

# NICKEL ROAD OPERATING

## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	
3	1150.00	5.00	190.00	1149.68	-10.74	-1.89	2.00	190.00	-0.12	
4	1696.84	15.19	216.51	1687.56	-92.02	-48.79	2.00	38.04	-33.14	
5	6719.94	15.19	216.51	6535.25	-1149.65	-831.65	0.00	0.00	-633.18	
6	7957.90	90.31	91.08	7340.51	-1342.20	-123.49	8.00	-124.40	96.90	
7	17275.90	90.31	91.08	7290.00	-1518.44	9192.71	0.00	0.00	9317.27	DEHAAN N 4X-HC-16-07-65 BHL

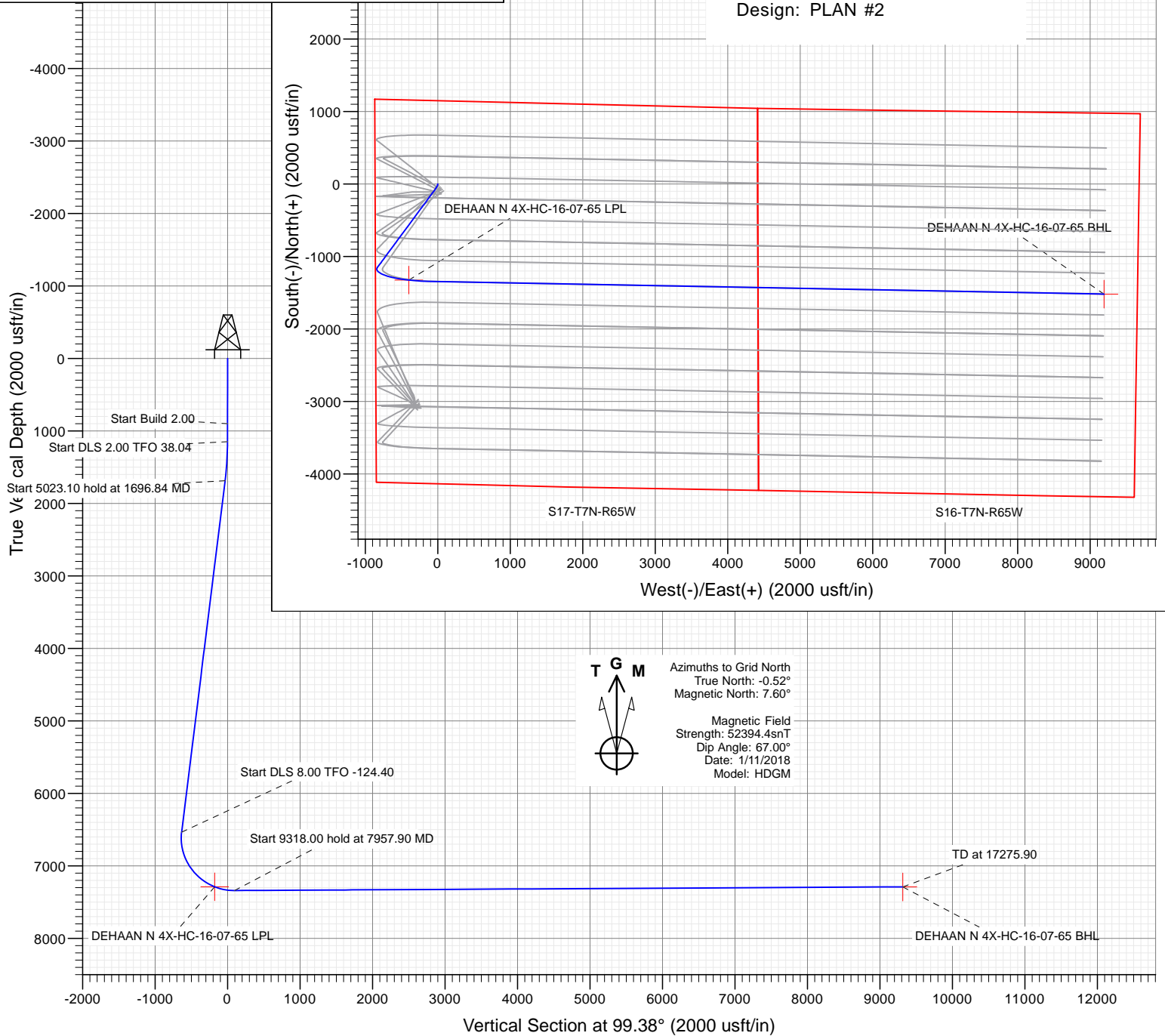
PLAN #2  
DEHAAN 4X-HC-16-07-65  
20' KB @ 4914.00usft  
Ground Level @ 4894.00  
North American Datum 1983  
Well DEHAAN 4X-HC-16-07-65 - Slot DEHAAN N 4X-HC-16-07-65 SHL Grid North

