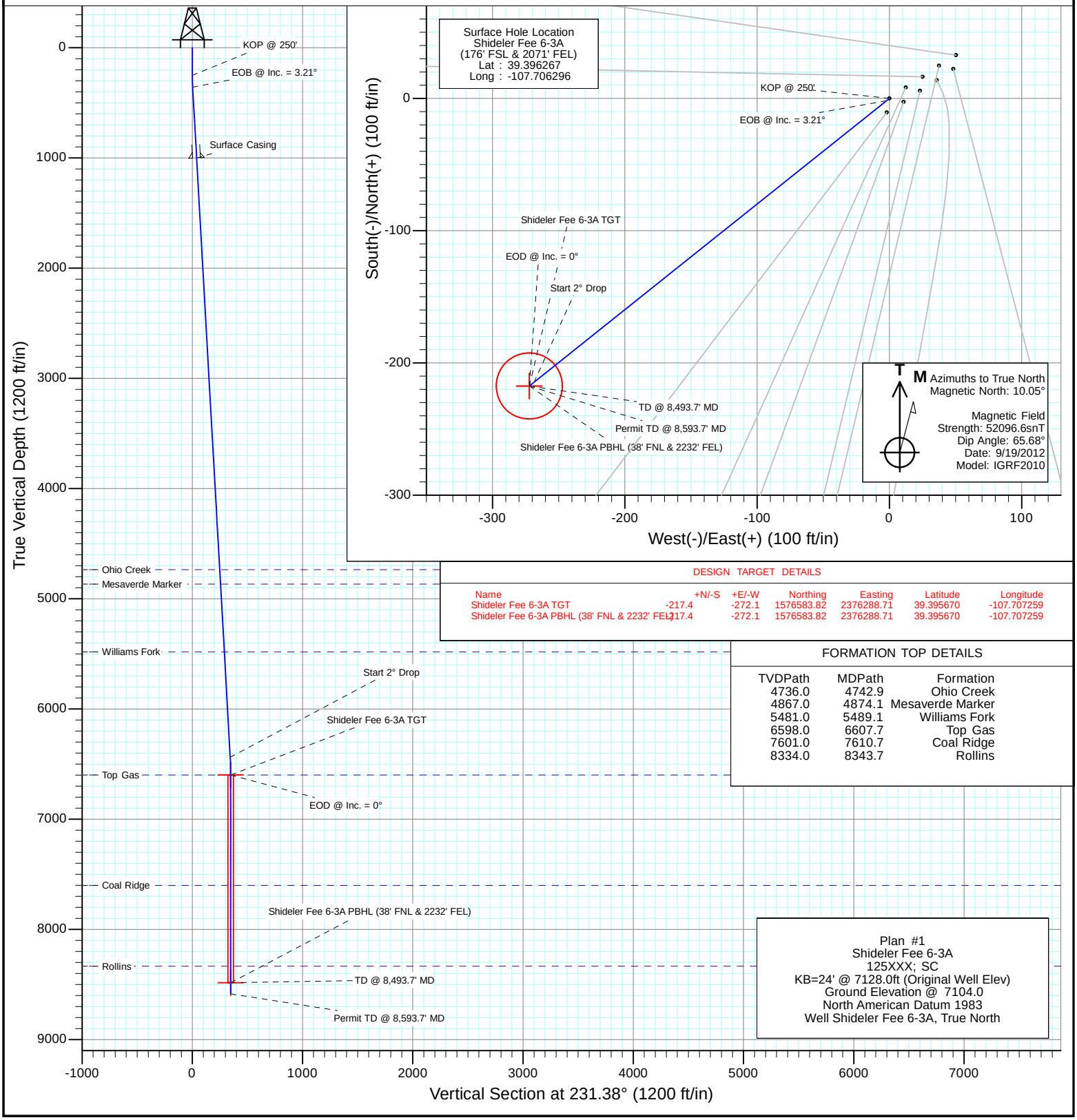
encana natural gas

Project: Mamm Creek
Site: O31E Pad
Well: Shideler Fee 6-3A
Wellbore: DD
Design: Plan #1

