



CHISHOLM
ENERGY

30-025-43829

Chisholm Energy Operating, LLC

Lea County, NM

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

Buffalo West 2 State Com 2BS 2H

Wellbore #1

Design: Wellbore #1

HOBBS OCD

APR 16 2018

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QES Survey Report

05 December, 2017



Company:	Chisholm Energy Operating, LLC	Local Co-ordinate Reference:	Well Buffalo West 2 State Com 2BS 2H
Project:	Lea County, NM	TVD Reference:	Well @ 3790.0usft (Latslaw #17)
Site:	Sec 2, T-19-S, R-33-E	MD Reference:	Well @ 3790.0usft (Latslaw #17)
Well:	Buffalo West 2 State Com 2BS 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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

Site	Sec 2, T-19-S, R-33-E		
Site Position:		Northing:	617,848.60 usft
From:	Map	Easting:	757,878.60 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 41' 47.519 N
		Longitude:	103° 37' 45.915 W
		Grid Convergence:	0.38 °

Well	Buffalo West 2 State Com 2BS 2H		
Well Position	+N/-S	0.0 usft	Northing: 617,820.40 usft
	+E/-W	0.0 usft	Easting: 755,189.80 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 41' 47.416 N
		Longitude:	103° 38' 17.381 W
		Ground Level:	3,764.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/13/2017	6.98	60.48	48,166.62392258

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	189.16	

Survey Program	Date	12/5/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
148.0	14,900.0	MWD Survey (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
First MWD Survey @ 148.0' MD / 148.0' TVD									
148.0	0.70	319.80	148.0	0.7	-0.6	-0.6	0.47	0.47	0.00
265.0	0.60	330.70	265.0	1.8	-1.3	-1.5	0.14	-0.09	9.32
325.0	0.70	330.00	325.0	2.4	-1.7	-2.1	0.17	0.17	-1.17
384.0	0.90	332.10	384.0	3.1	-2.1	-2.7	0.34	0.34	3.56
444.0	1.30	322.60	444.0	4.0	-2.7	-3.6	0.73	0.67	-15.83
503.0	1.30	314.40	503.0	5.0	-3.6	-4.4	0.32	0.00	-13.90
562.0	1.10	306.30	561.9	5.8	-4.5	-5.0	0.44	-0.34	-13.73
622.0	1.50	303.30	621.9	6.6	-5.7	-5.6	0.68	0.67	-5.00
712.0	1.50	292.60	711.9	7.7	-7.7	-6.4	0.31	0.00	-11.89

