Honea 19-05 Pad
WMC 412-19-793
Well WMC 412-19-793 - Slot WMC 412-19-793, True North
Surveys

Terra Energy Partners, LLP
WMC 412-19-793
Garfield County, CO (Nad 83)
KB @ 8593.0ft

PROJECT DETAILS: Garfield County, CO (Nad 83)

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Central Zone

System Datum: Mean Sea Level

WELL DETAILS: WMC 412-19-793

Ground Level: 8563.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1588610.091	2343987.900	39.426476	-107.822591	WMC 412-19-793

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
VP	7558.0	124.6	-244.3	1588740.900	2343746.900	39.426818	-107.823455
PBHL	10833.0	124.6	-244.3	1588740.900	2343746.900	39.426818	-107.823455

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation
201.0	201.0	1.71	278.85	0.5	-3.0	2.9	3.0	First Survey @ 201 MD/ 201 TVD
10594.7	10603.0	4.66	235.78	97.8	-256.2	274.2	370.1	PTB @ 10603 MD/ 10594.7 TVD

SLOTS

Slot Name	+N/-S	+E/-W	Northing	Easting
HONEA 19-05B	10.4	24.8	1588619.891	2344013.000
Honea 24-01C	-3.5	10.8	1588606.291	2343998.600
HONEA 24-09C	-17.6	-3.7	1588592.591	2343983.800
WMC 11-19-793	15.8	16.1	1588625.491	2344004.400
WMC 311-19-793	10.6	10.7	1588620.391	2343998.900
WMC 32-19-793	31.6	32.1	1588640.891	2344020.800
WMC 33-19-793	19.3	33.8	1588628.491	2344022.200
WMC 332-19-793	26.4	26.7	1588635.791	2344015.300
WMC 333-19-793	3.5	17.7	1588613.091	2344005.700
WMC 343-24-794	-26.3	-26.6	1588584.491	2343960.600
WMC 344-24-794	-49.2	-35.7	1588561.791	2343951.000
WMC 411-19-793	5.3	5.4	1588615.291	2343993.400
WMC 412-19-793	0.0	0.0	1588610.091	2343987.900
WMC 432-19-793	21.1	21.4	1588630.591	2344009.800
WMC 433-19-793	-5.2	-5.3	1588604.991	2343982.500
WMC 44-24-794	-36.9	-37.4	1588574.191	2343949.600
WMC 444-24-794	-44.0	-30.3	1588566.891	2343956.500
WMC 512-19-793	-31.5	-32.0	1588579.391	2343955.100
WMC 532-19-793	24.5	39.1	1588633.591	2344027.600
WMC 533-19-793	-12.4	1.7	1588597.691	2343989.300
WMC 543-24-794	-42.1	-42.6	1588569.091	2343944.200

Azimuths to True North
Magnetic North: 8.85°

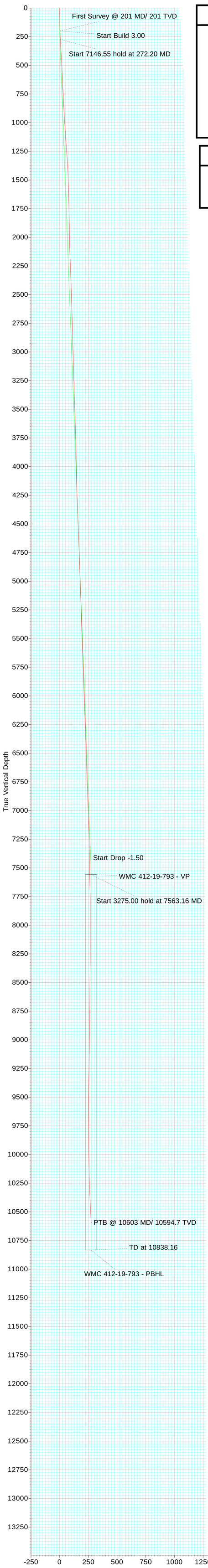
Magnetic Field
Strength: 51015.2snT
Dip Angle: 65.35°
Date: 12/23/2022
Model: HDGM

