



30 015 43249

Apache Corporation

Eddy County, NM (NAD27 NME)

NFE Federal

#60H

OH / Job #1514082

Design: Surveys (Capstar 119)

NM OIL CONSERVATION
ARTESIA DISTRICT

FEB 17 2016

RECEIVED

Standard Survey Report

14 September, 2015



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #60H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3848.00usft (Capstar 119)
Site:	NFE Federal	MD Reference:	KB @ 3848.00usft (Capstar 119)
Well:	#60H	North Reference:	Grid
Wellbore:	OH / Job #1514082	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
From:	Map	Easting:	633,303.50 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 51' 0.49036 N
		Longitude:	103° 53' 57.34966 W
		Grid Convergence:	0.24 °

Well	#60H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 50' 47.63652 N
		Longitude:	103° 52' 58.30908 W
		Ground Level:	3,837.00 usft

Wellbore	OH / Job #1514082		
Magnetics	Model Name	Sample Date	Declination
			(°)
	HDGM	8/27/2015	7.62
			Dip Angle
			(°)
			60.80
			Field Strength
			(nT)
			48,584

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
			(°)
			269.60

Survey Program	Date 9/14/2015		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.00	4,971.00	Phoenix Gyro Survey (OH / Job #1514082	PHX_SPT_GTD
5,034.00	10,304.00	Phoenix MWD Survey (OH / Job #1514082	PHX+MWD+HDGM
			Description
			PHX Continuous north-seeking gyro
			PHX+MWD+HDGM

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn	
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate	
(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	
100.00	0.68	114.24	100.00	-0.24	0.54	-0.54	0.68	0.68	0.00	
200.00	1.66	110.27	199.98	-0.99	2.44	-2.43	0.98	0.98	-3.97	
300.00	1.80	116.96	299.93	-2.20	5.20	-5.18	0.25	0.14	6.69	
400.00	1.72	100.90	399.88	-3.20	8.07	-8.05	0.50	-0.08	-16.06	
500.00	1.52	114.80	499.84	-4.04	10.75	-10.72	0.44	-0.20	13.90	
600.00	1.07	79.99	599.82	-4.43	12.87	-12.84	0.89	-0.45	-34.81	
700.00	1.18	88.39	699.80	-4.24	14.82	-14.79	0.20	0.11	8.40	
800.00	1.12	105.99	799.78	-4.48	16.79	-16.76	0.36	-0.06	17.60	
900.00	0.89	109.30	899.77	-5.01	18.46	-18.43	0.24	-0.23	3.31	

