

WELL NAME: HUMMINGBIRD FEDERAL 7H
API: 30-013-19050
SPUD DATE: 9/17/2015
PRODUCING FORMATION: PADDOCK
FIELD: CEDAR LAKE (BP)
COUNTY: EDOY
STATE: NEW MEXICO
WORKING INTEREST: 100.00%

SURFACE LOC: 2310' FNL & 100' FWL
SECTION: 1
TOWNSHIP: 17-S
RANGE: 31-E
SURVEY: JOHN WEST SURVEYING CO
BOTTOM HOLE LOC: 2318' FNL & 332' FEL
SECTION: 1
TOWNSHIP: 17-S
RANGE: 31-E
SURVEY: JOHN WEST SURVEYING CO
DRILL RIG: CAPSTAR 114
RIG RELEASE: 10/1/2015

KB (ft): 4,029.00
GL (ft): 4,018.00
KB/GI DIFF (ft): 11.00
TMD (ft): 10,033.00
TD OF PILOT HOLE (ft): N/A
FC DEPTH (ft): 10,009.00
PBMD (ft): 10,033.00
RDV DEPTH (ft): N/A
ORIO VALVE (ft): N/A
DEEPEST TVD (ft): 5,480.00

TAPERED CASING STRING:

7" 28# L-80 TO X-OVER @ 4,935'
TAPERING TO 5" 20# L-80 SET @ 10,018'

KOP (ft):
LATERAL LENGTH (ft):
TD OF PILOT HOLE (ft): N/A

COMPLETION:

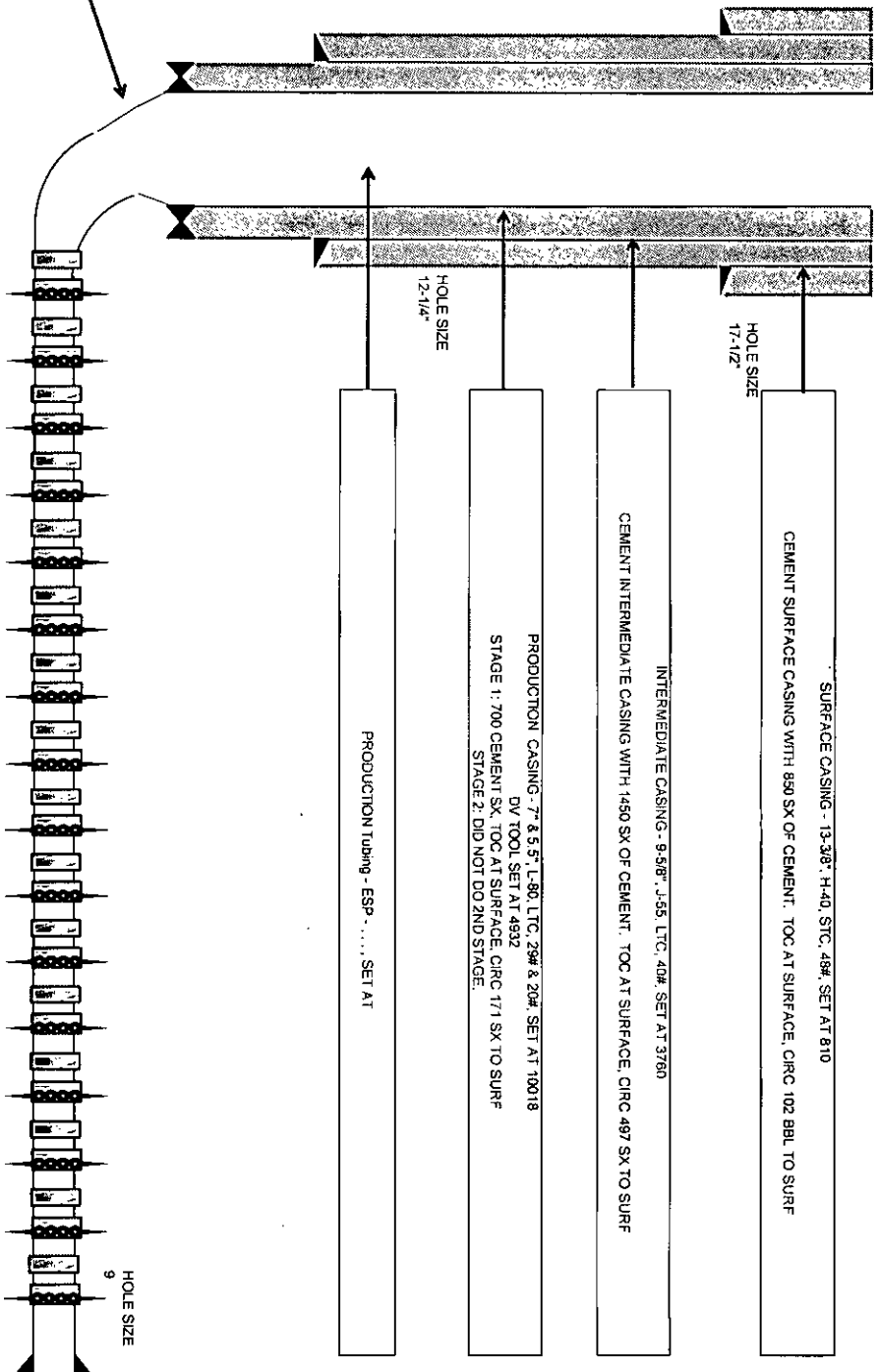
STIMULATION:

