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: 2-5-15
Well information;
Operator Encana, Well Name and Number Lybrook D22 2306 #1H

API# 30-043-21252, Section 22, Township 23 N/S, Range 6 E/W

Conditions of Approval:
(See the below checked and handwritten conditions)

- X Notify Aztec OCD 24hrs prior to casing & cement.
- X Hold C-104 for directional survey & "As Drilled" Plat
- X Hold C-104 for NSL, NSP, DHC
- o Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- o 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
- o 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.

*APD Held for name change rec'd on 11-19-15

[signature] 11-20-2015
NMOCD Approved by Signature Date

1220 South St. Francis Drive • Santa Fe, New Mexico 87505
Phone (505) 476-3460 • Fax (505) 476-3462 • www.emnrd.state.nm.us/ocd

OIL CONS. DIV DIST. 3

JUN 15 2015

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FEB 06 2015

Farmington Field Office
Bureau of Land Management

Form 3160-3
(March 2012)

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☑ DRILL ☐ REENTER		5. Lease Serial No. NMNM112953, Fee Mineral Tract
		6. If Indian, Allotee or Tribe Name N/A
		7. If Unit or CA Agreement, Name and No. N/A
1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☐ Single Zone ☐ Multiple Zone		8. Lease Name and Well No. Lybrook D22-2306 01H
2. Name of Operator Encana Oil & Gas (USA) Inc.		9. API Well No. 30-043-21252
3a. Address 370 17th Street, Suite 1700 Denver, CO 80202	3b. Phone No. *(include area code)* 720-876-3740	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 D 985' FNL and 648' FWL Section 22, T23N, R6W NWNW; At proposed prod. zone D 700' FNL and 330' FWL Section 21, T23N, R6W NWNW		11. Sec., T. R. M. or Blk. and Survey or Area BHL Section 21, T23N, R6W NMPM; SHL Sec. 22, T23N, R6W
14. Distance in miles and direction from nearest town or post office* +/- 55 miles South from the intersection of Hwy 64 & US HWY 550 in Bloomfield, NM		12. County or Parish Sandoval / 13. State NM
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) BHL is 330' FWL Section 21, T23N, R6W	16. No. of acres in lease NMNM112953 - 1760 acres Fee Mineral - 80 acres	17. Spacing Unit dedicated to this well 320.0 acres - N/2 Section 21, T23N, R6W
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL is +/- 30' S of Lybrook D22-2306 02H	19. Proposed Depth 5,572' TVD/ 10,725' MD	20. BLM/BIA Bond No. on file COB-000235
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6,986' GL; 7,002' KB	22. Approximate date work will start* 07/01/2015	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.
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 *Rosalie Thim*	Name *(Printed/Typed)* Rosalie Thim	Date 02/05/2015
Title Regulatory Analyst		
Approved by *(Signature)* *[signature]*	Name *(Printed/Typed)*	Date 6/11/15
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.

(Continued on page 2)

*(Instructions 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

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

NMOCD AV

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

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
DISTRICT IV
1220 S. St. Francis Dr., 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

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FEB 06 2015
Farmington Field Office
Bureau of Land Management

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
30-043-21252	13379	COUNSELORS GALLUP-DAKOTA

4 Property Code	5 Property Name	6 Well Number
314990	LYBROOK D22-2306	01H

7 OGRID No.	8 Operator Name	9 Elevation
282327	ENCANA OIL & GAS (USA) INC.	6985.9

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
D	22	23N	6W		985'	NORTH	648'	WEST	SANDOVAL

11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	21	23N	6W		700'	NORTH	330'	WEST	SANDOVAL

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.
PROJECT AREA 320.00 ACRES N/2 SEC. 21			

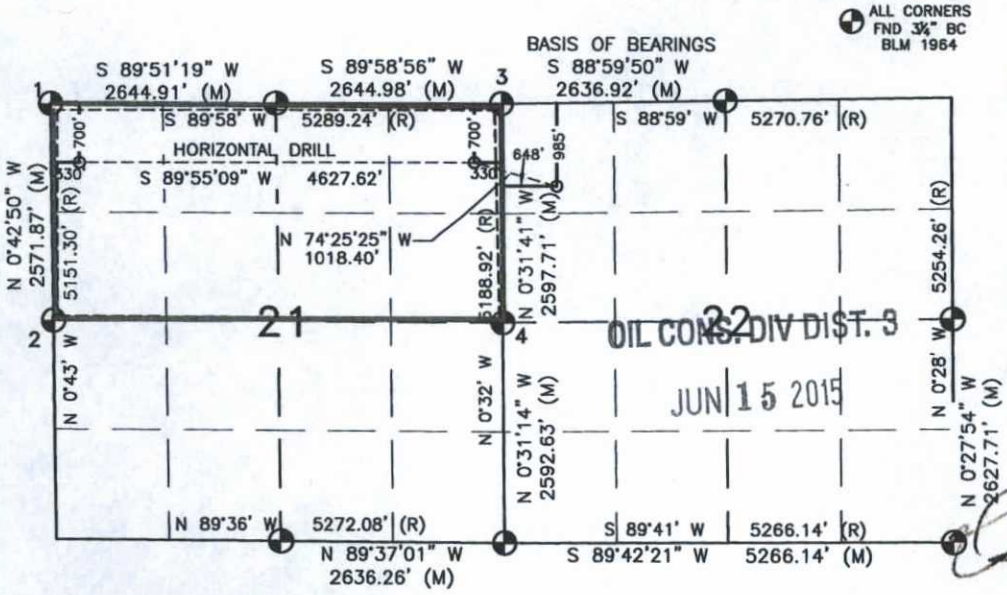
NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

16

BOTTOM HOLE
LAT. 36.215679° N (NAD83)
LONG. 107.481468° W (NAD83)
LAT. 36.215665° N (NAD27)
LONG. 107.480863° W (NAD27)

ENTRY POINT
LAT. 36.215698° N (NAD83)
LONG. 107.465787° W (NAD83)
LAT. 36.215684° N (NAD27)
LONG. 107.465183° W (NAD27)

WELL FLAG
LAT. 36.214948° N (NAD83)
LONG. 107.462462° W (NAD83)
LAT. 36.214934° N (NAD27)
LONG. 107.461858° W (NAD27)



1. LAT. 36.217598° N (NAD83)
LONG. 107.482616° W (NAD83)
LAT. 36.217584° N (NAD27)
LONG. 107.482011° W (NAD27)

2. LAT. 36.210537° N (NAD83)
LONG. 107.482506° W (NAD83)
LAT. 36.210523° N (NAD27)
LONG. 107.481901° W (NAD27)

3. LAT. 36.217621° N (NAD83)
LONG. 107.464690° W (NAD83)
LAT. 36.217607° N (NAD27)
LONG. 107.464086° W (NAD27)

4. LAT. 36.210488° N (NAD83)
LONG. 107.464609° W (NAD83)
LAT. 36.210474° N (NAD27)
LONG. 107.464005° W (NAD27)

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.