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #60H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3848.00usft (Capstar 119)
Site:	NFE Federal	MD Reference:	KB @ 3848.00usft (Capstar 119)
Well:	#60H	North Reference:	Grid
Wellbore:	OH / Job #1514082	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)
1,000.00	0.92	80.96	999.75	-5.14	19.99	-19.95	0.44	0.03	-28.34
1,100.00	1.33	72.88	1,099.73	-4.67	21.89	-21.86	0.44	0.41	-8.08
1,200.00	1.79	83.86	1,199.70	-4.16	24.55	-24.52	0.55	0.46	10.98
1,300.00	1.97	85.75	1,299.64	-3.87	27.82	-27.79	0.19	0.18	1.89
1,400.00	2.32	75.02	1,399.57	-3.22	31.49	-31.47	0.53	0.35	-10.73
1,500.00	2.13	86.55	1,499.50	-2.58	35.30	-35.28	0.49	-0.19	11.53
1,600.00	2.02	86.80	1,599.43	-2.37	38.92	-38.90	0.11	-0.11	0.25
1,700.00	1.28	83.96	1,699.39	-2.16	41.79	-41.77	0.74	-0.74	-2.84
1,800.00	1.24	91.38	1,799.37	-2.06	43.98	-43.96	0.17	-0.04	7.42
1,900.00	1.06	99.90	1,899.35	-2.25	45.97	-45.95	0.25	-0.18	8.52
2,000.00	0.91	121.45	1,999.33	-2.82	47.56	-47.54	0.40	-0.15	21.55
2,100.00	0.61	140.87	2,099.32	-3.65	48.57	-48.55	0.39	-0.30	19.42
2,200.00	0.46	159.62	2,199.32	-4.44	49.05	-49.02	0.23	-0.15	18.75
2,300.00	0.24	70.88	2,299.32	-4.75	49.39	-49.35	0.51	-0.22	-88.74
2,400.00	0.19	32.51	2,399.32	-4.54	49.67	-49.64	0.15	-0.05	-38.37
2,500.00	0.51	247.69	2,499.32	-4.57	49.35	-49.32	0.67	0.32	-144.82
2,600.00	0.53	268.70	2,599.31	-4.75	48.48	-48.44	0.19	0.02	21.01
2,700.00	0.21	67.60	2,699.31	-4.69	48.18	-48.15	0.73	-0.32	158.90
2,800.00	0.04	175.73	2,799.31	-4.65	48.36	-48.32	0.23	-0.17	108.13
2,900.00	0.47	235.78	2,899.31	-4.92	48.02	-47.98	0.45	0.43	60.05
3,000.00	0.52	252.44	2,999.31	-5.29	47.25	-47.21	0.15	0.05	16.66
3,100.00	0.43	314.69	3,099.30	-5.16	46.55	-46.51	0.50	-0.09	62.25
3,200.00	0.10	328.91	3,199.30	-4.82	46.24	-46.20	0.33	-0.33	14.22
3,300.00	0.37	231.78	3,299.30	-4.95	45.94	-45.90	0.40	0.27	-97.13
3,400.00	0.63	284.97	3,399.30	-5.00	45.15	-45.12	0.50	0.26	53.19
3,500.00	0.50	295.44	3,499.29	-4.67	44.23	-44.19	0.17	-0.13	10.47
3,600.00	0.30	288.01	3,599.29	-4.41	43.58	-43.55	0.21	-0.20	-7.43
3,700.00	0.29	200.45	3,699.29	-4.56	43.25	-43.21	0.41	-0.01	-87.56
3,800.00	0.15	335.62	3,799.29	-4.68	43.10	-43.07	0.41	-0.14	135.17
3,900.00	0.18	170.25	3,899.29	-4.71	43.08	-43.04	0.33	0.03	-165.37
4,000.00	0.50	110.30	3,999.29	-5.02	43.51	-43.48	0.44	0.32	-59.95
4,100.00	0.78	181.53	4,099.28	-5.85	43.90	-43.86	0.78	0.28	71.23
4,200.00	0.89	200.78	4,199.27	-7.26	43.61	-43.56	0.30	0.11	19.25
4,300.00	0.90	225.54	4,299.26	-8.54	42.77	-42.71	0.38	0.01	24.76
4,400.00	0.83	218.74	4,399.25	-9.65	41.76	-41.69	0.12	-0.07	-6.80
4,500.00	0.32	52.32	4,499.25	-10.04	41.53	-41.46	1.14	-0.51	-166.42
4,600.00	0.69	191.69	4,599.24	-10.46	41.63	-41.55	0.96	0.37	139.37
4,700.00	1.00	248.68	4,699.23	-11.37	40.69	-40.61	0.85	0.31	56.99
4,800.00	0.42	181.08	4,799.23	-12.05	39.87	-39.79	0.93	-0.58	-67.60
4,900.00	1.14	203.51	4,899.22	-13.33	39.47	-39.37	0.77	0.72	22.43
4,971.00	0.48	268.00	4,970.21	-13.99	38.89	-38.79	1.45	-0.93	90.83
Tie-on to Phoenix Gyro Survey									
5,034.00	0.80	232.50	5,033.21	-14.27	38.28	-38.18	0.79	0.51	-56.35