STATUS:

COMMENTS:

LAST UPDATED BY: HILLARI GOULD
LAST UPDATED: 3/23/2016

CROSSOVER SUB @ 4,935'



MAY 16 2016

RECEIVED



Apache Corporation

Eddy County, NM (NAD27 NME)

Hummingbird Federal Com

#7H

OH / Job #1514235

Design: Surveys (Capstar 114)

Standard Survey Report

28 September, 2015





Phoenix Technology Services LP Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #7H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 4029.00usft (Capstar 114)
Site:	Hummingbird Federal Com	MD Reference:	KB @ 4029.00usft (Capstar 114)
Well:	#7H	North Reference:	Grid
Wellbore:	OH / Job #1514235	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		Hummingbird Federal Com			
Site Position:		Northing:	677,262.80 usft	Latitude:	32° 51' 39.07462 N
From:	Map	Easting:	655,481.80 usft	Longitude:	103° 49' 37.14798 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.27 °

Well:	#7H					
Well Position	+N/-S	0.00 usft	Northing:	678,572.30 usft	Latitude:	32° 51' 52.08916 N
	+E/-W	0.00 usft	Easting:	654,274.80 usft	Longitude:	103° 49' 51.22520 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,018.00 usft	

Wellbore		OH / Job #1514235			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	9/22/2015	7.50	80.85	48,607

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	Direction
		(usft)	(usft)	(usft)	(°)
		0.00	0.00	0.00	89.57

Survey Program		Date	9/28/2015	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	4,857.00	Phoenix Gyro Survey (OH / Job #1514235	PHX_SPT_GTD	PHX Continuous north-seeking gyro
4,857.00	10,033.00	Phoenix MWD Survey (OH / Job #1514235	PHX+MWD+HDGM	PHX+MWD+HDGM

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.23	214.18	100.00	-0.17	-0.11	-0.11	0.23	0.23	0.00
200.00	0.26	74.80	200.00	-0.27	-0.01	-0.01	0.46	0.03	-139.58
300.00	0.23	294.41	300.00	-0.13	0.03	0.03	0.46	-0.03	-140.19
400.00	0.22	280.80	400.00	0.02	-0.33	-0.33	0.02	-0.01	-3.61
500.00	0.19	239.93	500.00	0.01	-0.66	-0.66	0.18	-0.03	-50.87
600.00	0.35	302.60	600.00	0.09	-1.06	-1.06	0.31	0.16	62.67
700.00	0.33	2.02	700.00	0.54	-1.30	-1.30	0.34	-0.02	59.42
800.00	0.19	131.98	799.99	0.72	-1.17	-1.17	0.47	-0.14	128.94
900.00	0.20	306.26	899.99	0.71	-1.19	-1.18	0.39	0.01	174.30



