

# **SandRidge Energy**

**North Park Basin  
T8N-R81W-S7  
Hebron 0781 1-12H**

**Wellbore #1**

**Plan: Design #1**

## **Standard Survey Report**

**29 September, 2016**

# SandRidge Energy

## Survey Report

<b>Company:</b> SandRidge Energy	<b>Local Co-ordinate Reference:</b> Well Hebron 0781 1-12H
<b>Project:</b> North Park Basin	<b>TVD Reference:</b> KB @ 8146.0usft
<b>Site:</b> T8N-R81W-S7	<b>MD Reference:</b> KB @ 8146.0usft
<b>Well:</b> Hebron 0781 1-12H	<b>North Reference:</b> Grid
<b>Wellbore:</b> Wellbore #1	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> Design #1	<b>Database:</b> EDMProd

<b>Project</b> North Park Basin		
<b>Map System:</b> US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b> North American Datum 1983		
<b>Map Zone:</b> Colorado Northern Zone		

<b>Site</b> T8N-R81W-S7		
<b>Site Position:</b>	<b>Northing:</b> 1,462,087.17 usft	<b>Latitude:</b> 40° 35' 53.334 N
<b>From:</b> Map	<b>Easting:</b> 2,743,086.13 usft	<b>Longitude:</b> 106° 25' 30.641 W
<b>Position Uncertainty:</b> 0.0 usft	<b>Slot Radius:</b> 13-3/16 "	<b>Grid Convergence:</b> -0.60 °

<b>Well</b> Hebron 0781 1-12H			
<b>Well Position</b>	<b>+N/-S</b> 0.0 usft	<b>Northing:</b> 1,461,937.18 usft	<b>Latitude:</b> 40° 35' 51.852 N
	<b>+E/-W</b> 0.0 usft	<b>Easting:</b> 2,743,084.61 usft	<b>Longitude:</b> 106° 25' 30.641 W
<b>Position Uncertainty</b>	0.0 usft	<b>Wellhead Elevation:</b> 0.0 usft	<b>Ground Level:</b> 8,130.0 usft

<b>Wellbore</b> Wellbore #1					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	9.90	66.98	53,194

<b>Design</b> Design #1				
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b> PROTOTYPE	<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	180.00

<b>Survey Tool Program</b>		<b>Date</b> 9/29/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	11,355.5	Design #1 (Wellbore #1)	Sperry MWD	Fixed:v2:standard declination

<b>Planned 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	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00	

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<b>Project:</b>	North Park Basin	<b>TVD Reference:</b>	KB @ 8146.0usft
<b>Site:</b>	T8N-R81W-S7	<b>MD Reference:</b>	KB @ 8146.0usft
<b>Well:</b>	Hebron 0781 1-12H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Design #1	<b>Database:</b>	EDMProd

Planned 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	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
<b>Start Build 2.00</b>										
3,600.0	2.00	336.04	3,600.0	1.6	-0.7	-1.6	2.00	2.00	0.00	
3,700.0	4.00	336.04	3,699.8	6.4	-2.8	-6.4	2.00	2.00	0.00	
3,800.0	6.00	336.04	3,799.5	14.3	-6.4	-14.3	2.00	2.00	0.00	
3,900.0	8.00	336.04	3,898.7	25.5	-11.3	-25.5	2.00	2.00	0.00	
4,000.0	10.00	336.04	3,997.5	39.8	-17.7	-39.8	2.00	2.00	0.00	
4,100.0	12.00	336.04	4,095.6	57.2	-25.4	-57.2	2.00	2.00	0.00	
4,156.8	13.14	336.04	4,151.1	68.5	-30.4	-68.5	2.00	2.00	0.00	
<b>Start 1837.0 hold at 4156.8 MD</b>										
4,200.0	13.14	336.04	4,193.1	77.5	-34.4	-77.5	0.00	0.00	0.00	
4,300.0	13.14	336.04	4,290.5	98.2	-43.7	-98.2	0.00	0.00	0.00	
4,400.0	13.14	336.04	4,387.9	119.0	-52.9	-119.0	0.00	0.00	0.00	
4,500.0	13.14	336.04	4,485.3	139.8	-62.1	-139.8	0.00	0.00	0.00	
4,600.0	13.14	336.04	4,582.7	160.5	-71.4	-160.5	0.00	0.00	0.00	
4,700.0	13.14	336.04	4,680.0	181.3	-80.6	-181.3	0.00	0.00	0.00	
4,800.0	13.14	336.04	4,777.4	202.1	-89.8	-202.1	0.00	0.00	0.00	
4,900.0	13.14	336.04	4,874.8	222.8	-99.0	-222.8	0.00	0.00	0.00	
5,000.0	13.14	336.04	4,972.2	243.6	-108.3	-243.6	0.00	0.00	0.00	

