

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary

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

David R. Catanach, Division Director
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-3 APD form.

Operator Signature Date: 8-14-14

Well information;

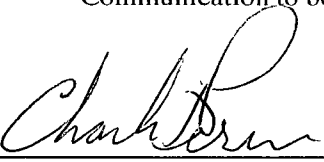
Operator Enranga, Well Name and Number Lybrook E13 2306 #2H

API# 30-039-31308, Section 13, Township 23 N/S, Range 06 E/W

Conditions of Approval:

(See the below checked and handwritten conditions)

- ☒ Notify Aztec OCD 24hrs prior to casing & cement.
- ☒ Hold C-104 for directional survey & "As Drilled" Plat 5.9 compliance
- ☒ Hold C-104 for NSL NSP, DHC
- ☐ Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned.
- ☐ Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
 - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
 - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
 - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- ☐ Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
- ☒ Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84
- ☒ Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.
- ☒ Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.


NMOCD Approved by Signature

3-20-2015
Date LC

RECEIVED

Form 3160-3
(August 2007)

MAR 10 2015

NMOCD
DISTRICTUNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

RECEIVED

AUG 1

FORM APPROVED
OMB No. 1004-0137
Expires July 31, 2010Lease Serial No.
NMNM 18946 & NMNM 23231Indian Allottee or Tribe Name
Bannan

1a. Type of work: ☒ DRILL ☐ REENTER		7. If Unit or CA Agreement, Name and No. CA Pending
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		8. Lease Name and Well No. Lybrook E13-2306 02H
2. Name of Operator Encana Oil & Gas (USA) Inc.		9. API Well No. 30-039-31308
3a. Address 370 17th Street, Suite 1700 Denver, CO 80202	3b. Phone No. (include area code) 720-876-3533	10. Field and Pool, or Exploratory Counselors Gallup-Dakota
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface E 1445' FNL and 424' FWL Section 13, T23N, R6W SW NW At proposed prod. zone E 1720' FNL and 330' FWL Section 14, T23N, R6W SW NW		11. Sec., T. R. M. or Blk. and Survey or Area Section 13, T23N, R6W NMPM Sec 14, T23N, R6W
14. Distance in miles and direction from nearest town or post office* +/- 57 miles southeast of the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM		12. County or Parish Rio Arriba
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) BHL is 330' from west lease line Section 14, T23N, R6W		13. State NM
16. No. of acres in lease NMNM 18946 - 280 ac. NMNM 23231 - 40 ac. 240.00 ac.	17. Spacing Unit dedicated to this well 320 acres - N2 of Section 14, T23N, R6W	
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. Lybrook E13-2306 01H is +/- 30' from SHL	19. Proposed Depth 5,499' TVD/10,653' MD	20. BLM/BIA Bond No. on file COB-000235
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6,774' GL, 6,790' KB	22. Approximate date work will start* 02/11/2015	23. Estimated duration 20 days

24. Attachments

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

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification |
| 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). | 6. Such other site specific information and/or plans as may be required by the BLM. |

25. Signature <i>Katie Wegner</i>	Name (Printed/Typed) Katie Wegner	Date 8/14/14
Title Regulatory Analyst		
Approved by (Signature) <i>D. Mankiewicz</i>	Name (Printed/Typed)	Date 3/4/14
Title AFM		
Office FFO		

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

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

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

BLM'S APPROVAL OR ACCEPTANCE OF THIS
ACTION DOES NOT RELIEVE THE LESSEE AND
OPERATOR FROM OBTAINING ANY OTHER
AUTHORIZATION REQUIRED FOR OPERATIONS

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

NMOCD

DISTRICT I
1836 N. French Dr., Hobbs, N.M. 88240
Phone: (505) 593-6151 Fax: (505) 593-0780

DISTRICT II
811 S. First St., Arizola, N.M. 88310
Phone: (505) 746-1899 Fax: (505) 746-9780

DISTRICT III
1000 Rio Brazos Rd., Arton, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1820 S. St. Francis Dr., Santa Fe, NM 87506
Phone: (505) 476-8480 Fax: (505) 476-8483

State of New Mexico
Energy, Minerals & Natural Resources Department

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

Form C-102
Revised August 1, 2011

Submit one copy to appropriate
District Office

AUG 15 2014

AMENDED REPORT
Bureau of Land Management

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-039-31308	Pool Code 13379	Pool Name COUNSELORS GALLUP-DAKOTA
Property Code 314324	Property Name LYBROOK E13-2306	Well Number 02H
OGRID No. 282327	Operator Name ENCANA OIL & GAS (USA) INC.	Elevation 6773.7

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
E	13	23N	6W		1445'	NORTH	424'	WEST	RIO ARRIBA

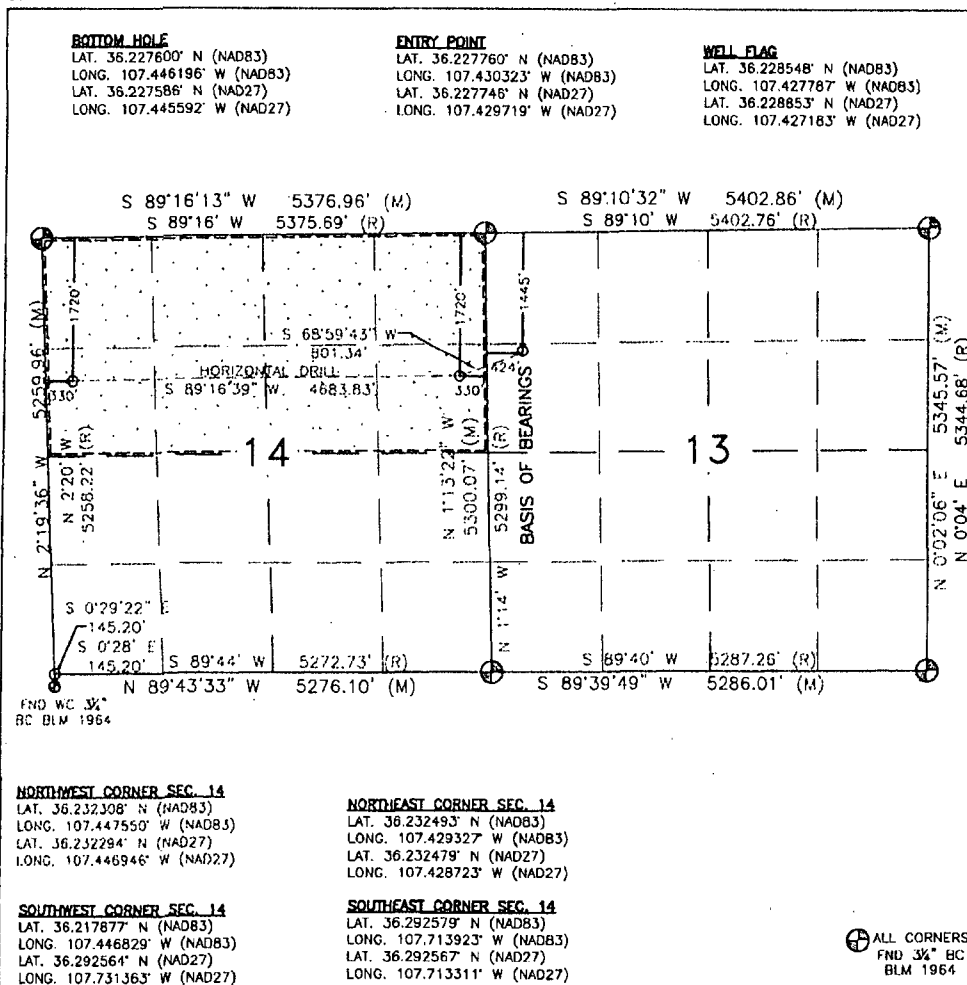
11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	14	23N	6W		1720'	NORTH	330'	WEST	RIO ARRIBA

