

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 3160-4 or 3160-5 form.

Operator Signature Date: 10/17/2012

Well information:
Encana Oil & Gas
Lybrook H01-2206 #1H
30-043-21122
Sec1 T22N R6W

Conditions of Approval:

Notify NMOCD 24hrs prior to beginning operations.
Hold C104 for Directional Survey & As Drilled Plat

NMOCD Approved by Signature

JUL 09 2013

Date

RECEIVED

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCT 17 2012

FORM APPROVED
OMB No. 1004-0137
Expires: July 31, 2010Farmington Field Office
Bureau of Land Management**SUNDRY NOTICES AND REPORTS ON WELLS**
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.5. Lease Serial No.
NMNM 1093856. If Indian, Allottee or Tribe Name
N/ARCVD JUN 17 '13
OIL CONS. DIV.**SUBMIT IN TRIPLICATE – Other instructions on page 2.**

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other7. If Unit of CA/Agreement, Name and/or No.
N/A DIST. 32. Name of Operator
Encana Oil & Gas (USA) Inc.8. Well Name and No.
Lybrook H01-2206 01H9. API Well No.
30-043-211223a. Address
370 17th Street, Suite 1700
Denver CO, 802023b. Phone No. (include area code)
720-876-533110. Field and Pool or Exploratory Area
Wildcat (Gallup)4. Location of Well (Footage, Sec., T. R. M., or Survey Description)
SHL: 2323' FNL and 497' FEL, Section 1, T22N R6W
BHL: 1959' FNL and 339' FWL, Section 1, T22N R6W11. Country or Parish, State
Sandoval, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other _____
	<input checked="" type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleting horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleting in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

Encana Oil & Gas (USA) Inc. (Encana) would like to adjust the bottom hole location, target depths, access road and pipeline installation, 10-point Drilling Plan, casing and cementing program, mud program, plug back procedures, wellbore diagram, wellhead blowout control system, pipe specifications, wellbore directional plan and design, and Surface Use Plan of Operations for the Lybrook H01-2206 01H oil well.

Additionally, Encana would like to adjust the Lybrook H01-2206 01H oil well to be drilled in two phases, starting with the pilot hole in the first phase, followed by a horizontal lateral in the wellbore in the second phase.

Please see the attached description of Proposed Operation for further detail.

CONFIDENTIAL

14. I hereby certify that the foregoing is true and correct.

Name (Printed/Typed)
Holly Hill

Title Regulatory Analyst

Signature

Holly Hill

Date

10/17/12

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

[Signature]

Title

AFM

Date

6/18/13

Conditions of approval, if any, are attached. Approval of this notice 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.

Office

FEO

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.

(Instructions on page 2)

NMOCDA

RECEIVED

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

OCT 17 2012 Form C-102
(Revised August 1, 2011)

Submit one copy to
Appropriate District Office

OIL CONSERVATION DIVISION
Bureau of Land Management
1220 South St. Francis Drive
Santa Fe, NM 87505

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-043-21122		*Pool Code	*Pool Name WILDCAT (GALLUP)
*Property Code 39999	*Property Name LYBROOK H01-2206		*Well Number 01H
*UGRID No. 282327	*Operator Name ENCANA OIL & GAS (USA) INC.		*Elevation 6931'

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
H	1	22N	6W		2323	NORTH	497	EAST	SANDOVAL

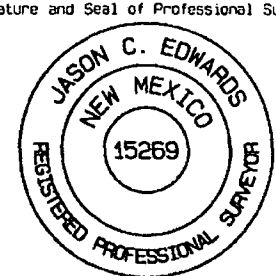
11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	1	22N	6W		1959	NORTH	339	WEST	SANDOVAL

*Dedicated Acres 160.0 Acres - (S/2 N/2)	*Joint or Infill	*Consolidation Code	*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

