



MARATHON OIL CORP.

Eddy County, NM (NAD27)
Southern Comfort State 24-28-25
WD #12H

30-015-45030

ST01

NM OIL CONSERVATION
ARTESIA DISTRICT

DEC 03 2018

RECEIVED

Design: ST01 (Actual)

Standard Survey Report

25 August, 2018



Company: MARATHON OIL CORP.
Project: Eddy County, NM (NAD27)
Site: Southern Comfort State 24-28-25
Well: WD #12H
Wellbore: ST01
Design: ST01 (Actual)

Local Co-ordinate Reference: Well WD #12H
TVD Reference: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)
MD Reference: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project	Eddy County, NM (NAD27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		Using geodetic scale factor

Site Southern Comfort State 24-28-25

Site Position: **From:** Map **Northing:** 432,128.89 usft **Latitude:** 32° 11' 15.6951 N
Easting: 591,559.01 usft **Longitude:** 104° 2' 14.5418 W
Position Uncertainty: 0.00 usft **Slot Radius:** 13-3/16 " **Grid Convergence:** 0.16 °

Well WD #12H
Well Position **+N/-S** 0.00 usft **Northing:** 432,128.89 usft **Latitude:** 32° 11' 15.6967 N
+E/-W 0.00 usft **Easting:** 591,499.01 usft **Longitude:** 104° 2' 15.2400 W
Position Uncertainty 0.00 usft **Wellhead Elevation:** 0.00 usft **Ground Level:** 2,917.00 usft

Wellbore ST01

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/10/2018	7.13	59.97	47,974

Design ST01 (Actual)

Audit Notes:

Version: Actual **Phase:** ACTUAL **Tie On Depth:** 10,344.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	180.00

Survey Program Date 8/25/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
210.00	10,344.00	Survey #1 (OH)	MWD+IFR1+MS	MWD + IFR1 + Multi-Station Correction
10,438.00	16,748.00	LEAM MWD Surveys (10344' MD) 10438'	MWD+IFR1+MS	MWD + IFR1 + Multi-Station Correction
16,797.00	16,797.00	Projected to T.D.- 16,797' MD- 10795.54'	Project	Projection

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
210.00	1.19	68.09	209.98	0.81	2.02	-0.81	0.57	0.57	0.00
332.00	1.23	68.09	331.96	1.78	4.41	-1.78	0.03	0.03	0.00
391.00	1.27	55.79	390.94	2.38	5.54	-2.38	0.46	0.07	-20.85
515.00	1.19	49.37	514.92	3.99	7.66	-3.99	0.13	-0.06	-5.18
606.00	1.19	55.61	605.90	5.14	9.15	-5.14	0.14	0.00	6.86
698.00	0.70	68.27	697.88	5.89	10.46	-5.89	0.58	-0.53	13.76
790.00	0.57	122.67	789.88	5.85	11.37	-5.85	0.64	-0.14	59.13
883.00	0.44	174.00	882.87	5.24	11.80	-5.24	0.49	-0.14	55.19

Company: MARATHON OIL CORP.
Project: Eddy County, NM (NAD27)
Site: Southern Comfort State 24-28-25
Well: WD #12H
Wellbore: ST01
Design: ST01 (Actual)

Local Co-ordinate Reference: Well WD #12H
TVD Reference: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)
MD Reference: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

