

SandRidge Energy

North Park Basin

T7N-R80W-S16

Ray Ranch 0780 7-16H

Wellbore #1

Plan: Design #1

Standard Survey Report

08 July, 2016

SandRidge Energy

Survey Report

Company:	SandRidge Energy	Local Co-ordinate Reference:	Well Ray Ranch 0780 7-16H
Project:	North Park Basin	TVD Reference:	KB @ 8152.0usft
Site:	T7N-R80W-S16	MD Reference:	KB @ 8152.0usft
Well:	Ray Ranch 0780 7-16H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	EDMProd

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

Site		T7N-R80W-S16			
Site Position:		Northing:	1,453,179.12 usft	Latitude:	40° 34' 26.505 N
From:	Map	Easting:	2,754,928.85 usft	Longitude:	106° 22' 55.973 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.57 °

Well	Ray Ranch 0780 7-16H					
Well Position	+N/-S	0.0 usft	Northing:	1,453,254.12 usft	Latitude:	40° 34' 27.246 N
	+E/-W	0.0 usft	Easting:	2,754,928.85 usft	Longitude:	106° 22' 55.983 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	8,136.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	9.88	66.97	53,186

Design	Design #1				
Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	350.64	

Survey Tool Program	Date	7/8/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	12,429.9	Design #1 (Wellbore #1)	Sperry MWD	Fixed:v2:standard declination	

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)	
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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Well:	Ray Ranch 0780 7-16H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	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
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 2.00									
3,800.0	2.00	216.74	3,800.0	-1.4	-1.0	-1.2	2.00	2.00	0.00
3,900.0	4.00	216.74	3,899.8	-5.6	-4.2	-4.8	2.00	2.00	0.00
4,000.0	6.00	216.74	3,999.5	-12.6	-9.4	-10.9	2.00	2.00	0.00
4,100.0	8.00	216.74	4,098.7	-22.3	-16.7	-19.3	2.00	2.00	0.00
4,200.0	10.00	216.74	4,197.5	-34.9	-26.0	-30.2	2.00	2.00	0.00
4,300.0	12.00	216.74	4,295.6	-50.2	-37.4	-43.4	2.00	2.00	0.00
4,400.0	14.00	216.74	4,393.1	-68.2	-50.9	-59.0	2.00	2.00	0.00
4,500.0	16.00	216.74	4,489.6	-88.9	-66.4	-77.0	2.00	2.00	0.00
4,511.2	16.22	216.74	4,500.4	-91.4	-68.2	-79.1	2.00	2.00	0.00
Start 2941.2 hold at 4511.2 MD									
4,600.0	16.22	216.74	4,585.7	-111.3	-83.1	-96.3	0.00	0.00	0.00
4,700.0	16.22	216.74	4,681.7	-133.7	-99.8	-115.7	0.00	0.00	0.00
4,800.0	16.22	216.74	4,777.7	-156.1	-116.5	-135.1	0.00	0.00	0.00
4,900.0	16.22	216.74	4,873.7	-178.5	-133.2	-154.4	0.00	0.00	0.00
5,000.0	16.22	216.74	4,969.7	-200.9	-149.9	-173.8	0.00	0.00	0.00

