

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

Well Name: **Thistle Down PC F36-69HN**

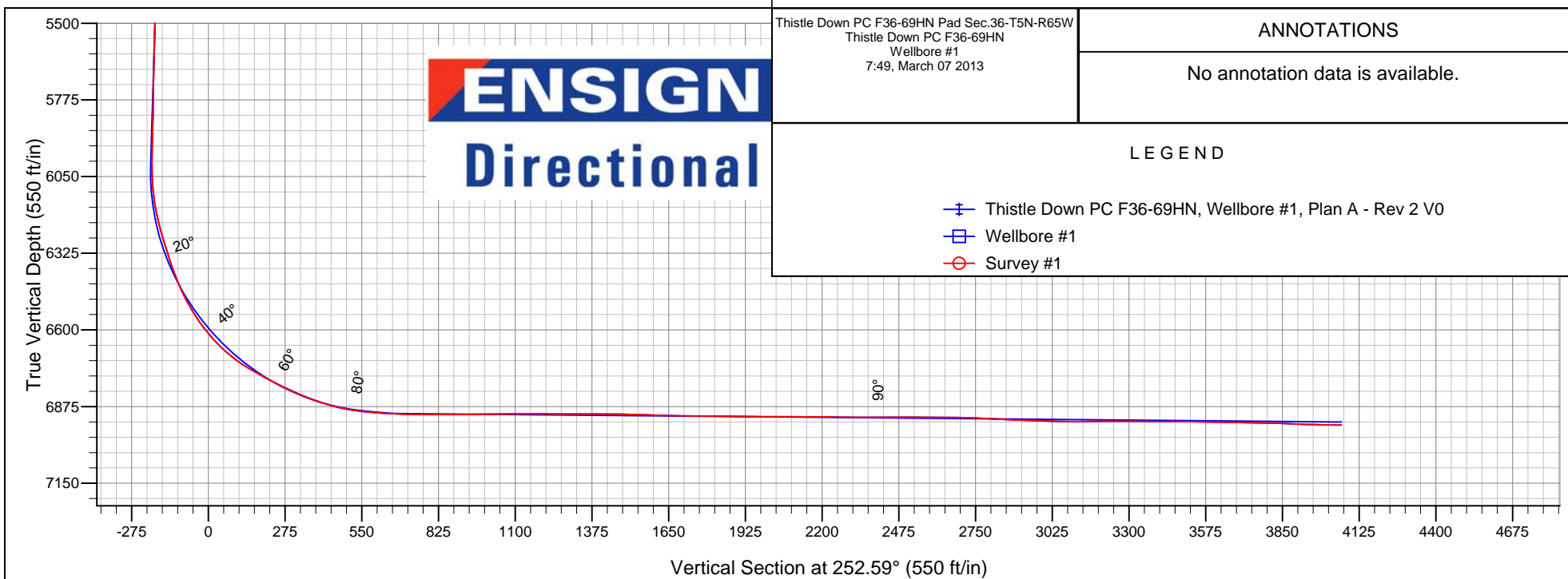
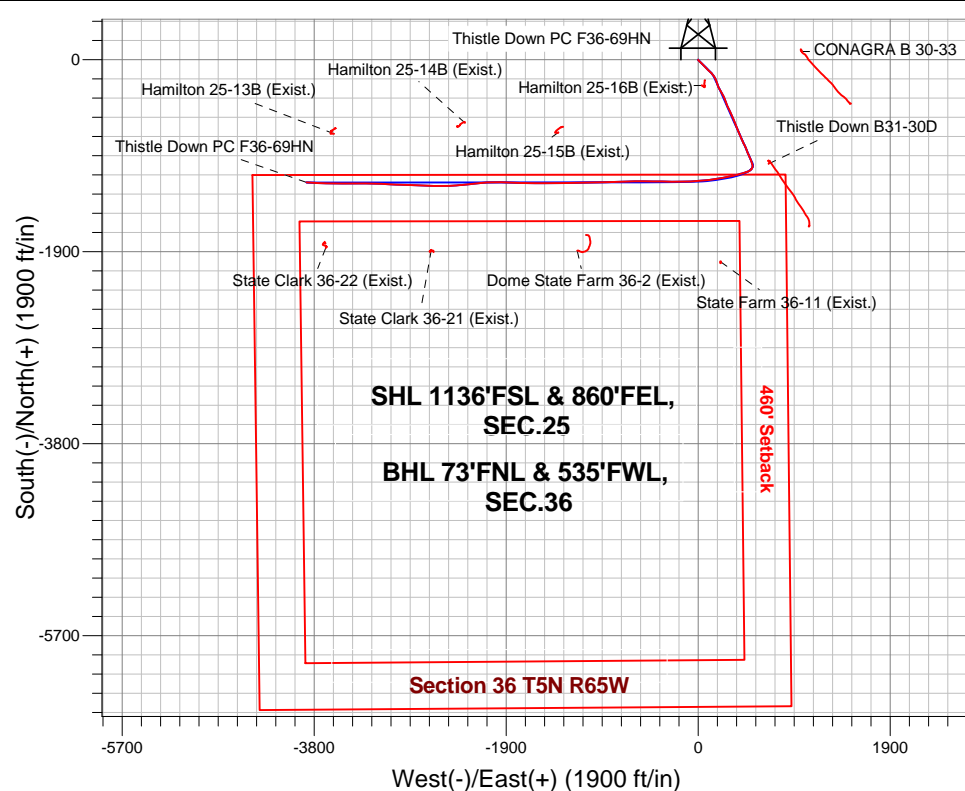
Surface Location: Thistle Down PC F36-69HN Pad Sec.36-T5N-R65W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4723.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1377428.92	3249356.94	40.365990	-104.605110	