16 N88°52'W 2619.54' (RECORD) N88°52'W 2619.54' (RECORD)
N88°05'28"W 2618.28' (MEASURED) N88°09'09"W 2620.37' (MEASURED)

<p>LOT 4</p> <p>LOT 3</p> <p>LOT 2</p> <p>LOT 1</p> <p>1959'</p> <p>2083'</p> <p>2323'</p> <p>339'</p> <p>1099'</p> <p>497'</p> <p>N86°14.8'W 3801.5'</p> <p>N66°34.5'W 648.3'</p>			<p>17 OPERATOR CERTIFICATION</p> <p>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.</p> <p>Signature: <i>Brenda R. Linster</i> Date: 10-12-12</p> <p>Printed Name: Brenda R. Linster</p> <p>E-mail Address: brenda.linster@encana.com</p>					
<p>END OF LATERAL LAT: 36.16888°N LONG: 107.42720°W DATUM: NAD1927</p> <p>LAT: 36.16890°N LONG: 107.42780°W DATUM: NAD1983</p>			<p>LANDING POINT LAT: 36.16832°N LONG: 107.41434°W DATUM: NAD1927</p> <p>LAT: 36.16834°N LONG: 107.41494°W DATUM: NAD1983</p>			<p>SURFACE LOCATION LAT: 36.16763°N LONG: 107.41232°W DATUM: NAD1927</p> <p>LAT: 36.16765°N LONG: 107.41292°W DATUM: NAD1983</p>		
<p>N89°18'W 2617.89' (RECORD) N88°38'12"W 2618.28' (MEASURED)</p>			<p>N89°18'W 2617.89' (RECORD) N88°37'04"W 2615.10' (MEASURED)</p>			<p>18 SURVEYOR CERTIFICATION</p> <p>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.</p> <p>Date of Survey: AUGUST 24, 2012</p> <p>Signature and Seal of Professional Surveyor</p> <div style="text-align: center;">  <p>JASON C. EDWARDS</p> <p>Certificate Number 15269</p> </div>		

Directions from the Intersection of US Hwy 550 & US Hwy 64
in Bloomfield, NM to Encana Oil & Gas (USA) Inc. Lybrook H01-2206 01H
2323' FNL & 497' FEL, Section 1, T22N, R6W, N.M.P.M., Sandoval County, NM

Latitude: 36.16765°N Longitude: 107.41292°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 3.3 miles to an unimproved roadway;








Go left (South-easterly) along Lybrook Access Road #1 for 12,155' to " T " intersection in proposed roadway;

Go left (Northerly) for an additional 7,398' along unimproved roadway to staked Encana Lybrook H01-2206 01H location.

encana.

natural gas

**SAN JUAN COUNTY,
NEW MEXICO**

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

1 inch = 2,000 feet

WARNER-GOVT

GULF STATE - 36

25

30

35

36

23N
5W

31

Lybrook A01-2206 01H

Lybrook H03-2206 01H

2

1

Lybrook H01-2206 01H

6

22N
6W

11

12

22N
5W

7

8

DOUBLE OUGHT

0 0.1 0.2 0.4 Miles

Lybrook H01-2206 01H
SHL: SENE Section 1, T22N, R6W
2323 FNL and 497 FEL
BHL: SWNW Section 1, T22N, R6W
1959 FNL and 339 FWL
Sandoval County, New Mexico
Lease Number: NMNM 109385

**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	1362'
Kirtland	1491'
Fruitland Coal	1579'
Pictured Cliffs	1880'
Lewis	2004'
Cliffhouse	2677'
Menefee	3443'
Point Lookout	4111'
Mancos	4314'
Gallup	5151'

The referenced surface elevation is 6931', KB 6944'

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

<u>Substance</u>	<u>Formation</u>	<u>Depth (TVD)</u>
Water	Ojo Alamo	1362'
Gas	Fruitland Coal	1579'
Gas	Pictured Cliffs	1880'
Gas	Cliffhouse	2677'
Gas	Point Lookout	4111'
Oil/Gas	Mancos	4314'

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 H01-2206 01H

SHL: SENE Section 1, T22N, R6W
2323 FNL and 497 FEL

BHL: SWNW Section 1, T22N, R6W
1959 FNL and 339 FWL

Sandoval County, New Mexico

Lease Number: NMNM 109385

- 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'-5585'MD	8 1/2"	7"	26#	J55, LTC New
Production Liner	5385'-9602'	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 H01-2206 01H
 SHL: SENE Section 1, T22N, R6W
 2323 FNL and 497 FEL
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Casing	Depth	Cement Volume (sacks)	Cement Type&Yield	Designed TOC	Centralizers
Conductor	60'	100sk	Type I Neat 14.8ppg	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 turbolizer per joint on bottom 3 joints
Intermediate	5380'TVD/ 5585'MD	30% open hole excess Lead: 155sk Tail: 434sk	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*	5385'MD- 9602'MD	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 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	5702'/5702'	Gallup
2	Horizontal Lateral	5386'/9602'	Gallup

