

LEAM Drilling Systems LLC

Survey Report

DEC 27 2017

30-015-44090

Company:	Rockcliff Energy	Well Name:	Well El Toro Gigante 23 #211H
Project:	Eddy County, NM	Well Depth:	GE 2996' + KB 25' @ 3021.00usft
Site:	Toro Pad	Well Type:	GE 2996' + KB 25' @ 3021.00usft
Well:	El Toro Gigante 23 #211H	Grid:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi User Db

Project:	Eddy County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site:		Toro Pad			
Site Position:		Northing:	472,609.00 usft	Latitude:	32° 17' 56.521 N
From:	Map	Easting:	582,897.00 usft	Longitude:	104° 3' 54.163 W
Position Uncertainty:	1.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.14 °

Well	El Toro Gigante 23 #211H					
Well Position	+N/-S	0.00 usft	Northing:	472,609.00 usfi	Latitude:	32° 17' 56.521 N
	+E/-W	0.00 usft	Easting:	582,897.00 usfi	Longitude:	104° 3' 54.163 W
Position Uncertainty	1.00 usft	Wellhead Elevation:	0.00 usfi	Ground Level:	2,996.00 usfi	

Wellbore:	OH
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Magnetic	Mode Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (mT)
	HDGM	8/9/2017	7.28	60.15	48,114

Design:	OH
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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	0.00	0.00	179.22

Survey Program	From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
	226.00	6,582.00	Survey #1 (OH)	MWD-ISCWSA	MWD - Standard
	6,665.00	12,371.00	Survey #2 (OH)	MWD-ISCWSA	MWD - Standard
	12,440.00	12,440.00	Projection (OH)	Project	Projection

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	0.00	0.00	0.00	0.00	0.00	0.00
	226.00	0.92	244.18	225.99	-0.79	-1.63	0.77	0.41	0.41	0.00
	284.00	0.93	243.21	283.98	-1.21	-2.47	1.17	0.03	0.02	-1.67
	346.00	1.19	244.56	345.97	-1.71	-3.50	1.66	0.42	0.42	2.18
	410.00	1.10	246.71	409.96	-2.24	-4.67	2.17	0.16	-0.14	3.36
	473.00	1.23	238.65	472.95	-2.83	-5.80	2.75	0.33	0.21	-12.79
	618.00	1.31	227.29	617.91	-4.76	-8.35	4.65	0.18	0.06	-7.83
	678.00	0.61	161.70	677.90	-5.53	-8.75	5.41	1.99	-1.17	-109.32
	740.00	2.04	80.96	739.89	-5.67	-7.56	5.57	3.28	2.31	-130.23

