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# Geological Report

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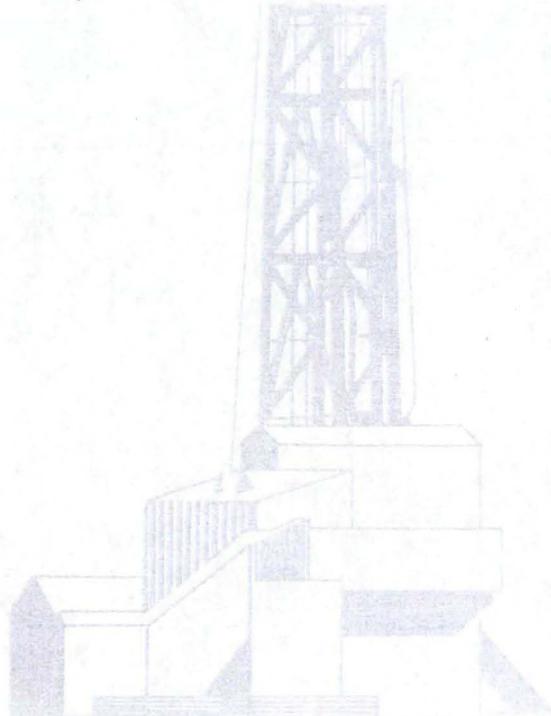
*PARAMOUNT et al*

*LIARD F-36*

60° 05.46' 123° 22.06'

File No: 98N-2114

P211-P33-11-1



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**1958 - 1998**  
*"Logging the Past 40 Years"*

**PARAMOUNT *et al***

**LIARD F-36**

**60° 05.46' 123° 22.06'**

**File No: 98N-2114**

*9211-P33-11-1*

Prepared by:

**BARRY CLATTENBURG**

Staff Wellsite Geologist  
CL Consultants Limited

NATIONAL ENERGY BOARD  
ENGINEERING BRANCH  
APR - 3 1998

Prepared for:

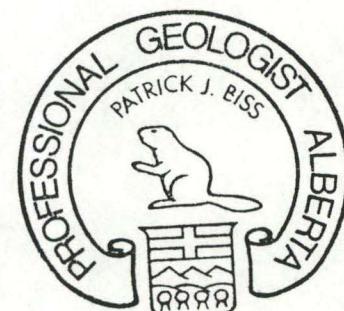
Paul Collens  
PARAMOUNT RESOURCES LIMITED

PERMIT TO PRACTICE  
CL CONSULTANTS LIMITED

Signature: *[Signature]*  
Date: April 1, 1998

PERMIT NUMBER: P 2911

The Association of Professional Engineers,  
Geologists and Geophysicists of Alberta



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### SYNOPSIS

**OPERATOR:** Paramount Resources Ltd.  
**WELL NAME:** Paramount et al Liard F-36  
**LOCATION:** 60° 05.46' 123° 22.06'  
**FIELD:** Undefined  
**PROVINCE:** Northwest Territories  
**ELEVATIONS:** G.L. 464.8m K.B. 469.4m  
**SPUD DATE:** March 3, 1998 00:15 hrs.  
**T.D. DATE:** March 24, 1998 11:15 hrs.  
**CONTRACTOR:** Akita Drilling Ltd Rig: 15  
**HOLE SIZE:** Surface: 311mm Main: 222mm  
**MUD COMPANY:** Concord Drilling Fluids Ltd.  
**MUD TYPE:** Gel Chem  
**WIRELINE LOGGING CO.:** Schlumberger  
**LOG RECORD:**

1) DP SH SONIC/GR/CAL U DP MODE 1477.5m - 502m P&S MODE 1486.2m - 0m  
2) PE/A IND-RXO SP CAL/ML GR/CNL/DENS 1484.5m - 502m  
3) HR CNL DENS A IND 875m - 950m; 1100m - 1175m; 1400m - T.D.

**TESTING COMPANY:** Baker Tools/Delta P Test Corp.  
**TEST RECORD:** DST #1 1145m - 1155m (Triassic)  
DST #2 1115m - 1125m (Chinkeh)  
DST #3 1455m - 1494m (Mattson)  
**DRILLING SUPERVISION:** Mike Beaudin/Dave Campbell  
**GEOLOGICAL SUPERVISION:** Barry C. Clattenburg  
**TOTAL DEPTH:** DRILLER: 1494.0 metres LOGGER: 1486.5 metres

FORMATION TOPS (m)

FORMATION	PROGNOSIS		SAMPLES		LOGS	
	(subsea)	(KB)			(KB)	(subsea)
<b>LOWER CRETACEOUS</b>						
Lepine					390.5	+ 78.9
Scatter	- 357.2	826.6	784		789.5	- 320.1
Garbutt	- 600.2	1069.6	981		969.5	- 500.1
Chinkeh	- 690.2	1159.6	1107		1110.0	- 640.6
TRIASSIC	- 700.2	1169.6	1125		1125	- 655.6
<b>PERMIAN</b>						
Fantasque	- 760.2	1229.6	1225		1224.5	- 755.1
<b>MISSISSIPPIAN</b>						
Mattson	- 948.2	1417.6	1397		1398.5	- 929.1
T.D.	-1591.2	2060.6	1494		1486.5	-1017.1

DEVIATION SURVEY RECORD

<u>Depth (m)</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
31	1/8		
60	1/2		
90	7/8		
122	7/8		
155	3/4		
196	1/4		
225	3/4		
256	3/4		
285	1		
312	1/2		
340	1/4		
370	1/2		
398	1/2		
426	1		
456	1		
495	1		
534	1/2		
591	7/8		
650	7/8		
706	1		
764	7/8		
818	3/4		
871	1/4		
933	1/8		
986	1/4		
1050	1/4		
1113	1		
1156	1/4		
1213	1 1/8		
1262	1		
1318	2 3/4		
1354	3		
1383	3		
1440	3/4		
1484	1 1/2		

BIT RECORD

#	Type	Size	In	Out	Total	Hrs	FOB	RPM	Cond.
									T B G
1A	S44GF	311	0	236	236	22.75	6	190	6 1 01
2A	HW X1G	311	236	369	133	18.5	6-8	190	4 1 01
3A	SM H88S	311	369	502	133	22.5	8	190	1 4 01
1	SM F15HP	222	502	792	290	41.25	6-8	120	4 3 IN
2	S. ERA22	222	792	1145	353	54.0	10-12	120	5 2 01
3	S.GERA33	222	1145	1173	28	4.75	12	120	NO WEAR
3RR	S.GERA33	222	1173	1292	147	37.5	12	120-130	7 4 02
4	ATJM44G	222	1292	1348	56	17.5	10	130	8 3 02
5	R.EPH53A	222	1348	1368	20	6.25	8-10	100-140	5 1 01
6	S.GM84F	222	1368	1454	86	33.5	12-14	120	6 8 02
7	S.GM89TG	222	1454	1494	40	15.75	14-16	90-120	4 2 IN

BIT CONDITION	SCALE
Tooth Wear (T)	0 - 8
Bearing Wear (B)	0 - 8
Gauge (G)	In or mm under

DAILY DRILLING CHRONOLOGY

Date	Depth 24:00	Progress (24 hrs)	Drilling (hrs)	Rig activity 00:00 - 24:00
Mar. 3/98				00:15-02:00: Drill 311mm hole. 02:00-02:15: Survey. 02:15-05:00: Drill 311mm hole. 05:00-05:15: Survey. 05:15-07:00: Drill 311mm hole. 07:00-07:15: Survey. 07:15-08:00: Drill 311mm hole. 08:00-08:15: Rig service. 08:15-17:00: Rig repair. 17:00-17:15: Rig service. 17:15-21:15: Drill 311mm hole. 21:15-21:30: Survey. 21:30-24:00: Drill 311mm hole.
Mar. 4/98				00:00-00:45: Drill 311mm hole. 00:45-01:00: Rig service. 01:00-01:45: Drill 311mm hole. 01:45-02:00: Survey. 02:00-06:45: Drill 311mm hole. 06:45-07:00: Survey. 07:00-10:00: Drill 311 mm hole. 10:00-10:15: Survey. 10:15-10:30: Rig service. 10:30-12:30: P.O.H. with bit #1A. 12:30-15:15: R.I.H. with bit #2A. 15:15-18:15: Drill 311mm hole. 18:15-18:30: Rig service. 18:30-18:45: Survey. 18:45-22:15: Drill 311mm hole. 22:15-22:30: Survey. 22:30-24:00: Drill 311mm hole.
Mar. 5/98				00:00-01:00: Drill 311mm hole. 01:00-01:15: Rig service. 01:15-02:30: Drill 311mm hole. 02:30-02:45: Survey. 02:45-06:30: Drill 311mm hole. 06:30-06:45: Survey. 06:45-11:15: Drill 311mm hole. 11:15-11:30: Circulate sample. 11:30-11:45: Rig service. 11:45-16:00: Trip for bit 2A. 16:00-18:15: Ream bridges from 369-373m.

DAILY DRILLING CHRONOLOGY (cont.)

