

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

Well Name: **Shable LB32-68HN**

Surface Location: Shable Pad Sec.33-T9N-R60W

North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

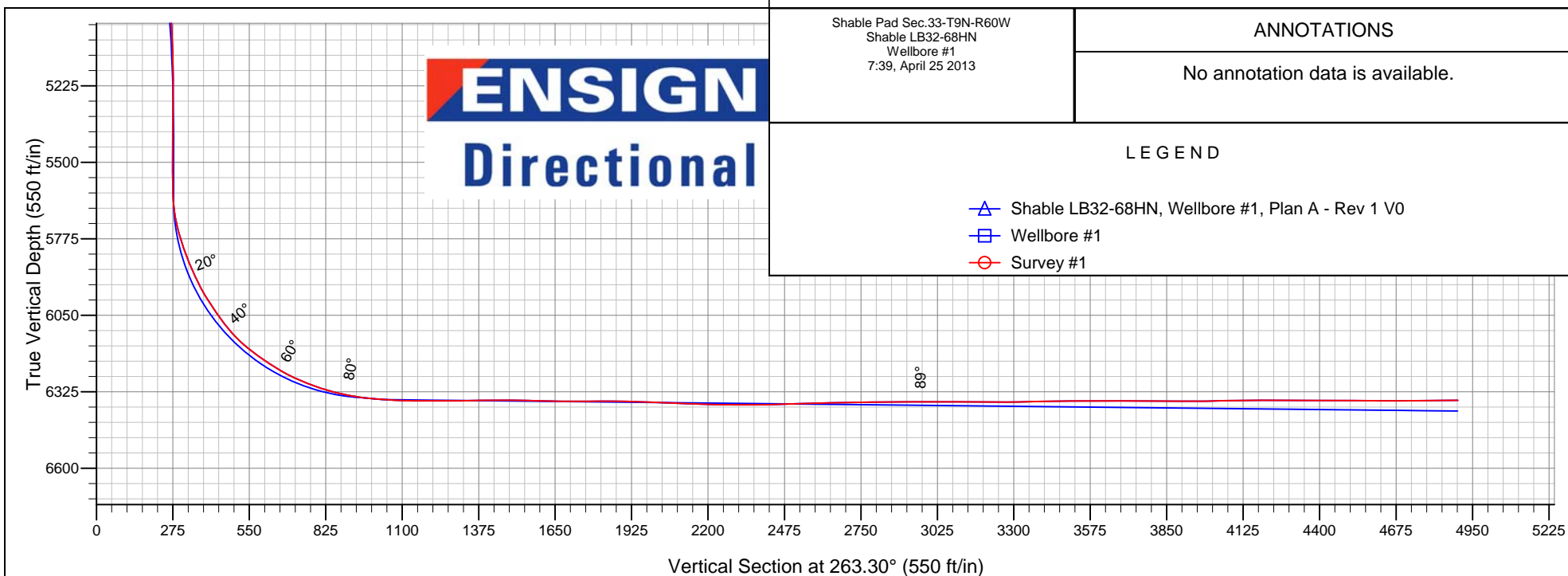
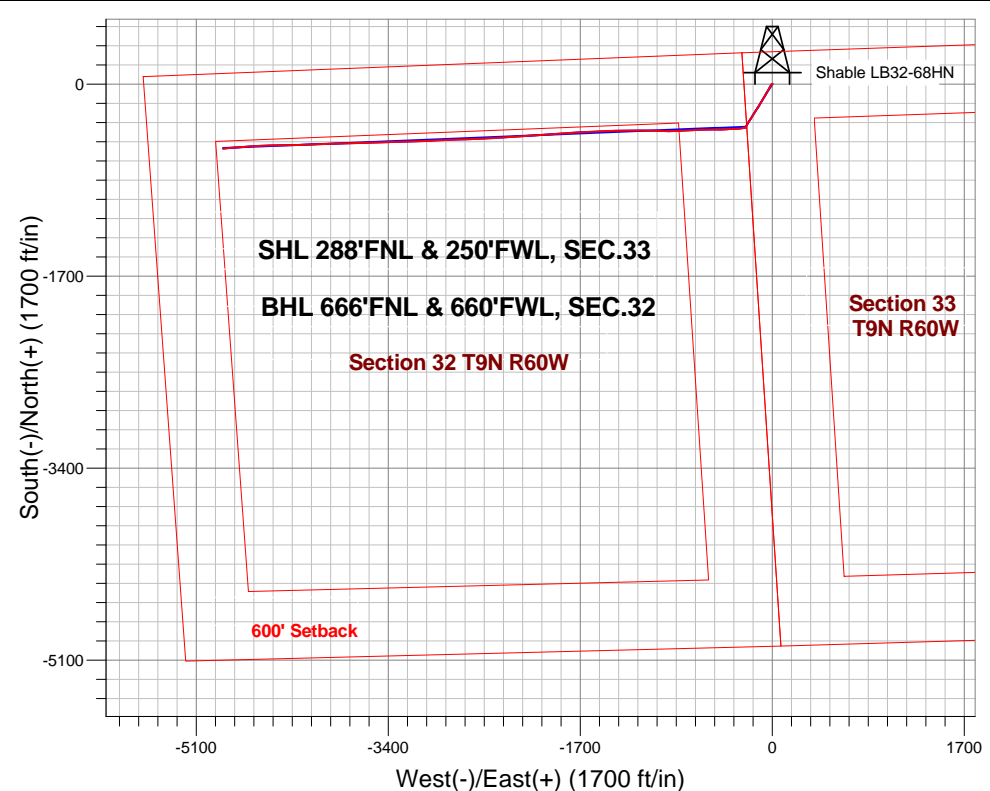
Ground Elevation: 4940.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1505406.95	3386325.28	40.712400	-104.106408	

