



5D Survey Report

Apache Corporation

Field Name: *Apache NM (Nad 83 NMEZ)*

Site Name: *Black & Tan 27 Fed Com Pad 1*

Well Name: *Black and Tan 27 Fed Com 401H*

File number: *13840991*

Survey: *Definitive survey*

13 November 2019



Weatherford®



Black and Tan 27 Fed Com 401H

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 1	Units: US ft	North Reference: Grid	Convergence Angle: 0.42	
	Position:	Northing: 560131.70 US ft	Latitude: 32.537447998	
		Easting: 781352.90 US ft	Longitude: -103.554493117	
Elevation above MSL: 3728.00 US ft				
Comment: Lea Co., NM				
Slot: Black & Tan 27 Fed Com 401H	Position (Relative to Site Centre)			
	+N/-S: 3.60 US ft	Northing: 560135.30 US ft	Latitude: 32.537459098	
	+E/-W: -60.00 US ft	Easting: 781292.90 US ft	Longitude: -103.554687713	
	Slot TVD Reference: Ground Elevation			
Elevation above MSL: 3729.00 US ft				
Comment:				
Well: Black and Tan 27 Fed Com 401H	Type: Main well		UWI:	
	File Number:	Comment:		
	13840991			
	Closure Distance: 4968.66 US ft		Closure Azimuth: 0.01°	
	Vertical Section: Position of Origin (Relative to Slot centre)			
+N/-S: -0.00 US ft		+E/-W: -0.00 US ft		Az: 358.11°

Drill floor: Survey Name: Definitive Survey

Survey Name:Definitive Survey			
Date: 20/Aug/2018	Survey Tool: See Survey Tool Ranges below.	Comment:	Company:

Magnetic Model:				
Model Name: IFR	Date: 01/Nov/2019	Field Strength: 48144.4nT	Declination: 6.59°	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

Survey Tool Ranges:			
Name	Start MD(USFt)	End MD(USFt)	Source Survey
VES GyroFlex V3	0.00	10822.47	VES Gyros
MWD+IFR1+SAG+FDIR	10822.47	11709.00	WFT MWD 04
MWD+IFR1+SAG+FDIR	11709.00	16356.00	WFT MWD 05

