

# US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

5N-R68W-12 Encore 41N-12HZ Pad

ENCORE 8C-12HZ

Plan A

Plan: Permit Rev-1

## Sperry Drilling Services Proposal Report

15 December, 2014

Well Coordinates: 14,679,779.21 N, 1,650,690.25 E (40° 25' 12.98" N, 104° 57' 47.12" W)

Ground Level: 4,990.00 usft

Local Coordinate Origin:

Centered on Well ENCORE 8C-12HZ

Viewing Datum:

RKB = 17' @ 5007.00usft (D Rig)

TVDs to System:

N

North Reference:

True

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Version: 5000.1 Build: 70

**HALLIBURTON**

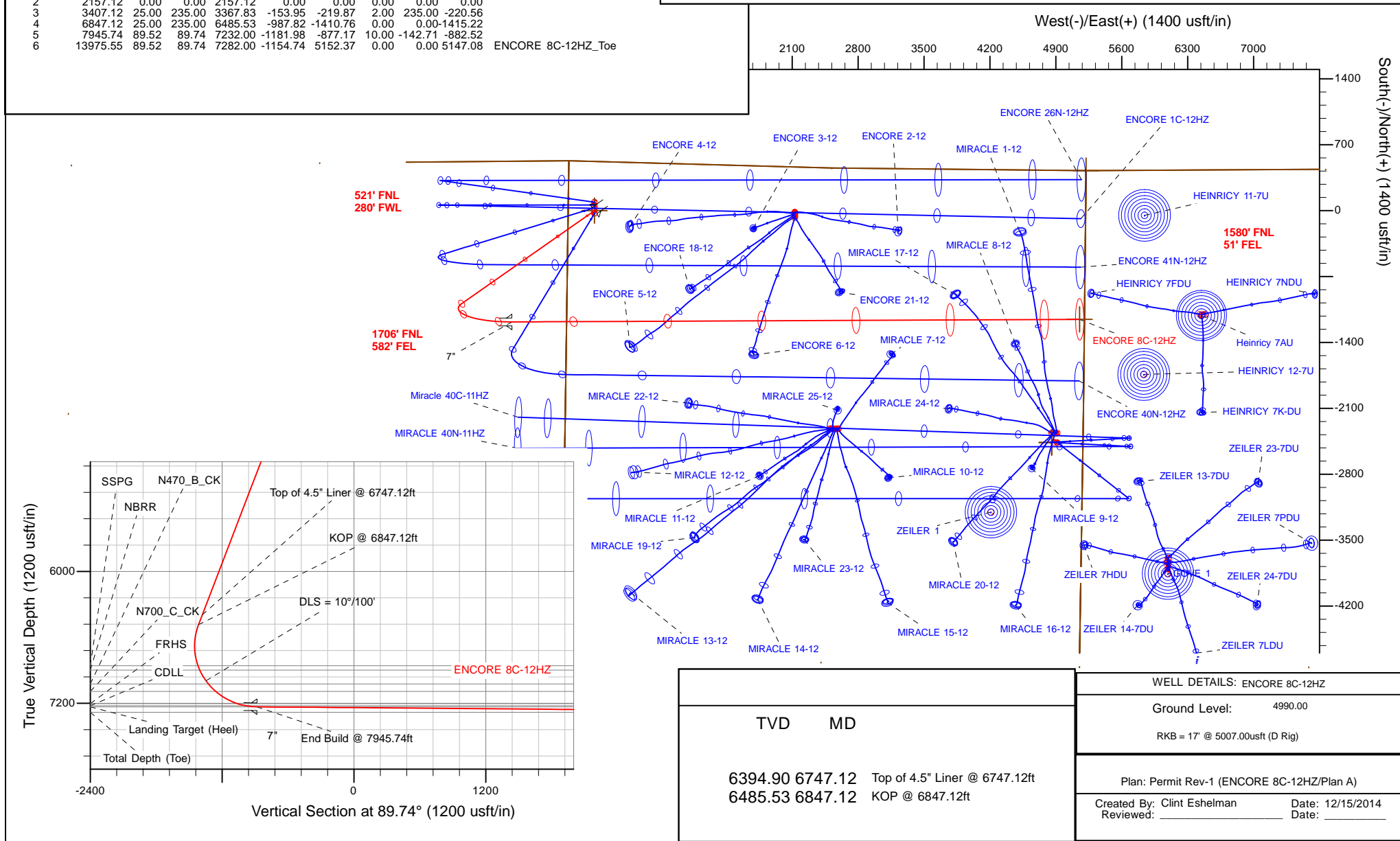
Project: WELD-NAD83-UTMFT13N  
Site: 5N-R68W-12 Encore 41N-12HZ Pad  
Well: ENCORE 8C-12HZ  
Wellbore: Plan A  
Design: Permit Rev-1