Date	Depth 24:00	Progress (24 hrs)	Drilling (hrs)	Rig activity 00:00 - 24:00
				18:15-18:45: Drill 311mm hole. 18:45-19:00: Rig service. 19:00-19:45: Drill 311mm hole. 19:45-20:00: Survey. 20:00-23:45: Drill 311mm hole. 23:45-24:00: Survey.
Mar. 6/98				00:00-01:15: Drill 311mm hole. 01:15-01:30: Rig service. 01:30-05:45: Drill 311mm hole. 05:45-06:00: Survey. 06:00-07:00: Rig repair. 07:00-11:15: Drill 311mm hole. 11:15-11:30: Rig service. 11:30-11:45: Survey. 11:45-13:00: Rig repair. 13:00-18:15: Drill 311mm hole. 18:15-18:30: Rig service. 18:30-18:45: Survey. 18:45-20:15: Drill 311mm hole. 20:15-20:45: Circulate and condition hole. 20:45-23:45: Strap out with bit #3A. 23:45-24:00: Lay down 2 x 192mm D.C.s.
Mar. 7/98				00:00-00:45: Lay down 2 x 192mm D.C.s. 00:45-01:00: Safety meeting and rig to run 244.5mm surface casing. 01:00-01:15: Rig service. 01:15-09:00: Run surface casing. 09:00-09:30: Circulate casing. 09:30-11:00: Cement with Sanjel. 11:00-15:00: Wait on cement. 15:00-18:00: Cut conductor and surface casing. Rig out diverter equipment. 18:00-22:00: Wait on B.O.P. equipment. 22:00-24:00: Cut surface casing to height. Preheat and weld casing head.

DAILY DRILLING CHRONOLOGY (cont.)

Date	Depth 24:00	Progress (24 hrs)	Drilling (hrs)	Rig activity 00:00 - 24:00
Mar. 8/98				00:00-01:45: Cut surface casing to height. Preheat and weld casing head. 01:45-17:00: Nipple up Class IV B.O.P. stack as per NEB requirements. 17:00-18:30: Pressure test blind rams, HCR and manifold. 1400kPa low and 7000kPa high. 10 min. each. O.K. 18:30-18:45: Rig service. 18:45-20:00: Lay down 4 x 171mm DCs. 20:00-22:30: R.I.H. with bit #1. 22:30-24:00: Thaw kelly.
Mar. 9/98				00:00-03:00: Pressure test pipe rams, kelly cock, annular, stabbing valve, inside B.O.P. and all related subs and stock valves. 1400kPa low and 7000kPa high. 10 min. each. O.K. 03:00-04:45: Drill out float, cement, and shoe. 04:45-05:00: B.O.P. drill. 05:00-06:30: Drill 222mm hole from 502m to 512m. 06:30-08:00: Conduct formation leak off test. Leak off gradient confirmed a minimum of 23.05kPa/m. 08:00-09:30: Drill from 512m to 527m. 09:30-11:15: Pump out 3 singles D.P. 11:15-12:45: P.O.O.H. to change B.H.A. 12:45-13:00: Rig service. 13:00-13:15: B.O.P. drill. 13:15-14:30: Make up stabilized B.H.A. 14:30-16:00: R.I.H. with bit #1. 16:00-17:00: Ream B.H.A. to bottom. 17:00-19:30: Drill from 527m to 545m. 19:30-19:45: Survey. 19:45-20:00: Rig service. 20:00-24:00: Drill 222mm hole.

DAILY DRILLING CHRONOLOGY (cont.)

Date	Depth 24:00	Progress (24 hrs)	Drilling (hrs)	Rig activity 00:00 - 24:00
Mar. 10/98				00:00-05:00: Drill 222mm hole to 602m. 05:00-05:15: Survey. 05:15-05:30: Rig service. 05:30-08:30: Drill from 602m to 621m. 08:30-08:45: Rig service. 08:45-14:00: Drill from 621m to 659m. 14:00-14:15: Survey. 14:15-20:45: Drill from 659m to 698m. 20:45-21:00: Rig service. 21:00-22:00: Drill from 698m to 707m. 22:00-24:00: Work tight hole.
Mar. 11/98				00:00-01:00: Drill from 707m to 717m. 01:00-01:15: Survey. 01:15-01:30: Rig service. 01:30-08:30: Drill from 717m to 774m. 08:30-08:45: Survey. 08:45-09:00: Rig service. 09:00-12:00: Drill from 774m to 792m. 12:00-13:00: Circulate and condition hole. 13:00-16:00: Blow kelly and strap out of hole with bit #1. 16:00-19:30: Change bit. Pick up 4 x 155mm D.C.s. R.I.H. with bit #2. 19:30-20:30: Wash to bottom from 750m to 792m. 20:30-24:00: Drill from 792m to 814m.
Mar. 12/98				00:00-02:30: Drill from 814m to 828m. 02:30-02:45: Survey. 02:45-03:00: Rig service. 03:00-05:00: Repair 2 broken valve keepers on PZ-8 mud pump. 05:00-08:00: Drill from 828m to 847m. 08:00-08:15: Rig service. 08:15-10:30: Drill from 847m to 866m. 10:30-10:45: B.O.P. drill. 10:45-14:00: Drill from 866m to 885m. 14:00-14:15: Survey. 14:15-17:30: Drill from 885m to 903m. 17:30-17:45: Rig service. 17:45-24:00: Drill from 903m to 939m.

DAILY DRILLING CHRONOLOGY (cont.)

Date	Depth 24:00	Progress (24 hrs)	Drilling (hrs)	Rig activity 00:00 - 24:00
Mar. 13/98				00:00-00:30: Drill from 932m to 942m. 00:30-00:45: Survey. 00:45-01:00: Rig service. 01:00-11:00: Drill from 942m to 999m. 11:00-11:15: Survey. 11:15-11:30: Rig service. 11:30-16:15: Drill from 999m to 1046m. 16:15-16:30: Rig service. 16:30-18:30: Drill from 1046m to 1065m. 18:30-18:45: Survey. 18:45-24:00: Drill from 1065m to 1113mm
Mar. 14/98				00:00-01:45: Drill from 1113m to 1122m. 01:45-02:00: Survey. 02:00-02:15: Rig service. 02:15-08:00: Drill from 1122m to 1145m. 08:00-08:15: Rig service. 08:15-08:45: Circulate bottom hole sample. 08:45-11:45: P.O.O.H. with bit #2. 11:45-12:45: R.I.H. with bit #3. 12:45-13:45: Slip and cut drilling line. 13:45-15:45: Finish R.I.H. with bit #3. 15:45-16:15: Break circulation and wash to bottom from 1130m to 1145m. 16:15-20:30: Drill from 1145m to 1170m. 20:30-21:00: Circulate bottom hole sample. 21:00-21:15: Survey. 21:15-21:30: Rig service. 21:30-22:00: Drill from 1170m to 1173.5m 22:00-22:45: Circulate bottom hole sample. 22:45-23:30: Wiper trip 5 stands of drill pipr. 23:30-24:00: Circulate and condition hole.
Mar. 15/98				00:00-00:45: Circulate and condition hole. 00:45-01:00: Rig service. 01:00-03:30: P.O.O.H. with bit #3. 03:30-04:30: Lay down B.H.A.

DAILY DRILLING CHRONOLOGY (cont.)

Date	Depth 24:00	Progress (24 hrs)	Drilling (hrs)	Rig activity 00:00 - 24:00
				04:30-08:00: Make up Baker inflate tool for DST#1. 08:00-11:00: Strap in hole with DST#1. 11:00-11:30: Head up test tool; safety meeting. 11:30-14:00: Inflate packer and conduct DST#1. 14:00-14:30: Deflate packer and lay down 3 singles D.P. 14:30-19:45: Inflate packer and conduct DST#2. 19:45-24:00: Deflate packer and P.O.O.H. with test tools.
Mar. 16/98				00:00-01:30: P.O.O.H. with test tools. 01:30-04:30: Lay down test tools. 04:30-04:45: Rig service. 04:45-08:30: Make up stabilized B.H.A.; R.I.H. with bit #3RR. 08:30-08:45: Rig service. 08:45-09:15: Wash to bottom from 1160m to 1173m. 09:15-19:00: Drill from 1173m to 1227m. 19:00-19:30: Rig service. 19:30-24:00: Drill from 1227m to 1245m.
Mar. 17/98				00:00-00:15: Rig service. 00:15-08:00: Drill from 1245m to 1271m. 08:00-08:15: Rig service. 08:15-09:30: Drill from 1271m to 1275m. 09:30-10:00: Survey. 10:00-14:45: Drill from 1275m to 1292m. 14:45-15:15: Circulate bottoms up. 15:15-19:00: Strap out with bit #3RR. 19:00-23:00: R.I.H. with NB#4. 23:00-24:00: Ream (wash) to bottom from 1254m to 1292m.
Mar. 18/98				00:00-00:45: Ream (wash) to bottom. 00:45-01:15: Drill from 1292m to 1293m. 01:15-01:30: Rig service. 01:30-10:15: Drill from 1293m to 1322m. 10:15-10:30: Rig service. 10:30-13:30: Drill from 1322m to 1332m.

DAILY DRILLING CHRONOLOGY (cont.)

Date	Depth 24:00	Progress (24 hrs)	Drilling (hrs)	Rig activity 00:00 - 24:00
				13:30-14:00: Survey. 14:00-17:00: Drill from 1332m to 1341m. 17:00-17:15: Rig service. 17:15-19:30: Drill from 1341m to 1348m. Kelly swivel packed up. Unable to continue drilling 19:30-20:30: Circulate bottoms up. 20:30-22:15: Pump out 9 singles of D.P. 22:15-22:30: B.O.P. drill. 22:30-24:00: Circulate and raise viscosity of mud.
Mar. 19/98				00:00-01:30: Circulate and condition. 01:30-05:00: Trip bit into surface casing. Broke 1 tong jaw. Unable to continue tripping 05:00-12:00: Wait on swivel and tong jaw Replace water pump on PZ-8 379 Cat engine. 12:00-15:15: Change out swivel and make up tong. 15:15-17:15: Finish P.O.O.H. with bit #4. 17:15-21:00: Change bit and B.H.A. R.I.H. with bit #5. 21:00-22:15: Ream 9 singles D.P. to bottom (1263m to 1348m). 22:15-24:00: Drill from 1348m to 1357m.
Mar. 20/98				00:00-04:30: Drill from 1357m to 1368m. 04:30-04:45: Rig service. 04:45-05:30: Circulate bottoms up. 05:30-06:00: Survey. 06:00-12:00: P.O.O.H. with bit #5. 12:00-13:45: Make up bit #6 and R.I.H. with B.H.A. and 1 single D.P. 13:45-14:00: Rig service. 14:00-14:45: Slip and cut drilling line. 14:45-17:15: Finish R.I.H. with bit #6 17:15-18:30: Wash 3 singles D.P. to bottom. 18:30-21:30: Drill from 1368m to 1374m.

