

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_HEIN 2-1 PAD

HEIN 27-1

HEIN 27-1

Plan: HEIN 27-1 (wp02)

Standard Planning Report

09 January, 2012

Project: COLORADO NORTHERN ZONE - 83
Site: WELD_HEIN 2-1 PAD
Well: HEIN 27-1
Wellbore: HEIN 27-1
Section:
SHL:
Design: HEIN 27-1 (wp02)
Latitude: 40.082105
Longitude: -104.836625
GL: 4893.00
KB: 15' rkb + 4893' gl @ 4908.00ft

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4008.00	4202.18	PK Depth
4470.00	4693.64	SX Depth
7166.00	7487.72	NIO Depth
7485.00	7806.72	CD Depth
7572.00	7893.72	GH Depth

WELL DETAILS: HEIN 27-1						
+N/-S	+E/-W	Northing	Ground Level: Easting	4893.00 Latitude	Longitude	Slot
0.00	0.00	1273449.97	3185621.41	40.082105	-104.836625	

CASING DETAILS			
TVD	MD	Name	Size
915.00	919.82	8-5/8"	8-5/8

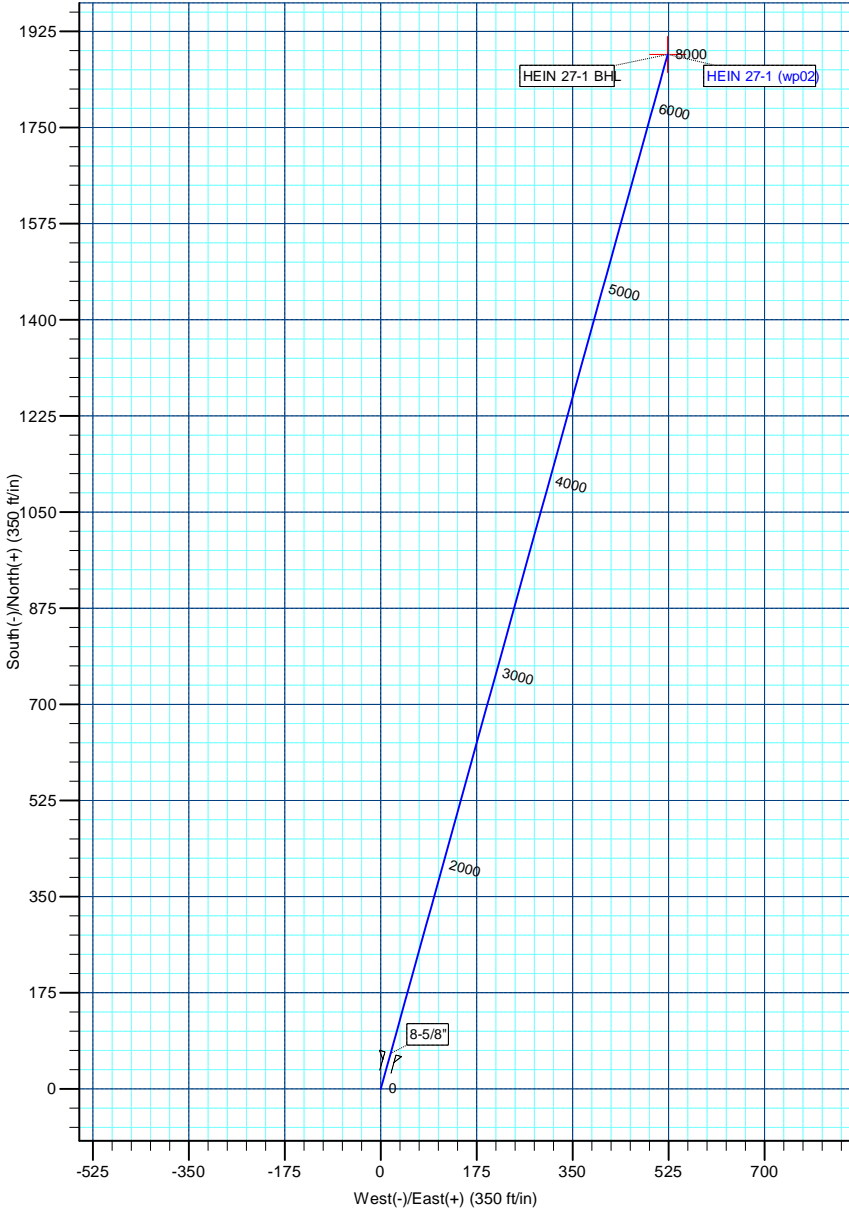
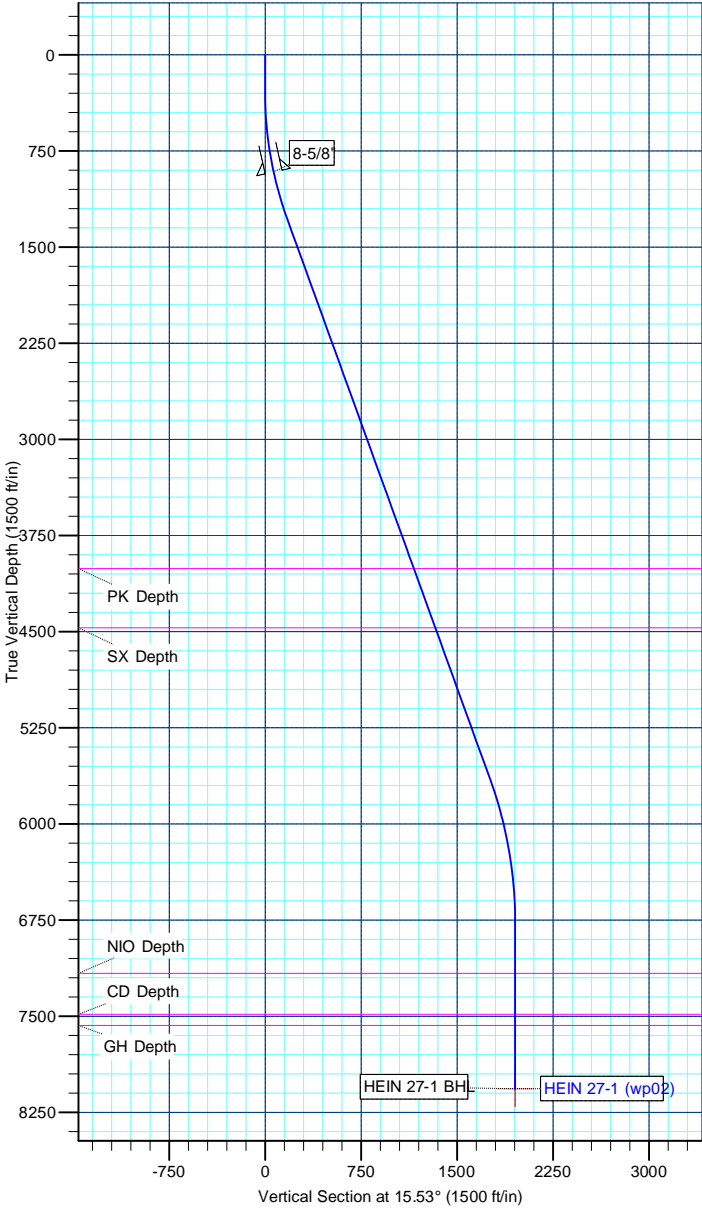
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Azimuths to True North
Magnetic North: 8.95°

