

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary-Designate

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Jami Bailey, Division Director
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-3 APD form.

Operator Signature Date: 5.16.13

Well information:

Operator Encana, Well Name and Number Lybrook E 27-2306 #1H

API# 30043-21152 Section 27, Township 23 NS, Range 10 EW

Conditions of Approval:

(See the below checked and handwritten conditions)

- ☒ Notify Aztec OCD 24hrs prior to casing & cement.
- ☒ Hold C-104 for directional survey & "As Drilled" Plat
- ☒ Hold C-104 for NSL, NSP, DHC
- ☐ Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- ☒ Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
 - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
 - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
 - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- ☐ Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
- ☐ Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils

Charles T. Leru
NMOCD Approved by Signature

8-21-2013
Date

ca

RECEIVED

Form 3160-3
(August 2007)

MAY 20 2013

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

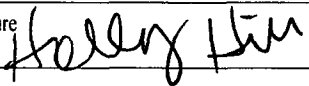
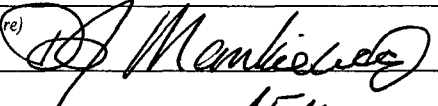
Farmington Field Office
Bureau of Land Management

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM 112953
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name N/A
2. Name of Operator Encana Oil & Gas (USA) Inc.		7. If Unit or CA Agreement, Name and No. N/A
3a. Address 370 17th Street, Suite 1700 Denver, CO 80202	3b. Phone No. (include area code) 720-876-3989	8. Lease Name and Well No. Lybrook E27-2306 01H
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 1569' FNL and 199' FWL Section 27, T23N, R6W At proposed prod. zone 550' FNL and 330' FWL Section 28, T23N, R6W		9. ABL Well No. 3004321152
14. Distance in miles and direction from nearest town or post office* +/- 54.8 miles southeast of the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM		10. Field and Pool, or Exploratory Counselors Gallup-Dakota
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) BHL is 330' from west lease line	16. No. of acres in lease NMNM 112953 - 1,760.0	11. Sec., T. R. M. or Blk. and Survey or Area Section 27, T23N, R6W NMPM
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. Dome Et Al Fed 28-23 2 is +/- 1135' SW of SHL	19. Proposed Depth 5,560' TVD/11,171' MD	12. County or Parish Sandoval
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 7054' GL, 7067' KB	22. Approximate date work will start* 11/19/2013	13. State NM
17. Spacing Unit dedicated to this well 320.0 acres - N2 of Section 28 RCVD AUG 16 '13		
20. BLM/BIA Bond No. on file COB-000235 OIL CONS. DIV. DIST. 3		
23. Estimated duration 25 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:

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

25. Signature 	Name (Printed/Typed) Holly Hill	Date 05/16/2013
Title Regulatory Analyst		
Approved by (Signature) 	Name (Printed/Typed) J. Mankiewicz	Date 8/13/13
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 OPERATIONS ON FEDERAL AND INDIAN LANDS

This action is subject to technical and procedural review pursuant to 43 CFR 3165.2 and appeal pursuant to 43 CFR 3165.4

NMOC

AV

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

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

OIL CONSERVATION DIVISION

1220 South St. Francis Drive
Santa Fe, NM 87505

Submit one copy to
Appropriate District Office

RECEIVED
AMENDED REPORT

MAY 20 2013

WELL LOCATION AND ACREAGE DEDICATION PLAT.

Farmington Field Office
Bureau of Land Management

*API Number 30-043-21152		*Pool Code 13379	*Pool Name COUNSELORS GALLUP-DAKOTA
*Property Code 40083	*Property Name LYBROOK E27-2306		*Well Number 01H
*OGRID No. 282327	*Operator Name ENCANA OIL & GAS (USA) INC.		*Elevation 7054'

