

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 23-T2N-R66W

Turkey Springs 29N-14HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

## Sperry Drilling Services

## Proposal Report

27 November, 2012

Well Coordinates: 1,290,706.92 N, 3,211,702.76 E (40° 07' 44.05" N, 104° 44' 34.41" W)

Ground Level: 5,155.00 ft

Local Coordinate Origin: Centered on Well Turkey Springs 29N-14HZ

Viewing Datum: RKB=17 @ 5172.00ft (Drilling Rig)

TVDs to System: N

North Reference: True

Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

**HALLIBURTON**

Project: Weld County, CO (NAD 83)  
Site: Sec. 23-T2N-R66W  
Well: Turkey Springs 29N-14HZ  
Wellbore: Plan A Rev 0  
Design: Plan A Rev 0 Permit

# Anadarko Petroleum Corp.

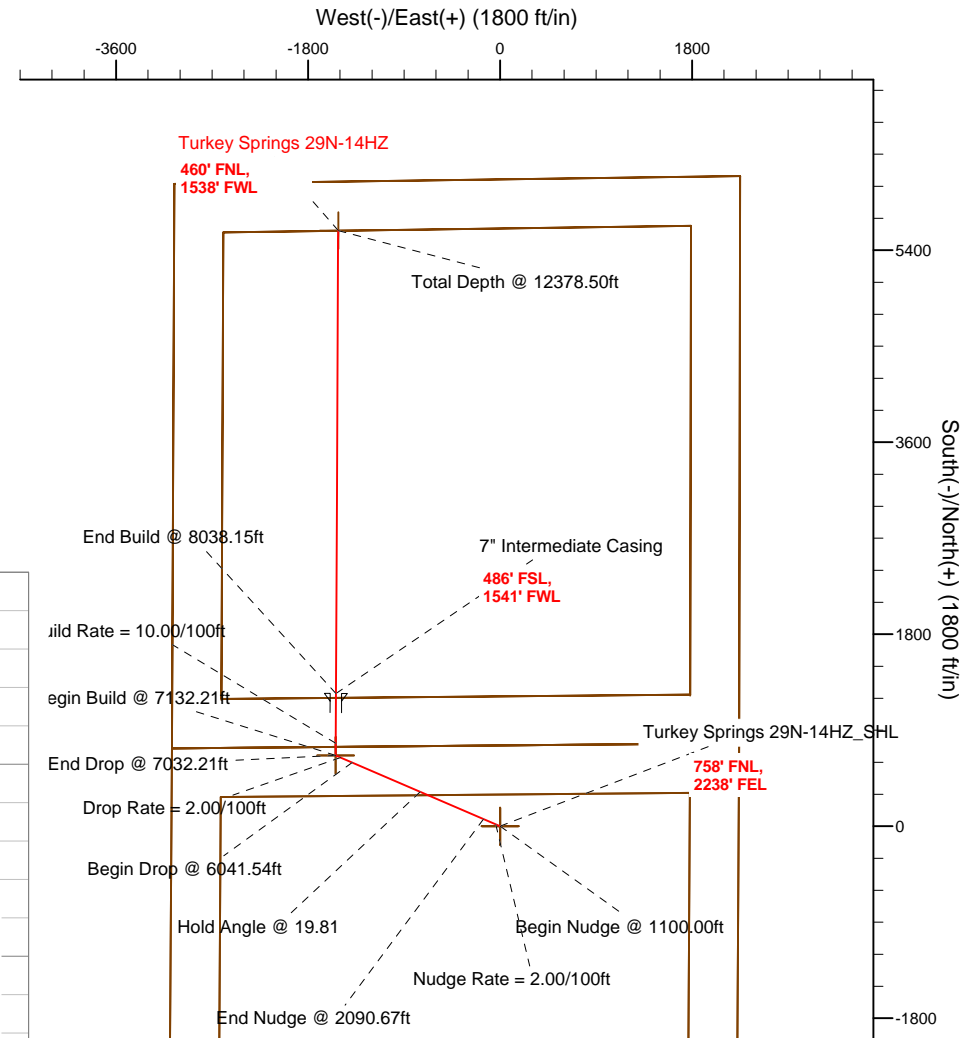
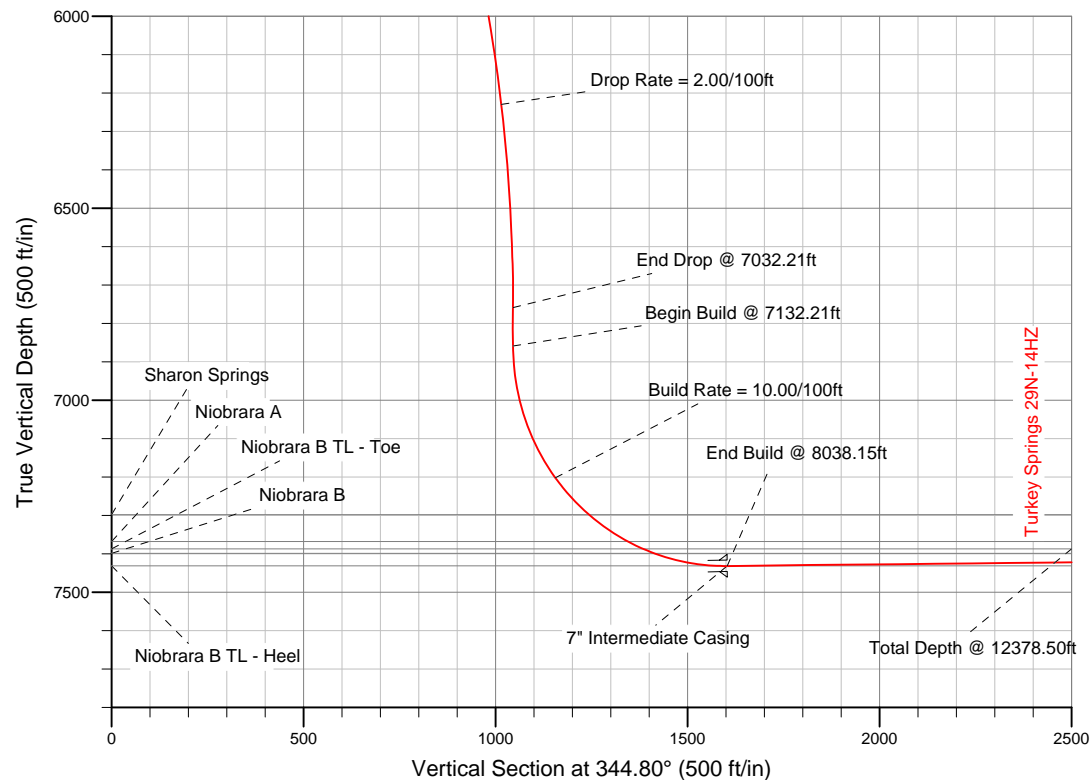
**HALLIBURTON**  
Sperry Drilling

## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00	
3	2090.67	19.81	293.34	2071.05	67.20	-155.71	2.00	293.34	105.67	
4	6041.54	19.81	293.34	5788.02	597.80	-1385.29	0.00	0.00	940.12	
5	7032.21	0.00	0.00	6759.07	665.00	-1541.00	2.00	180.00	1045.79	Turkey Springs 29N-14HZ_Dtgt
6	7132.21	0.00	0.00	6859.07	665.00	-1541.00	0.00	0.00	1045.79	Turkey Springs 29N-14HZ_Dtgt2
7	8038.15	90.59	0.28	7432.00	1243.89	-1538.20	10.00	0.28	1603.70	
8	12378.50	90.59	0.28	7387.00	5583.96	-1517.24	0.00	0.00	5786.42	Turkey Springs 29N-14HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Turkey Springs 29N-14HZ_SB22	0.00	0.00	0.00	40.128903	-104.742893	Polygon
Turkey Springs 29N-14HZ_SB23	0.00	0.00	0.00	40.128903	-104.742893	Polygon
Turkey Springs 29N-14HZ_Sec22	0.00	0.00	0.00	40.128903	-104.742893	Polygon
Turkey Springs 29N-14HZ_Sec23	0.00	0.00	0.00	40.128903	-104.742893	Polygon
Turkey Springs 29N-14HZ_SHL	0.00	0.00	0.00	40.128903	-104.742893	Point
Turkey Springs 29N-14HZ_Dtgt	6759.07	665.00	-1541.00	40.130728	-104.748404	Point
Turkey Springs 29N-14HZ_Dtgt2	6859.07	665.00	-1541.00	40.130728	-104.748404	Point
Turkey Springs 29N-14HZ_BHL	7387.00	5583.96	-1517.24	40.144231	-104.748320	Point