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Well:	#60H	North Reference:	Grid
Wellbore:	OH / Job #1514082	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)
First Phoenix MWD Survey									
5,076.00	2.70	257.80	5,075.19	-14.66	37.08	-36.97	4.78	4.52	60.24
5,119.00	7.70	266.80	5,118.00	-15.03	33.21	-33.10	11.75	11.63	20.93
5,162.00	13.50	270.10	5,160.24	-15.18	25.31	-25.20	13.56	13.49	7.67
5,204.00	19.00	274.60	5,200.55	-14.63	13.58	-13.48	13.42	13.10	10.71
5,247.00	23.90	275.70	5,240.56	-13.20	-2.07	2.17	11.43	11.40	2.56
5,289.00	28.20	273.10	5,278.29	-11.82	-20.46	20.54	10.59	10.24	-6.19
5,332.00	32.50	271.40	5,315.39	-10.98	-42.16	42.24	10.20	10.00	-3.95
5,375.00	36.90	269.40	5,350.73	-10.84	-66.63	66.71	10.57	10.23	-4.65
5,417.00	41.60	268.50	5,383.25	-11.33	-93.19	93.27	11.27	11.19	-2.14
5,460.00	45.50	269.90	5,414.41	-11.73	-122.81	122.89	9.34	9.07	3.26
5,502.00	49.50	271.00	5,442.78	-11.48	-153.77	153.84	9.72	9.52	2.62
5,545.00	53.00	270.60	5,469.69	-11.02	-187.29	187.37	8.17	8.14	-0.93
5,587.00	57.70	270.50	5,493.56	-10.69	-221.83	221.90	11.19	11.19	-0.24
5,630.00	61.00	271.60	5,515.48	-10.00	-258.81	258.88	7.98	7.67	2.56
5,673.00	66.70	272.50	5,534.42	-8.61	-297.37	297.42	13.39	13.26	2.09
5,715.00	72.40	272.30	5,549.09	-6.97	-336.67	336.71	13.58	13.57	-0.48
5,758.00	78.40	271.20	5,559.93	-5.70	-378.25	378.28	14.17	13.95	-2.56
5,800.00	84.00	269.50	5,566.35	-5.46	-419.73	419.76	13.92	13.33	-4.05
5,843.00	89.20	268.40	5,568.90	-6.24	-462.63	462.67	12.36	12.09	-2.56
5,885.00	89.90	268.50	5,569.23	-7.38	-504.62	504.66	1.68	1.67	0.24
5,928.00	90.40	268.50	5,569.12	-8.50	-547.60	547.65	1.16	1.16	0.00
6,056.00	92.00	267.90	5,566.43	-12.52	-675.51	675.58	1.33	1.25	-0.47
6,183.00	92.00	269.50	5,562.00	-15.40	-802.39	802.48	1.26	0.00	1.26
6,311.00	90.00	270.10	5,559.77	-15.85	-930.36	930.45	1.63	-1.56	0.47
6,439.00	90.70	269.60	5,558.99	-16.18	-1,058.36	1,058.45	0.67	0.55	-0.39
6,567.00	90.40	269.00	5,557.76	-17.75	-1,186.34	1,186.44	0.52	-0.23	-0.47
6,695.00	90.50	270.20	5,556.75	-18.64	-1,314.33	1,314.43	0.94	0.08	0.94
6,823.00	90.30	269.90	5,555.86	-18.53	-1,442.33	1,442.43	0.28	-0.16	-0.23
6,951.00	90.80	269.90	5,554.63	-18.75	-1,570.33	1,570.42	0.39	0.39	0.00
7,078.00	90.70	269.30	5,552.97	-19.64	-1,697.31	1,697.41	0.48	-0.08	-0.47
7,206.00	91.20	268.80	5,550.85	-21.76	-1,825.27	1,825.38	0.55	0.39	-0.39
7,334.00	91.60	267.90	5,547.72	-25.45	-1,953.18	1,953.31	0.77	0.31	-0.70
7,462.00	90.60	268.10	5,545.26	-29.91	-2,081.08	2,081.24	0.80	-0.78	0.16
7,590.00	91.30	270.10	5,543.14	-31.92	-2,209.04	2,209.21	1.66	0.55	1.56
7,718.00	91.20	269.50	5,540.35	-32.37	-2,337.01	2,337.17	0.48	-0.08	-0.47
7,845.00	91.80	271.00	5,537.02	-31.82	-2,463.96	2,464.12	1.27	0.47	1.18
7,974.00	92.40	270.40	5,532.29	-30.24	-2,592.86	2,593.01	0.66	0.47	-0.47
8,101.00	92.30	270.20	5,527.09	-29.58	-2,719.75	2,719.89	0.18	-0.08	-0.16
8,229.00	91.40	269.90	5,522.95	-29.46	-2,847.68	2,847.82	0.74	-0.70	-0.23
8,357.00	91.40	270.00	5,519.83	-29.58	-2,975.64	2,975.78	0.08	0.00	0.08
8,485.00	91.40	270.30	5,516.70	-29.24	-3,103.61	3,103.73	0.23	0.00	0.23
8,612.00	90.90	270.40	5,514.15	-28.47	-3,230.58	3,230.70	0.40	-0.39	0.08
8,740.00	90.90	270.90	5,512.14	-27.01	-3,358.55	3,358.66	0.39	0.00	0.39