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Sandoval County, New Mexico
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Proposed Plug Back Procedure:
KOP 4800'

Set kick plug at KOP

1. Spot 300' kick plug from 4700' – 5000'
 - a. 91sx of Class A cement with salt (1.3ft³/sk yield)
 - 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)	TVD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
30"	0-60'	Fresh Water	8.3-9.2	38-100	4-28
12 1/4"	0-500'	Fresh Water	8.4-8.6	60-70	NC
8 1/2"	500-5702'	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 1/2"	4800' (KOP)- 5380' (5585'MD)	Fresh Water LSND	8.5-8.8	40-50	8-10

c) Intermediate Casing Point to TD:

Hole Size (in)	Depth (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	5585'MD- 9602'MD	Synthetic Oil Based Mud	8.6-9.0	15-25	<15

- d) 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.
- e) 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 H01-2206 01H

**SHL: SENE Section 1, T22N, R6W
2323 FNL and 497 FEL**

**BHL: SWNW Section 1, T22N, R6W
1959 FNL and 339 FWL**

Sandoval County, New Mexico

Lease Number: NMNM 109385

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/GRVDL will be run as needed for perforating control

8. ABNORMAL PRESSURES & HYDROGEN SULFIDE

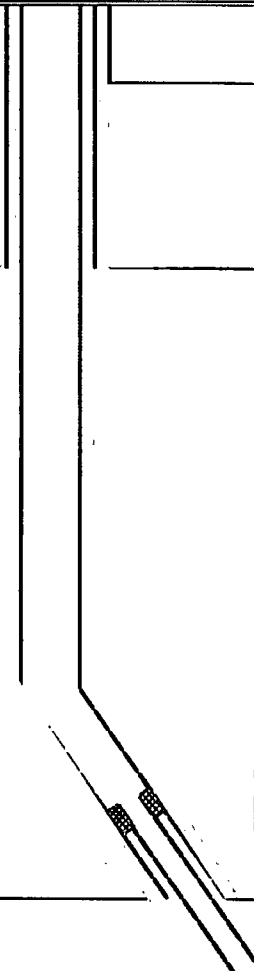
The anticipated bottom hole pressure is +/- 2,667 psi based on a 9.0 ppg at 5702' TVD of the vertical pilot hole. No abnormal pressure or temperatures are anticipated.

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 May 2, 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.

LOC: Sec 1, T22N, R6W County: Sandoval WELL: Lybrook H01-2206 01H			Encana Natural Gas WELL SUMMARY				encana natural gas		ENG: J. Fox/ A. RIG: GLE: 6931 RKBE: 6944		10/3/12
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	Nacimiento	154			12 1/4	9 5/8" 36ppf J55 STC	Fresh wtr 8.4-8.6	Vertical <1°		
			500	500			TOC @ surface				
Surveys every 500'	No OH logs	Ojo Alamo Kirtland Shale Fruitland Coal Pictured Cliffs Ss Lewis Shale Cliffhouse Ss Menefee Fn Point Lookout Ss Mancos Sh Mancos Silt	1362 1491 1579 1880 2004 2677 3443 4111 4314 4902			8 1/2	7" 26ppf J55 LTC	Fresh Wtr 8.5-8.8	Vertical <1°		
	Mud logger onsite	KICK OFF PT	4800				TOC @ surface				
		Gallup Top	5151						KOP 4800 10 deg/100'		
			5380	5585							
Surveys every 500' Gyro at CP MWD Gamma Directional	No OH Logs	horz target	5413	5800		6 1/8	200' overlap at liner top		.5deg updip 5386'TVD TD = 9602' MD		
		Base Gallup	5502			3800' Lateral				8.6-9.0 OBM	
		Pilot Hole TD	5702				4 1/2" 11.6ppf SB80 LTC	OBM 8.6-9.0			
							Running external swellable csg packers for isolation of prod string				

