

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: May 14, 2013

Well information:

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf. Owner	UL	Sec	Twp	N/S	Rng	W/E
30-045-35328-00-00	LYBROOK H04 2208	001H	ENCANA OIL & GAS (USA) INC.	O	N	San Juan	F	H	4	22	N	8	W

Conditions of Approval:

Hold C-104 for: NSL/ "As Drilled" C102/ Directional Survey

**JUN 11 2013**

\_\_\_\_\_  
NMOCD Approved by Signature

\_\_\_\_\_  
Date

RECEIVED

Form 3160-5  
(August 2007)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

MAY 15 2013

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

**SUNDRY NOTICES AND REPORTS ON** *Navarino Field Office*  
**Do not use this form for proposals to drill or re-enter an** *Operator/Field Management*  
**abandoned well. Use Form 3160-3 (APD) for such proposals.**

5. Lease Serial No.  
NM 55836  
6. If Indian, Allottee or Tribe Name

**SUBMIT IN TRIPLICATE - Other instructions on page 2.**

7. If Unit of CA/Agreement, Name and/or No.  
RCVD JUN 4 '13

1. Type of Well  
 Oil Well     Gas Well     Other

8. Well Name and No.  
Lybrook H04-2208 01H OIL CONS. DIV.

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

9. API Well No.  
30-045-35328 DIST. 3

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

3b. Phone No. (include area code)  
720-876-3437

10. Field and Pool or Exploratory Area  
Basin Mancos

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)  
SHL: 1980' FNL and 330' FEL Section 4, T22N, R8W  
BHL: 1980' FNL and 330' FWL Section 4, T22N, R8W

11. Country or Parish, State  
San Juan, New Mexico

**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 checked="" type="checkbox"/> Other <u>Revise dedicated</u>
	<input checked="" type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	<u>acres, request removal</u>
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	<u>of timing stipulations</u>

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 recomplete 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 recompletion 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 change the BHL footage from 1980' FNL and 2310' FEL Section 5, T22N, R8W to 1980' FNL and 330' FWL Sec 4, T22N, R8W.

Encana would also like to amend the casing program (to 9 5/8" surface casing, 7" intermediate casing and 4 1/2" production casing), the pilot hole depth (from 5863' to 5Q14'), BOP and directional plans. Please see attached wellbore diagram, 10-point drilling plan, pipe specs, BOP diagram and directional plan.

The New Mexico Oil Conservation Division (OCD) has informed Encana of the applicability and interpretation of the Basin Mancos Gas Pool (Order Number 12984, Pool Code 97232), which applies to the Lybrook H04-2208 01H well. Therefore, Encana wishes to increase the project area for this well from 240 to 644 acres. Please see attached C-102.

Encana also requests permission to remove the recreation timing restrictions (Special Stipulation 5).

**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 AUTORIZATION 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 <i>Amanda Cavoto</i>	Date 5/14/13

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

Approved by <i>Troy L. Salyers</i>	Title <i>Petroleum Engineer</i>	Date <i>5/28/2013</i>
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 <i>FFO</i>	

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)

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

Form C-102  
Revised August 1, 2011

Submit one copy to  
Appropriate District Office

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

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-045-35328		*Pool Code 97232	*Pool Name BASIN MANCOS
*Property Code 39160	*Property Name LYBROOK H04-2208		*Well Number 01H
*GRID No. 282327	*Operator Name ENCANA OIL & GAS (USA) INC.		*Elevation 6850'

