

RECEIVED

MAR 30 2012

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Farmington Field Office
Bureau of Land Management

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No. 3 and NM 29560
6. Indian, Allottee or Tribe Name N/A
7. If Unit or CA Agreement, Name and No.
8. Lease Name and Well No. Lybrook I02-2308 01H
9. API Well No. 30-045-35365
10. Field and Pool, or Exploratory Nageezi Gallup
11. Sec., T. R. M. or Blk. and Survey or Area Section 2, T23N, R8W NMPM
12. County or Parish San Juan
13. State NM
14. Distance in miles and direction from nearest town or post office* +/- 45.5 miles S of Bloomfield, NM
15. Distance from proposed* location to nearest property or lease line, ft (Also to nearest drig. unit line, if any) BHL is 330' from west lease line
16. No. of acres in lease V07843: 160 NM29560: 160
17. Spacing Unit dedicated to this well 160 acres (N2S2 Sec. 2)
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft Jeffers Federal 2-23 is 543' south of wellbore
19. Proposed Depth 6678' TVD/9369' MD
20. BLM/BIA Bond No. on file COB-000235
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6973' GL, 6987' KB
22. Approximate date work will start* 07/15/2012
23. Estimated duration 45 days
24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No 1, must be attached to this form

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

25. Signature *Brenda R. Linster* Name (Printed/Typed) Brenda R. Linster Date 03 28 12
Title Regulatory Advisor
Approved by (Signature) *[Signature]* Name (Printed/Typed) AFM Office FFC Date 10/12/12
Title AFM

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

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

Hold C104
for Directional Survey
and "As Drilled" plat

*(Instructions on page 2)

NOTIFY AZTEC OCD 24 HRS. PRIOR TO CASING & CEMENT!

CONFIDENTIAL

NMOCD

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

NOV 08 2012 *ca*

This action is subject to technical and procedural review pursuant to 43 CFR 3165.9 and appeal pursuant to 43 CFR 3165.4

Submit one copy to appropriate District Office

District I
1625 N. French Dr., Hobbs, NM 88240
Phone (575) 393-6161 Fax (575) 393-0720
District II
811 S. First St., 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 Dr., Santa Fe, NM 87505
Phone (505) 176-3460 Fax (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

RECEIVED

MAR 30 2012

AMENDED REPORT

Farmington Field Office
Bureau of Land Management

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-045-38365	² Pool Code 47540	³ Pool Name NAGEEZI-GALLUP
⁴ Property Code 39532	⁵ Property Name LYBROOK 102-2308	⁶ Well Number 01H
⁷ GRID No. 282327	⁸ Operator Name ENCANA OIL & GAS (USA) INC.	⁹ Elevation 6973'

¹⁰ Surface Location

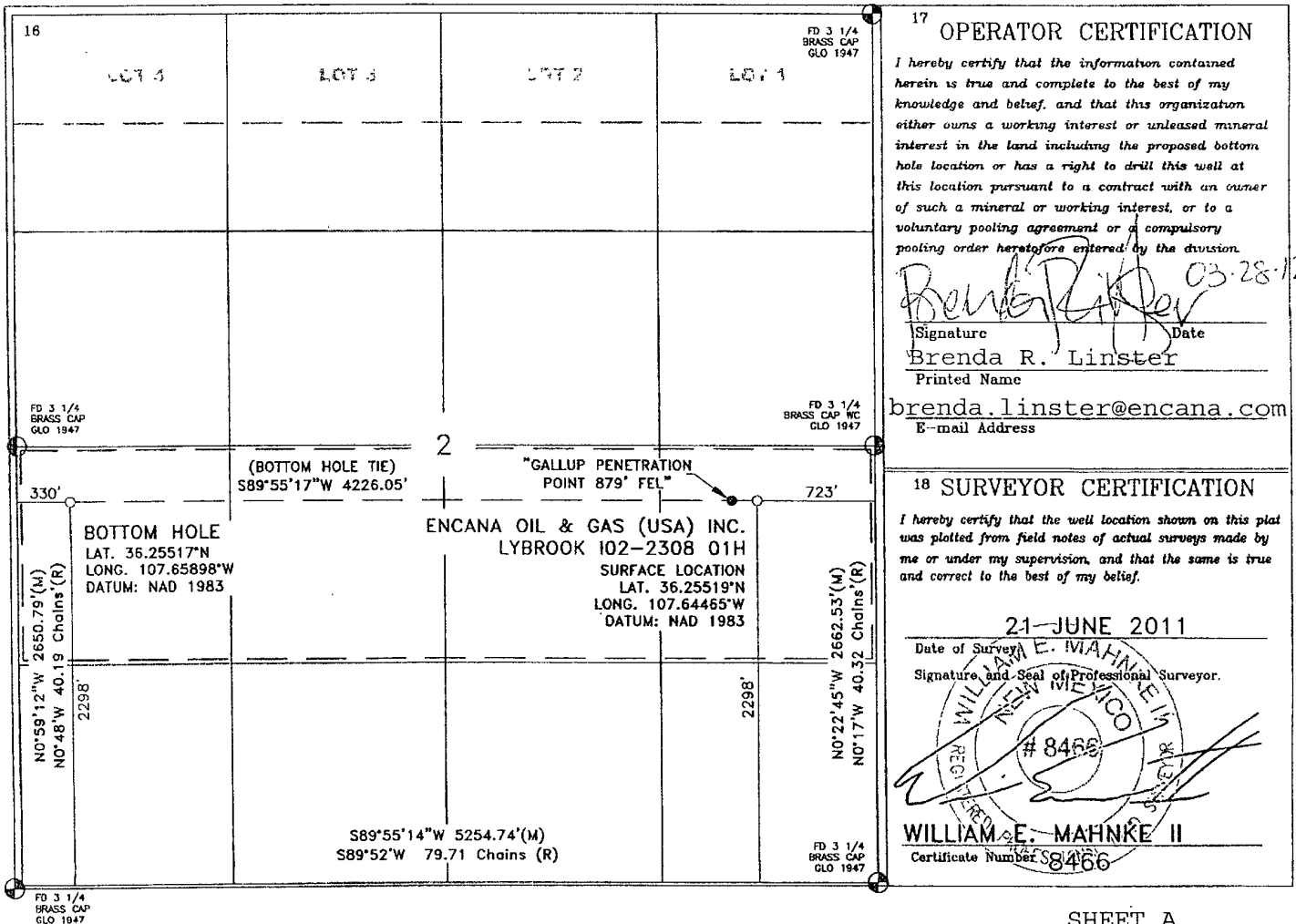
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
1	2	23-N	8-W		2298'	SOUTH	723'	EAST	SAN JUAN

