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JUL 05 2018

DISTRICT II-ARTESIA O.C.D.



30-015-44362

November 16, 2017

Devon Energy Production Company, LP
Well: Onyx PWU 29-28 61H
County/Parish: Eddy County, NM

LEAM MWD: (OH) from 1,354' MD – 18,994' MD
Projection; 19,087' MD

This Borehole Survey taken between 10/27/2017 and 11/15/2017 had been conducted and calculated according to the highest professional standards and complies with all known State and Federal requirements.

Reviewed and Approved:

Date: November 16, 2017

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Survey Certification Form

State of New Mexico
Eddy County

I, Randy W. Rakowitz, certify that; I am employed by LEAM Drilling Services, that I did on the day(s) of 10/27/2017 through 11/15/2017, conduct or supervise the taking of MWD Survey from a depth of 1,354' MD to 19,087' MD; that the data is true, correct, complete and within the limitations of the tools as set forth by LEAM Drilling Services, that I am authorized and qualified to make this report; that this survey was conducted at the request of Devon Energy Production Company, LP for the Onyx PWU 29-28 61H in Eddy 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 Services.

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

Randy W. Rakowitz
MWD Operations Coordinator

LEAM Drilling Systems LLC

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 61H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3308.7' GE + 23.5' RKB @ 3332.20usft
Site:	Onyx PWU 29-28	MD Reference:	3308.7' GE + 23.5' RKB @ 3332.20usft
Well:	61H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 MULTI User DB

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

Site	Onyx PWU 29-28				
Site Position:		Northing:	596,305.26 usft	Latitude:	32° 38' 20.7014 N
From:	Map	Easting:	611,703.20 usft	Longitude:	104° 6' 17.0602 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.12 °

Well	61H					
Well Position	+N/-S	0.00 usft	Northing:	594,630.56 usft	Latitude:	32° 38' 4.1292 N
	+E/-W	0.00 usft	Easting:	611,724.93 usft	Longitude:	104° 6' 16.8482 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,308.70 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	HDGM	10/19/2017	7.40	60.50	48,165

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.00	0.00	0.00	88.15	

Survey Program:	Date	11/16/2017			
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
50.00	1,263.00	Survey #1 - Gyro (OH)	SDI Keeper	Keeper Standard Rate Gyro	
1,354.00	18,994.00	Survey #2 - MWD (OH)	LEAM MWD+HDGM	MWD+HDGM	
19,087.00	19,087.00	Survey #3 (OH)	Project	Projection	

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	0.33	143.25	50.00	-0.12	0.09	0.08	0.66	0.66	0.00
100.00	0.32	90.58	100.00	-0.23	0.31	0.30	0.58	-0.02	-105.34
135.00	0.20	11.97	135.00	-0.17	0.42	0.42	0.98	-0.34	-224.60
252.00	0.10	105.00	252.00	0.00	0.56	0.56	0.20	-0.09	79.51
343.00	0.20	92.90	343.00	-0.03	0.80	0.80	0.11	0.11	-13.30
442.00	0.20	79.70	442.00	-0.01	1.14	1.14	0.05	0.00	-13.33
532.00	0.20	71.40	532.00	0.07	1.44	1.45	0.03	0.00	-9.22
624.00	0.20	56.00	624.00	0.21	1.73	1.74	0.06	0.00	-16.74

