

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 23-T2N-R66W

Turkey Springs 3C-14HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

Sperry Drilling Services

Proposal Report

27 November, 2012

Well Coordinates: 1,290,707.55 N, 3,211,732.67 E (40° 07' 44.05" N, 104° 44' 34.03" W)

Ground Level: 5,154.00 ft

Local Coordinate Origin: Centered on Well Turkey Springs 3C-14HZ

Viewing Datum: RKB=17 @ 5171.00ft (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 3C-14HZ
Wellbore: Plan A Rev 0
Design: Plan A Rev 0 Permit

Anadarko Petroleum Corp.

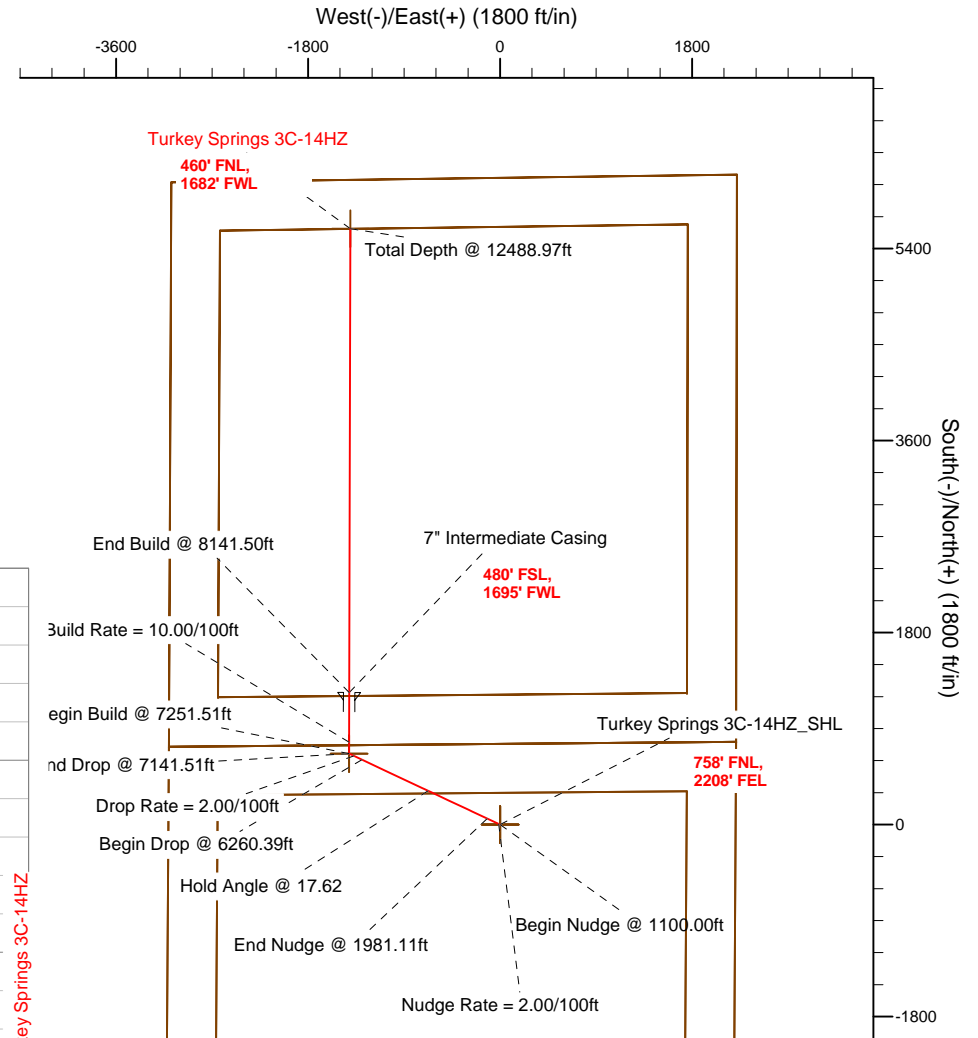
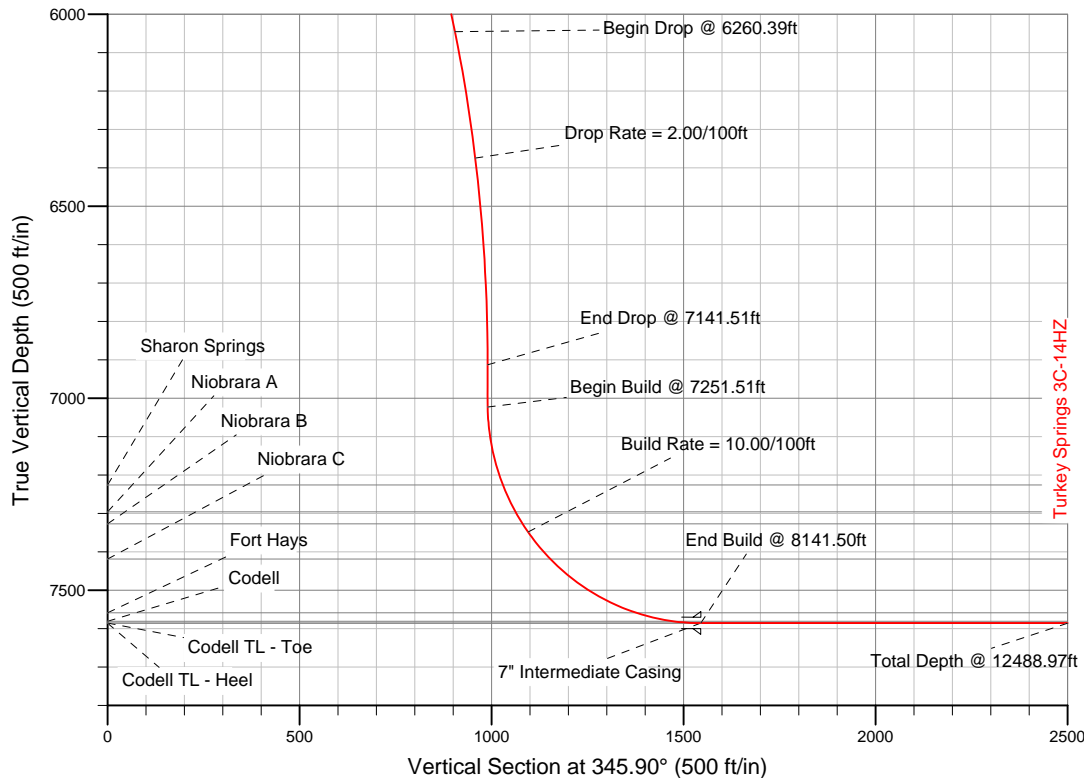
HALLIBURTON
Sperry Drilling