Precision 828 RKB - 16' WELL @ 4956.0ft (Precision 828 RKB - 16')

## FINAL SURVEY

Projected Bottom Hole Location  
10687' MD 6356' TVD 571' S & 4863' W of SHL  
90.5 degree Incl @ 263.9 degree AZM



Shable Pad Sec.33-T9N-R60W  
Shable LB32-68HN  
Wellbore #1  
7:39, April 25 2013

### ANNOTATIONS

No annotation data is available.

### LEGEND

- Shable LB32-68HN, Wellbore #1, Plan A - Rev 1 V0
- Wellbore #1
- Survey #1



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

**SEC.33-T9N-R60W**

**Shable Pad Sec.33-T9N-R60W**

**Shable LB32-68HN**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**25 April, 2013**

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)
Survey	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
	638.0	0.00	0.00	638.0	0.0	0.0	0.0	0.00	0.00	0.00
	655.0	0.40	299.70	655.0	0.0	-0.1	0.0	2.35	2.35	0.00
	745.0	0.20	233.30	745.0	0.1	-0.5	0.4	0.41	-0.22	-73.78
	835.0	0.00	228.00	835.0	0.0	-0.6	0.6	0.22	-0.22	0.00
	924.0	0.20	345.80	924.0	0.1	-0.6	0.6	0.22	0.22	0.00
	1,014.0	0.70	84.70	1,014.0	0.4	-0.1	0.1	0.84	0.56	109.89
	1,122.0	1.00	67.20	1,122.0	0.8	1.4	-1.5	0.36	0.28	-16.20
	1,216.0	0.80	25.30	1,216.0	1.7	2.5	-2.6	0.71	-0.21	-44.57
	1,311.0	0.80	46.10	1,311.0	2.7	3.2	-3.5	0.30	0.00	21.89
	1,406.0	1.10	226.40	1,406.0	2.6	3.0	-3.3	2.00	0.32	-189.16
	1,500.0	1.10	256.80	1,499.9	1.8	1.5	-1.7	0.61	0.00	32.34