LEAM Drilling Systems LLC

Survey Report

Company: Devon Energy
Project: Eddy County, NM (NAD-83)
Site: Onyx PWU 29-28
Well: 61H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well 61H
TVD Reference: 3308.7' GE + 23.5' RKB @ 3332.20usft
MD Reference: 3308.7' GE + 23.5' RKB @ 3332.20usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
716.00	0.30	36.10	716.00	0.50	2.00	2.02	0.14	0.11	-21.63
807.00	0.40	77.90	806.99	0.76	2.46	2.48	0.29	0.11	45.93
898.00	0.40	88.00	897.99	0.83	3.08	3.11	0.08	0.00	11.10
988.00	0.40	83.70	987.99	0.88	3.71	3.74	0.03	0.00	-4.78
1,079.00	0.30	54.90	1,078.99	1.05	4.22	4.25	0.22	-0.11	-31.65
1,171.00	0.20	31.20	1,170.99	1.33	4.50	4.54	0.15	-0.11	-25.76
1,263.00	0.30	8.00	1,262.99	1.70	4.62	4.67	0.15	0.11	-25.22
1,354.00	0.40	5.20	1,353.98	2.26	4.68	4.75	0.11	0.11	-3.08
1,445.00	0.40	356.90	1,444.98	2.89	4.69	4.78	0.06	0.00	-9.12
1,536.00	0.40	343.70	1,535.98	3.51	4.58	4.70	0.10	0.00	-14.51
1,629.00	0.70	331.90	1,628.98	4.32	4.23	4.36	0.34	0.32	-12.69
1,724.00	0.80	341.60	1,723.97	5.46	3.74	3.92	0.17	0.11	10.21
1,820.00	0.80	341.30	1,819.96	6.74	3.32	3.53	0.00	0.00	-0.31
1,915.00	0.80	339.90	1,914.95	7.99	2.88	3.13	0.02	0.00	-1.47
2,011.00	0.60	336.50	2,010.94	9.08	2.45	2.74	0.21	-0.21	-3.54
2,107.00	0.70	334.80	2,106.94	10.07	2.00	2.32	0.11	0.10	-1.77
2,202.00	0.60	330.70	2,201.93	11.03	1.51	1.86	0.12	-0.11	-4.32
2,298.00	0.60	333.70	2,297.92	11.92	1.04	1.42	0.03	0.00	3.13
2,393.00	1.10	322.60	2,392.91	13.09	0.26	0.68	0.55	0.53	-11.68
2,489.00	2.10	321.90	2,488.87	15.20	-1.38	-0.89	1.04	1.04	-0.73
2,584.00	3.20	325.30	2,583.77	18.75	-3.97	-3.36	1.17	1.16	3.58
2,680.00	4.00	328.60	2,679.58	23.81	-7.24	-6.46	0.86	0.83	3.44
2,776.00	4.90	328.60	2,775.29	30.17	-11.12	-10.14	0.94	0.94	0.00
2,871.00	5.90	326.90	2,869.87	37.72	-15.90	-14.67	1.07	1.05	-1.79
2,967.00	6.00	326.90	2,965.35	46.06	-21.33	-19.83	0.10	0.10	0.00
3,062.00	5.80	326.30	3,059.85	54.21	-26.71	-24.94	0.22	-0.21	-0.63
3,158.00	5.60	325.40	3,155.37	62.11	-32.06	-30.04	0.23	-0.21	-0.94
3,253.00	6.20	325.10	3,249.87	70.13	-37.62	-35.34	0.63	0.63	-0.32
3,349.00	6.10	325.10	3,345.32	78.56	-43.51	-40.95	0.10	-0.10	0.00
3,457.00	5.90	325.60	3,452.73	87.85	-49.93	-47.07	0.19	-0.19	0.46
3,527.00	5.50	327.70	3,522.38	93.65	-53.75	-50.70	0.64	-0.57	3.00
3,623.00	5.90	332.10	3,617.91	101.90	-58.52	-55.20	0.62	0.42	4.58
3,718.00	7.10	331.10	3,712.29	111.36	-63.64	-60.01	1.27	1.26	-1.05
3,814.00	7.40	329.80	3,807.53	121.90	-69.62	-65.65	0.36	0.31	-1.35
3,909.00	6.90	329.50	3,901.79	132.10	-75.59	-71.29	0.53	-0.53	-0.32
4,005.00	6.50	332.10	3,997.13	141.87	-81.06	-76.44	0.52	-0.42	2.71
4,100.00	6.10	335.50	4,091.56	151.22	-85.67	-80.75	0.58	-0.42	3.58
4,196.00	5.80	340.00	4,187.04	160.42	-89.45	-84.22	0.58	-0.31	4.69
4,291.00	6.20	339.90	4,281.52	169.74	-92.85	-87.32	0.42	0.42	-0.11
4,387.00	7.20	336.70	4,376.86	180.14	-97.01	-91.15	1.11	1.04	-3.33
4,483.00	7.30	330.70	4,472.10	190.98	-102.38	-96.16	0.80	0.10	-6.25
4,578.00	6.90	324.60	4,566.37	200.90	-108.64	-102.09	0.90	-0.42	-6.42
4,674.00	6.10	324.20	4,661.75	209.73	-114.96	-108.13	0.83	-0.83	-0.42

