



**CHISHOLM
ENERGY**

30-025-43831

Chisholm Energy Operating, LLC

Lea County, NM

Sec 2, T-19-S, R-33-E

Buffalo West 2 State Com 2BS 4H

Wellbore #1

Design: Wellbore #1

HOBBS OGD
APR 16 2018
RECEIVED

QES Survey Report

16 October, 2017





Company: Chisholm Energy Operating, LLC
Project: Lea County, NM
Site: Sec 2, T-19-S, R-33-E
Well: Buffalo West 2 State Com 2BS 4H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Buffalo West 2 State Com 2BS 4H
TVD Reference: RKB @ 3792.0usft (Latshaw #17)
MD Reference: RKB @ 3792.0usft (Latshaw #17)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project Lea County, NM

Map System: US State Plane 1983
Geo Datum: North American Datum 1983
Map Zone: New Mexico Eastern Zone

System Datum: Mean Sea Level

Site Sec 2, T-19-S, R-33-E

Site Position: Northing: 617,848.60 usft Latitude: 32° 41' 47.519 N
From: Map Easting: 757,878.60 usft Longitude: 103° 37' 45.915 W
Position Uncertainty: 0.0 usft Slot Radius: 13-3/16 " Grid Convergence: 0.38 °

Well Buffalo West 2 State Com 2BS 4H

Well Position +N/-S 0.0 usft Northing: 617,821.70 usft Latitude: 32° 41' 47.421 N
 +E/-W 0.0 usft Easting: 755,309.90 usft Longitude: 103° 38' 15.975 W
Position Uncertainty 0.0 usft Wellhead Elevation: usft Ground Level: 3,766.0 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	9/19/2017	6.99	60.48	48,182.26828698

Design Wellbore #1

Audit Notes:

Version: 1.0 **Phase:** ACTUAL **Tie On Depth:** 0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	179.56

Survey Program Date 10/16/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
94.0	3,061.0	MS Surveys (Wellbore #1)	MWD	OWSG MWD - Standard
3,123.0	15,180.0	QES MWD Surveys (Wellbore #1)	MWD	OWSG MWD - Standard

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
94.0	1.50	248.73	94.0	-0.4	-1.1	0.4	1.60	1.60	0.00
188.0	1.93	251.44	187.9	-1.4	-3.8	1.4	0.47	0.46	2.88
282.0	1.79	258.72	281.9	-2.2	-6.7	2.1	0.29	-0.15	7.74
376.0	1.89	255.20	375.8	-2.9	-9.7	2.8	0.16	0.11	-3.74
426.0	1.93	251.94	425.8	-3.3	-11.3	3.3	0.23	0.08	-6.52
495.0	2.31	254.06	494.8	-4.1	-13.7	4.0	0.56	0.55	3.07
552.0	2.09	251.98	551.7	-4.7	-15.8	4.6	0.41	-0.39	-3.65
613.0	2.16	248.55	612.7	-5.5	-17.9	5.3	0.24	0.11	-5.62
687.0	2.31	253.13	686.6	-6.4	-20.7	6.3	0.32	0.20	6.19



