



# **Departure**

## **Energy Services (US) LP**

### **Foundation Energy**

**Rio Blanco County, Colorado**

**SWSW Sec 18-T1S-R103W**

**Banta Ridge Federal #4A-18-1-103**

**Wellbore #1**

**Survey: Survey #1**

### **Final Survey Report**

**10 September, 2012**





Company Name: Foundation Energy

Banta Ridge Federal #4A-18-1-103  
North American Datum 1983  
GRS 1980  
Colorado Northern Zone  
North Ref: True  
WELL @ 6074.00ft (RKB @ 10')  
39.957414°N  
109.005419°W



Project: Rio Blanco County, Colorado  
Site: SWSW Sec 18-T1S-R103W  
Well: Banta Ridge Federal #4A-18-1-103  
Wellbore: Wellbore #1  
Design: Wellbore #1

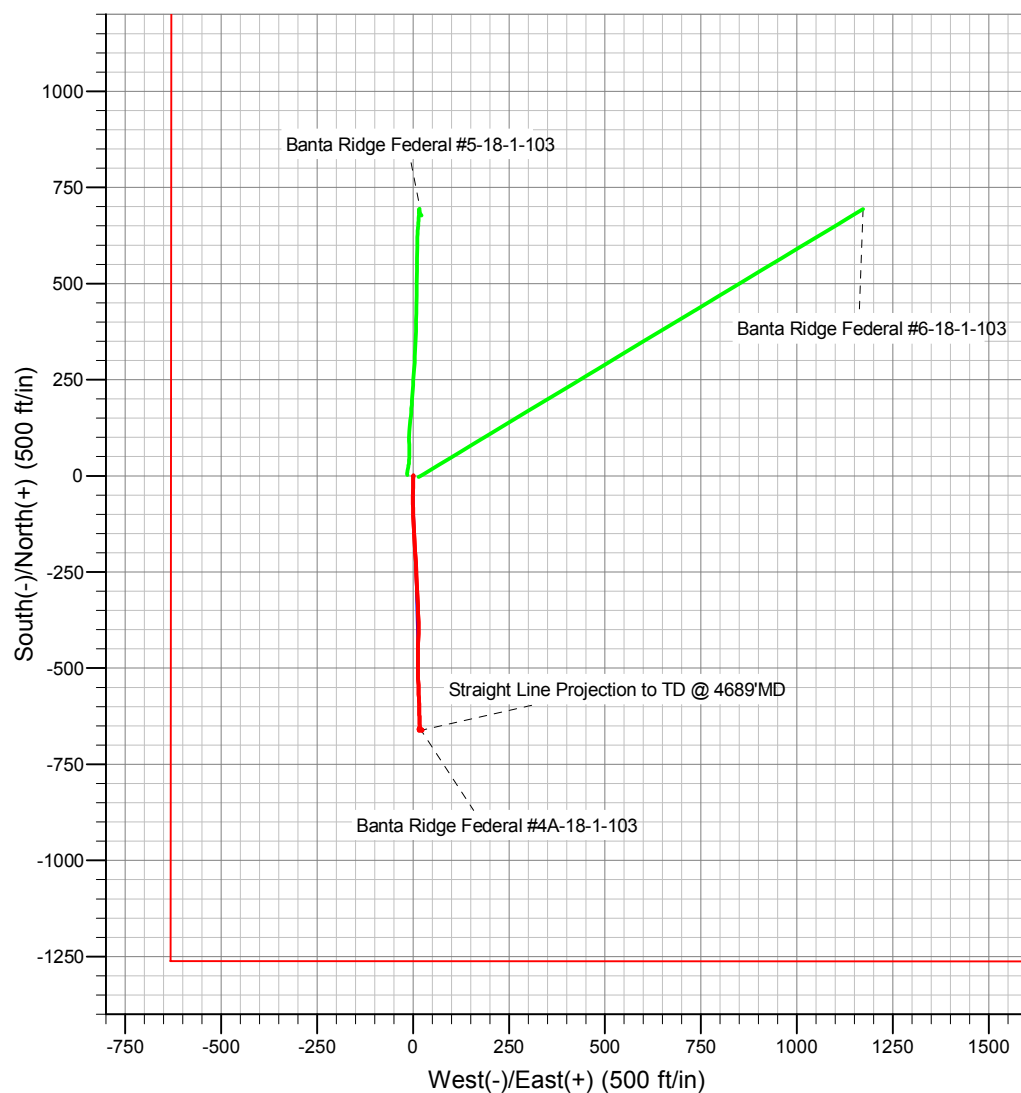
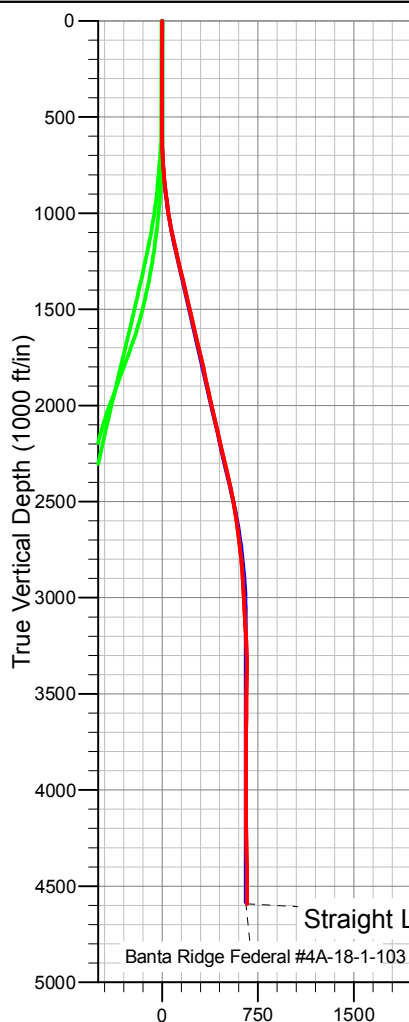


