

WELL DETAILS: Butterball 24N2-34HZ

GL 4916' & KB 20' @ 4936.00ft (Precision 461) 4916.00
 Northing 14584393.10 Easting 1676821.81 Latitude 40.1582690 Longitude -104.8697040

Design: OH (Butterball 24N2-34HZ/OH)

Created By: Seth Burstad Date: 5-26-2017

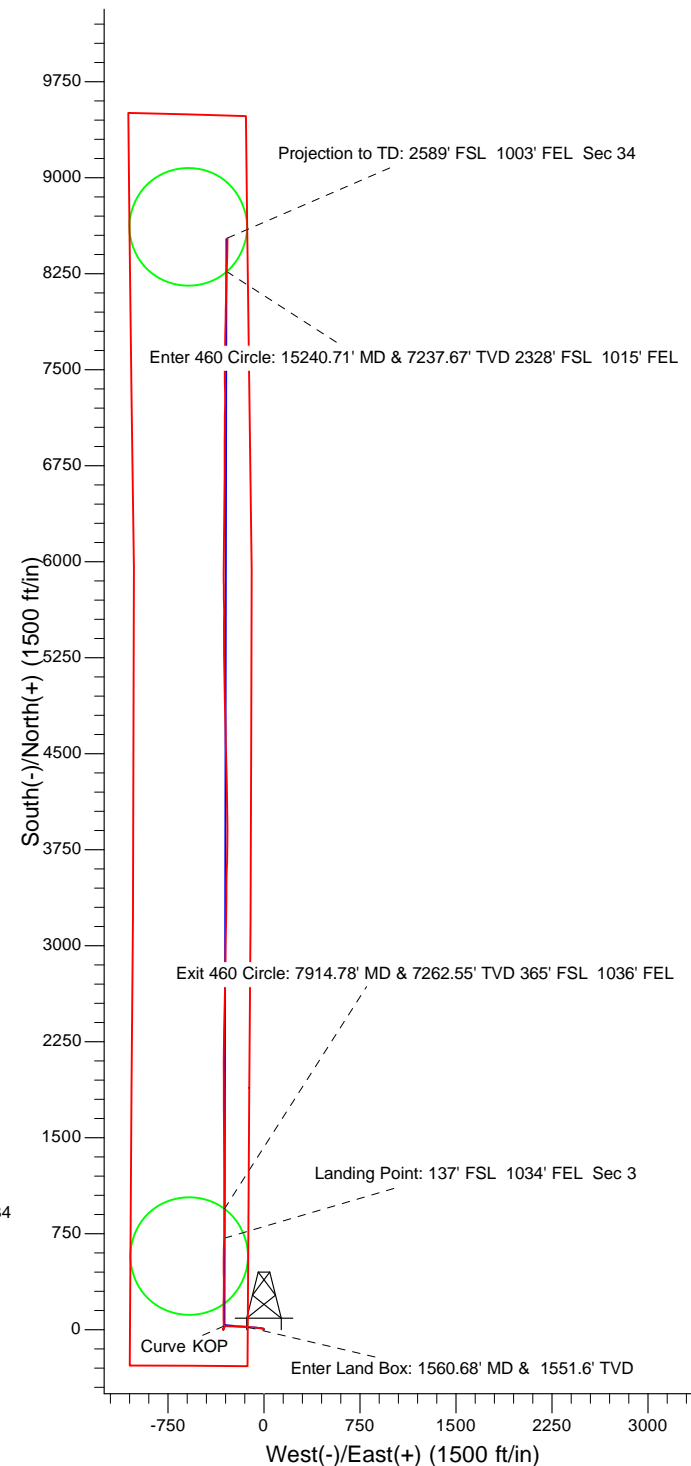
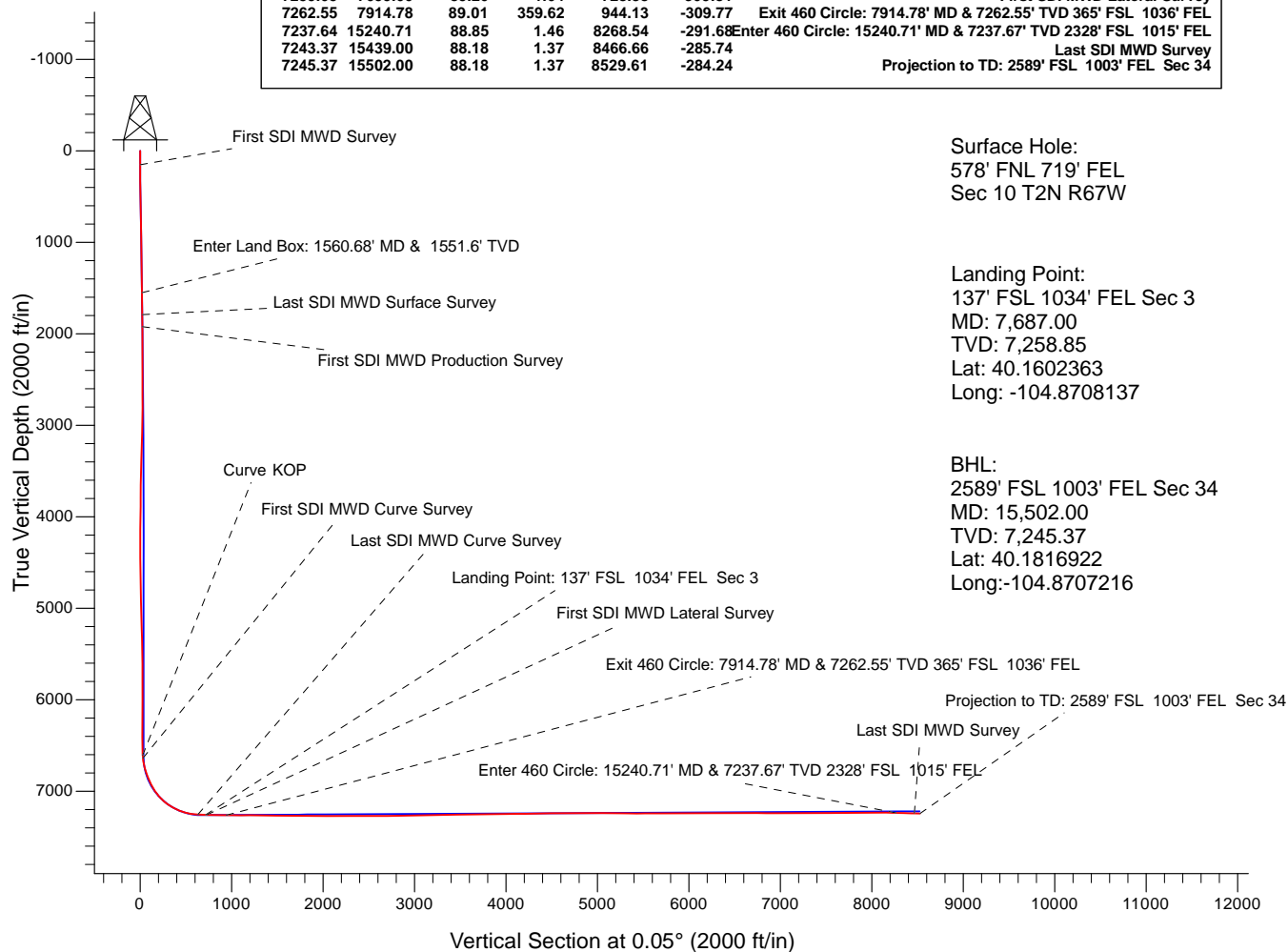
PROJECT DETAILS: US Rockies Wattenberg Planning UTM83

Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Zone 13N (108 W to 102 W)

System Datum: Mean Sea Level
 Local North: True

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	Annotation
153.00	153.00	0.27	72.76	0.11	0.34	First SDI MWD Survey
1551.60	1560.68	9.88	274.90	20.88	-126.43	Enter Land Box: 1560.68' MD & 1551.6' TVD
1791.03	1804.00	9.66	273.07	24.72	-169.56	Last SDI MWD Surface Survey
1922.28	1937.00	8.91	274.20	26.07	-190.98	First SDI MWD Production Survey
6608.55	6631.00	3.87	6.36	29.33	-313.89	Curve KOP
6638.45	6661.00	5.50	4.56	31.77	-313.66	First SDI MWD Curve Survey
7255.60	7604.00	86.64	2.35	633.49	-312.62	Last SDI MWD Curve Survey
7258.85	7687.00	88.88	1.21	716.38	-310.05	Landing Point: 137' FSL 1034' FEL Sec 3
7259.05	7699.00	89.20	1.04	728.38	-309.81	First SDI MWD Lateral Survey
7262.55	7914.78	89.01	359.62	944.13	-309.77	Exit 460 Circle: 7914.78' MD & 7262.55' TVD 365' FSL 1036' FEL
7237.64	15240.71	88.85	1.46	8268.54	-291.68	Enter 460 Circle: 15240.71' MD & 7237.67' TVD 2328' FSL 1015' FEL
7243.37	15439.00	88.18	1.37	8466.66	-285.74	Last SDI MWD Survey
7245.37	15502.00	88.18	1.37	8529.61	-284.24	Projection to TD: 2589' FSL 1003' FEL Sec 34





US ROCKIES REGION PLANNING

US Rockies Wattenberg Planning UTM83

Butterball 1-10HZ Pad 2N-67W-10

Butterball 24N2-34HZ

OH

Design: OH

Standard Survey Report

30 May, 2017



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Butterball 24N2-34HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
Site:	Butterball 1-10HZ Pad 2N-67W-10	MD Reference:	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
Well:	Butterball 24N2-34HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Project	US Rockies Wattenberg Planning UTM83		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 13N (108 W to 102 W)		

Site	Butterball 1-10HZ Pad 2N-67W-10, Site Center : Butterball 9N-34HZ		
Site Position:		Northing:	14,584,393.12 usft
From:	Lat/Long	Easting:	1,676,836.61 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	40.1582690
		Longitude:	-104.8696510
		Grid Convergence:	0.08 °

Well	Butterball 24N2-34HZ, 578' FNL 719' FEL Sec 10 T2N R67W		
Well Position	+N/-S	0.00 ft	Northing: 14,584,393.09 usft
	+E/-W	0.00 ft	Easting: 1,676,821.80 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	40.1582690
		Longitude:	-104.8697040
		Ground Level:	4,916.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2016	4/6/2017	8.44	66.67	52,273

