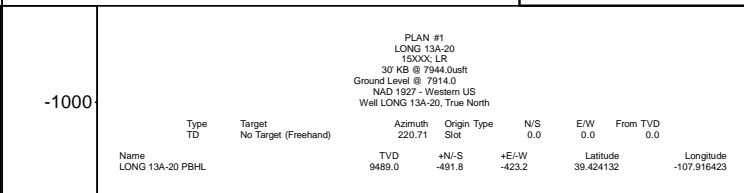


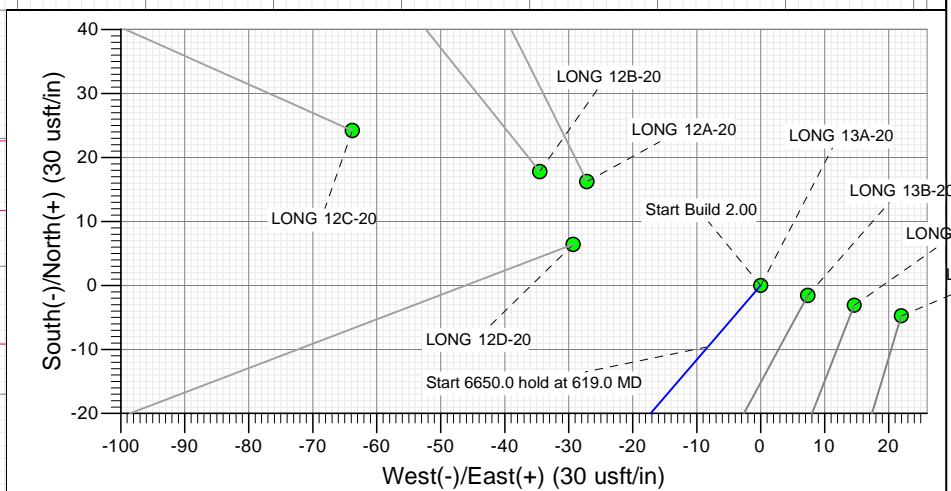