WELL DETAILS: Turkey Springs 29N-14HZ

Ground Level: 5155.00 RKB=17 @ 5172.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Turkey Springs 29N-14HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 12/14/2012  
Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_

**Plan Report for Turkey Springs 29N-14HZ - Plan A Rev 0 Permit**

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)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Turkey Springs 29N-14HZ_SB22 - Turkey Springs 29N-14HZ_SB23 - Turkey Springs 29N-14HZ_SHL - Turkey Springs 29N-14HZ_</b>										
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 1100.00ft</b>										
1,200.00	2.00	293.34	1,199.98	0.69	-1.60	1.09	2.00	2.00	0.00	293.34
1,300.00	4.00	293.34	1,299.84	2.77	-6.41	4.35	2.00	2.00	0.00	0.00
1,400.00	6.00	293.34	1,399.45	6.22	-14.41	9.78	2.00	2.00	0.00	0.00
1,500.00	8.00	293.34	1,498.70	11.05	-25.60	17.37	2.00	2.00	0.00	0.00
1,600.00	10.00	293.34	1,597.47	17.24	-39.96	27.12	2.00	2.00	0.00	0.00
<b>Nudge Rate = 2.00/100ft</b>										
1,700.00	12.00	293.34	1,695.62	24.80	-57.48	39.01	2.00	2.00	0.00	0.00
1,800.00	14.00	293.34	1,793.06	33.72	-78.13	53.02	2.00	2.00	0.00	0.00
1,900.00	16.00	293.34	1,889.64	43.97	-101.89	69.15	2.00	2.00	0.00	0.00
2,000.00	18.00	293.34	1,985.27	55.55	-128.74	87.37	2.00	2.00	0.00	0.00
2,090.67	19.81	293.34	2,071.04	67.20	-155.71	105.67	2.00	2.00	0.00	0.00
<b>End Nudge @ 2090.67ft</b>										
2,100.00	19.81	293.34	2,079.82	68.45	-158.61	107.64	0.00	0.00	0.00	0.00
2,200.00	19.81	293.34	2,173.90	81.88	-189.74	128.76	0.00	0.00	0.00	0.00
2,300.00	19.81	293.34	2,267.98	95.31	-220.86	149.88	0.00	0.00	0.00	0.00
2,400.00	19.81	293.34	2,362.06	108.74	-251.98	171.01	0.00	0.00	0.00	0.00
2,500.00	19.81	293.34	2,456.14	122.17	-283.10	192.13	0.00	0.00	0.00	0.00
2,600.00	19.81	293.34	2,550.22	135.60	-314.22	213.25	0.00	0.00	0.00	0.00
2,700.00	19.81	293.34	2,644.30	149.03	-345.34	234.37	0.00	0.00	0.00	0.00
2,800.00	19.81	293.34	2,738.38	162.46	-376.47	255.49	0.00	0.00	0.00	0.00
2,900.00	19.81	293.34	2,832.46	175.89	-407.59	276.61	0.00	0.00	0.00	0.00
3,000.00	19.81	293.34	2,926.54	189.32	-438.71	297.73	0.00	0.00	0.00	0.00
3,100.00	19.81	293.34	3,020.62	202.75	-469.83	318.85	0.00	0.00	0.00	0.00
3,200.00	19.81	293.34	3,114.70	216.18	-500.95	339.97	0.00	0.00	0.00	0.00
3,300.00	19.81	293.34	3,208.78	229.61	-532.08	361.09	0.00	0.00	0.00	0.00
3,400.00	19.81	293.34	3,302.86	243.04	-563.20	382.21	0.00	0.00	0.00	0.00
3,500.00	19.81	293.34	3,396.94	256.47	-594.32	403.33	0.00	0.00	0.00	0.00
3,600.00	19.81	293.34	3,491.02	269.90	-625.44	424.45	0.00	0.00	0.00	0.00
3,700.00	19.81	293.34	3,585.10	283.33	-656.56	445.57	0.00	0.00	0.00	0.00
3,800.00	19.81	293.34	3,679.18	296.76	-687.68	466.69	0.00	0.00	0.00	0.00
3,900.00	19.81	293.34	3,773.26	310.19	-718.81	487.81	0.00	0.00	0.00	0.00
4,000.00	19.81	293.34	3,867.34	323.62	-749.93	508.94	0.00	0.00	0.00	0.00
<b>Hold Angle @ 19.81</b>										
4,100.00	19.81	293.34	3,961.42	337.05	-781.05	530.06	0.00	0.00	0.00	0.00
4,200.00	19.81	293.34	4,055.50	350.48	-812.17	551.18	0.00	0.00	0.00	0.00
4,300.00	19.81	293.34	4,149.58	363.91	-843.29	572.30	0.00	0.00	0.00	0.00
4,400.00	19.81	293.34	4,243.66	377.34	-874.41	593.42	0.00	0.00	0.00	0.00
4,500.00	19.81	293.34	4,337.74	390.77	-905.54	614.54	0.00	0.00	0.00	0.00
4,568.30	19.81	293.34	4,402.00	399.95	-926.79	628.96	0.00	0.00	0.00	0.00
<b>Parkman</b>										
4,600.00	19.81	293.34	4,431.82	404.20	-936.66	635.66	0.00	0.00	0.00	0.00
4,700.00	19.81	293.34	4,525.90	417.63	-967.78	656.78	0.00	0.00	0.00	0.00
4,800.00	19.81	293.34	4,619.98	431.06	-998.90	677.90	0.00	0.00	0.00	0.00
4,900.00	19.81	293.34	4,714.06	444.49	-1,030.02	699.02	0.00	0.00	0.00	0.00