<sup>10</sup> Surface Location

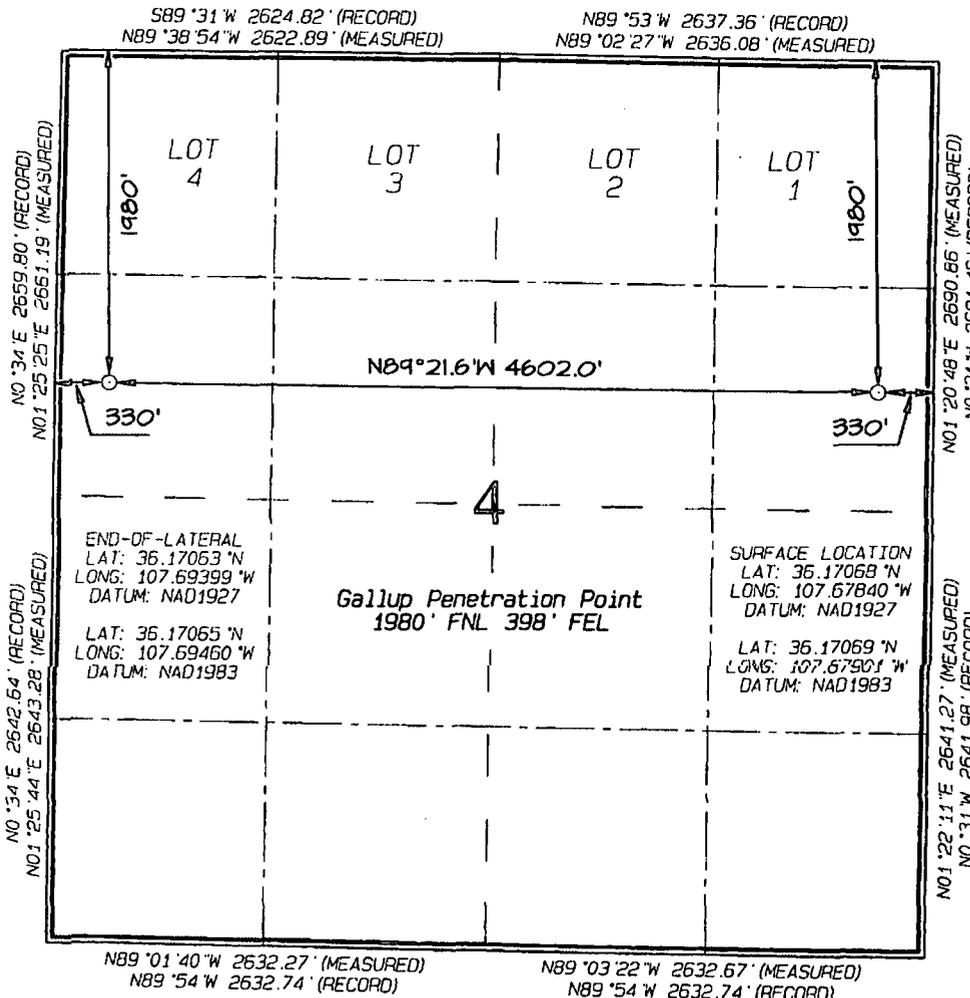
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	4	22N	8W		1980	NORTH	330	EAST	SAN JUAN

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

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	4	22N	8W		1980	NORTH	330	WEST	SAN JUAN

<sup>12</sup> Dedicated Acres 644.03 Acres Entire Section 4	<sup>13</sup> Joint or Infill	<sup>14</sup> Consolidation Code	<sup>15</sup> Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



**<sup>17</sup> 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: *Brenda R. Linster* Date: 5/14/12  
Brenda R. Linster, Regulatory Lead  
Printed Name: Brenda Linster  
E-mail Address: brenda.linster@encana.com

**<sup>18</sup> 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: APRIL 3, 2013  
Date of Survey: APRIL 4, 2012  
Signature and Seal of Professional Surveyor

