

NM OIL CONSERVATION
ARTESIA DISTRICT

OCT 03 2019

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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: March 1, 2019

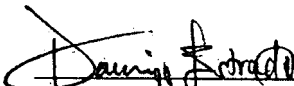
Attention: John Vacek

Re: Apache Corporation
Well: Apache Palmillo 21 State Com 324H
Eddy 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:

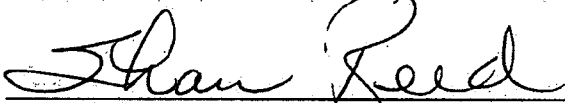
<u>Name & Title Of Surveyor</u>	<u>Well Number</u>	<u>Surveyed Depths</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
Domingo Estrada	324H	7,959 MD	2/24/2019	Measurement
MWD Ops. Coordinator		13,307 MD	2/28/2019	While Drilling

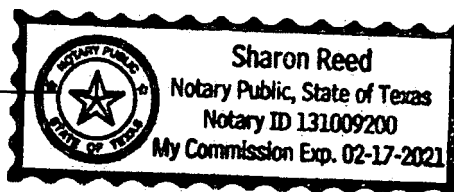
A notarized plan vs. actual is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.


Domingo Estrada
MWD Ops. Coordinator

On this, the 1st day of March, 2019, before me a notary public, the undersigned officer, personally appeared Domingo Estrada, 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: *Palmillo 21 State Com Pad (325H,227H,324H)*

Well Name: *Palmillo 21 State Com 324H*

File number: *13600598*

Survey: *Definitive survey*

1 March 2019



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Palmillo 21 State Com 324H

Field Name: Apache NM (Nad 83 NMEZ)	Map Units: US ft Vertical Reference Datum (VRD): Mean Sea Level Projected Coordinate System: NAD83 / New Mexico East (ftUS) Comment:	Company Name: Apache Corporation
Site: Palmillo 21 State Com Pad (325H, 227H, 324H)	Units: US ft Position: North Reference: Grid Northing: 599759.30 US ft Easting: 585960.40 US ft Elevation above MSL: 3458.00 US ft Comment: Eddy Co., NM	Convergence Angle: 0.08 Latitude: 32.648702310 Longitude: -104.188352988
Slot: Palmillo 21 State Com 324H	Position (Relative to Site Centre) +N/-S: -80.00 US ft Northing: 599679.30 US ft Latitude: 32.648482414 +E/-W: -0.20 US ft Easting: 585960.20 US ft Longitude: -104.188353993 Slot TVD Reference: Ground Elevation Elevation above MSL: 3457.00 US ft Comment:	
Well: Palmillo 21 State Com 324H	Type: Main well UWI: File Number: 13600598 Comment: H&P 482 Closure Distance: 4776.53 US ft Closure Azimuth: 94.28° Vertical Section: Position of Origin (Relative to Slot centre) +N/-S: 0.00 US ft +E/-W: 0.00 US ft Az: 94.44°	

Drill floor: Survey Name: Definitive Survey

Rig Height (Drill Floor): 26.00 US ft **Elevation above MSL:** 3483.00 US ft **Inclination:** 0.00° **Azimuth:** 0.00°

Survey Name: Definitive Survey

Date: 24/Sep/2018 **Survey Tool:** See Survey Tool Ranges below. **Comment:** **Company:**

Magnetic Model:

Model Name: Surcon **Date:** 29/Jan/2019 **Field Strength:** 48013.0nT **Declination:** 7.31° **Dip:** 60.41°
MVHD

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	7860.85	VES Gyro
MWD + HDGM + MS	7860.85	8744.00	WFT MWD 06
MWD + HDGM + Sag Corr + MS_OW	8744.00	13370.00	WFT MWD 06-01

