

Apache Corporation (873)

303 Veterans Airpark Lane, #3000

Midland, TX 79705

Cedar Lake Federal CA #738H

NFE Federal #038H

Eddy County, New Mexico

30-015-40902

A-7-175-31E

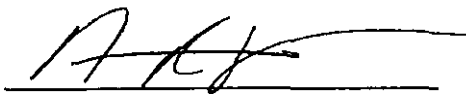
637' FNL + 1000' FEL

250	2.50	0.50	0.88	2.19	2.19
416	1.66	0.20	0.35	0.58	2.77
620	2.04	0.40	0.70	1.43	4.20
832	2.12	0.30	0.53	1.11	5.31
1044	2.12	0.70	1.23	2.60	7.91
1257	2.13	1.20	2.10	4.47	12.38
1470	2.13	1.30	2.28	4.85	17.23
1682	2.12	0.70	1.23	2.60	19.82
2023	3.41	0.10	0.18	0.60	20.42
2108	0.85	0.10	0.18	0.15	20.57
2364	2.56	0.60	1.05	2.69	23.26
2576	2.12	0.60	1.05	2.23	25.48
2789	2.13	0.60	1.05	2.24	27.72
3001	2.12	0.50	0.88	1.86	29.57
3215	2.14	0.20	0.35	0.75	30.32
3428	2.13	0.50	0.88	1.86	32.19
3511	0.83	0.80	1.40	1.16	33.35
3743	2.32	0.70	1.23	2.84	36.19
3955	2.12	0.60	1.05	2.23	38.42
4210	2.55	0.70	1.23	3.12	41.54
4465	2.55	0.70	1.23	3.12	44.66
4678	2.13	1.00	1.75	3.73	48.39

NM OIL CONSERVATION
ARTESIA DISTRICT

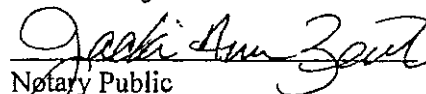
MAR 10 2016

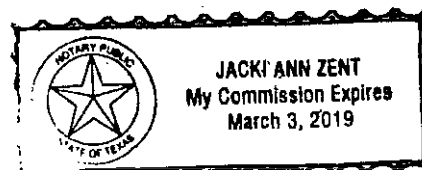
RECEIVED



Archie Brown - General Manager

The attached instrument was acknowledged before me on the 7th day of July, 2015 by
Archie Brown - General Manager, CapStar Drilling, Inc.


Notary Public





Apache Corporation (873)

Eddy County, NM (NAD27 NME)

NFE Federal 30-015-40902

#38H

Cedar Lake Federal CA #738H

OH / Job #1513575

A-7-175-31E

637' FUL + 1000' FEL

Design: Surveys (Capstar 119)

Standard Survey Report

11 June, 2015

NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 10 2016

RECEIVED



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #38H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3758.00usft (Capstar 119)
Site:	NFE Federal	MD Reference:	KB @ 3758.00usft (Capstar 119)
Well:	#38H	North Reference:	Grid
Wellbore:	OH / Job #1513575	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	Database:	Compass 5000 GCR

Project	Eddy County, NM (NAD27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD-1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	NFE Federal		
Site Position:	Northing:	673,264.70 usft	Latitude: 32° 51' 0.49036 N
From: Map	Easting:	633,303.50 usft	Longitude: 103° 53' 57.34966 W
Position Uncertainty:	0.00 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.24 °

Well	#38H		
Well Position	+N/-S	0.00 usft	Northing: 674,811.70 usft
	+E/-W	0.00 usft	Easting: 632,074.90 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
			Ground Level: 3,747.00 usft

Wellbore	OH / Job #1513575				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	5/16/2015	7.68	60.80	48,567

Design	Surveys (Capstar 119)				
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	89.60	