Rosalie Thim 02/05/15
Signature Date

Rosalie Thim
Printed Name

rosalie.thim@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.

MARCH 24, 2014
Date of Survey

Signature and Seal of Professional Surveyor:

DAVID RUSSELL NEW MEXICO 10201 REGISTERED PROFESSIONAL LAND SURVEYOR

DAVID RUSSELL
Certificate Number 10201

OIL CONS. DIV DIST. 3
JUN 15 2015

SHEET A

Lybrook D22-2306 01H
SHL: 985' FNL, 648' FWL Sec 22 T23N R06W
BHL: 700' FNL, 330' FWL Sec 21 T23N R06W
Sandoval, 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
San Jose Fn.	n/a
Nacimiento Fn.	surface
Ojo Alamo Ss.	1,487
Kirtland Shale	1,668
Fruitland Coal	1,831
Pictured Cliffs Ss.	2,054
Lewis Shale	2,183
Cliffhouse Ss.	2,875
Menefee Fn.	3,596
Point Lookout Ss.	4,311
Mancos Shale	4,520
Mancos Silt	5,131
Gallup Fn.	5,363
Base Gallup	5,685

The referenced surface elevation is 6986', KB 7002'

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

Substance	Formation	Depth (TVD) units = feet
Water/Gas	Fruitland Coal	1,831
Oil/Gas	Pictured Cliffs Ss.	2,054
Oil/Gas	Cliffhouse Ss.	2,875
Gas	Menefee Fn.	3,596
Oil/Gas	Point Lookout Ss.	4,311
Oil/Gas	Mancos Shale	4,520
Oil/Gas	Mancos Silt	5,131
Oil/Gas	Gallup Fn.	5,363

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

Lybrook D22-2306 01H
SHL: 985' FNL, 648' FWL Sec 22 T23N R06W
BHL: 700' FNL, 330' FWL Sec 21 T23N R06W
Sandoval, New Mexico

3. PRESSURE CONTROL

a) Pressure contol 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.
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 (MD)	Hole Size	Csg Size	Weight	Grade
Conductor	0'-60'	26"	16"	42.09#	
Surface	0'-500'	12 1/4"	9 5/8"	36#	J55, STC New
Intermediate	0'-5637'	8 3/4"	7"	26#	J55, LTC New
Production Liner	5537'-10725'	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

Lybrook D22-2306 01H
SHL: 985' FNL, 648' FWL Sec 22 T23N R06W
BHL: 700' FNL, 330' FWL Sec 21 T23N R06W
Sandoval, New Mexico

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

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'	276 sks	Type III Cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water	Surface	1 per joint on bottom 3 joints
Intermediate	0'-5637'	100% open hole excess Stage 1 Lead: 750 sks Stage 1 Tail: 566 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	5537'-10725'	50% OH excess Stage 1 Blend Total: 294sks	Blend: Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwow Potassium Chloride + 0.25lbs/sack Cello Flake + 0.5% bwoc CD-32 + 1.15% bwoc FL-52A + 60 lbs/sack Calcium Carbonate + 124.4% Fresh Water. Yield 2.63 cuft/sk	Liner Hanger	N/A

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 3700'. Directional plans are attached.

Description	Proposed Depth (TVD/MD)	Formation
Horizontal Lateral TD	5572'/10725'	Gallup

Lybrook D22-2306 01H
SHL: 985' FNL, 648' FWL Sec 22 T23N R06W
BHL: 700' FNL, 330' FWL Sec 21 T23N R06W
Sandoval, New Mexico

6. DRILLING FLUIDS PROGRAM

a) Surface through Intermediate Casing Point:

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'-5499'/5637	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"	5499'/5637'-5572'/10725'	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 +/- 2626 psi based on a 9.0 ppg at 5611' TVD of the horizontal lateral target. No abnormal pressure or temperatures are anticipated.

No hydrogen sulfide gas is anticipated, however, if H_2S 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 1, 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: 985' FNL, 648' FWL Sec 22 T23N R06W County: Sandoval WELL: Lybrook D22-2306 01H	Encana Natural Gas WELL SUMMARY			ENG: Michael Sanch 2-3-15 RIG: Unassigned GLE: 6986 RKBE: 7002

MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH TVD	DEPTH MD	HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			60	60'	26	16" 42.09# 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	San Jose Fn.	0		12 1/4	9 5/8" 36ppf J55 STC TOC Surface with 100% OH Excess: 276 sks Type III Cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52A + 58.9% Fresh Water.	Fresh wtr 8.3-10	Vertical <1°
		Nacimiento Fn.	surface					
		9 5/8" Csg	500	500.00				
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 Ss.	1,487		8 3/4	7" 26ppf J55 LTC TOC @ surface (100% OH excess - 70% Lead 30% Tail) Stage 1 Total: 1316sks Stage 1 Lead: 750 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: 566 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°
		Kirtland Shale	1,668					
		Fruitland Coal	1,831					
		Pictured Cliffs Ss.	2,054					
		Lewis Shale	2,183					
		Cliffhouse Ss.	2,875					
		Menefee Fn.	3,596					
		Point Lookout Ss.	4,311					
		Mancos Shale	4,520					
	Mud logger onsite	KOP	3,700	3,700				
Surveys every 30' through the curve		Mancos Silt	5,131					
		Gallup Fn.	5,363					
		7" Csg	5,499	5,637'				
Surveys every stand to TD unless directed otherwise by Geologist MWD Gamma Directional	No OH Logs	Horizontal Target	5,611		6 1/8	100' overlap at liner top		Horz Inc/TVD 90.4deg/5611ft
		TD	5,572	10,725		5087' Drilled Lateral		TD = 10724.5 MD
		Base Gallup	5,685			4 1/2" 11.6ppf SB80 LTC TOC @ hanger (50% OH excess) Stage 1 Total: 294sks Stage 1 Blend: 294 sks Premium Lite High Strength FM + 0.7% bwoc R-3 + 3% bwow Potassium Chloride + 0.25lbs/sack Cello Flake + 0.5% bwoc CD-32 + 1.15% bwoc FL-52A + 60 lbs/sack Calcium Carbonate + 124.4% Fresh Water. Yield 2.63 cuft/sk.	WBM 8.3-10	

NOTES:

1) Drill with 26" bit to 60', set 16" 42.09ppf conductor pipe
2) Drill surface to 500', R&C 9 5/8" casing
3) N/U BOP and surface equipment
4) Drill to KOP of 3700', 8 3/4 inch holesize
5) Start curve at 10deg/100' build rate
6) Drill to csg point of 5637' MD
7) R&C 7" csg, circ cmt to surface
8) Land at ~90 deg, drill lateral to 10725' run 4 1/2 inch cemented liner

encana

Project: Sandoval County, NM
Site: S22-T23N-R6W
Well: Lybrook D22-2306 01H
Wellbore: HZ
Design: Plan #1

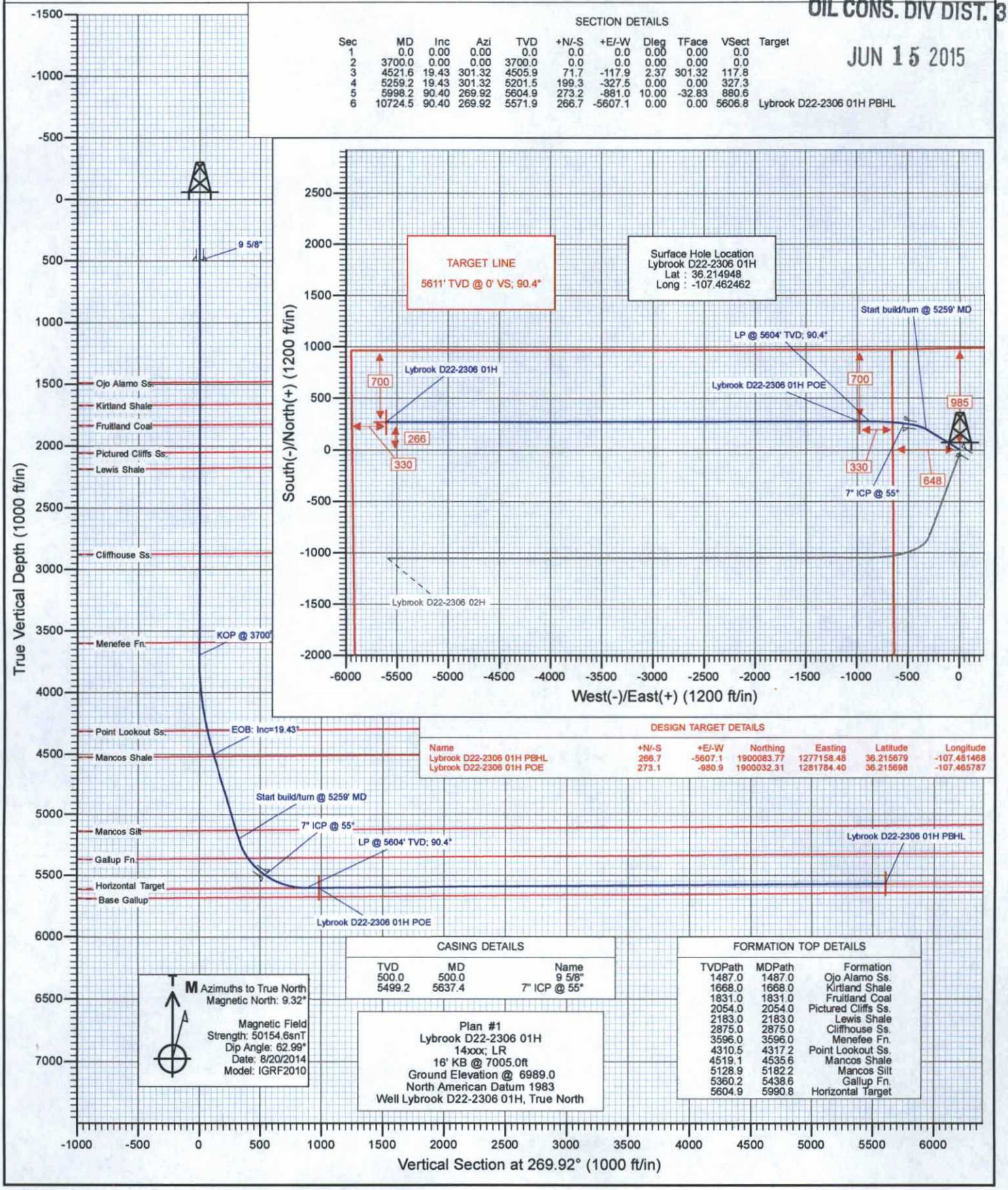
CATHEDRAL

OIL CONS. DIV DIST. 3

JUN 15 2015

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	3700.0	0.00	0.00	3700.0	0.0	0.0	0.00	0.00	0.0	
3	4521.6	19.43	301.32	4505.9	71.7	-117.9	2.37	301.32	117.8	
4	5259.2	19.43	301.32	5201.5	199.3	-327.5	0.00	0.00	327.3	
5	5998.2	90.40	269.92	5604.9	273.2	-881.0	10.00	-32.83	880.6	
6	10724.5	90.40	269.92	5571.9	266.7	-5607.1	0.00	0.00	5606.8	Lybrook D22-2306 01H PBHL



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Lybrook D22-2306 01H PBHL	266.7	-5607.1	1900083.77	1277158.48	36.215679	-107.481468
Lybrook D22-2306 01H POE	273.1	-980.9	1900032.31	1281784.40	36.215698	-107.465787

CASING DETAILS

TVD	MD	Name
500.0	500.0	9 5/8"
5499.2	5637.4	7" ICP @ 55°

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1487.0	1487.0	Ojo Alamo Ss.
1668.0	1668.0	Kirtland Shale
1831.0	1831.0	Fruitland Coal
2054.0	2054.0	Pictured Cliffs Ss.
2183.0	2183.0	Lewis Shale
2875.0	2875.0	Cliffhouse Ss.
3596.0	3596.0	Menefee Fn.
4310.5	4317.2	Point Lookout Ss.
4519.1	4535.6	Mancos Shale
5128.9	5182.2	Mancos Silt
5360.2	5438.6	Gallup Fn.
5604.9	5990.8	Horizontal Target

Azimuths to True North
Magnetic North: 9.32°

Magnetic Field
Strength: 50154.6snT
Dip Angle: 62.99°
Date: 8/20/2014
Model: IGRF2010

Plan #1
Lybrook D22-2306 01H
14xxx; LR
16' KB @ 7005.0ft
Ground Elevation @ 6989.0
North American Datum 1983
Well Lybrook D22-2306 01H, True North

