

Received

Operator: Apache Corporation
Well/Lease: Palmillo State 14-4H
County: Eddy, NM

JAN 30 2015

Apache Corp
Permian

STATE OF NEW MEXICO
DEVIATION REPORT

15-42543

<u>Footage</u>	<u>Degree</u>
110	0.14
265	0.14
440	0.44
710	1.40
953	0.30
1330	0.10
1612	0.18
1895	0.31
2083	0.43
2365	0.60
2648	0.48
2930	0.45
3292	0.50
3480	0.70
3858	1.10
4235	1.10
4612	0.40
4706	0.80
5082	0.50
5458	0.90
5835	1.30
6210	2.10
6492	1.90
6908	1.40

NM OIL CONSERVATION

ARTESIA DISTRICT

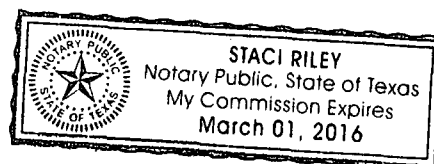
MAR 11 2015

RECEIVED

Signed By: Charles Walsh
Charles Walsh, Division Manager
Pioneer Drilling Company

Appeared before me on Jan 26, 2015.

Staci Riley
Notary Public





NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 11 2015

RECEIVED

Apache Corporation

Eddy County, NM (NAD27 NME)

Palmillo 14 State Com

#4H

WB1/Job #1411413

Design: Surveys (Pioneer 28)

Standard Survey Report

07 January, 2015



Company:	Apache Corporation	Local Co-ordinate Reference:	Well #4H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3476.00usft (Pioneer 28)
Site:	Palmillo 14 State Com	MD Reference:	KB @ 3476.00usft (Pioneer 28)
Well:	#4H	North Reference:	Grid
Wellbore:	WB1/Job #1411413	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 28)	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	Palmillo 14 State Com		
Site Position:		Northing:	602,138.10 usft
From:	Map	Easting:	555,133.20 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 39' 18.90442 N
		Longitude:	104° 9' 15.10476 W
		Grid Convergence:	0.10 °

Well	#4H		
Well Position	+N/-S	0.00 usft	Northing: 606,096.10 usft
	+E/-W	0.00 usft	Easting: 555,141.80 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 39' 58.07122 N
		Longitude:	104° 9' 14.92602 W
		Ground Level:	3,451.00 usft

Wellbore	WB1/Job #1411413				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	BGGM2013	12/23/2014	(°)	(°)	(nT)
			7.59	60.39	48,426

Design	Surveys (Pioneer 28)				
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	89.55	

Survey Program	Date	1/7/2015			
From	To	Survey (Wellbore)	Tool Name	Description	
(usft)	(usft)				
100.00	6,811.00	Phoenix Gyro Survey (WB1/Job #1411413)	NS-GYRO-MS	North sensing gyrocompassing m/s	
6,876.00	11,759.00	Phoenix MWD Survey (WB1/Job #141141)	PHX+MWD+BGGM	PHX+MWD+BGGM v3: standard declination	

Survey										
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate	
(usft)	(°)	(°)	(usft)	(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	0.09	100.40	100.00	-0.01	0.08	0.08	0.09	0.09	0.00	
200.00	0.07	223.17	200.00	-0.07	0.11	0.11	0.14	-0.02	122.77	
300.00	0.26	253.63	300.00	-0.18	-0.15	-0.15	0.20	0.19	30.46	
400.00	0.76	248.81	400.00	-0.49	-0.98	-0.99	0.50	0.50	-4.82	
500.00	1.09	50.94	499.99	-0.13	-0.86	-0.86	1.83	0.33	162.13	
600.00	1.23	46.06	599.97	1.22	0.65	0.66	0.17	0.14	-4.88	
700.00	1.06	45.88	699.95	2.61	2.09	2.11	0.17	-0.17	-0.18	
800.00	0.91	5.20	799.94	4.04	2.82	2.85	0.70	-0.15	-40.68	
900.00	0.77	8.51	899.93	5.50	2.99	3.04	0.15	-0.14	3.31	