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Site:	NFE Federal	MD Reference:	KB @ 3848.00usft (Capstar 119)
Well:	#60H	North Reference:	Grid
Wellbore:	OH / Job #1514082	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)
8,868.00	90.60	268.80	5,510.46	-27.35	-3,486.53	3,486.64	1.66	-0.23	-1.64
8,995.00	91.50	268.60	5,508.14	-30.23	-3,613.48	3,613.60	0.73	0.71	-0.16
9,123.00	91.70	269.60	5,504.56	-32.24	-3,741.41	3,741.55	0.80	0.16	0.78
9,251.00	90.40	267.00	5,502.22	-36.04	-3,869.32	3,869.48	2.27	-1.02	-2.03
9,379.00	90.00	268.80	5,501.77	-40.73	-3,997.23	3,997.41	1.44	-0.31	1.41
9,506.00	91.50	269.70	5,500.11	-42.39	-4,124.20	4,124.40	1.38	1.18	0.71
9,634.00	91.40	270.70	5,496.87	-41.94	-4,252.16	4,252.35	0.78	-0.08	0.78
9,762.00	91.70	270.70	5,493.41	-40.38	-4,380.10	4,380.28	0.23	0.23	0.00
9,890.00	91.40	270.40	5,489.94	-39.15	-4,508.05	4,508.21	0.33	-0.23	-0.23
10,017.00	90.90	269.70	5,487.40	-39.04	-4,635.02	4,635.18	0.68	-0.39	-0.55
10,146.00	90.60	270.90	5,485.71	-38.36	-4,764.01	4,764.16	0.96	-0.23	0.93
10,234.00	90.70	271.00	5,484.71	-36.91	-4,851.99	4,852.13	0.16	0.11	0.11
Last Phoenix MWD Survey									
10,304.00	90.70	271.00	5,483.85	-35.68	-4,921.97	4,922.10	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)	
4,971.00	4,970.21	-13.99	38.89	Tie-on to Phoenix Gyro Survey
5,034.00	5,033.21	-14.27	38.28	First Phoenix MWD Survey
10,234.00	5,484.71	-36.91	-4,851.99	Last Phoenix MWD Survey
10,304.00	5,483.85	-35.68	-4,921.97	Projection to TD

Checked By: _____ Approved By: _____ Date: _____



TECHNOLOGY SERVICES USA INC.

Celebrating 20 Years of Focused Solutions

3610 Elkins Road, Midland, Texas 79705 T. 432.684.0057 F. 432.686.7964 www.phxtech.com

September 14, 2015

Apache Corporation
Attention: Regulatory Department
303 Veterans Airpark Lane, Suite 3000,
Midland, TX 79705

Re: Apache Corporation
NFE Federal #60H
Eddy County, NM
API #30-015-43249
Job No. 1514301

Dear Regulatory Department;

Phoenix Technology Services, Inc. has filed the Survey Data Certification, Surveys, and Lease Plat for the above referenced well with the State of New Mexico Oil Conservation Division – District 2 via certified mail. A copy of the filing is attached for your records.

Name of Surveyor	Drain Hole Number	Surveyed Depths		Dates Performed		Type of Survey
		From	To	Start	End	
Noe Garza	60H	0	4,971	09/08/15	09/08/15	Gyro

Thank you for the opportunity to be of service. Please contact me if you have any questions or require additional information.