Phoenix Technology Services LP
Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #7H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 4029.00usft (Capstar 114)
Site:	Hummingbird Federal Com	MD Reference:	KB @ 4029.00usft (Capstar 114)
Well:	#7H	North Reference:	Grid
Wellbore:	OH / Job #1514235	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)
1,000.00	0.10	126.47	999.99	0.76	-1.28	-1.25	0.30	-0.10	-179.79
1,100.00	0.11	90.08	1,099.99	0.71	-1.09	-1.09	0.07	0.01	-36.39
1,200.00	0.27	254.08	1,199.99	0.65	-1.22	-1.22	0.38	0.16	164.00
1,300.00	0.25	258.67	1,299.99	0.54	-1.66	-1.66	0.03	-0.02	4.59
1,400.00	0.13	217.71	1,399.99	0.41	-1.85	-1.84	0.17	-0.12	-40.88
1,500.00	0.63	93.91	1,499.99	0.28	-1.47	-1.47	0.71	0.50	-123.80
1,600.00	0.82	81.00	1,599.98	0.35	-0.21	-0.21	0.25	0.19	-12.91
1,700.00	0.88	72.78	1,699.97	0.89	1.23	1.23	0.14	0.06	-8.22
1,800.00	1.43	61.08	1,799.95	1.52	3.05	3.06	0.80	0.55	-11.70
1,900.00	1.56	59.29	1,899.92	2.82	5.32	5.34	0.14	0.13	-1.79
2,000.00	1.53	59.33	1,999.88	4.20	7.83	7.87	0.03	-0.03	0.04
2,100.00	1.31	61.85	2,099.85	5.42	9.79	9.83	0.23	-0.22	2.52
2,200.00	0.90	60.70	2,199.83	6.34	11.48	11.53	0.41	-0.41	-1.15
2,300.00	0.65	79.33	2,299.82	6.83	12.73	12.78	0.35	-0.25	18.83
2,400.00	0.82	58.31	2,399.82	7.22	13.74	13.80	0.23	-0.03	-21.02
2,500.00	0.53	50.52	2,499.81	7.80	14.58	14.62	0.12	-0.09	-7.79
2,600.00	0.20	321.87	2,599.81	8.23	14.81	14.87	0.56	-0.33	-88.65
2,700.00	0.03	351.79	2,699.81	8.39	14.70	14.76	0.17	-0.17	29.92
2,800.00	0.16	139.02	2,799.81	8.31	14.79	14.85	0.19	0.13	147.23
2,900.00	0.19	298.56	2,899.81	8.29	14.73	14.79	0.34	0.03	159.54
3,000.00	0.24	343.85	2,999.81	8.57	14.53	14.59	0.17	0.05	45.29
3,100.00	0.37	175.30	3,099.81	8.45	14.50	14.56	0.61	0.13	-168.55
3,200.00	0.48	240.46	3,199.81	7.92	14.18	14.22	0.47	0.11	65.16
3,300.00	0.55	253.43	3,299.80	7.57	13.33	13.39	0.14	0.07	12.97
3,400.00	0.51	219.37	3,399.80	7.09	12.59	12.64	0.31	-0.04	-34.06
3,500.00	0.54	250.38	3,499.79	6.59	11.87	11.91	0.28	0.03	31.01
3,600.00	0.46	255.31	3,599.79	6.33	11.03	11.08	0.09	-0.08	4.93
3,700.00	0.51	268.53	3,699.79	6.22	10.20	10.25	0.12	0.05	13.22
3,800.00	0.38	220.32	3,799.78	5.95	9.54	9.59	0.38	-0.13	-48.21
3,900.00	0.29	359.32	3,899.78	5.95	9.32	9.37	0.63	-0.09	139.00
4,000.00	0.38	210.88	3,999.78	5.92	9.15	9.19	0.65	0.09	-148.44
4,100.00	0.43	295.59	4,099.78	5.80	8.64	8.68	0.55	0.05	84.71
4,200.00	0.42	321.89	4,199.78	6.25	8.08	8.12	0.19	-0.01	26.30
4,300.00	0.30	175.55	4,299.78	6.28	7.87	7.92	0.69	-0.12	-146.34
4,400.00	0.22	262.18	4,399.78	5.99	7.70	7.75	0.38	-0.08	88.63
4,500.00	0.18	150.13	4,499.78	5.83	7.59	7.63	0.33	-0.04	-112.05
4,600.00	0.05	118.81	4,599.78	5.87	7.71	7.75	0.14	-0.13	-31.32
4,700.00	0.08	99.78	4,699.78	5.64	7.81	7.85	0.04	0.03	-19.03
4,800.00	0.13	196.36	4,799.78	5.52	7.85	7.89	0.16	0.05	96.58
4,857.00	0.15	188.52	4,856.77	5.38	7.82	7.88	0.05	0.04	-13.75
Tie-on to Phoenix Gyro Survey									
4,940.00	3.40	90.90	4,939.73	5.24	10.27	10.30	4.12	3.92	-117.61
First Phoenix MWD Survey									