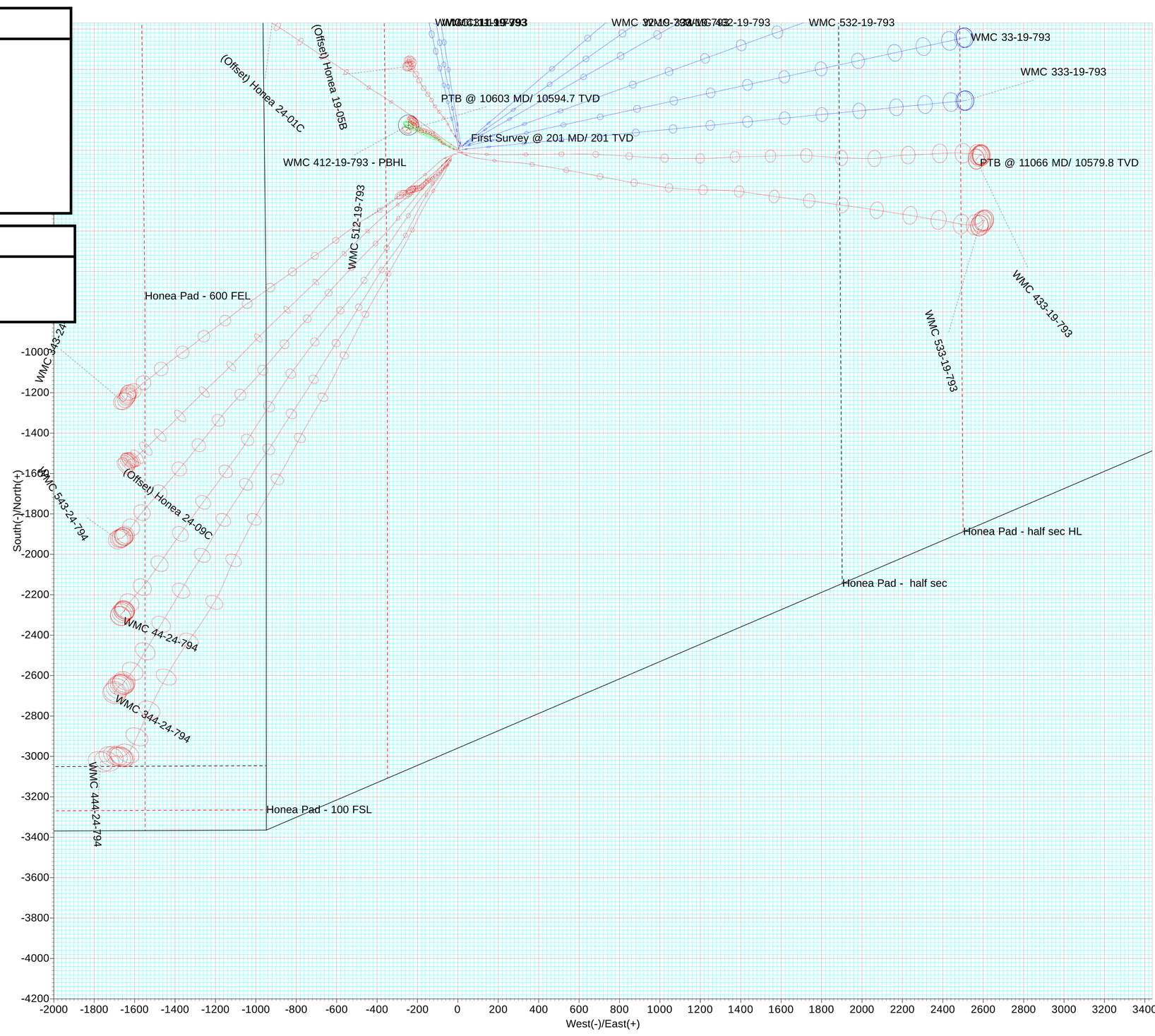
FORMATION TOP DETAILS

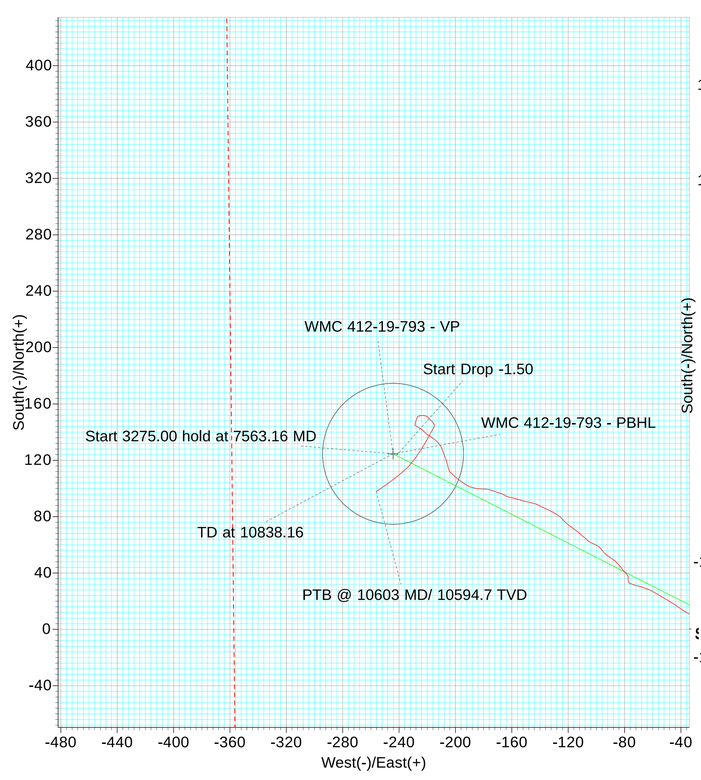
TVDPath	MDPath	Formation
0.0	0.0	GRRV
300.0	300.0	U__WASATCH
4628.0	4631.1	G_SAND
5718.0	5721.9	FRUN
6588.0	6592.5	L__WSCH
7028.0	7032.9	OCRK
7558.0	7563.2	TOPGAS
7558.0	7563.2	U__MVRD
9643.0	9648.2	CMEO
10483.0	10488.2	RLNS