# US ROCKIES WATTENBERG PLANNING



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	2157.12	0.00	0.00	2157.12	0.00	0.00	0.00	0.00	0.00	
3	3407.12	25.00	235.00	3367.83	-153.95	-219.87	2.00	235.00	-220.56	
4	6847.12	25.00	235.00	6485.53	-987.82	-1410.76	0.00	0.00	-1415.22	
5	7945.74	89.52	89.74	7232.00	-1181.98	-877.17	10.00	-142.71	-882.52	
6	13975.55	89.52	89.74	7282.00	-1154.74	5152.37	0.00	0.00	5147.08	ENCORE 8C-12HZ_Toe

WELLBORE TARGET DETAILS (LAT/LONG)						
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	
ENCORE 8C-12HZ_SHL	0.00	0.00	0.00	40.420272	-104.963088	
5N-R67W-Sec. 7_Section Lines	42.00	424.19	5220.88	40.421435	-104.943330	Polygon
5N-R68W-Sec. 11_Section Lines	42.00	-2462.02	4854.50	40.413510	-104.945648	Polygon
5N-R68W-Sec. 12_Section Lines	42.00	-2462.02	4854.50	40.413510	-104.945648	Polygon
ENCORE 8C-12HZ_Toe	7282.00	-1154.74	5152.37	40.417100	-104.944577	Polygon



## Plan Report for ENCORE 8C-12HZ - Permit Rev-1

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
<b>ENCORE 8C-12HZ_SHL</b>										
42.00	0.00	0.00	42.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>5N-R68W-Sec. 12_Section Lines - 5N-R67W-Sec. 7_Section Lines - 5N-R68W-Sec. 11_Section Lines</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
287.00	0.00	0.00	287.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Base Fox Hills</b>										
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
746.00	0.00	0.00	746.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Surface Csg Setting Depth - 9 5/8"</b>										
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
1,300.00	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
2,157.12	0.00	0.00	2,157.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 2157.12ft</b>										
2,200.00	0.86	235.00	2,200.00	-0.18	-0.26	-0.26	2.00	2.00	0.00	235.00
2,300.00	2.86	235.00	2,299.94	-2.04	-2.92	-2.93	2.00	2.00	0.00	0.00
2,400.00	4.86	235.00	2,399.71	-5.90	-8.43	-8.46	2.00	2.00	0.00	0.00
2,500.00	6.86	235.00	2,499.18	-11.76	-16.79	-16.84	2.00	2.00	0.00	0.00
2,600.00	8.86	235.00	2,598.24	-19.60	-27.99	-28.08	2.00	2.00	0.00	0.00
2,700.00	10.86	235.00	2,696.76	-29.42	-42.01	-42.14	2.00	2.00	0.00	0.00
2,800.00	12.86	235.00	2,794.62	-41.20	-58.84	-59.03	2.00	2.00	0.00	0.00
2,900.00	14.86	235.00	2,891.70	-54.94	-78.46	-78.71	2.00	2.00	0.00	0.00
3,000.00	16.86	235.00	2,987.89	-70.61	-100.84	-101.16	2.00	2.00	0.00	0.00
3,100.00	18.86	235.00	3,083.07	-88.20	-125.96	-126.36	2.00	2.00	0.00	0.00
3,200.00	20.86	235.00	3,177.12	-107.68	-153.78	-154.27	2.00	2.00	0.00	0.00
3,300.00	22.86	235.00	3,269.92	-129.03	-184.28	-184.86	2.00	2.00	0.00	0.00
3,400.00	24.86	235.00	3,361.38	-152.23	-217.41	-218.10	2.00	2.00	0.00	0.00
3,407.12	25.00	235.00	3,367.83	-153.95	-219.87	-220.56	2.00	2.00	0.00	0.00
<b>End Nudge @ 3407.12ft</b>										
3,500.00	25.00	235.00	3,452.01	-176.47	-252.02	-252.82	0.00	0.00	0.00	0.00
3,525.37	25.00	235.00	3,475.00	-182.62	-260.80	-261.63	0.00	0.00	0.00	0.00
<b>Parkman</b>										
3,600.00	25.00	235.00	3,542.64	-200.71	-286.64	-287.55	0.00	0.00	0.00	0.00
3,700.00	25.00	235.00	3,633.27	-224.95	-321.26	-322.28	0.00	0.00	0.00	0.00
3,800.00	25.00	235.00	3,723.90	-249.19	-355.88	-357.01	0.00	0.00	0.00	0.00
3,900.00	25.00	235.00	3,814.53	-273.43	-390.50	-391.73	0.00	0.00	0.00	0.00
4,000.00	25.00	235.00	3,905.16	-297.67	-425.12	-426.46	0.00	0.00	0.00	0.00
4,100.00	25.00	235.00	3,995.79	-321.91	-459.73	-461.19	0.00	0.00	0.00	0.00
4,200.00	25.00	235.00	4,086.43	-346.15	-494.35	-495.92	0.00	0.00	0.00	0.00
4,300.00	25.00	235.00	4,177.06	-370.39	-528.97	-530.65	0.00	0.00	0.00	0.00

