

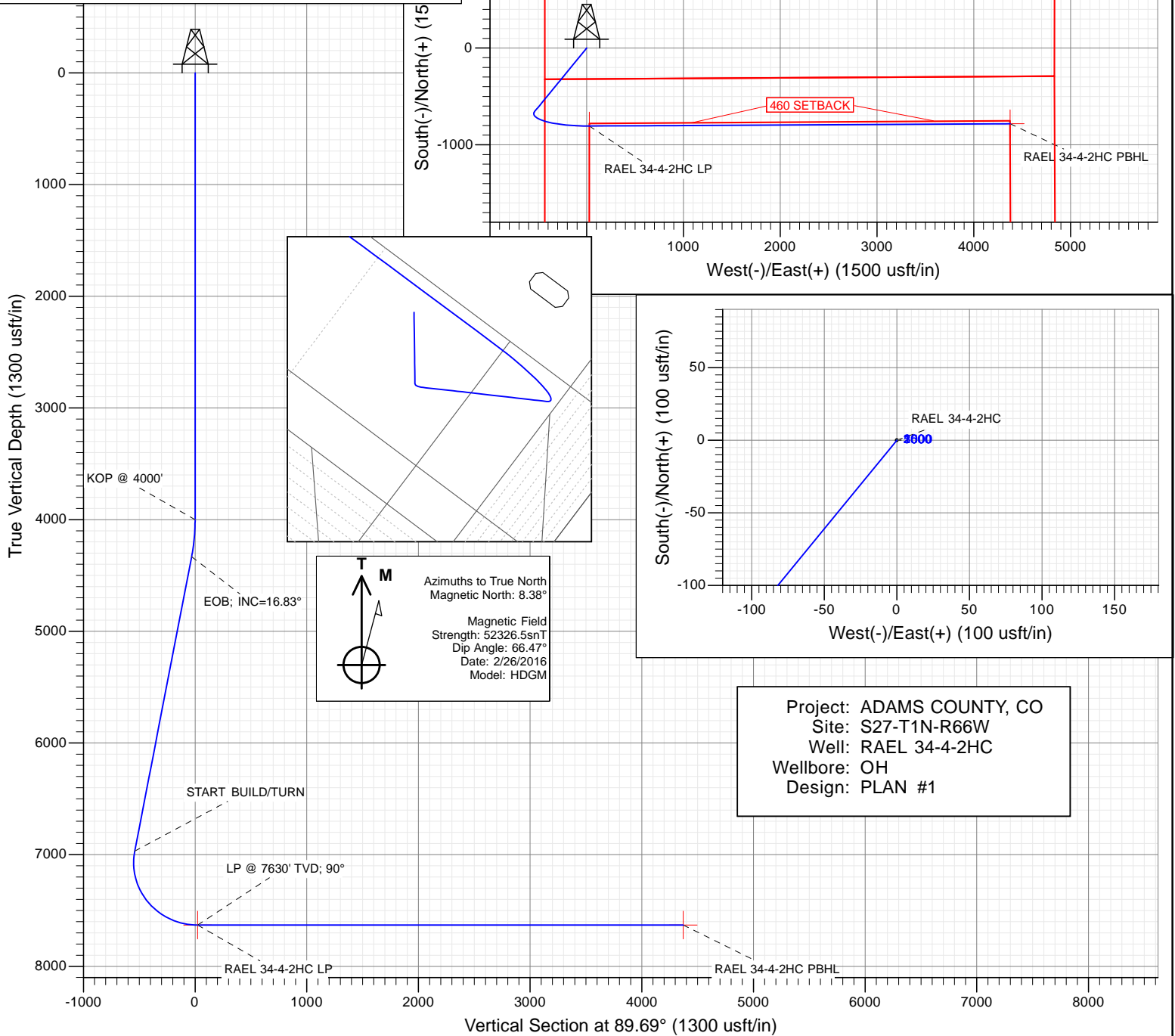


SECTION DETAILS

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	4000.0	0.00	0.00	4000.0	0.0	0.0	0.00	0.00	0.0	
3	4336.7	16.83	219.34	4331.8	-38.0	-31.1	5.00	219.34	-31.3	
4	7091.7	16.83	219.34	6968.9	-655.0	-536.9	0.00	0.00	-540.4	
5	8098.2	90.00	89.69	7630.0	-806.0	27.0	10.00	-128.42	22.6	RAEL 34-4-2HC LP
6	12446.4	90.00	89.69	7630.0	-782.8	4375.1	0.00	0.00	4370.8	RAEL 34-4-2HC PBHL

PLAN #1
RAEL 34-4-2HC
10300' LR
KB @ 5073.0usft
Ground Level @ 5058.0
North American Datum 1983
Well RAE 34-4-2HC, True North

Type	User	Target	No Target (Freshhand)	Azimuth	Origin	Type	N/S	E/W	From	TVD	+N/-S	+E/-W	Latitude	Longitude
Name	RAEL 34-4-2HC LP													
RAEL 34-4-2HC PBHL														



WELL DETAILS: RAE 34-4-2HC

+N/-S	+E/-W	Northing	Ground Level:	5058.0	Latitude	Longitude
0.0	0.0	1249455.87	Easting	3204137.42	40.015840	-104.771160

