : 240 hours
Drying Equipment : Conventional oven
Drying Time/Temp : 48 hours @ 108°C

ANALYSIS

Grain volume measured by Boyle's Law using helium
Bulk volume measured by calipering on right-cylindrical samples
Fluid saturations by retort on end pieces
Permeability measured on 25.50 mm diameter drilled plugs

REMARKS

SIDEWALL PLUGS SAMPLES.

AGAT Laboratories

COMMON ABBREVIATIONS

abnt	Abundant
abv	Above
Alg	Algae (al)
alt	Altered (ing)
amor	Amorphous
Amph	Amphipora
ang	Angular
anhy	Anhydrite (ic)
app	Appear
apr	Apparent
aprox	Approximate (ly)
arg	Argillaceous
ark	Arkose (ic)
asph	Asphalt (ic)
AST	Assigned similar to (no actual sample taken)
apha	Aphanitic
bcm	Become (ing)
bd	Bed
bdd	Bedded
bdg	Bedding
Belm	Belemnites
bent	Bentonite (ic)
bf	Buff
biocl	Bioclastic
bioturb	Bioturbated
bit	Bitumen (inous)
bl	Blue (ish)
blk	Black
blky	Blocky
bnd	Band (ed)
Brac	Brachiopod
brec	Breccia (ted)
bri	Bright
brit	Brittle
brn	Brown
Bry	Bryozoa
bulb	Bulbous
bur	Burrowed
c	Coarse (ly)
calc	Calcite (areous)
carb	Carbonaceous
cbl	Cobble (64-256 mm)
Ceph	Cephalopod
cgl	Conglomerate
chk	Chalk (y)
chlor	Chlorite
cht	Chert
chty	Cherty
cl	Clastic
cln	Clean
clr	Clear
cly	Clay (ey)
com	Common
coq	Coquina
Cor	Coral
crbnt	Carbonate
Crin	Crinoid (al)
crm	Cream
crpxl	Cryptocrystalline
ctc	Contact
deb	Debris
decr	Decrease (ing)
desi	Desiccation
dism	Disseminated
dk	Dark (er)
dns	Dense (er)
dol	Dolomite (ic)
drsy	Drusy
dtrl	Detrital (us)
elg	Elongate
euhed	Euhedral
f	Fine (ly)
fau	Fauna
Fe	Iron-Ferruginous
Fe-mag	Feromagnesian
fenst	Fenestral
fis	Fissile
fl	Fill (ed)
fld	Feldspar (thic)
flk	Flake
flky	Flaky
flor	Fluorescence
flt	Fault (ed)
fltg	Floating
foram	Foraminifera
fos	Fossil (iferous)
fr	Fair
frac	Fracture (ed)
frag	Fragment (al)
fri	Friable
frmwk	Framework
fros	Frosted
g	Good
Gast	Gastropod
gl	Glass (y)
glau	Glauconite (ic)
gn	Green
gr	Grain (ed)
gran	Granular
grd	Grade (ed)
grnl	Granule (2-4 mm)
gy	Grey
gyp	Gypsum (iferous)

AGAT® Laboratories

COMMON ABBREVIATIONS (CONTINUED)

hd	Hard
hfrac	Horizontal Fracture
hi	High
hrtl	Horizontal
hvy	Heavy
hydc	Hydrocarbon
ig	Igneous
imbed	Imbedded
imp	Impression
incl	Included (sion)
incr	Increase
indst	Indistinct
intbd	Interbedded
intcl	Intraclast (s)
intfrag	Interfragmental
intgran	Intergranular
intlam	Interlaminated
intr	Intrusion (ive)
intv	Interval
intxl	Intercrystalline
ireg	Irregular
ird	Iridescent
intrsk	Intraskeletal
kao	Kaolin
lam	Laminated
lchd	Leached
len	Lentil (cular)
lith	Lithographic
lmy	Limy
lrg	Large (er)
ls	Limestone
lse	Loose
lstr	Lustre
lt	Light (er)
m	Medium
mar	Maroon
mas	Massive
mat	Material, matter
mica	Mica (ceous)
mic	Micro
mky	Milky
mnr	Minor
mnrl	Mineral (ized)
mnut	Minute
Mol	Mollusca
mot	Mottled
mrly	Marly
mtx	Matrix
n	No,none,non
nod	Nodule
num	Numerous
o	Oil
occ	Occasional
od	Odor
ool	Oolite (ic)
op	Opaque
org	Organic
orng	Orange
orth	Orthoclase
Ost	Ostracod
ovgth	Overgrowth
ox	Oxidized
p	Preliminary (as suffix)
pbl	Pebble (4-64 mm)
pel	Pellet
perm	permeability
pet	Petroleum (iferous)
phos	Phosphate (ic)
pk	Pink
plag	Plagioclase
plcy	Pelecypod
pl	Plant
plty	Platy
por	Porous (sity)
pos	Possible (ility)
p-p	Pin-Point
pred	Predominant (ly)
prim	Primary
prob	Probable (ly)
prom	Prominent (ly)
pt	Part (ly)
ptch	Patch (es)
ptg	Parting
purp	Purple
pyr	Pyrite (ic) (ized)
pyrbit	Pyrobitumen
qtz	Quartz
qtzc	Quartzitic
qtzs	Quartzose
rd	Round (ed)
repl	Replaced (ing) (ment)
rexl	Recrystallized
rmn	Remains (nant)
rr	Rare
rsns	Resinous
rthy	Earthy
s	Small
sa	Salt (y)
S	Sulphur
s&p	Salt & Pepper
sat	Saturated
sb	Sub

AGAT® Laboratories

COMMON ABBREVIATIONS (CONTINUED)

sc	Scales
scat	Scattered
sd	Sand (1/16 - 2mm)
sdy	Sandy
sec	Secondary
sed	Sediment (ary)
sft	Soft
sh	Shale
shad	Shadow
shy	Shaly
sid	Siderite (ic)
sil	Silica
sks	Slickensided
sl	Slight (ly)
sln	Solution
slt	Silt
sltst	Siltstone
slty	Silty
sm	Smooth
SP	Small Plug (as prefix)
sp	Spot (ted) (ty)
spec	Speck (led)
spl	Sample
srt	Sort (ed) (ing)
strg	Stringer
Strom	Stromatoporoid
stromlt	Stromatolite
struc	Structure
styl	Stylolite (ic)
suc	Sucrosic
sug	Sugary
sup	Supported
surf	Surface
sz	Size

tab	Tabular
tex	Texture
Tham	Thamnopora
thk	Thick
thn	Thin
thru	Throughout
tr	Trace
trnsl	Translucent
trnsp	Transparent
tt	Tight
tub	Tubular
uncons	Unconsolidated
unident	Unidentifiable
up	Upper
v	Very
var	Variable
vcol	Varicolored
vfrac	Vertical Fracture
vgt	Varigated
vn	Vein
vrtl	Vertical
vug	Vug (gy) (ular)
w	Well
wh	White
wk	Weak
wthrd	Weathered
wtr	Water
wvy	Wavy
wxy	Waxy
wsrt	Well sorted

xbd	Cross-bedded
xbdg	Cross-bedding
xl	Crystal (line)
xlam	Cross-laminated
yel	Yellow
zn	Zone
*	Broken core
/	With
>10000	Permeability over 10000 mD
<0.01	Permeability less than 0.01 mD
CC	Cracked Core
DR	Drilled
LC	Lost Core
RU	Rubble
mD	milliDarcy

AGAT® Laboratories

GEOLOGICAL REPORT

WID 1816

BELLOY PETROLEUM CONSULTING LTD.

#915, 706 - 7TH AVENUE S.W.
CALGARY, ALBERTA T2P 0Z1

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UNOCAL CANADA EXPLORATION LTD.

GEOLOGICAL REPORT

UCEL ET AL LIARD K-02 60-20

Location: K-02 60-20-123-30

9211-418-1-1

Prepared for: Peter Cameron

Prepared by: Michael Freeman, P.Geol.

NATIONAL ENERGY BOARD
ENG[illegible]RCH
FEB 19 1997

UCEL ET AL LIARD K-02 60-20-123-30

WELL DATA SUMMARY

Well Name:	UCEL ET AL LIARD K-02 60-20	
Well Location:	K-02 60-20-123-30	
Elevation:	Ground:	311 mm
	Kelly Bushing:	222 mm
Contractor:	Cactus Drilling Rig # 1	
Spud Date:	96-12-14-1000	
Hole Size:	Surface:	311 mm
	Main:	222 mm
Total Depth:	1657.0 meters:	97-01-12-0115
Surface Casing:	Set at 434.0 m K.B.	(244.5 mm)
	Drilled Out:	96-12-07-0615
Cores:	One Mattson	1131.00 - 1149.25 m
	Cut: 18.25 m	Recovered: 18.25 m
	Two Mattson	1162.00 - 1180.25 m
	Cut: 18.25 m	Recovered: 17.20 m
	Three Mattson	1309.50 - 1327.75 m
	Cut: 18.25 m	Recovered: 18.25 m
	Sidewall Coring Tool	
	# Shots: 23	Recovered: 20
Drill Stem Tests:	Not available at time of report.	

Open Hole Logs:	Schlumberger	Nisku
	DITE-DSST-GR	T.D. to Surface Casing 1:600, 1:240 1:48 T.D. to 1025.0 meters
	LDT-CNL-XY CAL-GR	T.D. to Surface Casing 1:600, 1:240 1:48 T.D. to 1025.0 meters
	MSCT-GR	T.D. to Surface Casing 1:600, 1:240 (Mechanical Sidewall Coring Tool)
	MDT-GR	T.D. to Surface Casing 1:240, 1:600 (Modular Dynamic Tester)

Ditch Samples: 5 meter intervals from Surface to 955.0 m and 2.5 meter intervals from 957.5 m to T.D. dried and vialed for
UNOCAL CANADA EXPLORATION LTD.
Samples caught at 5 meter intervals from Surface to T.D., dried and vialed for
OCELOT EXPLORATION LTD.
Samples caught at 5 m intervals from Surface to T.D. dried, bagged and vialed for
The National Energy Board.

Well Status: Not available at time of report.

Rig Release Date: Not available at time of report.

UCEL LIARD K-02 60-20-123-30

GEOLOGICAL MARKERS

K.B. ELEVATION: 379.30 m

Formation	Sample Depth (m)	Log Depth (m)	Log Subsea (m)
Scatter	453.0	452.0	- 72.7
Chinkeh (Equivalent)	787.0	786.5	- 407.2
Toad-Grayling	796.0	795.0	- 415.7
Fantasque	858.0	857.5	- 478.2
Mattson	1043.0	1038.5	- 659.2
Flett	1654.0	1654.5	-1275.2
Total Depth - Logger	-	1656.0	-1276.7
- Driller	1657.0	-	-1277.7

UCEL ET AL LIARD K-02 60-20-123-30

CORE INFORMATION SHEET

CORE NUMBER: 1

DATE: 24/12/96

OPERATOR: UNOCAL CANADA EXPLORATION LTD.

CONTRACTOR: CACTUS DRILLING RIG #1

WELL NAME: UCEL ET AL LIARD K-02 60-20-123-30

WELL LOCATION: K-02 60-20-123-30

FIELD: NOT APPLICABLE (WILDCAT WELL)

CORE COMPANY BAKER-HUGHES-INTEQ

SERVICE ENGINEER: G. McDONALD

FORMATION CORED: MATTSON

DEPTH INTERVAL: 1131.00 - 1149.25 m

METRES CORED: 18.25 m

METRES RECOVERED: ✓ 18.25 m

HOLE SIZE (mm): 222 mm

BIT TYPE: SC279

BIT SIZE (mm): 159 x 89 mm

BIT SERIAL #: 0321079

CORE BARREL SIZE: 146 x 89 mm

CORE BARREL SERIAL #: 1296

CORE BARREL LENGTH: 20.12 m

HOURS: 22:02 RPM: 60 WOB: 6000 MUD FLOWRATE (m3/min): 0.809

PUMP SIZE: 165 x 229 mm PRESSURE (kPa): 5200 DEN (kg/m3): 1090

VIS (s/l): 48 W.L. (cc/30 min): 8.0 pH: 9.0 GelS: N/A

PV/YP: 22/4.5 F.C.: 1.0

UCEL ET AL LIARD K-02 60-20-123-30

CORING TIMES - LOG NUMBER ONE

Depth (m)	Min/0.25 m	Depth (m)	Min/0.25 m
1131.25	24	1131.50	26
1131.75	26	1132.00	17
1132.25	16	1132.50	17
1132.75	16	1133.00	17
1133.25	17	1133.50	26
1133.75	14	1134.00	16
1134.25	14	1134.50	13
1134.75	14	1135.00	14
1135.25	12	1135.50	14
1135.75	17	1136.00	14
1136.25	15	1136.50	18
1136.75	18	1137.00	20
1137.25	21	1137.50	20
1137.75	18	1138.00	18
1138.25	26	1138.50	19
1138.75	17	1139.00	19
1139.25	20	1139.50	19
1139.75	19	1140.00	19
1140.25	20	1140.50	20
1140.75	19	1141.00	22
1141.25	21	1141.50	23
1141.75	21	1142.00	22
1142.25	22	1142.50	22
1142.75	20	1143.00	19
1143.25	20	1143.50	23
1143.75	24	1144.00	23
1144.25	24	1144.50	26
1144.75	20	1145.00	16
1145.25	15	1145.50	15

UCEL ET AL LIARD K-02 60-20-123-30

CORING TIMES - LOG NUMBER ONE

Depth (m)	Min/0.25 m	Depth (m)	Min/0.25 m
1145.75	15	1146.00	14
1146.25	15	1146.50	17
1146.75	15	1147.00	16
1147.25	18	1147.50	18
1147.75	18	1148.00	15
1148.25	14	1148.50	12
1148.75	13	1149.00	13
1149.25	14		

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1105 - 1107.5

Min/m 24.0,27.0,27.0

% 3.50,6.70,8.50

Sandstone (50%): buff, very fine to fine grained, minor medium to coarse grained, common pebble fragments, 80% quartz, 20% chert, calcareous and dolomitic cement, predominantly tight, weak fluorescence, slow cut;

Siltstone (25%): buff, quartzose, grading to very fine sandstone, calcareous dolomitic, tight;

Shale (25%): as above.

1107.5 - 1110

Min/m 19.0,17.5

% 7.00,69.00

Shale (60%): brown-gray, splintery;

Sandstone (30%): as above, shows as above;

Siltstone (15%): as above.

1110 - 1112.5

Min/m 26.0,21.0,21.0

% 29.00,13.00,10.00

Sandstone (60%): light to dark gray-brown, very fine to coarse grained, common pebble fragments, common loose fine grains, calcareous and dolomitic cement, tight to in part 10% porosity (conglomerate), in part even oil stain, good fluorescence and cut;

Shale (40%): as above.

1112.5 - 1115

Min/m 29.0,21.0

% 14.70,8.50

Sandstone (65%): buff, very fine grained, grading to siltstone, 5% chert, trace pyrite, tight, trace weak shows;

Shale (35%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1115 - 1117.5

Min/m 26.0,25.0,27.0

% 8.00,5.50,5.20

Sandstone (65%): buff, very fine grained, trace pebble fragments, 95% quartz, 5% chert, trace pyrite, rare glauconite, calcareous and dolomitic cement, tight, slow weak cut;

Shale (35%): gray to black, part red, splintery.

1117.5 - 1120

Min/m 30.0,26.0

% 6.00,6.30

Sandstone (60%): as above, in part gray-brown, in part fine to medium grained, in part porosity to (3%), trace spotty stain and fluorescence, slow moderately cut;

Shale (40%): as above.

1120 - 1122.5

Min/m 25.0,30.0,27.0

% 4.70,5.60,5.00

Shale (50%): black, part red, splintery;

Sandstone (50%): very fine to lower fine grained, 95% quartz, 5% chert, common loose grains, common very coarse angular chert pebble fragments, trace pyrite, calcareous and silica cement, trace porosity, trace spotty stain and fluorescence, very weak cut.

1122.5 - 1125

Min/m 26.0,30.0

% 4.80,7.20

Sandstone (65%): as above, minor upper fine to medium grained, porosity and shows as above;

Shale (35%): as above.

1125 - 1127.5

Min/m 13.0,13.5,22.5

% 7.90,10.00

Sandstone (60%): light brown, very fine to minor fine grained, 95% quartz, 5% chert, silica, calcareous cement, porosity to (10%), patchy to even stain and moderately fluorescence, slow moderately cut;

Shale (40%): gray to black, minor round, splintery.

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1127.5 - 1131

Min/m 34.0,0.00.0,93.0

% 7.00,6.20,3.00,5.00

Shale (60%): as above;

Sandstone (40%): as above. minor white. trace medium to very coarse grained. minor chert pebbles, in part fair porosity and shows as above.

1131 - 1149.25

Min/m 50.0,73.0,55.0,57.0,71.0,77.0,81.0,77.0,81.0,87.0,83.0,90.0,86.0,59.0,60.0,69.0,52.0,15.0

% 5.30,3.90,4.50,4.40,4.30,4.30,4.80,2.40,5.00,2.50,2.40,3.70,2.90,2.40,2.60,0.80

Cored interval number one. See detailed descriptions.

1149 - 1152.5

Min/m 15.0,22.0,19.5,15.0

% 2.70,0.75,0.80,1.70

Sandstone (55%): white. very fine to lower fine grained. quartzose. trace dark chert, trace shale fragments, subangular to subrounded, well sorted. silica. dolomitic and calcareous cement, common loose grains, predominantly tight, very weak fluorescence and cut;

Shale (45%): dark brown-gray, round. dolomitic, cavings in part ?.

1152.5 - 1155

Min/m 23.0,18.0

% 0.90,1.10

Shale (55%): as above;

Sandstone (45%): white. very fine grained. as above. abundant loose grains. tight. very weak cut.

1155 - 1157.5

Min/m 18.0,19.0,24.0

% 1.60,1.20,1.30

Sandstone (55%): buff. very fine to lower fine grained. trace shale fragments. silica. dolomitic and calcareous cement, minor loose grains. predominantly tight. very weak fluorescence and cut;

Shale (45%): as above.

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1157.5 - 1160

Min/m 21.5,16.0

% 1.20,2.20

Shale (70%): dark brown-gray, fissile platy;

Sandstone (30%): white, very fine grained, in part dark brown, grading siltstone, in part poor porosity, in part dark brown oil stain, spotty weak fluorescence and cut.

1160 - 1162

Min/m 13.5,16.0,82.0

% 30.00,2.20,2.35

Sandstone (60%): medium to dark gray-brown, very fine to lower fine grained, 95% quartz, 5% chert, trace shale fragments, subangular to rounded, moderately sorted, silica, dolomitic, calcareous, 5 - 10% porosity, patchy to even medium brown oil stain, slow milky yellow-white cut;

Shale (40%): dark brown-gray, silty in part, blocky.

1165 - 1180.25

Min/m 52.0,40.0,41.0,29.0,15.0,14.0,15.0,16.0,14.0,13.0,12.0,12.0,16.0,14.0,13.0,18.0,35.0

% 2.40,2.20,2.35,2.50,2.10,2.70,2.50,2.45,2.10,2.20,2.10,2.10,2.05,2.00,2.05,2.00,1.95

Core interval number two. See detailed descriptions.

1180 - 1182.5

Min/m 21.0,22.0,13.0

% 1.60,1.50,1.55

Sandstone (60%): white, lower very fine to lower medium grained, 85% quartz, 15% dark chert and minor shale fragments, grading to siltstone in part, tight to minor poor (6%): porosity, no shows;

Shale (40%): brown-gray, dark gray, bitumenous in part, fissile to blocky.

1182.5 - 1185

Min/m 9.0,8.5

% 2.60,2.90

Shale (100%): dark brown to black, very bitumenous, waxy, fissile to blocky;

Sandstone (trace): as above, tight, no shows.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1185 - 1187.5

Min/m 15.0,25.0,17.0

% 1.75,1.45,1.50

Sandstone (65%): buff, white, lower fine to upper fine grained, quartzose, trace chert, subangular to rounded, well sorted, calcareous, dolomitic and silica cement, tight to in part 8% porosity, no shows;

Shale (35%): as above.

1187.5 - 1190

Min/m 19.5,17.5

% 1.60,1.70

Sandstone (90%): clear, white, lower fine to upper fine grained, quartzose, trace chert, porosity to (12%), spotty very light brown oil stain and yellow fluorescence, moderately streaming cut;

Shale (10%): as above.

1190 - 1192.5

Min/m 28.0,25.0,25.0

% 1.20,1.40,1.30

Sandstone (80%): buff, medium brown in part, very fine to lower fine grained, very silty in part, argillaceous in part, tight to trace poor porosity, no shows;

Shale (20%): dark brown-gray, dark gray, bitumenous in part, fissile to blocky.

1192.5 - 1195

Min/m 31.0,37.0

% 1.25,1.10

Sandstone (75%): buff, trace medium brown, very fine to lower fine grained, as above, rare pyrobitumen, porosity as above, trace weak fluorescence, very weak cut;

Shale (25%): dark brown-gray, as above.

1195 - 1197.5

Min/m 35.0,24.0,13.5

% 1.15,1.55,1.70

Shale (80%): dark brown-black, bitumenous in part, silty, fissile to blocky;

Sandstone (20%): white, light brown, very fine to lower fine grained, silica and minor dolomitic cement, predominantly tight, no shows.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1197.5 - 1200

Min/m 35.0,39.0

% 1.30,1.20

Siltstone (50%): light to medium brown, quartzose, argillaceous, minor chert, grading to very fine sandstone, common fossil fragments, tight;

Sandstone (25%): as above, tight, no shows;

Shale (25%): as above.

1200 - 1202.5

Min/m 21.0,28.0,25.0

% 1.40,1.30,1.75

Sandstone (60%): very fine to fine grained, trace medium grained, 95% quartz, 5% chert, trace shale fragments, silica, calcareous and dolomitic cement, trace porosity, trace very weak fluorescence and cut;

Siltstone (20%): as above, tight;

Shale (20%): as above.

1202.5 - 1205

Min/m 31.0,27.0

% 1.50,1.20

Sandstone (60%): white, light brown, as above, trace porosity and very weak shows as above;

Shale (30%): dark gray-brown, fissile;

Siltstone (10%): as above.

1205 - 1207.5

Min/m 33.0,34.0,35.0

% 0.95,1.40,1.25

Sandstone (70%): light brown, very fine grained, grading to siltstone, quartzose, trace dark chert, silica, dolomitic and minor calcareous cement, predominantly tight, no shows;

Shale (30%): dark gray, minor dark brown, fissile to platy.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1207.5 - 1210

Min/m 22.0,21.0

% 1.55,2.25

Sandstone (65%): light brown, as above, in part white, predominantly tight, no shows;

Shale (35%): dark gray, minor dark brown, as above.

1210 - 1212.5

Min/m 26.0,33.0,30.0

% 2.50,1.80,1.50

Sandstone (70%): light gray-brown, very fine to fine grained, quartzose, trace chert, slightly argillaceous in part, subangular to subrounded, moderately sorted, 5% white Tripoli chert fragments, abundant loose grains, trace porosity, trace weak fluorescence and cut;

Shale (30%): dark gray, red, cavings in part ?.

1212.5 - 1215

Min/m 32.0,27.0

% 1.45,1.40

Sandstone (75%): as above, trace pyrite, very silty in part, predominantly tight, no shows;

Shale (25%): as above.

1215 - 1217.5

Min/m 29.0,25.0,18.0

% 2.00,2.35,7.00

Sandstone (90%): light brown, predominantly fine grained, quartzose, trace chert, minor white Tripoli chert fragments, porosity to (12%), even light brown stain, trace very weak fluorescence and cut;

Shale (10%): as above.

1217.5 - 1220

Min/m 28.0,28.0

% 4.30,5.20

Sandstone (70%): in part as above, in part white, very fine to fine grained, predominantly tight, no shows;

Shale (30%): dark gray, subfissile.

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1220 - 1222.5

Min/m 27.0,27.0,18.0

% 5.60,5.85,5.85

Sandstone (80%): buff, white, quartzose, trace chert, tight to trace porosity, trace weak fluorescence and cut;

Shale (20%): brown-gray, fissile to platy.

1222.5 - 1225

Min/m 10.0,10.0

% 18.50,7.30

Sandstone (95%): buff, fine to minor medium grained, minor white Tripoli chert fragments, trace calcareous, 15 - 18% porosity, even very light brown stain, trace weak fluorescence and cut;

Shale (5%): as above.

1225 - 1227.5

Min/m 11.0,10.5,14.5

% 8.40,25.00,7.50

Sandstone (95%): buff, fine to medium grained, trace coarse grained, quartzose, trace chert, subangular to rounded, moderately sorted, silica, 12 - 14% porosity, even very light brown stain, trace weak fluorescence and cut;

Shale (5%): dark brown-gray, cavings.

1227.5 - 1230

Min/m 14.5,12.0

% 6.90,7.00

Sandstone (95%): buff, very fine to trace fine grained, quartzose, rare chert, silica and dolomitic cement, trace poor porosity, no shows, very weak cut;

Shale (5%): as above.

1230 - 1232.5

Min/m 12.0,13.0,21.0

% 7.20,6.90,6.40

Sandstone (85%): buff, white, very fine to minor fine grained, quartzose, trace chert, rare pyrite, subangular to subrounded, well sorted, silica and dolomitic cement, trace poor porosity, very weak cut;

Shale (15%): medium to dark gray, silty in part, fissile to platy.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1232.5 - 1235

Min/m 25.0,23.0

% 6.00,6.00

Sandstone (50%): as above, porosity and shows as above;

Siltstone (30%): light gray-green, quartzose, argillaceous, trace pyrite, tight;

Shale (20%): as above, part gray-green.

1235 - 1237.5

Min/m 22.0,23.0,31.0

% 6.60,5.90,6.30

Sandstone (45%): light gray-brown, very fine to minor fine grained, quartzose, trace chert, argillaceous, silica, calcareous, trace porosity, no shows;

Siltstone (30%): light to medium brown-gray, quartzose, very argillaceous in part, dolomitic, tight;

Shale (25%): medium to dark gray, silty in part, platy.

1237.5 - 1240

Min/m 22.0,33.0

% 7.50,5.90

Sandstone (75%): as above, trace fossil fragments, trace porosity, no shows;

Shale (25%): as above, trace green.

1240 - 1242.5

Min/m 31.0,29.0,33.0

% 5.95,5.80,5.80

Siltstone (65%): medium to dark brown, quartzose, grading to very fine grained sandstone, silica, minor fossil fragments, trace porosity, patchy dark brown oil stain, spotty weak fluorescence and cut;

Shale (20%): as above;

Sandstone (15%): as above, tight.

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1242.5 - 1245

Min/m 34.0,38.0

% 5.60,5.50

Sandstone (75%): white, buff, very fine to fine to occasional medium grained, quartzose, minor chert, trace calcareous, tight, no shows;

Shale (20%): as above;

Siltstone (5%): as above.

1245 - 1247.5

Mi m 25.0,21.0,20.0

% 5.60,5.60,5.60

Chert (60%): white, light gray, massive, angular fragments, silty in part, blocky;

Dolomite (35%): buff, microcrystalline to very finely crystalline, microsucrosic, slightly silty and sandy, rare vuggy porosity, no shows;

Shale (5%): as above, cavings.

1247.5 - 1250

Min/m 28.0,29.0

% 5.50,5.50

Dolomite (75%): buff, as above, part light to medium brown, tight, no shows;

Chert (20%): as above, part medium to dark gray, trace pyrite;

Shale (5%): as above, cavings.

1250 - 1252.5

Min/m 30.0,31.0,37.0

% 5.00,5.00,5.20

Chert (60%): light to dark gray, brown-gray, massive, angular fragments, in part silty, rare pyrite, blocky;

Dolomite (40%): light brown, microcrystalline to very finely crystalline, microsucrosic, dense in part, tight, no shows.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1252.5 - 1255

Min/m 38.0,39.0

% 5.80,5.50

Dolomite (85%): brown, as above, grading to dolomitic sandstone in part, tight, no shows;

Sandstone (10%): buff, very fine to fine grained, very dolomitic, tight, no shows;

Chert (5%): as above.

1255 - 1257.5

Min/m 17.5,13.0,36.0

% 5.50,5.20,5.20

Sandstone (60%): clear, buff, lower fine to trace medium grained, quartz, trace chert, rounded to subrounded, moderately sorted, dolomitic cement, abundant loose grains, porosity to (25%), no shows;

Dolomite (40%): brown, microcrystalline, silty, sandy, tight, no shows.

1257.5 - 1260

Min/m 30.0,50.0

% 5.30,5.30

Sandstone (90%): light gray-brown, very fine to trace lower fine grained, quartz, 5% chert, very silica, slightly dolomitic, tight, no shows;

Shale (10%): dark gray, fissile.

1260 - 1262.5

Min/m 42.0,36.0,35.0

% 6.00,7.00,8.20

Dolomite (60%): light to medium gray-brown, argillaceous, silty, slightly to very sandy in part, tight, no shows;

Sandstone (40%): light gray-brown, very fine to trace lower fine grained, quartzose, trace chert, silica and dolomitic cement, tight, no shows.

1262.5 - 1265

Min/m 27.0,33.0

% 8.00,8.40

Dolomite (60%): as above, common dark brown and very argillaceous, tight;

Shale (25%): dark brown-gray, dolomitic, slightly bitumenous, platy;

Sandstone (15%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1265 - 1267.5

Min/m 25.0,31.0,26.0

% 8.30,7.20,7.80

Dolomite (50%): medium to dark brown, microsucrosic, silty, very argillaceous, trace pyrite, tight, no shows;

Sandstone (40%): white, light brown, very fine to lower fine grained, quartz, 5% chert, silica, slightly dolomitic, tight, no shows;

Shale (10%): as above.

1267.5 - 1270

Min/m 35.0,40.0

% 5.60,5.20

Dolomite (85%): light to medium brown, microsucrosic, very silty, slightly argillaceous, slightly sandy, tight, no shows;

Sandstone (10%): as above, tight;

Shale (5%): as above.

1270 - 1272.5

Min/m 38.0,38.0,22.0

% 5.30,5.30,4.30

Dolomite (95%): light to dark gray-brown, microcrystalline, silty, slightly to very argillaceous, minor white chert fragments, tight, no shows;

Shale (5%): dark brown-gray, dolomitic.

1272.5 - 1275

Min/m 26.0,29.0

% 3.40,4.00

Dolomite (40%): as above, no shows;

Sandstone (40%): white, light to dark brown, fine to coarse grained, common chert pebble fragments, abundant silica and dolomitic cement, trace pyrite, tight, very weak cut;

Shale (20%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1275 - 1277.5

Min/m 28.0,29.0,25.0

% 4.00,3.60,3.80

Sandstone (90%): in part as above, predominantly clear, upper fine grained, trace medium grained, quartzose, trace chert, 5% white Tripoli chert, very silica, dolomitic, abundant loose grains, trace porosity, very weak yellow-green cut;

Shale (10%): dark gray, platy.

1277.5 - 1280

Min/m 15.0,14.5

% 3.90,3.90

Sandstone (95%): clear, upper fine grained, quartz, trace chert, silica and dolomitic cement, porosity to (15%), very weak cut;

Shale (5%): as above.

1280 - 1282.5

Min/m 34.0,35.0,34.0

% 3.70,3.50,3.70

Sandstone (85%): buff, white, very fine to trace lower fine grained, quartz, trace chert, very dolomitic, silica, slightly calcareous, tight, trace very weak cut;

Shale (15%): as above.

1282.5 - 1285

Min/m 22.0,36.0

% 3.70,4.50

Dolomite (90%): medium gray-brown, microcrystalline, argillaceous, very silty and sandy, grading to dolomitic sandstone, trace poor vuggy porosity, spotty oil stain and fluorescence, slow weak cut;

Shale (10%): dark gray, dolomitic, fissile to platy.

1285 - 1287.5

Min/m 34.0,32.0,34.0

% 4.80,5.40,6.00

Sandstone (90%): light gray-brown, lower fine to very fine grained, quartzose, trace dark chert, grading to sandy dolomitic, trace poor porosity, spotty oil stain and weak fluorescence, slow weak cut;

Dolomite (10%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1287.5 - 1290

Min/m 31.0,29.0

% 6.30,6.50

Dolomite (90%): medium gray-brown, microcrystalline, argillaceous, grading to dolomitic sandstone, trace poor vuggy porosity, spotty oil stain, slow weak cut;

Sandstone (20%): as above, shows as above.

1290 - 1292.5

Min/m 28.0,20.0,17.0

% 6.40,7.10,7.50

Sandstone (90%): buff, white, very fine grained, 95% quartz, 5% chert, common wavy shale laminated, abundant silica and dolomitic cement, tight, no shows;

Shale (10%): dark gray, dolomitic, fissile, as partings in sandstone.

1292.5 - 1295

Min/m 14.5,17.0

% 7.20,5.00

Sandstone (75%): as above, subangular to subrounded, well sorted, argillaceous in part, slightly silty in part, tight, no shows;

Shale (25%): dark gray, as above, silty in part.

1295 - 1297.5

Min/m 22.0,34.0,29.0

% 4.80,4.40,5.60

Dolomite (90%): light to dark brown, microcrystalline to very finely crystalline, silty, slightly argillaceous, minor Crinoid, tight, trace very weak cut;

Shale (5%): dark gray, as above;

Sandstone (5%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1297.5 - 1300

Min/m 37.0,23.0

% 4.80,4.60

Sandstone (85%): white, buff, lower fine to lower medium grained, quartzose, 5% chert, silica and dolomitic cement, trace poor porosity, trace fluorescence, slow weak cut;

Dolomite (10%): as above;

Shale (5%): as above, trace black coal.

1300 - 1302.5

Min/m 10.0,22.0,42.0

% 27.00,28.20,7.60

Sandstone (75%): buff, white, very fine to fine to occasional medium grained, minor calcareous fossil fragments, trace to fair porosity, possible 30% porosity in part ?, spotty oil stain and fluorescence, slow weak cut;

Shale (20%): dark gray, platy;

Coal (5%). black, shaly, blocky.

1302.5 - 1305

Min/m 37.0,37.0

% 66.00,52.00

Sandstone (80%): as above, predominantly fine grained, minor Tripoli chert, trace porosity, trace weak shows as above;

Shale (20%): as above.

1305 - 1307.5

Min/m 34.0,21.0,24.0

% 63.00,62.00,63.00

Sandstone (90%): clear, lower fine grained, quartzose, trace white Tripoli chert, dolomitic and silica cement, in part porosity to (10%), trace weak cut;

Shale (10%): dark gray, platy.

1307.5 - 1309

Min/m 12.0

% 68.00

Sandstone (100%): clear, lower fine to upper fine grained, trace medium grained, quartzose, trace Tripoli chert, silica and trace dolomitic cement, fair to very good (20%) porosity, spotty fluorescence, slow weak cut.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1309 - 1327.75

Min/m 18.0,22.0,15.0,13.0,13.0,15.0,18.0,20.0,15.0,13.0,11.0,12.0,10.0,13.0,10.0,12.0,9.0,7.0

% 4.20,3.65,2.90,2.40,2.50,2.75,2.65,2.70,2.65,2.70,2.52,2.40,2.20,-,-,-,-,-,-

Cored interval number three. See detailed descriptions.

1327.75 - 1330

Min/m 32.0,35.0,41.0

% 2.50,2.40,2.50

Sandstone (60%): white, lower fine grained, quartzose, silica and rare dolomitic cement, trace to minor good (18%) porosity, trace weak fluorescence and cut:

Shale (40%): medium to dark gray, in part medium brown and very silty, cavings in part ?.

1330 - 1332.5

Min/m 36.0,42.0,73.0

% 2.45,2.50,1.80

Shale (65%): medium to dark gray, in part round, in part grading to siltstone, blocky;

Sandstone (35%): white, lower fine grained, quartzose, trace dark chert, silica and trace dolomitic cement, abundant loose grains, trace porosity, trace weak fluorescence and cut.

1332.5 - 1335

Min/m 48.0,32.0

% 1.80,1.50

Shale (65%): medium to dark gray, part round, as above;

Sandstone (35%): as above, part upper fine grained, trace porosity, trace weak shows as above.

1335 - 1337.5

Min/m 10.5,10.5,32.0

% 3.10,2.60,1.40

Sandstone (80%): cream, white, upper very fine to upper fine grained, quartzose, trace dark chert, 10% white Tripoli chert, tight to in part good (18%) porosity, spotty very light brown oil stain, spotty moderately fluorescence and cut:

Shale (20%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1337.5 - 1340

Min/m 34.0,36.0

% 1.85,1.85

Sandstone (75%): cream, white, as above, very fine to trace lower fine grained, occasional shale partings, tight to trace porosity, trace very weak fluorescence;

Shale (25%): as above.

1340 - 1342.5

Min/m 36.0,29.0,13.0,14.0,16.0

% 1.70,1.70,1.75,1.75,1.70

Sandstone (85%): clear, lower fine to upper fine grained, quartzose, trace dark chert, trace shale partings, silica and trace dolomitic cement, good porosity to (15%), trace weak fluorescence, very weak cut;

Shale (15%): medium to dark gray, part round, platy, cavings in part.

1342.5 - 1345

Min/m 14.0,16.0

% 1.75,1.70

Sandstone (90%): as above, predominantly lower fine grained, predominantly loose grains, porosity and trace weak shows as above;

Shale (10%): as above.

1345 - 1347.5

Min/m 18.0,18.0,19.0

% 1.70,1.70,1.60

Sandstone (90%): clear, lower fine grained, quartzose, silica and trace dolomitic cement, 5% white Tripoli chert, abundant loose grains, fair porosity to (12%), spotty weak fluorescence, very weak cut;

Shale (10%): medium to dark gray, platy.

1347.5 - 1350

Min/m 22.0,22.0

% 1.80,2.00

Sandstone (75%): cream, white, upper very fine to lower fine grained, 10% white Tripoli chert, trace to in part fair porosity, shows as above;

Shale (25%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1350 - 1352.5

Min/m 24.0,31.0,31.0

% 2.05,1.80,1.90.0

Sandstone (70%): cream, buff, upper very fine grained, quartzose, shale partings, 5% white Tripoli chert, silica and dolomitic cement, predominantly tight, very weak cut;

Shale (30%): dark gray, in part round, silty in part, platy, cavings in part ?.

1352.5 - 1355

Min/m 47.0,38.0

% 1.90,1.90

Sandstone (65%): cream, buff, as above, in part lower fine grained, in part argillaceous and silty, predominantly tight, trace weak cut;

Shale (35%): dark gray, as above, dolomitic.

1355 - 1357.5

Min/m 35.0,48.0,92.0

% 1.90,2.10,3.00

Siltstone (40%): light brown, argillaceous, sandy, grading silty dolomitic, tight, very weak cut;

Shale (40%): as above;

Sandstone (20%): cream, buff, lower fine to upper very fine grained, quartzose, silica, dolomitic, abundant loose grains, predominantly tight, very weak cut.

1357.5 - 1360

Min/m 37.0,43.0

% 10.50,9.00

Sandstone (70%): buff, lower to upper very fine grained, quartzose, silica, very dolomitic, trace porosity, very weak cut;

Siltstone (15%): as above;

Shale (15%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1360 - 1362.5

Min/m 34.0,36.0,26.0

% 10.80,10.00,12.00

Shale (45%): dark gray, minor round, silty in part, platy;

Siltstone (35%): light brown, argillaceous, sandy, very dolomitic, tight;

Sandstone (20%): buff, very fine grained, quartzose, silica, dolomitic, tight, very weak cut.

1362.5 - 1365

Min/m 26.0,23.0

% 11.50,12.20

Dolomite (55%): medium to dark gray-brown, microcrystalline, microsucrosic, silty, argillaceous, tight, no shows;

Shale (45%): dark brown-gray, silty, fissile to platy.

1365 - 1367.5

Min/m 25.0,21.0,26.0

% 12.00,9.60,6.80

Sandstone (95%): lower fine to upper fine grained, trace medium to lower coarse grained, quartzose, silica and dolomitic cement, common pyrobitumen, porosity to (14%), patchy light brown stain and yellow-green fluorescence, moderately streaming blue-white cut;

Shale (5%): as above.

1367.5 - 1370

Min/m 44.0,47.0

% 3.90,3.00

Sandstone (85%): white, very fine grained, quartzose, silica and dolomitic cement, predominantly tight, trace good porosity and shows as above;

Shale (15%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1370 - 1372.5

Min/m 42.0,34.0,34.0

% 2.90,3.10,2.50

Sandstone (95%): white, upper very fine to lower fine grained, minor upper fine to upper coarse grained, 95% quartz, 5% dark chert, subangular to rounded, poorly sorted, minor pyrobitumen, silica and dolomitic cement, tight, in part fair (7 - 9%) porosity, spotty light brown oil stain and yellow-green fluorescence, moderately streaming blue-white cut;

Shale (5%): as above.

1372.5 - 1375

Min/m 38.0,35.0

% 2.25,2.50

Sandstone (90%): as above, 5% white Tripoli chert;

Shale (10%): as above.

1375 - 1377.5

Min/m 37.0,52.0,49.0

% 2.30,2.50,2.40

Sandstone (75%): light brown, upper very fine to lower fine grained, quartz, 5% chert, silica and dolomitic cement, tight, trace weak fluorescence and cut;

Dolomite (20%): medium brown, argillaceous, silty, tight, no shows;

Shale (5%): dark brown-gray, platy.

1377.5 - 1380

Min/m 47.0,45.0

% 2.50,2.45

Siltstone (65%): light brown, argillaceous, dolomitic, tight;

Sandstone (20%): as above, trace pyrobitumen, trace poor porosity and weak shows;

Shale (15%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1380 - 1382.5

Min/m 42.0,43.0,44.0

% 2.50,2.30,2.10

Sandstone (90%): white, cream, lower very fine to upper very fine grained, quartzose, 5% white Tripoli chert, shale partings, silica and dolomitic cement, tight, trace weak fluorescence and cut;

Shale (10%): dark brown-gray, platy.

1382.5 - 1385

Min/m 41.0,38.0

% 1.90,1.70

Sandstone (90%): white, cream, lower very fine to upper very fine grained, as above, tight, trace weak fluorescence and cut;

Shale (10%): dark brown-gray, trace dolomitic, fissile to platy.

1385 - 1387.5

Min/m 44.0,37.0,34.0

% 1.90,1.80,1.85

Sandstone (75%): light gray-brown, lower very fine to upper very fine grained, quartzose, argillaceous, common shale partings, silica and dolomitic cement, predominantly tight, trace very weak fluorescence and cut;

Siltstone (20%): medium brown-gray, argillaceous, sandy, dolomitic, tight;

Shale (5%): as above.

1387.5 - 1390

Min/m 32.0,50.0

% 1.80,1.70

Sandstone (50%): as above, trace lower fine grained, tight, very weak shows as above;

Shale (30%): brown-gray, as above;

Siltstone (20%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1390 - 1392.5

Min/m 67.0,48.0,48.0

% 1.75,1.80,1.90

Dolomite (90%): dark gray-brown, microcrystalline to very finely crystalline, microsucrosic, silty, very argillaceous, slightly bitumenous, tight, slow weak cut;

Shale (10%): dark brown-gray, platy.

1392.5 - 1395

Min/m 48.0,55.0

% 1.90,1.80

Sandstone (60%): white, light brown, very fine to lower fine grained, quartzose, trace chert, shale partings, predominantly tight, trace very weak fluorescence and cut;

Dolomite (25%): as above, slow weak cut;

Shale (15%): as above.

1395 - 1397.5

Min/m 47.0,33.0,47.0

% 3.00,2.60,2.15

Sandstone (85%): cream, white, lower very fine to upper very fine grained, quartzose, silica and dolomitic cement, tight, trace fair (7 - 9%) porosity, trace spotty light brown oil stain and moderately fluorescence, moderately streaming blue-white cut;

Shale (10%): dark brown-gray, platy;

Dolomite (5%): as above.

1397.5 - 1400

Min/m 40.0,37.0

% 2.20,2.25

Sandstone (90%): cream, white, as above, tight, rare weak shows as above;

Shale (10%): as above, trace pyrite.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1400 - 1402.5

Min/m 42.0,44.0,43.0,52.0,43.0

% 2.20,1.65,1.50,1.58,1.60

Sandstone (90%): cream, lower-upper very fine grained, quartzose, 5% white Tripoli chert, silica and dolomitic cement, predominantly tight, rare weak fluorescence and cut;

Shale (10%): dark gray to black, in part carbonaceous, trace pyrite, subfissile.

1402.5 - 1405

Min/m 52.0,43.0

% 1.58,1.60

Sandstone (85%): cream, as above, predominantly tight, rare shows as above;

Shale (15%): as above, in part brown-gray, silty, trace glauconitic, blocky.

1405 - 1407.5

Min/m 82.0,87.0,65.0

% 1.70,1.85,1.80

Dolomite (70%): light brown, very fine to fine crystalline, dense, silty, chert included, trace pyrite, fossil impression, tight, no shows;

Chert (20%): light gray to brown, cryptocrystalline, angular, massive, very dolomitic, slightly sandy;

Shale (10%): dark gray, platy.

1407.5 - 1410

Min/m 62.0,32.0

% 1.65,1.65

Sandstone (80%): cream, lower fine to very fine grained, quartzose, silica and dolomitic cement, trace porosity, no shows;

Shale (15%): as above;

Dolomite (5%): as above.

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1410 - 1412.5

Min/m 34.0,39.0,49.0

% 1.70,1.35,1.25

Sandstone (90%): cream, lower fine to upper very fine grained, 95% quartz, 5% yellow and round chert, slightly oxidized, subangular to subrounded, well sorted, silica, calcareous and dolomitic cement, trace poor (5%) porosity, no shows;

Shale (10%): dark gray, silty, platy.

1412.5 - 1415

Min/m 43.0,44.0

% 1.50,1.53

Sandstone (90%): cream, lower fine to upper very fine grained, as above, 5% white Tripoli chert, minor fossil fragments, predominantly tight, no shows;

Shale (10%): as above.

1415 - 1417.5

Min/m 43.0,48.0,43.0

% 1.70,1.80,1.90

Sandstone (85%): cream, very fine to minor lower fine grained, quartzose, trace pyrite, trace Tripoli chert, trace fossil fragments, silica and dolomitic cement, tight, no shows;

Shale (15%): medium to dark gray, grading to siltstone, sandy, platy.

1417.5 - 1420

Min/m 38.0,43.0

% 1.90,2.00

Sandstone (60%): as above, lower fine to very fine grained, common fossil fragments, tight, no shows;

Shale (30%): as above;

Siltstone (10%): brown-gray, dolomitic, sandy, tight.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1420 - 1422.5

Min/m 57.0,44.0,50.0

% 1.60,1.40,1.00

Sandstone (70%): buff, cream, fine to coarse grained, quartzose, fossil fragments, interbedded dolomite, trace pyrite, silica cement, tight, no shows;

Shale (30%): light green-gray, dark gray, silty, fissile to platy.

1422.5 - 1425

Min/m 46.0,38.0

% 1.05,1.15

Sandstone (75%): as above, predominantly lower fine to upper fine grained, minor pyrobitumen, in part fair (7 - 9%) porosity, spotty oil stain and yellow fluorescence, moderately cut;

Shale (25%): as above.

1425 - 1427.5

Min/m 35.0,41.0,38.0

% 1.05,1.08,1.20

Sandstone (75%): cream, very fine to minor lower fine grained, quartzose, minor fossil fragments, rare pyrite, silica and dolomitic cement, trace poor (5%) porosity, rare spotty shows as above;

Shale (25%): medium to dark gray, part round, silty, part cavings ?.

1427.5 - 1430

Min/m 42.0,36.0

% 0.97,0.95

Dolomite (85%): light gray, cream, fine to medium crystalline, sucrosic, very pyritic, slightly argillaceous, tight, no shows;

Shale (10%): as above;

Sandstone (5%): as above, no shows.

1430 - 1432.5

Min/m 40.0,40.0,31.0

% 0.97,0.97,0.98

Sandstone (80%): cream, white, very fine to lower fine grained, quartzose, 5% Tripoli chert, silica and dolomitic cement, trace poor (4%) porosity, trace weak fluorescence and cut;

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

Dolomite (10%): as above;

Shale (10%): as above.

1432.5 - 1435

Min/m 40.0,31.0

% 1.00,0.90

Dolomite (60%): light to medium brown, white, cryptocrystalline to microcrystalline, argillaceous, chert included, trace pyrite, tight, no shows;

Shale (25%): as above;

Sandstone (15%): as above, predominantly loose grains.

1435 - 1437.5

Min/m 9.0,20.0,45.0

% 1.50,0.90,1.00

Sandstone (70%): cream, buff, very fine to lower fine grained, quartzose, trace chert, rare pyrite, silica and dolomitic cement, common loose grains, in part good (16%) porosity questionable, trace very weak cut;

Shale (25%): dark brown-gray, silty, platy;

Dolomite (5%): as above.

1437.5 - 1440

Min/m 36.0,14.0

% 1.15,1.50

Sandstone (75%): as above, lower fine to upper fine grained, porosity to 14% ?, trace very weak cut;

Shale (25%): as above, grading to siltstone.

1440 - 1442.5

Min/m 18.0,26.0,41.0

% 1.00,1.00,1.25

Siltstone (60%): light brown, sandy, very dolomitic, grading to silty dolomitic, slightly argillaceous, tight;

Sandstone (20%): clear, lower fine grained, quartzose, predominantly loose grains, porosity as above, trace very weak cut;

Shale (20%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1442.5 - 1445

Min/m 30.0,45.0

% 1.13,1.25

Siltstone (60%): as above, tight;

Shale (25%): brown-gray, silty;

Sandstone (15%): as above, in part upper fine grained, porosity to 12% ?, very weak cut.

1445 - 1447.5

Min/m 44.0,38.0,30.0

% 1.30,1.25,1.28

Sandstone (70%): buff, cream, lower fine to upper fine grained, quartzose, dolomitic and minor silica cement, common loose grains, poor (3 - 4%): porosity, no shows;

Shale (30%): dark gray, brown-gray, silty in part, fissile to platy.

1447.5 - 1450

Min/m 31.0,42.0

% 1.30,1.20

Sandstone (65%): cream, lower fine to very fine grained, quartzose, 15% white Tripoli chert, porosity as above, no shows;

Shale (35%): as above, in part grading siltstone.

1450 - 1452.5

Min/m 30.0,11.5,12.0

% 1.00,1.02,0.97

Sandstone (90%): cream, white, upper very fine to lower fine grained, quartzose, 5% white kaolinite stringers, silica and trace dolomitic cement, porosity to (16%), trace very weak cut;

Shale (10%): dark gray, silty, platy.

1452.5 - 1455

Min/m 19.5,9.5

% 1.00,1.10

Sandstone (90%): as above, predominantly lower fine grained, rare pyrobitumen, abundant loose grains, in part porosity to (18%), trace weak fluorescence and cut;

Shale (10%): as above, blocky in part.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m),
Penetration Rate- Min/m
Total Gas %

1455 - 1457.5

Min/m 25.0,33.0,36.0

% 1.03,1.12,1.18

Sandstone (55%): cream, very fine to lower fine grained, quartzose, silty, minor kaolinite stringers, trace Iron-Ferruginous stain, silica and dolomitic cement, trace poor porosity, trace weak fluorescence and cut;

Shale (30%): light to dark gray, green-gray, silty;

Siltstone (15%): brown-gray, argillaceous, blocky.

1457.5 - 1460

Min/m 33.0,34.0

% 1.18,1.18

Sandstone (70%): as above, shows as above;

Shale (20%): as above;

Siltstone (10%): as above, in part very dolomitic.

1460 - 1462.5

Min/m 23.0,37.0,29.0

% 1.16,1.10,1.20

Sandstone (65%): cream, very fine to lower fine grained, quartzose, silty, 10% kaolinite stringers, silica and dolomitic cement, abundant loose grains, trace pyrite, predominantly tight, no shows;

Shale (25%): light to dark gray, as above;

Siltstone (10%): brown-gray, blocky.

1462.5 - 1465

Min/m 26.0,32.0

% 1.20,1.12

Sandstone (75%): as above, predominantly lower fine grained, trace porosity, very weak cut;

Shale (25%): light to dark gray, silty, platy.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1465 - 1467.5

Min/m 30.0,25.0,26.0,32.0,28.0

% 1.19,1.19,1.14,1.12,1.20

Sandstone (75%): cream, lower fine to upper fine grained, quartzose, trace shale partings, minor kaolinite stringers, dolomitic and silica cement, trace poor (3 - 4%): porosity, trace very weak cut;

Shale (25%): as above.

1467.5 - 1470

Min/m 32.0,28.0

% 1.12,1.20

Sandstone (70%): as above, very fine grained and silty in part, minor sandy dolomite stringers, predominantly tight, trace very weak cut;

Shale (20%): as above;

Siltstone (10%): brown-gray, argillaceous, blocky.

1470 - 1472.5

Min/m 48.0,50.0,55.0

% 1.22,1.30,1.60

Shale (60%): dark gray, green-gray in part, dolomitic, fissile to platy;

Siltstone (20%): medium to dark brown, argillaceous, dolomitic, tight;

Sandstone (20%): cream, very fine to fine grained, fossil fragments, tight, no shows.

1472.5 - 1475

Min/m 43.0,29.0

% 1.50,1.40

Sandstone (60%): light brown, fine to medium grained, trace pyrite, minor pyrobitumen, 8 - 12% porosity, patchy oil stain and fluorescence, moderately cut;

Shale (30%): as above;

Siltstone (10%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1475 - 1477.5

Min/m 6.5,6.0,12.0

% 1.55,1.50,1.50

Sandstone (100%): buff, upper very fine to upper fine grained, trace medium grained, quartzose, trace pyrite, trace kaolinite, subangular to rounded, moderately sorted, silica and dolomitic cement, common pyrobitumen, good porosity to (22%), spotty oil, patch pale brown stain, patch yellow fluorescence, slow moderately cut.

1477.5 - 1480

Min/m 13.0,22.0

% 1.45,1.40

Sandstone (95%): as above, common medium grained, in part good (18%) porosity, shows as above:

Shale (5%): as above.

1480 - 1482.5

Min/m 37.0,35.0,36.0

% 1.53,1.55,1.60

Sandstone (80%): light brown, predominantly lower fine grained, quartzose, 5% kaolinite stringers, common pyrobitumen, poor to in part good (15%): porosity, patch weak fluorescence, slow cut:

Shale (20%): light green-gray, dark gray, grading to siltstone, fissile to blocky.

1482.5 - 1485

Min/m 32.0,28.0

% 1.50,1.55

Sandstone (70%): as above, part white, tight to fair (12%): porosity, spotty weak shows as above:

Shale (30%): as above.

1485 - 1487.5

Min/m 37.0,67.0,43.0

% 1.55,1.60,1.73

Sandstone (50%): white, buff, in part organic and oxidized, very fine to lower fine grained, minor pyrite, trace poor porosity, trace weak fluorescence and cut:

Siltstone (30%): brown-gray, argillaceous, dolomitic, tight:

Shale (20%): light to dark gray, fissile to platy.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1487.5 - 1490

Min/m 31.0,63.0

% 1.70,1.60

Sandstone (40%): buff, white, trace oxidized, as above, very fine to lower medium grained, in part fair porosity, trace weak shows as above;

Shale (40%): as above;

Siltstone (20%): as above.

1490 - 1492.5

Min/m 48.0,36.0,59.0

% 1.73,1.72,1.55

Sandstone (65%): cream, white, very fine to fine grained, 5% varicoloured quartz and chert grains, trace pyrite, dolomitic, silica cement, predominantly tight, very weak cut;

Shale (25%): as above;

Siltstone (10%): as above.

1492.5 - 1495

Min/m 7.0,5.0

% 1.55,1.55

Sandstone (50%): as above, lower fine to trace medium grained, 15% varicoloured grains, abundant loose grains, porosity to (25%), trace weak fluorescence and cut;

Shale (40%): as above;

Siltstone (10%): as above.

1495 - 1497.5

Min/m 9.0,13.0,6.0

% 1.50,1.48,1.70

Sandstone (95%): cream, upper very fine to lower fine grained, trace upper fine to lower medium grained, quartzose, 5% oxidized varicoloured grains, trace pyrite, trace kaolinite stringers, 60% unconsolidated, dolomitic, silica cement, good porosity to (20%), trace very weak cut;

Shale (5%): dark gray, platy.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1497.5 - 1500

Min/m 6.0,4.0

% 1.47,1.50

Sandstone (95%): as above, lower fine to upper fine grained, 85% unconsolidated, porosity to (25%), shows as above;

Shale (5%): as above.

1500 - 1502.5

Min/m 3.5,3.5,11.0

% 1.50,1.50,1.42

Sandstone (100%): cream, upper very fine to upper fine grained, trace oxidized, trace pyrite and kaolinite, dolomitic and silica cement, 80% unconsolidated, porosity to (25%), trace very weak cut.

1502.5 - 1505

Min/m 26.0,44.0

% 1.49,1.10

Sandstone (75%): in part as above, in part very fine grained, consolidated, silica and dolomitic cement, predominantly tight, no shows;

Shale (15%): light to dark gray, silty, platy;

Siltstone (10%): brown-gray, blocky.

1505 - 1507.5

Min/m 49.0,42.0,36.0

% 1.12,2.20,1.12

Sandstone (70%): cream, upper very fine to lower fine grained, quartzose, dolomitic and silica cement, abundant loose grains, in part cavings ?, tight, no shows;

Shale (20%): as above;

Siltstone (10%): as above, in part very dolomitic.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1507.5 - 1510

Min/m 49.0,37.0

% 1.30,1.40

Sandstone (80%): as above, very fine grained, well consolidated, minor kaolinite stringers, trace poor porosity, weak yellow fluorescence, slow very weak cut;

Shale (10%): as above;

Siltstone (10%): as above.

1510 - 1512.5

Min/m 36.0,48.0,40.0

% 0.95,1.02,1.00

Shale (50%): dark gray, in part round (cavings ?), silty, fissile to platy;

Sandstone (40%): cream, upper very fine to fine grained, trace medium grained, quartzose, dolomitic and silica cement, common loose grains, trace poor porosity, shows as above;

Siltstone (10%): brown-gray, argillaceous, blocky.

1512.5 - 1515

Min/m 40.0,38.0

% 0.98,1.00

Shale (70%): as above, minor pyrite;

Sandstone (15%): as above, tight, no shows;

Siltstone (15%): as above.

1515 - 1517.5

Min/m 39.0,35.0,18.0

% 1.30,0.95,0.95

Sandstone (60%): cream, white, lower very fine to lower fine grained, quartzose, 10% kaolinite stringers, 10% oxidized grains, common pyrobitumen, silica and dolomitic cement, fair (8 - 10%) porosity, spotty yellow fluorescence, slow moderately cut;

Shale (30%): as above;

Siltstone (10%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1517.5 - 1520

Min/m 24.0,31.0

% 1.90,1.10

Sandstone (80%): cream, as above, lower fine to upper fine grained, 4 - 6% porosity, trace shows as above;

Shale (20%): dark gray, platy.

1520 - 1522.5

Min/m 18.0,23.0,28.0

% 1.00,0.80,0.78

Sandstone (85%): cream, white, upper very fine to upper fine grained, quartzose, 15% kaolinite stringers, silica and dolomitic cement, part fair (10%): porosity, trace spotty weak fluorescence, very weak cut;

Shale (15%): as above.

1522.5 - 1525

Min/m 22.0,19.0

% 0.83,0.80

Sandstone (95%): cream, white, as above, lower fine to upper fine grained, trace oxidized, subangular to subrounded, moderately to well sorted, porosity as above, very weak cut;

Shale (5%): dark gray, fissile to platy.

1525 - 1527.5

Min/m 35.0,35.0,20.0

% 0.78,0.78,0.80

Sandstone (90%): cream, buff, lower fine to upper fine grained, trace medium grained, quartzose, common dolomitic fossil fragments, trace kaolinite stringers, dolomitic and silica cement, predominantly tight, very weak fluorescence and cut;

Shale (10%): as above.

1527.5 - 1530

Min/m 17.0,22.0

% 0.78,0.77

Sandstone (85%): as above, 5% yellow and round oxidized grains, rare pyrite, abundant loose grains, part porosity to (14%), shows as above;

Shale (15%): dark gray, silty.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1530 - 1532.5

Min/m 14.0,43.0,45.0

% 1.85,0.85,0.90

Sandstone (80%): cream to buff, very fine to upper fine grained, quartzose, 10% oxidized grains, rare kaolinite and pyrite, dolomitic and silica cement, trace pyrobitumen, porosity to (16%), trace weak fluorescence and cut;

Shale (10%): as above;

Siltstone (10%): brown-gray, argillaceous, dolomitic.

1532.5 - 1535

Min/m 60.0,57.0

% 0.85,1.10

Shale (45%): dark gray, brown-gray, silty;

Siltstone (30%): as above;

Sandstone (25%): as above, porosity and shows as above.

1535 - 1537.5

Min/m 47.0,60.0,45.0

% 1.00,0.90,0.85

Shale (50%): medium to dark gray, silty, platy;

Siltstone (40%): light to dark brown-gray, quartzose, dolomitic, pyritic, grading to sandstone;

Sandstone (10%): light gray, very fine to fine grained, dolomitic, trace pyrobitumen, poor porosity, very weak shows.

1537.5 - 1540

Min/m 46.0,47.0

% 0.82,0.72

Sandstone (75%): light brown, very fine grained, silica and dolomitic cement, tight to poor (3%) porosity, no shows;

Shale (15%): as above;

Siltstone (10%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1540 - 1542.5

Min/m 37.0,41.0,46.0

% 0.57,0.57,0.60

Sandstone (80%): light brown, very fine grained, trace lower fine grained, quartzose, slightly oxidized, 5% kaolinite stringers, silica and dolomitic cement, trace poor (3%) porosity, no shows;

Shale (20%): dark gray, pyritic in part, silty in part, trace carbonaceous, fissile to platy.

1542.5 - 1545

Min/m 60.0,73.0

% 0.60,0.64

Siltstone (50%): light to medium brown, sandy, argillaceous, very dolomitic, tight;

Sandstone (25%): as above, no shows;

Shale (25%): as above.

1545 - 1547.5

Min/m 99.0,51.0,33.0

% 0.75,0.80,0.95

Shale (40%): medium to dark gray, minor mica, silty in part, fissile to platy;

Sandstone (30%): cream, white, upper very fine to upper fine grained, silica and dolomitic cement, trace porosity, no shows;

Siltstone (30%): as above, grading to very fine grained sandstone.

1547.5 - 1550

Min/m 33.0,18.0

% 0.95,1.25

Sandstone (80%): as above, lower very fine to lower fine grained, quartzose, common shale partings, predominantly tight, no shows;

Shale (20%): as above, trace pyrite.

UCEL ET AL LIARD K-'2 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1550 - 1552.5

Min/m 23.0,22.0,24.0

% 1.30,1.25,0.95

Sandstone (80%): light brown, lower fine to upper very fine grained, quartzose, 5% kaolinite stringers, minor shale partings, silica and dolomitic cement, abundant loose grains, in part fair (10%): porosity, no shows;

Shale (20%): as above, in part carbonaceous.

1552.5 - 1555

Min/m 14.0,11.0

% 0.85,1.70

Sandstone (70%): as above, lower fine to trace upper fine grained, 12% porosity, very weak cut;

Shale (30%): green-gray, medium gray, silty in part, rare pyrite, fissile.

1555 - 1557.5

Min/m 28.0,23.0,22.0

% 0.80,0.95,1.00

Sandstone (80%): light brown-gray, very fine grained, trace lower fine grained, common grading to siltstone, quartzose, shale partings, dolomitic and silica cement, tight to poor (4%) porosity, no shows;

Shale (20%): as above, predominantly dark gray.

1557.5 - 1560

Min/m 21.0,41.0

% 0.95,0.70

Sandstone (75%): as above, predominantly upper very fine to lower fine grained, porosity to (6%), very weak cut;

Shale (25%): medium to dark gray, in part silty, in part carbonaceous, fissile.

1560 - 1562.5

Min/m 21.0,28.0,32.0

% 2.20,0.70,0.72

Siltstone (60%): light to medium gray-brown, sandy, argillaceous, very dolomitic, grading to silty dolomitic, tight;

Sandstone (20%): cream, white, lower fine to very fine grained, trace pyrobitumen, in part fair (10%) porosity, spotty weak fluorescence and cut;

Shale (20%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1562.5 - 1565

Min/m 24.0,20.0

% 0.87,1.05

Sandstone (65%): as above, in part fair porosity to 8%, trace weak fluorescence and cut;

Shale (20%): as above;

Siltstone (15%): as above.

1565 - 1567.5

Min/m 26.0,28.0,38.0

% 0.92,0.90,0.92

Sandstone (45%): light brown-gray, very fine to lower fine grained, argillaceous in part, silica and dolomitic cement, trace poor porosity, no shows;

Shale (30%): dark gray, black, very carbonaceous in part, silty in part, fissile to blocky;

Siltstone (25%): brown-gray, argillaceous, sandy, dolomitic, tight.

1567.5 - 1570

Min/m 24.0,26.0

% 1.10,0.90

Sandstone (85%): as above, lower fine to minor upper fine grained, porosity as above, no shows;

Shale (15%): as above, silty in part.

1570 - 1572.5

Min/m 29.0,29.0,62.0

% 0.95,0.80,0.87

Sandstone (90%): light brown-gray, upper very fine to lower fine grained, quartzose, 5% kaolinite stringers, silica and dolomitic cement, trace calcareous, abundant loose grains, rare pyrobitumen, poor porosity to (6%), slow weak cut;

Shale (10%): as above.

1572.5 - 1575

Min/m 32.0,29.0

% 0.80,0.68

Sandstone (85%): as above, shale partings, minor loose grains, predominantly tight, no shows;

Shale (15%): dark gray, carbonaceous in part, silty in part, fissile.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1575 - 1577.5

Min/m 21.0,27.0,32.0

% 1.15,0.95,0.83

Sandstone (80%): light brown-gray, upper very fine to upper fine grained, trace medium grained, quartzose, shale partings, in part silty and argillaceous, dolomitic, silica cement, trace poor porosity, slow very weak cut;

Shale (20%): dark gray to black, in part silty, in part carbonaceous, trace pyrite, fissile.

1577.5 - 1580

Min/m 27.0,31.0

% 0.85,0.82

Sandstone (85%): as above, predominantly tight, no shows;

Siltstone (10%): brown-gray, sandy, argillaceous;

Shale (5%): as above.

1580 - 1582.5

Min/m 30.0,15.0,17.0

% 0.78,0.75,0.77

Sandstone (95%): light brown, lower fine to minor upper very fine grained, quartzose, rare chert, 5% white kaolinite stringers, trace silty, shale partings, silica and minor dolomitic cement, porosity to (14%), slow very weak cut;

Shale (5%): black, carbonaceous, fissile.

1582.5 - 1585

Min/m 19.0,32.0

% 0.82,0.78

Sandstone (80%): as above, minor upper fine grained, porosity and shows as above;

Siltstone (10%): brown-gray, argillaceous, sandy;

Shale (10%): as above.

1585 - 1587.5

Min/m 24.0,24.0,19.0

% 0.80,0.90,0.85

Sandstone (90%): light brown, upper very fine to upper fine grained, quartzose, 5% kaolinite stringers, shale partings, trace silty, trace pyrite, silica and dolomitic cement, tight to fair (8 - 10%): porosity, slow very weak cut;

Shale (10%): dark gray to black, carbonaceous in part, fissile.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1587.5 - 1590

Min/m 21.0,28.0

% 0.80,0.87

Sandstone (90%): as above, in part medium grained, in part medium brown and silty, trace porosity, no shows;

Shale (10%): as above.

1590 - 1592.5

Min/m 33.0,28.0,31.0

% 0.79,0.81,0.69

Sandstone (75%): light brown, very fine to minor lower fine grained, quartzose, trace kaolinite stringers, shale partings, silty, trace pyrite, silica and dolomitic cement, predominantly tight, no shows;

Shale (15%): as above;

Siltstone (10%): brown-gray, argillaceous, sandy, tight.

1592.5 - 1595

Min/m 37.0,28.0

% 0.62,0.78

Sandstone (60%): as above, very silica, trace porosity, very weak cut;

Siltstone (30%): as above;

Shale (10%): as above, part coal fragments.

1595 - 1597.5

Min/m 30.0,30.0,30.0

% 0.70,0.73,0.71

Sandstone (75%): light brown, upper very fine to minor lower fine grained, quartzose, trace kaolinite stringers, shale partings, silty, trace pyrite, silica and dolomitic cement, predominantly tight, no shows;

Siltstone (15%): as above;

Shale (10%): dark gray to black, coal fragments, fissile.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1597.5 - 1600

Min/m 38.0,37.0

% 0.60,0.64

Sandstone (75%): as above, common lower very fine grained, trace porosity, weak cut;

Siltstone (15%): as above;

Shale (10%): as above.

1600 - 1602.5

Min/m 42.0,39.0,39.0

% 0.81,0.84,0.81

Siltstone (70%): brown-gray, grading to lower very fine grained sandstone, slightly argillaceous, silica, tight;

Sandstone (25%): light brown, very fine to fine grained, abundant kaolinite stringers, predominantly tight, no shows;

Shale (5%): as above.

1602.5 1605

Min/m 44.0,42.0

% 1.20,1.05

Sandstone (80%): light brown, lower fine to upper very fine grained, quartzose, silty, slightly argillaceous, silica cement, trace dolomitic, predominantly tight, no shows;

Siltstone (10%): as above;

Shale (10%): as above.

1605 - 1607.5

Min/m 35.0,33.0,35.0

% 1.00,1.38,1.00

Sandstone (80%): light brown, upper very fine to lower fine grained, quartzose, 10% kaolinite stringers, minor shale partings, silty, argillaceous, silica cement, 4 - 6% porosity, no shows;

Siltstone (10%): as above;

Shale (10%): dark gray to black, carbonaceous, fissile.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1607.5 - 1610

Min/m 40.0,43.0

% 1.05,1.03

Sandstone (50%): as above, very silty, porosity as above, no shows;

Siltstone (30%): brown-gray, sandy, argillaceous, silica, tight;

Shale (20%): as above.

1610 - 1612.5

Min/m 44.0,57.0,28.0

% 1.50,1.05,1.28

Sandstone (85%): light to medium gray-brown, upper very fine to upper fine grained, quartzose, silty, argillaceous, minor kaolinite stringers, silica cement, trace porosity, no shows;

Shale (10%): dark gray to black, part carbonaceous, fissile;

Siltstone (5%): as above.

1612.5 - 1615

Min/m 30.0,31.0

% 1.48,1.40

Sandstone (75%): as above, predominantly lower very fine to upper very fine grained, shale partings, trace poor porosity, no shows;

Shale (15%): as above;

Siltstone (10%): brown-gray, argillaceous.

1615 - 1617.5

Min/m 28.0,39.0,38.0

% 1.35,1.30,1.30

Sandstone (85%): gray-brown, upper very fine to lower fine grained, quartzose, shale partings, silty, argillaceous, 5% kaolinite stringers, silica cement, trace porosity, no shows;

Shale (10%): medium gray to black, carbonaceous in part, fissile;

Siltstone (5%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1617.5 - 1620

Min/m 27.0,32.0

% 1.30,1.20

Sandstone (80%): as above, lower very fine to lower fine grained, trace poor porosity, no shows;

Shale (10%): as above;

Siltstone (10%): brown-gray, sandy, argillaceous, silica, tight.

1620 - 1622.5

Min/m 39.0,41.0,28.0

% 0.98,1.05,1.12

Siltstone (65%): as above, shale partings, grading to very fine grained sandstone;

Sandstone (20%): gray-brown, very fine to lower fine grained, quartzose, silty, argillaceous, silica cement, tight, no shows;

Shale (15%): medium gray to black, carbonaceous, fissile to platy.

1622.5 - 1625

Min/m 38.0,27.0

% 1.25,2.70

Sandstone (85%): light gray-brown, lower fine to upper fine grained, quartzose, silica, poor (4 - 6%) porosity, very weak cut;

Shale (10%): as above;

Siltstone (5%): as above.

1625 - 1627.5

Min/m 40.0,55.0,42.0

% 1.20,1.40,1.28

Siltstone (40%): brown-gray, argillaceous, sandy, shale partings, tight;

Sandstone (40%): gray-brown, very fine to lower fine grained, quartzose, silty, argillaceous, common loose grains, porosity as above, no shows;

Shale (20%): medium gray to black, carbonaceous, fissile.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1627.5 - 1630

Min/m 32.0,35.0

% 1.00,1.00

Sandstone (75%): brown-gray, lower very fine to lower fine grained, argillaceous, minor kaolinite, silica, trace poor porosity, no shows;

Siltstone (15%): as above;

Shale (10%): as above.

1630 - 1632.5

Min/m 39.0,47.0,40.0

% 0.92,0.94,0.97

Sandstone (80%): light gray-brown, very fine to trace lower fine grained, quartzose, shale partings, argillaceous, 5% kaolinite stringers, silica cement, predominantly tight, no shows;

Shale (15%): medium to dark gray, carbonaceous, fissile to platy;

Siltstone (5%): as above.

1632.5 - 1635

Min/m 35.0,24.0

% 0.90,0.90

Sandstone (60%): as above, in part light gray, very dolomitic, minor fine to medium crystalline dolomite fragments, tight, no shows;

Siltstone (20%): as above;

Shale (20%): as above.

1635 - 1637.5

Min/m 21.0,56.0,67.0

% 0.92,0.98,0.97

Sandstone (60%): gray-brown, upper very fine to lower fine grained, quartzose, argillaceous, silica cement, minor light gray and very dolomitic, minor dolomite fragments, abundant loose grains, porosity to (8%), slow weak cut;

Shale (25%): medium to dark gray, in part carbonaceous, fissile to platy;

Siltstone (15%): as above.

UCEL ET AL LIARD K-02 60-20-123-30

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1637.5 - 1640

Min/m 78.0,39.0

% 0.90,0.97

Chert (60%): buff-gray, very sandy, quartz fracture fill, dense, hard;

Shale (40%): as above.

1640 - 1642.5

Min/m 23.0,20.0,25.0

% 1.00,1.05,1.25

Chert (90%): medium brown-gray, very silty and sandy, grading to siltstone and very fine sandstone, minor carbonaceous material, quartz fracture fill, shale partings, rare pyrite, hard;

Shale (10%): dark gray, carbonaceous, fissile to blocky.

1642.5 - 1645

Min/m 25.0,43.0

% 1.19,1.00

Siltstone (60%): brown-gray, sandy, argillaceous, silica, grading to silty chert, trace pyrite, blocky, tight;

Chert (30%): as above;

Shale (10%): as above.

1645 - 1647.5

Min/m 39.0,42.0,40.0

% 1.08,0.99,1.12

Sandstone (55%): gray-brown, very fine grained, quartzose, argillaceous, shale partings, minor kaolinite stringers, silica cement, trace poor porosity, slow very weak cut;

Siltstone (40%): gray-brown, sandy, argillaceous, silica, tight;

Shale (5%): as above.

1647.5 - 1650

Min/m 32.0,28.0

% 1.00,1.00

Siltstone (60%): as above, grading to very fine grained sandstone, trace pyrite;

Sandstone (30%): as above, porosity and shows as above;

Shale (10%): dark gray, carbonaceous.

SAMPLE DESCRIPTIONS

Depth (m)
Penetration Rate- Min/m
Total Gas %

1650 - 1652.5

Min/m 23.0,52.0,64.0

% 1.05,0.88,0.74

Sandstone (55%): gray-brown, very fine grained, quartzose, argillaceous, silica cement, poor porosity, slow weak cut;

Shale (25%): as above, in part dark brown, silty, bitumenous, dolomitic;

Siltstone (20%): as above.

— FLETT 1654.0 m —

1652.5 - 1655

Min/m 60.0,74.0

% 0.75,0.75

Dolomite (60%): dark brown, argillaceous, cryptocrystalline, abundant fossil debris (Ostracod, Gastropod, Bryozoa), scattered pyrite, tight, no shows;

Sandstone (20%): as above, in part siltstone;

Shale (20%): as above.

1655 - 1656.5

Min/m 63.0,100.0

% 0.80,0.65

Dolomite (35%): as above, recrystallize packstone, trace calcareous, trace limestone fragments, tight, no shows;

Sandstone (35%): as above, cavings;

Shale (30%): as above.

TOTAL DEPTH 1656.5 meters

UCEL LIARD K-02 60-20-123-30

DAILY MUD PROPERTIES

DATE	DEPTH (m)	DENSITY (kg/m3)	WATER LOSS (cm3/30 min)	FILTER CAKE (mm)	pH	VISCOSITY (s/l)	PV/YP	GEL STRENGTH
96-12-15	208	1135			8	38		
96-12-16	427	1150			8	62		
96-12-17	434	1150			8	62		
96-12-18	550	1040			11.5	28		
96-12-19	864	1050	16.4	1	10	40	12/2.8	
96-12-20	933	1060	9.6	1	9	42	12/1.9	
96-12-21	983	1060	8	1	9	48	20/3.8	0/2.0
96-12-22	1059	1060	8	1	9	45	19/4.3	0/1.0
96-12-23	1112	1065	7	1	9	46	19/3.8	0/1.0
96-12-24	1132	1090	8	1	9	48	22/4.3	0/1.0
96-12-25	1149	1090	7.5	1	9.5	48	21/4.8	0/1.0
96-12-26	1162	1090	8	1	9.5	43	7/11.5	0/1.0
96-12-27	1178	1090	8	1	9	46	18/3.8	0/1.0
96-12-28	1227	1095	7.2	1	9.5	45	19/3.4	0/1.0
96-12-29	1272	1090	7.6	1	9	46	18/2.9	0/1.0
96-12-30	1300	1100	7	1	9	54	22/6.7	0/2.0
96-12-31	1309	1130	8.4	1	9	52	20/3.8	0/2.0
97-01-01	1334	1140	7.2	1	9.5	48	26/3.8	1/2.0
97-01-02	1358	1150	7.2	1	9	50	23/2.9	1/2.0
97-01-03	1389	1150	7.6	1	9.5	47	18/2.0	0/1.0
97-01-04	1408	1155	7.1	1	9	55	26/5.8	1/4.0

UCEL LIARD K-02 60-20-123-30

DAILY MUD PROPERTIES

DATE	DEPTH (m)	DENSITY (kg/m3)	WATER LOSS (cm3/30 min)	FILTER CAKE (mm)	pH	VISCOSITY (s/l)	PV/YP	GEL STRENGTH
97-01-05	1444	1140	7.2	1	9	52	24/3.4	0/3.0
97-01-06	1487	1155	7.4	1	9	53	29/3.8	1/2.0
97-01-07	1534	1160	8	1	9	53	28/4.8	1/2.0
97-01-08	1546	1165	8.1	1	8.5	53	27/5.7	1/3.0
97-01-09	1572	1165	7.4	1	8.5	55	28/5.7	1/3.0
97-01-10	1600	1165	7.8	1	8.5	58	28/7.7	1/6.0
97-01-11	1610	1155	8	1	9	63	30/10.5	1/6.0
97-01-12	1656	1160	8.1	1	8.5	58	30/9.6	2/6.0
97-01-13	1657	1160	8.1	1	8.5	58	30/9.6	2/6.0
97-01-14	1657	1160	6.6	1	9	68	35/7.2	1/4.0
97-01-15	1657	1160	6.6	1	9	68	35/7.2	1/4.0
97-01-16	1657	1160	6.6	1	9	72	35/7.2	1/4.0
97-01-17	1657	1160	6.6	1	9	72	35/7.2	1/4.0
97-01-18	1657	1160			9	72		

UCEL LIARD K-02 60-20-123-30

SURVEY RECORD

DEPTH (m)	DEVIATION (degrees)	DIRECTION (degrees)
66	0.250	-
94	0.500	-
122	0.250	-
149	0.500	-
171	0.250	-
284	2.000	-
309	3.000	-
338	2.500	-
366	3.000	-
395	2.750	-
456	3.000	35.00
503	3.000	34.00
607	4.000	37.00
664	5.000	39.00
720	5.000	44.00
758	5.000	46.00
806	5.000	51.00
853	4.500	54.00
910	4.500	45.00
948	5.000	47.00
1005	5.125	47.00
1062	5.000	51.00
1118	5.750	52.00
1165	5.500	54.00
1220	5.500	54.00
1306	5.500	51.00
1406	5.750	46.00
1514	5.750	42.00
1618	5.750	40.00

UCEL LIARD K-02 60-20-123-30

BIT RECORD

BIT #	SIZE (mm)	MAKE	TYPE	SERIAL #	# JETS (mm)	IN (m)	DRILLED (m)	HOURS	CONDITION
TIGHT HOLE - BIT STATUS REMAINS CONFIDENTIAL									

ELECTRO TEST REPORT (DST'S)

9211-U18-1-1

N.E.B. COPY

ELECTRO*TEST* REPORT

UNOCAL CANADA EXPLORATION LIMITED

WELL: UCEL LIARD k-02-80-20-123-30

DST #1: MATTSON (1488.8 - 1506.5mKB)

DATE: JANUARY 15, 1997

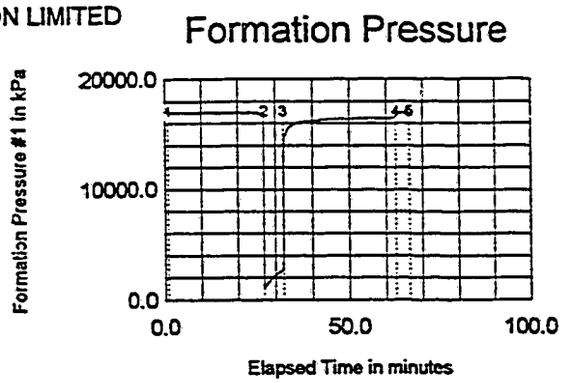
Downhole
Systems
Technology Canada Inc.

#7, 4539-6th St. N.E.
Calgary, Alberta
T2E 3Z6
(403) 299-1960

NATIONAL ENERGY BOARD
ENGINEERING RESEARCH
JAN 24 1997

DRILL STEM TEST - FINAL REPORT

Well Operator		UNOCAL CANADA EXPLORATION LIMITED
Well Name		UCEL LIARD
Location		k-02-60-20-123-30
DST #		ONE
Interval Tested		1488.8 - 1506.5
Formation		MATTSON
Date		15 JANUARY, 1997
Wellsite Rep.		GABOURY
Test Engineer		JAMES
Wireline Operator		WYRE
Drilling Contractor		CACTUS 1
Well Total Depth		1657.00 meters
Well Elevations	KB	379.30 meters
	GL	374.50 meters
Main Hole Size		222.00 mm



SUMMARY

		Time	Duration	Graph #	Pressure (kPa)	Extrapolated Press.(kPa)	Liq. Rate(m3/d) Average/Final	Gas Rate(m3/d) Average/Final
Initial Hydrostatic				1	17099			
Preflow	Start	13:44:10		2	1135		177.5	37
	End	13:49:15	5	3	2756			
Initial Shut In	End	14:19:50	31	4	16535	16622		
Flow #2	Start			4	0		0.0	0
	End		0	5	0			
Shut In #2	End		0	6	0			
Final Hydrostatic				7	17035			
Bottom Hole Temperature		49 deg C						

Electronics #3, Formation Pressure 1, Ser. # 154775, Depth 1490.7 mKB (all gauges at same depth)

LIQUID RECOVERY	Height	Volume
Muddy water.	233 m	0.747 m3

Samples sent to AGAT Laboratories in Calgary.

RESERVOIR PARAMETERS

Net Pay: 9.0 m Permeability(water): 14.6 mD
Porosity: 16 % Skin: 5
Sw: 100%

COMMENTS

Successful straddle inflate with real time pressure data and closed chamber flow rates.

A GR/CCL correlation log was run prior to inflating the packers and the packer depth was 0.8 meters high. A depth adjustment of 0.8 meters downward was made.

The preflow was run under closed chamber conditions throughout, with primarily liquid flow indicated.

Radial flow conditions were established during the initial shut in and the extrapolated pressure is valid.

No second flow period or final shut in were taken at the request of the well operator, since good inflow rates and presure buildup data were obtained on the preflow and initial shut in.

If you require additional information contact David Sask at (403) 299-1960.

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	ONE
WELL NAME:	UCEL LIARD	INTERVAL:	1488.8 - 1506.5
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

Mud Type: Gel Chem
Density: 1165.00 kg/cu m
Viscosity: 88.00 mPa S
Resistivity: 0.00 ohms/m

Fluid Cushion: Nil
Density of recovered fluids (used in liquid rate calculations): 1000 kg/m3
Calculated Fluid Recovery: 233 meters of water based upon density of 1000kg/m3.

Reverse Circulated: No

TOOL STRING CONFIGURATION

	Length meters	Inner Diameter mm	Outer Diameter mm
Drill Pipe Above K.B.	-0.15	70.21	88.90
Upper Drill Pipe	1315.59	70.21	85.00
Drill Collars	138.28	63.00	120.65
Stabbing Valve	0.50	50.80	120.65
RCV/DBS/XO'S	1.05	60.00	120.65
Drill Collar	27.43	50.80	120.65
Hydraulic Jars	2.00	50.80	127.00
Safety Joint	1.35	25.40	127.00
Top Packer	2.45	22.25	139.70
Top of Interval	**1488.80**		
Packer Stub	0.80	0.00	127.00
Downhole Flow Valve	0.92	0.00	127.00
Electronics Section	1.51	0.00	127.00
Inflation Pump	2.44	0.00	127.00
Spacer Pipe	11.48	0.00	127.00
Packer Stub	0.57	0.00	127.00
Bottom of Interval	**1506.52**		
Total Interval	**17.72**		
Bottom Packer	2.40	0.00	139.70

NOTE:

Test Tool Choke Diameter	22.50 mm	
Surface Choke	0.00 mm	Bean Choke
Total String Volume	5.58 cu m	
Initial Closed Chamber Gas Volume	5.58 cu m	
Annular Volume	0.46 cu m	

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	ONE
WELL NAME:	UCEL LIARD	INTERVAL:	1488.8 - 1506.5
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER INFLATION

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
13:17:55	00:00:00	17066.46	171.86	83.35	17029.26	17085.57	-56.31
13:18:10	00:00:15	17064.42	170.31	83.86	17101.16	17083.53	17.64
13:18:25	00:00:30	17062.38	168.25	82.85	17169.05	17082.50	86.56
13:18:40	00:00:45	17061.35	166.71	83.86	17231.41	17080.96	150.44
13:18:55	00:01:00	17060.82	165.67	82.85	17282.19	17081.45	200.75
13:19:25	00:01:30	17059.78	163.60	83.87	17357.11	17078.89	278.21
13:19:55	00:02:00	17057.73	163.56	83.87	17409.39	17077.35	332.04
13:20:25	00:02:30	17057.20	161.50	82.86	17440.04	17077.32	362.72
13:20:55	00:03:00	17055.16	160.97	82.86	17426.44	17075.28	351.16
13:21:25	00:03:30	17055.64	159.93	82.36	17437.48	17074.76	362.73
13:21:55	00:04:00	17055.62	159.39	83.38	17466.64	17072.22	394.42
13:22:25	00:04:30	17054.59	158.86	83.38	17561.69	17070.69	491.00
13:22:55	00:05:00	17054.58	158.34	83.89	17677.86	17069.16	608.70
13:23:55	00:06:00	17053.53	157.79	82.37	17845.32	17068.12	777.20
13:24:55	00:07:00	17052.50	157.75	83.39	17996.68	17067.58	929.10
13:25:55	00:08:00	17052.06	157.21	83.90	18327.09	17019.24	1307.85
13:26:55	00:09:00	17054.47	157.19	83.40	19467.14	17077.10	2390.04
13:27:55	00:10:00	17047.39	157.16	83.41	18909.94	17071.04	1838.90
13:28:55	00:11:00	17045.86	156.63	83.41	18865.66	17070.01	1795.65
13:29:55	00:12:00	17045.34	155.59	82.91	18821.38	17067.97	1753.41
13:30:55	00:13:00	17043.81	156.07	83.43	18782.14	17066.95	1715.19
13:31:55	00:14:00	17043.28	155.04	83.43	18749.43	17066.42	1683.01
13:32:55	00:15:00	17042.76	155.53	83.44	18719.75	17065.90	1653.84
13:33:55	00:16:00	17042.24	155.50	83.44	18692.57	17065.38	1627.19
13:34:55	00:17:00	17041.73	154.98	83.45	18668.92	17064.87	1604.06
13:35:55	00:18:00	17041.71	154.46	83.96	18646.78	17064.35	1582.43
13:36:55	00:19:00	17041.70	154.44	82.44	18626.65	17064.34	1562.32
13:37:55	00:20:00	17039.67	153.92	82.95	18609.54	17064.32	1545.22
13:38:05	00:20:09	17027.59	154.42	83.46	18602.50	17064.82	1537.68

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	ONE
WELL NAME:	UCEL LIARD	INTERVAL:	1488.8 - 1506.5
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PREFLOW

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Liquid Flowrate m3/d	Surface Gas Flowrate m3/d	Total Gas Flowrate m3/d	Gas Liquid Ratio m3/m3	Formation Temp. deg C
13:44:10	00:00:00	1135.10	667.39	82.46	2242.38	0.00	-1770.54	-0.79	46.24
13:44:25	00:00:15	1238.67	819.72	82.46	2172.90	0.00	-1713.16	-0.79	46.18
13:44:40	00:00:30	1340.68	959.83	82.46	2035.69	0.00	-1601.03	-0.79	46.18
13:44:55	00:00:45	1442.68	1099.41	82.46	1863.96	0.00	-1468.33	-0.79	46.19
13:45:10	00:01:00	1575.98	1249.61	82.46	1679.68	0.00	-1318.04	-0.78	46.20
13:45:25	00:01:15	1645.66	1340.63	84.49	1494.08	0.00	-1149.17	-0.77	46.21
13:45:40	00:01:30	1737.55	1455.42	84.99	1316.87	0.00	-983.94	-0.75	46.22
13:45:55	00:01:45	1828.93	1564.63	86.00	1152.57	0.00	-835.95	-0.73	46.23
13:46:10	00:02:00	1918.80	1668.79	86.51	1005.43	0.00	-705.88	-0.70	46.23
13:46:25	00:02:15	2021.80	1777.48	86.51	872.47	0.00	-588.46	-0.67	46.24
13:46:40	00:02:30	2141.45	1914.49	87.02	755.60	0.00	-486.94	-0.64	46.25
13:46:55	00:02:45	2218.18	1992.34	87.52	653.01	0.00	-403.29	-0.62	46.25
13:47:10	00:03:00	2269.67	2052.49	89.55	563.99	0.00	-321.30	-0.57	46.26
13:47:25	00:03:15	2322.16	2113.14	89.04	488.00	0.00	-255.14	-0.52	46.27
13:47:40	00:03:30	2378.19	2172.27	89.55	423.88	0.00	-200.64	-0.47	46.28
13:47:55	00:03:45	2435.73	2237.97	90.56	370.24	0.00	-153.76	-0.42	46.30
13:48:10	00:04:00	2499.32	2299.62	90.05	325.52	0.00	-121.48	-0.37	46.31
13:48:25	00:04:15	2558.87	2362.78	91.07	288.26	0.00	-87.50	-0.30	46.34
13:48:40	00:04:30	2610.34	2422.40	91.57	257.40	0.00	-61.10	-0.24	46.36
13:48:55	00:04:45	2678.47	2479.99	93.09	231.66	0.00	-41.01	-0.18	46.39
13:49:10	00:05:00	2730.94	2548.70	93.09	210.84	0.00	-24.06	-0.11	46.42
13:49:15	00:05:03	2755.66	2573.95	92.59	205.03	0.00	-23.17	-0.11	46.44

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	ONE
WELL NAME:	UCEL LIARD	INTERVAL:	1488.8 - 1506.5
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

INITIAL SHUT IN

Time	Elapsed Time	Formation Pressure #1 kPa	Formation Pressure #2 kPa	Transducer Difference kPa	Recovery Pressure kPa	Surface Pressure kPa	Formation Temp. deg C	Hydrostatic Pressure kPa
13:49:20	00:00:00	4731.88	6259.77	-1527.89	1792.95	93.09	46.44	17070.14
13:49:35	00:00:15	14540.35	14561.16	-20.31	2470.25	94.10	46.52	17073.59
13:49:50	00:00:30	15011.06	15024.10	-13.03	2478.77	94.11	46.59	17075.04
13:50:05	00:00:45	15210.41	15223.35	-12.94	2480.26	92.59	46.62	17053.38
13:50:20	00:01:00	15393.15	15406.01	-12.86	2482.26	93.09	46.64	17085.06
13:50:50	00:01:30	15617.63	15628.83	-11.20	2485.21	92.59	46.72	17085.00
13:51:20	00:02:00	15759.52	15771.10	-11.57	2488.66	94.61	46.81	17084.92
13:51:50	00:02:30	15862.64	15873.59	-10.95	2491.59	94.11	46.90	17085.85
13:52:20	00:03:00	15942.60	15953.42	-10.82	2494.02	93.60	47.01	17085.76
13:52:50	00:03:30	16005.94	16016.14	-10.20	2495.43	93.09	47.11	17086.68
13:53:20	00:04:00	16057.20	16067.79	-10.59	2497.85	94.11	47.21	17088.10
13:53:50	00:04:30	16100.91	16111.38	-10.47	2497.74	93.10	47.32	17088.51
13:54:20	00:05:00	16136.57	16148.44	-11.87	2498.65	93.60	47.42	17088.93
13:55:20	00:06:00	16195.80	16205.96	-10.16	2499.46	94.11	47.61	17088.26
13:56:20	00:07:00	16242.46	16253.44	-10.97	2499.28	94.12	47.79	17086.60
13:57:20	00:08:00	16281.08	16289.37	-8.28	2499.61	94.12	47.96	17086.45
13:58:20	00:09:00	16310.65	16320.29	-9.64	2499.97	94.12	48.11	17086.32
13:59:20	00:10:00	16336.21	16346.22	-10.01	2498.82	94.63	48.25	17084.70
14:00:20	00:11:00	16358.76	16367.13	-8.37	2499.20	94.13	48.37	17082.58
14:01:20	00:12:00	16376.79	16386.06	-9.27	2498.06	94.13	48.47	17080.98
14:02:20	00:13:00	16393.32	16403.00	-9.68	2496.97	94.14	48.57	17079.90
14:03:20	00:14:00	16408.86	16417.45	-8.59	2496.89	94.14	48.65	17077.81
14:04:20	00:15:00	16422.39	16430.90	-8.51	2494.79	94.14	48.72	17076.75
14:05:20	00:16:00	16434.42	16442.36	-7.95	2494.73	93.64	48.78	17074.68
14:06:20	00:17:00	16445.44	16452.83	-7.39	2494.17	94.65	48.84	17073.12
14:07:20	00:18:00	16455.97	16463.31	-7.34	2493.11	95.16	48.89	17072.08
14:08:20	00:19:00	16465.00	16472.80	-7.80	2491.55	95.16	48.93	17071.54
14:09:20	00:20:00	16473.53	16480.78	-7.26	2491.01	94.66	48.96	17070.50
14:10:20	00:21:00	16481.55	16489.79	-8.23	2489.97	94.66	48.99	17068.96
14:11:20	00:22:00	16489.59	16495.78	-6.20	2488.93	94.16	49.02	17067.94
14:12:20	00:23:00	16495.61	16503.29	-7.68	2488.41	95.17	49.04	17067.42
14:13:20	00:24:00	16502.14	16510.30	-8.16	2487.88	94.16	49.06	17066.39
14:14:20	00:25:00	16508.67	16516.82	-8.15	2486.86	94.16	49.07	17065.88
14:15:20	00:26:00	16512.69	16521.33	-8.64	2485.83	95.17	49.08	17064.86
14:16:20	00:27:00	16518.72	16526.34	-7.62	2484.81	94.16	49.09	17064.35
14:17:20	00:28:00	16524.25	16533.38	-9.12	2484.30	94.67	49.10	17063.34
14:18:20	00:29:00	16529.28	16537.90	-8.62	2483.79	95.17	49.10	17063.34
14:19:20	00:30:00	16533.81	16542.43	-8.62	2482.78	95.17	49.10	17062.33
14:19:50	00:30:30	16534.79	16545.39	-10.60	2482.25	94.67	49.13	17062.81

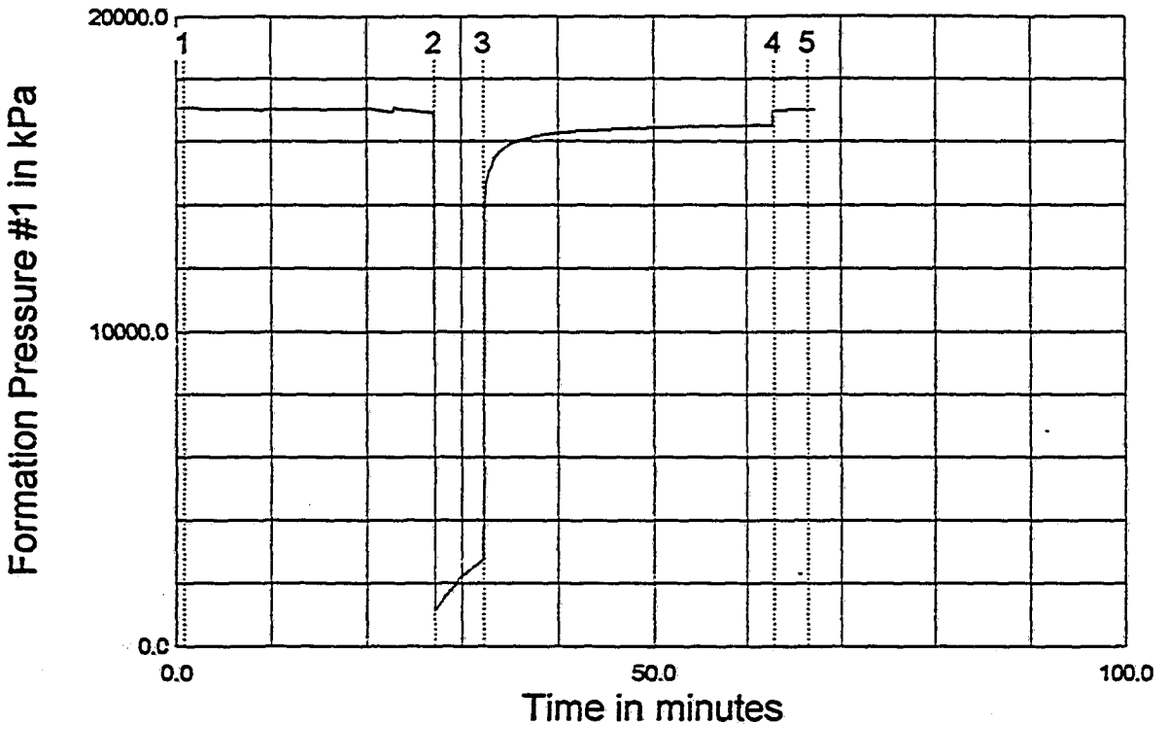
TEST DATE:	15 JANUARY, 1997	DST NUMBER:	ONE
WELL NAME:	UCEL LIARD	INTERVAL:	1488.8 - 1506.5
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER DEFLATION

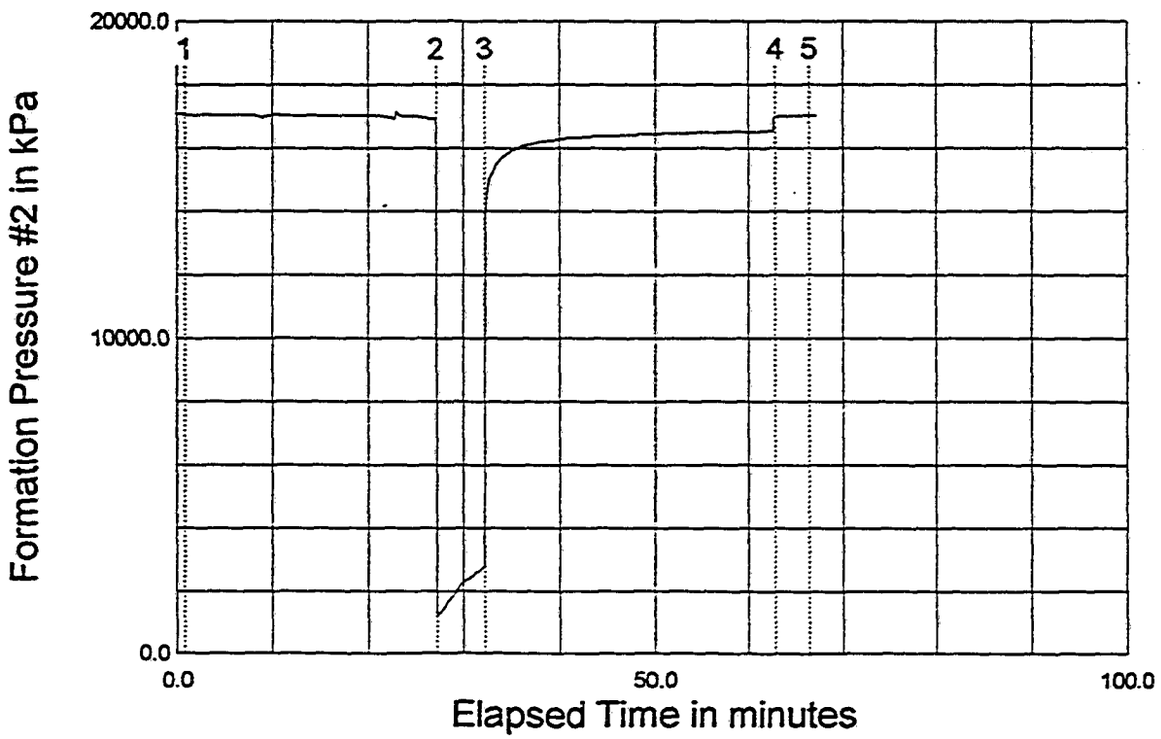
Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
14:20:30	00:00:00	17004.45	2482.27	95.68	18454.81	17035.15	1419.67
14:20:45	00:00:15	17007.47	2481.76	93.66	18441.24	17037.67	1403.57
14:21:00	00:00:30	17008.98	2481.76	96.19	18429.67	17039.68	1389.99
14:21:15	00:00:45	17011.00	2480.75	95.18	18423.13	17040.69	1382.45
14:21:30	00:01:00	16990.86	5574.25	95.18	17185.81	17029.62	156.19
14:21:45	00:01:15	17029.62	5302.20	94.67	17155.63	17053.77	101.85
14:22:00	00:01:30	17030.13	5268.88	95.68	17121.92	17052.77	69.16
14:22:15	00:01:45	17030.63	5241.62	95.18	17096.77	17051.76	45.01
14:22:30	00:02:00	17030.13	5215.38	94.67	17079.17	17050.25	28.91
14:22:45	00:02:15	17029.63	5190.14	94.16	17067.10	17049.25	17.85
14:23:00	00:02:30	17029.63	5167.93	95.18	17059.55	17049.76	9.80
14:23:15	00:02:45	17029.13	5153.80	94.16	17055.54	17048.25	7.28
14:23:30	00:03:00	17028.64	5128.07	94.67	17052.02	17042.72	9.30

UCEL LIARD k-02-60-20-123-30
DST #ONE, MATTSON, 1488.8 - 1506.5

Formation Pressure #1

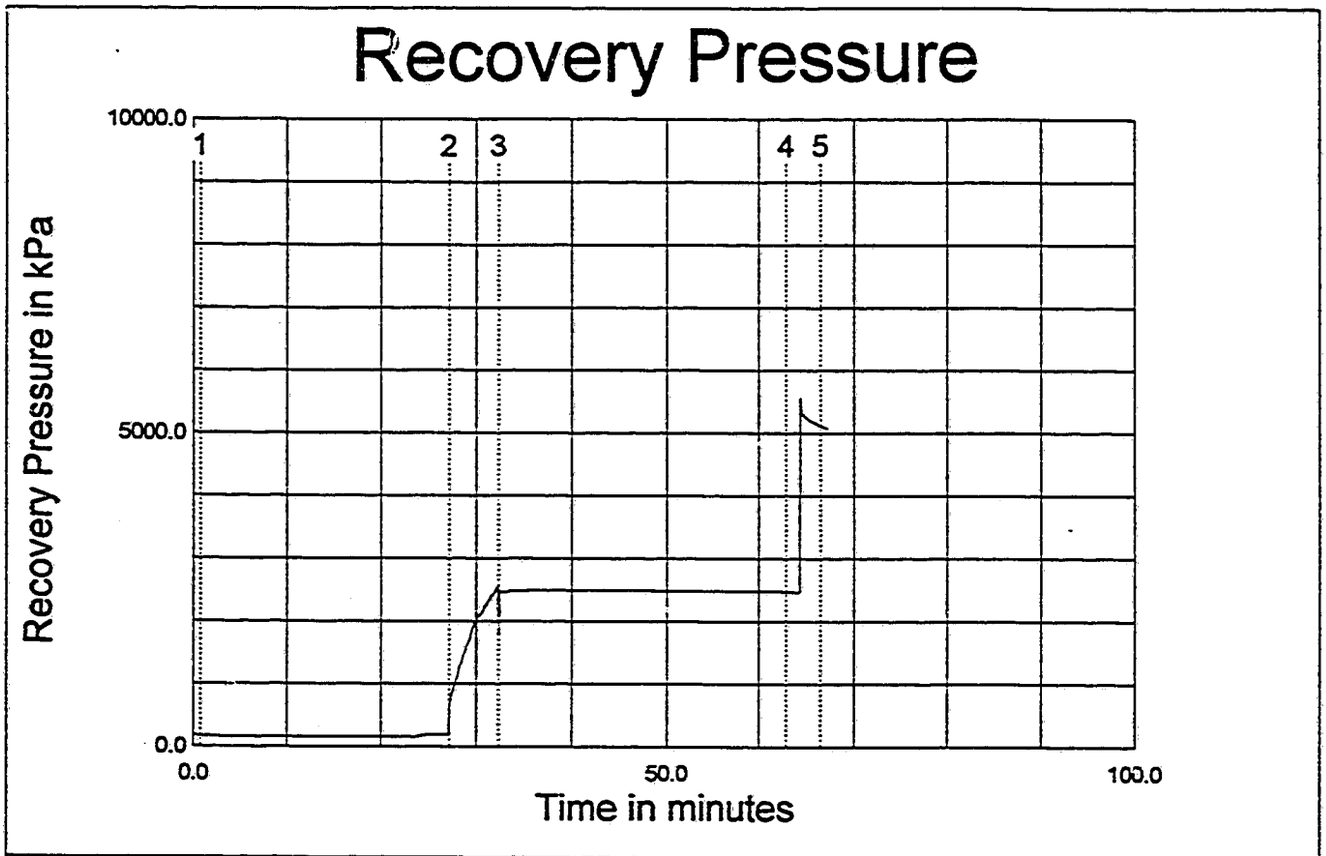


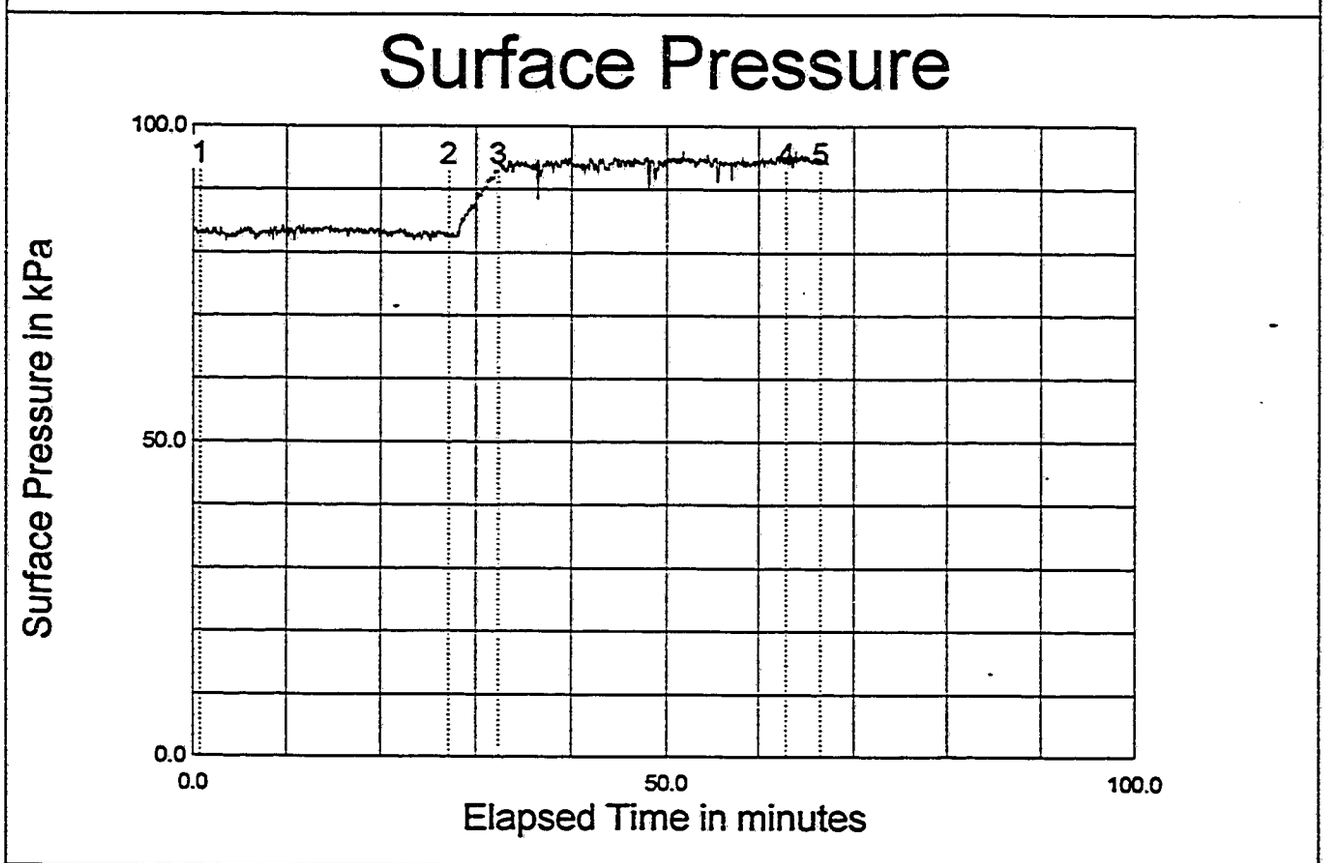
Formation Pressure #2



Downhole Systems Technology Canada Inc.

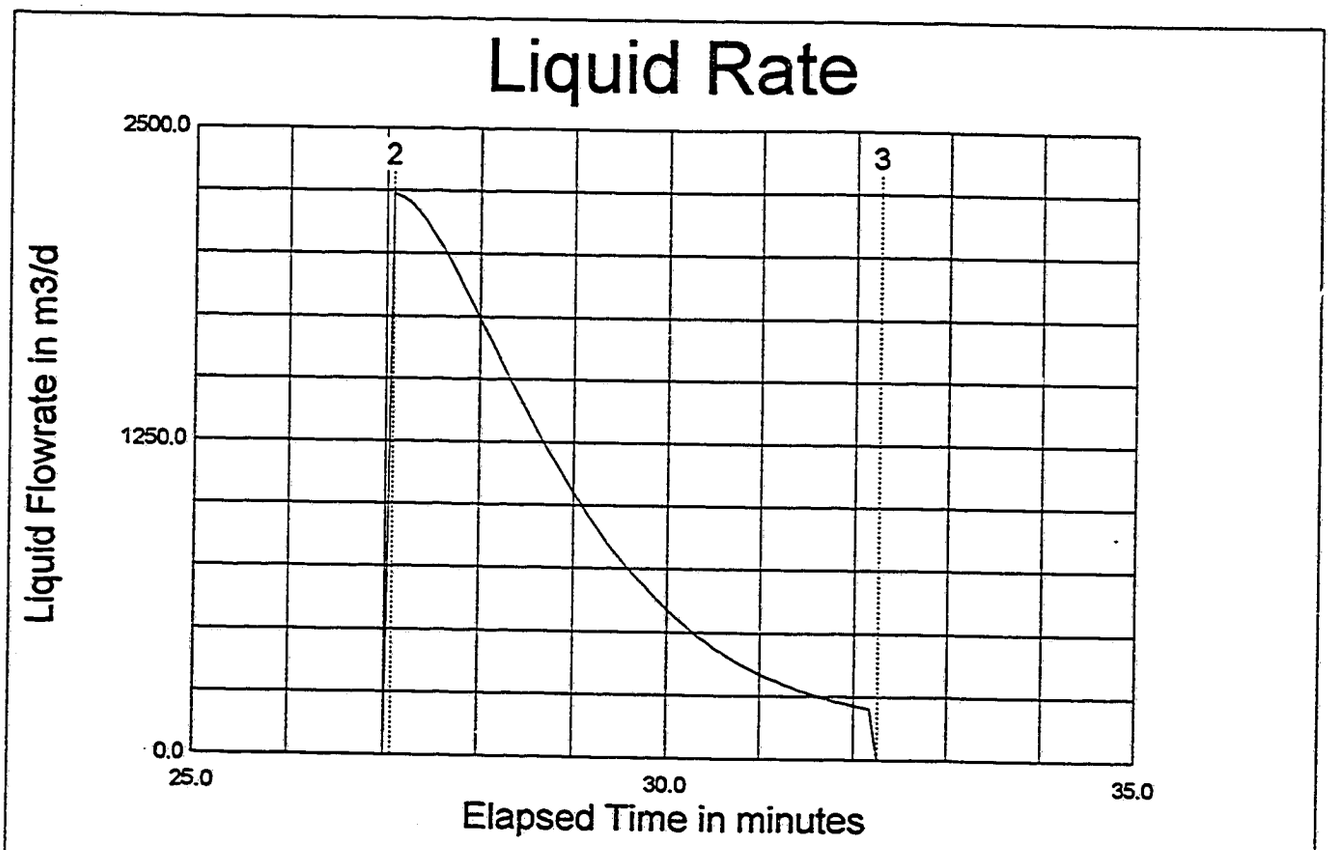
UCEL LIARD k-02-60-20-123-30
DST #ONE, MATTSON, 1488.8 - 1506.5

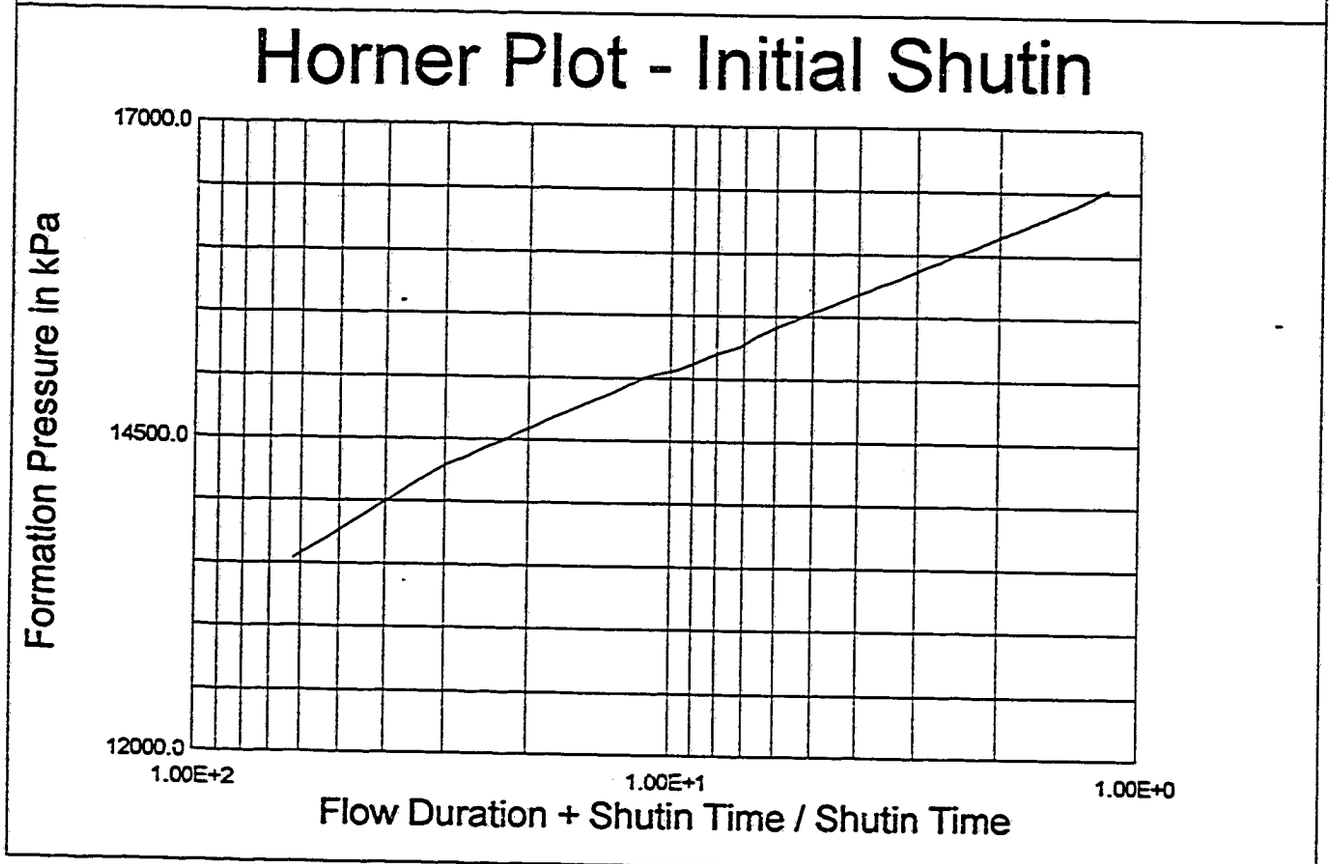




Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
DST #ONE, MATTSON, 1488.8 - 1506.5

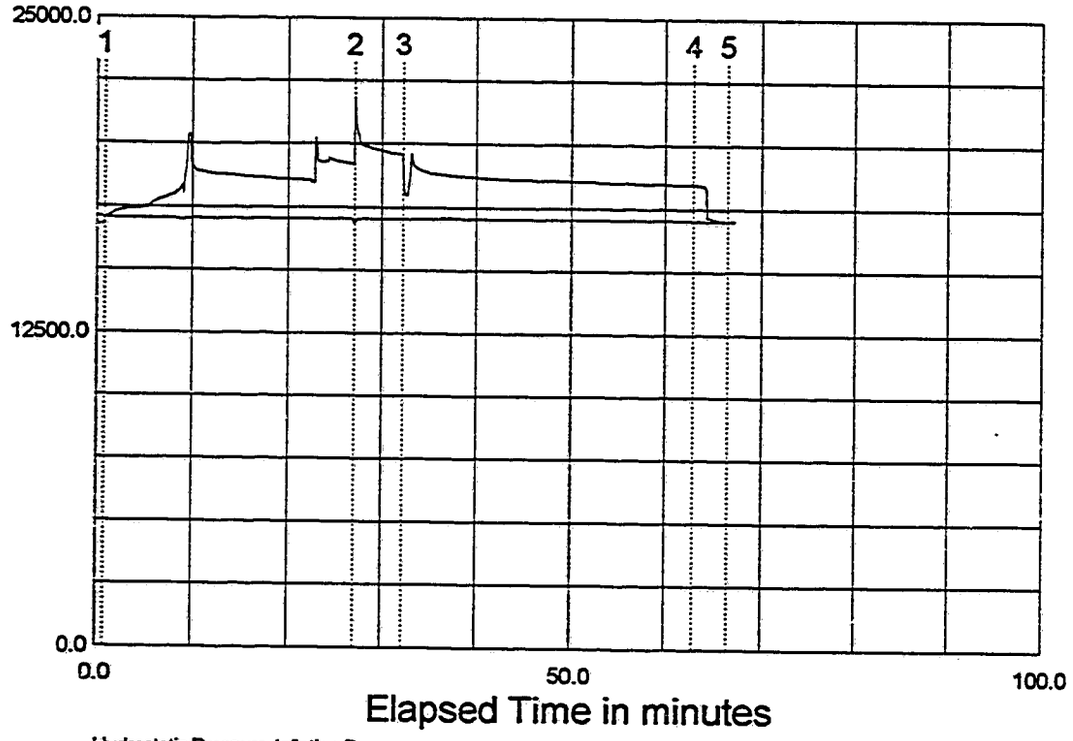




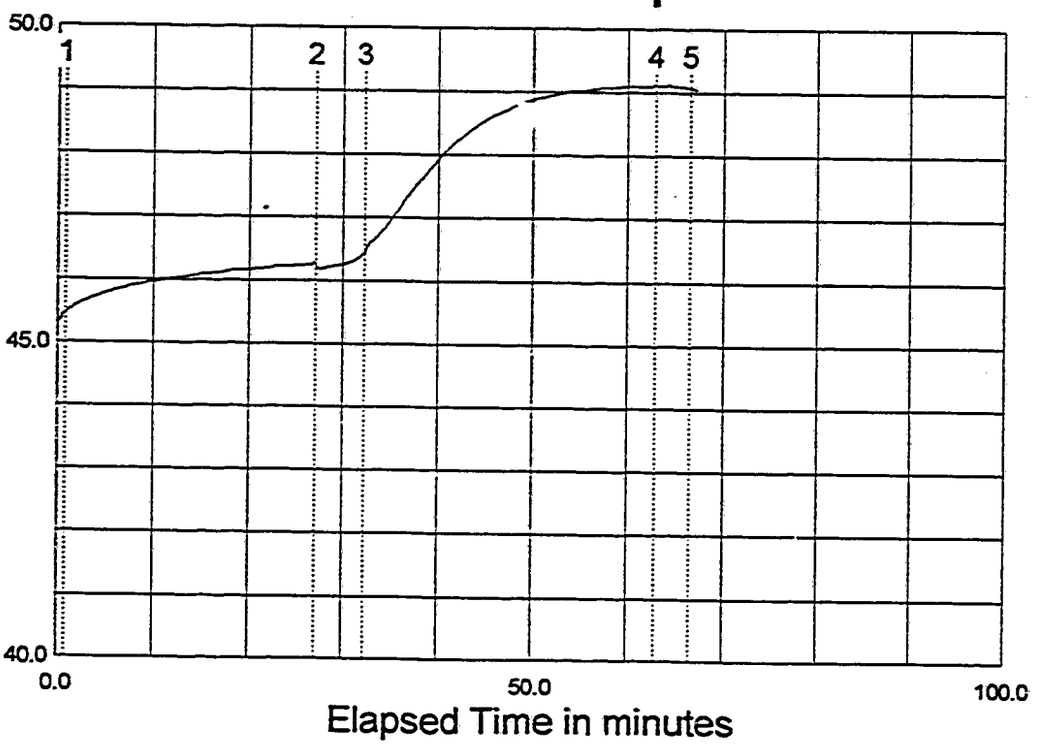
Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
DST #ONE, MATTSON, 1488.8 - 1506.5

Hydrostatic & Inflation Pressure



Formation Temperature



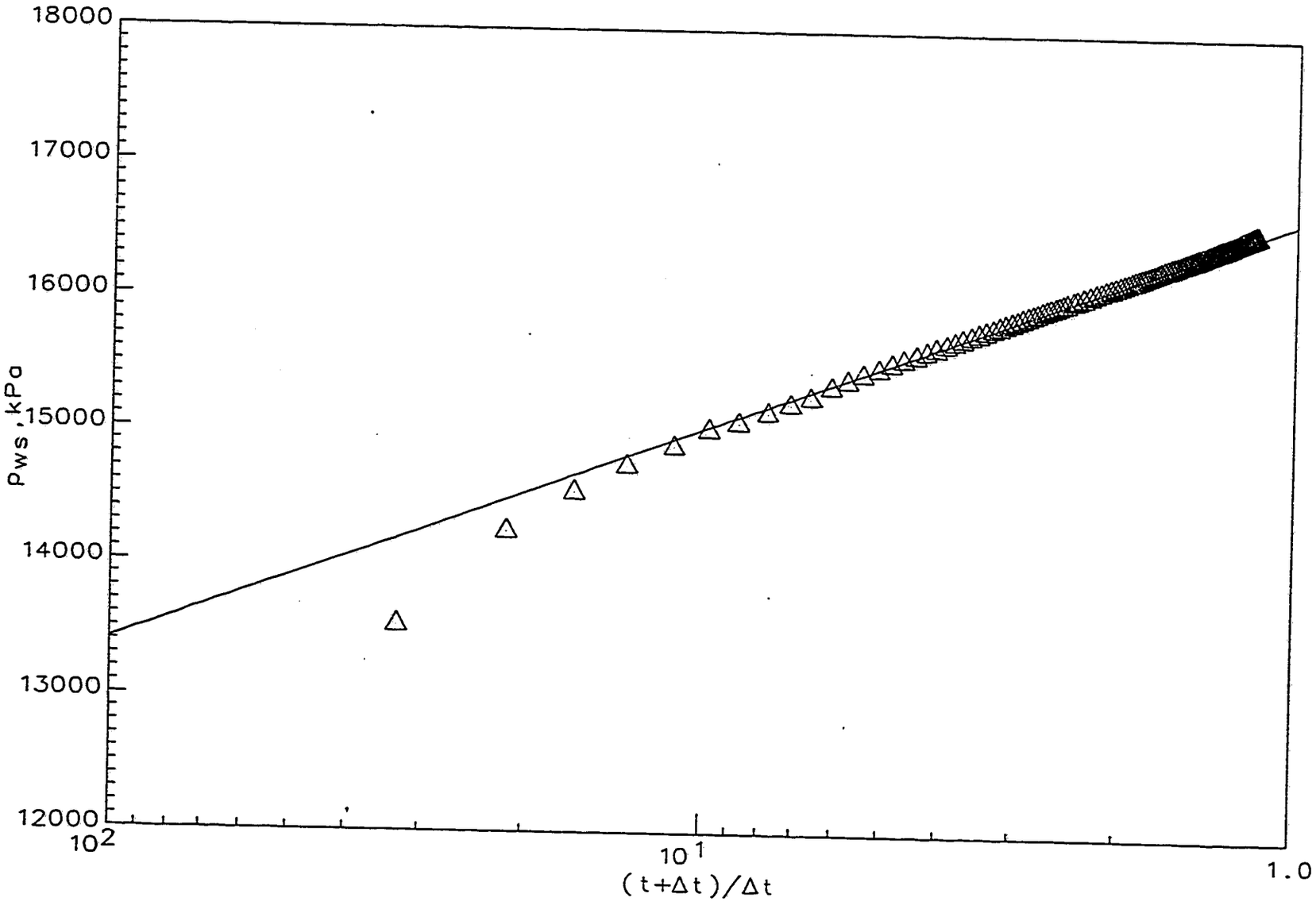
Downhole Systems Technology Canada Inc.

HORNER
PRESSURE BUILDUP PLOT

UCEL LIARD k-02-60-20-123-30
DST #1, MATTSON, 1488.8-1506.5 mKB

Initial Shut In

$[k_1/u]_t$=26.31 k_1=14.57 mD s=5.2 p*=16622.1

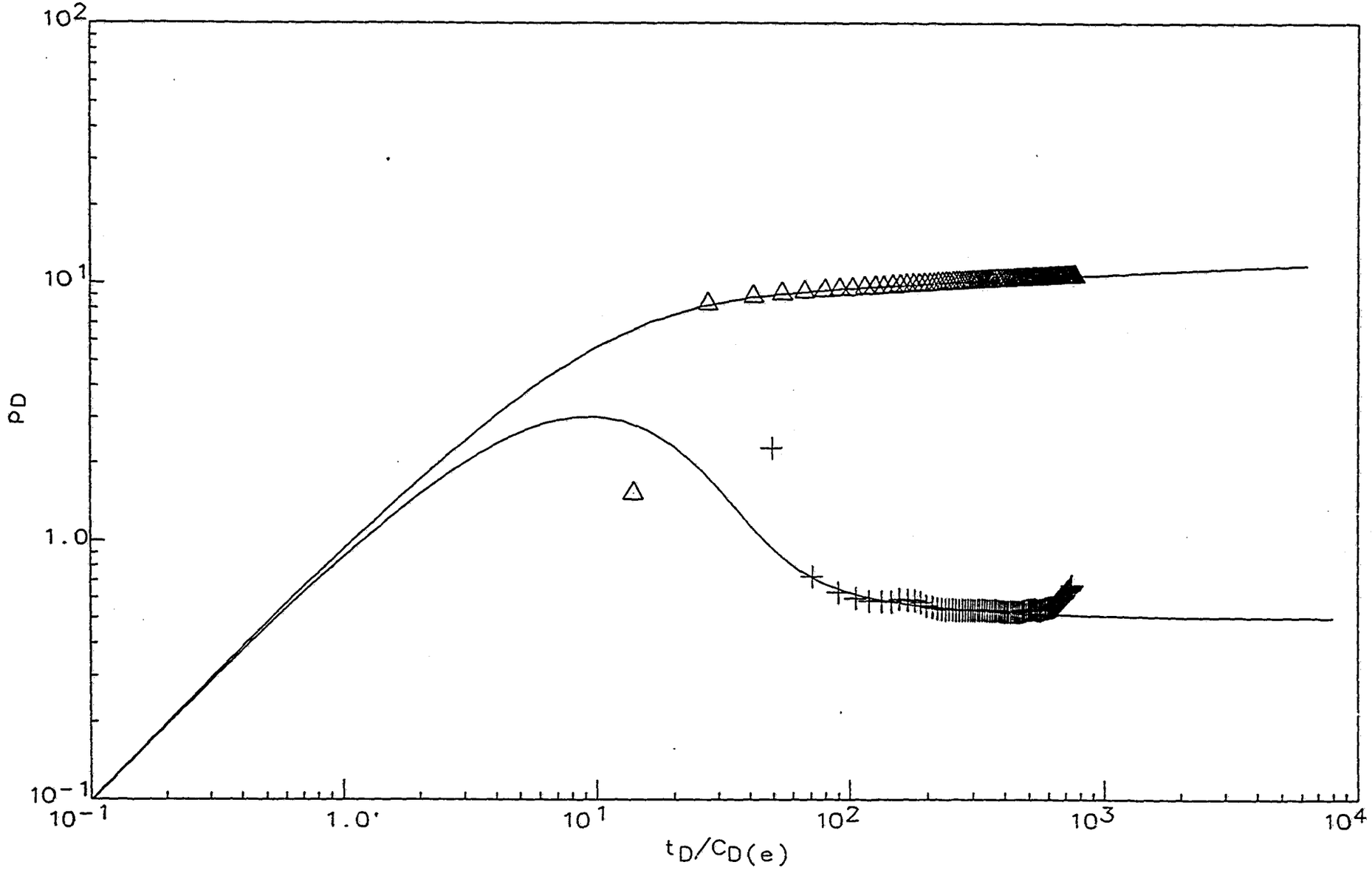


STORAGE AND SKIN TYPECURVE (Bourdet et al)

PRESSURE BUILDUP PLOT

UCEL LIARD k-02-60-20-123-30
DST #1, MATTSON, 1488.8-1506.5 mKB
$[k_1/u]_t$=28.36 k_1=15.70 C_D=7 s=5.9

Initial Shut In



Water Well Test - BUILDUP (Horner Time)

UCEL LIARD k-02-60-20-123-30
DST #1, MATTSON, 1488.8-1506.5 mKB

Initial Shut In

Input Data

Final Water Rate	=	178.00	m3/d
Total Porosity	=	16.00	%
Oil Saturation	=	0.00	%
Water Saturation	=	100.00	%
Gas Saturation	=	0.00	%
Net Pay	=	9.00	m
Perforated Interval	=	-	m
Horiz To Vert Perm Ratio	=	1.000	
Net Wellbore Inclination	=	0.	
Wellbore Radius	=	0.09	m
Drainage Area - Zone	=	64.7	ha
Shape Code - Zone 1	=	R1A	
Drainage Area -	=	64.7	ha
Shape Code - Zone2	=	R1A	
Water Formation Vol Factor	=	1.01	
Water Viscosity	=	0.554	mPa.s
Water Compressibility	=	4.269e-07	1/kPa
Initial Pressure	=	-	kPa
Final Flowing Pressure	=	2755.7	kPa
Formation Temperature	=	48.89	deg C
Cumulative Production (water)	=	-	m3
Corrected Flow Time	=	0.085	hr

Calculations

Total Compressibility	=	1.007e-06	1/kPa
Wellbore Storage Constant	=	-	m3/kPa

Results

Bourdet Et Al Type Curve Analysis

Dimensionless Storage Constant	=	7.20	
Wellbore Storage Constant	=	5.46e-07	m3/kPa
Permeability	=	15.70	mD
Skin Effect (Total)	=	5.921	
Inter Porosity Coeff	=	-	
Storativity Ratio	=	-	

Results

Radial Analysis - Zone 1

Transmissivity	=	236.83	mDm/mPa.s
Mobility (Total)	=	26.314	mD/mPa.s
Permeability (Water)	=	14.57	mD
Permeability (Oil)	=	-	mD
Permeability (Gas)	=	-	mD
Extrapolated Pressure	=	16622.1	kPa
Average Reservoir Pressure	=	-	kPa
Extrapolated Pressure At 72	=	16621.3	kPa
Skin Effect	=	5.19	
Partial Penetration Skin	=	-	
Inclination Skin	=	0.000	
Damage Skin	=	5.19	
Pressure Drop (Total Skin)	=	7241.3	kPa
Damage Ratio	=	2.09	
Flow Efficiency	=	0.48	
Radius Of Investigation	=	-	m
@ Time Of Investigation	=	-	hr
Specified Reservoir Pressure	=	16622.1	kPa
Specified Flowing Pressure	=	2755.7	kPa
PI / II (Total Actual)	=	1.284e-02	m3/d/kPa
PI / II (Total Ideal)	=	2.687e-02	m3/d/kPa
Stab PI / II (Total Actual)	=	9.397e-03	m3/d/kPa
Stab PI / II (Total Ideal)	=	1.967e-02	m3/d/kPa
Stabilization / Specified Time	=	110.131	hr
Stabilized Rate @ Current Skin	=	130.31	m3/d
Stabilized Rate @ Skin Of 0	=	210.96	m3/d
Stabilized Rate @ Skin Of -4	=	403.27	m3/d

Radial Analysis - Zone 2

Permeability (Water)	=	-	mD
Permeability (Oil)	=	-	mD
Permeability (Gas)	=	-	mD
Extrapolated Pressure	=	-	kPa
Average Reservoir Pressure	=	-	kPa
Extrapolated Pressure At 72	=	-	kPa
Apparent Skin	=	-	
Specified Reservoir Pressure	=	-	kPa
Specified Flowing Pressure	=	-	kPa
Stabilization / Specified Time	=	-	hr
Stabilized Rate @ Current Skin	=	-	m3/d
Stabilized Rate @ Skin Of 0	=	-	m3/d
Stabilized Rate @ Skin Of -4	=	-	m3/d

ELECTRO*TEST* REPORT

UNOCAL CANADA EXPLORATION LIMITED

WELL: UCEL LIARD k-02-80-20-123-30

DST #2: MATTSON (1159.0 - 1176.7mKB)

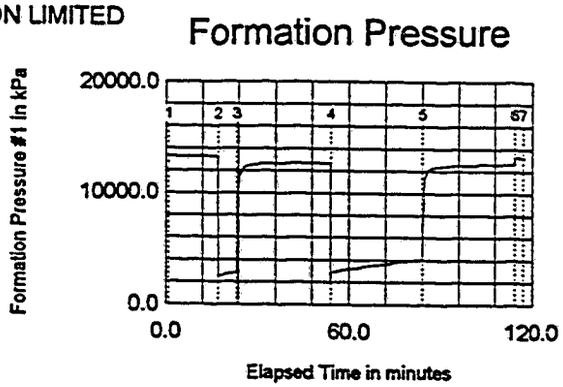
DATE: JANUARY 15, 1997

Downhole
Systems
Technology Canada Inc.

#7, 4539-6th St. N.E.
Calgary, Alberta
T2E 3Z6
(403) 299-1960

DRILL STEM TEST - FINAL REPORT

Well Operator		UNOCAL CANADA EXPLORATION LIMITED
Well Name		UCEL LIARD
Location		k-02-60-20-123-30
DST #		TWO
Interval Tested		1159.0 - 1176.7 mKB
Formation		MATTSON
Date		15 JANUARY, 1997
Wellsite Rep.		GABOURY
Test Engineer		JAMES
Wireline Operator		WYRE
Drilling Contractor		CACTUS 1
Well Total Depth		1657.00 meters
Well Elevations	KB	379.3[illegible] meters
	GL	374.50 meters
Main Hole Size		222.00 mm



SUMMARY

		Time	Duration	Graph #	Pressure (kPa)	Extrapolated Press.(kPa)	Liq. Rate(m3/d) Average/Final	Gas Rate(m3/d) Average/Final
Initial Hydrostatic				1	13366			
Preflow	Start	18:31:27		2	2565		45	-6
	End	18:37:47	6	3	2886		39.2	
Initial Shut In	End	19:07:57	30	4	12691	12724		
Flow #2	Start	19:08:12		4	2908		28.9	8
	End	19:38:07	30	5	4131		23.9	
Shut In #2	End	20:08:27	30	6	12636	12731		
Final Hydrostatic				7	13301			

Bottom Hole Temperature 44 deg C

Electronics #3, Formation Pressure 1, Ser. # 154775, Depth 1160.9 mKB (all gauges at same depth)

LIQUID RECOVERY	Height	Volume
Muddy water.	169 m	0.654 m3

Samples sent to AGAT Laboratories in Calgary.

RESERVOIR PARAMETERS

Net Pay: 13.0 m Permeability(water): 9.6 mD
Porosity: 17 % Skin: 30
Sw: 100%

COMMENTS

Successful straddle inflate with real time pressure data and closed chamber flow rates.

A GR/CCL correlation log was run prior to inflating the packers and the packer depth was 0.8 meters high. A depth adjustment of 0.8 meters downward was made.

The preflow was run under closed chamber conditions throughout, with primarily liquid flow indicated.

The second flow period was also run under closed chamber conditions throughout, with liquid inflow recorded.

Pressure buildup analysis of both shut ins indicates reservoir anomolies, possibly due to multiple layers in the reservoir.

If you require additional information contact David Sask at (403) 299-1960.

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	TWO
WELL NAME:	UCEL LIARD	INTERVAL:	1159.0 - 1176.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

Mud Type Gel Chem
Density 1165.00 kg/cu m
Viscosity 88.00 mPa S
Resistivity 0.00 ohms/m

Fluid Cushion: 233 metres of liquid from DST#1
Density of recovered fluids (used in liquid rate calculations): 1000 kg/m3
Calculated Fluid Recovery: 169 meters of drilling mud based upon density of water.

