



HOBBS OCD

JUN 13 2016

RECEIVED

Legacy Reserves

Lea County, NM

Lea Unit

#33H

OH

Design: OH

Standard Survey Report

02 September, 2015





TDS
Survey Report



Company:	Legacy Reserves	Local Co-ordinate Reference:	Well #33H
Project:	Lea County, NM	TVD Reference:	KB @ 3673.0usft (McVay 4)
Site:	Lea Unit	MD Reference:	KB @ 3673.0usft (McVay 4)
Well:	#33H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single 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	Lea Unit				
Site Position:		Northing:	567,504.40 usft	Latitude:	32° 33' 26.922 N
From:	Map	Easting:	753,784.90 usft	Longitude:	103° 30' 34.732 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.44 °

Well	#33H					
Well Position	+N/-S	0.0 usft	Northing:	575,615.10 usft	Latitude:	32° 34' 47.321 N
	+E/-W	0.0 usft	Easting:	751,882.00 usft	Longitude:	103° 30' 56.236 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,655.0 usft	

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	8/7/2015	7.15	60.42	48,346

Design	OH				
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	357.70	

Survey Program	Date 9/2/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	5,290.0	Gyro #1 (OH)	VES-ISCWSA-GYRO-3	Biaxial Semi-Cont. Gyro	
5,467.0	15,600.0	MWD #1 (OH)	MWD	MWD - Standard	

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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
100.0	0.15	161.69	100.0	-0.1	0.0	-0.1	0.15	0.15	0.00	
200.0	0.49	142.35	200.0	-0.6	0.3	-0.6	0.35	0.34	-19.34	
300.0	0.52	119.37	300.0	-1.1	1.0	-1.2	0.20	0.03	-22.98	
400.0	0.56	135.26	400.0	-1.7	1.7	-1.8	0.15	0.04	15.89	
500.0	0.53	136.57	500.0	-2.4	2.4	-2.5	0.03	-0.03	1.31	
600.0	0.46	138.66	600.0	-3.0	3.0	-3.2	0.07	-0.07	2.09	
700.0	0.30	145.06	700.0	-3.6	3.4	-3.7	0.17	-0.16	6.40	
800.0	0.27	181.64	800.0	-4.0	3.5	-4.1	0.18	-0.03	36.58	
900.0	0.13	209.44	900.0	-4.3	3.5	-4.5	0.17	-0.14	27.80	

