

# **BISON EXPLORATION**

**Arapahoe County  
Sec 4-T4S-R65W  
JAMASO 4-65 5-6-1**

**Original Wellbore**

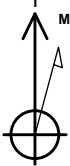
**Plan: Proposal 1**

## **Standard Planning Report**

**20 January, 2017**



Project: Arapahoe County  
Site: Sec 4-T4S-R65W  
Well: JAMASO 4-65 5-6-1  
Wellbore: Original Wellbore  
Design: Proposal 1



Azimuths to True North  
Magnetic North: 8.15°  
Magnetic Field  
Strength: 52093.1nT  
Dip Angle: 66.34°  
Date: 1/18/2017  
Model: IGRF2015

WELL DETAILS: JAMASO 4-65 5-6-1

5585.0										
		+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot		
		0.0	0.0	1146787.62	3231398.96	39° 44' 0.060 N	104° 40' 38.040 W			
SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1550.0	0.00	0.00	1550.0	0.0	0.0	0.00	0.00	0.0	
3	2746.5	23.93	350.67	2712.0	243.0	-39.9	2.00	350.67	84.8	
4	6449.3	23.93	350.67	6096.5	1725.0	-283.6	0.00	0.00	602.2	
5	7645.7	0.00	0.00	7258.5	1968.0	-323.5	2.00	180.00	687.0	
6	7845.7	0.00	0.00	7458.5	1968.0	-323.5	0.00	0.00	687.0	
7	8595.8	90.00	270.25	7936.0	1970.1	-801.0	12.00	270.25	1156.4	
8	18332.3	90.00	270.25	7936.0	2012.8	-10537.4	0.00	0.00	10727.9	JAMASO 4-65 5-6-1

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation
1550.0	0.00	0.00	1550.0	0.0	0.0	0.0	0.0	Start Build 2.00
2746.5	23.93	350.67	2712.0	243.0	-39.9	84.8	246.3	Start 3702.8 hold at 2746.5 MD
6449.3	23.93	350.67	6096.5	1725.0	-283.6	602.2	1748.2	Start Drop -2.00
7645.7	0.00	0.00	7258.5	1968.0	-323.5	687.0	1994.4	Start 200.0 hold at 7645.7 MD
7845.7	0.00	0.00	7458.5	1968.0	-323.5	687.0	1994.4	Start Build 12.00
8595.8	90.00	270.25	7936.0	1970.1	-801.0	1156.4	2471.9	Start 9736.5 hold at 8595.8 MD
18332.3	90.00	270.25	7936.0	2012.8	-10537.4	10727.9	12208.4	TD at 18332.3

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
JAMASO 4-65 5-6-1 PBHL	7936.0	2012.8	-10537.4	1148702.56	3220843.34	39° 44' 19.930 N	104° 42' 52.930 W	Point
- plan hits target center								