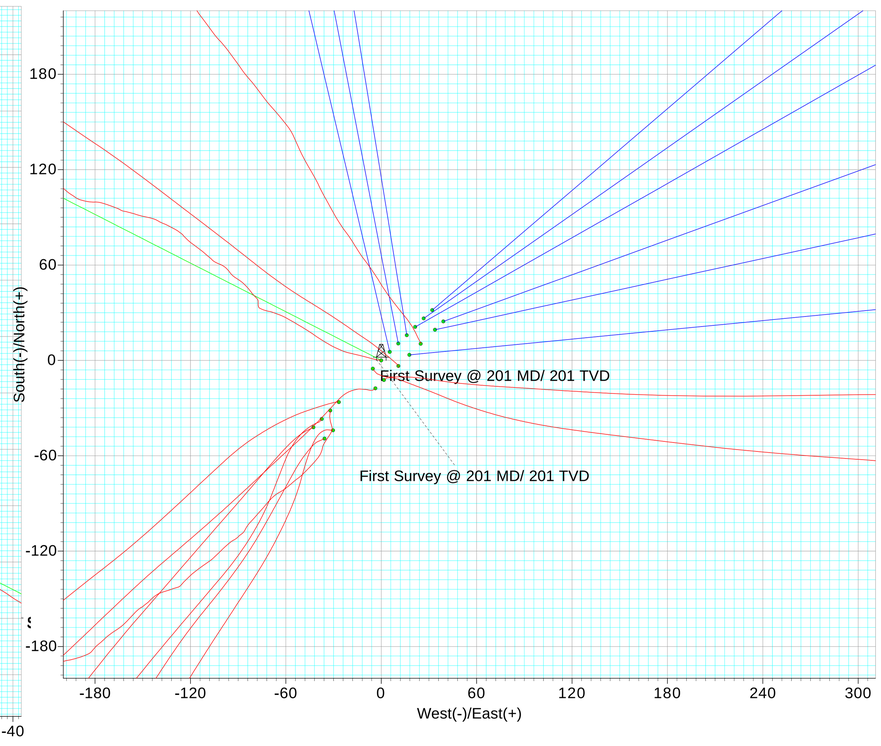
CASING DETAILS

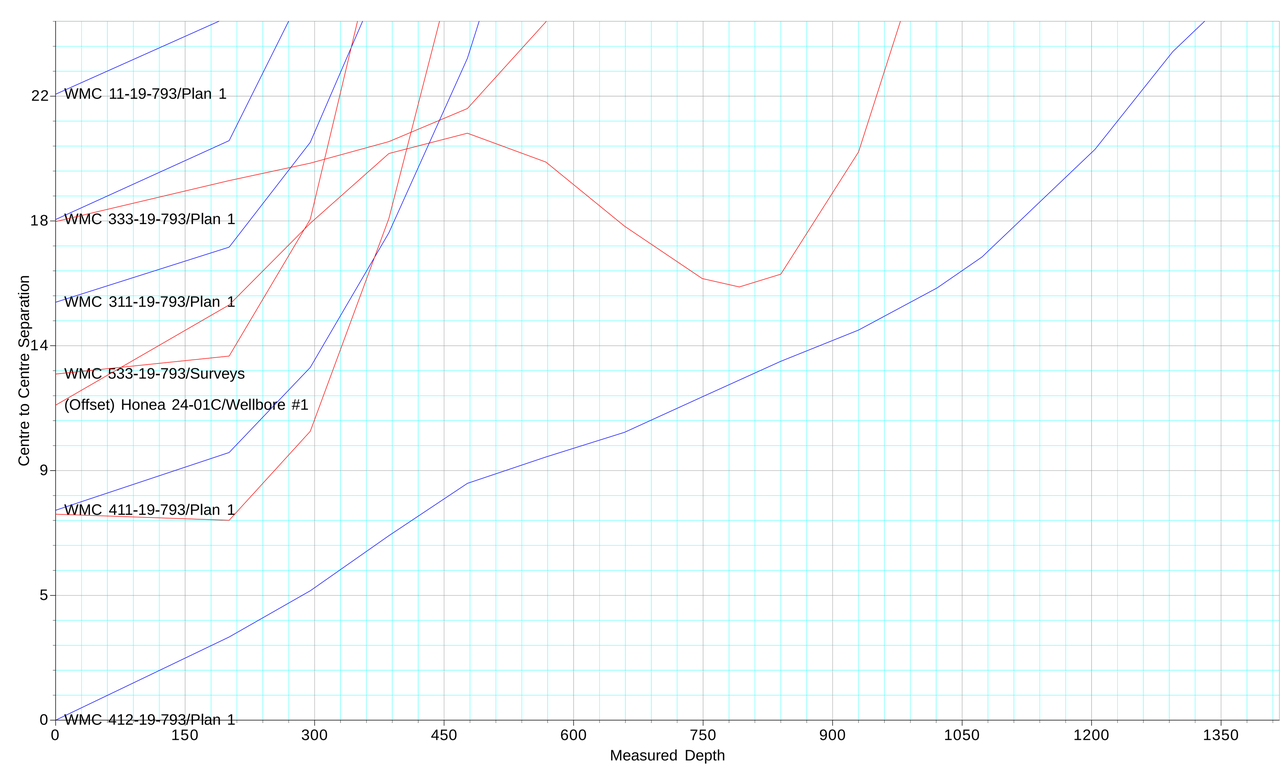
TVD	MD	Name	Size
1100.0	1109.5	9 5/8" Surface Casing	9-5/8











