

Project: Garfield County, CO
 Site: Sec 17, T7S, R93W
 Well: RU 441-17
 Wellbore: Wellbore #1
 Design: Plan 4
 Latitude: 39.450013
 Longitude: -107.795842
 Ground Level: 7861.40
 KB=24' @ 7885.40usft (H&P #318)

PROJECT DETAILS: Garfield County, CO	
Geodetic System: US State Plane 1983	
Datum: North American Datum 1983	
Ellipsoid: GRS 1980	
Zone: Colorado Central Zone	
System Datum: Mean Sea Level	

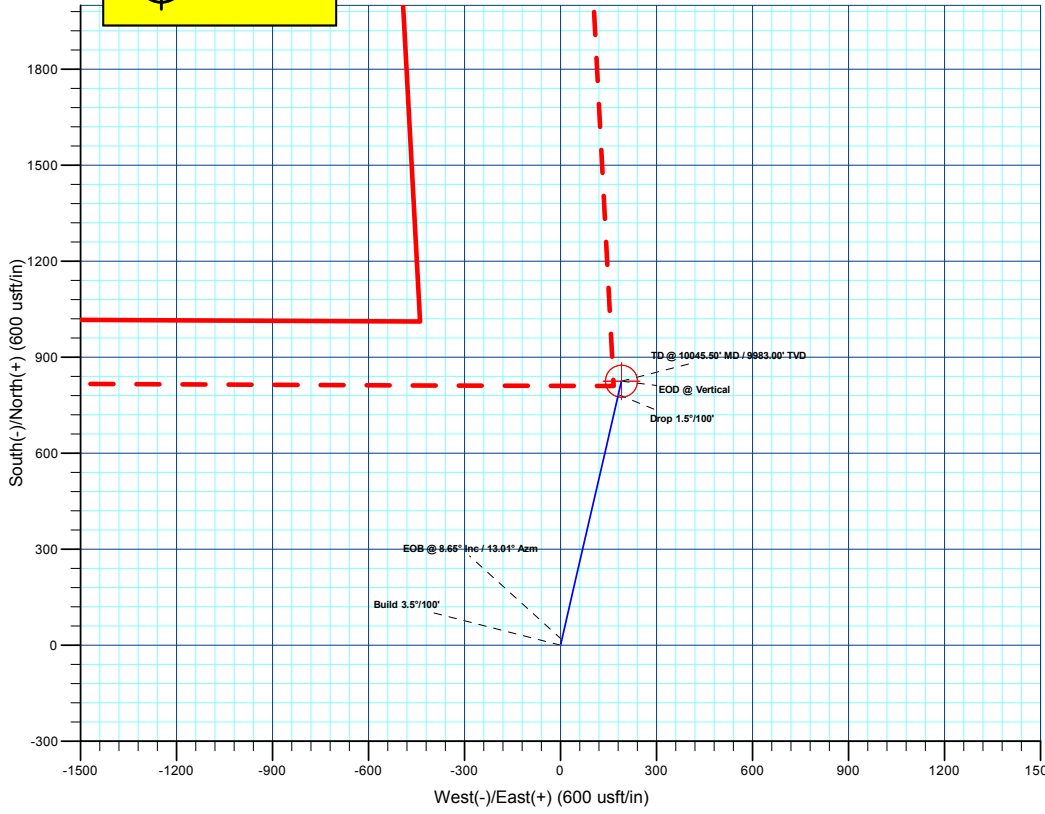