Azimuths to True North  
Magnetic North: 10.71°

Magnetic Field  
Strength: 52249.0snT  
Dip Angle: 65.90°  
Date: 8/13/2012  
Model: IGRF2010

### ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Departure	Annotation
4547.48	4644.00	0.30	100.70	-662.54	16.19	662.73	693.65	4644.00' MD - Last Survey
4592.47	4689.00	0.30	100.70	-662.58	16.42	662.78	693.89	Straight Line Projection to TD @ 4689'MD



Vertical Section at 178.50° (1500 ft/in)



<b>Company:</b>	Foundation Energy	<b>Local Co-ordinate Reference:</b>	Well Banta Ridge Federal #4A-18-1-103
<b>Project:</b>	Rio Blanco County, Colorado	<b>TVD Reference:</b>	WELL @ 6074.00ft (RKB @ 10')
<b>Site:</b>	SWSW Sec 18-T1S-R103W	<b>MD Reference:</b>	WELL @ 6074.00ft (RKB @ 10')
<b>Well:</b>	Banta Ridge Federal #4A-18-1-103	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

<b>Project</b>	Rio Blanco County, Colorado		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		

Site		SWSW Sec 18-T1S-R103W			
Site Position:		Northing:	1,246,760.38 ft	Latitude:	39.957422°N
From:	Lat/Long	Easting:	2,017,576.26 ft	Longitude:	109.005472°W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	-2.27 °

Well	Banta Ridge Federal #4A-18-1-103					
Well Position	+N/-S	0.00 ft	Northing:	1,246,756.87 ft	Latitude:	39.957414°N
	+E/-W	0.00 ft	Easting:	2,017,590.99 ft	Longitude:	109.005419°W
Position Uncertainty		0.00 ft	Wellhead Elevation:	6,074.00 ft	Ground Level:	6,064.00 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	8/13/2012	10.71	65.90	52,249

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	178.50	

<b>Survey Program</b>	<b>Date</b>	9/10/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
539.00	4,689.00	Survey #1 (Wellbore #1)			

<b>Survey</b>								
<b>MD (ft)</b>	<b>Inc (°)</b>	<b>Azi (°)</b>	<b>TVD (ft)</b>	<b>N/S (ft)</b>	<b>E/W (ft)</b>	<b>V. Sec (ft)</b>	<b>DLeg (°/100ft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
539.00	0.40	40.60	539.00	1.43	1.22	-1.40	0.07	
632.00	2.50	189.60	631.97	-0.33	1.10	0.35	3.06	
725.00	5.30	179.30	724.75	-6.62	0.81	6.64	3.09	
820.00	7.60	180.70	819.14	-17.29	0.79	17.31	2.43	
912.00	10.50	182.50	909.98	-31.75	0.35	31.75	3.17	
1,005.00	12.70	182.10	1,001.08	-50.44	-0.40	50.41	2.37	
1,097.00	16.60	177.30	1,090.07	-73.68	-0.15	73.65	4.44	
1,192.00	19.40	178.60	1,180.42	-103.01	0.88	103.00	2.98	
1,285.00	19.70	177.20	1,268.05	-134.11	2.02	134.12	0.60	
1,378.00	19.60	176.30	1,355.64	-165.33	3.79	165.38	0.34	
1,473.00	19.00	175.70	1,445.30	-196.66	5.98	196.75	0.67	