Precision 828 RKB - 16' WELL @ 4739.0ft (Precision 828 RKB - 16')

FINAL SURVEY

Projected Bottom Hole Location
11126' MD 6941' TVD 1214' S & 3875' W of SHL
89.3 degree Incl @ 272.7 degree AZM





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

Sec.36-T5N-R65W

Thistle Down PC F36-69HN Pad Sec.36-T5N-R65W

Thistle Down PC F36-69HN

Wellbore #1

Survey: Survey #1

Standard Survey Report

07 March, 2013

Survey	Wellbore Data									
	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 1	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
	684.0	0.00	0.00	684.0	0.0	0.0	0.0	0.00	0.00	0.00
	706.0	0.40	16.60	706.0	0.1	0.0	0.0	1.82	1.82	0.00
	796.0	0.20	45.10	796.0	0.5	0.2	-0.4	0.27	-0.22	31.67
	886.0	0.30	309.60	886.0	0.7	0.2	-0.4	0.42	0.11	-106.11
	976.0	0.40	209.80	976.0	0.6	-0.2	0.0	0.60	0.11	-110.89
	1,066.0	3.40	161.30	1,065.9	-2.2	0.5	0.2	3.50	3.33	-53.89
	1,161.0	3.70	131.60	1,160.8	-6.9	3.7	-1.5	1.94	0.32	-31.26
	1,256.0	5.60	138.80	1,255.4	-12.4	9.1	-4.9	2.09	2.00	7.58
	1,351.0	5.60	128.60	1,350.0	-18.8	15.7	-9.4	1.05	0.00	-10.74
	1,446.0	7.90	130.20	1,444.3	-25.9	24.3	-15.5	2.43	2.42	1.68
	1,541.0	7.90	130.20	1,539.6	-25.9	24.3	-15.5	2.43	2.42	1.68

