



Tap Rock Operating

Eddy County, New Mexico (NAD 83)

Pliny the Elder 23S27E0506

Pliny the Elder 23S27E0506 201H

NM OIL CONSERVATION
ARTESIA DISTRICT

JUN 07 2018

RECEIVED

Wellbore #1

30.015-44998

Plan: Design #1

Standard Planning Report

04 June, 2018

MS *Directional*



MS Directional Planning Report



Database: EDM 5000.14 Conroe Db
Company: Tap Rock Operating
Project: Eddy County, New Mexico (NAD 83)
Site: Pliny the Elder 23S27E0506
Well: Pliny the Elder 23S27E0506 201H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well Pliny the Elder 23S27E0506 201H
TVD Reference: WELL @ 3176.50usft (H&P 422)
MD Reference: WELL @ 3176.50usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Eddy County, New Mexico (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 23S27E0506		
Site Position:		Northing:	487,015.04 usft
From:	Map	Easting:	581,704.34 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 20' 19.709 N
		Longitude:	104° 12' 9.468 W

Well	Pliny the Elder 23S27E0506 201H		
Well Position	+N/-S	0.00 usft	Northing: 487,015.04 usft
	+E/-W	0.00 usft	Easting: 581,704.34 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
Grid Convergence:	0.070 °	Ground Level:	3,150.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2018	6/30/2018	7.208	60.007	47,894.24

Design	Design #1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	269.64	

Plan Survey Tool Program	Date 6/4/2018				
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1 0.00	19,212.36	Design #1 (Wellbore #1)	MWD		
			OWSG MWD - Standard		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,157.44	6.86	351.07	1,156.35	27.03	-4.25	1.50	1.50	0.00	351.069	
5,052.64	6.86	351.07	5,023.65	486.75	-76.49	0.00	0.00	0.00	0.000	
5,510.08	0.00	0.00	5,480.00	513.78	-80.74	1.50	-1.50	0.00	180.000	
8,343.62	0.00	0.00	8,313.54	513.78	-80.74	0.00	0.00	0.00	0.000	KOP - Pliny the Eld
9,243.34	89.97	269.64	8,886.50	510.18	-653.40	10.00	10.00	-10.04	269.640	
19,212.37	89.97	269.64	8,891.50	447.56	-10,622.23	0.00	0.00	0.00	0.000	PBHL - Pliny the El



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Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
556.50	0.00	0.00	556.50	0.00	0.00	0.00	0.00	0.00	0.00
Rustler Anhydrite									
585.00	0.00	0.00	585.00	0.00	0.00	0.00	0.00	0.00	0.00
13 3/8"									
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, 1.50°/100' Build									
800.00	1.50	351.07	799.99	1.29	-0.20	0.20	1.50	1.50	0.00
900.00	3.00	351.07	899.91	5.17	-0.81	0.78	1.50	1.50	0.00
1,000.00	4.50	351.07	999.69	11.63	-1.83	1.75	1.50	1.50	0.00
1,100.00	6.00	351.07	1,099.27	20.67	-3.25	3.12	1.50	1.50	0.00
1,122.37	6.34	351.07	1,121.51	23.05	-3.62	3.48	1.50	1.50	0.00
Top Salt									
1,157.44	6.86	351.07	1,156.35	27.03	-4.25	4.08	1.50	1.50	0.00
Hold 6.86° Inc, 351.07° Azm									
1,200.00	6.86	351.07	1,198.60	32.05	-5.04	4.84	0.00	0.00	0.00
1,300.00	6.86	351.07	1,297.89	43.85	-6.89	6.62	0.00	0.00	0.00
1,400.00	6.86	351.07	1,397.17	55.65	-8.75	8.40	0.00	0.00	0.00
1,500.00	6.86	351.07	1,496.45	67.46	-10.60	10.18	0.00	0.00	0.00
1,600.00	6.86	351.07	1,595.74	79.26	-12.46	11.96	0.00	0.00	0.00
1,700.00	6.86	351.07	1,695.02	91.06	-14.31	13.74	0.00	0.00	0.00
1,800.00	6.86	351.07	1,794.31	102.86	-16.17	15.52	0.00	0.00	0.00
1,832.46	6.86	351.07	1,826.53	106.69	-16.77	16.10	0.00	0.00	0.00
Base Salt									
1,900.00	6.86	351.07	1,893.59	114.67	-18.02	17.30	0.00	0.00	0.00
1,983.54	6.86	351.07	1,976.53	124.53	-19.57	18.79	0.00	0.00	0.00
Delaware Mountain Gp									
2,000.00	6.86	351.07	1,992.87	126.47	-19.87	19.08	0.00	0.00	0.00
2,030.00	6.86	351.07	2,022.66	130.01	-20.43	19.61	0.00	0.00	0.00
9 5/8"									
2,100.00	6.86	351.07	2,092.16	138.27	-21.73	20.86	0.00	0.00	0.00
2,134.63	6.86	351.07	2,126.54	142.36	-22.37	21.48	0.00	0.00	0.00
Bell Canyon									
2,139.67	6.86	351.07	2,131.54	142.95	-22.47	21.57	0.00	0.00	0.00
Lamar									
2,159.81	6.86	351.07	2,151.54	145.33	-22.84	21.93	0.00	0.00	0.00
Ramsey Sand									
2,200.00	6.86	351.07	2,191.44	150.07	-23.58	22.64	0.00	0.00	0.00
2,300.00	6.86	351.07	2,290.72	161.88	-25.44	24.42	0.00	0.00	0.00
2,400.00	6.86	351.07	2,390.01	173.68	-27.29	26.20	0.00	0.00	0.00
2,500.00	6.86	351.07	2,489.29	185.48	-29.15	27.98	0.00	0.00	0.00
2,600.00	6.86	351.07	2,588.58	197.28	-31.00	29.76	0.00	0.00	0.00
2,700.00	6.86	351.07	2,687.86	209.09	-32.86	31.54	0.00	0.00	0.00
2,800.00	6.86	351.07	2,787.14	220.89	-34.71	33.32	0.00	0.00	0.00
2,900.00	6.86	351.07	2,886.43	232.69	-36.57	35.11	0.00	0.00	0.00
2,980.72	6.86	351.07	2,966.56	242.22	-38.07	36.54	0.00	0.00	0.00



