

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 31-T1N-R67W

Sack 15C-6HZ

Plan A

Plan: Rev A0 Permit

Sperry Drilling Services

Proposal Report

27 December, 2013

Well Coordinates: 1,244,313.66 N, 3,159,502.42 E (40° 00' 09.44" N, 104° 55' 50.29" W)

Ground Level: 5,041.00 usft

Local Coordinate Origin:

Centered on Well Sack 15C-6HZ

Viewing Datum:

GL+RKB=17' @ 5058.00usft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

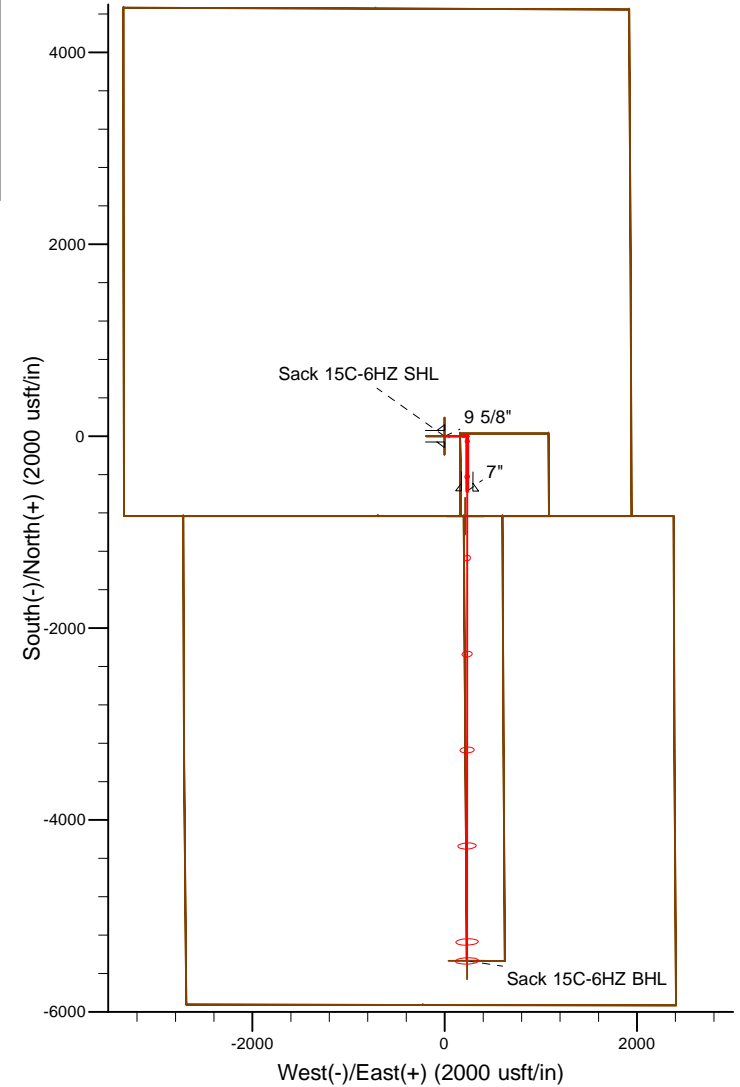
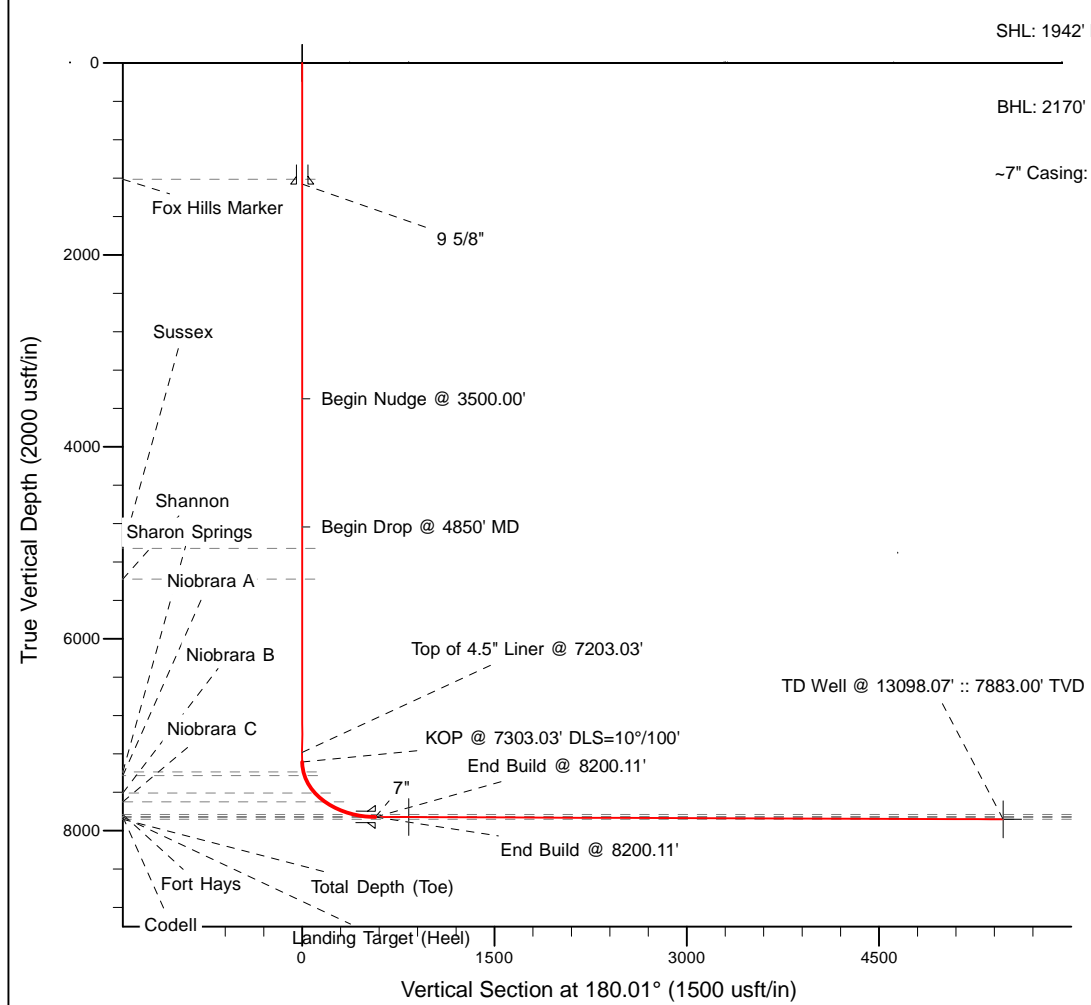
Project: Weld County, CO (NAD 83)
 Site: Sec. 31-T1N-R67W
 Well: Sack 15C-6HZ
 Wellbore: Plan A
 Design: Rev A0 Permit