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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	16.22	216.74	5,065.8	-223.3	-166.6	-193.2	0.00	0.00	0.00
5,200.0	16.22	216.74	5,161.8	-245.7	-183.4	-212.6	0.00	0.00	0.00
5,300.0	16.22	216.74	5,257.8	-268.0	-200.1	-231.9	0.00	0.00	0.00
5,400.0	16.22	216.74	5,353.8	-290.4	-216.8	-251.3	0.00	0.00	0.00
5,500.0	16.22	216.74	5,449.8	-312.8	-233.5	-270.7	0.00	0.00	0.00
5,600.0	16.22	216.74	5,545.8	-335.2	-250.2	-290.1	0.00	0.00	0.00
5,700.0	16.22	216.74	5,641.9	-357.6	-266.9	-309.4	0.00	0.00	0.00
5,800.0	16.22	216.74	5,737.9	-380.0	-283.6	-328.8	0.00	0.00	0.00
5,900.0	16.22	216.74	5,833.9	-402.4	-300.3	-348.2	0.00	0.00	0.00
6,000.0	16.22	216.74	5,929.9	-424.8	-317.1	-367.6	0.00	0.00	0.00
6,100.0	16.22	216.74	6,025.9	-447.2	-333.8	-386.9	0.00	0.00	0.00
6,200.0	16.22	216.74	6,121.9	-469.6	-350.5	-406.3	0.00	0.00	0.00
6,300.0	16.22	216.74	6,218.0	-492.0	-367.2	-425.7	0.00	0.00	0.00
6,400.0	16.22	216.74	6,314.0	-514.3	-383.9	-445.1	0.00	0.00	0.00
6,500.0	16.22	216.74	6,410.0	-536.7	-400.6	-464.5	0.00	0.00	0.00
6,600.0	16.22	216.74	6,506.0	-559.1	-417.3	-483.8	0.00	0.00	0.00
6,700.0	16.22	216.74	6,602.0	-581.5	-434.0	-503.2	0.00	0.00	0.00
6,800.0	16.22	216.74	6,698.0	-603.9	-450.8	-522.6	0.00	0.00	0.00
6,900.0	16.22	216.74	6,794.1	-626.3	-467.5	-542.0	0.00	0.00	0.00
7,000.0	16.22	216.74	6,890.1	-648.7	-484.2	-561.3	0.00	0.00	0.00
7,100.0	16.22	216.74	6,986.1	-671.1	-500.9	-580.7	0.00	0.00	0.00
7,200.0	16.22	216.74	7,082.1	-693.5	-517.6	-600.1	0.00	0.00	0.00
7,300.0	16.22	216.74	7,178.1	-715.9	-534.3	-619.5	0.00	0.00	0.00
7,400.0	16.22	216.74	7,274.2	-738.3	-551.0	-638.8	0.00	0.00	0.00
7,452.4	16.22	216.74	7,324.5	-750.0	-559.8	-649.0	0.00	0.00	0.00
Start DLS 8.00 TFO 167.76									
7,500.0	12.53	220.46	7,370.6	-759.3	-567.1	-656.9	8.00	-7.77	7.82
7,550.0	8.75	227.65	7,419.7	-765.9	-573.5	-662.5	8.00	-7.56	14.38
7,600.0	5.30	244.75	7,469.3	-769.5	-578.4	-665.2	8.00	-6.90	34.21
7,650.0	3.40	293.80	7,519.2	-769.9	-581.8	-665.0	8.00	-3.80	98.09
7,700.0	5.19	344.21	7,569.1	-767.1	-583.8	-662.0	8.00	3.59	100.82
7,741.5	8.00	360.00	7,610.3	-762.4	-584.3	-657.3	8.00	6.77	38.08
Start 150.0 hold at 7741.5 MD									
7,800.0	8.00	360.00	7,668.2	-754.3	-584.3	-649.2	0.00	0.00	0.00
7,891.5	8.00	360.00	7,758.8	-741.5	-584.3	-636.7	0.00	0.00	0.00
Start DLS 10.00 TFO 0.00									
7,900.0	8.85	0.00	7,767.2	-740.3	-584.3	-635.4	10.00	10.00	0.00
7,950.0	13.85	0.00	7,816.2	-730.4	-584.3	-625.7	10.00	10.00	0.00
7,993.5	18.20	0.00	7,858.0	-718.5	-584.3	-613.9	10.00	10.00	0.00
Niobrara									
8,000.0	18.85	0.00	7,864.2	-716.4	-584.3	-611.8	10.00	10.00	0.00
8,050.0	23.85	0.00	7,910.8	-698.2	-584.3	-593.9	10.00	10.00	0.00
8,100.0	28.85	0.00	7,955.5	-676.0	-584.3	-572.0	10.00	10.00	0.00
8,150.0	33.85	0.00	7,998.2	-650.0	-584.3	-546.3	10.00	10.00	0.00

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Well:	Ray Ranch 0780 7-16H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	EDMPProd