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)
974.00	0.53	212.32	973.87	4.54	11.61	-4.54	0.36	0.10	42.11
1,033.00	0.48	234.56	1,032.87	4.17	11.26	-4.17	0.34	-0.08	37.69
1,128.00	0.62	243.17	1,127.87	3.70	10.48	-3.70	0.17	0.15	9.06
1,222.00	1.27	255.92	1,221.85	3.22	9.01	-3.22	0.72	0.69	13.56
1,316.00	1.54	250.29	1,315.82	2.54	6.81	-2.54	0.32	0.29	-5.99
1,411.00	2.11	247.57	1,410.78	1.44	4.00	-1.44	0.61	0.60	-2.86
1,506.00	1.27	241.33	1,505.73	0.27	1.46	-0.27	0.90	-0.88	-6.57
1,601.00	0.70	230.08	1,600.72	-0.61	0.09	0.61	0.63	-0.60	-11.84
1,695.00	0.70	238.07	1,694.71	-1.28	-0.84	1.28	0.10	0.00	8.50
1,790.00	0.53	266.99	1,789.71	-1.61	-1.77	1.61	0.37	-0.18	30.44
1,885.00	0.13	147.02	1,884.71	-1.72	-2.15	1.72	0.64	-0.42	-126.28
1,979.00	1.85	100.09	1,978.69	-2.08	-0.60	2.08	1.88	1.83	-49.93
2,073.00	3.91	125.66	2,072.57	-4.21	3.50	4.21	2.53	2.19	27.20
2,168.00	4.97	148.51	2,167.29	-9.61	8.28	9.61	2.15	1.12	24.05
2,262.00	5.14	161.43	2,260.93	-17.07	11.75	17.07	1.22	0.18	13.74
2,357.00	4.79	175.94	2,355.57	-25.07	13.38	25.07	1.37	-0.37	15.27
2,452.00	5.45	170.84	2,450.19	-33.48	14.38	33.48	0.84	0.69	-5.37
2,546.00	5.05	163.37	2,543.80	-41.85	16.28	41.85	0.84	-0.43	-7.95
2,591.00	4.79	163.81	2,588.63	-45.55	17.37	45.55	0.58	-0.58	0.98
2,746.00	5.28	144.30	2,743.05	-57.56	23.33	57.56	1.14	0.32	-12.59
2,840.00	6.68	122.32	2,836.55	-63.99	30.48	63.99	2.83	1.49	-23.38
2,935.00	6.68	98.77	2,930.92	-67.79	40.61	67.79	2.86	0.00	-24.79
3,030.00	7.65	94.72	3,025.18	-69.15	52.38	69.15	1.15	1.02	-4.26
3,124.00	8.09	76.97	3,118.30	-68.18	65.06	68.18	2.62	0.47	-18.88
3,219.00	9.94	78.20	3,212.13	-64.99	79.60	64.99	1.96	1.95	1.29
3,313.00	11.34	76.97	3,304.51	-61.25	96.54	61.25	1.51	1.49	-1.31
3,407.00	10.99	75.04	3,396.73	-56.85	114.20	56.85	0.54	-0.37	-2.05
3,502.00	11.61	63.26	3,489.90	-50.21	131.49	50.21	2.51	0.65	-12.40
3,596.00	10.38	70.82	3,582.18	-43.17	147.94	43.17	2.01	-1.31	8.04
3,691.00	11.87	90.33	3,675.42	-40.42	165.80	40.42	4.24	1.57	20.54
3,786.00	13.19	78.03	3,768.18	-38.23	186.18	38.23	3.13	1.39	-12.95
3,880.00	15.12	88.75	3,859.33	-35.73	208.93	35.73	3.45	2.05	11.40
3,974.00	15.30	79.78	3,950.05	-33.27	233.40	33.27	2.51	0.19	-9.54
4,069.00	14.51	79.78	4,041.86	-28.93	257.44	28.93	0.83	-0.83	0.00
4,163.00	13.10	74.16	4,133.14	-23.93	279.28	23.93	2.07	-1.50	-5.98
4,257.00	14.86	82.95	4,224.36	-19.54	301.50	19.54	2.93	1.87	9.35
4,352.00	14.42	86.11	4,316.28	-17.25	325.39	17.25	0.96	-0.46	3.33
4,446.00	13.81	81.54	4,407.45	-14.80	348.16	14.80	1.35	-0.65	-4.86
4,540.00	13.63	84.71	4,498.76	-12.13	370.29	12.13	0.82	-0.19	3.37
4,634.00	14.33	66.07	4,590.03	-6.39	391.96	6.39	4.83	0.74	-19.83
4,729.00	14.33	80.31	4,682.10	0.36	414.30	-0.36	3.70	0.00	14.99
4,824.00	13.72	78.03	4,774.27	4.68	436.91	-4.68	0.87	-0.64	-2.40
4,919.00	12.13	78.03	4,866.86	9.08	457.70	-9.08	1.67	-1.67	0.00

Company: MARATHON OIL CORP.
Project: Eddy County, NM (NAD27)
Site: Southern Comfort State 24-28-25
Well: WD #12H
Wellbore: ST01
Design: ST01 (Actual)

Local Co-ordinate Reference: Well WD #12H
TVD Reference: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)
MD Reference: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

