

INTERFERID

Directional Services

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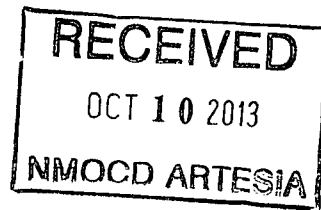
SM Energy

Eddy County, NM (NAD 83)

Sec 34, T19S, R29E

Osage 34 Fed #5H

Original Wellbore



Survey: MWD Survey

Standard Survey Report

19 June, 2013



Company:	SM Energy	Local Co-ordinate Reference:	Well Osage 34 Fed #5H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	WELL @ 3344.0usft (Original Well Elev)
Site:	Sec 34, T19S, R29E	MD Reference:	WELL @ 3344.0usft (Original Well Elev)
Well:	Osage 34 Fed #5H	North Reference:	Grid
Wellbore:	Original Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	Original Wellbore	Database:	EDM 5000.1 Single User Db

Project:	Eddy 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	Sec 34, T19S, R29E				
Site Position:		Northing:	0.00 usft	Latitude:	30° 59' 18.404 N
From:	Map	Easting:	0.00 usft	Longitude:	106° 3' 38.987 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.89 °

Well:		Osage 34 Fed #5H				
Well Position	+N-S	0.0 usft	Northing:	586,290.85 usft	Latitude:	32° 36' 41.237 N
	+E-W	0.0 usft	Easting:	627,286.00 usft	Longitude:	104° 3' 15.126 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	3,344.0 usft	Ground Level:	3,326.0 usft	

Wellbore	Original Wellbore				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/27/2013	7.60	60.41	48.602

Design:	Original Wellbore				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/S	+E/W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	268.20	

Survey Program		Date	6/19/2013		
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
116.0	11,855.0	MWD Survey (Original Wellbore)	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
	116.0	1.30	334.00	116.0	1.2	-0.6	0.5	1.12	1.12	0.00
First MWD Survey										
	338.0	0.70	343.00	338.0	4.7	-2.1	1.9	0.28	-0.27	4.05
	428.0	0.50	309.00	428.0	5.5	-2.5	2.4	0.44	-0.22	-37.78
	570.0	0.50	359.50	569.9	6.5	-3.0	2.8	0.30	0.00	35.56
	668.0	0.90	30.50	667.9	7.6	-2.6	2.4	0.55	0.41	31.63
	763.0	1.30	27.50	762.9	9.2	-1.8	1.5	0.43	0.42	-3.16
	858.0	1.30	49.50	857.9	10.9	-0.4	0.1	0.52	0.00	23.16
	938.0	1.00	55.00	937.9	11.9	0.8	-1.2	0.40	-0.38	6.88
	1,033.0	1.90	77.00	1,032.9	12.7	3.0	-3.4	1.10	0.95	23.16