**JASON C. EDWARDS**  
NEW MEXICO  
REGISTERED PROFESSIONAL SURVEYOR  
15269

**JASON C. EDWARDS**  
Certificate Number 15269

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		500	500	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          Mud logger onsite	Ojo Alamo Kirtland  Fruitland Coal  Pictured Cliffs Ss Lewis Shale  Cliffhouse Ss Menefee Fn Point Lookout Ss Mancos Sh  Mancos Silt  KICK OFF PT   Gallup Top	429 566  768  1119 1261  1862 2586 3485 3674  4180  4184   4473  4729	4904	8 3/4	7" 26ppf J55 LTC  TOC @ surface 30% OH excess; 506 sks Total Stage 1 Lead: 240 sks Stage 1 Tail: 165 sks Stage 2 Lead: 101 sks	Fresh Wtr  8.5-8.8	Vertical  <1°          KOP 4184 10 deg/100'
Surveys every 500' Gyro at CP MWD Gamma Directional		No OH Logs	horz target  Base Gallup Pilot Hole TD	4757  4814 5014	5087	6 1/8	200' overlap at liner top  4026' Lateral  4 1/2" 11.6ppf SB80 LTC  Running external swellable csg packers for isolation of prod string  Plan on setting top packer within 100' of intermediate casing shoe	8.6-9.0 OBM 8.6-9.0	25deg up dip 4736'TVD TD = 9113' 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 pilot hole TD of 5014' and run OH logs.
  - 5) Spot cement kick plug
  - 6) Kick off at 4184' and start curve at 10deg/100' build rate
  - 7) Drill to casing point of 4904' MD
  - 8) R&C 7" casing, circ cmt to surface, switch to OBM
  - 9) Land at 90deg, drill 4026' lateral to 9113', run 4 1/2" liner with external swellable csg packers

**Lybrook H04-2208 01H**  
**SHL: SENE Section 4, T22N, R8W**  
**1980 FNL and 330 FEL**  
**BHL: SWNW Section 8, T22N, R8W**  
**1980 FNL and 330 FWL**  
**San Juan County, New Mexico**  
**Lease Number: NM 55836**

**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	429'
Kirtland	566'
Fruitland Coal	768'
Pictured Cliffs	1119'
Lewis	1261'
Cliffhouse	1862'
Menefee	2586'
Point Lookout	3485'
Mancos	3674'
Gallup	4473'

The referenced surface elevation is 6850', KB 6863'

**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	429'
Gas	Fruitland Coal	768'
Gas	Pictured Cliffs	1119'
Gas	Cliffhouse	1862'
Gas	Point Lookout	3485'
Oil/Gas	Mancos	3674'

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 H04-2208 01H**

**SHL: SENE Section 4, T22N, R8W  
1980 FNL and 330 FEL**

**BHL: SWNW Section 8, T22N, R8W  
1980 FNL and 330 FWL**

**San Juan County, New Mexico**

**Lease Number: NM 55836**

- 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'-4904'MD	8 3/4"	7"	26#	J55, LTC New
Production Liner	4704'-9113'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 H04-2208 01H**  
**SHL: SENE Section 4, T22N, R8W**  
**1980 FNL and 330 FEL**  
**BHL: SWNW Section 8, T22N, R8W**  
**1980 FNL and 330 FWL**  
**San Juan County, New Mexico**  
**Lease Number: NIM 55836**

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	4729'TVD/ 4904'MD	30% open hole excess Stage 1 Lead: 240sk Stage 1 Tail: 165sk Stage 2 Lead: 101sk	<b>Lead</b> (Stages 1 and 2): PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuf/sk <b>Tail</b> (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*	4704'MD- 9113'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	5014'/5014'	Gallup
2	Horizontal Lateral	4736'/9113'	Gallup

**Lybrook H04-2208 01H**

**SHL: SENE Section 4, T22N, R8W  
1980 FNL and 330 FEL**

**BHL: SWNW Section 8, T22N, R8W  
1980 FNL and 330 FWL**

**San Juan County, New Mexico**

**Lease Number: NM 55836**

**Proposed Plug Back Procedure:**

KOP 4184'

Set kick plug at KOP

1. Spot 400' kick plug from 3984' – 4384'
  - a. 167sx of Class G cement with salt (0.94ft<sup>3</sup>/sk yield, 17.5ppg)
  - b. Spot tuned spacer
2. Pull uphole and reverse out
3. Pump bottoms up 2 times, pull uphole
4. Tag plug, drill ahead to KOP when cement is solid

