

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N

1N-65W-08 English Farms 15C-8HZ Pad

ENGLISH FARMS 36N-8HZ

Plan B

Plan: Permit Rev-1

Sperry Drilling Services Proposal Report

06 January, 2015

Well Coordinates: 14,553,196.66 N, 1,728,159.28 E (40° 04' 20.09" N, 104° 41' 10.90" W)

Ground Level: 4,948.00 usft

Local Coordinate Origin: Centered on Well ENGLISH FARMS 36N-8HZ

Viewing Datum: RKB = 17' @ 4965.00usft (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: 1N-65W-08 English Farms 15C-8HZ Pad
Well: ENGLISH FARMS 36N-8HZ
Wellbore: Plan B
Design: Permit Rev-1

US ROCKIES WATTENBERG PLANNING

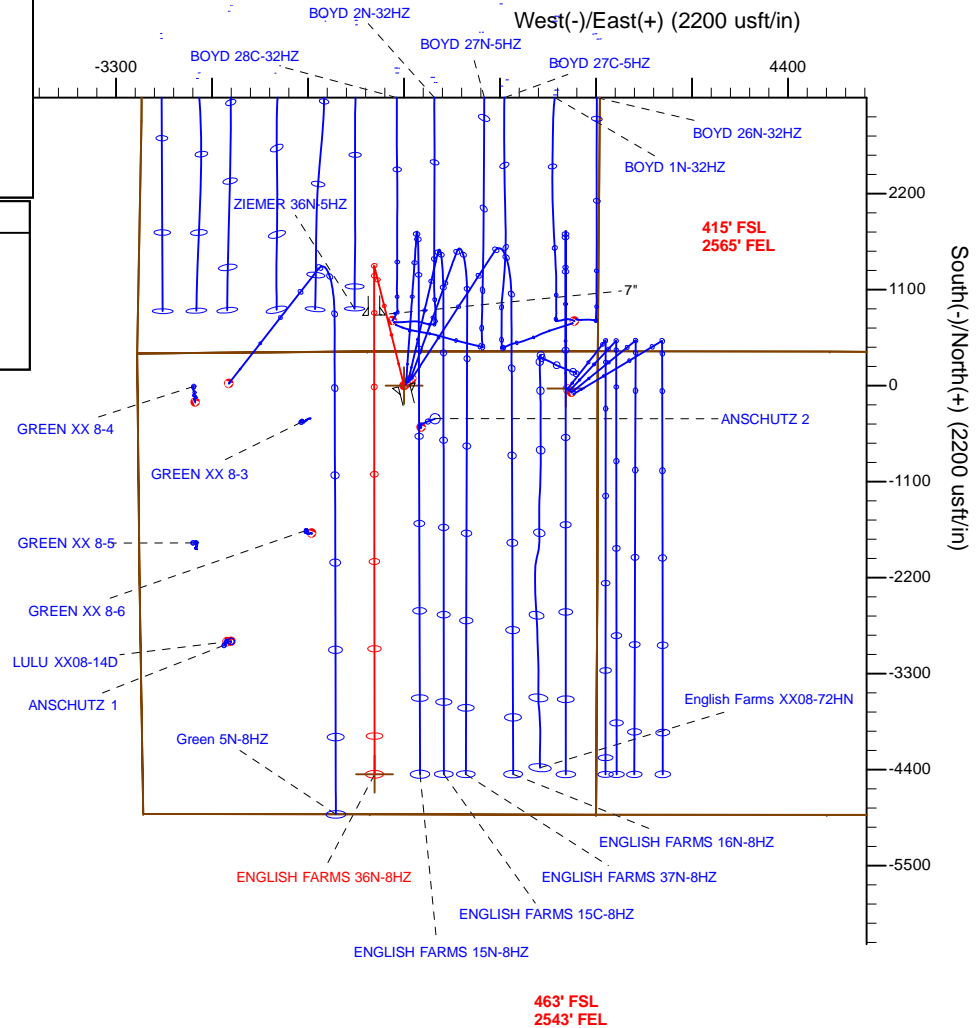
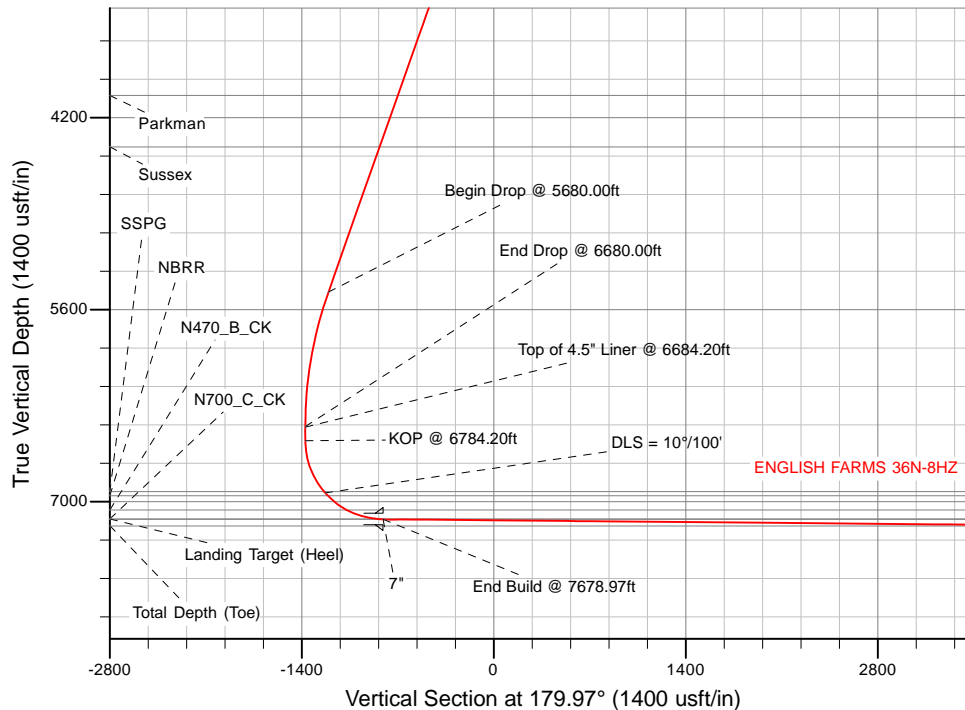
HALLIBURTON
Sperry Drilling

