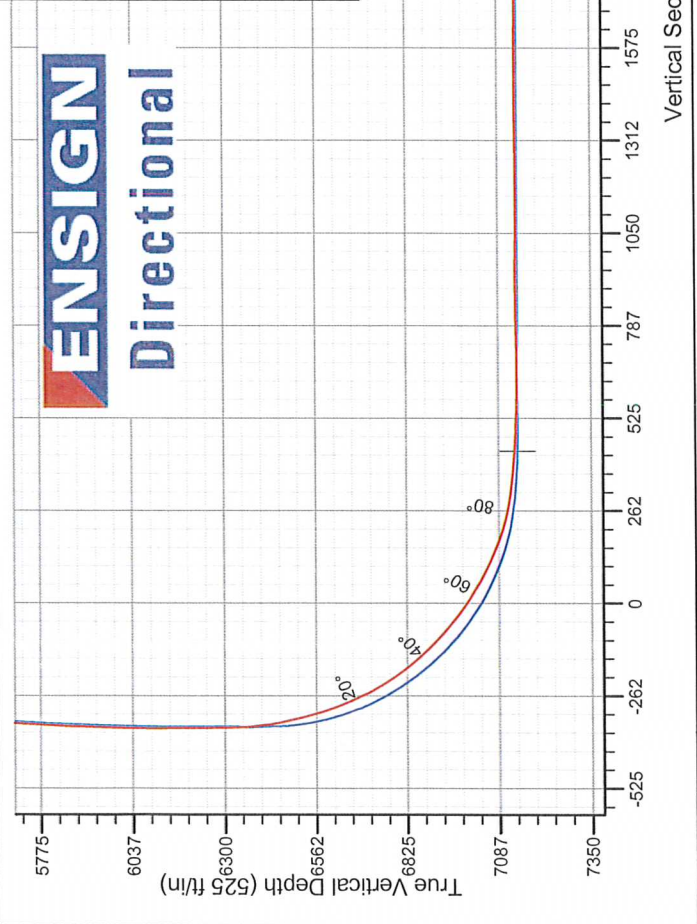
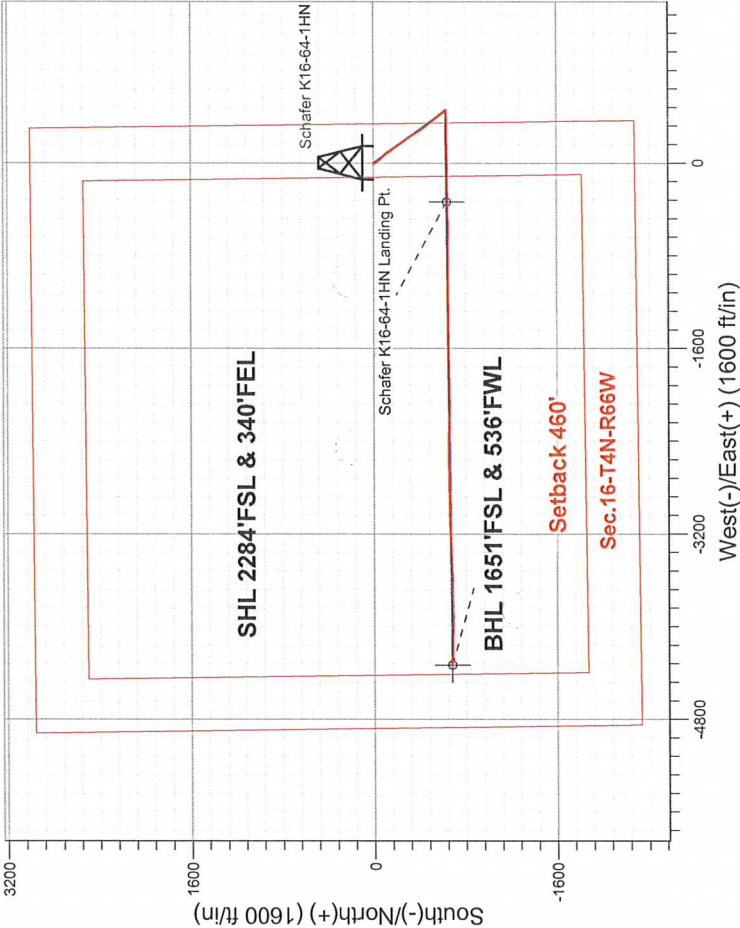