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)	H.Offset (US ft)	E.Offset (US ft)	DLS (°/100US ft)	Borthing (US ft)	Easting (US ft)	Comment
0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	0.00	560135.30	781292.90	
102.02	0.15	107.30	102.02	-0.04	-0.04	0.13	0.15	560135.26	781293.03	
195.80	0.27	185.84	195.80	-0.30	-0.30	0.22	0.30	560135.00	781293.12	
289.58	0.47	196.19	289.58	-0.89	-0.89	0.09	0.22	560134.41	781292.99	
383.36	0.48	200.58	383.35	-1.62	-1.62	-0.15	0.04	560133.68	781292.75	
477.14	0.47	210.73	477.13	-2.30	-2.32	-0.49	0.09	560132.98	781292.41	
570.92	0.45	217.87	570.91	-2.91	-2.94	-0.91	0.06	560132.36	781291.99	
664.70	0.44	211.50	664.69	-3.49	-3.54	-1.32	0.05	560131.76	781291.58	
758.48	0.36	206.15	758.46	-4.05	-4.11	-1.64	0.09	560131.19	781291.26	
852.26	0.38	199.07	852.24	-4.61	-4.67	-1.87	0.05	560130.63	781291.03	
946.04	0.40	199.00	946.02	-5.20	-5.27	-2.08	0.02	560130.03	781290.82	
1039.82	0.34	198.02	1039.80	-5.77	-5.85	-2.27	0.06	560129.45	781290.63	
1133.60	0.36	203.22	1133.58	-6.30	-6.38	-2.48	0.04	560128.92	781290.42	
1227.38	0.30	192.80	1227.35	-6.80	-6.89	-2.65	0.09	560128.41	781290.25	
1321.16	0.12	184.10	1321.13	-7.14	-7.23	-2.71	0.19	560128.07	781290.19	
1414.94	0.10	148.30	1414.91	-7.31	-7.40	-2.67	0.07	560127.90	781290.23	
1508.72	0.11	115.21	1508.69	-7.42	-7.51	-2.55	0.06	560127.79	781290.35	
1602.50	0.12	106.62	1602.47	-7.49	-7.57	-2.37	0.02	560127.73	781290.53	
1696.28	0.15	104.32	1696.25	-7.56	-7.63	-2.16	0.03	560127.67	781290.74	
1790.06	0.20	114.72	1790.03	-7.66	-7.73	-1.89	0.06	560127.57	781291.01	
1883.84	0.87	147.50	1883.81	-8.35	-8.40	-1.36	0.76	560126.90	781291.54	
1977.62	3.39	150.49	1977.51	-11.42	-11.41	0.39	2.69	560123.89	781293.29	
2071.40	3.39	151.93	2071.13	-16.36	-16.27	3.06	0.09	560119.03	781295.96	
2165.18	4.17	149.40	2164.71	-21.84	-21.65	6.10	0.85	560113.65	781299.00	
2258.96	5.27	148.26	2258.17	-28.57	-28.25	10.10	1.18	560107.05	781303.00	
2352.74	5.27	142.13	2351.55	-35.79	-35.31	15.01	0.60	560099.99	781307.91	
2446.52	5.96	140.40	2444.88	-43.13	-42.46	20.76	0.76	560092.84	781313.66	
2540.30	7.07	135.46	2538.05	-51.22	-50.33	27.91	1.32	560084.97	781320.81	
2634.08	8.40	133.96	2630.98	-60.38	-59.20	36.89	1.43	560076.10	781329.79	
2727.86	9.48	132.93	2723.62	-70.74	-69.21	47.47	1.16	560066.09	781340.37	
2821.64	10.13	133.86	2816.03	-82.09	-80.19	59.07	0.71	560055.11	781351.97	
2915.42	10.89	134.57	2908.23	-94.42	-92.12	71.33	0.82	560043.18	781364.23	
3009.20	11.54	132.36	3000.22	-107.39	-104.66	84.57	0.83	560030.64	781377.47	
3102.98	10.40	134.32	3092.29	-120.05	-116.89	97.56	1.28	560018.41	781390.46	
3196.76	9.25	135.97	3184.69	-131.75	-128.23	108.86	1.26	560007.07	781401.76	
3290.54	8.62	138.26	3277.33	-142.73	-138.89	118.78	0.77	559996.41	781411.68	
3384.32	6.53	139.96	3370.29	-152.32	-148.22	126.89	2.24	559987.08	781419.79	
3478.10	5.03	140.06	3463.59	-159.75	-155.45	132.96	1.60	559979.85	781425.86	
3571.88	4.01	137.47	3557.08	-165.48	-161.02	137.81	1.11	559974.28	781430.71	
3665.66	3.07	132.37	3650.68	-169.72	-165.13	141.88	1.06	559970.17	781434.78	
3759.44	1.64	118.32	3744.38	-172.15	-167.46	144.92	1.63	559967.84	781437.82	
3853.22	1.25	81.27	3838.13	-172.70	-167.94	147.11	1.06	559967.36	781440.01	
3947.00	1.19	20.04	3931.89	-171.68	-166.87	148.46	1.33	559968.43	781441.36	
4040.78	1.14	359.56	4025.65	-169.84	-165.02	148.78	0.44	559970.28	781441.68	
4134.56	1.10	353.04	4119.41	-168.01	-163.20	148.67	0.14	559972.10	781441.57	
4228.34	0.60	352.72	4213.18	-166.62	-161.82	148.50	0.53	559973.48	781441.40	
4322.12	0.14	322.68	4306.96	-166.04	-161.24	148.36	0.52	559974.06	781441.26	
4415.90	0.47	256.57	4400.74	-166.03	-161.24	147.92	0.46	559974.06	781440.82	
4509.68	0.69	247.34	4494.52	-166.30	-161.54	147.03	0.25	559973.76	781439.93	
4603.46	0.54	250.68	4588.29	-166.64	-161.91	146.09	0.16	559973.39	781438.99	
4697.24	0.69	262.03	4682.06	-166.83	-162.13	145.11	0.21	559973.17	781438.01	
4791.02	0.66	262.55	4775.84	-166.94	-162.28	144.02	0.03	559973.02	781436.92	
4884.80	0.75	166.35	4869.61	-167.59	-162.95	143.63	1.12	559972.35	781436.53	
4978.58	0.89	157.58	4963.38	-168.88	-164.21	144.05	0.20	559971.09	781436.95	
5072.36	0.88	157.72	5057.15	-170.23	-165.55	144.60	0.01	559969.75	781437.50	
5166.14	1.08	157.87	5150.92	-171.74	-167.04	145.21	0.21	559968.26	781438.11	
5259.92	1.10	164.19	5244.68	-173.44	-168.72	145.78	0.13	559966.58	781438.68	