Company: Legacy Reserves
Project: Lea County, NM
Site: Lea Unit
Well: #33H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #33H
TVD Reference: KB @ 3673.0usft (McVay 4)
MD Reference: KB @ 3673.0usft (McVay 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single 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)
1,000.0	0.23	212.85	1,000.0	-4.6	3.3	-4.7	0.10	0.10	3.41
1,100.0	0.40	221.35	1,100.0	-5.0	3.0	-5.2	0.18	0.17	8.50
1,200.0	0.39	241.33	1,200.0	-5.5	2.4	-5.6	0.14	-0.01	19.98
1,300.0	0.28	251.81	1,300.0	-5.7	1.9	-5.8	0.13	-0.11	10.48
1,400.0	0.27	274.07	1,400.0	-5.8	1.4	-5.8	0.11	-0.01	22.26
1,500.0	0.95	294.80	1,500.0	-5.4	0.5	-5.4	0.70	0.68	20.73
1,600.0	1.58	285.81	1,599.9	-4.7	-1.6	-4.6	0.66	0.63	-8.99
1,700.0	1.83	278.38	1,699.9	-4.1	-4.5	-3.9	0.33	0.25	-7.43
1,800.0	1.62	271.43	1,799.9	-3.8	-7.5	-3.5	0.30	-0.21	-6.95
1,900.0	1.47	280.12	1,899.8	-3.5	-10.2	-3.1	0.28	-0.15	8.69
2,000.0	1.29	285.34	1,999.8	-3.0	-12.5	-2.5	0.22	-0.18	5.22
2,100.0	1.50	286.28	2,099.8	-2.3	-14.9	-1.7	0.21	0.21	0.94
2,200.0	1.35	293.84	2,199.7	-1.5	-17.2	-0.8	0.24	-0.15	7.56
2,300.0	1.34	295.34	2,299.7	-0.5	-19.4	0.2	0.04	-0.01	1.50
2,400.0	1.05	301.76	2,399.7	0.5	-21.2	1.3	0.32	-0.29	6.42
2,500.0	1.11	305.09	2,499.7	1.5	-22.8	2.4	0.09	0.06	3.33
2,600.0	0.99	312.34	2,599.6	2.6	-24.2	3.6	0.18	-0.12	7.25
2,700.0	1.04	320.50	2,699.6	3.9	-25.4	4.9	0.15	0.05	8.16
2,800.0	1.05	334.86	2,799.6	5.4	-26.4	6.5	0.26	0.01	14.36
2,900.0	1.55	1.18	2,899.6	7.6	-26.7	8.7	0.77	0.50	26.32
3,000.0	1.81	9.26	2,999.5	10.5	-26.5	11.6	0.35	0.26	8.08
3,100.0	2.05	9.42	3,099.5	13.9	-25.9	14.9	0.24	0.24	0.16
3,200.0	2.23	20.23	3,199.4	17.4	-24.9	18.4	0.44	0.18	10.81
3,300.0	2.31	18.62	3,299.3	21.2	-23.6	22.1	0.10	0.08	-1.61
3,400.0	2.17	21.21	3,399.3	24.9	-22.3	25.7	0.17	-0.14	2.59
3,500.0	1.93	22.53	3,499.2	28.2	-21.0	29.0	0.24	-0.24	1.32
3,600.0	1.63	21.24	3,599.1	31.1	-19.8	31.8	0.30	-0.30	-1.29
3,700.0	1.50	19.44	3,699.1	33.6	-18.9	34.3	0.14	-0.13	-1.80
3,800.0	1.44	12.75	3,799.1	36.1	-18.1	36.8	0.18	-0.06	-6.69
3,900.0	1.40	11.98	3,899.0	38.5	-17.6	39.2	0.04	-0.04	-0.77
4,000.0	1.26	5.84	3,999.0	40.8	-17.2	41.4	0.20	-0.14	-6.14
4,100.0	1.30	7.15	4,099.0	43.0	-17.0	43.7	0.05	0.04	1.31
4,200.0	0.94	4.44	4,199.0	45.0	-16.8	45.6	0.36	-0.36	-2.71
4,300.0	0.85	9.65	4,299.0	46.5	-16.6	47.1	0.12	-0.09	5.21
4,400.0	1.14	8.19	4,398.9	48.2	-16.3	48.8	0.29	0.29	-1.46
4,500.0	0.87	338.50	4,498.9	49.9	-16.5	50.5	0.58	-0.27	-29.69
4,600.0	1.11	325.73	4,598.9	51.4	-17.3	52.1	0.32	0.24	-12.77
4,700.0	1.27	323.77	4,698.9	53.1	-18.5	53.8	0.17	0.16	-1.96
4,800.0	1.50	327.14	4,798.9	55.1	-19.9	55.9	0.24	0.23	3.37
4,900.0	1.73	323.14	4,898.8	57.4	-21.5	58.2	0.26	0.23	-4.00
5,000.0	1.94	323.65	4,998.8	60.0	-23.4	60.9	0.21	0.21	0.51
5,100.0	2.02	314.91	5,098.7	62.6	-25.6	63.6	0.31	0.08	-8.74
5,200.0	1.81	314.87	5,198.7	64.9	-28.0	66.0	0.21	-0.21	-0.04



