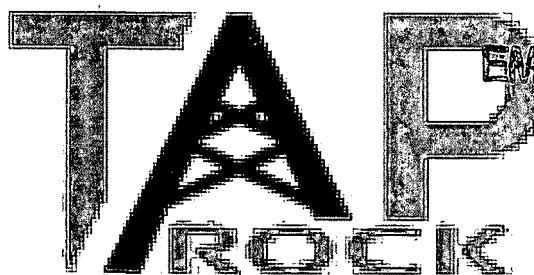




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EMNRD-OCDARTESIA



Pliny The Elder Fee No. 215H
Eddy County, NM

February 15, 2019

Job No. LNM5196518
API No. 30-015-45558

Survey Completion Report



PRO DIRECTIONAL

Survey Certification Letter

February 15, 2019



Operator Name: Tap Rock Operating
Well Name: Pliny The Elder Fee No. 215H
County/Parish: Eddy County,
State: NM
Rig Name: H&P 422
Job Number: LNM5196518

This is to certify the surveys performed on the referenced well by Professional Directional Ent., Inc. are true and correct MWD Surveys, data provided as follows:

<u>Surveyor</u>	<u>Surveyed Depths</u>	<u>Projection to Bit</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
ProDirectional	187' MD – 19,350' MD	19,426' MD	12/29/18 – 01/18/19	MWD

Sincerely,

Mike Coats
Regulatory Specialist
Professional Directional

850 Conroe Park West Drive | Conroe, TX 77303 | Phone: 936.441.7266

prodirectional.com

The Standard of Excellence in Directional Supervision



Tap Rock Operating, LLC

**Eddy County, NM
Pliny The Elder Fee
No. 215H
OH**

Survey: ProDirectional

Survey Report

15 February, 2019





ProDirectional
Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 215H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Site:	Pliny The Elder Fee	MD Reference:	Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Well:	215H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH 187-19350 PTB 19426'	Database:	WellPlanner1

Project	Eddy County, NM (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Pliny The Elder Fee			
Site Position:	Northing:	486,990.00 usft	Latitude:	32.338739
From: Map	Easting:	581,705.00 usft	Longitude:	-104.202628
Position Uncertainty:	Slot Radius:	13-3/16 "	Grid Convergence:	0.07 °

Well	215H					
Well Position	+N/-S	0.00 usft	Northing:	486,990.00 usft	Latitude:	32.338739
	+E/-W	0.00 usft	Easting:	581,705.00 usft	Longitude:	-104.202628
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,150.00 usft	

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/15/2019	7.27	60.05	47,936.30

Design	OH 187-19350 PTB 19426'				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	269.83	

Survey Program	Date 2/15/2019				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
187.00	19,426.00	OH (OH)	MWD+HDGM	OWSG MWD + HRGM	



