



PHOENIX
TECHNOLOGY SERVICES

September 17, 2014

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

NM OIL CONSERVATION
ARTESIA DISTRICT

SEP 19 2014

RECEIVED

Dear District 2 - Artesia

Attention: Regulatory Department

Re: Apache Corporation
Crow Federal #36H
Eddy County, NM
API #30-015-42141
Job No. 1410979

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	
Brad Hill	36H	620	10,991	07/15/14	07/29/14	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,

Dana Robinson

Dana Robinson
Operations Administrator
Certified mail receipt number: _____

7011 1570 0001 4365 2384

PHOENIX TECHNOLOGY SERVICES SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER 1410979

OPERATOR Apache Corporation

WELL NAME Crow Federal 36H

COUNTY & STATE

Eddy Co, New Mexico

API WELL NUMBER 30-015-42141

PROPOSED DIRECTION 269.59

TIE-IN DATA						
MEASURED DEPTH	VERTICAL DEPTH	INCLIN	AZIMUTH	N-S COORD	E-W COORD	DATA SOURCE
620 ft	619.94 ft	0.92	89.42	2.85 S	8.14 E	Gyro

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
15-Jul-14	735 ft	1.2	82.1

SURVEY INSTRUMENT TYPE
Phoenix MWD

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
29-Jul-14	10,991 ft	91.7	267.2

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
29-Jul-14	11,061 ft	91.7	267.2

Bradley Hill

PRINT YOUR NAME ABOVE

Bradley Hill

SIGN YOUR NAME ABOVE

7/29/2014

TODAY'S DATE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.26
DECLINATION OR GRID	Grid

MWD SUPERVISOR 1

Brad Hill

DIRECTIONAL DRILLER 1

Richard Thurman

MWD SUPERVISOR 2

Shelby Johnson

DIRECTIONAL DRILLER 2

Jon Woodgate

1805 Brittmore Road

Houston, Texas 77043

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

SEP 19 2014

Form C-102

Revised August 1, 2011

RECEIVED Submit one copy to appropriate District Office

☐ AMENDED REPORT

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 Bruzard 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

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-	Pool Code 26770	Pool Name Fren; Glorieta -Yeso
Property Code 308711	Property Name CROW FEDERAL	Well Number 36H
OGRID No. 873	Operator Name APACHE CORPORATION	Elevation 3929'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	3	17-S	31-E		970	SOUTH	537	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
M	4	17-S	31-E		970	SOUTH	330	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
200			

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

	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. Sorina L. Flores 9/25/13 Signature Date Sorina L. Flores Printed Name Sorina.Flores@apachecorp.com E-mail Address
CORNER COORDINATES TABLE ① - Y=676812.0 N, X=638343.2 E ② - Y=676849.1 N, X=643624.5 E ③ - Y=675492.7 N, X=638350.7 E ④ - Y=675566.2 N, X=648912.5 E DETAIL GEODETIC COORDINATES NAD 27, NME SURFACE LOCATION Y=676503.8 N X=644163.7 E LAT.=32.858912° N LONG.=103.863854° W BOTTOM HOLE LOCATION Y=676464.7 N X=638675.1 E LAT.=32° 51' 32\"/>	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. MAY 2, 2012 Date of Survey Signature & Seal of Professional Surveyor: Ronald J. Eidson 05/02/2012 Certification Number: Gary Eidson 12641 Ronald J. Eidson 3239 DSS NWSC W.O. 12.11.0832



NM OIL CONSERVATION
ARTESIA DISTRICT

SEP 19 2014

RECEIVED

Apache Corporation

Eddy County, NM (NAD27 NME)

Crow Federal

#36H

WB1/Job #1410979

Survey: Phoenix MWD Survey

Standard Survey Report

29 July, 2014



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #36H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3940.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3940.00usft (Capstar 114)
Well:	#36H	North Reference:	Grid
Wellbore:	WB1/Job #1410979	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB

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
From:	Map	Easting:	643,906.80 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 50' 38.92796 N
		Longitude:	103° 51' 53.16689 W
		Grid Convergence:	0.25 °

Well:	#36H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 51' 32.08179 N
		Longitude:	103° 51' 49.87573 W
		Ground Level:	3,929.00 usft

Wellbore:	WB1/Job #1410979		
Magnetics	Model Name	Sample Date	Declination
	BGGM2013	07/10/14	7.52
			Dip Angle
			60.63
			Field Strength
			48,627

Design:	Surveys (Capstar 114)		
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
			(°)
			268.92