Company:	Chisholm Energy Operating, LLC	Local Co-ordinate Reference:	Well Buffalo West 2 State Com 2BS 2H
Project:	Lea County, NM	TVD Reference:	Well @ 3790.0usft (Latashaw #17)
Site:	Sec 2, T-19-S, R-33-E	MD Reference:	Well @ 3790.0usft (Latashaw #17)
Well:	Buffalo West 2 State Com 2BS 2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	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)
803.0	1.90	282.20	802.9	8.5	-10.3	-6.7	0.55	0.44	-11.43
895.0	1.60	292.20	894.8	9.3	-13.0	-7.1	0.46	-0.33	10.87
988.0	2.00	289.40	987.8	10.3	-15.7	-7.7	0.44	0.43	-3.01
1,082.0	1.20	315.60	1,081.7	11.6	-17.9	-8.6	1.13	-0.85	27.87
1,175.0	1.70	324.40	1,174.7	13.4	-19.4	-10.1	0.59	0.54	9.46
1,268.0	2.20	319.80	1,267.6	15.9	-21.4	-12.3	0.56	0.54	-4.95
1,361.0	3.10	314.20	1,360.5	19.0	-24.3	-14.9	1.01	0.97	-6.02
1,454.0	2.80	317.20	1,453.4	22.4	-27.7	-17.7	0.36	-0.32	3.23
1,494.0	2.80	325.30	1,493.4	23.9	-28.9	-19.0	0.99	0.00	20.25
1,564.0	2.70	325.10	1,563.3	26.7	-30.8	-21.4	0.14	-0.14	-0.29
1,657.0	1.10	335.00	1,656.2	29.3	-32.5	-23.8	1.75	-1.72	10.65
1,750.0	1.10	342.50	1,749.2	31.0	-33.1	-25.3	0.15	0.00	8.06
1,844.0	0.80	347.30	1,843.2	32.5	-33.5	-26.7	0.33	-0.32	5.11
1,937.0	0.90	353.10	1,936.2	33.8	-33.7	-28.0	0.14	0.11	6.24
2,030.0	1.10	348.10	2,029.2	35.4	-34.0	-29.6	0.23	0.22	-5.38
2,123.0	0.70	291.40	2,122.2	36.5	-34.7	-30.5	0.99	-0.43	-60.97
2,216.0	0.60	288.90	2,215.2	36.9	-35.7	-30.7	0.11	-0.11	-2.69
2,310.0	0.80	294.90	2,309.2	37.3	-36.8	-31.0	0.23	0.21	6.38
2,402.0	0.50	299.30	2,401.2	37.8	-37.7	-31.3	0.33	-0.33	4.78
2,497.0	0.70	341.50	2,496.2	38.5	-38.3	-31.9	0.50	0.21	44.42
2,590.0	0.60	332.50	2,589.1	39.5	-38.7	-32.8	0.15	-0.11	-9.68
2,683.0	0.90	1.10	2,682.1	40.7	-38.9	-33.9	0.51	0.32	30.75
2,776.0	1.10	246.70	2,775.1	41.0	-39.7	-34.2	1.81	0.22	-123.01
2,868.0	1.10	249.40	2,867.1	40.4	-41.3	-33.3	0.06	0.00	2.93
2,962.0	0.90	248.80	2,961.1	39.8	-42.9	-32.5	0.21	-0.21	-0.64
3,054.0	1.00	268.00	3,053.1	39.5	-44.3	-31.9	0.36	0.11	20.87
3,147.0	0.80	244.40	3,146.1	39.2	-45.7	-31.4	0.45	-0.22	-25.38
3,240.0	0.70	248.70	3,239.1	38.7	-46.8	-30.8	0.12	-0.11	4.62
3,334.0	0.70	262.40	3,333.1	38.4	-47.9	-30.3	0.18	0.00	14.57
3,428.0	0.70	262.20	3,427.1	38.3	-49.1	-30.0	0.00	0.00	-0.21
3,520.0	0.70	230.20	3,519.0	37.8	-50.1	-29.4	0.42	0.00	-34.78
3,613.0	0.50	235.50	3,612.0	37.2	-50.8	-28.7	0.22	-0.22	5.70
3,706.0	0.90	242.00	3,705.0	36.7	-51.8	-27.9	0.44	0.43	6.99
3,800.0	0.80	256.20	3,799.0	36.2	-53.1	-27.2	0.25	-0.11	15.11
3,892.0	0.80	258.10	3,891.0	35.9	-54.4	-26.8	0.03	0.00	2.07
3,987.0	0.70	266.00	3,986.0	35.7	-55.6	-26.4	0.15	-0.11	8.32
4,082.0	0.90	240.00	4,081.0	35.3	-56.8	-25.8	0.43	0.21	-27.37
4,175.0	0.90	254.60	4,174.0	34.7	-58.2	-25.0	0.25	0.00	15.70
4,269.0	0.50	251.80	4,268.0	34.4	-59.3	-24.5	0.43	-0.43	-2.98
4,363.0	0.30	158.80	4,362.0	34.0	-59.6	-24.1	0.63	-0.21	-98.94
4,456.0	0.70	265.50	4,455.0	33.8	-60.0	-23.8	0.90	0.43	114.73
4,550.0	0.70	259.90	4,549.0	33.6	-61.2	-23.5	0.07	0.00	-5.96
4,644.0	0.60	236.20	4,643.0	33.2	-62.1	-22.9	0.30	-0.11	-25.21

