

WELL DETAILS: Norden 27N-14HZ

GL 4951' & KB 17' @ 4968.00ft (Xtreme 24)	4951.00
Northing 14543160.78	Longitude -104.8552660
Easting 1680922.94	Latitude 40.0450220

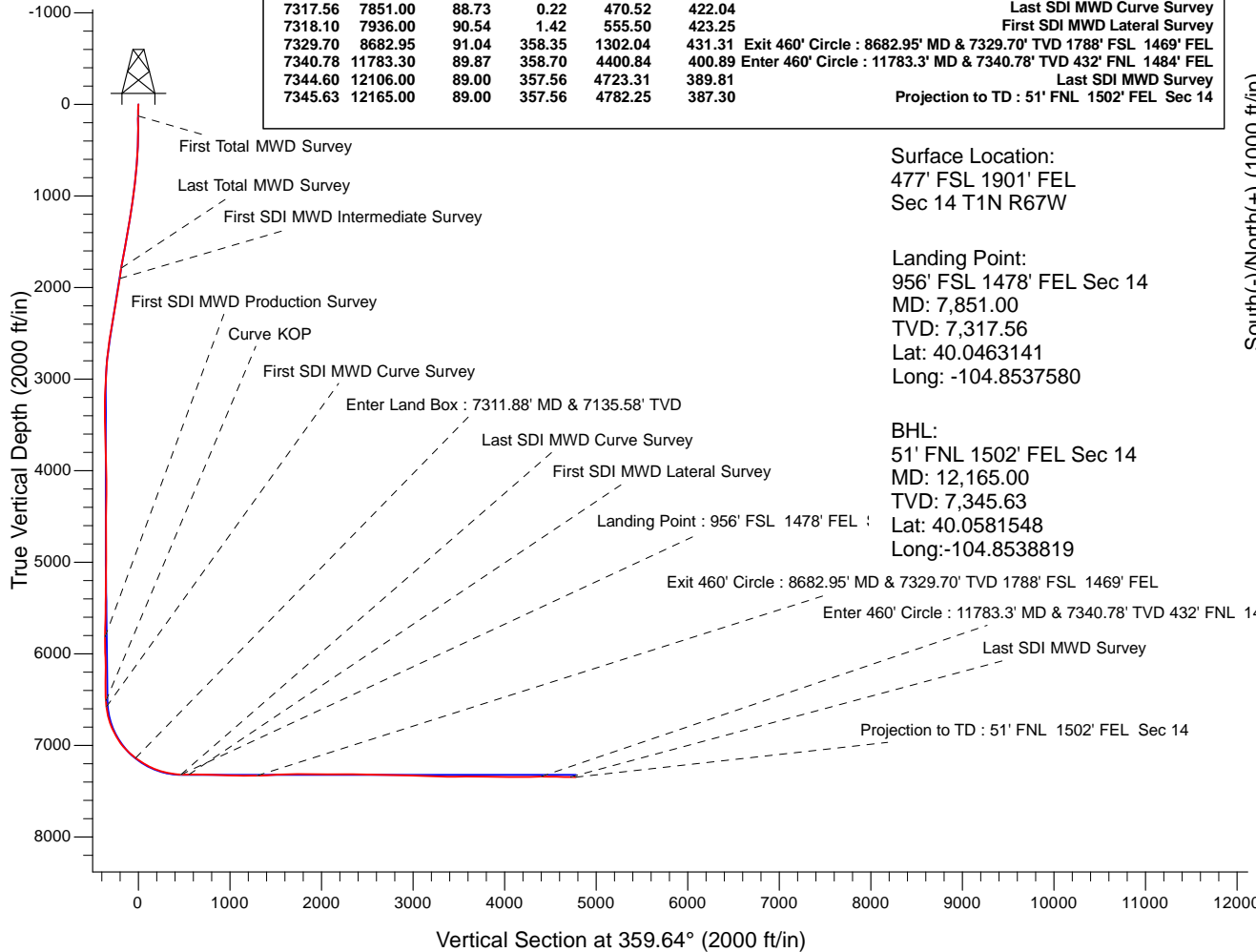
PROJECT DETAILS: US Rockies Wattenberg Planning UTM83