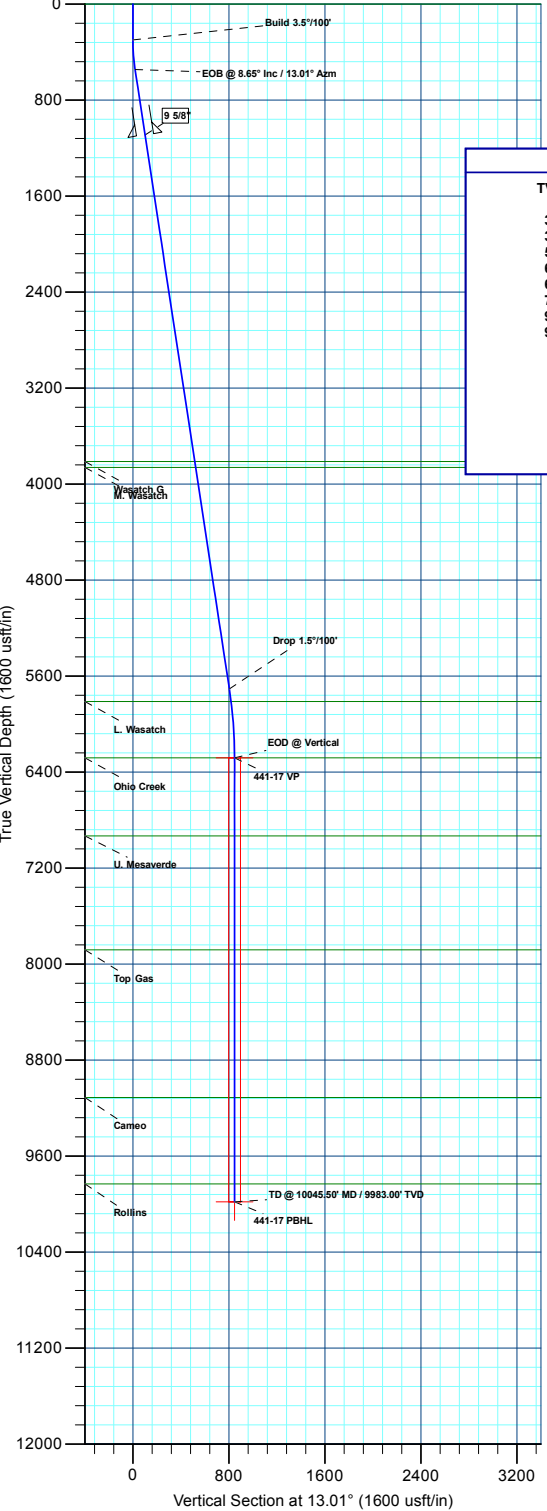
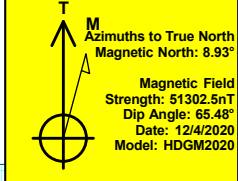
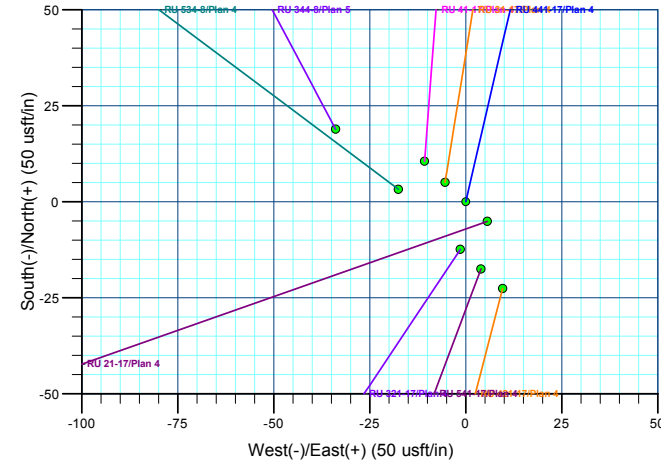
REFERENCE INFORMATION	
Co-ordinate (N/E) Reference: Well RU 441-17, True North	
Vertical (TVD) Reference: KB=24' @ 7885.40usft (H&P #318)	
Section (VS) Reference: Slot - (0.00N, 0.00E)	
Measured Depth Reference: KB=24' @ 7885.40usft (H&P #318)	
Calculation Method: Minimum Curvature	