TDS
Survey Report



Company:	Legacy Reserves	Local Co-ordinate Reference:	Well #33H
Project:	Lea County, NM	TVD Reference:	KB @ 3673.0usft (McVay 4)
Site:	Lea Unit	MD Reference:	KB @ 3673.0usft (McVay 4)
Well:	#33H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single 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)
5,290.0	1.93	313.85	5,288.6	67.0	-30.1	68.2	0.14	0.13	-1.13
TIE-IN to Gyro									
5,467.0	1.90	303.70	5,465.5	70.7	-34.7	72.0	0.19	-0.02	-5.73
5,561.0	2.00	304.40	5,559.5	72.5	-37.3	73.9	0.11	0.11	0.74
5,656.0	1.90	305.30	5,654.4	74.3	-40.0	75.9	0.11	-0.11	0.95
5,750.0	1.70	306.80	5,748.4	76.1	-42.4	77.7	0.22	-0.21	1.60
5,844.0	1.70	307.20	5,842.3	77.7	-44.6	79.5	0.01	0.00	0.43
5,938.0	1.50	308.20	5,936.3	79.3	-46.7	81.2	0.21	-0.21	1.06
6,032.0	1.40	312.70	6,030.2	80.9	-48.5	82.8	0.16	-0.11	4.79
6,126.0	1.10	315.20	6,124.2	82.3	-50.0	84.2	0.32	-0.32	2.66
6,220.0	2.70	312.20	6,218.2	84.4	-52.3	86.5	1.70	1.70	-3.19
6,315.0	2.90	316.90	6,313.1	87.7	-55.6	89.8	0.32	0.21	4.95
6,409.0	2.80	320.70	6,406.9	91.2	-58.6	93.5	0.23	-0.11	4.04
6,503.0	2.40	320.00	6,500.8	94.5	-61.4	96.9	0.43	-0.43	-0.74
6,597.0	2.40	323.50	6,594.8	97.6	-63.8	100.1	0.16	0.00	3.72
6,691.0	2.20	321.10	6,688.7	100.6	-66.1	103.1	0.24	-0.21	-2.55
6,785.0	2.10	323.30	6,782.6	103.4	-68.3	106.0	0.14	-0.11	2.34
6,880.0	2.00	317.90	6,877.6	106.0	-70.4	108.7	0.23	-0.11	-5.68
6,974.0	2.00	319.40	6,971.5	108.4	-72.6	111.3	0.06	0.00	1.60
7,068.0	2.00	319.10	7,065.4	110.9	-74.7	113.8	0.01	0.00	-0.32
7,162.0	1.80	320.70	7,159.4	113.3	-76.7	116.3	0.22	-0.21	1.70
7,256.0	1.80	321.40	7,253.3	115.6	-78.6	118.7	0.02	0.00	0.74
7,350.0	1.80	317.00	7,347.3	117.8	-80.5	121.0	0.15	0.00	-4.68
7,445.0	1.70	317.40	7,442.3	120.0	-82.5	123.2	0.11	-0.11	0.42
7,539.0	1.50	319.40	7,536.2	121.9	-84.2	125.2	0.22	-0.21	2.13
7,633.0	1.50	317.20	7,630.2	123.8	-85.9	127.1	0.06	0.00	-2.34
7,727.0	1.20	319.00	7,724.2	125.4	-87.3	128.8	0.32	-0.32	1.91
7,821.0	1.30	317.80	7,818.1	126.9	-88.7	130.4	0.11	0.11	-1.28
7,915.0	1.50	318.30	7,912.1	128.6	-90.2	132.2	0.21	0.21	0.53
8,009.0	1.50	309.40	8,006.1	130.3	-92.0	133.9	0.25	0.00	-9.47
8,104.0	1.50	305.60	8,101.0	131.9	-94.0	135.5	0.10	0.00	-4.00
8,198.0	1.50	305.50	8,195.0	133.3	-96.0	137.0	0.00	0.00	-0.11
8,292.0	1.30	306.50	8,289.0	134.6	-97.8	138.5	0.21	-0.21	1.06
8,386.0	1.20	314.20	8,383.0	136.0	-99.4	139.8	0.21	-0.11	8.19
8,480.0	1.40	303.60	8,476.9	137.3	-101.1	141.2	0.33	0.21	-11.28
8,575.0	2.50	305.10	8,571.9	139.1	-103.7	143.2	1.16	1.16	1.58
8,669.0	2.70	306.80	8,665.8	141.6	-107.2	145.8	0.23	0.21	1.81
8,763.0	2.40	308.50	8,759.7	144.2	-110.5	148.5	0.33	-0.32	1.81
8,857.0	2.10	319.10	8,853.6	146.7	-113.2	151.1	0.54	-0.32	11.28
8,952.0	1.70	330.50	8,948.6	149.2	-115.0	153.7	0.58	-0.42	12.00
9,046.0	1.60	338.70	9,042.5	151.7	-116.2	156.2	0.27	-0.11	8.72
9,140.0	2.80	314.50	9,136.5	154.5	-118.3	159.1	1.59	1.28	-25.74
9,234.0	3.60	311.50	9,230.3	158.1	-122.1	162.8	0.87	0.85	-3.19