Type	Target	Target	Origin	N/S	E/W	From	TVD
TD	No Target (Freehand)	99.38	Slot	0.00	0.00	0.00	0.00

Name  
DEHAAN N 4X-HC-16-07-65 LPL  
DEHAAN N 4X-HC-16-07-65 BHL

TVD	+N/-S	+E/-W	Latitude	Longitude
7288.05	-1325.03	-388.63	40.575435	-104.694799
7290.00	-1518.44	9192.71	40.574660	-104.692080

Project: WELD COUNTY, CO  
Site: S17-T7N-R65W (DEHAAN)  
Well: DEHAAN 4X-HC-16-07-65  
Wellbore: OH  
Design: PLAN #2



## WELL DETAILS: DEHAAN 4X-HC-16-07-65

4894.00  
+N/-S 0.00 +E/-W 0.00 Northing 1454812.83 Easting 3224072.00 Latitude 40.579062 Longitude -104.693321

CATHEDRAL



# **Nickel Road Operating LLC**

**WELD COUNTY, CO**

**S17-T7N-R65W (DEHAAN)**

**DEHAAN 4X-HC-16-07-65 - Slot DEHAAN N 4X-HC-16-07-65**

**SHL**

**OH**

**Plan: PLAN #2**

## **Standard Planning Report**

**16 January, 2018**

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well DEHAAN 4X-HC-16-07-65 - Slot DEHAAN N 4X-HC-16-07-65 SHL
<b>Company:</b>	Nickel Road Operating LLC	<b>TVD Reference:</b>	20' KB @ 4914.00usft
<b>Project:</b>	WELD COUNTY, CO	<b>MD Reference:</b>	20' KB @ 4914.00usft
<b>Site:</b>	S17-T7N-R65W (DEHAAN)	<b>North Reference:</b>	Grid
<b>Well:</b>	DEHAAN 4X-HC-16-07-65	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #2		

<b>Project</b>	WELD COUNTY, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		S17-T7N-R65W (DEHAAN)			
Site Position:		Northing:	1,454,732.81 usft	Latitude:	40.578843
From:	Map	Easting:	3,224,073.79 usft	Longitude:	-104.693317
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.52 °

Well	DEHAAN 4X-HC-16-07-65 - Slot DEHAAN N 4X-HC-16-07-65 SHL					
Well Position	+N/-S	80.02 usft	Northing:	1,454,812.83 usft	Latitude:	40.579062
	+E/-W	-1.79 usft	Easting:	3,224,072.00 usft	Longitude:	-104.693321
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	4,894.00 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	1/11/2018	8.12	67.00	52,394.40000000

<b>Design</b>	PLAN #2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	99.38

<b>Plan Sections</b>										
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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,150.00	5.00	190.00	1,149.68	-10.74	-1.89	2.00	2.00	0.00	190.00	
1,696.84	15.19	216.51	1,687.56	-92.02	-48.79	2.00	1.86	4.85	38.04	
6,719.94	15.19	216.51	6,535.25	-1,149.65	-831.65	0.00	0.00	0.00	0.00	
7,957.90	90.31	91.08	7,340.51	-1,342.20	-123.49	8.00	6.07	-10.13	-124.40	
17,275.90	90.31	91.08	7,290.00	-1,518.44	9,192.71	0.00	0.00	0.00	0.00	DEHAAN N 4X-HC-16

