

**WELL DETAILS: Butterball 24N-34HZ**

GL 4916' & KB 20' @ 4936.00ft (Precision 461) 4916.00  
 Northing 14584393.40 Easting 1676776.82 Latitude 40.1582700 Longitude -104.8698650

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

Created By: Seth Burstad Date: 6-12-2017

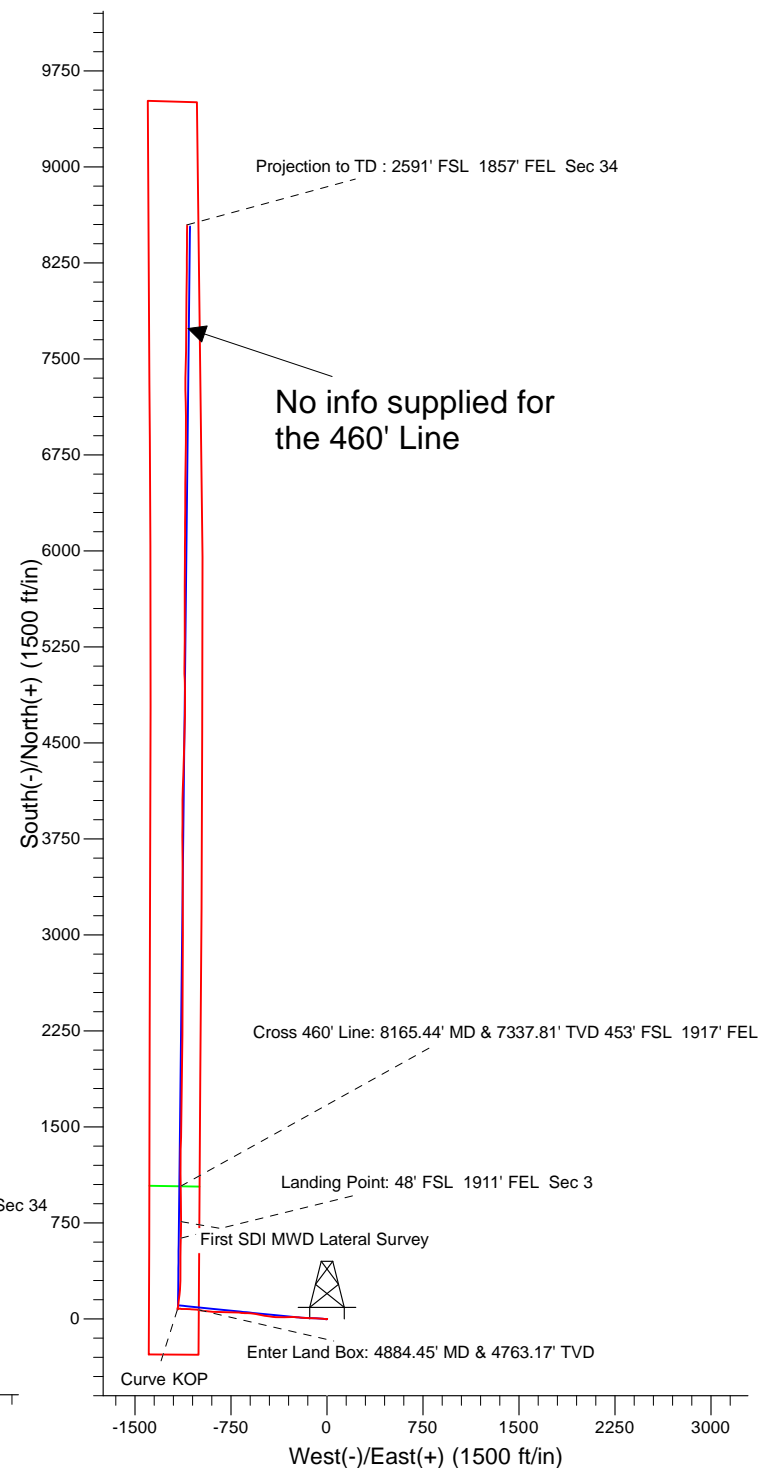
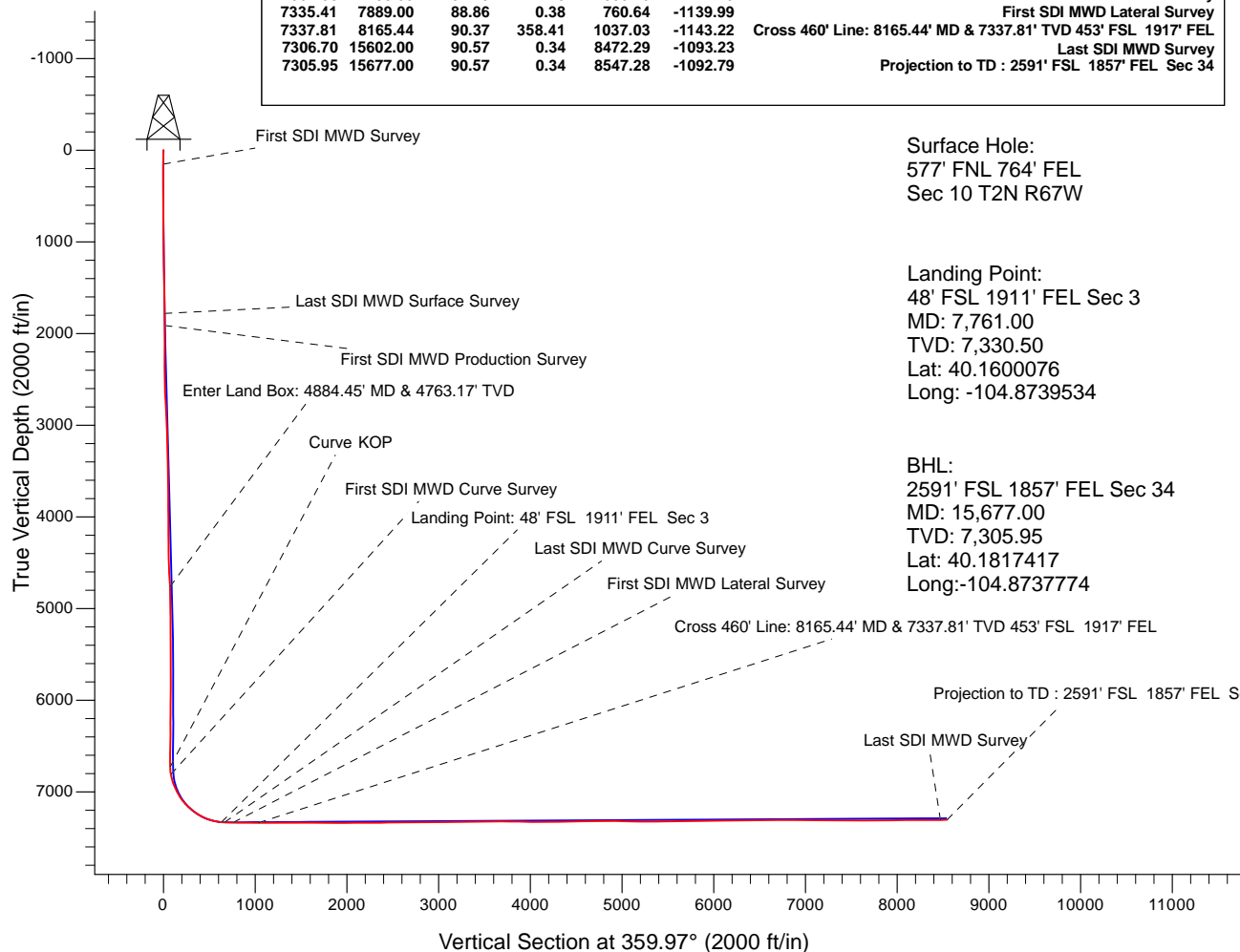
**PROJECT DETAILS: US Rockies Wattenberg Planning UTM83**

