

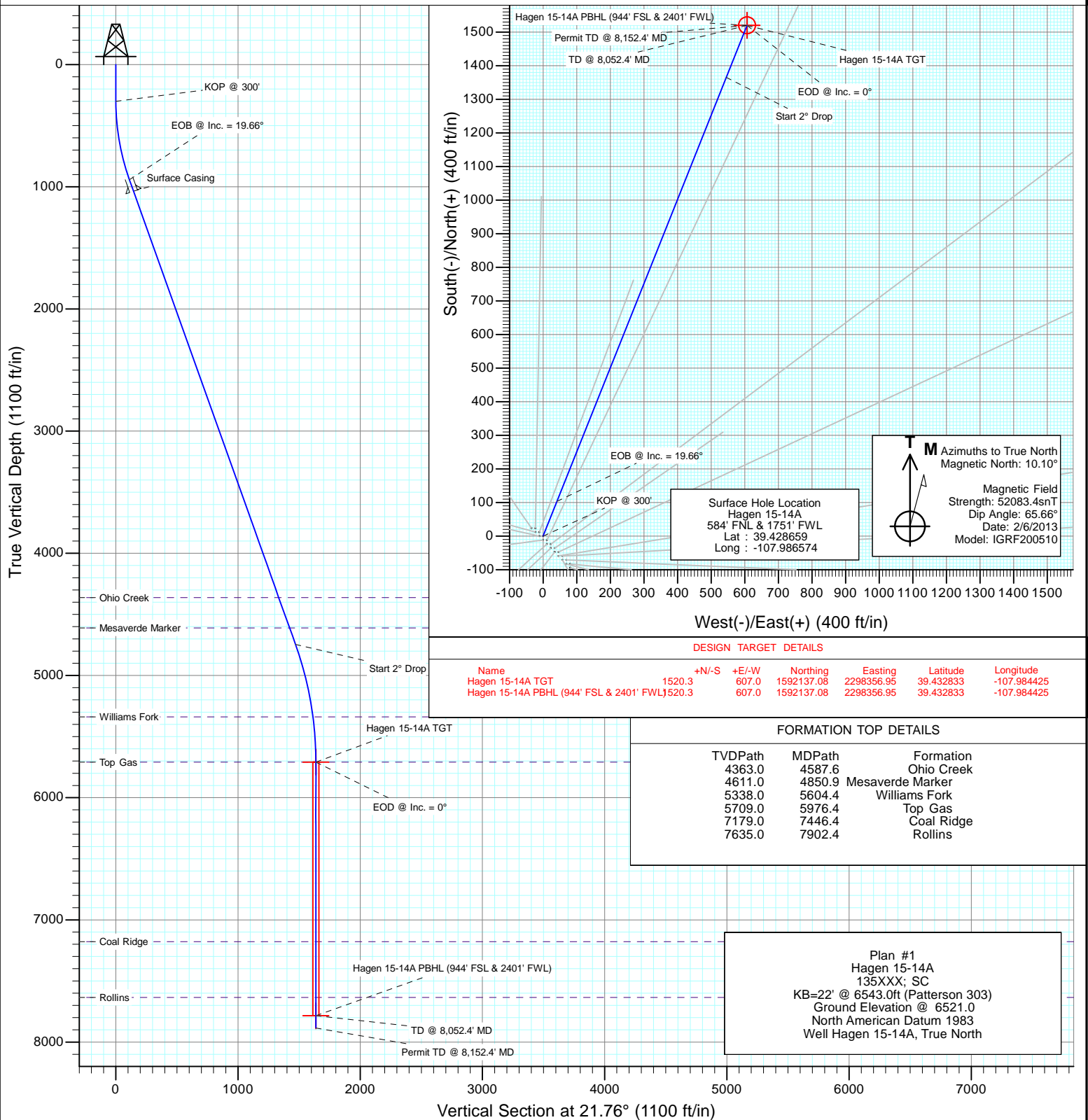


Project: S. Piceance (Parachute)
Site: PC-22 Pad NENW 2 7S 95W
Well: Hagen 15-14A
Wellbore: OH
Design: Plan #1