DAILY DRILLING CHRONOLOGY (cont.)

Date	Depth 24:00	Progress (24 hrs)	Drilling (hrs)	Rig activity 00:00 - 24:00
Mar. 21/98				21:30-23:15: Top connection on swivel quill started leaking. Attempted to tighten unsuccessfully. 23:15-24:00: Pump out singles of D.P.
				00:00-02:00: Pump out 11 singles D.P. and hoist bit into surface casing. 02:00-02:15: Rig service. 02:15-08:00: Circulate at reduced rate and wait on replacement swivel 08:00-08:15: Rig service. 08:15-17:00: Wait on replacement swivel 17:00-18:15: Install swivel and kelly spinner. 18:15-20:15: R.I.H. with bit #6. 20:15-20:45: Wash 2 singles D.P. to bottom. 20:45-24:00: Drill from 1374m to 1381m
Mar. 22/98				00:00-00:15: Rig service. 00:15-04:30: Drill from 1381m to 1397m 04:30-05:00: Survey. 05:00-05:15: Work on shale shaker. 05:15-09:45: Drill from 1397m to 1406m 09:45-10:00: Rig service. 10:00-17:45: Drill from 1406m to 1425m 17:45-18:00: Rig service. 18:00-24:00: Drill from 1425m to 1441m
Mar. 23/98				00:00-01:15: Drill from 1441m to 1444m 01:15-01:30: Rig service. 01:30-05:00: Drill from 1444m to 1454m 05:00-05:30: Survey. 05:30-05:45: Circulate and condition. 05:45-06:30: Survey. 06:30-08:00: Circulate and condition (mix barite) prior to P.O.O.H. to change bit #6 08:00-08:15: Rig service. 08:15-09:00: Circulate and condition.

DAILY DRILLING CHRONOLOGY (cont.)

Date	Depth 24:00	Progress (24 hrs)	Drilling (hrs)	Rig activity 00:00 - 24:00
Mar. 24/98				09:00-15:00: P.O.O.H. with bit #6. Lay down stabilizers. 15:00-18:30: R.I.H. with bit #7. 18:30-19:00: Ream (clean) 4 singles D.P. to bottom. 19:00-24:00: Drill from 1454m to 1466m
Mar. 25/98				00:00-01:15: Drill from 1466m to 1469m 01:15-01:30: Rig service. 01:30-08:00: Drill from 1469m to 1488m 08:00-08:15: Rig service. 08:15-11:15: Drill from 1488m to 1494m 11:15-12:30: Circulate and condition. 12:30-13:15: Wiper trip 5 stands D.P. 13:15-14:45: Circulate and condition. 14:45-19:30: P.O.O.H. to run DST #3. 19:30-21:30: Make up Baker inflate bottom hole test tool. 21:30-24:00: R.I.H. with DST #3.
Mar. 26/98				00:00-00:30: R.I.H. with DST #3. 00:30-00:45: Safety meeting. 00:45-08:00: Head up test tool; inflate packer and conduct DST #3. 08:00-08:30: Deflate packer and pull loose. 08:30-13:15: P.O.O.H. with DST #3. 13:15-17:00: Recover recorders, service, and load out test tools. 17:00-17:15: Rig service. 17:15-24:00: Floor motor quit. Fuel pump not working. Wait on parts and mechanic.

**DAILY DRILLING CHRONOLOGY (cont.)**

Date	Depth 24:00	Progress (24 hrs)	Drilling (hrs)	Rig activity 00:00 - 24:00
Mar. 27/98				00:00-01:00: Circulate and condition. 01:00-01:30: Survey. 01:30-06:45: Lay down drill string. 06:45-07:00: Safety and procedure meeting. 07:00-08:00: Rig to and run 177.8mm casing.

## DRILLSTEM TEST

### DRILLSTEM TEST No. 1

Date: March 15, 1998  
Formation: Triassic  
Interval: 1145m to 1155m  
Test type: Closed Chamber Inflate Straddle  
Packers: Inflate 194mm  
Hole size: 222mm  
Drill pipe: OD: 101.6mm ID: 84.84mm  
Collars: OD: 158.0mm ID: 63.0mm  
Testing Company: Baker Tools/Delta P Test Corp.

#### PRESSURES: Times:

IH:	12581.9	kPa	
1st IPF:	237.7	kPa	PF: 10 min.
FPF:	184.5	kPa	
ISI:	203.9	kPa	ISI: 60 min.
2nd IF:	243.3	kPa	VO: 60 min.
FF:	245.4	kPa	
FSI:		kPa	FSI: 0 min.
FH:		kPa	BHT: 38.01C

#### Results:

Flow Comments - PF. Increase in pressure was 0.2kPa (86.5 TO 86.7kPa) instantly then no further increases. Not enough pressure to allow real time tool to provide data.

Recovery - 0.5m drilling mud.

Test Comments - Testers felt test was mechanically successful and tool had not plugged off. Test was terminated after 60 minutes VO produced only 2kPa pressure increase. Test indicated no permeability in test interval.

DRILLSTEM TEST

DRILLSTEM TEST No. 2

Date: March 15, 1998  
Formation: Chinkeh  
Interval: 1115m to 1125m  
Test type: Closed Chamber Inflate Straddle  
Packers: Inflate 194mm  
Hole size: 222mm  
Drill pipe: OD: 101.6mm ID: 84.84mm  
Collars: OD: 158.0mm ID: 63.0mm  
Testing Company: Baker Tools/Delta P Test Corp.

<u>PRESSURES:</u>		<u>Times:</u>
IH:	12255 kPa	
1st IPF:	272.3 kPa	PF: 10 min.
FPF:	282.8 kPa	
ISI:	807.7 kPa	ISI: 60 min.
2nd IF:	321.2 kPa	VO: 90 min.
FF:	338.0 kPa	
FSI:	706.7 kPa	FSI: 180 min.
FH:	12195.6 kPa	BHT: 37.13C

Results:

Flow Comments - PF. Slow increase in pressure (272 TO 283kPa).  
VO. Very slow increase in pressure from 321 to 338kPa over 90 minutes.

Recovery - 8.0m drilling mud. Salinity 2000ppm.

Test Comments - Low pressures and slow increases in pressures indicate a low permeability reservoir over the test interval. Test appears mechanically successful.

DRILLSTEM TEST

DRILLSTEM TEST No. 3

Date: March 24-25, 1998  
Formation: Mattson  
Interval: 1455m to 1494m  
Test Type: Bottom Hole Inflate  
Packers: Inflate 178 mm  
Hole size: 222mm  
Drill pipe: OD: 101.6mm ID: 84.84mm  
Collars: OD: 158.0mm ID: 63.0mm  
Testing Company: Baker Tools/Delta P Test Corp.

PRESSURES:

Times:

IH:	16237.0 kPa	
1st IPF:	5354.2 kPa	PF: 5 min.
1st FPF:	12735.1 kPa	
ISI:	16321.5 kPa	ISI: 60 min.
2nd IF:	6518.8 kPa	2nd VO: 60 min.
2nd FF:	2902.2 kPa	
2nd SI:	15537.8 kPa	2nd SI: 60 min.
3rd IF:	6159.4 kPa	3rd VO: 60 min.
3rd FF:	2592.1 kPa	
3rd SI:	14990.0 kPa	3rd SI: 90 min.
FH:	16181.7 kPa	BHT: 55.5C

Results:

Flow Comments - 6 metres of fill on bottom. Inflate packer. Tool skidded 2 metres. Stopped PF after 5 minutes because good flow and packer seat started to fail. GTS immediately. Strong 4 metre flare. Rates varied widely as intermittent plugging occurred. 2nd VO produced GTS immediately. Strong 5 metre flare. The ISI pressure was so close to hydrostatic that the validity could not be determined and it was decided to run a 3rd SI.

DRILLSTEM TEST (cont.)

DRILLSTEM TEST No. 3

During 2nd SI the chamber was left open to vent contents to flare. No significant liquids were expelled while flaring. Real time suggested possible depletion. The 3rd VO was ran in open mode throughout. Rates peaked at minute 20 and declined slowly and steadily. For 3rd SI chamber was left open to the pit. Real time again indicated possible depletion.

Recovery - 80 metres of fluid recovery. This consisted of 42 metres of drilling mud; 19 metres of slightly gassified mud; and 19 metres of gassified mud. Gas samples were collected on PF and at end of 2nd flow. 5 mud samples were collected from the fluid recovery. 2 bottom hole samplers were run.

Test Comments - The testers felt the test was mechanically successful. Paramount felt that the short PF time may not have allowed time for the tool to clean itself and may have affected results of the test. Depletion may be in the order of only 1% rather than the 3.5% indicated by the test results.