LEAM Drilling Systems LLC

Survey Report

Company: Devon Energy
Project: Eddy County, NM (NAD-83)
Site: Onyx PWU 29-28
Well: 61H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well 61H
TVD Reference: 3308.7' GE + 23.5' RKB @ 3332.20usft
MD Reference: 3308.7' GE + 23.5' RKB @ 3332.20usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
4,769.00	6.10	324.90	4,756.21	217.96	-120.82	-113.72	0.08	0.00	0.74
4,865.00	6.00	324.20	4,851.68	226.20	-126.68	-119.32	0.13	-0.10	-0.73
4,960.00	5.50	323.30	4,946.20	233.88	-132.31	-124.69	0.53	-0.53	-0.95
5,056.00	6.20	330.50	5,041.70	242.08	-137.61	-129.72	1.06	0.73	7.50
5,151.00	6.20	334.60	5,136.15	251.18	-142.34	-134.15	0.47	0.00	4.32
5,247.00	6.20	327.20	5,231.59	260.22	-147.37	-138.89	0.83	0.00	-7.71
5,342.00	6.20	328.60	5,326.03	268.91	-152.82	-144.06	0.16	0.00	1.47
5,438.00	6.00	327.20	5,421.49	277.55	-158.24	-149.20	0.26	-0.21	-1.46
5,534.00	6.00	329.30	5,516.96	286.08	-163.52	-154.20	0.23	0.00	2.19
5,629.00	6.00	329.70	5,611.44	294.64	-168.56	-158.96	0.04	0.00	0.42
5,725.00	5.70	331.60	5,706.94	303.16	-173.36	-163.48	0.37	-0.31	1.98
5,820.00	6.20	328.60	5,801.43	311.69	-178.28	-168.12	0.62	0.53	-3.16
5,916.00	5.80	327.60	5,896.90	320.21	-183.58	-173.14	0.43	-0.42	-1.04
6,011.00	6.10	328.30	5,991.39	328.56	-188.80	-178.09	0.32	0.32	0.74
6,107.00	5.70	328.40	6,086.88	336.96	-193.98	-183.00	0.42	-0.42	0.10
6,203.00	5.50	324.00	6,182.43	344.74	-199.18	-187.95	0.49	-0.21	-4.58
6,298.00	4.70	321.00	6,277.05	351.45	-204.31	-192.85	0.89	-0.84	-3.16
6,394.00	4.10	320.20	6,372.76	357.14	-208.98	-197.34	0.63	-0.63	-0.83
6,489.00	3.80	320.70	6,467.54	362.19	-213.15	-201.34	0.32	-0.32	0.53
6,585.00	3.50	324.00	6,563.34	367.02	-216.88	-204.92	0.38	-0.31	3.44
6,680.00	2.40	324.90	6,658.22	371.00	-219.73	-207.64	1.16	-1.16	0.95
6,776.00	1.00	330.20	6,754.17	373.37	-221.30	-209.13	1.47	-1.46	5.52
6,872.00	1.40	325.80	6,850.15	375.06	-222.38	-210.15	0.43	0.42	-4.58
6,967.00	0.40	278.50	6,945.14	376.07	-223.36	-211.10	1.23	-1.05	-49.79
7,063.00	0.50	243.90	7,041.14	375.94	-224.07	-211.81	0.30	0.10	-36.04
7,158.00	0.80	237.20	7,136.13	375.40	-225.00	-212.76	0.33	0.32	-7.05
7,254.00	0.60	229.30	7,232.12	374.71	-225.94	-213.73	0.23	-0.21	-8.23
7,349.00	0.80	233.20	7,327.12	373.98	-226.85	-214.66	0.22	0.21	4.11
7,444.00	1.10	246.00	7,422.10	373.22	-228.21	-216.05	0.38	0.32	13.47
7,540.00	0.80	244.10	7,518.09	372.55	-229.66	-217.51	0.31	-0.31	-1.98
7,635.00	1.80	243.50	7,613.06	371.59	-231.59	-219.47	1.05	1.05	-0.63
7,731.00	1.80	223.80	7,709.02	369.83	-233.98	-221.92	0.64	0.00	-20.52
7,826.00	1.10	198.50	7,803.99	367.89	-235.30	-223.31	0.98	-0.74	-26.63
7,922.00	0.90	156.90	7,899.97	366.32	-235.30	-223.35	0.76	-0.21	-43.33
8,017.00	1.10	189.90	7,994.96	364.74	-235.17	-223.27	0.63	0.21	34.74
8,113.00	1.30	195.90	8,090.94	362.78	-235.62	-223.79	0.25	0.21	6.25
8,208.00	1.30	201.30	8,185.91	360.74	-236.31	-224.54	0.13	0.00	5.68
8,304.00	1.00	194.00	8,281.90	358.92	-236.91	-225.20	0.35	-0.31	-7.60
8,368.00	0.80	201.00	8,345.89	357.96	-237.20	-225.52	0.36	-0.31	10.94
8,457.00	2.32	105.98	8,434.86	356.88	-235.69	-224.05	2.83	1.71	-106.76
8,505.00	7.30	95.23	8,482.68	356.33	-231.72	-220.10	10.50	10.38	-22.40
8,553.00	11.40	89.70	8,530.03	356.08	-223.94	-212.32	8.73	8.54	-11.52
8,601.00	15.21	89.87	8,576.73	356.12	-212.89	-201.28	7.94	7.94	0.35