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well DEHAAN 4X-HC-16-07-65 - Slot DEHAAN N 4X-HC-16-07-65 SHL
<b>Company:</b>	Nickel Road Operating LLC	<b>TVD Reference:</b>	20' KB @ 4914.00usft
<b>Project:</b>	WELD COUNTY, CO	<b>MD Reference:</b>	20' KB @ 4914.00usft
<b>Site:</b>	S17-T7N-R65W (DEHAAN)	<b>North Reference:</b>	Grid
<b>Well:</b>	DEHAAN 4X-HC-16-07-65	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #2		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	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	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,000.00	2.00	190.00	999.98	-1.72	-0.30	-0.02	2.00	2.00	0.00	
1,100.00	4.00	190.00	1,099.84	-6.87	-1.21	-0.08	2.00	2.00	0.00	
1,150.00	5.00	190.00	1,149.68	-10.74	-1.89	-0.12	2.00	2.00	0.00	
1,200.00	5.82	196.09	1,199.46	-15.32	-2.97	-0.44	2.00	1.64	12.18	
1,300.00	7.59	204.13	1,298.77	-26.22	-7.08	-2.71	2.00	1.77	8.04	
1,400.00	9.45	209.09	1,397.67	-39.42	-13.77	-7.16	2.00	1.86	4.96	
1,500.00	11.36	212.41	1,496.02	-54.92	-23.05	-13.79	2.00	1.91	3.32	
1,600.00	13.30	214.78	1,593.71	-72.68	-34.89	-22.58	2.00	1.94	2.37	
1,696.84	15.19	216.51	1,687.56	-92.02	-48.79	-33.14	2.00	1.95	1.78	
1,700.00	15.19	216.51	1,690.62	-92.69	-49.28	-33.52	0.00	0.00	0.00	
1,800.00	15.19	216.51	1,787.13	-113.74	-64.87	-45.46	0.00	0.00	0.00	
1,900.00	15.19	216.51	1,883.63	-134.80	-80.45	-57.41	0.00	0.00	0.00	
2,000.00	15.19	216.51	1,980.14	-155.85	-96.04	-69.35	0.00	0.00	0.00	
2,100.00	15.19	216.51	2,076.65	-176.91	-111.62	-81.30	0.00	0.00	0.00	
2,200.00	15.19	216.51	2,173.16	-197.96	-127.21	-93.24	0.00	0.00	0.00	
2,300.00	15.19	216.51	2,269.67	-219.02	-142.79	-105.19	0.00	0.00	0.00	
2,400.00	15.19	216.51	2,366.17	-240.07	-158.38	-117.13	0.00	0.00	0.00	
2,500.00	15.19	216.51	2,462.68	-261.13	-173.96	-129.08	0.00	0.00	0.00	
2,600.00	15.19	216.51	2,559.19	-282.18	-189.55	-141.03	0.00	0.00	0.00	
2,700.00	15.19	216.51	2,655.70	-303.24	-205.13	-152.97	0.00	0.00	0.00	
2,800.00	15.19	216.51	2,752.20	-324.29	-220.72	-164.92	0.00	0.00	0.00	
2,900.00	15.19	216.51	2,848.71	-345.35	-236.30	-176.86	0.00	0.00	0.00	
3,000.00	15.19	216.51	2,945.22	-366.40	-251.89	-188.81	0.00	0.00	0.00	
3,100.00	15.19	216.51	3,041.73	-387.46	-267.47	-200.75	0.00	0.00	0.00	
3,200.00	15.19	216.51	3,138.24	-408.52	-283.06	-212.70	0.00	0.00	0.00	
3,300.00	15.19	216.51	3,234.74	-429.57	-298.65	-224.65	0.00	0.00	0.00	
3,400.00	15.19	216.51	3,331.25	-450.63	-314.23	-236.59	0.00	0.00	0.00	
3,500.00	15.19	216.51	3,427.76	-471.68	-329.82	-248.54	0.00	0.00	0.00	
3,600.00	15.19	216.51	3,524.27	-492.74	-345.40	-260.48	0.00	0.00	0.00	
3,700.00	15.19	216.51	3,620.78	-513.79	-360.99	-272.43	0.00	0.00	0.00	
3,800.00	15.19	216.51	3,717.28	-534.85	-376.57	-284.37	0.00	0.00	0.00	
3,900.00	15.19	216.51	3,813.79	-555.90	-392.16	-296.32	0.00	0.00	0.00	
4,000.00	15.19	216.51	3,910.30	-576.96	-407.74	-308.26	0.00	0.00	0.00	
4,100.00	15.19	216.51	4,006.81	-598.01	-423.33	-320.21	0.00	0.00	0.00	
4,200.00	15.19	216.51	4,103.32	-619.07	-438.91	-332.16	0.00	0.00	0.00	
4,300.00	15.19	216.51	4,199.82	-640.12	-454.50	-344.10	0.00	0.00	0.00	
4,400.00	15.19	216.51	4,296.33	-661.18	-470.08	-356.05	0.00	0.00	0.00	
4,500.00	15.19	216.51	4,392.84	-682.23	-485.67	-367.99	0.00	0.00	0.00	
4,600.00	15.19	216.51	4,489.35	-703.29	-501.25	-379.94	0.00	0.00	0.00	
4,700.00	15.19	216.51	4,585.85	-724.34	-516.84	-391.88	0.00	0.00	0.00	
4,800.00	15.19	216.51	4,682.36	-745.40	-532.43	-403.83	0.00	0.00	0.00	
4,900.00	15.19	216.51	4,778.87	-766.45	-548.01	-415.77	0.00	0.00	0.00	
5,000.00	15.19	216.51	4,875.38	-787.51	-563.60	-427.72	0.00	0.00	0.00	