Survey Program	Date 07/29/14		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.00	620.00	Gyrodata Survey (WB1/Job #1410979)	NS-GYRO-MS
735.00	11,061.00	Phoenix MWD Survey (WB1/Job #141097)	PHX+MWD+BGGM
			Description
			North sensing gyrocompassing m/s
			PHX+MWD+BGGM v3: standard declination

Survey			
Measured	Inclination	Azimuth	Vertical
Depth	(°)	(°)	Depth
(usft)			(usft)
			+N/-S
			(usft)
			+E/-W
			(usft)
			Vertical
			Section
			(usft)
			Dogleg
			Rate
			(°/100usft)
			Build
			Rate
			(°/100usft)
			Turn
			Rate
			(°/100usft)
620.00	0.92	89.42	619.94
			-2.85
			8.14
			-8.08
			0.00
			0.00
			0.00
Tie-on to Gyrodata Survey			
735.00	1.20	82.10	734.92
			-2.67
			10.25
			-10.20
			0.27
			0.24
			-6.37
First Phoenix MWD Survey			
864.00	1.30	83.90	863.88
			-2.33
			13.04
			-13.00
			0.08
			0.08
			1.40
992.00	1.10	79.20	991.86
			-1.95
			15.70
			-15.66
			0.17
			-0.16
			-3.67
1,120.00	0.80	343.70	1,119.85
			-0.86
			16.65
			-16.63
			1.11
			-0.23
			-74.61
1,248.00	1.10	343.50	1,247.83
			1.18
			16.05
			-16.07
			0.23
			0.23
			-0.16
1,376.00	1.50	357.20	1,375.79
			4.03
			15.62
			-15.69
			0.39
			0.31
			10.70

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #36H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3940.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3940.00usft (Capstar 114)
Well:	#36H	North Reference:	Grid
Wellbore:	WB1/Job #1410979	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB

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)
1,505.00	2.20	3.50	1,504.73	8.19	15.69	-15.84	0.56	0.54	4.88
1,633.00	1.70	348.30	1,632.65	12.50	15.45	-15.69	0.56	-0.39	-11.88
1,762.00	1.50	246.80	1,761.62	13.71	13.51	-13.77	1.92	-0.16	-78.68
1,890.00	1.90	244.00	1,889.57	12.12	10.07	-10.29	0.32	0.31	-2.19
2,018.00	2.30	216.90	2,017.48	9.13	6.62	-6.79	0.83	0.31	-21.17
2,146.00	2.30	209.20	2,145.38	4.84	3.82	-3.91	0.24	0.00	-6.02
2,274.00	2.20	208.20	2,273.28	0.43	1.41	-1.42	0.08	-0.08	-0.78
2,402.00	2.50	209.70	2,401.17	-4.16	-1.14	1.21	0.24	0.23	1.17
2,531.00	2.00	224.70	2,530.07	-8.21	-4.11	4.27	0.60	-0.39	11.63
2,659.00	1.20	245.70	2,658.02	-10.34	-6.91	7.10	0.76	-0.63	16.41
