

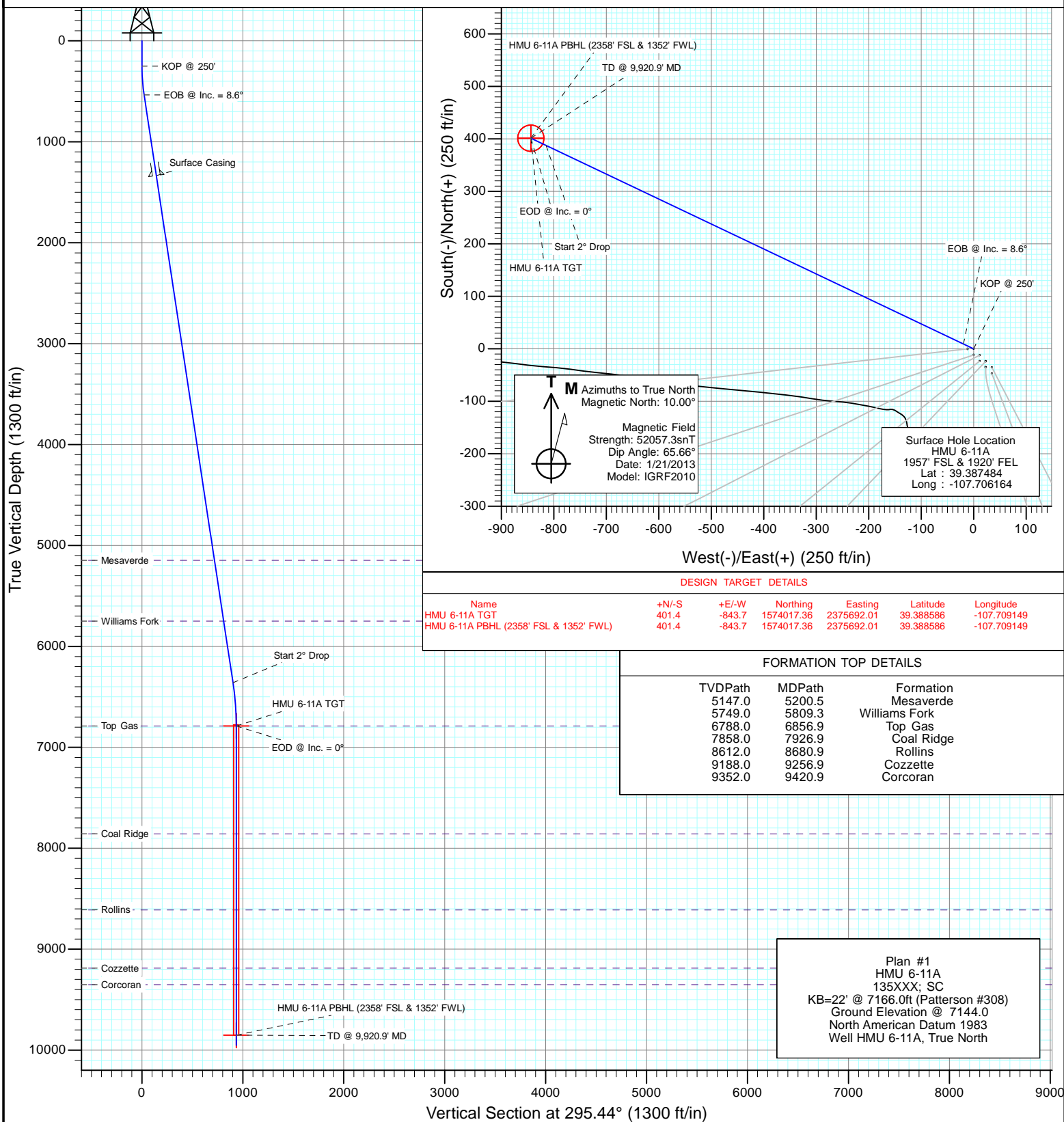


Project: Mamm Creek
Site: J6SEB Pad
Well: HMU 6-11A
Wellbore: OH
Design: Plan #1



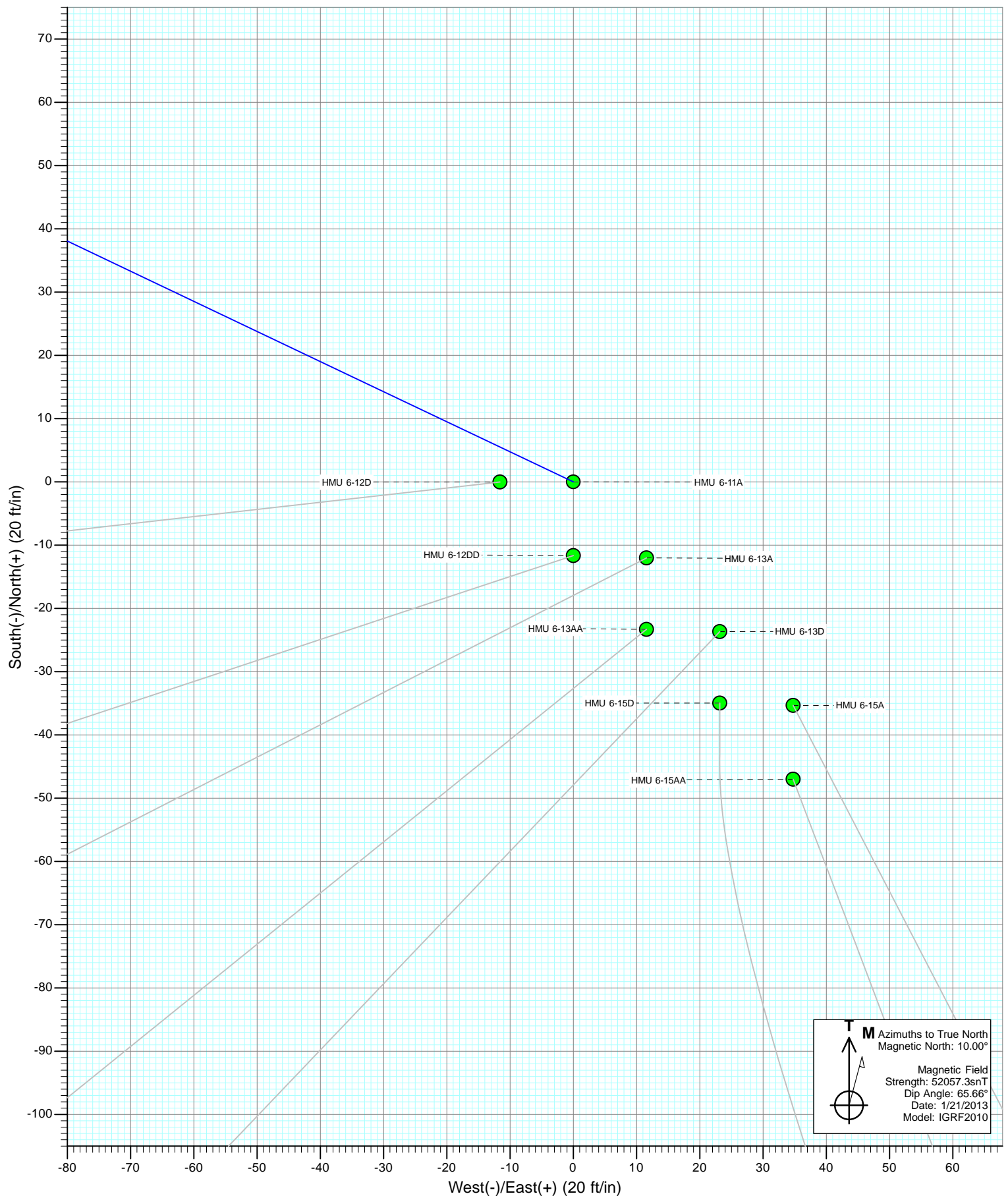
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	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	536.6	8.60	295.44	535.5	9.2	-19.4	3.00	295.44	21.5	
4	6427.0	8.60	295.44	6359.7	387.6	-814.6	0.00	0.00	902.1	
5	6856.9	0.00	0.00	6788.0	401.4	-843.7	2.00	180.00	934.3	HMU 6-11A TGT
6	9920.9	0.00	0.00	9852.0	401.4	-843.7	0.00	0.00	934.3	HMU 6-11A PBHL (2358' FSL & 1352' FWL)
7	10020.9	0.00	0.00	9952.0	401.4	-843.7	0.00	0.00	934.3	