Best Regards,

Alicia Marquez
Operations Administrator

SURVEY CERTIFICATION FORM

3610 Elkins Road Midland, TX 79705 t:432-684-0057 f:432-686-7964



Company: Apache
Well Name: NFE Federal 60H
Survey Instrument Type: North Seek Rate Gyro

Job #: 01514301
County/State: Eddy Co., New Mexico
API #: 30-015-43249

TIE-IN DATA

Measure Depth (ft)	Vertical Depth (ft)	Inclination (°)	Azimuth (°)	N-S Coordinates	E-W Coordinates	Data Source
0	0	0	0	0	0	Surface

First Survey

Date	Depth (ft)	Inclination (°)	Azimuth (°)
2015-09-08	0	0	0

Last Survey

Date	Depth (ft)	Inclination (°)	Azimuth (°)
2015-09-08	4971	0.48	268

Projected TD Survey

Date	Depth (ft)	Inclination (°)	Azimuth (°)
0	0	0	0

Grid Correction
0.24

Gyro Operator: Phoenix Technology Services USA Ltd.

Gyro Supervisor: Jaime Stephenson

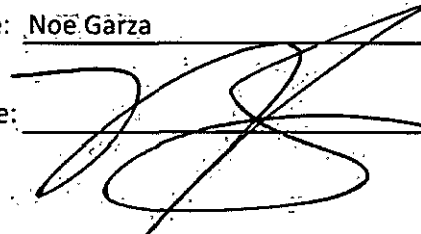
To the best of my knowledge I certify this survey data to be correct and true

Date:

09-08-15

Print Name: Noe Garza

Signature:





Company: Apache
 Well: NFE Federal 60H
 Location: Eddy Co., New Mexico
 Rig: Capstar 119

Job Number: _____
 Grid Corr.: 0.24
 Lat: -103.88
 Long: _____

Calculation Method
 Proposed Azimuth
 RKB - MSL in feet
 Tie Into: _____

Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure	
							N/S (ft)	E/W (ft)	Distance (ft)	Angle (deg)
Enter Tie-In Survey on Line 10						Field Copy Non Definitive				
TIE IN	0	0.00	0	0	0	0	0	0		
Gyro	100.00	0.68	114.24	100	100.00	-0.24	0.24 S	0.54 E	0.59	114
	200.00	1.66	110.27	100	199.98	-0.99	0.99 S	2.44 E	2.63	112
	300.00	1.80	116.96	100	299.93	-2.20	2.20 S	5.20 E	5.65	112
	400.00	1.72	100.90	100	399.88	-3.20	3.20 S	8.07 E	8.68	111
	500.00	1.52	114.80	100	499.84	-4.04	4.04 S	10.75 E	11.48	110
	600.00	1.07	79.99	100	599.82	-4.43	4.43 S	12.87 E	13.62	109
	700.00	1.18	88.39	100	699.80	-4.24	4.24 S	14.82 E	15.42	105
	800.00	1.12	105.99	100	799.78	-4.48	4.48 S	16.79 E	17.38	104
	900.00	0.89	109.30	100	899.76	-5.01	5.01 S	18.46 E	19.13	105
	1000.00	0.92	80.96	100	999.75	-5.14	5.14 S	19.99 E	20.64	104
	1100.00	1.33	72.88	100	1099.73	-4.67	4.67 S	21.89 E	22.38	102
	1200.00	1.79	83.86	100	1199.70	-4.16	4.16 S	24.55 E	24.90	99
	1300.00	1.97	85.75	100	1299.64	-3.87	3.87 S	27.82 E	28.09	97
	1400.00	2.32	75.02	100	1399.57	-3.22	3.22 S	31.49 E	31.65	95
	1500.00	2.13	86.55	100	1499.50	-2.58	2.58 S	35.30 E	35.39	94
	1600.00	2.02	86.80	100	1599.43	-2.37	2.37 S	38.92 E	38.99	93
	1700.00	1.28	83.96	100	1699.39	-2.16	2.16 S	41.79 E	41.84	92
	1800.00	1.24	91.38	100	1799.37	-2.06	2.06 S	43.98 E	44.03	92
	1900.00	1.06	99.90	100	1899.35	-2.25	2.25 S	45.97 E	46.03	92
	2000.00	0.91	121.45	100	1999.33	-2.82	2.82 S	47.56 E	47.64	93
	2100.00	0.61	140.87	100	2099.32	-3.65	3.65 S	48.57 E	48.71	94
	2200.00	0.46	159.62	100	2199.32	-4.44	4.44 S	49.05 E	49.25	95
	2300.00	0.24	70.88	100	2299.32	-4.75	4.75 S	49.39 E	49.61	95
	2400.00	0.19	32.51	100	2399.32	-4.54	4.54 S	49.67 E	49.88	95
	2500.00	0.51	247.69	100	2499.31	-4.57	4.57 S	49.35 E	49.56	95