Anadarko Petroleum Corp.



Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Sack 15C-6HZ LD	0.00	0.00	0.00	1244313.66	3159502.42	40.002621	-104.930635
Sack 15C-6HZ Sec. Line 31-6	0.00	0.00	0.00	1244313.66	3159502.42	40.002621	-104.930635
Sack 15C-6HZ SHL	0.00	0.00	0.00	1244313.66	3159502.42	40.002621	-104.930635
Sack 15C-6HZ Heel	7858.00	-832.02	213.48	1243483.05	3159721.24	40.000337	-104.929873
Sack 15C-6HZ BHL	7883.00	-5467.93	233.42	1238847.53	3159770.94	39.987611	-104.929802

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3500.00	0.00	0.00	3500.00	0.00	0.00	0.00	0.00
4000.00	10.00	90.00	3997.47	0.00	43.52	2.00	-0.01
4850.00	10.00	90.00	4834.55	0.00	191.12	0.00	-0.03
5350.00	0.00	0.00	5332.02	0.00	234.65	2.00	-0.04
7303.03	0.00	0.00	7285.05	0.00	234.65	0.00	-0.04
8200.11	89.71	180.01	7858.00	-570.03	234.52	10.00	569.99
13098.07	89.71	180.01	7883.00	-5467.93	233.42	0.00	5467.89



WELL DETAILS: Sack 15C-6HZ	
Ground Level:	5041.00
GL+RKB=17' @ 5058.00usft (Drilling Rig)	
Plan: Rev A0 Permit (Sack 15C-6HZ/Plan A)	
Created By: Pari Amanlou	Date: 12-23-2013

