

End of Well Recap For:



Well Name and Number:

Nakagawa B13-64-1HN

Rig: H & P 330

Weld County, CO

Services Provided By:

Sharewell Energy Services





Noble Energy, Inc.

Weld County, CO

Wattenberg Field

Nakagawa B13-64-1HN

OH

Survey: MWD Survey

Standard Survey Report

12 July, 2013

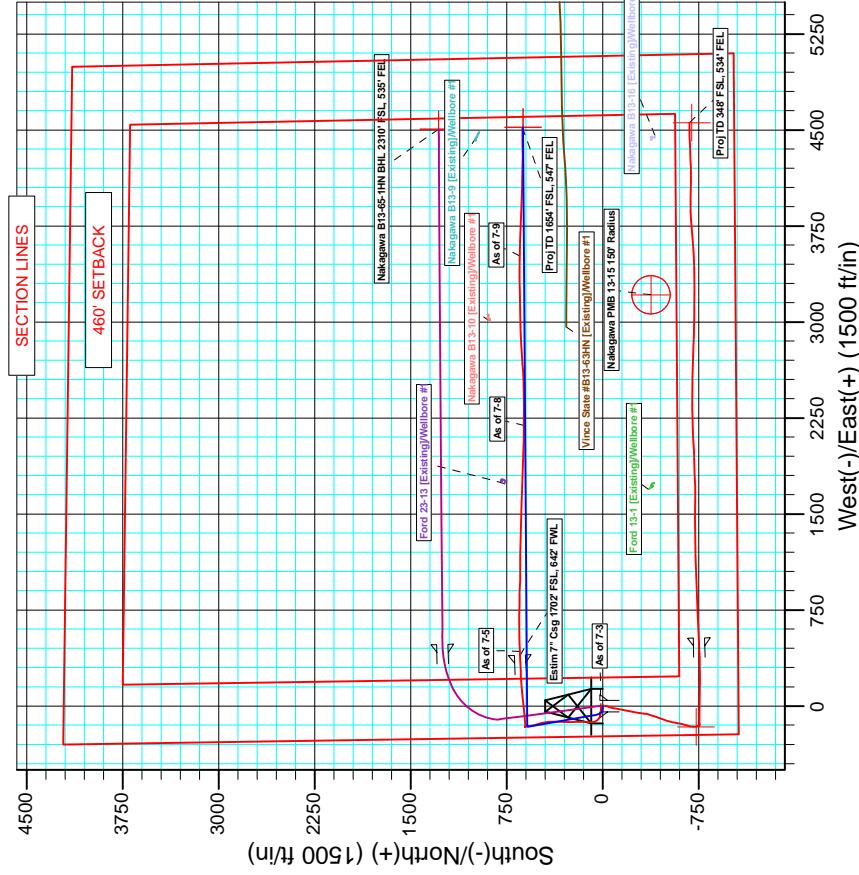
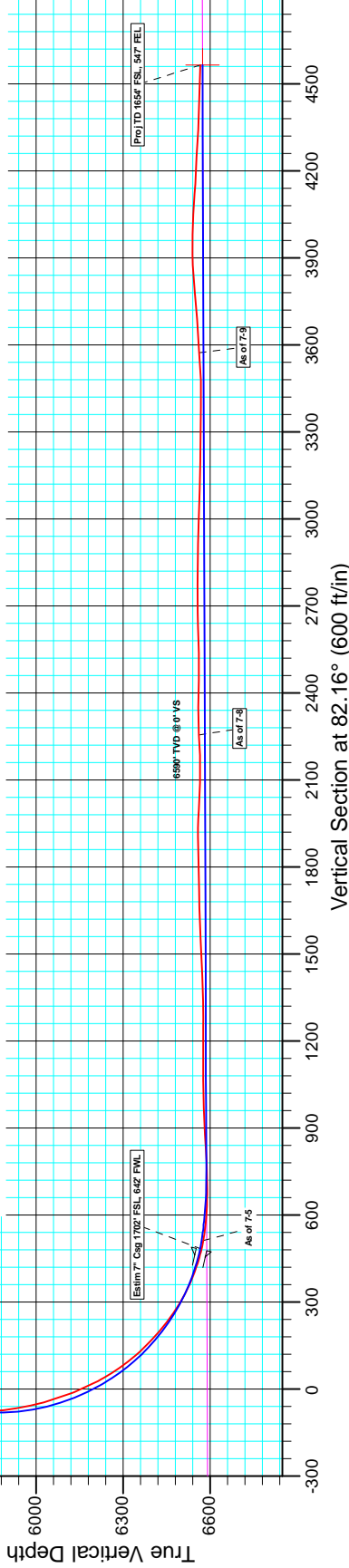
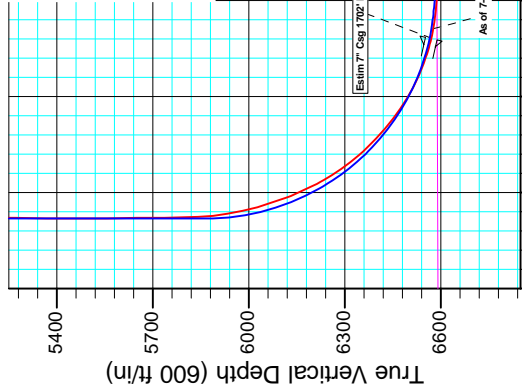
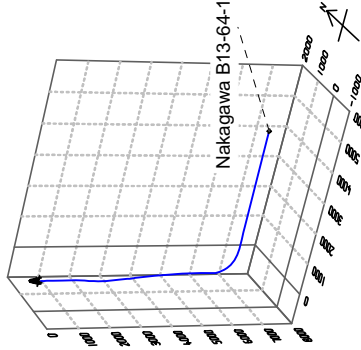