FD 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
5353.70	1.11	167.56	5338.44	-175.21	-170.48	146.22	0.07	559964.82	781439.12	
5447.48	0.55	184.07	5432.21	-176.55	-171.81	146.39	0.64	559963.49	781439.29	
5541.26	0.51	200.09	5525.99	-177.38	-172.65	146.21	0.16	559962.65	781439.11	
5635.04	0.50	206.52	5619.77	-178.13	-173.41	145.89	0.06	559961.89	781438.79	
5728.82	0.60	214.83	5713.54	-178.88	-174.18	145.42	0.14	559961.12	781438.32	
5822.60	0.75	213.39	5807.32	-179.78	-175.10	144.81	0.16	559960.20	781437.71	
5916.38	0.91	206.53	5901.09	-180.93	-176.28	144.14	0.20	559959.02	781437.04	
6010.16	0.94	204.95	5994.85	-182.28	-177.64	143.48	0.04	559957.66	781436.38	
6103.94	1.00	207.44	6088.62	-183.68	-179.06	142.78	0.08	559956.24	781435.68	
6197.72	1.05	211.28	6182.39	-185.11	-180.52	141.95	0.09	559954.78	781434.85	
6291.50	1.03	209.86	6276.15	-186.54	-181.99	141.09	0.03	559953.31	781433.99	
6385.28	0.52	14.57	6369.93	-186.85	-182.31	140.77	1.64	559952.99	781433.67	
6479.06	1.20	15.14	6463.70	-185.51	-180.95	141.14	0.73	559954.35	781434.04	
6572.84	1.22	12.90	6557.45	-183.60	-179.03	141.62	0.05	559956.27	781434.52	
6666.62	1.12	21.95	6651.21	-181.80	-177.20	142.18	0.22	559958.10	781435.08	
6760.40	0.93	21.12	6744.98	-180.26	-175.64	142.80	0.20	559959.66	781435.70	
6854.18	0.81	19.91	6838.75	-178.94	-174.31	143.30	0.13	559960.99	781436.20	
6947.96	0.72	20.06	6932.52	-177.78	-173.13	143.73	0.10	559962.17	781436.63	
7041.74	0.63	17.41	7026.29	-176.75	-172.09	144.08	0.10	559963.21	781436.98	
7135.52	0.62	13.09	7120.07	-175.77	-171.10	144.35	0.05	559964.20	781437.25	
7229.30	0.57	9.38	7213.84	-174.82	-170.15	144.54	0.07	559965.15	781437.44	
7323.08	0.51	5.81	7307.62	-173.95	-169.27	144.66	0.07	559966.03	781437.56	
7416.86	0.50	5.09	7401.40	-173.13	-168.45	144.74	0.01	559966.85	781437.64	
7510.64	0.49	359.00	7495.17	-172.33	-167.64	144.77	0.06	559967.66	781437.67	
7604.42	0.51	357.97	7588.95	-171.51	-166.82	144.75	0.02	559968.48	781437.65	
7698.20	0.59	358.16	7682.72	-170.61	-165.92	144.72	0.09	559969.38	781437.62	
7791.98	0.68	358.79	7776.50	-169.57	-164.89	144.69	0.10	559970.41	781437.59	
7885.76	0.70	354.79	7870.27	-168.44	-163.76	144.63	0.06	559971.54	781437.53	
7979.54	0.43	153.81	7964.05	-168.19	-163.50	144.73	1.19	559971.80	781437.63	
8073.32	0.46	159.41	8057.83	-168.87	-164.17	145.02	0.06	559971.13	781437.92	
8167.10	0.50	161.90	8151.60	-169.61	-164.91	145.28	0.05	559970.39	781438.18	
8260.88	0.52	165.05	8245.38	-170.42	-165.71	145.51	0.04	559969.59	781438.41	
8354.66	0.53	172.34	8339.16	-171.27	-166.55	145.68	0.07	559968.75	781438.58	
8448.44	0.60	173.51	8432.93	-172.19	-167.47	145.80	0.08	559967.83	781438.70	
8542.22	0.64	175.41	8526.71	-173.20	-168.48	145.89	0.05	559966.82	781438.79	
8636.00	0.57	169.94	8620.48	-174.19	-169.46	146.02	0.10	559965.84	781438.92	
8729.78	0.64	155.78	8714.26	-175.13	-170.40	146.31	0.18	559964.90	781439.21	
8823.56	0.51	128.27	8808.03	-175.89	-171.14	146.86	0.32	559964.16	781439.76	
8917.34	0.40	117.74	8901.81	-176.32	-171.55	147.47	0.15	559963.75	781440.37	
9011.12	0.36	149.62	8995.59	-176.74	-171.95	147.91	0.23	559963.35	781440.81	
9104.90	0.36	160.29	9089.36	-177.28	-172.49	148.16	0.07	559962.81	781441.06	
9198.68	0.37	174.99	9183.14	-177.86	-173.06	148.29	0.10	559962.24	781441.19	
9292.46	0.47	217.97	9276.92	-178.46	-173.67	148.08	0.34	559961.63	781440.98	
9386.24	0.71	224.95	9370.70	-179.15	-174.38	147.43	0.27	559960.92	781440.33	
9480.02	0.68	231.44	9464.47	-179.88	-175.14	146.58	0.09	559960.16	781439.48	
9573.80	0.86	248.40	9558.24	-180.45	-175.75	145.49	0.31	559959.55	781438.39	
9667.58	1.07	249.56	9652.01	-180.97	-176.31	144.02	0.22	559958.99	781436.92	
9761.36	1.18	243.58	9745.77	-181.65	-177.05	142.33	0.17	559958.25	781435.23	
9855.14	1.28	241.59	9839.53	-182.51	-177.98	140.55	0.12	559957.32	781433.45	
9948.92	1.30	216.75	9933.28	-183.81	-179.33	138.99	0.59	559955.97	781431.89	
10042.70	1.37	211.00	10027.04	-185.59	-181.14	137.78	0.16	559954.16	781430.68	
10136.48	1.00	204.71	10120.80	-187.26	-182.84	136.86	0.42	559952.46	781429.76	
10230.26	0.97	196.50	10214.56	-188.74	-184.35	136.29	0.15	559950.95	781429.19	
10324.04	0.56	140.10	10308.34	-189.86	-185.46	136.36	0.86	559949.84	781429.26	
10417.82	0.84	140.28	10402.11	-190.76	-186.34	137.09	0.30	559948.96	781429.99	
10511.60	0.15	22.65	10495.89	-191.19	-186.76	137.58	0.98	559948.54	781430.48	
10605.38	0.61	218.84	10589.67	-191.46	-187.03	137.31	0.81	559948.27	781430.21	
10699.16	1.85	206.17	10683.42	-193.17	-188.78	136.33	1.35	559946.52	781429.23	
10792.94	1.01	227.13	10777.17	-195.05	-190.70	135.06	1.04	559944.60	781427.96	

D. Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										Comment
HD (US ft)	Incl (°)	Az (°)	TVD (US ft)	VS (US ft)	N. Offset (US ft)	E. Offset (US ft)	DLS (%/100US ft)	Northing (US ft)	Easting (US ft)	
10822.47	1.03	251.44	10806.70	-195.30	-190.96	134.61	1.46	559944.34	781427.51	First WFT MWD Svy
10841.00	1.77	244.08	10825.22	-195.46	-191.14	134.20	4.10	559944.16	781427.10	
10853.00	1.26	249.72	10837.22	-195.58	-191.27	133.91	4.42	559944.03	781426.81	
10900.00	1.14	251.36	10884.21	-195.88	-191.60	132.98	0.27	559943.70	781425.88	
10948.00	4.29	323.58	10932.16	-194.54	-190.30	131.46	8.52	559945.00	781424.36	
10995.00	10.86	348.44	10978.73	-188.72	-184.54	129.53	15.31	559950.76	781422.43	
11042.00	16.14	357.11	11024.42	-177.81	-173.67	128.31	12.00	559961.63	781421.21	
11089.00	21.02	358.60	11068.96	-162.84	-158.71	127.78	10.43	559976.59	781420.68	
11142.00	26.76	355.11	11117.40	-141.40	-137.30	126.52	11.15	559998.00	781419.42	
11189.00	35.03	352.32	11157.70	-117.37	-113.35	123.82	17.85	560021.95	781416.72	
11236.00	41.85	351.03	11194.49	-88.36	-84.46	119.56	14.61	560050.84	781412.46	
11283.00	47.07	350.78	11228.02	-55.71	-51.97	114.36	11.11	560083.33	781407.26	
11331.00	51.71	351.27	11259.26	-19.56	-15.98	108.68	9.70	560119.32	781401.58	
11378.00	55.61	352.48	11287.10	18.07	21.49	103.34	8.55	560156.79	781396.24	
11425.00	59.75	352.75	11312.23	57.60	60.87	98.24	8.82	560196.17	781391.14	
11472.00	64.33	353.71	11334.26	98.95	102.08	93.35	9.91	560237.38	781386.25	
11520.00	69.05	354.60	11353.25	142.92	145.93	88.87	9.98	560281.23	781381.77	
11567.00	72.83	354.78	11368.59	187.25	190.15	84.76	8.05	560325.45	781377.66	
11614.00	76.74	354.53	11380.93	232.51	235.30	80.54	8.33	560370.60	781373.44	
11709.00	88.05	354.47	11393.48	326.34	328.88	71.53	11.91	560464.18	781364.43	
11734.00	91.43	353.67	11393.59	351.27	353.74	68.94	13.89	560489.04	781361.84	
11829.00	89.12	356.33	11393.13	446.12	448.36	60.67	3.71	560583.66	781353.57	
11923.00	90.66	358.71	11393.32	540.10	542.26	56.60	3.02	560677.56	781349.50	
11970.00	88.84	0.85	11393.52	587.08	589.26	56.42	5.98	560724.56	781349.32	
12018.00	87.51	1.24	11395.05	634.99	637.22	57.29	2.89	560772.52	781350.19	
12112.00	83.22	2.55	11402.64	728.45	730.84	60.39	4.77	560866.14	781353.29	
12207.00	84.28	3.68	11412.99	822.52	825.13	65.52	1.63	560960.43	781358.42	
12301.00	85.40	3.94	11421.44	915.68	918.54	71.74	1.22	561053.84	781364.64	