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	0.29	109.05	-0.13	0.37	First SDI MWD Survey
1780.48	1803.00	13.21	275.10	13.28	-232.41	Last SDI MWD Surface Survey
1913.16	1939.00	12.15	271.70	15.09	-262.19	First SDI MWD Production Survey
4763.17	4884.45	13.80	278.18	70.70	-1001.18	Enter Land Box: 4884.45' MD & 4763.17' TVD
6728.82	6865.00	1.16	2.99	73.10	-1168.31	Curve KOP
6809.29	6946.00	10.76	12.67	81.32	-1166.61	First SDI MWD Curve Survey
7330.50	7761.00	84.93	1.45	632.78	-1142.29	Landing Point: 48' FSL 1911' FEL Sec 3
7332.66	7795.00	87.79	1.40	666.70	-1141.45	Last SDI MWD Curve Survey
7335.41	7889.00	88.86	0.38	760.64	-1139.99	First SDI MWD Lateral Survey
7337.81	8165.44	90.37	358.41	1037.03	-1143.22	Cross 460' Line: 8165.44' MD & 7337.81' TVD 453' FSL 1917' FEL
7306.70	15602.00	90.57	0.34	8472.29	-1093.23	Last SDI MWD Survey
7305.95	15677.00	90.57	0.34	8547.28	-1092.79	Projection to TD : 2591' FSL 1857' FEL Sec 34





