



NM OIL CONSERVATION
ARTESIA DISTRICT

MAY 16 2016

RECEIVED

Apache Corporation

Eddy County, NM (NAD27 NME)

NFE Federal

#40H

OH / Job #1513705

Design: Surveys (Capstar 119)

Standard Survey Report

28 June, 2015

API#: 30-015-42900

6-17S-31E 2000FSL 200FEL

Survey Report

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #40H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3769.00usft (Capstar 119)
Site:	NFE Federal	MD Reference:	KB @ 3769.00usft (Capstar 119)
Well:	#40H	North Reference:	Grid
Wellbore:	OH / Job #1513705	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' 0.49038 N
From: Map	Easting:	633,303.50 usft	Longitude: 103° 53' 57.34666 W
Position Uncertainty:	0.00 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.24 °

Well:	#40H		
Well Position	+N/-S	0.00 usft	Northing: 677,453.30 usft
	+E/-W	0.00 usft	Easting: 632,859.70 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Ground Level:	3,758.00 usft

Wellbore:	OH / Job #1513705		
Magnetics	Model Name	Sample Date	Declination
	HDGM	6/4/2015	7.67
			Dip Angle
			80.80
			Field Strength
			48,565

Design:	Surveys (Capstar 119)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			269.62

Survey Program	Date 6/28/2015		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
120.00	4,318.00	Phoenix Gyro Survey (OH / Job #1513705)	PHX_SPT_GTD
4,351.00	9,090.00	Phoenix MWD Survey (OH / Job #1513705)	PHX+MWD+HDGM
			Description
			PHX Continuous north-seeking gyro
			PHX+MWD+HDGM

Survey	Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
	(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	120.00	0.55	6.84	120.00	0.57	0.07	-0.07	0.46	0.46	0.00
	211.00	0.78	22.31	210.99	1.58	0.36	-0.37	0.32	0.25	17.00
	395.00	0.83	28.23	394.98	3.63	1.31	-1.33	0.09	-0.08	3.22
	484.00	0.58	358.88	483.97	4.51	1.53	-1.58	0.35	-0.06	-32.98
	570.00	0.85	2.75	569.97	5.43	1.55	-1.58	0.09	0.08	4.50
	740.00	0.71	359.44	739.96	7.45	1.58	-1.83	0.04	0.04	-1.95
	825.00	0.58	354.25	824.95	8.40	1.53	-1.59	0.17	-0.15	-6.11
	911.00	0.40	338.32	910.95	9.12	1.38	-1.44	0.26	-0.21	-18.52
	998.00	0.42	354.77	995.95	9.70	1.24	-1.31	0.14	0.02	19.35

Survey Report

Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: NFE Federal
Well: #40H
Wellbore: OH / Job #1513705
Design: Surveys (Capstar 119)

