

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
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District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico

Form C-101
Revised July 18, 2013

Energy Minerals and Natural Resources

Oil Conservation Division

1220 South St. Francis Dr.

Santa Fe, NM 87505

☒ AMENDED REPORT

RCVD FEB 19 '14
OIL CONS. DIV.

DIST. 3

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

¹ Operator Name and Address ENCANA OIL AND GAS (USA) INC. 370 17 TH STREET, SUITE 1700 DENVER, CO 80202		² OGRID Number 282327
		³ APJ Number 30-043-21196
⁴ Property Code 40405	⁵ Property Name Lybrook E33-2307	⁶ Well No. 02H

⁷ Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
SHL: E	33	23N	7W		1,770	NORTH	545	WEST	SANDOVAL

⁸ Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
BHL: E	32	23N	7W		1,720	NORTH	330	WEST	SANDOVAL

⁹ Pool Information

Pool Name ALAMITO-GALLUP	Pool Code 1039
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Additional Well Information

¹¹ Work Type N	¹² Well Type O	¹³ Cable/Rotary R	¹⁴ Lease Type S	¹⁵ Ground Level Elevation 6,853'
¹⁶ Multiple N/A	¹⁷ Proposed Depth 4,994' TVD/10,194' MD	¹⁸ Formation GALLUP	¹⁹ Contractor AZTEC	²⁰ Spud Date 11/13/14
Depth to Ground water UNKNOWN		Distance from nearest fresh water well GREATER THAN 5,280'		Distance to nearest surface water ~6,000'

☒ We will be using a closed-loop system in lieu of lined pits

²¹ Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
CONDUCTOR	30"	20"	94#	60'	100	SURFACE
SURFACE	12 1/4"	9 5/8"	36#	500'	178	SURFACE
INTERMEDIATE	8 3/4"	7"	26#	5,048' TVD/5,525' MD	566 (30% EXCESS)	SURFACE
PROD. LINER	6 1/8"	4 1/2"	11.6#	5,325' - 10,194' MD	N/A	N/A

Casing/Cement Program: Additional Comments

HORIZONTAL LATERAL IN THE GALLUP FORMATION. NO CEMENT IN THE PRODUCTION LINER. WILL RUN EXTERNAL SWELL CASING PACKER SYSTEM. WILL USE OIL-BASED MUD SYSTEM FROM INTERMEDIATE CASING POINT TO TD OF HORIZONTAL LATERAL.

²² Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
ANNULAR	3,000	1,500	TBD
SINGLE RAM	3,000	3,000	TBD
ROTATING HEAD	3,000	1,500	TBD

²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief. **NO DRILLING PIT WILL BE USED.**

I further certify that I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☐, if applicable.

Signature: *Jessica Gregg*

Printed name: Jessica Gregg

Title: Regulatory Analyst

E-mail Address: jessica.gregg@encana.com

Date: 2/13/2014

Phone: 720-838-5458

OIL CONSERVATION DIVISION

Approved By:

Chen H. Chen 2-26-2014

Title: SUPERVISOR DISTRICT #3

Approved Date: FEB 26 2014

Expiration Date: 2/26/16

Conditions of Approval Attached

FEB 26 2014 CA

AV

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

Directions from the Intersection of US Hwy 550 & US Hwy 64
in Bloomfield, NM to Encana Oil & Gas (USA) Inc. Lybrook E33-2307 02H
1770' FNL & 545' FWL, Section 33, T23N, R7W, N.M.P.M., Sandoval County, NM

Latitude: 36.18571°N Longitude: 107.58694°W Datum: NAD1983

From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM, travel Southerly on US Hwy 550 for 38.7 miles to Mile Marker 112.7;

Go right (Southerly) on County Road #7900 for 4.9 miles to fork in road;

Go straight (South-easterly) remaining on County Road #7900 for 0.2 miles to fork in road;

Go left (North-easterly) exiting County Road #7900 for 2.8 miles to three-way intersection;

Go straight (Easterly) for 0.2 miles to fork in road at gate;

Go straight (Easterly) for 1.0 miles to fork in road;

