

Grizzly Operating

Weld Co., Co.

Sec.18-T6N-R65W

Goza 18-2Ae

Wellbore #1

Survey: Survey #1

Standard Survey Report

16 November, 2015

Archer

Survey Report

Company:	Grizzly Operating	Local Co-ordinate Reference:	Site Sec.18-T6N-R65W
Project:	Weld Co., Co.	TVD Reference:	Well @ 4770.00usft
Site:	Sec.18-T6N-R65W	MD Reference:	Well @ 4770.00usft
Well:	Goza 18-2Ae	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

Project	Weld Co., Co.		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		Sec.18-T6N-R65W			
Site Position:		Northing:	1,420,797.129 usft	Latitude:	40° 29' 8.628 N
From:	Lat/Long	Easting:	3,222,687.612 usft	Longitude:	104° 41' 57.876 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.52 °

Well	Goza 18-2Ae					
Well Position	+N/-S	-0.01 usft	Northing:	1,420,797.121 usft	Latitude:	40° 29' 8.628 N
	+E/-W	0.00 usft	Easting:	3,222,687.612 usft	Longitude:	104° 41' 57.876 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,756.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2015/11/03	8.24	66.98	52,721

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	-0.01	0.00	199.14	

Survey Program	Date	2015/11/16			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
115.00	7,640.00	Survey #1 (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)	
0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	
First Archer Survey										
115.00	0.80	234.50	115.00	-0.47	-0.65	0.65	0.70	0.70	0.00	
175.00	1.10	248.70	174.99	-0.93	-1.53	1.37	0.63	0.50	23.67	
234.00	1.30	251.60	233.98	-1.34	-2.69	2.15	0.35	0.34	4.92	
295.00	1.70	259.60	294.95	-1.73	-4.24	3.01	0.74	0.66	13.11	
355.00	2.00	267.00	354.92	-1.94	-6.16	3.85	0.64	0.50	12.33	
416.00	2.20	273.30	415.88	-1.93	-8.39	4.57	0.50	0.33	10.33	
524.00	2.20	275.90	523.80	-1.60	-12.52	5.61	0.09	0.00	2.41	
598.00	2.40	276.80	597.74	-1.27	-15.48	6.26	0.27	0.27	1.22	
722.00	4.60	201.00	721.56	-5.60	-19.84	11.79	3.74	1.77	-61.13	
817.00	5.90	190.40	816.16	-13.96	-22.09	20.43	1.70	1.37	-11.16	
910.00	7.50	193.10	908.52	-24.58	-24.32	31.19	1.75	1.72	2.90	

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Survey Report

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Site:	Sec.18-T6N-R65W	MD Reference:	Well @ 4770.00usft
Well:	Goza 18-2Ae	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