¹⁰ Surface Location

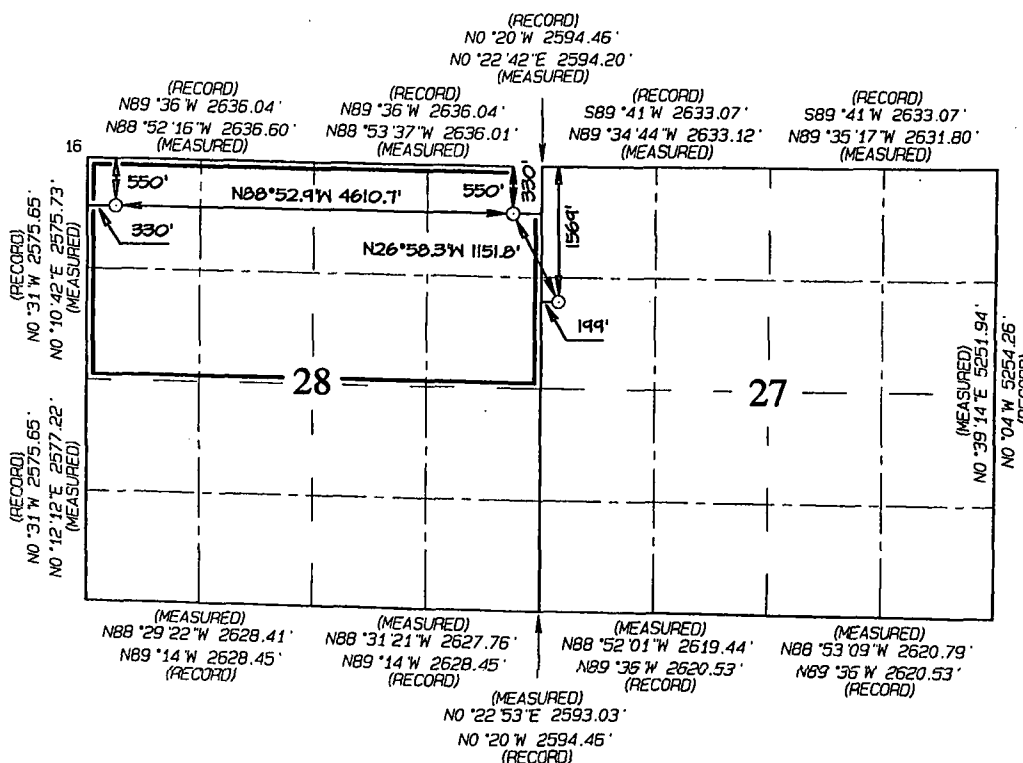
UL or lot no.	Section	Township	Range	Lot Idh	Feet from the	North/South line	Feet from the	East/West line	County
E	27	23N	6W		1569	NORTH	199	WEST	SANDOVAL

¹¹ 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
D	28	23N	6W		550	NORTH	330	WEST	SANDOVAL

12	Dedicated Acres	320.00 Acres N/2 - Section 28	13	Joint or Infill	14	Consolidation Code	15	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



17 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom-hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or pursuant to a pooling agreement or compulsory pooling order designated entered by the Division.

Signature H. G. Hill Date 4/2/13

Signature *[Signature]* Date _____
Holly Hill

Printed Name
holly.hill@encana.com

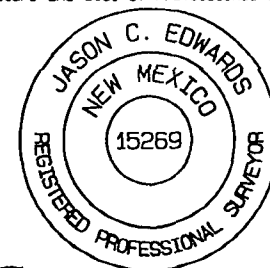
E-mail Address

18 SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Survey Date: OCTOBER 22, 2012

Signature and Seal of Professional Surveyor



JASON C. EDWARDS

Certificate Number 15269

END-OF-LATERAL
550' FNL 330' FWL
SECTION 28, T23N, R6W
LAT: 36.20194°N
LONG: 107.48066°W
DATUM: NAD1927

LAT: 36.20195 °N
LONG: 107.48126 °W
DATUM: NAD1983

POINT-OF-ENTRY
550' FNL 330' FEL
SECTION 28, T23N, R6W
LAT: 36.20185°N
LONG: 107.46503°W
DATUM: NAD1927

LAT: 36.20187°N
LONG: 107.46563°W
DATUM: NAD1983

SURFACE LOCATION
1569' FNL 199' FWL
SECTION 27, T23N, R6W
LAT: 36.19905°N
LONG: 107.46322°W
DATUM: NAD1927

LAT: 36.19906 °N
LONG: 107.46382 °W
DATUM: NAD1983

Directions from the Intersection of US Hwy 550 & US Hwy 64
in Bloomfield, NM to Encana Oil & Gas (USA) Inc. Lybrook E27-2306 01H
1569' FNL & 199' FWL, Section 27, T23N, R6W, N.M.P.M., Sandoval County, NM

Latitude: 36.19906°N Longitude: 107.46382°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 0.8 miles to fork in road;

Go right (South-westerly) for 250' along Encana Lybrook M27-2306 01H proposed access road to fork in road;

Go right (North-westerly) along Encana Lybrook E27-2306 01H proposed access road for an additional 1775' to staked location.