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Wellbore:	Original Wellbore	Survey Calculation Method:	Minimum Curvature
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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)
1,129.0	1.20	70.00	1,128.8	13.4	5.5	-5.9	0.75	-0.73	-7.29
1,224.0	1.10	33.50	1,223.8	14.5	7.0	-7.4	0.76	-0.11	-38.42
1,319.0	1.20	45.50	1,318.8	16.0	8.2	-8.7	0.27	0.11	12.63
1,415.0	0.00	89.50	1,414.8	16.7	8.9	-9.4	1.25	-1.25	0.00
1,459.0	0.20	7.00	1,458.8	16.7	8.9	-9.4	0.45	0.45	0.00
1,521.0	0.20	91.50	1,520.8	16.8	9.0	-9.5	0.43	0.00	136.29
1,616.0	0.20	140.50	1,615.8	16.7	9.3	-9.8	0.17	0.00	51.58
1,712.0	0.20	161.50	1,711.8	16.4	9.5	-10.0	0.08	0.00	21.88
1,807.0	0.50	180.20	1,806.8	15.8	9.5	-10.0	0.44	0.42	19.68
1,903.0	0.90	181.30	1,902.8	14.5	9.5	-9.9	0.31	0.31	1.15
1,998.0	0.80	154.10	1,997.7	13.2	9.8	-10.2	0.43	-0.11	-28.63
2,094.0	0.20	124.90	2,093.7	12.5	10.2	-10.6	0.66	-0.63	-30.42
2,190.0	0.30	19.00	2,189.7	12.6	10.4	-10.8	0.42	0.10	-110.31
2,285.0	0.50	43.00	2,284.7	13.1	10.8	-11.2	0.27	0.21	25.26
2,381.0	0.80	35.00	2,380.7	14.0	11.4	-11.9	0.33	0.31	-8.33
2,476.0	1.00	47.00	2,475.7	15.1	12.4	-12.9	0.29	0.21	12.63
2,572.0	1.00	43.70	2,571.7	16.3	13.6	-14.1	0.06	0.00	-3.44
2,667.0	1.00	52.90	2,666.7	17.4	14.9	-15.4	0.17	0.00	9.68
2,762.0	1.00	44.00	2,761.7	18.5	16.1	-16.7	0.16	0.00	-9.37
2,857.0	0.90	41.70	2,856.7	19.3	17.2	-17.6	0.11	-0.11	-2.42
2,953.0	0.90	22.50	2,952.7	20.3	17.9	-18.6	0.31	0.00	-20.00
3,048.0	1.10	12.00	3,047.6	22.5	18.4	-19.1	0.28	0.21	-11.05
3,143.0	0.50	330.20	3,142.6	23.7	18.4	-19.1	0.84	-0.63	-44.00
3,278.0	0.60	299.30	3,277.6	24.6	17.5	-18.3	0.23	0.07	-22.89
3,373.0	0.50	295.10	3,372.6	25.0	16.7	-17.5	0.11	-0.11	-4.42
3,469.0	0.60	305.80	3,468.6	25.3	15.9	-16.7	0.15	0.10	11.15
3,564.0	0.40	316.50	3,563.6	26.0	15.3	-16.1	0.23	-0.21	11.26
3,660.0	0.40	325.40	3,659.6	26.5	14.9	-15.7	0.06	0.00	9.27
3,755.0	0.20	335.40	3,754.6	26.9	14.6	-15.4	0.22	-0.21	10.53
3,851.0	0.20	304.30	3,850.6	27.2	14.4	-15.2	0.11	0.00	-32.40
3,946.0	0.20	8.90	3,945.6	27.5	14.3	-15.1	0.22	0.00	68.00
4,042.0	0.30	49.40	4,041.6	27.8	14.5	-15.4	0.21	0.10	42.19
4,137.0	0.40	55.10	4,136.6	28.1	15.0	-15.6	0.11	0.11	6.00
4,233.0	0.70	44.00	4,232.6	28.7	15.6	-16.5	0.33	0.31	-11.56
4,329.0	0.70	48.90	4,328.6	29.6	16.5	-17.4	0.06	0.00	5.10
4,424.0	1.00	59.30	4,423.6	30.4	17.6	-18.6	0.35	0.32	10.95
4,520.0	1.00	52.80	4,519.6	31.3	19.0	-20.0	0.12	0.00	-6.77
4,615.0	1.20	52.10	4,614.6	32.4	20.5	-21.5	0.21	0.21	-0.74
4,710.0	1.20	44.20	4,709.5	33.7	21.9	-23.0	0.17	0.00	-8.32
4,806.0	1.10	38.10	4,805.5	35.2	23.2	-24.3	0.16	-0.10	-6.35
4,901.0	1.20	42.40	4,900.5	36.6	24.4	-25.6	0.14	0.11	4.53
4,997.0	1.20	37.10	4,996.5	38.2	25.7	-26.9	0.12	0.00	-5.52
5,092.0	1.10	34.60	5,091.5	39.7	26.8	-28.1	0.12	-0.11	-2.63

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Project: Eddy County, NM (NAD 83)
Site: Sec 34, T19S, R29E
Well: Osage 34 Fed #5H
Wellbore: Original Wellbore
Design: Original Wellbore