Noble Energy, Inc.
Project: Weld County, CO
Site: Wattenberg Field
Well: Nakagawa B13-64-1HN
Wellbore: OH
Design: plan2.28jun13 rbw
Lat: 40° 23' 41.75 N
Long: 104° 30' 26.03 W
Pad GL: 4570.00
KB @ 4600.00ft



SECTION DETAILS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
1200.00	0.000	0.00	1200.00	0.00	0.00	0.00	0.00	0.00	Start DLS 2.00 TFO 112.27
1550.00	7.000	270.00	1549.13	0.00	0.00	0.00	270.00	-21.15	Start 2259.04 hold at 2189.36 MD
2189.36	11.999	350.14	2181.76	65.75	-21.35	2.00	112.27	-62.26	Start Drop -2.00
4448.41	11.999	350.14	4391.45	528.45	-152.29	0.00	0.00	-78.77	Start 877.69 hold at 5048.34 MD
5048.34	0.000	0.00	4987.00	590.11	-163.00	2.00	180.00	-80.97	Start Build 8.00
5926.03	0.000	0.00	5864.69	590.11	-163.00	0.00	0.00	-80.97	Start Build 8.00
6988.53	85.000	89.60	6578.16	594.67	490.76	8.00	89.60	567.30	Start 75.00 hold at 6988.53 MD
7063.53	85.000	89.60	6584.70	595.20	565.47	0.00	0.00	641.39	Start Build 8.00
7128.53	90.200	89.60	6587.42	595.65	630.39	8.00	0.00	705.76	Start 3892.07 hold at 7128.53 MD
11020.60	90.200	89.60	6573.83	622.82	4522.34	0.00	0.00	4565.03	TD at 11020.60

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	+N/-S	+E/-W	Latitude	Longitude	Shape
Nakagawa B13-64-1HN BHL 1650' FSL, 535' FEL	623.07	4522.31	40° 23' 47.40 N	104° 29' 27.49 W	Point



Azimuths to Grid North
True North: -0.64°
Magnetic North: 7.82°
Magnetic Field
Strength: 52948.45nT
Dip Angle: 67.02°
Date: 6/10/2013
Model: IGRF2010

Company:	Noble Energy, Inc.	Local Co-ordinate Reference:	Well Nakagawa B13-64-1HN
Project:	Weld County, CO	TVD Reference:	KB @ 4600.00ft
Site:	Wattenberg Field	MD Reference:	KB @ 4600.00ft
Well:	Nakagawa B13-64-1HN	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	CompassVM