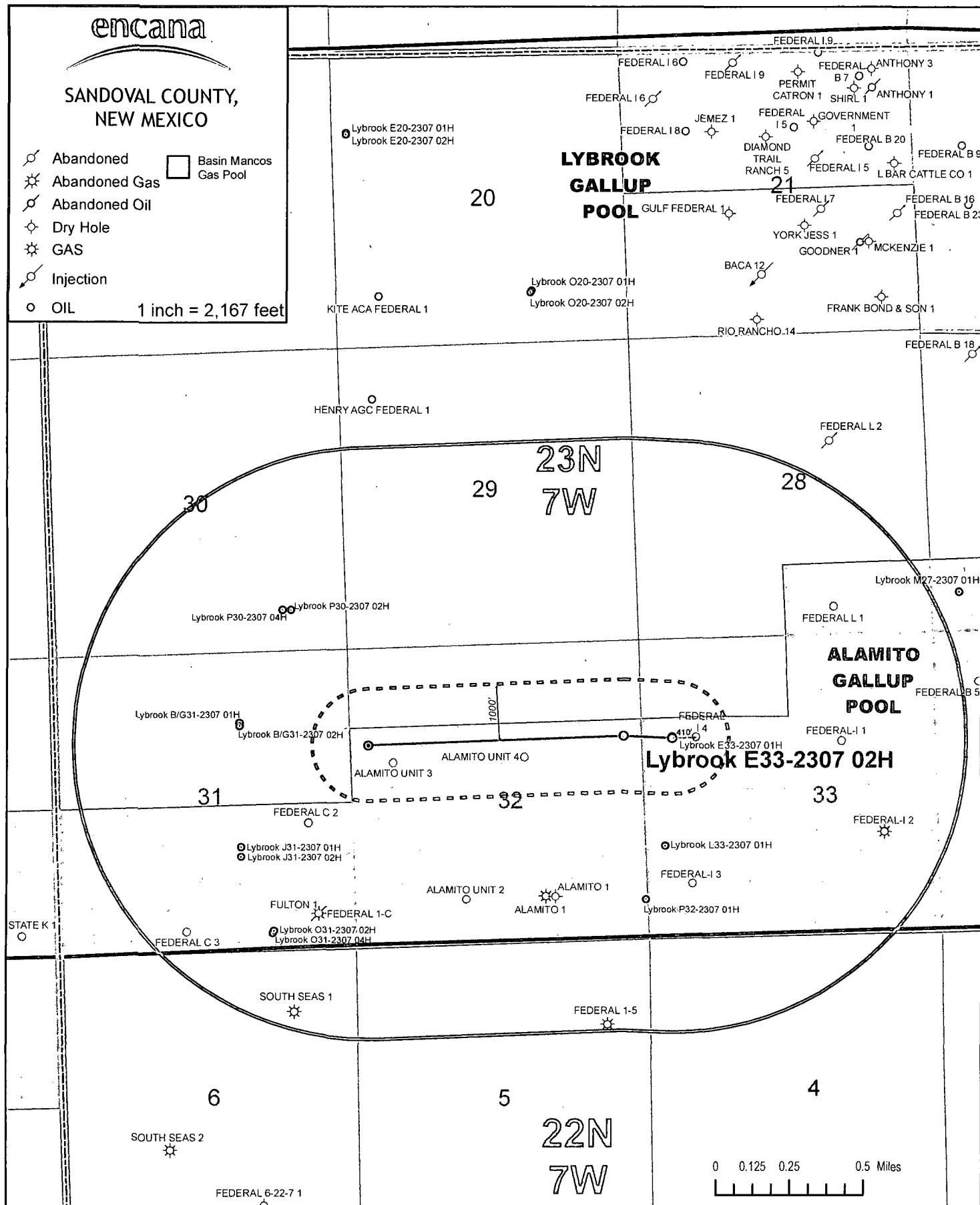
Go right which is straight (Easterly) for 1.4 miles to fork in road;

Go left (Northerly) for 0.4 miles to an existing wellpad from which new access on left-hand side continues for 123' to staked Encana Lybrook E33-2307 02H location.

encana

SANDOVAL COUNTY,
NEW MEXICO

- ⊗ Abandoned
 - ⊗ Abandoned Gas
 - ⊗ Abandoned Oil
 - ⊗ Dry Hole
 - ⊗ GAS
 - ⊗ Injection
 - OIL
 - Basin Mancos Gas Pool
- 1 inch = 2,167 feet



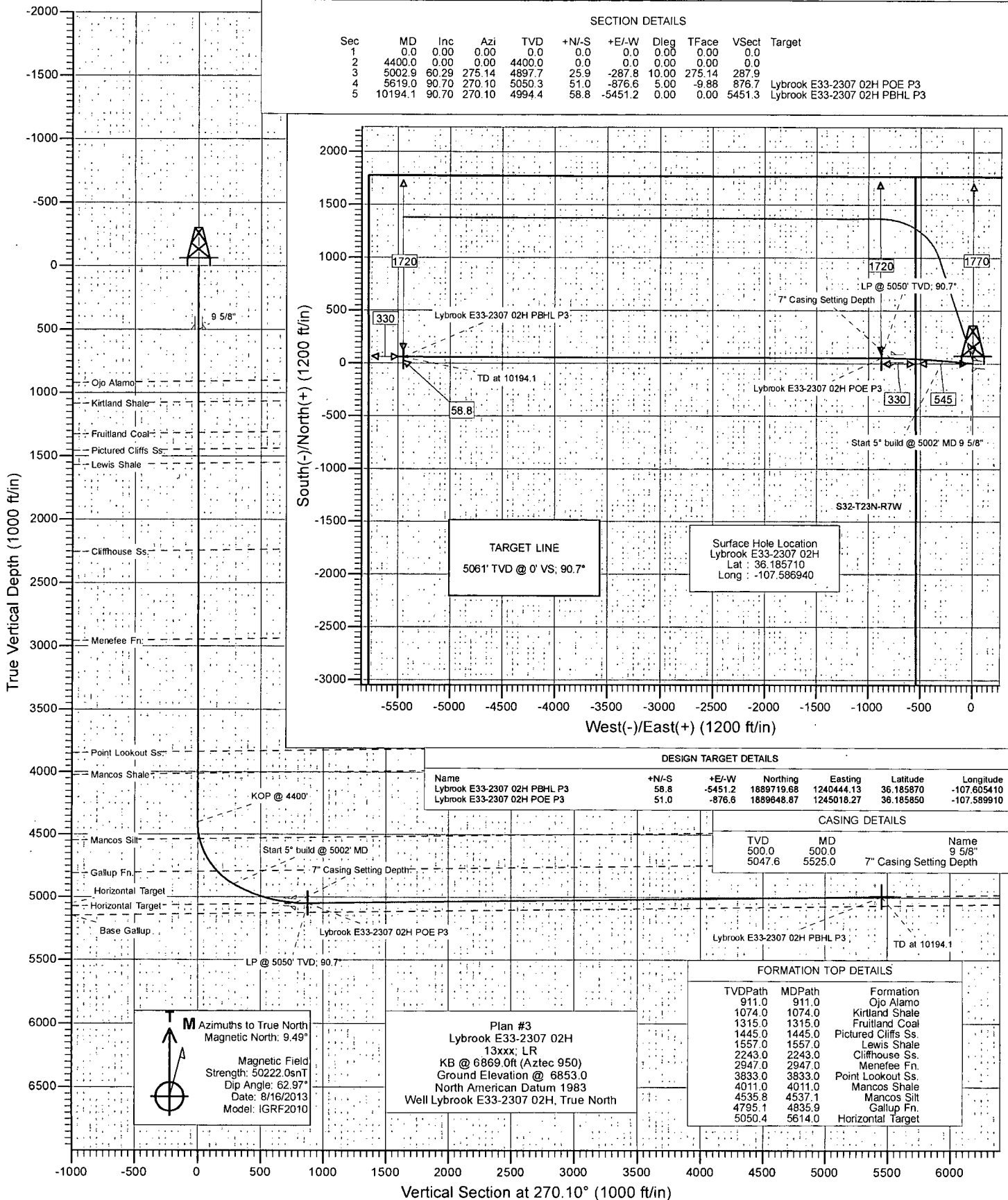


Project: Sandoval County, NM
 Site: Lybrook
 Well: Lybrook E33-2307 02H
 Wellbore: Hz
 Design: Plan #3



