

Noble Energy, Inc

Weld County, CO (NAD 83)

Sec 24, T6N-R65W (Storis E24 Pad)

Storis E24-78-1HN

Wellbore #1

Design: OH

Standard Survey Report

16 May, 2014

IDS

Survey Report

Company:	Noble Energy, Inc	Local Co-ordinate Reference:	Well Storis E24-78-1HN
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 E24-78-1HN	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 E24-78-1HN					
Well Position	+N-S	0.0 usft	Northing:	1,413,520.05 usft	Latitude:	40° 27' 54.576 N
	+E-W	0.0 usft	Easting:	3,245,550.66 usft	Longitude:	104° 37' 2.928 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	359.92	

Survey Program	Date	5/16/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
382.0	750.0	Survey #1 (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
817.0	7,048.0	Survey #2 (Wellbore #1)	MWD	MWD - Standard	
7,132.0	11,516.0	Survey #3 (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	0.20	126.20	382.0	-0.4	0.5	-0.4	0.05	0.05	0.00
750.0	0.20	245.60	750.0	-1.0	0.5	-1.0	0.09	0.00	32.45
817.0	0.70	230.80	817.0	-1.3	0.0	-1.3	0.76	0.75	-22.09
First MWD									
909.0	1.00	229.00	909.0	-2.2	-1.0	-2.2	0.33	0.33	-1.96
1,002.0	1.00	240.40	1,002.0	-3.2	-2.3	-3.2	0.21	0.00	12.26
1,095.0	1.00	242.20	1,095.0	-3.9	-3.7	-3.9	0.03	0.00	1.94
1,188.0	1.00	238.20	1,187.9	-4.7	-5.1	-4.7	0.08	0.00	-4.30

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Well:	Storis E24-78-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	OH	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)
1,280.0	1.10	234.40	1,279.9	-5.7	-6.5	-5.7	0.13	0.11	-4.13
1,373.0	1.00	237.30	1,372.9	-6.6	-8.0	-6.6	0.12	-0.11	3.12
1,465.0	1.10	236.90	1,464.9	-7.6	-9.4	-7.5	0.11	0.11	-0.43
1,558.0	1.00	240.30	1,557.9	-8.4	-10.8	-8.4	0.13	-0.11	3.66
1,653.0	1.50	166.20	1,652.9	-10.1	-11.2	-10.0	1.64	0.53	-78.00
1,749.0	1.50	149.60	1,748.8	-12.4	-10.3	-12.4	0.45	0.00	-17.29
1,844.0	2.70	135.10	1,843.8	-15.0	-8.1	-15.0	1.37	1.26	-15.26
1,939.0	4.00	136.60	1,938.6	-19.0	-4.2	-19.0	1.37	1.37	1.58
2,034.0	5.00	128.00	2,033.3	-24.0	1.3	-24.0	1.27	1.05	-9.05
2,129.0	6.70	134.60	2,127.8	-30.4	8.5	-30.4	1.92	1.79	6.95
