

HOBES OCD
SEP 21 2018
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ENERGEN RESOURCES CORPORATION

**Lea County, NM
Angus State 24-35 16 456H
456H**

Lateral

Design: Lateral

Standard Survey Report

25 July, 2018

Survey Report

Company:	ENERGEN RESOURCES CORPORATION	Local Co-ordinate Reference:	Well 456H
Project:	Lea County, NM	TVD Reference:	3366+25 @ 3391.00usft (Cactus139)
Site:	Angus State 24-35 16 456H	MD Reference:	3366+25 @ 3391.00usft (Cactus139)
Well:	456H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Lateral	Database:	EDM 5000.14 Multi User Db

Project	Lea 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	Angus State 24-35 16 456H			
Site Position:		Northing:	446,291.15 usft	Latitude: 32° 13' 23.74 N
From: Map		Easting:	799,476.94 usft	Longitude: 103° 21' 53.74 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence: 0.52 °

Well	456H			
Well Position	+N/-S	0.00 usft	Northing: 446,291.15 usft	Latitude: 32° 13' 23.74 N
	+E/-W	0.00 usft	Easting: 799,476.94 usft	Longitude: 103° 21' 53.74 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level: 3,366.00 usft

Wellbore	Lateral				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	07/01/18	6.77	59.92	47,975

Design	Lateral			
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	179.46

Survey Program	Date 07/25/18			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
93.00	16,918.00	Survey #1 (Lateral)	MWD+HRGM	OWSG MWD + HRGM
16,980.00	16,980.00	Survey #2 (Lateral)	Projection	Projection

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
93.00	0.20	278.79	93.00	0.02	-0.16	-0.03	0.22	0.22	0.00
180.00	0.40	174.79	180.00	-0.25	-0.28	0.25	0.56	0.23	-119.54
270.00	0.20	349.79	270.00	-0.41	-0.28	0.41	0.67	-0.22	194.44
365.00	0.60	248.79	365.00	-0.43	-0.78	0.42	0.70	0.42	-106.32
459.00	1.40	242.79	458.98	-1.13	-2.26	1.11	0.86	0.85	-6.38
522.00	1.40	221.79	521.96	-2.06	-3.45	2.03	0.81	0.00	-33.33
534.00	1.20	253.79	533.96	-2.20	-3.67	2.17	6.18	-1.67	266.67
553.00	1.10	226.79	552.96	-2.38	-4.00	2.35	2.87	-0.53	-142.10
648.00	1.40	235.79	647.93	-3.66	-5.62	3.61	0.38	0.32	9.47