# Cathedral Energy Services

## Planning Report

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<b>Well:</b>	DEHAAN 4X-HC-16-07-65	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #2		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,100.00	15.19	216.51	4,971.89	-808.57	-579.18	-439.67	0.00	0.00	0.00	
5,200.00	15.19	216.51	5,068.39	-829.62	-594.77	-451.61	0.00	0.00	0.00	
5,300.00	15.19	216.51	5,164.90	-850.68	-610.35	-463.56	0.00	0.00	0.00	
5,400.00	15.19	216.51	5,261.41	-871.73	-625.94	-475.50	0.00	0.00	0.00	
5,500.00	15.19	216.51	5,357.92	-892.79	-641.52	-487.45	0.00	0.00	0.00	
5,600.00	15.19	216.51	5,454.43	-913.84	-657.11	-499.39	0.00	0.00	0.00	
5,700.00	15.19	216.51	5,550.93	-934.90	-672.69	-511.34	0.00	0.00	0.00	
5,800.00	15.19	216.51	5,647.44	-955.95	-688.28	-523.28	0.00	0.00	0.00	
5,900.00	15.19	216.51	5,743.95	-977.01	-703.86	-535.23	0.00	0.00	0.00	
6,000.00	15.19	216.51	5,840.46	-998.06	-719.45	-547.18	0.00	0.00	0.00	
6,100.00	15.19	216.51	5,936.97	-1,019.12	-735.03	-559.12	0.00	0.00	0.00	
6,200.00	15.19	216.51	6,033.47	-1,040.17	-750.62	-571.07	0.00	0.00	0.00	
6,300.00	15.19	216.51	6,129.98	-1,061.23	-766.21	-583.01	0.00	0.00	0.00	
6,400.00	15.19	216.51	6,226.49	-1,082.28	-781.79	-594.96	0.00	0.00	0.00	
6,500.00	15.19	216.51	6,323.00	-1,103.34	-797.38	-606.90	0.00	0.00	0.00	
6,600.00	15.19	216.51	6,419.50	-1,124.39	-812.96	-618.85	0.00	0.00	0.00	
6,700.00	15.19	216.51	6,516.01	-1,145.45	-828.55	-630.80	0.00	0.00	0.00	
6,719.94	15.19	216.51	6,535.25	-1,149.65	-831.65	-633.18	0.00	0.00	0.00	
6,800.00	12.69	191.74	6,613.02	-1,166.71	-839.69	-638.33	8.00	-3.12	-30.94	
6,900.00	13.70	156.42	6,710.54	-1,188.35	-837.19	-632.33	8.00	1.01	-35.32	
7,000.00	18.44	132.74	6,806.70	-1,209.97	-820.81	-612.64	8.00	4.75	-23.67	
7,100.00	24.87	119.68	6,899.65	-1,231.15	-790.87	-579.65	8.00	6.43	-13.07	
7,200.00	31.98	111.92	6,987.56	-1,251.48	-747.96	-534.01	8.00	7.11	-7.76	
7,300.00	39.41	106.78	7,068.74	-1,270.56	-692.91	-476.59	8.00	7.42	-5.13	
