

# **8 NORTH LLC**

**Weld County**

**Sec 30-T12N-R61W**

**DUNSTON WEST 31S-20-2C**

**ORIGINAL WELLBORE**

**Plan: PROPOSAL 1**

## **Standard Planning Report**

**12 October, 2017**



Project: Weld County  
Site: Sec 30-T12N-R61W  
Well: DUNSTON WEST 31S-20-2C  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL 1

PROJECT DETAILS: Weld County

Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Colorado Northern Zone  
System Datum: Mean Sea Level



Azimuths to True North  
Magnetic North: 7.95°  
Magnetic Field  
Strength: 52702.6snT  
Dip Angle: 67.38°  
Date: 10/3/2017  
Model: IGRF2015

WELL DETAILS: DUNSTON WEST 31S-20-2C

+N/S	+E/-W	Northing	Easting	5268.00	Latitude	Longitude	Slot
0.00	0.00	1600107.09	3344855.90		40° 58' 26.353 N	104° 15' 4.208 W	

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	
3	897.61	11.95	270.76	893.28	0.82	-62.10	2.00	270.76	7.37	
4	6131.41	11.95	270.76	6013.62	15.11	-1145.90	0.00	0.00	135.98	
5	6729.01	0.00	0.00	6606.90	15.93	-1208.00	2.00	180.00	143.35	
6	6759.01	0.00	0.00	6636.90	15.93	-1208.00	0.00	0.00	143.35	
7	7659.25	90.00	181.12	7210.00	-557.07	-1219.24	10.00	181.12	712.84	DW 31S-2C - LP
8	17768.13	90.00	181.12	7210.00	-10664.01	-1417.28	0.00	0.00	10757.78	DW 31S-2C - PBHL

FORMATION TOP DETAILS

TVDPATH	MDPATH	FORMATION
3180.00	3235.00	PARKMAN
3750.00	3817.63	SUSSEX
4155.00	4231.60	SHANNON
6945.00	7084.30	NIORARA
7028.00	7189.46	NIO B TARGET
7180.00	7472.98	FORT HAYS
7210.00	7659.25	CODELL

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	BUILD 2°/100'
897.61	11.95	270.76	893.28	0.82	-62.10	7.37	62.11	HOLD 11.95° INC
6131.41	11.95	270.76	6013.62	15.11	-1145.90	135.98	1146.00	DROP 2°/100'
6729.01	0.00	0.00	6606.90	15.93	-1208.00	143.35	1208.11	HOLD VERTICAL
6759.01	0.00	0.00	6636.90	15.93	-1208.00	143.35	1208.11	KOP, BUILD 10°/100'
7659.25	90.00	181.12	7210.00	-557.07	-1219.24	712.84	1781.21	LP @ 90° INC, 181.12° AZM HOLD
17768.13	90.00	181.12	7209.83	-10664.00	-1417.48	10757.80	11890.09	TD at 17768.13' MD

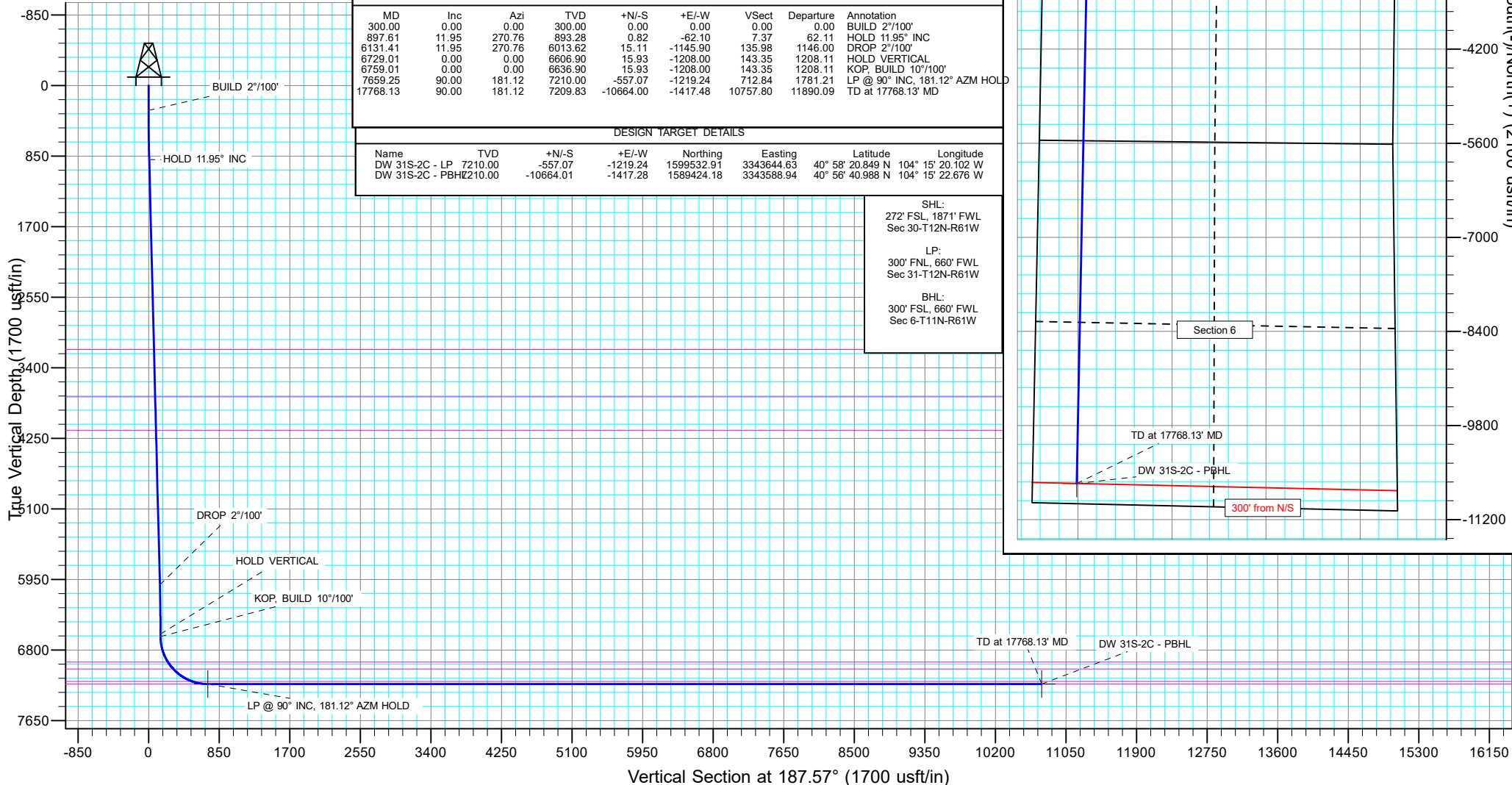
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
DW 31S-2C - LP	7210.00	-557.07	-1219.24	1599532.91	3343644.63	40° 58' 20.849 N	104° 15' 20.102 W
DW 31S-2C - PBHL	7210.00	-10664.01	-1417.28	1589424.18	3343588.94	40° 56' 40.988 N	104° 15' 22.676 W