Phoenix Technology Services LP Survey Report



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #7H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 4029.00usft (Capstar 114)
Site:	Hummingbird Federal Com	MD Reference:	KB @ 4029.00usft (Capstar 114)
Well:	#7H	North Reference:	Grid
Wellbore:	OH / Job #1514235	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)
4,983.00	8.30	90.30	4,982.49	5.20	14.85	14.69	11.40	11.40	-1.40
5,025.00	13.30	86.70	5,023.73	5.46	22.51	22.55	12.01	11.90	-8.57
5,068.00	18.60	84.80	5,065.06	6.37	34.28	34.33	12.38	12.33	-4.42
5,111.00	23.90	88.70	5,105.13	7.18	49.83	49.88	12.75	12.33	9.07
5,153.00	29.30	92.30	5,142.67	6.97	68.62	68.67	13.41	12.86	8.57
5,196.00	35.40	92.90	5,178.98	5.92	91.80	91.64	14.21	14.19	1.40
5,238.00	39.30	92.10	5,212.36	4.81	117.05	117.08	9.36	9.29	-1.90
5,281.00	44.10	91.70	5,244.46	3.87	145.63	145.65	11.18	11.16	-0.93
5,324.00	50.20	89.90	5,273.69	3.45	177.13	177.15	14.51	14.19	-4.19
5,368.00	55.20	89.20	5,299.13	3.72	210.53	210.55	11.98	11.90	-1.67
5,409.00	59.20	89.90	5,322.42	4.00	246.87	246.89	9.40	9.30	1.63
5,452.00	62.40	90.60	5,343.40	3.83	284.20	284.22	7.58	7.44	1.63
5,494.00	65.30	90.70	5,361.90	3.41	321.89	321.91	6.91	6.90	0.24
5,537.00	68.30	90.70	5,378.84	2.92	361.41	361.42	6.98	6.98	0.00
5,580.00	72.50	90.30	5,393.26	2.57	401.00	401.91	9.81	9.77	-0.93
5,622.00	75.90	89.80	5,404.70	2.54	442.31	442.32	8.18	8.10	-1.19
5,665.00	78.50	89.40	5,414.22	2.83	484.24	484.24	8.11	6.05	-0.93
5,708.00	82.00	89.10	5,421.50	3.39	526.61	526.62	8.17	8.14	-0.70
5,751.00	86.30	89.10	5,425.89	4.06	569.37	569.38	10.00	10.00	0.00
5,794.00	89.30	89.10	5,427.54	4.73	612.32	612.34	6.98	6.98	0.00
5,836.00	90.30	89.40	5,427.68	5.28	654.32	654.34	2.49	2.38	0.71
5,864.00	90.00	89.80	5,427.35	6.18	782.32	782.34	0.39	-0.23	0.31
6,092.00	89.40	88.80	5,428.02	7.96	910.30	910.33	1.05	-0.47	-0.94
6,220.00	90.50	88.50	5,428.13	11.20	1,038.26	1,038.31	0.86	0.86	-0.08
6,347.00	89.70	89.10	5,427.91	13.86	1,165.23	1,165.30	0.79	-0.63	0.47
6,476.00	89.50	88.30	5,428.81	16.79	1,294.19	1,294.28	0.64	-0.16	-0.62
6,604.00	89.00	89.20	5,430.48	19.58	1,422.15	1,422.25	0.80	-0.39	0.70
6,732.00	89.80	89.00	5,431.71	21.59	1,550.12	1,550.24	0.72	0.70	-0.16
6,860.00	90.00	90.30	5,431.82	22.37	1,678.12	1,678.24	1.02	0.08	1.02
6,988.00	88.80	91.30	5,433.16	20.59	1,806.09	1,806.20	1.22	-0.94	0.78
7,119.00	89.40	91.00	5,435.22	17.96	1,937.05	1,937.13	0.51	0.46	-0.23
7,247.00	90.40	90.70	5,435.45	16.06	2,065.03	2,065.10	0.82	0.78	-0.23
7,375.00	90.90	90.90	5,433.99	14.27	2,193.01	2,193.06	0.42	0.39	0.16
7,503.00	89.60	89.40	5,433.44	13.94	2,321.01	2,321.04	1.55	-1.02	-1.17
7,631.00	91.30	89.60	5,432.43	15.05	2,448.99	2,449.04	1.34	1.33	0.16
7,759.00	87.10	89.50	5,434.22	16.08	2,576.95	2,576.99	3.28	-3.28	-0.08
7,887.00	88.50	89.90	5,439.13	16.73	2,704.85	2,704.90	1.14	1.09	0.31
8,016.00	89.80	90.60	5,441.04	16.17	2,833.83	2,833.87	1.14	1.01	0.54
8,143.00	90.20	90.40	5,441.04	15.06	2,960.82	2,960.85	0.35	0.31	-0.16
8,271.00	87.90	89.10	5,443.17	15.61	3,088.79	3,088.82	2.06	-1.80	-1.02
8,400.00	89.40	89.60	5,446.21	17.08	3,217.74	3,217.78	1.23	1.16	0.39
8,528.00	90.10	89.00	5,446.76	18.64	3,345.73	3,345.78	0.72	0.55	-0.47
8,656.00	90.40	88.50	5,446.21	21.43	3,473.70	3,473.78	0.46	0.23	-0.39
8,784.00	89.90	88.80	5,445.87	24.45	3,601.66	3,601.75	0.46	-0.39	0.23



