



PHOENIX
TECHNOLOGY SERVICES

May 28, 2015

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

NM OIL CONSERVATION

ARTESIA DISTRICT

FEB 17 2016

Dear District 2 - Artesia

RECEIVED

Attention: Regulatory Department

Re: Apache Corporation
NFE Federal # 37H
Eddy County, NM
API #30-015-40901
Job No. 1513430

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	37H	4,340	10,600	05/02/15	05/07/15	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,

Alva Dunigan

Alva Dunigan
Operations Administrator

Certified mail receipt number: 7011 1570 0001 4365 0540

NM OIL CONSERVATION
Phoenix Technology Services
SURVEY DATA CERTIFICATION

ARTESTA DISTRICT

FEB 17 2016



PHOENIX JOB NUMBER

1513430

RECEIVED
OPERATOR

Apache

WELL NAME

NFE Federal #37H

COUNTY & STATE

Eddy County, NM

API WELL NUMBER

30-015-40901

PROPOSED DIRECTION

89.60

TIE-IN DATA						
MEASURED DEPTH	VERTICAL DEPTH	INCLIN	AZIMUTH	N-S COORD	E-W COORD	DATA SOURCE
4,244.61 ft	4,243.66 ft	1.26	264.41	-36.23 ft	-46.80 ft	Gyro

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
2-May-15	4,340.00 ft	1.30	278.70

SURVEY INSTRUMENT
TYPE

Phoenix MWD

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
7-May-15	10,600.00 ft	90.50	88.50

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

PROJECTED TD SURVEY DATE	PROJECTED TD SURVEY DEPTH	INCLIN	AZIMUTH
7-May-15	10,670.00 ft	90.50	88.50

Mike Miller

PRINT YOUR NAME ABOVE

Mike Miller

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.45
DECLINATION OR GRID	GRID

7-May-15

TODAY'S DATE

MWD SUPERVISOR 1

Mike Miller

DIRECTIONAL DRILLER 1

Steven Hawkins

MWD SUPERVISOR 2

Jay Conyers

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

#37H

WB1 / Job #1513430

Survey: Phoenix MWD Surveys

Standard Survey Report

08 May, 2015

NM OIL CONSERVATION
ARTESTA DISTRICT

FEB 17 2016

RECEIVED



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #37H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3756.00usft (Capstar 119)
Site:	NFE Federal	MD Reference:	KB @ 3756.00usft (Capstar 119)
Well:	#37H	North Reference:	Grid
Wellbore:	WB1 / Job #1513430	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	#37H					
Well Position	+N/-S	0.00 usft	Northing:	674,746.80 usft	Latitude:	32° 51' 15.20561 N
	+E/-W	0.00 usft	Easting:	632,075.30 usft	Longitude:	103° 54' 11.67614 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,745.00 usft

Wellbore	WB1 / Job #1513430				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	4/22/2015	7.68	60.80	48,574

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	5/8/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
69.55	4,244.61	Gyro Survey (WB1 / Job #1513430)	CB-GYRO-MS	Camera based gyro multishot	
4,340.00	10,670.00	Phoenix MWD Surveys (WB1 / Job #1513)	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)	
4,244.61	1.26	264.41	4,243.66	-36.23	-46.80	-47.05	0.00	0.00	0.00	
Tie In to Phoenix Gyros										
4,340.00	1.30	278.70	4,339.03	-36.17	-48.92	-49.17	0.34	0.04	14.98	
First Phoenix MWD Survey										
4,382.00	0.50	278.70	4,381.02	-36.07	-49.57	-49.82	1.90	-1.90	0.00	
4,425.00	4.30	90.50	4,423.99	-36.06	-48.14	-48.39	11.15	8.84	399.53	
4,467.00	9.90	89.70	4,465.65	-36.05	-42.95	-43.20	13.34	13.33	-1.90	
4,510.00	15.30	85.20	4,507.60	-35.56	-33.59	-33.84	12.75	12.56	-10.47	
4,553.00	20.40	84.80	4,548.52	-34.40	-20.47	-20.71	11.86	11.86	-0.93	