Reverse Circulated: No

TOOL STRING CONFIGURATION

	Length meters	Inner Diameter mm	Outer Diameter mm
Drill Pipe Above K.B.	-1.61	70.21	88.90
Upper Drill Pipe	984.33	84.00	85.00
Drill Collars	138.23	63.00	120.65
Stabbing Valve	0.50	50.80	120.65
RCV/DBS/XO'S	1.05	60.00	120.65
Drill Collar	27.43	63.00	120.65
Hydraulic Jars	2.00	50.80	127.00
Safety Joint	1.35	25.40	127.00
Top Packer	2.45	22.25	139.70
Top of Interval	**1159.00**		
Packer Stub	0.80	0.00	127.00
Downhole Flow Valve	0.92	0.00	127.00
Electronics Section	1.51	0.00	127.00
Inflation Pump	2.44	0.00	127.00
Spacer Pipe	11.48	0.00	127.00
Packer Stub	0.57	0.00	127.00
Bottom of Interval	**1176.72**		
Total Interval	**17.72**		
Bottom Packer	2.40	0.00	139.70

NOTE:

Test Tool Choke Diameter	22.50 mm	
Surface Choke	0.00 mm	Bean Choke
Total String Volume	5.97 cu m	
Initial Closed Chamber Gas Volume	5.97 cu m	
Annular Volume	0.46 cu m	

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	TWO
WELL NAME:	UCEL LIARD	INTERVAL:	1159.0 - 1176.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER INFLATION

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
18:14:52	00:00:00	13336.48	3415.55	98.71	13453.08	13352.36	100.73
18:15:07	00:00:15	13333.93	3412.48	99.76	13490.81	13349.80	141.00
18:15:22	00:00:30	13331.38	3408.40	99.30	13519.97	13347.76	172.21
18:15:37	00:00:45	13330.35	3404.84	98.70	13543.11	13346.23	196.88
18:15:52	00:01:00	13328.31	3402.28	99.53	13561.71	13344.69	217.02
18:16:07	00:01:15	13327.28	3398.72	98.70	13577.79	13343.66	234.13
18:16:22	00:01:30	13325.75	3395.16	99.21	13592.37	13342.13	250.24
18:16:37	00:01:45	13325.23	3392.61	99.48	13604.94	13342.62	262.32
18:16:52	00:02:00	13324.71	3390.07	98.93	13617.51	13341.59	275.92
18:17:07	00:02:15	13323.68	3387.02	99.25	13628.07	13340.07	288.00
18:17:22	00:02:30	13323.16	3384.98	99.93	13640.13	13339.55	300.58
18:17:37	00:02:45	13323.15	3382.44	99.25	13649.68	13339.03	310.65
18:17:52	00:03:00	13322.13	3380.91	99.70	13659.23	13339.52	319.71
18:18:07	00:03:15	13322.12	3378.37	99.34	13668.29	13338.50	329.78
18:18:22	00:03:30	13321.61	3376.84	99.48	13678.34	13337.99	340.35
18:18:37	00:03:45	13321.59	3374.80	99.66	13687.39	13337.47	349.92
18:18:52	00:04:00	13321.58	3372.77	99.61	13697.95	13336.96	360.99
18:19:07	00:04:15	13320.57	3369.73	98.83	13707.00	13336.95	370.05
18:19:22	00:04:30	13321.06	3368.70	98.47	13717.56	13336.94	380.62
18:19:37	00:04:45	13321.05	3365.66	98.10	13728.63	13336.43	392.20
18:19:52	00:05:00	13321.04	3363.63	99.15	13739.69	13336.92	402.77
18:20:22	00:05:30	13320.52	3357.05	98.65	13761.83	13336.91	424.92
18:20:52	00:06:00	13320.51	3344.90	99.88	13788.99	13337.39	451.60
18:21:22	00:06:30	13319.99	3314.06	99.52	13821.70	13336.37	485.32
18:21:52	00:07:00	13321.48	3178.64	99.15	13866.48	13335.85	530.63
18:22:22	00:07:30	13320.46	3019.97	98.97	13923.85	13333.83	590.02
18:22:52	00:08:00	13319.44	2897.16	98.84	13991.28	13332.80	658.47
18:23:22	00:08:30	13311.88	2716.74	98.61	14082.87	13327.76	755.11
18:23:52	00:09:00	13281.65	2396.81	98.98	14317.90	13307.60	1010.30
18:24:22	00:09:30	13286.67	2034.36	99.12	15969.93	13311.12	2658.81
18:24:52	00:10:00	13305.79	2004.01	100.12	15564.38	13325.71	2238.67
18:25:22	00:10:30	13312.85	2010.59	99.39	15168.88	13333.27	1835.61
18:25:52	00:11:00	13299.73	2011.56	99.25	16392.01	13322.66	3069.35
18:26:22	00:11:30	13313.33	2005.00	99.48	15344.98	13334.25	2010.72
18:26:52	00:12:00	13312.31	2011.05	99.02	15084.81	13333.23	1751.58
18:27:22	00:12:30	13311.30	2017.11	95.78	14920.25	13331.71	1588.53
18:27:52	00:13:00	13311.29	2020.64	93.02	14845.76	13330.69	1515.06
18:28:22	00:13:30	13309.77	2021.13	99.43	14863.86	13331.19	1532.68
18:28:52	00:14:00	13309.76	2021.63	99.75	14866.37	13330.68	1535.70
18:29:22	00:14:30	13282.55	2451.27	99.57	14889.51	13308.51	1581.00
18:29:52	00:15:00	13298.66	2459.85	99.39	14863.84	13321.59	1542.25
18:30:22	00:15:30	13305.20	2462.37	98.98	14849.74	13326.62	1523.12
18:30:42	00:15:49	13299.66	2462.87	99.25	14841.18	13328.63	1512.55

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	TWO
WELL NAME:	UCEL LIARD	INTERVAL:	1159.0 - 1176.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PREFLOW

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Liquid Flowrate m3/d	Surface Gas Flowrate m3/d	Total Gas Flowrate m3/d	Gas Liquid Ratio m3/m3	Formation Temp. deg C
18:31:27	00:00:00	2564.88	2530.59	99.66	-7551.16	0.00	7274.22	-0.96	42.85
18:31:42	00:00:15	2572.48	2567.53	99.02	-3533.20	0.00	3318.44	-0.94	42.82
18:31:57	00:00:30	2591.16	2584.21	99.85	-1146.65	0.00	1141.10	-1.00	42.81
18:32:12	00:00:45	2605.79	2598.85	99.67	-305.49	0.00	341.66	-1.12	42.82
18:32:27	00:01:00	2619.92	2613.00	100.72	-55.21	0.00	210.53	-3.81	42.83
18:32:42	00:01:15	2634.05	2626.13	99.26	14.66	0.00	-81.85	-5.58	42.84
18:32:57	00:01:30	2643.63	2637.24	100.13	27.61	0.00	14.06	0.51	42.85
18:33:12	00:01:45	2650.69	2642.79	99.81	21.65	0.00	-48.56	-2.24	42.85
18:33:27	00:02:00	2659.77	2653.40	99.67	25.21	0.00	-54.33	-2.16	42.86
18:33:42	00:02:15	2673.90	2669.56	99.63	35.91	0.00	-44.45	-1.24	42.87
18:33:57	00:02:30	2688.54	2681.69	100.22	36.22	0.00	50.54	1.40	42.87
18:34:12	00:02:45	2701.66	2694.82	99.76	36.93	0.00	-54.85	-1.49	42.87
18:34:27	00:03:00	2713.27	2707.45	99.22	36.07	0.00	-26.54	-0.74	42.88
18:34:42	00:03:15	2726.89	2720.59	101.46	33.42	0.00	266.05	7.96	42.88
18:34:57	00:03:30	2739.00	2733.73	100.41	35.51	0.00	50.40	1.42	42.89
18:35:12	00:03:45	2751.62	2746.36	100.36	35.38	0.00	8.00	0.23	42.89
18:35:27	00:04:00	2765.25	2758.48	101.19	33.43	0.00	114.09	3.41	42.89
18:35:42	00:04:15	2779.88	2773.64	100.05	39.76	0.00	-149.04	-3.75	42.90
18:35:57	00:04:30	2822.28	2814.06	100.46	39.43	0.00	-146.02	-3.70	42.90
18:36:12	00:04:45	2822.28	2814.06	100.46	39.43	0.00	-146.02	-3.70	42.90
18:36:27	00:05:00	2822.28	2814.06	100.46	39.43	0.00	-146.02	-3.70	42.90
18:36:42	00:05:15	2829.85	2824.17	100.23	39.70	0.00	-107.99	-2.72	42.90
18:36:57	00:05:30	2842.47	2836.29	101.56	35.72	0.00	133.94	3.75	42.91
18:37:12	00:05:45	2854.58	2848.92	101.01	35.48	0.00	-7.86	-0.22	42.91
18:37:27	00:06:00	2866.19	2860.04	101.15	33.17	0.00	-8.91	-0.27	42.91
18:37:42	00:06:15	2880.82	2875.19	101.74	36.95	0.00	24.12	0.65	42.91
18:37:47	00:06:18	2886.37	2880.24	101.29	39.20	0.00	-23.93	-0.61	42.92

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	TWO
WELL NAME:	UCEL LIARD	INTERVAL:	1159.0 - 1176.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

INITIAL SHUT IN

Time	Elapsed Time	Formation Pressure #1 kPa	Formation Pressure #2 kPa	Transducer Difference kPa	Recovery Pressure kPa	Surface Pressure kPa	Formation Temp. deg C	Hydrostatic Pressure kPa
18:37:52	00:00:00	3382.52	3611.11	-228.59	2903.48	101.84	42.92	13330.08
18:38:07	00:00:15	9859.79	9911.38	-51.59	2872.14	100.19	42.94	13333.59
18:38:22	00:00:30	11129.03	11148.90	-19.88	2872.61	101.20	42.97	13306.87
18:38:37	00:00:45	11541.11	11555.77	-14.66	2872.57	101.24	43.01	13298.28
18:38:52	00:01:00	11715.41	11728.00	-12.59	2872.58	100.61	43.00	13297.28
18:39:22	00:01:30	11975.89	11992.46	-16.57	2874.14	101.98	42.96	13316.45
18:39:52	00:02:00	12271.57	12283.50	-11.93	2874.64	101.43	42.96	13328.53
18:40:22	00:02:30	12363.75	12374.64	-10.89	2875.65	101.20	42.97	13330.04
18:40:52	00:03:00	12421.17	12432.53	-11.37	2876.15	101.62	42.97	13329.53
18:41:22	00:03:30	12463.97	12474.82	-10.84	2876.64	101.98	42.98	13330.03
18:41:52	00:04:00	12497.21	12508.03	-10.82	2877.64	101.16	42.99	13330.02
18:42:22	00:04:30	12523.39	12533.69	-10.30	2878.14	101.12	43.00	13330.01
18:42:52	00:05:00	12543.53	12554.32	-10.79	2878.63	102.12	43.01	13330.51
18:43:52	00:06:00	12573.73	12583.98	-10.25	2880.63	100.98	43.03	13329.98
18:44:52	00:07:00	12595.87	12605.58	-9.71	2879.59	101.62	43.06	13330.46
18:45:52	00:08:00	12611.97	12621.65	-9.68	2881.59	101.48	43.09	13330.44
18:46:52	00:09:00	12624.54	12634.69	-10.16	2881.56	101.57	43.11	13330.92
18:47:52	00:10:00	12633.58	12642.70	-9.12	2881.54	100.29	43.14	13331.41
18:48:52	00:11:00	12641.62	12651.21	-9.59	2882.52	101.62	43.16	13331.89
18:49:52	00:12:00	12648.15	12658.22	-10.07	2882.50	101.12	43.19	13331.36
18:50:52	00:13:00	12653.67	12663.21	-9.55	2882.98	100.30	43.21	13331.34
18:51:52	00:14:00	12659.69	12668.21	-8.52	2882.96	100.89	43.23	13330.82
18:52:52	00:15:00	12662.70	12671.70	-9.00	2883.44	100.44	43.25	13331.81
18:53:52	00:16:00	12666.21	12675.69	-9.48	2884.43	101.40	43.27	13330.79
18:54:52	00:17:00	12669.72	12678.69	-8.97	2883.41	101.08	43.28	13329.77
18:55:52	00:18:00	12672.73	12681.68	-8.95	2882.88	100.86	43.30	13329.25
18:56:52	00:19:00	12675.23	12683.66	-8.43	2883.37	101.41	43.32	13329.24
18:57:52	00:20:00	12677.24	12687.16	-9.92	2883.36	100.45	43.33	13329.73
18:58:52	00:21:00	12678.74	12688.65	-9.91	2883.35	101.32	43.34	13328.71
18:59:52	00:22:00	12680.74	12690.14	-9.40	2883.34	100.55	43.36	13328.20
19:00:52	00:23:00	12682.75	12692.14	-9.39	2883.32	100.51	43.37	13327.69
19:01:52	00:24:00	12684.25	12693.62	-9.38	2882.81	100.42	43.38	13328.18
19:02:52	00:25:00	12685.75	12695.12	-9.37	2882.80	99.83	43.39	13327.67
19:03:52	00:26:00	12686.75	12696.11	-9.36	2882.28	101.29	43.40	13328.17
19:04:52	00:27:00	12688.76	12697.61	-8.85	2883.79	100.66	43.40	13328.16
19:05:52	00:28:00	12688.75	12698.10	-9.34	2882.77	101.35	43.41	13328.15
19:06:52	00:29:00	12690.26	12699.60	-9.34	2883.27	99.75	43.42	13327.14
19:07:52	00:30:00	12691.26	12701.10	-9.83	2883.27	100.08	43.42	13327.14
19:07:57	00:30:04	12690.73	12700.54	-9.81	2883.24	100.67	43.45	13327.11

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	TWO
WELL NAME:	UCEL LIARD	INTERVAL:	1159.0 - 1176.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

SECOND FLOW PERIOD

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Liquid Flowrate m3/d	Surface Gas Flowrate m3/d	Total Gas Flowrate m3/d	Gas Liquid Ratio m3/m3	Formation Temp. deg C
19:08:12	00:00:00	2908.18	2913.62	100.12	323.17	0.00	-846.25	-2.62	43.39
19:08:27	00:00:15	2927.37	2925.25	100.54	170.42	0.00	-407.43	-2.39	43.38
19:08:42	00:00:30	2942.01	2938.39	100.45	81.07	0.00	-123.75	-1.53	43.38
19:08:57	00:00:45	2956.13	2951.52	99.72	50.95	0.00	-209.09	-4.10	43.39
19:09:12	00:01:00	2969.25	2965.16	100.68	40.25	0.00	-10.09	-0.25	43.40
19:09:42	00:01:30	2995.49	2992.43	100.50	39.38	0.00	-31.97	-0.81	43.40
19:10:12	00:02:00	3018.71	3015.67	102.01	32.13	0.00	136.22	4.24	43.41
19:10:42	00:02:30	3043.43	3040.42	101.74	33.42	0.00	19.06	0.57	43.42
19:11:12	00:03:00	3068.67	3065.68	101.33	35.30	0.00	-54.28	-1.54	43.42
19:11:42	00:03:30	3096.43	3093.47	102.06	38.24	0.00	44.77	1.17	43.42
19:12:12	00:04:00	3118.63	3115.20	102.66	31.85	0.00	38.29	1.20	43.42
19:12:42	00:04:30	3141.35	3136.42	102.89	29.38	0.00	41.51	1.41	43.42
19:13:12	00:05:00	3164.06	3159.66	102.16	32.86	0.00	-158.04	-4.81	43.43
19:14:12	00:06:00	3213.02	3208.67	102.85	34.05	0.00	-66.81	-1.96	43.42
19:15:12	00:07:00	3256.93	3252.63	103.95	28.81	0.00	111.16	3.86	43.42
19:16:12	00:08:00	3302.86	3298.10	104.96	30.50	0.00	105.93	3.47	43.42
19:17:12	00:09:00	3347.78	3342.56	103.55	32.57	0.00	-156.61	-4.81	43.43
19:18:12	00:10:00	3395.21	3390.55	105.20	33.61	0.00	9.79	0.29	43.43
19:19:12	00:11:00	3439.12	3433.98	105.12	31.57	0.00	-70.13	-2.22	43.44
19:20:12	00:12:00	3480.49	3476.41	106.40	29.28	0.00	25.15	0.86	43.45
19:21:12	00:13:00	3517.83	3513.78	106.31	26.78	0.00	-86.72	-3.24	43.46
19:22:12	00:14:00	3555.67	3552.16	106.86	27.27	0.00	-140.28	-5.14	43.47
19:23:12	00:15:00	3596.03	3592.05	107.54	27.31	0.00	-101.61	-3.72	43.49
19:24:12	00:16:00	3633.86	3630.42	107.27	28.24	0.00	-149.10	-5.28	43.51
19:25:12	00:17:00	3673.21	3669.81	109.10	27.17	0.00	41.60	1.53	43.53
19:26:12	00:18:00	3710.54	3707.67	109.37	25.65	0.00	-14.45	-0.56	43.55
19:27:12	00:19:00	3749.88	3746.04	110.20	27.08	0.00	29.43	1.09	43.57
19:28:12	00:20:00	3785.69	3783.89	110.98	25.51	0.00	-4.76	-0.19	43.60
19:29:12	00:21:00	3822.51	3821.25	111.76	25.61	0.00	31.24	1.22	43.62
19:30:12	00:22:00	3860.33	3859.10	112.30	24.90	0.00	74.38	2.99	43.65
19:31:12	00:23:00	3895.13	3892.92	112.58	22.54	0.00	34.47	1.53	43.68
19:32:12	00:24:00	3931.44	3930.27	113.27	26.74	0.00	26.41	0.99	43.70
19:33:12	00:25:00	3966.24	3965.59	113.00	23.92	0.00	14.59	0.61	43.73
19:34:12	00:26:00	4000.02	3999.91	113.13	24.78	0.00	-51.93	-2.10	43.76
19:35:12	00:27:00	4035.83	4035.24	113.96	24.02	0.00	4.09	0.17	43.78
19:36:12	00:28:00	4067.09	4066.53	115.15	20.81	0.00	42.90	2.06	43.81
19:37:12	00:29:00	4098.87	4098.83	114.64	23.13	0.00	-36.51	-1.58	43.83
19:38:07	00:29:54	4131.13	4130.11	115.15	23.93	0.00	-39.67	-1.66	43.86

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	TWO
WELL NAME:	UCEL LIARD	INTERVAL:	1159.0 - 1176.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

SECOND SHUTIN

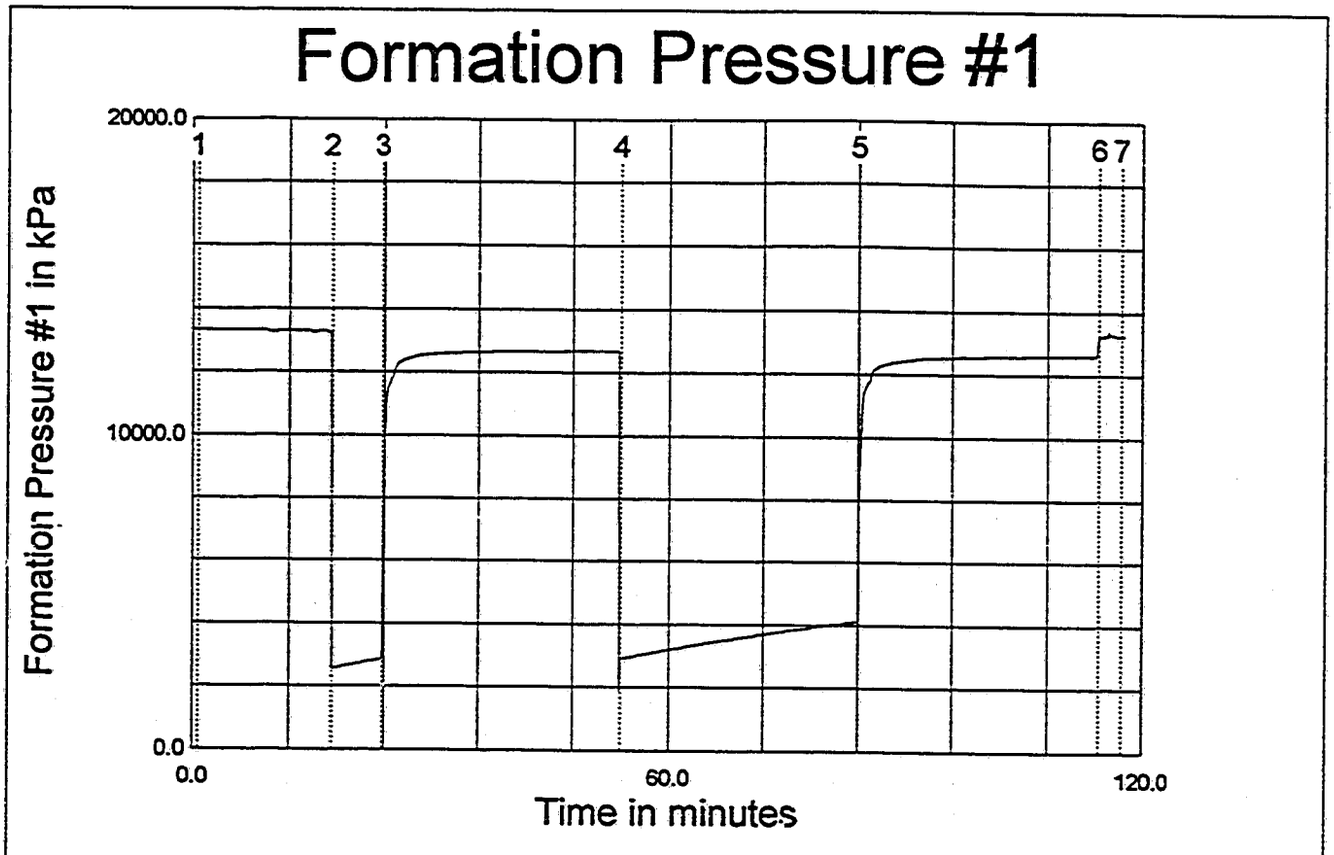
Time	Elapsed Time	Formation Pressure #1 kPa	Formation Pressure #2 kPa	Transducer Difference kPa	Recovery Pressure kPa	Surface Pressure kPa	Formation Temp. deg C	Hydrostatic Pressure kPa
19:38:12	00:00:00	4627.63	4803.01	-175.38	4024.05	115.52	43.86	13321.22
19:38:27	00:00:15	9879.65	9930.32	-50.67	4139.69	115.65	43.88	13331.78
19:38:42	00:00:30	11277.85	11294.75	-16.90	4135.60	115.88	43.92	13334.26
19:38:57	00:00:45	11530.75	11545.04	-14.29	4135.60	115.93	43.93	13308.58
19:39:12	00:01:00	11655.18	11669.42	-14.24	4136.10	116.29	43.93	13306.06
19:39:42	00:01:30	11943.84	11960.00	-16.16	4136.11	115.74	43.92	13321.17
19:40:12	00:02:00	12159.93	12172.48	-12.55	4137.61	116.66	43.93	13330.23
19:40:42	00:02:30	12242.03	12254.04	-12.01	4138.11	116.70	43.94	13331.23
19:41:12	00:03:00	12296.42	12308.40	-11.98	4138.10	115.87	43.95	13331.72
19:41:42	00:03:30	12337.72	12349.67	-11.96	4138.59	116.70	43.96	13331.71
19:42:12	00:04:00	12373.47	12385.40	-11.93	4138.58	116.01	43.97	13331.20
19:42:42	00:04:30	12402.17	12413.58	-11.41	4139.58	116.60	43.98	13330.68
19:43:12	00:05:00	12425.83	12437.22	-11.39	4140.07	116.14	43.99	13331.18
19:44:12	00:06:00	12462.58	12474.44	-11.86	4140.55	116.60	44.02	13330.15
19:45:12	00:07:00	12490.77	12501.58	-10.81	4141.03	115.77	44.04	13329.12
19:46:12	00:08:00	12509.89	12521.68	-11.79	4140.00	116.91	44.07	13328.10
19:47:12	00:09:00	12525.99	12537.76	-11.77	4141.49	116.81	44.09	13327.57
19:48:12	00:10:00	12539.07	12550.81	-11.74	4140.97	116.75	44.11	13326.55
19:49:12	00:11:00	12550.64	12561.86	-11.22	4140.95	115.87	44.12	13326.54
19:50:12	00:12:00	12561.20	12572.41	-11.20	4140.93	117.14	44.14	13325.52
19:51:12	00:13:00	12569.76	12579.94	-10.18	4140.42	116.99	44.15	13326.01
19:52:12	00:14:00	12576.80	12587.97	-11.17	4140.41	116.03	44.16	13325.50
19:53:12	00:15:00	12582.33	12594.00	-11.67	4140.40	115.48	44.17	13324.48
19:54:12	00:16:00	12588.87	12600.02	-11.15	4139.88	116.48	44.18	13323.97
19:55:12	00:17:00	12594.91	12605.04	-10.13	4139.87	115.42	44.19	13323.96
19:56:12	00:18:00	12599.43	12610.57	-11.13	4139.87	116.06	44.20	13323.45
19:57:12	00:19:00	12603.46	12615.09	-11.63	4139.36	116.66	44.20	13322.95
19:58:12	00:20:00	12607.49	12618.61	-11.12	4138.85	115.79	44.20	13322.94
19:59:12	00:21:00	12611.51	12622.13	-10.62	4138.85	115.66	44.21	13322.44
20:00:12	00:22:00	12614.03	12625.65	-11.62	4138.34	115.43	44.21	13321.93
20:01:12	00:23:00	12617.56	12629.17	-11.62	4137.83	116.39	44.21	13321.93
20:02:12	00:24:00	12621.08	12632.19	-11.11	4137.33	117.80	44.21	13320.42
20:03:12	00:25:00	12624.10	12633.70	-9.60	4137.33	116.57	44.21	13320.92
20:04:12	00:26:00	12626.12	12637.73	-11.61	4137.33	116.20	44.21	13321.42
20:05:12	00:27:00	12627.63	12638.74	-11.11	4137.33	116.61	44.21	13320.92
20:06:12	00:28:00	12630.15	12641.26	-11.11	4136.82	116.52	44.21	13320.42
20:07:12	00:29:00	12632.67	12642.27	-9.60	4136.83	116.34	44.21	13319.42
20:08:12	00:30:00	12635.69	12646.80	-11.11	4136.83	115.65	44.21	13319.92
20:08:27	00:30:15	12635.67	12646.76	-11.09	4136.80	116.84	44.23	13319.90

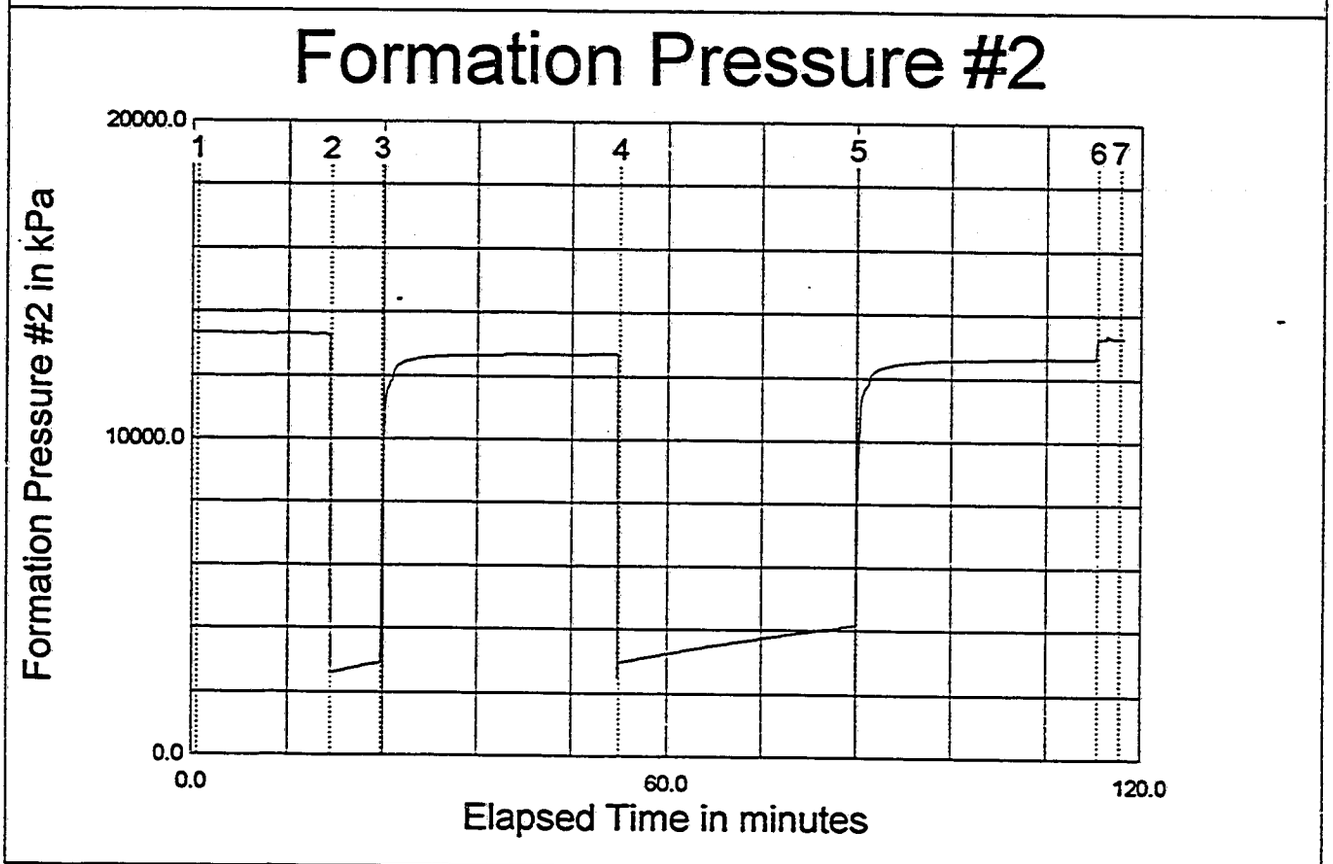
TEST DATE:	15 JANUARY, 1997	DST NUMBER:	TWO
WELL NAME:	UCEL LIARD	INTERVAL:	1159.0 - 1176.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER DEFLATION

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
20:08:57	00:00:00	13267.78	4136.32	116.38	14895.96	13300.78	1595.17
20:09:12	00:00:15	13270.80	4136.32	116.47	14875.32	13302.29	1573.03
20:09:27	00:00:30	13272.31	4136.32	117.29	14860.23	13304.31	1555.92
20:09:42	00:00:45	13272.81	4136.32	117.24	14845.63	13303.81	1541.83
20:09:57	00:01:00	13315.12	4135.32	116.55	13503.33	13328.99	174.34
20:10:12	00:01:15	13302.02	4135.31	117.33	13439.40	13312.87	126.53
20:10:27	00:01:30	13295.98	4135.82	115.96	13403.66	13308.34	95.32
20:10:42	00:01:45	13291.95	4135.82	116.60	13381.01	13306.33	74.68
20:10:57	00:02:00	13290.45	4134.81	116.55	13364.90	13306.83	58.07
20:11:12	00:02:15	13292.46	4135.82	116.50	13351.31	13286.69	64.62
20:11:22	00:02:24	13288.43	4134.31	116.41	13346.28	13299.28	47.00

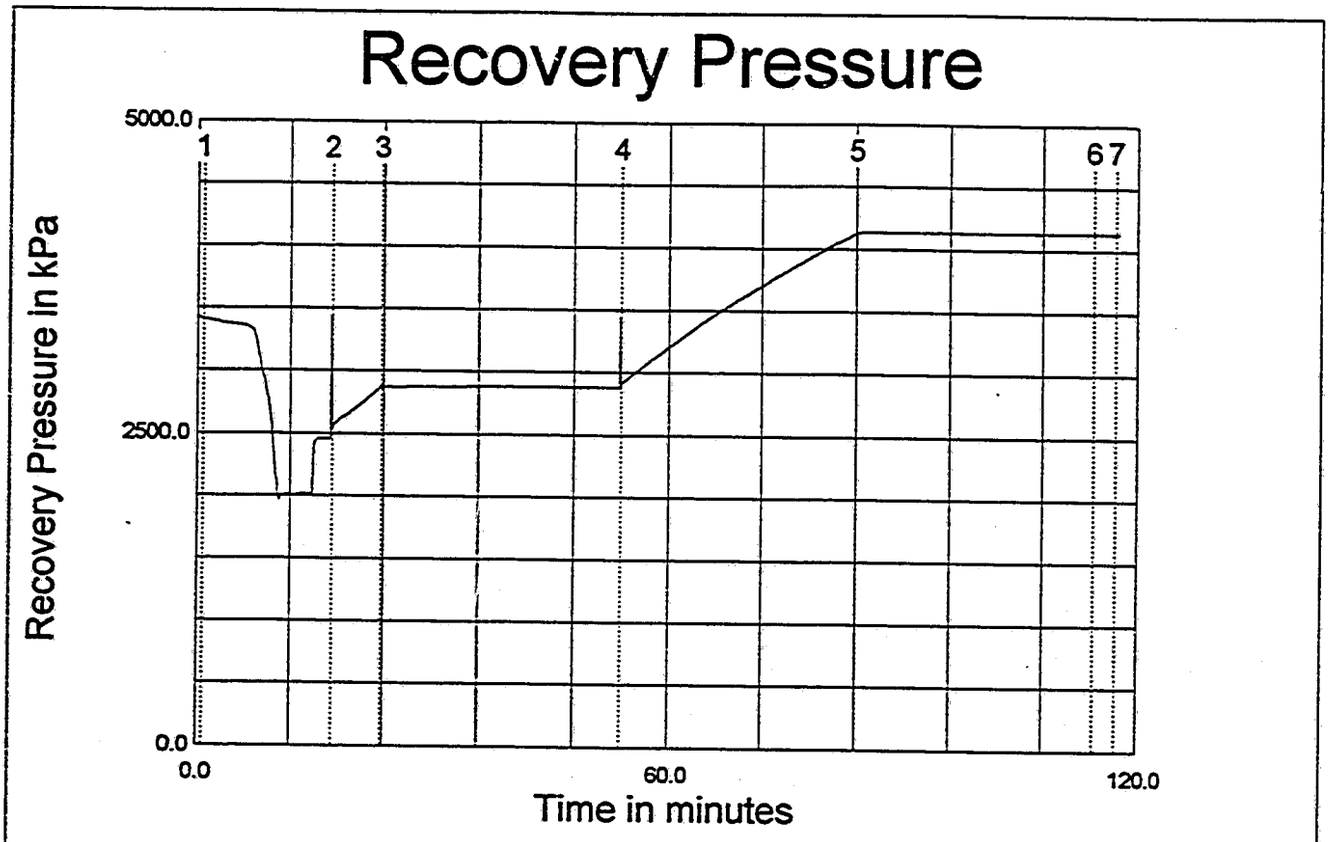
UCEL LIARD k-02-60-20-123-30
DST #TWO, MATTSON, 1159.0 - 1176.7 mKB

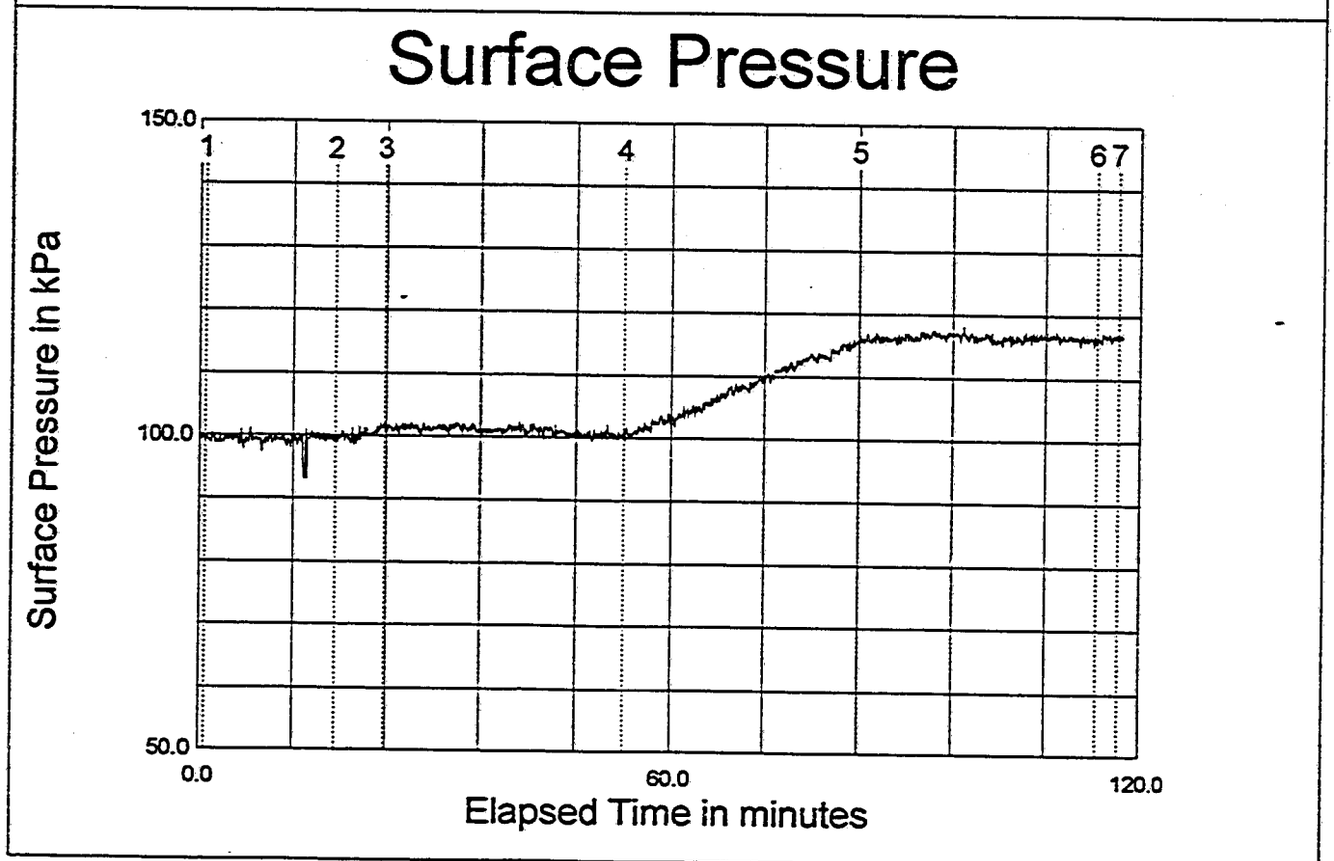




Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
DST #TWO, MATTSON, 1159.0 - 1176.7 mKB

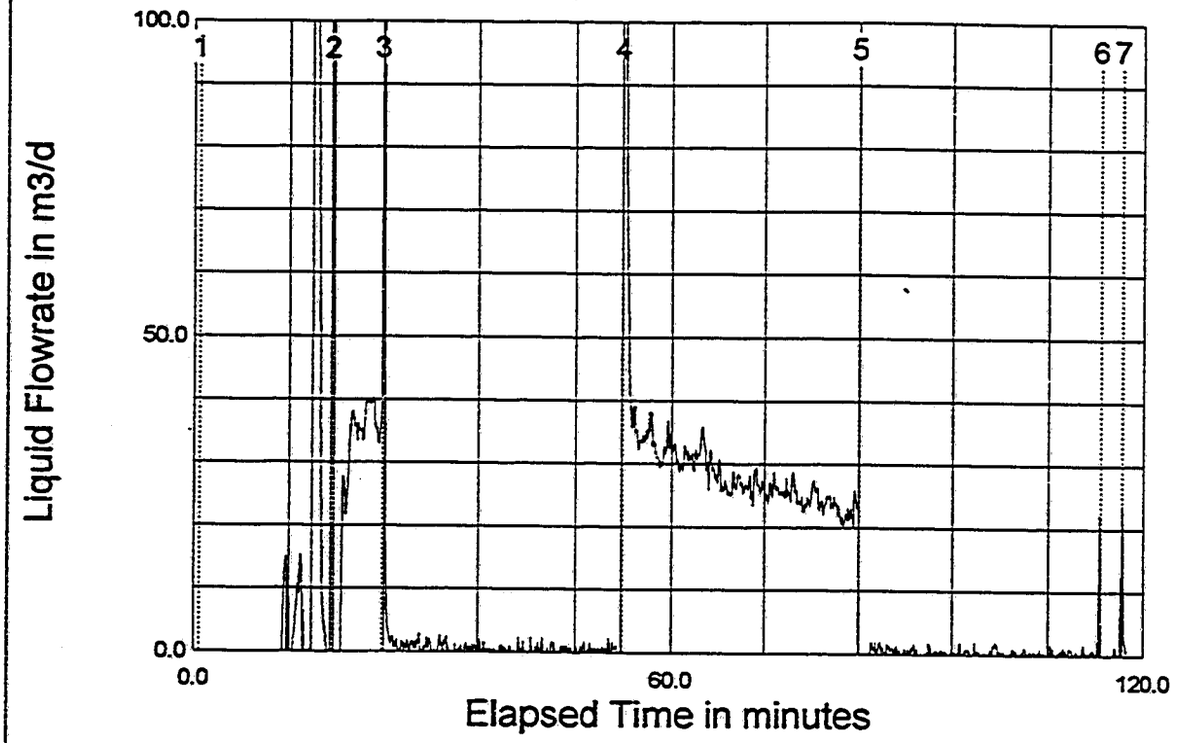




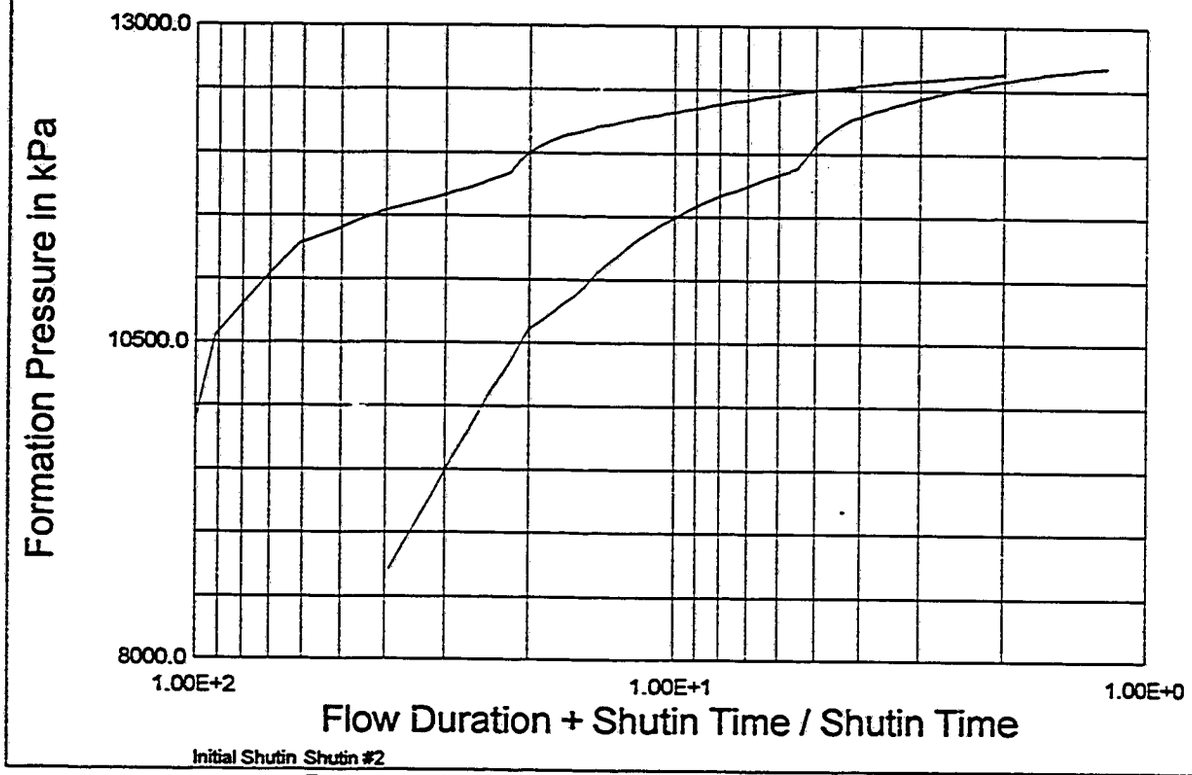
Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
DST #TWO, MATTSON, 1159.0 - 1176.7 mKB

Liquid Rate

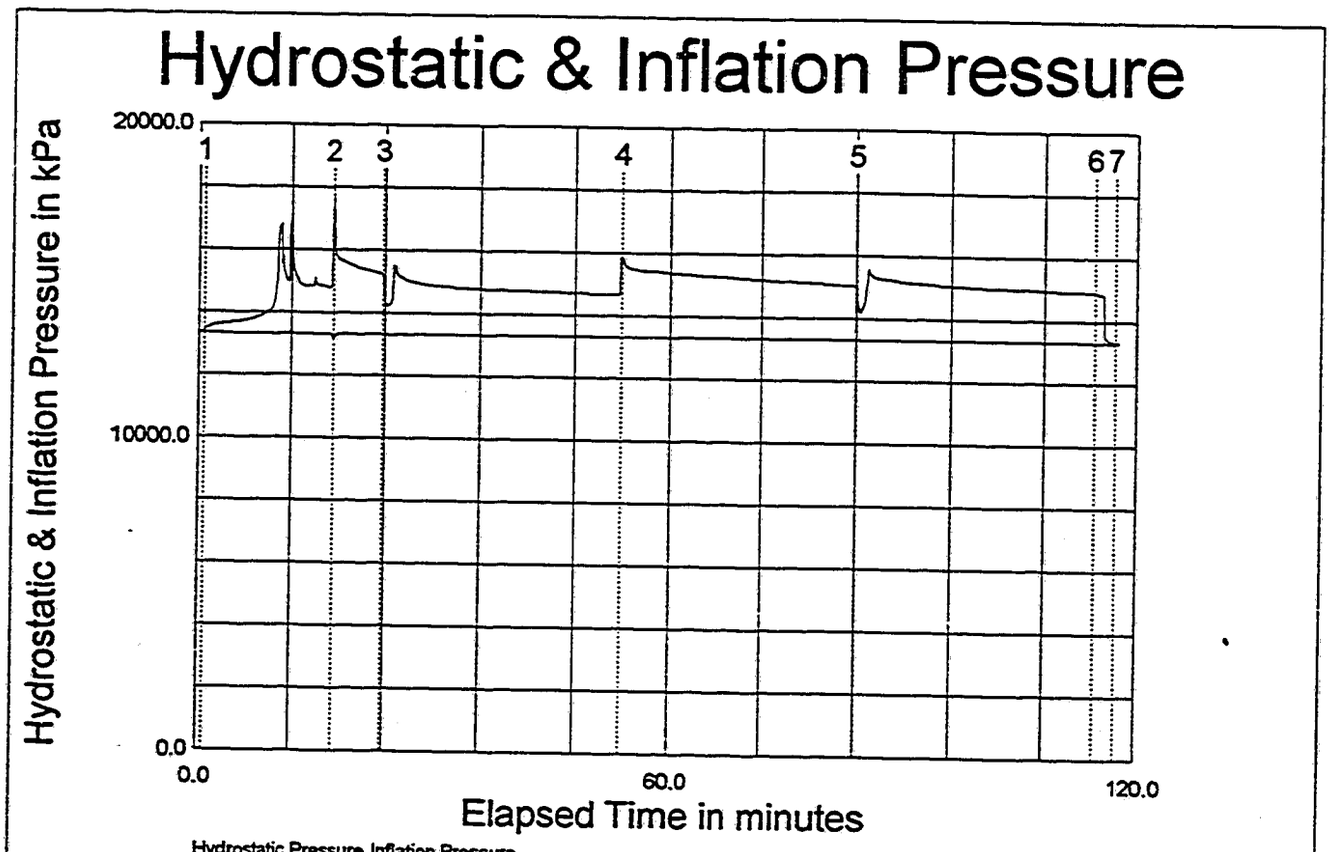


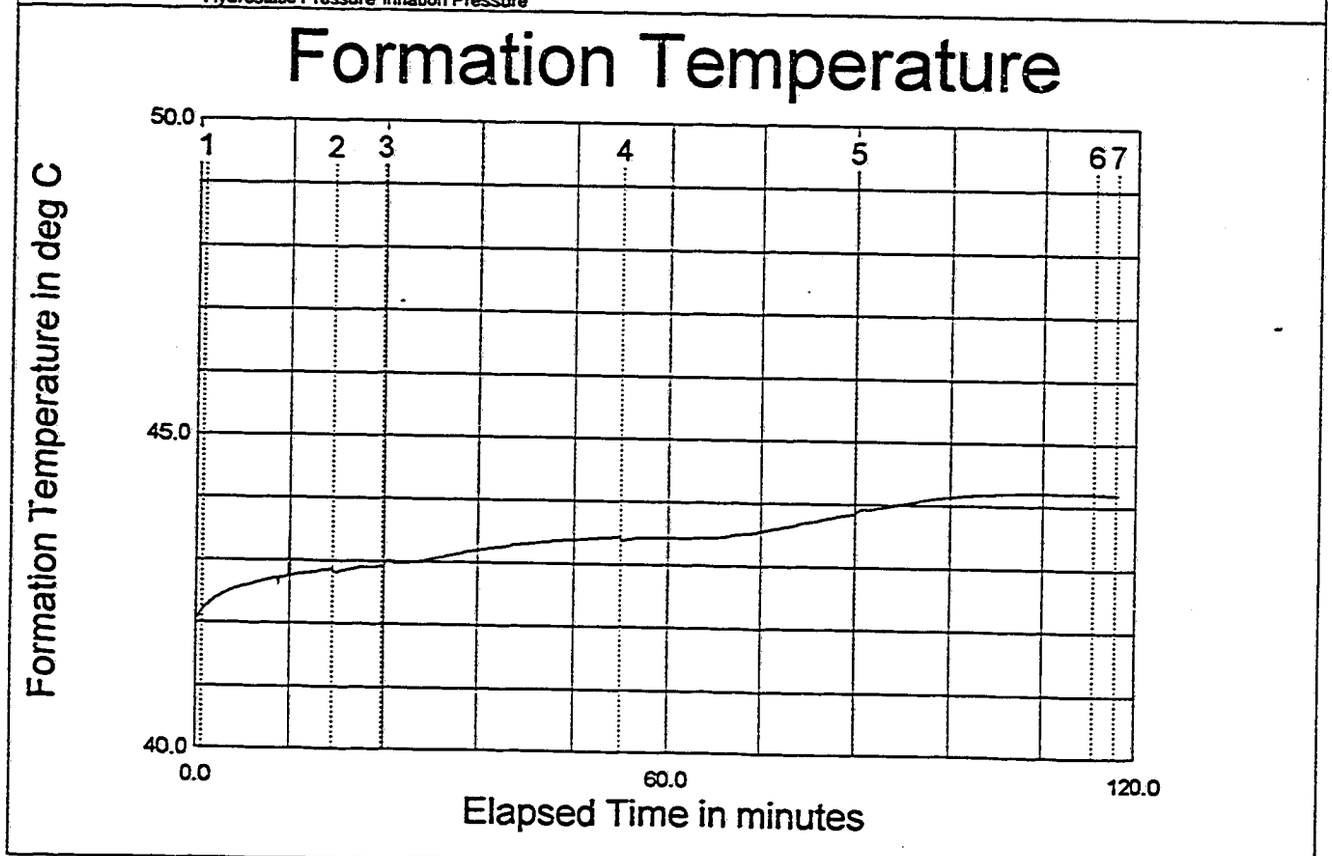
Horner Plot



Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
DST #TWO, MATTSON, 1159.0 - 1176.7 mKB





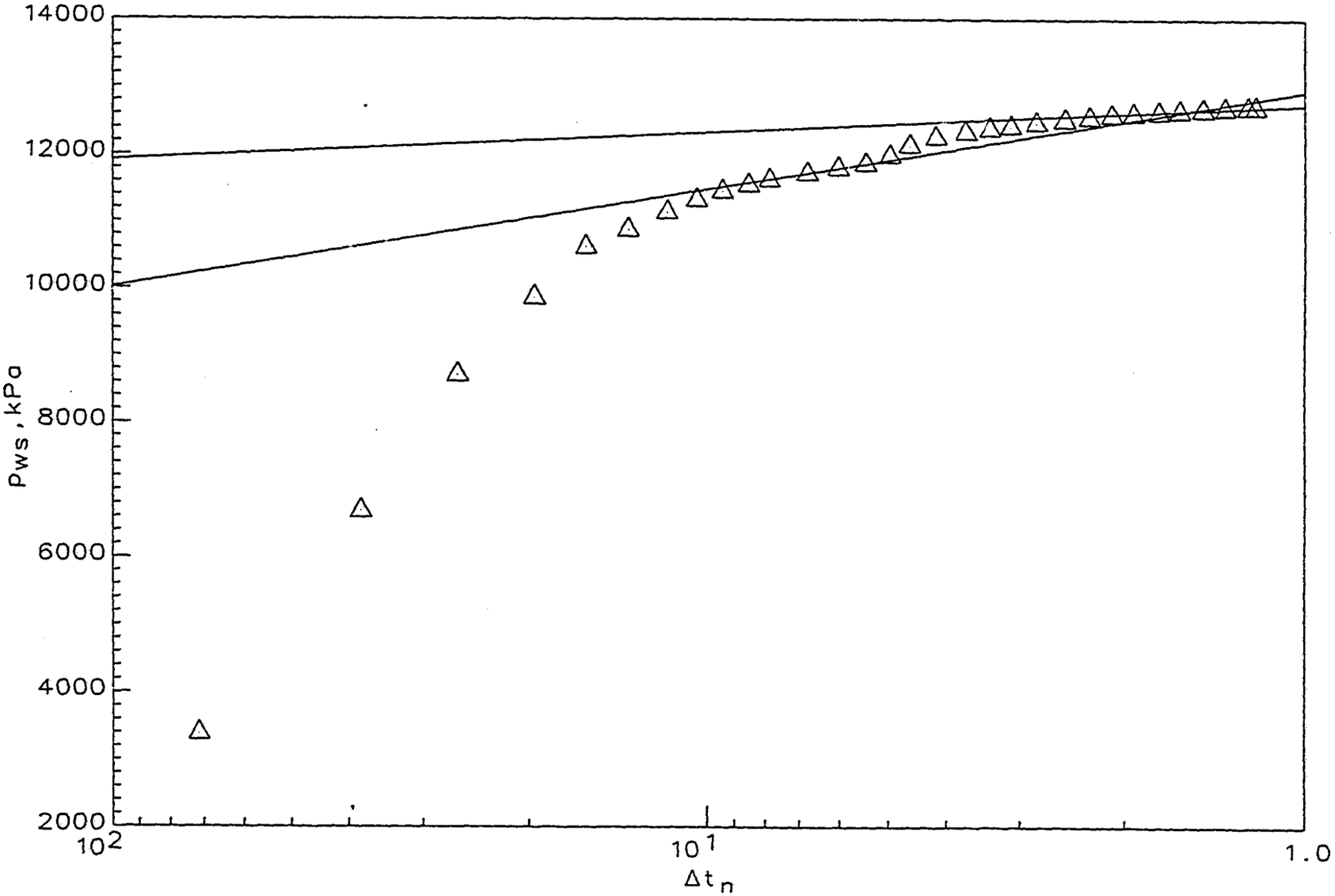
Downhole Systems Technology Canada Inc.

SUPERPOSITION
PRESSURE BUILDUP PLOT

UCEL LIARD k-02-60-20-123-30
DST #2, MATTSON, 1159.0-1176.7 mKB

Initial Shut In

$[k_1/u]_t$=5.19 k_1=2.87 mD s=3.9 p*=12929.5
$[k_2/u]_t$=18.84 k_2=10.43 mD s=23.6 p*=12724.3

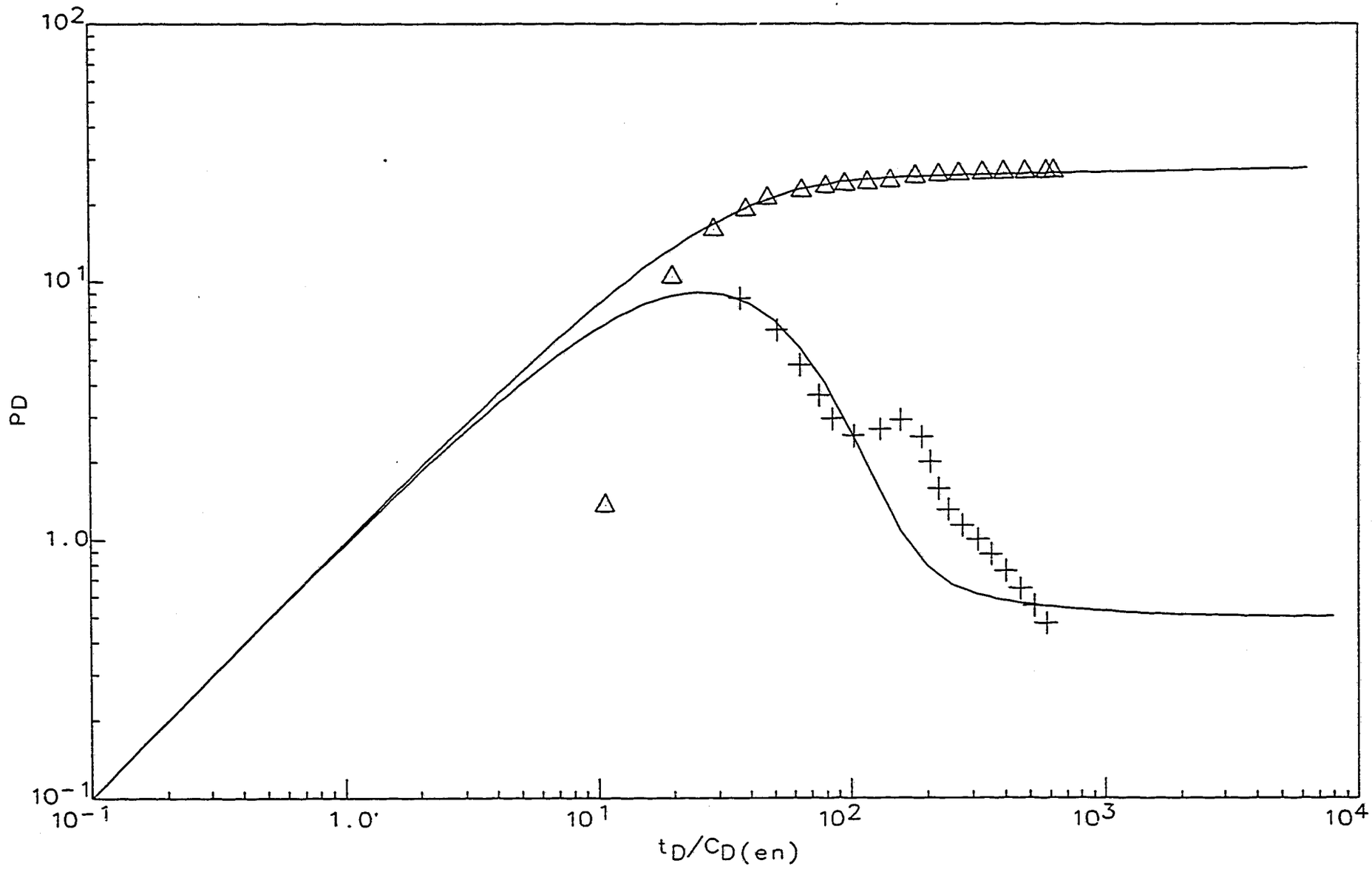


STORAGE AND SKIN TYPECURVE (Bourdet et al)

PRESSURE BUILDUP PLOT

UCEL LIARD k-02-60-20-123-30
DST #2, MATTSON, 1159.0-1176.7 mKB
$[k_1/u]_t$=18.04 k_1=9.98 C_D=6 s=22.1

Initial Shut In

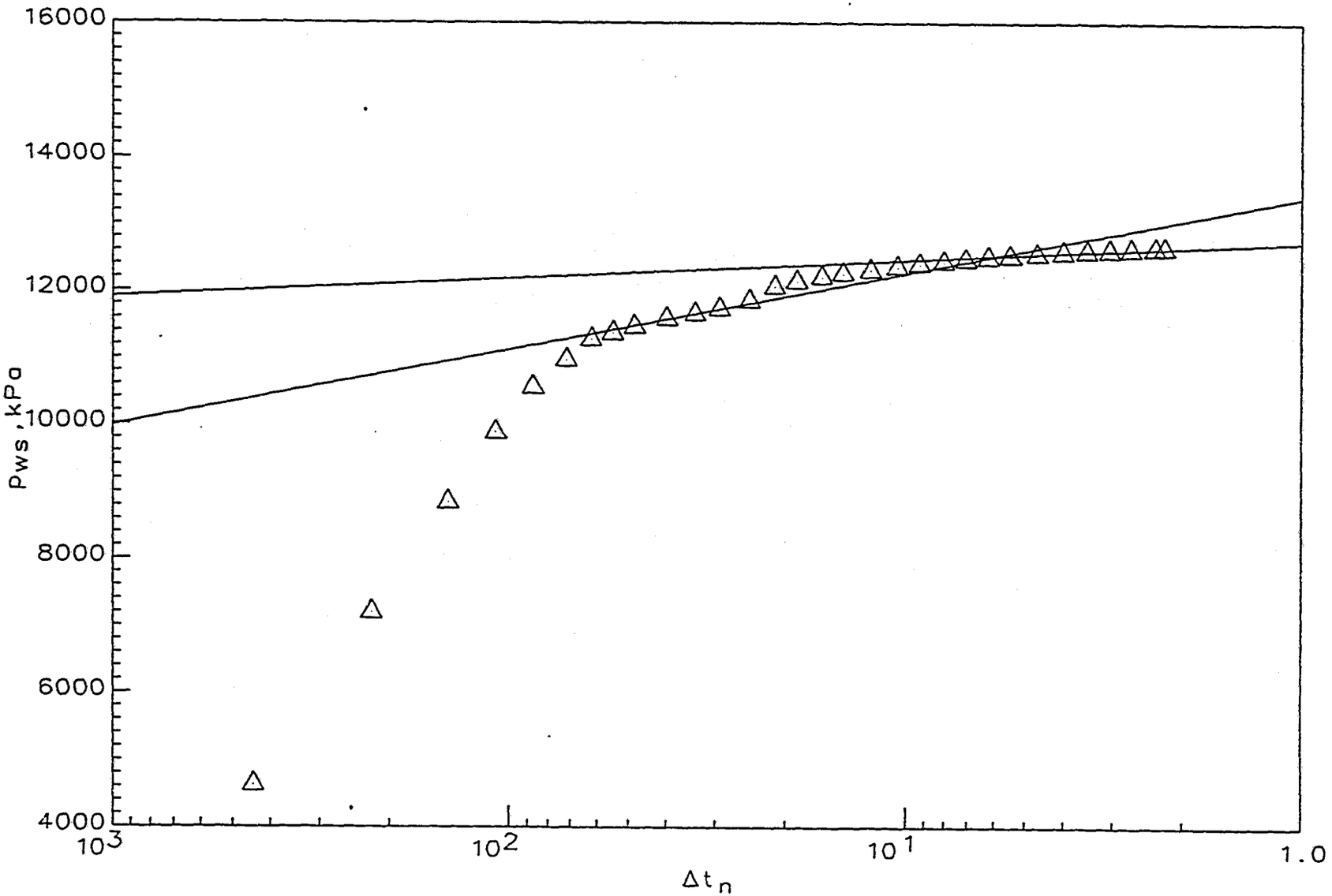


SUPERPOSITION
PRESSURE BUILDUP PLOT

UCEL LIARD k-02-60-20-123-30
DST #2, MATTSON, 1159.0-1176.7 mKB

Final Shut In

$[k_1/u]_t$=4.18 k_1=2.31 mD s=4.6 p*=13398.3
$[k_2/u]_t$=17.32 k_2=9.58 mD s=30.6 p*=12731.1

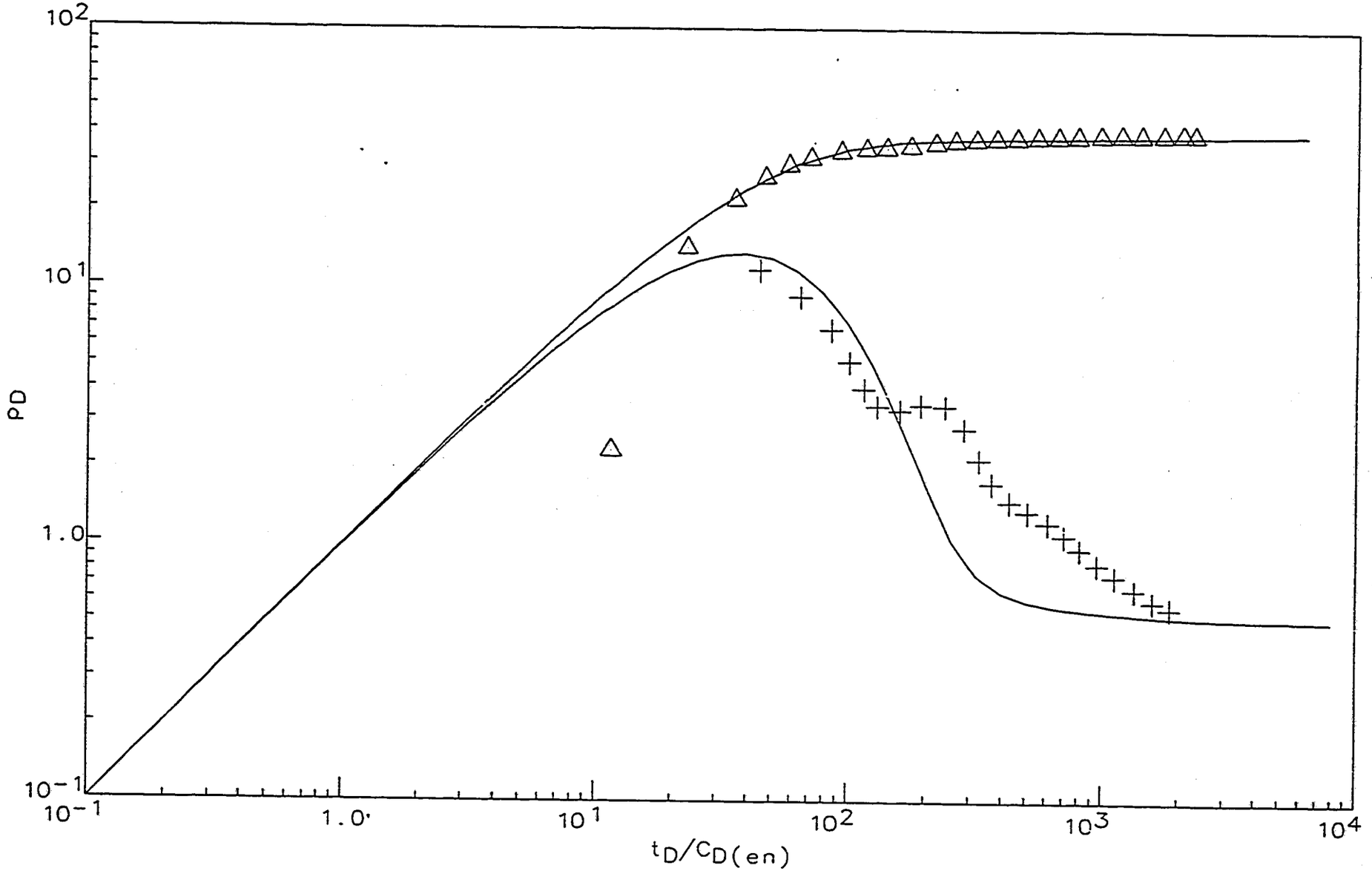


STORAGE AND SKIN TYPECURVE (Bourdet et al)

PRESSURE BUILDUP PLOT

UCEL LIARD k-02-60-20-123-30
DST #2, MATTSON, 1159.0-1176.7 mKB
$[k_1/u]_t$=19.15 k_1=10.60 C_D=6 s=33.7

Final Shut In



Water Well Test - BUILDUP (Superposition)

UCEL LIARD k-02-60-20-123-30
DST #2, MATTSON, 1159.0-1176.7 mKB

Final Shut In

Input Data

Final Water Rate	=	28.90	m3/d
Total Porosity	=	17.00	%
Oil Saturation	=	0.00	%
Water Saturation	=	100.00	%
Gas Saturation	=	0.00	%
Net Pay	=	13.00	m
Perforated Interval	=	-	m
Horiz To Vert Perm Ratio	=	1.000	
Net Wellbore Inclination	=	0.	
Wellbore Radius	=	0.09	m
Drainage Area - Zone	=	64.7	ha
Shape Code - Zone 1	=	R1A	
Drainage Area -	=	64.7	ha
Shape Code - Zone2	=	R1A	
Water Formation Vol Factor	=	1.01	
Water Viscosity	=	0.553	mPa.s
Water Compressibility	=	4.342e-07	1/kPa
Initial Pressure	=	-	kPa
Final Flowing Pressure	=	4131.1	kPa
Formation Temperature	=	48.89	deg C
Cumulative Production (water)	=	-	m3
Corrected Flow Time	=	0.670	hr

Calculations

Total Compressibility	=	1.000e-06	1/kPa
Wellbore Storage Constant	=	-	m3/kPa

Results

Bourdet Et Al Type Curve Analysis

Dimensionless Storage Constant	=	5.62	
Wellbore Storage Constant	=	6.50e-07	m3/kPa
Permeability	=	10.60	mD
Skin Effect (Total)	=	33.675	
Inter Porosity Coeff	=	-	
Storativity Ratio	=	-	

Results

Radial Analysis - Zone 1

Transmissivity	=	54.29	mDm/mPa.s
Mobility (Total)	=	4.176	mD/mPa.s
Permeability (Water)	=	2.31	mD
Permeability (Oil)	=	-	mD
Permeability (Gas)	=	-	mD
Extrapolated Pressure	=	13398.3	kPa
Average Reservoir Pressure	=	-	kPa
Extrapolated Pressure At 72	=	13393.7	kPa
Skin Effect	=	4.60	
Partial Penetration Skin	=	-	
Inclination Skin	=	0.000	
Damage Skin	=	4.60	
Pressure Drop (Total Skin)	=	4549.3	kPa
Damage Ratio	=	1.96	
Flow Efficiency	=	0.51	
Radius Of Investigation	=	-	m
@ Time Of Investigation	=	-	hr
Specified Reservoir Pressure	=	13398.3	kPa
Specified Flowing Pressure	=	4131.1	kPa
PI / II (Total Actual)	=	3.119e-03	m3/d/kPa
PI / II (Total Ideal)	=	6.126e-03	m3/d/kPa
Stab PI / II (Total Actual)	=	2.250e-03	m3/d/kPa
Stab PI / II (Total Ideal)	=	4.420e-03	m3/d/kPa
Stabilization / Specified Time	=	732.192	hr
Stabilized Rate @ Current Skin	=	20.85	m3/d
Stabilized Rate @ Skin Of 0	=	32.29	m3/d
Stabilized Rate @ Skin Of -4	=	61.73	m3/d

Radial Analysis - Zone 2

Permeability (Water)	=	9.58	mD
Permeability (Oil)	=	-	mD
Permeability (Gas)	=	-	mD
Extrapolated Pressure	=	12731.1	kPa
Average Reservoir Pressure	=	-	kPa
Extrapolated Pressure At 72	=	12730.0	kPa
Apparent Skin	=	30.581	
Specified Reservoir Pressure	=	12731.1	kPa
Specified Flowing Pressure	=	4131.1	kPa
Stabilization / Specified Time	=	176.553	hr
Stabilized Rate @ Current Skin	=	26.75	m3/d
Stabilized Rate @ Skin Of 0	=	124.28	m3/d
Stabilized Rate @ Skin Of -4	=	237.57	m3/d

ELECTRO*TEST* REPORT

UNOCAL CANADA EXPLORATION LIMITED

WELL: UCEL LIARD k-02-80-20-123-30

DST #3: MATTSON (1112.5 - 1130.2mKB)

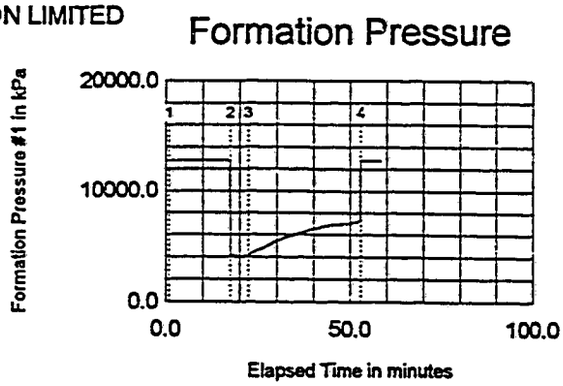
DATE: JANUARY 15, 1997

Downhole
Systems
Technology Canada Inc.

#7, 4539-6th St. N.E.
Calgary, Alberta
T2E 3Z6
(403) 299-1960

DRILL STEM TEST - FINAL REPORT

Well Operator		UNOCAL CANADA EXPLORATION LIMITED
Well Name		UCEL LIARD
Location		k-02-60-20-123-30
DST #		THREE
Interval Tested		1112.5 - 1130.2 mKB
Formation		MATTSON
Date		15 JANUARY, 1997
Wellsite Rep.		GABOURY
Test Engineer		JAMES
Wireline Operator		WYRE
Drilling Contractor		CACTUS 1
Well Total Depth		1657.00 meters
Well Elevations	KB	379.30 meters
	GL	374.50 meters
Main Hole Size		222.00 mm



SUMMARY

		Time	Duration	Graph #	Pressure (kPa)	Extrapolated Press.(kPa)	Liq. Rate(m3/d) Average/Final	Gas Rate(m3/d) Average/Final
Initial Hydrostatic				1	12828			
Preflow	Start	23:03:07		2	4093		-1.8	20
	End	23:08:12	5	3	4127			
Initial Shut In	End	23:38:22	30	4	7220			
Flow #2	Start							
	End		0					
Shut In #2	End		0					
Final Hydrostatic				4	12791			
Bottom Hole Temperature		42 deg C						

Electronics #3, Formation Pressure 1, Ser. # 154775, Depth 1114.4 mKB (all gauges at same depth)

LIQUID RECOVERY Height Volume

No liquid recovered.

COMMENTS

Successful straddle inflate with real time pressure data and closed chamber flow rates.

A depth adjustment of 0.8 meters downward was made, based upon the GR/CCL correlation log run prior to DST #2.

The preflow was run under closed chamber conditions throughout, with no inflow of liquid or gas indicated.

Radial flow conditions were not established during the initial shut in and a valid extrapolated pressure was not obtained.

The second flow period and final shut in were not taken at the request of the well operator.

If you require additional information contact David Sask at (403) 299-1960.

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	THREE
WELL NAME:	UCEL LIARD	INTERVAL:	1112.5 - 1130.2 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

Mud Type: Gel Chem
Density: 1165.00 kg/cu m
Viscosity: 88.00 mPa S
Resistivity: 0.00 ohms/m

Fluid Cushion: Nil

Calculated Fluid Recovery: No inflow of liquids was measured.

Reverse Circulated: No

TOOL STRING CONFIGURATION

	Length meters	Inner Diameter mm	Outer Diameter mm
Drill Pipe Above K.B.	-1.58	70.21	88.90
Upper Drill Pipe	937.86	84.00	85.00
Drill Collars	138.28	63.00	120.65
Stabbing Valve	0.50	50.80	120.65
RCV/DBS/XO'S	1.05	60.00	120.65
Drill Collar	27.43	63.00	120.65
Hydraulic Jars	2.00	50.80	127.00
Safety Joint	1.35	25.40	127.00
Top Packer	2.45	22.25	139.70
Top of Interval	**1112.50**		
Packer Stub	0.80	0.00	127.00
Downhole Flow Valve	0.92	0.00	127.00
Electronics Section	1.51	0.00	127.00
Inflation Pump	2.44	0.00	127.00
Spacer Pipe	11.48	0.00	127.00
Packer Stub	0.57	0.00	127.00
Bottom of Interval	**1130.22**		
Total Interval	**17.72**		
Bottom Packer	2.40	0.00	139.70

Test Tool Choke Diameter	22.50 mm	
Surface Choke	0.00 mm	Bean Choke
Total String Volume	5.71 cu m	
Initial Closed Chamber Gas Volume	5.71 cu m	
Annular Volume	0.46 cu m	

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	THREE
WELL NAME:	UCEL LIARD	INTERVAL:	1112.5 - 1130.2 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER INFLATION

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
22:46:32	00:00:00	12790.47	4152.54	95.74	12904.79	12812.97	91.82
22:46:47	00:00:15	12787.42	4149.98	96.01	12943.52	12810.92	132.60
22:47:02	00:00:30	12784.87	4146.91	95.82	12969.17	12807.87	161.30
22:47:17	00:00:45	12783.83	4144.35	95.41	12990.29	12805.83	184.46
22:47:32	00:01:00	12781.79	4142.81	96.00	13008.89	12803.79	205.11
22:47:47	00:01:15	12780.26	4141.27	95.81	13023.97	12801.75	222.22
22:48:02	00:01:30	12778.73	4140.24	96.17	13039.06	12801.23	237.83
22:48:17	00:01:45	12779.22	4138.70	96.54	13051.13	12800.20	250.92
22:48:32	00:02:00	12776.68	4138.68	97.34	13062.18	12799.18	263.01
22:48:47	00:02:15	12777.17	4137.14	96.48	13071.23	12798.16	273.08
22:49:02	00:02:30	12776.65	4136.62	96.39	13081.29	12797.64	283.65
22:49:17	00:02:45	12775.63	4135.60	96.39	13089.83	12796.62	293.21
22:49:32	00:03:00	12775.62	4135.58	96.39	13098.38	12796.10	302.28
22:49:47	00:03:15	12774.60	4134.56	96.39	13105.92	12794.58	311.34
22:50:02	00:03:30	12775.09	4134.55	96.39	13113.46	12794.57	318.89
22:50:17	00:03:45	12775.08	4134.03	96.39	13122.51	12794.56	327.95
22:50:32	00:04:00	12775.07	4133.51	96.39	13132.07	12795.05	337.01
22:50:47	00:04:15	12774.56	4133.00	96.39	13140.62	12794.54	346.08
22:51:02	00:04:30	12773.04	4132.48	96.39	13150.68	12794.03	356.65
22:51:17	00:04:45	12773.54	4132.47	96.39	13161.75	12794.02	367.72
22:51:32	00:05:00	12773.53	4132.46	96.12	13176.34	12793.51	382.83
22:52:02	00:05:30	12774.52	4131.94	95.88	13220.62	12792.49	428.14
22:52:32	00:06:00	12774.00	4131.92	95.92	13273.97	12790.46	483.51
22:53:02	00:06:30	12773.49	4131.91	96.05	13324.30	12790.95	533.35
22:53:32	00:07:00	12767.93	4131.89	96.86	13404.32	12786.91	617.42
22:54:02	00:07:30	12743.75	4131.37	95.53	13590.56	12770.28	820.28
22:54:32	00:08:00	12743.73	4131.36	95.80	15016.37	12771.77	2244.60
22:55:02	00:08:30	12763.37	4130.85	96.66	16251.64	12788.89	3462.74
22:55:32	00:09:00	12766.39	4130.85	96.47	14771.29	12789.90	1981.39
22:56:02	00:09:30	12766.39	4130.85	97.15	14771.29	12789.90	1981.39
22:56:32	00:10:00	12766.39	4130.85	97.09	14771.29	12789.90	1981.39
22:57:02	00:10:30	12766.39	4130.85	97.32	14771.29	12789.90	1981.39
22:57:32	00:11:00	12766.39	4130.85	96.85	14771.29	12789.90	1981.39
22:58:02	00:11:30	12766.39	4130.85	97.26	14771.29	12789.90	1981.39
22:58:32	00:12:00	12766.39	4130.85	97.34	14771.29	12789.90	1981.39
22:59:02	00:12:30	12766.39	4130.85	96.92	14771.29	12789.90	1981.39
22:59:32	00:13:00	12766.39	4130.85	97.79	14771.29	12789.90	1981.39
23:00:02	00:13:30	12766.39	4130.85	97.50	14771.29	12789.90	1981.39
23:00:32	00:14:00	12766.39	4130.85	97.86	14771.29	12789.90	1981.39
23:01:02	00:14:30	12841.08	4206.36	97.95	14696.41	12860.04	1836.36
23:01:32	00:15:00	12810.71	4175.88	98.22	14778.29	12835.72	1942.58
23:02:02	00:15:30	12799.00	4167.65	98.35	14722.32	12824.01	1898.31
23:02:32	00:16:00	12789.33	4155.92	98.30	14696.56	12813.84	1882.72
23:02:52	00:16:19	12782.23	4150.31	97.79	14682.93	12809.76	1873.16

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	THREE
WELL NAME:	UCEL LIARD	INTERVAL:	1112.5 - 1130.2 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PREFLOW

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Liquid Flowrate m3/d	Surface Gas Flowrate m3/d	Total Gas Flowrate m3/d	Gas Liquid Ratio m3/m3	Formation Temp. deg C
23:03:07	00:00:00	4092.90	3382.46	98.84	-6426.05	0.00	6432.53	-1.00	41.95
23:03:22	00:00:15	4115.13	4174.00	98.47	-108.11	0.00	107.18	-0.99	41.92
23:03:37	00:00:30	4137.31	4149.74	98.52	-0.61	0.00	-12.94	21.08	41.94
23:03:52	00:00:45	4135.27	4149.20	98.61	-0.46	0.00	-41.57	91.26	41.97
23:04:07	00:01:00	4134.23	4148.16	99.29	-4.00	0.00	138.46	-34.63	42.00
23:04:22	00:01:15	4133.71	4147.13	98.92	-2.32	0.00	-16.75	7.21	42.02
23:04:37	00:01:30	4132.68	4146.60	98.28	0.05	0.00	-151.83	-3330.83	42.04
23:04:52	00:01:45	4131.15	4145.57	99.83	-6.94	0.00	367.83	-53.01	42.07
23:05:07	00:02:00	4130.63	4145.55	98.51	1.04	0.00	-33.09	-31.91	42.08
23:05:22	00:02:15	4130.61	4143.51	98.32	-3.84	0.00	-128.18	33.41	42.10
23:05:37	00:02:30	4129.59	4144.51	98.59	0.97	0.00	-126.36	-129.64	42.11
23:05:52	00:02:45	4128.57	4144.50	99.28	-0.69	0.00	113.01	-163.14	42.13
23:06:07	00:03:00	4129.07	4144.49	99.32	-0.94	0.00	125.00	-133.07	42.14
23:06:22	00:03:15	4128.55	4143.97	98.86	-0.84	0.00	25.46	-30.35	42.15
23:06:37	00:03:30	4128.04	4143.96	97.99	2.27	0.00	-173.02	-76.24	42.16
23:06:52	00:03:45	4127.53	4143.44	98.86	-1.58	0.00	85.54	-54.09	42.17
23:07:07	00:04:00	4128.03	4143.43	99.04	-1.24	0.00	45.09	-36.42	42.18
23:07:22	00:04:15	4128.02	4143.93	98.03	3.15	0.00	-198.57	-63.02	42.19
23:07:37	00:04:30	4127.51	4143.92	99.03	-0.59	0.00	149.60	-255.57	42.20
23:07:52	00:04:45	4127.50	4142.91	98.03	1.64	0.00	-243.66	-148.50	42.20
23:08:07	00:05:00	4126.49	4142.39	99.63	-4.98	0.00	261.87	-52.63	42.21
23:08:12	00:05:03	4127.49	4142.89	98.71	0.55	0.00	-38.07	-68.67	42.22

TEST DATE:	15 JANUARY, 1997	DST NUMBER:	THREE
WELL NAME:	UCEL LIARD	INTERVAL:	1112.5 - 1130.2 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

INITIAL SHUT IN

Time	Elapsed Time	Formation Pressure #1 kPa	Formation Pressure #2 kPa	Transducer Difference kPa	Recovery Pressure kPa	Surface Pressure kPa	Formation Temp. deg C	Hydrostatic Pressure kPa
23:08:17	00:00:00	4192.08	4204.70	-12.63	4276.72	98.58	42.22	12787.32
23:08:32	00:00:15	4247.08	4259.69	-12.62	4146.42	98.85	42.22	12789.83
23:08:47	00:00:30	4315.69	4328.29	-12.59	4139.35	93.37	42.23	12790.83
23:09:02	00:00:45	4363.62	4377.21	-13.59	4139.85	95.60	42.23	12791.33
23:09:17	00:01:00	4409.54	4421.60	-12.06	4140.35	98.72	42.23	12791.33
23:09:47	00:01:30	4494.29	4506.82	-12.53	4140.34	98.34	42.25	12790.82
23:10:17	00:02:00	4571.99	4584.49	-12.51	4139.32	98.25	42.25	12790.81
23:10:47	00:02:30	4649.17	4661.15	-11.97	4139.31	98.52	42.26	12790.30
23:11:17	00:03:00	4726.36	4738.31	-11.95	4139.30	99.30	42.27	12789.79
23:11:47	00:03:30	4804.56	4816.49	-11.93	4138.79	97.47	42.27	12790.29
23:12:17	00:04:00	4876.70	4888.60	-11.90	4139.29	98.79	42.28	12789.78
23:12:47	00:04:30	4948.84	4962.23	-13.39	4138.78	97.87	42.29	12790.28
23:13:17	00:05:00	5042.16	5054.52	-12.35	4138.77	98.65	42.29	12790.27
23:14:17	00:06:00	5216.70	5229.51	-12.80	4138.76	97.91	42.30	12791.27
23:15:17	00:07:00	5374.59	5386.84	-12.25	4138.25	98.14	42.31	12790.76
23:16:17	00:08:00	5532.47	5544.67	-12.20	4138.24	97.68	42.32	12790.25
23:17:17	00:09:00	5670.17	5682.33	-12.16	4138.23	99.00	42.33	12789.74
23:18:17	00:10:00	5795.76	5807.38	-11.62	4137.72	98.13	42.33	12789.74
23:19:17	00:11:00	5915.81	5927.39	-11.58	4138.23	98.54	42.33	12789.23
23:20:17	00:12:00	6017.69	6028.73	-11.05	4137.72	98.58	42.34	12788.22
23:21:17	00:13:00	6103.42	6114.44	-11.02	4137.71	98.63	42.34	12787.71
23:22:17	00:14:00	6204.79	6215.78	-10.98	4137.71	98.08	42.35	12788.21
23:23:17	00:15:00	6309.69	6321.15	-11.46	4137.70	99.17	42.35	12789.22
23:24:17	00:16:00	6414.59	6426.02	-11.42	4137.20	98.07	42.35	12789.21
23:25:17	00:17:00	6508.90	6521.30	-12.40	4137.70	98.30	42.36	12788.21
23:26:17	00:18:00	6596.14	6607.00	-10.86	4136.69	98.80	42.36	12787.70
23:27:17	00:19:00	6681.36	6693.71	-12.35	4137.19	98.17	42.36	12788.20
23:28:17	00:20:00	6772.63	6783.94	-11.31	4137.18	97.85	42.37	12788.20
23:29:17	00:21:00	6824.07	6834.35	-10.28	4138.19	97.67	42.37	12786.68
23:30:17	00:22:00	6871.47	6882.24	-10.77	4137.69	98.58	42.37	12786.68
23:31:17	00:23:00	6918.36	6929.62	-11.26	4137.18	98.08	42.37	12785.67
23:32:17	00:24:00	6964.25	6974.99	-10.74	4137.68	98.36	42.37	12786.18
23:33:17	00:25:00	7009.12	7019.85	-10.73	4137.17	98.50	42.38	12785.67
23:34:17	00:26:00	7051.48	7063.70	-12.22	4137.17	98.82	42.38	12785.16
23:35:17	00:27:00	7094.34	7105.03	-10.69	4137.17	98.32	42.38	12785.67
23:36:17	00:28:00	7137.19	7149.39	-12.19	4137.17	98.19	42.38	12784.66
23:37:17	00:29:00	7176.52	7187.69	-11.17	4137.67	98.55	42.39	12784.65
23:38:17	00:30:00	7217.36	7227.51	-10.15	4137.66	98.29	42.39	12784.65
23:38:22	00:30:04	7219.86	7230.99	-11.13	4137.13	97.83	42.42	12784.13

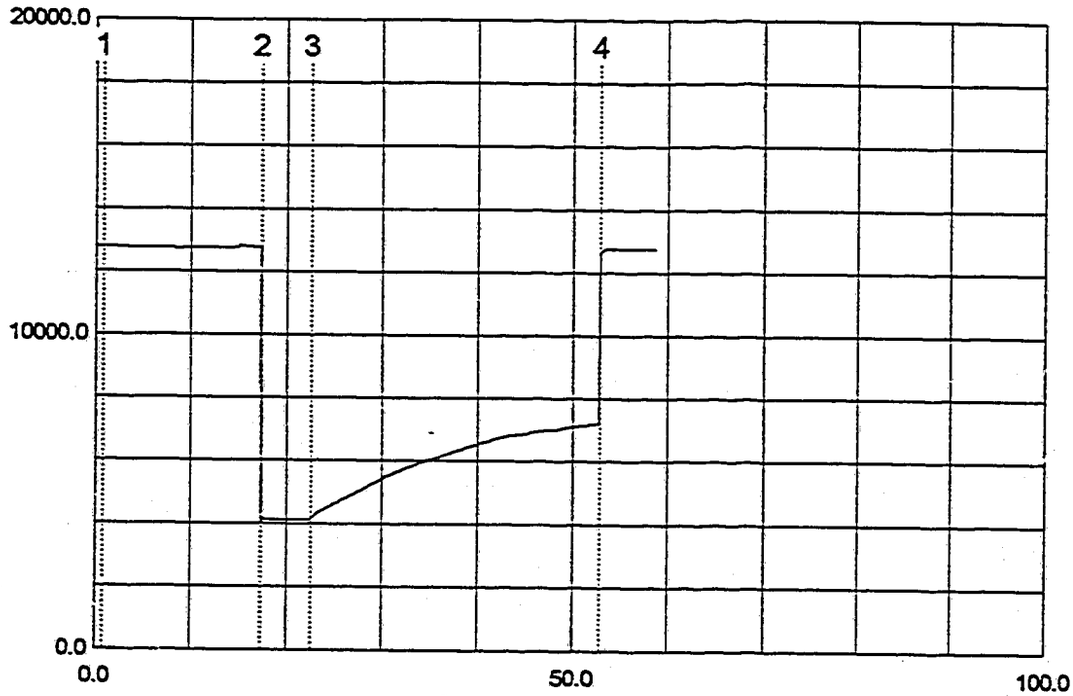
TEST DATE:	15 JANUARY, 1997	DST NUMBER:	THREE
WELL NAME:	UCEL LIARD	INTERVAL:	1112.5 - 1130.2 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER DEFLATION

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
23:38:28	00:00:00	12631.69	4135.63	96.10	13206.26	12697.52	508.74
23:38:43	00:00:15	12737.95	4135.62	99.43	13147.34	12764.99	382.36
23:38:58	00:00:30	12753.06	4136.12	98.88	13153.89	12779.09	374.80
23:39:13	00:00:45	12758.10	4136.63	99.02	13156.91	12782.62	374.29
23:39:28	00:01:00	12759.11	4136.63	98.56	13159.43	12784.13	375.30
23:39:43	00:01:15	12768.16	4142.67	99.06	13014.43	12806.27	208.16
23:39:58	00:01:30	12762.64	4156.84	98.01	12926.85	12789.67	137.18
23:40:13	00:01:45	12764.66	4136.64	98.15	12880.04	12791.18	88.85
23:40:28	00:02:00	12765.16	4137.14	99.01	12854.86	12790.68	64.18
23:40:43	00:02:15	12765.66	4136.64	98.83	12836.24	12790.18	46.06
23:40:58	00:02:30	12765.16	4136.64	98.42	12818.62	12789.67	28.94
23:41:13	00:02:45	12765.16	4136.64	98.10	12807.54	12789.67	17.87
23:41:28	00:03:00	12765.66	4136.13	99.06	12799.99	12789.17	10.82
23:41:43	00:03:15	12765.66	4136.64	98.28	12795.96	12789.17	6.79
23:41:58	00:03:30	12766.17	4137.14	98.55	12792.94	12789.67	3.27
23:42:13	00:03:45	12766.17	4136.64	98.83	12791.43	12789.17	2.26
23:42:28	00:04:00	12765.66	4136.64	98.78	12790.93	12789.67	1.25
23:42:43	00:04:15	12766.17	4137.14	98.96	12789.92	12789.17	0.75
23:42:58	00:04:30	12766.17	4137.14	98.69	12789.92	12789.17	0.75
23:43:13	00:04:45	12765.66	4137.14	99.28	12789.42	12789.17	0.25
23:43:28	00:05:00	12766.17	4137.14	99.74	12789.42	12790.17	-0.76
23:43:43	00:05:15	12766.16	4136.13	99.05	12789.41	12789.67	-0.26
23:43:58	00:05:30	12766.16	4137.14	100.10	12788.91	12788.66	0.25
23:44:13	00:05:45	12766.16	4137.64	98.91	12789.41	12790.17	-0.76
23:44:17	00:05:48	12766.16	4137.64	98.91	12789.41	12790.17	-0.76

UCEL LIARD k-02-60-20-123-30
DST #THREE, MATTSON, 1112.5 - 1130.2 mKB

Formation Pressure #1



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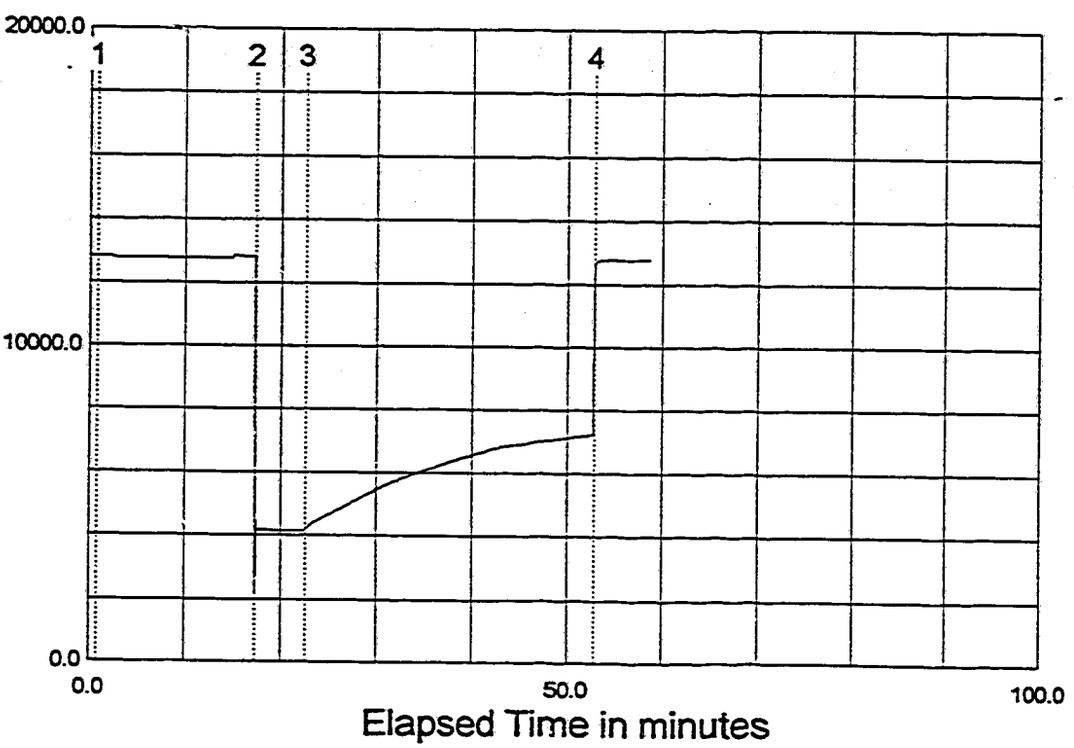
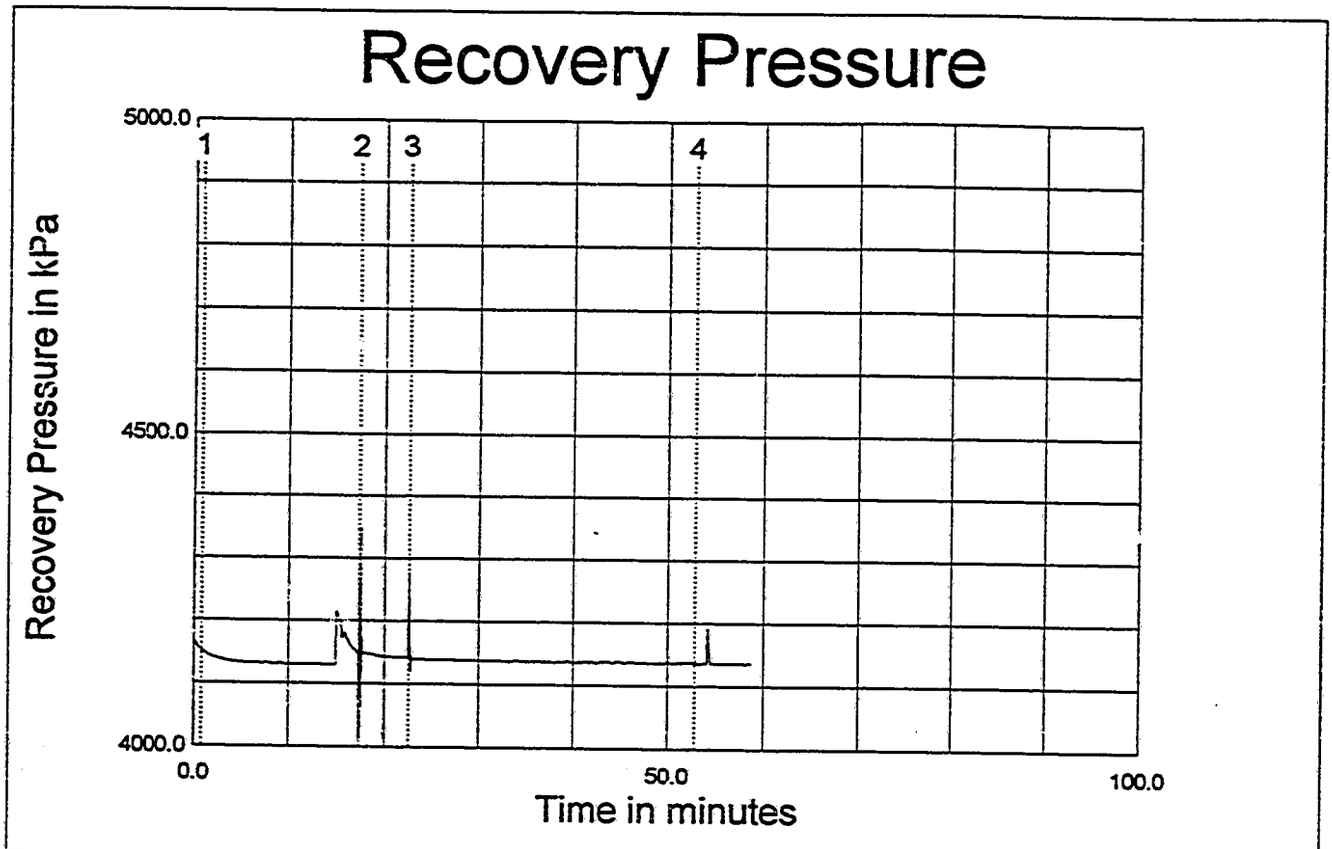
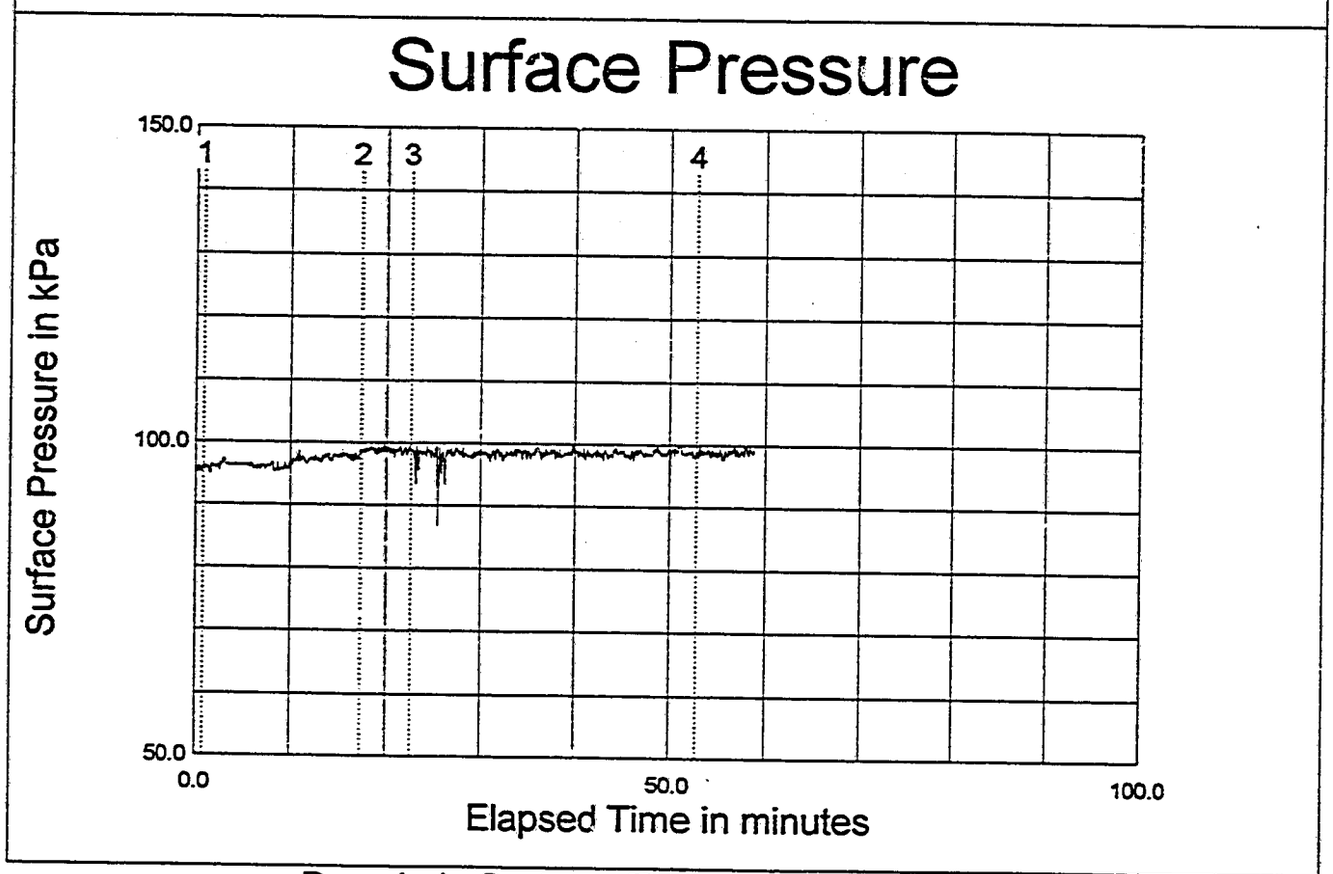


Downhole Systems Technology Canada Inc.

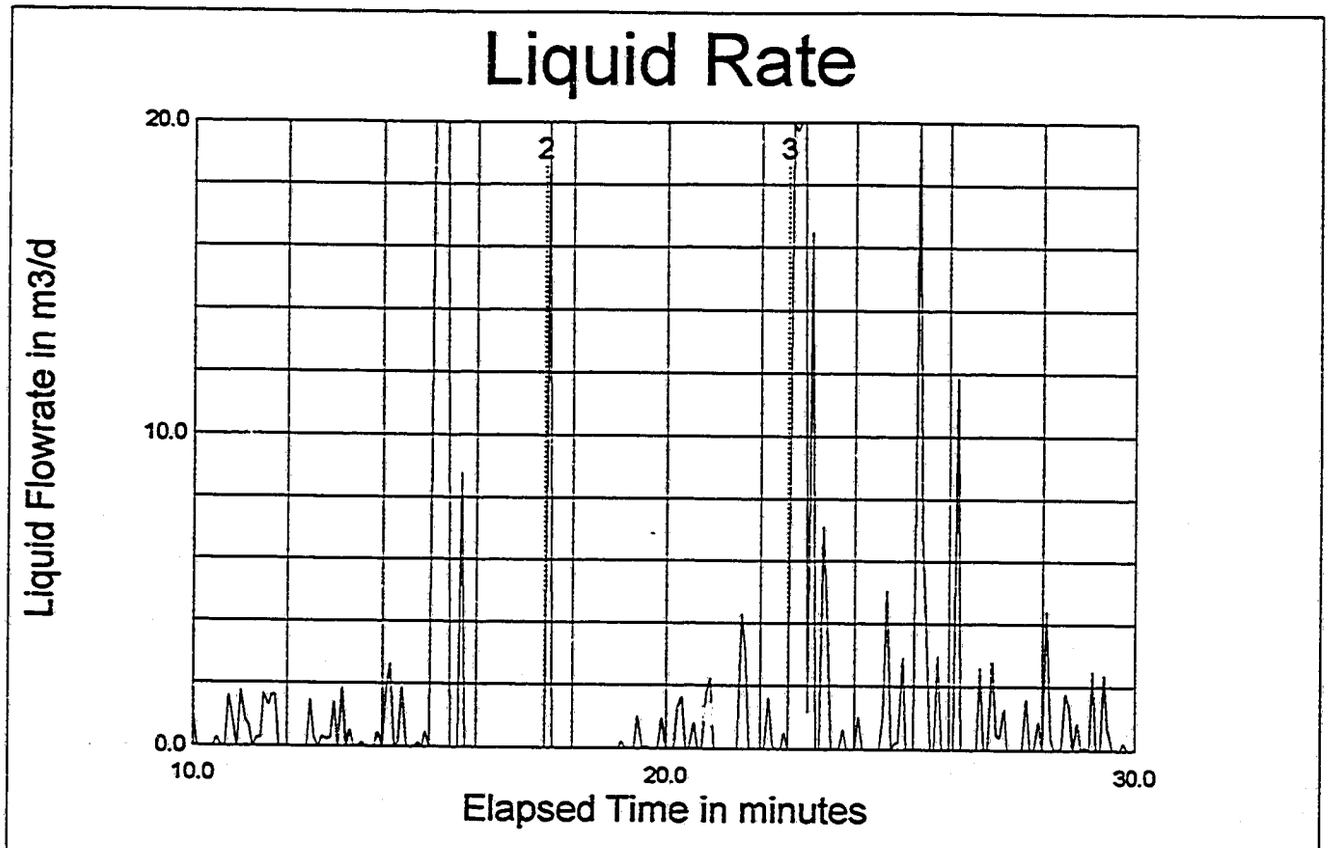
UCEL LIARD k-02-60-20-123-30
DST #THREE, MATTSON, 1112.5 - 1130.2 mKB

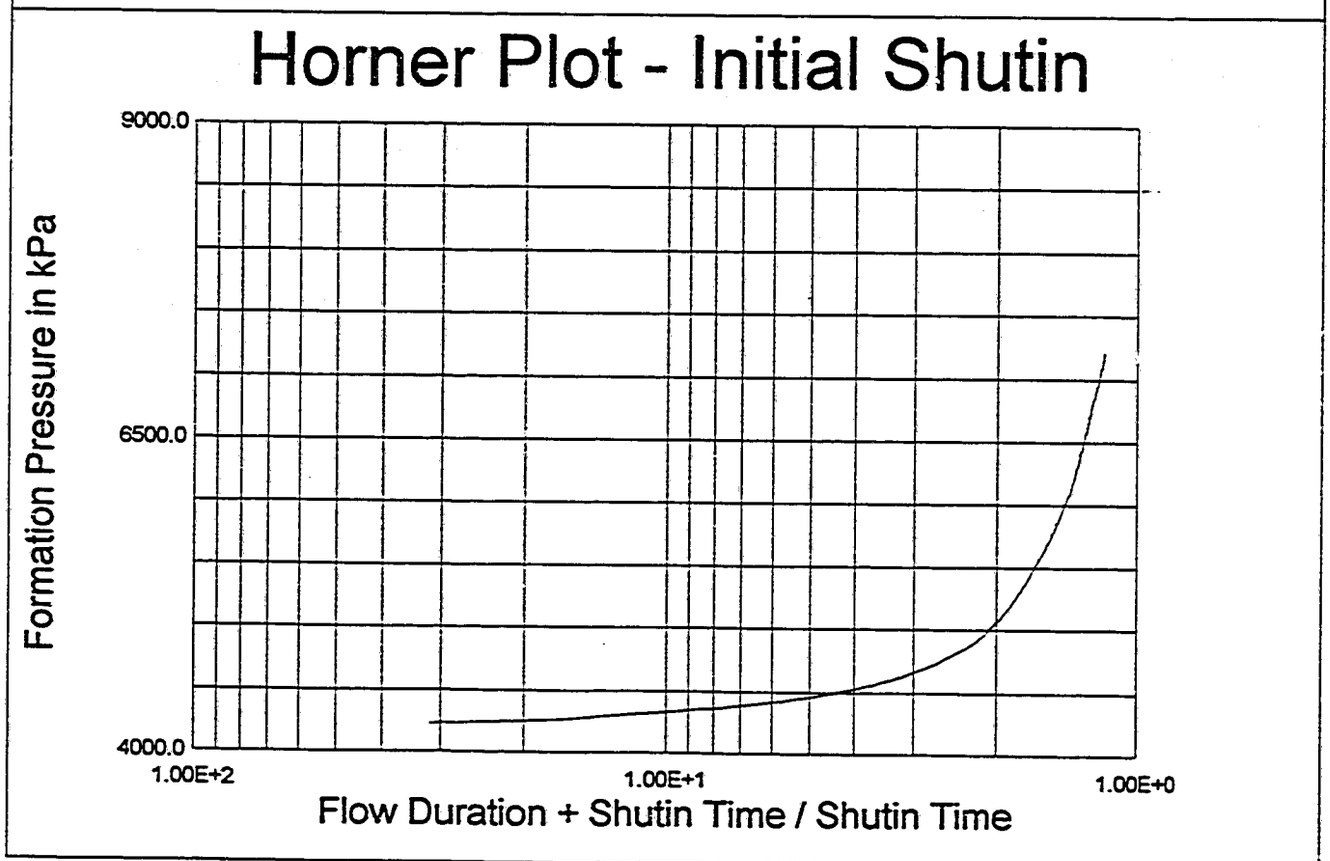




Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
DST #THREE, MATTSON, 1112.5 - 1130.2 mKB

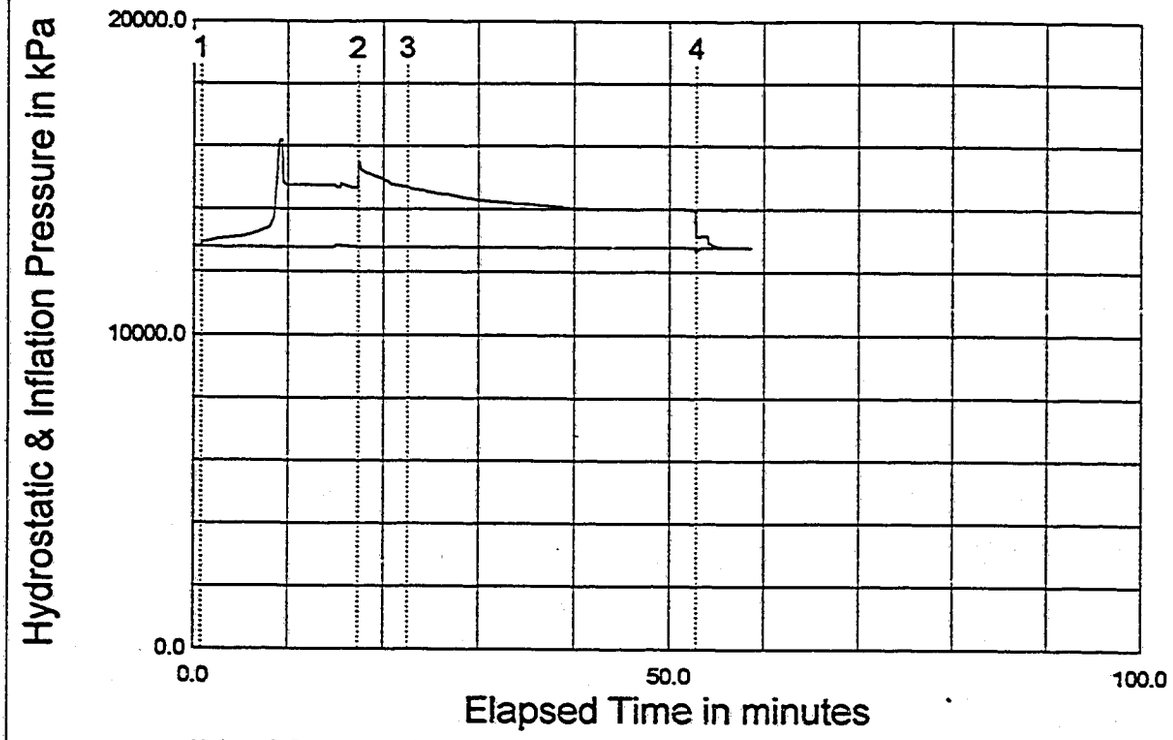




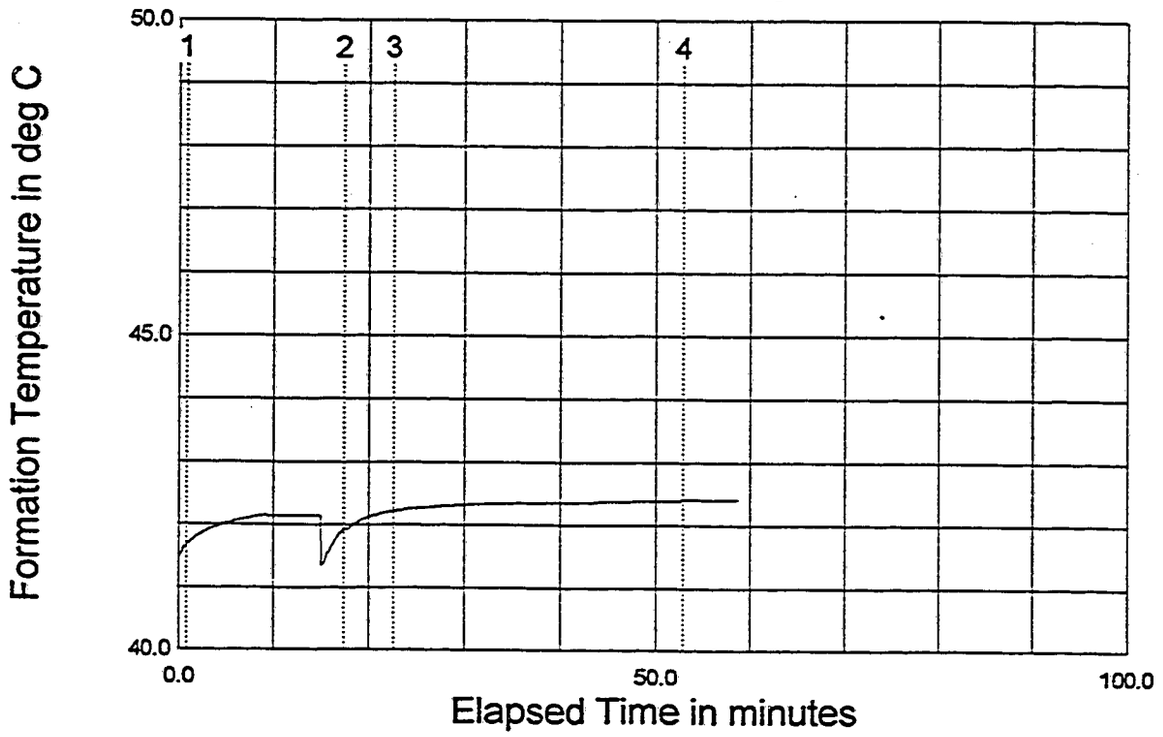
Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
DST #THREE, MATTSON, 1112.5 - 1130.2 mKB

Hydrostatic & Inflation Pressure



Formation Temperature



Downhole Systems Technology Canada Inc.

ELECTRO*TEST* REPORT

UNOCAL CANADA EXPLORATION LIMITED

WELL: UCEL LIARD k-02-80-20-123-30

DST #4: MATTSON (1097.0 - 1114.7mKB)

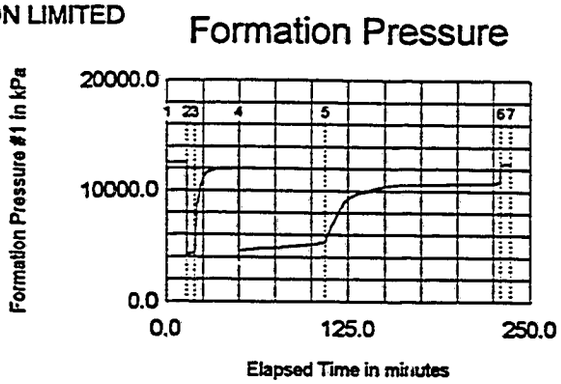
DATE: JANUARY 16, 1997

Downhole
Systems
Technology Canada Inc.

#7, 4539-6th St. N.E.
Calgary, Alberta
T2E 3Z6
(403) 299-1960

DRILL STEM TEST - FIELD REPORT

Well Operator		UNOCAL CANADA EXPLORATION LIMITED
Well Name		UCEL LIARD
Location		k-02-60-20-123-30
DST #		FOUR
Interval Tested		1097.0 - 1114.7 mKB
Formation		MATTSON
Date		16 JANUARY, 1997
Wellsite Rep.		GABOURY
Test Engineer		JAMES
Wireline Operator		WYRE
Drilling Contractor		CACTUS 1
Well Total Depth		1657.00 meters
Well Elevations	KB	379.30 meters
	GL	374.50 meters
Main Hole Size		222.00 mm



SUMMARY

		Time	Duration	Graph #	Pressure (kPa)	Extrapolated Press.(kPa)	Liq. Rate(m3/d) Average/Final	Gas Rate(m3/d) Average/Final
Initial Hydrostatic				1	12645			
Preflow	Start	01:24:04		2	4224		34.5	22
	End	01:29:04	5	3	4449		29.7	
Initial Shut In	End	01:59:14	30	4	12055	12198		
Flow #2	Start	01:59:29		4	4566		10.8	574
	End	02:59:24	60	5	5338		7.3	213
Shut In #2	End	04:59:34	120	6	10813	11404		
Final Hydrostatic				7	12561			
Bottom Hole Temperature		43 deg C						

Electronics #3, Formation Pressure 1, Ser. # 154775, Depth 1098.9 mKB (all gauges at same depth)

LIQUID RECOVERY	Height	Volume
Oil, 13 deg API @ 13C.	100 m	0.387 m3
Drilling mud.	20 m	0.077 m3
Samples sent to AGAT Laboratories in Calgary.		

RESERVOIR PARAMETERS

Net Pay: 1.0 m — Permeability: 23 mD
Porosity: 10 % — Skin: -3
Sw: 95%

COMMENTS

Successful straddle inflate with real time pressure data and closed chamber flow rates.

A GR/CCL correlation log was run prior to inflating the packers and the packer depth was 0.5 meters high. A depth adjustment of 0.5 meters downward was made.

The preflow was run under closed chamber conditions throughout, with primarily liquid flow indicated.

During the initial shut in, the derivative and semi-log plots both indicate the presence of reservoir anomolies, possibly due to multiple layers in the reservoir.

The second flow period was also run under closed chamber conditions throughout, with liquid inflow recorded. Gas breakout during the flow period and final shut in provide indications of oil production.

Reservoir anomolies are very evident during the final shut in, making evaluation difficult. The significant difference in extrapolated pressures from the two shut in periods may be due to the reservoir anomolies rather than depletion. The reservoir parameters calculated above are based on the late time pressure data.

If you require additional information contact David Sask at (403) 299-1960.

DOWNHOLE SYSTEMS TECHNOLOGY CANADA INC.

TEST DATE:	16 JANUARY, 1997	DST NUMBER:	FOUR
WELL NAME:	UCEL LIARD	INTERVAL:	1097.0 - 1114.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

Mud Type: Gel Chem
Density: 1165.00 kg/cu m
Viscosity: 88.00 mPa S
Resistivity: 0.00 ohms/m

Fluid Cushion: Nil
Density of recovered fluids (used in liquid rate calculations): 950 kg/m3
Calculated Fluid Recovery: 127 meters of oil and interval mud.
Observed Fluid Recovery from DST's 1-4: 100 metres oil, 420 metres of mud cut water (402m of water from DST's 1-3).

Reverse Circulated: No

TOOL STRING CONFIGURATION

	Length meters	Inner Diameter mm	Outer Diameter mm
Drill Pipe Above K.B.	4.70	70.21	88.90
Upper Drill Pipe	928.64	74.00	85.00
Drill Collars	138.28	63.00	120.65
Stabbing Valve	0.50	50.80	120.65
RCV/DBS/XO'S	1.05	60.00	120.65
Drill Collar	27.43	63.00	120.65
Hydraulic Jars	2.00	50.80	127.00
Safety Joint	1.35	25.40	127.00
Top Packer	2.45	22.25	139.70
Top of Interval	**1097.00**		
Packer Stub	0.80	0.00	127.00
Downhole Flow Valve	0.92	0.00	127.00
Electronics Section	1.51	0.00	127.00
Inflation Pump	2.44	0.00	127.00
Spacer Pipe	11.48	0.00	127.00
Packer Stub	0.57	0.00	127.00
Bottom of Interval	**1114.72**		
Total Interval	**17.72**		
Bottom Packer	2.40	0.00	139.70

Test Tool Choke Diameter	22.50 mm	
Surface Choke	0.00 mm	Bean Choke
Total String Volume	5.66 cu m	
Initial Closed Chamber Gas Volume	5.66 cu m	
Annular Volume	0.46 cu m	

TEST DATE:	16 JANUARY, 1997	DST NUMBER:	FOUR
WELL NAME:	UCEL LIARD	INTERVAL:	1097.0 - 1114.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER INFLATION

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
01:10:29	00:00:00	12606.40	4174.59	93.89	12724.31	12628.42	95.90
01:10:44	00:00:15	12603.84	4171.51	94.81	12759.01	12625.86	133.16
01:10:59	00:00:30	12601.80	4168.44	94.40	12783.65	12623.81	159.84
01:11:14	00:00:45	12599.25	4166.39	93.76	12803.26	12621.27	182.00
01:11:29	00:01:00	12597.21	4163.83	93.86	12819.85	12619.23	200.63
01:11:44	00:01:15	12596.18	4162.29	94.09	12834.43	12618.20	216.23
01:11:59	00:01:30	12594.65	4161.25	94.56	12846.49	12616.16	230.33
01:12:14	00:01:45	12593.62	4159.21	94.70	12857.05	12615.13	241.91
01:12:29	00:02:00	12593.60	4158.68	94.60	12866.59	12615.11	251.48
01:12:44	00:02:15	12592.08	4158.16	93.93	12877.15	12614.59	262.56
01:12:59	00:02:30	12592.56	4156.63	94.57	12886.20	12613.57	272.63
01:13:14	00:02:45	12591.04	4156.11	94.67	12894.24	12613.56	280.68
01:13:29	00:03:00	12591.03	4155.58	94.85	12902.79	12613.04	289.75
01:13:44	00:03:15	12590.01	4155.07	94.67	12909.32	12612.02	297.30
01:13:59	00:03:30	12589.99	4154.55	93.99	12916.86	12611.00	305.86
01:14:14	00:03:45	12589.98	4154.53	94.45	12923.90	12610.49	313.41
01:14:29	00:04:00	12589.47	4154.01	94.82	12932.45	12610.48	321.97
01:14:44	00:04:15	12590.47	4153.50	94.78	12939.49	12610.47	329.02
01:14:59	00:04:30	12589.96	4153.99	95.01	12948.04	12610.96	337.07
01:15:14	00:04:45	12589.44	4153.48	94.47	12956.08	12610.96	345.13
01:15:29	00:05:00	12589.43	4152.96	96.25	12967.15	12610.44	356.71
01:15:59	00:05:30	12588.91	4152.44	95.85	12997.34	12609.92	387.42
01:16:29	00:06:00	12590.41	4152.42	94.48	13042.63	12609.91	432.73
01:16:59	00:06:30	12589.39	4152.41	95.13	13092.96	12607.38	485.59
01:17:29	00:07:00	12588.37	4151.88	94.77	13153.36	12606.86	546.50
01:17:59	00:07:30	12587.35	4151.36	95.73	13243.96	12605.33	638.63
01:18:29	00:08:00	12586.83	4151.85	96.05	13382.38	12604.82	777.56
01:18:59	00:08:30	12585.31	4151.33	95.97	13602.34	12603.80	998.54
01:19:29	00:09:00	12556.59	4151.32	96.25	14242.57	12585.16	1657.41
01:19:59	00:09:30	12575.22	4151.82	95.66	16073.24	12601.77	3471.47
01:20:29	00:10:00	12580.26	4151.32	96.21	14300.44	12604.79	1695.65
01:20:59	00:10:30	12569.15	4151.28	96.53	15561.01	12595.70	2965.31
01:21:29	00:11:00	12581.75	4151.80	95.44	14546.53	12605.28	1941.25
01:21:59	00:11:30	12580.73	4150.78	96.54	14309.98	12604.26	1705.72
01:22:29	00:12:00	12580.72	4151.27	96.82	14208.30	12602.74	1605.56
01:22:59	00:12:30	12580.21	4146.21	96.69	14286.31	12603.24	1683.07
01:23:29	00:13:00	12581.21	4147.21	97.24	14194.19	12603.22	1590.97
01:23:39	00:13:08	12581.71	4147.20	96.97	14161.47	12602.72	1558.76

TEST DATE:	16 JANUARY, 1997	DST NUMBER:	FOUR
WELL NAME:	UCEL LIARD	INTERVAL:	1097.0 - 1114.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PREFLOW

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Liquid Flowrate m3/d	Surface Gas Flowrate m3/d	Total Gas Flowrate m3/d	Gas Liquid Ratio m3/m3	Formation Temp. deg C
01:24:04	00:00:00	4223.60	4219.43	96.98	2799.25	0.00	-2329.84	-0.83	41.94
01:24:19	00:00:15	4229.17	4225.01	96.75	2296.39	0.00	-1930.62	-0.84	41.92
01:24:34	00:00:30	4240.26	4235.61	96.20	1624.07	0.00	-1382.46	-0.85	41.92
01:24:49	00:00:45	4247.83	4243.68	96.11	1067.00	0.00	-897.44	-0.84	41.93
01:25:04	00:01:00	4261.95	4258.32	96.07	675.49	0.00	-578.73	-0.86	41.94
01:25:19	00:01:15	4275.06	4271.94	96.03	421.27	0.00	-371.54	-0.88	41.95
01:25:34	00:01:30	4285.65	4283.05	96.67	262.01	0.00	-230.04	-0.88	41.96
01:25:49	00:01:45	4293.72	4292.13	96.72	163.81	0.00	-161.91	-0.99	41.96
01:26:04	00:02:00	4303.81	4303.24	97.68	105.89	0.00	-69.18	-0.65	41.96
01:26:19	00:02:15	4312.88	4311.31	97.36	71.41	0.00	-42.38	-0.59	41.97
01:26:34	00:02:30	4323.48	4323.93	98.28	52.46	0.00	17.50	0.33	41.97
01:26:49	00:02:45	4331.55	4331.00	97.64	40.51	0.00	8.62	0.21	41.98
01:27:04	00:03:00	4344.66	4343.62	97.83	35.48	0.00	2.05	0.06	41.98
01:27:19	00:03:15	4354.75	4353.71	96.96	32.58	0.00	-15.98	-0.49	41.99
01:27:34	00:03:30	4362.82	4362.29	98.61	29.16	0.00	22.89	0.78	41.99
01:27:49	00:03:45	4372.40	4371.38	98.34	27.68	0.00	13.50	0.49	41.99
01:28:04	00:04:00	4375.43	4376.43	98.16	25.73	0.00	-25.06	-0.97	42.00
01:28:19	00:04:15	4385.52	4386.52	97.75	23.91	0.00	-9.42	-0.39	42.00
01:28:34	00:04:30	4391.57	4392.58	98.16	22.99	0.00	-8.30	-0.36	42.00
01:28:49	00:04:45	4420.83	4420.86	97.75	29.74	0.00	-18.69	-0.63	42.01
01:29:04	00:05:00	4448.57	4443.06	98.12	42.93	0.00	-34.83	-0.81	42.02

TEST DATE:	16 JANUARY, 1997	DST NUMBER:	FOUR
WELL NAME:	UCEL LIARD	INTERVAL:	1097.0 - 1114.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

INITIAL SHUT IN

Time	Elapsed Time	Formation Pressure #1 kPa	Formation Pressure #2 kPa	Transducer Difference kPa	Recovery Pressure kPa	Surface Pressure kPa	Formation Temp. deg C	Hydrostatic Pressure kPa
01:29:10	00:00:00	4550.50	4586.44	-35.95	4515.78	99.40	42.01	12582.01
01:29:25	00:00:15	6057.81	6081.26	-23.45	4387.52	99.90	42.01	12586.55
01:29:40	00:00:30	6582.31	6596.02	-13.71	4388.52	98.58	42.02	12594.09
01:29:55	00:00:45	6877.31	6906.56	-29.25	4389.02	98.76	42.02	12591.57
01:30:10	00:01:00	7425.91	7446.42	-20.51	4389.02	99.77	42.03	12593.08
01:30:40	00:01:30	8811.24	8861.03	-49.79	4389.52	99.55	42.04	12588.04
01:31:10	00:02:00	9082.89	9092.76	-9.87	4390.00	98.78	42.06	12581.97
01:31:40	00:02:30	9501.73	9515.00	-13.27	4390.52	99.19	42.05	12601.63
01:32:10	00:03:00	9850.47	9863.11	-12.64	4392.03	98.51	42.05	12605.65
01:32:40	00:03:30	10223.87	10236.88	-13.01	4392.53	98.84	42.06	12603.63
01:33:10	00:04:00	10494.45	10506.36	-11.91	4392.52	99.48	42.06	12604.13
01:33:40	00:04:30	10708.09	10719.92	-11.83	4393.02	99.49	42.07	12603.12
01:34:10	00:05:00	10879.89	10890.65	-10.75	4393.01	98.71	42.08	12603.62
01:35:10	00:06:00	11170.59	11181.22	-10.64	4394.51	99.73	42.09	12604.11
01:36:10	00:07:00	11441.62	11452.14	-10.52	4395.00	99.92	42.11	12603.59
01:37:10	00:08:00	11613.39	11623.33	-9.94	4395.98	99.74	42.13	12603.57
01:38:10	00:09:00	11703.04	11712.43	-9.39	4395.97	99.11	42.15	12603.05
01:39:10	00:10:00	11759.45	11767.80	-8.35	4396.45	99.90	42.17	12603.04
01:40:10	00:11:00	11805.28	11815.61	-10.33	4396.94	98.95	42.18	12602.52
01:41:10	00:12:00	11839.02	11848.31	-9.29	4397.43	99.37	42.20	12602.00
01:42:10	00:13:00	11861.67	11871.95	-10.28	4397.92	98.96	42.21	12601.48
01:43:10	00:14:00	11870.22	11878.97	-8.75	4398.41	99.61	42.23	12601.98
01:44:10	00:15:00	11888.85	11898.59	-9.74	4399.41	99.49	42.24	12601.46
01:45:10	00:16:00	11906.47	11915.18	-8.71	4397.88	99.45	42.25	12601.45
01:46:10	00:17:00	11919.56	11929.27	-9.71	4398.88	99.50	42.26	12600.94
01:47:10	00:18:00	11933.15	11942.85	-9.69	4398.37	100.01	42.27	12600.43
01:48:10	00:19:00	11946.25	11956.43	-10.19	4398.86	99.06	42.28	12599.92
01:49:10	00:20:00	11956.81	11966.99	-10.17	4399.86	100.16	42.29	12600.92
01:50:10	00:21:00	11966.38	11977.04	-10.67	4399.86	99.34	42.30	12598.39
01:51:10	00:22:00	11976.45	11986.10	-9.65	4399.85	98.85	42.30	12599.39
01:52:10	00:23:00	11982.99	11992.63	-9.64	4399.34	99.77	42.31	12598.88
01:53:10	00:24:00	11990.04	11999.17	-9.13	4399.33	99.73	42.32	12598.38
01:54:10	00:25:00	11997.08	12007.21	-10.13	4399.32	99.31	42.32	12598.87
01:55:10	00:26:00	12007.15	12017.77	-10.62	4399.32	99.73	42.33	12598.36
01:56:10	00:27:00	12018.74	12028.84	-10.11	4398.81	99.37	42.33	12597.86
01:57:10	00:28:00	12031.83	12041.43	-9.60	4399.31	99.37	42.33	12598.86
01:58:10	00:29:00	12043.42	12053.00	-9.59	4398.80	99.42	42.34	12597.35
01:59:10	00:30:00	12054.97	12065.54	-10.56	4398.77	100.48	42.37	12597.32
01:59:14	00:30:02	12054.97	12065.54	-10.56	4398.77	100.48	42.37	12597.32

TEST DATE:	16 JANUARY, 1997	DST NUMBER:	FOUR
WELL NAME:	UCEL LIARD	INTERVAL:	1097.0 - 1114.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

SECOND FLOW PERIOD

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Liquid Flowrate m3/d	Surface Gas Flowrate m3/d	Total Gas Flowrate m3/d	Gas Liquid Ratio m3/m3	Formation Temp. deg C
01:59:29	00:00:00	4565.88	4539.20	100.98	-136.83	0.00	911.23	-6.66	42.32
01:59:44	00:00:15	4557.81	4546.79	99.38	-107.38	0.00	688.81	-6.41	42.31
01:59:59	00:00:30	4555.29	4549.82	101.03	-72.24	0.00	494.23	-6.84	42.31
02:00:14	00:00:45	4556.29	4553.85	100.21	-43.24	0.00	331.10	-7.66	42.31
02:00:29	00:01:00	4559.32	4558.39	101.17	-22.34	0.00	226.83	-10.15	42.32
02:00:59	00:01:30	4570.41	4571.51	101.76	2.36	0.00	100.35	42.57	42.32
02:01:29	00:02:00	4581.51	4583.63	101.53	11.14	0.00	48.44	4.35	42.33
02:01:59	00:02:30	4592.61	4594.73	101.85	14.81	0.00	3.72	0.25	42.33
02:02:29	00:03:00	4602.70	4604.33	102.31	14.46	0.00	13.40	0.93	42.33
02:02:59	00:03:30	4613.29	4615.43	103.14	14.29	0.00	28.80	2.02	42.33
02:03:29	00:04:00	4621.87	4625.03	103.23	13.82	0.00	17.24	1.25	42.33
02:03:59	00:04:30	4632.97	4635.13	103.28	13.42	0.00	19.82	1.48	42.33
02:04:29	00:05:00	4643.06	4644.72	103.46	13.65	0.00	12.29	0.90	42.33
02:05:29	00:06:00	4660.22	4662.90	103.74	11.87	0.00	26.11	2.20	42.33
02:06:29	00:07:00	4669.31	4673.01	104.15	8.00	0.00	19.57	2.45	42.32
02:07:29	00:08:00	4685.96	4689.17	104.89	10.01	0.00	3.49	0.35	42.32
02:08:29	00:09:00	4700.60	4703.82	104.16	11.39	0.00	-12.97	-1.14	42.31
02:09:29	00:10:00	4720.28	4723.51	104.94	13.41	0.00	-11.29	-0.84	42.30
02:10:29	00:11:00	4735.42	4738.67	105.99	9.49	0.00	12.71	1.34	42.30
02:11:29	00:12:00	4757.62	4761.39	104.90	12.95	0.00	-44.04	-3.40	42.29
02:12:29	00:13:00	4786.89	4789.67	106.23	19.20	0.00	19.60	1.02	42.29
02:13:29	00:14:00	4801.02	4804.31	106.78	11.50	0.00	5.20	0.45	42.29
02:14:29	00:15:00	4811.61	4814.92	107.24	7.54	0.00	18.89	2.50	42.28
02:15:29	00:16:00	4813.63	4816.94	107.93	2.90	0.00	54.44	18.80	42.28
02:16:29	00:17:00	4818.68	4823.51	107.52	4.10	0.00	8.17	1.99	42.28
02:17:29	00:18:00	4824.73	4829.56	108.31	4.30	0.00	37.76	8.79	42.28
02:18:29	00:19:00	4832.30	4836.13	108.22	4.96	0.00	-4.74	-0.96	42.28
02:19:29	00:20:00	4831.29	4836.13	109.50	1.22	0.00	10.64	8.71	42.28
02:20:29	00:21:00	4838.86	4843.70	108.96	4.65	0.00	-7.22	-1.55	42.28
02:21:29	00:22:00	4845.42	4849.76	110.06	4.75	0.00	21.41	4.51	42.28
02:22:29	00:23:00	4857.52	4861.37	111.53	6.68	0.00	32.91	4.93	42.29
02:23:29	00:24:00	4865.09	4869.44	111.35	6.02	0.00	27.21	4.52	42.29
02:24:29	00:25:00	4874.17	4879.03	112.95	5.86	0.00	51.38	8.77	42.29
02:25:29	00:26:00	4885.27	4889.63	113.78	6.73	0.00	50.64	7.52	42.29
02:26:29	00:27:00	4895.35	4899.73	114.60	6.69	0.00	20.93	3.13	42.29
02:27:29	00:28:00	4904.94	4910.33	116.76	5.86	0.00	87.33	14.89	42.30
02:28:29	00:29:00	4917.04	4921.43	117.86	6.53	0.00	70.02	10.72	42.30
02:29:29	00:30:00	4927.63	4932.53	120.65	5.93	0.00	112.89	19.04	42.30
02:31:29	00:32:00	4947.81	4952.72	122.99	5.88	0.00	82.18	13.98	42.31
02:33:29	00:34:00	4974.54	4978.97	128.52	6.81	0.00	124.73	18.32	42.32
02:35:29	00:36:00	4998.24	5003.19	133.46	6.27	0.00	136.90	21.83	42.33
02:37:29	00:38:00	5026.49	5029.43	139.05	6.38	0.00	150.60	23.59	42.33
02:39:29	00:40:00	5051.20	5055.68	144.40	6.95	0.00	127.80	18.38	42.34
02:41:29	00:42:00	5078.94	5082.93	152.09	7.00	0.00	179.42	25.63	42.35
02:43:29	00:44:00	5106.68	5111.19	160.83	7.32	0.00	175.41	23.97	42.36
02:45:29	00:46:00	5136.43	5141.47	171.02	6.66	0.00	246.92	37.08	42.37
02:47:29	00:48:00	5164.17	5167.71	180.17	6.58	0.00	214.98	32.66	42.38
02:49:29	00:50:00	5192.92	5196.47	189.05	6.88	0.00	216.64	31.47	42.39
02:51:29	00:52:00	5223.69	5227.76	199.39	7.64	0.00	225.17	29.46	42.40
02:53:29	00:54:00	5253.95	5258.04	208.49	7.28	0.00	213.22	29.27	42.41

TEST DATE:	16 JANUARY, 1997	DST NUMBER:	FOUR
WELL NAME:	UCEL LIARD	INTERVAL:	1097.0 - 1114.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

SECOND SHUTIN

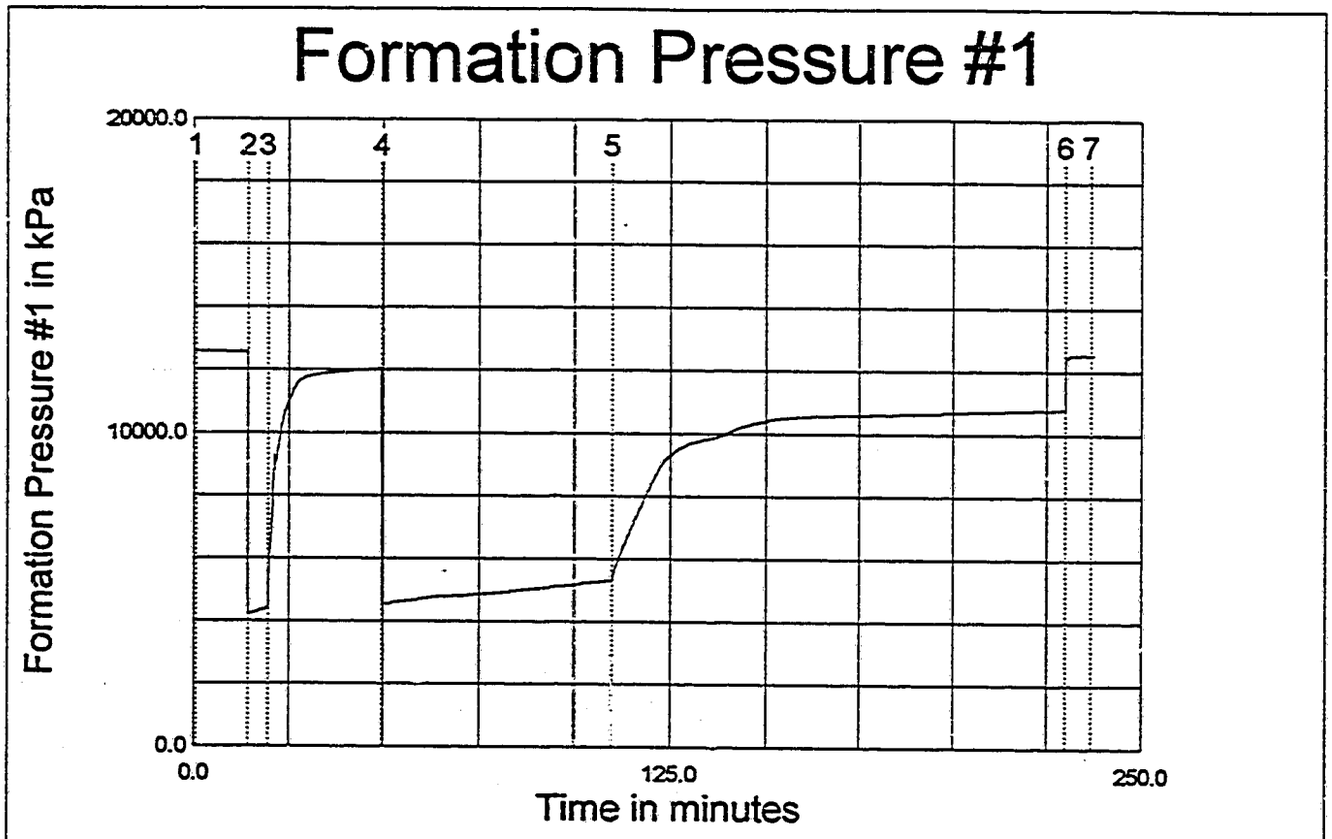
Time	Elapsed Time	Formation Pressure #1 kPa	Formation Pressure #2 kPa	Transducer Difference kPa	Recovery Pressure kPa	Surface Pressure kPa	Formation Temp. deg C	Hydrostatic Pressure kPa
02:59:29	00:00:00	5354.30	5367.45	-13.14	5325.65	237.94	42.44	12586.69
03:00:29	00:01:00	5772.47	5784.50	-12.02	5347.35	243.11	42.44	12591.22
03:01:29	00:02:00	6099.30	6109.72	-10.42	5357.44	246.54	42.45	12591.72
03:02:29	00:03:00	6402.41	6414.25	-11.84	5368.04	250.16	42.45	12592.22
03:03:29	00:04:00	6692.88	6705.13	-12.25	5378.63	253.96	42.46	12591.71
03:04:29	00:05:00	6971.23	6983.40	-12.17	5390.74	257.81	42.46	12592.71
03:05:29	00:06:00	7248.05	7258.62	-10.56	5403.85	262.34	42.47	12591.70
03:06:29	00:07:00	7518.80	7530.79	-11.99	5416.97	266.51	42.48	12591.69
03:07:29	00:08:00	7790.55	7801.94	-11.39	5431.60	268.89	42.49	12591.68
03:08:29	00:09:00	8055.22	8067.02	-11.80	5442.19	274.66	42.50	12591.68
03:09:29	00:10:00	8303.74	8315.45	-11.71	5449.25	276.86	42.51	12592.17
03:11:29	00:12:00	8767.98	8779.02	-11.04	5463.86	285.01	42.53	12591.65
03:13:29	00:14:00	9161.61	9171.49	-9.88	5474.94	292.20	42.55	12592.13
03:15:29	00:16:00	9361.18	9371.98	-10.80	5487.54	300.12	42.57	12594.64
03:17:29	00:18:00	9535.03	9545.24	-10.21	5499.63	308.42	42.59	12595.62
03:19:29	00:20:00	9656.47	9666.12	-9.65	5510.71	314.74	42.62	12595.60
03:21:29	00:22:00	9742.12	9753.22	-11.11	5521.29	322.39	42.64	12595.08
03:23:29	00:24:00	9808.62	9818.67	-10.05	5530.85	327.97	42.66	12595.06
03:25:29	00:26:00	9863.03	9873.54	-10.52	5538.90	333.38	42.69	12595.04
03:27:29	00:28:00	9911.39	9921.37	-9.98	5546.46	340.07	42.71	12594.01
03:29:29	00:30:00	10020.22	10031.14	-10.93	5555.52	345.84	42.73	12594.00
03:34:29	00:35:00	10267.09	10278.39	-11.30	5570.61	356.91	42.78	12593.45
03:39:29	00:40:00	10401.60	10411.80	-10.20	5582.68	362.85	42.82	12593.42
03:44:29	00:45:00	10507.38	10517.51	-10.13	5591.22	367.63	42.86	12591.87
03:49:29	00:50:00	10551.19	10562.28	-11.09	5595.23	369.80	42.89	12590.84
03:54:29	00:55:00	10574.35	10583.89	-9.55	5321.63	97.69	42.92	12590.81
03:59:29	01:00:00	10590.95	10600.98	-10.02	5318.58	99.52	42.94	12588.78
04:04:29	01:05:00	10602.53	10613.03	-10.51	5320.07	98.54	42.96	12588.76
04:09:29	01:10:00	10618.64	10628.12	-9.48	5324.60	100.01	42.97	12587.24
04:14:29	01:15:00	10636.77	10647.24	-10.47	5325.60	99.64	42.98	12586.73
04:19:29	01:20:00	10654.90	10664.86	-9.96	5327.11	99.88	42.99	12585.72
04:24:29	01:25:00	10673.54	10683.49	-9.95	5329.13	100.06	42.99	12587.23
04:29:29	01:30:00	10693.70	10703.14	-9.44	5330.14	99.15	42.99	12587.23
04:34:29	01:35:00	10709.83	10721.28	-11.45	5331.15	98.95	42.98	12586.22
04:39:29	01:40:00	10729.48	10739.42	-9.94	5333.17	100.14	42.98	12585.72
04:44:29	01:45:00	10748.13	10758.07	-9.94	5334.70	99.45	42.97	12585.23
04:49:29	01:50:00	10768.80	10779.24	-10.44	5335.21	100.26	42.96	12584.73
04:54:29	01:55:00	10790.98	10800.92	-9.94	5335.22	99.79	42.95	12584.74
04:59:29	02:00:00	10813.16	10823.11	-9.95	5335.24	99.14	42.94	12582.74
04:59:34	02:00:03	10813.13	10823.05	-9.92	5334.70	100.42	42.97	12582.21

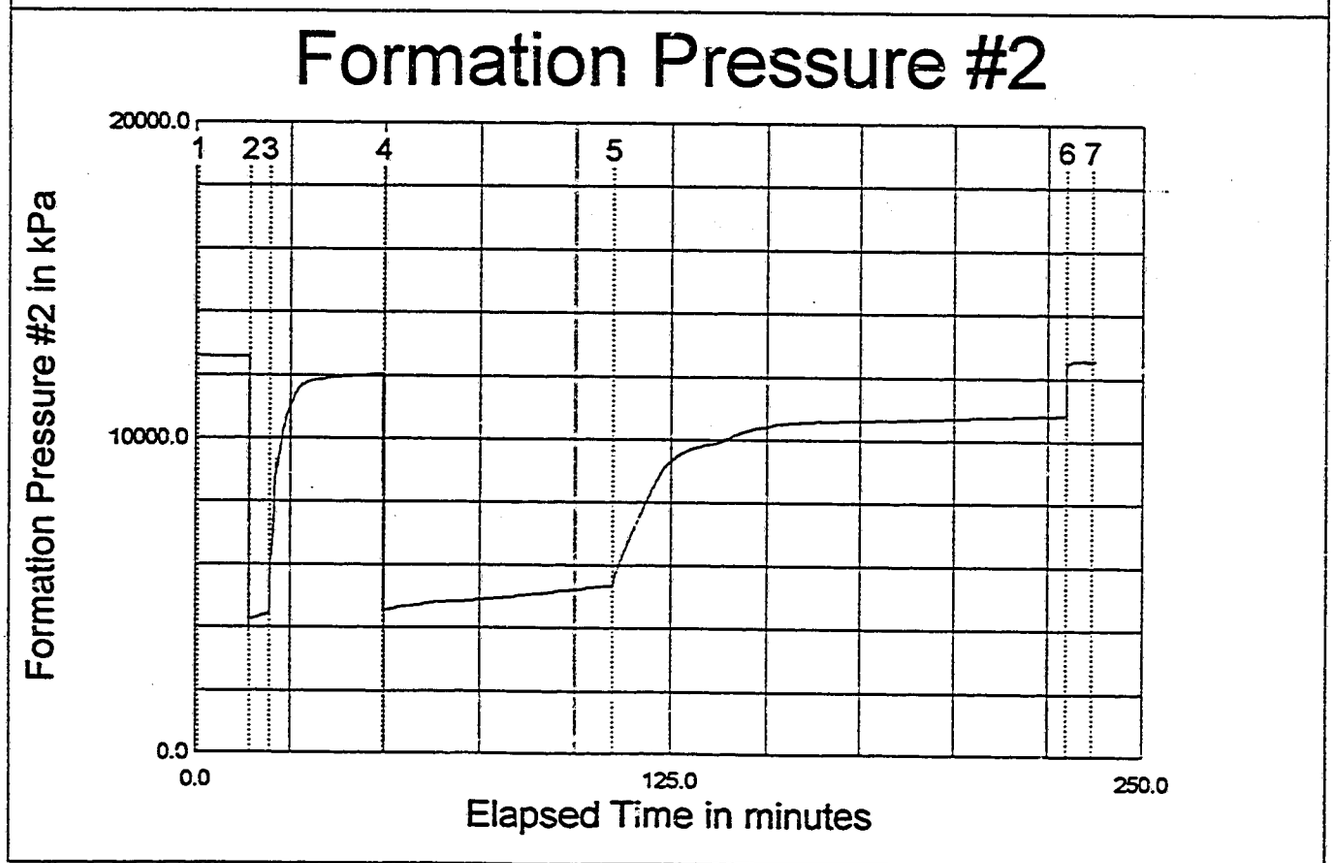
TEST DATE:	16 JANUARY, 1997	DST NUMBER:	FOUR
WELL NAME:	UCEL LIARD	INTERVAL:	1097.0 - 1114.7 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER DEFLATION

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
05:03:04	00:00:00	12533.03	5336.76	99.35	13729.85	12560.59	1169.26
05:03:19	00:00:15	12533.53	5336.77	99.76	13729.35	12561.09	1168.25
05:03:34	00:00:30	12535.55	5336.26	99.90	13728.34	12562.10	1166.24
05:03:49	00:00:45	12537.57	5336.27	99.36	13727.34	12563.62	1163.72
05:04:04	00:01:00	12537.57	5336.27	98.81	13727.85	12564.12	1163.72
05:04:19	00:01:15	12540.59	5335.77	99.59	13728.35	12565.64	1162.71
05:04:34	00:01:30	12543.62	5336.27	99.50	13728.86	12568.15	1160.70
05:04:49	00:01:45	12584.39	5354.93	99.87	12804.10	12592.31	211.79
05:05:04	00:02:00	12530.02	5347.38	99.19	12674.23	12554.56	119.67
05:05:19	00:02:15	12515.92	5345.37	99.55	12629.43	12540.96	88.46
05:05:34	00:02:30	12534.06	5343.35	99.74	12627.42	12557.08	70.33
05:05:49	00:02:45	12519.45	5342.34	99.79	12598.22	12541.98	56.24
05:06:04	00:03:00	12527.51	5340.83	100.57	12592.68	12545.50	47.18
05:06:14	00:03:09	12531.54	5341.34	100.39	12589.66	12549.03	40.63

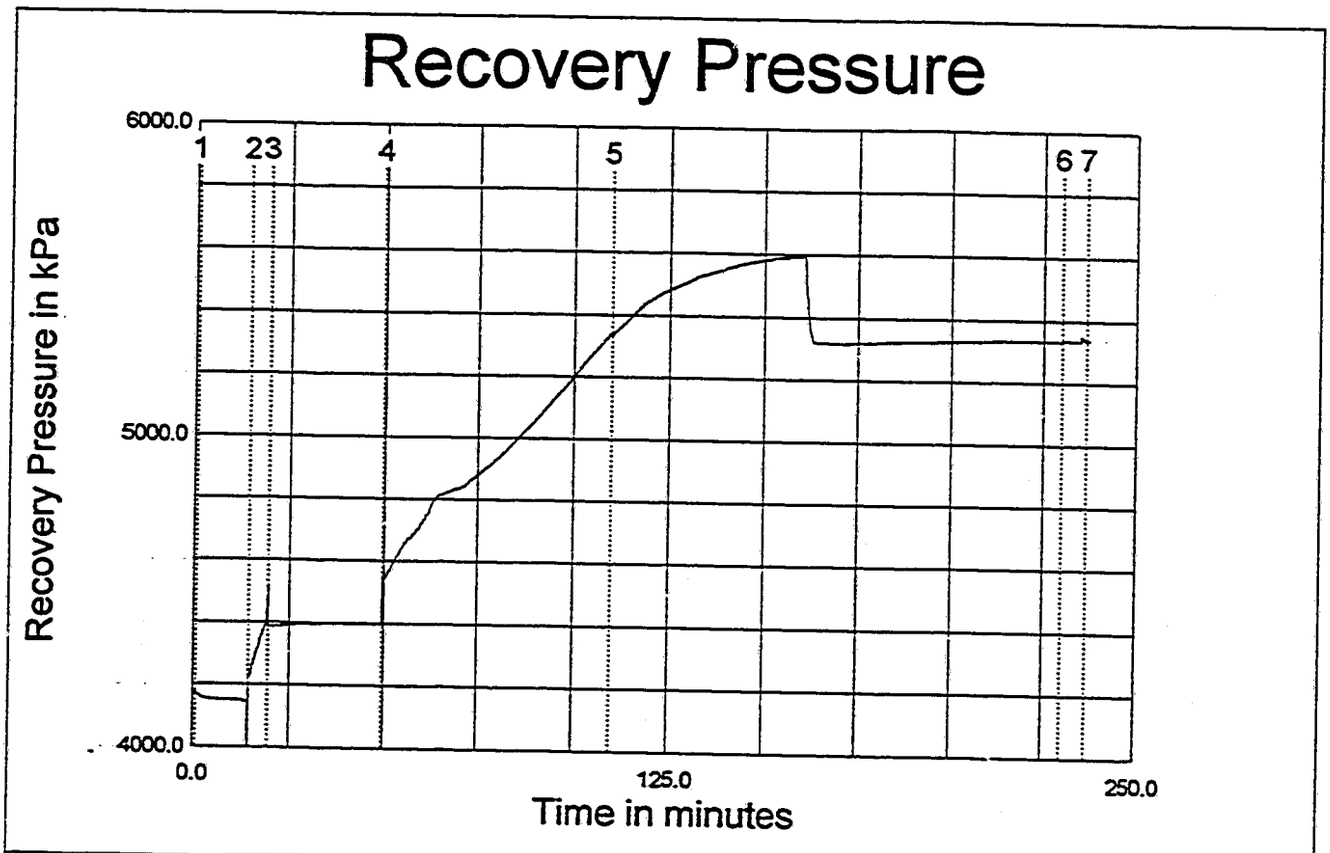
UCEL LIARD k-02-60-20-123-30
DST #FOUR, MATTSON, 1097.0 - 1114.7 mKB

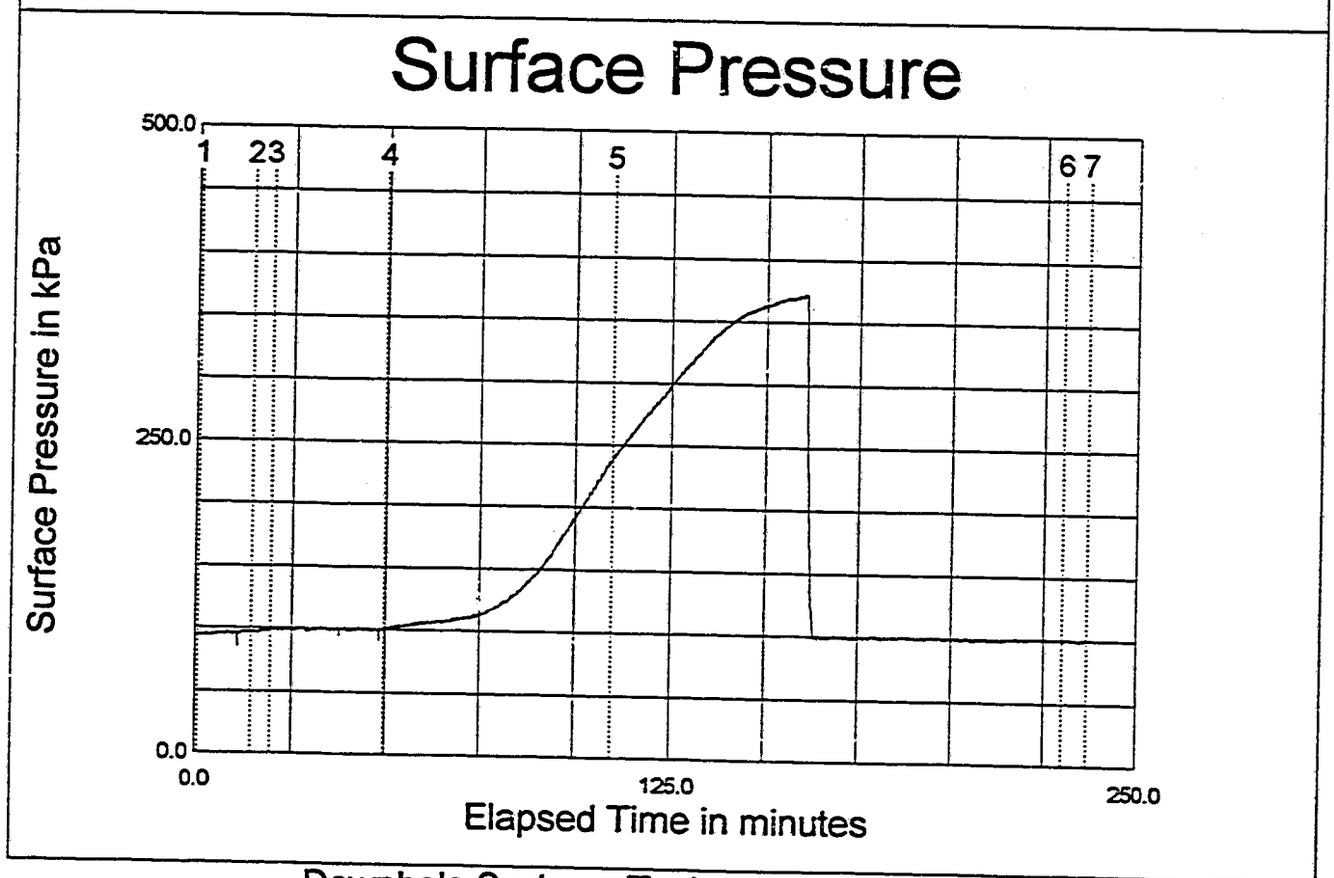




Downhole Systems Technology Canada Inc.

