



Weatherford

Drilling Services
10000 West County Rd. 116
P.O. Box 61028
Midland, TX USA 79711
Tel. (432) 561-8892 Fax (432) 561-8895

Apache Corporation
303 Veterans Airpark Lane
Midland, TX, 79705

Date: October 21, 2019

Attention: Taylor Thetford

Re: Apache Corporation
Well: Black & Tan 27 Fed Com 406H
Lea County, New Mexico

Enclosed, please find the original survey performed on the referenced well by Precision Energy Services, Inc. (P-5 No. 676004), a Weatherford company. Other information required by your office is as follows:

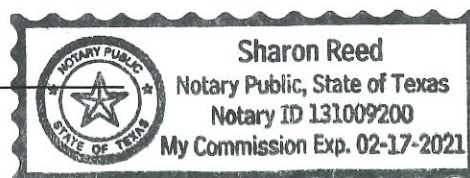
<u>Name & Title Of Surveyor</u>	<u>Well Number</u>	<u>Surveyed Depths</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
Cory Snyder MWD Ops. Coordinator	406H	10,788 MD 16,204 MD	10/17/2019 10/21/2019	Measurement While Drilling

A notarized plan vs. actual is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.

Cory Snyder
MWD Ops. Coordinator

On this, the 22 day of October, 2019, before me a notary public, the undersigned officer, personally appeared Cory Snyder, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument, and acknowledged that he executed the same for the purposes therein contained.

In witness hereof, I hereunto set my hand and official seal.

Notary Public

**5D Survey Report**

Apache Corporation

Field Name: *Apache NM (Nad 83 NMEZ)*
Site Name: *Black & Tan 27 Fed Com Pad 4*
Well Name: *Black and Tan 27 Fed Com 406H*
File number: *13841057*
Survey: *Definitive survey*

22 October 2019





Black and Tan 27 Fed Com 406H

Field Name: Apache NM (Nad 83 NMEZ)	Map Units: US ft		Company Name: Apache Corporation	
	Vertical Reference Datum (VRD): Mean Sea Level			
	Projected Coordinate System: NAD83 / New Mexico East (ftUS)			
	Comment:			
Site: Black & Tan 27 Fed Com Pad 4	Units: US ft	North Reference: Grid	Convergence Angle: 0.43	
	Position:	Northing: 560155.80 US ft	Latitude: 32.537436469	
		Easting: 785192.00 US ft	Longitude: -103.542035828	
	Elevation above MSL: 3715.00 US ft			
Comment: Lea Co., NM				
Slot: Black & Tan 27 Fed Com 406H	Position (Relative to Site Centre)			
	+N/-S: 0.20 US ft	Northing: 560156.00 US ft	Latitude: 32.537436610	
	+E/-W: 20.00 US ft	Easting: 785212.00 US ft	Longitude: -103.541970929	
	Slot TVD Reference: Ground Elevation			
	Elevation above MSL: 3716.00 US ft			
Comment:				
Well: Black and Tan 27 Fed Com 406H	Type: Main well		UWI:	
	File Number: 13841057	Comment:		
	Closure Distance: 5015.04US ft		Closure Azimuth: 0.34°	
	Vertical Section: Position of Origin (Relative to Slot centre)			
	+N/-S: -0.00 US ft		+E/-W: -0.00 US ft	
	Az: 2.77°			

Drill floor: Survey Name: Definitive Survey

Rig Height (Drill Floor): 26.00 US ft **Elevation above MSL:** 3742.00 US ft **Inclination:** 0.00° **Azimuth:** 0.00°

Survey Name: Definitive Survey

Date: 22/Aug/2018

Survey Tool: See Survey Tool Ranges below.

Comment:

Company:

Magnetic Model:

Model Name: IFR

Date: 02/Oct/2019

Field Strength: 48145.0 nT

Declination: 6.58°

Dip: 60.47°

Tie Point:

MD: 0.00 US ft

Inclination: 0.00°

Azimuth: 0.00°

TVD: -0.00 US ft

North Offset: -0.00 US ft

East Offset: -0.00 US ft

5D Survey Report

Survey Tool Ranges:			
Name	Start MD(USft)	End MD(USft)	Source Survey
GYRO_GC_WIR+DPIPE_GYD	0.00	6606.59	GyroData Gyro 02-1
MWD+IFR1+SAG+FDIR	6606.59	6723.00	WFT MWD 03
GYRO_GC_WIR+DPIPE_GYD	6723.00	10715.03	GyroData Gyro 02-2
MWD+IFR1+SAG+FDIR	10715.03	11541.00	WFT MWD 05
MWD+IFR1+SAG+FDIR	11541.00	16269.00	WFT MWD 06

Casing Points: (Relative to Slot centre)(TVD relative to Drill Floor)								
Name	MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (US ft)	Easting (US ft)
9 5/8 in	5680.00	0.40	73.66	5672.31	-153.25	42.92	560002.75	785254.92
7 5/8 in	10728.00	1.29	232.34	10720.04	-172.38	31.89	559983.62	785243.89

Wellpath created using minimum curvature.