# **US ROCKIES REGION PLANNING**

**US Rockies Wattenberg Planning UTM83**

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

**Butterball 24N-34HZ**

**OH**

**Design: OH**

## **Standard Survey Report**

**12 June, 2017**



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

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

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

<b>Well</b>	Butterball 24N-34HZ, 577' FNL 764' FEL Sec 10 T2N R67W		
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Latitude:</b> 40.1582700
	<b>+E/-W</b>	0.00 ft	<b>Longitude:</b> -104.8698650
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	0.00 ft
		<b>Ground Level:</b>	4,916.00 ft

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

<b>Design</b>	OH				
<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) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	359.97	

<b>Survey Program</b>	<b>Date</b>	6/8/2017			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
153.00	1,803.00	Survey #1 - Surface (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
1,939.00	15,677.00	Survey #2 - Production (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:Rockies, crustal dec + 3-axis correction	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
153.00	0.29	109.05	153.00	-0.13	0.37	-0.13	0.19	0.19	0.00	
<b>First SDI MWD Survey</b>										
239.00	0.34	160.15	239.00	-0.44	0.66	-0.44	0.32	0.06	59.42	
328.00	0.80	226.21	327.99	-1.12	0.30	-1.12	0.82	0.52	74.22	
415.00	1.77	264.39	414.97	-1.67	-1.48	-1.67	1.43	1.11	43.89	
503.00	3.00	270.37	502.89	-1.79	-5.13	-1.78	1.42	1.40	6.80	
592.00	3.90	271.54	591.73	-1.69	-10.49	-1.68	1.01	1.01	1.31	
679.00	5.13	281.07	678.46	-0.86	-17.26	-0.85	1.65	1.41	10.95	
765.00	6.27	275.50	764.04	0.33	-25.71	0.34	1.47	1.33	-6.48	