Noble Energy Inc.- Weld County, CO (Grid North)

Well Name: Schafer K16-64-1HN					
Surface Location: Schafer K16-64-1HN Pad Sec.16-T4N-R66W					
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone					
Ground Elevation: 4744.0		Longitude		Slot	
+N/-S	+E/-W	Northing	Easting	Latitude	
0.0	0.0	1356853.18	3202345.50	40.310690	-104.774420
Precision 828 RKB - 16' WELL @ 4760.0ft (Precision 828 RKB - 16')					

FINAL SURVEY

Projected Bottom Hole Location
11642'MD 7145'TVD 679'S & 4330'W of SHL
89.6 degree Incl @ 271.4 degree AZM



Schafer K16-64-1HN Pad Sec.16-T4N-R66W Schafer K16-64-1HN Wellbore #1 13.57, November 08 2013		ANNOTATIONS No annotation data is available.	
Schafer K16-64-1HN, Wellbore #1, Plan B - Rev 0 V0		LEGEND Schafer K16-64-1HN, Wellbore #1, Plan B - Rev 0 V0 Wellbore #1	



Directional

Noble Energy Inc.- Weld County, CO (Grid North)

Sec.16-T4N-R66W

Schafer K16-64-1HN Pad Sec.16-T4N-R66W

Schafer K16-64-1HN

Wellbore #1

Design: Wellbore #1

Standard Survey Report

08 November, 2013

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Schafer K16-64-1HN
Project:	Sec.16-T4N-R66W	TVD Reference:	WELL @ 4760.0ft (Precision 828 RKB - 16')
Site:	Schafer K16-64-1HN Pad Sec.16-T4N-R66W	MD Reference:	WELL @ 4760.0ft (Precision 828 RKB - 16')
Well:	Schafer K16-64-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	Sec.16-T4N-R66W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Schafer K16-64-1HN Pad Sec.16-T4N-R66W				
Site Position:		Northing:	1,356,853.19ft	Latitude:	40.310690
From:	Lat/Long	Easting:	3,202,345.50ft	Longitude:	-104.774420
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.47 °

Well	Schafer K16-64-1HN					
Well Position	+N/-S	0.0 ft	Northing:	1,356,853.18 ft	Latitude:	40.310690
	+E/-W	0.0 ft	Easting:	3,202,345.50 ft	Longitude:	-104.774420
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,744.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/23/2013	8.57	66.90	52,853

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	261.09	

Survey Program	Date	11/8/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
290.0	595.0	Survey #1 (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
613.0	11,642.0	Survey #2 (Wellbore #1)	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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
14.0	0.01	227.50	14.0	0.0	0.0	0.0	0.07	0.07	0.00	
Schafer K15-33 150' Circle										
14.2	0.01	227.50	14.2	0.0	0.0	0.0	0.07	0.07	0.00	
Weber K16-23 150' Circle										
22.1	0.02	227.50	22.1	0.0	0.0	0.0	0.07	0.07	0.00	
Weber K16-22 150' Circle										
23.3	0.02	227.50	23.3	0.0	0.0	0.0	0.07	0.07	0.00	
Weber PM K16-10 150' Circle										
26.3	0.02	227.50	26.3	0.0	0.0	0.0	0.07	0.07	0.00	