Company:	Legacy Reserves	Local Co-ordinate Reference:	Well #33H
Project:	Lea County, NM	TVD Reference:	KB @ 3673.0usft (McVay 4)
Site:	Lea Unit	MD Reference:	KB @ 3673.0usft (McVay 4)
Well:	#33H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single 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)
9,329.0	3.60	308.40	9,325.1	161.9	-126.7	166.9	0.20	0.00	-3.26
9,423.0	3.50	305.70	9,418.9	165.4	-131.3	170.5	0.21	-0.11	-2.87
9,517.0	3.30	305.80	9,512.8	168.7	-135.9	174.0	0.21	-0.21	0.11
9,611.0	3.30	307.30	9,606.6	171.9	-140.2	177.4	0.09	0.00	1.60
9,705.0	3.80	308.40	9,700.4	175.5	-144.8	181.1	0.54	0.53	1.17
9,799.0	3.50	309.30	9,794.3	179.2	-149.5	185.1	0.32	-0.32	0.96
9,893.0	2.60	312.90	9,888.1	182.5	-153.2	188.5	0.98	-0.96	3.83
9,987.0	2.30	310.60	9,982.0	185.2	-156.2	191.3	0.34	-0.32	-2.45
10,081.0	1.20	4.70	10,076.0	187.4	-157.6	193.5	1.99	-1.17	57.55
10,176.0	0.90	27.90	10,171.0	189.0	-157.2	195.2	0.54	-0.32	24.42
10,300.0	2.60	16.60	10,294.9	192.6	-155.9	198.7	1.39	1.37	-9.11
10,332.0	5.50	5.70	10,326.8	194.8	-155.5	200.9	9.34	9.06	-34.06
10,363.0	8.10	358.00	10,357.6	198.5	-155.5	204.5	8.87	8.39	-24.84
10,395.0	11.00	359.00	10,389.2	203.8	-155.6	209.8	9.08	9.06	3.13
10,426.0	14.30	2.50	10,419.4	210.6	-155.5	216.6	10.92	10.65	11.29
10,458.0	16.50	3.80	10,450.3	219.0	-155.0	225.1	6.96	6.88	4.06
10,489.0	17.50	3.40	10,479.9	228.1	-154.4	234.1	3.25	3.23	-1.29
10,520.0	18.80	2.10	10,509.4	237.7	-154.0	243.7	4.39	4.19	-4.19
10,552.0	21.90	0.70	10,539.4	248.9	-153.7	254.8	9.81	9.69	-4.38
10,583.0	25.80	359.60	10,567.7	261.4	-153.7	267.3	12.66	12.58	-3.55
10,615.0	29.80	359.10	10,596.0	276.3	-153.9	282.3	12.52	12.50	-1.56
10,646.0	33.20	358.60	10,622.4	292.5	-154.2	298.4	11.00	10.97	-1.61
10,677.0	36.00	358.80	10,648.0	310.1	-154.6	316.0	9.04	9.03	0.65
10,709.0	38.60	358.40	10,673.4	329.5	-155.1	335.4	8.16	8.13	-1.25
10,740.0	41.50	357.60	10,697.1	349.4	-155.8	355.4	9.50	9.35	-2.58
10,772.0	44.30	356.70	10,720.6	371.2	-156.9	377.2	8.96	8.75	-2.81
10,803.0	46.20	356.00	10,742.4	393.1	-158.3	399.2	6.34	6.13	-2.26
10,834.0	48.20	356.70	10,763.5	415.8	-159.7	421.9	6.66	6.45	2.26
10,866.0	51.30	356.50	10,784.1	440.2	-161.2	446.3	9.70	9.69	-0.63
10,897.0	54.20	355.60	10,802.9	464.8	-162.9	471.0	9.64	9.35	-2.90
10,929.0	58.30	356.20	10,820.7	491.4	-164.8	497.6	12.91	12.81	1.88
10,960.0	62.80	356.80	10,835.9	518.3	-166.4	524.5	14.61	14.52	1.94
10,991.0	67.00	357.70	10,849.1	546.3	-167.7	552.6	13.80	13.55	2.90
11,023.0	70.20	358.40	10,860.7	576.1	-168.8	582.4	10.21	10.00	2.19
11,054.0	72.70	359.10	10,870.6	605.5	-169.4	611.8	8.34	8.06	2.26
11,086.0	76.20	359.20	10,879.2	636.3	-169.9	642.6	10.94	10.94	0.31
11,167.0	85.30	0.40	10,892.2	716.2	-170.1	722.4	11.33	11.23	1.48
11,261.0	86.60	0.00	10,898.8	809.9	-169.8	816.1	1.45	1.38	-0.43
11,355.0	88.40	359.90	10,902.9	903.8	-169.9	909.9	1.92	1.91	-0.11
11,450.0	89.30	0.10	10,904.8	998.8	-169.9	1,004.8	0.97	0.95	0.21
11,544.0	89.50	0.60	10,905.8	1,092.8	-169.3	1,098.7	0.57	0.21	0.53
11,638.0	89.80	0.60	10,906.4	1,186.8	-168.3	1,192.6	0.32	0.32	0.00
11,732.0	90.40	0.90	10,906.2	1,280.8	-167.1	1,286.5	0.71	0.64	0.32
11,826.0	88.40	359.90	10,907.2	1,374.8	-166.4	1,380.3	2.38	-2.13	-1.06