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	1981.11	17.62	295.16	1967.29	57.15	-121.68	2.00	295.16	85.07	
4	6260.39	17.62	295.16	6045.75	607.85	-1294.32	0.00	0.00	904.84	
5	7141.51	0.00	0.00	6913.04	665.00	-1416.00	2.00	180.00	989.91	Turkey Springs 3C-14HZ_DPtgt
6	7241.51	0.00	0.00	7013.04	665.00	-1416.00	0.00	0.00	989.91	Turkey Springs 3C-14HZ_DPtgt2
7	8141.50	90.00	0.15	7586.00	1237.96	-1414.47	10.00	0.15	1545.23	
8	12488.97	90.00	0.15	7586.00	5585.41	-1402.89	0.00	0.00	5758.89	Turkey Springs 3C-14HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Turkey Springs 3C-14HZ_SB22	0.00	0.00	0.00	40.128904	-104.742786	Polygon
Turkey Springs 3C-14HZ_SB23	0.00	0.00	0.00	40.128904	-104.742786	Polygon
Turkey Springs 3C-14HZ_Sec22	0.00	0.00	0.00	40.128904	-104.742786	Polygon
Turkey Springs 3C-14HZ_Sec23	0.00	0.00	0.00	40.128904	-104.742786	Polygon
Turkey Springs 3C-14HZ_SHL	0.00	0.00	0.00	40.128904	-104.742786	Point
Turkey Springs 3C-14HZ_DPtgt	6913.04	665.00	-1416.00	40.130729	-104.747850	Point
Turkey Springs 3C-14HZ_DPtgt2	7013.04	665.00	-1416.00	40.130729	-104.747850	Point
Turkey Springs 3C-14HZ_BHL	7586.00	5585.41	-1402.89	40.144236	-104.747804	Point