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Thistle Down PC F36-69HN
Project:	Sec.36-T5N-R65W	TVD Reference:	WELL @ 4739.0ft (Precision 828 RKB - 16')
Site:	Thistle Down PC F36-69HN Pad	MD Reference:	WELL @ 4739.0ft (Precision 828 RKB - 16')
Well:	Thistle Down PC F36-69HN	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)
1,541.0	9.80	137.00	1,538.2	-36.0	34.8	-22.5	2.28	2.00	7.16
1,636.0	11.60	135.40	1,631.5	-48.7	47.1	-30.3	1.92	1.89	-1.68
1,731.0	14.30	136.00	1,724.1	-64.0	61.9	-39.9	2.85	2.84	0.63
1,826.0	13.50	133.80	1,816.3	-80.1	78.1	-50.5	1.01	-0.84	-2.32
1,921.0	14.90	134.90	1,908.4	-96.4	94.7	-61.5	1.50	1.47	1.16
2,045.0	14.30	133.00	2,028.4	-118.1	117.2	-76.5	0.62	-0.48	-1.53
2,135.0	14.20	138.10	2,115.7	-133.9	132.7	-86.6	1.40	-0.11	5.67
2,225.0	14.10	139.80	2,202.9	-150.5	147.2	-95.4	0.47	-0.11	1.89
2,315.0	14.40	150.00	2,290.2	-168.5	159.9	-102.1	2.81	0.33	11.33
2,404.0	13.80	152.80	2,376.5	-187.6	170.2	-106.3	1.02	-0.67	3.15
2,494.0	14.10	160.60	2,463.9	-207.5	178.8	-108.5	2.11	0.33	8.67
2,584.0	14.20	162.20	2,551.1	-228.3	185.8	-109.0	0.45	0.11	1.78
2,674.0	15.40	161.80	2,638.1	-250.2	192.9	-109.2	1.34	1.33	-0.44
2,764.0	16.10	154.10	2,724.8	-272.8	202.1	-111.2	2.45	0.78	-8.56
2,854.0	14.90	151.80	2,811.5	-294.2	213.0	-115.2	1.50	-1.33	-2.56
2,944.0	14.90	149.30	2,898.5	-314.3	224.4	-120.0	0.71	0.00	-2.78
3,033.0	14.10	150.20	2,984.6	-333.6	235.6	-125.0	0.93	-0.90	1.01
3,123.0	13.20	154.20	3,072.1	-352.3	245.5	-128.8	1.45	-1.00	4.44
3,213.0	12.60	154.80	3,159.8	-370.5	254.2	-131.7	0.68	-0.67	0.67
3,303.0	12.50	156.50	3,247.7	-388.3	262.3	-134.0	0.43	-0.11	1.89
3,393.0	14.20	157.20	3,335.2	-407.4	270.4	-136.1	1.90	1.89	0.78
3,482.0	14.90	162.90	3,421.4	-428.4	278.0	-137.1	1.79	0.79	6.40
3,572.0	14.30	156.90	3,508.5	-449.7	285.8	-138.1	1.81	-0.67	-6.67
3,662.0	14.00	157.20	3,595.7	-469.9	294.4	-140.2	0.34	-0.33	0.33