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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Design #1	<b>Database:</b>	EDMProd

Planned 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)	
5,100.0	13.14	336.04	5,069.6	264.4	-117.5	-264.4	0.00	0.00	0.00	
5,200.0	13.14	336.04	5,167.0	285.1	-126.7	-285.1	0.00	0.00	0.00	
5,300.0	13.14	336.04	5,264.3	305.9	-136.0	-305.9	0.00	0.00	0.00	
5,400.0	13.14	336.04	5,361.7	326.7	-145.2	-326.7	0.00	0.00	0.00	
5,500.0	13.14	336.04	5,459.1	347.4	-154.4	-347.4	0.00	0.00	0.00	
5,600.0	13.14	336.04	5,556.5	368.2	-163.7	-368.2	0.00	0.00	0.00	
5,700.0	13.14	336.04	5,653.9	389.0	-172.9	-389.0	0.00	0.00	0.00	
5,800.0	13.14	336.04	5,751.3	409.8	-182.1	-409.8	0.00	0.00	0.00	
5,900.0	13.14	336.04	5,848.6	430.5	-191.3	-430.5	0.00	0.00	0.00	
5,993.8	13.14	336.04	5,940.0	450.0	-200.0	-450.0	0.00	0.00	0.00	
<b>Start DLS 8.00 TFO -149.02</b>										
6,000.0	12.71	334.88	5,946.0	451.3	-200.6	-451.3	8.00	-6.82	-18.71	
6,050.0	9.56	321.98	5,995.1	459.5	-205.5	-459.5	8.00	-6.31	-25.80	
6,100.0	7.28	299.18	6,044.6	464.3	-210.8	-464.3	8.00	-4.56	-45.61	
6,150.0	6.82	266.35	6,094.2	465.7	-216.5	-465.7	8.00	-0.92	-65.65	
6,200.0	8.48	238.57	6,143.8	463.6	-222.6	-463.6	8.00	3.31	-55.57	
6,250.0	11.36	222.25	6,193.0	458.0	-229.1	-458.0	8.00	5.77	-32.65	
6,300.0	14.77	212.89	6,241.7	449.0	-235.9	-449.0	8.00	6.82	-18.71	
6,350.0	18.41	207.07	6,289.7	436.6	-242.9	-436.6	8.00	7.29	-11.64	
6,400.0	22.17	203.15	6,336.5	420.9	-250.2	-420.9	8.00	7.53	-7.85	
6,447.6	25.82	200.44	6,380.0	402.9	-257.4	-402.9	8.00	7.66	-5.69	
<b>Niobrara</b>										
6,450.0	26.01	200.32	6,382.2	401.9	-257.8	-401.9	8.00	7.71	-4.90	
6,500.0	29.88	198.18	6,426.3	379.8	-265.4	-379.8	8.00	7.75	-4.28	
6,550.0	33.78	196.49	6,468.8	354.7	-273.3	-354.7	8.00	7.80	-3.38	
6,600.0	37.70	195.12	6,509.4	326.6	-281.2	-326.6	8.00	7.84	-2.75	
6,650.0	41.63	193.97	6,547.9	295.7	-289.2	-295.7	8.00	7.86	-2.30	
6,700.0	45.57	192.98	6,584.1	262.1	-297.2	-262.1	8.00	7.88	-1.97	
6,750.0	49.52	192.12	6,617.8	226.1	-305.2	-226.1	8.00	7.90	-1.72	
6,800.0	53.48	191.36	6,649.0	187.8	-313.2	-187.8	8.00	7.91	-1.53	
6,850.0	57.43	190.66	6,677.3	147.4	-321.1	-147.4	8.00	7.92	-1.38	
6,882.4	60.00	190.25	6,694.1	120.2	-326.1	-120.2	8.00	7.92	-1.28	
<b>Start 150.0 hold at 6882.4 MD</b>										
6,900.0	60.00	190.25	6,702.9	105.2	-328.8	-105.2	0.00	0.00	0.00	
7,000.0	60.00	190.25	6,752.9	20.0	-344.2	-20.0	0.00	0.00	0.00	
7,032.4	60.00	190.25	6,769.1	-7.6	-349.2	7.6	0.00	0.00	0.00	
<b>Start DLS 10.00 TFO -19.89</b>										
7,050.0	61.66	189.57	6,777.7	-22.8	-351.8	22.8	10.00	9.41	-3.87	
7,100.0	66.38	187.74	6,799.6	-67.2	-358.6	67.2	10.00	9.45	-3.65	
7,150.0	71.13	186.05	6,817.7	-113.4	-364.2	113.4	10.00	9.49	-3.39	
7,200.0	75.88	184.44	6,831.9	-161.2	-368.5	161.2	10.00	9.52	-3.21	
7,250.0	80.65	182.90	6,842.1	-210.0	-371.7	210.0	10.00	9.54	-3.08	
7,300.0	85.43	181.41	6,848.1	-259.6	-373.5	259.6	10.00	9.55	-2.99	
7,347.9	90.00	180.00	6,850.0	-307.4	-374.1	307.4	10.00	9.56	-2.95	