Dedicated Acres 320.00 ACRES N/2 SEC. 14	PROJECT AREA	Joint or Infill	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

18



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.

Katie Wegner 8/14/14
Signature Date

Katie Wegner

Printed Name

katie.wegner@encana.com

E-mail Address

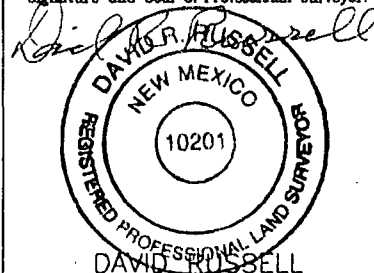
SURVEYOR CERTIFICATION

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.

JUNE 17, 2014

Date of Survey

Signature and Seal of Professional Surveyor:



Certificate Number

10201

Lybrook E13-2306 02H

SHL: SW/4 NW/4 Sec 13 T23N R6W,
1445' FNL, 424' FWL

BHL: SW/4 NW/4 Sec 14 T23N R6W,
1720' FNL, 330' FWL

Rio Arriba, New Mexico

Encana Oil & Gas (USA) Inc. Drilling Plan

1. ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)

The estimated tops of important geologic markers are as follows:

Formation	Depth (TVD) units = feet
Ojo Alamo	1,444
Kirtland Shale	1,611
Fruitland Coal	1,851
Pictured Cliffs Ss.	1,960
Lewis Shale	2,104
Cliffhouse Ss.	2,809
Menefee Fn.	3,515
Point Lookout Ss.	4,225
Mancos Shale	4,436
Mancos Silt	5,052
Gallup Fn.	5,263
Horizontal Target	5,512
Base Gallup	5,578

The referenced surface elevation is 6774', KB 6790'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,851
Oil/Gas	Pictured Cliffs Ss.	1,960
Oil/Gas	Cliffhouse Ss.	2,809
Gas	Menefee Fn.	3,515
Oil/Gas	Point Lookout Ss.	4,225
Oil/Gas	Mancos Shale	4,436
Oil/Gas	Mancos Silt	5,052
Oil/Gas	Gallup Fn.	5,263

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 E13-2306 02H

SHL: SW/4 NW/4 Sec 13 T23N R6W,
1445' FNL, 424' FWL

BHL: SW/4 NW/4 Sec 14 T23N R6W,
1720' FNL, 330' FWL

Rio Arriba, New Mexico

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

Proposed BOP and choke manifold arrangements are attached.

4. CASING & CEMENTING PROGRAM

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

- a) The proposed casing design is as follows:

Casing	Depth (MD)	Hole Size	Csg Size	Weight	Grade
Conductor	0'-60'	30"	20"	94#	
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-5872'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5672'-10653'	6 1/8"	4 1/2"	11.6#	B80*, LTC New

Casing String				Casing Strength Properties			Minimum Design Factors		
Size	Weight (ppf)	Grade	Connection	Collapse (psi)	Burst (psi)	Tensile (1000lbs)	Collapse	Burst	Tension
9 5/8"	36	J55	STC	2020	3520	394	1.125	1.1	1.5
7"	26	J55	LTC	4320	4980	367	1.125	1.1	1.5
4.5"	11.6	B80	LTC	6350	7780	201	1.125	1.1	1.5

*B80 pipe specifications are attached

Casing design is subject to revision based on geologic conditions encountered

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 E13-2306 02H

SHL: SW/4 NW/4 Sec 13 T23N R6W,
1445' FNL, 424' FWL

BHL: SW/4 NW/4 Sec 14 T23N R6W,
1720' FNL, 330' FWL

Rio Arriba, New Mexico

b) The proposed cementing program is as follows

Casing	Depth (MD)	Cement Volume (sacks)	Cement Type & Yield	Designed TOC	Centralizers
Conductor	0'-60'	100 sks	Type I Neat 16 ppg	Surface	None
Surface	0'-500'	247 sks	HALCEM™ SYSTEM + 2% CaCl ₂ + 0.125lbm/sk Poly-E- Flake. 15.8 ppg, 1.174 cuft/sk	Surface	1 per joint on bottom 3 joints
Intermediate	0'-5872'	100% open hole excess Stage 1 Lead: 690 sks Stage 1 Tail: 305 sks	Lead: PremLite + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 12.1ppg 2.13cuft/sk Tail: Type III Cmt + 1% CaCl + 0.25lb/sk Cello Flake 14.5ppg 1.38cuft/sk	Surface	1 every 3 joints through water bearing zones
Production Liner	5672'- 10653'	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 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 3800'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5499'/10653'	Gallup

6. DRILLING FLUIDS PROGRAM

a) Surface through Intermediate Casing Point:

Lybrook E13-2306 02H

SHL: SW/4 NW/4 Sec 13 T23N R6W,
1445' FNL, 424' FWL

BHL: SW/4 NW/4 Sec 14 T23N R6W,
1720' FNL, 330' FWL

Rio Arriba, New Mexico

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
30"	0-60'/60'	Fresh Water	8.3-9.2	38-100	4-28
12 1/4"	0'-500'/500'	Fresh Water	8.3-10	60-70	NC
8 3/4"	500'/500'-5516'/5872'	Fresh Water LSND	8.3-10	40-50	8-10

b) Intermediate Casing Point to TD:

Hole Size (in)	Depth (TVD/MD)	Mud Type	Density (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
6 1/8"	5516'/5872'- 5499'/10653'	Fresh Water LSND	8.3-10	15-25	<15

c) There will be sufficient mud on location to control a blowout should one occur. Mud flow and volume will be monitored both visually and with electronic pit volume totalizers. Mud tests shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

✓ d) A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystems, Inc. The location will be lined in accordance with the Surface Use Plan of Operations.