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

Design: OH (Norden 27N-14HZ/OH)
Created By: Seth Burstad Date: 9-18-2017

ANNOTATIONS

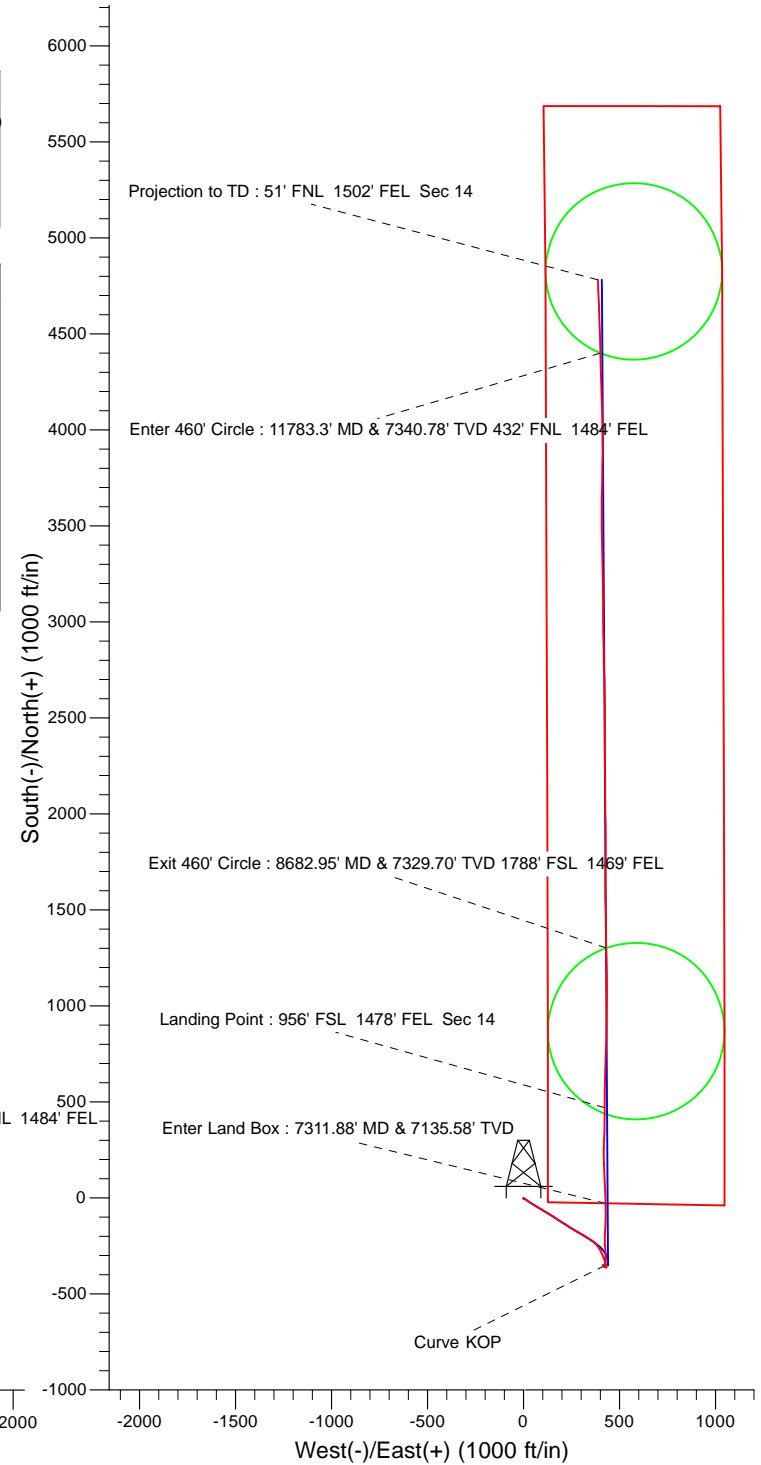
TVD	MD	Inc	Azi	+N/-S	+E/-W	Annotation
125.99	126.00	1.45	206.94	-1.42	-0.72	First Total MWD Survey
1788.27	1835.00	17.89	120.46	-184.56	293.19	Last Total MWD Survey
1901.11	1953.00	16.12	116.53	-201.06	323.48	First SDI MWD Intermediate Survey
5816.08	5888.00	1.07	228.47	-359.72	419.79	First SDI MWD Production Survey
6515.99	6588.00	2.07	28.20	-351.90	423.08	Curve KOP
6578.73	6651.00	7.81	15.45	-346.77	424.76	First SDI MWD Curve Survey
7135.58	7311.88	53.32	359.03	-27.18	427.04	Enter Land Box : 7311.88' MD & 7135.58' TVD
7317.56	7851.00	88.73	0.22	470.52	422.04	Landing Point : 956' FSL 1478' FEL Sec 14
7317.56	7851.00	88.73	0.22	470.52	422.04	Last SDI MWD Curve Survey
7318.10	7936.00	90.54	1.42	555.90	423.25	First SDI MWD Lateral Survey
7329.70	8682.95	91.04	358.35	1302.04	431.31	Exit 460' Circle : 8682.95' MD & 7329.70' TVD 1788' FSL 1469' FEL
7340.78	11783.30	89.87	358.70	4400.84	400.89	Enter 460' Circle : 11783.3' MD & 7340.78' TVD 432' FNL 1484' FEL
7344.60	12106.00	89.00	357.56	4723.31	389.81	Last SDI MWD Survey
7345.63	12165.00	89.00	357.56	4782.25	387.30	Projection to TD : 51' FNL 1502' FEL Sec 14