12396.00	86.95	2.09	11427.78	1010.11	1013.19	76.72	2.54	561148.49	781369.62	
12491.00	88.00	0.59	11431.96	1104.87	1108.07	78.94	1.93	561243.37	781371.84	
12585.00	89.26	359.21	11434.21	1198.79	1202.04	78.78	1.99	561337.34	781371.68	
12680.00	89.33	358.87	11435.38	1293.77	1297.02	77.19	0.37	561432.32	781370.09	
12774.00	90.38	358.88	11435.62	1387.76	1391.00	75.34	1.12	561526.30	781368.24	
12869.00	90.03	356.00	11435.28	1482.74	1485.89	71.10	3.05	561621.19	781364.00	
12963.00	90.45	356.99	11434.88	1576.70	1579.72	65.35	1.14	561715.02	781358.25	
13058.00	90.59	359.16	11434.02	1671.69	1674.65	62.16	2.29	561809.95	781355.06	
13152.00	89.54	358.10	11433.91	1765.69	1768.62	59.91	1.59	561903.92	781352.81	
13247.00	89.89	359.09	11434.39	1860.68	1863.59	57.58	1.11	561998.89	781350.48	
13341.00	89.68	0.01	11434.74	1954.65	1957.59	56.85	1.00	562092.89	781349.75	
13436.00	91.15	0.61	11434.05	2049.57	2052.58	57.36	1.67	562187.88	781350.26	
13530.00	90.94	358.00	11432.34	2143.53	2146.55	56.22	2.79	562281.85	781349.12	
13625.00	90.52	355.91	11431.13	2238.50	2241.40	51.17	2.24	562376.70	781344.07	
13719.00	90.17	355.35	11430.56	2332.41	2335.13	44.01	0.70	562470.43	781336.91	
13814.00	89.75	356.08	11430.63	2427.32	2429.86	36.91	0.89	562565.16	781329.81	
13909.00	90.94	1.37	11430.05	2522.28	2524.80	34.80	5.71	562660.10	781327.70	
14003.00	91.99	6.39	11427.65	2615.74	2618.52	41.16	5.45	562753.82	781334.06	
14098.00	90.10	2.98	11425.92	2710.08	2713.17	48.91	4.10	562848.47	781341.81	
14192.00	89.96	1.79	11425.87	2803.82	2807.09	52.82	1.27	562942.39	781345.72	
14287.00	90.03	2.48	11425.88	2898.58	2902.02	56.36	0.73	563037.32	781349.26	
14381.00	90.31	1.40	11425.60	2992.37	2995.97	59.54	1.19	563131.27	781352.44	
14476.00	91.15	359.57	11424.39	3087.28	3090.95	60.35	2.12	563226.25	781353.25	
14571.00	91.29	0.26	11422.36	3182.21	3185.93	60.21	0.74	563321.23	781353.11	
14665.00	89.89	355.99	11421.40	3276.18	3279.85	57.13	4.78	563415.15	781350.03	
14759.00	91.08	358.29	11420.60	3370.16	3373.72	52.44	2.75	563509.02	781345.34	
14854.00	91.50	359.15	11418.46	3465.13	3468.67	50.32	1.01	563603.97	781343.22	
14949.00	91.29	1.84	11416.15	3560.01	3563.63	51.14	2.84	563698.93	781344.04	
15043.00	91.29	0.15	11414.03	3653.86	3657.59	52.77	1.80	563792.89	781345.67	
15138.00	90.87	358.64	11412.24	3748.82	3752.56	51.77	1.65	563887.86	781344.67	