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	1550.00	0.00	0.00	1550.00	0.00	0.00	0.00	0.00	0.00	
3	2550.00	20.00	346.00	2529.82	167.64	-41.80	2.00	346.00	-167.66	
4	5680.00	20.00	346.00	5471.05	1206.36	-300.78	0.00	0.00	-1206.52	
5	6680.00	0.00	0.00	6450.87	1374.00	-342.58	2.00	180.00	-1374.18	
6	6784.20	0.00	0.00	6555.07	1374.00	-342.58	0.00	0.00	-1374.18	
7	7678.97	89.48	179.97	7128.00	806.27	-342.24	10.00	179.97	-806.45	
8	12936.43	89.48	179.97	7176.00	-4450.98	-339.13	0.00	0.00	4450.80	ENGLISH FARMS 36N-8HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
ENGLISH FARMS 36N-8HZ_SHL	0.00	0.00	0.00	40.072248	-104.686360
ENGLISH FARMS 36N-8HZ_BHL	7176.00	-4450.98	-339.13	40.060025	-104.687572



TVD MD

6455.07 6684.20 Top of 4.5" Liner @ 6684.20ft
6555.07 6784.20 KOP @ 6784.20ft

WELL DETAILS: ENGLISH FARMS 36N-8HZ

Ground Level: 4948.00

RKB = 17' @ 4965.00usft (D Rig)

Plan: Permit Rev-1 (ENGLISH FARMS 36N-8HZ/Plan B)

Created By: Clint Eshelman

Reviewed:

Date: 1/06/2014

Date:

Plan Report for ENGLISH FARMS 36N-8HZ - 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
1N-R65W-Sec. 9_Section lines - ENGLISH FARMS 36N-8HZ_SHL - 1N-R65W-Sec. 8_Section lines										
16.00	0.00	0.00	16.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1N-R65W-Sec. 5_Section Lines										
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
962.00	0.00	0.00	962.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Base Fox Hills										
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
1,494.00	0.00	0.00	1,494.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface Csg Setting Depth - 9 5/8"										
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,550.00	0.00	0.00	1,550.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1550.00ft										
1,600.00	1.00	346.00	1,600.00	0.42	-0.11	-0.42	2.00	2.00	0.00	346.00
1,700.00	3.00	346.00	1,699.93	3.81	-0.95	-3.81	2.00	2.00	0.00	0.00
1,800.00	5.00	346.00	1,799.68	10.58	-2.64	-10.58	2.00	2.00	0.00	0.00
1,900.00	7.00	346.00	1,899.13	20.72	-5.17	-20.72	2.00	2.00	0.00	0.00
2,000.00	9.00	346.00	1,998.15	34.22	-8.53	-34.23	2.00	2.00	0.00	0.00
2,100.00	11.00	346.00	2,096.63	51.07	-12.73	-51.08	2.00	2.00	0.00	0.00
2,200.00	13.00	346.00	2,194.44	71.24	-17.76	-71.25	2.00	2.00	0.00	0.00
2,300.00	15.00	346.00	2,291.46	94.72	-23.62	-94.73	2.00	2.00	0.00	0.00
2,400.00	17.00	346.00	2,387.58	121.46	-30.28	-121.48	2.00	2.00	0.00	0.00
2,500.00	19.00	346.00	2,482.68	151.44	-37.76	-151.46	2.00	2.00	0.00	0.00
2,550.00	20.00	346.00	2,529.82	167.64	-41.80	-167.66	2.00	2.00	0.00	0.00
End Nudge @ 2550.00ft										
2,600.00	20.00	346.00	2,576.80	184.23	-45.93	-184.25	0.00	0.00	0.00	0.00
2,700.00	20.00	346.00	2,670.77	217.42	-54.21	-217.44	0.00	0.00	0.00	0.00
2,800.00	20.00	346.00	2,764.74	250.60	-62.48	-250.63	0.00	0.00	0.00	0.00
2,900.00	20.00	346.00	2,858.71	283.79	-70.76	-283.82	0.00	0.00	0.00	0.00
3,000.00	20.00	346.00	2,952.68	316.97	-79.03	-317.01	0.00	0.00	0.00	0.00
3,100.00	20.00	346.00	3,046.65	350.16	-87.30	-350.21	0.00	0.00	0.00	0.00
3,200.00	20.00	346.00	3,140.62	383.35	-95.58	-383.40	0.00	0.00	0.00	0.00
3,300.00	20.00	346.00	3,234.59	416.53	-103.85	-416.59	0.00	0.00	0.00	0.00
3,400.00	20.00	346.00	3,328.55	449.72	-112.13	-449.78	0.00	0.00	0.00	0.00
3,500.00	20.00	346.00	3,422.52	482.90	-120.40	-482.97	0.00	0.00	0.00	0.00
3,600.00	20.00	346.00	3,516.49	516.09	-128.68	-516.16	0.00	0.00	0.00	0.00
3,700.00	20.00	346.00	3,610.46	549.28	-136.95	-549.35	0.00	0.00	0.00	0.00
3,800.00	20.00	346.00	3,704.43	582.46	-145.22	-582.54	0.00	0.00	0.00	0.00
3,900.00	20.00	346.00	3,798.40	615.65	-153.50	-615.73	0.00	0.00	0.00	0.00
4,000.00	20.00	346.00	3,892.37	648.83	-161.77	-648.92	0.00	0.00	0.00	0.00
4,100.00	20.00	346.00	3,986.34	682.02	-170.05	-682.11	0.00	0.00	0.00	0.00
4,154.98	20.00	346.00	4,038.00	700.26	-174.60	-700.36	0.00	0.00	0.00	0.00
Parkman										
4,200.00	20.00	346.00	4,080.31	715.21	-178.32	-715.30	0.00	0.00	0.00	0.00
4,300.00	20.00	346.00	4,174.28	748.39	-186.60	-748.49	0.00	0.00	0.00	0.00