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Schafer K16-64-1HN
Project:	Sec.16-T4N-R66W	TVD Reference:	WELL @ 4760.0ft (Precision 828 RKB - 16')
Site:	Schafer K16-64-1HN Pad Sec.16-T4N-R66W	MD Reference:	WELL @ 4760.0ft (Precision 828 RKB - 16')
Well:	Schafer K16-64-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
Haren K16-21 150' Circle									
28.5	0.02	227.50	28.5	0.0	0.0	0.0	0.07	0.07	0.00
Smits 1 150' Circle									
290.0	0.20	227.50	290.0	-0.3	-0.4	0.4	0.07	0.07	0.00
595.0	0.00	132.40	595.0	-0.7	-0.8	0.9	0.07	-0.07	0.00
613.0	0.30	243.80	613.0	-0.7	-0.8	0.9	1.67	1.67	0.00
703.0	0.40	254.50	703.0	-0.9	-1.3	1.4	0.13	0.11	11.89
793.0	0.50	258.90	793.0	-1.1	-2.0	2.2	0.12	0.11	4.89
882.0	0.40	256.30	882.0	-1.2	-2.7	2.8	0.11	-0.11	-2.92
972.0	0.40	261.00	972.0	-1.3	-3.3	3.5	0.04	0.00	5.22
1,062.0	1.00	161.70	1,062.0	-2.1	-3.4	3.7	1.26	0.67	-110.33
1,157.0	2.60	174.60	1,156.9	-5.1	-2.9	3.7	1.73	1.68	13.58
1,252.0	3.60	160.90	1,251.8	-10.0	-1.7	3.3	1.30	1.05	-14.42
1,347.0	4.70	148.90	1,346.5	-16.2	1.3	1.3	1.47	1.16	-12.63
1,442.0	5.50	142.70	1,441.2	-23.1	6.0	-2.4	1.02	0.84	-6.53
1,537.0	6.20	137.50	1,535.7	-30.5	12.3	-7.4	0.92	0.74	-5.47
1,632.0	7.50	143.60	1,630.0	-39.3	19.4	-13.1	1.57	1.37	6.42
1,727.0	7.70	142.00	1,724.2	-49.3	27.0	-19.0	0.31	0.21	-1.68
1,821.0	8.40	137.80	1,817.2	-59.4	35.5	-25.9	0.97	0.74	-4.47
1,916.0	9.50	134.00	1,911.1	-70.0	45.8	-34.4	1.31	1.16	-4.00
2,014.0	9.50	137.30	2,007.7	-81.5	57.1	-43.8	0.56	0.00	3.37
2,104.0	10.50	142.60	2,096.4	-93.5	67.1	-51.8	1.51	1.11	5.89
2,194.0	10.80	140.30	2,184.8	-106.5	77.5	-60.0	0.58	0.33	-2.56
2,284.0	10.30	137.70	2,273.3	-118.9	88.3	-68.8	0.77	-0.56	-2.89
2,373.0	10.40	141.00	2,360.9	-131.1	98.7	-77.2	0.68	0.11	3.71
2,463.0	11.30	143.80	2,449.2	-144.5	109.0	-85.3	1.16	1.00	3.11
2,553.0	11.60	148.90	2,537.5	-159.4	118.9	-92.8	1.17	0.33	5.67
2,643.0	11.70	147.70	2,625.6	-174.8	128.4	-99.8	0.29	0.11	-1.33
2,733.0	12.20	148.70	2,713.6	-190.7	138.3	-107.1	0.60	0.56	1.11
2,823.0	12.20	146.80	2,801.6	-206.7	148.4	-114.6	0.45	0.00	-2.11
2,913.0	10.80	143.50	2,889.8	-221.5	158.6	-122.4	1.72	-1.56	-3.67
3,002.0	12.10	145.60	2,977.0	-235.9	168.9	-130.3	1.53	1.46	2.36
3,092.0	11.50	144.70	3,065.1	-251.0	179.4	-138.3	0.70	-0.67	-1.00
3,182.0	10.40	142.60	3,153.5	-264.8	189.5	-146.2	1.30	-1.22	-2.33
3,272.0	10.20	143.50	3,242.0	-277.6	199.2	-153.8	0.29	-0.22	1.00
3,362.0	10.50	144.30	3,330.6	-290.7	208.7	-161.1	0.37	0.33	0.89
3,452.0	11.00	143.80	3,419.0	-304.3	218.5	-168.8	0.57	0.56	-0.56
3,542.0	11.00	144.50	3,507.3	-318.2	228.6	-176.6	0.15	0.00	0.78
3,632.0	11.10	148.50	3,595.7	-332.6	238.1	-183.7	0.86	0.11	4.44
3,722.0	11.90	151.90	3,683.9	-348.1	247.0	-190.1	1.16	0.89	3.78
3,811.0	11.90	150.50	3,771.0	-364.2	255.8	-196.4	0.32	0.00	-1.57
3,901.0	12.00	150.00	3,859.0	-380.4	265.1	-203.0	0.16	0.11	-0.56
3,991.0	10.90	149.60	3,947.2	-395.8	274.1	-209.5	1.23	-1.22	-0.44
4,081.0	10.20	145.00	4,035.7	-409.7	283.0	-216.1	1.22	-0.78	-5.11
4,171.0	9.10	141.70	4,124.4	-421.8	291.9	-223.1	1.37	-1.22	-3.67
4,261.0	9.50	140.60	4,213.2	-433.1	301.1	-230.4	0.49	0.44	-1.22
4,351.0	9.10	144.50	4,302.1	-444.7	309.9	-237.3	0.83	-0.44	4.33
4,441.0	9.00	139.20	4,390.9	-455.8	318.6	-244.2	0.93	-0.11	-5.89
4,531.0	10.30	141.00	4,479.7	-467.4	328.3	-252.0	1.48	1.44	2.00
4,621.0	9.50	139.60	4,568.3	-479.3	338.2	-259.9	0.93	-0.89	-1.56
4,711.0	9.00	140.80	4,657.2	-490.4	347.4	-267.3	0.60	-0.56	1.33
4,801.0	9.30	147.10	4,746.0	-502.0	355.8	-273.8	1.16	0.33	7.00
4,891.0	9.80	146.40	4,834.8	-514.5	364.0	-280.0	0.57	0.56	-0.78

