MANZANO ENERGY PARTNERS

Project: Lea Co., NM (NAD 83)
Site: Sec 28-T12S-R38E
Rig: Norton #4
Well: 07S State Com #1H
Wellbore: HZ [440637]
Design: Final

CATHEDRAL

T G M

Total Azimuth to Grid North + 5.89°
Gravity = 0.9986°

Magnetic Field
Strength: 48327.1nT
Dip Angle: 60.90°
Date: 12/10/2018
Model: HDGM_FILE

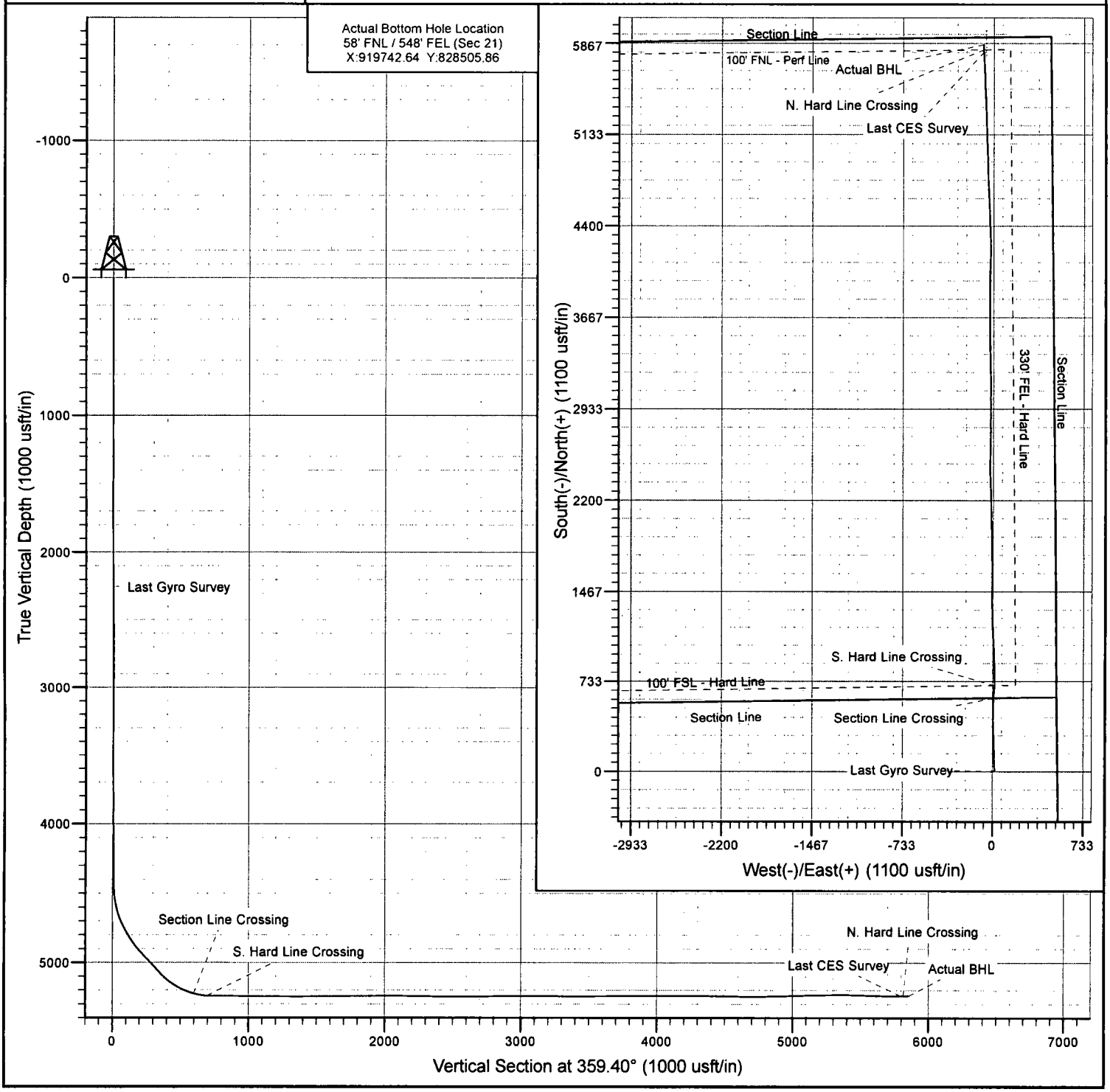
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	822650.30	919826.10	33.255257	-103.095230

TARGET LINE
90.10° INC @ 5247.24' TVD @ 0' VS
10' Up / 10' Down
30' Left / 30' Right

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Annotation
2252.00	0.20	14.96	2251.81	2.31	-3.98	2.35	Last Gyro Survey
5477.00	75.28	3.85	5225.38	598.15	8.90	598.03	Section Line Crossing
5579.00	86.65	2.40	5241.68	698.43	15.74	698.23	S. Hard Line Crossing
10679.00	90.40	357.10	5241.93	5795.64	-80.43	5796.16	Last CES Survey
10698.00	90.40	357.10	5241.80	5814.61	-81.39	5815.15	N. Hard Line Crossing
10739.00	90.40	357.10	5241.52	5855.56	-83.46	5856.11	Actual BHL

Actual Bottom Hole Location
58' FNL / 548' FEL (Sec 21)
X:919742.64 Y:828505.86



Survey Report

Company:	Manzano LLC	**Local Co-ordinate Reference:**	Well 07S State Com #1H
Project:	Lea Co., NM (NAD 83)	**TVD Reference:**	13' KB @ 3834.00usft (Norton #4)
Site:	Sec 28-T12S-R38E	**MD Reference:**	13' KB @ 3834.00usft (Norton #4)
Well:	07S State Com #1H	**North Reference:**	Grid
Wellbore:	HZ [440637]	**Survey Calculation Method:**	Minimum Curvature
Design:	Final	**Database:**	USA EDM 5000 Multi Users DB