NATIVE NAVIGATION

DIRECTIONAL DRILLING SPECIALISTS

Directional Survey Certification

Survey Company: Native Navigation **Survey Company Job #:** 23032714

Well Name: WMC 412-19-793 **A.P.I.#** 05-045-24540 **Operator:** Terra Energy Partners

Latitude: 40.217433 **Longitude:** -107.822591 **County, State:** Garfield County, CO

Legal Description (S,TS,R): Sec 19, T7S, R93W

Final Report 3/8/2023 **Date of First Survey** 3/3/2023 **Date of Last Survey:** 3/7/2023

Datum: NAD83 **Survey MD From:** 201.00 **To:** 10533 FT. **Tool Type:** MWD + HRGM

Bit to Sensor: 70 FT. **Rig (Company & Number):** HP 329 **RKB Height:** 30.00 FT.

Ground Elevation: 8563.00 **Northings:** 1588610.091 **Eastings:** 2343987.9

Surveyor: Kyle Temple **Depth of Final Projection:** 10603 FT.

The data and calculations for this survey have been checked by me and conform to the calibration standards and operational procedures set forth by Native Navigation. I am authorized and qualified to review the data, calculations and this report, and that the report represents a true and correct Directional Survey of this well, based on the original data corrected to True North and obtained at the well site. Wellbore coordinates are calculated using the minimum curvature method.

Signature	Title	Company	Date
	Well Planner	Native Navigation	3/8/23

Terra Energy Partners, LLP

Garfield County, CO (Nad 83)
Honea 19-05 Pad
WMC 412-19-793 - Slot WMC 412-19-793
Wellbore #1

Survey: Surveys

Survey Certification Report

08 March, 2023

Company:	Terra Energy Partners, LLP	**Local Co-ordinate Reference:**	Well WMC 412-19-793 - Slot WMC 412-19-793
Project:	Garfield County, CO (Nad 83)	**TVD Reference:**	KB @ 8593.0ft
Site:	Honea 19-05 Pad	**MD Reference:**	KB @ 8593.0ft
Well:	WMC 412-19-793	**North Reference:**	True
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Surveys	**Database:**	NN

Project Garfield County, CO (Nad 83)

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site Honea 19-05 Pad

Site Position:		**Northing:**	1,588,561.791 usft	**Latitude:**	39.426341
From:	Map	**Easting:**	2,343,951.000 usft	**Longitude:**	-107.822717
Position Uncertainty:	0.0 ft	**Slot Radius:**	13-3/16"	**Grid Convergence:**	-1.46 °

Well WMC 412-19-793 - Slot WMC 412-19-793

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,588,610.091 usft	**Latitude:**	39.426476
	+E/-W	0.0 ft	**Easting:**	2,343,987.900 usft	**Longitude:**	-107.822591
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	0.0 ft	**Ground Level:**	8,563.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/23/2022	8.85	65.35	51,015

Design Surveys

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	291.58

Survey Program **Date** 3/6/2023

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
201.0	10,603.0	Surveys (Wellbore #1)	OWSG (REV5) MWD HDGM	OWSG MWD - Standard

Survey

MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Closure Azimuth (°)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
201.0	1.71	278.85	201.0	0.5	-3.0	3.0	278.85
First Survey @ 201 MD/ 201 TVD							
295.0	2.90	285.62	294.9	1.3	-6.6	6.8	281.22
386.0	3.69	284.12	385.7	2.7	-11.7	12.0	282.77
477.0	2.72	282.72	476.6	3.8	-16.6	17.1	283.00
568.0	2.42	283.51	567.5	4.8	-20.6	21.2	283.02
659.0	2.81	292.47	658.4	6.1	-24.5	25.3	283.88
749.0	3.25	295.20	748.3	8.0	-28.9	30.0	285.47
840.0	2.99	300.82	839.2	10.3	-33.3	34.8	287.22
930.0	3.16	301.70	929.0	12.8	-37.4	39.5	288.92
1,021.0	3.56	305.31	1,019.9	15.8	-41.8	44.7	290.65