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
7860.85	1.77	359.97	7813.56	-282.71	-452.67	-318.71	0.17	599226.63	585641.49	Tieon VES Gyro
7959.00	1.51	47.22	7911.67	-281.95	-450.28	-317.76	1.36	599229.02	585642.44	First WFT MWD Svy
8022.00	2.73	62.20	7974.63	-280.11	-449.01	-315.82	2.11	599230.29	585644.38	
8053.00	6.57	74.72	8005.52	-277.82	-448.20	-313.46	12.74	599231.10	585646.74	
8100.00	11.93	80.65	8051.90	-270.57	-446.70	-306.07	11.57	599232.60	585654.13	
8148.00	17.67	82.39	8098.28	-258.61	-444.93	-293.94	11.99	599234.37	585666.26	
8195.00	23.91	83.32	8142.20	-242.27	-442.88	-277.39	13.29	599236.42	585682.81	
8242.00	29.05	82.10	8184.26	-221.77	-440.20	-256.62	11.00	599239.10	585703.58	
8289.00	34.34	82.21	8224.23	-197.65	-436.83	-232.16	11.26	599242.47	585728.04	
8337.00	39.94	83.19	8262.48	-169.28	-433.17	-203.43	11.73	599246.13	585756.77	
8384.00	43.87	84.89	8297.46	-138.41	-429.92	-172.21	8.70	599249.38	585787.99	
8431.00	49.30	85.60	8329.75	-104.72	-427.11	-138.20	11.61	599252.19	585822.00	
8478.00	55.74	84.67	8358.33	-67.94	-423.93	-101.06	13.79	599255.37	585859.14	
8526.00	60.85	86.83	8383.55	-27.58	-420.93	-60.35	11.31	599258.37	585899.85	
8573.00	64.94	87.65	8404.96	13.92	-418.92	-18.57	8.84	599260.38	585941.63	
8621.00	68.06	87.75	8424.10	57.63	-417.15	25.41	6.50	599262.15	585985.61	
8668.00	71.42	89.20	8440.37	101.47	-415.99	69.48	7.71	599263.31	586029.68	
8715.00	74.21	89.84	8454.26	146.20	-415.61	114.37	6.08	599263.69	586074.57	
8744.00	76.66	89.97	8461.55	174.18	-415.56	142.44	8.46	599263.74	586102.64	
8785.00	78.76	89.57	8470.28	214.11	-415.40	182.50	5.21	599263.90	586142.70	
8816.00	79.33	90.14	8476.17	244.44	-415.33	212.93	2.58	599263.97	586173.13	
8848.00	80.61	89.60	8481.74	275.85	-415.25	244.44	4.33	599264.05	586204.64	
8879.00	82.31	90.55	8486.34	306.42	-415.30	275.10	6.27	599264.00	586235.30	
8911.00	84.42	91.09	8490.04	338.14	-415.75	306.88	6.80	599263.55	586267.08	
8942.00	85.68	91.23	8492.72	368.97	-416.38	337.75	4.09	599262.92	586297.95	
9037.00	88.20	90.85	8497.79	463.66	-418.10	432.60	2.68	599261.20	586392.80	
9131.00	88.62	90.60	8500.40	557.43	-419.29	526.55	0.52	599260.01	586486.75	
9225.00	89.74	90.20	8501.74	651.19	-419.94	620.54	1.27	599259.36	586580.74	
9320.00	87.99	88.53	8503.62	745.79	-418.89	715.51	2.55	599260.41	586675.71	
9414.00	88.55	87.88	8506.46	839.19	-415.95	809.42	0.91	599263.35	586769.62	
9509.00	87.57	87.94	8509.68	933.52	-412.48	904.30	1.03	599266.82	586864.50	
9603.00	88.27	87.24	8513.09	1026.78	-408.53	998.15	1.05	599270.77	586958.35	
9698.00	88.40	87.78	8515.85	1121.05	-404.41	1093.02	0.58	599274.89	587053.22	
9793.00	87.78	89.11	8519.01	1215.47	-401.83	1187.93	1.54	599277.47	587148.13	
9887.00	88.48	88.74	8522.08	1308.99	-400.07	1281.86	0.84	599279.23	587242.06	
9982.00	88.27	90.80	8524.78	1403.63	-399.69	1376.82	2.18	599279.61	587337.02	
10076.00	88.83	90.50	8527.15	1497.39	-400.75	1470.78	0.68	599278.55	587430.98	
10171.00	89.60	90.69	8528.46	1592.17	-401.74	1565.77	0.83	599277.56	587525.97	
10266.00	89.53	90.63	8529.18	1686.96	-402.83	1660.76	0.10	599276.47	587620.96	
10360.00	90.16	90.70	8529.43	1780.76	-403.93	1754.75	0.67	599275.37	587714.95	
10455.00	89.32	89.14	8529.86	1875.46	-403.79	1849.75	1.87	599275.51	587809.95	
10549.00	89.74	88.88	8530.63	1969.03	-402.17	1943.73	0.53	599277.13	587903.93	
10644.00	88.13	89.90	8532.40	2063.64	-401.16	2038.70	2.01	599278.14	587998.90	
10738.00	88.27	89.34	8535.35	2157.26	-400.53	2132.65	0.61	599278.77	588092.85	
10833.00	88.76	88.86	8537.81	2251.82	-399.04	2227.61	0.72	599280.26	588187.81	
10928.00	89.46	88.60	8539.29	2346.33	-396.94	2322.57	0.79	599282.36	588282.77	
11022.00	88.76	89.15	8540.75	2439.88	-395.09	2416.54	0.95	599284.21	588376.74	
11117.00	89.25	88.94	8542.40	2534.44	-393.51	2511.52	0.56	599285.79	588471.72	
11211.00	88.13	90.00	8544.55	2628.06	-392.64	2605.48	1.64	599286.66	588565.68	