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 5702' and run OH logs.
- 5) Spot cement plug over Graneros and pull up to spot cement kick plug
- 6) Kick off at 4800' and start curve at 10deg/100' build rate
- 7) Drill to casing point of 5585' MD
- 8) R&C 7" casing, circ cmt to surface, switch to OBM
- 9) Land at 90deg, drill 3800' lateral to 9602', 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
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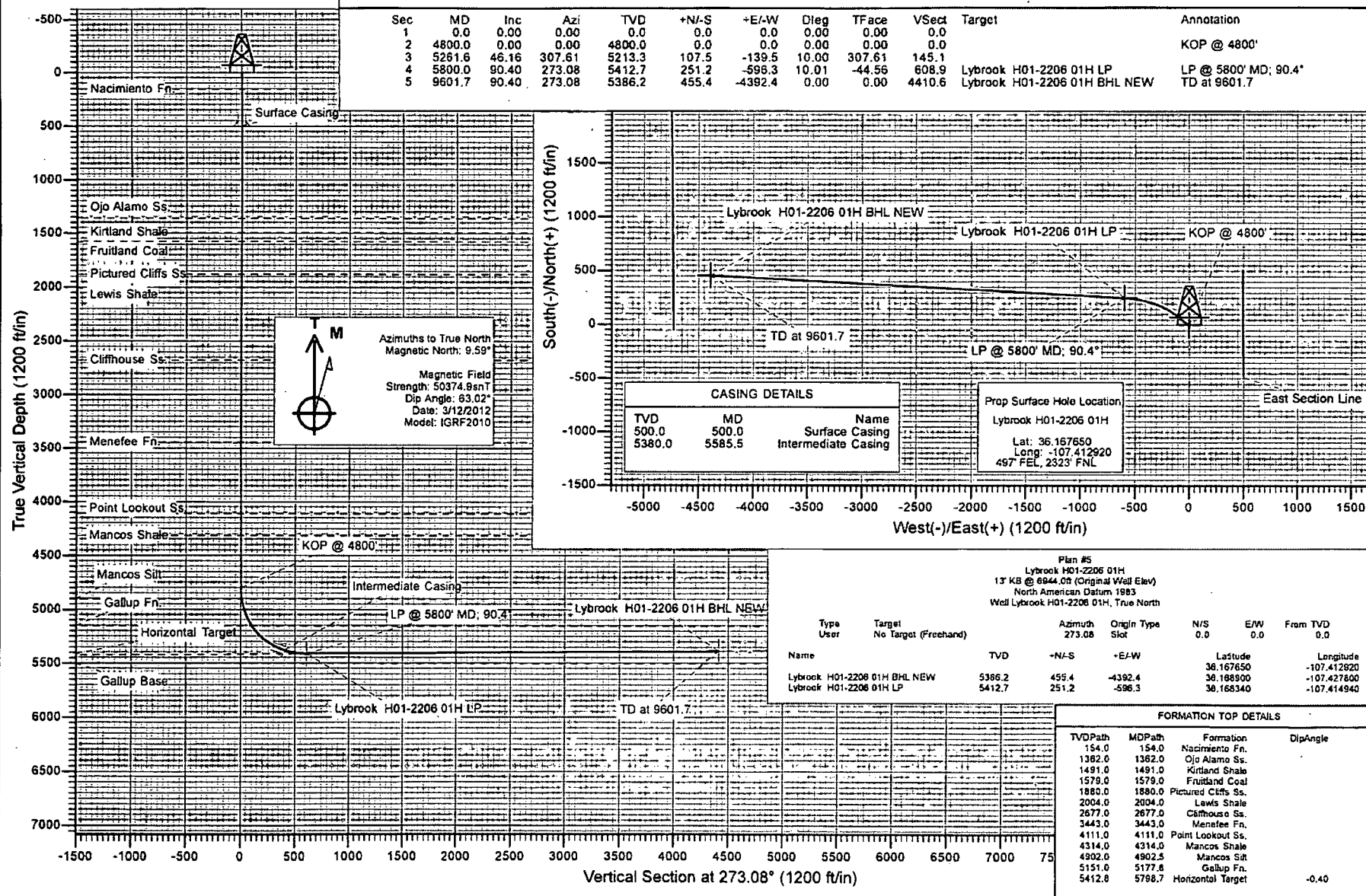
encana™

natural gas

Project: Sandoval County, NM
Site: Lybrook
Well: Lybrook H01-2206 01H
Wellbore: HZ
Design: Plan #5



