

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

**Harper Co. (KS27S)**

**Sec 13-T35S-R06W**

**Dalrymple Farms 3506 1-13H/ Horizon 15**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**04 February, 2013**

# Archer Survey Report

<b>Company:</b> Sandridge Energy, INC.(mid-con.)	<b>Local Co-ordinate Reference:</b> Well Dalrymple Farms 3506 1-13H/ Horizon 15
<b>Project:</b> Harper Co. (KS27S)	<b>TVD Reference:</b> WELL @ 1240.0usft (Original Well Elev)
<b>Site:</b> Sec 13-T35S-R06W	<b>MD Reference:</b> WELL @ 1240.0usft (Original Well Elev)
<b>Well:</b> Dalrymple Farms 3506 1-13H/ Horizon 15	<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> Harper Co. (KS27S)	
<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 13-T35S-R06W		
<b>Site Position:</b>	<b>Northing:</b> 121,378.00 usft	<b>Latitude:</b> 36° 59' 54.990 N
<b>From:</b> Map	<b>Easting:</b> 2,166,766.00 usft	<b>Longitude:</b> 97° 55' 44.415 W
<b>Position Uncertainty:</b> 0.0 usft	<b>Slot Radius:</b> 13-3/16 "	<b>Grid Convergence:</b> 0.35 °

<b>Well</b> Dalrymple Farms 3506 1-13H/ Horizon 15			
<b>Well Position</b>	<b>+N/-S</b> 0.0 usft	<b>Northing:</b> 121,640.00 usft	<b>Latitude:</b> 36° 59' 57.449 N
	<b>+E/-W</b> 0.0 usft	<b>Easting:</b> 2,168,934.00 usft	<b>Longitude:</b> 97° 55' 17.672 W
<b>Position Uncertainty</b>	0.0 usft	<b>Wellhead Elevation:</b> usft	<b>Ground Level:</b> 1,220.0 usft

<b>Wellbore</b> Wellbore #1					
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	2012/12/27	4.46	65.15	51,743

<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) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	357.24

<b>Survey Program</b>		<b>Date</b> 2013/02/04		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
232.0	487.0	Single Shot Surveys (Wellbore #1)	MWD	MWD - Standard
682.0	9,199.0	Archer MWD Surveys (Wellbore #1)	MWD	MWD - Standard

<b>Survey</b>									
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
232.0	0.30	311.30	232.0	0.4	-0.5	0.4	0.13	0.13	0.00
<b>First Single Shot MWD Survey</b>									
487.0	0.20	311.30	487.0	1.1	-1.3	1.2	0.04	-0.04	0.00
<b>Last Single Shot MWD Survey</b>									
682.0	0.20	311.30	682.0	1.6	-1.8	1.7	0.00	0.00	0.00
<b>First Archer MWD Survey</b>									
956.0	0.40	166.30	956.0	1.0	-1.9	1.1	0.21	0.07	-52.92
1,324.0	1.50	180.90	1,323.9	-5.1	-1.7	-5.0	0.30	0.30	3.97

