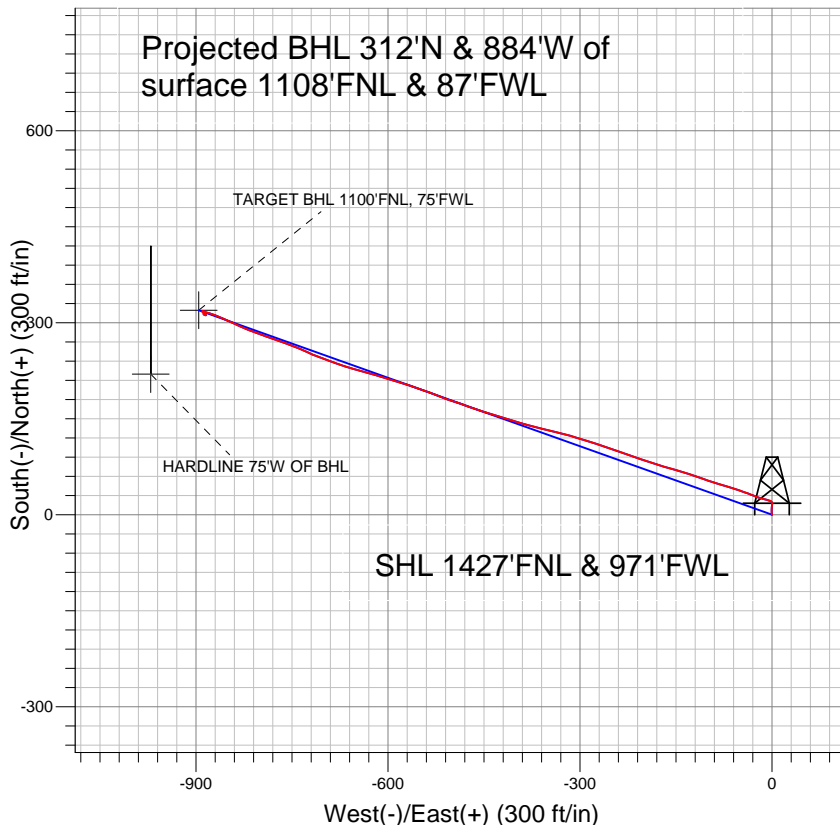


## NOBLE ENERGY INC WELD COUNTY CO



### LEGEND

- IGO Farms J28-31D, Wellbore #1, Plan #2 (01-10-11) V0
- Wellbore #1
- Survey #1

## Final Survey Plot

Projected Final Survey -  
 7592'MD & 7480'TVD @ 937' VS  
 0.5 deg Inc 83.8 deg AZ

Project: SEC.28-T5N-R66W  
 Site: IGO Farms Pad Sec.28-T5N-R66W  
 Well: IGO Farms J28-31D  
 Plan: Wellbore #1



## **Directional**

# **NOBLE ENERGY INC WELD COUNTY CO**

**SEC.28-T5N-R66W**

**IGO Farms Pad Sec.28-T5N-R66W**

**IGO Farms J28-31D**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**18 January, 2011**



<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well IGO Farms J28-31D
<b>Project:</b>	SEC.28-T5N-R66W	<b>TVD Reference:</b>	WELL @ 4889.0ft (Original Well Elev)
<b>Site:</b>	IGO Farms Pad Sec.28-T5N-R66W	<b>MD Reference:</b>	WELL @ 4889.0ft (Original Well Elev)
<b>Well:</b>	IGO Farms J28-31D	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

<b>Project</b>	SEC.28-T5N-R66W, WELD COUNTY COLORADO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	IGO Farms Pad Sec.28-T5N-R66W		
<b>Site Position:</b>		<b>Northing:</b>	1,379,821.42 ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,197,699.53 ft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"
		<b>Latitude:</b>	40° 22' 25.824 N
		<b>Longitude:</b>	104° 47' 25.512 W
		<b>Grid Convergence:</b>	0.46 °

<b>Well</b>	IGO Farms J28-31D		
<b>Well Position</b>	<b>+N-S</b>	0.0 ft	<b>Northing:</b> 1,379,821.21 ft
	<b>+E-W</b>	0.0 ft	<b>Easting:</b> 3,197,674.45 ft
<b>Position Uncertainty</b>	0.0 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	40° 22' 25.824 N
		<b>Longitude:</b>	104° 47' 25.836 W
		<b>Ground Level:</b>	4,876.0 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	7/6/2009	9.10	67.10	53,338

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N-S (ft)</b>	<b>+E-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	289.96	