2,224.0	7.00	149.90	2,222.1	-39.3	15.4	-39.3	1.94	0.32	16.11
2,319.0	8.10	161.10	2,316.3	-50.7	20.4	-50.7	1.93	1.16	11.79
2,414.0	9.80	168.90	2,410.2	-64.9	24.2	-65.0	2.19	1.79	8.21
2,509.0	11.70	170.00	2,503.5	-82.3	27.4	-82.4	2.01	2.00	1.16
2,605.0	10.50	159.30	2,597.7	-100.1	32.2	-100.2	2.48	-1.25	-11.15
2,700.0	10.60	153.00	2,691.1	-116.0	39.2	-116.1	1.22	0.11	-6.63
2,795.0	12.10	159.00	2,784.2	-133.1	46.7	-133.1	2.01	1.58	6.32
2,890.0	14.10	161.70	2,876.8	-153.4	53.9	-153.4	2.20	2.11	2.84
2,985.0	12.40	160.60	2,969.2	-174.0	61.0	-174.1	1.81	-1.79	-1.16
3,080.0	13.50	166.10	3,061.8	-194.4	67.0	-194.5	1.74	1.16	5.79
3,175.0	11.80	166.80	3,154.5	-214.6	71.9	-214.7	1.80	-1.79	0.74
3,270.0	9.70	167.70	3,247.8	-231.9	75.8	-232.0	2.22	-2.21	0.95
3,365.0	7.80	181.70	3,341.7	-246.1	77.3	-246.2	2.99	-2.00	14.74
3,460.0	6.20	183.80	3,436.0	-257.7	76.8	-257.8	1.71	-1.68	2.21
3,556.0	4.70	195.40	3,531.6	-266.7	75.4	-266.8	1.93	-1.56	12.08
3,650.0	3.10	205.80	3,625.4	-272.7	73.3	-272.8	1.85	-1.70	11.06
3,746.0	2.00	231.90	3,721.3	-276.0	70.8	-276.1	1.64	-1.15	27.19
3,841.0	0.30	199.00	3,816.3	-277.3	69.4	-277.4	1.85	-1.79	-34.63
3,936.0	0.50	237.60	3,911.3	-277.7	69.0	-277.8	0.34	0.21	40.63
4,031.0	0.90	260.40	4,006.3	-278.1	67.9	-278.2	0.51	0.42	24.00
4,126.0	0.90	2.60	4,101.2	-277.5	67.2	-277.6	1.47	0.00	107.58
4,221.0	1.20	340.40	4,196.2	-275.8	66.9	-275.9	0.53	0.32	-23.37
4,316.0	2.00	352.00	4,291.2	-273.2	66.4	-273.3	0.90	0.84	12.21
4,412.0	2.00	11.90	4,387.1	-269.9	66.5	-270.0	0.72	0.00	20.73
4,507.0	2.90	66.20	4,482.1	-267.3	69.0	-267.4	2.50	0.95	57.16
4,602.0	0.60	28.10	4,577.0	-265.9	71.4	-266.0	2.59	-2.42	-40.11
4,697.0	0.90	160.30	4,672.0	-266.2	71.9	-266.3	1.45	0.32	139.16
4,792.0	1.10	174.10	4,767.0	-267.8	72.3	-267.9	0.33	0.21	14.53
4,888.0	1.40	161.00	4,863.0	-269.8	72.8	-269.9	0.43	0.31	-13.65
4,983.0	1.40	165.00	4,957.9	-272.0	73.4	-272.1	0.10	0.00	4.21
5,078.0	1.10	169.50	5,052.9	-274.0	73.9	-274.1	0.33	-0.32	4.74
5,173.0	0.80	169.00	5,147.9	-275.6	74.2	-275.7	0.32	-0.32	-0.53
5,268.0	0.50	173.10	5,242.9	-276.7	74.4	-276.8	0.32	-0.32	4.32