5D Survey Report

Survey Points: (Relative to Slot centre)(TVD relative to Drill Floor)										Comment
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)	
15232.00	90.80	358.86	11410.87	3842.80	3846.53	49.72	0.25	563981.83	781342.62	
15327.00	92.90	357.20	11407.80	3937.74	3941.42	46.46	2.82	564076.72	781339.36	
15421.00	93.04	356.12	11402.93	4031.58	4035.13	40.99	1.16	564170.43	781333.89	
15516.00	91.71	355.88	11399.00	4126.44	4129.82	34.37	1.42	564265.12	781327.27	
15611.00	91.50	356.32	11396.34	4221.34	4224.56	27.91	0.51	564359.86	781320.81	
15705.00	90.03	357.40	11395.08	4315.31	4318.40	22.76	1.94	564453.70	781315.66	
15799.00	91.92	357.89	11393.48	4409.28	4412.31	18.90	2.08	564547.61	781311.80	
15894.00	92.48	357.93	11389.83	4504.21	4507.17	15.44	0.59	564642.47	781308.34	
15988.00	92.76	357.70	11385.54	4598.11	4601.01	11.86	0.39	564736.31	781304.76	
16083.00	92.27	359.05	11381.37	4693.02	4695.88	9.17	1.51	564831.18	781302.07	
16177.00	89.82	359.05	11379.65	4786.98	4789.84	7.61	2.61	564925.14	781300.51	
16272.00	88.49	357.74	11381.06	4881.97	4884.79	4.95	1.96	565020.09	781297.85	
16284.00	88.42	357.21	11381.38	4893.96	4896.77	4.42	4.45	565032.07	781297.32	Last WFT MWD Svy
16356.00	88.42	357.21	11383.36	4965.93	4968.66	0.92	0.00	565103.96	781293.82	TD@16,356' MD / PTB

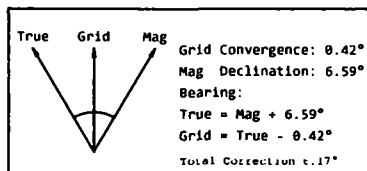


Apache Corporation
Black & Tan 27 Fed Com 401H
Lea Co, New Mexico



KB:3755'
GL:3729'

Plan
vs
Actual



Plan Data for Black and Tan 27 Fed Com 401H

Field: Apache NM (Nad 83 NME2)
Map Unit: USFT Vertical Reference Datum (VRD): Mean Sea Level
Projected Coordinate System: NAD83 / New Mexico East (ftUS)