FORMATION TOP DETAILS

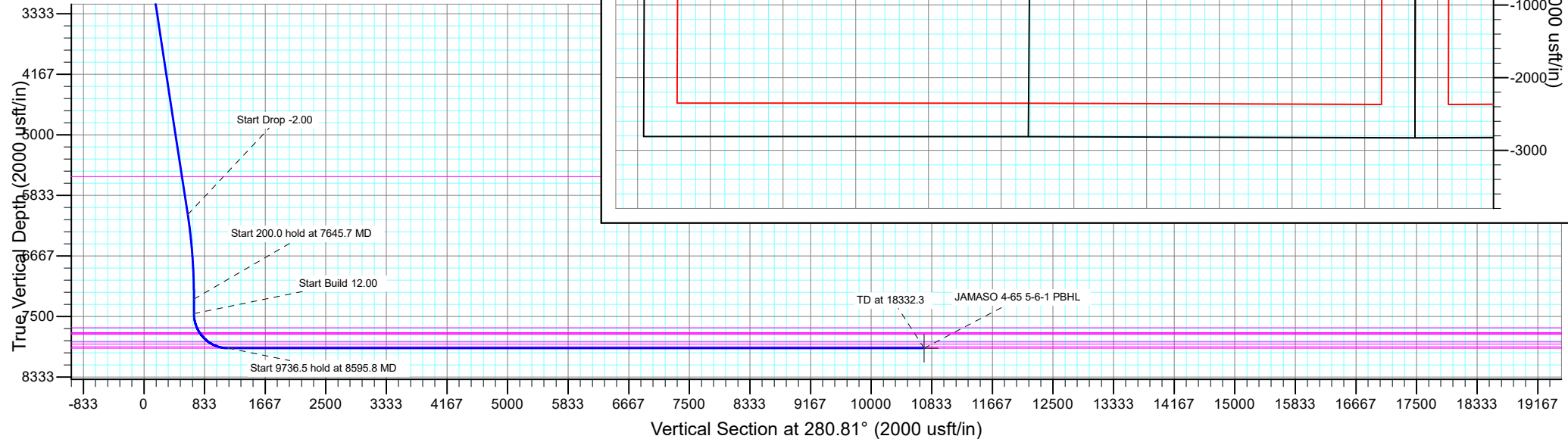
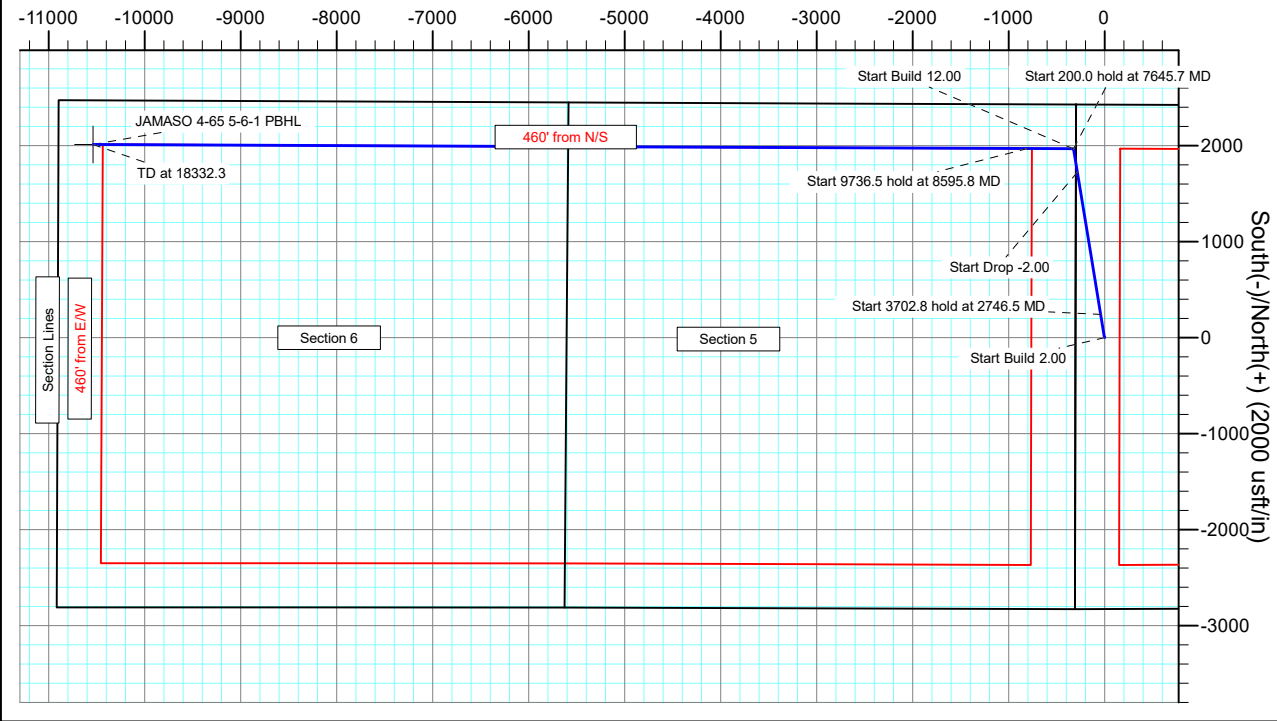
TVDPath	MDPath	Formation
293.0	293.0	Denver
877.0	877.0	Upper Arapahoe
1165.0	1165.0	Lower Arapahoe
1718.0	1718.1	Laramie - Fox Hills
1970.0	1970.0	Pierre Shale (Base of Fox Hills)
5575.0	5878.5	Shannon Sandstone Member
7655.0	8048.3	Sharon Springs Shale
7720.0	8122.5	Niobrara Formation
7735.0	8140.6	Niobrara A Chalk
7745.0	8153.0	Niobrara A Landing Point
7849.0	8303.0	Niobrara B Chalk
7879.0	8360.1	Niobrara B Landing Point
7916.0	8457.1	Niobrara C Chalk
7936.0	8595.8	Niobrara C Landing Point

