

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

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

JAN 24 2013

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an Field Class II well. Use Form 3160-3 (APD) for such proposals.

5. Lease Serial No.
JNM NM 109386

6. If Indian, Allottee or Tribe Name
N/A

SUBMIT IN TRIPLICATE – Other instructions on page 2.

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

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

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

8. Well Name and No.
Lybrook H03-2206 01H

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

ATTN: ROBYNN HADEN

3b. Phone No. (include area code)
720-876-3941

9. API Well No.
30-043-21123

10. Field and Pool or Exploratory Area
Wildcat Gallup

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SHL: 2325' FNL and 138' FEL, Sec 3 Township 22N Range 6W
BHL: 1895' FNL and 330' FWL, Sec 3 Township 22N Range 6W

11. Country or Parish, State
Sandoval, New Mexico

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other _____
	☒ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ 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 recompleate 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 recompleation 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 amend the casing, cementing and BOP program for the Lybrook H03-2206 01H well. Encana would also like to amend the horizontal target to 5429'TVD. Please see attached 10 point drilling plan, wellbore diagram, BOP diagram, pipe specifications and C-102 and directional plan for details.

RCVD FEB 4 '13
OIL CONS. DIV.
DIST. 3

CONFIDENTIAL

CONDITIONS OF APPROVAL

Adhere to previously issued stipulations.

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

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

Name (Printed/Typed)
Amanda Cavoto

Title Engineering Technologist

Signature

Date 1/23/13

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Troy L. Saliers

Title Petroleum Engineer

Date 1/28/13

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 FFO

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)

NMOCDAV

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

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

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

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

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

OIL CONSERVATION DIVISION

1220 South St. Francis Drive
Santa Fe, NM 87505

RECEIVED
NAME OF REPORT

JAN 24 2013

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-043-21123		*Pool Code	*Pool Name WILDCAT (GALLOP)	
*Property Code 39534	*Property Name LYBROOK H03-2206			*Well Number 01H
*GRID No. 282327	*Operator Name ENCANA OIL & GAS (USA) INC.			*Elevation 7052'

10 Surface Location

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

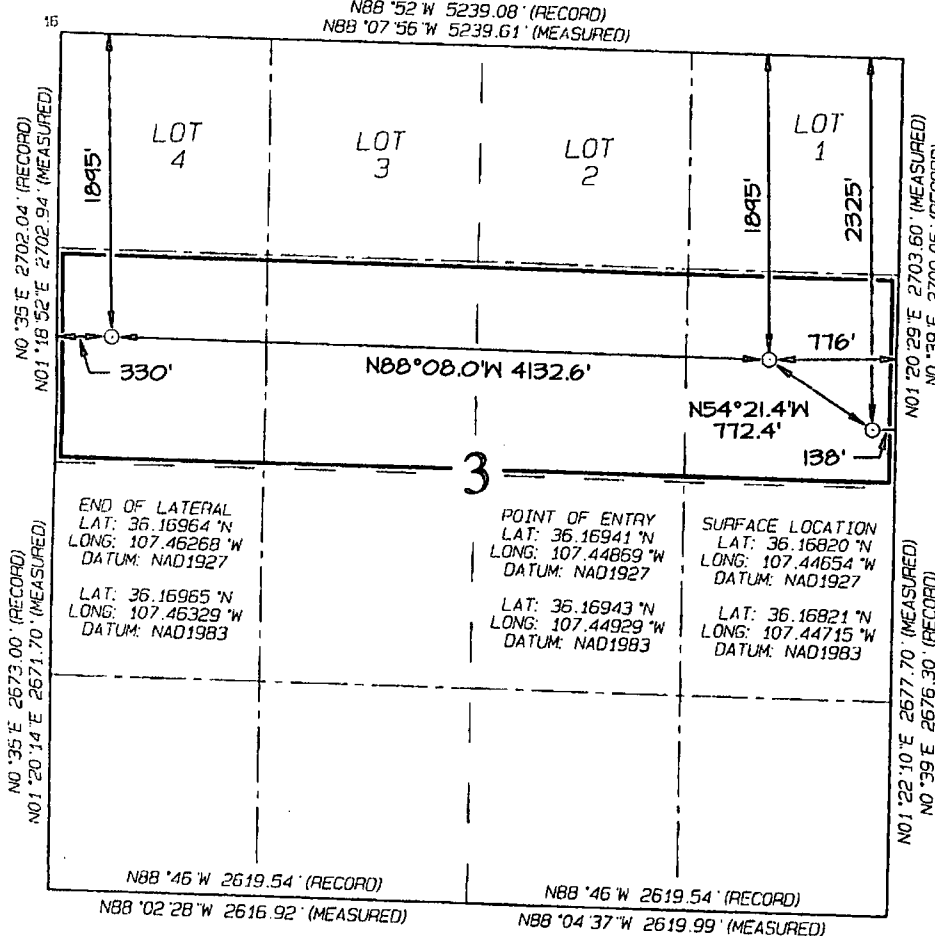
11 Bottom Hole Location If Different From Surface