Plan Report for ENGLISH FARMS 36N-8HZ - 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	20.00	346.00	4,268.25	781.58	-194.87	-781.68	0.00	0.00	0.00	0.00
4,500.00	20.00	346.00	4,362.22	814.76	-203.14	-814.87	0.00	0.00	0.00	0.00
4,554.04	20.00	346.00	4,413.00	832.70	-207.62	-832.81	0.00	0.00	0.00	0.00
Sussex										
4,600.00	20.00	346.00	4,456.19	847.95	-211.42	-848.06	0.00	0.00	0.00	0.00
4,700.00	20.00	346.00	4,550.15	881.14	-219.69	-881.25	0.00	0.00	0.00	0.00
4,800.00	20.00	346.00	4,644.12	914.32	-227.97	-914.44	0.00	0.00	0.00	0.00
4,900.00	20.00	346.00	4,738.09	947.51	-236.24	-947.63	0.00	0.00	0.00	0.00
5,000.00	20.00	346.00	4,832.06	980.69	-244.51	-980.82	0.00	0.00	0.00	0.00
5,100.00	20.00	346.00	4,926.03	1,013.88	-252.79	-1,014.01	0.00	0.00	0.00	0.00
5,200.00	20.00	346.00	5,020.00	1,047.07	-261.06	-1,047.20	0.00	0.00	0.00	0.00
5,300.00	20.00	346.00	5,113.97	1,080.25	-269.34	-1,080.39	0.00	0.00	0.00	0.00
5,400.00	20.00	346.00	5,207.94	1,113.44	-277.61	-1,113.58	0.00	0.00	0.00	0.00
5,500.00	20.00	346.00	5,301.91	1,146.62	-285.89	-1,146.77	0.00	0.00	0.00	0.00
5,600.00	20.00	346.00	5,395.88	1,179.81	-294.16	-1,179.96	0.00	0.00	0.00	0.00
5,680.00	20.00	346.00	5,471.05	1,206.36	-300.78	-1,206.52	0.00	0.00	0.00	0.00
Begin Drop @ 5680.00ft										
5,700.00	19.60	346.00	5,489.87	1,212.93	-302.42	-1,213.09	2.00	-2.00	0.00	180.00
5,800.00	17.60	346.00	5,584.64	1,243.88	-310.13	-1,244.04	2.00	-2.00	0.00	180.00
5,900.00	15.60	346.00	5,680.47	1,271.60	-317.05	-1,271.76	2.00	-2.00	0.00	180.00
6,000.00	13.60	346.00	5,777.24	1,296.06	-323.14	-1,296.23	2.00	-2.00	0.00	180.00
6,100.00	11.60	346.00	5,874.82	1,317.22	-328.42	-1,317.39	2.00	-2.00	0.00	180.00
6,200.00	9.60	346.00	5,973.11	1,335.07	-332.87	-1,335.24	2.00	-2.00	0.00	180.00
6,300.00	7.60	346.00	6,071.98	1,349.58	-336.49	-1,349.75	2.00	-2.00	0.00	180.00
6,400.00	5.60	346.00	6,171.31	1,360.73	-339.27	-1,360.91	2.00	-2.00	0.00	180.00
6,500.00	3.60	346.00	6,270.99	1,368.51	-341.21	-1,368.69	2.00	-2.00	0.00	180.00
6,600.00	1.60	346.00	6,370.88	1,372.91	-342.31	-1,373.09	2.00	-2.00	0.00	180.00
6,680.00	0.00	0.00	6,450.87	1,374.00	-342.58	-1,374.18	2.00	-2.00	17.50	180.00
End Drop @ 6680.00ft										
6,684.20	0.00	0.00	6,455.07	1,374.00	-342.58	-1,374.18	0.00	0.00	0.00	180.00
Top of 4.5" Liner @ 6684.20ft										
6,700.00	0.00	0.00	6,470.87	1,374.00	-342.58	-1,374.18	0.00	0.00	0.00	0.00
6,784.20	0.00	0.00	6,555.07	1,374.00	-342.58	-1,374.18	0.00	0.00	0.00	0.00
KOP @ 6784.20ft										
6,800.00	1.58	179.97	6,570.87	1,373.78	-342.58	-1,373.96	10.00	10.00	0.00	179.97
6,900.00	11.58	179.97	6,670.08	1,362.33	-342.57	-1,362.51	10.00	10.00	0.00	0.00
7,000.00	21.58	179.97	6,765.80	1,333.83	-342.55	-1,334.01	10.00	10.00	0.00	0.00
7,100.00	31.58	179.97	6,855.12	1,289.15	-342.53	-1,289.33	10.00	10.00	0.00	0.00
7,187.66	40.35	179.97	6,926.00	1,237.72	-342.50	-1,237.90	10.00	10.00	0.00	0.00
SSPG										
7,200.00	41.58	179.97	6,935.32	1,229.63	-342.49	-1,229.81	10.00	10.00	0.00	0.00
DLS = 10°/100'										
7,228.27	44.41	179.97	6,956.00	1,210.35	-342.48	-1,210.53	10.00	10.00	0.00	0.00
NBRR										
7,300.00	51.58	179.97	7,003.97	1,157.09	-342.45	-1,157.27	10.00	10.00	0.00	0.00
7,400.00	61.58	179.97	7,058.98	1,073.73	-342.40	-1,073.91	10.00	10.00	0.00	0.00
7,402.16	61.80	179.97	7,060.00	1,071.82	-342.40	-1,072.00	10.00	10.00	0.00	0.00
N470_B_CK										
7,500.00	71.58	179.97	7,098.67	982.08	-342.34	-982.26	10.00	10.00	0.00	0.00
7,600.00	81.58	179.97	7,121.85	884.94	-342.29	-885.11	10.00	10.00	0.00	0.00
7,635.99	85.18	179.97	7,126.00	849.19	-342.27	-849.37	10.00	10.00	0.00	0.00
N700_C_CK										
7,678.97	89.48	179.97	7,128.00	806.27	-342.24	-806.45	10.00	10.00	0.00	0.00
End Build @ 7678.97ft - Landing Target (Heel) - 7"										
7,700.00	89.48	179.97	7,128.19	785.24	-342.23	-785.42	0.00	0.00	0.00	0.00
7,800.00	89.48	179.97	7,129.11	685.24	-342.17	-685.42	0.00	0.00	0.00	0.00
7,900.00	89.48	179.97	7,130.02	585.25	-342.11	-585.43	0.00	0.00	0.00	0.00
8,000.00	89.48	179.97	7,130.93	485.25	-342.05	-485.43	0.00	0.00	0.00	0.00