Company:	Terra Energy Partners, LLP	**Local Co-ordinate Reference:**	Well WMC 412-19-793 - Slot WMC 412-19-793
Project:	Garfield County, CO (Nad 83)	**TVD Reference:**	KB @ 8593.0ft
Site:	Honea 19-05 Pad	**MD Reference:**	KB @ 8593.0ft
Well:	WMC 412-19-793	**North Reference:**	True
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Surveys	**Database:**	NN

Survey

MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Closure Azimuth (°)
1,073.0	3.69	303.28	1,071.8	17.6	-44.5	47.9	291.58
1,204.0	4.31	300.30	1,202.4	22.4	-52.3	56.9	293.19
1,294.0	4.66	300.03	1,292.2	26.0	-58.4	63.9	293.96
1,385.0	3.12	289.92	1,383.0	28.6	-63.9	70.1	294.13
1,476.0	1.67	291.77	1,473.9	30.0	-67.5	73.9	293.95
1,568.0	1.89	280.52	1,565.8	30.8	-70.2	76.7	293.65
1,659.0	1.49	287.02	1,656.8	31.4	-72.8	79.3	293.30
1,749.0	1.27	292.74	1,746.8	32.1	-74.9	81.5	293.21
1,840.0	1.01	297.75	1,837.7	32.9	-76.5	83.3	293.25
1,931.0	1.80	352.85	1,928.7	34.7	-77.4	84.8	294.12
2,021.0	1.36	5.77	2,018.7	37.1	-77.5	85.9	295.60
2,112.0	2.59	312.86	2,109.6	39.6	-78.9	88.3	296.66
2,203.0	2.59	323.94	2,200.5	42.7	-81.6	92.1	297.60
2,294.0	2.19	317.70	2,291.5	45.6	-84.0	95.6	298.51
2,384.0	2.11	314.97	2,381.4	48.0	-86.3	98.8	299.11
2,474.0	2.07	303.28	2,471.3	50.1	-88.8	102.0	299.43
2,565.0	1.89	303.20	2,562.3	51.8	-91.5	105.1	299.54
2,656.0	1.71	313.71	2,653.2	53.6	-93.7	107.9	299.77
2,746.0	1.80	324.11	2,743.2	55.7	-95.5	110.5	300.24
2,837.0	1.63	314.36	2,834.2	57.7	-97.3	113.1	300.69
2,927.0	1.76	302.67	2,924.1	59.4	-99.3	115.7	300.87
3,018.0	1.32	290.45	3,015.1	60.5	-101.5	118.2	300.79
3,108.0	2.07	295.81	3,105.0	61.6	-103.9	120.8	300.64
3,199.0	1.71	315.85	3,196.0	63.3	-106.4	123.7	300.74
3,290.0	1.71	308.21	3,287.0	65.1	-108.4	126.4	300.98
3,380.0	2.20	311.99	3,376.9	67.1	-110.7	129.4	301.20
3,471.0	1.76	307.85	3,467.9	69.1	-113.1	132.5	301.41
3,561.0	1.93	306.98	3,557.8	70.8	-115.4	135.4	301.54
3,652.0	1.80	305.75	3,648.8	72.6	-117.8	138.4	301.64
3,742.0	1.63	308.03	3,738.7	74.2	-120.0	141.1	301.74
3,832.0	1.54	313.74	3,828.7	75.8	-121.8	143.5	301.90
3,923.0	1.45	315.94	3,919.7	77.5	-123.5	145.8	302.11
4,013.0	0.97	321.04	4,009.6	78.9	-124.8	147.6	302.31
4,104.0	1.27	302.76	4,100.6	80.1	-126.1	149.4	302.41
4,194.0	1.23	309.26	4,190.6	81.2	-127.7	151.3	302.45
4,285.0	2.72	297.83	4,281.5	82.8	-130.4	154.5	302.43
4,375.0	2.20	297.83	4,371.5	84.6	-133.8	158.3	302.32
4,466.0	2.42	291.15	4,462.4	86.2	-137.1	161.9	302.14
4,556.0	2.37	301.17	4,552.3	87.8	-140.5	165.7	302.00
4,647.0	2.15	285.35	4,643.2	89.2	-143.7	169.2	301.83
4,737.0	2.07	282.45	4,733.2	90.0	-147.0	172.3	301.49
4,828.0	1.76	281.40	4,824.1	90.7	-149.9	175.2	301.16
4,918.0	2.15	287.55	4,914.1	91.4	-152.9	178.2	300.88
5,009.0	1.89	286.06	5,005.0	92.4	-156.0	181.3	300.63

