

Noble Energy, Inc

Weld County, CO (NAD 83)

Sec 24, T6N-R65W (Storis E24 Pad)

Storis E24-77-1HN

Wellbore #1

Design: OH

Standard Survey Report

26 May, 2014

IDS

Survey Report

Company:	Noble Energy, Inc	Local Co-ordinate Reference:	Well Storis E24-77-1HN
Project:	Weld County, CO (NAD 83)	TVD Reference:	Well @ 4722.0usft (H&P 330)
Site:	Sec 24, T6N-R65W (Storis E24 Pad)	MD Reference:	Well @ 4722.0usft (H&P 330)
Well:	Storis E24-77-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project	Weld County, CO (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	Sec 24, T6N-R65W (Storis E24 Pad)				
Site Position:		Northing:	1,413,520.50 usft	Latitude:	40° 27' 54.576 N
From:	Lat/Long	Easting:	3,245,595.18 usft	Longitude:	104° 37' 2.352 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.57 °

Well	Storis E24-77-1HN					
Well Position	+N/-S	0.0 usft	Northing:	1,413,520.27 usft	Latitude:	40° 27' 54.576 N
	+E/-W	0.0 usft	Easting:	3,245,572.92 usft	Longitude:	104° 37' 2.640 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	4,692.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/18/2014	8.42	67.03	52,891

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	7.77

Survey Program	Date 5/26/2014				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
382.0	754.0	Surface (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
817.0	7,258.0	Intermediate (Wellbore #1)	MWD	MWD - Standard	
7,324.0	11,327.0	Lateral (Wellbore #1)	MWD	MWD - Standard	

Survey										
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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
382.0	0.30	2.30	382.0	1.0	0.0	1.0	0.08	0.08	0.00	
754.0	0.20	86.30	754.0	2.0	0.7	2.1	0.09	-0.03	22.58	
817.0	0.53	126.85	817.0	1.8	1.1	2.0	0.63	0.52	64.37	
909.0	0.62	122.46	909.0	1.3	1.8	1.6	0.11	0.10	-4.77	
1,002.0	0.79	105.50	1,002.0	0.9	2.9	1.3	0.29	0.18	-18.24	
1,095.0	0.97	91.79	1,095.0	0.7	4.3	1.3	0.30	0.19	-14.74	
1,188.0	2.99	91.43	1,187.9	0.6	7.5	1.6	2.17	2.17	-0.39	
1,280.0	4.40	120.00	1,279.7	-1.2	12.9	0.5	2.48	1.53	31.05	

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Wellbore: Wellbore #1
Design: OH

Local Co-ordinate Reference: Well Storis E24-77-1HN
TVD Reference: Well @ 4722.0usft (H&P 330)
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