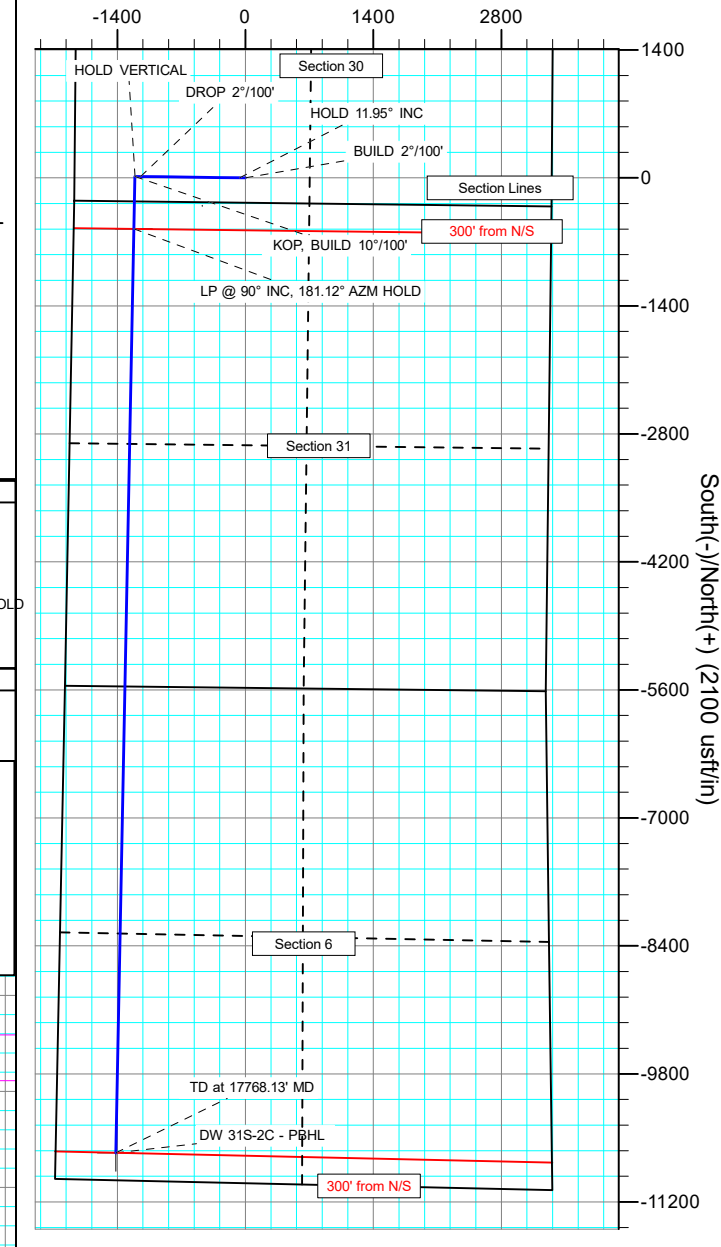
SHL:  
272' FSL, 1871' FWL  
Sec 30-T12N-R61W

LP:  
300' FNL, 660' FWL  
Sec 31-T12N-R61W

BHL:  
300' FSL, 660' FWL  
Sec 6-T11N-R61W



West(-)/East(+) (2100 usft/in)



## Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well DUNSTON WEST 31S-20-2C
<b>Company:</b>	8 NORTH LLC	<b>TVD Reference:</b>	KB 25' @ 5293.00usft
<b>Project:</b>	Weld County	<b>MD Reference:</b>	KB 25' @ 5293.00usft
<b>Site:</b>	Sec 30-T12N-R61W	<b>North Reference:</b>	True
<b>Well:</b>	DUNSTON WEST 31S-20-2C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL 1		

<b>Project</b>	Weld County		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		Sec 30-T12N-R61W			
Site Position:		Northing:	1,599,831.59 usft	Latitude:	40° 58' 23.891 N
From:	Lat/Long	Easting:	3,342,986.16 usft	Longitude:	104° 15' 28.631 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.80 °

Well	DUNSTON WEST 31S-20-2C					
Well Position	+N/-S	249.29 usft	Northing:	1,600,107.09 usft	Latitude:	40° 58' 26.353 N
	+E/-W	1,873.42 usft	Easting:	3,344,855.90 usft	Longitude:	104° 15' 4.208 W
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	5,268.00 usft

<b>Wellbore</b>	ORIGINAL WELLBORE				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	10/3/2017	7.95	67.38	52,702.60053205

<b>Design</b>	PROPOSAL 1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	187.57

<b>Plan Survey Tool Program</b>	<b>Date</b>	10/12/2017		
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.00	17,768.13	PROPOSAL 1 (ORIGINAL WELL	MWD OWSG
			OWSG MWD - Standard	

<b>Plan Sections</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	<b>TFO (°)</b>	<b>Target</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
897.61	11.95	270.76	893.28	0.82	-62.10	2.00	2.00	0.00	270.76	
6,131.41	11.95	270.76	6,013.62	15.11	-1,145.90	0.00	0.00	0.00	0.00	
6,729.01	0.00	0.00	6,606.90	15.93	-1,208.00	2.00	-2.00	0.00	180.00	
6,759.01	0.00	0.00	6,636.90	15.93	-1,208.00	0.00	0.00	0.00	0.00	
7,659.25	90.00	181.12	7,210.00	-557.07	-1,219.24	10.00	10.00	-19.87	181.12	DW 31S-2C - LP
17,768.13	90.00	181.12	7,210.00	-10,664.01	-1,417.28	0.00	0.00	0.00	0.00	DW 31S-2C - PBHL