encana.

natural gas

**SANDOVAL COUNTY,
NEW MEXICO**

-  Abandoned
 -  Abandoned Gas
 -  Abandoned Oil
 -  Dry Hole
 -  GAS
 -  Injection
 -  OIL
 -  Basin Mancos Gas Pool
- 1 inch = 2,167 feet

RINCON 32

STATE 16 1

ENCHILADA 2

ENCHILADA 1

ZINK THEODORE 1

STATE 16 2

STATE 16 6

16

COUNSELORS GALLUP DAKOTA POOL

STATE 16 3

STATE 16 5

RITA COM 3

RITA COM 3

STATE 16 4

STATE 16 6

STATE 16 4

STATE 16 5

**LYBROOK
GALLUP
POOL**

20

21

22

**23N
6W**

EMILY 2

EMILY 1

CHAPMAN A-3

CHAPMAN A-1

LYBROOK A-1

CHRISTIAN

Lybrook E29-2306 01H

Lybrook E29-2306 02H

Lybrook E29-2306 03H

Lybrook E29-2306 04H

CHAPMAN A-2

LU-LU 6

CHAPMAN A-1

1000'

28-23 2

Lybrook E27-2306 01H

Lybrook E27-2306 02H

Lybrook E27-2306 03H

Lybrook E27-2306 04H

27

28

2-2

DOME ET AL

FED 28-1

DOME-FEDERAL

28-23 1

Lybrook M27-2306 01H

Lybrook M27-2306 02H

Lybrook M27-2306 03H

Lybrook M27-2306 04H

PINON TANK

ABZ FED 1

Lybrook
A32-2306 01H

GUS YJ STATE 1

32

Lybrook H32-2306 01H

33

34

**BASIN MANCOS
GAS POOL**

DOME ET AL
FED 33-1

MADDOX F-A 1

0 0.125 0.25 0.5 Miles

Lybrook I32-2306 01H

Lybrook I32-2306 02H

Lybrook E27-2306 01H
SHL: SWNW Section 27, T23N, R6W
1569 FNL and 199 FWL
BHL: NWNW Section 28, T23N, R6W
550 FNL and 330 FWL
Sandoval County, New Mexico
Lease Number: NMNM 112953

**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.	1474'
Kirtland	1630'
Fruitland Coal	1849'
Pictured Cliffs	2031'
Lewis	2154'
Cliffhouse	2893'
Menefee	3577'
Point Lookout	4277'
Mancos Shale	4478'
Mancos Silt	5095'
Gallup	5339'

The referenced surface elevation is 7054', KB 7067'

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	1849'
Gas	Pictured Cliffs	2031'
Gas	Cliffhouse	2893'
Gas	Point Lookout	4277'
Oil/Gas	Mancos	4478'

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 100 percent of rated working pressure.
- 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.

Lybrook E27-2306 01H

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550 FNL and 330 FWL

Sandoval County, New Mexico

Lease Number: NMNM 112953

- 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'	30"	20"	94#	H40, STC New
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-6450'MD	8 3/4"	7"	26#	J55, LTC New
Production Liner	6250'-11171'MD	6 1/8"	4 1/2"	11.6#	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
9 5/8"	36	J55	STC	2020	3520	394	1.125	1.1	1.5
7"	26	J55	LTC	4320	4980	367	1.125	1.1	1.5
4 1/2"	11.6	B80	LTC	6350	7780	201	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.

- 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.

Lybrook E27-2306 01H

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Sandoval County, New Mexico

Lease Number: NMNM 112953

Casing	Depth	Cement Volume (sacks)	Cement Type&Yield	Designed TOC	Centralizers
Conductor	60'	100sk	Type I Neat 14.8 ppg	Surface	None
Surface	500'	178sk	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	6450'MD	30% open hole excess Stage 1 Lead: 281sks Stage 1 Tail: 192sks Stage 2 Lead: 184sks	Lead (Stages 1 and 2): PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuf/sk Tail (Stage 1): 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*	6250'-11171'	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 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.