**6. DRILLING FLUIDS PROGRAM**

a) Vertical Pilot Hole:

Hole Size (in)	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 3/4"	500-5014'	Fresh Water LSND	8.5-8.8	40-50	8-10

b) Kick off Point to Intermediate Casing Point:

Hole Size (in)	TVD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
8 3/4"	4184' (KOP)- 4729' (4904'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"	4904'MD- 9113'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 H04-2208 01H**

**SHL: SENE Section 4, T22N, R8W  
1980 FNL and 330 FEL**

**BHL: SWNW Section 8, T22N, R8W  
1980 FNL and 330 FWL**

**San Juan County, New Mexico**

**Lease Number: NM 55836**

## **7. TESTING, CORING and LOGGING**

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

Open Hole:

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

Cased Hole:

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

## **8. ABNORMAL PRESSURES & HYDROGEN SULFIDE**

The anticipated bottom hole pressure is +/- 2,347 psi based on a 9.0 ppg at 5014' TVD of the vertical pilot hole. No abnormal pressure or temperatures are anticipated.

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

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

Drilling is estimated to commence on November 1, 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.



# 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

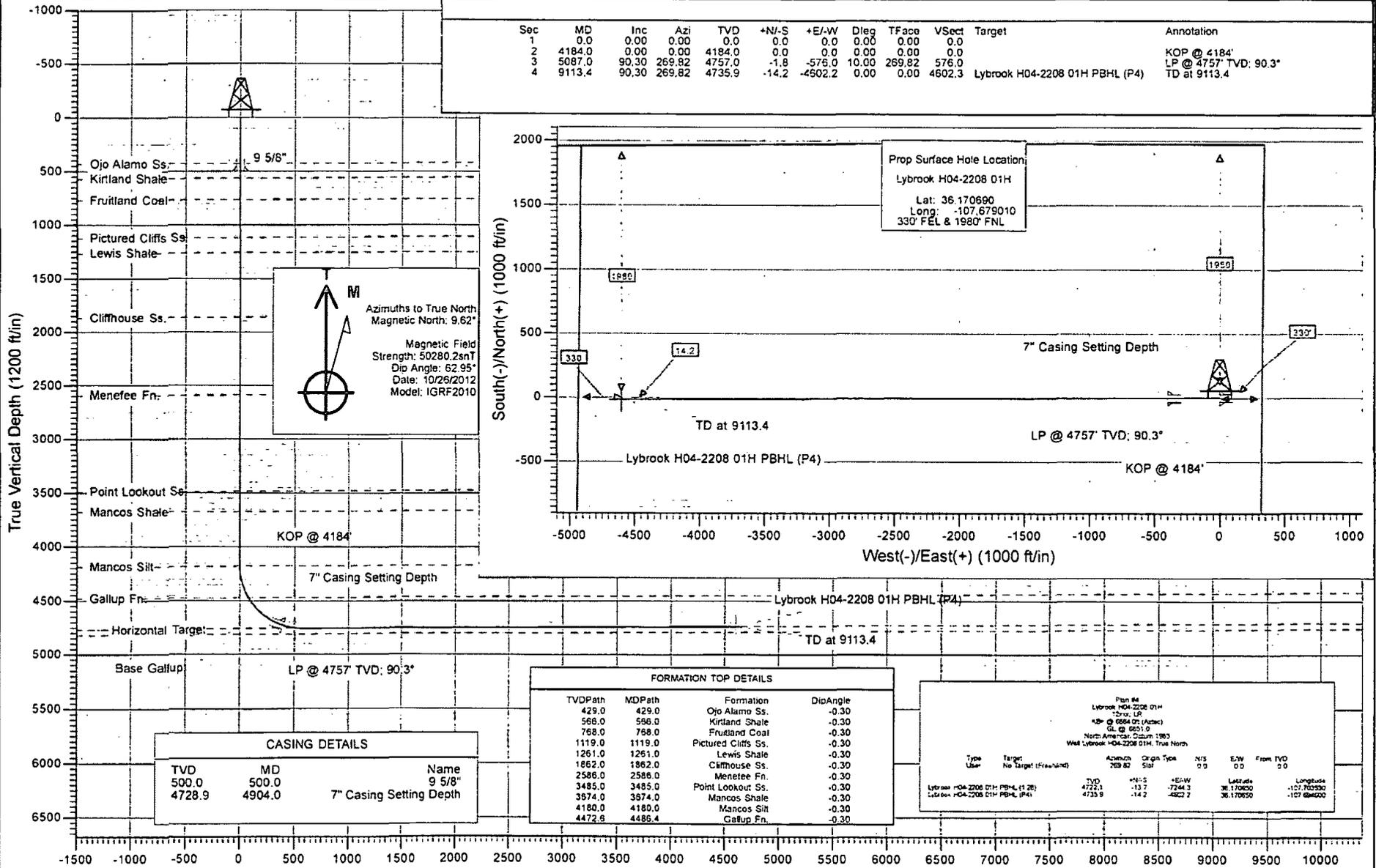
## API RELATED VALUES and INTERMEDIATE CALCULATION RESULTS