**Plan Report for Turkey Springs 29N-14HZ - Plan A Rev 0 Permit**

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)	Toolface Azimuth (°)
4,916.94	19.81	293.34	4,730.00	446.77	-1,035.29	702.60	0.00	0.00	0.00	0.00
<b>Sussex</b>										
5,000.00	19.81	293.34	4,808.14	457.92	-1,061.14	720.14	0.00	0.00	0.00	0.00
5,100.00	19.81	293.34	4,902.22	471.35	-1,092.27	741.26	0.00	0.00	0.00	0.00
5,200.00	19.81	293.34	4,996.30	484.78	-1,123.39	762.38	0.00	0.00	0.00	0.00
5,300.00	19.81	293.34	5,090.38	498.21	-1,154.51	783.50	0.00	0.00	0.00	0.00
5,400.00	19.81	293.34	5,184.46	511.64	-1,185.63	804.62	0.00	0.00	0.00	0.00
5,500.00	19.81	293.34	5,278.55	525.07	-1,216.75	825.74	0.00	0.00	0.00	0.00
5,600.00	19.81	293.34	5,372.63	538.51	-1,247.87	846.87	0.00	0.00	0.00	0.00
5,700.00	19.81	293.34	5,466.71	551.94	-1,279.00	867.99	0.00	0.00	0.00	0.00
5,800.00	19.81	293.34	5,560.79	565.37	-1,310.12	889.11	0.00	0.00	0.00	0.00
5,900.00	19.81	293.34	5,654.87	578.80	-1,341.24	910.23	0.00	0.00	0.00	0.00
6,000.00	19.81	293.34	5,748.95	592.23	-1,372.36	931.35	0.00	0.00	0.00	0.00
6,041.54	19.81	293.34	5,788.03	597.80	-1,385.29	940.12	0.00	0.00	0.00	0.00
<b>Begin Drop @ 6041.54ft</b>										
6,100.00	18.64	293.34	5,843.22	605.43	-1,402.97	952.12	2.00	-2.00	0.00	180.00
6,200.00	16.64	293.34	5,938.51	617.44	-1,430.79	971.00	2.00	-2.00	0.00	180.00
6,300.00	14.64	293.34	6,034.81	628.13	-1,455.55	987.81	2.00	-2.00	0.00	180.00
6,400.00	12.64	293.34	6,131.98	637.47	-1,477.21	1,002.50	2.00	-2.00	0.00	180.00
6,500.00	10.64	293.34	6,229.92	645.47	-1,495.74	1,015.08	2.00	-2.00	0.00	180.00
<b>Drop Rate = 2.00/100ft</b>										
6,600.00	8.64	293.34	6,328.50	652.11	-1,511.12	1,025.52	2.00	-2.00	0.00	180.00
6,700.00	6.64	293.34	6,427.60	657.38	-1,523.33	1,033.81	2.00	-2.00	0.00	180.00
6,800.00	4.64	293.34	6,527.11	661.27	-1,532.36	1,039.93	2.00	-2.00	0.00	180.00
6,900.00	2.64	293.34	6,626.91	663.79	-1,538.20	1,043.89	2.00	-2.00	0.00	180.00
7,000.00	0.64	293.34	6,726.86	664.93	-1,540.83	1,045.68	2.00	-2.00	0.00	180.00
7,032.21	0.00	0.00	6,759.07	665.00	-1,541.00	1,045.79	2.00	-2.00	206.94	180.00
<b>End Drop @ 7032.21ft - Turkey Springs 29N-14HZ_Dtgt</b>										