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<b>Project:</b>	North Park Basin	<b>TVD Reference:</b>	KB @ 8146.0usft
<b>Site:</b>	T8N-R81W-S7	<b>MD Reference:</b>	KB @ 8146.0usft
<b>Well:</b>	Hebron 0781 1-12H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Design #1	<b>Database:</b>	EDMProd

### Planned 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)
<b>Start 4007.7 hold at 7347.9 MD</b>									
7,400.0	90.00	180.00	6,850.0	-359.5	-374.1	359.5	0.00	0.00	0.00
7,500.0	90.00	180.00	6,850.0	-459.5	-374.1	459.5	0.00	0.00	0.00
7,600.0	90.00	180.00	6,850.0	-559.5	-374.1	559.5	0.00	0.00	0.00
7,700.0	90.00	180.00	6,850.0	-659.5	-374.1	659.5	0.00	0.00	0.00
7,800.0	90.00	180.00	6,850.0	-759.5	-374.1	759.5	0.00	0.00	0.00
7,900.0	90.00	180.00	6,850.0	-859.5	-374.1	859.5	0.00	0.00	0.00
8,000.0	90.00	180.00	6,850.0	-959.5	-374.1	959.5	0.00	0.00	0.00
8,100.0	90.00	180.00	6,850.0	-1,059.5	-374.1	1,059.5	0.00	0.00	0.00
8,200.0	90.00	180.00	6,850.0	-1,159.5	-374.0	1,159.5	0.00	0.00	0.00
8,300.0	90.00	180.00	6,850.0	-1,259.5	-374.0	1,259.5	0.00	0.00	0.00
8,400.0	90.00	180.00	6,850.0	-1,359.5	-374.0	1,359.5	0.00	0.00	0.00
8,500.0	90.00	180.00	6,850.0	-1,459.5	-374.0	1,459.5	0.00	0.00	0.00
8,600.0	90.00	180.00	6,850.0	-1,559.5	-374.0	1,559.5	0.00	0.00	0.00
8,700.0	90.00	180.00	6,850.0	-1,659.5	-374.0	1,659.5	0.00	0.00	0.00
8,800.0	90.00	180.00	6,850.0	-1,759.5	-374.0	1,759.5	0.00	0.00	0.00
8,900.0	90.00	180.00	6,850.0	-1,859.5	-374.0	1,859.5	0.00	0.00	0.00
9,000.0	90.00	180.00	6,850.0	-1,959.5	-374.0	1,959.5	0.00	0.00	0.00
9,100.0	90.00	180.00	6,850.0	-2,059.5	-374.0	2,059.5	0.00	0.00	0.00
9,200.0	90.00	180.00	6,850.0	-2,159.5	-374.0	2,159.5	0.00	0.00	0.00
9,300.0	90.00	180.00	6,850.0	-2,259.5	-373.9	2,259.5	0.00	0.00	0.00
9,400.0	90.00	180.00	6,850.0	-2,359.5	-373.9	2,359.5	0.00	0.00	0.00
9,500.0	90.00	180.00	6,850.0	-2,459.5	-373.9	2,459.5	0.00	0.00	0.00
9,600.0	90.00	180.00	6,850.0	-2,559.5	-373.9	2,559.5	0.00	0.00	0.00
9,700.0	90.00	180.00	6,850.0	-2,659.5	-373.9	2,659.5	0.00	0.00	0.00
9,800.0	90.00	180.00	6,850.0	-2,759.5	-373.9	2,759.5	0.00	0.00	0.00
9,900.0	90.00	180.00	6,850.0	-2,859.5	-373.9	2,859.5	0.00	0.00	0.00
10,000.0	90.00	180.00	6,850.0	-2,959.5	-373.9	2,959.5	0.00	0.00	0.00