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well DUNSTON WEST 31S-20-2C
<b>Company:</b>	8 NORTH LLC	<b>TVD Reference:</b>	KB 25' @ 5293.00usft
<b>Project:</b>	Weld County	<b>MD Reference:</b>	KB 25' @ 5293.00usft
<b>Site:</b>	Sec 30-T12N-R61W	<b>North Reference:</b>	True
<b>Well:</b>	DUNSTON WEST 31S-20-2C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	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
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>BUILD 2°/100'</b>									
400.00	2.00	270.76	399.98	0.02	-1.75	0.21	2.00	2.00	0.00
500.00	4.00	270.76	499.84	0.09	-6.98	0.83	2.00	2.00	0.00
600.00	6.00	270.76	599.45	0.21	-15.69	1.86	2.00	2.00	0.00
700.00	8.00	270.76	698.70	0.37	-27.88	3.31	2.00	2.00	0.00
800.00	10.00	270.76	797.47	0.57	-43.52	5.16	2.00	2.00	0.00
897.61	11.95	270.76	893.28	0.82	-62.10	7.37	2.00	2.00	0.00
<b>HOLD 11.95° INC</b>									
900.00	11.95	270.76	895.62	0.83	-62.60	7.43	0.00	0.00	0.00
1,000.00	11.95	270.76	993.46	1.10	-83.30	9.89	0.00	0.00	0.00
1,100.00	11.95	270.76	1,091.29	1.37	-104.01	12.34	0.00	0.00	0.00
1,200.00	11.95	270.76	1,189.12	1.64	-124.72	14.80	0.00	0.00	0.00
1,300.00	11.95	270.76	1,286.95	1.92	-145.43	17.26	0.00	0.00	0.00
1,400.00	11.95	270.76	1,384.78	2.19	-166.13	19.71	0.00	0.00	0.00
1,500.00	11.95	270.76	1,482.62	2.46	-186.84	22.17	0.00	0.00	0.00
1,600.00	11.95	270.76	1,580.45	2.74	-207.55	24.63	0.00	0.00	0.00
1,700.00	11.95	270.76	1,678.28	3.01	-228.26	27.09	0.00	0.00	0.00
1,800.00	11.95	270.76	1,776.11	3.28	-248.97	29.54	0.00	0.00	0.00
1,900.00	11.95	270.76	1,873.94	3.56	-269.67	32.00	0.00	0.00	0.00
2,000.00	11.95	270.76	1,971.78	3.83	-290.38	34.46	0.00	0.00	0.00
2,100.00	11.95	270.76	2,069.61	4.10	-311.09	36.92	0.00	0.00	0.00
2,200.00	11.95	270.76	2,167.44	4.38	-331.80	39.37	0.00	0.00	0.00
2,300.00	11.95	270.76	2,265.27	4.65	-352.50	41.83	0.00	0.00	0.00
2,400.00	11.95	270.76	2,363.10	4.92	-373.21	44.29	0.00	0.00	0.00
2,500.00	11.95	270.76	2,460.94	5.19	-393.92	46.75	0.00	0.00	0.00
2,600.00	11.95	270.76	2,558.77	5.47	-414.63	49.20	0.00	0.00	0.00
2,700.00	11.95	270.76	2,656.60	5.74	-435.33	51.66	0.00	0.00	0.00
2,800.00	11.95	270.76	2,754.43	6.01	-456.04	54.12	0.00	0.00	0.00
2,900.00	11.95	270.76	2,852.27	6.29	-476.75	56.57	0.00	0.00	0.00
3,000.00	11.95	270.76	2,950.10	6.56	-497.46	59.03	0.00	0.00	0.00
3,100.00	11.95	270.76	3,047.93	6.83	-518.17	61.49	0.00	0.00	0.00
3,200.00	11.95	270.76	3,145.76	7.11	-538.87	63.95	0.00	0.00	0.00
3,235.00	11.95	270.76	3,180.00	7.20	-546.12	64.81	0.00	0.00	0.00
<b>PARKMAN</b>									
3,300.00	11.95	270.76	3,243.59	7.38	-559.58	66.40	0.00	0.00	0.00
3,400.00	11.95	270.76	3,341.43	7.65	-580.29	68.86	0.00	0.00	0.00
3,500.00	11.95	270.76	3,439.26	7.93	-601.00	71.32	0.00	0.00	0.00
3,600.00	11.95	270.76	3,537.09	8.20	-621.70	73.78	0.00	0.00	0.00
3,700.00	11.95	270.76	3,634.92	8.47	-642.41	76.23	0.00	0.00	0.00
3,800.00	11.95	270.76	3,732.75	8.74	-663.12	78.69	0.00	0.00	0.00
3,817.63	11.95	270.76	3,750.00	8.79	-666.77	79.12	0.00	0.00	0.00
<b>SUSSEX</b>									
3,900.00	11.95	270.76	3,830.59	9.02	-683.83	81.15	0.00	0.00	0.00
4,000.00	11.95	270.76	3,928.42	9.29	-704.53	83.61	0.00	0.00	0.00
4,100.00	11.95	270.76	4,026.25	9.56	-725.24	86.06	0.00	0.00	0.00
4,200.00	11.95	270.76	4,124.08	9.84	-745.95	88.52	0.00	0.00	0.00
4,231.60	11.95	270.76	4,155.00	9.92	-752.49	89.30	0.00	0.00	0.00
<b>SHANNON</b>									
4,300.00	11.95	270.76	4,221.91	10.11	-766.66	90.98	0.00	0.00	0.00