WELL DETAILS: Turkey Springs 3C-14HZ

Ground Level: 5154.00 RKB=17 @ 5171.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Turkey Springs 3C-14HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 12/14/2012
Reviewed: _____ Date: _____

Plan Report for Turkey Springs 3C-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
Turkey Springs 3C-14HZ_SB22 - Turkey Springs 3C-14HZ_SB23 - Turkey Springs 3C-14HZ_SHL - Turkey Springs 3C-14HZ_Sec2										
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
Begin Nudge @ 1100.00ft										
1,200.00	2.00	295.16	1,199.98	0.74	-1.58	1.10	2.00	2.00	0.00	295.16
1,300.00	4.00	295.16	1,299.84	2.97	-6.32	4.42	2.00	2.00	0.00	0.00
1,400.00	6.00	295.16	1,399.45	6.67	-14.21	9.93	2.00	2.00	0.00	0.00
Nudge Rate = 2.00/100ft										
1,500.00	8.00	295.16	1,498.70	11.85	-25.24	17.64	2.00	2.00	0.00	0.00
1,600.00	10.00	295.16	1,597.47	18.50	-39.39	27.54	2.00	2.00	0.00	0.00
1,700.00	12.00	295.16	1,695.62	26.61	-56.66	39.61	2.00	2.00	0.00	0.00
1,800.00	14.00	295.16	1,793.06	36.17	-77.03	53.85	2.00	2.00	0.00	0.00
1,900.00	16.00	295.16	1,889.64	47.18	-100.45	70.22	2.00	2.00	0.00	0.00
1,981.11	17.62	295.16	1,967.28	57.15	-121.68	85.07	2.00	2.00	0.00	0.00
End Nudge @ 1981.11ft										
2,000.00	17.62	295.16	1,985.29	59.58	-126.86	88.69	0.00	0.00	0.00	0.00
2,100.00	17.62	295.16	2,080.59	72.45	-154.26	107.84	0.00	0.00	0.00	0.00
2,200.00	17.62	295.16	2,175.90	85.32	-181.67	127.00	0.00	0.00	0.00	0.00
2,300.00	17.62	295.16	2,271.21	98.19	-209.07	146.16	0.00	0.00	0.00	0.00
2,400.00	17.62	295.16	2,366.52	111.05	-236.47	165.31	0.00	0.00	0.00	0.00
2,500.00	17.62	295.16	2,461.82	123.92	-263.87	184.47	0.00	0.00	0.00	0.00
2,600.00	17.62	295.16	2,557.13	136.79	-291.28	203.63	0.00	0.00	0.00	0.00
2,700.00	17.62	295.16	2,652.44	149.66	-318.68	222.78	0.00	0.00	0.00	0.00
2,800.00	17.62	295.16	2,747.75	162.53	-346.08	241.94	0.00	0.00	0.00	0.00
2,900.00	17.62	295.16	2,843.05	175.40	-373.48	261.10	0.00	0.00	0.00	0.00
3,000.00	17.62	295.16	2,938.36	188.27	-400.89	280.25	0.00	0.00	0.00	0.00
3,100.00	17.62	295.16	3,033.67	201.14	-428.29	299.41	0.00	0.00	0.00	0.00
3,200.00	17.62	295.16	3,128.98	214.01	-455.69	318.57	0.00	0.00	0.00	0.00
3,300.00	17.62	295.16	3,224.28	226.88	-483.09	337.73	0.00	0.00	0.00	0.00
3,400.00	17.62	295.16	3,319.59	239.75	-510.50	356.88	0.00	0.00	0.00	0.00
3,500.00	17.62	295.16	3,414.90	252.61	-537.90	376.04	0.00	0.00	0.00	0.00
3,600.00	17.62	295.16	3,510.20	265.48	-565.30	395.20	0.00	0.00	0.00	0.00
3,700.00	17.62	295.16	3,605.51	278.35	-592.70	414.35	0.00	0.00	0.00	0.00
3,800.00	17.62	295.16	3,700.82	291.22	-620.11	433.51	0.00	0.00	0.00	0.00
3,900.00	17.62	295.16	3,796.13	304.09	-647.51	452.67	0.00	0.00	0.00	0.00
4,000.00	17.62	295.16	3,891.43	316.96	-674.91	471.82	0.00	0.00	0.00	0.00
Hold Angle @ 17.62										
4,100.00	17.62	295.16	3,986.74	329.83	-702.31	490.98	0.00	0.00	0.00	0.00
4,200.00	17.62	295.16	4,082.05	342.70	-729.72	510.14	0.00	0.00	0.00	0.00
4,300.00	17.62	295.16	4,177.36	355.57	-757.12	529.29	0.00	0.00	0.00	0.00
4,400.00	17.62	295.16	4,272.66	368.44	-784.52	548.45	0.00	0.00	0.00	0.00
4,460.16	17.62	295.16	4,330.00	376.18	-801.01	559.98	0.00	0.00	0.00	0.00
Parkman										
4,500.00	17.62	295.16	4,367.97	381.31	-811.92	567.61	0.00	0.00	0.00	0.00
4,600.00	17.62	295.16	4,463.28	394.17	-839.33	586.76	0.00	0.00	0.00	0.00
4,700.00	17.62	295.16	4,558.59	407.04	-866.73	605.92	0.00	0.00	0.00	0.00
4,800.00	17.62	295.16	4,653.89	419.91	-894.13	625.08	0.00	0.00	0.00	0.00
4,804.31	17.62	295.16	4,658.00	420.47	-895.31	625.90	0.00	0.00	0.00	0.00