7,400.00	46.99	103.07	7,141.60	-1,288.03	-626.80	-408.51	8.00	7.59	-3.72	
7,500.00	54.68	100.18	7,204.71	-1,303.53	-550.91	-331.11	8.00	7.68	-2.89	
7,600.00	62.41	97.79	7,256.86	-1,316.77	-466.71	-245.88	8.00	7.74	-2.38	
7,675.39	68.27	96.21	7,288.30	-1,325.10	-398.73	-177.45	8.00	7.77	-2.10	
DEHAAN N 4X-HC-16-07-65 LPL										
7,700.00	70.19	95.73	7,297.03	-1,327.49	-375.85	-154.49	8.00	7.78	-1.98	
7,800.00	77.98	93.85	7,324.43	-1,335.48	-280.10	-58.71	8.00	7.79	-1.87	
7,900.00	85.79	92.09	7,338.54	-1,340.60	-181.31	39.59	8.00	7.81	-1.77	
7,957.90	90.31	91.08	7,340.51	-1,342.20	-123.49	96.90	8.00	7.81	-1.73	
8,000.00	90.31	91.08	7,340.28	-1,342.99	-81.39	138.56	0.00	0.00	0.00	
8,100.00	90.31	91.08	7,339.74	-1,344.88	18.59	237.52	0.00	0.00	0.00	
8,200.00	90.31	91.08	7,339.20	-1,346.77	118.57	336.47	0.00	0.00	0.00	
8,300.00	90.31	91.08	7,338.65	-1,348.67	218.55	435.42	0.00	0.00	0.00	
8,400.00	90.31	91.08	7,338.11	-1,350.56	318.53	534.37	0.00	0.00	0.00	
8,500.00	90.31	91.08	7,337.57	-1,352.45	418.51	633.33	0.00	0.00	0.00	
8,600.00	90.31	91.08	7,337.03	-1,354.34	518.49	732.28	0.00	0.00	0.00	
8,700.00	90.31	91.08	7,336.49	-1,356.23	618.47	831.23	0.00	0.00	0.00	
8,800.00	90.31	91.08	7,335.94	-1,358.12	718.45	930.18	0.00	0.00	0.00	
8,900.00	90.31	91.08	7,335.40	-1,360.01	818.43	1,029.13	0.00	0.00	0.00	
9,000.00	90.31	91.08	7,334.86	-1,361.91	918.41	1,128.09	0.00	0.00	0.00	
9,100.00	90.31	91.08	7,334.32	-1,363.80	1,018.39	1,227.04	0.00	0.00	0.00	
9,200.00	90.31	91.08	7,333.78	-1,365.69	1,118.38	1,325.99	0.00	0.00	0.00	
9,300.00	90.31	91.08	7,333.23	-1,367.58	1,218.36	1,424.94	0.00	0.00	0.00	
9,400.00	90.31	91.08	7,332.69	-1,369.47	1,318.34	1,523.90	0.00	0.00	0.00	
9,500.00	90.31	91.08	7,332.15	-1,371.36	1,418.32	1,622.85	0.00	0.00	0.00	
9,600.00	90.31	91.08	7,331.61	-1,373.25	1,518.30	1,721.80	0.00	0.00	0.00	
9,700.00	90.31	91.08	7,331.07	-1,375.15	1,618.28	1,820.75	0.00	0.00	0.00	
9,800.00	90.31	91.08	7,330.52	-1,377.04	1,718.26	1,919.70	0.00	0.00	0.00	
9,900.00	90.31	91.08	7,329.98	-1,378.93	1,818.24	2,018.66	0.00	0.00	0.00	

