



Caza Operating LLC

Lennox 32 State 3H

Lennox 32 State 3H

Lennox 32 State 3H

Lennox 32 State 3H

Plan: 181025 Lennox 32 State 3H

Morcor Standard Plan

26 October, 2018

**MORCOR
ENGINEERING**

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Morcor Engineering
Morcor Standard Plan

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Company:	Caza Operating LLC	Local Co-ordinate Reference:	Well Lennox 32 State 3H
Project:	Lennox 32 State 3H	TVD Reference:	WELL @ 3557.0usft (Original Well Elev)
Site:	Lennox 32 State 3H	MD Reference:	WELL @ 3557.0usft (Original Well Elev)
Well:	Lennox 32 State 3H	North Reference:	Grid
Wellbore:	Lennox 32 State 3H	Survey Calculation Method:	Minimum Curvature
Design:	181025 Lennox 32 State 3H	Database:	EDM 5000.1 Single User Db

Project	Lennox 32 State 3H		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Lennox 32 State 3H		
Site Position:		Northing:	493,932.84 usft
From:	Lat/Long	Easting:	831,727.32 usft
Position Uncertainty:	1.0 usft	Slot Radius:	17-1/2 "
		Latitude:	32° 21' 15.790 N
		Longitude:	103° 23' 34.580 W
		Grid Convergence:	0.50 °

Well	Lennox 32 State 3H		
Well Position	+N/-S	0.0 usft	Northing: 493,932.84 usft
	+E/-W	0.0 usft	Easting: 831,727.32 usft
Position Uncertainty	1.0 usft		Wellhead Elevation: usft
			Latitude: 32° 21' 15.790 N
			Longitude: 103° 23' 34.580 W
			Ground Level: 3,535.0 usft

Wellbore	Lennox 32 State 3H		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	10/25/2018	6.60
			Dip Angle
			(°)
			60.15
			Field Strength
			(nT)
			47,975

Design	181025 Lennox 32 State 3H		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			175.46

Survey Tool Program	Date 10/26/2018		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
0.0	16,325.0	181025 Lennox 32 State 3H (Lennox 32 S	MWD
			Description
			MWD - Standard

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TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well Lennox 32 State 3H
WELL @ 3557.0usft (Original Well Elev)
WELL @ 3557.0usft (Original Well Elev)
Grid
Minimum Curvature
EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
0.0	0.00	0.00	0.0	-3,557.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
100.0	0.00	44.50	100.0	-3,457.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
120.0	0.00	44.50	120.0	-3,437.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
20" Conductor										
200.0	0.00	44.50	200.0	-3,357.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
300.0	0.00	44.50	300.0	-3,257.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
400.0	0.00	44.50	400.0	-3,157.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
500.0	0.00	44.50	500.0	-3,057.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
600.0	0.00	44.50	600.0	-2,957.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
700.0	0.00	44.50	700.0	-2,857.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
800.0	0.00	44.50	800.0	-2,757.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
900.0	0.00	44.50	900.0	-2,657.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
1,000.0	0.00	44.50	1,000.0	-2,557.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
1,100.0	0.00	44.50	1,100.0	-2,457.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
1,200.0	0.00	44.50	1,200.0	-2,357.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
1,300.0	0.00	44.50	1,300.0	-2,257.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
1,400.0	0.00	44.50	1,400.0	-2,157.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
1,500.0	0.00	44.50	1,500.0	-2,057.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
1,600.0	0.00	44.50	1,600.0	-1,957.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
1,700.0	0.00	44.50	1,700.0	-1,857.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
1,800.0	0.00	44.50	1,800.0	-1,757.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
1,900.0	0.00	44.50	1,900.0	-1,657.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
1,926.0	0.00	44.50	1,926.0	-1,631.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
Rustler										
1,951.0	0.00	44.50	1,951.0	-1,606.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
13 3/8" Surface Casing										
2,000.0	0.00	44.50	2,000.0	-1,557.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
2,100.0	0.00	44.50	2,100.0	-1,457.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00



