State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary

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

David R. Catanach 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: 1-7-15
Well information;
Operator Encana, Well Name and Number Lybrook I01 2207 #1H

API# 30-043-21249, Section 1, Township 22 (N)/S, Range 7 E/(W)

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
- ✓ Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84
- ✓ 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. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.
- ✓ Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.

Charlie Perrin
NMOCD Approved by Signature

8-21-2015
Date

1220 South St. Francis Drive • Santa Fe, New Mexico 87505
Phone (505) 476-3460 • Fax (505) 476-3462 • www.emnrd.state.nm.us/ocd

OIL CONS. DIV DIST. 3

AUG 12 2015

RECEIVED

JAN 08 2015

Farmington Field Office
Bureau of Land Management

Form 3160-3
(August 2007)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No. NM 109391

6. If Indian, Allotee or Tribe Name: N/A

1a. Type of work: ☑ DRILL ☐ REENTER

7. If Unit or CA Agreement, Name and No.: N/A

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

8. Lease Name and Well No.: Lybrook I01-2207 01H

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

9. API Well No. 30-043-21249

3a. Address: 370 17th Street, Suite 1700, Denver, CO 80202

3b. Phone No. *(include area code)*: 720-876-3740

10. Field and Pool, or Exploratory: Lybrook Gallup

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface I 1713' FSL and 457' FEL Section 1, T22N, R7W

At proposed prod. zone L 2261' FSL and 330' FWL Section 1, T22N, R7W

KP

11. Sec., T. R. M. or Blk. and Survey or Area: Section 1, T22N, R7W NMPM

14. Distance in miles and direction from nearest town or post office*: +/- 62.5 miles south of the intersection of US Hwy 550 & US Hwy 64 in 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 330' from west lease line Section 1, T22N, R7W

16. No. of acres in lease: NM 109391- 880 ac.

17. Spacing Unit dedicated to this well: 160 acres- N/2 S/2 of Section 1

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.: Lybrook P01-2207 01H is +/- 894' S from SHL

19. Proposed Depth: 5368' TVD, 10147' MD

20. BLM/BIA Bond No. on file: COB-000235

21. Elevations (Show whether DF, KDB, RT, GL, etc.): 7154' GL, 7170' KB

22. Approximate date work will start*: 06/07/2015

23. Estimated duration: 20 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: Rosalie Thim — Name (Printed/Typed): Rosalie Thim — Date: 1/7/15

Title: Regulatory Analyst

Approved by (Signature): [signature] — Name (Printed/Typed): — Date: 8/6/15

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)

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

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

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

NMOCD AV

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

OIL CONSERVATION DIVISION
1220 South St. Francis Drive
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

☐ AMENDED REPORT

RECEIVED
JAN 08 2015
Farmington Field Office
Bureau of Land Management

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
30-043-21249	42289	LYBROOK GALLUP

4 Property Code	5 Property Name	6 Well Number
315163	LYBROOK I01-2207	01H
7 OGRID No.	**8 Operator Name**	**9 Elevation**
282327	ENCANA OIL & GAS (USA) INC.	7154'