7,100.00	0.00	0.00	6,826.86	665.00	-1,541.00	1,045.79	0.00	0.00	0.00	180.00
7,132.21	0.00	0.00	6,859.07	665.00	-1,541.00	1,045.79	0.00	0.00	0.00	0.00
<b>Begin Build @ 7132.21ft - Turkey Springs 29N-14HZ_Dtgt2</b>										
7,200.00	6.78	0.28	6,926.70	669.01	-1,540.98	1,049.65	10.00	10.00	0.00	0.28
7,300.00	16.78	0.28	7,024.47	689.39	-1,540.88	1,069.30	10.00	10.00	0.00	0.00
7,400.00	26.78	0.28	7,117.22	726.45	-1,540.70	1,105.01	10.00	10.00	0.00	0.00
7,500.00	36.78	0.28	7,202.12	779.05	-1,540.45	1,155.70	10.00	10.00	0.00	0.00
<b>Build Rate = 10.00/100ft</b>										
7,600.00	46.78	0.28	7,276.59	845.59	-1,540.13	1,219.83	10.00	10.00	0.00	0.00
7,632.24	50.00	0.28	7,298.00	869.69	-1,540.01	1,243.06	10.00	10.00	0.00	0.00
<b>Sharon Springs</b>										
7,700.00	56.78	0.28	7,338.39	924.05	-1,539.75	1,295.45	10.00	10.00	0.00	0.00
7,758.75	62.65	0.28	7,368.00	974.76	-1,539.50	1,344.32	10.00	10.00	0.00	0.00
<b>Niobrara A</b>										
7,800.00	66.78	0.28	7,385.61	1,012.05	-1,539.32	1,380.26	10.00	10.00	0.00	0.00
7,836.72	70.45	0.28	7,399.00	1,046.23	-1,539.16	1,413.21	10.00	10.00	0.00	0.00
<b>Niobrara B</b>										
7,900.00	76.78	0.28	7,416.84	1,106.91	-1,538.87	1,471.68	10.00	10.00	0.00	0.00
8,000.00	86.78	0.28	7,431.12	1,205.76	-1,538.39	1,566.95	10.00	10.00	0.00	0.00
8,038.15	90.59	0.28	7,432.00	1,243.89	-1,538.20	1,603.70	10.00	10.00	0.00	0.00
<b>End Build @ 8038.15ft - Niobrara B TL - Heel - 7" Intermediate Casing</b>										
8,100.00	90.59	0.28	7,431.36	1,305.74	-1,537.91	1,663.30	0.00	0.00	0.00	0.00
8,200.00	90.59	0.28	7,430.32	1,405.73	-1,537.42	1,759.67	0.00	0.00	0.00	0.00
8,300.00	90.59	0.28	7,429.28	1,505.72	-1,536.94	1,856.04	0.00	0.00	0.00	0.00
8,400.00	90.59	0.28	7,428.25	1,605.72	-1,536.46	1,952.41	0.00	0.00	0.00	0.00
8,500.00	90.59	0.28	7,427.21	1,705.71	-1,535.97	2,048.77	0.00	0.00	0.00	0.00
8,600.00	90.59	0.28	7,426.17	1,805.70	-1,535.49	2,145.14	0.00	0.00	0.00	0.00
8,700.00	90.59	0.28	7,425.14	1,905.70	-1,535.01	2,241.51	0.00	0.00	0.00	0.00
8,800.00	90.59	0.28	7,424.10	2,005.69	-1,534.52	2,337.88	0.00	0.00	0.00	0.00
8,900.00	90.59	0.28	7,423.06	2,105.68	-1,534.04	2,434.25	0.00	0.00	0.00	0.00