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)
5,014.00	12.75	64.31	4,959.65	15.70	476.92	-15.70	3.17	0.65	-14.44
5,108.00	13.89	75.56	5,051.13	23.01	497.19	-23.01	3.01	1.21	11.97
5,202.00	15.48	78.38	5,142.06	28.35	520.41	-28.35	1.85	1.69	3.00
5,297.00	12.84	78.73	5,234.17	32.97	543.18	-32.97	2.78	-2.78	0.37
5,392.00	12.40	64.31	5,326.89	39.46	562.73	-39.46	3.34	-0.46	-15.18
5,487.00	12.75	74.69	5,419.63	46.65	582.04	-46.65	2.40	0.37	10.93
5,582.00	14.16	80.14	5,512.02	51.41	603.60	-51.41	1.99	1.48	5.74
5,677.00	15.74	76.80	5,603.80	56.34	627.59	-56.34	1.89	1.66	-3.52
5,771.00	14.68	89.63	5,694.54	59.33	651.93	-59.33	3.75	-1.13	13.65
5,865.00	14.25	84.18	5,785.56	60.58	675.35	-60.58	1.52	-0.46	-5.80
5,960.00	14.77	67.13	5,877.57	66.47	698.15	-66.47	4.51	0.55	-17.95
6,055.00	16.09	67.83	5,969.15	76.15	721.50	-76.15	1.40	1.39	0.74
6,149.00	17.06	75.74	6,059.25	84.46	746.93	-84.46	2.61	1.03	8.41
6,243.00	15.56	95.60	6,149.54	86.63	772.86	-86.63	6.11	-1.60	21.13
6,338.00	14.86	91.39	6,241.21	85.09	797.72	-85.09	1.38	-0.74	-4.43
6,432.00	13.45	86.46	6,332.36	85.47	820.68	-85.47	1.97	-1.50	-5.24
6,527.00	11.43	83.65	6,425.12	87.19	841.07	-87.19	2.22	-2.13	-2.96
6,622.00	10.73	90.15	6,518.36	88.21	859.27	-88.21	1.51	-0.74	6.84
6,716.00	11.17	85.23	6,610.65	88.95	877.09	-88.95	1.10	0.47	-5.23
6,811.00	11.52	97.01	6,703.80	88.55	895.68	-88.55	2.46	0.37	12.40
6,905.00	15.21	91.21	6,795.24	87.15	917.33	-87.15	4.17	3.93	-6.17
7,000.00	12.66	79.61	6,887.46	88.76	940.04	-88.76	3.97	-2.68	-12.21
7,094.00	13.54	86.64	6,979.02	91.27	961.16	-91.27	1.93	0.94	7.48
7,189.00	17.50	77.32	7,070.55	95.05	986.21	-95.05	4.91	4.17	-9.81
7,283.00	16.53	69.94	7,160.44	102.75	1,012.56	-102.75	2.52	-1.03	-7.85
7,376.00	17.59	75.56	7,249.36	110.79	1,038.60	-110.79	2.11	1.14	6.04
7,471.00	17.76	76.80	7,339.87	117.68	1,066.61	-117.68	0.43	0.18	1.31
7,566.00	16.80	82.60	7,430.59	122.75	1,094.33	-122.75	2.07	-1.01	6.11
7,660.00	13.98	84.18	7,521.21	125.66	1,119.11	-125.66	3.03	-3.00	1.68
7,754.00	13.63	80.31	7,612.50	128.67	1,141.32	-128.67	1.05	-0.37	-4.12
7,849.00	13.10	72.22	7,704.93	133.84	1,162.61	-133.84	2.04	-0.56	-8.52
7,943.00	13.98	90.86	7,796.36	136.93	1,184.11	-136.93	4.71	0.94	19.83
8,038.00	15.48	89.28	7,888.24	136.91	1,208.27	-136.91	1.63	1.58	-1.66
8,133.00	12.84	94.37	7,980.35	136.27	1,231.47	-136.27	3.07	-2.78	5.36
8,227.00	12.57	72.75	8,072.10	138.51	1,251.67	-138.51	5.04	-0.29	-23.00
8,322.00	13.72	89.28	8,164.64	141.72	1,272.81	-141.72	4.12	1.21	17.40
8,417.00	15.48	90.86	8,256.57	141.67	1,296.76	-141.67	1.90	1.85	1.66
8,511.00	16.27	87.69	8,346.99	142.01	1,322.46	-142.01	1.25	0.84	-3.37
8,606.00	14.86	75.21	8,438.53	145.66	1,347.54	-145.66	3.82	-1.48	-13.14
8,701.00	13.89	82.24	8,530.56	150.31	1,370.62	-150.31	2.10	-1.02	7.40
8,795.00	14.33	84.00	8,621.72	153.05	1,393.37	-153.05	0.65	0.47	1.87
8,890.00	12.49	78.90	8,714.13	156.25	1,415.14	-156.25	2.30	-1.94	-5.37
8,984.00	12.57	76.97	8,805.89	160.52	1,435.08	-160.52	0.45	0.09	-2.05

Company: MARATHON OIL CORP.
Project: Eddy County, NM (NAD27)
Site: Southern Comfort State 24-28-25
Well: WD #12H
Wellbore: ST01
Design: ST01 (Actual)

Local Co-ordinate Reference: Well WD #12H
TVD Reference: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)
MD Reference: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

