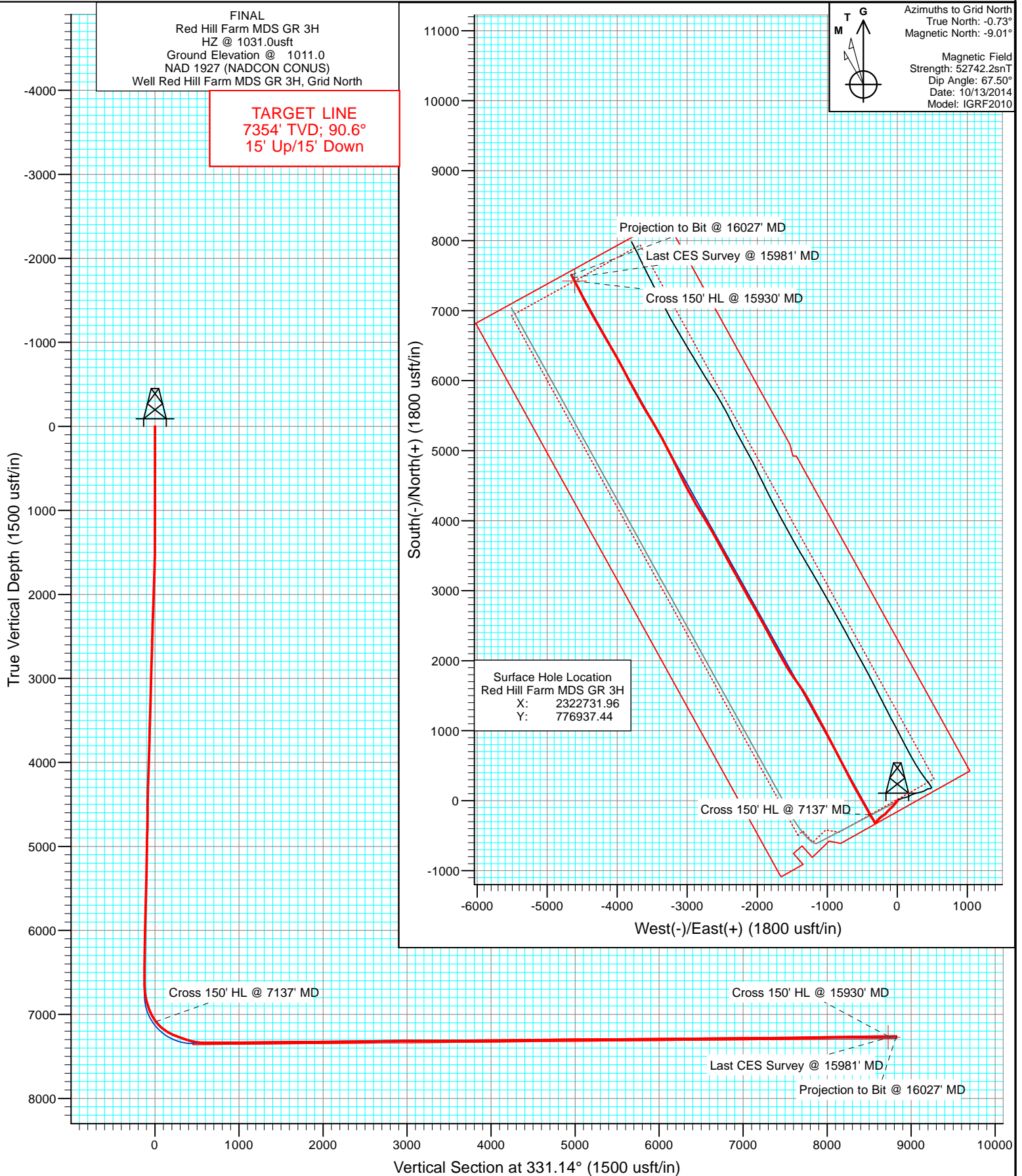




CATHEDRAL



Survey Report

Company:	American Energy - Utica, LLC	Local Co-ordinate Reference:	Well Red Hill Farm MDS GR 3H
Project:	Guernsey County, OH	TVD Reference:	HZ @ 1031.0usft
Site:	Red Hill Farm Pad	MD Reference:	HZ @ 1031.0usft
Well:	Red Hill Farm MDS GR 3H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	Guernsey County, OH		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Ohio South 3402		Using geodetic scale factor