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #4H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3476.00usft (Pioneer 28)
Site:	Palmillo 14 State Com	MD Reference:	KB @ 3476.00usft (Pioneer 28)
Well:	#4H	North Reference:	Grid
Wellbore:	WB1/Job #1411413	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 28)	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	0.52	5.26	999.92	6.61	3.13	3.19	0.25	-0.25	-3.25
1,100.00	0.59	11.31	1,099.91	7.57	3.28	3.34	0.09	0.07	6.05
1,200.00	0.34	104.31	1,199.91	8.00	3.67	3.73	0.70	-0.25	93.00
1,300.00	0.44	296.23	1,299.91	8.10	3.61	3.67	0.78	0.10	-168.08
1,400.00	0.36	154.21	1,399.91	7.99	3.40	3.46	0.76	-0.08	-142.02
1,500.00	0.29	110.10	1,499.91	7.62	3.77	3.83	0.25	-0.07	-44.11
1,600.00	0.32	345.70	1,599.91	7.80	3.94	4.00	0.54	0.03	-124.40
1,700.00	0.43	337.49	1,699.91	8.42	3.73	3.80	0.12	0.11	-8.21
1,800.00	0.43	162.76	1,799.90	8.40	3.70	3.76	0.86	0.00	-174.73
1,900.00	0.15	230.11	1,899.90	7.96	3.71	3.77	0.40	-0.28	67.35
2,000.00	0.27	294.95	1,999.90	7.98	3.40	3.46	0.25	0.12	64.84
2,100.00	0.26	62.65	2,099.90	8.18	3.38	3.45	0.48	-0.01	127.70
2,200.00	0.20	350.11	2,199.90	8.46	3.55	3.62	0.28	-0.06	-72.54
2,300.00	0.08	309.58	2,299.90	8.67	3.47	3.54	0.15	-0.12	-40.53
2,400.00	0.12	302.32	2,399.90	8.77	3.33	3.40	0.04	0.04	-7.26
2,500.00	0.22	202.03	2,499.90	8.65	3.17	3.24	0.27	0.10	-100.29
2,600.00	0.17	148.78	2,599.90	8.35	3.17	3.24	0.18	-0.05	-53.25
2,700.00	0.10	301.52	2,699.90	8.27	3.18	3.24	0.26	-0.07	152.74
2,800.00	0.19	59.98	2,799.90	8.40	3.24	3.31	0.25	0.09	118.46
2,900.00	0.14	84.61	2,899.90	8.49	3.51	3.58	0.09	-0.05	24.63
3,000.00	0.04	216.29	2,999.90	8.47	3.61	3.68	0.17	-0.10	131.68
3,100.00	0.15	43.18	3,099.90	8.54	3.68	3.75	0.19	0.11	-173.11
3,200.00	0.36	288.54	3,199.90	8.74	3.47	3.54	0.44	0.21	-114.64
3,300.00	0.52	230.75	3,299.90	8.55	2.82	2.89	0.45	0.16	-57.79
3,400.00	0.72	233.73	3,399.89	7.89	1.96	2.03	0.20	0.20	2.98
3,500.00	0.69	310.78	3,499.89	7.91	1.00	1.06	0.88	-0.03	77.05
3,600.00	0.83	237.71	3,599.88	7.92	-0.07	0.00	0.91	0.14	-73.07
3,700.00	0.90	235.81	3,699.87	7.09	-1.33	-1.27	0.08	0.07	-1.90
3,800.00	1.04	256.45	3,799.85	6.44	-2.86	-2.81	0.37	0.14	20.64
3,900.00	1.17	242.94	3,899.83	5.76	-4.65	-4.61	0.29	0.13	-13.51
4,000.00	1.22	245.65	3,999.81	4.85	-6.53	-6.49	0.08	0.05	2.71
4,100.00	1.22	250.34	4,099.79	4.06	-8.50	-8.47	0.10	0.00	4.69
4,200.00	0.92	251.80	4,199.77	3.45	-10.27	-10.24	0.30	-0.30	1.46
4,300.00	1.01	271.39	4,299.76	3.22	-11.91	-11.89	0.34	0.09	19.59
4,400.00	0.56	187.06	4,399.75	2.76	-12.85	-12.83	1.11	-0.45	-84.33
4,500.00	0.64	104.65	4,499.75	2.13	-12.37	-12.36	0.79	0.08	-82.41
4,600.00	0.74	89.42	4,599.74	1.99	-11.19	-11.17	0.21	0.10	-15.23
4,700.00	0.70	214.40	4,699.74	1.50	-10.89	-10.87	1.28	-0.04	124.98
4,800.00	0.58	164.25	4,799.73	0.51	-11.09	-11.09	0.55	-0.12	-50.15
4,900.00	0.52	214.73	4,899.73	-0.35	-11.22	-11.22	0.47	-0.06	50.48
5,000.00	0.64	307.67	4,999.72	-0.39	-11.92	-11.92	0.85	0.12	92.94
5,100.00	0.72	227.34	5,099.72	-0.47	-12.82	-12.82	0.88	0.08	-80.33
5,200.00	0.48	301.78	5,199.71	-0.68	-13.64	-13.64	0.75	-0.24	74.44