PHOENIX

TECHNOLOGY SERVICES

Company: Apache
 Well: NFE Federal 60H
 Location: Eddy Co., New Mexico
 Rig: Capstar 119

Job Number:
 Grid Corr.: 0.24
 Lat: -103.88
 Long:

Calculation Method
 Proposed Azimuth
 RKB - MSL in feet
 Tie Into:

Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure	
							N/S (ft)	E/W (ft)	Distance (ft)	Angle (deg)
	2600.00	0.53	268.70	100	2599.31	-4.75	4.75 S	48.48 E	48.71	95
	2700.00	0.21	67.60	100	2699.31	-4.69	4.69 S	48.18 E	48.41	95
	2800.00	0.04	175.73	100	2799.31	-4.65	4.65 S	48.36 E	48.58	95
	2900.00	0.47	235.78	100	2899.31	-4.92	4.92 S	48.02 E	48.27	95
	3000.00	0.52	252.44	100	2999.30	-5.29	5.29 S	47.25 E	47.54	96
	3100.00	0.43	314.69	100	3099.30	-5.16	5.16 S	46.55 E	46.83	96
	3200.00	0.10	328.91	100	3199.30	-4.82	4.82 S	46.24 E	46.49	95
	3300.00	0.37	231.78	100	3299.30	-4.95	4.95 S	45.94 E	46.20	96
	3400.00	0.63	284.97	100	3399.30	-5.00	5.00 S	45.15 E	45.43	96
	3500.00	0.50	295.44	100	3499.29	-4.67	4.67 S	44.23 E	44.47	96
	3600.00	0.30	288.01	100	3599.29	-4.41	4.41 S	43.58 E	43.81	95
	3700.00	0.29	200.45	100	3699.29	-4.56	4.56 S	43.25 E	43.49	96
	3800.00	0.15	335.62	100	3799.29	-4.68	4.68 S	43.10 E	43.36	96
	3900.00	0.18	170.25	100	3899.29	-4.71	4.71 S	43.08 E	43.33	96
	4000.00	0.50	110.30	100	3999.29	-5.02	5.02 S	43.51 E	43.80	96
	4100.00	0.78	181.53	100	4099.28	-5.85	5.85 S	43.90 E	44.29	97
	4200.00	0.89	200.78	100	4199.27	-7.26	7.26 S	43.61 E	44.21	99
	4300.00	0.90	225.54	100	4299.26	-8.54	8.54 S	42.77 E	43.62	101
	4400.00	0.83	218.74	100	4399.25	-9.65	9.65 S	41.76 E	42.86	103
	4500.00	0.32	52.32	100	4499.24	-10.04	10.04 S	41.53 E	42.73	103
	4600.00	0.69	191.69	100	4599.24	-10.46	10.46 S	41.63 E	42.92	104
	4700.00	1.00	248.68	100	4699.23	-11.37	11.37 S	40.69 E	42.25	105
	4800.00	0.42	181.08	100	4799.23	-12.05	12.05 S	39.87 E	41.65	106
	4900.00	1.14	203.51	100	4899.22	-13.33	13.33 S	39.47 E	41.66	108
	4971.00	0.48	268.00	71	4970.21	-13.99	13.99 S	38.89 E	41.33	109



PHOENIX

TECHNOLOGY SERVICES USA INC.

Celebrating 20 Years of Focused Solutions

3610 Elkins Road, Midland, Texas 79705 T. 432.684.0057 F. 432.686.7964 www.phxtech.com

September 14, 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 #60H
Eddy County, NM
API #30-015-43249
Job No. 1514301

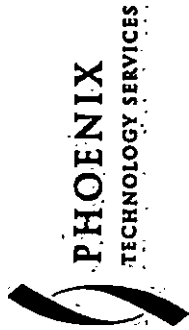
Enclosed please find the Survey Data Certification, and the original Plat and one copy of the Survey Report performed on the above referenced Well by Phoenix Technology Services, Inc. (P-5 No. 664171). Other information required by your office is as follows:

Name & Title of Surveyor	Drain Hole Number	Surveyed Depths		Dates Performed		Type of Survey
		From	To	Start	End	
Noe Garza	60H	0	4,971	09/08/15	09/08/15	Gyro