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well Osage 34 Fed #5H
WELL @ 3344.0usft (Original Well Elev)
WELL @ 3344.0usft (Original Well Elev)
Grid
Minimum Curvature
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)
5,188.0	1.10	44.90	5,187.4	41.1	28.0	-29.3	0.21	0.00	10.73
5,233.0	1.10	42.80	5,282.4	42.4	29.3	-30.6	0.04	0.00	-2.21
5,378.0	1.20	34.70	5,377.4	43.9	30.5	-31.8	0.20	0.11	-8.53
5,474.0	1.30	35.90	5,473.4	45.6	31.7	-33.1	0.11	0.10	1.25
5,569.0	1.20	33.50	5,568.4	47.3	32.9	-34.3	0.12	-0.11	-2.53
5,665.0	1.20	32.50	5,664.3	49.0	34.0	-35.5	0.02	0.00	-1.04
5,760.0	1.20	31.30	5,759.3	50.7	35.0	-36.6	0.03	0.00	-1.26
5,856.0	1.10	23.60	5,855.3	52.4	35.9	-37.5	0.19	-0.10	-8.02
5,951.0	1.10	26.70	5,950.3	54.1	36.7	-38.4	0.06	0.00	3.26
6,047.0	1.10	17.90	6,046.3	55.8	37.4	-39.1	0.18	0.00	-9.17
6,142.0	1.30	13.00	6,141.2	57.7	37.9	-39.7	0.24	0.21	-5.16
6,238.0	1.20	8.70	6,237.2	59.7	38.3	-40.2	0.14	-0.10	-4.48
6,333.0	1.10	11.10	6,332.2	61.6	38.6	-40.5	0.12	-0.11	2.53
6,428.0	0.90	343.50	6,427.2	63.2	38.6	-40.5	0.54	-0.21	-29.05
6,484.0	1.10	342.00	6,483.2	64.2	33.3	-40.3	0.36	0.36	-2.68
6,516.0	2.50	289.60	6,515.2	64.7	37.5	-35.6	6.32	4.38	-163.13
6,548.0	5.70	269.50	6,547.1	64.9	35.3	-37.3	10.83	10.00	-63.44
6,580.0	9.10	266.30	6,578.8	64.7	31.2	-53.2	10.70	10.63	-10.00
6,612.0	11.60	273.20	6,610.3	64.8	25.4	-27.5	3.71	7.81	21.56
6,643.0	14.40	269.60	6,640.5	64.9	18.3	-20.5	9.40	9.03	-11.61
6,675.0	17.40	269.80	6,671.3	64.9	9.7	-11.7	9.38	9.38	0.63
6,707.0	20.20	269.80	6,701.5	64.8	-0.6	-1.4	3.75	8.75	0.00
6,739.0	23.70	271.20	6,731.2	64.9	-12.6	10.5	11.06	10.94	4.38
6,770.0	28.30	270.80	6,759.1	65.2	-26.1	24.1	14.85	14.84	-1.29
6,802.0	33.50	269.60	6,786.5	65.2	-42.6	40.5	16.36	16.25	-3.75
6,834.0	37.10	268.20	6,812.6	64.9	-61.1	59.0	11.53	11.25	-4.38
6,866.0	38.90	266.60	6,837.9	60.9	-80.7	78.7	6.41	5.63	-5.00
6,896.0	40.80	266.20	6,862.4	62.7	-101.2	93.2	5.99	5.94	-1.25
6,929.0	43.00	265.80	6,885.5	61.2	-121.9	119.9	7.15	7.10	-1.29
6,961.0	44.00	265.70	6,908.7	59.6	-143.8	141.9	3.13	3.13	-0.31
6,993.0	44.10	265.20	6,931.7	57.3	-166.0	164.1	1.13	0.31	-1.56
7,025.0	44.80	265.80	6,954.5	56.1	-188.3	186.5	2.55	2.19	1.88
7,057.0	46.30	267.40	6,977.0	54.7	-211.1	209.3	5.89	4.69	5.00
7,088.0	48.00	267.40	6,998.0	53.7	-233.8	232.0	5.48	5.48	0.00
7,120.0	51.40	268.70	7,018.7	52.9	-253.2	256.4	11.07	10.53	4.06
7,152.0	55.30	270.50	7,037.8	52.7	-283.9	282.1	13.00	12.19	5.63
7,184.0	59.60	270.20	7,055.0	52.8	-310.9	309.0	13.46	13.44	-0.94
7,215.0	62.20	268.40	7,070.6	52.5	-338.8	337.0	9.50	8.13	-5.63
7,248.0	64.10	267.40	7,085.1	51.3	-367.3	365.5	6.56	5.94	-3.13
7,279.0	68.80	268.30	7,096.2	50.4	-395.4	393.6	6.08	5.48	2.90
7,311.0	68.20	268.20	7,110.7	49.5	-424.6	423.1	7.51	7.50	-0.31
7,343.0	71.90	267.60	7,121.6	48.4	-454.9	453.2	11.70	11.56	-1.88
7,375.0	76.40	267.00	7,130.3	46.0	-485.6	483.9	14.18	14.03	-1.88