Well Phase	Description	Proposed Depth (TVD/MD)	Formation
1	Vertical Pilot Hole	5836'/5836'	Gallup
2	Horizontal Lateral	5560'/11171'	Gallup

Lybrook E27-2306 01H

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1569 FNL and 199 FWL

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550 FNL and 330 FWL

Sandoval County, New Mexico

Lease Number: NMNM 112953

Proposed Plug Back Procedure:

KOP 4935'

Set kick plug at KOP

1. Spot 400' kick plug from 4735' – 5135'
 - a. 167sx of Class G cement with salt (0.94ft³/sk yield, 17.5ppg)
 - 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) Vertical Pilot Hole:

Hole Size (in)	Depth (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
30"	0-60' TVD	Fresh Water	8.3-9.2	38-100	4-28
12 1/4"	0-500' TVD	Fresh Water	8.4-8.6	60-70	NC
8 3/4"	500'-5836'	Fresh Water LSND	8.5-8.8	40-50	8-10

b) Kick off Point to Intermediate Casing Point:

Hole Size (in)	TVD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
8 3/4"	4935' (KOP)- 5581' (6450'MD)	Fresh Water LSND	8.5-8.8	40-50	8-10

c) Intermediate Casing Point to TD:

Hole Size (in)	MD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	6450'-11171'	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.

Lybrook E27-2306 01H

**SHL: SWNW Section 27, T23N, R6W
1569 FNL and 199 FWL**

**BHL: NWNW Section 28, T23N, R6W
550 FNL and 330 FWL**

Sandoval County, New Mexico

Lease Number: NMNM 112953 & NMNM 117564

7. TESTING, CORING and LOGGING

- a) Drill Stem Testing – None anticipated
- b) Coring – None anticipated.
- c) Mud Logging – Mud loggers will be on location from kick off point to TD.
- d) Logging – See Below

Open Hole:

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

Cased Hole:

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

8. ABNORMAL PRESSURES & HYDROGEN SULFIDE

The anticipated bottom hole pressure is +/- 2613 psi based on a 9.0 ppg at 2613' TVD of the landing point of the horizontal lateral. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H₂S 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 November 19, 2013. 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.

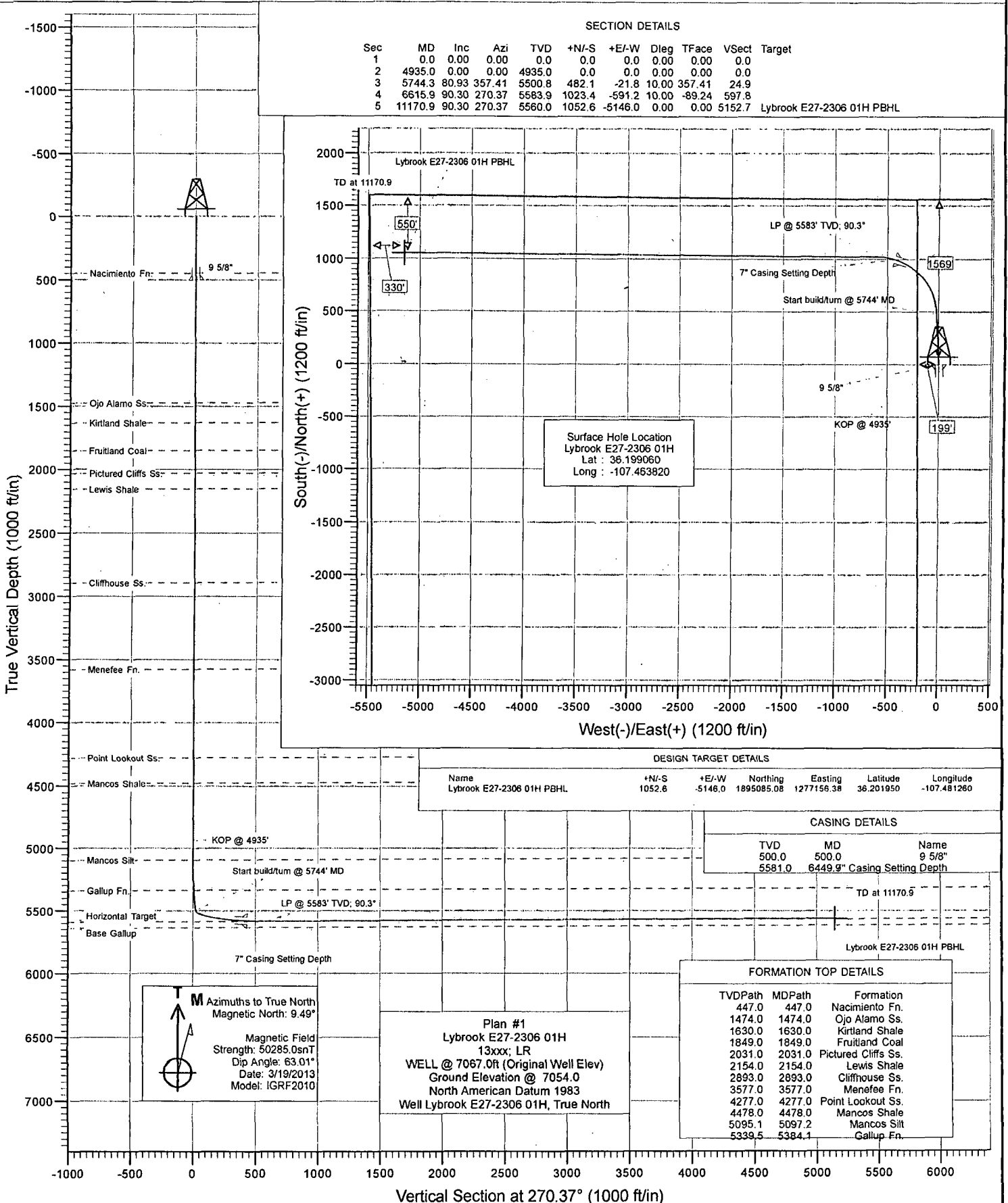
It is anticipated that the drilling of this well will take approximately 25 days.