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Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
742.00	1.30	256.79	741.91	-4.55	-7.61	4.48	0.53	-0.11	22.34
837.00	1.50	228.79	836.88	-5.61	-9.59	5.52	0.74	0.21	-29.47
931.00	2.20	253.79	930.83	-6.93	-12.25	6.81	1.12	0.74	26.60
1,004.00	1.60	234.79	1,003.79	-7.91	-14.43	7.77	1.18	-0.82	-26.03
1,081.00	1.62	248.36	1,080.76	-8.93	-16.32	8.77	0.49	0.03	17.62
1,175.00	1.87	256.60	1,174.72	-9.77	-19.05	9.59	0.38	0.27	8.77
1,271.00	2.01	300.43	1,270.67	-9.28	-22.02	9.08	1.51	0.15	45.66
1,365.00	3.18	321.53	1,364.57	-6.41	-25.06	6.17	1.59	1.24	22.45
1,460.00	3.13	325.54	1,459.43	-2.21	-28.17	1.94	0.24	-0.05	4.22
1,555.00	2.41	343.47	1,554.32	1.85	-30.21	-2.13	1.18	-0.76	18.87
1,650.00	2.24	357.07	1,649.24	5.62	-30.87	-5.91	0.61	-0.18	14.32
1,744.00	2.14	346.05	1,743.17	9.15	-31.39	-9.45	0.46	-0.11	-11.72
1,839.00	2.00	339.85	1,838.11	12.43	-32.39	-12.74	0.28	-0.15	-6.53
1,933.00	1.98	336.89	1,932.06	15.46	-33.59	-15.78	0.11	-0.02	-3.15
2,028.00	2.05	8.97	2,027.00	18.65	-33.97	-18.97	1.17	0.07	33.77
2,122.00	2.33	19.44	2,120.93	22.12	-33.07	-22.43	0.52	0.30	11.14
2,216.00	1.98	14.65	2,214.86	25.49	-32.02	-25.79	0.42	-0.37	-5.10
2,311.00	1.96	11.85	2,309.81	28.67	-31.27	-28.96	0.10	-0.02	-2.95
2,406.00	1.76	11.94	2,404.76	31.68	-30.64	-31.97	0.21	-0.21	0.09
2,501.00	1.83	15.01	2,499.71	34.58	-29.94	-34.86	0.13	0.07	3.23
2,595.00	1.83	12.37	2,593.66	37.49	-29.23	-37.77	0.09	0.00	-2.81
2,689.00	1.69	11.30	2,687.62	40.32	-28.64	-40.58	0.15	-0.15	-1.14
2,783.00	1.87	12.23	2,781.57	43.17	-28.04	-43.44	0.19	0.19	0.99
2,878.00	1.83	15.56	2,876.52	46.15	-27.31	-46.41	0.12	-0.04	3.51
2,973.00	1.96	16.07	2,971.47	49.17	-26.45	-49.42	0.14	0.14	0.54
3,067.00	1.99	17.57	3,065.42	52.27	-25.51	-52.51	0.06	0.03	1.60
3,162.00	2.14	28.98	3,160.36	55.40	-24.16	-55.62	0.46	0.16	12.01
3,256.00	2.27	40.27	3,254.29	58.35	-22.10	-58.56	0.48	0.14	12.01
3,351.00	2.63	46.17	3,349.20	61.30	-19.31	-61.48	0.46	0.38	6.21
3,445.00	2.37	47.20	3,443.11	64.11	-16.33	-64.26	0.28	-0.28	1.10
3,539.00	1.58	46.29	3,537.05	66.33	-13.97	-66.46	0.84	-0.84	-0.97
3,634.00	1.20	28.92	3,632.03	68.10	-12.54	-68.22	0.59	-0.40	-18.28
3,728.00	1.59	48.26	3,726.00	69.83	-11.09	-69.94	0.64	0.41	20.57
3,822.00	0.78	348.94	3,819.98	71.33	-10.24	-71.42	1.46	-0.86	-63.11
3,917.00	1.57	299.69	3,914.96	72.61	-11.50	-72.71	1.28	0.83	-51.84
4,012.00	1.09	326.30	4,009.94	74.01	-13.13	-74.13	0.81	-0.51	28.01
4,106.00	1.07	13.21	4,103.92	75.60	-13.43	-75.73	0.91	-0.02	49.90
4,201.00	1.05	22.77	4,198.91	77.27	-12.89	-77.39	0.19	-0.02	10.06
4,296.00	0.72	7.69	4,293.89	78.66	-12.47	-78.78	0.42	-0.35	-15.87
4,391.00	0.68	15.52	4,388.89	79.80	-12.24	-79.91	0.11	-0.04	8.24
4,485.00	0.73	37.65	4,482.88	80.81	-11.72	-80.92	0.29	0.05	23.54
4,580.00	0.87	46.43	4,577.87	81.79	-10.83	-81.89	0.20	0.15	9.24
4,674.00	0.73	39.73	4,671.86	82.74	-9.93	-82.83	0.18	-0.15	-7.13

