

AXIS EXPLORATION

ARAPAHOE COUNTY

Sec 4-T4S-R65W

JAMASO 4-65 5-6-9

ORIGINAL WELLBORE

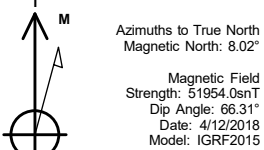
Plan: PROPOSAL 1

Standard Planning Report

18 October, 2018



Project: ARAPAHOE COUNTY
Site: Sec 4-T4S-R65W
Well: JAMASO 4-65 5-6-9
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL 1



WELL DETAILS: JAMASO 4-65 5-6-9						
	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
	0.00	0.00	1146770.73	3232285.75	39.733281°N	104.674081°W

SECTION DETAILS									
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00
3	1478.85	15.58	223.02	1469.29	-76.93	-71.78	2.00	223.02	78.94
4	6579.62	15.58	223.02	6382.71	-1078.42	-1006.23	0.00	0.00	1106.56
5	7358.47	0.00	0.00	7152.00	-1155.35	-1078.01	2.00	180.00	1185.51
6	7388.47	0.00	0.00	7182.00	-1155.35	-1078.01	0.00	0.00	1185.51
7	8288.54	90.00	270.25	7755.00	-1152.85	-1651.01	10.00	270.25	1755.53
8	17972.19	90.00	270.25	7755.00	-1110.26	-11334.57	0.00	11388.82	1755.53

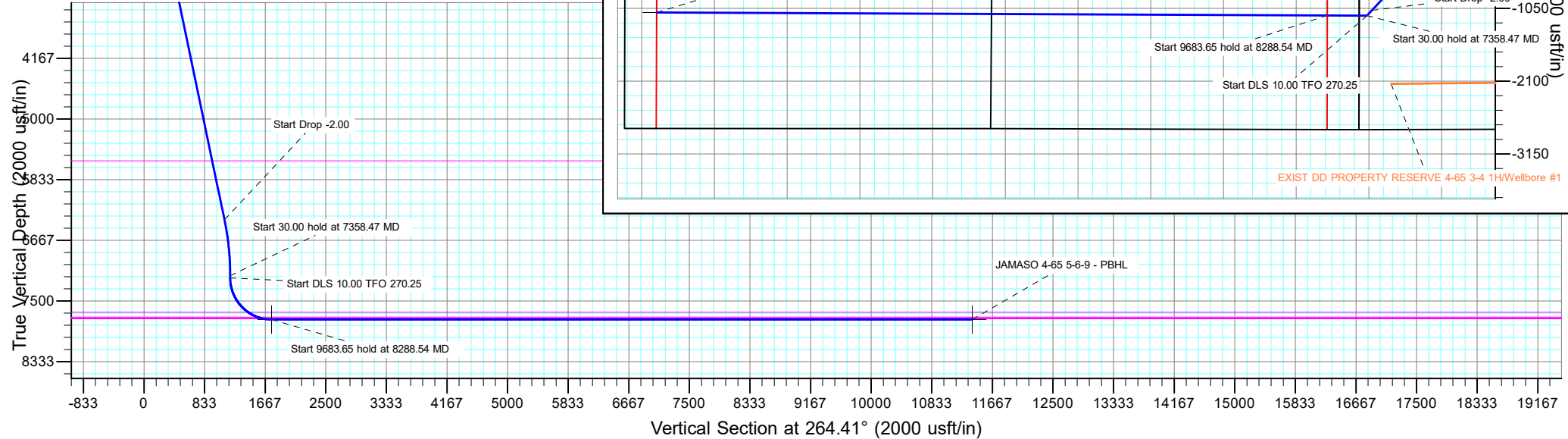
ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	Start Build 2.00	
1478.85	15.58	223.02	1469.29	-76.93	-71.78	78.94	105.22	Start 5100.77 hold at 1478.85 MD	
6579.62	15.58	223.02	6382.71	-1078.42	-1006.23	1106.56	1474.95	Start Drop -2.00	
7358.47	0.00	0.00	7152.00	-1155.35	-1078.01	1185.51	1580.17	Start 30.00 hold at 7358.47 MD	
7388.47	0.00	0.00	7182.00	-1155.35	-1078.01	1185.51	1580.17	Start DLS 10.00 TFO 270.25	
8288.54	90.00	270.25	7755.00	-1152.85	-1651.01	1755.53	2153.18	Start 9683.65 hold at 8288.54 MD	
17972.19	90.00	270.25	7754.92	-1110.53	-11334.57	11388.84	11836.83	TD at 17972.19	