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)
1,373.0	5.28	105.06	1,372.4	-4.1	20.2	-1.4	1.65	0.95	-16.06
1,465.0	6.95	105.67	1,463.9	-6.7	29.6	-2.7	1.82	1.82	0.66
1,558.0	8.62	110.51	1,556.0	-10.7	41.6	-5.0	1.93	1.80	5.20
1,653.0	10.55	107.61	1,649.7	-15.8	56.5	-8.0	2.09	2.03	-3.05
1,748.0	12.22	109.63	1,742.8	-21.8	74.3	-11.6	1.81	1.76	2.13
1,843.0	14.51	110.15	1,835.2	-29.3	94.9	-16.2	2.41	2.41	0.55
1,939.0	13.45	110.77	1,928.4	-37.4	116.7	-21.3	1.12	-1.10	0.65
2,034.0	14.51	111.12	2,020.6	-45.6	138.1	-26.5	1.12	1.12	0.37
2,129.0	15.74	109.45	2,112.3	-54.2	161.3	-31.9	1.37	1.29	-1.76
2,224.0	15.12	107.78	2,203.9	-62.3	185.3	-36.7	0.80	-0.65	-1.76
2,319.0	13.89	103.65	2,295.8	-68.7	208.2	-40.0	1.69	-1.29	-4.35
2,414.0	14.77	112.70	2,387.9	-76.1	230.4	-44.3	2.53	0.93	9.53
2,509.0	13.72	109.45	2,480.0	-84.5	252.2	-49.7	1.39	-1.11	-3.42
2,604.0	13.98	112.26	2,572.2	-92.6	273.5	-54.8	0.76	0.27	2.96
2,700.0	13.19	111.47	2,665.5	-101.0	294.4	-60.3	0.85	-0.82	-0.82
2,795.0	14.95	117.36	2,757.7	-110.6	315.4	-67.0	2.39	1.85	6.20
2,890.0	15.83	117.45	2,849.3	-122.2	337.7	-75.5	0.93	0.93	0.09
2,985.0	14.95	116.75	2,940.8	-133.7	360.2	-83.8	0.95	-0.93	-0.74
3,080.0	14.60	116.95	3,032.7	-144.7	381.8	-91.7	0.37	-0.37	0.21
3,175.0	13.98	116.48	3,124.8	-155.2	402.7	-99.4	0.66	-0.65	-0.49
3,270.0	11.87	115.25	3,217.4	-164.5	421.9	-106.0	2.24	-2.22	-1.29
3,365.0	13.10	110.86	3,310.1	-172.5	440.8	-111.4	1.63	1.29	-4.62
3,460.0	13.45	116.39	3,402.6	-181.2	460.7	-117.3	1.39	0.37	5.82
3,555.0	13.72	114.11	3,494.9	-190.7	480.9	-124.0	0.63	0.28	-2.40
3,650.0	15.21	111.91	3,586.9	-200.0	502.7	-130.2	1.67	1.57	-2.32
3,745.0	14.42	113.49	3,678.7	-209.4	525.1	-136.5	0.93	-0.83	1.66
3,841.0	15.21	115.87	3,771.6	-219.6	547.4	-143.6	1.04	0.82	2.48
3,936.0	16.44	110.33	3,863.0	-229.7	571.3	-150.4	2.05	1.29	-5.83
4,031.0	17.15	109.45	3,953.9	-239.1	597.1	-156.2	0.79	0.75	-0.93
4,126.0	14.25	111.91	4,045.4	-248.1	621.1	-161.9	3.13	-3.05	2.59
4,221.0	11.52	105.41	4,138.0	-255.0	641.1	-166.0	3.25	-2.87	-6.84
4,316.0	10.29	101.81	4,231.2	-259.2	658.6	-167.9	1.48	-1.29	-3.79
4,412.0	8.44	94.86	4,326.0	-261.6	674.0	-168.1	2.26	-1.93	-7.24
4,507.0	6.60	108.48	4,420.1	-263.9	686.1	-168.8	2.68	-1.94	14.34
4,602.0	5.80	99.43	4,514.6	-266.4	696.0	-169.9	1.33	-0.84	-9.53
4,697.0	4.40	119.65	4,609.2	-269.0	703.9	-171.4	2.38	-1.47	21.28
4,792.0	4.13	120.79	4,704.0	-272.6	710.1	-174.1	0.30	-0.28	1.20
4,887.0	1.49	107.08	4,798.8	-274.7	714.2	-175.7	2.85	-2.78	-14.43
4,983.0	1.41	115.34	4,894.8	-275.6	716.4	-176.2	0.23	-0.08	8.60
5,078.0	1.49	120.26	4,989.8	-276.7	718.6	-177.1	0.16	0.08	5.18
5,173.0	0.88	95.56	5,084.8	-277.4	720.3	-177.5	0.82	-0.64	-26.00
5,268.0	1.23	124.74	5,179.7	-278.0	721.9	-177.9	0.66	0.37	30.72
5,363.0	0.79	136.61	5,274.7	-279.1	723.2	-178.8	0.51	-0.46	12.49

