



PHOENIX
TECHNOLOGY SERVICES

August 20, 2015

Oil Conservation Division
State of New Mexico
811 S. First St.
Artesia, New Mexico 88210

Dear District 2 - Artesia

Attention: Regulatory Department

Re: Apache Corporation
NFE Federal #41H
Eddy County, NM
API #30-015-42901
Job No. 1513794

Enclosed please find the Survey Data Certification, and the original Plat and one copy of the Survey Report performed on the above referenced Well by Phoenix Technology Services, Inc. (P-5 No. 664171). Other information required by your office is as follows:

Name & Title of Surveyor	Drain Hole Number	Surveyed Depths		Dates Performed		Type of Survey
		From	To	Start	End	
Mike Miller	41H	4,367	9,774	07/07/15	07/11/15	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.

Best Regards,

Claudia Carreon

Claudia Carreon
Operations Administrator

Certified mail receipt number: 7015 0640 0000 9907 5067

Phoenix Technology Services
SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER 1513794

OPERATOR Apache

WELL NAME NFE Federal #41H

COUNTY & STATE Eddy County, NM

API WELL NUMBER	30-015-42901
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PROPOSED DIRECTION	89.59
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TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
4,336.67 ft	4,336.44 ft	0.54	279.46	23.62 ft	-27.58 ft	Gyro

FIRST	FIRST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
7-Jul-15	4,367.00 ft	0.30	357.90

SURVEY INSTRUMENT
TYPE
Phoenix MWD

LAST	LAST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
11-Jul-15	9,774.00 ft	88.50	88.80

TO THE BEST OF MY KNOWLEDGE I
CERTIFY THIS SURVEY DATA TO BE
TRUE AND CORRECT.

PROJECTED	PROJECTED		
TD SURVEY	TD SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
11-Jul-15	9,845.00 ft	88.50	88.80

Mike Miller

PRINT YOUR NAME ABOVE

Mike Miller

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.41
DECLINATION OR GRID	GRID

12-Jul-15

TODAY'S DATE

MWD SUPERVISOR 1 Mike Miller

DIRECTIONAL DRILLER 1

Steven Hawkins

MWD SUPERVISOR 2 Bruce Manser

DIRECTIONAL DRILLER 2

Brant Duplechain

12329 Cutten Rd., Houston, Texas 777066 (713)337-0600 (Voice), (713)337-0599 (Fax)



Apache Corporation

Eddy County, NM (NAD27 NME)

NFE Federal

#41H

OH / Job #1513794

Survey: Phoenix MWD Survey

Standard Survey Report

12 July, 2015



Survey Report

Company: Apache Corporation
 Project: Eddy County, NM (NAD27 NME)
 Site: NFE Federal
 Well: #41H
 Wellbore: OH / Job #1513794
 Design: Surveys (Capstar 119)

Local Co-ordinate Reference: Well #41H
 TVD Reference: KB @ 3769.00usft (Capstar 119)
 MD Reference: KB @ 3769.00usft (Capstar 119)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 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	#41H					
Well Position	+N/-S	0.00 usft	Northing:	677,478.30 usft	Latitude:	32° 51' 42.20235 N
	+E/-W	0.00 usft	Easting:	632,859.60 usft	Longitude:	103° 54' 2.35078 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,758.00 usft

Wellbore	OH / Job #1513794				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	6/30/2015	7.65	60.80	48,556

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	89.59	

Survey Program	Date 7/12/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
75.87	4,336.67	Phoenix Gyro Survey (OH / Job #1513794)	PHX_SPT_GTD	PHX Continuous north-seeking gyro	
4,367.00	9,845.00	Phoenix MWD Survey (OH / Job #1513794)	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)	
4,336.67	0.54	279.46	4,336.44	23.62	-27.58	-27.41	0.00	0.00	0.00	
Tie-on to Phoenix Gyro Survey										
4,367.00	0.30	357.90	4,366.76	23.72	-27.73	-27.56	1.86	-0.79	258.62	
First Phoenix MWD Survey										
4,410.00	3.00	83.30	4,409.74	23.96	-26.61	-26.44	6.96	6.28	198.60	
4,453.00	7.60	77.40	4,452.55	24.72	-22.72	-22.54	10.76	10.70	-13.72	
4,495.00	12.70	75.70	4,493.88	26.46	-15.53	-15.34	12.16	12.14	-4.05	
4,538.00	18.20	74.70	4,535.31	29.40	-4.46	-4.25	12.81	12.79	-2.33	
4,581.00	23.70	78.40	4,575.45	32.92	10.49	10.73	13.15	12.79	8.60	