Project Lea Co., NM (NAD 83)

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site Sec 28-T12S-R38E, 0.9986g

Site Position:		**Northing:**	820,594.72 usft	**Latitude:**	33.249677
From:	Map	**Easting:**	917,727.51 usft	**Longitude:**	-103.102172
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16"	**Grid Convergence:**	0.68 °

Well 07S State Com #1H

Well Position	**+N/-S**	0.00 usft	**Northing:**	822,650.30 usft	**Latitude:**	33.255257
	+E/-W	0.00 usft	**Easting:**	919,826.10 usft	**Longitude:**	-103.095230
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,821.00 usft

Wellbore HZ [440637]

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM_FILE	12/10/2018	6.57	60.90	48,327.10000000

Design Final

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	359.40

Survey Program **Date** 12/21/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
188.00	2,252.00	Surface Gyros (HZ [440637])	GyroFlex	
2,329.00	10,739.00	CES MWD (HZ [440637])	MWD+HDGM	OWSG MWD + HDGM

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf	Build Rate (°/100u	Formations / Comments
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
188.00	0.70	53.96	188.00	0.68	0.93	0.67	0.37	0.37	
280.00	0.80	69.96	279.99	1.23	1.99	1.21	0.25	0.11	
370.00	1.00	296.96	369.98	1.80	1.88	1.78	1.84	0.22	
459.00	0.60	20.96	458.98	2.59	1.35	2.57	1.25	-0.45	
543.00	0.60	119.96	542.97	2.78	1.89	2.76	1.09	0.00	
633.00	1.10	193.96	632.97	1.70	2.09	1.68	1.22	0.56	
729.00	1.10	269.96	728.95	0.81	0.95	0.80	1.41	0.00	
823.00	0.90	336.96	822.94	1.49	-0.25	1.49	1.19	-0.21	
918.00	0.60	68.96	917.94	2.35	-0.07	2.35	1.16	-0.32	
1,012.00	1.30	203.96	1,011.93	1.55	-0.05	1.55	1.89	0.74	
1,104.00	0.60	60.96	1,103.92	0.83	-0.05	0.83	1.97	-0.76	

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Well:	07S State Com #1H	**North Reference:**	Grid
Wellbore:	HZ [440637]	**Survey Calculation Method:**	Minimum Curvature
Design:	Final	**Database:**	USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf	Build Rate (°/100u	Formations / Comments
1,293.00	0.60	305.96	1,292.92	1.90	0.01	1.89	0.54	0.00	
1,384.00	0.40	149.96	1,383.91	1.90	-0.21	1.90	1.08	-0.22	
1,478.00	1.00	171.96	1,477.91	0.80	0.07	0.80	0.69	0.64	
1,573.00	1.40	223.96	1,572.89	-0.85	-0.62	-0.85	1.17	0.42	
1,667.00	0.40	359.96	1,666.88	-1.35	-1.42	-1.34	1.82	-1.06	
1,762.00	1.40	275.96	1,761.87	-0.90	-2.57	-0.87	1.49	1.05	
1,855.00	1.40	307.96	1,854.84	-0.08	-4.60	-0.03	0.83	0.00	
1,951.00	0.70	130.96	1,950.84	0.25	-5.08	0.31	2.19	-0.73	
2,044.00	0.70	292.96	2,043.83	0.10	-5.18	0.16	1.49	0.00	
2,138.00	1.00	65.96	2,137.83	0.66	-4.96	0.71	1.66	0.32	
2,234.00	1.30	8.96	2,233.81	2.08	-4.02	2.12	1.18	0.31	
2,252.00	0.20	14.96	2,251.81	2.31	-3.98	2.35	6.12	-6.11	Last Gyro Survey
2,329.00	0.80	45.40	2,328.81	2.82	-3.56	2.86	0.83	0.78	
2,424.00	0.80	47.90	2,423.80	3.73	-2.60	3.76	0.04	0.00	
2,518.00	0.50	45.70	2,517.79	4.46	-1.82	4.47	0.32	-0.32	
2,612.00	0.40	4.70	2,611.79	5.07	-1.50	5.08	0.35	-0.11	
2,706.00	0.20	60.60	2,705.79	5.48	-1.33	5.49	0.35	-0.21	
2,800.00	0.40	149.80	2,799.79	5.27	-1.02	5.28	0.47	0.21	
2,894.00	0.30	127.90	2,893.79	4.84	-0.66	4.85	0.18	-0.11	
2,989.00	0.40	149.90	2,988.78	4.40	-0.30	4.40	0.17	0.11	
3,083.00	0.70	109.90	3,082.78	3.92	0.41	3.92	0.50	0.32	
3,177.00	0.70	100.50	3,176.77	3.62	1.51	3.60	0.12	0.00	
3,272.00	0.90	119.10	3,271.76	3.15	2.73	3.12	0.34	0.21	
3,366.00	1.00	113.60	3,365.75	2.46	4.13	2.42	0.14	0.11	
3,460.00	1.20	98.80	3,459.73	1.98	5.85	1.92	0.37	0.21	
3,554.00	1.10	72.20	3,553.72	2.11	7.69	2.03	0.57	-0.11	
3,648.00	0.90	74.00	3,647.70	2.59	9.25	2.49	0.22	-0.21	
3,743.00	1.10	70.20	3,742.69	3.10	10.83	2.99	0.22	0.21	
3,837.00	1.20	67.10	3,836.67	3.79	12.58	3.66	0.13	0.11	
3,931.00	1.70	76.90	3,930.64	4.49	14.85	4.33	0.59	0.53	
4,025.00	0.60	25.10	4,024.62	5.25	16.42	5.08	1.50	-1.17	
4,119.00	0.70	32.50	4,118.61	6.18	16.93	6.00	0.14	0.11	
4,213.00	0.80	24.30	4,212.60	7.27	17.51	7.08	0.16	0.11	
4,307.00	0.70	35.60	4,306.60	8.33	18.12	8.14	0.19	-0.11	
4,401.00	0.60	47.00	4,400.59	9.13	18.81	8.93	0.17	-0.11	
4,433.00	1.20	0.70	4,432.59	9.58	18.94	9.38	2.80	1.87	
4,464.00	2.90	349.00	4,463.57	10.68	18.79	10.48	5.62	5.48	
4,495.00	5.50	349.00	4,494.48	12.91	18.36	12.71	8.39	8.39	
4,526.00	8.40	352.90	4,525.25	16.61	17.79	16.42	9.47	9.35	
4,558.00	10.50	354.30	4,556.81	21.83	17.22	21.65	6.60	6.56	
4,589.00	11.90	353.90	4,587.22	27.82	16.60	27.64	4.52	4.52	
4,621.00	13.90	355.70	4,618.41	34.94	15.96	34.77	6.37	6.25	
4,652.00	17.30	357.00	4,648.27	43.25	15.44	43.09	11.02	10.97	
4,684.00	20.80	358.10	4,678.51	53.69	15.00	53.53	10.99	10.94	
4,714.00	23.90	359.40	4,706.25	65.09	14.76	64.93	10.46	10.33	
4,745.00	26.80	359.80	4,734.26	78.36	14.67	78.20	9.37	9.35	
4,777.00	28.70	359.80	4,762.58	93.26	14.62	93.10	5.94	5.94	
4,808.00	30.70	0.00	4,789.51	108.62	14.59	108.46	6.46	6.45	
4,840.00	32.80	359.60	4,816.72	125.46	14.53	125.30	6.60	6.56	
4,872.00	34.90	359.30	4,843.29	143.28	14.36	143.12	6.58	6.56	
4,903.00	36.80	358.40	4,868.42	161.43	13.99	161.27	6.36	6.13	
4,935.00	39.00	358.20	4,893.67	181.08	13.41	180.93	6.89	6.87	
4,966.00	41.80	358.10	4,917.27	201.16	12.76	201.01	9.03	9.03	