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
0 - 2	<b>SILTSTONE</b> - medium gray, very argillaceous, very slightly calcareous;
2 - 5	<b>SANDSTONE</b> - light medium gray, very fine grained, subangular to angular, well sorted, micaceous, argillaceous;
5 - 20	<b>SANDSTONE</b> - medium light gray salt and pepper, very fine grained to fine grained, subangular to angular, well sorted, calcareous cemented;
20 - 30	<b>SANDSTONE</b> - medium light gray salt and pepper, fine grained to medium grained, subangular to angular, well sorted, <u>rare intergranular porosity</u> , moderately consolidated, moderately calcareous cemented, occasionally kaolin cemented, very micaceous;
30 - 35	<b>SANDSTONE</b> - light medium gray salt and pepper, very fine grained to fine grained, subangular to angular, well sorted, grading to light medium gray silt;
35 - 40	<b>SANDSTONE</b> - medium light gray salt and pepper, very fine grained to fine grained, subangular to angular, well sorted, slightly to medium calcareous in part;
40 - 47	<b>SILTSTONE</b> - medium gray, very fine grained in part;
47 - 49	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, grading to medium gray silt;
49 - 50	<b>SILTSTONE</b> - medium gray, argillaceous;
50 - 64	<b>SANDSTONE</b> - medium light gray, fine grained to medium grained, subangular to angular, well sorted, <u>trace intergranular porosity</u> , moderately consolidated, occasionally micaceous, quartz, chert, rock fragments, slightly calcareous, kaolin cemented in part;
64 - 67	<b>SANDSTONE</b> - medium light gray salt and pepper, fine grained to medium grained, subangular to angular, well sorted, calcareous cemented in part, kaolin cemented in part;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
67 - 69	<b>SILTSTONE</b> - medium gray, argillaceous;
69 - 71	<b>SANDSTONE</b> - medium light gray, fine grained to medium grained, subangular to angular, well sorted;
71 - 80	<b>SANDSTONE</b> - medium light gray salt and pepper, fine grained to medium grained, subangular to angular, well sorted, <u>trace intergranular porosity</u> , calcareous cemented;
80 - 82	<b>SANDSTONE</b> - medium light gray salt and pepper, fine grained to medium grained, subangular to angular, well sorted, <u>trace intergranular porosity</u> , calcareous to kaolin cemented;
82 - 86	<b>SILTSTONE</b> - medium gray, argillaceous, non to very slightly calcareous;
86 - 88	<b>SANDSTONE</b> - light medium gray salt and pepper, very fine grained, subangular to angular, well sorted, silty, argillaceous, calcareous cemented;
88 - 94	<b>SILTSTONE</b> - medium gray, argillaceous, very fine grained in part;
94 - 108	<b>SILTSTONE</b> - medium gray, non calcareous, laminae of very fine grained sand, very argillaceous;
108 - 114	<b>SHALE</b> - medium dark gray, blocky, non calcareous;
114 - 130	<b>SANDSTONE</b> - light medium gray, fine grained to medium grained, subangular to angular, well sorted, occurs as loose grains in sample;
130 - 160	<b>SANDSTONE</b> - medium light gray, very fine grained to fine grained, subangular to angular, well sorted, <u>trace intergranular porosity</u> , moderately consolidated, kaolin cemented in part, occasionally medium grained in part;
160 - 170	<b>SANDSTONE</b> - light medium gray, very fine grained to fine grained, subangular to angular, well sorted, silty, slightly carbonaceous;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
170 - 178	<b>SANDSTONE</b> - light medium gray, very fine grained to fine grained and some medium grained, subangular to angular, well sorted, <u>trace intergranular porosity</u> , silty;
178 - 194	<b>SANDSTONE</b> - medium light gray salt and pepper, very fine grained to fine grained, subangular to angular, well sorted, rare laminae of brown dolomitic argillaceous siltstone, moderately silty;
194 - 224	<b>SANDSTONE</b> - medium light gray salt and pepper, very fine grained, subangular to angular, well sorted, well consolidated in part, occasionally carbonaceous;
224 - 235	<b>SANDSTONE</b> - medium light gray salt and pepper, very fine grained, subangular to angular, well sorted, slightly calcareous in part, very silty;
235 - 250	<b>SANDSTONE</b> - medium light gray salt and pepper, very fine grained, subangular to angular, well sorted, occasional carbonaceous laminae, well consolidated, slightly siliceous cemented, shale laminae, trace kaolin cement, very silty;
250 - 261	<b>SANDSTONE</b> - medium light gray salt and pepper, very fine grained, subangular to angular, well sorted, increasingly argillaceous;
261 - 269	<b>SANDSTONE</b> - medium light gray salt and pepper, very fine grained, subangular to angular, well sorted, shale laminae;
269 - 286	<b>SHALE</b> - dark gray, blocky to subfissile, micromicaceous in part, non calcareous, occasional thin interbedded very fine grained argillaceous sand;
286 - 294	<b>SHALE</b> - dark gray, carbonaceous in part, fish scales;
294 - 312	<b>SHALE</b> - dark gray, occasional thin interbedded very fine grained well consolidated silty sand, fish scales;
312 - 340	<b>SHALE</b> - dark gray, carbonaceous in part, fish scales, rare sand laminae;
340 - 370	<b>SHALE</b> - dark gray to black, carbonaceous, micromicaceous, non calcareous;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
370 - 375	<b>SHALE</b> - very dark gray to black, carbonaceous in part, micromicaceous, non calcareous, occasionally silty;
375 - 380	<b>SHALE</b> - very dark gray to black, thinly interbedded very fine grained sand;
380 - 391	<b>SHALE</b> - very dark gray to black, carbonaceous in part, micromicaceous, non calcareous;
391 - 400	<b>SANDSTONE</b> - light gray to medium light gray, very fine grained, subangular to angular, well sorted, well consolidated, argillaceous, slightly calcareous, fish scales, grading to silt, moderately silty;
400 - 407	<b>SILTSTONE</b> - medium gray, very fine grained in part, very argillaceous;
407 - 409	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, well consolidated, silty, carbonaceous laminae in part, slightly to moderately calcareous, kaolin cement in part;
409 - 410	<b>SHALE</b> - very dark gray to black, silty;
410 - 413	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, moderately calcareous, kaolin cement in part;
413 - 414	<b>SHALE</b> - very dark gray;
414 - 421	<b>SANDSTONE</b> - medium light gray, very fine grained to fine grained and some medium grained, subangular to angular, well sorted, moderately consolidated, calcareous cement in part, kaolin cement in part, rare fish scales;
421 - 431	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, argillaceous in part;
431 - 432	<b>SHALE</b> - very dark gray, blocky to subfissile, non calcareous;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
432 - 437	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, slightly calcareous cemented, kaolin cemented, slightly siliceous cemented, carbonaceous laminae in part, moderately silty;
437 - 442	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, <u>rare intergranular porosity</u> , kaolin cemented, scattered glauconite;
442 - 443	<b>SANDSTONE</b> - very fine grained;
443 - 444	<b>SHALE</b> - very dark gray, non calcareous;
444 - 452	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, <u>rare intergranular porosity</u> , scattered glauconite;
452 - 474	<b>SANDSTONE</b> - medium light gray, very fine grained and some fine grained, subangular to angular, well sorted, <u>rare intergranular porosity</u> , siliceous cemented, scattered glauconite;
474 - 478	<b>SILTSTONE</b> - medium gray, non calcareous, very argillaceous;
478 - 479	<b>SHALE</b> - very dark gray, non calcareous;
479 - 481	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, well consolidated, very slightly calcareous, kaolin cement, slightly siliceous cemented, scattered glauconite, moderately silty;
481 - 483	<b>SANDSTONE</b> - medium light gray, very fine grained to fine grained and some medium grained, subangular to angular, moderately sorted, <u>trace intergranular porosity</u> , kaolin cement, siliceous cemented, scattered glauconite;
483 - 489	<b>SILTSTONE</b> - medium gray, very fine grained in part, very argillaceous;
489 - 496	<b>SANDSTONE</b> - medium light gray, very fine grained to fine grained, subangular to angular, well sorted, <u>trace intergranular porosity</u> , kaolin cemented, siliceous cemented, scattered glauconite;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
496 - 499	<b>SANDSTONE</b> - medium light gray, very fine grained to fine grained, subangular to angular, well sorted, scattered glauconite;
499 - 502	<b>SILTSTONE</b> - medium gray, argillaceous;
502 - 513	<b>SILTSTONE</b> - medium gray, argillaceous;
513 - 524	<b>SANDSTONE</b> - medium light gray and light medium gray, very fine grained, subangular to angular, well sorted, silty, argillaceous in part, kaolin cement, loose fine to medium subrounded to rounded grains in sample, occasional glauconite;
524 - 527	<b>SILTSTONE</b> - medium gray, argillaceous, very fine grained;
527 - 539	<b>SANDSTONE</b> - light gray, very fine grained to medium grained and some coarse grained, subangular to angular, poorly sorted, occurs as abundant loose grains in sample, sample quality poor;
539 - 545	<b>SILTSTONE</b> - medium gray, grading to micromicaceous silty shale, very argillaceous;
545 - 547	<b>SHALE</b> - medium gray, micromicaceous, non calcareous, silty;
547 - 551	<b>SILTSTONE</b> - medium gray, argillaceous, grading to silty shale;
551 - 552	<b>SHALE</b> - dark gray, blocky to subfissile, micromicaceous, non calcareous, silty in part;
552 - 559	<b>SILTSTONE</b> - medium gray, argillaceous, very fine grained in part;
559 - 567	<b>SANDSTONE</b> - light gray, very fine grained, subangular to angular, well sorted, slightly siliceous cemented, slightly calcareous cemented, kaolin cemented, trace glauconite;
567 - 568	<b>SHALE</b> - dark gray to black, fissile, micromicaceous, non calcareous, moderately carbonaceous;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
568 - 574	<b>SANDSTONE</b> - light medium gray, very fine grained, subangular to angular, well sorted, carbonaceous, moderately silty;
574 - 575	<b>SHALE</b> - dark gray to black, fissile, micromicaceous;
575 - 583	<b>SILTSTONE</b> - medium gray, very fine grained in part, very argillaceous;
583 - 584	<b>SHALE</b> - dark gray to black, fissile, micromicaceous;
584 - 587	<b>SANDSTONE</b> - light medium gray, very fine grained, subangular to angular, well sorted, carbonaceous, argillaceous, moderately silty;
587 - 597	<b>SILTSTONE</b> - medium gray, very fine grained in part;
597 - 605	<b>SHALE</b> - dark gray to black, fissile, micromicaceous, grading to silt in part;
605 - 610	<b>SILTSTONE</b> - medium gray, very argillaceous;
610 - 615	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, very silty, well consolidated, moderately carbonaceous;
615 - 623	<b>SILTSTONE</b> - medium gray, very fine grained in part;
623 - 625	<b>SHALE</b> - dark gray to black, non calcareous;
625 - 632	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted, calcareous cemented in part, medium gray and carbonaceous in part, moderately silty, trace glauconite;
632 - 635	<b>SHALE</b> - dark gray to black;
635 - 658	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted, medium gray and very carbonaceous in part, no observable porosity, moderately carbonaceous;
658 - 660	<b>SHALE</b> - dark gray to black, very carbonaceous;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
660 - 661	<b>SANDSTONE</b> - light gray, very fine grained, subangular to angular, well sorted, carbonaceous, silty;
661 - 665	<b>SILTSTONE</b> - medium gray, carbonaceous, very argillaceous;
665 - 674	<b>SANDSTONE</b> - light medium gray, very fine grained, subangular to angular, well sorted, silty, no observable porosity, very carbonaceous;
674 - 675	<b>SILTSTONE</b> - medium gray, carbonaceous;
675 - 677	<b>SHALE</b> - dark gray to black, non calcareous;
677 - 678	<b>SANDSTONE</b> - light medium gray, very fine grained, subangular to angular, well sorted, silty, carbonaceous;
678 - 679	<b>SHALE</b> - dark gray to black, carbonaceous;
679 - 686	<b>SANDSTONE</b> - medium gray, very fine grained, subangular to angular, well sorted, no oil staining, no fluorescence, no cut, no observable porosity, very carbonaceous;
686 - 692	<b>SANDSTONE</b> - light medium gray to medium gray, very fine grained, subangular to angular, well sorted, silty, very carbonaceous;
692 - 696	<b>SILTSTONE</b> - medium gray, carbonaceous;
696 - 699	<b>SHALE</b> - dark gray to black, blocky to fissile, non calcareous, micromicaceous in part, very carbonaceous;
699 - 701	<b>SILTSTONE</b> - medium gray, argillaceous, very fine grained in part, carbonaceous;
701 - 706	<b>SANDSTONE</b> - light medium gray, very fine grained, subangular to angular, well sorted, silty, very carbonaceous;
706 - 709	<b>SHALE</b> - dark gray;
709 - 718	<b>SILTSTONE</b> - medium gray, carbonaceous, very fine grained in part, grading to silty shale in part, slightly calcareous, trace glauconite, trace pyrite;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
718 - 720	<b>SHALE</b> - dark gray;
720 - 725	<b>SILTSTONE</b> - medium gray, carbonaceous, very fine grained in part, grading to silty shale in part, slightly calcareous, trace glauconite, trace pyrite;
725 - 728	<b>SHALE</b> - dark gray, silty in part;
728 - 741	<b>SILTSTONE</b> - medium gray, carbonaceous, grading to silty shale, trace glauconite, trace pyrite;
741 - 747	<b>SHALE</b> - dark gray to gray black, blocky, micromicaceous, silty in part, trace pyrite;
747 - 753	<b>SILTSTONE</b> - medium gray, carbonaceous, argillaceous;
753 - 757	<b>SHALE</b> - dark gray to gray black, occasional thin interbedded very fine grained sand and argillaceous silt;
757 - 759	<b>SILTSTONE</b> - medium gray, very fine grained in part;
759 - 762	<b>SHALE</b> - dark gray to gray black;
762 - 772	<b>SILTSTONE</b> - medium gray, argillaceous, very fine grained in part;
772 - 776	<b>SHALE</b> - dark gray to gray black;
776 - 778	<b>SILTSTONE</b> - medium gray, grading to medium light gray slightly calcareous slightly siliceous cemented very fine grained sand;
778 - 784	<b>SHALE</b> - dark gray to gray black;
Scatter	<u>784m Sample    789.5m Log</u>
784 - 788	<b>SANDSTONE</b> - light medium gray, medium green in part, very fine grained, subangular to angular, well sorted, moderately consolidated, slightly argillaceous, carbonaceous in part, moderately calcareous, abundant glauconite;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
788 - 793	<b>SANDSTONE</b> - light medium gray salt and pepper, very fine grained, subangular to angular, well sorted, moderately calcareous cemented, slightly siliceous cemented, scattered glauconite;
793 - 804	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted, very slightly calcareous, slightly siliceous cemented, silty, argillaceous, occasional carbonaceous laminae;
804 - 831	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted, trace glauconite;
831 - 837	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted, siliceous cemented, very slightly calcareous cemented, scattered glauconite;
837 - 838	<b>SHALE</b> - dark gray to gray black, subfissile, micromicaceous, non calcareous;
838 - 842	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted;
842 - 846	<b>SHALE</b> - dark gray to gray black;
846 - 857	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted;
857 - 858	<b>SHALE</b> - dark gray to gray black, non calcareous;
858 - 870	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted, occasional carbonaceous laminae;
870 - 871	<b>SHALE</b> - dark gray to gray black;
871 - 872	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted;
872 - 873	<b>SHALE</b> - dark gray to gray black, trace pyrite;
873 - 877	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
877 - 881	<b>SHALE</b> - dark gray to gray black;
881 - 882	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted;
882 - 886	<b>SHALE</b> - dark gray to gray black;
886 - 887	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted;
887 - 888	<b>SHALE</b> - dark gray to gray black, non calcareous;
888 - 891	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted;
891 - 892	<b>SHALE</b> - dark gray to gray black;
892 - 893	<b>SANDSTONE</b> - light gray salt and pepper;
893 - 895	<b>SHALE</b> - dark gray to gray black, silty in part;
895 - 897	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained, subangular to angular, well sorted;
897 - 898	<b>SHALE</b> - as above;
898 - 906	<b>SANDSTONE</b> - light brown gray, very fine grained, subangular to angular, well sorted, <u>trace pinpoint porosity</u> , <u>dull yellow fluorescence</u> , <u>milky white cut</u> , siliceous cemented, scattered glauconite;
906 - 908	<b>SHALE</b> - dark gray to gray black;
908 - 910	<b>SANDSTONE</b> - light brown gray, very fine grained, subangular to angular, well sorted, <u>trace pinpoint porosity</u> , <u>dull yellow fluorescence</u> , <u>milky white cut</u> , siliceous cemented, scattered glauconite;
910 - 911	<b>SHALE</b> - dark gray to gray black;