10 Surface Location

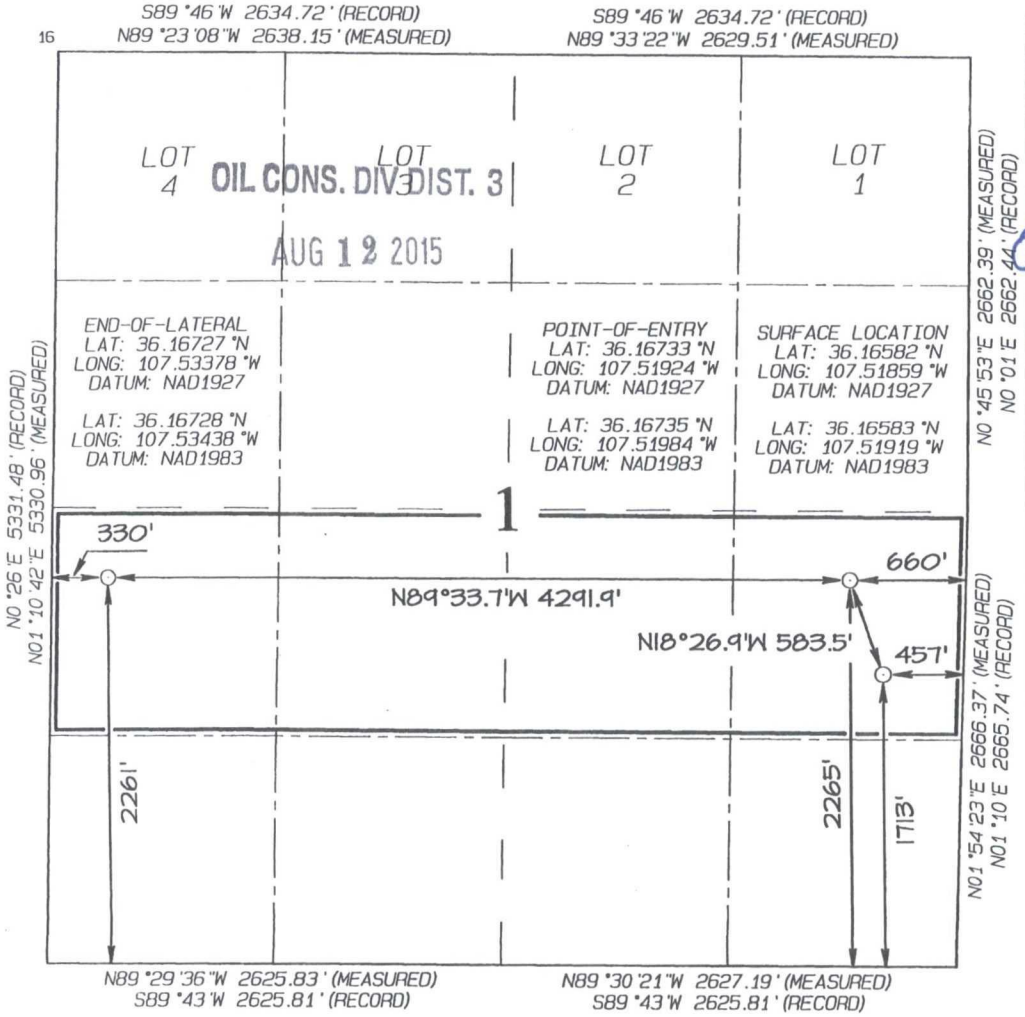
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
I	1	22N	7W		1713	SOUTH	457	EAST	SANDOVAL

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
L	1	22N	7W		2261	SOUTH	330	WEST	SANDOVAL

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.
160.0 Acres - (N/2 S/2)			

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



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 to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature 1/7/15 Date

Rosalie Thim
Printed Name

rosalie.thim@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.

Date Revised: JULY 24, 2014
Survey Date: OCTOBER 1, 2013

Signature and Seal of Professional Surveyor

JASON C. EDWARDS
NEW MEXICO
15269
REGISTERED PROFESSIONAL SURVEYOR

JASON C. EDWARDS
Certificate Number 15269

Lybrook I01-2207 01H
SHL: 1713' FSL & 457' FEL Sec 1 22N 07W
BHL: 2261' FSL & 330' FWL Sec 1 22N 07W
Sandoval, New Mexico

Encana Oil & Gas (USA) Inc.
Drilling Plan

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

Formation	Depth (TVD) units = feet
San Jose Fn.	n/a
Nacimiento Fn.	surface
Ojo Alamo Ss.	1,310
Kirtland Shale	1,492
Fruitland Coal	1,725
Pictured Cliffs Ss.	1,946
Lewis Shale	2,061
Cliffhouse Ss.	2,756
Menefee Fn.	3,360
Point Lookout Ss.	4,145
Mancos Shale	4,349
Mancos Silt	4,878
Gallup Fn.	5,142
Base Gallup	5,457

The referenced surface elevation is 7154', KB 7170'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,725
Oil/Gas	Pictured Cliffs Ss.	1,946
Oil/Gas	Cliffhouse Ss.	2,756
Gas	Menefee Fn.	3,360
Oil/Gas	Point Lookout Ss.	4,145
Oil/Gas	Mancos Shale	4,349
Oil/Gas	Mancos Silt	4,878
Oil/Gas	Gallup Fn.	5,142

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

Lybrook I01-2207 01H
SHL: 1713' FSL & 457' FEL Sec 1 22N 07W
BHL: 2261' FSL & 330' FWL Sec 1 22N 07W
Sandoval, New Mexico

3. PRESSURE CONTROL

a) Pressure contol 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.
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 (MD)	Hole Size	Csg Size	Weight	Grade
Conductor	0'-60'	26"	16"	42.09#	
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-5480'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5380'-10147'	6 1/8"	4 1/2"	11.6#	B80*, LTC New

Casing String				Casing Strength Properties			Minimum Design Factors		
Size	Weight (ppf)	Grade	Connection	Collapse (psi)	Burst (psi)	Tensile (1000lbs)	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
4.5"	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

Lybrook I01-2207 01H
SHL: 1713' FSL & 457' FEL Sec 1 22N 07W
BHL: 2261' FSL & 330' FWL Sec 1 22N 07W
Sandoval, New Mexico