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook D22-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7005.0ft
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7005.0ft
Site:	S22-T23N-R6W	**North Reference:**	True
Well:	Lybrook D22-2306 01H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Project	Sandoval County, NM		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site	S22-T23N-R6W				
Site Position:		**Northing:**	1,899,747.00 ft	**Latitude:**	36.214948
From:	Lat/Long	**Easting:**	1,282,761.84 ft	**Longitude:**	-107.462462
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-0.72 °

Well	Lybrook D22-2306 01H					
Well Position	**+N/-S**	0.0 ft	**Northing:**	1,899,747.00 ft	**Latitude:**	36.214948
	+E/-W	0.0 ft	**Easting:**	1,282,761.84 ft	**Longitude:**	-107.462462
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	0.0 ft	**Ground Level:**	6,989.0 ft

Wellbore	HZ			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	8/20/2014	9.32	62.99	50,155

Design	Plan #1				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**	
	0.0	0.0	0.0	269.92	

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	
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,521.6	19.43	301.32	4,505.9	71.7	-117.9	2.37	2.37	0.00	301.32	
5,259.2	19.43	301.32	5,201.5	199.3	-327.5	0.00	0.00	0.00	0.00	
5,998.2	90.40	269.92	5,604.9	273.2	-881.0	10.00	9.60	-4.25	-32.83	
10,724.5	90.40	269.92	5,571.9	266.7	-5,607.1	0.00	0.00	0.00	0.00	Lybrook D22-2306 01

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook D22-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7005.0ft
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7005.0ft
Site:	S22-T23N-R6W	**North Reference:**	True
Well:	Lybrook D22-2306 01H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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	
1,487.0	0.00	0.00	1,487.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo Ss.
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,668.0	0.00	0.00	1,668.0	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	
1,831.0	0.00	0.00	1,831.0	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	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,054.0	0.00	0.00	2,054.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,183.0	0.00	0.00	2,183.0	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	
2,875.0	0.00	0.00	2,875.0	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	
3,596.0	0.00	0.00	3,596.0	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	KOP @ 3700'
3,800.0	2.37	301.32	3,800.0	1.1	-1.8	1.8	2.37	2.37	
3,900.0	4.73	301.32	3,899.8	4.3	-7.0	7.0	2.37	2.37	
4,000.0	7.10	301.32	3,999.2	9.6	-15.9	15.8	2.37	2.37	
4,100.0	9.46	301.32	4,098.2	17.1	-28.2	28.1	2.37	2.37	
4,200.0	11.83	301.32	4,196.5	26.7	-43.9	43.9	2.37	2.37	
4,300.0	14.19	301.32	4,293.9	38.4	-63.2	63.1	2.37	2.37	
4,317.2	14.60	301.32	4,310.5	40.6	-66.8	66.8	2.37	2.37	Point Lookout Ss.

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook D22-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7005.0ft
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7005.0ft
Site:	S22-T23N-R6W	**North Reference:**	True
Well:	Lybrook D22-2306 01H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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
4,400.0	16.56	301.32	4,390.3	52.2	-85.8	85.7	2.37	2.37	
4,500.0	18.92	301.32	4,485.5	68.0	-111.8	111.7	2.37	2.37	
4,521.6	19.43	301.32	4,505.9	71.7	-117.9	117.8	2.37	2.37	EOB: Inc=19.43°
4,535.6	19.43	301.32	4,519.1	74.2	-121.9	121.8	0.00	0.00	Mancos Shale
4,600.0	19.43	301.32	4,579.9	85.3	-140.2	140.1	0.00	0.00	
4,700.0	19.43	301.32	4,674.2	102.6	-168.6	168.5	0.00	0.00	
4,800.0	19.43	301.32	4,768.5	119.9	-197.0	196.9	0.00	0.00	
4,900.0	19.43	301.32	4,862.8	137.2	-225.5	225.3	0.00	0.00	
5,000.0	19.43	301.32	4,957.1	154.5	-253.9	253.7	0.00	0.00	
5,100.0	19.43	301.32	5,051.4	171.7	-282.3	282.1	0.00	0.00	
5,182.2	19.43	301.32	5,128.9	186.0	-305.6	305.4	0.00	0.00	Mancos Silt
5,200.0	19.43	301.32	5,145.7	189.0	-310.7	310.5	0.00	0.00	
5,259.2	19.43	301.32	5,201.5	199.3	-327.5	327.3	0.00	0.00	Start build/turn @ 5259' MD
5,300.0	22.96	295.64	5,239.6	206.3	-340.5	340.2	10.00	8.65	
5,400.0	32.15	286.96	5,328.2	222.5	-383.7	383.4	10.00	9.18	
5,438.6	35.80	284.73	5,360.2	228.4	-404.4	404.1	10.00	9.46	Gallup Fn.
5,500.0	41.68	281.88	5,408.0	237.1	-441.8	441.5	10.00	9.57	
5,600.0	51.36	278.43	5,476.8	249.7	-513.1	512.8	10.00	9.68	
5,637.4	55.00	277.37	5,499.2	253.9	-542.8	542.4	10.00	9.74	7" ICP @ 55°
5,700.0	61.12	275.80	5,532.3	259.9	-595.5	595.2	10.00	9.77	
5,800.0	70.92	273.63	5,572.9	267.4	-686.5	686.1	10.00	9.80	
5,900.0	80.75	271.71	5,597.3	271.8	-783.2	782.8	10.00	9.82	
5,990.8	89.67	270.05	5,604.9	273.2	-873.6	873.2	10.00	9.83	Horizontal Target
5,998.2	90.40	269.92	5,604.9	273.2	-881.0	880.6	10.00	9.84	LP @ 5604' TVD; 90.4°
6,000.0	90.40	269.92	5,604.9	273.2	-882.8	882.4	0.00	0.00	
6,098.1	90.40	269.92	5,604.2	273.1	-980.9	980.6	0.00	0.00	Lybrook D22-2306 01H POE
6,100.0	90.40	269.92	5,604.2	273.1	-982.8	982.4	0.00	0.00	
6,200.0	90.40	269.92	5,603.5	272.9	-1,082.8	1,082.4	0.00	0.00	
6,300.0	90.40	269.92	5,602.8	272.8	-1,182.8	1,182.4	0.00	0.00	
6,400.0	90.40	269.92	5,602.1	272.7	-1,282.8	1,282.4	0.00	0.00	
6,500.0	90.40	269.92	5,601.4	272.5	-1,382.8	1,382.4	0.00	0.00	
6,600.0	90.40	269.92	5,600.7	272.4	-1,482.8	1,482.4	0.00	0.00	
6,700.0	90.40	269.92	5,600.0	272.2	-1,582.8	1,582.4	0.00	0.00	
6,800.0	90.40	269.92	5,599.3	272.1	-1,682.8	1,682.4	0.00	0.00	
6,900.0	90.40	269.92	5,598.6	272.0	-1,782.8	1,782.4	0.00	0.00	
7,000.0	90.40	269.92	5,597.9	271.8	-1,882.8	1,882.4	0.00	0.00	
7,100.0	90.40	269.92	5,597.2	271.7	-1,982.8	1,982.4	0.00	0.00	
7,200.0	90.40	269.92	5,596.5	271.5	-2,082.8	2,082.4	0.00	0.00	
7,300.0	90.40	269.92	5,595.8	271.4	-2,182.8	2,182.4	0.00	0.00	
7,400.0	90.40	269.92	5,595.1	271.3	-2,282.8	2,282.4	0.00	0.00	
7,500.0	90.40	269.92	5,594.4	271.1	-2,382.8	2,382.4	0.00	0.00	
7,600.0	90.40	269.92	5,593.7	271.0	-2,482.8	2,482.4	0.00	0.00	
7,700.0	90.40	269.92	5,593.0	270.9	-2,582.8	2,582.4	0.00	0.00	
7,800.0	90.40	269.92	5,592.3	270.7	-2,682.7	2,682.4	0.00	0.00	
7,900.0	90.40	269.92	5,591.6	270.6	-2,782.7	2,782.4	0.00	0.00	
8,000.0	90.40	269.92	5,590.9	270.4	-2,882.7	2,882.4	0.00	0.00	
8,100.0	90.40	269.92	5,590.2	270.3	-2,982.7	2,982.4	0.00	0.00	
8,200.0	90.40	269.92	5,589.5	270.2	-3,082.7	3,082.4	0.00	0.00	
8,300.0	90.40	269.92	5,588.8	270.0	-3,182.7	3,182.4	0.00	0.00	
8,400.0	90.40	269.92	5,588.1	269.9	-3,282.7	3,282.4	0.00	0.00	
8,500.0	90.40	269.92	5,587.4	269.8	-3,382.7	3,382.4	0.00	0.00	
8,600.0	90.40	269.92	5,586.7	269.6	-3,482.7	3,482.3	0.00	0.00	