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00		0.05

Survey Program	Date	5/30/2017			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
153.00	1,804.00	Survey #1 - Surface (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
1,937.00	15,502.00	Survey #2 - Production (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
153.00	0.27	72.76	153.00	0.11	0.34	0.11	0.18	0.18	0.00	
First SDI MWD Survey										
239.00	0.33	27.40	239.00	0.39	0.65	0.39	0.28	0.07	-52.74	
328.00	0.62	23.27	328.00	1.06	0.96	1.06	0.33	0.33	-4.64	
415.00	1.12	351.80	414.99	2.33	1.02	2.33	0.77	0.57	-36.17	
503.00	1.83	313.42	502.96	4.15	-0.12	4.15	1.34	0.81	-43.61	
592.00	2.87	306.87	591.88	6.46	-2.93	6.46	1.20	1.17	-7.36	
679.00	3.55	287.96	678.75	8.60	-7.24	8.59	1.44	0.78	-21.74	
765.00	4.79	285.17	764.52	10.36	-13.24	10.35	1.46	1.44	-3.24	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Butterball 24N2-34HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
Site:	Butterball 1-10HZ Pad 2N-67W-10	MD Reference:	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
Well:	Butterball 24N2-34HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
854.00	5.35	278.37	853.17	11.94	-20.93	11.92	0.92	0.63	-7.64
943.00	6.72	277.10	941.67	13.18	-30.20	13.16	1.55	1.54	-1.43
1,032.00	7.10	275.16	1,030.03	14.32	-40.85	14.29	0.50	0.43	-2.18
1,121.00	7.86	273.69	1,118.27	15.21	-52.40	15.16	0.88	0.85	-1.65
1,209.00	9.19	276.90	1,205.30	16.44	-65.38	16.38	1.60	1.51	3.65
1,298.00	10.10	274.93	1,293.04	17.96	-80.21	17.89	1.09	1.02	-2.21
1,382.00	10.85	271.72	1,375.64	18.83	-95.45	18.75	1.13	0.89	-3.82
1,469.00	9.68	274.34	1,461.24	19.63	-110.93	19.54	1.45	-1.34	3.01
1,556.00	9.84	274.82	1,546.99	20.81	-125.63	20.70	0.21	0.18	0.55
1,560.68	9.88	274.90	1,551.60	20.88	-126.43	20.77	0.94	0.89	1.78
Enter Land Box: 1560.68' MD & 1551.6' TVD									
1,640.00	10.59	276.22	1,629.65	22.25	-140.46	22.13	0.94	0.89	1.66
1,729.00	10.36	274.83	1,717.17	23.81	-156.56	23.67	0.38	-0.26	-1.56
1,804.00	9.66	273.07	1,791.03	24.72	-169.56	24.57	1.02	-0.93	-2.35
Last SDI MWD Surface Survey									
1,937.00	8.91	274.20	1,922.28	26.07	-190.98	25.90	0.58	-0.56	0.85
First SDI MWD Production Survey									
2,031.00	8.47	271.15	2,015.21	26.74	-205.16	26.56	0.68	-0.47	-3.24
2,126.00	7.55	270.01	2,109.28	26.88	-218.40	26.69	0.98	-0.97	-1.20
2,221.00	7.10	269.06	2,203.50	26.79	-230.51	26.59	0.49	-0.47	-1.00
2,314.00	6.51	272.43	2,295.85	26.92	-241.52	26.71	0.77	-0.63	3.62
2,407.00	6.12	268.63	2,388.28	27.02	-251.75	26.80	0.61	-0.42	-4.09
2,502.00	5.57	267.99	2,482.79	26.74	-261.42	26.51	0.58	-0.58	-0.67
2,596.00	6.58	275.08	2,576.26	27.06	-271.34	26.82	1.34	1.07	7.54
2,690.00	6.52	275.34	2,669.65	28.03	-282.02	27.78	0.07	-0.06	0.28
2,784.00	6.38	271.01	2,763.05	28.62	-292.55	28.36	0.54	-0.15	-4.61
2,878.00	4.44	261.81	2,856.63	28.19	-301.38	27.93	2.25	-2.06	-9.79
2,972.00	2.66	242.61	2,950.45	26.67	-306.92	26.40	2.25	-1.89	-20.43
3,068.00	1.88	192.94	3,046.38	24.11	-309.25	23.84	2.12	-0.81	-51.74
3,160.00	1.83	194.92	3,138.34	21.22	-309.96	20.95	0.09	-0.05	2.15
3,254.00	1.55	202.57	3,232.29	18.59	-310.84	18.32	0.38	-0.30	8.14
3,348.00	1.47	195.84	3,326.26	16.26	-311.66	15.99	0.21	-0.09	-7.16
3,440.00	1.54	192.14	3,418.23	13.92	-312.24	13.64	0.13	0.08	-4.02
3,534.00	1.40	192.32	3,512.20	11.56	-312.75	11.29	0.15	-0.15	0.19
3,628.00	1.62	187.79	3,606.17	9.12	-313.17	8.85	0.27	0.23	-4.82
3,722.00	1.48	248.97	3,700.14	7.37	-314.49	7.10	1.68	-0.15	65.09
3,816.00	1.29	268.51	3,794.11	6.91	-316.68	6.63	0.54	-0.20	20.79
3,909.00	1.53	263.45	3,887.08	6.74	-318.96	6.46	0.29	0.26	-5.44
4,004.00	0.59	160.92	3,982.07	6.13	-320.06	5.85	1.85	-0.99	-107.93
4,099.00	0.86	155.61	4,077.06	5.02	-319.60	4.74	0.29	0.28	-5.59
4,193.00	0.85	149.77	4,171.05	3.77	-318.96	3.50	0.09	-0.01	-6.21
4,287.00	0.64	132.62	4,265.04	2.82	-318.22	2.54	0.32	-0.22	-18.24
4,382.00	0.65	168.72	4,360.04	1.93	-317.73	1.65	0.42	0.01	38.00
4,476.00	0.54	182.27	4,454.03	0.96	-317.64	0.69	0.19	-0.12	14.41