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MD Reference: WELL @ 3557.0usft (Original Well Elev)
North Reference: Grid
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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
2,200.0	0.00	44.50	2,200.0	-1,357.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
2,300.0	0.00	44.50	2,300.0	-1,257.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
2,400.0	0.00	44.50	2,400.0	-1,157.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
2,500.0	0.00	44.50	2,500.0	-1,057.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
2,501.0	0.00	44.50	2,501.0	-1,056.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
Top of Salt										
2,600.0	0.00	44.50	2,600.0	-957.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
2,700.0	0.00	44.50	2,700.0	-857.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
2,800.0	0.00	44.50	2,800.0	-757.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
2,900.0	0.00	44.50	2,900.0	-657.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
3,000.0	0.00	44.50	3,000.0	-557.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
3,100.0	0.00	44.50	3,100.0	-457.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
3,200.0	0.00	44.50	3,200.0	-357.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
3,300.0	0.00	44.50	3,300.0	-257.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
3,400.0	0.00	44.50	3,400.0	-157.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
3,500.0	0.00	44.50	3,500.0	-57.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
3,600.0	0.00	44.50	3,600.0	43.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
3,700.0	0.00	44.50	3,700.0	143.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
3,800.0	0.00	44.50	3,800.0	243.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
3,900.0	0.00	44.50	3,900.0	343.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
4,000.0	0.00	44.50	4,000.0	443.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
4,096.0	0.00	44.50	4,096.0	539.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
Base of Salt										
4,100.0	0.00	44.50	4,100.0	543.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
4,200.0	0.00	44.50	4,200.0	643.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
4,300.0	0.00	44.50	4,300.0	743.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00
4,400.0	0.00	44.50	4,400.0	843.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00



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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)	
4,500.0	0.00	44.50	4,500.0	943.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
4,600.0	0.00	44.50	4,600.0	1,043.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
4,700.0	0.00	44.50	4,700.0	1,143.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
4,716.0	0.00	44.50	4,716.0	1,159.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
Capitan											
4,800.0	0.00	44.50	4,800.0	1,243.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
4,900.0	0.00	44.50	4,900.0	1,343.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
5,000.0	0.00	44.50	5,000.0	1,443.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
5,100.0	0.00	44.50	5,100.0	1,543.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
5,200.0	0.00	44.50	5,200.0	1,643.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
5,300.0	0.00	44.50	5,300.0	1,743.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
5,400.0	0.00	44.50	5,400.0	1,843.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
5,500.0	0.00	44.50	5,500.0	1,943.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
5,600.0	0.00	44.50	5,600.0	2,043.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
5,661.0	0.00	44.50	5,661.0	2,104.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
9 5/8" Intermediate Casing											
5,686.0	0.00	44.50	5,686.0	2,129.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
Delaware											
5,700.0	0.00	44.50	5,700.0	2,143.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
5,800.0	0.00	44.50	5,800.0	2,243.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
5,850.0	0.00	44.50	5,850.0	2,293.0	0.0	0.0	831,727.32	493,932.84	0.00	0.00	
Start Build 3.00											
5,900.0	1.50	44.50	5,900.0	2,343.0	0.5	0.5	831,727.78	493,933.31	-0.43	3.00	
6,000.0	4.50	44.50	5,999.8	2,442.8	4.2	4.1	831,731.45	493,937.04	-3.86	3.00	
6,041.3	5.74	44.50	6,041.0	2,484.0	6.8	6.7	831,734.03	493,939.67	-6.28	3.00	
Cherry Canyon											
6,050.0	6.00	44.50	6,049.6	2,492.6	7.5	7.3	831,734.66	493,940.30	-6.86	3.00	
Start 4600.0 hold at 6050.0 MD											