DESIGN TARGET DETAILS									
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape	
JAMASO 4-65 5-6-9 - LP	7755.00	-1152.85	-1651.01	1145602.56	3230645.55	39.730116°N	104.679951°W	Point	
- plan hits target center									
JAMASO 4-65 5-6-9 - PBHL	7755.00	-1110.26	-11334.57	1145554.96	3220962.01	39.730226°N	104.714380°W	Point	
- plan hits target center									

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
293.00	293.00	Denver
877.00	877.11	Upper Arapahoe
1165.00	1167.07	Lower Arapahoe
1718.00	1737.04	Laramie - Fox Hills
1970.00	1990.66	Shale (Base of Fox Hills)
5575.00	5741.58	Shannon Sandstone Member
7655.00	7944.88	Sharon Springs Shale
7720.00	8087.23	Niobrara Formation
7735.00	8136.70	Niobrara A Chalk
7745.00	8181.33	Niobrara A 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:
2450' FNL, 1188' FWL
Sec 4-T4S-R65W
LP:
1648' FSL, 460' FEL
Sec 5-T4S-R65W
BHL:
1673' FSL, 460' FWL
Sec 6-T4S-R65W



Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-9
Company:	AXIS EXPLORATION	TVD Reference:	KB 25' @ 5610.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5610.00usft
Site:	Sec 4-T4S-R65W	North Reference:	True
Well:	JAMASO 4-65 5-6-9	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	PROPOSAL 1		

Project	ARAPAHOE COUNTY		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		Sec 4-T4S-R65W			
Site Position:		Northing:	1,149,213.35 usft	Latitude:	39.740017°N
From:	Lat/Long	Easting:	3,231,079.56 usft	Longitude:	104.678289°W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.53 °

Well	JAMASO 4-65 5-6-9					
Well Position	+N/-S	-2,453.69 usft	Northing:	1,146,770.73 usft	Latitude:	39.733281°N
	+E/-W	1,183.50 usft	Easting:	3,232,285.75 usft	Longitude:	104.674081°W
Position Uncertainty	0.00 usft		Wellhead Elevation:		Ground Level:	5,585.00 usft

Wellbore	ORIGINAL WELLBORE				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	4/12/2018	8.02	66.31	51,953.95171698

Design	PROPOSAL 1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	264.41

Plan Survey Tool Program	Date	10/18/2018		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	17,971.93	PROPOSAL 1 (ORIGINAL WELL	MWD OWSG
			OWSG MWD - Standard	

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	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	
1,478.85	15.58	223.02	1,469.29	-76.93	-71.78	2.00	2.00	0.00	223.02	
6,579.62	15.58	223.02	6,382.71	-1,078.42	-1,006.23	0.00	0.00	0.00	0.00	
7,358.47	0.00	0.00	7,152.00	-1,155.35	-1,078.01	2.00	-2.00	0.00	180.00	
7,388.47	0.00	0.00	7,182.00	-1,155.35	-1,078.01	0.00	0.00	0.00	0.00	
8,288.54	90.00	270.25	7,755.00	-1,152.85	-1,651.01	10.00	10.00	-9.97	270.25	JAMASO 4-65 5-6-9 -
17,972.19	90.00	270.25	7,755.00	-1,110.26	-11,334.57	0.00	0.00	0.00	0.00	JAMASO 4-65 5-6-9 -

