



Ursa Operating Company, LLC

Rio Blanco County, Colorado

Boies Ranch B-19N Pad

Boies Ranch B-19N FED 23B-19-2-97

Wellbore #1

Design: Actual

End of Well Report

31 October, 2018

Payzone Directional Service

End of Well Report

Company:	Ursa Operating Company, LLC	Local Co-ordinate Reference:	Well Boies Ranch B-19N FED 23B-19-2-97
Project:	Rio Blanco County, Colorado	TVD Reference:	Boies Ranch B-19N 23B-19-2-97 @ 6325.8usft (Est KB
Site:	Boies Ranch B-19N Pad	MD Reference:	Boies Ranch B-19N 23B-19-2-97 @ 6325.8usft (Est KB
Well:	Boies Ranch B-19N FED 23B-19-2-97	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 5000.1 Single User Db

Project	Rio Blanco County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Boies Ranch B-19N Pad		
Site Position:		Northing:	1,203,643.44 usft
From:	Lat/Long	Easting:	2,206,000.33 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	39.857609622
		Longitude:	-108.328733084
		Grid Convergence:	-1.83 °

Well	Boies Ranch B-19N FED 23B-19-2-97, SHL: Lat 39.857496901 Long -108.328182130		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	6,325.8 usft
		Latitude:	39.857496901
		Longitude:	-108.328182130
		Ground Level:	6,304.8 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	9/25/2017	9.86	65.82	51,647

Design	Actual			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	6.21

Survey Program	Date	10/31/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
147.0	11,028.0	Actual (Wellbore #1)	MWD	MWD - Standard

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Design:	Actual	Database:	EDM 5000.1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
147.0	0.09	78.24	147.0	0.0	0.0	0.1	0.06	0.06	0.00	
238.0	0.18	333.47	238.0	0.2	0.2	0.1	0.24	0.10	-115.13	
329.0	0.09	141.21	329.0	0.2	0.2	0.1	0.30	-0.10	184.33	
420.0	0.28	286.29	420.0	0.2	0.2	-0.1	0.39	0.21	159.43	
512.0	0.48	307.90	512.0	0.5	0.5	-0.6	0.26	0.22	23.49	
604.0	0.40	300.43	604.0	0.8	0.9	-1.2	0.11	-0.09	-8.12	
635.0	0.40	348.37	635.0	1.0	1.1	-1.3	1.05	0.00	154.65	
665.0	0.44	41.24	665.0	1.2	1.3	-1.2	1.25	0.13	176.23	
695.0	1.14	20.98	695.0	1.5	1.7	-1.0	2.48	2.33	-67.53	
725.0	1.71	12.15	725.0	2.3	2.4	-0.8	2.03	1.90	-29.43	
756.0	2.81	10.12	756.0	3.5	3.6	-0.6	3.56	3.55	-6.55	
786.0	3.47	3.14	785.9	5.1	5.2	-0.4	2.54	2.20	-23.27	
816.0	4.70	358.96	815.8	7.3	7.3	-0.4	4.22	4.10	-13.93	
846.0	5.89	357.86	845.7	10.0	10.1	-0.5	3.98	3.97	-3.67	
876.0	6.66	358.66	875.5	13.2	13.4	-0.6	2.58	2.57	2.67	
906.0	7.47	359.40	905.3	16.9	17.1	-0.6	2.72	2.70	2.47	
936.0	8.75	359.75	935.0	21.1	21.3	-0.7	4.27	4.27	1.17	
967.0	9.54	359.88	965.6	26.0	26.2	-0.7	2.55	2.55	0.42	
998.0	10.63	2.83	996.1	31.4	31.7	-0.6	3.89	3.52	9.52	
1,030.0	11.51	5.15	1,027.5	37.6	37.8	-0.1	3.08	2.75	7.25	
1,061.0	12.04	6.61	1,057.9	43.9	44.1	0.5	1.96	1.71	4.71	
1,093.0	12.26	9.11	1,089.2	50.6	50.7	1.4	1.78	0.69	7.81	
1,125.0	12.35	10.39	1,120.4	57.4	57.5	2.6	0.90	0.28	4.00	
1,156.0	13.25	11.11	1,150.7	64.3	64.2	3.9	2.95	2.90	2.32	
1,251.0	14.11	10.87	1,243.0	86.6	86.3	8.2	0.91	0.91	-0.25	
1,346.0	13.89	8.54	1,335.1	109.6	108.9	12.0	0.64	-0.23	-2.45	