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

# encana™

natural gas

Project: San Juan County, NM CZ  
 Site: S4-T22N-R8W (Lybrook)  
 Well: Lybrook H04-2208 01H  
 Wellbore: Hz  
 Design: Plan #4



**M**

Azimuths to True North  
 Magnetic North: 9.62°

Magnetic Field  
 Strength: 50280.2snT  
 Dip Angle: 62.95°  
 Date: 10/26/2012  
 Model: IGRF2010

Prop Surface Hole Location  
 Lybrook H04-2208 01H

Lat: 36.170690  
 Long: -107.679010  
 330° FEL & 1990° FNL

**CASING DETAILS**

TVD	MD	Name
500.0	500.0	9 5/8"
4728.9	4904.0	7" Casing Setting Depth

**FORMATION TOP DETAILS**

TVDPath	MDPath	Formation	DipAngle
429.0	429.0	Ojo Alamo Ss.	-0.30
566.0	566.0	Kirtland Shale	-0.30
768.0	768.0	Fruitland Coal	-0.30
1119.0	1119.0	Pictured Cliffs Ss.	-0.30
1261.0	1261.0	Lewis Shale	-0.30
1862.0	1862.0	Cliffhouse Ss.	-0.30
2586.0	2586.0	Menefee Fn.	-0.30
3485.0	3485.0	Point Lookout Ss.	-0.30
3974.0	3974.0	Mancos Shale	-0.30
4180.0	4180.0	Mancos Silt	-0.30
4472.9	4488.4	Gallup Fn.	-0.30

Plan #4  
 Lybrook H04-2208 01H  
 2208: LP  
 \*B\* @ 6584.0' (Actual)  
 GL @ 6551.0  
 North American Datum 1983  
 Well: Lybrook H04-2208 01H, True North

Type	Target	Apexch	Origin	Type	N/S	E/W	From
User	No Target (Freehand)	269.82	Stat	Stat	0.0	0.0	TVD
Lybrook H04-2208 01H PBHL (P4)		4722.1			+N/-S	+E/-W	Latitude
Lybrook H04-2208 01H PBHL (P4)		4735.9			-14.2	-4822.7	Longitude
							36.170690
							-107.679010

Vertical Section at 269.82° (1200 ft/in)

## Planning Report

**Database:** USA EDM 5000 Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** San Juan County, NM CZ  
**Site:** S4-T22N-R8W (Lybrook)  
**Well:** Lybrook H04-2208 01H  
**Wellbore:** Hz  
**Design:** Plan #4

**Local Co-ordinate Reference:** Well Lybrook H04-2208 01H  
**TVD Reference:** KB= @ 6864.0ft (Aztec)  
**MD Reference:** KB= @ 6864.0ft (Aztec)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