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Survey

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7,407.0	80.80	266.30	7,136.7	45.1	-516.3	515.3	13.92	13.75	-2.19
7,438.0	82.00	266.20	7,141.3	43.1	-547.5	545.9	3.88	3.67	-0.32
7,470.0	84.00	266.10	7,145.2	41.0	-579.2	577.6	6.26	6.25	-0.31
7,592.0	91.30	264.40	7,150.2	30.9	-700.6	699.3	6.14	5.98	-1.39
7,687.0	92.60	263.10	7,147.0	20.5	-795.0	794.0	1.93	1.37	-1.37
7,732.0	91.30	263.50	7,143.7	9.5	-889.3	888.5	1.43	-1.37	0.42
7,876.0	91.50	262.90	7,141.4	-1.7	-982.6	982.2	0.67	0.21	-0.64
7,971.0	92.00	262.30	7,138.5	-13.9	-1,076.9	1,076.7	0.82	0.53	-0.63
8,065.0	92.40	262.20	7,134.9	-26.7	-1,170.8	1,171.1	0.43	0.42	-0.11
8,161.0	91.80	264.50	7,131.4	-37.7	-1,265.1	1,265.7	2.50	-0.63	2.42
8,255.0	91.00	266.10	7,129.1	-45.5	-1,359.8	1,360.5	1.60	-0.84	1.68
8,350.0	91.50	266.10	7,127.0	-51.9	-1,453.5	1,454.4	0.53	0.53	0.00
8,445.0	92.30	266.10	7,123.9	-58.3	-1,546.2	1,549.3	0.84	0.84	0.00
8,540.0	91.80	268.10	7,120.5	-63.1	-1,643.1	1,644.2	2.17	-0.53	2.11
8,635.0	90.10	268.40	7,118.9	-66.0	-1,738.0	1,739.2	1.62	-1.79	0.32
8,730.0	91.10	268.70	7,117.9	-68.4	-1,833.0	1,834.2	1.10	1.05	0.32
8,824.0	91.80	268.70	7,115.5	-70.6	-1,926.9	1,928.2	0.74	0.74	0.00
8,915.0	89.50	268.60	7,114.2	-72.8	-2,020.9	2,022.2	2.13	-2.13	-0.11
9,013.0	89.80	263.30	7,114.8	-75.3	-2,115.8	2,117.2	0.32	0.00	-0.32
9,107.0	90.30	268.40	7,114.5	-78.0	-2,209.8	2,211.2	0.54	0.53	0.11
9,202.0	90.60	268.30	7,113.7	-80.8	-2,304.8	2,306.2	0.33	0.32	-0.11
9,297.0	90.90	267.90	7,112.5	-83.9	-2,399.7	2,401.1	0.53	0.32	-0.42
9,391.0	91.70	267.90	7,110.4	-87.4	-2,493.6	2,495.1	0.65	0.85	0.00
9,485.0	90.80	265.00	7,108.3	-90.6	-2,588.5	2,590.1	0.95	-0.95	0.11
9,581.0	92.50	266.80	7,105.5	-93.4	-2,683.4	2,685.0	1.98	1.79	0.84
9,676.0	90.40	268.90	7,103.1	-95.5	-2,778.4	2,780.0	2.21	-2.21	0.11
9,771.0	91.20	269.00	7,101.8	-97.1	-2,873.4	2,875.0	0.85	0.84	0.11
9,866.0	91.90	268.70	7,099.2	-99.0	-2,968.3	2,969.9	0.80	0.74	-0.32
9,960.0	90.40	269.10	7,097.4	-100.8	-3,062.3	3,063.9	1.65	-1.60	0.43
10,055.0	91.20	269.10	7,096.0	-102.3	-3,157.2	3,158.9	0.84	0.84	0.00
10,150.0	89.80	263.20	7,095.2	-104.5	-3,252.2	3,253.9	1.75	-1.47	-0.95
10,245.0	91.10	268.40	7,094.5	-107.3	-3,347.2	3,348.9	1.38	1.57	0.21
10,340.0	90.10	269.20	7,093.5	-109.3	-3,442.1	3,443.9	1.35	-1.05	0.84
10,434.0	91.10	269.20	7,092.5	-110.6	-3,536.1	3,537.8	1.06	1.06	0.00
10,529.0	90.10	263.80	7,091.5	-112.3	-3,631.1	3,632.8	1.13	-1.05	-0.42
10,624.0	91.00	268.90	7,090.6	-114.2	-3,726.1	3,727.8	0.95	0.95	0.11
10,718.0	89.80	263.20	7,089.9	-116.6	-3,820.0	3,821.6	1.48	-1.28	-0.74
10,813.0	90.20	268.30	7,089.9	-119.5	-3,915.0	3,916.8	0.43	0.42	0.11
10,908.0	90.10	268.30	7,089.7	-122.3	-4,010.0	4,011.8	0.11	-0.11	0.00
11,003.0	90.50	263.30	7,089.2	-125.1	-4,104.9	4,105.8	0.42	0.42	0.00
11,098.0	87.90	267.90	7,090.5	-128.3	-4,199.8	4,201.8	2.77	-2.74	-0.42
11,193.0	87.70	268.30	7,094.1	-131.4	-4,294.7	4,296.7	0.17	-0.21	0.42
11,287.0	87.80	263.70	7,097.8	-134.9	-4,389.6	4,390.8	0.44	0.11	0.43
11,382.0	88.40	263.60	7,101.0	-136.1	-4,483.5	4,485.6	0.64	0.63	-0.11