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Survey										
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4,769.00	0.65	51.45	4,766.86	83.54	-9.12	-83.62	0.17	-0.08	12.34	
4,864.00	0.60	57.66	4,861.85	84.14	-8.28	-84.22	0.09	-0.05	6.54	
4,959.00	0.74	60.23	4,956.84	84.71	-7.33	-84.78	0.15	0.15	2.71	
5,054.00	0.78	63.22	5,051.83	85.31	-6.22	-85.36	0.06	0.04	3.15	
5,142.00	0.84	60.90	5,139.83	85.89	-5.12	-85.94	0.08	0.07	-2.64	
5,240.00	0.91	62.94	5,237.81	86.60	-3.80	-86.63	0.08	0.07	2.08	
5,335.00	0.87	56.68	5,332.80	87.34	-2.52	-87.36	0.11	-0.04	-6.59	
5,430.00	0.77	62.86	5,427.79	88.02	-1.35	-88.03	0.14	-0.11	6.51	
5,524.00	0.65	334.61	5,521.79	88.79	-1.02	-88.80	1.06	-0.13	-93.88	
5,619.00	0.66	315.63	5,616.78	89.67	-1.63	-89.68	0.23	0.01	-19.98	
5,713.00	0.75	315.34	5,710.78	90.50	-2.45	-90.51	0.10	0.10	-0.31	
5,807.00	0.78	306.85	5,804.77	91.32	-3.39	-91.34	0.12	0.03	-9.03	
5,901.00	0.83	304.10	5,898.76	92.08	-4.47	-92.12	0.07	0.05	-2.93	
5,996.00	0.81	306.26	5,993.75	92.87	-5.58	-92.91	0.04	-0.02	2.27	
6,090.00	0.77	303.81	6,087.74	93.61	-6.64	-93.67	0.06	-0.04	-2.61	
6,184.00	0.90	295.03	6,181.73	94.27	-7.83	-94.34	0.19	0.14	-9.34	
6,278.00	1.02	292.47	6,275.72	94.91	-9.27	-94.99	0.14	0.13	-2.72	
6,373.00	0.84	340.68	6,370.70	95.89	-10.28	-95.98	0.82	-0.19	50.75	
6,467.00	0.75	348.74	6,464.70	97.14	-10.63	-97.24	0.15	-0.10	8.57	
6,561.00	0.79	339.32	6,558.69	98.35	-10.98	-98.45	0.14	0.04	-10.02	
6,655.00	0.76	329.27	6,652.68	99.49	-11.53	-99.60	0.15	-0.03	-10.69	
6,750.00	0.87	333.60	6,747.67	100.68	-12.17	-100.79	0.13	0.12	4.56	
6,844.00	0.96	340.05	6,841.66	102.06	-12.76	-102.17	0.15	0.10	6.86	
6,939.00	0.91	337.04	6,936.64	103.50	-13.32	-103.62	0.07	-0.05	-3.17	
7,033.00	1.01	336.16	7,030.63	104.95	-13.95	-105.07	0.11	0.11	-0.94	
7,128.00	1.02	331.76	7,125.62	106.46	-14.69	-106.59	0.08	0.01	-4.63	
7,223.00	0.87	333.53	7,220.60	107.85	-15.41	-107.99	0.16	-0.16	1.86	
7,317.00	0.77	328.52	7,314.59	109.02	-16.06	-109.17	0.13	-0.11	-5.33	
7,412.00	1.09	334.01	7,409.58	110.38	-16.79	-110.53	0.35	0.34	5.78	
7,507.00	1.99	341.74	7,504.55	112.76	-17.70	-112.92	0.97	0.95	8.14	
7,602.00	2.81	345.07	7,599.46	116.58	-18.82	-116.75	0.88	0.86	3.51	
7,696.00	3.55	341.50	7,693.32	121.56	-20.33	-121.75	0.81	0.79	-3.80	
7,791.00	4.02	341.79	7,788.11	127.52	-22.31	-127.72	0.50	0.49	0.31	
7,886.00	3.89	346.90	7,882.88	133.82	-24.08	-134.04	0.40	-0.14	5.38	
7,980.00	3.87	350.19	7,976.67	140.05	-25.34	-140.28	0.24	-0.02	3.50	
8,075.00	4.19	348.64	8,071.43	146.61	-26.57	-146.85	0.36	0.34	-1.63	
8,169.00	4.08	350.27	8,165.19	153.27	-27.81	-153.53	0.17	-0.12	1.73	
8,264.00	4.36	354.59	8,259.93	160.20	-28.72	-160.46	0.45	0.29	4.55	
8,358.00	5.08	354.36	8,353.61	167.90	-29.47	-168.17	0.77	0.77	-0.24	
8,452.00	5.73	352.46	8,447.19	176.69	-30.50	-176.97	0.72	0.69	-2.02	
8,546.00	6.41	349.41	8,540.67	186.50	-32.08	-186.79	0.80	0.72	-3.24	
8,640.00	6.51	349.94	8,634.07	196.91	-33.97	-197.22	0.12	0.11	0.56	
8,735.00	7.19	355.40	8,728.39	208.13	-35.39	-208.46	0.99	0.72	5.75	