## Plan Report for ENCORE 8C-12HZ - Permit Rev-1

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 (°)
4,400.00	25.00	235.00	4,267.69	-394.63	-563.59	-565.38	0.00	0.00	0.00	0.00
4,500.00	25.00	235.00	4,358.32	-418.87	-598.21	-600.10	0.00	0.00	0.00	0.00
4,600.00	25.00	235.00	4,448.95	-443.11	-632.83	-634.83	0.00	0.00	0.00	0.00
4,700.00	25.00	235.00	4,539.58	-467.35	-667.45	-669.56	0.00	0.00	0.00	0.00
4,719.22	25.00	235.00	4,557.00	-472.01	-674.10	-676.24	0.00	0.00	0.00	0.00
<b>Sussex</b>										
4,800.00	25.00	235.00	4,630.21	-491.59	-702.07	-704.29	0.00	0.00	0.00	0.00
4,900.00	25.00	235.00	4,720.84	-515.83	-736.69	-739.02	0.00	0.00	0.00	0.00
5,000.00	25.00	235.00	4,811.47	-540.07	-771.30	-773.75	0.00	0.00	0.00	0.00
5,100.00	25.00	235.00	4,902.10	-564.31	-805.92	-808.48	0.00	0.00	0.00	0.00
5,200.00	25.00	235.00	4,992.73	-588.55	-840.54	-843.20	0.00	0.00	0.00	0.00
5,300.00	25.00	235.00	5,083.36	-612.79	-875.16	-877.93	0.00	0.00	0.00	0.00
5,400.00	25.00	235.00	5,173.99	-637.03	-909.78	-912.66	0.00	0.00	0.00	0.00
5,500.00	25.00	235.00	5,264.63	-661.27	-944.40	-947.39	0.00	0.00	0.00	0.00
5,600.00	25.00	235.00	5,355.26	-685.52	-979.02	-982.12	0.00	0.00	0.00	0.00
5,700.00	25.00	235.00	5,445.89	-709.76	-1,013.64	-1,016.85	0.00	0.00	0.00	0.00
5,800.00	25.00	235.00	5,536.52	-734.00	-1,048.26	-1,051.58	0.00	0.00	0.00	0.00
5,900.00	25.00	235.00	5,627.15	-758.24	-1,082.87	-1,086.30	0.00	0.00	0.00	0.00
6,000.00	25.00	235.00	5,717.78	-782.48	-1,117.49	-1,121.03	0.00	0.00	0.00	0.00
6,100.00	25.00	235.00	5,808.41	-806.72	-1,152.11	-1,155.76	0.00	0.00	0.00	0.00
6,200.00	25.00	235.00	5,899.04	-830.96	-1,186.73	-1,190.49	0.00	0.00	0.00	0.00
6,300.00	25.00	235.00	5,989.67	-855.20	-1,221.35	-1,225.22	0.00	0.00	0.00	0.00
6,400.00	25.00	235.00	6,080.30	-879.44	-1,255.97	-1,259.95	0.00	0.00	0.00	0.00
6,500.00	25.00	235.00	6,170.93	-903.68	-1,290.59	-1,294.67	0.00	0.00	0.00	0.00
6,600.00	25.00	235.00	6,261.56	-927.92	-1,325.21	-1,329.40	0.00	0.00	0.00	0.00
6,700.00	25.00	235.00	6,352.19	-952.16	-1,359.82	-1,364.13	0.00	0.00	0.00	0.00
6,747.12	25.00	235.00	6,394.90	-963.58	-1,376.14	-1,380.50	0.00	0.00	0.00	0.00