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Site:	Butterball 1-10HZ Pad 2N-67W-10	MD Reference:	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
Well:	Butterball 24N2-34HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,571.00	1.37	348.86	4,549.03	1.63	-317.88	1.35	2.00	0.87	175.36
4,664.00	1.98	356.69	4,641.99	4.33	-318.19	4.05	0.70	0.66	8.42
4,758.00	1.66	2.17	4,735.94	7.31	-318.23	7.03	0.39	-0.34	5.83
4,852.00	1.50	13.26	4,829.90	9.86	-317.89	9.59	0.37	-0.17	11.80
4,947.00	1.42	36.90	4,924.87	12.02	-316.90	11.74	0.63	-0.08	24.88
5,042.00	1.13	32.52	5,019.85	13.75	-315.69	13.47	0.32	-0.31	-4.61
5,135.00	1.65	23.28	5,112.82	15.75	-314.67	15.48	0.61	0.56	-9.94
5,255.00	1.41	19.04	5,232.78	18.73	-313.51	18.46	0.22	-0.20	-3.53
5,350.00	1.50	23.81	5,327.75	20.98	-312.62	20.70	0.16	0.09	5.02
5,445.00	1.40	16.28	5,422.72	23.23	-311.79	22.96	0.23	-0.11	-7.93
5,539.00	1.35	16.13	5,516.69	25.39	-311.17	25.12	0.05	-0.05	-0.16
5,633.00	0.53	329.00	5,610.68	26.83	-311.08	26.56	1.13	-0.87	-50.14
5,725.00	1.38	287.81	5,702.67	27.53	-312.36	27.26	1.13	0.92	-44.77
5,818.00	1.48	285.55	5,795.64	28.20	-314.58	27.92	0.12	0.11	-2.43
5,912.00	0.71	226.40	5,889.62	28.12	-316.17	27.85	1.35	-0.82	-62.93
6,004.00	0.51	218.11	5,981.62	27.41	-316.84	27.13	0.24	-0.22	-9.01
6,099.00	0.29	177.28	6,076.62	26.83	-317.09	26.56	0.37	-0.23	-42.98
6,192.00	0.34	125.96	6,169.61	26.44	-316.85	26.16	0.30	0.05	-55.18
6,285.00	0.40	100.28	6,262.61	26.22	-316.31	25.94	0.19	0.06	-27.61
6,380.00	0.38	83.83	6,357.61	26.19	-315.67	25.92	0.12	-0.02	-17.32
6,474.00	0.48	58.41	6,451.61	26.43	-315.02	26.16	0.23	0.11	-27.04
6,568.00	0.59	44.19	6,545.60	26.98	-314.35	26.71	0.18	0.12	-15.13
6,631.00	3.87	6.36	6,608.55	29.33	-313.89	29.06	5.44	5.21	-60.05
Curve KOP									
6,661.00	5.50	4.56	6,638.45	31.77	-313.66	31.50	5.44	5.42	-6.00
First SDI MWD Curve Survey									
6,755.00	14.10	357.31	6,730.99	47.73	-313.84	47.46	9.22	9.15	-7.71
6,849.00	20.62	356.38	6,820.66	75.72	-315.43	75.44	6.94	6.94	-0.99
6,943.00	25.02	358.68	6,907.28	112.13	-316.93	111.85	4.78	4.68	2.45
7,037.00	32.43	1.07	6,989.66	157.27	-316.92	156.99	7.98	7.88	2.54
7,131.00	42.40	2.39	7,064.23	214.28	-315.12	214.00	10.64	10.61	1.40
7,226.00	52.15	0.52	7,128.61	283.95	-313.44	283.68	10.36	10.26	-1.97
7,320.00	60.92	359.08	7,180.40	362.29	-313.76	362.02	9.42	9.33	-1.53
7,415.00	70.17	358.75	7,219.68	448.66	-315.41	448.38	9.74	9.74	-0.35
7,510.00	79.65	1.13	7,244.39	540.27	-315.46	539.99	10.27	9.98	2.51
7,604.00	86.64	2.35	7,255.60	633.49	-312.62	633.22	7.55	7.44	1.30
Last SDI MWD Curve Survey									
7,687.00	88.88	1.21	7,258.85	716.38	-310.05	716.11	3.03	2.69	-1.38
Landing Point: 137' FSL 1034' FEL Sec 3									
7,699.00	89.20	1.04	7,259.05	728.38	-309.81	728.11	3.03	2.70	-1.38
First SDI MWD Lateral Survey									
7,792.00	89.02	359.80	7,260.49	821.37	-309.13	821.10	1.35	-0.19	-1.33
7,886.00	89.06	359.65	7,262.07	915.35	-309.58	915.08	0.17	0.04	-0.16
7,914.78	89.01	359.62	7,262.55	944.13	-309.77	943.86	0.21	-0.18	-0.11

