

# **EXTRACTION OIL & GAS**

**Broomfield County**

**Sec 9-T1S-R68W**

**NORTHWEST B S20-25-19N**

**ORIGINAL WELLBORE**

**Plan: PROPOSAL 1**

## **Standard Planning Report**

**18 January, 2018**



Project: Broomfield County  
Site: Sec 9-T1S-R68W  
Well: NORTHWEST B S20-25-19N  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL 1

PROJECT DETAILS: Broomfield 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: 8.25°

Magnetic Field  
Strength: 52082.5nT  
Dip Angle: 66.47°  
Date: 1/4/2018  
Model: IGRF2015

WELL DETAILS: NORTHWEST B S20-25-19N

+N/-S	+E/-W	Northing	Easting	5293.00	Latitude	Longitude	Slot
0.00	0.00	1237231.42	3137322.26		39° 59' 0.755 N	105° 0' 35.813 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	1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00	
3	2157.19	21.14	303.85	2133.36	107.44	-160.17	2.00	303.85	-83.59	
4	6798.43	21.14	303.85	6462.14	1040.06	-1550.48	0.00	0.00	-809.23	
5	7855.62	0.00	0.00	7495.50	1147.50	-1710.65	2.00	180.00	-892.82	
6	7885.62	0.00	0.00	7525.50	1147.50	-1710.65	0.00	0.00	-892.82	
7	8635.68	90.00	179.80	8003.00	670.00	-1709.02	12.00	179.80	-420.40	NORTHWEST B S20-19N - LP
8	20913.97	90.00	179.80	8003.00	-11608.22	-1666.13	0.00	-94.01	11727.18	NORTHWEST B S20-19N - PBHL

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
5122.00	5361.56	SUSSEX
7825.00	8209.36	NIOBRARA
7993.00	8537.78	NIO B TARGET

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation
1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	Start Build 2.00
2157.19	21.14	303.85	2133.36	107.44	-160.17	-83.59	192.86	Start 4641.24 hold at 2157.19 MD
6798.43	21.14	303.85	6462.14	1040.06	-1550.48	-809.23	1867.01	Start Drop -2.00
7855.62	0.00	0.00	7495.50	1147.50	-1710.65	-892.82	2059.87	Start 30.00 hold at 7855.62 MD
7885.62	0.00	0.00	7525.50	1147.50	-1710.65	-892.82	2059.87	Start DLS 12.00 TFO 179.80
8635.68	90.00	179.80	8003.00	670.00	-1709.02	-420.40	2537.38	Start DLS 0.00 TFO -94.01
20913.97	90.00	179.80	8003.00	-11608.22	-1666.13	11727.18	14815.67	TD at 20913.97