Surface Location:
 477' FSL 1901' FEL
 Sec 14 T1N R67W

Landing Point:
 956' FSL 1478' FEL Sec 14
 MD: 7,851.00
 TVD: 7,317.56
 Lat: 40.0463141
 Long: -104.8537580

BHL:
 51' FNL 1502' FEL Sec 14
 MD: 12,165.00
 TVD: 7,345.63
 Lat: 40.0581548
 Long: -104.8538819





US ROCKIES REGION PLANNING

US Rockies Wattenberg Planning UTM83

Norden 15-14HZ Pad

Norden 27N-14HZ

OH

Design: OH

Standard Survey Report

18 September, 2017



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Norden 27N-14HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4951' & KB 17' @ 4968.00ft (Xtreme 24)
Site:	Norden 15-14HZ Pad	MD Reference:	GL 4951' & KB 17' @ 4968.00ft (Xtreme 24)
Well:	Norden 27N-14HZ	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	Norden 15-14HZ Pad, Site Center : Norden 26N-14HZ				
Site Position:		Northing:	14,543,160.20 usft	Latitude:	40.0450200
From:	Lat/Long	Easting:	1,681,012.77 usft	Longitude:	-104.8549450
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.09 °

Well	Norden 27N-14HZ, 477' FSL 1901' FEL Sec 14 T1N R67W					
Well Position	+N/-S	0.00 ft	Northing:	14,543,160.78 usft	Latitude:	40.0450220
	+E/-W	0.00 ft	Easting:	1,680,922.93 usft	Longitude:	-104.8552660
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	4,951.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/3/2017	8.33	66.47	52,213