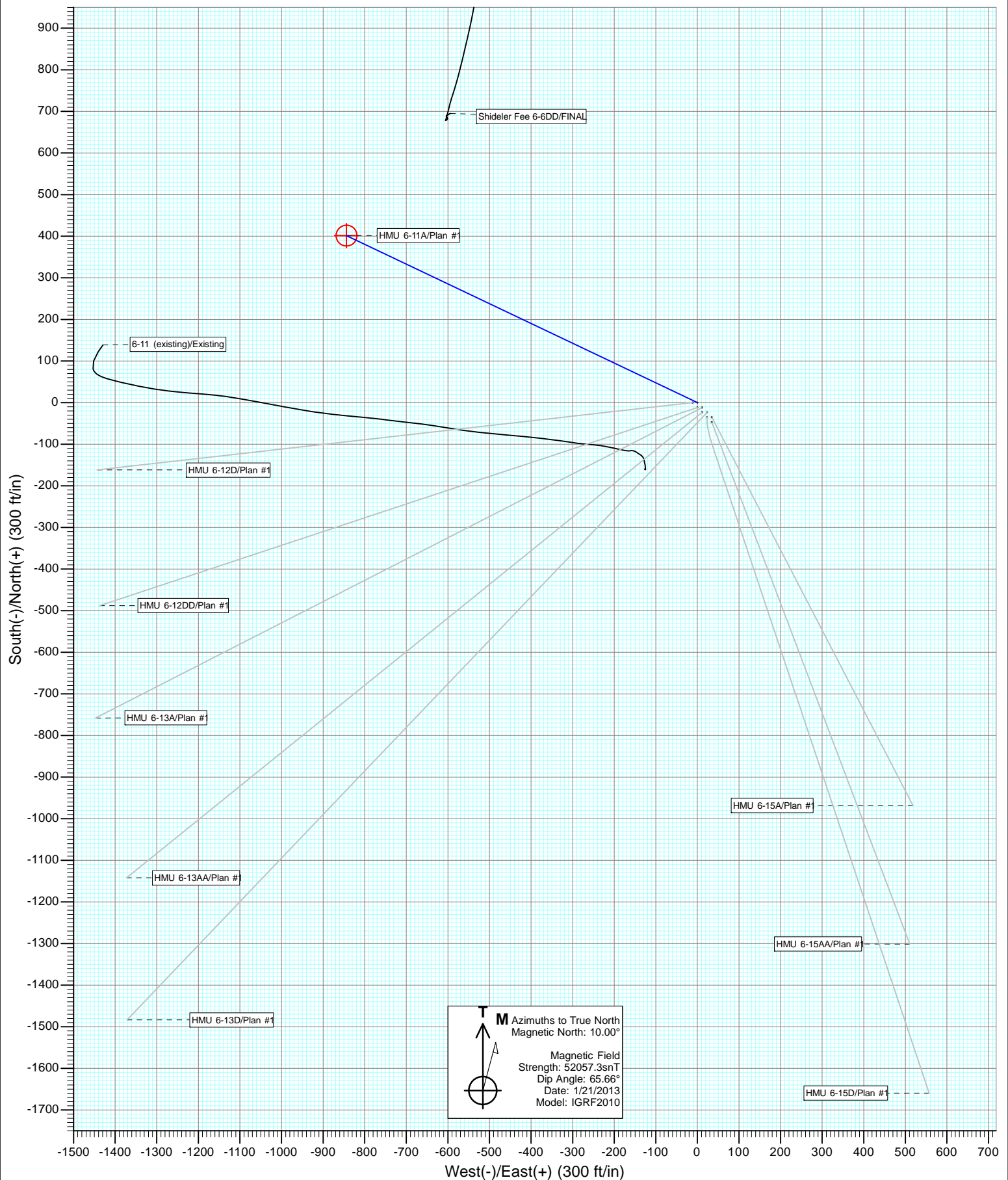


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Site: J6SEB Pad