3,752.0	14.60	153.90	3,683.0	-490.2	303.6	-143.0	1.12	0.67	-3.67
3,842.0	14.90	152.10	3,770.0	-510.6	314.0	-146.8	0.61	0.33	-2.00
3,932.0	14.40	156.70	3,857.1	-531.1	323.8	-150.0	1.41	-0.56	5.11
4,022.0	14.20	156.00	3,944.3	-551.4	332.7	-152.4	0.29	-0.22	-0.78
4,111.0	13.60	154.80	4,030.7	-570.9	341.6	-155.1	0.75	-0.67	-1.35
4,201.0	14.90	158.30	4,117.9	-591.2	350.4	-157.4	1.73	1.44	3.89
4,291.0	14.00	158.10	4,205.1	-612.1	358.7	-159.1	1.00	-1.00	-0.22
4,381.0	13.50	159.30	4,292.5	-632.0	366.5	-160.6	0.64	-0.56	1.33
4,471.0	14.20	156.70	4,379.9	-652.0	374.6	-162.3	1.04	0.78	-2.89
4,561.0	13.80	156.50	4,467.2	-671.9	383.2	-164.6	0.45	-0.44	-0.22
4,651.0	15.60	159.50	4,554.2	-693.1	391.8	-166.4	2.17	2.00	3.33
4,741.0	13.80	158.60	4,641.3	-714.4	399.9	-167.8	2.02	-2.00	-1.00
4,830.0	14.40	157.10	4,727.6	-734.5	408.1	-169.6	0.79	0.67	-1.69
4,920.0	13.50	156.70	4,815.0	-754.5	416.6	-171.7	1.01	-1.00	-0.44
5,010.0	13.70	156.20	4,902.4	-773.9	425.1	-174.0	0.26	0.22	-0.56
5,100.0	14.20	155.50	4,989.8	-793.7	433.9	-176.5	0.59	0.56	-0.78
5,190.0	15.10	157.20	5,076.9	-814.5	443.1	-179.0	1.11	1.00	1.89
5,280.0	13.50	151.30	5,164.1	-834.6	452.7	-182.1	2.40	-1.78	-6.56
5,370.0	13.20	154.20	5,251.6	-853.0	462.2	-185.7	0.82	-0.33	3.22
5,460.0	13.10	156.50	5,339.3	-871.6	470.7	-188.3	0.59	-0.11	2.56
5,550.0	14.60	159.20	5,426.7	-891.6	478.8	-190.0	1.81	1.67	3.00
5,639.0	14.00	157.90	5,512.9	-912.0	486.8	-191.6	0.76	-0.67	-1.46
5,729.0	13.50	155.10	5,600.3	-931.7	495.4	-193.8	0.92	-0.56	-3.11
5,819.0	13.00	156.70	5,687.9	-950.5	503.8	-196.2	0.69	-0.56	1.78
5,909.0	14.70	158.50	5,775.3	-970.4	512.0	-198.1	1.95	1.89	2.00
5,999.0	14.90	158.50	5,862.3	-991.8	520.4	-199.7	0.22	0.22	0.00
6,089.0	15.20	159.70	5,949.2	-1,013.6	528.7	-201.1	0.48	0.33	1.33
6,179.0	15.20	163.90	6,036.1	-1,036.0	536.1	-201.5	1.22	0.00	4.67
6,224.0	15.10	176.20	6,079.5	-1,047.6	538.1	-199.9	7.13	-0.22	27.33