CATHEDRAL



Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook H01-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	13' KB @ 6944.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	13' KB @ 6944.0ft (Original Well Elev)
Site:	Lybrook	North Reference:	True
Well:	Lybrook H01-2206 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #5		

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

Well	Lybrook H01-2206 01H		
Well Position	+N/-S	0.0 ft	Northing:
	+E/-W	0.0 ft	Easting:
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft
		Latitude:	36.167650
		Longitude:	-107.412920
		Ground Level:	8,931.0 ft

Wellbore	HZ		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	3/12/2012	9.59
			Dip Angle
			63.02
			Field Strength
			50.374

Design	Plan #5		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(ft)	(ft)	(ft)
	0.0	0.0	0.0
			Direction
			273.08

Plan Sections			
Measured	Inclination	Azimuth	Vertical
Depth	(°)	(°)	Depth
(ft)			(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
4,800.0	0.00	0.00	0.0
5,261.6	46.18	307.61	5,213.3
5,800.0	90.40	273.08	5,412.7
9,601.7	90.40	273.08	5,386.2
			107.5
			-139.5
			10.00
			10.00
			8.22
			-6.41
			-44.56 Lybrook H01-2206 01
			0.00 Lybrook H01-2206 01

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Sandoval County, NM
 Site: Lybrook
 Well: Lybrook H01-2206 01H
 Wellbore: HZ
 Design: Plan #5

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

Well Lybrook H01-2206 01H
 13' KB @ 6944.0ft (Original Well Elev)
 13' KB @ 6944.0ft (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
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	Lybrook H01-2206 01H BHL SHL Section Line
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
154.0	0.00	0.00	154.0	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	
1,362.0	0.00	0.00	1,362.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,491.0	0.00	0.00	1,491.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,579.0	0.00	0.00	1,579.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
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	
1,880.0	0.00	0.00	1,880.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
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	
2,004.0	0.00	0.00	2,004.0	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	
2,677.0	0.00	0.00	2,677.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
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	
2,900.0	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	
3,443.0	0.00	0.00	3,443.0	0.0	0.0	0.0	0.00	0.00	Menefee 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	
4,111.0	0.00	0.00	4,111.0	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	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook H01-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	13' KB @ 6944.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	13' KB @ 6944.0ft (Original Well Elev)
Site:	Lybrook	North Reference:	True
Well:	Lybrook H01-2206 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #5		