WELL DETAILS: RU 441-17					
7861.40					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	1596988.18	2351758.01	39.450013	-107.795842

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)								
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
441-17 VP	6283.00	825.48	190.80	1597808.57	2351969.61	39.452279	-107.795166	Point
441-17 PBHL	9983.00	825.48	190.80	1597808.57	2351969.61	39.452279	-107.795166	Circle (Radius: 50.00)

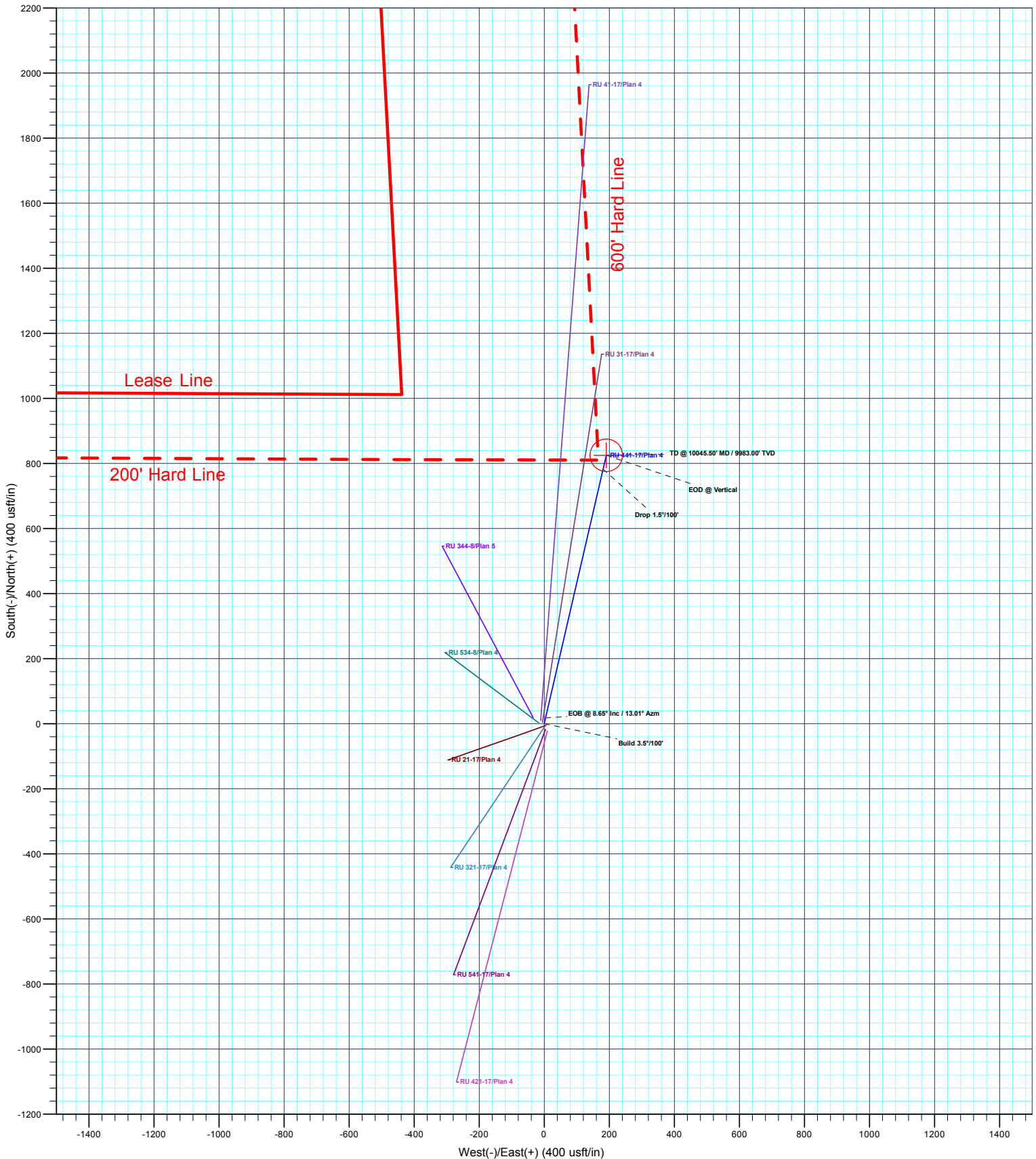
ANNOTATIONS								
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSecDeparture	Annotation	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	Build 3.5°/100'	
547.09	8.65	13.01	546.15	18.13	4.19	18.61	EOB @ 8.65° Inc / 13.01° Azm	
5768.95	8.65	13.01	5708.64	783.17	181.02	803.81	Drop 1.5°/100'	
6345.50	0.00	0.00	6283.00	825.48	190.80	847.24	EOD @ Vertical	
10045.50	0.00	0.00	9983.00	825.48	190.80	847.24	TD @ 10045.50' MD / 9983.00' TVD	

FORMATION TOP DETAILS		
TVDPATH	MDPATH	Formation
0.00	0.00	U. Wasatch
3813.00	3851.51	Wasatch G
3863.00	3902.08	M. Wasatch
5813.00	5874.30	L. Wasatch
6283.00	6345.50	Ohio Creek
6933.00	6995.50	U. Mesaverde
7883.00	7945.50	Top Gas
9113.00	9175.50	Cameo
9833.00	9895.50	Rollins