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	4400.0	0.00	0.00	4400.0	0.0	0.0	0.00	0.00	0.0	
3	5002.9	60.29	275.14	4897.7	25.9	-287.8	10.00	275.14	287.9	Lybrook E33-2307 02H POE P3
4	5619.0	90.70	270.10	5050.3	51.0	-876.6	5.00	-9.88	876.7	Lybrook E33-2307 02H PBHL P3
5	10194.1	90.70	270.10	4994.4	58.8	-5451.2	0.00	0.00	5451.3	



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Lybrook E33-2307 02H PBHL P3	58.8	-5451.2	1889719.68	1240444.13	36.185870	-107.605410
Lybrook E33-2307 02H POE P3	51.0	-876.6	1889648.87	1245018.27	36.185850	-107.589910

CASING DETAILS

TVD	MD	Name
500.0	500.0	9 5/8"
5047.6	5525.0	7" Casing Setting Depth

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
911.0	911.0	Ojo Alamo
1074.0	1074.0	Kirtland Shale
1315.0	1315.0	Fruitland Coal
1445.0	1445.0	Pictured Cliffs Ss.
1557.0	1557.0	Lewis Shale
2243.0	2243.0	Cliffhouse Ss.
2947.0	2947.0	Menefee Fm.
3833.0	3833.0	Point Lookout Ss.
4011.0	4011.0	Mancos Shale
4535.8	4537.1	Mancos Silt
4795.1	4835.9	Gallup Fm.
5050.4	5614.0	Horizontal Target

M Azimuths to True North
 Magnetic North: 9.49°
 Magnetic Field
 Strength: 50222.0snT
 Dip Angle: 62.97°
 Date: 8/16/2013
 Model: IGRF2010

Plan #3
 Lybrook E33-2307 02H
 13xxx: LR
 KB @ 6869.0ft (Aztec 950)
 Ground Elevation @ 6853.0
 North American Datum 1983
 Well Lybrook E33-2307 02H, True North

Vertical Section at 270.10° (1000 ft/in)

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook E33-2307 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB @ 6869.0ft (Aztec 950)
Project:	Sandoval County, NM	MD Reference:	KB @ 6869.0ft (Aztec 950)
Site:	Lybrook	North Reference:	True
Well:	Lybrook E33-2307 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #3		

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

Site	Lybrook				
Site Position:		Northing:	1,882,676.45 ft	Latitude:	36.168210
From:	Lat/Long	Easting:	1,287,068.90 ft	Longitude:	-107.447150
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-0.71 °

Well	Lybrook E33-2307 02H					
Well Position	+N/-S	0.0 ft	Northing:	1,889,585.81 ft	Latitude:	36.185710
	+E/-W	0.0 ft	Easting:	1,245,894.05 ft	Longitude:	-107.586940
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,853.0 ft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	8/16/2013	9.49	62.97	50,222

Design	Plan #3				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	270.10	

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,002.9	60.29	275.14	4,897.7	25.9	-287.8	10.00	10.00	0.00	275.14	
5,619.0	90.70	270.10	5,050.3	51.0	-876.6	5.00	4.94	-0.82	-9.88	Lybrook E33-2307 02
10,194.1	90.70	270.10	4,994.4	58.8	-5,451.2	0.00	0.00	0.00	0.00	Lybrook E33-2307 02

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook E33-2307 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB @ 6869.0ft (Aztec 950)
Project:	Sandoval County, NM	MD Reference:	KB @ 6869.0ft (Aztec 950)
Site:	Lybrook	North Reference:	True
Well:	Lybrook E33-2307 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #3		

