

**FINAL WELL REPORT**

**APACHE CANADA LTD.**

**APACHE PARAMOUNT LAC MANOIR C-34**

**Grid Area 67 DEG. 20 MIN/ 125 DEG. 00 MIN**

**DATE: Oct. 15, 2004**

**COMPANY REPRESENTATIVE: Greg D. Hladun**

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#### A. INTRODUCTION

Apache Canada Ltd. In partnership with Paramount Resources Ltd drilled a 945 meter exploratory well spudded on January 20, 2004 and finishing on February 23, 2004 to evaluate gas potential in the Mt. Clarke formation at a depth of 840 to 867 mKB.

The drilling contractor was Akita Drilling Rig #51 based out of Calgary, Alberta. The drilling rig used was a Conventional land rig. The rig had a 54 m<sup>3</sup> mud system and was equipped with two boilers. The well was drilled on Exploration License No 1995. Operating License No 1995 was issued to Apache Canada Ltd. on Dec 12/04. The well is located on Sahtu Settlement Lands, Block C-34.

The well is located approximately 80km north of Colville Lake. The exact co-ordinates of the well in NAD 27 are as follows:

Latitude: 67 deg 13 ', 02.171 "  
 Longitude: 125 deg, 06 ', 56.649 ".

The co-ordinates in NAD 83 are as follows:

Latitude 67 deg 13' 2.741"  
 Longitude 125 deg, 7' 3.941"

The "Bernie's" rat hole rig started moving onto the location January 14, 2003. Started digging cellar on Jan 19, 2004 and the conductor hole was commenced on Jan 20, 2003 at 11:00 hours. The 444.5 mm conductor hole was air drilled to a depth of 34 m. At this point the rat-hole rig got stuck in the hole and the decision was made to move the rig off the well and move in the drilling rig. Started rigging up Akita rig 51 on Jan 24, 2004. On January 27, 2004 Akita rig #51 began fishing and recovered the fish on Jan 28, 2004. On Jan 29, 2004 the conductor hole was started. The conductor hole was drilled with a 311 mm pilot bit and was opened to 445 mm with a 445 mm hole opener and a drill bit to a depth of 62m. Using the rat hole rig and the drilling rig to drill the mousehole, rathole and conductor hole took a total of 13 days. The conductor hole was dolomite with some limestone. The 5 joints of 339.7 mm X 101.71 kg/m K-55, LT&C conductor pipe were set with the shoe depth being at 61 m. The conductor pipe was cemented with 7.4m<sup>3</sup>(10 tonnes) of Artic Set cement + 0.5%D065 + 0.2%D046 + 1.0%D013 with good mud returns throughout the cement job and was displaced with 4.8m<sup>3</sup> fresh water. Returns of 0.5 m<sup>3</sup> contaminated drilling mud were obtained. The casing annulus was then topped up with an additional 7.5m<sup>3</sup>(10 tonnes) of artic set cement through a 25.4mm pipe from surface. The diverter was nippled up and function tested.

The conductor shoe was then drilled out and the 311 mm surface hole was spudded on Feb 6, 2004 at 21:45 hours using a directional drilling assembly and a water based gel mud. Surface hole was drilled to a total depth of 461m KB. No significant lost circulation was observed.

A total of 32 joints of 244.5 mm, 59.53 kg/m L-80 ERW casing was run to 451 m. The casing was cemented with 8.5 tonnes (7.5m<sup>3</sup>) of Dowell Schlumberger Arctic Set cement + 0.5% D065 + 0.2%D046 + 1.0%D013, followed by 17 tonnes(13.9m<sup>3</sup>) class "G" + 2.0% CaCl<sub>2</sub>. The cement was displaced with 17.7m<sup>3</sup> fresh water. The cement reached surface with 5m<sup>3</sup> good cement returns. Plug down was at 07:35hrs Feb 15, 2004.

A 279.4 mm x 244.5 mm, 21,000 kPa Cameron slip lock type IC-2, 11"x 9 5/8" 21000kPa casing bowl was installed onto the 244.5 mm casing and BOP's were installed and pressure tested. The annular preventor was pressure tested to 1,400 kPa low and 14,000 kPa high. The pipe rams, blind rams, Kelly cock, stabbing valve and downhole BOP valve were tested to 1,400 kPa low and 14,000 kPa high. The accumulator precharge bottles were checked and the accumulator function tested prior to drilling out. The cuttings from the conductor and surface hole were disposed of in a surface sump.