Project: Garfield County, CO
Site: Sec 17, T7S, R93W
Well: RU 441-17
Design: Plan 4
Latitude: 39.450013
Longitude: -107.795842
Ground Level: 7861.40
KB=24' @ 7885.40usft (H&P #318)



Plan: Plan 4 (RU 441-17/Wellbore #1)
Created By: Chase Chambers Date: 10:47, December 11 2020



Terra Energy Partners, LLP

**Garfield County, CO
Sec 17, T7S, R93W
RU 441-17**

Wellbore #1

Plan: Plan 4

QES Well Planning Report

11 December, 2020



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well RU 441-17
Company:	Terra Energy Partners, LLP	TVD Reference:	KB=24' @ 7885.40usft (H&P #318)
Project:	Garfield County, CO	MD Reference:	KB=24' @ 7885.40usft (H&P #318)
Site:	Sec 17, T7S, R93W	North Reference:	True
Well:	RU 441-17	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 4		

Project	Garfield County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	Sec 17, T7S, R93W				
Site Position:		Northing:	1,596,982.95 usft	Latitude:	39.449999
From:	Lat/Long	Easting:	2,351,763.53 usft	Longitude:	-107.795822
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.45 °

Well	RU 441-17					
Well Position	+N/-S	5.09 usft	Northing:	1,596,988.17 usft	Latitude:	39.450013
	+E/-W	-5.65 usft	Easting:	2,351,758.01 usft	Longitude:	-107.795842
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	7,861.40 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM2020	12/4/2020	8.93	65.48	51,302.50000000

Design	Plan 4			
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	13.01

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build 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	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
547.09	8.65	13.01	546.16	18.13	4.19	3.50	3.50	0.00	13.01	
5,768.94	8.65	13.01	5,708.64	783.17	181.02	0.00	0.00	0.00	0.00	
6,345.50	0.00	0.00	6,283.00	825.48	190.80	1.50	-1.50	0.00	180.00	441-17 VP
10,045.50	0.00	0.00	9,983.00	825.48	190.80	0.00	0.00	0.00	0.00	441-17 PBHL

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well RU 441-17
Company:	Terra Energy Partners, LLP	TVD Reference:	KB=24' @ 7885.40usft (H&P #318)
Project:	Garfield County, CO	MD Reference:	KB=24' @ 7885.40usft (H&P #318)
Site:	Sec 17, T7S, R93W	North Reference:	True
Well:	RU 441-17	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 4		

