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MAY 22 2012

Form 3160-3  
(August 2007)

Farmington Field Office  
UNITED STATES OF LAND MANAGEMENT  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

FORM APPROVED  
OMB No. 1004-0137  
Expires July 31, 2010

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.  
NM NM 109386

6. If Indian, Allottee or Tribe Name  
N/A RCVD NOV 1 '12

7. If Unit or CA Agreement, Name and No.  
OIL CONS. DIV.

8. Lease Name and Well No.  
Lybrook H03-2206 01A DIST. 3

9. API Well No.  
30-043-21123

10. Field and Pool, or Exploratory  
Wildcat Gallup - Lybrook Gallup

11. Sec., T. R. M. or Blk. and Survey or Area  
Section 3, T22N, R6W NMPM

1a. Type of work:  DRILL  REENTER

1b. Type of Well:  Oil Well  Gas Well  Other  Single Zone  Multiple Zone

2. Name of Operator Encana Oil & Gas (USA) Inc. **CONFIDENTIAL**

3a. Address 370 17th Street, Suite 1700  
Denver, CO 80202  
3b. Phone No. (include area code)  
720-876-3989

4. Location of Well (Report location clearly and in accordance with any State requirements. \*)  
At surface 2325' FNL and 138' FEL Section 3, T22N, R6W  
At proposed prod. zone 2325' FNL and 330' FWL Section 3, 22N, R6W

14. Distance in miles and direction from nearest town or post office\*  
+/- 56.7 miles S of Bloomfield, NM  
12. County or Parish Sandoval  
13. State NM

15. Distance from proposed\* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)  
BHL is 138' from east lease line  
16. No. of acres in lease  
NM NM 109386: 1,286.3  
17. Spacing Unit dedicated to this well  
160 acres (S2N2 Sec. 3)

18. Distance from proposed location\* to nearest well, drilling, completed, applied for, on this lease, ft.  
Maddox F-A-1 is 3000' north of wellbore  
19. Proposed Depth  
6675' TVD/10105' MD  
20. BLM/BIA Bond No. on file  
COB-000235

21. Elevations (Show whether DF, KDB, RT, GL, etc.)  
7052' GL, 7065' KB  
22. Approximate date work will start\*  
10/01/2012  
23. Estimated duration  
45 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, must be attached to this form:

- 1. Well plat certified by a registered surveyor.
- 2. A Drilling Plan.
- 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
- 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- 5. Operator certification
- 6. Such other site specific information and/or plans as may be required by the BLM.

25. Signature *Brenda R. Linster*  
Name (Printed/Typed) Brenda R. Linster  
Date 05-21-12  
Title Regulatory Advisor

Approved by *[Signature]*  
Name (Printed/Typed) [Blank]  
Date 10/30/12  
Title AFM  
Office FFO

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.  
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

\*(Instructions on page 2)

BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATION ON FEDERAL AND INDIAN LANDS

A COMPLETE C-144 MUST BE SUBMITTED TO AND APPROVED BY THE NMOCD FOR: A PIT, CLOSED LOOP SYSTEM, BELOW GRADE TANK, OR PROPOSED ALTERNATIVE METHOD, PURSUANT TO NMOCD PART 19.15.17, PRIOR TO THE USE OR CONSTRUCTION OF THE ABOVE APPLICATIONS.

Hold C104  
for Directional Survey and "As Drilled" plat

And location of Swellable packers \*

NMOCD

PV JAN 04 2013 ca

This action is subject to technical and procedural review pursuant to 43 CFR 3165.3 and appeal pursuant to 43 CFR 3165.4

NOTIFY AZTEC OCD 24 HRS PRIOR TO CASING & CEMENT

DRILLING OPERATIONS AUTHORIZED ARE SUBJECT TO COMPLIANCE WITH ATTACHED "GENERAL REQUIREMENTS".

Hold C104  
for Directional Survey and "As Drilled" plat

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MAY 22 2012

District I  
1625 N. French Drive, Hobbs, NM 88240  
Phone: (575) 393-6161 Fax: (575) 393-0720

District II  
811 S. First Street, Artesia, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720

District III  
1000 Rio Brazos Road, Aztec, NM 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170

District IV  
1220 S. St. Francis Drive, Santa Fe, NM 87505  
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico  
Energy, Minerals & Natural Resources Department

Form C-102  
Revised August 1, 2011

Submit one copy to  
Appropriate District Office

OIL CONSERVATION DIVISION

1220 South St. Francis Drive  
Santa Fe, NM 87505

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number <b>30-043-3123</b>		*Pool Code <b>42289</b>	*Pool Name <b>Lybrook Gallup</b>
*Property Code <b>39534</b>	*Property Name <b>LYBROOK H03-2205</b>		*Well Number <b>01H</b>
*OGRJD No. <b>28327</b>	*Operator Name <b>ENCANA OIL &amp; GAS (USA) INC.</b>		*Elevation <b>7052'</b>

<sup>10</sup> Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	3	22N	6W		2325	NORTH	138	EAST	SANDOVAL