Survey Report

Company: Apache Corporation
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 Site: NFE Federal
 Well: #41H
 Wellbore: OH / Job #1513794
 Design: Surveys (Capstar 119)

Local Co-ordinate Reference: Well #41H
 TVD Reference: KB @ 3769.00usft (Capstar 119)
 MD Reference: KB @ 3769.00usft (Capstar 119)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 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)
4,623.00	29.00	83.10	4,613.08	35.84	28.88	29.14	13.55	12.62	11.19
4,666.00	33.20	88.20	4,649.90	37.46	51.01	51.28	11.52	9.77	11.86
4,708.00	38.20	91.70	4,684.00	37.44	75.50	75.77	12.86	11.90	8.33
4,751.00	42.50	94.10	4,716.76	36.01	103.29	103.55	10.63	10.00	5.58
4,794.00	47.00	96.80	4,747.30	33.10	133.41	133.65	11.36	10.47	6.28
4,836.00	52.10	97.00	4,774.54	29.26	165.13	165.34	12.15	12.14	0.48
4,879.00	56.00	97.50	4,799.77	24.87	199.66	199.83	9.12	9.07	1.16
4,921.00	61.70	96.40	4,821.49	20.53	235.32	235.46	13.75	13.57	-2.62
4,964.00	67.30	94.60	4,840.00	16.83	273.94	274.05	13.56	13.02	-4.19
5,006.00	73.20	92.20	4,854.19	14.50	313.38	313.47	15.04	14.05	-5.71
5,049.00	77.80	91.70	4,864.95	13.08	354.97	355.06	10.76	10.70	-1.16
5,076.00	79.90	91.30	4,870.17	12.39	381.45	381.53	7.91	7.78	-1.48
5,119.00	84.70	90.50	4,875.93	11.72	424.05	424.12	11.31	11.16	-1.86
5,161.00	86.60	90.50	4,879.12	11.36	465.92	465.99	4.52	4.52	0.00
5,289.00	87.40	90.10	4,885.81	10.69	593.74	593.81	0.70	0.63	-0.31
5,417.00	88.10	89.70	4,890.84	10.91	721.64	721.70	0.63	0.55	-0.31
5,544.00	89.30	89.10	4,893.72	12.24	848.60	848.67	1.06	0.94	-0.47
5,672.00	90.40	89.20	4,894.06	14.14	976.59	976.66	0.86	0.86	0.08
5,800.00	89.40	89.90	4,894.28	15.15	1,104.58	1,104.66	0.95	-0.78	0.55
5,927.00	90.30	90.70	4,894.61	14.48	1,231.57	1,231.65	0.95	0.71	0.63
6,055.00	89.10	90.00	4,895.28	13.70	1,359.57	1,359.63	1.09	-0.94	-0.55
6,183.00	88.70	89.20	4,897.74	14.59	1,487.54	1,487.61	0.70	-0.31	-0.63
6,311.00	90.20	89.30	4,898.97	16.27	1,615.52	1,615.59	1.17	1.17	0.08
6,438.00	88.30	89.40	4,900.63	17.71	1,742.49	1,742.58	1.50	-1.50	0.08
6,566.00	88.70	89.20	4,903.98	19.27	1,870.44	1,870.53	0.35	0.31	-0.16
6,694.00	88.40	90.80	4,907.22	19.27	1,998.39	1,998.48	1.27	-0.23	1.25
6,822.00	88.80	90.90	4,910.35	17.37	2,126.34	2,126.41	0.32	0.31	0.08
6,949.00	89.10	90.90	4,912.68	15.38	2,253.31	2,253.36	0.24	0.24	0.00
7,077.00	88.40	90.00	4,915.47	14.37	2,381.27	2,381.31	0.89	-0.55	-0.70
7,205.00	88.30	89.20	4,919.15	15.27	2,509.21	2,509.26	0.63	-0.08	-0.63
7,333.00	88.70	89.30	4,922.50	16.94	2,637.16	2,637.21	0.32	0.31	0.08
7,460.00	89.30	89.00	4,924.72	18.83	2,764.12	2,764.19	0.53	0.47	-0.24
7,588.00	87.50	89.70	4,928.29	20.28	2,892.06	2,892.13	1.51	-1.41	0.55
7,716.00	87.70	89.60	4,933.65	21.06	3,019.94	3,020.02	0.17	0.16	-0.08
7,844.00	87.80	89.20	4,938.68	22.40	3,147.84	3,147.92	0.32	0.08	-0.31
7,972.00	88.00	89.40	4,943.37	23.96	3,275.74	3,275.83	0.22	0.16	0.16
8,100.00	88.30	89.30	4,947.50	25.41	3,403.67	3,403.76	0.25	0.23	-0.08
8,228.00	88.90	89.60	4,950.63	26.64	3,531.62	3,531.72	0.52	0.47	0.23
8,355.00	89.50	89.90	4,952.40	27.19	3,658.61	3,658.71	0.53	0.47	0.24
8,483.00	89.50	89.80	4,953.52	27.53	3,786.60	3,786.70	0.08	0.00	-0.08
8,611.00	89.40	90.00	4,954.75	27.75	3,914.60	3,914.69	0.17	-0.08	0.16
8,739.00	89.60	90.00	4,955.87	27.75	4,042.59	4,042.69	0.16	0.16	0.00
8,866.00	89.20	90.00	4,957.20	27.75	4,169.58	4,169.68	0.31	-0.31	0.00