Company: Legacy Reserves
Project: Lea County, NM
Site: Lea Unit
Well: #33H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #33H
TVD Reference: KB @ 3673.0usft (McVay 4)
MD Reference: KB @ 3673.0usft (McVay 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single 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)
11,920.0	88.60	359.90	10,909.7	1,468.7	-166.6	1,474.2	0.21	0.21	0.00
12,015.0	88.00	0.00	10,912.5	1,563.7	-166.7	1,569.1	0.64	-0.63	0.11
12,109.0	88.40	358.70	10,915.4	1,657.6	-167.7	1,663.0	1.45	0.43	-1.38
12,203.0	88.60	359.10	10,917.9	1,751.6	-169.5	1,757.0	0.48	0.21	0.43
12,297.0	88.80	357.70	10,920.0	1,845.5	-172.2	1,850.9	1.50	0.21	-1.49
12,391.0	89.80	357.50	10,921.2	1,939.4	-176.1	1,944.9	1.08	1.06	-0.21
12,486.0	91.00	358.40	10,920.5	2,034.4	-179.5	2,039.9	1.58	1.26	0.95
12,580.0	91.70	358.50	10,918.3	2,128.3	-182.0	2,133.9	0.75	0.74	0.11
12,674.0	90.80	358.00	10,916.2	2,222.2	-184.9	2,227.9	1.10	-0.96	-0.53
12,768.0	91.30	357.60	10,914.5	2,316.2	-188.5	2,321.9	0.68	0.53	-0.43
12,862.0	90.70	355.50	10,912.9	2,410.0	-194.2	2,415.8	2.32	-0.64	-2.23
12,956.0	91.40	355.20	10,911.2	2,503.6	-201.8	2,509.7	0.81	0.74	-0.32
13,051.0	89.90	355.50	10,910.1	2,598.3	-209.5	2,604.6	1.61	-1.58	0.32
13,145.0	90.00	359.30	10,910.2	2,692.2	-213.8	2,698.6	4.04	0.11	4.04
13,239.0	90.60	359.70	10,909.7	2,786.2	-214.6	2,792.6	0.77	0.64	0.43
13,333.0	91.60	0.10	10,907.9	2,880.2	-214.7	2,886.5	1.15	1.06	0.43
13,428.0	91.20	359.50	10,905.5	2,975.2	-215.1	2,981.4	0.76	-0.42	-0.63
13,522.0	92.30	1.00	10,902.7	3,069.1	-214.7	3,075.2	1.98	1.17	1.60
13,616.0	92.00	0.70	10,899.1	3,163.0	-213.3	3,169.0	0.45	-0.32	-0.32
13,710.0	91.40	1.00	10,896.4	3,257.0	-211.9	3,262.9	0.71	-0.64	0.32
13,805.0	91.30	1.20	10,894.1	3,351.9	-210.1	3,357.7	0.24	-0.11	0.21
13,899.0	91.30	1.00	10,892.0	3,445.9	-208.3	3,451.5	0.21	0.00	-0.21
13,993.0	89.80	1.30	10,891.1	3,539.9	-206.4	3,545.3	1.63	-1.60	0.32
14,087.0	89.80	1.50	10,891.4	3,633.8	-204.1	3,639.1	0.21	0.00	0.21
14,181.0	89.90	1.60	10,891.7	3,727.8	-201.5	3,732.9	0.15	0.11	0.11
14,275.0	90.20	1.30	10,891.6	3,821.8	-199.2	3,826.7	0.45	0.32	-0.32
14,370.0	90.10	1.30	10,891.3	3,916.7	-197.0	3,921.5	0.11	-0.11	0.00
14,464.0	90.60	1.00	10,890.8	4,010.7	-195.1	4,015.3	0.62	0.53	-0.32
14,558.0	89.10	0.50	10,891.0	4,104.7	-193.9	4,109.2	1.68	-1.60	-0.53
14,652.0	89.70	0.70	10,892.0	4,198.7	-192.9	4,203.1	0.67	0.64	0.21
14,746.0	88.70	0.00	10,893.3	4,292.7	-192.3	4,296.9	1.30	-1.06	-0.74
14,840.0	89.20	359.90	10,895.0	4,386.7	-192.4	4,390.9	0.54	0.53	-0.11
14,935.0	89.80	359.80	10,895.8	4,481.7	-192.7	4,485.8	0.64	0.63	-0.11
15,029.0	88.70	359.30	10,897.1	4,575.7	-193.4	4,579.7	1.29	-1.17	-0.53
15,123.0	88.40	359.30	10,899.5	4,669.6	-194.5	4,673.7	0.32	-0.32	0.00
15,218.0	88.50	358.80	10,902.0	4,764.6	-196.1	4,768.6	0.54	0.11	-0.53
15,312.0	89.00	358.70	10,904.1	4,858.5	-198.2	4,862.6	0.54	0.53	-0.11
15,406.0	89.80	358.60	10,905.1	4,952.5	-200.4	4,956.5	0.66	0.65	-0.11
15,501.0	90.30	358.70	10,905.0	5,047.5	-202.6	5,051.5	0.54	0.53	0.11
15,548.0	90.60	358.80	10,904.6	5,094.5	-203.6	5,098.5	0.67	0.64	0.21
Final MWD Survey									
15,600.0	90.60	358.80	10,904.1	5,146.4	-204.7	5,150.5	0.00	0.00	0.00
Projection to Bit/TD									