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-9
Company:	AXIS EXPLORATION	TVD Reference:	KB 25' @ 5610.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5610.00usft
Site:	Sec 4-T4S-R65W	North Reference:	True
Well:	JAMASO 4-65 5-6-9	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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
293.00	0.00	0.00	293.00	0.00	0.00	0.00	0.00	0.00	0.00
Denver									
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
Start Build 2.00									
800.00	2.00	223.02	799.98	-1.28	-1.19	1.31	2.00	2.00	0.00
877.11	3.54	223.02	877.00	-4.00	-3.73	4.11	2.00	2.00	0.00
Upper Arapahoe									
900.00	4.00	223.02	899.84	-5.10	-4.76	5.24	2.00	2.00	0.00
1,000.00	6.00	223.02	999.45	-11.47	-10.71	11.77	2.00	2.00	0.00
1,100.00	8.00	223.02	1,098.70	-20.38	-19.02	20.92	2.00	2.00	0.00
1,167.07	9.34	223.02	1,165.00	-27.78	-25.92	28.50	2.00	2.00	0.00
Lower Arapahoe									
1,200.00	10.00	223.02	1,197.47	-31.82	-29.69	32.65	2.00	2.00	0.00
1,300.00	12.00	223.02	1,295.62	-45.77	-42.71	46.97	2.00	2.00	0.00
1,400.00	14.00	223.02	1,393.06	-62.22	-58.05	63.84	2.00	2.00	0.00
1,478.85	15.58	223.02	1,469.29	-76.93	-71.78	78.94	2.00	2.00	0.00
Start 5100.77 hold at 1478.85 MD									
1,500.00	15.58	223.02	1,489.66	-81.09	-75.66	83.20	0.00	0.00	0.00
1,600.00	15.58	223.02	1,585.99	-100.72	-93.98	103.35	0.00	0.00	0.00
1,700.00	15.58	223.02	1,682.32	-120.35	-112.30	123.50	0.00	0.00	0.00
1,737.04	15.58	223.02	1,718.00	-127.63	-119.08	130.96	0.00	0.00	0.00
Laramie - Fox Hills									
1,800.00	15.58	223.02	1,778.65	-139.99	-130.62	143.64	0.00	0.00	0.00
1,900.00	15.58	223.02	1,874.97	-159.62	-148.94	163.79	0.00	0.00	0.00
1,998.65	15.58	223.02	1,970.00	-178.99	-167.01	183.66	0.00	0.00	0.00
Pierre Shale (Base of Fox Hills)									
2,000.00	15.58	223.02	1,971.30	-179.26	-167.26	183.94	0.00	0.00	0.00
2,100.00	15.58	223.02	2,067.63	-198.89	-185.58	204.08	0.00	0.00	0.00
2,200.00	15.58	223.02	2,163.95	-218.52	-203.90	224.23	0.00	0.00	0.00
2,300.00	15.58	223.02	2,260.28	-238.16	-222.22	244.37	0.00	0.00	0.00
2,400.00	15.58	223.02	2,356.61	-257.79	-240.54	264.52	0.00	0.00	0.00
2,500.00	15.58	223.02	2,452.93	-277.43	-258.86	284.67	0.00	0.00	0.00
2,600.00	15.58	223.02	2,549.26	-297.06	-277.17	304.81	0.00	0.00	0.00
2,700.00	15.58	223.02	2,645.59	-316.69	-295.49	324.96	0.00	0.00	0.00
2,800.00	15.58	223.02	2,741.92	-336.33	-313.81	345.11	0.00	0.00	0.00
2,900.00	15.58	223.02	2,838.24	-355.96	-332.13	365.25	0.00	0.00	0.00
3,000.00	15.58	223.02	2,934.57	-375.60	-350.45	385.40	0.00	0.00	0.00
3,100.00	15.58	223.02	3,030.90	-395.23	-368.77	405.55	0.00	0.00	0.00
3,200.00	15.58	223.02	3,127.22	-414.86	-387.09	425.69	0.00	0.00	0.00
3,300.00	15.58	223.02	3,223.55	-434.50	-405.41	445.84	0.00	0.00	0.00
3,400.00	15.58	223.02	3,319.88	-454.13	-423.73	465.99	0.00	0.00	0.00
3,500.00	15.58	223.02	3,416.20	-473.77	-442.05	486.13	0.00	0.00	0.00
3,600.00	15.58	223.02	3,512.53	-493.40	-460.37	506.28	0.00	0.00	0.00
3,700.00	15.58	223.02	3,608.86	-513.03	-478.69	526.42	0.00	0.00	0.00
3,800.00	15.58	223.02	3,705.19	-532.67	-497.01	546.57	0.00	0.00	0.00
3,900.00	15.58	223.02	3,801.51	-552.30	-515.33	566.72	0.00	0.00	0.00