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	359.64	

Survey Program	Date	9/18/2017			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
126.00	1,835.00	Survey #1 - Surface (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
1,953.00	5,786.00	Survey #2 - Intermediate (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination	
5,888.00	12,165.00	Survey #3- 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	0.00
126.00	1.45	206.94	125.99	-1.42	-0.72	-1.42	1.15	1.15	0.00	
First Total MWD Survey										
158.00	1.01	203.07	157.98	-2.04	-1.02	-2.04	1.40	-1.38	-12.09	
189.00	0.92	203.95	188.97	-2.52	-1.22	-2.51	0.29	-0.29	2.84	
221.00	0.70	142.60	220.97	-2.91	-1.21	-2.90	2.65	-0.69	-191.72	
253.00	1.01	102.00	252.97	-3.12	-0.82	-3.12	2.06	0.97	-126.88	
284.00	1.49	94.18	283.96	-3.21	-0.15	-3.21	1.64	1.55	-25.23	
348.00	2.90	107.98	347.91	-3.77	2.22	-3.79	2.34	2.20	21.56	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Norden 27N-14HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4951' & KB 17' @ 4968.00ft (Xtreme 24)
Site:	Norden 15-14HZ Pad	MD Reference:	GL 4951' & KB 17' @ 4968.00ft (Xtreme 24)
Well:	Norden 27N-14HZ	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)	
380.00	3.12	102.88	379.87	-4.22	3.84	-4.24	1.08	0.69	-15.94	
411.00	3.16	104.81	410.82	-4.62	5.49	-4.66	0.36	0.13	6.23	
443.00	3.78	110.17	442.76	-5.21	7.33	-5.26	2.18	1.94	16.75	
475.00	3.87	118.43	474.69	-6.09	9.27	-6.15	1.74	0.28	25.81	
507.00	4.66	126.96	506.60	-7.38	11.26	-7.45	3.16	2.47	26.66	
539.00	5.01	129.77	538.49	-9.06	13.37	-9.14	1.32	1.09	8.78	
569.00	5.63	126.26	568.36	-10.77	15.57	-10.87	2.33	2.07	-11.70	
601.00	6.24	129.42	600.19	-12.80	18.18	-12.91	2.16	1.91	9.88	
633.00	6.99	126.78	631.98	-15.07	21.08	-15.20	2.53	2.34	-8.25	
665.00	8.00	124.59	663.70	-17.50	24.47	-17.65	3.28	3.16	-6.84	
696.00	8.53	123.44	694.38	-19.99	28.17	-20.17	1.79	1.71	-3.71	
728.00	9.18	122.04	726.00	-22.65	32.31	-22.86	2.14	2.03	-4.38	
759.00	9.45	123.01	756.59	-25.35	36.54	-25.58	1.01	0.87	3.13	
791.00	10.24	122.57	788.12	-28.32	41.14	-28.57	2.48	2.47	-1.38	
823.00	11.38	121.16	819.55	-31.48	46.24	-31.77	3.66	3.56	-4.41	
854.00	11.78	121.86	849.92	-34.73	51.55	-35.06	1.37	1.29	2.26	
918.00	13.10	120.81	912.42	-41.90	63.32	-42.29	2.09	2.06	-1.64	
949.00	13.54	121.77	942.58	-45.61	69.43	-46.04	1.59	1.42	3.10	
981.00	13.80	120.54	973.67	-49.52	75.90	-49.99	1.22	0.81	-3.84	
1,012.00	14.72	120.46	1,003.72	-53.39	82.48	-53.91	2.97	2.97	-0.26	
1,044.00	15.29	120.19	1,034.63	-57.58	89.63	-58.14	1.79	1.78	-0.84	
1,076.00	15.78	120.37	1,065.46	-61.90	97.03	-62.51	1.54	1.53	0.56	
1,107.00	16.52	119.14	1,095.24	-66.18	104.52	-66.83	2.63	2.39	-3.97	
1,139.00	17.45	119.84	1,125.84	-70.78	112.65	-71.48	2.98	2.91	2.19	
1,171.00	18.28	120.02	1,156.30	-75.68	121.16	-76.44	2.60	2.59	0.56	
1,202.00	18.15	122.92	1,185.74	-80.73	129.42	-81.54	2.95	-0.42	9.35	
1,234.00	17.80	123.01	1,216.18	-86.11	137.71	-86.97	1.10	-1.09	0.28	
1,266.00	17.18	123.09	1,246.70	-91.35	145.77	-92.27	1.94	-1.94	0.25	
1,297.00	16.92	122.39	1,276.34	-96.27	153.41	-97.23	1.07	-0.84	-2.26	
1,329.00	16.66	121.42	1,306.98	-101.15	161.26	-102.16	1.19	-0.81	-3.03	
1,361.00	17.09	122.83	1,337.60	-106.09	169.13	-107.15	1.86	1.34	4.41	
1,392.00	17.27	123.18	1,367.21	-111.08	176.81	-112.19	0.67	0.58	1.13	
1,424.00	17.27	123.09	1,397.77	-116.27	184.76	-117.43	0.08	0.00	-0.28	
1,456.00	17.53	122.30	1,428.31	-121.44	192.81	-122.65	1.10	0.81	-2.47	
1,487.00	17.58	122.39	1,457.86	-126.45	200.71	-127.70	0.18	0.16	0.29	
1,519.00	17.84	122.48	1,488.35	-131.67	208.93	-132.98	0.82	0.81	0.28	
1,551.00	17.62	122.48	1,518.83	-136.90	217.15	-138.26	0.69	-0.69	0.00	
1,583.00	18.33	121.25	1,549.27	-142.11	225.54	-143.52	2.52	2.22	-3.84	
1,614.00	19.03	121.60	1,578.63	-147.29	234.01	-148.76	2.29	2.26	1.13	
1,645.00	18.24	122.57	1,608.01	-152.55	242.40	-154.07	2.74	-2.55	3.13	
1,677.00	18.24	123.09	1,638.40	-157.98	250.82	-159.55	0.51	0.00	1.63	
1,708.00	18.37	121.86	1,667.83	-163.20	259.03	-164.83	1.31	0.42	-3.97	
1,740.00	18.41	123.18	1,698.20	-168.63	267.54	-170.31	1.31	0.13	4.13	