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)
8,200.0	38.85	0.00	8,038.5	-620.4	-584.3	-517.1	10.00	10.00	0.00
8,250.0	43.85	0.00	8,076.0	-587.3	-584.3	-484.5	10.00	10.00	0.00
8,300.0	48.85	0.00	8,110.5	-551.2	-584.3	-448.8	10.00	10.00	0.00
8,350.0	53.85	0.00	8,141.7	-512.1	-584.3	-410.3	10.00	10.00	0.00
8,400.0	58.85	0.00	8,169.4	-470.5	-584.3	-369.2	10.00	10.00	0.00
8,450.0	63.85	0.00	8,193.4	-426.6	-584.3	-326.0	10.00	10.00	0.00
8,500.0	68.85	0.00	8,213.4	-380.9	-584.3	-280.8	10.00	10.00	0.00
8,550.0	73.85	0.00	8,229.4	-333.5	-584.3	-234.1	10.00	10.00	0.00
8,600.0	78.85	0.00	8,241.2	-284.9	-584.3	-186.1	10.00	10.00	0.00
8,650.0	83.85	0.00	8,248.7	-235.5	-584.3	-137.4	10.00	10.00	0.00
8,700.0	88.85	0.00	8,251.9	-185.6	-584.3	-88.1	10.00	10.00	0.00
8,711.5	90.00	0.00	8,252.0	-174.2	-584.3	-76.8	10.00	10.00	0.00
Start 3718.4 hold at 8711.5 MD									
8,800.0	90.00	0.00	8,252.0	-85.6	-584.3	10.5	0.00	0.00	0.00
8,900.0	90.00	0.00	8,252.0	14.4	-584.3	109.2	0.00	0.00	0.00
9,000.0	90.00	0.00	8,252.0	114.4	-584.3	207.9	0.00	0.00	0.00
9,100.0	90.00	0.00	8,252.0	214.4	-584.2	306.5	0.00	0.00	0.00
9,200.0	90.00	0.00	8,252.0	314.4	-584.2	405.2	0.00	0.00	0.00
9,300.0	90.00	0.00	8,252.0	414.4	-584.2	503.9	0.00	0.00	0.00
9,400.0	90.00	0.00	8,252.0	514.4	-584.2	602.5	0.00	0.00	0.00
9,500.0	90.00	0.00	8,252.0	614.4	-584.2	701.2	0.00	0.00	0.00
9,600.0	90.00	0.00	8,252.0	714.4	-584.2	799.9	0.00	0.00	0.00
9,700.0	90.00	0.00	8,252.0	814.4	-584.2	898.5	0.00	0.00	0.00
9,800.0	90.00	0.00	8,252.0	914.4	-584.2	997.2	0.00	0.00	0.00
9,900.0	90.00	0.00	8,252.0	1,014.4	-584.2	1,095.9	0.00	0.00	0.00
10,000.0	90.00	0.00	8,252.0	1,114.4	-584.2	1,194.5	0.00	0.00	0.00
10,100.0	90.00	0.00	8,252.0	1,214.4	-584.2	1,293.2	0.00	0.00	0.00
10,200.0	90.00	0.00	8,252.0	1,314.4	-584.2	1,391.9	0.00	0.00	0.00
10,300.0	90.00	0.00	8,252.0	1,414.4	-584.2	1,490.5	0.00	0.00	0.00
10,400.0	90.00	0.00	8,252.0	1,514.4	-584.2	1,589.2	0.00	0.00	0.00
10,500.0	90.00	0.00	8,252.0	1,614.4	-584.2	1,687.9	0.00	0.00	0.00
10,600.0	90.00	0.00	8,252.0	1,714.4	-584.2	1,786.6	0.00	0.00	0.00
10,700.0	90.00	0.00	8,252.0	1,814.4	-584.2	1,885.2	0.00	0.00	0.00
10,800.0	90.00	0.00	8,252.0	1,914.4	-584.2	1,983.9	0.00	0.00	0.00
10,900.0	90.00	0.00	8,252.0	2,014.4	-584.2	2,082.6	0.00	0.00	0.00
11,000.0	90.00	0.00	8,252.0	2,114.4	-584.2	2,181.2	0.00	0.00	0.00
11,100.0	90.00	0.00	8,252.0	2,214.4	-584.2	2,279.9	0.00	0.00	0.00
11,200.0	90.00	0.00	8,252.0	2,314.4	-584.2	2,378.6	0.00	0.00	0.00
11,300.0	90.00	0.00	8,252.0	2,414.4	-584.2	2,477.2	0.00	0.00	0.00
11,400.0	90.00	0.00	8,252.0	2,514.4	-584.2	2,575.9	0.00	0.00	0.00
11,500.0	90.00	0.00	8,252.0	2,614.4	-584.1	2,674.6	0.00	0.00	0.00
11,600.0	90.00	0.00	8,252.0	2,714.4	-584.1	2,773.2	0.00	0.00	0.00
11,700.0	90.00	0.00	8,252.0	2,814.4	-584.1	2,871.9	0.00	0.00	0.00
11,800.0	90.00	0.00	8,252.0	2,914.4	-584.1	2,970.6	0.00	0.00	0.00