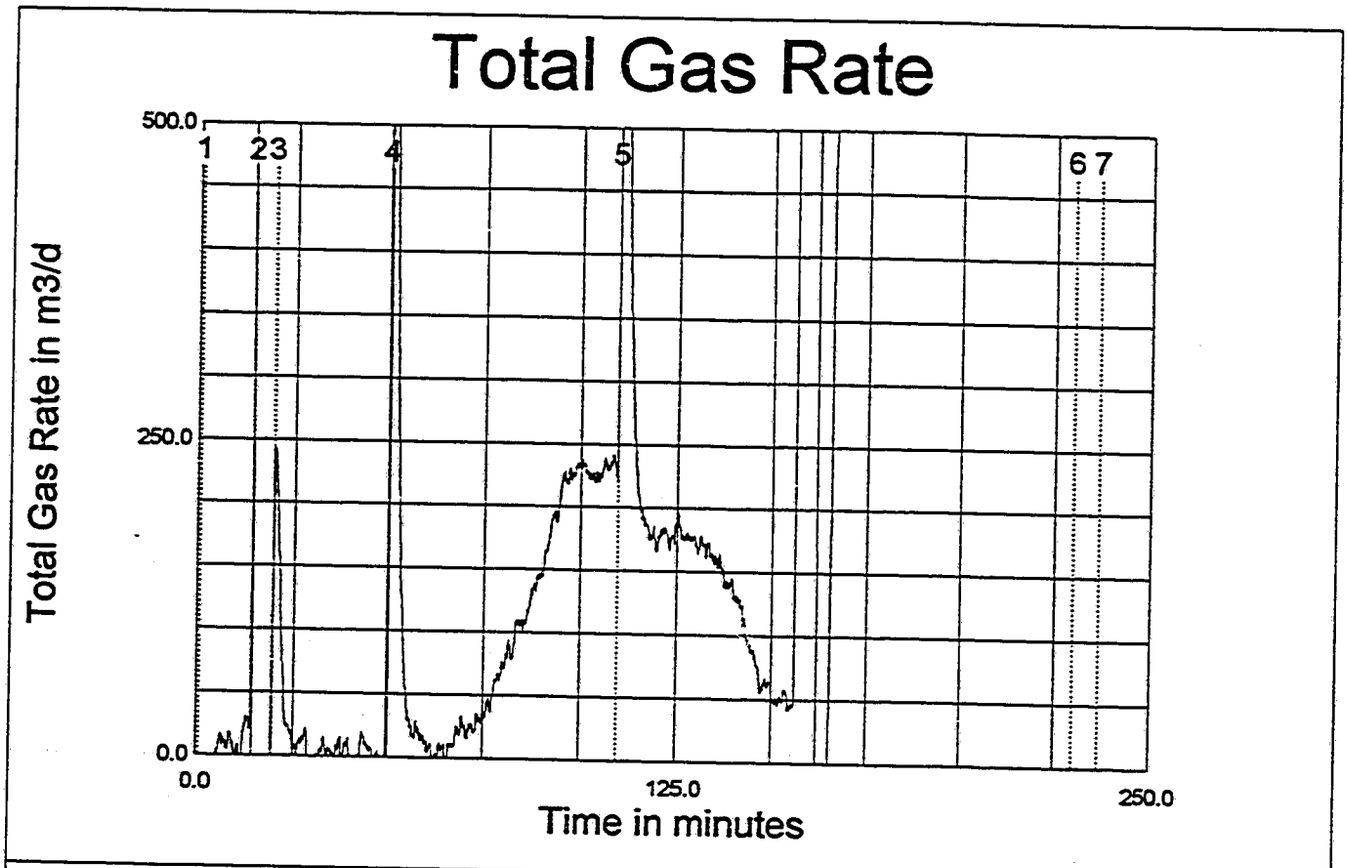
UCEL LIARD k-02-60-20-123-30
DST #FOUR, MATTSON, 1097.0 - 1114.7 mKB

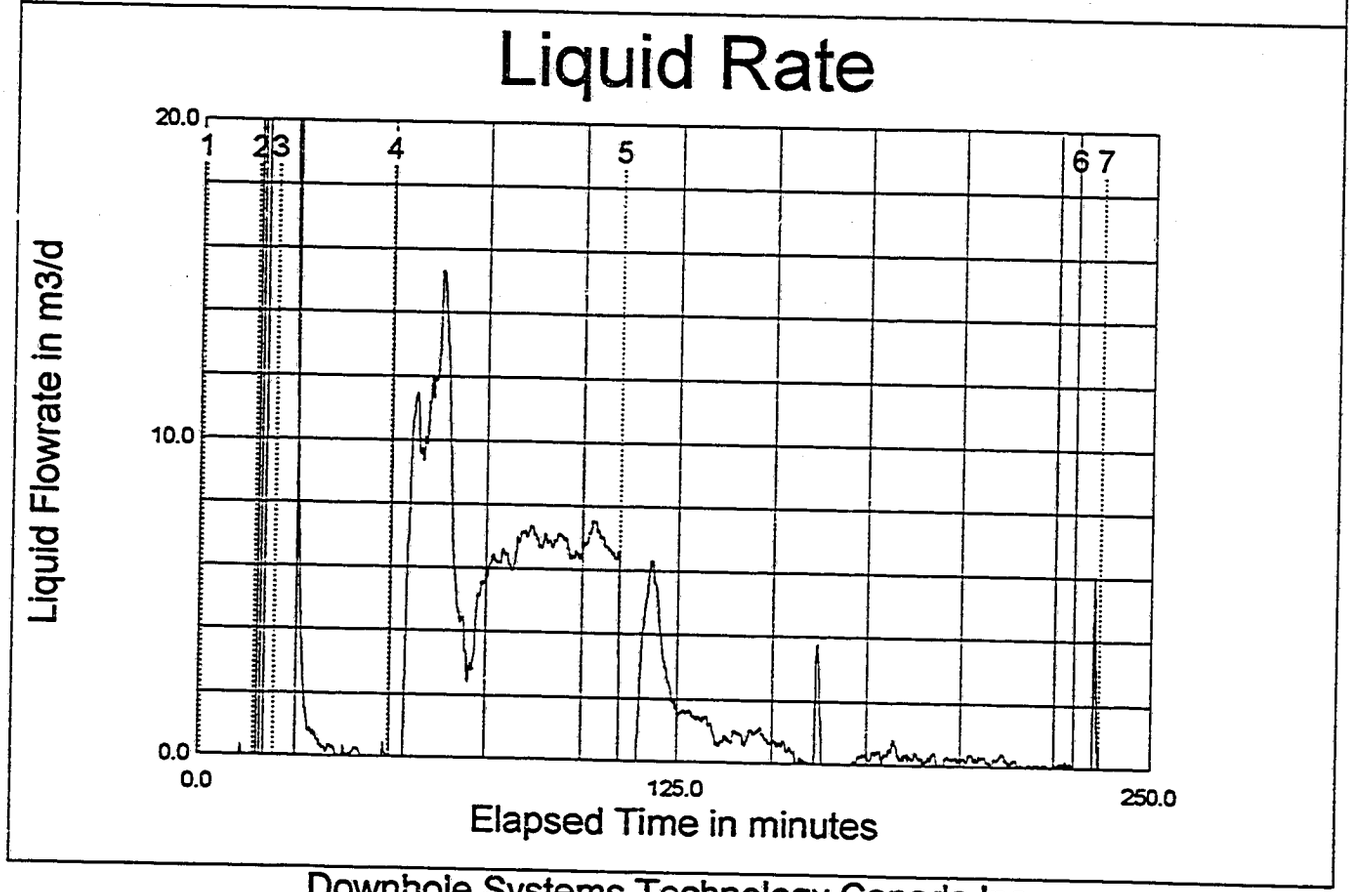




Downhole Systems Technology Canada Inc.

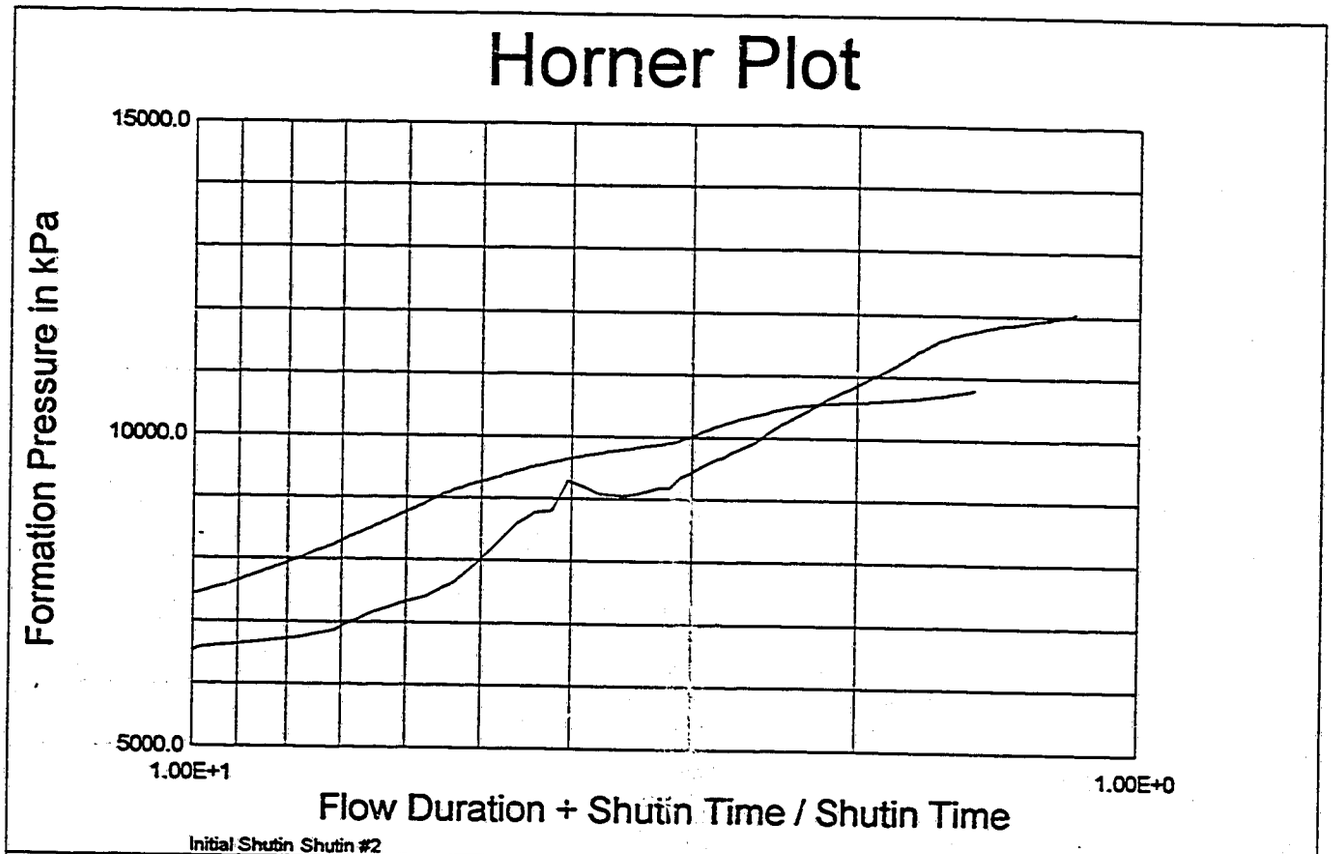
UCEL LIARD k-02-60-20-123-30
DST #FOUR, MATTSON, 1097.0 - 1114.7 mKB



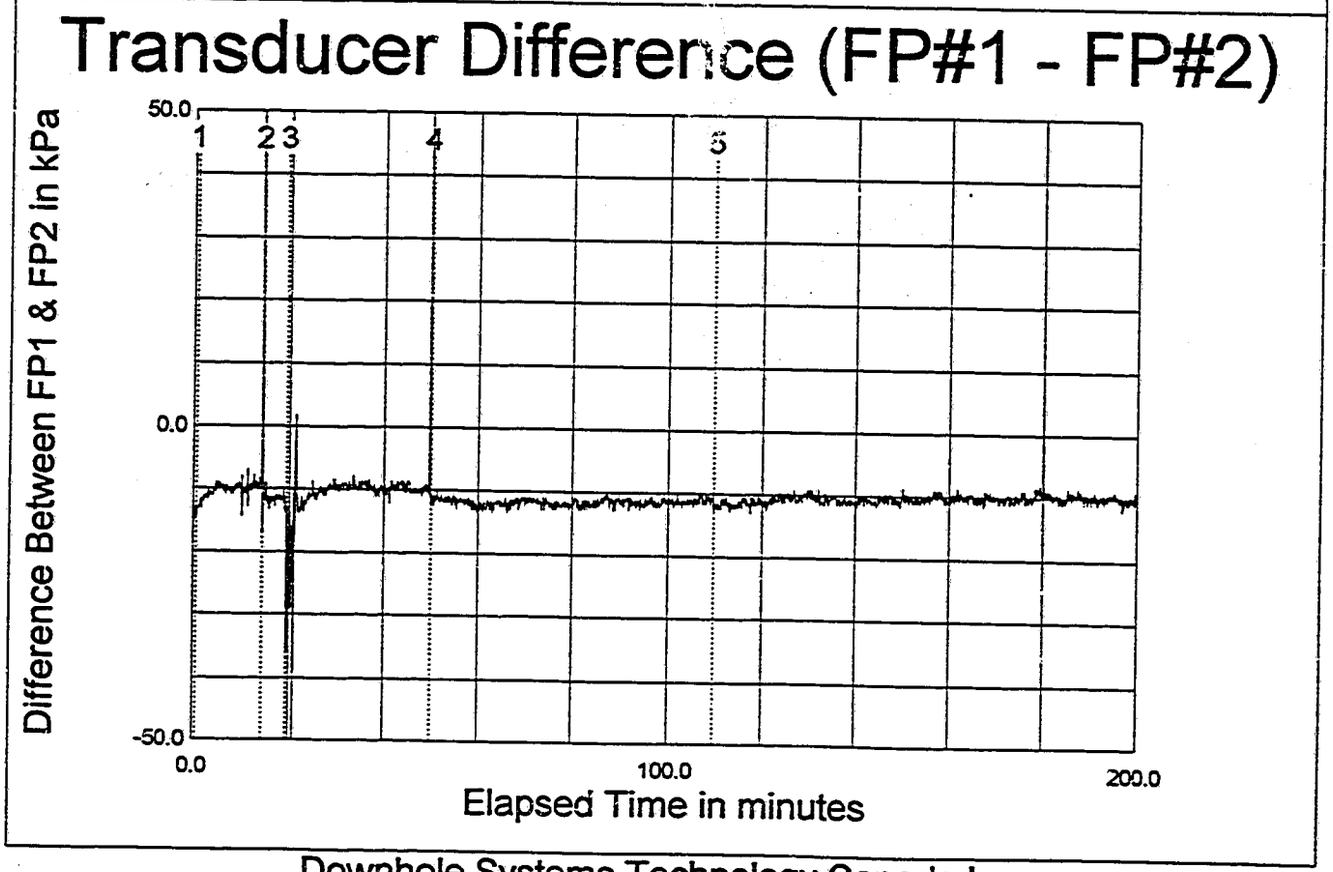


Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
DST #FOUR, MATTSON, 1097.0 - 1114.7 mKB



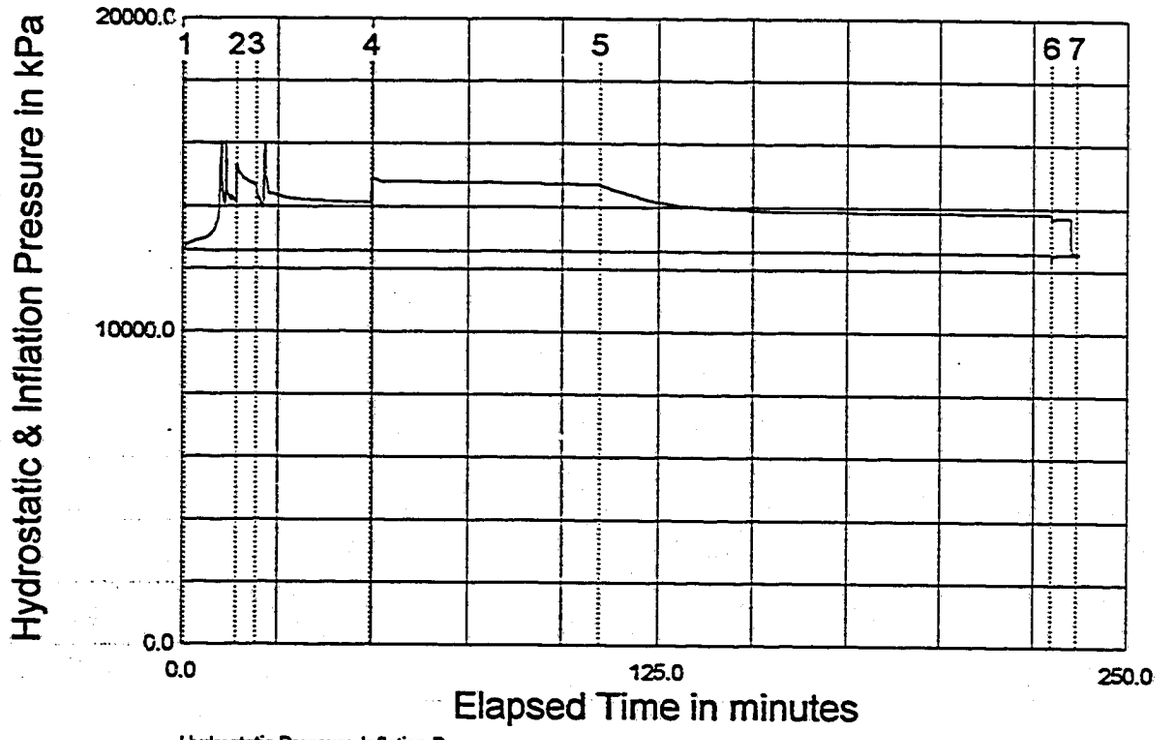
Initial Shutin Shutin #2



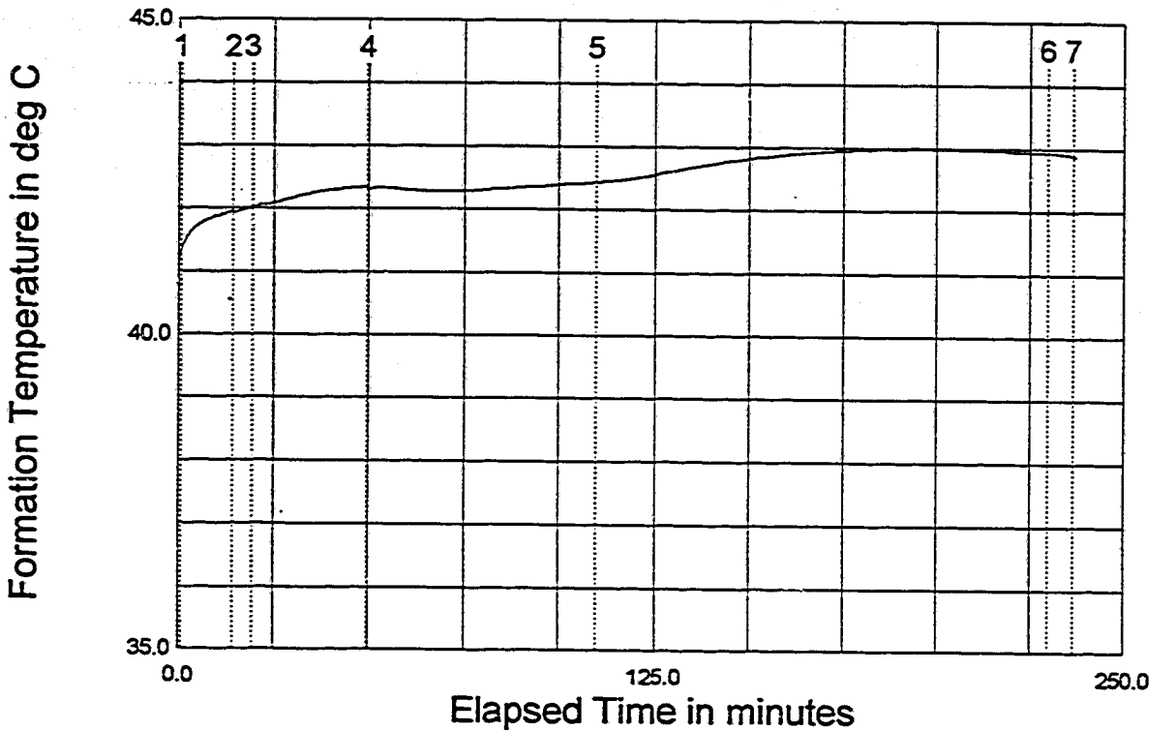
Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
DST #FOUR, MATTSON, 1097.0 - 1114.7 mKB

Hydrostatic & Inflation Pressure



Formation Temperature



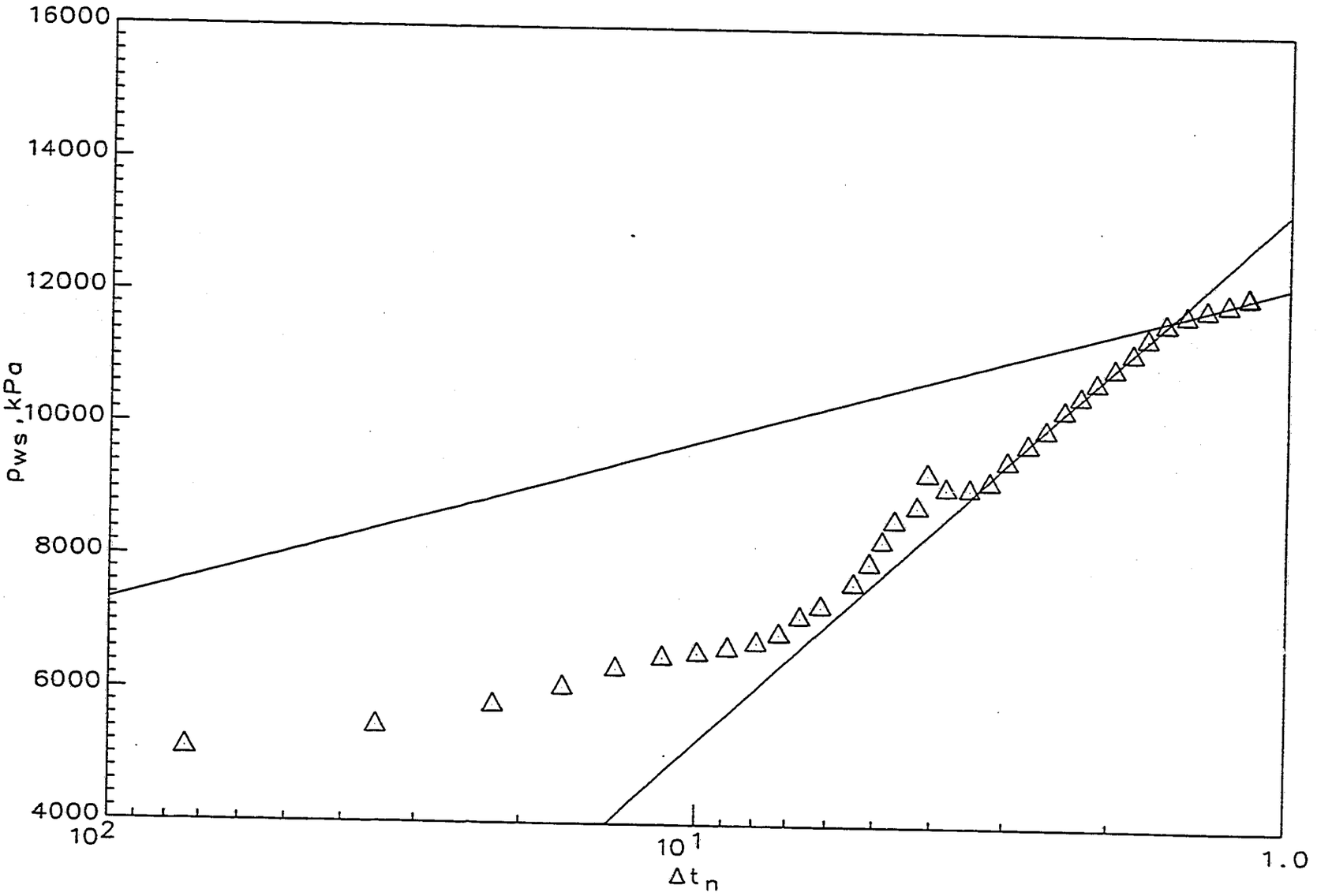
Downhole Systems Technology Canada Inc.

SUPERPOSITION
PRESSURE BUILDUP PLOT

UCEL LIARD k-02-60-20-123-30
DST #4, MATTSON, 1097.0-1114.7 mKB

Initial Shut In

$[k_1/u]_t$=10.68 k_1=23.78 mD s=-1.8 p*=13320.8
$[k_2/u]_t$=35.36 k_2=78.72 mD s=-5.292e-02 p*=12198.3

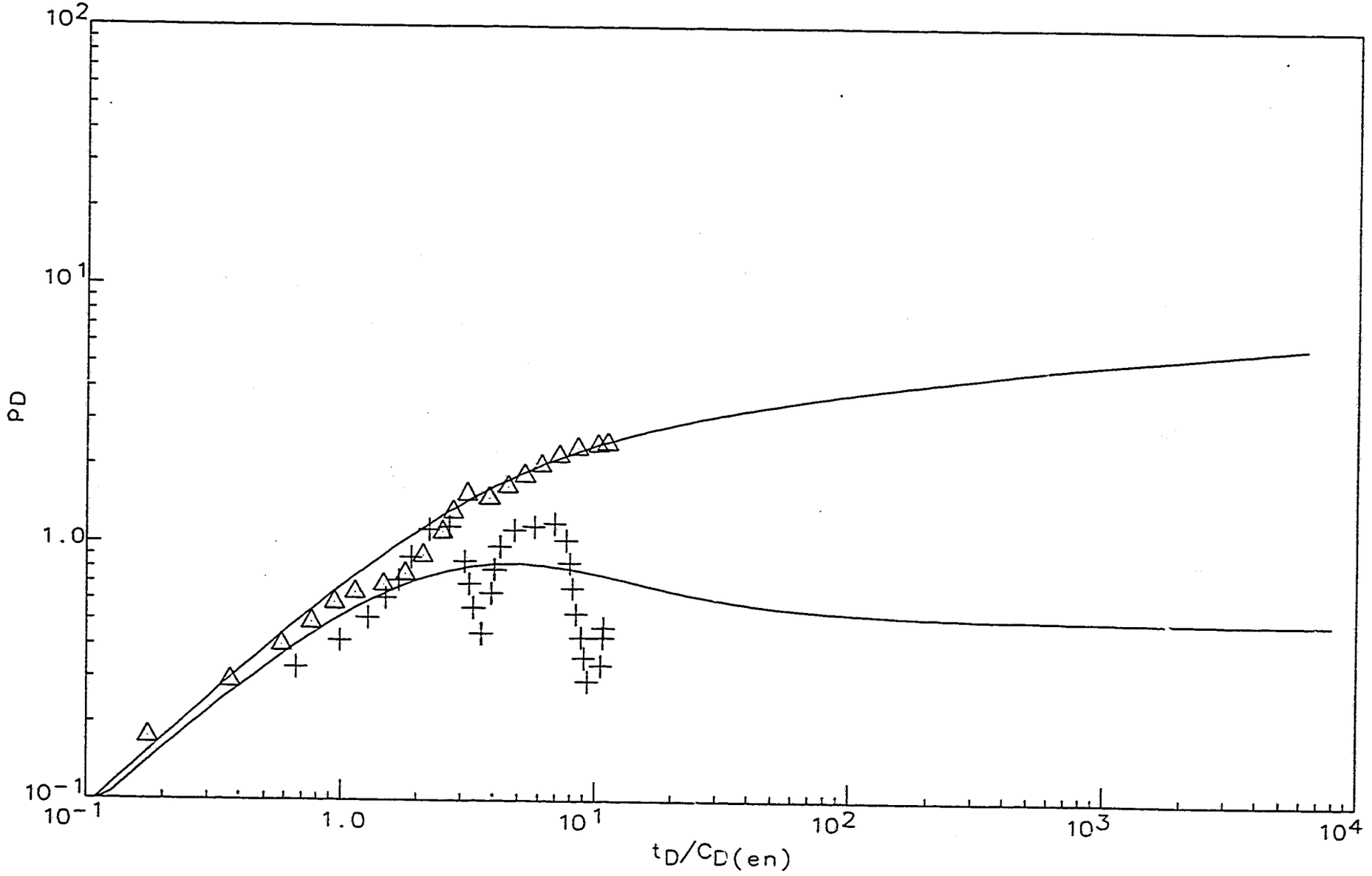


STORAGE AND SKIN TYPECURVE (Bourdet et al)

PRESSURE BUILDUP PLOT

UCEL LIARD k-02-60-20-123-30
DST #4, MATTSON, 1097.0-1114.7 mKB
$[k_1/u]_t$=24.37 k_1=54.26 C_D=36 s=-0.6

Initial Shut In



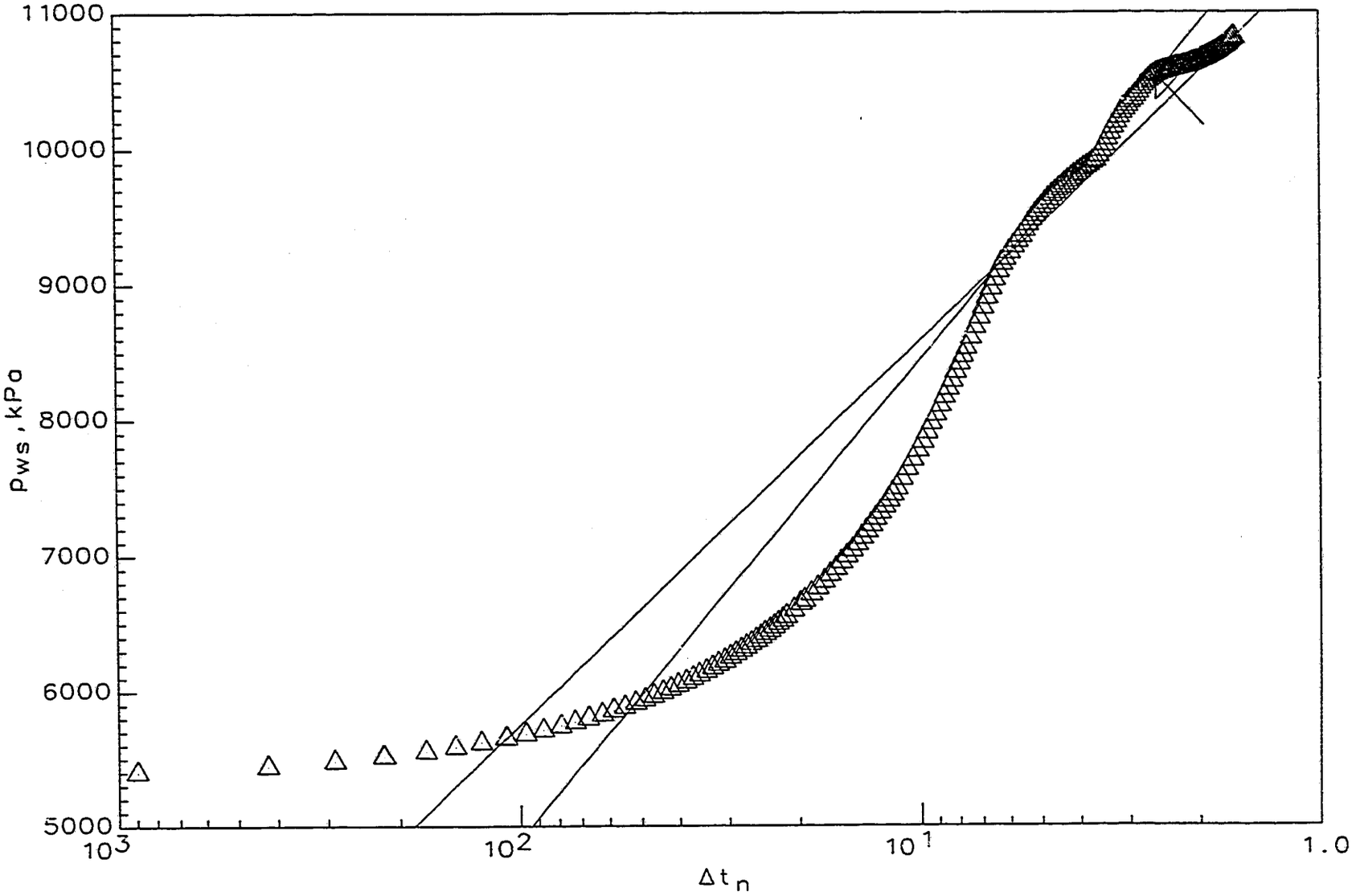
SUPERPOSITION
PRESSURE BUILDUP PLOT

UCEL LIARD k-02-60-20-123-30
DST #4, MATTSON, 1097.0-1114.7 mKB

Final Shut In

$[k_1/u]_t$=7.56 k_1=18.35 mD s=-3.1 p*=11965.6
$[k_2/u]_t$=9.44 k_2=22.92 mD s=-2.9 p*=11404.9

t=0.80 hr r=15 m



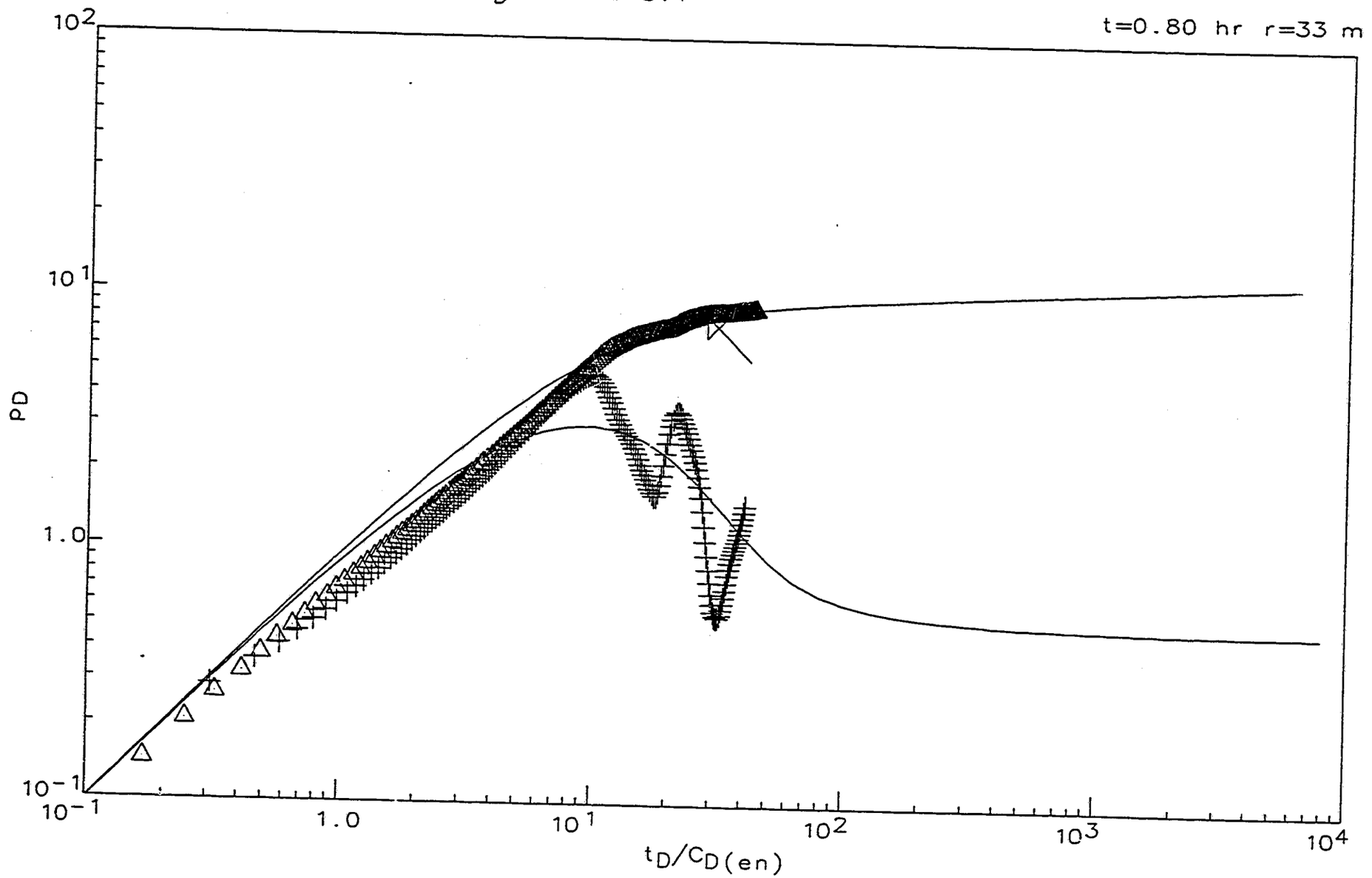
STORAGE AND SKIN TYPECURVE (Bourdet et al)

PRESSURE BUILDUP PLOT

UCEL LIARD k-02-60-20-123-30
DST #4, MATTSON, 1097.0-1114.7 mKB
$[k_1/u]_t$=37.61 k_1=91.36 C_D=1183 s=3.4

Final Shut In

t=0.80 hr r=33 m



Oil Well Test - BUILDUP (Superposition)

UCEL LIARD k-02-60-20-123-30
DST #4, MATTSON, 1097.0-1114.7 mKB

Final Shut In

Input Data

Final Oil Rate	=	10.80	m3/d
Final Water Rate	=	0.00	m3/d
Final Gas Rate	=	0.000	e3m3/d
Total Porosity	=	10.00	%
Oil Saturation	=	5.00	%
Water Saturation	=	95.00	%
Gas Saturation	=	0.00	%
Net Pay	=	1.00	m
Perforated Interval	=	-	m
Horiz To Vert Perm Ratio	=	1.000	
Net Wellbore Inclination	=	0.	
Wellbore Radius	=	0.09	m
Drainage Area - Zone	=	64.7	ha
Shape Code - Zone 1	=	R1A	
Drainage Area -	=	64.7	ha
Shape Code - Zone2	=	R1A	
Oil Gravity	=	0.876	
Bubble Point Pressure	=	-	kPa
P V T Reference Pressure	=	10813.1	kPa
Solution Gas Oil Ratio	=	49.3	m3/m3
Oil Formation Vol Factor	=	1.16	
Oil Viscosity	=	2.429	mPa.s
Oil Compressibility	=	2.722e-05	1/kPa
Initial Pressure	=	-	kPa
Final Flowing Pressure	=	5354.3	kPa
Formation Temperature	=	48.89	deg C
Cumulative Production (oil)	=	-	m3
Corrected Flow Time	=	1.276	hr

Calculations

Total Compressibility	=	2.298e-06	1/kPa
Wellbore Storage Constant	=	-	m3/kPa

Results

Bourdet Et Al Type Curve Analysis

Dimensionless Storage Constant	=	1183.24	
Wellbore Storage Constant	=	1.42e-05	m3/kPa
Permeability	=	91.36	mD
Skin Effect (Total)	=	3.370	
Inter Porosity Coeff	=	-	
Storativity Ratio	=	-	

Results

Radial Analysis - Zone 1

Transmissivity	=	7.56	mDm/mPa.s
Mobility (Total)	=	7.556	mD/mPa.s
Permeability (Oil)	=	18.35	mD
Permeability (Gas)	=	-	mD
Permeability (Water)	=	-	mD
Extrapolated Pressure	=	11965.6	kPa
Average Reservoir Pressure Pr	=	-	kPa
Extrapolated Pressure At 72 Hrs	=	11938.7	kPa
Skin Effect	=	-3.11	
Partial Penetration Skin	=	-	
Inclination Skin	=	0.000	
Damage Skin	=	-3.11	
Pressure Drop (Total Skin)	=	-	kPa
Damage Ratio	=	0.41	
Flow Efficiency	=	2.44	
Radius Of Investigation	=	15	m
@ Time Of Investigation	=	0.797	hr
Specified Reservoir Pressure	=	11965.6	kPa
Specified Flowing Pressure	=	5354.3	kPa
PI / II (Total Actual)	=	1.634e-03	m3/d/kPa
PI / II (Total Ideal)	=	6.683e-04	m3/d/kPa
Stab PI / II (Total Actual)	=	6.678e-04	m3/d/kPa
Stab PI / II (Total Ideal)	=	2.732e-04	m3/d/kPa
Stabilization / Specified Time	=	546.896	hr
Stabilized Rate @ Current Skin	=	4.41	m3/d
Stabilized Rate @ Skin Of 0	=	-	m3/d
Stabilized Rate @ Skin Of -4	=	5.31	m3/d

Radial Analysis - Zone 2

Permeability (Oil)	=	22.92	mD
Permeability (Gas)	=	-	mD
Permeability (Water)	=	-	mD
Extrapolated Pressure	=	11404.9	kPa
Average Reservoir Pressure Pr	=	-	kPa
Extrapolated Pressure At 72 Hrs	=	11383.4	kPa
Apparent Skin	=	-2.917	
Specified Reservoir Pressure	=	11404.9	kPa
Specified Flowing Pressure	=	5354.3	kPa
Stabilization / Specified Time	=	437.910	hr
Stabilized Rate @ Current Skin	=	4.86	m3/d
Stabilized Rate @ Skin Of 0	=	-	m3/d
Stabilized Rate @ Skin Of -4	=	6.07	m3/d

ELECTRO*TEST* REPORT

UNOCAL CANADA EXPLORATION LIMITED

WELL: UCEL LIARD k-02-80-20-123-30

DST #5: MATTSON (1299.0 - 1329.6mKB)

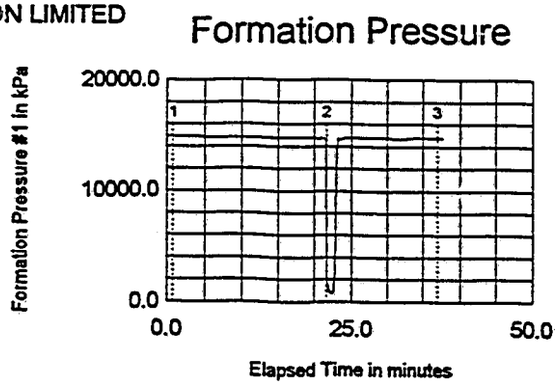
DATE: JANUARY 16, 1997

Downhole
Systems
Technology Canada Inc.

#7, 4539-6th St. N.E.
Calgary, Alberta
T2E 3Z6
(403) 299-1960

DRILL STEM TEST - FIINAL REPORT

Well Operator		UNOCAL CANADA EXPLORATION LIMITED
Well Name		UCEL LIARD
Location		k-02-60-20-123-30
DST #		FIVE
Interval Tested		1299.0 - 1329.6 mKB
Formation		MATTSON
Date		16 JANUARY, 1997
Wellsite Rep.		GABOURY
Test Engineer		JAMES
Wireline Operator		WYRE
Drilling Contractor		CACTUS 1
Well Total Depth		1657.00 meters
Well Elevations	KB	379.30 meters
	GL	374.50 meters
Main Hole Size		222.00 mm



SUMMARY

		Time	Duration	Graph #	Pressure (kPa)	Extrapolated Press.(kPa)	Liq. Rate(m3/d) Average/Final	Gas Rate(m3/d) Average/Final
Initial Hydrostatic				1	14915			
Preflow	Start	18:37:21		2	2021		0.0	0
	End	18:38:31	1		6751			
Initial Shut In	End		0		0			
Flow #2	Start				0		0.0	0
	End		0		0			
Shut In #2	End		0		0			
Final Hydrostatic				3	14881			
Bottom Hole Temperature		46 deg C						

Electronics #3, Formation Pressure 1, Ser. # 154775, Depth 1300.9 mKB (all gauges at same depth)

LIQUID RECOVERY	Height	Volume
Drilling mud.	147 m	0.459 m3

COMMENTS

Unsuccessful straddle inflate with real time pressure data and closed chamber flow rates.

A GR/CCL correlation log was run prior to inflating the packers and the packer depth was 0.8 meters high. A depth adjustment of 0.8 meters downwards was made.

After one minute of the preflow, a packer ruptured and the packer seat was lost. The pump was turned on to confirm that the packers would not inflate, and the test was then terminated.

If you require additional information contact David Sask at (403) 299-1960.

TEST DATE:	16 JANUARY, 1997	DST NUMBER:	FIVE
WELL NAME:	UCEL LIARD	INTERVAL:	1299.0 - 1329.6 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

Mud Type Gel Chem
Density 1165.00 kg/cu m
Viscosity 88.00 mPa S
Resistivity 0.00 ohms/m

Fluid Cushion: Nil
Density of recovered fluids (used in liquid rate calculations): 1165 kg/m3
Calculated Fluid Recovery: 147 meters of drilling mud based upon density of drilling mud.

Reverse Circulated: No

TOOL STRING CONFIGURATION

	Length meters	Inner Diameter mm	Outer Diameter mm
Drill Pipe Above K.B.	1.00	70.21	88.90
Upper Drill Pipe	1126.94	84.00	85.00
Drill Collars	138.28	63.00	120.65
Stabbing Valve	0.50	50.80	120.65
RCV/DBS/XO'S	1.05	60.00	120.65
Drill Collar	27.43	63.00	120.65
Hydraulic Jars	2.00	50.80	127.00
Safety Joint	1.35	25.40	127.00
Top Packer	2.45	22.25	139.70
Top of Interval	**1299.00**		
Packer Stub	0.80	0.00	127.00
Downhole Flow Valve	0.92	0.00	127.00
Electronics Section	1.51	0.00	127.00
Inflation Pump	2.44	0.00	127.00
Spacer Pipe	24.35	0.00	127.00
Packer Stub	0.57	0.00	127.00
Bottom of Interval	**1329.59**		
Total Interval	**30.59**		
Bottom Packer	2.40	0.00	139.70

Test Tool Choke Diameter	22.50 mm	
Surface Choke	0.00 mm	Bean Choke
Total String Volume	6.76 cu m	
Initial Closed Chamber Gas Volume	6.76 cu m	
Annular Volume	0.80 cu m	

TEST DATE:	16 JANUARY, 1997	DST NUMBER:	FIVE
WELL NAME:	UCEL LIARD	INTERVAL:	1299.0 - 1329.6 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER INFLATION

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
18:16:26	00:00:00	14880.72	289.98	72.58	14956.92	14896.84	60.08
18:16:41	00:00:15	14878.17	286.90	73.09	14971.99	14894.79	77.20
18:16:56	00:00:30	14876.13	284.34	72.58	15000.64	14893.25	107.39
18:17:11	00:00:45	14874.59	282.79	72.58	15029.30	14891.71	137.59
18:17:26	00:01:00	14873.56	280.23	72.58	15050.92	14889.67	161.24
18:17:41	00:01:15	14872.53	279.19	73.09	15070.52	14887.64	182.88
18:17:56	00:01:30	14871.50	277.65	73.09	15082.08	14886.61	195.46
18:18:11	00:01:45	14870.48	276.61	72.59	15095.64	14884.58	211.07
18:18:26	00:02:00	14869.45	275.58	73.10	15109.21	14884.06	225.16
18:18:41	00:02:15	14868.93	275.05	72.08	15117.25	14883.03	234.22
18:18:56	00:02:30	14868.41	274.53	73.10	15127.30	14882.51	244.79
18:19:11	00:02:45	14867.90	274.01	72.59	15135.34	14882.00	253.34
18:19:26	00:03:00	14867.88	273.48	73.10	15142.37	14881.98	260.39
18:19:41	00:03:15	14867.87	272.97	72.59	15150.41	14880.97	269.45
18:19:56	00:03:30	14866.85	272.95	73.10	15155.43	14880.96	274.48
18:20:11	00:03:45	14867.34	271.93	72.60	15161.46	14880.94	280.52
18:20:26	00:04:00	14865.82	271.41	73.61	15166.99	14880.43	286.56
18:20:41	00:04:15	14865.81	270.89	72.60	15172.01	14879.91	292.09
18:20:56	00:04:30	14865.30	271.38	72.60	15178.54	14879.40	299.14
18:21:11	00:04:45	14865.29	270.36	73.11	15183.56	14879.89	303.67
18:21:26	00:05:00	14864.78	269.84	72.60	15192.11	14878.88	313.23
18:21:56	00:05:30	14863.76	269.83	72.60	15208.20	14879.37	328.83
18:22:26	00:06:00	14863.24	269.30	73.11	15224.79	14878.85	345.94
18:22:56	00:06:30	14859.70	269.28	73.62	15250.94	14875.31	375.63
18:23:26	00:07:00	14816.88	269.27	73.12	15332.95	14846.60	486.35
18:23:56	00:07:30	14823.42	268.74	73.12	15872.33	14848.60	1023.73
18:24:26	00:08:00	14840.52	269.23	73.13	17693.91	14862.68	2831.23
18:24:56	00:08:30	14857.65	268.73	74.14	17367.47	14879.30	2488.17
18:25:26	00:09:00	14857.63	267.71	73.13	17212.53	14878.79	2333.75
18:25:56	00:09:30	14857.63	267.70	73.64	16903.15	14878.78	2024.38
18:26:26	00:10:00	14858.12	267.18	73.65	16696.38	14877.76	1818.63
18:26:56	00:10:30	14856.60	266.66	73.14	16715.49	14877.75	1837.74
18:27:26	00:11:00	14856.08	266.65	73.15	16713.97	14877.24	1836.74
18:27:56	00:11:30	14855.58	266.64	73.15	16708.43	14876.73	1831.71
18:28:26	00:12:00	14855.06	265.62	73.66	16701.38	14875.71	1825.67
18:28:56	00:12:30	14851.97	264.01	74.22	16630.38	14872.62	1757.76
18:29:26	00:13:00	14851.97	264.01	74.22	16630.38	14872.62	1757.76
18:29:56	00:13:30	14851.97	264.01	74.22	16630.38	14872.62	1757.76
18:30:26	00:14:00	14851.97	264.01	74.22	16630.38	14872.62	1757.76
18:30:56	00:14:30	14851.97	264.01	74.22	16630.38	14872.62	1757.76
18:31:26	00:15:00	14851.97	264.01	74.22	16630.38	14872.62	1757.76
18:31:56	00:15:30	14851.97	264.01	74.22	16630.38	14872.62	1757.76
18:32:26	00:16:00	14851.97	264.01	74.22	16630.38	14872.62	1757.76
18:32:56	00:16:30	14851.97	264.01	74.22	16630.38	14872.62	1757.76
18:33:26	00:17:00	14851.97	264.01	74.22	16630.38	14872.62	1757.76
18:33:56	00:17:30	14851.97	264.01	74.22	16630.38	14872.62	1757.76
18:34:26	00:18:00	14851.97	264.01	74.22	16630.38	14872.62	1757.76
18:34:56	00:18:30	14850.45	264.01	74.22	16625.85	14873.12	1752.73
18:35:11	00:18:45	14833.84	263.50	74.73	16617.29	14873.62	1743.68

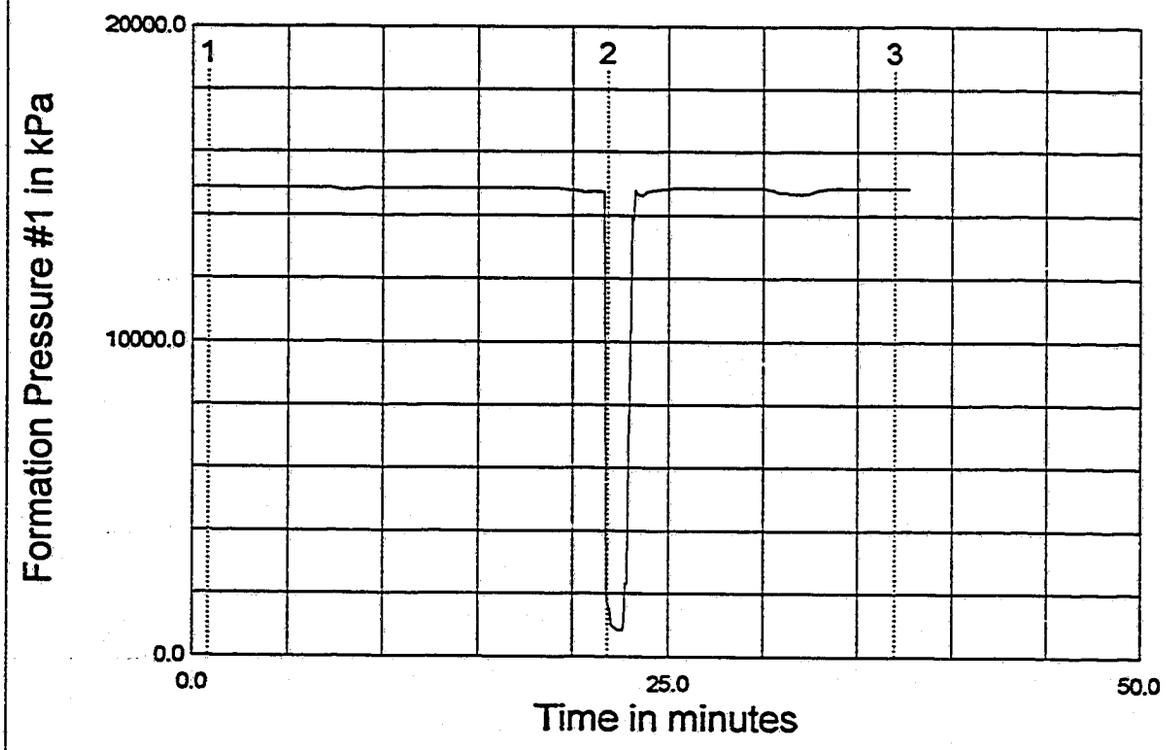
TEST DATE:	16 JANUARY, 1997	DST NUMBER:	FIVE
WELL NAME:	UCEL LIARD	INTERVAL:	1299.0 - 1329.6 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PREFLOW

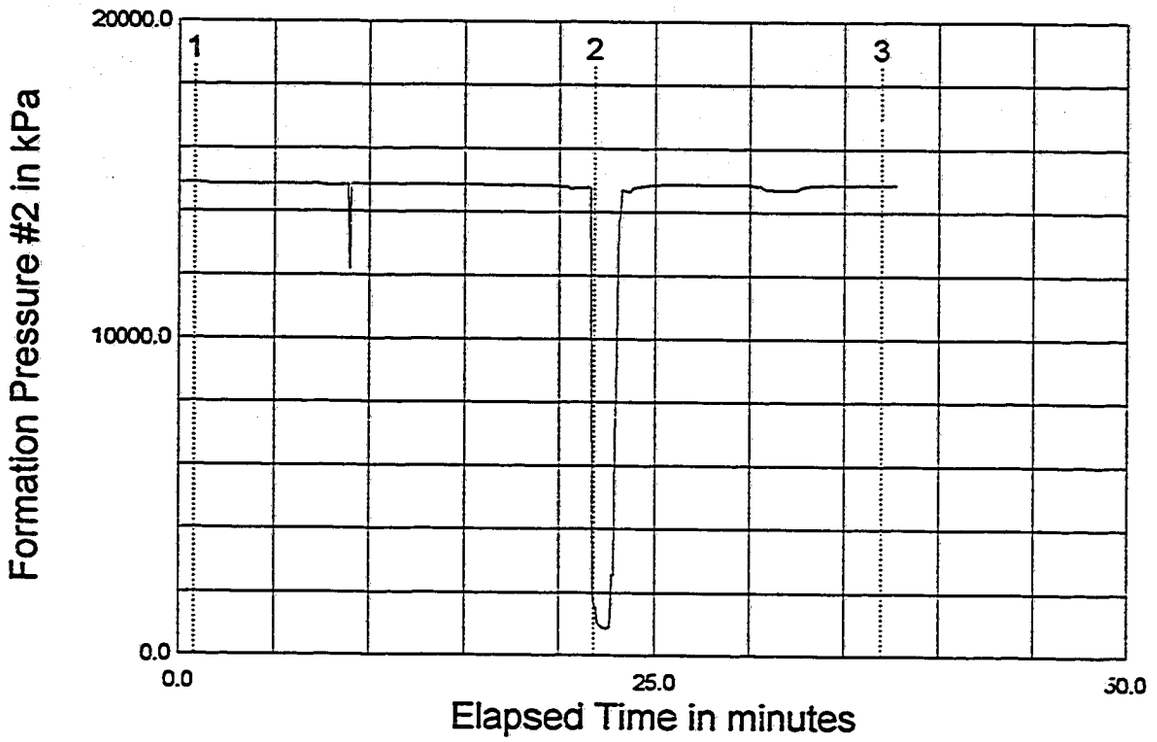
Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Liquid Flowrate m3/d	Surface Gas Flowrate m3/d	Total Gas Flowrate m3/d	Gas Liquid Ratio m3/m3	Formation Temp. deg C
18:37:21	00:00:00	2021.49	1219.06	74.74	30.25	0.00	-25.46	-0.84	45.41
18:37:36	00:00:15	1074.23	920.19	75.25	-563.50	0.00	406.97	-0.72	45.37
18:37:51	00:00:30	875.25	756.82	74.74	-551.28	0.00	402.08	-0.73	45.36
18:38:06	00:00:45	834.84	758.83	83.35	-521.67	0.00	440.66	-0.84	45.37
18:38:21	00:01:00	2337.57	1513.42	100.57	-452.44	0.00	740.70	-1.64	45.38
18:38:31	00:01:09	6751.37	3344.07	108.67	-299.77	0.00	875.85	-2.92	45.41

UCEL LIARD k-02-60-20-123-30
DST #FIVE, MATTSON, 1299.0 - 1329.6 mKB

Formation Pressure #1

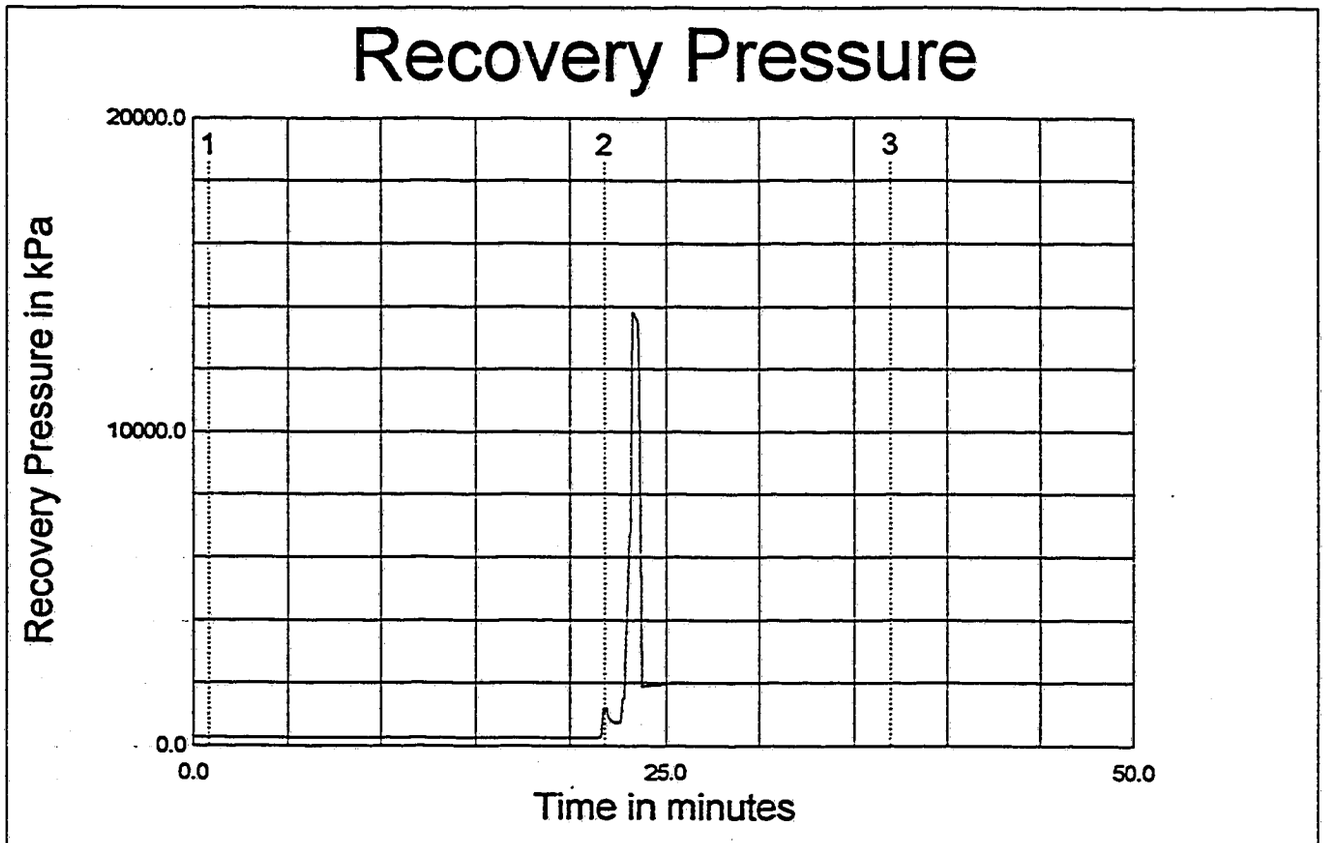


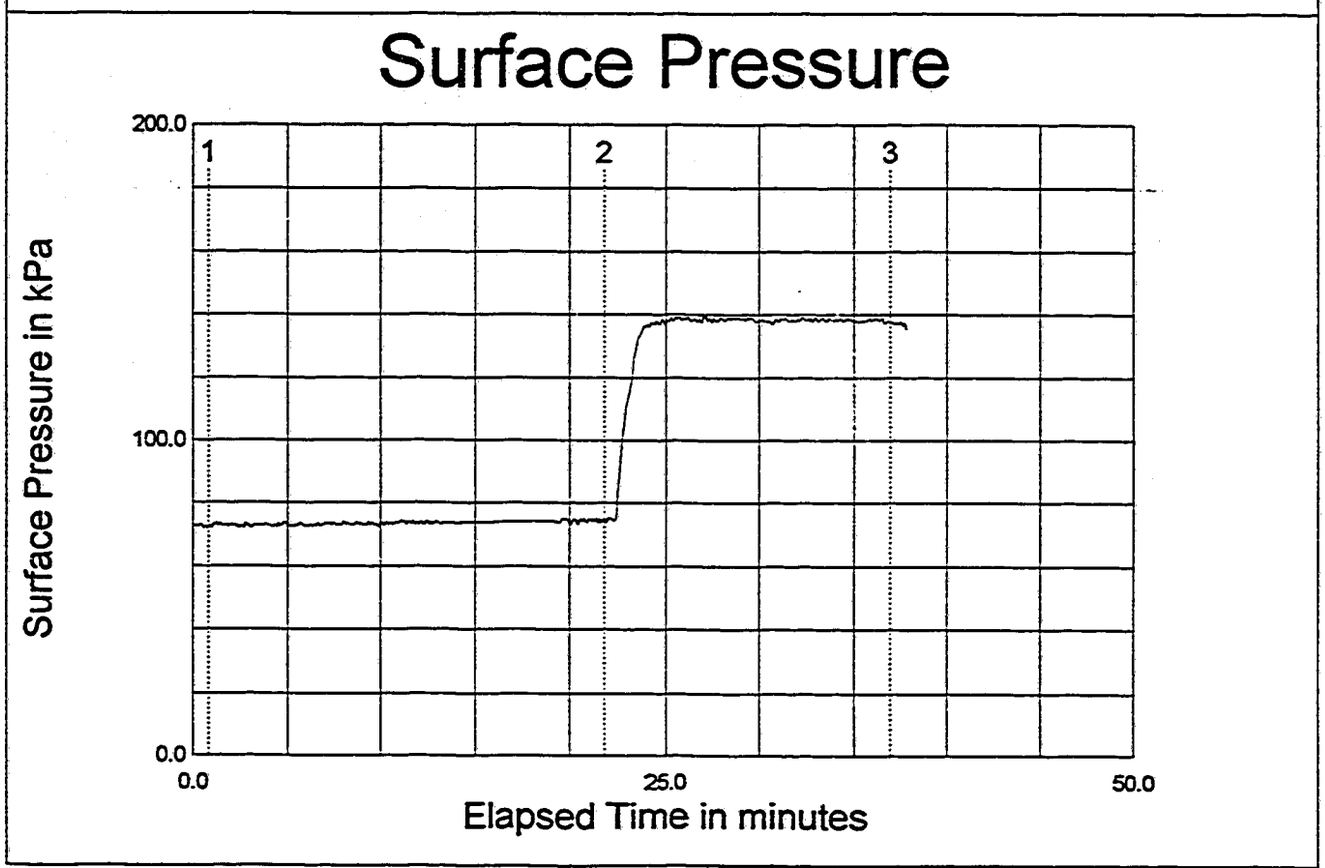
Formation Pressure #2



Downhole Systems Technology Canada Inc.

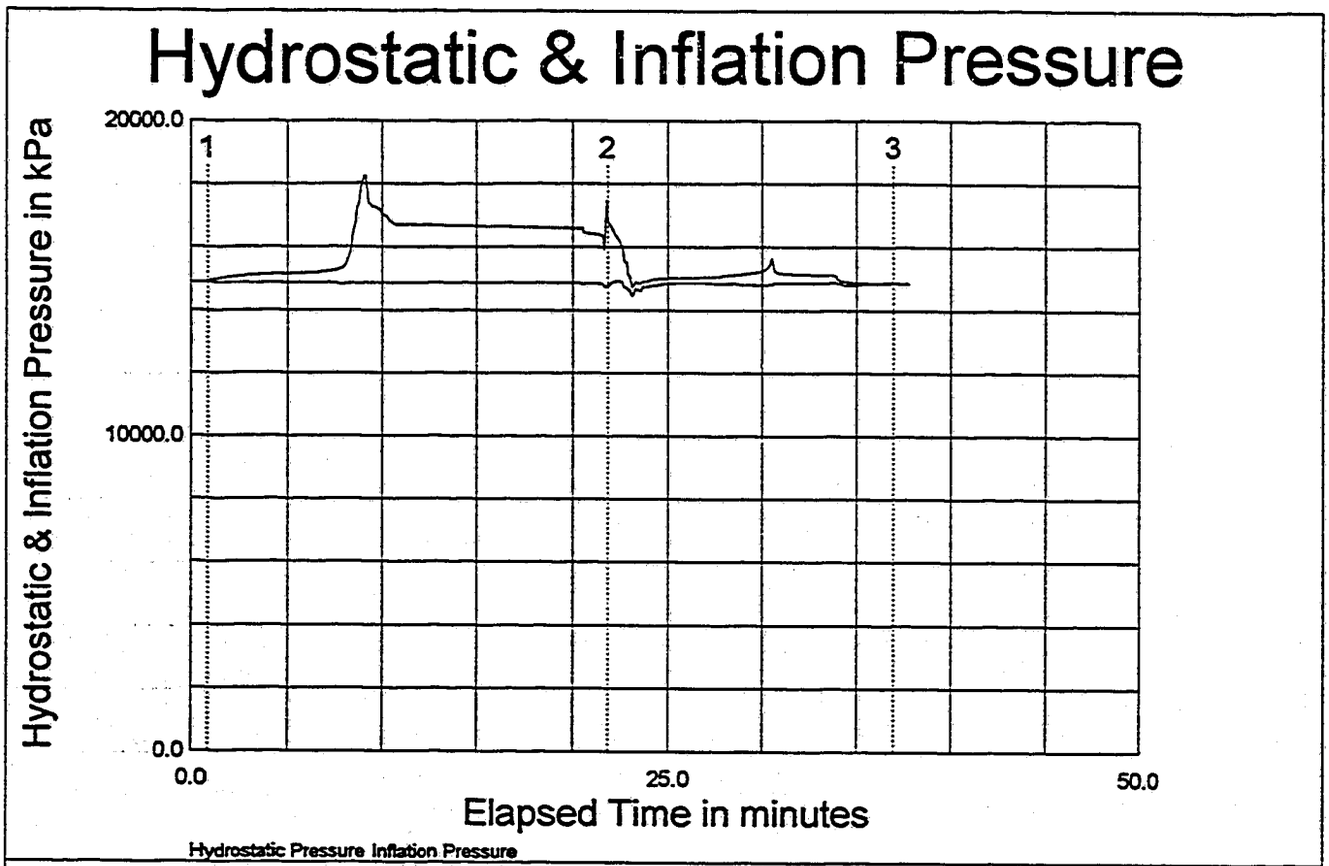
UCEL LIARD k-02-60-20-123-30
DST #FIVE, MATTSON, 1299.0 - 1329.6 mKB

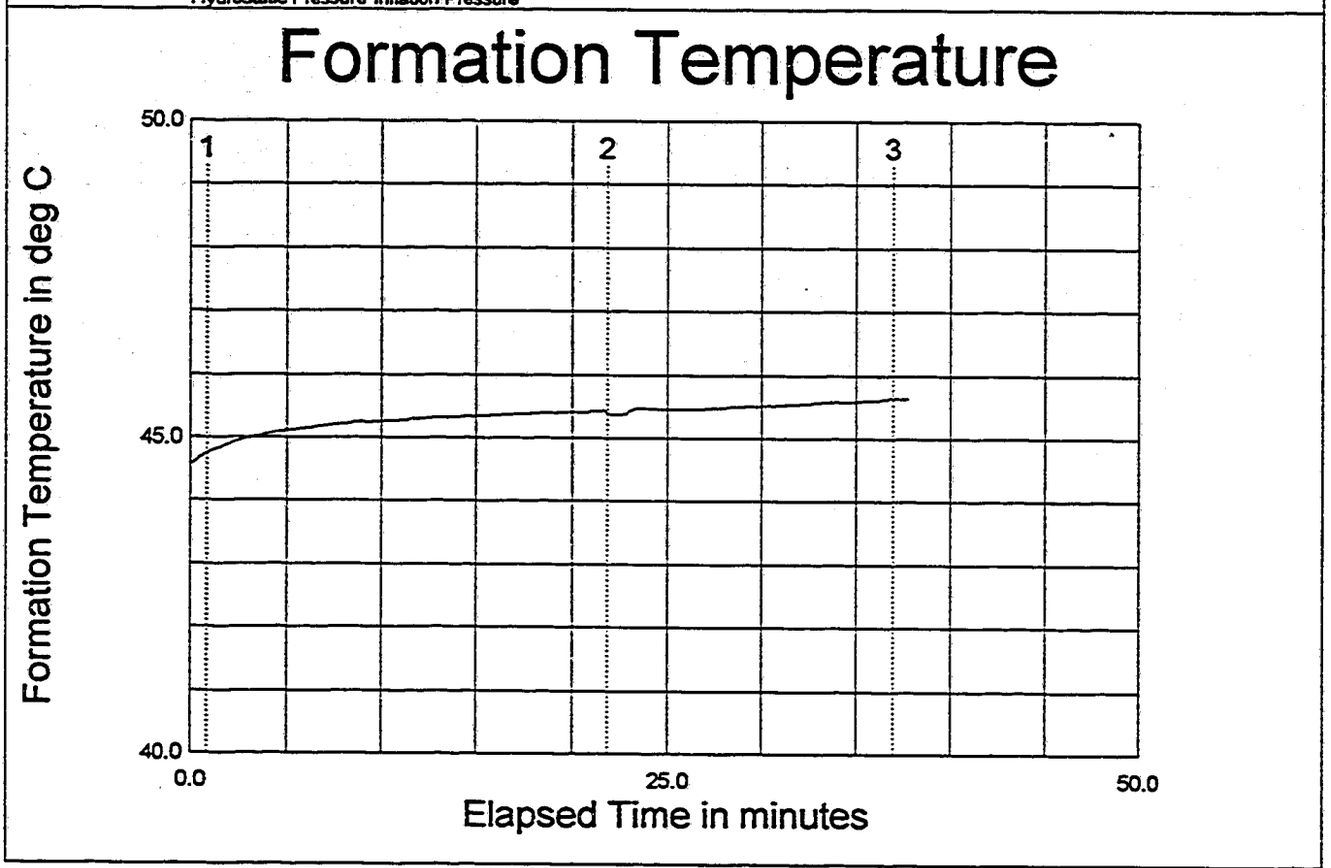




Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
DST #FIVE, MATTSON, 1299.0 - 1329.6 mKB





Downhole Systems Technology Canada Inc.

ELECTRO*TEST* REPORT

UNOCAL CANADA EXPLORATION LIMITED

WELL: UCEL LIARD k-02-80-20-123-30

DST #6: MATTSON (1299.0 - 1329.6mKB)

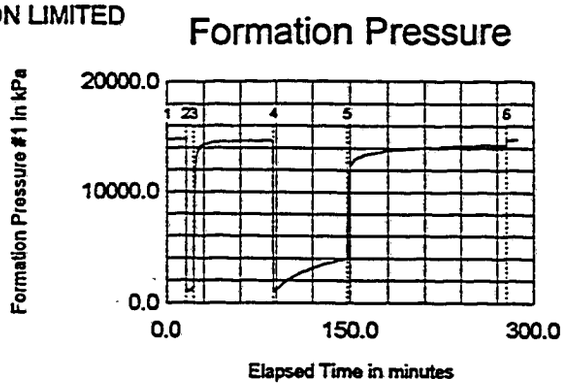
DATE: JANUARY 17, 1997

Downhole
Systems
Technology Canada Inc.

#7, 4539-6th St. N.E.
Calgary, Alberta
T2E 3Z6
(403) 299-1960

DRILL STEM TEST - FINALREPORT

Well Operator		UNOCAL CANADA EXPLORATION LIMITED
Well Name		UCEL LIARD
Location		k-02-60-20-123-30
DST #		SIX
Interval Tested		1299.0 - 1329.6 mKB
Formation		MATTSON
Date		17 JANUARY, 1997
Wellsite Rep.		GABOURY
Test Engineer		JAMES
Wireline Operator		WYRE
Drilling Contractor		CACTUS 1
Well Total Depth		1657.00 meters
Well Elevations	KB	379.30 meters
	GL	374.50 meters
Main Hole Size		222.00 mm



SUMMARY

		Time	Duration	Graph #	Pressure (kPa)	Extrapolated Press.(kPa)	Liq. Rate(m3/d) Average/Final	Gas Rate(m3/d) Average/Final
Initial Hydrostatic				1	14895			
Preflow	Start	04:11:50		2	1289		20.	5135
	End	04:16:40	5	3	1325		26.5	4411
Initial Shut In	End	05:22:35	66	4	14684	14714		
Flow #2	Start	05:22:55		4	1849		22.0	4446
	End	06:22:45	60	5	4043		10.1	3930
Shut In #2	End	08:33:05	130	6	14325	14335		
Final Hydrostatic				6	14811			

Bottom Hole Temperature 45 deg C

Electronics #3, Formation Pressure 1, Ser. # 154775, Depth 1300.9 mKB (all gauges at same depth)

LIQUID RECOVERY	Height	Volume
Water.	303 m	1.048 m3

Samples sent to AGAT Laboratories in Calgary.

RESERVOIR PARAMETERS

Net Pay: 1.0 m Permeability(gas): 0.8 mD
Porosity: 21 % Skin: 2
Sw: 88%

COMMENTS

Successful straddle inflate with real time pressure data and closed chamber flow rates.

A GR/CCL correlation log was run prior to inflating the packers and the packer depth was 1.0 meters high. A depth adjustment of 1.0 meters downward was made.

The preflow was run under closed chamber conditions throughout, with primarily liquid flow indicated.

Radial flow conditions were established during the initial shut in and reservoir anomolies are evident at the end of the buildup.

The second flow period was run open flow conditions through a 6.35mm bean choke. The gas rate at surface reached a maximum of 4550 m3/d and then declined to a final rate of 4330 m3/d.

Radial flow conditions were reached during the final shut in, and reservoir anomolies were again evident. The lower extrapolated pressure may be due to the reservoir anomolies.

If you require additional information contact David Sask at (403) 299-1960.

DOWNHOLE SYSTEMS TECHNOLOGY CANADA INC.

TEST DATE:	17 JANUARY, 1997	DST NUMBER:	SIX
WELL NAME:	UCEL LIARD	INTERVAL:	1299.0 - 1329.6 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

Mud Type Gel Chem
Density 1165.00 kg/cu m
Viscosity 88.00 mPa S
Resistivity 0.00 ohms/m

Fluid Cushion: Nil
Density of recovered fluids (used in liquid rate calculations): 1000 kg/m3
Calculated Fluid Recovery: 303 meters of drilling mud based upon water density.

Reverse Circulated: No

TOOL STRING CONFIGURATION

	Length meters	Inner Diameter mm	Outer Diameter mm
Drill Pipe Above K.B.	1.00	70.21	88.90
Upper Drill Pipe	1126.94	84.00	85.00
Drill Collars	138.28	63.00	120.65
Stabbing Valve	0.50	50.80	120.65
RCV/DBS/XO'S	1.05	60.00	120.65
Drill Collar	27.43	63.00	120.65
Hydraulic Jars	2.00	50.80	127.00
Safety Joint	1.35	25.40	127.00
Top Packer	2.45	22.25	139.70
Top of Interval	**1299.00**		
Packer Stub	0.80	0.00	127.00
Downhole Flow Valve	0.92	0.00	127.00
Electronics Section	1.51	0.00	127.00
Inflation Pump	2.44	0.00	127.00
Spacer Pipe	24.35	0.00	127.00
Packer Stub	0.57	0.00	127.00
Bottom of Interval	**1329.59**		
Total Interval	**30.59**		
Bottom Packer	2.40	0.00	139.70

Test Tool Choke Diameter	22.50 mm	
Surface Choke	6.35 mm	Bean Choke
Total String Volume	6.76 cu m	
Initial Closed Chamber Gas Volume	6.76 cu m	
Annular Volume	0.80 cu m	

TEST DATE:	17 JANUARY, 1997	DST NUMBER:	SIX
WELL NAME:	UCEL LIARD	INTERVAL:	1299.0 - 1329.6 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER INFLATION

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
03:55:50	00:00:00	14861.46	885.45	101.96	15027.68	14878.08	149.61
03:56:05	00:00:15	14859.91	882.37	101.86	15101.62	14876.53	225.09
03:56:20	00:00:30	14856.85	879.80	101.53	15133.80	14873.47	260.32
03:56:35	00:00:45	14855.81	878.25	102.63	15164.46	14872.44	292.03
03:56:50	00:01:00	14854.28	875.69	103.26	15187.08	14870.40	316.69
03:57:05	00:01:15	14852.74	873.63	103.21	15205.68	14868.86	336.82
03:57:20	00:01:30	14851.71	872.09	102.98	15221.25	14868.33	352.92
03:57:35	00:01:45	14851.69	871.05	103.34	15234.32	14867.30	367.01
03:57:50	00:02:00	14850.16	870.52	102.42	15241.34	14866.28	375.07
03:58:05	00:02:15	14849.13	869.49	103.14	15255.42	14865.75	389.66
03:58:20	00:02:30	14848.11	868.96	104.23	15267.98	14864.23	403.75
03:58:35	00:02:45	14824.43	868.94	102.35	15290.61	14845.08	445.53
03:58:50	00:03:00	14794.20	868.92	102.62	15351.98	14824.43	527.56
03:59:05	00:03:15	14795.70	868.40	102.94	15471.22	14825.42	645.80
03:59:20	00:03:30	14817.33	867.37	102.75	15686.57	14839.00	847.57
03:59:35	00:03:45	14832.93	866.85	102.92	15847.56	14850.56	997.00
03:59:50	00:04:00	14838.96	866.33	102.78	15942.14	14854.58	1087.57
04:00:05	00:04:15	14842.97	866.31	103.87	16007.54	14857.58	1149.95
04:00:20	00:04:30	14842.97	866.31	102.63	16007.54	14857.58	1149.96
04:00:35	00:04:45	14844.97	864.26	103.81	16095.56	14860.58	1234.98
04:00:50	00:05:00	14844.97	864.26	102.85	16095.56	14860.58	1234.98
04:01:20	00:05:30	14847.97	864.26	103.61	16095.56	14860.58	1234.98
04:01:50	00:06:00	14847.95	865.73	103.51	16095.56	14859.03	1236.53
04:02:20	00:06:30	14845.91	863.68	103.04	15603.43	14861.53	741.90
04:02:50	00:07:00	14833.31	864.17	103.53	15651.72	14847.42	804.30
04:03:20	00:07:30	14835.81	863.14	102.88	16278.11	14847.41	1430.71
04:03:50	00:08:00	14836.83	863.66	102.87	17363.22	14858.49	2504.73
04:04:20	00:08:30	14834.80	863.14	103.32	17048.31	14855.96	2192.36
04:04:50	00:09:00	14834.79	862.62	103.04	16915.00	14855.95	2059.05
04:05:20	00:09:30	14834.28	862.61	103.35	16853.11	14855.94	1997.17
04:05:50	00:10:00	14834.77	861.58	102.89	16810.84	14856.43	1954.42
04:06:20	00:10:30	14834.26	861.07	103.80	16778.64	14855.41	1923.23
04:06:50	00:11:00	14834.75	861.06	102.42	16750.96	14854.40	1896.56
04:07:20	00:11:30	14834.24	860.54	103.92	16728.82	14854.89	1873.93
04:07:50	00:12:00	14834.23	860.53	103.32	16708.69	14855.39	1853.30
04:08:20	00:12:30	14833.72	861.03	103.86	16687.05	14854.38	1832.68
04:08:50	00:13:00	14832.71	860.52	104.09	16663.40	14853.36	1810.04
04:09:20	00:13:30	14832.70	860.00	104.41	16642.27	14852.85	1789.41
04:09:50	00:14:00	14830.18	859.99	104.31	16717.72	14851.33	1866.39
04:10:20	00:14:30	14830.68	860.49	103.85	16621.63	14851.83	1769.79
04:10:50	00:15:00	14831.68	859.47	103.11	16615.08	14853.34	1761.75
04:11:20	00:15:30	14827.64	860.48	104.16	16599.48	14857.86	1741.62

TEST DATE:	17 JANUARY, 1997	DST NUMBER:	SIX
WELL NAME:	UCEL LIARD	INTERVAL:	1299.0 - 1329.6 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PREFLOW

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Liquid Flowrate m3/d	Surface Gas Flowrate m3/d	Total Gas Flowrate m3/d	Gas Liquid Ratio m3/m3	Formation Temp. deg C
04:11:50	00:00:00	1289.22	1023.40	104.43	-1824.23	0.00	1884.77	-1.03	44.36
04:12:05	00:00:15	1037.73	903.03	116.58	-1529.93	0.00	1826.60	-1.19	44.35
04:12:20	00:00:30	932.17	785.16	135.04	-1150.04	0.00	3500.62	-3.04	44.35
04:12:35	00:00:45	977.62	886.32	148.88	-762.64	0.00	4360.78	-5.72	44.36
04:12:50	00:01:00	1015.49	852.42	161.27	-471.04	0.00	4658.71	-9.89	44.37
04:13:05	00:01:15	1062.95	919.18	174.70	-283.12	0.00	4806.10	-16.98	44.38
04:13:20	00:01:30	1121.02	883.26	188.31	-176.22	0.00	4884.47	-27.72	44.39
04:13:35	00:01:45	1164.45	944.45	200.01	-87.63	0.00	4757.24	-54.28	44.40
04:13:50	00:02:00	1118.49	920.17	213.44	-43.68	0.00	4695.01	-107.48	44.40
04:14:05	00:02:15	1118.99	1008.67	226.55	-9.12	0.00	4655.14	-510.37	44.41
04:14:20	00:02:30	1119.49	964.16	239.57	-13.44	0.00	4708.73	-350.26	44.41
04:14:35	00:02:45	1145.24	1009.17	251.23	-0.68	0.00	4618.33	-6743.84	44.42
04:14:50	00:03:00	1155.84	1038.00	263.79	8.40	0.00	4609.67	548.78	44.42
04:15:05	00:03:15	1185.63	1051.65	277.36	11.15	0.00	4611.21	413.41	44.43
04:15:20	00:03:30	1204.82	1086.54	289.10	12.72	0.00	4602.78	361.87	44.43
04:15:35	00:03:45	1234.61	1110.31	302.53	18.45	0.00	4563.00	247.32	44.44
04:15:50	00:04:00	1248.75	1136.10	314.05	17.21	0.00	4525.54	262.98	44.44
04:16:05	00:04:15	1267.93	1156.32	326.06	18.48	0.00	4431.58	239.78	44.44
04:16:20	00:04:30	1306.82	1208.42	339.73	26.46	0.00	4476.62	169.19	44.44
04:16:35	00:04:45	1307.32	1222.07	351.88	22.84	0.00	4463.15	195.42	44.44
04:16:40	00:04:48	1325.50	1256.96	355.22	26.46	0.00	4411.20	166.69	44.45

TEST DATE:	17 JANUARY, 1997	DST NUMBER:	SIX
WELL NAME:	UCEL LIARD	INTERVAL:	1299.0 - 1329.6 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

INITIAL SHUT IN

Time	Elapsed Time	Formation Pressure #1 kPa	Formation Pressure #2 kPa	Transducer Difference kPa	Recovery Pressure kPa	Surface Pressure kPa	Formation Temp. deg C	Hydrostatic Pressure kPa
04:16:45	00:00:00	1402.76	1454.62	-51.86	1068.32	360.24	44.45	14853.29
04:17:45	00:01:00	8715.90	8749.25	-33.35	1090.02	373.43	44.49	14861.82
04:18:45	00:02:00	12428.46	12442.92	-14.46	1118.88	377.63	44.46	14855.80
04:19:45	00:03:00	13433.27	13444.38	-11.11	1316.14	378.30	44.44	14857.83
04:20:45	00:04:00	13833.13	13843.12	-9.98	1341.95	379.11	44.42	14857.84
04:21:45	00:05:00	14032.05	14040.97	-8.92	1345.49	377.68	44.42	14858.35
04:22:45	00:06:00	14152.40	14160.77	-8.37	1351.56	378.35	44.42	14859.36
04:23:45	00:07:00	14230.44	14239.28	-8.83	1355.60	379.66	44.43	14860.36
04:24:45	00:08:00	14286.32	14295.62	-9.30	1358.61	379.64	44.45	14859.84
04:25:45	00:09:00	14329.10	14337.86	-8.76	1362.63	380.07	44.47	14860.82
04:26:45	00:10:00	14363.31	14371.52	-8.21	1365.13	379.22	44.51	14861.30
04:28:45	00:12:00	14413.61	14422.74	-9.14	1370.11	380.36	44.58	14861.74
04:30:45	00:14:00	14453.32	14462.36	-9.05	1375.09	379.35	44.66	14862.18
04:32:45	00:16:00	14483.46	14490.90	-7.44	1379.05	380.47	44.74	14861.10
04:34:45	00:18:00	14507.05	14515.91	-8.86	1381.99	380.52	44.83	14860.52
04:36:45	00:20:00	14526.61	14535.89	-9.28	1384.94	380.31	44.91	14860.95
04:38:45	00:22:00	14543.16	14552.36	-9.20	1387.39	379.25	44.99	14859.88
04:40:45	00:24:00	14557.20	14566.33	-9.12	1389.85	379.36	45.06	14859.32
04:42:45	00:26:00	14569.73	14578.78	-9.05	1391.29	379.95	45.13	14858.75
04:44:45	00:28:00	14580.25	14590.24	-9.99	1392.23	380.22	45.20	14858.19
04:46:45	00:30:00	14591.27	14600.70	-9.42	1394.20	381.03	45.26	14859.15
04:48:45	00:32:00	14600.29	14608.65	-8.36	1395.15	380.48	45.31	14859.60
04:50:45	00:34:00	14607.29	14617.11	-9.82	1395.60	381.02	45.37	14859.05
04:52:45	00:36:00	14616.82	14625.08	-8.26	1397.07	379.20	45.41	14858.01
04:54:45	00:38:00	14623.83	14632.05	-8.22	1397.53	379.40	45.46	14857.97
04:56:45	00:40:00	14629.34	14638.02	-8.68	1398.50	379.15	45.50	14857.94
04:58:45	00:42:00	14635.35	14643.48	-8.14	1398.97	379.74	45.53	14857.40
05:00:45	00:44:00	14640.85	14649.46	-8.61	1399.95	379.50	45.57	14856.87
05:02:45	00:46:00	14645.36	14654.43	-9.08	1399.91	379.44	45.60	14855.83
05:04:45	00:48:00	14650.87	14659.92	-9.05	1400.90	378.83	45.63	14855.31
05:06:45	00:50:00	14655.88	14664.40	-8.51	1401.88	378.17	45.66	14855.28
05:08:45	00:52:00	14659.39	14668.38	-8.99	1402.36	378.74	45.68	14856.27
05:10:45	00:54:00	14663.39	14672.36	-8.97	1402.84	376.33	45.71	14855.74
05:12:45	00:56:00	14666.90	14676.35	-9.45	1401.81	362.41	45.73	14854.72
05:14:45	00:58:00	14671.41	14679.83	-8.42	1394.70	351.04	45.75	14854.70
05:16:45	01:00:00	14674.92	14683.32	-8.40	1385.58	343.45	45.77	14854.18
05:21:45	01:05:00	14682.94	14691.30	-8.36	1128.63	106.28	45.81	14853.64
05:22:35	01:05:48	14683.92	14692.74	-8.82	1127.58	104.57	45.85	14853.10

TEST DATE:	17 JANUARY, 1997	DST NUMBER:	SIX
WELL NAME:	UCEL LIARD	INTERVAL:	1299.0 - 1329.6 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

SECOND FLOW PERIOD

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Liquid Flowrate m3/d	Surface Gas Flowrate m3/d	Total Gas Flowrate m3/d	Gas Liquid Ratio m3/m3	Formation Temp. deg C
05:22:55	00:00:00	1849.01	1586.33	105.85	-2084.97	587.35	2803.42	-1.34	45.77
05:23:10	00:00:15	1302.16	1143.35	119.69	-1846.66	664.16	3451.29	-1.87	45.76
05:23:25	00:00:30	1144.09	1047.76	177.54	-1422.32	985.20	7524.04	-5.29	45.77
05:23:40	00:00:45	1121.86	1029.54	191.20	-1004.43	1060.99	9293.12	-9.25	45.77
05:23:55	00:01:00	1139.03	1021.44	191.01	-650.93	1059.93	7866.48	-12.08	45.78
05:24:25	00:01:30	1181.44	1099.83	181.08	-215.14	1004.81	3314.30	-15.41	45.79
05:24:55	00:02:00	1209.22	1098.31	176.03	-50.54	976.81	1068.78	-21.14	45.79
05:25:25	00:02:30	1230.43	1151.42	170.63	5.75	946.83	293.99	51.11	45.78
05:25:55	00:03:00	1249.14	1144.87	186.10	12.04	1032.73	1177.85	97.81	45.76
05:26:25	00:03:30	1281.98	1226.83	216.71	12.86	1202.59	4563.38	354.93	45.73
05:26:55	00:04:00	1341.10	1270.87	245.80	15.00	1364.09	6029.47	402.07	45.69
05:27:25	00:04:30	1399.21	1332.61	275.40	16.56	1528.40	6572.47	396.89	45.65
05:27:55	00:05:00	1447.73	1378.68	305.68	14.79	1696.54	6866.92	464.41	45.60
05:28:55	00:06:00	1555.39	1495.61	344.35	22.65	1911.33	5746.70	253.66	45.48
05:29:55	00:07:00	1654.48	1612.05	381.97	25.67	2120.39	5489.79	213.85	45.35
05:30:55	00:08:00	1734.88	1696.12	408.92	26.85	2270.24	4952.11	184.43	45.21
05:31:55	00:09:00	1841.54	1795.88	444.20	26.04	2466.45	5116.08	196.46	45.06
05:32:55	00:10:00	1927.00	1878.94	472.30	23.55	2622.76	5021.97	213.26	44.92
05:33:55	00:11:00	2010.92	1935.70	499.84	13.86	2776.05	5118.93	369.41	44.78
05:34:55	00:12:00	2080.20	1964.14	523.37	4.19	2907.05	5060.69	1208.06	44.65
05:35:55	00:13:00	2154.02	1994.09	545.45	2.66	3029.96	5054.75	1900.27	44.53
05:36:55	00:14:00	2215.70	2017.46	569.39	0.86	3163.27	5161.04	6004.44	44.42
05:37:55	00:15:00	2282.93	2038.79	587.55	0.80	3264.40	4996.14	6239.14	44.32
05:38:55	00:16:00	2350.66	2058.60	605.92	0.52	3366.77	5030.00	9644.11	44.23
05:39:55	00:17:00	2410.80	2081.43	624.85	1.29	3472.19	5209.64	4048.04	44.15
05:40:55	00:18:00	2473.97	2109.30	642.64	3.11	3571.24	5204.06	1673.33	44.08
05:41:55	00:19:00	2532.59	2150.32	659.23	8.60	3663.66	5129.00	596.58	44.02
05:42:55	00:20:00	2591.19	2174.64	673.64	4.11	3743.88	5057.44	1231.55	43.96
05:43:55	00:21:00	2643.74	2196.93	688.67	3.72	3827.62	5087.87	1368.45	43.91
05:44:55	00:22:00	2697.79	2218.21	699.32	4.02	3886.95	4854.04	1208.86	43.86
05:45:55	00:23:00	2748.30	2236.95	708.55	3.66	3938.37	4740.53	1293.99	43.82
05:46:55	00:24:00	2798.80	2253.16	716.40	3.71	3982.13	4721.14	1271.31	43.79
05:47:55	00:25:00	2848.30	2267.85	723.11	3.22	4019.52	4608.02	1429.16	43.76
05:48:55	00:26:00	2892.23	2282.53	730.64	2.95	4061.44	4688.78	1588.99	43.74
05:49:55	00:27:00	2939.19	2298.73	734.92	3.98	4085.31	4530.94	1137.95	43.72
05:50:55	00:28:00	2980.60	2315.93	741.12	4.35	4119.82	4589.65	1054.97	43.70
05:51:55	00:29:00	3027.55	2330.09	745.26	4.17	4142.88	4511.51	1081.15	43.69
05:52:55	00:30:00	3053.90	2345.27	749.39	4.59	4165.89	4463.17	972.01	43.68
05:54:55	00:32:00	3147.19	2375.61	756.87	4.60	4207.50	4444.60	967.01	43.67
05:56:55	00:34:00	3229.46	2405.43	760.99	5.18	4230.42	4354.96	840.43	43.67
05:58:55	00:36:00	3304.67	2433.23	763.33	5.38	4554.63	4570.09	849.22	43.67
06:00:55	00:38:00	3375.32	2459.00	763.05	6.05	4552.90	4313.13	712.77	43.68
06:02:55	00:40:00	3445.46	2485.77	762.38	5.66	4548.85	4455.97	786.93	43.69
06:04:55	00:42:00	3511.56	2512.03	759.64	5.92	4532.40	4360.71	736.43	43.71
06:06:55	00:44:00	3577.65	2549.92	757.50	9.27	4519.56	4332.61	467.62	43.73
06:08:55	00:46:00	3640.72	2580.72	752.16	6.81	4487.62	4201.49	616.55	43.76
06:10:55	00:48:00	3704.79	2605.46	745.70	6.35	4448.99	4089.41	644.19	43.78
06:12:55	00:50:00	3762.80	2628.68	740.04	6.11	4415.12	4043.90	661.79	43.80
06:14:55	00:52:00	3818.80	2650.39	733.85	9.21	4378.12	4049.08	439.65	43.83
06:16:55	00:54:00	3881.86	2672.60	725.43	10.11	4327.83	3932.14	388.76	43.85

TEST DATE:	17 JANUARY, 1997	DST NUMBER:	SIX
WELL NAME:	UCEL LIARD	INTERVAL:	1299.0 - 1329.6 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

SECOND SHUTIN

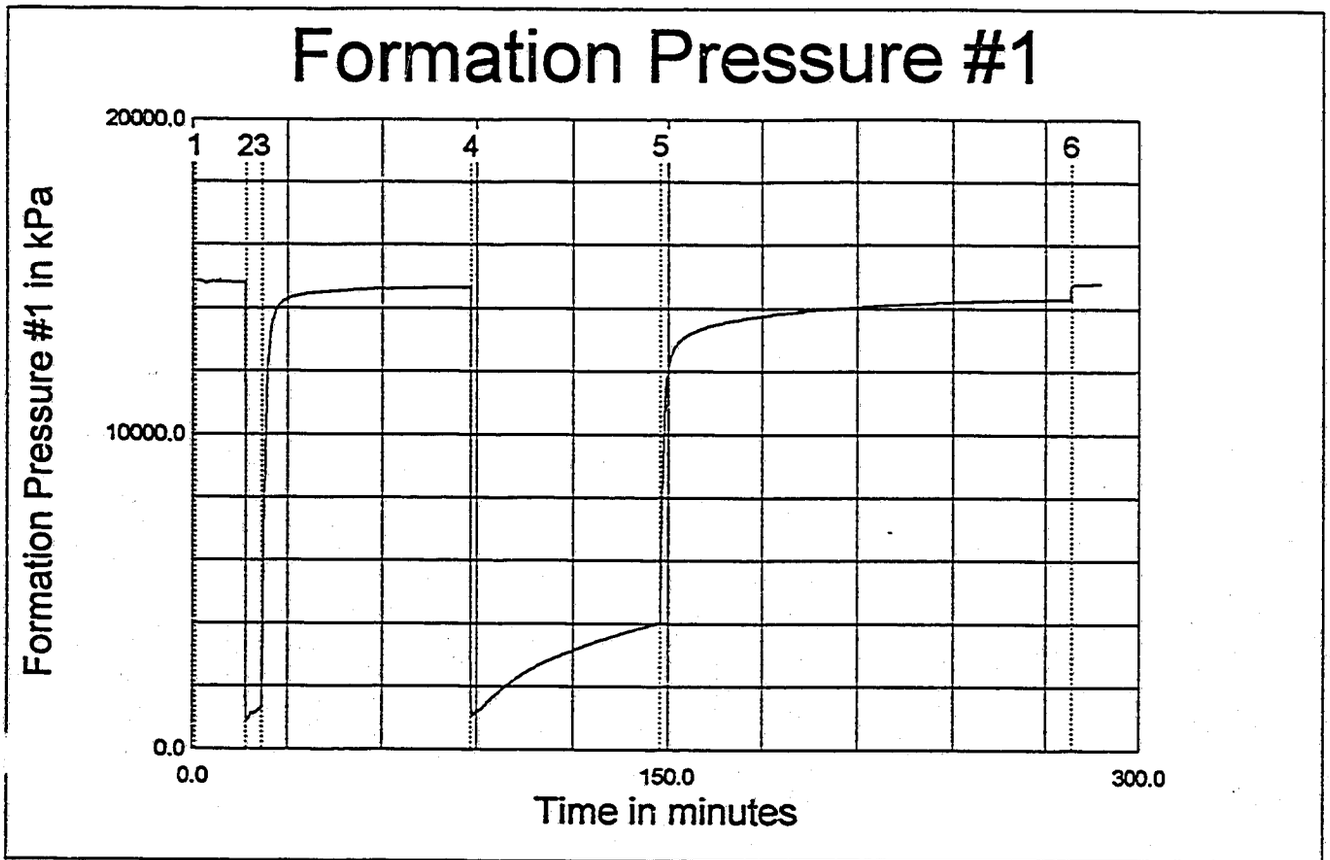
Time	Elapsed Time	Formation Pressure #1 kPa	Formation Pressure #2 kPa	Transducer Difference kPa	Recovery Pressure kPa	Surface Pressure kPa	Formation Temp. deg C	Hydrostatic Pressure kPa
06:22:50	00:00:00	4123.00	4172.85	-49.84	4004.79	700.36	43.93	14841.66
06:23:50	00:01:00	9904.78	9925.64	-20.87	3986.07	684.09	43.96	14856.73
06:24:50	00:02:00	11785.61	11798.75	-13.14	3991.61	665.35	43.98	14857.22
06:25:50	00:03:00	12408.71	12418.58	-9.88	3992.59	650.13	44.00	14856.19
06:26:50	00:04:00	12693.27	12703.54	-10.26	3998.13	636.11	44.02	14855.17
06:27:50	00:05:00	12860.47	12870.65	-10.18	4008.20	622.48	44.04	14852.63
06:28:50	00:06:00	12972.77	12981.89	-9.12	4019.30	612.79	44.06	14851.11
06:29:50	00:07:00	13058.38	13067.46	-9.08	4028.88	605.16	44.07	14850.59
06:30:50	00:08:00	13128.38	13137.93	-9.55	4039.99	594.87	44.08	14849.08
06:31:50	00:09:00	13185.79	13194.82	-9.03	4047.56	586.50	44.08	14848.07
06:32:50	00:10:00	13236.15	13244.66	-8.50	4053.62	575.66	44.08	14847.57
06:34:50	00:12:00	13319.76	13329.26	-9.49	4074.34	548.82	44.07	14846.06
06:36:50	00:14:00	13395.31	13403.27	-7.96	4070.81	515.90	44.07	14846.07
06:38:50	00:16:00	13453.22	13461.66	-8.44	4064.23	489.93	44.07	14845.56
06:40:50	00:18:00	13507.59	13516.49	-8.90	4059.16	469.24	44.10	14848.06
06:42:50	00:20:00	13555.41	13564.26	-8.85	4061.65	446.68	44.13	14848.03
06:44:50	00:22:00	13600.70	13610.50	-9.80	4064.14	418.35	44.17	14848.50
06:46:50	00:24:00	13639.94	13649.19	-9.25	4066.62	393.96	44.21	14849.97
06:48:50	00:26:00	13675.66	13685.86	-10.20	4049.40	367.82	44.25	14848.93
06:50:50	00:28:00	13709.36	13719.00	-9.64	4027.64	343.46	44.30	14849.39
06:52:50	00:30:00	13741.54	13751.12	-9.58	4006.88	317.97	44.35	14849.85
06:57:50	00:35:00	13810.93	13819.86	-8.93	3955.74	258.38	44.48	14849.24
07:02:50	00:40:00	13869.74	13879.04	-9.29	3898.03	203.25	44.60	14848.63
07:07:50	00:45:00	13921.52	13930.69	-9.17	3808.52	106.97	44.71	14848.54
07:12:50	00:50:00	13967.28	13977.36	-10.09	3822.58	106.49	44.79	14848.47
07:17:50	00:55:00	14007.01	14017.53	-10.52	3825.55	105.20	44.85	14847.42
07:22:50	01:00:00	14043.74	14054.21	-10.47	3828.04	106.06	44.89	14846.38
07:27:50	01:05:00	14076.45	14086.88	-10.43	3828.01	106.01	44.91	14846.86
07:32:50	01:10:00	14106.15	14117.06	-10.92	3826.99	107.57	44.93	14844.33
07:37:50	01:15:00	14133.84	14143.23	-9.39	3826.99	106.43	44.93	14845.84
07:42:50	01:20:00	14158.51	14168.40	-9.89	3826.99	106.11	44.93	14844.83
07:47:50	01:25:00	14180.17	14191.56	-11.39	3825.47	105.62	44.93	14844.33
07:52:50	01:30:00	14201.82	14213.20	-11.38	3826.48	105.50	44.93	14843.82
07:57:50	01:35:00	14221.96	14232.32	-10.37	3826.48	106.04	44.93	14842.81
08:02:50	01:40:00	14240.08	14250.44	-10.36	3826.48	106.99	44.93	14842.81
08:07:50	01:45:00	14256.70	14267.05	-10.35	3826.47	104.87	44.94	14842.81
08:12:50	01:50:00	14272.80	14283.64	-10.84	3827.98	106.01	44.95	14843.30
08:17:50	01:55:00	14286.39	14297.22	-10.83	3827.97	106.88	44.95	14842.29
08:22:50	02:00:00	14299.48	14309.79	-10.31	3828.47	106.51	44.96	14841.28
08:27:50	02:05:00	14312.56	14322.86	-10.30	3828.46	104.04	44.97	14841.27
08:32:50	02:10:00	14324.64	14334.93	-10.29	3829.46	104.24	44.98	14841.26
08:33:05	02:10:15	14325.12	14336.90	-11.77	3828.93	104.34	45.00	14760.19

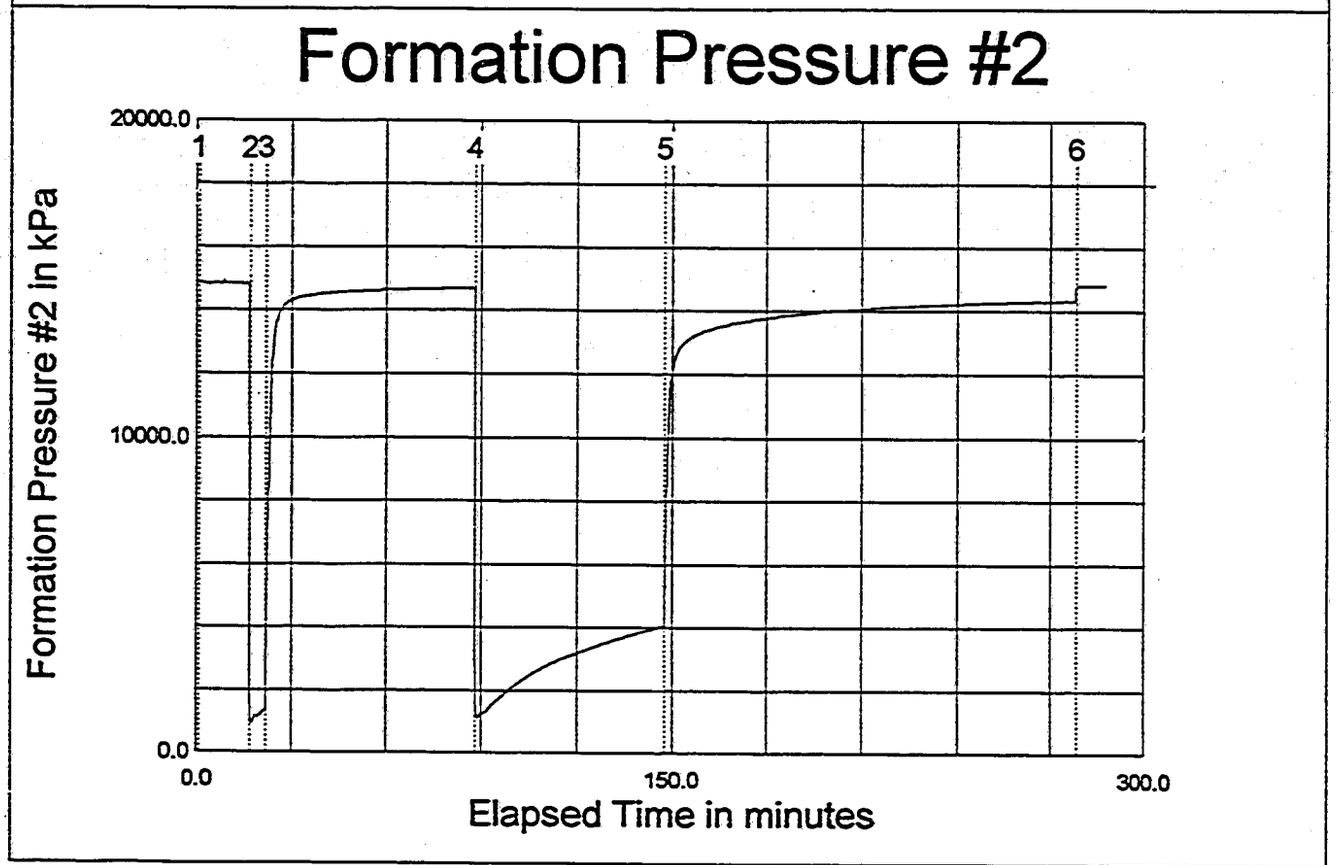
TEST DATE:	17 JANUARY, 1997	DST NUMBER:	SIX
WELL NAME:	UCEL LIARD	INTERVAL:	1299.0 - 1329.6 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER DEFLATION

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
08:34:05	00:00:00	14782.84	3830.97	104.82	15945.48	14811.06	1134.43
08:34:20	00:00:15	14784.35	3830.97	103.64	15941.46	14812.57	1128.89
08:34:35	00:00:30	14786.87	3831.48	104.97	15939.45	14814.08	1125.37
08:34:50	00:00:45	14787.86	3831.96	104.47	15937.41	14815.06	1122.35
08:35:05	00:01:00	14773.78	3833.50	104.98	14945.15	14810.55	134.60
08:35:20	00:01:15	14788.38	3829.96	104.48	14902.38	14814.58	87.80
08:35:35	00:01:30	14785.35	3830.46	103.66	14871.68	14811.05	60.63
08:35:50	00:01:45	14789.38	3830.97	104.17	14852.56	14811.05	41.51
08:36:05	00:02:00	14786.36	3831.47	105.59	14832.93	14807.02	25.91
08:36:20	00:02:15	14785.86	3830.97	104.04	14822.36	14805.01	17.35
08:36:35	00:02:30	14787.87	3830.96	104.96	14817.83	14807.52	10.31
08:36:50	00:02:45	14788.87	3831.97	105.14	14814.81	14808.53	6.28
08:37:05	00:03:00	14790.38	3831.97	104.60	14813.80	14810.54	3.26
08:37:20	00:03:15	14794.91	3832.97	105.29	14816.82	14815.07	1.75
08:37:35	00:03:30	14796.42	3832.46	104.24	14816.81	14816.57	0.24
08:37:50	00:03:45	14797.92	3832.46	104.47	14816.81	14817.07	-0.26
08:38:00	00:03:54	14797.42	3832.96	105.16	14816.30	14800.46	15.85

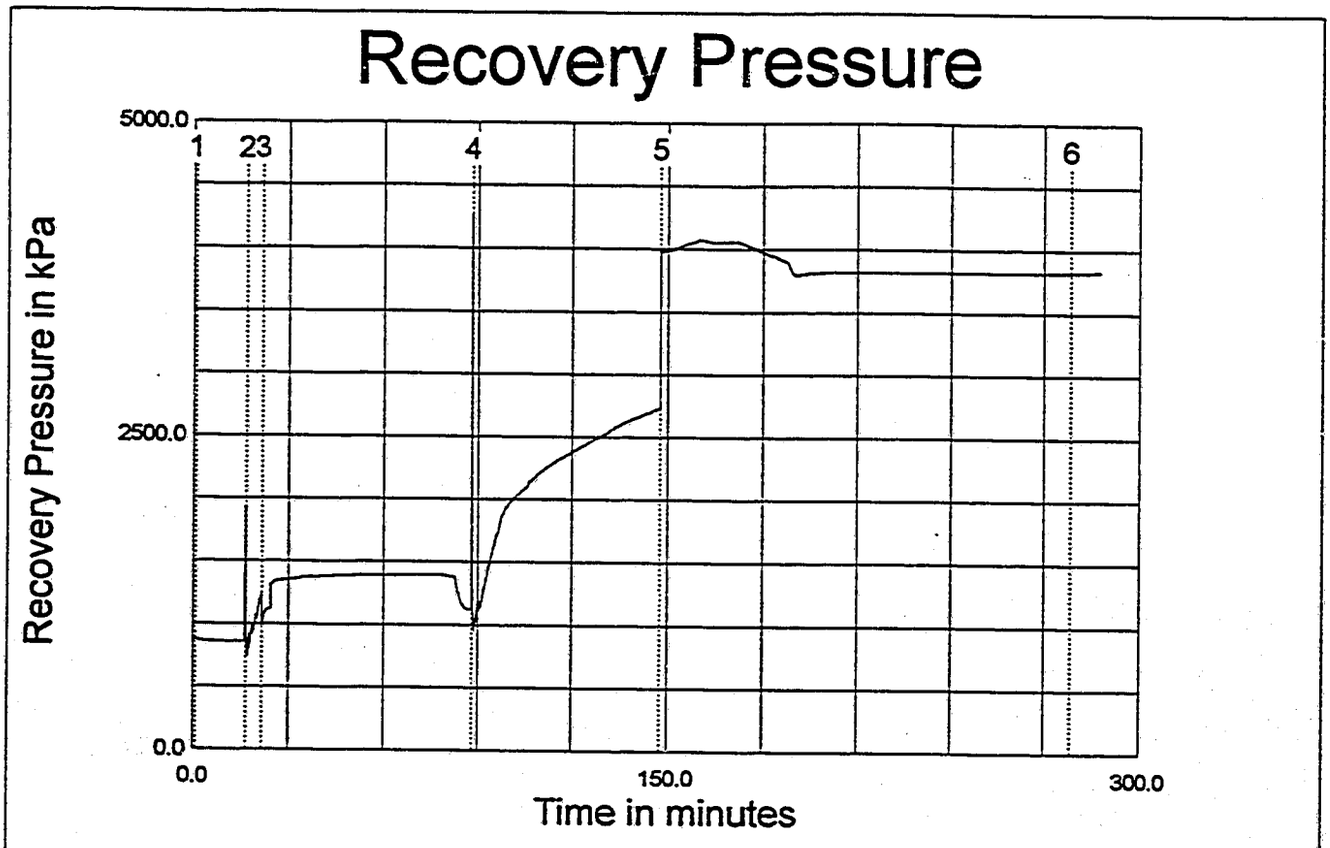
UCEL LIARD k-02-60-20-123-30
DST #SIX, MATTSON, 1299.0 - 1329.6 mKB

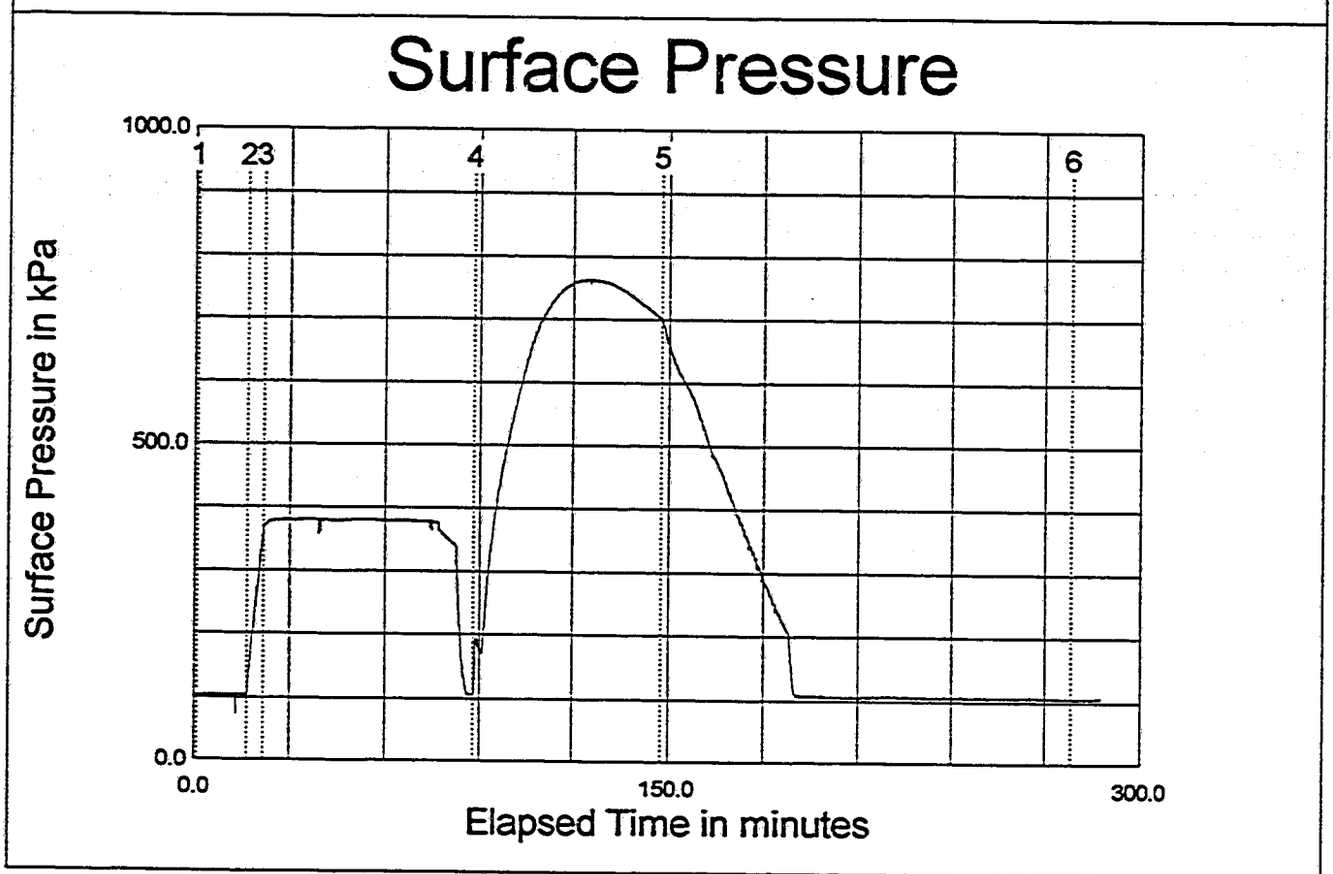




Downhole Systems Technology Canada Inc.

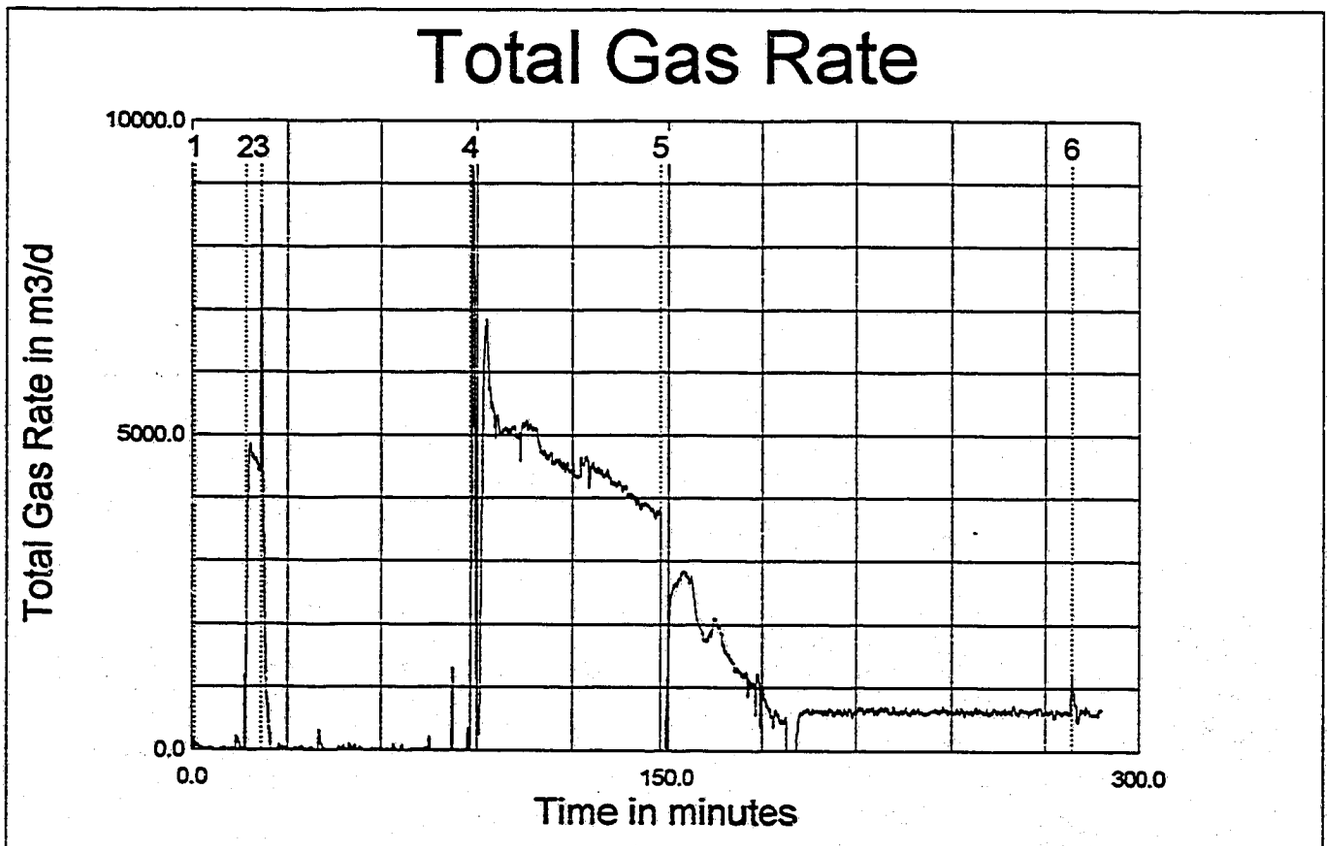
UCEL LIARD k-02-60-20-123-30
DST #SIX, MATTSON, 1299.0 - 1329.6 mKB

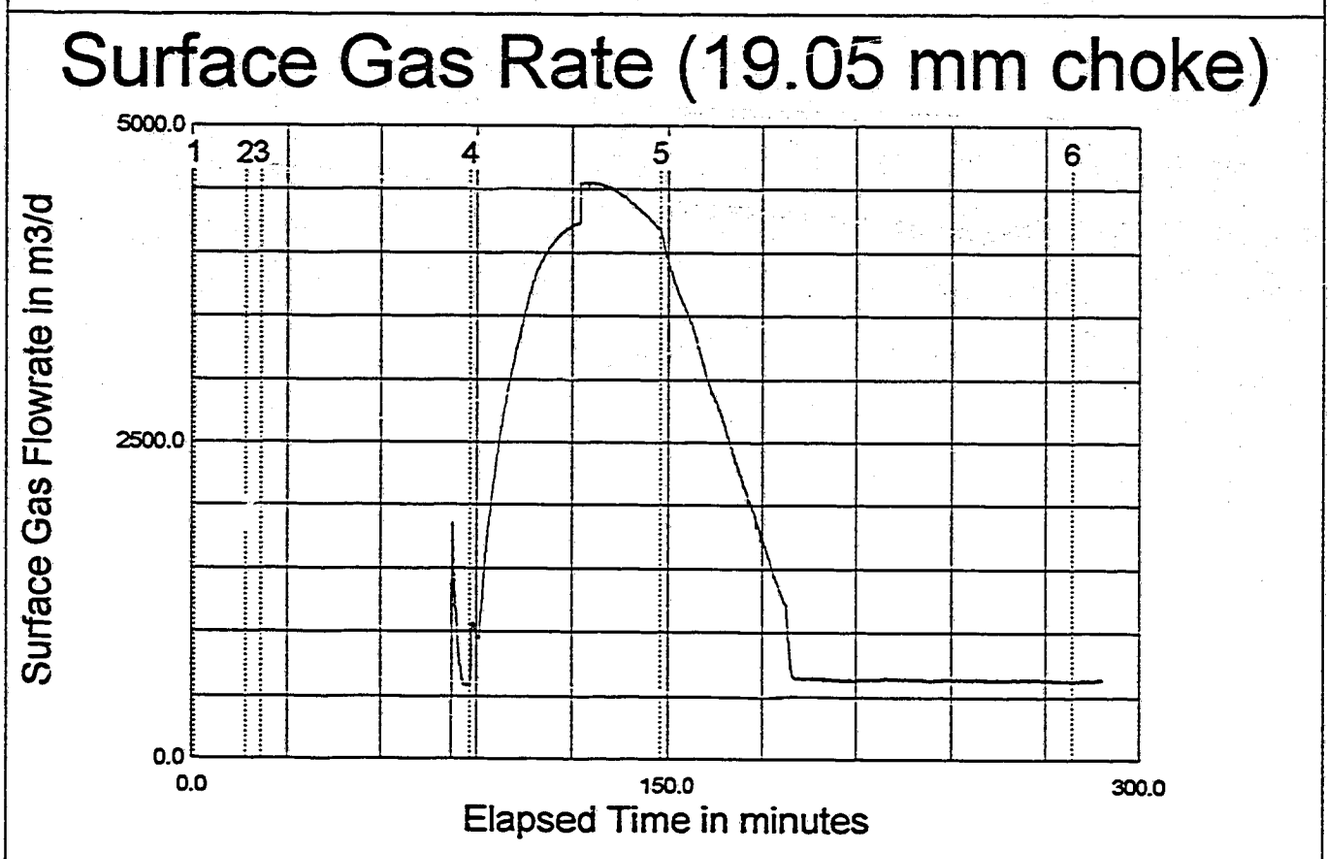




Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
DST #SIX, MATTSON, 1299.0 - 1329.6 mKB





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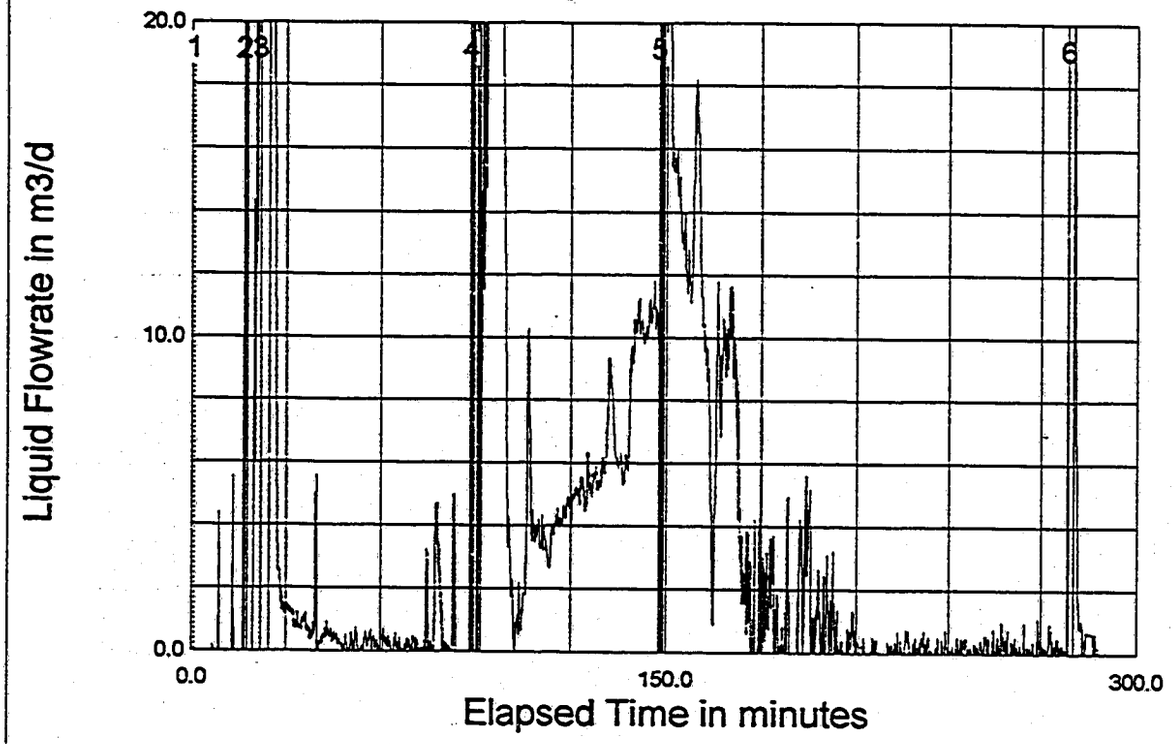
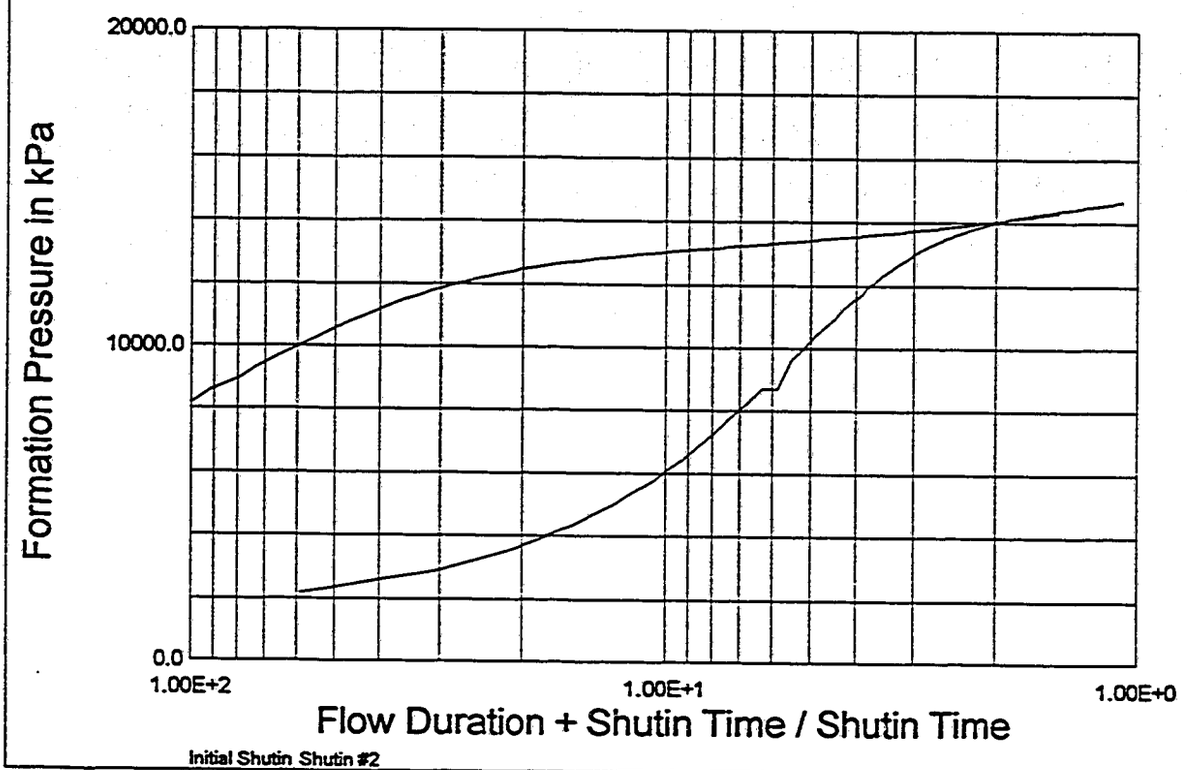
UCEL LIARD k-02-60-20-123-30
DST #SIX, MATTSON, 1299.0 - 1329.6 mKB

Liquid Rate

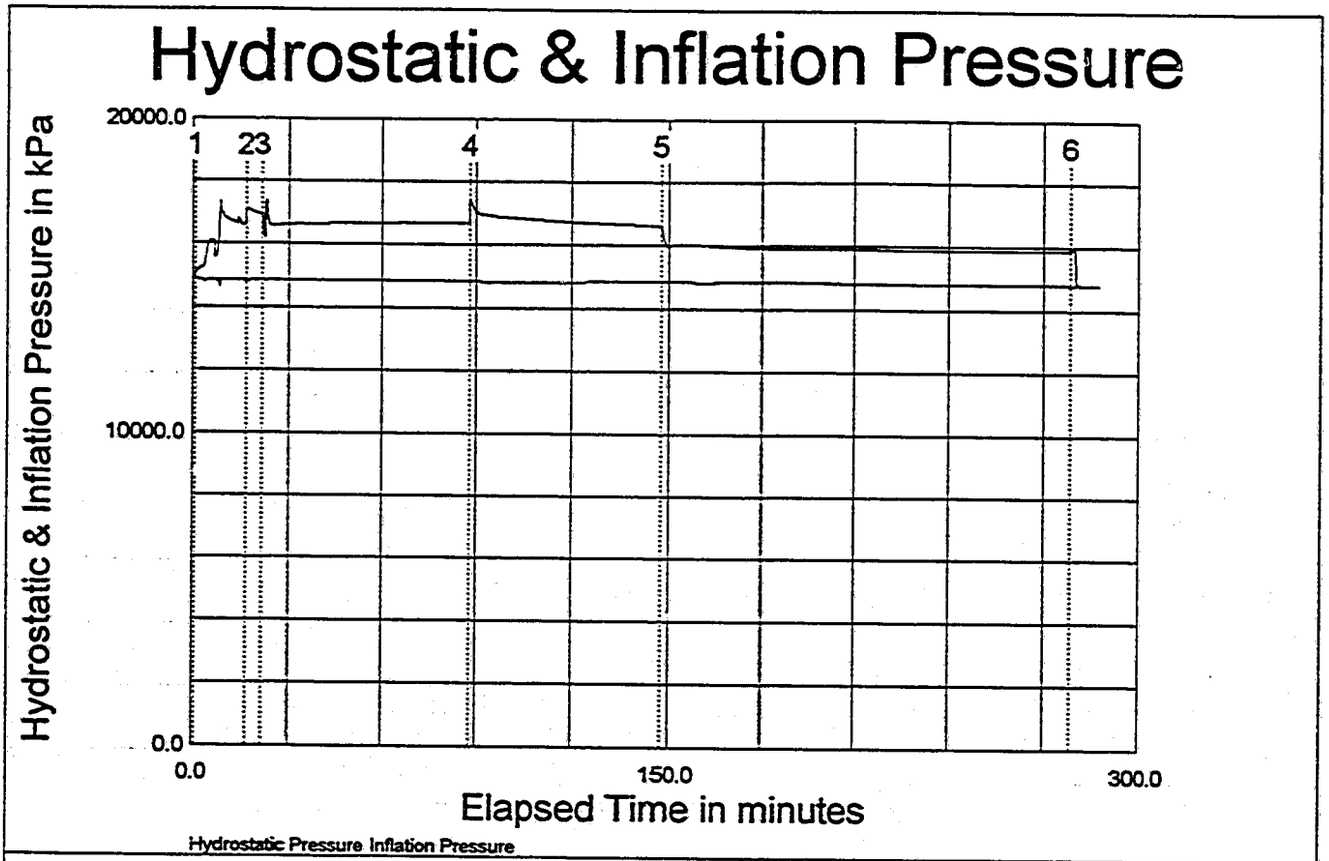


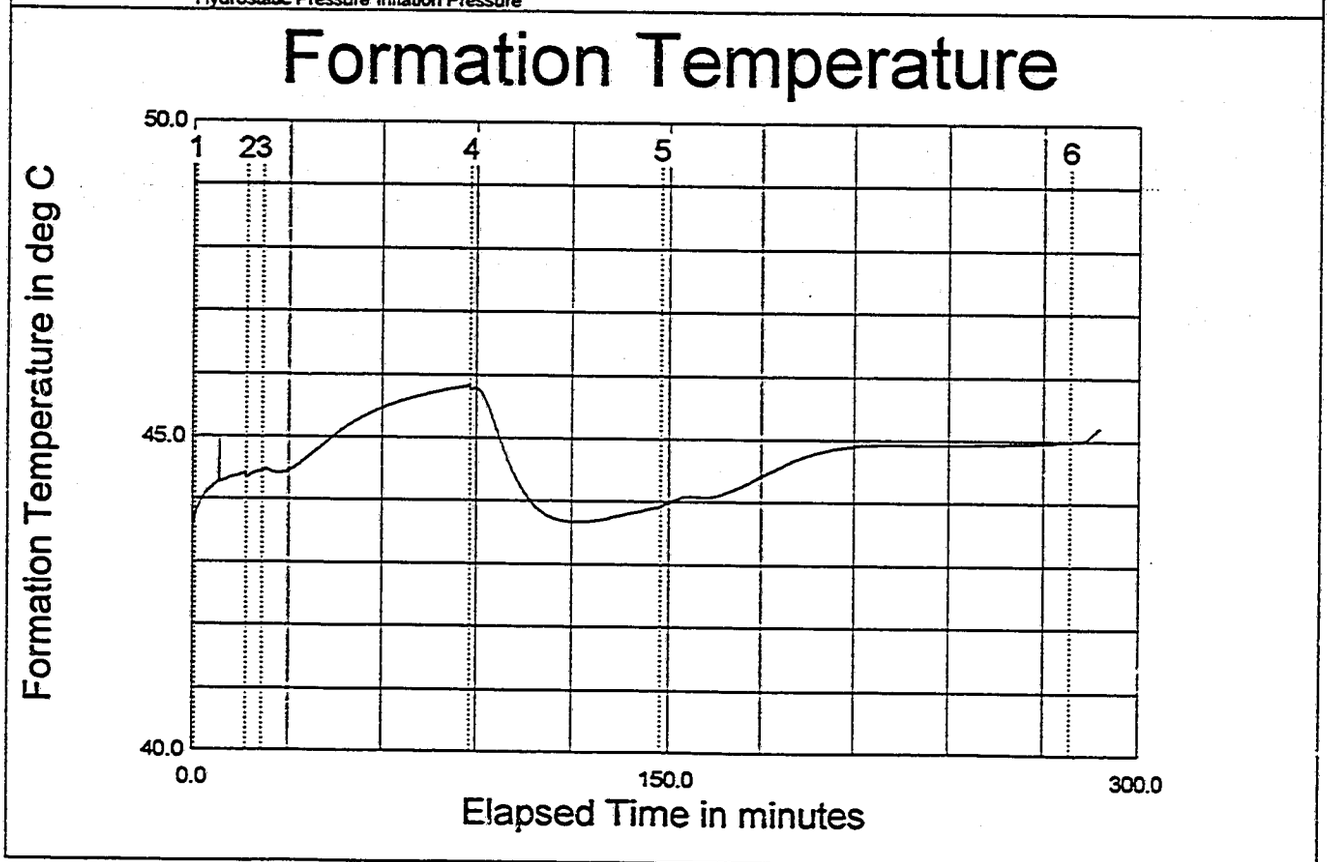
Horner Plot



Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
DST #SIX, MATTSON, 1299.0 - 1329.6 mKB





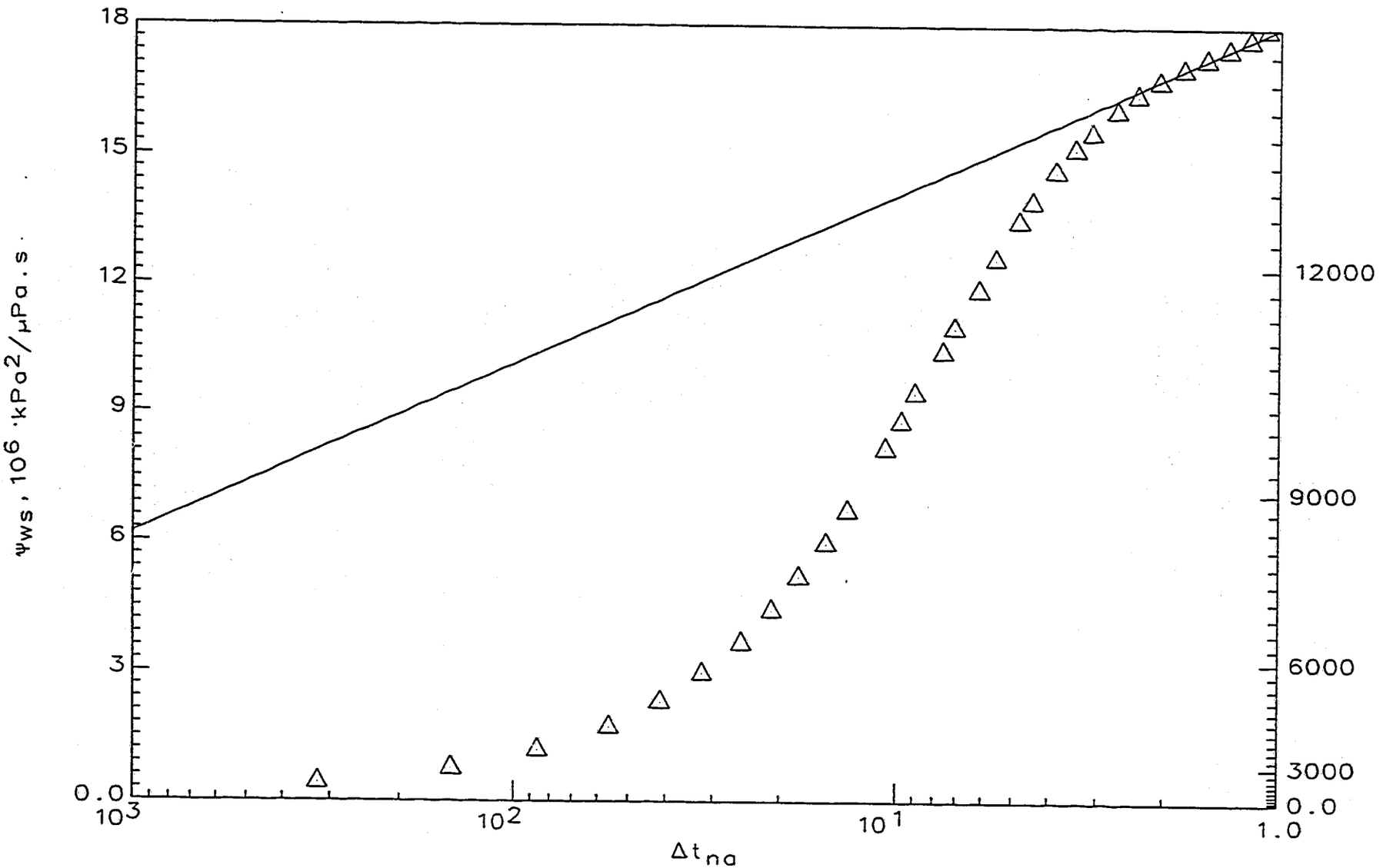
Downhole Systems Technology Canada Inc.

SUPERPOSITION
PRESSURE BUILDUP PLOT

UCEL LIARD k-02-60-20-123-30
DST #6, MATTSON, 1299.0-1329.6 mKB

Initial Shut In

$[k_1/u]=0.04$ $k_1=0.63$ mD s=1.5 $p^*=14714.3$

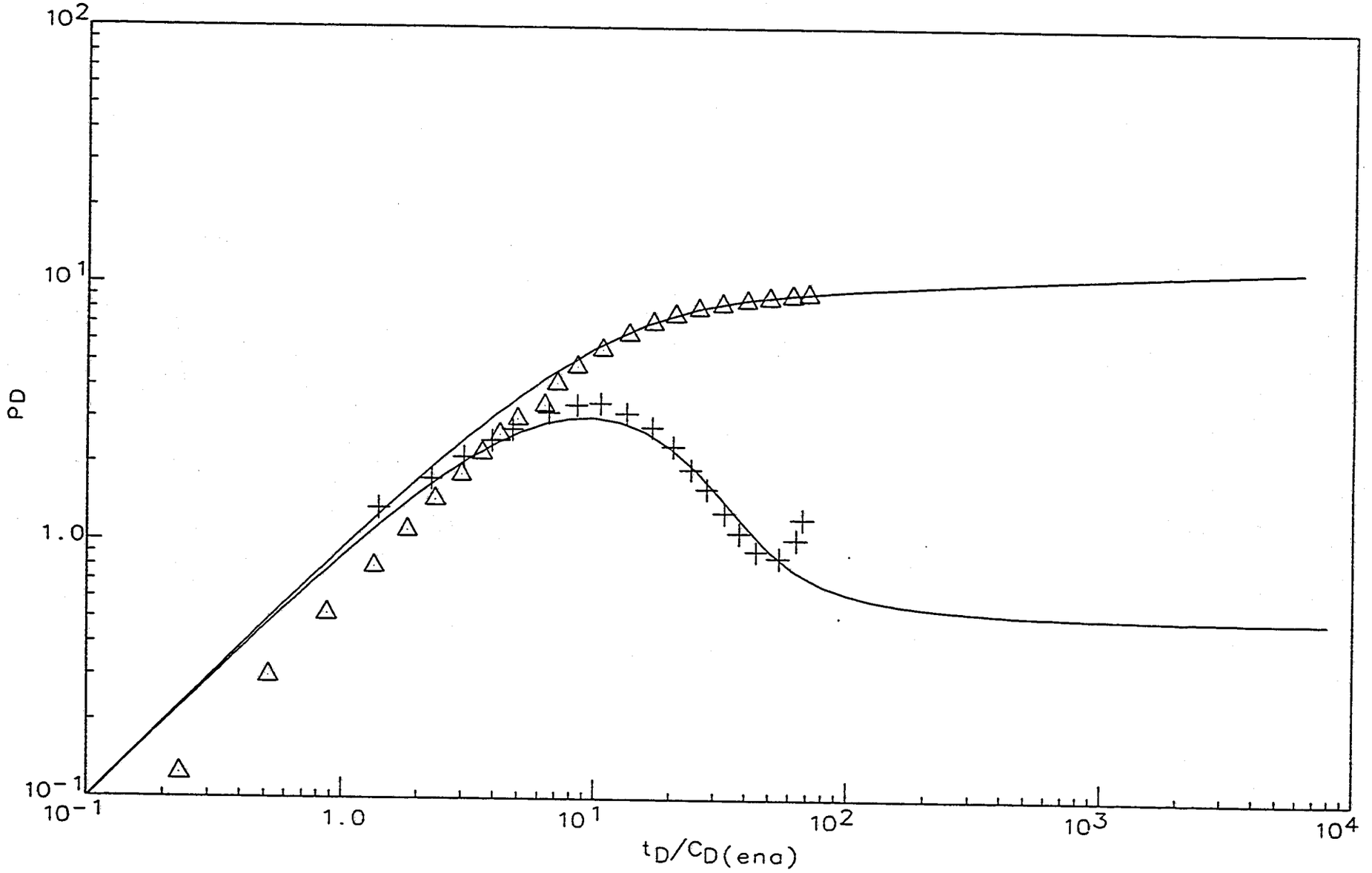


STORAGE AND SKIN TYPECURVE (Bourdet et al)

PRESSURE BUILDUP PLOT

UCEL LIARD k-02-60-20-123-30
DST #6, MATTSON, 1299.0-1329.6 mKB
$[k_1/u]_t$=0.07 k_1=1.11 C_D=16 s=5.5

Initial Shut In

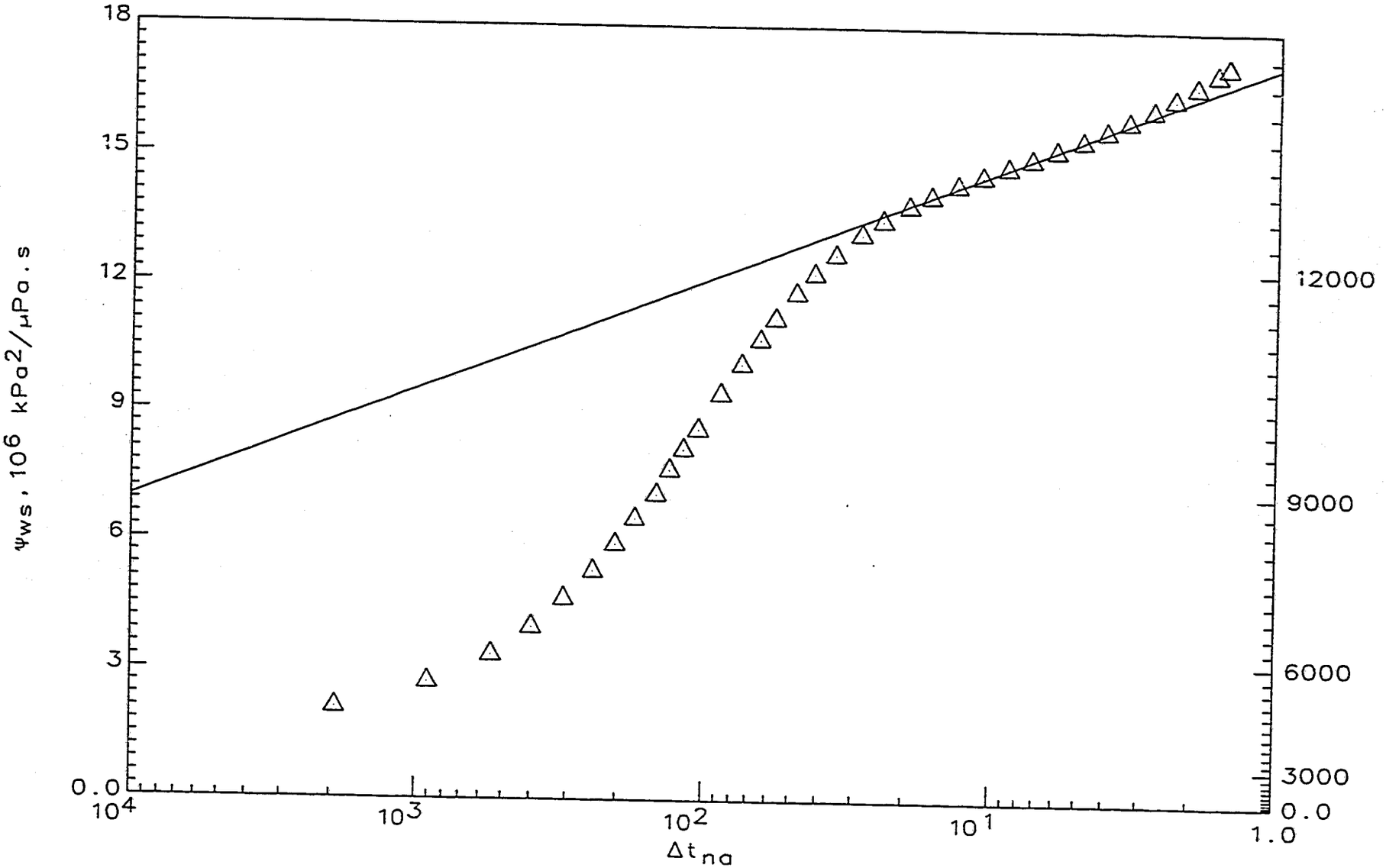


SUPERPOSITION
PRESSURE BUILDUP PLOT

UCEL LIARD k-02-60-20-123-30
DST #6, MATTSON, 1299.0-1329.6 mKB

Final Shut In

$[k_1/u]=0.05$ $k_1=0.84$ mD $s=2.0$ $p^*=14335.1$

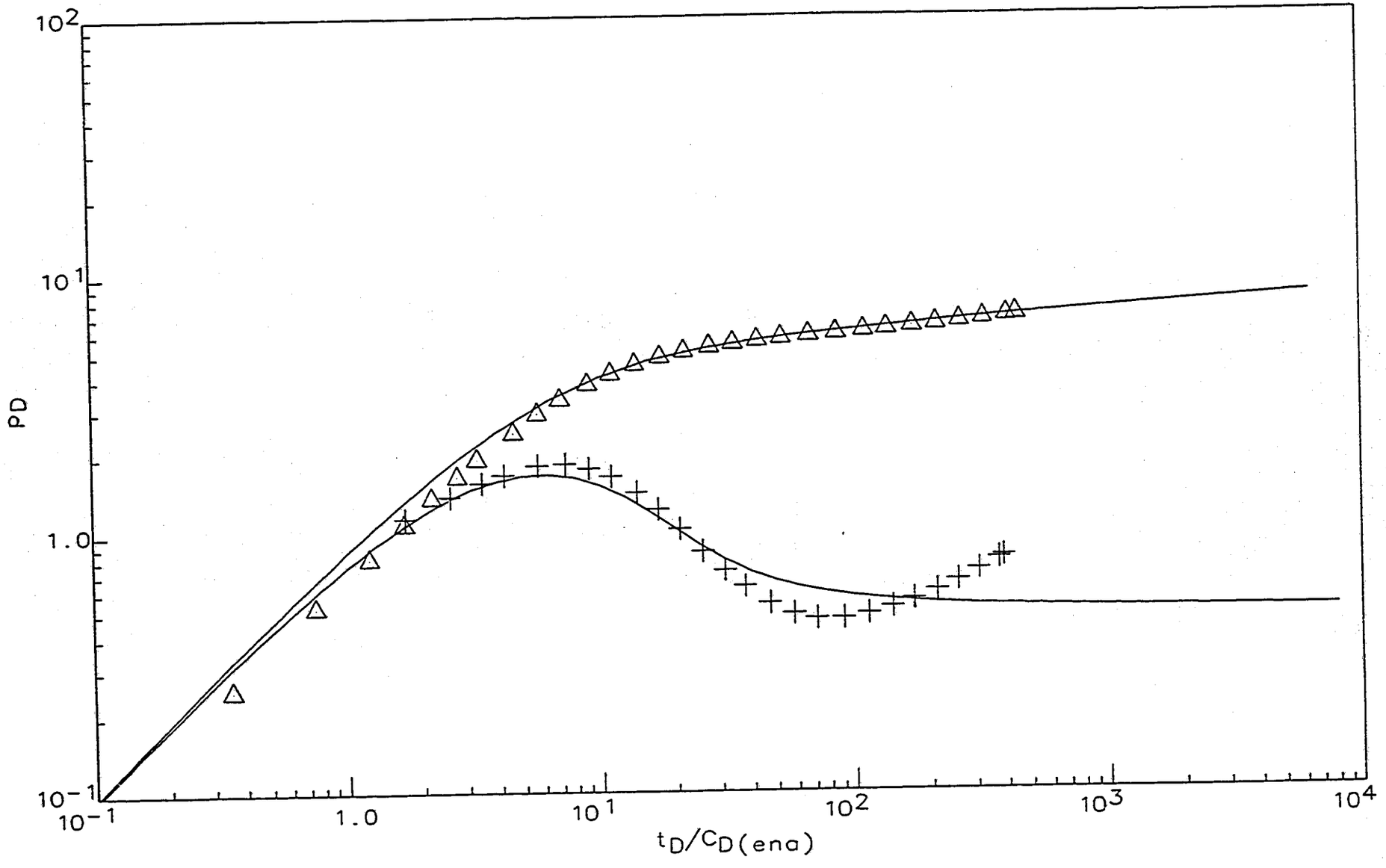


STORAGE AND SKIN TYPECURVE (Bourdet et al)

PRESSURE BUILDUP PLOT

Final Shut In

UCEL LIARD k-02-60-20-123-30
DST #6, MATTSON, 1299.0-1329.6 mKB
$[k_1/u]_t$=0.05 k_1=0.82 C_D=16 s=2.1



Gas Well Test - BUILDUP (Superposition Pseudo Time)

UCEL LIARD k-02-60-20-123-30
DST #6, MATTSON, 1299.0-1329.6 mKB

Final Shut In

Input Data

Final Gas Rate	=	4.446	e3m3/d
Total Porosity	=	21.00	%
Oil Saturation	=	0.00	%
Water Saturation	=	88.00	%
Gas Saturation	=	12.00	%
Net Pay	=	1.00	m
Perforated Interval	=	-	m
Horiz To Vert Perm Ratio	=	1.000	
Net Wellbore Inclination	=	0.	
Wellbore Radius	=	0.09	m
Drainage Area - Zone	=	259.0	ha
Shape Code - Zone 1	=	R1A	
Drainage Area -	=	259.0	ha
Shape Code - Zone2	=	R1A	
Gas Gravity	=	0.65	
P V T Reference Pressure	=	14325.1	kPa
Co2	=	0.00	%
H2s	=	0.00	%
N2	=	0.00	%
Initial Pressure	=	-	kPa
Final Flowing Pressure	=	4123.0	kPa
Formation Temperature	=	48.89	deg C
Cumulative Production (gas)	=	-	e3m3
Corrected Flow Time	=	1.102	hr

Calculations

Gas Compressibility	=	7.395e-05	1/kPa
Total Compressibility	=	9.775e-06	1/kPa
Compressibility Factor	=	0.8078	
Gas Viscosity	=	16.31	uPa.s
Wellbore Storage Constant	=	-	m3/kPa

Results

Bourdet Et Al Type Curve Analysis

Dimensionless Storage Constant	=	16.32	
Wellbore Storage Constant	=	1.75e-06	m3/kPa
Permeability	=	0.82	mD
Skin Effect (Total)	=	2.058	
Inter Porosity Coeff	=	-	
Storativity Ratio	=	-	

Radial Analysis - Zone 1

Transmissivity	=	0.05	mDm/uPa.s
Mobility (Total)	=	0.051	mD/uPa.s
Permeability (Gas)	=	0.84	mD
Extrapolated Pressure	=	14335.1	kPa
Average Reservoir Pressure Pr	=	-	kPa
Extrapolated Pressure At 72 Hrs	=	14327.4	kPa
Skin Effect	=	1.99	
Partial Penetration Skin	=	-	
Inclination Skin	=	0.000	
Pressure Drop (Total Skin)	=	4058.4	kPa
Damage Ratio	=	1.39	
Flow Efficiency	=	0.72	
Radius Of Investigation	=	-	m
@ Time Of Investigation	=	-	hr
Specified Reservoir Pressure	=	14335.1	kPa
Specified Flowing Pressure	=	4123.0	kPa
Stabilization / Specified Time	=	2879.854	hr
Stabilized Rate @ Current Skin	=	2.836	e3m3/d
Stabilized Rate @ Skin Of 0	=	3.457	e3m3/d
Stabilized Rate @ Skin Of -4	=	6.179	e3m3/d

Radial Analysis - Zone 2

Permeability (Gas)	=	-	mD
Extrapolated Pressure	=	-	kPa
Average Reservoir Pressure	=	-	kPa
Extrapolated Pressure At 72 Hrs	=	-	kPa
Apparent Skin S	=	-	
Specified Reservoir Pressure	=	-	kPa
Specified Flowing Pressure	=	-	kPa
Stabilization / Specified Time	=	-	hr
Stabilized Rate @ Current Skin	=	-	e3m3/d
Stabilized Rate @ Skin Of 0	=	-	e3m3/d
Stabilized Rate @ Skin Of -4	=	-	e3m3/d

ELECTRO*TEST* REPORT

UNOCAL CANADA EXPLORATION LIMITED

WELL: UCEL LIARD k-02-80-20-123-30

DST #7: MATTSON (1043.0 - 1063.74mKB)

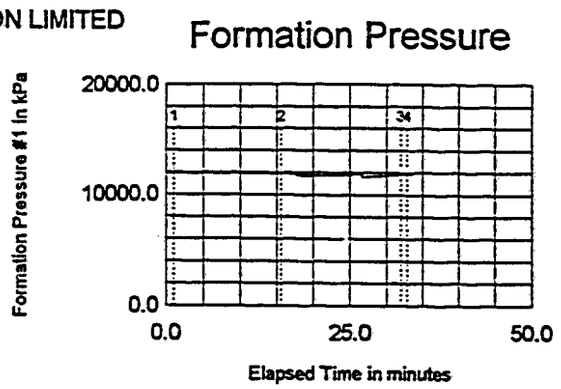
DATE: JANUARY 17, 1997

Downhole
Systems
Technology Canada Inc.