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well DUNSTON WEST 31S-20-2C
<b>Company:</b>	8 NORTH LLC	<b>TVD Reference:</b>	KB 25' @ 5293.00usft
<b>Project:</b>	Weld County	<b>MD Reference:</b>	KB 25' @ 5293.00usft
<b>Site:</b>	Sec 30-T12N-R61W	<b>North Reference:</b>	True
<b>Well:</b>	DUNSTON WEST 31S-20-2C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,400.00	11.95	270.76	4,319.75	10.38	-787.37	93.43	0.00	0.00	0.00
4,500.00	11.95	270.76	4,417.58	10.66	-808.07	95.89	0.00	0.00	0.00
4,600.00	11.95	270.76	4,515.41	10.93	-828.78	98.35	0.00	0.00	0.00
4,700.00	11.95	270.76	4,613.24	11.20	-849.49	100.81	0.00	0.00	0.00
4,800.00	11.95	270.76	4,711.07	11.48	-870.20	103.26	0.00	0.00	0.00
4,900.00	11.95	270.76	4,808.91	11.75	-890.90	105.72	0.00	0.00	0.00
5,000.00	11.95	270.76	4,906.74	12.02	-911.61	108.18	0.00	0.00	0.00
5,100.00	11.95	270.76	5,004.57	12.29	-932.32	110.64	0.00	0.00	0.00
5,200.00	11.95	270.76	5,102.40	12.57	-953.03	113.09	0.00	0.00	0.00
5,300.00	11.95	270.76	5,200.24	12.84	-973.73	115.55	0.00	0.00	0.00
5,400.00	11.95	270.76	5,298.07	13.11	-994.44	118.01	0.00	0.00	0.00
5,500.00	11.95	270.76	5,395.90	13.39	-1,015.15	120.47	0.00	0.00	0.00
5,600.00	11.95	270.76	5,493.73	13.66	-1,035.86	122.92	0.00	0.00	0.00
5,700.00	11.95	270.76	5,591.56	13.93	-1,056.56	125.38	0.00	0.00	0.00
5,800.00	11.95	270.76	5,689.40	14.21	-1,077.27	127.84	0.00	0.00	0.00
5,900.00	11.95	270.76	5,787.23	14.48	-1,097.98	130.29	0.00	0.00	0.00
6,000.00	11.95	270.76	5,885.06	14.75	-1,118.69	132.75	0.00	0.00	0.00
6,100.00	11.95	270.76	5,982.89	15.03	-1,139.40	135.21	0.00	0.00	0.00
6,131.41	11.95	270.76	6,013.62	15.11	-1,145.90	135.98	0.00	0.00	0.00
<b>DROP 2°/100'</b>									
6,200.00	10.58	270.76	6,080.89	15.29	-1,159.30	137.57	2.00	-2.00	0.00
6,300.00	8.58	270.76	6,179.49	15.51	-1,175.94	139.55	2.00	-2.00	0.00
6,400.00	6.58	270.76	6,278.61	15.68	-1,189.13	141.11	2.00	-2.00	0.00
6,500.00	4.58	270.76	6,378.13	15.81	-1,198.85	142.27	2.00	-2.00	0.00
6,600.00	2.58	270.76	6,477.93	15.89	-1,205.10	143.01	2.00	-2.00	0.00
6,700.00	0.58	270.76	6,577.89	15.93	-1,207.85	143.33	2.00	-2.00	0.00
6,729.01	0.00	0.00	6,606.90	15.93	-1,208.00	143.35	2.00	-2.00	0.00
<b>HOLD VERTICAL</b>									
6,759.01	0.00	0.00	6,636.90	15.93	-1,208.00	143.35	0.00	0.00	0.00
<b>KOP, BUILD 10°/100'</b>									
6,800.00	4.10	181.12	6,677.85	14.47	-1,208.03	144.81	10.00	10.00	0.00
6,850.00	9.10	181.12	6,727.50	8.72	-1,208.14	150.51	10.00	10.00	0.00
6,900.00	14.10	181.12	6,776.47	-1.32	-1,208.34	160.50	10.00	10.00	0.00
6,950.00	19.09	181.12	6,824.37	-15.59	-1,208.62	174.68	10.00	10.00	0.00
7,000.00	24.09	181.12	6,870.85	-33.99	-1,208.98	192.96	10.00	10.00	0.00
7,050.00	29.09	181.12	6,915.54	-56.36	-1,209.42	215.19	10.00	10.00	0.00
7,084.30	32.52	181.12	6,945.00	-73.92	-1,209.76	232.65	10.00	10.00	0.00
<b>NIOBRARA</b>									
7,100.00	34.09	181.12	6,958.12	-82.53	-1,209.93	241.21	10.00	10.00	0.00
7,150.00	39.09	181.12	6,998.25	-112.32	-1,210.52	270.82	10.00	10.00	0.00
7,189.46	43.03	181.12	7,028.00	-138.23	-1,211.02	296.57	10.00	10.00	0.00
<b>NIO B TARGET</b>									
7,200.00	44.09	181.12	7,035.64	-145.49	-1,211.17	303.79	10.00	10.00	0.00
7,250.00	49.09	181.12	7,069.99	-181.80	-1,211.88	339.87	10.00	10.00	0.00
7,300.00	54.09	181.12	7,101.05	-220.95	-1,212.65	378.78	10.00	10.00	0.00
7,350.00	59.08	181.12	7,128.57	-262.67	-1,213.46	420.24	10.00	10.00	0.00
7,400.00	64.08	181.12	7,152.36	-306.62	-1,214.33	463.92	10.00	10.00	0.00
7,450.00	69.08	181.12	7,172.23	-352.48	-1,215.23	509.50	10.00	10.00	0.00
7,472.98	71.38	181.12	7,180.00	-374.10	-1,215.65	530.99	10.00	10.00	0.00
<b>FORT HAYS</b>									
7,500.00	74.08	181.12	7,188.02	-399.89	-1,216.16	556.62	10.00	10.00	0.00
7,550.00	79.08	181.12	7,199.62	-448.50	-1,217.11	604.94	10.00	10.00	0.00
7,600.00	84.08	181.12	7,206.94	-497.94	-1,218.08	654.07	10.00	10.00	0.00