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #37H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3756.00usft (Capstar 119)
Site:	NFE Federal	MD Reference:	KB @ 3756.00usft (Capstar 119)
Well:	#37H	North Reference:	Grid
Wellbore:	WB1 / Job #1513430	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)	
4,595.00	24.50	86.60	4,587.33	-33.22	-4.48	-4.71	9.90	9.76	4.29	
4,638.00	29.70	88.10	4,625.59	-32.34	15.08	14.86	12.20	12.09	3.49	
4,680.00	34.90	89.60	4,661.08	-31.91	37.51	37.29	12.53	12.38	3.57	
4,723.00	40.40	90.00	4,695.11	-31.82	63.77	63.54	12.80	12.79	0.93	
4,765.00	45.80	87.90	4,725.77	-31.27	92.44	92.22	13.30	12.86	-5.00	
4,808.00	48.60	86.80	4,754.98	-29.81	123.96	123.75	6.78	6.51	-2.56	
4,851.00	51.10	84.90	4,782.71	-27.42	156.73	156.54	6.72	5.81	-4.42	
4,893.00	54.60	85.70	4,808.07	-24.68	190.09	189.91	8.47	8.33	1.90	
4,936.00	60.30	85.20	4,831.20	-21.80	226.21	226.05	13.29	13.26	-1.16	
4,978.00	66.50	85.40	4,849.99	-18.73	263.62	263.48	14.77	14.76	0.48	
5,021.00	73.10	85.20	4,864.83	-15.42	303.81	303.70	15.36	15.35	-0.47	
5,063.00	79.70	85.20	4,874.70	-12.01	344.47	344.38	15.71	15.71	0.00	
5,106.00	84.70	85.10	4,880.54	-8.41	386.91	386.84	11.63	11.63	-0.23	
5,134.00	84.60	85.60	4,883.15	-6.15	414.69	414.64	1.81	-0.36	1.79	
5,176.00	86.60	86.30	4,886.37	-3.19	456.46	456.43	5.04	4.76	1.67	
5,304.00	89.60	87.90	4,890.61	3.28	584.21	584.22	2.66	2.34	1.25	
5,431.00	91.00	87.70	4,889.95	8.16	711.11	711.15	1.11	1.10	-0.16	
5,559.00	89.30	89.10	4,889.61	11.73	839.05	839.11	1.72	-1.33	1.09	
5,686.00	89.60	90.70	4,890.83	11.95	966.04	966.10	1.28	0.24	1.26	
5,814.00	88.40	91.00	4,893.07	10.05	1,094.01	1,094.05	0.97	-0.94	0.23	
5,941.00	89.70	90.80	4,895.17	8.06	1,220.97	1,221.00	1.04	1.02	-0.16	
6,069.00	88.40	90.00	4,897.29	7.16	1,348.95	1,348.96	1.19	-1.02	-0.63	
6,197.00	89.40	89.90	4,899.75	7.28	1,476.92	1,476.94	0.79	0.78	-0.08	
6,324.00	86.80	89.70	4,903.96	7.72	1,603.84	1,603.85	2.05	-2.05	-0.16	
6,451.00	87.60	88.80	4,910.17	9.38	1,730.67	1,730.70	0.95	0.63	-0.71	
6,579.00	88.20	89.00	4,914.86	11.84	1,858.56	1,858.60	0.49	0.47	0.16	
6,707.00	88.80	88.90	4,918.21	14.18	1,986.50	1,986.55	0.48	0.47	-0.08	
6,835.00	89.10	88.90	4,920.55	16.64	2,114.45	2,114.52	0.23	0.23	0.00	
6,962.00	89.40	88.60	4,922.21	19.41	2,241.41	2,241.49	0.33	0.24	-0.24	
7,090.00	89.70	88.00	4,923.22	23.20	2,369.35	2,369.45	0.52	0.23	-0.47	
7,218.00	88.00	90.00	4,925.79	25.44	2,497.29	2,497.41	2.05	-1.33	1.56	
7,345.00	88.30	89.20	4,929.89	26.32	2,624.22	2,624.34	0.67	0.24	-0.63	
7,473.00	88.80	88.60	4,933.13	28.78	2,752.16	2,752.29	0.61	0.39	-0.47	
7,600.00	88.30	90.20	4,936.34	30.11	2,879.11	2,879.25	1.32	-0.39	1.26	
7,728.00	89.10	89.70	4,939.25	30.22	3,007.07	3,007.21	0.74	0.63	-0.39	
7,855.00	90.10	90.00	4,940.13	30.55	3,134.07	3,134.20	0.82	0.79	0.24	
7,983.00	89.40	90.40	4,940.69	30.11	3,262.06	3,262.19	0.63	-0.55	0.31	
8,110.00	89.90	89.70	4,941.47	30.00	3,389.06	3,389.19	0.68	0.39	-0.55	
8,238.00	89.30	92.10	4,942.36	27.99	3,517.03	3,517.14	1.93	-0.47	1.88	
8,366.00	90.40	92.30	4,942.70	23.07	3,644.93	3,645.01	0.87	0.86	0.16	
8,493.00	89.70	92.40	4,942.58	17.87	3,771.83	3,771.86	0.56	-0.55	0.08	
8,621.00	88.20	91.50	4,944.93	13.51	3,899.73	3,899.72	1.37	-1.17	-0.70	
8,748.00	87.20	89.20	4,950.03	12.74	4,026.61	4,026.60	1.97	-0.79	-1.81	