Survey Program	Date 6/11/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	4,400.00	Phoenix Gyro Survey (OH / Job #1513575)	PHX_SPT_GTD	PHX Continuous north-seeking gyro	
4,518.00	11,035.00	Phoenix MWD Survey (OH / Job #1513575)	PHX+MWD+HDGM	PHX+MWD+HDGM	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.28	218.13	100.00	-0.19	-0.15	-0.15	0.28	0.28	0.00	
200.00	0.93	227.69	199.99	-0.93	-0.90	-0.91	0.66	0.65	9.56	
300.00	0.41	217.88	299.99	-1.76	-1.72	-1.73	0.53	-0.52	-9.81	
400.00	0.39	230.93	399.98	-2.26	-2.21	-2.22	0.09	-0.02	13.05	
500.00	0.47	147.70	499.98	-2.82	-2.25	-2.27	0.57	0.08	-83.23	
600.00	0.31	25.10	599.98	-2.92	-1.92	-1.94	0.69	-0.16	-122.60	
700.00	0.16	6.13	699.98	-2.54	-1.79	-1.80	0.17	-0.15	-18.97	
800.00	0.46	91.14	799.98	-2.40	-1.37	-1.39	0.47	0.30	85.01	
900.00	0.52	107.45	899.98	-2.55	-0.54	-0.55	0.15	0.06	16.31	

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #38H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3758.00usft (Capstar 119)
Site:	NFE Federal	MD Reference:	KB @ 3758.00usft (Capstar 119)
Well:	#38H	North Reference:	Grid
Wellbore:	OH / Job #1513575	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	Database:	Compass 5000 GCR

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.00	0.45	111.56	999.97	-2.83	0.26	0.24	0.08	-0.07	4.11
1,100.00	0.87	117.21	1,099.96	-3.32	1.30	1.28	0.42	0.42	5.65
1,200.00	0.83	112.61	1,199.95	-3.95	2.65	2.62	0.08	-0.04	-4.60
1,300.00	1.44	98.95	1,299.93	-4.42	4.56	4.52	0.66	0.61	-13.66
1,400.00	1.14	88.67	1,399.91	-4.59	6.79	6.76	0.38	-0.30	-10.28
1,500.00	1.30	97.29	1,499.89	-4.71	8.91	8.88	0.24	0.16	8.62
1,600.00	1.12	92.30	1,599.86	-4.90	11.01	10.98	0.21	-0.18	-4.99
1,700.00	0.52	74.43	1,699.85	-4.81	12.43	12.39	0.65	-0.60	-17.87
1,800.00	0.40	47.95	1,799.85	-4.46	13.12	13.09	0.24	-0.12	-26.48
1,900.00	0.27	4.69	1,899.85	-3.99	13.40	13.37	0.27	-0.13	-43.26
2,000.00	0.16	284.77	1,999.85	-3.72	13.29	13.26	0.29	-0.11	-79.92