Phoenix Technology Services LP Survey Report



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Site:	Hummingbird Federal Com	MD Reference:	KB @ 4029.00usft (Capstar 114)
Well:	#7H	North Reference:	Grid
Wellbore:	OH / Job #1514235	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Capstar 114)	Database:	Compass 5000 GCR

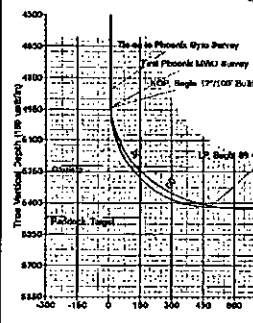
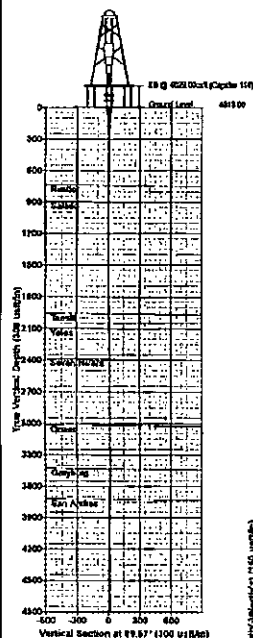
Survey

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)
8,912.00	89.80	89.10	5,448.21	26.79	3,729.64	3,729.74	0.25	-0.08	0.23
9,040.00	88.70	89.80	5,447.88	28.02	3,857.62	3,857.72	1.02	-0.88	0.55
9,168.00	88.70	89.40	5,450.78	28.92	3,985.59	3,985.69	0.31	0.00	-0.31
9,298.00	90.10	89.70	5,452.12	29.92	4,113.57	4,113.68	1.12	1.09	0.23
9,424.00	89.70	88.90	5,452.35	31.49	4,241.58	4,241.68	0.70	-0.31	-0.63
9,552.00	88.90	90.50	5,453.81	32.16	4,369.54	4,369.66	1.40	-0.63	1.25
9,681.00	88.10	90.40	5,457.29	31.14	4,498.49	4,498.60	0.82	-0.62	-0.08
9,809.00	89.80	91.30	5,459.63	29.24	4,628.45	4,628.54	1.50	1.33	0.70
9,937.00	89.90	89.80	5,459.97	28.02	4,754.44	4,754.52	1.17	0.08	-1.17
9,988.00	90.40	89.90	5,459.89	28.10	4,785.44	4,785.52	1.64	1.61	0.32
Last Phoenix MWD Survey									
10,033.00	90.40	89.90	5,459.43	28.21	4,850.44	4,850.52	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)	
4,857.00	4,856.77	5.38	7.82	Tie-on to Phoenix Gyro Survey
4,940.00	4,939.73	5.24	10.27	First Phoenix MWD Survey
9,968.00	5,459.89	28.10	4,785.44	Last Phoenix MWD Survey
10,033.00	5,459.43	28.21	4,850.44	Projection to TD

Checked By: _____ Approved By: _____ Date: _____



WELL DETAILS												
WGS		UTM		Northing		Easting		Latitude		Longitude		
WGS	UTM	UTM	UTM	Northing	Easting	UTM	UTM	UTM	UTM	UTM	UTM	
445750	613	164331	436577	938	772	900	610	758	32° 51' 43.123333 N	100° 47' 54.321191 W		

SECTION DETAILS												
Sec	WGS	UTM	UTM	UTM	UTM	UTM	UTM	UTM	UTM	UTM	UTM	UTM
1	445750	613	164331	436577	938	772	900	610	758			
2	441600	610	164331	436230	938	772	900	610	758			
3	435200	610	164331	435830	938	772	900	610	758			
4	428800	610	164331	435430	938	772	900	610	758			