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Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey

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)
5,458.0	1.14	111.91	5,369.7	-279.9	724.5	-179.4	0.56	0.37	-26.00
5,554.0	0.18	354.05	5,465.7	-280.1	725.4	-179.5	1.29	-1.00	-122.77
5,649.0	0.97	25.52	5,560.7	-279.2	725.7	-178.6	0.87	0.83	33.13
5,744.0	0.44	37.21	5,655.7	-278.2	726.3	-177.5	0.58	-0.56	12.31
5,839.0	0.62	173.35	5,750.7	-278.5	726.6	-177.7	1.04	0.19	143.31
5,933.0	1.32	344.73	5,844.7	-277.9	726.3	-177.2	2.06	0.74	182.32
6,028.0	0.97	11.81	5,939.7	-276.1	726.2	-175.4	0.67	-0.37	28.51
6,123.0	0.62	7.23	6,034.7	-274.8	726.5	-174.1	0.37	-0.37	-4.82
6,148.0	0.53	37.73	6,059.7	-274.5	726.5	-173.9	1.26	-0.36	122.00
6,213.0	2.02	353.79	6,124.6	-273.2	726.6	-172.5	2.58	2.29	-67.60
6,260.0	6.07	350.45	6,171.5	-269.9	726.1	-169.3	8.63	8.62	-7.11
6,308.0	9.40	358.10	6,219.1	-263.5	725.5	-163.0	7.25	6.94	15.94
6,355.0	12.93	358.45	6,265.2	-254.4	725.3	-154.0	7.51	7.51	0.74
6,403.0	16.50	354.50	6,311.6	-242.2	724.5	-142.1	7.72	7.44	-8.23
6,450.0	20.10	354.90	6,356.2	-227.5	723.1	-127.7	7.66	7.66	0.85
6,498.0	23.04	357.48	6,400.8	-209.9	722.0	-110.4	6.43	6.13	5.38
6,545.0	25.85	359.50	6,443.6	-190.5	721.5	-91.2	6.24	5.98	4.30
6,593.0	29.90	2.30	6,486.0	-168.1	721.9	-69.0	8.87	8.44	5.83
6,640.0	33.77	1.61	6,526.0	-143.3	722.7	-44.3	8.27	8.23	-1.47
6,688.0	38.08	359.41	6,564.8	-115.1	722.9	-16.4	9.37	8.98	-4.58
6,735.0	41.77	0.38	6,600.9	-85.0	722.9	13.5	7.96	7.85	2.06
6,783.0	45.30	0.50	6,635.7	-51.9	723.1	46.3	7.36	7.35	0.25
6,830.0	48.72	358.97	6,667.7	-17.5	723.0	80.3	7.66	7.28	-3.26
6,878.0	51.53	357.57	6,698.5	19.3	721.8	116.6	6.27	5.85	-2.92
6,925.0	54.17	357.04	6,726.9	56.7	720.1	153.5	5.69	5.62	-1.13
6,973.0	57.60	357.57	6,753.8	96.4	718.2	192.5	7.20	7.15	1.10
7,020.0	60.85	358.53	6,777.8	136.7	716.9	232.3	7.13	6.91	2.04
7,068.0	64.54	358.71	6,799.8	179.4	715.8	274.4	7.69	7.69	0.38
7,115.0	68.59	0.38	6,818.5	222.5	715.5	317.1	9.21	8.62	3.55
7,163.0	73.07	0.38	6,834.3	267.8	715.8	362.1	9.33	9.33	0.00
7,210.0	75.89	1.96	6,846.9	313.1	716.7	407.0	6.82	6.00	3.36
7,258.0	79.84	3.10	6,856.9	359.9	718.8	453.8	8.55	8.23	2.38
Last MWD									
7,311.0	84.58	1.06	6,864.1	412.4	720.7	506.0	9.72	8.94	-3.86
Actual 7" Csg @ 7311' MD / 6864' TVD / 758' FSL & 1675' FWL - 7"									
7,324.0	85.74	0.56	6,865.2	425.3	720.9	518.9	9.72	8.95	-3.81
7,419.0	88.29	359.76	6,870.2	520.2	721.1	612.9	2.81	2.68	-0.84
7,514.0	91.71	358.18	6,870.2	615.2	719.4	706.8	3.97	3.60	-1.66
7,609.0	92.33	357.39	6,866.8	710.0	715.8	800.3	1.06	0.65	-0.83
7,705.0	90.92	358.45	6,864.1	805.9	712.3	894.8	1.84	-1.47	1.10
7,800.0	88.55	358.80	6,864.5	900.9	710.0	988.6	2.52	-2.49	0.37
7,895.0	89.43	358.53	6,866.2	995.9	707.8	1,082.4	0.97	0.93	-0.28
7,990.0	89.25	357.74	6,867.3	1,090.8	704.7	1,176.0	0.85	-0.19	-0.83
8,085.0	89.16	357.22	6,868.6	1,185.7	700.5	1,269.5	0.56	-0.09	-0.55