CATHEDRAL

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	250.0	0.00	0.00	250.0	0.0	0.0	0.00	0.00	0.0	
3	356.9	3.21	231.38	356.9	-1.9	-2.3	3.00	231.38	3.0	
4	6447.3	3.21	231.38	6437.7	-214.6	-268.6	0.00	0.00	343.8	
5	6607.7	0.00	0.00	6598.0	-217.4	-272.1	2.00	180.00	348.3	Shideler Fee 6-3A TGT
6	8493.7	0.00	0.00	8484.0	-217.4	-272.1	0.00	0.00	348.3	Shideler Fee 6-3A PBHL (38' FNL & 2232' FEL)
7	8593.7	0.00	0.00	8584.0	-217.4	-272.1	0.00	0.00	348.3	



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Shideler Fee 6-3A TGT	-217.4	-272.1	1576583.82	2376288.71	39.395670	-107.707259
Shideler Fee 6-3A PBHL (38' FNL & 2232' FEL)	-217.4	-272.1	1576583.82	2376288.71	39.395670	-107.707259

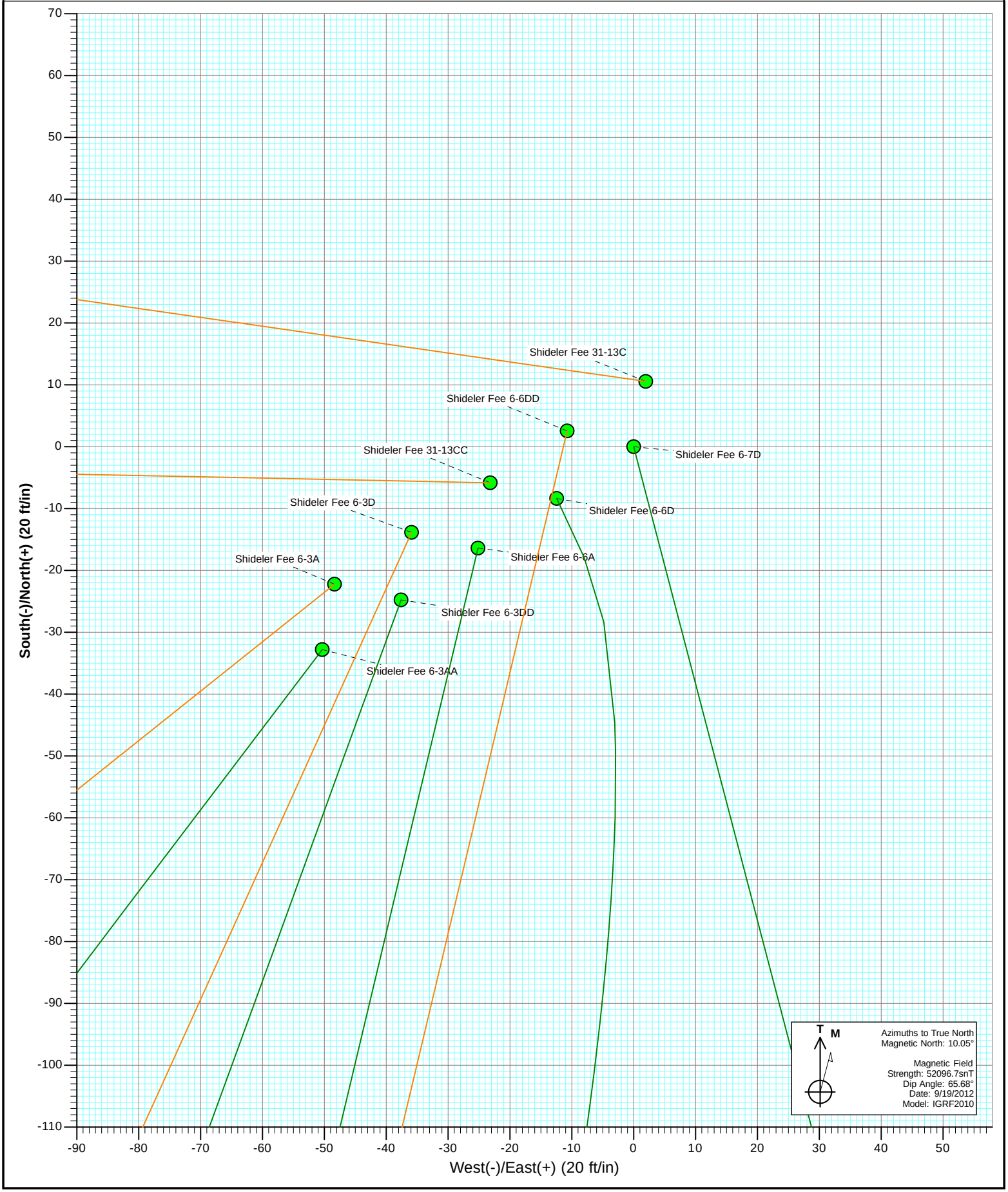
FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4736.0	4742.9	Ohio Creek
4867.0	4874.1	Mesaverde Marker
5481.0	5489.1	Williams Fork
6598.0	6607.7	Top Gas
7601.0	7610.7	Coal Ridge
8334.0	8343.7	Rollins