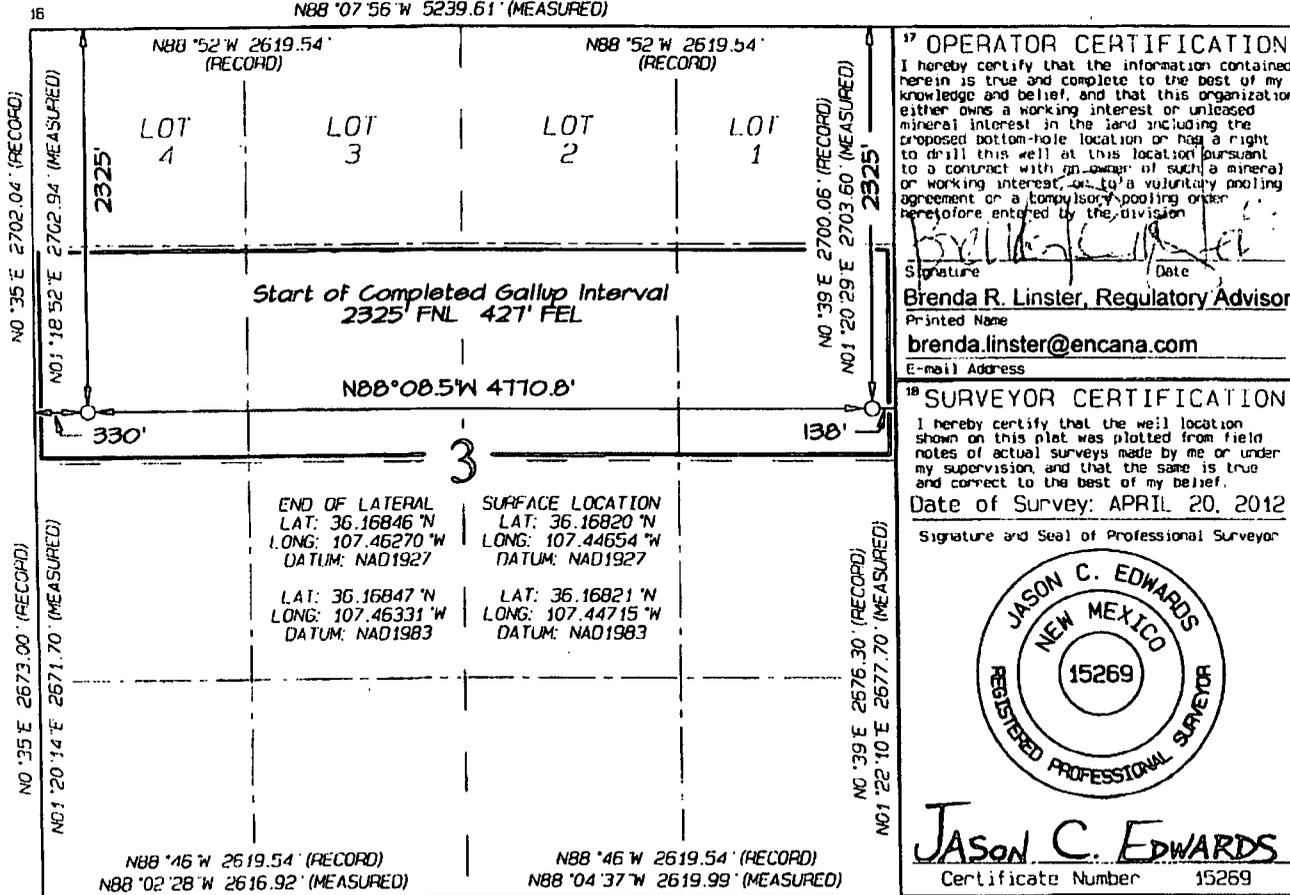
<sup>11</sup> Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	3	22N	6W		2325	NORTH	330	WEST	SANDOVAL

<sup>12</sup> Dedicated Acres <b>160.0 Acres - (5/2 N/2)</b>	<sup>13</sup> Joint or Infill	<sup>14</sup> Consolidation Code	<sup>15</sup> Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

N88°07'56"W 5239.61' (MEASURED)



**Directions from the Intersection of US Hwy 550 & US Hwy 64**  
**in Bloomfield, NM to Encana Oil & Gas (USA) Inc. Lybrook H03-2206 01H**  
**2325' ENE & 138' EEL, Section 3, T22N, R6W, N.M.P.M., Sandoval County, NM**

**Latitude: 36.16821°N Longitude: 107.44715°W Datum: NAD1983**

From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM, travel Southerly on US Hwy 550 for 53.6 miles to Mile Marker 97.7;

Go right (South-easterly) for 3.1 miles to new access on right-hand side of existing roadway which continues for 415' to staked location.

**encana.**

*natural gas*

**SAN JUAN COUNTY,  
NEW MEXICO**

-  Abandoned
-  Abandoned Gas
-  Abandoned Oil
-  Dry Hole
-  GAS
-  Injection
-  OIL

1 inch = 2,000 feet

FEDERAL-26

GALLO CANYON

27  
23N  
6W

26  
GULF-FEDERAL

WARNER-GOVT

33

34

35

DOME ETAL FED-33 1

MADDOX F-A-1

Lybrook A03-2206 01H

4

Lybrook H03-2206 01H

3

2

22N  
6W

9

10

11

12

EL PASO-FEDERAL

0.050.1 0.2 Miles



**Lybrook H03-2206 01H**  
**SHL: SENE Section 3, T22N, R6W**  
**2325 FNL and 138 FEL**  
**BHL: SWNW Section 3, T22N, R6W**  
**2325 FNL and 330 FWL**  
**Sandoval County, New Mexico**  
**Lease Number: NM NM 109386**

**Encana Oil & Gas (USA) Inc.**  
**Drilling Plan**

**1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)**

The estimated tops of important geologic markers are as follows:

<u>Formation</u>	<u>Depth (TVD)</u>
Ojo Alamo Ss.	1425'
Kirtland	1544'
Fruitland Coal	1627'
Pictured Cliffs	1933'
Lewis	2021'
Cliffhouse	2714'
Menefee	3449'
Point Lookout	4173'
Mancos	4390'
Gallup	5212'
Juana Lopez	5836'
Lower Carlile	5953'
Greenhorn	6158'
Graneros	6216'
Dakota	6234'
Morrison	6575'

The referenced surface elevation is 7052', KB 7065'

**2. ESTIMATED DEPTH OF POTENTIAL WATER, OIL, GAS, & OTHER MINERAL BEARING FORMATIONS**

<u>Substance</u>	<u>Formation</u>	<u>Depth (TVD)</u>
Gas	Fruitland Coal	1627'
Gas	Pictured Cliffs	1933'
Gas	Cliffhouse	2714'
Gas	Point Lookout	4173'
Oil/Gas	Mancos	4390'
Oil/Gas	Dakota	6234'

All shows of fresh water and minerals will be reported and protected.