Survey Report

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Wellbore:	HZ [440637]	**Survey Calculation Method:**	Minimum Curvature
Design:	Final	**Database:**	USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf	Build Rate (°/100u	Formations / Comments
4,998.00	44.80	358.20	4,940.56	223.09	12.05	222.95	9.38	9.37	
5,029.00	44.40	358.20	4,962.63	244.84	11.37	244.71	1.29	-1.29	
5,061.00	44.00	358.00	4,985.57	267.14	10.63	267.01	1.32	-1.25	
5,093.00	43.60	357.50	5,008.67	289.27	9.76	289.15	1.65	-1.25	
5,123.00	43.30	357.00	5,030.45	309.88	8.77	309.77	1.52	-1.00	
5,155.00	42.90	356.40	5,053.81	331.71	7.51	331.61	1.79	-1.25	
5,186.00	42.80	356.30	5,076.54	352.75	6.17	352.66	0.39	-0.32	
5,218.00	46.30	358.20	5,099.34	375.17	5.10	375.09	11.70	10.94	
5,250.00	49.90	359.60	5,120.71	398.98	4.65	398.90	11.71	11.25	
5,281.00	53.40	0.40	5,139.94	423.28	4.66	423.21	11.47	11.29	
5,313.00	56.30	0.00	5,158.36	449.44	4.75	449.37	9.12	9.06	
5,344.00	59.50	359.60	5,174.84	475.70	4.65	475.63	10.38	10.32	
5,376.00	63.40	0.80	5,190.13	503.80	4.76	503.73	12.62	12.19	
5,407.00	67.30	2.10	5,203.05	531.96	5.47	531.88	13.14	12.58	
5,440.00	71.20	2.80	5,214.74	562.79	6.80	562.69	11.98	11.82	
5,470.00	74.60	3.80	5,223.56	591.41	8.45	591.29	11.77	11.33	
5,477.00	75.28	3.85	5,225.38	598.15	8.90	598.03	9.69	9.67	Section Line Crossing
5,500.00	77.50	4.00	5,230.80	620.45	10.43	620.31	9.69	9.67	
5,531.00	81.00	4.30	5,236.58	650.83	12.63	650.66	11.33	11.29	
5,563.00	84.90	3.80	5,240.50	682.50	14.88	682.30	12.29	12.19	
5,579.00	86.65	2.40	5,241.68	698.43	15.74	698.23	14.00	10.96	S. Hard Line Crossing
5,594.00	88.30	1.10	5,242.34	713.41	16.20	713.20	14.00	10.97	
5,624.00	90.10	359.90	5,242.76	743.40	16.46	743.19	7.21	6.00	
5,720.00	89.40	358.30	5,243.18	839.39	14.95	839.18	1.82	-0.73	
5,814.00	89.30	357.90	5,244.25	933.33	11.83	933.15	0.44	-0.11	
5,908.00	89.40	357.70	5,245.31	1,027.25	8.23	1,027.11	0.24	0.11	
6,003.00	89.50	356.60	5,246.22	1,122.13	3.50	1,122.03	1.16	0.11	
6,098.00	89.70	356.70	5,246.89	1,216.96	-2.05	1,216.92	0.24	0.21	
6,192.00	89.50	359.60	5,247.54	1,310.90	-5.08	1,310.88	3.09	-0.21	
6,285.00	89.40	359.30	5,248.44	1,403.89	-5.98	1,403.88	0.34	-0.11	
6,380.00	91.20	359.90	5,247.94	1,498.89	-6.64	1,498.87	2.00	1.89	
6,474.00	90.90	0.10	5,246.22	1,592.87	-6.64	1,592.85	0.38	-0.32	
6,566.00	90.90	359.60	5,244.77	1,684.86	-6.88	1,684.84	0.54	0.00	
6,658.00	90.60	359.50	5,243.57	1,776.85	-7.60	1,776.83	0.34	-0.33	
6,750.00	90.50	359.30	5,242.68	1,868.84	-8.57	1,868.83	0.24	-0.11	
6,843.00	90.30	358.90	5,242.04	1,961.82	-10.03	1,961.82	0.48	-0.22	
6,935.00	90.20	358.90	5,241.63	2,053.81	-11.79	2,053.82	0.11	-0.11	
7,026.00	89.50	358.20	5,241.87	2,144.78	-14.10	2,144.81	1.09	-0.77	
7,117.00	89.00	357.70	5,243.06	2,235.71	-17.35	2,235.77	0.78	-0.55	
7,209.00	88.50	357.50	5,245.07	2,327.61	-21.20	2,327.70	0.59	-0.54	
7,301.00	88.70	359.00	5,247.32	2,419.53	-24.01	2,419.65	1.64	0.22	
7,393.00	90.20	0.40	5,248.20	2,511.52	-24.49	2,511.64	2.23	1.63	
7,487.00	90.20	0.50	5,247.87	2,605.52	-23.75	2,605.63	0.11	0.00	
7,581.00	91.30	1.10	5,246.64	2,699.50	-22.44	2,699.59	1.33	1.17	
7,674.00	90.70	0.90	5,245.02	2,792.47	-20.82	2,792.54	0.68	-0.65	
7,769.00	90.60	0.80	5,243.94	2,887.46	-19.41	2,887.50	0.15	-0.11	
7,863.00	89.80	0.00	5,243.61	2,981.45	-18.75	2,981.48	1.20	-0.85	
7,957.00	90.40	359.20	5,243.45	3,075.45	-19.41	3,075.48	1.06	0.64	
8,052.00	90.00	359.30	5,243.12	3,170.44	-20.65	3,170.48	0.43	-0.42	
8,146.00	89.00	358.80	5,243.94	3,264.42	-22.21	3,264.47	1.19	-1.06	
8,240.00	88.60	358.50	5,245.91	3,358.37	-24.43	3,358.44	0.53	-0.43	
8,335.00	91.00	359.90	5,246.24	3,453.35	-25.75	3,453.43	2.92	2.53	
8,429.00	90.70	359.10	5,244.84	3,547.34	-26.57	3,547.42	0.91	-0.32	