#7, 4539-6th St. N.E.
Calgary, Alberta
T2E 3Z6
(403) 299-1960

DRILL STEM TEST - FINAL REPORT

Well Operator		UNOCAL CANADA EXPLORATION LIMITED
Well Name		UCEL LIARD
Location		k-02-60-20-123-30
DST #		SEVEN
Interval Tested		1043.0 -1063.74 mKB
Formation		MATTSON
Date		17 JANUARY, 1997
Wellsite Rep.		GABOURY
Test Engineer		JAMES
Wireline Operator		WYRE
Drilling Contractor		CACTUS 1
Well Total Depth		1657.00 meters
Well Elevations	KB	379.30 meters
	GL	374.50 meters
Main Hole Size		222.00 mm



SUMMARY

		Time	Duration	Graph #	Pressure (kPa)	Extrapolated Press.(kPa)	Liq. Rate(m3/d) Average/Final	Gas Rate(m3/d) Average/Final
Initial Hydrostatic				1	11956			
Preflow	Start	19:30:06		2	11909		0.0	0
	End	19:46:16	16	3	11908			
Initial Shut In	End		0	4	0			
Flow #2	Start			4	0		0.0	0
	End		0	5	0			
Shut In #2	End		0	6	0			
Final Hydrostatic				7	11934			
Bottom Hole Temperature		40 deg C						

Electronics #3, Formation Pressure 1, Ser. # 154775, Depth 1044.9 mKB (all gauges at same depth)

LIQUID RECOVERY

Height Volume

No liquid recovery.

COMMENTS

Unsuccessful straddle inflate with real time pressure data and closed chamber flow rates.

A GR/CCL correlation log was run prior to inflating the packers and the packer depth was 1.5 meters high. A depth adjustment of 1.5 meters downward was made.

The downhole flow valve was plugged on initial valve open and no inflow into the drill string took place. Attempts to unplug the valve by cycling the valve open and closed were unsuccessful and the test was terminated.

If you require additional information contact David Sask at (403) 299-1960.

TEST DATE:	17 JANUARY, 1997	DST NUMBER:	SEVEN
WELL NAME:	UCEL LIARD	INTERVAL:	1043.0 -1063.74 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

Mud Type: Gel Chem
Density: 1165.00 kg/cu m
Viscosity: 88.00 mPa S
Resistivity: 0.00 ohms/m

Fluid Cushion: Nil
Density of recovered fluids (used in liquid rate calculations): 1165 kg/m3
Calculated Fluid Recovery: Nil

Reverse Circulated: No

TOOL STRING CONFIGURATION

	Length meters	Inner Diameter mm	Outer Diameter mm
Drill Pipe Above K.B.	1.70	70.21	88.90
Upper Drill Pipe	871.64	84.00	85.00
Drill Collars	138.28	63.00	120.65
Stabbing Valve	0.50	50.80	120.65
RCV/DBS/XO'S	1.05	60.00	120.65
Drill Collar	27.43	63.00	120.65
Hydraulic Jars	2.00	50.80	127.00
Safety Joint	1.35	25.40	127.00
Top Packer	2.45	22.25	139.70
Top of Interval	**1043.00**		
Packer Stub	0.80	0.00	127.00
Downhole Flow Valve	0.92	0.00	127.00
Electronics Section	1.51	0.00	127.00
Inflation Pump	2.44	0.00	127.00
Spacer Pipe	14.50	0.00	127.00
Packer Stub	0.57	0.00	127.00
Bottom of Interval	**1063.74**		
Total Interval	**20.74**		
Bottom Packer	2.40	0.00	139.70

Test Tool Choke Diameter	22.50 mm	
Surface Choke	0.00 mm	Bean Choke
Total String Volume	5.35 cu m	
Initial Closed Chamber Gas Volume	5.35 cu m	
Annular Volume	0.54 cu m	

TEST DATE:	17 JANUARY, 1997	DST NUMBER:	SEVEN
WELL NAME:	UCEL LIARD	INTERVAL:	1043.0 -1063.74 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER INFLATION

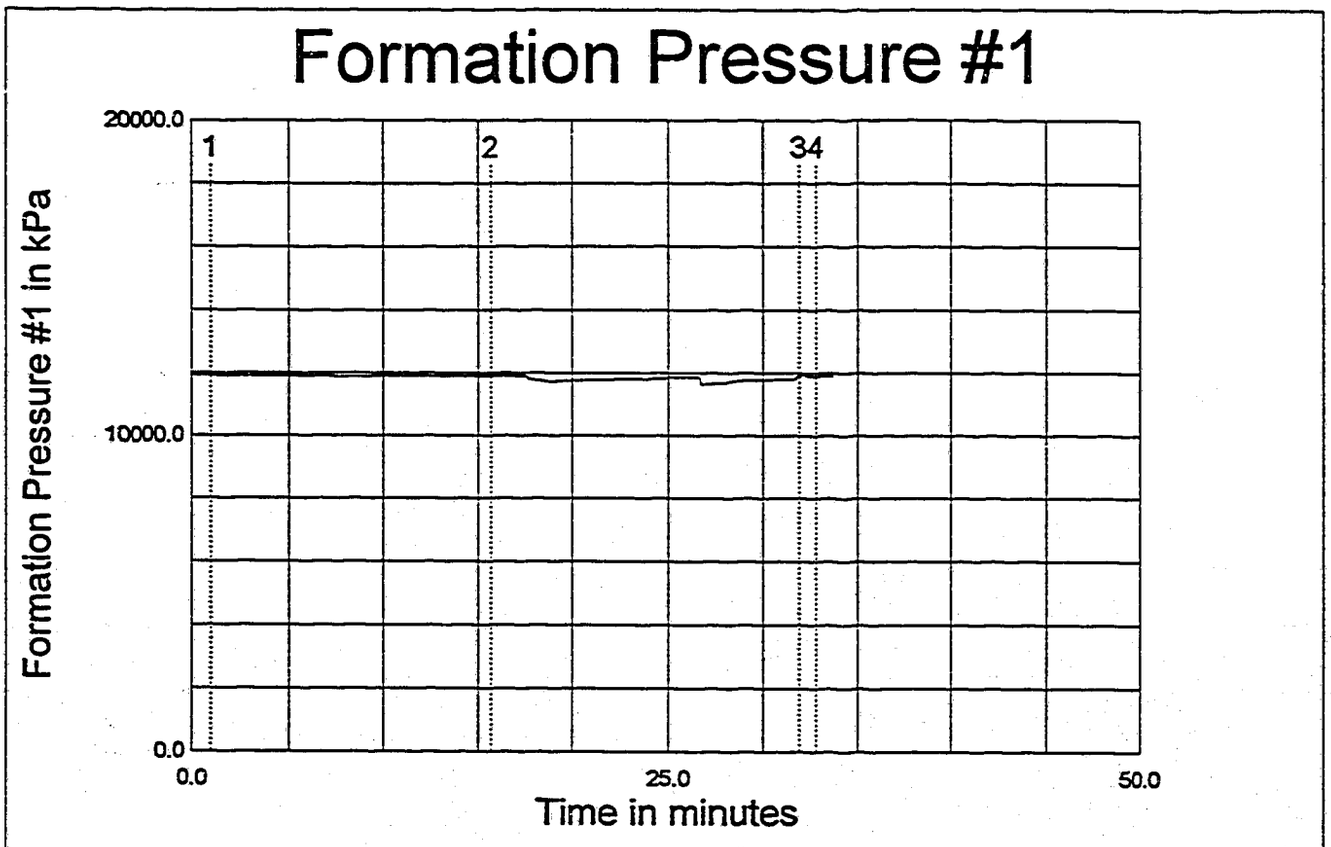
Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
19:15:26	00:00:00	11930.50	4189.21	103.67	12038.01	11944.52	93.49
19:15:41	00:00:15	11928.96	4186.15	103.76	12098.41	11942.98	155.42
19:15:56	00:00:30	11928.45	4184.62	103.99	12121.56	11942.47	179.09
19:16:11	00:00:45	11927.42	4183.59	104.36	12147.22	11942.45	204.77
19:16:26	00:01:00	11927.40	4182.55	104.27	12173.88	11940.92	232.96
19:16:41	00:01:15	11926.38	4182.03	105.05	12189.98	11940.90	249.08
19:16:56	00:01:30	11926.87	4181.51	104.60	12199.54	11940.89	258.65
19:17:11	00:01:45	11926.35	4181.50	103.82	12213.12	11940.88	272.24
19:17:26	00:02:00	11926.34	4180.97	104.60	12224.18	11940.36	283.82
19:17:41	00:02:15	11924.82	4218.83	103.46	12234.75	11940.35	294.40
19:17:56	00:02:30	11925.81	4179.43	103.92	12245.81	11940.84	304.97
19:18:11	00:02:45	11925.80	4178.91	103.96	12254.86	11939.32	315.55
19:18:26	00:03:00	11925.29	4178.90	104.33	12264.42	11939.31	325.11
19:18:41	00:03:15	11924.77	4178.88	104.28	12273.98	11939.30	334.68
19:18:56	00:03:30	11924.76	4178.87	104.69	12281.52	11938.28	343.24
19:19:11	00:03:45	11924.75	4178.85	103.86	12291.07	11938.77	352.30
19:19:26	00:04:00	11925.24	4178.84	105.50	12300.13	11939.26	360.87
19:19:41	00:04:15	11925.23	4179.34	104.50	12304.15	11938.75	365.40
19:19:56	00:04:30	11924.72	4178.82	104.81	12311.69	11938.74	372.95
19:20:11	00:04:45	11924.71	4178.81	105.12	12316.72	11937.72	378.99
19:20:26	00:05:00	11924.70	4178.29	104.48	12323.76	11936.71	387.05
19:20:56	00:05:30	11922.66	4178.77	105.55	12341.36	11935.17	406.19
19:21:26	00:06:00	11919.12	4179.26	106.18	12356.45	11931.63	424.82
19:21:56	00:06:30	11899.45	4177.72	106.07	12378.58	11918.51	460.07
19:22:26	00:07:00	11887.38	4174.71	106.74	12416.36	11908.96	507.40
19:22:56	00:07:30	11890.86	4174.14	105.72	12769.24	11912.44	856.81
19:23:26	00:08:00	11899.91	4175.14	105.89	14330.67	11917.46	-162.55
19:23:56	00:08:30	11909.48	4176.65	105.18	14361.37	11931.56	2429.81
19:24:26	00:09:00	11911.99	4173.60	105.12	14047.80	11933.56	2114.24
19:24:56	00:09:30	11912.98	4170.56	105.11	13977.83	11933.55	2044.28
19:25:26	00:10:00	11914.47	4168.01	105.55	13951.14	11934.04	2017.10
19:25:56	00:10:30	11913.96	4164.97	105.40	13921.93	11934.03	1987.91
19:26:26	00:11:00	11913.44	4161.42	105.66	13877.12	11927.97	1949.16
19:26:56	00:11:30	11913.43	4161.40	106.48	13918.39	11934.00	1984.38
19:27:26	00:12:00	11912.92	4157.35	105.00	13916.36	11933.49	1982.88
19:27:56	00:12:30	11913.41	4153.81	105.40	13895.21	11933.48	1961.74
19:28:26	00:13:00	11912.90	4151.27	105.03	13877.08	11932.96	1944.12
19:28:56	00:13:30	11907.85	4150.76	103.97	13958.12	11929.93	2028.18
19:29:26	00:14:00	11909.36	4148.73	104.56	13935.46	11931.44	2004.02
19:29:45	00:14:18	11907.84	4146.19	105.52	13921.86	11930.93	1990.93

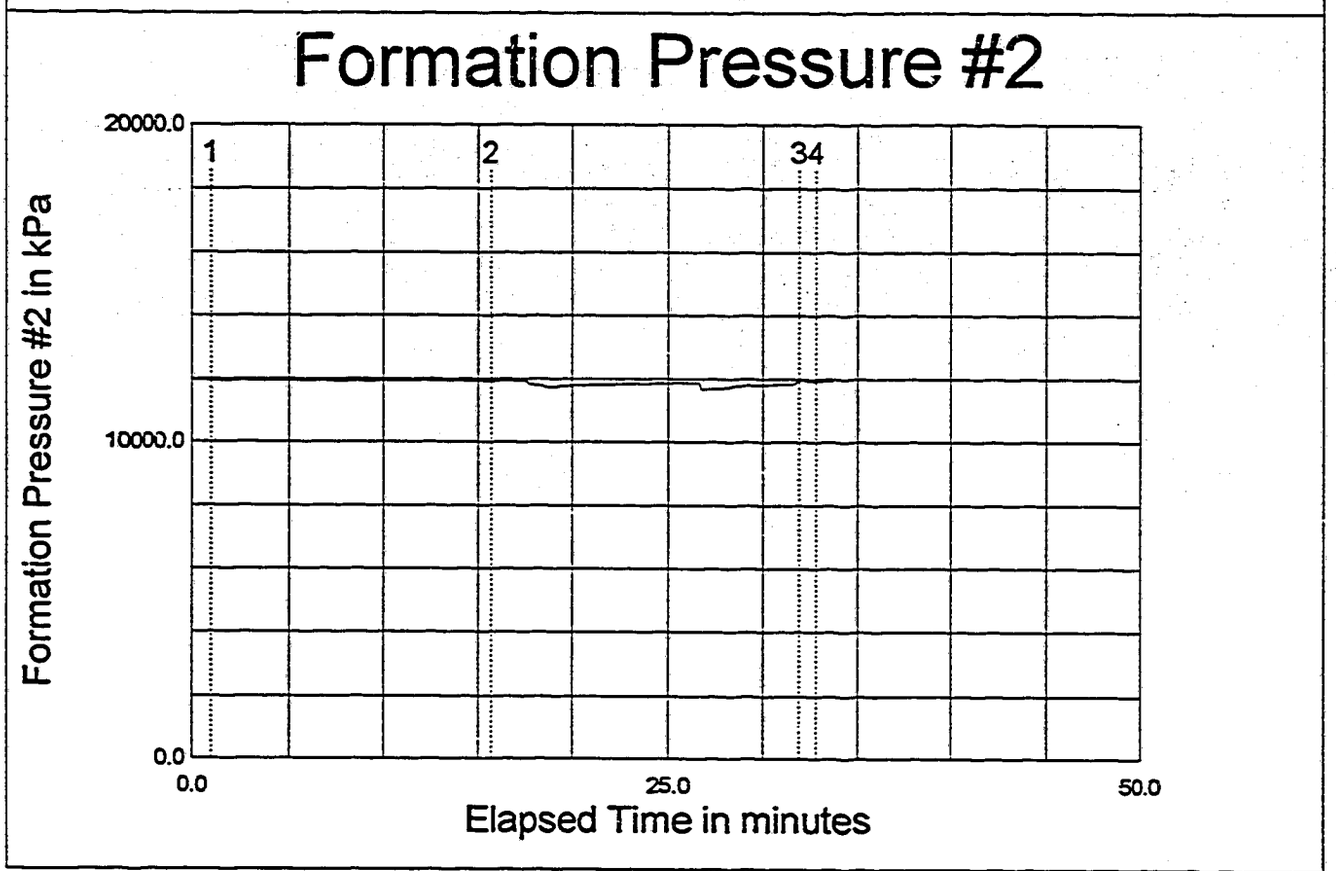
TEST DATE:	17 JANUARY, 1997	DST NUMBER:	SEVEN
WELL NAME:	UCEL LIARD	INTERVAL:	1043.0 -1063.74 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PREFLOW

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Liquid Flowrate m3/d	Surface Gas Flowrate m3/d	Total Gas Flowrate m3/d	Gas Liquid Ratio m3/m3	Formation Temp. deg C
19:30:06	00:00:00	11908.84	11083.66	103.37	1119.41	0.00	-1209.90	-1.08	39.47
19:30:21	00:00:15	11908.84	11063.51	104.33	1078.98	0.00	-1165.48	-1.08	39.48
19:30:36	00:00:30	11910.34	11060.98	104.86	1000.29	0.00	-1081.09	-1.08	39.48
19:30:51	00:00:45	11911.35	11071.56	104.33	904.87	0.00	-979.50	-1.08	39.48
19:31:06	00:01:00	11911.85	11080.12	103.73	803.72	0.00	-868.67	-1.08	39.49
19:31:21	00:01:15	11913.86	11085.65	104.83	703.83	0.00	-758.97	-1.08	39.49
19:31:36	00:01:30	11916.38	11086.66	104.37	609.26	0.00	-655.89	-1.08	39.50
19:31:51	00:01:45	11919.90	11072.55	103.28	520.52	0.00	-560.39	-1.08	39.50
19:32:06	00:02:00	11836.27	11173.28	103.87	446.03	0.00	-479.50	-1.08	39.50
19:32:21	00:02:15	11802.01	11172.27	104.28	387.89	0.00	-415.74	-1.07	39.51
19:32:36	00:02:30	11776.82	11161.69	104.51	332.39	0.00	-357.46	-1.08	39.51
19:32:51	00:02:45	11756.67	11151.11	104.19	281.12	0.00	-303.54	-1.08	39.51
19:33:06	00:03:00	11740.04	11141.53	105.34	234.60	0.00	-251.83	-1.07	39.52
19:33:21	00:03:15	11734.49	11111.30	103.56	192.69	0.00	-206.34	-1.07	39.53
19:33:36	00:03:30	11739.03	11908.04	103.65	264.00	0.00	-275.91	-1.05	39.53
19:33:51	00:03:45	11749.10	11903.51	104.47	293.95	0.00	-304.21	-1.03	39.53
19:34:06	00:04:00	11757.16	11898.97	103.65	297.10	0.00	-305.86	-1.03	39.54
19:34:21	00:04:15	11764.21	11916.59	104.30	286.11	0.00	-293.54	-1.03	39.54
19:34:36	00:04:30	11770.75	11909.54	104.12	265.29	0.00	-271.54	-1.02	39.54
19:34:51	00:04:45	11778.31	11900.47	104.49	229.13	0.00	-233.99	-1.02	39.54
19:35:06	00:05:00	11782.34	11896.95	104.76	209.92	0.00	-214.18	-1.02	39.55
19:35:36	00:05:30	11793.42	11885.36	104.22	154.60	0.00	-157.46	-1.02	39.55
19:36:06	00:06:00	11802.48	11874.78	104.09	107.85	0.00	-109.68	-1.02	39.56
19:36:36	00:06:30	11811.54	11864.70	104.47	71.81	0.00	-72.94	-1.02	39.56
19:37:06	00:07:00	11820.10	11854.63	105.12	45.11	0.00	-45.70	-1.01	39.57
19:37:36	00:07:30	11835.21	11806.78	104.76	24.17	0.00	-24.46	-1.01	39.57
19:38:06	00:08:00	11818.08	11822.38	105.87	2.41	0.00	-2.29	-0.95	39.58
19:38:36	00:08:30	11840.24	11745.84	104.19	-4.88	0.00	4.99	-1.02	39.58
19:39:06	00:09:00	11852.33	11721.16	104.65	-21.43	0.00	20.68	-0.97	39.59
19:39:36	00:09:30	11861.39	11712.59	105.27	-26.85	0.00	27.00	-1.01	39.59
19:40:06	00:10:00	11868.44	11705.53	105.60	-26.29	0.00	27.00	-1.03	39.60
19:40:36	00:10:30	11875.99	11698.48	104.65	-23.56	0.00	24.55	-1.04	39.60
19:41:06	00:11:00	11874.98	11736.25	104.85	-17.90	0.00	18.76	-1.05	39.60
19:41:36	00:11:30	11660.37	11885.30	105.46	26.47	0.00	-26.51	-1.00	39.61
19:42:06	00:12:00	11686.57	11877.24	106.34	36.56	0.00	-37.03	-1.01	39.61
19:42:36	00:12:30	11728.88	11752.85	106.71	22.18	0.00	-22.18	-1.00	39.62
19:43:06	00:13:00	11756.58	11715.08	106.08	-9.45	0.00	10.21	-1.08	39.62
19:43:36	00:13:30	11772.70	11711.55	105.94	-20.51	0.00	21.40	-1.04	39.63
19:44:06	00:14:00	11786.80	11708.02	107.14	-22.19	0.00	23.14	-1.04	39.63
19:44:36	00:14:30	11799.39	11704.99	106.73	-20.22	0.00	21.45	-1.06	39.63
19:45:06	00:15:00	11811.48	11701.97	105.82	-16.89	0.00	17.67	-1.05	39.63
19:45:36	00:15:30	11821.55	11897.86	106.55	5.53	0.00	-5.55	-1.00	39.64
19:46:06	00:16:00	11830.62	11896.34	106.42	35.66	0.00	-37.88	-1.03	39.64
19:46:16	00:16:09	11908.19	11904.90	106.01	40.96	0.00	-42.39	-1.03	39.64

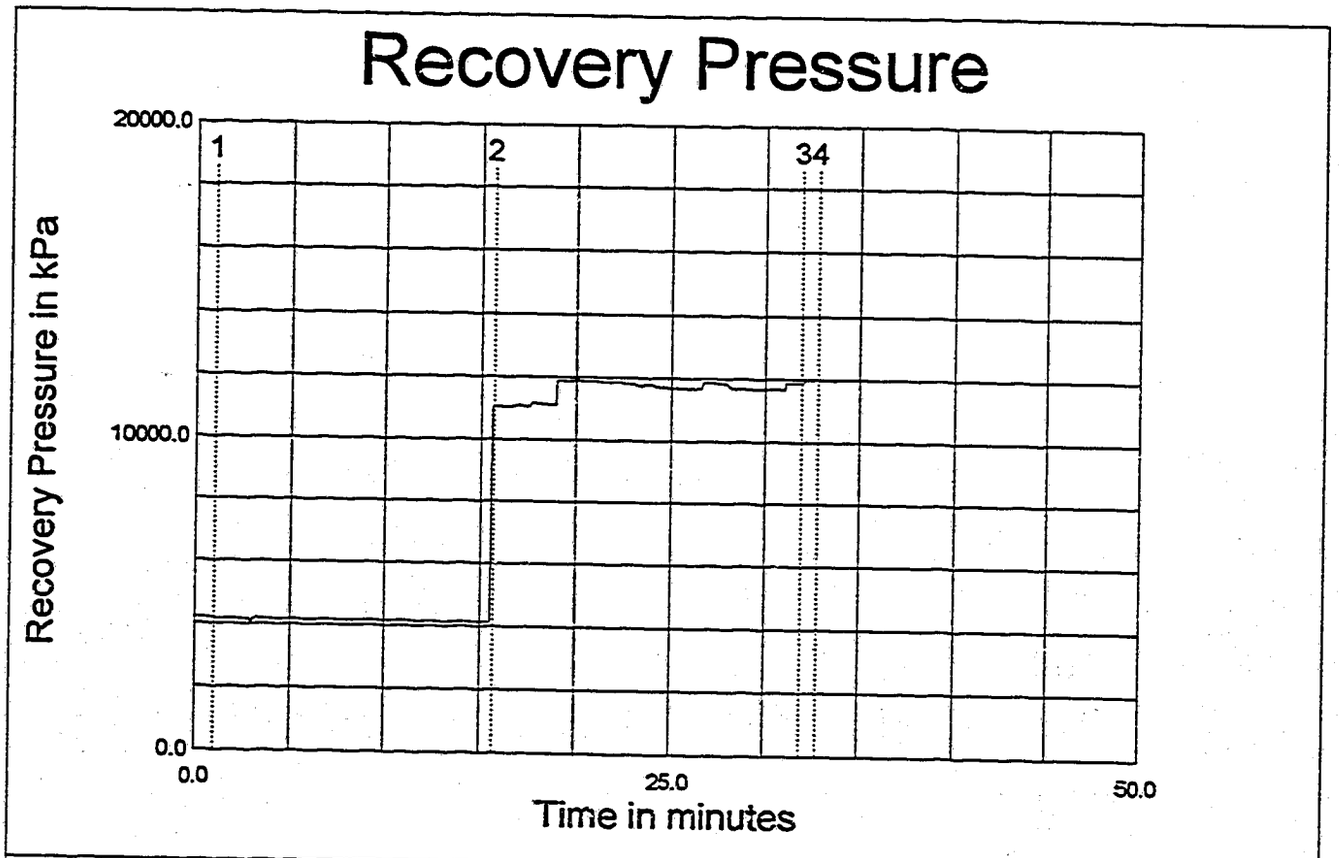
UCEL LIARD k-02-60-20-123-30
DST #SEVEN, MATTSON, 1043.0 -1063.74 mKB

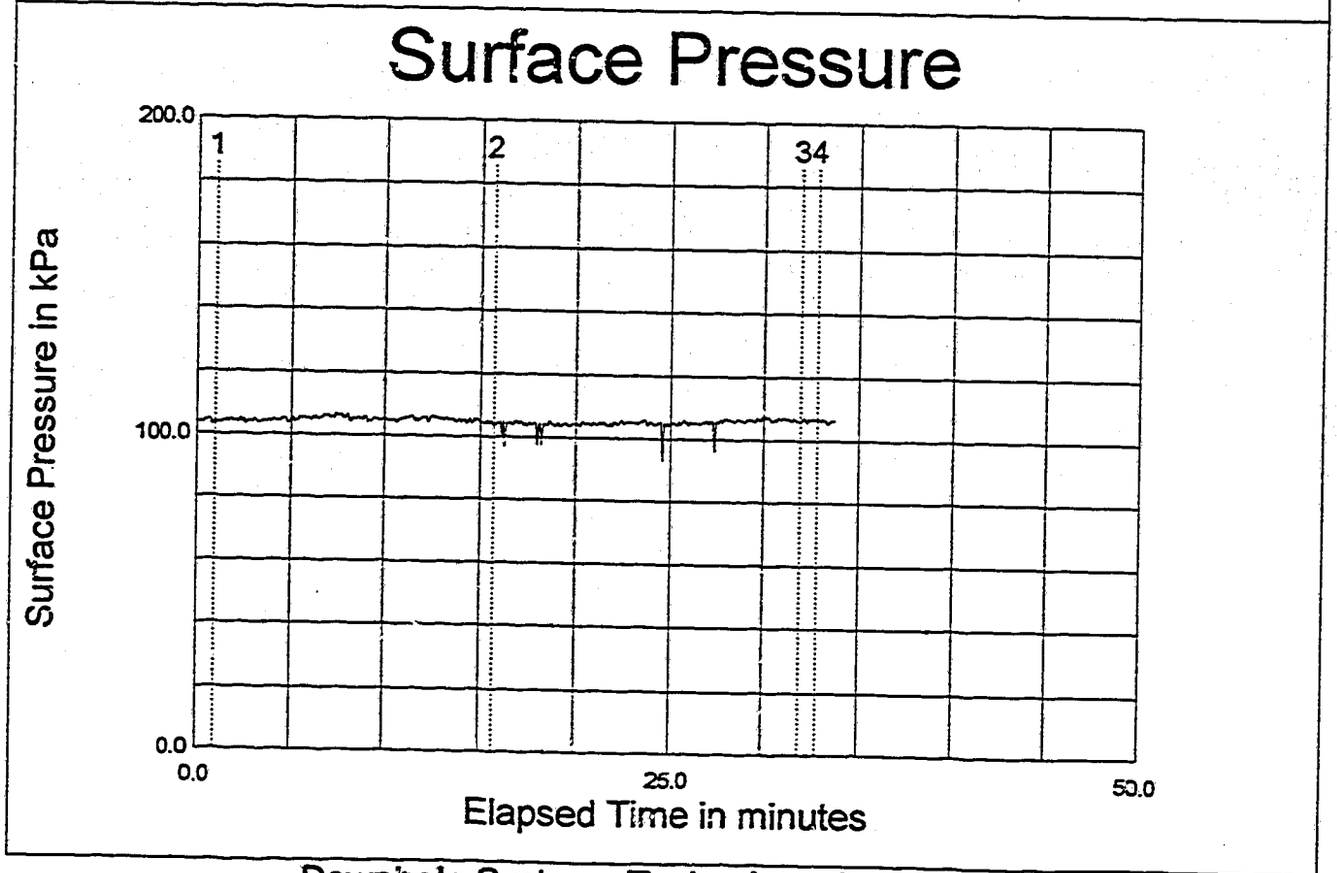




Downhole Systems Technology Canada Inc.

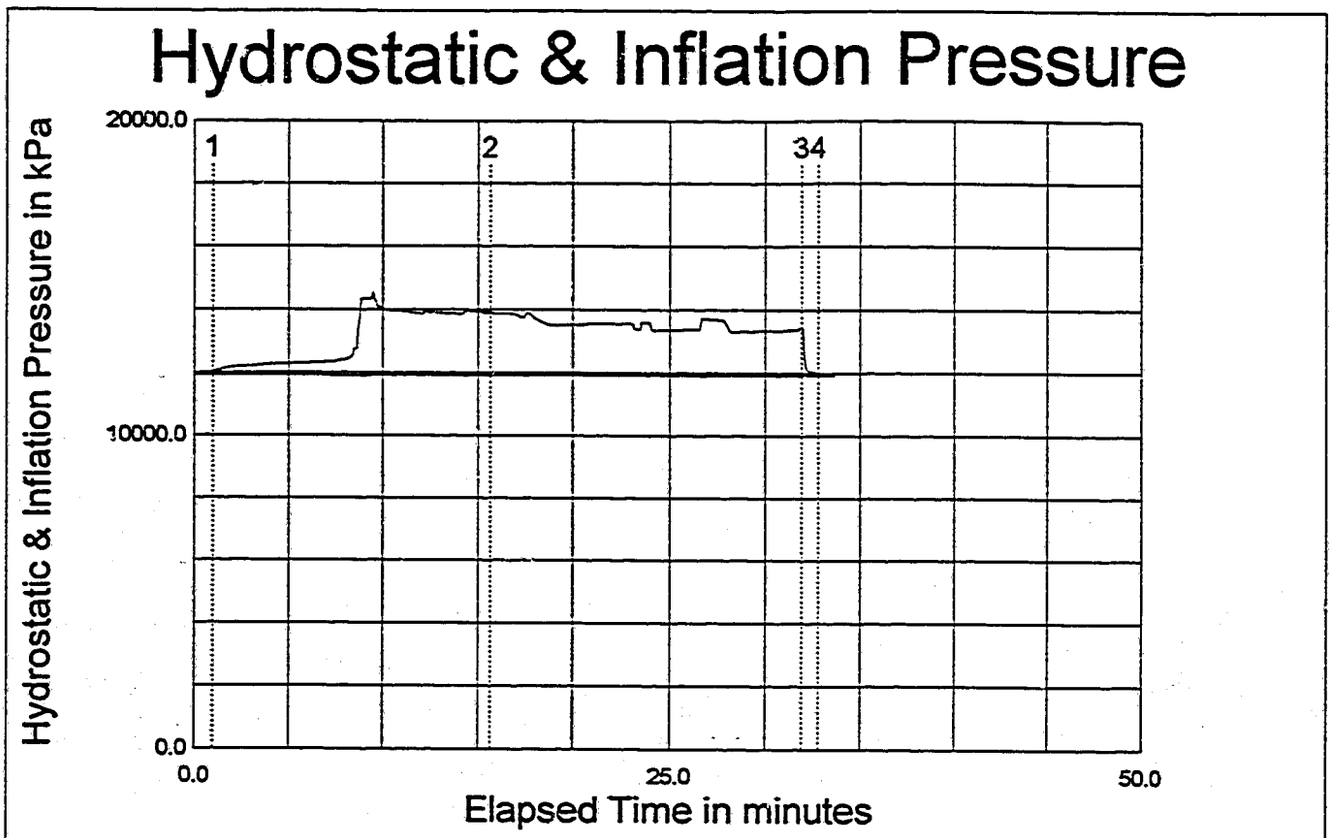
UCEL LIARD k-02-60-20-123-30
DST #SEVEN, MATTSON, 1043.0 -1063.74 mKB

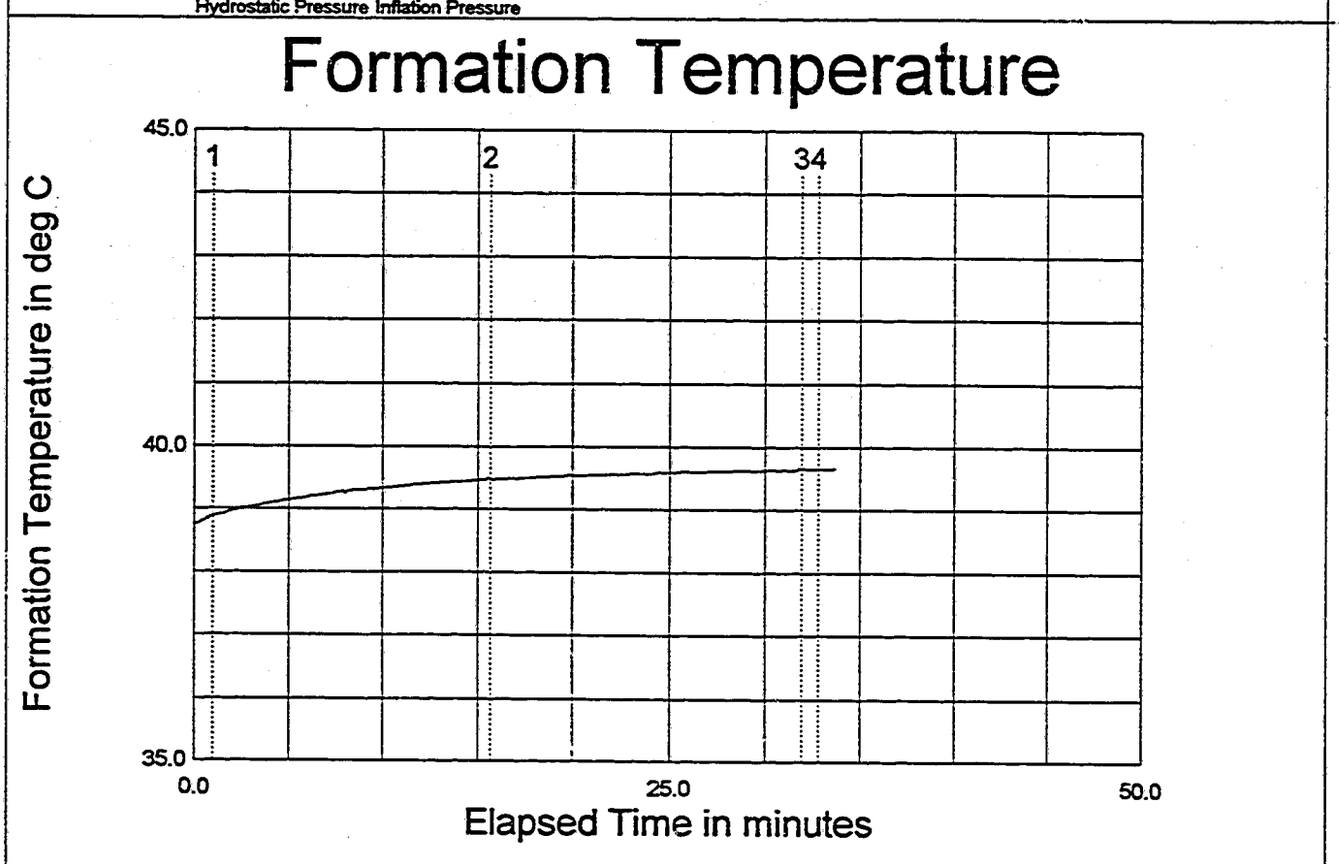




Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
DST #SEVEN, MATTSON, 1043.0 -1063.74 mKB





Downhole Systems Technology Canada Inc.

ELECTRO*TEST* REPORT

UNOCAL CANADA EXPLORATION LIMITED

WELL: UCEL LIARD k-02-80-20-123-30

DST #8: MATTSON (1043.0 - 1063.74mKB)

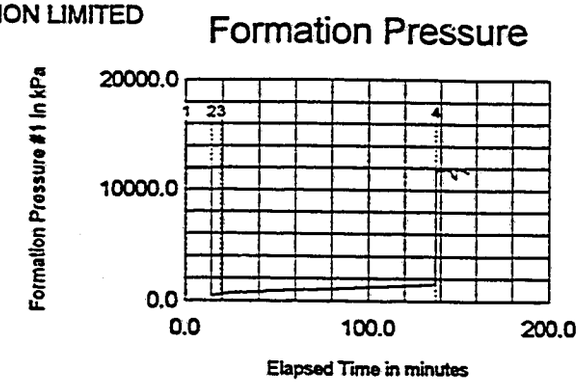
DATE: JANUARY 18' 1997

Downhole
Systems
Technology Canada Inc.

#7, 4539-6th St. N.E.
Calgary, Alberta
T2E 3Z6
(403) 299-1960

DRILL STEM TEST - FINAL REPORT

Well Operator		UNOCAL CANADA EXPLORATION LIMITED
Well Name		UCEL LIARD
Location		k-02-60-20-123-30
DST #		EIGHT
Interval Tested		1043.0 -1063.74 mKB
Formation		MATTSON
Date		18 JANUARY, 1997
Wellsite Rep.		GABOURY
Test Engineer		JAMES
Wireline Operator		WYRE
Drilling Contractor		CACTUS 1
Well Total Depth		1657.00 meters
Well Elevations	KB	379.30 meters
	GL	374.50 meters
Main Hole Size		222.00 mm



SUMMARY

		Time	Duration	Graph #	Pressure (kPa)	Extrapolated Press.(kPa)	Liq. Rate(m3/d) Average/Final	Gas Rate(m3/d) Average/Final
Initial Hydrostatic				1	11965			
Preflow	Start	09:27:39		2	475		25.9	135
	End	09:32:49	5	3	548		4.4	
Initial Shut In	End	11:30:24	118	4	1552			
Flow #2	Start				0		0.0	0
	End		0		0			
Shut In #2	End		0		0			
Final Hydrostatic				4	11727			
Bottom Hole Temperature		40 deg C						

Electronics #3, Formation Pressure 1, Ser. # 154775, Depth 1044.9 mKB (all gauges at same depth)

LIQUID RECOVERY	Height	Volume
Drilling mud.	30 m	0.094 m3

Samples sent to AGAT Laboratories in Calgary.

COMMENTS

Successful straddle inflate with real time pressure data and closed chamber flow rates.

A GR/CCL correlation log was not run at the start of the test.

The preflow was run under closed chamber conditions throughout, with primarily liquid flow indicated.

Radial flow conditions were not established during the initial shut in and a valid extrapolated pressure was not obtained.

A second flow period and shut in period were not taken at the request of the well operator.

If you require additional information contact David Sask at (403) 299-1960.

TEST DATE:	18 JANUARY, 1997	DST NUMBER:	EIGHT
WELL NAME:	UCEL LIARD	INTERVAL:	1043.0 -1063.74 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

Mud Type: Gel Chem
Density: 1165.00 kg/cu m
Viscosity: 88.00 mPa S
Resistivity: 0.00 ohms/m

Fluid Cushion: Nil
Density of recovered fluids (used in liquid rate calculations): 1165 kg/m3
Calculated Fluid Recovery: 30 meters of drilling mud based upon density of drilling mud.

Reverse Circulated: No

TOOL STRING CONFIGURATION

	Length meters	Inner Diameter mm	Outer Diameter mm
Drill Pipe Above K.B.	1.70	70.21	88.90
Upper Drill Pipe	871.64	84.00	85.00
Drill Collars	138.28	63.00	120.65
Stabbing Valve	0.50	50.80	120.65
RCV/DBS/XO'S	1.05	60.00	120.65
Drill Collar	27.43	63.00	120.65
Hydraulic Jars	2.00	50.80	127.00
Safety Joint	1.35	25.40	127.00
Top Packer	2.45	22.25	139.70
Top of Interval	**1043.00**		
Packer Stub	0.80	0.00	127.00
Downhole Flow Valve	0.92	0.00	127.00
Electronics Section	1.51	0.00	127.00
Inflation Pump	2.44	0.00	127.00
Spacer Pipe	14.50	0.00	127.00
Packer Stub	0.57	0.00	127.00
Bottom of Interval	**1063.74**		
Total Interval	**20.74**		
Bottom Packer	2.40	0.00	139.70

Test Tool Choke Diameter	22.50 mm	
Surface Choke	0.00 mm	Bean Choke
Total String Volume	5.35 cu m	
Initial Closed Chamber Gas Volume	5.35 cu m	
Annular Volume	0.54 cu m	

TEST DATE:	18 JANUARY, 1997	DST NUMBER:	EIGHT
WELL NAME:	UCEL LIARD	INTERVAL:	1043.0 -1063.74 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER INFLATION

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
09:14:04	00:00:00	11929.85	301.52	109.99	11940.62	11939.84	0.78
09:14:19	00:00:15	11927.29	299.45	110.66	11988.42	11935.77	52.65
09:14:34	00:00:30	11925.24	297.39	110.32	12036.22	11934.73	101.49
09:14:49	00:00:45	11923.70	295.33	110.17	12076.98	11931.68	145.30
09:15:04	00:01:00	11921.15	294.28	109.97	12108.67	11926.61	182.06
09:15:19	00:01:15	11919.61	293.74	109.72	12134.83	11929.10	205.73
09:15:34	00:01:30	11918.08	293.71	109.93	12156.46	11930.08	226.38
09:15:49	00:01:45	11917.55	294.19	109.96	12174.57	11929.05	245.51
09:16:04	00:02:00	11917.03	293.66	109.53	12189.15	11927.02	262.13
09:16:19	00:02:15	11916.00	294.65	109.24	12202.22	11925.99	276.23
09:16:34	00:02:30	11915.48	294.63	109.96	12213.28	11923.96	289.32
09:16:49	00:02:45	11913.95	295.62	109.67	12222.33	11922.43	299.90
09:17:04	00:03:00	11913.94	296.11	109.24	12231.88	11921.92	309.97
09:17:19	00:03:15	11913.92	296.60	109.50	12240.93	11920.39	320.54
09:17:34	00:03:30	11913.41	297.09	109.81	12248.47	11918.36	330.11
09:17:49	00:03:45	11912.89	298.60	108.84	12255.51	11916.84	338.67
09:18:04	00:04:00	11912.38	299.59	108.86	12263.05	11913.80	349.25
09:18:19	00:04:15	11911.86	300.08	108.58	12270.09	11921.35	348.74
09:18:34	00:04:30	11911.85	301.08	109.98	12278.14	11917.81	360.32
09:18:49	00:04:45	11911.34	302.09	109.46	12285.18	11921.33	363.85
09:19:04	00:05:00	11911.32	302.58	108.40	12292.22	11910.74	381.48
09:19:19	00:05:15	11910.81	303.58	109.12	12299.76	11916.27	383.49
09:19:34	00:05:30	11910.80	304.07	109.33	12306.30	11915.76	390.54
09:19:49	00:05:45	11910.29	305.58	107.95	12314.85	11913.73	401.11
09:20:04	00:06:00	11910.28	306.58	107.80	12322.39	11913.22	409.17
09:20:19	00:06:15	11910.78	307.58	108.61	12331.95	11914.72	417.23
09:20:34	00:06:30	11910.26	308.08	108.74	12340.00	11902.12	437.88
09:20:49	00:06:45	11909.75	308.57	109.36	12349.56	11895.57	453.99
09:21:04	00:07:00	11912.77	310.09	108.07	12363.65	11898.08	465.57
09:21:19	00:07:15	11916.79	305.52	108.29	12381.26	11896.06	485.21
09:21:34	00:07:30	11904.19	289.32	108.78	12396.86	11902.09	494.77
09:21:49	00:07:45	11912.24	263.01	108.82	12431.10	11897.05	534.05
09:22:04	00:08:00	11953.54	223.02	108.90	12500.07	11887.98	612.09
09:22:19	00:08:15	11889.56	222.00	108.93	12695.40	11893.51	801.89
09:22:34	00:08:30	11898.12	223.01	108.28	13650.36	11900.05	1750.30
09:22:49	00:08:45	11896.60	226.54	110.74	15039.42	11905.08	3134.34
09:23:04	00:09:00	11893.59	223.02	110.18	14457.18	11917.19	2539.99
09:23:19	00:09:15	11895.60	222.50	109.30	14040.44	11918.69	2121.75
09:23:34	00:09:30	11897.61	222.50	109.93	13947.32	11919.19	2028.13
09:23:49	00:09:45	11898.61	221.98	109.60	13934.73	11919.68	2015.05
09:24:04	00:10:00	11899.61	222.48	112.02	13913.59	11921.19	1992.40
09:24:19	00:10:15	11900.61	222.47	111.51	13893.45	11921.69	1971.76
09:24:34	00:10:30	11901.11	222.47	111.68	13874.32	11922.19	1952.13
09:24:49	00:10:45	11902.11	222.46	109.94	13856.69	11922.18	1934.51
09:25:04	00:11:00	11901.10	222.96	110.25	13850.65	11922.68	1927.97
09:25:19	00:11:15	11902.10	222.44	110.15	13831.52	11923.17	1908.34
09:25:34	00:11:30	11902.60	222.94	109.64	13815.91	11923.67	1892.23
09:25:49	00:11:45	11902.59	222.43	110.50	13805.33	11923.17	1882.17
09:25:59	00:11:53	11903.09	222.42	110.40	13792.24	11923.66	1868.58

TEST DATE:	18 JANUARY, 1997	DST NUMBER:	EIGHT
WELL NAME:	UCEL LIARD	INTERVAL:	1043.0 -1063.74 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PREFLOW

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Liquid Flowrate m3/d	Surface Gas Flowrate m3/d	Total Gas Flowrate m3/d	Gas Liquid Ratio m3/m3	Formation Temp. deg C
09:27:39	00:00:00	474.96	410.62	108.62	873.05	0.00	-877.76	-1.01	38.56
09:27:54	00:00:15	429.03	405.09	108.43	563.96	0.00	-555.01	-0.98	38.53
09:28:09	00:00:30	435.59	423.80	109.20	297.55	0.00	-260.39	-0.88	38.53
09:28:24	00:00:45	444.67	443.02	108.24	150.89	0.00	-238.15	-1.58	38.54
09:28:39	00:01:00	459.82	461.22	108.51	81.39	0.00	-130.02	-1.60	38.55
09:28:54	00:01:15	472.94	477.40	108.27	48.98	0.00	-80.15	-1.64	38.56
09:29:09	00:01:30	483.03	490.04	109.73	32.79	0.00	65.56	2.00	38.57
09:29:24	00:01:45	492.62	501.16	108.90	24.82	0.00	-8.45	-0.34	38.58
09:29:39	00:02:00	499.18	508.74	108.85	18.36	0.00	-2.08	-0.11	38.59
09:29:54	00:02:15	505.74	516.32	110.12	14.29	0.00	101.99	7.14	38.60
09:30:09	00:02:30	510.79	521.68	110.43	11.53	0.00	90.16	7.82	38.61
09:30:24	00:02:45	515.83	527.94	108.64	10.94	0.00	-73.86	-6.75	38.62
09:30:39	00:03:00	520.87	532.99	109.73	9.38	0.00	-7.40	-0.79	38.63
09:30:54	00:03:15	524.40	537.53	110.00	8.02	0.00	43.29	5.40	38.63
09:31:09	00:03:30	527.42	542.08	110.54	7.35	0.00	60.39	8.22	38.64
09:31:24	00:03:45	531.45	545.61	110.95	6.26	0.00	79.43	12.69	38.65
09:31:39	00:04:00	534.48	550.15	109.98	6.65	0.00	-9.56	-1.44	38.66
09:31:54	00:04:15	538.00	553.68	110.71	6.12	0.00	13.37	2.19	38.67
09:32:09	00:04:30	541.03	556.71	110.93	5.40	0.00	48.07	8.90	38.68
09:32:24	00:04:45	543.54	559.73	109.78	5.56	0.00	-66.30	-11.93	38.69
09:32:39	00:05:00	546.06	563.26	113.02	3.60	0.00	300.09	83.29	38.71
09:32:49	00:05:09	548.07	566.79	112.19	4.36	0.00	250.75	57.50	38.72

TEST DATE:	18 JANUARY, 1997	DST NUMBER:	EIGHT
WELL NAME:	UCEL LIARD	INTERVAL:	1043.0 -1063.74 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

INITIAL SHUT IN

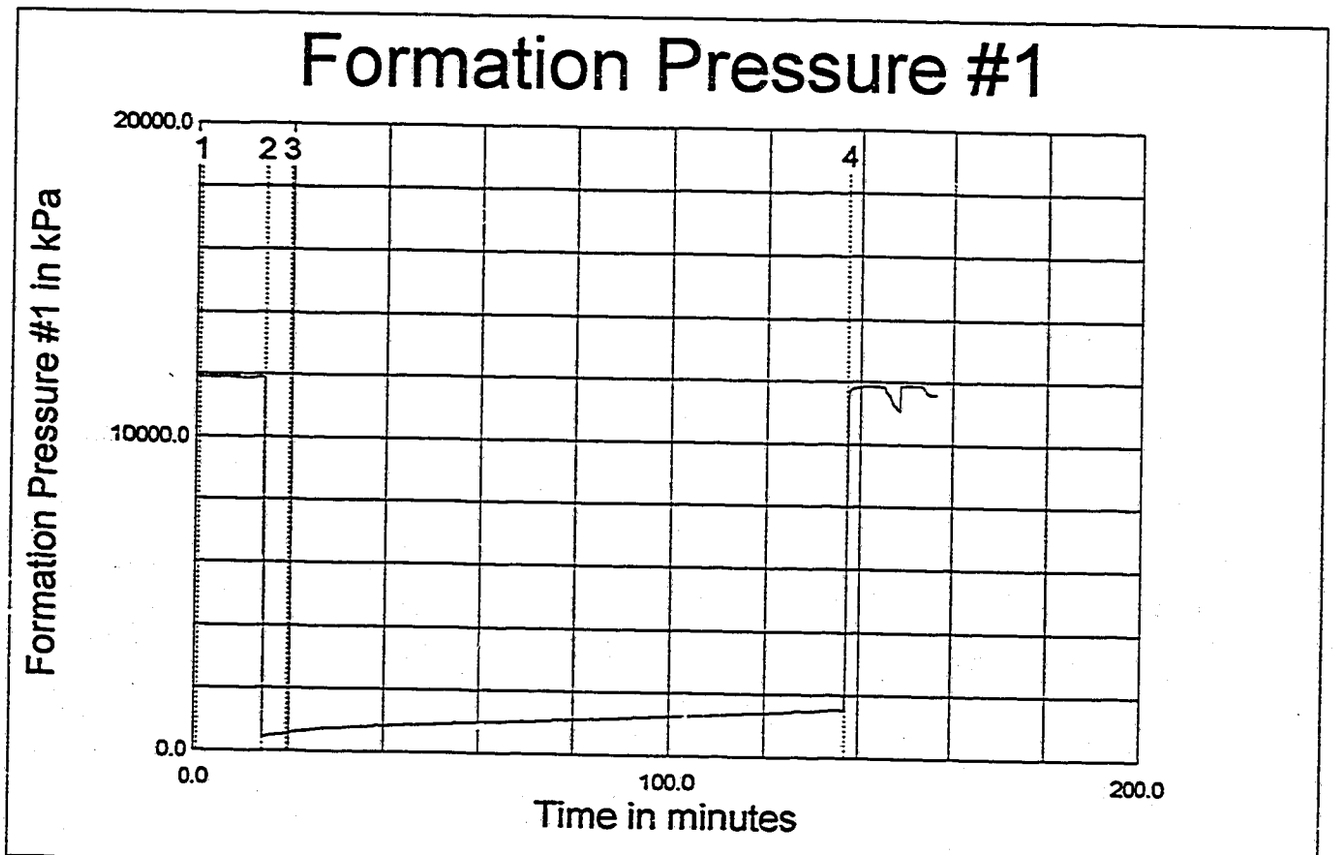
Time	Elapsed Time	Formation Pressure #1 kPa	Formation Pressure #2 kPa	Transducer Difference kPa	Recovery Pressure kPa	Surface Pressure kPa	Formation Temp. deg C	Hydrostatic Pressure kPa
09:32:54	00:00:00	552.11	565.13	-13.02	549.59	112.01	38.72	11925.02
09:33:54	00:01:00	589.95	601.41	-11.46	562.19	111.52	38.77	11930.01
09:34:54	00:02:00	620.21	632.61	-12.41	566.18	111.80	38.82	11930.97
09:35:54	00:03:00	644.91	656.75	-11.85	568.65	111.86	38.88	11929.91
09:36:54	00:04:00	666.58	678.36	-11.79	571.12	111.74	38.94	11929.36
09:37:54	00:05:00	686.22	697.45	-11.22	572.07	111.35	39.00	11929.31
09:38:54	00:06:00	702.33	714.00	-11.67	573.02	112.19	39.06	11929.76
09:39:54	00:07:00	716.93	728.54	-11.61	573.97	112.89	39.12	11928.70
09:40:54	00:08:00	730.01	741.05	-11.04	574.41	112.36	39.19	11928.14
09:41:54	00:09:00	740.56	752.05	-11.49	574.35	112.65	39.24	11927.09
09:42:54	00:10:00	750.11	762.56	-12.44	574.29	113.95	39.30	11927.04
09:44:54	00:12:00	769.21	781.55	-12.34	574.68	113.18	39.41	11925.43
09:46:54	00:14:00	787.30	799.03	-11.73	574.07	111.41	39.52	11924.84
09:48:54	00:16:00	804.90	815.53	-10.63	574.48	110.70	39.61	11924.26
09:50:54	00:18:00	820.99	831.54	-10.55	574.40	112.88	39.69	11923.68
09:52:54	00:20:00	835.57	846.55	-10.98	573.31	113.97	39.77	11921.60
09:54:54	00:22:00	851.17	861.07	-9.90	573.24	114.88	39.84	11920.03
09:56:54	00:24:00	865.77	876.11	-10.34	573.68	113.64	39.90	11919.48
09:58:54	00:26:00	879.36	889.65	-10.29	572.62	114.65	39.95	11920.44
10:00:54	00:28:00	893.96	903.70	-9.74	572.57	114.02	40.00	11920.90
10:02:54	00:30:00	907.06	917.26	-10.20	573.03	113.59	40.04	11920.36
10:04:54	00:32:00	920.66	930.32	-9.66	573.49	114.66	40.08	11919.82
10:06:54	00:34:00	934.27	943.89	-9.62	572.95	112.12	40.12	11919.29
10:08:54	00:36:00	946.87	957.47	-10.60	572.42	113.65	40.15	11917.75
10:10:54	00:38:00	960.99	971.06	-10.07	572.90	112.84	40.18	11917.23
10:12:54	00:40:00	974.09	984.14	-10.04	572.87	112.88	40.20	11916.20
10:14:54	00:42:00	986.20	997.23	-11.03	572.85	113.70	40.22	11915.17
10:16:54	00:44:00	1000.32	1010.33	-10.00	572.83	112.91	40.24	11915.16
10:18:54	00:46:00	1013.95	1023.93	-9.99	573.32	113.66	40.26	11914.64
10:20:54	00:48:00	1027.07	1037.54	-10.48	572.80	113.03	40.27	11914.13
10:22:54	00:50:00	1040.69	1050.15	-9.46	572.79	113.58	40.28	11914.62
10:24:54	00:52:00	1053.31	1063.76	-10.45	572.27	113.89	40.29	11913.10
10:26:54	00:54:00	1065.93	1076.88	-10.95	572.26	115.15	40.30	11912.08
10:28:54	00:56:00	1080.57	1090.50	-9.93	572.76	114.76	40.31	11911.57
10:30:54	00:58:00	1093.69	1104.62	-10.93	571.74	114.06	40.32	11911.06
10:32:54	01:00:00	1107.83	1117.74	-9.92	571.23	113.59	40.32	11911.56
10:37:54	01:05:00	1141.15	1152.56	-11.42	571.22	112.86	40.33	11909.54
10:42:54	01:10:00	1177.50	1187.38	-9.89	571.21	114.64	40.35	11908.52
10:47:54	01:15:00	1212.84	1222.72	-9.87	572.21	114.36	40.35	11906.50
10:52:54	01:20:00	1249.70	1260.06	-10.37	572.20	116.32	40.36	11906.49
10:57:54	01:25:00	1286.05	1296.41	-10.35	573.20	116.52	40.37	11905.48
11:02:54	01:30:00	1323.41	1334.26	-10.85	573.70	114.42	40.38	11903.96
11:07:54	01:35:00	1361.78	1372.61	-10.83	574.20	114.48	40.39	11903.44
11:12:54	01:40:00	1402.68	1413.50	-10.82	574.19	114.21	40.40	11901.92
11:17:54	01:45:00	1443.57	1454.88	-11.31	575.19	115.09	40.41	11903.43
11:22:54	01:50:00	1485.47	1496.26	-10.79	575.17	114.48	40.42	11902.41
11:27:54	01:55:00	1528.90	1539.67	-10.78	575.17	113.66	40.43	11900.89
11:30:24	01:57:30	1551.59	1565.37	-13.77	575.14	112.82	40.46	11191.59

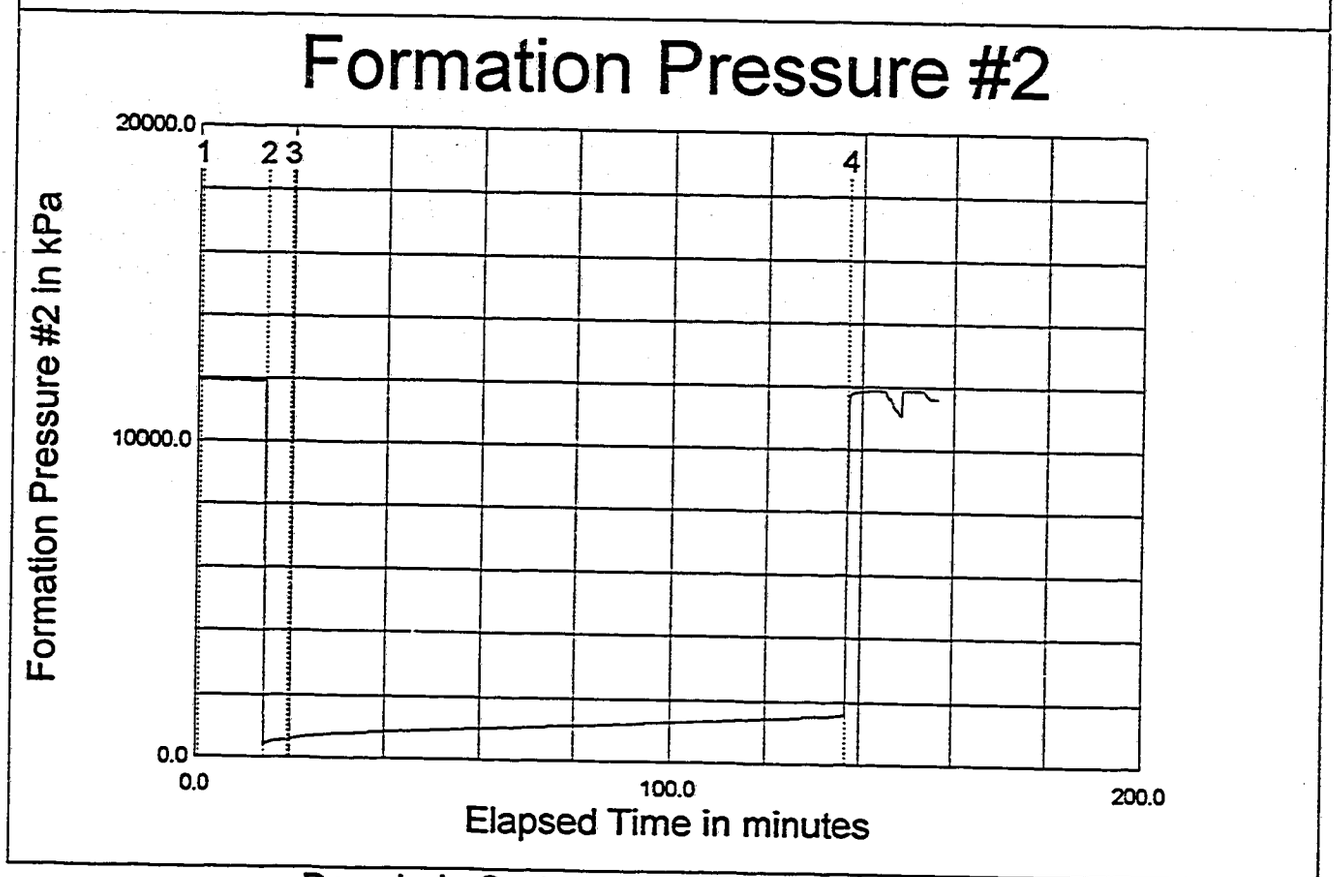
TEST DATE:	18 JANUARY, 1997	DST NUMBER:	EIGHT
WELL NAME:	UCEL LIARD	INTERVAL:	1043.0 -1063.74 mKB
LOCATION:	k-02-60-20-123-30	FORMATION NAME:	MATTSON

PACKER DEFLATION

Time	Elapsed Time	Formation Pressure #1 kPa	Recovery Pressure kPa	Surface Pressure kPa	Inflation Pressure kPa	Hydrostatic Pressure kPa	Net Inflation Pressure kPa
11:30:54	00:00:00	11643.51	580.68	113.18	12533.18	11727.07	806.12
11:31:09	00:00:15	11745.77	579.16	112.77	12511.53	11800.10	711.43
11:31:24	00:00:30	11786.07	578.65	112.81	12506.50	11831.33	675.16
11:31:39	00:00:45	11807.74	578.16	113.31	12500.96	11847.46	653.50
11:31:54	00:01:00	11821.34	578.66	113.40	12498.95	11858.54	640.41
11:32:09	00:01:15	11830.41	578.67	112.76	12494.93	11865.09	629.83
11:32:24	00:01:30	11837.47	578.16	104.79	12497.95	11870.64	627.31
11:32:39	00:01:45	11842.51	578.67	112.52	12497.95	11874.67	623.28
11:32:54	00:02:00	11846.54	578.67	112.97	12500.97	11877.19	623.78
11:33:09	00:02:15	11849.06	578.67	113.88	12502.48	11879.71	622.78
11:33:24	00:02:30	11853.07	579.66	113.37	12505.49	11882.21	623.28
11:33:39	00:02:45	11857.12	579.69	113.42	12505.50	11886.26	619.25
11:33:54	00:03:00	11859.61	578.65	112.18	12509.01	11888.25	620.76
11:34:09	00:03:15	11862.66	579.68	112.63	12511.54	11890.28	621.26
11:34:24	00:03:30	11863.64	580.16	112.58	12513.03	11891.27	621.77
11:34:39	00:03:45	11865.67	580.18	114.63	12515.06	11892.80	622.27
11:34:54	00:04:00	11866.66	580.66	112.06	12516.05	11893.78	622.27
11:35:09	00:04:15	11869.18	580.15	112.84	12518.57	11895.79	622.77
11:35:24	00:04:30	11871.19	580.66	111.87	12522.09	11898.31	623.78
11:35:39	00:04:45	11872.72	580.17	112.05	12523.61	11898.83	624.78
11:35:54	00:05:00	11873.72	581.18	112.41	12526.13	11899.34	626.79
11:36:24	00:05:30	11875.21	581.15	111.67	12527.11	11901.33	625.79
11:36:54	00:06:00	11877.24	581.17	111.74	12526.12	11902.85	623.27
11:37:24	00:06:30	11877.72	582.15	110.68	12528.61	11903.83	624.78
11:37:54	00:07:00	11858.57	582.65	111.90	13276.21	11890.73	1385.48
11:38:24	00:07:30	11872.17	582.14	112.53	12969.12	11897.28	1071.85
11:38:54	00:08:00	11692.32	581.63	111.65	12874.97	11907.34	967.63
11:39:24	00:08:30	11637.41	581.63	111.36	12850.81	11910.87	939.94
11:39:54	00:09:00	11435.91	582.14	111.39	14583.35	11905.84	2677.51
11:40:24	00:09:30	11325.04	583.12	110.88	14166.60	11908.84	2257.77
11:40:54	00:10:00	11217.73	582.11	110.55	14113.75	11911.35	2202.40
11:41:24	00:10:30	11133.10	581.62	110.49	14068.97	11913.38	2155.59
11:41:54	00:11:00	11068.59	581.08	110.88	14099.65	11772.31	2327.34
11:42:24	00:11:30	11880.70	582.11	111.56	13954.70	11905.31	2049.40
11:42:54	00:12:00	11883.20	582.08	112.09	13951.66	11906.79	2044.87
11:43:24	00:12:30	11883.20	581.57	111.99	13943.10	11906.29	2036.82
11:43:54	00:13:00	11884.20	582.07	112.79	13931.52	11906.79	2024.74
11:44:24	00:13:30	11884.20	581.56	111.60	13924.47	11907.79	2016.68
11:44:54	00:14:00	11885.22	581.08	112.31	13916.44	11907.31	2009.13
11:45:24	00:14:30	11884.19	581.55	112.80	13908.87	11907.28	2001.58
11:45:54	00:15:00	11885.22	581.58	112.56	13902.34	11907.80	1994.54
11:46:24	00:15:30	11884.71	581.57	110.85	13897.30	11907.80	1989.50
11:46:54	00:16:00	11844.91	581.57	112.44	13881.19	11910.31	1970.88
11:47:24	00:16:30	11736.60	582.07	112.61	13849.48	11911.82	1937.66
11:47:54	00:17:00	11647.93	581.06	110.95	13823.30	11911.32	1911.99
11:48:24	00:17:30	11620.73	580.55	110.95	13814.75	11911.82	1902.93
11:48:54	00:18:00	11620.73	580.55	110.95	13814.75	11911.82	1902.93
11:49:04	00:18:09	11620.73	580.55	110.95	13814.75	11911.82	1902.93

UCEL LIARD k-02-60-20-123-30
DST #EIGHT, MATTSON, 1043.0 -1063.74 mKB





Downhole Systems Technology Canada Inc.

UCEL LIARD k-02-60-20-123-30
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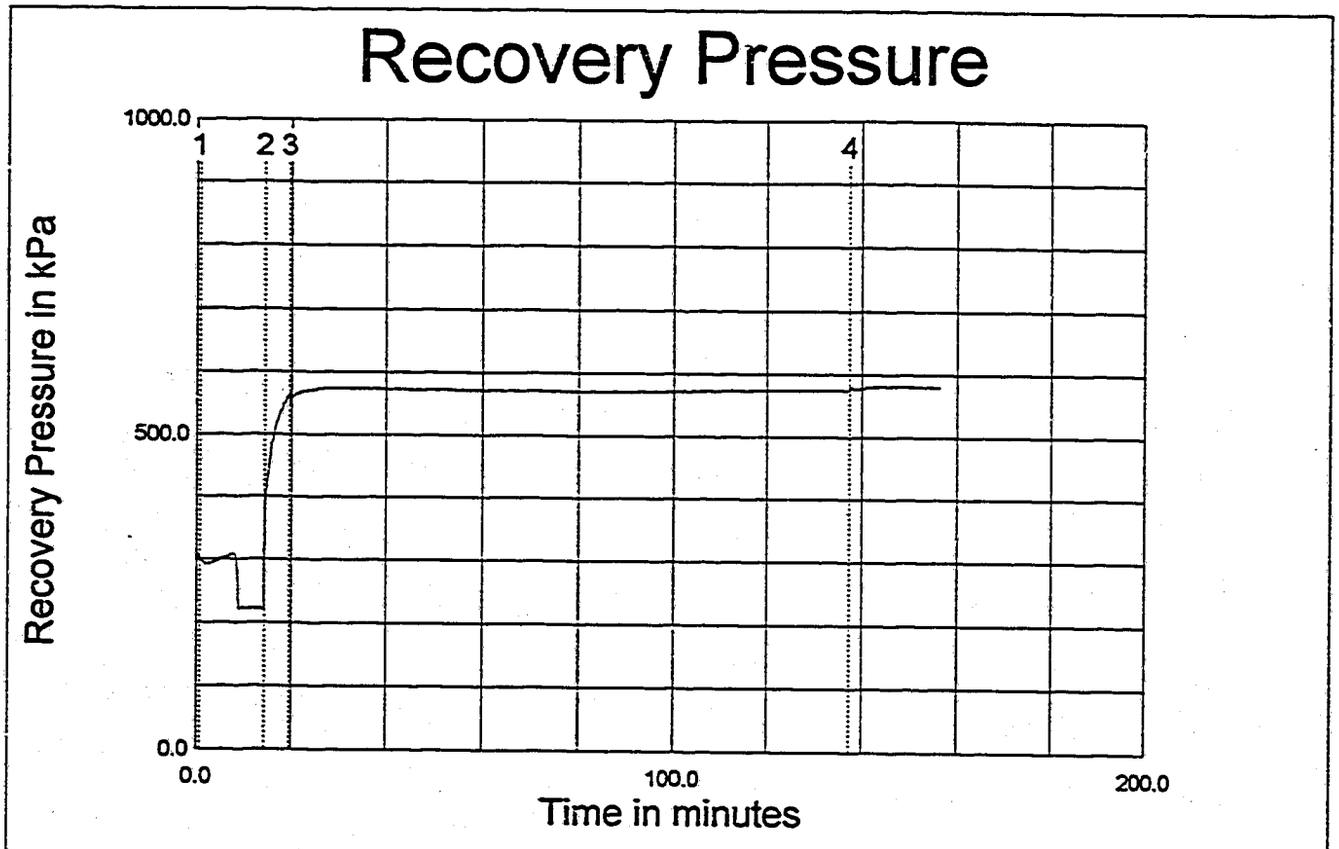

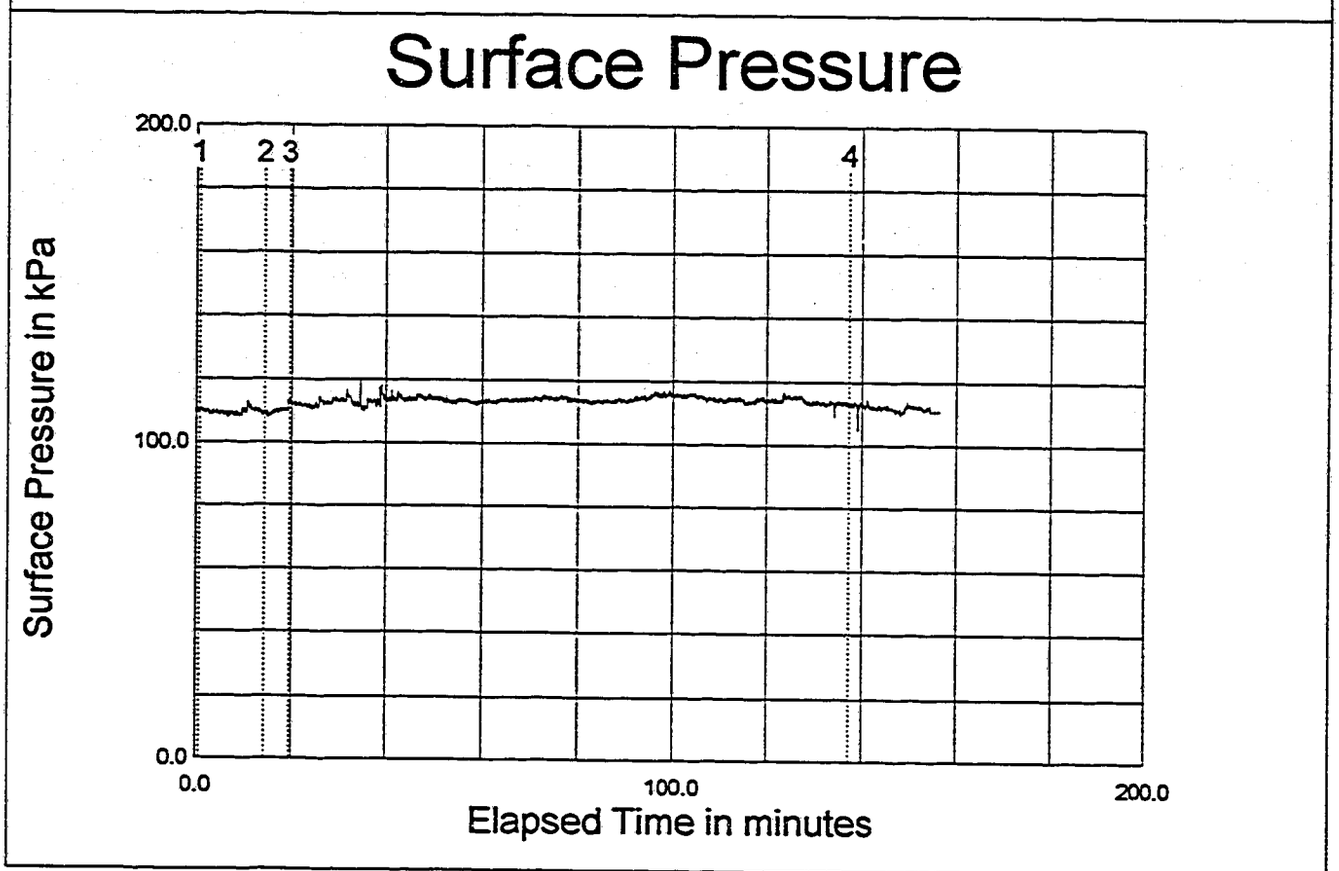

Downhole Systems Technology Canada Inc.

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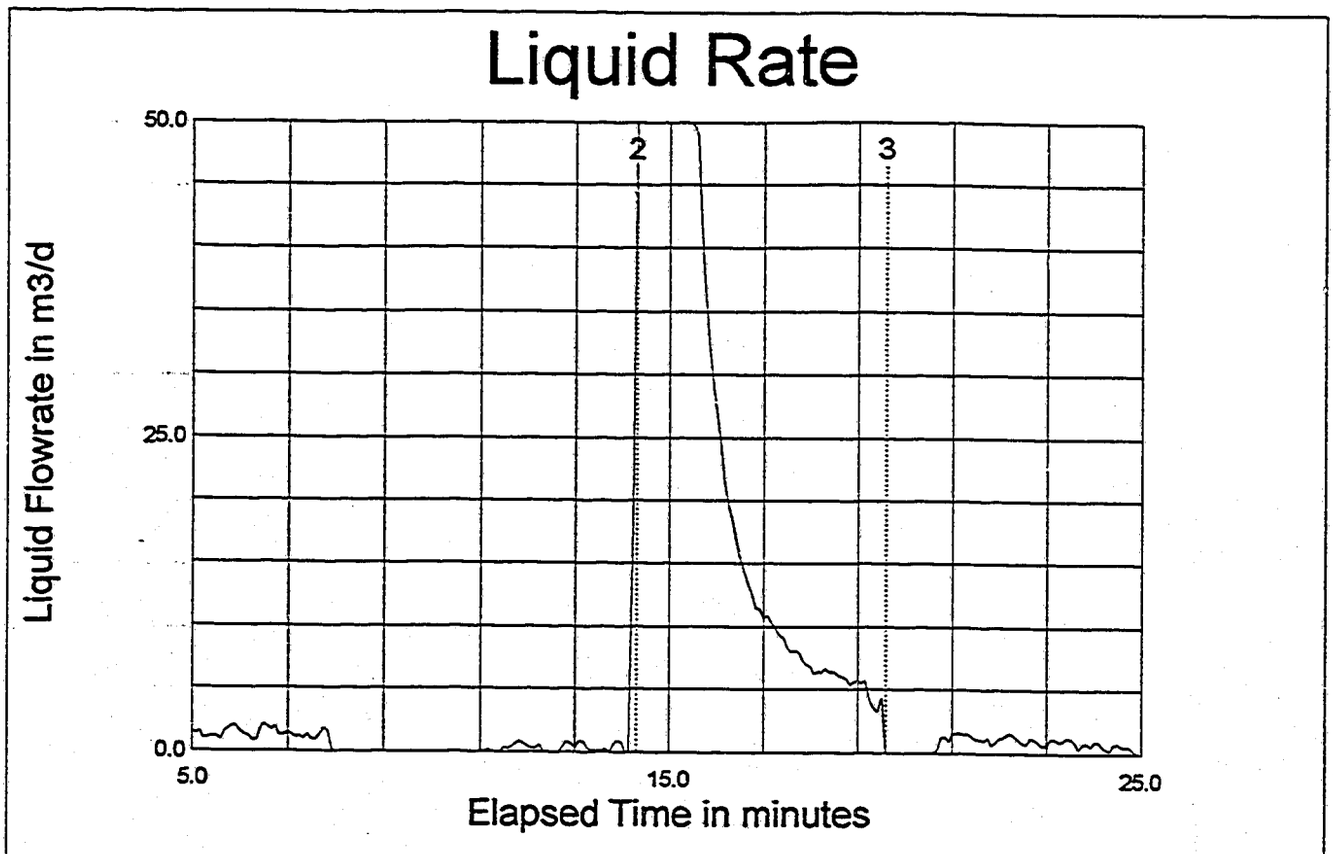

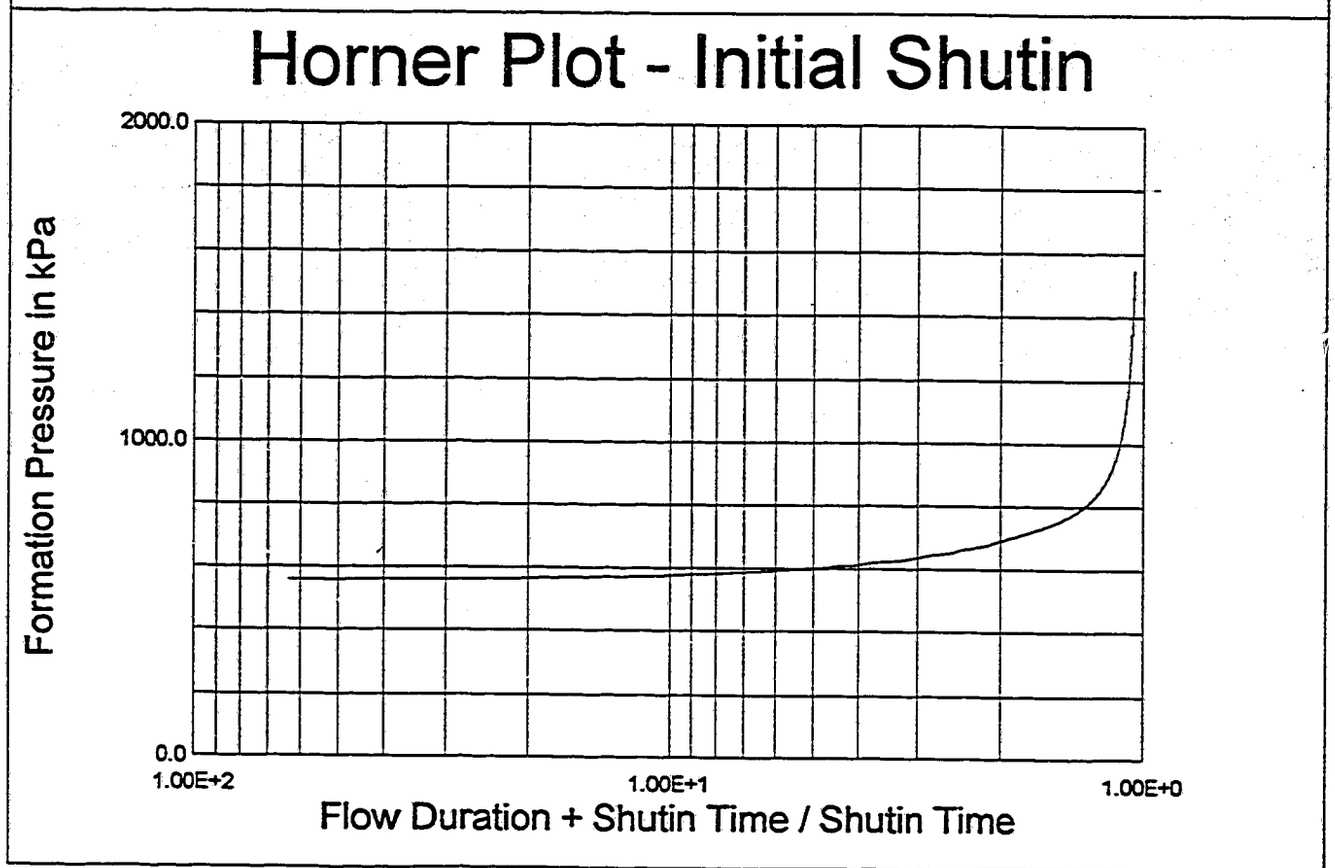

Downhole Systems Technology Canada Inc.

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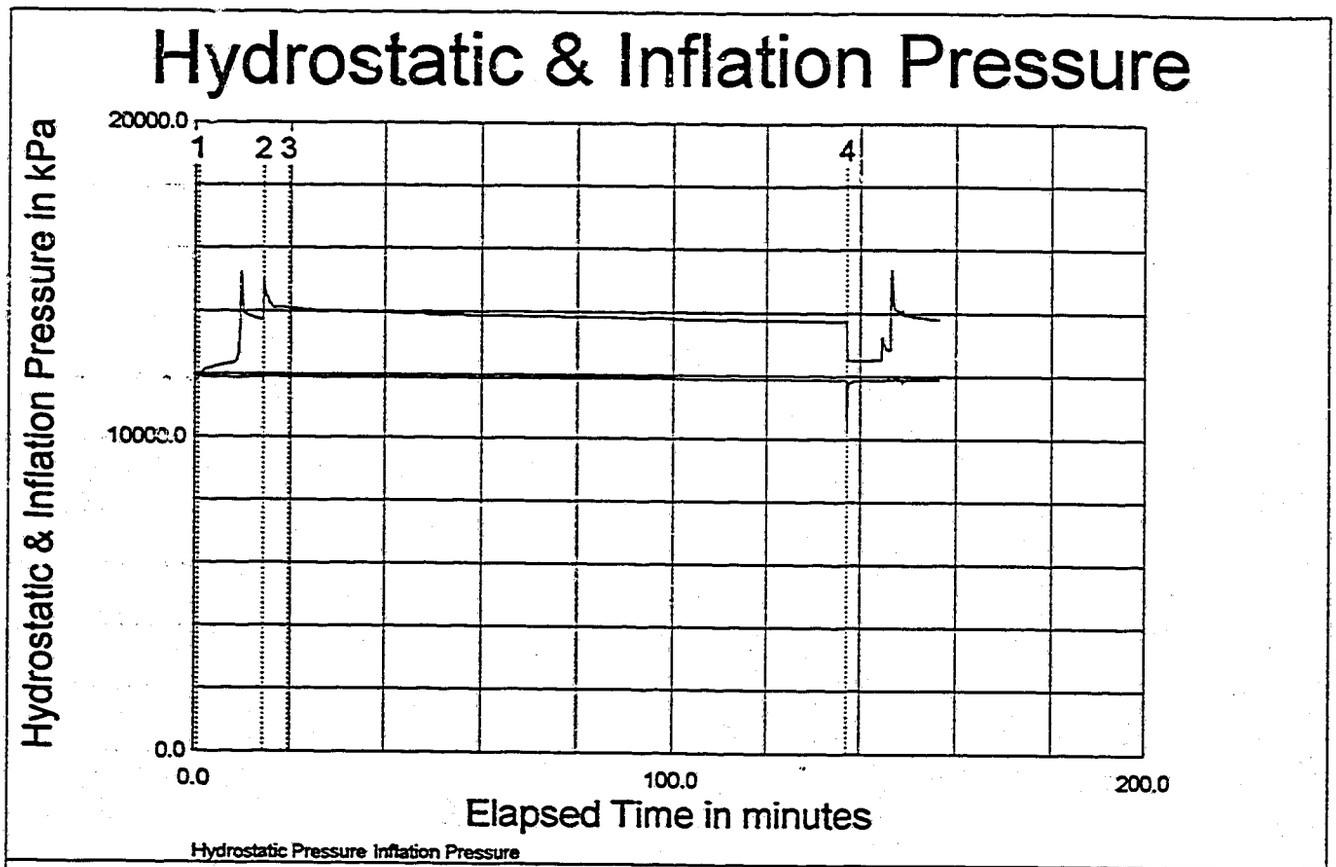

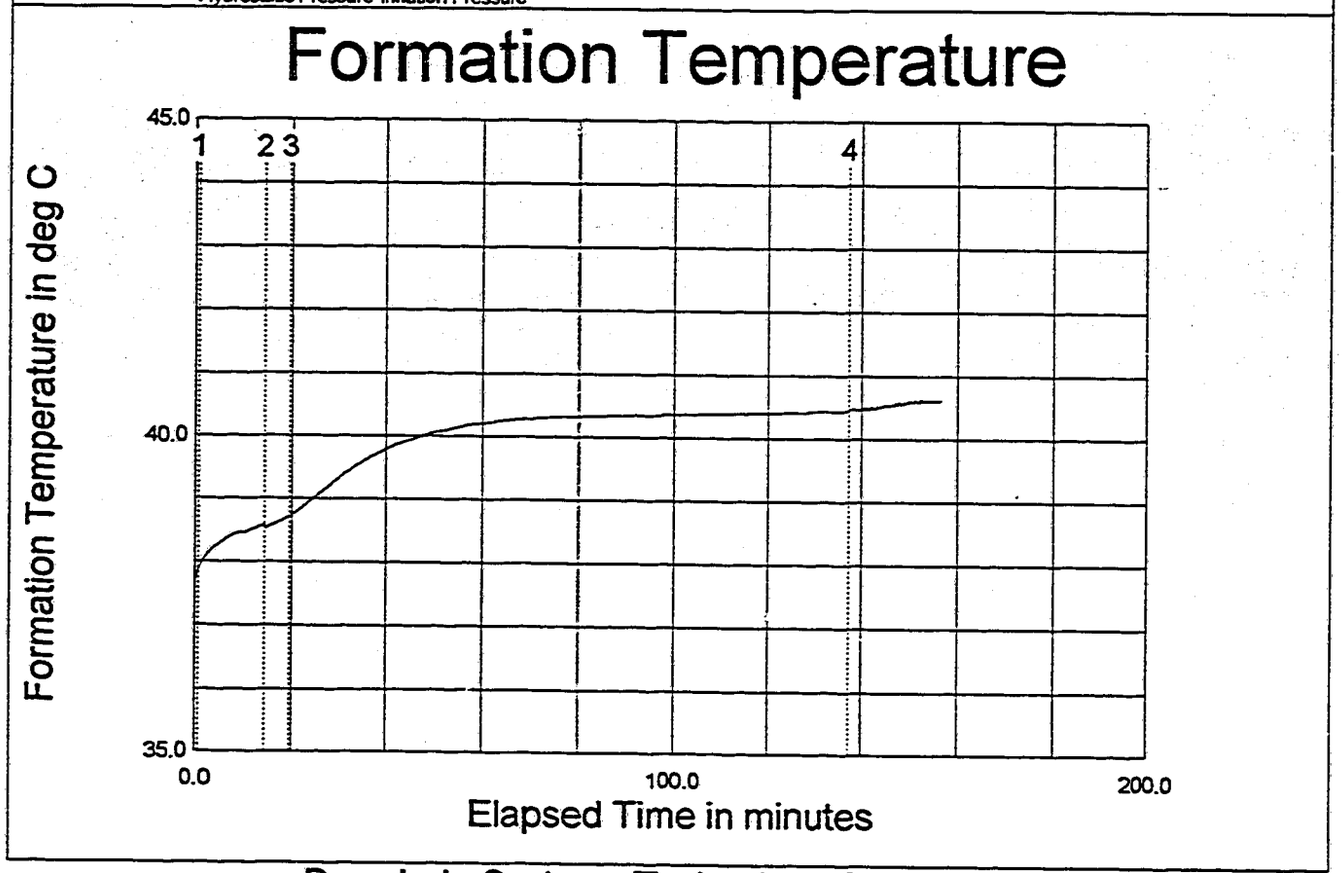

Downhole Systems Technology Canada Inc.

MDT ADVISOR

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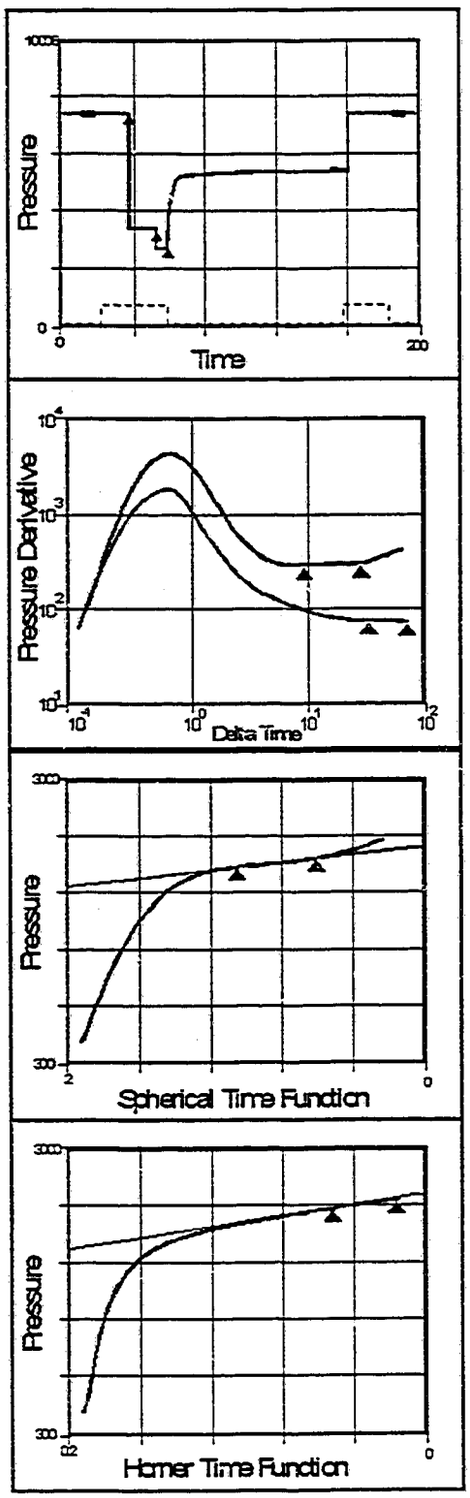
MDT ADVISOR

Modular Dynamics Tester Transient and Pressure vs Depth Analysis



UNOCAL CANADA EXPLORATION LIMITED

UCEL LIARD K-02

Logging Date: 14-JAN-1997
Reference: 500853
Analyst: A. Boustani

NATIONAL ENERGY BOARD
ENGINEERING BRANCH
JAN 2 4 1997

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WIRELINE FORMATION TESTER INTERPRETATION

Objective/Methodology

Modular Dynamics Tester (MDT) was run to measure reservoir pressure across several zones of interest, and collect representative reservoir fluid samples.

Interpretation

To achieve the objectives of testing and sampling, 40 pretests were attempted across the interval of interest. Of these, 9 were Dry, 12 were Lost Seal and 19 were interpretable. The fluid gradient marked as 1041.5 Kg/m3 is an asymptotic line passing through all the points and is simply used as a reference for comparison purposes.

The pretest pertinent to File-42 indicates an average reservoir pressure of 7229.4 kPa at 790.56 M M.D. Since this point has a lower pressure compared to the rest of the points, it could be located in a different reservoir unit. File-41 taken about half a meter above this point was Dry.

All pressure points taken from 1048.97 to 1102.34 M were either Dry or Lost Seal.

The straight line passing through points relevant to File-34, 29 and 28 indicates an average fluid density of 806 Kg/m3. However, the collected reservoir fluid samples from this point were filtrate. Should the results of petrophysical evaluation indicate that this zone is oil bearing, it can be concluded that during the pumpout period, the filtrate is not cleaned up properly.

Due to extremely low permeability of Pretest-27, this test was terminated before complete pressure buildup. Pressure extrapolation has improved the estimated reservoir pressure. However, the improvement has not been adequate to consider this point as a valid pressure value.

File-52,51,50,24,49,25,48 and 26 are taken within the next zone of interest. Apart from File-50,51 and 48 that are Dry, the estimated low Drawdown Mobility of the rest of the points indicates a very low permeability rock at this interval. Although the pressure points are close to the asymptotic fluid gradient of the overlaying interval, it is possible that a slight supercharge is associated with all these points.

File-20 and 22, indicate a lower pressure than the asymptotic gradient, where as pretest-17,18 and 19 indicate higher pressures. Therefore, it is likely that the later points are located in a different reservoir unit.

File-14,15 and 16 are taken across the lower section of the wellbore. Although all pretests indicate low drawdown mobility, their pressure points seem to be in equilibrium with pretest 20 and 22.

The lower most pretests pertinent to File-11,12 and 13 were all lost seal.

Conclusions/Recommendations

RFT has successfully achieved the objectives of pressure profiling. However, due to extremely low permeability of rock, the sampling has done only across 1 single point. Dual-Packer module of MDT is recommended for future fluid samplings.

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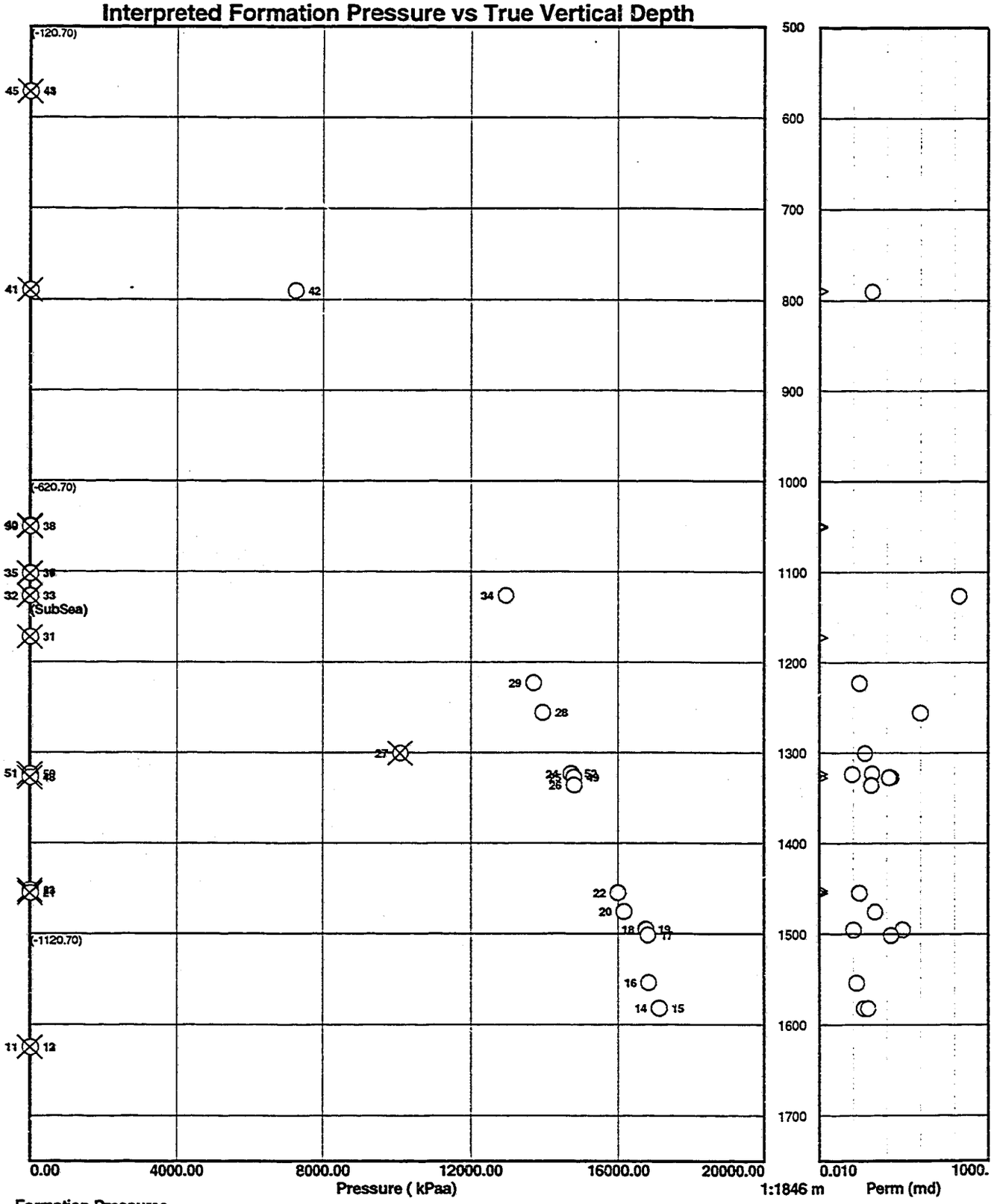
UCEL LIARD K-02 (14-JAN-1997, Run #1)

WIRELINE FORMATION TESTER INTERPRETATION

Interpreted Formation Pressure vs True Vertical Depth



Formation Pressures
○ Well # 1

X -Denotes points not used, or considered invalid. (PD-Plot Ver 1.09)

●Above Cutoff (1.0md)
● Below Cutoff
> Dry Tests

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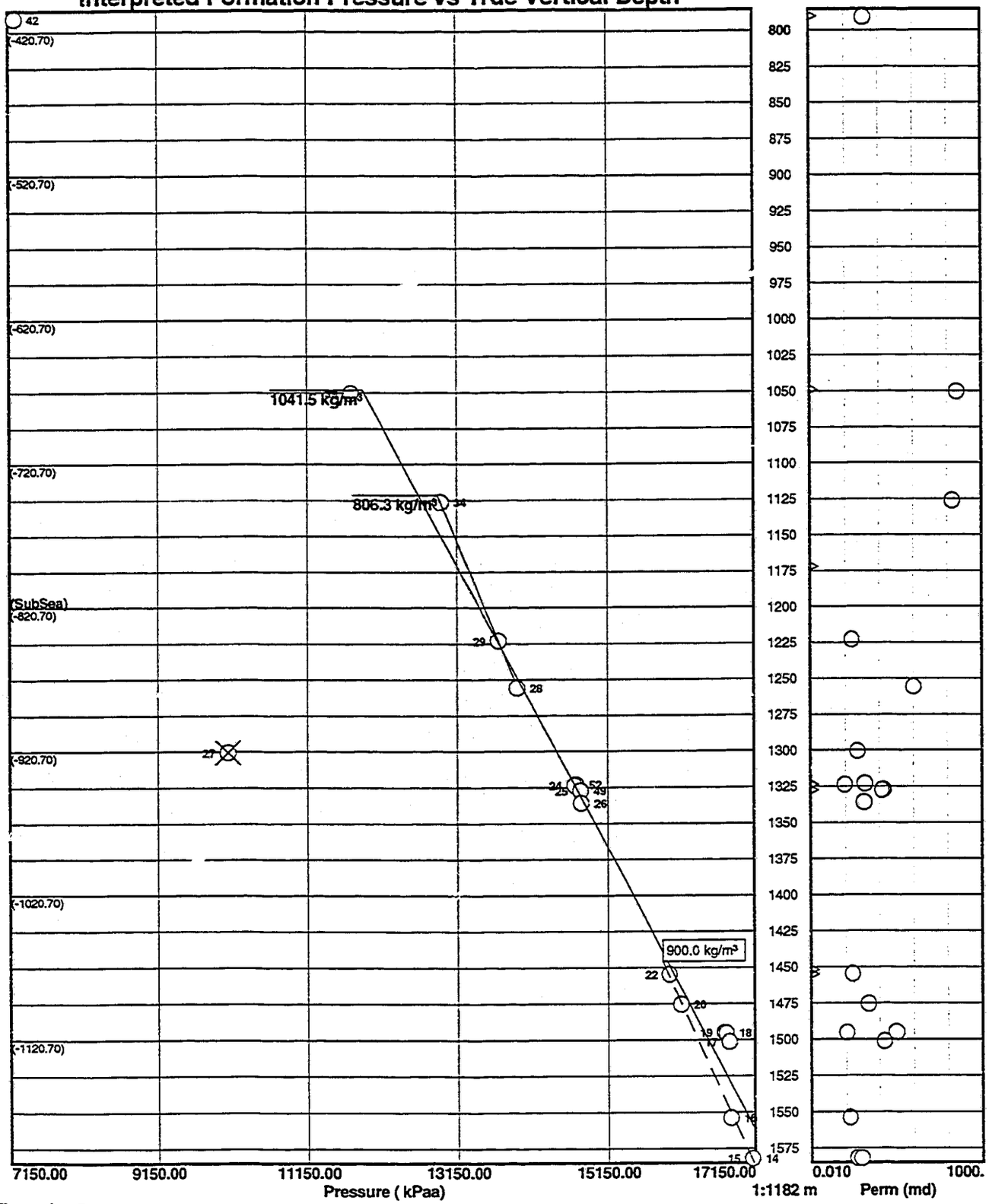
UCEL LIARD K-02 (14-JAN-1997, Run #1)

WIRELINE FORMATION TESTER INTERPRETATION

Interpreted Formation Pressure vs True Vertical Depth



Formation Pressures
○ Well # 1

X -Denotes points not used, or considered invalid. (PD-Plot Ver 1.09)

●Above Cutoff (1.0md)
● Below Cutoff
> Dry Tests

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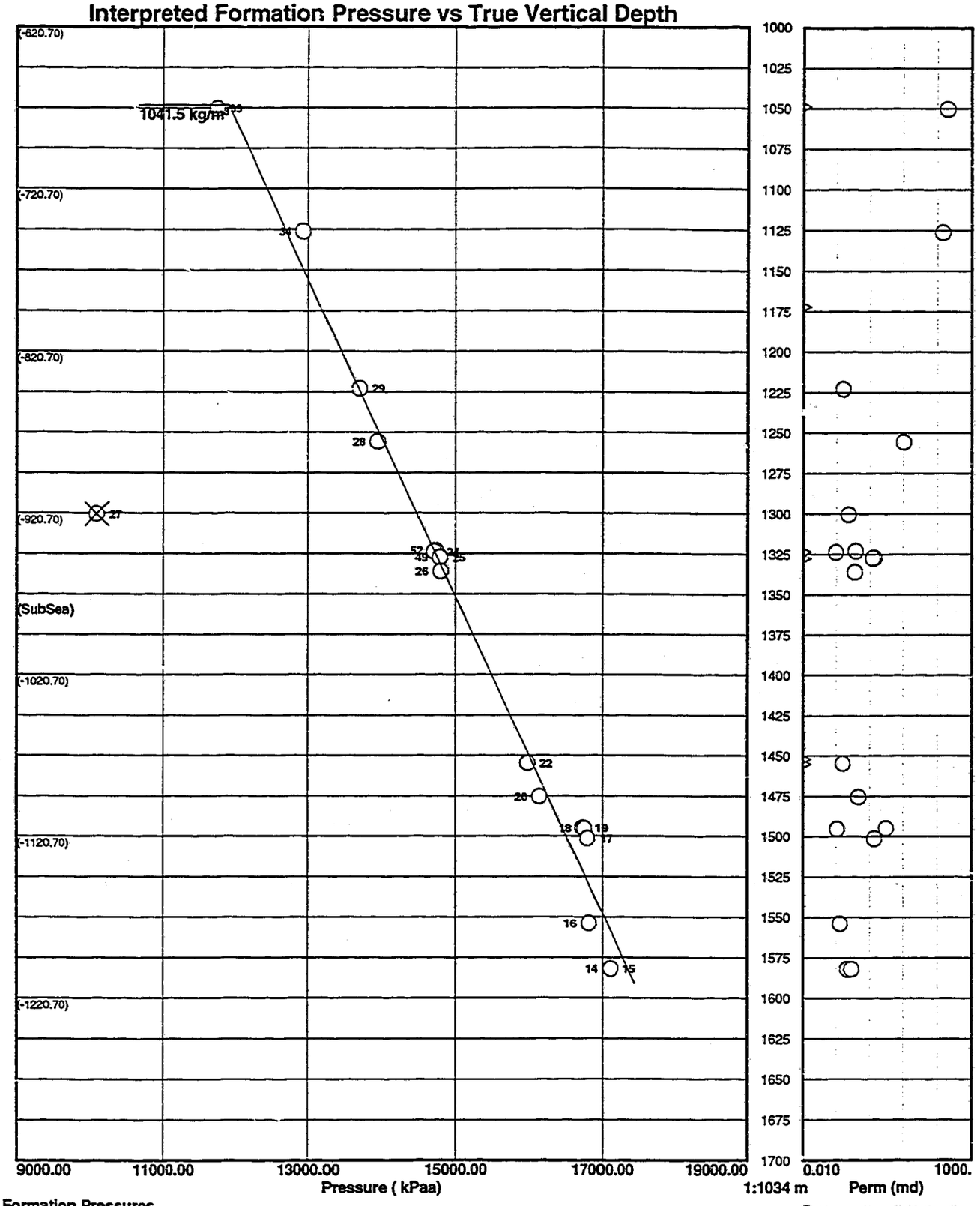
GeoQuest

UCEL LIARD K-02 (14-JAN-1997, Run #1)

WIRELINE FORMATION TESTER INTERPRETATION



Formation Pressures
○ Well # 1

X -Denotes points not used, or considered invalid. (PD-Plot Ver 1.09)

● Above Cutoff (1.0md)
● Below Cutoff
> Dry Tests

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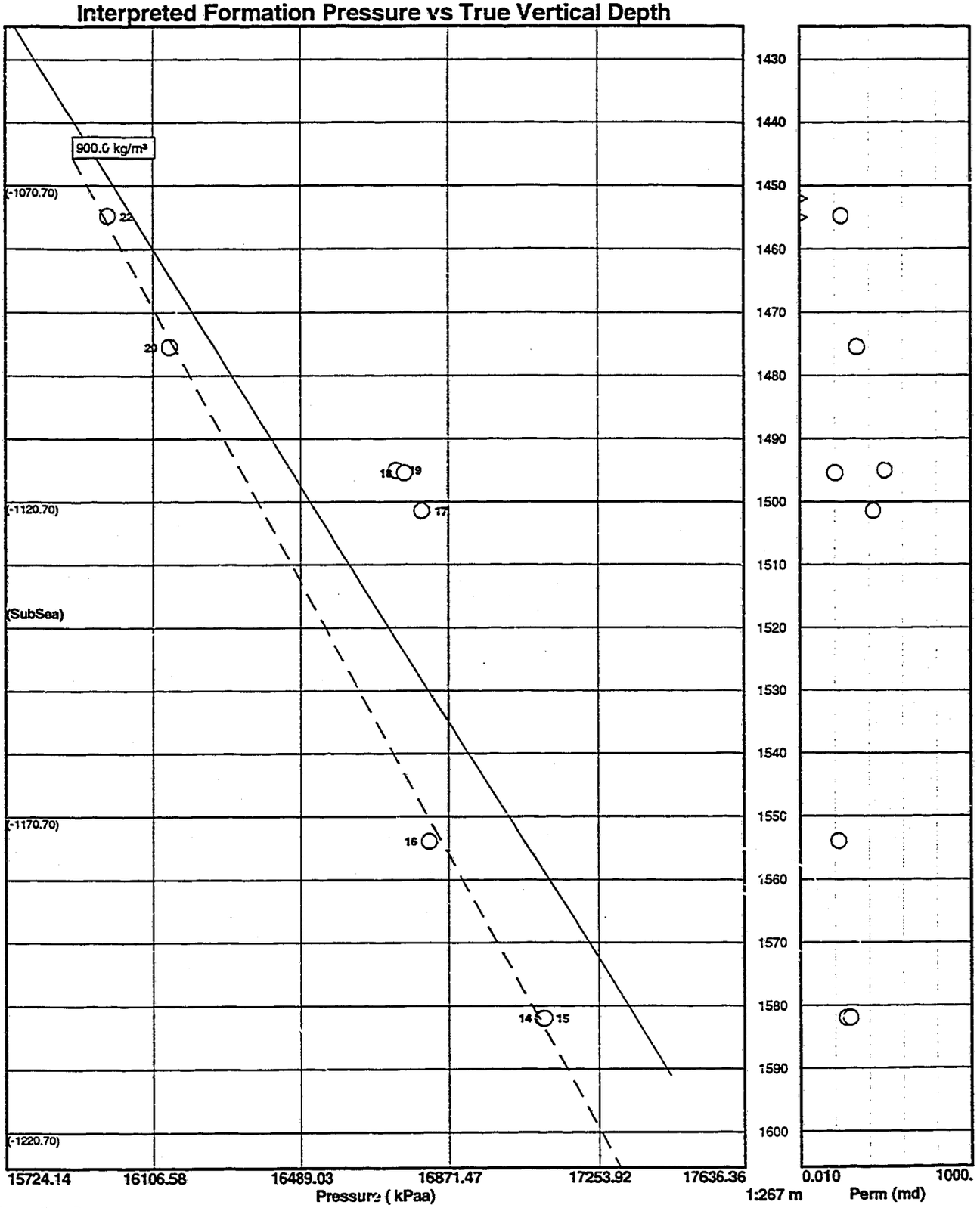
UCEL LIARD K-02 (14-JAN-1997, Run #1)

WIRELINE FORMATION TESTER INTERPRETATION

Interpreted Formation Pressure vs True Vertical Depth



Formation Pressures
○ Well # 1

X -Denotes points not used, or considered invalid. (PD-Plot Ver 1.09)

●Above Cutoff (1.0md)
● Below Cutoff
> Dry Tests

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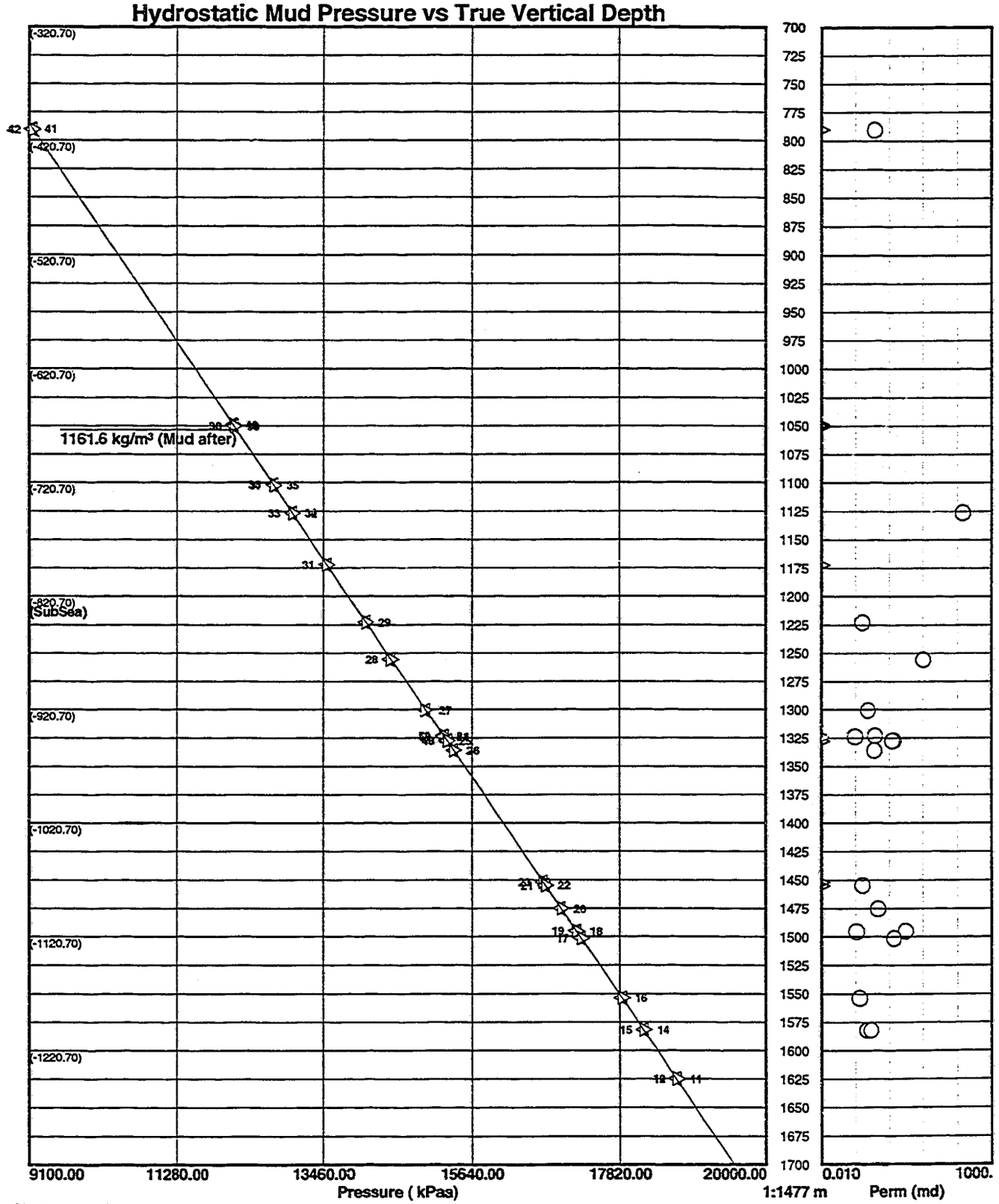
UCEL LIARD K-02 (14-JAN-1997, Run #1)

WIRELINE FORMATION TESTER INTERPRETATION

Hydrostatic Mud Pressure vs True Vertical Depth



Hydrostatic Pressures
◁ Before ▷ After

Drilling Mud Weight=1164.7 kg/m³

X -Denotes points not used, or considered invalid. (PD-Plot Ver 1.09)

● Above Cutoff (1.0md)
● Below Cutoff
> Dry Tests

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WIRELINE FORMATION TESTER INTERPRETATION

Well Plotted

Wellname	Kelly Elev. m	Tester Type	Gauge Type	Packer Type	Logging Date	Service Order #
UCEL LIARD K-02	379.30	MDT	CQG	Lg.Probe	14-JAN-1997	500853

Depth/Pressure Data

File #	TVD Depth m	Final BU kPaa	Formation kPaa	Mud Before/After kPaa	Perm md	Status	User Remarks
43	571.52			6646.7 / 6646.1		Seal Failure	
45	571.88			6650.4 / 0.0		Seal Failure	
44	572.04			6652.5 / 6652.3		Seal Failure	
41	790.03			9149.4 / 9152.7	0.000	Dry Test	
42	790.56	7229.4	7229.4	9160.5 / 9160.0	0.368	Interpreted	Very Low Perm
40	1048.97			12109.8 / 12107.4	0.000	Dry Test	
38	1050.05			12121.7 / 12121.5		Seal Failure	
39	1050.56	11739.8	11739.8	12127.6 / 12127.8	195.6	Interpreted	Excellent Perm
36	1101.49			12706.8 / 12706.2		Seal Failure	
35	1102.06			12715.5 / 12714.0		Seal Failure	
37	1102.34			12719.2 / 12719.1		Seal Failure	
34	1126.37	12937.4	12937.4	12993.0 / 12991.4	142.9	Interpreted	Excellent Perm
33	1126.74			12998.0 / 12996.9		Seal Failure	
32	1127.04			12998.7 / 12998.2		Seal Failure	
31	1172.22			13514.9 / 13513.0	0.000	Dry Test	
29	1222.91	13700.7	13700.7	14088.7 / 14088.5	0.156	Interpreted	Very Low Perm
28	1255.75	13945.3	13946.9	14454.7 / 14457.3	10.3	Interpreted	Good Perm
27	1300.56	10088.5	10088.5	14972.7 / 14956.0	0.228	Interpreted	Very Low Perm, Incomplete Build-up.
52	1323.04	14729.9	14729.9	15228.3 / 15226.6	0.373	Interpreted	Very Low Perm
51	1323.54			15235.2 / 15238.5	0.000	Dry Test	
50	1323.74			15238.6 / 15239.7	0.000	Dry Test	
24	1323.77	14711.5	14711.5	15233.6 / 15236.8	0.095	Interpreted	Very Low Perm
49	1327.23	14655.3	14792.8	15282.8 / 15277.1	1.4	Interpreted	Low Perm
25	1327.45	14788.0	14789.5	15268.9 / 15274.8	1.2	Interpreted	Low Perm
48	1327.53			15288.0 / 15283.1	0.000	Dry Test	
26	1335.96	14799.5	14799.5	15378.1 / 15374.2	0.353	Interpreted	Very Low Perm
23	1452.01			16699.1 / 16698.4	0.000	Dry Test	
22	1454.78	15989.5	15989.5	16730.3 / 16727.7	0.156	Interpreted	Very Low Perm
21	1455.03			16735.0 / 16735.1	0.000	Dry Test	
20	1475.47	16150.4	16150.4	16966.9 / 16968.0	0.459	Interpreted	Very Low Perm
19	1495.01	16738.8	16738.8	17194.2 / 17186.8	3.1	Interpreted	Fair Perm
18	1495.42	16760.6	16760.6	17199.2 / 17197.9	0.104	Interpreted	Very Low Perm
17	1501.44	16805.2	16805.2	17261.9 / 17267.0	1.4	Interpreted	Low Perm
16	1553.92	16823.9	16823.9	17862.9 / 17860.8	0.128	Interpreted	Very Low Perm
15	1581.96	17111.3	17111.3	18185.2 / 18183.1	0.213	Interpreted	Low Perm
14	1581.96	17115.5	17115.5	18188.7 / 18185.2	0.283	Interpreted	Low Perm
13	1624.57			18676.8 / 18676.8		Seal Failure	
11	1624.86			18682.7 / 18682.1		Seal Failure	
12	1625.00			18683.5 / 18683.0		Seal Failure	

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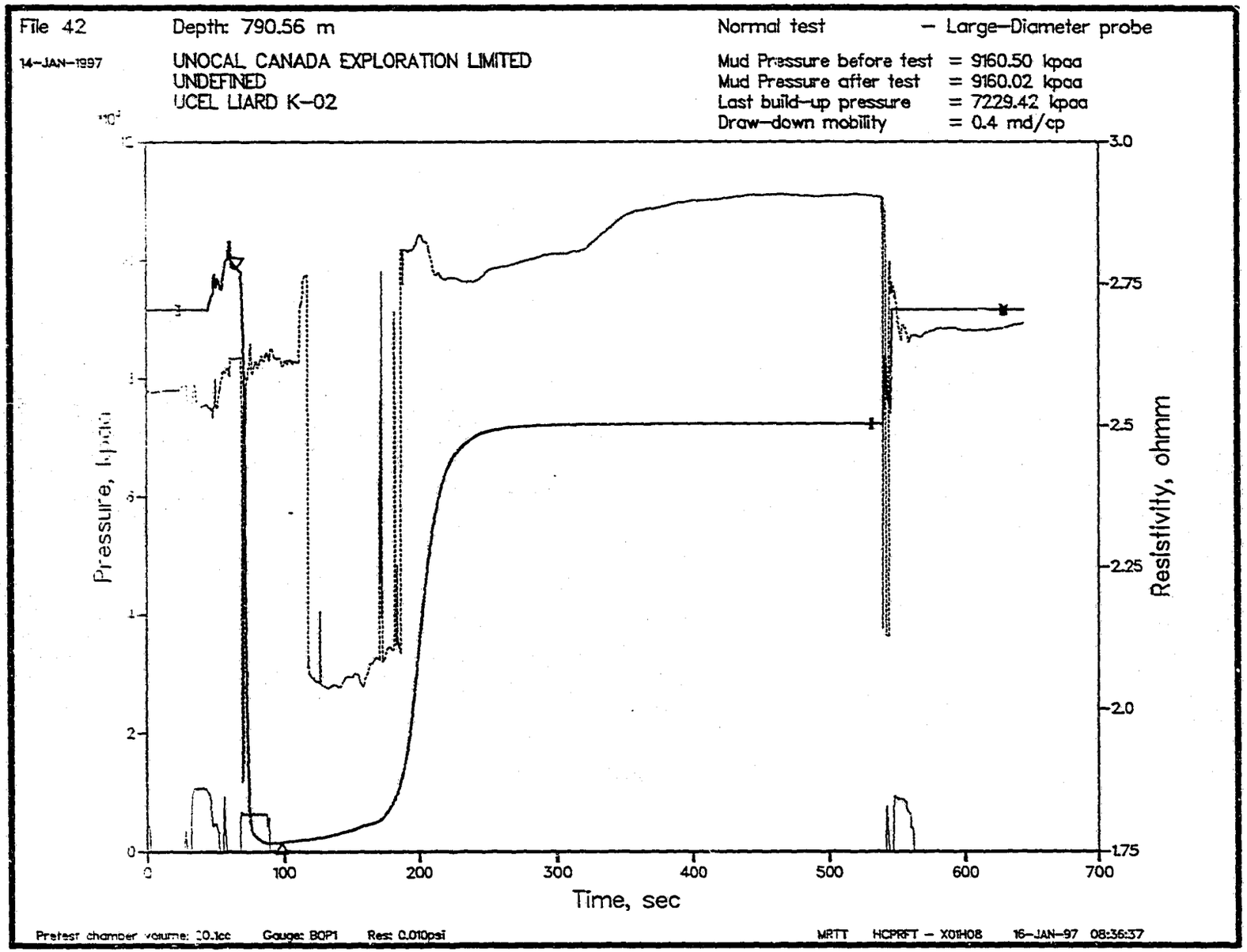
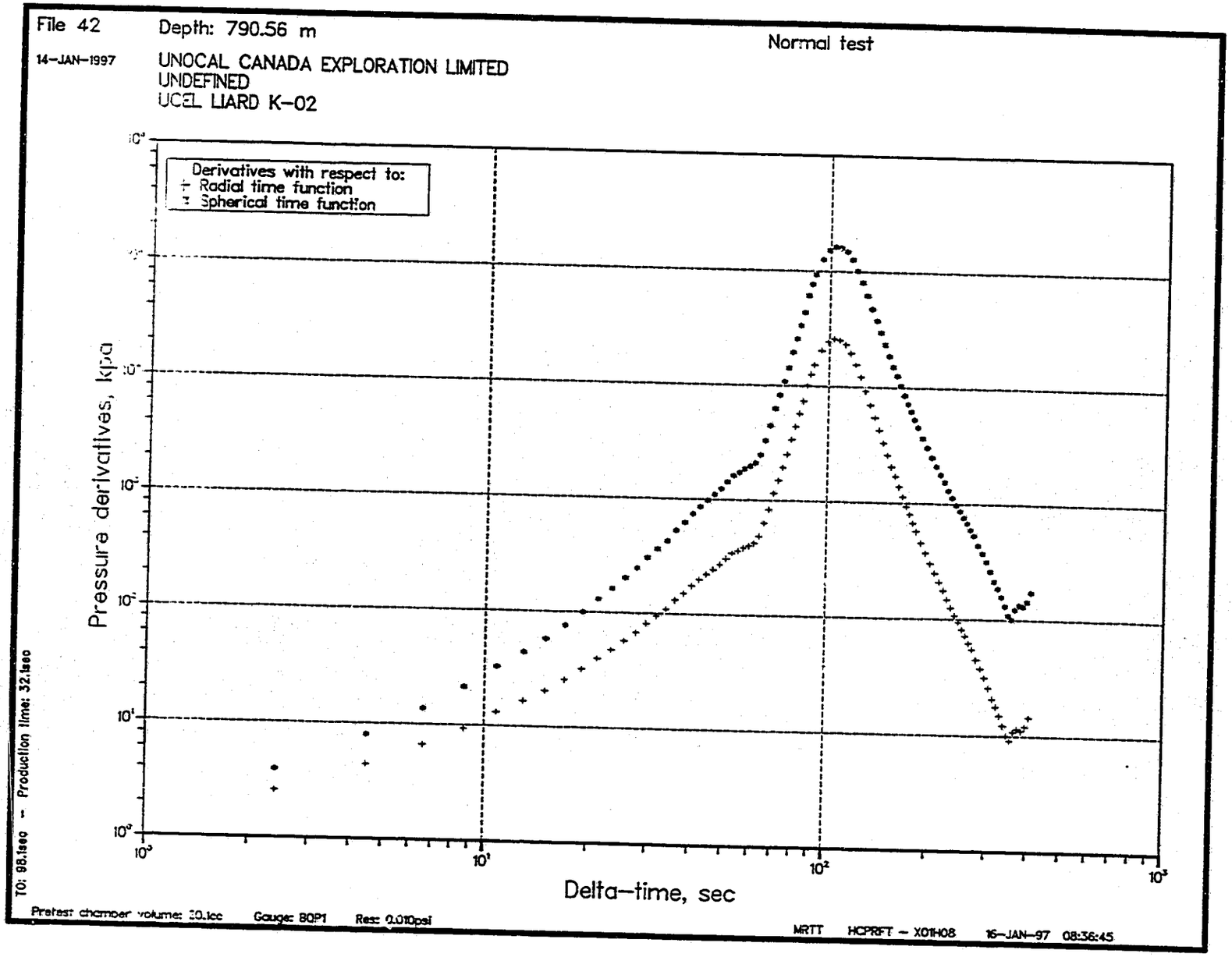
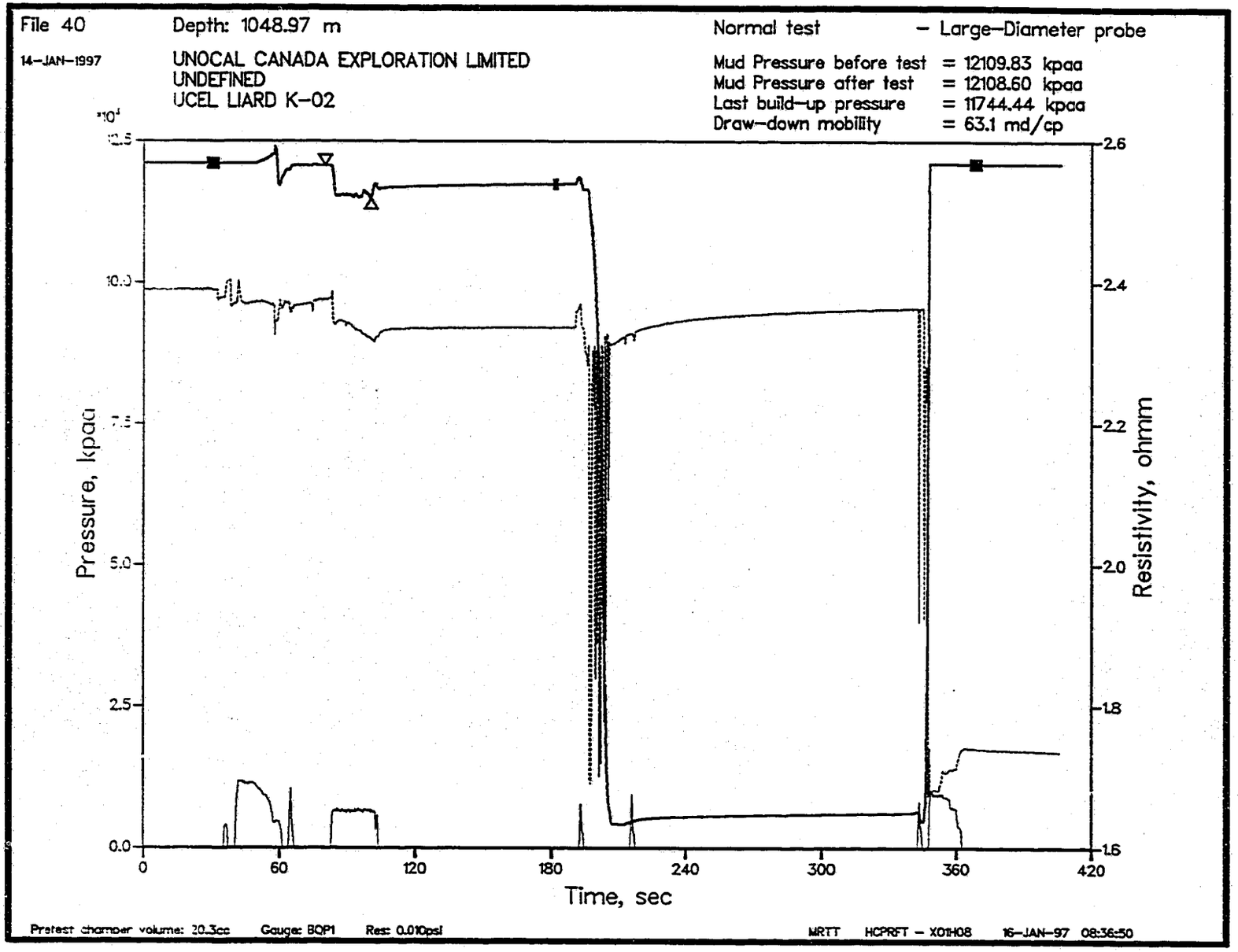
WIRELINE FORMATION TESTER INTERPRETATION

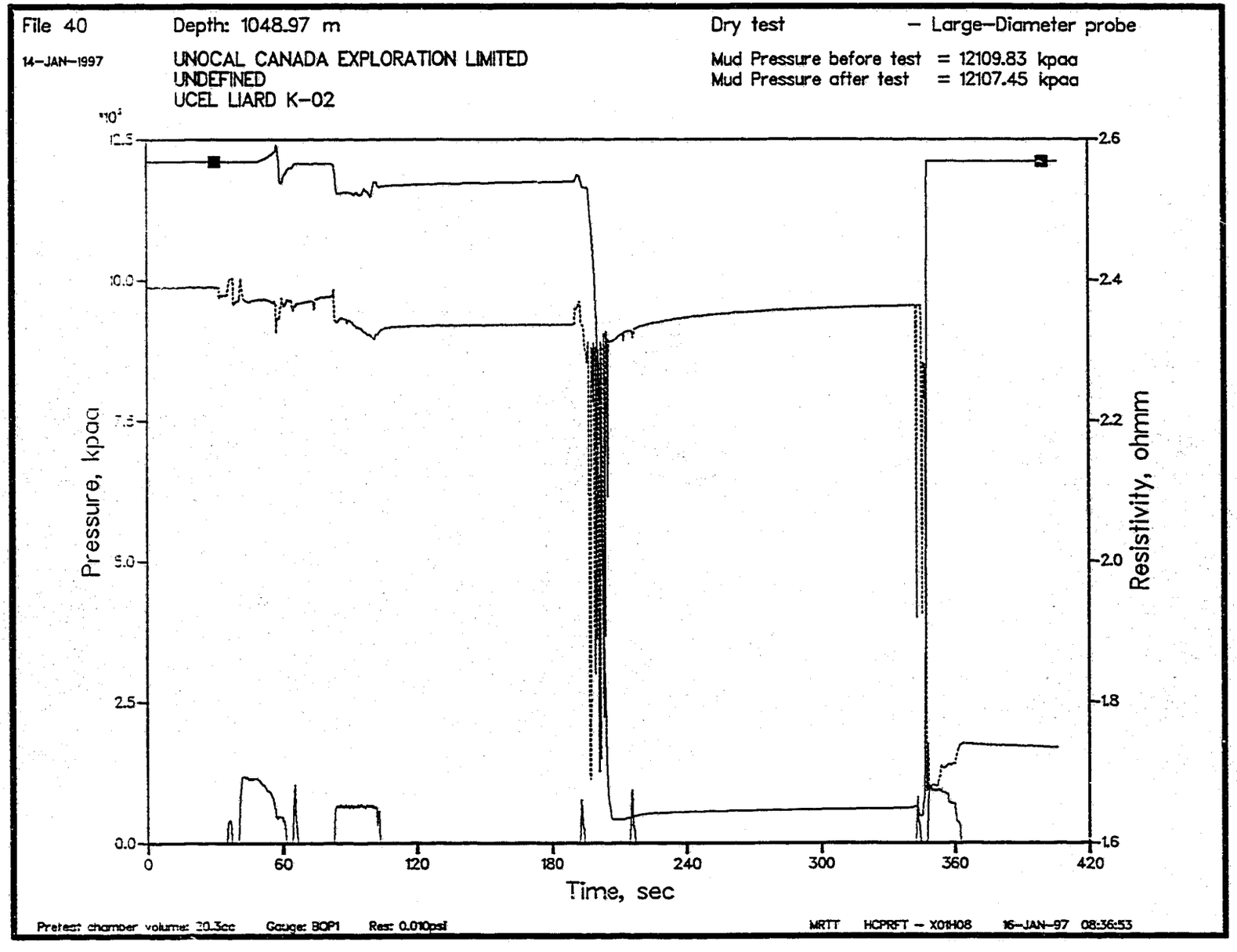
Density/Gradient Line Fit Data

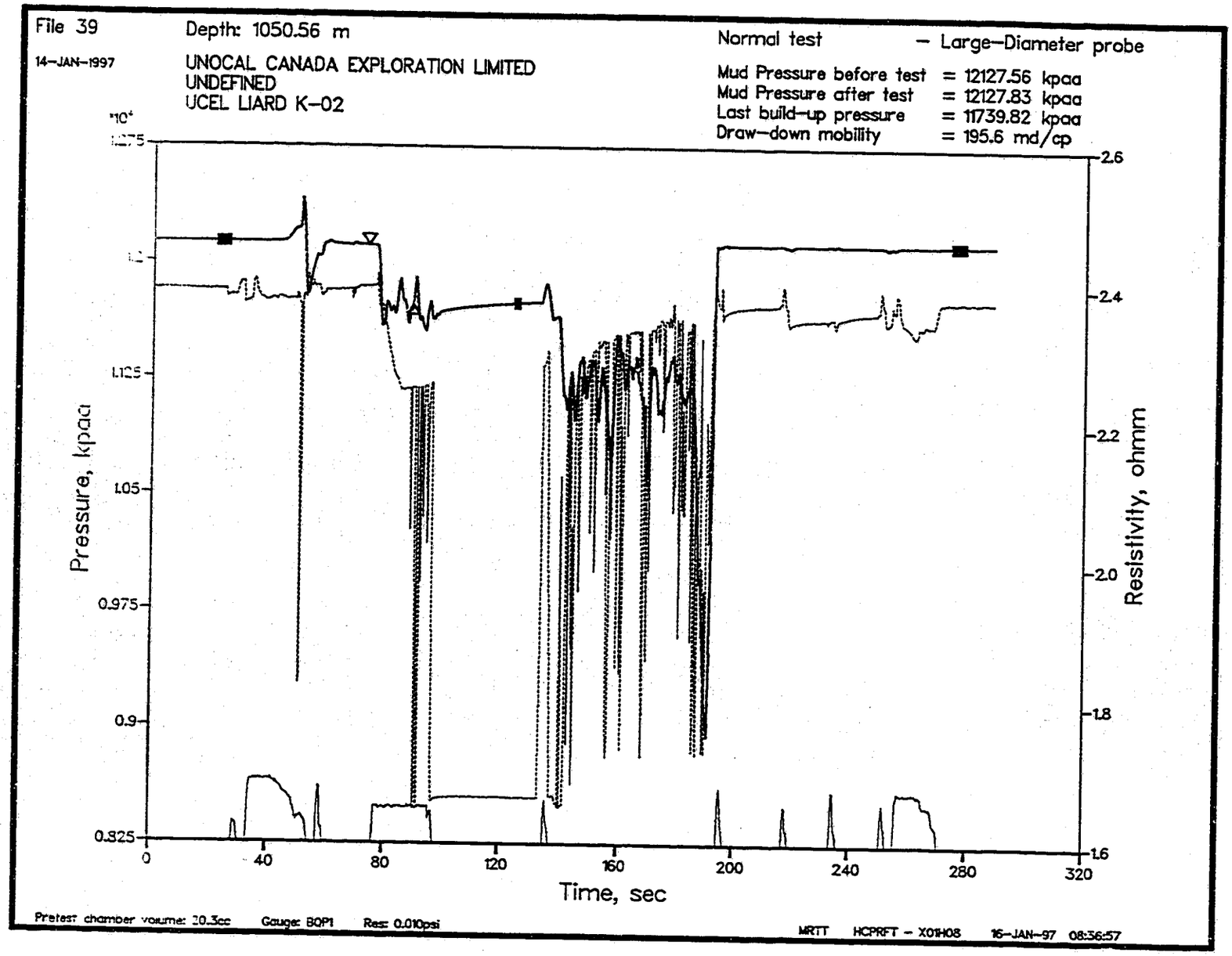
Start Depth m	Stop Depth m	Deviation Deg kg/m³	Gradient kpa/m	Gradient psi/f	Density kg/m³	Fluid Type (from ranges)	Salinity (if water) API (if Oil)	Pressure Used
1048.31	1591.01	0.0 (1.00)	10.2	3.1	1041.5	Water	61484 ppm	Formation
1121.35	1250.56	0.0 (1.00)	10.2	3.1	1041.5	Water	61484 ppm	Formation

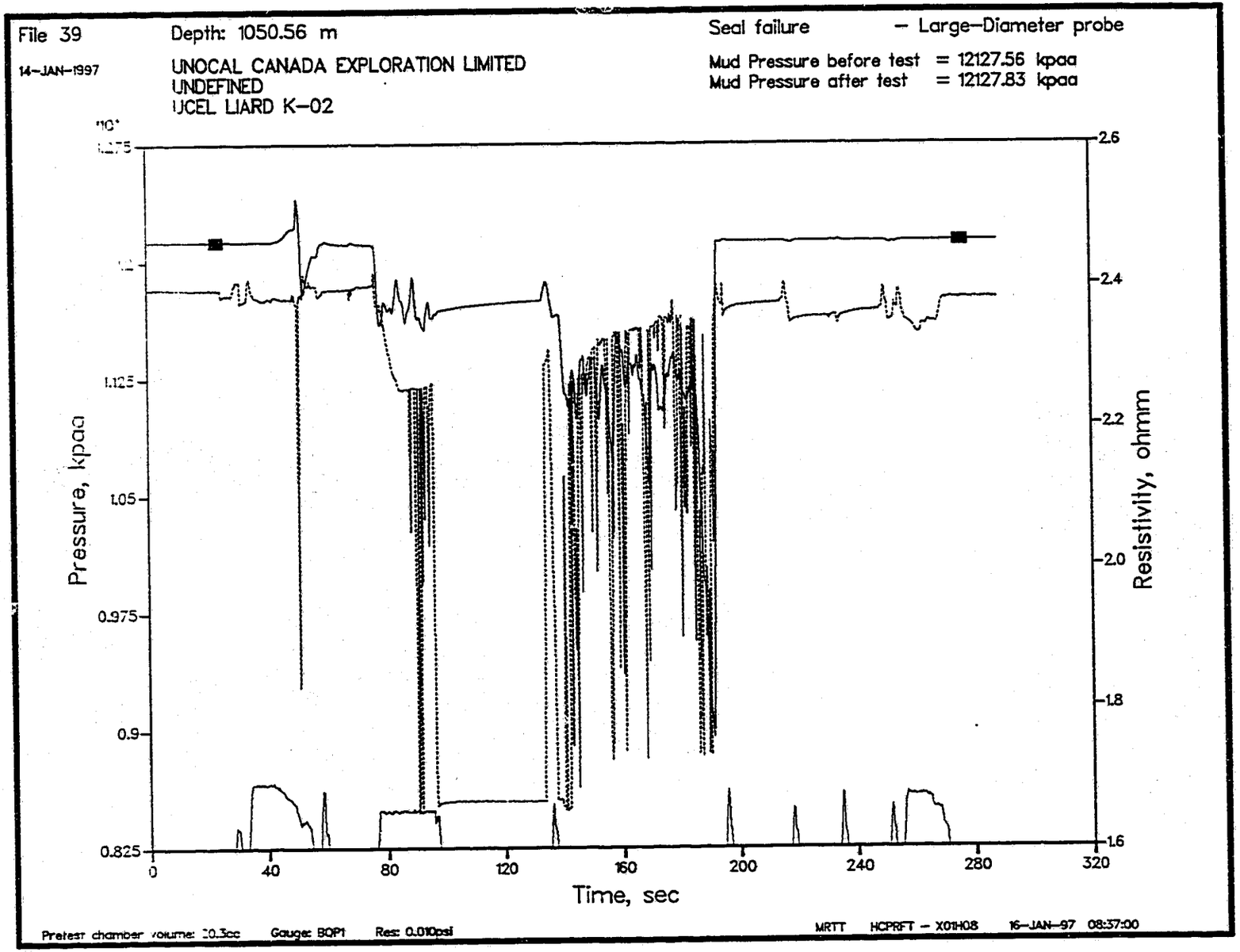

File 42
Depth: 790.56 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 9160.50 kpaa
Mud Pressure after test = 9160.02 kpaa
Last build–up pressure = 7229.42 kpaa
Draw–down mobility = 0.4 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
100
200
300
400
500
600
700
1.75
2.0
2.25
2.5
2.75
3.0
Pretest chamber volume: 20.1cc
Gauge: BOP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 08:36:37

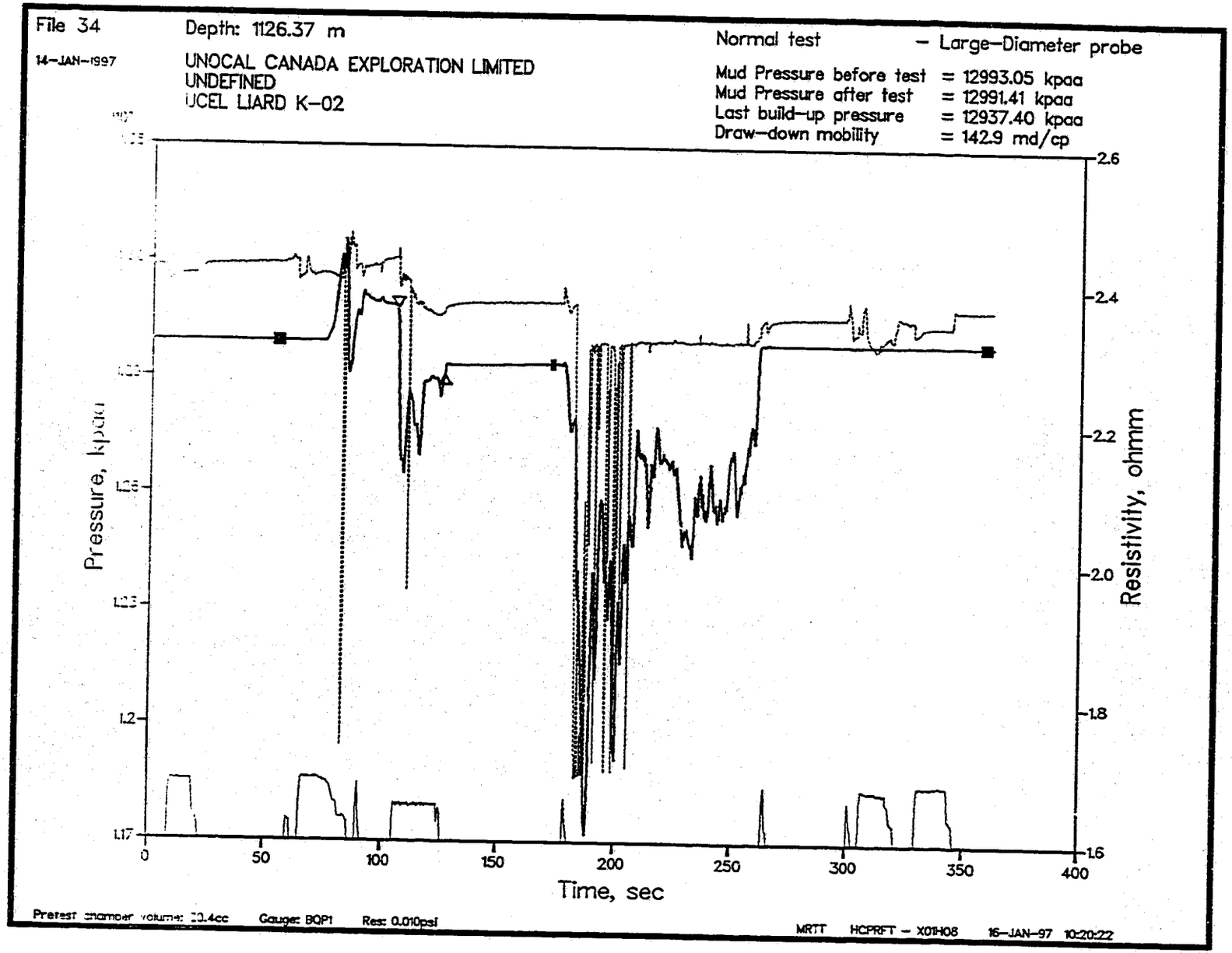

File 42
Depth: 790.56 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 98.1sec - Production time: 32.1sec
Pretest chamber volume: 20.1cc
Gauge: BOP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 08:36:45