**3. PRESSURE CONTROL**

- a) Pressure control equipment and configuration will be designed to meet 2M standards.
- b) Working pressure on rams and BOPE will be 3,000 psi
- c) Function test and visual inspection of the BOP will be conducted daily and noted in the IADC Daily Drilling Report.
- d) The Annular BOP will be pressure tested to a minimum of 50 percent of its rated working pressure.
- e) Blind and Pipe Rams/BOP will be tested against a test plug to either 70 percent of the casings internal yield pressure or 100 percent of rated working pressure.

**Lybrook H03-2206 01H**

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**Sandoval County, New Mexico**

**Lease Number: NM NM 109386**

- f) Pressure tests are required before drilling out from under all casing strings set and cemented in place.
- g) BOP controls must be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned.
- h) BOP testing procedures and testing frequency will conform to Onshore Order No. 2.
- i) BOP remote controls shall be located on the rig floor at a location readily accessible to the driller. Master controls shall be on the ground at the accumulator and shall have the capability to function all preventers.
- j) The kill line shall be 2-inch minimum and contain two kill line valves, one of which shall be a check valve.
- k) The choke line shall be a 2-inch minimum and contain two choke line valves (2-inch minimum).
- l) The choke and manifold shall contain two adjustable chokes.
- m) Hand wheels shall be installed on all ram preventers.
- n) Safety valves and wrenches (with subs for drill string connections) shall be available on the rig floor at all times.
- o) Inside BOP or float sub shall also be available on the rig floor at all times.

Proposed BOP and choke manifold arrangements are attached.

**4. CASING & CEMENTING PROGRAM**

The proposed casing and cementing program has been designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use. The casing setting depth shall be calculated to position the casing seat opposite a competent formation which will contain the maximum pressure to which it will be exposed during normal drilling operations. All indications of useable water shall be reported.

a) The proposed casing design is as follows:

Casing	Depth	Hole Size	Csg Size	Weight	Grade
Conductor	0-60'	26"	20"	94#	H40, STC New
Surface	0'-500'	17 1/2"	13 3/8"	48#	H40, STC New
Intermediate	0'-4700'	12 1/4"	9 5/8"	40#	J55, STC New
Production Liner	4500'-10105'	8 1/2"	5 1/2"	17#	B80*, LTC New

Casing String				Casing Strength Properties			Minimum Design Factors		
Size	Weight (lb/ft)	Grade	Connection	Collapse (psi)	Burst (psi)	Tensile (1000lb)	Collapse	Burst	Tension
13 3/8"	48	H40	STC	740	1730	322	1.125	1.1	1.5
9 5/8"	40	J55	STC	2570	3950	452	1.125	1.1	1.5
5 1/2"	17	B80	LTC	6290	7740	320	1.125	1.1	1.5

\*B80 pipe specifications are attached

Casing design is subject to revision based on geologic conditions encountered.

All casing strings below the conductor shall be pressure tested to 0.22 psi per foot of casing string length or 1,500 psi, whichever is greater, but not to exceed 70 percent of the minimum internal yield. If pressure declines more than 10 percent in 30 minutes, corrective action shall be taken.

**Lybrook H03-2206 01H**

**SHL: SENE Section 3, T22N, R6W  
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**Sandoval County, New Mexico**

**Lease Number: NM NM 109386**

b) The proposed cementing program is as follows:

Top plugs shall be used to reduce contamination of cement by displacement fluid. A bottom plug or other acceptable technique, such as a pre-flush fluid, inner string cement method, etc. shall be utilized to help isolate the cement from contamination by the mud fluid being displaced ahead of the cement slurry.

Casing	Depth	Cement Volume (sacks)	Cement Type&Yield	Designed TOC	Centralizers
Conductor	60'	80sk	Redi-mix Construction Grade Cement	Surface	None
Surface	500'	291sk	Type III Cement + 1% CaCl + 0.25lb/sk Cello Flake + 0.2% FL, 14.6ppg, 1.38cuf/sk	Surface	1 per joint on bottom 3 joints
Intermediate	4700'	50% open hole excess Lead:923sk Tail: 182sk	Lead: PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuf/sk Tail: Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuf/sk	Surface	1 per joint for bottom 3 joints, 1 every 3 joints for remaining joints
Production Liner*	4500'-10105'	None – External casing packers	N/A	N/A	N/A

\*Production liner clarification: Utilizing external swell casing packer system for zonal isolation will not use cement in the production liner.

Actual volumes will be calculated and determined by conditions onsite. All cement slurries will meet or exceed minimum BLM and New Mexico Oil Conservation Division requirements. Slurries used will be the slurries listed above or equivalent slurries depending on service provider selected. Cement yields may change depending on slurries selected.

All waiting on cement times shall be a minimum of 8 hours or adequate to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

**5. WELL PLAN & DIRECTIONAL DRILLING PROGRAM**

The proposed well will be drilled in two phases. A pilot hole will be drilled in the first phase, followed by kicking off a horizontal lateral in the existing wellbore in the second phase. The intent of drilling a pilot hole is to obtain open hole log and core data. The intent of the second phase of the well is to plug back the pilot hole with cement to the kick off point. After plugging back, the plan is to drill a horizontal lateral from the kick off point in the existing wellbore to the proposed bottom hole location.

Directional plans are attached.