Company:	Terra Energy Partners, LLP	**Local Co-ordinate Reference:**	Well WMC 412-19-793 - Slot WMC 412-19-793
Project:	Garfield County, CO (Nad 83)	**TVD Reference:**	KB @ 8593.0ft
Site:	Honea 19-05 Pad	**MD Reference:**	KB @ 8593.0ft
Well:	WMC 412-19-793	**North Reference:**	True
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Surveys	**Database:**	NN

Survey

MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Closure Azimuth (°)
5,099.0	1.93	284.91	5,095.0	93.2	-158.9	184.2	300.39
5,190.0	1.85	280.78	5,185.9	93.8	-161.8	187.0	300.11
5,281.0	1.36	303.46	5,276.9	94.7	-164.1	189.5	299.99
5,371.0	2.11	290.89	5,366.8	95.9	-166.6	192.2	299.93
5,462.0	2.11	290.19	5,457.8	97.1	-169.7	195.5	299.77
5,552.0	2.50	288.08	5,547.7	98.2	-173.1	199.1	299.57
5,643.0	2.02	284.48	5,638.6	99.3	-176.6	202.6	299.34
5,733.0	2.11	268.30	5,728.6	99.6	-179.8	205.5	298.99
5,824.0	1.80	275.16	5,819.5	99.7	-182.9	208.3	298.60
5,914.0	2.24	281.92	5,909.5	100.2	-186.0	211.2	298.31
6,005.0	2.02	286.94	6,000.4	101.0	-189.3	214.5	298.09
6,096.0	2.29	305.04	6,091.3	102.5	-192.3	217.9	298.07
6,185.0	2.29	302.23	6,180.3	104.5	-195.2	221.4	298.16
6,276.0	2.11	311.63	6,271.2	106.6	-198.0	224.9	298.29
6,367.0	2.15	309.17	6,362.1	108.8	-200.6	228.2	298.47
6,457.0	2.02	312.86	6,452.1	110.9	-203.1	231.4	298.64
6,547.0	2.59	343.10	6,542.0	113.9	-204.8	234.4	299.08
6,638.0	3.21	344.15	6,632.9	118.4	-206.1	237.7	299.86
6,728.0	3.25	340.02	6,722.7	123.2	-207.7	241.5	300.67
6,819.0	2.99	338.18	6,813.6	127.8	-209.4	245.4	301.39
6,910.0	2.55	321.39	6,904.5	131.6	-211.6	249.2	301.88
7,000.0	2.20	308.56	6,994.4	134.2	-214.2	252.8	302.07
7,091.0	1.89	306.27	7,085.4	136.2	-216.8	256.0	302.14
7,181.0	2.24	301.79	7,175.3	138.0	-219.5	259.2	302.16
7,272.0	1.19	318.66	7,266.3	139.7	-221.6	261.9	302.22
7,362.0	0.66	312.16	7,356.3	140.7	-222.6	263.3	302.30
7,453.0	0.79	314.71	7,447.3	141.5	-223.4	264.5	302.35
7,544.0	1.27	301.61	7,538.2	142.5	-224.7	266.1	302.37
7,634.0	1.10	293.09	7,628.2	143.3	-226.4	267.9	302.34
7,725.0	1.58	310.05	7,719.2	144.5	-228.1	270.0	302.35
7,815.0	0.88	28.36	7,809.2	145.9	-228.8	271.3	302.53
7,906.0	0.57	21.77	7,900.2	146.9	-228.3	271.5	302.77
7,997.0	0.92	15.71	7,991.2	148.0	-227.9	271.8	303.01
8,087.0	0.57	23.35	8,081.2	149.2	-227.5	272.1	303.25
8,178.0	0.75	9.73	8,172.1	150.2	-227.2	272.4	303.45
8,268.0	0.66	51.21	8,262.1	151.1	-226.7	272.5	303.67
8,359.0	0.79	80.74	8,353.1	151.5	-225.7	271.8	303.87
8,449.0	0.75	78.46	8,443.1	151.7	-224.5	271.0	304.05
8,540.0	0.22	105.44	8,534.1	151.8	-223.8	270.4	304.15
8,631.0	0.26	81.54	8,625.1	151.8	-223.4	270.1	304.19
8,722.0	0.66	85.31	8,716.1	151.8	-222.7	269.5	304.29
8,813.0	1.01	112.91	8,807.1	151.6	-221.4	268.3	304.39
8,903.0	0.53	129.00	8,897.1	151.0	-220.4	267.1	304.42
8,993.0	0.62	102.98	8,987.1	150.6	-219.6	266.3	304.45
9,084.0	0.70	160.64	9,078.1	150.0	-218.9	265.4	304.42