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #37H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3756.00usft (Capstar 119)
Site:	NFE Federal	MD Reference:	KB @ 3756.00usft (Capstar 119)
Well:	#37H	North Reference:	Grid
Wellbore:	WB1 / Job #1513430	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)
8,875.00	87.60	88.60	4,955.79	15.17	4,153.46	4,153.46	0.57	0.31	-0.47
9,003.00	88.30	89.10	4,960.37	17.74	4,281.35	4,281.37	0.67	0.55	0.39
9,130.00	89.20	88.70	4,963.14	20.18	4,408.29	4,408.33	0.78	0.71	-0.31
9,258.00	90.00	88.20	4,964.03	23.64	4,536.24	4,536.29	0.74	0.63	-0.39
9,386.00	90.40	88.10	4,963.58	27.77	4,664.17	4,664.25	0.32	0.31	-0.08
9,513.00	88.10	87.90	4,965.25	32.20	4,791.08	4,791.18	1.82	-1.81	-0.16
9,641.00	88.40	88.80	4,969.16	35.89	4,918.96	4,919.09	0.74	0.23	0.70
9,769.00	89.60	88.40	4,971.39	39.01	5,046.90	5,047.05	0.99	0.94	-0.31
9,896.00	88.90	89.80	4,973.05	41.01	5,173.87	5,174.03	1.23	-0.55	1.10
10,024.00	89.00	90.40	4,975.40	40.78	5,301.85	5,302.00	0.48	0.08	0.47
10,152.00	88.80	90.80	4,977.86	39.44	5,429.82	5,429.96	0.35	-0.16	0.31
10,280.00	89.40	90.40	4,979.87	38.10	5,557.79	5,557.92	0.56	0.47	-0.31
10,407.00	90.20	90.00	4,980.31	37.66	5,684.79	5,684.92	0.70	0.63	-0.31
10,535.00	90.50	88.80	4,979.53	39.00	5,812.78	5,812.91	0.97	0.23	-0.94
10,600.00	90.50	88.50	4,978.96	40.53	5,877.76	5,877.90	0.46	0.00	-0.46
Last Phoenix MWD Survey									
10,670.00	90.50	88.50	4,978.35	42.36	5,947.73	5,947.88	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)	
4,244.61	4,243.66	-36.23	-46.80	Tie In to Phoenix Gyros
4,340.00	4,339.03	-36.17	-48.92	First Phoenix MWD Survey
10,600.00	4,978.96	40.53	5,877.76	Last Phoenix MWD Survey
10,670.00	4,978.35	42.36	5,947.73	Projection to TD

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------