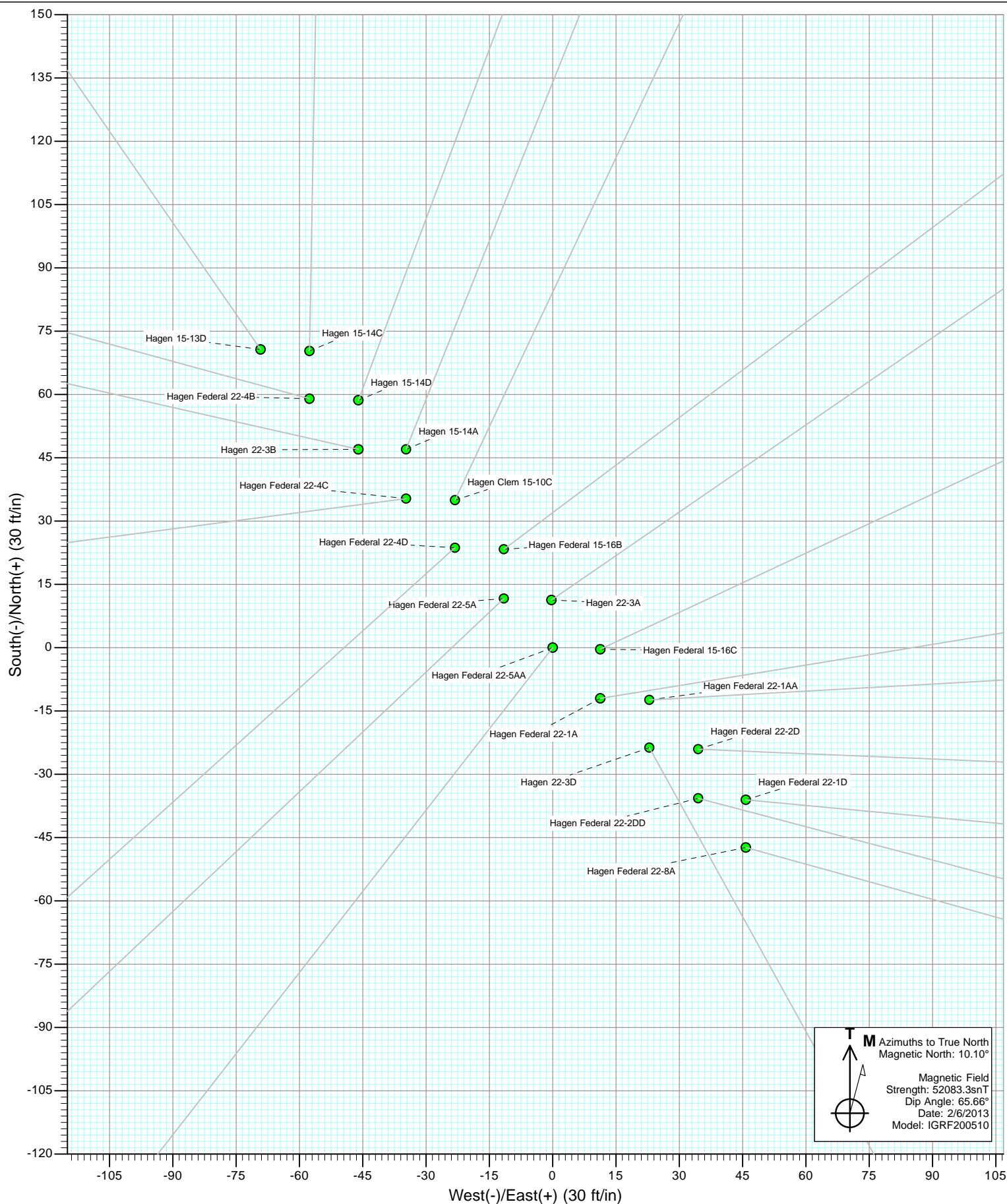
SECTION DETAILS

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	300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.0	
3	955.4	19.66	21.76	942.6	103.4	41.3	3.00	21.76	111.4	
4	4993.3	19.66	21.76	4745.1	1365.2	545.1	0.00	0.00	1470.0	
5	5976.4	0.00	0.00	5709.0	1520.3	607.0	2.00	180.00	1637.0	Hagen 15-14A TGT
6	8052.4	0.00	0.00	7785.0	1520.3	607.0	0.00	0.00	1637.0	Hagen 15-14A PBHL (944' FSL & 2401' FWL)
7	8152.4	0.00	0.00	7885.0	1520.3	607.0	0.00	0.00	1637.0	