U. or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	3	22N	6W		1895	NORTH	330	WEST	SANDOVAL

*Dedicated Acres 160.0 Acres - (S/2 N/2)	*Joint or Infill	*Consolidation Code	*Order No. RCVD FEB 4 '13
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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

OIL CONS. DIV.
DIST. 3



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

Signature: Holly Hill Date: 1/23/13

Printed Name: Holly Hill, Regulatory Analyst

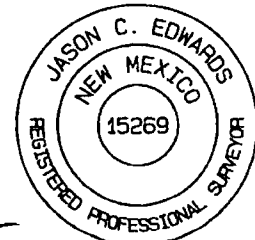
E-mail Address: holly.hill@encana.com

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: JANUARY 14, 2013
Date of Survey: APRIL 20, 2012

Signature and Seal of Professional Surveyor



JASON C. EDWARDS
Certificate Number 15269

Lybrook H03-2206 01H

SHL: SENE Section 3, T22N, R6W
2325 FNL and 138 FEL

BHL: SWNW Section 3, T22N, R6W
1895 FNL and 330 FWL

San Juan County, New Mexico

Lease Number: NMNM 109386

Encana Oil & Gas (USA) Inc. Drilling Plan

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

<u>Formation</u>	<u>Depth (TVD)</u>
Ojo Alamo Ss.	1425'
Kirtland	1544'
Fruitland Coal	1627'
Pictured Cliffs	1933'
Lewis	2021'
Cliffhouse	2714'
Menefee	3449'
Point Lookout	4173'
Mancos Shale	4390'
Mancos Silt	4943'
Gallup	5212'

The referenced surface elevation is 7052', KB 7065'

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

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

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

3. PRESSURE CONTROL

- Pressure control equipment and configuration will be designed to meet 2M standards.
- Working pressure on rams and BOPE will be 3,000 psi
- Function test and visual inspection of the BOP will be conducted daily and noted in the IADC Daily Drilling Report.
- The Annular BOP will be pressure tested to a minimum of 50 percent of its rated working pressure.
- Blind and Pipe Rams/BOP will be tested against a test plug to 100 percent of rated working pressure.
- Pressure tests are required before drilling out from under all casing strings set and cemented in place.
- BOP controls must be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned.
- BOP testing procedures and testing frequency will conform to Onshore Order No. 2.

Lybrook H03-2206 01H

**SHL: SENE Section 3, T22N, R6W
2325 FNL and 138 FEL**

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San Juan County, New Mexico

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- 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'-5652'MD	8 1/2"	7"	26#	J55, LTC New
Production Liner	5452'-10062'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 H03-2206 01H

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San Juan County, New Mexico

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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	5652'MD	30% open hole excess Stage 1 Lead: 199sks Stage 1 Tail: 138sks Stage 2 Lead: 154sks	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*	5452'-10062'	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 horizontal well will have a kick off point of 4753'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5397'/10062'	Gallup