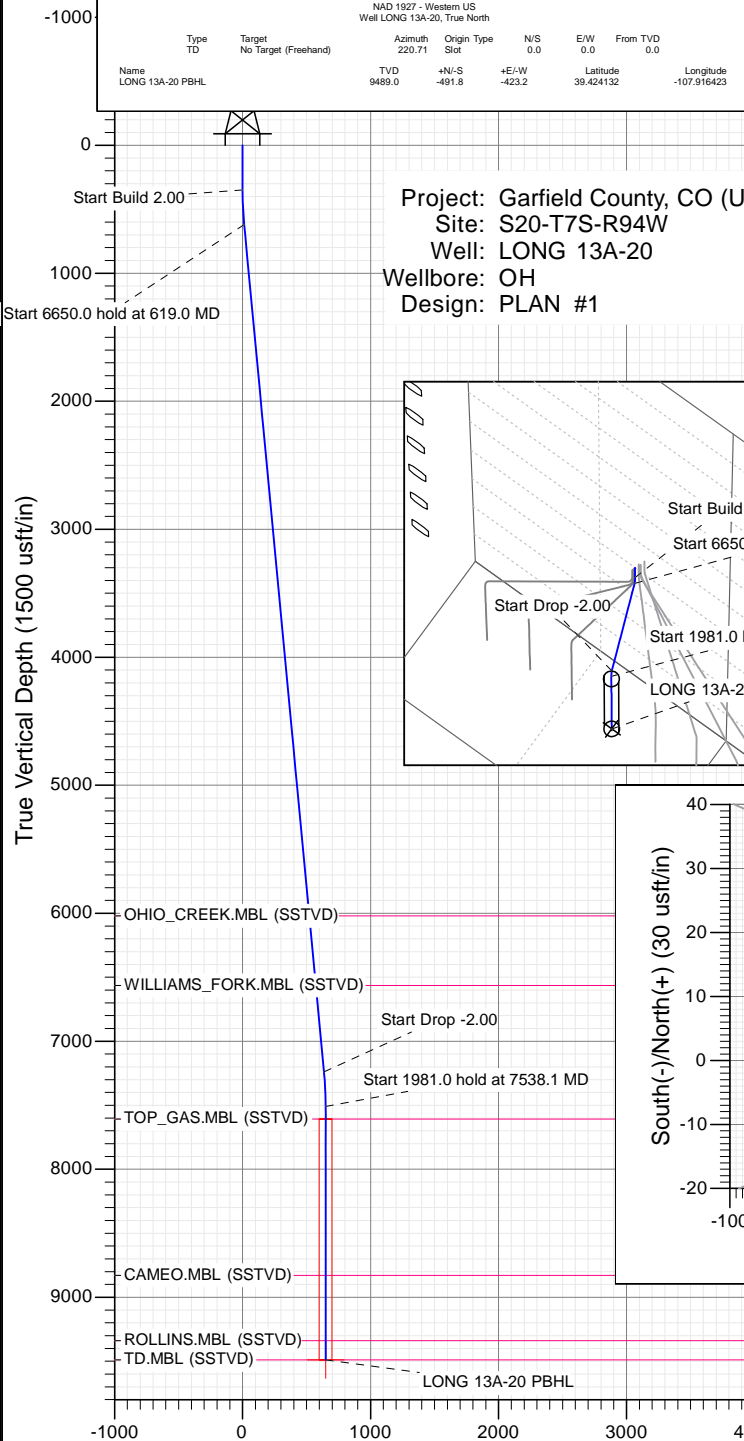
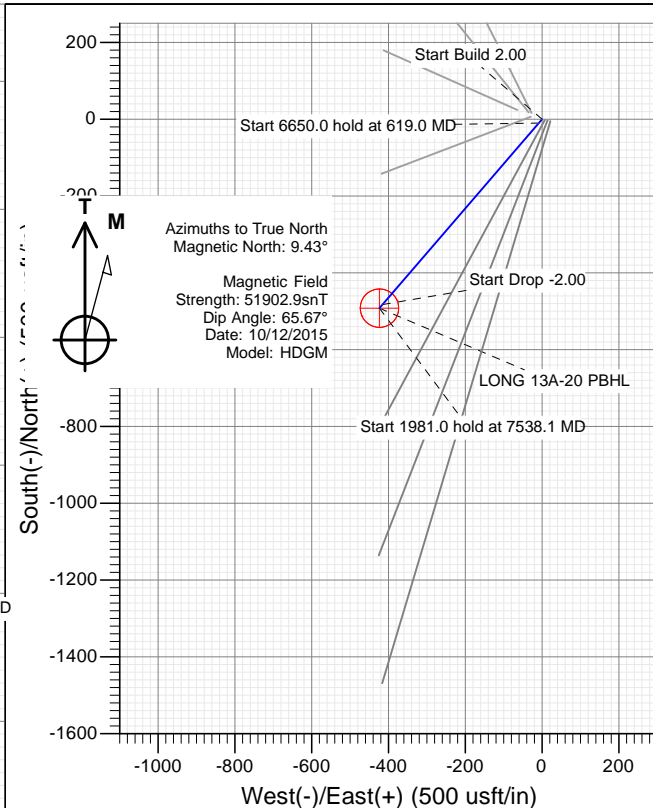
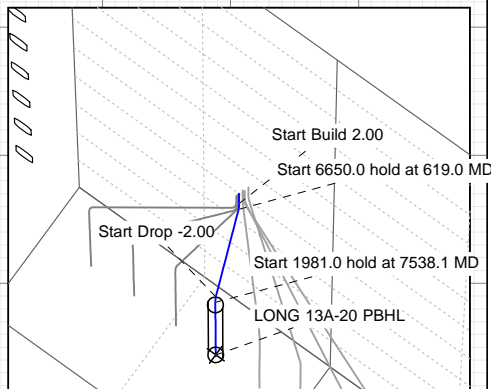