Magnetic Field
Strength: 53012.1snT
Dip Angle: 66.80°
Date: 12/1/2010
Model: IGRF2010

DESIGN TARGET DETAILS									
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape	
HEIN 27-1 BHL	8066.00	1882.97	523.22	1275336.80	3186130.53	40.087274	-104.834755	Point	

SECTION DETAILS								
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00
1297.02	19.94	15.53	1277.02	165.48	45.98	2.00	15.53	171.75
5948.27	19.94	15.53	5649.41	1693.85	470.67	0.00	0.00	1758.03
7087.72	0.00	0.00	6766.00	1882.97	523.22	1.75	180.00	1954.31
8387.72	0.00	0.00	8066.00	1882.97	523.22	0.00	0.00	1954.31



Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HEIN 27-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' rkb + 4893' gl @ 4908.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' rkb + 4893' gl @ 4908.00ft
Site:	WELD_HEIN 2-1 PAD	North Reference:	True
Well:	HEIN 27-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	HEIN 27-1		
Design:	HEIN 27-1 (wp02)		

Project	COLORADO NORTHERN ZONE - 83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		WELD_HEIN 2-1 PAD			
Site Position:		Northing:	1,273,385.87 usft	Latitude:	40.081929
From:	Lat/Long	Easting:	3,185,622.17 usft	Longitude:	-104.836624
Position Uncertainty:	0.00 ft	Slot Radius:	0 "	Grid Convergence:	0.43 °

Well	HEIN 27-1					
Well Position	+N/-S	64.10 ft	Northing:	1,273,449.97 usft	Latitude:	40.082105
	+E/-W	-0.28 ft	Easting:	3,185,621.41 usft	Longitude:	-104.836625
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	4,893.00 ft