ProDirectional
Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 215H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Site:	Pliny The Elder Fee	MD Reference:	Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Well:	215H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH 187'-19350 PTB 19426'	Database:	WellPlanner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	486,990.00	581,705.00	
187.00	0.70	339.40	187.00	0.40	1.07	-0.40	1.14	339.40	486,991.07	581,704.60	
Pro MWD First Survey: 187' MD											
249.00	1.00	20.80	248.99	0.34	1.93	-0.34	1.96	349.92	486,991.93	581,704.66	
338.00	2.60	41.80	337.94	-1.29	4.16	1.28	4.35	17.08	486,994.16	581,706.28	
518.00	3.50	75.80	517.70	-9.35	8.55	9.33	12.65	47.48	486,998.55	581,714.33	
582.00	3.20	82.40	581.59	-13.02	9.27	12.99	15.96	54.50	486,999.27	581,717.99	
702.00	2.20	84.50	701.46	-18.63	9.93	18.60	21.09	61.90	486,999.93	581,723.60	
792.00	0.90	128.80	791.42	-20.90	9.65	20.87	23.00	65.18	486,999.65	581,725.87	
883.00	2.20	199.50	882.40	-20.87	7.56	20.85	22.18	70.07	486,997.56	581,725.85	
973.00	3.70	217.70	972.28	-18.51	3.63	18.50	18.85	78.89	486,993.63	581,723.50	
1,063.00	3.80	226.70	1,062.08	-14.55	-0.71	14.55	14.57	92.79	486,989.29	581,719.55	
1,154.00	3.90	227.70	1,152.88	-10.05	-4.86	10.07	11.18	115.77	486,985.14	581,715.07	
1,244.00	3.80	219.10	1,242.68	-5.89	-9.23	5.92	10.97	147.33	486,980.77	581,710.92	
1,334.00	2.80	207.10	1,332.53	-3.00	-13.51	3.04	13.84	167.32	486,976.49	581,708.04	
1,429.00	2.20	214.90	1,427.44	-0.89	-17.07	0.94	17.09	176.85	486,972.93	581,705.94	
1,523.00	2.30	201.90	1,521.36	0.86	-20.30	-0.80	20.31	182.25	486,969.70	581,704.20	
1,618.00	2.20	180.40	1,616.29	1.59	-23.89	-1.52	23.94	183.64	486,966.11	581,703.48	
1,713.00	1.50	190.10	1,711.24	1.83	-26.94	-1.75	26.99	183.72	486,963.06	581,703.25	
1,807.00	1.90	223.80	1,805.20	3.13	-29.27	-3.05	29.43	185.94	486,960.73	581,701.95	
1,901.00	2.00	227.30	1,899.15	5.42	-31.51	-5.33	31.96	189.60	486,958.49	581,699.67	
1,996.00	2.60	231.30	1,994.07	8.33	-33.98	-8.23	34.96	193.61	486,956.02	581,696.77	
2,010.00	2.60	232.60	2,008.06	8.83	-34.37	-8.73	35.46	194.25	486,955.63	581,696.27	
2,163.00	2.00	231.70	2,160.93	13.70	-38.14	-13.58	40.48	199.60	486,951.86	581,691.42	
2,257.00	1.90	226.40	2,254.88	16.12	-40.23	-16.00	43.29	201.69	486,949.77	581,689.00	
2,351.00	3.70	227.20	2,348.76	19.48	-43.36	-19.35	47.48	204.05	486,946.64	581,685.65	
2,446.00	3.50	228.70	2,443.58	23.92	-47.36	-23.78	52.99	206.66	486,942.64	581,681.22	



ProDirectional
Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 215H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Site:	Pliny The Elder Fee	MD Reference:	Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Well:	215H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH 187-19350 PTB 19426'	Database:	WellPlanner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
2,540.00	3.70	228.30	2,537.39	28.35	-51.27	-28.20	58.51	208.81	486,938.73	581,676.80	
2,635.00	3.70	228.00	2,632.19	32.93	-55.36	-32.77	64.33	210.62	486,934.64	581,672.23	
2,729.00	3.70	226.30	2,726.00	37.39	-59.49	-37.21	70.17	212.03	486,930.51	581,667.79	
2,824.00	3.50	224.80	2,820.81	41.66	-63.66	-41.47	75.98	213.08	486,926.34	581,663.53	
2,918.00	3.50	225.20	2,914.63	45.73	-67.72	-45.53	81.60	213.91	486,922.28	581,659.47	
3,013.00	3.60	224.10	3,009.45	49.88	-71.90	-49.66	87.39	214.63	486,918.10	581,655.34	
3,107.00	3.60	223.50	3,103.27	53.97	-76.16	-53.75	93.22	215.21	486,913.84	581,651.25	
3,202.00	3.70	223.30	3,198.07	58.14	-80.56	-57.90	99.21	215.71	486,909.44	581,647.10	
3,296.00	3.60	221.60	3,291.88	62.20	-84.97	-61.94	105.15	216.09	486,905.03	581,643.06	
3,391.00	3.50	221.10	3,386.70	66.09	-89.39	-65.83	111.01	216.37	486,900.61	581,639.17	
3,485.00	3.40	221.60	3,480.53	69.84	-93.63	-69.57	116.65	216.61	486,896.37	581,635.43	
3,580.00	1.70	223.90	3,575.43	72.70	-96.76	-72.41	120.85	216.81	486,893.24	581,632.59	
3,674.00	1.50	225.00	3,669.40	74.54	-98.63	-74.25	123.46	216.97	486,891.37	581,630.75	
3,768.00	0.30	267.10	3,763.38	75.66	-99.51	-75.37	124.83	217.14	486,890.49	581,629.63	
3,863.00	0.30	351.70	3,858.38	75.95	-99.28	-75.65	124.82	217.31	486,890.72	581,629.35	
3,957.00	0.30	350.10	3,952.38	76.02	-98.79	-75.73	124.48	217.47	486,891.21	581,629.27	
4,051.00	0.20	315.90	4,046.38	76.18	-98.43	-75.89	124.29	217.63	486,891.57	581,629.11	
4,146.00	0.30	297.00	4,141.38	76.51	-98.20	-76.22	124.31	217.82	486,891.80	581,628.78	
4,240.00	0.40	286.60	4,235.38	77.05	-98.00	-76.76	124.48	218.07	486,892.00	581,628.24	
4,335.00	0.50	276.20	4,330.37	77.78	-97.86	-77.49	124.82	218.37	486,892.14	581,627.51	
4,429.00	0.50	271.70	4,424.37	78.59	-97.80	-78.30	125.29	218.68	486,892.20	581,626.70	
4,522.00	0.60	92.70	4,517.37	78.51	-97.81	-78.22	125.24	218.65	486,892.19	581,626.78	
4,617.00	0.80	102.80	4,612.36	77.37	-97.98	-77.08	124.67	218.19	486,892.02	581,627.92	
4,712.00	0.70	107.40	4,707.35	76.17	-98.30	-75.88	124.18	217.66	486,891.70	581,629.12	
4,806.00	0.50	112.90	4,801.35	75.25	-98.63	-74.95	123.88	217.23	486,891.37	581,630.05	
4,901.00	0.30	135.50	4,896.35	74.69	-98.97	-74.40	123.82	216.93	486,891.03	581,630.60	
4,995.00	0.30	144.00	4,990.34	74.37	-99.35	-74.08	123.93	216.71	486,890.65	581,630.92	