Planning Report

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Company:	AXIS EXPLORATION	TVD Reference:	KB 25' @ 5610.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5610.00usft
Site:	Sec 4-T4S-R65W	North Reference:	True
Well:	JAMASO 4-65 5-6-9	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
4,000.00	15.58	223.02	3,897.84	-571.94	-533.65	586.86	0.00	0.00	0.00
4,100.00	15.58	223.02	3,994.17	-591.57	-551.97	607.01	0.00	0.00	0.00
4,200.00	15.58	223.02	4,090.49	-611.20	-570.29	627.16	0.00	0.00	0.00
4,300.00	15.58	223.02	4,186.82	-630.84	-588.61	647.30	0.00	0.00	0.00
4,400.00	15.58	223.02	4,283.15	-650.47	-606.93	667.45	0.00	0.00	0.00
4,500.00	15.58	223.02	4,379.48	-670.11	-625.25	687.60	0.00	0.00	0.00
4,600.00	15.58	223.02	4,475.80	-689.74	-643.57	707.74	0.00	0.00	0.00
4,700.00	15.58	223.02	4,572.13	-709.37	-661.89	727.89	0.00	0.00	0.00
4,800.00	15.58	223.02	4,668.46	-729.01	-680.21	748.03	0.00	0.00	0.00
4,900.00	15.58	223.02	4,764.78	-748.64	-698.53	768.18	0.00	0.00	0.00
5,000.00	15.58	223.02	4,861.11	-768.27	-716.85	788.33	0.00	0.00	0.00
5,100.00	15.58	223.02	4,957.44	-787.91	-735.17	808.47	0.00	0.00	0.00
5,200.00	15.58	223.02	5,053.76	-807.54	-753.49	828.62	0.00	0.00	0.00
5,300.00	15.58	223.02	5,150.09	-827.18	-771.80	848.77	0.00	0.00	0.00
5,400.00	15.58	223.02	5,246.42	-846.81	-790.12	868.91	0.00	0.00	0.00
5,500.00	15.58	223.02	5,342.75	-866.44	-808.44	889.06	0.00	0.00	0.00
5,600.00	15.58	223.02	5,439.07	-886.08	-826.76	909.21	0.00	0.00	0.00
5,700.00	15.58	223.02	5,535.40	-905.71	-845.08	929.35	0.00	0.00	0.00
5,741.11	15.58	223.02	5,575.00	-913.78	-852.61	937.63	0.00	0.00	0.00
Shannon Sandstone Member									
5,800.00	15.58	223.02	5,631.73	-925.35	-863.40	949.50	0.00	0.00	0.00
5,900.00	15.58	223.02	5,728.05	-944.98	-881.72	969.65	0.00	0.00	0.00
6,000.00	15.58	223.02	5,824.38	-964.61	-900.04	989.79	0.00	0.00	0.00
6,100.00	15.58	223.02	5,920.71	-984.25	-918.36	1,009.94	0.00	0.00	0.00
6,200.00	15.58	223.02	6,017.04	-1,003.88	-936.68	1,030.08	0.00	0.00	0.00
6,300.00	15.58	223.02	6,113.36	-1,023.52	-955.00	1,050.23	0.00	0.00	0.00
6,400.00	15.58	223.02	6,209.69	-1,043.15	-973.32	1,070.38	0.00	0.00	0.00
6,500.00	15.58	223.02	6,306.02	-1,062.78	-991.64	1,090.52	0.00	0.00	0.00
6,579.62	15.58	223.02	6,382.71	-1,078.42	-1,006.23	1,106.56	0.00	0.00	0.00
Start Drop -2.00									
6,600.00	15.17	223.02	6,402.36	-1,082.37	-1,009.91	1,110.62	2.00	-2.00	0.00
6,700.00	13.17	223.02	6,499.32	-1,100.26	-1,026.61	1,128.98	2.00	-2.00	0.00
6,800.00	11.17	223.02	6,597.06	-1,115.68	-1,040.99	1,144.80	2.00	-2.00	0.00
6,900.00	9.17	223.02	6,695.49	-1,128.58	-1,053.04	1,158.04	2.00	-2.00	0.00
7,000.00	7.17	223.02	6,794.47	-1,138.97	-1,062.73	1,168.70	2.00	-2.00	0.00
7,100.00	5.17	223.02	6,893.88	-1,146.83	-1,070.06	1,176.76	2.00	-2.00	0.00
7,200.00	3.17	223.02	6,993.61	-1,152.15	-1,075.02	1,182.22	2.00	-2.00	0.00
7,300.00	1.17	223.02	7,093.54	-1,154.91	-1,077.60	1,185.06	2.00	-2.00	0.00
7,358.47	0.00	0.00	7,152.00	-1,155.35	-1,078.01	1,185.51	2.00	-2.00	0.00
Start 30.00 hold at 7358.47 MD									
7,388.47	0.00	0.00	7,182.00	-1,155.35	-1,078.01	1,185.51	0.00	0.00	0.00
Start DLS 10.00 TFO 270.25									
7,400.00	1.15	270.25	7,193.53	-1,155.35	-1,078.13	1,185.62	10.00	10.00	0.00
7,450.00	6.15	270.25	7,243.41	-1,155.34	-1,081.31	1,188.79	10.00	10.00	0.00
7,500.00	11.15	270.25	7,292.83	-1,155.30	-1,088.83	1,196.27	10.00	10.00	0.00
7,550.00	16.15	270.25	7,341.40	-1,155.25	-1,100.63	1,208.01	10.00	10.00	0.00
7,600.00	21.15	270.25	7,388.76	-1,155.18	-1,116.61	1,223.91	10.00	10.00	0.00
7,650.00	26.15	270.25	7,434.55	-1,155.09	-1,136.67	1,243.86	10.00	10.00	0.00
7,700.00	31.15	270.25	7,478.41	-1,154.99	-1,160.63	1,267.70	10.00	10.00	0.00
7,750.00	36.15	270.25	7,520.02	-1,154.87	-1,188.33	1,295.25	10.00	10.00	0.00
7,800.00	41.15	270.25	7,559.05	-1,154.73	-1,219.55	1,326.31	10.00	10.00	0.00
7,850.00	46.15	270.25	7,595.22	-1,154.58	-1,254.05	1,360.63	10.00	10.00	0.00
7,900.00	51.15	270.25	7,628.24	-1,154.42	-1,291.57	1,397.96	10.00	10.00	0.00