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Project:	North Park Basin	TVD Reference:	KB @ 8152.0usft
Site:	T7N-R80W-S16	MD Reference:	KB @ 8152.0usft
Well:	Ray Ranch 0780 7-16H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Design #1	Database:	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)
11,900.0	90.00	0.00	8,252.0	3,014.4	-584.1	3,069.2	0.00	0.00	0.00
12,000.0	90.00	0.00	8,252.0	3,114.4	-584.1	3,167.9	0.00	0.00	0.00
12,100.0	90.00	0.00	8,252.0	3,214.4	-584.1	3,266.6	0.00	0.00	0.00
12,200.0	90.00	0.00	8,252.0	3,314.4	-584.1	3,365.2	0.00	0.00	0.00
12,300.0	90.00	0.00	8,252.0	3,414.4	-584.1	3,463.9	0.00	0.00	0.00
12,400.0	90.00	0.00	8,252.0	3,514.4	-584.1	3,562.6	0.00	0.00	0.00
12,429.9	90.00	0.00	8,252.0	3,544.3	-584.1	3,592.1	0.00	0.00	0.00
TD at 12429.9									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Ray Ranch 7-16H - plan hits target center - Point	0.00	360.00	8,252.0	3,544.3	-584.1	1,456,798.41	2,754,344.74	40° 35' 2.211 N	106° 23' 4.010 W

Formations

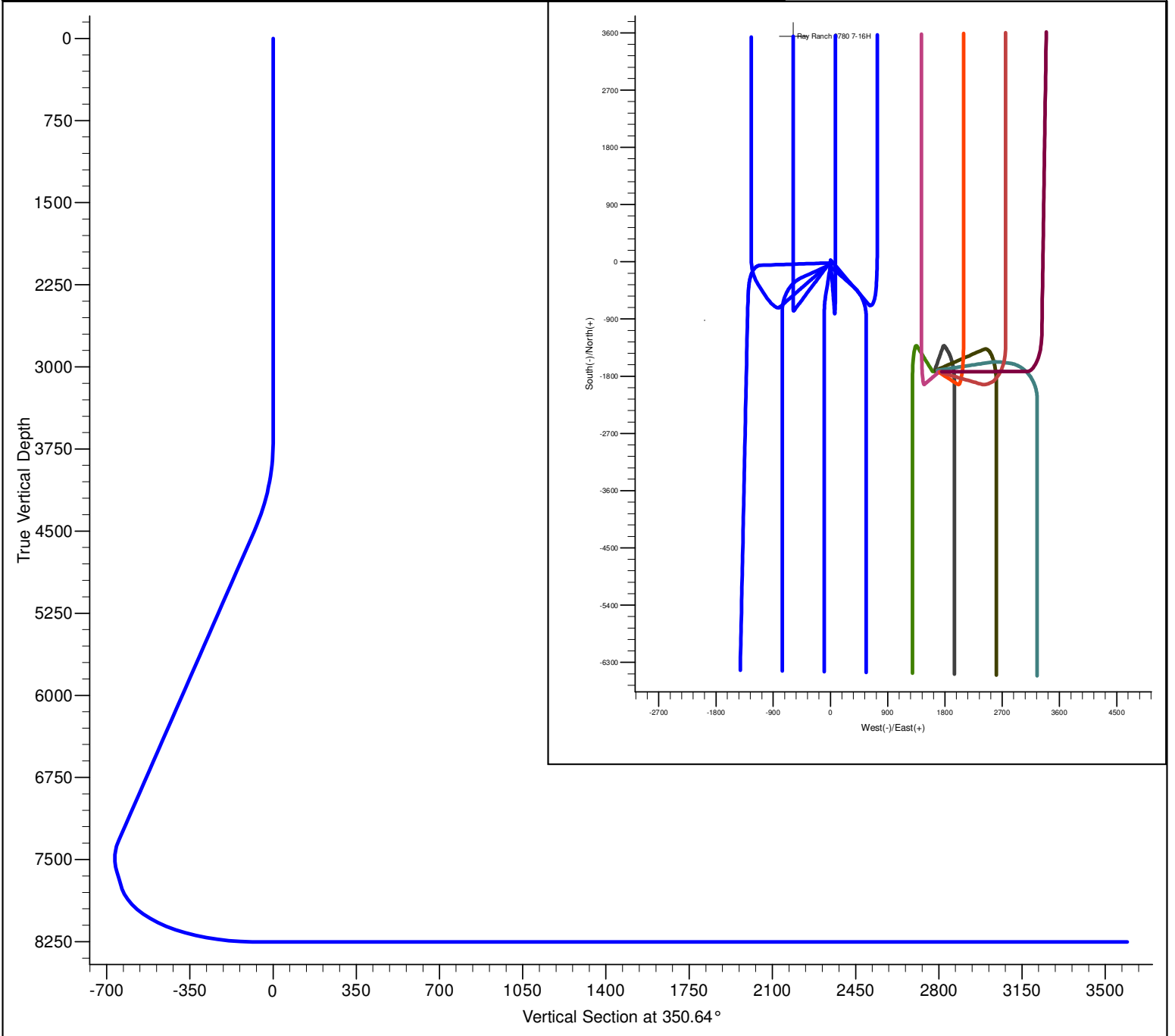
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,993.5	7,858.0	Niobrara		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3700	3700	0	0	Start Build 2.00
4511	4500	-91	-68	Start 2941.2 hold at 4511.2 MD
7452	7325	-750	-560	Start DLS 8.00 TFO 167.76
7741	7610	-762	-584	Start 150.0 hold at 7741.5 MD
7891	7759	-742	-584	Start DLS 10.00 TFO 0.00
8711	8252	-174	-584	Start 3718.4 hold at 8711.5 MD
12,430	8252	3544	-584	TD at 12429.9