DESIGN TARGET DETAILS												
WGS	UTM	UTM	UTM	UTM	UTM	UTM	UTM	UTM	UTM	UTM	UTM	UTM
441600	610	164331	436230	938	772	900	610	758	32° 51' 43.123333 N	100° 47' 54.321191 W		

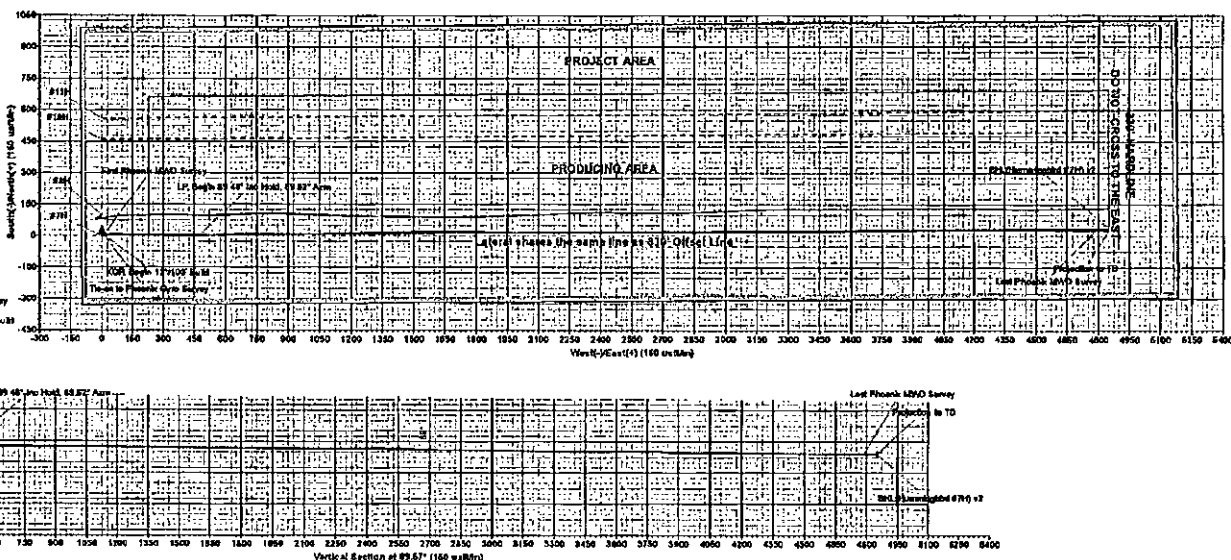
FORMATION TOP DETAILS				
Typical	Width	Formation	Dip-Slope	Dip-Slope
3222.00	3242.41	Gravels	0.51	29.87

LEGEND

——— 071, CH 1 Job #154233, Surveyors (Chaparral 114) V0
 - - - - 0104, CH 1, Plan #1 3-21-94 V0
 - - - - 0104, CH 1, Plan #1 3-21-94 V0
 - - - - 001, CH 1 Job #154233, Surveyors (Chaparral 114) V0
 ——— Plan #1 00-22-98

Map System: US 4-64 Plate 1957 (Graticule)
Datum: IAD 1907 BANCROFT-COBBIN
Elevation: Chart 1888
Zone Name: New Iberia East 3001
Local Grid: YNH 8714, Odd North
Latitude: 32° 51' 52.06"N N
Longitude: 102° 49' 51.225"W W
GCS Ears: 85421.80
Grid North: 97832.30
Baths Fath: 1,500
Oceanographic Model: HODGM
Sample Date: 22 Jan 15
Magnetic Declination: 7.8°
Dip Angle from Horizontal: 49.25°
Liquids PHM Strength: 4.8877

To convert a Magnetic Direction to a Grid Direction, Add 7.3°
 To convert a Magnetic Direction to a True Direction, Add 7.50° East
 To convert a True Direction to a GMD Direction, Subtract 7.50°



SURVEY CERTIFICATION FORM

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



PHOENIX
TECHNOLOGY SERVICES

Company: Apache

Job #: 1514353

Well Name: Hummingbird Fed 7H

County/State: Eddy Co, New Mexico

Survey Instrument Type: North Seek Rate Gyro ✓

API # 30-015-43050

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 (°)
9-22-15	0	0	0

Last Survey

Date	Depth (ft)	Inclination (°)	Azimuth (°)
9-22-15	4857	0.15	188.52

Projected TD Survey

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

Grid Correction
-0.27

Gyro Operator: Leon Laskowski

Gyro Supervisor: [Signature]

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

Date: 2015-09-22

Print Name: Leon Laskowski

Signature: [Signature]

MAY 16 2015



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

RECEIVED

September 23, 2015

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

Re: Apache Corporation
Hummingbird Federal Com #7H
Eddy County, NM
API #30-015-43050
Job No. 1514353

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	
Leon Laskowski	7H	0	4,857	09/22/15	09/22/15	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



PHOENIX

TECHNOLOGY SERVICES USA INC.