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	DLS (°/100US ft)	Northing (US ft)	Easting (US ft)	Comment	
10715.03	1.21	232.90	10707.08	-170.45	-172.20	32.12	0.85	559983.80	785244.12	Tieon GyroData Gyro	
10788.00	1.66	230.45	10780.02	-171.66	-173.34	30.69	0.62	559982.66	785242.69	First WFT MWD Svy	
10835.00	2.42	314.68	10827.00	-171.45	-173.08	29.46	5.94	559982.92	785241.46		
10882.00	10.88	357.62	10873.66	-166.36	-167.94	28.56	19.69	559988.06	785240.56		
10929.00	19.77	0.68	10918.94	-153.97	-155.53	28.47	18.99	560000.47	785240.47		
10976.00	26.44	0.38	10962.15	-135.55	-137.10	28.64	14.19	560018.90	785240.64		
11023.00	28.48	358.10	11003.85	-113.93	-115.43	28.34	4.88	560040.57	785240.34		
11070.00	29.83	358.22	11044.90	-91.11	-92.55	27.60	2.88	560063.45	785239.60		
11117.00	33.47	359.26	11084.90	-66.51	-67.90	27.07	7.83	560088.10	785239.07		
11164.00	40.49	0.45	11122.42	-38.29	-39.64	27.02	15.01	560116.36	785239.02		
11212.00	47.70	1.75	11156.88	-4.93	-6.27	27.69	15.14	560149.73	785239.69		
11259.00	53.93	3.00	11186.56	31.48	30.11	29.22	13.41	560186.11	785241.22		
11306.00	58.90	3.14	11212.55	70.62	69.19	31.31	10.58	560225.19	785243.31		
11353.00	64.18	3.21	11234.94	111.93	110.43	33.60	11.23	560266.43	785245.60		
11400.00	69.50	2.88	11253.42	155.13	153.57	35.89	11.34	560309.57	785247.89		
11447.00	73.49	2.72	11268.33	199.69	198.08	38.07	8.50	560354.08	785250.07		
11494.00	76.96	2.53	11280.31	245.13	243.47	40.15	7.39	560399.47	785252.15		
11541.00	81.34	2.48	11289.16	291.27	289.57	42.17	9.32	560445.57	785254.17		
11615.00	87.69	2.20	11296.23	364.89	363.14	45.17	8.59	560519.14	785257.17		
11662.00	88.11	1.91	11297.95	411.86	410.07	46.86	1.09	560566.07	785258.86		
11709.00	88.39	1.95	11299.39	458.83	457.03	48.44	0.60	560613.03	785260.44		
11803.00	89.37	1.72	11301.22	552.80	550.96	51.45	1.07	560706.96	785263.45		
11897.00	90.21	1.44	11301.57	646.78	644.92	54.04	0.94	560800.92	785266.04		
11991.00	91.12	1.54	11300.48	740.75	738.88	56.48	0.97	560894.88	785268.48		
12085.00	90.70	2.00	11298.99	834.72	832.82	59.39	0.66	560988.82	785271.39		
12179.00	91.75	2.53	11296.98	928.69	926.73	63.10	1.25	561082.73	785275.10		
12273.00	91.40	1.29	11294.39	1022.65	1020.64	66.23	1.37	561176.64	785278.23		
12367.00	90.00	0.80	11293.24	1116.59	1114.61	67.95	1.58	561270.61	785279.95		
12461.00	90.21	1.34	11293.07	1210.55	1208.60	69.70	0.62	561364.60	785281.70		
12556.00	89.44	359.61	11293.36	1305.47	1303.59	70.49	1.99	561459.59	785282.49		
12650.00	90.00	0.43	11293.82	1399.36	1397.59	70.52	1.06	561553.59	785282.52		
12745.00	89.86	359.93	11293.94	1494.26	1492.58	70.82	0.55	561648.58	785282.82		
12839.00	88.74	359.04	11295.09	1588.10	1586.57	69.98	1.52	561742.57	785281.98		
12934.00	88.25	359.19	11297.58	1682.87	1681.53	68.51	0.54	561837.53	785280.51		
13028.00	87.97	358.74	11300.68	1776.61	1775.46	66.81	0.56	561931.46	785278.81		
13122.00	90.42	358.43	11302.00	1870.35	1869.42	64.49	2.63	562025.42	785276.49		
13216.00	91.26	358.46	11300.62	1964.07	1963.37	61.94	0.89	562119.37	785273.94		
13310.00	89.16	359.13	11300.28	2057.84	2057.34	59.96	2.34	562213.34	785271.96		
13404.00	89.44	358.70	11301.43	2151.62	2151.32	58.18	0.55	562307.32	785270.18		
13498.00	91.33	0.42	11300.80	2245.46	2245.31	57.46	2.72	562401.31	785269.46		
13592.00	92.80	0.79	11297.41	2339.33	2339.24	58.45	1.61	562495.24	785270.45		