ProDirectional
Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 215H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Site:	Pliny The Elder Fee	MD Reference:	Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Well:	215H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH 187'-19350 PTB 19426'	Database:	WellPlanner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
5,090.00	0.30	163.60	5,085.34	74.16	-99.79	-73.86	124.15	216.51	486,890.21	581,631.14	
5,184.00	0.40	179.20	5,179.34	74.09	-100.35	-73.79	124.56	216.33	486,889.65	581,631.21	
5,373.00	0.60	189.10	5,368.33	74.24	-101.99	-73.94	125.97	215.94	486,888.01	581,631.06	
5,468.00	0.80	179.20	5,463.33	74.31	-103.14	-74.01	126.95	215.66	486,886.86	581,630.99	
5,563.00	1.00	168.70	5,558.32	74.14	-104.62	-73.83	128.05	215.21	486,885.38	581,631.17	
5,657.00	0.70	169.30	5,652.30	73.88	-105.99	-73.57	129.02	214.77	486,884.01	581,631.43	
5,752.00	0.30	148.40	5,747.30	73.65	-106.77	-73.33	129.52	214.48	486,883.23	581,631.67	
5,846.00	0.60	142.50	5,841.30	73.22	-107.37	-72.90	129.78	214.18	486,882.63	581,632.10	
5,941.00	0.50	156.60	5,936.29	72.75	-108.14	-72.43	130.16	213.81	486,881.86	581,632.57	
6,035.00	1.30	182.40	6,030.28	72.64	-109.59	-72.31	131.30	213.42	486,880.41	581,632.69	
6,130.00	1.90	186.10	6,125.24	72.86	-112.23	-72.53	133.62	212.87	486,877.77	581,632.47	
6,224.00	2.10	187.10	6,219.19	73.25	-115.49	-72.91	136.57	212.26	486,874.51	581,632.09	
6,318.00	2.40	187.00	6,313.11	73.71	-119.15	-73.36	139.92	211.62	486,870.85	581,631.64	
6,413.00	0.90	157.90	6,408.07	73.68	-121.82	-73.32	142.18	211.04	486,868.18	581,631.68	
6,508.00	1.40	185.40	6,503.05	73.52	-123.66	-73.15	143.68	210.61	486,866.34	581,631.85	
6,602.00	1.50	199.00	6,597.03	74.03	-125.97	-73.66	145.92	210.32	486,864.03	581,631.34	
6,697.00	0.70	148.30	6,692.01	74.14	-127.64	-73.76	147.42	210.02	486,862.36	581,631.24	
6,791.00	1.00	140.40	6,786.00	73.31	-128.76	-72.93	147.98	209.53	486,861.24	581,632.07	
6,885.00	1.80	107.20	6,879.97	71.38	-129.83	-71.00	147.97	208.67	486,860.17	581,634.00	
6,980.00	2.30	125.20	6,974.91	68.41	-131.37	-68.02	147.93	207.37	486,858.63	581,636.98	
7,075.00	2.20	127.30	7,069.84	65.40	-133.57	-65.01	148.55	205.95	486,856.43	581,639.99	
7,169.00	1.10	109.80	7,163.80	63.12	-134.97	-62.72	148.83	204.93	486,855.03	581,642.28	
7,264.00	0.40	47.80	7,258.79	62.02	-135.06	-61.62	148.45	204.53	486,854.94	581,643.38	
7,358.00	0.30	349.90	7,352.79	61.82	-134.59	-61.42	147.95	204.53	486,855.41	581,643.58	
7,453.00	0.80	283.60	7,447.78	62.51	-134.19	-62.11	147.87	204.84	486,855.81	581,642.89	
7,547.00	1.50	279.80	7,541.77	64.36	-133.83	-63.96	148.33	205.54	486,856.17	581,641.04	
7,642.00	2.50	289.20	7,636.71	67.54	-132.94	-67.14	148.93	206.80	486,857.06	581,637.86	