Survey Report

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Wellbore:	HZ [440637]	**Survey Calculation Method:**	Minimum Curvature
Design:	Final	**Database:**	USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf	Build Rate (°/100u	Formations / Comments
8,523.00	90.60	359.50	5,243.78	3,641.33	-27.72	3,641.42	0.44	-0.11	
8,617.00	90.10	359.20	5,243.20	3,735.32	-28.79	3,735.41	0.62	-0.53	
8,712.00	90.60	0.20	5,242.62	3,830.31	-29.28	3,830.41	1.18	0.53	
8,807.00	90.00	1.10	5,242.13	3,925.30	-28.21	3,925.38	1.14	-0.63	
8,901.00	90.30	1.80	5,241.88	4,019.27	-25.83	4,019.32	0.81	0.32	
8,995.00	90.40	1.80	5,241.31	4,113.23	-22.87	4,113.24	0.11	0.11	
9,089.00	90.80	0.10	5,240.32	4,207.20	-21.32	4,207.19	1.86	0.43	
9,184.00	89.10	357.60	5,240.40	4,302.17	-23.22	4,302.18	3.18	-1.79	
9,279.00	88.90	357.60	5,242.06	4,397.08	-27.20	4,397.12	0.21	-0.21	
9,374.00	88.90	357.60	5,243.89	4,491.97	-31.18	4,492.05	0.00	0.00	
9,468.00	88.80	357.50	5,245.77	4,585.87	-35.20	4,585.99	0.15	-0.11	
9,563.00	89.80	357.90	5,246.93	4,680.78	-39.01	4,680.94	1.13	1.05	
9,658.00	89.80	357.40	5,247.26	4,775.70	-42.90	4,775.89	0.53	0.00	
9,752.00	92.00	358.80	5,245.79	4,869.63	-46.02	4,869.85	2.77	2.34	
9,846.00	92.30	358.20	5,242.26	4,963.53	-48.48	4,963.77	0.71	0.32	
9,940.00	92.50	357.80	5,238.32	5,057.39	-51.76	5,057.66	0.48	0.21	
10,034.00	90.50	358.70	5,235.86	5,151.31	-54.62	5,151.60	2.33	-2.13	
10,130.00	90.50	358.00	5,235.03	5,247.27	-57.39	5,247.58	0.73	0.00	
10,225.00	90.50	358.10	5,234.20	5,342.21	-60.62	5,342.55	0.11	0.00	
10,314.00	88.40	357.30	5,235.05	5,431.13	-64.19	5,431.50	2.52	-2.36	
10,409.00	87.90	357.30	5,238.12	5,525.97	-68.67	5,526.39	0.53	-0.53	
10,503.00	88.00	357.50	5,241.48	5,619.82	-72.93	5,620.27	0.24	0.11	
10,598.00	90.60	357.80	5,242.64	5,714.72	-76.82	5,715.21	2.75	2.74	
10,679.00	90.40	357.10	5,241.93	5,795.64	-80.43	5,796.16	0.90	-0.25	Last CES Survey
10,698.00	90.40	357.10	5,241.80	5,814.61	-81.39	5,815.15	0.00	0.00	N. Hard Line Crossing
10,739.00	90.40	357.10	5,241.52	5,855.56	-83.46	5,856.11	0.00	0.00	Actual BHL