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

Casing	Depth (MD)	Cement Volume (sacks)	Cement Type & Yield	Designed TOC	Centralizers
Conductor	0'-60'	100 sks	Type I Neat 16 ppg	Surface	None
Surface	0'-500'	276 sks	Type III Cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water	Surface	1 per joint on bottom 3 joints
Intermediate	0'-5480'	100% open hole excess Stage 1 Lead: 728 sks Stage 1 Tail: 551 sks	Lead: PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuft/sk Tail: Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuft/sk	Surface	1 every 3 joints through water bearing zones
Production Liner	5380'-10147'	50% OH excess Stage 1 Blend Total: 279sks	Blend: Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwow Potassium Chloride + 0.25lbs/sack Cello Flake + 0.5% bwoc CD-32 + 1.15% bwoc FL-52A + 60 lbs/sack Calcium Carbonate + 124.4% Fresh Water. Yield 2.63 cuft/sk	Liner Hanger	N/A

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 minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

5. WELL PLAN & DIRECTIONAL DRILLING PROGRAM

The proposed horizontal well will have a kick off point of 3000'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5368'/10147'	Gallup

Lybrook I01-2207 01H
SHL: 1713' FSL & 457' FEL Sec 1 22N 07W
BHL: 2261' FSL & 330' FWL Sec 1 22N 07W
Sandoval, New Mexico

6. DRILLING FLUIDS PROGRAM

a) Surface through Intermediate Casing Point:

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
30"	0-60'/60'	Fresh Water	8.3-9.2	38-100	4-28
12 1/4"	0'-500'/500'	Fresh Water	8.3-10	60-70	NC
8 3/4"	500'/500'-5288'/5480	Fresh Water LSND	8.3-10	40-50	8-10

b) Intermediate Casing Point to TD:

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	5288'/5480'-5368'/10147'	Fresh Water LSND	8.3-10	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. 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, & LOGGING

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

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 +/- 2527 psi based on a 9.0 ppg at 5399' TVD of the horizontal lateral target. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H_2S 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 March 23, 2015. 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 20 days.

LOC: 1713' FSL & 457' FEL Sec 1 22N 07W County: Sandoval WELL: Lybrook l01-2207 01H	**Encana Natural Gas** **WELL SUMMARY**		ENG: Sydney Kuyke 9/24/14 RIG: Unassigned GLE: 7154 RKBE: 7170

MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH TVD	DEPTH MD	HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			60	60'	26	**16" 42.09#** **100sx Type I Neat 16.0ppg cmt**	Fresh wtr 8.3-9.2	
Multi-Well pad - take survey every stand and run anti-collision report prior to spud	None	San Jose Fn. Nacimiento Fn. **9 5/8" Csg**	0 surface **500**	**500.00**	12 1/4	**9 5/8" 36ppf J55 STC** TOC Surface with 100% OH Excess: 276 sks Type III Cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water.	**Fresh wtr** 8.3-10	Vertical <1°
Survey Every 60'-120', updating anticollision report after surveys. Stop operations and contact drilling engineer if separation factor approaches 1.5	No OH logs Mud logger onsite	Ojo Alamo Ss. Kirtland Shale Fruitland Coal Pictured Cliffs Ss. Lewis Shale Cliffhouse Ss. Menefee Fn. Point Lookout Ss. Mancos Shale **KOP**	1,310 1,492 1,725 1,946 2,061 2,756 3,360 4,145 4,349 **3,000**	**3,000**	8 3/4	**7" 26ppf J55 LTC** TOC @ surface (100% OH excess - 70% Lead 30% Tail) Stage 1 Total: 1279sks Stage 1 Lead: 728 sks Premium Lite FM + 3% CaCl2 + 0.25/sk Cello Flake + 5#/sk LCM-1 + 8% Bentonite + 0.4% FL-52A + 0.4% Sodium Metasilicate. Mixed at 12.1 ppg. Yield 2.13 cuft/sk. Stage 1 Tail: 551 sks Type III Cement + 1% CaCl2 + 0.25#/sk Cello Flake + 0.2% FL-52A. Mixed at 14.6 ppg. Yield 1.38 cuft/sk.	Fresh Wtr 8.3-10	Vertical <1°
Surveys every 30' through the curve		Mancos Silt Gallup Fn. **7" Csg**	4,878 5,142 **5,288**	**5,480'**				
Surveys every stand to TD unless directed otherwise by Geologist MWD Gamma Directional	No OH Logs	Horizontal Target **TD** Base Gallup	5,399 **5,368** 5,457	**10,147**	6 1/8	100' overlap at liner top 4666' Drilled Lateral **4 1/2" 11.6ppf SB80 LTC** TOC @ hanger (50% OH excess) Stage 1 Total: 279sks Stage 1 Blend: 279 sks Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwow Potassium Chloride + 0.25lbs/sack Cello Flake + 0.5% bwoc CD-32 + 1.15% bwoc FL-52A + 60 lbs/sack Calcium Carbonate + 124.4% Fresh Water. Yield 2.63 cuft/sk.	**WBM** 8.3-10	Horz Inc/TVD 90.4deg/5399ft TD = 10146.5 MD