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	2	23-N	8-W		2298'	SOUTH	330'	WEST	SAN JUAN

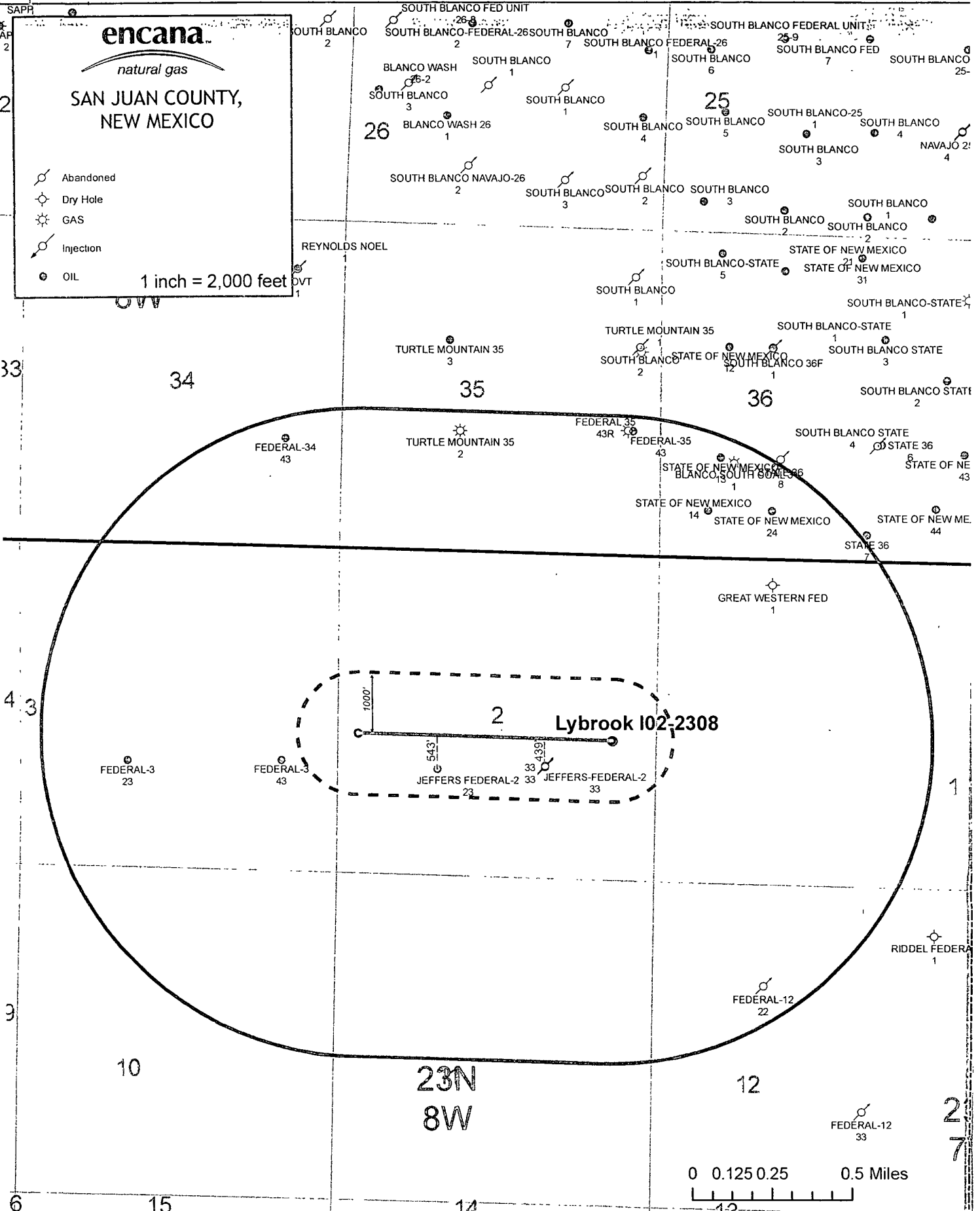
¹² Dedicated Acres 160 ACRES - (N/2 S/2)	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
--	-------------------------------	----------------------------------	-------------------------

No allowable will be assigned to this completion until all interest have been consolidated or a non-standard unit has been approved by the division.



Lybrook 102-2308 OH

Travel south from Bloomfield, N.M. 44.7 miles on Highway 550. Turn right at highway Milepost 109.7. Travel southeast .2 miles on dirt road to existing Dugan well pad Jeffers Fed #22-23. Turn east at the east end of existing well pad. Follow flagged access road east and southeast 0.6 miles to stake well pad and well flag for Lybrook 102-2308 OH.



Lybrook I02-2308 01H
SHL: NESE Section 2, T23N, R8W
2298 FSL and 723 FEL
BHL: NWSW Section 2, T23N, R8W
2298 FSL and 330 FWL
San Juan County, New Mexico
Lease Number: V07843 and NM 29560

**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	1161'
Kirtland	1315'
Fruitland Coal	1559'
Pictured Cliffs	1834'
Lewis	1945'
Cliffhouse	3319'
Menefee	3398'
Point Lookout	4194'
Mancos	4426'
Gallup	5217'
Upper Carlile	5742'
Juana Lopez	5814'
Lower Carlile	5934'
Greenhorn	6166'
Graneros	6231'
Dakota	6278'
Morrison	6578'

The referenced surface elevation is 6973', KB 6987'

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	1161'
Gas	Fruitland Coal	1559'
Gas	Pictured Cliffs	1834'
Gas	Cliffhouse	3319'
Gas	Point Lookout	4194'
Oil/Gas	Mancos	4426'
Oil/Gas	Dakota	6278'

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.