The float collar and shoe were drilled out with fresh water to a depth of 461m on February 17, 2004. A formation leak off test was then conducted at a depth of 461m and a gradient of 25.3kPa/m was established. The hole was then displaced to a distillate 822 oil base system. The production hole was drilled from 451m – 945m. The well was drilled ahead using a directional drilling assembly to control deviation in the wellbore. Total depth was reached on February 20, 2004. After total depth had been reached the open hole was logged by Schlumberger. Log run # 1 was an AIT/CNL/TLD/GR. Run #2 was an OBMI/DSI/EMS/GR.

After the logs were evaluated it was decided to case the well. A total of 78 joints of 177.8 mm, 43.16 kg/m, L-80 casing was run and landed at 945m. The casing was cemented from T.D to surface with 21 tonnes class G + 0.5% D065 + 0.2% D046 and 0.3 % D167. The slurry volume was 18.8m<sup>3</sup> at 1900 kg/m<sup>3</sup> and was displaced with 18.1m<sup>3</sup> fresh water. All of the preflush and a trace of cement were observed at surface. Full mud returns were obtained throughout the job. The casing was cut off and the wellhead installed. The well was then turned over to completions.

## B. GENERAL DATA

1. Well Name: Apache Paramount Lac Manoir C-34

Authority to Drill a Well No:1955

Exploration Agreement Number: Sahtu Settlement Lands Block C-34

Location: Unit: C Section: 34

Grid Area: 67 deg 20' 125 deg 00 '

Classification: Exploration

2. Well Location Area: Lac Manoir

Coordinates( NAD 27) Latitude: 67 deg 13' 02.171"

Longitude: 125 deg 06' 56.649 "

3. Unique Well Identifier: 300C346720125000

4. Operator Apache Canada Ltd. in conjunction with Paramount Resources Ltd

5. Contractor: Akita Drilling Rig #51

6. Drilling Unit: #51  
Land Rig

7. Position Keeping: Not Applicable, Land Rig

8. Support Craft: Trucking via Winter Road from Norman Wells / Fort Good Hope

9. Drilling Unit Performance: Surface spud to T.D. in 18 days

10. Difficulties and Delays:

- Fifteen days to drill rat hole, mouse hole and conductor due to rathole rig getting

stuck and moving drilling rig in to complete drilling.

11. Total Well Cost: \$5.0 M
12. Vertical well controlled with directional drilling equipment.

### C. SUMMARY OF DRILLING OPERATIONS

1. Elevations:  
Ground 622.83 m above sea level  
KB: 628.0 m above sea level  
KB To Casing Flange: 4.8 m
2. Total Depth:  
FTD: 945.0 m KB  
PBTD: 933.9 m KB  
TVD: 944.32.0 m KB
3. Date and Hour Spudded: Jan 20, 2004, 11:00 hrs
4. Date Drilling Completed: Feb 20, 2004, 09:30 hrs
5. Date of Rig Release: February 23, 2004, 24:00 hrs
6. Well status: Completed
7. Hole Sizes and Depths:  
Conductor Hole: 444.5 mm to 61 m KB  
Surface Hole: 311 mm to 451.0 m KB  
Main Hole: 216 mm to 945.0 m KB
8. Casing and Cementing Record:  
Conductor Hole: 444.5mm  
Casing Size: 339.7 mm  
Casing Weight: 101kg/m  
Casing Grade: K-55  
Casing Make: Ipsco  
Number of Joints: 5  
Thread: BT&C  
Depth Set: 61 m (KB)  
Cut Height: At Surface  
Cut off Depth: At Surface