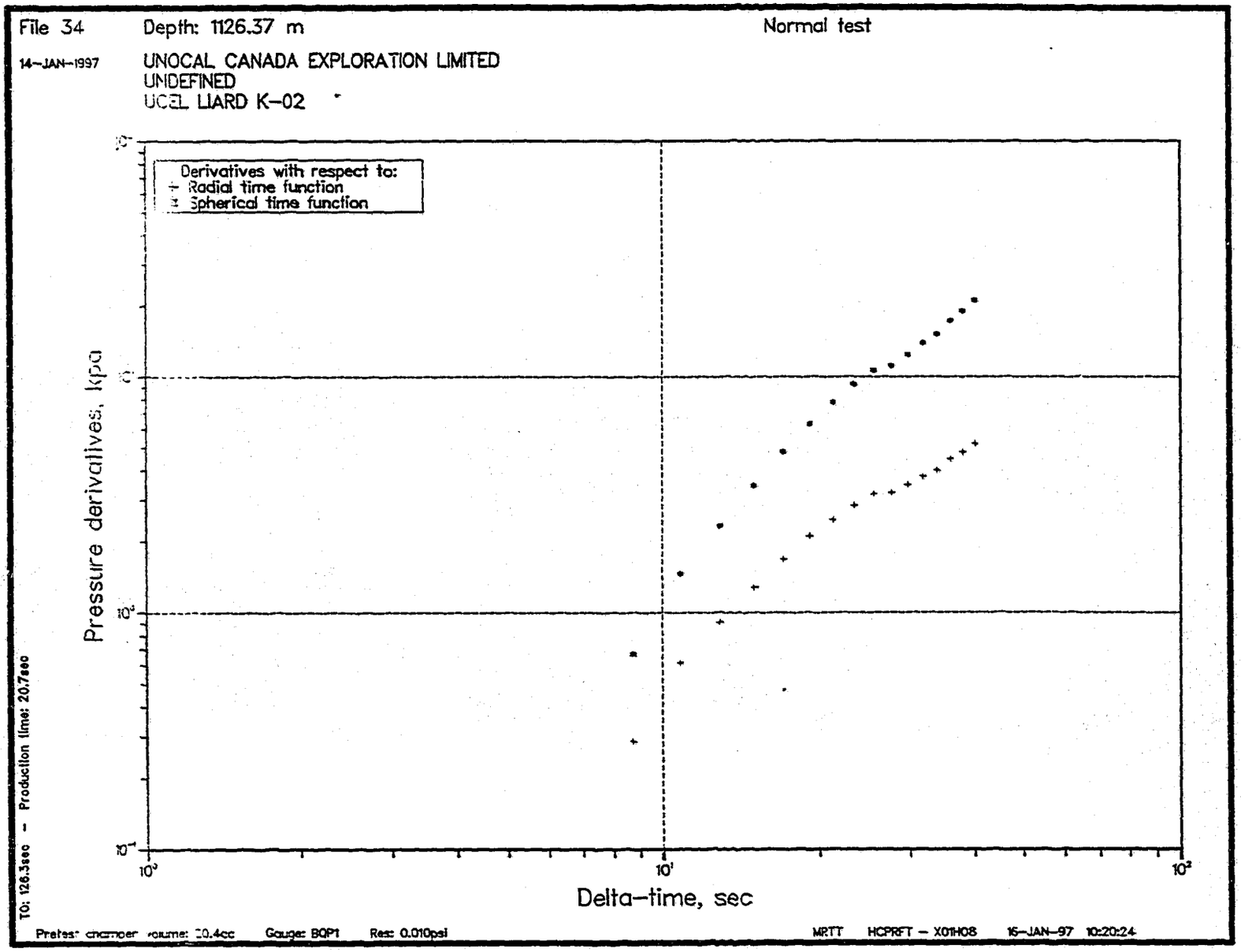

File 40
Depth: 1048.97 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 12109.83 kpaa
Mud Pressure after test = 12108.60 kpaa
Last build–up pressure = 11744.44 kpaa
Draw–down mobility = 63.1 md/cp
*10⁴
12.5
10.0
7.5
5.0
2.5
0.0
Pressure, kpaa
2.6
2.4
2.2
2.0
1.8
1.6
Resistivity, ohmm
0
60
120
180
240
300
360
420
Time, sec
Pretest chamber volume: 20.3cc
Gauge: BQP1
Res: 0.010psi
MRTT HCPRFT – X01H08
16–JAN–97 08:36:50

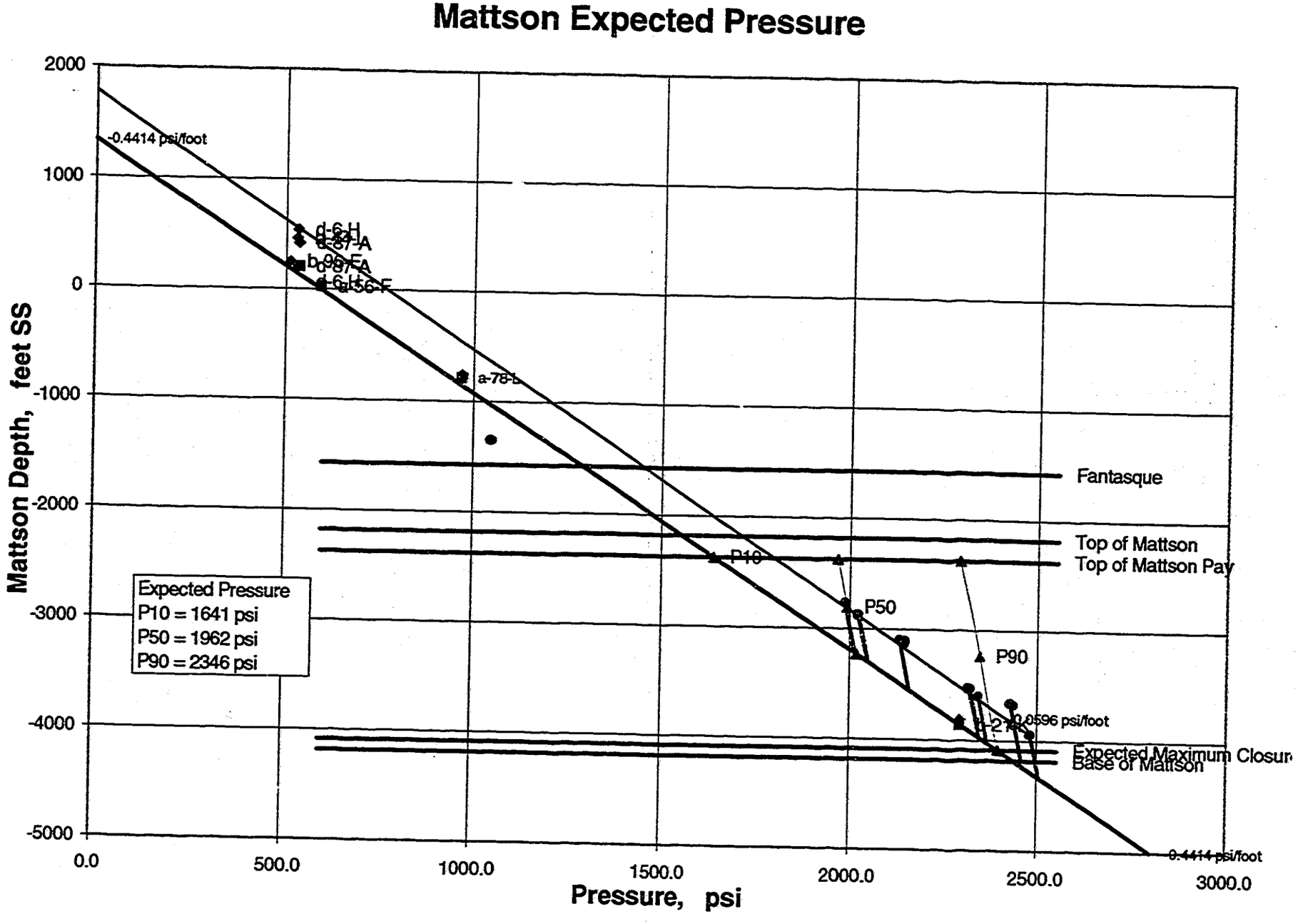

File 40
Depth: 1048.97 m
Dry test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 12109.83 kpaa
Mud Pressure after test = 12107.45 kpaa
*10³
12.5
10.0
7.5
5.0
2.5
0.0
Pressure, kpaa
2.6
2.4
2.2
2.0
1.8
1.6
Resistivity, ohmm
0
60
120
180
240
300
360
420
Time, sec
Pretest chamber volume: 20.3cc
Gauge: BOP1
Res: 0.010psi
MRTT HCPRFT – X01H08
16–JAN–97 08:36:53


File 39
Depth: 1050.56 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
- Large-Diameter probe
Mud Pressure before test = 12127.56 kpaa
Mud Pressure after test = 12127.83 kpaa
Last build-up pressure = 11739.82 kpaa
Draw-down mobility = 195.6 md/cp
*10^4
1.075
1.05
0.975
0.9
0.825
Pressure, kpaa
2.6
2.4
2.2
2.0
1.8
1.6
Resistivity, ohmm
0
40
80
120
160
200
240
280
320
Time, sec
Pretest chamber volume: 20.3cc
Gauge: BOP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 08:36:57

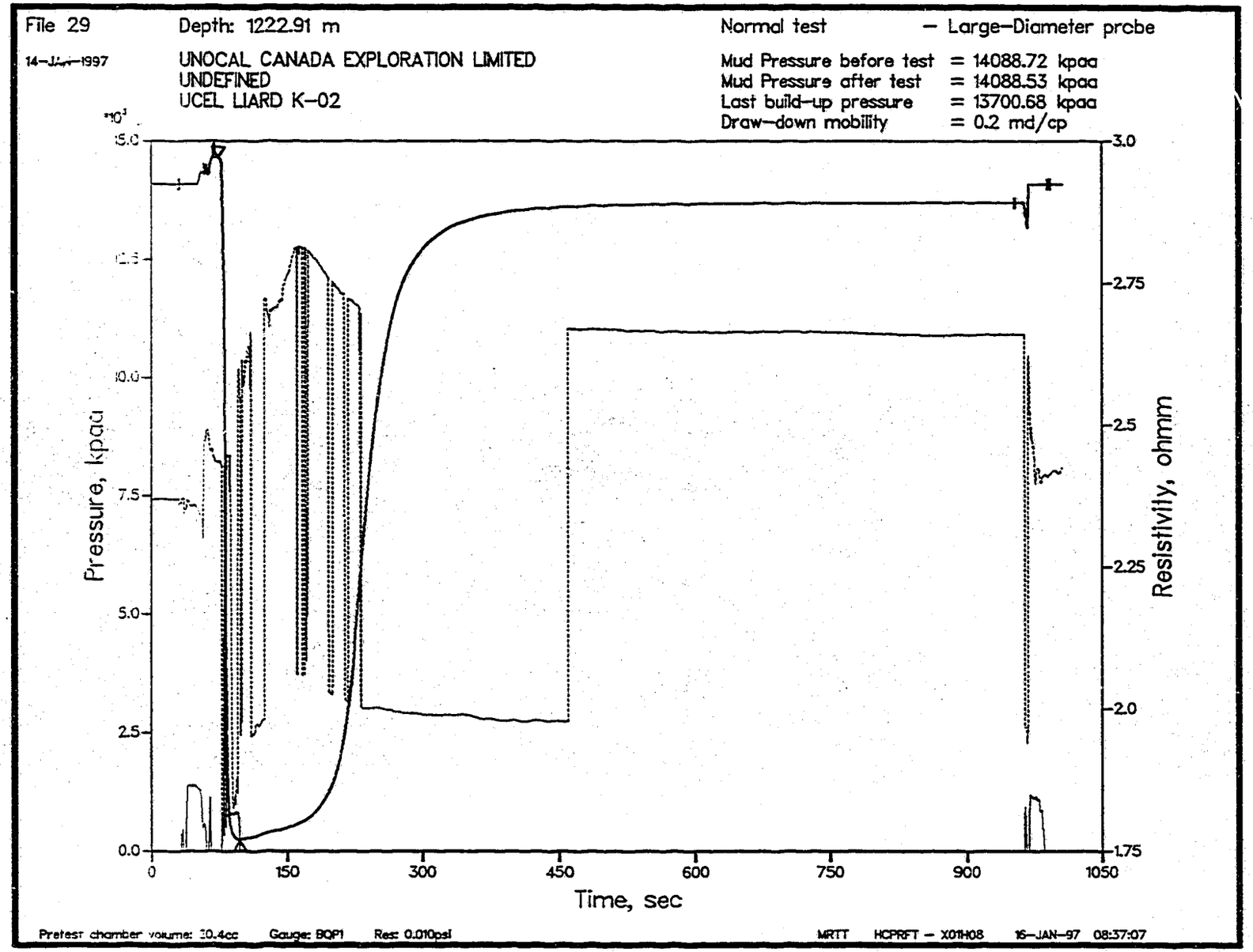

File 39
Depth: 1050.56 m
Seal failure
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 12127.56 kpaa
Mud Pressure after test = 12127.83 kpaa
Pressure, kpaa
1.125
1.05
0.975
0.9
0.825
Resistivity, ohmm
2.6
2.4
2.2
2.0
1.8
1.6
0
40
80
120
160
200
240
280
320
Time, sec
Pretest chamber volume: 20.3cc
Gauge: BOP1
Res: 0.010psi
MRTT HCPRFT – X01H08 16–JAN–97 08:37:00

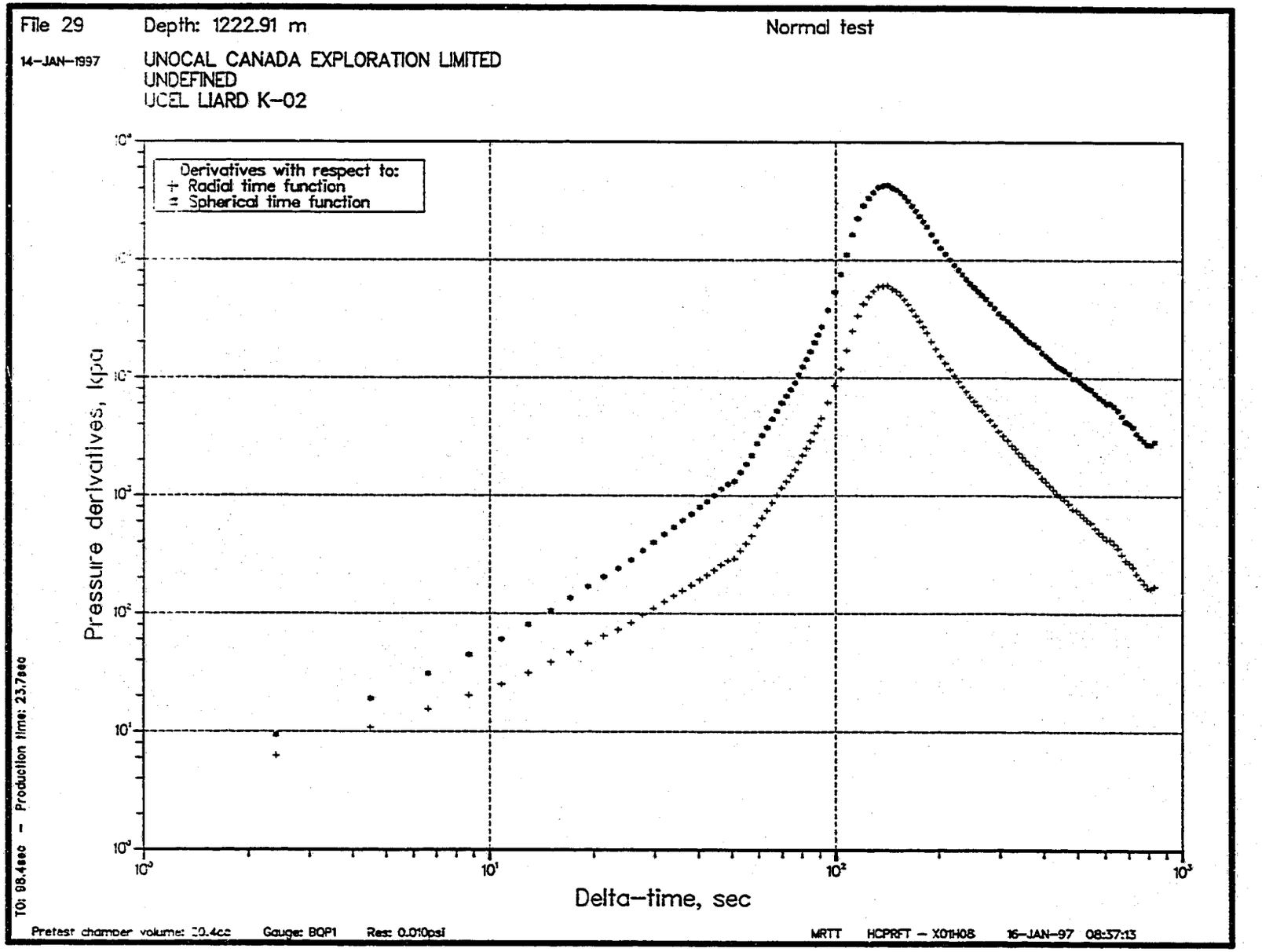

File 34
Depth: 1126.37 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
- Large-Diameter probe
Mud Pressure before test = 12993.05 kpaa
Mud Pressure after test = 12991.41 kpaa
Last build-up pressure = 12937.40 kpaa
Draw-down mobility = 142.9 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
50
100
150
200
250
300
350
400
1.6
1.8
2.0
2.2
2.4
2.6
Pretest chamber volume: 10.4cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 10:20:22

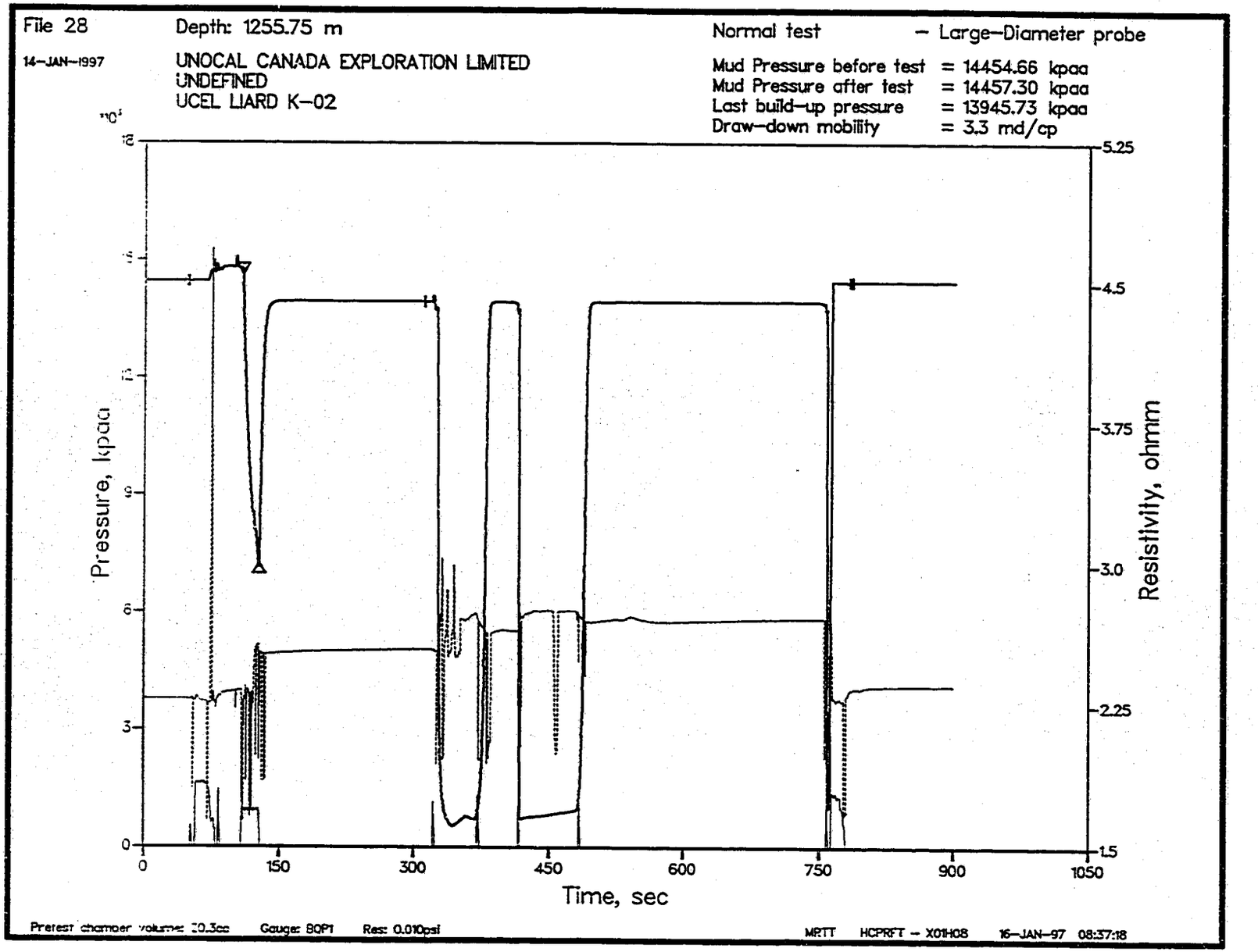

File 34
Depth: 1126.37 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
x Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 126.3sec - Production time: 20.7sec
Pretest chamber volume: 10.4cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 10:20:24



PHI_DE.XLS Chart2 1/14/97 JMac


File 29
Depth: 1222.91 m
Normal test — Large-Diameter probe
14-Jan-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Mud Pressure before test = 14088.72 kpaa
Mud Pressure after test = 14088.53 kpaa
Last build-up pressure = 13700.68 kpaa
Draw-down mobility = 0.2 md/cp
*10³
15.0
12.5
10.0
7.5
5.0
2.5
0.0
Pressure, kpaa
3.0
2.75
2.5
2.25
2.0
1.75
Resistivity, ohmm
0
150
300
450
600
750
900
1050
Time, sec
Pretest chamber volume: 10.4cc
Gauge: BQP1
Res: 0.010psi
MRTT HCPRFT — X01H08 16-JAN-97 08:37:07


File 29
Depth: 1222.91 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 98.4sec - Production time: 23.7sec
Pretest chamber volume: 20.4cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 08:37:13

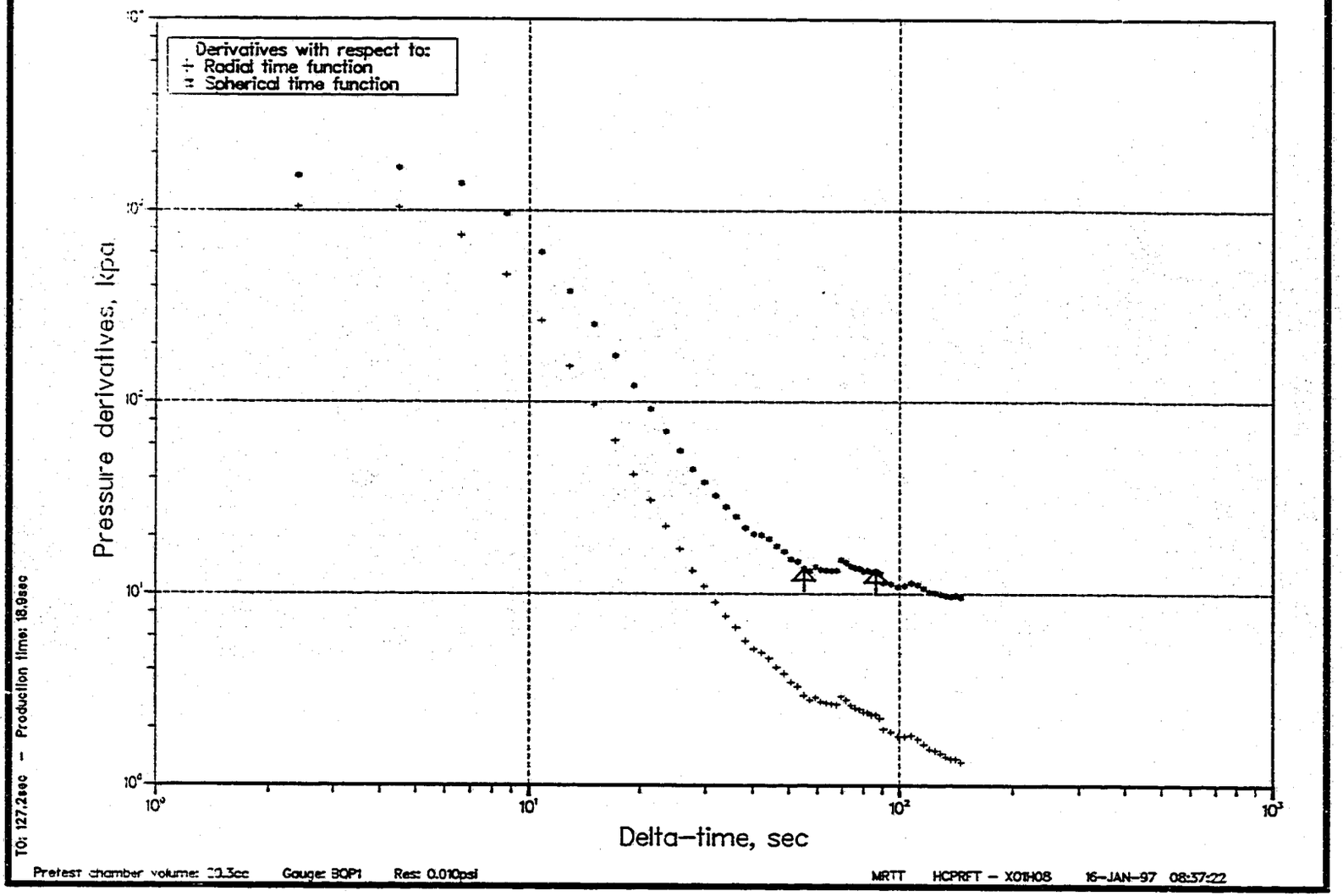

File 28
Depth: 1255.75 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
- Large-Diameter probe
Mud Pressure before test = 14454.66 kpaa
Mud Pressure after test = 14457.30 kpaa
Last build-up pressure = 13945.73 kpaa
Draw-down mobility = 3.3 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
150
300
450
600
750
900
1050
3
6
5.25
4.5
3.75
3.0
2.25
1.5
Gauge: 80PT
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 08:37:18

File 28 Depth: 1255.75 m

14-JAN-1997 UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02

Normal test

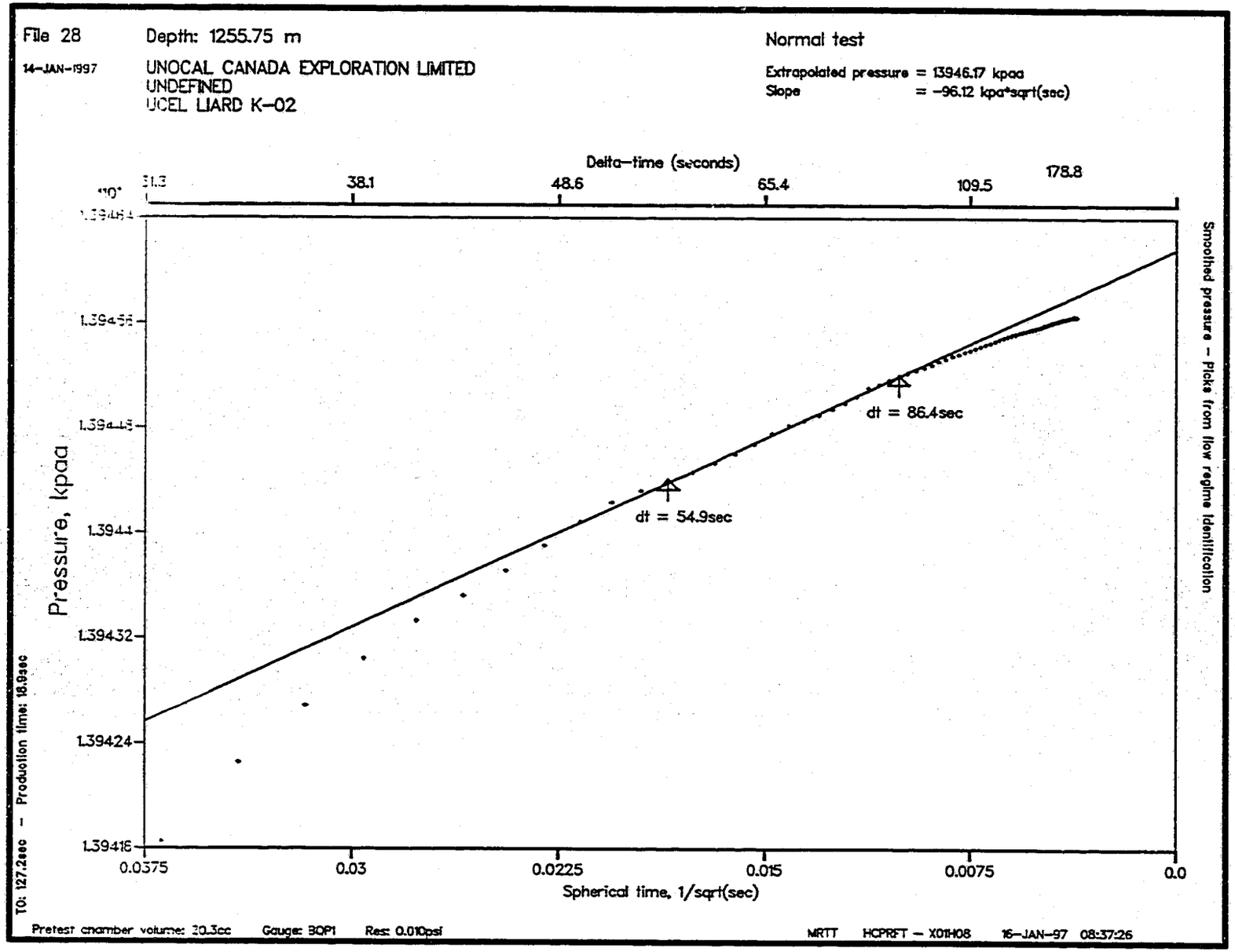
From picks on spherical derivative:
Slope on spherical = -0.040
Slope on radial = -0.467



T0: 127.2sec - Production time: 18.9sec

Pretest chamber volume: 23.3cc Gauge: BOP1 Res: 0.010psi

MRTT HCPRFT - X01H08 16-JAN-97 08:37:22

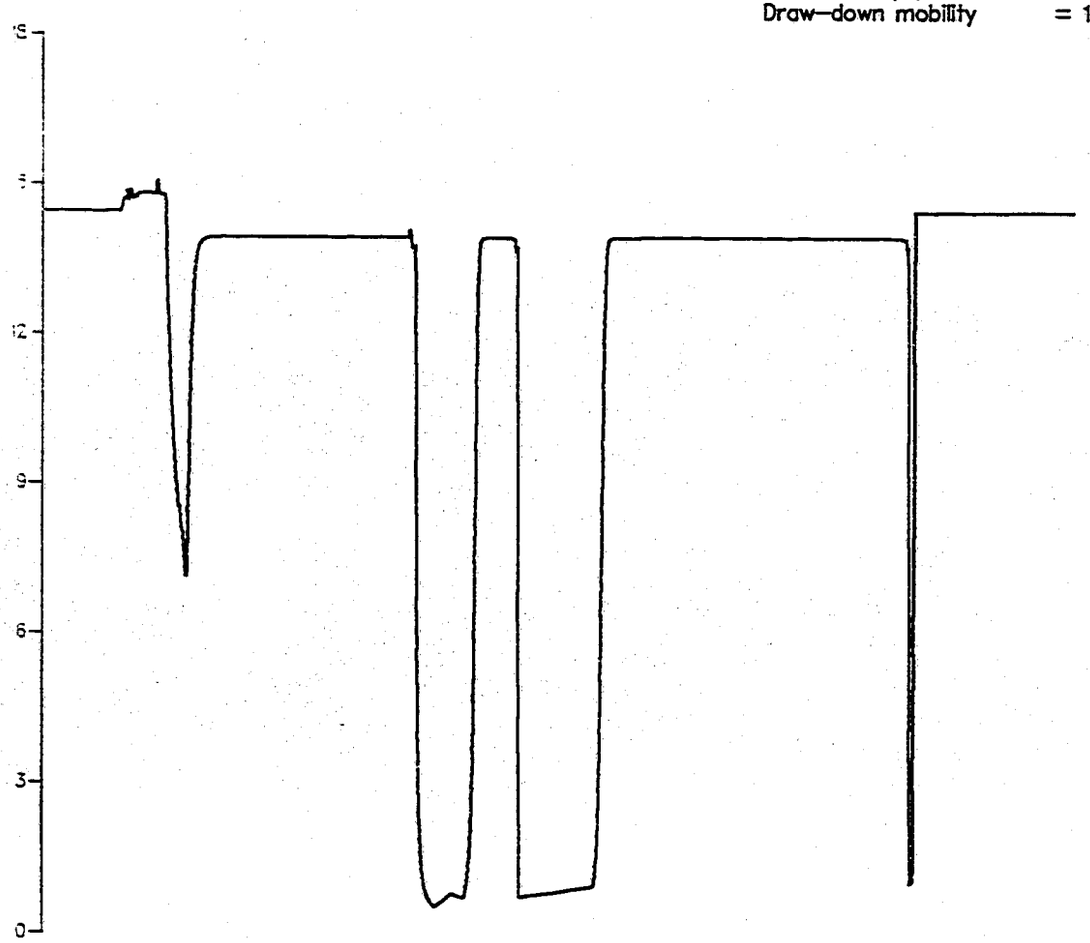

File 28
Depth: 1255.75 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Extrapolated pressure = 13946.17 kpaa
Slope = -96.12 kpa*sqrt(sec)
Delta-time (seconds)
31.3
38.1
48.6
65.4
109.5
178.8
1.39464
1.39456
1.39448
1.3944
1.39432
1.39424
1.39416
Pressure, kpaa
dt = 86.4sec
dt = 54.9sec
0.0375
0.03
0.0225
0.015
0.0075
0.0
Spherical time, 1/sqrt(sec)
Smoothed pressure - Picks from flow regime identification
T0: 127.2sec - Production time: 18.9sec
Pretest chamber volume: 20.3cc
Gauge: BOP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 08:37:26

File 28 Depth: 1255.75 m

14-JAN-1997 UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UPTIOIC UCEL LIARD K-02

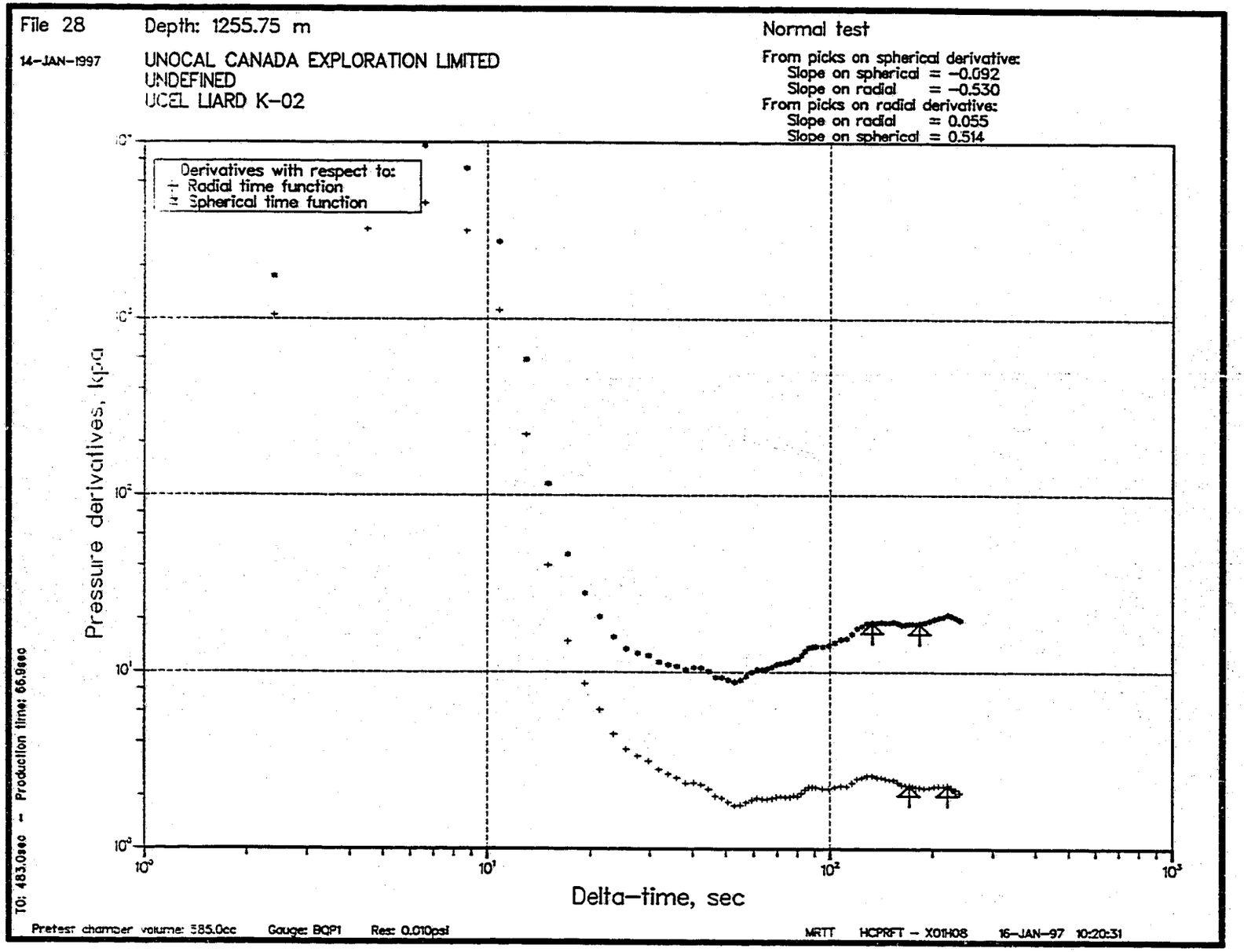
Normal test – Large-Diameter probe

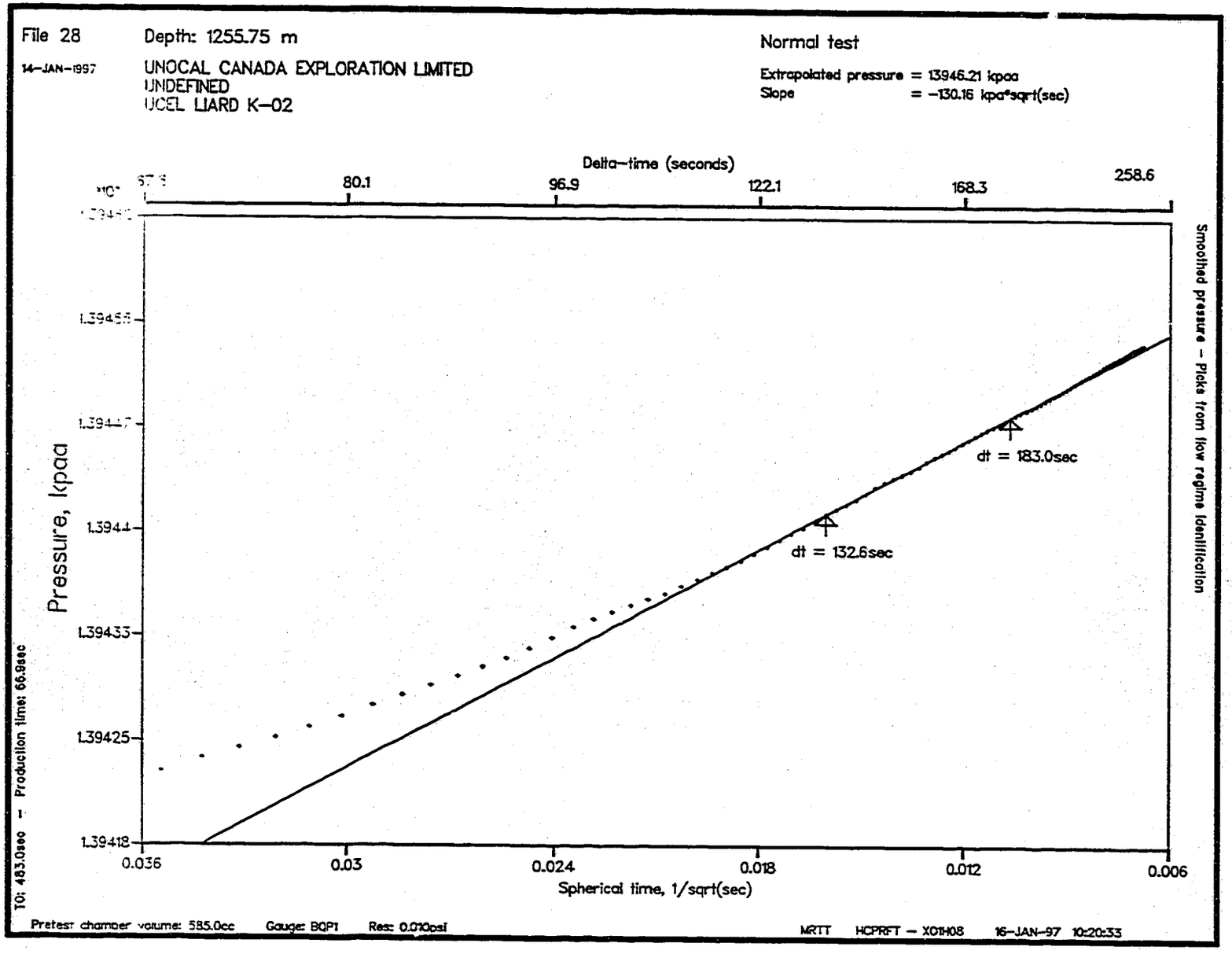
Mud Pressure before test = 14454.66 kpaa
Mud Pressure after test = 14457.30 kpaa
Last build-up pressure = 13945.35 kpaa
Draw-down mobility = 10.3 md/cp

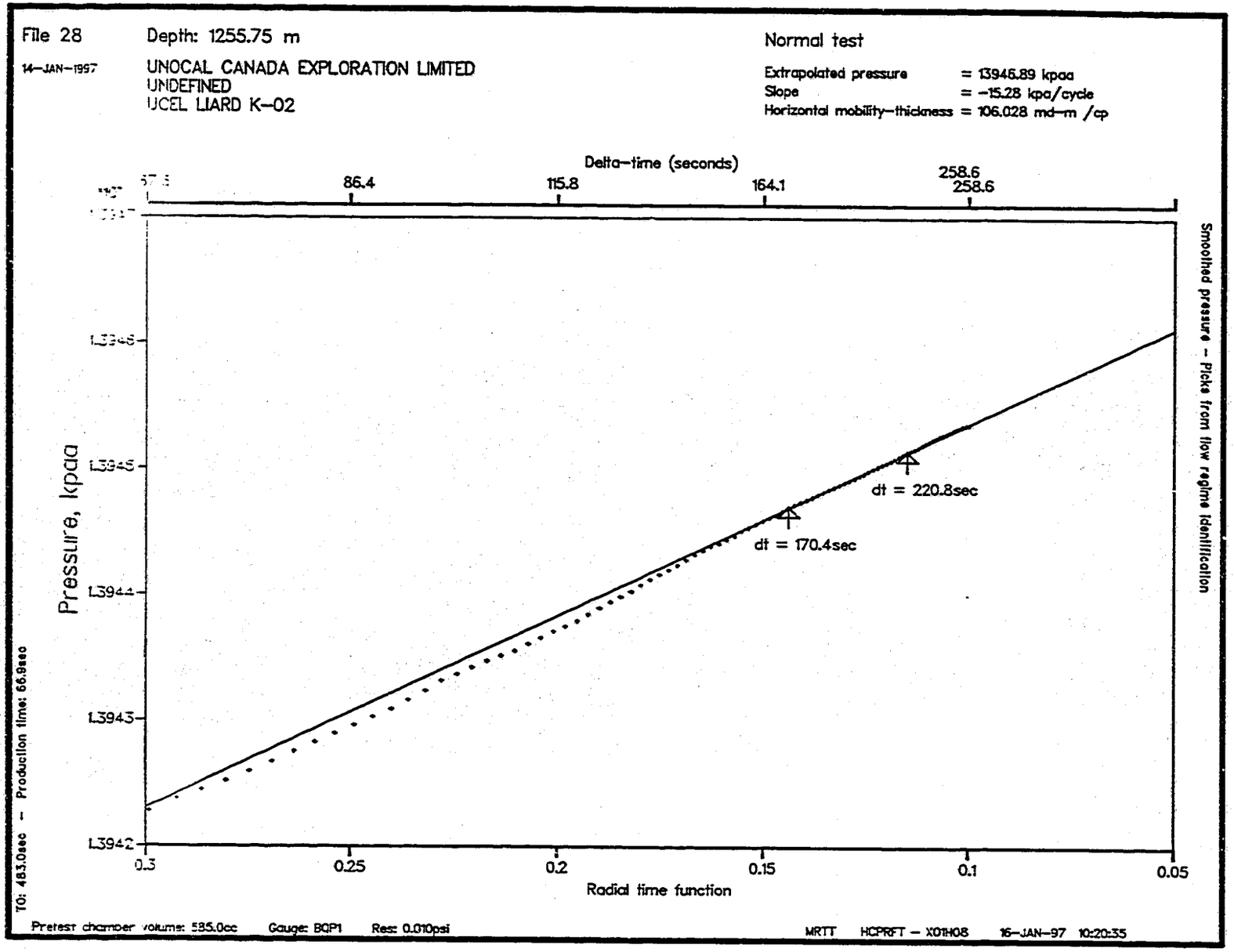


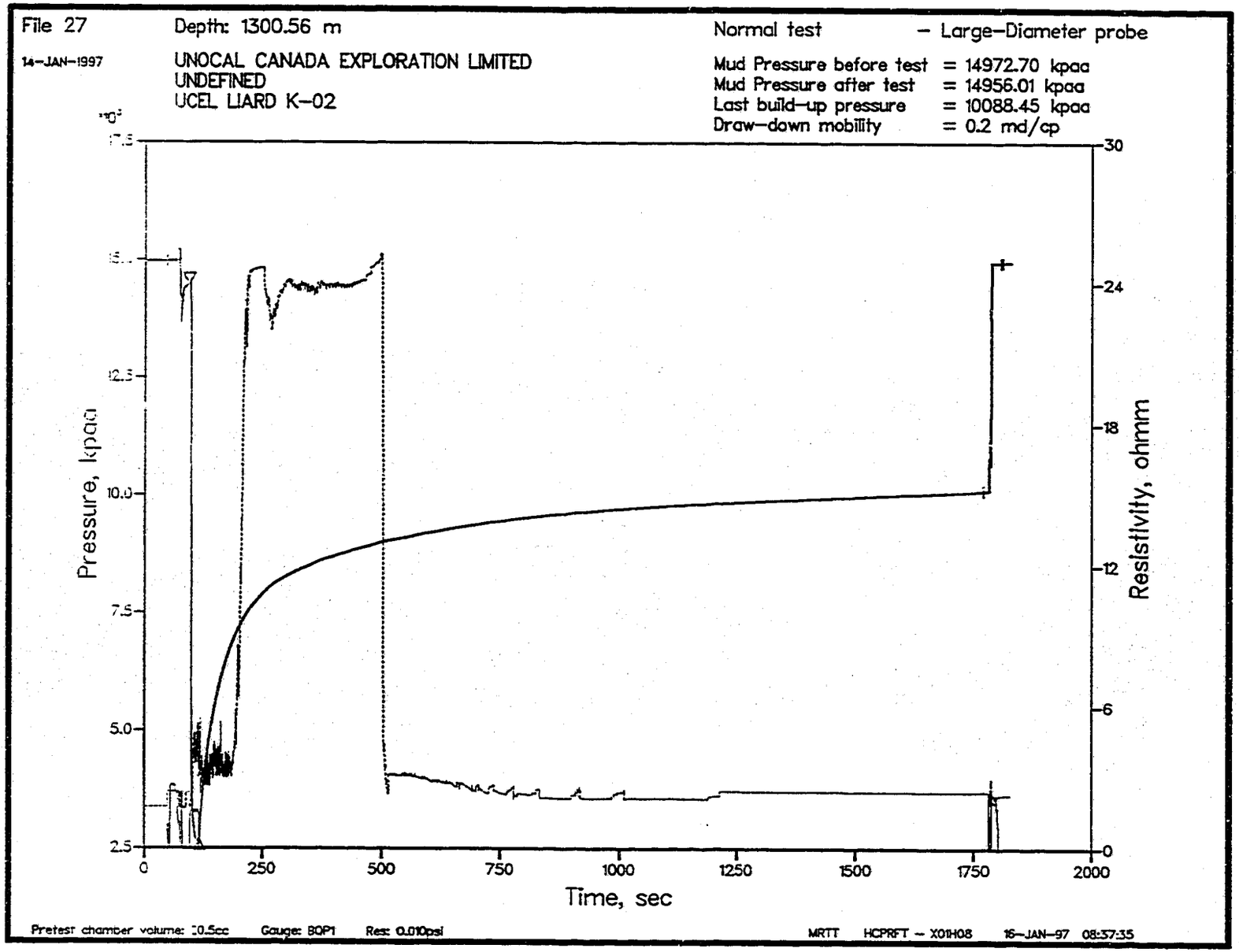
Pretest chamber volume: 535.0cc Gauge: BQP1 Res: 0.010psi

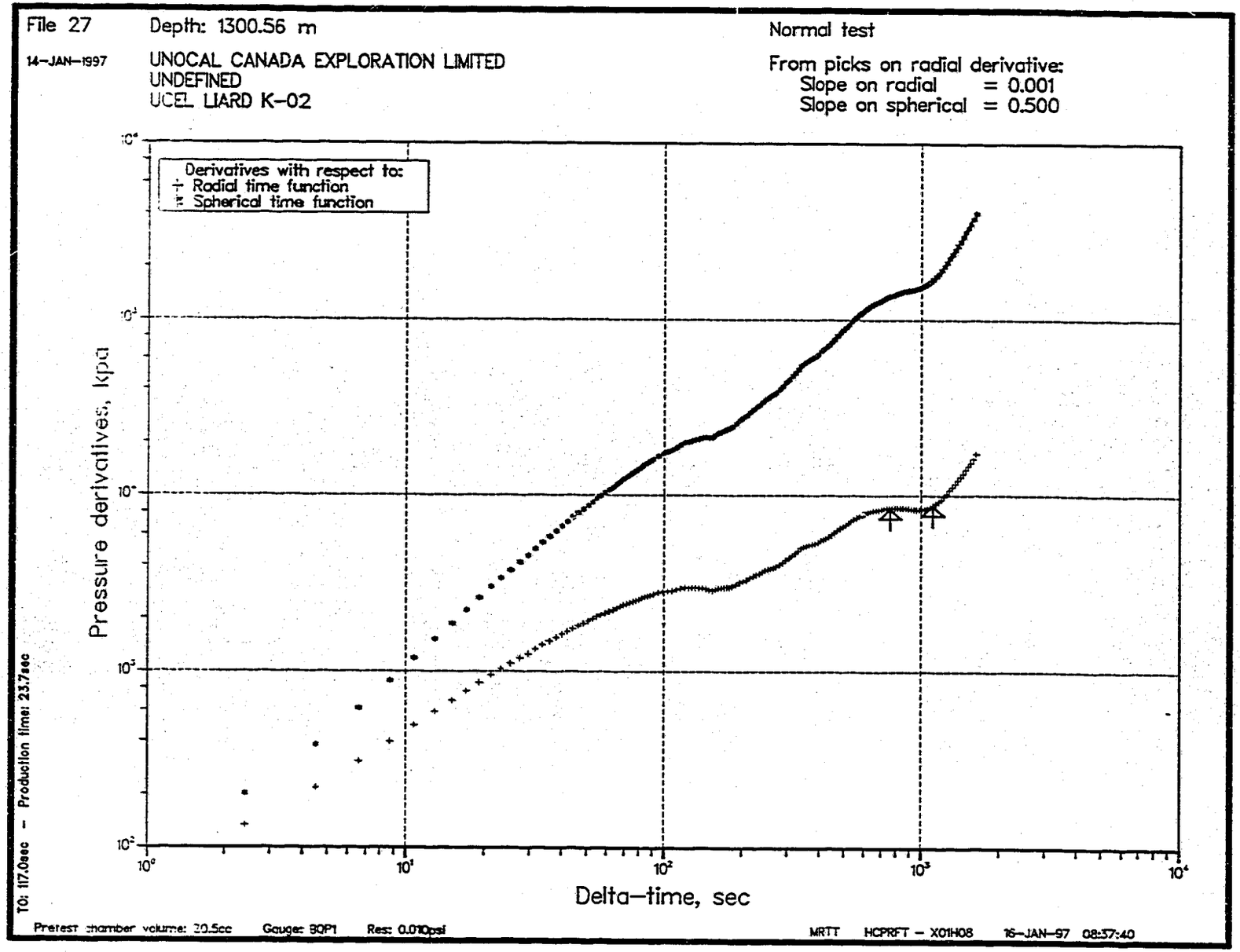
MRTT HCPRFT – X01H08 16-JAN-97 10:20:28


File 28
Depth: 1255.75 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
From picks on spherical derivative:
Slope on spherical = -0.092
Slope on radial = -0.530
From picks on radial derivative:
Slope on radial = 0.055
Slope on spherical = 0.514
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 483.0sec - Production time: 66.9sec
Pretest chamber volume: 585.0cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 10:20:31


File 28
Depth: 1255.75 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
Extrapolated pressure = 13946.21 kpaa
Slope = -130.16 kpa*sqrt(sec)
Delta-time (seconds)
80.1
96.9
122.1
168.3
258.6
Pressure, kpaa
1.39433
1.39425
1.39418
dt = 183.0sec
dt = 132.6sec
Smoothed pressure - Picks from flow regime identification
TO: 483.0sec - Production time: 66.9sec
0.036
0.03
0.024
0.018
0.012
0.006
Spherical time, 1/sqrt(sec)
Pretest chamber volume: 585.0cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 10:20:33


File 28
Depth: 1255.75 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Extrapolated pressure = 13946.89 kpaa
Slope = -15.28 kpa/cycle
Horizontal mobility-thickness = 106.028 md-m /cp
Delta-time (seconds)
86.4
115.8
164.1
258.6
258.6
Pressure, kpaa
L3946
L3945
L3944
L3943
L3942
dt = 220.8sec
dt = 170.4sec
0.3
0.25
0.2
0.15
0.1
0.05
Radial time function
Smoothed pressure - Picks from flow regime identification
TO: 483.0sec - Production time: 66.9sec
Pretest chamber volume: 585.0cc
Gauge: BQP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 10:20:35


File 27
Depth: 1300.56 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 14972.70 kpaa
Mud Pressure after test = 14956.01 kpaa
Last build–up pressure = 10088.45 kpaa
Draw–down mobility = 0.2 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
250
500
750
1000
1250
1500
1750
2000
2.5
5.0
7.5
10.0
12.5
15.0
17.5
0
6
12
18
24
30
Pretest chamber volume: 10.5cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 08:57:35

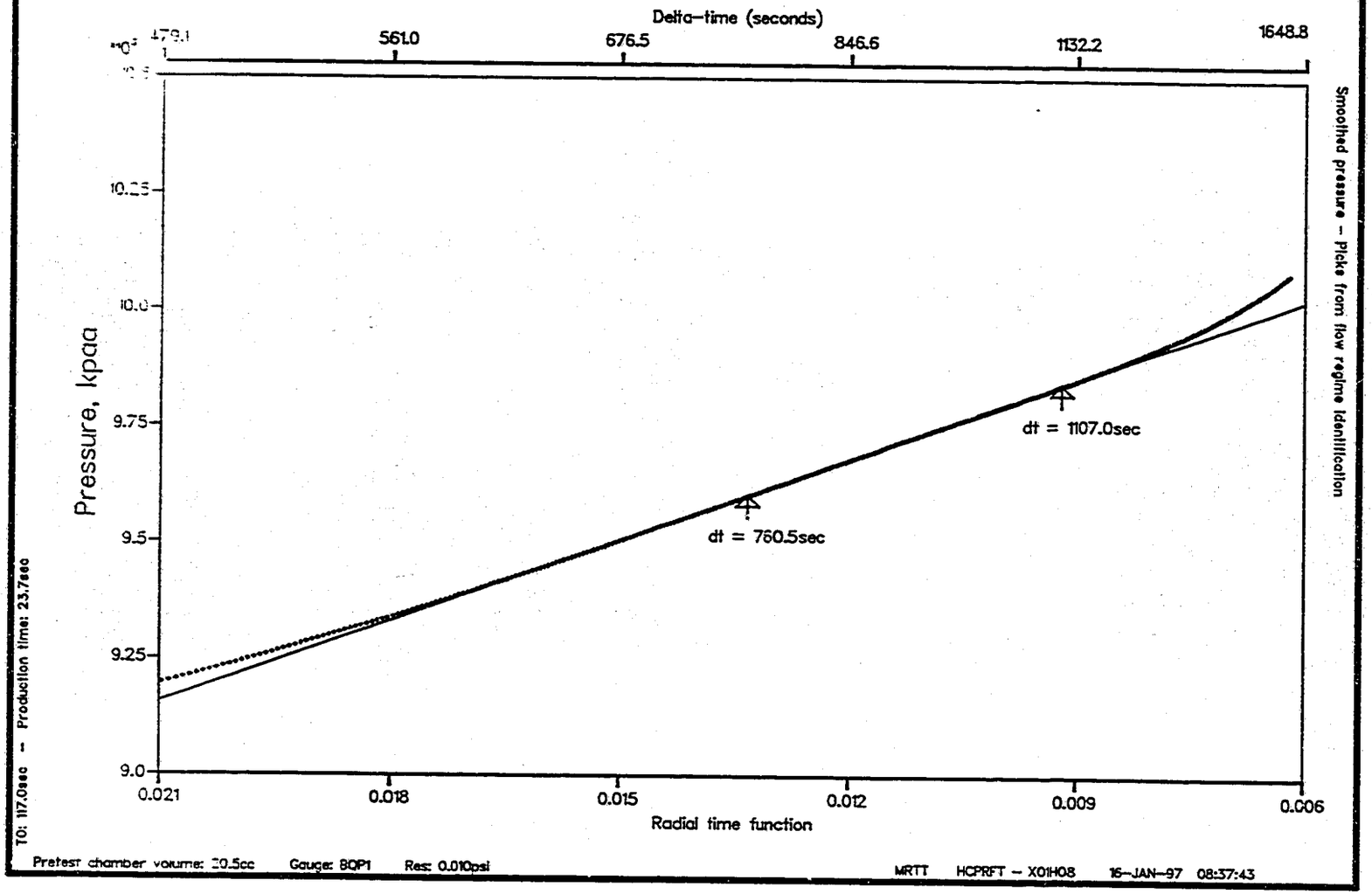

File 27
Depth: 1300.56 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
From picks on radial derivative:
Slope on radial = 0.001
Slope on spherical = 0.500
Derivatives with respect to:
+ Radial time function
× Spherical time function
Pressure derivatives, kpa
Delta-time, sec
T0: 117.0sec - Production time: 23.7sec
Pretest chamber volume: 20.5cc
Gauge: 80P1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 08:37:40

File 27 Depth: 1300.56 m

14-JAN-1997 UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02

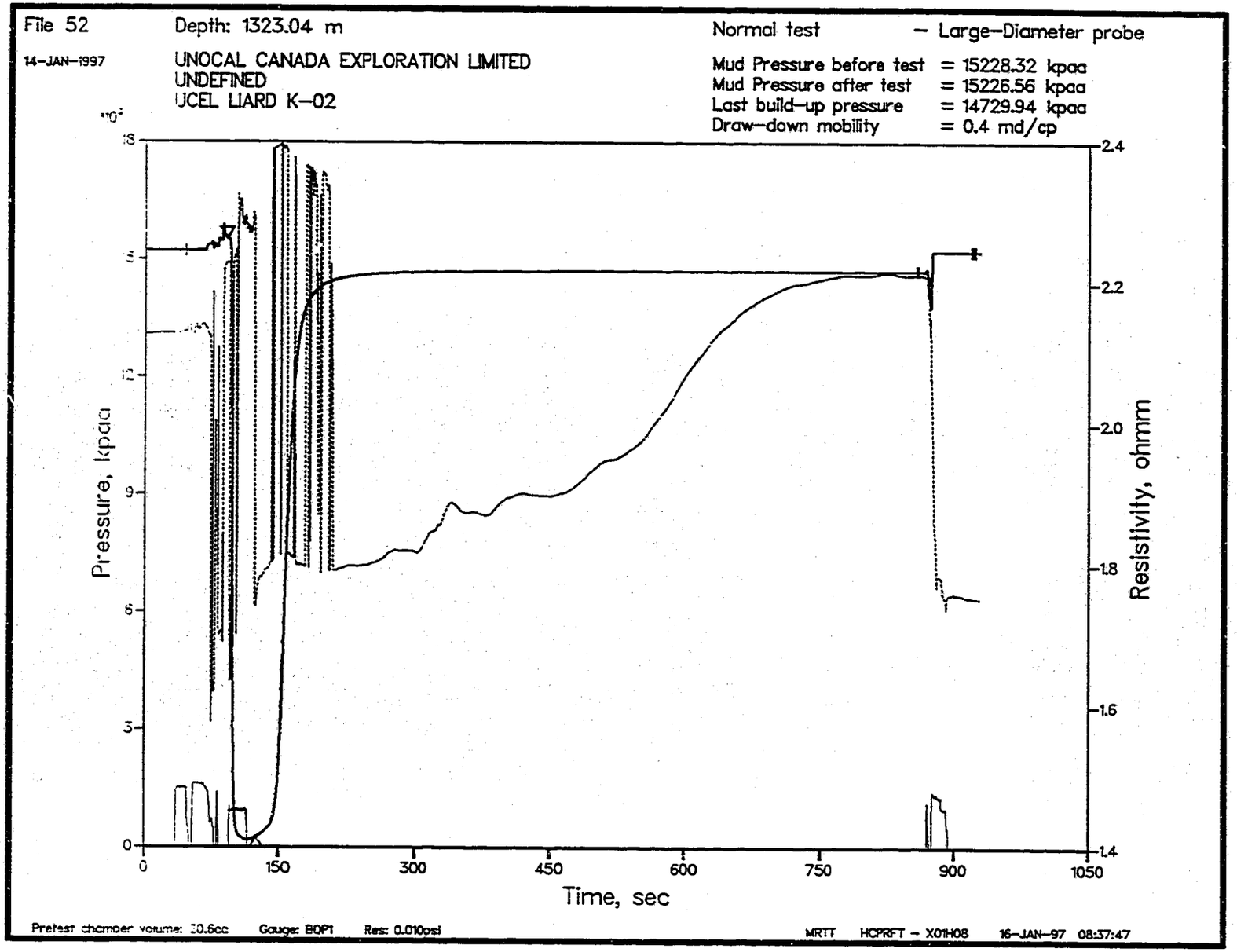
Normal test

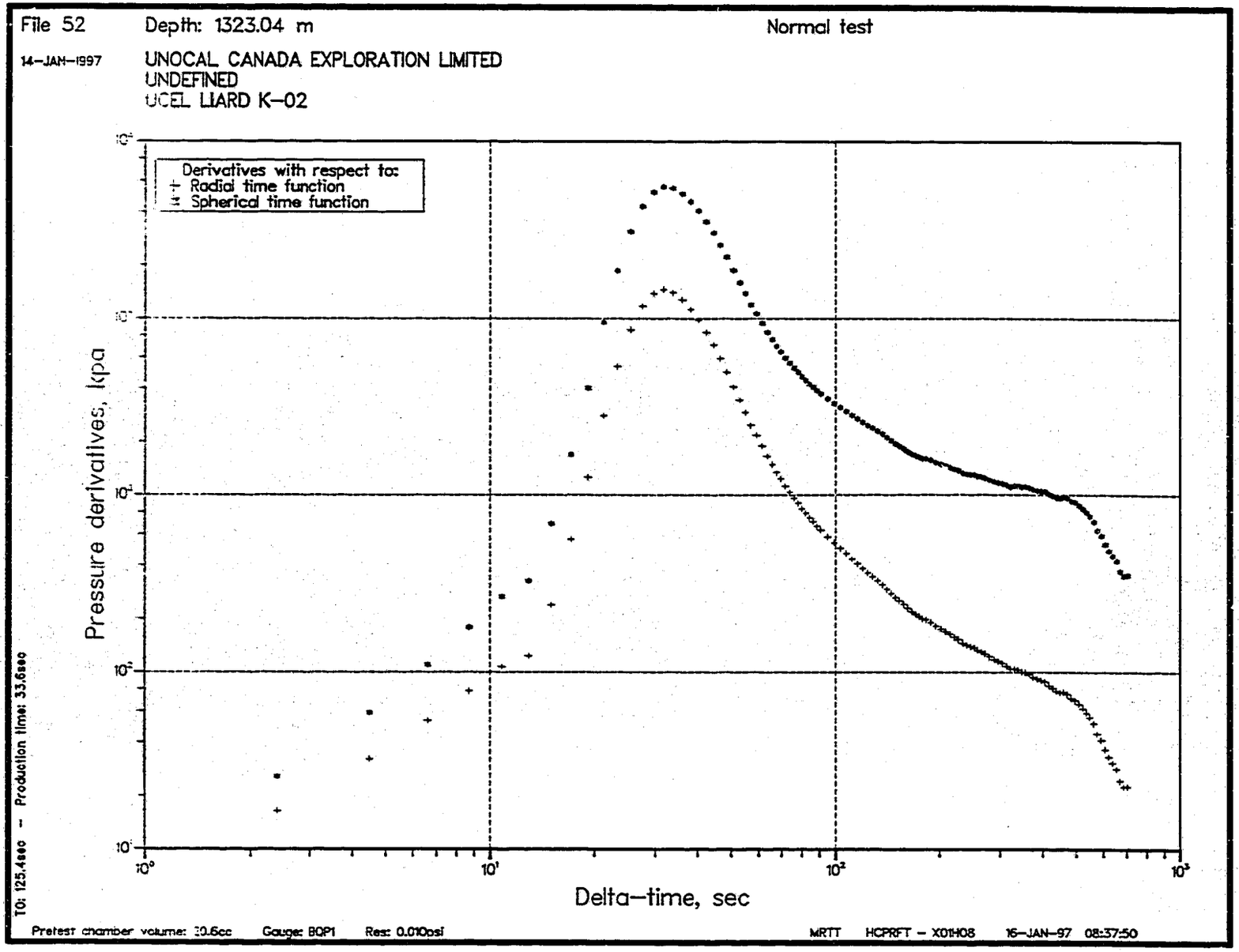
Extrapolated pressure = 10374.70 kpaa
Slope = -57922.64 kpa/cycle
Horizontal mobility-thickness = 0.003 md-m /cp

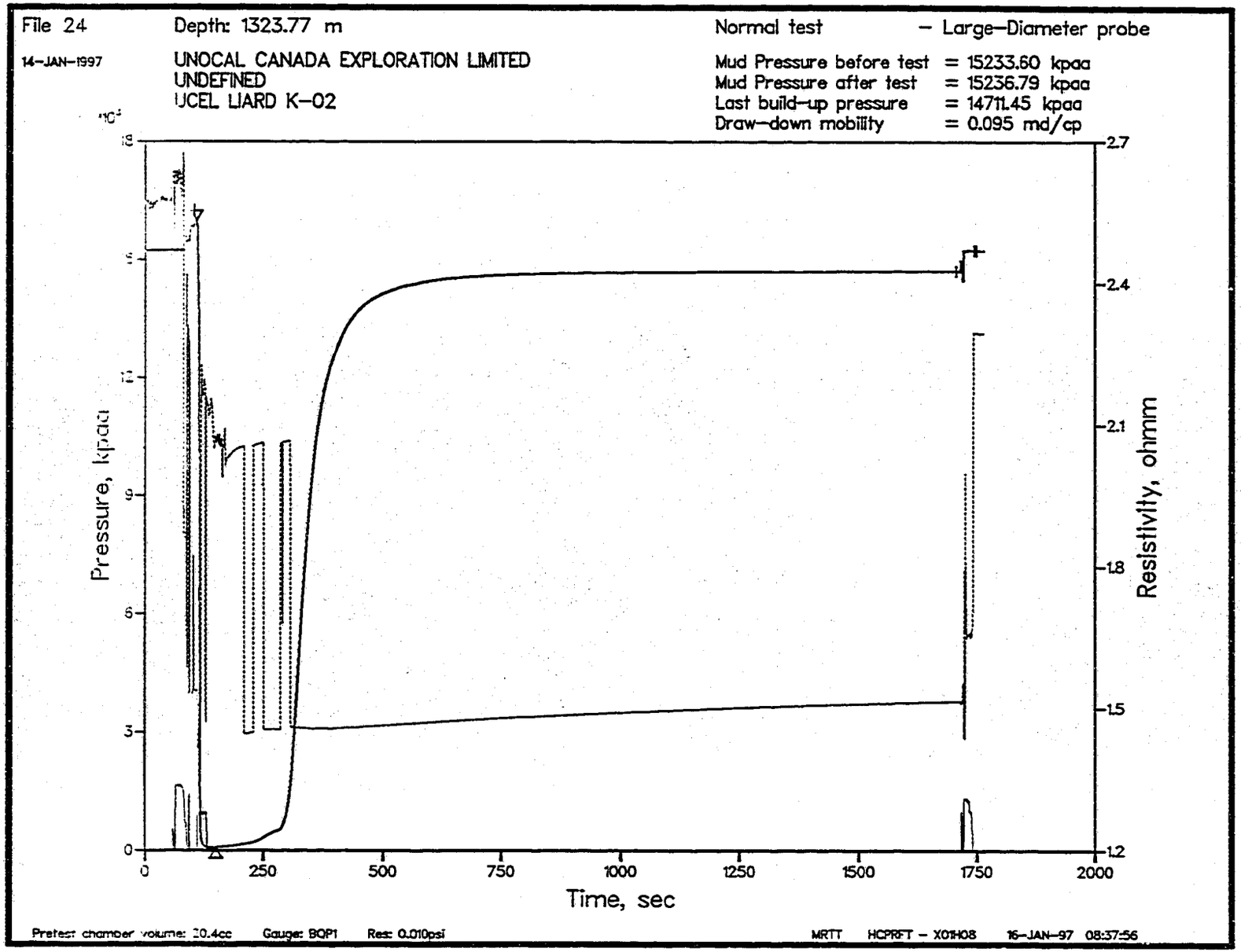


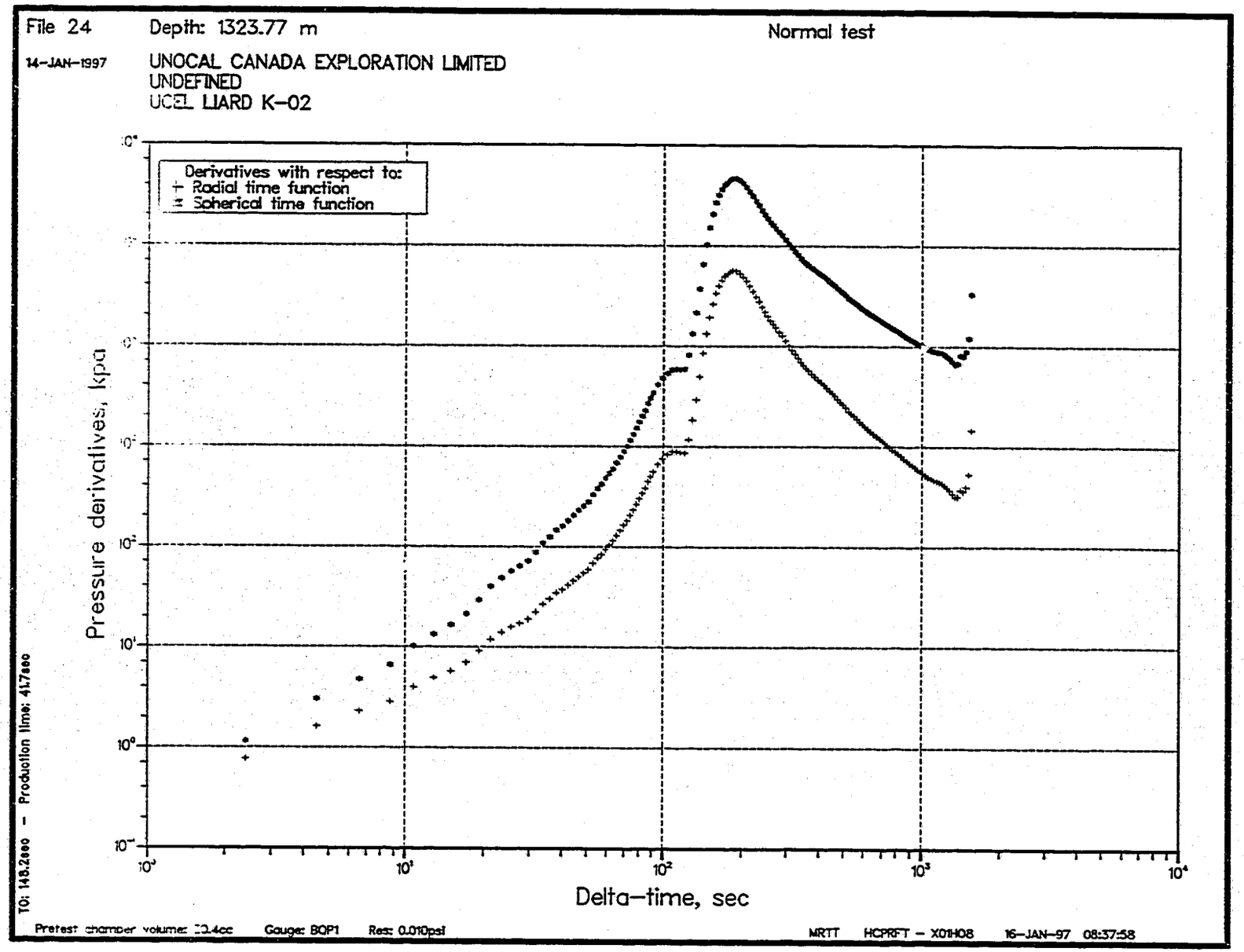
Pretest chamber volume: 20.5cc Gauge: 80P1 Res: 0.010psi

MRTT HCPRFT - X01H08 16-JAN-97 08:37:43


File 52
Depth: 1323.04 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 15228.32 kpaa
Mud Pressure after test = 15226.56 kpaa
Last build–up pressure = 14729.94 kpaa
Draw–down mobility = 0.4 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
150
300
450
600
750
900
1050
1.4
1.6
1.8
2.0
2.2
2.4
Pretest chamber volume: 10.6cc
Gauge: BOP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 08:37:47


File 52
Depth: 1323.04 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
Spherical time function
Pressure derivatives, kpa
Delta-time, sec
10°
10¹
10²
10³
Tp: 125.4sec -- Production time: 33.6sec
Pretest chamber volume: 30.6cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 08:37:50


File 24
Depth: 1323.77 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 15233.60 kpaa
Mud Pressure after test = 15236.79 kpaa
Last build–up pressure = 14711.45 kpaa
Draw–down mobility = 0.095 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
250
500
750
1000
1250
1500
1750
2000
1.2
1.5
1.8
2.1
2.4
2.7
Pretest chamber volume: 20.4cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 08:37:56


File 24
Depth: 1323.77 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
± Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 148.2sec - Production time: 41.7sec
Pretest chamber volume: 20.4cc
Gauge: BOP1
Res: 0.010psi
MRTT HCPRFT - X01H08
16-JAN-97 08:37:58

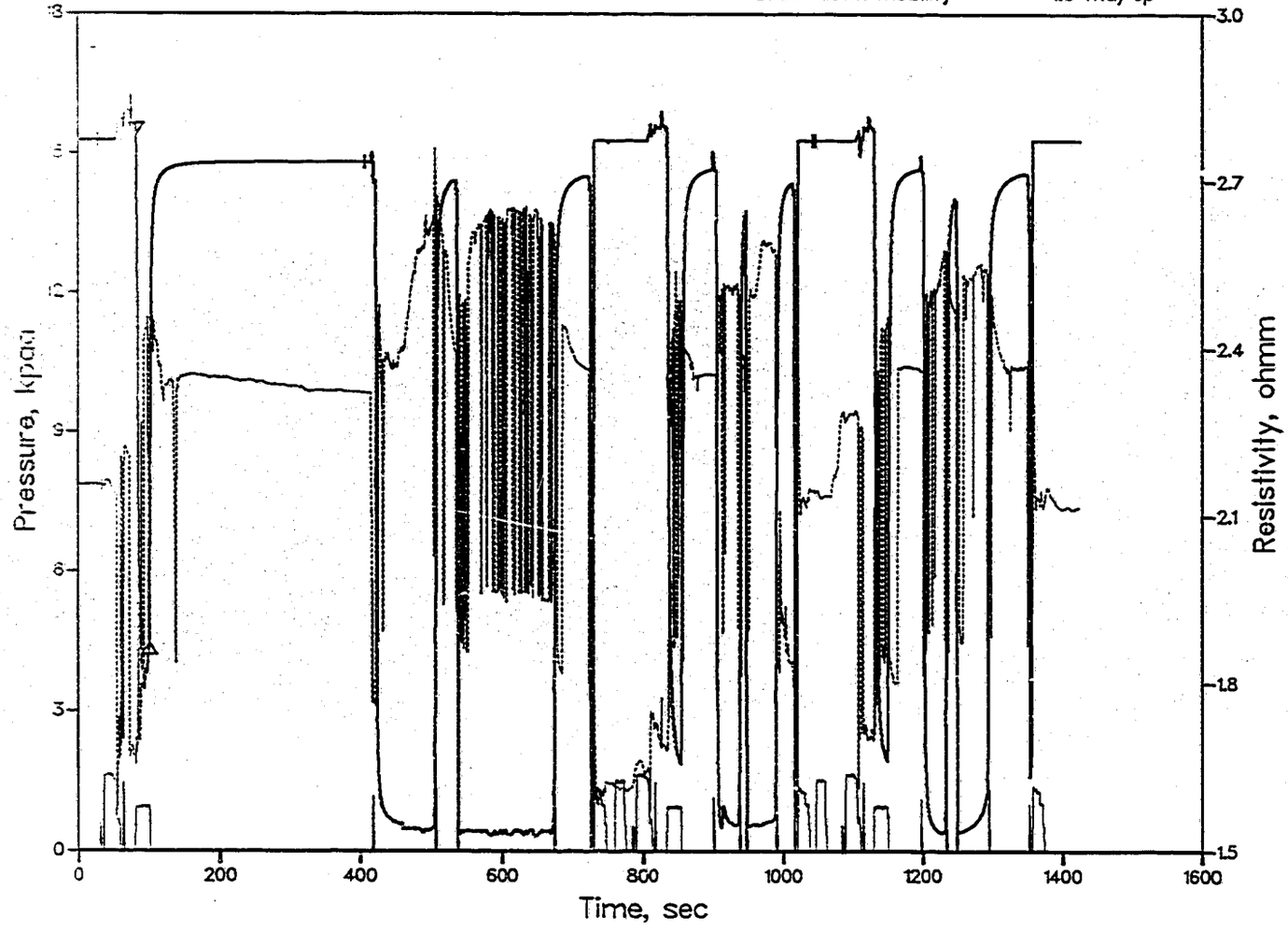
File 49 Depth: 1327.23 m

14-JAN-1997

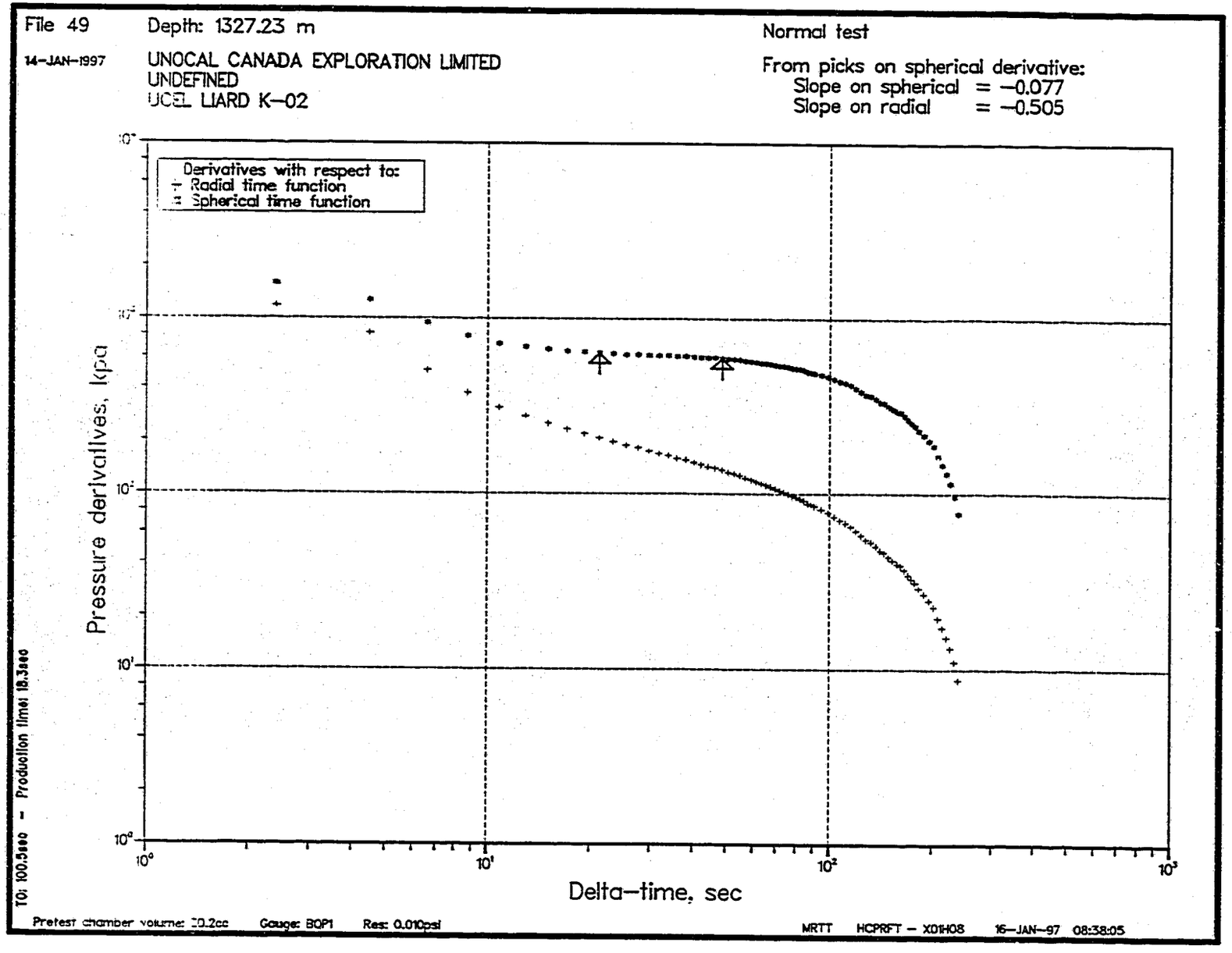
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02

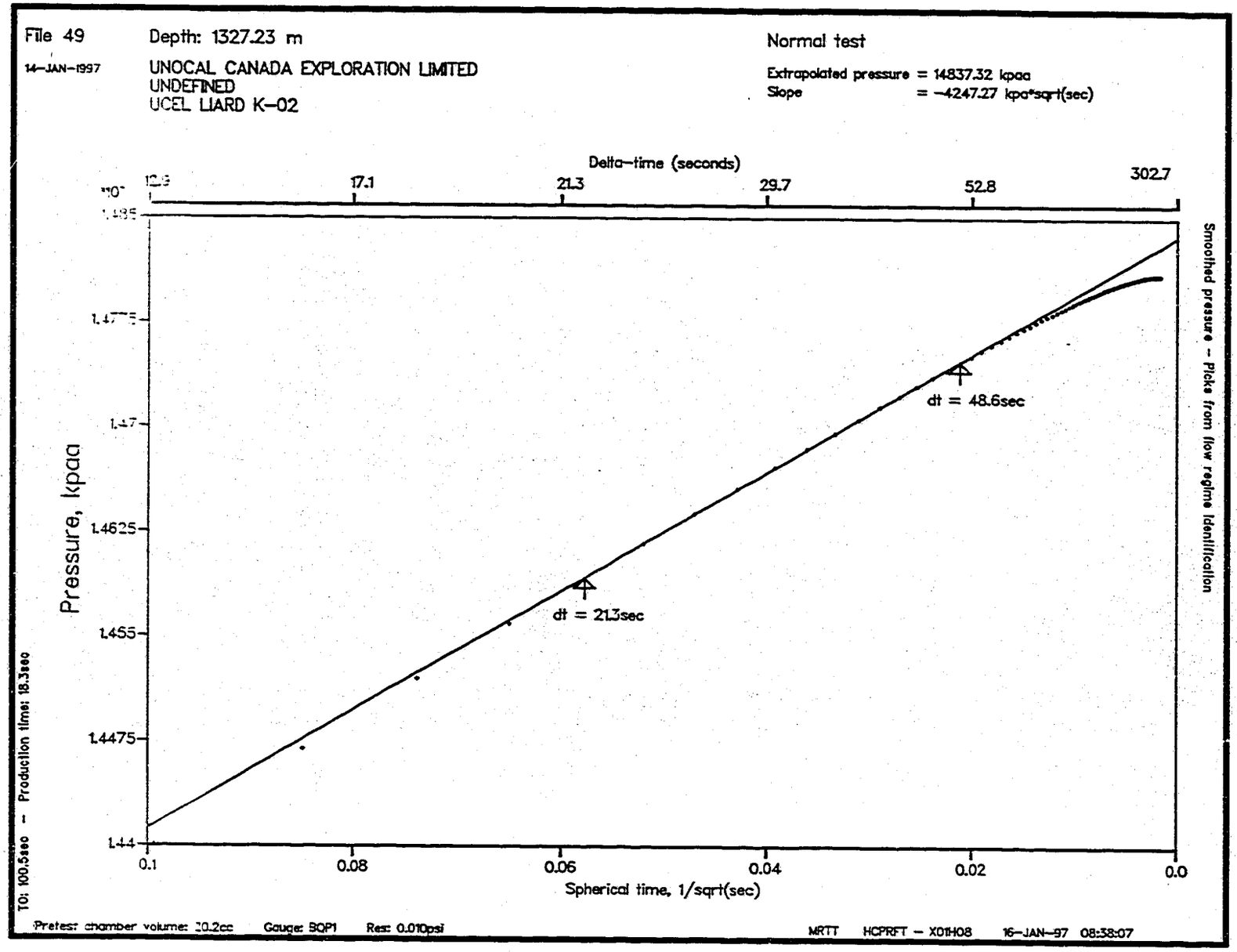
Normal test – Large-Diameter probe

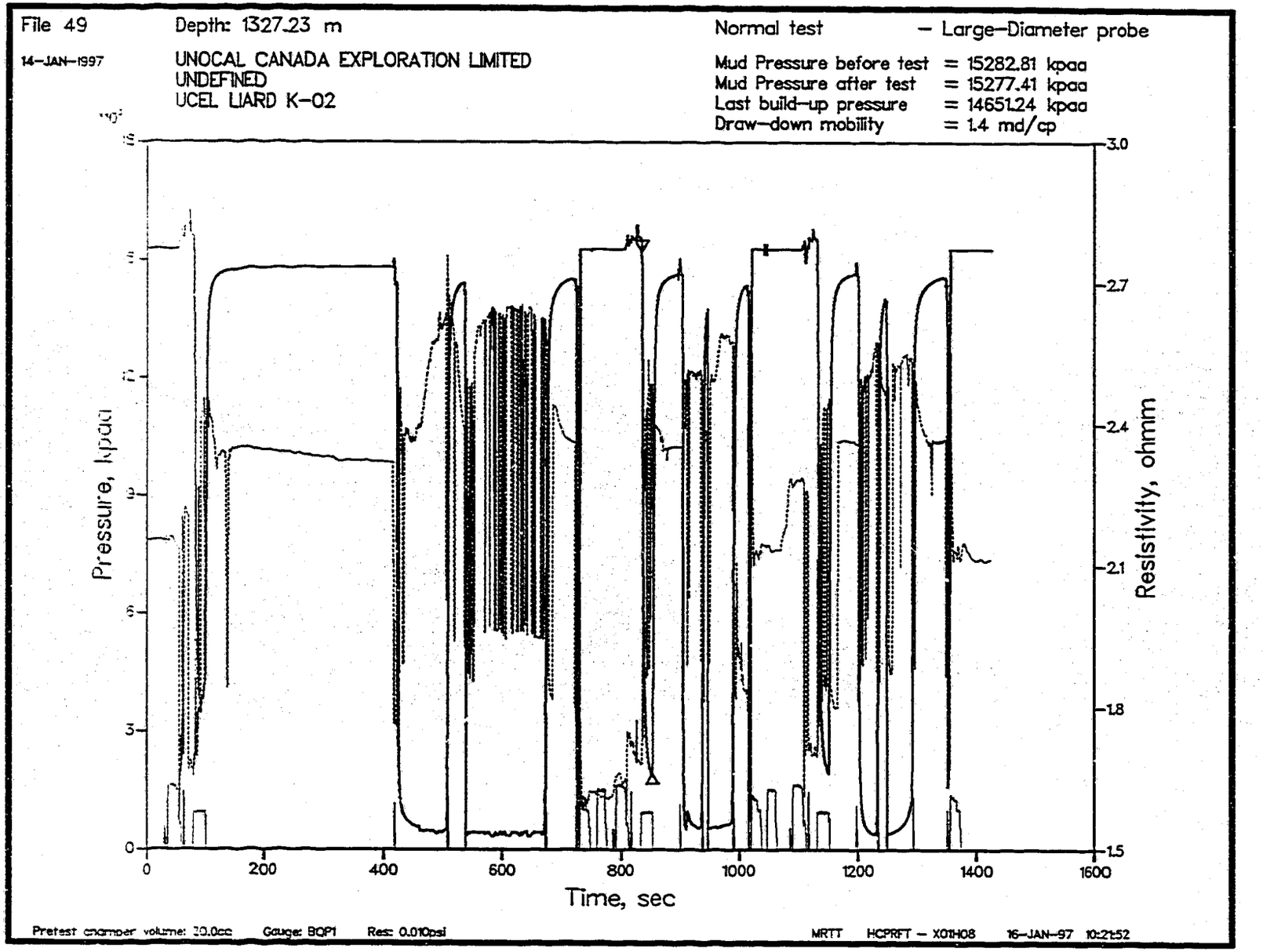
Mud Pressure before test = 15282.81 kpaa
Mud Pressure after test = 15277.41 kpaa
Last build-up pressure = 14809.83 kpaa
Draw-down mobility = 1.6 md/cp

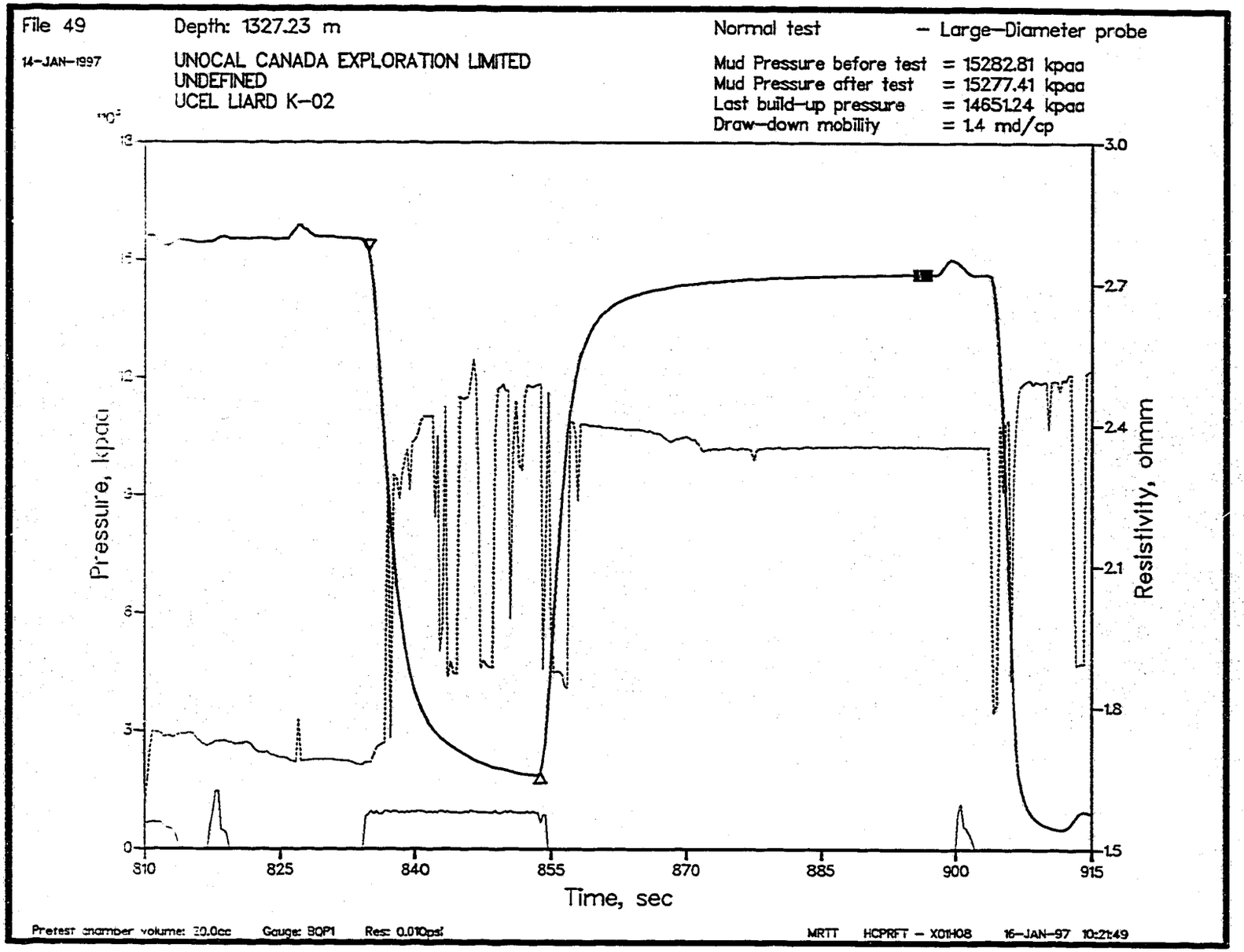


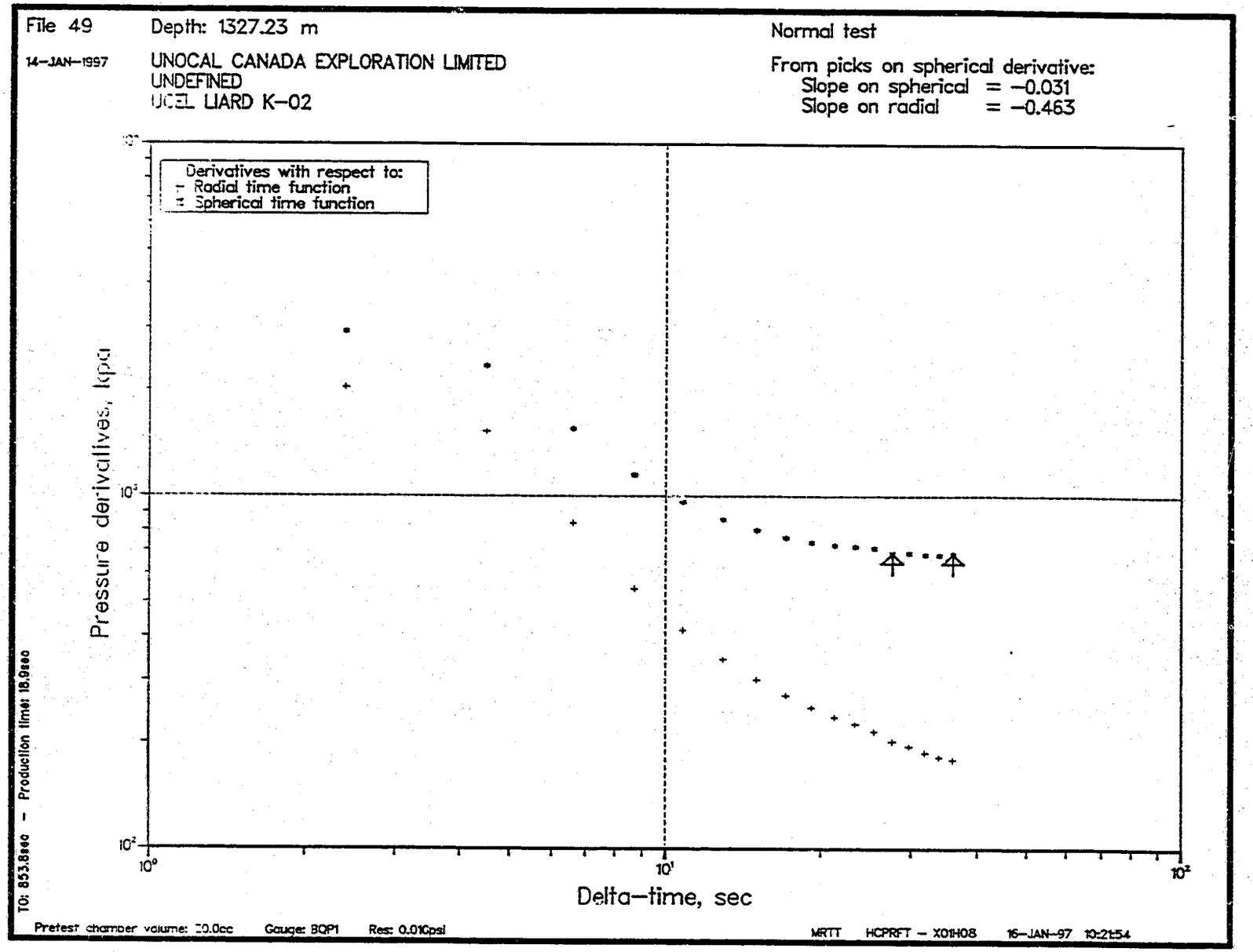
Pretest chamber volume: 20.2cc Gauge: BQP1 Res: 0.010psi MRTT HCPRFT – X01H08 16-JAN-97 08:38:03

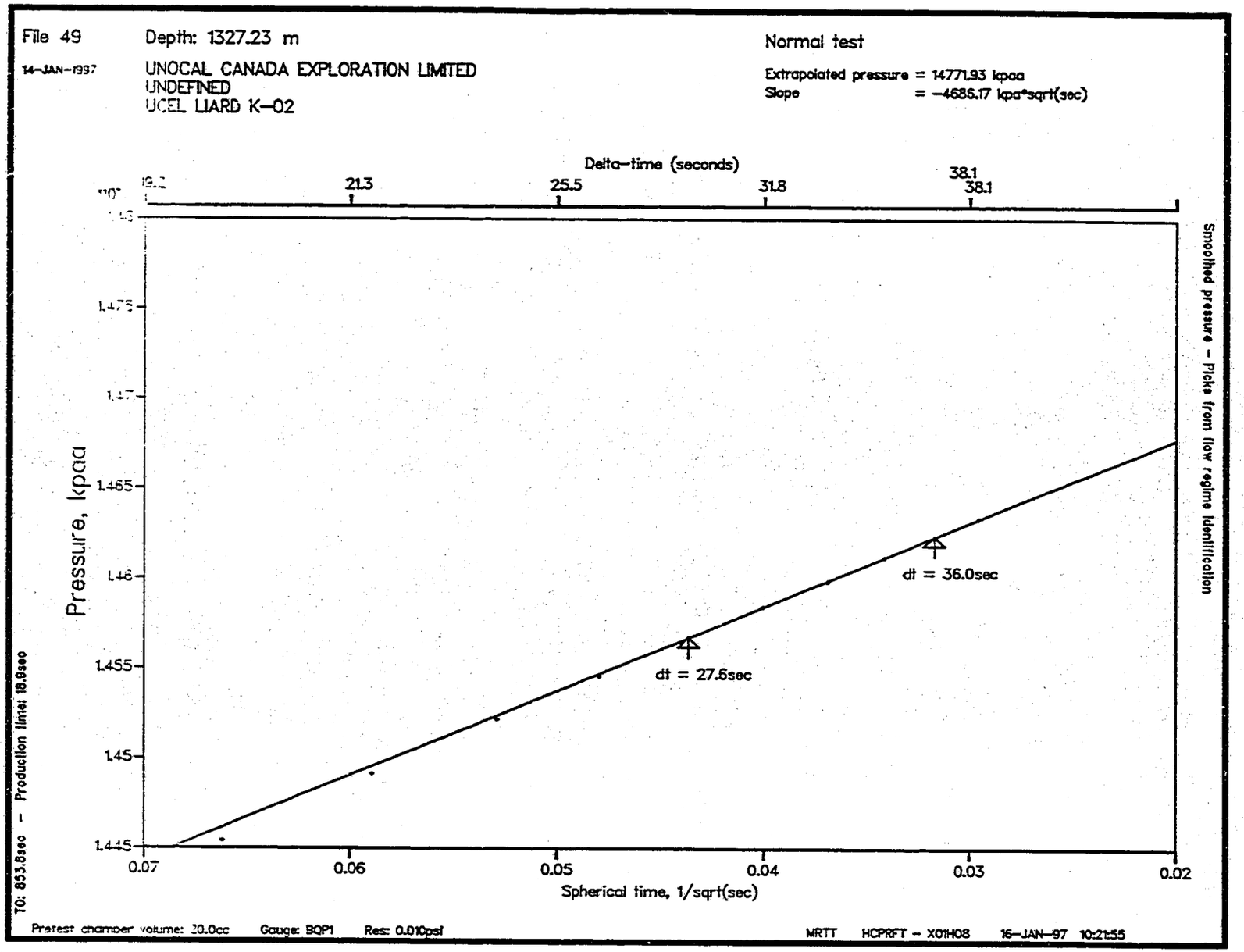

File 49
Depth: 1327.23 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
From picks on spherical derivative:
Slope on spherical = -0.077
Slope on radial = -0.505
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 100.5000 - Production time: 18.3800
Pretest chamber volume: 20.2cc
Gauge: BOP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 08:38:05

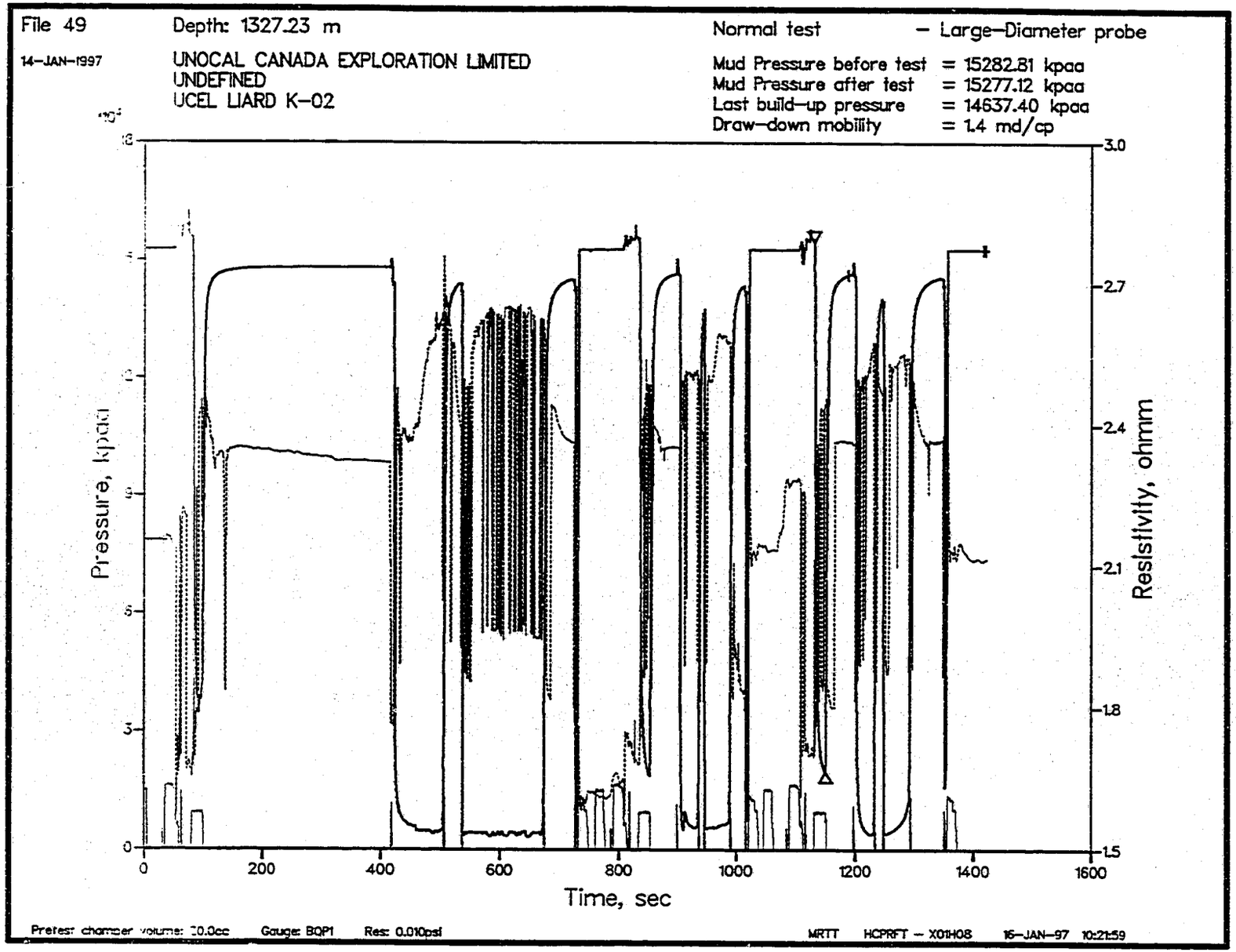

File 49
Depth: 1327.23 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Extrapolated pressure = 14837.32 kpaa
Slope = -4247.27 kpa*sqrt(sec)
Delta-time (seconds)
10.3
17.1
21.3
29.7
52.8
302.7
1.485
1.4775
1.47
1.4625
1.455
1.4475
1.44
Pressure, kpaa
dt = 48.6sec
dt = 21.3sec
0.1
0.08
0.06
0.04
0.02
0.0
Spherical time, 1/sqrt(sec)
Smoothed pressure - Picks from flow regime identification
TO: 100.5sec - Production time: 18.3sec
Pretest chamber volume: 10.2cc
Gauge: SQP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 08:38:07

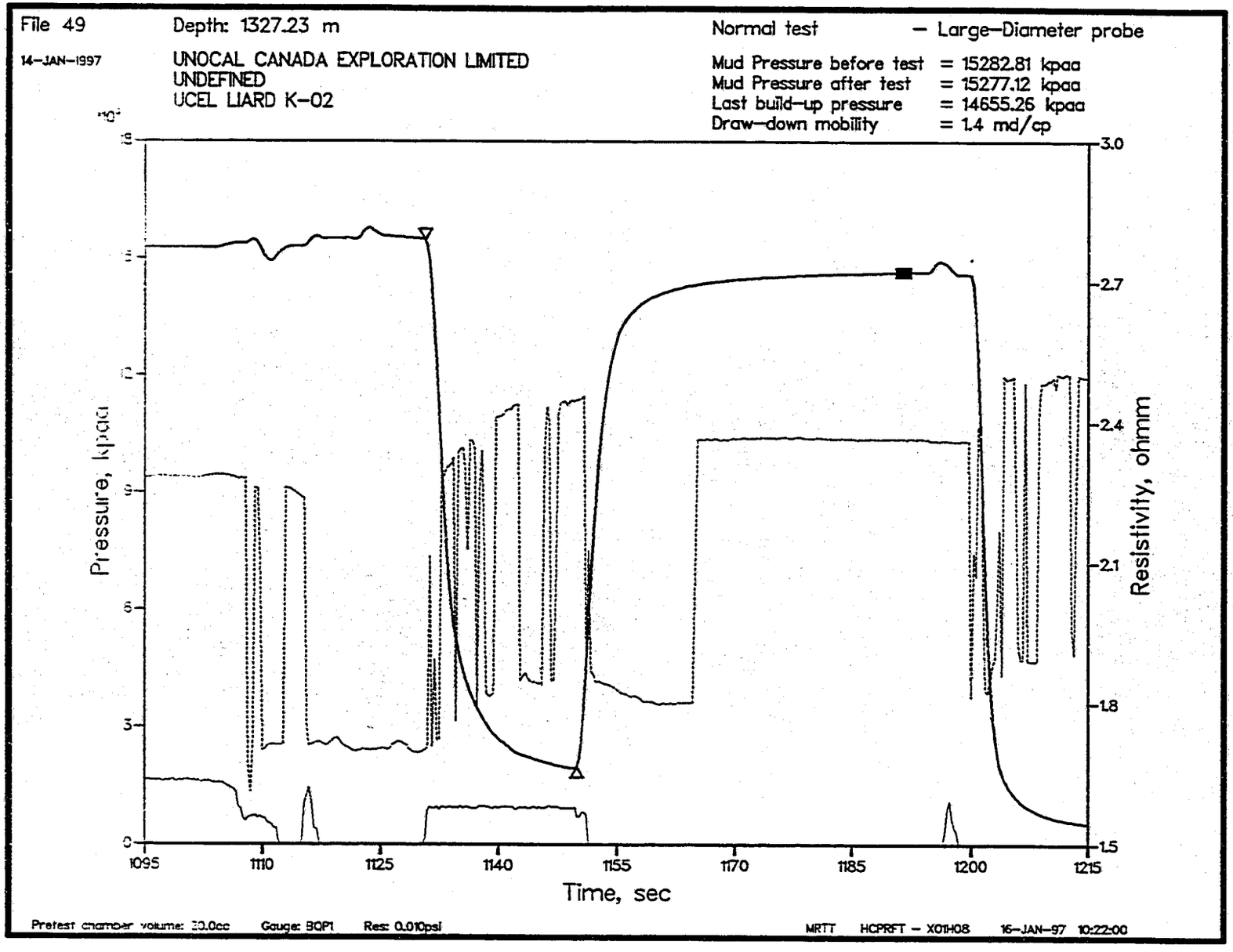

File 49
Depth: 1327.23 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 15282.81 kpaa
Mud Pressure after test = 15277.41 kpaa
Last build–up pressure = 14651.24 kpaa
Draw–down mobility = 1.4 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
200
400
600
800
1000
1200
1400
1600
3
1.5
1.8
2.1
2.4
2.7
3.0
Pretest chamber volume: 20.0cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 10:21:52

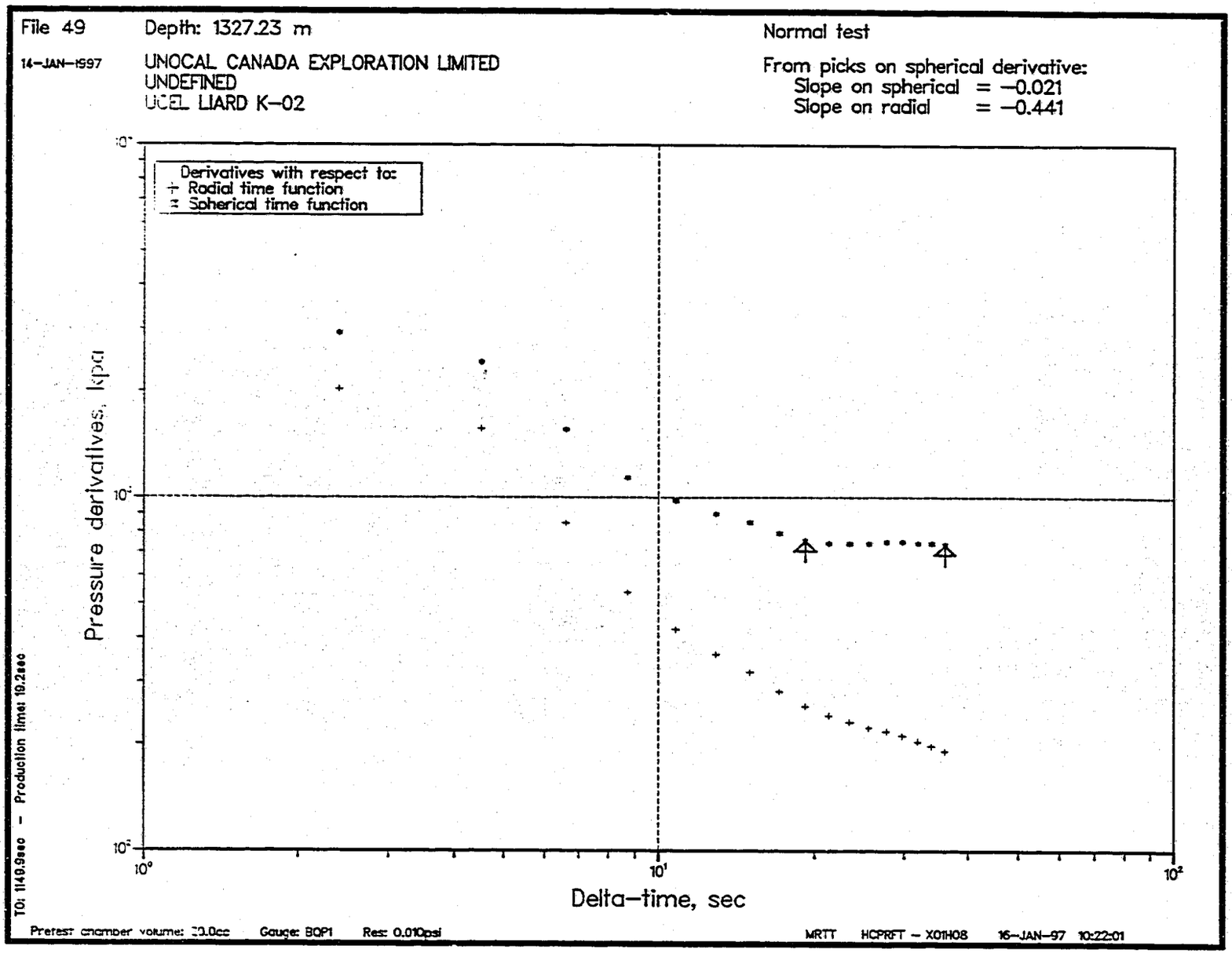

File 49
Depth: 1327.23 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 15282.81 kpaa
Mud Pressure after test = 15277.41 kpaa
Last build–up pressure = 14651.24 kpaa
Draw–down mobility = 1.4 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
810
825
840
855
870
885
900
915
3.0
2.7
2.4
2.1
1.8
1.5
Pretest chamber volume: 20.0cc
Gauge: SQP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 10:21:49


File 49
Depth: 1327.23 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
From picks on spherical derivative:
Slope on spherical = -0.031
Slope on radial = -0.463
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 853.8sec - Production time: 18.0sec
Pretest chamber volume: 20.0cc
Gauge: BQP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 10:21:54


File 49
Depth: 1327.23 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Extrapolated pressure = 14771.93 kpaa
Slope = -4686.17 kpa*sqrt(sec)
Delta-time (seconds)
21.3
25.5
31.8
38.1
38.1
Pressure, kpaa
1.465
1.46
1.455
1.45
1.445
dt = 36.0sec
dt = 27.6sec
0.07
0.06
0.05
0.04
0.03
0.02
Spherical time, 1/sqrt(sec)
Smoothed pressure - Picks from flow regime identification
T0: 853.8sec - Production time: 18.9sec
Pretest chamber volume: 20.0cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 10:21:55


File 49
Depth: 1327.23 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 15282.81 kpaa
Mud Pressure after test = 15277.12 kpaa
Last build–up pressure = 14637.40 kpaa
Draw–down mobility = 1.4 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
200
400
600
800
1000
1200
1400
1600
3.0
2.7
2.4
2.1
1.8
1.5
Pretest chamber volume: 10.0cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 10:21:59


File 49
Depth: 1327.23 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 15282.81 kpaa
Mud Pressure after test = 15277.12 kpaa
Last build–up pressure = 14655.26 kpaa
Draw–down mobility = 1.4 md/cp
Pressure, kpaa
Resistivity, ohmm
3.0
2.7
2.4
2.1
1.8
1.5
0
3
6
9
12
15
1095
1110
1125
1140
1155
1170
1185
1200
1215
Time, sec
Pretest chamber volume: 20.0cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 10:22:00

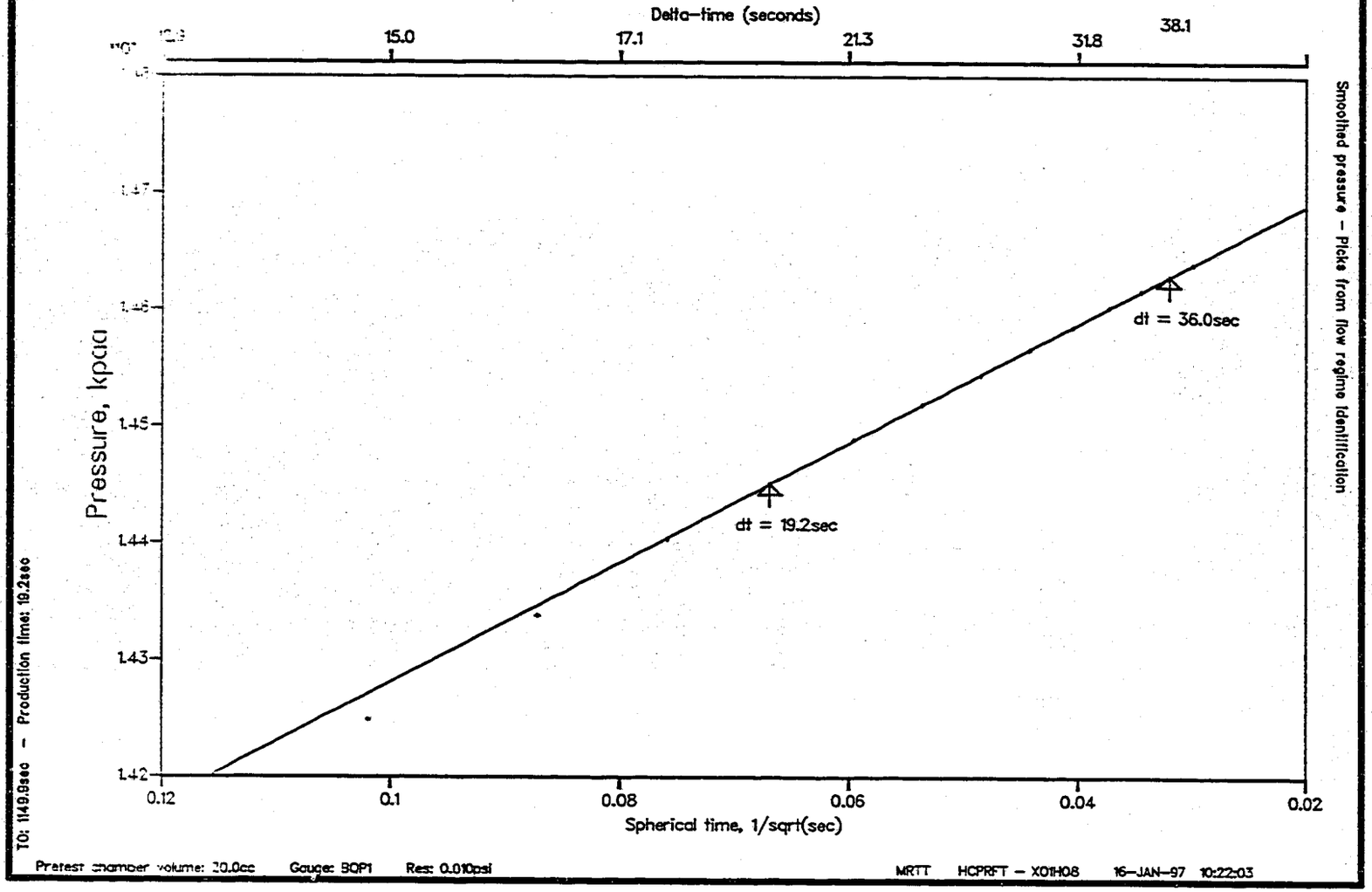

File 49
Depth: 1327.23 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
From picks on spherical derivative:
Slope on spherical = -0.021
Slope on radial = -0.441
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 1149.9sec - Production time: 19.2sec
Pretest chamber volume: 20.0cc
Gauge: BQP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 10:22:01

File 49 Depth: 1327.23 m

14-JAN-1997 UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02

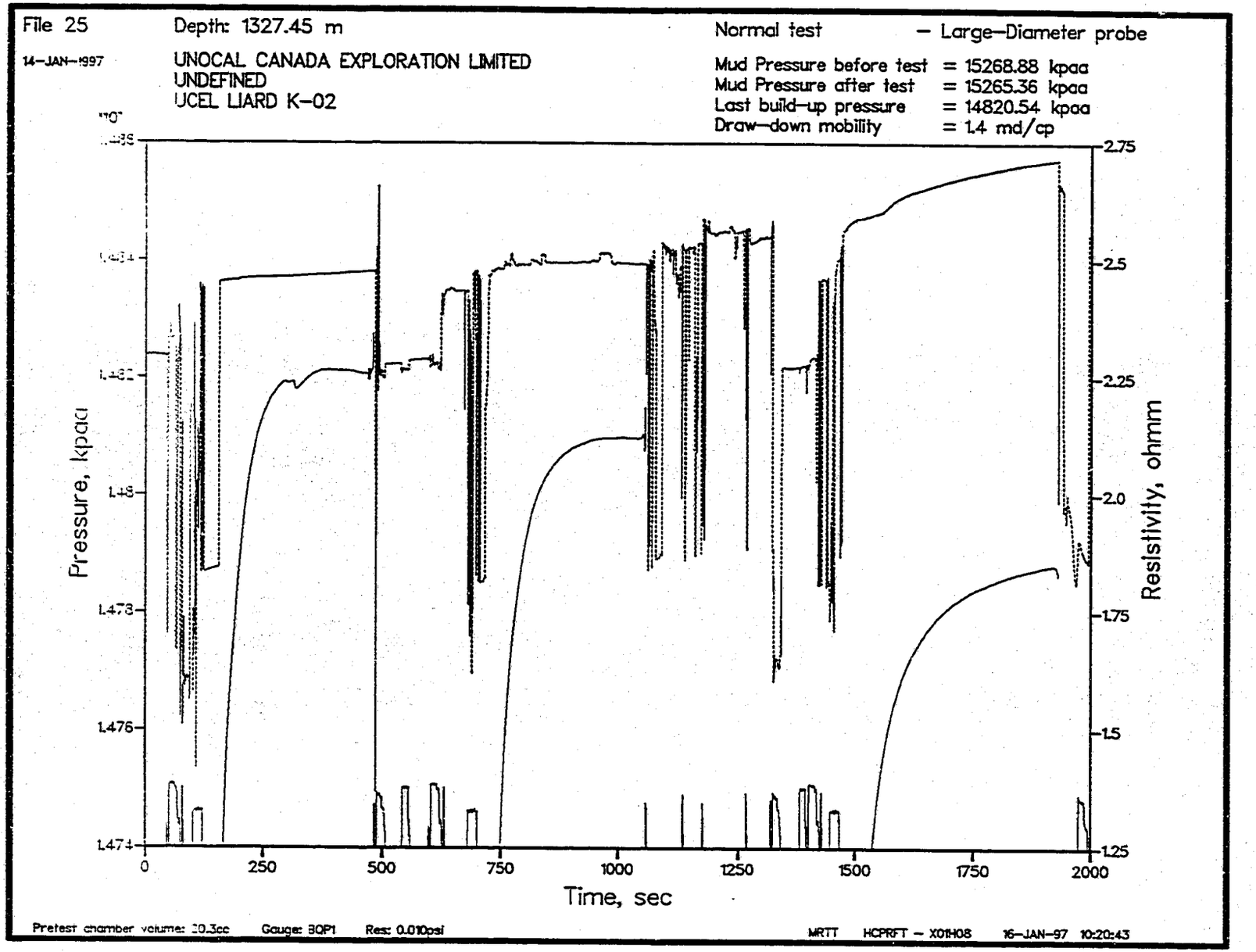
Normal test

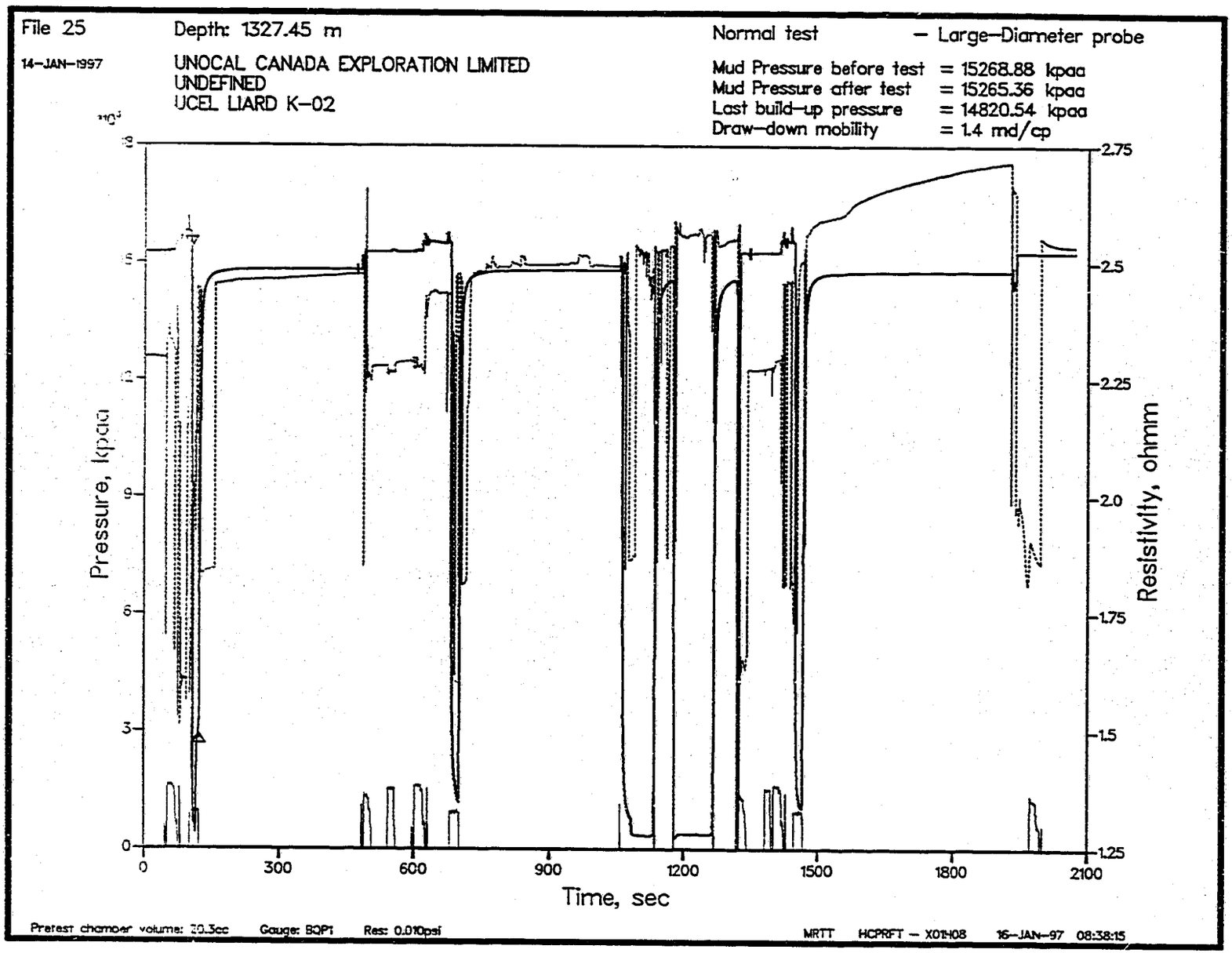
Extrapolated pressure = 14792.79 kpaa
Slope = -5116.07 kpa*sqrt(sec)

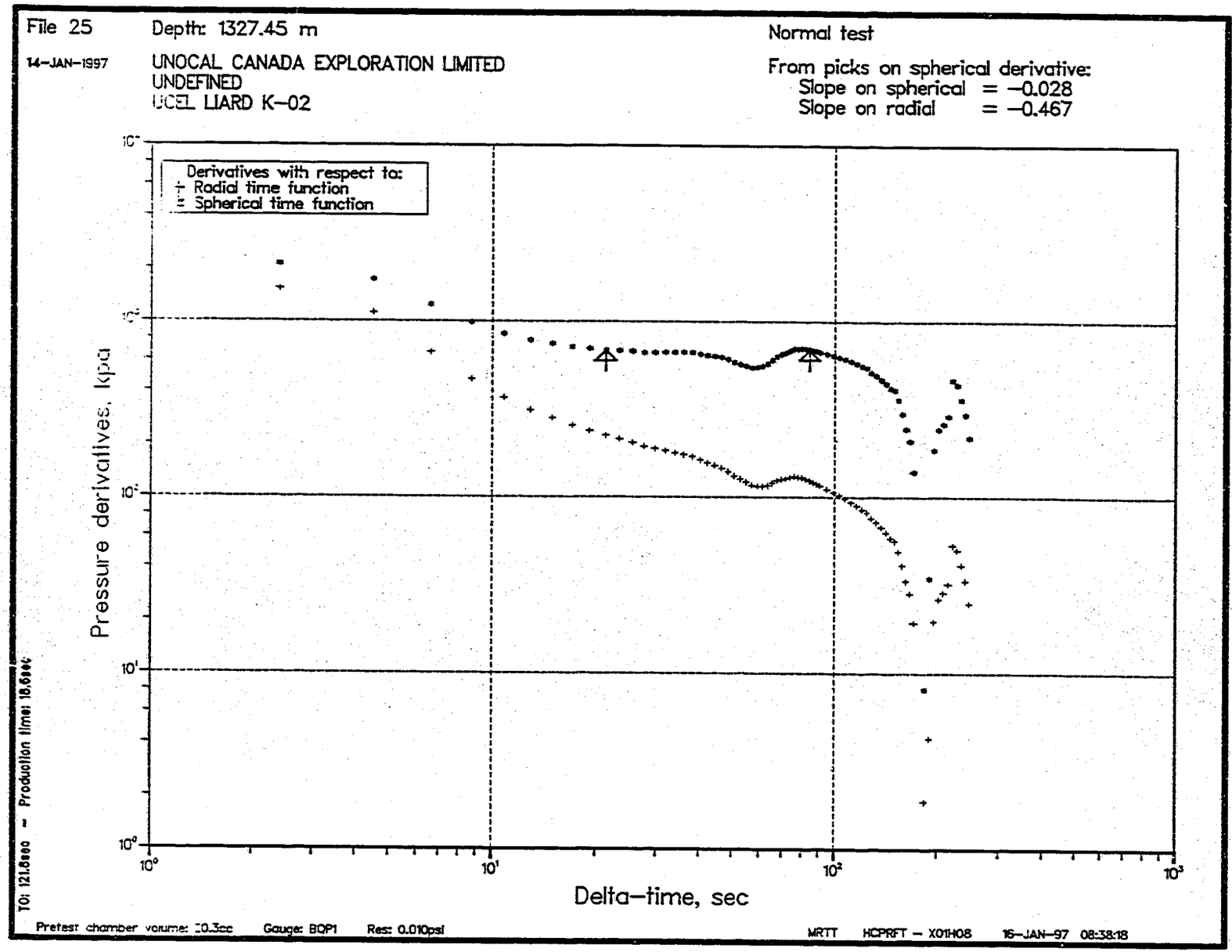


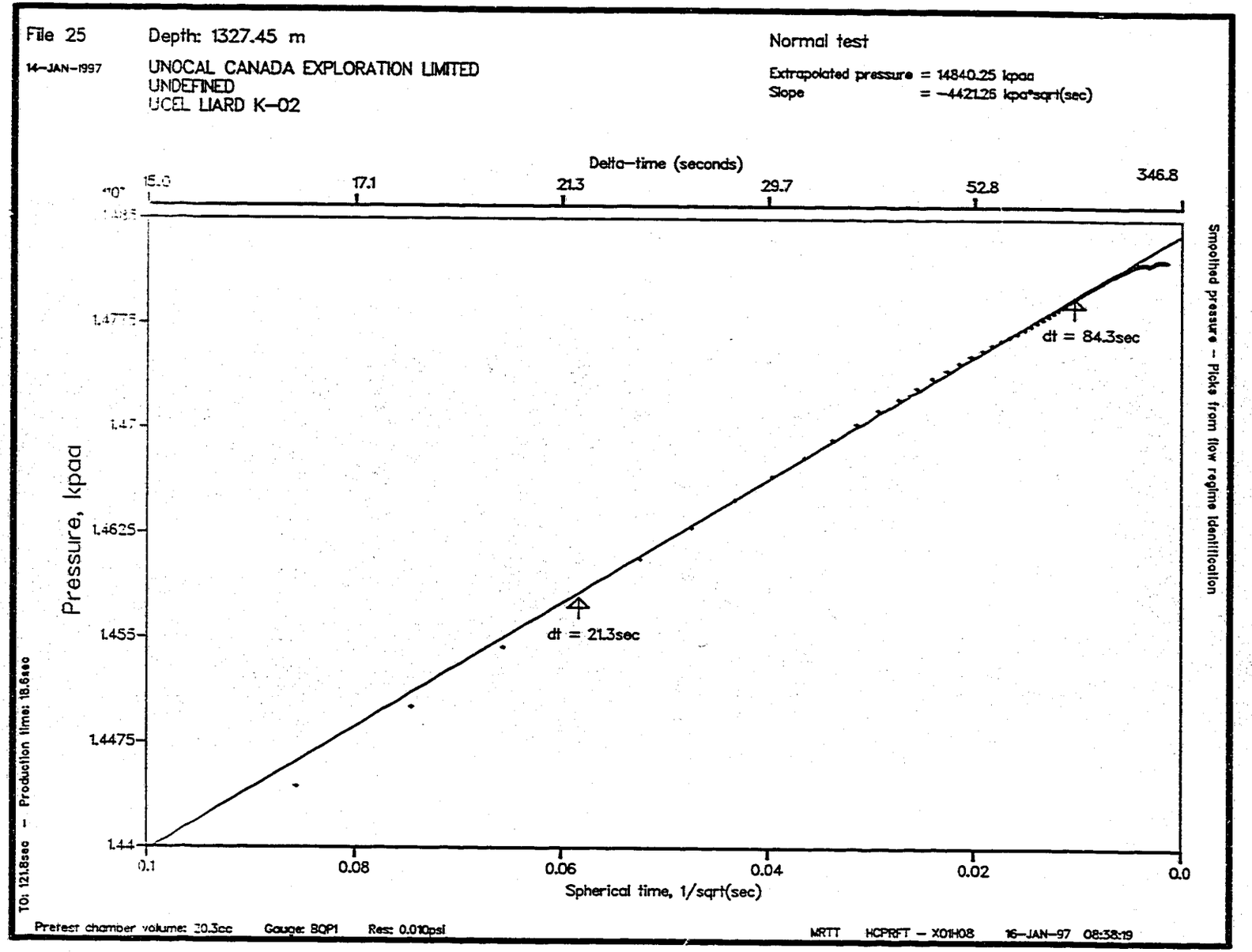
Pretest chamber volume: 20.0cc Gauge: BQP1 Res: 0.010psi

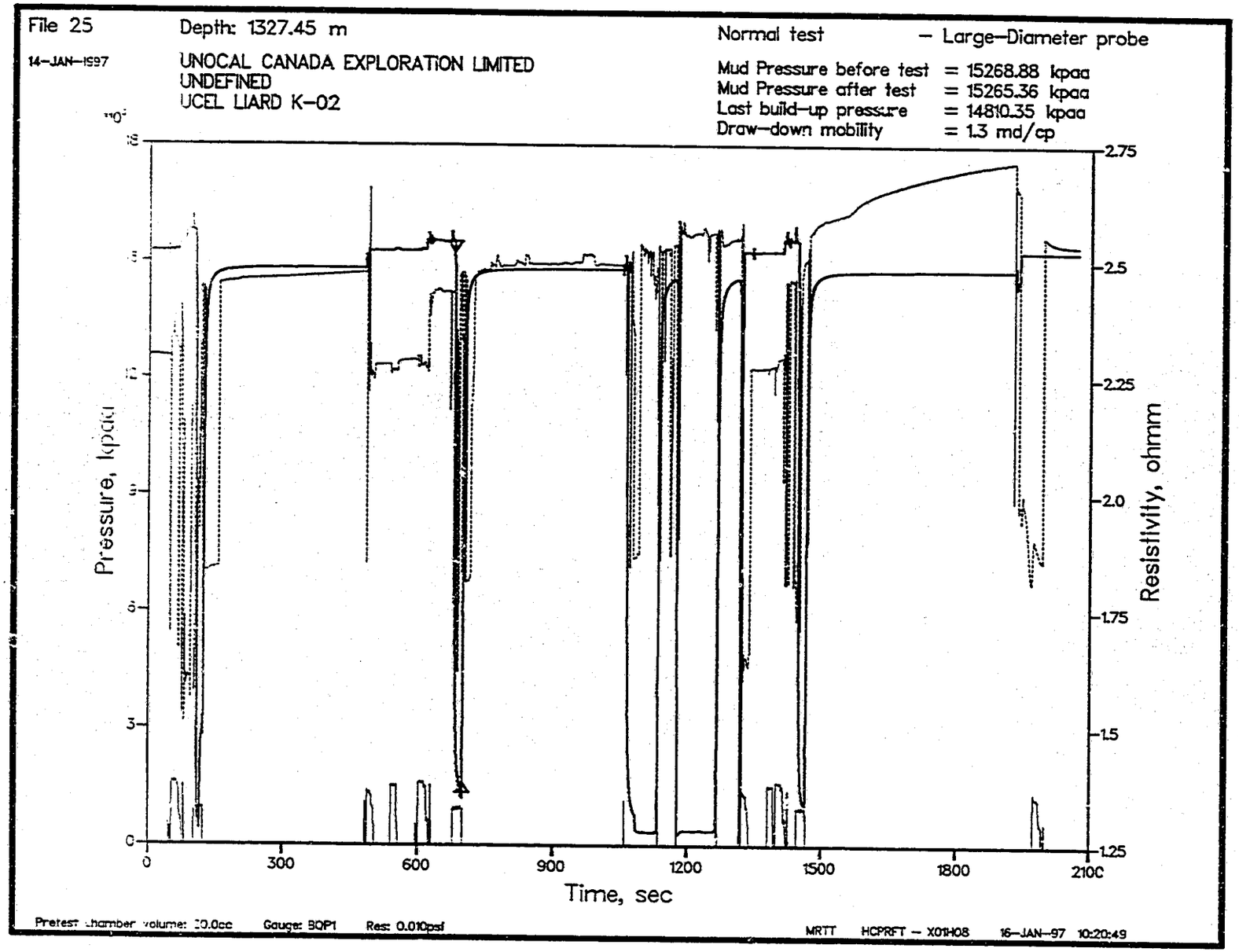
MRTT HCPRFT - X01H08 16-JAN-97 10:22:03


File 25
Depth: 1327.45 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
- Large-Diameter probe
Mud Pressure before test = 15268.88 kpaa
Mud Pressure after test = 15265.36 kpaa
Last build-up pressure = 14820.54 kpaa
Draw-down mobility = 1.4 md/cp
Pressure, kpaa
1.474
1.476
1.478
1.48
0
250
500
750
1000
1250
1500
1750
2000
Time, sec
Resistivity, ohmm
1.25
1.5
1.75
2.0
2.25
2.5
2.75
Pretest chamber volume: 20.3cc
Gauge: 3QP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 10:20:43


File 25
Depth: 1327.45 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 15268.88 kpaa
Mud Pressure after test = 15265.36 kpaa
Last build–up pressure = 14820.54 kpaa
Draw–down mobility = 1.4 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
300
600
900
1200
1500
1800
2100
2.75
2.5
2.25
2.0
1.75
1.5
1.25
Pretest chamber volume: 20.3cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 08:38:15


File 25
Depth: 1327.45 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
From picks on spherical derivative:
Slope on spherical = -0.028
Slope on radial = -0.467
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 121.6sec - Production time: 18.6sec
Pretest chamber volume: 20.3cc
Gauge: BOP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 08:38:18


File 25
Depth: 1327.45 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Extrapolated pressure = 14840.25 kpaa
Slope = -4421.26 kpa*sqrt(sec)
Delta-time (seconds)
15.0
17.1
21.3
29.7
52.8
346.8
1.4775
1.47
1.4625
1.455
1.4475
1.44
Pressure, kpaa
dt = 84.3sec
dt = 21.3sec
0.1
0.08
0.06
0.04
0.02
0.0
Spherical time, 1/sqrt(sec)
Smoothed pressure - Picks from flow regime identification
T0: 121.8sec - Production time: 18.6sec
Pretest chamber volume: 20.3cc
Gauge: BQP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 08:38:19

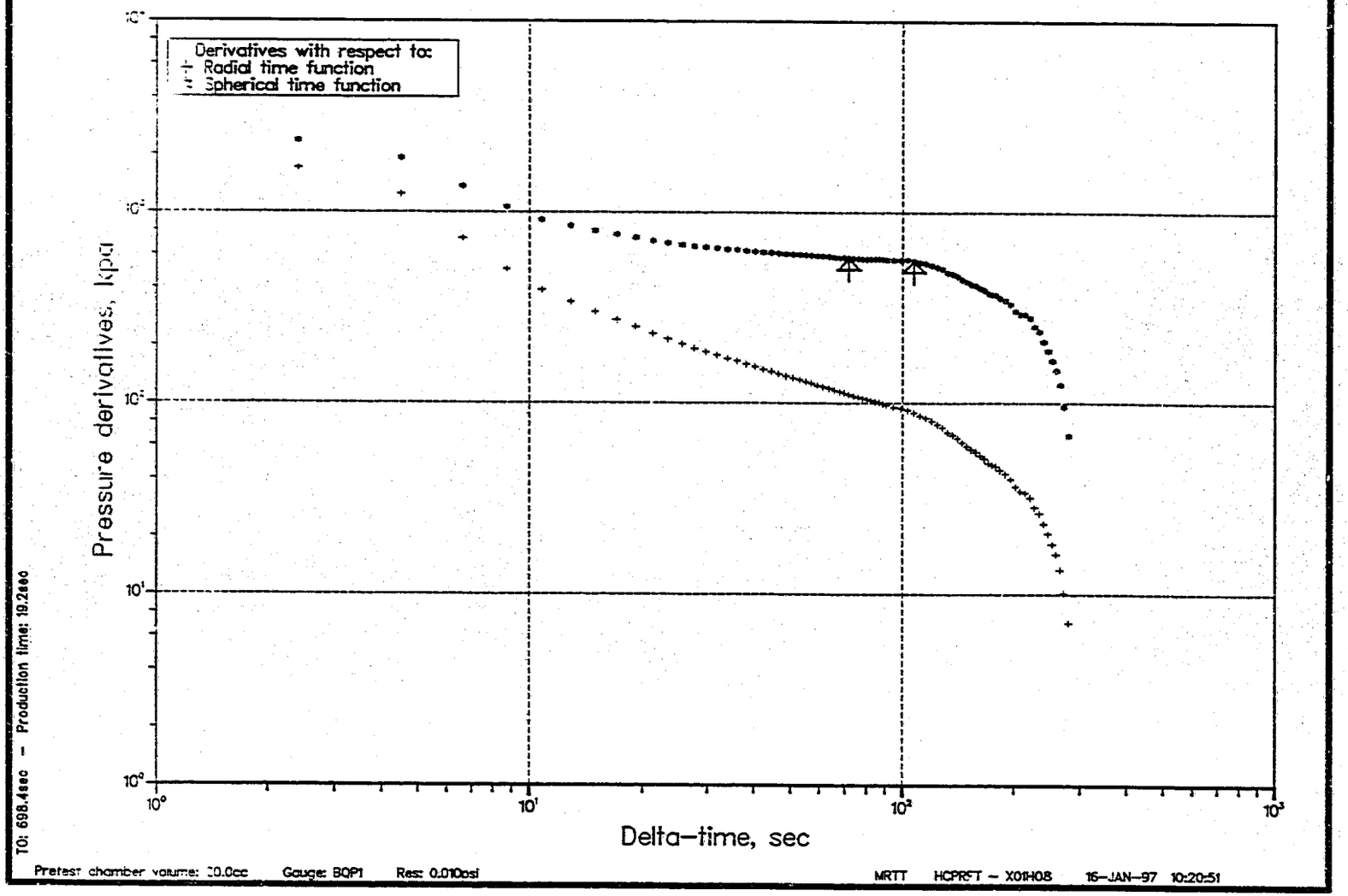

File 25
Depth: 1327.45 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
- Large-Diameter probe
Mud Pressure before test = 15268.88 kpaa
Mud Pressure after test = 15265.36 kpaa
Last build-up pressure = 14810.35 kpaa
Draw-down mobility = 1.3 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
300
600
900
1200
1500
1800
2100
2.75
2.5
2.25
2.0
1.75
1.5
1.25
Pretest Chamber Volume: 20.0cc
Gauge: BOP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 10:20:49

File 25 Depth: 1327.45 m

14-JAN-1997 UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02

Normal test

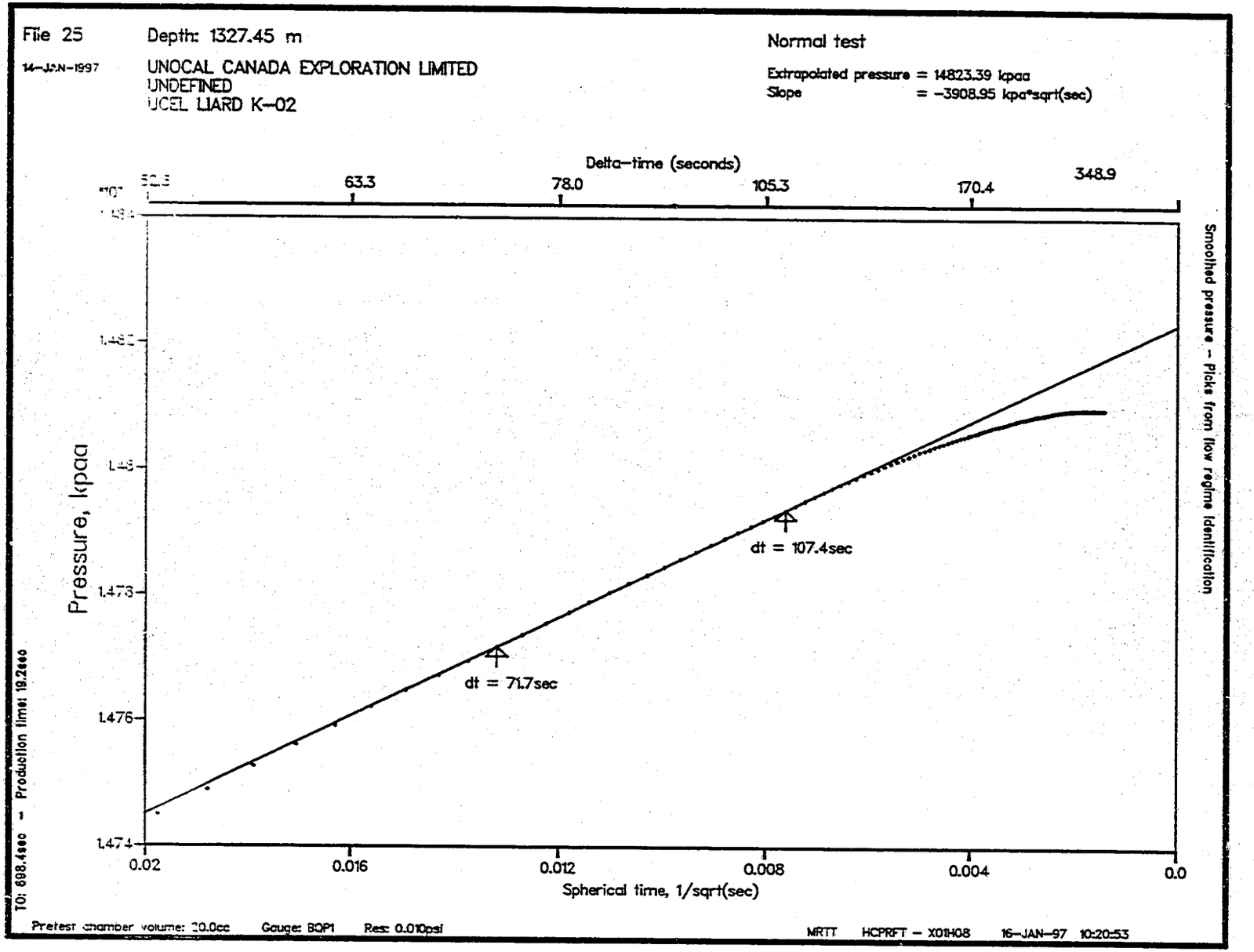
From picks on spherical derivative:
Slope on spherical = -0.066
Slope on radial = -0.526