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #4H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3476.00usft (Pioneer 28)
Site:	Palmillo 14 State Com	MD Reference:	KB @ 3476.00usft (Pioneer 28)
Well:	#4H	North Reference:	Grid
Wellbore:	WB1/Job #1411413	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 28)	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)
5,300.00	0.69	303.21	5,299.71	-0.12	-14.50	-14.50	0.21	0.21	1.43
5,400.00	0.91	317.29	5,399.70	0.79	-15.54	-15.53	0.29	0.22	14.08
5,500.00	1.32	314.71	5,499.68	2.18	-16.90	-16.88	0.41	0.41	-2.58
5,600.00	1.48	314.47	5,599.65	3.90	-18.64	-18.61	0.16	0.16	-0.24
5,700.00	1.47	306.49	5,699.62	5.56	-20.59	-20.55	0.21	-0.01	-7.98
5,800.00	1.54	297.25	5,799.58	6.94	-22.82	-22.76	0.25	0.07	-9.24
5,900.00	1.58	294.72	5,899.55	8.13	-25.26	-25.20	0.08	0.04	-2.53
6,000.00	1.65	296.27	5,999.51	9.35	-27.81	-27.73	0.08	0.07	1.55
6,100.00	1.59	283.86	6,099.47	10.32	-30.44	-30.36	0.36	-0.06	-12.41
6,200.00	2.08	273.02	6,199.42	10.75	-33.60	-33.52	0.60	0.49	-10.84
6,300.00	1.60	268.71	6,299.36	10.81	-36.81	-36.73	0.50	-0.48	-4.31
6,400.00	1.72	261.95	6,399.32	10.57	-39.69	-39.61	0.23	0.12	-6.76
6,500.00	1.98	254.90	6,499.27	9.91	-42.85	-42.77	0.35	0.26	-7.05
6,600.00	1.84	253.03	6,599.21	8.99	-46.05	-45.98	0.15	-0.14	-1.87
6,700.00	1.93	257.03	6,699.16	8.14	-49.23	-49.16	0.16	0.09	4.00
6,800.00	1.77	257.11	6,799.11	7.42	-52.37	-52.31	0.16	-0.16	0.08
6,811.00	1.79	255.84	6,810.10	7.34	-52.71	-52.65	0.40	0.18	-11.55
Tie-on to Phoenix Gyro Survey									
6,876.00	1.80	253.10	6,875.07	6.80	-54.67	-54.61	0.13	0.02	-4.22
First Phoenix MWD Survey									
6,908.00	1.40	250.20	6,907.06	6.52	-55.52	-55.46	1.27	-1.25	-9.06
6,939.00	2.00	116.60	6,938.05	6.15	-55.39	-55.34	10.11	1.94	-430.97
6,971.00	6.90	108.50	6,969.95	5.29	-53.06	-53.02	15.40	15.31	-25.31
7,002.00	12.00	106.20	7,000.52	3.80	-48.20	-48.17	16.49	16.45	-7.42
7,033.00	18.10	104.30	7,030.44	1.70	-40.43	-40.42	19.74	19.68	-6.13
7,065.00	23.60	107.30	7,060.33	-1.43	-29.49	-29.50	17.50	17.19	9.38
7,096.00	27.50	107.50	7,088.29	-5.43	-16.74	-16.78	12.58	12.58	0.65
7,127.00	30.00	107.70	7,115.47	-9.94	-2.52	-2.60	8.07	8.06	0.65
7,159.00	32.60	105.70	7,142.81	-14.70	13.40	13.28	8.75	8.13	-6.25
7,190.00	36.10	104.30	7,168.40	-19.22	30.29	30.14	11.57	11.29	-4.52
7,221.00	39.40	102.20	7,192.91	-23.56	48.76	48.58	11.42	10.65	-6.77
7,253.00	42.50	100.70	7,217.08	-27.71	69.32	69.10	10.16	9.69	-4.69
7,284.00	45.50	98.30	7,239.38	-31.25	90.55	90.31	11.07	9.68	-7.74
7,315.00	48.30	94.80	7,260.56	-33.82	113.03	112.77	12.23	9.03	-11.29
7,347.00	52.40	92.90	7,280.98	-35.46	137.61	137.33	13.60	12.81	-5.94
7,378.00	56.80	92.10	7,298.93	-36.56	162.85	162.56	14.35	14.19	-2.58
7,409.00	60.60	91.20	7,315.03	-37.32	189.32	189.02	12.51	12.26	-2.90
7,441.00	63.40	90.60	7,330.05	-37.76	217.57	217.27	8.91	8.75	-1.88
7,473.00	66.50	89.70	7,343.60	-37.83	246.55	246.25	10.02	9.69	-2.81
7,504.00	69.40	89.20	7,355.24	-37.55	275.28	274.98	9.47	9.35	-1.61
7,535.00	72.40	88.90	7,365.38	-37.07	304.57	304.27	9.72	9.68	-0.97
7,567.00	75.00	88.80	7,374.36	-36.45	335.27	334.98	8.13	8.13	-0.31
7,598.00	78.60	88.00	7,381.44	-35.61	365.44	365.15	11.88	11.61	-2.58
7,662.00	84.50	87.50	7,390.84	-33.12	428.67	428.39	9.25	9.22	-0.78