Lybrook I02-2308 01H
SHL: NESE Section 2, T23N, R8W
2298 FSL and 723 FEL
BHL: NWSW Section 2, T23N, R8W
2298 FSL and 330 FWL
San Juan County, New Mexico
Lease Number: V07843 and NM 29560

- e) Blind and Pipe Rams/BOP will be tested against a test plug to either 70 percent of the casings internal yield pressure or 100 percent of rated working pressure.
- f) Pressure tests are required before drilling out from under all casing strings set and cemented in place.
- g) BOP controls must be installed prior to drilling the surface casing plug and will remain in use until the well is completed or abandoned.
- h) BOP testing procedures and testing frequency will conform to Onshore Order No. 2.
- i) BOP remote controls shall be located on the rig floor at a location readily accessible to the driller. Master controls shall be on the ground at the accumulator and shall have the capability to function all preventers.
- j) The kill line shall be 2-inch minimum and contain two kill line valves, one of which shall be a check valve.
- k) The choke line shall be a 2-inch minimum and contain two choke line valves (2-inch minimum).
- l) The choke and manifold shall contain two adjustable chokes.
- m) Hand wheels shall be installed on all ram preventers.
- n) Safety valves and wrenches (with subs for drill string connections) shall be available on the rig floor at all times.
- o) Inside BOP or float sub shall also be available on the rig floor at all times.

Proposed BOP and choke manifold arrangements are attached.

4. CASING & CEMENTING PROGRAM

The proposed casing and cementing program has been designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use. The casing setting depth shall be calculated to position the casing seat opposite a competent formation which will contain the maximum pressure to which it will be exposed during normal drilling operations. All indications of useable water shall be reported.

- a) The proposed casing design is as follows:

Casing	Depth	Hole Size	Csg Size	Weight	Grade
Conductor	0-60'	26"	20"	94#	H40, STC New
Surface	0'-500'	17 1/2"	13 3/8"	48#	H40, STC New
Intermediate	0'-4600'	12 1/4"	9 5/8"	40#	J55, STC New
Production Liner	4400'-9369'	8 1/2"	5 1/2"	17#	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
13 3/8"	48	H40	STC	740	1730	322	1.125	1.1	1.5
9 5/8"	40	J55	STC	2570	3950	452	1.125	1.1	1.5
5 1/2"	17	B80	LTC	6290	7740	320	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.

Lybrook I02-2308 01H

**SHL: NESE Section 2, T23N, R8W
2298 FSL and 723 FEL**

**BHL: NWSW Section 2, T23N, R8W
2298 FSL and 330 FWL**

San Juan County, New Mexico

Lease Number: V07843 and NM 29560

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.

Casing	Depth	Cement Volume (sacks)	Cement Type&Yield	Designed TOC	Centralizers
Conductor	60'	80sk	Redi-mix Construction Grade Cement	Surface	None
Surface	500'	Lead: 130sk Tail: 100sk	Lead: Varicem Poz Cmt 1% Cal-Seal 12.7ppg, 1.78cuft/sk Tail: Type III Prem Plus 6% Salt 13.5ppg 1.77cuft/sk	Surface	1 per joint on bottom 3 joints
Intermediate	4600'	50% open hole excess Lead: 1342sk Tail: 176sk	Lead: Fillseal Poz Cmt 1% foam 13ppg, 1.43cuft/sk Tail: HalCem Class H 1% foam 13ppg 1.43cuft/sk	Surface	1 per joint for bottom 3 joints, 1 every 3 joints for remaining joints, turbolizers will be used at the base of the Ojo Alamo
Production Liner*	4400'- 9369'	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.

Waiting on cement time will be 8 hours and will 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 and core 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.

Lybrook I02-2308 01H
SHL: NESE Section 2, T23N, R8W
2298 FSL and 723 FEL
BHL: NWSW Section 2, T23N, R8W
2298 FSL and 330 FWL
San Juan County, New Mexico
Lease Number: V07843 and NM 29560

Well Phase	Description	Proposed Depth (TVD/MD)	Formation
1	Vertical Pilot Hole	6678'/6678'	Morrison
2	Horizontal Lateral	5390'/9369'	Gallup

Proposed Plug Back Procedure:

TOPS: TVD
 KOP: 4817'
 Graneros Shale: 6231'
 Dakota: 6278'

Set 2 cement plugs in 8 1/2" hole
 Plug A: Bottom plug over Dakota
 Plug B: Kick plug at KOP

Plug A

1. TIH to TD of vertical pilot hole at ~~6678'~~ *6181*
2. Spot 400' cement plug from 6278'-6678'
 - a. 135sx of Class A cement (1.18ft³/sk yield)
 - b. Spot tuned spacer
3. Pull uphole and reverse out
4. TIH and tag plug, proceed when cement is solid
5. Fill hole and move uphole to spot kick plug

Plug B

1. Spot 300' kick plug from 4717' – 5017'
 - 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) Phase 1, Vertical Pilot Hole:

Hole Size (in)	TVD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
26"	0-60'	Fresh Water	8.3-9.2	38-100	4-28
17 1/2"	0-500'	Fresh Water	8.4-8.6	60-70	NC
12 1/4"	500-4600'	Fresh Water LSND	8.5-8.8	40-50	8-10
8 1/2"	4400-6678'	Fresh Water LSND	8.5-8.8	40-50	8-10

b) Phase 2, Kick off to Horizontal Lateral:

Hole Size (in)	TVD (ft)	Mud Type	Density (lb/gal)	Viscosity (sec/qt)	Fluid Loss (cc)
8 1/2"	4817' (KOP)- 9369'	Synthetic Oil Based Mud	8.6-9.0	15-25	<15

Lybrook I02-2308 01H
SHL: NESE Section 2, T23N, R8W
2298 FSL and 723 FEL
BHL: NWSW Section 2, T23N, R8W
2298 FSL and 330 FWL
San Juan County, New Mexico
Lease Number: V07843 and NM 29560

- 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 – Obtain core starting in the Mancos formation. Specific cored intervals will be determined real time by onsite geologists.
- c) Mud Logging – Mud loggers will be on location from Surface Casing 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 +/- 3125 psi based on a 9.0 ppg at 6678' 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 July 15, 2012. 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 45 days.