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Survey

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737.0	2.70	250.97	736.6	-7.1	-22.7	6.9	0.80	0.78	-4.32
829.0	3.01	250.49	828.5	-8.6	-27.1	8.4	0.34	0.34	-0.52
918.0	3.34	248.73	917.3	-10.3	-31.7	10.1	0.39	0.37	-1.98
1,009.0	3.82	249.15	1,008.2	-12.4	-37.0	12.1	0.53	0.53	0.46
1,099.0	3.53	249.50	1,098.0	-14.4	-42.4	14.1	0.32	-0.32	0.39
1,192.0	2.64	257.25	1,190.8	-15.9	-47.1	15.5	1.05	-0.96	8.33
1,282.0	2.56	244.20	1,280.7	-17.2	-51.0	16.8	0.66	-0.09	-14.50
1,377.0	1.75	242.44	1,375.7	-18.8	-54.2	18.4	0.86	-0.85	-1.85
1,472.0	1.42	244.50	1,470.6	-20.0	-56.5	19.6	0.35	-0.35	2.17
1,567.0	1.34	235.45	1,565.6	-21.1	-58.5	20.7	0.24	-0.08	-9.53
1,660.0	0.62	229.05	1,658.6	-22.1	-59.8	21.6	0.78	-0.77	-6.88
1,754.0	0.82	241.46	1,752.6	-22.7	-60.8	22.3	0.27	0.21	13.20
1,848.0	0.45	242.56	1,846.6	-23.2	-61.7	22.8	0.39	-0.39	1.17
1,941.0	0.43	228.50	1,939.6	-23.6	-62.3	23.1	0.12	-0.02	-15.12
2,034.0	0.47	127.87	2,032.6	-24.1	-62.2	23.6	0.75	0.04	-108.20
2,128.0	0.11	210.13	2,126.6	-24.4	-62.0	23.9	0.50	-0.38	87.51
2,221.0	0.15	165.26	2,219.6	-24.6	-62.0	24.1	0.11	0.04	-48.25
2,313.0	0.45	319.88	2,311.6	-24.4	-62.2	24.0	0.64	0.33	168.07
2,406.0	0.00	33.15	2,404.6	-24.2	-62.4	23.7	0.48	-0.48	0.00
2,501.0	2.23	42.77	2,499.6	-22.8	-61.2	22.3	2.35	2.35	0.00
2,594.0	2.81	47.68	2,592.5	-19.9	-58.2	19.5	0.66	0.62	5.28
2,688.0	3.36	46.03	2,686.3	-16.5	-54.6	16.1	0.59	0.59	-1.76
2,783.0	4.04	39.97	2,781.1	-12.0	-50.4	11.6	0.82	0.72	-6.38
2,876.0	4.06	34.07	2,873.9	-6.7	-46.5	6.4	0.45	0.02	-6.34
2,969.0	3.61	33.64	2,966.7	-1.6	-43.0	1.2	0.48	-0.48	-0.46
MS Tie-in @ 3061.0' MD / 3058.5' TVD									
3,061.0	3.05	27.43	3,058.5	3.0	-40.3	-3.3	0.72	-0.61	-6.75
3,123.0	2.90	24.90	3,120.4	5.9	-38.8	-6.2	0.32	-0.24	-4.08
3,216.0	3.00	24.50	3,213.3	10.2	-36.8	-10.5	0.11	0.11	-0.43
3,310.0	3.30	31.80	3,307.2	14.8	-34.4	-15.0	0.53	0.32	7.77
3,405.0	2.80	35.80	3,402.0	19.0	-31.6	-19.2	0.57	-0.53	4.21
3,499.0	2.20	38.40	3,496.0	22.3	-29.1	-22.5	0.65	-0.64	2.77
3,592.0	2.50	40.00	3,588.9	25.2	-26.7	-25.4	0.33	0.32	1.72
3,685.0	2.10	40.70	3,681.8	28.1	-24.3	-28.2	0.43	-0.43	0.75
3,778.0	2.30	43.70	3,774.7	30.7	-21.9	-30.9	0.25	0.22	3.23
3,872.0	2.50	40.00	3,868.7	33.6	-19.3	-33.8	0.27	0.21	-3.94
3,966.0	2.50	42.70	3,962.6	36.7	-16.6	-36.8	0.13	0.00	2.87
4,060.0	2.50	42.50	4,056.5	39.7	-13.8	-39.8	0.01	0.00	-0.21
4,154.0	2.40	37.90	4,150.4	42.8	-11.2	-42.9	0.23	-0.11	-4.89
4,249.0	2.30	41.80	4,245.3	45.8	-8.7	-45.8	0.20	-0.11	4.11
4,342.0	2.40	37.00	4,338.2	48.7	-6.3	-48.8	0.24	0.11	-5.16
4,436.0	2.50	42.50	4,432.1	51.8	-3.7	-51.8	0.27	0.11	5.85
4,530.0	2.60	45.80	4,526.1	54.8	-0.8	-54.8	0.19	0.11	3.51