encana™

natural gas

Project: Sandoval County, NM
Site: Lybrook
Well: Lybrook E27-2306 01H
Wellbore: Hz
Design: Plan #1

CATHEDRAL



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook E27-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7067.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 7067.0ft (Original Well Elev)
Site:	Lybrook	North Reference:	True
Well:	Lybrook E27-2306 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #1		

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

Site	Lybrook				
Site Position:		Northing:	1,882,676.45 ft	Latitude:	36.168210
From:	Lat/Long	Easting:	1,287,068.90 ft	Longitude:	-107.447150
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-0.71 °

Well	Lybrook E27-2306 01H					
Well Position	+N/-S	0.0 ft	Northing:	1,893,968.14 ft	Latitude:	36.199060
	+E/-W	0.0 ft	Easting:	1,282,288.84 ft	Longitude:	-107.463820
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,054.0 ft	

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/19/2013	9.49	63.01	50,285

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	270.37

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,935.0	0.00	0.00	4,935.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,744.3	80.93	357.41	5,500.8	482.1	-21.8	10.00	10.00	0.00	357.41	
6,615.9	90.30	270.37	5,583.9	1,023.4	-591.2	10.00	1.08	-9.99	-89.24	
11,170.9	90.30	270.37	5,560.0	1,052.6	-5,146.0	0.00	0.00	0.00	0.00	Lybrook E27-2306 01

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook E27-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7067.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 7067.0ft (Original Well Elev)
Site:	Lybrook	North Reference:	True
Well:	Lybrook E27-2306 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	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	
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	
447.0	0.00	0.00	447.0	0.0	0.0	0.0	0.00	0.00	Nacimiento Fn.
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	9 5/8"
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	
1,474.0	0.00	0.00	1,474.0	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	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,630.0	0.00	0.00	1,630.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
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	
1,849.0	0.00	0.00	1,849.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,031.0	0.00	0.00	2,031.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,154.0	0.00	0.00	2,154.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
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	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,893.0	0.00	0.00	2,893.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
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	
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	
3,577.0	0.00	0.00	3,577.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
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	
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	
4,277.0	0.00	0.00	4,277.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.

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 E27-2306 01H
Wellbore: Hz
Design: Plan #1