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well Butterball 24N-34HZ
<b>Project:</b>	US Rockies Wattenberg Planning UTM83	<b>TVD Reference:</b>	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
<b>Site:</b>	Butterball 1-10HZ Pad 2N-67W-10	<b>MD Reference:</b>	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
<b>Well:</b>	Butterball 24N-34HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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	7.76	276.44	852.37	1.47	-36.52	1.48	1.68	1.67	1.06
943.00	9.25	279.03	940.39	3.26	-49.55	3.29	1.73	1.67	2.91
1,032.00	10.25	272.35	1,028.10	4.71	-64.53	4.74	1.69	1.12	-7.51
1,121.00	11.48	273.23	1,115.51	5.53	-81.29	5.58	1.39	1.38	0.99
1,209.00	12.95	270.29	1,201.51	6.08	-99.89	6.13	1.81	1.67	-3.34
1,298.00	12.61	270.65	1,288.31	6.24	-119.58	6.30	0.39	-0.38	0.40
1,382.00	13.39	271.42	1,370.15	6.58	-138.47	6.66	0.95	0.93	0.92
1,469.00	12.82	272.54	1,454.89	7.26	-158.18	7.34	0.72	-0.66	1.29
1,598.00	13.12	274.06	1,580.60	8.93	-187.09	9.03	0.35	0.23	1.18
1,685.00	12.52	275.74	1,665.43	10.57	-206.32	10.68	0.81	-0.69	1.93
1,773.00	12.99	276.27	1,751.26	12.61	-225.64	12.73	0.55	0.53	0.60
1,803.00	13.21	275.10	1,780.48	13.28	-232.41	13.40	1.15	0.73	-3.90
Last SDI MWD Surface Survey									
1,939.00	12.15	271.70	1,913.16	15.09	-262.19	15.22	0.95	-0.78	-2.50
First SDI MWD Production Survey									
2,033.00	13.37	269.91	2,004.84	15.36	-282.95	15.51	1.36	1.30	-1.90
2,128.00	14.32	266.20	2,097.08	14.57	-305.65	14.73	1.37	1.00	-3.91
2,223.00	14.90	268.84	2,189.01	13.54	-329.59	13.71	0.93	0.61	2.78
2,316.00	14.37	269.57	2,278.99	13.21	-353.08	13.40	0.60	-0.57	0.78
2,409.00	14.84	272.24	2,368.98	13.59	-376.53	13.79	0.88	0.51	2.87
2,504.00	14.97	273.87	2,460.79	14.89	-400.92	15.10	0.46	0.14	1.72
2,598.00	15.52	275.96	2,551.48	17.02	-425.54	17.24	0.83	0.59	2.22
2,692.00	15.09	275.92	2,642.15	19.59	-450.22	19.82	0.46	-0.46	-0.04
2,786.00	14.97	280.75	2,732.93	23.11	-474.32	23.36	1.34	-0.13	5.14
2,880.00	15.95	281.40	2,823.53	27.93	-498.91	28.19	1.06	1.04	0.69
2,974.00	15.35	281.33	2,914.05	32.93	-523.77	33.20	0.64	-0.64	-0.07
3,070.00	14.95	280.02	3,006.71	37.58	-548.42	37.87	0.55	-0.42	-1.36
3,162.00	14.73	277.81	3,095.64	41.23	-571.70	41.53	0.66	-0.24	-2.40
3,256.00	14.81	274.50	3,186.54	43.80	-595.52	44.11	0.90	0.09	-3.52
3,350.00	14.92	272.96	3,277.39	45.37	-619.58	45.69	0.44	0.12	-1.64
3,442.00	14.64	272.14	3,366.35	46.41	-643.02	46.75	0.38	-0.30	-0.89
3,536.00	13.19	274.79	3,457.59	47.75	-665.58	48.10	1.68	-1.54	2.82
3,630.00	13.22	275.37	3,549.10	49.65	-686.97	50.01	0.14	0.03	0.62
3,725.00	13.99	272.56	3,641.44	51.18	-709.26	51.56	1.07	0.81	-2.96
3,818.00	14.11	270.16	3,731.66	51.72	-731.82	52.10	0.64	0.13	-2.58
3,911.00	14.80	273.21	3,821.71	52.41	-755.02	52.81	1.10	0.74	3.28
4,006.00	15.00	271.22	3,913.52	53.36	-779.43	53.76	0.58	0.21	-2.09
4,101.00	15.14	270.37	4,005.25	53.70	-804.12	54.12	0.28	0.15	-0.89
4,195.00	15.36	272.25	4,095.94	54.27	-828.84	54.70	0.58	0.23	2.00
4,289.00	15.40	272.21	4,186.58	55.24	-853.75	55.68	0.04	0.04	-0.04
4,384.00	14.45	272.26	4,278.37	56.19	-878.20	56.65	1.00	-1.00	0.05
4,478.00	14.04	271.09	4,369.48	56.87	-901.32	57.34	0.53	-0.44	-1.24
4,573.00	14.04	274.03	4,461.64	57.90	-924.34	58.38	0.75	0.00	3.09