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-9
Company:	AXIS EXPLORATION	TVD Reference:	KB 25' @ 5610.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5610.00usft
Site:	Sec 4-T4S-R65W	North Reference:	True
Well:	JAMASO 4-65 5-6-9	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)	
7,944.88	55.64	270.25	7,655.00	-1,154.26	-1,327.59	1,433.79	10.00	10.00	0.00	
Sharon Springs Shale										
7,950.00	56.15	270.25	7,657.87	-1,154.24	-1,331.83	1,438.01	10.00	10.00	0.00	
8,000.00	61.15	270.25	7,683.88	-1,154.05	-1,374.51	1,480.47	10.00	10.00	0.00	
8,050.00	66.15	270.25	7,706.06	-1,153.86	-1,419.30	1,525.03	10.00	10.00	0.00	
8,087.23	69.87	270.25	7,720.00	-1,153.71	-1,453.81	1,559.36	10.00	10.00	0.00	
Niobrara Formation										
8,100.00	71.15	270.25	7,724.26	-1,153.66	-1,465.86	1,571.34	10.00	10.00	0.00	
8,136.70	74.82	270.25	7,735.00	-1,153.50	-1,500.94	1,606.24	10.00	10.00	0.00	
Niobrara A Chalk										
8,150.00	76.15	270.25	7,738.34	-1,153.45	-1,513.82	1,619.05	10.00	10.00	0.00	
8,181.33	79.28	270.25	7,745.00	-1,153.31	-1,544.42	1,649.50	10.00	10.00	0.00	
Niobrara A Landing Point										
8,200.00	81.15	270.25	7,748.17	-1,153.23	-1,562.82	1,667.80	10.00	10.00	0.00	
8,250.00	86.15	270.25	7,753.70	-1,153.01	-1,612.50	1,717.22	10.00	10.00	0.00	
8,288.54	90.00	270.25	7,755.00	-1,152.85	-1,651.01	1,755.53	10.00	10.00	0.00	
Start 9683.65 hold at 8288.54 MD										
8,300.00	90.00	270.25	7,755.00	-1,152.80	-1,662.47	1,766.93	0.00	0.00	0.00	
8,400.00	90.00	270.25	7,755.00	-1,152.36	-1,762.47	1,866.41	0.00	0.00	0.00	
8,500.00	90.00	270.25	7,755.00	-1,151.92	-1,862.47	1,965.89	0.00	0.00	0.00	
8,600.00	90.00	270.25	7,755.00	-1,151.49	-1,962.47	2,065.37	0.00	0.00	0.00	
8,700.00	90.00	270.25	7,755.00	-1,151.05	-2,062.47	2,164.85	0.00	0.00	0.00	
8,800.00	90.00	270.25	7,755.00	-1,150.61	-2,162.47	2,264.33	0.00	0.00	0.00	
8,900.00	90.00	270.25	7,754.99	-1,150.17	-2,262.47	2,363.82	0.00	0.00	0.00	
9,000.00	90.00	270.25	7,754.99	-1,149.74	-2,362.46	2,463.30	0.00	0.00	0.00	
9,100.00	90.00	270.25	7,754.99	-1,149.30	-2,462.46	2,562.78	0.00	0.00	0.00	
9,200.00	90.00	270.25	7,754.99	-1,148.86	-2,562.46	2,662.26	0.00	0.00	0.00	
9,300.00	90.00	270.25	7,754.99	-1,148.43	-2,662.46	2,761.74	0.00	0.00	0.00	
9,400.00	90.00	270.25	7,754.99	-1,147.99	-2,762.46	2,861.22	0.00	0.00	0.00	
9,500.00	90.00	270.25	7,754.99	-1,147.55	-2,862.46	2,960.70	0.00	0.00	0.00	
9,600.00	90.00	270.25	7,754.99	-1,147.12	-2,962.46	3,060.18	0.00	0.00	0.00	
9,700.00	90.00	270.25	7,754.99	-1,146.68	-3,062.46	3,159.66	0.00	0.00	0.00	
9,800.00	90.00	270.25	7,754.99	-1,146.24	-3,162.46	3,259.14	0.00	0.00	0.00	
9,900.00	90.00	270.25	7,754.99	-1,145.80	-3,262.46	3,358.62	0.00	0.00	0.00	
10,000.00	90.00	270.25	7,754.99	-1,145.37	-3,362.45	3,458.10	0.00	0.00	0.00	
10,100.00	90.00	270.25	7,754.98	-1,144.93	-3,462.45	3,557.58	0.00	0.00	0.00	
10,200.00	90.00	270.25	7,754.98	-1,144.49	-3,562.45	3,657.06	0.00	0.00	0.00	
10,300.00	90.00	270.25	7,754.98	-1,144.06	-3,662.45	3,756.54	0.00	0.00	0.00	
10,400.00	90.00	270.25	7,754.98	-1,143.62	-3,762.45	3,856.02	0.00	0.00	0.00	
10,500.00	90.00	270.25	7,754.98	-1,143.18	-3,862.45	3,955.50	0.00	0.00	0.00	
10,600.00	90.00	270.25	7,754.98	-1,142.75	-3,962.45	4,054.98	0.00	0.00	0.00	
10,700.00	90.00	270.25	7,754.98	-1,142.31	-4,062.45	4,154.46	0.00	0.00	0.00	
10,800.00	90.00	270.25	7,754.98	-1,141.87	-4,162.45	4,253.94	0.00	0.00	0.00	
10,900.00	90.00	270.25	7,754.98	-1,141.43	-4,262.45	4,353.42	0.00	0.00	0.00	
11,000.00	90.00	270.25	7,754.98	-1,141.00	-4,362.45	4,452.90	0.00	0.00	0.00	
11,100.00	90.00	270.25	7,754.98	-1,140.56	-4,462.44	4,552.38	0.00	0.00	0.00	
11,200.00	90.00	270.25	7,754.98	-1,140.12	-4,562.44	4,651.86	0.00	0.00	0.00	
11,300.00	90.00	270.25	7,754.97	-1,139.69	-4,662.44	4,751.34	0.00	0.00	0.00	
11,400.00	90.00	270.25	7,754.97	-1,139.25	-4,762.44	4,850.82	0.00	0.00	0.00	
11,500.00	90.00	270.25	7,754.97	-1,138.81	-4,862.44	4,950.30	0.00	0.00	0.00	
11,600.00	90.00	270.25	7,754.97	-1,138.38	-4,962.44	5,049.78	0.00	0.00	0.00	
11,700.00	90.00	270.25	7,754.97	-1,137.94	-5,062.44	5,149.26	0.00	0.00	0.00	
11,800.00	90.00	270.25	7,754.97	-1,137.50	-5,162.44	5,248.74	0.00	0.00	0.00	
11,900.00	90.00	270.25	7,754.97	-1,137.06	-5,262.44	5,348.22	0.00	0.00	0.00	