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Survey

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4,623.0	2.60	43.70	4,619.0	57.8	2.2	-57.8	0.10	0.00	-2.26
4,716.0	2.40	46.50	4,711.9	60.7	5.0	-60.6	0.25	-0.22	3.01
4,810.0	2.30	50.90	4,805.8	63.2	7.9	-63.2	0.22	-0.11	4.68
4,902.0	2.10	50.40	4,897.7	65.5	10.7	-65.4	0.22	-0.22	-0.54
4,993.0	2.30	53.90	4,988.7	67.6	13.4	-67.5	0.26	0.22	3.85
5,087.0	2.10	58.50	5,082.6	69.6	16.4	-69.5	0.28	-0.21	4.89
5,181.0	2.00	56.00	5,176.5	71.4	19.2	-71.3	0.14	-0.11	-2.66
5,263.0	2.30	59.70	5,258.5	73.1	21.8	-72.9	0.40	0.37	4.51
5,335.0	2.30	52.00	5,330.4	74.7	24.2	-74.5	0.43	0.00	-10.69
5,429.0	1.00	55.30	5,424.4	76.3	26.4	-76.1	1.39	-1.38	3.51
5,523.0	0.70	54.10	5,518.4	77.1	27.5	-76.9	0.32	-0.32	-1.28
5,617.0	0.60	42.70	5,612.4	77.8	28.3	-77.6	0.17	-0.11	-12.13
5,711.0	0.50	31.00	5,706.3	78.5	28.9	-78.3	0.16	-0.11	-12.45
5,805.0	0.40	14.50	5,800.3	79.2	29.2	-79.0	0.17	-0.11	-17.55
5,898.0	0.50	345.20	5,893.3	79.9	29.1	-79.7	0.27	0.11	-31.51
5,992.0	0.40	322.70	5,987.3	80.5	28.8	-80.3	0.21	-0.11	-23.94
6,085.0	0.30	310.50	6,080.3	81.0	28.5	-80.7	0.13	-0.11	-13.12
6,179.0	0.30	313.90	6,174.3	81.3	28.1	-81.1	0.02	0.00	3.62
6,274.0	0.40	293.70	6,269.3	81.6	27.6	-81.4	0.17	0.11	-21.26
6,368.0	0.40	285.80	6,363.3	81.8	27.0	-81.6	0.06	0.00	-8.40
6,462.0	0.60	252.50	6,457.3	81.8	26.2	-81.6	0.37	0.21	-35.43
6,556.0	0.70	247.30	6,551.3	81.4	25.2	-81.2	0.12	0.11	-5.53
6,650.0	1.30	266.90	6,645.3	81.1	23.6	-80.9	0.73	0.64	20.85
6,743.0	1.40	268.20	6,738.3	81.0	21.4	-80.9	0.11	0.11	1.40
6,837.0	1.40	268.00	6,832.3	80.9	19.1	-80.8	0.01	0.00	-0.21
6,928.0	1.40	271.70	6,923.2	80.9	16.9	-80.8	0.10	0.00	4.07
7,021.0	1.30	269.80	7,016.2	81.0	14.7	-80.9	0.12	-0.11	-2.04
7,115.0	1.20	272.00	7,110.2	81.0	12.7	-80.9	0.12	-0.11	2.34
7,207.0	1.20	268.90	7,202.2	81.0	10.7	-80.9	0.07	0.00	-3.37
7,300.0	1.20	267.60	7,295.1	81.0	8.8	-80.9	0.03	0.00	-1.40
7,393.0	1.10	263.80	7,388.1	80.8	6.9	-80.8	0.14	-0.11	-4.09
7,486.0	1.10	261.80	7,481.1	80.6	5.2	-80.6	0.04	0.00	-2.15
7,578.0	1.00	252.50	7,573.1	80.2	3.5	-80.2	0.21	-0.11	-10.11
7,672.0	0.80	228.40	7,667.1	79.5	2.3	-79.5	0.45	-0.21	-25.64
7,766.0	0.80	194.90	7,761.1	78.5	1.6	-78.5	0.49	0.00	-35.64
7,859.0	1.10	181.20	7,854.1	77.0	1.4	-76.9	0.40	0.32	-14.73
7,952.0	1.20	165.20	7,947.0	75.1	1.6	-75.1	0.36	0.11	-17.20
8,045.0	1.40	152.50	8,040.0	73.2	2.4	-73.2	0.38	0.22	-13.66
8,139.0	1.50	117.70	8,134.0	71.6	4.0	-71.5	0.93	0.11	-37.02
8,232.0	1.30	114.40	8,227.0	70.6	6.1	-70.5	0.23	-0.22	-3.55
8,325.0	0.90	93.30	8,319.9	70.1	7.8	-70.0	0.61	-0.43	-22.69
8,419.0	0.80	95.60	8,413.9	70.0	9.1	-69.9	0.11	-0.11	2.45
8,512.0	0.30	134.60	8,506.9	69.8	10.0	-69.7	0.64	-0.54	41.94