Payzone Directional Service

End of Well Report

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Well:	Boies Ranch B-19N FED 23B-19-2-97	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 5000.1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)		TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)
1,440.0	14.02	10.26		1,426.4	132.2	131.3	15.7	0.46	0.14	1.83
1,535.0	14.06	9.42		1,518.5	155.2	154.0	19.7	0.22	0.04	-0.88
1,630.0	14.37	9.77		1,610.6	178.5	177.0	23.6	0.34	0.33	0.37
1,724.0	14.50	8.19		1,701.6	201.9	200.1	27.2	0.44	0.14	-1.68
1,819.0	12.44	5.47		1,794.0	224.0	222.1	29.9	2.27	-2.17	-2.86
1,914.0	10.94	9.11		1,887.1	243.3	241.2	32.3	1.76	-1.58	3.83
2,009.0	11.56	6.56		1,980.2	261.8	259.5	34.8	0.84	0.65	-2.68
2,103.0	13.01	5.51		2,072.1	281.8	279.4	36.9	1.56	1.54	-1.12
2,198.0	12.92	3.71		2,164.7	303.1	300.7	38.6	0.44	-0.09	-1.89
2,293.0	13.84	6.17		2,257.1	325.1	322.6	40.5	1.14	0.97	2.59
2,388.0	13.45	5.11		2,349.4	347.5	344.9	42.7	0.49	-0.41	-1.12
2,483.0	13.45	8.76		2,441.8	369.6	366.8	45.4	0.89	0.00	3.84
2,578.0	13.75	8.41		2,534.1	391.9	388.9	48.7	0.33	0.32	-0.37
2,673.0	13.54	4.91		2,626.5	414.3	411.1	51.3	0.90	-0.22	-3.68
2,768.0	13.36	4.24		2,718.8	436.4	433.2	53.1	0.25	-0.19	-0.71
2,863.0	12.85	6.23		2,811.4	457.9	454.6	55.1	0.72	-0.54	2.09
2,958.0	12.04	5.90		2,904.1	478.4	475.0	57.2	0.86	-0.85	-0.35
3,052.0	12.52	6.26		2,996.0	498.4	494.8	59.3	0.52	0.51	0.38
3,147.0	13.36	9.86		3,088.6	519.6	515.9	62.3	1.23	0.88	3.79
3,242.0	13.62	9.16		3,181.0	541.7	537.7	66.0	0.32	0.27	-0.74
3,337.0	14.59	8.28		3,273.1	564.9	560.6	69.5	1.05	1.02	-0.93
3,431.0	13.84	6.43		3,364.2	587.9	583.5	72.5	0.93	-0.80	-1.97
3,526.0	13.32	4.81		3,456.6	610.2	605.7	74.7	0.68	-0.55	-1.71
Last PZD Surface Survey										
3,614.0	13.30	4.10		3,542.2	630.5	625.9	76.2	0.19	-0.02	-0.81
3,709.0	13.20	2.80		3,634.7	652.2	647.6	77.6	0.33	-0.11	-1.37
3,804.0	13.10	2.90		3,727.2	673.8	669.2	78.6	0.11	-0.11	0.11

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Design:	Actual	Database:	EDM 5000.1 Single User Db