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:
Well #40H
KB @ 3769.00usft (Capstar 119)
KB @ 3769.00usft (Capstar 119)
Grid
Minimum Curvature
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)
1,082.00	0.38	11.95	1,081.94	10.29	1.27	-1.34	0.15	-0.05	19.98
1,167.00	0.51	55.72	1,166.94	10.78	1.64	-1.72	0.42	0.15	51.49
1,252.00	0.78	70.28	1,251.94	11.19	2.49	-2.56	0.35	0.29	17.13
1,337.00	0.80	82.45	1,336.93	11.45	3.61	-3.68	0.20	0.05	14.32
1,422.00	1.02	95.52	1,421.92	11.46	4.95	-5.02	0.35	0.26	15.38
1,507.00	0.80	98.92	1,506.91	11.32	6.28	-6.36	0.26	-0.26	1.65
1,592.00	0.54	107.65	1,591.80	11.12	7.26	-7.33	0.34	-0.31	12.62
1,677.00	0.50	107.11	1,676.90	10.89	8.00	-8.07	0.05	-0.05	-0.64
1,762.00	0.23	114.17	1,761.90	10.71	8.51	-8.58	0.32	-0.32	8.31
1,847.00	0.18	105.83	1,846.90	10.61	8.79	-8.86	0.07	-0.06	-9.81
1,932.00	0.13	125.18	1,931.89	10.51	9.00	-9.07	0.08	-0.06	22.76
2,018.00	0.05	285.20	2,017.89	10.47	9.04	-9.11	0.21	-0.09	186.07
2,103.00	0.17	352.13	2,102.89	10.60	8.99	-9.06	0.19	0.14	78.74
2,188.00	0.20	291.73	2,187.89	10.78	8.83	-8.90	0.22	0.04	-71.06
2,273.00	0.16	293.15	2,272.89	10.88	8.59	-8.66	0.05	-0.05	1.67
2,358.00	0.32	290.54	2,357.89	11.01	8.25	-8.33	0.19	0.19	-3.07
2,444.00	0.20	298.11	2,443.89	11.17	7.90	-7.97	0.14	-0.14	8.80
2,529.00	0.26	340.26	2,528.89	11.42	7.70	-7.78	0.21	0.07	49.59
2,614.00	0.45	303.81	2,613.89	11.79	7.38	-7.44	0.34	0.22	-42.88
2,700.00	0.49	311.90	2,699.89	12.22	6.80	-6.89	0.09	0.05	9.41
2,785.00	0.48	320.70	2,784.88	12.74	6.31	-6.39	0.09	-0.01	10.35
2,870.00	0.29	306.22	2,869.88	13.14	5.91	-6.00	0.25	-0.22	-17.04
2,955.00	0.40	296.08	2,954.88	13.40	5.47	-5.56	0.15	0.13	-11.93
3,040.00	0.46	295.91	3,039.88	13.68	4.90	-4.99	0.07	0.07	-0.20
3,125.00	0.44	308.50	3,124.88	14.03	4.33	-4.43	0.12	-0.02	14.81
3,210.00	0.36	305.80	3,209.87	14.39	3.86	-3.96	0.10	-0.09	-3.18
3,295.00	0.32	302.14	3,294.87	14.67	3.44	-3.54	0.05	-0.05	-4.31
3,381.00	0.31	284.96	3,380.87	14.86	3.02	-3.11	0.11	-0.01	-19.98
3,466.00	0.22	267.98	3,465.87	14.92	2.63	-2.73	0.14	-0.11	-19.98
3,551.00	0.23	269.24	3,550.87	14.91	2.30	-2.40	0.01	0.01	1.48
3,636.00	0.25	291.12	3,635.87	14.97	1.95	-2.05	0.11	0.02	25.74
3,721.00	0.24	253.68	3,720.87	14.99	1.61	-1.71	0.19	-0.01	-44.05
3,806.00	0.25	260.19	3,805.87	14.91	1.28	-1.36	0.03	0.01	7.66
3,892.00	0.21	247.93	3,891.87	14.82	0.93	-1.02	0.07	-0.05	-14.28
3,977.00	0.43	235.12	3,976.88	14.57	0.52	-0.62	0.27	0.26	-15.07
4,062.00	0.25	246.09	4,061.86	14.32	0.09	-0.18	0.22	-0.21	12.91
4,147.00	0.25	257.76	4,146.88	14.20	-0.26	0.17	0.06	0.00	13.73
4,232.00	0.11	159.18	4,231.86	14.09	-0.41	0.32	0.34	-0.16	-115.98
4,318.00	0.12	283.91	4,317.86	14.03	-0.47	0.38	0.24	0.01	145.03
Tie-on to Phoenix Gyro Survey									
4,351.00	1.30	276.60	4,350.86	14.08	-0.88	0.78	3.58	3.58	-22.15
First Phoenix MWD Survey									
4,393.00	6.20	270.20	4,392.76	14.15	-3.62	3.53	11.69	11.67	-15.24

Survey Report

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Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3769.00usft (Capstar 119)
Site:	NFE Federal	MO Reference:	KB @ 3769.00usft (Capstar 119)
Well:	#40H	North Reference:	Grid
Wellbore:	OH / Job #1513705	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 119)	Database:	Compass 5000 GCR

