

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

Well Name: **Mahalo State AA09-72-1AHNB**

Surface Location: Mahalo State AA09-72-A Sec.4-T6N-R63W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

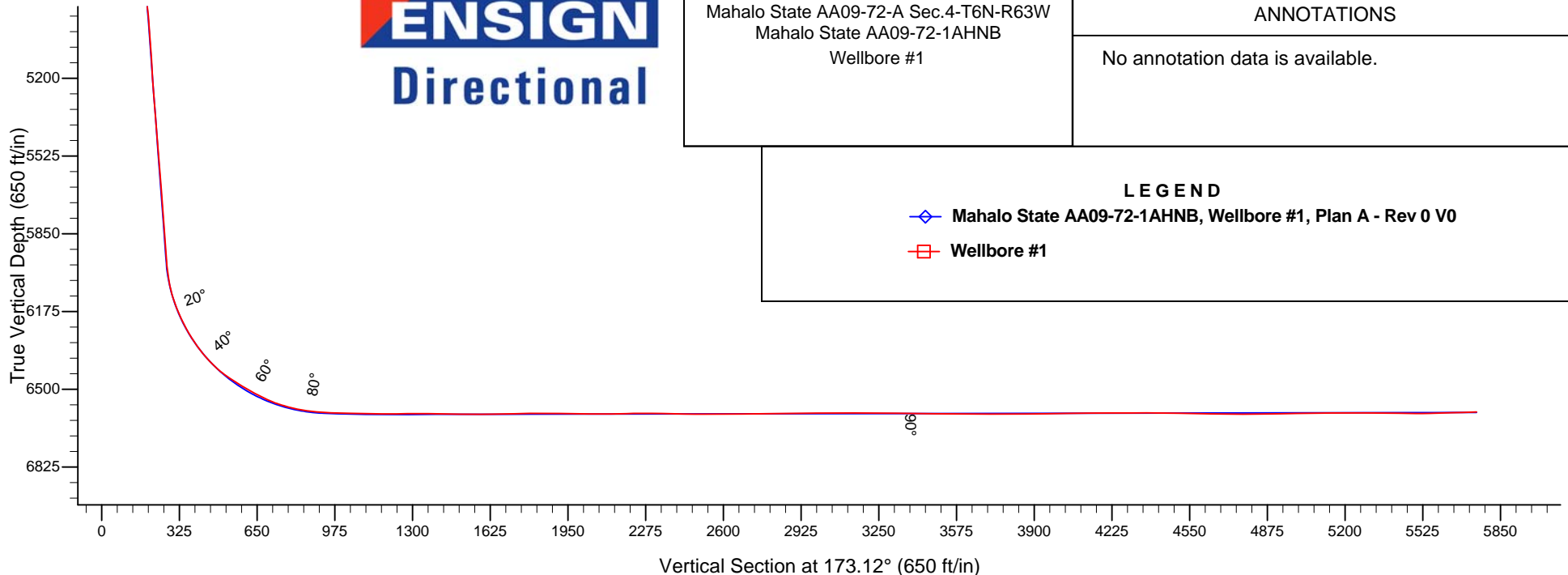
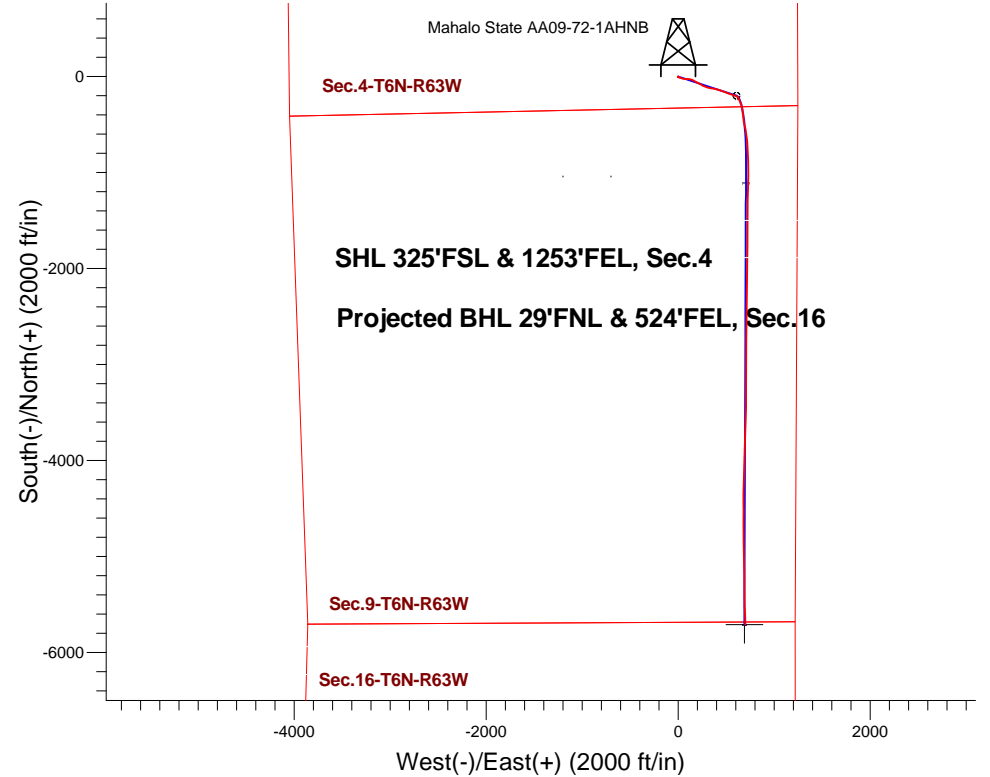
Ground Elevation: 4700.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1430227.74	3295662.94	40.509510	-104.436670	