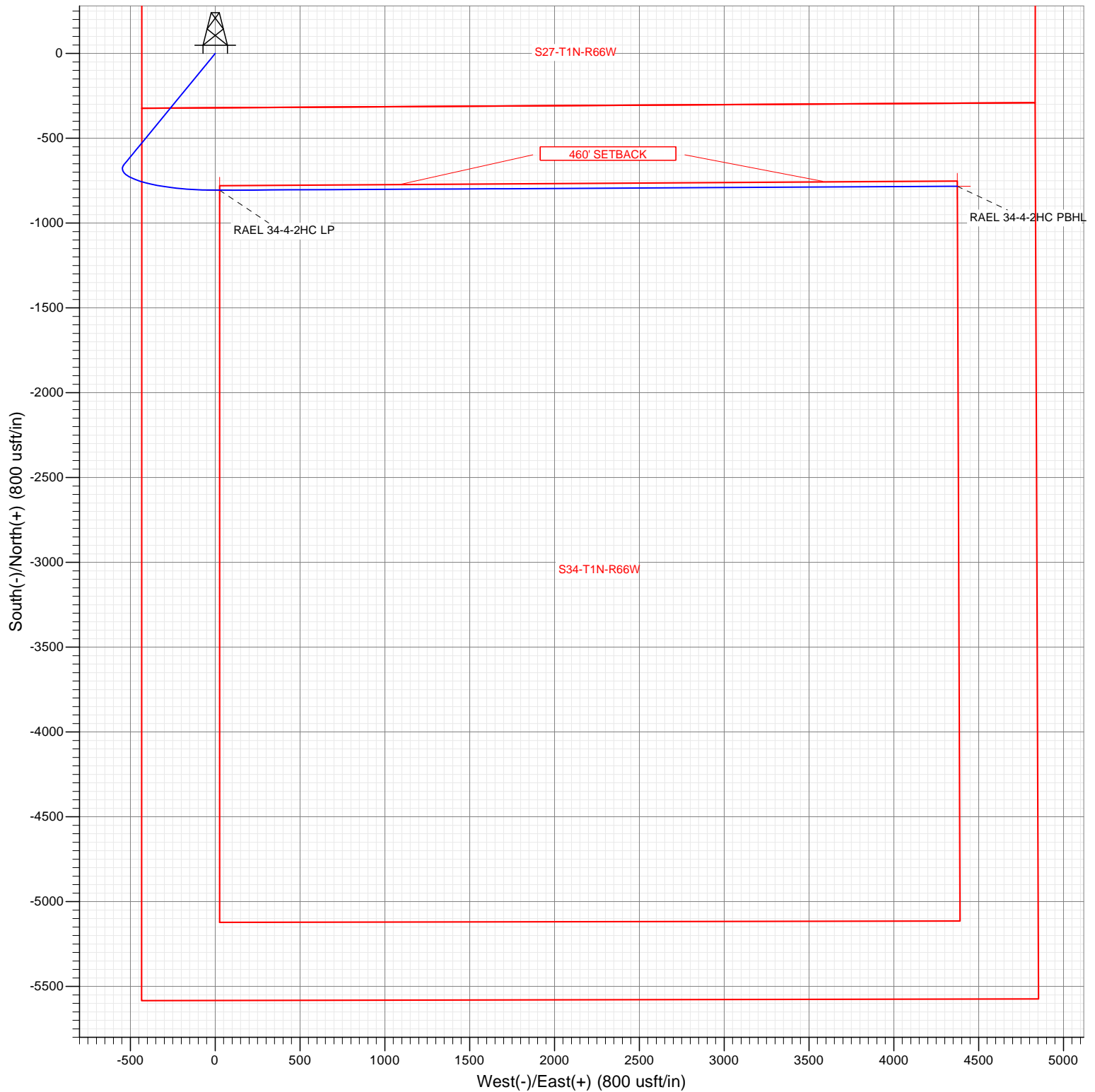
CATHEDRAL





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	4000.0	0.00	0.00	4000.0	0.0	0.0	0.00	0.00	0.0	
3	4336.7	16.83	219.34	4331.8	-38.0	-31.1	5.00	219.34	-31.3	
4	7091.7	16.83	219.34	6968.9	-655.0	-536.9	0.00	0.00	-540.4	
5	8098.2	90.00	89.69	7630.0	-806.0	27.0	10.00	-128.42	22.6	RAEL 34-4-2HC LP
6	12446.4	90.00	89.69	7630.0	-782.8	4375.1	0.00	0.00	4370.8	RAEL 34-4-2HC PBHL



CATHEDRAL

WELL DETAILS: RAE 34-4-2HC

+N/-S	+E/-W	Northing	Ground Level:	5058.0	Latitude	Longitude
0.0	0.0	1249455.87	Easting	3204137.42	40.015840	-104.771160



Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well RAEI 34-4-2HC
Company:	Ward Petroleum	TVD Reference:	KB @ 5073.0usft
Project:	ADAMS COUNTY, CO	MD Reference:	KB @ 5073.0usft
Site:	S27-T1N-R66W	North Reference:	True
Well:	RAEL 34-4-2HC	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	PLAN #1		

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

Site		S27-T1N-R66W			
Site Position:		Northing:	1,249,455.87 usft	Latitude:	40.015840
From:	Lat/Long	Easting:	3,204,137.42 usft	Longitude:	-104.771160
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.47 °

Well	RAEL 34-4-2HC					
Well Position	+N/-S	0.0 usft	Northing:	1,249,455.87 usft	Latitude:	40.015840
	+E/-W	0.0 usft	Easting:	3,204,137.42 usft	Longitude:	-104.771160
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	5,058.0 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	2/26/2016	8.38	66.47	52,327

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	89.69

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	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
4,336.7	16.83	219.34	4,331.8	-38.0	-31.1	5.00	5.00	0.00	219.34	
7,091.7	16.83	219.34	6,968.9	-655.0	-536.9	0.00	0.00	0.00	0.00	
8,098.2	90.00	89.69	7,630.0	-806.0	27.0	10.00	7.27	-12.88	-128.42	RAEL 34-4-2HC LP
12,446.4	90.00	89.69	7,630.0	-782.8	4,375.1	0.00	0.00	0.00	0.00	RAEL 34-4-2HC PBH