IDS

Survey Report

Company:	Noble Energy, Inc	Local Co-ordinate Reference:	Well Storis E24-77-1HN
Project:	Weld County, CO (NAD 83)	TVD Reference:	Well @ 4722.0usft (H&P 330)
Site:	Sec 24, T6N-R65W (Storis E24 Pad)	MD Reference:	Well @ 4722.0usft (H&P 330)
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8,181.0	89.78	358.01	6,869.5	1,281.6	696.5	1,364.0	1.05	0.65	0.82
8,276.0	90.22	358.09	6,869.5	1,376.6	693.3	1,457.6	0.47	0.46	0.08
8,371.0	90.40	357.39	6,869.0	1,471.5	689.5	1,551.2	0.76	0.19	-0.74
8,466.0	87.70	358.09	6,870.6	1,566.4	685.8	1,644.7	2.94	-2.84	0.74
8,561.0	87.41	358.36	6,874.6	1,661.3	682.9	1,738.3	0.42	-0.31	0.28
8,656.0	89.78	357.92	6,877.0	1,756.2	679.8	1,831.9	2.54	2.49	-0.46
8,751.0	89.87	357.30	6,877.3	1,851.1	675.8	1,925.4	0.66	0.09	-0.65
8,847.0	89.52	356.25	6,877.8	1,946.9	670.4	2,019.7	1.15	-0.36	-1.09
8,942.0	89.78	355.98	6,878.3	2,041.7	664.0	2,112.7	0.39	0.27	-0.28
9,037.0	91.01	358.53	6,877.7	2,136.6	659.4	2,206.1	2.98	1.29	2.68
9,132.0	91.63	359.15	6,875.5	2,231.5	657.5	2,299.9	0.92	0.65	0.65
9,227.0	90.84	2.05	6,873.5	2,326.5	658.5	2,394.2	3.16	-0.83	3.05
9,322.0	91.71	1.87	6,871.3	2,421.4	661.8	2,488.6	0.94	0.92	-0.19
9,417.0	90.92	2.05	6,869.2	2,516.3	665.0	2,583.1	0.85	-0.83	0.19
9,513.0	89.87	0.03	6,868.5	2,612.3	666.7	2,678.5	2.37	-1.09	-2.10
9,608.0	90.13	359.59	6,868.5	2,707.3	666.4	2,772.5	0.54	0.27	-0.46
9,703.0	90.57	358.89	6,867.9	2,802.3	665.2	2,866.5	0.87	0.46	-0.74
9,798.0	90.31	358.71	6,867.2	2,897.3	663.2	2,960.3	0.33	-0.27	-0.19
9,893.0	89.87	357.92	6,867.0	2,992.2	660.4	3,054.0	0.95	-0.46	-0.83
9,988.0	90.13	357.65	6,867.0	3,087.2	656.7	3,147.6	0.39	0.27	-0.28
10,083.0	89.69	356.51	6,867.2	3,182.0	651.9	3,240.9	1.29	-0.46	-1.20
10,178.0	89.87	357.92	6,867.6	3,276.9	647.3	3,334.3	1.50	0.19	1.48
10,273.0	89.69	0.38	6,867.9	3,371.9	645.8	3,428.3	2.60	-0.19	2.59
10,369.0	88.99	359.15	6,869.0	3,467.9	645.5	3,523.3	1.47	-0.73	-1.28
10,464.0	88.37	357.48	6,871.2	3,562.8	642.7	3,617.0	1.87	-0.65	-1.76
10,559.0	90.84	358.89	6,871.9	3,657.8	639.7	3,710.7	2.99	2.60	1.48
10,654.0	91.10	1.26	6,870.3	3,752.8	639.8	3,804.8	2.51	0.27	2.49
10,749.0	90.48	0.56	6,868.9	3,847.7	641.3	3,899.1	0.98	-0.65	-0.74
10,845.0	89.87	359.06	6,868.7	3,943.7	641.0	3,994.2	1.69	-0.64	-1.56
10,940.0	89.60	357.92	6,869.1	4,038.7	638.5	4,087.9	1.23	-0.28	-1.20
11,035.0	89.69	356.34	6,869.7	4,133.6	633.7	4,181.3	1.67	0.09	-1.66
11,130.0	89.43	354.75	6,870.4	4,228.3	626.3	4,274.1	1.70	-0.27	-1.67
11,225.0	89.16	353.08	6,871.6	4,322.7	616.3	4,366.4	1.78	-0.28	-1.76
11,257.0	89.16	352.64	6,872.0	4,354.5	612.3	4,397.3	1.37	0.00	-1.38
Last MWD @ 11257' MD / 6872' TVD									
11,327.0	89.16	352.64	6,873.1	4,423.9	603.3	4,464.8	0.00	0.00	0.00
PTD @ 11327' MD / 6873' TVD / 536' FNL & 1621' FWL									