Planning Report

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Company:	AXIS EXPLORATION	TVD Reference:	KB 25' @ 5610.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5610.00usft
Site:	Sec 4-T4S-R65W	North Reference:	True
Well:	JAMASO 4-65 5-6-9	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)
12,000.00	90.00	270.25	7,754.97	-1,136.63	-5,362.44	5,447.70	0.00	0.00	0.00
12,100.00	90.00	270.25	7,754.97	-1,136.19	-5,462.43	5,547.18	0.00	0.00	0.00
12,200.00	90.00	270.25	7,754.97	-1,135.75	-5,562.43	5,646.66	0.00	0.00	0.00
12,300.00	90.00	270.25	7,754.97	-1,135.32	-5,662.43	5,746.14	0.00	0.00	0.00
12,400.00	90.00	270.25	7,754.96	-1,134.88	-5,762.43	5,845.62	0.00	0.00	0.00
12,500.00	90.00	270.25	7,754.96	-1,134.44	-5,862.43	5,945.10	0.00	0.00	0.00
12,600.00	90.00	270.25	7,754.96	-1,134.01	-5,962.43	6,044.58	0.00	0.00	0.00
12,700.00	90.00	270.25	7,754.96	-1,133.57	-6,062.43	6,144.06	0.00	0.00	0.00
12,800.00	90.00	270.25	7,754.96	-1,133.13	-6,162.43	6,243.54	0.00	0.00	0.00
12,900.00	90.00	270.25	7,754.96	-1,132.69	-6,262.43	6,343.02	0.00	0.00	0.00
13,000.00	90.00	270.25	7,754.96	-1,132.26	-6,362.43	6,442.50	0.00	0.00	0.00
13,100.00	90.00	270.25	7,754.96	-1,131.82	-6,462.43	6,541.98	0.00	0.00	0.00
13,200.00	90.00	270.25	7,754.96	-1,131.38	-6,562.42	6,641.46	0.00	0.00	0.00
13,300.00	90.00	270.25	7,754.96	-1,130.95	-6,662.42	6,740.94	0.00	0.00	0.00
13,400.00	90.00	270.25	7,754.96	-1,130.51	-6,762.42	6,840.42	0.00	0.00	0.00
13,500.00	90.00	270.25	7,754.96	-1,130.07	-6,862.42	6,939.90	0.00	0.00	0.00
13,600.00	90.00	270.25	7,754.95	-1,129.64	-6,962.42	7,039.38	0.00	0.00	0.00
13,700.00	90.00	270.25	7,754.95	-1,129.20	-7,062.42	7,138.86	0.00	0.00	0.00
13,800.00	90.00	270.25	7,754.95	-1,128.76	-7,162.42	7,238.34	0.00	0.00	0.00
13,900.00	90.00	270.25	7,754.95	-1,128.32	-7,262.42	7,337.82	0.00	0.00	0.00
14,000.00	90.00	270.25	7,754.95	-1,127.89	-7,362.42	7,437.30	0.00	0.00	0.00
14,100.00	90.00	270.25	7,754.95	-1,127.45	-7,462.42	7,536.78	0.00	0.00	0.00
14,200.00	90.00	270.25	7,754.95	-1,127.01	-7,562.41	7,636.26	0.00	0.00	0.00
14,300.00	90.00	270.25	7,754.95	-1,126.58	-7,662.41	7,735.74	0.00	0.00	0.00
14,400.00	90.00	270.25	7,754.95	-1,126.14	-7,762.41	7,835.22	0.00	0.00	0.00