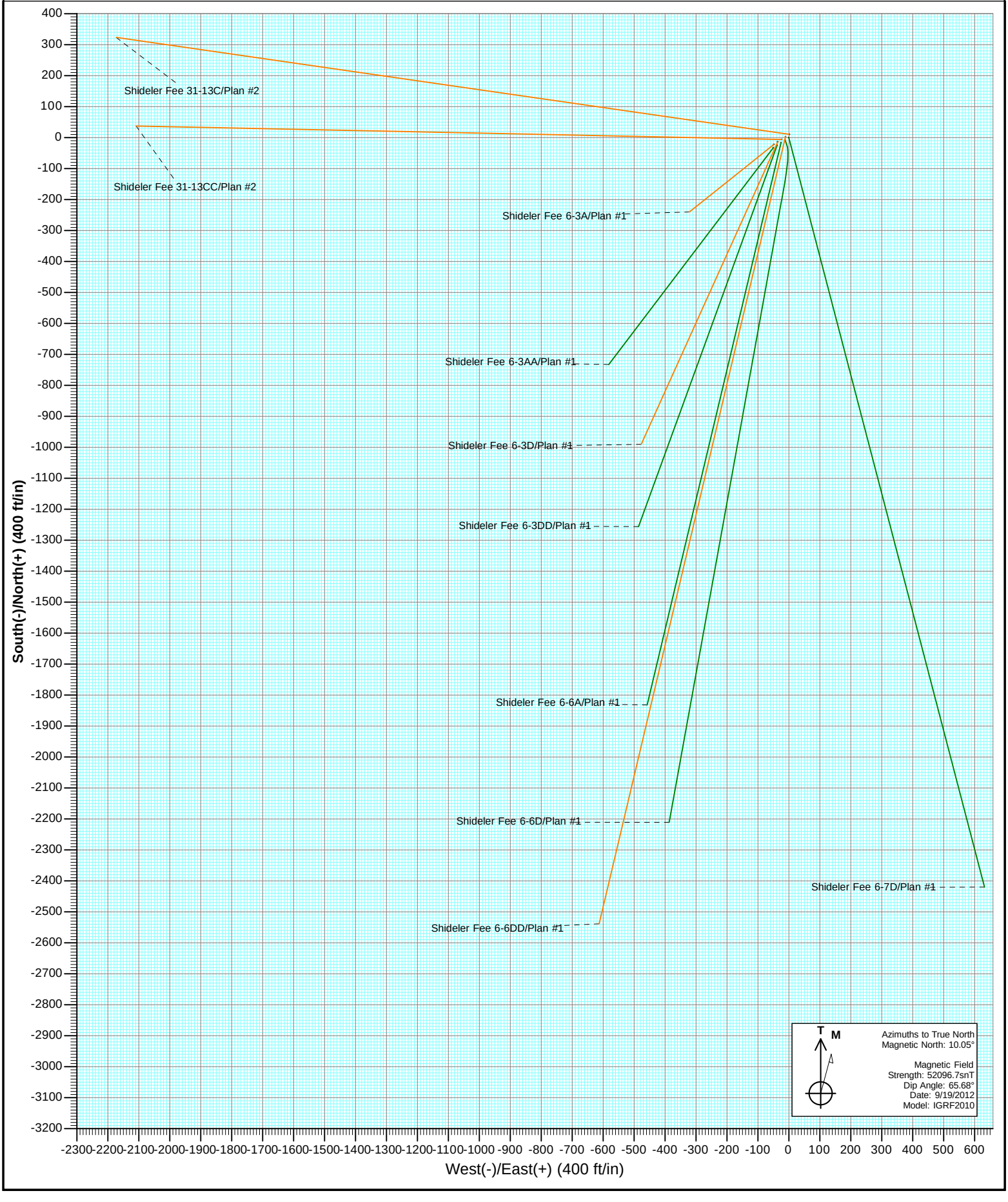
Plan #1
Shideler Fee 6-3A
125XXX; SC
KB=24' @ 7128.0ft (Original Well Elev)
Ground Elevation @ 7104.0
North American Datum 1983
Well Shideler Fee 6-3A, True North