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<b>Site:</b>	Sec 13-T35S-R06W	<b>MD Reference:</b>	WELL @ 1240.0usft (Original Well Elev)
<b>Well:</b>	Dalrymple Farms 3506 1-13H/ Horizon 15	<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)	
1,798.0	1.00	160.80	1,797.8	-15.2	-0.4	-15.2	0.14	-0.11	-4.24	
2,273.0	1.10	140.80	2,272.7	-22.7	3.8	-22.8	0.08	0.02	-4.21	
2,747.0	1.00	124.10	2,746.7	-28.5	10.1	-28.9	0.07	-0.02	-3.52	
3,031.0	1.40	129.80	3,030.6	-32.1	14.8	-32.8	0.15	0.14	2.01	
3,126.0	1.40	131.30	3,125.6	-33.6	16.6	-34.4	0.04	0.00	1.58	
3,221.0	1.30	146.80	3,220.6	-35.3	18.0	-36.1	0.40	-0.11	16.32	
3,316.0	1.10	155.90	3,315.5	-37.0	19.0	-37.9	0.29	-0.21	9.58	
3,411.0	1.30	151.10	3,410.5	-38.8	19.9	-39.7	0.24	0.21	-5.05	
3,505.0	1.30	146.00	3,504.5	-40.6	21.0	-41.6	0.12	0.00	-5.43	
3,600.0	1.30	132.20	3,599.5	-42.2	22.4	-43.3	0.33	0.00	-14.53	
3,695.0	1.00	102.80	3,694.4	-43.1	24.0	-44.2	0.69	-0.32	-30.95	
3,787.0	1.00	116.00	3,786.4	-43.7	25.5	-44.8	0.25	0.00	14.35	
3,819.0	0.90	121.80	3,818.4	-43.9	26.0	-45.1	0.43	-0.31	18.13	
3,850.0	1.80	24.40	3,849.4	-43.6	26.4	-44.8	6.82	2.90	-314.19	
3,883.0	4.50	7.60	3,882.4	-41.8	26.8	-43.1	8.56	8.18	-50.91	
3,914.0	7.10	5.50	3,913.2	-38.7	27.1	-40.0	8.41	8.39	-6.77	
3,946.0	8.80	8.30	3,944.9	-34.3	27.7	-35.6	5.45	5.31	8.75	
3,977.0	10.40	8.80	3,975.5	-29.2	28.4	-30.6	5.17	5.16	1.61	
4,009.0	12.30	6.80	4,006.8	-23.0	29.3	-24.4	6.06	5.94	-6.25	
4,041.0	14.30	2.90	4,038.0	-15.7	29.9	-17.1	6.85	6.25	-12.19	
4,072.0	17.10	358.50	4,067.8	-7.3	30.0	-8.7	9.81	9.03	-14.19	
4,104.0	20.00	357.90	4,098.2	2.9	29.6	1.5	9.08	9.06	-1.88	
4,136.0	22.20	358.70	4,128.0	14.4	29.3	13.0	6.93	6.88	2.50	
4,167.0	24.30	359.50	4,156.5	26.6	29.1	25.2	6.85	6.77	2.58	
4,199.0	26.20	1.30	4,185.4	40.3	29.2	38.8	6.40	5.94	5.63	
4,230.0	28.60	1.10	4,212.9	54.6	29.5	53.1	7.75	7.74	-0.65	
4,262.0	31.40	0.70	4,240.7	70.5	29.8	69.0	8.77	8.75	-1.25	
4,293.0	34.10	1.20	4,266.7	87.3	30.0	85.8	8.75	8.71	1.61	
4,325.0	35.20	1.00	4,293.1	105.5	30.4	103.9	3.46	3.44	-0.63	
4,356.0	36.40	359.70	4,318.2	123.6	30.5	122.0	4.58	3.87	-4.19	
4,388.0	38.90	358.10	4,343.5	143.2	30.1	141.6	8.39	7.81	-5.00	
4,419.0	42.50	356.70	4,367.0	163.4	29.2	161.8	11.98	11.61	-4.52	
4,451.0	45.50	355.30	4,390.0	185.5	27.6	184.0	9.85	9.38	-4.38	
4,482.0	47.40	355.00	4,411.4	207.9	25.7	206.4	6.17	6.13	-0.97	
4,514.0	48.40	354.40	4,432.9	231.6	23.5	230.2	3.42	3.13	-1.88	
4,545.0	49.50	354.30	4,453.2	254.8	21.2	253.5	3.56	3.55	-0.32	
4,577.0	50.90	353.60	4,473.7	279.3	18.6	278.1	4.69	4.38	-2.19	
4,608.0	50.80	353.50	4,493.3	303.2	15.9	302.0	0.41	-0.32	-0.32	
4,640.0	50.60	352.90	4,513.5	327.8	13.0	326.7	1.58	-0.63	-1.88	
4,671.0	50.90	351.90	4,533.2	351.5	9.8	350.7	2.68	0.97	-3.23	
4,703.0	50.50	351.40	4,553.4	376.0	6.2	375.3	1.74	-1.25	-1.56	
4,734.0	49.90	350.80	4,573.3	399.6	2.6	399.0	2.44	-1.94	-1.94	
4,766.0	50.50	351.20	4,593.7	423.9	-1.3	423.4	2.11	1.88	1.25	
4,797.0	53.00	352.10	4,612.9	447.9	-4.8	447.7	8.38	8.06	2.90	