Checked By: _____ Approved By: _____ Date: _____

PROJECT DETAILS: North Park Basin										<div><div><div><div></div><div>G</div></div><div><div></div><div>T</div></div><div><div></div><div>M</div></div></div><div><div></div></div></div> <div><div>Azimuths to Grid North</div><div>True North: 0.57°</div><div>Magnetic North: 10.45°</div><div>Magnetic Field</div><div>Strength: 53186.4snT</div><div>Dip Angle: 66.97°</div><div>Date: 12/31/2009</div><div>Model: IGRF200510</div></div>			
Geodetic System: US State Plane 1983 Datum: North American Datum 1983 Ellipsoid: GRS 1980 Zone: Colorado Northern Zone System Datum: Mean Sea Level													
FORMATION TOP DETAILS												CASING DETAILS	
TVDPPath		MDPath		Formation		DipAngle		DipDir		No casing data is available			
7858.0		7993.5		Niobrara		0.00							
DESIGN DETAILS: Design #1												Project: North Park Basin Site: T7N-R80W-S16 Well: Ray Ranch 0780 7-16H Wellbore: Wellbore #1 Design: Design #1	
0' Vertical Section coordinates													
Type	Target	Azimuth	Origin	Type	N/S	E/W	From	TVD					
TD		350.64	Slot		0.0	0.0		0.0					



SECTION DETAILS												
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target		
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0			
2	3700.0	0.00	0.00	3700.0	0.0	0.0	0.00	0.00	0.0			
3	4511.2	16.22	216.74	4500.4	-91.4	-68.2	2.00	216.74	-79.1			
4	7452.4	16.22	216.74	7324.5	-750.0	-559.8	0.00	0.00	-649.0			
5	7741.5	8.00	360.00	7610.3	-762.4	-584.3	8.00	167.76	-657.3			
6	7891.5	8.00	360.00	7758.8	-741.5	-584.3	0.00	0.00	-636.7			
7	8711.5	90.00	0.00	8252.0	-174.2	-584.3	10.00	0.00	-76.8	Ray Ranch 7-16H		
8	12429.9	90.00	0.00	8252.0	3544.3	-584.1	0.00	0.00	3592.1	Ray Ranch 7-16H		