Survey										
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3,898.0	12.90	3.10	3,818.8	694.9	690.4	79.7	0.22	-0.21	0.21	
3,993.0	13.10	3.80	3,911.3	716.3	711.7	81.0	0.27	0.21	0.74	
4,088.0	12.97	2.39	4,003.9	737.7	733.1	82.2	0.36	-0.14	-1.48	
4,183.0	13.45	4.32	4,096.4	759.3	754.7	83.5	0.69	0.51	2.03	
4,277.0	14.15	5.20	4,187.7	781.8	777.1	85.3	0.78	0.74	0.94	
4,373.0	15.86	5.47	4,280.4	806.6	801.8	87.6	1.78	1.78	0.28	
4,468.0	14.59	5.38	4,372.0	831.6	826.7	90.0	1.34	-1.34	-0.09	
4,562.0	14.46	4.94	4,463.0	855.1	850.1	92.1	0.18	-0.14	-0.47	
4,657.0	14.11	4.32	4,555.1	878.6	873.5	94.0	0.40	-0.37	-0.65	
4,752.0	14.37	3.97	4,647.2	901.9	896.8	95.7	0.29	0.27	-0.37	
4,847.0	13.80	1.42	4,739.3	925.0	919.9	96.8	0.89	-0.60	-2.68	
4,944.0	13.54	2.13	4,833.6	947.8	942.8	97.5	0.32	-0.27	0.73	
5,036.0	12.22	2.57	4,923.3	968.3	963.3	98.3	1.44	-1.43	0.48	
5,131.0	11.00	1.60	5,016.3	987.4	982.4	99.0	1.30	-1.28	-1.02	
5,225.0	10.80	1.10	5,108.6	1,005.1	1,000.2	99.5	0.24	-0.21	-0.53	
5,320.0	9.80	356.60	5,202.1	1,021.9	1,017.2	99.2	1.35	-1.05	-4.74	
5,415.0	10.30	357.60	5,295.6	1,038.3	1,033.7	98.3	0.56	0.53	1.05	
5,447.0	10.40	359.10	5,327.1	1,044.0	1,039.5	98.2	0.90	0.31	4.69	
5,478.0	10.70	0.30	5,357.6	1,049.6	1,045.1	98.1	1.20	0.97	3.87	
5,510.0	11.10	0.70	5,389.0	1,055.6	1,051.2	98.2	1.27	1.25	1.25	
5,605.0	11.50	1.90	5,482.2	1,074.2	1,069.8	98.6	0.49	0.42	1.26	
5,699.0	12.40	6.30	5,574.1	1,093.6	1,089.2	100.0	1.36	0.96	4.68	
5,794.0	13.40	9.90	5,666.7	1,114.8	1,110.2	103.0	1.35	1.05	3.79	
5,889.0	13.80	17.80	5,759.1	1,136.9	1,131.8	108.4	2.00	0.42	8.32	
5,984.0	12.30	21.90	5,851.6	1,157.7	1,152.0	115.6	1.85	-1.58	4.32	
6,079.0	10.40	24.80	5,944.8	1,175.6	1,169.2	123.0	2.09	-2.00	3.05	
6,173.0	8.30	25.60	6,037.5	1,190.0	1,183.0	129.5	2.24	-2.23	0.85	