DESIGN TARGET DETAILS

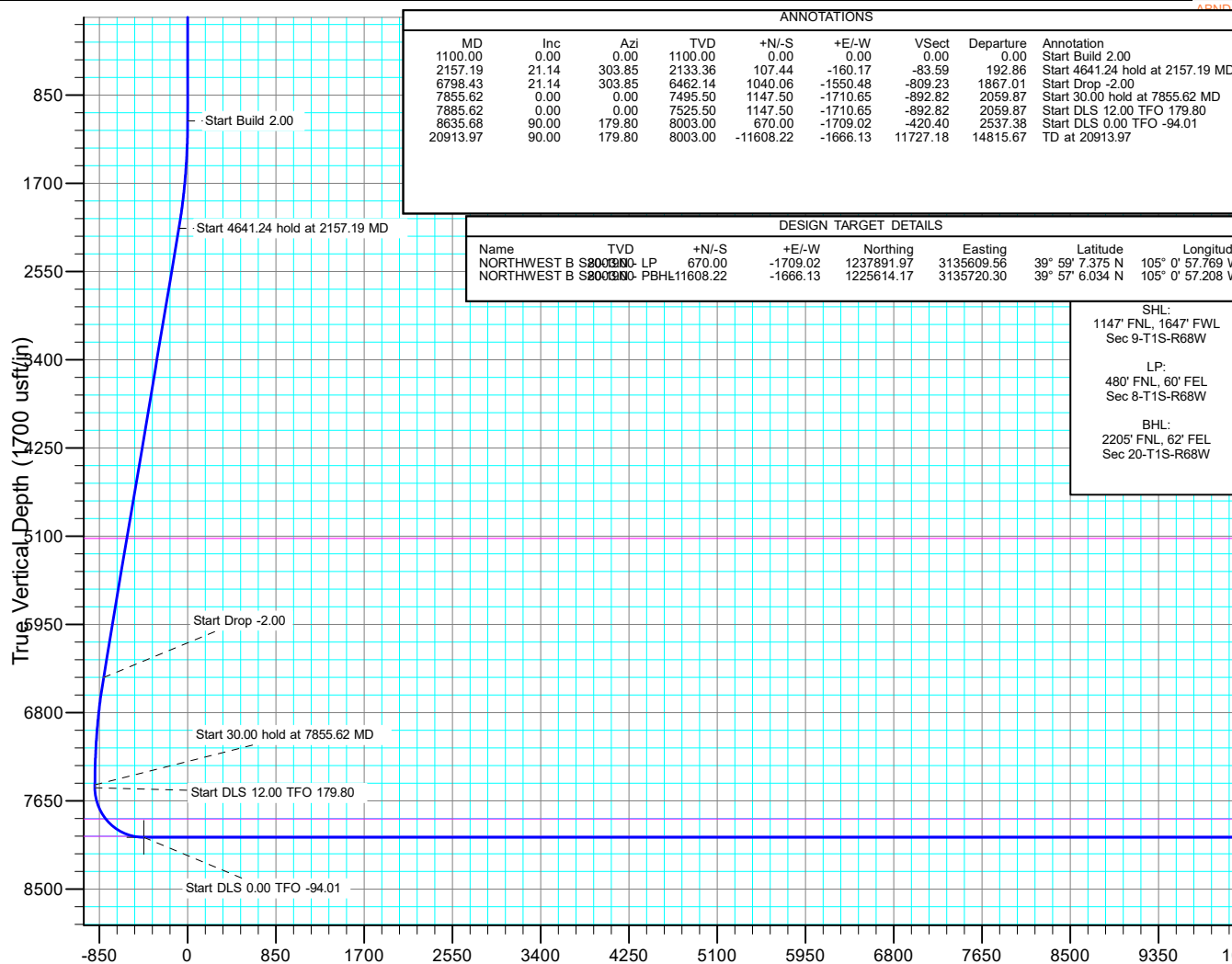
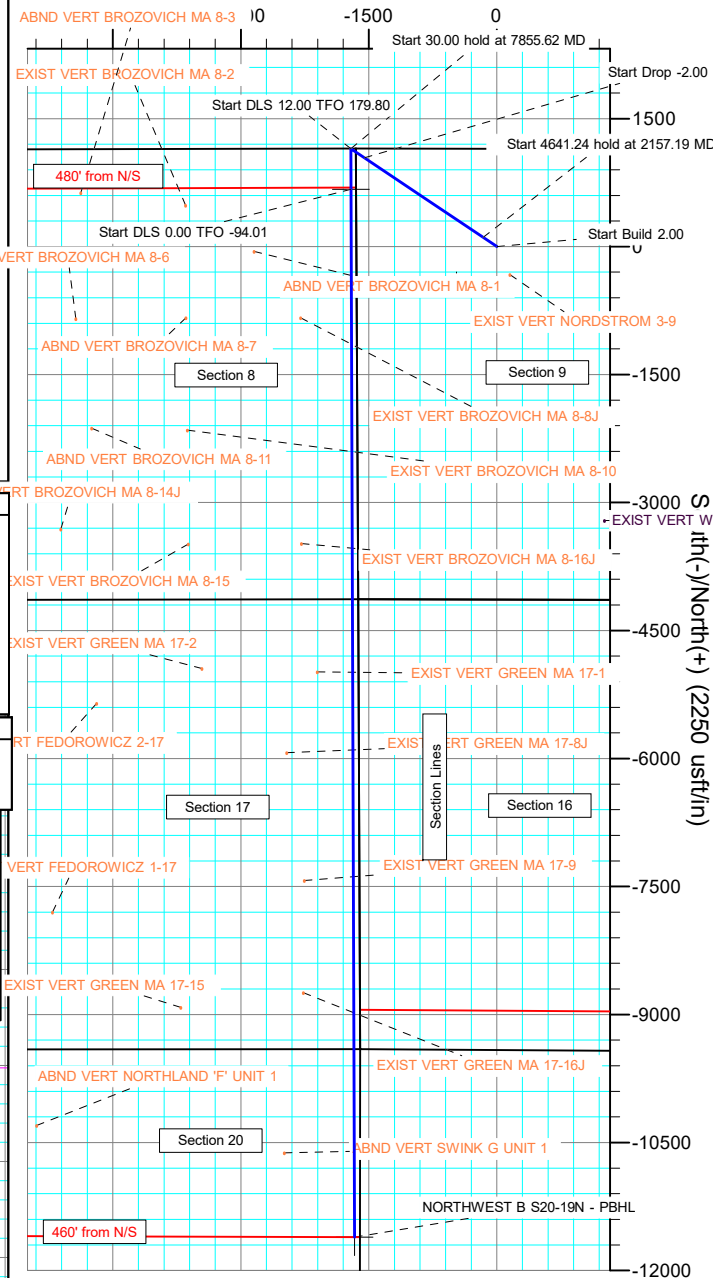
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
NORTHWEST B S20-19N - LP	670.00	-1709.02	1237891.97	3135609.56	39° 59' 7.375 N	105° 0' 57.769 W	
NORTHWEST B S20-19N - PBHL	11608.22	-1666.13	1225614.17	3135720.30	39° 57' 6.034 N	105° 0' 57.208 W	

SHL:  
1147' FNL, 1647' FWL  
Sec 9-T1S-R68W

LP:  
480' FNL, 60' FEL  
Sec 8-T1S-R68W

BHL:  
2205' FNL, 62' FEL  
Sec 20-T1S-R68W

West(-)/East(+) (2250 usft/in)



Vertical Section at 188.17° (1700 usft/in)

## Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well NORTHWEST B S20-25-19N
<b>Company:</b>	EXTRACTION OIL & GAS	<b>TVD Reference:</b>	KB 25' @ 5318.00usft
<b>Project:</b>	Broomfield County	<b>MD Reference:</b>	KB 25' @ 5318.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>North Reference:</b>	True
<b>Well:</b>	NORTHWEST B S20-25-19N	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL 1		

<b>Project</b>	Broomfield 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 9-T1S-R68W			
Site Position:		Northing:	1,238,372.37 usft	Latitude:	39° 59' 12.120 N
From:	Lat/Long	Easting:	3,135,664.83 usft	Longitude:	105° 0' 57.025 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.31 °

Well	NORTHWEST B S20-25-19N					
Well Position	+N/-S	-1,149.99 usft	Northing:	1,237,231.42 usft	Latitude:	39° 59' 0.755 N
	+E/-W	1,651.18 usft	Easting:	3,137,322.26 usft	Longitude:	105° 0' 35.813 W
Position Uncertainty	0.00 usft		Wellhead Elevation:		Ground Level:	5,293.00 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	1/4/2018	8.25	66.47	52,082.45164868

