

# **Sandridge Energy, INC.(mid-con.)**

**Comanche County (KS27S)**

**Sec 05-T34S-R19W**

**Thyme 3119 3-5H/ Job # 04209-431-22/Lariat 20**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**14 May, 2013**

# Archer Survey Report

<b>Company:</b>	Sandridge Energy, INC.(mid-con.)	<b>Local Co-ordinate Reference:</b>	Well Thyme 3119 3-5H/ Job # 04209-431-22/Lariat 20
<b>Project:</b>	Comanche County (KS27S)	<b>TVD Reference:</b>	WELL @ 1898.0usft (Original Well Elev)
<b>Site:</b>	Sec 05-T34S-R19W	<b>MD Reference:</b>	WELL @ 1898.0usft (Original Well Elev)
<b>Well:</b>	Thyme 3119 3-5H/ Job # 04209-431-22/Lariat 20	<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 5000.1 Single User Db

<b>Project</b> Comanche County (KS27S), KS South			
<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	Kansas South 1502		

<b>Site</b> Sec 05-T34S-R19W			
<b>Site Position:</b>		<b>Northing:</b>	161,087.00 usft
<b>From:</b>	Map	<b>Easting:</b>	1,733,061.00 usft
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	37° 6' 19.690 N
		<b>Longitude:</b>	99° 24' 55.075 W
		<b>Grid Convergence:</b>	-0.56 °

<b>Well</b> Thyme 3119 3-5H/ Job # 04209-431-22/Lariat 20			
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>
	<b>+E/-W</b>	0.0 usft	166,116.00 usft
			<b>Latitude:</b>
			37° 7' 9.603 N
			<b>Longitude:</b>
			99° 24' 31.080 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>
			usft
			<b>Ground Level:</b>
			1,878.0 usft

<b>Wellbore</b> Wellbore #1					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2013/04/17	5.35	65.07	51,674

<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
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0		180.15

<b>Survey Program</b> Date 2013/05/14					
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
969.0	9,630.0	Archer MWD Survey (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
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	
969.0	0.70	191.80	969.0	-5.8	-1.2	5.8	0.07	0.07	0.00	
<b>First Archer MWD Survey</b>										
1,213.0	0.50	123.50	1,213.0	-7.8	-0.6	7.8	0.28	-0.08	-27.99	
1,712.0	1.50	87.60	1,711.9	-8.8	7.7	8.7	0.23	0.20	-7.19	
2,187.0	0.70	95.10	2,186.8	-8.8	16.8	8.7	0.17	-0.17	1.58	
2,662.0	0.60	27.30	2,661.8	-6.8	20.8	6.8	0.15	-0.02	-14.27	
3,136.0	0.80	340.70	3,135.7	-1.5	20.9	1.4	0.12	0.04	-9.83	
3,611.0	1.00	323.90	3,610.7	5.0	17.4	-5.0	0.07	0.04	-3.54	
4,086.0	0.70	263.80	4,085.6	8.0	12.0	-8.1	0.19	-0.06	-12.65	