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Planned 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)
Cherry Canyon									
3,000.00	6.86	351.07	2,985.71	244.49	-38.42	36.89	0.00	0.00	0.00
3,100.00	6.86	351.07	3,084.99	256.29	-40.28	38.67	0.00	0.00	0.00
3,200.00	6.86	351.07	3,184.28	268.10	-42.13	40.45	0.00	0.00	0.00
3,300.00	6.86	351.07	3,283.56	279.90	-43.99	42.23	0.00	0.00	0.00
3,400.00	6.86	351.07	3,382.85	291.70	-45.84	44.01	0.00	0.00	0.00
3,500.00	6.86	351.07	3,482.13	303.50	-47.70	45.79	0.00	0.00	0.00
3,600.00	6.86	351.07	3,581.41	315.31	-49.55	47.57	0.00	0.00	0.00
3,700.00	6.86	351.07	3,680.70	327.11	-51.41	49.35	0.00	0.00	0.00
3,800.00	6.86	351.07	3,779.98	338.91	-53.26	51.13	0.00	0.00	0.00
3,900.00	6.86	351.07	3,879.26	350.71	-55.12	52.91	0.00	0.00	0.00
3,947.67	6.86	351.07	3,926.59	356.34	-56.00	53.76	0.00	0.00	0.00
Brushy Canyon									
4,000.00	6.86	351.07	3,978.55	362.52	-56.97	54.69	0.00	0.00	0.00
4,100.00	6.86	351.07	4,077.83	374.32	-58.83	56.47	0.00	0.00	0.00
4,200.00	6.86	351.07	4,177.12	386.12	-60.68	58.25	0.00	0.00	0.00
4,300.00	6.86	351.07	4,276.40	397.92	-62.53	60.03	0.00	0.00	0.00
4,400.00	6.86	351.07	4,375.68	409.73	-64.39	61.81	0.00	0.00	0.00
4,500.00	6.86	351.07	4,474.97	421.53	-66.24	63.59	0.00	0.00	0.00
4,600.00	6.86	351.07	4,574.25	433.33	-68.10	65.38	0.00	0.00	0.00
4,700.00	6.86	351.07	4,673.53	445.13	-69.95	67.16	0.00	0.00	0.00
4,800.00	6.86	351.07	4,772.82	456.94	-71.81	68.94	0.00	0.00	0.00
4,900.00	6.86	351.07	4,872.10	468.74	-73.66	70.72	0.00	0.00	0.00
5,000.00	6.86	351.07	4,971.39	480.54	-75.52	72.50	0.00	0.00	0.00
5,052.64	6.86	351.07	5,023.65	486.75	-76.49	73.43	0.00	0.00	0.00
Begin 1.50°/100' Drop									
5,100.00	6.15	351.07	5,070.70	492.05	-77.33	74.23	1.50	-1.50	0.00
5,200.00	4.65	351.07	5,170.26	501.35	-78.79	75.64	1.50	-1.50	0.00
5,300.00	3.15	351.07	5,270.02	508.07	-79.85	76.65	1.50	-1.50	0.00
5,400.00	1.65	351.07	5,369.93	512.21	-80.50	77.28	1.50	-1.50	0.00
5,500.00	0.15	351.07	5,469.92	513.77	-80.74	77.51	1.50	-1.50	0.00
5,510.08	0.00	0.00	5,480.00	513.78	-80.74	77.51	1.50	-1.50	0.00
Begin Vertical Hold									
5,511.72	0.00	0.00	5,481.64	513.78	-80.74	77.51	0.00	0.00	0.00
Bone Spring Lime									
5,600.00	0.00	0.00	5,569.92	513.78	-80.74	77.51	0.00	0.00	0.00
5,700.00	0.00	0.00	5,669.92	513.78	-80.74	77.51	0.00	0.00	0.00
5,800.00	0.00	0.00	5,769.92	513.78	-80.74	77.51	0.00	0.00	0.00
5,900.00	0.00	0.00	5,869.92	513.78	-80.74	77.51	0.00	0.00	0.00
6,000.00	0.00	0.00	5,969.92	513.78	-80.74	77.51	0.00	0.00	0.00
6,100.00	0.00	0.00	6,069.92	513.78	-80.74	77.51	0.00	0.00	0.00
6,200.00	0.00	0.00	6,169.92	513.78	-80.74	77.51	0.00	0.00	0.00
6,300.00	0.00	0.00	6,269.92	513.78	-80.74	77.51	0.00	0.00	0.00
6,400.00	0.00	0.00	6,369.92	513.78	-80.74	77.51	0.00	0.00	0.00
6,481.72	0.00	0.00	6,451.64	513.78	-80.74	77.51	0.00	0.00	0.00
1st Bone Spring Sand									
6,500.00	0.00	0.00	6,469.92	513.78	-80.74	77.51	0.00	0.00	0.00
6,600.00	0.00	0.00	6,569.92	513.78	-80.74	77.51	0.00	0.00	0.00
6,700.00	0.00	0.00	6,669.92	513.78	-80.74	77.51	0.00	0.00	0.00
6,800.00	0.00	0.00	6,769.92	513.78	-80.74	77.51	0.00	0.00	0.00
6,900.00	0.00	0.00	6,869.92	513.78	-80.74	77.51	0.00	0.00	0.00
7,000.00	0.00	0.00	6,969.92	513.78	-80.74	77.51	0.00	0.00	0.00
7,016.72	0.00	0.00	6,986.64	513.78	-80.74	77.51	0.00	0.00	0.00