Plan Report for ENGLISH FARMS 36N-8HZ - 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	89.48	179.97	7,131.85	385.26	-341.99	-385.43	0.00	0.00	0.00	0.00
8,200.00	89.48	179.97	7,132.76	285.26	-341.93	-285.44	0.00	0.00	0.00	0.00
8,300.00	89.48	179.97	7,133.67	185.26	-341.87	-185.44	0.00	0.00	0.00	0.00
8,400.00	89.48	179.97	7,134.59	85.27	-341.81	-85.45	0.00	0.00	0.00	0.00
8,500.00	89.48	179.97	7,135.50	-14.73	-341.75	14.55	0.00	0.00	0.00	0.00
8,600.00	89.48	179.97	7,136.41	-114.72	-341.70	114.54	0.00	0.00	0.00	0.00
8,700.00	89.48	179.97	7,137.32	-214.72	-341.64	214.54	0.00	0.00	0.00	0.00
8,800.00	89.48	179.97	7,138.24	-314.71	-341.58	314.54	0.00	0.00	0.00	0.00
8,900.00	89.48	179.97	7,139.15	-414.71	-341.52	414.53	0.00	0.00	0.00	0.00
9,000.00	89.48	179.97	7,140.06	-514.71	-341.46	514.53	0.00	0.00	0.00	0.00
9,100.00	89.48	179.97	7,140.98	-614.70	-341.40	614.52	0.00	0.00	0.00	0.00
9,200.00	89.48	179.97	7,141.89	-714.70	-341.34	714.52	0.00	0.00	0.00	0.00
9,300.00	89.48	179.97	7,142.80	-814.69	-341.28	814.52	0.00	0.00	0.00	0.00
9,400.00	89.48	179.97	7,143.71	-914.69	-341.22	914.51	0.00	0.00	0.00	0.00
9,500.00	89.48	179.97	7,144.63	-1,014.69	-341.16	1,014.51	0.00	0.00	0.00	0.00
9,600.00	89.48	179.97	7,145.54	-1,114.68	-341.10	1,114.50	0.00	0.00	0.00	0.00
9,700.00	89.48	179.97	7,146.45	-1,214.68	-341.04	1,214.50	0.00	0.00	0.00	0.00
9,800.00	89.48	179.97	7,147.37	-1,314.67	-340.99	1,314.49	0.00	0.00	0.00	0.00
9,900.00	89.48	179.97	7,148.28	-1,414.67	-340.93	1,414.49	0.00	0.00	0.00	0.00
10,000.00	89.48	179.97	7,149.19	-1,514.66	-340.87	1,514.49	0.00	0.00	0.00	0.00
10,100.00	89.48	179.97	7,150.11	-1,614.66	-340.81	1,614.48	0.00	0.00	0.00	0.00
10,200.00	89.48	179.97	7,151.02	-1,714.66	-340.75	1,714.48	0.00	0.00	0.00	0.00
10,300.00	89.48	179.97	7,151.93	-1,814.65	-340.69	1,814.47	0.00	0.00	0.00	0.00
10,400.00	89.48	179.97	7,152.84	-1,914.65	-340.63	1,914.47	0.00	0.00	0.00	0.00
10,500.00	89.48	179.97	7,153.76	-2,014.64	-340.57	2,014.47	0.00	0.00	0.00	0.00