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Site:	Toro Pad	MD Reference:	GE 2996' + KB 25' @ 3021.00usft
Well:	El Toro Gigante 23 #211H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	ΔN/ΔS (usft)	ΔE/ΔW (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
877.00	2.33	87.41	876.79	-5.16	-2.37	5.13	0.28	0.21	4.71
1,000.00	0.66	189.04	999.75	-5.75	0.02	5.75	2.07	-1.36	82.63
1,137.00	1.08	282.34	1,136.74	-6.25	-1.37	6.23	0.95	0.31	68.10
1,227.00	1.97	273.37	1,226.71	-5.98	-3.74	5.93	1.02	0.99	-9.97
1,318.00	2.41	261.69	1,317.64	-6.16	-7.19	6.07	0.69	0.48	-12.84
1,409.00	0.53	76.36	1,408.62	-6.34	-8.68	6.22	3.23	-2.07	191.95
1,590.00	1.11	72.16	1,589.60	-5.61	-6.20	5.52	0.32	0.32	-2.32
1,681.00	0.93	62.93	1,680.59	-5.00	-4.70	4.94	0.27	-0.20	-10.14
1,772.00	1.05	86.92	1,771.58	-4.62	-3.21	4.58	0.47	0.13	26.36
1,953.00	3.49	119.72	1,952.43	-7.26	3.23	7.31	1.47	1.35	18.12
2,044.00	1.12	123.31	2,043.35	-9.12	6.38	9.21	2.61	-2.60	3.95
2,135.00	2.10	125.78	2,134.31	-10.59	8.48	10.70	1.08	1.08	2.71
2,226.00	3.41	129.61	2,225.20	-13.29	11.92	13.45	1.45	1.44	4.21
2,317.00	1.85	105.51	2,316.10	-15.41	15.42	15.61	2.07	-1.71	-26.48
2,408.00	1.88	26.67	2,407.07	-14.46	17.50	14.70	2.60	0.03	-86.64
2,552.00	1.75	14.30	2,551.00	-10.22	19.11	10.48	0.29	-0.09	-8.59
2,597.00	1.91	11.97	2,595.98	-8.83	19.43	9.09	0.39	0.35	-5.18
8 5/8"									
2,679.00	2.20	8.59	2,677.92	-5.93	19.95	6.20	0.39	0.36	-4.12
2,770.00	2.29	8.60	2,768.85	-2.41	20.48	2.69	0.10	0.10	0.01
2,860.00	2.11	6.45	2,858.79	1.01	20.94	-0.73	0.22	-0.20	-2.39
2,951.00	1.14	119.22	2,949.76	2.24	21.91	-1.94	3.03	-1.07	123.92
3,042.00	1.68	112.20	3,040.74	1.29	23.94	-0.97	0.62	0.59	-7.71
3,132.00	1.65	117.70	3,130.70	0.19	26.31	0.17	0.18	-0.03	6.11
3,223.00	3.52	113.10	3,221.60	-1.51	30.04	1.92	2.07	2.05	-5.05
3,314.00	4.21	106.48	3,312.39	-3.56	35.81	4.04	0.90	0.76	-7.27
3,496.00	2.83	109.61	3,494.05	-6.96	46.45	7.59	0.77	-0.76	1.72
3,586.00	2.76	107.49	3,583.94	-8.36	50.61	9.05	0.14	-0.08	-2.36
3,677.00	2.60	109.10	3,674.84	-9.69	54.65	10.43	0.19	-0.18	1.77
3,768.00	2.59	108.56	3,765.75	-11.02	58.55	11.82	0.03	-0.01	-0.59
3,858.00	2.65	110.32	3,855.65	-12.39	62.43	13.24	0.11	0.07	1.96
3,949.00	1.54	44.93	3,946.60	-12.26	65.26	13.14	2.69	-1.22	-71.86
4,131.00	1.30	39.08	4,128.55	-8.92	68.29	9.85	0.15	-0.13	-3.21
4,312.00	1.19	40.00	4,309.50	-5.89	70.80	6.85	0.06	-0.06	0.51
4,494.00	1.16	34.79	4,491.46	-2.93	73.06	3.92	0.06	-0.02	-2.86
4,675.00	1.03	25.17	4,672.43	0.05	74.80	0.97	0.12	-0.07	-5.31
4,857.00	0.62	350.51	4,854.41	2.50	75.33	-1.48	0.35	-0.23	-19.04
4,948.00	0.64	336.26	4,945.41	3.45	75.05	-2.43	0.17	0.02	-15.66
5,039.00	0.75	258.59	5,036.40	3.80	74.26	-2.79	0.96	0.12	-85.35
5,129.00	0.73	283.20	5,126.40	3.81	73.12	-2.82	0.35	-0.02	27.34
5,311.00	0.90	264.34	5,308.38	3.94	70.57	-2.98	0.17	0.09	-10.36
5,493.00	0.90	266.85	5,490.36	3.72	67.72	-2.80	0.02	0.00	1.38
5,674.00	0.81	241.84	5,671.34	3.04	65.17	-2.15	0.21	-0.05	-13.82