LOC: Sec 2-T23N-R8W
 County: San Juan
 WELL: Lybrook I02-2308 01H

WELL SUMMARY



ENG: J. Fox/A: 2/23/12
 RIG:
 GLE: xxx
 RKBE: xxx

MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH		HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			TVD	MD				
		Nacimiento	60	60'	26	20" 94# 80sx Type I Neat 48 8ppg cmt	Fresh wtr 8 3-9 2 Vis 38-100 YP 4-28 FL 4-28	
Surveys After csg is run	None Mud logger onsite at spud		500	500	17 1/2	13 3/8" 48ppf H40 STC Lead 130sx Varicem Poz cmt 1% Cal- Seal 12 7ppg 1 78cuft/sk (231 cuft) + tail 100sx Type III Prem Plus 0 3% Thix 6% Salt 13 5ppg 1 77cuft/sk (177 cuft) TOC @ sfc	Fresh wtr 8 4-8 6 Vis 40-50 YP 25-35	Vertical <1°
Surveys every 500'	Triple combo	Ojo Alamo Ss Kirtland Shale Fruitland Coal Pictured Cliffs Ss Lewis Shale Cliffhouse Ss Menefee Fn Point Lookout Ss Mancos Sh	1161 1315 1559 1834 1945 3319 3398 4194 4426 4600	4600	12 1/4	9 5/8" 40ppf J55 STC 50% OH Excess Lead 1342sx Fillseal Poz Cmt w/1% foam 13ppg 1 43cuft/sk (1919 cuft) + tail 176sx HalCem Cmt Class H 1% foam 13ppg 1 43cuft/sk (252 cuft) Permit TOC @ surface	Fresh Wtr 8 5-8 8 Vis 40-50 YP 10-12 FL 8-10	Vertical <1°
Surveys every 500' Gyro at CP MWD Gamma Directional	High Def DLL Microlaterlog WTS comp Neut WTS ZDL with PE Caliper Digital GR DAL	KICK OFF PT	4817		8 1/2 w/opt 7 7/8 in lateral	5 1/2" 17ppf I/L80 LTC Running external swellable csg packers for isolation of prod string	Fresh Wtr LSND-in pilot 8 5-8 8 Switch to OBM at K/O 8 6-9 0	KOP 4817 10 deg/100'
		Gallup Top horz target Prodelta Gallup Upper Carlile Shale Juana Lopez Sh Lower Carlile Sh Greenhorn LS Graneros Sh Dakota Grp Morrison Pilot Hole TD	5217 5390 5555 5742 5814 5934 6166 6231 6278 6578 6678	5722		3647' Lateral	8.6-9 0 OBM	5358'TVD TD = 9,369' MD

NOTES:

- 1) Drill with 26" bit to 60', set 20" 94# conductor pipe
- 2) Drill surface to 500', R&C 13 3/8" casing
- 3) N/U BOP and surface equipment
- 4) Drill to 4600', 12 1/4" hole size
- 5) Run OH logs, R&C 9 5/8" casing, circ cmt 50' into sur csg shoe
- 6) Drill 8 1/2" hole to core point, core Gallup & possibly Dakota, confirm coring details
- 7) RIH with 8 1/2" bit to drill 150' rathole, run OH logs
- 8) Plugback to 4600' with cmt
- 9) PU directional tools and K/O cmt plug and start curve at 10deg/100' build rate
- 10) Drill curve to 20-30deg then switch over to OBM system
- 11) If drill curve without hole issues, omit contingent csg string and proceed with 8 1/2 bit to landing depth
- 12) If need bit trip, option to switch to 7 7/8 bit for remainder of well
- 13) Land at 90deg, drill 3647' lateral to 9,369', run 5 1/2" liner with external swellable csg packers



Boomerang Tube LLC

CASING (OR) TUBING DESCRIPTION AND PERFORMANCE PROPERTIES

Pipe Outside Diameter (ins)	_____	5.500
Pipe Wall Thickness (ins)	_____	0.304
Nominal Weight Per Foot (lbs)	_____	17.00
Thread Name	_____	Long Thread CSG
Grade Name	_____	B-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)	_____	6.050
Drift Diameter (ins)	_____	4.767
Plain End Weight per Foot (lbs)	_____	16.89
Joint Strength (lbs)	_____	320,000
Internal Yield (psi)	_____	7,740
Collapse Rating (psi)	_____	6,290

MAXIMUM DEPTH/LENGTH BASED ON MUD WTS & SAFETY FACTORS

Drilling Mud Weight (ppg)	_____	9.625
Tension Safety Factor	_____	1.80
Maximum Tension Length (ft)	_____	10,460
Internal Yield Safety Factor	_____	1.10
Maximum Depth for Internal Yield (ft)	_____	14,070
Collapse Safety Factor	_____	1.125
Maximum Collapse Depth (ft)	_____	11,180

API RELATED VALUES and INTERMEDIATE CALCULATION RESULTS

Coupling Thread Fracture Strength	_____	633,000
Pipe Thread Fracture Strength (lbs)	_____	320,000
Pipe Body Plain End Yield (lbs)	_____	397,000
Round Thread Pull-Out (lbs)	_____	335,000
Minimum Make-up Torque (ft-lbs)	_____	2,510
Nominal Make-up Torque (ft-lbs)	_____	3,350
Maximum Make-up Torque (ft-lbs)	_____	4,190
Coupling Internal Yield (psi)	_____	9,880
Pipe Body Internal Yield (psi)	_____	7,740
Leak @ E1 or E7 plane (psi)	_____	13,160
Pipe Hydrostatic Test Pressure @ 80 % SMYS	_____	7,100



Encana Oil & Gas
 Project: San Juan Co., NM (NAD83)
 Site: Sec.2-T23N-R8W
 Well: Lybrook 102-2308 01H
 Wellbore: Wellbore #1
 Design: Design #1
 Lat: 36.255190
 Long: -107.644650
 Pad GL: 6973.00
 KB: WELL @ 6987.00usft