**Plan Report for Turkey Springs 29N-14HZ - Plan A Rev 0 Permit**

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)	Toolface Azimuth (°)
9,000.00	90.59	0.28	7,422.03	2,205.68	-1,533.56	2,530.61	0.00	0.00	0.00	0.00
9,100.00	90.59	0.28	7,420.99	2,305.67	-1,533.08	2,626.98	0.00	0.00	0.00	0.00
9,200.00	90.59	0.28	7,419.95	2,405.66	-1,532.59	2,723.35	0.00	0.00	0.00	0.00
9,300.00	90.59	0.28	7,418.92	2,505.66	-1,532.11	2,819.72	0.00	0.00	0.00	0.00
9,400.00	90.59	0.28	7,417.88	2,605.65	-1,531.63	2,916.09	0.00	0.00	0.00	0.00
9,500.00	90.59	0.28	7,416.84	2,705.64	-1,531.14	3,012.46	0.00	0.00	0.00	0.00
9,600.00	90.59	0.28	7,415.81	2,805.64	-1,530.66	3,108.82	0.00	0.00	0.00	0.00
9,700.00	90.59	0.28	7,414.77	2,905.63	-1,530.18	3,205.19	0.00	0.00	0.00	0.00
9,800.00	90.59	0.28	7,413.73	3,005.63	-1,529.69	3,301.56	0.00	0.00	0.00	0.00
9,900.00	90.59	0.28	7,412.69	3,105.62	-1,529.21	3,397.93	0.00	0.00	0.00	0.00
10,000.00	90.59	0.28	7,411.66	3,205.61	-1,528.73	3,494.30	0.00	0.00	0.00	0.00
10,100.00	90.59	0.28	7,410.62	3,305.61	-1,528.25	3,590.66	0.00	0.00	0.00	0.00
10,200.00	90.59	0.28	7,409.58	3,405.60	-1,527.76	3,687.03	0.00	0.00	0.00	0.00
10,300.00	90.59	0.28	7,408.55	3,505.59	-1,527.28	3,783.40	0.00	0.00	0.00	0.00
10,400.00	90.59	0.28	7,407.51	3,605.59	-1,526.80	3,879.77	0.00	0.00	0.00	0.00
10,500.00	90.59	0.28	7,406.47	3,705.58	-1,526.31	3,976.14	0.00	0.00	0.00	0.00
10,600.00	90.59	0.28	7,405.44	3,805.57	-1,525.83	4,072.51	0.00	0.00	0.00	0.00
10,700.00	90.59	0.28	7,404.40	3,905.57	-1,525.35	4,168.87	0.00	0.00	0.00	0.00
10,800.00	90.59	0.28	7,403.36	4,005.56	-1,524.86	4,265.24	0.00	0.00	0.00	0.00
10,900.00	90.59	0.28	7,402.33	4,105.55	-1,524.38	4,361.61	0.00	0.00	0.00	0.00
11,000.00	90.59	0.28	7,401.29	4,205.55	-1,523.90	4,457.98	0.00	0.00	0.00	0.00
11,100.00	90.59	0.28	7,400.25	4,305.54	-1,523.42	4,554.35	0.00	0.00	0.00	0.00
11,200.00	90.59	0.28	7,399.22	4,405.53	-1,522.93	4,650.71	0.00	0.00	0.00	0.00
11,300.00	90.59	0.28	7,398.18	4,505.53	-1,522.45	4,747.08	0.00	0.00	0.00	0.00
11,400.00	90.59	0.28	7,397.14	4,605.52	-1,521.97	4,843.45	0.00	0.00	0.00	0.00
11,500.00	90.59	0.28	7,396.11	4,705.51	-1,521.48	4,939.82	0.00	0.00	0.00	0.00
11,600.00	90.59	0.28	7,395.07	4,805.51	-1,521.00	5,036.19	0.00	0.00	0.00	0.00
11,700.00	90.59	0.28	7,394.03	4,905.50	-1,520.52	5,132.56	0.00	0.00	0.00	0.00
11,800.00	90.59	0.28	7,393.00	5,005.49	-1,520.03	5,228.92	0.00	0.00	0.00	0.00
11,900.00	90.59	0.28	7,391.96	5,105.49	-1,519.55	5,325.29	0.00	0.00	0.00	0.00
12,000.00	90.59	0.28	7,390.92	5,205.48	-1,519.07	5,421.66	0.00	0.00	0.00	0.00
12,100.00	90.59	0.28	7,389.89	5,305.47	-1,518.59	5,518.03	0.00	0.00	0.00	0.00
12,200.00	90.59	0.28	7,388.85	5,405.47	-1,518.10	5,614.40	0.00	0.00	0.00	0.00
12,300.00	90.59	0.28	7,387.81	5,505.46	-1,517.62	5,710.77	0.00	0.00	0.00	0.00
12,378.48	90.59	0.28	7,387.00	5,583.94	-1,517.24	5,786.39	0.00	0.00	0.00	0.00
<b>Niobrara B TL - Toe</b>										
12,378.50	90.59	0.28	7,387.00	5,583.96	-1,517.24	5,786.41	0.00	0.00	0.00	0.00
<b>Total Depth @ 12378.50ft - Turkey Springs 29N-14HZ_BHL</b>										