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<b>Site:</b>	Butterball 1-10HZ Pad 2N-67W-10	<b>MD Reference:</b>	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
<b>Well:</b>	Butterball 24N-34HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
4,666.00	14.24	280.87	4,551.83	60.85	-946.82	61.34	1.81	0.22	7.35
4,760.00	15.50	281.04	4,642.68	65.43	-970.51	65.94	1.34	1.34	0.18
4,854.00	13.89	279.04	4,733.60	69.61	-993.98	70.13	1.80	-1.71	-2.13
4,884.45	13.80	278.18	4,763.17	70.70	-1,001.18	71.23	0.74	-0.31	-2.82
<b>Enter Land Box: 4884.45' MD &amp; 4763.17' TVD</b>									
4,949.00	13.61	276.32	4,825.88	72.63	-1,016.35	73.17	0.74	-0.29	-2.88
5,044.00	13.83	273.40	4,918.17	74.54	-1,038.79	75.08	0.76	0.23	-3.07
5,137.00	13.83	274.97	5,008.48	76.16	-1,060.96	76.72	0.40	0.00	1.69
5,257.00	11.59	271.92	5,125.53	77.81	-1,087.30	78.38	1.95	-1.87	-2.54
5,352.00	9.63	270.67	5,218.90	78.22	-1,104.79	78.80	2.08	-2.06	-1.32
5,447.00	7.75	271.14	5,312.81	78.44	-1,119.14	79.03	1.98	-1.98	0.49
5,542.00	7.08	271.01	5,407.01	78.67	-1,131.40	79.26	0.71	-0.71	-0.14
5,635.00	5.07	278.90	5,499.49	79.41	-1,141.19	80.01	2.34	-2.16	8.48
5,727.00	3.72	275.11	5,591.21	80.30	-1,148.18	80.90	1.50	-1.47	-4.12
5,820.00	3.01	275.12	5,684.05	80.79	-1,153.61	81.39	0.76	-0.76	0.01
5,915.00	2.30	244.23	5,778.96	80.18	-1,157.81	80.79	1.65	-0.75	-32.52
6,007.00	1.82	256.35	5,870.90	79.04	-1,160.90	79.64	0.70	-0.52	13.17
6,101.00	0.85	241.47	5,964.87	78.35	-1,162.96	78.96	1.09	-1.03	-15.83
6,194.00	0.77	252.24	6,057.86	77.83	-1,164.16	78.44	0.18	-0.09	11.58
6,288.00	0.72	246.69	6,151.85	77.40	-1,165.31	78.01	0.09	-0.05	-5.90
6,383.00	0.48	231.13	6,246.85	76.92	-1,166.16	77.53	0.30	-0.25	-16.38
6,477.00	0.57	219.69	6,340.84	76.31	-1,166.77	76.92	0.15	0.10	-12.17
6,570.00	0.71	204.00	6,433.84	75.43	-1,167.30	76.04	0.24	0.15	-16.87
6,664.00	0.55	188.14	6,527.83	74.45	-1,167.60	75.06	0.25	-0.17	-16.87
6,758.00	0.49	207.15	6,621.83	73.65	-1,167.85	74.26	0.19	-0.06	20.22
6,852.00	0.46	222.09	6,715.83	73.01	-1,168.28	73.62	0.14	-0.03	15.89
6,865.00	1.16	2.99	6,728.82	73.10	-1,168.31	73.71	11.88	5.38	1,083.81
<b>Curve KOP</b>									
6,946.00	10.76	12.67	6,809.29	81.32	-1,166.61	81.93	11.88	11.85	11.96
<b>First SDI MWD Curve Survey</b>									
7,040.00	19.22	6.91	6,900.02	105.28	-1,162.81	105.89	9.13	9.00	-6.13
7,134.00	26.70	7.19	6,986.51	141.64	-1,158.30	142.25	7.96	7.96	0.30
7,229.00	34.14	6.86	7,068.37	189.35	-1,152.44	189.96	7.83	7.83	-0.35
7,323.00	44.64	2.88	7,140.93	248.70	-1,147.61	249.30	11.48	11.17	-4.23
7,418.00	51.80	1.58	7,204.19	319.44	-1,144.90	320.04	7.61	7.54	-1.37
7,512.00	59.91	358.80	7,256.91	397.16	-1,144.74	397.76	8.97	8.63	-2.96
7,606.00	69.18	0.32	7,297.27	481.94	-1,145.34	482.54	9.97	9.86	1.62
7,702.00	79.98	1.54	7,322.76	574.33	-1,143.82	574.93	11.32	11.25	1.27
7,761.00	84.93	1.45	7,330.50	632.78	-1,142.29	633.38	8.40	8.40	-0.15
<b>Landing Point: 48' FSL 1911' FEL Sec 3</b>									
7,795.00	87.79	1.40	7,332.66	666.70	-1,141.45	667.30	8.40	8.40	-0.15
<b>Last SDI MWD Curve Survey</b>									
7,889.00	88.86	0.38	7,335.41	760.64	-1,139.99	761.24	1.57	1.14	-1.09
<b>First SDI MWD Lateral Survey</b>									
7,984.00	89.46	359.69	7,336.80	855.63	-1,139.93	856.23	0.96	0.63	-0.73