LITHOLOGY

Formation tops  
Sample interval  
(in meters)

SAMPLE DESCRIPTION

911 - 915	<b>SANDSTONE</b> - light brown gray to medium gray, very fine grained, subangular to angular, well sorted, <u>rare pinpoint porosity</u> , <u>scattered dull yellow fluorescence</u> , <u>milky white cut</u> , scattered glauconite;
915 - 921	<b>SHALE</b> - dark gray to gray black, occasionally silty, non calcareous;
921 - 927	<b>SANDSTONE</b> - brown gray to medium gray, very fine grained, subangular to angular, well sorted, <u>rare pinpoint porosity</u> , <u>scattered dull yellow fluorescence</u> , <u>milky white cut</u> , carbonaceous, siliceous cemented;
927 - 930	<b>SHALE</b> - dark gray to gray black, blocky to subfissile, non calcareous, silty, very carbonaceous;
930 - 932	<b>SHALE</b> - dark gray to gray black, blocky to subfissile, non calcareous, silty, very carbonaceous;
932 - 938	<b>SANDSTONE</b> - medium gray to medium brown gray, very fine grained, subangular to angular, well sorted, <u>occasional dull yellow fluorescence</u> , <u>milky white cut</u> , moderately carbonaceous;
938 - 941	<b>SHALE</b> - dark gray to gray black, non calcareous;
941 - 952	<b>SANDSTONE</b> - medium brown gray, very fine grained, subangular to angular, well sorted, <u>scattered dull yellow fluorescence</u> , <u>milky white cut</u> , non calcareous, argillaceous, slightly siliceous cemented, silty, no observable porosity, very carbonaceous, trace glauconite;
952 - 961	<b>SHALE</b> - dark gray to gray black, grading to medium to dark gray very carbonaceous silt;
961 - 962	<b>SILTSTONE</b> - medium to dark gray, very carbonaceous;
962 - 963	<b>SANDSTONE</b> - medium brown gray, very fine grained, subangular to angular, well sorted, carbonaceous;
963 - 970	<b>SHALE</b> - dark gray to gray black, carbonaceous, non calcareous;



LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
970 - 971	<b>SILTSTONE</b> - medium to dark gray, carbonaceous;
971 - 973	<b>SANDSTONE</b> - light medium gray, very fine grained, subangular to angular, well sorted, silty, argillaceous, non shales, tight;
973 - 976	<b>SHALE</b> - dark gray to gray black;
976 - 979	<b>SANDSTONE</b> - light medium gray to medium gray, very fine grained, subangular to angular, well sorted, argillaceous, silty, no observable porosity;
979 - 981	<b>SILTSTONE</b> - medium to dark gray, carbonaceous;
<u>Garbutt</u>	<u>981m Sample 969.5m Log</u>
981 - 1020	<b>SHALE</b> - dark gray to gray black, fissile to subfissile, splintery in part, micromicaceous in part, non calcareous;
1020 - 1040	<b>SHALE</b> - dark gray to gray black, micromicaceous in part, non calcareous, subfissile to fissile, rare gray brown very argillaceous silt laminae;
1040 - 1050	<b>SHALE</b> - dark gray to gray black, rare laminae of medium gray very argillaceous silt;
1050 - 1062	<b>SHALE</b> - dark gray to gray black, carbonaceous in part, non calcareous;
1062 - 1066	<b>SHALE</b> - dark gray to gray black, rare trace light gray bentonite;
1066 - 1070	<b>SHALE</b> - dark gray to gray black, rare trace pyrobitumen, non calcareous;
1070 - 1075	<b>SHALE</b> - dark gray to gray black, rare trace light gray bentonite;
1075 - 1107	<b>SHALE</b> - dark gray to gray black, rare light gray to light green bentonite laminae, very rare pyrobitumen;
<u>Chinkeh</u>	<u>1107m Sample 1110m Log</u>

LITHOLOGY

Formation tops  
Sample interval  
(in meters)

SAMPLE DESCRIPTION

1107 - 1114	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, <u>very rare slow blue white cut</u> , silty, slightly calcareous cemented, slightly siliceous cemented, slightly carbonaceous, <u>very rare oil staining</u> , moderately glauconitic;
1114 - 1119	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, <u>rare pinpoint porosity</u> , <u>occasional dull yellow fluorescence</u> , <u>blue white cut</u> , well consolidated, siliceous cemented, scattered glauconite;
1119 - 1125	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, <u>trace pinpoint porosity</u> , <u>occasional dull yellow fluorescence</u> , <u>slow blue white cut</u> , siliceous cemented, scattered glauconite;
Triassic	<u>1125m Sample</u> <u>1125m Log</u>
1125 - 1130	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, siliceous cemented, dolomite cemented; <b>SILTSTONE</b> - medium gray, very argillaceous, siliceous cemented;
1130 - 1145	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, well consolidated, siliceous cemented, dolomite cemented, silty;
1145 - 1155	<b>SANDSTONE</b> - medium brown gray to light medium gray, very fine grained, subangular to angular, well sorted, no live oil staining, no fluorescence, no cut, silty, dolomite cemented in part, siliceous cemented in part, scattered pyrobitumen, no visible porosity;
1155 - 1174	<b>SHALE</b> - gray red to medium gray, blocky to subfissile, very slightly dolomitic;
1174 - 1184	<b>SHALE</b> - medium to dark gray, gray red;
1184 - 1188	<b>SANDSTONE</b> - light medium gray, very fine grained, subangular to angular, well sorted, slightly dolomitic cemented, slightly siliceous cemented, argillaceous, grading to silt, very silty, scattered pyrite;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
1188 - 1197	<b>SHALE</b> - medium gray to gray brown, thin interbeds of light medium gray silt and very fine grained glauconitic sand;
1197 - 1205	<b>SHALE</b> - medium gray to gray brown, very fine grained silty dolomite, cemented sand interbeds;
1205 - 1208	<b>SILTSTONE</b> - light medium gray, slightly argillaceous;
1208 - 1212	<b>SANDSTONE</b> - medium light gray, very fine grained, subangular to angular, well sorted, dolomitic cemented, very silty;
1212 - 1215	<b>SHALE</b> - medium gray to gray brown;
1215 - 1216	<b>SANDSTONE</b> - light medium gray, very fine grained, subangular to angular, well sorted, slightly dolomitic cemented;
1216 - 1218	<b>SHALE</b> - gray brown, blocky to subfissile;
1218 - 1220	<b>SANDSTONE</b> - light medium gray, very fine grained, subangular to angular, well sorted, slightly dolomitic cemented;
1220 - 1222	<b>SHALE</b> - gray brown;
1222 - 1225	<b>SHALE</b> - medium gray;
<u>Fantasque</u>	<u>1225m Sample 1224.5m Log</u>
1225 - 1228	<b>CHERT</b> - medium dark gray, carbonaceous in part;
1228 - 1230	<b>CHERT</b> - medium dark gray, <u>trace microvuggy porosity</u> , <u>trace dull yellow fluorescence</u> , <u>streaming milky white cut</u> , very finely arenaceous in part, rarely spiculer, pyrobitumen in part, carbonaceous in part;
1230 - 1233	<b>SANDSTONE</b> - medium dark gray, very fine grained, subangular to angular, well sorted, very well consolidated, very siliceous cemented, slightly dolomitic cemented, silty, abundant glauconite;
1233 - 1235	<b>CHERT</b> - medium dark gray, carbonaceous in part;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
1235 - 1238	<b>SANDSTONE</b> - medium dark gray, very fine grained, subangular to angular, well sorted, silty, very siliceous cemented, very well consolidated, abundant glauconite;
1238 - 1241	<b>CHERT</b> - medium dark gray;
1241 - 1242	<b>SANDSTONE</b> - medium dark gray, very fine grained, subangular to angular, well sorted, silty, very siliceous cemented, very well consolidated, abundant glauconite;
1242 - 1245	<b>CHERT</b> - medium gray to medium brown gray, spiculer in part, very slightly dolomitic, very rare trace pyrobitumen lined <u>microvuggy porosity</u> , very finely arenaceous and carbonaceous in part;
1245 - 1249	<b>SANDSTONE</b> - medium gray, very fine grained to fine grained, subangular to angular, moderately sorted, subrounded in part, carbonaceous in part, siliceous cemented, very slightly dolomitic cemented, no visible porosity, abundant glauconite;
1249 - 1256	<b>SANDSTONE</b> - dark gray, very fine grained to fine grained, subangular to angular, moderately sorted, slightly argillaceous, siliceous cemented, slightly dolomitic cemented, subrounded in part, very carbonaceous;
1256 - 1257	<b>SANDSTONE</b> - medium dark gray, very fine grained to fine grained, subangular to angular, moderately sorted, <u>trace microvuggy porosity</u> , <u>trace dull yellow fluorescence</u> , <u>slow blue white cut</u> , trace pyrobitumen, rare pyrite replacement of spicula, <u>rare trace microvuggy porosity</u> , abundant glauconite;
1257 - 1260	<b>SANDSTONE</b> - medium dark gray, very fine grained to fine grained, subangular to angular, moderately sorted, siliceous cemented, trace pyrobitumen;
1260 - 1269	<b>CHERT</b> - medium brown gray, occasionally very finely arenaceous, slightly dolomitic in part, no observable porosity, occasional glauconite;
1269 - 1274	<b>CHERT</b> - dark gray to dark brown gray, very finely arenaceous and very carbonaceous in part, pyritic in part;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
1274 - 1279	<b>SANDSTONE</b> - dark gray, very fine grained to fine grained, subangular to angular, moderately sorted, rare rounded grains, very glauconitic;
1279 - 1292	<b>CHERT</b> - light brown gray, <u>trace microvuggy porosity</u> , very fine to finely glauconitic in part, scattered pyrite in part, <u>rare microvuggy and moldic porosity</u> ;
1292 - 1296	<b>CHERT</b> - medium brown gray to gray brown, <u>trace microvuggy porosity</u> , very finely glauconitic in part, very slightly dolomitic, rare sparry calcite, spiculer in part, pyritic;
1296 - 1299	<b>CHERT</b> - medium brown gray to gray brown, occasional carbonaceous laminae;
1299 - 1301	<b>CHERT</b> - medium brown gray to gray brown, abundant very fine to fine grained glauconite, pyrite, trace pyrobitumen, <u>trace microvuggy solution porosity</u> .
1301 - 1303	<b>CHERT</b> - medium brown gray to gray brown;
1303 - 1306	<b>CHERT</b> - light gray brown, <u>trace microvuggy porosity</u> , occasionally very finely glauconitic;
1306 - 1308	<b>CHERT</b> - light gray brown;
1308 - 1309	<b>CHERT</b> - light gray brown, <u>trace microvuggy porosity</u> , occasionally very finely glauconitic;
1309 - 1311	<b>CHERT</b> - light gray brown;
1311 - 1313	<b>CHERT</b> - light gray brown, <u>trace microvuggy porosity</u> , occasionally very fine glauconitic;
1313 - 1315	<b>CHERT</b> - light gray brown, rare white kaolinite laminae;
1315 - 1325	<b>CHERT</b> - light to medium gray brown, <u>trace microvuggy porosity</u> , rare kaolin laminae;
1325 - 1333	<b>CHERT</b> - dark brown gray to medium brown gray, argillaceous;
1333 - 1345	<b>CHERT</b> - medium to light gray brown, <u>trace microvuggy porosity</u> , spiculer in part, slightly dolomitic;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
1345 - 1348	CHERT - medium to light blue gray, poor <u>microvuggy porosity</u> , poor <u>fracture porosity</u> , dull <u>yellow fluorescence</u> , <u>blue white cut</u> , fractures infilled with white flinty chert, rarely clear quartz, and very fine grained argillaceous carbonaceous <u>dolomitic oil stained sand</u> , fractures not completely infilled in part.
1348 - 1352	CHERT - medium to light blue gray, poor <u>vuggy porosity</u> , poor <u>fracture porosity</u> , dull <u>yellow fluorescence</u> , <u>blue white cut</u> , fractures infilled with very fine grained argillaceous carbonaceous <u>dolomitic oil stained sand</u> , white flinty fracture infilling;
1352 - 1360	CHERT - light blue gray to gray brown, <u>trace dull yellow fluorescence</u> , <u>trace blue white cut</u> , <u>rare microvuggy porosity</u> ;
1360 - 1369	SANDSTONE - dark brown gray, very fine grained, subangular to angular, moderately sorted, <u>trace pinpoint porosity</u> , <u>very rare dull yellow fluorescence</u> , <u>blue white cut</u> , carbonaceous, pyritic in part, pyrobituminous, slightly siliceous cemented, very dolomitic, very argillaceous, silty, rare subrounded glauconite grains at top of interval;
1369 - 1375	SILTSTONE - dark brown gray, very dolomitic, very carbonaceous, very argillaceous;
1375 - 1380	DOLOMITE - dark gray brown, microcrystalline, silty, pyritic, carbonaceous, very argillaceous;
1380 - 1389	DOLOMITE - dark gray brown, microcrystalline, very argillaceous, moderately limy;
1389 - 1397	SILTSTONE - dark gray, very carbonaceous, silty, shaley, dolomitic in part, very argillaceous, very calcareous;
Mattson	<u>1397m Sample 1398.5m Log</u>
1397 - 1402	SANDSTONE - light gray to light medium gray, very fine grained, subangular to angular, well sorted, <u>dull yellow fluorescence</u> , <u>blue white cut</u> , well consolidated, slightly siliceous cemented, pyrobituminous, very calcareous;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
1402 - 1407	<b>SANDSTONE</b> - light gray to light medium gray, very fine grained, subangular to angular, well sorted, well consolidated, slightly siliceous cemented, pyrobituminous, very calcareous;
1407 - 1408	<b>SANDSTONE</b> - light brown gray, black with heavy oil in part, very fine grained, subangular to angular, well sorted, <u>trace intergranular porosity</u> , <u>immediate yellow white cut</u> , abundant pyrobitumen in part, <u>live black oil</u> , trace sparry calcite may indicate fracture porosity, very calcareous;
1408 - 1414	<b>SANDSTONE</b> - light gray, very fine grained, subangular to angular, well sorted, <u>trace pinpoint porosity</u> , calcareous cemented in part, siliceous cemented, very rare glauconite, trace pyrite,;
1414 - 1429	<b>SANDSTONE</b> - light gray, very fine grained to fine grained, subangular to angular, well sorted, <u>trace intergranular porosity</u> , siliceous cemented, calcareous cemented, very rare glauconite, trace pyrite;
1429 - 1430	<b>SANDSTONE</b> - light gray, very fine grained to fine grained, subangular to angular, well sorted, <u>poor intergranular porosity</u> , <u>dull yellow fluorescence in part</u> , <u>blue white cut</u> ;
1430 - 1432	<b>SANDSTONE</b> - light gray, very fine grained to fine grained, subangular to angular, well sorted, calcareous cement, siliceous cement;
1432 - 1435	<b>SANDSTONE</b> - light gray, very fine grained to fine grained, subangular to angular, well sorted, <u>trace intergranular porosity</u> ;
1435 - 1437	<b>SANDSTONE</b> - light gray, very fine grained to fine grained, subangular to angular, well sorted, <u>trace intergranular porosity</u> ;
1437 - 1441	<b>SANDSTONE</b> - light gray salt and pepper, very fine grained to fine grained, subangular to angular, well sorted, trace pyrobitumen, siliceous cemented, calcareous cemented, slightly pyritic, occasional carbonaceous laminae;