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well DEHAAN 4X-HC-16-07-65 - Slot DEHAAN N 4X-HC-16-07-65 SHL
<b>Company:</b>	Nickel Road Operating LLC	<b>TVD Reference:</b>	20' KB @ 4914.00usft
<b>Project:</b>	WELD COUNTY, CO	<b>MD Reference:</b>	20' KB @ 4914.00usft
<b>Site:</b>	S17-T7N-R65W (DEHAAN)	<b>North Reference:</b>	Grid
<b>Well:</b>	DEHAAN 4X-HC-16-07-65	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,000.00	90.31	91.08	7,329.44	-1,380.82	1,918.22	2,117.61	0.00	0.00	0.00
10,100.00	90.31	91.08	7,328.90	-1,382.71	2,018.20	2,216.56	0.00	0.00	0.00
10,200.00	90.31	91.08	7,328.36	-1,384.60	2,118.18	2,315.51	0.00	0.00	0.00
10,300.00	90.31	91.08	7,327.81	-1,386.49	2,218.16	2,414.47	0.00	0.00	0.00
10,400.00	90.31	91.08	7,327.27	-1,388.39	2,318.14	2,513.42	0.00	0.00	0.00
10,500.00	90.31	91.08	7,326.73	-1,390.28	2,418.12	2,612.37	0.00	0.00	0.00
10,600.00	90.31	91.08	7,326.19	-1,392.17	2,518.10	2,711.32	0.00	0.00	0.00
10,700.00	90.31	91.08	7,325.64	-1,394.06	2,618.09	2,810.27	0.00	0.00	0.00
10,800.00	90.31	91.08	7,325.10	-1,395.95	2,718.07	2,909.23	0.00	0.00	0.00
10,900.00	90.31	91.08	7,324.56	-1,397.84	2,818.05	3,008.18	0.00	0.00	0.00
11,000.00	90.31	91.08	7,324.02	-1,399.73	2,918.03	3,107.13	0.00	0.00	0.00
11,100.00	90.31	91.08	7,323.48	-1,401.63	3,018.01	3,206.08	0.00	0.00	0.00
11,200.00	90.31	91.08	7,322.93	-1,403.52	3,117.99	3,305.04	0.00	0.00	0.00
11,300.00	90.31	91.08	7,322.39	-1,405.41	3,217.97	3,403.99	0.00	0.00	0.00
11,400.00	90.31	91.08	7,321.85	-1,407.30	3,317.95	3,502.94	0.00	0.00	0.00
11,500.00	90.31	91.08	7,321.31	-1,409.19	3,417.93	3,601.89	0.00	0.00	0.00
11,600.00	90.31	91.08	7,320.77	-1,411.08	3,517.91	3,700.84	0.00	0.00	0.00
11,700.00	90.31	91.08	7,320.22	-1,412.98	3,617.89	3,799.80	0.00	0.00	0.00
11,800.00	90.31	91.08	7,319.68	-1,414.87	3,717.87	3,898.75	0.00	0.00	0.00
11,900.00	90.31	91.08	7,319.14	-1,416.76	3,817.85	3,997.70	0.00	0.00	0.00
12,000.00	90.31	91.08	7,318.60	-1,418.65	3,917.83	4,096.65	0.00	0.00	0.00
12,100.00	90.31	91.08	7,318.06	-1,420.54	4,017.81	4,195.61	0.00	0.00	0.00
12,200.00	90.31	91.08	7,317.51	-1,422.43	4,117.79	4,294.56	0.00	0.00	0.00
12,300.00	90.31	91.08	7,316.97	-1,424.32	4,217.78	4,393.51	0.00	0.00	0.00