Plan Report for Turkey Springs 3C-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 (°)
Sussex										
4,900.00	17.62	295.16	4,749.20	432.78	-921.53	644.23	0.00	0.00	0.00	0.00
5,000.00	17.62	295.16	4,844.51	445.65	-948.94	663.39	0.00	0.00	0.00	0.00
5,100.00	17.62	295.16	4,939.81	458.52	-976.34	682.55	0.00	0.00	0.00	0.00
5,200.00	17.62	295.16	5,035.12	471.39	-1,003.74	701.71	0.00	0.00	0.00	0.00
5,300.00	17.62	295.16	5,130.43	484.26	-1,031.14	720.86	0.00	0.00	0.00	0.00
5,400.00	17.62	295.16	5,225.74	497.13	-1,058.55	740.02	0.00	0.00	0.00	0.00
5,500.00	17.62	295.16	5,321.04	510.00	-1,085.95	759.18	0.00	0.00	0.00	0.00
5,600.00	17.62	295.16	5,416.35	522.87	-1,113.35	778.33	0.00	0.00	0.00	0.00
5,700.00	17.62	295.16	5,511.66	535.74	-1,140.75	797.49	0.00	0.00	0.00	0.00
5,800.00	17.62	295.16	5,606.97	548.60	-1,168.16	816.65	0.00	0.00	0.00	0.00
5,900.00	17.62	295.16	5,702.27	561.47	-1,195.56	835.80	0.00	0.00	0.00	0.00
6,000.00	17.62	295.16	5,797.58	574.34	-1,222.96	854.96	0.00	0.00	0.00	0.00
6,100.00	17.62	295.16	5,892.89	587.21	-1,250.36	874.12	0.00	0.00	0.00	0.00
6,200.00	17.62	295.16	5,988.20	600.08	-1,277.77	893.27	0.00	0.00	0.00	0.00
6,260.39	17.62	295.16	6,045.75	607.85	-1,294.31	904.84	0.00	0.00	0.00	0.00
Begin Drop @ 6260.39ft										
6,300.00	16.83	295.16	6,083.58	612.84	-1,304.93	912.26	2.00	-2.00	0.00	180.00
6,400.00	14.83	295.16	6,179.79	624.43	-1,329.62	929.53	2.00	-2.00	0.00	180.00
6,500.00	12.83	295.16	6,276.88	634.60	-1,351.26	944.65	2.00	-2.00	0.00	180.00
6,600.00	10.83	295.16	6,374.75	643.31	-1,369.81	957.62	2.00	-2.00	0.00	180.00
Drop Rate = 2.00/100ft										
6,700.00	8.83	295.16	6,473.28	650.57	-1,385.27	968.43	2.00	-2.00	0.00	-180.00
6,800.00	6.83	295.16	6,572.34	656.36	-1,397.60	977.05	2.00	-2.00	0.00	180.00
6,900.00	4.83	295.16	6,671.82	660.68	-1,406.79	983.47	2.00	-2.00	0.00	180.00
7,000.00	2.83	295.16	6,771.59	663.51	-1,412.84	987.70	2.00	-2.00	0.00	180.00
7,100.00	0.83	295.16	6,871.54	664.87	-1,415.73	989.72	2.00	-2.00	0.00	180.00
7,141.51	0.00	295.16	6,913.04	665.00	-1,416.00	989.91	2.00	-2.00	0.00	180.00
End Drop @ 7141.51ft - Turkey Springs 3C-14HZ_DPtgt										
7,200.00	0.00	0.00	6,971.53	665.00	-1,416.00	989.91	0.00	0.00	0.00	180.00
7,241.51	0.00	0.00	7,013.04	665.00	-1,416.00	989.91	0.00	0.00	0.00	0.00
Turkey Springs 3C-14HZ_DPtgt2										
7,251.51	1.00	0.15	7,023.04	665.09	-1,416.00	990.00	10.00	10.00	0.00	0.15
Begin Build @ 7251.51ft										
7,300.00	5.85	0.15	7,071.43	667.98	-1,415.99	992.80	10.00	10.00	0.00	0.00
7,400.00	15.85	0.15	7,169.52	686.78	-1,415.94	1,011.02	10.00	10.00	0.00	0.00
7,459.70	21.82	0.15	7,226.00	706.05	-1,415.89	1,029.70	10.00	10.00	0.00	0.00
Sharon Springs										
7,500.00	25.85	0.15	7,262.85	722.33	-1,415.85	1,045.48	10.00	10.00	0.00	0.00
7,537.45	29.59	0.15	7,296.00	739.75	-1,415.80	1,062.36	10.00	10.00	0.00	0.00
Niobrara A										
7,573.78	33.23	0.15	7,327.00	758.68	-1,415.75	1,080.71	10.00	10.00	0.00	0.00
Niobrara B										
7,600.00	35.85	0.15	7,348.60	773.54	-1,415.71	1,095.11	10.00	10.00	0.00	0.00
Build Rate = 10.00/100ft										
7,692.66	45.12	0.15	7,419.00	833.63	-1,415.55	1,153.36	10.00	10.00	0.00	0.00
Niobrara C										
7,700.00	45.85	0.15	7,424.14	838.87	-1,415.54	1,158.43	10.00	10.00	0.00	0.00
7,800.00	55.85	0.15	7,487.20	916.32	-1,415.33	1,233.49	10.00	10.00	0.00	0.00
7,900.00	65.85	0.15	7,535.85	1,003.54	-1,415.10	1,318.03	10.00	10.00	0.00	0.00
7,964.92	72.34	0.15	7,559.00	1,064.15	-1,414.94	1,376.78	10.00	10.00	0.00	0.00
Fort Hays										
8,000.00	75.85	0.15	7,568.61	1,097.89	-1,414.85	1,409.47	10.00	10.00	0.00	0.00
8,065.77	82.43	0.15	7,581.00	1,162.44	-1,414.68	1,472.05	10.00	10.00	0.00	0.00
Codell										
8,100.00	85.85	0.15	7,584.50	1,196.49	-1,414.58	1,505.04	10.00	10.00	0.00	0.00
8,141.50	90.00	0.15	7,586.00	1,237.95	-1,414.47	1,545.23	10.00	10.00	0.00	0.00
End Build @ 8141.50ft - Codell TL - Heel - 7" Intermediate Casing										