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4,737.0	0.80	234.80	4,736.0	32.6	-63.1	-22.1	0.22	0.22	-1.51
4,830.0	1.00	237.60	4,828.9	31.8	-64.3	-21.2	0.22	0.22	3.01
4,924.0	1.00	238.80	4,922.9	30.9	-65.7	-20.1	0.02	0.00	1.28
5,017.0	1.00	242.90	5,015.9	30.1	-67.1	-19.1	0.08	0.00	4.41
5,110.0	0.80	259.40	5,108.9	29.6	-68.5	-18.4	0.35	-0.22	17.74
5,204.0	0.90	239.70	5,202.9	29.2	-69.7	-17.7	0.33	0.11	-20.96
5,288.0	1.00	237.40	5,286.9	28.4	-70.9	-16.8	0.13	0.12	-2.74
5,422.0	1.00	232.20	5,420.9	27.1	-72.8	-15.1	0.07	0.00	-3.88
5,516.0	0.80	235.00	5,514.8	26.2	-74.0	-14.1	0.22	-0.21	2.98
5,610.0	0.80	237.10	5,608.8	25.5	-75.1	-13.2	0.03	0.00	2.23
5,702.0	0.70	252.80	5,700.8	25.0	-76.2	-12.5	0.25	-0.11	17.07
5,795.0	0.50	236.10	5,793.8	24.6	-77.1	-12.0	0.28	-0.22	-17.96
5,888.0	0.70	220.10	5,886.8	23.9	-77.8	-11.2	0.28	0.22	-17.20
5,981.0	0.80	226.50	5,979.8	23.0	-78.6	-10.2	0.14	0.11	6.88
6,075.0	0.80	232.30	6,073.8	22.2	-79.6	-9.2	0.09	0.00	6.17
6,170.0	0.80	217.40	6,168.8	21.2	-80.5	-8.1	0.22	0.00	-15.68
6,262.0	0.80	221.60	6,260.8	20.2	-81.4	-7.0	0.06	0.00	4.57
6,356.0	0.80	219.10	6,354.8	19.2	-82.2	-5.9	0.04	0.00	-2.66
6,450.0	0.70	221.40	6,448.8	18.3	-83.0	-4.9	0.11	-0.11	2.45
6,543.0	0.90	227.00	6,541.8	17.4	-83.9	-3.8	0.23	0.22	6.02
6,637.0	0.90	246.60	6,635.7	16.6	-85.1	-2.8	0.33	0.00	20.85
6,730.0	1.20	254.60	6,728.7	16.0	-86.7	-2.0	0.36	0.32	8.60
6,823.0	1.10	255.80	6,821.7	15.6	-88.5	-1.3	0.11	-0.11	1.29
6,916.0	1.30	260.80	6,914.7	15.2	-90.4	-0.6	0.24	0.22	5.38
7,010.0	1.30	262.50	7,008.7	14.9	-92.6	0.1	0.04	0.00	1.81
7,103.0	1.40	262.70	7,101.6	14.6	-94.7	0.7	0.11	0.11	0.22
7,197.0	1.30	258.10	7,195.6	14.2	-96.9	1.4	0.16	-0.11	-4.89
7,292.0	1.40	260.80	7,290.6	13.8	-99.1	2.2	0.12	0.11	2.84
7,386.0	1.40	269.00	7,384.6	13.6	-101.4	2.7	0.21	0.00	8.72
7,479.0	1.50	264.50	7,477.5	13.5	-103.7	3.2	0.16	0.11	-4.84
7,572.0	1.50	263.70	7,570.5	13.2	-106.2	3.9	0.02	0.00	-0.86
7,665.0	1.50	254.60	7,663.5	12.8	-108.5	4.7	0.26	0.00	-9.78
7,759.0	1.40	244.30	7,757.4	11.9	-110.8	5.9	0.30	-0.11	-10.96
7,852.0	0.80	236.60	7,850.4	11.1	-112.3	6.9	0.66	-0.65	-8.28
7,945.0	1.10	228.20	7,943.4	10.1	-113.5	8.1	0.35	0.32	-9.03
8,039.0	1.30	211.60	8,037.4	8.6	-114.8	9.8	0.42	0.21	-17.66
8,134.0	1.60	214.10	8,132.4	6.6	-116.1	12.0	0.32	0.32	2.63
8,229.0	1.80	213.80	8,227.3	4.3	-117.7	14.5	0.21	0.21	-0.32
8,325.0	0.90	265.00	8,323.3	2.9	-119.2	16.1	1.48	-0.94	53.33
8,419.0	0.80	271.70	8,417.3	2.9	-120.6	16.3	0.15	-0.11	7.13
8,515.0	0.10	291.50	8,513.3	3.0	-121.4	16.4	0.74	-0.73	20.63
8,610.0	0.10	99.20	8,608.3	3.0	-121.4	16.4	0.21	0.00	176.53
8,706.0	0.30	24.80	8,704.3	3.2	-121.2	16.1	0.30	0.21	-77.50