**Lybrook H03-2206 01H**  
**SHL: SENE Section 3, T22N, R6W**  
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**Sandoval County, New Mexico**  
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Well Phase	Description	Proposed Depth (TVD/MD)	Formation
1	Vertical Pilot Hole	6675'/6675'	Morrison
2	Horizontal Lateral	5449'/10105'	Gallup

**Proposed Plug Back Procedure:**

TOPS: TVD  
 KOP 4800'  
 Graneros Shale 6216'  
 Dakota 6234'

Set 2 cement plugs in 8 1/2" hole  
 Plug A: Bottom plug 100' over Graneros  
 Plug B: Kick plug at KOP

**Plug A**

1. TIH to TD of vertical pilot hole at 6675'
2. Spot 280' cement plug from 6395' - 6675'
  - a. 80sx of Class C cement with 1% CaCl + 0.25#/sk celloflake + 0.2% FL (1.38ft<sup>3</sup>/sk yield, 14.6 ppg)
  - b. Pump displacement and 10 bbl spacer
3. Pull uphole 280' and reverse out
4. Spot 280' cement plug from 6115' - 6395'
  - a. 80 sx of Class C cement with 1% CaCl + 0.25#/sk celloflake + 0.2% FL (1.38ft<sup>3</sup>/sk yield, 14.6 ppg)
  - b. Pump displacement
5. Pull uphole and reverse out
6. Pump bottoms up 2 times, pull uphole
7. TIH and tag plug, proceed when cement is solid
8. Fill hole and move uphole to spot kick plug

**Plug B**

1. Spot 300' kick plug from 4700' - 5000'
  - a. 78sx of Class C cement (1.52ft<sup>3</sup>/sk yield, 15.7 ppg)
  - b. Spot tuned spacer
2. Pull uphole and reverse out
3. Pump bottoms up 2 times, pull uphole
4. Tag plug, drill ahead to KOP when cement is solid

**6. DRILLING FLUIDS PROGRAM**

a) Phase 1, Vertical Pilot Hole:

Hole Size (in)	TVD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
26"	0-60'	Fresh Water	8.3-9.2	38-100	4-28
17 1/2"	0-500'	Fresh Water	8.4-8.6	60-70	NC
12 1/4"	500-4700'	Fresh Water LSND	8.5-8.8	40-50	8-10
8 1/2"	4700-6675'	Fresh Water LSND	8.5-8.8	40-50	8-10

**Lybrook H03-2206 01H**

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**Sandoval County, New Mexico**

**Lease Number: NM NM 109386**

b) Phase 2, Kick off to Horizontal Lateral:

Hole Size (in)	TVD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
8 1/2"	4800' (KOP)- 10105'	Synthetic Oil Based Mud	8.6-9.0	15-25	<15

- c) There will be sufficient mud on location to control a blowout should one occur. Mud flow and volume will be monitored both visually and with electronic pit volume totalizers. Mud tests shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.
- d) A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals, including fresh water and oil-based operations. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystems, Inc. The location will be lined in accordance with the Surface Use Plan of Operations.

**7. TESTING, CORING and LOGGING**

- a) Drill Stem Testing – None anticipated
- b) Coring – None planned at this time.
- c) Mud Logging – Mud loggers will be on location from Intermediate Casing to TD.
- d) Logging – See Below

Open Hole:

Triple combo with Spectral Gamma TD to intermediate casing  
Specialty logs will be decided real time by onsite geologists

Cased Hole:

CBL/CCCL/GR/VDL will be run as needed for perforating control

**8. ABNORMAL PRESSURES & HYDROGEN SULFIDE**

The anticipated bottom hole pressure is +/- 3124 psi based on a 9.0 ppg at 6675' TVD of the vertical pilot hole. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H<sub>2</sub>S is encountered, the guidelines in Onshore Order No. 6 will be followed.

**9. ANTICIPATED START DATE AND DURATION OF OPERATIONS**

Drilling is estimated to commence on October 1, 2012. It is anticipated that completion operations will begin within 30 days after the well has been drilled depending on fracture treatment schedules with various pumping service companies.

It is anticipated that the drilling of this well will take approximately 45 days.

LOC: Sec 3-T22N-R6W  
 County: Sandoval  
 WELL: Lybrook H03-2206-#01H

**Encana Natural Gas  
 New Mexico Mancos Test  
 WELL SUMMARY**



ENG: J. Fox/A. 4/11/12  
 RIG:  
 GLE: 7052  
 RKBE:

MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH		HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			TVD	MD				
			60	60'	26	20" 94# 80sx Type I Neat 48.8ppg cmt	Fresh wtr 8.3-9.2	
Surveys After csg is run	None	Ojo Alamo Kirtland Shale	1,425 1,544		17 1/2	13 3/8" 48ppf H40 STC	Fresh wtr 8.4-8.6	Vertical <1°
			500	500		TOC @ surface		
Surveys every 500'	No OH logs  Mud logger onsite	Fruitland Coal  Pictured Cliffs Ss Lewis Shale  Cliffhouse Ss Menefee Fn Point Lookout Ss Mancos Sh	1627 1933 2021  2714 3449 4173 4390 4700		12 1/4	9 5/8" 40ppf J55 STC	Fresh Wtr 8.5-8.8	Vertical <1°
			4700	4700		TOC @ surface		
Surveys every 500' Gyro at CP MWD Gamma Directional	Triple Combo	KICK OFF PT   Mancos Silt  Gallup Top horz target Base Gallup	4800   4943  5212 5478 5523		8 1/2	5 1/2" 17ppf I/L80 LTC  Running external swellable csg packers for isolation of prod string  200' overlap at liner top	Fresh Wtr LSND-in pilot 8.5-8.8  Switch to OBM at K/O 8.6-9.0	KOP 4800 10 deg/100'   25deg updip 5449' TVD TD = 10105' MD
				5974		4130' Lateral	8.6-9.0 OBM	

**NOTES:**

- 1) Drill with 26" bit to 60', set 20" 94# conductor pipe
- 2) Drill surface to 500', R&C 13 3/8" casing
- 3) N/U BOP and surface equipment
- 4) Drill to 4700', 12 1/4" hole size
- 5) R&C 9 5/8" casing, circ cmt 50' into sur csg shoe
- 6) Drill 8 1/2" hole to KOP, switch to OBM
- 7) PU directional tools and start curve at 10deg/100' build rate
- 8) If drill curve without hole issues, omit contingent csg string and proceed with 8 1/2" bit to landing depth
- 9) Land at 90deg, drill 4130' lateral to 10105', run 5 1/2" liner with external swellable csg packers