2,100.00	0.29	151.10	2,099.85	-3.91	13.27	13.25	0.42	0.13	-133.67
2,200.00	0.09	17.32	2,199.85	-4.05	13.42	13.39	0.36	-0.20	-133.78
2,300.00	0.60	284.62	2,299.85	-3.84	12.94	12.91	0.61	0.51	-92.70
2,400.00	0.64	303.77	2,399.84	-3.40	11.96	11.94	0.21	0.04	19.15
2,500.00	0.40	302.67	2,499.84	-2.90	11.21	11.19	0.24	-0.24	-1.10
2,600.00	0.69	290.33	2,599.83	-2.51	10.35	10.33	0.31	0.29	-12.34
2,700.00	0.61	293.39	2,699.82	-2.08	9.29	9.28	0.09	-0.08	3.06
2,800.00	0.55	257.87	2,799.82	-1.97	8.34	8.32	0.36	-0.06	-35.52
2,900.00	0.77	276.30	2,899.81	-2.00	7.20	7.19	0.30	0.22	18.43
3,000.00	0.55	259.01	2,999.81	-2.02	6.06	6.05	0.29	-0.22	-17.29
3,100.00	0.54	303.54	3,099.80	-1.85	5.20	5.18	0.41	-0.01	44.53
3,200.00	0.16	255.55	3,199.80	-1.62	4.67	4.66	0.45	-0.38	-47.99
3,300.00	0.24	266.40	3,299.80	-1.67	4.32	4.31	0.09	0.08	10.85
3,400.00	0.77	272.34	3,399.80	-1.66	3.44	3.43	0.53	0.53	5.94
3,500.00	0.69	311.69	3,499.79	-1.23	2.32	2.31	0.50	-0.08	39.35
3,600.00	0.68	315.89	3,599.78	-0.40	1.46	1.46	0.05	-0.01	4.20
3,700.00	0.58	302.25	3,699.77	0.29	0.62	0.62	0.18	-0.10	-13.64
3,800.00	0.55	312.71	3,799.77	0.89	-0.16	-0.16	0.11	-0.03	10.46
3,900.00	0.66	309.02	3,899.76	1.58	-0.96	-0.95	0.12	0.11	-3.69
4,000.00	0.54	351.09	3,999.76	2.40	-1.48	-1.47	0.45	-0.12	42.07
4,100.00	0.82	317.50	4,099.75	3.40	-2.04	-2.01	0.48	0.28	-33.59
4,200.00	0.76	318.38	4,199.74	4.42	-2.96	-2.93	0.06	-0.06	0.88
4,300.00	0.75	322.12	4,299.73	5.43	-3.80	-3.77	0.05	-0.01	3.74
4,400.00	0.78	303.99	4,399.73	6.33	-4.77	-4.73	0.24	0.03	-18.13
Tie-on to Phoenix Gyro Survey									
4,518.00	0.80	309.90	4,517.71	7.31	-6.07	-6.02	0.07	0.02	5.01
First Phoenix MWD Survey									
4,645.00	0.90	307.20	4,644.70	8.48	-7.54	-7.48	0.08	0.08	-2.13
4,772.00	0.80	312.30	4,771.69	9.68	-8.99	-8.93	0.10	-0.08	4.02
4,815.00	3.10	76.30	4,814.67	10.16	-8.09	-8.01	8.39	5.35	288.37
4,857.00	8.70	82.00	4,856.43	10.87	-3.83	-3.76	13.39	13.33	13.57
4,900.00	14.60	81.70	4,898.52	12.10	4.76	4.84	13.72	13.72	-0.70