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)
9,079.00	10.99	71.87	8,898.89	165.67	1,453.76	-165.67	1.99	-1.66	-5.37
9,173.00	8.62	70.29	8,991.51	170.83	1,468.91	-170.83	2.54	-2.52	-1.68
9,268.00	10.55	72.75	9,085.18	175.81	1,483.92	-175.81	2.08	2.03	2.59
9,362.00	10.20	84.53	9,177.65	179.16	1,500.43	-179.16	2.28	-0.37	12.53
9,457.00	8.88	85.23	9,271.34	180.57	1,516.11	-180.57	1.39	-1.39	0.74
9,551.00	7.91	84.18	9,364.33	181.83	1,529.77	-181.83	1.04	-1.03	-1.12
9,645.00	4.75	77.67	9,457.75	183.31	1,540.01	-183.31	3.44	-3.36	-6.93
9,740.00	1.85	92.79	9,552.58	184.08	1,545.39	-184.08	3.16	-3.05	15.92
9,834.00	1.58	103.16	9,646.54	183.71	1,548.17	-183.71	0.44	-0.29	11.03
9,928.00	1.23	202.48	9,740.52	182.48	1,549.04	-182.48	2.29	-0.37	105.66
9,980.00	1.14	206.70	9,792.51	181.51	1,548.60	-181.51	0.24	-0.17	8.12
10,059.00	1.49	229.60	9,871.49	180.14	1,547.46	-180.14	0.79	0.44	28.99
10,155.00	1.54	245.52	9,967.46	178.79	1,545.34	-178.79	0.44	0.05	16.58
10,249.00	2.20	248.58	10,061.41	177.61	1,542.51	-177.61	0.71	0.70	3.26
10,344.00	1.98	257.37	10,156.34	176.59	1,539.21	-176.59	0.41	-0.23	9.25
ST01 Tie-In - 10344' MD - 10156.34' TVD									
10,438.00	10.07	287.04	10,249.76	178.64	1,529.75	-178.64	8.94	8.61	31.56
ST01 First Survey- 10438' MD- 10249.76' TVD									
10,509.00	13.23	245.51	10,319.40	177.09	1,516.40	-177.09	12.29	4.45	-58.49
10,604.00	18.15	205.51	10,411.09	159.17	1,500.07	-159.17	12.19	5.18	-42.11
10,699.00	21.80	174.67	10,500.61	128.16	1,495.33	-128.16	11.58	3.84	-32.46
10,794.00	26.30	174.26	10,587.34	89.63	1,499.07	-89.63	4.74	4.74	-0.43
10,888.00	37.53	181.46	10,667.03	40.12	1,500.43	-40.12	12.60	11.95	7.66
10,982.00	55.75	182.42	10,731.30	-27.90	1,498.04	27.90	19.40	19.38	1.02
11,080.00	74.26	182.20	10,772.53	-116.26	1,494.49	116.26	18.89	18.89	-0.22
11,174.00	82.15	181.02	10,791.73	-208.17	1,491.92	208.17	8.48	8.39	-1.26
11,268.00	84.31	179.49	10,802.81	-301.50	1,491.51	301.50	2.81	2.30	-1.63
11,363.00	87.76	174.05	10,809.38	-396.07	1,496.85	396.07	6.77	3.63	-5.73
11,460.00	94.49	176.80	10,807.48	-492.68	1,504.59	492.68	7.49	6.94	2.84
11,555.00	94.85	175.78	10,799.74	-587.16	1,510.71	587.16	1.14	0.38	-1.07
11,649.00	91.97	175.79	10,794.15	-680.73	1,517.61	680.73	3.06	-3.06	0.01
11,743.00	89.26	172.55	10,793.14	-774.22	1,527.15	774.22	4.49	-2.88	-3.45
11,837.00	88.15	171.98	10,795.27	-867.34	1,539.80	867.34	1.33	-1.18	-0.61
11,932.00	89.74	174.44	10,797.02	-961.65	1,551.03	961.65	3.08	1.67	2.59
12,026.00	89.67	177.25	10,797.50	-1,055.39	1,557.84	1,055.39	2.99	-0.07	-2.99
12,121.00	90.89	184.49	10,797.03	-1,150.31	1,556.40	1,150.31	7.73	1.28	7.62
12,215.00	87.35	181.45	10,798.48	-1,244.15	1,551.53	1,244.15	4.96	-3.77	-3.23
12,309.00	91.23	184.23	10,799.64	-1,338.00	1,546.87	1,338.00	5.08	4.13	2.96
12,405.00	93.70	185.77	10,795.51	-1,433.54	1,538.52	1,433.54	3.03	2.57	1.60
12,499.00	91.24	184.24	10,791.46	-1,527.08	1,530.32	1,527.08	3.08	-2.62	-1.63
12,594.00	93.57	184.54	10,787.48	-1,621.71	1,523.06	1,621.71	2.47	2.45	0.32
12,688.00	92.29	184.21	10,782.67	-1,715.31	1,515.90	1,715.31	1.41	-1.36	-0.35
12,784.00	90.72	182.64	10,780.15	-1,811.10	1,510.17	1,811.10	2.31	-1.64	-1.64
12,878.00	89.98	180.92	10,779.58	-1,905.05	1,507.25	1,905.05	1.99	-0.79	-1.83

Company: MARATHON OIL CORP.
Project: Eddy County, NM (NAD27)
Site: Southern Comfort State 24-28-25
Well: WD #12H
Wellbore: ST01
Design: ST01 (Actual)

Local Co-ordinate Reference: Well WD #12H
TVD Reference: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)
MD Reference: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