SECTION DETAILS

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	350.0	0.00	0.00	350.0	0.0	0.0	0.00	0.00	0.0	
3	619.0	5.38	220.71	618.6	-9.6	-8.2	2.00	220.71	12.6	
4	7269.1	5.38	220.71	7239.4	-482.2	-414.9	0.00	0.00	636.2	
5	7538.1	0.00	0.00	7508.0	-491.8	-423.2	2.00	180.00	648.8	
6	9519.1	0.00	0.00	9489.0	-491.8	-423.2	0.00	0.00	648.8	LONG 13A-20 PBHL



Project: Garfield County, CO (UTM 12N)
Site: S20-T7S-R94W
Well: LONG 13A-20
Wellbore: OH
Design: PLAN #1



Vertical Section at 220.71° (1500 usft/in)

WELL DETAILS: LONG 13A-20

+N/-S	+E/-W	North	Ground Level:	7914.0	Latitude	Longitude
0.0	0.0	14331758.00	Easting	2511696.60	39.425481	-107.914925



Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LONG 13A-20
Company:	Caerus Oil & Gas	TVD Reference:	30' KB @ 7944.0usft
Project:	Garfield County, CO (UTM 12N)	MD Reference:	30' KB @ 7944.0usft
Site:	S20-T7S-R94W	North Reference:	True
Well:	LONG 13A-20	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1		

Project	Garfield County, CO (UTM 12N)		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 - Western US		
Map Zone:	Zone 12N (114 W to 108 W)		

Site		S20-T7S-R94W			
Site Position:		Northing:	14,331,773.30 usft	Latitude:	39.425526
From:	Map	Easting:	2,511,668.90 usft	Longitude:	-107.915021
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.96 °

Well	LONG 13A-20					
Well Position	+N/-S	0.0 usft	Northing:	14,331,758.00 usft	Latitude:	39.425481
	+E/-W	0.0 usft	Easting:	2,511,696.60 usft	Longitude:	-107.914925
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,914.0 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	10/12/2015	9.43	65.67	51,903

Design	PLAN #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	220.71

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
350.0	0.00	0.00	350.0	0.0	0.0	0.00	0.00	0.00	0.00	
619.0	5.38	220.71	618.6	-9.6	-8.2	2.00	2.00	0.00	220.71	
7,269.1	5.38	220.71	7,239.4	-482.2	-414.9	0.00	0.00	0.00	0.00	
7,538.1	0.00	0.00	7,508.0	-491.8	-423.2	2.00	-2.00	0.00	180.00	
9,519.1	0.00	0.00	9,489.0	-491.8	-423.2	0.00	0.00	0.00	0.00	LONG 13A-20 PBHL