Plan Report for Turkey Springs 3C-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 (°)
8,200.00	90.00	0.15	7,586.00	1,296.45	-1,414.32	1,601.93	0.00	0.00	0.00	0.00
8,300.00	90.00	0.15	7,586.00	1,396.45	-1,414.05	1,698.85	0.00	0.00	0.00	0.00
8,400.00	90.00	0.15	7,586.00	1,496.45	-1,413.79	1,795.77	0.00	0.00	0.00	0.00
8,500.00	90.00	0.15	7,586.00	1,596.45	-1,413.52	1,892.70	0.00	0.00	0.00	0.00
8,600.00	90.00	0.15	7,586.00	1,696.45	-1,413.25	1,989.62	0.00	0.00	0.00	0.00
8,700.00	90.00	0.15	7,586.00	1,796.45	-1,412.99	2,086.54	0.00	0.00	0.00	0.00
8,800.00	90.00	0.15	7,586.00	1,896.45	-1,412.72	2,183.46	0.00	0.00	0.00	0.00
8,900.00	90.00	0.15	7,586.00	1,996.45	-1,412.45	2,280.38	0.00	0.00	0.00	0.00
9,000.00	90.00	0.15	7,586.00	2,096.45	-1,412.19	2,377.31	0.00	0.00	0.00	0.00
9,100.00	90.00	0.15	7,586.00	2,196.45	-1,411.92	2,474.23	0.00	0.00	0.00	0.00
9,200.00	90.00	0.15	7,586.00	2,296.45	-1,411.65	2,571.15	0.00	0.00	0.00	0.00
9,300.00	90.00	0.15	7,586.00	2,396.45	-1,411.39	2,668.07	0.00	0.00	0.00	0.00
9,400.00	90.00	0.15	7,586.00	2,496.45	-1,411.12	2,765.00	0.00	0.00	0.00	0.00
9,500.00	90.00	0.15	7,586.00	2,596.45	-1,410.86	2,861.92	0.00	0.00	0.00	0.00
9,600.00	90.00	0.15	7,586.00	2,696.45	-1,410.59	2,958.84	0.00	0.00	0.00	0.00
9,700.00	90.00	0.15	7,586.00	2,796.45	-1,410.32	3,055.76	0.00	0.00	0.00	0.00
9,800.00	90.00	0.15	7,586.00	2,896.44	-1,410.06	3,152.68	0.00	0.00	0.00	0.00
9,900.00	90.00	0.15	7,586.00	2,996.44	-1,409.79	3,249.61	0.00	0.00	0.00	0.00
10,000.00	90.00	0.15	7,586.00	3,096.44	-1,409.52	3,346.53	0.00	0.00	0.00	0.00
10,100.00	90.00	0.15	7,586.00	3,196.44	-1,409.26	3,443.45	0.00	0.00	0.00	0.00
10,200.00	90.00	0.15	7,586.00	3,296.44	-1,408.99	3,540.37	0.00	0.00	0.00	0.00
10,300.00	90.00	0.15	7,586.00	3,396.44	-1,408.72	3,637.30	0.00	0.00	0.00	0.00
10,400.00	90.00	0.15	7,586.00	3,496.44	-1,408.46	3,734.22	0.00	0.00	0.00	0.00
10,500.00	90.00	0.15	7,586.00	3,596.44	-1,408.19	3,831.14	0.00	0.00	0.00	0.00
10,600.00	90.00	0.15	7,586.00	3,696.44	-1,407.93	3,928.06	0.00	0.00	0.00	0.00
10,700.00	90.00	0.15	7,586.00	3,796.44	-1,407.66	4,024.98	0.00	0.00	0.00	0.00
10,800.00	90.00	0.15	7,586.00	3,896.44	-1,407.39	4,121.91	0.00	0.00	0.00	0.00
10,900.00	90.00	0.15	7,586.00	3,996.44	-1,407.13	4,218.83	0.00	0.00	0.00	0.00
11,000.00	90.00	0.15	7,586.00	4,096.44	-1,406.86	4,315.75	0.00	0.00	0.00	0.00
11,100.00	90.00	0.15	7,586.00	4,196.44	-1,406.59	4,412.67	0.00	0.00	0.00	0.00
11,200.00	90.00	0.15	7,586.00	4,296.44	-1,406.33	4,509.60	0.00	0.00	0.00	0.00
11,300.00	90.00	0.15	7,586.00	4,396.44	-1,406.06	4,606.52	0.00	0.00	0.00	0.00
11,400.00	90.00	0.15	7,586.00	4,496.44	-1,405.80	4,703.44	0.00	0.00	0.00	0.00
11,500.00	90.00	0.15	7,586.00	4,596.44	-1,405.53	4,800.36	0.00	0.00	0.00	0.00
11,600.00	90.00	0.15	7,586.00	4,696.44	-1,405.26	4,897.28	0.00	0.00	0.00	0.00
11,700.00	90.00	0.15	7,586.00	4,796.44	-1,405.00	4,994.21	0.00	0.00	0.00	0.00
11,800.00	90.00	0.15	7,586.00	4,896.44	-1,404.73	5,091.13	0.00	0.00	0.00	0.00
11,900.00	90.00	0.15	7,586.00	4,996.44	-1,404.46	5,188.05	0.00	0.00	0.00	0.00
12,000.00	90.00	0.15	7,586.00	5,096.44	-1,404.20	5,284.97	0.00	0.00	0.00	0.00
12,100.00	90.00	0.15	7,586.00	5,196.44	-1,403.93	5,381.90	0.00	0.00	0.00	0.00
12,200.00	90.00	0.15	7,586.00	5,296.44	-1,403.66	5,478.82	0.00	0.00	0.00	0.00
12,300.00	90.00	0.15	7,586.00	5,396.44	-1,403.40	5,575.74	0.00	0.00	0.00	0.00
12,400.00	90.00	0.15	7,586.00	5,496.44	-1,403.13	5,672.66	0.00	0.00	0.00	0.00
12,488.96	90.00	0.15	7,586.00	5,585.40	-1,402.89	5,758.88	0.00	0.00	0.00	0.00
Codell TL - Toe										
12,488.97	90.00	0.15	7,586.00	5,585.41	-1,402.89	5,758.89	0.00	0.00	0.00	0.00
Turkey Springs 3C-14HZ_BHL										