LEAM Drilling Systems LLC

Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Well 61H
Project:	Eddy County, NM (NAD-83)	TVD Reference:	3308.7' GE + 23.5' RKB @ 3332.20usft
Site:	Onyx PWU 29-28	MD Reference:	3308.7' GE + 23.5' RKB @ 3332.20usft
Well:	61H	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)
8,648.00	18.60	89.94	8,621.70	356.14	-199.23	-187.62	7.21	7.21	0.15
8,696.00	22.26	91.25	8,666.67	355.95	-182.48	-170.89	7.68	7.63	2.73
8,744.00	25.15	88.65	8,710.62	355.99	-163.19	-151.61	6.40	6.02	-5.42
8,807.00	30.19	85.96	8,766.40	357.43	-133.98	-122.37	8.24	8.00	-4.27
8,837.00	31.35	84.98	8,792.17	358.64	-118.68	-107.04	4.21	3.87	-3.27
8,869.00	33.03	83.98	8,819.25	360.28	-101.71	-90.03	5.51	5.25	-3.13
8,901.00	36.86	83.70	8,845.48	362.25	-83.50	-71.76	11.98	11.97	-0.88
8,933.00	40.16	84.45	8,870.51	364.30	-63.68	-51.89	10.42	10.31	2.34
8,961.00	43.70	84.80	8,891.34	366.05	-45.05	-33.21	12.67	12.64	1.25
8,993.00	47.80	84.30	8,913.67	368.24	-22.24	-10.34	12.86	12.81	-1.56
9,025.00	54.20	83.90	8,933.79	370.79	2.48	14.45	20.02	20.00	-1.25
9,056.00	60.80	83.90	8,950.44	373.57	28.46	40.51	21.29	21.29	0.00
9,088.00	67.60	85.20	8,964.36	376.30	57.13	69.25	21.56	21.25	4.06
9,120.00	74.20	85.90	8,974.83	378.64	87.26	99.44	20.73	20.63	2.19
9,131.00	76.90	85.50	8,977.57	379.44	97.88	110.08	24.80	24.55	-3.64
9,146.00	79.50	84.43	8,980.64	380.73	112.50	124.74	18.69	17.33	-7.13
9,178.00	86.13	83.22	8,984.64	384.14	144.05	156.38	21.06	20.72	-3.78
9,210.00	87.77	82.78	8,986.34	388.03	175.77	188.20	5.31	5.13	-1.38
9,240.00	90.03	84.24	8,986.92	391.42	205.57	218.09	8.97	7.53	4.87
9,273.00	90.51	87.88	8,986.76	393.69	238.48	251.07	11.13	1.45	11.03
9,305.00	90.84	89.91	8,986.39	394.31	270.47	283.06	6.43	1.03	6.34
9,337.00	91.24	91.82	8,985.80	393.83	302.46	315.02	6.10	1.25	5.97
9,433.00	91.71	91.96	8,983.33	390.66	398.38	410.78	0.51	0.49	0.15
9,528.00	91.78	92.05	8,980.44	387.34	493.27	505.52	0.12	0.07	0.09
9,624.00	91.61	91.95	8,977.60	383.99	589.17	601.26	0.21	-0.18	-0.10
9,718.00	90.28	91.08	8,976.05	381.51	683.13	695.09	1.69	-1.41	-0.93
9,814.00	88.98	90.56	8,976.67	380.13	779.11	790.98	1.46	-1.35	-0.54
9,909.00	88.23	90.34	8,978.98	379.39	874.08	885.87	0.82	-0.79	-0.23
10,004.00	88.77	90.17	8,981.47	378.96	969.05	980.77	0.60	0.57	-0.18
10,099.00	91.33	91.27	8,981.39	377.77	1,064.03	1,075.67	2.93	2.69	1.16
10,195.00	92.11	91.42	8,978.51	375.52	1,159.96	1,171.48	0.83	0.81	0.16
10,291.00	91.79	90.75	8,975.24	373.70	1,255.88	1,267.29	0.77	-0.33	-0.70
10,386.00	91.89	90.46	8,972.19	372.70	1,350.83	1,362.16	0.32	0.11	-0.31
10,477.00	91.47	90.41	8,969.52	372.01	1,441.79	1,453.05	0.46	-0.46	-0.05
10,567.00	90.66	90.35	8,967.85	371.41	1,531.77	1,542.96	0.90	-0.90	-0.07
10,660.00	90.58	90.09	8,966.84	371.05	1,624.76	1,635.90	0.29	-0.09	-0.28
10,752.00	90.16	90.53	8,966.25	370.56	1,716.76	1,727.83	0.66	-0.46	0.48
10,842.00	90.16	91.18	8,966.00	369.21	1,806.75	1,817.73	0.72	0.00	0.72
10,933.00	90.09	91.55	8,965.80	367.04	1,897.72	1,908.58	0.41	-0.08	0.41
11,023.00	89.69	90.12	8,965.97	365.73	1,987.71	1,998.48	1.65	-0.44	-1.59
11,115.00	89.44	89.46	8,966.67	366.07	2,079.71	2,090.44	0.77	-0.27	-0.72
11,206.00	88.97	89.87	8,967.93	366.60	2,170.70	2,181.40	0.69	-0.52	0.45
11,299.00	89.24	89.97	8,969.38	366.73	2,263.68	2,274.34	0.31	0.29	0.11
11,389.00	89.29	90.11	8,970.54	366.67	2,353.68	2,364.29	0.17	0.06	0.16