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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
6,100.0	6.00	44.50	6,099.4	2,542.4	11.2	11.0	831,738.32	493,944.03	-10.28	0.00
6,200.0	6.00	44.50	6,198.8	2,641.8	18.6	18.3	831,745.65	493,951.49	-17.14	0.00
6,300.0	6.00	44.50	6,298.3	2,741.3	26.1	25.6	831,752.97	493,958.94	-23.99	0.00
6,400.0	6.00	44.50	6,397.7	2,840.7	33.6	33.0	831,760.30	493,966.40	-30.84	0.00
6,500.0	6.00	44.50	6,497.2	2,940.2	41.0	40.3	831,767.62	493,973.85	-37.69	0.00
6,600.0	6.00	44.50	6,596.6	3,039.6	48.5	47.6	831,774.95	493,981.31	-44.54	0.00
6,700.0	6.00	44.50	6,696.1	3,139.1	55.9	55.0	831,782.28	493,988.76	-51.40	0.00
6,800.0	6.00	44.50	6,795.5	3,238.5	63.4	62.3	831,789.60	493,996.22	-58.25	0.00
6,900.0	6.00	44.50	6,895.0	3,338.0	70.8	69.6	831,796.93	494,003.67	-65.10	0.00
7,000.0	6.00	44.50	6,994.4	3,437.4	78.3	76.9	831,804.26	494,011.13	-71.95	0.00
7,100.0	6.00	44.50	7,093.9	3,536.9	85.7	84.3	831,811.58	494,018.59	-78.81	0.00
7,200.0	6.00	44.50	7,193.3	3,636.3	93.2	91.6	831,818.91	494,026.04	-85.66	0.00
7,300.0	6.00	44.50	7,292.8	3,735.8	100.7	98.9	831,826.24	494,033.50	-92.51	0.00
7,400.0	6.00	44.50	7,392.2	3,835.2	108.1	106.2	831,833.56	494,040.95	-99.36	0.00
7,403.8	6.00	44.50	7,396.0	3,839.0	108.4	106.5	831,833.84	494,041.23	-99.62	0.00
Brushy Canyon										
7,500.0	6.00	44.50	7,491.7	3,934.7	115.6	113.6	831,840.89	494,048.41	-106.21	0.00
7,600.0	6.00	44.50	7,591.1	4,034.1	123.0	120.9	831,848.22	494,055.86	-113.07	0.00
7,700.0	6.00	44.50	7,690.6	4,133.6	130.5	128.2	831,855.54	494,063.32	-119.92	0.00
7,800.0	6.00	44.50	7,790.0	4,233.0	137.9	135.5	831,862.87	494,070.77	-126.77	0.00
7,900.0	6.00	44.50	7,889.5	4,332.5	145.4	142.9	831,870.20	494,078.23	-133.62	0.00
8,000.0	6.00	44.50	7,989.0	4,432.0	152.8	150.2	831,877.52	494,085.69	-140.47	0.00
8,100.0	6.00	44.50	8,088.4	4,531.4	160.3	157.5	831,884.85	494,093.14	-147.33	0.00
8,200.0	6.00	44.50	8,187.9	4,630.9	167.8	164.9	831,892.18	494,100.60	-154.18	0.00
8,300.0	6.00	44.50	8,287.3	4,730.3	175.2	172.2	831,899.50	494,108.05	-161.03	0.00
8,400.0	6.00	44.50	8,386.8	4,829.8	182.7	179.5	831,906.83	494,115.51	-167.88	0.00
8,500.0	6.00	44.50	8,486.2	4,929.2	190.1	186.8	831,914.15	494,122.96	-174.73	0.00