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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)
2nd Bone Spring Sand									
7,100.00	0.00	0.00	7,069.92	513.78	-80.74	77.51	0.00	0.00	0.00
7,200.00	0.00	0.00	7,169.92	513.78	-80.74	77.51	0.00	0.00	0.00
7,300.00	0.00	0.00	7,269.92	513.78	-80.74	77.51	0.00	0.00	0.00
7,400.00	0.00	0.00	7,369.92	513.78	-80.74	77.51	0.00	0.00	0.00
7,500.00	0.00	0.00	7,469.92	513.78	-80.74	77.51	0.00	0.00	0.00
7,600.00	0.00	0.00	7,569.92	513.78	-80.74	77.51	0.00	0.00	0.00
7,700.00	0.00	0.00	7,669.92	513.78	-80.74	77.51	0.00	0.00	0.00
7,800.00	0.00	0.00	7,769.92	513.78	-80.74	77.51	0.00	0.00	0.00
7,900.00	0.00	0.00	7,869.92	513.78	-80.74	77.51	0.00	0.00	0.00
8,000.00	0.00	0.00	7,969.92	513.78	-80.74	77.51	0.00	0.00	0.00
8,100.00	0.00	0.00	8,069.92	513.78	-80.74	77.51	0.00	0.00	0.00
8,200.00	0.00	0.00	8,169.92	513.78	-80.74	77.51	0.00	0.00	0.00
8,243.62	0.00	0.00	8,213.54	513.78	-80.74	77.51	0.00	0.00	0.00
7 5/8"									
8,300.00	0.00	0.00	8,269.92	513.78	-80.74	77.51	0.00	0.00	0.00
8,343.62	0.00	0.00	8,313.54	513.78	-80.74	77.51	0.00	0.00	0.00
Begin 10.00°/100' Build									
8,350.00	0.64	269.64	8,319.92	513.78	-80.78	77.55	10.00	10.00	0.00
8,400.00	5.64	269.64	8,369.92	513.76	-83.51	80.28	10.00	10.00	0.00
8,450.00	10.64	269.64	8,419.31	513.72	-90.59	87.36	10.00	10.00	0.00
8,500.00	15.64	269.64	8,467.98	513.65	-101.95	98.72	10.00	10.00	0.00
8,535.33	19.17	269.64	8,501.69	513.58	-112.52	109.29	10.00	10.00	0.00
3rd Bone Spring Sand									
8,550.00	20.64	269.64	8,515.48	513.55	-117.51	114.28	10.00	10.00	0.00
8,600.00	25.64	269.64	8,561.45	513.43	-137.15	133.92	10.00	10.00	0.00
8,650.00	30.64	269.64	8,605.52	513.28	-160.72	157.49	10.00	10.00	0.00
8,700.00	35.64	269.64	8,647.38	513.11	-188.04	184.82	10.00	10.00	0.00
8,750.00	40.64	269.64	8,686.69	512.91	-218.91	215.68	10.00	10.00	0.00
8,800.00	45.64	269.64	8,723.17	512.70	-253.09	249.86	10.00	10.00	0.00
8,850.00	50.64	269.64	8,756.52	512.46	-290.31	287.09	10.00	10.00	0.00
8,900.00	55.64	269.64	8,786.51	512.21	-330.30	327.08	10.00	10.00	0.00
8,950.00	60.64	269.64	8,812.89	511.95	-372.75	369.53	10.00	10.00	0.00
9,000.00	65.64	269.64	8,835.48	511.67	-417.34	414.12	10.00	10.00	0.00
9,044.65	70.10	269.64	8,852.30	511.41	-458.70	455.47	10.00	10.00	0.00
Wolfcamp A									
9,050.00	70.64	269.64	8,854.09	511.37	-463.73	460.51	10.00	10.00	0.00
9,100.00	75.64	269.64	8,868.59	511.07	-511.57	508.34	10.00	10.00	0.00
9,150.00	80.64	269.64	8,878.87	510.77	-560.48	557.26	10.00	10.00	0.00
9,200.00	85.64	269.64	8,884.84	510.45	-610.11	606.89	10.00	10.00	0.00
9,243.34	89.97	269.64	8,886.50	510.18	-653.40	650.18	10.00	10.00	0.00
Begin 89.97° Lateral									
9,300.00	89.97	269.64	8,886.53	509.83	-710.06	706.85	0.00	0.00	0.00
9,400.00	89.97	269.64	8,886.58	509.20	-810.06	806.85	0.00	0.00	0.00
9,500.00	89.97	269.64	8,886.63	508.57	-910.06	906.85	0.00	0.00	0.00
9,600.00	89.97	269.64	8,886.68	507.94	-1,010.06	1,006.85	0.00	0.00	0.00
9,700.00	89.97	269.64	8,886.73	507.31	-1,110.05	1,106.85	0.00	0.00	0.00
9,800.00	89.97	269.64	8,886.78	506.69	-1,210.05	1,206.85	0.00	0.00	0.00
9,900.00	89.97	269.64	8,886.83	506.06	-1,310.05	1,306.85	0.00	0.00	0.00
10,000.00	89.97	269.64	8,886.88	505.43	-1,410.05	1,406.85	0.00	0.00	0.00
10,100.00	89.97	269.64	8,886.93	504.80	-1,510.05	1,506.85	0.00	0.00	0.00
10,200.00	89.97	269.64	8,886.98	504.17	-1,610.04	1,606.85	0.00	0.00	0.00
10,300.00	89.97	269.64	8,887.03	503.55	-1,710.04	1,706.85	0.00	0.00	0.00