Plan Report for Turkey Springs 3C-14HZ - Plan A Rev 0 Permit

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
1,400.00	1,399.45	6.67	-14.21	Nudge Rate = 2.00/100ft
1,981.11	1,967.28	57.15	-121.68	End Nudge @ 1981.11ft
4,000.00	3,891.43	316.96	-674.91	Hold Angle @ 17.62
6,260.39	6,045.75	607.85	-1,294.31	Begin Drop @ 6260.39ft
6,600.00	6,374.75	643.31	-1,369.81	Drop Rate = 2.00/100ft
7,141.51	6,913.04	665.00	-1,416.00	End Drop @ 7141.51ft
7,251.51	7,023.04	665.09	-1,416.00	Begin Build @ 7251.51ft
7,600.00	7,348.60	773.54	-1,415.71	Build Rate = 10.00/100ft
8,141.50	7,586.00	1,237.95	-1,414.47	End Build @ 8141.50ft
12,488.97	7,586.00	5,585.41	-1,402.89	Total Depth @ 12488.97ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Turkey Springs 3C-14HZ_BHL	345.90	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	12,488.97	Plan A Rev 0 Permit	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
8,141.50	7,586.00	7" Intermediate Casing	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,460.16	4,330.00	Parkman		0.00	
4,804.31	4,658.00	Sussex		0.00	
7,459.70	7,226.00	Sharon Springs		0.00	
7,537.45	7,296.00	Niobrara A		0.00	
7,573.78	7,327.00	Niobrara B		0.00	
7,692.66	7,419.00	Niobrara C		0.00	
7,964.92	7,559.00	Fort Hays		0.00	
8,065.77	7,581.00	Codell		0.00	
8,141.50	7,586.00	Codell TL - Heel		0.00	
12,488.96	7,586.00	Codell TL - Toe		0.00	

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Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Turkey Springs 3C-14HZ_SB22	0.00	0.00	0.00	Polygon
Turkey Springs 3C-14HZ_SB23	0.00	0.00	0.00	Polygon
Turkey Springs 3C-14HZ_Sec22	0.00	0.00	0.00	Polygon
Turkey Springs 3C-14HZ_DPtgt	6,913.04	665.00	-1,416.00	Point
Turkey Springs 3C-14HZ_DPtgt2	7,013.04	665.00	-1,416.00	Point
Turkey Springs 3C-14HZ_BHL	7,586.00	5,585.41	-1,402.89	Point
Turkey Springs 3C-14HZ_SHL	0.00	0.00	0.00	Point
Turkey Springs 3C-14HZ_Sec23	0.00	0.00	0.00	Polygon

North Reference Sheet for Sec. 23-T2N-R66W - Turkey Springs 3C-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 @ 5171.00ft (Drilling Rig). Northing and Easting are relative to Turkey Springs 3C-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: 1,290,707.55 ft N, 3,211,732.67 ft E
Geographical Coordinates of Well: 40° 07' 44.05" N, 104° 44' 34.03" W
Grid Convergence at Surface is: 0.49°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,488.97ft
the Bottom Hole Displacement is 5,758.89ft in the Direction of 345.90° (True).

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