Site: Black & Tan 27 Fed Com Pad 1
Unit: USFoot TVD Reference:
Company Name: Apache Corporation
Position: Northing: 560131.70USft Latitude: 32.537448°
Easting: 781352.90USft Longitude: -103.554493°
North Reference: Grid Grid Convergence: 0.42°
Elevation Above VRD: 3728.00USft
Comment: Lea Co., NM

Slot: Black & Tan 27 Fed Com 401H

Position:
Offset is from Site centre
+N/-S: 3.60USft Northing: 560135.30USft Latitude: 32.537459°
+E/-W: -60.00USft Easting: 781292.90USft Longitude: -103.554688°
Elevation Above VRD: 3729.00USft

Well: Black and Tan 27 Fed Com 401H

Type: Main-Well
File Number: 13840991
Plan Folder: P2 Plan: P2/V2
Vertical Section: Position offset of origin from Slot centre:
+N/-S: -0.00USft Azimuth: 358.11°
+E/-W: -0.00USft
Magnetic Parameters:
Model: Field Strength: Declination: Dip: Date:
IFR 48144(NT) 6.59° 60.47° 2019-11-01

Plan Data for Black and Tan 27 Fed Com 401H

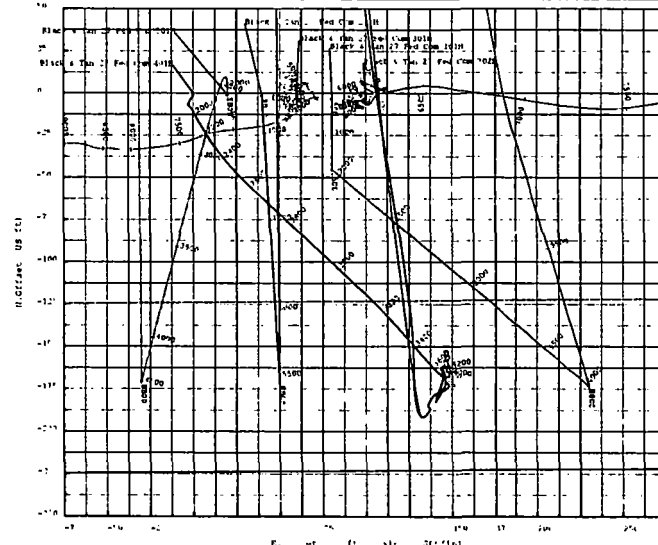
Casing Point Information:
Position offsets from Slot centre
Name MD TVD +N/-S +E/-W Northing Easting
(USft) (USft) (USft) (USft) (USft) (USft)
13 3/8 in 1650.00 1649.97 -7.60 -2.27 560127.70 781290.63
9 5/8 in 5620.00 5604.73 -173.29 145.94 559962.01 781438.04
7 5/8 in 10830.00 10814.23 -191.01 134.49 559944.29 781427.39

Formation Point Information:

Name	TVD	Elevation	MD
(USft)	(USft)	(USft)	(USft)
WOLF CAMP B	11539.00	-7784.00	-1.00
RUSTLER	1629.00	2126.00	1629.03
SALADO	1962.00	1793.00	1962.08
TANSILL	3364.00	391.00	3377.99
YATES	3519.00	236.00	3533.70
SEVEN RIVERS	3920.00	-165.00	3935.11
DELMARE	5629.00	-1874.00	5644.27
AVALON	8609.00	-4854.00	8624.52
1 BSC	9284.00	-5529.00	9299.54
1 BSS	9679.00	-5924.00	9694.58
2 BSC	9949.00	-6194.00	9964.64
2 BSS	10214.00	-6459.00	10229.70
3 BSC	10734.00	-6979.00	10749.76
3 BSS	11019.00	-7264.00	11035.42
WOLF CAMP A	11349.00	-7594.00	11462.79