<b>Survey Program</b>	<b>Date</b>	1/18/2011			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
147.0	7,592.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N-S (ft)</b>	<b>+E-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
147.0	1.00	347.00	147.0	1.2	-0.3	0.7	0.68	0.68	0.00	
238.0	1.40	358.00	238.0	3.1	-0.5	1.5	0.51	0.44	12.09	
326.0	1.50	354.20	325.9	5.4	-0.7	2.4	0.16	0.11	-4.32	
415.0	1.60	3.70	414.9	7.8	-0.7	3.3	0.31	0.11	10.67	
505.0	1.80	6.60	504.9	10.4	-0.5	4.0	0.24	0.22	3.22	
580.0	2.00	11.60	579.8	12.9	-0.1	4.4	0.35	0.27	6.67	
667.0	1.80	8.90	666.8	15.7	0.5	4.9	0.25	-0.23	-3.10	
760.0	2.20	340.80	759.7	18.8	0.1	6.3	1.12	0.43	-30.22	
885.0	2.10	287.50	884.7	21.8	-2.9	10.1	1.54	-0.08	-42.64	
947.0	2.00	285.10	946.6	22.4	-5.0	12.4	0.21	-0.16	-3.87	
1,041.0	1.50	283.00	1,040.6	23.1	-7.8	15.2	0.54	-0.53	-2.23	
1,135.0	1.40	285.50	1,134.5	23.7	-10.1	17.6	0.13	-0.11	2.66	

<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well IGO Farms J28-31D
<b>Project:</b>	SEC.28-T5N-R66W	<b>TVD Reference:</b>	WELL @ 4889.0ft (Original Well Elev)
<b>Site:</b>	IGO Farms Pad Sec.28-T5N-R66W	<b>MD Reference:</b>	WELL @ 4889.0ft (Original Well Elev)
<b>Well:</b>	IGO Farms J28-31D	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
1,228.0	1.40	285.30	1,227.5	24.3	-12.3	19.8	0.01	0.00	-0.22	
1,322.0	1.40	287.90	1,321.5	25.0	-14.5	22.1	0.07	0.00	2.77	
1,415.0	1.50	283.90	1,414.5	25.6	-16.7	24.5	0.15	0.11	-4.30	
1,509.0	2.80	288.30	1,508.4	26.6	-20.1	28.0	1.39	1.38	4.68	
1,603.0	4.30	291.10	1,602.2	28.6	-25.6	33.8	1.61	1.60	2.98	
1,696.0	5.90	290.00	1,694.8	31.5	-33.3	42.1	1.72	1.72	-1.18	
1,790.0	7.30	291.40	1,788.2	35.3	-43.4	52.9	1.50	1.49	1.49	
1,883.0	8.90	287.50	1,880.3	39.6	-55.8	66.0	1.82	1.72	-4.19	
1,977.0	10.90	286.40	1,972.9	44.3	-71.3	82.1	2.14	2.13	-1.17	
2,071.0	12.00	288.40	2,065.0	49.9	-89.1	100.8	1.24	1.17	2.13	
2,164.0	12.90	288.60	2,155.8	56.3	-108.1	120.8	0.97	0.97	0.22	
2,258.0	14.60	288.10	2,247.1	63.3	-129.3	143.1	1.81	1.81	-0.53	
2,351.0	14.40	286.50	2,337.2	70.3	-151.5	166.4	0.48	-0.22	-1.72	
2,445.0	15.30	285.10	2,428.0	76.8	-174.7	190.4	1.03	0.96	-1.49	
2,539.0	16.00	290.40	2,518.5	84.5	-198.8	215.7	1.69	0.74	5.64	
2,632.0	14.90	288.90	2,608.2	92.9	-222.1	240.5	1.26	-1.18	-1.61	
2,726.0	15.50	288.90	2,698.9	100.9	-245.4	265.1	0.64	0.64	0.00	
2,819.0	15.40	288.20	2,788.5	108.8	-268.9	289.9	0.23	-0.11	-0.75	
2,913.0	15.50	288.00	2,879.1	116.5	-292.7	314.9	0.12	0.11	-0.21	
3,007.0	14.10	285.70	2,970.0	123.5	-315.7	338.9	1.61	-1.49	-2.45	
3,100.0	13.60	283.10	3,060.3	129.1	-337.3	361.1	0.86	-0.54	-2.80	
3,194.0	14.10	283.90	3,151.6	134.3	-359.1	383.4	0.57	0.53	0.85	
3,287.0	14.10	284.30	3,241.8	139.8	-381.1	406.0	0.10	0.00	0.43	
3,381.0	13.80	289.00	3,333.0	146.3	-402.8	428.6	1.25	-0.32	5.00	
3,474.0	14.70	285.70	3,423.1	153.1	-424.7	451.4	1.30	0.97	-3.55	
3,568.0	13.10	286.50	3,514.4	159.4	-446.4	473.9	1.71	-1.70	0.85	
3,662.0	13.00	291.20	3,606.0	166.2	-466.4	495.1	1.13	-0.11	5.00	
3,755.0	12.70	287.40	3,696.6	173.1	-485.9	515.8	0.96	-0.32	-4.09	
3,849.0	13.50	289.60	3,788.2	179.8	-506.1	537.1	1.00	0.85	2.34	
3,942.0	14.50	291.40	3,878.4	187.7	-527.2	559.6	1.17	1.08	1.94	
4,036.0	14.30	290.10	3,969.5	196.0	-549.1	583.0	0.40	-0.21	-1.38	
4,130.0	15.70	288.00	4,060.3	203.9	-572.1	607.3	1.60	1.49	-2.23	
4,223.0	14.90	286.70	4,150.0	211.2	-595.5	631.8	0.94	-0.86	-1.40	
4,317.0	15.30	284.60	4,240.7	217.8	-619.1	656.2	0.72	0.43	-2.23	
4,410.0	15.10	286.50	4,330.5	224.4	-642.5	680.5	0.58	-0.22	2.04	
4,504.0	16.20	287.70	4,421.0	231.8	-666.8	705.9	1.22	1.17	1.28	
4,598.0	17.40	290.00	4,511.0	240.6	-692.5	733.0	1.46	1.28	2.45	
4,691.0	17.30	292.40	4,599.7	250.7	-718.3	760.7	0.78	-0.11	2.58	
4,785.0	16.70	293.20	4,689.6	261.3	-743.7	788.2	0.69	-0.64	0.85	
4,878.0	15.50	290.00	4,779.0	270.8	-767.6	814.0	1.60	-1.29	-3.44	
4,972.0	14.40	287.70	4,869.8	278.7	-790.6	838.2	1.33	-1.17	-2.45	
5,066.0	14.30	291.60	4,960.9	286.5	-812.5	861.5	1.03	-0.11	4.15	
5,159.0	12.60	295.30	5,051.3	295.1	-832.3	883.1	2.05	-1.83	3.98	
5,253.0	10.90	293.80	5,143.3	303.0	-849.7	902.1	1.84	-1.81	-1.60	
5,346.0	8.60	292.60	5,235.0	309.3	-864.2	917.9	2.48	-2.47	-1.29	
5,440.0	6.10	289.00	5,328.2	313.6	-875.4	929.9	2.70	-2.66	-3.83	
5,533.0	4.40	284.60	5,420.8	316.1	-883.5	938.4	1.88	-1.83	-4.73	
5,627.0	2.50	287.20	5,514.6	317.6	-889.0	944.0	2.03	-2.02	2.77	
5,721.0	1.10	112.10	5,608.6	317.9	-890.1	945.2	3.83	-1.49	-186.28	
5,814.0	0.90	96.30	5,701.6	317.5	-888.6	943.6	0.36	-0.22	-16.99	
5,908.0	0.70	82.80	5,795.6	317.4	-887.3	942.3	0.29	-0.21	-14.36	
5,912.3	0.68	81.92	5,799.9	317.5	-887.2	942.3	0.59	-0.53	-20.26	
TARGET BHL 1100'FNL, 75'FWL										
6,001.0	0.30	34.90	5,888.6	317.7	-886.6	941.8	0.59	-0.42	-53.04	