Site		Red Hill Farm Pad			
Site Position:		Northing:	776,953.28 usft	Latitude:	40.127515
From:	Map	Easting:	2,322,744.17 usft	Longitude:	-81.345885
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.73 °

Well	Red Hill Farm MDS GR 3H					
Well Position	+N/-S	0.0 usft	Northing:	776,937.44 usft	Latitude:	40.127472
	+E/-W	0.0 usft	Easting:	2,322,731.96 usft	Longitude:	-81.345930
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	1,011.0 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/13/2014	-8.28	67.50	52,742

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	331.14	

Survey Program	Date	12/1/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	6,386.0	Gyro surveys (11.23.14) (HZ)	ISCWSA MWD	MWD - ISCWSA	
6,524.0	16,027.0	Survey #4 (HZ)	ISCWSA MWD	MWD - ISCWSA	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Formations / Comments	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
100.0	0.16	247.26	100.0	-0.1	-0.1	0.0	0.16	0.16		
191.1	0.17	254.15	191.1	-0.1	-0.4	0.1	0.02	0.01		
281.8	0.09	266.82	281.8	-0.2	-0.6	0.1	0.09	-0.09		
372.4	0.20	269.21	372.4	-0.2	-0.8	0.2	0.12	0.12		
463.1	0.17	259.33	463.1	-0.2	-1.1	0.3	0.05	-0.03		
553.8	0.15	278.45	553.8	-0.2	-1.3	0.5	0.06	-0.02		
644.4	0.12	273.85	644.4	-0.2	-1.6	0.6	0.04	-0.03		
735.1	0.24	162.13	735.1	-0.4	-1.6	0.4	0.34	0.13		
825.7	0.56	153.36	825.7	-0.9	-1.3	-0.2	0.36	0.35		
916.4	0.49	122.01	916.4	-1.6	-0.8	-1.0	0.32	-0.08		
1,007.1	0.33	100.89	1,007.0	-1.8	-0.2	-1.5	0.24	-0.18		