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #4H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3476.00usft (Pioneer 28)
Site:	Palmillo 14 State Com	MD Reference:	KB @ 3476.00usft (Pioneer 28)
Well:	#4H	North Reference:	Grid
Wellbore:	WB1/Job #1411413	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 28)	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)
7,756.00	85.70	87.80	7,398.87	-29.28	522.24	522.00	1.32	1.28	0.32
7,851.00	87.00	88.10	7,404.92	-25.89	616.99	616.77	1.40	1.37	0.32
7,945.00	87.60	88.30	7,409.34	-22.94	710.84	710.63	0.67	0.64	0.21
8,039.00	88.40	88.30	7,412.62	-20.15	804.74	804.55	0.85	0.85	0.00
8,133.00	87.50	88.30	7,415.99	-17.37	898.63	898.47	0.96	-0.96	0.00
8,227.00	87.70	88.60	7,419.92	-14.83	992.52	992.37	0.38	0.21	0.32
8,321.00	88.50	88.30	7,423.04	-12.28	1,086.43	1,086.30	0.91	0.85	-0.32
8,415.00	87.90	89.30	7,425.99	-10.32	1,180.36	1,180.24	1.24	-0.64	1.06
8,509.00	88.40	89.00	7,429.03	-8.92	1,274.30	1,274.19	0.62	0.53	-0.32
8,603.00	87.20	89.00	7,432.64	-7.28	1,368.22	1,368.12	1.28	-1.28	0.00
8,697.00	86.00	88.50	7,438.21	-5.24	1,462.03	1,461.94	1.38	-1.28	-0.53
8,792.00	86.10	89.10	7,444.75	-3.25	1,556.78	1,556.71	0.64	0.11	0.63
8,886.00	86.50	88.60	7,450.82	-1.37	1,650.56	1,650.50	0.68	0.43	-0.53
8,980.00	87.20	88.10	7,455.99	1.33	1,744.38	1,744.34	0.91	0.74	-0.53
9,074.00	86.30	87.90	7,461.31	4.61	1,838.17	1,838.15	0.98	-0.96	-0.21
9,168.00	86.00	88.00	7,467.63	7.96	1,931.90	1,931.90	0.34	-0.32	0.11
9,262.00	85.50	89.10	7,474.59	10.34	2,025.61	2,025.63	1.28	-0.53	1.17
9,356.00	86.50	88.60	7,481.15	12.22	2,119.36	2,119.39	1.19	1.06	-0.53
9,450.00	86.30	88.80	7,487.05	14.35	2,213.15	2,213.20	0.30	-0.21	0.21
9,544.00	86.80	88.70	7,492.71	16.39	2,306.96	2,307.02	0.54	0.53	-0.11
9,638.00	87.40	89.30	7,497.46	18.03	2,400.82	2,400.89	0.90	0.64	0.64
9,732.00	88.10	89.70	7,501.15	18.85	2,494.75	2,494.82	0.86	0.74	0.43
9,827.00	89.10	89.80	7,503.48	19.27	2,589.71	2,589.79	1.06	1.05	0.11
9,921.00	90.00	89.10	7,504.21	20.17	2,683.71	2,683.78	1.21	0.96	-0.74
10,015.00	89.70	89.70	7,504.46	21.15	2,777.70	2,777.78	0.71	-0.32	0.64