7. TESTING, CORING, & LOGGING

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

Cased Hole:

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

8. ABNORMAL PRESSURES & HYDROGEN SULFIDE

The anticipated bottom hole pressure is +/- 2580 psi based on a 9.0 ppg at 5512' TVD of the horizontal lateral target. No abnormal pressure or temperatures are anticipated.

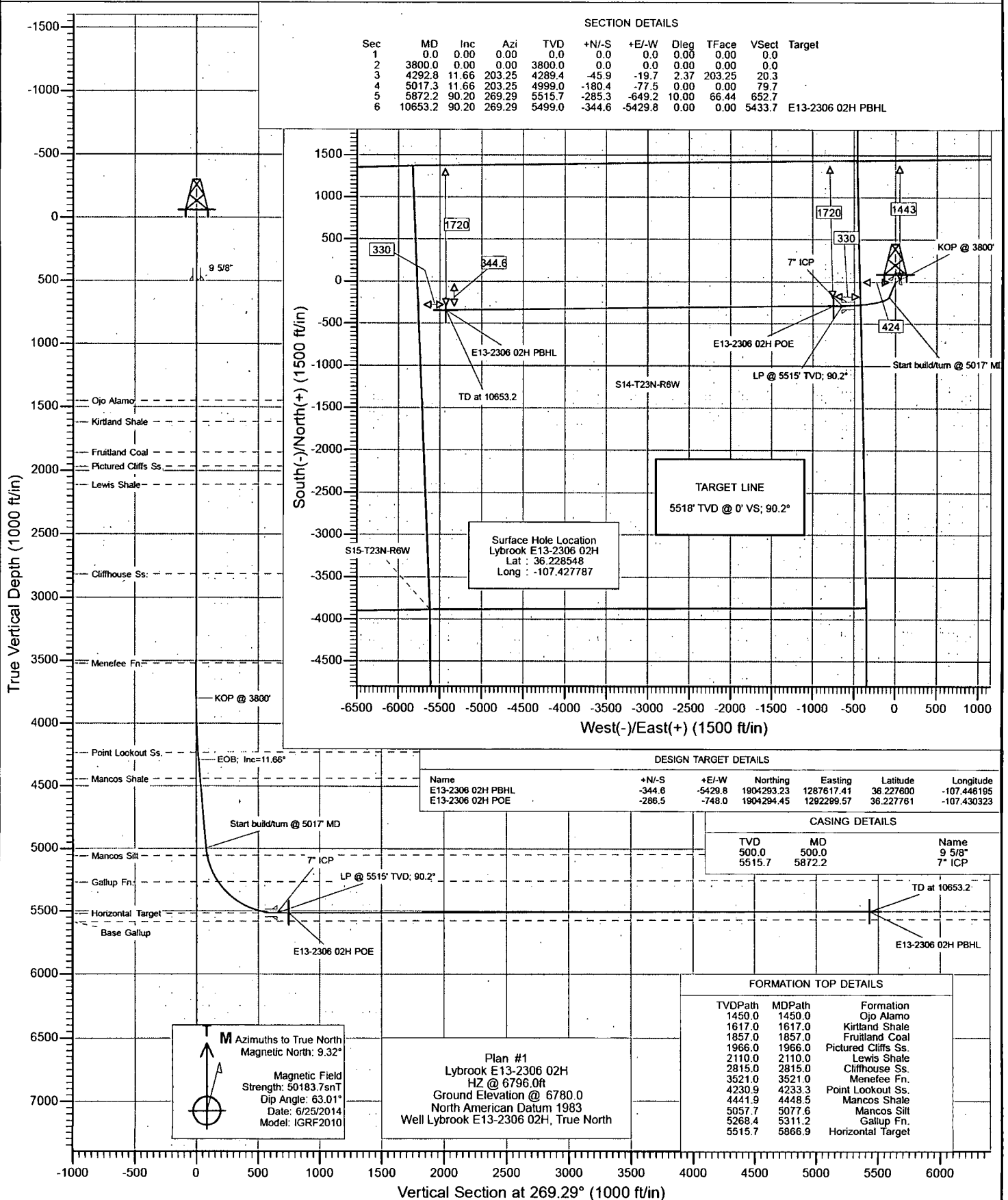
No hydrogen sulfide gas is anticipated, however, if H₂S is encountered, the guidelines in Onshore Order No. 6 will be followed.

9. ANTICIPATED START DATE AND DURATION OF OPERATIONS

Drilling is estimated to commence on February 11, 2015. It is anticipated that completion operations will begin within 30 days after the well has been drilled depending on fracture treatment schedules with various pumping service companies.

It is anticipated that the drilling of this well will take approximately 20 days.

LOC: SW/4 NW/4 Sec 13 T23N R6W, 1443' FNL, 42 County: Rio Arriba WELL: Lybrook E13-2306 02H			Encana Natural Gas WELL SUMMARY			ENG: 0 RIG: Aztec 950 GLE: 6774 RKBE: 6790			8/13/14
MWD	OPEN HOLE	FORM	DEPTH			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
LWD	LOGGING		TVD	MD					
			60	60'		30	16" 42# 100sx Type I Neat 16.0ppg cmt	Fresh wtr 8.3-9.2	
Multi-Well pad take survey every stand and run anti- collision report prior to spud	None	Nacimiento 9 5/8" Csg	0 500	500.00		12 1/4	9 5/8" 36ppf J55 STC TOC Surface - 247 sks of Type III Cement	Fresh wtr 8.3-10	Vertical <1°
Survey Every 60'-120', updating anticollision report after surveys. Stop operations and contact drilling engineer if separation factor approaches 1.5	No OH logs	Ojo Alamo Kirtland Shale Fruitland Coal Pictured Cliffs Ss. Lewis Shale Cliffhouse Ss. Menefee Fn. Point Lookout Ss. Mancos Shale	1,444 1,611 1,851 1,960 2,104 2,809 3,515 4,225 4,436			8 3/4	7" 26ppf J55 LTC TOC @ surface (100% OH excess - 70% Lead 30% Tail) Stage 1 Total: 996sks Stage 1 Lead: 690 sks Premium Lite FM + 3% CaCl2 + 0.25/sk Cello Flake + 5#/sk LCM-1 + 8% Bentonite + 0.4% FL-52A + 0.4% Sodium Metasilicate. Mixed at 12.1 ppg. Yield 2.13 cuft/sk. Stage 1 Tail: 305 sks Type III Cement + 1% CaCl2 + 0.25#/sk Cello Flake + 0.2% FL-52A. Mixed at 14.6 ppg. Yield 1.38 cuft/sk.	Fresh Wtr 8.3-10	Vertical <1°
Surveys every 30' through the curve	Mud logger onsite	KOP Mancos Silt Gallup Fn. 7" Csg	3,800 5,052 5,263 5,516	3,800 5,872'					
Surveys every stand to TD unless directed otherwise by Geologist	No OH Logs	Horizontal Target TD Base Gallup	5,512 5,499 5,578	10,653		6 1/8	200' overlap at liner top 4781' Drilled Lateral		Horiz Inc/TVD 90.2 degdeg/5512ft TD = 10653.2 MD
MWD Gamma Directional							4 1/2" 11.6ppf SB80 LTC Running external swellable csg packers for isolation of prod string	WBM 8.3-10	



Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Rio Arriba County, NM
Site: S13-T23N-R6W
Well: Lybrook E13-2306 02H
Wellbore: HZ
Design: Plan #1

Local Co-ordinate Reference: Well Lybrook E13-2306 02H
TVD Reference: HZ @ 6796.0ft
MD Reference: HZ @ 6796.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature

Project	Rio Arriba 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		S13-T23N-R6W			
Site Position:		Northing:	1,904,601.27 ft	Latitude:	36.228629
From:	Lat/Long	Easting:	1,293,056.71 ft	Longitude:	-107.427769
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-0.70 °

Well	Lybrook E13-2306 02H					
Well Position	+N/-S	0.0 ft	Northing:	1,904,571.85 ft	Latitude:	36.228548
	+E/-W	0.0 ft	Easting:	1,293,051.04 ft	Longitude:	-107.427787
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	6,780.0 ft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/25/2014	9.32	63.01	50,184

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	269.29

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,292.8	11.66	203.25	4,289.4	-45.9	-19.7	2.37	2.37	0.00	203.25	
5,017.3	11.66	203.25	4,999.0	-180.4	-77.5	0.00	0.00	0.00	0.00	
5,872.2	90.20	269.29	5,515.7	-285.3	-649.2	10.00	9.19	7.72	66.44	
10,653.2	90.20	269.29	5,499.0	-344.6	-5,429.8	0.00	0.00	0.00	0.00	E13-2306 02H PBHL

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Rio Arriba County, NM
 Site: S13-T23N-R6W
 Well: Lybrook E13-2306 02H
 Wellbore: HZ
 Design: Plan #1

Local Co-ordinate Reference: Well Lybrook E13-2306 02H
 TVD Reference: HZ @ 6796.0ft
 MD Reference: HZ @ 6796.0ft
 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	
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	
1,450.0	0.00	0.00	1,450.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo
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	
1,617.0	0.00	0.00	1,617.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
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	
1,857.0	0.00	0.00	1,857.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
1,966.0	0.00	0.00	1,966.0	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	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,110.0	0.00	0.00	2,110.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
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	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,815.0	0.00	0.00	2,815.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
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	
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	
3,521.0	0.00	0.00	3,521.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
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	KOP @ 3800'
3,900.0	2.37	203.25	3,900.0	-1.9	-0.8	0.8	2.37	2.37	
4,000.0	4.73	203.25	3,999.8	-7.6	-3.3	3.4	2.37	2.37	
4,100.0	7.10	203.25	4,099.2	-17.0	-7.3	7.5	2.37	2.37	
4,200.0	9.46	203.25	4,198.2	-30.3	-13.0	13.4	2.37	2.37	
4,233.3	10.25	203.25	4,230.9	-35.5	-15.3	15.7	2.37	2.37	Point Lookout Ss.
4,292.8	11.66	203.25	4,289.4	-45.9	-19.7	20.3	2.37	2.37	EOB; Inc=11.66°

Planning Report

Database: USA EDM 5000 Multi Users DB
 Company: EnCana Oil & Gas (USA) Inc
 Project: Rio Arriba County, NM
 Site: S13-T23N-R6W
 Well: Lybrook E13-2306 02H
 Wellbore: HZ
 Design: Plan #1

