

Magpie Operating, Inc.

Well Name: **Bunker 3A-1H**

Surface Location: Bunker 3A Pad Sec.32-T5N-R68W

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

Ground Elevation: 5050.0

+N/-S+E/-W Northing Easting Latitude Longitude Slot

0.0 0.0 1373581.50 3129774.33 40.357947 -105.034328

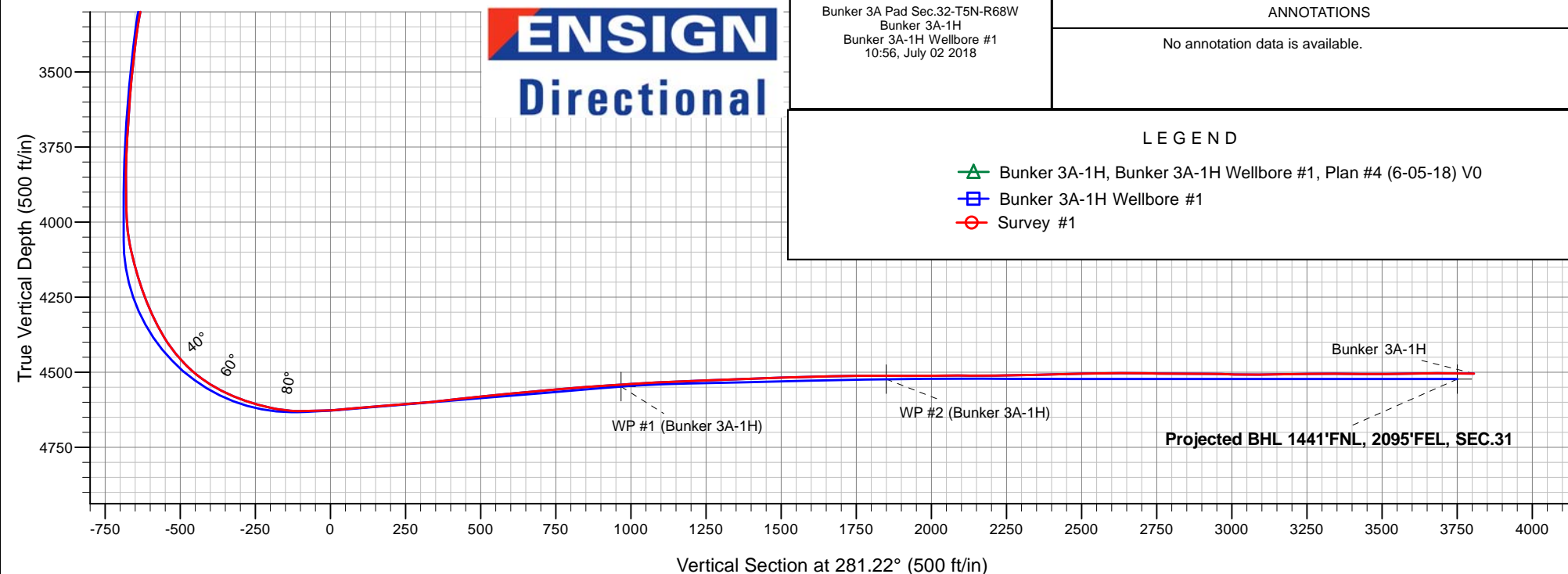
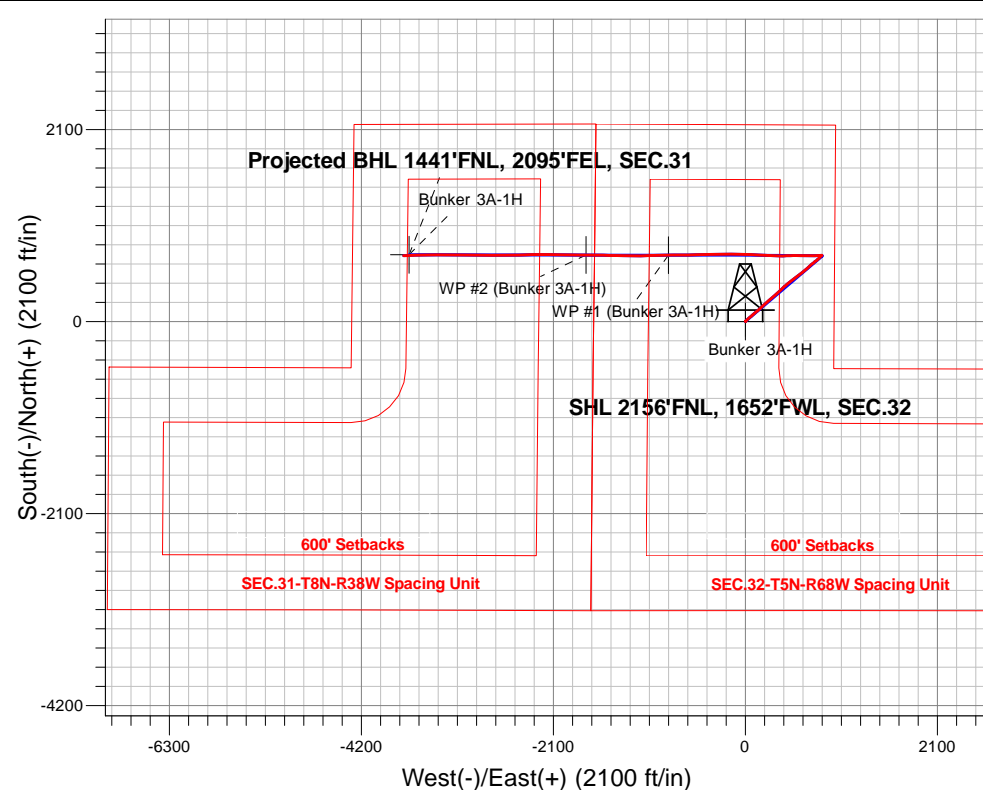
Original Well Elev WELL @ 5068.0ft (Original Well Elev)