PD 828 RKB - 16' WELL @ 4716.0ft (PD 828 RKB - 16')

FINAL SURVEY

Projected Bottom Hole Location
11883'MD 6595'TVD 5707'S & 699'E of SHL
91.8 degree Incl @ 177.4 degree AZM



Mahalo State AA09-72-A Sec.4-T6N-R63W
Mahalo State AA09-72-1AHNB
Wellbore #1

ANNOTATIONS

No annotation data is available.

LEGEND

- ◆ Mahalo State AA09-72-1AHNB, Wellbore #1, Plan A - Rev 0 V0
- Wellbore #1



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

Sec.4-T6N-R63W

Mahalo State AA09-72-A Sec.4-T6N-R63W

Mahalo State AA09-72-1AHNB

Wellbore #1

Design: Wellbore #1

Final Survey

19 January, 2015

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Mahalo State AA09-72-1AHNB
Project:	Sec.4-T6N-R63W	TVD Reference:	WELL @ 4716.0ft (PD 828 RKB - 16')
Site:	Mahalo State AA09-72-A Sec.4-T6N-R63W	MD Reference:	WELL @ 4716.0ft (PD 828 RKB - 16')
Well:	Mahalo State AA09-72-1AHNB	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	Sec.4-T6N-R63W, Weld County, Colorado		
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	Mahalo State AA09-72-A Sec.4-T6N-R63W				
Site Position:		Northing:	1,430,231.84 ft	Latitude:	40.509520
From:	Lat/Long	Easting:	3,295,699.04 ft	Longitude:	-104.436540
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.69 °

Well	Mahalo State AA09-72-1AHNB					
Well Position	+N/-S	0.0 ft	Northing:	1,430,227.74 ft	Latitude:	40.509510
	+E/-W	0.0 ft	Easting:	3,295,662.94 ft	Longitude:	-104.436670
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,700.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/31/2014	8.22	67.07	52,850

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	173.12	

Survey Program	Date	1/19/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
321.0	606.0	Surface (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
885.0	6,985.0	Intermediate/Curve (Wellbore #1)	MWD	MWD - Standard	
7,081.0	11,883.0	Lateral (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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	
321.0	0.30	43.50	321.0	0.6	0.6	-0.5	0.09	
606.0	0.30	223.60	606.0	0.6	0.6	-0.5	0.21	
885.0	0.40	136.70	885.0	-0.6	0.7	0.7	0.17	
975.0	0.40	146.60	975.0	-1.1	1.1	1.2	0.08	
1,065.0	0.10	136.50	1,065.0	-1.4	1.4	1.6	0.34	
1,159.0	0.30	197.40	1,159.0	-1.7	1.3	1.9	0.28	
1,253.0	0.50	184.90	1,253.0	-2.4	1.2	2.5	0.23	
1,348.0	0.40	199.30	1,348.0	-3.1	1.1	3.2	0.16	
1,442.0	0.30	211.50	1,442.0	-3.6	0.8	3.7	0.13	