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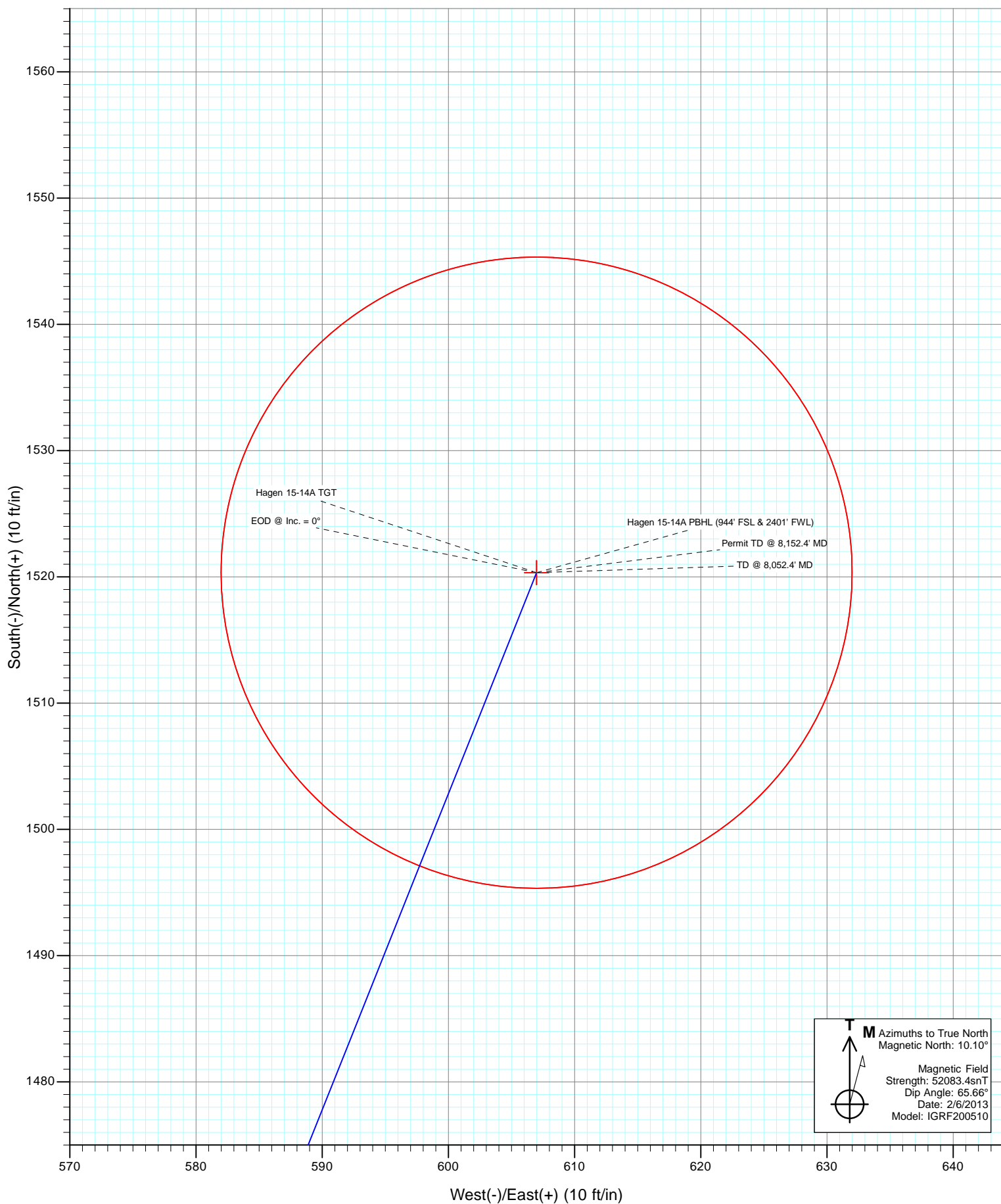


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Site: PC-22 Pad NENW 2 7S 95W
Well: Hagen 15-14A
Wellbore: OH
Design: Plan #1



Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well Hagen 15-14A
Company:	EnCana Oil & Gas (USA) Inc	TVD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Project:	S. Piceance (Parachute)	MD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Site:	PC-22 Pad NENW 2 7S 95W	North Reference:	True
Well:	Hagen 15-14A	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Project	S. Piceance (Parachute), Garfield County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		PC-22 Pad NENW 2 7S 95W			
Site Position:		Northing:	1,590,596.09 ft	Latitude:	39.428560
From:	Lat/Long	Easting:	2,297,773.66 ft	Longitude:	-107.986340
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	-1.57 °