<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	188.17

<b>Plan Survey Tool Program</b>	<b>Date</b>	1/18/2018		
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.00	20,913.51	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	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,157.19	21.14	303.85	2,133.36	107.44	-160.17	2.00	2.00	0.00	303.85	
6,798.43	21.14	303.85	6,462.14	1,040.06	-1,550.48	0.00	0.00	0.00	0.00	
7,855.62	0.00	0.00	7,495.50	1,147.50	-1,710.65	2.00	-2.00	0.00	180.00	
7,885.62	0.00	0.00	7,525.50	1,147.50	-1,710.65	0.00	0.00	0.00	0.00	
8,635.68	90.00	179.80	8,003.00	670.00	-1,709.02	12.00	12.00	23.97	179.80	NORTHWEST B S20-
20,913.97	90.00	179.80	8,003.00	-11,608.22	-1,666.13	0.00	0.00	0.00	-94.01	NORTHWEST B S20-

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well NORTHWEST B S20-25-19N
<b>Company:</b>	EXTRACTION OIL & GAS	<b>TVD Reference:</b>	KB 25' @ 5318.00usft
<b>Project:</b>	Broomfield County	<b>MD Reference:</b>	KB 25' @ 5318.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>North Reference:</b>	True
<b>Well:</b>	NORTHWEST B S20-25-19N	<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
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,200.00	2.00	303.85	1,199.98	0.97	-1.45	-0.76	2.00	2.00	0.00
1,300.00	4.00	303.85	1,299.84	3.89	-5.80	-3.02	2.00	2.00	0.00
1,400.00	6.00	303.85	1,399.45	8.74	-13.03	-6.80	2.00	2.00	0.00
1,500.00	8.00	303.85	1,498.70	15.53	-23.15	-12.08	2.00	2.00	0.00
1,600.00	10.00	303.85	1,597.47	24.25	-36.14	-18.86	2.00	2.00	0.00
1,700.00	12.00	303.85	1,695.62	34.87	-51.99	-27.13	2.00	2.00	0.00
1,800.00	14.00	303.85	1,793.06	47.41	-70.67	-36.88	2.00	2.00	0.00
1,900.00	16.00	303.85	1,889.64	61.82	-92.16	-48.10	2.00	2.00	0.00
2,000.00	18.00	303.85	1,985.27	78.11	-116.44	-60.77	2.00	2.00	0.00
2,100.00	20.00	303.85	2,079.82	96.24	-143.48	-74.88	2.00	2.00	0.00
2,157.19	21.14	303.85	2,133.36	107.44	-160.17	-83.59	2.00	2.00	0.00
Start 4641.24 hold at 2157.19 MD									
2,200.00	21.14	303.85	2,173.29	116.04	-172.99	-90.29	0.00	0.00	0.00
2,300.00	21.14	303.85	2,266.55	136.14	-202.95	-105.92	0.00	0.00	0.00
2,400.00	21.14	303.85	2,359.82	156.23	-232.90	-121.56	0.00	0.00	0.00
2,500.00	21.14	303.85	2,453.09	176.32	-262.86	-137.19	0.00	0.00	0.00
2,600.00	21.14	303.85	2,546.36	196.42	-292.81	-152.82	0.00	0.00	0.00
2,700.00	21.14	303.85	2,639.62	216.51	-322.77	-168.46	0.00	0.00	0.00
2,800.00	21.14	303.85	2,732.89	236.61	-352.72	-184.09	0.00	0.00	0.00
2,900.00	21.14	303.85	2,826.16	256.70	-382.68	-199.73	0.00	0.00	0.00
3,000.00	21.14	303.85	2,919.43	276.80	-412.64	-215.36	0.00	0.00	0.00
3,100.00	21.14	303.85	3,012.70	296.89	-442.59	-231.00	0.00	0.00	0.00
3,200.00	21.14	303.85	3,105.96	316.98	-472.55	-246.63	0.00	0.00	0.00
3,300.00	21.14	303.85	3,199.23	337.08	-502.50	-262.27	0.00	0.00	0.00
3,400.00	21.14	303.85	3,292.50	357.17	-532.46	-277.90	0.00	0.00	0.00
3,500.00	21.14	303.85	3,385.77	377.27	-562.41	-293.53	0.00	0.00	0.00
3,600.00	21.14	303.85	3,479.03	397.36	-592.37	-309.17	0.00	0.00	0.00
3,700.00	21.14	303.85	3,572.30	417.45	-622.33	-324.80	0.00	0.00	0.00
3,800.00	21.14	303.85	3,665.57	437.55	-652.28	-340.44	0.00	0.00	0.00
3,900.00	21.14	303.85	3,758.84	457.64	-682.24	-356.07	0.00	0.00	0.00
4,000.00	21.14	303.85	3,852.11	477.74	-712.19	-371.71	0.00	0.00	0.00
4,100.00	21.14	303.85	3,945.37	497.83	-742.15	-387.34	0.00	0.00	0.00
4,200.00	21.14	303.85	4,038.64	517.93	-772.10	-402.98	0.00	0.00	0.00
4,300.00	21.14	303.85	4,131.91	538.02	-802.06	-418.61	0.00	0.00	0.00
4,400.00	21.14	303.85	4,225.18	558.11	-832.02	-434.24	0.00	0.00	0.00
4,500.00	21.14	303.85	4,318.44	578.21	-861.97	-449.88	0.00	0.00	0.00
4,600.00	21.14	303.85	4,411.71	598.30	-891.93	-465.51	0.00	0.00	0.00
4,700.00	21.14	303.85	4,504.98	618.40	-921.88	-481.15	0.00	0.00	0.00
4,800.00	21.14	303.85	4,598.25	638.49	-951.84	-496.78	0.00	0.00	0.00
4,900.00	21.14	303.85	4,691.52	658.59	-981.79	-512.42	0.00	0.00	0.00