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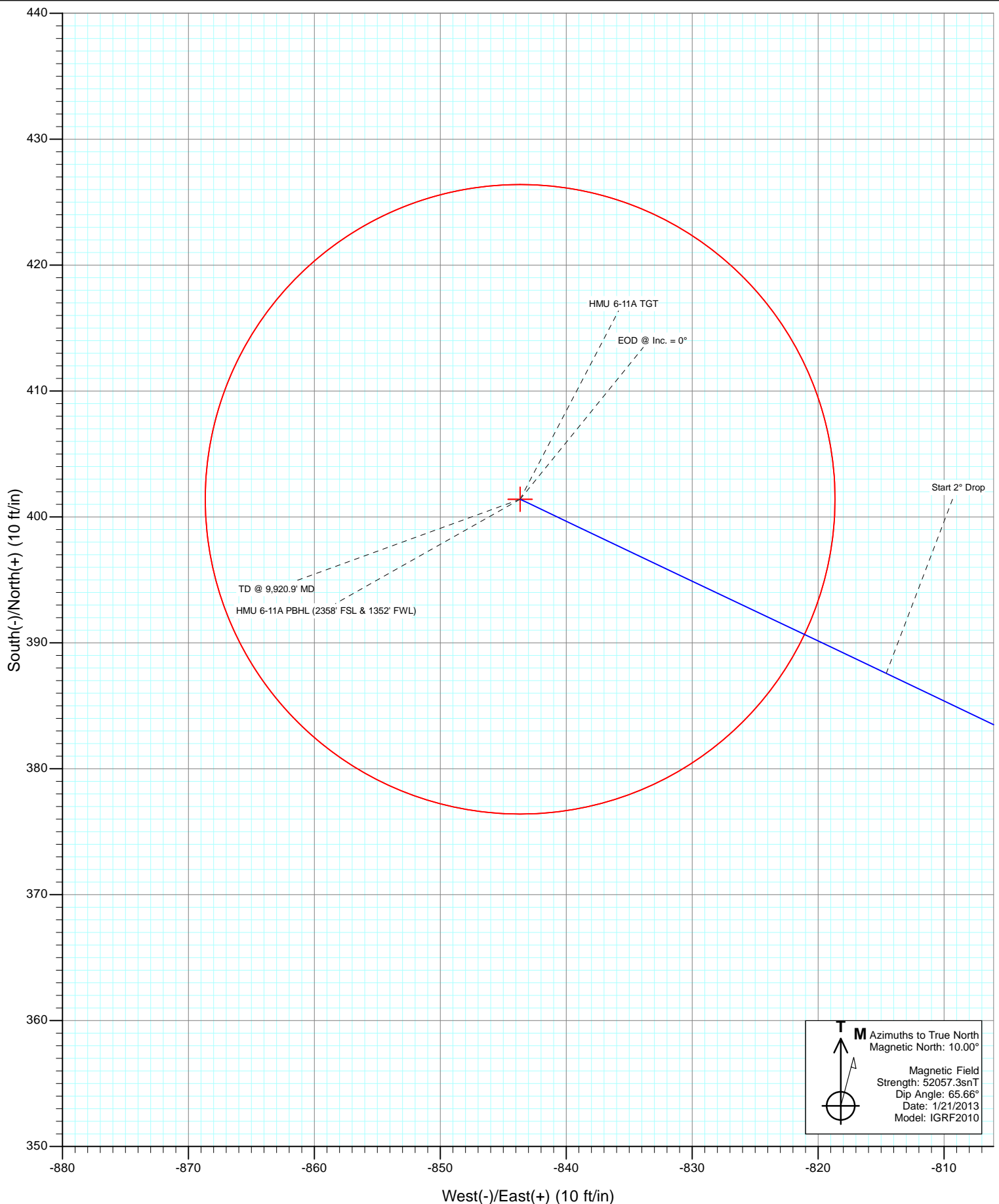