10,600.00	89.48	179.97	7,154.67	-2,114.64	-340.51	2,114.46	0.00	0.00	0.00	0.00
10,700.00	89.48	179.97	7,155.58	-2,214.64	-340.45	2,214.46	0.00	0.00	0.00	0.00
10,800.00	89.48	179.97	7,156.50	-2,314.63	-340.39	2,314.45	0.00	0.00	0.00	0.00
10,900.00	89.48	179.97	7,157.41	-2,414.63	-340.33	2,414.45	0.00	0.00	0.00	0.00
11,000.00	89.48	179.97	7,158.32	-2,514.62	-340.28	2,514.44	0.00	0.00	0.00	0.00
11,100.00	89.48	179.97	7,159.23	-2,614.62	-340.22	2,614.44	0.00	0.00	0.00	0.00
11,200.00	89.48	179.97	7,160.15	-2,714.61	-340.16	2,714.44	0.00	0.00	0.00	0.00
11,300.00	89.48	179.97	7,161.06	-2,814.61	-340.10	2,814.43	0.00	0.00	0.00	0.00
11,400.00	89.48	179.97	7,161.97	-2,914.61	-340.04	2,914.43	0.00	0.00	0.00	0.00
11,500.00	89.48	179.97	7,162.89	-3,014.60	-339.98	3,014.42	0.00	0.00	0.00	0.00
11,600.00	89.48	179.97	7,163.80	-3,114.60	-339.92	3,114.42	0.00	0.00	0.00	0.00
11,700.00	89.48	179.97	7,164.71	-3,214.59	-339.86	3,214.42	0.00	0.00	0.00	0.00
11,800.00	89.48	179.97	7,165.63	-3,314.59	-339.80	3,314.41	0.00	0.00	0.00	0.00
11,900.00	89.48	179.97	7,166.54	-3,414.59	-339.74	3,414.41	0.00	0.00	0.00	0.00
12,000.00	89.48	179.97	7,167.45	-3,514.58	-339.68	3,514.40	0.00	0.00	0.00	0.00
12,100.00	89.48	179.97	7,168.36	-3,614.58	-339.62	3,614.40	0.00	0.00	0.00	0.00
12,200.00	89.48	179.97	7,169.28	-3,714.57	-339.57	3,714.39	0.00	0.00	0.00	0.00
12,300.00	89.48	179.97	7,170.19	-3,814.57	-339.51	3,814.39	0.00	0.00	0.00	0.00
12,400.00	89.48	179.97	7,171.10	-3,914.56	-339.45	3,914.39	0.00	0.00	0.00	0.00
12,500.00	89.48	179.97	7,172.02	-4,014.56	-339.39	4,014.38	0.00	0.00	0.00	0.00
12,600.00	89.48	179.97	7,172.93	-4,114.56	-339.33	4,114.38	0.00	0.00	0.00	0.00
12,700.00	89.48	179.97	7,173.84	-4,214.55	-339.27	4,214.37	0.00	0.00	0.00	0.00
12,800.00	89.48	179.97	7,174.75	-4,314.55	-339.21	4,314.37	0.00	0.00	0.00	0.00
12,900.00	89.48	179.97	7,175.67	-4,414.54	-339.15	4,414.37	0.00	0.00	0.00	0.00
12,936.43	89.48	179.97	7,176.00	-4,450.97	-339.13	4,450.79	0.00	0.00	0.00	0.00