Project: Mamm Creek
Site: O31E Pad
Well: Shideler Fee 6-7D
Wellbore: DD
Plan: Plan #1

Plan #1 (Shideler F



Project: Mamm Creek
Site: O31E Pad



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Shideler Fee 6-3A
Company:	EnCana Oil & Gas (USA) Inc	**TVD Reference:**	KB=24' @ 7128.0ft (Original Well Elev)
Project:	Mamm Creek	**MD Reference:**	KB=24' @ 7128.0ft (Original Well Elev)
Site:	O31E Pad	**North Reference:**	True
Well:	Shideler Fee 6-3A	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Project Mamm Creek

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site O31E Pad

Site Position:		**Northing:**	1,577,012.73 ft	**Latitude:**	39.396873
From:	Lat/Long	**Easting:**	2,376,675.10 ft	**Longitude:**	-107.705929
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-1.39 °

Well Shideler Fee 6-3A

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,576,794.57 ft	**Latitude:**	39.396267
	+E/-W	0.0 ft	**Easting:**	2,376,566.05 ft	**Longitude:**	-107.706296
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	7,104.0 ft

Wellbore DD

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/19/2012	10.05	65.68	52,097

Design Plan #1

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	231.38

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
250.0	0.00	0.00	250.0	0.0	0.0	0.00	0.00	0.00	0.00	
356.9	3.21	231.38	356.9	-1.9	-2.3	3.00	3.00	0.00	231.38	
6,447.3	3.21	231.38	6,437.7	-214.6	-268.6	0.00	0.00	0.00	0.00	
6,607.7	0.00	0.00	6,598.0	-217.4	-272.1	2.00	-2.00	0.00	180.00	Shideler Fee 6-3A TG
8,493.7	0.00	0.00	8,484.0	-217.4	-272.1	0.00	0.00	0.00	0.00	Shideler Fee 6-3A PB
8,593.7	0.00	0.00	8,584.0	-217.4	-272.1	0.00	0.00	0.00	0.00	