Local Co-ordinate Reference: Well Lybrook E13-2306 02H
 TVD Reference: HZ @ 6796.0ft
 MD Reference: HZ @ 6796.0ft
 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
4,300.0	11.66	203.25	4,296.5	-47.2	-20.3	20.9	0.00	0.00	
4,400.0	11.66	203.25	4,394.4	-65.8	-28.3	29.1	0.00	0.00	
4,448.5	11.66	203.25	4,441.9	-74.8	-32.1	33.1	0.00	0.00	Mancos Shale
4,500.0	11.66	203.25	4,492.3	-84.4	-36.2	37.3	0.00	0.00	
4,600.0	11.66	203.25	4,590.3	-102.9	-44.2	45.5	0.00	0.00	
4,700.0	11.66	203.25	4,688.2	-121.5	-52.2	53.7	0.00	0.00	
4,800.0	11.66	203.25	4,786.1	-140.1	-60.2	61.9	0.00	0.00	
4,900.0	11.66	203.25	4,884.1	-158.6	-68.1	70.1	0.00	0.00	
5,000.0	11.66	203.25	4,982.0	-177.2	-76.1	78.3	0.00	0.00	
5,017.3	11.66	203.25	4,999.0	-180.4	-77.5	79.7	0.00	0.00	Start build/turn @ 5017' MD
5,077.6	15.10	224.95	5,057.7	-191.6	-85.5	87.8	10.00	5.71	Mancos Silt
5,100.0	16.75	230.47	5,079.2	-195.7	-90.0	92.4	10.00	7.36	
5,200.0	25.22	245.66	5,172.5	-213.7	-120.6	123.3	10.00	8.47	
5,300.0	34.48	253.32	5,259.2	-230.6	-167.3	170.1	10.00	9.26	
5,311.2	35.54	253.95	5,268.4	-232.4	-173.4	176.3	10.00	9.46	Gallup Fn.
5,400.0	44.04	258.01	5,336.6	-246.0	-228.5	231.6	10.00	9.57	
5,500.0	53.73	261.30	5,402.3	-259.4	-302.6	305.7	10.00	9.69	
5,600.0	63.49	263.86	5,454.3	-270.3	-387.1	390.4	10.00	9.76	
5,700.0	73.29	266.01	5,491.1	-278.4	-479.6	483.0	10.00	9.80	
5,800.0	83.10	267.95	5,511.5	-283.5	-577.2	580.7	10.00	9.82	
5,866.9	89.67	269.19	5,515.7	-285.2	-643.9	647.4	10.00	9.83	Horizontal Target
5,872.2	90.20	269.29	5,515.7	-285.3	-649.2	652.7	10.00	9.83	LP @ 5515' TVD; 90.2° - 7" ICP
5,900.0	90.20	269.29	5,515.6	-285.6	-677.0	680.5	0.01	0.01	
6,000.0	90.20	269.29	5,515.3	-286.9	-777.0	780.5	0.00	0.00	
6,100.0	90.20	269.29	5,514.9	-288.1	-877.0	880.5	0.00	0.00	
6,200.0	90.20	269.29	5,514.6	-289.4	-977.0	980.5	0.00	0.00	
6,300.0	90.20	269.29	5,514.2	-290.6	-1,077.0	1,080.5	0.00	0.00	
6,400.0	90.20	269.29	5,513.9	-291.8	-1,177.0	1,180.5	0.00	0.00	
6,500.0	90.20	269.29	5,513.5	-293.1	-1,277.0	1,280.5	0.00	0.00	
6,600.0	90.20	269.29	5,513.2	-294.3	-1,377.0	1,380.5	0.00	0.00	
6,700.0	90.20	269.29	5,512.8	-295.6	-1,477.0	1,480.5	0.00	0.00	
6,800.0	90.20	269.29	5,512.5	-296.8	-1,577.0	1,580.5	0.00	0.00	
6,900.0	90.20	269.29	5,512.1	-298.0	-1,676.9	1,680.5	0.00	0.00	
7,000.0	90.20	269.29	5,511.8	-299.3	-1,776.9	1,780.5	0.00	0.00	
7,100.0	90.20	269.29	5,511.4	-300.5	-1,876.9	1,880.5	0.00	0.00	
7,200.0	90.20	269.29	5,511.1	-301.8	-1,976.9	1,980.5	0.00	0.00	
7,300.0	90.20	269.29	5,510.7	-303.0	-2,076.9	2,080.5	0.00	0.00	
7,400.0	90.20	269.29	5,510.4	-304.2	-2,176.9	2,180.5	0.00	0.00	
7,500.0	90.20	269.29	5,510.0	-305.5	-2,276.9	2,280.5	0.00	0.00	
7,600.0	90.20	269.29	5,509.7	-306.7	-2,376.9	2,380.5	0.00	0.00	
7,700.0	90.20	269.29	5,509.3	-308.0	-2,476.9	2,480.5	0.00	0.00	
7,800.0	90.20	269.29	5,509.0	-309.2	-2,576.9	2,580.5	0.00	0.00	
7,900.0	90.20	269.29	5,508.6	-310.5	-2,676.9	2,680.5	0.00	0.00	
8,000.0	90.20	269.29	5,508.3	-311.7	-2,776.9	2,780.5	0.00	0.00	
8,100.0	90.20	269.29	5,507.9	-312.9	-2,876.8	2,880.5	0.00	0.00	
8,200.0	90.20	269.29	5,507.6	-314.2	-2,976.8	2,980.5	0.00	0.00	
8,300.0	90.20	269.29	5,507.2	-315.4	-3,076.8	3,080.5	0.00	0.00	
8,400.0	90.20	269.29	5,506.9	-316.7	-3,176.8	3,180.5	0.00	0.00	
8,500.0	90.20	269.29	5,506.5	-317.9	-3,276.8	3,280.5	0.00	0.00	
8,600.0	90.20	269.29	5,506.2	-319.1	-3,376.8	3,380.5	0.00	0.00	
8,700.0	90.20	269.29	5,505.8	-320.4	-3,476.8	3,480.5	0.00	0.00	
8,800.0	90.20	269.29	5,505.5	-321.6	-3,576.8	3,580.5	0.00	0.00	

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Rio Arriba County, NM
Site: S13-T23N-R6W
Well: Lybrook E13-2306 02H
Wellbore: HZ
Design: Plan #1

Local Co-ordinate Reference: Well Lybrook E13-2306 02H
TVD Reference: HZ @ 6796.0ft
MD Reference: HZ @ 6796.0ft
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
8,900.0	90.20	269.29	5,505.1	-322.9	-3,676.8	3,680.5	0.00	0.00	
9,000.0	90.20	269.29	5,504.8	-324.1	-3,776.8	3,780.5	0.00	0.00	
9,100.0	90.20	269.29	5,504.4	-325.3	-3,876.8	3,880.5	0.00	0.00	
9,200.0	90.20	269.29	5,504.1	-326.6	-3,976.8	3,980.5	0.00	0.00	
9,300.0	90.20	269.29	5,503.7	-327.8	-4,076.7	4,080.5	0.00	0.00	
9,400.0	90.20	269.29	5,503.4	-329.1	-4,176.7	4,180.5	0.00	0.00	
9,500.0	90.20	269.29	5,503.0	-330.3	-4,276.7	4,280.5	0.00	0.00	
9,600.0	90.20	269.29	5,502.7	-331.6	-4,376.7	4,380.5	0.00	0.00	
9,700.0	90.20	269.29	5,502.3	-332.8	-4,476.7	4,480.5	0.00	0.00	
9,800.0	90.20	269.29	5,502.0	-334.0	-4,576.7	4,580.5	0.00	0.00	
9,900.0	90.20	269.29	5,501.6	-335.3	-4,676.7	4,680.5	0.00	0.00	
10,000.0	90.20	269.29	5,501.3	-336.5	-4,776.7	4,780.5	0.00	0.00	
10,100.0	90.20	269.29	5,500.9	-337.8	-4,876.7	4,880.5	0.00	0.00	
10,200.0	90.20	269.29	5,500.6	-339.0	-4,976.7	4,980.5	0.00	0.00	
10,300.0	90.20	269.29	5,500.2	-340.2	-5,076.7	5,080.5	0.00	0.00	
10,400.0	90.20	269.29	5,499.9	-341.5	-5,176.7	5,180.5	0.00	0.00	
10,500.0	90.20	269.29	5,499.5	-342.7	-5,276.6	5,280.5	0.00	0.00	
10,600.0	90.20	269.29	5,499.2	-344.0	-5,376.6	5,380.5	0.00	0.00	
10,653.2	90.20	269.29	5,499.0	-344.6	-5,429.8	5,433.7	0.00	0.00	TD at 10653.2

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
E13-2306 02H PBHL	0.00	0.00	5,499.0	-344.6	-5,429.8	1,904,293.23	1,287,617.41	36.227600	-107.446195
- plan hits target center									
- Point									
E13-2306 02H POE	0.00	0.00	5,515.4	-286.5	-748.0	1,904,294.45	1,292,299.57	36.227761	-107.430323
- plan hits target center									
- Point									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
5,872.2	5,515.7	7" ICP	5.500	6.000
500.0	500.0	9 5/8"	9.625	12.250

