



PHOENIX
TECHNOLOGY SERVICES

March 25, 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
Crow Federal #40H
Eddy County, NM
API #30-015-42762
Job No. 1512792

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	
Burton Fowles	40H	708	9,925	03/14/15	03/21/15	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

LRO 3/31/15
NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 30 2015

RECEIVED

Certified mail receipt number: 7014 2120 0004 3423 7286

Phoenix Technology Services
SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER

1512792

Energy Company

Apache

WELL NAME

Crow Federal #40H

COUNTY & STATE

Eddy County, NM

API WELL NUMBER

30-015-42762

PROPOSED DIRECTION

269.59

TIE-IN DATA

MEASURED DEPTH	VERTICAL DEPTH	INCLIN	AZIMUTH	N-S COORD	E-W COORD	DATA SOURCE
560.00 ft	559.98 ft	0.43	115.53	3.59 S	1.70 E	Gyro

FIRST
SURVEY
DATE

FIRST
SURVEY
DEPTH

INCLIN

AZIMUTH

14-Mar-15

708.00 ft

0.30

168.70

SURVEY INSTRUMENT
TYPE

Phoenix P-360

LAST
SURVEY
DATE

LAST
SURVEY
DEPTH

INCLIN

AZIMUTH

21-Mar-15

9,925.00 ft

91.60

266.80

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

21-Mar-15

9,989.00 ft

91.60

266.80

Burton Fowles

PRINT YOUR NAME ABOVE

Burton P. Fowles

SIGN YOUR NAME ABOVE

3/21/2015

TODAY'S DATE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.24
DECLINATION OR GRID	GRID

MWD SUPERVISOR 1

Burton Fowles

DIRECTIONAL DRILLER 1

Ian Hobbs

MWD SUPERVISOR 2

DIRECTIONAL DRILLER 2

Joshua Ashley

12329 Cutten Rd., Houston, Texas 77066

(713)3370609 (Voice), (713)337-0599 (Fax)



NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 30 2015

RECEIVED

Apache Corporation

Eddy County, NM (NAD27 NME)

Crow Federal

#40H

WB1 / Job #1512792

Survey: Phoenix MWD Surveys

Standard Survey Report

23 March, 2015



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #40H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3951.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3951.00usft (Capstar 114)
Well:	#40H	North Reference:	Grid
Wellbore:	WB1 / Job #1512792	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	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:		Crow Federal			
Site Position:		Northing:	671,130.90 usft	Latitude:	32° 50' 38.92796 N
From:	Map	Easting:	643,906.80 usft	Longitude:	103° 51' 53.16689 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.25 °

Well	#40H					
Well Position	+N/-S	0.00 usft	Northing:	677,737.90 usft	Latitude:	32° 51' 44.31673 N
	+E/-W	0.00 usft	Easting:	643,629.00 usft	Longitude:	103° 51' 56.08010 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,940.00 usft

Wellbore		WB1 / Job #1512792			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	3/11/2015	7.49	60.63	48,536

Design		Surveys (Capstar 114)			
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	269.59	

Survey Program		Date	3/23/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	560.00	Gyrodata Surveys (WB1 / Job #1512792)	NS-GYRO-MS	North sensing gyrocompassing m/s	
708.00	9,989.00	Phoenix MWD Surveys (WB1 / Job #1512	PHX+MWD+BGGM	PHX+MWD+BGGM v3:standard declination	

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)
560.00	0.43	115.53	559.98	-3.59	1.70	-1.67	0.00	0.00	0.00
Tie-on to Gyrodata Gyro Survey									
708.00	0.30	168.70	707.98	-4.21	2.28	-2.25	0.23	-0.09	35.93
First Phoenix MWD Survey									
836.00	0.70	325.00	835.98	-3.89	1.89	-1.86	0.77	0.31	122.11
964.00	1.60	285.90	963.95	-2.76	-0.27	0.29	0.89	0.70	-30.55
1,096.00	2.20	282.60	1,095.88	-1.71	-4.52	4.53	0.46	0.45	-2.50
1,224.00	2.60	291.80	1,223.77	-0.09	-9.61	9.61	0.43	0.31	7.19
1,352.00	3.20	290.70	1,351.60	2.25	-15.65	15.63	0.47	0.47	-0.86

