



October 6, 2015

Devon Energy Production Company, L.P.
Well: Billiken 7 Federal #1H
County/Parish: Lea County, NM

HOBBS OCD
JUL 21 2017
RECEIVED

LEAM MWD: (OH) from 8,575' MD – 13,646' MD
Projection: 13,710'

This Borehole Survey taken between 09/27/15 and 10/04/15 had been conducted and calculated according to the highest professional standards and complies with all known State and Federal requirements.

Reviewed and Approved:

Date: October 6, 2015

Physical & Mailing: 303 Longmire Dr., Suite 801, Conroe, TX 77304
936-756-7577 • www.lead.net • 1 (800) 756-7504



Survey Certification Form

State of New Mexico

Lea County

I, Randy W. Rakowitz, certify that; I am employed by LEAM Drilling Systems LLC, that I did on the day(s) of September 27, 2015 through October 4, 2015, conduct or supervise the taking of MWD Survey from a depth of 8,575' to 13,710' MD; that the data is true, correct, complete and within the limitations of the tools as set forth by LEAM Drilling Systems LLC, that I am authorized and qualified to make this report; that this survey was conducted at the request of Devon Energy Production Company, L.P. for the Billiken 7 Federal #1H in Lea County, New Mexico; and that I reviewed this report and find that it conforms to the principals and procedures as set forth by LEAM Drilling Systems LLC.

A handwritten signature in black ink, appearing to read 'Randy W. Rakowitz', is written over a solid black horizontal line.

Randy W. Rakowitz
MWD Operations Coordinator

Leam Drilling Systems LLC

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 1H
Project:	Lea County, NM (NAD-83)	TVD Reference:	3267' GL + 30' RKB @ 3297.00usft (H&P 536)
Site:	Billiken 7 Federal	MD Reference:	3267' GL + 30' RKB @ 3297.00usft (H&P 536)
Well:	1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi_User Db

Project	Lea County, NM (NAD-83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Billiken 7 Federal		
Site Position:		Northing:	384,022.88 usft
From:	Map	Easting:	826,015.10 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 3' 8.742 N
		Longitude:	103° 24' 52.118 W
		Grid Convergence:	0.49 °

Well	1H		
Well Position	+N/-S	0.00 usft	Northing: 384,022.90 usft
	+E/-W	0.00 usft	Easting: 826,015.10 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	3,297.00 usft
		Ground Level:	3,267.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	BGGM2015	09/17/15	7.15
			Dip Angle (°) 60.01
			Field Strength (nT) 48,112

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°) 89.68

Survey Program	Date	10/06/15		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
166.00	8,559.00	Survey #1 (OH)	MWD-ISCWSA	MWD - Standard
8,575.00	13,646.00	Survey #2 (OH)	LEAM MWD+HDGM	MWD+HDGM
13,710.00	13,710.00	Survey #3 (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
166.00	0.10	146.71	166.00	-0.12	0.08	0.08	0.06	0.06	0.00
207.00	0.22	30.09	207.00	-0.08	0.14	0.14	0.68	0.29	-284.44
392.00	0.22	6.31	392.00	0.58	0.36	0.36	0.05	0.00	-12.85
483.00	0.09	105.89	483.00	0.73	0.44	0.45	0.28	-0.14	109.43
576.00	0.31	5.11	576.00	0.96	0.54	0.54	0.36	0.24	-108.37
760.00	0.70	295.69	759.99	1.95	-0.43	-0.42	0.36	0.21	-37.73
945.00	1.10	287.39	944.97	2.97	-3.15	-3.13	0.23	0.22	-4.49
1,038.00	1.32	294.20	1,037.95	3.67	-4.97	-4.95	0.28	0.24	7.32