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)
4,438.00	11.70	270.90	4,435.22	14.22	-10.31	10.21	12.79	12.79	1.63
4,478.00	17.10	271.80	4,475.88	14.48	-20.75	20.65	12.87	12.88	2.14
4,521.00	21.20	273.10	4,516.49	15.10	-34.83	34.73	9.59	9.53	3.02
4,564.00	26.40	272.90	4,555.82	16.01	-52.16	52.05	12.09	12.09	-0.47
4,606.00	30.50	273.30	4,592.74	17.09	-72.13	72.02	9.77	9.76	0.95
4,649.00	35.90	271.20	4,628.71	17.99	-95.65	95.53	12.84	12.58	-4.88
4,691.00	41.90	269.70	4,661.38	18.17	-122.01	121.88	14.46	14.29	-3.57
4,734.00	46.60	268.50	4,692.18	17.69	-152.00	151.88	11.10	10.93	-2.79
4,776.00	50.70	268.30	4,719.92	16.80	-183.51	183.39	9.77	9.76	-0.48
4,818.00	55.70	267.70	4,745.87	15.60	-217.91	217.80	11.68	11.63	-1.40
4,861.00	60.10	268.80	4,767.98	13.88	-253.44	253.34	10.83	10.48	-2.14
4,904.00	64.80	266.50	4,787.83	11.65	-291.50	291.42	11.18	11.16	-0.70
4,947.00	69.00	267.50	4,804.66	9.59	-331.01	330.93	9.77	9.53	2.33
4,989.00	71.70	268.50	4,818.79	8.21	-370.53	370.47	8.81	8.43	2.38
5,032.00	74.50	268.30	4,831.29	7.06	-411.85	411.60	8.53	8.51	-0.47
5,075.00	77.10	267.10	4,841.83	5.39	-453.30	453.26	8.82	8.05	-2.79
5,117.00	80.80	267.10	4,849.88	3.30	-494.46	494.43	8.81	8.81	0.00
5,161.00	85.50	266.90	4,855.13	1.02	-538.08	538.06	10.69	10.68	-0.45
5,203.00	86.50	266.40	4,858.08	-1.43	-579.90	579.80	2.66	2.38	-1.19
5,246.00	88.40	266.40	4,859.97	-4.13	-622.77	622.79	4.42	4.42	0.00
5,288.00	91.60	267.80	4,859.97	-6.25	-664.71	664.74	8.32	7.62	3.33
5,416.00	93.50	267.80	4,854.28	-11.16	-792.49	792.54	1.48	1.48	0.00
5,544.00	92.80	270.00	4,847.13	-13.62	-920.25	920.32	1.78	-0.47	1.72
5,671.00	92.00	270.50	4,841.70	-13.08	-1,047.14	1,047.20	0.81	-0.71	0.39
5,799.00	93.90	270.50	4,835.12	-11.95	-1,174.96	1,175.01	1.48	1.48	0.00
5,927.00	92.10	270.80	4,828.42	-10.50	-1,302.77	1,302.81	1.43	-1.41	0.23
6,054.00	94.20	270.50	4,821.44	-9.08	-1,429.58	1,429.59	1.87	1.85	-0.24
6,182.00	92.20	271.40	4,814.29	-6.94	-1,557.33	1,557.35	1.71	-1.56	0.70
6,310.00	92.00	271.30	4,809.60	-3.92	-1,685.21	1,685.20	0.17	-0.16	-0.08
6,438.00	90.80	270.00	4,806.48	-2.47	-1,813.16	1,813.14	1.38	-0.94	-1.02
6,565.00	90.80	268.30	4,804.59	-3.25	-1,940.14	1,940.12	0.58	0.08	-0.55
6,693.00	90.80	269.00	4,802.69	-5.15	-2,068.12	2,068.10	0.25	-0.08	-0.23
6,821.00	91.80	267.70	4,799.79	-8.83	-2,196.03	2,196.04	1.28	0.78	-1.02
6,949.00	93.00	267.60	4,794.43	-14.07	-2,323.80	2,323.85	0.94	0.94	-0.08
7,077.00	93.90	268.90	4,786.73	-17.98	-2,451.51	2,451.57	1.23	0.70	1.02
7,204.00	92.10	269.60	4,780.08	-19.84	-2,578.32	2,578.39	1.52	-1.42	0.55
7,332.00	93.50	269.90	4,773.83	-20.19	-2,708.16	2,708.23	1.12	1.09	0.23
7,460.00	91.30	270.50	4,768.47	-19.75	-2,834.04	2,834.11	1.78	-1.72	0.47
7,587.00	92.30	270.40	4,764.48	-18.75	-2,960.97	2,961.03	0.79	0.79	-0.08
7,715.00	91.30	270.20	4,760.46	-18.08	-3,088.90	3,088.95	0.80	-0.78	-0.16
7,843.00	92.40	270.30	4,756.32	-17.52	-3,216.83	3,216.88	0.86	0.86	0.08
7,971.00	90.70	270.40	4,752.86	-16.74	-3,344.78	3,344.82	1.33	-1.33	0.08
8,099.00	91.00	269.00	4,750.96	-17.41	-3,472.72	3,472.80	1.12	0.23	-1.09
8,226.00	92.40	269.00	4,747.20	-18.63	-3,599.68	3,599.73	1.10	1.10	0.00

Survey Report

Company: Apache Corporation
Project: Eddy County, NM (NAD27 NME)
Site: NFE Federal
Well: #40H
Wellbore: OH / Job #1513705
Design: Surveys (Capstar 119)