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,

Alicia Marquez
Operations Administrator



Company:

Well: NFE Federal 60H
Location: Eddy Co., New Mexico
Rig: Capstar 119

Apache

Job Number:

Grid Corr.: 0.24
Lat: -103.88
Long:

Calculation Method

Proposed Azimuth
RKB - MSL in feet
Tie Into:

Minimum Curvature

11 Feet

Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
Enter Tie-In Survey on Line 10							Field Copy Non Definitive						
TIE IN	0	0.00	0	0	0	0	N/S (ft)	E/W (ft)	Distance (ft)	Angle (deg)			
Gyro	100.00	0.68	114.24	100	100.00	-0.24	0.24 S	0.54 E	0.59	114.24	0.68	0.68	114.24
	200.00	1.66	110.27	100	199.98	-0.99	0.99 S	2.44 E	2.63	112.06	0.98	0.98	-3.97
	300.00	1.80	116.96	100	299.93	-2.20	2.20 S	5.20 E	5.65	112.96	0.25	0.14	6.69
	400.00	1.72	100.90	100	399.88	-3.20	3.20 S	8.07 E	8.68	111.61	0.50	-0.08	-16.06
	500.00	1.52	114.80	100	499.84	-4.04	4.04 S	10.75 E	11.48	110.59	0.44	-0.20	13.90
	600.00	1.07	79.99	100	599.82	-4.43	4.43 S	12.87 E	13.62	109.00	0.89	-0.45	-34.81
	700.00	1.18	88.39	100	699.80	-4.24	4.24 S	14.82 E	15.42	105.97	0.20	0.11	8.40
	800.00	1.12	105.99	100	799.78	-4.48	4.48 S	16.79 E	17.38	104.94	0.36	-0.06	17.60
	900.00	0.89	109.30	100	899.76	-5.01	5.01 S	18.46 E	19.13	105.17	0.24	-0.23	3.31
	1000.00	0.92	80.96	100	999.75	-5.14	5.14 S	19.99 E	20.64	104.42	0.44	0.03	-28.34
	1100.00	1.33	72.88	100	1099.73	-4.67	4.67 S	21.89 E	22.38	102.04	0.44	0.41	-8.08
	1200.00	1.79	83.86	100	1199.70	-4.16	4.16 S	24.55 E	24.90	99.62	0.55	0.46	10.98
	1300.00	1.97	85.75	100	1299.64	-3.87	3.87 S	27.82 E	28.09	97.91	0.19	0.18	1.89
	1400.00	2.32	75.02	100	1399.57	-3.22	3.22 S	31.49 E	31.65	95.83	0.53	0.35	-10.73
	1500.00	2.13	86.55	100	1499.50	-2.58	2.58 S	35.30 E	35.39	94.18	0.49	-0.19	11.53
	1600.00	2.02	86.80	100	1599.43	-2.37	2.37 S	38.92 E	38.99	93.49	0.11	-0.11	0.25
	1700.00	1.28	83.96	100	1699.39	-2.16	2.16 S	41.79 E	41.84	92.95	0.74	-0.74	-2.84
	1800.00	1.24	91.38	100	1799.37	-2.06	2.06 S	43.98 E	44.03	92.69	0.17	-0.04	7.42
	1900.00	1.06	99.90	100	1899.35	-2.25	2.25 S	45.97 E	46.03	92.80	0.25	-0.18	8.52
	2000.00	0.91	121.45	100	1999.33	-2.82	2.82 S	47.56 E	47.64	93.40	0.40	-0.15	21.55
	2100.00	0.61	140.87	100	2099.32	-3.65	3.65 S	48.57 E	48.71	94.30	0.39	-0.30	19.42
	2200.00	0.46	159.62	100	2199.32	-4.44	4.44 S	49.05 E	49.25	95.17	0.23	-0.15	18.75
	2300.00	0.24	70.88	100	2299.32	-4.75	4.75 S	49.39 E	49.61	95.49	0.51	-0.22	-88.74
	2400.00	0.19	32.51	100	2399.32	-4.54	4.54 S	49.67 E	49.88	95.22	0.15	-0.05	-38.37
	2500.00	0.51	247.69	100	2499.31	-4.57	4.57 S	49.35 E	49.56	95.29	0.67	0.32	215.18