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Site:	Norden 15-14HZ Pad	MD Reference:	GL 4951' & KB 17' @ 4968.00ft (Xtreme 24)
Well:	Norden 27N-14HZ	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)	
1,772.00	18.68	122.39	1,728.53	-174.14	276.10	-175.87	1.15	0.84	-2.47	
1,804.00	18.76	121.25	1,758.84	-179.56	284.83	-181.34	1.17	0.25	-3.56	
1,835.00	17.89	120.46	1,788.27	-184.56	293.19	-186.40	2.92	-2.81	-2.55	
Last Total MWD Survey										
1,953.00	16.12	116.53	1,901.11	-201.06	323.48	-203.09	1.79	-1.50	-3.33	
First SDI MWD Intermediate Survey										
2,038.00	14.38	121.12	1,983.12	-211.79	343.07	-213.94	2.49	-2.05	5.40	
2,123.00	14.18	128.65	2,065.50	-223.75	360.24	-226.01	2.20	-0.24	8.86	
2,209.00	14.80	137.30	2,148.77	-238.40	375.92	-240.76	2.62	0.72	10.06	
2,294.00	13.62	145.68	2,231.18	-254.65	388.92	-257.09	2.79	-1.39	9.86	
2,381.00	12.37	150.63	2,315.95	-271.23	399.27	-273.73	1.92	-1.44	5.69	
2,468.00	10.28	154.51	2,401.25	-286.36	407.18	-288.91	2.56	-2.40	4.46	
2,553.00	8.94	154.76	2,485.06	-299.18	413.26	-301.77	1.58	-1.58	0.29	
2,638.00	8.35	163.76	2,569.10	-311.08	417.81	-313.70	1.73	-0.69	10.59	
2,723.00	7.36	165.58	2,653.30	-322.28	420.89	-324.92	1.20	-1.16	2.14	
2,810.00	6.11	157.32	2,739.70	-331.95	424.06	-334.61	1.81	-1.44	-9.49	
2,895.00	5.04	161.18	2,824.29	-339.66	427.01	-342.34	1.33	-1.26	4.54	
2,980.00	3.68	160.85	2,909.05	-345.77	429.11	-348.46	1.60	-1.60	-0.39	
3,065.00	3.65	161.39	2,993.87	-350.91	430.87	-353.61	0.05	-0.04	0.64	
3,150.00	3.18	169.47	3,078.72	-355.79	432.16	-358.50	0.79	-0.55	9.51	
3,235.00	2.27	188.99	3,163.63	-359.77	432.33	-362.48	1.51	-1.07	22.96	
3,320.00	1.35	225.21	3,248.59	-362.14	431.36	-364.85	1.68	-1.08	42.61	
3,405.00	0.92	289.27	3,333.57	-362.62	430.00	-365.32	1.48	-0.51	75.36	
3,490.00	1.20	334.54	3,418.56	-361.59	428.97	-364.28	1.01	0.33	53.26	
3,575.00	1.50	322.45	3,503.54	-359.91	427.91	-362.59	0.48	0.35	-14.22	
3,659.00	1.48	320.17	3,587.51	-358.20	426.55	-360.88	0.07	-0.02	-2.71	
3,743.00	1.84	324.74	3,671.47	-356.27	425.08	-358.93	0.46	0.43	5.44	
3,829.00	1.85	335.07	3,757.43	-353.88	423.69	-356.54	0.39	0.01	12.01	
3,913.00	1.75	358.83	3,841.39	-351.37	423.10	-354.02	0.89	-0.12	28.29	
3,998.00	1.11	344.73	3,926.36	-349.28	422.85	-351.93	0.85	-0.75	-16.59	
4,083.00	0.62	334.04	4,011.35	-348.07	422.43	-350.72	0.60	-0.58	-12.58	
4,168.00	0.67	331.73	4,096.35	-347.22	422.00	-349.86	0.07	0.06	-2.72	
4,253.00	0.36	251.96	4,181.34	-346.86	421.51	-349.51	0.83	-0.36	-93.85	
4,338.00	0.66	219.98	4,266.34	-347.32	420.94	-349.96	0.47	0.35	-37.62	
4,422.00	1.07	263.40	4,350.33	-347.78	419.85	-350.41	0.89	0.49	51.69	
4,507.00	0.70	283.21	4,435.32	-347.76	418.56	-350.38	0.56	-0.44	23.31	
4,591.00	0.67	265.41	4,519.31	-347.68	417.57	-350.30	0.25	-0.04	-21.19	
4,678.00	1.16	230.29	4,606.30	-348.28	416.38	-350.89	0.83	0.56	-40.37	
4,763.00	1.30	246.23	4,691.28	-349.22	414.84	-351.82	0.43	0.16	18.75	
4,849.00	0.99	286.79	4,777.27	-349.40	413.23	-351.99	0.98	-0.36	47.16	
4,934.00	0.49	293.42	4,862.26	-349.04	412.20	-351.62	0.60	-0.59	7.80	
5,018.00	1.19	62.82	4,946.26	-348.50	412.64	-351.09	1.84	0.83	154.05	
5,103.00	1.81	95.39	5,031.23	-348.22	414.77	-350.82	1.21	0.73	38.32	
5,188.00	1.47	125.28	5,116.19	-348.98	416.99	-351.59	1.07	-0.40	35.16	