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Wellbore:	OH / Job #1513575	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	Database:	Compass 5000 GCR

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,942.00	20.10	82.90	4,938.60	13.76	17.17	17.26	13.12	13.10	2.86
4,985.00	24.70	86.40	4,978.34	15.24	33.47	33.58	11.13	10.70	8.14
5,027.00	28.70	89.40	5,015.86	15.90	52.32	52.43	10.05	9.52	7.14
5,070.00	32.50	92.70	5,052.87	15.46	74.20	74.30	9.66	8.84	7.67
5,113.00	37.10	94.40	5,088.17	13.92	98.68	98.78	10.93	10.70	3.95
5,155.00	41.60	95.80	5,120.64	11.54	125.20	125.27	10.92	10.71	3.33
5,198.00	46.80	95.10	5,151.46	8.70	155.03	155.09	12.15	12.09	-1.63
5,240.00	51.70	93.20	5,178.86	6.42	186.75	186.79	12.16	11.67	-4.52
5,283.00	56.00	91.70	5,204.23	4.95	221.43	221.46	10.39	10.00	-3.49
5,325.00	60.20	90.30	5,226.42	4.33	257.08	257.10	10.39	10.00	-3.33
5,368.00	64.30	90.40	5,246.43	4.10	295.12	295.14	9.54	9.53	0.23
5,411.00	69.80	90.60	5,263.19	3.75	334.70	334.72	12.80	12.79	0.47
5,453.00	74.80	91.00	5,275.96	3.19	374.70	374.71	11.94	11.90	0.95
5,496.00	79.80	91.50	5,285.41	2.28	416.62	416.63	11.68	11.63	1.16
5,537.00	83.80	92.30	5,291.26	0.93	457.17	457.17	9.95	9.76	1.95
5,580.00	87.40	91.40	5,294.55	-0.45	500.01	500.00	8.63	8.37	-2.09
5,623.00	90.00	90.90	5,295.53	-1.31	542.99	542.97	6.16	6.05	-1.16
5,665.00	91.30	91.50	5,295.05	-2.19	584.98	584.95	3.41	3.10	1.43
5,793.00	89.10	88.70	5,294.61	-2.42	712.96	712.92	2.78	-1.72	-2.19
5,921.00	90.00	87.20	5,295.61	2.16	840.86	840.86	1.37	0.70	-1.17
6,048.00	88.10	87.50	5,297.72	8.03	967.71	967.74	1.51	-1.50	0.24
6,176.00	89.10	86.70	5,300.84	14.51	1,095.50	1,095.58	1.00	0.78	-0.63
6,303.00	88.80	88.20	5,303.17	20.16	1,222.35	1,222.46	1.20	-0.24	1.18
6,431.00	88.10	89.80	5,306.63	22.39	1,350.28	1,350.40	1.36	-0.55	1.25
6,558.00	87.80	91.10	5,311.18	21.39	1,477.19	1,477.30	1.05	-0.24	1.02
6,686.00	88.50	90.80	5,315.31	19.27	1,605.11	1,605.20	0.59	0.55	-0.23
6,813.00	86.80	91.10	5,320.74	17.17	1,731.97	1,732.04	1.51	-1.50	0.24
6,941.00	86.70	91.20	5,328.22	14.60	1,859.72	1,859.78	0.11	0.08	0.08
7,069.00	86.70	91.00	5,335.59	12.15	1,987.49	1,987.52	0.16	0.00	-0.16
7,197.00	87.10	90.80	5,342.51	10.14	2,115.28	2,115.30	0.35	0.31	-0.16
7,324.00	86.90	89.00	5,349.16	10.36	2,242.10	2,242.12	1.42	-0.16	-1.42
7,451.00	89.00	88.30	5,353.70	13.35	2,368.98	2,369.01	1.74	1.65	-0.55
7,579.00	87.90	85.50	5,357.16	20.27	2,496.73	2,496.81	2.35	-0.86	-2.19
7,707.00	88.40	86.90	5,361.29	28.75	2,624.38	2,624.51	1.16	0.39	1.09
7,834.00	88.80	89.90	5,364.40	32.29	2,751.28	2,751.43	2.38	0.31	2.36
7,961.00	89.50	89.70	5,366.28	32.74	2,878.26	2,878.42	0.57	0.55	-0.16
8,089.00	89.40	90.50	5,367.51	32.51	3,006.25	3,006.41	0.63	-0.08	0.63
8,217.00	89.80	90.90	5,368.40	30.95	3,134.24	3,134.38	0.44	0.31	0.31
8,344.00	90.10	90.30	5,368.51	29.62	3,261.23	3,261.36	0.53	0.24	-0.47
8,472.00	90.60	89.70	5,367.73	29.62	3,389.23	3,389.35	0.61	0.39	-0.47
8,600.00	89.00	90.10	5,368.18	29.84	3,517.22	3,517.35	1.29	-1.25	0.31
8,728.00	89.00	89.80	5,370.41	29.96	3,645.20	3,645.32	0.23	0.00	-0.23
8,855.00	89.70	89.50	5,371.85	30.73	3,772.19	3,772.31	0.60	0.55	-0.24
8,983.00	87.60	89.60	5,374.87	31.74	3,900.15	3,900.27	1.64	-1.64	0.08

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Well:	#38H	North Reference:	Grid
Wellbore:	OH / Job #1513575	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	Database:	Compass 5000 GCR