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Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
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Survey

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8,830.00	7.10	357.48	8,822.65	219.93	-36.12	-220.26	0.29	-0.09	2.19
8,924.00	6.51	356.72	8,915.99	231.05	-36.68	-231.38	0.63	-0.63	-0.81
9,019.00	5.59	357.36	9,010.46	241.05	-37.20	-241.39	0.97	-0.97	0.67
9,113.00	5.63	356.17	9,104.01	250.22	-37.72	-250.57	0.13	0.04	-1.27
9,208.00	6.59	351.19	9,198.47	260.26	-38.87	-260.61	1.15	1.01	-5.24
9,302.00	6.44	350.96	9,291.86	270.80	-40.52	-271.17	0.16	-0.16	-0.24
9,396.00	6.06	347.75	9,385.30	280.85	-42.41	-281.24	0.55	-0.40	-3.41
9,490.00	6.58	349.97	9,478.73	291.00	-44.40	-291.41	0.61	0.55	2.36
9,584.00	6.70	349.23	9,572.10	301.69	-46.36	-302.12	0.16	0.13	-0.79
9,679.00	6.46	348.46	9,666.48	312.37	-48.46	-312.82	0.27	-0.25	-0.81
9,773.00	6.39	350.23	9,759.89	322.71	-50.41	-323.17	0.22	-0.07	1.88
9,867.00	6.45	348.36	9,853.30	333.04	-52.36	-333.51	0.23	0.06	-1.99
9,961.00	5.94	351.79	9,946.75	343.02	-54.12	-343.52	0.67	-0.54	3.65
10,057.00	5.85	354.99	10,042.24	352.81	-55.26	-353.32	0.35	-0.09	3.33
10,151.00	5.29	1.72	10,135.80	361.92	-55.55	-362.42	0.91	-0.60	7.16
10,246.00	5.34	358.65	10,230.39	370.71	-55.52	-371.22	0.30	0.05	-3.23
10,341.00	4.53	1.37	10,325.04	378.88	-55.53	-379.39	0.89	-0.85	2.86
10,435.00	5.98	356.43	10,418.64	387.48	-55.75	-387.99	1.61	1.54	-5.26
10,530.00	6.00	354.38	10,513.12	397.36	-56.54	-397.88	0.23	0.02	-2.16
10,624.00	6.04	351.95	10,606.60	407.15	-57.72	-407.67	0.27	0.04	-2.59
10,719.00	5.53	347.88	10,701.12	416.57	-59.38	-417.11	0.69	-0.54	-4.28
10,814.00	5.34	342.18	10,795.69	425.26	-61.69	-425.82	0.60	-0.20	-6.00
10,908.00	6.06	341.32	10,889.23	434.12	-64.62	-434.71	0.77	0.77	-0.91
11,002.00	5.99	336.94	10,982.71	443.33	-68.13	-443.96	0.49	-0.07	-4.66
11,096.00	4.55	329.20	11,076.31	451.05	-71.96	-451.71	1.71	-1.53	-8.23
11,191.00	4.59	330.61	11,171.01	457.60	-75.76	-458.29	0.13	0.04	1.48
11,285.00	4.32	330.86	11,264.72	463.97	-79.33	-464.69	0.29	-0.29	0.27
11,366.00	4.83	331.10	11,345.47	469.62	-82.46	-470.37	0.63	0.63	0.30
11,438.00	3.99	338.37	11,417.25	474.60	-84.85	-475.38	1.40	-1.17	10.10
11,469.00	0.65	286.09	11,448.22	475.65	-85.42	-476.43	11.71	-10.77	-168.64
11,501.00	3.97	180.51	11,480.20	474.59	-85.60	-475.38	13.10	10.37	-329.94
11,532.00	8.45	164.39	11,511.01	471.32	-85.00	-472.10	15.37	14.45	-52.00
11,563.00	11.70	166.85	11,541.53	466.07	-83.67	-466.84	10.57	10.48	7.94
11,595.00	13.27	161.84	11,572.77	459.42	-81.78	-460.17	5.96	4.91	-15.66
11,626.00	14.07	162.24	11,602.89	452.45	-79.53	-453.18	2.60	2.58	1.29
11,658.00	15.35	172.90	11,633.85	444.54	-77.82	-445.25	9.34	4.00	33.31
11,689.00	18.54	176.32	11,663.50	435.55	-76.99	-436.25	10.78	10.29	11.03
11,720.00	22.77	177.53	11,692.50	424.63	-76.42	-425.33	13.71	13.65	3.90
11,752.00	27.61	178.36	11,721.45	411.02	-75.94	-411.72	15.16	15.12	2.59
11,783.00	32.12	179.75	11,748.33	395.59	-75.70	-396.29	14.72	14.55	4.48
11,815.00	36.62	179.24	11,774.73	377.53	-75.53	-378.23	14.09	14.06	-1.59
11,846.00	41.05	177.59	11,798.88	358.11	-74.98	-358.80	14.67	14.29	-5.32
11,878.00	45.66	175.75	11,822.14	336.19	-73.69	-336.87	14.94	14.41	-5.75
11,909.00	51.06	174.20	11,842.73	313.12	-71.65	-313.78	17.81	17.42	-5.00