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well RAEI 34-4-2HC
Company:	Ward Petroleum	TVD Reference:	KB @ 5073.0usft
Project:	ADAMS COUNTY, CO	MD Reference:	KB @ 5073.0usft
Site:	S27-T1N-R66W	North Reference:	True
Well:	RAEL 34-4-2HC	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	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	KOP @ 4000'
4,100.0	5.00	219.34	4,099.9	-3.4	-2.8	-2.8	5.00	5.00	
4,200.0	10.00	219.34	4,199.0	-13.5	-11.0	-11.1	5.00	5.00	
4,300.0	15.00	219.34	4,296.6	-30.2	-24.8	-24.9	5.00	5.00	
4,336.7	16.83	219.34	4,331.8	-38.0	-31.1	-31.3	5.00	5.00	EOB; INC=16.83°
4,400.0	16.83	219.34	4,392.5	-52.2	-42.8	-43.0	0.00	0.00	
4,500.0	16.83	219.34	4,488.2	-74.6	-61.1	-61.5	0.00	0.00	
4,600.0	16.83	219.34	4,583.9	-96.9	-79.5	-80.0	0.00	0.00	
4,700.0	16.83	219.34	4,679.6	-119.3	-97.8	-98.5	0.00	0.00	
4,800.0	16.83	219.34	4,775.3	-141.7	-116.2	-117.0	0.00	0.00	
4,900.0	16.83	219.34	4,871.0	-164.1	-134.5	-135.4	0.00	0.00	
5,000.0	16.83	219.34	4,966.8	-186.5	-152.9	-153.9	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well RAEI 34-4-2HC
Company:	Ward Petroleum	TVD Reference:	KB @ 5073.0usft
Project:	ADAMS COUNTY, CO	MD Reference:	KB @ 5073.0usft
Site:	S27-T1N-R66W	North Reference:	True
Well:	RAEI 34-4-2HC	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
5,100.0	16.83	219.34	5,062.5	-208.9	-171.3	-172.4	0.00	0.00	
5,200.0	16.83	219.34	5,158.2	-231.3	-189.6	-190.9	0.00	0.00	
5,300.0	16.83	219.34	5,253.9	-253.7	-208.0	-209.3	0.00	0.00	
5,400.0	16.83	219.34	5,349.6	-276.1	-226.3	-227.8	0.00	0.00	
5,500.0	16.83	219.34	5,445.3	-298.5	-244.7	-246.3	0.00	0.00	
5,600.0	16.83	219.34	5,541.0	-320.9	-263.1	-264.8	0.00	0.00	
5,700.0	16.83	219.34	5,636.8	-343.3	-281.4	-283.3	0.00	0.00	
5,800.0	16.83	219.34	5,732.5	-365.7	-299.8	-301.7	0.00	0.00	
5,900.0	16.83	219.34	5,828.2	-388.1	-318.1	-320.2	0.00	0.00	
6,000.0	16.83	219.34	5,923.9	-410.5	-336.5	-338.7	0.00	0.00	
6,100.0	16.83	219.34	6,019.6	-432.9	-354.8	-357.2	0.00	0.00	
6,200.0	16.83	219.34	6,115.3	-455.3	-373.2	-375.7	0.00	0.00	
6,300.0	16.83	219.34	6,211.1	-477.7	-391.6	-394.1	0.00	0.00	
6,400.0	16.83	219.34	6,306.8	-500.1	-409.9	-412.6	0.00	0.00	
6,500.0	16.83	219.34	6,402.5	-522.5	-428.3	-431.1	0.00	0.00	