MS Directional Planning Report



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Site: Pliny the Elder 23S27E0506
Well: Pliny the Elder 23S27E0506 201H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well Pliny the Elder 23S27E0506 201H
TVD Reference: WELL @ 3176.50usft (H&P 422)
MD Reference: WELL @ 3176.50usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned 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)
10,400.00	89.97	269.64	8,887.08	502.92	-1,810.04	1,806.85	0.00	0.00	0.00
10,500.00	89.97	269.64	8,887.13	502.29	-1,910.04	1,906.85	0.00	0.00	0.00
10,600.00	89.97	269.64	8,887.18	501.66	-2,010.04	2,006.85	0.00	0.00	0.00
10,700.00	89.97	269.64	8,887.23	501.03	-2,110.03	2,106.85	0.00	0.00	0.00
10,800.00	89.97	269.64	8,887.28	500.40	-2,210.03	2,206.85	0.00	0.00	0.00
10,900.00	89.97	269.64	8,887.33	499.78	-2,310.03	2,306.85	0.00	0.00	0.00
11,000.00	89.97	269.64	8,887.38	499.15	-2,410.03	2,406.85	0.00	0.00	0.00
11,100.00	89.97	269.64	8,887.43	498.52	-2,510.03	2,506.85	0.00	0.00	0.00
11,200.00	89.97	269.64	8,887.48	497.89	-2,610.03	2,606.85	0.00	0.00	0.00
11,300.00	89.97	269.64	8,887.53	497.26	-2,710.02	2,706.85	0.00	0.00	0.00
11,400.00	89.97	269.64	8,887.58	496.64	-2,810.02	2,806.85	0.00	0.00	0.00
11,500.00	89.97	269.64	8,887.63	496.01	-2,910.02	2,906.85	0.00	0.00	0.00
11,600.00	89.97	269.64	8,887.68	495.38	-3,010.02	3,006.85	0.00	0.00	0.00
11,700.00	89.97	269.64	8,887.73	494.75	-3,110.02	3,106.85	0.00	0.00	0.00
11,800.00	89.97	269.64	8,887.78	494.12	-3,210.01	3,206.85	0.00	0.00	0.00
11,900.00	89.97	269.64	8,887.83	493.49	-3,310.01	3,306.85	0.00	0.00	0.00
12,000.00	89.97	269.64	8,887.88	492.87	-3,410.01	3,406.85	0.00	0.00	0.00
12,100.00	89.97	269.64	8,887.93	492.24	-3,510.01	3,506.85	0.00	0.00	0.00
12,200.00	89.97	269.64	8,887.98	491.61	-3,610.01	3,606.85	0.00	0.00	0.00
12,300.00	89.97	269.64	8,888.03	490.98	-3,710.00	3,706.85	0.00	0.00	0.00
12,400.00	89.97	269.64	8,888.08	490.35	-3,810.00	3,806.85	0.00	0.00	0.00
12,500.00	89.97	269.64	8,888.13	489.73	-3,910.00	3,906.85	0.00	0.00	0.00
12,600.00	89.97	269.64	8,888.18	489.10	-4,010.00	4,006.85	0.00	0.00	0.00
12,700.00	89.97	269.64	8,888.23	488.47	-4,110.00	4,106.85	0.00	0.00	0.00
12,800.00	89.97	269.64	8,888.28	487.84	-4,209.99	4,206.85	0.00	0.00	0.00
12,900.00	89.97	269.64	8,888.33	487.21	-4,309.99	4,306.85	0.00	0.00	0.00
13,000.00	89.97	269.64	8,888.38	486.58	-4,409.99	4,406.85	0.00	0.00	0.00
13,100.00	89.97	269.64	8,888.43	485.96	-4,509.99	4,506.85	0.00	0.00	0.00
13,200.00	89.97	269.64	8,888.48	485.33	-4,609.99	4,606.85	0.00	0.00	0.00
13,300.00	89.97	269.64	8,888.53	484.70	-4,709.98	4,706.85	0.00	0.00	0.00
13,400.00	89.97	269.64	8,888.58	484.07	-4,809.98	4,806.85	0.00	0.00	0.00
13,500.00	89.97	269.64	8,888.63	483.44	-4,909.98	4,906.84	0.00	0.00	0.00
13,600.00	89.97	269.64	8,888.68	482.82	-5,009.98	5,006.84	0.00	0.00	0.00
13,700.00	89.97	269.64	8,888.73	482.19	-5,109.98	5,106.84	0.00	0.00	0.00
13,800.00	89.97	269.64	8,888.78	481.56	-5,209.97	5,206.84	0.00	0.00	0.00
13,900.00	89.97	269.64	8,888.83	480.93	-5,309.97	5,306.84	0.00	0.00	0.00
14,000.00	89.97	269.64	8,888.88	480.30	-5,409.97	5,406.84	0.00	0.00	0.00
14,100.00	89.97	269.64	8,888.93	479.68	-5,509.97	5,506.84	0.00	0.00	0.00
14,200.00	89.97	269.64	8,888.99	479.05	-5,609.97	5,606.84	0.00	0.00	0.00
14,300.00	89.97	269.64	8,889.04	478.42	-5,709.96	5,706.84	0.00	0.00	0.00
14,400.00	89.97	269.64	8,889.09	477.79	-5,809.96	5,806.84	0.00	0.00	0.00
14,500.00	89.97	269.64	8,889.14	477.16	-5,909.96	5,906.84	0.00	0.00	0.00
14,600.00	89.97	269.64	8,889.19	476.53	-6,009.96	6,006.84	0.00	0.00	0.00
14,700.00	89.97	269.64	8,889.24	475.91	-6,109.96	6,106.84	0.00	0.00	0.00
14,800.00	89.97	269.64	8,889.29	475.28	-6,209.95	6,206.84	0.00	0.00	0.00
14,900.00	89.97	269.64	8,889.34	474.65	-6,309.95	6,306.84	0.00	0.00	0.00
15,000.00	89.97	269.64	8,889.39	474.02	-6,409.95	6,406.84	0.00	0.00	0.00
15,100.00	89.97	269.64	8,889.44	473.39	-6,509.95	6,506.84	0.00	0.00	0.00
15,200.00	89.97	269.64	8,889.49	472.77	-6,609.95	6,606.84	0.00	0.00	0.00
15,300.00	89.97	269.64	8,889.54	472.14	-6,709.94	6,706.84	0.00	0.00	0.00
15,400.00	89.97	269.64	8,889.59	471.51	-6,809.94	6,806.84	0.00	0.00	0.00
15,500.00	89.97	269.64	8,889.64	470.88	-6,909.94	6,906.84	0.00	0.00	0.00
15,600.00	89.97	269.64	8,889.69	470.25	-7,009.94	7,006.84	0.00	0.00	0.00
15,700.00	89.97	269.64	8,889.74	469.62	-7,109.94	7,106.84	0.00	0.00	0.00