Project	Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site		Wattenberg Field			
Site Position:		Northing:	1,388,239.43 usft	Latitude:	40° 23' 41.53 N
From:	Lat/Long	Easting:	3,276,511.88 usft	Longitude:	104° 30' 26.03 W
Position Uncertainty:	0.00 ft	Slot Radius:	1.10 ft	Grid Convergence:	0.64 °

Well	Nakagawa B13-64-1HN					
Well Position	+N/-S	0.00 ft	Northing:	1,388,261.27 usft	Latitude:	40° 23' 41.75 N
	+E/-W	0.00 ft	Easting:	3,276,511.63 usft	Longitude:	104° 30' 26.03 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,570.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/10/2013	8.46	67.02	52,948

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	82.16	

Survey Program	Date	7/12/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
290.00	11,025.00	MWD Survey (OH)	MWD	MWD - Standard	

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)	
0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
290.00	1.600	170.38	289.96	-3.99	0.68	0.13	0.55	0.55	0.00	
605.00	1.400	22.58	604.92	-4.77	2.89	2.21	0.92	-0.06	-46.92	
641.00	1.100	53.70	640.91	-4.16	3.34	2.74	2.03	-0.83	86.44	
702.00	1.100	31.40	701.90	-3.32	4.11	3.62	0.70	0.00	-36.56	
796.00	1.200	50.30	795.88	-1.92	5.34	5.03	0.42	0.11	20.11	
890.00	1.100	45.80	889.86	-0.66	6.75	6.59	0.14	-0.11	-4.79	
984.00	0.700	300.80	983.86	0.26	6.90	6.87	1.54	-0.43	-111.70	
1,078.00	1.200	295.20	1,077.84	0.98	5.52	5.60	0.54	0.53	-5.96	
1,172.00	1.300	310.40	1,171.82	2.09	3.81	4.06	0.37	0.11	16.17	

Company:	Noble Energy, Inc.	Local Co-ordinate Reference:	Well Nakagawa B13-64-1HN
Project:	Weld County, CO	TVD Reference:	KB @ 4600.00ft
Site:	Wattenberg Field	MD Reference:	KB @ 4600.00ft
Well:	Nakagawa B13-64-1HN	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	CompassVM