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<b>Site:</b>	Butterball 1-10HZ Pad 2N-67W-10	<b>MD Reference:</b>	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
<b>Well:</b>	Butterball 24N-34HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
8,078.00	89.46	358.85	7,337.68	949.62	-1,141.13	950.22	0.89	0.00	-0.89
8,165.44	90.37	358.41	7,337.81	1,037.03	-1,143.22	1,037.63	1.16	1.04	-0.50
<b>Cross 460' Line: 8165.44' MD &amp; 7337.81' TVD 453' FSL 1917' FEL</b>									
8,172.00	90.44	358.38	7,337.77	1,043.59	-1,143.40	1,044.19	1.16	1.04	-0.50
8,266.00	89.80	0.19	7,337.57	1,137.58	-1,144.57	1,138.18	2.04	-0.68	1.93
8,360.00	90.27	1.04	7,337.51	1,231.57	-1,143.57	1,232.17	1.03	0.50	0.90
8,454.00	89.97	1.00	7,337.32	1,325.56	-1,141.89	1,326.16	0.32	-0.32	-0.04
8,548.00	89.90	0.59	7,337.42	1,419.55	-1,140.59	1,420.15	0.44	-0.07	-0.44
8,642.00	90.67	0.92	7,336.95	1,513.54	-1,139.35	1,514.13	0.89	0.82	0.35
8,737.00	89.87	1.08	7,336.51	1,608.52	-1,137.69	1,609.12	0.86	-0.84	0.17
8,831.00	89.66	1.08	7,336.89	1,702.50	-1,135.92	1,703.10	0.22	-0.22	0.00
8,926.00	89.50	0.91	7,337.59	1,797.49	-1,134.27	1,798.08	0.25	-0.17	-0.18
9,020.00	89.36	0.34	7,338.52	1,891.48	-1,133.25	1,892.07	0.62	-0.15	-0.61
9,115.00	90.24	0.62	7,338.86	1,986.47	-1,132.45	1,987.06	0.97	0.93	0.29
9,208.00	91.01	0.86	7,337.84	2,079.46	-1,131.25	2,080.05	0.87	0.83	0.26
9,304.00	89.90	0.24	7,337.08	2,175.45	-1,130.33	2,176.04	1.32	-1.16	-0.65
9,398.00	90.03	0.08	7,337.14	2,269.45	-1,130.06	2,270.04	0.22	0.14	-0.17
9,493.00	90.91	0.46	7,336.36	2,364.44	-1,129.62	2,365.03	1.01	0.93	0.40
9,587.00	90.50	0.26	7,335.20	2,458.43	-1,129.03	2,459.02	0.49	-0.44	-0.21
9,682.00	90.97	0.51	7,333.98	2,553.42	-1,128.39	2,554.01	0.56	0.49	0.26
9,775.00	90.50	0.59	7,332.79	2,646.41	-1,127.50	2,647.00	0.51	-0.51	0.09
9,869.00	90.37	0.33	7,332.07	2,740.41	-1,126.74	2,740.99	0.31	-0.14	-0.28
9,964.00	90.44	0.52	7,331.40	2,835.40	-1,126.04	2,835.99	0.21	0.07	0.20
10,057.00	90.57	0.30	7,330.58	2,928.39	-1,125.37	2,928.98	0.27	0.14	-0.24
10,151.00	90.77	359.89	7,329.48	3,022.39	-1,125.21	3,022.98	0.49	0.21	-0.44
10,246.00	90.07	359.71	7,328.79	3,117.38	-1,125.55	3,117.97	0.76	-0.74	-0.19
10,339.00	90.34	359.64	7,328.46	3,210.38	-1,126.07	3,210.97	0.30	0.29	-0.08
10,433.00	90.57	359.49	7,327.71	3,304.38	-1,126.79	3,304.97	0.29	0.24	-0.16
10,526.00	91.01	359.51	7,326.43	3,397.36	-1,127.60	3,397.95	0.47	0.47	0.02
10,621.00	90.97	359.23	7,324.79	3,492.34	-1,128.64	3,492.93	0.30	-0.04	-0.29
10,716.00	90.71	358.76	7,323.39	3,587.32	-1,130.31	3,587.91	0.57	-0.27	-0.49
10,809.00	89.56	1.05	7,323.17	3,680.31	-1,130.46	3,680.90	2.76	-1.24	2.46
10,903.00	89.33	0.36	7,324.08	3,774.30	-1,129.31	3,774.89	0.77	-0.24	-0.73
10,998.00	89.16	0.47	7,325.34	3,869.29	-1,128.62	3,869.88	0.21	-0.18	0.12
11,093.00	88.56	0.06	7,327.23	3,964.27	-1,128.18	3,964.86	0.76	-0.63	-0.43
11,185.00	89.50	0.54	7,328.78	4,056.25	-1,127.70	4,056.84	1.15	1.02	0.52
11,279.00	90.91	1.52	7,328.45	4,150.23	-1,126.01	4,150.82	1.83	1.50	1.04
11,373.00	90.70	2.20	7,327.13	4,244.17	-1,122.96	4,244.76	0.76	-0.22	0.72
11,466.00	90.94	1.67	7,325.80	4,337.11	-1,119.82	4,337.69	0.63	0.26	-0.57
11,560.00	90.44	1.24	7,324.66	4,431.07	-1,117.43	4,431.66	0.70	-0.53	-0.46
11,653.00	91.04	1.51	7,323.46	4,524.04	-1,115.20	4,524.62	0.71	0.65	0.29
11,746.00	92.42	1.87	7,320.65	4,616.95	-1,112.46	4,617.53	1.53	1.48	0.39
11,841.00	91.07	1.06	7,317.76	4,711.87	-1,110.03	4,712.45	1.66	-1.42	-0.85