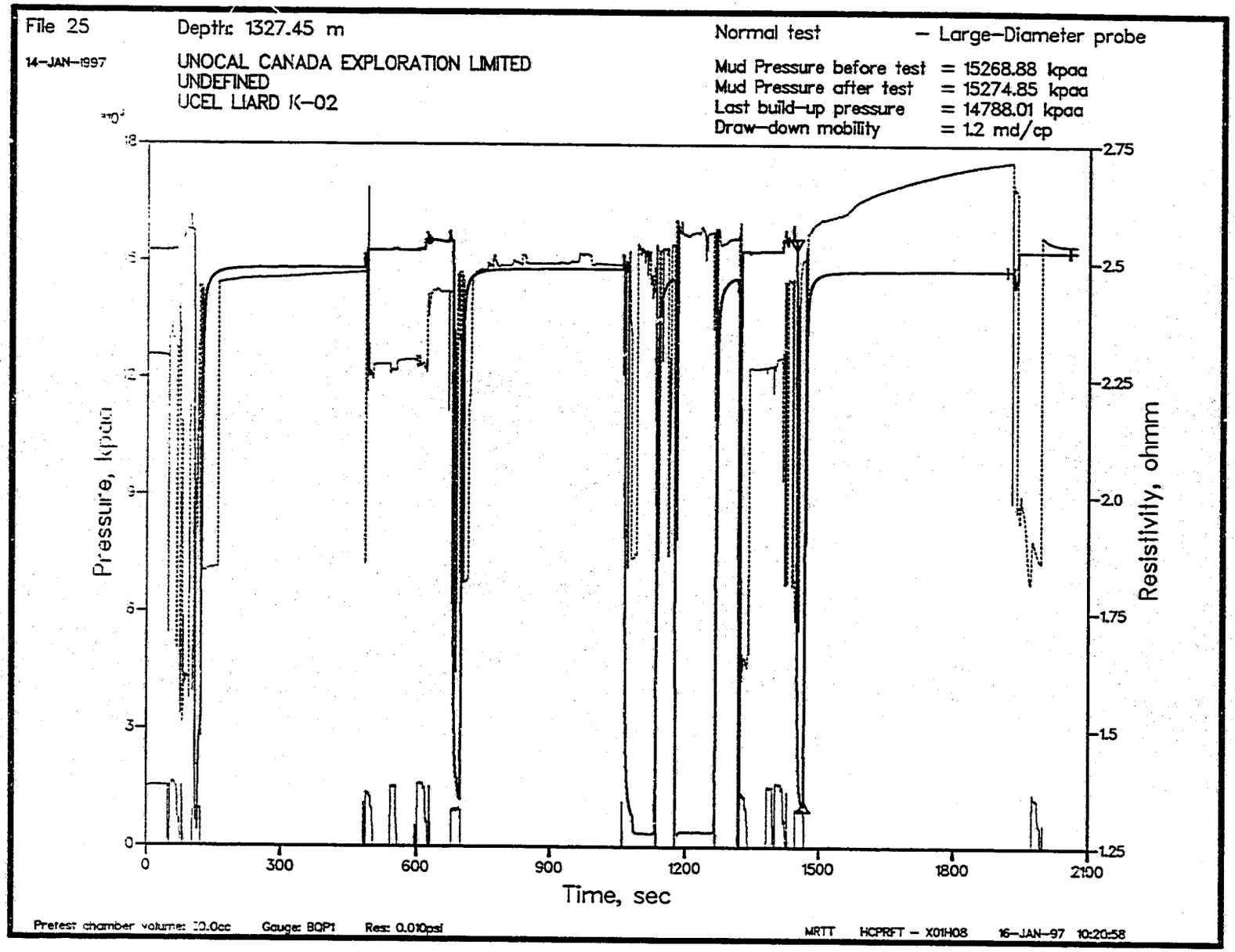


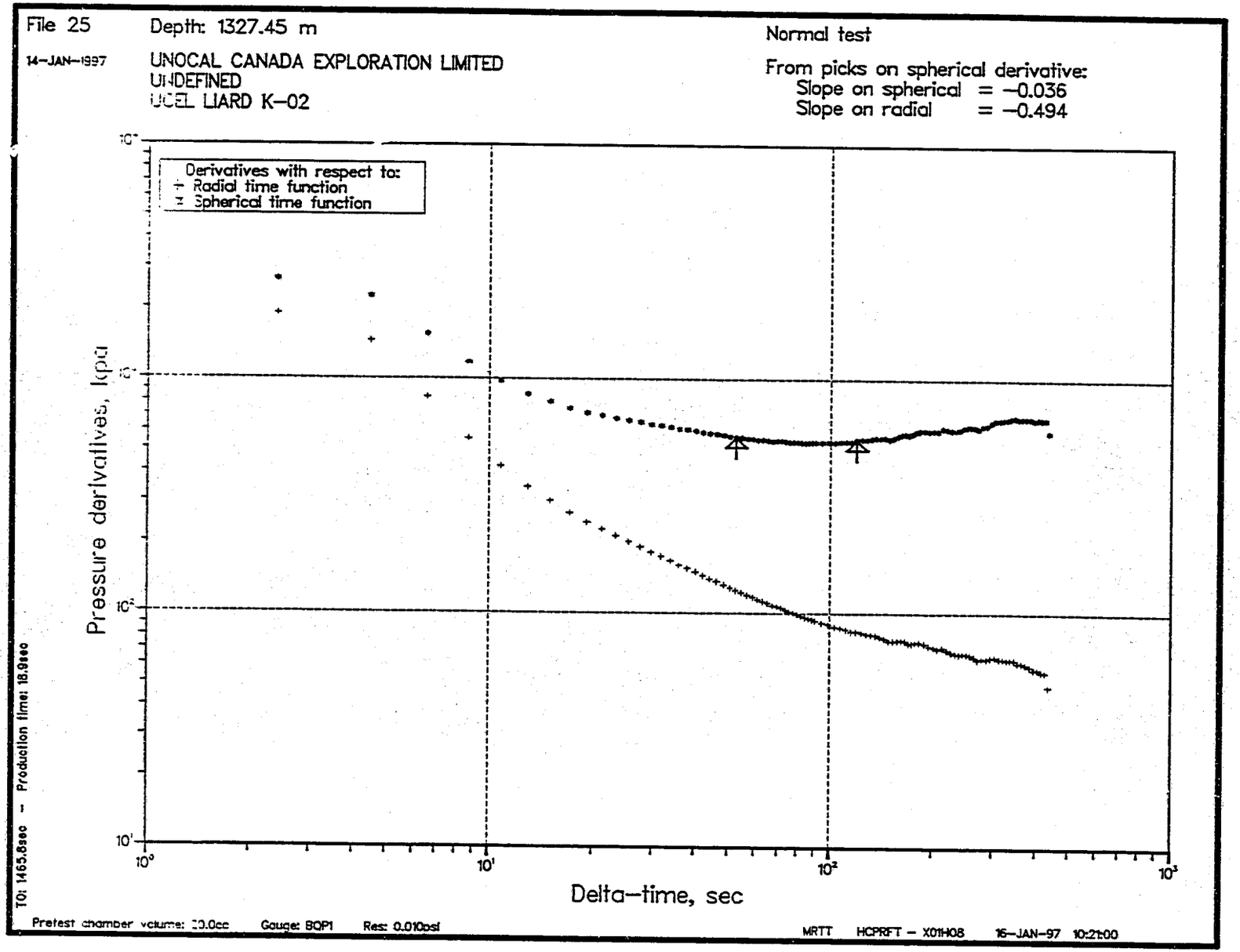
TO: 698.4sec - Production time: 19.2sec

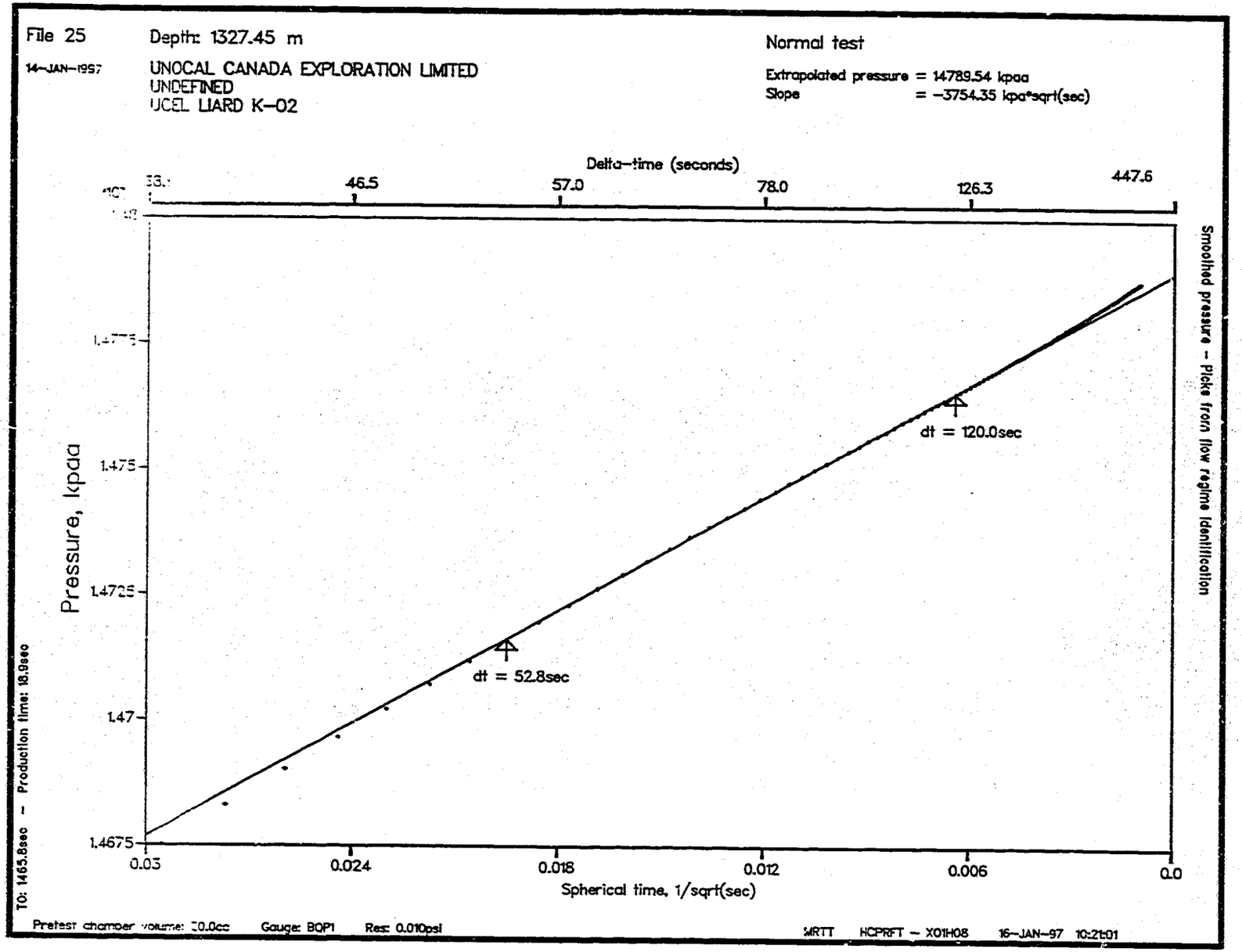
Pretest chamber volume: 20.0cc Gauge: BQP1 Res: 0.010psi

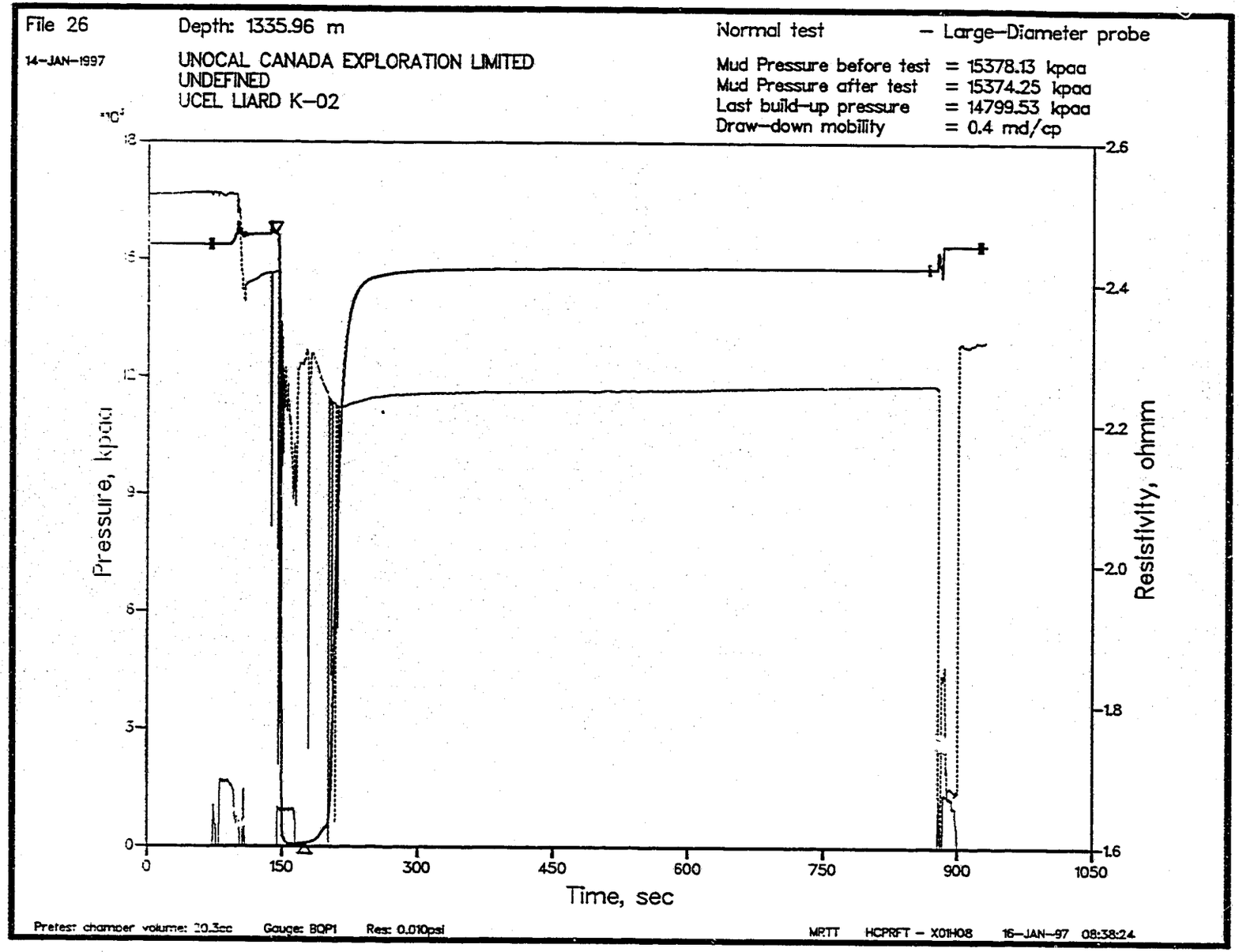
MRTT HCPRST - X01H08 16-JAN-97 10:20:51

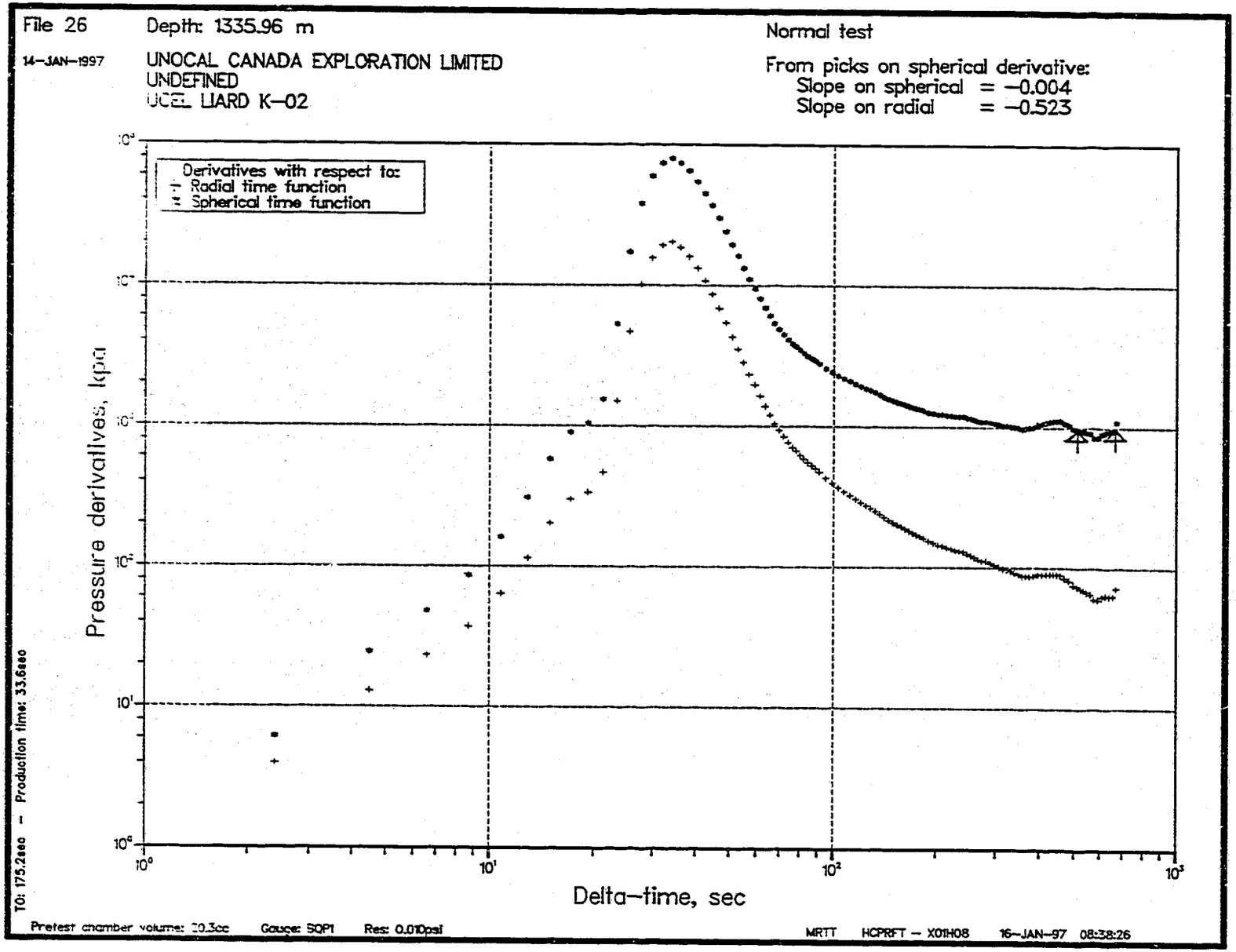

File 25
Depth: 1327.45 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
Extrapolated pressure = 14823.39 kpaa
Slope = -3908.95 kpa*sqrt(sec)
Delta-time (seconds)
63.3
78.0
105.3
170.4
348.9
Pressure, kpaa
1.476
1.474
dt = 107.4sec
dt = 71.7sec
0.02
0.016
0.012
0.008
0.004
0.0
Spherical time, 1/sqrt(sec)
Smoothed pressure - Picks from flow regime identification
TO: 698.4sec - Production time: 19.2sec
Pretest chamber volume: 20.0cc
Gauge: BQP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 10:20:53

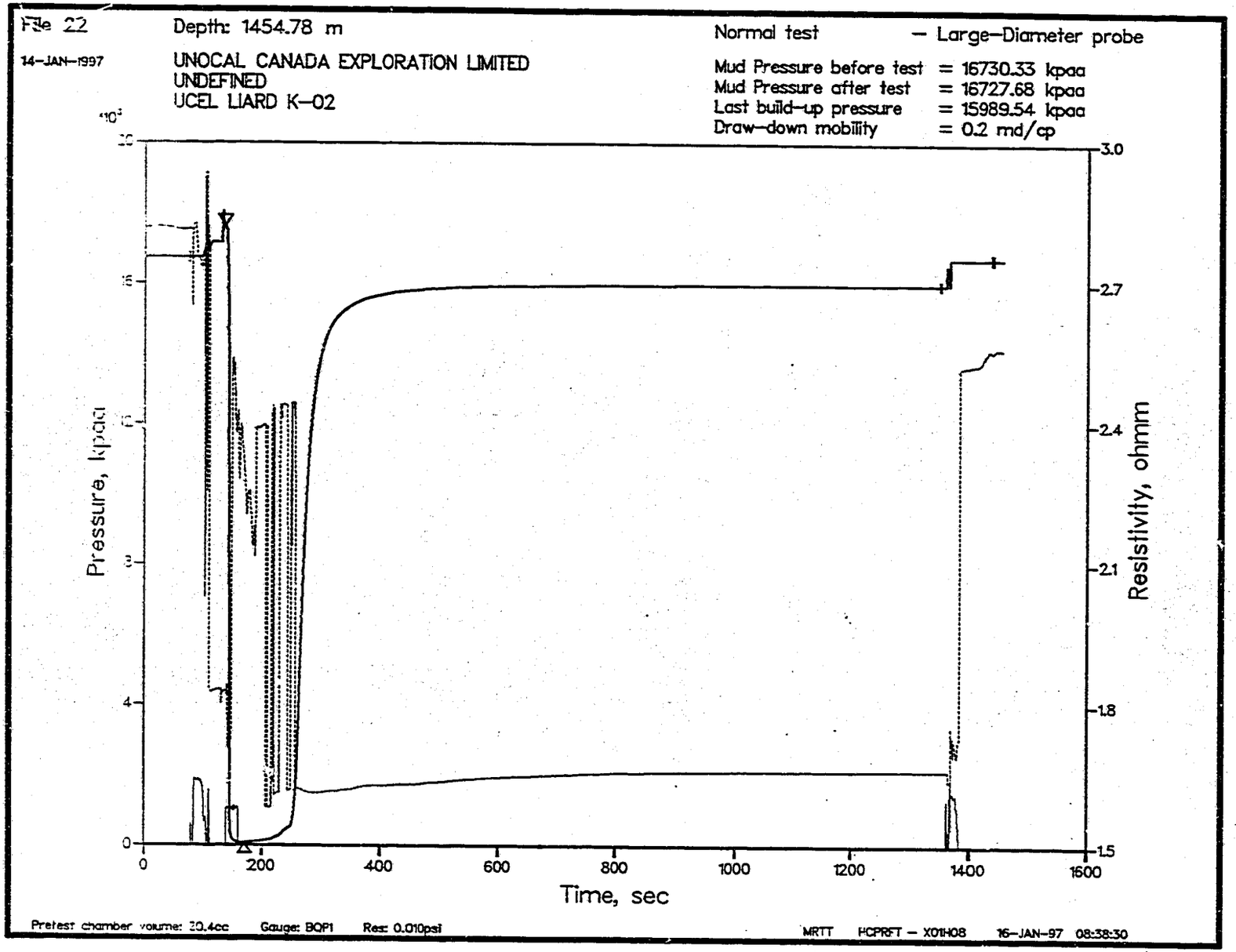

File 25
Depth: 1327.45 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 15268.88 kpaa
Mud Pressure after test = 15274.85 kpaa
Last build–up pressure = 14788.01 kpaa
Draw–down mobility = 1.2 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
300
600
900
1200
1500
1800
2100
1.25
1.5
1.75
2.0
2.25
2.5
2.75
Pretest chamber volume: 10.0cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 10:20:58

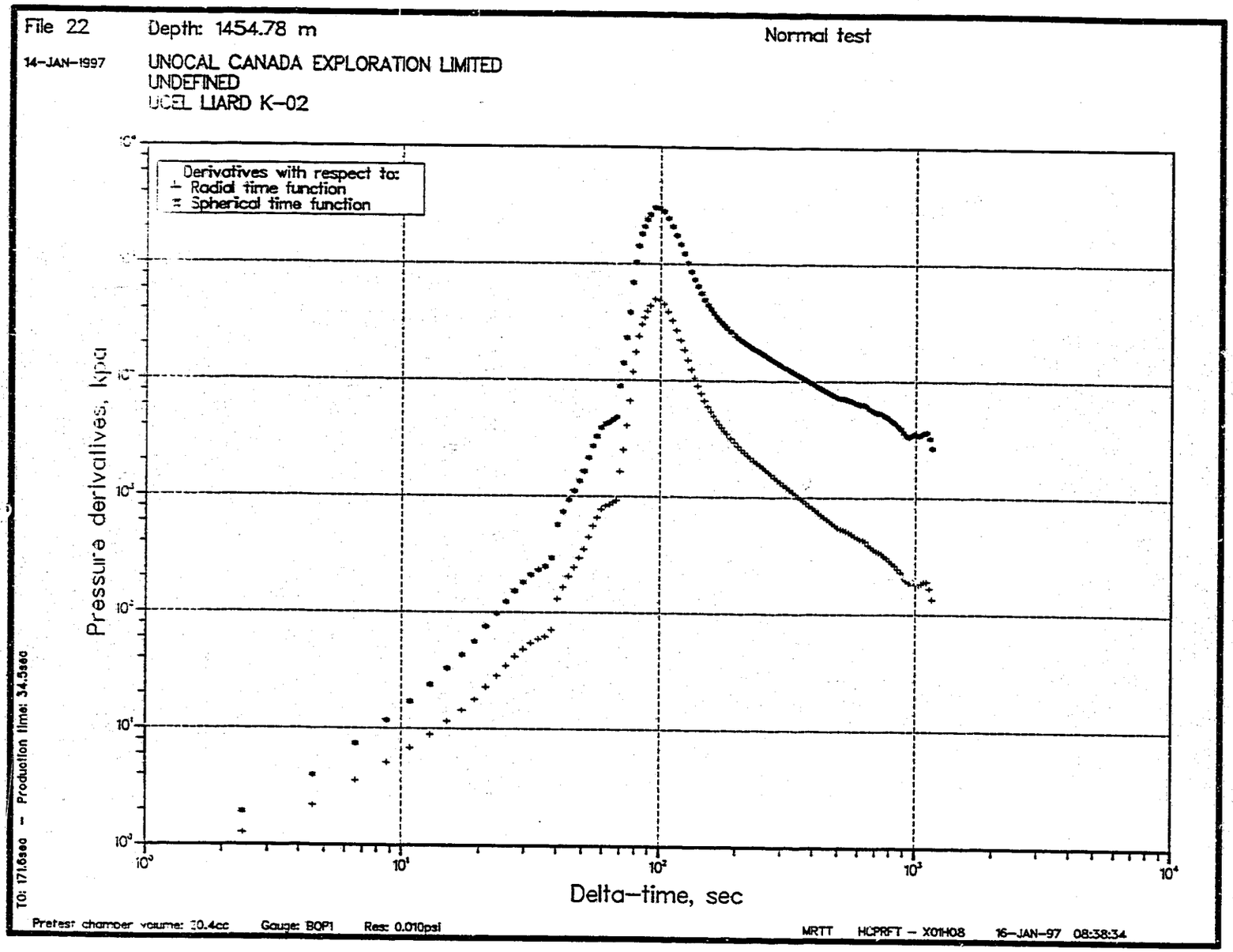

File 25
Depth: 1327.45 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
From picks on spherical derivative:
Slope on spherical = -0.036
Slope on radial = -0.494
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kpa
Delta-time, sec
T0: 1465.6sec - Production time: 18.9sec
Pretest chamber volume: 10.0cc
Gauge: BQP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 10:21:00

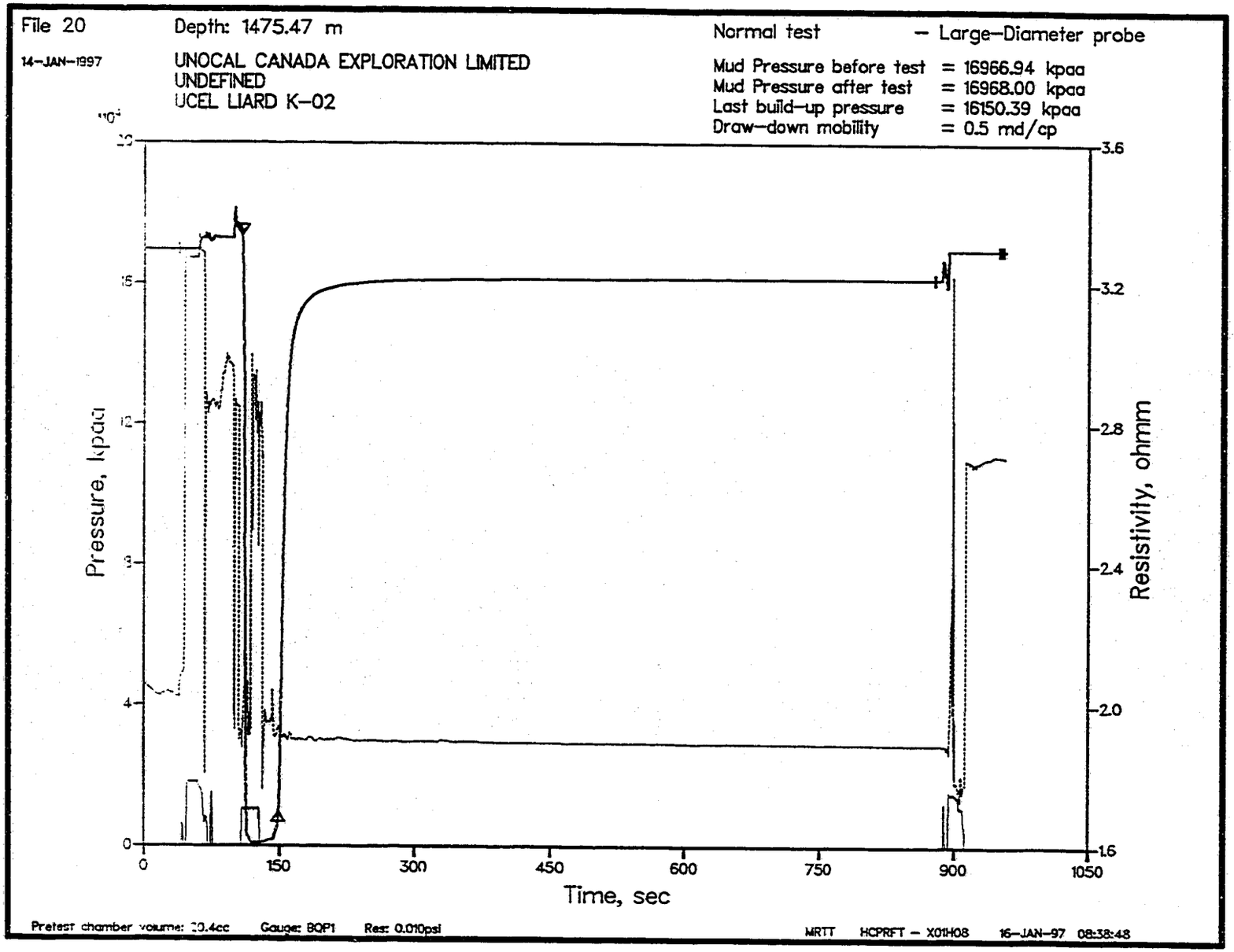

File 25
Depth: 1327.45 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
Extrapolated pressure = 14789.54 kpaa
Slope = -3754.35 kpa*sqrt(sec)
Delta-time (seconds)
46.5
57.0
78.0
126.3
447.6
Pressure, kpaa
1.4675
1.47
1.4725
1.475
dt = 52.8sec
dt = 120.0sec
0.03
0.024
0.018
0.012
0.006
0.0
Spherical time, 1/sqrt(sec)
TO: 1465.8sec - Production time: 18.9sec
Smoothed pressure - Picks from flow regime identification
Pretest chamber volume: 30.0cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 10:21:01


File 26
Depth: 1335.96 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 15378.13 kpaa
Mud Pressure after test = 15374.25 kpaa
Last build–up pressure = 14799.53 kpaa
Draw–down mobility = 0.4 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
150
300
450
600
750
900
1050
1.6
1.8
2.0
2.2
2.4
2.6
Pretest chamber volume: 20.3cc
Gauge: BOP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 08:38:24


File 26
Depth: 1335.96 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
From picks on spherical derivative:
Slope on spherical = -0.004
Slope on radial = -0.523
Derivatives with respect to:
Radial time function
Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 175.2sec - Production time: 33.6sec
Pretest chamber volume: 20.3cc
Gauge: SQP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 08:38:26

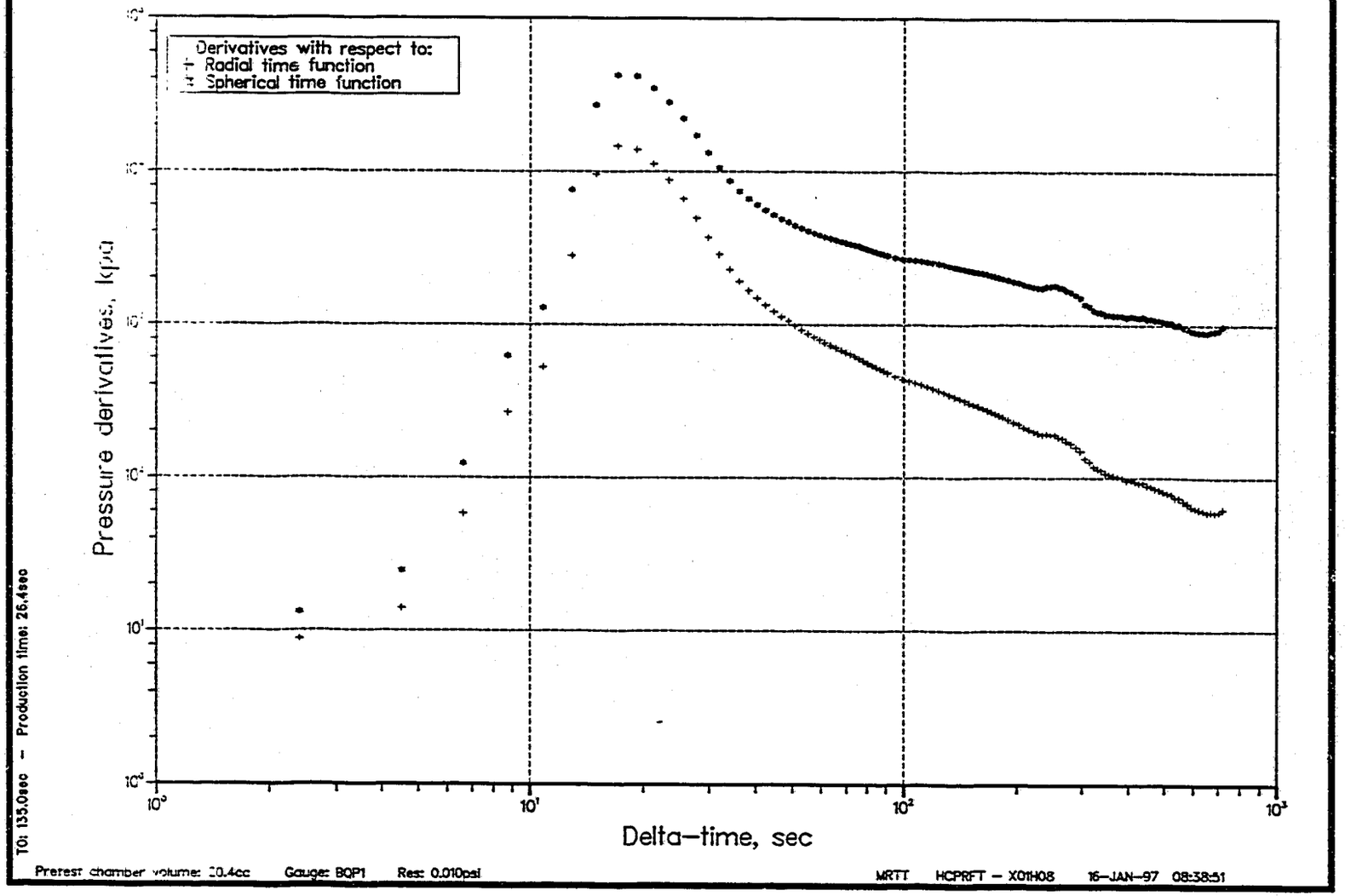

File 22
Depth: 1454.78 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test — Large-Diameter probe
Mud Pressure before test = 16730.33 kpaa
Mud Pressure after test = 16727.68 kpaa
Last build-up pressure = 15989.54 kpaa
Draw-down mobility = 0.2 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
200
400
600
800
1000
1200
1400
1600
1.5
1.8
2.1
2.4
2.7
3.0
Pretest chamber volume: 20.4cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT — X01H08
16-JAN-97 08:38:30


File 22
Depth: 1454.78 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 171.6sec - Production time: 34.5sec
Pretest chamber volume: 20.4cc
Gauge: BOP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 08:38:34


File 20
Depth: 1475.47 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test — Large-Diameter probe
Mud Pressure before test = 16966.94 kpaa
Mud Pressure after test = 16968.00 kpaa
Last build-up pressure = 16150.39 kpaa
Draw-down mobility = 0.5 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
150
300
450
600
750
900
1050
1.6
2.0
2.4
2.8
3.2
3.6
Pretest chamber volume: 20.4cc
Gauge: BQP1
Res: 0.010psi
MRTT HCPRFT — X01H08 16-JAN-97 08:38:48

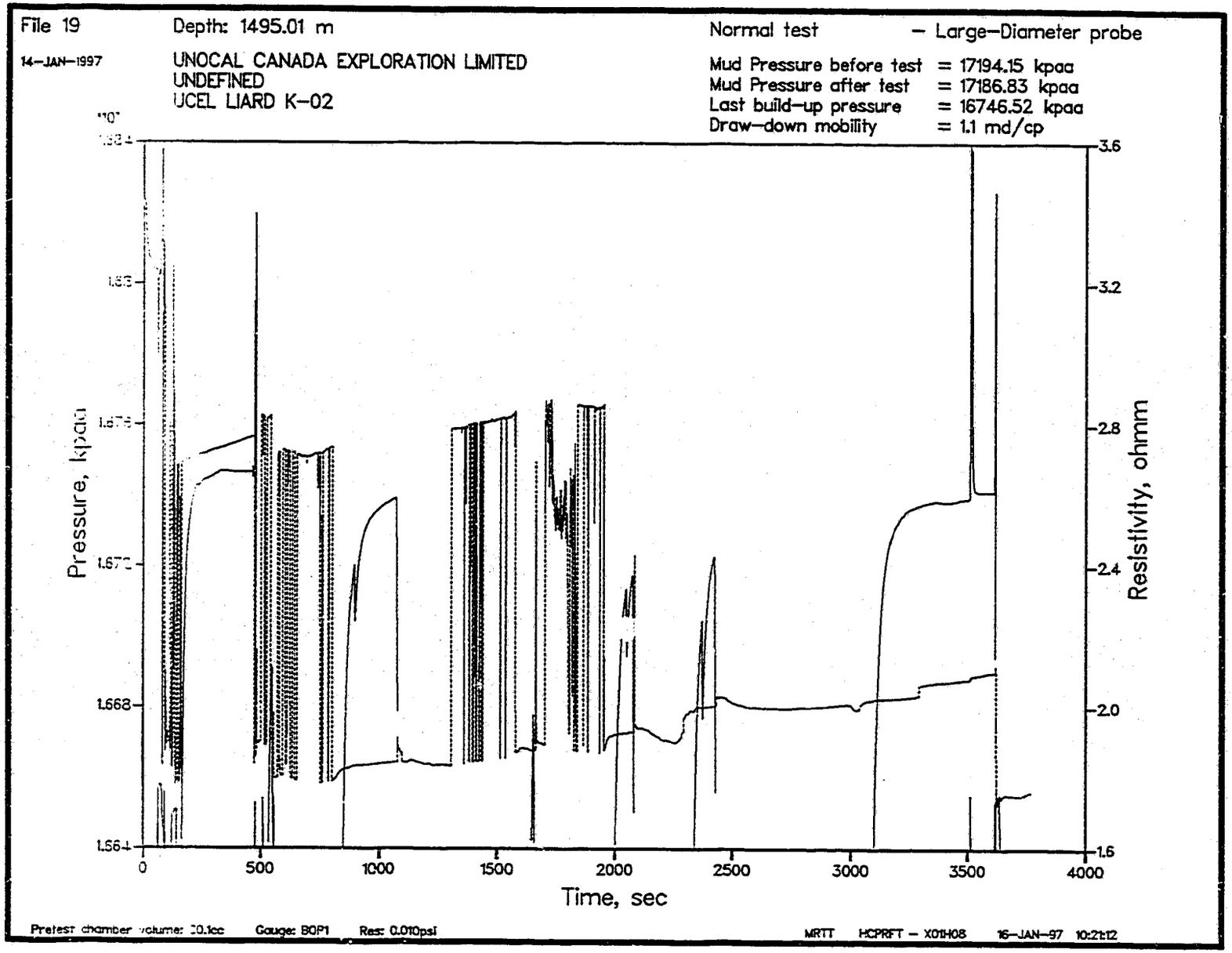
File 20 Depth: 1475.47 m Normal test

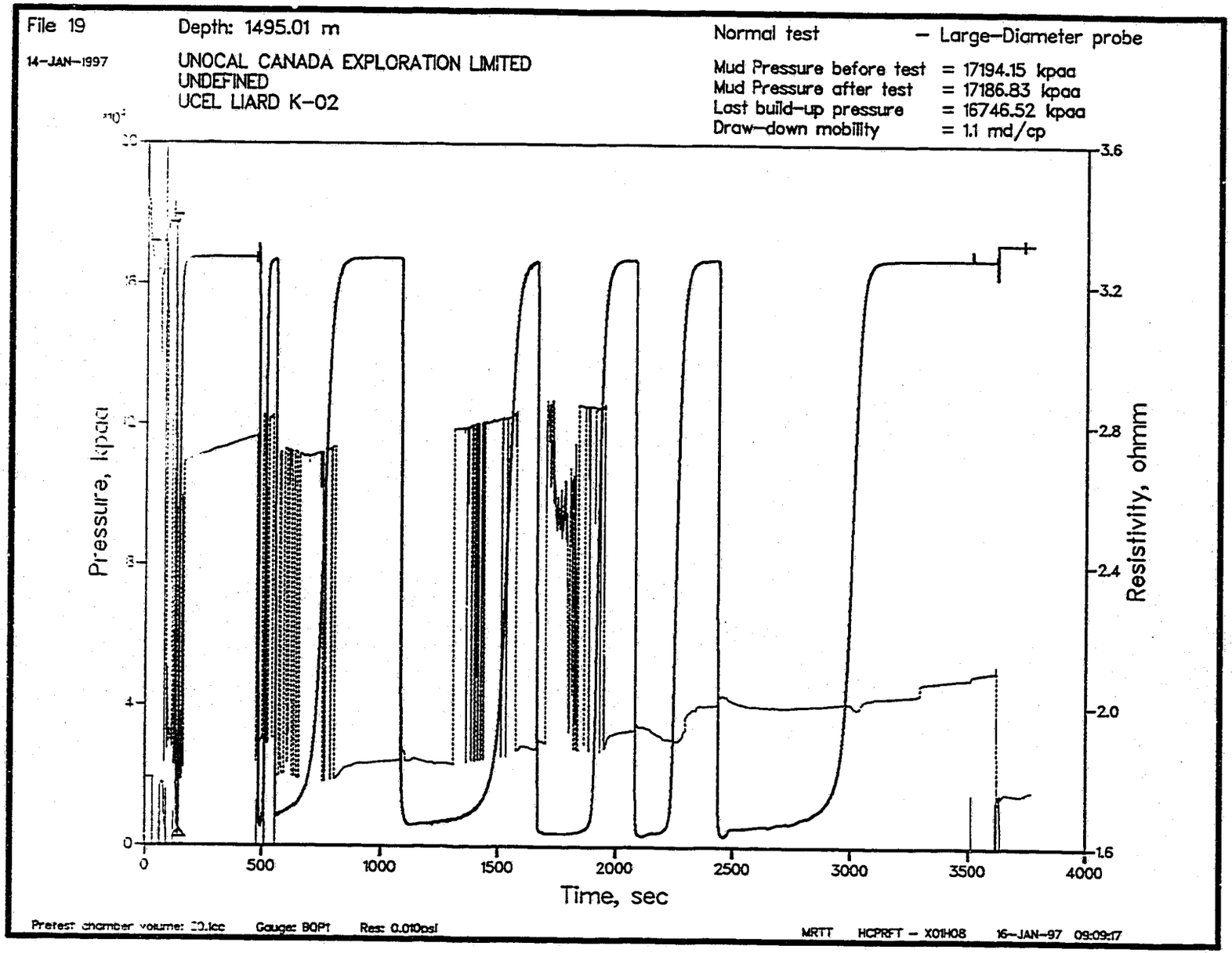
14-JAN-1997 UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02

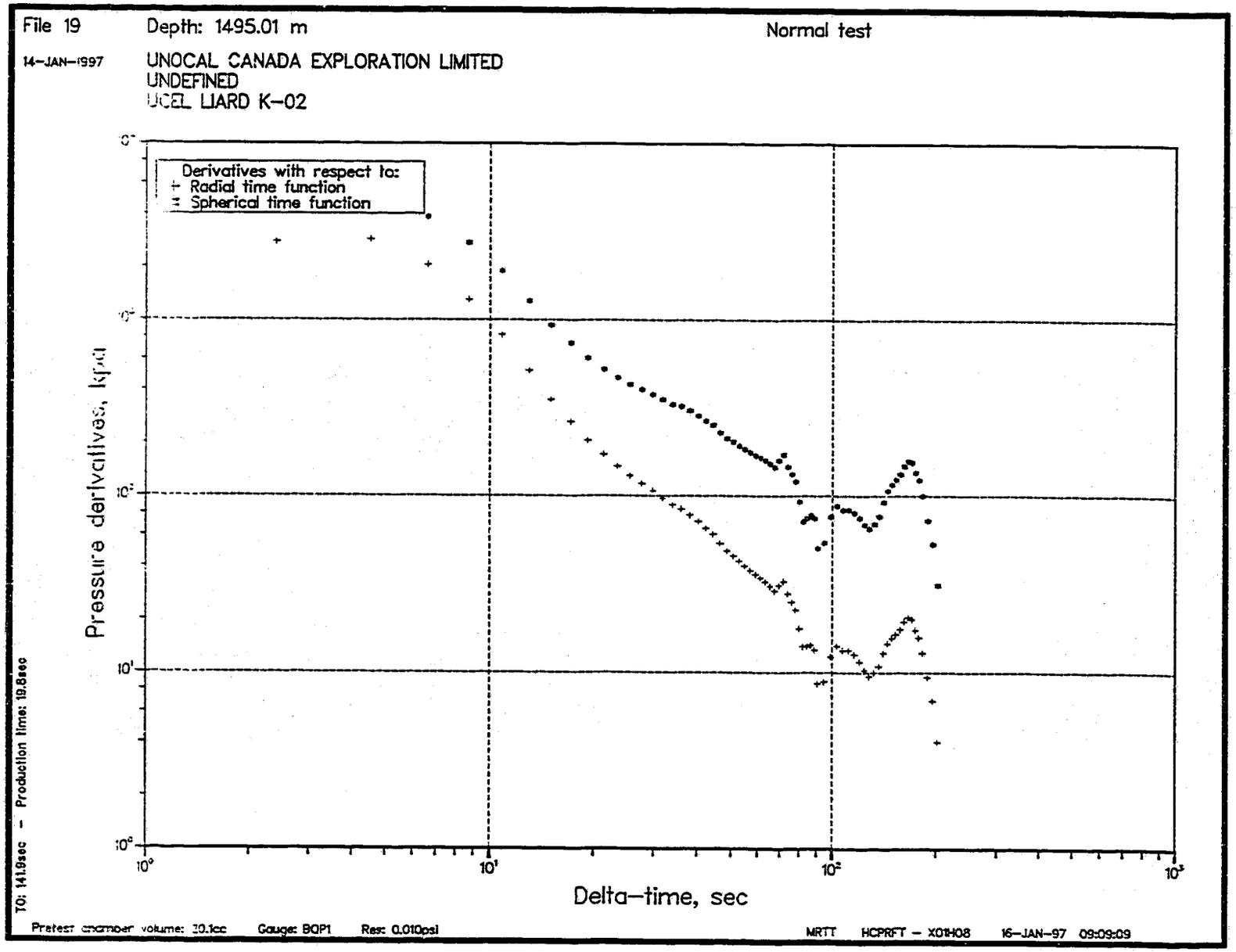


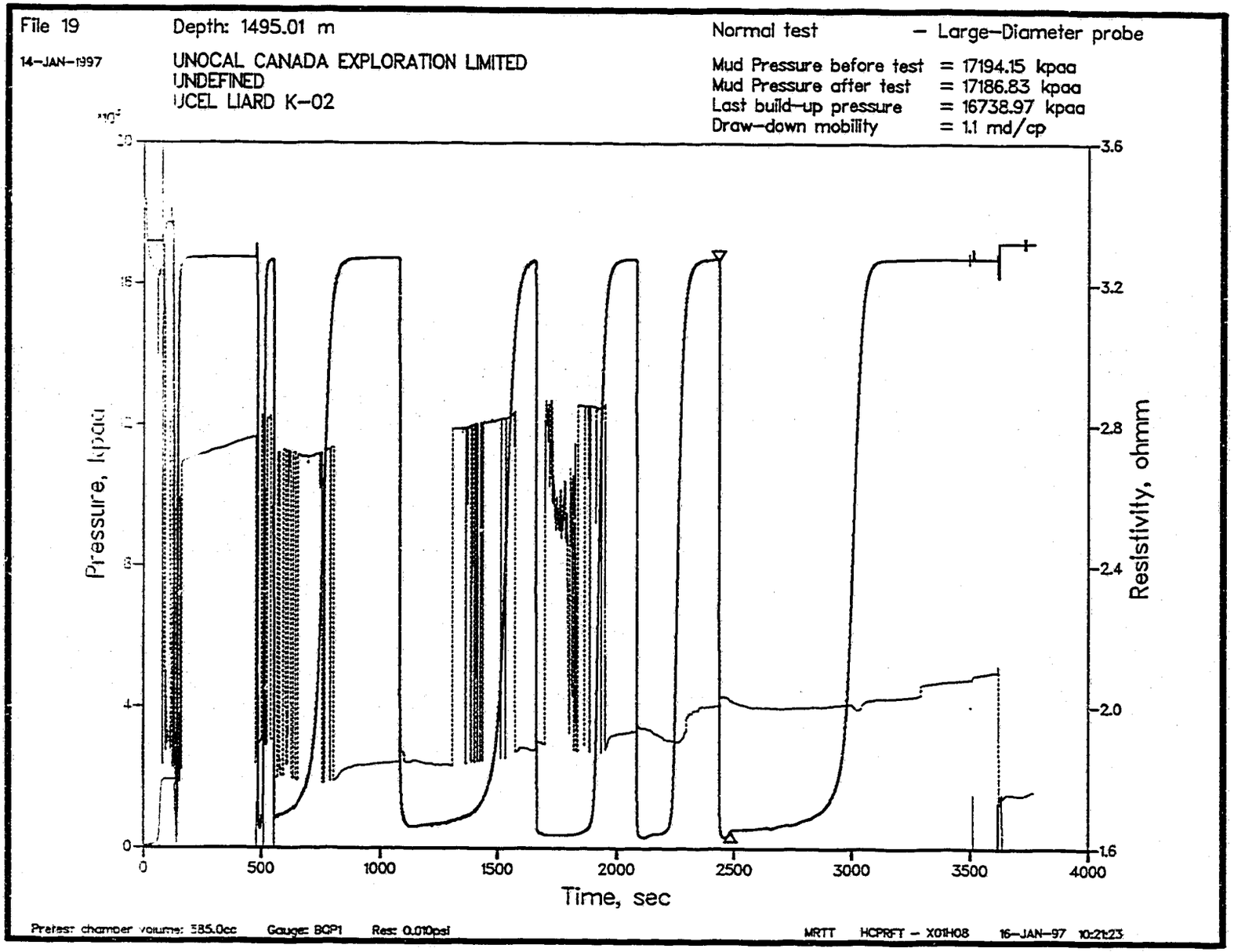
T0: 133.0sec - Production time: 26.4sec

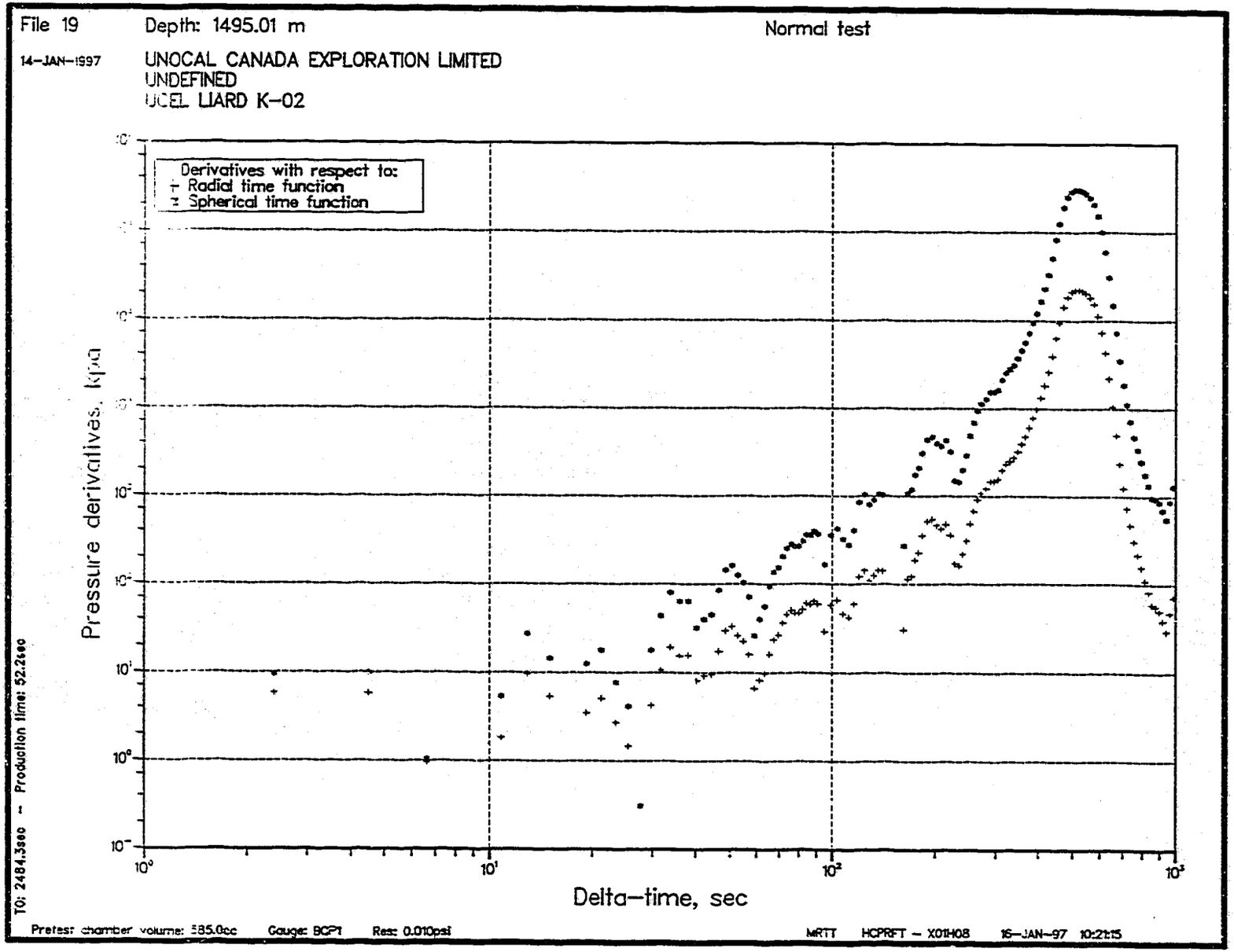
Pretest chamber volume: 20.4cc Gauge: BQP1 Res: 0.010psi MRTT HCPRFT - X011H08 16-JAN-97 08:38:51

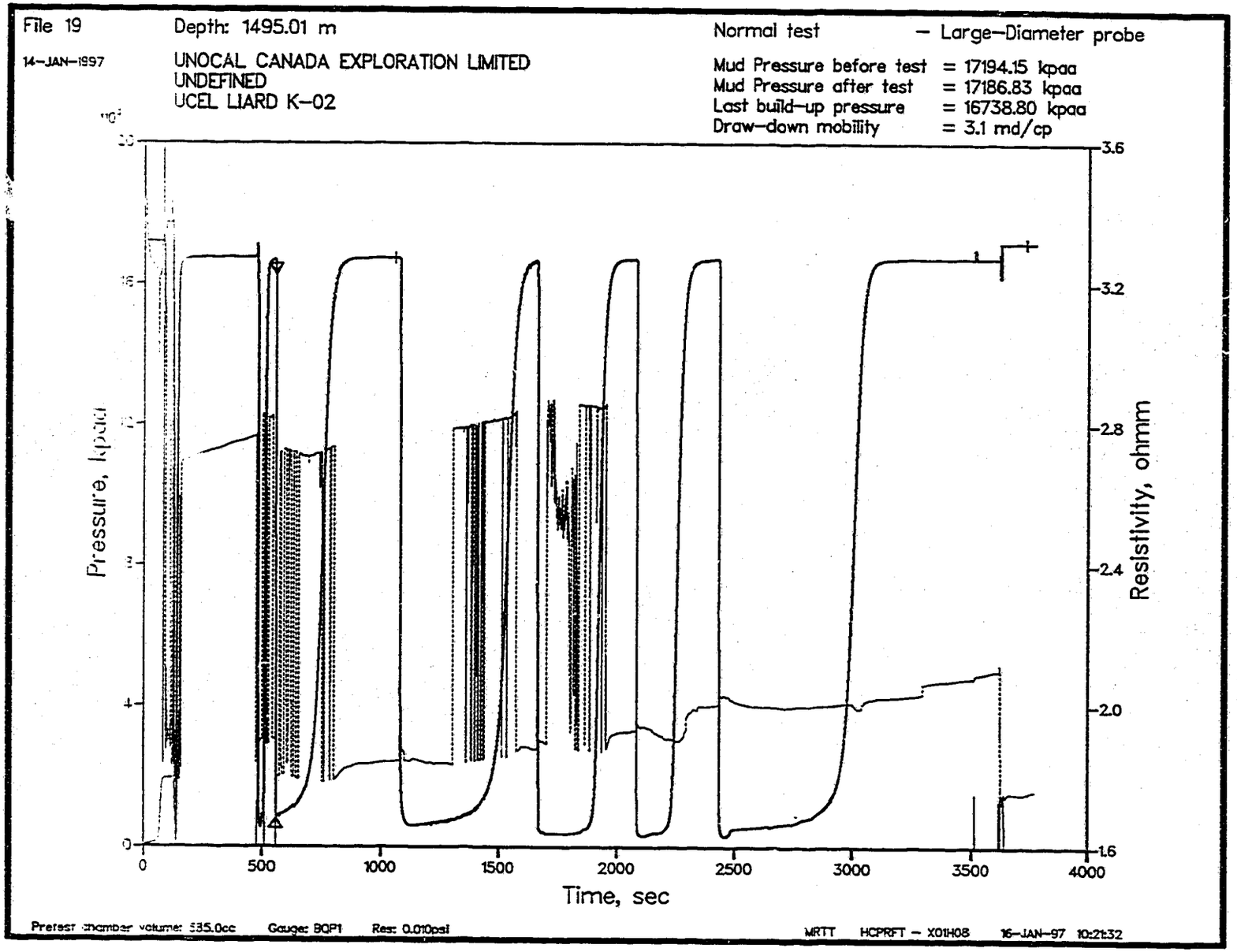

File 19
Depth: 1495.01 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 17194.15 kpaa
Mud Pressure after test = 17186.83 kpaa
Last build–up pressure = 16746.52 kpaa
Draw–down mobility = 1.1 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
500
1000
1500
2000
2500
3000
3500
4000
1.564
1.668
3.6
3.2
2.8
2.4
2.0
1.6
Pretest chamber volume: 20.1cc
Gauge: BOP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 10:21:12

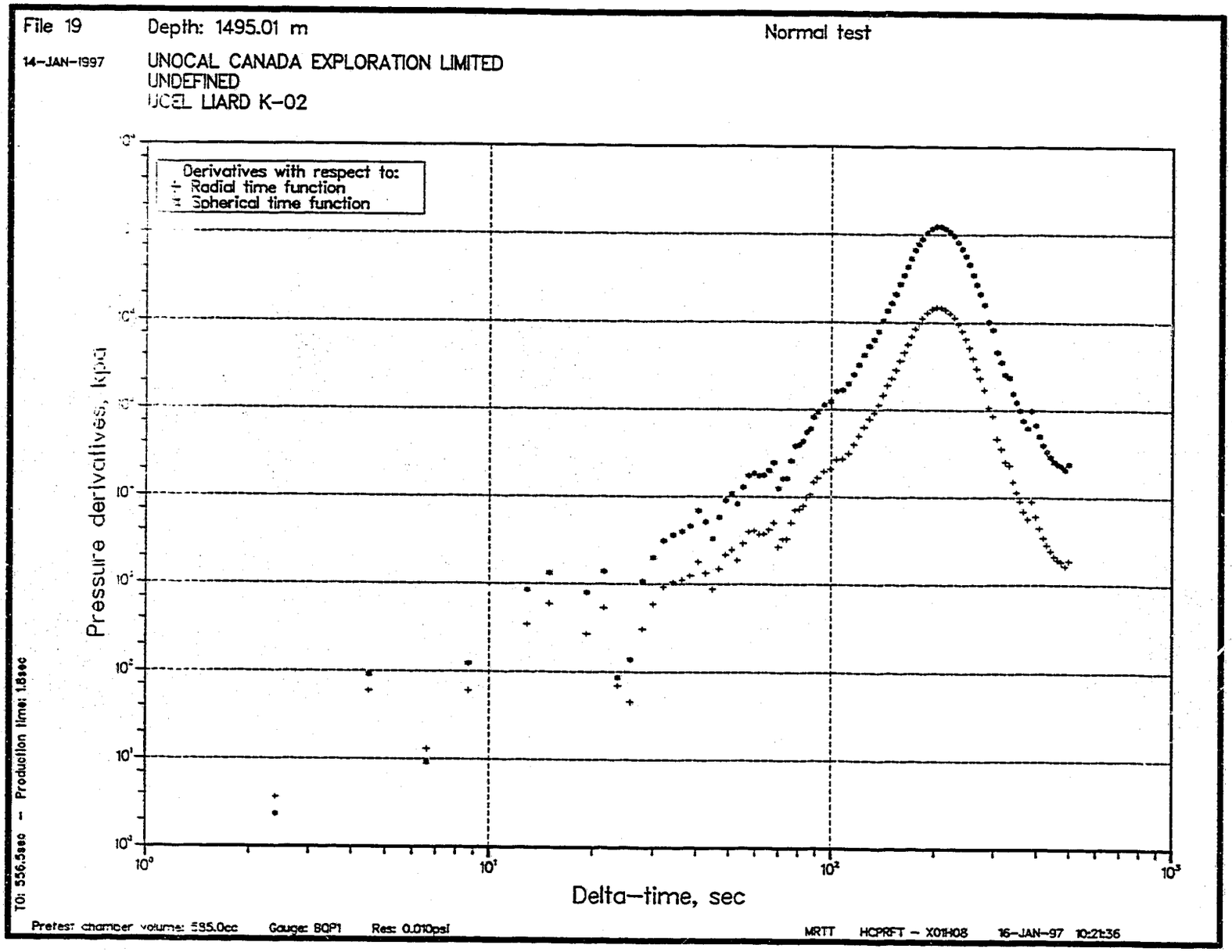

File 19
Depth: 1495.01 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
- Large-Diameter probe
Mud Pressure before test = 17194.15 kpaa
Mud Pressure after test = 17186.83 kpaa
Last build-up pressure = 16746.52 kpaa
Draw-down mobility = 1.1 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
500
1000
1500
2000
2500
3000
3500
4000
1.6
2.0
2.4
2.8
3.2
3.6
Pretest chamber volume: 20.1cc
Gauge: BOPT
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 09:09:17

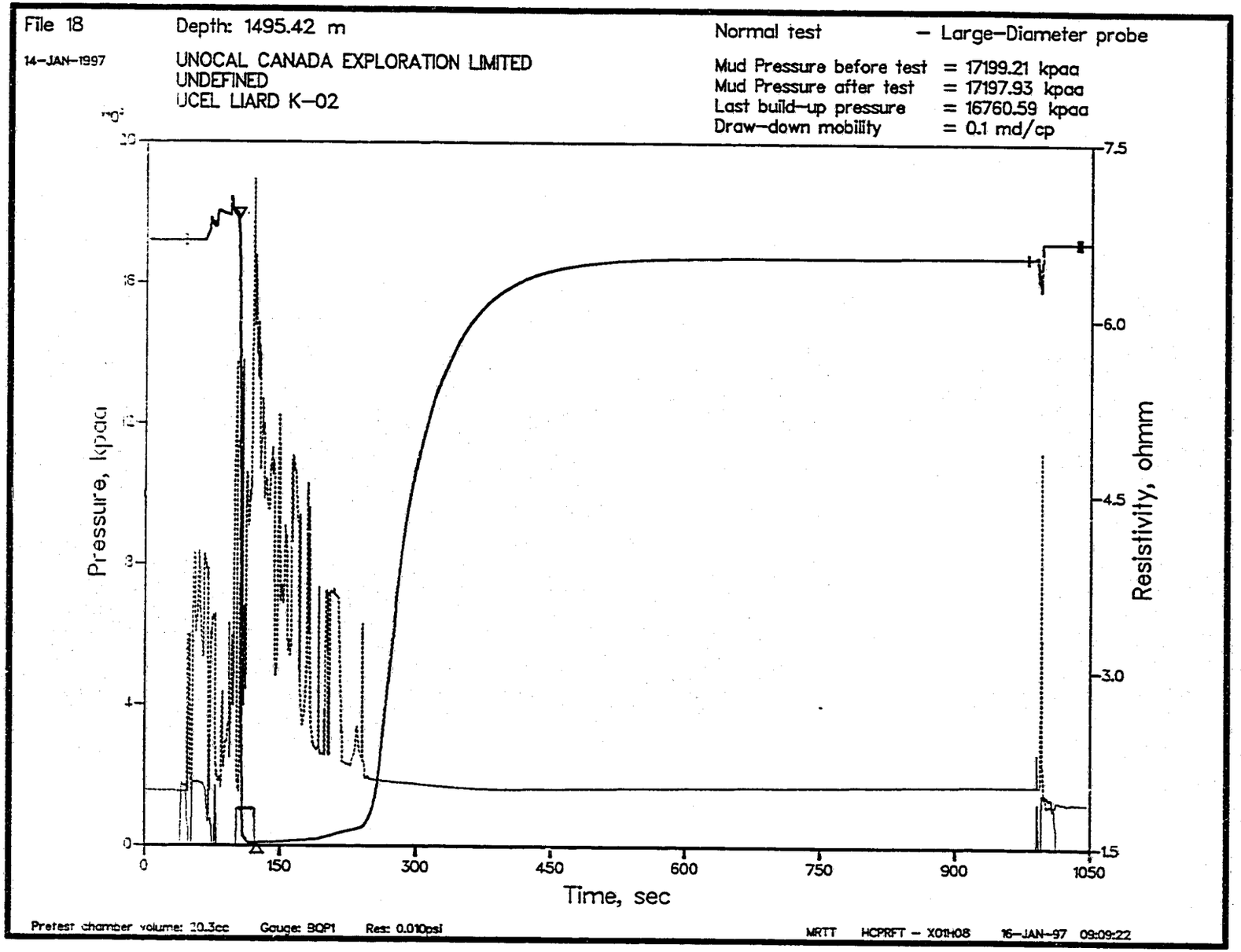

File 19
Depth: 1495.01 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 141.8sec - Production time: 19.8sec
Pretest chamber volume: 20.1cc
Gauge: BOP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 09:09:09

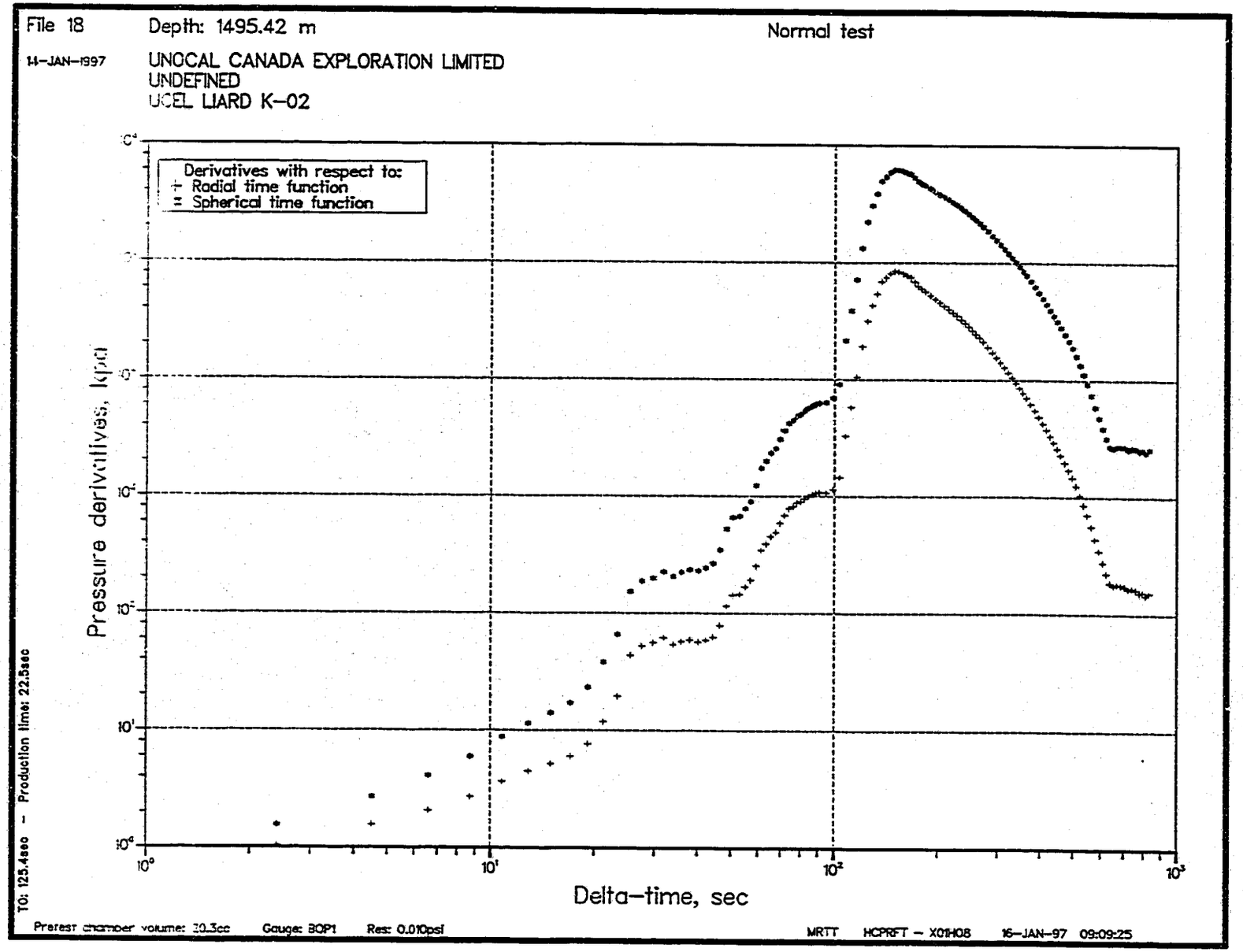

File 19
Depth: 1495.01 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 17194.15 kpaa
Mud Pressure after test = 17186.83 kpaa
Last build–up pressure = 16738.97 kpaa
Draw–down mobility = 1.1 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
500
1000
1500
2000
2500
3000
3500
4000
1.6
2.0
2.4
2.8
3.2
3.6
Pretest chamber volume: 585.0cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 10:21:23

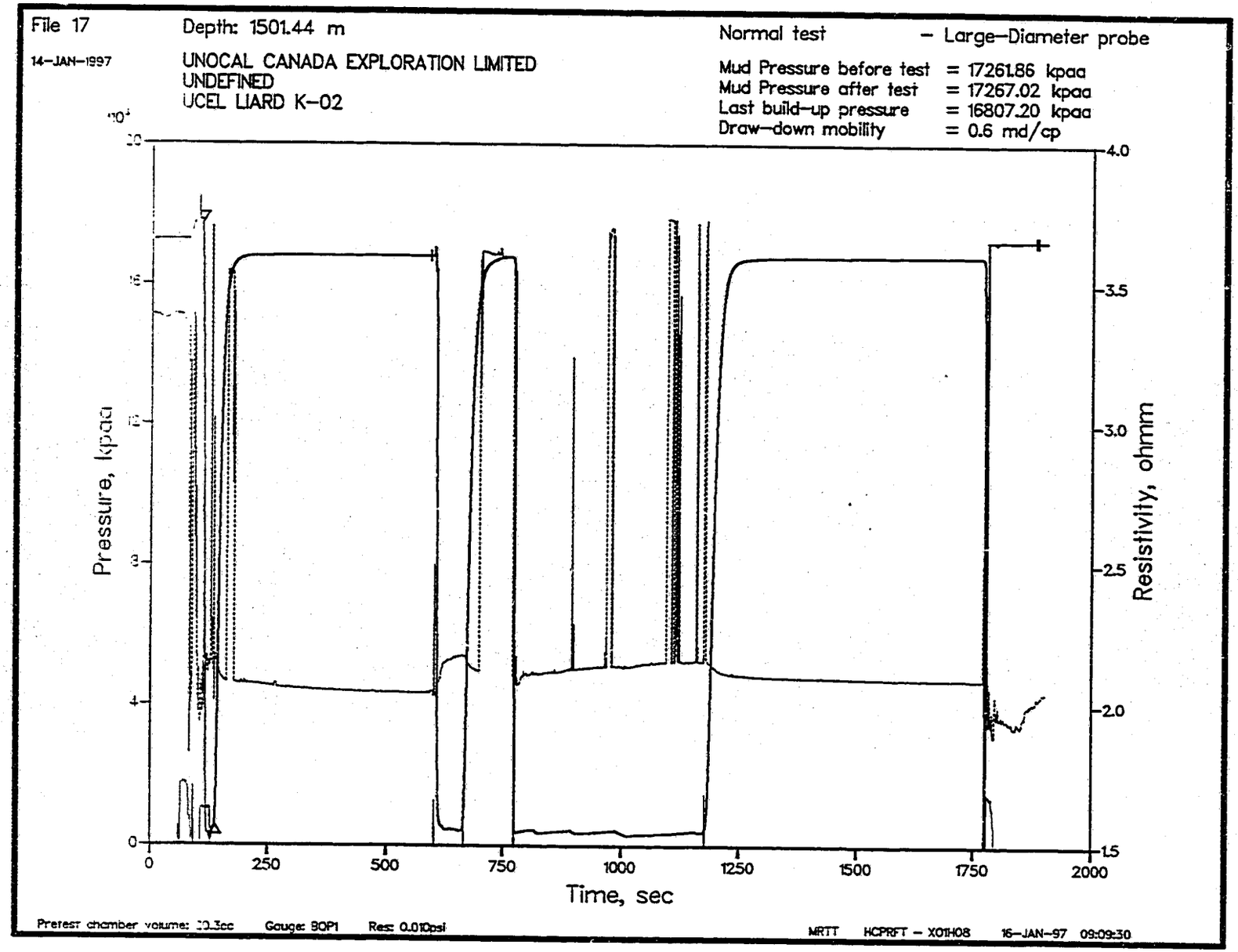

File 19
Depth: 1495.01 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kPa
Delta-time, sec
T0: 2484.3sec -- Production time: 52.2sec
Pretest: chamber volume: 585.0cc
Gauge: BCP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 10:21:15


File 19
Depth: 1495.01 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 17194.15 kpaa
Mud Pressure after test = 17186.83 kpaa
Last build–up pressure = 16738.80 kpaa
Draw–down mobility = 3.1 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
500
1000
1500
2000
2500
3000
3500
4000
1.6
2.0
2.4
2.8
3.2
3.6
Pretest chamber volume: 535.0cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 10:21:32


File 19
Depth: 1495.01 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kPa
Delta-time, sec
T0: 536.5sec - Production time: 1.8sec
Pretest chamber volume: 535.0cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 10:21:36


File 18
Depth: 1495.42 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test - Large-Diameter probe
Mud Pressure before test = 17199.21 kpaa
Mud Pressure after test = 17197.93 kpaa
Last build-up pressure = 16760.59 kpaa
Draw-down mobility = 0.1 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
150
300
450
600
750
900
1050
7.5
6.0
4.5
3.0
1.5
Pretest chamber volume: 20.3cc
Gauge: BOP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 09:09:22


File 18
Depth: 1495.42 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kPa
Delta-time, sec
TO: 125.4sec - Production time: 22.5sec
Preresr chamber volume: 20.3cc
Gauge: BOP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 09:09:25

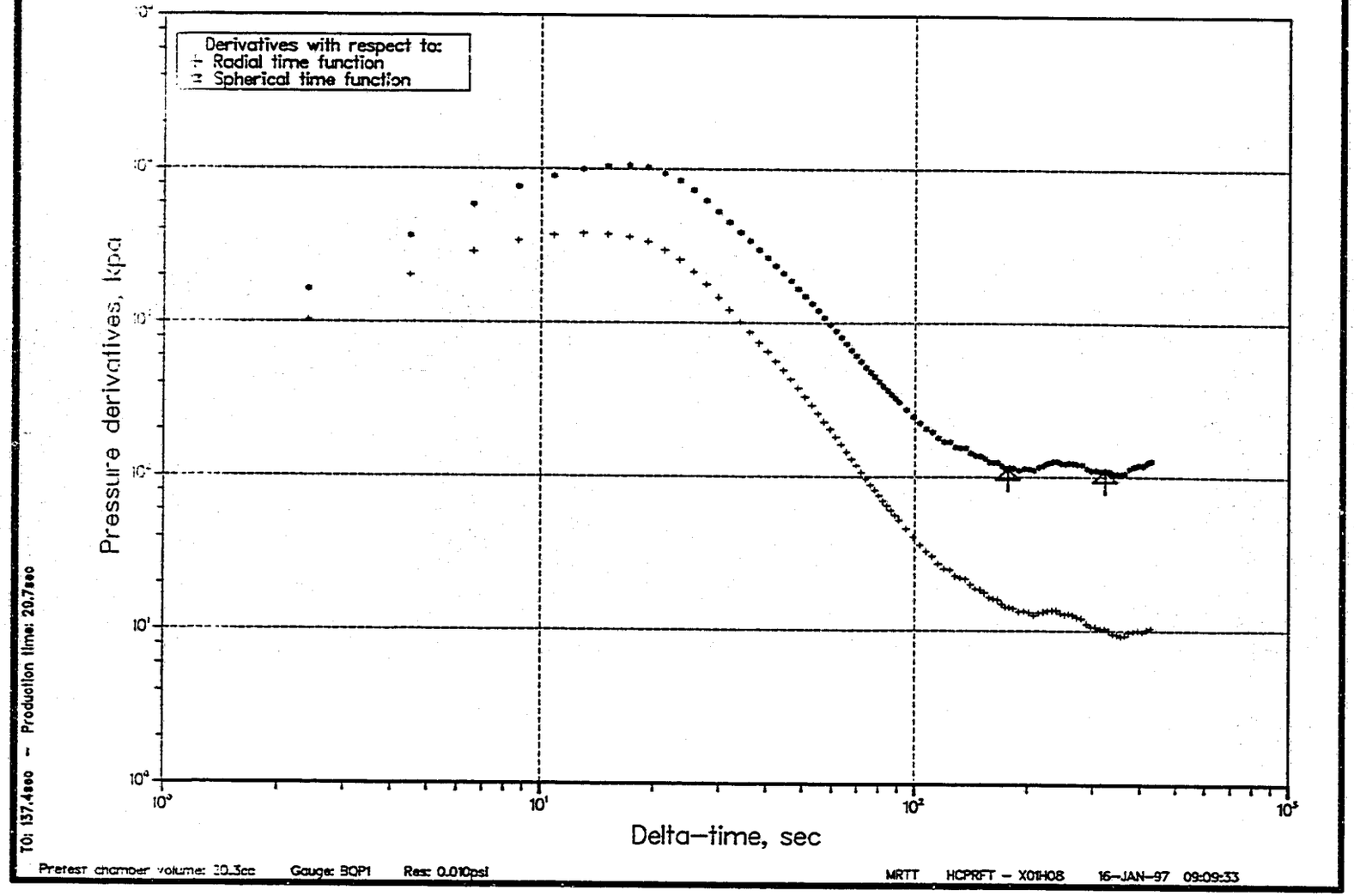

File 17
Depth: 1501.44 m
Normal test
– Large–Diameter probe
14–JAN–1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K–02
Mud Pressure before test = 17261.86 kpaa
Mud Pressure after test = 17267.02 kpaa
Last build–up pressure = 16807.20 kpaa
Draw–down mobility = 0.6 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
250
500
750
1000
1250
1500
1750
2000
1.5
2.0
2.5
3.0
3.5
4.0
Pretest chamber volume: 10.3cc
Gauge: 80P1
Res: 0.010psi
MRTT
HCPRFT – X01H08
16–JAN–97 09:09:30

File 17 Depth: 1501.44 m

14-JAN-1997 UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02

Normal test

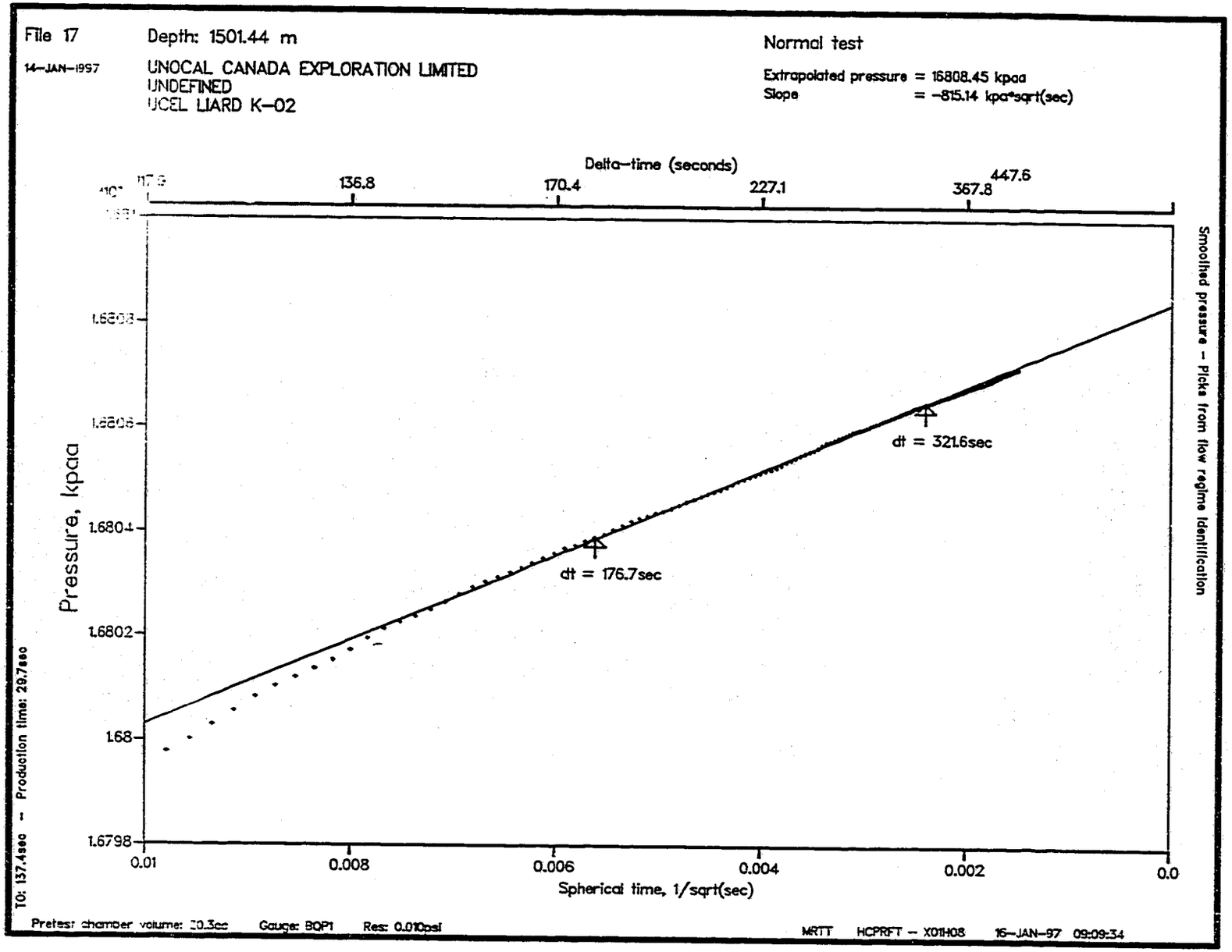
From picks on spherical derivative:
Slope on spherical = -0.035
Slope on radial = -0.503

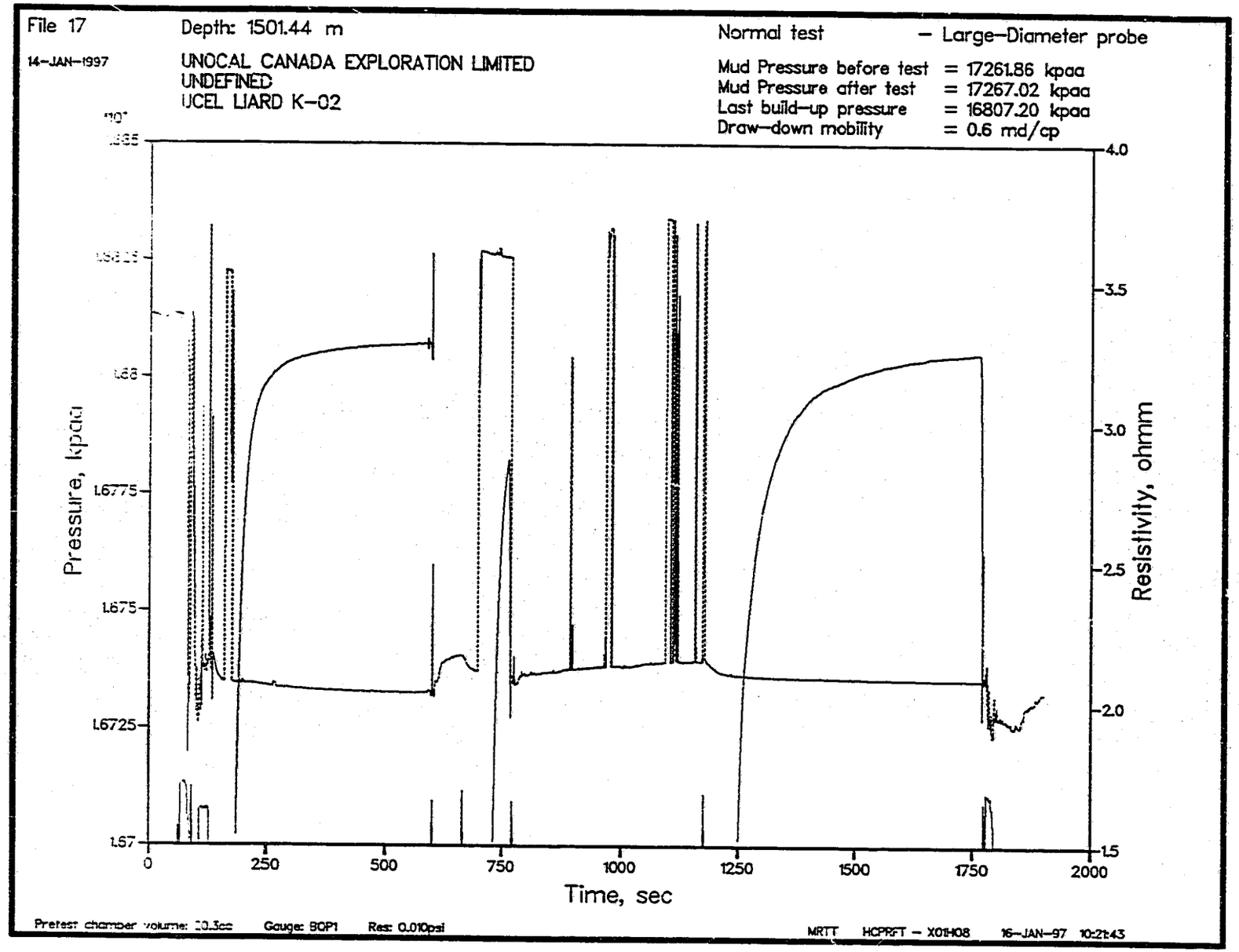


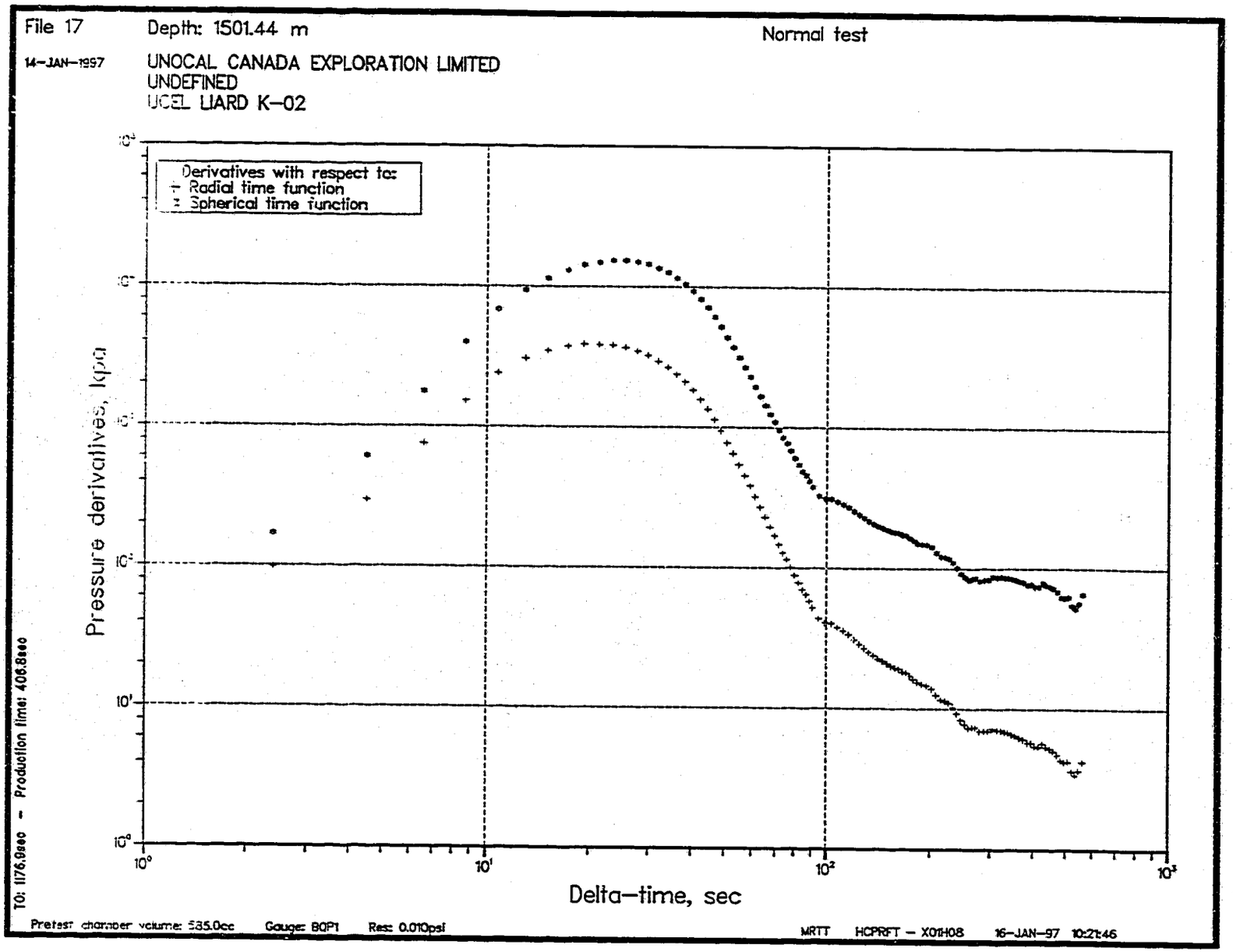
T0: 137.4sec - Production time: 20.7sec

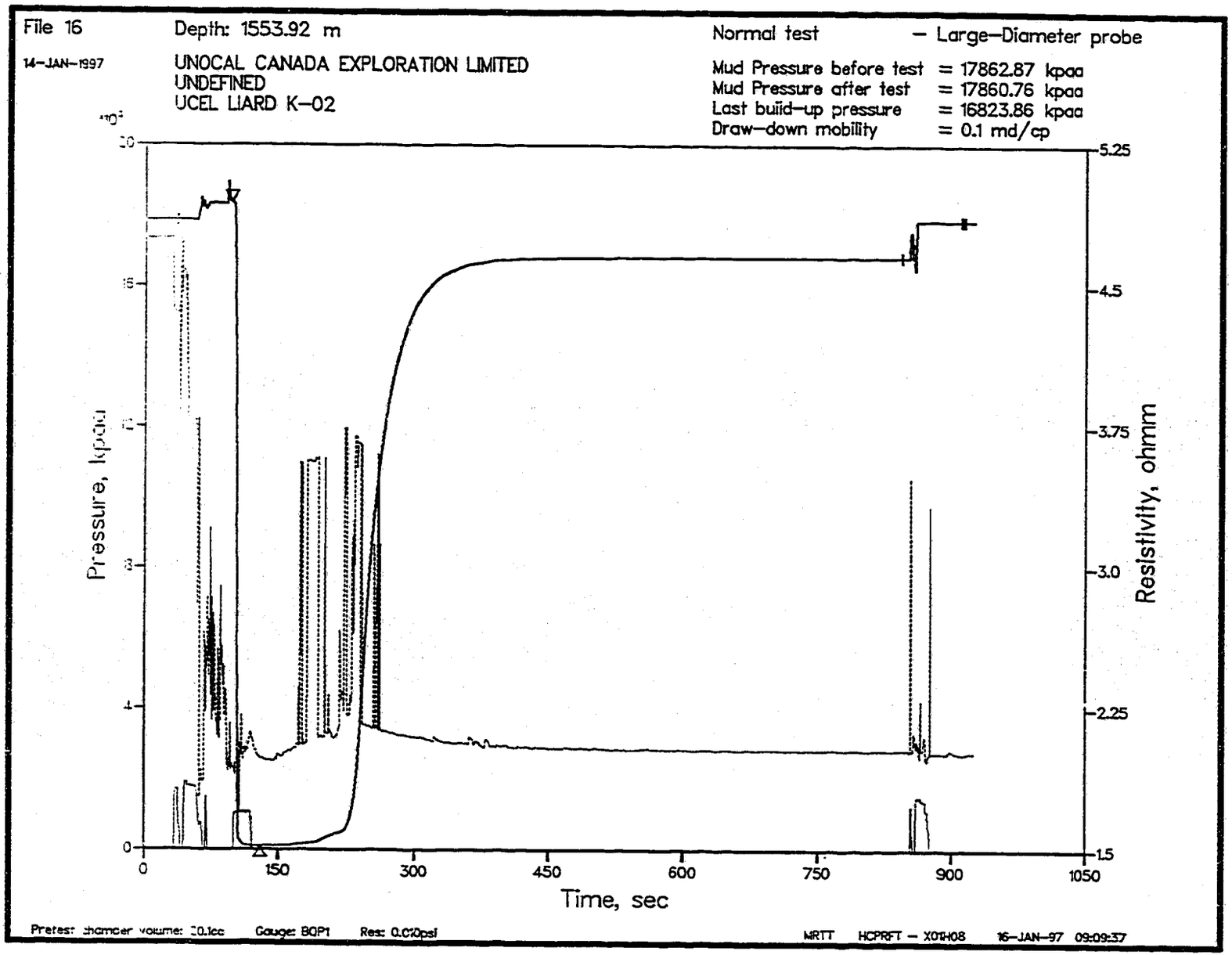
Pretest chamber volume: 20.3cc Gauge: BOP1 Res: 0.010psi

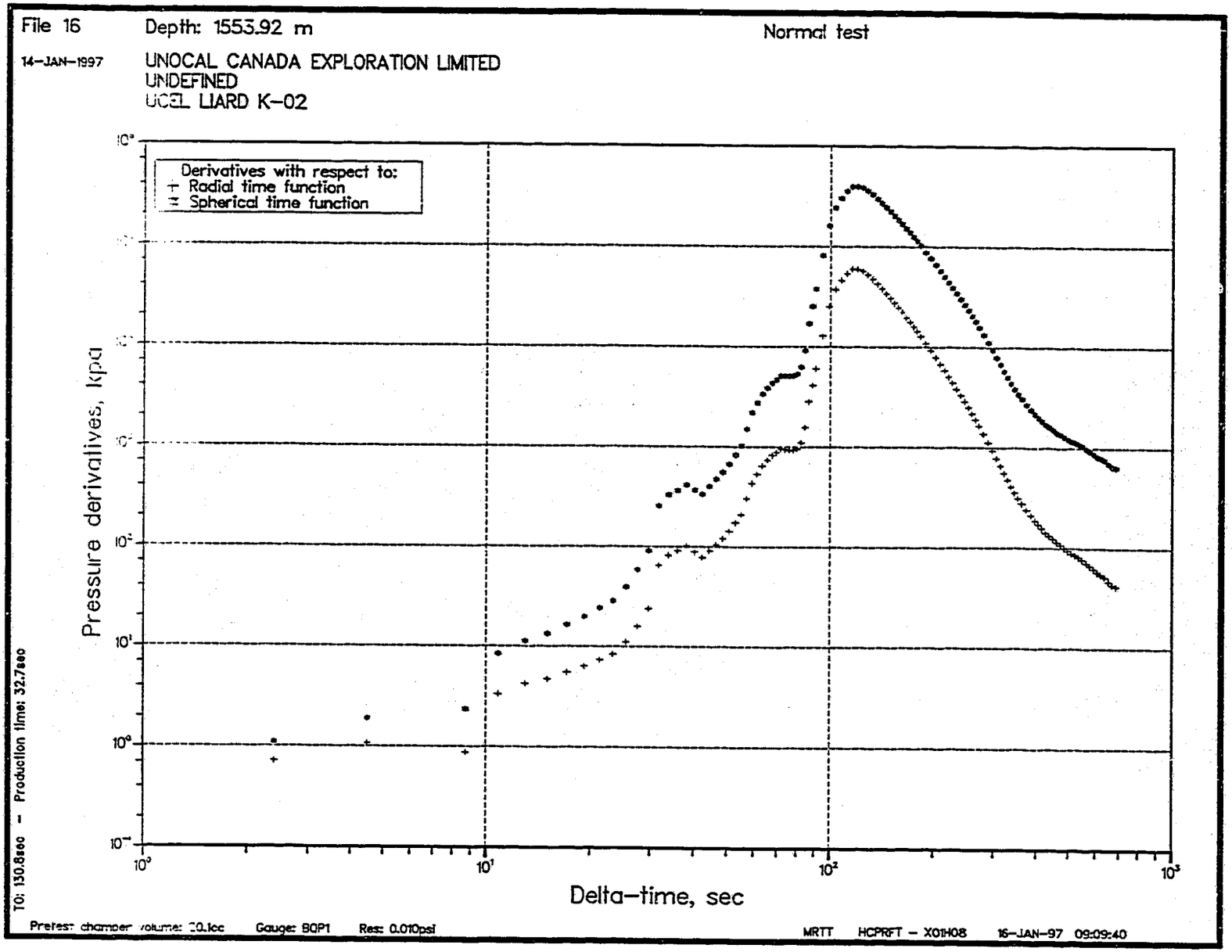
MRTT HCPRFT - X01H08 16-JAN-97 09:09:33

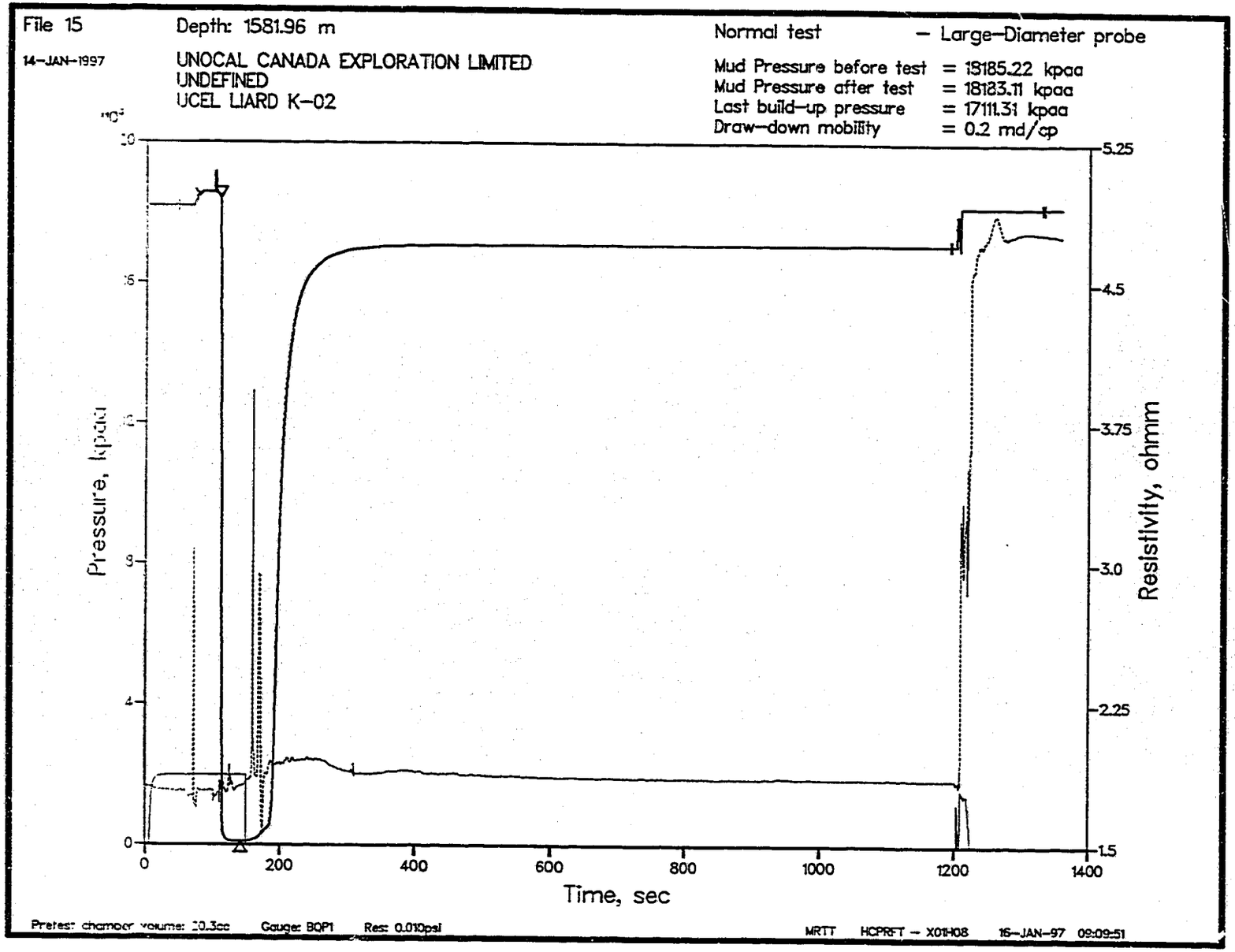

File 17
Depth: 1501.44 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
Extrapolated pressure = 16808.45 kpaa
Slope = -815.14 kpa*sqrt(sec)
Delta-time (seconds)
136.8
170.4
227.1
367.8
447.6
dt = 321.6sec
dt = 176.7sec
Pressure, kpaa
1.6798
1.68
1.6802
1.6804
0.01
0.008
0.006
0.004
0.002
0.0
Spherical time, 1/sqrt(sec)
Smoothed pressure - Picks from flow regime identification
TO: 137.4sec - Production time: 29.7sec
Pretest chamber volume: 20.3cc
Gauge: BQP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 09:09:34

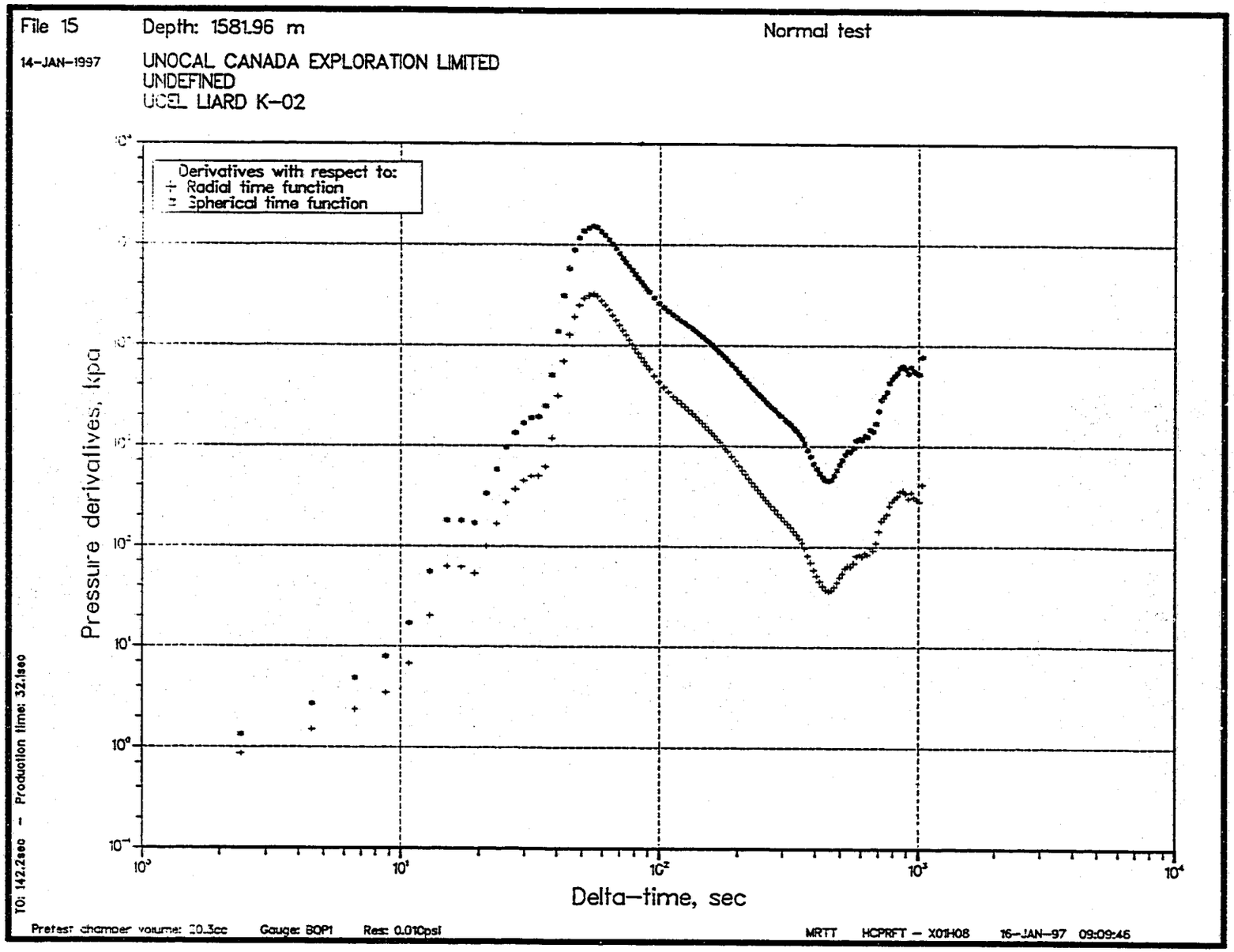

File 17
Depth: 1501.44 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
- Large-Diameter probe
Mud Pressure before test = 17261.86 kpaa
Mud Pressure after test = 17267.02 kpaa
Last build-up pressure = 16807.20 kpaa
Draw-down mobility = 0.6 md/cp
Pressure, kpaa
1.6775
1.675
1.6725
1.67
Resistivity, ohmm
4.0
3.5
3.0
2.5
2.0
1.5
0
250
500
750
1000
1250
1500
1750
2000
Time, sec
Pretest chamber volume: 10.3cc
Gauge: BOP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 10:21:43

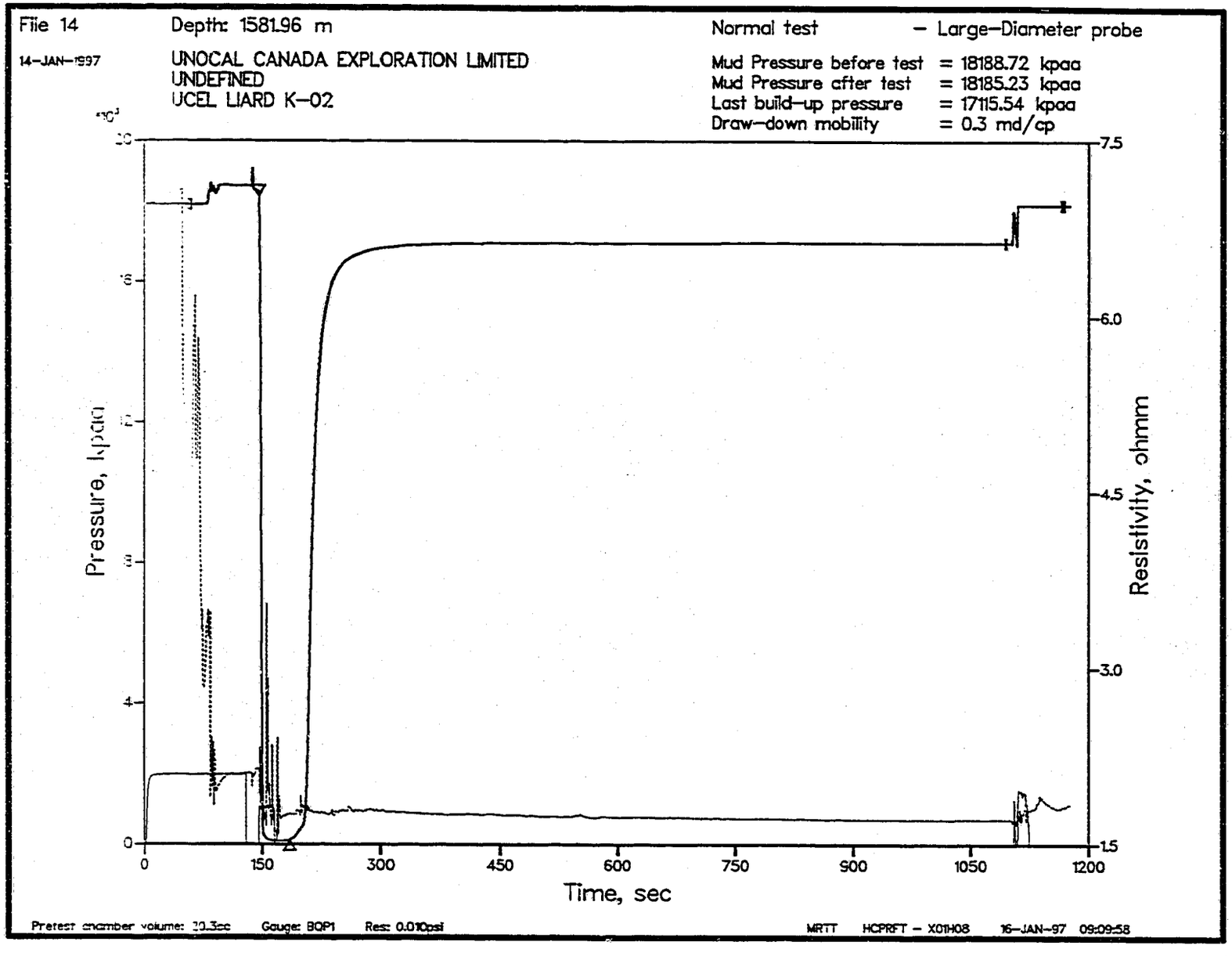

File 17
Depth: 1501.44 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 1176.0sec - Production time: 406.8sec
Pretest chamber volume: 585.0cc
Gauge: BOP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 10:21:46

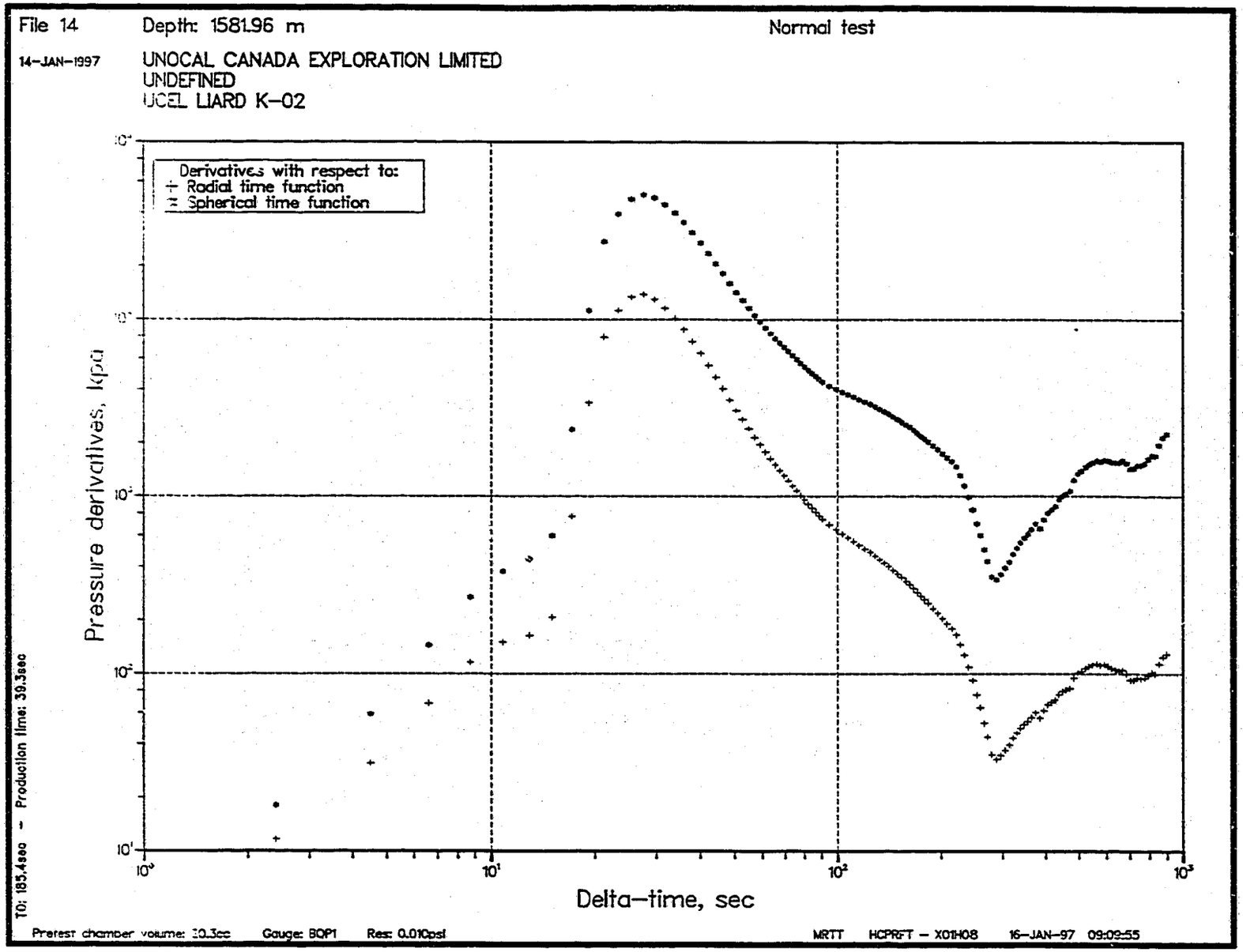

File 16
Depth: 1553.92 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
- Large-Diameter probe
Mud Pressure before test = 17862.87 kpaa
Mud Pressure after test = 17860.76 kpaa
Last build-up pressure = 16823.86 kpaa
Draw-down mobility = 0.1 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
150
300
450
600
750
900
1050
5.25
4.5
3.75
3.0
2.25
1.5
Pretest chamber volume: 10.1cc
Gauge: BQP1
Res: 0.020psi
MRTT
HCPRFT - X01H08
16-JAN-97 09:09:37


File 16
Depth: 1553.92 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 130.8sec - Production time: 32.7sec
Pretest chamber volume: 20.1cc
Gauge: 80P1
Res: 0.010psi
MRTT HCPRFT - X01H08
16-JAN-97 09:09:40


File 15
Depth: 1581.96 m
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Normal test
- Large-Diameter probe
Mud Pressure before test = 18185.22 kpaa
Mud Pressure after test = 18183.11 kpaa
Last build-up pressure = 17111.31 kpaa
Draw-down mobility = 0.2 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
200
400
600
800
1000
1200
1400
1.5
2.25
3.0
3.75
4.5
5.25
Pretest chamber volume: 10.3cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 09:09:51


File 15
Depth: 1581.96 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 142.2sec - Production time: 32.1sec
Pretest chamber volume: 20.3cc
Gauge: BOP1
Res: 0.010psi
MRTT HCPRFT - X01H08
16-JAN-97 09:09:46


File 14
Depth: 1581.96 m
Normal test - Large-Diameter probe
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Mud Pressure before test = 18188.72 kpaa
Mud Pressure after test = 18185.23 kpaa
Last build-up pressure = 17115.54 kpaa
Draw-down mobility = 0.3 md/cp
Pressure, kpaa
Resistivity, ohmm
Time, sec
0
150
300
450
600
750
900
1050
1200
7.5
6.0
4.5
3.0
1.5
Pretest chamber volume: 20.3cc
Gauge: BQP1
Res: 0.010psi
MRTT
HCPRFT - X01H08
16-JAN-97 09:09:58


File 14
Depth: 1581.96 m
Normal test
14-JAN-1997
UNOCAL CANADA EXPLORATION LIMITED
UNDEFINED
UCEL LIARD K-02
Derivatives with respect to:
+ Radial time function
= Spherical time function
Pressure derivatives, kpa
Delta-time, sec
TO: 185.4sec - Production time: 39.3sec
Pretest chamber volume: 10.3cc
Gauge: BOP1
Res: 0.010psi
MRTT HCPRFT - X01H08 16-JAN-97 09:09:55

TOUR

SHEETS

COY Lodge #25 000586

FOLD HERE →

LICENCE NO.: 7511 WELL NAME AND NO.: UCEL LIARD K02

OPERATOR: UNOCAL EXPLORATION LTD. CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30 UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE: SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS — OPR. / R.M. — Initial

(1) Daily Walk Around Inspection
(2) Detailed Inspection-Weekly (using checklist)
(3) H²S Signs Posted (if required)
(4) Well License & Stick Diagram Posted
(5) Flare Lines Staked
(6) BOP Drills Performed
(7) Visually inspect BOP's - Flarelines & Degasser Lines

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

YEAR 97 — RIG NO. — FL — RIG 10 — TEMPER — CURREN CONDITI — WIND DI — ROAD — WEATHER

TIME-HRS

CODE NO.	1 OPER.	2 RIG UP & TEAR DOWN	3 DRILL ACTUAL	4 REAMING	5 CORING	6 COND. MUD & CIRC	7 TRIPS	8 RIG SERVICE	9 REPAIR RIG	10 CUT OFF DRILL LINE	11 DEV. SURVEY	12 WIRE LINE LOGS	13 RUN CASE & CEMENT	14 WAIT ON CEMENT	15 NIPPLE UP B.O.P.	16 TEST B.O.P.	17 DRILL STEM TEST	18 PLUG BACK	19 SQUEEZE CEMENT	20 FISHING	21 DIR. WORK	22 SAFETY MTG.	23 WASH	24 WOR: TIS
MORN.			4½	½		½	1¼															½		½
DAY			7½					¼																½
EVE.			7¾					¼																
TOTAL																								

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTHS
1	BIT SUB		.24 m
1	JUNK SUB		.85 m
1	BIS FLOAT		.80 m
3	DC	197	25.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	10mm		199.76 m
			m
40	D.P.	STANDS	m
XX	D.P.	SINGLES	1153.59 m
	KELLY DOWN		12.97 m
	TOTAL		1366.32 m
WT. OF DC			31.000 1000 daN
WT. OF STRING			51.000 1000 daN

BIT RECORD

BIT NO.	8
SIZE (mm)	222
IADC CODE	6 3 7
MFG.	RBI
TYPE	C57LRG
SERIAL NO.	BL180
JETS (mm)	11 11 12
DEPTH OUT (m)	
DEPTH IN (m)	1356
TOTAL METRES DRILLED (m)	8
TOTAL HOURS RUN	4¼

CUTTING STRUCTURE: T_i | T_o | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG 1000 DAN

TORQUE AT BOTTOM

FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASE

TIME	02:00	04:00	06:30
DENSITY kg/m³	1125	1130	1120
FUNNEL VIS. - (S/L)	46	47	46
W.L. (cm³)	7.5	7.5	7.5
pH	9.0	9.0	9.0

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENT #1	0			
CENT #2	0			

PVT @ 0300-69.9 m³
PVT @ 0700-70.1 m³

MORNING TOUR

METRES DRILLED

FROM	TO	CORE-C
1355	1358	3
1358	1366	8

LINER SIZE (mm)	S.P.M.
165	97

REDUCED — STAND PIPE @ 1700

DEVIATION

DEPTH (m)	DEVIATION (°)

DRILLER'S SIGNATURE

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTHS
1	BIT SUB		.24 m
1	JUNK SUB		.84 m
1	BIS FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		199.76 m
			m
41	D.P.	STANDS	m
X	D.P.	SINGLES	1172.74 m
	KELLY DOWN		12.97 m
	TOTAL		1385.47 m
WT. OF DC			31.000 1000 daN
WT. OF STRING			52.000 1000 daN

BIT RECORD

BIT NO.	8
SIZE (mm)	222
IADC CODE	6 3 7
MFG.	RBI
TYPE	C57LRG
SERIAL NO.	BL180
JETS (mm)	11 11 12
DEPTH OUT (m)	
DEPTH IN (m)	1358
TOTAL METRES DRILLED (m)	30
TOTAL HOURS RUN	15¾

CUTTING STRUCTURE: T_i | T_o | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG MIN.

TORQUE AT BOTTOM

FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASE

TIME	08:00	11:30	15:00
DENSITY kg/m³	1130	1150	1155
FUNNEL VIS. - (S/L)	47	47	53
W.L. (cm³)	7.5	7.6	7.0
pH	8.5	9.5	9.5
PVT	71.5 m³	72.9 m³	67.2

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
BARITE	75
GEL	16

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENT #1	0			
CENT #2				

13:30 SUCKED 10m FROM #2 TANK

DAY TOUR

METRES DRILLED

FROM	TO	CORE-C
1366	1378	12

LINER SIZE (mm)	S.P.M.
165	97

STAND PIPE @ 2700

DEVIATION

DEPTH (m)	DEVIATION (°)

DRILLER'S SIGNATURE

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTHS
1	BIT SUB		.24 m
1	JUNK SUB		.84 m
1	S/S FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			199.76 m
			m
41	D.P.	STANDS	m
XX	D.P.	SINGLES	1162.22 m
	KELLY DOWN		7.02 m
	TOTAL		1389 m
WT. OF DC			31.000 1000 daN
WT. OF STRING			52.000 1000 daN

BIT RECORD

BIT NO.	8
SIZE (mm)	222
IADC CODE	6 3 7
MFG.	RBI
TYPE	C57LRG
SERIAL NO.	BL180
JETS (mm)	11 11 12
DEPTH OUT (m)	
DEPTH IN (m)	1358
TOTAL METRES DRILLED (m)	31
TOTAL HOURS RUN	23¼

CUTTING STRUCTURE: T_i | T_o | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG 1600 DAN.

TORQUE AT BOTTOM

FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASE

TIME	16:30	19:30	22:30
DENSITY kg/m³	1150	1150	1150
FUNNEL VIS. - (S/L)	49	55	55
W.L. (cm³)	7.7	7.7	7.7
pH	9.0	9.0	8.5

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	20
LIG	1
CAUS	1

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENT #1				
CENT #2				

P.V.T. @ 16:00 - 68.
P.V.T. @ 2300 - 71.5
SUCKED OUT

EVENING TOUR

METRES DRILLED

FROM	TO	CORE-C
1378	1389	11

LINER SIZE (mm)	S.P.M.
165	94

STAND PIPE @ 3600

DEVIATION

DEPTH (m)	DEVIATION (°)

DRILLER'S SIGNATURE

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DAILY CHECKS

	OPR.	R.M.
Daily Walk Around Inspection	Initial DC	Initial
Detailed Inspection-Weekly (using checklist)	Initial	Initial
H2S Signs Posted (if required)	Initial	Initial
Well License & Stick Diagram Posted	Initial DC	Initial
Flare Lines Staked	Initial DC	Initial
BOP Drills Performed	Initial DC	Initial
Daily Inspect BOP's - Flarelines & Degasser Lines	Initial DC	Initial
Site Health and Safety Meeting (one/crew/month)		Initial
C.O.D.C. Rig Safety Inspection Checklist (one/rig/month)		Initial
Pre-Inspection Before Raising or Lowering		Initial
Vacuum Sewer Checked		Initial
Blow Out Kills checked		Initial

YEAR 97 MONTH 01 DAY 02

RIG NO. ONE

FUEL @ 8:00

RIG 105 BOILER

WEATHER: TEMPERATURE -31 °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	194	2[illegible]	53.57	PRUD	J-55	33	435.68	4.74	434
TUBING OR LINER									

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	[illegible]	E		129	F.H	165	P2-9	G-D	229
							D-375	Emsco	356

	22	23	24	25	26	TOTALS
	WASH	WORK JTS				
	1/2	1/2				8
		1/4				8
						3

SHALE SHAKER(S): NO. 3; TYPE FLOW LINE; SCREENS CHANGED ☐ YES ☑ NO; TOP 175; MIDDLE 175; BOTTOM 175

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	DRLG RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1355	1358	3	60	13
1358	1366	8	60	16

LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9,000	165	94	127

REDUCED PUMP SPEED: STANDPIPE @ 2700 @ 49

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
00:00	01:45	1 1/4	6	R.I.H. BREAK CIRC 777m R.I.H 934m.
01:45	02:15	1/2	22	WASH 934m - 1355 m FLOW CHECK. I. K.
02:15	02:45	1/2	5	CIRCULATE OUT TRIP GAS, SLOW Pump Rate.
02:45	03:15	1/2	3	REAM UNDER GAGE HOLE 1355 m - 1358
03:15	03:45	1/2	23	WORK JUNK SUB.
03:45	08:00	4 1/4	2	DRILL 1358 m - 1366 m.

NOTES: BREAK CIRC AT [illegible] m FLOW ↓ REMOTE CHOKE 23 SEC

CREW	STACK TEMP	ACCUMULATOR PRESSURE	CASING PRESS	ODOMETER READING
8 11		2120 KPa		11604

DAY TOUR

METRES DRILLED

FROM	TO	DRLG RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1366	1378	12	60	16

LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9,000	165	94	127

REDUCED PUMP SPEED: STANDPIPE @ [illegible] @ 45

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
0800	0815	1/4	7	Rig Service CLOSE TOP Pipe ram 5 sec Annular Preventer
0815	1345	5 1/2	2	Drill 1366 → 1375m.
1345	1400	1/4	23	WORK JUNK SUB.
1400	1600	2	2	DRILL 1375m → 1378m.

NOTES: CLOSE Hydrill 10 SEC CLOSE REMOTE CHOKE 23 SEC. WORK JUNK SUB IN CONNECTION.

CREW	STACK TEMP	ACCUMULATOR PRESSURE	CASING PRESS	ODOMETER READING
8 11		5200 KPa		11519

EVENING TOUR

METRES DRILLED

FROM	TO	DRLG RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1378	1389	11	60	16

LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9500	155	94	127

REDUCED PUMP SPEED: STANDPIPE @ 3600 @ 55

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

P.V.T. @ 16:00 - 68.4 m³
P.V.T. @ 22:30 - 71.5 m³
SUCKED OUT 9 m³

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
16:00	16:15	1/4	7	Rig Service ✓ ANNULAR & TOPPIPE RAMS. & REMOTE CHOKE.
16:15	24:00	7 3/4	2	DRILL 1378-1389

P.V.T. @ 22:30 - 62.5 m³

NOTES: ANNULAR 9 sec 4/0, TOP RAMS 4 sec 4/0. REMOTE CHOKE 22 sec 4/0

CREW	STACK TEMP	ACCUMULATOR PRESSURE	CASING PRESS	ODOMETER READING
8 11		5200 KPa		11519

RELEASED
JAN 09 1997
CACTUS DRILLING
NISKU

000587

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LICENCE NO.: 9211-HS8-1-1 | WELL NAME AND NO.: UCEL LIARD K02

OPERATOR: UNOCAL EXPLORATION LTD. | CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30 | UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE: | SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS

	OPR.	R.M.
(1) Daily Walk Around Inspection	Initial	Initial
(2) Detailed Inspection-Weekly (using checklist)	Initial	Initial
(3) HPS Signs Posted (if required)	Initial	Initial
(4) Well License & Stick Diagram Posted	Initial	Initial
(5) Flare Lines Staked	Initial	Initial
(6) BOP Drills Performed	Initial	Initial
(7) Visually inspect SOP's - Flarelines & Degasser Lines	Initial D.L.	Initial
(1) Rig Site Health and Safety Meeting (one/crew/month)		Initial
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)		Initial
(3) Mast Inspection Before Raising or Lowering		Initial
(4) Crown Saver Checked		Initial
(5) Motor Kills checked		Initial

RIG | WEATHER

TIME - HRS

CODE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV. SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.	B.O. DRILL	C + FLOW
	MORN.		7¼					¼																
	DAY		7½					¼															¼	
	EVE.		1			1¼	5	¼		½														E
	TOTAL																							

DRILLING ASSEMBLY (At End of Tour)

NO.		OD	LENGTH
			.24 m
1	JUNK SUB		.84 m
1	B/S FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			199.75 m
42	D.P.	STANDS	m
X	D.P.	SINGLES	1201.03 m
	KELLYDOWN		6.72 m
	TOTAL		1407 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		52,000	1000 daN

BIT RECORD

BIT NO.	8
SIZE (mm)	222
IADC CODE	637
MFG.	RBI
TYPE	C57LRG
SERIAL NO.	BL180
JETS (mm)	11.9 / 11.9 / 12.7
DEPTH OUT (m)	
DEPTH IN (m)	1358
TOTAL METRES DRILLED (m)	49
TOTAL HOURS RUN	34 3/4

CUTTING STRUCTURE	T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☐ WATER BASED ☐ OIL BASED

TIME	11:30	17:30	
DENSITY kg/m³	1155	1155	1155
FUNNEL VIS. - (S/L)	50	55	55
W.L. (cm³)	8.2	7.2	7.2
pH	9.5	9.5	9.0
P.V.T.	64.8	66.0	72.0

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	15
BARITE	36
LIG	1
DRILPAC	1

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m)	OVERFLOW DENSITY (kg/m)	UNDERFLOW DENSITY (kg/m)
CENT #1	HOURS RUN	INTAKE DENSITY (kg/m)	OVERFLOW DENSITY (kg/m)	UNDERFLOW DENSITY (kg/m)
CENT #2	HOURS RUN	INTAKE DENSITY (kg/m)	OVERFLOW DENSITY (kg/m)	UNDERFLOW DENSITY (kg/m)

DRILLING ASSEMBLY (At End of Tour)

NO.		OD	LENGTH
			.24 m
1	JUNK SUB		.84 m
1	B/S FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			199.75 m
42	D.P.	STANDS	m
X	D.P.	SINGLES	1201.03 m
	KELLYDOWN		6.72 m
	TOTAL		1407 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		52,000	1000 daN

BIT RECORD

BIT NO.	8	9
SIZE (mm)	222	222
IADC CODE	637G	737G
MFG.	RBI	STC
TYPE	C57LRG	F70D
SERIAL NO.	BL180	JP3551
JETS (mm)	11.9 / 11.9 / 12.7	12.7 / 11.9
DEPTH OUT (m)	1405	
DEPTH IN (m)	1358	1405
TOTAL METRES DRILLED (m)	50	
TOTAL HOURS RUN	35 3/4	

CUTTING STRUCTURE	T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.
	S	S	FC	#1	E	1	CT	TD	1.79

HOLE CONDITION

HOLE DRAG	1200
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☐ WATER BASED ☐ OIL BASED

TIME			
DENSITY kg/m³			
FUNNEL VIS. - (S/L)			
W.L. (cm³)			
pH			

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
BARITE	20 SX

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m)	OVERFLOW DENSITY (kg/m)	UNDERFLOW DENSITY (kg/m)
CENTRIFUGE	HOURS RUN	INTAKE DENSITY (kg/m)	OVERFLOW DENSITY (kg/m)	UNDERFLOW DENSITY (kg/m)

MORNING TOUR

METRES FROM	TO
1389	1398

LINER SIZE (mm): 165

9400

REDUCED

STAND PIPE

DEPTH (m)	DEV

DAY TOUR

METRES FROM	TO
1398	1407

LINER SIZE (mm): 165

9400

STANDPIPE

DEPTH (m)	DEVIA

EVENING TOUR

METRES FROM	TO
1407	1405

LINER SIZE (mm): 165

9200

STANDPIP

DEPTH (m)	DEVIAT

P.V.T. START

P.V.T. OUT OF

FOLD HERE →

CHECKS	OPR.	R.M.
Walk Around Inspection	Initial	Initial
Inspection-Weekly (using checklist)	Initial	Initial
Signs Posted (if required)	Initial	Initial
Grease & Stick Diagram Posted	Initial	Initial
Lines Staked	Initial	Initial
Drills Performed	Initial	Initial
Inspect BOP's - Flarelines & Degasser Lines	Initial	Initial
Health and Safety Meeting (one/crew/month)		Initial
H.S.E. Rig Safety Inspection Checklist (one/rig/month)		Initial
Inspection Before Raising or Lowering		Initial
Derrick Checked		Initial
Lines checked		Initial

YEAR 97 | MONTH 01 | DAY 03

RIG NO. ONE

FUEL @ 8:00

RIG 142 | BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
244	229	53.57	PRUD	J-55	33	435.65	4.74	434

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.86	E		129	F.H	160	P2-9	G-D	229
							D-375	EMSCO	356

22	23	24	25	26
B.O.P. DRILL	T FLOW			
1/4				
E				

TOTALS: 8 / 8 / 8

SHALE SHAKER(S): NO. 1 TYPE BRANDT CLEANER; SCREENS CHANGED ☐ YES ☑ NO; TOP 175; MIDDLE 175; BOTTOM 175

RENTALS/SERVICES

MORNING TOUR

DRILLING TIME: 06:30 / 11:55 / 5.3 / 7.2 / 9.5 / 69.9 m³

MUD CONTROL

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

METRES DRILLED

FROM	TO	DRILL RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1389	1398	9	60	16

PUMP	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
4400	165	44	127	

REDUCED PUMP SPEED: STANDPIPE @ # @ 44

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
0000	0445	4 1/4	2
0445	0500	1/4	8
0500	0800	3	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

- 0000 – 0445 (4 1/4 hrs) CODE 2: DRILL 1389m ⇒ 1395m.
- 0445 – 0500 (1/4 hr) CODE 8: RIG SERVICE ✓ PIPE RAMS C/O 6SEC.
- 0500 – 0800 (3 hrs) CODE 2: DRILL 1395m ⇒ 1395m.

NOTES: FLOW CHECK ✓ ANNULAR 9SEC C/O.

NO. OF CREW	HRS RAIG	HRS STANDBY	ACCUMULATED FOOTAGE FROM PREVIOUS TOUR	ACCUMULATED FOOTAGE TO END OF TOUR	ACCUMULATED HOURS TO END OF TOUR
8	11		32,000		11519

DAY TOUR

DRILLING TIME: 14:30 / 11:55 / 5.5 / 7.2 / 9.0 / 72.0

MUD CONTROL

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

METRES DRILLED

FROM	TO	DRILL RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1398	1407	9	60	16

PUMP	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9400	165	99	127	

REDUCED PUMP SPEED: STANDPIPE @ 200 @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
08:00	08:15	1/4	7
08:15	11:45	3 1/2	2
11:45	12:00	1/4	22
12:00	16:00	4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

- 08:00 – 08:15 (1/4 hr) CODE 7: RIG SERVICE ✓ ANNULAR 9SEC C/O.
- 08:15 – 11:45 (3 1/2 hrs) CODE 2: DRILL 1398-1404
- 11:45 – 12:00 (1/4 hr) CODE 22: B.O.P. DRILL. WELL SECURE 90SEC.
- 12:00 – 16:00 (4 hrs) CODE 2: DRILL 1404-1407

RECEIVED
JAN 09 1997
CACTUS DRILLING
NISKU

NOTES: REMOTE CHOKE 22SEC C/O.

NO. OF CREW	HRS RAIG	HRS STANDBY	ACCUMULATED FOOTAGE FROM PREVIOUS TOUR	ACCUMULATED FOOTAGE TO END OF TOUR	ACCUMULATED HOURS TO END OF TOUR
8	11				

B.O.P. DRILL. DRESSING CASING.

EVENING TOUR

DRILLING TIME: 14:30 / 11:55 / 5.5 / 7.2 / 9.0 / 72.0

MUD CONTROL

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

METRES DRILLED

FROM	TO	DRILL RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1407	1407	1	60	16

PUMP	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9200	165	94	127	—

REDUCED PUMP SPEED: STANDPIPE @ 200 @

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

P.V.T. START TRIP - 68.4m³

P.U.T. OUT OF HOLE - 60.8m³

7.6m³

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
16:00	17:00	1	2
17:00	19:30	2 1/2	6
19:30	19:45	1/4	7
19:45	20:45	1	6
20:45	21:15	1/2	7
21:15	22:15	1	6
22:15	23:15	1	5
23:15	23:45	1/2	6
23:45	24:00	1/4	5

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

- 16:00 – 17:00 (1 hr) CODE 2: DRILL 1407 - 1408
- 17:00 – 19:30 (2 1/2 hrs) CODE 6: FLOW ✓, PUMP PILL, HOIST BIT #8, FLOW ✓ AS PER REGULATIONS
- 19:30 – 19:45 (1/4 hr) CODE 7: RIG SERVICE ✓ BLIND RAMS
- 19:45 – 20:45 (1 hr) CODE 6: MAKE UP BIT #9 @ 0.25° BEND.
- 20:45 – 21:15 (1/2 hr) CODE 7: SLIP & CUT DRILL LINE.
- 21:15 – 22:15 (1 hr) CODE 6: RIH TO 1210m.
- 22:15 – 23:15 (1 hr) CODE 5: PICK UP KELLY CIRC MIN BUP FLOW ✓ OK.
- 23:15 – 23:45 (1/2 hr) CODE 6: RIH
- 23:45 – 24:00 (1/4 hr) CODE 5: BREAK CIRC WASH 1 JNT. NO FILL

FILL VOLUME. ACTUAL 8.65m³
CALCU. 7.12m³
+ 1.53m³

NOTES: BLIND RAMS 4SEC C/O

NO. OF CREW	HRS RAIG	HRS STANDBY	ACCUMULATED FOOTAGE FROM PREVIOUS TOUR	ACCUMULATED FOOTAGE TO END OF TOUR	ACCUMULATED HOURS TO END OF TOUR
5	11		32,000		11519

#27

000588

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LICENCE NO.: 9211-VIS-1-1

WELL NAME AND NO.: UCEL LIARD K02

OPERATOR: UNOCAL EXPLORATION LTD.

CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60 - 20 - 123 - 30

UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE:

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS — OPR. / R.M.

(1) Daily Walk Around Inspection — Initial / Initial
(2) Detailed Inspection-Weekly (using checklist) — Initial / Initial
(3) H²S Signs Posted (if required) — Initial / Initial
(4) Well License & Site Diagram Posted — Initial / Initial
(5) Flare Lines Staked — Initial / Initial
(6) BOP Drills Performed — Initial / Initial
(7) Visually inspect BOP's - Flarelines & Degasser Lines — Initial / Initial

(1) Rig Site Health and Safety Meeting (one/crew/month) — Initial
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month) — Initial
(3) Mast Inspection Before Raising or Lowering — Initial
(4) Crown Saver Checked — Initial
(5) Motor Kills checked — Initial

TIME - HRS

CODE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC.	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV. SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.			
MORN.		7¼					¼															Flow ✓	B.O.P. drill	
DAY		7¾					¼																	
EVE		7¼					¼															¼	¼	
TOTAL																								

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
			.24 m
1	BIT SUB FLOAT		.80 m
3	DC.	197	28.36 m
1	X/O		.77 m
1	STAB 8 1/2		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
42	D.P.	STANDS	m
XX	D.P.	SINGLES	1210.56 m
	KELLY DOWN		5.53 m
	TOTAL		1414.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		52,000	1000 daN

BIT RECORD

BIT NO.	#9
SIZE (mm)	222
IADC CODE	7 3 7 6
MFG.	STC
TYPE	F70DPP
SERIAL NO.	1P5551
JETS (mm)	12 12 11 11 (11.9)
DEPTH OUT (m)	—
DEPTH IN (m)	1408
TOTAL METRES DRILLED (m)	10.
TOTAL HOURS RUN	7¾

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1 000 DAN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	01:30	04:00	0.30
DENSITY kg/m³	1155	1155	1150
FUNNEL VIS. - (S/L)	48	55	53
W.L. (cm³)	7.5	6.5	7.0
pH	9.5	9.0	9.0
PVT	66.0 m³	69.5 m³	71.9 m³

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	20 SX

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
SHALE SHAKER				
CENTRIFUGE	0			
DESILTER	0			

METRES

FROM	TO
1408	1418

LINER SIZE (mm): 165

REDUCED

STANDPIPE

DEPTH (m)	DE
7200	

MORNING TOUR

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
			.24 m
1	B/S FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.91 m
			m
			m
43	D.P.	STANDS	m
X	D.P.	SINGLES	1220.00 m
	KELLY DOWN		10.09 m
	TOTAL		1429 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		52,000	1000 daN

BIT RECORD

BIT NO.	#9
SIZE (mm)	222
IADC CODE	7 3 7 6
MFG.	STC
TYPE	F70DPP
SERIAL NO.	1P5551
JETS (mm)	12.7 12.7 11.9
DEPTH OUT (m)	
DEPTH IN (m)	1408.
TOTAL METRES DRILLED (m)	21
TOTAL HOURS RUN	15½

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1,000 DAN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	05:00	11:30	14:30
DENSITY kg/m³	1140	1160	1160
FUNNEL VIS. - (S/L)	51	57	57
W.L. (cm³)	7.2	7.0	7.1
pH	9.0	9.0	9.0
PVT	73.5	52.1	53.8

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	16
BARITE	45

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
SHALE SHAKER				
CENTRIFUGE	0			
DESILTER	0			

METRES

FROM	TO
1418	1429

LINER SIZE (mm): 165

DEPTH (m)	DEVI
9500	

STANDPIPE

DAY TOUR

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
			.24 m
1	BIT SUB/FLOAT		.80 m
3	DCs	197	28.36 m
1	X/O		.77 m
1	STAB 8 1/2		3.04 m
1	NMDC	165	9.14 m
17	DCs	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
43	D.P.	STANDS	1237.10 m
XX	D.P.	SINGLES	m
	KELLY DOWN		5.44 m
	TOTAL		1414.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		52,000	1000 daN

BIT RECORD

BIT NO.	#9
SIZE (mm)	222
IADC CODE	7 3 7 6
MFG.	STC
TYPE	F70DPP
SERIAL NO.	1P5551
JETS (mm)	12.7 12.7 11.9
DEPTH OUT (m)	—
DEPTH IN (m)	1408
TOTAL METRES DRILLED (m)	36
TOTAL HOURS RUN	22¾

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1,000 DAN.
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	16:30	20:00	23:30
DENSITY kg/m³	1160	1160	1160
FUNNEL VIS. - (S/L)	56	55	55
W.L. (cm³)	7.2	7.4	7.4
pH	9.0	9.0	9.0
PVT	54.4	56.1	54.1

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
SHALE SHAKER				
CENTRIFUGE	0			
DESILTER	0			

METRES

FROM	TO
1429	1444

LINER SIZE (mm): 165

DEPTH (m)	DEVIA
4500	

STANDPIPE

EVENING TOUR

FOLD HERE →

S	OPR.	R.M.
d Inspection	Initial	Initial
n-Weekly (using checklist)	Initial	Initial
d (if required)	Initial	Initial
ack Diagram Posted	Initial	Initial
ed	Initial	Initial
rmed	Initial	Initial
OP's - Flarelines & Degasser	Initial	Initial
nd Safety Meeting (one/crew/month)		Initial
Safety Inspection Checklist (one/rig/month)		Initial
Before Raising or Lowering		Initial
epted		Initial
ed		Initial

YEAR 97 | MONTH 01 | DAY 4

RIG NO. ONE

FUEL @ 8:00

RIG F30 | BOILER

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244	229	53.57	PRUD	J-55	33	435.60	4.74	434
TUBING OR LINER									

WEATHER	DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
TEMPERATURE °C										
CURRENT CONDITIONS	102	20.56	E		129	FH	165	PZ9	G-D	229
WIND DIRECTION								D-375	Emsco	356
ROAD										

22	23	24	25	26
ow ✓	F.O.T. Drill			
1/4	1/4			

TOTALS

SHALE SHAKER(S)

NO. | TYPE

SCREENS CHANGED ☐ YES ☑ NO

TOP 175 | TOP

MIDDLE 175 | MIDDLE

BOTTOM 175 | BOTTOM

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	DRD RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1408	1418	10	60	16

LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
7200	165	94	127	—

REDUCED PUMP SPEED

STANDPIPE @ 700 @

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
0000	0400	4	2
0400	0415	1/4	7
0415	0500	3/4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

DRILL 1408 → 1413m

RIG SERVICE ✓ HYDRIL 6/10 SEC.

DRILL 1413m → 1418m.

NOTES BTMS HAD OIL CUT MUD + TRACE OF OIL

REMOTE CHOKE 6/10 SEC. , IN

HRS RAN 8 | SERVICE 10

CUMULATIVE FOOTAGE 22.000

CUMULATIVE HOURS 11 519

DAY TOUR

METRES DRILLED

FROM	TO	DRD RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1418	1429	11	78	16

LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9500	165	94	127	

REDUCED PUMP SPEED

STANDPIPE @ 700 @ 50

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
08:00	08:15	1/4	7
08:15	16:00	7 3/4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

RIG SERVICE ✓ ANNULAR + REMOTE CHOKE

DRILL 1418 - 1429

NOTES ANNULAR 9 SEC C/O

REMOTE CHOKE 22 SEC C/O

HRS RAN 8 | SERVICE 11

CUMULATIVE FOOTAGE

CUMULATIVE HOURS 11519.

RECEIVED
JAN 09 1997
CACTUS DRILLING
NISKU

EVENING TOUR

METRES DRILLED

FROM	TO	DRD RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1429	1444	15	78	16

LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9500	165	94	127	—

REDUCED PUMP SPEED

STANDPIPE @ 700 @ 50

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
16:00	16:15	1/4	7
16:15	20:15	4	2
20:15	20:30	1/4	22
20:30	20:45	1/4	23
20:45	24:00	3/4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

RIG SERVICE ✓ ANNULAR + REMOTE CHOKE

DRILL 1429 - 1436m.

FLOW ✓ O.K (DRILLING BREAK)

B.O.P. DRILL WELL SECURED. 2 MINS.

DRILL 1436m → 1444m.

NOTES ANNULAR 9 SEC C/O FLOW ✓ S IN CONNECTIONS.

REMOTE CHOKE 22 SEC C/O

HRS RAN 8 | SERVICE 11

CUMULATIVE FOOTAGE

CUMULATIVE HOURS 11519

#25 — 0005899

LICENCE NO.: 9211 - V18-11 | WELL NAME AND NO.: UCEL LIARD K02

OPERATOR: UNOCAL EXPLORATION LTD | CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30 | UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE: | SIGNATURE OF CONTRACTOR'S RIG MANAGER:

FOLD HERE →

DAILY CHECKS

	OPR.	R.M.
(1) Daily Walk-Around Inspection	Initial	Initial
(2) Detailed Inspection-Weekly (using checklist)	Initial	Initial
(3) HFS Signs Posted (if required)	Initial	Initial
(4) Well License & Slick Diagram Posted	Initial	Initial
(5) Flare Lines Staked	Initial	Initial
(6) BOP Drills Performed	Initial	Initial
(7) Visually Inspect BOP's - Flexibles & Degasser Lines	Initial	Initial
(1) Rig Site Health and Safety Meeting (one/crew/month)		Initial
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)		Initial
(3) Mast Inspection Before Raising or Lowering		Initial
(4) Crown Saver Checked		Initial
(5) Motor Kills checked		Initial

WEATHER — RIG NO. — RIG

TIME - HRS

CODE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV. SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.			
MORN.		7 1/4					1/4			1/2														
DAY		7					1/4	3/4																
EVE.		7 1/4					1/4																	
TOTAL																								

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
			.24 m
1	BIT SUB/FLOAT		.50 m
3	DCS	197	28.36 m
1	X/O		.77 m
1	SHOCK SUB		3.04 m
1	NMDC	165	9.14 m
17	DCS	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
44	D.P.	STANDS	1248.75 m
	D.P.	SINGLES	m
	KELLY DOWN		10.34 m
	TOTAL		1458.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		52,000	1000 daN

BIT RECORD

BIT NO.	#9
SIZE (mm)	222
IADC CODE	7 3 7 6
MFG.	STC
TYPE	F70DPP
SERIAL NO.	1P5551
JETS (mm)	12.7 12.7 11.9
DEPTH OUT (m)	
DEPTH IN (m)	1408
TOTAL METRES DRILLED (m)	50
TOTAL HOURS RUN	30

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1,000 DAN.
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED / ☐ OIL BASED

TIME	00:00	04:00	06:30
DENSITY kg/m³	1160	1160	1160
FUNNEL VIS. - (S/L)	53	50	51
W.L. (cm³)	7.4	7.2	7.5
pH	9.0	9.0	9.0
PVT	59.6	63.1	66.6

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	19

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
	0			
CENTRIFUGE #2				
	0			

MORNING TOUR

METRES

FROM	TO
1444	1458

LINER SIZE (mm)
165

DEPTH (m)	DEVIATION
1406m.	5

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
			.24 m
1	B/S FLOAT		.80 m
3	DC.	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.91 m
			m
			m
44	D.P.	STANDS	m
XX	D.P.	SINGLES	1267.40 m
	KELLY DOWN		5.69 m
	TOTAL		1472 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		52,000	1000 daN

BIT RECORD

BIT NO.	#9
SIZE (mm)	222
IADC CODE	7 3 7 6
MFG.	STC
TYPE	F70DPP
SERIAL NO.	1P5551
JETS (mm)	12.7 12.7 11.9
DEPTH OUT (m)	
DEPTH IN (m)	1408
TOTAL METRES DRILLED (m)	64
TOTAL HOURS RUN	37

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DN.
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☐ WATER BASED / ☑ OIL BASED

TIME	09:30	11:30	15:00
DENSITY kg/m³	1160	1155	1155
FUNNEL VIS. - (S/L)	56	55	54
W.L. (cm³)	7.6	7.4	7.1
pH	8.0	9.5	9.5
PVT	67.5	69.1	66.6

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
CAUSTIC	1SX
LIGNITE	1SX

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
POOR BOY	DEPTH	3	PH	
CENTRIFUGE				
POOR BOY	DEPTH	3	PH	

DAY TOUR

METRES

FROM	TO
1458	1472

LINER SIZE (mm)
165

DEPTH (m)	DEVIATION

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
			.24 m
1	BIT SUB/FLOAT		.50 m
3	D.C	197	28.36 m
1	X/O		.77 m
1	SHOCK SUB		3.04 m
1	NMDC	165	9.14 m
17	DCS	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
40	D.P.	STANDS	1271.00 m
	D.P.	SINGLES	m
	KELLY DOWN		11.09 m
	TOTAL		1457.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		52,000	1000 daN

BIT RECORD

BIT NO.	#9
SIZE (mm)	222
IADC CODE	7 3 7 6
MFG.	STC
TYPE	F70DPP
SERIAL NO.	1P5551
JETS (mm)	12.7 12.7 11.9
DEPTH OUT (m)	
DEPTH IN (m)	1408
TOTAL METRES DRILLED (m)	79
TOTAL HOURS RUN	44 3/4

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1,000 DAN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☐ WATER BASED / ☑ OIL BASED

TIME	16:30	20:00	23:30
DENSITY kg/m³	1155	1155	1155
FUNNEL VIS. - (S/L)	54	55	54
W.L. (cm³)	7.1	6.5	6.5
pH	9.5	9.5	9.5
PVT	61.2	62.6	65.0

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
	0			
CENTRIFUGE #2				
	0			

EVENING TOUR

METRES

FROM	TO
1472	1481

LINER SIZE (mm)
165

DEPTH (m)	DEVIATION

FOLD HERE →

DAILY CHECKS

	OPR.	R.M.
Daily Walk Around Inspection	Initial	Initial
Scaffold Inspection-Weekly (using checklist)	Initial	Initial
H2S Signs Posted (if required)	Initial	Initial
Operator License & Stick Diagram Posted	Initial	Initial
Pipeline Lines Staked	Initial	Initial
BOP Drills Performed	Initial	Initial
Daily Inspect BOP's - Flarelines & Degasser Lines	Initial	Initial
Rig Site Health and Safety Meeting (one/crew/month)		Initial
A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)		Initial
Pre-Tour Inspection Before Raising or Lowering		Initial
Crown Saver Checked		Initial
Monitor Kills checked		Initial

YEAR 97 | MONTH 1 | DAY 2

RIG NO. CNE

FUEL @ 8:00

RIG 114 | BOILER

WEATHER: TEMPERATURE °C | CURRENT CONDITIONS | WIND DIRECTION | ROAD

LAST CASING / TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
244.5	229	53.57	PRUD	J-55	33	435.68	4.74	434

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.54	E		129	F.H	180	PZ9	G-D	227
							D-375	EMSCO	356

21	22	23	24	25	26
CTY					

TOTALS: 5 / 8 / 8

SHALE SHAKER(S): NO. | TYPE

SCREENS CHANGED ☐ YES ☑ NO

TOP 175 | TOP

MIDDLE 175 | MIDDLE

BOTTOM 175 | BOTTOM

RENTALS/SERVICES

MORNING TOUR

RD

DEGASSER

00	06:30
0	1160
	57
	7.5
	9.0
	66.6

SOLIDS CONTROL

DESILTER

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENT #2

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

METRES DRILLED

FROM	TO	DBC RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1444	1455	14	78	16

CIRCULATING SYSTEM

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
4500	165	94	127	18

REDUCED PUMP SPEED ACTIVITY

STD Pipe @ 500 @ 49

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION
1406m.	5 3/4°	NE 46

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
0000	0415	4 1/4	2
0415	0430	1/4	7
0430	0500	1/2	10
0500	0500	3	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

- DRILL 1444m → 1450m
- RIG SERVICE ✓ PIPE RAMS (UPPER) 4/0 5 SEC.
- SURVEY @ 1406m 5 3/4° NE M.
- DRILL 1450m → 1455m.