Plan Report for Sack 15C-6HZ - Rev A0 Permit

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)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,213.00	0.00	0.00	1,213.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Marker										
1,263.00	0.00	0.00	1,263.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 3500.00'										
3,600.00	2.00	90.00	3,599.98	0.00	1.75	0.00	2.00	2.00	0.00	90.00
3,700.00	4.00	90.00	3,699.84	0.00	6.98	0.00	2.00	2.00	0.00	0.00
3,800.00	6.00	90.00	3,799.45	0.00	15.69	0.00	2.00	2.00	0.00	0.00
3,900.00	8.00	90.00	3,898.70	0.00	27.88	0.00	2.00	2.00	0.00	0.00
4,000.00	10.00	90.00	3,997.47	0.00	43.52	-0.01	2.00	2.00	0.00	0.00
4,100.00	10.00	90.00	4,095.95	0.00	60.89	-0.01	0.00	0.00	0.00	0.00
4,200.00	10.00	90.00	4,194.43	0.00	78.25	-0.01	0.00	0.00	0.00	0.00
4,300.00	10.00	90.00	4,292.91	0.00	95.62	-0.02	0.00	0.00	0.00	0.00
4,400.00	10.00	90.00	4,391.39	0.00	112.98	-0.02	0.00	0.00	0.00	0.00
4,500.00	10.00	90.00	4,489.87	0.00	130.35	-0.02	0.00	0.00	0.00	0.00
4,600.00	10.00	90.00	4,588.35	0.00	147.71	-0.03	0.00	0.00	0.00	0.00
4,700.00	10.00	90.00	4,686.83	0.00	165.08	-0.03	0.00	0.00	0.00	0.00
4,800.00	10.00	90.00	4,785.31	0.00	182.44	-0.03	0.00	0.00	0.00	0.00
4,850.00	10.00	90.00	4,834.55	0.00	191.12	-0.03	0.00	0.00	0.00	0.00
Begin Drop @ 4850' MD										
4,900.00	9.00	90.00	4,883.87	0.00	199.38	-0.03	2.00	-2.00	0.00	180.00
5,000.00	7.00	90.00	4,982.89	0.00	213.29	-0.04	2.00	-2.00	0.00	180.00