TD Well @ 12936.43ft - Total Depth (Toe) - ENGLISH FARMS 36N-8HZ_BHL

Plan Report for ENGLISH FARMS 36N-8HZ - Permit Rev-1

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,550.00	1,550.00	0.00	0.00	Begin Nudge @ 1550.00ft
2,550.00	2,529.82	167.64	-41.80	End Nudge @ 2550.00ft
5,680.00	5,471.05	1,206.36	-300.78	Begin Drop @ 5680.00ft
6,680.00	6,450.87	1,374.00	-342.58	End Drop @ 6680.00ft
6,684.20	6,455.07	1,374.00	-342.58	Top of 4.5" Liner @ 6684.20ft
6,784.20	6,555.07	1,374.00	-342.58	KOP @ 6784.20ft
7,200.00	6,935.32	1,229.63	-342.49	DLS = 10°/100'
7,678.97	7,128.00	806.27	-342.24	End Build @ 7678.97ft
12,936.43	7,176.00	-4,450.97	-339.13	TD Well @ 12936.43ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
User	No Target (Freehand)	179.97	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,678.97	Permit Rev-1	MWD+IFR1
7,678.97	12,936.43	Permit Rev-1	MWD+IFR1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,494.00	1,494.00	9 5/8"	9-5/8	13-1/2
7,678.97	7,128.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
962.00	962.00	Base Fox Hills		0.00	
1,494.00	1,494.00	Surface Csg Setting Depth		0.00	
4,154.98	4,038.00	Parkman		0.00	
4,554.04	4,413.00	Sussex		0.00	
7,187.66	6,926.00	SSPG		0.00	
7,228.27	6,956.00	NBRR		0.00	
7,402.16	7,060.00	N470_B_CK		0.00	
7,635.99	7,126.00	N700_C_CK		0.00	
7,678.97	7,128.00	Landing Target (Heel)		0.00	
12,936.43	7,176.00	Total Depth (Toe)		0.00	

Plan Report for ENGLISH FARMS 36N-8HZ - Permit Rev-1

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
1N-R65W-Sec. 9_Section lines	-16.00	-4,298.07	5,929.66	Polygon
ENGLISH FARMS 36N-8HZ_BHL	7,176.00	-4,450.98	-339.13	Point
1N-R65W-Sec. 5_Section Lines	16.00	-31.61	1,852.28	Polygon
ENGLISH FARMS 36N-8HZ_SHL	0.00	0.00	0.00	Point
1N-R65W-Sec. 8_Section lines	-16.00	-4,298.07	5,929.66	Polygon

North Reference Sheet for 1N-65W-08 English Farms 15C-8HZ Pad - ENGLISH FARMS 36N-8HZ - Plan B

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' @ 4965.00usft (D Rig). Northing and Easting are relative to ENGLISH FARMS 36N-8HZ

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: 0.99960880

Grid Coordinates of Well: 14,553,196.66 usft N, 1,728,159.28 usft E

Geographical Coordinates of Well: 40° 04' 20.09" N, 104° 41' 10.90" W

Grid Convergence at Surface is: 0.20°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,936.43usft
the Bottom Hole Displacement is 4,463.87usft in the Direction of 184.36° (True).

Magnetic Convergence at surface is: -8.14° (22 October 2014, , IGRF2010)