ProDirectional
Survey Report



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Site:	Pliny The Elder Fee	MD Reference:	Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Well:	215H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH 187-19350 PTB 19426'	Database:	WellPlanner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
7,736.00	2.20	296.00	7,730.63	71.09	-131.47	-70.70	149.27	208.27	486,858.53	581,634.30	
7,831.00	2.00	274.40	7,825.56	74.38	-130.54	-73.99	150.05	209.54	486,859.46	581,631.01	
7,926.00	1.30	260.90	7,920.53	77.09	-130.59	-76.71	151.45	210.43	486,859.41	581,628.29	
8,020.00	1.50	271.70	8,014.50	79.38	-130.72	-78.99	152.73	211.14	486,859.28	581,626.01	
8,115.00	1.50	207.50	8,109.47	81.20	-131.79	-80.81	154.59	211.52	486,858.21	581,624.19	
8,209.00	1.90	194.10	8,203.43	82.15	-134.39	-81.76	157.30	211.31	486,855.61	581,623.24	
8,304.00	1.80	199.80	8,298.38	83.05	-137.32	-82.64	160.27	211.04	486,852.68	581,622.36	
8,382.00	1.70	204.30	8,376.34	83.95	-139.53	-83.54	162.62	210.91	486,850.47	581,621.46	
8,453.00	1.30	215.90	8,447.32	84.86	-141.14	-84.44	164.47	210.89	486,848.86	581,620.56	
8,504.00	1.20	226.90	8,498.31	85.59	-141.97	-85.17	165.56	210.96	486,848.03	581,619.83	
8,598.00	13.40	274.00	8,591.39	97.22	-141.88	-96.80	171.76	214.30	486,848.12	581,608.20	
8,692.00	26.10	279.50	8,679.69	128.60	-137.69	-128.19	188.13	222.95	486,852.31	581,576.81	
8,786.00	31.00	274.50	8,762.25	173.14	-132.38	-172.75	217.64	232.54	486,857.62	581,532.25	
8,880.00	34.20	268.10	8,841.45	223.70	-131.35	-223.31	259.08	239.54	486,858.65	581,481.69	
8,974.00	35.80	262.10	8,918.47	277.37	-136.01	-276.97	308.56	243.85	486,853.99	581,428.03	
9,067.00	41.50	259.00	8,991.08	334.64	-145.64	-334.21	364.56	246.45	486,844.36	581,370.79	
9,160.00	50.90	260.50	9,055.38	400.66	-157.50	-400.20	430.07	248.52	486,832.50	581,304.80	
9,255.00	64.90	262.30	9,105.74	480.08	-169.41	-479.58	508.62	250.54	486,820.59	581,225.42	
9,348.00	79.40	261.60	9,134.17	567.53	-181.79	-566.99	595.43	252.22	486,808.21	581,138.01	
9,442.00	90.20	262.30	9,142.68	660.12	-194.88	-659.55	687.74	253.54	486,795.12	581,045.45	
9,536.00	94.10	267.90	9,139.15	753.68	-202.90	-753.08	779.94	254.92	486,787.10	580,951.92	
9,630.00	92.50	274.60	9,133.73	847.44	-200.85	-846.85	870.34	256.66	486,789.15	580,858.15	
9,723.00	90.90	273.80	9,130.97	940.12	-194.04	-939.55	959.38	258.33	486,795.96	580,765.45	
9,817.00	91.80	272.80	9,128.76	1,033.92	-188.63	-1,033.37	1,050.45	259.65	486,801.37	580,671.63	
9,911.00	93.60	273.00	9,124.33	1,127.68	-183.88	-1,127.14	1,142.04	260.73	486,806.12	580,577.86	
10,005.00	92.30	274.10	9,119.49	1,221.36	-178.07	-1,220.83	1,233.75	261.70	486,811.93	580,484.17	
10,098.00	89.60	274.50	9,117.95	1,314.05	-171.10	-1,313.55	1,324.65	262.58	486,818.90	580,391.45	