Project: Mamm Creek
Site: J6SEB Pad
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Project: Mamm Creek
Site: J6SEB Pad
Well: HMU 6-11A
Wellbore: OH
Design: Plan #1



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well HMU 6-11A
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Site:	J6SEB Pad	North Reference:	True
Well:	HMU 6-11A	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
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		J6SEB Pad			
Site Position:		Northing:	1,573,595.87 ft	Latitude:	39.387484
From:	Lat/Long	Easting:	2,376,514.08 ft	Longitude:	-107.706205
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.39 °

Well	HMU 6-11A					
Well Position	+N/-S	0.0 ft	Northing:	1,573,595.58 ft	Latitude:	39.387484
	+E/-W	0.0 ft	Easting:	2,376,525.67 ft	Longitude:	-107.706164
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	7,144.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/21/2013	10.00	65.66	52,057

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	295.44

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	
536.6	8.60	295.44	535.5	9.2	-19.4	3.00	3.00	0.00	295.44	
6,427.0	8.60	295.44	6,359.7	387.6	-814.6	0.00	0.00	0.00	0.00	
6,856.9	0.00	0.00	6,788.0	401.4	-843.7	2.00	-2.00	0.00	180.00	HMU 6-11A TGT
9,920.9	0.00	0.00	9,852.0	401.4	-843.7	0.00	0.00	0.00	0.00	HMU 6-11A PBHL (23
10,020.9	0.00	0.00	9,952.0	401.4	-843.7	0.00	0.00	0.00	0.00	