NOTES ✓ HYDRIL 4/0 10 SEC
REMOTE CHOKE 22 SEC 4/0

BOILER HRS | BIT RUN | STAND PIPE | CASING PRESS | EXPERIENCED HOOKLOAD | SAFETY CODE

8 | 11 | | | 52,000 | | 115 19

DAY TOUR

DEGASSER

00	15:00
5	1155
	5.4
	7.5
	9.5
1	64.0

SOLIDS CONTROL

DESILTER

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENT #2

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
DEPTH 3	3/4	

CENT

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
DEPTH 3	3/4	

METRES DRILLED

FROM	TO	DBC RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1458	1472	14	78	16.

CIRCULATING SYSTEM

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9400	165	94	127	

REDUCED PUMP SPEED ACTIVITY

STD Pipe @ 500 @ 55

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
08:00	08:15	1/4	7
08:15	14:30	6 1/4	2
14:30	15:15	3/4	8
15:15	16:00	3/4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

- RIG SERVICE ✓ ANNULAR + REMOTE CHOKE.
- DRILL 1458 - 1471
- REPAIR PUMP DRIVE CHAIN.
- DRILL 1471 - 1472 m.

NOTES ANNULAR 9 SEC 4/0 , LOWER RAMS 4 SEC 4/0
REMOTE CHOKE 22 SEC 4/0 , UPPER RAMS 4 SEC 4/0

BOILER HRS | BIT RUN | STAND PIPE | CASING PRESS | EXPERIENCED HOOKLOAD

8 | 11 | | | 52,000

EVENING TOUR

DEGASSER

00	13:30
5	1155
	5.4
	6.5
	9.5
6	65.7

SOLIDS CONTROL

DESILTER

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENT #2

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

METRES DRILLED

FROM	TO	DBC RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1472	1457	15	76	16

CIRCULATING SYSTEM

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
7300	165	94	127	—

REDUCED PUMP SPEED ACTIVITY

STD Pipe @ 500 @ 50

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
16:00	16:15	1/4	7
16:15	24:00	7 3/4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

- RIG SERVICE ✓ ANNULAR + REMOTE CHOKE
- DRILL 1472 - 1457m

NOTES ANNULAR 9 SEC 4/0, REMOTE CHOKE 22 SEC 4/0.
FLOW ✓ DRILLING BREAKS. O.K.

BOILER HRS | BIT RUN | STAND PIPE | CASING PRESS | EXPERIENCED HOOKLOAD | SAFETY CODE

8 | 11 | | | 52,000 | | 11 19

RECEIVED
JAN 09 1997
CACTUS DRILLING
NISKU

#29 000590

FOLD HERE →

LICENCE NO.: 421-018-1-1 | WELL NAME AND NO.: UCEL LIARD K02

OPERATOR: UNOCAL EXPLORATION LTD | CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60- 20-123-30 | UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE: Dave Holowaty | SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS — OPR 2.0 C.M.

(1) Daily Walk Around Inspection
(2) Detailed Inspection-Weekly (using checklist)
(3) HPS Signs Posted (if required)
(4) Well License & Stick Diagram Posted
(5) Flare Lines Staked
(6) BOP Drills Performed
(7) Visually Inspect BOP's - Flarelines & Degasser Lines

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

RIG

WEATHER

TIME - HRS

CODE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV. SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.			
MORN.		7¼					¼																	
DAY		7¾					¼																	
EVE.		7½				½	1¼																	
TOTAL																								

DRILLING ASSEMBLY (At End of Tour)

NO.	OD		LENGTH
			.24 m
1	BIT SUB/FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	SHOCK SUB		3.04 m
1	NMDC	165	9.14 m
17	DC's	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
45	D.P.	STANDS	m
XX	D.P.	SINGLES	1295.96 m
	KELLY DOWN		11.13 m
	TOTAL		1506.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		52,000	1000 daN

BIT RECORD

BIT NO.	#9
SIZE (mm)	222
IADC CODE	7 3 7 6
MFG.	STC
TYPE	F70 DPP
SERIAL NO.	1P5551
JETS (mm)	12.7 12.7 11.9
DEPTH OUT (m)	—
DEPTH IN (m)	1408
TOTAL METRES DRILLED (m)	98
TOTAL HOURS RUN	52 ¾

CUTTING STRUCTURE: T1 | To | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1,000 DAN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	00:00	04:00	06:30
DENSITY kg/m³	1155	1150	1160
FUNNEL VIS. - (S/L)	54	53	51
W.L. (cm³)	6.5	6.6	7.4
pH	9.5	9.0	9.0
PVT	65.7	68.5	70.4

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
CAUSTIC	1 SX
LIG	1 SX
GEL	20 SK

SOLIDS CONTROL

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENT. #1			
0			
CENT. #2			
0			

MORNING TOUR

METRES

FROM	TO
1457	1506

LINER SIZE (mm)
9600 / 165

S.D. PIPE @

DEPTH (m)	DEVIATION

DRILLING ASSEMBLY (At End of Tour)

NO.	OD		LENGTH
			.24 m
1	B/S FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.91 m
			m
			m
46	D.P.	STANDS	m
X	D.P.	SINGLES	1314.98 m
	KELLY DOWN		4.11 m
	TOTAL		1515 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		52,000	1000 daN

BIT RECORD

BIT NO.	#9
SIZE (mm)	222
IADC CODE	7 3 7 6
MFG.	STC
TYPE	F70DPP
SERIAL NO.	1P5551
JETS (mm)	12.7 12.7 11.9
DEPTH OUT (m)	
DEPTH IN (m)	1408.
TOTAL METRES DRILLED (m)	110
TOTAL HOURS RUN	60 ¾

CUTTING STRUCTURE: T1 | To | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DAN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	06:00	11:30	14:30
DENSITY kg/m³	1155	1160	1160
FUNNEL VIS. - (S/L)	58	57	57
W.L. (cm³)	6.1	6.0	6.2
pH	9.0	9.0	9.0
PVT	71.1	62.9	64.6

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	9
BARITE	39
LIG	1
DRISPAC	1

SOLIDS CONTROL

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENT. #1			
0			
CENT. #2			
0			

DAY TOUR

METRES

FROM	TO
1506	1518

LINER SIZE (mm)
9600 / 165

S.D. PIPE @

R.S.P.P. ON @ 1507

DEPTH (m)	DEVIATION

DRILLING ASSEMBLY (At End of Tour)

NO.	OD		LENGTH
			.24 m
1	BIT SUB/FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	SHOCK SUB		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
46	D.P.	STANDS	1324.13 m
XX	D.P.	SINGLES	m
	KELLY DOWN		10.96 m
	TOTAL		1534.06 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		53,000	1000 daN

BIT RECORD

BIT NO.	#9
SIZE (mm)	222
IADC CODE	7 3 7 6
MFG.	STC
TYPE	F70DPP
SERIAL NO.	1P5551
JETS (mm)	12.7 12.7 11.9
DEPTH OUT (m)	1534
DEPTH IN (m)	1408
TOTAL METRES DRILLED (m)	126
TOTAL HOURS RUN	67 ½

CUTTING STRUCTURE: T1 | To | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.: 1 | 1 | FC | A | E | 1 | CT | PR | 1.91

HOLE CONDITION

HOLE DRAG	1000 DAN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	16:30	20:00	22:00
DENSITY kg/m³	1160	1165	1165
FUNNEL VIS. - (S/L)	59	63	61
W.L. (cm³)	7.7	7.5	7.6
pH	9.0	9.0	9.2
PVT	65.6	67.4	63.2

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
SUCKED FROM SHAKER TANK	7.4 m³

SOLIDS CONTROL

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENT. #1			
0			
CENT. #2			
0			

EVENING TOUR

METRES

FROM	TO
1518	1534

LINER SIZE (mm)
9600 / 165

S.D. PIPE @

DEPTH (m)	DEVIATION

FOLD HERE →

Y CHECKS

OPR. B.O.P.M.

- y Walk Around Inspection — Initial
- alled Inspection-Weekly (using checklist) — Initial
- Signs Posted (if required) — Initial
- l Licenses & Stick Diagram Posted — Initial
- e Lines Staked — Initial
- P Drills Performed — Initial
- ily inspect BOP's - Flarelines & Degasser Lines — Initial
- She Health and Safety Meeting (one/crew/month) — Initial
- .O.D.C. Rig Safety Inspection Checklist (one/rig/month) — Initial
- t Inspection Before Raising or Lowering — Initial
- m Saver Checked — Initial
- r Kills checked — Initial

YEAR 97 | MONTH 01 | DAY 16

RIG NO. ONE

FUEL @ 8:00

RIG 174 | BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

LAST CASING / TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
244	229	53.57	PRUD	J-55	33	435.66	4.74	434

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.59	E		129	F.H	180	PZ9	G-D	229
							D-375	EMSCO	356

22	23	24	25	26

TOTALS: 8 / 8

SHALE SHAKER(S)

NO. 2 TYPE DERRICK

SCREENS CHANGED ☐ YES ☑ NO

TOP	175	TOP
MIDDLE	175	MIDDLE
BOTTOM	175	BOTTOM

RENTALS/SERVICES

MORNING TOUR

BOP DRILL	06:30
	11.60
	5'
	7.4
	9.0
	70.4

METRES DRILLED

FROM	TO	DB-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1457	1506	19	75	16

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9600	165	94	140	65

REDUCED PUMP SPEED: STD PIPE @ 80 @ 45

DEVIATION SURVEY

REMOVED #1 PUMP

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	CLASS	CODE
0000	0030	1/2	2
0030	0045	1/4	7
0045	0200	7 1/4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

0000 DRILL 1457m → 1465m

0030 RIG SERVICE ✓ HCR % 3 SEC.

0045 DRILL 1458m → 1506m

REMOTE CHOKE % 22 SEC.
HYDRIL % 10 SEC.
UPPER RAM % 5 SEC
LOWER RAM % 5 SEC.

NOTES: SWITCH PUMP TO #2 FOR 2hrs. / BACK TO #1
FLOW ✓ DRILLING BREAKS .OK

HRS	BOP DRILL	STACK TEMP	MUD EXPERIENCED ON LOAD	WEATHER
5	4.0		32,000	

11 519

DAY TOUR

METRES DRILLED

FROM	TO	DB-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1506	1518	12	78	16

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9300	165	94	140	65

REDUCED PUMP SPEED: STD. PIPE @ 200 @ 30

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
R.S.P.P. ON #2 PUMP @ 1507m.		

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	CLASS	CODE
08:00	08:15	1/4	7
08:15	16:00	7 3/4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

08:00 RIG SERVICE ✓ ANNULAR + REMOTE CHOKE

08:15 DRILL 1506 - 1518

NOTES: ANNULAR 9 SEC % , R.S.P.P. #1 PUMP SWACO 3300
REMOTE CHOKE 22 SEC % @ 1507m. STD. PIPE 3100 49 STKS
MANIFOLD 2500

HRS	BOP DRILL	STACK TEMP	MUD EXPERIENCED ON LOAD	WEATHER
8	9.0			

EVENING TOUR

METRES DRILLED

FROM	TO	DB-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1518	1534	16	78	16

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9500	165	94	140	

REDUCED PUMP SPEED: STD. PIPE @ 3100 @ 49

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	CLASS	CODE
16:00	16:15	1/4	7
16:15	23:30	7 1/2	2
23:30	24:00	1/2	6

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

16:00 RIG SERVICE ✓ ANNULAR + REMOTE CHOKE

16:15 DRILL 1518 - 1534m

23:30 P.O.O.H. Bit # 1

NOTES:

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JAN 09 1997
CACTUS DRILLING
N.S.C.U

HRS	BOP DRILL	STACK TEMP	MUD EXPERIENCED ON LOAD	WEATHER
8	9.0			

11 511 DAY

#30 000591

FOLD HERE →

LICENCE NO.: 9211-VIS-1-1 | WELL NAME AND NO.: UCEL LIARD K62.

OPERATOR: UNOCAL EXPLORATION LTD.

CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-26-123-30

UNIQUE ID:

SIGNATURE OF OPERATOR'S REPRESENTATIVE:

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS (OPR. / R.M.)

(1) Daily Walk Around Inspection
(2) Detailed Inspection-Weekly (using checklist)
(3) HPS Signs Posted (if required)
(4) Well Licanse & Stick Diagram Posted
(5) Flare Lines Staked
(6) BOP Drills Performed
(7) Visually Inspect BOP's - Flarelines & Degasser Lines

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

YEA
RIG NO.
RIG
WEATHER: TE CU CC WI RC

TIME HRS

CODE NO. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV. SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.
MORN.					1/4	6 1/4	1/4	1/4													
DAY		7 1/2					1/4														FL-1
EVE		3 1/4				4	1/4														
TOTAL																					

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
			.24 m
1	BIT SUB/FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	STAB 5 1/8		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
40	D.P.	STANDS	m
5	D.P.	SINGLES	13.13 m
	KELLY DOWN		m
	TOTAL		m
WT. OF DC		31,000	1000 daN
WT. OF STRING		52,000	1000 daN

BIT RECORD

BIT NO.	#10
SIZE (mm)	222
IADC CODE	7 3 7
MFG.	REED
TYPE	HP72J
SERIAL NO.	RC3111
JETS (mm)	12.7 12.7 12.7
DEPTH OUT (m)	
DEPTH IN (m)	1534
TOTAL METRES DRILLED (m)	
TOTAL HOURS RUN	

CUTTING STRUCTURE: T_i T_o MDC LOC B Gage ODC Reason Pulled Total Run m/hr.

HOLE CONDITION

HOLE DRAG 1,000 DAN

TORQUE AT BOTTOM

FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☐ WATER BASED ☐ OIL BASED

TIME	
DENSITY kg/m³	
FUNNEL VIS. - (S/L)	TRIP
W.L. (cm³)	
pH	

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
BARITE	20 SX

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
DESILTER	0			
DESANDER	0			
CENTRIFUGE	0			

METRES DRILLED

FROM	TO
1534	

LINER SIZE (mm): 165

REDUCED TO

DEPTH (m) | DEVIATION

PUT START @

TOH WITH

MORNING TOUR

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
			.24 m
1	B/S FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.91 m
			m
			m
47	D.P.	STANDS	1333.33 m
	D.P.	SINGLES	m
	KELLY DOWN		10.36 m
	TOTAL		1543 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		52,000	1000 daN

BIT RECORD

BIT NO.	#10
SIZE (mm)	222
IADC CODE	7 3 7
MFG.	REED
TYPE	HP72J
SERIAL NO.	RC3111
JETS (mm)	12.7 12.7 12.7
DEPTH OUT (m)	
DEPTH IN (m)	1534
TOTAL METRES DRILLED (m)	9
TOTAL HOURS RUN	7 1/4

CUTTING STRUCTURE: T_i T_o MDC LOC B Gage ODC Reason Pulled Total Run m/hr.

HOLE CONDITION

HOLE DRAG 1000 DAN.

TORQUE AT BOTTOM

FILL ON BOTTOM (m) NO FILL

MUD RECORD

MUD TYPE: ☐ WATER BASED ☐ OIL BASED

TIME	06:30	11:30	15:00
DENSITY kg/m³	1165	1165	1170
FUNNEL VIS. - (S/L)	58	58	60
W.L. (cm³)	6.1	6.2	6.8
pH	8.5	8.5	9.5
PVT	63.0	63.9	64.8

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	9
DRISPAC	1
DESCO	1
CAUSTIC	1
LIG	1

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
DESILTER	H₂O	84	51	
DESANDER				
CENTRIFUGE				

METRES DRILLED

FROM	TO	DAILY RUN	CORE
1534	1543		

LINER SIZE (mm): 165

REDUCED TO: 9600

STD. PIPE

DEPTH (m) | DEVIATION

DAY TOUR

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
			.24 m
1	BIT SUB/FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	STAB SUB		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
47	D.P.	STANDS	m
X	D.P.	SINGLES	1342.50 m
	KELLY DOWN		m
	TOTAL		1541.41 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		52,000	1000 daN

BIT RECORD

BIT NO.	#10
SIZE (mm)	222
IADC CODE	7 3 7
MFG.	REED
TYPE	HP72J
SERIAL NO.	RC3111
JETS (mm)	12.7 12.7 12.7
DEPTH OUT (m)	1546
DEPTH IN (m)	1534
TOTAL METRES DRILLED (m)	12
TOTAL HOURS RUN	11.74

CUTTING STRUCTURE: T_i T_o MDC LOC B Gage ODC Reason Pulled Total Run m/hr.

2	5	5	M	E	T	NO	PR	1.0

HOLE CONDITION

HOLE DRAG 1,000.

TORQUE AT BOTTOM

FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER DISPERSED ☐ OIL BASED

TIME	16:30		
DENSITY kg/m³	1170		
FUNNEL VIS. - (S/L)	60		
W.L. (cm³)	6.7		
pH	9.5		
PVT	60.2		

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
~~NO TYPE~~	~~ES~~
BARITE	20 SX
SPOT	5 SX.

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
DESILTER	0			
DESANDER	1.5	2 1/2	2295	2230
CENTRIFUGE		CKD		
	0			

METRES DRILLED

FROM	TO	DAILY RUN	CORE
1543	1546	3	

LINER SIZE (mm): 165

REDUCED TO: 9600

STD. PIPE

DEPTH (m) | DEVIATION

PUT @ START

PVT @ (OUT) (IN)

EVENING TOUR

FOLD HERE →

DAILY CHECKS — OPR. R.M.

- Daily Walk Around Inspection — Initial / Initial
- Mutual Inspection-Weekly (using checklist) — Initial / Initial
- H2S Signs Posted (if required) — Initial / Initial
- Well License & Stick Diagram Posted — Initial / Initial
- Flare Lines Staked — Initial / Initial
- BOP Drills Performed — Initial / Initial
- Visually inspect BOP's - Flarelines & Degasser Lines — Initial / Initial

- Rig Site Health and Safety Meeting (one/crew/month) — Initial
- C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month) — Initial
- Mast Inspection Before Raising or Lowering — Initial
- Crown Saver Checked — Initial
- Floor Kills checked — Initial

YEAR 97 | MONTH 01 | DAY 7

RIG NO. ONE

FUEL @ 8:00

RIG 95 | BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244.1	229	53.57	PRUD	J-55	33	435.68	4.74	434
TUBING OR LINER									

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.89	E		129	F.H	180	PZ9	G-D	329
							D-375	EMSCO	356

21 22 23 24 25 26

SAFETY MTG. — Flow

TOTALS: 8 / 8

SHALE SHAKER(S): NO. | TYPE; SCREENS CHANGED ☐ YES ☐ NO; TOP 175 TOP; MIDDLE 175 MIDDLE; BOTTOM 175 BOTTOM

RENTALS/SERVICES

MORNING TOUR

RECORD — ☐ OBSERVED

METRES DRILLED

FROM	TO	DR-D RM-P CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1534				

PUMP NO. 1: LINER SIZE (mm) 165, S.P.M. 94 — PUMP NO. 2: LINER SIZE (mm), S.P.M.

REDUCED PUMP SPEED @ @

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
PUT START 63.2m³.		

DRILLER'S SIGNATURE: Tom Smith

SOLIDS CONTROL

DESILTER: INTAKE DENSITY (kg/m³) | OVERFLOW DENSITY (kg/m³) | UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE: INTAKE DENSITY (kg/m³) | OVERFLOW DENSITY (kg/m³) | UNDERFLOW DENSITY (kg/m³)

	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

TIME LOG

FROM	TO	CLASS TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
0000	0015	1/4	7	RIG SERVICE ✓ HYDRIL & REMOTE CHOKE 22
0015	0230	2 1/4	6	HOIST BIT #9 FLOW ✓ 1200
0230	0315	3/4	8	TRIP BHA - LAY.
0315	0415	1	6	HOIST BIT #4 FLOW ✓ @ CHANGES.
0415	0645	2 1/2	6	MAKE UP NEW BIT RIH
0645	0730	1/4	5	CIRC BTMS UP @ 1200m. FLOW OK.
0730	0500	1/2	6	RIH. WASH TO BTM 9m OF FILL.

NOTES ✓ BLIND RAMS 4/0 4 SEC.

FILL VOL ANTICIPATED 750m³
ACTUAL 566
TOTAL DIFF 1.16m³ +

HRS RAN	BOILER STACK TEMP	ACCUMULATOR PRESSURE (OPERATING)	OPERATOR'S INITIALS
7.0		52,000	

SAFETY MTG. 11 5/19

DAY TOUR

RECORD — ☐ OBSERVED

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1534	1543	9	78	16
			40	

PUMP NO. 1: LINER SIZE (mm) 165, S.P.M. 94 — PUMP NO. 2: LINER SIZE (mm) 140, S.P.M.

PUMP NO. 1: 9600

REDUCED PUMP SPEED: STD. PIPE @ 300 @ 55

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE:

SOLIDS CONTROL

DESILTER: INTAKE DENSITY (kg/m³) | OVERFLOW DENSITY (kg/m³) | UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE: INTAKE DENSITY (kg/m³) | OVERFLOW DENSITY (kg/m³) | UNDERFLOW DENSITY (kg/m³)

	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

TIME LOG

FROM	TO	CLASS TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
08:00	08:15	1/4	7	RIG SERVICE, ANNULAR & REMOTE CHOKE
08:15	08:30	1/4	22	~~DRILL 1534~~ - FLOW OK. SLIGHT TRIP GAS.
08:30	16:00	7 1/2	2	DRILL 1534 - 1543

NOTES: ANNULAR 9 SEC 4/0
REMOTE CHOKE 22 SEC 4/0

JAN 09 1997
CACTUS DRILLING
NISKU

HRS RAN	BOILER STACK TEMP	ACCUMULATOR PRESSURE (OPERATING)	OPERATOR'S INITIALS
8	90		

SAFETY MTG. 11434

EVENING TOUR

RECORD — ☐ OBSERVED

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1543	1546	3	78	16

PUMP NO. 1: LINER SIZE (mm) 165, S.P.M. 94 — PUMP NO. 2: LINER SIZE (mm) 140, S.P.M. —

PUMP NO. 1: 4600

REDUCED PUMP SPEED: STD. PIPE @ 100 @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
PUT @ START 68.0		
PUT @ (-m) (2400) 67.4		

DRILLER'S SIGNATURE:

SOLIDS CONTROL

DESILTER: INTAKE DENSITY (kg/m³) | OVERFLOW DENSITY (kg/m³) | UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE: INTAKE DENSITY (kg/m³) | OVERFLOW DENSITY (kg/m³) | UNDERFLOW DENSITY (kg/m³)

	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

TIME LOG

FROM	TO	CLASS TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
16:00	16:15	1/4	7	RIG SERVICE ✓ ANNULAR + REMOTE CHOKE
16:15	20:00	3 1/2	2	DRILL 1543 -
20:00	21:00	1	6	HOIST BIT #10 FLOW'S.

ANTICIPATED 755m³.
ACTUAL 566 m³
1.11 m³

NOTES: ANNULAR 9 SEC 4/0 ✓ BLIND RAMS 4/0 4 SEC.
REMOTE CHOKE 22 SEC 4/0

HRS RAN	BOILER STACK TEMP	ACCUMULATOR PRESSURE (OPERATING)	OPERATOR'S INITIALS
8	9	51,000	

SAFETY MTG. 11 734

#31 000592

FOLD HERE →

LICENCE NO.: 921-V18-1-1 | WELL NAME AND NO.: UCEL LIARD K02

OPERATOR: UNOCAL EXPLORATION LTD | CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30 | UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE: | SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS — OPR. D.F. R.M.

(1) Daily Walk Around Inspection
(2) Detailed Inspection-Weekly (using checklist)
(3) HPS Signs Posted (if required)
(4) Well License & Stick Diagram Posted
(5) Flare Lines Staked
(6) BOP Drills Performed
(7) Visually Inspect BOP's - Flarelines & Degasser Lines

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

YEAR 97 | RIG NO. | RIG | WEATHER | TEMPERA | CURRENT CONDITIO | WIND DIR | ROAD

TIME-HRS

CODE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV. SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.	JUNK JUNK SUB		
MORN.					1/2	2 1/4	1/4	4 1/2																
DAY		6 1/2				1/2	1/4			1/2												1/4		
EVE.		4 1/4			1/4	2 1/4	1/4																	
TOTAL																								

DRILLING ASSEMBLY (At End of Tour)

NO.	DESCRIPTION	LENGTHS
	KB	.24 m
1	JUNK SUB	.84 m
1	BIT SUB/FLOAT	.80 m
3	DCs 197	85.36 m
1	X/O	.77 m
1	SHOCK SUB	3.04 m
1	NMDC 165	9.14 m
17	DCs 165	156.00 m
1	X/O	.56 m
	BHA	199.75 m
		m
25	D.P. STANDS	m
1	D.P. SINGLES	506-36 m
	KELLYDOWN	m
	TOTAL	m
WT. OF DC		1000 daN
WT. OF STRING		1000 daN

BIT RECORD

BIT NO.	11
SIZE (mm)	222
IADC CODE	7 3 7 B
MFG.	SEC
TYPE	GH87F
SERIAL NO.	654198
JETS (mm)	12.7 12.7 12.7
DEPTH OUT (m)	
DEPTH IN (m)	1546
TOTAL METRES DRILLED (m)	
TOTAL HOURS RUN	

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1,000
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ GEL BASED

TIME	
DENSITY kg/m³	
FUNNEL VIS. - (S/L)	TRIP
W.L. (cm³)	
pH	

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

DESILTER

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

DEGASSER

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

MORNING TOUR

METRES DRILLED

FROM	TO	DRD RMR CORE-C
1546		

LINER SIZE (mm)	S.P.M.
165	94

RECEIVED

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)

DRILLER'S SIGNATURE

DRILLING ASSEMBLY (At End of Tour)

NO.	DESCRIPTION	LENGTHS
	KB	.24 m
1	JUNK SUB	.84 m
1	B/S FLOAT	.80 m
3	DC	28.36 m
1	X/O	.77 m
1	S/S	3.04 m
1	NMDC	9.14 m
17	DC	156.00 m
1	X/O	.56 m
		199.75 m
		m
47	D.P. STANDS	m
XX	D.P. SINGLES	1352.57 m
	KELLYDOWN	8.68 m
	TOTAL	1561 m
WT. OF DC		31.000 1000 daN
WT. OF STRING		52.000 1000 daN

BIT RECORD

BIT NO.	#11
SIZE (mm)	222
IADC CODE	7 3 7 B
MFG.	SEC
TYPE	GH87F
SERIAL NO.	654198
JETS (mm)	12.7 12.7 12.7
DEPTH OUT (m)	
DEPTH IN (m)	1546
TOTAL METRES DRILLED (m)	15
TOTAL HOURS RUN	6 1/2

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DN.
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	NO FILL

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ GEL BASED

TIME	09:30	11:30	15:00
DENSITY kg/m³	1160	1160	1165
FUNNEL VIS. - (S/L)	56	55	59
W.L. (cm³)	7.4	7.3	7.8
pH	8.5	8.5	9.0
PVT	60.2	60.7	62.3

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
H2O-9	4/mm = 54 m³
	hr.
GEL	9
LIG	1
CAUSTIC	1

SOLIDS CONTROL

DESILTER

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

DEGASSER

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

DAY TOUR

METRES DRILLED

FROM	TO	DRD RMR CORE-C
1546	1561	15

LINER SIZE (mm)	S.P.M.
9800	165 95

Sta Pipe 310

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)
1504	5 3/4

DRILLER'S SIGNATURE

DRILLING ASSEMBLY (At End of Tour)

NO.	DESCRIPTION	LENGTHS
	KB	.24 m
1	JUNK SUB	.84 m
1	BIT SUB/FLOAT	.80 m
3	DC	25.36 m
1	X/O	.77 m
1	SHOCK SUB	3.04 m
1	NMDC	9.14 m
17	DC	156.00 m
1	X/O	.56 m
	BHA	199.75 m
		m
48	D.P. STANDS	1363.24 m
	D.P. SINGLES	m
	KELLYDOWN	10.01 m
	TOTAL	m
WT. OF DC		31.000 1000 daN
WT. OF STRING		53.000 1000 daN

BIT RECORD

BIT NO.	#11
SIZE (mm)	222
IADC CODE	7 3 7 B
MFG.	SEC
TYPE	GH87F
SERIAL NO.	654198
JETS (mm)	12.7 12.7 12.7
DEPTH OUT (m)	1572
DEPTH IN (m)	1546
TOTAL METRES DRILLED (m)	26
TOTAL HOURS RUN	11 1/4

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.
6	8	BT	H	S	1/16	IT	TQ	2.3

HOLE CONDITION

HOLE DRAG	1,000
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ GEL BASED

TIME	14:30	20:00	
DENSITY kg/m³	1165	1165	
FUNNEL VIS. - (S/L)	56	56	
W.L. (cm³)	7.7	7.9	
pH	9.0	9.0	
PVT	63.2	63.9	

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
H2O-9	4/mm = 54 m³
H2O-9	4/m @ 5 hrs. = 2.1 m³
BARITE	20 SX

SOLIDS CONTROL

DESILTER

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

DEGASSER

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

EVENING TOUR

METRES DRILLED

FROM	TO	DRD RMR CORE-C
1561	1572	11

LINER SIZE (mm)	S.P.M.
9800	165 94

Sta Pipe 310

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)

DRILLER'S SIGNATURE

FOLD HERE →

DAILY CHECKS — OPR. D.L. R.M.

	OPR. Initial	R.M. Initial
Daily Walk Around Inspection		
Detailed Inspection-Weekly (using checklist)		
HPS Signs Posted (if required)		
Well Licensee & Stick Diagram Posted		
Flare Lines Staked		
BOP Drills Performed		
Visually Inspect BOP's - Flarelines & Degasser Lines		
Rig Site Health and Safety Meeting (one/crew/month)		
C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)		
Mast Inspection Before Raising or Lowering		
Crown Saver Checked		
Motor Kills checked		

YEAR 97 MONTH 01 DAY 03

RIG NO. ONE

FUEL @ 8:00

RIG | BOILER

WEATHER

TEMPERATURE °C	
CURRENT CONDITIONS	
WIND DIRECTION	
ROAD	

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244	224	53.57	PRUD	J-55	33	435.65	4.74	434
TUBING OR LINER									

	DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
	102	2089	E		129	F.H	180	PZ9	G-D	229
								D-375	EMSCO	356

21 22 23 24 25 26

SAFETY MTG. JUNK IN SUB

1/4

TOTALS

SHALE SHAKER(S)

NO. TYPE

8 SCREENS CHANGED ☐ YES ☐ NO

TOP 175 TOP

MIDDLE 175 MIDDLE

BOTTOM 175 BOTTOM

RENTALS/SERVICES

RECORD

MORNING TOUR

CASED

SOLIDS CONTROL

DESILTER

	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

METRES DRILLED

FROM	TO	DRD RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1546			—	—

PUMP(S)

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9460	165	94	140	—

REDUCED PUMP SPEED

@ @

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER SIGNATURE

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.
0000	0015	1/4	7
0015	0200	1 3/4	6
0200	0630	4 1/2	8
0630	0730	1	6
0730	0800	1/2	5
ANTICIPATED		7 00	
MUD	/	500	OFF 1.11 m³.

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

NOTES ANNULAR 7 SEC C/O / UPPER RAMS 5 SECS C/O

REMOTE CHOKE 22 SEC C/O

BOILER HRS RUN | STACK TEMP | DOWN EXPERIENCED | DOWNLOAD | SAFETY TOPIC

8 9 11 434

RECORD

DAY TOUR

CASED 15:00

	1166
	59
	7.8
	7.0
	62.2

SOLIDS CONTROL

DESILTER

	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENT

	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

METRES DRILLED

FROM	TO	DRD RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1546	1561	15	78	16

PUMP(S)

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9800	165	95	140	

REDUCED PUMP SPEED

Std. Pipe @ 100 @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
1514	5 3/4	42 Az.

DRILLER SIGNATURE

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.
08:00	08:15	1/4	7
08:15	08:45	1/2	8
08:45	09:00	1/4	22
09:00	12:45	3 3/4	2
12:45	13:15	1/2	10
13:15	16:00	2 3/4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

RIG SERVICE ✓ ANNULAR & REMOTE CHOKE.

~~DRILL~~ FINISH IN HOLE, WASH TO BTM 5M.

WORK JUNK SUB NO FILL

DRILL 1546 - 1555

SURVEY AT 1514 - 5 3/4 - 42 AZ.

DRILL 1555 - 1561

NOTES ANNULAR 9 SEC C/O ; ✓ MOTOR KILLS & CROWN SAVER O.K.

REMOTE CHOKE 22 SEC C/O ;

BOILER HRS RUN | STACK TEMP | DOWN EXPERIENCED | DOWNLOAD | SAFETY TOPIC

8 9

RECORD

EVENING TOUR

CASED 1

	1
	1
	2

SOLIDS CONTROL

DESILTER

	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENT #2

	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

METRES DRILLED

FROM	TO	DRD RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1561	1572	11	78	16

PUMP(S)

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
4800	165	94	140	

REDUCED PUMP SPEED

Std. Pipe @ 200 @ 55

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER SIGNATURE

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.
16:00	16:15	1/4	7
16:15	21:00	4 3/4	2
21:00	21:45	3/4	5
21:45	24:00	2 1/4	6

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

RIG SERVICE ✓ ANNULAR & REMOTE CHOKE.

DRILL 1561 -

CIRC OF SAMPLE.

HOIST PIPE 11 FLOWS

NOTES ANNULAR 9 SEC C/O -38'

REMOTE CHOKE 22 SEC C/O

BOILER HRS RUN | STACK TEMP | DOWN EXPERIENCED | DOWNLOAD | SAFETY TOPIC

8 9 DT 7.00 11 514

RECEIVED JAN 09 1997 CACTUS DRILLING NISKU

#32 000593

FOLD HERE →

LICENCE NO.: 9214 UB 1-1 | WELL NAME AND NO.: UCEL-LIARD K02

OPERATOR: UNOCAL EXPLORATION LTD.

CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30

UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE:

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS OPR: D.L. T.R.M.

(1) Daily Walk Around Inspection
(2) Detailed Inspection-Weekly (using checklist)
(3) H²S Signs Posted (if required)
(4) Well License & Stick Diagram Posted
(5) Flare Lines Staked
(6) BOP Drills Performed
(7) Visually Inspect BOP's - Flarelines & Degasser Lines

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

RIG

WEATHER

TIME - HRS

CODE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC.	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV. SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.			
MORN.			3		3/4	4	1/4																	
DAY		6 1/2	1 1/4				1 1/4																	
EVE.		7 1/2					1/4																	
TOTAL																								

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
	KB		.24 m
1	JUNK SUB		.54 m
1	BIT SUB/FLOAT		.50 m
3	DC		25.36 m
1	X/O		.77 m
1	SHOCK SUB		3.04 m
1	NMDC		9.14 m
17	DC		156.00 m
1	X/O		.56 m
	BHA		199.35 m
			m
48	D.P.	STANDS	1362.24 m
	D.P.	SINGLES	m
	KELLYDOWN		10.01 m
	TOTAL		1572.00 m
WT. OF DC		31 000	1000 daN
WT. OF STRING		54,000	1000 daN

BIT RECORD

BIT NO.	#12.
SIZE (mm)	222
IADC CODE	
MFG.	H.W
TYPE	ATJ-77
SERIAL NO.	T33WG
JETS (mm)	12 12 12 12
DEPTH OUT (m)	
DEPTH IN (m)	1572.
TOTAL METRES DRILLED (m)	
TOTAL HOURS RUN	

CUTTING STRUCTURE: T_i | T_o | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1,000
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASE

TIME	T.	T.	06:30
DENSITY kg/m³	T	T	1165
FUNNEL VIS. - (S/L)	R	R	59
W.L. (cm³)			7.4
pH	P	P	9.0
PVT			65.7

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
DRIWATE	25x.
H20	2½ HRS = 1.35 m³

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
	0			

METRES

FROM	TO
1512	

CASING

	LINER SIZE (mm)
7800	165

DEVIATION

STORAGE @

DEPTH (m)	DEVI

MORNING TOUR

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
	KB		.24 m
1	JUNK SUB		.84 m
1	B/S FLOAT		.80 m
3	8" DC		28.36 m
1	BE X/O		.77 m
1	S/S		3.04 m
1	NMDC		9.14 m
17	DC		156.00 m
1	X/O		.56 m
			199.35 m
			m
48	D.P.	STANDS	m
XX	D.P.	SINGLES	1381.12 m
	KELLYDOWN		4.83 m
	TOTAL		1586 m
WT. OF DC		28,000.	1000 daN
WT. OF STRING		55,000	1000 daN

BIT RECORD

BIT NO.	# 12
SIZE (mm)	222
IADC CODE	
MFG.	HW
TYPE	ATJ-77
SERIAL NO.	T33WG
JETS (mm)	12 12 12
DEPTH OUT (m)	
DEPTH IN (m)	1572.
TOTAL METRES DRILLED (m)	14
TOTAL HOURS RUN	6½

CUTTING STRUCTURE: T_i | T_o | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DN.
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASE

TIME	07:30	11:30	14:30
DENSITY kg/m³	1165	1165	1165
FUNNEL VIS. - (S/L)	58	58	56
W.L. (cm³)	7.8	7.4	7.4
pH	8.5	9.5	9.0
PVT	66.8	66.8	56.1

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
H₂O - 9 m³/hr = 54 m³/hr	4.32 m³
VAC 10 m³ Sucker	
CAUSTIC	1
LIG	1

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
#5	3	1095	2310	

METRES

FROM	TO
1572	1586

CASING

	LINER SIZE (mm)
9700	165

DEVIATION

S.D. PIPE @

DEPTH (m)	DEVIAT

DAY TOUR

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
	KB		.24 m
1	JUNK SUB		.54 m
1	B/S FLOAT		.50 m
3	DC		28.36 m
1	X/O		.77 m
1	SHOCK SUB		3.04 m
1	NMDC		9.14 m
17	DC		156.00 m
1	X/O		.56 m
	BHA		199.35 m
			m
49	D.P.	STANDS	139.01 m
	D.P.	SINGLES	m
	KELLYDOWN		9.24 m
	TOTAL		1600.00 m
WT. OF DC		31 000	1000 daN
WT. OF STRING		55.000	1000 daN

BIT RECORD

BIT NO.	# 12
SIZE (mm)	222
IADC CODE	
MFG.	H-W
TYPE	ATJ-77
SERIAL NO.	T33WG
JETS (mm)	12 12 12
DEPTH OUT (m)	
DEPTH IN (m)	1572
TOTAL METRES DRILLED (m)	28
TOTAL HOURS RUN	14¼

CUTTING STRUCTURE: T_i | T_o | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☐ WATER BASED ☐ OIL BASE

TIME	16:00	19:00	22:00
DENSITY kg/m³	1160	1160	1162
FUNNEL VIS. - (S/L)	57	54	64
W.L. (cm³)	7.6	8.0	7.6
pH	9.0	9.0	9.5
PVT	59.4	59.7	60.9

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	20 SX
Caustic	1 SX
LIG	1 SX
H2O - 9 m³/hr = 54 m³/hr	
8 HRS = 4.32 m³	

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
	0			

METRES

FROM	TO
1586	1600

CASING

	LINER SIZE (mm)
9600	165

DEVIATION

SD PIPE @

DEPTH (m)	DEVIATIO

EVENING TOUR

FOLD HERE →

CHECKS — OPR. D.F.R.M.

- Walk Around Inspection — Initial DF / Initial
- ...ed Inspection-Weekly (using checklist) — Initial / Initial
- Signs Posted (if required) — Initial DF / Initial
- License & Stick Diagram Posted — Initial MG / Initial
- ...Lines Staked — Initial / Initial
- ...Drills Performed — Initial / Initial
- ...ly Inspect BOP's - Flarelines, & Degasser Lines — Initial DF / Initial
- ...ite Health and Safety Meeting (one/crew/month) — Initial
- D.D.C. Rig Safety Inspection Checklist (one/rig/month) — Initial
- ...Inspection Before Raising or Lowering — Initial
- ...n Saver Checked — Initial
- ...Kills checked — Initial

YEAR	MONTH	DAY
97	01	04

RIG NO. ONE

FUEL @ 8:00

RIG | BOILER

WEATHER: TEMPERATURE −5 °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

LAST CASING / TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
244	229	53.57	IPSCO	J-55	33	435.68	1.74	434

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.54	E		129	FH	100	PZP	G-D	227
							D-375	EMSCO	356

22	23	24	25	26

TOTALS: 8 / 8 / 8

SHALE SHAKER(S)

NO. | TYPE

SCREENS CHANGED ☐ YES ☑ NO

TOP 175 | TOP

MIDDLE 175 | MIDDLE

BOTTOM 175 | BOTTOM

RENTALS/SERVICES

D

OT BASED

	06:30
	1165
	59
	1.4
	9.0
	65.1

DLES CONTROL

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

MORNING TOUR

METRES DRILLED

FROM	TO	DRLD RMR CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1512				

DESCRIPTION | SUMP/MUD | PUMPING

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9800	165	94	140	—

REDUCED PUMP SPEED

SWIFE @ @

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
1512	SMART	0.4
1547		0.7
		0.2

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	EMP.	CODE
2:00	01:15	1¼	6
01:15	01:30	¼	7
01:30	03:30	2	6
03:30	04:15		5
04:15	07:00		6
5:00			

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

HOIST BIT #11 FLOAT & COLLARS.
RIG SERVICE ✓ ANNULAR & REMOTE CHOKE.
MAKE UP BIT RIH TO 1200m
CIRC BTMS UP.
RIH W/ DRILL 2 SINGLES.
WASH F 1514m → 1570 (½ DRN.)
UNDER GAGE 5mm.

ANTICIPATED 770m³
ACTUAL 896m³
DIFF 1.26m³

NOTES ANNULAR ¾ 10SEC
REMOTE CHOKE ¾ 22SEC.

BOILER | PRESS | RPM | STACK TEMP | MUD WT | EXPERIENCED HOOKLOAD | SLACK OFF | TORQUE

5 | 4.0 | 63,000 | 11.5/9

DAY TOUR

METRES DRILLED

FROM	TO	DRLD RMR CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1572	1586	14	60	16

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9700	165	94	140	

REDUCED PUMP SPEED

STD PIPE @ 30 @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	EMP.	CODE
08:00	09:15	1¼	3
09:15	09:30	¼	7
09:30	16:00	6½	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

REAM 1570-1572, WORK JUNK SUB.
RIG SERVICE ✓ ANNULAR & REMOTE CHOKE.
DRILL 1572 - 1586

NOTES ANNULAR 9 SEC ¾ / WORK JUNK SUB ON CONNECTIONS!
REMOTE CHOKE 22 SEC ¾,

BOILER | PRESS | RPM | STACK TEMP | MUD WT | EXPERIENCED HOOKLOAD | SLACK OFF | TORQUE

8 | 9 | 11519

EVENING TOUR

METRES DRILLED

FROM	TO	DRLD RMR CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1586	1600	14	60	16

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9600	165	94	140	

REDUCED PUMP SPEED

STD PIPE @ 70 @ 55

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	EMP.	CODE
16:00	16:15	¼	7
16:15	24:00	7¾	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

RIG SERVICE ✓ ANNULAR & REMOTE CHOKE
DRILL 1586m - 1600 m

RECEIVED
JAN 16 1997
CACTUS DRILLING
AGENT

NOTES ANNULAR 9 SEC ¾ WORK JUNK SUB ON CONNECTIONS
REMOTE CHOKE 22 SEC ¾

BOILER | PRESS | RPM | STACK TEMP | MUD WT | EXPERIENCED HOOKLOAD | SLACK OFF | TORQUE

8 | 9 | 11517

000594

FOLD HERE →

LICENCE NO.: 9211-U18-1-1
WELL NAME AND NO.: UCOL LIZARD K-02 60-20-123-30
OPERATOR: UNOCAL EXPLORATION LTD.
CONTRACTOR: CACTUS DRILLING
SURFACE LOCATION: 60-20-123-30
UNIQUE ID.:
SIGNATURE OF OPERATOR'S REPRESENTATIVE:
SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS — OPR. / R.M.

	OPR. Initial	R.M. Initial
(1) Daily Walk Around Inspection		
(2) Detailed Inspection-Weekly (using checklist)		
(3) H²S Signs Posted (if required)		
(4) Well License & Stick Diagram Posted		
(5) Flare Lines Staked		
(6) BOP Drills Performed		
(7) Visually Inspect BOP's - Flarelines & Degasser Lines		
(1) Rig Site Health and Safety Meeting (one/crew/month)		
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)		
(3) Mast Inspection Before Raising or Lowering		
(4) Crown Saver Checked		
(5) Motor Kills checked		

TIME-HRS

CODE NO.	1 OPER.	2 RIG UP & TEAR DOWN	3 DRILL ACTUAL	4 REAMING	5 CORING	6 COND. MUD & CIRC	7 TRIPS	8 RIG SERVICE	9 REPAIR RIG	10 CUT OFF DRILL LINE	11 DEV. SURVEY	12 WIRE LINE LOGS	13 RUN CASE & CEMENT	14 WAIT ON CEMENT	15 NIPPLE UP B.O.P.	16 TEST B.O.P.	17 DRILL STEM TEST	18 PLUG BACK	19 SQUEEZE CEMENT	20 FISHING	21 DIR. WORK	22 SAFETY MTG.	23 WORK PIPE	24 WTD
MORN.			5 3/4				1 1/2	1/4															1/2	
DAY							7	1/4																1/2
EVE.			7 3/4					1/4																
TOTAL			13 1/2				8 3/4	3/4															1/2	1/2

DRILLING ASSEMBLY (At End of Tour)

ENG.			LEN. STD.
	DRILL BIT		.24 m
1	JUNK SUB		.24 m
1	B/S FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.041 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			199.75 m
			m
49	D.P.	STANDS	1400.53 m
X	D.P.	SINGLES	m
	KELLY DOWN		9.72 m
	TOTAL		1610 m
WT. OF DC		28,000	1000 daN
WT. OF STRING		55,000	1000 daN

BIT RECORD

BIT NO.	#12
SIZE (mm)	222
IADC CODE	
MFG.	H-N
TYPE	ATI-77
SERIAL NO.	T33W6
JETS (mm)	12.7 12.7 12.7
DEPTH OUT (m)	
DEPTH IN (m)	1572.
TOTAL METRES DRILLED (m)	38
TOTAL HOURS RUN	20

CUTTING STRUCTURE T1	T2	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DAN.
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	00:30	03:30	06:00
DENSITY kg/m³	1165	1165	1160
FUNNEL VIS. - (S/L)	64	61	56
W.L. (cm³)	7.5	7.6	
pH	9.5	9.0	9.0
PVT	62.2	63.7	66

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
H2O	94 m³

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			
CENT				
	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			

MORNING TOUR

METRES

FROM	TO	LINER SIZE (mm)
1600	1610	
9300		165
STD. PIPE		

DEPTH (m) | DE

DRILLING ASSEMBLY (At End of Tour)

ENG.			LEN. STD.
	DRILL BIT		.24 m
1	B/S FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		2.97 m
1	NMDC	165	9.14 m
16	DC	165	146.73 m
1	X/O		.56 m
	DART		159.5 m
			m
			m
49	D.P.	STANDS	m
XX	D.P.	SINGLES	1409.90 m
	KELLY DOWN		10.53 m
	TOTAL		1610.00 m
WT. OF DC		27,000	1000 daN
WT. OF STRING		53,000	1000 daN

BIT RECORD

BIT NO.	#12	#13
SIZE (mm)	222	222
IADC CODE		737
MFG.	H-N	H-N
TYPE	ATI-77	ATJ-77D
SERIAL NO.	T33W6	X16-WN
JETS (mm)	12.7 12.7 12.7	12.7 12.7 12.7
DEPTH OUT (m)	1610	
DEPTH IN (m)	1572	1610
TOTAL METRES DRILLED (m)	38	
TOTAL HOURS RUN	20	

CUTTING STRUCTURE T1	T2	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.
6	5	6	H	E	1	FC	WT	

HOLE CONDITION

HOLE DRAG	1000 DAN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	NO FILL

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME			15:00
DENSITY kg/m³			11.55
FUNNEL VIS. - (S/L)	TRIP		63
W.L. (cm³)			9.0
pH			9.0
PVT			65.9

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
H2O	54 m³

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			

DAY TOUR

METRES

FROM	TO	LINER SIZE (mm)
1610		
9800		165
STD. PIPE		

DEPTH (m) | DEVIA

TRIP VOL
ACTUAL — 93
ANTICIPATED — 77
+ 16

DRILLING ASSEMBLY (At End of Tour)

ENG.			LEN. STD.
	DRILL BIT		.24 m
1	B/S FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		2.97 m
1	NMDC	165	9.14 m
16	DC	165	146.73 m
1	X/O		.56 m
	DART		159.5 m
			m
			m
50	D.P.	STANDS	m
X	D.P.	SINGLES	1427.36 m
	KELLY DOWN		6.12 m
	TOTAL		1624 m
WT. OF DC		27,000	1000 daN
WT. OF STRING		53,000	1000 daN

BIT RECORD

BIT NO.	#13
SIZE (mm)	222
IADC CODE	737
MFG.	H-W
TYPE	ATJ-77D
SERIAL NO.	X16-WN
JETS (mm)	12.7 12.7 12.7
DEPTH OUT (m)	
DEPTH IN (m)	1610
TOTAL METRES DRILLED (m)	14
TOTAL HOURS RUN	7 3/4

CUTTING STRUCTURE T1	T2	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DN.
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	17:00	19:30	22:30
DENSITY kg/m³	1160	1160	1160
FUNNEL VIS. - (S/L)	63	60	56
W.L. (cm³)	8.0	8.4	7.5
pH	9.0	9.0	9.0
PVT	66.1	66.6	66.2

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
VAL-T	3 sacks
H2O	94 m³

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			
CENT				
	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			

EVENING TOUR

METRES D

FROM	TO	LINER SIZE (mm)
1610	1624	
9800		165
STD. PIPE		

DEPTH (m) | DEVIATI

FOLD HERE →

CHECKS	OPR.	R.M.
Walk Around Inspection	Initial	Initial
Inspection-Weekly (using checklist)	Initial	Initial
Signs Posted (if required)	Initial	Initial
Licenses & Stick Diagram Posted	Initial	Initial
Areas Staked	Initial	Initial
Drills Performed	Initial	Initial
Inspect BOP's - Flarelines & Degasser / lines	Initial	Initial
Safety Health and Safety Meeting (one/crew/month)		Initial
H.S.E. Rig Safety Inspection Checklist (one/rig/month)		Initial
Inspection Before Raising or Lowering		Initial
Blowout Preventer Checked		Initial
Derrick checked		Initial

YEAR 1997 | MONTH JAN | DAY 10

RIG NO. ONE.

FUEL @ 8:00

RIG 165 | BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244	229	53.57	PRUD	J-55	33	435.68	4.74	434
TUBING OR LINER									

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.86	E		129	FH	180	P-29	G-D.	229
							D-375	EMSCO	356

22	23	24	25	26
WORK PIPE	W.T.D.			
1/2	1/2			
1/2	1/2			

TOTALS: 8 / 8 / 8 / 24

SHALE SHAKER(S): NO. 1 TYPE FLOWLINE CLEANER; SCREENS CHANGED ☐ YES ☑ NO; TOP 175; MIDDLE 175; BOTTOM 175

RENTALS/SERVICES

MORNING TOUR

MUD CLOSED	
6	06:00
	1160
	56
	9.0
7	66

DRILLS CONDUCTED

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENT

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1600	1610	10	60	16

PUMP NO.	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9300	165	94	140	

REDUCED PUMP SPEED

STD. PIPE @ 300 @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
00:00	00:15	1/4	7
00:15	06:00	5 3/4	2
06:00	06:30	1/2	22
06:30	08:00	1 1/2	6

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

RIG SERVICE ✓ ANNULAR + REMOTE CHOKE.
DRILL 1600 - 1610
WORKPIPE. ✓ FOR WASH, 300 KPA LOSS.
HOIST WET FOR WASH, CHAIN OUT. FLOW ✓
AS PER REGULATIONS.
P.V.T. START TRIP 65.8 m³
HELD SAFETY MEETING WITH S.O.S.
SAFETY SERVICE.

NOTES: ANNULAR 9 SEC C/O
REMOTE CHOKE 22 SEC C/O

BOP DRILL	HRS RAM	HRS ANN	STACK TEMP	MAX MUD EXPERIENCED	MUD LOSS	SAFETY MTG	DAILY COST
	8	9					11514

DAY TOUR

MUD CLOSED	
15:00	
11:55	
63	
9.0	
9.0	
65.9	

DRILLS CONDUCTED

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENT

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1610			60	

PUMP NO.	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9800	165	94	140	

REDUCED PUMP SPEED

STD PIPE @ 50 @

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
TRIP VOLUME CALCULATED		
ACTUAL -	9.35 m³	
ANNULAR -	7.10 m³	
+	165 m³	

DRILLER SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
08:00			6
	15:15	7 1/4	
15:15	15:30	1/4	7
15:30	16:00	1/2	23

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

HOIST WET FOR WASH CHAIN OUT FLOW ✓
AS PER REGULATIONS HANDLE B.H.A CHANGE
SHOCK SUB + LAY DOWN 1 CRACKED D.C.
CHANGE BIT + R.I.H BREAK CIRC AND FLOW ✓
AT 1155 m. R.I.H.
RIG SERVICE ✓ ANNULAR + REMOTE CHOKE
WASH FROM 1595 m - 1610 m NO FILL
P.V.T. START TRIP 65.8 m³
P.V.T. OUT OF HOLE 56.3 m³
DIFF 9.5

NOTES: FUNCTION BLIND RAMS WHEN OUT OF HOLE 9/0 4 SECS, CHANGE WORKING SINGLE, ANNULAR 9 SEC 9/0 REMOTE CHOKE 22 SEC 9/0

BOP DRILL	HRS RAM	HRS ANN	STACK TEMP	MAX MUD EXPERIENCED	MUD LOSS	SAFETY MTG	DAILY COST
	8	9		59 000			11517

EVENING TOUR

MUD CLOSED	
12:30	
11:60	
58	
7.3	
9.6	
60.2	

DRILLS CONDUCTED

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENT

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1610	1624	14	60	15

PUMP NO.	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9800	165	94	140	

REDUCED PUMP SPEED

STD PIPE @ 600 @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
16:00	17:00	1	2
17:00	17:15	1/4	7
17:15	24:00	6 3/4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

DRILL 1610 m - 1624 m
RIG SERVICE ✓ ANNULAR + REMOTE CHOKE
DRILL 1624 m - 1624

RECEIVED
JAN 16 1997
CACTUS DRILLING
N.SKU

NOTES: ANNULAR 9 SEC C/O
REMOTE CHOKE 22 SEC C/O

BOP DRILL	HRS RAM	HRS ANN	STACK TEMP	MAX MUD EXPERIENCED	MUD LOSS	SAFETY MTG	DAILY COST
	8	9					11517

H 34

000595

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LICENCE NO.: 9211-U18-1-1 | WELL NAME AND NO.: ACEL LEARD K-02.

OPERATOR: UNOCAL EXPLORATION LTD. | CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30 | UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE: [signature] | SIGNATURE OF CONTRACTOR'S RIG MANAGER: [signature]

DAILY CHECKS — OPR. / R.M.

	OPR.	R.M.
(1) Daily Walk Around Inspection	Initial	Initial
(2) Detailed Inspection-Weekly (using checklist)	Initial	Initial
(3) HPS Signs Posted (if required)	Initial	Initial
(4) Well Licence & Stick Diagram Posted	Initial	Initial
(5) Flare Lines Staked	Initial	Initial
(6) BOP Drills Performed	Initial	Initial
(7) Visually Inspect BOP's - Flarelines & Degasser Lines	Initial	Initial
(1) Rig Site Health and Safety Meeting (one/crew/month)		Initial
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)		Initial
(3) Mast Inspection Before Raising or Lowering		Initial
(4) Crown Saver Checked		Initial
(5) Motor Kills checked		Initial

TIME HRS

CODE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
OPER.	HIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV. SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.			
MORN.		7 3/4					1/4															CORORIG		
DAY		7 1/2					1/4															1/4		
EVE.		7 3/4					1/4																	
TOTAL		23					3/4															1/4		

DRILLING ASSEMBLY (At End of Tour)

NO.	OD		LENGTH
			.24 m
1	8 1/2 FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		2.97 m
1	NMDC	165	9.14 m
16	DC	165	146.73 m
1	X/O		.56 m
			189.57 m
			m
			m
50	D.P.	STANDS	m
XX	D.P.	SINGLES	1438.06 m
	KELLYDOWN		9.37 m
	TOTAL		1637 m
WT. OF DC			27,000 1000 daN
WT. OF STRING			53,000 1000 daN

BIT RECORD

BIT NO.	#13
SIZE (mm)	222
IADC CODE	7 3 7
MFG.	H-W
TYPE	ATJ-77D
SERIAL NO.	X16-WN
JETS (mm)	3/12.7
DEPTH OUT (m)	
DEPTH IN (m)	1610
TOTAL METRES DRILLED (m)	27
TOTAL HOURS RUN	15 1/2

CUTTING STRUCTURE

T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DN.
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASE

TIME	01:00	03:30	06:30
DENSITY kg/m³	1160	1160	1160
FUNNEL VIS. - (S/L)	53	52	52
W.L. (cm³)	7.1	6.1	6.8
pH	9.0	9.0	9.0
	61.5	63.9	63.4

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	18
CAUSTIC	1
DESCO	1
7 1/2 m.m	.42 m³/hr

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
	0			
CENT #2				
	0			

MORNING TOUR

FROM	TO
1624	1637
9800	165
STD. PIPE	
DEPTH (m)	DE

DRILLING ASSEMBLY (At End of Tour)

NO.	OD		LENGTH
			.24 m
1	8 1/2 FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		2.97 m
1	NMDC	165	9.14 m
16	DC	165	146.73 m
1	X/O		.56 m
			189.57 m
			m
			m
51	D.P.	STANDS	1441.69 m
	D.P.	SINGLES	m
	KELLYDOWN		9.75 m
	TOTAL		1647.00 m
WT. OF DC			27,000 1000 daN
WT. OF STRING			53,000 1000 daN

BIT RECORD

BIT NO.	#13
SIZE (mm)	222
IADC CODE	7 3 7
MFG.	H-W
TYPE	ATJ-77D
SERIAL NO.	X16-WN
JETS (mm)	12 12 12
DEPTH OUT (m)	
DEPTH IN (m)	1610
TOTAL METRES DRILLED (m)	37
TOTAL HOURS RUN	23

CUTTING STRUCTURE

T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASE

TIME	09:00	12:00	15:00
DENSITY kg/m³	1160	1160	1160
FUNNEL VIS. - (S/L)	59	59	57
W.L. (cm³)	7.8	7.8	8.0
pH	9.0	9.0	9.0
F.V.T	61.5	65.3	61.6

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
CAUSTIC	1
DESCO	1
BIT	2.85 m³
04/m	.36 m³/hr
AT 14:00	BUCKED OUT 3.9 m³

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
	0			
CENT #2				
	0			

DAY TOUR

FROM	TO
1637	1647
9800	165
STD. PIPE	
DEPTH (m)	DEVI

DRILLING ASSEMBLY (At End of Tour)

NO.	OD		LENGTH
			24 m
1	8½ CSG		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		2.97 m
1	NMDC	165	9.14 m
16	DC	165	146.72 m
1	X/O		.56 m
			189.57 m
			m
			m
51	D.P.	STANDS	m
X	D.P.	SINGLES	1456.81 m
	KELLYDOWN		9.62 m
	TOTAL		1656 m
WT. OF DC			27.000 1000 daN
WT. OF STRING			53.000 1000 daN

BIT RECORD

BIT NO.	#13
SIZE (mm)	222
IADC CODE	7 3 7
MFG.	H-W
TYPE	ATJ-77D
SERIAL NO.	X16-WN
JETS (mm)	12 12 12
DEPTH OUT (m)	
DEPTH IN (m)	1610
TOTAL METRES DRILLED (m)	46
TOTAL HOURS RUN	30 3/4

CUTTING STRUCTURE

T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DN.
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASE

TIME	1800	19:30	22:30
DENSITY kg/m³	1160	1165	1165
FUNNEL VIS. - (S/L)	58	63	60
W.L. (cm³)	8.1	6.8	7.2
pH	8.5	9.0	9.5
F.V.T	61.9	62.1	63.1

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	19
CAUSTIC	1
DRISPAC	1
DESCO	2.

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
CENT #2				

EVENING TOUR

FROM	TO
1647	1656
10000	165
STD. PIPE	
DEPTH (m)	DEVIAT

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DAILY CHECKS — OPR. R.M.

	OPR.	R.M.
Daily Walk Around Inspection	Initial	Initial
Detailed Inspection-Weekly (using checklist)	Initial	Initial
WPS Signs Posted (if required)	Initial	Initial
Well Licenses & Stick Diagram Posted	Initial	Initial
Flare Lines Staked	Initial	Initial
BOP Drills Performed	Initial	Initial
Visually Inspect BOP's - Flarelines & Degasser Lines	Initial	Initial
Rig Site Health and Safety Meeting (one/crew/month)		Initial
H.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)		Initial
Hoist Inspection Before Raising or Lowering		Initial
Crown Saver Checked		Initial
Motor Kills checked		Initial

YEAR 1997 | MONTH JAN | DAY 11

RIG NO. ONE.

FUEL @ 8:00

RIG 102. | BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244	229	53.57	IPSCO.	J-55	33	1335.68	4.74	4364
TUBING OR LINER									

	DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
	102	70.86	E		129	FH	180	PZ9	G-D	229
								D-375	EMSCO	356

21	22	23	24	25	26
ETY G.	BOTORIL				
	1/4				
	1/4				

TOTALS

	SHALE SHAKER(S)	RENTALS/SERVICES
	NO. 1 TYPE FLOWLINE CLEANER	
8	SCREENS CHANGED ☐ YES ☑ NO	
8	TOP 175	TOP
8	MIDDLE 175	MIDDLE
24	BOTTOM 175	BOTTOM

MORNING TOUR

RD

METRES DRILLED

FROM	TO	BIT RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1624	1637	13	60	15

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9800	165	94	140	

REDUCED PUMP SPEED

STD. PIPE @ 1200 @ 55

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER SIGNATURE

TIME LOG

FROM	TO	HRS	CODE	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
00:00	00:15	1/4	7	RIG SERVICE / ANNULAR & REMOTE CHOKE.
00:15	08:00	7 3/4	2	DRILL 1624 - 1637

NOTES ANNULAR 9 SEC C/O
REMOTE CHOKE 22 SEC C/O

8 | 9

115.7

DAY TOUR

METRES DRILLED

FROM	TO	BIT RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1637	1641	10	60	18

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9800	165	94	140	

REDUCED PUMP SPEED

STD PIPE @ 300 @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER SIGNATURE

TIME LOG

FROM	TO	HRS	CODE	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
05:00	11:15	5 1/4	2	DRILL 1637m - 1640m
11:15	11:30	1/4	22	B.O.P DRILL - WELL SECURE TO SEC
11:30	11:45	1/4	7	RIG SERVICE / ANNULAR + REMOTE CHOKE
11:45	15:00	3 1/4	2	DRILL 1640m - 1647m

NOTES ANNULAR 9 SEC C/O
REMOTE CHOKE 29 SEC C/O

8 | 9 | 54,000

115.9

EVENING TOUR

METRES DRILLED

FROM	TO	BIT RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1647	1656	9	60	18

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
10000	165	94	140	

REDUCED PUMP SPEED

STD PIPE @ 330 @ 52

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER SIGNATURE

TIME LOG

FROM	TO	HRS	CODE	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
16:00	17:00	1	2	DRILL 1647m - 1649m
17:00	17:15	1/4	7	RIG SERVICE / ANNULAR + REMOTE CHOKE
17:15	24:00	6 3/4	2	DRILL 1649m - 1656

NOTES ANNULAR 9 SEC C/O
REMOTE CHOKE 22 SEC C/O

8 | 9

115.4

RECEIVED
JAN 16 1997
CACTUS DRILLING
NISKU

#35

000596

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LICENCE NO.: 9211-018-1-1

WELL NAME AND NO.: ACCEL LAIRD K-02

OPERATOR: UNOCAL EXPLORATION LTD.

CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-173-30

UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE:

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS — OPR'D. / R.M.

(1) Daily Walk Around Inspection — Initial / Initial
(2) Detailed Inspection-Weekly (using checklist) — Initial / Initial
(3) H²S Signs Posted (if required) — Initial / Initial
(4) Well License & Stick Diagram Posted — Initial / Initial
(5) Flare Lines Staked — Initial / Initial
(6) BOP Drills Performed — Initial / Initial
(7) Visually inspect BOP's - Flarelines & Drgasser Lines. — Initial / Initial

(1) Rig Site Health and Safety Meeting (one/crew/month) — Initial
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month) — Initial
(3) Mast Inspection Before Raising or Lowering — Initial
(4) Crown Saver Checked — Initial
(5) Motor Kills checked — Initial

TIME - HRS

CODE NO.	OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC.	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV. SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRIL. STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	MORN.		1			1 1/4	4 1/2	1/4		1												
	DAY									1/2		7 1/2										
	EVE.											8										
	TOTAL		1			1 1/4	4 1/2	1/4		1 1/2		15 1/4										

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			.24 m
1	B/S FLOAT		.80 m
3	DC	197	18.36 m
1	X/O		.77 m
1	S/S		2.97 m
1	NMDC	165	9.14 m
16	DC	165	146.73 m
1	X/O		.56 m
			189.57 m
			m
			m
51	D.P.	STANDS	m
X	D.P.	SINGLES	1456.81 m
	KELLYDOWN		10.62 m
	TOTAL		1657 m
WT. OF DC			27,000 1000 daN
WT. OF STRING			53,000 1000 daN

BIT RECORD

BIT NO.	#13
SIZE (mm)	222
IADC CODE	7 3 7
MFG.	H-W
TYPE	ATJ-77D
SERIAL NO.	X16-WN
JETS (mm)	3/12.7.
DEPTH OUT (m)	1657
DEPTH IN (m)	1610
TOTAL METRES DRILLED (m)	47
TOTAL HOURS RUN	31 3/4

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.
7	7	FC	A	E	I	BT	LOG	1.48

HOLE CONDITION

HOLE DRAG	1000 S.O.
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	NO FILL ON WIPER TRIP.

MUD RECORD

MUD TYPE: ☐ WATER BASED ☐ OIL BASED

TIME	0300
DENSITY kg/m³	1165
FUNNEL VIS. - (S/L)	88
W.L. (cm³)	6.2
pH	9.5
	65.3

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	20
DRIS PAC	1
DESCO	1
BARITE	40

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			m
			m
			m
			m
			m
			m
			m
			m
			m
			m
			m
	D.P.	STANDS	m
	D.P.	SINGLES	m
	KELLYDOWN		m
	TOTAL		m
WT. OF DC			1000 daN
WT. OF STRING			1000 daN

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HOURS RUN	

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☐ WATER BASED ☐ OIL BASED

TIME	
DENSITY kg/m³	
FUNNEL VIS. - (S/L)	
W.L. (cm³)	
pH	

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			m
			m
			m
			m
			m
			m
			m
			m
			m
			m
			m
	D.P.	STANDS	m
	D.P.	SINGLES	m
	KELLYDOWN		m
	TOTAL		m
WT. OF DC			1000 daN
WT. OF STRING			1000 daN

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HOURS RUN	

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☐ WATER BASED ☐ OIL BASED

TIME	
DENSITY kg/m³	
FUNNEL VIS. - (S/L)	
W.L. (cm³)	
pH	

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

DAY TOUR

METRE

FROM	TO
1656	1657

	LINER SIZE (mm)
10,600	165

S.O. PUMP

DEPTH (m)	DEV
WIPER TRIP	
ACTUAL	
CALC.	
—	+

BRINE UP CASING

METRES D

FROM	TO

	LINER SIZE (mm)
	165

DEPTH (m)	DEVIATION
P.U.T. A	08:00
P.U.T. A	16:00

METRES DRIL

FROM	TO	DRL FLW CORE

	LINER SIZE (mm)	S.P.
	165	

DEPTH (m)	DEVIATION (°

EVENING TOUR

FOLD HERE →

DAILY CHECKS

	OPR.	R.M.
Daily Walk Around Inspection	Initial	Initial
Detailed Inspection-Weekly (using checklist)	Initial	Initial
HPS Signs Posted (if required)	Initial	Initial
Well Licensee & Stick Diagram Posted	Initial	Initial
Flare Lines Staked	Initial	Initial
BOP Drills Performed	Initial	Initial
Visually Inspect BOP's - Flarelines & Degasser Lines	Initial	Initial
Rig Site Health and Safety Meeting (one/crew/month)		Initial
C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)		Initial
Mast Inspection Before Raising or Lowering		Initial
Crown Saver Checked		Initial
Motor Kills checked		Initial

YEAR 1997 | MONTH JAN | DAY 12

RIG NO. ONE.

FUEL @ 8:00

RIG 148 | BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244	229	53.57	PRUD	J-55	33	435.68	4.74	434
TUBING OR LINER									

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	70.86	E		129	FH	180	PZ-9	G-D	229
							D-375	EMSCO	356

21 22 23 24 25 26

SAFETY MTG.

TOTALS: 8 / 8 / 8 / 24

SHALE SHAKER(S): NO. 1 TYPE FLOWLINE CLEANER; SCREENS CHANGED ☐ YES ☑ NO; TOP 175; MIDDLE 175; BOTTOM 175

RENTALS/SERVICES

RECORD

DEGASSER

SOLIDS CONTROL

DESILTER: INTAKE DENSITY (kg/m³) | OVERFLOW DENSITY (kg/m³) | UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE: INTAKE DENSITY (kg/m³) | OVERFLOW DENSITY (kg/m³) | UNDERFLOW DENSITY (kg/m³)

MORNING TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1656	1657	1	60	18

REDUCED PUMP SPEED: LINER SIZE (mm) 165 | S.P.M. 94 | LINER SIZE (mm) 140 | S.P.M. 140; 10 MOC

S-D. PIPE @ 1400 @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
WIPER TRIP VOLUMES		
ACTUAL 1.50	(NO FLOW INCREASE ON BTMS. UP AFTER WIPER TRIP)	
CALC. 1.29		
+ .21 m³		
BMS UP-GAS 325 UNITS		

DRILLER SIGNATURE

TIME LOG

FROM	TO	HOURS	CODE
00:00	00:15	1/4	7
00:15	01:15	1	2
~~01:15~~			~~16~~
01:15	02:45	1½	6
02:45	04:00	1¼	5
04:00	07:00	3	6
07:00	08:30	1½	9

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

- REG SERVICE ANNULAR + REMOTE CHOKE.
- DRILL 1656 - 1657
- ~~PUMP DRILL HOUSE BOP #13 CHOKE LINE.~~
- 17 STD. WIPER TRIP, FLOW AS PER REG.
- CIRC. COND. HOLE.
- HOIST TO LOG, FLOW AS PER REGULATIONS.
- PUMP PILL, CHAIN & STRAP OUT.
- SLIP & CUT ADJUST BANDS CHECK ALL
- TRIP VOLUME ACTUAL 9.0 KMLE
- CALC. 8.00 m³
- + 1.07 m³
- P.V.T. START TRIP 65.1 m³
- P.V.T. OUT OF HOLE 54.2 m³
- 10.9 m³

NOTES: ANNULAR 9 SEC C/O
REMOTE CHOKE 22 SEC C/O

BOILER | HPS | RANGE | STACK TEMP. | EXPERIENCED HOOKLOAD | WORKING HOOKLOAD | SAFE WORKLOAD

8 | 9 | 115 K

DAY TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)

REDUCED PUMP SPEED: LINER SIZE (mm) 165 | S.P.M. | LINER SIZE (mm) 140 | S.P.M.

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
P.U.T. AT 08:00 54.2 m³		
P.U.T. AT 16:00 59.4 m³		

DRILLER SIGNATURE

TIME LOG

FROM	TO	HOURS	CODE
08:00	08:30	½	9
08:30	16:00	7½	11

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

- SLIP & CUT GREASE & ADJ. BRAKES LINKAGE
- RIG UP LOGGERS & LOG WITH SCHLUMBERGER.
- MONITOR WELL AS PER REGULATIONS.

NOTES: FUNCTION BLIND RAMS C/O 4 SEC
REMOTE CHOKE 22 SEC C/O

BOILER | HPS | RANGE | STACK TEMP. | EXPERIENCED HOOKLOAD | WORKING HOOKLOAD | SAFE WORKLOAD

8 | 9 | 115 K

EVENING TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)

REDUCED PUMP SPEED: LINER SIZE (mm) 165 | S.P.M. | LINER SIZE (mm) 140 | S.P.M.

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER SIGNATURE

TIME LOG

FROM	TO	HOURS	CODE
16:00	24:00	8	11

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

- LOG WITH SCHLUMBERGER MONITOR WELL AS PER REGULATIONS.

NOTES:

RECEIVED
JAN 16 1997
CACTUS DRILLING
NISKU

BOILER | HPS | RANGE | STACK TEMP. | EXPERIENCED HOOKLOAD | WORKING HOOKLOAD | SAFE WORKLOAD

8 | 9 | 115 K

#36

000597

FOLD HERE →

LICENCE NO.: 9211-W3-7-1

WELL NAME AND NO.: UNOCAL LIARD K-02

OPERATOR: UNOCAL EXPLORATION LTD.

CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30

UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE:

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS OPR. R.M.

(1) Daily Walk Around Inspection
(2) Detailed Inspection-Weekly (using checklist)
(3) H²S Signs Posted (if required)
(4) Well License & Stick Diagram Posted
(5) Flare Lines Staked
(6) BOP Drills Performed
(7) Visually Inspect BOP's - Flarelines & Degasser Lines

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME ~ HRS

CODE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV. SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.			
MORN.																						W10		
DAY						T6	3/4				8													
EVE.					3	4 3/4	1/4				T9													
TOTAL					3	4 3/4	1/4				13 1/4											1 1/2		

DRILLING ASSEMBLY (At End of Tour)

NO.	OD	LENGTH
		m
		m
		m
		m
		m
		m
		m
		m
		m
		m
D.P.	STANDS	m
D.P.	SINGLES	m
KELLY DOWN		m
TOTAL		m
WT. OF DC		1000 daN
WT. OF STRING		1000 daN

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HOURS RUN	

CUTTING STRUCTURE

T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE ☐ WATER BASED ☐ OIL BASED

TIME	
DENSITY kg/m³	1165
FUNNEL VIS. - (S/L)	
W.L. (cm³)	
pH	

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				

METRES

FROM	TO
1657	

MORNING TOUR

DRILLING ASSEMBLY (At End of Tour)

NO.	OD	LENGTH
1	BIT	.24 m
1	BIT SUB	.80 m
3	DC	28.36 m
1	X/O	.77 m
1	NMDC	9.14 m
16	DC	146.73 m
1	X/O	.56 m
	DART	196.60 m
	D.P. STANDS	m
	D.P. SINGLES	m
	KELLY DOWN	m
	TOTAL	m
WT. OF DC	27,000	1000 daN
WT. OF STRING		1000 daN

BIT RECORD

BIT NO.	#13 RR
SIZE (mm)	222
IADC CODE	7 3 7
MFG.	H-W
TYPE	ATJ 77D
SERIAL NO.	X16-WN
JETS (mm)	3 X 12.7
DEPTH OUT (m)	
DEPTH IN (m)	1657
TOTAL METRES DRILLED (m)	
TOTAL HOURS RUN	

CUTTING STRUCTURE

T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE ☐ WATER BASED ☐ OIL BASED

TIME	
DENSITY kg/m³	
FUNNEL VIS. - (S/L)	
W.L. (cm³)	
pH	

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				

METRES

FROM	TO
1657	

DAY TOUR

DRILLING ASSEMBLY (At End of Tour)

NO.	OD	LENGTH
1	BIT	.24 m
1	BHS	.80 m
3	DC	28.36 m
1	X/O	.77 m
1	NMDC	9.14 m
16	DC	146.73 m
1	X/O	.56 m
	DART	196.60 m
21	D.P. STANDS	m
22	D.P. SINGLES	1446.46 m
	KELLY DOWN	3.94 m
	TOTAL	1657.00 m
WT. OF DC	27,000	1000 daN
WT. OF STRING	93,000	1000 daN

BIT RECORD

BIT NO.	#13 RR
SIZE (mm)	222
IADC CODE	7 3 7
MFG.	H-W
TYPE	ATJ-77D
SERIAL NO.	X16-WN
JETS (mm)	3 X 12.7
DEPTH OUT (m)	
DEPTH IN (m)	1657
TOTAL METRES DRILLED (m)	
TOTAL HOURS RUN	

CUTTING STRUCTURE

T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 PUP
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	3 m FILL

MUD RECORD

MUD TYPE ☐ WATER BASED ☐ OIL BASED

TIME	20:00	22:00
DENSITY kg/m³	1160	1160
FUNNEL VIS. - (S/L)	68	74
W.L. (cm³)	6.6	6.6
pH	9.0	9.0
PVT	65.0	64.7

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	10
BARITE	20

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				

METRES

FROM	TO
1657	

EVENING TOUR

FOLD HERE →

LY CHECKS — OPR. R.M.

- ily Walk Around Inspection
- rtailed Inspection-Weekly (using checklist)
- PS Signs Posted (if required)
- ell License & Stick Diagram Posted
- ure Lines Staked
- OP Drills Performed
- ually Inspect BOP's - Flarelines & Degasser Lines
- g Site Health and Safety Meeting (one/crew/month)
- A.O.D.C. Rig Safety Inspection-Checklist (one/rig/month)
- ast Inspection Before Raising or Lowering
- own Saver Checked
- tor Kills checked

YEAR 97 | MONTH JAN | DAY 12

RIG NO. ONE.

FUEL @ 8:00

RIG 130 | BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244	229	53.57	PRUD	J-55	33	435.68	4.74	434
TUBING OR LINER									

	DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
	102	20.86	E		129	FH	180	PZ-9	G-D	229
								D-375	EMSCO	356

1	22	23	24	25	26
ETY G.	WD				
	5/8				
	11/2				

TOTALS — SHALE SHAKER(S) — RENTALS/SERVICES

NO. 1	TYPE FLOWLINE CLEANER
8	SCREENS CHANGED ☐ YES ☐ NO
8	TOP 175 / TOP
8	MIDDLE 175 / MIDDLE
24	BOTTOM 175 / BOTTOM

RD

CASED

SOLIDS CONTROL

DESILTER

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

MORNING TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1657				

PUMPS

LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
165		140	

REDUCED PUMP SPEED

Std. Prog @ 1400 @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
STRAP OUT TO LOG.		
STRAP 1659.08		
TALLY 1657.00		
+2.08m		
NO CHANGE		

DRILLER SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
00:00	08:00	8	11

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

LOG WITH SCHLUMBERGER MONITOR WELL

R.S.P.P. AS OF JAN 12/97 AT 1656M.

P.V.T. @ 05:30 - 46.3m³, CLEANED 6.0m³ OF SOLIDS FROM SHAKER & DEGASSER TANKS

NOTES REMOTE CHOKE 77 SEC %

BOILER HRS RAN 8 | STACK TEMP 9 | MAXIMUM EXPERIENCED HOOKLOAD | SAFE HOOKLOAD

11434 KPA

DAY TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1657				

PUMPS

LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
165		140	

REDUCED PUMP SPEED

@ @

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
08:00			11
	15:30	7½	
15:30	16:00	½	6

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

LOG WITH SCHLUMBERGER MONITOR WELL AS PER REGULATIONS.

R.I.H. CLEAN OUT TRIP

JAN 16 1997

CACTUS DRILLING NISKU

NOTES REMOTE CHOKE 72 SEC %0 SUNDRY BLIND RAMS WHEN LOGGERS OUT OF HOLE %0 9 SEC

BOILER HRS RAN 8 | STACK TEMP 9 | MAXIMUM EXPERIENCED HOOKLOAD | SAFE HOOKLOAD

11434 KPA

EVENING TOUR

00	22:00
0	11:00
	7.4
0	6.6
0	9.0
	6.7

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1657				
1000	1656	94	140	

PUMPS

LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
165	94	140	

REDUCED PUMP SPEED

Std. Prog @ 1400 @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
R.S.P.P. @ 1656m.		

DRILLER SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
11:00			6
	18:30	2½	
18:30	19:00	½	22
19:00	22:00	3	5
22:00	22:15	¼	7
22:15	24:00	1¾	6

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

R.I.H. TO 600 METRES CHECK R.I.H. RECORD.

CIRC. MATE GOTOCO. P R.I.H. 1644m

WASH FROM 1644m TO 1657m 3m FILL

CIRC. COND. MUD.

R & SERVICE ANNULAR & REMOTE CHOKE.

HOIST TO LOG, FLOW ✓ AS PER REGULATIONS.

CHAIN & STRAP OUT.

STRAP 1657.33

TALLY 1657.00

.33

NOTES ANNULAR 9 SEC %

REMOTE CHOKE 72 SEC %

BOILER HRS RAN 8 | STACK TEMP 9 | MAXIMUM EXPERIENCED HOOKLOAD | SAFE HOOKLOAD

#37

000598

FOLD HERE →

LICENCE NO.:	WELL NAME AND NO.:
9211-U-C-1-1	ACEL LEARD K-02
OPERATOR:	**CONTRACTOR:**
UNOCAL EXPLORATION LTD.	CACTUS DRILLING
SURFACE LOCATION:	**UNIQUE ID.:**
60-20-123-30.	
SIGNATURE OF OPERATOR'S REPRESENTATIVE:	**SIGNATURE OF CONTRACTOR'S RIG MANAGER:**

DAILY CHECKS — OPR. / R.M.

(1) Daily Walk Around Inspection — Initial / Initial
(2) Detailed Inspection-Weekly (using checklist) — Initial / Initial
(3) H²S Signs Posted (if required) — Initial / Initial
(4) Well Licensee & Stick Diagram Posted — Initial / Initial
(5) Flare Lines Staked — Initial / Initial
(6) BOP Drills Performed — Initial / Initial
(7) Visually inspect BOP's - Flarelines & Degasser Lines — Initial / Initial

(1) Rig Site Health and Safety Meeting (one/crew/month) — Initial
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month) — Initial
(3) Mast Inspection Before Raising or Lowering — Initial
(4) Crown Saver Checked — Initial
(5) Motor Kills checked — Initial

RIG N / RIG / WEATHER

TIME-HRS — CODE NO. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV. SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.
MORN.						1	1½				6¼										
DAY											8										
EVE.																					
TOTAL																					

DRILLING ASSEMBLY (At End of Tour)

NO.	DESCRIPTION		LENGTH
			m
			m
			m
			m
			m
			m
			m
			m
			m
			m
	D.P.	STANDS	m
	D.P.	SINGLES	m
	KELLY DOWN		m
	TOTAL		m
WT. OF DC			1000 daN
WT. OF STRING			1000 daN

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HOURS RUN	

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE ☐ WATER BASED ☐ OIL BASED

TIME	
DENSITY kg/m³	
FUNNEL VIS. - (S/L)	
W.L. (cm³)	
pH	

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

DESILTER

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

DEGASSER

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

MORNING TOUR

METRES

FROM	TO
1657	

LINER SIZE (mm)

DEPTH (m) / DEVIATION

P.V.T. START T
P.V.T. OUT OF H

DAY TOUR

METRES

FROM	TO
1657	

LINER SIZE (mm): 165

DEPTH (m) / DEVIATION

P.V.T. AT 06:00
P.V.T. AT 16:00

EVENING TOUR

NO.	DESCRIPTION		LENGTH
			.24 m
1	B/S FLOAT		.80 m
3	DC	197	15.36 m
1	X/O		.77 m
1	NMDC	165	9.14 m
16	DC	165	146.73 m
1	X/O		.56 m
			1823 m
			186.60 m
	D.P.	STANDS	m
	D.P.	SINGLES	m
	KELLY DOWN		m
	TOTAL		m
WT. OF DC			1000 daN
WT. OF STRING			1000 daN

BIT NO.: E13RR
SIZE (mm): 222
IADC CODE: 7 3 7
MFG.: H-W
TYPE: ATJ-77D
SERIAL NO.: X16-WN
JETS (mm): 3/12.7
DEPTH OUT (m):
DEPTH IN (m):
TOTAL METRES DRILLED (m):
TOTAL HOURS RUN:

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE DRAG:
TORQUE AT BOTTOM:
FILL ON BOTTOM (m):

MUD TYPE ☐ WATER BASED ☐ OIL BASED

TIME:
DENSITY kg/m³:
FUNNEL VIS. - (S/L):
W.L. (cm³):
pH:

MUD MATERIALS ADDED — PRODUCT / AMOUNT X UNIT

SOLIDS CONTROL

DESILTER

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

DEGASSER

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

EVENING TOUR

METRES

FROM	TO
1657	

LINER SIZE (mm): 165

DEPTH (m) / DEVIATION

P.V.T. AT 17:00

FOLD HERE →

DAILY CHECKS — OPR. / R.M.

	OPR.	R.M.
Daily Walk Around Inspection	Initial	Initial
Detailed Inspection-Weekly (using checklist)	Initial	Initial
H'S Signs Posted (if required)	Initial	Initial
Well License & Stick Diagram Posted	Initial	Initial
Flare Lines Staked	Initial	Initial
BOP Drills Performed	Initial	Initial
Visually inspect BOP's - Flarelines & Degasser Lines	Initial	Initial
Rig Site Health and Safety Meeting (one/crew/month)		Initial
C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)		Initial
Last Inspection Before Raising or Lowering		Initial
Crown Saver Checked		Initial
Motor Kills checked		Initial

YEAR 1997 | MONTH JAN | DAY 14

RIG NO. ONE.

FUEL @ 8:00

RIG 170 | BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244	229	53.57	PRUD	J-55	33	1/35.68	4.74	434
TUBING OR LINER									

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.46	E		129	FH	180	PZ-9	G-D	229
							D375	EMSCO	356

21 22 23 24 25 26

ETY / G.

TOTALS: 4 / 8

SHALE SHAKER(S)

NO. 1 TYPE FLOWLINE CLEANER

SCREENS CHANGED ☐ YES ☑ NO

TOP	175	TOP	
MIDDLE	175	MIDDLE	
BOTTOM	175	BOTTOM	

RENTALS/SERVICES

RD

MORNING TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1657				

PUMPS

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.

REDUCED PUMP SPEED: @ @

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
P.U.T. START TRIP		70.35 m³
P.U.T. OUT OF HOLE.		61.64 m³
		8.71 m³

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
00:00	01:00	1	6
01:00	01:15	1/4	7
01:15	08:00	6 3/4	11

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

HOIST TO LOG, FLOW ✓ AS PER REG.
REG SERVICE ✓ BLIND RAMS + REMOTE CHOKE.
RIG UP + LOG WITH SCHLUMBERGER.
MONITOR WELL

FILL VOLUME ACTUAL 9.02 m³
CALC. 8.01 m³
+ 1.01 m³

NOTES BLIND RAMS 4 SEC ✓
REMOTE CHOKE 22 SEC ✓

BOILER HRS	RAN	STACK TEMP'S	MUD WT.	EXPERIENCED HOOKLOAD	SAFETY MTG.	BOP'S
8	9					11519 KPA

DAY TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1657				

PUMPS

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
	165		140	

REDUCED PUMP SPEED: @ @

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
P.U.T. AT	06:00	58.5 m³
P.U.T. AT	16:00	58.8 m³

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
08:00	16:00	8	11

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

LOG WITH SCHLUMBERGER, MONITOR WELL

RECEIVED
JAN 16 1997
CACTUS DRILLING
NISKU

NOTES REMOTE CHOKE 22 SEC ✓

BOILER HRS	RAN	STACK TEMP'S	MUD WT.	EXPERIENCED HOOKLOAD	SAFETY MTG.	BOP'S
8	9				RIG IN LOGGERS	11519 KPA

EVENING TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1657				

PUMPS

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
	165	94	140	

REDUCED PUMP SPEED: @ @

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
P.U.T. AT	17:00	58.8 m³

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE
16:00	22:00	6	11
22:00	24:00	2	6

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

LOG WITH SCHLUMBERGER MONITOR WELL
R.I.H. FLOW ✓ AT 650m, BREAK CIRC. & FLOW ✓ AT 1250m.

NOTES REMOTE CHOKE 22 SEC ✓

BOILER HRS	RAN	STACK TEMP'S	MUD WT.	EXPERIENCED HOOKLOAD	SAFETY MTG.	BOP'S
8	9					11519

H 38

000599

FOLD HERE →

LICENCE NO.: 9218 (2)3-1-1

WELL NAME AND NO.: UNOCAL LEAD K-02

OPERATOR: UNOCAL EXPLORATION LTD.

CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30

UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE:

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS

	OPR.	R.M.
(1) Daily Walk Around Inspection	Initial	Initial
(2) Detailed Inspection-Weekly (using checklist)	Initial	Initial
(3) H²S Signs Posted (if required)	Initial	Initial
(4) Well License & Slack Diagram Posted	Initial	Initial
(5) Flare Lines Staked	Initial	Initial
(6) BOP Drills Performed	Initial	Initial
(7) Visually Inspect BOP's - Flarelines & Degasser Lines	Initial	Initial
(1) Rig Site Health and Safety Meeting (one/crew/month)		Initial
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)		Initial
(3) Mast Inspection Before Raising or Lowering		Initial
(4) Crown Saver Checked		Initial
(5) Motor Kills checked		Initial

TIME - HRS

CODE NO.	1 OPER.	2 RIG UP & TEAR DOWN	3 DRILL ACTUAL	4 REAMING	5 CORING	6 COND. MUD & CIRC	7 TRIPS	8 RIG SERVICE	9 REPAIR RIG	10 CUT OFF DRILL LINE	11 DEV. SURVEY	12 WIRE LINE LOGS	13 RUN CASE & CEMENT	14 WAIT ON CEMENT	15 NIPPLE UP B.O.P.	16 TEST B.O.P.	17 DRILL STEM TEST	18 PLUG BACK	19 SQUEEZE CEMENT	20 FISHING	21 DIR. WORK	22 SAFETY MTG.	23 HANDLE TOOLS	24
	MORN.					2½	3¾	¼			½													
	DAY						0¼																1	
	EVE.						1½	¼									4						1¼	
	TOTAL					2½	7½	¾			½						6¼							
																	10¾						2¾	

DRILLING ASSEMBLY (At End of Tour)

NO.		OD	LENGTH
			.74 m
1	D/S FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	NMDC		9.14 m
16	DC	165	146.73 m
1	X/O	165	.56 m
			186.60 m
			m
			m
			m
51	D.P.	STANDS	m
XX	D.P.	SINGLES	1466.46 m
	KELLYDOWN		3.94 m
	TOTAL		1657 m
WT. OF DC			27,000 1000 daN
WT. OF STRING			53,000 1000 daN

BIT RECORD

BIT NO.	RR #13
SIZE (mm)	222
IADC CODE	7 3 7
MFG.	H-N
TYPE	ATJ-77D
SERIAL NO.	X16-WN
JETS (mm)	3/12.7
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HOURS RUN	

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	2M FILL

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	01:00	23:00
DENSITY kg/m³	1160	1160
FUNNEL VIS. - (S/L)	64	72
W.L. (cm³)	7.2	7.1
pH	9.0	9.0
PVT	65.8	67.1

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	10
BARITE	20

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
SHALE				
CENTRIFUGE				

DRILLING ASSEMBLY (At End of Tour)

NO.		OD	LENGTH
16	DC		m
			m
3	DC		m
			165.71 m
	TEST TOOL		7.35 m
			m
			m
			m
			m
			m
45	D.P.	STANDS	1315.59 m
X	D.P.	SINGLES	m
	KELLYDOWN		m
	TOTAL		1455.05 m
WT. OF DC			24.000 1000 daN
WT. OF STRING			41,000 1000 daN

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HOURS RUN	

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☐ WATER BASED ☐ OIL BASED

TIME	
DENSITY kg/m³	
FUNNEL VIS. - (S/L)	
W.L. (cm³)	
pH	

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
SHALE				
CENTRIFUGE				

DRILLING ASSEMBLY (At End of Tour)

NO.		OD	LENGTH
16	DC		m
1	X/O		m
2	SINGLE DP		165.71 m
	TEST TOOL		7.35 m
			m
			m
			m
			m
			m
			m
34	D.P.	STANDS	m
XX	D.P.	SINGLES	987.33 m
TOP	KELLYDOWN		2.40 m
	TOTAL		1159.79 m
WT. OF DC			24.000 1000 daN
WT. OF STRING			1000 daN

BIT RECORD

BIT NO.	D.S.T. #3	
SIZE (mm)	16DC	
IADC CODE	1X/0	
MFG.	7 SINGLES	165.71
TYPE	TEST TOOL	7.35
SERIAL NO.		173.06
JETS (mm)	3 3 5.05	937.86
DEPTH OUT (m)	TEST HEAD	7.40
DEPTH IN (m)	TOP	1113.32
TOTAL METRES DRILLED (m)		
TOTAL HOURS RUN		

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☐ WATER BASED ☐ OIL BASED

TIME	D.S.T. #4		
DENSITY kg/m³	1.44	173.06	
FUNNEL VIS. - (S/L)	32	919.05	
W.L. (cm³)		1092.11	
pH	-SACHAR	-4.70	
	TOP	1087.41	

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
PVT NEW	60.9 m³
11 STAND TRIP	57.8 m³
PVT NEW	
11 STAND TRIP	
	3.1 m³

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
SHALE				
CENTRIFUGE				

METRE

FROM	TO
1657	

LINER SIZE (m

165

REDUCED

STD. PIPE

DEPTH (m) 1618

P.V.T. START

P.V.T. OUT OF

METRES D

FROM	TO
1657	

LINER SIZE (mm)

165

DEPTH (m) DEVIATI

PVT AT 05:00

PVT AT 12:00 J1

SUCK: OUT

PVT AT 16:00

METRES DR

FROM	TO
1657	

LINER SIZE (mm)

165

DEPTH (m) DEVIATION

TRUE CALCULATION

ACT - 3.10 m 3

ANI - 2.82 m 3

+ .28

DAY TOUR

EVENING TOUR

MORNING TOUR

FOLD HERE →

DAILY CHECKS

	OPR.	R.M.
Daily Walk Around Inspection	Initial	Initial
Detailed Inspection-Weekly (using checklist)	Initial	Initial
H²S Signs Posted (if required)	Initial	Initial
Well License & Stick Diagram Posted	Initial	Initial
Flare Lines Staked	Initial	Initial
BOP Drills Performed	Initial	Initial
Visually Inspect BOP's - Flarelines & Degasser Lines	Initial	Initial
Rig Site Health and Safety Meeting (one/crew/month)		Initial
C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)		Initial
Mast Inspection Before Raising or Lowering		Initial
Crown Saver Checked		Initial
Motor Kills checked		Initial

YEAR 1997 | MONTH JAN | DAY 15

RIG NO. ONE.

FUEL @ 8:00

RIG | BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244	229	53.57	PRUD	J-55	33	435.68	4.74	1134
TUBING OR LINER									

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	70.26	E		129	FH	180	PZ-9	G-D	229
							D-375	EMSCO	356

21 22 23 24 25 26

SAFETY MTG. HANDLE TOOLS.

1

1¼

2¾

TOTALS

SHALE SHAKER(S) — RENTALS/SERVICES

NO. 1 TYPE FLOWLINE CLEANER

SCREENS CHANGED ☐ YES ☑ NO

TOP 175 TOP

MIDDLE 175 MIDDLE

BOTTOM 175 BOTTOM

8 8 8 24

MORNING TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1657				

CIRCULATING PRESSURE (kPa) | PUMP NO. 1: LINER SIZE (mm) 165, S.P.M. 94 | PUMP NO. 2: LINER SIZE (mm) 140, S.P.M.

REDUCED PUMP SPEED: Std. Pipe @ 580 @ 55

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
1618	5¾°	40 AZ.
P.V.T. START TRIP	-74.06m³	
P.V.T. OUT OF HOLE	-63.66m³	
	10.4m³	

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
00:00	00:45	¾	6	FINISH IN HOLE.
00:45	01:00	¼	7	RIG SERVICE √ANNULAR & REMOTE CHOKE.
01:00	03:00	2	5	CIRC. COND. MUD & HOLE.
03:00	03:30	½	10	SURVEY 1618 - 5¾° - 40 AZ.
03:30	04:00	½	5	CIRCULATE.
04:00	07:00	3	6	PUMP PILL, HOIST TO TEST. FLOW √ AS PER REG.
07:00	08:00	1	22	LAY DOWN 3197 MM DC
				TRIP VOLUMES - ACTUAL - 9.90m³
				CALC. - 8.01m³
				+ 1.89m³
BTMS. UP GAS PEAK @ 1250m - 2140 UNITS.				
BTMS. UP GAS PEAK @ 1657m -				

NOTES ANNULAR 9 SEC ⅘

REMOTE CHOKE 11 SEC ⅘

BOILER HRS/RANGE | STACK TEMP. | MAXIMUM EXPERIENCED HOOKLOAD | SAFETY CHECK

8 9 11519

DAY TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1657				

PUMP NO. 1: LINER SIZE (mm) 165, S.P.M. | PUMP NO. 2: LINER SIZE (mm) 140, S.P.M.

REDUCED PUMP SPEED: @ @

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
P.V.T. AT 05:00	59 m³	OUT OF HOLE
RIH AT 12:00	71.8 m³	IN 1458 m
SUCKED OUT. 12.5 m³		
P.V.T. AT 16:00	60.9 m³	

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
0800	09:45	1¾	22	SAFETY MEETING WITH RECORD P.U.W.O. TEST BOP
09:45	12:00	2¼	6	RIH FLOW √ AS PER REGULATIONS
12:00	16:00	4	16	SAFETY MEETING RIG UP TEST HEAD T.D.S.I.
				WITH DOWN HOLE SYSTEMS TECHNOLOGY. DST #2
				AT 1485 m - 1506 m - MANNVILLE FORMATION

NOTES BLEED OUT TEST LINE WITH AIR. REMOTE CHOKE 22 SEC ⅘

FUNCTION BLIND RAMS 9/0 4 SEC.

BOILER HRS/RANGE | STACK TEMP. | MAXIMUM EXPERIENCED HOOKLOAD | SAFETY CHECK

8 9 RIG UP TEST TIME 11519

EVENING TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1657				

PUMP NO. 1: LINER SIZE (mm) 165, S.P.M. | PUMP NO. 2: LINER SIZE (mm) 140, S.P.M.

REDUCED PUMP SPEED: @ @

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
SEE CALCULATIONS		
ACT - 3.10 m³		
ANN - 2.82 m³		
+ .28 m³		

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	HRS	CODE	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
16:00	16:15	¼	7	RIG SERVICE √ ANNULAR + REMOTE CHOKE
16:15	17:15	1	6	P.O.O.H. TO 1159 m FLOW √ AS PER REGULATIONS
17:15	21:45	4½	16	RIG UP TEST HEAD + DST #2, 1159m - 1177 m
21:45	22:15	½	6	HOIST 2 STDS. FLOW √ O.K.
22:15	24:00	1¾	16	HEAD UP & TEST D.S.T. #3 1113 - 1131

NOTES ANNULAR 9 SEC

REMOTE CHOKE 22 SEC ⅘

BOILER HRS/RANGE | STACK TEMP. | MAXIMUM EXPERIENCED HOOKLOAD | SAFETY CHECK

8 9 11517

RECEIVED
JAN 16 1997
CACTUS DRILLING
NISKU

16376

DAILY DRILLING REPORT

REPORT No. 5

LEASE	WELL No.	WELL NUMBER	DATE
UCEL LIARD K02	K02		96-12-13 (Yr. Mo. Day)

OPERATOR	CONTRACTOR	RIG No.
UNOCAL CANADA LTD.	CACTUS DRILLING	ONE.

SIGNATURE OF OPERATOR'S REPRESENTATIVE: Doug Gahorne

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

D. P. SIZE	kg/m	GRADE	TOOL JT O. D.	TYPE THREAD	STRING No.

PUMP No.	PUMP MANUFACTURER	TYPE	STROKE LENGTH
1	G.D.	PZ-9	229
2	Emsco	375	356

TIME DISTRIBUTION - HOURS

CODE No.	OPERATION	MORN.	DAY	EVE.
1	RIG UP AND TEAR DOWN			
2	DRILL ACTUAL			
3	REAMING			
4	CORING			
5	CONDITION MUD & CIRCULATE			
6	TRIPS			
7	LUBRICATE RIG			
8	REPAIR RIG			
9	CUT OFF DRILLING LINE			
10	DEVIATION SURVEY			
11	WIRE LINE LOGS			
12	RUN CASING & CEMENT			
13	WAIT ON CEMENT			
14	NIPPLE UP B.O.P.			
15	TEST B.O.P.			
16	DRILL STEM TEST			
17	PLUG BACK			
18	SQUEEZE CEMENT			
19	FISHING			
20	DIR. WORK			
21				
22				
23				
COMPLETION	A. PERF'RT'N			
	B. TBG TRIPS			
	C. TREATING			
	D. SWABBING			
	E. TESTING			
	F. ADDIT'NL			
	G.			
TOTALS				

DAY WORK SUMMARY (OFFICE USE ONLY)

HRS. W/CONTR. D.P.			
HRS. W/OPR. D.P.			
HRS. WO/D.P.			
HRS. STANDBY			
TOTAL HRS. WORK			

No. OF DAYS FROM SPUD

CUMULATIVE ROTATING HRS.

TOTAL MUD COST

RECEIVED
DEC 19 1996

MORNING TOUR

No.	DRILLING ASSEMBLY (at end of tour)		BIT RECORD			MUD RECORD			
	BIT	m	BIT No.			TIME			
			SIZE			DENSITY kg/m³			
	STB RMR OD	m	MFG.			PRESSURE GRADIENT			
	D.C. ID OD	m	TYPE			VISCOSITY			
	STB RMR OD	m	JETS mm			PV mPa•s / YP Pa	/	/	/
	D.C. ID OD	m	SER. No.			GEL STR. Pa	/	/	/
	STB RMR OD	m	DEPTH OUT			WATER LOSS cm³			
			DEPTH IN			pH			
			TOTAL METRES DRILLED			SOLIDS %			
			TOTAL HRS. RUN						
	STANDS DP	m	COND 1/8's T/B/ GAGE			MUD & CHEMICALS ADDED			
	SINGLES DP	m	FLOW RATE m³/min	/	/	TYPE	AMT. kg	TYPE	AMT. kg
	KELLY DOWN	m	PRESSURE DROP kPa						
	TOTAL	m							
	(FORCE) WT. OF STRING	daN							

DAY TOUR

No.	DRILLING ASSEMBLY (at end of tour)		BIT RECORD			MUD RECORD			
	BIT	m	BIT No.			TIME			
			SIZE			DENSITY kg/m³			
	STB RMR OD	m	MFG.			PRESSURE GRADIENT			
	D.C. ID OD	m	TYPE			VISCOSITY			
	STB RMR OD	m	JETS mm			PV mPa•s / YP Pa	/	/	/
	D.C. ID OD	m	SER. No.			GEL STR. Pa	/	/	/
	STB RMR OD	m	DEPTH OUT			WATER LOSS cm³			
			DEPTH IN			pH			
			TOTAL METRES DRILLED			SOLIDS %			
			TOTAL HRS. RUN						
	STANDS DP	m	COND 1/8's T/B/ GAGE			MUD & CHEMICALS ADDED			
	SINGLES DP	m	FLOW RATE m³/min	/	/	TYPE	AMT. kg	TYPE	AMT. kg
	KELLY DOWN	m	PRESSURE DROP kPa						
	TOTAL	m							
	(FORCE) WT. OF STRING	daN							

EVENING TOUR

No.	DRILLING ASSEMBLY (at end of tour)		BIT RECORD			MUD RECORD			
	BIT	m	BIT No.			TIME			
			SIZE			DENSITY kg/m³			
	STB RMR OD	m	MFG.			PRESSURE GRADIENT			
	D.C. ID OD	m	TYPE			VISCOSITY			
	STB RMR OD	m	JETS mm			PV mPa•s / YP Pa	/	/	/
	D.C. ID OD	m	SER. No.			GEL STR. Pa	/	/	/
	STB RMR OD	m	DEPTH OUT			WATER LOSS cm³			
			DEPTH IN			pH			
			TOTAL METRES DRILLED			SOLIDS %			
			TOTAL HRS. RUN						
	STANDS DP	m	COND 1/8's T/B/ GAGE			MUD & CHEMICALS ADDED			
	SINGLES DP	m	FLOW RATE m³/min	/	/	TYPE	AMT. kg	TYPE	AMT. kg
	KELLY DOWN	m	PRESSURE DROP kPa						
	TOTAL	m							
	(FORCE) WT. OF STRING	daN							

APPROVAL PENDING

'APPROVED

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Revised December, 1986

OFFICIAL DAILY DRILLING REPORT FORM

E.R.C.B. — OPR. — R.M.

	OPR.	R.M.		R.M.
(1) Daily Walk Around Inspection	Initial	Initial	(1) Rig Site Health and Safety Meeting (one meeting/crew/month)	Initial
(2) Detailed Inspection-Weekly (using check list)	Initial	Initial	(2) C.A.O.D.C. Rig Safety Inspection Check List (one/rig/month)	Initial
(3) H2S Signs Posted (if required)	Initial DG	Initial	(3) Mast Inspection Before Raising or Lowering	Initial

LEGAL LAND DESCRIPTION 1-02

LAST CASING TUBING OR LINER	OUTSIDE DIAMETER	INSIDE DIAMETER	MAKE	kg/m	GRADE	No. JOINTS	TOTAL LENGTH	RKB. TO CSG. HD	SET AT

WIRE LINE RECORD REEL No.

SIZE	No. LINES	METRES SLIPPED
METRES CUT OFF	PRESENT LENGTH	
MEGAJOULES SINCE LAST CUT		
CUMULATIVE MEGAJOULES		

STROKE LENGTH 29 356

MORNING TOUR

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. 1 LINER SIZE	PUMP No. 1 STROKES per min	PUMP No. 2 LINER SIZE	PUMP No. 2 STROKES per min	METHOD RUN SGL S PAR'EL P COM'D C
								159		140		
					REDUCED PUMP SPEED							

DEVIATION RECORD	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS	BOILER HOURS
08:00	12:00	4	1	R/S TO SPUD	

DRILLER

DAY TOUR

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. LINER SIZE	PUMP No. STROKES per min	PUMP No. LINER SIZE	PUMP No. STROKES per min	METHOD RUN SGL S PAR'EL P COM'D C
					REDUCED PUMP SPEED							

DEVIATION RECORD	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS	BOILER HOURS
08:00	2400	12	1	RIG TO SPUD. HELD PRE-SPUD SAFETY MEETING WITH UNOCAL REPS. & ALL CACTUS DRLG. EMPLOYEES	8

DRILLER

EVENING TOUR

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. 1 LINER SIZE	PUMP No. 1 STROKES per min	PUMP No. 2 LINER SIZE	PUMP No. 2 STROKES per min	METHOD RUN SGL S PAR'EL P COM'D C
								159		140		
					REDUCED PUMP SPEED							

DEVIATION RECORD	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS	BOILER HOURS
20:00	24:00	4	1	Rig up To Spud, Weld on Deverter Flanc Put on Deverter	8

DRILLER

16377

DAILY DRILLING REPORT — REPORT No. 6

LEASE	WELL No.	WELL NUMBER	DATE (Yr. Mo. Day)
~~E 2 E 38~~ UCL LIARD.	K 2	~~K-02~~ 60-20-123-30	96 12 14

OPERATOR	CONTRACTOR	RIG No.
UNOCAL CANADA EXPLORATION LTD.	CACTUS DRILLING	ONE

SIGNATURE OF OPERATOR'S REPRESENTATIVE: Doug Galbraith

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

D.P. SIZE	kg/m	GRADE	TOOL JT O.D.	TYPE THREAD	STRING No.
102	20.86	E	129	FH	

PUMP No.	PUMP MANUFACTURER	TYPE	STROKE LENGTH
1	G.D.	PZ-9	229
2	EMSCO	D-375	356

TIME DISTRIBUTION - HOURS

CODE No.	OPERATION	MORN.	DAY	EVE.
1	RIG UP AND TEAR DOWN	8	2	
2	DRILL ACTUAL		3	5
3	REAMING			
4	CORING			
5	CONDITION MUD & CIRCULATE		3/4	1/2
6	TRIPS		1	1 1/4
7	LUBRICATE RIG			1/4
8	REPAIR RIG			
9	CUT OFF DRILLING LINE			
10	DEVIATION SURVEY		1	1
11	WIRE LINE LOGS			
12	RUN CASING & CEMENT			
13	WAIT ON CEMENT			
14	NIPPLE UP B.O.P.			
15	TEST B.O.P.			
16	DRILL STEM TEST			
17	PLUG BACK			
18	SQUEEZE CEMENT			
19	FISHING			
20	DIR. WORK			
21	HANDLE COLLARS		1/4	
22				
23				
COMPLETION	A. PERFR'TN			
	B. TBG TRIPS			
	C. TREATING			
	D. SWABBING			
	E. TESTING			
	F. ADDIT'NL			
	G.			
	TOTALS	8	8	8

DAY WORK SUMMARY (OFFICE USE ONLY)

HRS. W/CONTR. D.P.

HRS. W/OPR. D.P.

HRS. W/O D.P.

HRS. STANDBY

TOTAL DAY WORK

No. OF DAYS FROM SPUD

CUMULATIVE ROTATING HRS.

TOTAL MUD COST

RECEIVED
DEC 19 1996
CACTUS DRILLING

MORNING TOUR

No.	DRILLING ASSEMBLY (at end of tour)		BIT RECORD	
	BIT	m	BIT No.	
			SIZE	
	STB RMR OD	m	MFG.	
	D.C. ID OD	m	TYPE	
	STB RMR OD	m	JETS mm	
	D.C. ID OD	m	SER. No.	
	STB RMR OD	m	DEPTH OUT	
			DEPTH IN	
			TOTAL METRES DRILLED	
			TOTAL HRS. RUN	
	STANDS DP	m	COND 1/8's T/B/ GAGE	
	SINGLES DP	m	FLOW RATE m³/min	
	KELLY DOWN	m	PRESSURE DROP kPa	
	TOTAL	m		
	(FORCE) WT. OF STRING	daN		

MUD RECORD		
TIME		
DENSITY kg/m³		
PRESSURE GRADIENT		
VISCOSITY		
PV mPa·s / YP Pa		
GEL STR. Pa		
WATER LOSS cm³		
pH		
SOLIDS %		

MUD & CHEMICALS ADDED

TYPE	AMT. kg	TYPE	AMT. kg
GEL	35		
SODA ASH	1		

DAY TOUR

No.	DRILLING ASSEMBLY (at end of tour)		BIT RECORD	
	BIT	.30 m	BIT No.	1A
1	B/S	1.00	SIZE	311
2	STB RMR 222 OD	17.64 m	MFG.	SEC
1	D.C. ID BEL SUB OD	.94 m	TYPE	S335F
1	STB RMR MONEL OD	9.14 m	JETS mm	3/11.9 1/12.7
7	D.C. ID 5 5/8 DC OD	64.73 m	SER. No.	642460
1	STB RMR X/O OD	.56 m	DEPTH OUT	
		94.31	DEPTH IN	0
			TOTAL METRES DRILLED	107
			TOTAL HRS. RUN	3
	STANDS DP	m	COND 1/8's T/B/ GAGE	
	SINGLES DP	m	FLOW RATE m³/min	
	KELLY DOWN	12.97 m	PRESSURE DROP kPa	
	TOTAL	107.28 m		
	(FORCE) WT. OF STRING	23,000 daN		

MUD RECORD		
TIME	11:00	14:00
DENSITY kg/m³	1090	1140
PRESSURE GRADIENT		
VISCOSITY	55	39
PV mPa·s / YP Pa		
GEL STR. Pa		
WATER LOSS cm³		
pH	9.5	9.5
SOLIDS %		

MUD & CHEMICALS ADDED

TYPE	AMT. kg	TYPE	AMT. kg
DETGEL	2		

EVENING TOUR

No.	DRILLING ASSEMBLY (at end of tour)		BIT RECORD		
	BIT	.30 m	BIT No.	1A	2A
1	B/S	1.00	SIZE	311	311
2	STB RMR 222 OD	17.64 m	MFG.	SEC	SMITH
1	D.C. ID BEL SUB OD	.94 m	TYPE	S335F	MSDG
1	STB RMR NMDC OD	9.14 m	JETS mm	3/11.9 1/12.7	3/11.9 1/16
17	D.C. ID 5 5/8 DC OD	156.00 m	SER. No.	642460	R85685
1	STB RMR X/O OD	.56 m	DEPTH OUT	208	
		185.58	DEPTH IN	0	208
			TOTAL METRES DRILLED	208	
			TOTAL HRS. RUN	8 1/4	
1 1/4	STANDS DP	9.59 m	COND 1/8's T/B/ GAGE	8 4 1	
	SINGLES DP	m	FLOW RATE m³/min		
	KELLY DOWN	12.97 m	PRESSURE DROP kPa		
	TOTAL	208.14 m			
	(FORCE) WT. OF STRING	31,000 daN			

MUD RECORD			
TIME	5:30	20:00	
DENSITY kg/m³	1165	1165	
PRESSURE GRADIENT			
VISCOSITY	48	40	
PV mPa·s / YP Pa			
GEL STR. Pa			
WATER LOSS cm³			
pH	8.5	6.0	
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT. kg	TYPE	AMT. kg

E.R.C.B.
(1) Daily Walk Around Inspection — OPR. Initial — R.M. Initial
(2) Detailed Inspection-Weekly (using check list) — OPR. Initial — R.M. Initial
(3) H2S Signs Posted (if required) — OPR. Initial DH — R.M. Initial
(1) Rig Site Health and Safety Meeting (one meeting/crew/month) — R.M. Initial
(2) C.A.O.D.C. Rig Safety Inspection Check List (one/rig/month) — R.M. Initial
(3) Mast Inspection Before Raising or Lowering — R.M. Initial

LEGAL LAND DESCRIPTION: ~~E1-3-81~~ - ~~K-002~~. 60-20-123 W5

WIRE LINE RECORD — REEL No. — SIZE — No. LINES — METRES SLIPPED

LAST CASING TUBING OR LINER	OUTSIDE DIAMETER	INSIDE DIAMETER	MAKE	kg/m	GRADE	No. JOINTS	TOTAL LENGTH	RKB. TO CSG. HD	SET AT

METRES CUT OFF — PRESENT LENGTH
MEGAJOULES SINCE LAST CUT
CUMULATIVE MEGAJOULES

MORNING TOUR

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. LINER SIZE	PUMP No. STROKES per min	PUMP No. LINER SIZE	PUMP No. STROKES per min	METHOD RUN SGL S PAREL P COM'D C
					REDUCED PUMP SPEED							

DEVIATION RECORD	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION

BOILER HOURS 8

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
00:00	08:00	8	1	Nipple up Diverter - Pre-mix mud.

DRILLER

DAY TOUR

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. 1 LINER SIZE	PUMP No. 1 STROKES per min	PUMP No. 2 LINER SIZE	PUMP No. 2 STROKES per min	METHOD RUN SGL S PAREL P COM'D C
0	107	107		GRAVEL 64 to 69m, 75 to 78m, 96 to 97m,	170	12/14	7500	165	98	140	65	
					REDUCED PUMP SPEED							

DEVIATION RECORD	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION
	~~32~~		MISRUN/32m	-1/4°	/66m	-1/4°			

BOILER HOURS 8

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
08:00	10:00	2	1	Rig to spud ✓Diverter 15sec 4/0, ✓HCR 2sec 4/0
10:00	10:15	1/4	2	Spud + Drill 0-23m
10:15	10:30	1/4	21	Pick up 222mm Drill Collars.
10:30	12:00	1 1/2	2	Drill 23-70
12:00	12:45	3/4	6	Hoist install Totco Ring
12:45	13:00	1/4	10	Survey ~~Seq~~. MISRUN 32m
13:00	13:15	1/4	2	Drill 70-72
13:15	13:30	1/4	10	Survey ~~Seq~~. 32m MISRUN
13:30	13:45	1/4	2	Drill 72-79
13:45	14:30	3/4	5	Circ.
14:30	14:45	1/4	10	Survey 32m - 1/4°
14:45	15:00	1/4	6	Hoist Remove Totco Ring
15:00	15:15	1/4	10	Survey 66m - 1/4°
15:15	16:00	3/4	2	Drill 79-107

DRILLER

EVENING TOUR

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. 1 LINER SIZE	PUMP No. 1 STROKES per min	PUMP No. 2 LINER SIZE	PUMP No. 2 STROKES per min	METHOD RUN SGL S PAREL P COM'D C
107	208	101		GRAVEL 166-169,	170	16	10,000	165	98	140	65	
					REDUCED PUMP SPEED							

DEVIATION RECORD	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION
	94m	1/2°	// 122m	- 1/4°	// 149 -	1/2°	171 -	1/4°	

BOILER HOURS 8

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
16:00	16:15	1/4	7	Rig Service ✓Diverter 14sec 4/0
16:15	16:30	1/4	10	Survey 94m - 1/2°
16:30	17:00	1/2	2	Drill 107-135
17:00	17:15	1/4	10	Survey 122m - 1/4°
17:15	18:15	1/4	2	Drill 135-162
18:15	18:30	1/4	10	Survey 149 - 1/2°
18:30	19:45	1 1/4	2	Drill 162-180
19:45	20:00	1/4	10	Survey @ 171
20:00	22:15	2 1/4	2	Drill 180-208
22:15	22:45	1/2	5	Circ
22:45	24:00	1 1/4	6	Hoist Bit in & R/U H.

DRILLER

OFFICIAL DAILY DRILLING REPORT FORM

16378

DAILY DRILLING REPORT — REPORT No. 7

LEASE	WELL No.	WELL NUMBER	DATE (Yr. Mo. Day)
UNCAL - LTARD	K-2	60-20-123-30	96 12 15

OPERATOR	CONTRACTOR	RIG No.
UNOCAL CANADA EXPLORATION LTD.	CACTUS DRILLING	ONE

SIGNATURE OF OPERATOR'S REPRESENTATIVE: Doug Habourey

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

D.P. SIZE	kg/m	GRADE	TOOL JT O.D.	TYPE THREAD	STRING No.
102	20.86	E	129	FH	

PUMP No.	PUMP MANUFACTURER	TYPE	STROKE LENGTH
1	G.D.	PZ-9	229
2	EMSCO	D-375	356

TIME DISTRIBUTION - HOURS

CODE No.	OPERATION	MORN.	DAY	EVE.
1.	RIG UP AND TEAR DOWN			
2.	DRILL ACTUAL	6 3/4	6 3/4	7 1/4
3.	REAMING			
4.	CORING			
5.	CONDITION MUD & CIRCULATE			
6.	TRIPS			
7.	LUBRICATE RIG	1/4	1/4	1/4
8.	REPAIR RIG			
9.	CUT OFF DRILLING LINE			
10.	DEVIATION SURVEY	1	1	1/2
11.	WIRE LINE LOGS			
12.	RUN CASING & CEMENT			
13.	WAIT ON CEMENT			
14.	NIPPLE UP B.O.P.			
15.	TEST B.O.P.			
16.	DRILL STEM TEST			
17.	PLUG BACK			
18.	SQUEEZE CEMENT			
19.	FISHING			
20.	DIR. WORK			
21.				
22.				
23.				
COMPLETION	A. PERFR'TN			
	B. TBG TRIPS			
	C. TREATING			
	D. SWABBING			
	E. TESTING			
	F. ADDIT'NL			
	G.			
TOTALS		8	8	8

DAY WORK SUMMARY (OFFICE USE ONLY)

HRS. W/CONTR. D.P.

HRS. W/OPR. D.P.

HRS. STANDBY

RECEIVED
DEC 19 1996

CACTUS DRILLING
MISKU

TOTAL DAY WORK

No. OF DAYS FROM SPUD: 2

CUMULATIVE ROTATING HRS.

TOTAL MUD COST

MORNING TOUR

DRILLING ASSEMBLY (at end of tour)

No.		
	BIT	30 m
1	3/5	1.00
2	STB RMR 22206 OD	17.14 m
1	D.C. ID 3 1/2 OD	.94 m
1	STB RMR NMDC OD	9.14 m
18	D.C. ID 165 OD	156.00 m
1	STB RMR X/O OD	.56 m
		185.58
4	STANDS DP	114.67 m
	SINGLES DP	m
	KELLY DOWN	12.97 m
	TOTAL	313.22 m
	(FORCE) WT. OF STRING	32,000 daN

BIT RECORD

BIT No.	2A
SIZE	311
MFG.	SMITH
TYPE	MSDG
JETS mm	3/11.9 1/15.9
SER. No.	RT5685
DEPTH OUT	
DEPTH IN	208.
TOTAL METRES DRILLED	105
TOTAL HRS. RUN	6 3/4
COND 1/8's T/B/ GAGE	
FLOW RATE m³/min	
PRESSURE DROP kPa	

MUD RECORD

TIME	01:00	04:00	0630
DENSITY kg/m³	1135	1140	1140
PRESSURE GRADIENT			
VISCOSITY	38	42	38
PV mPa·s / YP Pa	/	/	/
GEL STR. Pa	/	/	/
WATER LOSS cm³			
pH	8.0	8.0	8.0
SOLIDS %	CENT	OF 3	1110
	L.P.M.	32 UF	1900

MUD & CHEMICALS ADDED

TYPE	AMT. kg	TYPE	AMT. kg
GEL	15		
DETERGENT	1		

DAY TOUR

DRILLING ASSEMBLY (at end of tour)

No.		
	BIT	.30 m
1	3/5	1.00
2	STB RMR 22206 OD	17.64 m
1	D.C. ID 3 1/2 OD	.94 m
1	STB RMR NMDC OD	9.14 m
17	D.C. ID 165 OD	156.00 m
1	STB RMR X/O OD	.56 m
		185.58
6	STANDS DP	m
X	SINGLES DP	181.22 m
	KELLY DOWN	6.2. m
	TOTAL	373 m
	(FORCE) WT. OF STRING	33,000 daN

BIT RECORD

BIT No.	2A
SIZE	311
MFG.	SMITH
TYPE	MSDG
JETS mm	3/11.9 1/15.9
SER. No.	RT5685
DEPTH OUT	
DEPTH IN	208
TOTAL METRES DRILLED	165
TOTAL HRS. RUN	13 1/2
COND 1/8's T/B/ GAGE	
FLOW RATE m³/min	
PRESSURE DROP kPa	

MUD RECORD

TIME	08:00	11:30	14:30
DENSITY kg/m³	1145	1145	1140
PRESSURE GRADIENT			
VISCOSITY	41	47	46
PV mPa·s / YP Pa	/	/	/
GEL STR. Pa	/	/	/
WATER LOSS cm³			
pH	8.0	8.0	8.0
SOLIDS %	1/min	UF	OF
CENT	4	1905	1135

MUD & CHEMICALS ADDED

TYPE	AMT. kg	TYPE	AMT. kg
GEL	17		
DET	1		

EVENING TOUR

DRILLING ASSEMBLY (at end of tour)

No.		
	BIT	.30 m
1	3/5	1.00
2	STB RMR 22206 OD	17.64 m
1	D.C. ID 3 1/2 OD	.94 m
1	STB RMR NMDC OD	9.14 m
17	D.C. ID 165 OD	156.00 m
1	STB RMR X/O OD	.56 m
		185.58
8	STANDS DP	228.67 m
	SINGLES DP	m
	KELLY DOWN	12.97 m
	TOTAL	427.22 m
	(FORCE) WT. OF STRING	35,000 daN

BIT RECORD

BIT No.	2A
SIZE	311
MFG.	SMITH
TYPE	MSDG
JETS mm	3/11.9 1/15.9
SER. No.	RT5685
DEPTH OUT	
DEPTH IN	208
TOTAL METRES DRILLED	219.
TOTAL HRS. RUN.	20 3/4
COND 1/8's T/B/ GAGE	
FLOW RATE m³/min	
PRESSURE DROP kPa	

MUD RECORD

TIME	16:00	20:00	23:30
DENSITY kg/m³	1145	1145	1150
PRESSURE GRADIENT			
VISCOSITY	45	47	62
PV mPa·s / YP Pa	/	/	/
GEL STR. Pa	/	/	/
WATER LOSS cm³			
pH	8.0	8.0	8.0
SOLIDS %	CENT	UF /	OF /
	LPM 5	1900	1145

MUD & CHEMICALS ADDED

TYPE	AMT. kg	TYPE	AMT. kg
GEL	10		

FORM 3T6m

APPROVAL PENDING

APPROVED

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Revised December, 1986

OF

E.R.C.B.

	OP.	R.M.
(1) Daily Walk Around Inspection	Initial DS.	Initial
(2) Detailed Inspection-Weekly (using check list)	Initial	Initial
(3) H_2S Signs Posted (if required)	Initial DS.	Initial

	R.M.
(1) Rig Site Health and Safety Meeting (one meeting/crew/month)	Initial
(2) C.A.O.D.C. Rig Safety Inspection Check List (one/rig/month)	Initial
(3) Mast Inspection Before Raising or Lowering	Initial

LEGAL LAND DESCRIPTION 60-20-123-30

WIRE LINE RECORD REEL No.

	OUTSIDE DIAMETER	INSIDE DIAMETER	MAKE	kg/m	GRADE	No. JOINTS	TOTAL LENGTH	RKB. TO CSG. HD	SET AT
LAST CASING TUBING OR LINER									

SIZE	No. LINES	METRES SLIPPED

METRES CUT OFF | PRESENT LENGTH

MEGAJOULES SINCE LAST CUT

CUMULATIVE MEGAJOULES

DAY TOUR

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. 1 LINER SIZE	PUMP No. 1 STROKES per min	PUMP No. 2 LINER SIZE	PUMP No. 2 STROKES per min	METHOD RUN SGL S PAR'L P COM'D C
208	313	105			170	14/10	10300	165	98	140	65	
					REDUCED PUMP SPEED							

DEVIATION RECORD	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION
	198 –	1°	227 –	1°	255 –	2°	284 –	2°	

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS			BOILER HOURS 8 Fuel: 146
0000	00:15	1/4	7	Rig Serv	0500	05:15	1/4 10 Survey @ 284
00:15	00:30	1/4	10	Survey @ 198	05:15	08:00	3/4 2 Drill 294-313
00:30	01:30	1	2	Drill 208-237			
01:30	01:45	1/4	10	Survey @ 227			
01:45	03:00	1 1/4	2	Drill 237-265			
03:00	03:15	1/4	10	Survey @ 255 2°			
03:15	05:00	1 3/4	2	Drill w/6 DRH. ON BIT 3 singles 265-294			DRILLER

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. 1 LINER SIZE	PUMP No. 1 STROKES per min	PUMP No. LINER SIZE	PUMP No. STROKES per min	METHOD RUN SGL S PAR'L P COM'D C
313	373	60			170	7/8	10300	165	98	140	65	
					REDUCED PUMP SPEED							

DEVIATION RECORD	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION
	309	3°		338	2 1/2°				

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS	BOILER HOURS 8
05:00	05:15	1/4	7	Rig Service, ✓Diverter 15 sec C/12 sec O.	
05:15	05:30	1/4	2	Drill 313-322.	
05:30	09:00	1/2	10	Survey 309 - 3°	
09:00	12:30	3 1/2	2	Drill 322-351	
12:30	13:00	1/2	10	Survey 338 - 2 1/2°	
13:00	16:00	3	2	Drill 351-373	
					DRILLER

EVENING TOUR

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. 1 LINER SIZE	PUMP No. 1 STROKES per min	PUMP No. 2 LINER SIZE	PUMP No. 2 STROKES per min	METHOD RUN SGL S PAR'L P COM'D C
373	427	54			170	7/8	11000	165	98	140	65	
					REDUCED PUMP SPEED							

DEVIATION RECORD	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION
	366	3°	395 –	2 3/4°					

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS	BOILER HOURS 8
16:00	16:15	1/4	7	Rig Service ✓Diverter 14 sec C/O	
16:15	~~17:00~~ 17:00	3/4	2	Drill 373-379	
17:00	17:15	1/4	10	Survey 366 - 3°	
17:15	21:15	4	2	Drill 379-408	
21:15	21:30	1/4	10	Survey @ 395 2 3/4°	
21:30	24:00	2 1/2	2	Drill 408-427.	
					DRILLER

OFFICIAL DAILY DRILLING REPORT FORM

16379

DAILY DRILLING REPORT — REPORT No. 8

LEASE	WELL No.	WELL NUMBER	DATE (Yr. Mo. Day)
UNCEL LIARD	K-2	60-20-123-30	96 12 16

OPERATOR	CONTRACTOR	RIG No.
UNOCAL EXPLORATION LTD.	CACTUS DRILLING	ONE

SIGNATURE OF OPERATOR'S REPRESENTATIVE: Doug Galbraith

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

D.P. SIZE	kg/m	GRADE	TOOL JT O.D.	TYPE THREAD	STRING No.
102	20.86	E	129	FH	

PUMP No.	PUMP MANUFACTURER	TYPE	STROKE LENGTH
1	G.D.	F2-9	229
2	EMSCO	D-375	356

TIME DISTRIBUTION - HOURS

CODE No.	OPERATION	MORN.	DAY	EVE.
1.	RIG UP AND TEAR DOWN			
2.	DRILL ACTUAL	3/4		
3.	REAMING			
4.	CORING			
5.	CONDITION MUD & CIRCULATE	1 1/4	1	
6.	TRIPS	3 3/4	1/2	
7.	LUBRICATE RIG	1/4	1/4	1/4
8.	REPAIR RIG			
9.	CUT OFF DRILLING LINE			
10.	DEVIATION SURVEY	2		
11.	WIRE LINE LOGS			
12.	RUN CASING & CEMENT		4 3/4	
13.	WAIT ON CEMENT			
14.	NIPPLE UP B.O.P.		1 1/2	3 1/2
15.	TEST B.O.P.			
16.	DRILL STEM TEST			
17.	PLUG BACK			
18.	SQUEEZE CEMENT			
19.	FISHING			
20.	DIR. WORK			
21.	WELL BOWL.			4 1/4
22.				
23.				
COMPLETION	A. PERF'RTN			
	B. TBG TRIPS			
	C. TREATING			
	D. SWABBING			
	E. TESTING			
	F. ADDIT'NL			
	G.			
	TOTALS	8.5	8	

DAY WORK SUMMARY (OFFICE USE ONLY)

HRS. W/CONTR. D.P.

HRS. W/OPR. D.P.

HRS. WO/D.P.

HRS. STANDBY

NO. OF DAYS FROM SPUD

CUMULATIVE ROTATING HRS.

TOTAL MUD COST

RECEIVED
DEC 19 1996

DRILLING ASSEMBLY (at end of tour)

No.		
1	BIT	.30 m
	[illegible]	
1	STB RMR OD	1.00 m
2	D.C. ID 222.00 OD	17.64 m
1	STB RMR BELL SUB OD	.94 m
1	D.C. ID NMDC OD	9.14 m
17	STB RMR DOD	156.00 m
1	X/O	.56
		185.58
8	STANDS DP	m
1	SINGLES DP	237.95 m
	KELLY DOWN	10.47 m
	TOTAL	434 m
	(FORCE) WT. OF STRING	35,000 daN

BIT RECORD

BIT No.	2A.
SIZE	311
MFG.	SMITH
TYPE	MSDG
JETS mm	3/11.9 1/15.9
SER. No.	RT5685
DEPTH OUT	
DEPTH IN	208
TOTAL METRES DRILLED	226
TOTAL HRS. RUN	21/2
COND 1/8's T/B/ GAGE	
FLOW RATE m³/min	/
PRESSURE DROP kPa	

MUD RECORD

TIME	00:00	04:00
DENSITY kg/m³	1150	1160
PRESSURE GRADIENT		
VISCOSITY	62	60
PV mPa•s / YP Pa	/	/
GEL STR. Pa	/	/
WATER LOSS cm³		
pH	9.0	9.0
SOLIDS %	LF/	OF/
LPM 4	1900	1150

MUD & CHEMICALS ADDED

TYPE	AMT. kg	TYPE	AMT. kg

MORNING TOUR

DRILLING ASSEMBLY (at end of tour)

No.		
	BIT	RAW 33 m
	STB RMR OD	SURFACE Csg. LANDED @ 434m. K.B.
	D.C. ID OD	PUMPED 1m³ H2O PRESSURE TEST LINES TO 28 MPa, PUMP 2m³ H2O
	STB RMR OD	CEMENTED WITH 28.6 TONNES D:L:B, "G" plus 2% CaCl2
	D.C. ID OD	DROP PLUG, DISPLACED W/ 16.9 m³ H2O BUMPED PLUG @
	STB RMR OD	1430 HRS, 7000 Kpa 5 min. HELD O.K. 4m³ good cement returns.
	STANDS DP	m
	SINGLES DP	m
	KELLY DOWN	m
	TOTAL	m
	(FORCE) WT. OF STRING	daN

BIT RECORD

BIT No.	
SIZE	
MFG.	
TYPE	
JETS mm	
SER. No.	
DEPTH OUT	
DEPTH IN	
TOTAL METRES DRILLED	
TOTAL HRS. RUN	
COND 1/8's T/B/ GAGE	
FLOW RATE m³/min	/
PRESSURE DROP kPa	

MUD RECORD

TIME		
DENSITY kg/m³	1550-1550 kg/m³	
PRESSURE GRADIENT		
VISCOSITY		
PV mPa•s / YP Pa	/	/
GEL STR. Pa	/	/
WATER LOSS cm³		
pH		
SOLIDS %		

MUD & CHEMICALS ADDED

TYPE	AMT. kg	TYPE	AMT. kg

DAY TOUR

DRILLING ASSEMBLY (at end of tour)

No.		
	BIT	m
	STB RMR OD	m
	D.C. ID OD	m
	STB RMR OD	m
	D.C. ID OD	m
	STB RMR OD	m
	STANDS DP	m
	SINGLES DP	m
	KELLY DOWN	m
	TOTAL	m
	(FORCE) WT. OF STRING	daN

BIT RECORD

BIT No.	
SIZE	
MFG.	
TYPE	
JETS mm	
SER. No.	
DEPTH OUT	
DEPTH IN	
TOTAL METRES DRILLED	
TOTAL HRS. RUN	
COND 1/8's T/B/ GAGE	
FLOW RATE m³/min	/
PRESSURE DROP kPa	

MUD RECORD

TIME		
DENSITY kg/m³		
PRESSURE GRADIENT		
VISCOSITY		
PV mPa•s / YP Pa	/	/
GEL STR. Pa	/	/
WATER LOSS cm³		
pH		
SOLIDS %		

MUD & CHEMICALS ADDED

TYPE	AMT. kg	TYPE	AMT. kg

EVENING TOUR

FORM 3106m — APPROVAL PENDING — CAODC APPROVED — COPYRIGHT 1977 JANUARY — Revised December, 1986 — OFI

E.R.C.B.

	OPR.	R.M.
(1) Daily Walk Around Inspection	Initial	Initial
(2) Detailed Inspection-Weekly (using check list)	Initial	Initial
(3) H_2S Signs Posted (if required)	Initial	Initial

	R.M.
(1) Rig Site Health and Safety Meeting (one meeting/crew/month)	Initial
(2) C.A.O.D.C. Rig Safety Inspection Check List (one/rig/month)	Initial
(3) Mast Inspection Before Raising or Lowering	Initial

LEGAL LAND DESCRIPTION 60-20-123-30

WIRE LINE RECORD REEL No.

	OUTSIDE DIAMETER	INSIDE DIAMETER	MAKE	kg/m	GRADE	No. JOINTS	TOTAL LENGTH	RKB. TO CSG. HD	SET AT
LAST CASING TUBING OR LINER	244.5	226	Prud.	53.57	J-55	33	433.68	4.74	434

SIZE	No. LINES	METRES SLIPPED

METRES CUT OFF | PRESENT LENGTH

MEGAJOULES SINCE LAST CUT

CUMULATIVE MEGAJOULES

MORNING TOUR

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. 1 LINER SIZE	PUMP No. 1 STROKES per min	PUMP No. 2 LINER SIZE	PUMP No. 2 STROKES per min	METHOD RUN SGL S PAR'EL P COM'D C
427	434	7		STRAP 427.57	170	7/8	4,000	165	98	140	65	
				TALLY 427.22								
				DIFF .35m								

REDUCED PUMP SPEED

DEVIATION RECORD	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION
	400	2 3/4°	341-3-16	312					
	AZ 29		374 AZ 37	339	255-2 1/2°	36	225-2°-1	196-2°-349	162-1°-355

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
00:00	00:15	1/4	7	Rig Serv ✓ Deverter.
00:15	00:45	1/2	5	CIRC
00:45	—	—	—	Wiper TRIP TO BIT STRAP OUT (EVERYTHING)
—	3:30	2 3/4	6	R.I.H. : CIRC OUT MUD RING
3:30	4:15	3/4	2	DRILL 427-434
4:15	5:00	3/4	5	CIRC
5:00	8:00	3	6	HOIST TO RUN CASING TAKING DIRC SURVEY

BOILER HOURS 8

TRIP TIME: 1

SURVEY TIME: 2 1/2

DRILLER

DAY TOUR

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. LINER SIZE	PUMP No. STROKES per min	PUMP No. LINER SIZE	PUMP No. STROKES per min	METHOD RUN SGL S PAR'EL P COM'D C
434												

REDUCED PUMP SPEED

DEVIATION RECORD	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION
	125-1/4°								

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
05:00	05:15	1/4	7	Rig Service
05:15	05:45	1/2	6	SAFETY MEETING, LAY DOWN 222mm DC.
05:45	12:15	3 1/2	12	SAFETY MEETING, RIG-UP + RUN CSG.
12:15	13:15	1	5	CIRC CASING.
13:15	14:30	1 1/4	12	SAFETY MEETING, HEAD-UP + CEMENT CSG.
14:30	16:00	1 1/2	14	NIPPLE DOWN DIVERTER.

BOILER HOURS 8

DRILLER

EVENING TOUR

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. LINER SIZE	PUMP No. STROKES per min	PUMP No. LINER SIZE	PUMP No. STROKES per min	METHOD RUN SGL S PAR'EL P COM'D C

REDUCED PUMP SPEED

DEVIATION RECORD	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
16:00	16:15	1/4	7	Rig Service
16:15	18:00	1 3/4	14	LOAD OUT DIVERTER EQUIP, CUT CONDUCTOR + CSG.
18:00	22:15	4 1/4	21	WELD ON BOWL. LET COOL & PRESSURE TEST TO 7000 KPA. 10 MINS.
22:15	24:00	1 3/4	14	Nipple up BOP's

BOILER HOURS 8

DRILLER

OFFICIAL DAILY DRILLING REPORT FORM

16380

DAILY DRILLING REPORT — REPORT No. 9

LEASE	WELL No.	WELL NUMBER	DATE
UNOCAL LIARD	K-2	60-20-123-30	96/12/4 (Yr. Mo. Day)

OPERATOR	CONTRACTOR	RIG No.
UNOCAL EXPLORATION LTD	CACTUS DRILLING	ONE

SIGNATURE OF OPERATOR'S REPRESENTATIVE: Doug Galloway

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

D.P. SIZE	kg/m	GRADE	TOOL JT O.D.	TYPE THREAD	STRING No.
102	20.86	E	129	FH	165

PUMP No.	PUMP MANUFACTURER	TYPE	STROKE LENGTH
1	G.D.	PZ-9	220
2	EMSCO	D-375	35

TIME DISTRIBUTION - HOURS

CODE No.	OPERATION	MORN.	DAY	EVE.
1.	RIG UP AND TEAR DOWN			
2.	DRILL ACTUAL		4/4	5/4
3.	REAMING			
4.	CORING			
5.	CONDITION MUD & CIRCULATE		1 1/4	1/4
6.	TRIPS	2 1/2		
7.	LUBRICATE RIG			1/4
8.	REPAIR RIG			
9.	CUT OFF DRILLING LINE			
10.	DEVIATION SURVEY			1
11.	WIRE LINE LOGS			
12.	RUN CASING & CEMENT			
13.	WAIT ON CEMENT			
14.	NIPPLE UP B.O.P.	2 1/2	1 3/4	
15.	TEST B.O.P.	3	2 1/4	
16.	DRILL STEM TEST			
17.	PLUG BACK			
18.	SQUEEZE CEMENT			
19.	FISHING			
20.	DIR. WORK			
21.	SAFETY MEETING		1/2	
22.	DRILL OUT		3/4	
23.	B.O.P. DRILL		1/4	1/4
COMPLETION	A. PERFR'T'N			
	B. TBG TRIPS			
	C. TREATING			
	D. SWABBING			
	E. TESTING			
	F. ADDIT'N'L			
	G.			
TOTALS		8	8	8

DAY WORK SUMMARY (OFFICE USE ONLY)

HRS. W/CONTR. D.P.
HRS. W/OPR. D.P.
HRS. WO/D.P.
HRS. STANDBY

RECEIVED
DEC 19 1996
DRILLING
TOTAL DAY WORK
No. OF DAYS FROM SPUD
CUMULATIVE ROTATING HRS.
TOTAL MUD COST

DRILLING ASSEMBLY (at end of tour)

No.		
	BIT	.30 m
1	BIT SUB W/FLOAT	.69
3	STB RMR OD	28.36
1	D.C. ID X/O OD	.77
1	STB RMR OD	3.04
1	D.C. ID NMDC OD	9.14
17	STB RMR 5 DC OD	156.00
1	X/O	.56
		198.86
7	STANDS DP	200.01 m
	SINGLES DP	m
	KELLY DOWN	m
	TOTAL	m
	(FORCE) WT. OF STRING	36,000 daN

BIT RECORD

BIT No.	1
SIZE	222
MFG.	REED
TYPE	EHP43A
JETS mm	3/8/7
SER. No.	DJ4158
DEPTH OUT	
DEPTH IN	434
TOTAL METRES DRILLED	
TOTAL HRS. RUN	
COND 1/8's T/B/ GAGE	
FLOW RATE m³/min	/ /
PRESSURE DROP kPa	

MUD RECORD

TIME			
DENSITY kg/m³			
PRESSURE GRADIENT			
VISCOSITY			
PV mPa·s / YP Pa	/	/	/
GEL STR. Pa	/	/	/
WATER LOSS cm³			
pH			
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT. kg	TYPE	AMT. kg
SAWDUST	2		

DRILLING ASSEMBLY (at end of tour)

No.		
	BIT	.30 m
1	B/S FLOAT	.69
3	STB RMR 47 DC OD	28.36
1	D.C. ID X/O OD	.77
1	STB RMR 5/5 OD	3.04
1	D.C. ID NMDC OD	9.14
17	STB RMR 165 DC OD	156.00
1	X/O	.56
		198.86
8	STANDS DP	228.36 m
	SINGLES DP	m
	KELLY DOWN	12.97 m
	TOTAL	440.19 m
	(FORCE) WT. OF STRING	36,000 daN

BIT RECORD

BIT No.	1
SIZE	222
MFG.	REED
TYPE	EHP43A
JETS mm	3/8/7
SER. No.	DJ4158
DEPTH OUT	
DEPTH IN	434
TOTAL METRES DRILLED	6
TOTAL HRS. RUN	1/4
COND 1/8's T/B/ GAGE	
FLOW RATE m³/min	/ /
PRESSURE DROP kPa	

MUD RECORD

TIME			15:30
DENSITY kg/m³			1005
PRESSURE GRADIENT			
VISCOSITY			29
PV mPa·s / YP Pa	/	/	/
GEL STR. Pa	/	/	/
WATER LOSS cm³			
pH			11.5
SOLIDS %			

MUD & CHEMICALS ADDED

TYPE	AMT. kg	TYPE	AMT. kg

DRILLING ASSEMBLY (at end of tour)

No.		
	BIT	.30 m
1	B/S FLOAT	.69
3	STB RMR 47 OD	28.36
1	D.C. ID X/O OD	.77
1	STB RMR 5/5 OD	3.04
1	D.C. ID NMDC OD	9.14
17	STB RMR 165 DC OD	156.00
1	X/O	.56
		198.86
12	STANDS DP	342.14 m
	SINGLES DP	m
	KELLY DOWN	9.00 m
	TOTAL	550 m
	(FORCE) WT. OF STRING	36,000 daN

BIT RECORD

BIT No.	1
SIZE	222
MFG.	REED
TYPE	EHP43A
JETS mm	3/8/7
SER. No.	DJ4158
DEPTH OUT	
DEPTH IN	434
TOTAL METRES DRILLED	116
TOTAL HRS. RUN	5 1/2
COND 1/8's T/B/ GAGE	
FLOW RATE m³/min	/ /
PRESSURE DROP kPa	

MUD RECORD

TIME	18:00	20:00	23:30
DENSITY kg/m³	1005	1005	1040
PRESSURE GRADIENT			
VISCOSITY	29	29	28
PV mPa·s / YP Pa	/	/	/
GEL STR. Pa	/	/	/
WATER LOSS cm³			
pH	11.5	11.5	11.5
SOLIDS #1	OF 1015	UF 1815	515
#2	OF 1010	UF 1900	14LPM

MUD & CHEMICALS ADDED

TYPE	AMT. kg	TYPE	AMT. kg
ENVIRO	1	FOR DEICING	

FORM 3T6m — APPROVAL PENDING — APPROVED CAODC — Revised December, 1986

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E.R.C.B.
(1) Daily Walk Around Inspection
(2) Detailed Inspection-Weekly (using check list)
(3) H2S Signs Posted (if required)

OPR Initial DY Initial DY Initial DY
R.M. Initial Initial Initial

(1) Rig Site Health and Safety Meeting (one meeting/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Check List (one/rig/month)
(3) Mast Inspection Before Raising or Lowering

R.M. Initial Initial Initial

LEGAL LAND DESCRIPTION 60-20-123-30

WIRE LINE RECORD REEL No.

	OUTSIDE DIAMETER	INSIDE DIAMETER	MAKE	kg/m	GRADE	No. JOINTS	TOTAL LENGTH	RKB. TO CSG. HD	SET AT
LAST CASING TUBING OR LINER	244.5	226	Prod	53.57	J55	33	435.68	4.74	434

SIZE | No. LINES | METRES SLIPPED
METRES CUT OFF | PRESENT LENGTH
MEGAJOULES SINCE LAST CUT
CUMULATIVE MEGAJOULES

MORNING TOUR

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. 1 LINER SIZE	PUMP No. 1 STROKES per min	PUMP No. 2 LINER SIZE	PUMP No. 2 STROKES per min	METHOD RUN SGL S PAR'EL P COM'D C
434				NEB CHECK PREFORMED. ⓓ				165				
				1300 HRS.								
					REDUCED PUMP SPEED							

DEVIATION RECORD

DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION

BOILER HOURS 8

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
00:00	02:30	2½	14	Nipple up Bop's ✓MOTOR KILLS
02:30	—	—	15	PRESSURE TEST BLIND Rams, HCR, ALL VALVES ADJACENT BOPS
—	04:00	1½	15	MANIFOLD ALL TESTS 1700 KPA Low 10 mins 17,000 KPA High 10 mins
04:00	06:30	2½	6	MAKE UP BHA : RIH
06:30	08:00	1½	15	PRESSURE TEST UPPER & Lower Pipe Rams, Annular, 1700 KPA Low 10 mins 17,000 KPA High 10 mins

DRILLER

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. 1 LINER SIZE	PUMP No. 1 STROKES per min	PUMP No. 2 LINER SIZE	PUMP No. 2 STROKES per min	METHOD RUN SGL S PAR'EL P COM'D C
434	440	6		PRESSURE TEST AS PER			4500	165	93	140		
				REGULATIONS.								
✓MOTOR KILLS, CROWN SAVER, FLARE & DEGASSER LINES					REDUCED PUMP SPEED		2600	165	50			

DEVIATION RECORD

DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION

BOILER HOURS 8

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
08:00	09:15	1¼	15	PRESSURE TEST Upper & Lower Kelly Cocks, & INSIDE B.O.P.
09:15	09:45	½	15	~~REMOVE FLARE LINES~~. ACCUMULATOR FUNCTION TEST.
09:45	11:30	1¾	14	RIG UP FLARE LINES.
11:30	12:00	½	21	PRE DRILL OUT SAFETY MEETING.
12:00	13:45	1¾	22	DRILL OUT TAGGED CEMENT AT 417m.
13:45	14:00	¼	2	DRILL 434-440
14:00	14:15	¼	23	B.O.P. DRILL

TIME LOG FROM	TO	ELAPSED TIME	CODE No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. 1 LINER SIZE	PUMP No. 1 STROKES per min	PUMP No. 2 LINER SIZE	PUMP No. 2 STROKES per min	METHOD RUN SGL S PAR'EL P COM'D C
14:15	14:30	¼	5	CIRC. BTMS UP								
14:30	15:00	½	15	LEAK OFF TEST								
15:00	16:00	1	5	CIRC. WAIT ON STABBING VALVE.								