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #40H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3951.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3951.00usft (Capstar 114)
Well:	#40H	North Reference:	Grid
Wellbore:	WB1 / Job #1512792	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	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)
1,480.00	3.60	300.30	1,479.38	5.54	-22.46	22.42	0.54	0.31	7.50
1,608.00	3.00	324.20	1,607.17	10.28	-27.89	27.82	1.16	-0.47	18.67
1,737.00	1.70	327.80	1,736.06	14.64	-30.89	30.78	1.01	-1.01	2.79
1,865.00	1.30	28.90	1,864.02	17.52	-31.20	31.07	1.22	-0.31	47.73
1,993.00	0.80	44.30	1,992.00	19.43	-29.87	29.73	0.45	-0.39	12.03
2,122.00	0.70	63.10	2,120.99	20.43	-28.54	28.39	0.20	-0.08	14.57
2,250.00	0.50	65.10	2,248.98	21.02	-27.33	27.18	0.16	-0.16	1.56
2,378.00	0.50	37.60	2,376.98	21.70	-26.49	26.33	0.19	0.00	-21.48
2,507.00	0.70	334.60	2,505.97	22.85	-26.48	26.32	0.50	0.16	-48.84
2,638.00	0.80	320.30	2,636.96	24.28	-27.41	27.23	0.16	0.08	-10.92
2,769.00	1.00	315.50	2,767.95	25.80	-28.79	28.61	0.16	0.15	-3.66
2,897.00	0.70	299.60	2,895.93	26.98	-30.26	30.06	0.30	-0.23	-12.42
3,026.00	1.00	294.50	3,024.92	27.84	-31.97	31.77	0.24	0.23	-3.95
3,152.00	1.20	288.50	3,150.89	28.71	-34.22	34.01	0.18	0.16	-4.76
3,280.00	1.40	269.90	3,278.86	29.14	-37.05	36.84	0.36	0.16	-14.53
3,448.00	1.30	266.80	3,446.81	29.03	-41.01	40.80	0.07	-0.06	-1.85
3,531.00	1.40	274.10	3,529.79	29.05	-42.96	42.75	0.24	0.12	8.80
3,615.00	2.00	189.60	3,613.76	27.67	-44.23	44.03	2.77	0.71	-100.60
3,743.00	3.00	177.60	3,741.64	22.13	-44.46	44.30	0.88	0.78	-9.38
3,871.00	3.10	176.10	3,869.46	15.33	-44.08	43.97	0.10	0.08	-1.17
3,999.00	3.20	180.60	3,997.27	8.30	-43.89	43.83	0.21	0.08	3.52
4,127.00	0.80	182.60	4,125.18	3.83	-43.96	43.94	1.88	-1.88	1.56
4,255.00	1.20	193.20	4,253.16	1.64	-44.31	44.30	0.34	0.31	8.28
4,383.00	1.20	192.40	4,381.13	-0.98	-44.90	44.91	0.01	0.00	-0.63
4,511.00	1.40	190.50	4,509.10	-3.82	-45.48	45.50	0.16	0.16	-1.48
4,639.00	1.20	195.90	4,637.07	-6.65	-46.13	46.18	0.18	-0.16	4.22
4,739.00	1.20	208.90	4,737.05	-8.57	-46.92	46.98	0.27	0.00	13.00
4,829.00	4.80	261.40	4,826.92	-9.96	-51.10	51.17	4.64	4.00	58.33
4,872.00	9.30	269.30	4,869.58	-10.27	-56.36	56.43	10.68	10.47	18.37
4,915.00	14.20	273.90	4,911.67	-9.96	-65.10	65.17	11.59	11.40	10.70
4,957.00	19.20	274.20	4,951.88	-9.10	-77.14	77.20	11.91	11.90	0.71
5,000.00	24.90	272.90	4,991.72	-8.12	-93.24	93.30	13.30	13.26	-3.02
5,043.00	30.40	271.40	5,029.80	-7.40	-113.17	113.22	12.89	12.79	-3.49
5,086.00	34.70	269.60	5,066.04	-7.22	-136.30	136.35	10.25	10.00	-4.19
5,128.00	40.20	269.00	5,099.37	-7.54	-161.83	161.88	13.12	13.10	-1.43
5,171.00	44.40	269.20	5,131.16	-7.99	-190.76	190.81	9.77	9.77	0.47
5,214.00	48.10	271.10	5,160.90	-7.90	-221.81	221.86	9.18	8.60	4.42
5,256.00	52.10	270.80	5,187.83	-7.36	-254.02	254.07	9.54	9.52	-0.71
5,299.00	56.20	270.70	5,213.01	-6.91	-288.86	288.91	9.54	9.53	-0.23
5,342.00	60.70	271.80	5,235.50	-6.10	-325.49	325.52	10.69	10.47	2.56
5,385.00	65.80	272.20	5,254.85	-4.76	-363.85	363.87	11.89	11.86	0.93
5,428.00	72.00	272.70	5,270.32	-3.04	-403.91	403.92	14.46	14.42	1.16
5,470.00	76.00	271.30	5,281.90	-1.64	-444.25	444.25	10.05	9.52	-3.33