Leam Drilling Systems LLC

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Site:	Billiken 7 Federal	MD Reference:	3267' GL + 30' RKB @ 3297.00usft (H&P 536)
Well:	1H	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)
1,087.00	1.19	281.50	1,086.94	4.00	-5.99	-5.96	0.62	-0.27	-25.92
1,245.00	1.19	297.80	1,244.90	5.10	-9.05	-9.02	0.21	0.00	10.32
1,435.00	1.19	291.83	1,434.86	6.75	-12.62	-12.58	0.07	0.00	-3.14
1,624.00	1.01	288.71	1,623.83	8.01	-16.02	-15.98	0.10	-0.10	-1.65
1,814.00	0.62	298.81	1,813.81	9.05	-18.51	-18.46	0.22	-0.21	5.32
2,000.00	0.48	263.53	1,999.80	9.44	-20.17	-20.11	0.19	-0.08	-18.97
2,189.00	0.22	261.11	2,188.80	9.30	-21.31	-21.26	0.14	-0.14	-1.28
2,379.00	0.09	190.01	2,378.79	9.10	-21.70	-21.65	0.11	-0.07	-37.42
2,570.00	0.22	144.61	2,569.79	8.65	-21.51	-21.46	0.09	0.07	-23.77
2,760.00	0.22	70.83	2,759.79	8.47	-20.95	-20.91	0.14	0.00	-38.83
2,950.00	0.40	51.23	2,949.79	9.01	-20.09	-20.04	0.11	0.09	-10.32
3,139.00	0.31	59.40	3,138.79	9.68	-19.14	-19.08	0.05	-0.05	4.32
3,330.00	0.22	8.12	3,329.78	10.31	-18.64	-18.58	0.13	-0.05	-26.85
3,520.00	0.48	27.63	3,519.78	11.37	-18.22	-18.16	0.15	0.14	10.27
3,708.00	0.62	36.81	3,707.77	12.88	-17.25	-17.17	0.09	0.07	4.88
3,898.00	0.40	43.10	3,897.76	14.19	-16.18	-16.10	0.12	-0.12	3.31
4,087.00	0.48	35.63	4,086.76	15.32	-15.27	-15.18	0.05	0.04	-3.95
4,276.00	0.22	7.02	4,275.76	16.32	-14.76	-14.67	0.16	-0.14	-15.14
4,473.00	0.09	25.12	4,472.75	16.84	-14.65	-14.55	0.07	-0.07	9.19
4,658.00	0.40	89.59	4,657.75	16.97	-13.94	-13.84	0.20	0.17	34.85
4,848.00	0.62	76.80	4,847.75	17.21	-12.28	-12.18	0.13	0.12	-6.73
5,035.00	0.79	92.93	5,034.73	17.38	-10.00	-9.91	0.14	0.09	8.63
5,225.00	0.62	97.59	5,224.72	17.17	-7.68	-7.58	0.09	-0.09	2.45
5,337.00	0.48	110.99	5,336.71	16.93	-6.64	-6.54	0.17	-0.13	11.96
5,490.00	0.22	86.60	5,489.71	16.71	-5.75	-5.65	0.19	-0.17	-15.94
5,681.00	0.62	261.81	5,680.71	16.59	-6.40	-6.31	0.44	0.21	91.73
5,872.00	0.22	312.70	5,871.70	16.69	-7.70	-7.60	0.27	-0.21	26.64
6,063.00	0.22	312.22	6,062.70	17.18	-8.24	-8.14	0.00	0.00	-0.25
6,254.00	0.09	353.13	6,253.70	17.58	-8.53	-8.43	0.09	-0.07	21.42
6,445.00	0.31	344.83	6,444.70	18.23	-8.68	-8.58	0.12	0.12	-4.35
6,636.00	0.40	325.40	6,635.69	19.28	-9.19	-9.08	0.08	0.05	-10.17
6,819.00	0.40	7.19	6,818.69	20.43	-9.48	-9.36	0.16	0.00	22.84
7,008.00	0.40	356.51	7,007.69	21.75	-9.43	-9.31	0.04	0.00	-5.65
7,199.00	0.40	337.71	7,198.68	23.03	-9.73	-9.60	0.07	0.00	-9.84
7,386.00	0.48	241.11	7,385.68	23.26	-10.66	-10.53	0.35	0.04	-51.66
7,576.00	0.70	228.02	7,575.67	22.09	-12.22	-12.10	0.14	0.12	-6.89
7,770.00	0.88	220.50	7,769.65	20.17	-14.07	-13.96	0.11	0.09	-3.88
7,954.00	1.19	233.60	7,953.62	17.96	-16.52	-16.42	0.21	0.17	7.12
8,144.00	1.41	234.92	8,143.57	15.45	-20.03	-19.94	0.12	0.12	0.69
8,334.00	1.41	234.83	8,333.51	12.76	-23.85	-23.78	0.00	0.00	-0.05
8,524.00	0.88	236.90	8,523.47	10.61	-26.98	-26.92	0.28	-0.28	1.09
8,559.00	0.79	237.51	8,558.47	10.34	-27.41	-27.35	0.26	-0.26	1.74
8,575.00	0.80	220.80	8,574.47	10.19	-27.58	-27.52	1.45	0.06	-104.44