FINAL SURVEY

Projected Bottom Hole Location

9,138'MD 4505'TVD 719'N & 3738'W of SHL

89.3 degree Incl @ 266.5 degree AZM



Bunker 3A Pad Sec.32-T5N-R68W
Bunker 3A-1H
Bunker 3A-1H Wellbore #1
10:56, July 02 2018

ANNOTATIONS

No annotation data is available.

LEGEND

- ▲ Bunker 3A-1H, Bunker 3A-1H Wellbore #1, Plan #4 (6-05-18) V0
- Bunker 3A-1H Wellbore #1
- Survey #1



Magpie Operating, Inc.

SEC.32-T5N-R68W

Bunker 3A Pad Sec.32-T5N-R68W

Bunker 3A-1H

Bunker 3A-1H Wellbore #1

Survey: Survey #1

Standard Survey Report

02 July, 2018

Company:	Magpie Operating, Inc.	Local Co-ordinate Reference:	Well Bunker 3A-1H
Project:	SEC.32-T5N-R68W	TVD Reference:	WELL @ 5068.0ft (Original Well Elev)
Site:	Bunker 3A Pad Sec.32-T5N-R68W	MD Reference:	WELL @ 5068.0ft (Original Well Elev)
Well:	Bunker 3A-1H	North Reference:	True
Wellbore:	Bunker 3A-1H Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Bunker 3A-1H Wellbore #1	Database:	US_EDM

Project	SEC.32-T5N-R68W		
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	Bunker 3A Pad Sec.32-T5N-R68W					
Site Position:		Northing:	1,373,556.30	usft	Latitude:	40.357878
From:	Lat/Long	Easting:	3,129,774.46	usft	Longitude:	-105.034328
Position Uncertainty:	0.0	Slot Radius:	13-3/16	"	Grid Convergence:	0.30 °

Well	Bunker 3A-1H					
Well Position	+N/-S	0.0 ft	Northing:	1,373,581.50 usft	Latitude:	40.357947
	+E/-W	0.0 ft	Easting:	3,129,774.33 usft	Longitude:	-105.034328
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	5,050.0 ft

Wellbore		Bunker 3A-1H Wellbore #1			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	6/5/2018	8.43	66.63	52,247