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #40H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3951.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3951.00usft (Capstar 114)
Well:	#40H	North Reference:	Grid
Wellbore:	WB1 / Job #1512792	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	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)
5,513.00	80.40	269.60	5,290.69	-1.31	-486.33	486.32	10.94	10.23	-3.95
5,556.00	84.30	268.40	5,296.41	-2.06	-528.93	528.93	9.48	9.07	-2.79
5,601.00	90.00	270.80	5,298.65	-2.37	-573.85	573.85	13.74	12.67	5.33
5,729.00	90.80	271.30	5,297.76	-0.02	-701.82	701.81	0.74	0.63	0.39
5,858.00	90.20	269.50	5,296.63	0.88	-830.81	830.78	1.47	-0.47	-1.40
5,989.00	91.30	269.00	5,294.92	-0.84	-961.79	961.77	0.92	0.84	-0.38
6,117.00	90.60	269.30	5,292.79	-2.74	-1,089.75	1,089.75	0.59	-0.55	0.23
6,246.00	91.10	268.20	5,290.88	-5.55	-1,218.71	1,218.71	0.94	0.39	-0.85
6,374.00	91.30	268.30	5,288.20	-9.46	-1,346.62	1,346.65	0.17	0.16	0.08
6,502.00	91.30	268.50	5,285.30	-13.03	-1,474.54	1,474.59	0.16	0.00	0.16
6,630.00	91.40	268.20	5,282.28	-16.71	-1,602.45	1,602.53	0.25	0.08	-0.23
6,759.00	92.00	269.10	5,278.45	-19.75	-1,731.35	1,731.45	0.84	0.47	0.70
6,887.00	92.40	268.60	5,273.54	-22.32	-1,859.23	1,859.34	0.50	0.31	-0.39
7,015.00	92.40	268.00	5,268.18	-26.11	-1,987.06	1,987.20	0.47	0.00	-0.47
7,143.00	92.70	268.90	5,262.48	-29.57	-2,114.89	2,115.04	0.74	0.23	0.70
7,271.00	90.40	269.20	5,259.02	-31.69	-2,242.81	2,242.98	1.81	-1.80	0.23
7,402.00	90.40	270.50	5,258.11	-32.04	-2,373.81	2,373.98	0.99	0.00	0.99
7,531.00	90.30	270.50	5,257.32	-30.91	-2,502.80	2,502.96	0.08	-0.08	0.00
7,659.00	90.00	270.00	5,256.98	-30.35	-2,630.80	2,630.95	0.46	-0.23	-0.39
7,787.00	89.50	269.50	5,257.54	-30.91	-2,758.79	2,758.95	0.55	-0.39	-0.39
7,916.00	90.60	269.00	5,257.43	-32.60	-2,887.78	2,887.94	0.94	0.85	-0.39
8,044.00	92.00	269.60	5,254.53	-34.16	-3,015.74	3,015.90	1.19	1.09	0.47
8,172.00	91.80	268.70	5,250.28	-36.06	-3,143.65	3,143.83	0.72	-0.16	-0.70
8,301.00	91.20	271.40	5,246.91	-35.95	-3,272.59	3,272.77	2.14	-0.47	2.09
8,429.00	90.90	271.00	5,244.56	-33.27	-3,400.54	3,400.69	0.39	-0.23	-0.31
8,556.00	90.40	270.20	5,243.12	-31.94	-3,527.53	3,527.66	0.74	-0.39	-0.63
8,684.00	89.90	270.00	5,242.78	-31.71	-3,655.52	3,655.66	0.42	-0.39	-0.16
8,812.00	89.80	269.80	5,243.12	-31.94	-3,783.52	3,783.66	0.17	-0.08	-0.16
8,940.00	89.40	270.10	5,244.01	-32.05	-3,911.52	3,911.65	0.39	-0.31	0.23
9,068.00	90.60	269.30	5,244.01	-32.72	-4,039.52	4,039.65	1.13	0.94	-0.63
9,196.00	90.80	268.90	5,242.45	-34.73	-4,167.49	4,167.63	0.35	0.16	-0.31
9,325.00	90.60	268.30	5,240.87	-37.88	-4,296.44	4,296.60	0.49	-0.16	-0.47
9,456.00	90.50	267.00	5,239.62	-43.25	-4,427.32	4,427.52	1.00	-0.08	-0.99
9,584.00	91.80	268.70	5,237.05	-48.05	-4,555.20	4,555.43	1.67	1.02	1.33
9,712.00	91.90	268.30	5,232.91	-51.40	-4,683.09	4,683.34	0.32	0.08	-0.31
9,839.00	91.60	267.00	5,229.04	-56.61	-4,809.92	4,810.20	1.05	-0.24	-1.02
9,925.00	91.60	266.80	5,226.63	-61.26	-4,895.76	4,896.07	0.23	0.00	-0.23
Last Phoenix MWD Survey									
9,989.00	91.60	266.80	5,224.85	-64.83	-4,959.64	4,959.97	0.00	0.00	0.00
Projection to TD									