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	
911.0	0.00	0.00	911.0	0.0	0.0	0.0	0.00	0.00	Ojo Alamo
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	
1,074.0	0.00	0.00	1,074.0	0.0	0.0	0.0	0.00	0.00	Kirtland Shale
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	
1,315.0	0.00	0.00	1,315.0	0.0	0.0	0.0	0.00	0.00	Fruitland Coal
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,445.0	0.00	0.00	1,445.0	0.0	0.0	0.0	0.00	0.00	Pictured Cliffs Ss.
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,557.0	0.00	0.00	1,557.0	0.0	0.0	0.0	0.00	0.00	Lewis Shale
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	
2,243.0	0.00	0.00	2,243.0	0.0	0.0	0.0	0.00	0.00	Cliffhouse Ss.
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	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	
2,947.0	0.00	0.00	2,947.0	0.0	0.0	0.0	0.00	0.00	Menefee Fn.
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	
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	
3,833.0	0.00	0.00	3,833.0	0.0	0.0	0.0	0.00	0.00	Point Lookout Ss.
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	
4,011.0	0.00	0.00	4,011.0	0.0	0.0	0.0	0.00	0.00	Mancos Shale
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook E33-2307 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB @ 6869.0ft (Aztec 950)
Project:	Sandoval County, NM	MD Reference:	KB @ 6869.0ft (Aztec 950)
Site:	Lybrook	North Reference:	True
Well:	Lybrook E33-2307 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #3		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4400'
4,500.0	10.00	275.14	4,499.5	0.8	-8.7	8.7	10.00	10.00	
4,537.1	13.71	275.14	4,535.8	1.5	-16.3	16.3	10.00	10.00	Mancos Silt
4,600.0	20.00	275.14	4,596.0	3.1	-34.4	34.4	10.00	10.00	
4,700.0	30.00	275.14	4,686.5	6.9	-76.4	76.5	10.00	10.00	
4,800.0	40.00	275.14	4,768.3	12.0	-133.5	133.5	10.00	10.00	
4,835.9	43.59	275.14	4,795.1	14.2	-157.3	157.4	10.00	10.00	Gallup Fn.
4,900.0	49.99	275.14	4,838.9	18.3	-203.8	203.9	10.00	10.00	
5,000.0	59.99	275.14	4,896.2	25.7	-285.3	285.3	10.00	10.00	
5,002.9	60.29	275.14	4,897.7	25.9	-287.8	287.9	10.00	10.00	Start 5° build @ 5002' MD
5,100.0	65.07	274.22	4,942.2	32.9	-373.8	373.8	5.00	4.93	
5,200.0	70.00	273.35	4,980.4	39.0	-465.9	466.0	5.00	4.93	
5,300.0	74.94	272.53	5,010.5	43.9	-561.1	561.2	5.00	4.94	
5,400.0	79.88	271.75	5,032.3	47.5	-658.6	658.7	5.00	4.94	
5,500.0	84.82	270.99	5,045.6	49.9	-757.7	757.8	5.00	4.94	
5,525.0	86.05	270.80	5,047.6	50.2	-782.6	782.7	5.00	4.94	7" Casing Setting Depth
5,600.0	89.76	270.24	5,050.4	50.9	-857.5	857.6	5.00	4.94	
5,614.0	90.45	270.13	5,050.4	51.0	-871.5	871.6	5.00	4.94	Horizontal Target
5,619.0	90.70	270.10	5,050.3	51.0	-876.5	876.6	5.00	4.94	Lybrook E33-2307 02H POE
5,619.0	90.70	270.10	5,050.3	51.0	-876.6	876.7	5.00	4.94	LP @ 5050' TVD; 90.7° - Lybrook E33-2307 02H
5,700.0	90.70	270.10	5,049.3	51.1	-957.5	957.6	0.00	0.00	
5,800.0	90.70	270.10	5,048.1	51.3	-1,057.5	1,057.6	0.00	0.00	
5,900.0	90.70	270.10	5,046.9	51.5	-1,157.5	1,157.6	0.00	0.00	
6,000.0	90.70	270.10	5,045.6	51.6	-1,257.5	1,257.6	0.00	0.00	
6,100.0	90.70	270.10	5,044.4	51.8	-1,357.5	1,357.6	0.00	0.00	
6,200.0	90.70	270.10	5,043.2	52.0	-1,457.5	1,457.6	0.00	0.00	
6,300.0	90.70	270.10	5,042.0	52.1	-1,557.5	1,557.6	0.00	0.00	
6,400.0	90.70	270.10	5,040.8	52.3	-1,657.5	1,657.6	0.00	0.00	
6,500.0	90.70	270.10	5,039.5	52.5	-1,757.5	1,757.6	0.00	0.00	
6,600.0	90.70	270.10	5,038.3	52.7	-1,857.5	1,857.5	0.00	0.00	
6,700.0	90.70	270.10	5,037.1	52.8	-1,957.5	1,957.5	0.00	0.00	
6,800.0	90.70	270.10	5,035.9	53.0	-2,057.4	2,057.5	0.00	0.00	
6,900.0	90.70	270.10	5,034.6	53.2	-2,157.4	2,157.5	0.00	0.00	
7,000.0	90.70	270.10	5,033.4	53.3	-2,257.4	2,257.5	0.00	0.00	
7,100.0	90.70	270.10	5,032.2	53.5	-2,357.4	2,357.5	0.00	0.00	
7,200.0	90.70	270.10	5,031.0	53.7	-2,457.4	2,457.5	0.00	0.00	
7,300.0	90.70	270.10	5,029.8	53.8	-2,557.4	2,557.5	0.00	0.00	
7,400.0	90.70	270.10	5,028.5	54.0	-2,657.4	2,657.5	0.00	0.00	
7,500.0	90.70	270.10	5,027.3	54.2	-2,757.4	2,757.5	0.00	0.00	
7,600.0	90.70	270.10	5,026.1	54.4	-2,857.4	2,857.5	0.00	0.00	
7,700.0	90.70	270.10	5,024.9	54.5	-2,957.4	2,957.5	0.00	0.00	
7,800.0	90.70	270.10	5,023.6	54.7	-3,057.4	3,057.5	0.00	0.00	
7,900.0	90.70	270.10	5,022.4	54.9	-3,157.4	3,157.5	0.00	0.00	
8,000.0	90.70	270.10	5,021.2	55.0	-3,257.4	3,257.4	0.00	0.00	
8,100.0	90.70	270.10	5,020.0	55.2	-3,357.3	3,357.4	0.00	0.00	
8,200.0	90.70	270.10	5,018.8	55.4	-3,457.3	3,457.4	0.00	0.00	
8,300.0	90.70	270.10	5,017.5	55.5	-3,557.3	3,557.4	0.00	0.00	
8,400.0	90.70	270.10	5,016.3	55.7	-3,657.3	3,657.4	0.00	0.00	
8,500.0	90.70	270.10	5,015.1	55.9	-3,757.3	3,757.4	0.00	0.00	
8,600.0	90.70	270.10	5,013.9	56.1	-3,857.3	3,857.4	0.00	0.00	
8,700.0	90.70	270.10	5,012.6	56.2	-3,957.3	3,957.4	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook E33-2307 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB @ 6869.0ft (Aztec 950)
Project:	Sandoval County, NM	MD Reference:	KB @ 6869.0ft (Aztec 950)
Site:	Lybrook	North Reference:	True
Well:	Lybrook E33-2307 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #3		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
8,800.0	90.70	270.10	5,011.4	56.4	-4,057.3	4,057.4	0.00	0.00	
8,900.0	90.70	270.10	5,010.2	56.6	-4,157.3	4,157.4	0.00	0.00	
9,000.0	90.70	270.10	5,009.0	56.7	-4,257.3	4,257.4	0.00	0.00	
9,100.0	90.70	270.10	5,007.8	56.9	-4,357.3	4,357.4	0.00	0.00	
9,200.0	90.70	270.10	5,006.5	57.1	-4,457.3	4,457.4	0.00	0.00	
9,300.0	90.70	270.10	5,005.3	57.2	-4,557.3	4,557.3	0.00	0.00	
9,400.0	90.70	270.10	5,004.1	57.4	-4,657.2	4,657.3	0.00	0.00	
9,500.0	90.70	270.10	5,002.9	57.6	-4,757.2	4,757.3	0.00	0.00	
9,600.0	90.70	270.10	5,001.6	57.8	-4,857.2	4,857.3	0.00	0.00	
9,700.0	90.70	270.10	5,000.4	57.9	-4,957.2	4,957.3	0.00	0.00	
9,800.0	90.70	270.10	4,999.2	58.1	-5,057.2	5,057.3	0.00	0.00	
9,900.0	90.70	270.10	4,998.0	58.3	-5,157.2	5,157.3	0.00	0.00	
10,000.0	90.70	270.10	4,996.8	58.4	-5,257.2	5,257.3	0.00	0.00	
10,100.0	90.70	270.10	4,995.5	58.6	-5,357.2	5,357.3	0.00	0.00	
10,193.5	90.70	270.10	4,994.4	58.8	-5,450.7	5,450.8	0.00	0.00	Lybrook E33-2307 02H PBHL
10,194.1	90.70	270.10	4,994.4	58.8	-5,451.2	5,451.3	0.00	0.00	TD at 10194.1 - Lybrook E33-2307 02H PBHL F

Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
Lybrook E33-2307 02H I	0.00	0.00	5,056.9	51.0	-876.6	1,889,648.87	1,245,018.27	36.185850	-107.589910
- plan misses target center by 6.6ft at 5619.0ft MD (5050.3 TVD, 51.0 N, -876.5 E)									
- Point									
Lybrook E33-2307 02H I	0.00	0.00	5,041.0	58.8	-5,451.2	1,889,719.68	1,240,444.13	36.185870	-107.605410
- plan misses target center by 46.6ft at 10193.5ft MD (4994.4 TVD, 58.8 N, -5450.7 E)									
- Point									
Lybrook E33-2307 02H I	0.00	0.00	5,050.3	51.0	-876.6	1,889,648.87	1,245,018.27	36.185850	-107.589910
- plan hits target center									
- Point									
Lybrook E33-2307 02H I	0.00	0.00	4,994.4	58.8	-5,451.2	1,889,719.68	1,240,444.13	36.185870	-107.605410
- plan hits target center									
- Point									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
500.0	500.0	9 5/8"	0.000	0.000
5,525.0	5,047.6	7" Casing Setting Depth	0.000	0.000

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Lybrook E33-2307 02H
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB @ 6869.0ft (Aztec 950)
Project:	Sandoval County, NM	MD Reference:	KB @ 6869.0ft (Aztec 950)
Site:	Lybrook	North Reference:	True
Well:	Lybrook E33-2307 02H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	Plan #3		

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
911.0	911.0	Ojo Alamo		-0.70	270.10
1,074.0	1,074.0	Kirtland Shale		-0.70	270.10
1,315.0	1,315.0	Fruitland Coal		-0.70	270.10
1,445.0	1,445.0	Pictured Cliffs Ss.		-0.70	270.10
1,557.0	1,557.0	Lewis Shale		-0.70	270.10
2,243.0	2,243.0	Cliffhouse Ss.		-0.70	270.10
2,947.0	2,947.0	Menefee Fn.		-0.70	270.10
3,833.0	3,833.0	Point Lookout Ss.		-0.70	270.10
4,011.0	4,011.0	Mancos Shale		-0.70	270.10
4,537.1	4,536.0	Mancos Silt		-0.70	270.10
4,835.9	4,797.0	Gallup Fn.		-0.70	270.10
5,614.0	5,061.0	Horizontal Target		-0.70	270.10

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,400.0	4,400.0	0.0	0.0	KOP @ 4400'
5,002.9	4,897.7	25.9	-287.8	Start 5° build @ 5002' MD
5,619.0	5,050.3	51.0	-876.6	LP @ 5050' TVD; 90.7°
10,194.1	4,994.4	58.8	-5,451.2	TD at 10194.1

Anticollision Report

Company:	EnCana Oil & Gas (USA) Inc	Local Co-ordinate Reference:	Well Lybrook E33-2307 02H
Project:	Sandoval County, NM	TVD Reference:	KB @ 6869.0ft (Aztec 950)
Reference Site:	Lybrook	MD Reference:	KB @ 6869.0ft (Aztec 950)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lybrook E33-2307 02H	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 #3	Offset TVD Reference:	Offset Datum

Reference	Plan #3		
Filter type:	GLOBAL FILTER APPLIED: All wellpaths within 200'+ 100/1000 of reference		
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 1,219.4ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date 1/2/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	10,194.1	Plan #3 (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						
Lybrook						
Lybrook E33-2307 01H - Hz - Plan #3	4,000.0	4,000.0	29.3	15.4	2.105	CC, ES, SF