Payzone Directional Service

End of Well Report

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6,205.0	7.30	25.70	6,069.2	1,194.1	1,186.9	131.4	3.13	-3.12	0.31
6,268.0	5.10	25.90	6,131.8	1,200.6	1,193.0	134.3	3.49	-3.49	0.32
6,317.3	3.80	26.93	6,180.9	1,204.1	1,196.5	136.0	2.64	-2.63	2.09
BRB 19N FED 23B-19-2-97 TGT									
6,363.0	2.60	28.80	6,226.6	1,206.5	1,198.7	137.2	2.64	-2.63	4.09
6,458.0	0.00	90.90	6,321.6	1,208.5	1,200.6	138.3	2.74	-2.74	0.00
6,552.0	0.09	260.70	6,415.6	1,208.5	1,200.6	138.2	0.10	0.10	0.00
6,647.0	0.13	301.57	6,510.6	1,208.5	1,200.6	138.0	0.09	0.04	43.02
6,742.0	0.04	286.89	6,605.6	1,208.6	1,200.7	137.9	0.10	-0.09	-15.45
6,837.0	0.09	60.49	6,700.6	1,208.6	1,200.7	137.9	0.13	0.05	140.63
6,932.0	0.84	165.95	6,795.6	1,208.0	1,200.1	138.2	0.91	0.79	111.01
7,026.0	3.60	160.68	6,889.5	1,204.7	1,196.7	139.3	2.94	2.94	-5.61
7,121.0	3.78	168.06	6,984.3	1,199.0	1,190.8	140.9	0.53	0.19	7.77
7,216.0	3.34	186.61	7,079.1	1,193.3	1,185.0	141.3	1.29	-0.46	19.53
7,311.0	0.79	268.70	7,174.1	1,190.4	1,182.2	140.3	3.50	-2.68	86.41
7,406.0	0.09	7.49	7,269.1	1,190.4	1,182.3	139.6	0.85	-0.74	103.99
7,500.0	0.04	228.00	7,363.1	1,190.5	1,182.3	139.6	0.13	-0.05	-148.39
7,595.0	0.09	115.07	7,458.1	1,190.4	1,182.3	139.7	0.12	0.05	-118.87
7,690.0	0.18	249.10	7,553.1	1,190.3	1,182.2	139.6	0.26	0.09	141.08
7,785.0	0.04	317.83	7,648.1	1,190.3	1,182.1	139.4	0.18	-0.15	72.35
7,879.0	0.13	167.89	7,742.1	1,190.2	1,182.1	139.4	0.18	0.10	-159.51
7,974.0	0.22	325.30	7,837.1	1,190.2	1,182.1	139.4	0.36	0.09	165.69
8,069.0	0.13	40.09	7,932.1	1,190.5	1,182.3	139.3	0.24	-0.09	78.73
8,164.0	0.09	183.53	8,027.1	1,190.5	1,182.3	139.4	0.22	-0.04	150.99
8,258.0	0.18	265.18	8,121.1	1,190.4	1,182.3	139.2	0.20	0.10	86.86
8,353.0	0.13	295.77	8,216.1	1,190.4	1,182.3	139.0	0.10	-0.05	32.20
8,448.0	0.00	306.40	8,311.1	1,190.4	1,182.3	138.9	0.14	-0.14	0.00