NOTES:

1) Drill with 26" bit to 60', set 16" 42.09ppf conductor pipe
2) Drill surface to 500', R&C 9 5/8" casing
3) N/U BOP and surface equipment
4) Drill to KOP of 3000', 8 3/4 inch holesize
5) Start curve at 10deg/100' build rate
6) Drill to csg point of 5480' MD
7) R&C 7" csg, circ cmt to surface
8) Land at ~90 deg, drill lateral to 10147' run 4 1/2 inch cemented liner

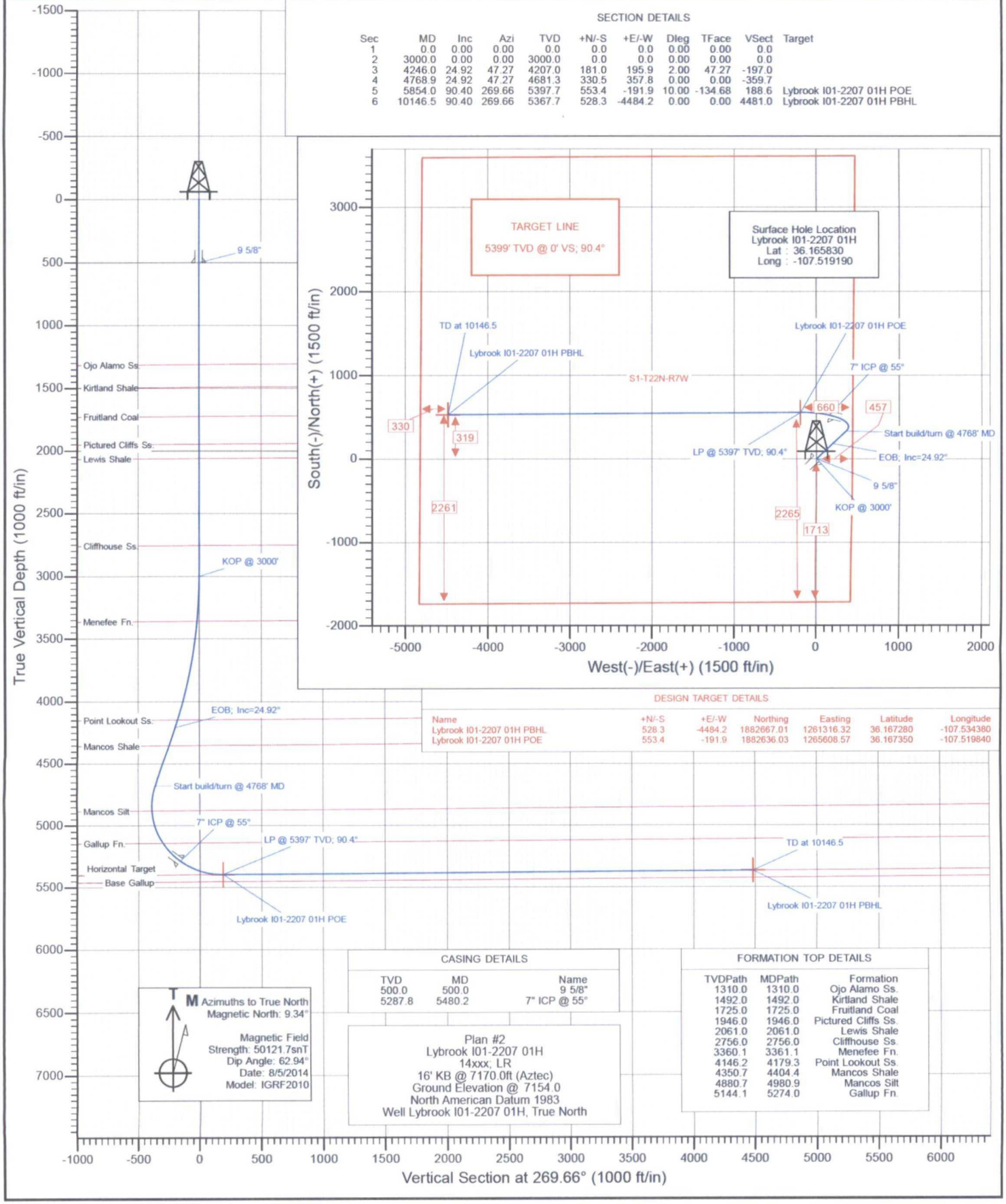
encana

CATHEDRAL

Project: Sandoval County, NM
Site: S1-T22N-R7W
Well: Lybrook I01-2207 01H
Wellbore: Hz
Design: Plan #2