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8,600.0	6.00	44.50	8,585.7	5,028.7	197.6	194.2	831,921.48	494,130.42	-181.59	0.00
8,700.0	6.00	44.50	8,685.1	5,128.1	205.0	201.5	831,928.81	494,137.87	-188.44	0.00
8,746.1	6.00	44.50	8,731.0	5,174.0	208.5	204.9	831,932.19	494,141.31	-191.60	0.00
Bone Spring										
8,800.0	6.00	44.50	8,784.6	5,227.6	212.5	208.8	831,936.13	494,145.33	-195.29	0.00
8,900.0	6.00	44.50	8,884.0	5,327.0	219.9	216.1	831,943.46	494,152.78	-202.14	0.00
9,000.0	6.00	44.50	8,983.5	5,426.5	227.4	223.5	831,950.79	494,160.24	-208.99	0.00
9,100.0	6.00	44.50	9,082.9	5,525.9	234.9	230.8	831,958.11	494,167.70	-215.85	0.00
9,200.0	6.00	44.50	9,182.4	5,625.4	242.3	238.1	831,965.44	494,175.15	-222.70	0.00
9,300.0	6.00	44.50	9,281.8	5,724.8	249.8	245.4	831,972.77	494,182.61	-229.55	0.00
9,400.0	6.00	44.50	9,381.3	5,824.3	257.2	252.8	831,980.09	494,190.06	-236.40	0.00
9,500.0	6.00	44.50	9,480.7	5,923.7	264.7	260.1	831,987.42	494,197.52	-243.25	0.00
9,600.0	6.00	44.50	9,580.2	6,023.2	272.1	267.4	831,994.75	494,204.97	-250.11	0.00
9,700.0	6.00	44.50	9,679.6	6,122.6	279.6	274.8	832,002.07	494,212.43	-256.96	0.00
9,771.8	6.00	44.50	9,751.0	6,194.0	284.9	280.0	832,007.33	494,217.78	-261.88	0.00
1st Bone Spring Sand										
9,800.0	6.00	44.50	9,779.1	6,222.1	287.0	282.1	832,009.40	494,219.88	-263.81	0.00
9,900.0	6.00	44.50	9,878.5	6,321.5	294.5	289.4	832,016.73	494,227.34	-270.66	0.00
10,000.0	6.00	44.50	9,978.0	6,421.0	302.0	296.7	832,024.05	494,234.80	-277.52	0.00
10,100.0	6.00	44.50	10,077.4	6,520.4	309.4	304.1	832,031.38	494,242.25	-284.37	0.00
10,200.0	6.00	44.50	10,176.9	6,619.9	316.9	311.4	832,038.71	494,249.71	-291.22	0.00
10,300.0	6.00	44.50	10,276.4	6,719.4	324.3	318.7	832,046.03	494,257.16	-298.07	0.00
10,337.9	6.00	44.50	10,314.0	6,757.0	327.1	321.5	832,048.81	494,259.98	-300.67	0.00
2nd Bone Spring Sand										
10,400.0	6.00	44.50	10,375.8	6,818.8	331.8	326.0	832,053.36	494,264.62	-304.92	0.00
10,500.0	6.00	44.50	10,475.3	6,918.3	339.2	333.4	832,060.68	494,272.07	-311.78	0.00
10,600.0	6.00	44.50	10,574.7	7,017.7	346.7	340.7	832,068.01	494,279.53	-318.63	0.00



Company:	Caza Operating LLC	Local Co-ordinate Reference:	Well Lennox 32 State 3H
Project:	Lennox 32 State 3H	TVD Reference:	WELL @ 3557.0usft (Original Well Elev)
Site:	Lennox 32 State 3H	MD Reference:	WELL @ 3557.0usft (Original Well Elev)
Well:	Lennox 32 State 3H	North Reference:	Grid
Wellbore:	Lennox 32 State 3H	Survey Calculation Method:	Minimum Curvature
Design:	181025 Lennox 32 State 3H	Database:	EDM 5000.1 Single User Db