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Shideler Fee 6-3A
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Project:	Mamm Creek	**MD Reference:**	KB=24' @ 7128.0ft (Original Well Elev)
Site:	O31E Pad	**North Reference:**	True
Well:	Shideler Fee 6-3A	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
250.0	0.00	0.00	250.0	0.0	0.0	0.0	0.00	0.00	KOP @ 250'
300.0	1.50	231.38	300.0	-0.4	-0.5	0.7	3.00	3.00	
356.9	3.21	231.38	356.9	-1.9	-2.3	3.0	3.00	3.00	EOB @ Inc. = 3.21°
400.0	3.21	231.38	399.9	-3.4	-4.2	5.4	0.00	0.00	
500.0	3.21	231.38	499.7	-6.9	-8.6	11.0	0.00	0.00	
600.0	3.21	231.38	599.6	-10.4	-13.0	16.6	0.00	0.00	
700.0	3.21	231.38	699.4	-13.9	-17.3	22.2	0.00	0.00	
800.0	3.21	231.38	799.2	-17.3	-21.7	27.8	0.00	0.00	
900.0	3.21	231.38	899.1	-20.8	-26.1	33.4	0.00	0.00	
1,000.0	3.21	231.38	998.9	-24.3	-30.5	39.0	0.00	0.00	
1,001.1	3.21	231.38	1,000.0	-24.4	-30.5	39.0	0.00	0.00	Surface Casing
1,100.0	3.21	231.38	1,098.8	-27.8	-34.8	44.6	0.00	0.00	
1,200.0	3.21	231.38	1,198.6	-31.3	-39.2	50.2	0.00	0.00	
1,300.0	3.21	231.38	1,298.5	-34.8	-43.6	55.8	0.00	0.00	
1,400.0	3.21	231.38	1,398.3	-38.3	-47.9	61.4	0.00	0.00	
1,500.0	3.21	231.38	1,498.2	-41.8	-52.3	67.0	0.00	0.00	
1,600.0	3.21	231.38	1,598.0	-45.3	-56.7	72.6	0.00	0.00	
1,700.0	3.21	231.38	1,697.8	-48.8	-61.1	78.2	0.00	0.00	
1,800.0	3.21	231.38	1,797.7	-52.3	-65.4	83.8	0.00	0.00	
1,900.0	3.21	231.38	1,897.5	-55.8	-69.8	89.4	0.00	0.00	
2,000.0	3.21	231.38	1,997.4	-59.3	-74.2	94.9	0.00	0.00	
2,100.0	3.21	231.38	2,097.2	-62.8	-78.6	100.5	0.00	0.00	
2,200.0	3.21	231.38	2,197.1	-66.3	-82.9	106.1	0.00	0.00	
2,300.0	3.21	231.38	2,296.9	-69.7	-87.3	111.7	0.00	0.00	
2,400.0	3.21	231.38	2,396.7	-73.2	-91.7	117.3	0.00	0.00	
2,500.0	3.21	231.38	2,496.6	-76.7	-96.0	122.9	0.00	0.00	
2,600.0	3.21	231.38	2,596.4	-80.2	-100.4	128.5	0.00	0.00	
2,700.0	3.21	231.38	2,696.3	-83.7	-104.8	134.1	0.00	0.00	
2,800.0	3.21	231.38	2,796.1	-87.2	-109.2	139.7	0.00	0.00	
2,900.0	3.21	231.38	2,896.0	-90.7	-113.5	145.3	0.00	0.00	
3,000.0	3.21	231.38	2,995.8	-94.2	-117.9	150.9	0.00	0.00	
3,100.0	3.21	231.38	3,095.6	-97.7	-122.3	156.5	0.00	0.00	
3,200.0	3.21	231.38	3,195.5	-101.2	-126.7	162.1	0.00	0.00	
3,300.0	3.21	231.38	3,295.3	-104.7	-131.0	167.7	0.00	0.00	
3,400.0	3.21	231.38	3,395.2	-108.2	-135.4	173.3	0.00	0.00	
3,500.0	3.21	231.38	3,495.0	-111.7	-139.8	178.9	0.00	0.00	
3,600.0	3.21	231.38	3,594.9	-115.2	-144.1	184.5	0.00	0.00	
3,700.0	3.21	231.38	3,694.7	-118.7	-148.5	190.1	0.00	0.00	
3,800.0	3.21	231.38	3,794.5	-122.1	-152.9	195.7	0.00	0.00	
3,900.0	3.21	231.38	3,894.4	-125.6	-157.3	201.3	0.00	0.00	
4,000.0	3.21	231.38	3,994.2	-129.1	-161.6	206.9	0.00	0.00	
4,100.0	3.21	231.38	4,094.1	-132.6	-166.0	212.5	0.00	0.00	
4,200.0	3.21	231.38	4,193.9	-136.1	-170.4	218.1	0.00	0.00	
4,300.0	3.21	231.38	4,293.8	-139.6	-174.7	223.7	0.00	0.00	
4,400.0	3.21	231.38	4,393.6	-143.1	-179.1	229.3	0.00	0.00	
4,500.0	3.21	231.38	4,493.5	-146.6	-183.5	234.9	0.00	0.00	
4,600.0	3.21	231.38	4,593.3	-150.1	-187.9	240.5	0.00	0.00	
4,700.0	3.21	231.38	4,693.1	-153.6	-192.2	246.1	0.00	0.00	
4,742.9	3.21	231.38	4,736.0	-155.1	-194.1	248.5	0.00	0.00	Ohio Creek