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well Butterball 24N-34HZ
<b>Project:</b>	US Rockies Wattenberg Planning UTM83	<b>TVD Reference:</b>	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
<b>Site:</b>	Butterball 1-10HZ Pad 2N-67W-10	<b>MD Reference:</b>	GL 4916' & KB 20' @ 4936.00ft (Precision 461)
<b>Well:</b>	Butterball 24N-34HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	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)
11,934.00	89.09	359.63	7,317.63	4,804.86	-1,109.47	4,805.44	2.63	-2.13	-1.54
12,029.00	89.23	359.51	7,319.02	4,899.85	-1,110.18	4,900.43	0.19	0.15	-0.13
12,123.00	88.46	358.07	7,320.92	4,993.81	-1,112.17	4,994.39	1.74	-0.82	-1.53
12,217.00	88.49	359.70	7,323.42	5,087.75	-1,114.00	5,088.34	1.73	0.03	1.73
12,312.00	89.43	1.09	7,325.15	5,182.73	-1,113.34	5,183.31	1.77	0.99	1.46
12,405.00	90.74	0.74	7,325.01	5,275.72	-1,111.86	5,276.30	1.46	1.41	-0.38
12,500.00	90.47	0.06	7,324.00	5,370.71	-1,111.19	5,371.29	0.77	-0.28	-0.72
12,594.00	90.57	359.66	7,323.15	5,464.71	-1,111.42	5,465.29	0.44	0.11	-0.43
12,689.00	90.20	359.21	7,322.51	5,559.70	-1,112.36	5,560.28	0.61	-0.39	-0.47
12,783.00	91.04	0.62	7,321.50	5,653.69	-1,112.50	5,654.27	1.75	0.89	1.50
12,876.00	91.38	0.40	7,319.53	5,746.67	-1,111.67	5,747.25	0.44	0.37	-0.24
12,971.00	91.81	0.15	7,316.89	5,841.63	-1,111.22	5,842.21	0.52	0.45	-0.26
13,066.00	90.57	0.57	7,314.91	5,936.60	-1,110.62	5,937.18	1.38	-1.31	0.44
13,159.00	90.00	0.66	7,314.45	6,029.60	-1,109.62	6,030.18	0.62	-0.61	0.10
13,254.00	90.17	0.15	7,314.31	6,124.59	-1,108.95	6,125.17	0.57	0.18	-0.54
13,349.00	90.81	0.50	7,313.50	6,219.59	-1,108.41	6,220.17	0.77	0.67	0.37
13,443.00	90.97	0.09	7,312.04	6,313.57	-1,107.93	6,314.15	0.47	0.17	-0.44
13,536.00	91.38	359.96	7,310.13	6,406.55	-1,107.89	6,407.13	0.46	0.44	-0.14
13,631.00	90.23	1.03	7,308.80	6,501.54	-1,107.07	6,502.12	1.65	-1.21	1.13
13,725.00	90.44	1.10	7,308.25	6,595.52	-1,105.32	6,596.10	0.24	0.22	0.07
13,819.00	90.30	0.76	7,307.64	6,689.51	-1,103.79	6,690.08	0.39	-0.15	-0.36
13,912.00	89.97	0.27	7,307.42	6,782.50	-1,102.96	6,783.08	0.64	-0.35	-0.53
14,007.00	89.80	0.15	7,307.61	6,877.50	-1,102.61	6,878.08	0.22	-0.18	-0.13
14,102.00	89.43	359.70	7,308.25	6,972.50	-1,102.73	6,973.07	0.61	-0.39	-0.47
14,197.00	89.83	359.65	7,308.86	7,067.49	-1,103.27	7,068.07	0.42	0.42	-0.05
14,290.00	89.50	359.40	7,309.41	7,160.49	-1,104.04	7,161.07	0.45	-0.35	-0.27
14,385.00	89.46	359.04	7,310.27	7,255.48	-1,105.34	7,256.05	0.38	-0.04	-0.38
14,479.00	88.89	1.09	7,311.62	7,349.46	-1,105.23	7,350.04	2.26	-0.61	2.18
14,574.00	88.76	0.95	7,313.57	7,444.43	-1,103.54	7,445.00	0.20	-0.14	-0.15
14,667.00	90.54	1.59	7,314.14	7,537.40	-1,101.48	7,537.97	2.03	1.91	0.69
14,761.00	90.34	0.70	7,313.42	7,631.38	-1,099.60	7,631.95	0.97	-0.21	-0.95
14,853.00	90.64	359.26	7,312.63	7,723.37	-1,099.63	7,723.94	1.60	0.33	-1.57
14,948.00	90.70	1.12	7,311.52	7,818.36	-1,099.32	7,818.93	1.96	0.06	1.96
15,041.00	91.11	1.08	7,310.05	7,911.33	-1,097.53	7,911.90	0.44	0.44	-0.04
15,135.00	90.71	359.63	7,308.56	8,005.31	-1,096.95	8,005.89	1.60	-0.43	-1.54
15,229.00	90.37	0.90	7,307.67	8,099.31	-1,096.51	8,099.88	1.40	-0.36	1.35
15,321.00	89.90	0.39	7,307.46	8,191.30	-1,095.48	8,191.87	0.75	-0.51	-0.55
15,415.00	89.93	0.43	7,307.59	8,285.30	-1,094.81	8,285.87	0.05	0.03	0.04
15,509.00	90.30	0.58	7,307.41	8,379.29	-1,093.98	8,379.86	0.42	0.39	0.16
15,602.00	90.57	0.34	7,306.70	8,472.29	-1,093.23	8,472.86	0.39	0.29	-0.26
<b>Last SDI MWD Survey</b>									
15,677.00	90.57	0.34	7,305.95	8,547.28	-1,092.79	8,547.85	0.00	0.00	0.00
<b>Projection to TD : 2591' FSL 1857' FEL Sec 34</b>									