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc
Project: Sandoval County, NM
Reference Site: Lybrook
Site Error: 0.0ft
Reference Well: Lybrook E33-2307 02H
Well Error: 0.0ft
Reference Wellbore: Hz
Reference Design: Plan #3

Local Co-ordinate Reference: Well Lybrook E33-2307 02H
TVD Reference: KB @ 6869.0ft (Aztec 950)
MD Reference: KB @ 6869.0ft (Aztec 950)
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 Lybrook - Lybrook E33-2307 01H - Hz - Plan #3														Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD														Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance		Total		Separation		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)	Uncertainty Axis	Factor			
0.0	0.0	0.0	0.0	0.0	0.0	5.79	29.1	3.0	29.3						
100.0	100.0	100.0	100.0	0.1	0.1	5.79	29.1	3.0	29.3	29.0	0.29	99.843			
200.0	200.0	200.0	200.0	0.3	0.3	5.79	29.1	3.0	29.3	28.6	0.64	45.580			
300.0	300.0	300.0	300.0	0.5	0.5	5.79	29.1	3.0	29.3	28.3	0.99	29.531			
400.0	400.0	400.0	400.0	0.7	0.7	5.79	29.1	3.0	29.3	27.9	1.34	21.841			
500.0	500.0	500.0	500.0	0.8	0.8	5.79	29.1	3.0	29.3	27.6	1.69	17.328			
600.0	600.0	600.0	600.0	1.0	1.0	5.79	29.1	3.0	29.3	27.2	2.04	14.361			
700.0	700.0	700.0	700.0	1.2	1.2	5.79	29.1	3.0	29.3	26.9	2.39	12.261			
800.0	800.0	800.0	800.0	1.4	1.4	5.79	29.1	3.0	29.3	26.5	2.74	10.697			
900.0	900.0	900.0	900.0	1.5	1.5	5.79	29.1	3.0	29.3	26.2	3.09	9.487			
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	5.79	29.1	3.0	29.3	25.8	3.43	8.523			
1,100.0	1,100.0	1,100.0	1,100.0	1.9	1.9	5.79	29.1	3.0	29.3	25.5	3.78	7.737			
1,200.0	1,200.0	1,200.0	1,200.0	2.1	2.1	5.79	29.1	3.0	29.3	25.1	4.13	7.083			
1,300.0	1,300.0	1,300.0	1,300.0	2.2	2.2	5.79	29.1	3.0	29.3	24.8	4.48	6.532			
1,400.0	1,400.0	1,400.0	1,400.0	2.4	2.4	5.79	29.1	3.0	29.3	24.4	4.83	6.060			
1,500.0	1,500.0	1,500.0	1,500.0	2.6	2.6	5.79	29.1	3.0	29.3	24.1	5.18	5.651			
1,600.0	1,600.0	1,600.0	1,600.0	2.8	2.8	5.79	29.1	3.0	29.3	23.7	5.53	5.295			
1,700.0	1,700.0	1,700.0	1,700.0	2.9	2.9	5.79	29.1	3.0	29.3	23.4	5.88	4.980			
1,800.0	1,800.0	1,800.0	1,800.0	3.1	3.1	5.79	29.1	3.0	29.3	23.0	6.23	4.701			
1,900.0	1,900.0	1,900.0	1,900.0	3.3	3.3	5.79	29.1	3.0	29.3	22.7	6.58	4.452			
2,000.0	2,000.0	2,000.0	2,000.0	3.5	3.5	5.79	29.1	3.0	29.3	22.3	6.93	4.227			
2,100.0	2,100.0	2,100.0	2,100.0	3.6	3.6	5.79	29.1	3.0	29.3	22.0	7.27	4.024			
2,200.0	2,200.0	2,200.0	2,200.0	3.8	3.8	5.79	29.1	3.0	29.3	21.7	7.62	3.840			
2,300.0	2,300.0	2,300.0	2,300.0	4.0	4.0	5.79	29.1	3.0	29.3	21.3	7.97	3.672			
2,400.0	2,400.0	2,400.0	2,400.0	4.2	4.2	5.79	29.1	3.0	29.3	21.0	8.32	3.518			
2,500.0	2,500.0	2,500.0	2,500.0	4.3	4.3	5.79	29.1	3.0	29.3	20.6	8.67	3.376			
2,600.0	2,600.0	2,600.0	2,600.0	4.5	4.5	5.79	29.1	3.0	29.3	20.3	9.02	3.246			
2,700.0	2,700.0	2,700.0	2,700.0	4.7	4.7	5.79	29.1	3.0	29.3	19.9	9.37	3.125			
2,800.0	2,800.0	2,800.0	2,800.0	4.9	4.9	5.79	29.1	3.0	29.3	19.6	9.72	3.012			
2,900.0	2,900.0	2,900.0	2,900.0	5.0	5.0	5.79	29.1	3.0	29.3	19.2	10.07	2.908			
3,000.0	3,000.0	3,000.0	3,000.0	5.2	5.2	5.79	29.1	3.0	29.3	18.9	10.42	2.811			
3,100.0	3,100.0	3,100.0	3,100.0	5.4	5.4	5.79	29.1	3.0	29.3	18.5	10.77	2.719			
3,200.0	3,200.0	3,200.0	3,200.0	5.6	5.6	5.79	29.1	3.0	29.3	18.2	11.11	2.634			
3,300.0	3,300.0	3,300.0	3,300.0	5.7	5.7	5.79	29.1	3.0	29.3	17.8	11.46	2.554			
3,400.0	3,400.0	3,400.0	3,400.0	5.9	5.9	5.79	29.1	3.0	29.3	17.5	11.81	2.478			
3,500.0	3,500.0	3,500.0	3,500.0	6.1	6.1	5.79	29.1	3.0	29.3	17.1	12.16	2.407			
3,600.0	3,600.0	3,600.0	3,600.0	6.3	6.3	5.79	29.1	3.0	29.3	16.8	12.51	2.340			
3,700.0	3,700.0	3,700.0	3,700.0	6.4	6.4	5.79	29.1	3.0	29.3	16.4	12.86	2.277			
3,800.0	3,800.0	3,800.0	3,800.0	6.6	6.6	5.79	29.1	3.0	29.3	16.1	13.21	2.216			
3,900.0	3,900.0	3,900.0	3,900.0	6.8	6.8	5.79	29.1	3.0	29.3	15.7	13.56	2.159			
4,000.0	4,000.0	4,000.0	4,000.0	7.0	7.0	5.79	29.1	3.0	29.3	15.4	13.91	2.105 CC, ES, SF			
4,100.0	4,100.0	4,094.7	4,094.3	7.1	7.1	0.70	36.5	0.4	37.0	22.7	14.25	2.595			
4,200.0	4,200.0	4,184.5	4,181.3	7.3	7.3	-6.51	57.0	-6.5	60.3	45.7	14.61	4.131			
4,300.0	4,300.0	4,265.8	4,256.4	7.5	7.5	-10.80	86.5	-16.5	98.3	83.3	15.00	6.549			
4,400.0	4,400.0	4,337.1	4,318.0	7.7	7.8	-13.09	120.4	-28.0	148.3	132.9	15.44	9.604			
4,500.0	4,499.5	4,400.0	4,368.3	7.8	8.1	66.10	156.1	-40.1	205.7	190.3	15.46	13.303			
4,600.0	4,596.0	4,450.0	4,405.1	8.0	8.4	62.22	188.1	-50.9	266.3	250.6	15.67	16.996			
4,700.0	4,686.5	4,500.0	4,438.9	8.3	8.8	59.26	223.0	-62.8	328.9	313.0	15.84	20.758			
4,800.0	4,768.3	4,550.0	4,469.3	8.8	9.2	56.87	260.5	-75.5	393.1	377.0	16.06	24.475			
4,900.0	4,838.9	4,583.7	4,487.8	9.6	9.5	53.23	287.2	-84.5	458.0	441.7	16.26	28.161			
5,000.0	4,896.2	4,616.4	4,504.2	10.8	9.9	49.83	314.0	-93.6	523.0	506.5	16.57	31.562			
5,100.0	4,942.2	4,658.9	4,523.7	12.3	10.4	50.51	349.8	-105.8	589.4	571.7	17.68	33.344			