Lybrook H03-2206 01H

SHL: SENE Section 3, T22N, R6W
2325 FNL and 138 FEL

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1895 FNL and 330 FWL

San Juan County, New Mexico

Lease Number: NMNM 109386

6. DRILLING FLUIDS PROGRAM

a) Surface through Intermediate Casing Point:

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 1/2"	500'TVD- 5387'TVD/5652'MD	Fresh Water LSND	8.5-8.8	40-50	8-10

b) Intermediate Casing Point to TD:

Hole Size (in)	MD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	5652'-10062'	Synthetic Oil Based Mud	8.6-9.0	15-25	<15

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

7. TESTING, CORING and LOGGING

- a) Drill Stem Testing – None anticipated
- b) Coring – None anticipated.
- c) Mud 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 +/- 2541 psi based on a 9.0 ppg at 5429' 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.

Lybrook H03-2206 01H

**SHL: SENE Section 3, T22N, R6W
2325 FNL and 138 FEL**

**BHL: SWNW Section 3, T22N, R6W
1895 FNL and 330 FWL**

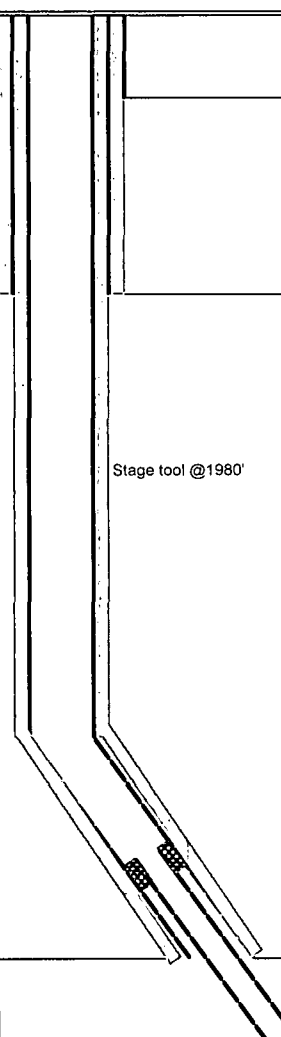
San Juan County, New Mexico

Lease Number: NMNM 109386

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on March 12, 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 3-T22N-R6W County: Sandoval WELL: Lybrook H03-2206 01H			Encana Natural Gas WELL SUMMARY			encana natural gas		ENG: J. Fox/ A. 1/23/13 RIG: GLE: 7052 RKBE: 7065	
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 KICK OFF PT Mancos Silt Gallup Top	1425 1,544 1627 1933 2021 2714 3449 4173 4390 4753 4943 5212 5387	500 5652		8 1/2	7" 26ppf J55 LTC TOC @ surface 30% OH excess: 465 sksTotal. Stage 1 Lead: 199sks Stage 1 Tail: 138sks. Stage 2 Lead: 154sks	Fresh Wtr 8.5-8.8	Vertical <1° KOP 4753 10 deg/100'
Surveys every 500' Gyro at CP MWD Gamma Directional	No OH Logs	horz target Base Gallup	5429 5523	5928		6 1/8	200' overlap at liner top 4134' Lateral	8.6-9.0 OBM Switch to OBM 8.6-9.0	.25deg updip 5397'TVD TD = 10062' MD

NOTES:

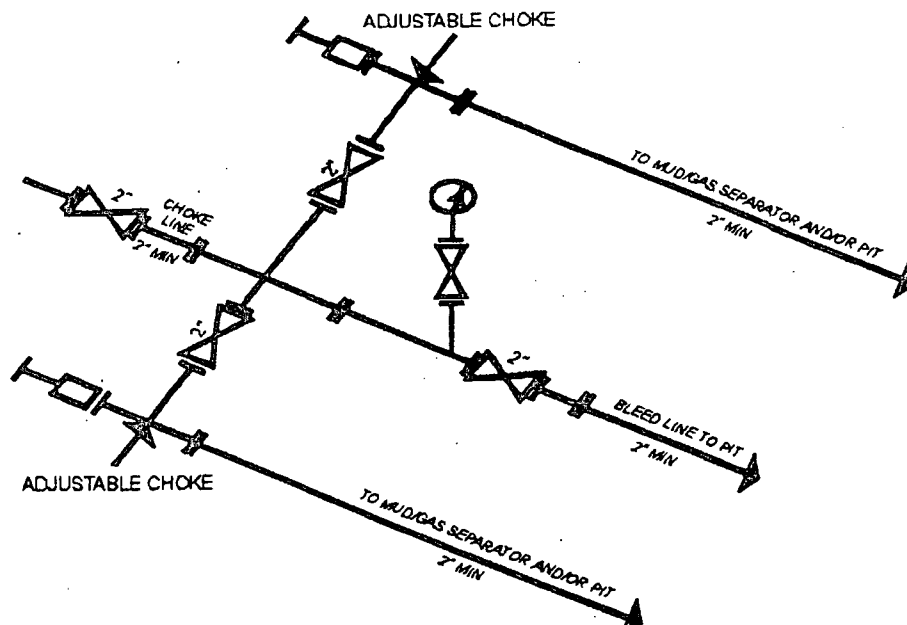
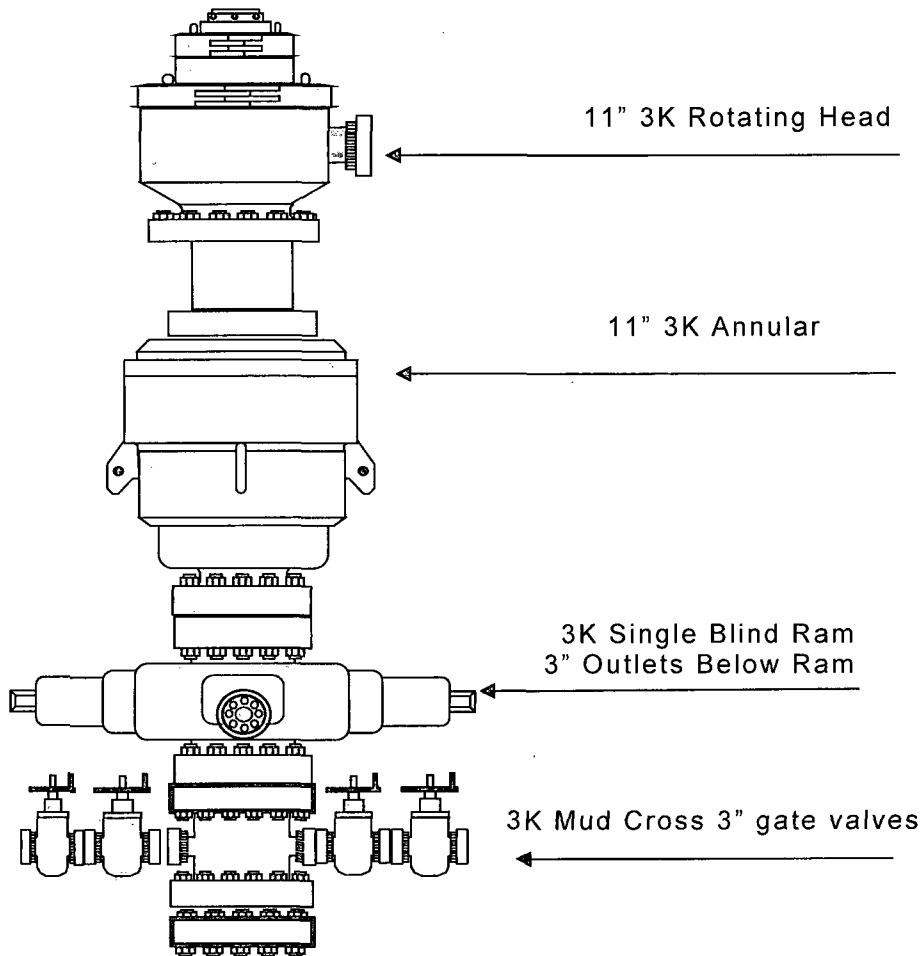
- 1) Drill with 30" bit to 60', set 20" 94# conductor pipe
- 2) Drill surface to 500', R&C 9 5/8" casing
- 3) N/U BOP and surface equipment
- 4) Drill to KOP of 4753', 8 1/2" hole size,
- 5) PU directional tools and start curve at 10deg/100' build rate
- 6) Drill to casing point of 5652' MD
- 7) R&C 7" casing, circ cmt to surface, switch to OBM
- 8) Land at 90deg, drill 4134' lateral to 10062', run 4 1/2" liner with external swellable csg packers