LEAM Drilling Systems LLC

Survey Report

Company: Devon Energy
Project: Eddy County, NM (NAD-83)
Site: Onyx PWU 29-28
Well: 61H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well 61H
TVD Reference: 3308.7' GE + 23.5' RKB @ 3332.20usft
MD Reference: 3308.7' GE + 23.5' RKB @ 3332.20usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
11,480.00	89.30	90.29	8,971.66	366.35	2,444.67	2,455.22	0.20	0.01	0.20
11,572.00	89.08	90.20	8,972.96	365.96	2,536.66	2,547.15	0.26	-0.24	-0.10
11,664.00	88.75	90.20	8,974.70	365.64	2,628.64	2,639.08	0.36	-0.36	0.00
11,760.00	88.01	89.78	8,977.41	365.65	2,724.60	2,734.99	0.89	-0.77	-0.44
11,855.00	89.02	89.19	8,979.88	366.51	2,819.57	2,829.93	1.23	1.06	-0.62
11,951.00	90.26	89.37	8,980.48	367.71	2,915.55	2,925.91	1.31	1.29	0.19
12,046.00	91.02	89.44	8,979.42	368.70	3,010.54	3,020.88	0.80	0.80	0.07
12,142.00	91.27	89.40	8,977.50	369.67	3,106.52	3,116.83	0.26	0.26	-0.04
12,237.00	91.52	89.50	8,975.19	370.58	3,201.49	3,211.78	0.28	0.26	0.11
12,333.00	90.01	89.65	8,973.91	371.30	3,297.47	3,307.74	1.58	-1.57	0.16
12,429.00	90.18	89.83	8,973.75	371.73	3,393.47	3,403.70	0.26	0.18	0.19
12,524.00	89.68	89.97	8,973.86	371.90	3,488.47	3,498.66	0.55	-0.53	0.15
12,620.00	89.59	90.15	8,974.47	371.80	3,584.47	3,594.60	0.21	-0.09	0.19
12,715.00	89.83	90.10	8,974.96	371.59	3,679.47	3,689.54	0.26	0.25	-0.05
12,811.00	90.16	90.06	8,974.96	371.46	3,775.47	3,785.49	0.35	0.34	-0.04
12,906.00	88.85	89.85	8,975.78	371.53	3,870.46	3,880.44	1.40	-1.38	-0.22
13,002.00	89.19	89.82	8,977.43	371.81	3,966.45	3,976.38	0.36	0.35	-0.03
13,098.00	90.73	90.06	8,977.49	371.91	4,062.44	4,072.33	1.62	1.60	0.25
13,193.00	89.49	90.47	8,977.31	371.47	4,157.44	4,167.26	1.37	-1.31	0.43