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Site:	Toro Pad	MD Reference:	GE 2996' + KB 25' @ 3021.00usft
Well:	El Toro Gigante 23 #211H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi User Db

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	True N (ft)	RAW (ft)	Vertical Section (ft)	Depth Rate (ft/100usft)	Build Rate (%/100usft)	Turn Rate (%/100usft)	
5,856.00	0.93	230.14	5,853.31	1.48	62.91	-0.63	0.12	0.07	-6.43	
5,947.00	0.90	222.79	5,944.30	0.48	61.85	0.36	0.13	-0.03	-8.08	
6,037.00	0.82	209.42	6,034.29	-0.60	61.06	1.43	0.24	-0.09	-14.86	
6,128.00	0.86	203.45	6,125.28	-1.79	60.47	2.61	0.11	0.04	-6.56	
6,219.00	0.71	208.47	6,216.27	-2.91	59.93	3.73	0.18	-0.16	5.52	
6,401.00	0.17	256.49	6,398.27	-3.97	59.13	4.77	0.33	-0.30	26.38	
6,491.00	0.16	288.00	6,488.27	-3.96	58.88	4.76	0.10	-0.01	35.01	
6,582.00	0.68	183.93	6,579.27	-4.46	58.72	5.26	0.81	0.57	-114.36	
6,665.00	0.79	192.33	6,662.26	-5.51	58.56	6.30	0.19	0.13	10.12	
6,756.00	0.64	192.51	6,753.25	-6.62	58.32	7.41	0.16	-0.16	0.20	
6,801.81	7.01	176.69	6,798.94	-9.66	58.42	10.45	13.95	13.90	-34.54	
330' HL Crossing 330' FSL 409' FWL										
6,846.00	13.17	175.95	6,842.42	-17.38	58.94	18.18	13.95	13.95	-1.67	
6,892.00	17.25	175.33	6,886.80	-29.41	59.86	30.22	8.88	8.87	-1.35	
6,937.00	23.52	176.44	6,928.96	-45.04	60.96	45.86	13.96	13.93	2.47	
6,982.00	28.31	177.02	6,969.43	-64.66	62.08	65.50	10.66	10.64	1.29	
7,028.00	35.01	176.87	7,008.56	-88.76	63.37	89.61	14.57	14.57	-0.33	
7,073.00	40.30	178.62	7,044.17	-116.22	64.42	117.08	11.99	11.76	3.89	
7,119.00	44.03	179.46	7,078.26	-147.09	64.93	147.96	8.20	8.11	1.83	
7,164.00	50.54	178.71	7,108.77	-180.13	65.47	181.00	14.52	14.47	-1.67	
7,209.00	55.35	178.98	7,135.88	-216.02	66.19	216.90	10.70	10.69	0.60	
7,255.00	57.76	179.55	7,161.23	-254.40	66.68	255.28	5.34	5.24	1.24	
7,300.00	60.14	180.28	7,184.44	-292.95	66.73	293.83	5.47	5.29	1.62	
7,346.00	63.29	180.68	7,206.24	-333.45	66.39	334.32	6.89	6.85	0.87	
7,352.88	63.80	180.47	7,209.30	-339.61	66.33	340.48	7.94	7.48	-2.98	
SL Crossing 0' FSL 416' FWL										
7,391.00	66.66	179.37	7,225.27	-374.22	66.38	375.09	7.94	7.49	-2.90	
7,436.00	69.33	179.07	7,242.13	-415.93	66.95	416.80	5.97	5.93	-0.67	
7,482.00	72.64	178.65	7,257.11	-459.41	67.82	460.29	7.25	7.20	-0.91	
7,527.00	75.16	179.30	7,269.59	-502.63	68.59	503.52	5.77	5.60	1.44	
7,572.00	78.15	179.81	7,279.98	-546.41	68.93	547.30	6.74	6.64	1.13	
7,618.00	82.24	179.92	7,287.81	-591.73	69.03	592.61	8.89	8.89	0.24	
7,663.00	86.97	180.76	7,292.04	-636.51	68.77	637.39	10.67	10.51	1.87	
7,696.14	87.23	180.70	7,293.72	-669.61	68.35	670.48	0.81	0.79	-0.17	
330' HL Crossing 330' FNL 418' FWL										
7,755.00	87.70	180.60	7,296.32	-728.41	67.68	729.26	0.81	0.79	-0.17	
7,845.00	90.78	180.94	7,297.51	-818.38	66.47	819.21	3.44	3.42	0.38	
7,936.00	91.23	180.19	7,295.92	-909.36	65.57	910.17	0.96	0.49	-0.82	
8,027.00	89.21	180.76	7,295.57	-1,000.35	64.82	1,001.14	2.31	-2.22	0.63	
8,117.00	89.22	180.77	7,296.80	-1,090.34	63.61	1,091.10	0.02	0.01	0.01	
8,208.00	91.12	180.72	7,296.53	-1,181.32	62.43	1,182.06	2.09	2.09	-0.05	
8,299.00	91.74	180.02	7,294.26	-1,272.29	61.84	1,273.02	1.03	0.68	-0.77	
8,390.00	90.73	179.20	7,292.30	-1,363.27	62.46	1,363.99	1.43	-1.11	-0.90	
8,481.00	90.67	178.75	7,291.19	-1,454.25	64.09	1,454.98	0.50	-0.07	-0.49	