<b>Top of 4.5" Liner @ 6747.12ft</b>										
6,800.00	25.00	235.00	6,442.83	-976.40	-1,394.44	-1,398.86	0.00	0.00	0.00	0.00
6,847.12	25.00	235.00	6,485.53	-987.82	-1,410.76	-1,415.22	0.00	0.00	0.00	0.00
<b>KOP @ 6847.12ft</b>										
6,900.00	21.02	226.05	6,534.21	-1,000.82	-1,426.75	-1,431.28	10.00	-7.52	-16.93	-142.71
7,000.00	15.66	198.71	6,629.27	-1,026.12	-1,444.03	-1,448.68	10.00	-5.36	-27.34	-134.46
7,100.00	15.62	160.98	6,725.81	-1,051.69	-1,443.98	-1,448.73	10.00	-0.04	-37.73	-108.43
7,200.00	20.93	133.45	6,820.90	-1,076.77	-1,426.58	-1,431.45	10.00	5.31	-27.54	-72.01
7,240.12	23.90	126.33	6,858.00	-1,086.52	-1,414.82	-1,419.74	10.00	7.39	-17.73	-45.79
<b>SSPG</b>										
7,284.51	27.47	120.25	6,898.00	-1,097.00	-1,398.73	-1,403.69	10.00	8.05	-13.72	-39.21
<b>NBRR</b>										
7,300.00	28.77	118.46	6,911.66	-1,100.58	-1,392.36	-1,397.34	10.00	8.39	-11.53	-33.72
7,400.00	37.58	109.75	6,995.33	-1,122.41	-1,342.38	-1,347.46	10.00	8.81	-8.71	-32.14
<b>DLS = 10°/100'</b>										
7,437.04	40.97	107.38	7,024.00	-1,129.85	-1,320.15	-1,325.26	10.00	9.14	-6.40	-24.82
<b>N470_B_CK</b>										
7,500.00	46.82	104.01	7,069.35	-1,141.59	-1,278.14	-1,283.31	10.00	9.29	-5.35	-22.99
7,534.13	50.02	102.45	7,092.00	-1,147.42	-1,253.29	-1,258.49	10.00	9.40	-4.58	-20.56
<b>N700_C_CK</b>										
7,600.00	56.26	99.80	7,131.50	-1,157.53	-1,201.60	-1,206.84	10.00	9.47	-4.01	-19.52
7,700.00	65.82	96.44	7,179.86	-1,169.76	-1,115.08	-1,120.37	10.00	9.56	-3.36	-17.93
7,761.14	71.70	94.64	7,202.00	-1,175.25	-1,058.38	-1,063.70	10.00	9.61	-2.95	-16.30
<b>FRHS</b>										
7,800.00	75.45	93.56	7,212.99	-1,177.91	-1,021.21	-1,026.54	10.00	9.64	-2.78	-15.65
7,841.49	79.45	92.44	7,222.00	-1,180.02	-980.78	-986.12	10.00	9.65	-2.69	-15.34
<b>CDLL</b>										
7,900.00	85.10	90.92	7,229.86	-1,181.72	-922.85	-928.20	10.00	9.66	-2.61	-15.10
7,945.74	89.52	89.74	7,232.00	-1,181.98	-877.17	-882.52	10.00	9.67	-2.57	-14.89
<b>End Build @ 7945.74ft - Landing Target (Heel) - 7"</b>										
8,000.00	89.52	89.74	7,232.45	-1,181.73	-822.91	-828.26	0.00	0.00	0.00	0.00