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
Exit 460 Circle: 7914.78' MD & 7262.55' TVD 365' FSL 1036' FEL									
7,981.00	88.89	359.55	7,263.77	1,010.33	-310.25	1,010.06	0.21	-0.18	-0.11
8,075.00	90.40	359.86	7,264.35	1,104.33	-310.73	1,104.06	1.64	1.61	0.33
8,170.00	91.11	359.90	7,263.10	1,199.32	-310.93	1,199.05	0.75	0.75	0.04
8,264.00	89.19	359.66	7,262.85	1,293.31	-311.29	1,293.04	2.06	-2.04	-0.26
8,357.00	89.06	359.87	7,264.27	1,386.30	-311.67	1,386.03	0.27	-0.14	0.23
8,451.00	88.79	359.37	7,266.04	1,480.28	-312.30	1,480.01	0.60	-0.29	-0.53
8,545.00	88.79	0.02	7,268.02	1,574.26	-312.80	1,573.99	0.69	0.00	0.69
8,639.00	89.40	359.92	7,269.51	1,668.25	-312.85	1,667.97	0.66	0.65	-0.11
8,734.00	89.09	359.99	7,270.76	1,763.24	-312.92	1,762.97	0.33	-0.33	0.07
8,828.00	90.17	359.89	7,271.36	1,857.24	-313.02	1,856.96	1.15	1.15	-0.11
8,924.00	90.37	359.83	7,270.91	1,953.23	-313.25	1,952.96	0.22	0.21	-0.06
9,017.00	89.70	358.82	7,270.85	2,046.23	-314.35	2,045.95	1.30	-0.72	-1.09
9,112.00	89.90	0.69	7,271.19	2,141.22	-314.75	2,140.94	1.98	0.21	1.97
9,206.00	89.60	1.19	7,271.60	2,235.21	-313.21	2,234.93	0.62	-0.32	0.53
9,301.00	90.50	1.47	7,271.51	2,330.18	-311.01	2,329.91	0.99	0.95	0.29
9,396.00	90.00	0.95	7,271.10	2,425.16	-309.00	2,424.89	0.76	-0.53	-0.55
9,490.00	90.37	1.11	7,270.80	2,519.14	-307.31	2,518.87	0.43	0.39	0.17
9,584.00	89.73	0.98	7,270.71	2,613.12	-305.60	2,612.86	0.69	-0.68	-0.14
9,679.00	90.91	0.29	7,270.18	2,708.12	-304.54	2,707.85	1.44	1.24	-0.73
9,772.00	91.27	1.82	7,268.41	2,801.08	-302.83	2,800.81	1.69	0.39	1.65
9,867.00	90.10	0.88	7,267.28	2,896.04	-300.59	2,895.78	1.58	-1.23	-0.99
9,961.00	91.78	0.63	7,265.74	2,990.02	-299.36	2,989.76	1.81	1.79	-0.27
10,054.00	91.71	0.82	7,262.90	3,082.97	-298.18	3,082.71	0.22	-0.08	0.20
10,148.00	90.87	0.55	7,260.79	3,176.94	-297.06	3,176.68	0.94	-0.89	-0.29
10,243.00	90.94	0.81	7,259.29	3,271.92	-295.93	3,271.66	0.28	0.07	0.27
10,336.00	90.30	1.16	7,258.28	3,364.90	-294.33	3,364.64	0.78	-0.69	0.38
10,430.00	89.70	0.07	7,258.28	3,458.89	-293.32	3,458.63	1.32	-0.64	-1.16
10,523.00	91.61	1.23	7,257.22	3,551.87	-292.27	3,551.62	2.40	2.05	1.25
10,618.00	91.48	1.16	7,254.66	3,646.82	-290.29	3,646.56	0.16	-0.14	-0.07
10,713.00	91.75	2.22	7,251.98	3,741.74	-287.49	3,741.49	1.15	0.28	1.12
10,806.00	90.44	0.26	7,250.20	3,834.69	-285.47	3,834.44	2.53	-1.41	-2.11
10,900.00	90.34	359.98	7,249.56	3,928.69	-285.28	3,928.44	0.32	-0.11	-0.30
10,995.00	91.48	359.52	7,248.05	4,023.68	-285.69	4,023.42	1.29	1.20	-0.48
11,090.00	90.40	358.32	7,246.49	4,118.64	-287.48	4,118.39	1.70	-1.14	-1.26
11,183.00	89.93	358.56	7,246.23	4,211.61	-290.01	4,211.35	0.57	-0.51	0.26
11,277.00	90.34	358.66	7,246.01	4,305.58	-292.29	4,305.32	0.45	0.44	0.11
11,370.00	91.04	358.67	7,244.89	4,398.55	-294.46	4,398.29	0.75	0.75	0.01
11,464.00	91.31	359.33	7,242.96	4,492.51	-296.10	4,492.25	0.76	0.29	0.70
11,557.00	91.58	358.68	7,240.61	4,585.47	-297.72	4,585.21	0.76	0.29	-0.70
11,650.00	90.10	358.79	7,239.25	4,678.43	-299.77	4,678.17	1.60	-1.59	0.12
11,743.00	89.73	359.00	7,239.39	4,771.42	-301.56	4,771.15	0.46	-0.40	0.23
11,838.00	90.03	358.41	7,239.59	4,866.39	-303.71	4,866.12	0.70	0.32	-0.62