Cathedral Energy Services

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Project:	Mamm Creek	MD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Site:	J6SEB Pad	North Reference:	True
Well:	HMU 6-11A	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
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	295.44	300.0	0.3	-0.6	0.7	3.00	3.00	
400.0	4.50	295.44	399.8	2.5	-5.3	5.9	3.00	3.00	
500.0	7.50	295.44	499.3	7.0	-14.8	16.3	3.00	3.00	
536.6	8.60	295.44	535.5	9.2	-19.4	21.5	3.00	3.00	EOB @ Inc. = 8.6°
600.0	8.60	295.44	598.2	13.3	-27.9	30.9	0.00	0.00	
700.0	8.60	295.44	697.1	19.7	-41.4	45.9	0.00	0.00	
800.0	8.60	295.44	796.0	26.1	-54.9	60.8	0.00	0.00	
900.0	8.60	295.44	894.8	32.6	-68.4	75.8	0.00	0.00	
1,000.0	8.60	295.44	993.7	39.0	-81.9	90.7	0.00	0.00	
1,100.0	8.60	295.44	1,092.6	45.4	-95.4	105.7	0.00	0.00	
1,200.0	8.60	295.44	1,191.5	51.8	-108.9	120.6	0.00	0.00	
1,300.0	8.60	295.44	1,290.3	58.3	-122.4	135.6	0.00	0.00	
1,345.2	8.60	295.44	1,335.0	61.2	-128.5	142.3	0.00	0.00	Surface Casing
1,400.0	8.60	295.44	1,389.2	64.7	-135.9	150.5	0.00	0.00	
1,500.0	8.60	295.44	1,488.1	71.1	-149.4	165.5	0.00	0.00	
1,600.0	8.60	295.44	1,587.0	77.5	-162.9	180.4	0.00	0.00	
1,700.0	8.60	295.44	1,685.9	83.9	-176.4	195.4	0.00	0.00	
1,800.0	8.60	295.44	1,784.7	90.4	-189.9	210.3	0.00	0.00	
1,900.0	8.60	295.44	1,883.6	96.8	-203.4	225.3	0.00	0.00	
2,000.0	8.60	295.44	1,982.5	103.2	-216.9	240.2	0.00	0.00	
2,100.0	8.60	295.44	2,081.4	109.6	-230.4	255.2	0.00	0.00	
2,200.0	8.60	295.44	2,180.2	116.1	-243.9	270.1	0.00	0.00	
2,300.0	8.60	295.44	2,279.1	122.5	-257.4	285.1	0.00	0.00	
2,400.0	8.60	295.44	2,378.0	128.9	-270.9	300.0	0.00	0.00	
2,500.0	8.60	295.44	2,476.9	135.3	-284.4	315.0	0.00	0.00	
2,600.0	8.60	295.44	2,575.7	141.8	-297.9	329.9	0.00	0.00	
2,700.0	8.60	295.44	2,674.6	148.2	-311.4	344.9	0.00	0.00	
2,800.0	8.60	295.44	2,773.5	154.6	-324.9	359.8	0.00	0.00	
2,900.0	8.60	295.44	2,872.4	161.0	-338.4	374.8	0.00	0.00	
3,000.0	8.60	295.44	2,971.2	167.5	-351.9	389.7	0.00	0.00	
3,100.0	8.60	295.44	3,070.1	173.9	-365.4	404.7	0.00	0.00	
3,200.0	8.60	295.44	3,169.0	180.3	-378.9	419.6	0.00	0.00	
3,300.0	8.60	295.44	3,267.9	186.7	-392.4	434.6	0.00	0.00	
3,400.0	8.60	295.44	3,366.7	193.1	-405.9	449.5	0.00	0.00	
3,500.0	8.60	295.44	3,465.6	199.6	-419.4	464.5	0.00	0.00	
3,600.0	8.60	295.44	3,564.5	206.0	-432.9	479.4	0.00	0.00	
3,700.0	8.60	295.44	3,663.4	212.4	-446.4	494.4	0.00	0.00	
3,800.0	8.60	295.44	3,762.2	218.8	-459.9	509.3	0.00	0.00	
3,900.0	8.60	295.44	3,861.1	225.3	-473.4	524.3	0.00	0.00	
4,000.0	8.60	295.44	3,960.0	231.7	-486.9	539.2	0.00	0.00	
4,100.0	8.60	295.44	4,058.9	238.1	-500.4	554.2	0.00	0.00	
4,200.0	8.60	295.44	4,157.8	244.5	-513.9	569.1	0.00	0.00	
4,300.0	8.60	295.44	4,256.6	251.0	-527.4	584.1	0.00	0.00	
4,400.0	8.60	295.44	4,355.5	257.4	-540.9	599.0	0.00	0.00	
4,500.0	8.60	295.44	4,454.4	263.8	-554.4	614.0	0.00	0.00	
4,600.0	8.60	295.44	4,553.3	270.2	-567.9	628.9	0.00	0.00	
4,700.0	8.60	295.44	4,652.1	276.6	-581.4	643.9	0.00	0.00	
4,800.0	8.60	295.44	4,751.0	283.1	-594.9	658.8	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well HMU 6-11A
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Project:	Mamm Creek	MD Reference:	KB=22' @ 7166.0ft (Patterson #308)