DRILLER

EVENING TOUR

METRES DRILLED FROM	TO	DR D RM R CORE C	CORE No.	FORMATION (SHOW CORE RECOVERY)	ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. 1 LINER SIZE	PUMP No. 1 STROKES per min	PUMP No. 2 LINER SIZE	PUMP No. 2 STROKES per min	METHOD RUN SGL S PAR'EL P COM'D C
440	550	110		Held CAMP FIRE DRILL WITH	120	14	1040	165	93	140		
				Rig Crews. OK								
					REDUCED PUMP SPEED		2700	165	50			

DEVIATION RECORD

DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION	DEPTH	DEV	DIRECTION
443 MIS RUN	3°	456	35			503	3°	34

BOILER HOURS 8

TIME LOG FROM	TO	ELAPSED TIME	COL No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
16:00	16:15	¼	7	RIG SERVICE ✓ANNULAR 9 SEC c/o, SWACO CHOKE 22 SEC c/o
16:15	17:30	1¼	5	CIRC. WAIT ON STABBING VALVE.
17:30	20:15	2¾	2	DRILL 440-488
20:15	20:30	¼	23	HELD BOP DRILL w/CREW WELL SECURED in 3 MINS
20:30	20:45	¼	10	DIR SURVEY @ 443 MIS RUN
20:45	21:00	¼	2	DRILL 488-497
21:00	21:30	½	10	DIR SURVEY @ 456

ROTARY RPM	(FORCE) WT ON BIT daN	PUMP PRESS	PUMP No. 1 LINER SIZE	PUMP No. 1 STROKES per min	PUMP No. 2 LINER SIZE	PUMP No. 2 STROKES per min	METHOD RUN SGL S PAR'EL P COM'D C
120	14	1040	165	93	140		
		2700	165	50			

TIME LOG FROM	TO	ELAPSED TIME	COL No.	DETAILS OF OPERATIONS IN SEQUENCE AND REMARKS
21:30	22:30	1	2	DRILL 497-544
22:30	23:45	¼	10	SURVEY @ 503
23:45	24:00	¼	2	DRILL 544

DRILLER

OFFICIAL DAILY DRILLING REPORT FORM

RP. 10

000571

LICENCE NO.:	WELL NAME AND NO.:
9211-U18-1-1	UNOCAL LIARD K-2/60-20-123-30
OPERATOR:	**CONTRACTOR:**
UNOCAL EXPLORATION LTD.	CACTUS DRILLING
SURFACE LOCATION:	**UNIQUE ID.:**
K-2 60-20-123-30	
SIGNATURE OF OPERATOR'S REPRESENTATIVE:	**SIGNATURE OF CONTRACTOR'S RIG MANAGER:**

DAILY CHECKS

(1) Daily Walk Around Inspection — Inv
(2) Detailed Inspection-Weekly (using checklist) — Inv
(3) HPS Signs Posted (if required) — Inv
(4) Well License & Stick Diagram Posted — Inv
(5) Flare Lines Staked — Inv
(6) BOP Drills Performed — Inv
(7) Visually Inspect BOP's - Flarelines & Degasser Lines — Inv

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/mon.
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME-HRS

CODE NO.	1 OPER.	2 RIG UP & TEAR DOWN	3 DRILL ACTUAL	4 REAMING	5 CORING	6 COND. MUD & CIRC	7 TRIPS	8 RIG SERVICE	9 REPAIR RIG	10 CUT OFF DRILL LINE	DEV SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.	22
MORN.			6 1/4					1/4			1/2												
DAY			6 3/4					1/4			1												
EVE.			6 3/4																				
TOTAL																							

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			m
1	BIT	222	.30 m
1	B/S W/FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.041 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.86 m
			m
17	D.P.	STANDS	m
1	D.P.	SINGLES	492.32 m
	KELLYDOWN		7.82 m
	TOTAL		699 m

WT. OF DC 38,000 1000 daN
WT. OF STRING 78,000 1000 daN

BIT RECORD

BIT NO.	1
SIZE (mm)	222
IADC CODE	
MFG.	Reed
TYPE	EHP43A
SERIAL NO.	D5-4158
JETS (mm)	3/8/7
DEPTH OUT (m)	
DEPTH IN (m)	434
TOTAL METRES DRILLED (m)	265
TOTAL HOURS RUN	11 3/4

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG :
TORQUE AT BOTTOM
FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	00:00	03:30	05:30
DENSITY kg/m³	1040	1040	1030
FUNNEL VIS. - (S/L)	28	28	27
W.L. (cm³)			
pH	11.5	10.0	10.0

MUD ADDITIONS

PRODUCT	AMOUNT X UNIT
03:00 DUMPED SAND TRAP 3.4 m³	
01:45 SUCKED 10.5 m³ FROM SHAKER TANK	
09:00/10.2 m³ FROM SHAKER TANK	
8.5 m³ SUCKED FROM DEGASSER TANK	

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
LPM 4	8		1015	1805
CENTRIFUGE				
LPM 4	8		1015	1855

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			m
1	BIT	222	.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.56 m
			m
20	D.P.	STANDS	m
XX	D.P.	SINGLES	586.56 m
	KELLYDOWN		7.58 m
	TOTAL		793 m

WT. OF DC 31,000 1000 daN
WT. OF STRING 39,000 1000 daN

BIT RECORD

BIT NO.	1
SIZE (mm)	222
IADC CODE	
MFG.	REED
TYPE	EHP43A
SERIAL NO.	DJ-4158
JETS (mm)	3/8/7
DEPTH OUT (m)	
DEPTH IN (m)	434
TOTAL METRES DRILLED (m)	359
TOTAL HOURS RUN	18 1/2

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG
TORQUE AT BOTTOM
FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	05:00	11:30	15:00
DENSITY kg/m³	1035	1050	1065
FUNNEL VIS. - (S/L)	28	40	45
W.L. (cm³)		16.4	9.3
pH	10.5	10.0	10.0

Dumped SAND TRAP.

MUD ADDITIONS

PRODUCT	AMOUNT X UNIT
GEL	102
DRISPAC	1
LIG	1
SODA ASH	3

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	8	L/min 1	1050	1475
CENT 2				
	8	L/min 2	1045	1705

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			m
1	BIT	222	.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
3	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.86 m
			m
23	D.P.	STANDS	653.13 m
	D.P.	SINGLES	m
	KELLYDOWN		12.01 m
	TOTAL		864.00 m

WT. OF DC 31,000 1000 daN
OF STRING 40,000 1000 daN

BIT RECORD

BIT NO.	1
SIZE (mm)	222
IADC CODE	
MFG.	REED
TYPE	EHP-43A
SERIAL NO.	DJ-4158
JETS (mm)	3/8.7
DEPTH OUT (m)	
DEPTH IN (m)	434
TOTAL METRES DRILLED (m)	430
TOTAL HOURS RUN	25 1/4

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

DEC

HOLE CONDITION

HOLE DRAG CACT...
TORQUE AT BOTTOM
FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	17:00	20:00	
DENSITY kg/m³	1065	1070	
FUNNEL VIS. - (S/L)	48	44	
W.L. (cm³)	9.3	9.0	
pH	10.0	9.5	

MUD ADDITIONS

PRODUCT	AMOUNT X UNIT
9 1996	

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE #1				
		2	1055	1765
CENT #2				
		3	1060	1835

PR. DG R.M. RL

Initial	
DG	

YEAR 96 | MONTH 12 | DAY 18

RIG NO. ONE

FUEL @ 8:00

RIG 138 cm | BOILER

WEATHER

	°C
TEMPERATURE	
CURRENT CONDITIONS	
WIND DIRECTION	
ROAD	

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244.5	226	53.37	Prud	J-55	33	435.62	4.74	434
TUBING OR LINER									

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS
102	20.86	E		129	FH	165

	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
1	RZ-9	G.D.	229
2	Dyna 375	EMSCO	356

23	24	25	26	TOTALS
				8
				8

SHALE SHAKER(S)

NO 3 TYPE Flowline BAKER

SCREENS CHANGED ☐ YES ☒ NO

TOP 175	TOP
MIDDLE 175	MIDDLE
BOTTOM 175	BOTTOM

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
550	699	149	120	14/10
			78	10

CIRCULATION — PUMP NO. 1 — PUMP NO. 2

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
11.2 UC	165	93	127	

REVOLUTIONS — 2000 Ft — 50 @

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
560	3½°	35 AZ
607	4°	37 AZ
654	MISRUN	

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.
00:00	00:15	1/4	7
00:15	02:00	1¾	2
02:00	02:30	½	10
02:30	04:30	2	2
04:30	05:00	½	10
05:00	07:15	2¼	2
07:15	07:45	½	10
07:45	08:00	1/4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

Rig Serv Function Annular / Remote choke
Drill 550-601
Survey @ 560m
Drill 601-648
Circ & Dirc Survey @ 607
Drill 648-695
Survey @ 654 MISRUN
Drill 695-699

NOTES VISUAL Flow checks on all connections

DRILLER'S SIGNATURE

BOILER HRS. RAN	STACK TEMP.	MAXIMUM EXPERIENCED FLOOD LOAD	SAFE LOAD
8	11		12,115 Kpa

DAY TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
699	793	94	78	6

CIRCULATION — PUMP NO. 1 — PUMP NO. 2

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
12400	165	95	129	

REVOLUTIONS — 1000 — @ 55

STAND PIPE — @ 500 — @ 55

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
664	5°	35 AZ
720	5°	44 AZ

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.
08:00	08:15	1/4	7
08:15	08:30	1/4	2
08:30	09:00	½	10
09:00	12:00	3	2
12:00	12:30	½	10
12:30	16:00	3½	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

Rig Service / Annular + Remote Choke
Drill 699-705
Survey 664 - 5° - 35° Az.
Drill 705-761
Survey 720 - 5° - 44 Az.
Drill 761-793

NOTES Annular 11 sec c/o
Remote Choke 22 sec c/o

DRILLER'S SIGNATURE

BOILER HRS. RAN	STACK TEMP.	MAXIMUM EXPERIENCED FLOOD LOAD	SAFE LOAD
8	11		11519 Kpa.

EVENING TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
793	864	71	97/77	7

CIRCULATION — PUMP NO. 1 — PUMP NO. 2

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
	165		127	

REVOLUTIONS — 1000 — @ 50

STAND PIPE — @ 500 — @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
758	5°	46 Az.
806	5½	51 Az

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.
16:00	16:15	1/4	7
16:15	16:45	½	2
16:45	17:00	1/4	10
17:00	20:15	3¼	2
20:15	20:45	½	10
20:45	23:45	3	2
23:45	24:00	1/4	5

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

Rig Service / Annular, Upper + Lower Rams, Chokes
Drill 793-799
Survey 758 - 5° - 46 Az.
Drill 799-847
Circ & Dirc Survey @ 806
Drill 847-864
Circ up Sample

NOTES Annular 11 sec c/o, Remote Choke 22 sec c/o; Rams 4 sec c/o

DRILLER'S SIGNATURE

BOILER HRS. RAN	STACK TEMP.	MAXIMUM EXPERIENCED FLOOD LOAD	SAFE LOAD
8	11		11810

R.P# 11

000572

LICENCE NO.: 9211-218-1-1

WELL NAME AND NO.: UNOCAL LIARD K-2 60-20-123-30

OPERATOR: UNOCAL EXPLORATION LTD

CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: K-2 60-20-123-30

UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE: Dena Halvorsen

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS — OP

(1) Daily Walk Around Inspection
(2) Detailed Inspection-Weekly (using checklist)
(3) HPS Signs Posted (if required)
(4) Well Licensee & Stick Diagram Posted
(5) Flare Lines Staked
(6) BOP Drills Performed
(7) Visually inspect BOP's - Flarelines & Degasser Lines

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME - HRS

CODE NO.	1 OPER.	2 MIG UP & TEAR DOWN	3 DRILL ACTUAL	4 REAMING	5 CORING	6 COND. MUD & CIRC	7 TRIPS	8 RIG SERVICE	9 REPAIR RIG	10 CUT OFF DRILL LINE	11 DEV. SURVEY	12 WIRE LINE LOGS	13 RUN CASE & CEMENT	14 WAIT ON CEMENT	15 NIPPLE UP B.O.P.	16 TEST B.O.P.	17 DRILL STEM TEST	18 PLUG BACK	19 SQUEEZE CEMENT	20 FISHING	21 DIR. WORK	22 SAFETY MTG.	23 BOP DRILL	24
	MORN.		3			10	3 3/4	1/4																
	DAY		7 1/4					1/4			1/2													
	EVE.		7 3/4					1/4															1/4	
	TOTAL																							

DEC 27 1996

DRILLING ASSEMBLY (At End of Tour)

NO.	DESCRIPTION		LENGTH
1	BIT	222	.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.86 m
23	D.P.	STANDS	m
1	D.P.	SINGLES	663.48 m
	KELLYDOWN		12.66 m
	TOTAL		875 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		41,000	1000 daN

BIT RECORD

BIT NO.	1	2	
SIZE (mm)	222	222	
IADC CODE		5 3 7 6	
MFG.	REED	SECURITY	
TYPE	EHP-43A	GS86F	
SERIAL NO.	DJ-4158	689242	
JETS (mm)	3/8.7	11.1 11.9 11.9	
DEPTH OUT (m)	865		
DEPTH IN (m)	484	865	
TOTAL METRES DRILLED (m)	439	10	
TOTAL HOURS RUN	25 1/4	3	

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG: UP 2 DAN DOWN 2 DAN
TORQUE AT BOTTOM:
FILL ON BOTTOM (m): 2m

MUD RECORD

MUD TYPE: ☐ WATER BASED ☐ OIL BASED

TIME	N3KU		06:30
DENSITY kg/m³			1090
FUNNEL VIS. - (S/L)			40
W.L. (cm³)			9.5
pH			10.0

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	~~37~~ 32
CAUSTIC	1
LIG	1
BARITE	15

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
SHALE SHAKER				
CENTRIFUGE	6	LPM 2	1065	1500
CENTRIFUGE	6	LPM 2	1065	1695

NGINEERING TOUR

DRILLING ASSEMBLY (At End of Tour)

NO.	DESCRIPTION		LENGTH
1	BIT		.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.86 m
24	D.P.	STANDS	m
XX	D.P.	SINGLES	702.11 m
	KELLYDOWN		9.03 m
	TOTAL		910 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		42,000	1000 daN

BIT RECORD

BIT NO.	2
SIZE (mm)	222
IADC CODE	5 3 7 B
MFG.	SECURITY
TYPE	GS86F
SERIAL NO.	689242
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	865.
TOTAL METRES DRILLED (m)	45
TOTAL HOURS RUN	10 1/4

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG: UP/DOWN 2000 DAN
TORQUE AT BOTTOM:
FILL ON BOTTOM (m):

MUD RECORD

MUD TYPE: ☒ WATER BASED ☐ OIL BASED

TIME	08:00	RENTAL LIGHT PLANT
DENSITY kg/m³	1060	15-40 MOTOR OIL USED
FUNNEL VIS. - (S/L)	41	TO DATE 10 GALS.
W.L. (cm³)	10.2	USES 1/2 GAL/12 HRS.
pH	9.5	
Dump SAND TRAP.	16m³ from shaker tank	

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
1130	1430
1065	1065
H7	H7
8.9	9.6
9.0	9.0
GEL	18
DRISPAC	1
LIG	1

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
SHALE SHAKER				
CENTRIFUGE	8	2	1060	1870
CENTRIFUGE	8	2	1060	1965

DRILLING ASSEMBLY (At End of Tour)

NO.	DESCRIPTION		LENGTH
1	BIT		.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
21	S/S		3.04 m
21	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		198.86 m
25	D.P.	STANDS	m
X	D.P.	SINGLES	721.17 m
	KELLYDOWN		12.97 m
	TOTAL		933.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		42,000	1000 daN

BIT RECORD

BIT NO.	2
SIZE (mm)	222
IADC CODE	5 3 7 B
MFG.	SECURITY
TYPE	GS86F
SERIAL NO.	689242
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	865
TOTAL METRES DRILLED (m)	68
TOTAL HOURS RUN	17 3/4

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG: UP / DOWN 2000 DAN
TORQUE AT BOTTOM:
FILL ON BOTTOM (m):

MUD RECORD

MUD TYPE: ☒ WATER BASED ☐ OIL BASED

TIME	1700	20:00	22:00
DENSITY kg/m³	1065	1060	1065
FUNNEL VIS. - (S/L)	H6	H3	48
W.L. (cm³)	9.5	9.5	8.0
pH	9.0	9.0	9.0

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	13 SX
DRISPAC	1 SX
LIGNITE	1 SX
P.V.T @ 2300 HR's	70.0 m³

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
SHALE SHAKER				
CENTRIFUGE	8	2	1060	1630
CENTRIFUGE	8	2	1060	1730

OPR. DG R.M. [illegible]

YEAR 96 MONTH 12 DAY 19

RIG NO. ONE

FUEL @ 8:00

RIG | BOILER

	LAST CASING	TUBING OR LINER
O.D. (mm)	244.5	
MIN. I.D. (mm)	226	
kg/m	53.37	
MAKE	Prud	
GRADE	J-55	
NO. OF JOINTS	33	
TOTAL(m) LENGTH	435.68	
KB. TO CSG HEAD (m)	4.74	
SET AT	43	

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	ST. LTH
102	20.86	E		129	FH	165	PZ-9	GARDNER DENVER	
							D-375	EMSCO	3

23 24 25 26

TOTALS: 8 / 8 / 8

SHALE SHAKER(S): NO. 1 TYPE Flowline Cleaner; SCREENS CHANGED ☐ YES ☒ NO; TOP; MIDDLE; BOTTOM

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	DH-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
865	875	10	77	10

CIRCULATION PRESSURE | PUMP NO. 1 LINER SIZE (mm) | S.P.M. | PUMP NO. 2 LINER SIZE (mm) | S.P.M.

8400 | 165 | 94 | 127 |

REDUCED PUMP SPEED

STAND PIPE PRESSURE @ 400 | @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
HOLE FILL	CAL.	
ACTUAL	6.31 m³	
ANTI.	5.63 m³	
	+ .68 m³	

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.
00:00	00:15	1/4	7
00:15	00:30	1/4	5
00:30	—	·	6
—	03:00	2 1/2	6
03:00	04:00	1	6
04:00	04:15	1/4	5
4:15	04:30	1/4	6
04:30	05:00	1/2	5
05:00	08:00	3	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

HOIST BIT #1

Rig Serv Annular & Remote choke

Circ up Sample

Flow / Pump Pill / Flow / 5 min / 1 way

Strap out Function Blind Rams 53 SPM 94 SPM

Change Bit : Run in Hole to 568m

Break Circ @ 568m

R.I.H. to 836m

Clean to Bottom 2m Fill

Drill 864-875. Made Correction of 1.23m on K.B.

Strap - 865.23

Diff of 1.23m Tally - 864.00

NOTES: Annular 11 sec c/o, Remote choke 22 sec c/o Rams 4 sec c/o

Tight stds out @ 3 $10

UNDERFLOW DENSITY (kg/m³): 1500

BOILER HRS RAN | STACK TEMP

8 | 11

56,000

UNDERFLOW DENSITY (kg/m³): 1695

DAY TOUR

METRES DRILLED

FROM	TO	DH-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
875	910	35	77	10
				14

PUMP NO. 1 LINER SIZE (mm) | S.P.M. | PUMP NO. 2 LINER SIZE (mm) | S.P.M.

8700 | 165 | 94 | 127 |

REDUCED PUMP SPEED

STAND PIPE PRESSURE @ 400 | @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
853	4 1/2°	54 Az.

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.
08:00	08:15	1/4	7
08:15	12:15	4	2
12:15	12:45	1/2	10
12:45	16:00	3 1/4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

Rig Service ✓ Annular 11 sec c/o, Remote ch

Drill 875-894

Survey 853-4 1/2° - 54 Az.

Drill 894-910

NOTES: Remote choke 22 sec c/o.

BOILER HRS RAN | STACK TEMP

8 | 11

Up 42,000, Down 40000

UNDERFLOW DENSITY (kg/m³): 1870

UNDERFLOW DENSITY (kg/m³): 1965

EVENING TOUR

METRES DRILLED

FROM	TO	DH-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
910	933	23	77	14
				16

CIRCULATION PRESSURE | PUMP NO. 1 LINER SIZE (mm) | S.P.M. | PUMP NO. 2 LINER SIZE (mm) | S.P.M.

8700 | 166 | 94 | 127 |

REDUCED PUMP SPEED

STAND PIPE PRESSURE @ 400 | @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.
16:00	16:45	3/4	2
16:45	17:00	1/4	7
17:00	17:15	1/4	22
17:15	24:00	6 3/4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

Drill 910 m - 913 m

Rig Service ✓ Annular, 11 sec c/o, Remote

BOP Drill, Discuss, Unical, Safety BOP

Drill 913 m - 933 m. (Well secure @ 20:30)

NOTES: P.V.T at 16:00 - 66.6 m³ P.V.T. at 23:00 - 70.0 m

Remote choke 22 sec c/o

BOILER HRS RAN | STACK TEMP

8 | 11

Up 44,000, Down 40000

UNDERFLOW DENSITY (kg/m³): 1630

UNDERFLOW DENSITY (kg/m³): 1730

#12

000573

LICENCE NO.:	WELL NAME AND NO.:
9211-U3Y-1-1	UCEL LIARD K-02
OPERATOR:	**CONTRACTOR:**
UNOCAL EXPLORATION LTD.	CACTUS DRILLING
SURFACE LOCATION:	**UNIQUE ID.:**
K-02 60-20-123-30	
SIGNATURE OF OPERATOR'S REPRESENTATIVE:	**SIGNATURE OF CONTRACTOR'S RIG MANAGER:**
David Pelgrom	

DAILY CHECKS — OF

(1) Daily Walk Around Inspection — Initi
(2) Detailed Inspection-Weekly (using checklist) — Initi
(3) H'S Signs Posted (if required) — Initi
(4) Well License & Stick Diagram Posted — Initi
(5) Flare Lines Staked — Initi
(6) BOP Drills Performed — Initi
(7) Visually inspect BOP's - Flarelines & Degasser Lines — Initi

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME-HRS

CODE NO.	1 OPER.	2 RIG UP & TEAR DOWN	3 DRILL ACTUAL	4 REAMING	5 CORING	6 COND. MUD & CIRC	7 TRIP	8 RIG SERVICE	9 REPAIR RIG	10 CUT OFF DRILL LINE	11 DEV. SURVEY	12 WIRE LINE LOGS	13 RUN CASE & CEMENT	14 WAIT ON CEMENT	15 NIPPLE UP B.O.P.	16 TEST B.O.P.	17 DRILL STEM TEST	18 PLUG BACK	19 SQUEEZE CEMENT	20 FISHING	21 DIR. WORK	22 SAFETY MTG.	22 WASH
	MORN.		5			1	1 1/4	1/4			1/2												
	DAY		-	1 1/4			5 1/2	1/4	1/2	1 1/2													1
	EVE.		3 1/4	4 1/2				1/4															
	TOTAL		8 1/4	5 3/4		1	4 3/4	3/4	1/2	1 1/2	1/2			DEC 27 1996									1

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	F/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	F/O		.56 m
			198.86 m
			m
			m

26	D.P.	STANDS	m
X	D.P.	SINGLES	749.31 m
	KELLYDOWN		6.83 m
	TOTAL		955 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		43,000	1000 daN

BIT RECORD

BIT NO.	2
SIZE (mm)	222
IADC CODE	5 3 7 B
MFG.	SECURITY
TYPE	GS86F
SERIAL NO.	689242
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	955
DEPTH IN (m)	865
TOTAL METRES DRILLED (m)	90.
TOTAL HOURS RUN	22 3/4

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.
7	7		A	7	10		P.P DP	

HOLE CONDITION

HOLE DRAG	
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	0:30	3:30	6:00
DENSITY kg/m³	1065	1065	1065
FUNNEL VIS. - (S/L)	50	47	49
W.L. (cm³)	8.0	8.0	8.2
pH	9.0	8.5	9.5
Vac 6 m³ From DEGASSER TANK			

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	10
CAUSTIC	1
LIG	1
BARITE	15

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
	3	2	1060	1140
CENT #2				
P.V.T. 1600 HES 71.1 m³	8	1	1060	1820

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			.30 m
1	B/S FLOAT		.69 m
3	DC	197	98.36 m
1	X10		.77 m
1	SS		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X10		.56 m
	BHA		198.86 m
			m
			m

25	D.P.	STANDS	m
X	D.P.	SINGLES	721.17 m
	KELLYDOWN		12.97 m
	TOTAL		933.00 m
WT. OF DC		31.000	1000 daN
WT. OF STRING		42.000	1000 daN

BIT RECORD

BIT NO.	3
SIZE (mm)	222
IADC CODE	6 1 7
MFG.	RBI
TYPE	C45LRG
SERIAL NO.	BK914
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	955
TOTAL METRES DRILLED (m)	
TOTAL HOURS RUN	

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	"	"	1500
DENSITY kg/m³	R	R	1060
FUNNEL VIS. - (S/L)	1	1	48
W.L. (cm³)	P	P	8.0
pH			9.0

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
	8	2	1060	1170
CENT #2				
P.V.T. 1600-1682 m³	8	1	1060	1800

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S	~~165~~	3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.86 m
			m
			m

27	D.P.	STANDS	m
X	D.P.	SINGLES	777.77 m
	KELLYDOWN		6.37 m
	TOTAL		983 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		44,000	1000 daN

BIT RECORD

BIT NO.	3
SIZE (mm)	222
IADC CODE	6 1 7
MFG.	RBI
TYPE	C45LRG
SERIAL NO.	BK914
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	955
TOTAL METRES DRILLED (m)	28
TOTAL HOURS RUN	3 1/4

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	0 UP/DOWN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☐ WATER BASED ☑ OIL BASED

TIME	1800	20:00	22:30
DENSITY kg/m³	1060	1060	1060
FUNNEL VIS. - (S/L)	46	46	45
W.L. (cm³)	8.0	7.8	8.0
pH	9.0	9.0	9.0

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
83/4 CENTRIFUGE				
	8	1	1055	1400
83/4 CENT - #2				
	8	.5	1055	2110

OPR. D.S. J.M.

YEAR 1996 | MONTH 12 | DAY 20

RIG NO. ONE.

FUEL @ 8:00

RIG | BOILER

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244	226	53.37	PRUD.	J-55	33	435.68	4.74	434
TUBING OR LINER									

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.86	E		129	FH	165	G.D.	P-2-4	229
							EMSCO	D-375	356

23	24	25	26

TOTALS: 4 | 8 | 8 | 24

SHALE SHAKER(S): NO. 1 TYPE FLOW-LINE CLEANER; SCREENS CHANGED ☐ YES ☑ NO; TOP 175; MIDDLE 175; BOTTOM 175

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	DRD RMR CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
933	955	22	77	18

CIRCULATION PRESSURE	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
8700	165	94	127	

REDUCED PUMP SPEED

STAND PIPE @ 8500 @ 55

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
910	4 1/2°	215 AZ

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAPSED TIME	CODE	NPT (HRS)
00:00	00:15	1/4	7	
00:15	04:45	4 1/2	2	
04:45	05:15	1/2	10	
05:15	05:45	1/2	2	
05:45	06:45	1	5	
6:45	08:00	1 1/4	6	

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

RIG SERVICE ✓ ANNULAR & REMOTE CHOKE.
DRILL 933-951
SURVEY 910 - 4 1/2° - 4/5 AZ.
DRILL 951-955
CIRC. SAMPLES. COND HOLE.
HOIST BIT #2, FLOW CHECK AS PER REGULATIONS.
TRIP DUE TO PENETRATION RATE DECREASE BY 1/2
INCREASE IN PUMP PRESSURE TO 13,500 KPA, NO TORQUE.
BIT UNDER GAUGE. P.U.T. START TRIP 72.4 m³

NOTES ANNULAR 10 SEC c/o, REMOTE CHOKE 22 SEC c/o, TOP RAMS 4 SEC c/o

BOILER | MAXIMUM EXPERIENCED LOOKOUT | SAFETY O.K.

8 | 11

DAY TOUR

METRES DRILLED

FROM	TO	DRD RMR CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
910	933	23	60	2/3

CIRCULATION PRESSURE	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
8700	165	94	127	

REDUCED PUMP SPEED

STAND PIPE @ 8400 @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
HOLE FILL	CAL	
ACTUAL	6.45	
ANTI	5.80	
+	.65	

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAPSED TIME	CODE	NPT (HRS)
08:00	08:15	1/4	7	
08:15	09:30	1 1/4	6	
09:30	10:00	1/2	8	
10:00	11:15	1 1/4	6	
11:15	12:45	1 1/2	9	
12:45	13:45	1	6	
13:45	14:45	1	22	
14:45	16:00	1 1/4	3	

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

RIG SERVICE ✓ ANNULAR & REMOTE CHOKE
HOIST BIT #2 FLOW CHECK AS PER REGULATIONS
REPAIR AIRPOT ON REVERSE.
MAKE UP BHA R.I.H DRILL COLLARS + 1 STANDPIPE
SLIP & CUT DRILLING LINE, ADJUST BRAKES
R.I.H
WASH FROM 872 m - 910 m
REAM FROM 910 m - 933 m
(UNDER GAUGE HOLE)

NOTES FUNCTION BLIND RAMS WHEN OUT OF HOLE 4 SECS c/o

BOILER | MAXIMUM EXPERIENCED LOOKOUT | SAFETY O.K.

8 | 11

EVENING TOUR

METRES DRILLED

FROM	TO	DRD RMR CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
933	955	22	60	2/3
955	983	28	60	18

CIRCULATION PRESSURE	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
8700	165	94	127	

REDUCED PUMP SPEED

STAND PIPE @ 8400 @ 50

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAPSED TIME	CODE	NPT (HRS)
16:00	16:15	1/4	7	
16:15	20:45	4 1/2	3	
20:45	24:00	3 1/4	2	

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

RIG SERVICE ✓ ANNULAR + REMOTE CHOKE
REAM UNDER GAUGE HOLE FROM 933m - 983m
DRILL 955-983

NOTES ANNULAR 10 SEC c/o, REMOTE CHOKE 22 SEC c/o
FLOW ✓ ON CONNECTIONS

BOILER | MAXIMUM EXPERIENCED LOOKOUT | SAFETY O.K.

8 | 11

11945

#13

000574

LICENCE NO.:	WELL NAME AND NO.:
9211 - 218-1-1	UCEL LIARD K-02
OPERATOR:	**CONTRACTOR:**
UNOCAL EXPLORATION LTD.	CACTUS DRILLING
SURFACE LOCATION:	**UNIQUE ID.:**
60-20-123-30	
SIGNATURE OF OPERATOR'S REPRESENTATIVE:	**SIGNATURE OF CONTRACTOR'S RIG MANAGER:**

DAILY CHECKS

(1) Daily Walk Around Inspection	In
(2) Detailed Inspection-Weekly (using checklist)	In
(3) H²S Signs Posted (if required)	In
(4) Well License & Stick Diagram Posted	In
(5) Flare Lines Staked	In
(6) BOP Drills Performed	In
(7) Visually Inspect BOPs - Flarelines & Degasser Lines	In

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME-HRS

CODE NO.	1 OPER.	2 RIG UP & TEAR DOWN	3 DRILL ACTUAL	4 REAMING	5 CORING	6 COND. MUD & CIRC	7 TRIPS	8 RIG SERVICE	9 REPAIR RIG	10 CUT OFF DRILL LINE	11 DEV. SURVEY	12 WIRE LINE LOGS	13 RUN CASE & CEMENT	14 WAIT ON CEMENT	15 NIPPLE UP B.O.P.	16 TEST B.O.P.	17 DRILL STEM TEST	18 PLUG BACK	19 SQUEEZE CEMENT	20 FISHING	21 DIR. WORK	22 SAFETY MTG.
	MORN.		7 1/4					1/4			1/2											
	DAY		7 1/4					1/4														
	EVE.		7 1/4					1/4			1/2											
	TOTAL		22 1/4					3/4			1											

DRILLING ASSEMBLY (At End of Tour)

			LENGTHS
			.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.86 m
			m
			m
28	D.P.	STANDS	m
X	D.P.	SINGLES	806.26 m
	KELLYDOWN		6.58 m
	TOTAL		1012 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		45,000	1000 daN

BIT RECORD

BIT NO.	3
SIZE (mm)	222
IADC CODE	6 1 7
MFG.	RBI
TYPE	C45LRG
SERIAL NO.	BK914
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	955
TOTAL METRES DRILLED (m)	57
TOTAL HOURS RUN	10 1/2

CUTTING STRUCTURE								
T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DAN / UP/DOWN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

RIG RELEASED DEC 27 98

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	0:30	03:30	06:00
DENSITY kg/m³	1065	1065	1065
FUNNEL VIS. - (S/L)	47	46	50
W.L. (cm³)	7.8	7.8	8.0
pH	9.0	8.5	9.5

VAC 12 m³ From SHAKER + DEGASSER

PRODUCT	AMOUNT X UNIT
GEL	21
CAUSTIC	1
LIG	1

CENTRIFUGE

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	~~2~~	~~1060~~	~~1810~~

CENT #1

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
8	2	1060	1810

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
8	1	1060	1420

DRILLING ASSEMBLY (At End of Tour)

			LENGTHS
			.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X10		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X10		.56 m
		BHA	198.86 m
			m
			m
99	D.P.	STANDS	825.39 m
	D.P.	SINGLES	m
	KELLYDOWN		12.97 m
	TOTAL		1037.22 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		45,000	1000 daN

BIT RECORD

BIT NO.	3
SIZE (mm)	222
IADC CODE	6 1 7
MFG.	RBI
TYPE	C45LRG
SERIAL NO.	BK914
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	955
TOTAL METRES DRILLED (m)	82
TOTAL HOURS RUN	18 1/4

CUTTING STRUCTURE								
T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DAN / UP/DOWN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	10:00	12:00	15:00
DENSITY kg/m³	1065	1065	1070
FUNNEL VIS. - (S/L)	47	45	52
W.L. (cm³)	8.0	8.0	7.0
pH	9.5	9.0	9.0

PRODUCT	AMOUNT X UNIT
GEL	18 SX

CENTRIFUGE

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENT #1

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
8	2	1060	1810

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
8	1	1060	1420

P.V.T. @ 0800 - 58.3 m³
PVT @ 16:00 - 62.3 m³

DRILLING ASSEMBLY (At End of Tour)

			LENGTHS
			.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.86 m
			m
			m
30	D.P.	STANDS	853.53 m
	D.P.	SINGLES	m
	KELLYDOWN		6.61 m
	TOTAL		1059 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		46,000	1000 daN

BIT RECORD

BIT NO.	3
SIZE (mm)	222
IADC CODE	6 1 7
MFG.	RBI
TYPE	C45LRG
SERIAL NO.	BK914
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	965
TOTAL METRES DRILLED (m)	10
TOTAL HOURS RUN	25 1/2

CUTTING STRUCTURE								
T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DAN UP/DOWN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	1300	20:00	22:30
DENSITY kg/m³	1070	1070	1070
FUNNEL VIS. - (S/L)	47	48	47
W.L. (cm³)		8.0	8.0
pH	9.0	8.5	9.5

Pump SAND TRAP.

PRODUCT	AMOUNT X UNIT

CENTRIFUGE

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
		1065	1780

CENT #1

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
8	2	1065	1780

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
8	1	1065	1400

PVT @ 19:00, 63.3 m³
P.V.T. @ 00:00 64.8 m³

OPR. R.M.
Initial DG Initial
Initial Initial
Initial DG Initial
Initial DG Initial
Initial Initial
Initial DG Initial
Initial Initial
Initial Initial
Initial Initial
Initial Initial
Initial Initial

YEAR 1996 | MONTH DEC. | DAY 21

RIG NO. ONE

FUEL @ 8:00

RIG 158cm | BOILER

WEATHER
TEMPERATURE °C
CURRENT CONDITIONS
WIND DIRECTION
ROAD

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244	226	53.57	PRUD	J-55	33	435.68	4.74	434
TUBING OR LINER									

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.86	E		129	FH	165	PZ-9	G-D.	220
							D-375	EMSCO	356

23	24	25	26

TOTALS
SHALE SHAKER(S)
NO. 1 TYPE FLO-LINE CLEANER
8 SCREENS CHANGED ☐ YES ☑ NO
8 TOP 175 TOP
8 MIDDLE 175 MIDDLE
24 BOTTOM 175 BOTTOM

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	DRLD / RMR / CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
983	1012	29	78	18

CIRCULATION

PUMP NO.	LINER SIZE (mm)	S.P.M.	PUMP NO.	LINER SIZE (mm)	S.P.M.
8200	165	93	127		

DRILLSTRING USED

STAND PIPE 500 49

DEPTH (m)	DEVIATION (°)	DIRECTION
948	5°	47 AZ

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
00:00	00:15	1/4	7	RIG SERVICE / ANNULAR, LOWER RAMS, REMOTE CHOKE
00:15	02:15	2	2	DRILL 983 - 999
02:15	02:45	1/2	10	SURVEY 948 - 5° - 47 AZ.
02:45	08:00	5 1/4	2	DRILL 999 - 1012

NOTES ANNULAR 10 SEC C/O, LOWER RAMS 4 SEC C/O, REMOTE CHOKE 22 SEC C/O

BOILER HRS. RAN 8 | ACCUM. HRS. SINCE LAST OVERHAUL 11 | STACK TEMP. | ACCUM. EXPERIENCE FACTOR HRS. | 46,000

DAY TOUR

METRES DRILLED

FROM	TO	DRLD / RMR / CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1012	1037	25	78	16

CIRCULATION

PUMP NO.	LINER SIZE (mm)	S.P.M.	PUMP NO.	LINER SIZE (mm)	S.P.M.
8,800	165	93	127		

DRILLSTRING USED

STAND PIPE 200 56

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
08:00	10:00	2	2	DRILL 1012 m - 1018 m
10:00	10:15	1/4	7	RIG SERVICE / ANNULAR + REMOTE CHOKE
10:15	16:00	5 3/4	2	DRILL 1018 m - 1037 m
				RENTAL LIGHT PLANT.

NOTES ANNULAR 11 SEC C/O REMOTE CHOKE 22 SEC C/O
FLOW CHECK ON CONNECTIONS

BOILER HRS. RAN 8 | ACCUM. HRS. SINCE LAST OVERHAUL 11 | STACK TEMP. | ACCUM. EXPERIENCE FACTOR HRS. | 46,000

EVENING TOUR

METRES DRILLED

FROM	TO	DRLD / RMR / CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1037	1059	22	78	18

CIRCULATION

PUMP NO.	LINER SIZE (mm)	S.P.M.	PUMP NO.	LINER SIZE (mm)	S.P.M.
	165	93	127		

DRILLSTRING USED

STAND PIPE @ 2600 @ 49

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
1005	5 1/8°	47 AZ

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
16:00	16:15	1/4	7	RIG SERVICE / ANNULAR + REMOTE CHOKE
16:15	19:15	3	2	DRILL 1037 m - 1046 m
19:15	19:45	1/2	10	SURVEY 1005 - 5 1/8° - 47 AZ.
19:45	24:00	4 1/4	2	DRILL 1046 - 1059

NOTES ANNULAR 11 SEC C/O REMOTE CHOKE 22 SEC C/O FLOW / ON CONNECTIONS.

BOILER HRS. RAN 8 | ACCUM. HRS. SINCE LAST OVERHAUL 11 | STACK TEMP. | ACCUM. EXPERIENCE FACTOR HRS. | 46,000 | 1160.

#14

000575

LICENCE NO.:	WELL NAME AND NO.:
9211-U18-1-1	UCEL LIARD K-02
OPERATOR:	**CONTRACTOR:**
UNOCAL EXPLORATION LTD.	CACTUS DRILLING
SURFACE LOCATION:	**UNIQUE ID.:**
60-20-123-30	
SIGNATURE OF OPERATOR'S REPRESENTATIVE:	**SIGNATURE OF CONTRACTOR'S RIG MANAGER:**

DAILY CHECKS — OK

(1) Daily Walk Around Inspection
(2) Detailed Inspection-Weekly (using checklist)
(3) H²S Signs Posted (if required)
(4) Well Licensee & Stick Diagram Posted
(5) Flare Lines Staked
(6) BOP Drills Performed
(7) Visually Inspect BOP's - Flarelines & Degasser Lines

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising w/ Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME - HRS

CODE NO.	1 OPER.	2 RIG UP & TEAR DOWN	3 DRILL ACTUAL	4 REAMING	5 CORING	6 COND MUD & CIRC	7 TRIPS	8 RIG SERVICE	9 REPAIR RIG	10 CUT OFF DRILL LINE	11 DEV SURVEY	12 WIRE LINE LOGS	13 RUN CASING & CEMENT	14 WAIT ON CEMENT	15 NIPPLE UP B.O.P.	16 TEST B.O.P.	17 DRILL STEM TEST	18 PLUG BACK	19 SQUEEZE CEMENT	20 FISHING	21 DIR. WORK	22 SAFETY MTG.	23
	MORN.		7 3/4					1/4															
	DAY		7 1/4					1/4			1/2												
	EVE.		4 3/4			2 1/2		1/4			1/2			DEC 27 1996									
	TOTAL		19 3/4			2 1/2		3/4			1												

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
	BIT		.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.86 m
			m
			m
30	D.P.	STANDS	m
26	D.P.	SINGLES	872.28 m
	KELLYDOWN		4.86 m
	TOTAL		1076 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		46,000	1000 daN

BIT RECORD

BIT NO.	3
SIZE (mm)	222
IADC CODE	6 1 7
MFG.	RBI
TYPE	C45LRG
SERIAL NO.	BK914
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	955
TOTAL METRES DRILLED (m)	121
TOTAL HOURS RUN	33 1/4

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG 1000 daN UP / DOWN

TORQUE AT BOTTOM

FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	00:30	04:00	06:00
DENSITY kg/m³	1070	1070	1070
FUNNEL VIS. - (S/L)	47	53	52
W.L. (cm³)	8.5	8.2	8.3
pH	9.5	9.0	9.0

MUD ADDITIVES USED

PRODUCT	AMOUNT X UNIT
GEL	13
CAUSTIC	1
LIG.	1

P.V.T. @ 00:15 64.8 m³

P.V.T. @ 07:00 70.2 m³

SOLIDS CONTROL EQUIPMENT

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
SHAKER				
DESILTER	8	1.5	1065	1650
CENT #2				
CENTRIFUGE	8	1.5	1065	1810

MUD ADDITIVES ADDED

PRODUCT	AMOUNT X UNIT
RESET PIT	
VAC. TRUCK OUT	60 m³
DUMP	
SANDTRAP	1 m³

P.V.T. @ 08:00 - 70.0 m³

P.V.T. @ 16:00 - 59.5 m³

SOLIDS CONTROL EQUIPMENT

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
SHAKER				
DESILTER	8	1.5	1065	1630
CENT. #2				
CENTRIFUGE	8	1.5	1065	1780

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
	BIT		.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		198.86 m
			m
			m
31	D.P.	STANDS	m
X	D.P.	SINGLES	891.35 m
	KELLYDOWN		6.79 m
	TOTAL		1097.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		47,000	1000 daN

BIT RECORD

BIT NO.	3
SIZE (mm)	222
IADC CODE	6 1 7
MFG.	RBI
TYPE	C45LRG
SERIAL NO.	BK914
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	955
TOTAL METRES DRILLED (m)	148
TOTAL HOURS RUN	40 1/2

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG 1000 DAN UP / DOWN

TORQUE AT BOTTOM

FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	0900	1200	1500
DENSITY kg/m³	1065	1070	1070
FUNNEL VIS. - (S/L)	48	47	48
W.L. (cm³)	8.0	8.0	8.5
pH	9.0	9.0	9.0

MUD ADDITIVES USED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL EQUIPMENT

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
SHAKER				
DESILTER				
CENT #2				
CENTRIFUGE	8	1.5	1065	1630
CENT. #2				
CENTRIFUGE	8	1.5	1065	1780

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
	BIT		.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.86 m
			m
			m
32	D.P.	STANDS	910.05 m
	D.P.	SINGLES	3.09 m
	KELLYDOWN		m
	TOTAL		1112 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		47,000	1000 daN

BIT RECORD

BIT NO.	3
SIZE (mm)	222
IADC CODE	6 1 7
MFG.	RBI
TYPE	C45LRG
SERIAL NO.	BK914
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	955
TOTAL METRES DRILLED (m)	157
TOTAL HOURS RUN	45 1/4

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG 1000 DAN UP/DOWN

TORQUE AT BOTTOM

FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	1800	21:00	22:30
DENSITY kg/m³	1065	1065	1065
FUNNEL VIS. - (S/L)	46	45	45
W.L. (cm³)	7.8	8.2	8.3
pH	9.0	8.5	8.5

MUD ADDITIVES USED

PRODUCT	AMOUNT X UNIT
BARITE	65

SOLIDS CONTROL EQUIPMENT

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
SHAKER				
DESILTER				
CENTRIFUGE	2			
CENT #2				
CENTRIFUGE	2			

P.V.T @ 20:00 - 61.4 m³

P.V.T. @ 24:00 - 63.6 m³

PR: DB R.M. Initial DB / RG / DB / DB / Initial

YEAR 1996 | MONTH DEC | DAY 22

RIG NO. ONE.

FUEL @ 8:00

RIG #2 | BOILER

LAST CASING: TUBING OR LINER	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
	244	226	53.57	Prud	J-55	33	435.65	4.74	434

WEATHER	TEMPERATURE °C	DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
	CURRENT CONDITIONS	102	20.86	E		129	FH	165	PZ-9	G-D.	229
	WIND DIRECTION								D-375	EMSCO	356
	ROAD										

23 | 24 | 25 | 26

TOTALS

SHALE SHAKER(S) — RENTALS/SERVICES

NO 1 TYPE FLOWLINE CLEANER

8 SCREENS CHANGED ☐ YES ☑ NO

8 TOP 175 TOP

8 MIDDLE 175 MIDDLE

24 BOTTOM 175 BOTTOM

MORNING TOUR

METRES DRILLED

FROM	TO	CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1059	1076	17	78	16

CIRCULATION | PUMP NO.1 | PUMP NO.2

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
8700	165	93	127	

STAND PIPE 3100 @ 55

DEPTH (m)	DEVIATION (°)	DIRECTION

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
00:00	00:15	1/4	7	RIG SERVICE ✓ ANNULAR & REMOTE CHOKE.
00:15	08:00	7 3/4	2	DRILL 1059 - 1076.

NOTES ANNULAR 10 sec c/o, REMOTE CHOKE 22 sec c/o
LOWER RAMS 4 sec c/o

8 | 11 | 47,000

DAY TOUR

METRES DRILLED

FROM	TO	CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1076	1097	21	78	16

CIRCULATION | PUMP NO.1 | PUMP NO.2

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
8900	165	94	127	

STAND PIPE 3500 @ 49

DEPTH (m)	DEVIATION (°)	DIRECTION

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
08:00	11:00	3	2	DRILL 1076 m - 1084 m
11:00	11:15	1/4	7	RIG SERVICE ✓ ANNULAR + REMOTE CHOKE
11:15	14:00	2 3/4	2	DRILL 1084 m - 1093 m
14:00	14:30	1/2	10	SURVEY 1052 m - MISRUN
14:30	16:00	1 1/2	2	DRILL 1093 m - 1097 m

NOTES ANNULAR 10 SECS c/o, REMOTE CHOKE 22 SECS c/o
DUMP SAND TRAP

DRILLER SIGNATURE

8 | 11 | 48,000

EVENING TOUR

METRES DRILLED

FROM	TO	CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1097	1112	15	78	16

CIRCULATION | PUMP NO.1 | PUMP NO.2

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9100	165	94	127	

STAND PIPE 3200 @ 65

ANNULAR 10 SECS @ 55

DEPTH (m)	DEVIATION (°)	DIRECTION
1062	5°	AZ 51

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
16:00	16:15	1/4	7	RIG SERVICE ✓ ANNULAR + REMOTE CHOKE
16:15	17:30	1 1/4	2	DRILL 1097 m - 1108 m
17:30	18:00	1/2	10	SURVEY 1062 m - 5° - AZ 51
18:00	18:15	1/4	2	DRILL 1108 m - 1103 m
18:15	19:15	1	5	CIRCULATE + WEIGHT UP MUD
19:15	19:45	1/2	2	DRILL 1103 m - 1105 — OIL + GAS CUT
19:45	20:45	1	5	CIRC. SAMPLE. — MUD AT SHAKER
20:45	23:30	2 3/4	2	DRILL 1105 - 1112. — GAS READING 4800
23:30	24:00	1/2	5	CIRC. SAMPLE. — 4800 UNITS

NOTES ANNULAR 10 SECS c/o REMOTE CHOKE 22 SECS c/o
FLOW J ON CONNECTIONS O.K.

DRILLER SIGNATURE

8 | 11 | 11774

#15

000576

LICENCE NO.:	WELL NAME AND NO.:
9211 - 415-1-1	UCFL LIARD K-2
OPERATOR:	**CONTRACTOR:**
UNOCAL EXPLORATION LTD.	CACTUS DRILLING
SURFACE LOCATION:	**UNIQUE ID.:**
60-20-123-30.	
SIGNATURE OF OPERATOR'S REPRESENTATIVE:	**SIGNATURE OF CONTRACTOR'S RIG MANAGER:**
Doug Halmrast	

DAILY CHECKS — OI

(1) Daily Walk Around Inspection — Ini
(2) Detailed Inspection-Weekly (using checklist) — Ini
(3) HS Signs Posted (if required) — Ini
(4) Well Licenses & Stick Diagram Posted — Ini
(5) Flare Lines Staked — Ini
(6) BOP Drills Performed — Ini
(7) Visually Inspect BOP's - Flarelines & Degasser Lines — Ini

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME - HRS

CODE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	2
	OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP BOP	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.	
MORN.		5 3/4	5 1/4			2		1/4														HANDLE BARRELS	
DAY		14				9 3/4	3 3/4	1/4															
EVE.					2	3/4	3 3/4																
TOTAL		7			2	5 1/2	7	1/2													1/4	13/4	
																					1/4	13/4	

DEC 27 1996

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.86 m
			m
			m
			m
32	D.P.	STANDS	m
X	D.P.	SINGLES	919.17 m
	KELLYDOWN		5.97 m
	TOTAL		1124 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		47,000	1000 daN

BIT RECORD

BIT NO.	3
SIZE (mm)	222
IADC CODE	6 1 7
MFG.	RBI
TYPE	C45 LRG
SERIAL NO.	BK914
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	955
TOTAL METRES DRILLED (m)	169
TOTAL HOURS RUN	30.51

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000 DAN UP/DOWN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	00:30	03:30	06:30
DENSITY kg/m³	1085	1085	1090
FUNNEL VIS. - (S/L)	45	49	50
W.L. (cm³)	8.6	7.4	7.3
pH	8.5	9.0	9.0

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	15
DRISPAC	1
LIG	1
CAUSTIC	1

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			

MUD ADDITIVES

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			

CENT #2.

P.V.T. @ 00:15 - 63.6 m³

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
P.V.T. @ 07:00 - 67.1 m³	0			

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			.30 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.86 m
			m
			m
			m
33	D.P.	STANDS	m
X	D.P.	SINGLES	919.17 m
	KELLYDOWN		18.97 m
	TOTAL		1131.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		47,000	1000 daN

BIT RECORD

BIT NO.	3
SIZE (mm)	222
IADC CODE	6 1 7
MFG.	RBI
TYPE	C45 LRG
SERIAL NO.	BK914
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	955
TOTAL METRES DRILLED (m)	176
TOTAL HOURS RUN	52 1/4

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.
7	7			6	4			

HOLE CONDITION

HOLE DRAG	1000 DAN UP/DOWN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	08:30	1300	TRIP
DENSITY kg/m³	1085	1090	
FUNNEL VIS. - (S/L)	48	48	
W.L. (cm³)	7.5	8.0	
pH	9.0	9.0	

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
BARITE	15 SX

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			

MUD ADDITIVES

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENT #2

PVT @ 08:00, 67.6 m³

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			.24 m
2	CORE BBLS.		19.66 m
1	D/P		.22 m
1	B/S FLOAT		.91 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			186.73 m
			m
			m
			m
33	D.P.	STANDS	937.72 m
	D.P.	SINGLES	m
	KELLYDOWN		7.55 m
	TOTAL		1132 m
WT. OF DC		25,000	1000 daN
WT. OF STRING		44,000	1000 daN

BIT RECORD

BIT NO.	10
SIZE (mm)	159
IADC CODE	
MFG.	BHI
TYPE	SC279
SERIAL NO.	0321079
JETS (mm)	40
DEPTH OUT (m)	
DEPTH IN (m)	1131
TOTAL METRES DRILLED (m)	1
TOTAL HOURS RUN	2

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	0 DAN UP/DOWN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	NO FILL

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME			22:30
DENSITY kg/m³			1095
FUNNEL VIS. - (S/L)			49
W.L. (cm³)			6.8
pH			8.5

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

MUD ADDITIVES

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	2	2	1080	2330

CENT #2

P.V.T. @ 22:00 - 56.2 m³
P.V.T. @ 24:00 - 56.0 m³

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			

OPR. DG R.M. DG DG DG DG

YEAR 1996 | MONTH DEC | DAY 23

RIG NO. ONE.

FUEL @ 8:00

RIG 175 CM | BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244	229	53.57	PRND	J55	33	435.68	4.74	434
TUBING OR LINER									

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.86	E		129	FH	165	PZ-9	G.D	229
							D-375	EMSCO	356

23	24	25	26

TOTALS

SHALE SHAKER(S)

NO. 1 TYPE FLOWLINE CLEANER

SCREENS CHANGED ☐ YES ☑ NO

TOP 175 | TOP

MIDDLE 175 | MIDDLE

BOTTOM 175 | BOTTOM

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1112	1124	12	78	18

CIRCULATION PRESSURE | PUMP NO. 1 LINER SIZE (mm) | S.P.M. | PUMP NO. 2 LINER SIZE (mm) | S.P.M.

9200 | 165 | 93 | 127 |

REDUCED PUMP SPEED

STAND PIPE 1250 @ 50

MULTI-SHOT DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAPS. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
00:00	00:15	1/4	7	RIG SERVICE ✓ ANNULAR + REMOTE CHOKE.
00:15	01:15	1	2	DRILL 1112 - 1115
01:15	02:15	1	5	CIRC. SAMPLE.
02:15	07:00	4 3/4	2	DRILL 1115 - 1124
07:00	08:00	1	5	CIRC. SAMPLE.

NOTES ANNULAR 10 SEC C/O

REMOTE CHOKE 22 SEC C/O

BOILER | MAN RAM | STACK TEMP | MAX. EXPERIENCED HOOKLOAD | SAFETY TOPIC

8 | 11 | | | | 11774

DAY TOUR

METRES DRILLED

FROM	TO	CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1124	1131	7	78	18

CIRCULATION PRESSURE | PUMP NO. 1 LINER SIZE (mm) | S.P.M. | PUMP NO. 2 LINER SIZE (mm) | S.P.M.

9200 | 165 | 94 | 127 |

REDUCED PUMP SPEED

STAND PIPE 500 @ 50

MULTI-SHOT DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

HOLE FILL CALCULATION

ACTUAL 8.06 m³

ANTICIPATED 6.27 m³

\+ 1.79 m³

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAPS. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
08:00	08:15	1/4	5	CIRC, SAMPLE
08:15	09:30	1 1/4	2	DRILL 1124m - 1131
09:30	10:45	1 1/4	5	CIRC, SAMPLE, DETERMINE CORE POINT.
10:45	11:00	1/4	7	RIG SERVICE, ✓ ANNULAR + REMOTE CHOKE
11:00	12:30	1 1/2	6	WIPER TRIP 10 STANDS FLOW ✓ AS REGULATIONS
12:30	13:45	1 1/4	5	CIRCULATE
13:45	16:00	2 1/4	6	HOIST TO CORE FLOW ✓ AS PER REGULATIONS
				STRAP = 1131.10
				TALLY = 1131.00 DIFF. 10

NOTES ANNULAR 10 SECS C/O STRAP OUT

REMOTE CHOKE 22 SECS C/O

BOILER | MAN RAM | STACK TEMP | MAX. EXPERIENCED HOOKLOAD | SAFETY TOPIC

8 | 11 | | | | 11774

EVENING TOUR

METRES DRILLED

FROM	TO	CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1131	1137	1	70	6

CIRCULATION PRESSURE | PUMP NO. 1 LINER SIZE (mm) | S.P.M. | PUMP NO. 2 LINER SIZE (mm) | S.P.M.

5200 | 165 | 55 | 127 |

REDUCED PUMP SPEED

STANDPIPE @ 200 @ 47

MULTI-SHOT DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAPS. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
16:00	17:30	1 1/2	6	HOIST TO CORE FLOW ✓ AS PER REGULATIONS
17:30	17:45	1/4	21	SAFETY MEETING WITH CORE HAND
17:45	19:30	1 3/4	4	PICK UP + MAKE UP CORE BARRELS
19:30	21:00	1 1/2	6	R.I.H. W/ CORE BBL.
21:00	21:15	1/4	5	BREAK CIRC. + FLOW ✓ AT. 960m. O.K.
21:15	21:30	1/4	6	FINISH IN HOLE. NO FILL
21:30	22:00	1/2	5	CIRC. BTMS. UP. FLOW ✓ O.K.
22:00	24:00	2	4	DROP BALL, CUT CORE #1, 159mm

NOTES R.S.P.P. TAKEN OFF BTM. CORING BALL IN PLACE

BOILER | MAN RAM | STACK TEMP | MAX. EXPERIENCED HOOKLOAD | SAFETY TOPIC

8 | 11 | | | | 11774

#16

000577

LICENCE NO.:	WELL NAME AND NO.:
9211-498-1-1	UCEL LIARD K-02.
OPERATOR:	**CONTRACTOR:**
UNOCAL EXPLORATION LTD.	CACTUS DRILLING
SURFACE LOCATION:	**UNIQUE ID.:**
60-20-123-30	
SIGNATURE OF OPERATOR'S REPRESENTATIVE:	**SIGNATURE OF CONTRACTOR'S RIG MANAGER:**

DAILY CHECKS OF

(1) Daily Walk-Around Inspection Init.
(2) Detailed Inspection-Weekly (using checklist) Init.
(3) H²S Signs Posted (if required) Init.
(4) Well Licensee & Slack Diagram Posted Init.
(5) Flare Lines Staked Init.
(6) BOP Drills Performed Init.
(7) Visually Inspect BOPs - Flarelines & Degasser Lines Init.

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME-HRS

CODE NO.	1 OPER.	2 RIG UP & TEAR DOWN	3 DRLG ACTUAL	4 REAMING	5 CORING	6 CIRC MUD & CIRC	7 TRIPS	8 RIG SERVICE	9 REPAIR RIG	10 CUT OFF DRILL LINE	11 DEV SURVEY	12 WIRE LINE LOGS	13 RUN CASE & CEMENT	14 CORE	15 TEST B.O.P.	16 DRILL STEM TEST	17 PLUG BACK	18 SQUEEZE CEMENT	19 FISHING	20 DIR. WORK	21 SAFETY MTG.	22 RECOVER CORE	23
MORN.					7¾			¼	½														
DAY					8																		
EVE.					4¾		2½	¼															
TOTAL					20½		2½	½								DEC 27 1996						½	
																						½	

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			.24 m
2	CORE BBLS.		19.66 m
1	D/P		.22 m
1	B/S FLOAT		.91 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			186.73 m
			m
			m
			m
			m
33	D.P.	STANDS	m
X	D.P.	SINGLES	947.20 m
	KELLY DOWN		4.07 m
	TOTAL		1138 m

WT. OF DC 25,000 1000 daN
WT. OF STRING 44,000 1000 daN

BIT RECORD

BIT NO.	10
SIZE (mm)	159
IADC CODE	
MFG.	BHI
TYPE	SC279
SERIAL NO.	0321079
JETS (mm)	.40
DEPTH OUT (m)	
DEPTH IN (m)	1131
TOTAL METRES DRILLED (m)	7
TOTAL HOURS RUN	9¾

CUTTING STRUCTURE: T_i | T_o | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG
TORQUE AT BOTTOM
FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	01:00	03:30	06:00
DENSITY kg/m³	1085	1085	1085
FUNNEL VIS. - (S/L)	48	46	47
W.L. (cm³)	7.5	7.4	7.3
pH	8.5	8.5	9.5

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
CAUSTIC	1

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			
CENT #2				

P.V.T. @ 00:00 - 56.0 m³
P.V.T. @ 07:00 - 61.3 m³

MORNING TOUR

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			.24 m
2	CORE BBLS		19.66 m
1	DP		.22 m
1	B/S FLOAT		.91 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		186.73 m
			m
			m
			m
			m
33	D.P.	STANDS	m
X	D.P.	SINGLES	947.20 m
	KELLY DOWN		10.82 m
	TOTAL		1144.75 m

WT. OF DC 25,200 1000 daN
WT. OF STRING 44,000 1000 daN

BIT RECORD

BIT NO.	10
SIZE (mm)	159
IADC CODE	
MFG.	BHI
TYPE	SC279
SERIAL NO.	0321079
JETS (mm)	.40
DEPTH OUT (m)	
DEPTH IN (m)	1131
TOTAL METRES DRILLED (m)	13.75
TOTAL HOURS RUN	17¾

CUTTING STRUCTURE: T_i | T_o | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG
TORQUE AT BOTTOM
FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	03:30	11:00	15:00
DENSITY kg/m³	1035	1090	1090
FUNNEL VIS. - (S/L)	43	52	47
W.L. (cm³)	7.7	7.6	7.0
pH	9.0	9.0	8.5

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	14 SX
DRISPAC	1 SX
LIGNITE	1 SX
CAUSTIC	1 SX

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			
CENT #2				

PVT @ 08:00 62.2 m³
PVT @ 16:00 66.9 m³

DAY TOUR

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			.24 m
2	CORE BBLS		19.66 m
1	DP		.22 m
1	B/S FLOAT		.91 m
1	NM DC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		186.73 m
			m
			m
			m
			m
33	D.P.	STANDS	m
XX	D.P.	SINGLES	956.71 m
	KELLY DOWN		5.81 m
	TOTAL		1149.25 m

WT. OF DC 25,000 1000 daN
WT. OF STRING 44,000 1000 daN

BIT RECORD

BIT NO.	10
SIZE (mm)	159
IADC CODE	
MFG.	BHI
TYPE	SC279
SERIAL NO.	0321079
JETS (mm)	.40
DEPTH OUT (m)	1149
DEPTH IN (m)	1131
TOTAL METRES DRILLED (m)	18
TOTAL HOURS RUN	22½

CUTTING STRUCTURE: T_i | T_o | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG ⑦ HOLE DRAG ON TRIP
TORQUE AT BOTTOM
FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	1800	20:00	
DENSITY kg/m³	1090	1090	
FUNNEL VIS. - (S/L)	46	50	
W.L. (cm³)			
pH	9.5	9.5	

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
BARITE	20

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			
CENT #2				

PVT @ 17:00 67.6 m³
SUCKED 3m³ OUT OF ACTIVE

EVENING TOUR

PR. R.M.
RG Initial
RG Initial
DG Initial
DG Initial
DG Initial
DG Initial
DG Initial
Initial
Initial
Initial
Initial
Initial

YEAR 1996 | MONTH DEC | DAY 24
RIG NO. ONE.
FUEL @ 8:00
RIG 167cm | BOILER

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	244	229	53.57	PRUD.	J-55	33	435.68	41.74	434
TUBING OR LINER									

WEATHER

TEMPERATURE °C	
CURRENT CONDITIONS	
WIND DIRECTION	
ROAD	

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.86	E		129	FH	165	PZ-9	G-D	229
							D-375	EMSCO	356

23 24 25 26

TOTALS
8
8
8
24

SHALE SHAKER(S)
NO. 1 TYPE FLOWLINE CLEANER
SCREENS CHANGED ☐ YES ☑ NO
TOP 175 | TOP
MIDDLE 175 | MIDDLE
BOTTOM 175 | BOTTOM

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	DRILLED OFF CORE	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1132	1133	6	70	6

CIRCULATION	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
5200	165	55	127	

REDUCED PUMP SPEED
STANDPIPE @ 200 @ 47

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
00:00	06:15	6¼	4	CUT 159 MM CORE #1, 1132 - 1137
06:15	06:30	¼	7	RIG SERVICE ✓ ANNULAR & REMOTE CHOKE.
06:30	08:00	1½	4	CUT 159 MM CORE #1 1137 - 1138

NOTES R.S.P.P. TAKEN OFF BTM.
FUNCTION REMOTE CHOKE 22 SEC C/O. ANNULAR 10 SEC C/O

DRILLER'S SIGNATURE | BOILER | HRS. RAN | WATER | STACK TEMP. | MAXIMUM EXPERIENCED HOOKLOAD | SAFE HOOKLOAD | M.D.
8 | 11

METRES DRILLED

FROM	TO	DRILLED OFF CORE	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1138	1144.75	6 3/4	70	6

CIRCULATION	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
5,400	165	55	127	

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
08:00	16:00	8	4	CUT 159 MM CORE # 1 11:38 m - 1144.75

NOTES FUNTION REMOTE CHOKE 22 SECS C/O

DRILLER'S SIGNATURE | BOILER | HRS. RAN | WATER | STACK TEMP. | MAXIMUM EXPERIENCED HOOKLOAD | SAFE HOOKLOAD | M.D.
8 | 11

EVENING TOUR

METRES DRILLED

FROM	TO	DRILLED OFF CORE	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1144.75	1149	4.25	70	6

CIRCULATION	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
5800	165	55	127	

REDUCED PUMP SPEED
STANDPIPE @ 200 @ 47

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
TRIP VOLUMES		
	ACTUAL - 6.75 m³	
	CALCULATED - 5.65 m³	
	+ 1.10 m³	

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
16:00	18:45	2¾	4	CUT 159 MM CORE #1, 1144.75m - 1147.50m
18:45	19:00	¼	7	RIG SERVICE ✓ ANNULAR + REMOTE CHOKE
19:00	21:00	2	4	CUT 159 MM CORE 1147.50 m - 1149
21:00	23:30	2½	6	FLOW I.O.K., PUMP PILL, HOIST CORE #1, FLOW AS PER REGULATIONS
23:30	24:00	½	22	RECOVER CORE.

P.V.T. START TRIP 63.1 m³
P.V.T. END TRIP 55.8 m³
7.3 m³

NOTES FUNTION REMOTE CHOKE 22 SECS C/O ANNULAR, 10 SECS C/O

DRILLER SIGNATURE | BOILER | HRS. RAN | WATER | STACK TEMP. | MAXIMUM EXPERIENCED HOOKLOAD | SAFE HOOKLOAD | M.D.
8 | 11 | 44,000 | 11774

#17

000578

FOLD HERE →

LICENCE NO.:	WELL NAME AND NO.:
9211 (18-1-1	UCEL LEARD K-02
OPERATOR:	**CONTRACTOR:**
UNOCAL EXPLORATION LTD.	CACTUS DRILLING
SURFACE LOCATION:	**UNIQUE ID.:**
60-29-123-30	
SIGNATURE OF OPERATOR'S REPRESENTATIVE:	**SIGNATURE OF CONTRACTOR'S RIG MANAGER:**
Doug Salsman	

DAILY CHECKS

(1) Daily Walk Around Inspection	Ini
(2) Detailed Inspection-Weekly (using checklist)	Ini
(3) HPS Signs Posted (if required)	Ini
(4) Well License & Stick Diagram Posted	Ini
(5) Flare Lines Staked	Ini
(6) BOP Drills Performed	Ini
(7) Visually inspect BOP's - Flarelines & Degasser Lines	Ini
(1) Rig Site Health and Safety Meeting (one/crew/month)	
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)	
(3) Mast Inspection Before Raising or Lowering	
(4) Crown Saver Checked	
(5) Motor Kills checked	

TIME-HRS (CODE NO. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23)

OPER.	MUD UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.	RECOVER CORE	HAND BOP
MORN.			4 3/4			2	1/4																
DAY		1 3/4	5 1/2		1/2		1/4															1/2	1/2
EVE.		1 3/4			2 1/2	2	1/4			1/2													
TOTAL		3 1/2	10 1/4		3	4	3/4			1/2												1/2	1

DEC 27 1996

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			.25 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.56 m
			m
			m
32	D.P.	STANDS	m
XX	D.P.	SINGLES	928.82 m
	KELLYDOWN		6.32 m
	TOTAL		1134 m
WT. OF DC		31,000 1000 daN	
WT. OF STRING		46,000 1000 daN	

BIT RECORD

BIT NO.	4
SIZE (mm)	222
IADC CODE	6 3 7
MFG.	RBI
TYPE	C57 LRG
SERIAL NO.	BK269
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	1149
TOTAL METRES DRILLED (m)	
TOTAL HOURS RUN	

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	O DAN UP/DOWN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	04:00	06:00
DENSITY kg/m³	1090	1090
FUNNEL VIS. - (S/L)	46	47
W.L. (cm³)	7.6	7.5
pH	9.5	9.5

PRODUCT	AMOUNT X UNIT

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

P.V.T. @ 03:00 - 61.5 m³
P.V.T. @ 07:30 - 63.0 m³

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			.25 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X10		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X10		.56 m
	BHA		198.86 m
			m
			m
33	D.P.	STANDS	m
X	D.P.	SINGLES	947.29 m
	KELLYDOWN		9.94 m
	TOTAL		1156.00 m
WT. OF DC		31,000 1000 daN	
WT. OF STRING		46,000 1000 daN	

BIT RECORD

BIT NO.	4
SIZE (mm)	222
IADC CODE	6 3 7
MFG.	RBI
TYPE	C57 LRG
SERIAL NO.	BK269
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	1149
TOTAL METRES DRILLED (m)	7
TOTAL HOURS RUN	1 3/4

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	O DAN UP/DOWN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	09:00	12:00	15:00
DENSITY kg/m³	1090	1090	1095
FUNNEL VIS. - (S/L)	45	47	45
W.L. (cm³)	7.8	8.0	8.0
pH	9.5	9.0	9.0

PRODUCT	AMOUNT X UNIT
GEL	8 SX

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
3	1095	1070	2165

P.V.T @ 07:30 - 63 m³
P.V.T @ 16:00 - 66.6 m³

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			.25 m
1	B/S FLOAT		.69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
			198.86 m
			m
			m
33	D.P.	STANDS	m
XX	D.P.	SINGLES	956.71 m
	KELLYDOWN		6.93 m
	TOTAL		1162.50 m
WT. OF DC		31,000 1000 daN	
WT. OF STRING		46,000 1000 daN	

BIT RECORD

BIT NO.	4
SIZE (mm)	222
IADC CODE	6 3 7
MFG.	RBI
TYPE	C57 LRG
SERIAL NO.	BK269
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	1149
TOTAL METRES DRILLED (m)	13
TOTAL HOURS RUN	3 1/2

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.
2	2		A	2	1		CP	

HOLE CONDITION

HOLE DRAG	O DAN UP/DOWN
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	17:00	19:30	
DENSITY kg/m³	1090	1075	
FUNNEL VIS. - (S/L)	49	48	
W.L. (cm³)	8.0	8.0	
pH	9.0	9.0	

PRODUCT	AMOUNT X UNIT
GEL	15 SX
BARITE	20
DUMP SAND TRAP	

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	1095	1070	2165

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

PVT @ 17:00 - 66.4 m³

OPR. DG R.M. DG DG

YEAR 1996 | MONTH Dec | DAY 25

RIG NO. ONE.

FUEL @ 8:00

RIG 179 | BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

LAST CASING TUBING OR LINER	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
	244	229	53.57	PRUD	J-55	33	435.68	4.74	434

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STK LTH.
102	20.86	E		129	FH	165	P-9	G-D.	22
							D-375	EMSCO	35

23	24	25	26	TOTALS
HANDLE 3 BARRELS				
1/2				8
				8
1				8
1 1/2				24

SHALE SHAKER(S): NO. 1 TYPE FLOWLINE CLEANER; SCREENS CHANGED ☐ YES ✓ NO; TOP 175; MIDDLE 175; BOTTOM 175

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	DRLD / CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1131	1134	3	78	2

CIRCULATION PRESS. 9000 | PUMP NO. 1: LINER SIZE (mm) 165, S.P.M. 93 | PUMP NO. 2: LINER SIZE (mm) 127, S.P.M.

RECIPROCATED PUMP SPEED 50

STAND PIPE P2P @ 5000 @ 50

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
00:00	00:30	1/2	22	RECOVER & BOX CORE.
00:30	01:00	1/2	23	SERVICE & LAY DOWN BARRELS
01:00	03:00	2	6	R.I.H. BREAK CIRC. & FLOW ✓ 1000 m.
03:00	05:00	2	3	REAM 1034 - 1131 *
05:00	05:15	1/4	7	RIG SERVICE ✓ ANNULAR & REMOTE CHOKE.
05:15	08:00	2 3/4	3	REAM RATHOLE 1131 - 1134

ANNULAR 9 SECS c/o, REMOTE CHOKE 22 SECS c/o.

NOTES * BRIDGE AT 1084 TO 1090; UNDERGAUGE HOLE 1015 TO 1131

FUNCTION BLIND RAMS UPPER & LOWER PIPE RAMS ALL 45 SEC c/o

BOP DRILL: HRS. 8 | RAN BY 11 | STACK TEMP | MAXIMUM EXPERIENCED KICK LOAD | SAFETY TOPIC

DAY TOUR

METRES DRILLED

FROM	TO	DRLD / CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1134	1149	15	78	6
1149	1156	7	78	18

CIRCULATION PRESS. 9,000 | PUMP NO. 1: LINER SIZE (mm) 165, S.P.M. 94 | PUMP NO. 2: LINER SIZE (mm) 127, S.P.M.

RECIPROCATED PUMP SPEED 55

STAND PIPE @ 5700 @ 55

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
08:00	10:15	2 1/4	3	REAM RATHOLE 1134 m - 1140 m
10:15	10:30	1/4	7	RIG SERVICE ✓ ANNULAR & REMOTE CHOKE
10:30	13:45	3 1/4	3	REAM RATHOLE 1140 m - 1149 m
13:45	14:45	1	2	DRILL 1149 m - 1153 m - FLOW CHECK.
14:45	15:15	1/2	5	CIRC SAMPLE.
15:15	16:00	3/4	2	DRILL 1153 m - 1156 m

NOTES ANNULAR 10 SECS c/o, REMOTE CHOKE 22 SECS c/o

BOP DRILL: HRS. 8 | RAN BY 11 | STACK TEMP | MAXIMUM EXPERIENCED KICK LOAD 46,000 | SAFETY TOPIC 11774

EVENING TOUR

METRES DRILLED

FROM	TO	DRLD / CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1156	1162	6	78	18

CIRCULATION PRESS. | PUMP NO. 1: LINER SIZE (mm) 165, S.P.M. 94 | PUMP NO. 2: LINER SIZE (mm) 127, S.P.M.

RECIPROCATED PUMP SPEED 50

STAND PIPE @ 5600 @ 50

MANIFOLD DEVIATION SURVEY @ 50

DEPTH (m)	DEVIATION (°)	DIRECTION
1118	5 1/4°	AZ 52

P.V.T. START TRIP - 58.4 m³

P.V.T. END TRIP - 51.2 m³

7.2 m³

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
16:00	17:15	1 1/4	2	DRILL 1156 m - 1159 m
17:15	17:30	1/4	7	RIG SERVICE ✓ ANNULAR & REMOTE CHOKE
17:30	18:00	1/2	10	SURVEY 1118 m - 5 1/4°, AZ 52
18:00	18:15	1/4	2	DRILL 1159 m - 1160 m
18:15	19:00	3/4	5	CIRC. SAMPLE
19:00	19:15	1/4	2	DRILL 1160 m - 1162 m. FLOW CHECK
19:15	21:00	1 3/4	5	CIRC SAMPLE, COND. HOLE.
21:00	23:00	2	6	FLOW ✓, TRIP TO CORE, FLOW ✓ AS PER REGULATIONS
23:00	24:00	1	23	PICK-UP & MAKE UP CORE BARRELS.

TRIP VOLUME ACTUAL - 7.61 m³

CALCULATED - 6.47 m³

+ 1.14 m³

NOTES ANNULAR 10 SECS c/o REMOKE CHOKE 22 SECS c/o

BOP DRILL: HRS. 8 | RAN BY 11 | STACK TEMP | MAXIMUM EXPERIENCED KICK LOAD | SAFETY TOPIC 11,860

#18

000579

FOLD HERE →

LICENCE NO.: 9211 — UWI 8-1-1

WELL NAME AND NO.: UCOL LIARD K-02

OPERATOR: UNOCAL EXPLORATION LTD.

CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30

UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE: Lael Lehrmann

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS — OF

(1) Daily Walk Around Inspection — Initi...
(2) Detailed Inspection-Weekly (using checklist) — Initi...
(3) H'S Signs Posted (if required) — Initi...
(4) Well License & Stick Diagram Posted — Initi...
(5) Flare Lines Staked — Initi...
(6) BOP Drills Performed — Initi...
(7) Visually Inspect BOP's - Flarelines & Degasser Lines — Initi...

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME - HRS

CODE NO.	1 OPER.	2 RIG UP & TEAR DOWN	3 DRILL ACTUAL	4 REAMING	5 CORING	6 COND. MUD & CIRC	7 TRIPS	8 RIG SERVICE	9 REPAIR RIG	10 CUT OFF DRILL LINE	11 DEV SURVEY	12 WIRE LINE LOGS	13 RUN CASE & CEMENT	14 WAIT ON CEMENT	15 NIPPLE UP B.O.P.	16 TEST B.O.P.	17 DRILL STEM TEST	18 PLUG BACK	19 SQUEEZE CEMENT	20 FISHING	21 DIR. WORK	22 SAFETY MTG.	23 RECOVER CORE	24 LAY DOWN DP
	MORN.				5 3/4	1/2	1 1/2	1/4																
	DAY				2		3 3/4	1/4																
	EVE.			4 1/2		1/4	2 1/4	1/4		1														
	TOTAL																							

DRILLING ASSEMBLY (At End of Tour)

		LENGTH
		.24 m
2	CORE BBLS	19.66 m
1	D/P	.22 m
1	B/S FLOAT	.91 m
1	NMDC 165	9.14 m
17	DC 165	156.00 m
1	X/O	.56 m
		186.73 m
		m
		m
		m
34	D.P. STANDS	m
X	D.P. SINGLES	975.51 m
	KELLYDOWN	8.76 m
	TOTAL	1171 m
WT. OF DC	25,000	1000 daN
WT. OF STRING	44,000	1000 daN

BIT RECORD

BIT NO.	10
SIZE (mm)	159
IADC CODE	
MFG.	BHI
TYPE	SC279
SERIAL NO.	0321079
JETS (mm)	T.F.A. .40
DEPTH OUT (m)	
DEPTH IN (m)	1162
TOTAL METRES DRILLED (m)	9
TOTAL HOURS RUN	5 3/4

CUTTING STRUCTURE: T_i | T_o | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

CONDITION

HOLE DRAG: O DAN UP/DOWN
TORQUE AT BOTTOM:
FILL ON BOTTOM (m): NO FILL

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	03:30	06:00
DENSITY kg/m³	1060	1080
FUNNEL VIS. - (S/L)	48	47
W.L. (cm³)	7.6	7.6
pH	9.0	9.0

MUD ADDITIVES ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
CENTRIFUGE				

MORNING TOUR

DRILLING ASSEMBLY (At End of Tour)

		LENGTH
		.24 m
2	CORE BBLS	19.66 m
1	DP	.28 m
1	B/S FLOAT	.91 m
1	NMDC 165	9.14 m
17	DC 165	156.00 m
1	X/O	.56 m
		186.73 m
		m
		m
		m
34	D.P. STANDS	m
XX	D.P. SINGLES	985.10 m
	KELLYDOWN	8.17 m
	TOTAL	1180.00 m
WT. OF DC	25,000	1000 daN
WT. OF STRING	44,000	1000 daN

BIT RECORD

BIT NO.	10	5
SIZE (mm)	159	222
IADC CODE		627
MFG.	BHI	REED
TYPE	SC279	HP62A
SERIAL NO.	0321079	EX4789
JETS (mm)	T.F.A. .40	11/11/11
DEPTH OUT (m)		
DEPTH IN (m)	1162	1180
TOTAL METRES DRILLED (m)	18	
TOTAL HOURS RUN	7 3/4	

CUTTING STRUCTURE: T_i | T_o | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

CONDITION

HOLE DRAG: 1,000 DAN, UP DOWN
TORQUE AT BOTTOM:
FILL ON BOTTOM (m):

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	0:800	09:30	TRIP
DENSITY kg/m³	1080	1080	
FUNNEL VIS. - (S/L)	45	46	
W.L. (cm³)	7.7	8.0	
pH	9.0	9.0	

MUD ADDITIVES ADDED

PRODUCT	AMOUNT X UNIT
BARITE	20 sx
P.V.T @ 08:00, 55.7 m³	

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			
CENTRIFUGE				
	0			
CENTRIFUGE 2				
	0			

DAY TOUR

DRILLING ASSEMBLY (At End of Tour)

		LENGTH
1		.25 m
1	DISFLOAT	.69 m
3	D.C. 197	28.36 m
1	O/X	.77 m
1	S/S	3.04 m
16	NMDC 165	9.14 m
17	DC 165	156.00 m
1	X/O	.56 m
	BHA	198.86 m
		m
		m
34	D.P. STANDS	96.25 m
	D.P. SINGLES	m
	KELLYDOWN	12.95 m
	TOTAL	1178.00 m
WT. OF DC	28,000	1000 daN
WT. OF STRING	46,000	1000 daN

BIT RECORD

BIT NO.	5	
SIZE (mm)	222	
IADC CODE	627	
MFG.	REED	
TYPE	HO 62A	
SERIAL NO.	6X4789	
JETS (mm)	3 X 11.9	
DEPTH OUT (m)	REBUILD	
DEPTH IN (m)	1162	
TOTAL METRES DRILLED (m)	16	
TOTAL HOURS RUN	4 1/2	

CUTTING STRUCTURE: T_i | T_o | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

CONDITION

HOLE DRAG: O DAN, UP/DOWN
TORQUE AT BOTTOM:
FILL ON BOTTOM (m):

MUD RECORD

MUD TYPE: ☐ WATER BASED ☑ OIL BASED

TIME	20:30	22:30	
DENSITY kg/m³	1040	1055	
FUNNEL VIS. - (S/L)	47	46	
W.L. (cm³)	6.5	7.2	
pH	9.0	9.0	
SHAKER SCREENS		3 X 175	

MUD ADDITIVES ADDED

PRODUCT	AMOUNT X UNIT

SOLIDS CONTROL

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENTRIFUGE				
	0			
CENTRIFUGE #2				
	0			

EVENING TOUR

OPR. DG R.M. DG DG DG

YEAR 1996 | MONTH Dec | DAY 26

RIG NO. ONE

FUEL @ 8:00

RIG 150cm | BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

LAST CASING TUBING OR LINER	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
	244	229	53.57	PRUD	J55	33	1/35.68	4.74	434

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.86	E		129	FH	165	PZ-9	G-D	229
							D-375	EMSCO	356

23 24 25 26

DOWN FOR REPAIRS

TOTALS: 8 / 8 / 8

SHALE SHAKER(S): NO. 1 TYPE FLOWLINE CLEANER; SCREENS CHANGED ☐ YES ☑ NO; TOP 175; MIDDLE 175; BOTTOM 175

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	DRLD (M) CORED	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1162	1171	9	70	6

CIRCULATION PRESSURE (kPa) 5100

PUMP NO. 1 LINER SIZE (mm)	S.P.M.	PUMP NO. 2 LINER SIZE (mm)	S.P.M.
165	55	127	

REDUCED PUMP SPEED

STAND PIPE 2 @ 1700 @ 55

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION
P.V.T. @ 01:30	57.4 m³	
P.V.T. @ 07:00	58.2 m³	

DRILLER SIGNATURE

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
00:00	01:30	1½	6	R.I.H. BREAK CIRC. & FLOW ✓ AT 1000m O.K.
01:30	01:45	¼	7	RIG SERVICE, ✓ANNULAR 9SEC%, REMOTE CHOKE
01:45	02:15	½	5	CIRC. BOTTOMS UP & FLOW ✓
02:15	08:00	5¾	4	DROP BALL, CUT CORE #2. 1162 - 1171

JAN 02 1997

CACTUS DRILLING

NISKU

NOTES: ANNULAR 9SEC%, REMOTE CHOKE 22SEC%, R.S.P.P. TAKEN OFF BOTH. CORING BALL IN PLACE.

BOILER HRS RAN	STACK TEMP	MAXIMUM EXPERIENCED HOOKLOAD	SAFE HOOKLOAD
8	11	44,000	111860

DAY TOUR

METRES DRILLED

FROM	TO	DRLD (M) CORED	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1171	1180	9	70	6

CIRCULATION PRESSURE (kPa) 5,400

PUMP NO. 1 LINER SIZE (mm)	S.P.M.	PUMP NO. 2 LINER SIZE (mm)	S.P.M.
165	55	127	

REDUCED PUMP SPEED

STAND PIPE 2300 @ 47

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION
TRIP VOLUMES		
ACTUAL - 7.17 m³		
CALCULATED - 5.73 m³		
+ 1.44 m³		

DRILLER SIGNATURE: BRIAN

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
08:00	08:15	¼	4	CUT CORE #2, 1171m - 1175m, FLOW ✓
08:15	08:30	¼	7	RIG SERVICE ✓ ANNULAR + REMOTE CHOKE
08:30	10:15	1¾	4	CUT CORE #2 1175m - 1180
10:15	13:00	2¾	6	FLOW ✓ OK, PUMP PILL, HOIST CORE #2, FLOW CHECK AS PER REGULATION
13:00	14:30	1½	22	RECOVER CORE + BOX.
14:30	15:00	½	23	SERVICE + LAY DOWN BARRELS
15:00	16:00	1	6	R.I.H DRILL COLLARS. Flow Check 0.15.

NOTES: ANNULAR 10 SEC, % REMOTE CHOKE 22 SEC %, FUNCTION BLIND RAMS 4/0 4 SECS

BOILER HRS RAN	STACK TEMP	MAXIMUM EXPERIENCED HOOKLOAD	SAFE HOOKLOAD
8	11	45,000	

EVENING TOUR

METRES DRILLED

FROM	TO	DRLD (M) CORED	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1162	1178/16	R	66	5/6

CIRCULATION PRESSURE (kPa) 8900

PUMP NO. 1 LINER SIZE (mm)	S.P.M.	PUMP NO. 2 LINER SIZE (mm)	S.P.M.
165	54	127	

REDUCED PUMP SPEED

STAND P.P. @ 2300 @ 41

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION
PVT	2130	58.5 m³
PVT	2300	60.1 m³

DRILLER SIGNATURE: David Mihay

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
16 00	16 15	¼	6	R.I.H. W/ Bit #5
16 15	16 30	¼	7	RIG SERV. ✓ Annular, Remote Choke.
16 30	17 30	1		SLIP + Cut ✓ BRAKES & LINKAGE.
17 30	18 30	1	6	R.I.H. TO 1000m BREAK CIRC.
18 30	1845	¼	5	CIRC
1845	1930	¾	6	RUNNING HOLE
1930	23:00	4½	3	REAMED RATE HOLE 1162 - 1178

NOTES: ANNULAR 9SEC, REMOTE CHOKE 22 SEC MACP 11860 KPA

BOILER HRS RAN	STACK TEMP	MAXIMUM EXPERIENCED HOOKLOAD	SAFE HOOKLOAD
8	11	48 000	

19 — 000580

LICENCE NO.:	WELL NAME AND NO.:
9211 - U18-1-1	UCEL LIARD K02
OPERATOR:	**CONTRACTOR:**
UNOCAL EXPLORATION LTD	CACTUS DRILLING
SURFACE LOCATION:	**UNIQUE ID.:**
60-20-123-30	
SIGNATURE OF OPERATOR'S REPRESENTATIVE:	**SIGNATURE OF CONTRACTOR'S RIG MANAGER:**
David Coleman	Shane Brown

DAILY CHECKS — OP

(1) Daily Walk Around Inspection — Initia
(2) Detailed Inspection-Weekly (using checklist) — Initia
(3) H²S Signs Posted (if required) — Initia
(4) Well License & Stick Diagram Posted — Initia
(5) Flare Lines Staked — Initia
(6) BOP Drills Performed — Initia
(7) Visually inspect BOP's - Flarelines & Degasser Lines — Initia

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME - HRS

COD NO.	OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.
	MORN.		6 1/2	1 1/4				1/4														
	DAY		7 1/4					1/4			1/2											
	EVE.		5 1/4		2 1/2			1/4														
	TOTAL																					

DAY TOUR

DRILLING ASSEMBLY (At End of Tour)

			24 m
1	BIS FLOAT		.69 m
3	DC	197	28.36 m
1	X10		.77 m
1	SIS		3.04 m
1	NMDC	165	9.14 m
17	DIC	165	156.00 m
1	X10		.56 m
	BHA		198.80 m
			m
			m
34	D.P.	STANDS	m
XX	D.P.	SINGLES	985.10 m
	KELLY DOWN		12.97 m
	TOTAL		1196.83 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		48,000	1000 daN

BIT RECORD

BIT NO.	5
SIZE (mm)	222
IADC CODE	6 2 7
MFG.	REED
TYPE	HPE2A
SERIAL NO.	EX4789
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	1180
TOTAL METRES DRILLED (m)	16 — REAM 18 m
TOTAL HOURS RUN	6 1/2 — 5 3/4 HOURS REAMING

CUTTING STRUCTURE								
T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG 0 DAN. UP / DOWN
TORQUE AT BOTTOM
FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	00:30	0300	0600
DENSITY kg/m³	1085	1090	1095
FUNNEL VIS. - (S/L)	43	45	49
W.L. (cm³)	8.0	7.3	7.5
pH	9.0	9.0	9.0

PRODUCT	AMOUNT X UNIT
DRISPAC	1 SX
LIGNITE	2 SX
GEL	18 SX

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

PVT @ 00:00 60.4 m³
PVT @ 07:00 63.3 m³

MORNING TOUR

DRILLING ASSEMBLY (At End of Tour)

1			24 m
1	BIS FLOAT		69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S.S.		3.04 m
1	NMDC	165	9.14 m
17	~~NMDC~~ DC	165	156.00 m
1	X/O		.56 m
	BHA		198.80 m
			m
			m
35	D.P.	STANDS	1003.72 m
5	D.P.	SINGLES	m
	KELLY DOWN		9.48 m
	TOTAL		1212.00 m
WT. OF DC		31 000	1000 daN
WT. OF STRING		49 000	1000 daN

BIT RECORD

BIT NO.	5
SIZE (mm)	222
IADC CODE	6 2 7
MFG.	~~HPE2A~~ REED
TYPE	~~EX4789~~ HPG2A
SERIAL NO.	EX4789
JETS (mm)	14 11.9 11.9
DEPTH OUT (m)	OB
DEPTH IN (m)	1180
TOTAL METRES DRILLED (m)	32
TOTAL HOURS RUN	~~13~~ 13 3/4

CUTTING STRUCTURE								
T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG 1000 daN
TORQUE AT BOTTOM
FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	08:00	12:00	15:30
DENSITY kg/m³	1095	1095	1095
FUNNEL VIS. - (S/L)	52	49	45
W.L. (cm³)	7.0	7.5	7.2
pH	8.5	9.0	9.5
PVT	08:00 64.0 m³	12:00 65.2 m³	1500 65.3 m³

PRODUCT	AMOUNT X UNIT
CAUSTIC	2
LIG	1
GEL	15

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
4	5 LPM	1080	2085

CENT # 2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

DAY TOUR

DRILLING ASSEMBLY (At End of Tour)

1			24 m
1	BIS FLOAT		69 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S.S.		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		198.80 m
			m
			m
36	D.P.	STANDS	1022.25 m
	D.P.	SINGLES	m
	KELLY DOWN		5.95 m
	TOTAL		1227.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		49,000	1000 daN

BIT RECORD

BIT NO.	5
SIZE (mm)	222
IADC CODE	6 2 7
MFG.	REED
TYPE	HPG2A
SERIAL NO.	EX4789
JETS (mm)	11.1 11.9 11.9
DEPTH OUT (m)	
DEPTH IN (m)	1180
TOTAL METRES DRILLED (m)	47
TOTAL HOURS RUN	19

CUTTING STRUCTURE								
T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG 1000 DAN / UP / DOWN
TORQUE AT BOTTOM
FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	16:30	20:00	2300
DENSITY kg/m³	1090	1080	1080
FUNNEL VIS. - (S/L)	55	51	49
W.L. (cm³)	7.4	7.7	7.5
pH	9.5	9.5	9.0
	16:00 65.1		

PRODUCT	AMOUNT X UNIT

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
5		1080	

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

PVT @ 16:00 65.1 m³
PVT @ 23:00 67.1 m³

EVE

OPR. R.M.

YEAR 1996 | MONTH 12 | DAY 27

RIG NO. ONE

FUEL @ 8:00

RIG 204 | BOILER

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	224	229	53.57	PRUD	J55	33	435.68	4.74	434
TUBING OR LINER									

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROK LTH. (m
102	20.86	E		129	F-H	165	PZ-9	G-D	32
							D-375	EMSCO	35

23	24	25	26

TOTALS: 8 | 8 | 9

SHALE SHAKER(S): NO. 1 TYPE FLOW LINE CLEANER; SCREENS CHANGED ☐ YES ☑ NO; TOP 175; MIDDLE 175; BOTTOM 175

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	DR-D RR-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1178	1180	2	66	5/6
1180	1196	16	78	16

CIRCULATION | PUMP NO. 1 | PUMP NO. 2

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9100	165	94	127	

REDUCED PUMP SPEED

STAND PIPE 500 @ 49

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE: Brian Jones

TIME LOG

FROM	TO	ELAP. TIME	CODE NOS.
00:00	00:15	1/4	7
00:15	01:30	1 1/4	3
01:30	08:00	6 1/2	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

00:00 RIG SERVICE ANNULAR & REMOTE CHOKE
00:15 REAM RAT HOLE 1179 m - 1180 m
01:30 DRILL 1180 m - 1184 m, FLOW 1134 m - 1196 m

NOTES: ANNULAR 10 SECS C/O REMOTE CHOKE 22 SEC C/O

BOILER HRS: RAN for 24 hrs | STACK TEMP. | MANUAL EXPERIENCED WORKFORCE

8 | 11 | 48,000 | 11860

DAY TOUR

METRES DRILLED

FROM	TO	DR-D RR-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1196	1212	16	78	16

CIRCULATION | PUMP NO. 1 | PUMP NO. 2

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9000	165	94	127	

STAND PIPE 58 @ 2600

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION
1164	5 1/2	NE 54

DRILLER'S SIGNATURE: David Woods

TIME LOG

FROM	TO	ELAP. TIME	CODE NOS.
0800	0815	1/4	7
0815	1200	3 3/4	2
1200	1230	1/2	10
1230	1600	3 1/2	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

08:00 Rig Service - CLOSE ANNULAR - REMOTE CHOKE
08:15 Drill 1196 - 1206
12:00 Survey - 1165 BOP Drill in 90 seconds
12:30 Drill - Flow check 1206 - 1212

NOTES: ANNULAR, 10 SEC REMOTE CHOKE 23 SEC

BOILER HRS: RAN for 24 hrs | STACK TEMP. | MANUAL EXPERIENCED WORKFORCE

8 | 11 | 50,000 | BOP Drills | 11774

EVENING TOUR

METRES DRILLED

FROM	TO	DR-D RR-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1212	1227	15	78	16

CIRCULATION | PUMP NO. 1 | PUMP NO. 2

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9000	165	94	127	

REDUCED PUMP SPEED

STAND PIPE 2800 @ 51

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE:

TIME LOG

FROM	TO	ELAP. TIME	CODE NOS.
1600	1715	1 1/4	2
1715	1730	1/4	10
1730	21:00	3 1/2	2
21:00	22:00	1	5
22:00	22:30	1/2	2
22:30	24:00	1 1/2	5

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

16:00 Drill 1212 - 1215
17:15 Rig Service CLOSE Annular 45 sec REMOTE CHOKE 22 sec
17:30 Drill 1215 - 1226 FLOW
21:00 CIRCULATE SAMPLE
22:00 DRILL 1225 m 1227 m
22:30 CIRC SAMPLE

NOTES:

BOILER HRS: RAN for 24 hrs | STACK TEMP. | MANUAL EXPERIENCED WORKFORCE

8 | 11 | 50,000

RECEIVED
JAN 02 1996
CACTUS DRILLING
NISKU

20

000581

LICENCE NO.: 9211-UIS-1-1

WELL NAME AND NO.: UCEL LIARD K02

OPERATOR: UNOCAL EXPLORATION LTD

CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30

UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE: David Halvorsen

SIGNATURE OF CONTRACTOR'S RIG MANAGER: Norman Sioux

DAILY CHECKS — OP

(1) Daily Walk Around Inspection
(2) Detailed Inspection-Weekly (using checklist)
(3) HPS Signs Posted (if required)
(4) Well License & Stick Diagram Posted
(5) Flare Lines Staked
(6) BOP Drills Performed
(7) Visually Inspect BOP's - Flarelines & Degasser Line

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME - HRS

CODE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
OPER.	RIG UP & TEAR DOWN	DRLG ACTUAL	REAMING	CORING	COND. MUD CIRC.	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.		
MORN.		7 1/2			1/4		1/4																
DAY		7 1/2					1/4			1/4													
EVE.		6 3/4			3/4		1/4			1/4													
TOTAL																							

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
			24 m
1	BIS FLOAT		69 m
3	DC	197	28.36 m
1	X10		.77 m
1	SIS		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X10		.56 m
	BHA		198.80 m
			m
			m
36	D.P.	STANDS	m
XX	D.P.	SINGLES	1040.60 m
	KELLY DOWN		5.60 m
	TOTAL		1245.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		50,000	1000 daN

BIT RECORD

BIT NO.	5
SIZE (mm)	222
IADC CODE	6 2 7
MFG.	REED
TYPE	HP62A
SERIAL NO.	EX4789
JETS (mm)	11 11 11
DEPTH OUT (m)	
DEPTH IN (m)	1180
TOTAL METRES DRILLED (m)	65
TOTAL HOURS RUN	25 1/2

CUTTING STRUCTURE: T_1 | T_0 | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG: 0 DAN. UP/DOWN
TORQUE AT BOTTOM:
FILL ON BOTTOM (m):

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	01:00	0300	0600
DENSITY kg/m³	1085	1080	1080
FUNNEL VIS. - (S/L)	47	47	47
W.L. (cm³)	7.7	7.8	7.5
pH	9.0	9.0	9.0

PRODUCT	AMOUNT X UNIT

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENT #1				
	0			
CENT #2				

P.V.T @ 00:00 - 67.0 m³
P.V.T @ 07:00 - 67.3 m³

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
1			24 m
1	BIS FLOAT		69 m
3	DC	197	28.36 m
1	X10		.77 m
1	SIS		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X10		.56 m
	BHA		198.80 m
			m
			m
37	D.P.	STANDS	1050.00 m
	D.P.	SINGLES	m
	KELLY DOWN		1220 m
	TOTAL		1461.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		49,000	1000 daN

BIT RECORD

BIT NO.	5
SIZE (mm)	222
IADC CODE	6 2 7
MFG.	REED
TYPE	HP62A
SERIAL NO.	EX4789
JETS (mm)	11 11 11
DEPTH OUT (m)	
DEPTH IN (m)	1180
TOTAL METRES DRILLED (m)	81
TOTAL HOURS RUN	34

CUTTING STRUCTURE: T_1 | T_0 | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG: 1000
TORQUE AT BOTTOM:
FILL ON BOTTOM (m):

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	08:00	12:00	15:30
DENSITY kg/m³	1045	1090	1095
FUNNEL VIS. - (S/L)	50	53	51
W.L. (cm³)	7.5	7.6	7.8
pH	8.5	9.0	9.5
	08:00 61.3 m³ PVT	12:00 64.8 m³	15:30 69.6 m³

PRODUCT	AMOUNT X UNIT
CAUSTIC	2
LIG	1

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENT #1				
CHANGE OUT 1 SHAKER SCREEN [WORE OUT] Centre Screen 3 x 175	3	52 LPM	1080	1995
CENT #2				
	0			

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
1	BIT	SUB	24 m
1	BIS FLOAT		69 m
3	DC	197	28.36 m
1	X10		.77 m
1	SIS		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X10		.56 m
	BHA		198.80 m
			m
			m
37	D.P.	STANDS	m
XX	D.P.	SINGLES	1069.31 m
	KELLY DOWN		3.89 m
	TOTAL		1272.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		49,000	1000 daN

BIT RECORD

BIT NO.	5
SIZE (mm)	222
IADC CODE	6 2 7
MFG.	REED
TYPE	HP62A
SERIAL NO.	EX4789
JETS (mm)	11 11 11
DEPTH OUT (m)	
DEPTH IN (m)	1180
TOTAL METRES DRILLED (m)	92
TOTAL HOURS RUN	40 3/4

CUTTING STRUCTURE: T_1 | T_0 | MDC | LOC | B | Gage | ODC | Reason Pulled | Total Run m/hr.

HOLE CONDITION

HOLE DRAG: 1000
TORQUE AT BOTTOM:
FILL ON BOTTOM (m):

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	16:00	20:00	22:30
DENSITY kg/m³	1095	1080	1080
FUNNEL VIS. - (S/L)	50	46	51
W.L. (cm³)	7.8	7.6	8.0
pH	9.5	9.0	9.0
	16:00 - 69.4 m³ PVT		

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	20 SX

	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	5	54 m³	1080	1995
CENT #2				
	0			

DUMPED 3.1 m³ SAND
TRIP TANK 20 m³ to 66.1 m³

DAY TOUR

EVE TOUR

MORNING TOUR

OPR. R.M.

YEAR	MONTH	DAY
96	12	28

RIG NO. ONE

FUEL @ 8:00

RIG 196 BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
LAST CASING	224	289	53.57	PRUD	J55	33	435.68	4.74	434
TUBING OR LINER									

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.86	E		129	F-H	165	PZ9	G-D	229
							D375	EMSCO	356

23	24	25	26

TOTALS: 8 / 9 / 8

SHALE SHAKER(S): NO. 1 TYPE FLOWLINE CLEANER; SCREENS CHANGED ☐ YES ☒ NO; TOP 175; MIDDLE 175; BOTTOM 175

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	BIT SIZE / CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1227	1245	18	78	16

CIRCULATION: 9,000

PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
165	94	127	

DEPTH / REDUCED PUMP SPEED / SPM: STANDPIPE @ 400 @ 55

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE: [signature]

TIME LOG

FROM	TO	TIME	CODE
00:00	00:15	1/4	5
00:15	02:00	1 3/4	2
02:00	02:15	1/4	7
02:15	08:00	5 3/4	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

CIRC. VLATE,
DRILL 1227 m - 1234m FLOW
RIG SERVICE ANNULAR + REMOTE CHOKE
DRILL 1234 m - 1245 m

NOTES: ANNULAR 10 SEC REMOTE CHOKE 22 SEC

BOILER	STACK TEMP.	MAXIMUM EXPERIENCED HOOKLOAD	SAFETY TOPIC	TIME
8	11	50,000		11960

METRES DRILLED

FROM	TO	BIT SIZE / CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1245	1261	7	78	16
1252	1261	9 7/8 6L	11	

CIRCULATION: STANDPIPE

PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
165	94	127	

DEPTH / REDUCED PUMP SPEED / SPM: STANDPIPE @ 2400 @ 44

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION
1261	MISS TRUN	

DRILLER'S SIGNATURE: [signature]

TIME LOG

FROM	TO	TIME	CODE
0800	1030	2 1/2	2
1030	1045	1/4	7
1045	1100	1/4	10
1100	1600	5	2

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

Drill 1245m - 1252
Rig Service CLOSE ANNULAR and REMOTE CHOKE
SURVEY / MISS RUN AT 1211
Drill 1252 - 1261

JAN 02 1996

CACTUS DRILLING
NISKU

NOTES: ANNULAR, 10SEC, REMOTE CHOKE 23 SEC.

BOILER	STACK TEMP.	MAXIMUM EXPERIENCED HOOKLOAD	SAFETY TOPIC	TIME
8	11	50,000		11974

EVENING TOUR

METRES DRILLED

FROM	TO	BIT SIZE / CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1261	1272	11	77/66	16

CIRCULATION: 9,000

PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
165	94	127	

REDUCED PUMP SPEED / SPM: STANDPIPE @ 2400 @ 44

DEVIATION SURVEYS

DEPTH (m)	DEVIATION (°)	DIRECTION
1261	5 1/2	NE 54

DRILLER'S SIGNATURE: [signature]

TIME LOG

FROM	TO	TIME	CODE
1600	1615	1/4	2
1615	1630	1/4	7
1630	1645	1/4	10
1645	23:15	6 1/2	2
23:15	24:00	3/4	5

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

Drill 1261 - 1261.77
Rig Service, CLOSE ANNULAR and REMOTE CHOKE
SURVEY - 1220 5 1/2 NE 54
Drill 1261.77 - 1272m
CIRC SAMPLE, MONOTERED 4-5% INCREASE ON FLOW LINE MONOTOR, CONDUCTED A 15 MIN. FLOW, A SMALL CONTINUOS FLOW WAS OBSERVED, ON BOTTOMS UP OIL WAS NOTED ON SHAKER, ALSO 5100 GAS UNITS REGISTERED AT MUD LOGGERS SHACK. DENSITY INCREASE OF 20KG/m3 WAS DECIDED, PRIOR TO BIT TRIP.

NOTES: ANNULAR, 10 SEC'S, REMOTE CHOKE 23 SEC'S

BOILER	STACK TEMP.	MAXIMUM EXPERIENCED HOOKLOAD	SAFETY TOPIC	TIME
8	11	50,000		11774

H21

000582

LICENCE NO.: 9921 / U18-1-1

WELL NAME AND NO.: UCEL LIARD K02

OPERATOR: UNOCAL EXPLORATION LTD

CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30

UNIQUE ID:

SIGNATURE OF OPERATOR'S REPRESENTATIVE: Doug Mahaney

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS (OI)

(1) Daily Walk Around Inspection — Ins
(2) Detailed Inspection-Weekly (using checklist) — Ins
(3) HPS Signs Posted (if required) — Ins
(4) Well License & Stick Diagram Posted — Ins
(5) Flare Lines Staked — Ins
(6) BOP Drills Performed — Ins
(7) Visually inspect BOP's - Flarelines & Degasser Lines — Ins

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/month)
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME-HRS

CODE NO.	1 OPER.	2 RIG UP & TEAR DOWN	3 DRILL ACTUAL	4 REAMING	5 CORING	6 COND. MUD & CIRC	7 TRIPS	8 RIG SERVICE	9 REPAIR RIG	10 CUT OFF DRILL LINE	11 DEV SURVEY	12 WIRE LINE LOGS	13 RUN CASE & CEMENT	14 WAIT ON CEMENT	15 NIPPLE UP B.O.P.	16 TEST B.O.P	17 DRILL STEM TEST	18 PLUG BACK	19 SQUEEZE CEMENT	20 FISHING	21 DIR. WORK	22 SAFETY MTG.	23 WASH AND CT3
	MORN.					2 1/4	5 1/2	1/4															
	DAY		4 1/2			1 1/4	1	1/4															WASH AND CT
	EVE.		7 3/4					1/4															1
	TOTAL																						

DRILLING ASSEMBLY (At End of Tour)

			.24 m
1	BIS FLOAT		.80 m
3	DC	197	28.36 m
1	X10		.71 m
1	SIS		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X10		.56 m
	BHA		198.91 m
			m
			m
	D.P.	STANDS	m
	D.P.	SINGLES	m
	KELLYDOWN		m
	TOTAL		m
WT. OF DC		31,000	1000 daN
WT. OF STRING			1000 daN

BIT RECORD

BIT NO.	5	6
SIZE (mm)	222	222
IADC CODE	6 2 7	6 3 7
MFG.	REED	H-W
TYPE	HP62A	ATJ 55 RG
SERIAL NO.	EX4789	U28XR
JETS (mm)	11 11 11	11 11 11
DEPTH OUT (m)	1272	
DEPTH IN (m)	1180	1272
TOTAL METRES DRILLED (m)	92	
TOTAL HOURS RUN	40 3/4	

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.
5	6	BT	A	E	I	CT	PT	2.26

HOLE CONDITION

HOLE DRAG	1,000
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	01:30	02:15
DENSITY kg/m³	1100	1100
FUNNEL VIS. - (S/L)	51	50
W.L. (cm³)	7.8	7.8
pH	9.0	9.0

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
BARITE	95 sx's
02:00	
P.V.T -	67.7 m³
06:00	
P.V.T -	59.2 m³
SHAKER SCREEN's	
3 x 175	

CENT #1	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENT #1	0			
CENT #2	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			

MORNING TOUR

DRILLING ASSEMBLY (At End of Tour)

			.24 m
1	BIS FLOAT		.30 m
3	D.C	197	28.36 m
1	X10		.77 m
1	SIS		3.04 m
1	NMDC	165	9.14 m
17	DC	165	155.00 m
1	X10		.56 m
	BHA		198.91 m
			m
			m
38	D.P.	STANDS	1078.87 m
	D.P.	SINGLES	m
	KELLYDOWN		522 m
	TOTAL		$1283.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		50,000	1000 daN

BIT RECORD

BIT NO.	6
SIZE (mm)	222
IADC CODE	6 3 7
MFG.	H-W
TYPE	ATJ 55RG
SERIAL NO.	U28XR
JETS (mm)	11 11 11
DEPTH OUT (m)	OB
DEPTH IN (m)	1272
TOTAL METRES DRILLED (m)	11
TOTAL HOURS RUN	4 1/2

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	10:30	12:00	16:00
DENSITY kg/m³	1100	1100	1100
FUNNEL VIS. - (S/L)	54	52	50
W.L. (cm³)	7.5	7.6	7.2
pH	9.0	9.0	9.0
PVT	10:30 - 65.4 m³	PVT 62.34	PVT 66.2

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT

CENT #1	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENT #1	2	4	1090	1015
CENT #2	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			

DAYS TOUR

DRILLING ASSEMBLY (At End of Tour)

			.24 m
1	BIS FLOAT		.80 m
5	DC	147	24.36 m
1	X10		.77 m
1	SIS		3.04 m
1	NMDC	165	9.14 m
17	DC	165	155.00 m
1	X10		.56 m
	BHA		198.91 m
			m
			m
38	D.P.	STANDS	m
X	D.P.	SINGLES	1085.51 m
	KELLYDOWN		12.97 m
	TOTAL		m
WT. OF DC		31,000	1000 daN
WT. OF STRING		50,000	1000 daN

BIT RECORD

BIT NO.	6
SIZE (mm)	222
IADC CODE	6 3 7
MFG.	~~REED~~ Hughs
TYPE	ATJ 55 RG
SERIAL NO.	U28XR
JETS (mm)	11 11 11
DEPTH OUT (m)	
DEPTH IN (m)	1272
TOTAL METRES DRILLED (m)	28
TOTAL HOURS RUN	10 1/4

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	16:00	20:00	23:00
DENSITY kg/m³	1100	1090	1090
FUNNEL VIS. - (S/L)	50	44	50
W.L. (cm³)	7.2	8.5	8.5
pH	9.0	9.0	9.0
PVT	66.2		

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	24 sx
CAUSTIC	2 sx
LIGNITE	1 sx
16:00	
P.V.T	66.2 m³
P.V.T @ 22:00	~~76.8~~ m³
P.V.T @ 24:00	63.8 m³
SUCKED OUT	26

CENT #1	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
CENT #1	5	44m	1090	1015
CENT #2	HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
	0			

EVENING TOUR

OPR. AG R.M.

YEAR 96 MONTH 12 DAY 29

RIG NO. ONE

FUEL @ 8:00

RIG 195 BOILER

WEATHER: TEMPERATURE °C; CURRENT CONDITIONS; WIND DIRECTION; ROAD

LAST CASING / TUBING / OR LINER	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
	224	229	53.57	PRUD	J55	33	435.68	4.74	434

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.86	E		129	NC-H	165	PZ 9	G-D	229
							0375	EMSCO	356

23 24 25 26

TOTALS: 8 8

SHALE SHAKER(S): NO. 1 TYPE FLOW LINE CLEANER; SCREENS CHANGED ☐ YES ☑ NO; TOP 175; MIDDLE 175; BOTTOM 175

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1272				

CIRCULATION	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
9,000	165	94	127	

REDUCED / PROPOSED

STAND PIPE @ 2400 kPa @ 49 SPM

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
TRIP VOLUMES		
ACTUAL	7.90 m3	
CAL	6.72 m3	
+	1.18	

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAP. TIME	CODE NUM.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
00:00	02:15	2¼	5	CIRCULATE + WEIGHT UP MUD FLOW OK
02:15	02:30	¼	7	RIG SERVICE ANNULAR + REMOTE CHOKE
02:30			6	PUMP PILL + HOIST BIT #5 (FLOW CHECKS AS PER REGULATIONS
	08:00	5½		CHANGE BIT + RIH

NOTES: ANNULAR 10 SEC REMOTE CHOKE 22 SEC FUNTION BLIND RAMS 4 SEC, CHANGE WORKING SINGLE + BIT SUB.

BOILER SYSTEM PRESSURE | STACK TEMP. | MAXIMUM EXPERIENCED HOOKLOAD | SAFE HOOKLOAD | TYPE

8 | 11 | 50,000 | 1774 KPA

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1272	1283	11	66/78	16

CIRCULATION	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
9000	165	94	127	

STAND PIPE 49 2400

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAP. TIME	CODE NUM.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
0800	0815	¼	7	Rig Service, close Hydrill 8 sec, REMOTE CHOKE
0815	0845	½	6	Build in HOLE
0845	0900	¼	5	Break circ. AT 1055m
0900	0930	½	6	Run in hole
0930	1030	1	22	WASH 1249 - 1267, CTB, 1267 - 1272
1030	0345	3¼	2	Drill 1267 - 1280
0345	1245	1	5	Circ up SAMPLE
1245	1600	2¼	2	Drill 1280 - 1283

NOTES: CLOSE Hydrill 10sec, OPEN 10sec, REMOTE CHOKE 23sec.

BOILER SYSTEM PRESSURE | STACK TEMP. | MAXIMUM EXPERIENCED HOOKLOAD | SAFE HOOKLOAD | TYPE

8 | 11 | 50000 | 11774 KPA

EVENING TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1283	1300	17	78	1600

CIRCULATION	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
9,100	165	[illegible]	127	

REDUCED / PROPOSED 2700 kPa

STAND PIPE @ 55 @ 3300

DEVIATION SURVEY 2605

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

TIME LOG

FROM	TO	ELAP. TIME	CODE NUM.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1600	2000	4	2	Drill 1283 - 1290m
20:00	20:15	¼	7	RIG SERVICE, ANNULAR + REMOTE CHOKE
20:15	24:00	3¾	2	DRILL 1290 m - 1300 m

JAN 02 1996

CACTUS DRILLING NISKU

NOTES: ANNULAR + REMOTE CHOKE, 23 SECS 10 SEC OPEN 10 SEC CLOSE,

BOILER SYSTEM PRESSURE | STACK TEMP. | MAXIMUM EXPERIENCED HOOKLOAD | SAFE HOOKLOAD | TYPE

8 | 11 | 51,000 | 11774 KPA

#22

000583

FOLD HERE →

LICENCE NO.: 92 V18-1-1

WELL NAME AND NO.: UCEL LIARD K02

OPERATOR: ENDOCAL EXPLORATION LTD

CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30 K02

UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE: Doug Delaney

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS

(1) Daily Walk Around Inspection
(2) Detailed Inspection-Weekly (using checklist)
(3) H²S Signs Posted (if required)
(4) Well License & Slick Diagram Posted
(5) Flare Lines Staked
(6) BOP Drills Performed
(7) Visually inspect BOP's - Flarelines & Degasser Lines

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/m
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME HRS

CODE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG	W.T.B
MORN.		3¾	¾		4		¼															
DAY				6½			¼															
EVE.				½	½	6½	¼															
TOTAL																						¼

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
	BIT		.24 m
1	BIS FLOAT		.90 m
3	DC	197	28.36 m
1	X10		.77 m
1	SIS		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X10		.56 m
	BHA		198.91 m
			m
			m
38	D.P.	STANDS	m
XX	D.P.	SINGLES	1098.11 m
	KELLY DOWN		12.97 m
	TOTAL		1309.99 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		49,000	1000 daN

BIT RECORD

BIT NO.	6							
SIZE (mm)	222							
IADC CODE	6 3 7							
MFG.	H-W							
TYPE	ATJ 55 RG							
SERIAL NO.	U28XR							
JETS (mm)	11.9 11.9 11.9							
DEPTH OUT (m)								
DEPTH IN (m)	1272							
TOTAL METRES DRILLED (m)	37							
TOTAL HOURS RUN	16							

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE DRAG 1,000
TORQUE AT BOTTOM
FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE ☒ WATER BASED ☐ OIL BASED

TIME	01:00	04:00	06:00
DENSITY kg/m³	1090	1110	1105
FUNNEL VIS. - (S/L)	48	51	50
W.L. (cm³)	8.2	7.4	7.5
pH	9.0	9.0	9.0

MUD ADDITIVES

PRODUCT	AMOUNT X UNIT
DRISPAC	1 sx
LIGNITE	2 sx
BARITE	127 sx

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

P.V.T. @ 04:00 645 m³
P.V.T. @ 06:00 668 m³

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
1	BIT		.24 m
1	BIS FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	SS		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
38	D.P.	STANDS	m
XX	D.P.	SINGLES	1098.11 m
	KELLY DOWN		12.97 m
	TOTAL		1309.99 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		50,000	1000 daN

BIT RECORD

BIT NO.	6							
SIZE (mm)	222							
IADC CODE	6 3 7							
MFG.	H-W							
TYPE	ATJ 55RG							
SERIAL NO.	U28XR							
JETS (mm)	11.9 11.9 11.9							
DEPTH OUT (m)								
DEPTH IN (m)	1272							
TOTAL METRES DRILLED (m)	37							
TOTAL HOURS RUN	16							

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION
HOLE DRAG 1000
TORQUE AT BOTTOM
FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE ☒ WATER BASED ☐ OIL BASED

TIME	08:00	12:30	15:30
DENSITY kg/m³	1115	1135	1150
FUNNEL VIS. - (S/L)	53	51	52
W.L. (cm³)	8.5	8.5	
pH	9.0	9.0	9.0
PVT	66.8 m³	66.1 m³	65.1 m³

MUD ADDITIVES

PRODUCT	AMOUNT X UNIT
BARITE	138
DRISPAC	1
LIG	2
SAWDUST	20

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

DRILLING ASSEMBLY (At End of Tour)

			LENGTH
	BIT		.24 m
2	CORE BBS		19.66 m
1	DP		.22 m
1	BIS		.91 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X10		.56 m
	BHA		186.73 m
			m
			m
			m
39	D.P.	STANDS	m
X	D.P.	SINGLES	1116.95 m
	KELLY DOWN		5.82 m
	TOTAL		1309.50 m
WT. OF DC		25,000	1000 daN
WT. OF STRING		48,000	1000 daN

BIT RECORD

BIT NO.	3C							
SIZE (mm)	159							
IADC CODE								
MFG.	BHI							
TYPE	C201							
SERIAL NO.	0321065							
JETS (mm)	T FA .40							
DEPTH OUT (m)								
DEPTH IN (m)	1309.5							
TOTAL METRES DRILLED (m)								
TOTAL HOURS RUN								

CUTTING STRUCTURE T_i	T_o	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION
HOLE DRAG 1000
TORQUE AT BOTTOM
FILL ON BOTTOM (m)

MUD RECORD

MUD TYPE ☒ WATER BASED ☐ OIL BASED

TIME			23:30
DENSITY kg/m³			1140
FUNNEL VIS. - (S/L)			47
W.L. (cm³)			7.5
pH			9.0

MUD ADDITIVES

PRODUCT	AMOUNT X UNIT

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

CENTRIFUGE

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

EVENING TOUR

OPR. DG R.M. | YEAR 96 | MONTH 12 | DAY 30

RIG NO. ONE

FUEL @ 8:00

RIG 194 | BOILER

WEATHER: TEMPERATURE °C | CURRENT CONDITIONS | WIND DIRECTION | ROAD

LAST CASING, TUBING OR LINER	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
	224	229	53.57	PRUD	J55	53	43568	4.74	434

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.86	E		129	F-H	165	PZ9	G-D	229
						1	D375	EMSCO	356

23	24	25	26

TOTALS: 9 / 8 / 8

SHALE SHAKER(S): NO. 1 TYPE FLOW LINE CLEANER | SCREENS CHANGED ☐ YES ☑ NO | TOP 175 | MIDDLE 175 | BOTTOM 175

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	DRLD BY BIT CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1300	1309	9	78	16

PRODUCTION: PUMP NO.1 LINER SIZE (mm) 165 S.P.M. 94 | PUMP NO.2 LINER SIZE (mm) 127 S.P.M.

9,300

REDUCED PUMP SPEED @ 49 @ 9,600

STANDPIPE

DEVIATION SURVEYS @ 9300

DEPTH (m)	DEVIATION (°)	DIRECTION

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.
00:00	00:15	1/4	7
00:15	00:45	1/2	2
00:45			5
		2 1/4	
	03:00		
03:00	06:15	3 1/4	2
06:15	08:00	1 3/4	5

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

R16 SERVICE ANNULAR & REMOTE CHOKE

DRILL 1300 m - COAL SEAM AT 1301 - DRILL - 1302

4-5% INCREASE IN FLOW RATE. CONDUCTED FLOW CHECK.

MONITORED A STEADY FLOW. A 20 KG/M3 DENSITY INCREASE MADE WELL STATIC. (CIRC + WEIGHT UP MUD)

DRILL 1302 m - 1309 m FLOW CHECK. (SMALL FLOW)

CIRC SAMPLE (WEIGHT UP MUD)

NOTES: CLOSE ANNULAR 10 SEC / OPEN 10 SEC. REMOTE CHOKE 23 SECS

DRILLER'S SIGNATURE

BOP TEST: HRS. RAN 8 | STACK TEMP 11 | MAXIMUM PREVIOUS CASING TEST 50,000 | LAST BOP TEST 11774 KPA

DAY TOUR

METRES DRILLED

FROM	TO	DRLD BY BIT CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1309				

PRODUCTION: PUMP NO.1 LINER SIZE (mm) 165 S.P.M. 94 | PUMP NO.2 LINER SIZE (mm) 127 S.P.M.

9300

REDUCED PUMP SPEED @ 49

STANDPIPE 2500

DEVIATION SURVEYS @ 9300

DEPTH (m)	DEVIATION (°)	DIRECTION

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.
0800	0915	1/4	7
0915	1015	2	5
1015	1130	1 1/4	6
1830			5
	16 00	8 1/2	5
		(	

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

Rig Service, CLOSE Top Pipe Ram 5secs, Flow check.

Sim. mix BARITE Flow check

Dummy TRIP 10 STAND. NO Fill.

Sim. mix BARITE - DENSITY to 1150 kg/m3

(FOR CORING). Flow ✓ pump pill.

JAN 02 1996

CACTUS DRILLING

NISKU

NOTES: CLOSE ANNULAR, 10SEC, CLOSE REMOTE CHOKE 22SEC

DRILLER'S SIGNATURE

BOP TEST: HRS. RAN 8 | STACK TEMP 11 | MAXIMUM PREVIOUS CASING TEST 50,000 | LAST BOP TEST 11561

EVENING TOUR

METRES DRILLED

FROM	TO	DRLD BY BIT CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1309.5			70	5

PRODUCTION: PUMP NO.1 LINER SIZE (mm) 165 S.P.M. 55 | PUMP NO.2 LINER SIZE (mm) 127 S.P.M.

6,600

REDUCED PUMP SPEED @ 49

STANDPIPE @ 3800 @ 49

MAN COLD DEVIATION SURVEY @ 9309

DEPTH (m)	DEVIATION (°)	DIRECTION
ANTICIPATED		675
ACTUAL		756
DIF		.81
PUT	66.5	
	61.3	

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.
1600	1615	1/4	7
16:15			
			6
	22:45	6 1/2	
22:45	23:00	1/4	22
23:00	23:30	1/2	5
23:30	24:00	1/2	4

DETAILS OF OPERATION IN SEQUENCE AND REMARKS

Rig Service CLOSE Hydrill, 10 sec, REMOTE Choke

POOH to PICK UP CORE BBL MAKE UP CORE BBLS

R.I.H BREAK CIRCULATION @ 754 m FLOW CHECK

R.I.H. (FUNTION BLIND RAMS) WHEN OUT OF HOLE

WASH TO BOTTOM 1294m - 1309 m

CIRC. BOTTOMS UP, FLOW ✓

DROP BALL + CUT CORE #3

RW

NOTES: CLOSE ANNULAR 10SEC REMOTE CHOKE 22 SEC. RRSP TAKEN WITH CORE BALL IN PLACE, OFF BOTTOM. BLIND RAMS 6/04 SEC

DRILLER'S SIGNATURE

BOP TEST: HRS. RAN 8 | STACK TEMP 11 | MAXIMUM PREVIOUS CASING TEST | LAST BOP TEST 11604

#23

000584

LICENCE NO.: 9211 - U18-1-1

WELL NAME AND NO.: UCEL LIARD K02

OPERATOR: UNOCAL EXPLORATION LTD

CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30

UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE: David Johnson

SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS

(1) Daily Walk Around Inspection
(2) Detailed Inspection-Weekly (using checklist)
(3) *PS Signs Posted (if required)
(4) Well License & Stick Diagram Posted
(5) Flare Lines Staked
(6) BOP Drills Performed
(7) Visually inspect BOP's - Flarelines & Degasser Lines

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/m
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME HRS — CODE NO. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

OPER.	RIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND. MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.	22
MORN.				4¼	½	3	¼															HANG / CO2: BE
DAY			2 3/4		½	2¾	¼															
EVE.		5¼	2¼			¼	¼															13/4
TOTAL																						

DRILLING ASSEMBLY (At End of Tour)

			.24 m
2	CORE BBLE		19.66 m
1	OIP		.32 m
1	BIS		.91 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X10		.56 m
	B.HA		186.73 m
			m
			m
			m
40	D.P.	STANDS	1135.21 m
	D.P.	SINGLES	m
	KELLYDOWN		5.56 m
	TOTAL		1327.50 m

WT. OF DC: 25,000 (1000 daN)
WT. OF STRING: 48,000 (1000 daN)

BIT RECORD

BIT NO.	3C
SIZE (mm)	159
IADC CODE	
MFG.	BHI
TYPE	C201
SERIAL NO.	0321065
JETS (mm)	15 A .40
DEPTH OUT (m)	
DEPTH IN (m)	1309.5
TOTAL METRES DRILLED (m)	18
TOTAL HOURS RUN	4¼

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE DRAG: 1000
TORQUE AT BOTTOM:
FILL ON BOTTOM (m):

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	02:00	04:00
DENSITY kg/m³	1145	1145
FUNNEL VIS. - (S/L)	50	48
W.L. (cm³)	7.3	7.5
pH	9.0	9.0

PRODUCT	AMOUNT X UNIT
CAUSTIC	2 SX
LIGNITE	1 SX
BARITE	20 SX

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

PVT @ 01:00 - 68.4 m³
PVT @ 07:00 65.1 m³

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

DRILLING ASSEMBLY (At End of Tour)

1	BIT		.24 m
1	B.T FLOAT		.92 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S.S.		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
39	D.P.	STANDS	1107.34 m
	D.P.	SINGLES	m
	KELLYDOWN		9.75 m
	TOTAL		1316.00 m

WT. OF DC: 31,200 (1000 daN)
WT. OF STRING: 50,000 (1000 daN)

BIT RECORD

BIT NO.	6RR	
SIZE (mm)	222	
IADC CODE	6 3 7	
MFG.	HW	
TYPE	ATJ 55RG	
SERIAL NO.	UZ8XR	
JETS (mm)	11.9 11.9 11.9	
DEPTH OUT (m)	Reamed	
DEPTH IN (m)	1309	
TOTAL METRES DRILLED (m)	7	
TOTAL HOURS RUN	2¾	

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE DRAG: 1000 daN
TORQUE AT BOTTOM:
FILL ON BOTTOM (m):

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	14:00	15:30
DENSITY kg/m³	1145	1145
FUNNEL VIS. - (S/L)	52	50
W.L. (cm³)	6.8	7.0
pH	9.5	9.5
PVT	66.6 m³	67.3 m³

PRODUCT	AMOUNT X UNIT
ANTICIPATED	6.18 m³
ACTUAL	6.94
Δ+	.76

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
7	6	1090	2580

CENT #1

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

DRILLING ASSEMBLY (At End of Tour)

1	BIT		.24 m
1	B.T FLOAT		.90 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S.S.		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
39	D.P.	STANDS	m
4	D.P.	SINGLES	1126.22 m
	KELLYDOWN		8.87 m
	TOTAL		1334.00 m

WT. OF DC: 31,000 (1000 daN)
WT. OF STRING: 50.000 (1000 daN)

BIT RECORD

BIT NO.	6RR	6RR
SIZE (mm)	222	222
IADC CODE	6 3 7	6 3 7
MFG.	HW	HW
TYPE	ATJ 55RG	ATJ-55RG
SERIAL NO.	UZ8YR	UZ8XR
JETS (mm)	11.9 11.9 11.9	11.9 11.9 11.9
DEPTH OUT (m)	READED 18m	
DEPTH IN (m)	1309	1327
TOTAL METRES DRILLED (m)	18	7
TOTAL HOURS RUN	5	5¼

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE DRAG: 1,000
TORQUE AT BOTTOM:
FILL ON BOTTOM (m):

MUD RECORD

MUD TYPE: ☐ WATER BASED ☑ OIL BASED

TIME	16:00	20:30	23:00
DENSITY kg/m³	1145	1140	1140
FUNNEL VIS. - (S/L)	50	43	47
W.L. (cm³)	7.0	6.8	6.8
pH	9.5	9.5	9.0
PVT	67.3 m³		

PRODUCT	AMOUNT X UNIT
GEL	20 SX
BARITE	20 SX

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

SUCKED OUT 68 m³
PVT @ 20:00 - 62.6 m³

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

EVENING TOUR

R.M. Initial

YEAR 96 | MONTH 12 | DAY 31

RIG NO. ONE

FUEL @ 8:00

TIG 124 | BOILER

WEATHER: TEMPERATURE °C | CURRENT CONDITIONS | WIND DIRECTION | ROAD

LAST CASING, TUBING OR LINER	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
	224	209	53.57	PRUD	J55	33	435.68	4.74	434

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.86	E		129	F-H	165	PZ9	G-D	229
							D375	EMSCO	356

24	25	26

TOTALS: 8 | 8 | 8

SHALE SHAKER(S): NO. 1 TYPE FLOW LINE CLEANER; SCREENS CHANGED ☐ YES ☐ NO; TOP; MIDDLE; BOTTOM

RENTALS/SERVICES | MORN | RDVR | EVE

METRES DRILLED

FROM	TO	DRD RM-R CORE'D	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1309.5	1327.5	18	70	5

CIRCULATION	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
7,000	165	55	127	

STANDPIPE 49 300

DEPTH (m)	DEVIATION (°)	DIRECTION

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
00:00	00:15	¼	7	RIG SERVICE ✓ ANNULAR + REMOTE CHOKE
00:15	04:30	4¼	4	CUT CORE # 3 1309.50 - 1327.50
04:30	05:00	½	5	CIRCULATE, FLOW CHECK, FLOW CHECK, OK
05:00	08:00	3	6	PUMP PILL HOIST CORE # 3 (FLOW CHECK AS PER REGULATIONS)

NOTES: ANNULAR 10 SEC, CLOSE REMOTE CHOKE 22 SECS

8 | 11 | 49,000 | 11604

METRES DRILLED

FROM	TO	DRD RM-R CORE'D	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1309	1316	7	66	5/6

CIRCULATION	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
9500	165	94	127	

DEPTH (m)	DEVIATION (°)	DIRECTION

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
0300	0315	¼	7	Rig Service, Close Hydrill 18sec Flow check OK
0315	0345	½	6	POOH, Fill Hole, Flow ✓ O.K. ✓ Blind Rams
0345	1030	13¾	22	Recover core Box core, Lay Down core Bbls
1030	1215	1¾	6	Run in Hole
1215	1245	½	5	Circ
1245	1315	½	6	Ream Hole
1315	1600	2¾	5	Reamed Rate Hole 1309 - 1316

NOTES: ANNULAR 10sec close, Remote Choke 23sec

8 | 11 | 51,000 | 11519

METRES DRILLED

FROM	TO	DRD RM-R CORE'D	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1309	1327	18	66	5/6
1327	1334	7	78	16

CIRCULATION	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.
9,100	165	94	127	

STANDPIPE 2100 49

DEPTH (m)	DEVIATION (°)	DIRECTION

TIME LOG

FROM	TO	ELAP. TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1600	1645	¾	3	REAMED RATE HOLE 1316 - 1319
1645	1700	¼	7	Rig Service Close Annular 9sec Function Hoist
1700	1830	1½	3	REAMED RATE HOLE - 1319 - 1327
1830	23:45	5¼	2	Drill 1327 - 1334 m FLOW CHECK, OK
23:45	2400	¼	6	PUMP PILL + HOISTER # 6, (FLOW CHECK AS PER REGULATIONS)

NOTES: ANNULAR 10 SEC, CLOSE REMOTE CHOKE 23 SEC

DRILLER'S SIGNATURE

8 | 11 | 51,000 | 11519

RECEIVED JAN 02 1996 CACTUS DRILLING N.S.U.

W10 24 1816 000585

LICENCE NO.: 9211-U18-1-1 | WELL NAME AND NO.: UCEL LIARD K02

OPERATOR: UNOCAL EXPLORATION LTD. | CONTRACTOR: CACTUS DRILLING

SURFACE LOCATION: 60-20-123-30 | UNIQUE ID.:

SIGNATURE OF OPERATOR'S REPRESENTATIVE: | SIGNATURE OF CONTRACTOR'S RIG MANAGER:

DAILY CHECKS
(1) Daily Walk Around Inspection
(2) Detailed Inspection-Weekly (using checklist)
(3) H²S Signs Posted (if required)
(4) Well License & Stick Diagram Posted
(5) Flare Lines Staked
(6) BOP Drills Performed
(7) Visually inspect BOPs - Flarelines & Degasser Lines

(1) Rig Site Health and Safety Meeting (one/crew/month)
(2) C.A.O.D.C. Rig Safety Inspection Checklist (one/rig/mo
(3) Mast Inspection Before Raising or Lowering
(4) Crown Saver Checked
(5) Motor Kills checked

TIME - HRS

CODE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
OPER.	HIG UP & TEAR DOWN	DRILL ACTUAL	REAMING	CORING	COND MUD & CIRC	TRIPS	RIG SERVICE	REPAIR RIG	CUT OFF DRILL LINE	DEV SURVEY	WIRE LINE LOGS	RUN CASE & CEMENT	WAIT ON CEMENT	NIPPLE UP B.O.P.	TEST B.O.P.	DRILL STEM TEST	PLUG BACK	SQUEEZE CEMENT	FISHING	DIR. WORK	SAFETY MTG.	WTB
MORN.		2				5½	¼															
DAY		7½					¼			¼												¼
EVE.		9¾			1	4	¼															
TOTAL																						

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
	BIT		.24 m
1	BIS FLOAT		.80 m
3	DC	197	98.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
40	D.P.	STANDS	1135.21 m
	D.P.	SINGLES	m
	KELLYDOWN		5.88 m
	TOTAL		1340.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		50,000	1000 daN

BIT RECORD

BIT NO.	7	6RR
SIZE (mm)	222	222
IADC CODE	637	637
MFG.	SEC	H-W
TYPE	GM90F	ATJ 55R6
SERIAL NO.	548055	UZBYR
JETS (mm)	119 119 119	119 119 119
DEPTH OUT (m)		1334
DEPTH IN (m)	1334	1272
TOTAL METRES DRILLED (m)	6	44
TOTAL HOURS RUN	2	2¼

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.
6	6	FCW	A	E	1	BT	PR	2.07

HOLE CONDITION

HOLE DRAG	1,000 DAN
TORQUE AT BOTTOM	NONE
FILL ON BOTTOM (m)	NO FILL

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	06:00	07:00
DENSITY kg/m³	1140	1145
FUNNEL VIS. - (S/L)	50	52
W.L. (cm³)	7.0	7.0
pH	9.0	9.0

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
PVT 24:00	62.2 m3
PVT 07:30	58.8 m3

SOLIDS CONTROL

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
2			

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
1	BIT		.24 m
1	BIS FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
40	D.P.	STANDS	m
1	D.P.	SINGLES	1144.34 m
	KELLYDOWN		1356.00 m
	TOTAL		1356.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		51,000	1000 daN

BIT RECORD

BIT NO.	7	
SIZE (mm)	222	
IADC CODE	637	
MFG.	SEC	
TYPE	GM90F	
SERIAL NO.	548055	
JETS (mm)	119 119 119	
DEPTH OUT (m)	OB	
DEPTH IN (m)	1334	
TOTAL METRES DRILLED (m)	22	
TOTAL HOURS RUN	9½	

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.

HOLE CONDITION

HOLE DRAG	1000
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	08:00	12:00	15:30
DENSITY kg/m³	1150	1155	1150
FUNNEL VIS. - (S/L)	53	50	47
W.L. (cm³)	7.0	7.2	7.2
pH	9.0	9.0	9.0
PVT	60.5 m3	63.4 m3	66.5 m3

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
GEL	18
BARITE	15

SOLIDS CONTROL

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
1½	3	1090	2436

CENT #2

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

DRILLING ASSEMBLY (At End of Tour)

NO.			LENGTH
1	BIT		.24 m
1	BIS FLOAT		.80 m
3	DC	197	28.36 m
1	X/O		.77 m
1	S/S		3.04 m
1	NMDC	165	9.14 m
17	DC	165	156.00 m
1	X/O		.56 m
	BHA		198.91 m
			m
			m
40	D.P.	STANDS	m
XX	D.P.	SINGLES	1153.59 m
	KELLYDOWN		550 m
	TOTAL		1358.00 m
WT. OF DC		31,000	1000 daN
WT. OF STRING		51,000	1000 daN

BIT RECORD

BIT NO.	7	8
SIZE (mm)	222	222
IADC CODE	637	637
MFG.	SEC	RBI
TYPE	GM90F	C57LRG
SERIAL NO.	548056	BL180
JETS (mm)	119 119 119	19 11 9 12
DEPTH OUT (m)	1358	
DEPTH IN (m)	1334	1358
TOTAL METRES DRILLED (m)	24	
TOTAL HOURS RUN	12¼	

CUTTING STRUCTURE T1	To	MDC	LOC	B	Gage	ODC	Reason Pulled	Total Run m/hr.
8	8	LT	H	E	2	CT	PR	1.9

HOLE CONDITION

HOLE DRAG	
TORQUE AT BOTTOM	
FILL ON BOTTOM (m)	

MUD RECORD

MUD TYPE: ☑ WATER BASED ☐ OIL BASED

TIME	16:00		
DENSITY kg/m³	1145		
FUNNEL VIS. - (S/L)	47		
W.L. (cm³)	7.2		
pH	9.0		
PVT	66.9 m3		

MUD MATERIALS ADDED

PRODUCT	AMOUNT X UNIT
TRIP VOL.	m3
ACT	7.83 m3
ANT	7.02 m3
+	.81

SOLIDS CONTROL

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

CENT #1

HOURS RUN	INTAKE DENSITY (kg/m³)	OVERFLOW DENSITY (kg/m³)	UNDERFLOW DENSITY (kg/m³)
0			

OPR. R.M.
Initial AG Initial
Initial Initial
Initial Initial
Initial Initial
Initial Initial
Initial Initial
Initial Initial
Initial Initial
Initial Initial
Initial Initial
Initial Initial

DAY 97 MONTH 01 DAY 01
RIG NO. ONE
FUEL @ 8:00
RIG 174 BOILER

WEATHER
TEMPERATURE °C
CURRENT CONDITIONS
WIND DIRECTION
ROAD

LAST CASING TUBING OR LINER	O.D. (mm)	MIN. I.D. (mm)	kg/m	MAKE	GRADE	NO. OF JOINTS	TOTAL(m) LENGTH	KB. TO CSG HEAD (m)	SET AT (m)
	224	229	53.57	RRUD	55S	33	435.68	4.74	434

DC/DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. ID (mm)	TOOL JT O.D. (mm)	TYPE THREAD	NO. OF JOINTS	PUMP TYPE	PUMP MANUFACTURER	STROKE LTH. (mm)
102	20.86	E		127	F-H	165	P2-9	G-D	229
							D 375	EMSCO	356

23	24	25	26

TOTALS
8
8
8

SHALE SHAKER(S)
NO. 1 TYPE FLOW LINE CLEANER
SCREENS CHANGED ☐ YES ☑ NO
TOP 175 TOP
MIDDLE 175 MIDDLE
BOTTOM 175 BOTTOM

RENTALS/SERVICES

MORNING TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1334	1340	6	78	16

CIRCULATION

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9,800	165	94	127	

REDUCED PUMP SPEED

STAND PIPE @ 800 @ 48

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

TRIP VOL
ACT 7.14 m3
ANT 6.29 m3
+ .85 m3

DRILLER'S SIGNATURE
Brad Cal

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
00:00			6	HOIST RR #6 FLOW AS PER REGULATIONS
				CHANGE BIT + RIH (BREAK CIRC. 766m - R.I.H FLOW CHECK)
	05:30	5½		
05:30	05:45	¼	22	WASH TO BOTTOM, FROM 1319 m - 1334 m NO FILL
05:45	06:00	¼	7	RIG SERVICE ANNULAR + REMOTE CHOKE
06:00	08:00	2	2	DRILL 1334 m - 1340 m

NOTES FUNTION BLIND RAMS 9/04 SECS ANNULAR 10 SEC CLOSE
REMOTE CHOKE 23 SEC, S

BOILER HRS RAN 8 STACK TEMP 11 MAXIMUM EXPERIENCED HOOKLOAD 51,000 SAFE TOPIC RUNNING LOADER 11519

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1340	1356	16	78	16

CIRCULATION

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9300	165	94	127	

REDUCED PUMP SPEED

STAND PIPE @ 2700 @ 49

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION
1306	5½	NE SI

DRILLER'S SIGNATURE
Dabl Mileuf.

TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
0800	1045	2¾	1	Drill - 1340 - 1347
1045	1100	¼	7	Rig Service, close Hydril 10sec, REMOTE CHOKE
1100	1115	¼	10	Survey 1306
1115	1600	4¾	2	Drill - 1347 - 1356

NOTES FUN CLOSE ANNULAR, 10 SEC, CLOSE REMOTE CHOKE 23 SEC

BOILER HRS RAN 8 STACK TEMP 11 MAXIMUM EXPERIENCED HOOKLOAD 52000 SAFE TOPIC 11519

RECEIVED
JAN 02 1995
CACTUS DRILLING
NISKU

EVENING TOUR

METRES DRILLED

FROM	TO	DR-D RM-R CORE-C	ROTARY R.P.M.	WT. ON BIT (1000 daN)
1356	1358	2	78	16000

CIRCULATION

	LINER SIZE (mm)	S.P.M.	LINER SIZE (mm)	S.P.M.
9,400	165	94	127	

REDUCED PUMP SPEED

STAND PIPE @ 2700 @ 49

DEVIATION SURVEY

DEPTH (m)	DEVIATION (°)	DIRECTION

DRILLER'S SIGNATURE

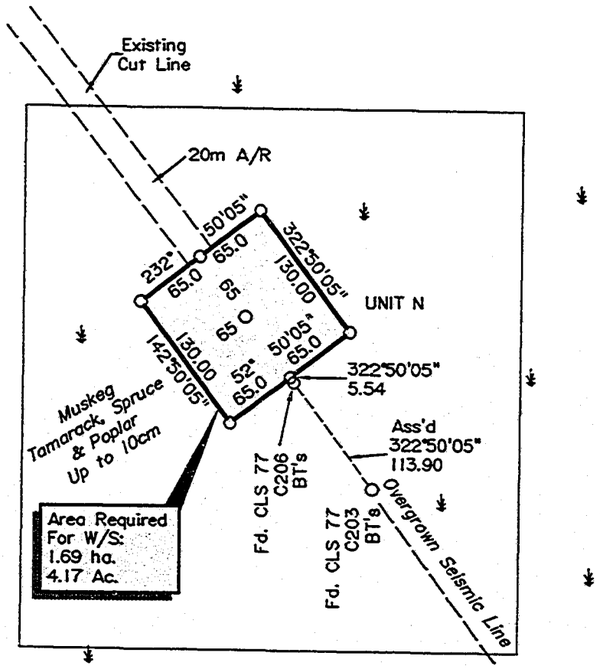
TIME LOG

FROM	TO	ELAPSED TIME	CODE NO.	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1600	1845	2¾	2	Drill 1356 - 1358
1845	1945	1	5	Circ mix Cel, mix up Pill
1945	20 CO	¼	7	Rig Service, CLOSE Hydrill, 10SEC, CLOSE REMOTE CHOKE
20 CO	24:00	4	6	Hoist Bit # 7 CHANG BIT + RIH (Flow check) (FUNCTION BLIND RAMS OUT OF HOLE) (AS PER REGULATIONS)

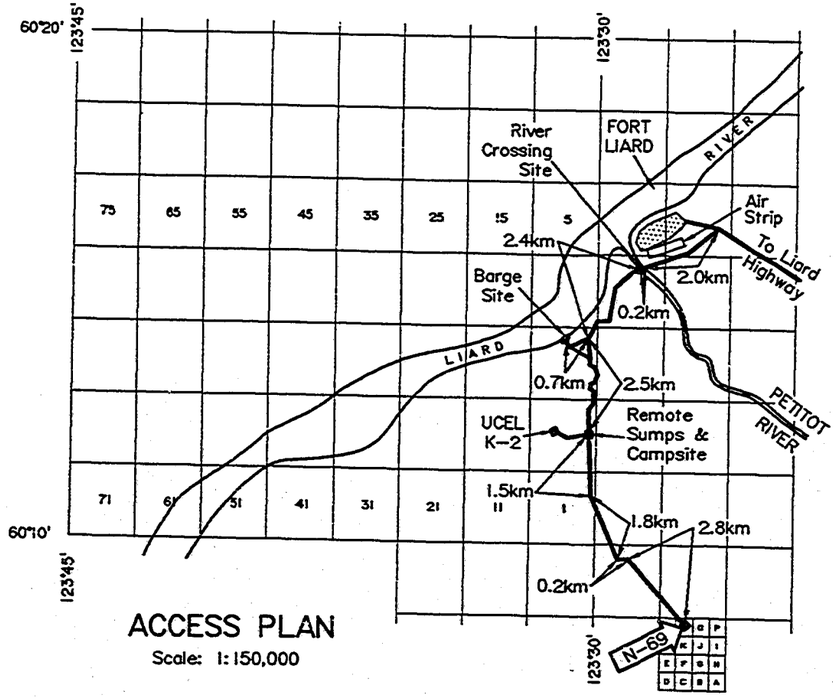
NOTES FUNTION BLIND RAMS CLO 4 SECS REMOTE CHOKE
23 SECS CLOSE ANNULAR 10 SECS

BOILER HRS RAN 8 STACK TEMP 11 MAXIMUM EXPERIENCED HOOKLOAD SAFE TOPIC 11519

SURVEY PLAN



Detail
SCALE: 1:5000



ACCESS PLAN
Scale: 1:150,000

OPERATOR:
UNOCAL 76
Unocal Canada Exploration Limited

Eric C. Howell

I CURTIS E. HENRIE, CERTIFY THAT THE SURVEY REPRESENTED BY THIS PLAN IS CORRECT AND TRUE TO THE BEST OF MY KNOWLEDGE AND WAS COMPLETED ON THE 14th DAY OF JUNE , 1996.

ALBERTA LAND SURVEYORS' ASSOCIATION
PERMIT NUMBER
P042
J. Stuart Engineering & Surveying Ltd.

(CANADA LANDS) SURVEYOR

AFE # X96E-002

Elevations:
W/C: 380.9
Corners:
N.W.: 381.1 N.E.: 379.3
S.W.: 382.8 S.E.: 380.8

Datum: Survey Control 829117
Elev. = 216.29m

Geographic Surface Co-ords:
Latitude: 60°08'54.234"
Longitude: 123°27'26.835"
NT Ver. 2.0

UCEL LIARD N-69
IN UNIT N, SECTION 69
GRID AREA 60°10' , 123°15'

SESL

Surveyor: BL Calculator: FS
Draftsperson: RW
Job No.: 96F117C

No.	Revision	Date

STUART ENGINEERING & SURVEYING LTD. 200, 517 - 10TH AVENUE S.W. CALGARY, ALBERTA, CANADA T2R 0A8 (403) 234-9018 FAX. (403) 266-2919