LITHOLOGY

Formation tops Sample interval (in meters)	<u>SAMPLE DESCRIPTION</u>
1441 - 1449	<b>SANDSTONE</b> - light gray to light medium gray, very fine grained to fine grained, subangular to angular, well sorted, <u>trace intergranular porosity</u> , rare subrounded medium to coarse grains in limestone matrix, microcrystalline limestone interbeds;
1449 - 1455	<b>SANDSTONE</b> - light gray, brown gray in part, very fine grained to fine grained, subangular to angular, well sorted, <u>dull yellow fluorescence and blue white cut where brown gray</u> , pyrobitumen in part, occasional medium grains;
1455 - 1462	<b>SANDSTONE</b> - light gray, very fine grained to fine grained, subangular to angular, well sorted, calcareous and siliceous cemented, no observable porosity
1462 - 1471	<b>SANDSTONE</b> - light gray, fine grained to medium grained, subangular to subrounded, well sorted, <u>poor intergranular porosity, dull yellow fluorescence on wet sample, blue white cut</u> , siliceous cemented, calcareous cemented in part, pyrobituminous in part, rare blue gray chert fragments;
1471 - 1483	<b>SANDSTONE</b> - light gray, very fine grained to fine grained, subangular to angular, well sorted, <u>trace intergranular porosity</u> , calcareous cemented, siliceous cemented;
1483 - 1494	<b>SANDSTONE</b> - light gray to light brown gray, very fine grained to fine grained, subangular to angular, well sorted, <u>rare intergranular porosity</u> , subrounded medium grains in sample, calcareous and siliceous cemented, medium gray and carbonaceous in part;
1494m	<b>TOTAL DEPTH</b>

## GEOLOGICAL SUMMARY AND CONCLUSIONS

Paramount et al Liard F-36 located at 60o05.46' 123o 22.06' was drilled to test the Lower Cretaceous Chinkeh formation for gas and the Mississippian Mattson sands for the presence of oil. The primary zone of interest was the Chinkeh. The secondary target was the Mattson.

The well is a structural play based on seismic data. Seismic line 2-264 indicates we are on the nose of a Liard Basin structure which is plunging to the south. Good correlation was expected with the Ucel Liard K-02 located approximately 14.5 kilometres to the northwest at 60-20-123-30.

The well was spudded March 3, 1998 at 00:15 hrs. As required 2 sets of sample vials were collected and washed for the National Energy Board and 1 set of sample vials for Paramount Resources Ltd. Samples were collected from surface to T.D. A Minipac 2100 gas detection system was set up and operating from surface to T.D.

No shows were encountered while drilling the 311mm surface hole. It was therefore decided not to open hole log this section of the hole. 244.5mm surface casing was landed at 502.0 metres.

On March 10th Geco Prakla shot an E-W seismic line across the F-36 lease. The line number is FTL11.

The Lower Cretaceous Scatter formation top came in at 784m (-315). Prognosed top of Scatter was -357m. The interval 898m to 928m contains oil shows with traces of pinpoint intergranular porosity. Gas readings over this interval increased from backgrounds of 20 - 37 units to 36 - 101 units.

The decision was made not to core the Chinkeh based on the time the coring would add to the number of days to drill the hole. It was decided that the Chinkeh would be tested soon after penetration to attempt to get pressures on an undamaged formation.

At 1107m drilling rate went from 7 min./m. to 9-10 min./m. Lithology changed from dark gray to grayish black non calcareous Garbutt shale to a medium light gray very fine grained sandstone, silty, slightly argillaceous, moderately glauconitic, slightly calcareous cemented and slightly siliceous cemented with very rare oil stain and a slow blue white cut. Only rare traces of pinpoint intergranular porosity was observed in samples. There were no increases in gas readings over the interval 1107m to 1125m. This interval was tentatively picked as the Chinkeh as the sample description compared well to that in the K-02 well. There was some discussion whether this zone might represent the Bluesky equivalent starting at -346 subsea in K-02. Further correlations of F-36 drilling rates and lithology with K-02 proved this to be incorrect.

GEOLOGICAL SUMMARY AND CONCLUSIONS (cont.)

Drilling was stopped at 1174 metres to run drillstem tests. D.S.T. #1 using an infate straddle tool was run over the interval 1145m - 1155m in the Triassic based on a gas detector increase from a background of 15 units to a maximum of 108 units. Lithology was a medium brown gray very fine grained sandstone, dolomitic and siliceous cemented, with no stain and no visible porosity. Gas readings may have been overlain slightly by the fact we had 100 units of trip gas after bit trip at 1144 metres. Times were 10-60-60. Preflow pressures decreased from 237.7 kPa to 184.5 kPa. Valve open produced a pressure increase of only 2.1 kPa over 60 minutes. Results indicated no permeability in this interval. D.S.T. #2 was run over the Chinkeh from 1115m - 1125m. Times were 10-60-90-180. PF pressures increased from 272.3 kPa to 282.8 kPa. I.S.I. pressures increased very slowly. V.O. pressures only increased from 321.2 to 338.0 kPa over 90 minutes. Recovery was 8.0 metres of drilling mud with a salinity of 2000 ppm. D.S.T. #2 indicated the interval has very low permeability. Both D.S.T.s appeared to be mechanically successful tests. Drilling continued with the interval 1228m to 1230m in the Permian Fantasque formation producing a gas increase from a background of 17 units to a maximum of 72 units. Samples indicated massive chert with traces of oil stain, dull yellow fluorescence, streaming milky white cut, and traces of microvuggy and moldic porosity. This zone should be looked at closely on logs. Traces of microvuggy porosity were also seen in the intervals 1255m - 1256m and 1282m - 1291m. There were no significant increases in gas readings over these intervals. The interval 1316m to 1320m produced a gas detector increase from a background of 10 units to 40 - 60 units. Lithology is chert with traces of microvuggy porosity in sample. From 1332m to 1334m gas increased from a background of 33 units to a maximum of 95 units. Again lithology was massive chert with traces of microvuggy porosity in sample.

From 1345m to 1348m the penetration rate increased from 19 min./m. to 9 -10 min./m. The gas detector readings increased from a background of 33 units to a maximum of 82 units. The kelly swivel started to leak at 1348m and we had to stop drilling and pull out of the hole. When we resumed drilling the penetration rate was 10.5 to 6.5 min/m. from 1348m - 1352m. The lithology in the interval 1345m to 1352m is medium to light bluish grey massive chert with evidence of fracturing. The fractures have been infilled with white and clear quartz, and with a very fine grained argillaceous, carbonaceous, dolomitic, oil stained sand. The oil staining gave a dull yellow fluorescence with a blue white cut. Scattered microvuggy porosity and evidence of fracture porosity caused by incomplete fracture filling are present in samples. We had 230 units of trip gas after the trip at 1348m and 222 units of trip gas after the trip at 1369m. This trip gas compares to 45 units of trip gas at 1292m and 40 units at 1173m. This increase in trip gas indicates some migration of gas into the hole and may be from the fracture zone from 1345m to 1352m. This zone warrants further evaluation.