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)	
U. Wasatch										
0.00	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	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Build 3.5°/100'										
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	3.50	13.01	399.94	2.97	0.69	3.05	3.50	3.50	3.50	0.00
500.00	7.00	13.01	499.50	11.89	2.75	12.20	3.50	3.50	3.50	0.00
EOB @ 8.65° Inc / 13.01° Azm										
547.09	8.65	13.01	546.15	18.13	4.19	18.61	3.50	3.50	3.50	0.00
600.00	8.65	13.01	598.46	25.89	5.98	26.57	0.00	0.00	0.00	0.00
700.00	8.65	13.01	697.32	40.54	9.37	41.61	0.00	0.00	0.00	0.00
800.00	8.65	13.01	796.19	55.19	12.76	56.64	0.00	0.00	0.00	0.00
900.00	8.65	13.01	895.05	69.84	16.14	71.68	0.00	0.00	0.00	0.00
1,000.00	8.65	13.01	993.91	84.49	19.53	86.72	0.00	0.00	0.00	0.00
9 5/8"										
1,100.00	8.65	13.01	1,092.78	99.14	22.91	101.75	0.00	0.00	0.00	0.00
1,200.00	8.65	13.01	1,191.64	113.79	26.30	116.79	0.00	0.00	0.00	0.00
1,300.00	8.65	13.01	1,290.50	128.44	29.69	131.83	0.00	0.00	0.00	0.00
1,400.00	8.65	13.01	1,389.37	143.09	33.07	146.86	0.00	0.00	0.00	0.00
1,500.00	8.65	13.01	1,488.23	157.74	36.46	161.90	0.00	0.00	0.00	0.00
1,600.00	8.65	13.01	1,587.09	172.39	39.85	176.94	0.00	0.00	0.00	0.00
1,700.00	8.65	13.01	1,685.95	187.04	43.23	191.97	0.00	0.00	0.00	0.00
1,800.00	8.65	13.01	1,784.82	201.69	46.62	207.01	0.00	0.00	0.00	0.00
1,900.00	8.65	13.01	1,883.68	216.34	50.01	222.05	0.00	0.00	0.00	0.00
2,000.00	8.65	13.01	1,982.54	230.99	53.39	237.08	0.00	0.00	0.00	0.00
2,100.00	8.65	13.01	2,081.41	245.64	56.78	252.12	0.00	0.00	0.00	0.00
2,200.00	8.65	13.01	2,180.27	260.29	60.16	267.16	0.00	0.00	0.00	0.00
2,300.00	8.65	13.01	2,279.13	274.95	63.55	282.19	0.00	0.00	0.00	0.00
2,400.00	8.65	13.01	2,378.00	289.60	66.94	297.23	0.00	0.00	0.00	0.00
2,500.00	8.65	13.01	2,476.86	304.25	70.32	312.27	0.00	0.00	0.00	0.00
2,600.00	8.65	13.01	2,575.72	318.90	73.71	327.30	0.00	0.00	0.00	0.00
2,700.00	8.65	13.01	2,674.58	333.55	77.10	342.34	0.00	0.00	0.00	0.00
2,800.00	8.65	13.01	2,773.45	348.20	80.48	357.38	0.00	0.00	0.00	0.00
2,900.00	8.65	13.01	2,872.31	362.85	83.87	372.42	0.00	0.00	0.00	0.00
3,000.00	8.65	13.01	2,971.17	377.50	87.26	387.45	0.00	0.00	0.00	0.00
3,100.00	8.65	13.01	3,070.04	392.15	90.64	402.49	0.00	0.00	0.00	0.00
3,200.00	8.65	13.01	3,168.90	406.80	94.03	417.53	0.00	0.00	0.00	0.00
3,300.00	8.65	13.01	3,267.76	421.45	97.41	432.56	0.00	0.00	0.00	0.00
3,400.00	8.65	13.01	3,366.63	436.10	100.80	447.60	0.00	0.00	0.00	0.00
3,500.00	8.65	13.01	3,465.49	450.75	104.19	462.64	0.00	0.00	0.00	0.00
3,600.00	8.65	13.01	3,564.35	465.40	107.57	477.67	0.00	0.00	0.00	0.00
3,700.00	8.65	13.01	3,663.21	480.05	110.96	492.71	0.00	0.00	0.00	0.00
3,800.00	8.65	13.01	3,762.08	494.70	114.35	507.75	0.00	0.00	0.00	0.00
Wasatch G										
3,851.51	8.65	13.01	3,813.00	502.25	116.09	515.49	0.00	0.00	0.00	0.00
3,900.00	8.65	13.01	3,860.94	509.35	117.73	522.78	0.00	0.00	0.00	0.00
M. Wasatch										
3,902.08	8.65	13.01	3,863.00	509.66	117.80	523.10	0.00	0.00	0.00	0.00
4,000.00	8.65	13.01	3,959.80	524.01	121.12	537.82	0.00	0.00	0.00	0.00
4,100.00	8.65	13.01	4,058.67	538.66	124.50	552.86	0.00	0.00	0.00	0.00
4,200.00	8.65	13.01	4,157.53	553.31	127.89	567.89	0.00	0.00	0.00	0.00
4,300.00	8.65	13.01	4,256.39	567.96	131.28	582.93	0.00	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well RU 441-17
Company:	Terra Energy Partners, LLP	TVD Reference:	KB=24' @ 7885.40usft (H&P #318)
Project:	Garfield County, CO	MD Reference:	KB=24' @ 7885.40usft (H&P #318)
Site:	Sec 17, T7S, R93W	North Reference:	True
Well:	RU 441-17	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 4		