PROJECT DETAILS: Arapahoe County

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

SHL:  
2428' FNL, 301' FWL  
Sec 4-T4S-R65W  
BHL:  
460' FNL, 360' FWL  
Sec 6-T4S-R65W  
LP:  
460' FNL, 500' FEL  
Sec 5-T4S-R65W

West(-)/East(+) (2000 usft/in)



## Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well JAMASO 4-65 5-6-1
<b>Company:</b>	BISON EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 5610.0usft
<b>Project:</b>	Arapahoe County	<b>MD Reference:</b>	KB 25' @ 5610.0usft
<b>Site:</b>	Sec 4-T4S-R65W	<b>North Reference:</b>	True
<b>Well:</b>	JAMASO 4-65 5-6-1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Wellbore		
<b>Design:</b>	Proposal 1		

<b>Project</b>	Arapahoe 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 4-T4S-R65W			
Site Position:		Northing:	1,149,213.35 usft	Latitude:	39° 44' 24.061 N
From:	Lat/Long	Easting:	3,231,079.56 usft	Longitude:	104° 40' 41.840 W
Position Uncertainty:	0.0 usft	Slot Radius:	13.200 in	Grid Convergence:	0.53 °

Well	JAMASO 4-65 5-6-1					
Well Position	+N/-S	-2,428.6 usft	Northing:	1,146,787.62 usft	Latitude:	39° 44' 0.060 N
	+E/-W	296.9 usft	Easting:	3,231,398.96 usft	Longitude:	104° 40' 38.040 W
Position Uncertainty	0.0 usft		Wellhead Elevation:		Ground Level:	5,585.0 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	1/18/2017	8.15	66.34	52,093.10903074

<b>Design</b>	Proposal 1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	280.81

<b>Plan Survey Tool Program</b>	<b>Date</b>	1/20/2017		
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.0	18,332.3	Proposal 1 (Original Wellbore)	MWD
				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>
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,550.0	0.00	0.00	1,550.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,746.5	23.93	350.67	2,712.0	243.0	-39.9	2.00	2.00	0.00	350.67	
6,449.3	23.93	350.67	6,096.5	1,725.0	-283.6	0.00	0.00	0.00	0.00	
7,645.7	0.00	0.00	7,258.5	1,968.0	-323.5	2.00	-2.00	0.00	180.00	
7,845.7	0.00	0.00	7,458.5	1,968.0	-323.5	0.00	0.00	0.00	0.00	
8,595.8	90.00	270.25	7,936.0	1,970.1	-801.0	12.00	12.00	0.00	270.25	
18,332.3	90.00	270.25	7,936.0	2,012.8	-10,537.4	0.00	0.00	0.00	0.00	JAMASO 4-65 5-6-1 F