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)	
1,005.00	9.60	201.30	1,002.46	-38.00	-28.61	45.27	2.55	2.21	8.63	
1,101.00	11.00	193.50	1,096.92	-54.36	-33.65	62.39	2.06	1.46	-8.12	
1,195.00	12.10	197.30	1,189.01	-72.49	-38.68	81.16	1.42	1.17	4.04	
1,290.00	13.50	197.30	1,281.65	-92.59	-44.94	102.19	1.47	1.47	0.00	
1,384.00	15.40	199.60	1,372.67	-114.82	-52.39	125.64	2.11	2.02	2.45	
1,478.00	17.30	199.90	1,462.87	-139.72	-61.33	152.10	2.02	2.02	0.32	
1,573.00	19.30	202.40	1,553.06	-167.52	-72.12	181.90	2.26	2.11	2.63	
1,665.00	20.80	201.00	1,639.48	-196.83	-83.77	213.41	1.71	1.63	-1.52	
1,759.00	20.90	195.80	1,727.34	-228.55	-94.32	246.83	1.97	0.11	-5.53	
1,854.00	20.80	193.50	1,816.12	-261.26	-102.87	280.54	0.87	-0.11	-2.42	
1,948.00	21.80	194.30	1,903.69	-294.40	-111.08	314.54	1.11	1.06	0.85	
2,043.00	20.40	193.40	1,992.32	-327.60	-119.27	348.59	1.51	-1.47	-0.95	
2,136.00	20.90	198.10	2,079.35	-359.14	-128.18	381.31	1.86	0.54	5.05	
2,232.00	21.00	199.90	2,169.01	-391.59	-139.36	415.63	0.68	0.10	1.87	
2,327.00	23.30	201.40	2,256.99	-425.09	-152.01	451.43	2.49	2.42	1.58	
2,422.00	21.50	201.30	2,344.82	-458.81	-165.19	487.60	1.90	-1.89	-0.11	
2,517.00	21.90	199.50	2,433.09	-491.73	-177.43	522.71	0.82	0.42	-1.89	
2,611.00	22.80	198.20	2,520.03	-525.56	-188.97	558.46	1.09	0.96	-1.38	
2,707.00	21.20	199.40	2,609.03	-559.60	-200.54	594.41	1.73	-1.67	1.25	
2,802.00	22.50	199.10	2,697.21	-592.98	-212.20	629.77	1.37	1.37	-0.32	
2,897.00	21.30	199.80	2,785.35	-626.40	-223.99	665.20	1.29	-1.26	0.74	
2,991.00	24.00	196.60	2,872.10	-660.79	-235.24	701.38	3.16	2.87	-3.40	
3,086.00	24.60	195.20	2,958.68	-698.38	-245.94	740.41	0.88	0.63	-1.47	
3,181.00	22.50	200.70	3,045.77	-734.48	-257.56	778.31	3.20	-2.21	5.79	
3,277.00	21.80	201.30	3,134.69	-768.27	-270.52	814.49	0.77	-0.73	0.62	
3,372.00	21.10	200.30	3,223.11	-800.74	-282.86	849.21	0.83	-0.74	-1.05	
3,467.00	18.50	199.30	3,312.48	-831.01	-293.78	881.39	2.76	-2.74	-1.05	
3,562.00	19.80	200.30	3,402.22	-860.33	-304.34	912.55	1.41	1.37	1.05	
3,657.00	19.00	198.70	3,491.83	-890.07	-314.88	944.10	1.01	-0.84	-1.68	
3,752.00	19.30	199.60	3,581.57	-919.50	-325.11	975.26	0.44	0.32	0.95	
3,847.00	19.70	200.70	3,671.12	-949.27	-336.04	1,006.97	0.57	0.42	1.16	
3,941.00	22.90	201.20	3,758.69	-981.15	-348.25	1,041.09	3.41	3.40	0.53	
4,036.00	24.60	200.30	3,845.64	-1,016.93	-361.80	1,079.34	1.83	1.79	-0.95	
4,131.00	24.60	199.10	3,932.02	-1,054.16	-375.13	1,118.88	0.53	0.00	-1.26	
4,226.00	23.70	197.80	4,018.71	-1,091.03	-387.44	1,157.74	1.10	-0.95	-1.37	
4,321.00	22.70	199.10	4,106.02	-1,126.53	-399.27	1,195.16	1.18	-1.05	1.37	
4,417.00	21.50	198.30	4,194.97	-1,160.74	-410.86	1,231.27	1.29	-1.25	-0.83	
4,510.00	22.20	199.20	4,281.29	-1,193.51	-421.99	1,265.88	0.83	0.75	0.97	
4,605.00	21.00	198.60	4,369.62	-1,226.59	-433.32	1,300.86	1.28	-1.26	-0.63	
4,697.00	21.80	199.70	4,455.27	-1,258.30	-444.33	1,334.42	0.97	0.87	1.20	
4,791.00	20.50	198.20	4,542.94	-1,290.37	-455.36	1,368.33	1.50	-1.38	-1.60	
4,885.00	22.30	200.50	4,630.46	-1,322.72	-466.75	1,402.63	2.11	1.91	2.45	
4,980.00	20.00	202.10	4,719.05	-1,354.66	-479.17	1,436.87	2.50	-2.42	1.68	
5,074.00	21.20	198.80	4,807.04	-1,385.64	-490.70	1,469.93	1.78	1.28	-3.51	
5,169.00	21.30	198.80	4,895.58	-1,418.24	-501.80	1,504.36	0.11	0.11	0.00	
5,263.00	20.80	197.60	4,983.31	-1,450.31	-512.34	1,538.11	0.70	-0.53	-1.28	
5,358.00	21.20	198.10	5,072.00	-1,482.71	-522.78	1,572.15	0.46	0.42	0.53	
5,454.00	19.70	197.70	5,161.95	-1,514.63	-533.09	1,605.68	1.57	-1.56	-0.42	
5,548.00	17.50	197.50	5,251.03	-1,543.20	-542.16	1,635.65	2.34	-2.34	-0.21	
5,643.00	16.10	198.20	5,341.98	-1,569.34	-550.57	1,663.10	1.49	-1.47	0.74	
5,737.00	14.00	200.30	5,432.75	-1,592.39	-558.59	1,687.50	2.31	-2.23	2.23	
5,832.00	14.10	197.80	5,524.91	-1,614.19	-566.11	1,710.56	0.65	0.11	-2.63	
5,926.00	13.00	200.00	5,616.29	-1,635.02	-573.23	1,732.58	1.29	-1.17	2.34	
6,018.00	12.00	195.90	5,706.11	-1,653.95	-579.39	1,752.48	1.45	-1.09	-4.46	