## Plan Report for ENCORE 8C-12HZ - Permit Rev-1

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 (°)
8,100.00	89.52	89.74	7,233.28	-1,181.28	-722.92	-728.27	0.00	0.00	0.00	0.00
8,200.00	89.52	89.74	7,234.11	-1,180.83	-622.92	-628.27	0.00	0.00	0.00	0.00
8,300.00	89.52	89.74	7,234.94	-1,180.38	-522.92	-528.27	0.00	0.00	0.00	0.00
8,400.00	89.52	89.74	7,235.77	-1,179.93	-422.93	-428.28	0.00	0.00	0.00	0.00
8,500.00	89.52	89.74	7,236.60	-1,179.47	-322.93	-328.28	0.00	0.00	0.00	0.00
8,600.00	89.52	89.74	7,237.43	-1,179.02	-222.94	-228.29	0.00	0.00	0.00	0.00
8,700.00	89.52	89.74	7,238.26	-1,178.57	-122.94	-128.29	0.00	0.00	0.00	0.00
8,800.00	89.52	89.74	7,239.09	-1,178.12	-22.95	-28.29	0.00	0.00	0.00	0.00
8,900.00	89.52	89.74	7,239.91	-1,177.67	77.05	71.70	0.00	0.00	0.00	0.00
9,000.00	89.52	89.74	7,240.74	-1,177.22	177.04	171.70	0.00	0.00	0.00	0.00
9,100.00	89.52	89.74	7,241.57	-1,176.76	277.04	271.70	0.00	0.00	0.00	0.00
9,200.00	89.52	89.74	7,242.40	-1,176.31	377.04	371.69	0.00	0.00	0.00	0.00
9,300.00	89.52	89.74	7,243.23	-1,175.86	477.03	471.69	0.00	0.00	0.00	0.00
9,400.00	89.52	89.74	7,244.06	-1,175.41	577.03	571.69	0.00	0.00	0.00	0.00
9,500.00	89.52	89.74	7,244.89	-1,174.96	677.02	671.68	0.00	0.00	0.00	0.00
9,600.00	89.52	89.74	7,245.72	-1,174.51	777.02	771.68	0.00	0.00	0.00	0.00
9,700.00	89.52	89.74	7,246.55	-1,174.05	877.01	871.68	0.00	0.00	0.00	0.00
9,800.00	89.52	89.74	7,247.38	-1,173.60	977.01	971.67	0.00	0.00	0.00	0.00
9,900.00	89.52	89.74	7,248.21	-1,173.15	1,077.00	1,071.67	0.00	0.00	0.00	0.00
10,000.00	89.52	89.74	7,249.04	-1,172.70	1,177.00	1,171.67	0.00	0.00	0.00	0.00
10,100.00	89.52	89.74	7,249.86	-1,172.25	1,277.00	1,271.66	0.00	0.00	0.00	0.00
10,200.00	89.52	89.74	7,250.69	-1,171.80	1,376.99	1,371.66	0.00	0.00	0.00	0.00
10,300.00	89.52	89.74	7,251.52	-1,171.34	1,476.99	1,471.66	0.00	0.00	0.00	0.00
10,400.00	89.52	89.74	7,252.35	-1,170.89	1,576.98	1,571.65	0.00	0.00	0.00	0.00
10,500.00	89.52	89.74	7,253.18	-1,170.44	1,676.98	1,671.65	0.00	0.00	0.00	0.00
10,600.00	89.52	89.74	7,254.01	-1,169.99	1,776.97	1,771.65	0.00	0.00	0.00	0.00
10,700.00	89.52	89.74	7,254.84	-1,169.54	1,876.97	1,871.64	0.00	0.00	0.00	0.00
10,800.00	89.52	89.74	7,255.67	-1,169.08	1,976.96	1,971.64	0.00	0.00	0.00	0.00
10,900.00	89.52	89.74	7,256.50	-1,168.63	2,076.96	2,071.64	0.00	0.00	0.00	0.00
11,000.00	89.52	89.74	7,257.33	-1,168.18	2,176.96	2,171.63	0.00	0.00	0.00	0.00