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi User Db

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8,571.00	91.35	178.88	7,289.60	-1,544.21	65.95	1,544.97	0.77	0.76	0.14	
8,662.00	91.79	178.98	7,287.11	-1,635.16	67.65	1,635.93	0.50	0.48	0.11	
8,753.00	90.22	179.41	7,285.51	-1,726.14	68.93	1,726.91	1.79	-1.73	0.47	
8,844.00	89.94	178.94	7,285.38	-1,817.13	70.24	1,817.91	0.60	-0.31	-0.52	
8,935.00	90.39	178.87	7,285.12	-1,908.11	71.98	1,908.91	0.50	0.49	-0.08	
9,026.00	88.71	179.90	7,285.84	-1,999.10	72.96	1,999.90	2.17	-1.85	1.13	
9,117.00	88.65	179.42	7,287.93	-2,090.07	73.49	2,090.88	0.53	-0.07	-0.53	
9,208.00	89.10	179.61	7,289.72	-2,181.05	74.27	2,181.86	0.54	0.49	0.21	
9,298.00	89.21	178.93	7,291.05	-2,271.03	75.41	2,271.85	0.77	0.12	-0.76	
9,390.00	89.50	178.98	7,292.08	-2,363.01	77.09	2,363.84	0.32	0.32	0.05	
9,481.00	89.61	179.03	7,292.79	-2,453.99	78.67	2,454.84	0.13	0.12	0.05	
9,572.00	89.83	178.55	7,293.23	-2,544.97	80.59	2,545.83	0.58	0.24	-0.53	
9,663.00	89.38	179.68	7,293.86	-2,635.96	82.00	2,636.83	1.34	-0.49	1.24	
9,753.00	89.21	179.43	7,294.97	-2,725.95	82.70	2,726.82	0.34	-0.19	-0.28	
9,844.00	89.44	179.41	7,296.04	-2,816.94	83.62	2,817.81	0.25	0.25	-0.02	
9,935.00	89.27	181.46	7,297.06	-2,907.92	82.93	2,908.78	2.26	-0.19	2.25	
10,026.00	89.33	181.54	7,298.18	-2,998.89	80.54	2,999.70	0.11	0.07	0.09	
10,117.00	89.38	181.18	7,299.20	-3,089.85	78.38	3,090.63	0.40	0.05	-0.40	
10,207.00	89.05	180.61	7,300.43	-3,179.83	76.98	3,180.59	0.73	-0.37	-0.63	
10,298.00	88.37	180.12	7,302.48	-3,270.81	76.40	3,271.55	0.92	-0.75	-0.54	
10,389.00	89.50	179.82	7,304.17	-3,361.79	76.45	3,362.52	1.28	1.24	-0.33	
10,480.00	91.79	178.87	7,303.15	-3,452.77	77.49	3,453.51	2.72	2.52	-1.04	
10,571.00	92.02	178.48	7,300.12	-3,543.70	79.59	3,544.45	0.50	0.25	-0.43	
10,662.00	90.39	180.41	7,298.21	-3,634.67	80.47	3,635.42	2.78	-1.79	2.12	
10,753.00	90.28	180.20	7,297.68	-3,725.66	79.99	3,726.41	0.26	-0.12	-0.23	