The replacement kelly swivel failed at 1374m. and drilling had to be stopped. Trip gas at 1374m. was 327 units.



#### GEOLOGICAL SUMMARY AND CONCLUSIONS (cont.)

The top of the Mattson was picked at 1397m (-928 subsea) from a change in drilling rate from 18 min./m to 24 min./m. and a change in lithology from dark grey very carbonaceous siltstone to light to light medium grey very fine grained very calcareous sandstone. The sandstone at the top of the Mattson had dull yellow fluorescence and a blue white cut but no observable porosity in sample.

From 1407.4m - 1408.2m the drilling rate increased slightly from 28 to 23 min./m. and 1 lag time later live black oil was spotted on the shaker. Gas readings increased from a background of 25 units to a maximum of 2592 units over this interval. Samples from the interval were light brown grey to black (with live heavy black oil) very fine grained sandstone with abundant pyrobitumin in part, very calcareous, immediate yellow white cut and trace intergranular porosity. A trace of sparry calcite in the sample may indicate there is also some fracture porosity.

The shale shaker was cleaned of oil regularly however oil continued to accumulate on the screens. No significant gas increase occurred until 1428.6m - 1429.8m when the drilling rate increased from 20.5 min./m. to 12 min./m. The gas readings increased from a background of 75 units to a maximum of 1009 units. Fresh brownish black oil appeared on the shaker. Sample 1425 - 1430m contained a very light grey very fine to fine grained sandstone, calcareous and siliceous cemented with a rare trace of oil stain with dull yellow fluorescence and blue white cut and a trace of intergranular porosity.

The next increase in gas readings occurred from 1435m - 1436m and may represent connection gas. Maximum reading was 772 units. Gas reading increases also occurred from 1445 - 1446m with 552 units and from 1448m - 1449m with a maximum reading of 635 units. Drilling rates were only slightly faster in these intervals. Samples from 1435 - 1440m indicate light grey very fine grained sandstone with calcareous and silica cement, no apparent stain, and only rare traces of intergranular porosity. Samples from 1445 - 1450m indicate a light grey to light medium grey very fine to fine grained sandstone with very rare medium grains, no apparent stain, and traces of intergranular porosity.

Connection gas after running a survey prior to coming out of the hole for a bit change at 1454 metres was 1456 units. Trip gas at 1454 metres was 1965 units.

In the interval 1469 - 71m the penetration rate went from 20 min./m to 14-15 min./m. Gas readings increased from a background of 130 units to 2862 units. There appeared to be fresh brownish black oil on the shaker which was sampled for later analysis. The lithology from 1462m - 1471m was light gray fine to medium grained sandstone, siliceous and calcareous cemented with dull yellow fluorescence on wet sample and blue white cut, a trace of oil stain, and scattered intergranular porosity. From 1479m - 1481m the penetration rate

GEOLOGICAL SUMMARY AND CONCLUSIONS (cont.)

went from 19.9 min./m. to 13.9-16.4 min./m. and the gas readings increased from a background of 224 units to 405 units. The lithology was light gray very fine to fine grained sandstone with a trace of intergranular porosity.

There were traces of blue gray chert fragments in the 1455m to 1494m samples but are probably not indicative of a conglomerate zone as no matrix or coarse to very coarse grains were present in the samples.

Drilling was stopped at 11:15 hours on March 24th and T.D. called at 1494 metres.

DST #3, a bottom hole inflate test, was run from 1455m to 1494 metres in the Mattson formation. Times were 5-60-60-60-60-90. 3 flow periods were run because ISI pressure appeared to be too high to be reliable. On PF and V.O. we had gas to surface immediately and a strong flare. Shut in pressures would appear to indicate a depleting reservoir; however the short preflow time may not have allowed time for the tool to clean itself and may have affected the results of the test. Depletion may be in the order of only 1% rather than the 3.5% indicated by the test.

A clean out trip was planned prior to logging; however, the rig's floor motor quit after running the bit and 1 drill collar in the hole. Rather than wait on rig repair for 24 hours it was decided to use the tugger line to remove the 1 drill collar from the hole and attempt to log. Because we had 6 metres of fill when we ran DST #3 we decided to run the DiPole Sonic and Platform Express in two separate runs. The DiPole Sonic was successfully run to bottom on the first attempt. Logger's T.D. was 1486.5 metres. Schlumberger had some tool problems with the Platform Express. When the caliper was opened it appeared to disturb the other tool readings. This problem was solved and logging continued. Washed out sections of hole affected density and microlog responses. High resolution CNL/DENS/A. IND was run over selected intervals. Logs indicated several gas zones in the Mattson that should be capable of production.

Because of time constraints due to spring break up road bans it was decided to run 177.8mm casing to T.D. without additional testing of this hole. DST #3 results in the Mattson, the appearance of live oil on the shaker, the active gas curve and observed porosity in samples suggest this hole has the potential to produce oil and gas. Perforating and testing through casing will be required to indicate which zones are producable.

SUMMARY OF ZONES OF GAS INCREASES AND OIL SHOWS

Interval	Formation	P.R. Change(min/m)	Gas Change	Lithology
651-661m	Lepine	None	13 to 410	SS/no vis por
676-684m	Lepine	None	69 to 205	SS/no vis por
708-711m	Lepine	None	8 to 106	SS/SLT/no vis por
898-902m	Scatter	10.2 to 7.2-8.2	27 to 62	SS/os/tr pp por
903-906m	Scatter	None	26 to 59	SS/os/tr pp por
908-910m	Scatter	9.3 to 7.8-8.1	27 to 101	SS/os/tr pp por
911-915m	Scatter	10.1 to 9.1-7.7	37 to 70	SS/os/rr pp por
921-922m	Scatter	11.1 to 8.9	18 to 36	SS/os/rr pp por
925-928m	Scatter	8.6 to 11.2-12.2	20 to 70	SS/os/rr pp por
1107-1125m	Chinkeh	7 to 9-10	25-28 to 13-29	SS/os/tr pp por
1145-1151m	Triassic	None	15 to 108*	SS/no vis por
1228-1230m	Fantasque	10.6 to 6.8-9.7	17 to 72	CHT/os/tr mv por
1316-1317m	Fantasque	15.5 to 12.1	10 to 60	CHT/tr mv por
1319-1320m	Fantasque	23.2 to 11.3	10 to 40	CHT/tr mv por
1332-1334m	Fantasque	22.7 to 17-18.5	33 to 95	CHT/tr mv por
1345-1352m	Fantasque	19 to 9-10	33 to 82**	CHT/os/tr mvf por
1407.4-08.2m	Mattson	28 to 23	25 to 2592***	SS/lo/tr ig por
1428.6-29.8m	Mattson	20.5 to 12	75 to 1009****	SS/lo/tr ig por
1436-1437m	Mattson	17.6 to 22.4	372 to 772	SS/tr ig por
1445-1446m	Mattson	25.4 to 21.6	275 to 552	SS/r ig por
1448-1449m	Mattson	16.6 to 15	312 to 635	SS/r ig por
1469-1471m	Mattson	20 to 14-15	130 to 2862****	SS/lo/scat ig por
1479-1481m	Mattson	19.9 to 13.9-16.4	224 to 405	SS/tr ig por

\*May be overlain by trip gas of 100 units at 1145m.

\*\*Trip gas after trip at 1348m increased to 230 units.

\*\*\*Live black oil on shaker.

\*\*\*\*Live brown black oil on shaker.

SUMMARY OF TRIP GAS AND CONNECTION GAS

Depth	Trip Gas	Connection Gas
1145m	100	
1173m	40	
1292m	45	
1348m	230	
1369m	222	
1374m	327	
1444m		552
1454m	1965	1456
1488m		1005
1494m (wiper)	545	

#### MUD SAMPLES

MUD SAMPLES SENT TO AGAT LABS MARCH 25/98 WITH BAKER OIL TOOLS REPRESENTATIVE KEN WILLIS (Paramount et al Liard F-36).

#### SAMPLES FROM DST #3 FLUID RECOVERY:

Sample # 1. Collected 80 metres above test tool. 25°C. 160 mg/l Cl. pH 8.5.

Sample # 2. Collected 57 metres above test tool. 26°C. 160 mg/l Cl. pH 8.0.

Sample # 3. Collected 38 metres above test tool. 27°C. 160 mg/l Cl. pH 8.0.

Sample # 4. Collected 19 metres above test tool. 29°C. 160 mg/l Cl. pH 8.0.

Sample # 5. Collected at tool. 31°C. 160 mg/l Cl. pH 8.0.

#### MISCELLANEOUS SAMPLES:

Flowline Sample. Collected March 22/98 at 11:00 hrs. lagged from depth of 1407 metres. 92°F. 160 mg/l Cl. pH 9.0.

Flowline Sample. Collected March 22/98 at 20:15 hrs. lagged from depth of 1429 metres. 92°F. 160 mg/l Cl. pH 8.5.

Flowline Sample. Collected March 24/98 at 02:30 hrs. lagged from depth of 1471 metres. 92°F. 160 mg/l Cl. pH 9.0.

Flowline Sample. Collected March 24/98 at 13:30 hrs. at 1494 metres prior to running DST #3. 96°F. 160 mg/l Cl. pH 8.5.

\*All salinity measurements were done by Concord Drilling Fluids representative Garth Shewchuk.