14,500.00	90.00	270.25	7,754.95	-1,125.70	-7,862.41	7,934.70	0.00	0.00	0.00
14,600.00	90.00	270.25	7,754.95	-1,125.27	-7,962.41	8,034.18	0.00	0.00	0.00
14,700.00	90.00	270.25	7,754.95	-1,124.83	-8,062.41	8,133.66	0.00	0.00	0.00
14,800.00	90.00	270.25	7,754.94	-1,124.39	-8,162.41	8,233.14	0.00	0.00	0.00
14,900.00	90.00	270.25	7,754.94	-1,123.96	-8,262.41	8,332.62	0.00	0.00	0.00
15,000.00	90.00	270.25	7,754.94	-1,123.52	-8,362.41	8,432.10	0.00	0.00	0.00
15,100.00	90.00	270.25	7,754.94	-1,123.08	-8,462.41	8,531.58	0.00	0.00	0.00
15,200.00	90.00	270.25	7,754.94	-1,122.64	-8,562.41	8,631.06	0.00	0.00	0.00
15,300.00	90.00	270.25	7,754.94	-1,122.21	-8,662.40	8,730.54	0.00	0.00	0.00
15,400.00	90.00	270.25	7,754.94	-1,121.77	-8,762.40	8,830.02	0.00	0.00	0.00
15,500.00	90.00	270.25	7,754.94	-1,121.33	-8,862.40	8,929.50	0.00	0.00	0.00
15,600.00	90.00	270.25	7,754.94	-1,120.90	-8,962.40	9,028.98	0.00	0.00	0.00
15,700.00	90.00	270.25	7,754.94	-1,120.46	-9,062.40	9,128.46	0.00	0.00	0.00
15,800.00	90.00	270.25	7,754.94	-1,120.02	-9,162.40	9,227.94	0.00	0.00	0.00
15,900.00	90.00	270.25	7,754.93	-1,119.59	-9,262.40	9,327.42	0.00	0.00	0.00
16,000.00	90.00	270.25	7,754.93	-1,119.15	-9,362.40	9,426.90	0.00	0.00	0.00
16,100.00	90.00	270.25	7,754.93	-1,118.71	-9,462.40	9,526.38	0.00	0.00	0.00
16,200.00	90.00	270.25	7,754.93	-1,118.27	-9,562.40	9,625.87	0.00	0.00	0.00
16,300.00	90.00	270.25	7,754.93	-1,117.84	-9,662.39	9,725.35	0.00	0.00	0.00
16,400.00	90.00	270.25	7,754.93	-1,117.40	-9,762.39	9,824.83	0.00	0.00	0.00
16,500.00	90.00	270.25	7,754.93	-1,116.96	-9,862.39	9,924.31	0.00	0.00	0.00
16,600.00	90.00	270.25	7,754.93	-1,116.53	-9,962.39	10,023.79	0.00	0.00	0.00
16,700.00	90.00	270.25	7,754.93	-1,116.09	-10,062.39	10,123.27	0.00	0.00	0.00
16,800.00	90.00	270.25	7,754.93	-1,115.65	-10,162.39	10,222.75	0.00	0.00	0.00
16,900.00	90.00	270.25	7,754.93	-1,115.22	-10,262.39	10,322.23	0.00	0.00	0.00
17,000.00	90.00	270.25	7,754.93	-1,114.78	-10,362.39	10,421.71	0.00	0.00	0.00
17,100.00	90.00	270.25	7,754.92	-1,114.34	-10,462.39	10,521.19	0.00	0.00	0.00
17,200.00	90.00	270.25	7,754.92	-1,113.90	-10,562.39	10,620.67	0.00	0.00	0.00
17,300.00	90.00	270.25	7,754.92	-1,113.47	-10,662.39	10,720.15	0.00	0.00	0.00