Survey Report

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Project:	Guernsey County, OH	TVD Reference:	HZ @ 1031.0usft
Site:	Red Hill Farm Pad	MD Reference:	HZ @ 1031.0usft
Well:	Red Hill Farm MDS GR 3H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Formations / Comments
1,097.7	0.63	51.17	1,097.7	-1.5	0.4	-1.6	0.54	0.33	
1,188.4	0.86	55.42	1,188.4	-0.8	1.4	-1.4	0.26	0.25	
1,279.0	0.91	39.68	1,279.0	0.1	2.4	-1.1	0.27	0.06	
1,369.7	0.48	72.14	1,369.7	0.8	3.2	-0.9	0.63	-0.47	
1,460.4	0.47	138.06	1,460.3	0.6	3.8	-1.3	0.57	-0.01	
1,551.0	2.29	209.56	1,551.0	-1.2	3.2	-2.6	2.41	2.01	
1,641.7	3.88	221.58	1,641.5	-5.1	0.2	-4.6	1.88	1.75	
1,732.3	4.86	220.90	1,731.9	-10.3	-4.3	-7.0	1.08	1.08	
1,823.0	4.92	219.75	1,822.2	-16.2	-9.3	-9.7	0.13	0.07	
1,913.7	5.54	221.38	1,912.5	-22.5	-14.7	-12.6	0.70	0.68	
2,004.3	5.87	221.56	2,002.7	-29.2	-20.7	-15.6	0.36	0.36	
2,095.0	5.60	220.85	2,092.9	-36.0	-26.6	-18.7	0.31	-0.30	
2,185.6	5.49	218.67	2,183.1	-42.8	-32.2	-21.9	0.26	-0.12	
2,276.3	4.99	216.71	2,273.4	-49.3	-37.3	-25.2	0.59	-0.55	
2,367.0	4.53	218.43	2,363.8	-55.3	-41.9	-28.2	0.53	-0.51	
2,457.6	4.06	219.04	2,454.2	-60.6	-46.1	-30.8	0.52	-0.52	
2,548.3	4.15	225.96	2,544.6	-65.4	-50.5	-32.9	0.55	0.10	
2,638.9	5.45	221.31	2,634.9	-70.9	-55.7	-35.2	1.50	1.43	
2,729.6	5.69	221.78	2,725.2	-77.5	-61.5	-38.1	0.27	0.26	
2,820.3	6.18	225.87	2,815.3	-84.2	-68.0	-40.9	0.71	0.54	
2,910.9	6.16	226.23	2,905.5	-91.0	-75.1	-43.4	0.05	-0.02	
3,001.6	5.97	225.41	2,995.6	-97.6	-81.9	-46.0	0.23	-0.21	
3,092.2	6.70	226.66	3,085.7	-104.6	-89.1	-48.6	0.82	0.81	
3,182.9	6.00	229.82	3,175.8	-111.3	-96.6	-50.8	0.86	-0.77	
3,273.6	5.53	225.61	3,266.0	-117.4	-103.3	-52.9	0.70	-0.52	
3,364.2	5.48	226.00	3,356.3	-123.4	-109.6	-55.2	0.07	-0.06	
3,454.9	5.58	225.87	3,446.5	-129.5	-115.8	-57.5	0.11	0.11	
3,545.5	5.72	222.56	3,536.7	-135.9	-122.1	-60.1	0.39	0.15	
3,636.2	5.95	226.55	3,626.9	-142.5	-128.5	-62.7	0.51	0.25	
3,726.9	5.71	227.57	3,717.1	-148.8	-135.3	-65.0	0.29	-0.26	
3,817.5	5.67	219.32	3,807.3	-155.3	-141.4	-67.7	0.90	-0.04	
3,908.2	4.99	218.99	3,897.6	-161.8	-146.8	-70.9	0.75	-0.75	
3,998.8	3.93	218.55	3,988.0	-167.3	-151.2	-73.5	1.17	-1.17	
4,089.5	4.58	220.49	4,078.4	-172.5	-155.5	-76.0	0.73	0.72	
4,180.2	5.41	221.53	4,168.7	-178.4	-160.6	-78.7	0.92	0.92	
4,270.8	7.19	219.40	4,258.8	-186.0	-167.1	-82.3	1.98	1.96	
4,361.5	6.66	221.30	4,348.8	-194.3	-174.2	-86.1	0.64	-0.58	
4,452.1	6.98	244.58	4,438.9	-200.7	-182.6	-87.6	3.05	0.35	
4,542.8	7.71	240.37	4,528.8	-206.0	-192.9	-87.4	1.00	0.81	
4,633.5	7.98	238.37	4,618.6	-212.3	-203.5	-87.7	0.42	0.30	
4,724.1	8.53	233.19	4,708.3	-219.7	-214.2	-89.0	1.02	0.61	
4,814.8	8.92	236.19	4,797.9	-227.6	-225.5	-90.5	0.66	0.43	
4,905.4	9.29	228.30	4,887.4	-236.4	-236.8	-92.7	1.44	0.41	
4,996.1	8.07	231.99	4,977.1	-245.2	-247.3	-95.4	1.48	-1.35	
5,086.8	5.94	227.14	5,067.0	-252.3	-255.7	-97.5	2.44	-2.35	
5,177.4	2.62	222.01	5,157.4	-257.0	-260.5	-99.3	3.68	-3.66	
5,268.1	2.03	211.47	5,248.0	-259.9	-262.8	-100.8	0.80	-0.65	
5,358.7	2.05	207.31	5,338.6	-262.7	-264.3	-102.5	0.16	0.02	
5,449.4	2.93	224.92	5,429.2	-265.8	-266.7	-104.1	1.28	0.97	
5,540.1	3.71	226.96	5,519.7	-269.5	-270.5	-105.4	0.87	0.86	
5,630.7	4.11	223.21	5,610.2	-273.8	-274.9	-107.1	0.52	0.44	
5,721.4	4.30	224.30	5,700.6	-278.6	-279.5	-109.1	0.23	0.21	
5,812.0	4.93	222.90	5,790.9	-283.9	-284.5	-111.3	0.71	0.69	