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Schafer K16-64-1HN
Project:	Sec.16-T4N-R66W	TVD Reference:	WELL @ 4760.0ft (Precision 828 RKB - 16')
Site:	Schafer K16-64-1HN Pad Sec.16-T4N-R66W	MD Reference:	WELL @ 4760.0ft (Precision 828 RKB - 16')
Well:	Schafer K16-64-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
4,981.0	9.90	141.30	4,923.4	-526.9	373.1	-287.0	0.98	0.11	-5.67
5,071.0	9.00	140.50	5,012.2	-538.3	382.4	-294.4	1.01	-1.00	-0.89
5,160.0	8.10	142.20	5,100.2	-548.7	390.7	-301.0	1.05	-1.01	1.91
5,250.0	8.00	141.30	5,189.3	-558.6	398.5	-307.2	0.18	-0.11	-1.00
5,340.0	9.40	141.90	5,278.3	-569.2	407.0	-313.9	1.56	1.56	0.67
5,430.0	7.70	141.00	5,367.3	-579.7	415.3	-320.5	1.89	-1.89	-1.00
5,520.0	7.60	144.00	5,456.5	-589.2	422.6	-326.2	0.46	-0.11	3.33
5,610.0	7.50	145.60	5,545.7	-598.9	429.4	-331.5	0.26	-0.11	1.78
5,700.0	7.40	142.40	5,635.0	-608.3	436.2	-336.8	0.47	-0.11	-3.56
5,790.0	5.20	132.40	5,724.4	-615.6	442.8	-342.1	2.72	-2.44	-11.11
5,880.0	5.60	139.20	5,814.0	-621.7	448.7	-347.0	0.84	0.44	7.56
5,970.0	4.20	140.30	5,903.7	-627.6	453.7	-351.0	1.56	-1.56	1.22
6,059.0	3.10	139.60	5,992.5	-631.9	457.3	-353.9	1.24	-1.24	-0.79
6,149.0	1.60	175.40	6,082.4	-635.0	459.0	-355.1	2.26	-1.67	39.78
6,239.0	0.40	269.80	6,172.4	-636.3	458.8	-354.7	1.87	-1.33	104.89
6,329.0	0.40	229.90	6,262.4	-636.5	458.2	-354.1	0.30	0.00	-44.33
6,374.0	0.40	247.50	6,307.4	-636.6	457.9	-353.8	0.27	0.00	39.11
6,419.0	3.30	269.70	6,352.4	-636.7	456.5	-352.4	6.52	6.44	49.33
6,464.0	6.80	272.70	6,397.2	-636.6	452.5	-348.5	7.80	7.78	6.67
6,509.0	10.20	273.40	6,441.7	-636.2	445.9	-342.0	7.56	7.56	1.56
6,554.0	12.60	269.80	6,485.8	-636.0	437.0	-333.2	5.56	5.33	-8.00
6,599.0	14.60	268.40	6,529.5	-636.2	426.4	-322.8	4.50	4.44	-3.11
6,644.0	16.60	267.90	6,572.9	-636.6	414.3	-310.8	4.45	4.44	-1.11
6,689.0	19.90	269.50	6,615.6	-636.9	400.3	-296.8	7.42	7.33	3.56