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Site:	Thistle Down PC F36-69HN Pad	MD Reference:	WELL @ 4739.0ft (Precision 828 RKB - 16')
Well:	Thistle Down PC F36-69HN	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)
6,269.0	15.60	188.70	6,122.9	-1,059.4	537.6	-195.9	7.42	1.11	27.78
6,314.0	15.90	203.80	6,166.3	-1,071.0	534.2	-189.2	9.11	0.67	33.56
6,359.0	16.60	218.80	6,209.5	-1,081.7	527.7	-179.8	9.43	1.56	33.33
6,404.0	17.40	230.90	6,252.5	-1,090.9	518.4	-168.2	8.04	1.78	26.89
6,449.0	17.50	239.30	6,295.5	-1,098.6	507.4	-155.3	5.60	0.22	18.67
6,494.0	17.50	248.50	6,338.4	-1,104.6	495.3	-142.0	6.14	0.00	20.44
6,539.0	20.00	250.90	6,381.0	-1,109.6	481.7	-127.5	5.81	5.56	5.33
6,584.0	22.40	253.60	6,423.0	-1,114.5	466.2	-111.3	5.76	5.33	6.00
6,629.0	25.00	252.50	6,464.2	-1,119.8	448.9	-93.2	5.86	5.78	-2.44
6,674.0	28.40	252.50	6,504.4	-1,125.9	429.6	-73.0	7.56	7.56	0.00
6,718.0	32.20	253.20	6,542.3	-1,132.4	408.4	-50.8	8.67	8.64	1.59
6,763.0	36.10	256.40	6,579.6	-1,139.0	384.0	-25.6	9.54	8.67	7.11
6,808.0	39.70	257.40	6,615.1	-1,145.2	357.1	2.0	8.12	8.00	2.22
6,853.0	44.00	258.30	6,648.6	-1,151.5	327.8	31.9	9.65	9.56	2.00
6,898.0	49.10	258.70	6,679.5	-1,158.0	295.8	64.4	11.35	11.33	0.89
6,943.0	53.90	259.70	6,707.5	-1,164.6	261.2	99.3	10.81	10.67	2.22
6,988.0	57.90	260.60	6,732.8	-1,171.0	224.5	136.3	9.04	8.89	2.00
7,033.0	61.40	260.60	6,755.5	-1,177.3	186.2	174.7	7.78	7.78	0.00
7,078.0	62.90	261.80	6,776.5	-1,183.4	146.9	214.1	4.08	3.33	2.67
7,123.0	63.30	263.20	6,796.9	-1,188.7	107.1	253.6	2.91	0.89	3.11
7,168.0	65.50	263.60	6,816.3	-1,193.3	66.8	293.4	4.95	4.89	0.89
7,213.0	67.80	264.30	6,834.2	-1,197.7	25.7	333.9	5.31	5.11	1.56
7,258.0	70.60	266.20	6,850.1	-1,201.2	-16.2	375.0	7.37	6.22	4.22
7,303.0	73.30	268.10	6,864.1	-1,203.3	-59.0	416.4	7.22	6.00	4.22
7,310.6	73.74	268.13	6,866.2	-1,203.5	-66.2	423.4	5.79	5.78	0.45
End of Build Thistle Down PC F36-69HC									
7,348.0	75.90	268.30	6,876.0	-1,204.6	-102.3	458.2	5.79	5.78	0.44
7,393.0	80.50	269.70	6,885.2	-1,205.4	-146.4	500.4	10.67	10.22	3.11
7,435.0	83.80	269.90	6,891.0	-1,205.5	-188.0	540.1	7.87	7.86	0.48
7,515.0	86.00	270.60	6,898.1	-1,205.2	-267.6	616.1	2.88	2.75	0.88
7,584.0	88.15	270.60	6,901.6	-1,204.5	-336.5	681.6	3.11	3.11	0.00
Landing Pt. Thistle Down PC F36-69HC									
7,605.0	88.80	270.60	6,902.2	-1,204.3	-357.5	701.6	3.11	3.11	0.00
7,695.0	89.30	270.60	6,903.6	-1,203.3	-447.5	787.1	0.56	0.56	0.00
7,784.0	90.70	270.40	6,903.6	-1,202.5	-536.5	871.8	1.59	1.57	-0.22
7,874.0	90.70	269.40	6,902.5	-1,202.7	-626.5	957.7	1.11	0.00	-1.11
7,964.0	90.60	267.80	6,901.5	-1,204.9	-716.5	1,044.2	1.78	-0.11	-1.78
8,054.0	90.10	268.50	6,901.0	-1,207.8	-806.4	1,130.9	0.96	-0.56	0.78
8,144.0	89.30	268.00	6,901.4	-1,210.5	-896.4	1,217.6	1.05	-0.89	-0.56
8,234.0	90.30	268.10	6,901.8	-1,213.6	-986.3	1,304.3	1.12	1.11	0.11
8,324.0	90.00	269.00	6,901.5	-1,215.9	-1,076.3	1,390.8	1.05	-0.33	1.00
8,414.0	89.10	269.00	6,902.2	-1,217.5	-1,166.3	1,477.2	1.00	-1.00	0.00
8,504.0	88.20	268.80	6,904.4	-1,219.2	-1,256.2	1,563.5	1.02	-1.00	-0.22
8,593.0	88.10	270.80	6,907.2	-1,219.5	-1,345.2	1,648.5	2.25	-0.11	2.25
8,683.0	89.80	269.90	6,908.9	-1,218.9	-1,435.2	1,734.2	2.14	1.89	-1.00
8,773.0	89.70	268.50	6,909.3	-1,220.2	-1,525.1	1,820.4	1.56	-0.11	-1.56
8,863.0	89.00	270.30	6,910.3	-1,221.1	-1,615.1	1,906.6	2.15	-0.78	2.00
8,953.0	89.70	271.00	6,911.3	-1,220.1	-1,705.1	1,992.1	1.10	0.78	0.78
9,043.0	89.80	272.00	6,911.7	-1,217.8	-1,795.1	2,077.3	1.12	0.11	1.11
9,133.0	89.90	272.70	6,911.9	-1,214.1	-1,885.0	2,162.0	0.79	0.11	0.78
9,223.0	88.90	270.10	6,912.9	-1,211.9	-1,975.0	2,247.1	3.10	-1.11	-2.89
9,312.0	90.40	267.80	6,913.4	-1,213.5	-2,063.9	2,332.5	3.09	1.69	-2.58