Payzone Directional Service

End of Well Report

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8,542.0	0.09	243.82	8,405.1	1,190.4	1,182.3	138.8	0.10	0.10	0.00
8,637.0	0.04	34.29	8,500.1	1,190.4	1,182.3	138.8	0.13	-0.05	158.39
8,732.0	0.13	76.39	8,595.1	1,190.4	1,182.4	138.9	0.11	0.09	44.32
8,827.0	0.09	208.93	8,690.1	1,190.4	1,182.3	139.0	0.21	-0.04	139.52
8,921.0	0.18	314.05	8,784.1	1,190.4	1,182.4	138.8	0.24	0.10	111.83
9,015.0	0.13	62.68	8,878.1	1,190.6	1,182.5	138.8	0.27	-0.05	115.56
9,110.0	0.18	241.54	8,973.1	1,190.6	1,182.5	138.8	0.33	0.05	188.27
9,205.0	0.13	170.44	9,068.1	1,190.4	1,182.3	138.7	0.19	-0.05	-74.84
9,299.0	0.13	62.33	9,162.1	1,190.3	1,182.2	138.8	0.22	0.00	-115.01
9,394.0	0.18	322.22	9,257.1	1,190.5	1,182.4	138.8	0.25	0.05	-105.38
9,488.0	0.13	350.79	9,351.1	1,190.7	1,182.6	138.7	0.10	-0.05	30.39
9,583.0	0.13	352.28	9,446.1	1,190.9	1,182.9	138.6	0.00	0.00	1.57
9,678.0	0.09	218.78	9,541.1	1,191.0	1,182.9	138.6	0.21	-0.04	-140.53
9,772.0	0.22	334.88	9,635.1	1,191.0	1,183.0	138.5	0.29	0.14	123.51
9,867.0	0.18	53.89	9,730.1	1,191.3	1,183.3	138.5	0.27	-0.04	83.17
9,962.0	0.31	349.38	9,825.1	1,191.6	1,183.6	138.6	0.30	0.14	-67.91
10,056.0	0.18	353.60	9,919.1	1,192.0	1,184.0	138.5	0.14	-0.14	4.49
10,151.0	0.09	280.12	10,014.1	1,192.2	1,184.2	138.4	0.19	-0.09	-77.35
10,246.0	0.26	349.21	10,109.1	1,192.4	1,184.4	138.3	0.26	0.18	72.73
10,341.0	0.22	296.56	10,204.1	1,192.7	1,184.7	138.1	0.23	-0.04	-55.42
10,438.0	0.26	39.04	10,301.1	1,192.9	1,184.9	138.1	0.39	0.04	105.65
10,530.0	0.40	313.79	10,393.1	1,193.3	1,185.3	138.0	0.50	0.15	-92.66
10,625.0	0.22	329.96	10,488.1	1,193.6	1,185.7	137.6	0.21	-0.19	17.02
10,719.0	0.26	247.78	10,582.0	1,193.7	1,185.8	137.4	0.34	0.04	-87.43
10,814.0	0.22	152.33	10,677.0	1,193.4	1,185.5	137.2	0.37	-0.04	-100.47
10,908.0	0.40	327.50	10,771.0	1,193.5	1,185.7	137.2	0.66	0.19	186.35

Payzone Directional Service

End of Well Report

Company:	Ursa Operating Company, LLC	Local Co-ordinate Reference:	Well Boies Ranch B-19N FED 23B-19-2-97
Project:	Rio Blanco County, Colorado	TVD Reference:	Boies Ranch B-19N 23B-19-2-97 @ 6325.8usft (Est KB
Site:	Boies Ranch B-19N Pad	MD Reference:	Boies Ranch B-19N 23B-19-2-97 @ 6325.8usft (Est KB
Well:	Boies Ranch B-19N FED 23B-19-2-97	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 5000.1 Single User Db