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)
12,973.00	88.64	181.32	10,780.72	-2,000.02	1,505.39	2,000.02	1.47	-1.41	0.42
13,068.00	89.03	180.49	10,782.65	-2,094.99	1,503.89	2,094.99	0.97	0.41	-0.87
13,162.00	88.82	179.60	10,784.42	-2,188.97	1,503.82	2,188.97	0.97	-0.22	-0.95
13,257.00	90.23	180.35	10,785.20	-2,283.97	1,503.86	2,283.97	1.68	1.48	0.79
13,350.00	89.98	179.24	10,785.03	-2,376.97	1,504.19	2,376.97	1.22	-0.27	-1.19
13,445.00	87.49	178.32	10,787.13	-2,471.91	1,506.21	2,471.91	2.79	-2.62	-0.97
13,540.00	92.07	181.55	10,787.49	-2,566.87	1,506.32	2,566.87	5.90	4.82	3.40
13,634.00	90.53	179.97	10,785.36	-2,660.84	1,505.07	2,660.84	2.35	-1.64	-1.68
13,729.00	90.11	179.87	10,784.83	-2,755.83	1,505.21	2,755.83	0.45	-0.44	-0.11
13,823.00	89.48	178.68	10,785.17	-2,849.82	1,506.39	2,849.82	1.43	-0.67	-1.27
13,918.00	89.84	177.49	10,785.73	-2,944.77	1,509.57	2,944.77	1.31	0.38	-1.25
14,012.00	92.63	178.13	10,783.71	-3,038.67	1,513.16	3,038.67	3.05	2.97	0.68
14,107.00	90.99	179.85	10,780.71	-3,133.60	1,514.83	3,133.60	2.50	-1.73	1.81
14,202.00	90.42	182.76	10,779.54	-3,228.56	1,512.67	3,228.56	3.12	-0.60	3.06
14,296.00	88.72	181.66	10,780.24	-3,322.48	1,509.05	3,322.48	2.15	-1.81	-1.17
14,390.00	91.58	185.48	10,780.00	-3,416.27	1,503.19	3,416.27	5.08	3.04	4.06
14,485.00	88.76	182.77	10,779.71	-3,511.00	1,496.36	3,511.00	4.12	-2.97	-2.85
14,579.00	93.30	187.27	10,778.02	-3,604.58	1,488.15	3,604.58	6.80	4.83	4.79
14,674.00	89.46	182.32	10,775.73	-3,699.17	1,480.21	3,699.17	6.59	-4.04	-5.21
14,769.00	87.17	179.33	10,778.53	-3,794.10	1,478.85	3,794.10	3.96	-2.41	-3.15
14,862.00	89.01	180.99	10,781.63	-3,887.05	1,478.58	3,887.05	2.66	1.98	1.78
14,956.00	86.10	180.02	10,785.64	-3,980.94	1,477.76	3,980.94	3.26	-3.10	-1.03
15,050.00	85.78	179.41	10,792.29	-4,074.71	1,478.22	4,074.71	0.73	-0.34	-0.65
15,144.00	89.63	181.61	10,796.06	-4,168.60	1,477.38	4,168.60	4.72	4.10	2.34
15,239.00	91.74	175.91	10,794.92	-4,263.53	1,479.44	4,263.53	6.40	2.22	-6.00
15,333.00	92.50	173.26	10,791.44	-4,357.04	1,488.30	4,357.04	2.93	0.81	-2.82
15,428.00	91.56	178.09	10,788.08	-4,451.68	1,495.46	4,451.68	5.18	-0.99	5.08
15,522.00	89.49	175.66	10,787.21	-4,545.52	1,500.58	4,545.52	3.40	-2.20	-2.59
15,617.00	87.89	175.31	10,789.39	-4,640.20	1,508.06	4,640.20	1.72	-1.68	-0.37
15,711.00	90.82	178.75	10,790.44	-4,734.04	1,512.93	4,734.04	4.81	3.12	3.66
15,805.00	91.84	181.46	10,788.26	-4,828.01	1,512.75	4,828.01	3.08	1.09	2.88
15,900.00	90.13	181.87	10,786.63	-4,922.95	1,509.99	4,922.95	1.85	-1.80	0.43
15,994.00	88.90	183.02	10,787.42	-5,016.86	1,505.98	5,016.86	1.79	-1.31	1.22
16,088.00	87.88	183.14	10,790.07	-5,110.68	1,500.94	5,110.68	1.09	-1.09	0.13
16,183.00	91.50	182.83	10,790.58	-5,205.54	1,495.99	5,205.54	3.82	3.81	-0.33
16,277.00	90.35	180.93	10,789.06	-5,299.47	1,492.91	5,299.47	2.36	-1.22	-2.02
16,371.00	87.51	176.84	10,790.82	-5,393.41	1,494.73	5,393.41	5.30	-3.02	-4.35
16,466.00	89.99	175.11	10,792.89	-5,488.14	1,501.40	5,488.14	3.18	2.61	-1.82
16,560.00	90.48	177.48	10,792.50	-5,581.93	1,507.47	5,581.93	2.57	0.52	2.52
16,654.00	89.36	176.80	10,792.64	-5,675.81	1,512.16	5,675.81	1.39	-1.19	-0.72
16,748.00	88.58	173.08	10,794.33	-5,769.42	1,520.45	5,769.42	4.04	-0.83	-3.96
LEAM MWD Surveys (10344' MD) 10438' MD- 16748' MD									
16,797.00	88.58	173.08	10,795.54	-5,818.04	1,526.35	5,818.04	0.00	0.00	0.00
Projected to T.D.- 16,797' MD- 10,795.54' TVD									

Company: MARATHON OIL CORP.
Project: Eddy County, NM (NAD27)
Site: Southern Comfort State 24-28-25
Well: WD #12H
Wellbore: ST01
Design: ST01 (Actual)

Local Co-ordinate Reference: Well WD #12H
TVD Reference: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)
MD Reference: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

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)
-----------------------------	--------------------	----------------	-----------------------------	-----------------	-----------------	-------------------------------	-------------------------------	------------------------------	-----------------------------

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,344.00	10,156.34	176.59	1,539.21	ST01 Tie-In - 10344' MD - 10156.34' TVD
10,438.00	10,249.76	178.64	1,529.75	ST01 First Survey- 10438' MD- 10249.76' TVD
16,748.00	10,794.33	-5,769.42	1,520.45	LEAM MWD Surveys (10344' MD) 10438' MD- 16748' MD
16,797.00	10,795.54	-5,818.04	1,526.35	Projected to T.D.- 16,797' MD- 10,795.54' TVD

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------

MARATHON OIL CORP.