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well DUNSTON WEST 31S-20-2C
<b>Company:</b>	8 NORTH LLC	<b>TVD Reference:</b>	KB 25' @ 5293.00usft
<b>Project:</b>	Weld County	<b>MD Reference:</b>	KB 25' @ 5293.00usft
<b>Site:</b>	Sec 30-T12N-R61W	<b>North Reference:</b>	True
<b>Well:</b>	DUNSTON WEST 31S-20-2C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL 1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
7,650.00	89.08	181.12	7,209.93	-547.82	-1,219.06	703.65	10.00	10.00	0.00	
7,659.25	90.00	181.12	7,210.00	-557.07	-1,219.24	712.84	10.00	10.00	0.00	
LP @ 90° INC, 181.12° AZM HOLD - CODELL										
7,700.00	90.00	181.12	7,210.00	-597.81	-1,220.04	753.33	0.00	0.00	0.00	
7,800.00	90.00	181.12	7,210.00	-697.80	-1,222.00	852.70	0.00	0.00	0.00	
7,900.00	90.00	181.12	7,210.00	-797.78	-1,223.96	952.07	0.00	0.00	0.00	
8,000.00	90.00	181.12	7,209.99	-897.76	-1,225.92	1,051.44	0.00	0.00	0.00	
8,100.00	90.00	181.12	7,209.99	-997.74	-1,227.88	1,150.80	0.00	0.00	0.00	
8,200.00	90.00	181.12	7,209.99	-1,097.72	-1,229.84	1,250.17	0.00	0.00	0.00	
8,300.00	90.00	181.12	7,209.99	-1,197.70	-1,231.81	1,349.54	0.00	0.00	0.00	
8,400.00	90.00	181.12	7,209.99	-1,297.68	-1,233.77	1,448.91	0.00	0.00	0.00	
8,500.00	90.00	181.12	7,209.99	-1,397.66	-1,235.73	1,548.27	0.00	0.00	0.00	
8,600.00	90.00	181.12	7,209.98	-1,497.64	-1,237.69	1,647.64	0.00	0.00	0.00	
8,700.00	90.00	181.12	7,209.98	-1,597.62	-1,239.65	1,747.01	0.00	0.00	0.00	
8,800.00	90.00	181.12	7,209.98	-1,697.60	-1,241.61	1,846.38	0.00	0.00	0.00	
8,900.00	90.00	181.12	7,209.98	-1,797.58	-1,243.57	1,945.74	0.00	0.00	0.00	
9,000.00	90.00	181.12	7,209.98	-1,897.56	-1,245.53	2,045.11	0.00	0.00	0.00	
9,100.00	90.00	181.12	7,209.98	-1,997.55	-1,247.49	2,144.48	0.00	0.00	0.00	
9,200.00	90.00	181.12	7,209.97	-2,097.53	-1,249.45	2,243.85	0.00	0.00	0.00	
9,300.00	90.00	181.12	7,209.97	-2,197.51	-1,251.42	2,343.22	0.00	0.00	0.00	
9,400.00	90.00	181.12	7,209.97	-2,297.49	-1,253.38	2,442.58	0.00	0.00	0.00	
9,500.00	90.00	181.12	7,209.97	-2,397.47	-1,255.34	2,541.95	0.00	0.00	0.00	
9,600.00	90.00	181.12	7,209.97	-2,497.45	-1,257.30	2,641.32	0.00	0.00	0.00	
9,700.00	90.00	181.12	7,209.96	-2,597.43	-1,259.26	2,740.69	0.00	0.00	0.00	
9,800.00	90.00	181.12	7,209.96	-2,697.41	-1,261.22	2,840.05	0.00	0.00	0.00	
9,900.00	90.00	181.12	7,209.96	-2,797.39	-1,263.18	2,939.42	0.00	0.00	0.00	
10,000.00	90.00	181.12	7,209.96	-2,897.37	-1,265.14	3,038.79	0.00	0.00	0.00	
10,100.00	90.00	181.12	7,209.96	-2,997.35	-1,267.10	3,138.16	0.00	0.00	0.00	
10,200.00	90.00	181.12	7,209.96	-3,097.33	-1,269.07	3,237.53	0.00	0.00	0.00	
10,300.00	90.00	181.12	7,209.95	-3,197.31	-1,271.03	3,336.89	0.00	0.00	0.00	
10,400.00	90.00	181.12	7,209.95	-3,297.30	-1,272.99	3,436.26	0.00	0.00	0.00	
10,500.00	90.00	181.12	7,209.95	-3,397.28	-1,274.95	3,535.63	0.00	0.00	0.00	
10,600.00	90.00	181.12	7,209.95	-3,497.26	-1,276.91	3,635.00	0.00	0.00	0.00	
10,700.00	90.00	181.12	7,209.95	-3,597.24	-1,278.87	3,734.36	0.00	0.00	0.00	
10,800.00	90.00	181.12	7,209.95	-3,697.22	-1,280.83	3,833.73	0.00	0.00	0.00	
10,900.00	90.00	181.12	7,209.94	-3,797.20	-1,282.79	3,933.10	0.00	0.00	0.00	
11,000.00	90.00	181.12	7,209.94	-3,897.18	-1,284.75	4,032.47	0.00	0.00	0.00	
11,100.00	90.00	181.12	7,209.94	-3,997.16	-1,286.72	4,131.83	0.00	0.00	0.00	
11,200.00	90.00	181.12	7,209.94	-4,097.14	-1,288.68	4,231.20	0.00	0.00	0.00	
11,300.00	90.00	181.12	7,209.94	-4,197.12	-1,290.64	4,330.57	0.00	0.00	0.00	
11,400.00	90.00	181.12	7,209.94	-4,297.10	-1,292.60	4,429.94	0.00	0.00	0.00	
11,500.00	90.00	181.12	7,209.93	-4,397.08	-1,294.56	4,529.31	0.00	0.00	0.00	
11,600.00	90.00	181.12	7,209.93	-4,497.06	-1,296.52	4,628.67	0.00	0.00	0.00	
11,700.00	90.00	181.12	7,209.93	-4,597.05	-1,298.48	4,728.04	0.00	0.00	0.00	
11,800.00	90.00	181.12	7,209.93	-4,697.03	-1,300.44	4,827.41	0.00	0.00	0.00	
11,900.00	90.00	181.12	7,209.93	-4,797.01	-1,302.40	4,926.78	0.00	0.00	0.00	
12,000.00	90.00	181.12	7,209.93	-4,896.99	-1,304.37	5,026.14	0.00	0.00	0.00	
12,100.00	90.00	181.12	7,209.92	-4,996.97	-1,306.33	5,125.51	0.00	0.00	0.00	
12,200.00	90.00	181.12	7,209.92	-5,096.95	-1,308.29	5,224.88	0.00	0.00	0.00	
12,300.00	90.00	181.12	7,209.92	-5,196.93	-1,310.25	5,324.25	0.00	0.00	0.00	
12,400.00	90.00	181.12	7,209.92	-5,296.91	-1,312.21	5,423.62	0.00	0.00	0.00	
12,500.00	90.00	181.12	7,209.92	-5,396.89	-1,314.17	5,522.98	0.00	0.00	0.00	
12,600.00	90.00	181.12	7,209.91	-5,496.87	-1,316.13	5,622.35	0.00	0.00	0.00	
12,700.00	90.00	181.12	7,209.91	-5,596.85	-1,318.09	5,721.72	0.00	0.00	0.00	