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Butterball 24N2-34HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
Site:	Butterball 1-10HZ Pad 2N-67W-10	MD Reference:	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
Well:	Butterball 24N2-34HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,932.00	89.63	358.34	7,239.86	4,960.35	-306.37	4,960.08	0.43	-0.43	-0.07
12,026.00	89.36	358.93	7,240.69	5,054.32	-308.61	5,054.05	0.69	-0.29	0.63
12,121.00	89.29	358.02	7,241.81	5,149.28	-311.14	5,149.01	0.96	-0.07	-0.96
12,214.00	89.39	0.24	7,242.88	5,242.26	-312.55	5,241.98	2.39	0.11	2.39
12,309.00	89.50	0.53	7,243.80	5,337.25	-311.92	5,336.98	0.33	0.12	0.31
12,403.00	90.13	359.88	7,244.11	5,431.25	-311.58	5,430.97	0.96	0.67	-0.69
12,497.00	90.07	359.80	7,243.94	5,525.25	-311.84	5,524.97	0.11	-0.06	-0.09
12,592.00	90.20	359.69	7,243.72	5,620.25	-312.26	5,619.97	0.18	0.14	-0.12
12,686.00	90.81	359.68	7,242.89	5,714.24	-312.78	5,713.97	0.65	0.65	-0.01
12,781.00	91.04	358.91	7,241.36	5,809.22	-313.95	5,808.94	0.85	0.24	-0.81
12,874.00	90.40	0.23	7,240.19	5,902.21	-314.65	5,901.93	1.58	-0.69	1.42
12,968.00	89.29	359.08	7,240.44	5,996.20	-315.21	5,995.93	1.70	-1.18	-1.22
13,063.00	89.50	1.15	7,241.45	6,091.19	-315.02	6,090.92	2.19	0.22	2.18
13,156.00	90.17	1.39	7,241.71	6,184.17	-312.96	6,183.89	0.77	0.72	0.26
13,251.00	90.40	1.08	7,241.24	6,279.15	-310.91	6,278.87	0.41	0.24	-0.33
13,347.00	90.30	0.64	7,240.66	6,375.13	-309.47	6,374.86	0.47	-0.10	-0.46
13,440.00	90.30	0.69	7,240.17	6,468.12	-308.39	6,467.85	0.05	0.00	0.05
13,533.00	90.24	359.83	7,239.73	6,561.12	-307.97	6,560.85	0.93	-0.06	-0.92
13,628.00	90.17	358.97	7,239.39	6,656.12	-308.97	6,655.84	0.91	-0.07	-0.91
13,722.00	89.50	0.73	7,239.66	6,750.11	-309.21	6,749.84	2.00	-0.71	1.87
13,816.00	89.76	0.61	7,240.27	6,844.10	-308.11	6,843.83	0.30	0.28	-0.13
13,909.00	90.50	0.98	7,240.06	6,937.09	-306.82	6,936.82	0.89	0.80	0.40
14,005.00	89.93	0.21	7,239.70	7,033.08	-305.83	7,032.82	1.00	-0.59	-0.80
14,100.00	90.13	0.13	7,239.65	7,128.08	-305.54	7,127.81	0.23	0.21	-0.08
14,194.00	90.47	0.57	7,239.15	7,222.08	-304.97	7,221.81	0.59	0.36	0.47
14,288.00	90.27	359.59	7,238.55	7,316.08	-304.84	7,315.81	1.06	-0.21	-1.04
14,382.00	89.80	0.04	7,238.49	7,410.08	-305.14	7,409.81	0.69	-0.50	0.48
14,476.00	89.80	359.29	7,238.82	7,504.07	-305.69	7,503.80	0.80	0.00	-0.80
14,571.00	89.19	0.53	7,239.66	7,599.07	-305.84	7,598.80	1.45	-0.64	1.31
14,665.00	90.84	1.31	7,239.63	7,693.05	-304.33	7,692.78	1.94	1.76	0.83
14,758.00	91.01	1.52	7,238.13	7,786.01	-302.04	7,785.74	0.29	0.18	0.23
14,851.00	91.88	0.77	7,235.78	7,878.96	-300.18	7,878.70	1.23	0.94	-0.81
14,945.00	89.56	1.49	7,234.60	7,972.93	-298.32	7,972.67	2.58	-2.47	0.77
15,038.00	89.87	1.20	7,235.07	8,065.90	-296.14	8,065.64	0.46	0.33	-0.31
15,132.00	89.19	1.22	7,235.84	8,159.88	-294.16	8,159.62	0.72	-0.72	0.02
15,226.00	88.96	1.36	7,237.35	8,253.84	-292.04	8,253.58	0.29	-0.24	0.15
15,240.71	88.85	1.46	7,237.64	8,268.54	-291.68	8,268.29	0.99	-0.72	0.68
Enter 460 Circle: 15240.71' MD & 7237.67' TVD 2328' FSL 1015' FEL									
15,319.00	88.29	1.99	7,239.59	8,346.77	-289.32	8,346.52	0.99	-0.72	0.68
15,412.00	88.12	1.57	7,242.50	8,439.68	-286.44	8,439.43	0.49	-0.18	-0.45
15,439.00	88.18	1.37	7,243.37	8,466.66	-285.74	8,466.41	0.77	0.22	-0.74
Last SDI MWD Survey									
15,502.00	88.18	1.37	7,245.37	8,529.61	-284.24	8,529.36	0.00	0.00	0.00
Projection to TD: 2589' FSL 1003' FEL Sec 34									