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### 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)
4,829.0	55.70	353.00	4,631.6	473.7	-8.2	473.6	8.74	8.44	2.81
4,860.0	59.00	353.30	4,648.3	499.6	-11.3	499.6	10.68	10.65	0.97
4,892.0	61.30	353.40	4,664.2	527.2	-14.5	527.3	7.19	7.19	0.31
4,923.0	64.30	353.80	4,678.4	554.6	-17.6	554.8	9.75	9.68	1.29
4,955.0	67.30	353.70	4,691.5	583.6	-20.8	583.9	9.38	9.38	-0.31
4,987.0	69.30	354.10	4,703.3	613.2	-23.9	613.6	6.36	6.25	1.25
5,018.0	71.50	355.10	4,713.7	642.2	-26.7	642.8	7.72	7.10	3.23
5,050.0	74.40	356.30	4,723.1	672.8	-29.0	673.4	9.75	9.06	3.75
5,081.0	77.00	356.90	4,730.8	702.7	-30.7	703.4	8.59	8.39	1.94
5,113.0	80.40	357.00	4,737.1	734.1	-32.4	734.8	10.63	10.63	0.31
5,144.0	83.80	356.50	4,741.3	764.7	-34.2	765.5	11.08	10.97	-1.61
5,176.0	86.40	356.50	4,744.0	796.5	-36.1	797.4	8.13	8.13	0.00
5,284.0	89.60	357.10	4,747.8	904.3	-42.1	905.3	3.01	2.96	0.56
5,378.0	89.80	357.30	4,748.3	998.2	-46.7	999.3	0.30	0.21	0.21
5,474.0	90.90	357.00	4,747.7	1,094.1	-51.5	1,095.3	1.19	1.15	-0.31
5,568.0	92.00	357.20	4,745.3	1,187.9	-56.2	1,189.2	1.19	1.17	0.21
5,663.0	92.60	358.50	4,741.5	1,282.8	-59.8	1,284.1	1.51	0.63	1.37
5,758.0	92.60	357.90	4,737.2	1,377.6	-62.8	1,379.0	0.63	0.00	-0.63
5,852.0	89.80	357.20	4,735.3	1,471.5	-66.8	1,473.0	3.07	-2.98	-0.74
5,948.0	90.20	357.50	4,735.3	1,567.4	-71.2	1,569.0	0.52	0.42	0.31
6,043.0	91.70	356.50	4,733.7	1,662.2	-76.2	1,664.0	1.90	1.58	-1.05
6,138.0	91.80	356.50	4,730.8	1,757.0	-82.0	1,758.9	0.11	0.11	0.00
6,232.0	89.80	356.60	4,729.5	1,850.8	-87.7	1,852.9	2.13	-2.13	0.11
6,327.0	90.50	356.50	4,729.2	1,945.7	-93.4	1,947.9	0.74	0.74	-0.11
6,422.0	90.60	356.30	4,728.3	2,040.5	-99.3	2,042.9	0.24	0.11	-0.21
6,517.0	89.50	356.60	4,728.2	2,135.3	-105.2	2,137.9	1.20	-1.16	0.32
6,612.0	88.40	357.10	4,730.0	2,230.1	-110.4	2,232.9	1.27	-1.16	0.53
6,707.0	88.70	358.30	4,732.4	2,325.0	-114.3	2,327.8	1.30	0.32	1.26
6,802.0	91.30	357.90	4,732.4	2,420.0	-117.4	2,422.8	2.77	2.74	-0.42
6,897.0	89.80	358.80	4,731.5	2,514.9	-120.1	2,517.8	1.84	-1.58	0.95
6,991.0	90.10	359.10	4,731.5	2,608.9	-121.9	2,611.7	0.45	0.32	0.32
7,086.0	87.60	358.70	4,733.4	2,703.9	-123.7	2,706.7	2.67	-2.63	-0.42
7,181.0	88.40	359.00	4,736.8	2,798.8	-125.6	2,801.6	0.90	0.84	0.32
7,302.0	89.10	359.40	4,739.4	2,919.7	-127.3	2,922.5	0.67	0.58	0.33
7,397.0	89.70	358.00	4,740.4	3,014.7	-129.4	3,017.4	1.60	0.63	-1.47
7,490.0	92.50	356.50	4,738.6	3,107.6	-133.9	3,110.4	3.42	3.01	-1.61
7,585.0	93.90	356.30	4,733.3	3,202.2	-139.9	3,205.2	1.49	1.47	-0.21
7,680.0	91.40	354.60	4,728.9	3,296.8	-147.4	3,300.1	3.18	-2.63	-1.79
7,775.0	89.40	354.20	4,728.3	3,391.4	-156.6	3,395.0	2.15	-2.11	-0.42
7,870.0	93.10	355.60	4,726.2	3,485.9	-165.1	3,489.8	4.16	3.89	1.47
7,901.0	95.30	355.80	4,723.9	3,516.8	-167.4	3,520.7	7.13	7.10	0.65
7,932.0	95.50	355.80	4,721.0	3,547.5	-169.7	3,551.6	0.65	0.65	0.00
7,964.0	93.80	356.50	4,718.4	3,579.4	-171.8	3,583.5	5.74	-5.31	2.19