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)
1,266.00	1.200	307.20	1,265.80	3.37	2.22	2.66	0.13	-0.11	-3.40
1,359.00	3.700	296.90	1,358.71	5.32	-1.24	-0.50	2.72	2.69	-11.08
1,454.00	6.400	290.70	1,453.33	8.58	-8.92	-7.67	2.90	2.84	-6.53
1,549.00	7.200	284.40	1,547.66	11.93	-19.64	-17.83	1.15	0.84	-6.63
1,644.00	6.600	277.50	1,641.98	14.12	-30.82	-28.61	1.08	-0.63	-7.26
1,739.00	6.100	276.40	1,736.39	15.40	-41.25	-38.76	0.54	-0.53	-1.16
As of 7-3									
1,833.00	5.700	275.50	1,829.89	16.40	-50.86	-48.15	0.44	-0.43	-0.96
1,928.00	7.300	274.70	1,924.28	17.35	-61.57	-58.63	1.69	1.68	-0.84
2,023.00	8.200	285.60	2,018.42	19.67	-74.12	-70.74	1.81	0.95	11.47
2,118.00	10.500	294.30	2,112.15	25.05	-88.53	-84.28	2.84	2.42	9.16
2,213.00	11.600	312.90	2,205.42	35.12	-103.42	-97.66	3.91	1.16	19.58
2,308.00	11.900	324.40	2,298.44	49.59	-116.12	-108.27	2.48	0.32	12.11
2,403.00	10.900	344.20	2,391.60	66.20	-124.27	-114.08	4.23	-1.05	20.84
2,498.00	11.700	359.00	2,484.78	84.48	-126.89	-114.17	3.16	0.84	15.58
2,592.00	14.100	2.00	2,576.40	105.45	-126.66	-111.08	2.65	2.55	3.19
2,687.00	14.800	0.40	2,668.40	129.15	-126.17	-107.36	0.85	0.74	-1.68
2,782.00	13.300	1.80	2,760.55	152.21	-125.74	-103.79	1.62	-1.58	1.47
2,877.00	14.600	1.10	2,852.75	175.10	-125.17	-100.10	1.38	1.37	-0.74
2,972.00	13.400	359.60	2,944.93	198.08	-125.01	-96.81	1.32	-1.26	-1.58
3,067.00	10.800	356.70	3,037.81	217.98	-125.60	-94.68	2.81	-2.74	-3.05
3,161.00	11.300	355.30	3,130.06	235.95	-126.86	-93.47	0.60	0.53	-1.49
3,255.00	13.000	3.30	3,221.96	255.69	-127.01	-90.92	2.54	1.81	8.51
3,350.00	15.000	2.10	3,314.14	278.64	-125.94	-86.73	2.13	2.11	-1.26
3,445.00	12.100	0.40	3,406.48	300.89	-125.42	-83.18	3.08	-3.05	-1.79
3,540.00	12.100	2.00	3,499.37	320.80	-125.01	-80.05	0.35	0.00	1.68
3,635.00	12.800	2.40	3,592.14	341.26	-124.22	-76.48	0.74	0.74	0.42
3,729.00	13.300	2.40	3,683.71	362.47	-123.33	-72.70	0.53	0.53	0.00
3,824.00	13.700	357.90	3,776.09	384.63	-123.28	-69.63	1.18	0.42	-4.74
3,918.00	11.400	355.40	3,867.84	405.02	-124.44	-67.99	2.51	-2.45	-2.66
4,013.00	10.100	354.70	3,961.17	422.67	-125.96	-67.09	1.38	-1.37	-0.74
4,107.00	9.500	354.50	4,053.79	438.60	-127.46	-66.41	0.64	-0.64	-0.21
4,203.00	9.800	350.90	4,148.44	454.55	-129.52	-66.26	0.70	0.31	-3.75
4,297.00	10.900	350.20	4,240.91	471.21	-132.29	-66.74	1.18	1.17	-0.74
4,392.00	12.400	345.40	4,333.95	489.93	-136.39	-68.25	1.88	1.58	-5.05
4,487.00	10.500	340.10	4,427.06	507.94	-141.91	-71.26	2.28	-2.00	-5.58
4,582.00	10.500	342.80	4,520.47	524.35	-147.42	-74.47	0.52	0.00	2.84
4,677.00	9.600	344.60	4,614.01	540.26	-152.08	-76.92	1.00	-0.95	1.89
4,771.00	8.800	353.20	4,706.80	554.96	-155.02	-77.82	1.69	-0.85	9.15
4,866.00	9.600	354.10	4,800.58	570.05	-156.69	-77.42	0.86	0.84	0.95
4,961.00	8.700	354.20	4,894.37	585.08	-158.23	-76.89	0.95	-0.95	0.11
5,055.00	5.800	349.60	4,987.61	596.83	-159.81	-76.85	3.14	-3.09	-4.89
5,150.00	3.600	341.50	5,082.28	604.38	-161.62	-77.62	2.41	-2.32	-8.53
5,244.00	1.500	328.30	5,176.19	608.22	-163.20	-78.66	2.31	-2.23	-14.04

Company:	Noble Energy, Inc.	Local Co-ordinate Reference:	Well Nakagawa B13-64-1HN
Project:	Weld County, CO	TVD Reference:	KB @ 4600.00ft
Site:	Wattenberg Field	MD Reference:	KB @ 4600.00ft
Well:	Nakagawa B13-64-1HN	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	CompassVM