Wellbore	HEIN 27-1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/1/2010	8.95	66.80	53,012

Design	HEIN 27-1 (wp02)			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	15.53

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,297.02	19.94	15.53	1,277.02	165.48	45.98	2.00	2.00	0.00	15.53	
5,948.27	19.94	15.53	5,649.41	1,693.85	470.67	0.00	0.00	0.00	0.00	
7,087.72	0.00	0.00	6,766.00	1,882.97	523.22	1.75	-1.75	0.00	180.00	
8,387.72	0.00	0.00	8,066.00	1,882.97	523.22	0.00	0.00	0.00	0.00	HEIN 27-1 BHL

Anadarko Petroleum Corp

Planning Report

Database:	edmp	Local Co-ordinate Reference:	Well HEIN 27-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' rkb + 4893' gl @ 4908.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' rkb + 4893' gl @ 4908.00ft
Site:	WELD_HEIN 2-1 PAD	North Reference:	True
Well:	HEIN 27-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	HEIN 27-1		
Design:	HEIN 27-1 (wp02)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
400.00	2.00	15.53	399.98	1.68	0.47	1.75	2.00	2.00	0.00
500.00	4.00	15.53	499.84	6.72	1.87	6.98	2.00	2.00	0.00
600.00	6.00	15.53	599.45	15.12	4.20	15.69	2.00	2.00	0.00
700.00	8.00	15.53	698.70	26.86	7.46	27.88	2.00	2.00	0.00
800.00	10.00	15.53	797.47	41.93	11.65	43.52	2.00	2.00	0.00
900.00	12.00	15.53	895.62	60.32	16.76	62.60	2.00	2.00	0.00
919.82	12.40	15.53	915.00	64.35	17.88	66.79	2.00	2.00	0.00
8-5/8"									
1,000.00	14.00	15.53	993.06	81.99	22.78	85.10	2.00	2.00	0.00
1,100.00	16.00	15.53	1,089.64	106.93	29.71	110.98	2.00	2.00	0.00
1,200.00	18.00	15.53	1,185.27	135.09	37.54	140.21	2.00	2.00	0.00
1,297.02	19.94	15.53	1,277.02	165.48	45.98	171.75	2.00	2.00	0.00
Start 4651.24 hold at 1297.02 MD									
1,300.00	19.94	15.53	1,279.82	166.46	46.25	172.77	0.00	0.00	0.00
1,400.00	19.94	15.53	1,373.82	199.32	55.38	206.87	0.00	0.00	0.00
1,500.00	19.94	15.53	1,467.83	232.18	64.51	240.97	0.00	0.00	0.00
1,600.00	19.94	15.53	1,561.83	265.04	73.65	275.08	0.00	0.00	0.00
1,700.00	19.94	15.53	1,655.84	297.90	82.78	309.18	0.00	0.00	0.00
1,800.00	19.94	15.53	1,749.84	330.76	91.91	343.29	0.00	0.00	0.00
1,900.00	19.94	15.53	1,843.84	363.62	101.04	377.39	0.00	0.00	0.00
2,000.00	19.94	15.53	1,937.85	396.47	110.17	411.50	0.00	0.00	0.00
2,100.00	19.94	15.53	2,031.85	429.33	119.30	445.60	0.00	0.00	0.00
2,200.00	19.94	15.53	2,125.86	462.19	128.43	479.70	0.00	0.00	0.00
2,300.00	19.94	15.53	2,219.86	495.05	137.56	513.81	0.00	0.00	0.00
2,400.00	19.94	15.53	2,313.87	527.91	146.69	547.91	0.00	0.00	0.00
2,500.00	19.94	15.53	2,407.87	560.77	155.82	582.02	0.00	0.00	0.00
2,600.00	19.94	15.53	2,501.88	593.63	164.95	616.12	0.00	0.00	0.00
2,700.00	19.94	15.53	2,595.88	626.49	174.08	650.23	0.00	0.00	0.00
2,800.00	19.94	15.53	2,689.89	659.35	183.21	684.33	0.00	0.00	0.00
2,900.00	19.94	15.53	2,783.89	692.21	192.34	718.44	0.00	0.00	0.00
3,000.00	19.94	15.53	2,877.90	725.07	201.47	752.54	0.00	0.00	0.00
3,100.00	19.94	15.53	2,971.90	757.93	210.60	786.64	0.00	0.00	0.00
3,200.00	19.94	15.53	3,065.91	790.79	219.73	820.75	0.00	0.00	0.00
3,300.00	19.94	15.53	3,159.91	823.65	228.87	854.85	0.00	0.00	0.00
3,400.00	19.94	15.53	3,253.92	856.51	238.00	888.96	0.00	0.00	0.00
3,500.00	19.94	15.53	3,347.92	889.37	247.13	923.06	0.00	0.00	0.00
3,600.00	19.94	15.53	3,441.93	922.22	256.26	957.17	0.00	0.00	0.00
3,700.00	19.94	15.53	3,535.93	955.08	265.39	991.27	0.00	0.00	0.00
3,800.00	19.94	15.53	3,629.94	987.94	274.52	1,025.37	0.00	0.00	0.00
3,900.00	19.94	15.53	3,723.94	1,020.80	283.65	1,059.48	0.00	0.00	0.00
4,000.00	19.94	15.53	3,817.94	1,053.66	292.78	1,093.58	0.00	0.00	0.00
4,100.00	19.94	15.53	3,911.95	1,086.52	301.91	1,127.69	0.00	0.00	0.00
4,200.00	19.94	15.53	4,005.95	1,119.38	311.04	1,161.79	0.00	0.00	0.00
4,202.18	19.94	15.53	4,008.00	1,120.10	311.24	1,162.53	0.00	0.00	0.00
PK Depth									
4,300.00	19.94	15.53	4,099.96	1,152.24	320.17	1,195.90	0.00	0.00	0.00
4,400.00	19.94	15.53	4,193.96	1,185.10	329.30	1,230.00	0.00	0.00	0.00
4,500.00	19.94	15.53	4,287.97	1,217.96	338.43	1,264.10	0.00	0.00	0.00
4,600.00	19.94	15.53	4,381.97	1,250.82	347.56	1,298.21	0.00	0.00	0.00