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well Lybrook E27-2306 01H
WELL @ 7067.0ft (Original Well Elev)
WELL @ 7067.0ft (Original Well Elev)
True
Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	
4,478.0	0.00	0.00	4,478.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale
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	
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	
4,935.0	0.00	0.00	4,935.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4935'
5,000.0	6.50	357.41	4,999.9	3.7	-0.2	0.2	10.00	10.00	
5,097.2	16.22	357.41	5,095.1	22.8	-1.0	1.2	10.00	10.00	Mancos Silt
5,100.0	16.50	357.41	5,097.7	23.6	-1.1	1.2	10.00	10.00	
5,200.0	26.50	357.41	5,190.7	60.1	-2.7	3.1	10.00	10.00	
5,300.0	36.50	357.41	5,275.8	112.3	-5.1	5.8	10.00	10.00	
5,384.1	44.91	357.41	5,339.5	167.0	-7.5	8.6	10.00	10.00	Gallup Fn.
5,400.0	46.50	357.41	5,350.6	178.4	-8.1	9.2	10.00	10.00	
5,500.0	56.50	357.41	5,412.8	256.5	-11.6	13.2	10.00	10.00	
5,600.0	66.50	357.41	5,460.4	344.1	-15.6	17.8	10.00	10.00	
5,700.0	76.50	357.41	5,492.1	438.8	-19.8	22.7	10.00	10.00	
5,744.3	80.93	357.41	5,500.8	482.1	-21.8	24.9	10.00	10.00	Start build/turn @ 5744' MD
5,800.0	81.05	351.78	5,509.5	536.9	-27.0	30.4	10.00	0.21	
5,900.0	81.47	341.67	5,524.8	633.0	-49.6	53.7	10.00	0.42	
6,000.0	82.15	331.59	5,539.0	723.7	-88.9	93.5	10.00	0.68	
6,100.0	83.07	321.56	5,551.9	806.3	-143.4	148.6	10.00	0.92	
6,200.0	84.20	311.56	5,563.0	878.4	-211.7	217.3	10.00	1.13	
6,300.0	85.51	301.61	5,572.0	937.7	-291.5	297.6	10.00	1.30	
6,400.0	86.95	291.70	5,578.6	982.4	-380.6	387.0	10.00	1.44	
6,449.9	87.70	286.76	5,581.0	998.8	-427.7	434.1	10.00	1.51	7" Casing Setting Depth
6,500.0	88.48	281.81	5,582.6	1,011.1	-476.2	482.7	10.00	1.55	
6,600.0	90.05	271.93	5,583.9	1,023.1	-575.3	581.9	10.00	1.57	
6,615.9	90.30	270.37	5,583.9	1,023.4	-591.2	597.8	10.00	1.58	LP @ 5583' TVD; 90.3°
6,700.0	90.30	270.37	5,583.4	1,023.9	-675.3	681.9	0.00	0.00	
6,800.0	90.30	270.37	5,582.9	1,024.6	-775.3	781.9	0.00	0.00	
6,900.0	90.30	270.37	5,582.4	1,025.2	-875.3	881.9	0.00	0.00	
7,000.0	90.30	270.37	5,581.9	1,025.9	-975.3	981.9	0.00	0.00	
7,100.0	90.30	270.37	5,581.3	1,026.5	-1,075.3	1,081.9	0.00	0.00	
7,200.0	90.30	270.37	5,580.8	1,027.1	-1,175.3	1,181.9	0.00	0.00	
7,300.0	90.30	270.37	5,580.3	1,027.8	-1,275.3	1,281.9	0.00	0.00	
7,400.0	90.30	270.37	5,579.8	1,028.4	-1,375.3	1,381.9	0.00	0.00	
7,500.0	90.30	270.37	5,579.2	1,029.1	-1,475.3	1,481.9	0.00	0.00	
7,600.0	90.30	270.37	5,578.7	1,029.7	-1,575.3	1,581.9	0.00	0.00	
7,700.0	90.30	270.37	5,578.2	1,030.4	-1,675.3	1,681.9	0.00	0.00	
7,800.0	90.30	270.37	5,577.7	1,031.0	-1,775.3	1,781.9	0.00	0.00	
7,900.0	90.30	270.37	5,577.1	1,031.6	-1,875.3	1,881.9	0.00	0.00	
8,000.0	90.30	270.37	5,576.6	1,032.3	-1,975.3	1,981.9	0.00	0.00	
8,100.0	90.30	270.37	5,576.1	1,032.9	-2,075.3	2,081.9	0.00	0.00	
8,200.0	90.30	270.37	5,575.6	1,033.6	-2,175.3	2,181.9	0.00	0.00	
8,300.0	90.30	270.37	5,575.0	1,034.2	-2,275.3	2,281.9	0.00	0.00	
8,400.0	90.30	270.37	5,574.5	1,034.8	-2,375.3	2,381.9	0.00	0.00	
8,500.0	90.30	270.37	5,574.0	1,035.5	-2,475.3	2,481.9	0.00	0.00	
8,600.0	90.30	270.37	5,573.5	1,036.1	-2,575.2	2,581.9	0.00	0.00	
8,700.0	90.30	270.37	5,572.9	1,036.8	-2,675.2	2,681.9	0.00	0.00	