Plan Report for Sack 15C-6HZ - Rev A0 Permit

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)	Tooface Azimuth (°)
5,075.56	5.49	90.00	5,058.00	0.00	221.51	-0.04	2.00	-2.00	0.00	180.00
Sussex										
5,100.00	5.00	90.00	5,082.33	0.00	223.74	-0.04	2.00	-2.00	0.00	180.00
5,200.00	3.00	90.00	5,182.09	0.00	230.72	-0.04	2.00	-2.00	0.00	180.00
5,300.00	1.00	90.00	5,282.02	0.00	234.21	-0.04	2.00	-2.00	0.00	180.00
5,350.00	0.00	0.00	5,332.02	0.00	234.65	-0.04	2.00	-2.00	0.00	-180.00
5,396.98	0.00	0.00	5,379.00	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
Shannon										
5,400.00	0.00	0.00	5,382.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,482.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,582.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,682.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,782.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,882.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	5,982.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,082.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,182.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,282.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,382.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,482.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,582.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,682.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,782.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,882.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,982.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,082.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,182.02	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
7,203.03	0.00	0.00	7,185.05	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 7203.03'										
7,303.03	0.00	0.00	7,285.05	0.00	234.65	-0.04	0.00	0.00	0.00	0.00
KOP @ 7303.03' DLS=10°/100'										
7,350.00	4.70	180.01	7,331.96	-1.92	234.65	1.88	10.00	10.00	0.00	180.01
7,400.00	9.70	180.01	7,381.56	-8.19	234.64	8.14	10.00	10.00	0.00	0.00
7,406.54	10.35	180.01	7,388.00	-9.32	234.64	9.28	10.00	10.00	0.00	0.00
Sharon Springs										
7,445.44	14.24	180.01	7,426.00	-17.61	234.64	17.57	10.00	10.00	0.00	0.00
Niobrara A										
7,450.00	14.70	180.01	7,430.41	-18.75	234.64	18.70	10.00	10.00	0.00	0.00
7,500.00	19.70	180.01	7,478.16	-33.52	234.64	33.48	10.00	10.00	0.00	0.00
7,550.00	24.70	180.01	7,524.44	-52.41	234.63	52.37	10.00	10.00	0.00	0.00
7,600.00	29.70	180.01	7,568.90	-75.25	234.63	75.21	10.00	10.00	0.00	0.00
7,646.12	34.31	180.01	7,608.00	-99.69	234.62	99.65	10.00	10.00	0.00	0.00
Niobrara B										
7,650.00	34.70	180.01	7,611.20	-101.89	234.62	101.84	10.00	10.00	0.00	0.00
7,700.00	39.70	180.01	7,651.01	-132.10	234.62	132.06	10.00	10.00	0.00	0.00
7,750.00	44.70	180.01	7,688.04	-165.68	234.61	165.64	10.00	10.00	0.00	0.00
7,768.53	46.55	180.01	7,701.00	-178.92	234.61	178.88	10.00	10.00	0.00	0.00
Niobrara C										
7,800.00	49.70	180.01	7,722.01	-202.35	234.60	202.31	10.00	10.00	0.00	0.00
7,850.00	54.70	180.01	7,752.64	-241.84	234.59	241.80	10.00	10.00	0.00	0.00
7,900.00	59.70	180.01	7,779.72	-283.86	234.58	283.82	10.00	10.00	0.00	0.00
7,950.00	64.70	180.01	7,803.04	-328.07	234.57	328.03	10.00	10.00	0.00	0.00
8,000.00	69.70	180.01	7,822.41	-374.15	234.56	374.11	10.00	10.00	0.00	0.00
8,033.13	73.01	180.01	7,833.00	-405.53	234.56	405.49	10.00	10.00	0.00	0.00
Fort Hays										
8,050.00	74.70	180.01	7,837.69	-421.74	234.55	421.70	10.00	10.00	0.00	0.00
8,100.00	79.70	180.01	7,848.77	-470.48	234.54	470.44	10.00	10.00	0.00	0.00
8,150.00	84.70	180.01	7,855.56	-520.00	234.53	519.96	10.00	10.00	0.00	0.00