Well	Hagen 15-14A					
Well Position	+N/-S	0.0 ft	Northing:	1,590,633.93 ft	Latitude:	39.428659
	+E/-W	0.0 ft	Easting:	2,297,708.58 ft	Longitude:	-107.986574
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	6,521.0 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF200510	2/6/2013	10.10	65.66	52,083

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	21.76

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	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
955.4	19.66	21.76	942.6	103.4	41.3	3.00	3.00	0.00	21.76	
4,993.3	19.66	21.76	4,745.1	1,365.2	545.1	0.00	0.00	0.00	0.00	
5,976.4	0.00	0.00	5,709.0	1,520.3	607.0	2.00	-2.00	0.00	180.00	Hagen 15-14A TGT
8,052.4	0.00	0.00	7,785.0	1,520.3	607.0	0.00	0.00	0.00	0.00	Hagen 15-14A PBHL
8,152.4	0.00	0.00	7,885.0	1,520.3	607.0	0.00	0.00	0.00	0.00	

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Project:	S. Piceance (Parachute)	MD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Site:	PC-22 Pad NENW 2 7S 95W	North Reference:	True
Well:	Hagen 15-14A	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	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	KOP @ 300'
400.0	3.00	21.76	400.0	2.4	1.0	2.6	3.00	3.00	
500.0	6.00	21.76	499.6	9.7	3.9	10.5	3.00	3.00	
600.0	9.00	21.76	598.8	21.8	8.7	23.5	3.00	3.00	
700.0	12.00	21.76	697.1	38.8	15.5	41.7	3.00	3.00	
800.0	15.00	21.76	794.3	60.4	24.1	65.1	3.00	3.00	
900.0	18.00	21.76	890.2	86.8	34.7	93.5	3.00	3.00	
955.4	19.66	21.76	942.6	103.4	41.3	111.4	3.00	3.00	EOB @ Inc. = 19.66°
1,000.0	19.66	21.76	984.6	117.4	46.9	126.4	0.00	0.00	
1,055.4	19.66	21.76	1,036.8	134.7	53.8	145.0	0.00	0.00	Surface Casing
1,100.0	19.66	21.76	1,078.8	148.6	59.3	160.0	0.00	0.00	
1,200.0	19.66	21.76	1,173.0	179.9	71.8	193.7	0.00	0.00	
1,300.0	19.66	21.76	1,267.1	211.1	84.3	227.3	0.00	0.00	
1,400.0	19.66	21.76	1,361.3	242.3	96.8	261.0	0.00	0.00	
1,500.0	19.66	21.76	1,455.5	273.6	109.2	294.6	0.00	0.00	
1,600.0	19.66	21.76	1,549.6	304.8	121.7	328.2	0.00	0.00	
1,700.0	19.66	21.76	1,643.8	336.1	134.2	361.9	0.00	0.00	
1,800.0	19.66	21.76	1,738.0	367.3	146.7	395.5	0.00	0.00	
1,900.0	19.66	21.76	1,832.1	398.6	159.1	429.2	0.00	0.00	
2,000.0	19.66	21.76	1,926.3	429.8	171.6	462.8	0.00	0.00	
2,100.0	19.66	21.76	2,020.5	461.1	184.1	496.5	0.00	0.00	
2,200.0	19.66	21.76	2,114.6	492.3	196.6	530.1	0.00	0.00	
2,300.0	19.66	21.76	2,208.8	523.6	209.0	563.8	0.00	0.00	
2,400.0	19.66	21.76	2,303.0	554.8	221.5	597.4	0.00	0.00	
2,500.0	19.66	21.76	2,397.2	586.1	234.0	631.1	0.00	0.00	
2,600.0	19.66	21.76	2,491.3	617.3	246.5	664.7	0.00	0.00	
2,700.0	19.66	21.76	2,585.5	648.6	258.9	698.4	0.00	0.00	
2,800.0	19.66	21.76	2,679.7	679.8	271.4	732.0	0.00	0.00	
2,900.0	19.66	21.76	2,773.8	711.1	283.9	765.7	0.00	0.00	
3,000.0	19.66	21.76	2,868.0	742.3	296.4	799.3	0.00	0.00	
3,100.0	19.66	21.76	2,962.2	773.6	308.9	833.0	0.00	0.00	
3,200.0	19.66	21.76	3,056.3	804.8	321.3	866.6	0.00	0.00	
3,300.0	19.66	21.76	3,150.5	836.1	333.8	900.2	0.00	0.00	
3,400.0	19.66	21.76	3,244.7	867.3	346.3	933.9	0.00	0.00	
3,500.0	19.66	21.76	3,338.8	898.6	358.8	967.5	0.00	0.00	
3,600.0	19.66	21.76	3,433.0	929.8	371.2	1,001.2	0.00	0.00	
3,700.0	19.66	21.76	3,527.2	961.1	383.7	1,034.8	0.00	0.00	
3,800.0	19.66	21.76	3,621.4	992.3	396.2	1,068.5	0.00	0.00	
3,900.0	19.66	21.76	3,715.5	1,023.6	408.7	1,102.1	0.00	0.00	
4,000.0	19.66	21.76	3,809.7	1,054.8	421.1	1,135.8	0.00	0.00	
4,100.0	19.66	21.76	3,903.9	1,086.1	433.6	1,169.4	0.00	0.00	
4,200.0	19.66	21.76	3,998.0	1,117.3	446.1	1,203.1	0.00	0.00	
4,300.0	19.66	21.76	4,092.2	1,148.6	458.6	1,236.7	0.00	0.00	
4,400.0	19.66	21.76	4,186.4	1,179.8	471.0	1,270.4	0.00	0.00	
4,500.0	19.66	21.76	4,280.5	1,211.1	483.5	1,304.0	0.00	0.00	
4,587.6	19.66	21.76	4,363.0	1,238.4	494.4	1,333.5	0.00	0.00	Ohio Creek
4,600.0	19.66	21.76	4,374.7	1,242.3	496.0	1,337.7	0.00	0.00	
4,700.0	19.66	21.76	4,468.9	1,273.6	508.5	1,371.3	0.00	0.00	
4,800.0	19.66	21.76	4,563.0	1,304.8	520.9	1,404.9	0.00	0.00	