PROJECT DETAILS: San Juan Co., NM (NAD83)

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: New Mexico Western Zone

System Datum: Mean Sea Level

Azimuths to True North
 Magnetic North: 9.74°

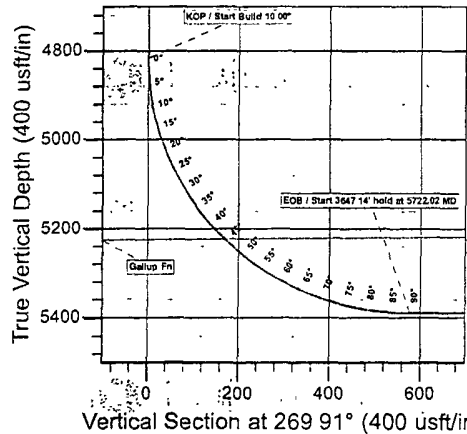
Magnetic Field
 Strength: 50433.5snT
 Dip Angle: 63.06°
 Date: 10/17/2011
 Model: IGRF2010

WELL DETAILS: Lybrook 102-2308 01H

+N/-S	+E/-W	Northing	Easting	Ground Level:	6973.00	Slot
0.00	0.00	1912241.962	2778721.486	Latitude	36.255190	
				Longitude	-107.644650	

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape Point
Lybrk 102-2308 01H PBHL	5358.13	-6.97	-4224.95	36.255170	-107.658980	

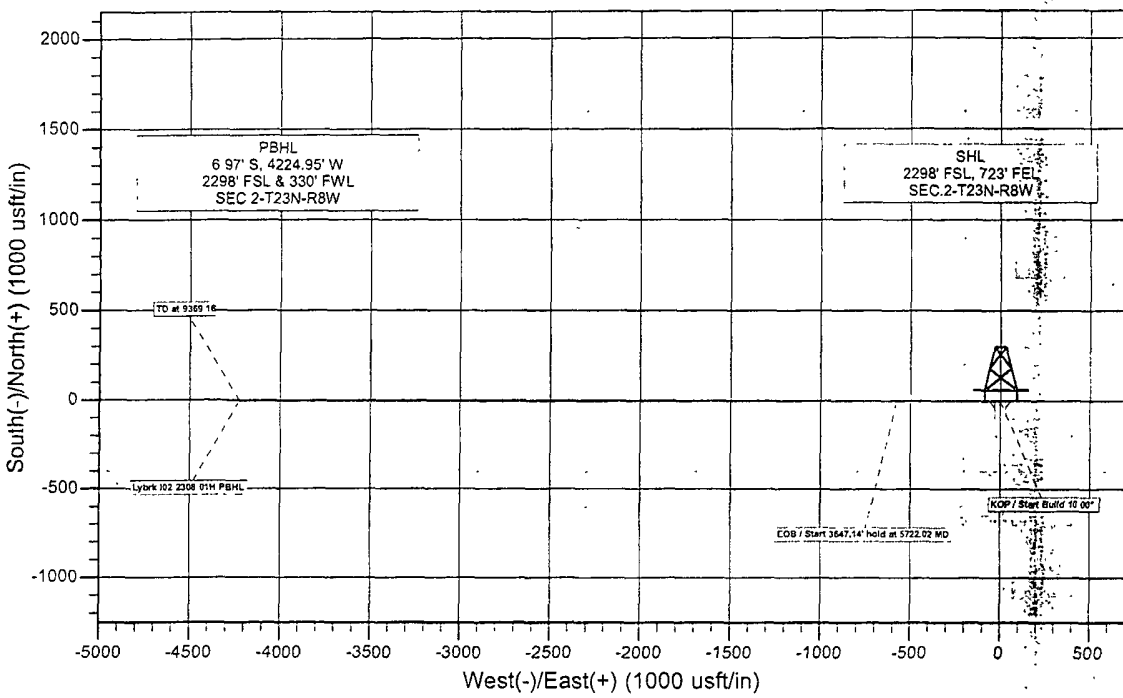


CASING DETAILS

TVD	MD	Name	Size
500.00	500.00	13 3/8" Csg.	13-3/8
4600.00	4600.00	9 5/8" Csg.	9-5/8

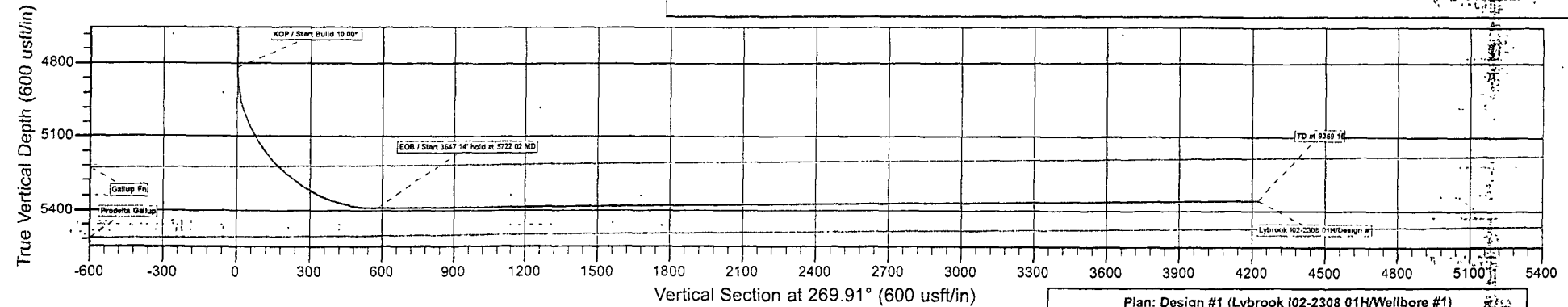
FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1164.00	1164.00	Ojo Alamo Ss.
1316.00	1316.00	Kirtland Shale
1563.00	1563.00	Fruitland Coal
1844.00	1844.00	Pictured Cliffs Ss.
1952.00	1952.00	Lewis Shale
3338.00	3338.00	Cliffhouse Ss.
3398.00	3398.00	Menefee Fn.
4195.00	4195.00	Point Lookout Ss.
4436.00	4436.00	Mancos Shale
5224.51	5270.36	Gallup Fn.



SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP / Start Build 10.00°
4817.02	0.00	0.00	4817.02	0.00	0.00	0.00	0.00	0.00	EOB / Start 3647.14' hold at 5722.02 MD
5722.02	90.50	269.91	5389.96	-0.95	-577.96	10.00	269.91	577.96	
9369.16	90.50	269.91	5358.13	-6.97	-4224.95	0.00	0.00	4224.96	TD at 9369.16



Plan: Design #1 (Lybrook 102-2308 01H/Wellbore #1)
 Created By: Bret Wolford Date: 13:47, October 17 2011

Database: EDMDBBW
 Company: Encana Oil & Gas
 Project: San Juan Co., NM (NAD83)
 Site: Sec 2-T23N-R8W
 Well: Lybrook I02-2308 01H
 Wellbore: Wellbore #1
 Design: Design #1

Local Co-ordinate Reference: Well Lybrook I02-2308 01H
 TVD Reference: WELL @ 6987.00usft
 MD Reference: WELL @ 6987.00usft
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Project:	San Juan Co., NM (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site: Sec 2-T23N-R8W

Site Position: Northing: 1,912,241.962 usft Latitude: 36.255190
 From: Lat/Long Easting: 2,778,721.486 usft Longitude: -107.644650
 Position Uncertainty: 0.00 usft Slot Radius: 13-3/16" Grid Convergence: 0.11 °

Well: Lybrook I02-2308 01H

Well Position: +N-S 0.00 usft Northing: 1,912,241.962 usft Latitude: 36.255190
 +E-W 0.00 usft Easting: 2,778,721.486 usft Longitude: -107.644650
 Position Uncertainty: 0.00 usft Wellhead Elevation: usft Ground Level: 6,973.00 usft

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/17/11	9.74	63.06	50,434

Design: Design #1

Audit Notes:

Version: Phase: PLAN Tie On Depth: 0.00

Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)
	5,358.13	0.00	0.00	269.91

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Dogleg Rate		Build Rate		Turn Rate		TFO (°)	Target
				+N-S (usft)	+E-W (usft)	(%/100usft)	(%/100usft)	(%/100usft)	(%/100usft)		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
4,817.02	0.00	0.00	4,817.02	0.00	0.00	0.00	0.00	0.00	0.00		
5,722.02	90.50	269.91	5,389.96	-0.95	-577.96	10.00	10.00	0.00	269.91	Lybrk I02-2308 01H P	
9,369.16	90.50	269.91	5,358.13	-6.97	-4,224.95	0.00	0.00	0.00	0.00	Lybrk I02-2308 01H P	



Database: EDMDBBW
 Company: Encana Oil & Gas
 Project: San Juan Co., NM (NAD83)
 Site: Sec.2-T23N-R8W
 Well: Lybrook I02-2308 01H
 Wellbore: Wellbore #1
 Design: Design #1

Local Co-ordinate Reference: Well Lybrook I02-2308 01H
 TVD Reference: WELL @ 6987.00usft
 MD Reference: WELL @ 6987.00usft
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0 00	0.00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00
100 00	0 00	0 00	100 00	0 00	0 00	0 00	0 00	0 00	0 00
200 00	0 00	0 00	200 00	0 00	0 00	0 00	0 00	0 00	0 00
300 00	0 00	0 00	300 00	0 00	0 00	0 00	0 00	0 00	0 00
400 00	0 00	0 00	400 00	0 00	0 00	0 00	0 00	0 00	0 00
13 3/8" Csg.									
500 00	0 00	0 00	500 00	0 00	0 00	0 00	0 00	0 00	0 00
600 00	0 00	0 00	600 00	0 00	0 00	0 00	0 00	0 00	0 00
700 00	0 00	0 00	700 00	0 00	0 00	0 00	0 00	0 00	0 00
800 00	0 00	0 00	800 00	0 00	0 00	0 00	0 00	0 00	0 00
900 00	0 00	0 00	900 00	0 00	0 00	0 00	0 00	0 00	0 00
1,000 00	0 00	0 00	1,000 00	0 00	0 00	0 00	0 00	0 00	0 00
1,100 00	0 00	0 00	1,100 00	0 00	0 00	0 00	0 00	0 00	0 00
Ojo Alamo Ss.									
1,164 00	0 00	0 00	1,164 00	0 00	0 00	0 00	0 00	0 00	0 00
1,200 00	0 00	0 00	1,200 00	0 00	0 00	0 00	0 00	0 00	0 00
1,300 00	0 00	0 00	1,300 00	0 00	0 00	0 00	0 00	0 00	0 00
Kirtland Shale									
1,316 00	0 00	0 00	1,316 00	0 00	0 00	0 00	0 00	0 00	0 00
1,400 00	0 00	0 00	1,400 00	0 00	0 00	0 00	0 00	0 00	0 00
1,500 00	0 00	0 00	1,500 00	0 00	0 00	0 00	0 00	0 00	0 00
Fruitland Coal									
1,563 00	0 00	0 00	1,563 00	0 00	0 00	0 00	0 00	0 00	0 00
1,600 00	0 00	0 00	1,600 00	0 00	0 00	0 00	0 00	0 00	0 00
1,700 00	0 00	0 00	1,700 00	0 00	0 00	0 00	0 00	0 00	0 00
1,800 00	0 00	0 00	1,800 00	0 00	0 00	0 00	0 00	0 00	0 00
Pictured Cliffs Ss.									
1,844 00	0 00	0 00	1,844 00	0 00	0 00	0 00	0 00	0 00	0 00
1,900 00	0 00	0 00	1,900 00	0 00	0 00	0 00	0 00	0 00	0 00
Lewis Shale									
1,952 00	0 00	0 00	1,952 00	0 00	0 00	0 00	0 00	0 00	0 00
2,000 00	0 00	0 00	2,000 00	0 00	0 00	0 00	0 00	0 00	0 00
2,100 00	0 00	0 00	2,100 00	0 00	0 00	0 00	0 00	0 00	0 00
2,200 00	0 00	0 00	2,200 00	0 00	0 00	0 00	0 00	0 00	0 00
2,300 00	0 00	0 00	2,300 00	0 00	0 00	0 00	0 00	0 00	0 00
2,400 00	0 00	0 00	2,400 00	0 00	0 00	0 00	0 00	0 00	0 00
2,500 00	0 00	0 00	2,500 00	0 00	0 00	0 00	0 00	0 00	0 00
2,600 00	0 00	0 00	2,600 00	0 00	0 00	0 00	0 00	0 00	0 00
2,700 00	0 00	0 00	2,700 00	0 00	0 00	0 00	0 00	0 00	0 00
2,800 00	0 00	0 00	2,800 00	0 00	0 00	0 00	0 00	0 00	0 00
2,900 00	0 00	0 00	2,900 00	0 00	0 00	0 00	0 00	0 00	0 00
3,000 00	0 00	0 00	3,000 00	0 00	0 00	0 00	0 00	0 00	0 00
3,100 00	0 00	0 00	3,100 00	0 00	0 00	0 00	0 00	0 00	0 00
3,200 00	0 00	0 00	3,200 00	0 00	0 00	0 00	0 00	0 00	0 00
3,300 00	0 00	0 00	3,300 00	0 00	0 00	0 00	0 00	0 00	0 00
Cliffhouse Ss.									
3,338 00	0 00	0 00	3,338 00	0 00	0 00	0 00	0 00	0 00	0 00
Menefee Fn.									
3,398 00	0 00	0 00	3,398 00	0 00	0 00	0 00	0 00	0 00	0 00
3,400 00	0 00	0 00	3,400 00	0 00	0 00	0 00	0 00	0 00	0 00
3,500 00	0 00	0 00	3,500 00	0 00	0 00	0 00	0 00	0 00	0 00
3,600 00	0 00	0 00	3,600 00	0 00	0 00	0 00	0 00	0 00	0 00
3,700 00	0 00	0 00	3,700 00	0 00	0 00	0 00	0 00	0 00	0 00