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)
4,400.00	8.65	13.01	4,355.26	582.61	134.66	597.97	0.00	0.00	0.00
4,500.00	8.65	13.01	4,454.12	597.26	138.05	613.00	0.00	0.00	0.00
4,600.00	8.65	13.01	4,552.98	611.91	141.44	628.04	0.00	0.00	0.00
4,700.00	8.65	13.01	4,651.84	626.56	144.82	643.08	0.00	0.00	0.00
4,800.00	8.65	13.01	4,750.71	641.21	148.21	658.12	0.00	0.00	0.00
4,900.00	8.65	13.01	4,849.57	655.86	151.60	673.15	0.00	0.00	0.00
5,000.00	8.65	13.01	4,948.43	670.51	154.98	688.19	0.00	0.00	0.00
5,100.00	8.65	13.01	5,047.30	685.16	158.37	703.23	0.00	0.00	0.00
5,200.00	8.65	13.01	5,146.16	699.81	161.75	718.26	0.00	0.00	0.00
5,300.00	8.65	13.01	5,245.02	714.46	165.14	733.30	0.00	0.00	0.00
5,400.00	8.65	13.01	5,343.89	729.11	168.53	748.34	0.00	0.00	0.00
5,500.00	8.65	13.01	5,442.75	743.76	171.91	763.37	0.00	0.00	0.00
5,600.00	8.65	13.01	5,541.61	758.41	175.30	778.41	0.00	0.00	0.00
5,700.00	8.65	13.01	5,640.47	773.06	178.69	793.45	0.00	0.00	0.00
Drop 1.5°/100'									
5,768.95	8.65	13.01	5,708.64	783.17	181.02	803.81	0.00	0.00	0.00
5,800.00	8.18	13.01	5,739.36	787.59	182.04	808.36	1.50	-1.50	0.00
L. Wasatch									
5,874.30	7.07	13.01	5,813.00	797.20	184.26	818.22	1.50	-1.50	0.00
5,900.00	6.68	13.01	5,838.51	800.20	184.96	821.29	1.50	-1.50	0.00
6,000.00	5.18	13.01	5,937.97	810.27	187.28	831.63	1.50	-1.50	0.00
6,100.00	3.68	13.01	6,037.67	817.80	189.03	839.36	1.50	-1.50	0.00
6,200.00	2.18	13.01	6,137.54	822.78	190.18	844.47	1.50	-1.50	0.00
6,300.00	0.68	13.01	6,237.50	825.22	190.74	846.97	1.50	-1.50	0.00
EOD @ Vertical - Ohio Creek									
6,345.50	0.00	0.00	6,283.00	825.48	190.80	847.24	1.50	-1.50	0.00
6,400.00	0.00	0.00	6,337.50	825.48	190.80	847.24	0.00	0.00	0.00
6,500.00	0.00	0.00	6,437.50	825.48	190.80	847.24	0.00	0.00	0.00
6,600.00	0.00	0.00	6,537.50	825.48	190.80	847.24	0.00	0.00	0.00
6,700.00	0.00	0.00	6,637.50	825.48	190.80	847.24	0.00	0.00	0.00
6,800.00	0.00	0.00	6,737.50	825.48	190.80	847.24	0.00	0.00	0.00
6,900.00	0.00	0.00	6,837.50	825.48	190.80	847.24	0.00	0.00	0.00
U. Mesaverde									
6,995.50	0.00	0.00	6,933.00	825.48	190.80	847.24	0.00	0.00	0.00
7,000.00	0.00	0.00	6,937.50	825.48	190.80	847.24	0.00	0.00	0.00
7,100.00	0.00	0.00	7,037.50	825.48	190.80	847.24	0.00	0.00	0.00
7,200.00	0.00	0.00	7,137.50	825.48	190.80	847.24	0.00	0.00	0.00
7,300.00	0.00	0.00	7,237.50	825.48	190.80	847.24	0.00	0.00	0.00
7,400.00	0.00	0.00	7,337.50	825.48	190.80	847.24	0.00	0.00	0.00
7,500.00	0.00	0.00	7,437.50	825.48	190.80	847.24	0.00	0.00	0.00
7,600.00	0.00	0.00	7,537.50	825.48	190.80	847.24	0.00	0.00	0.00
7,700.00	0.00	0.00	7,637.50	825.48	190.80	847.24	0.00	0.00	0.00
7,800.00	0.00	0.00	7,737.50	825.48	190.80	847.24	0.00	0.00	0.00
7,900.00	0.00	0.00	7,837.50	825.48	190.80	847.24	0.00	0.00	0.00
Top Gas									
7,945.50	0.00	0.00	7,883.00	825.48	190.80	847.24	0.00	0.00	0.00
8,000.00	0.00	0.00	7,937.50	825.48	190.80	847.24	0.00	0.00	0.00
8,100.00	0.00	0.00	8,037.50	825.48	190.80	847.24	0.00	0.00	0.00
8,200.00	0.00	0.00	8,137.50	825.48	190.80	847.24	0.00	0.00	0.00
8,300.00	0.00	0.00	8,237.50	825.48	190.80	847.24	0.00	0.00	0.00
8,400.00	0.00	0.00	8,337.50	825.48	190.80	847.24	0.00	0.00	0.00
8,500.00	0.00	0.00	8,437.50	825.48	190.80	847.24	0.00	0.00	0.00
8,600.00	0.00	0.00	8,537.50	825.48	190.80	847.24	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well RU 441-17
Company:	Terra Energy Partners, LLP	TVD Reference:	KB=24' @ 7885.40usft (H&P #318)
Project:	Garfield County, CO	MD Reference:	KB=24' @ 7885.40usft (H&P #318)
Site:	Sec 17, T7S, R93W	North Reference:	True
Well:	RU 441-17	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 4		