Date Set:	February 4, 2004
Cement Volume:	10Tonnes
Cement Type:	Artic Set
Additives:	2.0 % CaCl2
Surface Hole:	311.0mm
Casing Size:	244.5 mm
Casing Weight:	59.53 kg/m
Casing Grade:	L-80
Casing Make:	Ipsco
Number of Joints:	32
Thread:	LT&C
Depth Set:	451.0 m (KB)
Cut Height:	At Surface
Date Set:	Feb 15, 2004
Cement Volume:	16 m3
Float Shoe Depth:	451.0 m
Cut Off Depth:	Surface
Cement Type:	3.0 m3 Arctic Set Cement followed by 12.8 m3 Class G cement
Additives:	Arctic Set 0.5% D-56 TIC 0.2% D-13 Class G 2.0% CaCl2
Cement Top:	Surface (m KB )
Casing Bowl Size:	279 mm X 244.5 mm X 21 MPa
Casing Bowl Make:	Cameron Type 'IC-2' Slip Lock
Production Hole:	216.0mm
Casing Size:	178.0 mm
Casing Weight:	43.16 kg/m
Casing Grade:	L-80
Casing Make:	Ipsco
Number of Joints:	78
Thread:	LT&C
Depth Set:	945.0 m (KB)
Cut Height:	At Surface
Date Set:	Feb 23, 2004
Cement Volume:	15.9 m3
Float Shoe Depth:	945.0 m
Float Collar Depth: (Top)	933.9
Cut Off Depth:	Surface
Cement Type:	18.1m3 Class "G"

Additives:	0.2% D-046
	0.5% D-065
	0.3% D-167
Cement Top:	Surface

9. Sidetracked Hole: N/A

10. Drilling Fluid:

Conductor Hole:	Gel - Chemical
Properties:	Viscosity: 140 sec/L
	Weight: 1150 kg/m <sup>3</sup>
	PH: 9.5.0
	Gels: 12 / 23
	PV / YP: 36 / 21.0

Surface Hole:	Gel - Chemical
Properties:	Viscosity: 50 sec/L
	Weight: 1080 kg/m <sup>3</sup>
	PH: 9.0
	Gels: 5.0 / 10.0
	PV / YP: 6 / 21.0

Main:	Distillate 822 Oil
Properties:	Viscosity: 75 sec/L
	Weight: 1100 kg/m <sup>3</sup>
	PH:
	Water loss: 9.0 cc
	Solids: 1.0
	Gels: 3 /5
	Filter Cake: 1.0
	PV / YP: 12.0 / 4.7

11. Fishing Operations: Fished for Air drill tools on conductor hole.  
None on main hole

12. Well Kicks and Well Control Operations: n/a

13. Formation Leak- off Tests:

Depth:	451 m
Fluid Density:	1000 kg/m <sup>3</sup>

A leak-off was performed and a gradient of 23.5kPa/m was established at a depth of 461m KB

14. Time Distribution:

<b>Nohga C-34</b>		
Date	Time	Activity
Jan 11, 2004		Started moving Akita camp to location
Jan 12, 2004		Rigged up camp
Jan 13, 2004		Finished rigging up camp and started moving rig from staging area to camp location
Jan 14, 2004		Started moving Bernie's rathole equipment to location
Jan 15, 2004		Moved Bernie's rathole equipment to location
Jan 16, 2004		Moved Bernie's rathole equipment to location
Jan 17, 2004		Moved Bernie's rathole equipment to location
Jan 18, 2004		Rigged up Bernie's equipment
Jan 19, 2004	00:00 – 24:00 hrs	Rigged up Bernie's rat hole rig and drilled 444mm conductor hole.
Jan 20-24, 2004		Rat hole rig stuck in hole at 34m. Move rig off location
Jan 25-27, 2004		Move and rig up Akita rig #51
Jan 28, 2004	00:00 – 24:00 hrs	Moved and rigged up Akita rig #51 from rack site to location
Jan 29, 2003	00:00 – 24:00 hrs	Fished for air drill tools left in hole by Bernie's rat hole rig
Jan 30, 2003	00:00 – 24:00 hrs	Repaired leak in cellar crib and reamed 444mm hole from 0-23m. Picked up 311mm drill bit
Jan 31, 2003	13:15 - 24:00hrs	Rig repairs. Reamed f/23-34m. Drilled f/34-42m. Tripped out and mixed LCM pills
Feb 1, 2004	00:00 – 05:00 hrs	Mixed and spotted LCM pills
	05:00 – 20:00 hrs	Reamed 311mm hole f/10-42m
	20:00 – 24:00 hrs	Drilled and reamed 311mm hole f/42-46m
Feb 2, 2004	00:00 – 13:00 hrs	Drilled and surveyed 311mm hole f/46-62m
	13:00 – 24:00 hrs	Tripped out and picked up 444mm hole opener. Opened