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Well:	Norden 27N-14HZ	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)	
5,274.00	0.90	160.13	5,202.18	-350.25	418.12	-352.87	1.04	-0.66	40.52	
5,359.00	0.71	197.10	5,287.17	-351.38	418.19	-354.00	0.64	-0.22	43.49	
5,445.00	1.52	124.42	5,373.16	-352.54	418.98	-355.16	1.71	0.94	-84.51	
5,530.00	0.98	151.85	5,458.14	-353.82	420.25	-356.45	0.93	-0.64	32.27	
5,615.00	0.64	158.95	5,543.13	-354.90	420.76	-357.54	0.42	-0.40	8.35	
5,701.00	1.24	178.27	5,629.11	-356.28	420.97	-358.92	0.78	0.70	22.47	
5,786.00	1.20	194.57	5,714.10	-358.06	420.77	-360.70	0.41	-0.05	19.18	
5,888.00	1.07	228.47	5,816.08	-359.72	419.79	-362.35	0.66	-0.13	33.24	
First SDI MWD Production Survey										
6,059.00	1.59	34.35	5,987.06	-358.82	419.93	-361.45	1.54	0.30	97.01	
6,145.00	1.34	13.96	6,073.03	-356.86	420.85	-359.50	0.67	-0.29	-23.71	
6,229.00	0.74	15.22	6,157.02	-355.39	421.23	-358.03	0.71	-0.71	1.50	
6,314.00	0.74	10.84	6,242.01	-354.32	421.47	-356.96	0.07	0.00	-5.15	
6,399.00	0.51	24.22	6,327.01	-353.43	421.73	-356.08	0.32	-0.27	15.74	
6,486.00	0.52	33.68	6,414.00	-352.75	422.11	-355.40	0.10	0.01	10.87	
6,571.00	0.74	67.06	6,499.00	-352.22	422.83	-354.87	0.49	0.26	39.27	
6,588.00	2.07	28.20	6,515.99	-351.90	423.08	-354.55	9.22	7.84	-228.60	
Curve KOP										
6,651.00	7.81	15.45	6,578.73	-346.77	424.76	-349.43	9.22	9.11	-20.23	
First SDI MWD Curve Survey										
6,656.00	8.27	15.20	6,583.68	-346.09	424.94	-348.76	9.22	9.19	-5.05	
6,741.00	13.00	2.40	6,667.21	-330.63	426.95	-333.31	6.19	5.56	-15.06	
6,826.00	17.54	0.61	6,749.19	-308.26	427.48	-310.94	5.37	5.34	-2.11	
6,911.00	25.43	355.39	6,828.23	-277.21	426.15	-279.88	9.54	9.28	-6.14	
6,997.00	30.46	356.98	6,904.18	-237.01	423.52	-239.67	5.91	5.85	1.85	
7,082.00	35.71	3.48	6,975.39	-190.69	423.89	-193.35	7.45	6.18	7.65	
7,167.00	44.01	2.49	7,040.58	-136.33	426.68	-139.01	9.79	9.76	-1.16	
7,253.00	50.16	359.45	7,099.12	-73.40	427.66	-76.09	7.60	7.15	-3.53	
7,311.88	53.32	359.03	7,135.58	-27.18	427.04	-29.86	5.39	5.36	-0.72	
Enter Land Box : 7311.88' MD & 7135.58' TVD										
7,338.00	54.72	358.85	7,150.92	-6.04	426.65	-8.73	5.39	5.37	-0.68	
7,423.00	57.95	357.01	7,198.04	64.64	424.08	61.97	4.21	3.80	-2.16	
7,508.00	64.77	357.09	7,238.75	139.10	420.24	136.45	8.02	8.02	0.09	
7,594.00	71.78	359.49	7,270.57	218.90	417.90	216.27	8.55	8.15	2.79	
7,679.00	76.02	2.83	7,294.14	300.51	419.58	297.87	6.26	4.99	3.93	
7,764.00	81.87	0.17	7,310.44	383.86	421.74	381.21	7.54	6.88	-3.13	
7,851.00	88.73	0.22	7,317.56	470.52	422.04	467.86	7.89	7.89	0.06	
Landing Point : 956' FSL 1478' FEL Sec 14 - Last SDI MWD Curve Survey										
7,936.00	90.54	1.42	7,318.10	555.50	423.25	552.83	2.55	2.13	1.41	
First SDI MWD Lateral Survey										
8,022.00	90.67	0.96	7,317.20	641.48	425.04	638.80	0.56	0.15	-0.53	