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well NORTHWEST B S20-25-19N
<b>Company:</b>	EXTRACTION OIL & GAS	<b>TVD Reference:</b>	KB 25' @ 5318.00usft
<b>Project:</b>	Broomfield County	<b>MD Reference:</b>	KB 25' @ 5318.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>North Reference:</b>	True
<b>Well:</b>	NORTHWEST B S20-25-19N	<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)
5,000.00	21.14	303.85	4,784.78	678.68	-1,011.75	-528.05	0.00	0.00	0.00
5,100.00	21.14	303.85	4,878.05	698.77	-1,041.71	-543.69	0.00	0.00	0.00
5,200.00	21.14	303.85	4,971.32	718.87	-1,071.66	-559.32	0.00	0.00	0.00
5,300.00	21.14	303.85	5,064.59	738.96	-1,101.62	-574.95	0.00	0.00	0.00
5,361.56	21.14	303.85	5,122.00	751.33	-1,120.06	-584.58	0.00	0.00	0.00
<b>SUSSEX</b>									
5,400.00	21.14	303.85	5,157.85	759.06	-1,131.57	-590.59	0.00	0.00	0.00
5,500.00	21.14	303.85	5,251.12	779.15	-1,161.53	-606.22	0.00	0.00	0.00
5,600.00	21.14	303.85	5,344.39	799.25	-1,191.48	-621.86	0.00	0.00	0.00
5,700.00	21.14	303.85	5,437.66	819.34	-1,221.44	-637.49	0.00	0.00	0.00
5,800.00	21.14	303.85	5,530.93	839.43	-1,251.40	-653.13	0.00	0.00	0.00
5,900.00	21.14	303.85	5,624.19	859.53	-1,281.35	-668.76	0.00	0.00	0.00
6,000.00	21.14	303.85	5,717.46	879.62	-1,311.31	-684.40	0.00	0.00	0.00
6,100.00	21.14	303.85	5,810.73	899.72	-1,341.26	-700.03	0.00	0.00	0.00
6,200.00	21.14	303.85	5,904.00	919.81	-1,371.22	-715.66	0.00	0.00	0.00
6,300.00	21.14	303.85	5,997.26	939.90	-1,401.17	-731.30	0.00	0.00	0.00
6,400.00	21.14	303.85	6,090.53	960.00	-1,431.13	-746.93	0.00	0.00	0.00
6,500.00	21.14	303.85	6,183.80	980.09	-1,461.09	-762.57	0.00	0.00	0.00
6,600.00	21.14	303.85	6,277.07	1,000.19	-1,491.04	-778.20	0.00	0.00	0.00
6,700.00	21.14	303.85	6,370.34	1,020.28	-1,521.00	-793.84	0.00	0.00	0.00
6,798.43	21.14	303.85	6,462.14	1,040.06	-1,550.48	-809.23	0.00	0.00	0.00
<b>Start Drop -2.00</b>									
6,800.00	21.11	303.85	6,463.60	1,040.38	-1,550.95	-809.47	2.00	-2.00	0.00
6,900.00	19.11	303.85	6,557.50	1,059.53	-1,579.51	-824.37	2.00	-2.00	0.00
7,000.00	17.11	303.85	6,652.54	1,076.85	-1,605.32	-837.85	2.00	-2.00	0.00
7,100.00	15.11	303.85	6,748.61	1,092.31	-1,628.37	-849.88	2.00	-2.00	0.00
7,200.00	13.11	303.85	6,845.58	1,105.89	-1,648.62	-860.44	2.00	-2.00	0.00
7,300.00	11.11	303.85	6,943.35	1,117.58	-1,666.04	-869.54	2.00	-2.00	0.00
7,400.00	9.11	303.85	7,041.79	1,127.36	-1,680.62	-877.15	2.00	-2.00	0.00
7,500.00	7.11	303.85	7,140.79	1,135.22	-1,692.34	-883.27	2.00	-2.00	0.00
7,600.00	5.11	303.85	7,240.22	1,141.15	-1,701.19	-887.88	2.00	-2.00	0.00
7,700.00	3.11	303.85	7,339.95	1,145.15	-1,707.14	-890.99	2.00	-2.00	0.00
7,800.00	1.11	303.85	7,439.88	1,147.20	-1,710.20	-892.59	2.00	-2.00	0.00
7,855.62	0.00	0.00	7,495.50	1,147.50	-1,710.65	-892.82	2.00	-2.00	0.00
<b>Start 30.00 hold at 7855.62 MD</b>									
7,885.62	0.00	0.00	7,525.50	1,147.50	-1,710.65	-892.82	0.00	0.00	0.00
<b>Start DLS 12.00 TFO 179.80</b>									
7,900.00	1.73	179.80	7,539.87	1,147.28	-1,710.65	-892.61	12.00	12.00	0.00
7,925.00	4.72	179.80	7,564.83	1,145.88	-1,710.64	-891.21	12.00	12.00	0.00
7,950.00	7.72	179.80	7,589.68	1,143.17	-1,710.64	-888.53	12.00	12.00	0.00
7,975.00	10.72	179.80	7,614.36	1,139.16	-1,710.62	-884.57	12.00	12.00	0.00
8,000.00	13.72	179.80	7,638.79	1,133.87	-1,710.60	-879.33	12.00	12.00	0.00
8,025.00	16.72	179.80	7,662.91	1,127.30	-1,710.58	-872.84	12.00	12.00	0.00
8,050.00	19.72	179.80	7,686.65	1,119.49	-1,710.55	-865.10	12.00	12.00	0.00
8,075.00	22.72	179.80	7,709.95	1,110.44	-1,710.52	-856.15	12.00	12.00	0.00
8,100.00	25.72	179.80	7,732.75	1,100.18	-1,710.49	-846.00	12.00	12.00	0.00
8,125.00	28.72	179.80	7,754.98	1,088.75	-1,710.45	-834.69	12.00	12.00	0.00
8,150.00	31.72	179.80	7,776.57	1,076.16	-1,710.41	-822.24	12.00	12.00	0.00
8,175.00	34.72	179.80	7,797.49	1,062.47	-1,710.36	-808.69	12.00	12.00	0.00
8,200.00	37.72	179.80	7,817.65	1,047.70	-1,710.31	-794.08	12.00	12.00	0.00
8,209.36	38.85	179.80	7,825.00	1,041.90	-1,710.29	-788.34	12.00	12.00	0.00
<b>NIORARA</b>									
8,225.00	40.72	179.80	7,837.02	1,031.89	-1,710.26	-778.44	12.00	12.00	0.00
8,250.00	43.72	179.80	7,855.53	1,015.09	-1,710.20	-761.82	12.00	12.00	0.00