ProDirectional
Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 215H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Site:	Pliny The Elder Fee	MD Reference:	Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Well:	215H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH 187-19350 PTB 19426'	Database:	WellPlanner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
10,192.00	90.20	273.90	9,118.11	1,407.78	-164.22	-1,407.30	1,416.84	263.34	486,825.78	580,297.70	
10,286.00	91.90	272.50	9,116.39	1,501.59	-158.97	-1,501.13	1,509.52	263.95	486,831.03	580,203.87	
10,380.00	92.30	274.40	9,112.95	1,595.34	-153.32	-1,594.89	1,602.24	264.51	486,836.68	580,110.11	
10,474.00	90.20	274.00	9,110.90	1,689.04	-146.43	-1,688.61	1,694.95	265.04	486,843.57	580,016.39	
10,568.00	89.60	273.10	9,111.06	1,782.84	-140.61	-1,782.43	1,787.97	265.49	486,849.39	579,922.57	
10,661.00	91.00	271.50	9,110.57	1,875.74	-136.88	-1,875.35	1,880.34	265.83	486,853.12	579,829.65	
10,755.00	91.70	274.30	9,108.36	1,969.57	-132.13	-1,969.19	1,973.62	266.16	486,857.87	579,735.81	
10,850.00	89.40	276.60	9,107.45	2,064.10	-123.11	-2,063.74	2,067.41	266.59	486,866.89	579,641.26	
10,944.00	89.10	277.20	9,108.68	2,157.38	-111.82	-2,157.05	2,159.95	267.03	486,878.18	579,547.95	
11,038.00	90.40	277.50	9,109.09	2,250.56	-99.79	-2,250.28	2,252.49	267.46	486,890.21	579,454.72	
11,132.00	93.00	277.50	9,106.30	2,343.67	-87.53	-2,343.43	2,345.06	267.86	486,902.47	579,361.57	
11,225.00	91.00	274.30	9,103.05	2,436.08	-77.98	-2,435.86	2,437.11	268.17	486,912.02	579,269.14	
11,319.00	88.20	269.50	9,103.71	2,529.98	-74.86	-2,529.77	2,530.88	268.31	486,915.14	579,175.23	
11,413.00	88.20	268.50	9,106.66	2,623.92	-76.50	-2,623.71	2,624.82	268.33	486,913.50	579,081.29	
11,508.00	92.40	267.30	9,106.16	2,718.84	-79.98	-2,718.62	2,719.80	268.31	486,910.02	578,986.38	
11,602.00	91.30	266.60	9,103.13	2,812.67	-84.98	-2,812.43	2,813.72	268.27	486,905.02	578,892.57	
11,695.00	89.10	266.10	9,102.81	2,905.50	-90.90	-2,905.24	2,906.66	268.21	486,899.10	578,799.76	
11,789.00	91.80	265.90	9,102.07	2,999.28	-97.46	-2,999.00	3,000.58	268.14	486,892.54	578,706.00	
11,883.00	91.80	265.30	9,099.11	3,092.97	-104.66	-3,092.68	3,094.45	268.06	486,885.34	578,612.32	
11,978.00	89.80	266.10	9,097.79	3,187.71	-111.79	-3,187.39	3,189.35	267.99	486,878.21	578,517.61	
12,071.00	92.40	266.00	9,096.00	3,280.48	-118.19	-3,280.15	3,282.28	267.94	486,871.81	578,424.85	
12,165.00	89.90	266.20	9,093.72	3,394.21	-125.94	-3,393.85	3,396.19	267.87	486,864.06	578,311.15	
12,279.00	86.20	266.80	9,096.91	3,487.98	-131.68	-3,487.60	3,490.09	267.84	486,858.32	578,217.40	
12,373.00	91.40	267.10	9,098.88	3,581.81	-136.67	-3,581.42	3,584.03	267.81	486,853.33	578,123.58	
12,467.00	96.90	268.70	9,092.08	3,675.47	-140.11	-3,675.07	3,677.74	267.82	486,849.89	578,029.93	
12,561.00	95.20	268.20	9,082.17	3,768.92	-142.64	-3,768.51	3,771.21	267.83	486,847.36	577,936.49	
12,655.00	95.60	269.00	9,073.33	3,862.48	-144.93	-3,862.06	3,864.78	267.85	486,845.07	577,842.94	