Planning Report

Database: USA EDM 5000 Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: Rio Arriba County, NM
Site: S13-T23N-R6W
Well: Lybrook E13-2306 02H
Wellbore: HZ
Design: Plan #1

Local Co-ordinate Reference: Well Lybrook E13-2306 02H
TVD Reference: HZ @ 6796.0ft
MD Reference: HZ @ 6796.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,450.0	1,450.0	Ojo Alamo		-0.20	269.29
1,617.0	1,617.0	Kirtland Shale		-0.20	269.29
1,857.0	1,857.0	Fruitland Coal		-0.20	269.29
1,966.0	1,966.0	Pictured Cliffs Ss.		-0.20	269.29
2,110.0	2,110.0	Lewis Shale		-0.20	269.29
2,815.0	2,815.0	Cliffhouse Ss.		-0.20	269.29
3,521.0	3,521.0	Menefee Fn.		-0.20	269.29
4,233.3	4,231.0	Point Lookout Ss.		-0.20	269.29
4,448.5	4,442.0	Mancos Shale		-0.20	269.29
5,077.6	5,058.0	Mancos Silt		-0.20	269.29
5,311.2	5,269.0	Gallup Fn.		-0.20	269.29
5,866.9	5,518.0	Horizontal Target		-0.20	269.29

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
3,800.0	3,800.0	0.0	0.0	KOP @ 3800'
4,292.8	4,289.4	-45.9	-19.7	EOB; Inc=11.66°
5,017.3	4,999.0	-180.4	-77.5	Start build/turn @ 5017' MD
5,872.2	5,515.7	-285.3	-649.2	LP @ 5515' TVD; 90.2°
10,653.2	5,499.0	-344.6	-5,429.8	TD at 10653.2

EnCana Oil & Gas (USA) Inc

Rio Arriba County, NM

S13-T23N-R6W

Lybrook E13-2306 02H

HZ

Plan #1

Anticollision Report

09 July, 2014

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Rio Arriba County, NM
Reference Site: S13-T23N-R6W
Site Error: 0.0ft
Reference Well: Lybrook E13-2306 02H
Well Error: 0.0ft
Reference Wellbore: HZ
Reference Design: Plan #1

Local Co-ordinate Reference: Well Lybrook E13-2306 02H
TVD Reference: HZ @ 6796.0ft
MD Reference: HZ @ 6796.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Reference	Plan #1
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD Interval 100.0ft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 1,254.3ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	Systematic Ellipse
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic

Survey Tool Program		Date 7/9/2014		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	10,653.2	Plan #1 (HZ)	Geolink MWD	Geolink MWD

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S13-T23N-R6W						
Lybrook E13-2306 01H - HZ - Plan #1	3,000.0	3,000.0	30.0	19.5	2.877	CC, ES, SF

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Rio Arriba County, NM
Reference Site: S13-T23N-R6W
Site Error: 0.0ft
Reference Well: Lybrook E13-2306 02H
Well Error: 0.0ft
Reference Wellbore: HZ
Reference Design: Plan #1

Local Co-ordinate Reference: Well Lybrook E13-2306 02H
TVD Reference: HZ @ 6796.0ft
MD Reference: HZ @ 6796.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Offset Design S13-T23N-R6W - Lybrook E13-2306 01H - HZ - Plan #1