IDS

Survey Report

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Project: Weld County, CO (NAD 83)
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Well: Storis E24-77-1HN
Wellbore: Wellbore #1
Design: OH

Local Co-ordinate Reference: Well Storis E24-77-1HN
TVD Reference: Well @ 4722.0usft (H&P 330)
MD Reference: Well @ 4722.0usft (H&P 330)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
7,311.0	6,864.1	7"	7	8-3/4

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,258.0	6,856.9	359.9	718.8	Last MWD
7,311.0	6,864.1	412.4	720.7	Actual 7" Csg @ 7311' MD / 6864' TVD / 758' FSL & 1675' FWL
11,257.0	6,872.0	4,354.5	612.3	Last MWD @ 11257' MD / 6872' TVD
11,327.0	6,873.1	4,423.9	603.3	PTD @ 11327' MD / 6873' TVD / 536' FNL & 1621' FWL

Checked By: _____ Approved By: _____ Date: _____



Weld County, CO (NAD 83)

Storis E24-77-1HN

H&P 330

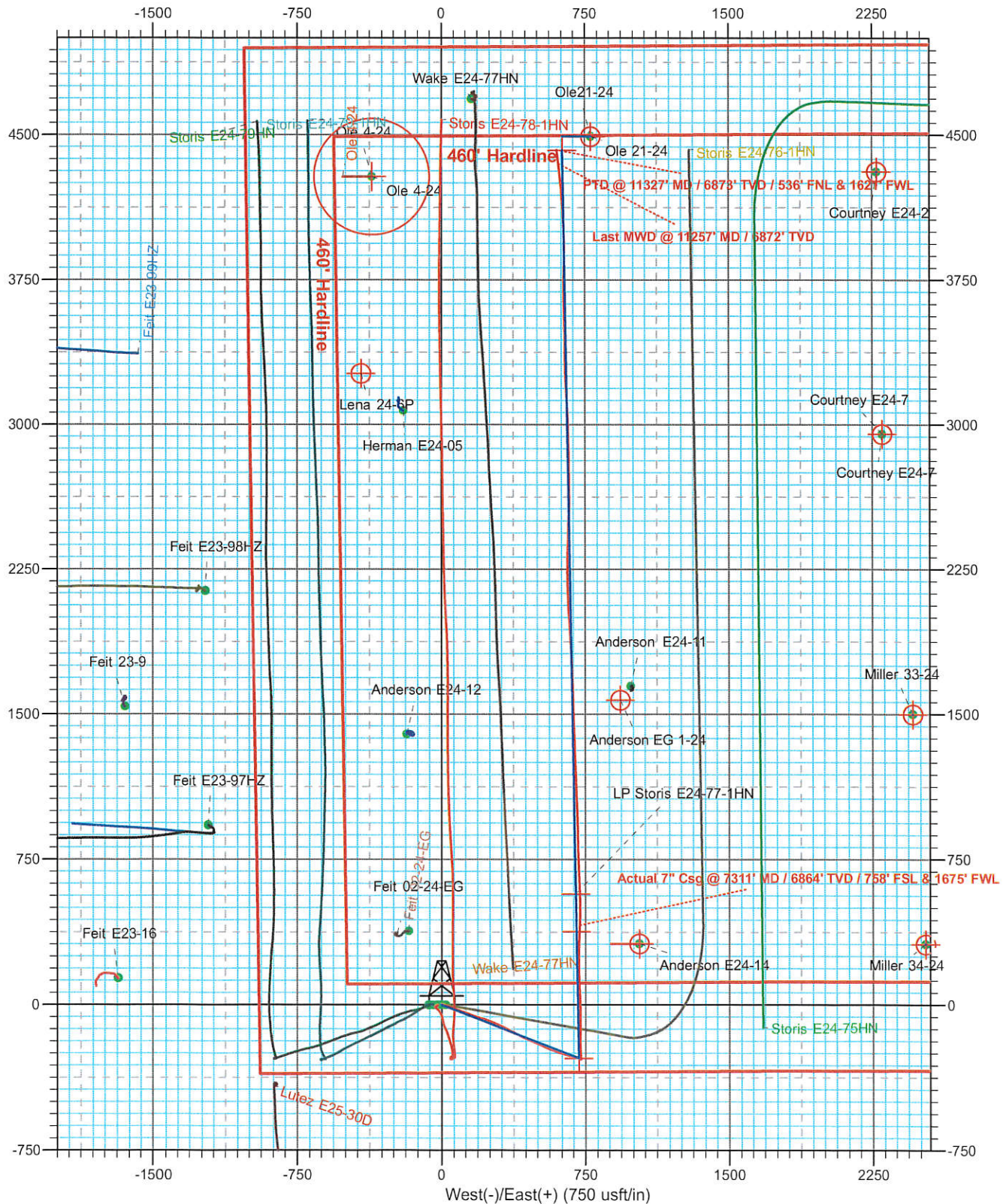
Plan #1



SHL @ 350' FSL & 950 FWL Sec 24

7" Csg 758' FSL & 16751' FW Sec 24

PBHL @ 536 FNL & 1621 FWL Sec 24





Weld County, CO (NAD 83)
Sec 24, T6N-R65W (Storis E24 Pad)
Storis E24-77-1HN
H&P 330
Plan #1



SHL @ 350' FSL & 950 FWL Sec 24
7' Csg @ 758' FSL & 1675 FWL Sec 24
PBHL @ 536' FNL & 1621' FWL Sec 24



Azimuths to Grid North
Convergence: 0.57°
Total Correction: 7.85°

Magnetic Field
Strength: 52891.3snT
Dip Angle: 67.03°
Date: 3/18/2014
Model: IGRF2010