Leam Drilling Systems LLC

Survey Report

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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)
8,606.00	0.30	157.70	8,605.47	9.95	-27.69	-27.63	2.31	-1.61	-203.55
8,638.00	2.60	81.00	8,637.46	9.99	-26.94	-26.88	7.96	7.19	-239.69
8,670.00	6.20	80.70	8,669.36	10.38	-24.52	-24.46	11.25	11.25	-0.94
8,716.00	12.30	80.80	8,714.74	11.57	-17.22	-17.16	13.26	13.26	0.22
8,764.00	18.60	82.10	8,760.98	13.44	-4.58	-4.50	13.14	13.13	2.71
8,811.00	24.70	85.20	8,804.64	15.29	12.65	12.73	13.20	12.98	6.60
8,859.00	29.50	88.60	8,847.36	16.42	34.47	34.56	10.50	10.00	7.08
8,906.00	34.40	90.20	8,887.23	16.66	59.33	59.42	10.58	10.43	3.40
8,953.00	40.40	90.50	8,924.55	16.48	87.86	87.96	12.77	12.77	0.64
9,000.00	45.90	90.90	8,958.83	16.08	119.99	120.08	11.72	11.70	0.85
9,048.00	51.50	91.40	8,990.50	15.35	156.03	156.12	11.69	11.67	1.04
9,095.00	56.00	91.90	9,018.28	14.26	193.91	193.99	9.61	9.57	1.06
9,143.00	59.80	91.70	9,043.78	12.98	234.54	234.61	7.92	7.92	-0.42
9,190.00	62.70	91.20	9,066.39	11.94	275.73	275.79	6.24	6.17	-1.06
9,238.00	66.20	91.40	9,087.09	10.96	319.02	319.08	7.30	7.29	0.42
9,285.00	71.60	90.70	9,104.00	10.16	362.84	362.90	11.57	11.49	-1.49
9,333.00	78.50	89.80	9,116.38	9.96	409.19	409.24	14.49	14.38	-1.88
9,362.00	81.00	90.20	9,121.54	9.96	437.73	437.77	8.73	8.62	1.38
9,409.00	84.70	89.80	9,127.39	9.96	484.35	484.40	7.92	7.87	-0.85
9,457.00	84.90	90.00	9,131.74	10.05	532.15	532.20	0.59	0.42	0.42
9,552.00	87.60	88.90	9,137.95	10.96	626.94	626.99	3.07	2.84	-1.16
9,647.00	87.50	89.10	9,142.01	12.61	721.83	721.89	0.24	-0.11	0.21
9,742.00	89.20	88.60	9,144.75	14.52	816.77	816.84	1.87	1.79	-0.53
9,837.00	89.80	88.40	9,145.57	17.01	911.74	911.82	0.67	0.63	-0.21
9,932.00	89.50	89.10	9,146.16	19.08	1,006.71	1,006.80	0.80	-0.32	0.74
10,027.00	89.80	89.50	9,146.74	20.24	1,101.70	1,101.80	0.53	0.32	0.42
10,122.00	89.40	89.60	9,147.40	20.99	1,196.70	1,196.80	0.43	-0.42	0.11
10,217.00	89.80	89.60	9,148.06	21.65	1,291.69	1,291.79	0.42	0.42	0.00
10,312.00	90.10	90.00	9,148.14	21.98	1,386.69	1,386.79	0.53	0.32	0.42
10,407.00	90.30	90.00	9,147.81	21.98	1,481.69	1,481.79	0.21	0.21	0.00
10,501.00	90.40	89.80	9,147.24	22.14	1,575.69	1,575.79	0.24	0.11	-0.21
10,596.00	88.80	89.80	9,147.90	22.48	1,670.68	1,670.78	1.68	-1.68	0.00
10,691.00	89.80	89.60	9,149.06	22.97	1,765.67	1,765.77	1.07	1.05	-0.21
10,785.00	90.50	88.70	9,148.82	24.37	1,859.66	1,859.77	1.21	0.74	-0.96
10,879.00	91.30	88.70	9,147.34	26.50	1,953.62	1,953.74	0.85	0.85	0.00
10,974.00	91.80	88.90	9,144.77	28.49	2,048.57	2,048.70	0.57	0.53	0.21
11,070.00	90.60	88.40	9,142.76	30.75	2,144.52	2,144.66	1.35	-1.25	-0.52
11,164.00	89.90	89.10	9,142.35	32.80	2,238.49	2,238.64	1.05	-0.74	0.74
11,259.00	91.00	89.50	9,141.60	33.96	2,333.48	2,333.64	1.23	1.16	0.42
11,354.00	90.70	91.40	9,140.19	33.22	2,428.46	2,428.61	2.02	-0.32	2.00
11,449.00	88.90	92.80	9,140.53	29.73	2,523.39	2,523.52	2.40	-1.89	1.47
11,543.00	86.90	92.60	9,143.97	25.31	2,617.22	2,617.32	2.14	-2.13	-0.21
11,638.00	86.70	92.80	9,149.27	20.84	2,711.97	2,712.04	0.30	-0.21	0.21