13,289.00	89.92	90.42	8,977.81	370.72	4,253.44	4,263.19	0.45	0.45	-0.05
13,384.00	90.16	90.20	8,977.74	370.21	4,348.43	4,358.12	0.34	0.25	-0.23
13,480.00	88.26	90.95	8,979.06	369.24	4,444.41	4,454.02	2.13	-1.98	0.78
13,575.00	88.12	90.76	8,982.06	367.83	4,539.36	4,548.87	0.25	-0.15	-0.20
13,671.00	88.26	90.39	8,985.10	366.86	4,635.30	4,644.73	0.41	0.15	-0.39
13,766.00	88.45	90.17	8,987.82	366.40	4,730.26	4,739.63	0.31	0.20	-0.23
13,862.00	88.91	90.27	8,990.03	366.03	4,826.24	4,835.54	0.49	0.48	0.10
13,957.00	89.34	90.13	8,991.48	365.70	4,921.23	4,930.47	0.48	0.45	-0.15
14,053.00	89.87	89.76	8,992.15	365.79	5,017.22	5,026.42	0.67	0.55	-0.39
14,148.00	90.21	89.73	8,992.08	366.22	5,112.22	5,121.38	0.36	0.36	-0.03
14,244.00	90.76	89.47	8,991.27	366.89	5,208.21	5,217.34	0.63	0.57	-0.27
14,339.00	91.05	89.36	8,989.77	367.86	5,303.20	5,312.31	0.33	0.31	-0.12
14,435.00	91.61	89.08	8,987.54	369.16	5,399.16	5,408.27	0.65	0.58	-0.29
14,530.00	90.52	89.15	8,985.77	370.63	5,494.13	5,503.23	1.15	-1.15	0.07
14,626.00	89.98	89.17	8,985.35	372.04	5,590.12	5,599.22	0.56	-0.56	0.02
14,722.00	89.44	89.72	8,985.84	372.97	5,686.12	5,695.19	0.80	-0.56	0.57
14,817.00	89.62	90.34	8,986.62	372.92	5,781.11	5,790.14	0.68	0.19	0.65
14,912.00	89.59	90.14	8,987.27	372.52	5,876.11	5,885.07	0.21	-0.03	-0.21
15,008.00	90.03	90.42	8,987.59	372.05	5,972.11	5,981.00	0.54	0.46	0.29
15,104.00	90.51	90.68	8,987.14	371.13	6,068.10	6,076.92	0.57	0.50	0.27
15,199.00	89.19	90.88	8,987.39	369.83	6,163.09	6,171.82	1.41	-1.39	0.21
15,295.00	89.34	91.19	8,988.62	368.10	6,259.07	6,267.69	0.36	0.16	0.32
15,390.00	89.51	90.69	8,989.57	366.54	6,354.05	6,362.57	0.56	0.18	-0.53
15,486.00	88.11	90.97	8,991.57	365.15	6,450.01	6,458.44	1.49	-1.46	0.29