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,111.00	88.40	89.50	5,379.34	32.74	4,028.06	4,028.19	0.63	0.63	-0.08
9,238.00	88.40	88.80	5,382.88	34.62	4,155.00	4,155.14	0.55	0.00	-0.55
9,367.00	88.60	90.50	5,386.26	35.41	4,283.95	4,284.09	1.33	0.16	1.32
9,494.00	87.80	90.30	5,390.25	34.53	4,410.88	4,411.01	0.65	-0.63	-0.16
9,622.00	88.90	90.30	5,393.93	33.86	4,538.82	4,538.95	0.86	0.86	0.00
9,750.00	88.90	89.40	5,396.39	34.19	4,666.80	4,666.92	0.70	0.00	-0.70
9,877.00	90.70	90.20	5,398.84	34.63	4,793.79	4,793.91	1.55	1.42	0.63
10,005.00	90.30	90.20	5,395.72	34.19	4,921.78	4,921.90	0.31	-0.31	0.00
10,133.00	90.30	90.70	5,395.05	33.18	5,049.78	5,049.89	0.39	0.00	0.39
10,260.00	89.40	91.30	5,395.38	30.97	5,176.76	5,176.85	0.85	-0.71	0.47
10,388.00	87.80	91.50	5,398.51	27.84	5,304.68	5,304.74	1.26	-1.25	0.16
10,516.00	86.30	90.90	5,405.09	25.16	5,432.47	5,432.52	1.26	-1.17	-0.47
10,643.00	85.60	90.10	5,414.06	24.06	5,559.15	5,559.18	0.84	-0.55	-0.63
10,771.00	85.00	91.00	5,424.55	22.83	5,686.71	5,686.73	0.84	-0.47	0.70
10,899.00	83.50	91.70	5,437.38	19.83	5,814.03	5,814.02	1.29	-1.17	0.55
10,965.00	82.40	92.20	5,445.48	17.60	5,879.49	5,879.47	1.83	-1.67	0.76
Last Phoenix MWD Survey									
11,035.00	82.40	92.20	5,454.74	14.94	5,948.82	5,948.78	0.00	0.00	0.00
Projection to TD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,400.00	4,399.73	6.33	-4.77	Tie-on to Phoenix Gyro Survey
4,518.00	4,517.71	7.31	-6.07	First Phoenix MWD Survey
10,965.00	5,445.48	17.60	5,879.49	Last Phoenix MWD Survey
11,035.00	5,454.74	14.94	5,948.82	Projection to TD

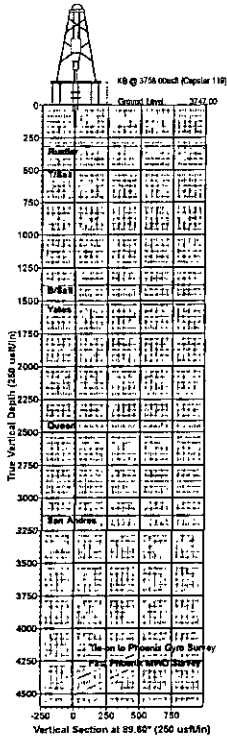
Checked By: _____ Approved By: _____ Date: _____



Project: Eddy County, NM (NAD27 NME)
 Site: NFE Federal
 Well: #38H
 Wellbore: OH / Job #1513575
 Design: Plan #5 06-01-15
 Rig: Capstar 119



Map System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone Name: New Mexico East 3001
 Local Origin: VNM #38H, Grid North
 Latitude: 32° 51' 15.84782 N
 Longitude: 103° 54' 11.6773 W
 Grid East: 632074.90
 Grid North: 674811.70
 Scale Factor: 1.000
 Geomagnetic Model: IHDGM
 Sample Date: 16-May-15
 Magnetic Declination: 7.98°
 Dip Angle from Horizontal: 60.80°
 Magnetic Field Strength: 43587
 To convert a Magnetic Direction to a Grid Direction, Add 7.98°
 To convert a Magnetic Direction to a True Direction, Add 7.98° East
 To convert a True Direction to a Grid Direction, Subtract 0.23°