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Survey							
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
1,537.0	0.40	186.50	1,537.0	-4.2	0.7	4.2	0.19
1,630.0	0.10	206.80	1,630.0	-4.6	0.6	4.6	0.33
1,725.0	0.40	303.80	1,725.0	-4.4	0.3	4.5	0.45
1,820.0	0.30	5.00	1,820.0	-4.0	0.0	4.0	0.39
1,915.0	0.60	290.40	1,915.0	-3.6	-0.4	3.5	0.63
2,013.0	0.90	188.80	2,013.0	-4.2	-1.0	4.0	1.20
2,103.0	1.70	131.20	2,102.9	-5.8	-0.1	5.7	1.59
2,193.0	3.10	97.50	2,192.9	-7.0	3.3	7.3	2.15
2,283.0	3.90	101.00	2,282.7	-7.9	8.7	8.8	0.92
2,373.0	5.50	109.60	2,372.4	-9.9	15.8	11.7	1.94
2,462.0	7.70	114.90	2,460.8	-13.8	25.2	16.7	2.56
2,552.0	9.40	106.20	2,549.8	-18.4	37.8	22.8	2.37
2,642.0	9.10	101.60	2,638.6	-21.9	51.8	27.9	0.89
2,732.0	10.60	94.40	2,727.3	-24.0	67.0	31.8	2.15
2,822.0	10.20	91.70	2,815.8	-24.8	83.2	34.6	0.70
2,912.0	10.20	89.80	2,904.4	-25.0	99.2	36.7	0.37
3,002.0	10.30	97.30	2,993.0	-26.0	115.1	39.6	1.49
3,092.0	9.80	107.80	3,081.6	-29.4	130.4	44.8	2.11
3,182.0	10.30	112.40	3,170.2	-34.8	145.1	51.9	1.05
3,271.0	9.40	119.20	3,257.9	-41.4	158.8	60.1	1.65
3,361.0	8.00	118.30	3,346.9	-47.9	170.8	68.1	1.56
3,451.0	9.00	116.20	3,435.9	-54.0	182.6	75.5	1.16
3,541.0	10.10	121.30	3,524.6	-61.2	195.6	84.2	1.54
3,631.0	12.20	119.00	3,612.9	-69.9	210.7	94.7	2.38
3,721.0	12.70	116.60	3,700.8	-79.0	227.9	105.7	0.80
3,811.0	12.60	117.10	3,788.6	-87.9	245.5	116.6	0.16
3,901.0	11.50	115.40	3,876.7	-96.2	262.3	126.9	1.28
3,990.0	11.10	114.60	3,963.9	-103.6	278.1	136.1	0.48
4,080.0	9.30	107.40	4,052.5	-109.4	292.9	143.7	2.45
4,170.0	8.70	104.60	4,141.4	-113.2	306.4	149.1	0.83
4,260.0	7.60	107.00	4,230.5	-116.7	318.7	154.0	1.28
4,350.0	7.80	99.20	4,319.7	-119.4	330.4	158.1	1.18
4,439.0	9.40	100.30	4,407.7	-121.7	343.6	162.0	1.81
4,529.0	9.00	97.30	4,496.5	-123.9	357.8	165.9	0.69
4,619.0	10.10	100.00	4,585.3	-126.2	372.5	169.9	1.32
4,709.0	10.20	103.00	4,673.9	-129.3	388.1	174.9	0.60
4,799.0	10.60	103.00	4,762.4	-133.0	403.9	180.4	0.44
4,888.0	11.00	109.30	4,849.8	-137.6	419.9	186.9	1.40
4,978.0	10.50	110.40	4,938.2	-143.3	435.7	194.5	0.60
5,068.0	10.10	108.30	5,026.8	-148.7	450.9	201.6	0.61
5,158.0	8.60	106.20	5,115.6	-153.0	464.8	207.6	1.71
5,248.0	8.60	108.40	5,204.6	-157.0	477.7	213.1	0.37
5,338.0	8.30	113.00	5,293.6	-161.7	490.0	219.2	0.82
5,427.0	9.20	117.30	5,381.6	-167.4	502.3	226.4	1.25
5,517.0	10.00	110.10	5,470.3	-173.4	516.0	234.0	1.60