11,100.00	89.52	89.74	7,258.16	-1,167.73	2,276.95	2,271.63	0.00	0.00	0.00	0.00
11,200.00	89.52	89.74	7,258.99	-1,167.28	2,376.95	2,371.63	0.00	0.00	0.00	0.00
11,300.00	89.52	89.74	7,259.81	-1,166.83	2,476.94	2,471.62	0.00	0.00	0.00	0.00
11,400.00	89.52	89.74	7,260.64	-1,166.37	2,576.94	2,571.62	0.00	0.00	0.00	0.00
11,500.00	89.52	89.74	7,261.47	-1,165.92	2,676.93	2,671.62	0.00	0.00	0.00	0.00
11,600.00	89.52	89.74	7,262.30	-1,165.47	2,776.93	2,771.61	0.00	0.00	0.00	0.00
11,700.00	89.52	89.74	7,263.13	-1,165.02	2,876.92	2,871.61	0.00	0.00	0.00	0.00
11,800.00	89.52	89.74	7,263.96	-1,164.57	2,976.92	2,971.60	0.00	0.00	0.00	0.00
11,900.00	89.52	89.74	7,264.79	-1,164.12	3,076.92	3,071.60	0.00	0.00	0.00	0.00
12,000.00	89.52	89.74	7,265.62	-1,163.66	3,176.91	3,171.60	0.00	0.00	0.00	0.00
12,100.00	89.52	89.74	7,266.45	-1,163.21	3,276.91	3,271.59	0.00	0.00	0.00	0.00
12,200.00	89.52	89.74	7,267.28	-1,162.76	3,376.90	3,371.59	0.00	0.00	0.00	0.00
12,300.00	89.52	89.74	7,268.11	-1,162.31	3,476.90	3,471.59	0.00	0.00	0.00	0.00
12,400.00	89.52	89.74	7,268.94	-1,161.86	3,576.89	3,571.58	0.00	0.00	0.00	0.00
12,500.00	89.52	89.74	7,269.77	-1,161.41	3,676.89	3,671.58	0.00	0.00	0.00	0.00
12,600.00	89.52	89.74	7,270.59	-1,160.95	3,776.88	3,771.58	0.00	0.00	0.00	0.00
12,700.00	89.52	89.74	7,271.42	-1,160.50	3,876.88	3,871.57	0.00	0.00	0.00	0.00
12,800.00	89.52	89.74	7,272.25	-1,160.05	3,976.88	3,971.57	0.00	0.00	0.00	0.00
12,900.00	89.52	89.74	7,273.08	-1,159.60	4,076.87	4,071.57	0.00	0.00	0.00	0.00
13,000.00	89.52	89.74	7,273.91	-1,159.15	4,176.87	4,171.56	0.00	0.00	0.00	0.00
13,100.00	89.52	89.74	7,274.74	-1,158.70	4,276.86	4,271.56	0.00	0.00	0.00	0.00
13,200.00	89.52	89.74	7,275.57	-1,158.24	4,376.86	4,371.56	0.00	0.00	0.00	0.00
13,300.00	89.52	89.74	7,276.40	-1,157.79	4,476.85	4,471.55	0.00	0.00	0.00	0.00
13,400.00	89.52	89.74	7,277.23	-1,157.34	4,576.85	4,571.55	0.00	0.00	0.00	0.00
13,500.00	89.52	89.74	7,278.06	-1,156.89	4,676.84	4,671.55	0.00	0.00	0.00	0.00
13,600.00	89.52	89.74	7,278.89	-1,156.44	4,776.84	4,771.54	0.00	0.00	0.00	0.00
13,700.00	89.52	89.74	7,279.72	-1,155.98	4,876.84	4,871.54	0.00	0.00	0.00	0.00
13,800.00	89.52	89.74	7,280.54	-1,155.53	4,976.83	4,971.54	0.00	0.00	0.00	0.00
13,900.00	89.52	89.74	7,281.37	-1,155.08	5,076.83	5,071.53	0.00	0.00	0.00	0.00
13,975.55	89.52	89.74	7,282.00	-1,154.74	5,152.37	5,147.08	0.00	0.00	0.00	0.00