Survey Report

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Project: Eddy County, NM (NAD27 NME)
Site: NFE Federal
Well: #41H
Wellbore: OH / Job #1513794
Design: Surveys (Capstar 119)

Local Co-ordinate Reference: Well #41H
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
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)
8,994.00	88.90	89.90	4,959.32	27.86	4,297.57	4,297.66	0.25	-0.23	-0.08
9,122.00	89.10	89.80	4,961.55	28.20	4,425.55	4,425.63	0.17	0.16	-0.08
9,249.00	88.80	89.60	4,963.88	28.86	4,552.52	4,552.61	0.28	-0.24	-0.16
9,377.00	88.60	89.50	4,966.78	29.87	4,680.49	4,680.58	0.17	-0.16	-0.08
9,505.00	88.60	89.20	4,969.91	31.32	4,808.44	4,808.54	0.23	0.00	-0.23
9,633.00	88.90	89.20	4,972.70	33.11	4,936.40	4,936.51	0.23	0.23	0.00
9,774.00	88.50	88.80	4,975.90	35.57	5,077.34	5,077.46	0.40	-0.28	-0.28
Final Phoenix MWD Survey									
9,845.00	88.50	88.80	4,977.76	37.05	5,148.30	5,148.43	0.00	0.00	0.00
Projection to TD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,336.67	4,336.44	23.62	-27.58	Tie-on to Phoenix Gyro Survey
4,367.00	4,366.76	23.72	-27.73	First Phoenix MWD Survey
9,774.00	4,975.90	35.57	5,077.34	Final Phoenix MWD Survey
9,845.00	4,977.76	37.05	5,148.30	Projection to TD

Checked By: _____ Approved By: _____ Date: _____

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-42901	Pool Code 96831	Pool Name Cedar Lake; Glorieta - Yeso
Property Code 308724	Property Name NFE FEDERAL	Well Number 41H
OGRID No. 873	Operator Name APACHE CORPORATION	Elevation 3758'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
1	6	17-S	31-E		2025	SOUTH	200	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
1	5	17-S	31-E		2025	SOUTH	330	EAST	EDDY

Dedicated Acres 1160	Joint or Infill	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

CORNER COORDINATES TABLE ① - Y=678094.7 N, X=633056.1 E ② - Y=678131.4 N, X=638335.7 E ③ - Y=676775.0 N, X=633063.5 E ④ - Y=676812.0 N, X=638343.2 E DETAIL 3755.4' 3771.2' 3745.5' 3758.7' 600' 600' GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION Y=677478.3 N X=632859.6 E LAT.=32.861723° N LONG.=103.900653° W LAT.=32° 51' 42" N LONG.=103° 54' 02" W BOTTOM HOLE LOCATION Y=677514.8 N X=638009.3 E	OPERATOR CERTIFICATION I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>Sorina L Flores</i> 5/1/14 Signature Date Sorina L. Flores Printed Name sorina.flores@apachecorp.com E-mail Address SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. APRIL 13, 2012 Date of Survey Signature & Seal of Professional Surveyor: <i>Ronald J. Eidson</i> Ronald J. Eidson 12641 Gary C. Eidson 3239 NEW MEXICO 3239 APR 13 2012 Certified by AP
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