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well JAMASO 4-65 5-6-1
<b>Company:</b>	BISON EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 5610.0usft
<b>Project:</b>	Arapahoe County	<b>MD Reference:</b>	KB 25' @ 5610.0usft
<b>Site:</b>	Sec 4-T4S-R65W	<b>North Reference:</b>	True
<b>Well:</b>	JAMASO 4-65 5-6-1	<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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
293.0	0.00	0.00	293.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Denver</b>									
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
877.0	0.00	0.00	877.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Upper Arapahoe</b>									
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,165.0	0.00	0.00	1,165.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Lower Arapahoe</b>									
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,550.0	0.00	0.00	1,550.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Start Build 2.00</b>									
1,600.0	1.00	350.67	1,600.0	0.4	-0.1	0.2	2.00	2.00	0.00
1,700.0	3.00	350.67	1,699.9	3.9	-0.6	1.4	2.00	2.00	0.00
1,718.1	3.36	350.67	1,718.0	4.9	-0.8	1.7	2.00	2.00	0.00
<b>Laramie - Fox Hills</b>									
1,800.0	5.00	350.67	1,799.7	10.8	-1.8	3.8	2.00	2.00	0.00
1,900.0	7.00	350.67	1,899.1	21.1	-3.5	7.4	2.00	2.00	0.00
1,971.5	8.43	350.67	1,970.0	30.5	-5.0	10.7	2.00	2.00	0.00
<b>Pierre Shale (Base of Fox Hills)</b>									
2,000.0	9.00	350.67	1,998.2	34.8	-5.7	12.1	2.00	2.00	0.00
2,100.0	11.00	350.67	2,096.6	51.9	-8.5	18.1	2.00	2.00	0.00
2,200.0	13.00	350.67	2,194.4	72.5	-11.9	25.3	2.00	2.00	0.00
2,300.0	15.00	350.67	2,291.5	96.3	-15.8	33.6	2.00	2.00	0.00
2,400.0	17.00	350.67	2,387.6	123.5	-20.3	43.1	2.00	2.00	0.00
2,500.0	19.00	350.67	2,482.7	154.0	-25.3	53.8	2.00	2.00	0.00
2,600.0	21.00	350.67	2,576.6	187.8	-30.9	65.5	2.00	2.00	0.00
2,700.0	23.00	350.67	2,669.4	224.7	-36.9	78.4	2.00	2.00	0.00
2,746.5	23.93	350.67	2,712.0	243.0	-39.9	84.8	2.00	2.00	0.00
<b>Start 3702.8 hold at 2746.5 MD</b>									
2,800.0	23.93	350.67	2,760.9	264.4	-43.5	92.3	0.00	0.00	0.00
2,900.0	23.93	350.67	2,852.3	304.4	-50.0	106.3	0.00	0.00	0.00
3,000.0	23.93	350.67	2,943.7	344.5	-56.6	120.2	0.00	0.00	0.00
3,100.0	23.93	350.67	3,035.1	384.5	-63.2	134.2	0.00	0.00	0.00
3,200.0	23.93	350.67	3,126.5	424.5	-69.8	148.2	0.00	0.00	0.00
3,300.0	23.93	350.67	3,217.9	464.5	-76.4	162.2	0.00	0.00	0.00
3,400.0	23.93	350.67	3,309.3	504.6	-82.9	176.1	0.00	0.00	0.00
3,500.0	23.93	350.67	3,400.7	544.6	-89.5	190.1	0.00	0.00	0.00
3,600.0	23.93	350.67	3,492.2	584.6	-96.1	204.1	0.00	0.00	0.00
3,700.0	23.93	350.67	3,583.6	624.6	-102.7	218.0	0.00	0.00	0.00
3,800.0	23.93	350.67	3,675.0	664.7	-109.3	232.0	0.00	0.00	0.00