Survey Report

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Site:	Red Hill Farm Pad	MD Reference:	HZ @ 1031.0usft
Well:	Red Hill Farm MDS GR 3H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Formations / Comments
5,902.7	5.68	222.17	5,881.2	-290.1	-290.2	-114.0	0.83	0.83	
5,993.4	6.26	225.06	5,971.4	-296.9	-296.7	-116.8	0.72	0.64	
6,084.0	3.61	226.76	6,061.7	-302.4	-302.2	-118.9	2.93	-2.92	
6,174.7	3.02	212.57	6,152.2	-306.3	-305.6	-120.8	1.11	-0.65	
6,265.3	2.57	215.92	6,242.8	-310.0	-308.1	-122.8	0.53	-0.50	
6,356.0	2.43	213.32	6,333.3	-313.2	-310.3	-124.5	0.20	-0.15	
6,386.0	2.05	216.70	6,363.3	-314.2	-311.0	-125.1	1.34	-1.27	
6,524.0	2.30	243.60	6,501.2	-317.4	-315.0	-126.0	0.75	0.18	
6,579.0	1.70	257.00	6,556.2	-318.1	-316.7	-125.7	1.38	-1.09	
6,674.0	1.10	273.70	6,651.1	-318.3	-319.0	-124.8	0.76	-0.63	
6,769.0	6.60	326.40	6,745.9	-313.7	-323.0	-118.9	6.31	5.79	
6,864.0	15.10	338.40	6,839.1	-297.6	-330.6	-101.1	9.21	8.95	
6,958.0	19.10	328.80	6,929.0	-273.1	-343.0	-73.6	5.19	4.26	
7,053.0	28.70	326.60	7,015.7	-240.7	-363.7	-35.2	10.15	10.11	
7,137.1	37.46	330.78	7,086.1	-201.4	-387.3	10.6	10.75	10.41	Cross 150' HL @ 7137' MD
7,148.0	38.60	331.20	7,094.7	-195.5	-390.6	17.3	10.75	10.49	
7,243.0	50.50	330.50	7,162.3	-137.5	-423.0	83.8	12.54	12.53	
7,338.0	60.80	330.50	7,215.8	-69.3	-461.6	162.1	10.84	10.84	
7,433.0	68.90	330.90	7,256.2	5.6	-503.6	248.0	8.53	8.53	
7,528.0	70.70	330.20	7,289.0	83.3	-547.5	337.2	2.02	1.89	
7,622.0	75.00	330.40	7,316.7	161.3	-592.0	427.0	4.58	4.57	
7,717.0	82.50	332.00	7,335.2	242.9	-636.8	520.1	8.07	7.89	
7,812.0	90.30	332.60	7,341.2	326.8	-680.9	614.8	8.23	8.21	
7,907.0	91.00	333.80	7,340.1	411.5	-723.7	709.7	1.46	0.74	
8,002.0	89.70	332.40	7,339.5	496.3	-766.7	804.7	2.01	-1.37	
8,097.0	90.10	332.20	7,339.7	580.4	-810.8	899.6	0.47	0.42	
8,191.0	89.90	332.00	7,339.7	663.4	-854.8	993.6	0.30	-0.21	
8,286.0	90.20	332.40	7,339.6	747.5	-899.1	1,088.6	0.53	0.32	
8,381.0	89.90	331.70	7,339.5	831.4	-943.6	1,183.6	0.80	-0.32	
8,476.0	91.10	333.70	7,338.7	915.8	-987.2	1,278.6	2.46	1.26	
8,571.0	91.10	332.90	7,336.9	1,000.7	-1,029.9	1,373.5	0.84	0.00	
8,666.0	90.00	330.70	7,336.0	1,084.4	-1,074.8	1,468.5	2.59	-1.16	
8,761.0	90.50	330.70	7,335.5	1,167.2	-1,121.3	1,563.5	0.53	0.53	
8,856.0	91.10	332.40	7,334.2	1,250.7	-1,166.5	1,658.4	1.90	0.63	
8,951.0	90.00	331.40	7,333.3	1,334.5	-1,211.3	1,753.4	1.56	-1.16	
9,046.0	89.50	330.80	7,333.7	1,417.7	-1,257.2	1,848.4	0.82	-0.53	
9,141.0	91.00	330.10	7,333.3	1,500.3	-1,304.0	1,943.4	1.74	1.58	
9,236.0	91.10	327.20	7,331.6	1,581.4	-1,353.4	2,038.3	3.05	0.11	
9,331.0	91.00	323.80	7,329.8	1,659.7	-1,407.2	2,132.8	3.58	-0.11	
9,426.0	90.60	324.50	7,328.5	1,736.7	-1,462.9	2,227.1	0.85	-0.42	
9,521.0	90.40	326.10	7,327.7	1,814.8	-1,516.9	2,321.6	1.70	-0.21	
9,616.0	91.30	330.10	7,326.3	1,895.4	-1,567.1	2,416.4	4.32	0.95	
9,711.0	91.00	328.80	7,324.3	1,977.2	-1,615.4	2,511.4	1.40	-0.32	
9,806.0	91.40	331.60	7,322.4	2,059.6	-1,662.6	2,606.3	2.98	0.42	
9,900.0	91.80	331.60	7,319.7	2,142.3	-1,707.3	2,700.3	0.43	0.43	
9,995.0	92.10	331.60	7,316.5	2,225.8	-1,752.4	2,795.2	0.32	0.32	
10,090.0	89.70	332.40	7,315.0	2,309.7	-1,797.0	2,890.2	2.66	-2.53	
10,185.0	89.80	331.60	7,315.4	2,393.6	-1,841.6	2,985.2	0.85	0.11	
10,280.0	90.50	333.10	7,315.2	2,477.7	-1,885.7	3,080.2	1.74	0.74	
10,375.0	88.90	330.20	7,315.7	2,561.3	-1,930.8	3,175.1	3.49	-1.68	
10,470.0	89.00	330.30	7,317.4	2,643.8	-1,977.9	3,270.1	0.15	0.11	
10,565.0	89.30	330.30	7,318.8	2,726.3	-2,025.0	3,365.1	0.32	0.32	
10,660.0	90.00	329.80	7,319.4	2,808.6	-2,072.4	3,460.1	0.91	0.74	