## Plan Report for ENCORE 8C-12HZ - Permit Rev-1

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 (°)
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TD Well @ 13975.55ft - Total Depth (Toe) - ENCORE 8C-12HZ\_Toe

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,157.12	2,157.12	0.00	0.00	Begin Nudge @ 2157.12ft
3,407.12	3,367.83	-153.95	-219.87	End Nudge @ 3407.12ft
6,747.12	6,394.90	-963.58	-1,376.14	Top of 4.5" Liner @ 6747.12ft
6,847.12	6,485.53	-987.82	-1,410.76	KOP @ 6847.12ft
7,400.00	6,995.33	-1,122.41	-1,342.38	DLS = 10°/100'
7,945.74	7,232.00	-1,181.98	-877.17	End Build @ 7945.74ft
13,975.55	7,282.00	-1,154.74	5,152.37	TD Well @ 13975.55ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
User	No Target (Freehand)	89.74	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,945.74	Permit Rev-1	MWD+IFR1
7,945.74	13,975.55	Permit Rev-1	MWD+IFR1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
746.00	746.00	9 5/8"	9-5/8	13-1/2
7,945.74	7,232.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
287.00	287.00	Base Fox Hills		0.00	
746.00	746.00	Surface Csg Setting Depth		0.00	
3,525.37	3,475.00	Parkman		0.00	
4,719.22	4,557.00	Sussex		0.00	
7,240.12	6,858.00	SSPG		0.00	
7,284.51	6,898.00	NBRR		0.00	
7,437.04	7,024.00	N470_B_CK		0.00	
7,534.13	7,092.00	N700_C_CK		0.00	
7,761.14	7,202.00	FRHS		0.00	
7,841.49	7,222.00	CDLL		0.00	
7,945.74	7,232.00	Landing Target (Heel)		0.00	
13,975.55	7,282.00	Total Depth (Toe)		0.00	

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Plan Report for ENCORE 8C-12HZ - Permit Rev-1

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*Targets associated with this wellbore*

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
ENCORE 8C-12HZ_Toe	7,282.00	-1,154.74	5,152.37	Point
ENCORE 8C-12HZ_SHL	0.00	0.00	0.00	Point
5N-R68W-Sec. 12_Section Lines	42.00	-2,462.02	4,854.50	Polygon
5N-R67W-Sec. 7_Section Lines	42.00	424.19	5,220.88	Polygon
5N-R68W-Sec. 11_Section Lines	42.00	-2,462.02	4,854.50	Polygon

## North Reference Sheet for 5N-R68W-12 Encore 41N-12HZ Pad - ENCORE 8C-12HZ - 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 RKB = 17' @ 5007.00usft (D Rig). Northing and Easting are relative to ENCORE 8C-12HZ

Coordinate System is Universal Transverse Mercator (US Survey Feet), Zone 13N (108 W to 102 W) using datum North American Datum 1983, ellipsoid

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is -105.00°, Longitude Origin:0.000000°, Latitude Origin:0.000000°

False Easting: 1,640,416.67usft, False Northing: 0.00usft, Scale Reduction: 0.99960012

Grid Coordinates of Well: 14,679,779.21 usft N, 1,650,690.25 usft E

Geographical Coordinates of Well: 40° 25' 12.98" N, 104° 57' 47.12" W

Grid Convergence at Surface is: 0.02°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,975.55usft  
the Bottom Hole Displacement is 5,280.18usft in the Direction of 102.63° (True).

Magnetic Convergence at surface is: -8.48° (15 December 2014, , IGRF2010)