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8,605.0	0.30	253.80	8,599.9	69.5	9.9	-69.4	0.56	0.00	128.17	
8,699.0	0.90	252.70	8,693.9	69.2	9.0	-69.2	0.64	0.64	-1.17	
8,791.0	1.10	270.50	8,785.9	69.0	7.4	-69.0	0.40	0.22	19.35	
8,885.0	0.90	267.30	8,879.9	69.0	5.8	-69.0	0.22	-0.21	-3.40	
8,955.0	1.12	124.21	8,949.9	68.6	5.8	-68.5	2.74	0.31	-204.41	
8,986.0	3.91	106.28	8,980.9	68.1	7.0	-68.1	9.24	9.00	-57.84	
9,017.0	6.81	100.74	9,011.7	67.5	9.9	-67.4	9.49	9.35	-17.87	
9,048.0	9.74	98.28	9,042.4	66.8	14.3	-66.7	9.52	9.45	-7.94	
9,079.0	12.39	98.81	9,072.8	65.9	20.1	-65.7	8.55	8.55	1.71	
9,110.0	15.47	98.20	9,102.9	64.8	27.5	-64.6	9.95	9.94	-1.97	
9,142.0	18.46	99.51	9,133.5	63.3	36.7	-63.0	9.42	9.34	4.09	
9,174.0	21.23	102.06	9,163.6	61.3	47.4	-60.9	9.07	8.66	7.97	
9,206.0	23.78	101.18	9,193.2	58.8	59.4	-58.4	8.04	7.97	-2.75	
9,237.0	26.92	99.25	9,221.2	56.5	72.5	-55.9	10.47	10.13	-6.23	
9,268.0	30.41	98.37	9,248.4	54.2	87.2	-53.5	11.34	11.26	-2.84	
9,299.0	33.80	97.23	9,274.6	52.0	103.5	-51.2	11.11	10.94	-3.68	
9,330.0	37.45	96.17	9,299.8	49.9	121.4	-48.9	11.94	11.77	-3.42	
9,362.0	40.30	94.68	9,324.7	48.0	141.4	-46.9	9.37	8.91	-4.66	
9,394.0	43.25	92.48	9,348.6	46.7	162.7	-45.4	10.29	9.22	-6.88	
9,425.0	46.96	91.34	9,370.5	45.9	184.6	-44.5	12.25	11.97	-3.68	
9,456.0	49.40	89.75	9,391.1	45.7	207.7	-44.1	8.75	7.87	-5.13	
9,487.0	51.66	88.88	9,410.8	46.0	231.6	-44.2	7.61	7.29	-2.81	
9,519.0	54.13	88.08	9,430.1	46.7	257.2	-44.7	7.97	7.72	-2.50	
9,550.0	57.80	87.65	9,447.5	47.7	282.8	-45.5	11.89	11.84	-1.39	
9,581.0	61.75	88.26	9,463.1	48.6	309.6	-46.2	12.85	12.74	1.97	
9,613.0	64.76	89.40	9,477.5	49.2	338.2	-46.6	9.93	9.41	3.56	
9,644.0	65.64	90.55	9,490.5	49.2	366.3	-46.4	4.40	2.84	3.71	
9,675.0	66.01	91.07	9,503.2	48.8	394.6	-45.8	1.94	1.19	1.68	
9,706.0	67.66	92.22	9,515.4	48.0	423.1	-44.7	6.32	5.32	3.71	
9,737.0	68.52	93.01	9,527.0	46.7	451.8	-43.2	3.64	2.77	2.55	
9,769.0	68.76	93.09	9,538.6	45.1	481.5	-41.4	0.79	0.75	0.25	
9,800.0	69.00	93.01	9,549.8	43.6	510.4	-39.6	0.81	0.77	-0.26	
9,831.0	69.46	93.27	9,560.8	42.0	539.4	-37.8	1.68	1.48	0.84	
9,862.0	70.17	93.45	9,571.5	40.3	568.4	-35.9	2.35	2.29	0.58	
9,893.0	70.26	96.43	9,582.0	37.7	597.5	-33.2	9.05	0.29	9.61	
9,924.0	69.77	100.57	9,592.6	33.4	626.3	-28.6	12.65	-1.58	13.35	
9,955.0	69.35	104.43	9,603.4	27.2	654.6	-22.1	11.75	-1.35	12.45	
9,986.0	68.98	108.56	9,614.4	18.9	682.4	-13.7	12.51	-1.19	13.32	
10,016.0	69.18	113.05	9,625.1	9.0	708.6	-3.5	14.00	0.67	14.97	
10,047.0	69.44	117.53	9,636.1	-3.4	734.8	9.0	13.55	0.84	14.45	
10,079.0	69.18	121.66	9,647.4	-18.2	760.8	24.0	12.10	-0.81	12.91	
10,110.0	69.05	123.24	9,658.5	-33.7	785.3	39.8	4.78	-0.42	5.10	
10,141.0	68.91	123.59	9,669.6	-49.7	809.4	55.9	1.15	-0.45	1.13	
10,172.0	68.83	123.59	9,680.8	-65.7	833.5	72.1	0.26	-0.26	0.00	