Survey Program: 0-Geolink MWD

Offset Site Error: 0.0 ft

Offset Well Error: 0.0 ft

Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
0.0	0.0	0.0	0.0	0.0	0.0	10.21	29.5	5.3	30.0				
100.0	100.0	100.0	100.0	0.1	0.1	10.21	29.5	5.3	30.0	29.7	0.29	102.189	
200.0	200.0	200.0	200.0	0.3	0.3	10.21	29.5	5.3	30.0	29.3	0.64	46.652	
300.0	300.0	300.0	300.0	0.5	0.5	10.21	29.5	5.3	30.0	29.0	0.99	30.225	
400.0	400.0	400.0	400.0	0.7	0.7	10.21	29.5	5.3	30.0	28.6	1.34	22.354	
500.0	500.0	500.0	500.0	0.8	0.8	10.21	29.5	5.3	30.0	28.3	1.69	17.735	
600.0	600.0	600.0	600.0	1.0	1.0	10.21	29.5	5.3	30.0	27.9	2.04	14.698	
700.0	700.0	700.0	700.0	1.2	1.2	10.21	29.5	5.3	30.0	27.6	2.39	12.550	
800.0	800.0	800.0	800.0	1.4	1.4	10.21	29.5	5.3	30.0	27.2	2.74	10.949	
900.0	900.0	900.0	900.0	1.5	1.5	10.21	29.5	5.3	30.0	26.9	3.09	9.710	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	10.21	29.5	5.3	30.0	26.5	3.43	8.723	
1,100.0	1,100.0	1,100.0	1,100.0	1.9	1.9	10.21	29.5	5.3	30.0	26.2	3.78	7.919	
1,200.0	1,200.0	1,200.0	1,200.0	2.1	2.1	10.21	29.5	5.3	30.0	25.8	4.13	7.250	
1,300.0	1,300.0	1,300.0	1,300.0	2.2	2.2	10.21	29.5	5.3	30.0	25.5	4.48	6.685	
1,400.0	1,400.0	1,400.0	1,400.0	2.4	2.4	10.21	29.5	5.3	30.0	25.1	4.83	6.202	
1,500.0	1,500.0	1,500.0	1,500.0	2.6	2.6	10.21	29.5	5.3	30.0	24.8	5.18	5.784	
1,600.0	1,600.0	1,600.0	1,600.0	2.8	2.8	10.21	29.5	5.3	30.0	24.4	5.53	5.419	
1,700.0	1,700.0	1,700.0	1,700.0	2.9	2.9	10.21	29.5	5.3	30.0	24.1	5.88	5.097	
1,800.0	1,800.0	1,800.0	1,800.0	3.1	3.1	10.21	29.5	5.3	30.0	23.7	6.23	4.812	
1,900.0	1,900.0	1,900.0	1,900.0	3.3	3.3	10.21	29.5	5.3	30.0	23.4	6.58	4.556	
2,000.0	2,000.0	2,000.0	2,000.0	3.5	3.5	10.21	29.5	5.3	30.0	23.0	6.93	4.327	
2,100.0	2,100.0	2,100.0	2,100.0	3.6	3.6	10.21	29.5	5.3	30.0	22.7	7.27	4.119	
2,200.0	2,200.0	2,200.0	2,200.0	3.8	3.8	10.21	29.5	5.3	30.0	22.3	7.62	3.930	
2,300.0	2,300.0	2,300.0	2,300.0	4.0	4.0	10.21	29.5	5.3	30.0	22.0	7.97	3.758	
2,400.0	2,400.0	2,400.0	2,400.0	4.2	4.2	10.21	29.5	5.3	30.0	21.6	8.32	3.601	
2,500.0	2,500.0	2,500.0	2,500.0	4.3	4.3	10.21	29.5	5.3	30.0	21.3	8.67	3.456	
2,600.0	2,600.0	2,600.0	2,600.0	4.5	4.5	10.21	29.5	5.3	30.0	20.9	9.02	3.322	
2,700.0	2,700.0	2,700.0	2,700.0	4.7	4.7	10.21	29.5	5.3	30.0	20.6	9.37	3.198	
2,800.0	2,800.0	2,800.0	2,800.0	4.9	4.9	10.21	29.5	5.3	30.0	20.2	9.72	3.083	
2,900.0	2,900.0	2,900.0	2,900.0	5.0	5.0	10.21	29.5	5.3	30.0	19.9	10.07	2.976	
3,000.0	3,000.0	3,000.0	3,000.0	5.2	5.2	10.21	29.5	5.3	30.0	19.5	10.42	2.877 CC, ES, SF	
3,100.0	3,100.0	3,099.0	3,099.0	5.4	5.4	9.24	31.2	5.1	31.6	20.8	10.76	2.937	
3,200.0	3,200.0	3,197.7	3,197.6	5.6	5.6	6.87	36.2	4.4	36.6	25.5	11.11	3.293	
3,300.0	3,300.0	3,296.0	3,295.5	5.7	5.7	4.09	44.6	3.2	45.0	33.5	11.46	3.925	
3,400.0	3,400.0	3,393.6	3,392.3	5.9	5.9	1.60	56.2	1.6	56.8	45.0	11.80	4.809	
3,500.0	3,500.0	3,490.2	3,487.8	6.1	6.1	-0.39	70.9	-0.5	72.0	59.8	12.15	5.923	
3,600.0	3,600.0	3,585.8	3,581.7	6.3	6.4	-1.91	88.6	-3.0	90.5	78.0	12.50	7.243	
3,700.0	3,700.0	3,680.0	3,673.7	6.4	6.6	-3.05	109.1	-5.8	112.3	99.5	12.84	8.746	
3,800.0	3,800.0	3,772.8	3,763.5	6.6	6.9	-3.91	132.1	-9.0	137.4	124.2	13.20	10.409	
3,900.0	3,900.0	3,863.4	3,850.4	6.8	7.2	152.17	157.4	-12.6	167.2	153.7	13.48	12.402	
4,000.0	3,999.8	3,951.0	3,933.6	7.0	7.5	152.01	184.4	-16.3	203.5	189.7	13.79	14.759	
4,100.0	4,099.2	4,035.0	4,012.6	7.1	7.9	152.09	212.6	-20.3	245.8	231.8	14.07	17.473	
4,200.0	4,198.2	4,115.0	4,087.1	7.3	8.2	152.24	241.7	-24.4	294.0	279.7	14.33	20.515	
4,300.0	4,296.5	4,190.8	4,156.8	7.6	8.6	152.43	271.1	-28.5	347.7	333.1	14.58	23.847	
4,400.0	4,394.4	4,263.3	4,222.7	7.8	9.0	153.13	300.9	-32.6	404.9	390.0	14.89	27.198	
4,500.0	4,492.3	4,333.2	4,285.6	8.0	9.5	153.62	331.2	-36.9	464.2	449.0	15.19	30.552	
4,600.0	4,590.3	4,400.0	4,344.9	8.3	9.9	153.97	361.6	-41.1	525.3	509.8	15.50	33.903	
4,700.0	4,688.2	4,465.8	4,402.7	8.5	10.4	154.23	392.8	-45.5	588.3	572.5	15.80	37.239	
4,800.0	4,786.1	4,536.2	4,463.8	8.8	10.9	154.43	427.5	-50.3	652.8	636.7	16.11	40.517	
4,900.0	4,884.1	4,612.5	4,529.9	9.1	11.4	154.62	465.1	-55.6	717.4	701.0	16.44	43.650	
5,000.0	4,982.0	4,688.8	4,596.1	9.4	12.0	154.77	502.8	-60.9	782.0	765.3	16.76	46.657	
5,100.0	5,079.2	4,764.9	4,662.0	9.7	12.6	122.06	540.3	-66.1	846.4	829.2	17.22	49.159	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Rio Arriba County, NM
Reference Site: S13-T23N-R6W
Site Error: 0.0ft
Reference Well: Lybrook E13-2306 02H
Well Error: 0.0ft
Reference Wellbore: HZ
Reference Design: Plan #1

Local Co-ordinate Reference: Well Lybrook E13-2306 02H
TVD Reference: HZ @ 6796.0ft
MD Reference: HZ @ 6796.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Offset Design S13-T23N-R6W - Lybrook E13-2306 01H - HZ - Plan #1													Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor		
5,200.0	5,172.5	4,839.0	4,726.3	10.1	13.1	101.73	576.9	-71.2	909.2	891.2	17.96	50.615		
5,300.0	5,259.2	4,909.0	4,787.0	10.7	13.7	90.29	611.5	-76.0	969.8	950.9	18.85	51.456		
5,400.0	5,336.6	4,972.7	4,842.2	11.4	14.2	82.75	642.9	-80.4	1,027.9	1,008.1	19.78	51.953		
5,500.0	5,402.3	5,028.2	4,890.3	12.3	14.6	77.16	670.3	-84.3	1,083.5	1,062.8	20.76	52.197		
5,600.0	5,454.3	5,073.7	4,929.8	13.6	15.0	72.58	692.8	-87.4	1,136.9	1,115.1	21.77	52.223		
5,700.0	5,491.1	5,108.0	4,959.5	15.1	15.3	68.50	709.7	-89.8	1,187.8	1,165.0	22.81	52.078		
5,800.0	5,511.5	5,129.9	4,978.5	17.0	15.5	64.68	720.5	-91.3	1,236.3	1,212.4	23.86	51.812		

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Rio Arriba County, NM
Reference Site: S13-T23N-R6W
Site Error: 0.0ft
Reference Well: Lybrook E13-2306 02H
Well Error: 0.0ft
Reference Wellbore: HZ
Reference Design: Plan #1

Local Co-ordinate Reference: Well Lybrook E13-2306 02H
TVD Reference: HZ @ 6796.0ft
MD Reference: HZ @ 6796.0ft
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA EDM 5000 Multi Users DB
Offset TVD Reference: Offset Datum