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)
5,340.00	0.700	240.70	5,272.17	609.01	-164.37	-79.72	1.70	-0.83	-91.25
5,435.00	0.800	211.80	5,367.16	608.16	-165.23	-80.68	0.41	0.11	-30.42
5,530.00	0.300	54.30	5,462.16	607.74	-165.38	-80.88	1.14	-0.53	-165.79
5,625.00	0.400	100.50	5,557.16	607.82	-164.85	-80.35	0.30	0.11	48.63
5,719.00	0.900	130.10	5,651.15	607.29	-163.96	-79.54	0.62	0.53	31.49
5,804.00	1.000	128.50	5,736.14	606.40	-162.87	-78.58	0.12	0.12	-1.88
5,909.00	2.600	103.60	5,841.09	605.27	-159.84	-75.73	1.66	1.52	-23.71
5,957.00	6.200	85.00	5,888.94	605.24	-156.20	-72.13	7.97	7.50	-38.75
6,003.00	9.300	80.10	5,934.52	606.09	-150.06	-65.93	6.88	6.74	-10.65
6,051.00	12.300	80.80	5,981.66	607.58	-141.19	-56.94	6.26	6.25	1.46
6,098.00	15.100	83.40	6,027.32	609.08	-130.16	-45.82	6.10	5.96	5.53
6,193.00	21.500	86.30	6,117.47	611.63	-100.47	-16.05	6.80	6.74	3.05
6,287.00	27.100	87.00	6,203.11	613.86	-61.87	22.50	5.97	5.96	0.74
6,382.00	34.600	84.70	6,284.61	617.49	-13.33	71.07	7.99	7.89	-2.42
6,477.00	42.500	82.40	6,358.85	624.24	45.43	130.21	8.45	8.32	-2.42
6,572.00	49.600	84.80	6,424.75	631.77	113.36	198.52	7.69	7.47	2.53
6,666.00	56.700	86.70	6,481.09	637.29	188.32	273.54	7.72	7.55	2.02
6,761.00	65.000	87.60	6,527.32	641.38	271.11	356.12	8.78	8.74	0.95
6,855.00	73.400	87.50	6,560.67	645.14	358.83	443.52	8.94	8.94	-0.11
6,895.00	77.287	87.50	6,570.79	646.82	397.48	482.04	9.72	9.72	0.00
Estim 7" Csg 1702' FSL, 642' FWL									
6,926.00	80.300	87.50	6,576.82	648.15	427.86	512.32	9.72	9.72	0.00
As of 7-5									
7,010.00	85.500	88.40	6,587.20	651.13	511.13	595.22	6.28	6.19	1.07
7,105.00	90.300	89.80	6,590.68	652.62	606.03	689.43	5.26	5.05	1.47
7,200.00	92.700	90.20	6,588.19	652.62	700.99	783.50	2.56	2.53	0.42
7,295.00	93.900	90.70	6,582.72	651.87	795.82	877.35	1.37	1.26	0.53
7,389.00	91.000	92.10	6,578.70	649.58	889.70	970.03	3.43	-3.09	1.49
7,484.00	91.100	91.50	6,576.96	646.59	984.63	1,063.67	0.64	0.11	-0.63
7,579.00	89.900	90.00	6,576.13	645.35	1,079.62	1,157.60	2.02	-1.26	-1.58
7,674.00	89.800	89.70	6,576.38	645.60	1,174.62	1,251.74	0.33	-0.11	-0.32
7,769.00	91.100	91.90	6,575.64	644.27	1,269.60	1,345.65	2.69	1.37	2.32
7,863.00	92.200	91.90	6,572.93	641.16	1,363.51	1,438.25	1.17	1.17	0.00
7,958.00	92.800	92.70	6,568.79	637.35	1,458.34	1,531.68	1.05	0.63	0.84
8,053.00	91.800	91.10	6,564.97	634.20	1,553.20	1,625.23	1.98	-1.05	-1.68
8,148.00	90.400	92.60	6,563.15	631.13	1,648.13	1,718.85	2.16	-1.47	1.58
8,242.00	92.700	92.30	6,560.61	627.12	1,742.01	1,811.30	2.47	2.45	-0.32
8,337.00	89.600	91.20	6,558.70	624.22	1,836.93	1,904.94	3.46	-3.26	-1.16
8,431.00	86.900	91.00	6,561.57	622.41	1,930.86	1,997.74	2.88	-2.87	-0.21
8,526.00	87.600	90.30	6,566.13	621.34	2,025.74	2,091.59	1.04	0.74	-0.74
8,621.00	92.700	93.00	6,565.88	618.60	2,120.66	2,185.25	6.07	5.37	2.84
8,693.00	93.300	91.90	6,562.11	615.53	2,192.50	2,255.99	1.74	0.83	-1.53
As of 7-8									
8,788.00	89.000	89.50	6,560.20	614.37	2,287.44	2,349.89	5.18	-4.53	-2.53

Company:	Noble Energy, Inc.	Local Co-ordinate Reference:	Well Nakagawa B13-64-1HN
Project:	Weld County, CO	TVD Reference:	KB @ 4600.00ft
Site:	Wattenberg Field	MD Reference:	KB @ 4600.00ft
Well:	Nakagawa B13-64-1HN	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	CompassVM