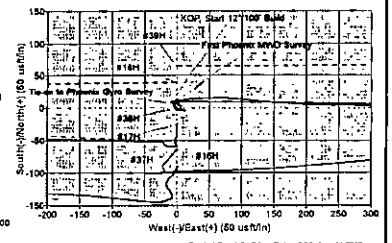
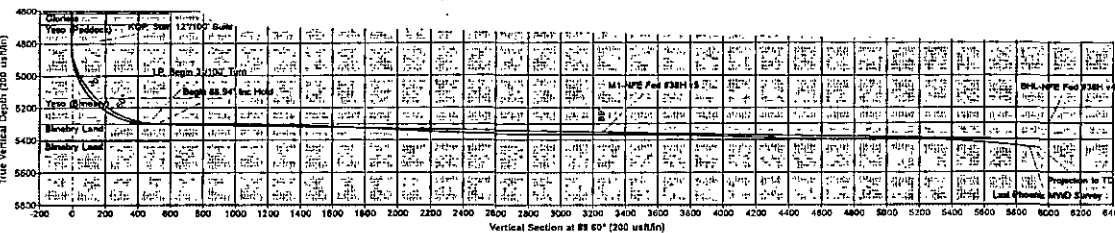
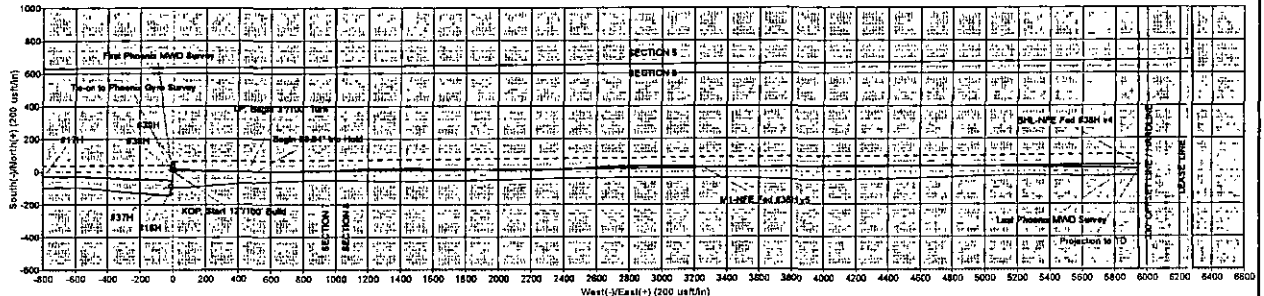
WELL DETAILS									
N/S	E/W	North	Ground Elev.	3747.00	Latitude	Longitude			
0.00	0.00	0.00	Easting	632074.90	32° 51' 15.84782 N	103° 54' 11.6773 W			

SECTION DETAILS									
Sec	MG	Inc	Adj	TVD	+N/S	-E/W	Orig	Plane	Vlact Target
1	4400.00	978	303.90	4399.73	5.33	-4.77	0.00	0.00	-4.73
2	4813.44	978	303.90	4813.17	8.48	-9.48	0.00	3.00	-8.29
3	5562.40	85.94	91.18	5208.00	4.67	4.58	17	12	488.14
4	6012.14	85.94	89.82	5295.52	3.69	809.15	3.00	-40.15	309.18
5	11053.57	88.94	89.82	5430.00	41.80	5849.50	0.00	0.00	5849.50

DESIGN TARGET DETAILS									
Name	TVD	+N/S	-E/W	North	Easting	Latitude	Longitude	Shape	
M1-NFE Fed #38H v4	5350.00	22.25	3258.31	674834.03	635333.31	32° 51' 15.84190 N	103° 57' 23.48017 W	Point	
BHL NFE Fed #38H v4	5402.00	+13.80	5943.50	674833.50	636024.40	32° 51' 16.01829 N	103° 57' 18.01110 W	Point	

FORMATION TOP DETAILS				
TVD	MD	Formation	Depth	Dip
4418.00	418.20	Qzels		
4580.00	458.30	Yaso (Paddock)		
5140.00	5178.80	Yaso (Boundary)		
5290.00	5582.35	Boundary Land		

LEGEND									
---	#17H, VBI / Job #1411574, Plan #5 05-15-15 VO								
---	#17H, VBI / Job #1411574, Surveys (Capstar 119) VO								
---	#18H, VBI / Job #1411575, Plan #3 08-25-12 VO								
---	#18H, VBI / Job #1411575, Surveys (Capstar 119) VO								
---	#38H, OH / Job #1513575, Surveys (Capstar 119) VO								
---	#37H, VBI / Job #1513430, Surveys (Capstar 119) VO								
---	#38H, Wellbore #1, Plan #1 07-16-12 VO								
---	Plan #5 06-01-15								



Created By: Jule Pate Date: 7 May 11 2015