Survey Report

Company:	ENERGEN RESOURCES CORPORATION	Local Co-ordinate Reference:	Well 456H
Project:	Lea County, NM	TVD Reference:	3366+25 @ 3391.00usft (Cactus139)
Site:	Angus State 24-35 16 456H	MD Reference:	3366+25 @ 3391.00usft (Cactus139)
Well:	456H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Lateral	Database:	EDM 5000.14 Multi User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,941.00	55.86	175.20	11,861.78	287.53	-69.28	-288.17	15.21	15.00	3.12
11,972.00	58.13	175.39	11,878.66	261.62	-67.15	-262.24	7.34	7.32	0.61
12,004.00	60.18	175.74	11,895.07	234.23	-65.03	-234.83	6.47	6.41	1.09
12,035.00	61.89	178.00	11,910.08	207.15	-63.55	-207.74	8.43	5.52	7.29
12,066.00	64.29	180.28	11,924.11	179.51	-63.14	-180.10	10.15	7.74	7.35
12,098.00	65.16	183.41	11,937.78	150.60	-64.08	-151.19	9.25	2.72	9.78
12,129.00	67.83	184.85	11,950.14	122.25	-66.13	-122.87	9.61	8.61	4.65
12,161.00	71.50	186.27	11,961.26	92.39	-69.04	-93.04	12.20	11.47	4.44
12,192.00	76.25	187.11	11,969.87	62.82	-72.51	-63.50	15.54	15.32	2.71
12,224.00	80.88	186.51	11,976.21	31.69	-76.22	-32.40	14.58	14.47	-1.87
12,255.00	86.34	184.52	11,979.66	1.03	-79.18	-1.78	18.73	17.61	-6.42
12,350.00	91.99	179.08	11,981.04	-93.83	-82.16	93.06	8.25	5.95	-5.73
12,444.00	91.08	178.35	11,978.52	-187.78	-80.05	187.01	1.24	-0.97	-0.78
12,538.00	89.69	177.41	11,977.89	-281.71	-76.58	280.97	1.79	-1.48	-1.00
12,632.00	89.43	177.80	11,978.62	-375.62	-72.65	374.92	0.50	-0.28	0.41
12,727.00	89.41	178.28	11,979.58	-470.56	-69.40	469.89	0.51	-0.02	0.51
12,821.00	88.90	178.53	11,980.96	-564.51	-66.78	563.86	0.60	-0.54	0.27
12,915.00	87.82	177.39	11,983.65	-658.41	-63.44	657.79	1.67	-1.15	-1.21
13,010.00	89.72	179.83	11,985.69	-753.35	-61.13	752.74	3.25	2.00	2.57