5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	VS (US ft)	N.Offset (US ft)	E.Offset (US ft)	DLS (°/100US ft)	Northing (US ft)	Easting (US ft)	Comment
13686.00	92.24	359.52	11293.28	2433.14	2433.14	58.71	1.48	562589.14	785270.71	
13780.00	91.40	359.04	11290.29	2526.91	2527.09	57.53	1.03	562683.09	785269.53	
13874.00	91.96	359.77	11287.53	2620.71	2621.04	56.55	0.98	562777.04	785268.55	
13968.00	90.14	1.28	11285.81	2714.62	2715.01	57.41	2.52	562871.01	785269.41	
14063.00	89.93	359.72	11285.75	2809.54	2810.01	58.24	1.66	562966.01	785270.24	
14157.00	89.16	358.50	11286.50	2903.34	2903.99	56.78	1.53	563059.99	785268.78	
14251.00	90.14	359.22	11287.07	2997.12	2997.97	54.91	1.29	563153.97	785266.91	
14345.00	91.05	359.78	11286.10	3090.96	3091.96	54.09	1.14	563247.96	785266.09	
14439.00	90.28	358.38	11285.01	3184.76	3185.94	52.58	1.70	563341.94	785264.58	
14533.00	91.12	359.94	11283.86	3278.56	3279.92	51.20	1.88	563435.92	785263.20	
14628.00	91.89	0.62	11281.36	3373.43	3374.88	51.67	1.08	563530.88	785263.67	
14722.00	89.30	359.74	11280.39	3467.32	3468.87	51.96	2.91	563624.87	785263.96	
14816.00	90.56	359.62	11280.50	3561.19	3562.86	51.44	1.35	563718.86	785263.44	
14910.00	90.98	358.85	11279.24	3655.00	3656.85	50.18	0.93	563812.85	785262.18	
15004.00	91.54	358.48	11277.17	3748.73	3750.80	47.99	0.71	563906.80	785259.99	
15099.00	91.75	358.14	11274.44	3843.41	3845.72	45.19	0.42	564001.72	785257.19	
15193.00	92.10	358.99	11271.29	3937.10	3939.63	42.84	0.98	564095.63	785254.84	
15287.00	93.15	359.47	11266.98	4030.82	4033.52	41.58	1.23	564189.52	785253.58	
15382.00	91.96	359.60	11262.75	4125.57	4128.42	40.81	1.26	564284.42	785252.81	
15476.00	90.91	359.52	11260.39	4219.39	4222.39	40.09	1.12	564378.39	785252.09	
15570.00	91.05	358.91	11258.79	4313.20	4316.37	38.80	0.67	564472.37	785250.80	
15665.00	91.47	358.22	11256.70	4407.92	4411.31	36.42	0.85	564567.31	785248.42	
15759.00	91.33	359.21	11254.40	4501.66	4505.26	34.31	1.06	564661.26	785246.31	
15853.00	92.31	359.26	11251.41	4595.43	4599.20	33.06	1.04	564755.20	785245.06	
15948.00	91.96	359.49	11247.88	4690.20	4694.13	32.02	0.44	564850.13	785244.02	
16042.00	91.40	359.11	11245.12	4783.98	4788.08	30.88	0.72	564944.08	785242.88	
16136.00	92.38	359.18	11242.02	4877.74	4882.02	29.47	1.05	565038.02	785241.47	
16204.00	91.54	0.43	11239.69	4945.61	4949.98	29.24	2.21	565105.98	785241.24	Last WFT MWD Svy
16269.00	91.54	0.43	11237.95	5010.53	5014.95	29.73	0.00	565170.95	785241.73	TD@16269' MD / PTB