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9,402.0	90.10	264.30	6,913.0	-1,219.7	-2,153.7	2,420.0	3.90	-0.33	-3.89
9,492.0	89.60	264.60	6,913.3	-1,228.4	-2,243.3	2,508.1	0.65	-0.56	0.33
9,582.0	89.90	264.10	6,913.7	-1,237.3	-2,332.8	2,596.2	0.65	0.33	-0.56
9,672.0	89.30	266.20	6,914.3	-1,244.9	-2,422.5	2,684.1	2.43	-0.67	2.33
9,762.0	87.40	269.00	6,916.9	-1,248.7	-2,512.4	2,770.9	3.76	-2.11	3.11
9,852.0	87.00	271.50	6,921.3	-1,248.3	-2,602.3	2,856.6	2.81	-0.44	2.78
9,942.0	88.20	272.20	6,925.0	-1,245.4	-2,692.1	2,941.5	1.54	1.33	0.78
10,031.0	88.50	271.80	6,927.6	-1,242.3	-2,781.1	3,025.4	0.56	0.34	-0.45
10,121.0	89.80	271.70	6,928.9	-1,239.5	-2,871.0	3,110.4	1.45	1.44	-0.11
10,211.0	91.40	271.50	6,928.0	-1,237.0	-2,961.0	3,195.5	1.79	1.78	-0.22
10,301.0	89.60	273.60	6,927.2	-1,233.0	-3,050.9	3,280.0	3.07	-2.00	2.33
10,391.0	88.90	272.20	6,928.4	-1,228.4	-3,140.7	3,364.4	1.74	-0.78	-1.56
10,481.0	90.50	272.40	6,928.9	-1,224.8	-3,230.7	3,449.1	1.79	1.78	0.22
10,571.0	89.30	269.70	6,929.0	-1,223.2	-3,320.6	3,534.5	3.28	-1.33	-3.00
10,661.0	88.70	269.00	6,930.6	-1,224.2	-3,410.6	3,620.7	1.02	-0.67	-0.78
10,750.0	88.80	270.30	6,932.5	-1,224.7	-3,499.6	3,705.7	1.46	0.11	1.46
10,840.0	89.30	270.40	6,934.0	-1,224.2	-3,589.6	3,791.4	0.57	0.56	0.11
10,930.0	87.40	271.50	6,936.6	-1,222.7	-3,679.5	3,876.8	2.44	-2.11	1.22
11,020.0	88.50	273.10	6,939.8	-1,219.1	-3,769.4	3,961.5	2.16	1.22	1.78
11,070.0	89.30	272.70	6,940.8	-1,216.6	-3,819.3	4,008.3	1.79	1.60	-0.80
11,126.0	89.30	272.70	6,941.5	-1,213.9	-3,875.2	4,060.9	0.00	0.00	0.00
Thistle Down PC F36-69HC BHL 75'FNL, 535'FWL									

Checked By: _____	Approved By: _____	Date: _____
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