6,600.0	16.83	219.34	6,498.2	-544.9	-446.6	-449.6	0.00	0.00	
6,700.0	16.83	219.34	6,593.9	-567.3	-465.0	-468.1	0.00	0.00	
6,800.0	16.83	219.34	6,689.6	-589.7	-483.3	-486.5	0.00	0.00	
6,900.0	16.83	219.34	6,785.3	-612.1	-501.7	-505.0	0.00	0.00	
7,000.0	16.83	219.34	6,881.1	-634.4	-520.1	-523.5	0.00	0.00	
7,091.7	16.83	219.34	6,968.9	-655.0	-536.9	-540.4	0.00	0.00	START BUILD/TURN
7,100.0	16.33	217.04	6,976.8	-656.8	-538.4	-541.9	10.00	-6.06	
7,200.0	13.11	178.91	7,073.7	-679.5	-546.6	-550.3	10.00	-3.22	
7,300.0	16.54	141.34	7,170.6	-702.0	-537.5	-541.3	10.00	3.43	
7,400.0	23.91	121.39	7,264.5	-723.7	-511.2	-515.1	10.00	7.37	
7,500.0	32.66	111.01	7,352.5	-744.0	-468.6	-472.7	10.00	8.74	
7,600.0	41.92	104.73	7,432.0	-762.2	-411.0	-415.1	10.00	9.26	
7,700.0	51.41	100.41	7,500.6	-777.8	-340.1	-344.3	10.00	9.50	
7,800.0	61.03	97.10	7,556.1	-790.3	-258.0	-262.3	10.00	9.62	
7,900.0	70.72	94.37	7,596.9	-799.3	-167.3	-171.7	10.00	9.68	
8,000.0	80.44	91.94	7,621.8	-804.6	-70.8	-75.1	10.00	9.72	
8,098.2	90.00	89.69	7,630.0	-806.0	27.0	22.6	10.00	9.74	LP @ 7630' TVD; 90°
8,100.0	90.00	89.69	7,630.0	-806.0	28.8	24.4	0.00	0.00	
8,200.0	90.00	89.69	7,630.0	-805.5	128.8	124.4	0.00	0.00	
8,300.0	90.00	89.69	7,630.0	-804.9	228.8	224.4	0.00	0.00	
8,400.0	90.00	89.69	7,630.0	-804.4	328.8	324.4	0.00	0.00	
8,500.0	90.00	89.69	7,630.0	-803.9	428.8	424.4	0.00	0.00	
8,600.0	90.00	89.69	7,630.0	-803.3	528.8	524.4	0.00	0.00	
8,700.0	90.00	89.69	7,630.0	-802.8	628.8	624.4	0.00	0.00	
8,800.0	90.00	89.69	7,630.0	-802.3	728.8	724.4	0.00	0.00	
8,900.0	90.00	89.69	7,630.0	-801.7	828.8	824.4	0.00	0.00	
9,000.0	90.00	89.69	7,630.0	-801.2	928.8	924.4	0.00	0.00	
9,100.0	90.00	89.69	7,630.0	-800.7	1,028.8	1,024.4	0.00	0.00	
9,200.0	90.00	89.69	7,630.0	-800.1	1,128.8	1,124.4	0.00	0.00	
9,300.0	90.00	89.69	7,630.0	-799.6	1,228.8	1,224.4	0.00	0.00	
9,400.0	90.00	89.69	7,630.0	-799.1	1,328.8	1,324.4	0.00	0.00	
9,500.0	90.00	89.69	7,630.0	-798.5	1,428.8	1,424.4	0.00	0.00	
9,600.0	90.00	89.69	7,630.0	-798.0	1,528.8	1,524.4	0.00	0.00	
9,700.0	90.00	89.69	7,630.0	-797.5	1,628.8	1,624.4	0.00	0.00	
9,800.0	90.00	89.69	7,630.0	-796.9	1,728.7	1,724.4	0.00	0.00	
9,900.0	90.00	89.69	7,630.0	-796.4	1,828.7	1,824.4	0.00	0.00	
10,000.0	90.00	89.69	7,630.0	-795.9	1,928.7	1,924.4	0.00	0.00	