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Butterball 24N2-34HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
Site:	Butterball 1-10HZ Pad 2N-67W-10	MD Reference:	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
Well:	Butterball 24N2-34HZ	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Denver Sales Office

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
153.00	153.00	0.11	0.34	First SDI MWD Survey
1,560.68	1,551.60	20.88	-126.43	Enter Land Box: 1560.68' MD & 1551.6' TVD
1,804.00	1,791.03	24.72	-169.56	Last SDI MWD Surface Survey
1,937.00	1,922.28	26.07	-190.98	First SDI MWD Production Survey
6,631.00	6,608.55	29.33	-313.89	Curve KOP
6,661.00	6,638.45	31.77	-313.66	First SDI MWD Curve Survey
7,604.00	7,255.60	633.49	-312.62	Last SDI MWD Curve Survey
7,687.00	7,258.85	716.38	-310.05	Landing Point: 137' FSL 1034' FEL Sec 3
7,699.00	7,259.05	728.38	-309.81	First SDI MWD Lateral Survey
7,914.78	7,262.55	944.13	-309.77	Exit 460 Circle: 7914.78' MD & 7262.55' TVD 365' FSL 1036' FEL
15,240.71	7,237.64	8,268.54	-291.68	Enter 460 Circle: 15240.71' MD & 7237.67' TVD 2328' FSL 1015' FEL
15,439.00	7,243.37	8,466.66	-285.74	Last SDI MWD Survey
15,502.00	7,245.37	8,529.61	-284.24	Projection to TD: 2589' FSL 1003' FEL Sec 34

Checked By: _____	Approved By: _____	Date: _____
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