6,734.0	23.40	271.40	6,657.4	-636.7	383.7	-280.4	7.93	7.78	4.22
6,779.0	26.30	271.80	6,698.3	-636.2	364.8	-261.8	6.46	6.44	0.89
6,824.0	29.00	271.90	6,738.1	-635.5	343.9	-241.3	6.00	6.00	0.22
6,869.0	32.70	271.90	6,776.7	-634.8	320.8	-218.7	8.22	8.22	0.00
6,914.0	36.90	270.20	6,813.7	-634.3	295.2	-193.4	9.58	9.33	-3.78
6,958.0	41.20	269.10	6,847.9	-634.5	267.4	-166.0	9.90	9.77	-2.50
7,003.0	44.50	267.70	6,880.8	-635.4	236.9	-135.6	7.63	7.33	-3.11
7,048.0	46.70	267.00	6,912.3	-636.9	204.7	-103.6	5.01	4.89	-1.56
7,093.0	49.50	268.10	6,942.4	-638.3	171.3	-70.4	6.48	6.22	2.44
7,138.0	52.20	268.40	6,970.8	-639.3	136.4	-35.7	6.02	6.00	0.67
7,183.0	55.80	268.40	6,997.2	-640.4	100.0	0.4	8.00	8.00	0.00
7,228.0	59.30	269.00	7,021.4	-641.2	62.1	38.0	7.86	7.78	1.33
7,273.0	62.80	269.80	7,043.1	-641.6	22.7	76.9	7.93	7.78	1.78
7,318.0	65.50	270.20	7,062.8	-641.6	-17.8	116.9	6.05	6.00	0.89
7,363.0	68.40	270.70	7,080.4	-641.3	-59.2	157.8	6.53	6.44	1.11
7,408.0	72.30	270.00	7,095.5	-641.0	-101.6	199.6	8.79	8.67	-1.56
7,452.0	75.70	269.50	7,107.6	-641.2	-143.9	241.4	7.80	7.73	-1.14
7,497.0	79.80	269.00	7,117.2	-641.8	-187.8	284.9	9.18	9.11	-1.11
7,507.0	81.30	268.80	7,118.8	-642.0	-197.7	294.7	15.13	15.00	-2.00
7,605.0	85.80	270.50	7,129.8	-642.6	-295.0	391.0	4.90	4.59	1.73
7,646.4	86.35	269.81	7,132.7	-642.5	-336.4	431.8	2.13	1.33	-1.67
Schafer K16-64-1HN Landing Pt.									
7,695.0	87.00	269.00	7,135.5	-643.0	-384.8	479.8	2.13	1.33	-1.67
7,785.0	88.40	266.80	7,139.1	-646.3	-474.7	569.1	2.90	1.56	-2.44
7,875.0	90.00	268.40	7,140.4	-650.0	-564.6	658.5	2.51	1.78	1.78
7,965.0	91.20	269.80	7,139.4	-651.4	-654.6	747.6	2.05	1.33	1.56
8,055.0	91.50	271.10	7,137.3	-650.7	-744.6	836.4	1.48	0.33	1.44
8,144.0	89.80	270.70	7,136.3	-649.3	-833.5	924.1	1.96	-1.91	-0.45
8,234.0	89.00	270.40	7,137.2	-648.5	-923.5	1,012.8	0.95	-0.89	-0.33