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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)
8,806.0	0.80	10.80	8,804.3	4.1	-120.9	15.2	0.51	0.50	-14.00
8,904.0	0.90	13.80	8,902.3	5.5	-120.6	13.7	0.11	0.10	3.06
9,000.0	0.80	9.90	8,998.3	6.9	-120.3	12.3	0.12	-0.10	-4.06
9,077.0	0.70	3.30	9,075.2	7.9	-120.2	11.3	0.17	-0.13	-8.57
9,168.0	7.80	279.60	9,166.0	9.5	-126.3	10.7	8.52	7.80	-91.98
9,200.0	13.10	282.50	9,197.4	10.7	-132.0	10.5	16.64	16.56	9.06
9,232.0	17.80	281.90	9,228.3	12.4	-140.3	10.0	14.70	14.69	-1.88
9,263.0	22.20	278.20	9,257.4	14.3	-150.7	9.9	14.76	14.19	-11.94
9,295.0	26.70	274.80	9,286.5	15.7	-163.9	10.6	14.73	14.06	-10.63
9,327.0	30.20	273.10	9,314.6	16.8	-179.1	12.0	11.23	10.94	-5.31
9,358.0	33.50	272.50	9,341.0	17.6	-195.4	13.8	10.69	10.65	-1.94
9,390.0	34.90	273.20	9,367.4	18.5	-213.4	15.8	4.54	4.38	2.19
9,422.0	38.20	273.10	9,393.1	19.5	-232.4	17.7	10.31	10.31	-0.31
9,454.0	42.20	272.30	9,417.6	20.5	-253.1	20.1	12.60	12.50	-2.50
9,485.0	47.00	270.90	9,439.6	21.1	-274.8	23.0	15.80	15.48	-4.52
9,516.0	49.80	269.30	9,460.2	21.1	-298.0	26.6	9.82	9.03	-5.16
9,548.0	50.20	268.90	9,480.8	20.7	-322.5	30.9	1.57	1.25	-1.25
9,579.0	51.80	268.50	9,500.3	20.2	-346.6	35.3	5.26	5.16	-1.29
9,611.0	56.40	265.40	9,519.1	18.8	-372.5	40.8	16.37	14.38	-9.69
9,643.0	58.10	259.70	9,536.4	15.3	-399.1	48.5	15.89	5.31	-17.81
9,675.0	58.20	252.70	9,553.3	8.8	-425.5	59.1	18.58	0.31	-21.88
9,707.0	58.70	248.20	9,570.0	-0.3	-451.2	72.2	12.08	1.56	-14.06
9,737.0	58.90	247.60	9,585.6	-10.0	-474.9	85.5	1.84	0.67	-2.00
9,769.0	59.10	247.20	9,602.0	-20.5	-500.3	99.9	1.24	0.63	-1.25
9,800.0	59.50	245.30	9,617.9	-31.3	-524.7	114.4	5.43	1.29	-6.13
9,831.0	60.20	240.60	9,633.5	-43.5	-548.5	130.2	13.30	2.26	-15.16
9,862.0	60.40	234.60	9,648.8	-57.9	-571.2	148.1	16.82	0.65	-19.35
9,893.0	61.30	229.10	9,663.9	-74.6	-592.5	168.0	15.76	2.90	-17.74
9,923.0	62.20	225.40	9,678.1	-92.5	-611.9	188.8	11.27	3.00	-12.33
9,956.0	62.40	224.40	9,693.5	-113.2	-632.5	212.5	2.75	0.61	-3.03
9,988.0	62.50	223.90	9,708.3	-133.6	-652.3	235.7	1.42	0.31	-1.56
10,020.0	63.80	220.10	9,722.7	-154.8	-671.4	259.7	11.35	4.06	-11.88
10,052.0	65.60	215.40	9,736.4	-177.7	-689.1	285.1	14.42	5.63	-14.69
10,083.0	67.50	210.80	9,748.8	-201.5	-704.6	311.1	14.93	6.13	-14.84
Crossed 330' HL @ 10096.7' MD / 9753.9' TVD									
10,096.7	68.16	209.47	9,753.9	-212.5	-711.0	322.9	10.21	4.79	-9.73
10,114.0	69.00	207.80	9,760.2	-226.6	-718.7	338.1	10.21	4.88	-9.63
10,146.0	69.10	207.10	9,771.7	-253.1	-732.5	366.5	2.07	0.31	-2.19
10,178.0	68.70	206.80	9,783.2	-279.7	-746.0	394.9	1.53	-1.25	-0.94
10,209.0	69.30	205.80	9,794.3	-305.7	-758.8	422.6	3.58	1.94	-3.23
10,241.0	72.20	202.20	9,804.9	-333.3	-771.1	451.8	13.96	9.06	-11.25
10,273.0	75.60	198.60	9,813.7	-362.1	-781.8	481.9	15.16	10.63	-11.25
10,305.0	78.10	196.20	9,821.0	-391.8	-791.1	512.8	10.69	7.81	-7.50
10,336.0	78.40	195.50	9,827.3	-421.0	-799.4	542.9	2.41	0.97	-2.26