Design	Bunker 3A-1H 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	281.22	

Survey Program		Date	7/2/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
231.0	9,138.0	Survey #1 (Bunker 3A-1H 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 (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
	1.0	0.00	239.10	1.0	0.0	0.0	0.0	0.00	0.00	0.00
SHL 2156'FNL, 1652'FWL, SEC.32										
	231.0	0.20	239.10	231.0	-0.2	-0.3	0.3	0.09	0.09	0.00
	320.0	1.70	45.30	320.0	0.6	0.5	-0.3	2.13	1.69	186.74
	409.0	3.60	44.30	408.9	3.6	3.3	-2.6	2.14	2.13	-1.12
	498.0	6.10	48.90	497.6	8.7	8.9	-7.0	2.84	2.81	5.17
	588.0	7.60	45.70	586.9	16.0	16.7	-13.3	1.72	1.67	-3.56
	635.0	8.60	45.20	633.4	20.6	21.4	-17.0	2.13	2.13	-1.06
	763.0	11.90	46.00	759.4	36.5	37.7	-29.9	2.58	2.58	0.63
	852.0	13.50	48.70	846.2	49.8	52.1	-41.5	1.92	1.80	3.03

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Site:	Bunker 3A Pad Sec.32-T5N-R68W	MD Reference:	WELL @ 5068.0ft (Original Well Elev)
Well:	Bunker 3A-1H	North Reference:	True
Wellbore:	Bunker 3A-1H Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Bunker 3A-1H Wellbore #1	Database:	US_EDM

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
941.0	14.80	51.30	932.5	63.7	68.8	-55.1	1.63	1.46	2.92
1,030.0	16.90	50.30	1,018.1	79.1	87.6	-70.6	2.38	2.36	-1.12
1,119.0	19.70	50.30	1,102.6	97.0	109.1	-88.2	3.15	3.15	0.00
1,207.0	22.20	48.50	1,184.8	117.5	133.0	-107.6	2.93	2.84	-2.05
1,296.0	23.70	49.60	1,266.7	140.2	159.2	-128.9	1.75	1.69	1.24
1,385.0	23.30	48.20	1,348.4	163.5	186.0	-150.6	0.77	-0.45	-1.57
1,474.0	22.20	44.10	1,430.4	187.3	210.8	-170.3	2.17	-1.24	-4.61
1,563.0	21.10	46.60	1,513.2	210.4	234.1	-188.7	1.61	-1.24	2.81
1,651.0	22.10	50.10	1,595.0	231.9	258.3	-208.3	1.85	1.14	3.98
1,740.0	23.30	50.80	1,677.1	253.8	284.8	-230.0	1.38	1.35	0.79
1,829.0	24.80	50.40	1,758.4	276.8	312.9	-253.0	1.70	1.69	-0.45
1,918.0	23.90	47.60	1,839.4	300.9	340.6	-275.5	1.64	-1.01	-3.15