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Schafer K16-64-1HN
Project:	Sec.16-T4N-R66W	TVD Reference:	WELL @ 4760.0ft (Precision 828 RKB - 16')
Site:	Schafer K16-64-1HN Pad Sec.16-T4N-R66W	MD Reference:	WELL @ 4760.0ft (Precision 828 RKB - 16')
Well:	Schafer K16-64-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
8,324.0	89.50	270.50	7,138.4	-647.8	-1,013.5	1,101.6	0.57	0.56	0.11
8,414.0	89.70	270.50	7,139.0	-647.0	-1,103.5	1,190.4	0.22	0.22	0.00
8,504.0	91.10	269.30	7,138.4	-647.1	-1,193.5	1,279.3	2.05	1.56	-1.33
8,593.0	91.30	268.10	7,136.5	-649.2	-1,282.5	1,367.5	1.37	0.22	-1.35
8,683.0	90.00	268.10	7,135.5	-652.1	-1,372.4	1,456.8	1.44	-1.44	0.00
8,773.0	89.20	269.10	7,136.1	-654.3	-1,462.4	1,546.1	1.42	-0.89	1.11
8,863.0	89.90	270.90	7,136.9	-654.3	-1,552.4	1,635.0	2.15	0.78	2.00
8,953.0	90.10	269.70	7,136.9	-653.9	-1,642.4	1,723.8	1.35	0.22	-1.33
9,042.0	89.40	269.10	7,137.2	-654.8	-1,731.4	1,811.9	1.04	-0.79	-0.67
9,132.0	90.70	268.40	7,137.2	-656.8	-1,821.3	1,901.1	1.64	1.44	-0.78
9,222.0	89.70	268.60	7,136.8	-659.1	-1,911.3	1,990.3	1.13	-1.11	0.22
9,312.0	90.30	269.30	7,136.8	-660.8	-2,001.3	2,079.5	1.02	0.67	0.78
9,402.0	90.60	269.50	7,136.1	-661.7	-2,091.3	2,168.5	0.40	0.33	0.22
9,492.0	89.50	270.50	7,136.1	-661.7	-2,181.3	2,257.4	1.65	-1.22	1.11
9,582.0	90.70	272.70	7,135.9	-659.2	-2,271.2	2,345.9	2.78	1.33	2.44
9,671.0	90.00	270.90	7,135.4	-656.4	-2,360.2	2,433.4	2.17	-0.79	-2.02
9,761.0	88.30	270.00	7,136.7	-655.7	-2,450.2	2,522.2	2.14	-1.89	-1.00
9,851.0	88.90	269.10	7,138.9	-656.4	-2,540.1	2,611.2	1.20	0.67	-1.00
9,941.0	89.30	268.40	7,140.3	-658.4	-2,630.1	2,700.3	0.90	0.44	-0.78
10,031.0	90.10	269.70	7,140.8	-659.9	-2,720.1	2,789.5	1.70	0.89	1.44
10,120.0	91.10	270.50	7,139.9	-659.7	-2,809.1	2,877.4	1.44	1.12	0.90
10,210.0	90.50	269.10	7,138.6	-660.0	-2,899.1	2,966.3	1.69	-0.67	-1.56
10,300.0	89.90	268.60	7,138.3	-661.8	-2,989.1	3,055.5	0.87	-0.67	-0.56
10,390.0	91.30	268.60	7,137.3	-664.0	-3,079.0	3,144.7	1.56	1.56	0.00
10,480.0	90.40	268.10	7,136.0	-666.6	-3,169.0	3,234.0	1.14	-1.00	-0.56
10,570.0	90.30	268.10	7,135.5	-669.6	-3,258.9	3,323.3	0.11	-0.11	0.00
10,660.0	89.30	267.90	7,135.8	-672.7	-3,348.9	3,412.6	1.13	-1.11	-0.22
10,750.0	90.30	267.40	7,136.1	-676.4	-3,438.8	3,502.1	1.24	1.11	-0.56
10,839.0	89.40	267.40	7,136.3	-680.5	-3,527.7	3,590.5	1.01	-1.01	0.00
10,929.0	87.80	270.50	7,138.5	-682.1	-3,617.6	3,679.6	3.88	-1.78	3.44
11,019.0	89.70	268.30	7,140.5	-683.1	-3,707.6	3,768.7	3.23	2.11	-2.44
11,109.0	90.50	267.60	7,140.3	-686.3	-3,797.5	3,858.0	1.18	0.89	-0.78
11,199.0	89.30	268.60	7,140.5	-689.3	-3,887.5	3,947.3	1.74	-1.33	1.11
11,289.0	89.20	271.40	7,141.7	-689.3	-3,977.5	4,036.2	3.11	-0.11	3.11
11,379.0	89.50	272.30	7,142.7	-686.4	-4,067.4	4,124.6	1.05	0.33	1.00
11,468.0	89.60	271.80	7,143.4	-683.2	-4,156.4	4,212.0	0.57	0.11	-0.56
11,558.0	89.50	271.20	7,144.1	-680.8	-4,246.3	4,300.5	0.68	-0.11	-0.67
11,586.0	89.60	271.40	7,144.3	-680.2	-4,274.3	4,328.1	0.80	0.36	0.71
11,642.0	89.60	271.40	7,144.7	-678.8	-4,330.3	4,383.2	0.00	0.00	0.00

Schafer K16-64-1HN BHL 1650'FSL & 535'FWL

Checked By: _____ Approved By: _____ Date: _____