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

NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 6 2016

RECEIVED

Celebrating 20 Years of Focused Solutions

September 23, 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
Hummingbird Federal Com #7H
Eddy County, NM
API #30-015-43050
Job No. 1514353

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	
Leon Laskowski	7H	0	4,857	09/22/15	09/22/15	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: Apache
Well: Hummingbird Fed 7H
Location: Eddy Co, New Mexico
Rig: Capstar 114

Job Number: 1514353
Grid Corr.: -0.27
Lat: 32.86
Long: -103.83

Date: 9-22-15
Calculation Method: Minimum Curvature
Proposed Azimuth: 11'
RKB - MSL in feet: 11'
Tie Into: Surface

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')
							N/S (ft)	E/W (ft)	Distance (ft)	Angle (deg)			
FIELD COPY, NON-DEFINITIVE													
Enter Tie-In Survey on Line 10													
TIE IN	0			0	0	0	0	0					
Gyro	100.00	0.23	214.18	100	100.00	-0.17	0.17 S	0.11 W	0.20	214.18	0.23	0.23	214.18
	200.00	0.26	74.60	100	200.00	-0.27	0.27 S	0.01 W	0.27	181.43	0.46	0.03	-139.58
	300.00	0.23	294.41	100	300.00	-0.13	0.13 S	0.03 E	0.13	167.21	0.46	-0.03	219.81
	400.00	0.22	290.80	100	400.00	0.02	0.02 N	0.33 W	0.33	273.86	0.02	-0.01	-3.61
	500.00	0.19	239.93	100	500.00	0.01	0.01 N	0.66 W	0.66	270.66	0.18	-0.03	-50.87
	600.00	0.35	302.60	100	600.00	0.09	0.09 N	1.06 W	1.06	274.82	0.31	0.16	62.67
	700.00	0.33	2.02	100	699.99	0.54	0.54 N	1.30 W	1.41	292.55	0.34	-0.02	-300.58
	800.00	0.19	131.96	100	799.99	0.72	0.72 N	1.17 W	1.37	301.54	0.47	-0.14	129.94
	900.00	0.20	306.26	100	899.99	0.71	0.71 N	1.19 W	1.38	300.89	0.39	0.01	174.30
	1000.00	0.10	126.47	100	999.99	0.76	0.76 N	1.26 W	1.47	301.20	0.30	-0.10	-179.79
	1100.00	0.11	90.08	100	1099.99	0.71	0.71 N	1.09 W	1.30	303.03	0.07	0.01	-36.39
	1200.00	0.27	254.08	100	1199.99	0.65	0.65 N	1.22 W	1.38	297.82	0.38	0.16	164.00
	1300.00	0.25	258.67	100	1299.99	0.54	0.54 N	1.66 W	1.75	287.92	0.03	-0.02	4.59
	1400.00	0.13	217.71	100	1399.99	0.41	0.41 N	1.95 W	1.99	281.76	0.17	-0.12	-40.96
	1500.00	0.63	93.91	100	1499.99	0.28	0.28 N	1.47 W	1.49	280.72	0.71	0.50	-123.80
	1600.00	0.82	81.00	100	1599.98	0.35	0.35 N	0.21 W	0.41	328.92	0.25	0.19	-12.91
	1700.00	0.88	72.78	100	1699.97	0.69	0.69 N	1.23 E	1.41	60.61	0.14	0.06	-8.22
	1800.00	1.43	61.08	100	1799.95	1.52	1.52 N	3.05 E	3.41	63.50	0.60	0.55	-11.70
	1900.00	1.56	59.29	100	1899.92	2.82	2.82 N	5.32 E	6.02	62.05	0.14	0.13	-1.79
	2000.00	1.53	59.33	100	1999.88	4.20	4.20 N	7.63 E	8.71	61.20	0.03	-0.03	0.04
	2100.00	1.31	61.85	100	2099.85	5.42	5.42 N	9.79 E	11.19	61.04	0.23	-0.22	2.52
	2200.00	0.90	60.70	100	2199.83	6.34	6.34 N	11.48 E	13.12	61.09	0.41	-0.41	-1.15
	2300.00	0.65	79.33	100	2299.82	6.83	6.83 N	12.73 E	14.44	61.78	0.35	-0.25	18.63
	2400.00	0.62	58.31	100	2399.82	7.22	7.22 N	13.74 E	15.52	62.29	0.23	-0.03	-21.02
	2500.00	0.53	50.52	100	2499.81	7.80	7.80 N	14.56 E	16.52	61.83	0.12	-0.09	-7.79
	2600.00	0.20	321.87	100	2599.81	8.23	8.23 N	14.81 E	16.94	60.94	0.56	-0.33	271.35
	2700.00	0.03	351.79	100	2699.81	8.39	8.39 N	14.70 E	16.93	60.27	0.17	-0.17	29.92
	2800.00	0.16	139.02	100	2799.81	8.31	8.31 N	14.79 E	16.96	60.66	0.19	0.13	-212.77
	2900.00	0.19	298.56	100	2899.81	8.29	8.29 N	14.73 E	16.90	60.64	0.34	0.03	159.54
	3000.00	0.24	343.85	100	2999.81	8.57	8.57 N	14.53 E	16.87	59.47	0.17	0.05	45.29