2,006.0	23.20	46.00	1,920.1	324.9	366.2	-296.0	1.08	-0.80	-1.82
2,095.0	24.40	47.80	2,001.5	349.4	392.4	-316.9	1.58	1.35	2.02
2,184.0	23.70	45.20	2,082.8	374.4	418.7	-337.9	1.43	-0.79	-2.92
2,272.0	24.90	50.60	2,163.0	398.6	445.6	-359.5	2.87	1.36	6.14
2,361.0	24.90	49.40	2,243.8	422.7	474.3	-383.0	0.57	0.00	-1.35
2,450.0	23.70	53.60	2,324.9	445.5	502.9	-406.6	2.36	-1.35	4.72
2,538.0	22.20	51.10	2,405.9	466.5	530.1	-429.2	2.03	-1.70	-2.84
2,627.0	22.80	52.20	2,488.1	487.6	556.8	-451.3	0.82	0.67	1.24
2,715.0	23.00	54.30	2,569.2	508.1	584.2	-474.2	0.96	0.23	2.39
2,804.0	23.40	53.10	2,651.0	528.8	612.5	-497.9	0.70	0.45	-1.35
2,893.0	21.40	50.80	2,733.3	549.7	639.2	-520.0	2.45	-2.25	-2.58
2,982.0	19.60	48.20	2,816.7	569.9	662.9	-539.4	2.27	-2.02	-2.92
3,071.0	18.90	46.60	2,900.7	589.8	684.5	-556.7	0.98	-0.79	-1.80
3,160.0	18.70	48.00	2,984.9	609.2	705.6	-573.6	0.55	-0.22	1.57
3,249.0	17.90	52.20	3,069.4	627.1	727.0	-591.1	1.73	-0.90	4.72
3,338.0	16.00	48.30	3,154.6	643.7	747.0	-607.4	2.49	-2.13	-4.38
3,427.0	15.10	54.10	3,240.3	658.6	765.5	-622.7	2.02	-1.01	6.52
3,516.0	14.10	51.10	3,326.4	672.3	783.4	-637.6	1.41	-1.12	-3.37
3,605.0	12.10	44.30	3,413.1	685.7	798.3	-649.6	2.83	-2.25	-7.64
3,694.0	10.60	47.50	3,500.4	697.9	810.9	-659.6	1.83	-1.69	3.60
3,783.0	8.60	37.40	3,588.1	708.8	821.0	-667.3	2.93	-2.25	-11.35
3,872.0	6.30	49.90	3,676.4	717.2	828.7	-673.3	3.15	-2.58	14.04
3,960.0	3.50	65.00	3,764.1	721.4	834.9	-678.5	3.48	-3.18	17.16
4,049.0	0.50	0.70	3,853.0	723.0	837.3	-680.6	3.72	-3.37	-72.25
4,138.0	1.10	286.90	3,942.0	723.6	836.5	-679.7	1.21	0.67	-82.92
4,183.0	2.70	265.90	3,987.0	723.7	835.0	-678.3	3.82	3.56	-46.67
4,227.0	6.90	265.40	4,030.8	723.4	831.4	-674.7	9.55	9.55	-1.14
4,272.0	11.00	269.60	4,075.2	723.1	824.4	-667.9	9.22	9.11	9.33
4,316.0	14.20	273.70	4,118.2	723.5	814.8	-658.4	7.55	7.27	9.32
4,361.0	16.70	269.30	4,161.6	723.7	802.8	-646.6	6.13	5.56	-9.78
4,405.0	19.00	264.70	4,203.4	723.0	789.4	-633.6	6.13	5.23	-10.45