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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' rkb + 4893' gl @ 4908.00ft
Site:	WELD_HEIN 2-1 PAD	North Reference:	True
Well:	HEIN 27-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	HEIN 27-1		
Design:	HEIN 27-1 (wp02)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,693.64	19.94	15.53	4,470.00	1,281.59	356.11	1,330.14	0.00	0.00	0.00
SX Depth									
4,700.00	19.94	15.53	4,475.98	1,283.68	356.69	1,332.31	0.00	0.00	0.00
4,800.00	19.94	15.53	4,569.98	1,316.54	365.82	1,366.42	0.00	0.00	0.00
4,900.00	19.94	15.53	4,663.99	1,349.40	374.95	1,400.52	0.00	0.00	0.00
5,000.00	19.94	15.53	4,757.99	1,382.26	384.08	1,434.63	0.00	0.00	0.00
5,100.00	19.94	15.53	4,852.00	1,415.11	393.22	1,468.73	0.00	0.00	0.00
5,200.00	19.94	15.53	4,946.00	1,447.97	402.35	1,502.83	0.00	0.00	0.00
5,300.00	19.94	15.53	5,040.01	1,480.83	411.48	1,536.94	0.00	0.00	0.00
5,400.00	19.94	15.53	5,134.01	1,513.69	420.61	1,571.04	0.00	0.00	0.00
5,500.00	19.94	15.53	5,228.02	1,546.55	429.74	1,605.15	0.00	0.00	0.00
5,600.00	19.94	15.53	5,322.02	1,579.41	438.87	1,639.25	0.00	0.00	0.00
5,700.00	19.94	15.53	5,416.03	1,612.27	448.00	1,673.36	0.00	0.00	0.00
5,800.00	19.94	15.53	5,510.03	1,645.13	457.13	1,707.46	0.00	0.00	0.00
5,900.00	19.94	15.53	5,604.04	1,677.99	466.26	1,741.56	0.00	0.00	0.00
5,948.27	19.94	15.53	5,649.41	1,693.85	470.67	1,758.03	0.00	0.00	0.00
Start Drop -1.75									
6,000.00	19.04	15.53	5,698.18	1,710.48	475.29	1,775.28	1.75	-1.75	0.00
6,100.00	17.29	15.53	5,793.19	1,740.51	483.63	1,806.45	1.75	-1.75	0.00
6,200.00	15.54	15.53	5,889.12	1,767.73	491.19	1,834.70	1.75	-1.75	0.00
6,300.00	13.79	15.53	5,985.86	1,792.11	497.97	1,860.01	1.75	-1.75	0.00
6,400.00	12.04	15.53	6,083.32	1,813.63	503.95	1,882.35	1.75	-1.75	0.00
6,500.00	10.29	15.53	6,181.43	1,832.28	509.13	1,901.70	1.75	-1.75	0.00
6,600.00	8.54	15.53	6,280.08	1,848.03	513.51	1,918.05	1.75	-1.75	0.00
6,700.00	6.79	15.53	6,379.18	1,860.88	517.08	1,931.38	1.75	-1.75	0.00
6,800.00	5.04	15.53	6,478.65	1,870.80	519.84	1,941.68	1.75	-1.75	0.00
6,900.00	3.29	15.53	6,578.38	1,877.79	521.78	1,948.93	1.75	-1.75	0.00
7,000.00	1.54	15.53	6,678.29	1,881.84	522.90	1,953.14	1.75	-1.75	0.00
7,087.72	0.00	0.00	6,766.00	1,882.97	523.22	1,954.31	1.75	-1.75	0.00
Start 1300.00 hold at 7087.72 MD									
7,100.00	0.00	0.00	6,778.28	1,882.97	523.22	1,954.31	0.00	0.00	0.00
7,200.00	0.00	0.00	6,878.28	1,882.97	523.22	1,954.31	0.00	0.00	0.00
7,300.00	0.00	0.00	6,978.28	1,882.97	523.22	1,954.31	0.00	0.00	0.00
7,400.00	0.00	0.00	7,078.28	1,882.97	523.22	1,954.31	0.00	0.00	0.00
7,487.72	0.00	0.00	7,166.00	1,882.97	523.22	1,954.31	0.00	0.00	0.00
NIO Depth									
7,500.00	0.00	0.00	7,178.28	1,882.97	523.22	1,954.31	0.00	0.00	0.00
7,600.00	0.00	0.00	7,278.28	1,882.97	523.22	1,954.31	0.00	0.00	0.00
7,700.00	0.00	0.00	7,378.28	1,882.97	523.22	1,954.31	0.00	0.00	0.00
7,800.00	0.00	0.00	7,478.28	1,882.97	523.22	1,954.31	0.00	0.00	0.00
7,806.72	0.00	0.00	7,485.00	1,882.97	523.22	1,954.31	0.00	0.00	0.00
CD Depth									
7,893.72	0.00	0.00	7,572.00	1,882.97	523.22	1,954.31	0.00	0.00	0.00
GH Depth									
7,900.00	0.00	0.00	7,578.28	1,882.97	523.22	1,954.31	0.00	0.00	0.00
8,000.00	0.00	0.00	7,678.28	1,882.97	523.22	1,954.31	0.00	0.00	0.00
8,100.00	0.00	0.00	7,778.28	1,882.97	523.22	1,954.31	0.00	0.00	0.00
8,200.00	0.00	0.00	7,878.28	1,882.97	523.22	1,954.31	0.00	0.00	0.00
8,300.00	0.00	0.00	7,978.28	1,882.97	523.22	1,954.31	0.00	0.00	0.00
8,387.72	0.00	0.00	8,066.00	1,882.97	523.22	1,954.31	0.00	0.00	0.00
TD at 8387.72 - HEIN 27-1 BHL									