PHOENIX
TECHNOLOGY SERVICES

Company: Apache
Well: Hummingbird Fed 7H
Location: Eddy Co, New Mexico
Rig: Capstar 114

Job Number: 1514353
Grid Corr.: -0.27
Lat: 32.86
Long: -103.83

Calculation Method: Minimum Curvature
Proposed Azimuth: 11'
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Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates N/S (ft)	E/W (ft)	Closure Distance (ft)	Angle (deg)	Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
	3100.00	0.37	175.30	100	3099.81	8.45	8.45 N	14.50 E	16.78	59.77	0.61	0.13	-168.55
	3200.00	0.48	240.46	100	3199.80	7.92	7.92 N	14.16 E	16.22	60.78	0.47	0.11	65.16
	3300.00	0.55	253.43	100	3299.80	7.57	7.57 N	13.33 E	15.34	60.40	0.14	0.07	12.97
	3400.00	0.51	219.37	100	3399.80	7.09	7.09 N	12.59 E	14.45	60.60	0.31	-0.04	-34.06
	3500.00	0.54	250.38	100	3499.79	6.59	6.59 N	11.87 E	13.57	60.95	0.28	0.03	31.01
	3600.00	0.46	255.31	100	3599.79	6.33	6.33 N	11.03 E	12.72	60.15	0.09	-0.08	4.93
	3700.00	0.51	268.53	100	3699.78	6.22	6.22 N	10.20 E	11.95	58.63	0.12	0.05	13.22
	3800.00	0.38	220.32	100	3799.78	5.95	5.95 N	9.54 E	11.25	58.03	0.38	-0.13	-48.21
	3900.00	0.29	359.32	100	3899.78	5.95	5.95 N	9.32 E	11.06	57.44	0.63	-0.09	139.00
	4000.00	0.38	210.88	100	3999.78	5.92	5.92 N	9.15 E	10.90	57.08	0.65	0.09	-148.44
	4100.00	0.43	295.59	100	4099.78	5.80	5.80 N	8.64 E	10.41	56.13	0.55	0.05	84.71
	4200.00	0.42	321.89	100	4199.78	6.25	6.25 N	8.08 E	10.21	52.26	0.19	-0.01	26.30
	4300.00	0.30	175.55	100	4299.78	6.28	6.28 N	7.87 E	10.07	51.42	0.69	-0.12	-146.34
	4400.00	0.22	262.18	100	4399.77	5.99	5.99 N	7.70 E	9.76	52.12	0.36	-0.08	86.63
	4500.00	0.18	150.13	100	4499.77	5.83	5.83 N	7.59 E	9.57	52.47	0.33	-0.04	-112.05
	4600.00	0.05	118.81	100	4599.77	5.67	5.67 N	7.71 E	9.57	53.65	0.14	-0.13	-31.32
	4700.00	0.08	99.78	100	4699.77	5.64	5.64 N	7.81 E	9.63	54.18	0.04	0.03	-19.03
	4800.00	0.13	196.36	100	4799.77	5.52	5.52 N	7.85 E	9.59	54.89	0.16	0.05	96.58
	4857.00	0.15	188.52	57	4856.77	5.38	5.38 N	7.82 E	9.49	55.46	0.05	0.04	-13.75