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL - 70S State Com #	0.00	0.00	5,237.00	5,865.60	-61.90	828,515.90	919,764.20	33.271377	-103.095205
- actual wellpath misses target center by 24.21usft at 10739.00usft MD (5241.52 TVD, 5855.56 N, -83.46 E)									
- Point									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
2,252.00	2,251.81	2.31	-3.98	Last Gyro Survey
5,477.00	5,225.38	598.15	8.90	Section Line Crossing
5,579.00	5,241.68	698.43	15.74	S. Hard Line Crossing
10,679.00	5,241.93	5,795.64	-80.43	Last CES Survey
10,698.00	5,241.80	5,814.61	-81.39	N. Hard Line Crossing
10,739.00	5,241.52	5,855.56	-83.46	Actual BHL

Checked By: _____ Approved By: _____ Date: _____

Manzano LLC
Lea Co. NM (NAD 83)
Sec 28-T12S-R38E
07S State Com #1H
HZ [440637]
Final

----- Geographical data ----------
Mapdatum.....: North American Datum 1983
Map System.....: US State Plane 1983
Map Zone: New Mexico Eastern Zone
Latitude:33.255257
Longitude: -103.095230

----- Geomagnetic data ----------
Magnetic model.....: HDGM_FILE
Magnetic date.....: 10-Dec-2018
Magnetic field strength..: 48327.10 HCNT
Magnetic dec (+E/W-).....: 6.57 degrees
Magnetic dip.....: 60.90 degrees

----- Depth reference ----------
Permanent datum.....: Mean Sea Level
Depth reference.....: 13' KB
GL above permanent.....: 3821.00 (ft)
KB above permanent.....: 3834.00 (ft)
DF above permanent.....: 3834.00 (ft)

----- Corrections ----------
Magnetic dec (+E/W-).....: 6.567 degrees
Grid convergence (+E/W-).: 0.68 degrees
Total az corr (+E/W-)....: 5.89 degrees
Total az corr (+E/W-)....: 5.89 degrees

All data are in feet unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to 13' KB. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100 feet.
Vertical Section is from Slot and calculated along an Azimuth of 359.395° (Grid).

Coordinate New Mexico Eastern Zone.
Grid Convergence at Surface is 0.679°.

Based upor at a Measured Depth of 10739.00ft.
the Bottom in the Direction of 359.395° (Grid).

MD	Inc	Azim.	SSTVD	TVD	N/S	E/W

(ft)	(Deg)	(Deg)	(ft)	(ft)	(ft)	(ft)
0.00	0.00	0.00	-3834.00	0.00	0.00 N	0.00 E
188.00	0.70	53.96	-3646.01	188.00	0.68 N	0.93 E
280.00	0.80	69.96	-3554.01	279.99	1.23 N	1.99 E
370.00	1.00	296.96	-3464.02	369.98	1.80 N	1.88 E
459.00	0.60	20.96	-3375.02	458.98	2.59 N	1.35 E
543.00	0.60	119.96	-3291.03	542.97	2.78 N	1.89 E
633.00	1.10	193.96	-3201.04	632.97	1.70 N	2.09 E
729.00	1.10	269.96	-3105.05	728.95	0.81 N	0.95 E
823.00	0.90	336.96	-3011.06	822.94	1.49 N	0.25 W
918.00	0.60	68.96	-2916.07	917.94	2.35 N	0.07 W
1012.00	1.30	203.96	-2822.07	1011.93	1.55 N	0.05 W
1104.00	0.60	60.96	-2730.08	1103.92	0.83 N	0.05 W
1293.00	0.60	305.96	-2541.08	1292.92	1.90 N	0.01 E
1384.00	0.40	149.96	-2450.09	1383.91	1.90 N	0.21 W
1478.00	1.00	171.96	-2356.09	1477.91	0.80 N	0.07 E
1573.00	1.40	223.96	-2261.11	1572.89	0.85 S	0.62 W
1667.00	0.40	359.96	-2167.12	1666.88	1.35 S	1.42 W
1762.00	1.40	275.96	-2072.13	1761.87	0.90 S	2.58 W
1855.00	1.40	307.96	-1979.16	1854.84	0.08 S	4.60 W
1951.00	0.70	130.96	-1883.16	1950.84	0.26 N	5.08 W
2044.00	0.70	292.96	-1790.17	2043.83	0.10 N	5.18 W
2138.00	1.00	65.96	-1696.17	2137.83	0.66 N	4.96 W
2234.00	1.30	8.96	-1600.19	2233.81	2.08 N	4.02 W
2252.00	0.20	14.96	-1582.19	2251.81	2.31 N	3.98 W
2329.00	0.80	45.40	-1505.19	2328.81	2.82 N	3.56 W
2424.00	0.80	47.90	-1410.20	2423.80	3.73 N	2.60 W
2518.00	0.50	45.70	-1316.21	2517.79	4.46 N	1.82 W
2612.00	0.40	4.70	-1222.21	2611.79	5.07 N	1.50 W
2706.00	0.20	60.60	-1128.21	2705.79	5.48 N	1.33 W
2800.00	0.40	149.80	-1034.21	2799.79	5.27 N	1.02 W
2894.00	0.30	127.90	-940.21	2893.79	4.84 N	0.66 W
2989.00	0.40	149.90	-845.22	2988.78	4.40 N	0.30 W
3083.00	0.70	109.90	-751.22	3082.78	3.92 N	0.41 E
3177.00	0.70	100.50	-657.23	3176.77	3.62 N	1.51 E
3272.00	0.90	119.10	-562.24	3271.76	3.15 N	2.73 E
3366.00	1.00	113.60	-468.25	3365.75	2.46 N	4.13 E
3460.00	1.20	98.80	-374.27	3459.73	1.98 N	5.85 E
3554.00	1.10	72.20	-280.29	3553.72	2.11 N	7.69 E
3648.00	0.90	74.00	-186.30	3647.70	2.59 N	9.25 E
3743.00	1.10	70.20	-91.31	3742.69	3.10 N	10.83 E
3837.00	1.20	67.10	2.67	3836.67	3.79 N	12.59 E
3931.00	1.70	76.90	96.64	3930.64	4.49 N	14.85 E
4025.00	0.60	25.10	190.62	4024.62	5.25 N	16.42 E
4119.00	0.70	32.50	284.61	4118.61	6.18 N	16.93 E
4213.00	0.80	24.30	378.61	4212.61	7.27 N	17.51 E