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LONG 13A-20
Company:	Caerus Oil & Gas	TVD Reference:	30' KB @ 7944.0usft
Project:	Garfield County, CO (UTM 12N)	MD Reference:	30' KB @ 7944.0usft
Site:	S20-T7S-R94W	North Reference:	True
Well:	LONG 13A-20	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	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	
350.0	0.00	0.00	350.0	0.0	0.0	0.0	0.00	0.00	Start Build 2.00
400.0	1.00	220.71	400.0	-0.3	-0.3	0.4	2.00	2.00	
500.0	3.00	220.71	499.9	-3.0	-2.6	3.9	2.00	2.00	
600.0	5.00	220.71	599.7	-8.3	-7.1	10.9	2.00	2.00	
619.0	5.38	220.71	618.6	-9.6	-8.2	12.6	2.00	2.00	Start 6650.0 hold at 619.0 MD
700.0	5.38	220.71	699.2	-15.3	-13.2	20.2	0.00	0.00	
800.0	5.38	220.71	798.8	-22.4	-19.3	29.6	0.00	0.00	
900.0	5.38	220.71	898.4	-29.5	-25.4	39.0	0.00	0.00	
1,000.0	5.38	220.71	997.9	-36.6	-31.5	48.3	0.00	0.00	
1,100.0	5.38	220.71	1,097.5	-43.8	-37.6	57.7	0.00	0.00	
1,200.0	5.38	220.71	1,197.0	-50.9	-43.8	67.1	0.00	0.00	
1,300.0	5.38	220.71	1,296.6	-58.0	-49.9	76.5	0.00	0.00	
1,400.0	5.38	220.71	1,396.2	-65.1	-56.0	85.9	0.00	0.00	
1,500.0	5.38	220.71	1,495.7	-72.2	-62.1	95.2	0.00	0.00	
1,600.0	5.38	220.71	1,595.3	-79.3	-68.2	104.6	0.00	0.00	
1,700.0	5.38	220.71	1,694.8	-86.4	-74.3	114.0	0.00	0.00	
1,800.0	5.38	220.71	1,794.4	-93.5	-80.5	123.4	0.00	0.00	
1,900.0	5.38	220.71	1,894.0	-100.6	-86.6	132.7	0.00	0.00	
2,000.0	5.38	220.71	1,993.5	-107.7	-92.7	142.1	0.00	0.00	
2,100.0	5.38	220.71	2,093.1	-114.8	-98.8	151.5	0.00	0.00	
2,200.0	5.38	220.71	2,192.6	-121.9	-104.9	160.9	0.00	0.00	
2,300.0	5.38	220.71	2,292.2	-129.0	-111.0	170.2	0.00	0.00	
2,400.0	5.38	220.71	2,391.8	-136.2	-117.2	179.6	0.00	0.00	
2,500.0	5.38	220.71	2,491.3	-143.3	-123.3	189.0	0.00	0.00	
2,600.0	5.38	220.71	2,590.9	-150.4	-129.4	198.4	0.00	0.00	
2,700.0	5.38	220.71	2,690.4	-157.5	-135.5	207.8	0.00	0.00	
2,800.0	5.38	220.71	2,790.0	-164.6	-141.6	217.1	0.00	0.00	
2,900.0	5.38	220.71	2,889.6	-171.7	-147.7	226.5	0.00	0.00	
3,000.0	5.38	220.71	2,989.1	-178.8	-153.8	235.9	0.00	0.00	
3,100.0	5.38	220.71	3,088.7	-185.9	-160.0	245.3	0.00	0.00	
3,200.0	5.38	220.71	3,188.2	-193.0	-166.1	254.6	0.00	0.00	
3,300.0	5.38	220.71	3,287.8	-200.1	-172.2	264.0	0.00	0.00	
3,400.0	5.38	220.71	3,387.4	-207.2	-178.3	273.4	0.00	0.00	
3,500.0	5.38	220.71	3,486.9	-214.3	-184.4	282.8	0.00	0.00	
3,600.0	5.38	220.71	3,586.5	-221.5	-190.5	292.1	0.00	0.00	
3,700.0	5.38	220.71	3,686.0	-228.6	-196.7	301.5	0.00	0.00	
3,800.0	5.38	220.71	3,785.6	-235.7	-202.8	310.9	0.00	0.00	
3,900.0	5.38	220.71	3,885.1	-242.8	-208.9	320.3	0.00	0.00	
4,000.0	5.38	220.71	3,984.7	-249.9	-215.0	329.7	0.00	0.00	