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Well:	Red Hill Farm MDS GR 3H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Formations / Comments
10,755.0	90.00	331.60	7,319.4	2,891.4	-2,118.9	3,555.1	1.89	0.00	
10,850.0	89.80	331.20	7,319.6	2,974.8	-2,164.4	3,650.1	0.47	-0.21	
10,945.0	90.30	331.00	7,319.5	3,058.0	-2,210.3	3,745.1	0.57	0.53	
11,040.0	90.30	331.00	7,319.0	3,141.1	-2,256.4	3,840.1	0.00	0.00	
11,136.0	90.50	330.50	7,318.3	3,224.8	-2,303.3	3,936.1	0.56	0.21	
11,231.0	90.60	330.30	7,317.4	3,307.4	-2,350.2	4,031.0	0.24	0.11	
11,326.0	90.80	331.50	7,316.2	3,390.4	-2,396.4	4,126.0	1.28	0.21	
11,421.0	91.10	332.20	7,314.7	3,474.2	-2,441.2	4,221.0	0.80	0.32	
11,516.0	91.30	331.20	7,312.7	3,557.8	-2,486.2	4,316.0	1.07	0.21	
11,611.0	91.70	331.60	7,310.2	3,641.2	-2,531.7	4,410.9	0.60	0.42	
11,706.0	92.20	331.70	7,307.0	3,724.8	-2,576.8	4,505.9	0.54	0.53	
11,802.0	90.10	329.90	7,305.0	3,808.5	-2,623.6	4,601.9	2.88	-2.19	
11,897.0	90.40	330.60	7,304.6	3,891.0	-2,670.7	4,696.8	0.80	0.32	
11,992.0	90.30	330.20	7,304.0	3,973.6	-2,717.7	4,791.8	0.43	-0.11	
12,087.0	90.80	327.40	7,303.1	4,054.9	-2,766.9	4,886.7	2.99	0.53	
12,181.0	91.10	328.50	7,301.6	4,134.5	-2,816.7	4,980.6	1.21	0.32	
12,276.0	90.60	330.00	7,300.2	4,216.2	-2,865.3	5,075.5	1.66	-0.53	
12,371.0	89.80	331.70	7,299.8	4,299.1	-2,911.6	5,170.5	1.98	-0.84	
12,466.0	89.80	331.10	7,300.2	4,382.5	-2,957.1	5,265.5	0.63	0.00	
12,561.0	90.00	331.00	7,300.3	4,465.7	-3,003.0	5,360.5	0.24	0.21	
12,656.0	89.90	333.50	7,300.4	4,549.7	-3,047.3	5,455.5	2.63	-0.11	
12,751.0	90.50	334.60	7,300.1	4,635.1	-3,088.8	5,550.4	1.32	0.63	
12,846.0	91.20	335.00	7,298.7	4,721.1	-3,129.3	5,645.2	0.85	0.74	
12,940.0	89.30	333.20	7,298.3	4,805.6	-3,170.3	5,739.0	2.78	-2.02	
13,036.0	89.60	333.40	7,299.2	4,891.4	-3,213.5	5,834.9	0.38	0.31	