<b>Company:</b>	Foundation Energy	<b>Local Co-ordinate Reference:</b>	Well Banta Ridge Federal #4A-18-1-103
<b>Project:</b>	Rio Blanco County, Colorado	<b>TVD Reference:</b>	WELL @ 6074.00ft (RKB @ 10')
<b>Site:</b>	SWSW Sec 18-T1S-R103W	<b>MD Reference:</b>	WELL @ 6074.00ft (RKB @ 10')
<b>Well:</b>	Banta Ridge Federal #4A-18-1-103	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1 Single User Db

Survey								
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	
1,568.00	19.40	177.60	1,535.02	-227.84	7.80	227.97	0.78	
1,663.00	19.30	178.50	1,624.65	-259.30	8.87	259.44	0.33	
1,759.00	19.40	177.40	1,715.23	-291.09	10.01	291.25	0.39	
1,854.00	18.80	176.00	1,805.00	-322.12	11.79	322.32	0.79	
1,949.00	17.80	178.10	1,895.19	-351.90	13.34	352.13	1.26	
2,043.00	18.10	178.80	1,984.62	-380.86	14.13	381.10	0.39	
2,135.00	19.30	181.60	2,071.76	-410.35	14.00	410.57	1.63	
2,227.00	18.80	180.40	2,158.72	-440.37	13.47	440.57	0.69	
2,319.00	20.40	180.70	2,245.39	-471.23	13.17	471.41	1.74	
2,415.00	20.10	179.50	2,335.46	-504.45	13.11	504.62	0.53	
2,509.00	17.50	177.70	2,424.43	-534.73	13.82	534.91	2.83	
2,605.00	14.60	178.90	2,516.68	-561.26	14.63	561.45	3.04	
2,699.00	12.10	175.90	2,608.14	-582.93	15.57	583.14	2.76	
2,792.00	11.10	179.30	2,699.24	-601.61	16.37	601.83	1.30	
2,886.00	8.20	180.10	2,791.90	-617.36	16.47	617.58	3.09	
2,979.00	5.50	177.40	2,884.22	-628.45	16.66	628.67	2.92	
3,063.00	5.40	179.60	2,967.84	-636.42	16.87	636.65	0.28	
3,158.00	5.10	177.60	3,062.45	-645.11	17.08	645.34	0.37	
3,251.00	4.60	173.00	3,155.11	-652.94	17.71	653.18	0.68	
3,342.00	3.60	162.90	3,245.88	-659.30	18.99	659.57	1.35	
3,435.00	2.70	97.00	3,338.77	-662.36	22.03	662.70	3.77	
3,528.00	1.50	36.80	3,431.71	-661.65	24.93	662.07	2.52	
3,619.00	2.40	305.60	3,522.67	-659.58	24.09	659.99	3.14	
3,712.00	2.10	292.70	3,615.60	-657.79	20.94	658.12	0.63	
3,804.00	0.90	304.40	3,707.57	-656.73	18.79	657.00	1.34	
3,895.00	0.70	294.30	3,798.56	-656.10	17.69	656.34	0.27	
3,987.00	0.70	300.00	3,890.55	-655.59	16.69	655.80	0.08	
4,078.00	0.50	253.00	3,981.55	-655.43	15.83	655.62	0.56	
4,172.00	0.70	206.40	4,075.55	-656.06	15.18	656.23	0.54	
4,267.00	1.00	189.20	4,170.53	-657.40	14.79	657.56	0.41	
4,361.00	1.30	176.70	4,264.52	-659.27	14.72	659.43	0.41	
4,453.00	1.50	167.50	4,356.49	-661.49	15.04	661.66	0.33	
4,547.00	0.40	72.20	4,450.48	-662.59	15.62	662.77	1.69	
4,644.00	0.30	100.70	4,547.48	-662.54	16.19	662.73	0.20	
4644.00' MD - Last Survey								
4,689.00	0.30	100.70	4,592.47	-662.58	16.42	662.78	0.00	
Straight Line Projection to TD @ 4689'MD								



**Company:** Foundation Energy  
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**Well:** Banta Ridge Federal #4A-18-1-103  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Banta Ridge Federal #4A-18-1-103  
**TVD Reference:** WELL @ 6074.00ft (RKB @ 10')  
**MD Reference:** WELL @ 6074.00ft (RKB @ 10')  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Single User Db

**Survey Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4,644.00	4,547.48	-662.54	16.19	4644.00' MD - Last Survey
4,689.00	4,592.47	-662.58	16.42	Straight Line Projection to TD @ 4689'MD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_