Planned Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)	
10,650.0	6.00	44.50	10,624.4	7,067.4	350.4	344.4	832,071.67	494,283.26	-322.05	0.00	
Start Drop -3.00											
10,700.0	4.50	44.50	10,674.2	7,117.2	353.7	347.6	832,074.88	494,286.52	-325.05	3.00	
10,800.0	1.50	44.50	10,774.1	7,217.1	357.4	351.2	832,078.55	494,290.25	-328.48	3.00	
10,850.0	0.00	0.00	10,824.1	7,267.1	357.9	351.7	832,079.01	494,290.72	-328.91	3.00	
Start 46.0 hold at 10850.0 MD											
10,896.0	0.00	180.00	10,870.1	7,313.1	357.9	351.7	832,079.01	494,290.72	-328.91	0.00	
Start Build 11.46											
10,900.0	0.46	180.00	10,874.1	7,317.1	357.9	351.7	832,079.01	494,290.70	-328.90	11.46	
11,000.0	11.92	180.00	10,973.3	7,416.3	347.1	351.7	832,079.01	494,279.94	-318.17	11.46	
11,100.0	23.38	180.00	11,068.5	7,511.5	316.8	351.7	832,079.01	494,249.67	-287.99	11.46	
11,199.2	34.74	180.00	11,155.0	7,598.0	268.7	351.7	832,079.01	494,201.58	-240.05	11.46	
3rd Bone Spring Sand											
11,200.0	34.84	180.00	11,155.7	7,598.7	268.3	351.7	832,079.01	494,201.10	-239.58	11.46	
11,300.0	46.30	180.00	11,231.5	7,674.5	203.3	351.7	832,079.01	494,136.18	-174.85	11.46	
11,400.0	57.76	180.00	11,292.9	7,735.9	124.6	351.7	832,079.01	494,057.47	-96.40	11.46	
11,500.0	69.22	180.00	11,337.5	7,780.5	35.3	351.7	832,079.01	493,968.14	-7.34	11.46	
11,600.0	80.68	180.00	11,363.4	7,806.4	-61.1	351.7	832,079.01	493,871.73	88.77	11.46	
11,680.0	89.85	180.00	11,370.0	7,813.0	-140.8	351.7	832,079.01	493,792.08	168.16	11.46	
Start Turn -0.02											
11,700.0	89.85	180.00	11,370.1	7,813.1	-160.8	351.7	832,079.01	493,772.08	188.09	0.00	
11,800.0	89.85	179.98	11,370.3	7,813.3	-260.8	351.7	832,079.03	493,672.08	287.78	0.00	
11,900.0	89.85	179.97	11,370.6	7,813.6	-360.8	351.7	832,079.07	493,572.08	387.47	0.00	
12,000.0	89.85	179.95	11,370.8	7,813.8	-460.8	351.8	832,079.14	493,472.09	487.16	0.00	
12,100.0	89.85	179.94	11,371.1	7,814.1	-560.8	351.9	832,079.24	493,372.09	586.86	0.00	
12,200.0	89.85	179.92	11,371.4	7,814.4	-660.8	352.0	832,079.36	493,272.09	686.55	0.00	
12,300.0	89.85	179.91	11,371.6	7,814.6	-760.8	352.2	832,079.51	493,172.09	786.25	0.00	
12,400.0	89.85	179.89	11,371.9	7,814.9	-860.8	352.4	832,079.69	493,072.09	885.95	0.00	



Morcor Engineering
Morcor Standard Plan

MORCOR
ENGINEERING

Company:	Caza Operating LLC	Local Co-ordinate Reference:	Well Lennox 32 State 3H
Project:	Lennox 32 State 3H	TVD Reference:	WELL @ 3557.0usft (Original Well Elev)
Site:	Lennox 32 State 3H	MD Reference:	WELL @ 3557.0usft (Original Well Elev)
Well:	Lennox 32 State 3H	North Reference:	Grid
Wellbore:	Lennox 32 State 3H	Survey Calculation Method:	Minimum Curvature
Design:	181025 Lennox 32 State 3H	Database:	EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
12,500.0	89.85	179.88	11,372.2	7,815.2	-960.8	352.6	832,079.89	492,972.09	985.65	0.02
12,600.0	89.85	179.86	11,372.4	7,815.4	-1,060.8	352.8	832,080.12	492,872.09	1,085.35	0.02
12,700.0	89.85	179.85	11,372.7	7,815.7	-1,160.8	353.1	832,080.38	492,772.09	1,185.06	0.02
12,800.0	89.85	179.83	11,372.9	7,815.9	-1,260.8	353.3	832,080.66	492,672.09	1,284.77	0.02
12,900.0	89.85	179.82	11,373.2	7,816.2	-1,360.8	353.6	832,080.97	492,572.09	1,384.48	0.02
13,000.0	89.85	179.80	11,373.5	7,816.5	-1,460.7	354.0	832,081.30	492,472.09	1,484.19	0.02
13,100.0	89.85	179.79	11,373.7	7,816.7	-1,560.7	354.3	832,081.66	492,372.09	1,583.90	0.02
13,200.0	89.85	179.77	11,374.0	7,817.0	-1,660.7	354.7	832,082.05	492,272.09	1,683.62	0.02
13,300.0	89.85	179.76	11,374.3	7,817.3	-1,760.7	355.1	832,082.46	492,172.09	1,783.34	0.02
13,400.0	89.85	179.74	11,374.5	7,817.5	-1,860.7	355.6	832,082.90	492,072.10	1,883.05	0.02
13,500.0	89.85	179.73	11,374.8	7,817.8	-1,960.7	356.0	832,083.36	491,972.10	1,982.78	0.02
13,600.0	89.85	179.71	11,375.0	7,818.0	-2,060.7	356.5	832,083.86	491,872.10	2,082.50	0.02
13,700.0	89.85	179.70	11,375.3	7,818.3	-2,160.7	357.1	832,084.37	491,772.10	2,182.23	0.02
13,800.0	89.85	179.68	11,375.6	7,818.6	-2,260.7	357.6	832,084.92	491,672.10	2,281.95	0.02
13,900.0	89.85	179.67	11,375.8	7,818.8	-2,360.7	358.2	832,085.49	491,572.10	2,381.68	0.02
14,000.0	89.85	179.65	11,376.1	7,819.1	-2,460.7	358.8	832,086.09	491,472.11	2,481.41	0.02
14,100.0	89.85	179.64	11,376.3	7,819.3	-2,560.7	359.4	832,086.71	491,372.11	2,581.15	0.02
14,200.0	89.85	179.62	11,376.6	7,819.6	-2,660.7	360.0	832,087.36	491,272.11	2,680.88	0.02
14,300.0	89.85	179.61	11,376.9	7,819.9	-2,760.7	360.7	832,088.04	491,172.11	2,780.62	0.02
14,400.0	89.85	179.59	11,377.1	7,820.1	-2,860.7	361.4	832,088.74	491,072.12	2,880.36	0.02
14,500.0	89.85	179.58	11,377.4	7,820.4	-2,960.7	362.1	832,089.47	490,972.12	2,980.10	0.02
14,600.0	89.85	179.56	11,377.7	7,820.7	-3,060.7	362.9	832,090.22	490,872.12	3,079.84	0.02
14,700.0	89.85	179.54	11,377.9	7,820.9	-3,160.7	363.7	832,091.00	490,772.13	3,179.59	0.02
14,800.0	89.85	179.53	11,378.2	7,821.2	-3,260.7	364.5	832,091.81	490,672.13	3,279.33	0.02
14,900.0	89.85	179.51	11,378.4	7,821.4	-3,360.7	365.3	832,092.64	490,572.13	3,379.08	0.02
15,000.0	89.85	179.50	11,378.7	7,821.7	-3,460.7	366.2	832,093.50	490,472.14	3,478.83	0.02
15,100.0	89.85	179.48	11,379.0	7,822.0	-3,560.7	367.1	832,094.39	490,372.14	3,578.58	0.02