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 2H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Buffalo West 2 State Com 2BS 2H
TVD Reference: Well @ 3790.0usft (Latshaw #17)
MD Reference: Well @ 3790.0usft (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)
10,368.0	78.30	195.50	9,833.8	-451.2	-807.8	574.0	0.31	-0.31	0.00
10,400.0	78.40	195.50	9,840.3	-481.4	-816.2	605.2	0.31	0.31	0.00
10,430.0	79.00	194.80	9,846.1	-509.8	-823.9	634.5	3.04	2.00	-2.33
10,462.0	80.40	190.70	9,851.9	-540.5	-830.8	665.9	13.34	4.38	-12.81
10,494.0	82.70	186.90	9,856.6	-571.8	-835.6	697.5	13.77	7.19	-11.88
10,525.0	84.60	183.30	9,860.0	-602.5	-838.4	728.2	13.07	6.13	-11.61
10,557.0	86.20	181.20	9,862.6	-634.3	-839.6	759.9	8.23	5.00	-6.56
10,589.0	88.80	179.00	9,864.0	-666.3	-839.7	791.5	10.64	8.13	-6.88
10,644.0	89.60	178.70	9,864.7	-721.3	-838.6	845.6	1.55	1.45	-0.55
10,738.0	89.20	178.50	9,865.7	-815.2	-836.3	938.0	0.48	-0.43	-0.21
10,834.0	88.80	177.90	9,867.4	-911.2	-833.3	1,032.2	0.75	-0.42	-0.63
10,928.0	88.50	178.00	9,869.6	-1,005.1	-829.9	1,124.4	0.34	-0.32	0.11
11,024.0	90.10	177.70	9,870.8	-1,101.0	-826.3	1,218.5	1.70	1.67	-0.31
11,119.0	92.00	178.50	9,869.0	-1,195.9	-823.2	1,311.7	2.17	2.00	0.84
11,214.0	92.50	179.20	9,865.3	-1,290.8	-821.2	1,405.1	0.91	0.53	0.74
11,309.0	90.70	181.00	9,862.7	-1,385.8	-821.4	1,498.9	2.68	-1.89	1.89
11,403.0	89.10	181.90	9,862.8	-1,479.8	-823.8	1,592.0	1.95	-1.70	0.96
11,498.0	88.90	181.70	9,864.5	-1,574.7	-826.8	1,686.2	0.30	-0.21	-0.21
11,592.0	88.60	181.90	9,866.5	-1,668.6	-829.7	1,779.4	0.38	-0.32	0.21
11,687.0	88.70	182.30	9,868.8	-1,763.5	-833.2	1,873.7	0.43	0.11	0.42
11,782.0	86.50	181.90	9,872.7	-1,858.4	-836.7	1,967.9	2.35	-2.32	-0.42
11,877.0	84.60	180.60	9,880.1	-1,953.1	-838.8	2,061.7	2.42	-2.00	-1.37
11,972.0	85.50	178.40	9,888.3	-2,047.7	-837.9	2,155.0	2.49	0.95	-2.32
12,066.0	88.00	176.30	9,893.6	-2,141.5	-833.6	2,246.8	3.47	2.66	-2.23
12,161.0	91.40	175.80	9,894.1	-2,236.2	-827.0	2,339.4	3.62	3.58	-0.53
12,256.0	94.10	176.60	9,889.6	-2,330.9	-820.8	2,431.8	2.96	2.84	0.84
12,352.0	90.50	178.60	9,885.7	-2,426.7	-816.7	2,525.8	4.29	-3.75	2.08
12,446.0	90.70	178.80	9,884.7	-2,520.7	-814.6	2,618.2	0.30	0.21	0.21
12,541.0	90.90	179.00	9,883.4	-2,615.6	-812.8	2,711.7	0.30	0.21	0.21
12,637.0	88.50	179.70	9,883.9	-2,711.6	-811.7	2,806.3	2.60	-2.50	0.73
12,731.0	88.50	179.50	9,886.4	-2,805.6	-811.0	2,898.9	0.21	0.00	-0.21
12,825.0	88.50	179.20	9,888.8	-2,899.6	-810.0	2,991.5	0.32	0.00	-0.32
12,920.0	88.40	179.20	9,891.4	-2,994.5	-808.6	3,085.1	0.11	-0.11	0.00
13,014.0	90.40	180.40	9,892.4	-3,088.5	-808.3	3,177.8	2.48	2.13	1.28
13,109.0	91.30	180.90	9,891.0	-3,183.5	-809.4	3,271.7	1.08	0.95	0.53
13,202.0	89.40	181.20	9,890.4	-3,276.5	-811.1	3,363.8	2.07	-2.04	0.32
13,300.0	89.40	181.20	9,891.4	-3,374.4	-813.2	3,460.8	0.00	0.00	0.00
13,394.0	89.30	181.50	9,892.5	-3,468.4	-815.4	3,554.0	0.34	-0.11	0.32
13,489.0	90.00	181.20	9,893.1	-3,563.4	-817.6	3,648.1	0.80	0.74	-0.32
13,582.0	89.70	181.00	9,893.3	-3,656.4	-819.4	3,740.2	0.39	-0.32	-0.22
13,677.0	90.00	180.70	9,893.6	-3,751.3	-820.8	3,834.2	0.45	0.32	-0.32
13,771.0	90.60	181.00	9,893.1	-3,845.3	-822.2	3,927.2	0.71	0.64	0.32
13,866.0	90.70	181.00	9,892.0	-3,940.3	-823.9	4,021.2	0.11	0.11	0.00

