

# **SandRidge Energy**

**Comanche County (KS27S)**

**Sec 30-T31S-R19W**

**Larry 1-30H**

**Wellbore #1**

**Survey: MWD Surveys**

## **Standard Survey Report**

**18 March, 2012**

# Wolverine Directional, LLC

## Survey Report

<b>Company:</b>	SandRidge Energy	<b>Local Co-ordinate Reference:</b>	Well Larry 1-30H
<b>Project:</b>	Comanche County (KS27S)	<b>TVD Reference:</b>	WELL @ 0.0ft (Original Well Elev)
<b>Site:</b>	Sec 30-T31S-R19W	<b>MD Reference:</b>	WELL @ 0.0ft (Original Well Elev)
<b>Well:</b>	Larry 1-30H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 2003.21 Single User Db

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	178.74	

<b>Survey Program</b>	Date 2012/03/18			
<b>From</b>	<b>To</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
1,039.0	9,527.0	MWD Surveys (Wellbore #1)	MWD	MWD - Standard

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
1,039.0	0.60	293.30	1,039.0	2.2	-5.0	-2.3	0.06	0.06	0.00
<b>First MWD Survey</b>									
1,230.0	0.90	286.40	1,230.0	3.0	-7.4	-3.1	0.16	0.16	-3.61
1,516.0	0.10	61.60	1,516.0	3.7	-9.3	-3.9	0.34	-0.28	47.27
1,992.0	0.40	151.10	1,991.9	2.5	-8.1	-2.6	0.09	0.06	18.80
2,469.0	0.50	169.40	2,468.9	-1.0	-6.9	0.9	0.04	0.02	3.84
2,945.0	0.30	116.30	2,944.9	-3.6	-5.4	3.5	0.08	-0.04	-11.16
3,422.0	0.50	57.70	3,421.9	-3.1	-2.6	3.0	0.09	0.04	-12.29
3,896.0	0.60	1.30	3,895.9	0.5	-0.8	-0.5	0.11	0.02	-11.90
3,992.0	0.80	36.80	3,991.9	1.6	-0.3	-1.6	0.49	0.21	36.98
4,087.0	0.60	65.50	4,086.9	2.3	0.5	-2.3	0.42	-0.21	30.21
4,182.0	0.70	56.30	4,181.9	2.8	1.4	-2.8	0.15	0.11	-9.68
4,214.0	0.60	55.70	4,213.9	3.0	1.7	-3.0	0.31	-0.31	-1.88
4,246.0	1.70	160.40	4,245.9	2.7	2.0	-2.6	6.07	3.44	327.19
4,277.0	4.20	169.80	4,276.8	1.1	2.4	-1.1	8.19	8.06	30.32
4,309.0	6.50	175.30	4,308.7	-1.8	2.8	1.9	7.36	7.19	17.19
4,341.0	8.20	174.90	4,340.4	-5.9	3.1	6.0	5.31	5.31	-1.25
4,373.0	10.30	176.30	4,372.0	-11.0	3.5	11.1	6.60	6.56	4.38
4,404.0	12.60	178.60	4,402.4	-17.2	3.8	17.3	7.56	7.42	7.42
4,436.0	15.20	180.30	4,433.4	-24.9	3.8	25.0	8.22	8.13	5.31
4,468.0	18.30	181.30	4,464.1	-34.1	3.7	34.2	9.73	9.69	3.13
4,500.0	20.80	181.40	4,494.2	-44.8	3.4	44.9	7.81	7.81	0.31
4,531.0	22.50	181.70	4,523.0	-56.2	3.1	56.3	5.50	5.48	0.97
4,563.0	24.20	181.40	4,552.4	-68.9	2.8	69.0	5.33	5.31	-0.94
4,595.0	26.50	180.70	4,581.3	-82.6	2.5	82.6	7.25	7.19	-2.19
4,627.0	28.10	179.90	4,609.8	-97.3	2.5	97.3	5.13	5.00	-2.50
4,658.0	29.30	179.90	4,637.0	-112.2	2.5	112.2	3.87	3.87	0.00
4,690.0	31.00	180.60	4,664.6	-128.2	2.4	128.3	5.42	5.31	2.19
4,722.0	33.50	180.60	4,691.7	-145.3	2.2	145.3	7.81	7.81	0.00
4,754.0	35.20	179.90	4,718.1	-163.4	2.2	163.4	5.45	5.31	-2.19
4,785.0	36.60	179.90	4,743.2	-181.6	2.2	181.6	4.52	4.52	0.00
4,817.0	38.90	178.90	4,768.5	-201.1	2.4	201.1	7.44	7.19	-3.13
4,849.0	41.40	178.50	4,793.0	-221.8	2.9	221.8	7.85	7.81	-1.25
4,881.0	43.00	179.10	4,816.7	-243.3	3.3	243.3	5.16	5.00	1.88
4,912.0	45.20	179.40	4,839.0	-264.8	3.6	264.8	7.13	7.10	0.97
4,944.0	48.30	179.60	4,860.9	-288.1	3.8	288.1	9.70	9.69	0.63
4,976.0	50.50	178.40	4,881.7	-312.4	4.2	312.4	7.44	6.88	-3.75
5,007.0	50.50	178.10	4,901.4	-336.3	5.0	336.4	0.75	0.00	-0.97