		hole f/20-56m
Feb 3, 2004	00:00 – 0630 hrs	Opened hole f/311mm to 444mm from 56-62m
	06:00 – 16:00 hrs	Tripped out and picked up 444mm drill bit. Reamed hole f/34-61m
	16:00 – 24:00 hrs	Tripped out and ran 5 jnts. new 339.7mm K-55 101.2kg/m casing. Landed at 61m
Feb 4, 2004	00:00 – 24:00 hrs	Conditioned hole and cemented w/ 10 tonne artic set cement. 0.5m3 contaminated mud returns. W.O.C.
Feb 5, 2004	00:00 – 09:30 hrs	Top filled conductor w/ 10 tonne artic set cement. W.O.C.
	09:30 – 18:30 hrs	Rigged up and tested diverter
	18:30 – 24:00 hrs	Cleaned tanks, picked up mud motor and drilled mouse hole
Feb 6, 2004	00:00 – 07:00 hrs	Picked up directional tools and tripped in hole
	07:00 – 20:00 hrs	Pressure tested (Waited on new HCR) diverter system
	20:00 – 24:00 hrs	Drilled out and drilled f/ 62-75m
Feb 7, 2004	00:00 – 24:00 hrs	Drilled 311mm hole f/75-132m.
Feb 8, 2004	00:00 – 24:00 hrs	Drilled f/132-222m
Feb 9, 2004	00:00 – 24:00 hrs	Drilled f/222-288m Tripped
Feb 10, 2004	00:00 – 10:30 hrs	Tripped in hole and cleaned to bottom from bridge at 247m
	10:30 – 24:00 hrs	Drilled f/288-295m. Thawed stand pipe (13 hrs) Circulated and conditioned mud
Feb 11, 2004	00:00 – 24:00 hrs	Drilled f/295-334m. Repaired rig 10 hrs
Feb 12, 2004	00:00 – 24:00 hrs	Drilled f/ 334-390m. Pump repairs 7 hrs.
Feb 13, 2004	00:00 – 24:00 hrs	Drilled f/390-444m. Wiper tripped @ 441m
Feb 14, 2004	00:00 – 02:30 hrs	Drilled f/444-451m
	02:30 – 24:00 hrs	Tripped out and ran 32 jnts. new 244.5mm 59.53kg/m L-80 LT&C casing. Landed at 451m KB.

Feb 15, 2004	00:00 – 08:00 hrs	Circulated and cemented casing w/8.5 tonne Artic Set cement and 17 tonne 0:1:0 class "G" + 2% CaCl2. 5m <sup>3</sup> good cement returns
	08:00 – 24:00 hrs	Waited on cement 4 hrs and headed up BOP
Feb 16, 2004	00:00 – 24:00 hrs	Head up BOP and pressure test
Feb 17, 2004	00:00 – 16:00 hrs	Tripped in hole and pressure tested.
	16:00 – 19:15 hrs	Drilled out. Drilled 215.9mm hole f/451-461m. Performed leak off test (gradient of 25.3kpa/m) Drilled f/461-466m
	19:15 – 24:00 hrs	Cleaned tanks and displaced hole to distillate 822 oil mud
Feb 18, 2004	00:00 – 03:45 hrs	Displaced hole to oil mud
	03:45 – 04:00 hrs	Drilled f/466-685m
Feb 19, 2004	00:00 – 24:00 hrs	Drilled f/685-872m. Raised mud density to 1060kg/m <sup>3</sup>
Feb 20, 2004	00:00 – 09:30 hrs	Drilled f/872-945m KB TD @ 09:30 hrs.
	09:30 – 24:00 hrs	Conditioned hole, wiper tripped and tripped out to log
Feb 21, 2004	00:00 – 02:30 hrs	Tripped out
	02:30 – 16:45 hrs	Logged w/Schlumberger. Run #1 AIT/TLD/CNL/LDT/GR. Run #2 OBMI/DSI/EMS/GR
	16:45 – 24:00 hrs	Tripped in hole. Circulated, Tripped out
Feb 22, 2004	00:00 – 24:00 hrs	Tripped out of hole and ran 78 jnts. new 177.8mm 43.16kg/m L-80 LT&C casing. Landed at 945mKB
Feb 23, 2004	00:00 – 03:15 hrs	Circulated and cemented w/18.8m <sup>3</sup> Class "G" cement + 0.5%D065 + 0.2%D046 + 0.3%D167
	03:15 – 10:30 hrs	Rigged out BOP and set slips
	10:30 – 24:00 hrs	Cleaned tanks and rigged out. Rig release at 24:00 hrs 2/23/2004