12,400.00	90.31	91.08	7,316.43	-1,426.22	4,317.76	4,492.46	0.00	0.00	0.00
12,500.00	90.31	91.08	7,315.89	-1,428.11	4,417.74	4,591.41	0.00	0.00	0.00
12,600.00	90.31	91.08	7,315.35	-1,430.00	4,517.72	4,690.37	0.00	0.00	0.00
12,700.00	90.31	91.08	7,314.80	-1,431.89	4,617.70	4,789.32	0.00	0.00	0.00
12,800.00	90.31	91.08	7,314.26	-1,433.78	4,717.68	4,888.27	0.00	0.00	0.00
12,900.00	90.31	91.08	7,313.72	-1,435.67	4,817.66	4,987.22	0.00	0.00	0.00
13,000.00	90.31	91.08	7,313.18	-1,437.56	4,917.64	5,086.18	0.00	0.00	0.00
13,100.00	90.31	91.08	7,312.64	-1,439.46	5,017.62	5,185.13	0.00	0.00	0.00
13,200.00	90.31	91.08	7,312.09	-1,441.35	5,117.60	5,284.08	0.00	0.00	0.00
13,300.00	90.31	91.08	7,311.55	-1,443.24	5,217.58	5,383.03	0.00	0.00	0.00
13,400.00	90.31	91.08	7,311.01	-1,445.13	5,317.56	5,481.99	0.00	0.00	0.00
13,500.00	90.31	91.08	7,310.47	-1,447.02	5,417.54	5,580.94	0.00	0.00	0.00
13,600.00	90.31	91.08	7,309.93	-1,448.91	5,517.52	5,679.89	0.00	0.00	0.00
13,700.00	90.31	91.08	7,309.38	-1,450.80	5,617.50	5,778.84	0.00	0.00	0.00
13,800.00	90.31	91.08	7,308.84	-1,452.70	5,717.49	5,877.79	0.00	0.00	0.00
13,900.00	90.31	91.08	7,308.30	-1,454.59	5,817.47	5,976.75	0.00	0.00	0.00
14,000.00	90.31	91.08	7,307.76	-1,456.48	5,917.45	6,075.70	0.00	0.00	0.00
14,100.00	90.31	91.08	7,307.22	-1,458.37	6,017.43	6,174.65	0.00	0.00	0.00
14,200.00	90.31	91.08	7,306.67	-1,460.26	6,117.41	6,273.60	0.00	0.00	0.00
14,300.00	90.31	91.08	7,306.13	-1,462.15	6,217.39	6,372.56	0.00	0.00	0.00
14,400.00	90.31	91.08	7,305.59	-1,464.04	6,317.37	6,471.51	0.00	0.00	0.00
14,500.00	90.31	91.08	7,305.05	-1,465.94	6,417.35	6,570.46	0.00	0.00	0.00
14,600.00	90.31	91.08	7,304.50	-1,467.83	6,517.33	6,669.41	0.00	0.00	0.00
14,700.00	90.31	91.08	7,303.96	-1,469.72	6,617.31	6,768.36	0.00	0.00	0.00
14,800.00	90.31	91.08	7,303.42	-1,471.61	6,717.29	6,867.32	0.00	0.00	0.00
14,900.00	90.31	91.08	7,302.88	-1,473.50	6,817.27	6,966.27	0.00	0.00	0.00
15,000.00	90.31	91.08	7,302.34	-1,475.39	6,917.25	7,065.22	0.00	0.00	0.00
15,100.00	90.31	91.08	7,301.79	-1,477.28	7,017.23	7,164.17	0.00	0.00	0.00
15,200.00	90.31	91.08	7,301.25	-1,479.18	7,117.21	7,263.13	0.00	0.00	0.00