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	3000.0	0.00	0.00	3000.0	0.0	0.0	0.00	0.00	0.0	
3	4246.0	24.92	47.27	4207.0	181.0	195.9	2.00	47.27	-197.0	
4	4768.9	24.92	47.27	4681.3	330.5	357.8	0.00	0.00	-359.7	
5	5854.0	90.40	269.66	5397.7	553.4	-191.9	10.00	-134.68	188.6	Lybrook I01-2207 01H POE
6	10146.5	90.40	269.66	5367.7	528.3	-4484.2	0.00	0.00	4481.0	Lybrook I01-2207 01H PBHL



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Lybrook I01-2207 01H PBHL	528.3	-4484.2	1882667.01	1261316.32	36.167280	-107.534380
Lybrook I01-2207 01H POE	553.4	-191.9	1882636.03	1265608.57	36.167350	-107.519840

CASING DETAILS

TVD	MD	Name
500.0	500.0	9 5/8"
5287.8	5480.2	7" ICP @ 55°

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1310.0	1310.0	Ojo Alamo Ss.
1492.0	1492.0	Kirtland Shale
1725.0	1725.0	Fruitland Coal
1946.0	1946.0	Pictured Cliffs Ss.
2061.0	2061.0	Lewis Shale
2756.0	2756.0	Cliffhouse Ss.
3360.1	3361.1	Menefee Fn.
4146.2	4179.3	Point Lookout Ss.
4350.7	4404.4	Mancos Shale
4880.7	4980.9	Mancos Silt
5144.1	5274.0	Gallup Fn.

M Azimuths to True North
Magnetic North: 9.34°

Magnetic Field
Strength: 50121.7snT
Dip Angle: 62.94°
Date: 8/5/2014
Model: IGRF2010

Plan #2
Lybrook I01-2207 01H
14xxx; LR
16' KB @ 7170.0ft (Aztec)
Ground Elevation @ 7154.0
North American Datum 1983
Well Lybrook I01-2207 01H, True North

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook I01-2207 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7170.0ft (Aztec)
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7170.0ft (Aztec)
Site:	S1-T22N-R7W	**North Reference:**	True
Well:	Lybrook I01-2207 01H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

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	S1-T22N-R7W				
Site Position:		**Northing:**	1,882,080.18 ft	**Latitude:**	36.165830
From:	Lat/Long	**Easting:**	1,265,793.20 ft	**Longitude:**	-107.519190
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-0.75 °

Well	Lybrook I01-2207 01H				
Well Position	**+N/-S** 0.0 ft	**Northing:**	1,882,080.18 ft	**Latitude:**	36.165830
	+E/-W 0.0 ft	**Easting:**	1,265,793.20 ft	**Longitude:**	-107.519190
Position Uncertainty	0.0 ft	**Wellhead Elevation:**	0.0 ft	**Ground Level:**	7,154.0 ft

Wellbore	Hz			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	8/5/2014	9.34	62.94	50,122

Design	Plan #2			
Audit Notes:				
Version:	**Phase:**	PLAN	**Tie On Depth:**	0.0

Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**
	0.0	0.0	0.0	269.66

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	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,246.0	24.92	47.27	4,207.0	181.0	195.9	2.00	2.00	0.00	47.27	
4,768.9	24.92	47.27	4,681.3	330.5	357.8	0.00	0.00	0.00	0.00	
5,854.0	90.40	269.66	5,397.7	553.4	-191.9	10.00	6.03	-12.68	-134.68	Lybrook I01-2207 01H
10,146.5	90.40	269.66	5,367.7	528.3	-4,484.2	0.00	0.00	0.00	0.00	Lybrook I01-2207 01H

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook I01-2207 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7170.0ft (Aztec)
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7170.0ft (Aztec)
Site:	S1-T22N-R7W	**North Reference:**	True
Well:	Lybrook I01-2207 01H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