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well #40H
KB @ 3769.00usft (Capstar 119)
KB @ 3769.00usft (Capstar 119)
Grid
Minimum Curvature
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)
8,354.00	92.20	268.70	4,742.06	-22.19	-3,727.55	3,727.62	0.28	-0.18	-0.23
8,462.00	89.30	269.30	4,740.38	-24.43	-3,855.51	3,855.58	2.31	-2.27	0.47
8,610.00	90.20	269.30	4,740.94	-25.99	-3,983.50	3,983.58	0.70	0.70	0.00
8,737.00	90.80	269.30	4,739.72	-27.54	-4,110.48	4,110.57	0.55	0.55	0.00
8,865.00	92.20	270.30	4,738.28	-27.99	-4,238.43	4,238.52	1.28	1.02	0.78
8,993.00	91.10	270.90	4,732.58	-26.65	-4,366.36	4,366.45	0.98	-0.88	0.47
9,020.00	91.30	271.20	4,732.01	-26.15	-4,393.35	4,393.43	1.34	0.74	1.11
Final Phoenix MWD Survey									
9,090.00	91.30	271.20	4,730.42	-24.69	-4,463.32	4,463.39	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)	
4,318.00	4,317.86	14.03	-0.47	Tie-on to Phoenix Gyro Survey
4,351.00	4,350.86	14.08	-0.88	First Phoenix MWD Survey
9,020.00	4,732.01	-26.15	-4,393.35	Final Phoenix MWD Survey
9,090.00	4,730.42	-24.69	-4,463.32	Projection to TD

Checked By: _____

Approved By: _____

Date: _____

WELL NAME: NFE FEDERAL COM 40H

AR: 30-015-42900

SPUD DATE: 6/16/2015

PRODUCING FORMATION: YESO PADDOCK

FIELD: CEDAR LAKE (BP)

COUNTY: EDDY

STATE: NEW MEXICO

WORKING INTEREST: 60.00%

SURFACE LOC: 2000 FSL & 200' FEL

SECTION: 6

TOWNSHIP: 17-S

RANGE: 31-E

SURVEY: JOHN WEST SURVEYING CO

BOTTOM HOLE LOC: 2005 FSL & 333' FWL

SECTION: 6

TOWNSHIP: 17-S

RANGE: 31-E

SURVEY: JOHN WEST SURVEYING CO

DRILL RIG: CAPSTAR 118

R/O RELEASE: 6/28/2015

KB (ft): 3,759.00

GL (ft): 3,756.00

KBGL DFF (ft): 11.00

TMD (ft): 9,090.00

TD OF PILOT HOLE (ft): N/A

FC DEPTH (ft): 9,054.00

PBMD (ft): 9,090.00

R/DV DEPTH (ft): N/A

ORVD VALVE (ft): N/A

DEEPEST T/D (ft): 4,950.00

TAPERED CASING STRING:

7" 28# L-80 TO X-OVER @ 4.37#
TAPERING TO 5.5" 20# L-80 SET @ 9.093'

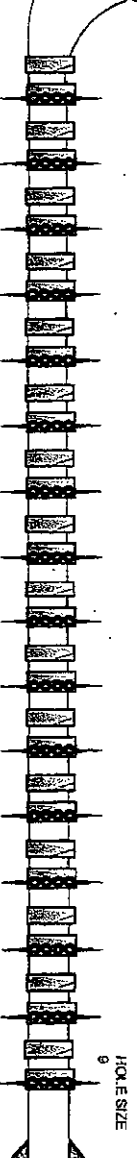
KOP (ft):
LATERAL LENGTH (ft):
TD OF PILOT HOLE (ft):

4,352
3,866

PACKERS & SLEEVES
TOP PERF (MD):
BOTTOM PERF (MD):

5,224
9,054

TMD (ft): 9,090
FC DEPTH (ft): 9,054
PBMD (ft): 9,090
R/DV DEPTH (ft): N/A
ORVD VALVE (ft): N/A



SURFACE CASING - 13.38" I.D. 40' SET AT 417

CEMENT SURFACE CASING WITH 420 SX OF CEMENT. TOC AT SURFACE, CIRC 129 SX TO SURF

HOLE SIZE
17-1/2"

INTERMEDIATE CASING - 9.58" I.D. 40' SET AT 3515

CEMENT INTERMEDIATE CASING WITH 1500 SX OF CEMENT. TOC AT SURFACE, CIRC 99 SX TO SURF

PRODUCTION CASING - 7" & 5.5" L-80, LTO, 20# & 20#, SET AT 9063

OV TOOL SET AT 4374

STAGE 1: 625 CEMENT SX, TOC AT 56' CBL

STAGE 2: DID NOT DO 2ND STAGE.

PRODUCTION tubing - ESP - SET AT

COMPLETION:

STIMULATION:

STATUS:

COMMENTS:

PACKERS & SLEEVES - 14 STAGES			
TOTAL ACID (bbl)	TOTAL LTR (bbl)	TOTAL PROPANT (lb)	MAX WH RATE (bpm)
2,363	62,272	2,661,140	93.00

PRODUCTION METHOD	LIFT TYPE	SETTING DEPTH
Pumping	ESP	0

CROSSOVER SUB @ 4.37#

LAST UPDATED BY: HILVARI GOULD
LAST UPDATED: 10/23/2015