Site:	J6SEB Pad	North Reference:	True
Well:	HMU 6-11A	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
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
4,900.0	8.60	295.44	4,849.9	289.5	-608.4	673.8	0.00	0.00	
5,000.0	8.60	295.44	4,948.8	295.9	-621.9	688.7	0.00	0.00	
5,100.0	8.60	295.44	5,047.6	302.3	-635.4	703.7	0.00	0.00	
5,200.0	8.60	295.44	5,146.5	308.8	-648.9	718.6	0.00	0.00	
5,200.5	8.60	295.44	5,147.0	308.8	-649.0	718.7	0.00	0.00	Mesaverde
5,300.0	8.60	295.44	5,245.4	315.2	-662.4	733.6	0.00	0.00	
5,400.0	8.60	295.44	5,344.3	321.6	-675.9	748.5	0.00	0.00	
5,500.0	8.60	295.44	5,443.1	328.0	-689.4	763.5	0.00	0.00	
5,600.0	8.60	295.44	5,542.0	334.5	-702.9	778.4	0.00	0.00	
5,700.0	8.60	295.44	5,640.9	340.9	-716.4	793.4	0.00	0.00	
5,800.0	8.60	295.44	5,739.8	347.3	-729.9	808.3	0.00	0.00	
5,809.3	8.60	295.44	5,749.0	347.9	-731.2	809.7	0.00	0.00	Williams Fork
5,900.0	8.60	295.44	5,838.6	353.7	-743.4	823.3	0.00	0.00	
6,000.0	8.60	295.44	5,937.5	360.1	-756.9	838.2	0.00	0.00	
6,100.0	8.60	295.44	6,036.4	366.6	-770.4	853.2	0.00	0.00	
6,200.0	8.60	295.44	6,135.3	373.0	-783.9	868.2	0.00	0.00	
6,300.0	8.60	295.44	6,234.2	379.4	-797.4	883.1	0.00	0.00	
6,400.0	8.60	295.44	6,333.0	385.8	-810.9	898.1	0.00	0.00	
6,427.0	8.60	295.44	6,359.7	387.6	-814.6	902.1	0.00	0.00	Start 2° Drop
6,500.0	7.14	295.44	6,432.0	391.9	-823.6	912.1	2.00	-2.00	
6,600.0	5.14	295.44	6,531.5	396.5	-833.3	922.8	2.00	-2.00	
6,700.0	3.14	295.44	6,631.2	399.6	-839.8	930.0	2.00	-2.00	
6,800.0	1.14	295.44	6,731.1	401.2	-843.1	933.7	2.00	-2.00	
6,856.9	0.00	0.00	6,788.0	401.4	-843.7	934.3	2.00	-2.00	EOD @ Inc. = 0° - Top Gas
6,900.0	0.00	0.00	6,831.1	401.4	-843.7	934.3	0.00	0.00	
7,000.0	0.00	0.00	6,931.1	401.4	-843.7	934.3	0.00	0.00	
7,100.0	0.00	0.00	7,031.1	401.4	-843.7	934.3	0.00	0.00	
7,200.0	0.00	0.00	7,131.1	401.4	-843.7	934.3	0.00	0.00	
7,300.0	0.00	0.00	7,231.1	401.4	-843.7	934.3	0.00	0.00	
7,400.0	0.00	0.00	7,331.1	401.4	-843.7	934.3	0.00	0.00	
7,500.0	0.00	0.00	7,431.1	401.4	-843.7	934.3	0.00	0.00	
7,600.0	0.00	0.00	7,531.1	401.4	-843.7	934.3	0.00	0.00	
7,700.0	0.00	0.00	7,631.1	401.4	-843.7	934.3	0.00	0.00	
7,800.0	0.00	0.00	7,731.1	401.4	-843.7	934.3	0.00	0.00	
7,900.0	0.00	0.00	7,831.1	401.4	-843.7	934.3	0.00	0.00	
7,926.9	0.00	0.00	7,858.0	401.4	-843.7	934.3	0.00	0.00	Coal Ridge
8,000.0	0.00	0.00	7,931.1	401.4	-843.7	934.3	0.00	0.00	
8,100.0	0.00	0.00	8,031.1	401.4	-843.7	934.3	0.00	0.00	
8,200.0	0.00	0.00	8,131.1	401.4	-843.7	934.3	0.00	0.00	
8,300.0	0.00	0.00	8,231.1	401.4	-843.7	934.3	0.00	0.00	
8,400.0	0.00	0.00	8,331.1	401.4	-843.7	934.3	0.00	0.00	
8,500.0	0.00	0.00	8,431.1	401.4	-843.7	934.3	0.00	0.00	
8,600.0	0.00	0.00	8,531.1	401.4	-843.7	934.3	0.00	0.00	
8,680.9	0.00	0.00	8,612.0	401.4	-843.7	934.3	0.00	0.00	Rollins
8,700.0	0.00	0.00	8,631.1	401.4	-843.7	934.3	0.00	0.00	
8,800.0	0.00	0.00	8,731.1	401.4	-843.7	934.3	0.00	0.00	
8,900.0	0.00	0.00	8,831.1	401.4	-843.7	934.3	0.00	0.00	
9,000.0	0.00	0.00	8,931.1	401.4	-843.7	934.3	0.00	0.00	
9,100.0	0.00	0.00	9,031.1	401.4	-843.7	934.3	0.00	0.00	
9,200.0	0.00	0.00	9,131.1	401.4	-843.7	934.3	0.00	0.00	
9,256.9	0.00	0.00	9,188.0	401.4	-843.7	934.3	0.00	0.00	Cozzette
9,300.0	0.00	0.00	9,231.1	401.4	-843.7	934.3	0.00	0.00	