8,107.00	88.42	1.79	7,317.87	726.45	427.08	723.75	2.82	-2.65	0.98	
8,193.00	88.09	2.31	7,320.49	812.35	430.15	809.63	0.72	-0.38	0.60	
8,278.00	87.99	0.87	7,323.40	897.27	432.51	894.53	1.70	-0.12	-1.69	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Norden 27N-14HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4951' & KB 17' @ 4968.00ft (Xtreme 24)
Site:	Norden 15-14HZ Pad	MD Reference:	GL 4951' & KB 17' @ 4968.00ft (Xtreme 24)
Well:	Norden 27N-14HZ	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)	
8,363.00	87.82	0.92	7,326.51	982.20	433.84	979.45	0.21	-0.20	0.06	
8,450.00	88.63	0.11	7,329.20	1,069.15	434.62	1,066.40	1.32	0.93	-0.93	
8,536.00	89.23	359.34	7,330.81	1,155.14	434.20	1,152.38	1.13	0.70	-0.90	
8,621.00	90.87	358.82	7,330.73	1,240.12	432.84	1,237.38	2.02	1.93	-0.61	
8,682.95	91.04	358.35	7,329.70	1,302.04	431.31	1,299.31	0.80	0.28	-0.75	
Exit 460' Circle : 8682.95' MD & 7329.70' TVD 1788' FSL 1469' FEL										
8,706.00	91.11	358.18	7,329.26	1,325.08	430.62	1,322.35	0.80	0.28	-0.75	
8,791.00	92.28	359.78	7,326.75	1,410.02	429.10	1,407.30	2.33	1.38	1.88	
8,876.00	93.02	358.98	7,322.82	1,494.93	428.18	1,492.21	1.28	0.87	-0.94	
8,962.00	94.33	358.31	7,317.31	1,580.72	426.15	1,578.01	1.71	1.52	-0.78	
9,047.00	91.94	0.49	7,312.66	1,665.58	425.27	1,662.88	3.80	-2.81	2.56	
9,132.00	89.09	1.29	7,311.89	1,750.56	426.59	1,747.84	3.48	-3.35	0.94	
9,217.00	89.16	0.17	7,313.19	1,835.54	427.67	1,832.82	1.32	0.08	-1.32	
9,302.00	89.83	359.05	7,313.94	1,920.53	427.09	1,917.81	1.54	0.79	-1.32	
9,387.00	90.44	359.08	7,313.74	2,005.52	425.71	2,002.81	0.72	0.72	0.04	
9,472.00	89.73	0.43	7,313.61	2,090.52	425.34	2,087.80	1.79	-0.84	1.59	
9,558.00	90.23	359.33	7,313.64	2,176.51	425.16	2,173.80	1.41	0.58	-1.28	
9,643.00	90.54	358.91	7,313.07	2,261.50	423.86	2,258.79	0.61	0.36	-0.49	
9,728.00	88.29	0.33	7,313.94	2,346.49	423.29	2,343.78	3.13	-2.65	1.67	
9,814.00	88.43	0.71	7,316.40	2,432.45	424.07	2,429.74	0.47	0.16	0.44	
9,901.00	88.69	359.38	7,318.59	2,519.42	424.14	2,516.71	1.56	0.30	-1.53	
9,988.00	89.09	359.15	7,320.27	2,606.40	423.03	2,603.69	0.53	0.46	-0.26	
10,073.00	89.40	358.09	7,321.39	2,691.36	420.98	2,688.67	1.30	0.36	-1.25	
10,158.00	88.69	358.36	7,322.81	2,776.31	418.35	2,773.63	0.89	-0.84	0.32	
10,244.00	88.19	359.89	7,325.15	2,862.27	417.03	2,859.59	1.87	-0.58	1.78	
10,329.00	88.02	358.20	7,327.96	2,947.20	415.62	2,944.53	2.00	-0.20	-1.99	
10,414.00	88.33	0.02	7,330.67	3,032.15	414.30	3,029.48	2.17	0.36	2.14	
10,499.00	88.29	359.96	7,333.18	3,117.11	414.28	3,114.45	0.08	-0.05	-0.07	
10,587.00	88.19	359.04	7,335.88	3,205.06	413.52	3,202.40	1.05	-0.11	-1.05	
10,672.00	88.29	358.50	7,338.49	3,290.00	411.69	3,287.35	0.65	0.12	-0.64	
10,758.00	88.49	357.80	7,340.91	3,375.92	408.92	3,373.29	0.85	0.23	-0.81	
10,845.00	90.54	0.10	7,341.64	3,462.90	407.32	3,460.27	3.54	2.36	2.64	