MS Directional
Planning Report



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North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned 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)
15,800.00	89.97	269.64	8,889.79	469.00	-7,209.93	7,206.84	0.00	0.00	0.00
15,900.00	89.97	269.64	8,889.84	468.37	-7,309.93	7,306.84	0.00	0.00	0.00
16,000.00	89.97	269.64	8,889.89	467.74	-7,409.93	7,406.84	0.00	0.00	0.00
16,100.00	89.97	269.64	8,889.94	467.11	-7,509.93	7,506.84	0.00	0.00	0.00
16,200.00	89.97	269.64	8,889.99	466.48	-7,609.93	7,606.84	0.00	0.00	0.00
16,300.00	89.97	269.64	8,890.04	465.86	-7,709.92	7,706.84	0.00	0.00	0.00
16,400.00	89.97	269.64	8,890.09	465.23	-7,809.92	7,806.84	0.00	0.00	0.00
16,500.00	89.97	269.64	8,890.14	464.60	-7,909.92	7,906.84	0.00	0.00	0.00
16,600.00	89.97	269.64	8,890.19	463.97	-8,009.92	8,006.84	0.00	0.00	0.00
16,700.00	89.97	269.64	8,890.24	463.34	-8,109.92	8,106.84	0.00	0.00	0.00
16,800.00	89.97	269.64	8,890.29	462.71	-8,209.91	8,206.84	0.00	0.00	0.00
16,900.00	89.97	269.64	8,890.34	462.09	-8,309.91	8,306.84	0.00	0.00	0.00
17,000.00	89.97	269.64	8,890.39	461.46	-8,409.91	8,406.84	0.00	0.00	0.00
17,100.00	89.97	269.64	8,890.44	460.83	-8,509.91	8,506.84	0.00	0.00	0.00
17,200.00	89.97	269.64	8,890.49	460.20	-8,609.91	8,606.84	0.00	0.00	0.00
17,300.00	89.97	269.64	8,890.54	459.57	-8,709.90	8,706.84	0.00	0.00	0.00
17,400.00	89.97	269.64	8,890.59	458.95	-8,809.90	8,806.84	0.00	0.00	0.00
17,500.00	89.97	269.64	8,890.64	458.32	-8,909.90	8,906.84	0.00	0.00	0.00
17,600.00	89.97	269.64	8,890.69	457.69	-9,009.90	9,006.84	0.00	0.00	0.00
17,700.00	89.97	269.64	8,890.74	457.06	-9,109.90	9,106.84	0.00	0.00	0.00
17,800.00	89.97	269.64	8,890.79	456.43	-9,209.89	9,206.84	0.00	0.00	0.00
17,900.00	89.97	269.64	8,890.84	455.80	-9,309.89	9,306.84	0.00	0.00	0.00
18,000.00	89.97	269.64	8,890.89	455.18	-9,409.89	9,406.84	0.00	0.00	0.00
18,100.00	89.97	269.64	8,890.94	454.55	-9,509.89	9,506.84	0.00	0.00	0.00
18,200.00	89.97	269.64	8,890.99	453.92	-9,609.89	9,606.84	0.00	0.00	0.00
18,300.00	89.97	269.64	8,891.04	453.29	-9,709.88	9,706.84	0.00	0.00	0.00
18,400.00	89.97	269.64	8,891.09	452.66	-9,809.88	9,806.84	0.00	0.00	0.00
18,500.00	89.97	269.64	8,891.14	452.04	-9,909.88	9,906.84	0.00	0.00	0.00
18,600.00	89.97	269.64	8,891.19	451.41	-10,009.88	10,006.84	0.00	0.00	0.00
18,700.00	89.97	269.64	8,891.24	450.78	-10,109.88	10,106.84	0.00	0.00	0.00
18,800.00	89.97	269.64	8,891.29	450.15	-10,209.87	10,206.84	0.00	0.00	0.00
18,900.00	89.97	269.64	8,891.34	449.52	-10,309.87	10,306.84	0.00	0.00	0.00
19,000.00	89.97	269.64	8,891.39	448.90	-10,409.87	10,406.84	0.00	0.00	0.00
19,100.00	89.97	269.64	8,891.44	448.27	-10,509.87	10,506.84	0.00	0.00	0.00
19,200.00	89.97	269.64	8,891.49	447.64	-10,609.87	10,606.84	0.00	0.00	0.00
19,212.36	89.97	269.64	8,891.50	447.56	-10,622.23	10,619.20	0.00	0.00	0.00

PBHL - 5 1/2"



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Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well Pliny the Elder 23S27E0506 201H
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MD Reference: WELL @ 3176.50usft (H&P 422)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
KOP - Pliny the Elder - plan hits target center - Point	0.00	0.00	8,313.54	513.78	-80.74	487,528.82	581,623.59	32° 20' 24.795 N	104° 12' 10.401 W
Upper Perf - Pliny the - plan misses target center by 0.01usft at 9243.33usft MD (8886.50 TVD, 510.18 N, -653.40 E) - Point	0.00	0.00	8,886.50	510.18	-653.40	487,525.22	581,050.94	32° 20' 24.766 N	104° 12' 17.077 W
Lower Perf - Pliny the - plan misses target center by 0.06usft at 19072.36usft MD (8891.43 TVD, 448.44 N, -10482.23 E) - Point	0.00	0.00	8,891.43	448.38	-10,482.23	487,463.42	571,222.10	32° 20' 24.256 N	104° 14' 11.648 W
PBHL - Pliny the Elde - plan hits target center - Point	0.00	0.00	8,891.50	447.56	-10,622.23	487,462.60	571,082.10	32° 20' 24.250 N	104° 14' 13.280 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
585.00	585.00	13 3/8"	13-3/8	17-1/2
2,030.00	2,022.66	9 5/8"	9-5/8	12-1/4
8,243.62	8,213.54	7 5/8"	7-5/8	8-3/4
19,212.36	8,891.50	5 1/2"	5-1/2	6-1/4