Company:

Apache

Job Number:

Calculation Method

Minimum Curvature

Well:

NFE Federal 60H

Grid Corr.:

0.24

Proposed Azimuth

Location:

Eddy Co., New Mexico

Lat:

-103.88

RKB - MSL in feet

11 Feet

Rig:

Capstar 119

Tie Into:

Long:

Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure Distance (ft)	Closure Angle (deg)	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
							N/S (ft)	E/W (ft)					
	2600.00	0.53	268.70	100	2599.31	-4.75	4.75 S	48.48 E	48.71	95.59	0.19	0.02	21.01
	2700.00	0.21	67.60	100	2699.31	-4.69	4.69 S	48.18 E	48.41	95.56	0.73	-0.32	-201.10
	2800.00	0.04	175.73	100	2799.31	-4.65	4.65 S	48.36 E	48.58	95.50	0.23	-0.17	108.13
	2900.00	0.47	235.78	100	2899.31	-4.92	4.92 S	48.02 E	48.27	95.85	0.45	0.43	60.05
	3000.00	0.52	252.44	100	2999.30	-5.29	5.29 S	47.25 E	47.54	96.38	0.15	0.05	16.66
	3100.00	0.43	314.69	100	3099.30	-5.16	5.16 S	46.55 E	46.83	96.32	0.50	-0.09	62.25
	3200.00	0.10	328.91	100	3199.30	-4.82	4.82 S	46.24 E	46.49	95.95	0.33	-0.33	14.22
	3300.00	0.37	231.78	100	3299.30	-4.95	4.95 S	45.94 E	46.20	96.14	0.40	0.27	-97.13
	3400.00	0.63	284.97	100	3399.30	-5.00	5.00 S	45.15 E	45.43	96.32	0.50	0.26	53.19
	3500.00	0.50	295.44	100	3499.29	-4.67	4.67 S	44.23 E	44.47	96.03	0.17	-0.13	10.47
	3600.00	0.30	288.01	100	3599.29	-4.41	4.41 S	43.58 E	43.81	95.77	0.21	-0.20	-7.43
	3700.00	0.29	200.45	100	3699.29	-4.56	4.56 S	43.25 E	43.49	96.02	0.41	-0.01	-87.56
	3800.00	0.15	335.62	100	3799.29	-4.68	4.68 S	43.10 E	43.36	96.20	0.41	-0.14	135.17
	3900.00	0.18	170.25	100	3899.29	-4.71	4.71 S	43.08 E	43.33	96.25	0.33	0.03	-165.37
	4000.00	0.50	110.30	100	3999.29	-5.02	5.02 S	43.51 E	43.80	96.58	0.44	0.32	-59.95
	4100.00	0.78	181.53	100	4099.28	-5.85	5.85 S	43.90 E	44.29	97.59	0.78	0.28	71.23
	4200.00	0.89	200.78	100	4199.27	-7.26	7.26 S	43.61 E	44.21	99.45	0.30	0.11	19.25
	4300.00	0.90	225.54	100	4299.26	-8.54	8.54 S	42.77 E	43.62	101.28	0.38	0.01	24.76
	4400.00	0.83	218.74	100	4399.25	-9.65	9.65 S	41.76 E	42.86	103.01	0.12	-0.07	-6.80
	4500.00	0.32	52.32	100	4499.24	-10.04	10.04 S	41.53 E	42.73	103.60	1.14	-0.51	-166.42
	4600.00	0.69	191.69	100	4599.24	-10.46	10.46 S	41.63 E	42.92	104.11	0.96	0.37	139.37
	4700.00	1.00	248.68	100	4699.23	-11.37	11.37 S	40.69 E	42.25	105.61	0.85	0.31	56.99
	4800.00	0.42	181.08	100	4799.23	-12.05	12.05 S	39.87 E	41.65	106.82	0.93	-0.58	-67.60
	4900.00	1.14	203.51	100	4899.22	-13.33	13.33 S	39.47 E	41.66	108.67	0.77	0.72	22.43
	4971.00	0.48	268.00	71	4970.21	-13.99	13.99 S	38.89 E	41.33	109.79	1.45	-0.93	90.83