Company: Caza Operating LLC
Project: Lennox 32 State 3H
Site: Lennox 32 State 3H
Well: Lennox 32 State 3H
Wellbore: Lennox 32 State 3H
Design: 181025 Lennox 32 State 3H

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

Well Lennox 32 State 3H
WELL @ 3557.0usft (Original Well Elev)
WELL @ 3557.0usft (Original Well Elev)
Grid
Minimum Curvature
EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Incl (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
15,200.0	89.85	179.47	11,379.2	7,822.2	-3,660.7	368.0	832,095.30	490,272.15	3,678.34	0.02
15,300.0	89.85	179.45	11,379.5	7,822.5	-3,760.7	368.9	832,096.24	490,172.15	3,778.09	0.02
15,400.0	89.85	179.44	11,379.8	7,822.8	-3,860.7	369.9	832,097.21	490,072.16	3,877.85	0.02
15,500.0	89.85	179.42	11,380.0	7,823.0	-3,960.7	370.9	832,098.20	489,972.16	3,977.61	0.02
15,600.0	89.85	179.41	11,380.3	7,823.3	-4,060.7	371.9	832,099.22	489,872.17	4,077.37	0.02
15,700.0	89.85	179.39	11,380.5	7,823.5	-4,160.7	372.9	832,100.26	489,772.17	4,177.13	0.02
15,800.0	89.85	179.38	11,380.8	7,823.8	-4,260.7	374.0	832,101.33	489,672.18	4,276.90	0.02
15,900.0	89.85	179.36	11,381.1	7,824.1	-4,360.7	375.1	832,102.43	489,572.18	4,376.67	0.02
16,000.0	89.85	179.35	11,381.3	7,824.3	-4,460.6	376.2	832,103.55	489,472.19	4,476.43	0.02
16,100.0	89.85	179.33	11,381.6	7,824.6	-4,560.6	377.4	832,104.70	489,372.20	4,576.20	0.02
16,200.0	89.85	179.32	11,381.8	7,824.8	-4,660.6	378.6	832,105.88	489,272.21	4,675.98	0.02
16,300.0	89.85	179.30	11,382.1	7,825.1	-4,760.6	379.8	832,107.08	489,172.21	4,775.75	0.02
16,325.0	89.85	179.30	11,382.2	7,825.2	-4,785.6	380.1	832,107.38	489,147.22	4,800.69	0.02