13,104.00	88.26	180.29	11,987.35	-847.33	-61.23	846.72	1.63	-1.55	0.49
13,198.00	88.62	181.25	11,989.91	-941.29	-62.50	940.66	1.09	0.38	1.02
13,293.00	91.06	181.83	11,990.17	-1,036.25	-65.05	1,035.59	2.64	2.57	0.61
13,387.00	90.36	181.27	11,989.01	-1,130.20	-67.59	1,129.52	0.95	-0.74	-0.60
13,481.00	89.04	181.09	11,989.50	-1,224.18	-69.53	1,223.47	1.42	-1.40	-0.19
13,576.00	86.09	178.91	11,993.54	-1,319.08	-69.53	1,318.36	3.86	-3.11	-2.29
13,670.00	86.18	177.88	11,999.87	-1,412.83	-66.90	1,412.13	1.10	0.10	-1.10
13,765.00	90.26	177.30	12,002.82	-1,507.68	-62.91	1,507.02	4.34	4.29	-0.61
13,859.00	89.92	177.35	12,002.68	-1,601.57	-58.52	1,600.95	0.37	-0.36	0.05
13,954.00	88.82	178.88	12,003.72	-1,696.51	-55.40	1,695.92	1.98	-1.16	1.61
14,048.00	84.04	177.24	12,009.57	-1,790.25	-52.23	1,789.67	5.37	-5.09	-1.74
14,142.00	89.41	180.99	12,014.94	-1,884.03	-50.79	1,883.47	6.96	5.71	3.99
14,237.00	89.81	180.30	12,015.59	-1,979.02	-51.86	1,978.44	0.84	0.42	-0.73
14,331.00	87.29	178.70	12,017.97	-2,072.98	-51.04	2,072.40	3.18	-2.68	-1.70
14,425.00	90.01	178.42	12,020.18	-2,166.91	-48.67	2,166.36	2.91	2.89	-0.30
14,519.00	91.02	180.31	12,019.34	-2,260.90	-47.63	2,260.35	2.28	1.07	2.01
14,613.00	88.97	179.81	12,019.35	-2,354.89	-47.73	2,354.34	2.24	-2.18	-0.53
14,707.00	88.00	179.58	12,021.83	-2,448.86	-47.23	2,448.30	1.06	-1.03	-0.24
14,802.00	88.51	180.72	12,024.72	-2,543.81	-47.48	2,543.25	1.31	0.54	1.20
14,896.00	92.33	182.25	12,024.04	-2,637.76	-49.91	2,637.17	4.38	4.06	1.63
14,991.00	90.93	180.88	12,021.33	-2,732.68	-52.51	2,732.06	2.06	-1.47	-1.44
15,085.00	89.79	181.88	12,020.74	-2,826.65	-54.77	2,826.00	1.61	-1.21	1.06
15,180.00	87.68	181.05	12,022.84	-2,921.59	-57.20	2,920.92	2.39	-2.22	-0.87
15,274.00	89.33	181.16	12,025.29	-3,015.53	-59.01	3,014.84	1.76	1.76	0.12