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	
4,314.0	0.00	0.00	4,314.0	0.0	0.0	0.0	0.00	0.00	Mancos 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	
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4800'
4,900.0	10.00	307.61	4,899.5	5.3	-6.9	7.2	10.00	10.00	
4,902.5	10.26	307.61	4,902.0	5.6	-7.3	7.5	10.00	10.00	Mancos Silt
5,000.0	20.00	307.61	4,996.0	21.1	-27.4	28.5	10.00	10.00	
5,100.0	30.00	307.61	5,086.5	46.9	-60.8	63.2	10.00	10.00	
5,177.8	37.78	307.61	5,151.0	73.3	-95.1	98.9	10.00	10.00	Gallup Fn.
5,200.0	40.00	307.61	5,168.3	81.8	-106.2	110.4	10.00	10.00	
5,261.6	46.16	307.61	5,213.3	107.5	-139.5	145.1	10.00	10.00	
5,300.0	48.96	304.04	5,239.2	124.1	-162.5	168.9	10.01	7.28	
5,400.0	56.67	296.01	5,299.6	163.6	-231.5	239.9	10.01	7.71	
5,500.0	64.82	289.33	5,348.5	197.0	-311.9	322.0	10.01	8.14	
5,585.5	71.99	284.31	5,380.0	219.9	-387.9	399.2	10.01	8.39	Intermediate Casing
5,600.0	73.22	283.50	5,384.3	223.2	-401.4	412.8	10.01	8.49	
5,700.0	81.78	278.18	5,405.9	241.5	-497.1	509.4	10.01	8.56	
5,798.7	90.29	273.14	5,412.8	251.1	-595.0	607.7	10.01	8.62	Horizontal Target
5,800.0	90.40	273.08	5,412.8	251.2	-596.3	608.9	9.87	8.51	LP @ 5800' MD; 90.4° - Lybrook H01-2206 01H
5,900.0	90.40	273.08	5,412.1	256.6	-698.2	708.9	0.00	0.00	
6,000.0	90.40	273.08	5,411.4	262.0	-796.0	808.9	0.00	0.00	
6,100.0	90.40	273.08	5,410.7	267.3	-895.9	908.9	0.00	0.00	
6,200.0	90.40	273.08	5,410.0	272.7	-995.7	1,008.9	0.00	0.00	
6,300.0	90.40	273.08	5,409.3	278.1	-1,095.6	1,108.9	0.00	0.00	
6,400.0	90.40	273.08	5,408.6	283.4	-1,195.4	1,208.9	0.00	0.00	
6,500.0	90.40	273.08	5,407.9	288.8	-1,295.3	1,308.9	0.00	0.00	
6,600.0	90.40	273.08	5,407.2	294.2	-1,395.1	1,408.9	0.00	0.00	
6,700.0	90.40	273.08	5,406.5	299.6	-1,495.0	1,508.9	0.00	0.00	
6,800.0	90.40	273.08	5,405.8	304.9	-1,594.8	1,608.9	0.00	0.00	
6,900.0	90.40	273.08	5,405.1	310.3	-1,694.7	1,708.9	0.00	0.00	
7,000.0	90.40	273.08	5,404.4	315.7	-1,794.5	1,808.9	0.00	0.00	
7,100.0	90.40	273.08	5,403.7	321.0	-1,894.4	1,908.9	0.00	0.00	
7,200.0	90.40	273.08	5,403.0	326.4	-1,994.3	2,008.9	0.00	0.00	
7,300.0	90.40	273.08	5,402.3	331.8	-2,094.1	2,108.9	0.00	0.00	
7,400.0	90.40	273.08	5,401.6	337.2	-2,194.0	2,208.9	0.00	0.00	
7,500.0	90.40	273.08	5,400.9	342.5	-2,293.8	2,308.9	0.00	0.00	
7,600.0	90.40	273.08	5,400.2	347.9	-2,393.7	2,408.9	0.00	0.00	
7,700.0	90.40	273.08	5,399.5	353.3	-2,493.5	2,508.9	0.00	0.00	
7,800.0	90.40	273.08	5,398.8	358.6	-2,593.4	2,608.9	0.00	0.00	
7,900.0	90.40	273.08	5,398.1	364.0	-2,693.2	2,708.9	0.00	0.00	
8,000.0	90.40	273.08	5,397.4	369.4	-2,793.1	2,808.9	0.00	0.00	
8,100.0	90.40	273.08	5,396.7	374.7	-2,892.9	2,908.9	0.00	0.00	
8,200.0	90.40	273.08	5,396.0	380.1	-2,992.8	3,008.9	0.00	0.00	
8,300.0	90.40	273.08	5,395.3	385.5	-3,092.6	3,108.9	0.00	0.00	
8,400.0	90.40	273.08	5,394.6	390.9	-3,192.5	3,208.9	0.00	0.00	
8,500.0	90.40	273.08	5,393.9	396.2	-3,292.3	3,308.9	0.00	0.00	
8,600.0	90.40	273.08	5,393.2	401.6	-3,392.2	3,408.9	0.00	0.00	
8,700.0	90.40	273.08	5,392.5	407.0	-3,492.1	3,508.9	0.00	0.00	
8,800.0	90.40	273.08	5,391.8	412.3	-3,591.9	3,608.9	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook H01-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	13' KB @ 6944.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	13' KB @ 6944.0ft (Original Well Elev)
Site:	Lybrook	North Reference:	True
Well:	Lybrook H01-2206 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #5		