Archer

Survey Report

Company:	Grizzly Operating	Local Co-ordinate Reference:	Site Sec.18-T6N-R65W
Project:	Weld Co., Co.	TVD Reference:	Well @ 4770.00usft
Site:	Sec.18-T6N-R65W	MD Reference:	Well @ 4770.00usft
Well:	Goza 18-2Ae	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDMDBBW

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)	
6,113.00	11.30	199.00	5,799.15	-1,672.24	-585.12	1,771.64	0.99	-0.74	3.26	
6,208.00	8.90	204.30	5,892.68	-1,687.75	-591.18	1,788.27	2.71	-2.53	5.58	
6,303.00	7.60	202.20	5,986.69	-1,700.26	-596.58	1,801.87	1.40	-1.37	-2.21	
6,398.00	6.90	202.90	6,080.93	-1,711.33	-601.17	1,813.83	0.74	-0.74	0.74	
6,493.00	6.20	208.80	6,175.31	-1,721.09	-605.86	1,824.59	1.02	-0.74	6.21	
6,586.00	3.80	197.80	6,267.95	-1,728.42	-609.23	1,832.62	2.77	-2.58	-11.83	
6,681.00	2.20	201.70	6,362.82	-1,733.11	-610.86	1,837.59	1.70	-1.68	4.11	
6,776.00	0.30	358.50	6,457.80	-1,734.56	-611.54	1,839.18	2.61	-2.00	165.05	
6,871.00	0.10	1.40	6,552.80	-1,734.23	-611.55	1,838.87	0.21	-0.21	3.05	
6,966.00	0.50	18.10	6,647.80	-1,733.75	-611.42	1,838.37	0.43	0.42	17.58	
7,062.00	0.40	55.30	6,743.79	-1,733.16	-611.01	1,837.68	0.31	-0.10	38.75	
7,157.00	0.40	28.30	6,838.79	-1,732.68	-610.58	1,837.09	0.20	0.00	-28.42	
7,252.00	0.50	47.70	6,933.79	-1,732.11	-610.12	1,836.40	0.19	0.11	20.42	
7,347.00	1.60	82.20	7,028.77	-1,731.65	-608.50	1,835.43	1.29	1.16	36.32	
7,443.00	1.50	98.80	7,124.74	-1,731.66	-605.93	1,834.60	0.48	-0.10	17.29	
7,538.00	1.30	104.50	7,219.71	-1,732.12	-603.66	1,834.29	0.26	-0.21	6.00	
Goza 18-2Ae tgt										
7,588.18	1.30	119.84	7,269.87	-1,732.55	-602.61	1,834.35	0.69	-0.01	30.58	
Last Archer Survey										
7,592.00	1.30	121.00	7,273.69	-1,732.59	-602.54	1,834.36	0.69	0.09	30.22	
PTB										
7,640.00	1.30	121.00	7,321.68	-1,733.15	-601.60	1,834.59	0.00	0.00	0.00	

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
115.00	115.00	-0.47	-0.65	First Archer Survey	
7,592.00	7,273.69	-1,732.59	-602.54	Last Archer Survey	
7,640.00	7,321.68	-1,733.15	-601.60	PTB	

Checked By: _____	Approved By: _____	Date: _____
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