Plan Report for Sack 15C-6HZ - Rev A0 Permit

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)	Toolface Azimuth (°)
8,155.05	85.20	180.01	7,856.00	-525.03	234.53	524.99	10.00	10.00	0.00	0.00
Codell										
8,200.04	89.70	180.01	7,858.00	-569.97	234.52	569.93	10.00	10.00	0.00	0.00
Landing Target (Heel)										
8,200.11	89.71	180.01	7,858.00	-570.04	234.52	569.99	9.73	9.73	0.00	0.00
End Build @ 8200.11' - 7"										
8,300.00	89.71	180.01	7,858.51	-669.92	234.50	669.88	0.00	0.00	0.00	0.00
8,400.00	89.71	180.01	7,859.02	-769.92	234.47	769.88	0.00	0.00	0.00	0.00
8,500.00	89.71	180.01	7,859.53	-869.92	234.45	869.88	0.00	0.00	0.00	0.00
8,600.00	89.71	180.01	7,860.04	-969.92	234.43	969.88	0.00	0.00	0.00	0.00
8,700.00	89.71	180.01	7,860.55	-1,069.92	234.41	1,069.88	0.00	0.00	0.00	0.00
8,800.00	89.71	180.01	7,861.06	-1,169.92	234.38	1,169.88	0.00	0.00	0.00	0.00
8,900.00	89.71	180.01	7,861.57	-1,269.92	234.36	1,269.88	0.00	0.00	0.00	0.00
9,000.00	89.71	180.01	7,862.08	-1,369.91	234.34	1,369.87	0.00	0.00	0.00	0.00
9,100.00	89.71	180.01	7,862.59	-1,469.91	234.32	1,469.87	0.00	0.00	0.00	0.00
9,200.00	89.71	180.01	7,863.10	-1,569.91	234.29	1,569.87	0.00	0.00	0.00	0.00
9,300.00	89.71	180.01	7,863.61	-1,669.91	234.27	1,669.87	0.00	0.00	0.00	0.00
9,400.00	89.71	180.01	7,864.12	-1,769.91	234.25	1,769.87	0.00	0.00	0.00	0.00
9,500.00	89.71	180.01	7,864.64	-1,869.91	234.23	1,869.87	0.00	0.00	0.00	0.00
9,600.00	89.71	180.01	7,865.15	-1,969.91	234.20	1,969.87	0.00	0.00	0.00	0.00
9,700.00	89.71	180.01	7,865.66	-2,069.91	234.18	2,069.86	0.00	0.00	0.00	0.00
9,800.00	89.71	180.01	7,866.17	-2,169.90	234.16	2,169.86	0.00	0.00	0.00	0.00
9,900.00	89.71	180.01	7,866.68	-2,269.90	234.14	2,269.86	0.00	0.00	0.00	0.00
10,000.00	89.71	180.01	7,867.19	-2,369.90	234.11	2,369.86	0.00	0.00	0.00	0.00
10,100.00	89.71	180.01	7,867.70	-2,469.90	234.09	2,469.86	0.00	0.00	0.00	0.00
10,200.00	89.71	180.01	7,868.21	-2,569.90	234.07	2,569.86	0.00	0.00	0.00	0.00
10,300.00	89.71	180.01	7,868.72	-2,669.90	234.05	2,669.86	0.00	0.00	0.00	0.00
10,400.00	89.71	180.01	7,869.23	-2,769.90	234.02	2,769.86	0.00	0.00	0.00	0.00
10,500.00	89.71	180.01	7,869.74	-2,869.90	234.00	2,869.85	0.00	0.00	0.00	0.00
10,600.00	89.71	180.01	7,870.25	-2,969.89	233.98	2,969.85	0.00	0.00	0.00	0.00
10,700.00	89.71	180.01	7,870.76	-3,069.89	233.96	3,069.85	0.00	0.00	0.00	0.00
10,800.00	89.71	180.01	7,871.27	-3,169.89	233.93	3,169.85	0.00	0.00	0.00	0.00
10,900.00	89.71	180.01	7,871.78	-3,269.89	233.91	3,269.85	0.00	0.00	0.00	0.00
11,000.00	89.71	180.01	7,872.29	-3,369.89	233.89	3,369.85	0.00	0.00	0.00	0.00
11,100.00	89.71	180.01	7,872.80	-3,469.89	233.87	3,469.85	0.00	0.00	0.00	0.00
11,200.00	89.71	180.01	7,873.31	-3,569.89	233.84	3,569.85	0.00	0.00	0.00	0.00
11,300.00	89.71	180.01	7,873.82	-3,669.88	233.82	3,669.84	0.00	0.00	0.00	0.00
11,400.00	89.71	180.01	7,874.33	-3,769.88	233.80	3,769.84	0.00	0.00	0.00	0.00
11,500.00	89.71	180.01	7,874.84	-3,869.88	233.78	3,869.84	0.00	0.00	0.00	0.00
11,600.00	89.71	180.01	7,875.35	-3,969.88	233.75	3,969.84	0.00	0.00	0.00	0.00
11,700.00	89.71	180.01	7,875.86	-4,069.88	233.73	4,069.84	0.00	0.00	0.00	0.00
11,800.00	89.71	180.01	7,876.37	-4,169.88	233.71	4,169.84	0.00	0.00	0.00	0.00
11,900.00	89.71	180.01	7,876.88	-4,269.88	233.69	4,269.84	0.00	0.00	0.00	0.00
12,000.00	89.71	180.01	7,877.40	-4,369.88	233.66	4,369.83	0.00	0.00	0.00	0.00
12,100.00	89.71	180.01	7,877.91	-4,469.87	233.64	4,469.83	0.00	0.00	0.00	0.00
12,200.00	89.71	180.01	7,878.42	-4,569.87	233.62	4,569.83	0.00	0.00	0.00	0.00
12,300.00	89.71	180.01	7,878.93	-4,669.87	233.60	4,669.83	0.00	0.00	0.00	0.00
12,400.00	89.71	180.01	7,879.44	-4,769.87	233.57	4,769.83	0.00	0.00	0.00	0.00
12,500.00	89.71	180.01	7,879.95	-4,869.87	233.55	4,869.83	0.00	0.00	0.00	0.00
12,600.00	89.71	180.01	7,880.46	-4,969.87	233.53	4,969.83	0.00	0.00	0.00	0.00
12,700.00	89.71	180.01	7,880.97	-5,069.87	233.51	5,069.83	0.00	0.00	0.00	0.00
12,800.00	89.71	180.01	7,881.48	-5,169.87	233.49	5,169.82	0.00	0.00	0.00	0.00
12,900.00	89.71	180.01	7,881.99	-5,269.86	233.46	5,269.82	0.00	0.00	0.00	0.00
13,000.00	89.71	180.01	7,882.50	-5,369.86	233.44	5,369.82	0.00	0.00	0.00	0.00
13,098.07	89.71	180.01	7,883.00	-5,467.93	233.42	5,467.89	0.00	0.00	0.00	0.00
TD Well @ 13098.07' :: 7883.00' TVD - Total Depth (Toe)										