ProDirectional
Survey Report



Company:	Tap Rock Operating, LLC	Local Co-ordinate Reference:	Well 215H
Project:	Eddy County, NM (NAD 83)	TVD Reference:	Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Site:	Pliny The Elder Fee	MD Reference:	Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Well:	215H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH 187'-19350 PTB 19426'	Database:	WellPlanner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
12,749.00	95.60	270.00	9,064.15	3,956.02	-145.75	-3,955.61	3,958.29	267.89	486,844.25	577,749.39	
12,843.00	92.20	270.80	9,057.76	4,049.79	-145.09	-4,049.37	4,051.97	267.95	486,844.91	577,655.63	
12,937.00	90.60	271.00	9,055.47	4,143.74	-143.61	-4,143.33	4,145.82	268.01	486,846.39	577,561.67	
13,032.00	91.40	270.10	9,053.81	4,238.72	-142.70	-4,238.31	4,240.71	268.07	486,847.30	577,466.69	
13,126.00	89.30	270.30	9,053.23	4,332.71	-142.37	-4,332.30	4,334.64	268.12	486,847.63	577,372.70	
13,220.00	88.80	269.50	9,054.79	4,426.69	-142.54	-4,426.29	4,428.58	268.16	486,847.46	577,278.71	
13,316.00	88.80	268.90	9,056.80	4,522.67	-143.88	-4,522.26	4,524.55	268.18	486,846.12	577,182.74	
13,410.00	90.70	268.30	9,057.21	4,616.64	-146.17	-4,616.22	4,618.54	268.19	486,843.83	577,088.78	
13,504.00	95.80	268.00	9,051.88	4,710.42	-149.20	-4,709.99	4,712.36	268.19	486,840.80	576,995.01	
13,598.00	94.90	268.20	9,043.12	4,803.96	-152.30	-4,803.53	4,805.95	268.18	486,837.70	576,901.47	
13,692.00	94.80	269.10	9,035.17	4,897.61	-154.51	-4,897.17	4,899.61	268.19	486,835.49	576,807.83	
13,787.00	92.80	271.10	9,028.88	4,992.39	-154.34	-4,991.95	4,994.34	268.23	486,835.66	576,713.05	
13,881.00	92.60	271.90	9,024.45	5,086.24	-151.89	-5,085.81	5,088.08	268.29	486,838.11	576,619.19	
13,976.00	89.30	272.80	9,022.87	5,181.12	-147.99	-5,180.71	5,182.82	268.36	486,842.01	576,524.29	
14,071.00	89.20	273.30	9,024.12	5,275.96	-142.94	-5,275.56	5,277.50	268.45	486,847.06	576,429.44	
14,164.00	89.00	273.50	9,025.58	5,368.77	-137.42	-5,368.39	5,370.15	268.53	486,852.58	576,336.61	
14,258.00	90.40	272.80	9,026.07	5,462.61	-132.26	-5,462.24	5,463.84	268.61	486,857.74	576,242.76	
14,353.00	90.50	270.50	9,025.32	5,557.55	-129.52	-5,557.19	5,558.70	268.66	486,860.48	576,147.81	
14,447.00	92.40	271.00	9,022.95	5,651.51	-128.29	-5,651.15	5,652.61	268.70	486,861.71	576,053.85	
14,541.00	92.70	272.00	9,018.76	5,745.37	-125.83	-5,745.02	5,746.40	268.75	486,864.17	575,959.98	
14,634.00	90.80	271.50	9,015.92	5,838.27	-123.00	-5,837.93	5,839.23	268.79	486,867.00	575,867.07	
14,729.00	90.80	270.80	9,014.60	5,933.24	-121.09	-5,932.90	5,934.14	268.83	486,868.91	575,772.10	
14,822.00	89.40	272.50	9,014.43	6,026.18	-118.41	-6,025.86	6,027.02	268.87	486,871.59	575,679.14	
14,916.00	88.70	272.00	9,015.99	6,120.09	-114.72	-6,119.77	6,120.85	268.93	486,875.28	575,585.23	
15,009.00	87.60	270.70	9,019.00	6,213.00	-112.53	-6,212.69	6,213.71	268.96	486,877.47	575,492.31	
15,104.00	90.90	269.10	9,020.24	6,307.98	-112.70	-6,307.67	6,308.68	268.98	486,877.30	575,397.33	
15,198.00	90.40	267.20	9,019.17	6,401.93	-115.73	-6,401.61	6,402.66	268.96	486,874.27	575,303.39	