Reference Depths are relative to HZ @ 6796.0ft

Offset Depths are relative to Offset Datum

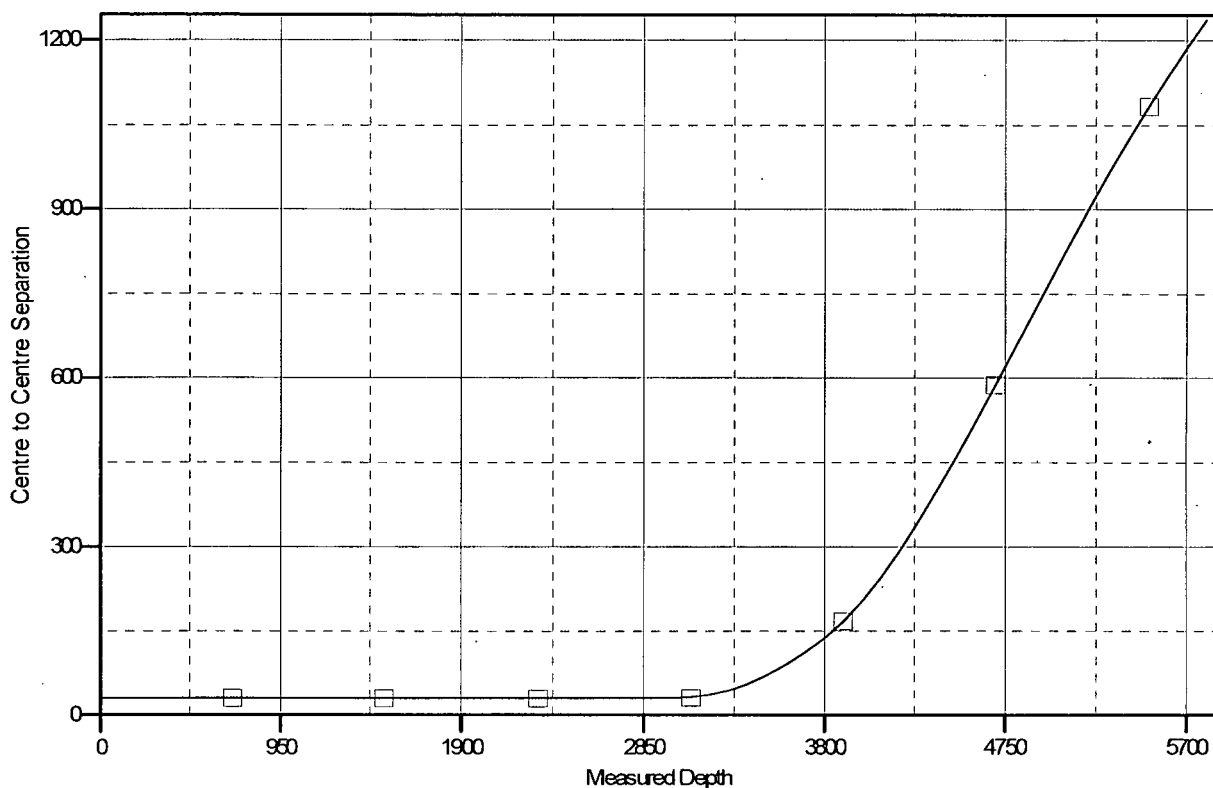
Central Meridian is -106.250000 °

Coordinates are relative to: Lybrook E13-2306 02H

Coordinate System is US State Plane 1983, New Mexico Central Zone

Grid Convergence at Surface is: -0.70°

Ladder Plot



LEGEND

— Lybrook E13-2306 01H, HZ, Plan #1 V0

Lybrook E13-2306 02H

**SHL: SWNW Section 13, T23N, R6W
1445 FNL and 424 FWL**

**BHL: SWNW Section 14, T23N, R6W
1720 FNL and 330 FWL**

Rio Arriba County, New Mexico

Lease Number: NMNM 18946 & NMNM 23231

stockpiled topsoil will be free of brush and tree limbs, trunks and root balls, but may include chipped or mulched material so long as it is incorporated into the topsoil stockpile.

Topsoil will be stockpiled separate from subsoil with a noticeable gap left between the stockpiles. Vehicle/equipment traffic will be prevented from crossing topsoil stockpiles.

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

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

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

The maximum cut will be approximately 7.3 feet on the southeast corner (corner 2) and the maximum fill will be approximately 4.8 feet on the northwest corner (corner 5).

4. As determined during the onsite on April 22, 2014, the following best management practices will be implemented:

Water will be diverted around the pad and silt traps installed as needed upon interim reclamation.

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

C. Pipeline

See the Standard SF-299 Application for authorization to construct, operate, maintain and terminate a 12,907 foot, up to 6-inch outside diameter, buried steel well connect pipeline that was submitted to the Bureau of Land Management on April 4, 2014.

7. METHODS FOR HANDLING WASTE

A. Cuttings

1. A closed-loop system will be used. Cuttings will be moved through a shaker system on the drill rig that separates drilling fluids from the cuttings. Cuttings will be stored onsite in above-ground storage tanks. Cuttings will be pulled from the storage tanks, mixed with saw dust or similar absorbent material, and disposed of at the Envirotech, Inc. and/or Industrial Ecosystem, Inc. waste disposal facilities.
2. The closed-loop system storage tanks will be adequately sized to ensure confinement of all fluids and will provide sufficient freeboard to prevent uncontrolled releases.
3. A 20-mil liner will be installed under tanks, pumps, ancillary facilities, and truck loading/unloading areas associated with the closed-loop system.

B. Drilling Fluids

ENCANA OIL & GAS (USA) INC.

LYBROOK E13-2306 #02H

1445' FNL & 424' FWL

LOCATED IN THE SW/4 NW/4 OF SECTION 13, T23N, R6W, N.M.P.M.,
RIO ARriba COUNTY, NEW MEXICO

DIRECTIONS

- 1) FROM THE INTERSECTION OF HWY 64 & HWY 550 IN BLOOMFIELD, GO SOUTH ON HWY 550, 53.6 MILES TO CR 379. (M.P. 197.7).
- 2) TURN LEFT AND GO 0.9 MILES.
- 3) TURN RIGHT AND GO 1.5 MILES TO INTERSECTION.
- 4) TURN RIGHT AND GO 1.0 MILE TO WHERE ACCESS IS STAKED ON LEFT SIDE OF ROAD.

WELL FLAG LOCATED AT LAT. 36.228548° N, LONG. 107.427787° W (NAD 83).



WELLHEAD BLOWOUT CONTROL SYSTEM

encana

Well Name and Number:
Lybrook E13-2306 02H