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

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
153.00	153.00	-0.13	0.37	First SDI MWD Survey
1,803.00	1,780.48	13.28	-232.41	Last SDI MWD Surface Survey
1,939.00	1,913.16	15.09	-262.19	First SDI MWD Production Survey
4,884.45	4,763.17	70.70	-1,001.18	Enter Land Box: 4884.45' MD & 4763.17' TVD
6,865.00	6,728.82	73.10	-1,168.31	Curve KOP
6,946.00	6,809.29	81.32	-1,166.61	First SDI MWD Curve Survey
7,761.00	7,330.50	632.78	-1,142.29	Landing Point: 48' FSL 1911' FEL Sec 3
7,795.00	7,332.66	666.70	-1,141.45	Last SDI MWD Curve Survey
7,889.00	7,335.41	760.64	-1,139.99	First SDI MWD Lateral Survey
8,165.44	7,337.81	1,037.03	-1,143.22	Cross 460' Line: 8165.44' MD & 7337.81' TVD 453' FSL 1917' FEL
15,602.00	7,306.70	8,472.29	-1,093.23	Last SDI MWD Survey
15,677.00	7,305.95	8,547.28	-1,092.79	Projection to TD : 2591' FSL 1857' FEL Sec 34

Checked By: _____	Approved By: _____	Date: _____
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