# Boomerang Tube LLC

## CASING (OR) TUBING DESCRIPTION AND PERFORMANCE PROPERTIES

Pipe Outside Diameter (ins)	_____	5.500
Pipe Wall Thickness (ins)	_____	0.304
Nominal Weight Per Foot (lbs)	_____	17.00
Thread Name	_____	Long Thread CSG
Grade Name	_____	B-80
Pipe Minimum Yield (psi)	_____	80,000
Pipe Minimum Ultimate (psi)	_____	90,000
Coupling Minimum Yield (psi)	_____	80,000
Coupling Minimum Ultimate (psi)	_____	100,000
Coupling or Joint Outside Diameter (ins)	_____	6.050
Drift Diameter (ins)	_____	4.767
Plain End Weight per Foot (lbs)	_____	16.89
Joint Strength (lbs)	_____	320,000
Internal Yield (psi)	_____	7,740
Collapse Rating (psi)	_____	6,290

## MAXIMUM DEPTH/LENGTH BASED ON MUD WTS & SAFETY FACTORS

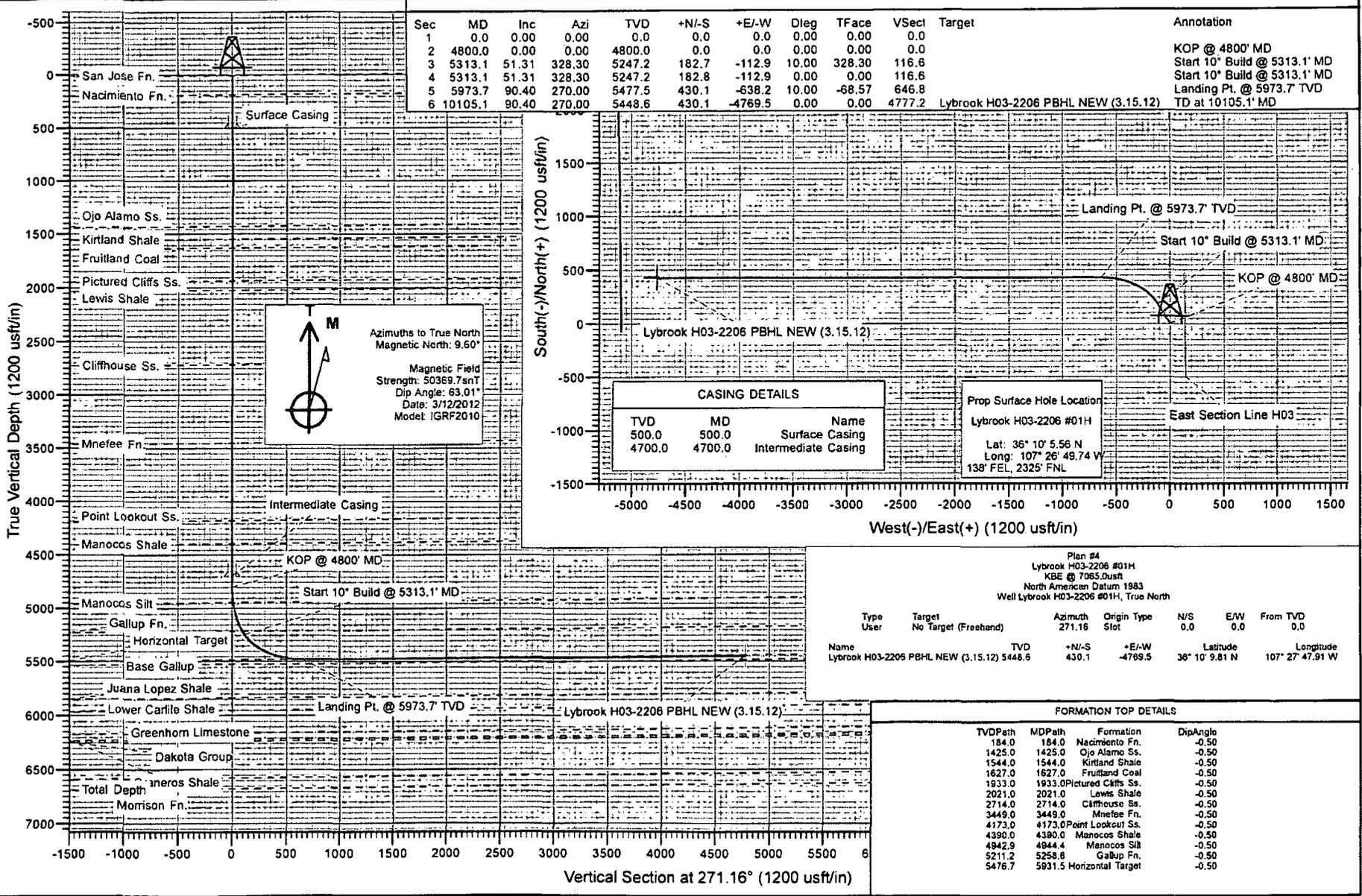
Drilling Mud Weight (ppg)	_____	9.625
Tension Safety Factor	_____	1.80
Maximum Tension Length (ft)	_____	10,460
Internal Yield Safety Factor	_____	1.10
Maximum Depth for Internal Yield (ft)	_____	14,070
Collapse Safety Factor	_____	1.125
Maximum Collapse Depth (ft)	_____	11,180

## API RELATED VALUES and INTERMEDIATE CALCULATION RESULTS

Coupling Thread Fracture Strength	_____	633,000
Pipe Thread Fracture Strength (lbs)	_____	320,000
Pipe Body Plain End Yield (lbs)	_____	397,000
Round Thread Pull-Out (lbs)	_____	335,000
Minimum Make-up Torque (ft-lbs)	_____	2,510
Nominal Make-up Torque (ft-lbs)	_____	3,350
Maximum Make-up Torque (ft-lbs)	_____	4,190
Coupling Internal Yield (psi)	_____	9,880
Pipe Body Internal Yield (psi)	_____	7,740
Leak @ E1 or E7 plane (psi)	_____	13,160
Pipe Hydrostatic Test Pressure @ 80 % SMYS	_____	7,100