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey									
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5,363.0	0.20	246.40	5,337.9	-277.1	74.3	-277.2	0.51	-0.32	77.16
5,458.0	0.20	67.50	5,432.9	-277.1	74.3	-277.2	0.42	0.00	-188.32
5,554.0	1.10	77.00	5,528.9	-276.9	75.3	-277.0	0.94	0.94	9.90
5,649.0	1.40	60.80	5,623.9	-276.1	77.2	-276.2	0.48	0.32	-17.05
5,744.0	1.60	65.70	5,718.8	-275.0	79.4	-275.1	0.25	0.21	5.16
5,839.0	1.40	77.00	5,813.8	-274.2	81.8	-274.3	0.37	-0.21	11.89
5,933.0	1.30	64.60	5,907.8	-273.5	83.9	-273.6	0.33	-0.11	-13.19
6,028.0	1.30	57.50	6,002.8	-272.4	85.7	-272.5	0.17	0.00	-7.47
6,108.0	1.20	64.00	6,082.7	-271.6	87.3	-271.7	0.22	-0.13	8.13
6,164.0	1.40	53.50	6,138.7	-270.9	88.3	-271.0	0.55	0.36	-18.75
6,212.0	2.60	17.20	6,186.7	-269.5	89.1	-269.6	3.52	2.50	-75.63
6,260.0	4.80	357.60	6,234.6	-266.5	89.4	-266.6	5.22	4.58	-40.83
6,307.0	6.70	356.10	6,281.4	-261.8	89.1	-261.9	4.05	4.04	-3.19
6,355.0	8.80	354.80	6,328.9	-255.3	88.6	-255.4	4.39	4.38	-2.71
6,402.0	10.90	353.40	6,375.2	-247.3	87.7	-247.4	4.50	4.47	-2.98
6,450.0	13.30	354.70	6,422.1	-237.3	86.7	-237.4	5.03	5.00	2.71
6,497.0	15.50	355.30	6,467.7	-225.7	85.7	-225.8	4.69	4.68	1.28
6,545.0	18.20	354.70	6,513.6	-211.8	84.5	-211.9	5.64	5.63	-1.25
6,591.0	20.50	354.20	6,557.0	-196.6	83.0	-196.8	5.01	5.00	-1.09
6,639.0	25.90	354.10	6,601.1	-177.8	81.1	-177.9	11.25	11.25	-0.21
6,686.0	27.10	0.90	6,643.2	-156.9	80.2	-157.0	6.94	2.55	14.47
6,734.0	32.70	2.40	6,684.8	-133.0	80.9	-133.1	11.77	11.67	3.13
6,781.0	40.50	4.50	6,722.5	-105.1	82.6	-105.2	16.81	16.60	4.47
6,829.0	47.60	3.40	6,756.9	-71.8	84.9	-71.9	14.88	14.79	-2.29
6,876.0	53.40	0.80	6,786.8	-35.6	86.2	-35.7	13.06	12.34	-5.53
6,924.0	60.10	359.40	6,813.1	4.5	86.3	4.4	14.17	13.96	-2.92
6,971.0	62.20	356.60	6,835.8	45.7	84.8	45.6	6.87	4.47	-5.96
7,019.0	68.90	356.70	6,855.7	89.3	82.3	89.2	13.96	13.96	0.21
7,048.0	72.90	356.40	6,865.2	116.6	80.6	116.5	13.83	13.79	-1.03
7,102.0	79.19	359.59	6,878.2	169.0	78.8	168.9	12.98	11.65	5.91
7" Csg @ 7102' MD / 6878' TVD / 517' FSL & 1008' FWL Sec 24 - 7"									
7,132.0	82.70	1.30	6,882.9	198.6	79.0	198.5	12.98	11.70	5.70
7,227.0	86.60	359.90	6,891.8	293.1	80.0	293.0	4.36	4.11	-1.47
7,322.0	90.13	359.59	6,894.5	388.1	79.6	388.0	3.73	3.72	-0.33
7,417.0	90.57	1.08	6,893.9	483.1	80.1	483.0	1.64	0.46	1.57
7,512.0	89.25	0.20	6,894.0	578.1	81.2	578.0	1.67	-1.39	-0.93
7,607.0	88.20	357.65	6,896.2	673.0	79.4	672.9	2.90	-1.11	-2.68
7,703.0	88.11	356.34	6,899.2	768.8	74.4	768.7	1.37	-0.09	-1.36
7,798.0	90.92	356.60	6,900.0	863.6	68.5	863.6	2.97	2.96	0.27
7,893.0	91.19	356.86	6,898.3	958.5	63.1	958.4	0.39	0.28	0.27
7,988.0	92.07	358.18	6,895.6	1,053.3	59.0	1,053.3	1.67	0.93	1.39
8,083.0	91.98	358.80	6,892.2	1,148.3	56.5	1,148.2	0.66	-0.09	0.65
8,179.0	91.89	359.59	6,889.0	1,244.2	55.2	1,244.1	0.83	-0.09	0.82
8,274.0	90.75	359.85	6,886.8	1,339.2	54.7	1,339.1	1.23	-1.20	0.27