10,109.00	90.20	89.20	7,504.54	22.05	2,871.70	2,871.78	0.75	0.53	-0.53
10,203.00	89.50	90.00	7,504.79	22.71	2,965.69	2,965.78	1.13	-0.74	0.85
10,297.00	89.70	90.00	7,505.44	22.71	3,059.69	3,059.77	0.21	0.21	0.00
10,391.00	90.50	89.50	7,505.28	23.12	3,153.69	3,153.77	1.00	0.85	-0.53
10,485.00	90.40	88.40	7,504.54	24.84	3,247.67	3,247.76	1.18	-0.11	-1.17
10,579.00	91.10	87.80	7,503.31	27.96	3,341.61	3,341.72	0.98	0.74	-0.64
10,673.00	90.70	87.80	7,501.84	31.57	3,435.52	3,435.67	0.43	-0.43	0.00
10,767.00	89.90	89.00	7,501.34	34.19	3,529.48	3,529.64	1.53	-0.85	1.28
10,861.00	90.70	88.50	7,500.85	36.24	3,623.46	3,623.63	1.00	0.85	-0.53
10,955.00	90.20	88.70	7,500.11	38.54	3,717.43	3,717.62	0.57	-0.53	0.21
11,049.00	90.10	88.70	7,499.87	40.67	3,811.40	3,811.61	0.11	-0.11	0.00
11,144.00	90.20	88.50	7,499.62	42.99	3,906.38	3,906.59	0.24	0.11	-0.21
11,238.00	90.10	89.00	7,499.37	45.04	4,000.35	4,000.58	0.54	-0.11	0.53
11,332.00	89.40	89.10	7,499.78	46.60	4,094.34	4,094.58	0.75	-0.74	0.11
11,426.00	89.50	90.10	7,500.68	47.26	4,188.33	4,188.57	1.07	0.11	1.06
11,520.00	89.80	90.20	7,501.26	47.01	4,282.33	4,282.56	0.34	0.32	0.11
11,615.00	89.70	90.20	7,501.67	46.68	4,377.33	4,377.56	0.11	-0.11	0.00
11,689.00	90.10	90.00	7,501.80	46.55	4,451.33	4,451.55	0.60	0.54	-0.27

Company:	Apache Corporation	Local Co-ordinate Reference:	Well #4H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3476.00usft (Pioneer 28)
Site:	Palmillo 14 State Com	MD Reference:	KB @ 3476.00usft (Pioneer 28)
Well:	#4H	North Reference:	Grid
Wellbore:	WB1/Job #1411413	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Pioneer 28)	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)
Last Phoenix MWD Survey									
11,759.00	90.10	90.00	7,501.68	46.55	4,521.33	4,521.55	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)	
6,811.00	6,810.10	7.34	-52.71	Tie-on to Phoenix Gyro Survey
6,876.00	6,875.07	6.80	-54.67	First Phoenix MWD Survey
11,689.00	7,501.80	46.55	4,451.33	Last Phoenix MWD Survey
11,759.00	7,501.68	46.55	4,521.33	Projection to TD

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