WELLHEAD BLOWOUT CONTROL SYSTEM



Well name and number:

Lybrook H03-2206 01H





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

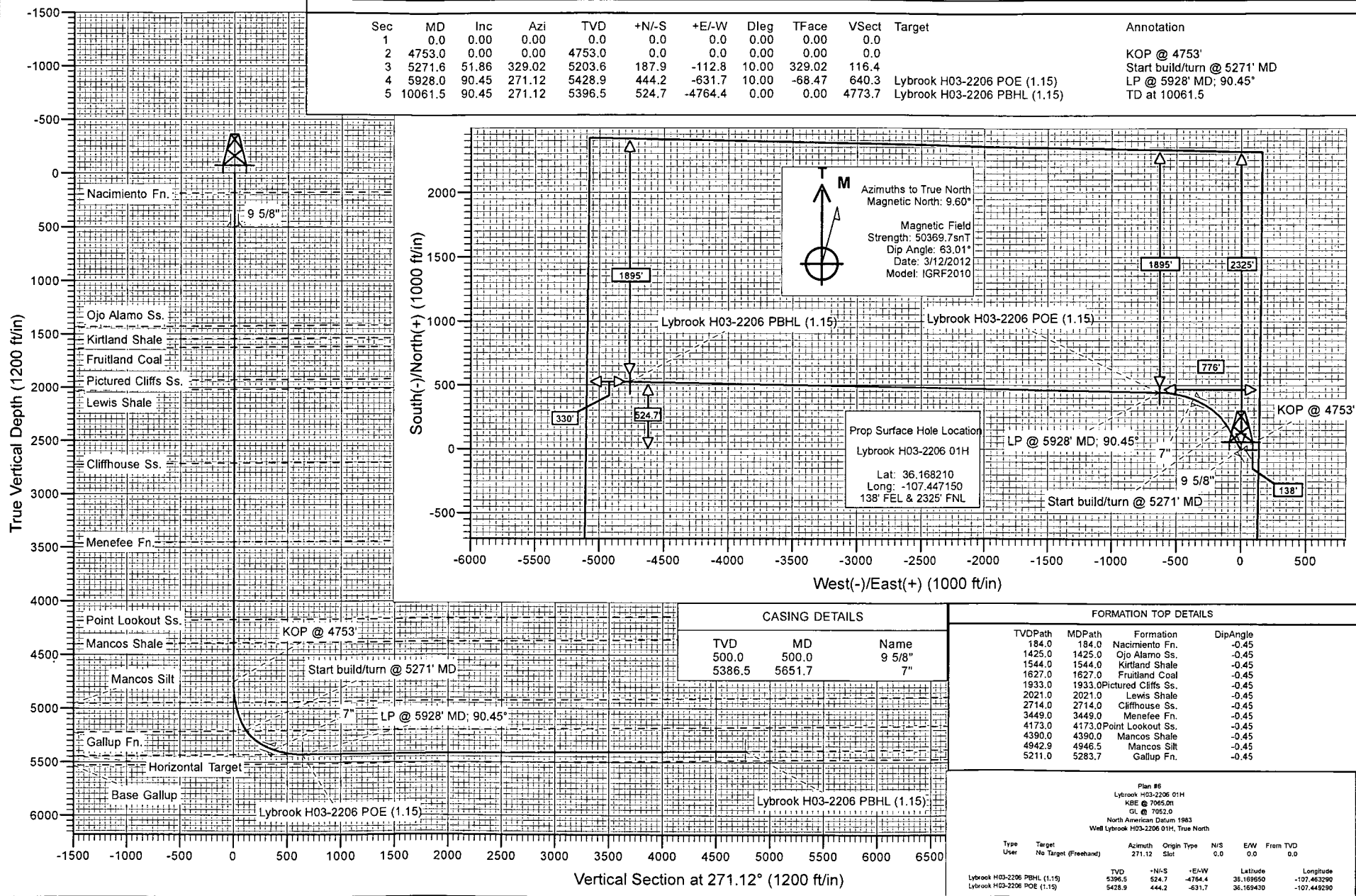
Drilling Mud Weight (ppg)	_____	9.625
Tension Safety Factor	_____	1.80
Maximum Tension Length (ft)	_____	9,630
Internal Yield Safety Factor	_____	1.10
Maximum Depth for Internal Yield (ft)	_____	14,150
Collapse Safety Factor	_____	1.125
Maximum Collapse Depth (ft)	_____	11,290