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	24.92	47.27	4,256.1	196.4	212.6	-213.8	0.00	0.00	
4,400.0	24.92	47.27	4,346.7	225.0	243.6	-244.9	0.00	0.00	
4,404.4	24.92	47.27	4,350.7	226.3	244.9	-246.3	0.00	0.00	Mancos Shale
4,500.0	24.92	47.27	4,437.4	253.6	274.5	-276.0	0.00	0.00	
4,600.0	24.92	47.27	4,528.1	282.2	305.5	-307.2	0.00	0.00	
4,700.0	24.92	47.27	4,618.8	310.8	336.4	-338.3	0.00	0.00	
4,768.9	24.92	47.27	4,681.3	330.5	357.8	-359.7	0.00	0.00	Start build/turn @ 4768' MD
4,800.0	22.83	41.56	4,709.7	339.4	366.6	-368.6	10.00	-6.71	
4,900.0	18.11	16.01	4,803.6	369.0	383.8	-386.0	10.00	-4.72	
4,980.9	17.70	349.51	4,880.7	393.2	385.0	-387.3	10.00	-0.51	Mancos Silt
5,000.0	18.12	343.45	4,898.9	398.9	383.6	-386.0	10.00	2.20	
5,100.0	22.86	317.94	4,992.7	428.3	366.2	-368.7	10.00	4.74	
5,200.0	30.17	302.48	5,082.2	456.3	331.9	-334.6	10.00	7.31	
5,274.0	36.35	295.05	5,144.1	475.6	296.3	-299.1	10.00	8.36	Gallup Fn.
5,300.0	38.62	292.94	5,164.7	482.0	281.8	-284.7	10.00	8.70	
5,400.0	47.59	286.46	5,237.7	504.7	217.5	-220.5	10.00	8.98	
5,480.2	54.99	282.49	5,287.8	520.2	156.9	-160.0	10.00	9.23	7" ICP @ 55°
5,500.0	56.84	281.63	5,298.9	523.6	140.9	-144.0	10.00	9.32	
5,600.0	66.24	277.74	5,346.6	538.2	54.3	-57.5	10.00	9.40	
5,700.0	75.72	274.37	5,379.1	548.1	-39.6	36.3	10.00	9.48	
5,800.0	85.25	271.29	5,395.6	552.9	-137.9	134.7	10.00	9.53	
5,854.0	90.40	269.66	5,397.7	553.4	-191.9	188.6	10.00	9.54	LP @ 5397' TVD; 90.4° - Lybrook I01-2207 01H
5,900.0	90.40	269.66	5,397.4	553.1	-237.9	234.6	0.00	0.00	
6,000.0	90.40	269.66	5,396.7	552.5	-337.9	334.6	0.00	0.00	
6,100.0	90.40	269.66	5,396.0	551.9	-437.9	434.6	0.00	0.00	
6,200.0	90.40	269.66	5,395.3	551.4	-537.9	534.6	0.00	0.00	
6,300.0	90.40	269.66	5,394.6	550.8	-637.9	634.6	0.00	0.00	
6,400.0	90.40	269.66	5,393.9	550.2	-737.9	734.6	0.00	0.00	
6,500.0	90.40	269.66	5,393.2	549.6	-837.9	834.6	0.00	0.00	
6,600.0	90.40	269.66	5,392.5	549.0	-937.9	934.6	0.00	0.00	
6,700.0	90.40	269.66	5,391.8	548.4	-1,037.8	1,034.6	0.00	0.00	
6,800.0	90.40	269.66	5,391.1	547.8	-1,137.8	1,134.6	0.00	0.00	
6,900.0	90.40	269.66	5,390.4	547.3	-1,237.8	1,234.6	0.00	0.00	
7,000.0	90.40	269.66	5,389.7	546.7	-1,337.8	1,334.6	0.00	0.00	
7,100.0	90.40	269.66	5,389.0	546.1	-1,437.8	1,434.6	0.00	0.00	
7,200.0	90.40	269.66	5,388.3	545.5	-1,537.8	1,534.6	0.00	0.00	
7,300.0	90.40	269.66	5,387.6	544.9	-1,637.8	1,634.6	0.00	0.00	
7,400.0	90.40	269.66	5,386.9	544.3	-1,737.8	1,734.6	0.00	0.00	
7,500.0	90.40	269.66	5,386.2	543.7	-1,837.8	1,834.6	0.00	0.00	
7,600.0	90.40	269.66	5,385.5	543.2	-1,937.8	1,934.6	0.00	0.00	
7,700.0	90.40	269.66	5,384.8	542.6	-2,037.8	2,034.6	0.00	0.00	
7,800.0	90.40	269.66	5,384.1	542.0	-2,137.8	2,134.5	0.00	0.00	
7,900.0	90.40	269.66	5,383.4	541.4	-2,237.8	2,234.5	0.00	0.00	
8,000.0	90.40	269.66	5,382.7	540.8	-2,337.8	2,334.5	0.00	0.00	
8,100.0	90.40	269.66	5,382.0	540.2	-2,437.8	2,434.5	0.00	0.00	
8,200.0	90.40	269.66	5,381.3	539.7	-2,537.8	2,534.5	0.00	0.00	
8,300.0	90.40	269.66	5,380.6	539.1	-2,637.8	2,634.5	0.00	0.00	
8,400.0	90.40	269.66	5,379.9	538.5	-2,737.8	2,734.5	0.00	0.00	
8,500.0	90.40	269.66	5,379.2	537.9	-2,837.8	2,834.5	0.00	0.00	
8,600.0	90.40	269.66	5,378.5	537.3	-2,937.8	2,934.5	0.00	0.00	
8,700.0	90.40	269.66	5,377.8	536.7	-3,037.8	3,034.5	0.00	0.00	
8,800.0	90.40	269.66	5,377.1	536.1	-3,137.8	3,134.5	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook I01-2207 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7170.0ft (Aztec)
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7170.0ft (Aztec)
Site:	S1-T22N-R7W	**North Reference:**	True
Well:	Lybrook I01-2207 01H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