IDS

Survey Report

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Site:	Sec 24, T6N-R65W (Storis E24 Pad)	MD Reference:	Well @ 4722.0usft (H&P 330)
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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	OH	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)
8,369.0	91.01	359.68	6,885.4	1,434.2	54.3	1,434.1	0.33	0.27	-0.18
8,464.0	89.78	0.29	6,884.7	1,529.1	54.3	1,529.1	1.45	-1.29	0.64
8,559.0	89.69	0.73	6,885.1	1,624.1	55.1	1,624.1	0.47	-0.09	0.46
8,654.0	89.08	359.15	6,886.2	1,719.1	55.0	1,719.1	1.78	-0.64	-1.66
8,749.0	88.72	359.15	6,888.0	1,814.1	53.6	1,814.0	0.38	-0.38	0.00
8,845.0	89.87	357.39	6,889.2	1,910.0	50.7	1,910.0	2.19	1.20	-1.83
8,940.0	92.51	356.16	6,887.2	2,004.9	45.4	2,004.8	3.07	2.78	-1.29
9,035.0	91.80	357.48	6,883.6	2,099.7	40.1	2,099.6	1.58	-0.75	1.39
9,130.0	92.07	358.62	6,880.4	2,194.5	36.9	2,194.5	1.23	0.28	1.20
9,225.0	92.59	358.09	6,876.5	2,289.4	34.2	2,289.4	0.78	0.55	-0.56
9,320.0	93.12	358.89	6,871.8	2,384.3	31.7	2,384.2	1.01	0.56	0.84
9,415.0	92.77	0.12	6,866.9	2,479.1	30.8	2,479.1	1.34	-0.37	1.29
9,511.0	91.80	358.71	6,863.1	2,575.1	29.9	2,575.0	1.78	-1.01	-1.47
9,606.0	89.87	359.24	6,861.7	2,670.0	28.2	2,670.0	2.11	-2.03	0.56
9,701.0	89.87	358.97	6,861.9	2,765.0	26.7	2,765.0	0.28	0.00	-0.28
9,796.0	90.22	358.97	6,861.9	2,860.0	25.0	2,860.0	0.37	0.37	0.00
9,891.0	90.40	358.71	6,861.3	2,955.0	23.1	2,954.9	0.33	0.19	-0.27
9,986.0	90.57	359.59	6,860.5	3,050.0	21.6	3,049.9	0.94	0.18	0.93
10,081.0	91.10	358.62	6,859.2	3,144.9	20.2	3,144.9	1.16	0.56	-1.02
10,176.0	91.19	358.18	6,857.3	3,239.9	17.5	3,239.9	0.47	0.09	-0.46
10,272.0	90.84	359.94	6,855.6	3,335.8	15.9	3,335.8	1.87	-0.36	1.83
10,367.0	91.28	358.89	6,853.8	3,430.8	15.0	3,430.8	1.20	0.46	-1.11
10,462.0	91.19	358.97	6,851.8	3,525.8	13.2	3,525.8	0.13	-0.09	0.08
10,557.0	90.48	359.50	6,850.4	3,620.8	11.9	3,620.7	0.93	-0.75	0.56
10,652.0	91.19	0.20	6,849.0	3,715.8	11.7	3,715.7	1.05	0.75	0.74
10,747.0	90.66	359.50	6,847.5	3,810.7	11.4	3,810.7	0.92	-0.56	-0.74
10,843.0	88.81	1.61	6,847.9	3,906.7	12.4	3,906.7	2.92	-1.93	2.20
10,938.0	88.64	0.64	6,850.0	4,001.7	14.2	4,001.7	1.04	-0.18	-1.02
11,033.0	88.90	1.35	6,852.0	4,096.6	15.9	4,096.6	0.80	0.27	0.75
11,128.0	89.52	0.38	6,853.4	4,191.6	17.3	4,191.6	1.21	0.65	-1.02
11,223.0	87.49	0.99	6,855.8	4,286.6	18.4	4,286.6	2.23	-2.14	0.64
11,318.0	87.67	0.38	6,859.8	4,381.5	19.6	4,381.5	0.67	0.19	-0.64
11,413.0	88.20	1.79	6,863.3	4,476.4	21.4	4,476.4	1.58	0.56	1.48
11,444.0	88.29	1.08	6,864.2	4,507.4	22.1	4,507.3	2.31	0.29	-2.29
Last MWD @ 11444' MD / 6864' TVD									
11,516.0	88.29	1.08	6,866.4	4,579.3	23.5	4,579.3	0.00	0.00	0.00
PTD @ 11516' MD / 6866' TVD / 379' FNL & 1020' FWL S									

IDS

Survey Report

Company:	Noble Energy, Inc	Local Co-ordinate Reference:	Well Storis E24-78-1HN
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 E24-78-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
7,102.0	6,878.2	7"	7	8-3/4	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
817.0	817.0	-1.3	0.0	First MWD	
7,102.0	6,878.2	169.0	78.8	7" Csg @ 7102' MD / 6878' TVD / 517' FSL & 1008' FWL Sec 24	
11,444.0	6,864.2	4,507.4	22.1	Last MWD @ 11444' MD / 6864' TVD	
11,516.0	6,866.4	4,579.3	23.5	PTD @ 11516' MD / 6866' TVD / 379' FNL & 1020' FWL S	