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook D22-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7005.0ft
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7005.0ft
Site:	S22-T23N-R6W	**North Reference:**	True
Well:	Lybrook D22-2306 01H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

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
8,700.0	90.40	269.92	5,586.0	269.5	-3,582.7	3,582.3	0.00	0.00	
8,800.0	90.40	269.92	5,585.3	269.3	-3,682.7	3,682.3	0.00	0.00	
8,900.0	90.40	269.92	5,584.6	269.2	-3,782.7	3,782.3	0.00	0.00	
9,000.0	90.40	269.92	5,583.9	269.1	-3,882.7	3,882.3	0.00	0.00	
9,100.0	90.40	269.92	5,583.2	268.9	-3,982.7	3,982.3	0.00	0.00	
9,200.0	90.40	269.92	5,582.5	268.8	-4,082.7	4,082.3	0.00	0.00	
9,300.0	90.40	269.92	5,581.8	268.6	-4,182.7	4,182.3	0.00	0.00	
9,400.0	90.40	269.92	5,581.1	268.5	-4,282.7	4,282.3	0.00	0.00	
9,500.0	90.40	269.92	5,580.4	268.4	-4,382.7	4,382.3	0.00	0.00	
9,600.0	90.40	269.92	5,579.7	268.2	-4,482.7	4,482.3	0.00	0.00	
9,700.0	90.40	269.92	5,579.0	268.1	-4,582.7	4,582.3	0.00	0.00	
9,800.0	90.40	269.92	5,578.3	268.0	-4,682.7	4,682.3	0.00	0.00	
9,900.0	90.40	269.92	5,577.6	267.8	-4,782.7	4,782.3	0.00	0.00	
10,000.0	90.40	269.92	5,576.9	267.7	-4,882.7	4,882.3	0.00	0.00	
10,100.0	90.40	269.92	5,576.2	267.5	-4,982.7	4,982.3	0.00	0.00	
10,200.0	90.40	269.92	5,575.5	267.4	-5,082.7	5,082.3	0.00	0.00	
10,300.0	90.40	269.92	5,574.8	267.3	-5,182.7	5,182.3	0.00	0.00	
10,400.0	90.40	269.92	5,574.1	267.1	-5,282.7	5,282.3	0.00	0.00	
10,500.0	90.40	269.92	5,573.4	267.0	-5,382.7	5,382.3	0.00	0.00	
10,600.0	90.40	269.92	5,572.7	266.9	-5,482.7	5,482.3	0.00	0.00	
10,700.0	90.40	269.92	5,572.0	266.7	-5,582.7	5,582.3	0.00	0.00	
10,724.5	90.40	269.92	5,571.9	266.7	-5,607.1	5,606.8	0.00	0.00	TD at 10724.5 - Lybrook D22-2306 01H PBHL

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Lybrook D22-2306 01H I - plan hits target center - Point	0.00	0.00	5,571.9	266.7	-5,607.1	1,900,083.77	1,277,158.48	36.215679	-107.481468
Lybrook D22-2306 01H I - plan hits target center - Point	0.00	0.00	5,604.2	273.1	-980.9	1,900,032.31	1,281,784.40	36.215698	-107.465787

500.0	500.0	9 5/8"		0.000	0.000
5,637.4	5,499.2	7" ICP @ 55°		0.000	0.000

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Lybrook D22-2306 01H
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	16' KB @ 7005.0ft
Project:	Sandoval County, NM	**MD Reference:**	16' KB @ 7005.0ft
Site:	S22-T23N-R6W	**North Reference:**	True
Well:	Lybrook D22-2306 01H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,487.0	1,487.0	Ojo Alamo Ss.		-0.40	269.92
1,668.0	1,668.0	Kirtland Shale		-0.40	269.92
1,831.0	1,831.0	Fruitland Coal		-0.40	269.92
2,054.0	2,054.0	Pictured Cliffs Ss.		-0.40	269.92
2,183.0	2,183.0	Lewis Shale		-0.40	269.92
2,875.0	2,875.0	Cliffhouse Ss.		-0.40	269.92
3,596.0	3,596.0	Menefee Fn.		-0.40	269.92
4,317.2	4,311.0	Point Lookout Ss.		-0.40	269.92
4,535.6	4,520.0	Mancos Shale		-0.40	269.92
5,182.2	5,131.0	Mancos Silt		-0.40	269.92
5,438.6	5,363.0	Gallup Fn.		-0.40	269.92
5,990.8	5,611.0	Horizontal Target		-0.40	269.92