Company:	Terra Energy Partners, LLP	**Local Co-ordinate Reference:**	Well WMC 412-19-793 - Slot WMC 412-19-793
Project:	Garfield County, CO (Nad 83)	**TVD Reference:**	KB @ 8593.0ft
Site:	Honea 19-05 Pad	**MD Reference:**	KB @ 8593.0ft
Well:	WMC 412-19-793	**North Reference:**	True
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Surveys	**Database:**	NN

Survey

MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	E/W (ft)	Closure Distance (ft)	Closure Azimuth (°)
9,174.0	1.01	128.03	9,168.1	149.0	-218.1	264.1	304.34
9,265.0	1.32	135.15	9,259.1	147.7	-216.7	262.3	304.28
9,355.0	0.97	146.84	9,349.0	146.4	-215.6	260.6	304.18
9,446.0	0.70	164.68	9,440.0	145.2	-215.0	259.4	304.03
9,537.0	0.48	187.44	9,531.0	144.3	-214.9	258.8	303.88
9,627.0	1.19	207.66	9,621.0	143.1	-215.4	258.6	303.59
9,718.0	1.10	215.39	9,712.0	141.5	-216.3	258.5	303.19
9,808.0	1.41	207.57	9,802.0	139.8	-217.3	258.4	302.76
9,899.0	2.46	208.01	9,892.9	137.1	-218.8	258.2	302.08
9,989.0	3.69	209.42	9,982.8	132.9	-221.1	258.0	301.01
10,080.0	4.26	213.81	10,073.6	127.5	-224.4	258.1	299.61
10,170.0	4.66	212.67	10,163.3	121.7	-228.3	258.7	298.06
10,261.0	5.01	224.62	10,254.0	115.7	-233.1	260.2	296.41
10,351.0	5.23	231.56	10,343.6	110.4	-239.0	263.3	294.79
10,442.0	4.92	232.18	10,434.3	105.4	-245.4	267.0	293.25
10,533.0	4.66	235.78	10,524.9	101.0	-251.5	271.0	291.87
10,603.0	4.66	235.78	10,594.7	97.8	-256.2	274.2	290.88

PTB @ 10603 MD/ 10594.7 TVD

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
201.0	201.0	0.5	-3.0	First Survey @ 201 MD/ 201 TVD
10,603.0	10,594.7	97.8	-256.2	PTB @ 10603 MD/ 10594.7 TVD

Checked By: _____ Approved By: _____ Date: _____