TDS
Survey Report



Company: Legacy Reserves
Project: Lea County, NM
Site: Lea Unit
Well: #33H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #33H
TVD Reference: KB @ 3673.0usft (McVay 4)
MD Reference: KB @ 3673.0usft (McVay 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,290.0	5,288.6	67.0	-30.1	TIE-IN to Gyro
15,548.0	10,904.6	5,094.5	-203.6	Final MWD Survey
15,600.0	10,904.1	5,146.4	-204.7	Projection to Bit/TD

Checked By: _____ Approved By: _____ Date: _____

Hydraulic Fracturing Fluid Product Component Information Disclosure

First Fracture Date:	9/29/2015
Last Fracture Date:	10/4/2015
State:	NEW MEXICO
County:	LEA
API Number:	30025423430000
Operator Name:	LEGACY RESERVES OPER
Well Name and Number:	LEA UNIT 33H
Longitude:	-103.5166
Latitude:	32.59456
Long/Lat Projection:	NAD27
Production Type:	OIL
True Vertical Depth (TVD):	10,905
Total Water Volume (gal)*:	5,308,208

HOBBBS OCD
JUN 13 2016
RECEIVED



Total Chemical Mass (lbs):	49,992,555
Total Max. Ingredient Mass (lbs):	50,020,505
Total Base Non-Water Volume (gal):	0

Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Operator	Carrier	Water	7732-18-5	100.00%	88.4813%	
HCl, 7.6 - 10%	Baker Hughes	Acidizing	Listed with Chemicals in Ingredients	N/A		0.8296%	SmartCare Product
Activator, 330 gal tote	Baker Hughes	Activator	Listed with Chemicals in Ingredients	N/A		0.0314%	
Alpha 114, 260 gal tote	Baker Hughes	Biocide	Listed with Chemicals in Ingredients	N/A		0.0231%	
GBW-5	Baker Hughes	Breaker	Listed with Chemicals in Ingredients	N/A		0.0043%	SmartCare Product
CI-14	Baker Hughes	Corrosion Inhibitor	Listed with Chemicals in Ingredients	N/A		0.0013%	
FRW-18	Baker Hughes	Friction Reducer	Listed with Chemicals in Ingredients	N/A		0.1177%	SmartCare Product
Ferrotrol 280L	Baker Hughes	Iron Control	Listed with Chemicals in Ingredients	N/A		0.0030%	
NE-23, 55 gallon drum	Baker Hughes	Non-emulsifier	Listed with Chemicals in Ingredients	N/A		0.0009%	
Sand, White, 30/50	Baker Hughes	Proppant	Listed with Chemicals in Ingredients	N/A		4.8882%	

Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Sand, White, 100 mesh	Baker Hughes	Proppant	Listed with Chemicals in Ingredients	N/A		3.3469%	
OilPlus Bulk (30/50)	Baker Hughes	Proppant	Listed with Chemicals in Ingredients	N/A		2.1717%	
Flo-Back 40, tote	Baker Hughes	Surfactant	Listed with Chemicals in Ingredients	N/A		0.0512%	SmartCare Product
Chemical Ingredients	Baker Hughes	Treatment System	2-Mercaptoethanol	60-24-2	100.0000000000%	0.002973%	
			Alcohols, C12-14-Secondary, Ethoxylated	84133-50-6	70.0000000000%	0.021950%	
			Alcohols, C12-16, ethoxylated	68551-12-2	2.0000000000%	0.002352%	
			Ammonium Chloride	12125-02-9	3.0000000000%	0.003528%	
			Ammonium Hydroxide	1336-21-6	5.0000000000%	0.000149%	
			Ammonium Persulphate	7727-54-0	100.0000000000%	0.004298%	
			Benzyl Chloride	100-44-7	1.0000000000%	0.000009%	
			Bis (hydroethyl) cocamine	68439-72-5	1.0000000000%	0.000009%	
			Cocamidopropyl betaine	61789-40-0	20.0000000000%	0.010240%	
			Cocamidopropylamide oxide	68155-09-9	20.0000000000%	0.010240%	
			Crystalline Silica (Quartz)	14808-60-7	100.0000000000%	8.230585%	
			Cupric Chloride	7447-39-4	5.0000000000%	0.000149%	
			Ethanol	64-17-5	0.3000000000%	0.000069%	
			Ethoxylated Nonylphenol	9016-45-9	5.0000000000%	0.000043%	
			Fatty Acids	61790-12-3	10.0000000000%	0.000129%	
			Formaldehyde	50-00-0	1.0000000000%	0.000013%	
			Glutaraldehyde	111-30-8	30.0000000000%	0.006925%	
			Glycerol	56-81-5	1.0000000000%	0.000512%	
			Hydrochloric Acid	7647-01-0	10.0000000000%	0.082923%	
			Hydrotreated Light Distillate	64742-47-8	30.0000000000%	0.035284%	
			Isopropanol	67-63-0	30.0000000000%	0.000255%	
			Methanol	67-56-1	100.0000000000%	0.017001%	
			Modified Thiourea Polymer	68527-49-1	7.0000000000%	0.000090%	
			Oleamide DEA	93-83-4	2.0000000000%	0.002352%	
			Olefin	64743-02-8	5.0000000000%	0.000064%	
			Olefin Sulfonate	30965-85-6	30.0000000000%	0.000510%	
			Poly (acrylamide-co-acrylic acid) partial sodium salt	62649-23-4	30.0000000000%	0.035284%	
			Polyester	68511-95-1	15.0000000000%	0.000128%	

Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
			Polyethylene glycol	25322-68-3	5.000000000%	0.001568%	
			Polyoxyalkylenes	68951-67-7	30.000000000%	0.000387%	
			Polyoxyethylene Sorbitan Monooleate	9005-65-6	0.500000000%	0.000588%	
			Propargyl Alcohol	107-19-7	5.000000000%	0.000064%	
			Quartz (Silica)	14808-60-7	100.000000000%	2.170510%	
			Quaternary Amine Compounds	61789-68-2	30.000000000%	0.000255%	
			Quaternary Ammonium Compound	68424-85-1	5.000000000%	0.001154%	
			Sodium Chloride	7647-14-5	30.000000000%	0.021241%	
			Sorbitan Monooleate	1338-43-8	0.500000000%	0.000588%	
			Water	7732-18-5	90.000000000%	0.854319%	
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.