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Local Co-ordinate Reference: Well Buffalo West 2 State Com 2BS 4H
TVD Reference: RKB @ 3792.0usft (Latshaw #17)
MD Reference: RKB @ 3792.0usft (Latshaw #17)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,203.0	68.15	126.67	9,692.1	-82.2	857.1	88.8	9.50	-2.19	9.94
10,234.0	67.73	130.80	9,703.8	-100.2	879.5	107.0	12.42	-1.35	13.32
10,265.0	67.09	134.58	9,715.7	-119.6	900.5	126.5	11.45	-2.06	12.19
10,295.0	66.87	138.36	9,727.4	-139.6	919.5	146.7	11.62	-0.73	12.60
10,327.0	67.40	142.05	9,739.9	-162.3	938.4	169.5	10.75	1.66	11.53
10,357.0	68.34	145.65	9,751.2	-184.7	954.8	192.0	11.55	3.13	12.00
330' HL Crossed @ 10370.1' MD / 9756.0' TVD									
10,370.1	68.55	147.42	9,756.0	-194.9	961.5	202.3	12.66	1.62	13.50
10,389.0	68.89	149.96	9,762.8	-209.9	970.7	217.4	12.66	1.79	13.45
10,420.0	70.47	153.83	9,773.6	-235.6	984.4	243.1	12.77	5.10	12.48
10,451.0	72.58	157.08	9,783.4	-262.3	996.6	270.0	12.05	6.81	10.48
10,481.0	75.29	157.96	9,791.7	-288.9	1,007.6	296.7	9.46	9.03	2.93
10,512.0	76.30	158.40	9,799.3	-316.8	1,018.7	324.7	3.54	3.26	1.42
10,543.0	76.47	158.31	9,806.6	-344.8	1,029.9	352.7	0.62	0.55	-0.29
10,574.0	76.94	158.31	9,813.8	-372.9	1,041.0	380.9	1.52	1.52	0.00
10,606.0	76.96	158.92	9,821.0	-401.9	1,052.4	410.0	1.86	0.06	1.91
10,637.0	76.94	158.57	9,828.0	-430.1	1,063.3	438.2	1.10	-0.06	-1.13
10,668.0	77.00	158.66	9,835.0	-458.2	1,074.3	466.4	0.34	0.19	0.29
10,699.0	77.99	160.07	9,841.7	-486.5	1,085.0	494.8	5.47	3.19	4.55
10,731.0	78.43	162.44	9,848.2	-516.2	1,095.1	524.6	7.38	1.38	7.41
10,762.0	79.68	165.43	9,854.1	-545.4	1,103.5	553.9	10.29	4.03	9.65
10,793.0	80.06	168.15	9,859.6	-575.1	1,110.5	583.6	8.72	1.23	8.77
10,824.0	81.46	170.44	9,864.5	-605.2	1,116.1	613.7	8.58	4.52	7.39
10,855.0	82.74	173.69	9,868.8	-635.6	1,120.4	644.2	11.17	4.13	10.48
10,886.0	85.00	175.89	9,872.1	-666.3	1,123.2	674.9	10.15	7.29	7.10
10,916.0	87.62	178.17	9,874.0	-696.2	1,124.7	704.8	11.57	8.73	7.60
10,948.0	89.46	179.93	9,874.9	-728.1	1,125.3	736.8	7.96	5.75	5.50
10,979.0	90.34	180.19	9,874.9	-759.1	1,125.2	767.8	2.96	2.84	0.84
11,010.0	91.20	180.46	9,874.5	-790.1	1,125.0	798.8	2.91	2.77	0.87
11,043.0	92.10	179.93	9,873.6	-823.1	1,124.9	831.7	3.16	2.73	-1.61
11,074.0	92.96	180.90	9,872.2	-854.1	1,124.7	862.7	4.18	2.77	3.13
11,105.0	91.40	180.11	9,871.0	-885.1	1,124.4	893.7	5.64	-5.03	-2.55
11,136.0	90.58	180.02	9,870.5	-916.1	1,124.4	924.7	2.66	-2.65	-0.29
11,167.0	90.63	180.37	9,870.1	-947.1	1,124.3	955.7	1.14	0.16	1.13
11,198.0	90.63	180.28	9,869.8	-978.1	1,124.1	986.7	0.29	0.00	-0.29
11,291.0	90.21	179.58	9,869.1	-1,071.1	1,124.2	1,079.7	0.88	-0.45	-0.75
11,384.0	90.36	179.93	9,868.7	-1,164.1	1,124.6	1,172.7	0.41	0.16	0.38
11,477.0	88.60	179.84	9,869.5	-1,257.0	1,124.8	1,265.6	1.89	-1.89	-0.10
11,571.0	88.34	179.58	9,872.0	-1,351.0	1,125.3	1,359.6	0.39	-0.28	-0.28
11,664.0	87.95	180.02	9,875.0	-1,444.0	1,125.6	1,452.6	0.63	-0.42	0.47
11,757.0	87.70	179.67	9,878.5	-1,536.9	1,125.9	1,545.5	0.46	-0.27	-0.38
11,850.0	87.86	178.79	9,882.2	-1,629.8	1,127.1	1,638.4	0.96	0.17	-0.95
11,944.0	87.51	179.05	9,885.9	-1,723.7	1,128.9	1,732.3	0.46	-0.37	0.28