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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)
5,607.0	10.00	108.90	5,558.9	-178.6	530.7	240.9	0.23
5,697.0	10.30	106.90	5,647.5	-183.5	545.8	247.6	0.51
5,787.0	10.90	108.50	5,736.0	-188.6	561.6	254.5	0.74
5,877.0	9.60	107.20	5,824.5	-193.5	576.8	261.2	1.47
5,967.0	10.50	107.50	5,913.2	-198.2	591.8	267.6	1.00
6,012.0	9.80	107.50	5,957.5	-200.5	599.4	270.9	1.56
6,025.7	10.25	110.97	5,971.0	-201.3	601.6	272.0	5.50
Mahalo State AA09-72-1AHNB Curve KOP							
6,057.0	11.40	117.80	6,001.7	-203.8	607.0	275.0	5.50
6,101.0	13.70	128.10	6,044.6	-209.0	614.9	281.2	7.27
6,146.0	16.30	138.30	6,088.1	-217.0	623.3	290.1	8.21
6,191.0	19.60	155.20	6,131.0	-228.6	630.7	302.5	13.63
6,236.0	23.40	159.80	6,172.8	-243.8	636.9	318.4	9.23
6,281.0	26.60	157.90	6,213.6	-261.6	643.8	336.8	7.33
6,326.0	30.10	159.20	6,253.2	-281.5	651.6	357.5	7.90
6,371.0	33.20	164.50	6,291.5	-303.9	658.9	380.6	9.25
6,416.0	36.30	169.60	6,328.5	-328.9	664.6	406.1	9.44
6,461.0	40.80	172.00	6,363.7	-356.6	669.1	434.1	10.54
6,506.0	45.30	172.90	6,396.5	-387.0	673.1	464.8	10.09
6,551.0	51.60	173.30	6,426.4	-420.4	677.1	498.5	14.02
6,596.0	55.60	172.40	6,453.1	-456.3	681.6	534.7	9.03
6,641.0	58.20	169.40	6,477.6	-493.6	687.6	572.4	8.03
6,686.0	60.30	168.80	6,500.7	-531.5	694.9	610.9	4.81
6,731.0	62.30	168.40	6,522.3	-570.2	702.7	650.3	4.51
6,776.0	65.20	169.80	6,542.2	-609.8	710.4	690.5	7.02
6,821.0	70.50	173.50	6,559.1	-651.1	716.4	732.2	14.02
6,866.0	74.80	177.60	6,572.6	-693.9	719.7	775.1	12.92
6,911.0	78.40	177.80	6,583.0	-737.6	721.5	818.7	8.01
6,956.0	82.20	176.40	6,590.6	-781.9	723.7	862.9	8.98
6,985.0	85.10	176.60	6,593.8	-810.7	725.5	891.7	10.02
7,081.0	88.30	178.65	6,599.3	-906.4	729.4	987.2	3.96
7,174.0	89.50	180.46	6,601.1	-999.4	730.2	1,079.6	2.33
7,267.0	88.70	181.81	6,602.5	-1,092.3	728.3	1,171.7	1.69
7,284.6	89.22	181.79	6,602.9	-1,109.9	727.8	1,189.1	2.98
Mahalo State AA09-72-1AHNB Landing Pt.							
7,361.0	91.50	181.68	6,602.4	-1,186.3	725.4	1,264.6	2.98
7,454.0	89.40	180.75	6,601.6	-1,279.3	723.5	1,356.7	2.47
7,548.0	88.60	179.29	6,603.3	-1,373.2	723.4	1,450.0	1.77
7,640.0	89.80	180.29	6,604.6	-1,465.2	723.8	1,541.4	1.70
7,734.0	90.90	181.04	6,604.0	-1,559.2	722.7	1,634.6	1.42
7,828.0	91.30	179.34	6,602.2	-1,653.2	722.4	1,727.8	1.86
7,923.0	90.60	181.27	6,600.6	-1,748.2	721.9	1,822.1	2.16
8,016.0	89.10	181.61	6,600.9	-1,841.1	719.5	1,914.1	1.65
8,111.0	88.80	180.14	6,602.6	-1,936.1	718.1	2,008.2	1.58