Survey Report

Company:	ENERGEN RESOURCES CORPORATION	Local Co-ordinate Reference:	Well 456H
Project:	Lea County, NM	TVD Reference:	3366+25 @ 3391.00usft (Cactus139)
Site:	Angus State 24-35 16 456H	MD Reference:	3366+25 @ 3391.00usft (Cactus139)
Well:	456H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Lateral	Database:	EDM 5000.14 Multi User Db

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
15,368.00	88.26	180.22	12,027.27	-3,109.50	-60.14	3,108.80	1.52	-1.14	-1.00	
15,462.00	88.53	179.74	12,029.90	-3,203.47	-60.11	3,202.76	0.59	0.29	-0.51	
15,557.00	87.84	178.85	12,032.91	-3,298.41	-58.94	3,297.71	1.19	-0.73	-0.94	
15,651.00	86.50	177.16	12,037.55	-3,392.23	-55.68	3,391.56	2.29	-1.43	-1.80	
15,746.00	88.80	178.83	12,041.45	-3,487.08	-52.36	3,486.44	2.99	2.42	1.76	
15,840.00	87.65	180.04	12,044.36	-3,581.03	-51.43	3,580.39	1.78	-1.22	1.29	
15,935.00	87.91	179.84	12,048.04	-3,675.96	-51.33	3,675.31	0.35	0.27	-0.21	
16,029.00	88.36	179.69	12,051.10	-3,769.91	-50.94	3,769.26	0.50	0.48	-0.16	
16,124.00	86.90	178.76	12,055.03	-3,864.82	-49.66	3,864.18	1.82	-1.54	-0.98	
16,218.00	87.86	178.25	12,059.32	-3,958.68	-47.21	3,958.06	1.16	1.02	-0.54	
16,312.00	87.62	178.02	12,063.03	-4,052.56	-44.15	4,051.96	0.35	-0.26	-0.24	
16,407.00	87.55	177.41	12,067.03	-4,147.40	-40.37	4,146.84	0.65	-0.07	-0.64	
16,501.00	87.34	176.77	12,071.22	-4,241.19	-35.60	4,240.66	0.72	-0.22	-0.68	
16,595.00	87.27	176.07	12,075.64	-4,334.90	-29.74	4,334.42	0.75	-0.07	-0.74	
16,690.00	91.00	176.65	12,077.08	-4,429.68	-23.71	4,429.26	3.97	3.93	0.61	
16,784.00	91.90	176.22	12,074.70	-4,523.46	-17.87	4,523.10	1.06	0.96	-0.46	
16,878.00	91.46	176.09	12,071.94	-4,617.21	-11.57	4,616.90	0.49	-0.47	-0.14	
16,918.00	91.07	175.36	12,071.06	-4,657.09	-8.59	4,656.80	2.07	-0.97	-1.82	
16,980.00	91.07	175.36	12,069.90	-4,718.88	-3.57	4,718.63	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
Angus State 24-35 16	0.00	0.00	0.00	0.00	0.00	446,291.15	799,476.94	32° 13' 23.74 N	103° 21' 53.74 W	
- actual wellpath hits target center										
- Point										
Angus State 24-35 16	0.00	0.00	12,069.90	-4,718.88	-3.57	441,572.27	799,473.37	32° 12' 37.05 N	103° 21' 54.28 W	
- actual wellpath hits target center										
- Point										

Checked By: _____ Approved By: _____ Date: _____