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
556.50	556.50	Rustler Anhydrite		0.100	269.64
1,122.37	1,121.51	Top Salt		0.100	269.64
1,832.46	1,826.53	Base Salt		0.100	269.64
1,983.54	1,976.53	Delaware Mountain Gp		0.100	269.64
2,134.63	2,126.54	Bell Canyon		0.100	269.64
2,139.67	2,131.54	Lamar		0.100	269.64
2,159.81	2,151.54	Ramsey Sand		0.100	269.64
2,980.72	2,966.56	Cherry Canyon		0.100	269.64
3,947.67	3,926.59	Brushy Canyon		0.100	269.64
5,511.72	5,481.64	Bone Spring Lime		0.100	269.64
6,481.72	6,451.64	1st Bone Spring Sand		0.100	269.64
7,016.72	6,986.64	2nd Bone Spring Sand		0.100	269.64
8,535.33	8,501.69	3rd Bone Spring Sand		0.100	269.64
9,044.65	8,852.30	Wolfcamp A		0.100	269.64



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North Reference: Grid
Survey Calculation Method: Minimum Curvature

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
700.00	700.00	0.00	0.00	KOP, 1.50°/100' Build
1,157.44	1,156.35	27.03	-4.25	Hold 6.86° Inc, 351.07° Azm
5,052.64	5,023.65	486.75	-76.49	Begin 1.50°/100' Drop
5,510.08	5,480.00	513.78	-80.74	Begin Vertical Hold
8,343.62	8,313.54	513.78	-80.74	Begin 10.00°/100' Build
9,243.34	8,886.50	510.18	-653.40	Begin 89.97° Lateral
19,212.37	8,891.50	447.56	-10,622.23	PBHL



Company: Tap Rock Operating
Site: Pliny the Elder 23S27E0506
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Project: Eddy County, New Mexico (NAD 83)
Rig: H&P 422