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Project:	Mamm Creek	**MD Reference:**	KB=24' @ 7128.0ft (Original Well Elev)
Site:	O31E Pad	**North Reference:**	True
Well:	Shideler Fee 6-3A	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,800.0	3.21	231.38	4,793.0	-157.1	-196.6	251.7	0.00	0.00	
4,874.1	3.21	231.38	4,867.0	-159.7	-199.9	255.8	0.00	0.00	Mesaverde Marker
4,900.0	3.21	231.38	4,892.8	-160.6	-201.0	257.3	0.00	0.00	
5,000.0	3.21	231.38	4,992.7	-164.1	-205.4	262.9	0.00	0.00	
5,100.0	3.21	231.38	5,092.5	-167.6	-209.7	268.4	0.00	0.00	
5,200.0	3.21	231.38	5,192.4	-171.1	-214.1	274.0	0.00	0.00	
5,300.0	3.21	231.38	5,292.2	-174.5	-218.5	279.6	0.00	0.00	
5,400.0	3.21	231.38	5,392.0	-178.0	-222.8	285.2	0.00	0.00	
5,489.1	3.21	231.38	5,481.0	-181.2	-226.7	290.2	0.00	0.00	Williams Fork
5,500.0	3.21	231.38	5,491.9	-181.5	-227.2	290.8	0.00	0.00	
5,600.0	3.21	231.38	5,591.7	-185.0	-231.6	296.4	0.00	0.00	
5,700.0	3.21	231.38	5,691.6	-188.5	-236.0	302.0	0.00	0.00	
5,800.0	3.21	231.38	5,791.4	-192.0	-240.3	307.6	0.00	0.00	
5,900.0	3.21	231.38	5,891.3	-195.5	-244.7	313.2	0.00	0.00	
6,000.0	3.21	231.38	5,991.1	-199.0	-249.1	318.8	0.00	0.00	
6,100.0	3.21	231.38	6,090.9	-202.5	-253.5	324.4	0.00	0.00	
6,200.0	3.21	231.38	6,190.8	-206.0	-257.8	330.0	0.00	0.00	
6,300.0	3.21	231.38	6,290.6	-209.5	-262.2	335.6	0.00	0.00	
6,400.0	3.21	231.38	6,390.5	-213.0	-266.6	341.2	0.00	0.00	
6,447.3	3.21	231.38	6,437.7	-214.6	-268.6	343.8	0.00	0.00	Start 2° Drop
6,500.0	2.15	231.38	6,490.3	-216.2	-270.6	346.3	2.00	-2.00	
6,607.7	0.00	0.00	6,598.0	-217.4	-272.1	348.3	2.00	-2.00	EOD @ Inc. = 0° - Top Gas
6,700.0	0.00	0.00	6,690.3	-217.4	-272.1	348.3	0.00	0.00	
6,800.0	0.00	0.00	6,790.3	-217.4	-272.1	348.3	0.00	0.00	
6,900.0	0.00	0.00	6,890.3	-217.4	-272.1	348.3	0.00	0.00	
7,000.0	0.00	0.00	6,990.3	-217.4	-272.1	348.3	0.00	0.00	
7,100.0	0.00	0.00	7,090.3	-217.4	-272.1	348.3	0.00	0.00	
7,200.0	0.00	0.00	7,190.3	-217.4	-272.1	348.3	0.00	0.00	
7,300.0	0.00	0.00	7,290.3	-217.4	-272.1	348.3	0.00	0.00	
7,400.0	0.00	0.00	7,390.3	-217.4	-272.1	348.3	0.00	0.00	
7,500.0	0.00	0.00	7,490.3	-217.4	-272.1	348.3	0.00	0.00	
7,600.0	0.00	0.00	7,590.3	-217.4	-272.1	348.3	0.00	0.00	
7,610.7	0.00	0.00	7,601.0	-217.4	-272.1	348.3	0.00	0.00	Coal Ridge
7,700.0	0.00	0.00	7,690.3	-217.4	-272.1	348.3	0.00	0.00	
7,800.0	0.00	0.00	7,790.3	-217.4	-272.1	348.3	0.00	0.00	
7,900.0	0.00	0.00	7,890.3	-217.4	-272.1	348.3	0.00	0.00	
8,000.0	0.00	0.00	7,990.3	-217.4	-272.1	348.3	0.00	0.00	
8,100.0	0.00	0.00	8,090.3	-217.4	-272.1	348.3	0.00	0.00	
8,200.0	0.00	0.00	8,190.3	-217.4	-272.1	348.3	0.00	0.00	
8,300.0	0.00	0.00	8,290.3	-217.4	-272.1	348.3	0.00	0.00	
8,343.7	0.00	0.00	8,334.0	-217.4	-272.1	348.3	0.00	0.00	Rollins
8,400.0	0.00	0.00	8,390.3	-217.4	-272.1	348.3	0.00	0.00	
8,493.7	0.00	0.00	8,484.0	-217.4	-272.1	348.3	0.00	0.00	TD @ 8,493.7' MD
8,500.0	0.00	0.00	8,490.3	-217.4	-272.1	348.3	0.00	0.00	
8,593.7	0.00	0.00	8,584.0	-217.4	-272.1	348.3	0.00	0.00	Permit TD @ 8,593.7' MD