4307.00	0.70	35.60	472.60	4306.60	8.33 N	18.12 E
4401.00	0.60	47.00	566.59	4400.59	9.13 N	18.81 E
4433.00	1.20	0.70	598.59	4432.59	9.58 N	18.94 E
4464.00	2.90	349.00	629.57	4463.57	10.68 N	18.79 E
4495.00	5.50	349.00	660.48	4494.48	12.91 N	18.36 E
4526.00	8.40	352.90	691.25	4525.25	16.61 N	17.80 E
4558.00	10.50	354.30	722.81	4556.81	21.83 N	17.22 E
4589.00	11.90	353.90	753.22	4587.22	27.82 N	16.60 E
4621.00	13.90	355.70	784.41	4618.41	34.94 N	15.96 E
4652.00	17.30	357.00	814.27	4648.27	43.25 N	15.44 E
4684.00	20.80	358.10	844.51	4678.51	53.69 N	15.00 E
4714.00	23.90	359.40	872.25	4706.25	65.09 N	14.76 E
4745.00	26.80	359.80	900.27	4734.27	78.36 N	14.67 E
4777.00	28.70	359.80	928.58	4762.58	93.26 N	14.62 E
4808.00	30.70	0.00	955.51	4789.51	108.62 N	14.59 E
4840.00	32.80	359.60	982.72	4816.72	125.46 N	14.53 E
4872.00	34.90	359.30	1009.29	4843.29	143.28 N	14.36 E
4903.00	36.80	358.40	1034.42	4868.42	161.43 N	13.99 E
4935.00	39.00	358.20	1059.67	4893.67	181.08 N	13.41 E
4966.00	41.80	358.10	1083.27	4917.27	201.16 N	12.76 E
4998.00	44.80	358.20	1106.56	4940.56	223.09 N	12.05 E
5029.00	44.40	358.20	1128.63	4962.63	244.85 N	11.37 E
5061.00	44.00	358.00	1151.57	4985.57	267.14 N	10.63 E
5093.00	43.60	357.50	1174.67	5008.67	289.27 N	9.76 E
5123.00	43.30	357.00	1196.45	5030.45	309.88 N	8.77 E
5155.00	42.90	356.40	1219.82	5053.82	331.71 N	7.51 E
5186.00	42.80	356.30	1242.54	5076.54	352.75 N	6.17 E
5218.00	46.30	358.20	1265.34	5099.34	375.17 N	5.10 E
5250.00	49.90	359.60	1286.71	5120.71	398.98 N	4.65 E
5281.00	53.40	0.40	1305.94	5139.94	423.28 N	4.66 E
5313.00	56.30	0.00	1324.36	5158.36	449.44 N	4.75 E
5344.00	59.50	359.60	1340.84	5174.84	475.70 N	4.65 E
5376.00	63.40	0.80	1356.13	5190.13	503.80 N	4.76 E
5407.00	67.30	2.10	1369.05	5203.05	531.96 N	5.48 E
5440.00	71.20	2.80	1380.74	5214.74	562.79 N	6.80 E
5470.00	74.60	3.80	1389.56	5223.56	591.41 N	8.45 E
5477.00	75.28	3.85	1391.38	5225.38	598.16 N	8.90 E
5500.00	77.50	4.00	1396.80	5230.80	620.46 N	10.43 E
5531.00	81.00	4.30	1402.58	5236.58	650.83 N	12.63 E
5563.00	84.90	3.80	1406.50	5240.50	682.50 N	14.88 E
5579.00	86.65	2.40	1407.68	5241.68	698.43 N	15.74 E
5594.00	88.30	1.10	1408.34	5242.34	713.41 N	16.20 E
5624.00	90.10	359.90	1408.76	5242.76	743.40 N	16.46 E
5720.00	89.40	358.30	1409.18	5243.18	839.39 N	14.95 E
5814.00	89.30	357.90	1410.25	5244.25	933.33 N	11.83 E
5908.00	89.40	357.70	1411.31	5245.31	1027.25 N	8.23 E
6003.00	89.50	356.60	1412.22	5246.22	1122.13 N	3.50 E