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)
8,700.00	0.00	0.00	8,637.50	825.48	190.80	847.24	0.00	0.00	0.00
8,800.00	0.00	0.00	8,737.50	825.48	190.80	847.24	0.00	0.00	0.00
8,900.00	0.00	0.00	8,837.50	825.48	190.80	847.24	0.00	0.00	0.00
9,000.00	0.00	0.00	8,937.50	825.48	190.80	847.24	0.00	0.00	0.00
9,100.00	0.00	0.00	9,037.50	825.48	190.80	847.24	0.00	0.00	0.00
Cameo									
9,175.50	0.00	0.00	9,113.00	825.48	190.80	847.24	0.00	0.00	0.00
9,200.00	0.00	0.00	9,137.50	825.48	190.80	847.24	0.00	0.00	0.00
9,300.00	0.00	0.00	9,237.50	825.48	190.80	847.24	0.00	0.00	0.00
9,400.00	0.00	0.00	9,337.50	825.48	190.80	847.24	0.00	0.00	0.00
9,500.00	0.00	0.00	9,437.50	825.48	190.80	847.24	0.00	0.00	0.00
9,600.00	0.00	0.00	9,537.50	825.48	190.80	847.24	0.00	0.00	0.00
9,700.00	0.00	0.00	9,637.50	825.48	190.80	847.24	0.00	0.00	0.00
9,800.00	0.00	0.00	9,737.50	825.48	190.80	847.24	0.00	0.00	0.00
Rollins									
9,895.50	0.00	0.00	9,833.00	825.48	190.80	847.24	0.00	0.00	0.00
9,900.00	0.00	0.00	9,837.50	825.48	190.80	847.24	0.00	0.00	0.00
10,000.00	0.00	0.00	9,937.50	825.48	190.80	847.24	0.00	0.00	0.00
TD @ 10045.50' MD / 9983.00' TVD									
10,045.50	0.00	0.00	9,983.00	825.48	190.80	847.24	0.00	0.00	0.00

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
441-17 VP - plan hits target center - Point	0.00	0.00	6,283.00	825.48	190.80	1,597,808.57	2,351,969.61	39.452279	-107.795167
441-17 PBHL - plan hits target center - Circle (radius 50.00)	0.00	0.00	9,983.00	825.48	190.80	1,597,808.57	2,351,969.61	39.452279	-107.795167

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,100.00	1,092.78	9 5/8"	9-5/8	12-1/4	

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well RU 441-17
Company:	Terra Energy Partners, LLP	TVD Reference:	KB=24' @ 7885.40usft (H&P #318)
Project:	Garfield County, CO	MD Reference:	KB=24' @ 7885.40usft (H&P #318)
Site:	Sec 17, T7S, R93W	North Reference:	True
Well:	RU 441-17	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 4		

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
0.00	0.00	U. Wasatch			
3,851.51	3,813.00	Wasatch G			
3,902.08	3,863.00	M. Wasatch			
5,874.30	5,813.00	L. Wasatch			
6,345.50	6,283.00	Ohio Creek			
6,995.50	6,933.00	U. Mesaverde			
7,945.50	7,883.00	Top Gas			
9,175.50	9,113.00	Cameo			
9,895.50	9,833.00	Rollins			

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
300.00	300.00	0.00	0.00	Build 3.5°/100'	
547.09	546.15	18.13	4.19	EOB @ 8.65° Inc / 13.01° Azm	
5,768.95	5,708.64	783.17	181.02	Drop 1.5°/100'	
6,345.50	6,283.00	825.48	190.80	EOD @ Vertical	
10,045.50	9,983.00	825.48	190.80	TD @ 10045.50' MD / 9983.00' TVD	