Cathedral Energy Services

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Project:	S. Piceance (Parachute)	MD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Site:	PC-22 Pad NENW 2 7S 95W	North Reference:	True
Well:	Hagen 15-14A	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
4,850.9	19.66	21.76	4,611.0	1,320.7	527.3	1,422.1	0.00	0.00	Mesaverde Marker
4,900.0	19.66	21.76	4,657.2	1,336.0	533.4	1,438.6	0.00	0.00	
4,993.3	19.66	21.76	4,745.1	1,365.2	545.1	1,470.0	0.00	0.00	Start 2° Drop
5,000.0	19.53	21.76	4,751.4	1,367.3	545.9	1,472.2	2.00	-2.00	
5,100.0	17.53	21.76	4,846.2	1,396.8	557.7	1,504.0	2.00	-2.00	
5,200.0	15.53	21.76	4,942.1	1,423.2	568.2	1,532.5	2.00	-2.00	
5,300.0	13.53	21.76	5,038.9	1,446.5	577.5	1,557.5	2.00	-2.00	
5,400.0	11.53	21.76	5,136.5	1,466.7	585.6	1,579.2	2.00	-2.00	
5,500.0	9.53	21.76	5,234.8	1,483.6	592.3	1,597.5	2.00	-2.00	
5,600.0	7.53	21.76	5,333.7	1,497.4	597.8	1,612.3	2.00	-2.00	
5,604.4	7.44	21.76	5,338.0	1,497.9	598.0	1,612.9	2.00	-2.00	Williams Fork
5,700.0	5.53	21.76	5,433.0	1,508.0	602.1	1,623.7	2.00	-2.00	
5,800.0	3.53	21.76	5,532.7	1,515.3	605.0	1,631.6	2.00	-2.00	
5,900.0	1.53	21.76	5,632.6	1,519.4	606.6	1,636.0	2.00	-2.00	
5,976.4	0.00	0.00	5,709.0	1,520.3	607.0	1,637.0	2.00	-2.00	EOD @ Inc. = 0° - Top Gas
6,000.0	0.00	0.00	5,732.6	1,520.3	607.0	1,637.0	0.00	0.00	
6,100.0	0.00	0.00	5,832.6	1,520.3	607.0	1,637.0	0.00	0.00	
6,200.0	0.00	0.00	5,932.6	1,520.3	607.0	1,637.0	0.00	0.00	
6,300.0	0.00	0.00	6,032.6	1,520.3	607.0	1,637.0	0.00	0.00	
6,400.0	0.00	0.00	6,132.6	1,520.3	607.0	1,637.0	0.00	0.00	
6,500.0	0.00	0.00	6,232.6	1,520.3	607.0	1,637.0	0.00	0.00	
6,600.0	0.00	0.00	6,332.6	1,520.3	607.0	1,637.0	0.00	0.00	
6,700.0	0.00	0.00	6,432.6	1,520.3	607.0	1,637.0	0.00	0.00	
6,800.0	0.00	0.00	6,532.6	1,520.3	607.0	1,637.0	0.00	0.00	
6,900.0	0.00	0.00	6,632.6	1,520.3	607.0	1,637.0	0.00	0.00	
7,000.0	0.00	0.00	6,732.6	1,520.3	607.0	1,637.0	0.00	0.00	
7,100.0	0.00	0.00	6,832.6	1,520.3	607.0	1,637.0	0.00	0.00	
7,200.0	0.00	0.00	6,932.6	1,520.3	607.0	1,637.0	0.00	0.00	
7,300.0	0.00	0.00	7,032.6	1,520.3	607.0	1,637.0	0.00	0.00	