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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,037.0	89.66	180.72	9,888.2	-1,816.7	1,129.1	1,825.3	2.93	2.31	1.80
12,130.0	89.66	180.46	9,888.8	-1,909.7	1,128.1	1,918.3	0.28	0.00	-0.28
12,223.0	89.57	181.51	9,889.4	-2,002.7	1,126.5	2,011.3	1.13	-0.10	1.13
12,317.0	90.41	180.55	9,889.4	-2,096.6	1,124.8	2,105.2	1.36	0.89	-1.02
12,411.0	89.64	180.46	9,889.4	-2,190.6	1,124.0	2,199.2	0.82	-0.82	-0.10
12,504.0	89.40	179.23	9,890.2	-2,283.6	1,124.3	2,292.2	1.35	-0.26	-1.32
12,597.0	90.52	178.26	9,890.2	-2,376.6	1,126.3	2,385.2	1.59	1.20	-1.04
12,690.0	90.32	178.96	9,889.6	-2,469.6	1,128.5	2,478.2	0.78	-0.22	0.75
12,784.0	90.01	178.61	9,889.3	-2,563.6	1,130.5	2,572.2	0.50	-0.33	-0.37
12,878.0	89.79	178.70	9,889.5	-2,657.5	1,132.7	2,666.2	0.25	-0.23	0.10
12,971.0	89.81	179.49	9,889.8	-2,750.5	1,134.2	2,759.1	0.85	0.02	0.85
13,065.0	89.51	179.32	9,890.3	-2,844.5	1,135.2	2,853.1	0.37	-0.32	-0.18
13,158.0	89.15	179.32	9,891.4	-2,937.5	1,136.3	2,946.1	0.39	-0.39	0.00
13,251.0	88.76	179.58	9,893.1	-3,030.5	1,137.2	3,039.1	0.50	-0.42	0.28
13,344.0	88.32	180.46	9,895.5	-3,123.4	1,137.2	3,132.1	1.06	-0.47	0.95
13,438.0	87.88	180.81	9,898.6	-3,217.4	1,136.1	3,226.0	0.60	-0.47	0.37
13,531.0	87.29	179.23	9,902.5	-3,310.3	1,136.1	3,318.9	1.81	-0.63	-1.70
13,624.0	86.80	178.26	9,907.3	-3,403.2	1,138.1	3,411.8	1.17	-0.53	-1.04
13,717.0	87.07	178.09	9,912.3	-3,496.0	1,141.1	3,504.6	0.34	0.29	-0.18
13,811.0	87.57	178.00	9,916.7	-3,589.8	1,144.3	3,598.5	0.54	0.53	-0.10
13,905.0	87.59	177.56	9,920.7	-3,683.7	1,147.9	3,692.4	0.47	0.02	-0.47