Leam Drilling Systems LLC

Survey Report

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Project:	Lea County, NM (NAD-83)	TVD Reference:	3267' GL + 30' RKB @ 3297.00usft (H&P 536)
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Well:	1H	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)
11,732.00	86.60	92.80	9,154.77	16.26	2,805.69	2,805.74	0.11	-0.11	0.00
11,827.00	84.60	91.70	9,162.05	12.54	2,900.33	2,900.36	2.40	-2.11	-1.16
11,922.00	84.10	90.50	9,171.41	10.72	2,994.85	2,994.87	1.36	-0.53	-1.26
12,017.00	83.10	92.80	9,182.00	8.01	3,089.22	3,089.21	2.63	-1.05	2.42
12,112.00	83.60	93.80	9,193.00	2.57	3,183.42	3,183.38	1.17	0.53	1.05
12,206.00	86.70	93.30	9,200.95	-3.22	3,276.89	3,276.82	3.34	3.30	-0.53
12,301.00	87.70	91.90	9,205.59	-7.53	3,371.68	3,371.58	1.81	1.05	-1.47
12,396.00	88.90	90.20	9,208.41	-9.27	3,466.61	3,466.50	2.19	1.26	-1.79
12,491.00	87.90	90.00	9,211.06	-9.43	3,561.57	3,561.46	1.07	-1.05	-0.21
12,585.00	87.50	89.60	9,214.83	-9.11	3,655.50	3,655.39	0.60	-0.43	-0.43
12,680.00	85.30	88.40	9,220.80	-7.45	3,750.29	3,750.19	2.64	-2.32	-1.26
12,775.00	84.90	88.00	9,228.91	-4.48	3,844.89	3,844.81	0.59	-0.42	-0.42
12,870.00	85.60	88.60	9,236.78	-1.67	3,939.52	3,939.45	0.97	0.74	0.63
12,965.00	85.70	88.70	9,243.98	0.56	4,034.22	4,034.16	0.15	0.11	0.11
13,059.00	86.20	88.60	9,250.62	2.77	4,127.96	4,127.91	0.54	0.53	-0.11
13,154.00	86.40	88.90	9,256.75	4.84	4,222.74	4,222.70	0.38	0.21	0.32
13,249.00	87.10	88.60	9,262.14	6.91	4,317.57	4,317.54	0.80	0.74	-0.32
13,344.00	87.70	88.70	9,266.45	9.14	4,412.44	4,412.42	0.64	0.63	0.11
13,438.00	88.80	89.30	9,269.32	10.78	4,506.38	4,506.37	1.33	1.17	0.64
13,533.00	88.60	89.30	9,271.47	11.94	4,601.35	4,601.34	0.21	-0.21	0.00
13,628.00	88.20	89.50	9,274.13	12.94	4,696.31	4,696.31	0.47	-0.42	0.21
13,646.00	88.30	89.60	9,274.68	13.08	4,714.30	4,714.30	0.79	0.56	0.56
13,710.00	88.30	89.60	9,276.57	13.53	4,778.27	4,778.27	0.00	0.00	0.00
Projection									