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well NORTHWEST B S20-25-19N
<b>Company:</b>	EXTRACTION OIL & GAS	<b>TVD Reference:</b>	KB 25' @ 5318.00usft
<b>Project:</b>	Broomfield County	<b>MD Reference:</b>	KB 25' @ 5318.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>North Reference:</b>	True
<b>Well:</b>	NORTHWEST B S20-25-19N	<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)
8,275.00	46.72	179.80	7,873.14	997.35	-1,710.14	-744.26	12.00	12.00	0.00
8,300.00	49.72	179.80	7,889.79	978.71	-1,710.07	-725.82	12.00	12.00	0.00
8,325.00	52.72	179.80	7,905.45	959.22	-1,710.01	-706.54	12.00	12.00	0.00
8,350.00	55.72	179.80	7,920.06	938.94	-1,709.94	-686.48	12.00	12.00	0.00
8,375.00	58.72	179.80	7,933.59	917.92	-1,709.87	-665.68	12.00	12.00	0.00
8,400.00	61.72	179.80	7,946.01	896.23	-1,709.79	-644.22	12.00	12.00	0.00
8,425.00	64.72	179.80	7,957.27	873.91	-1,709.72	-622.14	12.00	12.00	0.00
8,450.00	67.72	179.80	7,967.35	851.04	-1,709.64	-599.51	12.00	12.00	0.00
8,475.00	70.72	179.80	7,976.22	827.67	-1,709.56	-576.39	12.00	12.00	0.00
8,500.00	73.72	179.80	7,983.85	803.86	-1,709.48	-552.84	12.00	12.00	0.00
8,525.00	76.72	179.80	7,990.23	779.69	-1,709.40	-528.92	12.00	12.00	0.00
8,537.78	78.25	179.80	7,993.00	767.21	-1,709.35	-516.58	12.00	12.00	0.00
NIO B TARGET									
8,550.00	79.72	179.80	7,995.33	755.22	-1,709.31	-504.71	12.00	12.00	0.00
8,575.00	82.72	179.80	7,999.15	730.52	-1,709.23	-480.27	12.00	12.00	0.00
8,600.00	85.72	179.80	8,001.67	705.65	-1,709.14	-455.66	12.00	12.00	0.00
8,625.00	88.72	179.80	8,002.88	680.68	-1,709.06	-430.96	12.00	12.00	0.00
8,635.68	90.00	179.80	8,003.00	670.00	-1,709.02	-420.40	12.00	12.00	0.00
Start DLS 0.00 TFO -94.01									
8,700.00	90.00	179.80	8,003.00	605.68	-1,708.80	-356.76	0.00	0.00	0.00
8,800.00	90.00	179.80	8,003.00	505.68	-1,708.46	-257.82	0.00	0.00	0.00
8,900.00	90.00	179.80	8,003.00	405.68	-1,708.12	-158.89	0.00	0.00	0.00
9,000.00	90.00	179.80	8,003.00	305.68	-1,707.78	-59.95	0.00	0.00	0.00
9,100.00	90.00	179.80	8,003.00	205.68	-1,707.44	38.99	0.00	0.00	0.00
9,200.00	90.00	179.80	8,003.00	105.69	-1,707.10	137.92	0.00	0.00	0.00
9,300.00	90.00	179.80	8,003.00	5.69	-1,706.75	236.86	0.00	0.00	0.00
9,400.00	90.00	179.80	8,003.00	-94.31	-1,706.41	335.79	0.00	0.00	0.00
9,500.00	90.00	179.80	8,003.00	-194.31	-1,706.07	434.73	0.00	0.00	0.00
9,600.00	90.00	179.80	8,003.00	-294.31	-1,705.73	533.67	0.00	0.00	0.00
9,700.00	90.00	179.80	8,002.99	-394.31	-1,705.38	632.60	0.00	0.00	0.00
9,800.00	90.00	179.80	8,002.99	-494.31	-1,705.04	731.54	0.00	0.00	0.00
9,900.00	90.00	179.80	8,002.99	-594.31	-1,704.70	830.48	0.00	0.00	0.00
10,000.00	90.00	179.80	8,002.99	-694.31	-1,704.36	929.41	0.00	0.00	0.00
10,100.00	90.00	179.80	8,002.99	-794.31	-1,704.01	1,028.35	0.00	0.00	0.00
10,200.00	90.00	179.80	8,002.99	-894.31	-1,703.67	1,127.29	0.00	0.00	0.00
10,300.00	90.00	179.80	8,002.99	-994.31	-1,703.33	1,226.22	0.00	0.00	0.00
10,400.00	90.00	179.80	8,002.99	-1,094.31	-1,702.98	1,325.16	0.00	0.00	0.00
10,500.00	90.00	179.80	8,002.99	-1,194.31	-1,702.64	1,424.09	0.00	0.00	0.00
10,600.00	90.00	179.80	8,002.99	-1,294.31	-1,702.30	1,523.03	0.00	0.00	0.00
10,700.00	90.00	179.80	8,002.99	-1,394.31	-1,701.95	1,621.97	0.00	0.00	0.00
10,800.00	90.00	179.80	8,002.99	-1,494.31	-1,701.61	1,720.90	0.00	0.00	0.00
10,900.00	90.00	179.80	8,002.99	-1,594.30	-1,701.27	1,819.84	0.00	0.00	0.00
11,000.00	90.00	179.80	8,002.99	-1,694.30	-1,700.92	1,918.77	0.00	0.00	0.00
11,100.00	90.00	179.80	8,002.99	-1,794.30	-1,700.58	2,017.71	0.00	0.00	0.00
11,200.00	90.00	179.80	8,002.99	-1,894.30	-1,700.23	2,116.65	0.00	0.00	0.00
11,300.00	90.00	179.80	8,002.99	-1,994.30	-1,699.89	2,215.58	0.00	0.00	0.00
11,400.00	90.00	179.80	8,002.99	-2,094.30	-1,699.54	2,314.52	0.00	0.00	0.00
11,500.00	90.00	179.80	8,002.99	-2,194.30	-1,699.20	2,413.46	0.00	0.00	0.00
11,600.00	90.00	179.80	8,002.99	-2,294.30	-1,698.85	2,512.39	0.00	0.00	0.00
11,700.00	90.00	179.80	8,002.99	-2,394.30	-1,698.51	2,611.33	0.00	0.00	0.00
11,800.00	90.00	179.80	8,002.99	-2,494.30	-1,698.16	2,710.26	0.00	0.00	0.00
11,900.00	90.00	179.80	8,002.99	-2,594.30	-1,697.82	2,809.20	0.00	0.00	0.00
12,000.00	90.00	179.80	8,002.99	-2,694.30	-1,697.47	2,908.13	0.00	0.00	0.00