4,100.0	5.38	220.71	4,084.3	-257.0	-221.1	339.0	0.00	0.00	
4,200.0	5.38	220.71	4,183.8	-264.1	-227.2	348.4	0.00	0.00	
4,300.0	5.38	220.71	4,283.4	-271.2	-233.4	357.8	0.00	0.00	
4,400.0	5.38	220.71	4,382.9	-278.3	-239.5	367.2	0.00	0.00	
4,500.0	5.38	220.71	4,482.5	-285.4	-245.6	376.5	0.00	0.00	
4,600.0	5.38	220.71	4,582.1	-292.5	-251.7	385.9	0.00	0.00	
4,700.0	5.38	220.71	4,681.6	-299.6	-257.8	395.3	0.00	0.00	
4,800.0	5.38	220.71	4,781.2	-306.7	-263.9	404.7	0.00	0.00	
4,900.0	5.38	220.71	4,880.7	-313.9	-270.1	414.0	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LONG 13A-20
Company:	Caerus Oil & Gas	TVD Reference:	30' KB @ 7944.0usft
Project:	Garfield County, CO (UTM 12N)	MD Reference:	30' KB @ 7944.0usft
Site:	S20-T7S-R94W	North Reference:	True
Well:	LONG 13A-20	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
5,000.0	5.38	220.71	4,980.3	-321.0	-276.2	423.4	0.00	0.00	
5,100.0	5.38	220.71	5,079.9	-328.1	-282.3	432.8	0.00	0.00	
5,200.0	5.38	220.71	5,179.4	-335.2	-288.4	442.2	0.00	0.00	
5,300.0	5.38	220.71	5,279.0	-342.3	-294.5	451.6	0.00	0.00	
5,400.0	5.38	220.71	5,378.5	-349.4	-300.6	460.9	0.00	0.00	
5,500.0	5.38	220.71	5,478.1	-356.5	-306.7	470.3	0.00	0.00	
5,600.0	5.38	220.71	5,577.7	-363.6	-312.9	479.7	0.00	0.00	
5,700.0	5.38	220.71	5,677.2	-370.7	-319.0	489.1	0.00	0.00	
5,800.0	5.38	220.71	5,776.8	-377.8	-325.1	498.4	0.00	0.00	
5,900.0	5.38	220.71	5,876.3	-384.9	-331.2	507.8	0.00	0.00	
6,000.0	5.38	220.71	5,975.9	-392.0	-337.3	517.2	0.00	0.00	
6,045.3	5.38	220.71	6,021.0	-395.3	-340.1	521.4	0.00	0.00	OHIO_CREEK.MBL (SSTVD)
6,100.0	5.38	220.71	6,075.5	-399.1	-343.4	526.6	0.00	0.00	
6,200.0	5.38	220.71	6,175.0	-406.3	-349.6	535.9	0.00	0.00	
6,300.0	5.38	220.71	6,274.6	-413.4	-355.7	545.3	0.00	0.00	
6,400.0	5.38	220.71	6,374.1	-420.5	-361.8	554.7	0.00	0.00	
6,500.0	5.38	220.71	6,473.7	-427.6	-367.9	564.1	0.00	0.00	
6,590.7	5.38	220.71	6,564.0	-434.0	-373.5	572.6	0.00	0.00	WILLIAMS_FORK.MBL (SSTVD)
6,600.0	5.38	220.71	6,573.3	-434.7	-374.0	573.4	0.00	0.00	
6,700.0	5.38	220.71	6,672.8	-441.8	-380.1	582.8	0.00	0.00	
6,800.0	5.38	220.71	6,772.4	-448.9	-386.3	592.2	0.00	0.00	
6,900.0	5.38	220.71	6,871.9	-456.0	-392.4	601.6	0.00	0.00	
7,000.0	5.38	220.71	6,971.5	-463.1	-398.5	611.0	0.00	0.00	
7,100.0	5.38	220.71	7,071.0	-470.2	-404.6	620.3	0.00	0.00	
7,200.0	5.38	220.71	7,170.6	-477.3	-410.7	629.7	0.00	0.00	
7,269.1	5.38	220.71	7,239.4	-482.2	-414.9	636.2	0.00	0.00	Start Drop -2.00
7,300.0	4.76	220.71	7,270.2	-484.3	-416.7	638.9	2.00	-2.00	
7,400.0	2.76	220.71	7,370.0	-489.3	-421.0	645.5	2.00	-2.00	
7,500.0	0.76	220.71	7,469.9	-491.6	-423.0	648.6	2.00	-2.00	