<b>Company:</b>	Noble Energy Inc.- Weld County, CO (Grid North)	<b>Local Co-ordinate Reference:</b>	Well Shable LB32-68HN
<b>Project:</b>	SEC.33-T9N-R60W	<b>TVD Reference:</b>	WELL @ 4956.0ft (Precision 828 RKB - 16')
<b>Site:</b>	Shable Pad Sec.33-T9N-R60W	<b>MD Reference:</b>	WELL @ 4956.0ft (Precision 828 RKB - 16')
<b>Well:</b>	Shable LB32-68HN	<b>North Reference:</b>	Grid
<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)
1,595.0	1.00	278.30	1,594.9	1.7	-0.2	0.0	0.43	-0.11	22.63
1,690.0	1.00	277.60	1,689.9	1.9	-1.8	1.6	0.01	0.00	-0.74
1,784.0	1.50	223.40	1,783.9	1.1	-3.5	3.4	1.30	0.53	-57.66
1,879.0	4.60	227.30	1,878.7	-2.4	-7.2	7.4	3.27	3.26	4.11
1,995.0	6.10	210.30	1,994.2	-10.9	-13.7	14.9	1.87	1.29	-14.66
2,085.0	6.60	206.40	2,083.7	-19.6	-18.4	20.6	0.73	0.56	-4.33
2,175.0	7.80	208.80	2,173.0	-29.6	-23.6	26.9	1.37	1.33	2.67
2,265.0	8.30	208.30	2,262.1	-40.7	-29.7	34.2	0.56	0.56	-0.56
2,355.0	8.40	208.80	2,351.1	-52.2	-35.9	41.8	0.14	0.11	0.56
2,444.0	8.00	214.10	2,439.2	-63.0	-42.5	49.6	0.96	-0.45	5.96
2,534.0	8.80	212.50	2,528.3	-74.0	-49.7	58.0	0.93	0.89	-1.78
2,624.0	8.70	208.10	2,617.2	-85.8	-56.6	66.3	0.75	-0.11	-4.89
2,714.0	8.50	210.30	2,706.2	-97.5	-63.2	74.1	0.43	-0.22	2.44
2,804.0	8.70	208.50	2,795.2	-109.3	-69.8	82.1	0.37	0.22	-2.00
2,894.0	8.70	212.20	2,884.2	-121.0	-76.7	90.3	0.62	0.00	4.11
2,984.0	9.10	209.50	2,973.1	-133.0	-83.8	98.7	0.64	0.44	-3.00
3,073.0	9.20	208.30	3,060.9	-145.3	-90.6	107.0	0.24	0.11	-1.35
3,163.0	9.40	211.30	3,149.8	-158.0	-97.9	115.6	0.58	0.22	3.33
3,253.0	8.90	207.80	3,238.6	-170.4	-104.9	124.1	0.83	-0.56	-3.89
3,343.0	7.50	210.30	3,327.7	-181.6	-111.1	131.6	1.60	-1.56	2.78
3,433.0	6.60	212.50	3,417.0	-191.1	-116.9	138.4	1.04	-1.00	2.44
3,523.0	7.30	214.10	3,506.4	-200.2	-122.9	145.4	0.81	0.78	1.78
3,613.0	7.50	214.30	3,595.6	-209.7	-129.4	153.0	0.22	0.22	0.22
3,702.0	7.70	212.20	3,683.8	-219.6	-135.8	160.5	0.38	0.22	-2.36
3,792.0	7.50	214.30	3,773.0	-229.5	-142.4	168.2	0.38	-0.22	2.33
3,882.0	7.70	221.90	3,862.2	-238.9	-149.7	176.6	1.14	0.22	8.44
3,972.0	8.10	211.30	3,951.4	-248.8	-157.0	185.0	1.68	0.44	-11.78
4,062.0	9.00	207.80	4,040.4	-260.4	-163.6	192.9	1.15	1.00	-3.89
4,152.0	8.00	208.30	4,129.4	-272.2	-169.9	200.4	1.11	-1.11	0.56
4,242.0	7.70	213.10	4,218.6	-282.7	-176.1	207.9	0.80	-0.33	5.33
4,332.0	8.70	209.70	4,307.6	-293.7	-182.8	215.8	1.23	1.11	-3.78
4,422.0	8.10	214.30	4,396.7	-304.9	-189.7	224.0	1.00	-0.67	5.11
4,512.0	8.80	211.50	4,485.7	-316.0	-196.9	232.4	0.90	0.78	-3.11
4,602.0	8.40	216.10	4,574.7	-327.1	-204.4	241.1	0.88	-0.44	5.11
4,691.0	7.70	214.10	4,662.8	-337.3	-211.5	249.5	0.85	-0.79	-2.25
4,781.0	7.90	211.50	4,752.0	-347.6	-218.2	257.2	0.45	0.22	-2.89
4,871.0	6.00	203.70	4,841.3	-357.2	-223.3	263.4	2.35	-2.11	-8.67
4,961.0	4.50	204.80	4,930.9	-364.7	-226.6	267.6	1.67	-1.67	1.22
5,051.0	4.00	202.00	5,020.7	-370.8	-229.3	271.0	0.60	-0.56	-3.11
5,140.0	3.00	219.00	5,109.5	-375.5	-231.9	274.2	1.61	-1.12	19.10
5,230.0	2.10	183.40	5,199.4	-379.0	-233.5	276.1	1.98	-1.00	-39.56
5,320.0	1.50	120.60	5,289.4	-381.2	-232.6	275.5	2.16	-0.67	-69.78
5,410.0	0.50	141.50	5,379.4	-382.1	-231.3	274.3	1.16	-1.11	23.22
5,500.0	0.40	184.60	5,469.4	-382.7	-231.1	274.2	0.38	-0.11	47.89
5,590.0	0.50	152.40	5,559.4	-383.4	-231.0	274.1	0.30	0.11	-35.78
5,680.0	4.60	258.40	5,649.3	-384.5	-234.3	277.6	5.29	4.56	117.78
5,725.0	9.80	263.50	5,693.9	-385.3	-239.9	283.2	11.63	11.56	11.33
5,769.0	13.80	260.50	5,737.0	-386.6	-248.8	292.2	9.19	9.09	-6.82
5,814.0	17.10	259.50	5,780.3	-388.7	-260.6	304.2	7.36	7.33	-2.22
5,859.0	20.40	260.70	5,823.0	-391.1	-274.8	318.6	7.38	7.33	2.67
5,904.0	22.40	262.10	5,864.8	-393.6	-291.1	335.0	4.59	4.44	3.11
5,949.0	24.40	267.60	5,906.1	-395.2	-308.9	352.9	6.58	4.44	12.22
5,994.0	28.10	268.30	5,946.5	-395.9	-328.7	372.7	8.25	8.22	1.56