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #40H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3951.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3951.00usft (Capstar 114)
Well:	#40H	North Reference:	Grid
Wellbore:	WB1 / Job #1512792	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	Compass 5000 GCR

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
560.00	559.98	-3.59	1.70	Tie-on to Gyrodata Gyro Survey
708.00	707.98	-4.21	2.28	First Phoenix MWD Survey
9,925.00	5,226.63	-61.26	-4,895.76	Last Phoenix MWD Survey
9,989.00	5,224.85	-64.83	-4,959.64	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

NM OIL CONSERVATION
ARTESIA DISTRICT
MAR 30 2015

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

RECEIVED

AMENDED REPORT

20-27

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-42762	Pool Code 26770	Pool Name Fren; Glorieta-Yeso
Property Code 308711	Property Name CROW FEDERAL	Well Number 40H
OGRID No. 873	Operator Name APACHE CORPORATION	Elevation 3939'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	3	17-S	31-E		2208	SOUTH	10	WEST	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
L	4	17-S	31-E		2208	SOUTH	330	WEST	EDDY
Dedicated Acres 160	Joint or Infill	Consolidation Code	Order No.						

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

4 39.94 AC. 3 39.94 AC. 2 39.94 AC. 1 39.94 AC. 4 39.93 AC. 3 39.93 AC. 2 39.91 AC. 1 39.91 AC. GRID AZ. = 269°35'23" HORIZ. DIST. = 4962.3' SEE DETAIL	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> 3/27/14 Signature Date Sorina L Flores Printed Name Sorina.flores@apachecorp.com E-mail Address
SCALE: 1"=2000' CORNER COORDINATES TABLE A - Y=678131.4 N, X=638335.7 E B - Y=678167.7 N, X=643616.4 E C - Y=676812.0 N, X=638343.2 E D - Y=676849.1 N, X=643624.5 E DETAIL 3937.1' 3943.6' 3932.3' 3938.4' SCALE: 1"=1000' GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION Y=677737.9 N X=643629.0 E LAT.=32° 51' 44" N LONG.=103° 51' 56" W BOTTOM HOLE LOCATION Y=677702.4 N X=638668.0 E	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. JUNE 19, 2012 Date of Survey Signature & Seal of Professional Surveyor: <i>Ronald J. Eidson</i> NEW MEXICO 3239 Certificate Number 12641 Ronald J. Eidson 3239 AF JWSC W.O.: 12.11.1093