# Wolverine Directional, LLC

## Survey Report

<b>Company:</b>	SandRidge Energy	<b>Local Co-ordinate Reference:</b>	Well Larry 1-30H
<b>Project:</b>	Comanche County (KS27S)	<b>TVD Reference:</b>	WELL @ 0.0ft (Original Well Elev)
<b>Site:</b>	Sec 30-T31S-R19W	<b>MD Reference:</b>	WELL @ 0.0ft (Original Well Elev)
<b>Well:</b>	Larry 1-30H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 2003.21 Single User Db

### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,039.0	50.30	177.80	4,921.8	-361.0	5.8	361.0	0.96	-0.63	-0.94
5,071.0	50.00	177.30	4,942.3	-385.5	6.9	385.6	1.52	-0.94	-1.56
5,103.0	49.80	177.10	4,962.9	-410.0	8.1	410.0	0.79	-0.63	-0.63
5,134.0	49.50	176.80	4,983.0	-433.6	9.3	433.7	1.22	-0.97	-0.97
5,166.0	49.50	176.70	5,003.8	-457.8	10.7	458.0	0.24	0.00	-0.31
5,198.0	52.00	176.90	5,024.0	-482.6	12.1	482.7	7.83	7.81	0.63
5,230.0	55.30	177.80	5,043.0	-508.3	13.3	508.5	10.56	10.31	2.81
5,261.0	58.90	178.70	5,059.8	-534.3	14.1	534.5	11.87	11.61	2.90
5,293.0	62.00	178.90	5,075.6	-562.2	14.7	562.4	9.70	9.69	0.63
5,325.0	64.50	178.40	5,090.0	-590.7	15.3	590.9	7.94	7.81	-1.56
5,356.0	67.50	178.20	5,102.6	-619.0	16.2	619.2	9.70	9.68	-0.65
5,388.0	69.90	177.50	5,114.2	-648.8	17.3	649.1	7.77	7.50	-2.19
5,420.0	72.80	177.80	5,124.5	-679.1	18.5	679.4	9.11	9.06	0.94
5,452.0	76.10	178.10	5,133.1	-709.9	19.6	710.2	10.35	10.31	0.94
5,483.0	79.20	178.90	5,139.7	-740.2	20.4	740.5	10.31	10.00	2.58
5,515.0	81.30	179.80	5,145.1	-771.7	20.8	772.0	7.12	6.56	2.81
5,604.0	84.90	179.90	5,155.8	-860.1	21.0	860.3	4.05	4.04	0.11
5,635.0	86.80	179.90	5,158.0	-891.0	21.1	891.2	6.13	6.13	0.00
5,665.0	88.50	180.10	5,159.3	-921.0	21.1	921.2	5.71	5.67	0.67
5,696.0	89.10	180.30	5,159.9	-951.9	21.0	952.2	2.04	1.94	0.65
5,726.0	90.30	180.40	5,160.1	-981.9	20.8	982.2	4.01	4.00	0.33
5,757.0	90.70	180.60	5,159.8	-1,012.9	20.5	1,013.2	1.44	1.29	0.65
5,849.0	91.60	181.10	5,158.0	-1,104.9	19.2	1,105.1	1.12	0.98	0.54
5,940.0	91.30	177.90	5,155.7	-1,195.9	19.9	1,196.0	3.53	-0.33	-3.52
6,032.0	89.50	176.90	5,155.0	-1,287.8	24.1	1,288.0	2.24	-1.96	-1.09
6,124.0	90.70	177.10	5,154.8	-1,379.6	28.9	1,379.9	1.32	1.30	0.22
6,217.0	89.70	177.40	5,154.5	-1,472.5	33.4	1,472.9	1.12	-1.08	0.32
6,309.0	88.70	176.00	5,155.8	-1,564.4	38.7	1,564.8	1.87	-1.09	-1.52
6,399.0	88.40	176.80	5,158.1	-1,654.2	44.3	1,654.7	0.95	-0.33	0.89
6,492.0	88.60	177.20	5,160.5	-1,747.0	49.2	1,747.7	0.48	0.22	0.43
6,584.0	88.90	177.10	5,162.5	-1,838.9	53.8	1,839.6	0.34	0.33	-0.11
6,676.0	90.00	177.50	5,163.4	-1,930.8	58.1	1,931.6	1.27	1.20	0.43
6,772.0	90.80	176.90	5,162.7	-2,026.6	62.8	2,027.5	1.04	0.83	-0.63
6,867.0	90.60	177.00	5,161.6	-2,121.5	67.9	2,122.5	0.24	-0.21	0.11
6,962.0	87.20	178.70	5,163.4	-2,216.4	71.4	2,217.4	4.00	-3.58	1.79
7,057.0	88.40	178.60	5,167.1	-2,311.3	73.7	2,312.4	1.27	1.26	-0.11
7,152.0	89.20	179.10	5,169.0	-2,406.3	75.6	2,407.3	0.99	0.84	0.53
7,248.0	89.40	178.20	5,170.2	-2,502.2	77.8	2,503.3	0.96	0.21	-0.94
7,344.0	89.70	178.10	5,171.0	-2,598.2	80.9	2,599.3	0.33	0.31	-0.10
7,439.0	90.30	177.20	5,171.0	-2,693.1	84.8	2,694.3	1.14	0.63	-0.95
7,535.0	89.80	178.90	5,170.9	-2,789.0	88.1	2,790.3	1.85	-0.52	1.77
7,630.0	90.40	178.40	5,170.7	-2,884.0	90.3	2,885.3	0.82	0.63	-0.53
7,726.0	90.30	178.10	5,170.1	-2,980.0	93.3	2,981.3	0.33	-0.10	-0.31
7,821.0	90.20	177.80	5,169.7	-3,074.9	96.7	3,076.3	0.33	-0.11	-0.32
7,917.0	89.40	179.20	5,170.1	-3,170.9	99.2	3,172.3	1.68	-0.83	1.46
8,013.0	89.20	178.70	5,171.2	-3,266.8	100.9	3,268.3	0.56	-0.21	-0.52
8,108.0	89.80	178.40	5,172.1	-3,361.8	103.3	3,363.3	0.71	0.63	-0.32
8,204.0	89.50	178.10	5,172.6	-3,457.8	106.3	3,459.3	0.44	-0.31	-0.31
8,300.0	90.70	178.20	5,172.5	-3,553.7	109.4	3,555.2	1.25	1.25	0.10
8,395.0	90.90	178.10	5,171.1	-3,648.6	112.4	3,650.2	0.24	0.21	-0.11
8,491.0	92.60	179.00	5,168.2	-3,744.6	114.9	3,746.2	2.00	1.77	0.94
8,587.0	92.00	178.30	5,164.4	-3,840.5	117.1	3,842.1	0.96	-0.63	-0.73
8,683.0	90.60	177.50	5,162.2	-3,936.4	120.6	3,938.1	1.68	-1.46	-0.83
8,778.0	87.30	177.10	5,163.9	-4,031.2	125.1	4,033.0	3.50	-3.47	-0.42