7,400.0	0.00	0.00	7,132.6	1,520.3	607.0	1,637.0	0.00	0.00	
7,446.4	0.00	0.00	7,179.0	1,520.3	607.0	1,637.0	0.00	0.00	Coal Ridge
7,500.0	0.00	0.00	7,232.6	1,520.3	607.0	1,637.0	0.00	0.00	
7,600.0	0.00	0.00	7,332.6	1,520.3	607.0	1,637.0	0.00	0.00	
7,700.0	0.00	0.00	7,432.6	1,520.3	607.0	1,637.0	0.00	0.00	
7,800.0	0.00	0.00	7,532.6	1,520.3	607.0	1,637.0	0.00	0.00	
7,900.0	0.00	0.00	7,632.6	1,520.3	607.0	1,637.0	0.00	0.00	
7,902.4	0.00	0.00	7,635.0	1,520.3	607.0	1,637.0	0.00	0.00	Rollins
8,000.0	0.00	0.00	7,732.6	1,520.3	607.0	1,637.0	0.00	0.00	
8,052.4	0.00	0.00	7,785.0	1,520.3	607.0	1,637.0	0.00	0.00	TD @ 8,052.4' MD
8,100.0	0.00	0.00	7,832.6	1,520.3	607.0	1,637.0	0.00	0.00	
8,152.4	0.00	0.00	7,885.0	1,520.3	607.0	1,637.0	0.00	0.00	Permit TD @ 8,152.4' MD

Cathedral Energy Services

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Project:	S. Piceance (Parachute)	MD Reference:	KB=22' @ 6543.0ft (Patterson 303)
Site:	PC-22 Pad NENW 2 7S 95W	North Reference:	True
Well:	Hagen 15-14A	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
Hagen 15-14A PBHL (94 - plan hits target center - Circle (radius 25.0))	0.00	0.00	7,785.0	1,520.3	607.0	1,592,137.08	2,298,356.95	39.432833	-107.984425
Hagen 15-14A TGT - plan hits target center - Point	0.00	0.00	5,709.0	1,520.3	607.0	1,592,137.08	2,298,356.95	39.432833	-107.984425

Casing Points				
Measured Depth	Vertical Depth	Name		
(ft)	(ft)			
		Casing Diameter	Hole Diameter	
		(in)	(in)	
1,055.4	1,036.8	Surface Casing		

Formations						
Measured Depth	Vertical Depth	Name		Lithology	Dip	Dip Direction
(ft)	(ft)				(°)	(°)
4,587.6	4,363.0	Ohio Creek				
4,850.9	4,611.0	Mesaverde Marker				
5,604.4	5,338.0	Williams Fork				
5,976.4	5,709.0	Top Gas				
7,446.4	7,179.0	Coal Ridge				
7,902.4	7,635.0	Rollins				

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S	+E/-W	
		(ft)	(ft)	
300.0	300.0	0.0	0.0	KOP @ 300'
955.4	942.6	103.4	41.3	EOB @ Inc. = 19.66°
4,993.3	4,745.1	1,365.2	545.1	Start 2° Drop
5,976.4	5,709.0	1,520.3	607.0	EOD @ Inc. = 0°
8,052.4	7,785.0	1,520.3	607.0	TD @ 8,052.4' MD
8,152.4	7,885.0	1,520.3	607.0	Permit TD @ 8,152.4' MD