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	Local Co-ordinate Reference:	Well Lybrook E33-2307 02H
Project:	Sandoval County, NM	TVD Reference:	KB @ 6869.0ft (Aztec 950)
Reference Site:	Lybrook	MD Reference:	KB @ 6869.0ft (Aztec 950)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Lybrook E33-2307 02H	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 #3	Offset TVD Reference:	Offset Datum

Offset Design Lybrook - Lybrook E33-2307 01H - Hz - Plan #3												Offset Site Error:	0.0 ft
Survey Program: 0-Geolink MWD												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)			
5,200.0	4,980.4	4,707.8	4,545.9	14.0	10.9	51.36	391.0	-119.7	657.7	638.6	19.10	34.432	
5,300.0	5,010.5	4,752.8	4,566.4	16.0	11.5	51.42	429.0	-132.6	727.4	706.8	20.63	35.263	
5,400.0	5,032.3	4,793.7	4,585.0	18.1	12.0	50.77	463.4	-144.3	798.5	776.3	22.18	36.003	
5,500.0	5,045.6	4,830.0	4,601.6	20.3	12.5	49.48	494.1	-154.7	870.7	847.0	23.68	36.771	
5,600.0	5,050.4	4,861.6	4,616.0	22.5	12.9	47.61	520.7	-163.7	943.8	918.8	25.06	37.665	
5,700.0	5,049.3	4,889.9	4,628.8	24.8	13.3	49.00	544.5	-171.8	1,018.7	991.3	27.32	37.289	
5,800.0	5,048.1	4,918.1	4,641.7	27.2	13.6	51.19	568.3	-179.8	1,096.7	1,066.8	29.90	36.685	
5,900.0	5,046.9	4,946.2	4,654.5	29.5	14.0	53.30	592.1	-187.9	1,177.4	1,144.9	32.55	36.168	

Anticollision Report

Company: EnCana Oil & Gas (USA) Inc Project: Sandoval County, NM Reference Site: Lybrook Site Error: 0.0ft Reference Well: Lybrook E33-2307 02H Well Error: 0.0ft Reference Wellbore: Hz Reference Design: Plan #3	Local Co-ordinate Reference: Well Lybrook E33-2307 02H TVD Reference: KB @ 6869.0ft (Aztec 950) MD Reference: KB @ 6869.0ft (Aztec 950) 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	
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Reference Depths are relative to KB @ 6869.0ft (Aztec 950)