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well NORTHWEST B S20-25-19N
<b>Company:</b>	EXTRACTION OIL & GAS	<b>TVD Reference:</b>	KB 25' @ 5318.00usft
<b>Project:</b>	Broomfield County	<b>MD Reference:</b>	KB 25' @ 5318.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>North Reference:</b>	True
<b>Well:</b>	NORTHWEST B S20-25-19N	<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)	
12,100.00	90.00	179.80	8,002.99	-2,794.30	-1,697.13	3,007.07	0.00	0.00	0.00	
12,200.00	90.00	179.80	8,002.99	-2,894.30	-1,696.78	3,106.01	0.00	0.00	0.00	
12,300.00	90.00	179.80	8,002.99	-2,994.30	-1,696.43	3,204.94	0.00	0.00	0.00	
12,400.00	90.00	179.80	8,002.99	-3,094.30	-1,696.09	3,303.88	0.00	0.00	0.00	
12,500.00	90.00	179.80	8,002.98	-3,194.30	-1,695.74	3,402.81	0.00	0.00	0.00	
12,600.00	90.00	179.80	8,002.98	-3,294.29	-1,695.40	3,501.75	0.00	0.00	0.00	
12,700.00	90.00	179.80	8,002.98	-3,394.29	-1,695.05	3,600.69	0.00	0.00	0.00	
12,800.00	90.00	179.80	8,002.98	-3,494.29	-1,694.70	3,699.62	0.00	0.00	0.00	
12,900.00	90.00	179.80	8,002.98	-3,594.29	-1,694.36	3,798.56	0.00	0.00	0.00	
13,000.00	90.00	179.80	8,002.98	-3,694.29	-1,694.01	3,897.49	0.00	0.00	0.00	
13,100.00	90.00	179.80	8,002.98	-3,794.29	-1,693.66	3,996.43	0.00	0.00	0.00	
13,200.00	90.00	179.80	8,002.98	-3,894.29	-1,693.32	4,095.36	0.00	0.00	0.00	
13,300.00	90.00	179.80	8,002.98	-3,994.29	-1,692.97	4,194.30	0.00	0.00	0.00	
13,400.00	90.00	179.80	8,002.98	-4,094.29	-1,692.62	4,293.24	0.00	0.00	0.00	
13,500.00	90.00	179.80	8,002.98	-4,194.29	-1,692.27	4,392.17	0.00	0.00	0.00	
13,600.00	90.00	179.80	8,002.98	-4,294.29	-1,691.93	4,491.11	0.00	0.00	0.00	
13,700.00	90.00	179.80	8,002.98	-4,394.29	-1,691.58	4,590.04	0.00	0.00	0.00	
13,800.00	90.00	179.80	8,002.98	-4,494.29	-1,691.23	4,688.98	0.00	0.00	0.00	
13,900.00	90.00	179.80	8,002.98	-4,594.29	-1,690.88	4,787.91	0.00	0.00	0.00	
14,000.00	90.00	179.80	8,002.98	-4,694.29	-1,690.53	4,886.85	0.00	0.00	0.00	
14,100.00	90.00	179.80	8,002.98	-4,794.29	-1,690.19	4,985.78	0.00	0.00	0.00	
14,200.00	90.00	179.80	8,002.98	-4,894.29	-1,689.84	5,084.72	0.00	0.00	0.00	
14,300.00	90.00	179.80	8,002.98	-4,994.28	-1,689.49	5,183.66	0.00	0.00	0.00	
14,400.00	90.00	179.80	8,002.98	-5,094.28	-1,689.14	5,282.59	0.00	0.00	0.00	
14,500.00	90.00	179.80	8,002.98	-5,194.28	-1,688.79	5,381.53	0.00	0.00	0.00	
14,600.00	90.00	179.80	8,002.98	-5,294.28	-1,688.44	5,480.46	0.00	0.00	0.00	
14,700.00	90.00	179.80	8,002.98	-5,394.28	-1,688.09	5,579.40	0.00	0.00	0.00	
14,800.00	90.00	179.80	8,002.98	-5,494.28	-1,687.74	5,678.33	0.00	0.00	0.00	
14,900.00	90.00	179.80	8,002.98	-5,594.28	-1,687.39	5,777.27	0.00	0.00	0.00	
15,000.00	90.00	179.80	8,002.98	-5,694.28	-1,687.04	5,876.20	0.00	0.00	0.00	
15,100.00	90.00	179.80	8,002.98	-5,794.28	-1,686.69	5,975.14	0.00	0.00	0.00	
15,200.00	90.00	179.80	8,002.98	-5,894.28	-1,686.35	6,074.07	0.00	0.00	0.00	
15,300.00	90.00	179.80	8,002.98	-5,994.28	-1,686.00	6,173.01	0.00	0.00	0.00	
15,400.00	90.00	179.80	8,002.98	-6,094.28	-1,685.65	6,271.94	0.00	0.00	0.00	
15,500.00	90.00	179.80	8,002.98	-6,194.28	-1,685.29	6,370.88	0.00	0.00	0.00	
15,600.00	90.00	179.80	8,002.98	-6,294.28	-1,684.94	6,469.81	0.00	0.00	0.00	
15,700.00	90.00	179.80	8,002.98	-6,394.28	-1,684.59	6,568.75	0.00	0.00	0.00	
15,800.00	90.00	179.80	8,002.98	-6,494.28	-1,684.24	6,667.69	0.00	0.00	0.00	
15,900.00	90.00	179.80	8,002.98	-6,594.27	-1,683.89	6,766.62	0.00	0.00	0.00	
16,000.00	90.00	179.80	8,002.98	-6,694.27	-1,683.54	6,865.56	0.00	0.00	0.00	
16,100.00	90.00	179.80	8,002.98	-6,794.27	-1,683.19	6,964.49	0.00	0.00	0.00	
16,200.00	90.00	179.80	8,002.98	-6,894.27	-1,682.84	7,063.43	0.00	0.00	0.00	
16,300.00	90.00	179.80	8,002.98	-6,994.27	-1,682.49	7,162.36	0.00	0.00	0.00	
16,400.00	90.00	179.80	8,002.98	-7,094.27	-1,682.14	7,261.30	0.00	0.00	0.00	
16,500.00	90.00	179.80	8,002.98	-7,194.27	-1,681.79	7,360.23	0.00	0.00	0.00	
16,600.00	90.00	179.80	8,002.98	-7,294.27	-1,681.43	7,459.17	0.00	0.00	0.00	
16,700.00	90.00	179.80	8,002.98	-7,394.27	-1,681.08	7,558.10	0.00	0.00	0.00	
16,800.00	90.00	179.80	8,002.98	-7,494.27	-1,680.73	7,657.04	0.00	0.00	0.00	
16,900.00	90.00	179.80	8,002.98	-7,594.27	-1,680.38	7,755.97	0.00	0.00	0.00	
17,000.00	90.00	179.80	8,002.98	-7,694.27	-1,680.03	7,854.91	0.00	0.00	0.00	
17,100.00	90.00	179.80	8,002.98	-7,794.27	-1,679.67	7,953.84	0.00	0.00	0.00	
17,200.00	90.00	179.80	8,002.99	-7,894.27	-1,679.32	8,052.78	0.00	0.00	0.00	
17,300.00	90.00	179.80	8,002.99	-7,994.27	-1,678.97	8,151.71	0.00	0.00	0.00	
17,400.00	90.00	179.80	8,002.99	-8,094.27	-1,678.62	8,250.65	0.00	0.00	0.00	

## Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well NORTHWEST B S20-25-19N
<b>Company:</b>	EXTRACTION OIL & GAS	<b>TVD Reference:</b>	KB 25' @ 5318.00usft
<b>Project:</b>	Broomfield County	<b>MD Reference:</b>	KB 25' @ 5318.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>North Reference:</b>	True
<b>Well:</b>	NORTHWEST B S20-25-19N	<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)
17,500.00	90.00	179.80	8,002.99	-8,194.27	-1,678.26	8,349.58	0.00	0.00	0.00
17,600.00	90.00	179.80	8,002.99	-8,294.26	-1,677.91	8,448.52	0.00	0.00	0.00
17,700.00	90.00	179.80	8,002.99	-8,394.26	-1,677.56	8,547.45	0.00	0.00	0.00
17,800.00	90.00	179.80	8,002.99	-8,494.26	-1,677.20	8,646.38	0.00	0.00	0.00
17,900.00	90.00	179.80	8,002.99	-8,594.26	-1,676.85	8,745.32	0.00	0.00	0.00
18,000.00	90.00	179.80	8,002.99	-8,694.26	-1,676.50	8,844.25	0.00	0.00	0.00
18,100.00	90.00	179.80	8,002.99	-8,794.26	-1,676.14	8,943.19	0.00	0.00	0.00
18,200.00	90.00	179.80	8,002.99	-8,894.26	-1,675.79	9,042.12	0.00	0.00	0.00
18,300.00	90.00	179.80	8,002.99	-8,994.26	-1,675.43	9,141.06	0.00	0.00	0.00
18,400.00	90.00	179.80	8,002.99	-9,094.26	-1,675.08	9,239.99	0.00	0.00	0.00
18,500.00	90.00	179.80	8,002.99	-9,194.26	-1,674.73	9,338.93	0.00	0.00	0.00
18,600.00	90.00	179.80	8,002.99	-9,294.26	-1,674.37	9,437.86	0.00	0.00	0.00
18,700.00	90.00	179.80	8,002.99	-9,394.26	-1,674.02	9,536.80	0.00	0.00	0.00
18,800.00	90.00	179.80	8,002.99	-9,494.26	-1,673.66	9,635.73	0.00	0.00	0.00
18,900.00	90.00	179.80	8,002.99	-9,594.26	-1,673.31	9,734.67	0.00	0.00	0.00
19,000.00	90.00	179.80	8,002.99	-9,694.26	-1,672.95	9,833.60	0.00	0.00	0.00
19,100.00	90.00	179.80	8,002.99	-9,794.26	-1,672.60	9,932.54	0.00	0.00	0.00
19,200.00	90.00	179.80	8,002.99	-9,894.25	-1,672.24	10,031.47	0.00	0.00	0.00
19,300.00	90.00	179.80	8,002.99	-9,994.25	-1,671.89	10,130.40	0.00	0.00	0.00
19,400.00	90.00	179.80	8,002.99	-10,094.25	-1,671.53	10,229.34	0.00	0.00	0.00
19,500.00	90.00	179.80	8,002.99	-10,194.25	-1,671.18	10,328.27	0.00	0.00	0.00
19,600.00	90.00	179.80	8,002.99	-10,294.25	-1,670.82	10,427.21	0.00	0.00	0.00
19,700.00	90.00	179.80	8,002.99	-10,394.25	-1,670.46	10,526.14	0.00	0.00	0.00
19,800.00	90.00	179.80	8,002.99	-10,494.25	-1,670.11	10,625.08	0.00	0.00	0.00
19,900.00	90.00	179.80	8,002.99	-10,594.25	-1,669.75	10,724.01	0.00	0.00	0.00
20,000.00	90.00	179.80	8,003.00	-10,694.25	-1,669.40	10,822.95	0.00	0.00	0.00
20,100.00	90.00	179.80	8,003.00	-10,794.25	-1,669.04	10,921.88	0.00	0.00	0.00
20,200.00	90.00	179.80	8,003.00	-10,894.25	-1,668.68	11,020.81	0.00	0.00	0.00
20,300.00	90.00	179.80	8,003.00	-10,994.25	-1,668.33	11,119.75	0.00	0.00	0.00
20,400.00	90.00	179.80	8,003.00	-11,094.25	-1,667.97	11,218.68	0.00	0.00	0.00
20,500.00	90.00	179.80	8,003.00	-11,194.25	-1,667.61	11,317.62	0.00	0.00	0.00
20,600.00	90.00	179.80	8,003.00	-11,294.25	-1,667.25	11,416.55	0.00	0.00	0.00
20,700.00	90.00	179.80	8,003.00	-11,394.24	-1,666.90	11,515.48	0.00	0.00	0.00
20,800.00	90.00	179.80	8,003.00	-11,494.24	-1,666.54	11,614.42	0.00	0.00	0.00
20,900.00	90.00	179.80	8,003.00	-11,594.24	-1,666.18	11,713.35	0.00	0.00	0.00
20,913.97	90.00	179.80	8,003.00	-11,608.22	-1,666.13	11,727.18	0.00	0.00	0.00
TD at 20913.97									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
NORTHWEST B S20-19 - plan hits target center - Point	0.00	0.00	8,003.00	670.00	-1,709.02	1,237,891.96	3,135,609.56	39° 59' 7.375 N	105° 0' 57.769 W
NORTHWEST B S20-19 - plan hits target center - Point	0.00	0.00	8,003.00	-11,608.22	-1,666.13	1,225,614.17	3,135,720.30	39° 57' 6.034 N	105° 0' 57.208 W

## Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well NORTHWEST B S20-25-19N
<b>Company:</b>	EXTRACTION OIL & GAS	<b>TVD Reference:</b>	KB 25' @ 5318.00usft
<b>Project:</b>	Broomfield County	<b>MD Reference:</b>	KB 25' @ 5318.00usft
<b>Site:</b>	Sec 9-T1S-R68W	<b>North Reference:</b>	True
<b>Well:</b>	NORTHWEST B S20-25-19N	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIGINAL WELLBORE		
<b>Design:</b>	PROPOSAL 1		

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,361.56	5,122.00	SUSSEX			
8,209.36	7,825.00	NIOBRARA			
8,537.78	7,993.00	NIO B TARGET			

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,100.00	1,100.00	0.00	0.00	Start Build 2.00	
2,157.19	2,133.36	107.44	-160.17	Start 4641.24 hold at 2157.19 MD	
6,798.43	6,462.14	1,040.06	-1,550.48	Start Drop -2.00	
7,855.62	7,495.50	1,147.50	-1,710.65	Start 30.00 hold at 7855.62 MD	
7,885.62	7,525.50	1,147.50	-1,710.65	Start DLS 12.00 TFO 179.80	
8,635.68	8,003.00	670.00	-1,709.02	Start DLS 0.00 TFO -94.01	
20,913.97	8,003.00	-11,608.22	-1,666.13	TD at 20913.97	