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



Project: Sandoval County, NM
 Site: Lybrook
 Well: Lybrook H03-2206 01H
 Wellbore: HZ
 Design: Plan #6



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook H03-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7065.0ft
Project:	Sandoval County, NM	MD Reference:	KBE @ 7065.0ft
Site:	Lybrook	North Reference:	True
Well:	Lybrook H03-2206 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #6		

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 H03-2206 01H					
Well Position	+N/-S	0.0 ft	Northing:	1,882,676.43 ft	Latitude:	36.168210
	+E/-W	0.0 ft	Easting:	1,287,068.90 ft	Longitude:	-107.447150
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,052.0 ft

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

Design	Plan #6			
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	271.12

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	
4,753.0	0.00	0.00	4,753.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,271.6	51.86	329.02	5,203.6	187.9	-112.8	10.00	10.00	0.00	329.02	
5,928.0	90.45	271.12	5,428.9	444.2	-631.7	10.00	5.88	-8.82	-68.47	Lybrook H03-2206 PC
10,061.5	90.45	271.12	5,396.5	524.7	-4,764.4	0.00	0.00	0.00	0.00	Lybrook H03-2206 PE

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook H03-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7065.0ft
Project:	Sandoval County, NM	MD Reference:	KBE @ 7065.0ft
Site:	Lybrook	North Reference:	True
Well:	Lybrook H03-2206 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #6		

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	
184.0	0.00	0.00	184.0	0.0	0.0	0.0	0.00	0.00	Nacimiento Fn.
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	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	
1,425.0	0.00	0.00	1,425.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,544.0	0.00	0.00	1,544.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,627.0	0.00	0.00	1,627.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
1,933.0	0.00	0.00	1,933.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,021.0	0.00	0.00	2,021.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	
2,714.0	0.00	0.00	2,714.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	
3,449.0	0.00	0.00	3,449.0	0.0	0.0	0.0	0.00	0.00	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	
4,173.0	0.00	0.00	4,173.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook H03-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7065.0ft
Project:	Sandoval County, NM	MD Reference:	KBE @ 7065.0ft
Site:	Lybrook	North Reference:	True
Well:	Lybrook H03-2206 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #6		