Project: Sandoval County, NM  
 Site: Lybrook  
 Well: Lybrook H03-2206 #01H  
 Wellbore: HZ  
 Design: Plan #4



Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	V Sect	Target	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0		
2	4800.0	0.00	0.00	4800.0	0.0	0.0	0.00	0.00	0.0		KOP @ 4800' MD
3	5313.1	51.31	328.30	5247.2	182.7	-112.9	10.00	328.30	116.6		Start 10' Build @ 5313.1' MD
4	5313.1	51.31	328.30	5247.2	182.8	-112.9	0.00	0.00	116.6		Start 10' Build @ 5313.1' MD
5	5973.7	90.40	270.00	5477.5	430.1	-638.2	10.00	-68.57	646.8		Landing Pt. @ 5973.7' TVD
6	10105.1	90.40	270.00	5448.6	430.1	-4769.5	0.00	0.00	4777.2		TD at 10105.1' MD

CASING DETAILS		
TVD	MD	Name
500.0	500.0	Surface Casing
4700.0	4700.0	Intermediate Casing

Prop Surface Hole Location  
 Lybrook H03-2206 #01H  
 Lat: 36° 10' 5.56 N  
 Long: 107° 26' 49.74 W  
 138' FEL, 2325' FNL

Type	Target	Azimuth	Origin	Type	N/S	E/W	From TVD
User	No Target (Freehand)	271.16	Slot		0.0	0.0	0.0

Name	TVD	+N-S	+E-W	Latitude	Longitude
Lybrook H03-2206 PBHL NEW (3.15.12)	3448.6	430.1	-4769.5	36° 10' 9.81 N	107° 27' 47.91 W

FORMATION TOP DETAILS			
TVDPath	MDPath	Formation	DipAngle
184.0	184.0	Nacimiento Fn.	-0.50
1425.0	1425.0	Ojo Alamo Ss.	-0.50
1544.0	1544.0	Kirtland Shale	-0.50
1627.0	1627.0	Fruitland Coal	-0.50
1933.0	1933.0	Pictured Cliffs Ss.	-0.50
2021.0	2021.0	Lewis Shale	-0.50
2714.0	2714.0	Cliffhouse Ss.	-0.50
3449.0	3449.0	Mnefee Fn.	-0.50
4173.0	4173.0	Point Lookout Ss.	-0.50
4390.0	4390.0	Manoccos Shale	-0.50
4942.9	4944.4	Manoccos Silt	-0.50
5211.2	5258.8	Gallup Fn.	-0.50
5476.7	5931.5	Horizontal Target	-0.50

## Cathedral Energy Services Planning Report

**Database:** USA EDM 5000 Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** Sandoval County, NM  
**Site:** Lybrook  
**Well:** Lybrook H03-2206 #01H  
**Wellbore:** HZ  
**Design:** Plan #4

**Local Co-ordinate Reference:** Well Lybrook H03-2206 #01H  
**TVD Reference:** KBE @ 7065.0usft  
**MD Reference:** KBE @ 7065.0usft  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

<b>Project</b>	Sandoval County, NM		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	New Mexico Central Zone		

<b>Site</b>	Lybrook				
<b>Site Position:</b>		<b>Northing:</b>	1,882,672.69 usft	<b>Latitude:</b>	36° 10' 5.56 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,287,066.33 usft	<b>Longitude:</b>	107° 26' 49.74 W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16"	<b>Grid Convergence:</b>	-0.71 °

<b>Well</b>	Lybrook H03-2206 #01H					
<b>Well Position</b>	<b>+N-S</b>	0.0 usft	<b>Northing:</b>	1,882,672.69 usft	<b>Latitude:</b>	36° 10' 5.56 N
	<b>+E-W</b>	0.0 usft	<b>Easting:</b>	1,287,066.33 usft	<b>Longitude:</b>	107° 26' 49.74 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	7,052.0 usft

<b>Wellbore</b>	HZ				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b>	<b>Dip Angle</b>	<b>Field Strength</b>
	IGRF2010	3/12/2012	(°)	(°)	(nT)
			9.60	63.01	50,370

<b>Design</b>	Plan #4			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N-S</b>	<b>+E-W</b>	<b>Direction</b>
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	271.16

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,313.1	51.31	328.30	5,247.2	182.7	-112.9	10.00	10.00	0.00	328.30	
5,313.1	51.31	328.30	5,247.2	182.8	-112.9	0.00	0.00	0.00	0.00	
5,973.7	90.40	270.00	5,477.5	430.1	-638.2	10.00	5.92	-8.83	-68.57	
10,105.1	90.40	270.00	5,448.6	430.1	-4,769.5	0.00	0.00	0.00	0.00	Lybrook H03-2206 PE

## Cathedral Energy Services Planning Report

**Database:** USA EDM 5000 Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** Sandoval County, NM  
**Site:** Lybrook  
**Well:** Lybrook H03-2206 #01H  
**Wellbore:** HZ  
**Design:** Plan #4

**Local Co-ordinate Reference:** Well Lybrook H03-2206 #01H  
**TVD Reference:** KBE @ 7065.0usft  
**MD Reference:** KBE @ 7065.0usft  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
184.0	0.00	0.00	184.0	0.0	0.0	0.0	0.00	0.00	Nacimiento Fn.
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	Surface Casing
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,425.0	0.00	0.00	1,425.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,544.0	0.00	0.00	1,544.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,627.0	0.00	0.00	1,627.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
1,933.0	0.00	0.00	1,933.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,021.0	0.00	0.00	2,021.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	
2,714.0	0.00	0.00	2,714.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	
3,449.0	0.00	0.00	3,449.0	0.0	0.0	0.0	0.00	0.00	Mnefee Fn.
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	
4,173.0	0.00	0.00	4,173.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	