10,930.00	91.14	0.02	7,340.40	3,547.89	407.41	3,545.26	0.71	0.71	-0.09	
11,016.00	90.17	0.63	7,339.41	3,633.88	407.90	3,631.24	1.33	-1.13	0.71	
11,101.00	89.53	1.50	7,339.64	3,718.86	409.48	3,716.22	1.27	-0.75	1.02	
11,186.00	88.83	0.35	7,340.85	3,803.84	410.85	3,801.18	1.58	-0.82	-1.35	
11,271.00	89.16	0.37	7,342.34	3,888.83	411.39	3,886.16	0.39	0.39	0.02	
11,356.00	88.99	359.65	7,343.72	3,973.81	411.40	3,971.15	0.87	-0.20	-0.85	
11,441.00	88.29	359.59	7,345.73	4,058.79	410.84	4,056.13	0.83	-0.82	-0.07	
11,527.00	92.05	357.82	7,345.48	4,144.75	408.89	4,142.10	4.83	4.37	-2.06	
11,612.00	92.18	357.70	7,342.34	4,229.62	405.57	4,226.99	0.21	0.15	-0.14	
11,697.00	90.03	358.66	7,340.70	4,314.56	402.87	4,311.94	2.77	-2.53	1.13	
11,782.00	89.87	358.71	7,340.78	4,399.54	400.92	4,396.93	0.20	-0.19	0.06	
11,783.30	89.87	358.70	7,340.78	4,400.84	400.89	4,398.23	0.62	-0.25	-0.56	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well Norden 27N-14HZ
Project:	US Rockies Wattenberg Planning UTM83	TVD Reference:	GL 4951' & KB 17' @ 4968.00ft (Xtreme 24)
Site:	Norden 15-14HZ Pad	MD Reference:	GL 4951' & KB 17' @ 4968.00ft (Xtreme 24)
Well:	Norden 27N-14HZ	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)
Enter 460' Circle : 11783.3' MD & 7340.78' TVD 432' FNL 1484' FEL									
11,867.00	89.66	358.23	7,341.13	4,484.51	398.65	4,481.91	0.62	-0.25	-0.56
11,953.00	89.20	357.88	7,341.98	4,570.45	395.74	4,567.87	0.67	-0.53	-0.41
12,038.00	88.93	357.82	7,343.37	4,655.38	392.55	4,652.82	0.33	-0.32	-0.07
12,106.00	89.00	357.56	7,344.60	4,723.31	389.81	4,720.77	0.40	0.10	-0.38
Last SDI MWD Survey									
12,165.00	89.00	357.56	7,345.63	4,782.25	387.30	4,779.72	0.00	0.00	0.00
Projection to TD : 51' FNL 1502' FEL Sec 14									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
126.00	125.99	-1.42	-0.72	First Total MWD Survey	
1,835.00	1,788.27	-184.56	293.19	Last Total MWD Survey	
1,953.00	1,901.11	-201.06	323.48	First SDI MWD Intermediate Survey	
5,888.00	5,816.08	-359.72	419.79	First SDI MWD Production Survey	
6,588.00	6,515.99	-351.90	423.08	Curve KOP	
6,651.00	6,578.73	-346.77	424.76	First SDI MWD Curve Survey	
7,311.88	7,135.58	-27.18	427.04	Enter Land Box : 7311.88' MD & 7135.58' TVD	
7,851.00	7,317.56	470.52	422.04	Landing Point : 956' FSL 1478' FEL Sec 14	
7,851.00	7,317.56	470.52	422.04	Last SDI MWD Curve Survey	
7,936.00	7,318.10	555.50	423.25	First SDI MWD Lateral Survey	
8,682.95	7,329.70	1,302.04	431.31	Exit 460' Circle : 8682.95' MD & 7329.70' TVD 1788' FSL 1469' FEL	
11,783.30	7,340.78	4,400.84	400.89	Enter 460' Circle : 11783.3' MD & 7340.78' TVD 432' FNL 1484' FEL	
12,106.00	7,344.60	4,723.31	389.81	Last SDI MWD Survey	
12,165.00	7,345.63	4,782.25	387.30	Projection to TD : 51' FNL 1502' FEL Sec 14	

Checked By: _____ Approved By: _____ Date: _____