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
3,700.0	3,700.0	0.0	0.0	KOP @ 3700'
4,521.6	4,505.9	71.7	-117.9	EOB: Inc=19.43°
5,259.2	5,201.5	199.3	-327.5	Start build/turn @ 5259' MD
5,998.2	5,604.9	273.2	-881.0	LP @ 5604' TVD; 90.4°
10,724.5	5,571.9	266.7	-5,607.1	TD at 10724.5

EnCana Oil & Gas (USA) Inc

Sandoval County, NM
S22-T23N-R6W
Lybrook D22-2306 01H
HZ
Plan #1

Anticollision Report

20 August, 2014

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lybrook D22-2306 01H
Project:	Sandoval County, NM	**TVD Reference:**	16' KB @ 7005.0ft
Reference Site:	S22-T23N-R6W	**MD Reference:**	16' KB @ 7005.0ft
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lybrook D22-2306 01H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**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	**Error Model:**	Systematic Ellipse
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,236.6ft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**		

Survey Tool Program **Date** 8/20/2014

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	10,723.6	Plan #1 (HZ)	Geolink MWD	Geolink MWD

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
S22-T23N-R6W						
Lybrook D22-2306 02H - HZ - Plan #1	2,700.0	2,700.0	29.9	20.5	3.187	CC, ES, SF

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

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lybrook D22-2306 01H
Project:	Sandoval County, NM	**TVD Reference:**	16' KB @ 7005.0ft
Reference Site:	S22-T23N-R6W	**MD Reference:**	16' KB @ 7005.0ft
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lybrook D22-2306 01H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S22-T23N-R6W - Lybrook D22-2306 02H - HZ - Plan #1 — Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD — Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	178.87	-29.9	0.6	29.9				
100.0	100.0	100.0	100.0	0.1	0.1	178.87	-29.9	0.6	29.9	29.6	0.29	101.834	
200.0	200.0	200.0	200.0	0.3	0.3	178.87	-29.9	0.6	29.9	29.2	0.64	46.490	
300.0	300.0	300.0	300.0	0.5	0.5	178.87	-29.9	0.6	29.9	28.9	0.99	30.120	
400.0	400.0	400.0	400.0	0.7	0.7	178.87	-29.9	0.6	29.9	28.5	1.34	22.276	
500.0	500.0	500.0	500.0	0.8	0.8	178.87	-29.9	0.6	29.9	28.2	1.69	17.674	
600.0	600.0	600.0	600.0	1.0	1.0	178.87	-29.9	0.6	29.9	27.8	2.04	14.647	
700.0	700.0	700.0	700.0	1.2	1.2	178.87	-29.9	0.6	29.9	27.5	2.39	12.506	
800.0	800.0	800.0	800.0	1.4	1.4	178.87	-29.9	0.6	29.9	27.1	2.74	10.911	
900.0	900.0	900.0	900.0	1.5	1.5	178.87	-29.9	0.6	29.9	26.8	3.09	9.677	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	178.87	-29.9	0.6	29.9	26.4	3.43	8.693	
1,100.0	1,100.0	1,100.0	1,100.0	1.9	1.9	178.87	-29.9	0.6	29.9	26.1	3.78	7.891	
1,200.0	1,200.0	1,200.0	1,200.0	2.1	2.1	178.87	-29.9	0.6	29.9	25.7	4.13	7.225	
1,300.0	1,300.0	1,300.0	1,300.0	2.2	2.2	178.87	-29.9	0.6	29.9	25.4	4.48	6.662	
1,400.0	1,400.0	1,400.0	1,400.0	2.4	2.4	178.87	-29.9	0.6	29.9	25.0	4.83	6.181	
1,500.0	1,500.0	1,500.0	1,500.0	2.6	2.6	178.87	-29.9	0.6	29.9	24.7	5.18	5.764	
1,600.0	1,600.0	1,600.0	1,600.0	2.8	2.8	178.87	-29.9	0.6	29.9	24.3	5.53	5.400	
1,700.0	1,700.0	1,700.0	1,700.0	2.9	2.9	178.87	-29.9	0.6	29.9	24.0	5.88	5.080	
1,800.0	1,800.0	1,800.0	1,800.0	3.1	3.1	178.87	-29.9	0.6	29.9	23.6	6.23	4.795	
1,900.0	1,900.0	1,900.0	1,900.0	3.3	3.3	178.87	-29.9	0.6	29.9	23.3	6.58	4.540	
2,000.0	2,000.0	2,000.0	2,000.0	3.5	3.5	178.87	-29.9	0.6	29.9	22.9	6.93	4.312	
2,100.0	2,100.0	2,100.0	2,100.0	3.6	3.6	178.87	-29.9	0.6	29.9	22.6	7.27	4.105	
2,200.0	2,200.0	2,200.0	2,200.0	3.8	3.8	178.87	-29.9	0.6	29.9	22.2	7.62	3.917	
2,300.0	2,300.0	2,300.0	2,300.0	4.0	4.0	178.87	-29.9	0.6	29.9	21.9	7.97	3.745	
2,400.0	2,400.0	2,400.0	2,400.0	4.2	4.2	178.87	-29.9	0.6	29.9	21.5	8.32	3.588	
2,500.0	2,500.0	2,500.0	2,500.0	4.3	4.3	178.87	-29.9	0.6	29.9	21.2	8.67	3.444	
2,600.0	2,600.0	2,600.0	2,600.0	4.5	4.5	178.87	-29.9	0.6	29.9	20.8	9.02	3.310	
2,700.0	2,700.0	2,700.0	2,700.0	4.7	4.7	178.87	-29.9	0.6	29.9	20.5	9.37	3.187	CC, ES, SF
2,800.0	2,800.0	2,799.0	2,799.0	4.9	4.9	-180.00	-31.5	0.0	31.5	21.8	9.72	3.239	
2,900.0	2,900.0	2,897.8	2,897.6	5.0	5.0	-177.21	-36.3	-1.8	36.4	26.3	10.06	3.614	
3,000.0	3,000.0	2,996.1	2,995.5	5.2	5.2	-173.94	-44.2	-4.7	44.7	34.3	10.42	4.289	
3,100.0	3,100.0	3,093.7	3,092.4	5.4	5.4	-171.00	-55.2	-8.7	56.4	45.6	10.77	5.235	
3,200.0	3,200.0	3,190.3	3,188.0	5.6	5.6	-168.65	-69.1	-13.9	71.5	60.4	11.14	6.422	
3,300.0	3,300.0	3,285.9	3,281.8	5.7	5.8	-166.86	-85.9	-20.1	90.0	78.5	11.52	7.816	
3,400.0	3,400.0	3,380.2	3,373.8	5.9	6.1	-165.52	-105.3	-27.2	111.8	99.9	11.92	9.383	
3,500.0	3,500.0	3,473.0	3,463.6	6.1	6.4	-164.50	-127.1	-35.2	136.8	124.5	12.34	11.088	
3,600.0	3,600.0	3,564.1	3,551.1	6.3	6.7	-163.73	-151.2	-44.1	164.9	152.2	12.79	12.901	
3,700.0	3,700.0	3,653.5	3,636.0	6.4	7.0	-163.14	-177.4	-53.8	196.1	182.8	13.26	14.791	
3,800.0	3,800.0	3,740.9	3,718.1	6.6	7.4	-103.64	-205.3	-64.1	230.6	217.5	13.10	17.600	
3,900.0	3,899.8	3,825.8	3,797.1	6.8	7.9	-103.52	-234.8	-74.9	268.9	255.5	13.42	20.030	
4,000.0	3,999.2	3,908.1	3,872.6	7.0	8.3	-103.78	-265.3	-86.2	310.8	297.1	13.75	22.612	
4,100.0	4,098.2	3,987.4	3,944.5	7.2	8.8	-104.20	-296.8	-97.7	356.3	342.3	14.07	25.321	
4,200.0	4,196.5	4,073.6	4,022.1	7.4	9.3	-104.92	-332.0	-110.7	404.5	390.0	14.43	28.029	
4,300.0	4,293.9	4,159.4	4,099.3	7.6	9.9	-105.74	-367.1	-123.7	453.9	439.1	14.81	30.647	
4,400.0	4,390.3	4,243.9	4,175.3	7.9	10.4	-106.60	-401.7	-136.4	504.8	489.6	15.22	33.164	
4,500.0	4,485.5	4,327.0	4,250.1	8.3	11.0	-107.45	-435.8	-149.0	557.3	541.7	15.67	35.563	
4,600.0	4,579.9	4,409.1	4,324.0	8.6	11.5	-109.29	-469.4	-161.3	611.2	595.0	16.17	37.797	
4,700.0	4,674.2	4,491.2	4,397.9	9.0	12.1	-111.11	-503.0	-173.7	665.6	648.9	16.71	39.840	
4,800.0	4,768.5	4,573.3	4,471.7	9.4	12.7	-112.67	-536.6	-186.1	720.5	703.2	17.27	41.711	
4,900.0	4,862.8	4,655.3	4,545.5	9.9	13.3	-114.01	-570.2	-198.5	775.7	757.8	17.86	43.423	
5,000.0	4,957.1	4,737.4	4,619.4	10.4	13.9	-115.18	-603.8	-210.8	831.1	812.7	18.47	44.989	
5,100.0	5,051.4	4,819.5	4,693.2	10.8	14.5	-116.20	-637.3	-223.2	886.8	867.7	19.10	46.423	