Cathedral Energy Services

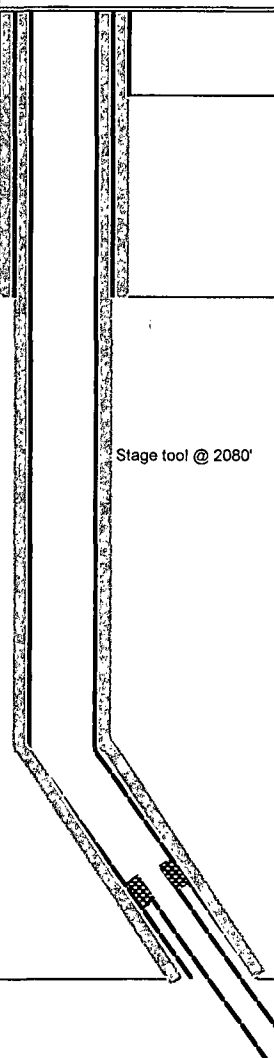
Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook E27-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	WELL @ 7067.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	WELL @ 7067.0ft (Original Well Elev)
Site:	Lybrook	North Reference:	True
Well:	Lybrook E27-2306 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
8,800.0	90.30	270.37	5,572.4	1,037.4	-2,775.2	2,781.9	0.00	0.00	
8,900.0	90.30	270.37	5,571.9	1,038.1	-2,875.2	2,881.9	0.00	0.00	
9,000.0	90.30	270.37	5,571.4	1,038.7	-2,975.2	2,981.9	0.00	0.00	
9,100.0	90.30	270.37	5,570.9	1,039.3	-3,075.2	3,081.9	0.00	0.00	
9,200.0	90.30	270.37	5,570.3	1,040.0	-3,175.2	3,181.9	0.00	0.00	
9,300.0	90.30	270.37	5,569.8	1,040.6	-3,275.2	3,281.9	0.00	0.00	
9,400.0	90.30	270.37	5,569.3	1,041.3	-3,375.2	3,381.9	0.00	0.00	
9,500.0	90.30	270.37	5,568.8	1,041.9	-3,475.2	3,481.9	0.00	0.00	
9,600.0	90.30	270.37	5,568.2	1,042.5	-3,575.2	3,581.9	0.00	0.00	
9,700.0	90.30	270.37	5,567.7	1,043.2	-3,675.2	3,681.9	0.00	0.00	
9,800.0	90.30	270.37	5,567.2	1,043.8	-3,775.2	3,781.9	0.00	0.00	
9,900.0	90.30	270.37	5,566.7	1,044.5	-3,875.2	3,881.9	0.00	0.00	
10,000.0	90.30	270.37	5,566.1	1,045.1	-3,975.2	3,981.9	0.00	0.00	
10,100.0	90.30	270.37	5,565.6	1,045.8	-4,075.2	4,081.9	0.00	0.00	
10,200.0	90.30	270.37	5,565.1	1,046.4	-4,175.2	4,181.9	0.00	0.00	
10,300.0	90.30	270.37	5,564.6	1,047.0	-4,275.2	4,281.9	0.00	0.00	
10,400.0	90.30	270.37	5,564.0	1,047.7	-4,375.2	4,381.9	0.00	0.00	
10,500.0	90.30	270.37	5,563.5	1,048.3	-4,475.2	4,481.9	0.00	0.00	
10,600.0	90.30	270.37	5,563.0	1,049.0	-4,575.2	4,581.9	0.00	0.00	
10,700.0	90.30	270.37	5,562.5	1,049.6	-4,675.2	4,681.9	0.00	0.00	
10,800.0	90.30	270.37	5,561.9	1,050.2	-4,775.2	4,781.9	0.00	0.00	
10,900.0	90.30	270.37	5,561.4	1,050.9	-4,875.2	4,881.9	0.00	0.00	
11,000.0	90.30	270.37	5,560.9	1,051.5	-4,975.2	4,981.9	0.00	0.00	
11,100.0	90.30	270.37	5,560.4	1,052.2	-5,075.2	5,081.9	0.00	0.00	
11,170.9	90.30	270.37	5,560.0	1,052.6	-5,146.0	5,152.7	0.00	0.00	TD at 11170.9 - Lybrook E27-2306 01H PBHL

Targets									
Target Name	Dip Angle (°)	Dip Dir (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lybrook E27-2306 01H f	0.00	0.00	5,560.0	1,052.6	-5,146.0	1,895,085.08	1,277,156.38	36.201950	-107.481260
- hit/miss target									
- Shape									
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
500.0	500.0	9 5/8"	0.000	0.000	
6,449.9	5,581.0	7" Casing Setting Depth	0.000	0.000	