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
8,900.0	90.40	269.66	5,376.4	535.6	-3,237.8	3,234.5	0.00	0.00	
9,000.0	90.40	269.66	5,375.7	535.0	-3,337.8	3,334.5	0.00	0.00	
9,100.0	90.40	269.66	5,375.0	534.4	-3,437.7	3,434.5	0.00	0.00	
9,200.0	90.40	269.66	5,374.3	533.8	-3,537.7	3,534.5	0.00	0.00	
9,300.0	90.40	269.66	5,373.6	533.2	-3,637.7	3,634.5	0.00	0.00	
9,400.0	90.40	269.66	5,372.9	532.6	-3,737.7	3,734.5	0.00	0.00	
9,500.0	90.40	269.66	5,372.2	532.0	-3,837.7	3,834.5	0.00	0.00	
9,600.0	90.40	269.66	5,371.5	531.5	-3,937.7	3,934.5	0.00	0.00	
9,700.0	90.40	269.66	5,370.8	530.9	-4,037.7	4,034.5	0.00	0.00	
9,800.0	90.40	269.66	5,370.1	530.3	-4,137.7	4,134.5	0.00	0.00	
9,900.0	90.40	269.66	5,369.4	529.7	-4,237.7	4,234.5	0.00	0.00	
10,000.0	90.40	269.66	5,368.7	529.1	-4,337.7	4,334.5	0.00	0.00	
10,100.0	90.40	269.66	5,368.0	528.5	-4,437.7	4,434.5	0.00	0.00	
10,146.5	90.40	269.66	5,367.7	528.3	-4,484.2	4,481.0	0.00	0.00	TD at 10146.5 - Lybrook I01-2207 01H PBHL

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lybrook I01-2207 01H P - plan hits target center - Point	0.00	0.00	5,367.7	528.3	-4,484.2	1,882,667.01	1,261,316.32	36.167280	-107.534380
Lybrook I01-2207 01H P - plan hits target center - Point	0.00	0.00	5,397.7	553.4	-191.9	1,882,636.03	1,265,608.57	36.167350	-107.519840

500.0	500.0	9 5/8"		0.000	0.000
5,480.2	5,287.8	7" ICP @ 55°		0.000	0.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,310.0	1,310.0	Ojo Alamo Ss.		-0.40	269.66
1,492.0	1,492.0	Kirtland Shale		-0.40	269.66
1,725.0	1,725.0	Fruitland Coal		-0.40	269.66
1,946.0	1,946.0	Pictured Cliffs Ss.		-0.40	269.66
2,061.0	2,061.0	Lewis Shale		-0.40	269.66
2,756.0	2,756.0	Cliffhouse Ss.		-0.40	269.66
3,361.1	3,360.0	Menefee Fn.		-0.40	269.66
4,179.3	4,145.0	Point Lookout Ss.		-0.40	269.66
4,404.4	4,349.0	Mancos Shale		-0.40	269.66
4,980.9	4,878.0	Mancos Silt		-0.40	269.66
5,274.0	5,142.0	Gallup Fn.		-0.40	269.66

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook I01-2207 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7170.0ft (Aztec)
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7170.0ft (Aztec)
Site:	S1-T22N-R7W	**North Reference:**	True
Well:	Lybrook I01-2207 01H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #2		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
3,000.0	3,000.0	0.0	0.0	KOP @ 3000'
4,246.0	4,207.0	181.0	195.9	EOB; Inc=24.92°
4,768.9	4,681.3	330.5	357.8	Start build/turn @ 4768' MD
5,854.0	5,397.7	553.4	-191.9	LP @ 5397' TVD; 90.4°
10,146.5	5,367.7	528.3	-4,484.2	TD at 10146.5

Topsoil will not be stripped when soils are moisture-saturated or frozen below the stripping depth.

If the location becomes prone to wind or water erosion, Encana will take appropriate measures to prevent topsoil loss from wind. Such measures may include using tackifiers or water to wet the topsoil stockpile so that a crust is created across the exposed soil to prevent soil loss.

3. All construction materials for the well pad will consist of native borrow and subsoil accumulated during well pad construction. If additional fill or surfacing material is required, it will be obtained from existing permitted or private sources and will be hauled in by trucks over existing access roads.

   The maximum cut will be approximately 21 feet on the east corner (corner 6) and the maximum fill will be approximately 21 feet on the west corner (corner 3).