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well JAMASO 4-65 5-6-1
<b>Company:</b>	BISON EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 5610.0usft
<b>Project:</b>	Arapahoe County	<b>MD Reference:</b>	KB 25' @ 5610.0usft
<b>Site:</b>	Sec 4-T4S-R65W	<b>North Reference:</b>	True
<b>Well:</b>	JAMASO 4-65 5-6-1	<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)
3,900.0	23.93	350.67	3,766.4	704.7	-115.8	246.0	0.00	0.00	0.00
4,000.0	23.93	350.67	3,857.8	744.7	-122.4	260.0	0.00	0.00	0.00
4,100.0	23.93	350.67	3,949.2	784.7	-129.0	273.9	0.00	0.00	0.00
4,200.0	23.93	350.67	4,040.6	824.8	-135.6	287.9	0.00	0.00	0.00
4,300.0	23.93	350.67	4,132.0	864.8	-142.2	301.9	0.00	0.00	0.00
4,400.0	23.93	350.67	4,223.4	904.8	-148.7	315.9	0.00	0.00	0.00
4,500.0	23.93	350.67	4,314.8	944.8	-155.3	329.8	0.00	0.00	0.00
4,600.0	23.93	350.67	4,406.2	984.9	-161.9	343.8	0.00	0.00	0.00
4,700.0	23.93	350.67	4,497.6	1,024.9	-168.5	357.8	0.00	0.00	0.00
4,800.0	23.93	350.67	4,589.0	1,064.9	-175.0	371.7	0.00	0.00	0.00
4,900.0	23.93	350.67	4,680.4	1,104.9	-181.6	385.7	0.00	0.00	0.00
5,000.0	23.93	350.67	4,771.8	1,145.0	-188.2	399.7	0.00	0.00	0.00
5,100.0	23.93	350.67	4,863.2	1,185.0	-194.8	413.7	0.00	0.00	0.00
5,200.0	23.93	350.67	4,954.6	1,225.0	-201.4	427.6	0.00	0.00	0.00
5,300.0	23.93	350.67	5,046.0	1,265.0	-207.9	441.6	0.00	0.00	0.00
5,400.0	23.93	350.67	5,137.4	1,305.0	-214.5	455.6	0.00	0.00	0.00
5,500.0	23.93	350.67	5,228.8	1,345.1	-221.1	469.5	0.00	0.00	0.00
5,600.0	23.93	350.67	5,320.2	1,385.1	-227.7	483.5	0.00	0.00	0.00
5,700.0	23.93	350.67	5,411.6	1,425.1	-234.3	497.5	0.00	0.00	0.00
5,800.0	23.93	350.67	5,503.0	1,465.1	-240.8	511.5	0.00	0.00	0.00
5,878.7	23.93	350.67	5,575.0	1,496.7	-246.0	522.5	0.00	0.00	0.00
Shannon Sandstone Member									
5,900.0	23.93	350.67	5,594.4	1,505.2	-247.4	525.4	0.00	0.00	0.00
6,000.0	23.93	350.67	5,685.9	1,545.2	-254.0	539.4	0.00	0.00	0.00
6,100.0	23.93	350.67	5,777.3	1,585.2	-260.6	553.4	0.00	0.00	0.00
6,200.0	23.93	350.67	5,868.7	1,625.2	-267.2	567.3	0.00	0.00	0.00
6,300.0	23.93	350.67	5,960.1	1,665.3	-273.7	581.3	0.00	0.00	0.00
6,400.0	23.93	350.67	6,051.5	1,705.3	-280.3	595.3	0.00	0.00	0.00
6,449.3	23.93	350.67	6,096.5	1,725.0	-283.6	602.2	0.00	0.00	0.00
Start Drop -2.00									
6,500.0	22.92	350.67	6,143.1	1,744.9	-286.8	609.1	2.00	-2.00	0.00
6,600.0	20.91	350.67	6,235.8	1,781.7	-292.9	622.0	2.00	-2.00	0.00
6,700.0	18.91	350.67	6,329.8	1,815.4	-298.4	633.7	2.00	-2.00	0.00
6,800.0	16.91	350.67	6,425.0	1,845.7	-303.4	644.3	2.00	-2.00	0.00
6,900.0	14.91	350.67	6,521.1	1,872.8	-307.8	653.7	2.00	-2.00	0.00
7,000.0	12.91	350.67	6,618.2	1,896.5	-311.7	662.0	2.00	-2.00	0.00
7,100.0	10.91	350.67	6,716.0	1,916.9	-315.1	669.1	2.00	-2.00	0.00
7,200.0	8.91	350.67	6,814.5	1,933.8	-317.9	675.1	2.00	-2.00	0.00
7,300.0	6.91	350.67	6,913.6	1,947.4	-320.1	679.8	2.00	-2.00	0.00
7,400.0	4.91	350.67	7,013.1	1,957.6	-321.8	683.4	2.00	-2.00	0.00
7,500.0	2.91	350.67	7,112.8	1,964.3	-322.9	685.7	2.00	-2.00	0.00
7,600.0	0.91	350.67	7,212.8	1,967.6	-323.4	686.9	2.00	-2.00	0.00
7,645.7	0.00	0.00	7,258.5	1,968.0	-323.5	687.0	2.00	-2.00	20.40
Start 200.0 hold at 7645.7 MD									
7,700.0	0.00	0.00	7,312.8	1,968.0	-323.5	687.0	0.00	0.00	0.00
7,800.0	0.00	0.00	7,412.8	1,968.0	-323.5	687.0	0.00	0.00	0.00
7,845.7	0.00	0.00	7,458.5	1,968.0	-323.5	687.0	0.00	0.00	0.00
Start Build 12.00									
7,850.0	0.51	270.25	7,462.8	1,968.0	-323.5	687.0	12.00	12.00	0.00
7,875.0	3.51	270.25	7,487.7	1,968.0	-324.4	687.9	12.00	12.00	0.00
7,900.0	6.51	270.25	7,512.6	1,968.0	-326.6	690.0	12.00	12.00	0.00
7,925.0	9.51	270.25	7,537.4	1,968.0	-330.1	693.4	12.00	12.00	0.00
7,950.0	12.51	270.25	7,561.9	1,968.0	-334.8	698.1	12.00	12.00	0.00

# Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well JAMASO 4-65 5-6-1
<b>Company:</b>	BISON EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 5610.0usft
<b>Project:</b>	Arapahoe County	<b>MD Reference:</b>	KB 25' @ 5610.0usft
<b>Site:</b>	Sec 4-T4S-R65W	<b>North Reference:</b>	True
<b>Well:</b>	JAMASO 4-65 5-6-1	<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)
7,975.0	15.51	270.25	7,586.2	1,968.1	-340.9	704.1	12.00	12.00	0.00
8,000.0	18.51	270.25	7,610.1	1,968.1	-348.2	711.3	12.00	12.00	0.00
8,025.0	21.51	270.25	7,633.6	1,968.1	-356.8	719.7	12.00	12.00	0.00
8,048.3	24.30	270.25	7,655.0	1,968.2	-365.8	728.6	12.00	12.00	0.00
Sharon Springs Shale									
8,050.0	24.51	270.25	7,656.6	1,968.2	-366.5	729.3	12.00	12.00	0.00
8,075.0	27.51	270.25	7,679.0	1,968.2	-377.5	740.1	12.00	12.00	0.00
8,100.0	30.51	270.25	7,700.9	1,968.3	-389.6	752.0	12.00	12.00	0.00
8,122.5	33.21	270.25	7,720.0	1,968.3	-401.5	763.6	12.00	12.00	0.00
Niobrara Formation									
8,125.0	33.51	270.25	7,722.1	1,968.3	-402.9	765.0	12.00	12.00	0.00
8,140.6	35.38	270.25	7,735.0	1,968.4	-411.7	773.7	12.00	12.00	0.00
Niobrara A Chalk									
8,150.0	36.51	270.25	7,742.6	1,968.4	-417.2	779.1	12.00	12.00	0.00
8,153.0	36.87	270.25	7,745.0	1,968.4	-419.0	780.9	12.00	12.00	0.00
Niobrara A Landing Point									
8,175.0	39.51	270.25	7,762.3	1,968.5	-432.6	794.2	12.00	12.00	0.00
8,200.0	42.51	270.25	7,781.1	1,968.6	-449.0	810.4	12.00	12.00	0.00
8,225.0	45.51	270.25	7,799.1	1,968.6	-466.4	827.4	12.00	12.00	0.00
8,250.0	48.51	270.25	7,816.2	1,968.7	-484.6	845.4	12.00	12.00	0.00
8,275.0	51.51	270.25	7,832.2	1,968.8	-503.8	864.2	12.00	12.00	0.00
8,300.0	54.51	270.25	7,847.3	1,968.9	-523.8	883.9	12.00	12.00	0.00
8,303.0	54.87	270.25	7,849.0	1,968.9	-526.2	886.3	12.00	12.00	0.00
Niobrara B Chalk									
8,325.0	57.51	270.25	7,861.2	1,969.0	-544.5	904.2	12.00	12.00	0.00
8,350.0	60.51	270.25	7,874.1	1,969.1	-565.9	925.3	12.00	12.00	0.00
8,360.1	61.72	270.25	7,879.0	1,969.1	-574.8	934.0	12.00	12.00	0.00
Niobrara B Landing Point									
8,375.0	63.51	270.25	7,885.9	1,969.2	-588.0	947.0	12.00	12.00	0.00
8,400.0	66.51	270.25	7,896.4	1,969.3	-610.6	969.3	12.00	12.00	0.00
8,425.0	69.51	270.25	7,905.8	1,969.4	-633.8	992.1	12.00	12.00	0.00
8,450.0	72.50	270.25	7,913.9	1,969.5	-657.4	1,015.3	12.00	12.00	0.00
8,457.1	73.36	270.25	7,916.0	1,969.5	-664.2	1,022.0	12.00	12.00	0.00
Niobrara C Chalk									
8,475.0	75.50	270.25	7,920.8	1,969.6	-681.5	1,038.9	12.00	12.00	0.00
8,500.0	78.50	270.25	7,926.4	1,969.7	-705.8	1,062.9	12.00	12.00	0.00
8,525.0	81.50	270.25	7,930.8	1,969.8	-730.5	1,087.1	12.00	12.00	0.00
8,550.0	84.50	270.25	7,933.8	1,969.9	-755.3	1,111.4	12.00	12.00	0.00
8,575.0	87.50	270.25	7,935.5	1,970.0	-780.2	1,136.0	12.00	12.00	0.00
8,595.8	90.00	270.25	7,936.0	1,970.1	-801.0	1,156.4	12.00	12.00	0.00
Start 9736.5 hold at 8595.8 MD - Niobrara C Landing Point									
8,600.0	90.00	270.25	7,936.0	1,970.1	-805.2	1,160.5	0.00	0.00	0.00
8,700.0	90.00	270.25	7,936.0	1,970.6	-905.2	1,258.8	0.00	0.00	0.00
8,800.0	90.00	270.25	7,936.0	1,971.0	-1,005.2	1,357.1	0.00	0.00	0.00
8,900.0	90.00	270.25	7,936.0	1,971.4	-1,105.2	1,455.4	0.00	0.00	0.00
9,000.0	90.00	270.25	7,936.0	1,971.9	-1,205.2	1,553.8	0.00	0.00	0.00
9,100.0	90.00	270.25	7,936.0	1,972.3	-1,305.2	1,652.1	0.00	0.00	0.00
9,200.0	90.00	270.25	7,936.0	1,972.7	-1,405.2	1,750.4	0.00	0.00	0.00
9,300.0	90.00	270.25	7,936.0	1,973.2	-1,505.2	1,848.7	0.00	0.00	0.00
9,400.0	90.00	270.25	7,936.0	1,973.6	-1,605.2	1,947.0	0.00	0.00	0.00
9,500.0	90.00	270.25	7,936.0	1,974.1	-1,705.2	2,045.3	0.00	0.00	0.00
9,600.0	90.00	270.25	7,936.0	1,974.5	-1,805.2	2,143.6	0.00	0.00	0.00
9,700.0	90.00	270.25	7,936.0	1,974.9	-1,905.2	2,241.9	0.00	0.00	0.00

## Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well JAMASO 4-65 5-6-1
<b>Company:</b>	BISON EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 5610.0usft
<b>Project:</b>	Arapahoe County	<b>MD Reference:</b>	KB 25' @ 5610.0usft
<b>Site:</b>	Sec 4-T4S-R65W	<b>North Reference:</b>	True
<b>Well:</b>	JAMASO 4-65 5-6-1	<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)	
9,800.0	90.00	270.25	7,936.0	1,975.4	-2,005.2	2,340.2	0.00	0.00	0.00	
9,900.0	90.00	270.25	7,936.0	1,975.8	-2,105.2	2,438.5	0.00	0.00	0.00	
10,000.0	90.00	270.25	7,936.0	1,976.3	-2,205.2	2,536.8	0.00	0.00	0.00	
10,100.0	90.00	270.25	7,936.0	1,976.7	-2,305.2	2,635.1	0.00	0.00	0.00	
10,200.0	90.00	270.25	7,936.0	1,977.1	-2,405.2	2,733.4	0.00	0.00	0.00	
10,300.0	90.00	270.25	7,936.0	1,977.6	-2,505.2	2,831.7	0.00	0.00	0.00	
10,400.0	90.00	270.25	7,936.0	1,978.0	-2,605.2	2,930.0	0.00	0.00	0.00	
10,500.0	90.00	270.25	7,936.0	1,978.4	-2,705.2	3,028.3	0.00	0.00	0.00	
10,600.0	90.00	270.25	7,936.0	1,978.9	-2,805.2	3,126.6	0.00	0.00	0.00	
10,700.0	90.00	270.25	7,936.0	1,979.3	-2,905.2	3,224.9	0.00	0.00	0.00	
10,800.0	90.00	270.25	7,936.0	1,979.8	-3,005.2	3,323.3	0.00	0.00	0.00	
10,900.0	90.00	270.25	7,936.0	1,980.2	-3,105.2	3,421.6	0.00	0.00	0.00	
11,000.0	90.00	270.25	7,936.0	1,980.6	-3,205.2	3,519.9	0.00	0.00	0.00	
11,100.0	90.00	270.25	7,936.0	1,981.1	-3,305.2	3,618.2	0.00	0.00	0.00	
11,200.0	90.00	270.25	7,936.0	1,981.5	-3,405.2	3,716.5	0.00	0.00	0.00	
11,300.0	90.00	270.25	7,936.0	1,982.0	-3,505.2	3,814.8	0.00	0.00	0.00	
11,400.0	90.00	270.25	7,936.0	1,982.4	-3,605.2	3,913.1	0.00	0.00	0.00	
11,500.0	90.00	270.25	7,936.0	1,982.8	-3,705.2	4,011.4	0.00	0.00	0.00	
11,600.0	90.00	270.25	7,936.0	1,983.3	-3,805.2	4,109.7	0.00	0.00	0.00	
11,700.0	90.00	270.25	7,936.0	1,983.7	-3,905.2	4,208.0	0.00	0.00	0.00	
11,800.0	90.00	270.25	7,936.0	1,984.1	-4,005.2	4,306.3	0.00	0.00	0.00	
11,900.0	90.00	270.25	7,936.0	1,984.6	-4,105.2	4,404.6	0.00	0.00	0.00	
12,000.0	90.00	270.25	7,936.0	1,985.0	-4,205.2	4,502.9	0.00	0.00	0.00	
12,100.0	90.00	270.25	7,936.0	1,985.5	-4,305.2	4,601.2	0.00	0.00	0.00	
12,200.0	90.00	270.25	7,936.0	1,985.9	-4,405.2	4,699.5	0.00	0.00	0.00	
12,300.0	90.00	270.25	7,936.0	1,986.3	-4,505.2	4,797.8	0.00	0.00	0.00	
12,400.0	90.00	270.25	7,936.0	1,986.8	-4,605.2	4,896.1	0.00	0.00	0.00	
12,500.0	90.00	270.25	7,936.0	1,987.2	-4,705.2	4,994.4	0.00	0.00	0.00	
12,600.0	90.00	270.25	7,936.0	1,987.7	-4,805.2	5,092.7	0.00	0.00	0.00	
12,700.0	90.00	270.25	7,936.0	1,988.1	-4,905.2	5,191.1	0.00	0.00	0.00	
18,332.3	90.00	270.25	7,936.0	2,012.8	-10,537.4	10,727.9	0.00	0.00	0.00	
TD at 18332.3 - JAMASO 4-65 5-6-1 PBHL										