Project: Eddy County, NM (NAD27)
 Site: Southern Comfort State 24-28-25
 Well: WD #12H
 Wellbore: ST01
 Design: ST01 Plan #1a



Azimuths to Grid North
 True North: -0.16°
 Magnetic North: 6.97°
 Magnetic Field
 Strength: 47973.8nT
 Dip Angle: 59.97°
 Date: 8/10/2018
 Model: HDGM

PROJECT DETAILS: Eddy County, (NAD27)
 Geodetic System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: New Mexico East 3001
 Datum: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)

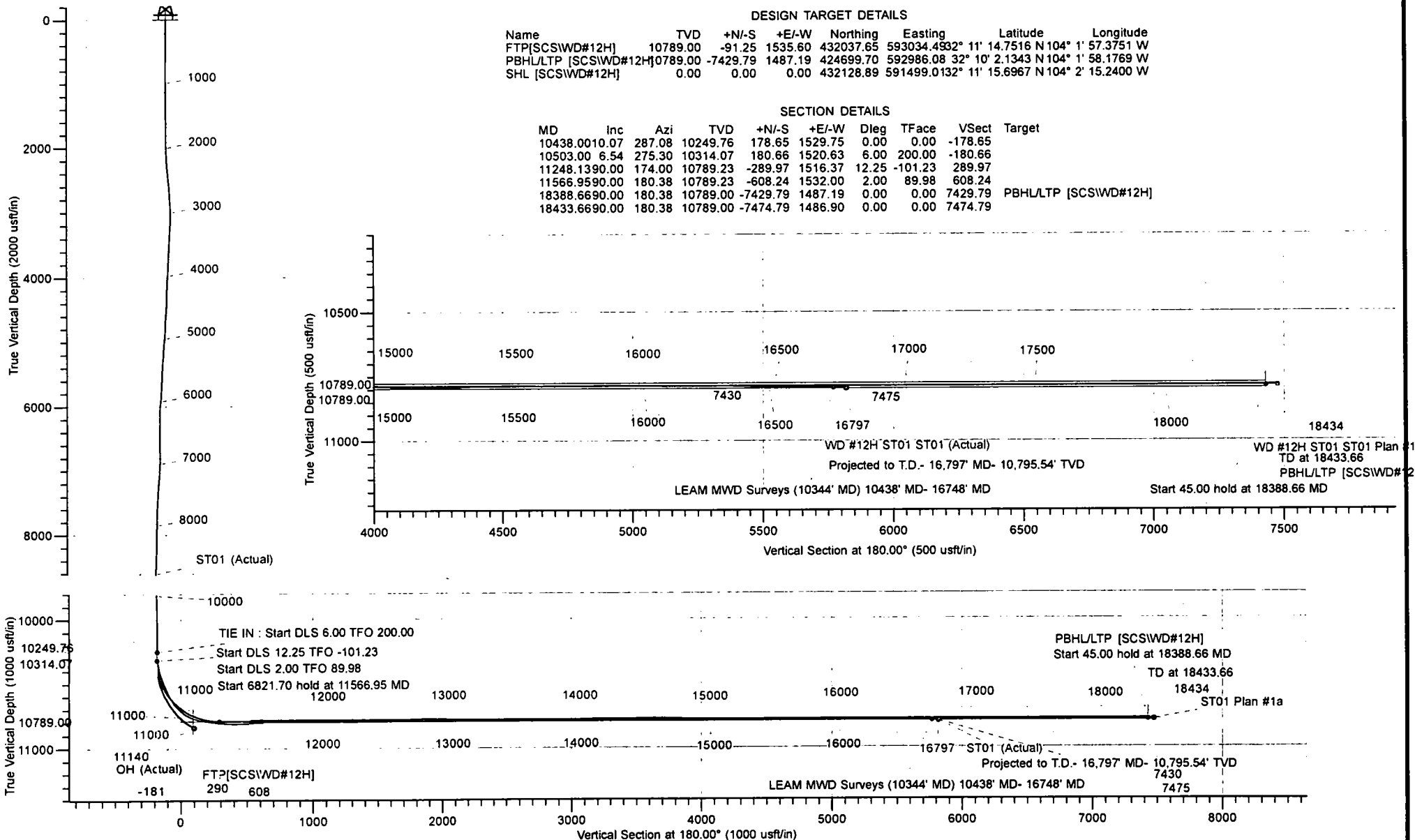


DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
FTP[SCSWD#12H]	10789.00	-91.25	1535.60	432037.65	593034.4932	11° 14.7516' N 104° 1' 57.3751' W	
PBHL/LTP [SCSWD#12H]	10789.00	-7429.79	1487.19	424699.70	592986.08	32° 10' 2.1343' N 104° 1' 58.1769' W	
SHL [SCSWD#12H]	0.00	0.00	0.00	432128.89	591499.0132	11° 15.6967' N 104° 2' 15.2400' W	