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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)
13,962.0	89.70	179.80	9,891.7	-4,036.3	-824.5	4,116.1	1.63	-1.04	-1.25
14,057.0	90.10	179.60	9,891.8	-4,131.3	-824.0	4,209.8	0.47	0.42	-0.21
14,153.0	90.20	179.80	9,891.6	-4,227.3	-823.5	4,304.5	0.23	0.10	0.21
14,248.0	90.60	179.70	9,890.9	-4,322.3	-823.1	4,398.2	0.43	0.42	-0.11
14,343.0	90.90	179.50	9,889.7	-4,417.3	-822.4	4,491.9	0.38	0.32	-0.21
14,437.0	89.20	178.90	9,889.6	-4,511.3	-821.1	4,584.5	1.92	-1.81	-0.64
14,531.0	89.60	178.50	9,890.6	-4,605.2	-819.0	4,676.9	0.60	0.43	-0.43
14,627.0	90.80	177.90	9,890.3	-4,701.2	-816.0	4,771.1	1.40	1.25	-0.63
14,722.0	89.80	177.50	9,889.8	-4,796.1	-812.2	4,864.2	1.13	-1.05	-0.42
14,817.0	90.60	177.50	9,889.4	-4,891.0	-808.0	4,957.3	0.84	0.84	0.00
14,830.0	90.70	177.50	9,889.3	-4,904.0	-807.5	4,970.0	0.77	0.77	0.00
Crossed 330' HL @ 14882.4' MD / 9888.6' TVD									
14,882.4	90.70	177.50	9,888.6	-4,956.4	-805.2	5,021.3	0.00	0.00	0.00
TD @ 14900.0' MD / 9888.4' TVD									
14,900.0	90.70	177.50	9,888.4	-4,973.9	-804.4	5,038.6	0.00	0.00	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
148.0	148.0	0.7	-0.6	First MWD Survey @ 148.0' MD / 148.0' TVD
10,096.7	9,753.9	-212.5	-711.0	Crossed 330' HL @ 10096.7' MD / 9753.9' TVD
14,882.4	9,888.6	-4,956.4	-805.2	Crossed 330' HL @ 14882.4' MD / 9888.6' TVD
14,900.0	9,888.4	-4,973.9	-804.4	TD @ 14900.0' MD / 9888.4' TVD