<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well IGO Farms J28-31D
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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,095.0	0.10	240.40	5,982.6	317.9	-886.5	941.8	0.42	-0.21	-164.36
6,189.0	0.30	210.00	6,076.6	317.6	-886.7	941.8	0.23	0.21	-32.34
6,282.0	0.40	227.20	6,169.6	317.2	-887.0	942.0	0.15	0.11	18.49
6,376.0	0.40	201.80	6,263.6	316.7	-887.4	942.2	0.19	0.00	-27.02
6,469.0	0.50	197.40	6,356.6	316.0	-887.6	942.2	0.11	0.11	-4.73
6,563.0	0.40	206.90	6,450.6	315.3	-887.9	942.2	0.13	-0.11	10.11
6,656.0	0.40	192.60	6,543.6	314.7	-888.1	942.2	0.11	0.00	-15.38
6,750.0	0.40	173.60	6,637.6	314.0	-888.2	942.0	0.14	0.00	-20.21
6,844.0	0.40	161.10	6,731.6	313.4	-888.0	941.7	0.09	0.00	-13.30
6,937.0	0.30	139.70	6,824.6	312.9	-887.8	941.3	0.18	-0.11	-23.01
7,031.0	0.40	116.90	6,918.6	312.6	-887.3	940.7	0.18	0.11	-24.26
7,124.0	0.40	105.30	7,011.6	312.3	-886.7	940.1	0.09	0.00	-12.47
7,218.0	0.30	111.70	7,105.6	312.2	-886.2	939.5	0.11	-0.11	6.81
7,312.0	0.30	106.60	7,199.6	312.0	-885.7	939.0	0.03	0.00	-5.43
7,405.0	0.30	100.30	7,292.6	311.9	-885.2	938.5	0.04	0.00	-6.77
7,499.0	0.40	84.90	7,386.6	311.9	-884.7	938.0	0.15	0.11	-16.38
7,590.7	0.50	83.81	7,478.2	311.9	-883.9	937.3	0.11	0.11	-1.19
HARDLINE 75'W OF BHL									
7,592.0	0.50	83.80	7,479.6	312.0	-883.9	937.3	0.11	0.11	-0.95

Checked By: _____	Approved By: _____	Date: _____
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