Anadarko Petroleum Corp

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Database:	edmp	Local Co-ordinate Reference:	Well HEIN 27-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' rkb + 4893' gl @ 4908.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' rkb + 4893' gl @ 4908.00ft
Site:	WELD_HEIN 2-1 PAD	North Reference:	True
Well:	HEIN 27-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	HEIN 27-1		
Design:	HEIN 27-1 (wp02)		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
HEIN 27-1 BHL	0.00	0.00	8,066.00	1,882.97	523.22	1,275,336.80	3,186,130.53	40.087274	-104.834755
- plan hits target center									
- Point									

Casing Points					
Measured Depth	Vertical Depth	Name		Casing Diameter	Hole Diameter
(ft)	(ft)			(")	(")
919.82	915.00	8-5/8"		8-5/8	11

Formations						
Measured Depth	Vertical Depth	Name		Lithology	Dip	Dip Direction
(ft)	(ft)				(°)	(°)
4,202.18	4,008.00	PK Depth				
4,693.64	4,470.00	SX Depth				
7,487.72	7,166.00	NIO Depth				
7,806.72	7,485.00	CD Depth				
7,893.72	7,572.00	GH Depth				

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(ft)	(ft)	+N/-S	+E/-W		
(ft)	(ft)	(ft)	(ft)		
300.00	300.00	0.00	0.00	Start Build 2.00	
1,297.02	1,277.02	165.48	45.98	Start 4651.24 hold at 1297.02 MD	
5,948.27	5,649.41	1,693.85	470.67	Start Drop -1.75	
7,087.72	6,766.00	1,882.97	523.22	Start 1300.00 hold at 7087.72 MD	
8,387.72	8,066.00	1,882.97	523.22	TD at 8387.72	