13,131.0	90.10	333.30	7,299.4	4,976.3	-3,256.1	5,929.9	0.54	0.53	
13,226.0	90.70	333.00	7,298.8	5,061.1	-3,299.0	6,024.8	0.71	0.63	
13,321.0	91.20	332.00	7,297.2	5,145.3	-3,342.9	6,119.8	1.18	0.53	
13,416.0	90.80	330.00	7,295.5	5,228.4	-3,388.9	6,214.7	2.15	-0.42	
13,511.0	91.80	330.20	7,293.4	5,310.7	-3,436.2	6,309.7	1.07	1.05	
13,606.0	90.20	329.40	7,291.7	5,392.8	-3,484.0	6,404.6	1.88	-1.68	
13,701.0	90.50	329.00	7,291.1	5,474.4	-3,532.7	6,499.6	0.53	0.32	
13,796.0	90.90	328.60	7,290.0	5,555.6	-3,581.9	6,594.5	0.60	0.42	
13,891.0	89.70	329.80	7,289.5	5,637.2	-3,630.5	6,689.4	1.79	-1.26	
13,987.0	89.70	331.40	7,290.0	5,720.9	-3,677.6	6,785.4	1.67	0.00	
14,082.0	90.10	331.70	7,290.1	5,804.4	-3,722.9	6,880.4	0.53	0.42	
14,177.0	90.30	330.90	7,289.8	5,887.7	-3,768.5	6,975.4	0.87	0.21	
14,272.0	90.80	332.30	7,288.9	5,971.3	-3,813.7	7,070.4	1.56	0.53	
14,357.0	90.90	332.70	7,287.6	6,046.7	-3,852.9	7,155.4	0.49	0.12	
14,462.0	90.90	331.90	7,286.0	6,139.6	-3,901.7	7,260.3	0.76	0.00	
14,557.0	90.70	331.60	7,284.7	6,223.3	-3,946.7	7,355.3	0.38	-0.21	
14,652.0	91.00	331.90	7,283.3	6,307.0	-3,991.7	7,450.3	0.45	0.32	
14,747.0	90.80	330.40	7,281.8	6,390.2	-4,037.5	7,545.3	1.59	-0.21	
14,842.0	90.30	328.70	7,280.9	6,472.1	-4,085.6	7,640.3	1.87	-0.53	
14,937.0	91.10	330.40	7,279.7	6,553.9	-4,133.8	7,735.2	1.98	0.84	
15,032.0	91.40	330.10	7,277.6	6,636.4	-4,180.9	7,830.2	0.45	0.32	
15,127.0	91.80	330.10	7,275.0	6,718.7	-4,228.2	7,925.1	0.42	0.42	
15,223.0	92.20	329.90	7,271.6	6,801.8	-4,276.2	8,021.0	0.47	0.42	
15,317.0	90.40	331.00	7,269.5	6,883.6	-4,322.5	8,115.0	2.24	-1.91	
15,412.0	90.30	331.00	7,268.9	6,966.6	-4,368.6	8,210.0	0.11	-0.11	
15,507.0	90.40	331.30	7,268.3	7,049.9	-4,414.5	8,305.0	0.33	0.11	
15,602.0	90.70	332.40	7,267.4	7,133.6	-4,459.3	8,400.0	1.20	0.32	
15,697.0	90.80	333.20	7,266.2	7,218.1	-4,502.7	8,495.0	0.85	0.11	