LEAM Drilling Systems LLC

Survey Report

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Site: Onyx PWU 29-28
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Local Co-ordinate Reference: Well 61H
TVD Reference: 3308.7' GE + 23.5' RKB @ 3332.20usft
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
15,581.00	88.31	90.92	8,994.54	363.59	6,544.96	6,553.28	0.22	0.21	-0.05
15,677.00	88.59	90.92	8,997.13	362.05	6,640.91	6,649.13	0.29	0.29	0.00
15,773.00	88.98	91.18	8,999.17	360.29	6,736.87	6,744.99	0.49	0.41	0.27
15,868.00	89.26	90.10	9,000.63	359.23	6,831.85	6,839.89	1.17	0.29	-1.14
15,964.00	89.54	89.19	9,001.63	359.82	6,927.84	6,935.85	0.99	0.29	-0.95
16,060.00	89.30	89.40	9,002.60	361.00	7,023.83	7,031.82	0.33	-0.25	0.22
16,155.00	91.23	89.70	9,002.16	361.75	7,118.82	7,126.79	2.06	2.03	0.32
16,251.00	91.20	90.00	9,000.13	362.00	7,214.80	7,222.73	0.31	-0.03	0.31
16,346.00	91.09	90.92	8,998.23	361.24	7,309.78	7,317.63	0.98	-0.12	0.97
16,442.00	89.01	91.94	8,998.15	358.84	7,405.74	7,413.46	2.41	-2.17	1.06
16,537.00	87.13	91.33	9,001.35	356.13	7,500.64	7,508.23	2.08	-1.98	-0.64
16,631.00	87.38	90.68	9,005.85	354.48	7,594.52	7,602.01	0.74	0.27	-0.69
16,726.00	87.73	88.62	9,009.90	355.06	7,689.43	7,696.88	2.20	0.37	-2.17
16,820.00	88.82	89.32	9,012.73	356.75	7,783.37	7,790.83	1.38	1.16	0.74
16,915.00	87.60	89.87	9,015.70	357.42	7,878.32	7,885.75	1.41	-1.28	0.58
17,010.00	88.91	91.42	9,018.59	356.36	7,973.26	7,980.61	2.14	1.38	1.63
17,104.00	88.73	91.87	9,020.53	353.66	8,067.20	8,074.41	0.52	-0.19	0.48
17,199.00	89.07	92.52	9,022.35	350.02	8,162.11	8,169.16	0.77	0.36	0.68
17,293.00	87.61	92.05	9,025.07	346.27	8,256.00	8,262.87	1.63	-1.55	-0.50
17,389.00	87.20	91.09	9,029.42	343.65	8,351.86	8,358.60	1.09	-0.43	-1.00
17,483.00	87.11	89.75	9,034.09	342.96	8,445.74	8,452.41	1.43	-0.10	-1.43
17,577.00	87.82	90.69	9,038.24	342.60	8,539.65	8,546.26	1.25	0.76	1.00
17,672.00	89.06	89.36	9,040.83	342.56	8,634.61	8,641.17	1.91	1.31	-1.40
17,766.00	90.02	90.15	9,041.58	342.96	8,728.60	8,735.12	1.32	1.02	0.84
17,861.00	90.54	91.70	9,041.12	341.42	8,823.59	8,830.01	1.72	0.55	1.63
17,955.00	91.33	92.75	9,039.59	337.78	8,917.50	8,923.76	1.40	0.84	1.12
18,049.00	90.87	93.39	9,037.78	332.74	9,011.35	9,017.39	0.84	-0.49	0.68
18,144.00	89.29	93.00	9,037.65	327.45	9,106.20	9,112.02	1.71	-1.66	-0.41
18,238.00	88.96	92.20	9,039.08	323.18	9,200.09	9,205.73	0.92	-0.35	-0.85
18,332.00	89.83	91.65	9,040.08	320.03	9,294.03	9,299.51	1.09	0.93	-0.59
18,427.00	90.17	91.05	9,040.08	317.79	9,389.00	9,394.37	0.73	0.36	-0.63
18,522.00	89.32	89.72	9,040.50	317.15	9,483.99	9,489.29	1.66	-0.89	-1.40
18,617.00	88.30	88.79	9,042.47	318.38	9,578.96	9,584.25	1.45	-1.07	-0.98
18,712.00	86.99	89.13	9,046.38	320.11	9,673.87	9,679.16	1.42	-1.38	0.36
18,806.00	86.45	89.36	9,051.75	321.34	9,767.70	9,772.99	0.62	-0.57	0.24
18,900.00	87.99	88.71	9,056.31	322.93	9,861.58	9,866.86	1.78	1.64	-0.69
18,994.00	89.28	88.44	9,058.55	325.26	9,955.52	9,960.83	1.40	1.37	-0.29
19,087.00	89.28	88.44	9,059.72	327.79	10,048.48	10,053.82	0.00	0.00	0.00
Projection									