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	
4,390.0	0.00	0.00	4,390.0	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	
4,753.0	0.00	0.00	4,753.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4753'
4,800.0	4.70	329.02	4,799.9	1.7	-1.0	1.0	10.00	10.00	
4,900.0	14.70	329.02	4,898.4	16.1	-9.7	10.0	10.00	10.00	
4,946.5	19.35	329.02	4,942.9	27.8	-16.7	17.2	10.00	10.00	Mancos Silt
5,000.0	24.70	329.02	4,992.4	44.9	-27.0	27.9	10.00	10.00	
5,100.0	34.70	329.02	5,079.2	87.4	-52.5	54.2	10.00	10.00	
5,200.0	44.70	329.02	5,156.0	142.1	-85.3	88.1	10.00	10.00	
5,271.6	51.86	329.02	5,203.6	187.9	-112.8	116.4	10.00	10.00	Start build/turn @ 5271' MD
5,283.7	52.31	327.61	5,211.0	195.9	-117.8	121.6	10.00	3.74	Gallup Fn.
5,300.0	52.95	325.71	5,221.0	206.8	-124.9	128.9	10.00	3.90	
5,400.0	57.45	314.83	5,278.1	269.6	-177.4	182.7	10.00	4.50	
5,500.0	62.79	305.08	5,328.0	325.1	-243.9	250.2	10.00	5.34	
5,600.0	68.75	296.27	5,369.1	371.4	-322.2	329.4	10.00	5.95	
5,651.7	72.00	292.00	5,386.5	391.2	-366.7	374.2	10.00	6.29	7"
5,700.0	75.12	288.16	5,400.1	407.1	-410.2	418.0	10.00	6.46	
5,800.0	81.76	280.53	5,420.2	431.3	-505.0	513.3	10.00	6.64	
5,900.0	88.54	273.16	5,428.7	443.1	-603.8	612.3	10.00	6.78	
5,928.0	90.45	271.12	5,428.9	444.2	-631.7	640.3	10.00	6.81	LP @ 5928' MD; 90.45° - Lybrook H03-2206 PC
6,000.0	90.45	271.12	5,428.3	445.6	-703.7	712.3	0.00	0.00	
6,100.0	90.45	271.12	5,427.6	447.5	-803.7	812.3	0.00	0.00	
6,200.0	90.45	271.12	5,426.8	449.5	-903.7	912.3	0.00	0.00	
6,300.0	90.45	271.12	5,426.0	451.4	-1,003.7	1,012.3	0.00	0.00	
6,400.0	90.45	271.12	5,425.2	453.4	-1,103.7	1,112.3	0.00	0.00	
6,500.0	90.45	271.12	5,424.4	455.3	-1,203.6	1,212.3	0.00	0.00	
6,600.0	90.45	271.12	5,423.6	457.3	-1,303.6	1,312.3	0.00	0.00	
6,700.0	90.45	271.12	5,422.8	459.2	-1,403.6	1,412.3	0.00	0.00	
6,800.0	90.45	271.12	5,422.1	461.2	-1,503.6	1,512.3	0.00	0.00	
6,900.0	90.45	271.12	5,421.3	463.1	-1,603.5	1,612.3	0.00	0.00	
7,000.0	90.45	271.12	5,420.5	465.1	-1,703.5	1,712.3	0.00	0.00	
7,100.0	90.45	271.12	5,419.7	467.0	-1,803.5	1,812.3	0.00	0.00	
7,200.0	90.45	271.12	5,418.9	468.9	-1,903.5	1,912.3	0.00	0.00	
7,300.0	90.45	271.12	5,418.1	470.9	-2,003.5	2,012.3	0.00	0.00	
7,400.0	90.45	271.12	5,417.4	472.8	-2,103.4	2,112.3	0.00	0.00	
7,500.0	90.45	271.12	5,416.6	474.8	-2,203.4	2,212.3	0.00	0.00	
7,600.0	90.45	271.12	5,415.8	476.7	-2,303.4	2,312.3	0.00	0.00	
7,700.0	90.45	271.12	5,415.0	478.7	-2,403.4	2,412.3	0.00	0.00	
7,800.0	90.45	271.12	5,414.2	480.6	-2,503.3	2,512.3	0.00	0.00	
7,900.0	90.45	271.12	5,413.4	482.6	-2,603.3	2,612.3	0.00	0.00	
8,000.0	90.45	271.12	5,412.7	484.5	-2,703.3	2,712.3	0.00	0.00	
8,100.0	90.45	271.12	5,411.9	486.5	-2,803.3	2,812.3	0.00	0.00	
8,200.0	90.45	271.12	5,411.1	488.4	-2,903.3	2,912.3	0.00	0.00	
8,300.0	90.45	271.12	5,410.3	490.4	-3,003.2	3,012.2	0.00	0.00	
8,400.0	90.45	271.12	5,409.5	492.3	-3,103.2	3,112.2	0.00	0.00	
8,500.0	90.45	271.12	5,408.7	494.3	-3,203.2	3,212.2	0.00	0.00	
8,600.0	90.45	271.12	5,408.0	496.2	-3,303.2	3,312.2	0.00	0.00	
8,700.0	90.45	271.12	5,407.2	498.2	-3,403.1	3,412.2	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook H03-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7065.0ft
Project:	Sandoval County, NM	MD Reference:	KBE @ 7065.0ft
Site:	Lybrook	North Reference:	True
Well:	Lybrook H03-2206 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #6		