## Cathedral Energy Services Planning Report

**Database:** USA EDM 5000 Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** Sandoval County, NM  
**Site:** Lybrook  
**Well:** Lybrook H03-2206 #01H  
**Wellbore:** HZ  
**Design:** Plan #4

**Local Co-ordinate Reference:** Well Lybrook H03-2206 #01H  
**TVD Reference:** KBE @ 7065.0usft  
**MD Reference:** KBE @ 7065.0usft  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	
4,390.0	0.00	0.00	4,390.0	0.0	0.0	0.0	0.00	0.00	Manocos Shale
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	Intermediate Casing
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4800' MD
4,900.0	10.00	328.30	4,899.5	7.4	-4.6	4.7	10.00	10.00	
4,944.4	14.44	328.30	4,942.9	15.4	-9.5	9.8	10.00	10.00	Manocos Silt
5,000.0	20.00	328.30	4,996.0	29.4	-18.2	18.8	10.00	10.00	
5,100.0	30.00	328.30	5,086.5	65.3	-40.3	41.7	10.00	10.00	
5,200.0	40.00	328.30	5,168.3	114.0	-70.4	72.7	10.00	10.00	
5,258.6	45.86	328.30	5,211.2	148.0	-91.4	94.4	10.00	10.00	Gallup Fn.
5,300.0	50.00	328.30	5,238.9	174.1	-107.6	111.1	10.00	10.00	
5,313.1	51.31	328.30	5,247.2	182.8	-112.9	116.6	9.97	9.97	Start 10° Build @ 5313.1' MD
5,400.0	54.91	318.40	5,299.5	238.3	-154.4	159.2	10.00	4.14	
5,500.0	59.95	308.14	5,353.4	295.8	-215.7	221.7	10.00	5.04	
5,600.0	65.70	298.94	5,399.1	344.7	-289.9	296.8	10.00	5.75	
5,700.0	71.96	290.57	5,435.3	383.5	-374.5	382.2	10.00	6.26	
5,800.0	78.55	282.79	5,460.7	411.1	-467.0	475.3	10.00	6.59	
5,900.0	85.34	275.37	5,474.7	428.7	-564.7	573.2	10.00	6.79	
5,931.5	87.50	273.07	5,476.7	429.0	-596.0	604.6	10.00	6.86	Horizontal Target
5,973.7	90.40	270.00	5,477.5	430.1	-638.2	646.8	10.00	6.87	Landing Pt. @ 5973.7' TVD
6,000.0	90.40	270.00	5,477.3	430.1	-664.5	673.1	0.00	0.00	
6,100.0	90.40	270.00	5,476.6	430.1	-764.5	773.0	0.00	0.00	
6,200.0	90.40	270.00	5,475.9	430.1	-864.5	873.0	0.00	0.00	
6,300.0	90.40	270.00	5,475.2	430.1	-964.5	973.0	0.00	0.00	
6,400.0	90.40	270.00	5,474.5	430.1	-1,064.5	1,073.0	0.00	0.00	
6,500.0	90.40	270.00	5,473.8	430.1	-1,164.5	1,173.0	0.00	0.00	
6,600.0	90.40	270.00	5,473.1	430.1	-1,264.5	1,272.9	0.00	0.00	
6,700.0	90.40	270.00	5,472.4	430.1	-1,364.5	1,372.9	0.00	0.00	
6,800.0	90.40	270.00	5,471.7	430.1	-1,464.5	1,472.9	0.00	0.00	
6,900.0	90.40	270.00	5,471.0	430.1	-1,564.4	1,572.9	0.00	0.00	
7,000.0	90.40	270.00	5,470.3	430.1	-1,664.4	1,672.8	0.00	0.00	
7,100.0	90.40	270.00	5,469.6	430.1	-1,764.4	1,772.8	0.00	0.00	
7,200.0	90.40	270.00	5,468.9	430.1	-1,864.4	1,872.8	0.00	0.00	
7,300.0	90.40	270.00	5,468.2	430.1	-1,964.4	1,972.8	0.00	0.00	
7,400.0	90.40	270.00	5,467.5	430.1	-2,064.4	2,072.7	0.00	0.00	
7,500.0	90.40	270.00	5,466.8	430.1	-2,164.4	2,172.7	0.00	0.00	
7,600.0	90.40	270.00	5,466.1	430.1	-2,264.4	2,272.7	0.00	0.00	
7,700.0	90.40	270.00	5,465.4	430.1	-2,364.4	2,372.7	0.00	0.00	
7,800.0	90.40	270.00	5,464.7	430.1	-2,464.4	2,472.7	0.00	0.00	
7,900.0	90.40	270.00	5,464.0	430.1	-2,564.4	2,572.6	0.00	0.00	
8,000.0	90.40	270.00	5,463.3	430.1	-2,664.4	2,672.6	0.00	0.00	
8,100.0	90.40	270.00	5,462.6	430.1	-2,764.4	2,772.6	0.00	0.00	
8,200.0	90.40	270.00	5,461.9	430.1	-2,864.4	2,872.6	0.00	0.00	
8,300.0	90.40	270.00	5,461.2	430.1	-2,964.4	2,972.5	0.00	0.00	
8,400.0	90.40	270.00	5,460.5	430.1	-3,064.4	3,072.5	0.00	0.00	
8,500.0	90.40	270.00	5,459.8	430.1	-3,164.4	3,172.5	0.00	0.00	
8,600.0	90.40	270.00	5,459.1	430.1	-3,264.4	3,272.5	0.00	0.00	
8,700.0	90.40	270.00	5,458.4	430.1	-3,364.4	3,372.4	0.00	0.00	
8,800.0	90.40	270.00	5,457.8	430.1	-3,464.4	3,472.4	0.00	0.00	