MS Directional

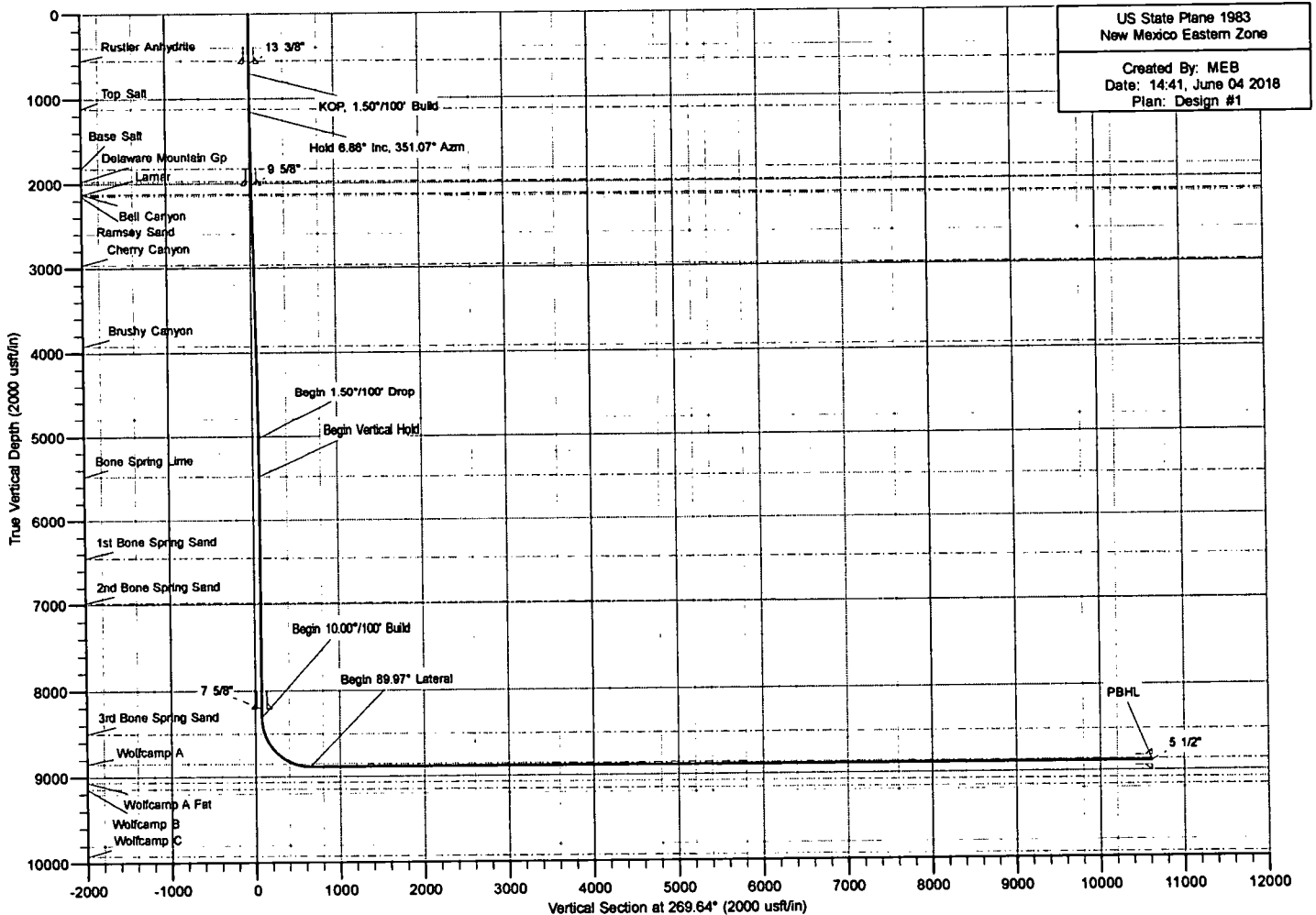
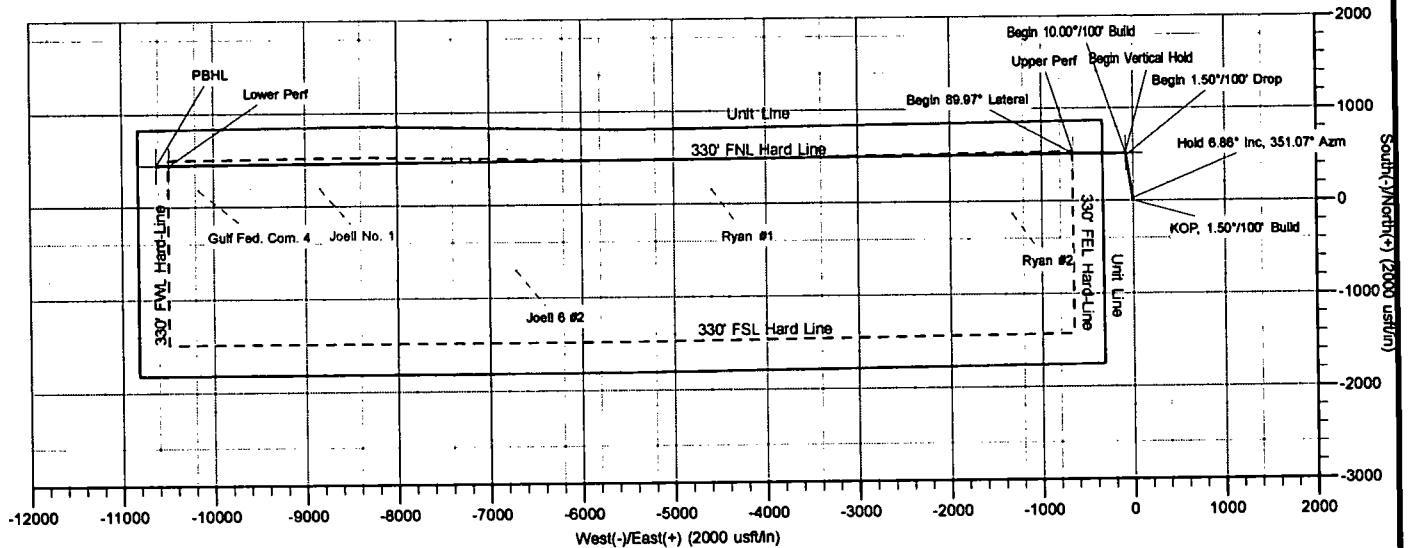


Azimuths to Grid North
True North: -0.07°
Magnetic North: 7.14°

Magnetic Field
Strength: 47894.2nT
Dip Angle: 60.01°
Date: 6/30/2018
Model: BGGM2018

ANNOTATIONS

MD	Inc	Azi	TVD	+N-S	+E-W	Vsect	Departure	Annotation
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	KOP, 1.50°/100' Build
1157.44	8.88	351.07	1158.35	27.03	-4.25	4.08	27.38	Hold 6.88° Inc, 351.07° Azm
5052.84	8.88	351.07	5023.65	488.75	-78.49	73.43	492.73	Begin 1.50°/100' Drop
5510.08	0.00	0.00	5480.00	513.78	-80.74	77.51	520.09	Begin Vertical Hold
8343.62	0.00	0.00	8313.54	513.78	-80.74	77.51	520.09	Begin 10.00°/100' Build
9243.34	89.97	269.84	8888.50	510.18	-853.40	650.18	1092.78	Begin 89.97° Lateral
19212.36	89.97	269.84	8891.50	447.58	-10622.23	10619.21	11061.78	PBHL



The customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented.
Any decisions made or wells drilled utilizing this or any other information supplied by MS Directional are at the sole risk and responsibility of the customer. MS Directional is not responsible for the accuracy of this schematic or the information contained herein.