**Plan Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,100.00	1,100.00	0.00	0.00	Begin Nudge @ 1100.00ft
1,600.00	1,597.47	17.24	-39.96	Nudge Rate = 2.00/100ft
2,090.67	2,071.04	67.20	-155.71	End Nudge @ 2090.67ft
4,000.00	3,867.34	323.62	-749.93	Hold Angle @ 19.81
6,041.54	5,788.03	597.80	-1,385.29	Begin Drop @ 6041.54ft
6,500.00	6,229.92	645.47	-1,495.74	Drop Rate = 2.00/100ft
7,032.21	6,759.07	665.00	-1,541.00	End Drop @ 7032.21ft
7,132.21	6,859.07	665.00	-1,541.00	Begin Build @ 7132.21ft
7,500.00	7,202.12	779.05	-1,540.45	Build Rate = 10.00/100ft
8,038.15	7,432.00	1,243.89	-1,538.20	End Build @ 8038.15ft
12,378.50	7,387.00	5,583.96	-1,517.24	Total Depth @ 12378.50ft

## Plan Report for Turkey Springs 29N-14HZ - Plan A Rev 0 Permit

### Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
Target	Turkey Springs 29N-14HZ_BHL	344.80	Slot	0.00	0.00	0.00

### Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	12,378.50	Plan A Rev 0 Permit	MWD

### Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
8,038.15	7,432.00	7" Intermediate Casing	7	8-3/4

### Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,568.30	4,402.00	Parkman		0.00	
4,916.94	4,730.00	Sussex		0.00	
7,632.24	7,298.00	Sharon Springs		0.00	
7,758.75	7,368.00	Niobrara A		0.00	
7,836.72	7,399.00	Niobrara B		0.00	
8,038.15	7,432.00	Niobrara B TL - Heel		0.00	
12,378.48	7,387.00	Niobrara B TL - Toe		0.00	

### Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Turkey Springs 29N-14HZ_Dtgt	6,759.07	665.00	-1,541.00	Point
Turkey Springs 29N-14HZ_Dtgt2	6,859.07	665.00	-1,541.00	Point
Turkey Springs 29N-14HZ_Sec22	0.00	0.00	0.00	Polygon
Turkey Springs 29N-14HZ_SB22	0.00	0.00	0.00	Polygon
Turkey Springs 29N-14HZ_SB23	0.00	0.00	0.00	Polygon
Turkey Springs 29N-14HZ_SHL	0.00	0.00	0.00	Point
Turkey Springs 29N-14HZ_BHL	7,387.00	5,583.96	-1,517.24	Point
Turkey Springs 29N-14HZ_Sec23	0.00	0.00	0.00	Polygon

## North Reference Sheet for Sec. 23-T2N-R66W - Turkey Springs 29N-14HZ - Plan A Rev 0

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB=17 @ 5172.00ft (Drilling Rig). Northing and Easting are relative to Turkey Springs 29N-14HZ

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.50°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99995910

Grid Coordinates of Well: 1,290,706.92 ft N, 3,211,702.76 ft E

Geographical Coordinates of Well: 40° 07' 44.05" N, 104° 44' 34.41" W

Grid Convergence at Surface is: 0.49°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,378.50ft  
the Bottom Hole Displacement is 5,786.41ft in the Direction of 344.80° (True).

Magnetic Convergence at surface is: -8.19° (26 November 2012, , BGGM2012)