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well RAEI 34-4-2HC
Company:	Ward Petroleum	TVD Reference:	KB @ 5073.0usft
Project:	ADAMS COUNTY, CO	MD Reference:	KB @ 5073.0usft
Site:	S27-T1N-R66W	North Reference:	True
Well:	RAEL 34-4-2HC	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
10,100.0	90.00	89.69	7,630.0	-795.3	2,028.7	2,024.4	0.00	0.00	
10,200.0	90.00	89.69	7,630.0	-794.8	2,128.7	2,124.4	0.00	0.00	
10,300.0	90.00	89.69	7,630.0	-794.3	2,228.7	2,224.4	0.00	0.00	
10,400.0	90.00	89.69	7,630.0	-793.7	2,328.7	2,324.4	0.00	0.00	
10,500.0	90.00	89.69	7,630.0	-793.2	2,428.7	2,424.4	0.00	0.00	
10,600.0	90.00	89.69	7,630.0	-792.7	2,528.7	2,524.4	0.00	0.00	
10,700.0	90.00	89.69	7,630.0	-792.1	2,628.7	2,624.4	0.00	0.00	
10,800.0	90.00	89.69	7,630.0	-791.6	2,728.7	2,724.4	0.00	0.00	
10,900.0	90.00	89.69	7,630.0	-791.1	2,828.7	2,824.4	0.00	0.00	
11,000.0	90.00	89.69	7,630.0	-790.5	2,928.7	2,924.4	0.00	0.00	
11,100.0	90.00	89.69	7,630.0	-790.0	3,028.7	3,024.4	0.00	0.00	
11,200.0	90.00	89.69	7,630.0	-789.5	3,128.7	3,124.4	0.00	0.00	
11,300.0	90.00	89.69	7,630.0	-788.9	3,228.7	3,224.4	0.00	0.00	
11,400.0	90.00	89.69	7,630.0	-788.4	3,328.7	3,324.4	0.00	0.00	
11,500.0	90.00	89.69	7,630.0	-787.9	3,428.7	3,424.4	0.00	0.00	
11,600.0	90.00	89.69	7,630.0	-787.3	3,528.7	3,524.4	0.00	0.00	
11,700.0	90.00	89.69	7,630.0	-786.8	3,628.7	3,624.4	0.00	0.00	
11,800.0	90.00	89.69	7,630.0	-786.3	3,728.7	3,724.4	0.00	0.00	
11,900.0	90.00	89.69	7,630.0	-785.7	3,828.7	3,824.4	0.00	0.00	
12,000.0	90.00	89.69	7,630.0	-785.2	3,928.7	3,924.4	0.00	0.00	
12,100.0	90.00	89.69	7,630.0	-784.7	4,028.7	4,024.4	0.00	0.00	
12,200.0	90.00	89.69	7,630.0	-784.1	4,128.7	4,124.4	0.00	0.00	
12,300.0	90.00	89.69	7,630.0	-783.6	4,228.7	4,224.4	0.00	0.00	
12,400.0	90.00	89.69	7,630.0	-783.1	4,328.7	4,324.4	0.00	0.00	
12,446.4	90.00	89.69	7,630.0	-782.8	4,375.1	4,370.8	0.00	0.00	TD at 12446.4

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
RAEL 34-4-2HC PBHL - hit/miss target - Shape - Point	0.00	0.00	7,630.0	-782.8	4,375.1	1,248,709.05	3,208,518.83	40.013690	-104.755540
RAEL 34-4-2HC LP - plan hits target center - Point	0.00	0.00	7,630.0	-806.0	27.0	1,248,650.11	3,204,171.04	40.013627	-104.771064

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
4,000.0	4,000.0	0.0	0.0	KOP @ 4000'
4,336.7	4,331.8	-38.0	-31.1	EOB; INC=16.83°
7,091.7	6,968.9	-655.0	-536.9	START BUILD/TURN
8,098.2	7,630.0	-806.0	27.0	LP @ 7630' TVD; 90°
12,446.4	7,630.0	-782.8	4,375.1	TD at 12446.4