## Cathedral Energy Services Planning Report

Database: USA EDM 5000 Multi Users DB	Local Co-ordinate Reference: Well Lybrook H03-2206 #01H	
Company: EnCana Oil & Gas (USA) Inc	TVD Reference: KBE @ 7065.0usft	
Project: Sandoval County, NM	MD Reference: KBE @ 7065.0usft	
Site: Lybrook	North Reference: True	
Well: Lybrook H03-2206 #01H	Survey Calculation Method: Minimum Curvature	
Wellbore: HZ		
Design: Plan #4		

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
8,900.0	90.40	270.00	5,457.1	430.1	-3,564.4	3,572.4	0.00	0.00	
9,000.0	90.40	270.00	5,456.4	430.1	-3,664.4	3,672.4	0.00	0.00	
9,100.0	90.40	270.00	5,455.7	430.1	-3,764.4	3,772.4	0.00	0.00	
9,200.0	90.40	270.00	5,455.0	430.1	-3,864.4	3,872.3	0.00	0.00	
9,300.0	90.40	270.00	5,454.3	430.1	-3,964.4	3,972.3	0.00	0.00	
9,400.0	90.40	270.00	5,453.6	430.1	-4,064.4	4,072.3	0.00	0.00	
9,500.0	90.40	270.00	5,452.9	430.1	-4,164.4	4,172.3	0.00	0.00	
9,600.0	90.40	270.00	5,452.2	430.1	-4,264.4	4,272.2	0.00	0.00	
9,700.0	90.40	270.00	5,451.5	430.1	-4,364.4	4,372.2	0.00	0.00	
9,800.0	90.40	270.00	5,450.8	430.1	-4,464.4	4,472.2	0.00	0.00	
9,900.0	90.40	270.00	5,450.1	430.1	-4,564.4	4,572.2	0.00	0.00	
10,000.0	90.40	270.00	5,449.4	430.1	-4,664.4	4,672.1	0.00	0.00	
10,100.0	90.40	270.00	5,448.7	430.1	-4,764.4	4,772.1	0.00	0.00	
10,105.1	90.40	270.00	5,448.6	430.1	-4,769.5	4,777.2	0.00	0.00	TD at 10105.1' MD

### Targets

#### Target Name

hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N-S (usft)	+E-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Lybrook H03-2206 PBHL	0.00	359.28	5,453.3	95.1	-4,770.3	1,882,826.56	1,282,297.52	36° 10' 6.49 N	107° 27' 47.92 W
- plan misses target center by 335.1usft at 10105.1usft MD (5448.6 TVD, 430.1 N, -4769.5 E)									
- Polygon									
Point 1			5,453.3	-500.0	-335.0	1,882,326.50	1,281,962.60		
Point 2			5,453.3	1,989.5	-335.0	1,884,816.00	1,281,962.18		
Lybrook H03-2206 PBHL	0.00	359.28	5,453.3	430.1	-4,769.5	1,883,161.58	1,282,302.54	36° 10' 9.81 N	107° 27' 47.91 W
- plan misses target center by 4.6usft at 10105.1usft MD (5448.6 TVD, 430.1 N, -4769.4 E)									
- Polygon									
Point 1			5,453.3	-500.0	-335.0	1,882,661.53	1,281,967.62		
Point 2			5,453.3	1,989.5	-335.0	1,885,151.02	1,281,967.21		
Lybrook H03-2206 PBHL	0.00	359.28	5,448.6	430.1	-4,769.5	1,883,161.59	1,282,302.53	36° 10' 9.81 N	107° 27' 47.91 W
- plan hits target center									
- Polygon									
Point 1			5,448.6	-500.0	-335.0	1,882,661.53	1,281,967.61		
Point 2			5,448.6	1,989.5	-335.0	1,885,151.03	1,281,967.20		

### Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
4,700.0	4,700.0	Intermediate Casing	0	0
500.0	500.0	Surface Casing	0	0

**Cathedral Energy Services**  
Planning Report

Database: USA EDM 5000 Multi Users DB  
 Company: EnCana Oil & Gas (USA) Inc  
 Project: Sandoval County, NM  
 Site: Lybrook  
 Well: Lybrook H03-2206 #01H  
 Wellbore: HZ  
 Design: Plan #4

Local Co-ordinate Reference: Well Lybrook H03-2206 #01H  
 TVD Reference: KBE @ 7065.0usft  
 MD Reference: KBE @ 7065.0usft  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
184.0	184.0	Nacimiento Fn.		-0.50	271.16	
1,425.0	1,425.0	Ojo Alamo Ss.		-0.50	271.16	
1,544.0	1,544.0	Kirtland Shale		-0.50	271.16	
1,627.0	1,627.0	Fruitland Coal		-0.50	271.16	
1,933.0	1,933.0	Pictured Cliffs Ss.		-0.50	271.16	
2,021.0	2,021.0	Lewis Shale		-0.50	271.16	
2,714.0	2,714.0	Cliffhouse Ss.		-0.50	271.16	
3,449.0	3,449.0	Mnefee Fn.		-0.50	271.16	
4,173.0	4,173.0	Point Lookout Ss.		-0.50	271.16	
4,390.0	4,390.0	Manocos Shale		-0.50	271.16	
4,944.4	4,943.0	Manocos Silt		-0.50	271.16	
5,258.6	5,212.0	Gallup Fn.		-0.50	271.16	
5,931.5	5,482.0	Horizontal Target		-0.50	271.16	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
4,800.0	4,800.0	0.0	0.0	KOP @ 4800' MD	
5,313.1	5,247.2	182.8	-112.9	Start 10" Build @ 5313.1' MD	
5,973.7	5,477.5	430.1	-638.2	Landing Pt. @ 5973.7' TVD	
10,105.1	5,448.6	430.1	-4,769.5	TD at 10105.1' MD	

WELLHEAD BLOWOUT CONTROL SYSTEM



Well name and number:  
Lybrook H03-2206 01H