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Project:	Mamm Creek	**MD Reference:**	KB=24' @ 7128.0ft (Original Well Elev)
Site:	O31E Pad	**North Reference:**	True
Well:	Shideler Fee 6-3A	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Shideler Fee 6-3A TGT - plan hits target center - Point	0.00	0.00	6,598.0	-217.4	-272.1	1,576,583.82	2,376,288.71	39.395670	-107.707259
Shideler Fee 6-3A PBHL - plan hits target center - Circle (radius 25.0)	0.00	0.00	8,484.0	-217.4	-272.1	1,576,583.82	2,376,288.71	39.395670	-107.707259

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,001.1	1,000.0	Surface Casing		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,742.9	4,736.0	Ohio Creek		0.00	
4,874.1	4,867.0	Mesaverde Marker		0.00	
5,489.1	5,481.0	Williams Fork		0.00	
6,607.7	6,598.0	Top Gas		0.00	
7,610.7	7,601.0	Coal Ridge		0.00	
8,343.7	8,334.0	Rollins		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
250.0	250.0	0.0	0.0	KOP @ 250'
356.9	356.9	-1.9	-2.3	EOB @ Inc. = 3.21°
6,447.3	6,437.7	-214.6	-268.6	Start 2° Drop
6,607.7	6,598.0	-217.4	-272.1	EOD @ Inc. = 0°
8,493.7	8,484.0	-217.4	-272.1	TD @ 8,493.7' MD
8,593.7	8,584.0	-217.4	-272.1	Permit TD @ 8,593.7' MD