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	273.08	5,391.1	417.7	-3,691.8	3,708.9	0.00	0.00	
9,000.0	90.40	273.08	5,390.4	423.1	-3,791.6	3,808.9	0.00	0.00	
9,100.0	90.40	273.08	5,389.7	428.5	-3,891.5	3,908.9	0.00	0.00	
9,200.0	90.40	273.08	5,389.0	433.8	-3,991.3	4,008.9	0.00	0.00	
9,300.0	90.40	273.08	5,388.3	439.2	-4,091.2	4,108.9	0.00	0.00	
9,400.0	90.40	273.08	5,387.6	444.6	-4,191.0	4,208.9	0.00	0.00	
9,500.0	90.40	273.08	5,386.9	449.9	-4,290.9	4,308.9	0.00	0.00	
9,596.6	90.40	273.08	5,386.2	455.1	-4,387.4	4,405.5	0.00	0.00	Lybrook H01-2206 01H BHL (New)
9,600.0	90.40	273.08	5,386.2	455.3	-4,390.7	4,408.9	0.00	0.00	
9,601.7	90.40	273.08	5,386.2	455.4	-4,392.4	4,410.6	0.00	0.00	TD at 9601.7 - Lybrook H01-2206 01H BHL - L

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lybrook H01-2206 01H	0.00	359.30	5,431.0	91.4	-4,407.3	1,882,493.91	1,292,764.37	36.167900	-107.427850
- hit/miss target									
- Shape									
- plan misses target center by 367.1ft at 9596.6ft MD (5386.2 TVD, 455.1 N, -4387.4 E)									
- Polygon									
Point 1			5,431.0	1,996.0	-335.0	1,884,489.86	1,292,429.07		
Point 2			5,431.0	-500.0	-335.0	1,881,993.86	1,292,429.45		
Lybrook H01-2206 01H	0.00	359.30	5,400.2	384.4	-4,400.9	1,882,766.86	1,292,774.01	36.168650	-107.427829
- plan misses target center by 92.5ft at 9601.7ft MD (5386.2 TVD, 455.4 N, -4392.4 E)									
- Polygon									
Point 1			5,400.2	1,996.0	-335.0	1,884,762.81	1,292,438.70		
Point 2			5,400.2	-500.0	-335.0	1,882,266.81	1,292,439.08		
Lybrook H01-2206 01H	0.00	359.30	5,412.7	251.2	-596.3	1,882,608.10	1,296,576.99	36.168340	-107.414940
- plan hits target center									
- Point									
Lybrook H01-2206 01H	0.00	359.31	-5,392.5	0.0	0.0	1,882,349.77	1,297,170.23	36.167650	-107.412920
- plan misses target center by 5392.5ft at 0.0ft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			-5,392.5	500.0	497.0	1,882,849.77	1,297,667.23		
Point 2			-5,392.5	-500.0	497.0	1,881,849.77	1,297,667.23		
Lybrook H01-2206 01H	0.00	359.30	5,386.2	455.4	-4,392.4	1,882,857.77	1,292,783.55	36.168900	-107.427800
- plan hits target center									
- Polygon									
Point 1			5,386.2	1,996.0	-335.0	1,884,853.71	1,292,448.24		
Point 2			5,386.2	-500.0	-335.0	1,882,357.71	1,292,448.63		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
500.0	500.0	Surface Casing	0.000	0.000	
5,585.5	5,380.0	Intermediate Casing	0.000	0.000	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook H01-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	13' KB @ 6944.0ft (Original Well Elev)
Project:	Sandoval County, NM	MD Reference:	13' KB @ 6944.0ft (Original Well Elev)
Site:	Lybrook	North Reference:	True
Well:	Lybrook H01-2206 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #5		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
154.0	154.0	Nacimiento Fn.			
1,362.0	1,362.0	Ojo Alamo Ss.			
1,491.0	1,491.0	Kirtland Shale			
1,579.0	1,579.0	Fruitland Coal			
1,880.0	1,880.0	Pictured Cliffs Ss.			
2,004.0	2,004.0	Lewis Shale			
2,677.0	2,677.0	Cliffhouse Ss.			
3,443.0	3,443.0	Menefee Fn.			
4,111.0	4,111.0	Point Lookout Ss.			
4,314.0	4,314.0	Mancos Shale			
4,902.5	4,902.0	Mancos Silt			
5,177.8	5,151.0	Gallup Fn.			
5,798.7	5,417.0	Horizontal Target		-0.40	273.08

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,800.0	4,800.0	0.0	0.0	KOP @ 4800'
5,800.0	5,412.7	107.5	-139.5	LP @ 5800' MD; 90.4°
9,601.7	5,386.2	251.2	-596.3	TD at 9601.7

WELLHEAD BLOWOUT CONTROL SYSTEM



Well name and number:

Lybrook H01-2206 01H