2,787.00	1.40	252.30	2,785.99	-11.37	-9.62	9.83	0.19	0.16	5.16
2,916.00	1.70	246.10	2,914.94	-12.63	-12.87	13.10	0.27	0.23	-4.81
3,044.00	1.50	249.70	3,042.89	-13.98	-16.17	16.44	0.17	-0.16	2.81
3,173.00	1.10	223.10	3,171.86	-15.47	-18.60	18.89	0.55	-0.31	-20.62
3,301.00	1.20	224.40	3,299.84	-17.32	-20.38	20.70	0.08	0.08	1.02
3,446.00	1.30	228.20	3,444.80	-19.50	-22.67	23.03	0.09	0.07	2.62
3,588.00	1.20	236.60	3,586.77	-21.39	-25.11	25.51	0.15	-0.07	5.92
3,716.00	1.00	184.30	3,714.75	-23.25	-26.31	26.75	0.77	-0.16	-40.86
3,844.00	1.50	89.00	3,842.73	-24.33	-24.72	25.18	1.47	0.39	-74.45
3,976.00	2.60	60.90	3,974.64	-22.84	-20.38	20.81	1.11	0.83	-21.29
4,104.00	2.00	42.30	4,102.54	-19.78	-16.34	16.71	0.74	-0.47	-14.53
4,232.00	1.80	40.00	4,230.47	-16.59	-13.54	13.85	0.17	-0.16	-1.80
4,361.00	1.80	37.00	4,359.41	-13.42	-11.02	11.27	0.07	0.00	-2.33
4,489.00	1.90	37.00	4,487.34	-10.12	-8.54	8.73	0.08	0.08	0.00
4,618.00	1.40	41.00	4,616.29	-7.22	-6.21	6.35	0.40	-0.39	3.10
4,746.00	1.50	38.20	4,744.25	-4.72	-4.15	4.24	0.10	0.08	-2.19
4,874.00	0.60	34.40	4,872.22	-2.85	-2.74	2.79	0.70	-0.70	-2.97
5,003.00	0.70	17.10	5,001.22	-1.54	-2.13	2.15	0.17	0.08	-13.41
5,131.00	0.60	359.40	5,129.21	-0.13	-1.90	1.90	0.17	-0.08	-13.83
5,221.00	0.50	353.40	5,219.20	0.73	-1.95	1.94	0.13	-0.11	-6.67
5,299.00	1.90	272.90	5,297.19	1.14	-3.28	3.26	2.41	1.79	-103.21
5,342.00	5.90	268.10	5,340.08	1.10	-6.20	6.18	9.33	9.30	-11.16
5,385.00	10.70	268.10	5,382.62	0.90	-12.41	12.39	11.16	11.16	0.00
5,428.00	15.80	268.10	5,424.46	0.57	-22.25	22.24	11.86	11.86	0.00
5,470.00	20.90	267.40	5,464.31	0.04	-35.46	35.45	12.15	12.14	-1.67
5,513.00	22.50	269.30	5,504.26	-0.41	-51.35	51.35	4.06	3.72	4.42
5,556.00	25.40	270.00	5,543.55	-0.51	-68.80	68.80	6.78	6.74	1.63
5,598.00	31.10	268.90	5,580.54	-0.72	-88.67	88.67	13.63	13.57	-2.62
5,641.00	38.30	269.90	5,615.87	-0.96	-113.13	113.13	16.80	16.74	2.33
5,684.00	45.80	269.20	5,647.77	-1.19	-141.91	141.91	17.48	17.44	-1.63
5,727.00	53.70	268.50	5,675.54	-1.86	-174.70	174.70	18.41	18.37	-1.63
5,770.00	61.60	268.70	5,698.53	-2.75	-210.99	211.00	18.38	18.37	0.47
5,813.00	68.10	270.30	5,716.79	-3.07	-249.89	249.90	15.49	15.12	3.72