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
10438.00	10.07	287.08	10249.76	178.65	1529.75	0.00	0.00	-178.65	
10503.00	6.54	275.30	10314.07	180.66	1520.63	6.00	200.00	-180.66	
11248.13	90.00	174.00	10789.23	-289.97	1516.37	12.25	-101.23	289.97	
11566.95	90.00	180.38	10789.23	-608.24	1532.00	2.00	89.98	608.24	
18388.66	90.00	180.38	10789.00	-7429.79	1487.19	0.00	0.00	7429.79	PBHL/LTP [SCSWD#12H]
18433.66	90.00	180.38	10789.00	-7474.79	1486.90	0.00	0.00	7474.79	



LEAM DRILLING SERVICES
 2010 East Davis, Conroe, Texas 77301
 Phone: 936/756-7618, Fax: 936/756-7595

Plan: ST01 Plan #1a (WD #12H/ST01)
 Southern Comfort State 24-28-25
 Created By: Nora Tucker Date: 6:58, August 28 2018
 Date: Approved: Date:

MARATHON OIL CORP.

Project: Eddy County, NM (NAD27)
 Site: Southern Comfort State 24-28-25
 Well: WD #12H
 Wellbore: ST01
 Design: ST01 Plan #1a



Azimuths to Grid North
 True North: -0.16°
 Magnetic North: 6.97°
 Magnetic Field
 Strength: 47973.8snT
 Dip Angle: 59.97°
 Date: 8/10/2018
 Model: HDGM