Plan Report for Sack 15C-6HZ - Rev A0 Permit**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,500.00	3,500.00	0.00	0.00	Begin Nudge @ 3500.00'
4,850.00	4,834.55	0.00	191.12	Begin Drop @ 4850' MD
7,203.03	7,185.05	0.00	234.65	Top of 4.5" Liner @ 7203.03'
7,303.03	7,285.05	0.00	234.65	KOP @ 7303.03' DLS=10"/100'
8,200.11	7,858.00	-570.04	234.52	End Build @ 8200.11'
13,098.07	7,883.00	-5,467.93	233.42	TD Well @ 13098.07' :: 7883.00' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	180.01	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	1,263.00	Rev A0 Permit	MWD
1,263.00	8,200.11	Rev A0 Permit	MWD
8,200.11	13,098.06	Rev A0 Permit	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,263.00	1,263.00	9 5/8"	9-5/8	12-3/4
8,200.11	7,858.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,213.00	1,213.00	Fox Hills Marker			
5,075.56	5,058.00	Sussex			
5,396.98	5,379.00	Shannon			
7,406.54	7,388.00	Sharon Springs			
7,445.44	7,426.00	Niobrara A			
7,646.12	7,608.00	Niobrara B			
7,768.53	7,701.00	Niobrara C			
8,033.13	7,833.00	Fort Hays			
8,155.05	7,856.00	Codell			
8,200.04	7,858.00	Landing Target (Heel)			
13,098.07	7,883.00	Total Depth (Toe)			



Plan Report for Sack 15C-6HZ - Rev A0 Permit

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Sack 15C-6HZ LD	0.00	0.00	0.00	Polygon
Sack 15C-6HZ SHL	0.00	0.00	0.00	Polygon
Sack 15C-6HZ Sec. Line 31-6	0.00	0.00	0.00	Polygon
Sack 15C-6HZ Heel	7,858.00	-832.02	213.48	Point
Sack 15C-6HZ BHL	7,883.00	-5,467.93	233.42	Point

Directional Difficulty Index

Average Dogleg over Survey:	0.84 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 8,200.11 usft
Net Tortosity applicable to Plans:	0.84 °/100usft	Directional Difficulty Index:	6.196

Audit Info

North Reference Sheet for Sec. 31-T1N-R67W - Sack 15C-6HZ - Plan A

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference .
Vertical Depths are relative to GL+RKB=17' @ 5058.00usft (Drilling Rig). Northing and Easting are relative to Sack 15C-6HZ
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: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996617

Grid Coordinates of Well: 1,244,313.66 usft N, 3,159,502.42 usft E
Geographical Coordinates of Well: 40° 00' 09.44" N, 104° 55' 50.29" W
Grid Convergence at Surface is: 0.37°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,098.07usft
the Bottom Hole Displacement is 5,472.91usft in the Direction of 177.56° (True).

Magnetic Convergence at surface is: -8.25° (19 December 2013, , BGGM2013)

Magnetic Model: BGGM2013
Date: 19-Dec-13
Declination: 8.62°
Inclination/Dip: 66.61°
Field Strength: 52561

Grid North is 0.37° East of True North (Grid Convergence)
Magnetic North is 8.62° East of True North (Magnetic Declination)
Magnetic North is 8.25° East of Grid North (Magnetic Convergence)

To convert a True Direction to a Grid Direction, Subtract 0.37°
To convert a Magnetic Direction to a True Direction, Add 8.62° East
To convert a Magnetic Direction to a Grid Direction, Add 8.25°