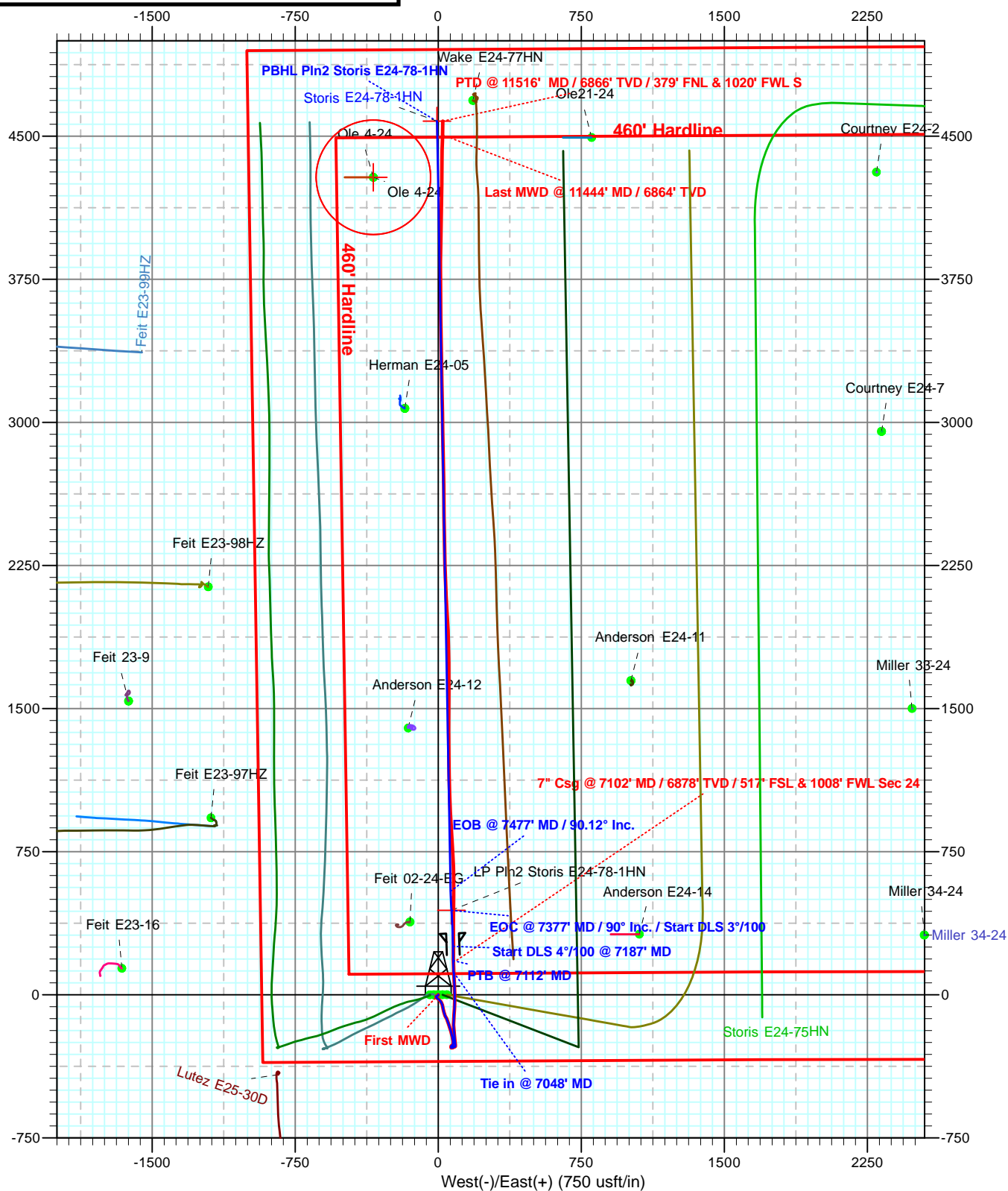
Checked By: _____	Approved By: _____	Date: _____
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Weld County, CO (NAD 83)
Sec 24, T6N-R65W (Storis E24 Pad)
Storis E24-78-1HN
H&P 330
Plan #2



SHL @ 350' FSL & 927 FWL Sec 24
7' Csg 518' FSL & 1008' FW Sec 24
PBHL @ 379 FNL & 1020 FWL Sec 24





Weld County, CO (NAD 83)
Sec 24, T6N-R65W (Storis E24 Pad)
Storis E24-78-1HN
H&P 330
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