# Wolverine Directional, LLC

## Survey Report

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<b>Site:</b> Sec 30-T31S-R19W	<b>MD Reference:</b> WELL @ 0.0ft (Original Well Elev)
<b>Well:</b> Larry 1-30H	<b>North Reference:</b> Grid
<b>Wellbore:</b> Wellbore #1	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> Wellbore #1	<b>Database:</b> EDM 2003.21 Single User Db

### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,874.0	86.90	175.40	5,168.8	-4,126.9	131.4	4,128.8	1.82	-0.42	-1.77
8,970.0	90.10	178.00	5,171.3	-4,222.7	136.9	4,224.7	4.29	3.33	2.71
9,065.0	88.80	175.20	5,172.2	-4,317.5	142.5	4,319.6	3.25	-1.37	-2.95
9,161.0	88.70	174.30	5,174.3	-4,413.1	151.3	4,415.3	0.94	-0.10	-0.94
9,256.0	89.40	177.80	5,175.9	-4,507.8	157.9	4,510.2	3.76	0.74	3.68
9,352.0	88.70	179.00	5,177.5	-4,603.8	160.5	4,606.2	1.45	-0.73	1.25
9,448.0	87.60	179.20	5,180.6	-4,699.7	162.0	4,702.1	1.16	-1.15	0.21
9,478.0	86.60	178.70	5,182.1	-4,729.7	162.6	4,732.1	3.73	-3.33	-1.67
<b>Last MWD Survey</b>									
9,524.5	86.60	178.70	5,184.8	-4,776.1	163.6	4,778.5	0.00	0.00	0.00
<b>Larry 1-30H PBHL</b>									
9,527.0	86.60	178.70	5,185.0	-4,778.6	163.7	4,781.0	0.00	0.00	0.00
<b>Proj to TD</b>									

### Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,039.0	1,039.0	2.2	-5.0	First MWD Survey
9,478.0	5,182.1	-4,729.7	162.6	Last MWD Survey
9,527.0	5,185.0	-4,778.6	163.7	Proj to TD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_