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

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lybrook D22-2306 01H
Project:	Sandoval County, NM	**TVD Reference:**	16' KB @ 7005.0ft
Reference Site:	S22-T23N-R6W	**MD Reference:**	16' KB @ 7005.0ft
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Lybrook D22-2306 01H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design S22-T23N-R6W - Lybrook D22-2306 02H - HZ - Plan #1

Offset Site Error: 0.0 ft

Survey Program: 0-Geolink MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,145.7	4,901.5	4,767.1	11.3	15.1	-117.11	-670.9	-235.6	942.6	922.9	19.75	47.737	
5,300.0	5,239.6	4,983.4	4,840.8	11.9	15.7	-110.00	-704.5	-247.9	998.5	978.1	20.39	48.971	
5,400.0	5,328.2	5,063.0	4,912.4	12.6	16.2	-97.50	-737.0	-259.9	1,053.0	1,031.8	21.28	49.488	
5,500.0	5,408.0	5,137.7	4,979.6	13.6	16.8	-89.66	-767.6	-271.2	1,105.5	1,083.1	22.44	49.257	
5,600.0	5,476.8	5,205.1	5,040.3	14.8	17.3	-84.16	-795.2	-281.4	1,155.9	1,132.1	23.82	48.521	
5,700.0	5,532.3	5,263.3	5,092.7	16.3	17.7	-79.91	-819.0	-290.1	1,204.4	1,179.1	25.39	47.440	

Company:	EnCana Oil & Gas (USA) Inc	**Local Co-ordinate Reference:**	Well Lybrook D22-2306 01H
Project:	Sandoval County, NM	**TVD Reference:**	16' KB @ 7005.0ft
Reference Site:	S22-T23N-R6W	**MD Reference:**	16' KB @ 7005.0ft
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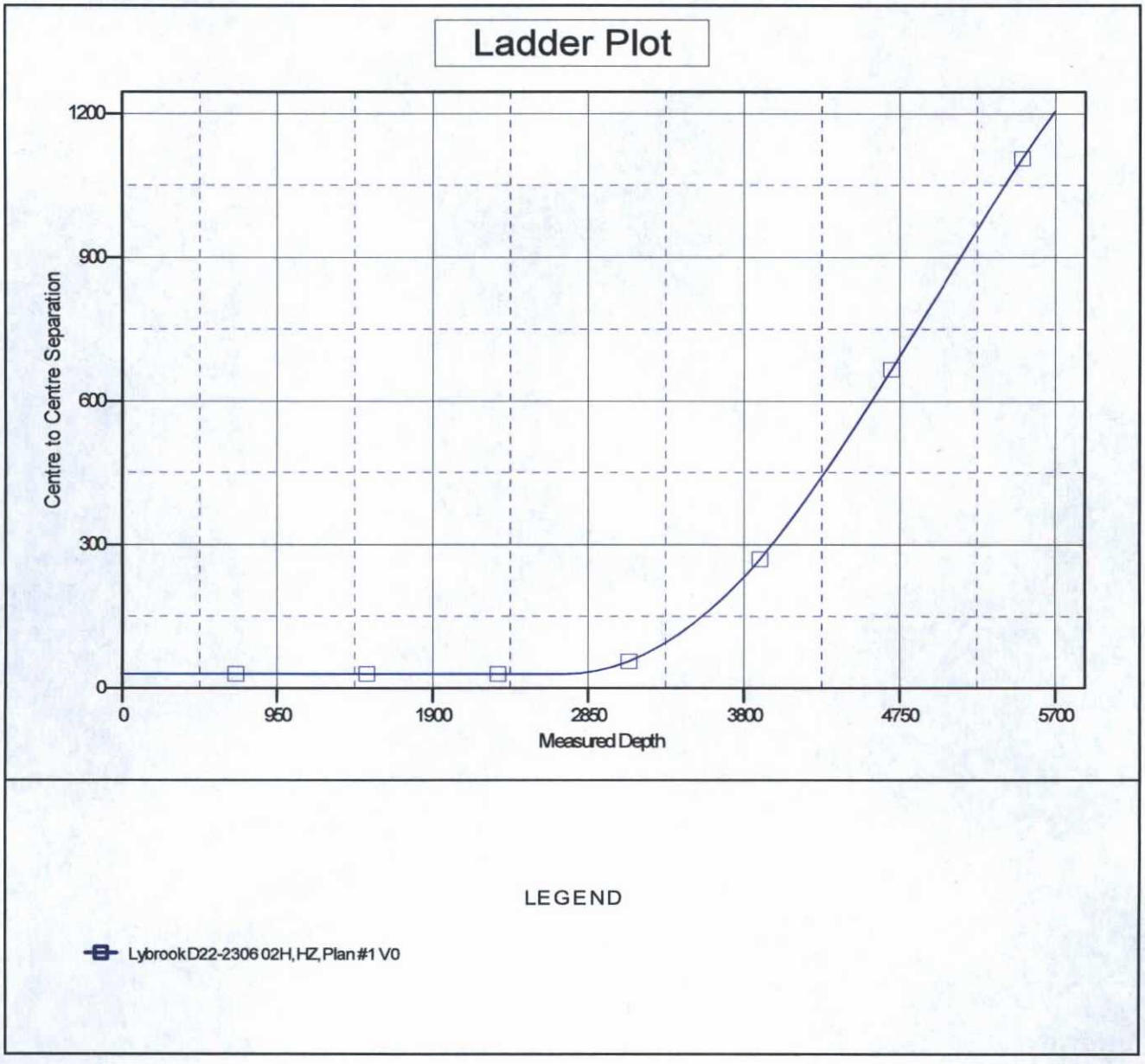
Reference Well:	Lybrook D22-2306 01H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	HZ	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to 16' KB @ 7005.0ft
Offset Depths are relative to Offset Datum
Central Meridian is -106.250000 °