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

<b>Site</b>	S4-T22N-R8W (Lybrook)				
<b>Site Position:</b>		<b>Northing:</b>	1,884,505.10 ft	<b>Latitude:</b>	36.170690
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,218,642.36 ft	<b>Longitude:</b>	-107.679010
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b>	-0.84 °

<b>Well</b>	Lybrook H04-2208 01H					
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b>	1,884,505.10 ft	<b>Latitude:</b>	36.170690
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>	1,218,642.36 ft	<b>Longitude:</b>	-107.679010
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	6,851.0 ft

<b>Wellbore</b>	Hz				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b> (°)	<b>Dip Angle</b> (°)	<b>Field Strength</b> (nT)
	IGRF2010	10/26/2012	9.62	62.95	50,280

<b>Design</b>	Plan #4			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b> (ft)	<b>+N/-S</b> (ft)	<b>+E/-W</b> (ft)	<b>Direction</b> (°)
	0.0	0.0	0.0	269.82

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	
4,184.0	0.00	0.00	4,184.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,087.0	90.30	269.82	4,757.0	-1.8	-576.0	10.00	10.00	0.00	269.82	
9,113.4	90.30	269.82	4,735.9	-14.2	-4,602.2	0.00	0.00	0.00	0.00	Lybrook H04-2208 01

## Planning Report

**Database:** USA EDM 5000 Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** San Juan County, NM CZ  
**Site:** S4-T22N-R8W (Lybrook)  
**Well:** Lybrook H04-2208 01H  
**Wellbore:** Hz  
**Design:** Plan #4

**Local Co-ordinate Reference:** Well Lybrook H04-2208 01H  
**TVD Reference:** KB= @ 6864.0ft (Aztec)  
**MD Reference:** KB= @ 6864.0ft (Aztec)  
**North Reference:** True  
**Survey Calculation Method:** 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	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
429.0	0.00	0.00	429.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	9 5/8"
566.0	0.00	0.00	566.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
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	
768.0	0.00	0.00	768.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
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	
1,119.0	0.00	0.00	1,119.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	
1,261.0	0.00	0.00	1,261.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
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	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,700.0	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	
1,862.0	0.00	0.00	1,862.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse 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	
2,100.0	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	
2,586.0	0.00	0.00	2,586.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,900.0	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	
3,485.0	0.00	0.00	3,485.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.
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	
3,674.0	0.00	0.00	3,674.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale
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	
4,180.0	0.00	0.00	4,180.0	0.0	0.0	0.0	0.00	0.00	Mancos Silt

## Planning Report

**Database:** USA EDM 5000 Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** San Juan County, NM CZ  
**Site:** S4-T22N-R8W (Lybrook)  
**Well:** Lybrook H04-2208 01H  
**Wellbore:** Hz  
**Design:** Plan #4

**Local Co-ordinate Reference:** Well Lybrook H04-2208 01H  
**TVD Reference:** KB= @ 6864.0ft (Aztec)  
**MD Reference:** KB= @ 6864.0ft (Aztec)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

### Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,184.0	0.00	0.00	4,184.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4184'
4,200.0	1.60	269.82	4,200.0	0.0	-0.2	0.2	10.00	10.00	
4,300.0	11.60	269.82	4,299.2	0.0	-11.7	11.7	10.00	10.00	
4,400.0	21.60	269.82	4,394.9	-0.1	-40.2	40.2	10.00	10.00	
4,486.4	30.24	269.82	4,472.6	-0.2	-78.0	78.0	10.00	10.00	Gallup Fm
4,500.0	31.60	269.82	4,484.2	-0.3	-84.9	84.9	10.00	10.00	
4,600.0	41.60	269.82	4,564.4	-0.4	-144.5	144.5	10.00	10.00	
4,700.0	51.60	269.82	4,633.0	-0.7	-217.0	217.0	10.00	10.00	
4,800.0	61.60	269.82	4,688.0	-0.9	-300.4	300.4	10.00	10.00	
4,900.0	71.60	269.82	4,727.7	-1.2	-392.1	392.1	10.00	10.00	
4,904.0	72.00	269.82	4,728.9	-1.2	-395.9	395.9	10.00	10.00	7" Casing Setting Depth
5,000.0	81.60	269.82	4,750.8	-1.5	-489.2	489.2	10.00	10.00	
5,087.0	90.30	269.82	4,757.0	-1.8	-576.0	576.0	10.00	10.00	LP @ 4757' TVD, 90.3°
5,100.0	90.30	269.82	4,756.9	-1.8	-588.9	588.9	0.00	0.00	
5,200.0	90.30	269.82	4,756.4	-2.1	-688.9	688.9	0.00	0.00	
5,300.0	90.30	269.82	4,755.9	-2.4	-788.9	788.9	0.00	0.00	
5,400.0	90.30	269.82	4,755.3	-2.7	-888.9	888.9	0.00	0.00	
5,500.0	90.30	269.82	4,754.8	-3.1	-988.9	988.9	0.00	0.00	
5,600.0	90.30	269.82	4,754.3	-3.4	-1,088.9	1,088.9	0.00	0.00	
5,700.0	90.30	269.82	4,753.8	-3.7	-1,188.9	1,188.9	0.00	0.00	
5,800.0	90.30	269.82	4,753.2	-4.0	-1,288.9	1,288.9	0.00	0.00	
5,900.0	90.30	269.82	4,752.7	-4.3	-1,388.9	1,388.9	0.00	0.00	
6,000.0	90.30	269.82	4,752.2	-4.6	-1,488.9	1,488.9	0.00	0.00	
6,100.0	90.30	269.82	4,751.7	-4.9	-1,588.9	1,588.9	0.00	0.00	
6,200.0	90.30	269.82	4,751.2	-5.2	-1,688.9	1,688.9	0.00	0.00	
6,300.0	90.30	269.82	4,750.6	-5.5	-1,788.9	1,788.9	0.00	0.00	
6,400.0	90.30	269.82	4,750.1	-5.8	-1,888.9	1,888.9	0.00	0.00	
6,500.0	90.30	269.82	4,749.6	-6.1	-1,988.9	1,988.9	0.00	0.00	
6,600.0	90.30	269.82	4,749.1	-6.4	-2,088.9	2,088.9	0.00	0.00	
6,700.0	90.30	269.82	4,748.5	-6.8	-2,188.9	2,188.9	0.00	0.00	
6,800.0	90.30	269.82	4,748.0	-7.1	-2,288.9	2,288.9	0.00	0.00	
6,900.0	90.30	269.82	4,747.5	-7.4	-2,388.9	2,388.9	0.00	0.00	
7,000.0	90.30	269.82	4,747.0	-7.7	-2,488.9	2,488.9	0.00	0.00	
7,100.0	90.30	269.82	4,746.4	-8.0	-2,588.9	2,588.9	0.00	0.00	
7,200.0	90.30	269.82	4,745.9	-8.3	-2,688.9	2,688.9	0.00	0.00	
7,300.0	90.30	269.82	4,745.4	-8.6	-2,788.9	2,788.9	0.00	0.00	
7,400.0	90.30	269.82	4,744.9	-8.9	-2,888.9	2,888.9	0.00	0.00	
7,500.0	90.30	269.82	4,744.3	-9.2	-2,988.9	2,988.9	0.00	0.00	
7,600.0	90.30	269.82	4,743.8	-9.5	-3,088.9	3,088.9	0.00	0.00	
7,700.0	90.30	269.82	4,743.3	-9.8	-3,188.9	3,188.9	0.00	0.00	
7,800.0	90.30	269.82	4,742.8	-10.1	-3,288.9	3,288.9	0.00	0.00	
7,900.0	90.30	269.82	4,742.3	-10.5	-3,388.9	3,388.9	0.00	0.00	
8,000.0	90.30	269.82	4,741.7	-10.8	-3,488.9	3,488.9	0.00	0.00	
8,100.0	90.30	269.82	4,741.2	-11.1	-3,588.9	3,588.9	0.00	0.00	
8,200.0	90.30	269.82	4,740.7	-11.4	-3,688.9	3,688.9	0.00	0.00	
8,300.0	90.30	269.82	4,740.2	-11.7	-3,788.9	3,788.9	0.00	0.00	
8,400.0	90.30	269.82	4,739.6	-12.0	-3,888.9	3,888.9	0.00	0.00	
8,500.0	90.30	269.82	4,739.1	-12.3	-3,988.9	3,988.9	0.00	0.00	
8,600.0	90.30	269.82	4,738.6	-12.6	-4,088.9	4,088.9	0.00	0.00	
8,700.0	90.30	269.82	4,738.1	-12.9	-4,188.9	4,188.9	0.00	0.00	
8,800.0	90.30	269.82	4,737.5	-13.2	-4,288.9	4,288.9	0.00	0.00	
8,900.0	90.30	269.82	4,737.0	-13.5	-4,388.9	4,388.9	0.00	0.00	