6098.00	89.70	356.70	1412.89	5246.89	1216.97 N	2.05 W
6192.00	89.50	359.60	1413.54	5247.54	1310.90 N	5.08 W
6285.00	89.40	359.30	1414.44	5248.44	1403.90 N	5.98 W
6380.00	91.20	359.90	1413.94	5247.94	1498.89 N	6.64 W
6474.00	90.90	0.10	1412.22	5246.22	1592.87 N	6.64 W
6566.00	90.90	359.60	1410.77	5244.77	1684.86 N	6.88 W
6658.00	90.60	359.50	1409.57	5243.57	1776.85 N	7.60 W
6750.00	90.50	359.30	1408.68	5242.68	1868.84 N	8.57 W
6843.00	90.30	358.90	1408.04	5242.04	1961.83 N	10.03 W
6935.00	90.20	358.90	1407.63	5241.63	2053.81 N	11.79 W
7026.00	89.50	358.20	1407.87	5241.87	2144.78 N	14.10 W
7117.00	89.00	357.70	1409.06	5243.06	2235.71 N	17.35 W
7209.00	88.50	357.50	1411.07	5245.07	2327.61 N	21.20 W
7301.00	88.70	359.00	1413.32	5247.32	2419.53 N	24.01 W
7393.00	90.20	0.40	1414.20	5248.20	2511.52 N	24.49 W
7487.00	90.20	0.50	1413.87	5247.87	2605.52 N	23.75 W
7581.00	91.30	1.10	1412.64	5246.64	2699.50 N	22.44 W
7674.00	90.70	0.90	1411.02	5245.02	2792.47 N	20.82 W
7769.00	90.60	0.80	1409.94	5243.94	2887.46 N	19.41 W
7863.00	89.80	0.00	1409.61	5243.61	2981.45 N	18.75 W
7957.00	90.40	359.20	1409.45	5243.45	3075.45 N	19.41 W
8052.00	90.00	359.30	1409.12	5243.12	3170.44 N	20.65 W
8146.00	89.00	358.80	1409.94	5243.94	3264.42 N	22.21 W
8240.00	88.60	358.50	1411.91	5245.91	3358.37 N	24.43 W
8335.00	91.00	359.90	1412.24	5246.24	3453.35 N	25.75 W
8429.00	90.70	359.10	1410.84	5244.84	3547.34 N	26.57 W
8523.00	90.60	359.50	1409.78	5243.78	3641.33 N	27.72 W
8617.00	90.10	359.20	1409.20	5243.20	3735.32 N	28.79 W
8712.00	90.60	0.20	1408.62	5242.62	3830.31 N	29.28 W
8807.00	90.00	1.10	1408.13	5242.13	3925.31 N	28.21 W
8901.00	90.30	1.80	1407.88	5241.88	4019.27 N	25.83 W
8995.00	90.40	1.80	1407.31	5241.31	4113.23 N	22.88 W
9089.00	90.80	0.10	1406.32	5240.32	4207.20 N	21.32 W
9184.00	89.10	357.60	1406.40	5240.40	4302.17 N	23.22 W
9279.00	88.90	357.60	1408.06	5242.06	4397.08 N	27.20 W
9374.00	88.90	357.60	1409.89	5243.89	4491.98 N	31.18 W
9468.00	88.80	357.50	1411.77	5245.77	4585.87 N	35.20 W
9563.00	89.80	357.90	1412.93	5246.93	4680.79 N	39.01 W
9658.00	89.80	357.40	1413.26	5247.26	4775.70 N	42.90 W
9752.00	92.00	358.80	1411.79	5245.79	4869.63 N	46.02 W
9846.00	92.30	358.20	1408.26	5242.26	4963.53 N	48.48 W
9940.00	92.50	357.80	1404.33	5238.33	5057.39 N	51.76 W
10034.00	90.50	358.70	1401.86	5235.86	5151.31 N	54.63 W
10130.00	90.50	358.00	1401.03	5235.03	5247.27 N	57.39 W
10225.00	90.50	358.10	1400.20	5234.20	5342.21 N	60.62 W
10314.00	88.40	357.30	1401.05	5235.05	5431.13 N	64.19 W
10409.00	87.90	357.30	1404.12	5238.12	5525.97 N	68.67 W

10503.00	88.00	357.50	1407.48	5241.48	5619.82 N	72.93 W
10598.00	90.60	357.80	1408.64	5242.64	5714.72 N	76.82 W
10679.00	90.40	357.10	1407.94	5241.94	5795.64 N	80.43 W
10698.00	90.40	357.10	1407.80	5241.80	5814.61 N	81.39 W
10739.00	90.40	357.10	1407.52	5241.52	5855.56 N	83.46 W

Y	X	DLS	V.S.	Comment

(ft)	(ft)	(dega/100f (ft)		
822650.30 N	919826.10 E	0.00	0.00	
822650.98 N	919827.03 E	0.37	0.67	
822651.53 N	919828.09 E	0.25	1.21	
822652.10 N	919827.98 E	1.84	1.78	
822652.89 N	919827.45 E	1.25	2.57	
822653.08 N	919827.99 E	1.09	2.76	
822652.00 N	919828.19 E	1.22	1.68	
822651.11 N	919827.05 E	1.41	0.80	
822651.79 N	919825.85 E	1.19	1.49	
822652.65 N	919826.03 E	1.16	2.35	
822651.85 N	919826.05 E	1.89	1.55	
822651.13 N	919826.05 E	1.97	0.83	
822652.20 N	919826.11 E	0.54	1.90	
822652.20 N	919825.89 E	1.08	1.90	
822651.10 N	919826.17 E	0.69	0.80	
822649.45 N	919825.48 E	1.17	-0.85	
822648.95 N	919824.68 E	1.82	-1.34	
822649.40 N	919823.53 E	1.49	-0.87	
822650.22 N	919821.50 E	0.83	-0.03	
822650.56 N	919821.02 E	2.19	0.31	
822650.40 N	919820.92 E	1.49	0.16	
822650.96 N	919821.14 E	1.66	0.72	
822652.38 N	919822.08 E	1.18	2.12	
822652.61 N	919822.12 E	6.12	2.35	Last Gyro Survey
822653.12 N	919822.54 E	0.83	2.86	
822654.03 N	919823.50 E	0.04	3.76	
822654.76 N	919824.28 E	0.32	4.47	
822655.37 N	919824.60 E	0.35	5.08	
822655.78 N	919824.77 E	0.35	5.49	
822655.57 N	919825.08 E	0.47	5.28	
822655.14 N	919825.44 E	0.18	4.85	
822654.70 N	919825.80 E	0.17	4.40	
822654.22 N	919826.51 E	0.50	3.92	
822653.92 N	919827.61 E	0.12	3.60	
822653.45 N	919828.83 E	0.34	3.12	
822652.76 N	919830.23 E	0.14	2.42	
822652.28 N	919831.95 E	0.37	1.92	
822652.41 N	919833.79 E	0.57	2.03	
822652.89 N	919835.35 E	0.22	2.49	
822653.40 N	919836.93 E	0.22	2.99	
822654.09 N	919838.69 E	0.13	3.66	
822654.79 N	919840.95 E	0.59	4.33	
822655.55 N	919842.52 E	1.50	5.08	
822656.48 N	919843.03 E	0.14	6.00	
822657.57 N	919843.61 E	0.16	7.08	