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## Survey

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7,996.0	92.70	357.40	4,716.6	3,611.3	-173.5	3,615.4	4.44	-3.44	2.81
8,059.0	90.30	357.70	4,714.9	3,674.2	-176.2	3,678.4	3.84	-3.81	0.48
8,122.0	91.30	359.10	4,714.1	3,737.1	-178.0	3,741.4	2.73	1.59	2.22
8,152.0	91.50	359.20	4,713.3	3,767.1	-178.4	3,771.4	0.75	0.67	0.33
8,184.0	88.30	358.30	4,713.4	3,799.1	-179.1	3,803.3	10.39	-10.00	-2.81
8,216.0	87.70	358.80	4,714.5	3,831.1	-179.9	3,835.3	2.44	-1.88	1.56
8,248.0	90.30	358.90	4,715.1	3,863.1	-180.6	3,867.3	8.13	8.13	0.31
8,279.0	91.50	359.20	4,714.6	3,894.1	-181.1	3,898.3	3.99	3.87	0.97
8,311.0	90.30	359.80	4,714.1	3,926.1	-181.3	3,930.2	4.19	-3.75	1.88
8,343.0	87.90	1.30	4,714.6	3,958.1	-181.0	3,962.2	8.84	-7.50	4.69
8,407.0	86.90	1.10	4,717.5	4,022.0	-179.7	4,026.0	1.59	-1.56	-0.31
8,438.0	88.30	1.40	4,718.8	4,052.9	-179.0	4,056.9	4.62	4.52	0.97
8,470.0	88.20	0.60	4,719.7	4,084.9	-178.5	4,088.8	2.52	-0.31	-2.50
8,501.0	87.60	0.30	4,720.9	4,115.9	-178.2	4,119.7	2.16	-1.94	-0.97
8,533.0	90.10	0.80	4,721.5	4,147.9	-177.9	4,151.6	7.97	7.81	1.56
8,565.0	91.10	0.00	4,721.2	4,179.9	-177.7	4,183.6	4.00	3.13	-2.50
8,596.0	89.90	0.00	4,720.9	4,210.9	-177.7	4,214.6	3.87	-3.87	0.00
8,628.0	87.10	359.90	4,721.8	4,242.9	-177.7	4,246.5	8.76	-8.75	-0.31
8,659.0	87.70	359.40	4,723.2	4,273.8	-177.9	4,277.4	2.52	1.94	-1.61
8,691.0	87.90	358.30	4,724.4	4,305.8	-178.6	4,309.4	3.49	0.63	-3.44
8,723.0	90.10	356.80	4,724.9	4,337.8	-179.9	4,341.4	8.32	6.88	-4.69
8,818.0	89.60	356.30	4,725.2	4,432.6	-185.6	4,436.4	0.74	-0.53	-0.53
8,913.0	90.40	355.80	4,725.2	4,527.4	-192.2	4,531.4	0.99	0.84	-0.53
9,008.0	89.80	356.70	4,725.0	4,622.2	-198.4	4,626.4	1.14	-0.63	0.95
9,103.0	91.90	357.70	4,723.6	4,717.0	-203.0	4,721.3	2.45	2.21	1.05
<b>Last Archer MWD Survey</b>									
9,198.7	91.90	357.70	4,720.4	4,812.6	-206.9	4,817.0	0.00	0.00	0.00
<b>PBHL Dalrymple Farms 1-13H</b>									
9,199.0	91.90	357.70	4,720.4	4,812.9	-206.9	4,817.3	0.00	0.00	0.00
<b>Projection to TD</b>									

## Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
232.0	232.0	0.4	-0.5	First Single Shot MWD Survey
487.0	487.0	1.1	-1.3	Last Single Shot MWD Survey
682.0	682.0	1.6	-1.8	First Archer MWD Survey
9,103.0	4,723.6	4,717.0	-203.0	Last Archer MWD Survey
9,199.0	4,720.4	4,812.9	-206.9	Projection to TD

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