## Planning Report

**Database:** USA EDM 5000 Multi Users DB  
**Company:** EnCana Oil & Gas (USA) Inc  
**Project:** San Juan County, NM CZ  
**Site:** S4-T22N-R8W (Lybrook)  
**Well:** Lybrook H04-2208 01H  
**Wellbore:** Hz  
**Design:** Plan #4

**Local Co-ordinate Reference:** Well Lybrook H04-2208 01H  
**TVD Reference:** KB= @ 6864.0ft (Aztec)  
**MD Reference:** KB= @ 6864.0ft (Aztec)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Doglog Rate (*/100ft)	Build Rate (*/100ft)	Comments / Formations
9,000.0	90.30	269.82	4,736.5	-13.8	-4,488.9	4,488.9	0.00	0.00	
9,100.0	90.30	269.82	4,736.0	-14.2	-4,588.8	4,588.9	0.00	0.00	
9,113.4	90.30	269.82	4,735.9	-14.2	-4,602.2	4,602.3	0.00	0.00	TD at 9113.4 - Lybrook H04-2208 01H PBHL (1

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lybrook H04-2208 01H I - hit/miss target - Shape - Point	0.00	0.00	4,722.1	-13.7	-7,244.3	1,884,598.10	1,211,398.60	36.170650	-107.703550
- plan misses target center by 2642.1ft at 9113.4ft MD (4735.9 TVD, -14.2 N, -4602.2 E)									
Lybrook H04-2208 01H I - plan hits target center - Point	0.00	0.00	4,735.9	-14.2	-4,602.2	1,884,558.66	1,214,040.40	36.170650	-107.694600

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		
4,904.0	4,728.9	7" Casing Setting Depth	0.000	0.000		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
429.0	429.0	Ojo Alamo Ss.		-0.30	269.82	
566.0	566.0	Kirtland Shale		-0.30	269.82	
768.0	768.0	Fruitland Coal		-0.30	269.82	
1,119.0	1,119.0	Pictured Cliffs Ss.		-0.30	269.82	
1,261.0	1,261.0	Lewis Shale		-0.30	269.82	
1,862.0	1,862.0	Cliffhouse Ss.		-0.30	269.82	
2,586.0	2,586.0	Menefee Fn.		-0.30	269.82	
3,485.0	3,485.0	Point Lookout Ss.		-0.30	269.82	
3,674.0	3,674.0	Mancos Shale		-0.30	269.82	
4,180.0	4,180.0	Mancos Silt		-0.30	269.82	
4,486.4	4,473.0	Gallup Fn.		-0.30	269.82	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment	
4,184.0	4,184.0	0.0	0.0	KOP @ 4184'	
5,087.0	4,757.0	-1.8	-576.0	LP @ 4757' TVD; 90.3°	
9,113.4	4,735.9	-14.2	-4,602.2	TD at 9113.4	

# WELLHEAD BLOWOUT CONTROL SYSTEM



Well name and number:

Lybrook H04-2208 01H