10,100.0	90.00	180.00	6,850.0	-3,059.5	-373.9	3,059.5	0.00	0.00	0.00
10,200.0	90.00	180.00	6,850.0	-3,159.5	-373.9	3,159.5	0.00	0.00	0.00
10,300.0	90.00	180.00	6,850.0	-3,259.5	-373.9	3,259.5	0.00	0.00	0.00
10,400.0	90.00	180.00	6,850.0	-3,359.5	-373.9	3,359.5	0.00	0.00	0.00
10,500.0	90.00	180.00	6,850.0	-3,459.5	-373.8	3,459.5	0.00	0.00	0.00
10,600.0	90.00	180.00	6,850.0	-3,559.5	-373.8	3,559.5	0.00	0.00	0.00
10,700.0	90.00	180.00	6,850.0	-3,659.5	-373.8	3,659.5	0.00	0.00	0.00
10,800.0	90.00	180.00	6,850.0	-3,759.5	-373.8	3,759.5	0.00	0.00	0.00
10,900.0	90.00	180.00	6,850.0	-3,859.5	-373.8	3,859.5	0.00	0.00	0.00
11,000.0	90.00	180.00	6,850.0	-3,959.5	-373.8	3,959.5	0.00	0.00	0.00
11,100.0	90.00	180.00	6,850.0	-4,059.5	-373.8	4,059.5	0.00	0.00	0.00
11,200.0	90.00	180.00	6,850.0	-4,159.5	-373.8	4,159.5	0.00	0.00	0.00
11,300.0	90.00	180.00	6,850.0	-4,259.5	-373.8	4,259.5	0.00	0.00	0.00
11,355.5	90.00	180.00	6,850.0	-4,315.1	-373.8	4,315.1	0.00	0.00	0.00
<b>TD at 11355.5</b>									

# SandRidge Energy

## Survey Report

<b>Company:</b> SandRidge Energy	<b>Local Co-ordinate Reference:</b> Well Hebron 0781 1-12H
<b>Project:</b> North Park Basin	<b>TVD Reference:</b> KB @ 8146.0usft
<b>Site:</b> T8N-R81W-S7	<b>MD Reference:</b> KB @ 8146.0usft
<b>Well:</b> Hebron 0781 1-12H	<b>North Reference:</b> Grid
<b>Wellbore:</b> Wellbore #1	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> Design #1	<b>Database:</b> EDMProd

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
Hebron 1-12	0.00	0.00	6,850.0	-4,315.1	-373.8	1,457,622.12	2,742,710.84	40° 35' 9.176 N	106° 25' 34.901 W
- plan hits target center									
- Point									

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(usft)	(usft)			(°)	(°)	
6,447.6	6,380.0	Niobrara		0.00		

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
		(usft)	(usft)		
3500	3500	0	0	Start Build 2.00	
4157	4151	69	-30	Start 1837.0 hold at 4156.8 MD	
5994	5940	450	-200	Start DLS 8.00 TFO -149.02	
6882	6694	120	-326	Start 150.0 hold at 6882.4 MD	
7032	6769	-8	-349	Start DLS 10.00 TFO -19.89	
7348	6850	-307	-374	Start 4007.7 hold at 7347.9 MD	
11,356	6850	-4315	-374	TD at 11355.5	

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