ProDirectional
Survey Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Site: Pliny The Elder Fee
Well: 215H
Wellbore: OH
Design: OH 187-19350 PTB 19426'

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:
Well 215H
Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Grid
Minimum Curvature
WellPlanner1

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
15,292.00	94.50	267.10	9,015.15	6,495.72	-120.40	-6,495.39	6,496.50	268.94	486,869.60	575,209.61
15,387.00	94.50	267.80	9,007.70	6,590.34	-124.61	-6,590.00	6,591.18	268.92	486,865.39	575,115.00
15,480.00	94.90	271.00	9,000.08	6,683.01	-125.59	-6,682.67	6,683.85	268.92	486,864.41	575,022.33
15,574.00	90.50	271.20	8,995.65	6,776.86	-123.78	-6,776.53	6,777.66	268.95	486,866.22	574,928.47
15,668.00	93.20	273.00	8,992.62	6,870.73	-120.34	-6,870.40	6,871.45	269.00	486,869.66	574,834.60
15,788.00	93.40	274.60	8,985.71	6,990.24	-112.40	-6,989.93	6,990.84	269.08	486,877.60	574,715.07
15,882.00	92.90	274.30	8,980.54	7,083.79	-105.12	-7,083.51	7,084.29	269.15	486,884.88	574,621.49
15,975.00	92.40	272.90	8,976.24	7,176.49	-99.29	-7,176.22	7,176.91	269.21	486,890.71	574,528.78
16,070.00	90.70	271.30	8,973.67	7,271.37	-95.81	-7,271.12	7,271.75	269.25	486,894.19	574,433.88
16,164.00	92.80	271.10	8,970.80	7,365.30	-93.84	-7,365.05	7,365.65	269.27	486,896.16	574,339.95
16,258.00	93.80	270.70	8,965.39	7,459.12	-92.37	-7,458.88	7,459.45	269.29	486,897.63	574,246.12
16,353.00	89.90	267.30	8,962.33	7,554.03	-94.03	-7,553.78	7,554.37	269.29	486,895.97	574,151.22
16,446.00	89.00	265.50	8,963.22	7,646.85	-99.87	-7,646.59	7,647.24	269.25	486,890.13	574,058.41
16,540.00	89.20	266.00	8,964.69	7,740.60	-106.83	-7,740.32	7,741.06	269.21	486,883.17	573,964.68
16,634.00	90.40	266.90	8,965.02	7,834.44	-112.65	-7,834.14	7,834.95	269.18	486,877.35	573,870.86
16,728.00	96.80	270.30	8,959.12	7,928.17	-114.95	-7,927.86	7,928.69	269.17	486,875.05	573,777.14
16,821.00	94.50	269.80	8,949.97	8,020.71	-114.87	-8,020.40	8,021.23	269.18	486,875.13	573,684.60
16,916.00	95.40	269.90	8,941.77	8,115.35	-115.12	-8,115.05	8,115.86	269.19	486,874.88	573,589.95
17,009.00	92.00	270.10	8,935.77	8,208.14	-115.12	-8,207.84	8,208.65	269.20	486,874.88	573,497.16
17,103.00	90.40	269.90	8,933.80	8,302.12	-115.12	-8,301.82	8,302.61	269.21	486,874.88	573,403.18
17,196.00	89.80	268.50	8,933.64	8,395.11	-116.42	-8,394.80	8,395.61	269.21	486,873.58	573,310.20
17,291.00	89.10	266.60	8,934.55	8,490.03	-120.48	-8,489.71	8,490.56	269.19	486,869.52	573,215.29
17,386.00	90.70	265.80	8,934.72	8,584.83	-126.77	-8,584.49	8,585.43	269.15	486,863.23	573,120.51
17,480.00	89.40	264.60	8,934.63	8,678.52	-134.64	-8,678.16	8,679.21	269.11	486,855.36	573,026.84
17,573.00	88.20	266.90	8,936.58	8,771.26	-141.53	-8,770.88	8,772.02	269.08	486,848.47	572,934.12
17,667.00	87.60	266.90	8,940.03	8,865.07	-146.61	-8,864.68	8,865.89	269.05	486,843.39	572,840.32
17,761.00	90.80	266.80	8,941.34	8,958.92	-151.77	-8,958.51	8,959.80	269.03	486,838.23	572,746.49