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
11306.00	88.48	89.82	8547.36	2722.72	-392.49	2700.44	0.41	599286.81	588660.64	
11400.00	89.04	89.65	8549.39	2816.38	-392.06	2794.42	0.62	599287.24	588754.62	
11495.00	88.20	89.78	8551.68	2911.03	-391.58	2889.39	0.89	599287.72	588849.59	
11589.00	88.41	89.74	8554.46	3004.68	-391.19	2983.35	0.23	599288.11	588943.55	
11684.00	88.97	89.61	8556.63	3099.33	-390.65	3078.32	0.61	599288.65	589038.52	
11778.00	89.04	89.45	8558.27	3192.97	-389.88	3172.30	0.19	599289.42	589132.50	
11873.00	89.04	89.09	8559.86	3287.57	-388.67	3267.28	0.38	599290.63	589227.48	
11968.00	88.83	89.13	8561.62	3382.14	-387.19	3362.25	0.23	599292.11	589322.45	
12062.00	90.37	89.88	8562.28	3475.78	-386.38	3456.25	1.82	599292.92	589416.45	
12157.00	91.07	89.96	8561.09	3570.48	-386.25	3551.24	0.74	599293.05	589511.44	
12251.00	92.12	89.82	8558.47	3664.15	-386.07	3645.20	1.13	599293.23	589605.40	
12346.00	92.96	89.33	8554.26	3758.71	-385.37	3740.10	1.02	599293.93	589700.30	
12440.00	91.77	88.77	8550.38	3852.21	-383.81	3834.01	1.40	599295.49	589794.21	
12534.00	91.35	88.14	8547.82	3945.67	-381.27	3927.94	0.81	599298.03	589888.14	
12629.00	90.09	88.19	8546.63	4040.09	-378.23	4022.88	1.33	599301.07	589983.08	
12723.00	90.65	88.56	8546.02	4133.56	-375.57	4116.84	0.71	599303.73	590077.04	
12817.00	91.14	88.17	8544.55	4227.02	-372.89	4210.79	0.67	599306.41	590170.99	
12912.00	91.14	87.86	8542.66	4321.40	-369.60	4305.71	0.33	599309.70	590265.91	
13006.00	91.63	87.64	8540.39	4414.74	-365.91	4399.61	0.57	599313.39	590359.81	
13101.00	91.77	88.79	8537.57	4509.13	-362.95	4494.52	1.22	599316.35	590454.72	
13195.00	92.33	88.62	8534.21	4602.60	-360.83	4588.44	0.62	599318.47	590548.64	
13290.00	92.75	88.72	8530.00	4697.03	-358.62	4683.32	0.45	599320.68	590643.52	
13307.00	92.89	88.60	8529.16	4713.92	-358.23	4700.29	1.08	599321.07	590660.49	Last WFT MWD Svy
13370.00	92.89	88.60	8525.99 ✓	4776.51	-356.69	4763.20	0.00	599322.61	590723.40	TD@13370' MD/PTB