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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)
8,205.0	90.80	181.35	6,602.9	-2,030.1	716.9	2,101.3	2.49
8,298.0	91.20	180.21	6,601.3	-2,123.1	715.6	2,193.5	1.30
8,361.0	90.10	180.48	6,600.6	-2,186.1	715.2	2,256.0	1.80
8,451.0	89.00	180.75	6,601.3	-2,276.1	714.2	2,345.2	1.26
8,541.0	88.70	180.26	6,603.1	-2,366.0	713.5	2,434.5	0.64
8,631.0	90.10	181.28	6,604.0	-2,456.0	712.2	2,523.7	1.92
8,721.0	90.60	181.36	6,603.5	-2,546.0	710.2	2,612.7	0.56
8,811.0	90.50	180.42	6,602.6	-2,636.0	708.8	2,701.9	1.05
8,900.0	90.50	179.60	6,601.9	-2,725.0	708.8	2,790.3	0.92
8,990.0	90.60	181.00	6,601.0	-2,815.0	708.3	2,879.5	1.56
9,080.0	90.60	180.40	6,600.1	-2,905.0	707.2	2,968.7	0.67
9,170.0	90.80	179.67	6,599.0	-2,994.9	707.1	3,058.1	0.84
9,260.0	89.50	180.35	6,598.7	-3,084.9	707.1	3,147.4	1.63
9,350.0	89.40	179.51	6,599.6	-3,174.9	707.2	3,236.8	0.94
9,440.0	89.80	181.64	6,600.2	-3,264.9	706.3	3,326.0	2.41
9,529.0	89.50	180.39	6,600.8	-3,353.9	704.7	3,414.2	1.44
9,619.0	89.10	179.52	6,601.9	-3,443.9	704.8	3,503.5	1.06
9,709.0	89.40	181.54	6,603.0	-3,533.9	704.0	3,592.8	2.27
9,799.0	89.60	182.44	6,603.8	-3,623.8	700.9	3,681.7	1.02
9,889.0	91.10	181.83	6,603.3	-3,713.8	697.5	3,770.6	1.80
9,979.0	90.00	180.99	6,602.4	-3,803.7	695.3	3,859.6	1.54
10,069.0	90.60	182.14	6,601.9	-3,893.7	692.8	3,948.6	1.44
10,159.0	90.80	181.84	6,600.8	-3,983.6	689.7	4,037.6	0.40
10,249.0	90.90	181.42	6,599.5	-4,073.6	687.2	4,126.6	0.48
10,338.0	90.00	182.31	6,598.8	-4,162.5	684.3	4,214.5	1.42
10,428.0	90.40	181.60	6,598.5	-4,252.5	681.2	4,303.5	0.91
10,518.0	89.40	179.86	6,598.6	-4,342.5	680.0	4,392.7	2.23
10,608.0	89.10	179.51	6,599.8	-4,432.5	680.5	4,482.1	0.51
10,698.0	88.60	179.08	6,601.6	-4,522.4	681.6	4,571.5	0.73
10,788.0	89.70	180.30	6,603.0	-4,612.4	682.1	4,660.9	1.83
10,878.0	90.10	180.40	6,603.1	-4,702.4	681.6	4,750.2	0.46
10,968.0	89.90	179.60	6,603.1	-4,792.4	681.6	4,839.5	0.92
11,057.0	91.60	179.80	6,602.0	-4,881.4	682.0	4,927.9	1.92
11,147.0	90.20	178.70	6,600.5	-4,971.4	683.2	5,017.4	1.98
11,237.0	90.80	177.60	6,599.8	-5,061.3	686.1	5,107.1	1.39
11,327.0	90.70	179.60	6,598.6	-5,151.3	688.3	5,196.6	2.22
11,417.0	89.40	180.20	6,598.5	-5,241.3	688.5	5,286.0	1.59
11,507.0	89.10	179.60	6,599.7	-5,331.3	688.6	5,375.4	0.75
11,597.0	89.10	178.70	6,601.1	-5,421.3	690.0	5,464.9	1.00
11,686.0	91.40	178.70	6,600.7	-5,510.2	692.0	5,553.4	2.58
11,776.0	91.80	177.80	6,598.2	-5,600.1	694.7	5,643.0	1.09
11,825.0	91.80	177.40	6,596.6	-5,649.1	696.8	5,691.9	0.82
11,883.0	91.80	177.40	6,594.8	-5,707.0	699.4	5,749.7	0.00
Mahalo State AA09-72-1AHNB BHL 30'FNL & 535'FEL							

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Checked By: _____	Approved By: _____	Date: _____
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