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<b>Site:</b>	Sec 05-T34S-R19W	<b>MD Reference:</b>	WELL @ 1898.0usft (Original Well Elev)
<b>Well:</b>	Thyme 3119 3-5H/ Job # 04209-431-22/Lariat 20	<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 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)
4,435.0	0.60	282.90	4,434.6	8.2	8.1	-8.2	0.07	-0.03	5.47
4,467.0	0.40	285.10	4,466.6	8.3	7.9	-8.3	0.63	-0.63	6.88
4,499.0	2.20	181.60	4,498.6	7.7	7.7	-7.7	7.27	5.63	-323.44
4,531.0	4.20	172.00	4,530.6	5.9	7.9	-5.9	6.45	6.25	-30.00
4,562.0	6.40	170.40	4,561.4	3.1	8.3	-3.1	7.11	7.10	-5.16
4,594.0	9.20	172.10	4,593.1	-1.2	9.0	1.2	8.78	8.75	5.31
4,626.0	12.40	178.40	4,624.6	-7.2	9.4	7.2	10.64	10.00	19.69
4,657.0	14.40	181.00	4,654.7	-14.4	9.4	14.3	6.74	6.45	8.39
4,689.0	15.70	179.30	4,685.6	-22.7	9.4	22.6	4.29	4.06	-5.31
4,721.0	17.60	179.30	4,716.3	-31.8	9.5	31.8	5.94	5.94	0.00
4,752.0	18.60	179.80	4,745.7	-41.5	9.6	41.4	3.26	3.23	1.61
4,784.0	19.80	179.80	4,775.9	-52.0	9.7	52.0	3.75	3.75	0.00
4,816.0	21.90	178.80	4,805.9	-63.4	9.8	63.4	6.66	6.56	-3.13
4,847.0	25.80	180.00	4,834.2	-75.9	9.9	75.9	12.68	12.58	3.87
4,879.0	27.80	182.90	4,862.8	-90.3	9.5	90.3	7.47	6.25	9.06
4,911.0	29.60	182.70	4,890.8	-105.7	8.8	105.7	5.63	5.63	-0.63
4,942.0	31.50	181.90	4,917.5	-121.4	8.2	121.4	6.27	6.13	-2.58
4,974.0	34.60	180.00	4,944.3	-138.9	7.9	138.8	10.21	9.69	-5.94
5,006.0	37.20	180.30	4,970.3	-157.6	7.8	157.6	8.14	8.13	0.94
5,037.0	38.70	180.80	4,994.7	-176.7	7.6	176.7	4.94	4.84	1.61
5,069.0	40.50	180.70	5,019.4	-197.1	7.4	197.1	5.63	5.63	-0.31
5,101.0	42.80	181.00	5,043.3	-218.3	7.1	218.3	7.21	7.19	0.94
5,132.0	44.90	181.20	5,065.6	-239.8	6.7	239.8	6.79	6.77	0.65
5,164.0	47.20	181.30	5,087.8	-262.8	6.1	262.8	7.19	7.19	0.31
5,196.0	49.40	180.50	5,109.1	-286.7	5.8	286.7	7.12	6.88	-2.50
5,227.0	50.20	180.40	5,129.1	-310.4	5.6	310.4	2.59	2.58	-0.32
5,259.0	50.10	180.00	5,149.6	-335.0	5.5	335.0	1.01	-0.31	-1.25
5,291.0	49.80	179.80	5,170.2	-359.5	5.5	359.5	1.05	-0.94	-0.63
5,322.0	49.10	179.50	5,190.4	-383.0	5.7	383.0	2.37	-2.26	-0.97
5,354.0	48.50	179.60	5,211.5	-407.1	5.9	407.1	1.89	-1.88	0.31
5,386.0	47.70	179.10	5,232.8	-430.9	6.1	430.9	2.76	-2.50	-1.56
5,417.0	49.70	178.50	5,253.3	-454.2	6.6	454.2	6.61	6.45	-1.94
5,449.0	53.30	178.50	5,273.2	-479.2	7.3	479.2	11.25	11.25	0.00
5,481.0	56.30	179.10	5,291.6	-505.4	7.8	505.4	9.50	9.38	1.88
5,512.0	57.40	181.10	5,308.6	-531.3	7.8	531.3	6.46	3.55	6.45
5,544.0	58.80	181.90	5,325.5	-558.5	7.1	558.5	4.86	4.38	2.50
5,576.0	61.40	182.30	5,341.5	-586.2	6.1	586.2	8.20	8.13	1.25
5,607.0	64.30	182.40	5,355.6	-613.8	4.9	613.7	9.36	9.35	0.32
5,639.0	67.10	182.80	5,368.8	-642.9	3.6	642.9	8.82	8.75	1.25
5,671.0	68.80	182.50	5,380.8	-672.5	2.2	672.5	5.38	5.31	-0.94
5,702.0	72.10	182.00	5,391.2	-701.7	1.1	701.7	10.75	10.65	-1.61
5,734.0	76.50	181.70	5,399.8	-732.5	0.1	732.5	13.78	13.75	-0.94