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well DEHAAN 4X-HC-16-07-65 - Slot DEHAAN N 4X-HC-16-07-65 SHL
<b>Company:</b>	Nickel Road Operating LLC	<b>TVD Reference:</b>	20' KB @ 4914.00usft
<b>Project:</b>	WELD COUNTY, CO	<b>MD Reference:</b>	20' KB @ 4914.00usft
<b>Site:</b>	S17-T7N-R65W (DEHAAN)	<b>North Reference:</b>	Grid
<b>Well:</b>	DEHAAN 4X-HC-16-07-65	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	PLAN #2		

### Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,300.00	90.31	91.08	7,300.71	-1,481.07	7,217.19	7,362.08	0.00	0.00	0.00
15,400.00	90.31	91.08	7,300.17	-1,482.96	7,317.18	7,461.03	0.00	0.00	0.00
15,500.00	90.31	91.08	7,299.63	-1,484.85	7,417.16	7,559.98	0.00	0.00	0.00
15,600.00	90.31	91.08	7,299.08	-1,486.74	7,517.14	7,658.93	0.00	0.00	0.00
15,700.00	90.31	91.08	7,298.54	-1,488.63	7,617.12	7,757.89	0.00	0.00	0.00
15,800.00	90.31	91.08	7,298.00	-1,490.52	7,717.10	7,856.84	0.00	0.00	0.00
15,900.00	90.31	91.08	7,297.46	-1,492.42	7,817.08	7,955.79	0.00	0.00	0.00
16,000.00	90.31	91.08	7,296.92	-1,494.31	7,917.06	8,054.74	0.00	0.00	0.00
16,100.00	90.31	91.08	7,296.37	-1,496.20	8,017.04	8,153.70	0.00	0.00	0.00
16,200.00	90.31	91.08	7,295.83	-1,498.09	8,117.02	8,252.65	0.00	0.00	0.00
16,300.00	90.31	91.08	7,295.29	-1,499.98	8,217.00	8,351.60	0.00	0.00	0.00
16,400.00	90.31	91.08	7,294.75	-1,501.87	8,316.98	8,450.55	0.00	0.00	0.00
16,500.00	90.31	91.08	7,294.21	-1,503.76	8,416.96	8,549.50	0.00	0.00	0.00
16,600.00	90.31	91.08	7,293.66	-1,505.66	8,516.94	8,648.46	0.00	0.00	0.00
16,700.00	90.31	91.08	7,293.12	-1,507.55	8,616.92	8,747.41	0.00	0.00	0.00
16,800.00	90.31	91.08	7,292.58	-1,509.44	8,716.90	8,846.36	0.00	0.00	0.00
16,900.00	90.31	91.08	7,292.04	-1,511.33	8,816.89	8,945.31	0.00	0.00	0.00
17,000.00	90.31	91.08	7,291.50	-1,513.22	8,916.87	9,044.27	0.00	0.00	0.00
17,100.00	90.31	91.08	7,290.95	-1,515.11	9,016.85	9,143.22	0.00	0.00	0.00
17,200.00	90.31	91.08	7,290.41	-1,517.00	9,116.83	9,242.17	0.00	0.00	0.00
17,275.90	90.31	91.08	7,290.00	-1,518.44	9,192.71	9,317.27	0.00	0.00	0.00
DEHAAN N 4X-HC-16-07-65 BHL									

### Design 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
DEHAAN N 4X-HC-16-0 - plan misses target center by 0.28usft at 7675.37usft MD (7288.30 TVD, -1325.10 N, -398.75 E) - Point	0.00	0.00	7,288.05	-1,325.03	-398.63	1,453,487.80	3,223,673.37	40.575435	-104.694799
DEHAAN N 4X-HC-16-0 - plan hits target center - Point	0.00	0.00	7,290.00	-1,518.44	9,192.71	1,453,294.39	3,233,264.71	40.574660	-104.660280