Planning Report

Database:	EDT_32Bit_ODBC	Local Co-ordinate Reference:	Well JAMASO 4-65 5-6-9
Company:	AXIS EXPLORATION	TVD Reference:	KB 25' @ 5610.00usft
Project:	ARAPAHOE COUNTY	MD Reference:	KB 25' @ 5610.00usft
Site:	Sec 4-T4S-R65W	North Reference:	True
Well:	JAMASO 4-65 5-6-9	Survey Calculation Method:	Minimum Curvature
Wellbore:	ORIGINAL WELLBORE		
Design:	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)	
17,400.00	90.00	270.25	7,754.92	-1,113.03	-10,762.38	10,819.63	0.00	0.00	0.00	
17,500.00	90.00	270.25	7,754.92	-1,112.59	-10,862.38	10,919.11	0.00	0.00	0.00	
17,600.00	90.00	270.25	7,754.92	-1,112.16	-10,962.38	11,018.59	0.00	0.00	0.00	
17,700.00	90.00	270.25	7,754.92	-1,111.72	-11,062.38	11,118.07	0.00	0.00	0.00	
17,800.00	90.00	270.25	7,754.92	-1,111.28	-11,162.38	11,217.55	0.00	0.00	0.00	
17,900.00	90.00	270.25	7,754.92	-1,110.85	-11,262.38	11,317.03	0.00	0.00	0.00	
17,972.19	90.00	270.25	7,754.92	-1,110.53	-11,334.57	11,388.84	0.00	0.00	0.00	
TD at 17972.19										

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										
JAMASO 4-65 5-6-9 - LF	0.00	0.00	7,755.00	-1,152.85	-1,651.01	1,145,602.56	3,230,645.55	39.730116°N	104.679951°W	
- plan hits target center										
- Point										
JAMASO 4-65 5-6-9 - PI	0.00	0.00	7,755.00	-1,110.26	-11,334.57	1,145,554.95	3,220,962.01	39.730226°N	104.714380°W	
- plan misses target center by 0.29usft at 17972.19usft MD (7754.92 TVD, -1110.53 N, -11334.57 E)										
- Point										

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
293.00	293.00	Denver				
877.11	877.00	Upper Arapahoe				
1,167.07	1,165.00	Lower Arapahoe				
1,737.04	1,718.00	Laramie - Fox Hills				
1,998.65	1,970.00	Pierre Shale (Base of Fox Hills)				
5,741.11	5,575.00	Shannon Sandstone Member				
7,944.88	7,655.00	Sharon Springs Shale				
8,087.23	7,720.00	Niobrara Formation				
8,136.70	7,735.00	Niobrara A Chalk				
8,181.33	7,745.00	Niobrara A Landing Point				

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
700.00	700.00	0.00	0.00	Start Build 2.00
1,478.85	1,469.29	-76.93	-71.78	Start 5100.77 hold at 1478.85 MD
6,579.62	6,382.71	-1,078.42	-1,006.23	Start Drop -2.00
7,358.47	7,152.00	-1,155.35	-1,078.01	Start 30.00 hold at 7358.47 MD
7,388.47	7,182.00	-1,155.35	-1,078.01	Start DLS 10.00 TFO 270.25
8,288.54	7,755.00	-1,152.85	-1,651.01	Start 9683.65 hold at 8288.54 MD
17,972.19	7,754.92	-1,110.53	-11,334.57	TD at 17972.19