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Survey										
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5,766.0	80.40	181.30	5,406.2	-763.8	-0.7	763.8	12.25	12.19	-1.25	
5,797.0	83.90	180.50	5,410.5	-794.5	-1.2	794.5	11.58	11.29	-2.58	
5,829.0	87.40	179.50	5,412.9	-826.4	-1.2	826.4	11.37	10.94	-3.13	
5,906.0	87.70	179.00	5,416.2	-903.3	-0.2	903.3	0.76	0.39	-0.65	
5,937.0	87.60	179.50	5,417.4	-934.3	0.2	934.3	1.64	-0.32	1.61	
5,967.0	89.10	179.10	5,418.3	-964.3	0.6	964.3	5.17	5.00	-1.33	
5,998.0	90.40	179.10	5,418.4	-995.3	1.1	995.3	4.19	4.19	0.00	
6,028.0	90.90	178.80	5,418.1	-1,025.3	1.6	1,025.3	1.94	1.67	-1.00	
6,059.0	91.30	179.10	5,417.5	-1,056.3	2.2	1,056.3	1.61	1.29	0.97	
6,089.0	90.80	179.70	5,417.0	-1,086.3	2.5	1,086.3	2.60	-1.67	2.00	
6,120.0	90.30	180.20	5,416.7	-1,117.3	2.5	1,117.3	2.28	-1.61	1.61	
6,150.0	90.20	180.70	5,416.5	-1,147.3	2.3	1,147.3	1.70	-0.33	1.67	
6,181.0	89.50	181.10	5,416.6	-1,178.3	1.8	1,178.3	2.60	-2.26	1.29	
6,212.0	88.90	180.70	5,417.0	-1,209.3	1.3	1,209.3	2.33	-1.94	-1.29	
6,244.0	88.70	181.00	5,417.7	-1,241.3	0.8	1,241.2	1.13	-0.63	0.94	
6,276.0	88.80	180.70	5,418.4	-1,273.2	0.4	1,273.2	0.99	0.31	-0.94	
6,371.0	89.20	181.20	5,420.1	-1,368.2	-1.2	1,368.2	0.67	0.42	0.53	
6,466.0	89.60	181.00	5,421.1	-1,463.2	-3.0	1,463.2	0.47	0.42	-0.21	
6,561.0	90.00	181.60	5,421.4	-1,558.2	-5.2	1,558.2	0.76	0.42	0.63	
6,656.0	88.90	181.80	5,422.3	-1,653.1	-8.0	1,653.1	1.18	-1.16	0.21	
6,750.0	89.70	180.70	5,423.5	-1,747.1	-10.1	1,747.1	1.45	0.85	-1.17	
6,845.0	89.80	180.50	5,423.9	-1,842.1	-11.1	1,842.1	0.24	0.11	-0.21	
6,940.0	87.30	179.60	5,426.3	-1,937.0	-11.1	1,937.1	2.80	-2.63	-0.95	
7,035.0	88.60	179.80	5,429.7	-2,032.0	-10.6	2,032.0	1.38	1.37	0.21	
7,130.0	89.30	180.20	5,431.4	-2,127.0	-10.6	2,127.0	0.85	0.74	0.42	
7,225.0	88.90	180.20	5,432.9	-2,221.9	-11.0	2,222.0	0.42	-0.42	0.00	
7,320.0	89.10	180.40	5,434.6	-2,316.9	-11.5	2,317.0	0.30	0.21	0.21	
7,415.0	88.20	180.70	5,436.8	-2,411.9	-12.4	2,411.9	1.00	-0.95	0.32	
7,510.0	88.60	180.50	5,439.5	-2,506.9	-13.4	2,506.9	0.47	0.42	-0.21	
7,605.0	90.30	180.80	5,440.4	-2,601.8	-14.5	2,601.9	1.82	1.79	0.32	
7,700.0	89.60	180.50	5,440.4	-2,696.8	-15.5	2,696.9	0.80	-0.74	-0.32	
7,794.0	89.50	180.00	5,441.2	-2,790.8	-15.9	2,790.9	0.54	-0.11	-0.53	
7,889.0	88.00	180.20	5,443.3	-2,885.8	-16.1	2,885.8	1.59	-1.58	0.21	
7,984.0	86.20	179.90	5,448.1	-2,980.7	-16.2	2,980.7	1.92	-1.89	-0.32	
8,079.0	86.40	179.60	5,454.2	-3,075.5	-15.8	3,075.5	0.38	0.21	-0.32	
8,174.0	87.50	180.50	5,459.3	-3,170.3	-15.9	3,170.4	1.50	1.16	0.95	
8,269.0	88.70	180.30	5,462.4	-3,265.3	-16.5	3,265.3	1.28	1.26	-0.21	
8,364.0	89.40	180.70	5,464.0	-3,360.3	-17.4	3,360.3	0.85	0.74	0.42	
8,459.0	90.10	179.80	5,464.4	-3,455.3	-17.8	3,455.3	1.20	0.74	-0.95	
8,554.0	90.80	178.60	5,463.6	-3,550.3	-16.4	3,550.3	1.46	0.74	-1.26	
8,649.0	92.40	178.70	5,461.0	-3,645.2	-14.2	3,645.2	1.69	1.68	0.11	
8,744.0	92.20	179.60	5,457.2	-3,740.1	-12.8	3,740.1	0.97	-0.21	0.95	
8,839.0	92.40	179.40	5,453.4	-3,835.0	-12.0	3,835.0	0.30	0.21	-0.21	

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<b>Well:</b>	Thyme 3119 3-5H/ Job # 04209-431-22/Lariat 20	<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 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)	
8,934.0	91.40	179.80	5,450.2	-3,930.0	-11.3	3,930.0	1.13	-1.05	0.42	
9,029.0	90.90	181.10	5,448.3	-4,024.9	-12.1	4,025.0	1.47	-0.53	1.37	
9,124.0	91.60	181.60	5,446.2	-4,119.9	-14.3	4,119.9	0.91	0.74	0.53	
9,219.0	91.30	182.70	5,443.8	-4,214.8	-17.9	4,214.8	1.20	-0.32	1.16	
9,314.0	89.50	182.70	5,443.2	-4,309.7	-22.3	4,309.7	1.89	-1.89	0.00	
9,409.0	89.30	183.00	5,444.2	-4,404.6	-27.0	4,404.6	0.38	-0.21	0.32	
9,504.0	89.80	183.30	5,444.9	-4,499.4	-32.3	4,499.5	0.61	0.53	0.32	
9,580.0	89.90	183.20	5,445.1	-4,575.3	-36.6	4,575.4	0.19	0.13	-0.13	
<b>Last Archer MWD Survey</b>										
9,630.0	89.90	183.20	5,445.2	-4,625.2	-39.4	4,625.3	0.00	0.00	0.00	
<b>Projection to TD - PBHL Thyme 3-5H</b>										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
969.0	969.0	-5.8	-1.2	First Archer MWD Survey	
9,580.0	5,445.1	-4,575.3	-36.6	Last Archer MWD Survey	
9,630.0	5,445.2	-4,625.2	-39.4	Projection to TD	

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