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	90.45	271.12	5,406.4	500.1	-3,503.1	3,512.2	0.00	0.00	
8,900.0	90.45	271.12	5,405.6	502.0	-3,603.1	3,612.2	0.00	0.00	
9,000.0	90.45	271.12	5,404.8	504.0	-3,703.1	3,712.2	0.00	0.00	
9,100.0	90.45	271.12	5,404.0	505.9	-3,803.1	3,812.2	0.00	0.00	
9,200.0	90.45	271.12	5,403.3	507.9	-3,903.0	3,912.2	0.00	0.00	
9,300.0	90.45	271.12	5,402.5	509.8	-4,003.0	4,012.2	0.00	0.00	
9,400.0	90.45	271.12	5,401.7	511.8	-4,103.0	4,112.2	0.00	0.00	
9,500.0	90.45	271.12	5,400.9	513.7	-4,203.0	4,212.2	0.00	0.00	
9,600.0	90.45	271.12	5,400.1	515.7	-4,303.0	4,312.2	0.00	0.00	
9,700.0	90.45	271.12	5,399.3	517.6	-4,402.9	4,412.2	0.00	0.00	
9,800.0	90.45	271.12	5,398.5	519.6	-4,502.9	4,512.2	0.00	0.00	
9,900.0	90.45	271.12	5,397.8	521.5	-4,602.9	4,612.2	0.00	0.00	
10,000.0	90.45	271.12	5,397.0	523.5	-4,702.9	4,712.2	0.00	0.00	
10,061.5	90.45	271.12	5,396.5	524.7	-4,764.4	4,773.7	0.00	0.00	TD at 10061.5 - Lybrook H03-2206 PBHL (1.15')

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lybrook H03-2206 PBHL - hit/miss target - Shape - Point	0.00	359.28	5,396.5	524.7	-4,764.4	1,883,259.82	1,282,311.35	36.169650	-107.463290
Lybrook H03-2206 POE - plan hits target center - Point	0.00	359.28	5,428.9	444.2	-631.7	1,883,128.37	1,286,442.72	36.169430	-107.449290

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		
5,651.7	5,386.5	7"	0.000	0.000		

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook H03-2206 01H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KBE @ 7065.0ft
Project:	Sandoval County, NM	MD Reference:	KBE @ 7065.0ft
Site:	Lybrook	North Reference:	True
Well:	Lybrook H03-2206 01H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #6		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
184.0	184.0	Nacimiento Fn.		-0.45	271.12
1,425.0	1,425.0	Ojo Alamo Ss.		-0.45	271.12
1,544.0	1,544.0	Kirtland Shale		-0.45	271.12
1,627.0	1,627.0	Fruitland Coal		-0.45	271.12
1,933.0	1,933.0	Pictured Cliffs Ss.		-0.45	271.12
2,021.0	2,021.0	Lewis Shale		-0.45	271.12
2,714.0	2,714.0	Cliffhouse Ss.		-0.45	271.12
3,449.0	3,449.0	Menefee Fn.		-0.45	271.12
4,173.0	4,173.0	Point Lookout Ss.		-0.45	271.12
4,390.0	4,390.0	Mancos Shale		-0.45	271.12
4,946.5	4,943.0	Mancos Silt		-0.45	271.12
5,283.7	5,212.0	Gallup Fn.		-0.45	271.12

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,753.0	4,753.0	0.0	0.0	KOP @ 4753'
5,271.6	5,203.6	187.9	-112.8	Start build/turn @ 5271' MD
5,928.0	5,428.9	444.2	-631.7	LP @ 5928' MD; 90.45°
10,061.5	5,396.5	524.7	-4,764.4	TD at 10061.5