Database: EDMDBBW
 Company: Encana Oil & Gas
 Project: San Juan Co., NM (NAD83)
 Site: Sec 2-T23N-R8W
 Well: Lybrook I02-2308 01H
 Wellbore: Wellbore #1
 Design: Design #1

Local Coordinate Reference: Well Lybrook I02-2308 01H
 TVD Reference: WELL @ 6987.00usft
 MD Reference: WELL @ 6987.00usft
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
Point Lookout Ss.										
4,195.00	0.00	0.00	4,195.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
Mancos Shale										
4,436.00	0.00	0.00	4,436.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
9 5/8" Csg.										
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
KOP / Start Build 10.00°										
4,817.02	0.00	0.00	4,817.02	0.00	0.00	0.00	0.00	0.00	0.00	
4,850.00	3.30	269.91	4,849.98	0.00	-0.95	0.95	10.00	10.00	0.00	
4,900.00	8.30	269.91	4,899.71	-0.01	-6.00	6.00	10.00	10.00	0.00	
4,950.00	13.30	269.91	4,948.81	-0.03	-15.36	15.36	10.00	10.00	0.00	
5,000.00	18.30	269.91	4,996.91	-0.05	-28.97	28.97	10.00	10.00	0.00	
5,050.00	23.30	269.91	5,043.63	-0.08	-46.72	46.72	10.00	10.00	0.00	
5,100.00	28.30	269.91	5,088.63	-0.11	-68.47	68.47	10.00	10.00	0.00	
5,150.00	33.30	269.91	5,131.57	-0.16	-94.06	94.06	10.00	10.00	0.00	
5,200.00	38.30	269.91	5,172.11	-0.20	-123.30	123.30	10.00	10.00	0.00	
5,250.00	43.30	269.91	5,209.95	-0.26	-155.96	155.96	10.00	10.00	0.00	
Gallup Fn.										
5,270.36	45.33	269.91	5,224.51	-0.28	-170.18	170.18	10.00	10.00	0.00	
5,300.00	48.30	269.91	5,244.80	-0.32	-191.79	191.79	10.00	10.00	0.00	
5,350.00	53.30	269.91	5,276.39	-0.38	-230.53	230.53	10.00	10.00	0.00	
5,400.00	58.30	269.91	5,304.49	-0.45	-271.87	271.87	10.00	10.00	0.00	
5,450.00	63.30	269.91	5,328.88	-0.52	-315.50	315.50	10.00	10.00	0.00	
5,500.00	68.30	269.91	5,349.37	-0.60	-361.09	361.09	10.00	10.00	0.00	
5,550.00	73.30	269.91	5,365.81	-0.67	-408.29	408.29	10.00	10.00	0.00	
5,600.00	78.30	269.91	5,378.07	-0.75	-456.75	456.75	10.00	10.00	0.00	
5,650.00	83.30	269.91	5,386.06	-0.83	-506.09	506.09	10.00	10.00	0.00	
5,700.00	88.30	269.91	5,389.73	-0.92	-555.94	555.94	10.00	10.00	0.00	
EOB / Start 3647.14' hold at 5722.02 MD										
5,722.02	90.50	269.91	5,389.96	-0.95	-577.96	577.96	10.00	10.00	0.00	
5,800.00	90.50	269.91	5,389.28	-1.08	-655.93	655.93	0.00	0.00	0.00	
5,900.00	90.50	269.91	5,388.40	-1.25	-755.93	755.93	0.00	0.00	0.00	
6,000.00	90.50	269.91	5,387.53	-1.41	-855.93	855.93	0.00	0.00	0.00	
6,100.00	90.50	269.91	5,386.66	-1.58	-955.92	955.92	0.00	0.00	0.00	
6,200.00	90.50	269.91	5,385.78	-1.74	-1,055.92	1,055.92	0.00	0.00	0.00	
6,300.00	90.50	269.91	5,384.91	-1.91	-1,155.91	1,155.92	0.00	0.00	0.00	
6,400.00	90.50	269.91	5,384.04	-2.07	-1,255.91	1,255.91	0.00	0.00	0.00	
6,500.00	90.50	269.91	5,383.17	-2.24	-1,355.91	1,355.91	0.00	0.00	0.00	
6,600.00	90.50	269.91	5,382.29	-2.40	-1,455.90	1,455.90	0.00	0.00	0.00	
6,700.00	90.50	269.91	5,381.42	-2.57	-1,555.90	1,555.90	0.00	0.00	0.00	
6,800.00	90.50	269.91	5,380.55	-2.73	-1,655.89	1,655.90	0.00	0.00	0.00	
6,900.00	90.50	269.91	5,379.68	-2.90	-1,755.89	1,755.89	0.00	0.00	0.00	
7,000.00	90.50	269.91	5,378.80	-3.06	-1,855.89	1,855.89	0.00	0.00	0.00	