ProDirectional
Survey Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Site: Pliny The Elder Fee
Well: 215H
Wellbore: OH
Design: OH 187'-19350 PTB 19426'

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:
Well 215H
Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Grid
Minimum Curvature
WellPlanner1

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
17,855.00	90.80	266.20	8,940.03	9,052.76	-157.51	-9,052.33	9,053.70	269.00	486,832.49	572,652.67
17,949.00	90.90	268.60	8,938.63	9,146.65	-161.77	-9,146.21	9,147.64	268.99	486,828.23	572,558.79
18,043.00	91.40	269.30	8,936.74	9,240.62	-163.50	-9,240.18	9,241.62	268.99	486,826.50	572,464.82
18,137.00	92.50	271.80	8,933.55	9,334.55	-162.60	-9,334.11	9,335.53	269.00	486,827.40	572,370.89
18,231.00	90.60	271.00	8,931.00	9,428.48	-160.30	-9,428.04	9,429.41	269.03	486,829.70	572,276.96
18,325.00	90.00	270.60	8,930.51	9,522.46	-158.99	-9,522.03	9,523.36	269.04	486,831.01	572,182.97
18,419.00	90.10	270.30	8,930.43	9,616.46	-158.25	-9,616.03	9,617.33	269.06	486,831.75	572,088.97
18,514.00	89.70	270.30	8,930.59	9,711.45	-157.75	-9,711.03	9,712.31	269.07	486,832.25	571,993.97
18,608.00	89.40	269.60	8,931.33	9,805.45	-157.83	-9,805.02	9,806.29	269.08	486,832.17	571,899.98
18,702.00	90.30	271.10	8,931.58	9,899.44	-157.26	-9,899.02	9,900.27	269.09	486,832.74	571,805.98
18,796.00	90.50	271.50	8,930.92	9,993.41	-155.13	-9,992.99	9,994.20	269.11	486,834.87	571,712.01
18,890.00	90.00	270.20	8,930.51	10,087.39	-153.73	-10,086.98	10,088.15	269.13	486,836.27	571,618.02
18,985.00	89.00	270.30	8,931.34	10,182.38	-153.32	-10,181.97	10,183.13	269.14	486,836.68	571,523.03
19,079.00	87.60	269.30	8,934.13	10,276.34	-153.65	-10,275.93	10,277.08	269.14	486,836.35	571,429.07
19,172.00	89.30	268.10	8,936.65	10,369.28	-155.76	-10,368.86	10,370.03	269.14	486,834.24	571,336.14
19,266.00	90.30	269.30	8,936.97	10,463.26	-157.89	-10,462.84	10,464.03	269.14	486,832.11	571,242.16
19,350.00	89.80	268.30	8,936.90	10,547.24	-159.65	-10,546.82	10,548.02	269.13	486,830.35	571,158.18
Final Survey, 19350.00' MD, 8936.90' TVD										
19,426.00	89.80	268.30	8,937.17	10,623.22	-161.90	-10,622.78	10,624.02	269.13	486,828.10	571,082.22
PTB, 19426.00' MD, 8937.17' TVD										



ProDirectional
Survey Report



Company: Tap Rock Operating, LLC
Project: Eddy County, NM (NAD 83)
Site: Pliny The Elder Fee
Well: 215H
Wellbore: OH
Design: OH 187'-19350 PTB 19426'

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well 215H
Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Well @ 3176.50usft (GL:3150' + KB: 26.5' (H&P 422))
Grid
Minimum Curvature
WellPlanner1

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
187.00	187.00	1.07	-0.40	Pro MWD First Survey: 187' MD
19,350.00	8,936.90	-159.65	-10,546.82	Final Survey, 19350.00' MD, 8936.90' TVD
19,426.00	8,937.17	-161.90	-10,622.78	PTB, 19426.00' MD, 8937.17' TVD