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Wellbore:	Bunker 3A-1H Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Bunker 3A-1H Wellbore #1	Database:	US_EDM

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,449.0	21.20	264.20	4,244.7	721.5	774.3	-619.1	5.02	5.00	-1.14
4,494.0	23.10	265.40	4,286.4	720.0	757.4	-602.8	4.34	4.22	2.67
4,538.0	26.50	266.10	4,326.4	718.6	739.0	-585.0	7.76	7.73	1.59
4,583.0	30.00	269.30	4,366.0	717.8	717.7	-564.3	8.47	7.78	7.11
4,627.0	34.90	272.60	4,403.1	718.3	694.2	-541.1	11.84	11.14	7.50
4,672.0	39.20	273.90	4,439.0	719.8	667.1	-514.3	9.71	9.56	2.89
4,716.0	44.70	271.80	4,471.7	721.2	637.7	-485.2	12.90	12.50	-4.77
4,760.0	49.80	269.30	4,501.6	721.5	605.4	-453.5	12.32	11.59	-5.68
4,805.0	55.80	269.60	4,528.8	721.2	569.6	-418.4	13.34	13.33	0.67
4,849.0	61.60	269.50	4,551.6	720.9	532.0	-381.6	13.18	13.18	-0.23
4,894.0	66.20	267.90	4,571.4	720.0	491.6	-342.1	10.71	10.22	-3.56
4,938.0	69.50	268.40	4,588.0	718.6	450.9	-302.5	7.57	7.50	1.14
4,983.0	72.70	269.60	4,602.6	717.9	408.4	-260.9	7.55	7.11	2.67
5,027.0	76.50	270.50	4,614.3	717.9	365.9	-219.2	8.86	8.64	2.05
5,071.0	80.50	272.10	4,623.1	718.9	322.9	-176.8	9.76	9.09	3.64
5,116.0	85.40	273.30	4,628.6	721.0	278.3	-132.6	11.21	10.89	2.67
5,139.0	87.70	273.68	4,630.0	722.4	255.3	-109.8	10.14	10.00	1.67
LPL 1430'FNL,1900'FWL, SEC.32									
5,140.0	87.80	273.70	4,630.0	722.5	254.3	-108.9	10.14	10.00	1.66
5,252.0	94.80	272.60	4,627.5	728.6	142.6	1.9	6.33	6.25	-0.98
5,336.0	95.40	272.30	4,620.0	732.2	59.0	84.6	0.80	0.71	-0.36
5,423.0	94.30	271.40	4,612.6	735.0	-27.6	170.1	1.63	-1.26	-1.03
5,508.0	94.00	270.50	4,606.5	736.4	-112.4	253.5	1.11	-0.35	-1.06
5,593.0	96.10	270.00	4,599.0	736.8	-197.0	336.7	2.54	2.47	-0.59
5,679.0	96.00	269.30	4,589.9	736.3	-282.6	420.4	0.82	-0.12	-0.81
5,764.0	95.90	268.80	4,581.1	734.9	-367.1	503.1	0.60	-0.12	-0.59
5,849.0	95.40	268.60	4,572.8	733.0	-451.7	585.7	0.63	-0.59	-0.24
5,934.0	94.90	268.20	4,565.1	730.6	-536.3	668.2	0.75	-0.59	-0.47
6,019.0	94.90	269.60	4,557.9	729.0	-621.0	750.9	1.64	0.00	1.65
6,105.0	94.50	269.60	4,550.8	728.4	-706.7	834.9	0.47	-0.47	0.00
6,190.0	94.00	269.30	4,544.5	727.5	-791.4	917.9	0.69	-0.59	-0.35
6,240.2	93.65	269.00	4,541.2	726.8	-841.5	966.8	0.92	-0.71	-0.59
WP #1 (Bunker 3A-1H)									
6,275.0	93.40	268.80	4,539.0	726.1	-876.2	1,000.8	0.92	-0.71	-0.59
6,360.0	92.90	268.60	4,534.4	724.2	-961.1	1,083.6	0.63	-0.59	-0.24
6,445.0	92.20	268.20	4,530.6	721.8	-1,046.0	1,166.4	0.95	-0.82	-0.47
6,530.0	91.60	267.70	4,527.8	718.8	-1,130.9	1,249.1	0.92	-0.71	-0.59
6,615.0	92.80	271.20	4,524.5	718.0	-1,215.8	1,332.3	4.35	1.41	4.12
6,700.0	92.20	271.20	4,520.8	719.8	-1,300.7	1,415.9	0.71	-0.71	0.00
6,785.0	90.90	270.50	4,518.5	721.0	-1,385.6	1,499.5	1.74	-1.53	-0.82
6,873.0	91.90	271.60	4,516.3	722.6	-1,473.6	1,586.1	1.69	1.14	1.25
6,958.0	91.40	271.40	4,513.9	724.9	-1,558.5	1,669.8	0.63	-0.59	-0.24
7,042.0	90.60	270.90	4,512.4	726.6	-1,642.5	1,752.5	1.12	-0.95	-0.60
7,127.0	90.10	270.50	4,511.9	727.6	-1,727.5	1,836.1	0.75	-0.59	-0.47