LOC: Sec 27-T23N-R6W County: Sandoval WELL: Lybrook E27-2306 01H			Encana Natural Gas WELL SUMMARY			encana[™] natural gas		ENG: J. Fox/ A. 3/21/13 RIG: GLE: 7054 RKBE: 7067	
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			TVD	MD					
			60	60'		30	20" 94# 100sx Type I Neat 48.8ppg cmt	Fresh wtr 8.3-9.2	
Surveys After csg is run	None					12 1/4	9 5/8" 36ppf J55 STC TOC @ surface 178 sks Type III Cmt	Fresh wtr 8.4-8.6	Vertical <1°
Surveys every 500'	No OH logs	Ojo Alamo Kirtland Fruitland Coal Pictured Cliffs Ss Lewis Shale Cliffhouse Ss Menefee Fn Point Lookout Ss Mancos Sh	1474 1630 1849 2031 2154 2893 3577 4277 4478	500 500		8 3/4	7" 26ppf J55 LTC TOC @ surface 30% OH excess: 657 sks Total Stage 1 Lead: 281 sks Stage 1 Tail: 192 sks Stage 2 Lead: 184 sks	Fresh Wtr 8.5-8.8	Vertical <1°
	Mud logger onsite	KICK OFF PT Mancos Silt Gallup Top	4935 5095 5339		Stage tool @ 2080'				KOP 4935 10 deg/100'
			5581	6450					
		horz target	5584	6616		6 1/8	200' overlap at liner top		25deg updip 5560'TVD TD = 11171' MD
Surveys every 500' Gyro at CP MWD Gamma Directional	No OH Logs	Base Gallup Pilot Hole TD	5636 5836				6731' Lateral 4 1/2" 11.6ppf SB80 LTC Running external swellable csg packers for isolation of prod string Plan on setting top packer within 100' of intermediate casing shoe	8.6-9.0 OBM Switch to OBM 8.6-9.0	

NOTES:

- 1) Drill with 30" bit to 60', set 20" 94# conductor pipe
- 2) Drill surface to 500', R&C 9 5/8" casing
- 3) N/U BOP and surface equipment
- 4) Drill to pilot hole TD of 5836' and run OH logs.
- 5) Spot cement kick plug
- 6) Kick off at 4935' and start curve at 10deg/100' build rate
- 7) Drill to casing point of 6450' MD
- 8) R&C 7" casing, circ cmt to surface, switch to OBM
- 9) Land at 90deg, drill 6731' lateral to 11171', run 4 1/2" liner with external swellable csg packers



Boomerang Tube LLC

CASING (OR) TUBING DESCRIPTION AND PERFORMANCE PROPERTIES

Pipe Outside Diameter (ins)	_____	4.500
Pipe Wall Thickness (ins)	_____	0.250
Nominal Weight Per Foot (lbs)	_____	11.60
Thread Name	_____	Long Thread CSG
Grade Name	_____	SB-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)	_____	5.000
Drift Diameter (ins)	_____	3.875
Plain End Weight per Foot (lbs)	_____	11.36
Joint Strength (lbs)	_____	201,000
Internal Yield (psi)	_____	7,780
Collapse Rating (psi)	_____	6,350

MAXIMUM DEPTH/LENGTH BASED ON MUD WTS & SAFETY FACTORS

Drilling Mud Weight (ppg)	_____	9.625
Tension Safety Factor	_____	1.80
Maximum Tension Length (ft)	_____	9,630
Internal Yield Safety Factor	_____	1.10
Maximum Depth for Internal Yield (ft)	_____	14,150
Collapse Safety Factor	_____	1.125
Maximum Collapse Depth (ft)	_____	11,290

API RELATED VALUES and INTERMEDIATE CALCULATION RESULTS

Coupling Thread Fracture Strength	_____	464,000
Pipe Thread Fracture Strength (lbs)	_____	201,000
Pipe Body Plain End Yield (lbs)	_____	267,000
Round Thread Pull-Out (lbs)	_____	219,000
Minimum Make-up Torque (ft-lbs)	_____	1,640
Nominal Make-up Torque (ft-lbs)	_____	2,190
Maximum Make-up Torque (ft-lbs)	_____	2,740
Coupling Internal Yield (psi)	_____	10,660
Pipe Body Internal Yield (psi)	_____	7,780
Leak @ E1 or E7 plane (psi)	_____	17,920
Pipe Hydrostatic Test Pressure @ 80 % SMYS	_____	7,100