Company: SM Energy
Project: Eddy County, NM (NAD 83)
Site: Sec 34, T19S, R29E
Well: Osage 34 Fed #5H
Wellbore: Original Wellbore
Design: Original Wellbore

Local Co-ordinate Reference: Well Osage 34 Fed #5H
TVD Reference: WELL @ 3344.0usft (Original Well Elev)
MD Reference: WELL @ 3344.0usft (Original Well Elev)
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)
11,477.0	89.10	268.60	7,103.1	-138.4	-4,576.5	4,580.6	0.74	0.74	0.00
11,573.0	91.00	269.90	7,103.0	-139.7	-4,674.5	4,676.5	2.40	1.98	1.35
11,668.0	91.50	270.30	7,100.9	-139.5	-4,769.4	4,771.5	0.67	0.53	0.42
11,763.0	91.90	270.40	7,098.1	-138.9	-4,864.4	4,866.4	0.43	0.42	0.11
11,803.0	92.00	270.60	7,096.7	-138.6	-4,904.4	4,906.3	0.56	0.25	0.50
Last MWD Survey									
11,855.0	92.00	270.60	7,094.9	-138.0	-4,956.3	4,958.2	0.00	0.00	0.00
PTB - TD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
116.0	116.0	1.2	-0.6	First MWD Survey
11,803.0	7,096.7	-138.6	-4,904.4	Last MWD Survey
11,855.0	7,094.9	-138.0	-4,956.3	PTB - TD

Checked By: _____ Approved By: _____ Date: _____