Survey Report

Company:	American Energy - Utica, LLC	Local Co-ordinate Reference:	Well Red Hill Farm MDS GR 3H
Project:	Guernsey County, OH	TVD Reference:	HZ @ 1031.0usft
Site:	Red Hill Farm Pad	MD Reference:	HZ @ 1031.0usft
Well:	Red Hill Farm MDS GR 3H	North Reference:	Grid
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Formations / Comments
15,792.0	90.70	333.20	7,264.9	7,302.9	-4,545.5	8,589.9	0.11	-0.11	
15,887.0	90.70	331.70	7,263.8	7,387.1	-4,589.5	8,684.9	1.58	0.00	
15,929.4	90.84	331.70	7,263.2	7,424.5	-4,609.6	8,727.3	0.32	0.32	3H First Perf P3
15,930.0	90.84	331.70	7,263.2	7,425.0	-4,609.8	8,727.9	0.32	0.32	Cross 150' HL @ 15930' MD
15,981.0	91.00	331.70	7,262.4	7,469.9	-4,634.0	8,778.8	0.32	0.32	Last CES Survey @ 15981' MD
16,027.0	91.00	331.70	7,261.6	7,510.4	-4,655.8	8,824.8	0.00	0.00	Projection to Bit @ 16027' MD

Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
3H First Perf - actual wellpath misses target center by 1.0usft at 15929.6usft MD (7263.2 TVD, 7424.6 N, -4609.6 E) - Rectangle (sides W30.0 H0.0 D8,715.0)	89.40	331.14	7,262.6	7,424.2	-4,610.3	784,361.83	2,318,121.54	40.148011	-81.362080
3H First Perf P3 - actual wellpath misses target center by 10.6usft at 15929.4usft MD (7263.2 TVD, 7424.5 N, -4609.6 E) - Rectangle (sides W30.0 H0.0 D8,275.6)	89.50	330.96	7,273.8	7,424.2	-4,610.3	784,361.83	2,318,121.54	40.148011	-81.362080

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
7,137.1	7,086.1	-201.4	-387.3	Cross 150' HL @ 7137' MD	
15,930.0	7,263.2	7,425.0	-4,609.8	Cross 150' HL @ 15930' MD	
15,981.0	7,262.4	7,469.9	-4,634.0	Last CES Survey @ 15981' MD	
16,027.0	7,261.6	7,510.4	-4,655.8	Projection to Bit @ 16027' MD	

Checked By: _____	Approved By: _____	Date: _____
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