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Well:	HMU 6-11A	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
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
9,400.0	0.00	0.00	9,331.1	401.4	-843.7	934.3	0.00	0.00	
9,420.9	0.00	0.00	9,352.0	401.4	-843.7	934.3	0.00	0.00	Corcoran
9,500.0	0.00	0.00	9,431.1	401.4	-843.7	934.3	0.00	0.00	
9,600.0	0.00	0.00	9,531.1	401.4	-843.7	934.3	0.00	0.00	
9,700.0	0.00	0.00	9,631.1	401.4	-843.7	934.3	0.00	0.00	
9,800.0	0.00	0.00	9,731.1	401.4	-843.7	934.3	0.00	0.00	
9,900.0	0.00	0.00	9,831.1	401.4	-843.7	934.3	0.00	0.00	
9,920.9	0.00	0.00	9,852.0	401.4	-843.7	934.3	0.00	0.00	TD @ 9,920.9' MD
10,000.0	0.00	0.00	9,931.1	401.4	-843.7	934.3	0.00	0.00	
10,020.9	0.00	0.00	9,952.0	401.4	-843.7	934.3	0.00	0.00	Permit TD @ 10,020.9' MD

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
HMU 6-11A PBHL (2358 - plan hits target center - Circle (radius 25.0))	0.00	0.00	9,852.0	401.4	-843.7	1,574,017.36	2,375,692.01	39.388586	-107.709149
HMU 6-11A TGT - plan hits target center - Point	0.00	0.00	6,788.0	401.4	-843.7	1,574,017.36	2,375,692.01	39.388586	-107.709149

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,345.2	1,335.0	Surface Casing		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,200.5	5,147.0	Mesaverde			
5,809.3	5,749.0	Williams Fork			
6,856.9	6,788.0	Top Gas			
7,926.9	7,858.0	Coal Ridge			
8,680.9	8,612.0	Rollins			
9,256.9	9,188.0	Cozzette			
9,420.9	9,352.0	Corcoran			

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Well:	HMU 6-11A	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
250.0	250.0	0.0	0.0	KOP @ 250'
536.6	535.5	9.2	-19.4	EOB @ Inc. = 8.6°
6,427.0	6,359.7	387.6	-814.6	Start 2° Drop
6,856.9	6,788.0	401.4	-843.7	EOD @ Inc. = 0°
9,920.9	9,852.0	401.4	-843.7	TD @ 9,920.9' MD
10,020.9	9,952.0	401.4	-843.7	Permit TD @ 10,020.9' MD