Database: EDMDBBW
Company: Encana Oil & Gas
Project: San Juan Co., NM (NAD83)
Site: Sec.2-T23N-R8W
Well: Lybrook I02-2308 01H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well Lybrook I02-2308 01H
TVD Reference: WELL @ 6987.00usft
MD Reference: WELL @ 6987.00usft
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,100.00	90.50	269.91	5,377.93	-3.23	-1,955.88	1,955.89	0.00	0.00	0.00
7,200.00	90.50	269.91	5,377.06	-3.39	-2,055.88	2,055.88	0.00	0.00	0.00
7,300.00	90.50	269.91	5,376.19	-3.56	-2,155.87	2,155.88	0.00	0.00	0.00
7,400.00	90.50	269.91	5,375.31	-3.72	-2,255.87	2,255.87	0.00	0.00	0.00
7,500.00	90.50	269.91	5,374.44	-3.89	-2,355.87	2,355.87	0.00	0.00	0.00
7,600.00	90.50	269.91	5,373.57	-4.05	-2,455.86	2,455.87	0.00	0.00	0.00
7,700.00	90.50	269.91	5,372.70	-4.21	-2,555.86	2,555.86	0.00	0.00	0.00
7,800.00	90.50	269.91	5,371.82	-4.38	-2,655.85	2,655.86	0.00	0.00	0.00
7,900.00	90.50	269.91	5,370.95	-4.54	-2,755.85	2,755.85	0.00	0.00	0.00
8,000.00	90.50	269.91	5,370.08	-4.71	-2,855.85	2,855.85	0.00	0.00	0.00
8,100.00	90.50	269.91	5,369.20	-4.87	-2,955.84	2,955.85	0.00	0.00	0.00
8,200.00	90.50	269.91	5,368.33	-5.04	-3,055.84	3,055.84	0.00	0.00	0.00
8,300.00	90.50	269.91	5,367.46	-5.20	-3,155.84	3,155.84	0.00	0.00	0.00
8,400.00	90.50	269.91	5,366.59	-5.37	-3,255.83	3,255.84	0.00	0.00	0.00
8,500.00	90.50	269.91	5,365.71	-5.53	-3,355.83	3,355.83	0.00	0.00	0.00
8,600.00	90.50	269.91	5,364.84	-5.70	-3,455.82	3,455.83	0.00	0.00	0.00
8,700.00	90.50	269.91	5,363.97	-5.86	-3,555.82	3,555.82	0.00	0.00	0.00
8,800.00	90.50	269.91	5,363.10	-6.03	-3,655.82	3,655.82	0.00	0.00	0.00
8,900.00	90.50	269.91	5,362.22	-6.19	-3,755.81	3,755.82	0.00	0.00	0.00
9,000.00	90.50	269.91	5,361.35	-6.36	-3,855.81	3,855.81	0.00	0.00	0.00
9,100.00	90.50	269.91	5,360.48	-6.52	-3,955.80	3,955.81	0.00	0.00	0.00
9,200.00	90.50	269.91	5,359.61	-6.69	-4,055.80	4,055.81	0.00	0.00	0.00
9,300.00	90.50	269.91	5,358.73	-6.85	-4,155.80	4,155.80	0.00	0.00	0.00
TD at 9369.16 - Lybrk I02-2308 01H PBHL									
9,369.16	90.50	269.91	5,358.13	-6.97	-4,224.95	4,224.96	0.00	0.00	0.00

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Lybrk I02-2308 01H PBHL	0.00	0.00	5,358.13	-6.97	-4,224.95	1,912,226.766	2,774,496.557	36 255170	-107 658980
- hit/miss target									
- plan hits target center									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
500.00	500.00	13 3/8" Csg.	13-3/8	17-1/2
4,600.00	4,600.00	9 5/8" Csg.	9-5/8	12-1/4

Database: EDMDBBW
 Company: Encana Oil & Gas
 Project: San Juan Co., NM (NAD83)
 Site: Sec.2-T23N-R8W
 Well: Lybrook I02-2308 01H
 Wellbore: Wellbore #1
 Design: Design #1

Local Co-ordinate Reference: Well Lybrook I02-2308 01H
 TVD Reference: WELL @ 6987.00usft
 MD Reference: WELL @ 6987.00usft
 North Reference: True
 Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Direction (°)
1,164.00	1,164.00	Ojo Alamo Ss.		-0.50	269.91
1,316.00	1,316.00	Kirtland Shale		-0.50	269.91
1,563.00	1,563.00	Fruitland Coal		-0.50	269.91
1,844.00	1,844.00	Pictured Cliffs Ss.		-0.50	269.91
1,952.00	1,952.00	Lewis Shale		-0.50	269.91
3,338.00	3,338.00	Cliffhouse Ss.		-0.50	269.91
3,398.00	3,398.00	Menefee Fn.		-0.50	269.91
4,195.00	4,195.00	Point Lookout Ss.		-0.50	269.91
4,436.00	4,436.00	Mancos Shale		-0.50	269.91
5,270.36	5,226.00	Gallup Fn.		-0.50	269.91

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,817.02	4,817.02	0.00	0.00	KOP / Start Build 10.00°
5,722.02	5,389.96	-0.95	-577.96	EOB / Start 3647 14' hold at 5722 02 MD
9,369.16	5,358.13	-6.97	-4,224.95	TD at 9369 16

WELLHEAD BLOWOUT CONTROL SYSTEM



Well name and number:

Lybrook I02-2308 01H