Time Break Down

Operation	Scheduled		Trouble	
	Hours	%	Hours	%
Rig Move	24.00	4.17		
Drilling	142.50	24.74		
Circulating	38.00	6.60	0.25	1.04
Tripping	54.50	9.46	1.00	4.17
Directional/Survey	13.25	2.30		
PU/LD DP/DC/TBG	13.25	2.30		
Lost Circulation	20.25	3.52	4.50	18.75
Reaming	11.50	2.00		
Logging & FEWD	11.00	1.91		
Run Csg/ RU & RD/ Test Csg	29.75	5.16		
Cementing	7.00	1.22	2.00	8.33
Drill out Cement	2.50	0.43		
NU/ND/ Bop Test/Drill	58.75	10.20		
Wait on Cement	19.00	3.30		
Rig Repair	33.50	5.82	13.25	55.21
Rig Maintenance	8.75	1.52		
Safety	3.75	0.65		
Other	84.75	14.72	3.00	12.50
Total	576.00	100.00	24.00	100.00

15. Deviation Survey: The bottom hole location is within 30 m well centre location.

16. Abandonment Plugs: n/a

17. Composite Well Record: See attached Well Logs

18. Completion Record:

Start Date: March 10, 2004

Finish Date: March 29, 2004

Contractor: Nabors 203

Completion Summary: See attached completions results

Final Well Configuration: See attached Stick Diagram

D: GEOLOGY

Geological Summary

Tops: See attached Geological Report summary, Page 16-1.

SAMPLE DESCRIPTIONS: See attached Geological Report, Page 19-1.

CORING RECORD: No coring performed.

GAS DETECTION REPORT: See attached Strip Log

DRILL STEM TESTS: No DST's performed.

**WELL EVALUATION:**

The following logs were run: (Example depths)

AIT/TLD/CNL/LDT/G: 945m – 451m

(GR/Neutron) (945M – 0m)

OBMI/DSI/EMS/GR: 945m – 451m

Hydrocarbon well log attached:

ANALYSES: See attached Geological report

MUD SALINITY: This well was drilled with a Distillate 822 oil base system and no further testing was done.

GAS, OIL, & WATER ANALYSES: No additional fluid analyses were conducted on this well.

FORMATION STIMULATION: See attached Post Job Frac Analyses:

FORMATION AND TEST RESULTS: See attached Completion reports

DETAILED TEST PRESSURE DATA READINGS: See attached subsurface pressure reports.

**E. ENVIRONMENTAL WELL ANALYSIS.**

The surface hole cuttings were disposed of via the mix-bury-cover method in an on-site sump. This was possible because a water based mud was used. The production hole was drilled with a distillate-based mud and contained salt from the naturally occurring salt formation that was drilled in the production hole. The production hole cuttings, which contained distillate and salt were mixed with sawdust, transported to Alberta by truck and barge and were disposed of in a licensed waste disposal facility. The total amount of cuttings to be transported was 97.0 tonnes of drill cuttings mixed with sawdust.

In addition, fluid was derived from snow melt obtained from scraping the lease. The amount of fluid disposed of was 103.8 m<sup>3</sup>. This fluid was also trucked and barged to Alberta and disposed of in a licensed waste disposal facility.

F. APPENDICES TO WELL HISTORY

Geological Report

Bit Record

Completion Reports

Tour Sheets

Surface Survey