10,843.00	90.50	180.08	7,297.07	-3,815.66	79.77	3,816.39	0.28	0.24	-0.13	
10,934.00	89.38	181.04	7,297.16	-3,906.65	78.88	3,907.37	1.62	-1.23	1.05	
11,025.00	89.44	180.95	7,298.10	-3,997.63	77.30	3,998.32	0.12	0.07	-0.10	
11,115.00	89.66	180.72	7,298.80	-4,087.62	75.99	4,088.28	0.35	0.24	-0.26	
11,205.00	90.00	180.27	7,299.07	-4,177.62	75.21	4,178.26	0.63	0.38	-0.50	
11,296.00	90.39	180.16	7,298.76	-4,268.62	74.87	4,269.24	0.45	0.43	-0.12	
11,387.00	90.28	180.68	7,298.23	-4,359.61	74.20	4,360.22	0.58	-0.12	0.57	
11,478.00	90.39	180.56	7,297.70	-4,450.61	73.21	4,451.19	0.18	0.12	-0.13	
11,568.00	90.90	180.40	7,296.68	-4,540.60	72.46	4,541.16	0.59	0.57	-0.18	
11,659.00	91.63	180.50	7,294.68	-4,631.57	71.75	4,632.12	0.81	0.80	0.11	
11,750.00	90.06	180.99	7,293.33	-4,722.55	70.56	4,723.07	1.81	-1.73	0.54	
11,840.00	88.66	182.39	7,294.34	-4,812.50	67.91	4,812.98	2.20	-1.56	1.56	
11,931.00	88.66	182.87	7,296.47	-4,903.38	63.73	4,903.79	0.53	0.00	0.53	
12,022.00	89.05	182.52	7,298.29	-4,994.26	59.46	4,994.61	0.58	0.43	-0.38	
12,113.00	89.44	182.41	7,299.48	-5,085.17	55.54	5,085.45	0.45	0.43	-0.12	
12,203.00	90.00	182.42	7,299.92	-5,175.09	51.75	5,175.31	0.62	0.62	0.01	
12,293.01	90.94	183.04	7,299.19	-5,264.99	47.46	5,265.15	1.25	1.04	0.69	
330' HL Crossing 330' FSL 385' FWL										
12,294.00	90.95	183.05	7,299.17	-5,265.98	47.41	5,266.14	1.25	1.04	0.69	

LEAM Drilling Systems LLC

Survey Report

Company:	Rockcliff Energy	Local Coordinate Reference:	Well El Toro Gigante 23 #211H
Project:	Eddy County, NM	IPD Reference:	GE 2996' + KB 25' @ 3021.00usft
Site:	Toro Pad	MP Reference:	GE 2996' + KB 25' @ 3021.00usft
Well:	El Toro Gigante 23 #211H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi 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)
12,371.00	91.74	182.83	7,297.36	-5,342.86	43.46	5,342.95	1.06	1.03	-0.29
12,440.00	91.74	182.83	7,295.27	-5,411.74	40.06	5,411.78	0.00	0.00	0.00
Projection									