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well DUNSTON WEST 31S-20-2C
<b>Company:</b>	8 NORTH LLC	<b>TVD Reference:</b>	KB 25' @ 5293.00usft
<b>Project:</b>	Weld County	<b>MD Reference:</b>	KB 25' @ 5293.00usft
<b>Site:</b>	Sec 30-T12N-R61W	<b>North Reference:</b>	True
<b>Well:</b>	DUNSTON WEST 31S-20-2C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL 1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
12,800.00	90.00	181.12	7,209.91	-5,696.83	-1,320.05	5,821.09	0.00	0.00	0.00
12,900.00	90.00	181.12	7,209.91	-5,796.81	-1,322.02	5,920.45	0.00	0.00	0.00
13,000.00	90.00	181.12	7,209.91	-5,896.80	-1,323.98	6,019.82	0.00	0.00	0.00
13,100.00	90.00	181.12	7,209.91	-5,996.78	-1,325.94	6,119.19	0.00	0.00	0.00
13,200.00	90.00	181.12	7,209.90	-6,096.76	-1,327.90	6,218.56	0.00	0.00	0.00
13,300.00	90.00	181.12	7,209.90	-6,196.74	-1,329.86	6,317.92	0.00	0.00	0.00
13,400.00	90.00	181.12	7,209.90	-6,296.72	-1,331.82	6,417.29	0.00	0.00	0.00
13,500.00	90.00	181.12	7,209.90	-6,396.70	-1,333.78	6,516.66	0.00	0.00	0.00
13,600.00	90.00	181.12	7,209.90	-6,496.68	-1,335.74	6,616.03	0.00	0.00	0.00
13,700.00	90.00	181.12	7,209.90	-6,596.66	-1,337.70	6,715.40	0.00	0.00	0.00
13,800.00	90.00	181.12	7,209.89	-6,696.64	-1,339.67	6,814.76	0.00	0.00	0.00
13,900.00	90.00	181.12	7,209.89	-6,796.62	-1,341.63	6,914.13	0.00	0.00	0.00
14,000.00	90.00	181.12	7,209.89	-6,896.60	-1,343.59	7,013.50	0.00	0.00	0.00
14,100.00	90.00	181.12	7,209.89	-6,996.58	-1,345.55	7,112.87	0.00	0.00	0.00
14,200.00	90.00	181.12	7,209.89	-7,096.56	-1,347.51	7,212.23	0.00	0.00	0.00
14,300.00	90.00	181.12	7,209.89	-7,196.55	-1,349.47	7,311.60	0.00	0.00	0.00
14,400.00	90.00	181.12	7,209.88	-7,296.53	-1,351.43	7,410.97	0.00	0.00	0.00
14,500.00	90.00	181.12	7,209.88	-7,396.51	-1,353.39	7,510.34	0.00	0.00	0.00
14,600.00	90.00	181.12	7,209.88	-7,496.49	-1,355.35	7,609.71	0.00	0.00	0.00
14,700.00	90.00	181.12	7,209.88	-7,596.47	-1,357.32	7,709.07	0.00	0.00	0.00
14,800.00	90.00	181.12	7,209.88	-7,696.45	-1,359.28	7,808.44	0.00	0.00	0.00
14,900.00	90.00	181.12	7,209.88	-7,796.43	-1,361.24	7,907.81	0.00	0.00	0.00
15,000.00	90.00	181.12	7,209.87	-7,896.41	-1,363.20	8,007.18	0.00	0.00	0.00
15,100.00	90.00	181.12	7,209.87	-7,996.39	-1,365.16	8,106.54	0.00	0.00	0.00
15,200.00	90.00	181.12	7,209.87	-8,096.37	-1,367.12	8,205.91	0.00	0.00	0.00
15,300.00	90.00	181.12	7,209.87	-8,196.35	-1,369.08	8,305.28	0.00	0.00	0.00
15,400.00	90.00	181.12	7,209.87	-8,296.33	-1,371.04	8,404.65	0.00	0.00	0.00
15,500.00	90.00	181.12	7,209.86	-8,396.31	-1,373.00	8,504.01	0.00	0.00	0.00
15,600.00	90.00	181.12	7,209.86	-8,496.30	-1,374.97	8,603.38	0.00	0.00	0.00
15,700.00	90.00	181.12	7,209.86	-8,596.28	-1,376.93	8,702.75	0.00	0.00	0.00
15,800.00	90.00	181.12	7,209.86	-8,696.26	-1,378.89	8,802.12	0.00	0.00	0.00
15,900.00	90.00	181.12	7,209.86	-8,796.24	-1,380.85	8,901.49	0.00	0.00	0.00
16,000.00	90.00	181.12	7,209.86	-8,896.22	-1,382.81	9,000.85	0.00	0.00	0.00
16,100.00	90.00	181.12	7,209.85	-8,996.20	-1,384.77	9,100.22	0.00	0.00	0.00
16,200.00	90.00	181.12	7,209.85	-9,096.18	-1,386.73	9,199.59	0.00	0.00	0.00
16,300.00	90.00	181.12	7,209.85	-9,196.16	-1,388.69	9,298.96	0.00	0.00	0.00
16,400.00	90.00	181.12	7,209.85	-9,296.14	-1,390.65	9,398.32	0.00	0.00	0.00
16,500.00	90.00	181.12	7,209.85	-9,396.12	-1,392.62	9,497.69	0.00	0.00	0.00
16,600.00	90.00	181.12	7,209.85	-9,496.10	-1,394.58	9,597.06	0.00	0.00	0.00
16,700.00	90.00	181.12	7,209.84	-9,596.08	-1,396.54	9,696.43	0.00	0.00	0.00
16,800.00	90.00	181.12	7,209.84	-9,696.06	-1,398.50	9,795.80	0.00	0.00	0.00
16,900.00	90.00	181.12	7,209.84	-9,796.05	-1,400.46	9,895.16	0.00	0.00	0.00
17,000.00	90.00	181.12	7,209.84	-9,896.03	-1,402.42	9,994.53	0.00	0.00	0.00
17,100.00	90.00	181.12	7,209.84	-9,996.01	-1,404.38	10,093.90	0.00	0.00	0.00
17,200.00	90.00	181.12	7,209.84	-10,095.99	-1,406.34	10,193.27	0.00	0.00	0.00
17,300.00	90.00	181.12	7,209.83	-10,195.97	-1,408.30	10,292.63	0.00	0.00	0.00
17,400.00	90.00	181.12	7,209.83	-10,295.95	-1,410.26	10,392.00	0.00	0.00	0.00
17,500.00	90.00	181.12	7,209.83	-10,395.93	-1,412.23	10,491.37	0.00	0.00	0.00
17,600.00	90.00	181.12	7,209.83	-10,495.91	-1,414.19	10,590.74	0.00	0.00	0.00
17,700.00	90.00	181.12	7,209.83	-10,595.89	-1,416.15	10,690.10	0.00	0.00	0.00
17,768.13	90.00	181.12	7,209.83	-10,664.00	-1,417.48	10,757.80	0.00	0.00	0.00
TD at 17768.13' MD									

## Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well DUNSTON WEST 31S-20-2C
<b>Company:</b>	8 NORTH LLC	<b>TVD Reference:</b>	KB 25' @ 5293.00usft
<b>Project:</b>	Weld County	<b>MD Reference:</b>	KB 25' @ 5293.00usft
<b>Site:</b>	Sec 30-T12N-R61W	<b>North Reference:</b>	True
<b>Well:</b>	DUNSTON WEST 31S-20-2C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL 1		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
DW 31S-2C - LP	0.00	0.00	7,210.00	-557.07	-1,219.24	1,599,532.90	3,343,644.63	40° 58' 20.849 N	104° 15' 20.102 W
- plan hits target center									
- Point									
DW 31S-2C - PBHL	0.00	0.00	7,210.00	-10,664.01	-1,417.28	1,589,424.18	3,343,588.95	40° 56' 40.988 N	104° 15' 22.676 W
- plan misses target center by 0.27usft at 17768.13usft MD (7209.83 TVD, -10664.00 N, -1417.48 E)									
- Point									

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(usft)	(usft)			(°)	(°)	
3,235.00	3,180.00	PARKMAN				
3,817.63	3,750.00	SUSSEX				
4,231.60	4,155.00	SHANNON				
7,084.30	6,945.00	NIOBRARA				
7,189.46	7,028.00	NIO B TARGET				
7,472.98	7,180.00	FORT HAYS				
7,659.25	7,210.00	CODELL				

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		
(usft)	(usft)	+N/-S (usft)	+E/-W (usft)	Comment
300.00	300.00	0.00	0.00	BUILD 2°/100'
897.61	893.28	0.82	-62.10	HOLD 11.95° INC
6,131.41	6,013.62	15.11	-1,145.90	DROP 2°/100'
6,729.01	6,606.90	15.93	-1,208.00	HOLD VERTICAL
6,759.01	6,636.90	15.93	-1,208.00	KOP, BUILD 10°/100'
7,659.25	7,210.00	-557.07	-1,219.24	LP @ 90° INC, 181.12° AZM HOLD
17,768.13	7,209.83	-10,664.00	-1,417.48	TD at 17768.13' MD