7,538.1	0.00	0.00	7,508.0	-491.8	-423.2	648.8	2.00	-2.00	Start 1981.0 hold at 7538.1 MD
7,600.0	0.00	0.00	7,569.9	-491.8	-423.2	648.8	0.00	0.00	
7,638.1	0.00	0.00	7,608.0	-491.8	-423.2	648.8	0.00	0.00	TOP_GAS.MBL (SSTVD)
7,700.0	0.00	0.00	7,669.9	-491.8	-423.2	648.8	0.00	0.00	
7,800.0	0.00	0.00	7,769.9	-491.8	-423.2	648.8	0.00	0.00	
7,900.0	0.00	0.00	7,869.9	-491.8	-423.2	648.8	0.00	0.00	
8,000.0	0.00	0.00	7,969.9	-491.8	-423.2	648.8	0.00	0.00	
8,100.0	0.00	0.00	8,069.9	-491.8	-423.2	648.8	0.00	0.00	
8,200.0	0.00	0.00	8,169.9	-491.8	-423.2	648.8	0.00	0.00	
8,300.0	0.00	0.00	8,269.9	-491.8	-423.2	648.8	0.00	0.00	
8,400.0	0.00	0.00	8,369.9	-491.8	-423.2	648.8	0.00	0.00	
8,500.0	0.00	0.00	8,469.9	-491.8	-423.2	648.8	0.00	0.00	
8,600.0	0.00	0.00	8,569.9	-491.8	-423.2	648.8	0.00	0.00	
8,700.0	0.00	0.00	8,669.9	-491.8	-423.2	648.8	0.00	0.00	
8,800.0	0.00	0.00	8,769.9	-491.8	-423.2	648.8	0.00	0.00	
8,859.1	0.00	0.00	8,829.0	-491.8	-423.2	648.8	0.00	0.00	CAMEO.MBL (SSTVD)
8,900.0	0.00	0.00	8,869.9	-491.8	-423.2	648.8	0.00	0.00	
9,000.0	0.00	0.00	8,969.9	-491.8	-423.2	648.8	0.00	0.00	
9,100.0	0.00	0.00	9,069.9	-491.8	-423.2	648.8	0.00	0.00	
9,200.0	0.00	0.00	9,169.9	-491.8	-423.2	648.8	0.00	0.00	
9,300.0	0.00	0.00	9,269.9	-491.8	-423.2	648.8	0.00	0.00	
9,369.1	0.00	0.00	9,339.0	-491.8	-423.2	648.8	0.00	0.00	ROLLINS.MBL (SSTVD)
9,400.0	0.00	0.00	9,369.9	-491.8	-423.2	648.8	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LONG 13A-20
Company:	Caerus Oil & Gas	TVD Reference:	30' KB @ 7944.0usft
Project:	Garfield County, CO (UTM 12N)	MD Reference:	30' KB @ 7944.0usft
Site:	S20-T7S-R94W	North Reference:	True
Well:	LONG 13A-20	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
9,500.0	0.00	0.00	9,469.9	-491.8	-423.2	648.8	0.00	0.00	
9,519.1	0.00	0.00	9,489.0	-491.8	-423.2	648.8	0.00	0.00	TD at 9519.1 - TD.MBL (SSTVD)

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LONG 13A-20 PBHL - plan hits target center - Circle (radius 50.0)	0.00	0.00	9,489.0	-491.8	-423.2	14,331,252.00	2,511,290.50	39.424132	-107.916423

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,045.3	6,021.0	OHIO_CREEK.MBL (SSTVD)		0.00	
6,590.7	6,564.0	WILLIAMS_FORK.MBL (SSTVD)		0.00	
7,638.1	7,608.0	TOP_GAS.MBL (SSTVD)		0.00	
8,859.1	8,829.0	CAMEO.MBL (SSTVD)		0.00	
9,369.1	9,339.0	ROLLINS.MBL (SSTVD)		0.00	
9,519.1	9,489.0	TD.MBL (SSTVD)		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
350.0	350.0	0.0	0.0	Start Build 2.00
619.0	618.6	-9.6	-8.2	Start 6650.0 hold at 619.0 MD
7,269.1	7,239.4	-482.2	-414.9	Start Drop -2.00
7,538.1	7,508.0	-491.8	-423.2	Start 1981.0 hold at 7538.1 MD
9,519.1	9,489.0	-491.8	-423.2	TD at 9519.1