Plan Data for Black and Tan 27 Fed Com 401H

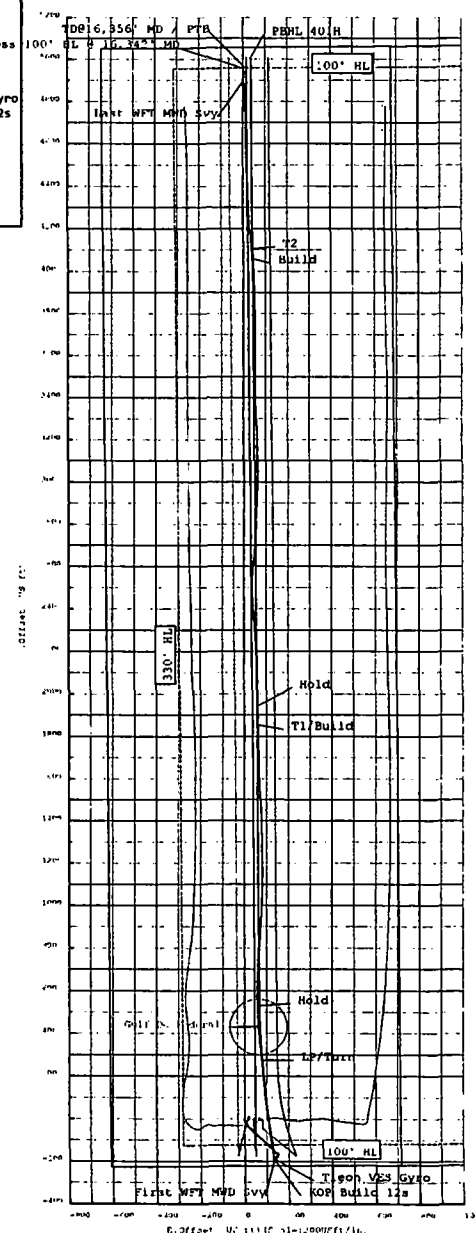
Plan Point Information:
Dogleg Severity Unit: 1/100.00ft Position offsets from Slot centre
MD Inc Az TVD +N/-S +E/-W Northing Easting VSec DLS Comments
(USft) (°) (°) (USft) (USft) (USft) (USft) (USft) (DLSU)
10822.47 1.03 251.44 10806.70 -190.96 134.61 559944.34 781427.51 -195.30 1.46 Ticon VES Gyro
10938.87 1.03 251.44 10923.08 -191.63 132.63 559943.67 781425.53 -195.90 0.00 KOP Build 12s
11681.56 88.89 354.48 11482.32 273.62 79.48 560408.92 781372.30 270.85 12.00 LP/Turn
11937.29 88.89 359.60 11407.28 528.87 66.19 560664.17 781359.09 526.40 2.00 Hold
13261.58 88.89 359.60 11433.00 1852.89 56.84 561988.19 781349.74 1850.01 0.00 TI/Build
13347.68 90.61 359.60 11433.38 1938.97 56.24 562074.27 781349.14 1936.06 2.00 Hold
15466.75 90.61 359.60 11410.85 4057.88 41.48 564193.18 781334.38 4054.30 0.00 Build
15512.47 91.52 359.60 11410.00 4103.59 41.16 564238.89 781334.06 4100.00 2.00 T2
16415.12 91.52 359.60 11386.00 5005.90 34.90 565141.20 781327.80 5002.03 0.00 PBHL 401H



Black and Tan 27 Fed Com 401H
Black and Tan 27 Fed Com 501H
Black and Tan 27 Fed Com 201H
Black & Tan 27 Fed Com 301H
Black and Tan 27 Fed Com 101H
Black & Tan 27 Fed Com 302H
Gulf De Federal 1
Black and Tan 27 Fed Com 401H

Plan Data for Black and Tan 27 Fed Com 401H

Target Set Information:
Name: B&T27FC401H
Position offsets from Slot centre
Name TVD Elevation +N/-S +E/-W Northing Easting
(USft) (USft) (USft) (USft) (USft) (USft)
PP/FTP 0.00 3755.00 -123.50 70.80 560011.80 781363.70
LP 11402.00 -7647.00 252.83 81.87 560388.13 781374.77
T1 11433.00 -7678.00 1852.89 56.84 561988.19 781349.74
T2 11410.00 -7655.00 4103.59 41.16 564238.89 781334.06
LTP 401H 11387.33 -7632.33 4955.90 35.30 565091.20 781328.20
PBHL 401H 11386.00 -7631.00 5005.90 34.90 565141.20 781327.80



Drawing By: Ty Hardin Date: 6 November 2019
Office Name: Drilling Services - Houston
Address: 12101 Cutten Road
Houston, TX 77066
Phone: +1.713.882.8256