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	
- hit/miss target									
- Shape								Longitude	
JAMASO 4-65 5-6-1 PBI	0.00	0.00	7,936.0	2,012.8	-10,537.4	1,148,702.56	3,220,843.35	39° 44' 19.930 N	
- plan hits target center									
- Point								104° 42' 52.930 W	

## Planning Report

<b>Database:</b>	EDT_32Bit_ODBC	<b>Local Co-ordinate Reference:</b>	Well JAMASO 4-65 5-6-1
<b>Company:</b>	BISON EXPLORATION	<b>TVD Reference:</b>	KB 25' @ 5610.0usft
<b>Project:</b>	Arapahoe County	<b>MD Reference:</b>	KB 25' @ 5610.0usft
<b>Site:</b>	Sec 4-T4S-R65W	<b>North Reference:</b>	True
<b>Well:</b>	JAMASO 4-65 5-6-1	<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 (°)	
293.0	293.0	Denver				
877.0	877.0	Upper Arapahoe				
1,165.0	1,165.0	Lower Arapahoe				
1,718.1	1,718.0	Laramie - Fox Hills				
1,971.5	1,970.0	Pierre Shale (Base of Fox Hills)				
5,878.7	5,575.0	Shannon Sandstone Member				
8,048.3	7,655.0	Sharon Springs Shale				
8,122.5	7,720.0	Niobrara Formation				
8,140.6	7,735.0	Niobrara A Chalk				
8,153.0	7,745.0	Niobrara A Landing Point				
8,303.0	7,849.0	Niobrara B Chalk				
8,360.1	7,879.0	Niobrara B Landing Point				
8,457.1	7,916.0	Niobrara C Chalk				
8,595.8	7,936.0	Niobrara C Landing Point				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,550.0	1,550.0	0.0	0.0	Start Build 2.00	
2,746.5	2,712.0	243.0	-39.9	Start 3702.8 hold at 2746.5 MD	
6,449.3	6,096.5	1,725.0	-283.6	Start Drop -2.00	
7,645.7	7,258.5	1,968.0	-323.5	Start 200.0 hold at 7645.7 MD	
7,845.7	7,458.5	1,968.0	-323.5	Start Build 12.00	
8,595.8	7,936.0	1,970.1	-801.0	Start 9736.5 hold at 8595.8 MD	
18,332.3	7,936.0	2,012.8	-10,537.4	TD at 18332.3	