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #36H
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Well:	#36H	North Reference:	Grid
Wellbore:	WB1/Job #1410979	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB

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)
5,858.00	72.00	271.40	5,732.14	-2.44	-292.17	292.17	8.97	8.67	2.44
5,901.00	74.50	271.30	5,744.53	-1.47	-333.33	333.30	5.82	5.81	-0.23
5,944.00	77.10	271.10	5,755.08	-0.60	-375.01	374.95	6.06	6.05	-0.47
5,987.00	81.40	270.80	5,763.10	0.10	-417.24	417.16	10.02	10.00	-0.70
6,029.00	83.60	270.50	5,768.58	0.57	-458.87	458.78	5.29	5.24	-0.71
6,073.00	86.10	269.40	5,772.53	0.53	-502.69	502.59	6.20	5.68	-2.50
6,201.00	89.20	268.60	5,777.78	-1.70	-630.54	630.46	2.50	2.42	-0.63
6,329.00	90.60	268.50	5,778.00	-4.94	-758.50	758.46	1.10	1.09	-0.08
6,461.00	90.60	268.30	5,776.62	-8.62	-890.44	890.45	0.15	0.00	-0.15
6,589.00	90.80	270.00	5,775.06	-10.52	-1,018.41	1,018.43	1.34	0.16	1.33
6,717.00	91.70	269.10	5,772.26	-11.53	-1,146.38	1,146.39	0.99	0.70	-0.70
6,846.00	91.70	270.40	5,768.44	-12.09	-1,275.32	1,275.32	1.01	0.00	1.01
6,974.00	89.20	272.20	5,767.43	-9.19	-1,403.26	1,403.19	2.41	-1.95	1.41
7,102.00	88.80	271.10	5,769.67	-5.50	-1,531.19	1,531.02	0.91	-0.31	-0.86
7,230.00	89.20	269.40	5,771.90	-4.94	-1,659.16	1,658.96	1.36	0.31	-1.33
7,362.00	89.40	268.20	5,773.51	-7.71	-1,791.12	1,790.95	0.92	0.15	-0.91
7,490.00	90.20	268.30	5,773.96	-11.61	-1,919.06	1,918.94	0.63	0.63	0.08
7,623.00	90.70	267.70	5,772.92	-16.26	-2,051.97	2,051.92	0.59	0.38	-0.45
7,751.00	91.20	268.40	5,770.79	-20.61	-2,179.88	2,179.88	0.67	0.39	0.55
7,880.00	91.10	270.30	5,768.20	-22.07	-2,308.84	2,308.85	1.47	-0.08	1.47
8,008.00	91.60	269.60	5,765.19	-22.19	-2,436.80	2,436.79	0.67	0.39	-0.55
8,136.00	90.90	270.10	5,762.40	-22.52	-2,564.77	2,564.74	0.67	-0.55	0.39
8,268.00	91.60	269.40	5,759.52	-23.10	-2,696.74	2,696.69	0.75	0.53	-0.53
8,396.00	91.40	271.30	5,756.17	-22.31	-2,824.69	2,824.60	1.49	-0.16	1.48
8,524.00	91.80	270.50	5,752.59	-20.30	-2,952.62	2,952.48	0.70	0.31	-0.63
8,655.00	90.40	271.20	5,750.08	-18.36	-3,083.58	3,083.37	1.19	-1.07	0.53
8,789.00	90.60	270.90	5,748.91	-15.91	-3,217.55	3,217.27	0.27	0.15	-0.22
8,916.00	91.10	270.50	5,747.02	-14.35	-3,344.52	3,344.20	0.50	0.39	-0.31
9,047.00	92.10	270.10	5,743.37	-13.67	-3,475.47	3,475.11	0.82	0.76	-0.31
9,175.00	90.30	269.10	5,740.68	-14.56	-3,603.43	3,603.06	1.61	-1.41	-0.78
9,303.00	90.60	269.20	5,739.68	-16.46	-3,731.41	3,731.06	0.25	0.23	0.08
9,431.00	90.00	268.90	5,739.01	-18.58	-3,859.39	3,859.06	0.52	-0.47	-0.23
9,560.00	90.30	268.00	5,738.67	-22.07	-3,988.34	3,988.05	0.74	0.23	-0.70
9,688.00	90.60	267.30	5,737.67	-27.32	-4,116.23	4,116.01	0.59	0.23	-0.55
9,817.00	90.80	268.60	5,736.09	-31.94	-4,245.14	4,244.98	1.02	0.16	1.01
9,945.00	91.70	269.20	5,733.30	-34.39	-4,373.08	4,372.95	0.84	0.70	0.47
10,073.00	91.30	269.10	5,729.95	-36.29	-4,501.02	4,500.90	0.32	-0.31	-0.08
10,201.00	91.70	269.40	5,726.60	-37.97	-4,628.97	4,628.86	0.39	0.31	0.23
10,333.00	92.40	268.60	5,721.87	-40.27	-4,760.86	4,760.77	0.81	0.53	-0.61
10,461.00	92.00	269.60	5,716.96	-42.28	-4,888.75	4,888.68	0.84	-0.31	0.78
10,590.00	91.50	269.40	5,713.02	-43.40	-5,017.68	5,017.61	0.42	-0.39	-0.16
10,718.00	91.60	268.50	5,709.56	-45.75	-5,145.61	5,145.56	0.71	0.08	-0.70
10,846.00	91.50	267.90	5,706.10	-49.77	-5,273.50	5,273.50	0.48	-0.08	-0.47
10,978.00	91.70	267.40	5,702.41	-55.18	-5,405.34	5,405.42	0.41	0.15	-0.38

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #36H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3940.00usft (Capstar 114)
Site:	Crow Federal	MD Reference:	KB @ 3940.00usft (Capstar 114)
Well:	#36H	North Reference:	Grid
Wellbore:	WB1/Job #1410979	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	GCR DB

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)	
10,991.00	91.70	267.20	5,702.03	-55.79	-5,418.32	5,418.41	1.54	0.00	-1.54	
Last Phonix MWD Survey										
11,061.00	91.70	267.20	5,699.95	-59.21	-5,488.21	5,488.34	0.00	0.00	0.00	
Projection to TD										

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
620.00	619.94	-2.85	8.14	Tie-on to Gyrodata Survey	
735.00	734.92	-2.67	10.25	First Phonix MWD Survey	
10,991.00	5,702.03	-55.79	-5,418.32	Last Phonix MWD Survey	
11,061.00	5,699.95	-59.21	-5,488.21	Projection to TD	

Checked By: _____	Approved By: _____	Date: _____
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