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<b>Well:</b>	Shable LB32-68HN	<b>North Reference:</b>	Grid
<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)
6,039.0	31.90	268.10	5,985.5	-396.6	-351.2	395.1	8.45	8.44	-0.44
6,084.0	33.80	266.70	6,023.3	-397.7	-375.6	419.4	4.55	4.22	-3.11
6,129.0	35.50	266.70	6,060.3	-399.2	-401.2	445.0	3.78	3.78	0.00
6,174.0	39.20	267.60	6,096.1	-400.5	-428.4	472.2	8.31	8.22	2.00
6,219.0	44.70	267.60	6,129.5	-401.8	-458.5	502.2	12.22	12.22	0.00
6,264.0	49.90	268.80	6,160.0	-402.8	-491.5	535.1	11.72	11.56	2.67
6,308.0	53.60	270.90	6,187.3	-402.9	-526.0	569.5	9.21	8.41	4.77
6,353.0	56.10	270.40	6,213.2	-402.4	-562.8	605.9	5.63	5.56	-1.11
6,398.0	57.80	268.80	6,237.7	-402.7	-600.6	643.4	4.81	3.78	-3.56
6,443.0	62.10	267.90	6,260.2	-403.8	-639.5	682.2	9.71	9.56	-2.00
6,488.0	66.30	267.40	6,279.8	-405.5	-679.9	722.6	9.39	9.33	-1.11
6,533.0	68.60	267.00	6,297.1	-407.5	-721.5	764.1	5.18	5.11	-0.89
6,578.0	71.80	266.90	6,312.3	-409.8	-763.7	806.3	7.11	7.11	-0.22
6,623.0	75.30	267.00	6,325.0	-412.1	-806.8	849.4	7.78	7.78	0.22
6,677.0	78.80	266.90	6,337.1	-414.9	-859.4	901.9	6.48	6.48	-0.19
6,737.0	83.10	271.20	6,346.6	-415.9	-918.6	960.8	10.07	7.17	7.17
6,826.0	86.80	271.60	6,354.4	-413.7	-1,007.2	1,048.6	4.18	4.16	0.45
6,836.7	87.11	271.47	6,355.0	-413.4	-1,017.9	1,059.1	3.14	2.89	-1.22
Shable LB32-68HN Landing Pt.									
6,916.0	89.40	270.50	6,357.4	-412.0	-1,097.1	1,137.7	3.14	2.89	-1.22
7,006.0	90.10	270.70	6,357.8	-411.1	-1,187.1	1,227.0	0.81	0.78	0.22
7,096.0	90.30	269.70	6,357.5	-410.8	-1,277.1	1,316.3	1.13	0.22	-1.11
7,186.0	91.30	269.00	6,356.2	-411.8	-1,367.1	1,405.8	1.36	1.11	-0.78
7,276.0	89.30	267.40	6,355.8	-414.6	-1,457.0	1,495.5	2.85	-2.22	-1.78
7,366.0	88.10	266.50	6,357.8	-419.4	-1,546.9	1,585.3	1.67	-1.33	-1.00
7,456.0	89.50	266.20	6,359.7	-425.1	-1,636.7	1,675.1	1.59	1.56	-0.33
7,546.0	90.60	267.00	6,359.6	-430.5	-1,726.5	1,765.0	1.51	1.22	0.89
7,635.0	89.60	266.70	6,359.4	-435.4	-1,815.4	1,853.8	1.17	-1.12	-0.34
7,725.0	88.20	266.90	6,361.2	-440.4	-1,905.2	1,943.6	1.57	-1.56	0.22
7,815.0	87.60	266.90	6,364.5	-445.3	-1,995.0	2,033.4	0.67	-0.67	0.00
7,905.0	87.50	266.30	6,368.3	-450.6	-2,084.8	2,123.1	0.68	-0.11	-0.67
7,995.0	89.10	265.10	6,371.0	-457.3	-2,174.5	2,213.0	2.22	1.78	-1.33
8,070.0	89.30	265.60	6,372.0	-463.4	-2,249.2	2,287.9	0.72	0.27	0.67
8,160.0	90.70	266.70	6,372.0	-469.5	-2,339.0	2,377.8	1.98	1.56	1.22
8,250.0	91.70	266.00	6,370.2	-475.2	-2,428.8	2,467.7	1.36	1.11	-0.78
8,340.0	91.80	267.20	6,367.4	-480.5	-2,518.6	2,557.5	1.34	0.11	1.33
8,430.0	91.20	267.60	6,365.0	-484.6	-2,608.5	2,647.2	0.80	-0.67	0.44
8,520.0	90.90	267.70	6,363.4	-488.3	-2,698.4	2,737.0	0.35	-0.33	0.11
8,609.0	90.50	268.40	6,362.3	-491.3	-2,787.4	2,825.6	0.91	-0.45	0.79
8,699.0	89.80	267.60	6,362.1	-494.5	-2,877.3	2,915.3	1.18	-0.78	-0.89
8,789.0	90.70	267.60	6,361.7	-498.2	-2,967.2	3,005.1	1.00	1.00	0.00
8,879.0	89.30	267.00	6,361.7	-502.5	-3,057.1	3,094.9	1.69	-1.56	-0.67
8,969.0	89.90	267.60	6,362.3	-506.7	-3,147.0	3,184.6	0.94	0.67	0.67
9,059.0	90.00	268.80	6,362.4	-509.5	-3,237.0	3,274.3	1.34	0.11	1.33
9,149.0	91.50	269.50	6,361.2	-510.9	-3,326.9	3,363.8	1.84	1.67	0.78
9,238.0	91.20	267.70	6,359.1	-513.0	-3,415.9	3,452.4	2.05	-0.34	-2.02
9,328.0	90.00	267.70	6,358.2	-516.7	-3,505.8	3,542.1	1.33	-1.33	0.00
9,418.0	90.00	268.10	6,358.2	-520.0	-3,595.8	3,631.9	0.44	0.00	0.44
9,508.0	90.00	268.40	6,358.2	-522.7	-3,685.7	3,721.5	0.33	0.00	0.33
9,598.0	89.30	268.80	6,358.7	-524.9	-3,775.7	3,811.1	0.90	-0.78	0.44
9,688.0	89.80	268.30	6,359.4	-527.2	-3,865.6	3,900.8	0.79	0.56	-0.56
9,778.0	90.60	267.70	6,359.1	-530.3	-3,955.6	3,990.4	1.11	0.89	-0.67
9,867.0	91.80	268.60	6,357.3	-533.2	-4,044.5	4,079.1	1.69	1.35	1.01