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7,141.1	90.03	270.45	4,511.9	727.7	-1,741.6	1,849.9	0.59	-0.47	-0.35
WP #2 (Bunker 3A-1H)									
7,212.0	89.70	270.20	4,512.1	728.1	-1,812.5	1,919.5	0.59	-0.47	-0.35
7,297.0	90.50	270.90	4,511.9	728.9	-1,897.5	2,003.1	1.25	0.94	0.82
7,384.0	90.20	270.70	4,511.4	730.1	-1,984.5	2,088.6	0.41	-0.34	-0.23
7,469.0	89.30	270.20	4,511.8	730.8	-2,069.5	2,172.1	1.21	-1.06	-0.59
7,554.0	91.50	270.30	4,511.2	731.2	-2,154.5	2,255.6	2.59	2.59	0.12
7,639.0	91.70	270.20	4,508.8	731.5	-2,239.4	2,339.0	0.26	0.24	-0.12
7,724.0	91.30	269.50	4,506.6	731.3	-2,324.4	2,422.3	0.95	-0.47	-0.82
7,808.0	90.70	268.60	4,505.1	729.9	-2,408.4	2,504.4	1.29	-0.71	-1.07
7,893.0	90.80	268.20	4,504.0	727.6	-2,493.3	2,587.3	0.49	0.12	-0.47
7,979.0	89.40	268.80	4,503.8	725.3	-2,579.3	2,671.1	1.77	-1.63	0.70
8,066.0	89.40	268.80	4,504.7	723.5	-2,666.3	2,756.1	0.00	0.00	0.00
8,151.0	89.90	271.00	4,505.3	723.3	-2,751.3	2,839.4	2.65	0.59	2.59
8,236.0	89.40	271.40	4,505.8	725.1	-2,836.2	2,923.1	0.75	-0.59	0.47
8,322.0	88.20	270.30	4,507.6	726.4	-2,922.2	3,007.7	1.89	-1.40	-1.28
8,407.0	91.00	270.50	4,508.2	727.0	-3,007.2	3,091.2	3.30	3.29	0.24
8,492.0	91.00	270.70	4,506.7	727.9	-3,092.2	3,174.7	0.24	0.00	0.24
8,579.0	90.50	270.50	4,505.6	728.8	-3,179.2	3,260.2	0.62	-0.57	-0.23
8,664.0	89.90	270.30	4,505.3	729.4	-3,264.2	3,343.7	0.74	-0.71	-0.24
8,752.0	89.00	269.30	4,506.1	729.1	-3,352.2	3,430.0	1.53	-1.02	-1.14
8,838.0	90.90	270.00	4,506.2	728.6	-3,438.2	3,514.2	2.35	2.21	0.81
8,926.0	91.10	269.50	4,504.6	728.2	-3,526.1	3,600.4	0.61	0.23	-0.57
9,011.0	90.00	267.40	4,503.8	725.9	-3,611.1	3,683.3	2.79	-1.29	-2.47
9,078.9	89.34	266.55	4,504.2	722.3	-3,678.9	3,749.2	1.58	-0.97	-1.25
BHL 1430°FNL, 2036°FEL, SEC.31									
9,083.0	89.30	266.50	4,504.3	722.0	-3,683.0	3,753.1	1.58	-0.97	-1.25
9,138.0	89.30	266.50	4,504.9	718.7	-3,737.9	3,806.3	0.00	0.00	0.00

Company:	Magpie Operating, Inc.	Local Co-ordinate Reference:	Well Bunker 3A-1H
Project:	SEC.32-T5N-R68W	TVD Reference:	WELL @ 5068.0ft (Original Well Elev)
Site:	Bunker 3A Pad Sec.32-T5N-R68W	MD Reference:	WELL @ 5068.0ft (Original Well Elev)
Well:	Bunker 3A-1H	North Reference:	True
Wellbore:	Bunker 3A-1H Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Bunker 3A-1H Wellbore #1	Database:	US_EDM

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL 2156'FNL, 1652'FM - survey hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,373,581.50	3,129,774.33	40.357947	-105.034328
BHL 1430'FNL, 2036'FE - survey misses target center by 20.3ft at 9079.0ft MD (4504.2 TVD, 722.3 N, -3679.0 E) - Point	0.00	0.00	4,523.0	729.9	-3,679.2	1,374,292.06	3,126,091.48	40.359950	-105.047530
WP #2 (Bunker 3A-1H) - survey misses target center by 11.1ft at 7141.1ft MD (4511.9 TVD, 727.7 N, -1741.6 E) - Point	0.00	0.00	4,523.0	727.2	-1,741.6	1,374,299.49	3,128,029.01	40.359943	-105.040578
WP #1 (Bunker 3A-1H) - survey misses target center by 6.9ft at 6240.2ft MD (4541.2 TVD, 726.8 N, -841.5 E) - Point	0.00	0.00	4,548.0	725.9	-841.9	1,374,302.94	3,128,928.67	40.359940	-105.037349

Checked By: _____	Approved By: _____	Date: _____
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