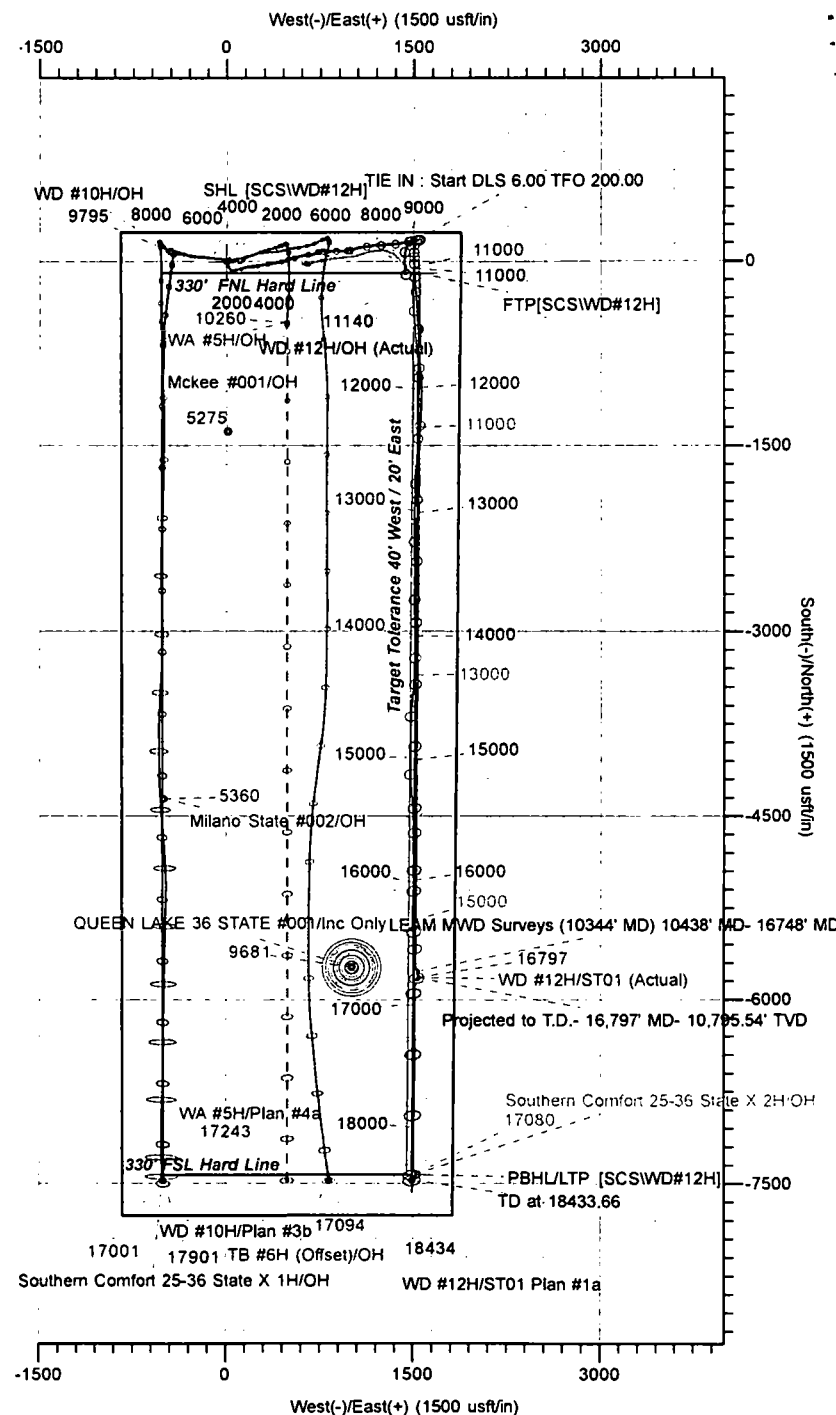
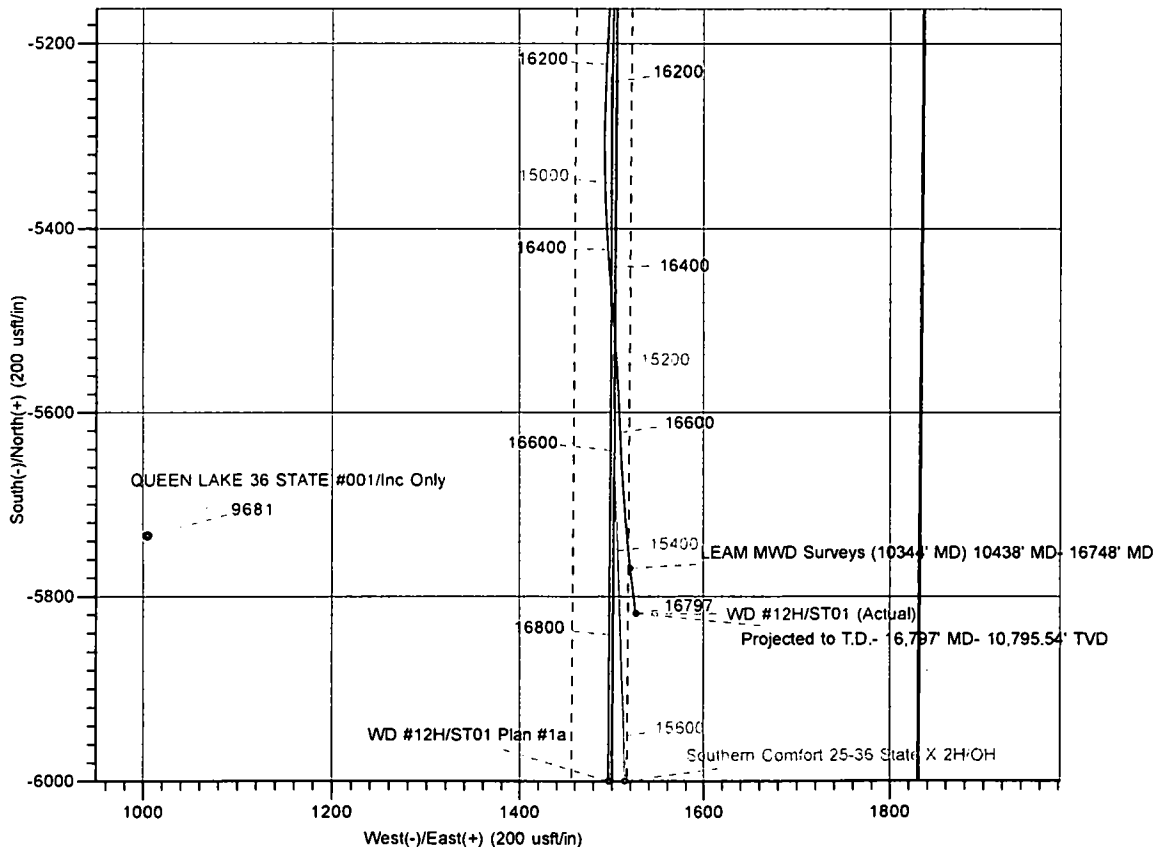


PROJECT DETAILS: Eddy County, NM (NAD27)

Geodetic System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: New Mexico East 3001
 Datum: GE 2917' + KB 26.5' @ 2943.50usft (H&P 498)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL [SCSWD#12H]	0.00	0.00	0.00	432128.89	591499.0132	11° 15.6967' N 104° 2' 15.2400' W	
FTP[SCSWD#12H]	10789.00	-91.25	1535.60	432037.65	593034.4932	11° 14.7516' N 104° 1' 57.3751' W	
PBHL/LTP [SCSWD#12H]	10789.00	-7429.79	1487.19	424699.70	592986.08	32° 10' 2.1343' N 104° 1' 58.1769' W	



LEAM DRILLING SERVICES
 2010 East Davis, Conroe, Texas 77301
 Phone: 936/756-7618, Fax: 936/756-7595

Plan: ST01 Plan #1a (WD #12H/ST01)
 Southern Comfort State 24-28-25
 Created By: Nora Tucker Date: 6:43, August 26 2018
 Date: _____
 Approved: _____ Date: _____