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<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

Survey									
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9,957.0	90.00	268.10	6,355.8	-535.8	-4,134.5	4,168.7	2.08	-2.00	-0.56
10,047.0	89.30	267.70	6,356.4	-539.1	-4,224.4	4,258.5	0.90	-0.78	-0.44
10,137.0	90.20	269.70	6,356.8	-541.1	-4,314.4	4,348.0	2.44	1.00	2.22
10,227.0	90.00	269.50	6,356.6	-541.8	-4,404.4	4,437.5	0.31	-0.22	-0.22
10,317.0	89.20	267.20	6,357.3	-544.3	-4,494.3	4,527.1	2.71	-0.89	-2.56
10,407.0	90.10	266.90	6,357.8	-549.0	-4,584.2	4,616.9	1.05	1.00	-0.33
10,497.0	90.40	266.00	6,357.4	-554.5	-4,674.0	4,706.8	1.05	0.33	-1.00
10,587.0	90.20	265.40	6,356.9	-561.3	-4,763.8	4,796.7	0.70	-0.22	-0.67
10,631.0	90.50	263.90	6,356.7	-565.4	-4,807.6	4,840.7	3.48	0.68	-3.41
10,686.3	90.50	263.90	6,356.2	-571.3	-4,862.6	4,896.0	0.00	0.00	0.00
<b>Shable LB32-68HN BHL 660'FNL &amp; 660'FWL</b>									
10,687.0	90.50	263.90	6,356.2	-571.3	-4,863.3	4,896.7	0.00	0.00	0.00

Checked By: _____	Approved By: _____	Date: _____
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