4. As determined during the onsite on June 13, 2014, the following best management practices will be implemented:
   a. The northern corner (corner 5) of the well pad will be rounded to avoid excess cuts
   b. The eastern corner (corner 6) of the well pad will be rounded to avoid excess cuts.

5. Construction equipment may include chain saws, a brush hog, scraper, maintainer, excavator, and dozer. Construction for the access road and well pad will take approximately 3 weeks.

6. Berm/close the two-track road at both ends of the well pad.

7. Construct diversion ditches above the cut draining from corner #6 towards corner #5 and then towards corner #3. Construct a diversion ditch above the cut draining from corner #6 towards corner #2.

C. Pipeline
   See the Standard SF-299 Application for authorization to construct, operate, maintain and terminate a 808 foot, up to 6-inch outside diameter, buried steel well connect pipeline (NMNM 132600) that was submitted to the BLM on May 14, 2013 and the final modifications to the SF-299 submitted concurrently with the Application for Permit to Drill.

7. METHODS FOR HANDLING WASTE

A. Cuttings

1. A closed-loop system will be used. Cuttings will be moved through a shaker system on the drill rig that separates drilling fluids from the cuttings. Cuttings will be stored onsite in above-ground storage tanks. Cuttings will be pulled from the storage tanks, mixed with saw dust or similar absorbent material, and disposed of at the Envirotech, Inc. and/or Industrial Ecosystem, Inc. waste disposal facilities.

2. The closed-loop system storage tanks will be adequately sized to ensure confinement of all fluids and will provide sufficient freeboard to prevent uncontrolled releases.

3. A 20-mil liner will be installed under tanks, pumps, ancillary facilities, and truck loading/unloading areas associated with the closed-loop system.

Directions from the Intersection of US Hwy 550 & US Hwy 64

in Bloomfield, NM to Encana Oil & Gas (USA) Inc. Lybrook I01-2207 01H

1713' FSL & 457' FEL, Section 1, T22N, R7W, N.M.P.M., Sandoval County, NM

Latitude: 36.16583°N Longitude: 107.51919°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) on Indian Service Route #474 for 4.3 miles to fork in road;

Go left (South-westerly) remaining on Indian Service Route #474 for 0.2 miles to 4-way intersection;

Go right (North-westerly) for 0.6 miles to 4-way intersection;

Go straight (Westerly) for 0.2 miles to 4-way intersection;

Go straight (Westerly) for 0.6 miles to fork in road;

Go right (North-westerly) for 1.4 miles to fork in road;

Go right (North-westerly) for 0.9 miles to fork in road;

Go left (South-easterly) for 0.6 miles to fork in road;

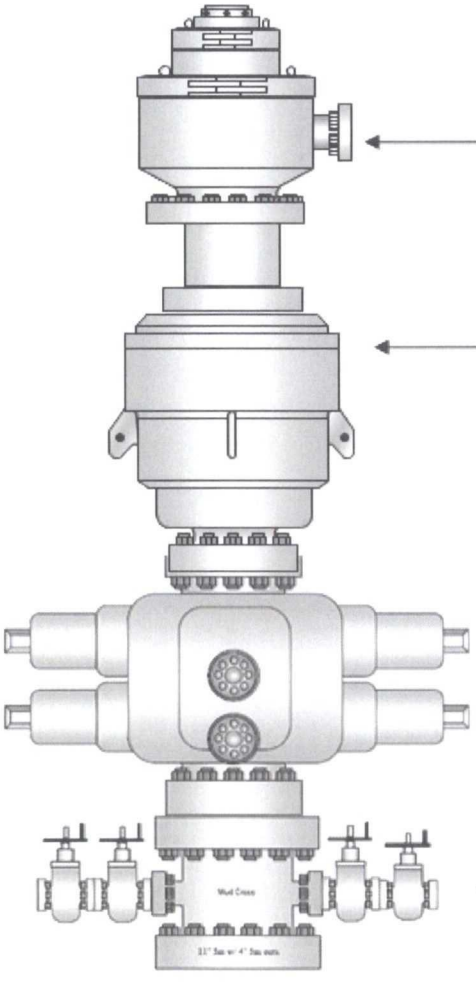
Go right (South-westerly) for 100' to fork in road;

Go left (South-easterly) for 0.15 miles to new access on left-hand side which continues for 78' to Encana Lybrook I01-2207 01H staked location.

WELLHEAD BLOWOUT CONTROL SYSTEM

encana

Well Name and Number:
Lybrook I01-2207 01H



11" 3K Rotating Head

11" 3K Annular

3K Double Ram
Top: Pipe Ram
Bottom: Blind Ram
3" Outlets Below Ram

3K Mud Cross 3" gate valves