Offset Depths are relative to Offset Datum

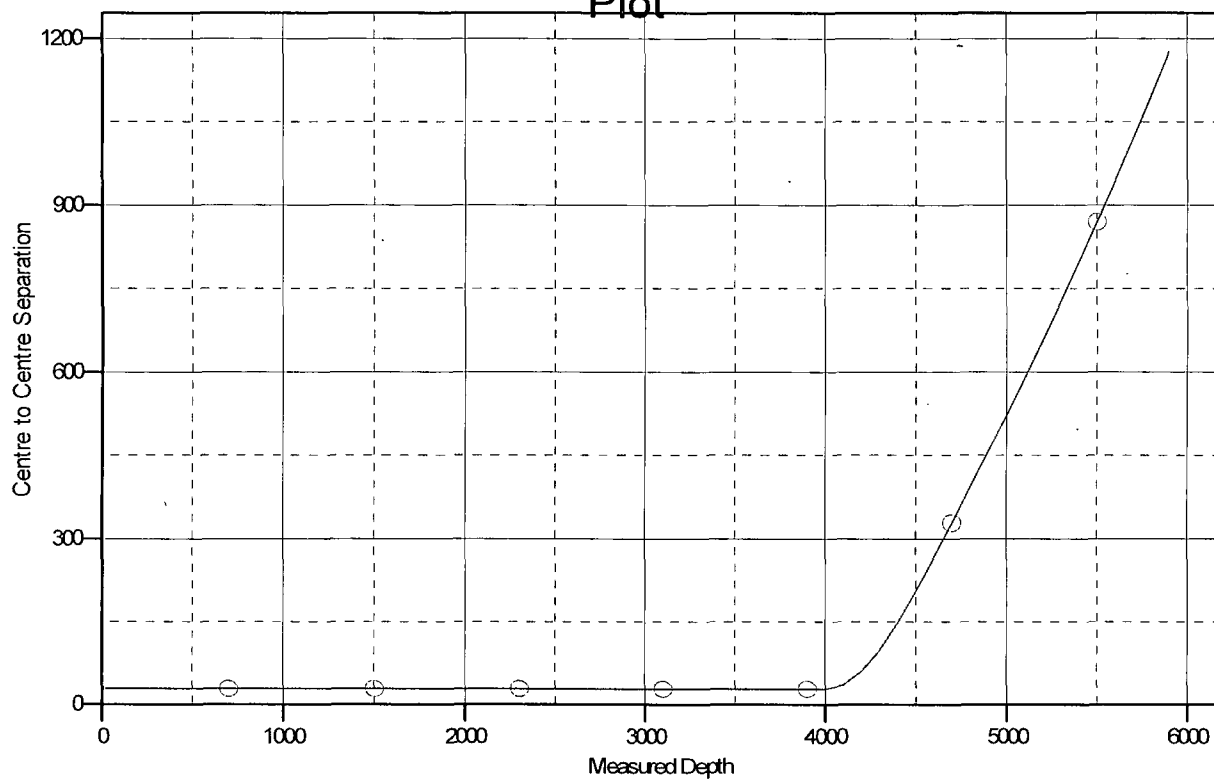
Central Meridian is -106.250000 °

Coordinates are relative to: Lybrook E33-2307 02H

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

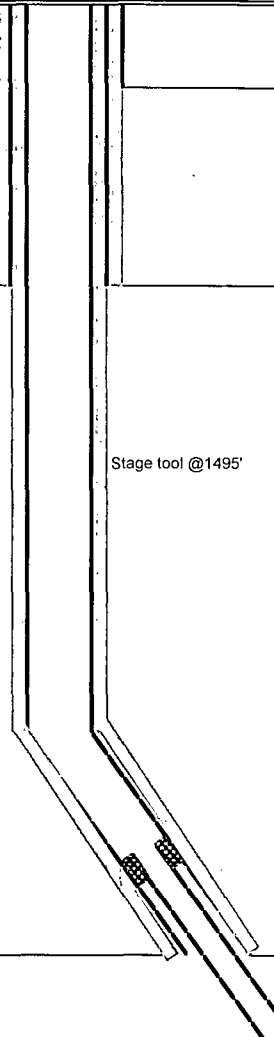
Grid Convergence at Surface is: -0.79°

Ladder Plot



LEGEND

—●— LybrookE33-2307 01H,Hz,Plan#3 V0

LOC: Sec 33-T23N-R7W County: Sandoval WELL: Lybrook E33-2307 02H			Encana Natural Gas WELL SUMMARY					ENG: 1/15/14 RIG: GLE: 6853 RKBE: 6869	
MWD LWD	OPEN HOLE LOGGING	FORM	DEPTH			HOLE SIZE	CASING SPECS	MW MUD TYPE	DEVIATION INFORMATION
			TVD	MD					
			60	60'		30	20" 94# 100sx Type I Neat 16ppg cmt	Fresh wtr 8.3-9.2	
Surveys After csg is run	None					12 1/4	9 5/8" 36ppf J55 STC TOC @ surface 178 sks Type III Cmt	Fresh wtr 8.4-8.6	Vertical <1°
Surveys every 500'	No OH logs	Ojo Alamo Kirtland Fruitland Coal Pictured Cliffs Ss Lewis Shale Cliffhouse Ss Menefee Fn	911 1074 1315 1445 1557 2243 2947			8 3/4	7" 26ppf J55 LTC TOC @ surface 30% OH excess: 566 sksTotal. Stage 1 Lead: 259sks Stage 1 Tail: 177sks. Stage 2 Lead: 130sks	Fresh Wtr 8.5-8.8	Vertical <1°
	Mud logger onsite	Point Lookout Ss Mancos Sh KICK OFF PT Mancos Silt Gallup Top 7" csg	3833 4011 4400 4536 4797 5048	5525		6 1/8	200' overlap at liner top 4575' Lateral	8.6-9.0 OBM	KOP 4400 10 deg/100'
Surveys every 500' Gyro at CP MWD Gamma Directional	No OH Logs	horz target Base Gallup	5050 5135	5619		4 1/2" 11.6ppf SB80 LTC Running external swellable csg packers for isolation of prod string Plan on setting top packer within 100' of intermediate casing shoe	Switch to OBM 8.6-9.0	.25deg updip 4994'TVD TD = 10194' MD	

NOTES:

- 1) Drill with 30" bit to 60', set 20" 94# conductor pipe
- 2) Drill surface to 500', R&C 9 5/8" casing
- 3) N/U BOP and surface equipment
- 4) Drill to KOP of 4400', 8 3/4" hole size,
- 5) PU directional tools and start curve at 10deg/100' build rate
- 6) Drill to casing point of 5525' MD
- 7) R&C 7" casing, circ cmt to surface, switch to OBM
- 8) Land at 90deg, drill 4575' lateral to 10194', run 4 1/2" liner with external swellable csg packers