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)	
8,883.00	89.500	88.10	6,561.45	616.36	2,382.41	2,444.24	1.56	0.53	-1.47	
8,978.00	90.300	88.30	6,561.61	619.35	2,477.36	2,538.71	0.87	0.84	0.21	
9,072.00	92.900	87.40	6,558.99	622.87	2,571.25	2,632.20	2.93	2.77	-0.96	
9,167.00	89.200	86.20	6,557.25	628.17	2,666.07	2,726.86	4.09	-3.89	-1.26	
9,262.00	89.900	86.70	6,558.00	634.05	2,760.88	2,821.58	0.91	0.74	0.53	
9,357.00	89.100	87.30	6,558.82	639.03	2,855.75	2,916.24	1.05	-0.84	0.63	
9,452.00	88.000	88.60	6,561.23	642.42	2,950.65	3,010.72	1.79	-1.16	1.37	
9,546.00	88.000	88.90	6,564.51	644.47	3,044.57	3,104.04	0.32	0.00	0.32	
9,641.00	89.600	88.30	6,566.50	646.79	3,139.52	3,198.42	1.80	1.68	-0.63	
9,736.00	89.100	89.30	6,567.58	648.78	3,234.49	3,292.77	1.18	-0.53	1.05	
9,830.00	89.500	89.70	6,568.72	649.60	3,328.48	3,385.99	0.60	0.43	0.43	
9,926.00	91.700	90.40	6,567.72	649.52	3,424.47	3,481.07	2.40	2.29	0.73	
10,020.00	93.900	91.60	6,563.13	647.88	3,518.33	3,573.84	2.67	2.34	1.28	
As of 7-9										
10,137.00	93.700	91.00	6,555.37	645.23	3,635.05	3,689.09	0.54	-0.17	-0.51	
10,232.00	95.300	92.70	6,547.92	642.18	3,729.70	3,782.44	2.45	1.68	1.79	
10,327.00	92.900	91.70	6,541.13	638.54	3,824.38	3,875.74	2.74	-2.53	-1.05	
10,422.00	89.100	92.40	6,539.47	635.14	3,919.28	3,969.29	4.07	-4.00	0.74	
10,516.00	86.700	91.40	6,542.91	632.03	4,013.16	4,061.87	2.77	-2.55	-1.06	
10,611.00	86.500	91.30	6,548.55	629.79	4,107.97	4,155.48	0.24	-0.21	-0.11	
10,706.00	86.500	91.50	6,554.35	627.48	4,202.76	4,249.07	0.21	0.00	0.21	
10,800.00	87.400	89.90	6,559.35	626.33	4,296.62	4,341.89	1.95	0.96	-1.70	
10,895.00	88.000	89.50	6,563.16	626.83	4,391.54	4,436.00	0.76	0.63	-0.42	
10,960.00	88.700	88.60	6,565.03	627.91	4,456.50	4,500.50	1.75	1.08	-1.38	
11,025.00	88.700	88.60	6,566.51	629.49	4,521.47	4,565.07	0.00	0.00	0.00	
Proj TD 1654' FSL, 547' FEL - Nakagawa B13-64-1HN BHL 1650' FSL, 535' FEL										

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (ft)	Hole Diameter (ft)	
6,895.00	6,570.79	Estim 7" Csg 1702' FSL, 642' FWL	0.46	0.50	

Survey Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,739.00	1,736.39	15.40	-41.25	As of 7-3	
6,926.00	6,576.82	648.15	427.86	As of 7-5	
8,693.00	6,562.11	615.53	2,192.50	As of 7-8	
10,020.00	6,563.13	647.88	3,518.33	As of 7-9	
11,025.00	6,566.51	629.49	4,521.47	Proj TD 1654' FSL, 547' FEL	

Company:	Noble Energy, Inc.	Local Co-ordinate Reference:	Well Nakagawa B13-64-1HN
Project:	Weld County, CO	TVD Reference:	KB @ 4600.00ft
Site:	Wattenberg Field	MD Reference:	KB @ 4600.00ft
Well:	Nakagawa B13-64-1HN	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	CompassVM

Checked By: _____	Approved By: _____	Date: _____
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