13,998.0	88.71	177.03	9,923.7	-3,776.5	1,152.3	3,785.2	1.33	1.20	-0.57
14,091.0	89.07	177.82	9,925.5	-3,869.4	1,156.5	3,878.2	0.93	0.39	0.85
14,184.0	89.77	177.38	9,926.4	-3,962.3	1,160.4	3,971.1	0.89	0.75	-0.47
14,277.0	89.48	177.82	9,927.0	-4,055.2	1,164.3	4,064.0	0.57	-0.31	0.47
14,371.0	87.66	177.91	9,929.4	-4,149.1	1,167.8	4,158.0	1.94	-1.94	0.10
14,464.0	87.62	178.09	9,933.2	-4,242.0	1,171.0	4,250.9	0.20	-0.04	0.19
14,557.0	87.37	179.14	9,937.3	-4,334.9	1,173.3	4,343.8	1.16	-0.27	1.13
14,651.0	87.29	179.14	9,941.6	-4,428.8	1,174.7	4,437.7	0.09	-0.09	0.00
14,744.0	87.09	179.84	9,946.2	-4,521.6	1,175.5	4,530.5	0.78	-0.22	0.75
14,838.0	86.63	180.02	9,951.3	-4,615.5	1,175.6	4,624.4	0.53	-0.49	0.19
14,932.0	85.57	180.11	9,957.7	-4,709.3	1,175.5	4,718.2	1.13	-1.13	0.10
15,026.0	86.17	181.42	9,964.5	-4,803.0	1,174.3	4,811.9	1.53	0.64	1.39
15,097.0	85.13	181.34	9,969.9	-4,873.8	1,172.5	4,882.7	1.47	-1.46	-0.11
330' HL Crossed @ 15166.8' MD / 9975.8' TVD									
15,166.8	85.13	181.34	9,975.8	-4,943.3	1,170.9	4,952.2	0.00	0.00	0.00
TD @ 15180.0' MD / 9976.9' TVD									
15,180.0	85.13	181.34	9,976.9	-4,956.5	1,170.6	4,965.3	0.00	0.00	0.00



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MD Reference: RKB @ 3792.0usft (Latshaw #17)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,061.0	3,058.5	3.0	-40.3	MS Tie-in @ 3061.0' MD / 3058.5' TVD
10,370.1	9,756.0	-194.9	961.5	330' HL Crossed @ 10370.1' MD / 9756.0' TVD
15,166.8	9,975.8	-4,943.3	1,170.9	330' HL Crossed @ 15166.8' MD / 9975.8' TVD
15,180.0	9,976.9	-4,956.5	1,170.6	TD @ 15180.0' MD / 9976.9' TVD