Coordinates are relative to: Lybrook D22-2306 01H
Coordinate System is US State Plane 1983, New Mexico Central Zone
Grid Convergence at Surface is: -0.72°



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

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 4 to 5 weeks.

C. Pipeline
See Standard SF-299 Application for authorization to construct, operate, maintain and terminate a 489 foot, up to 6-inch outside diameter, buried steel well connect pipeline that was submitted to the Bureau of Land Management. Final modifications to the SF-299 will be submitted concurrently with the APD.

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

1. A closed-loop system will be used. Drilling fluids will be stored onsite in above-ground storage tanks. Upon termination of drilling operations, the drilling fluids will be recycled and transferred to other permitted closed-loop systems or returned to the vendor for reuse, as practical. Residual fluids will be vacuumed from the storage tanks and disposed of at Basin Disposal, 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. The closed-loop system storage tanks will be placed in bermed secondary containment sized to accommodate a minimum of 110 percent of the volume of the largest storage tank.

4. A 20-mil liner will be installed under tanks, pumps, ancillary facilities, and truck loading/unloading areas associated with the closed-loop system.

C. Flowback Water

1. The water-based solution that flows back to the surface during and after completion operations will be placed in storage tanks on the location.

2. Flowback water will be confined to a storage tank for a period not to exceed 90 days after initial production and will be disposed of at Basin Disposal, Inc. and/or Industrial Ecosystem, Inc. waste disposal facilities.

D. Spills – any spills of non-freshwater fluids will be immediately cleaned up and removed to an approved disposal site. Encana will also notify the BLM within 24 hours of any spill.

ENCANA OIL & GAS (USA) INC.

LYBROOK D22-2306 #01H
985' FNL & 648' FWL
LOCATED IN THE NW/4 NW/4 OF SECTION 22,
T23N, R6W, N.M.P.M.,
SANDOVAL COUNTY, NEW MEXICO

DIRECTIONS

1) FROM THE INTERSECTION OF HWY 64 & HWY 550 IN BLOOMFIELD, GO SOUTH ON HWY 550, 54.5 MILES TO STATE HWY 403 (M.P. 97.1).
2) TURN LEFT ONTO HWY 403 AND GO 0.5 MILES TO FACILITY PAD WHERE ACCESS IS STAKED ON WEST SIDE OF FACILITY PAD.

WELL FLAG LOCATED AT LAT. 36.214948° N, LONG.107.462462° W (NAD 83).

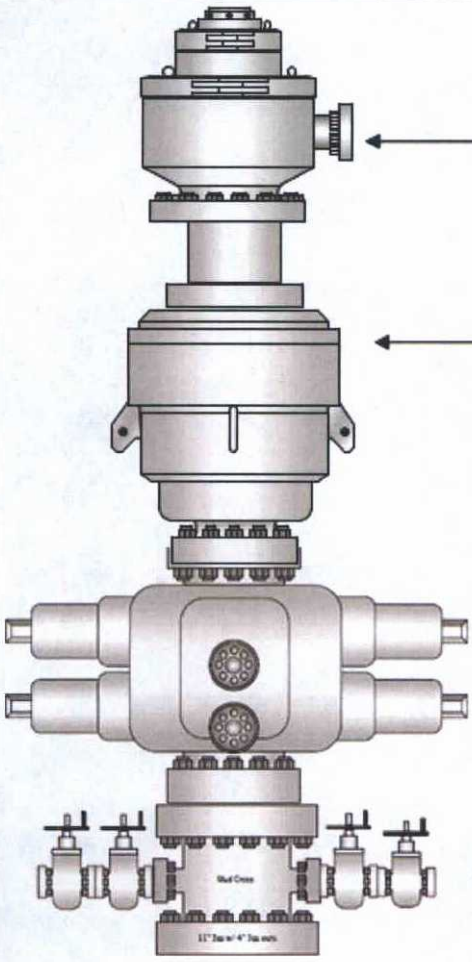
JOB No.: ENC158
DATE: 08/12/2014

Scorpion Survey & Consulting, L.L.C.
302 S. Ash
Aztec, New Mexico 87410
(505) 334-4007

WELLHEAD BLOWOUT CONTROL SYSTEM

encana

Well Name and Number:
Lybrook D22-2306 01H



11" 3K Rotating Head

11" 3K Annular

3K Double Ram
Top: Pipe Ram
Bottom: Blind Ram
3" Outlets Below Ram

3K Mud Cross 3" gate valves