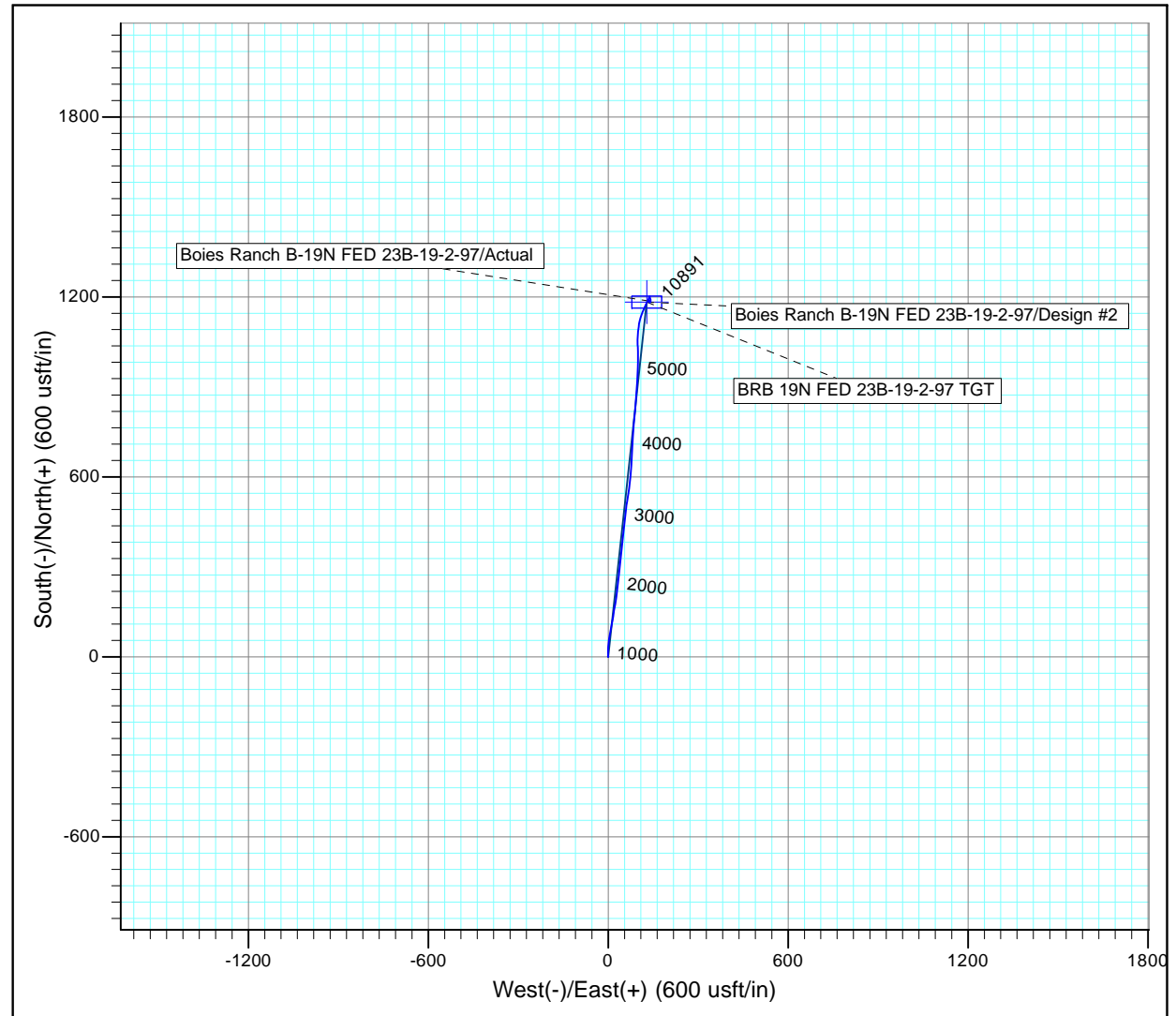
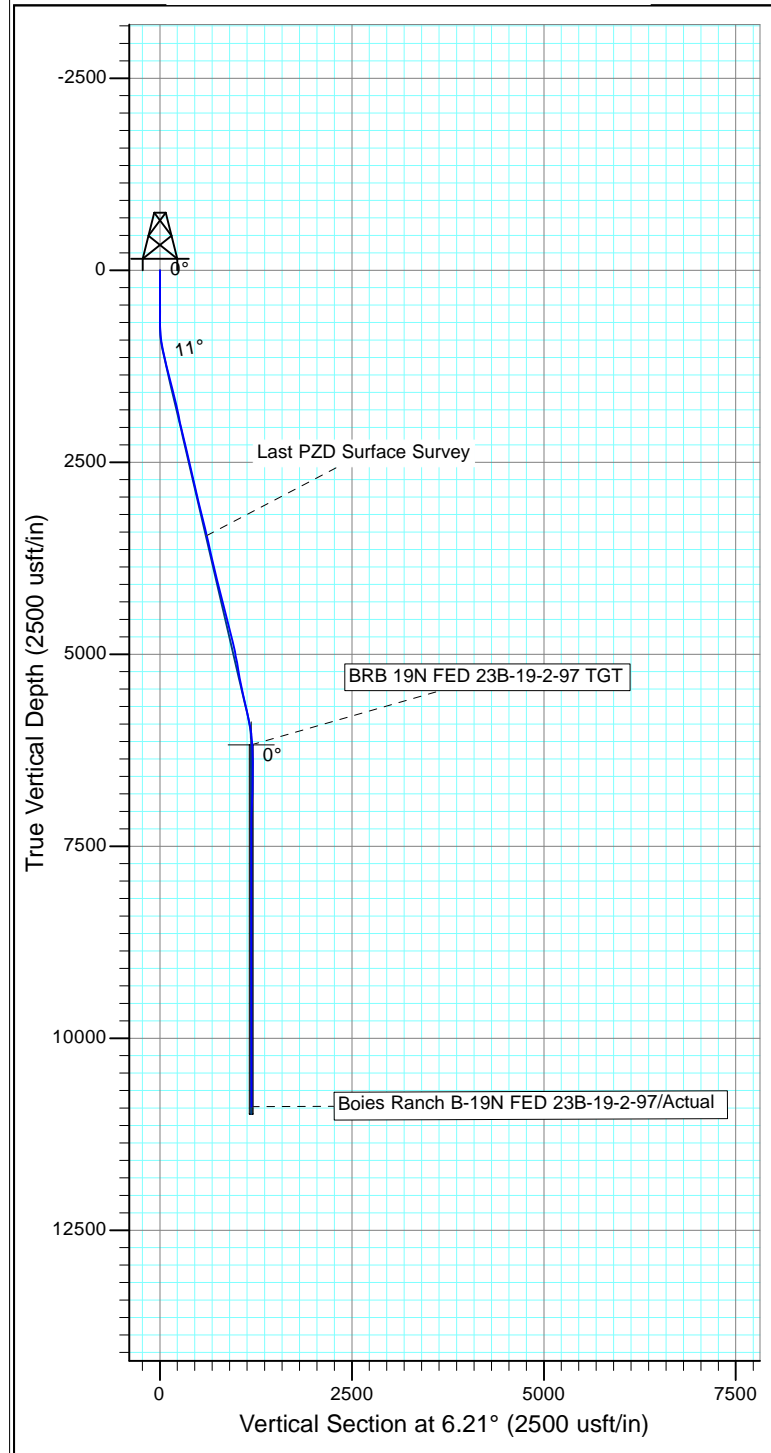
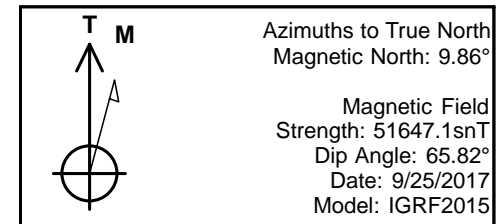
Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	
10,943.0	0.35	315.63	10,806.0	1,193.7	1,185.8	137.0	0.26	-0.14	-33.91	
Last PZD Survey										
11,028.0	0.35	315.63	10,891.0	1,194.0	1,186.2	136.7	0.00	0.00	0.00	
Straightline Projection to TD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
3,526.0	3,456.6	605.7	74.7	Last PZD Surface Survey	
10,943.0	10,806.0	1,185.8	137.0	Last PZD Survey	
11,028.0	10,891.0	1,186.2	136.7	Straightline Projection to TD	

Checked By: _____ Approved By: _____ Date: _____



Project: Rio Blanco County, Colorado
 Site: Boies Ranch B-19N Pad
 Well: Boies Ranch B-19N FED 23B-19-2-97
 Wellbore: Wellbore #1
 Design: Actual



Design: Actual (Boies Ranch B-19N FED 23B-19-2-97/Wellbore #1)

Created By: Derek Stephens Date: 21:46, October 31 2018

THIS SURVEY IS CORRECT TO THE BEST OF
 MY KNOWLEDGE AND IS SUPPORTED
 BY ACTUAL FIELD DATA