822658.63 N	919844.22 E	0.19	8.14	
822659.43 N	919844.91 E	0.17	8.93	
822659.88 N	919845.04 E	2.80	9.38	
822660.98 N	919844.89 E	5.62	10.48	
822663.21 N	919844.46 E	8.39	12.71	
822666.91 N	919843.90 E	9.47	16.42	
822672.13 N	919843.32 E	6.60	21.65	
822678.12 N	919842.70 E	4.52	27.65	
822685.24 N	919842.06 E	6.37	34.77	
822693.55 N	919841.54 E	11.03	43.09	
822703.99 N	919841.10 E	10.99	53.53	
822715.39 N	919840.86 E	10.46	64.93	
822728.66 N	919840.77 E	9.37	78.20	
822743.56 N	919840.72 E	5.94	93.10	
822758.92 N	919840.69 E	6.46	108.46	
822775.76 N	919840.63 E	6.60	125.30	
822793.58 N	919840.46 E	6.58	143.12	
822811.73 N	919840.09 E	6.36	161.27	
822831.38 N	919839.51 E	6.89	180.93	
822851.46 N	919838.86 E	9.04	201.01	
822873.39 N	919838.15 E	9.38	222.95	
822895.15 N	919837.47 E	1.29	244.71	
822917.44 N	919836.73 E	1.32	267.02	
822939.57 N	919835.86 E	1.65	289.15	
822960.18 N	919834.87 E	1.52	309.77	
822982.01 N	919833.61 E	1.79	331.61	
823003.05 N	919832.27 E	0.39	352.66	
823025.47 N	919831.20 E	11.70	375.09	
823049.28 N	919830.75 E	11.71	398.90	
823073.58 N	919830.76 E	11.47	423.21	
823099.74 N	919830.85 E	9.12	449.37	
823126.00 N	919830.75 E	10.38	475.63	
823154.10 N	919830.86 E	12.62	503.73	
823182.26 N	919831.58 E	13.15	531.88	
823213.09 N	919832.90 E	11.98	562.69	
823241.71 N	919834.55 E	11.77	591.29	
823248.46 N	919835.00 E	9.69	598.03	Section Line Crossing
823270.76 N	919836.53 E	9.69	620.31	
823301.13 N	919838.73 E	11.33	650.66	
823332.80 N	919840.98 E	12.29	682.30	
823348.73 N	919841.84 E	14.00	698.23	S. Hard Line Crossing
823363.71 N	919842.30 E	14.00	713.20	
823393.70 N	919842.56 E	7.21	743.19	
823489.69 N	919841.05 E	1.82	839.18	
823583.63 N	919837.93 E	0.44	933.15	
823677.55 N	919834.33 E	0.24	1027.11	
823772.43 N	919829.60 E	1.16	1122.03	

823867.27 N	919824.05 E	0.24	1216.92
823961.20 N	919821.02 E	3.09	1310.88
824054.20 N	919820.12 E	0.34	1403.88
824149.19 N	919819.46 E	2.00	1498.87
824243.17 N	919819.46 E	0.38	1592.85
824335.16 N	919819.22 E	0.54	1684.84
824427.15 N	919818.50 E	0.34	1776.83
824519.14 N	919817.53 E	0.24	1868.83
824612.13 N	919816.07 E	0.48	1961.82
824704.11 N	919814.31 E	0.11	2053.82
824795.08 N	919812.01 E	1.09	2144.81
824886.01 N	919808.75 E	0.78	2235.77
824977.91 N	919804.90 E	0.59	2327.70
825069.83 N	919802.09 E	1.64	2419.65
825161.82 N	919801.61 E	2.23	2511.64
825255.82 N	919802.35 E	0.11	2605.63
825349.80 N	919803.66 E	1.33	2699.59
825442.77 N	919805.28 E	0.68	2792.54
825537.76 N	919806.69 E	0.15	2887.50
825631.75 N	919807.35 E	1.20	2981.48
825725.75 N	919806.69 E	1.06	3075.48
825820.74 N	919805.45 E	0.43	3170.48
825914.72 N	919803.89 E	1.19	3264.47
826008.67 N	919801.68 E	0.53	3358.44
826103.65 N	919800.35 E	2.93	3453.43
826197.64 N	919799.53 E	0.91	3547.42
826291.63 N	919798.38 E	0.44	3641.42
826385.62 N	919797.31 E	0.62	3735.41
826480.61 N	919796.82 E	1.18	3830.41
826575.61 N	919797.89 E	1.14	3925.38
826669.57 N	919800.27 E	0.81	4019.32
826763.53 N	919803.23 E	0.11	4113.24
826857.50 N	919804.78 E	1.86	4207.19
826952.47 N	919802.88 E	3.18	4302.18
827047.38 N	919798.90 E	0.21	4397.12
827142.28 N	919794.92 E	0.00	4492.05
827236.17 N	919790.91 E	0.15	4585.99
827331.09 N	919787.09 E	1.13	4680.94
827426.00 N	919783.20 E	0.53	4775.89
827519.93 N	919780.08 E	2.77	4869.85
827613.83 N	919777.62 E	0.71	4963.77
827707.69 N	919774.34 E	0.48	5057.66
827801.61 N	919771.48 E	2.33	5151.60
827897.57 N	919768.71 E	0.73	5247.58
827992.51 N	919765.48 E	0.11	5342.55
828081.43 N	919761.91 E	2.53	5431.50
828176.27 N	919757.44 E	0.53	5526.39

828270.12 N	919753.17 E	0.24	5620.27	
828365.02 N	919749.28 E	2.76	5715.21	
828445.94 N	919745.68 E	0.90	5796.16	Last CES Survey
828464.91 N	919744.71 E	0.00	5815.15	N. Hard Line Crossing
828505.86 N	919742.64 E	0.00	5856.11	Actual BHL