TD at 16325.0 - 5 1/2" Production Casing

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
120.0	120.0	20" Conductor	20	26
16,325.0	11,382.2	5 1/2" Production Casing	5-1/2	8-3/4
1,951.0	1,951.0	13 3/8" Surface Casing	13-3/8	17-1/2
5,661.0	5,661.0	9 5/8" Intermediate Casing	9-5/8	12-1/4

Company:	Caza Operating LLC	Local Co-ordinate Reference:	Well Lennox 32 State 3H
Project:	Lennox 32 State 3H	TVD Reference:	WELL @ 3557.0usft (Original Well Elev)
Site:	Lennox 32 State 3H	MD Reference:	WELL @ 3557.0usft (Original Well Elev)
Well:	Lennox 32 State 3H	North Reference:	Grid
Wellbore:	Lennox 32 State 3H	Survey Calculation Method:	Minimum Curvature
Design:	181025 Lennox 32 State 3H	Database:	EDM 5000.1 Single User Db

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
7,403.8	7,396.0	Brushy Canyon		0.00	
8,746.1	8,731.0	Bone Spring		0.00	
6,041.3	6,041.0	Cherry Canyon		0.00	
2,501.0	2,501.0	Top of Salt		0.00	
9,771.8	9,751.0	1st Bone Spring Sand		0.00	
10,337.9	10,314.0	2nd Bone Spring Sand		0.00	
4,096.0	4,096.0	Base of Salt		0.00	
5,686.0	5,686.0	Delaware		0.00	
4,716.0	4,716.0	Capitan		0.00	
11,199.2	11,155.0	3rd Bone Spring Sand		0.00	
1,926.0	1,926.0	Rustler		0.00	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,850.0	5,850.0	0.0	0.0	Start Build 3.00
6,050.0	6,049.6	7.5	7.3	Start 4600.0 hold at 6050.0 MD
10,650.0	10,624.4	350.4	344.4	Start Drop -3.00
10,850.0	10,824.1	357.9	351.7	Start 46.0 hold at 10850.0 MD
10,896.0	10,870.1	357.9	351.7	Start Build 11.46
11,680.0	11,370.0	-140.8	351.7	Start Turn -0.02
16,325.0	11,382.2	-4,785.6	380.1	TD at 16325.0

Checked By: _____	Approved By: _____	Date: _____
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Project: Lennox 32 State 3H
 Site: Lennox 32 State 3H
 Well: Lennox 32 State 3H
 Wellbore: Lennox 32 State 3H
 Design: 181025 Lennox 32 State 3H



**Caza
Petroleum**



Azimuths to Grid North
 True North: -0.50°
 Magnetic North: 6.09°

Magnetic Field
 Strength: 47974.8snT
 Dip Angle: 60.15°
 Date: 10/25/2018
 Model: IGRF2010

CASING DETAILS

TVD	MD	Name	Size
120.0	120.0	20" Conductor	20
1951.0	1951.0	13 3/8" Surface Casing	13-3/8
5661.0	5661.0	9 5/8" Intermediate Casing	9-5/8
11382.2	16325.0	5 1/2" Production Casing	5-1/2

FORMATION TOP DETAILS

TVDPATH	MDPATH	Formation	DipAngle	DipDir
1926.0	1926.0	Rustler	0.00	
2501.0	2501.0	Top of Salt	0.00	
4096.0	4096.0	Base of Salt	0.00	
4716.0	4716.0	Capitan	0.00	
5686.0	5686.0	Delaware	0.00	
6041.0	6041.3	Cherry Canyon	0.00	
7396.0	7403.8	Brushy Canyon	0.00	
8731.0	8746.1	Bone Spring	0.00	
9751.0	9771.8	1st Bone Spring Sand	0.00	
10314.0	10337.9	2nd Bone Spring Sand	0.00	
11155.0	11199.2	3rd Bone Spring Sand	0.00	

HOBBS OCD
OCT 29 2018
RECEIVED

