

# 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	600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	
3	997.47	7.95	223.81	996.19	-19.87	-19.06	2.00	223.81	-17.19	
4	6624.43	7.95	223.81	6569.08	-581.47	-557.75	0.00	0.00	-503.23	
5	7820.98	90.34	91.08	7348.33	-675.42	157.90	8.00	-132.41	217.96	
6	17088.98	90.34	91.08	7293.00	-850.41	9424.08	0.00	0.00	9462.37	DEHAAN S 8X-HC-16-07-65 BHL

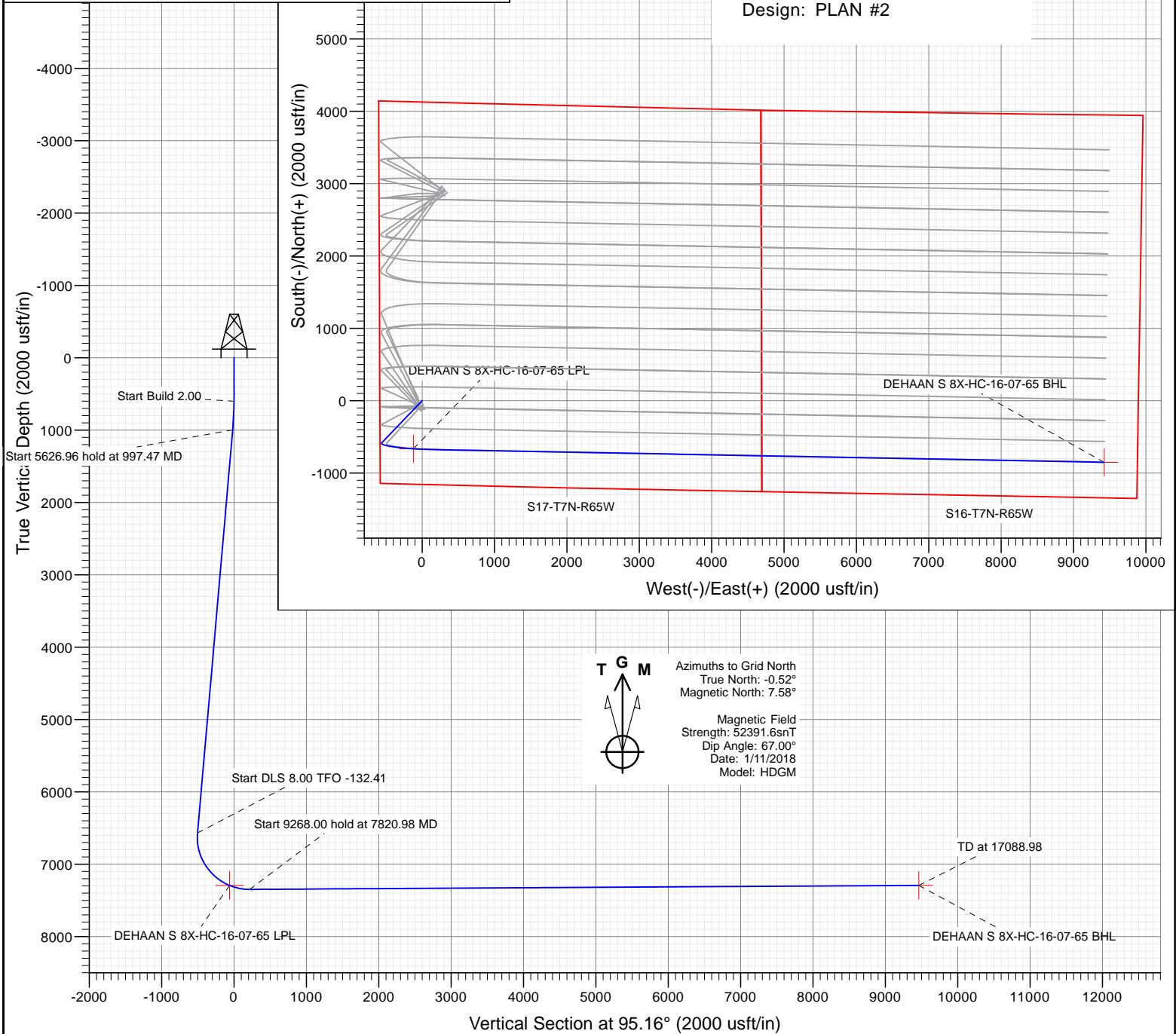
PLAN #2  
DEHAAN 8X-HC-16-07-65  
KB @ 5300.00usft  
Ground Level @ 5280.00  
North American Datum 1983  
Well DEHAAN 8X-HC-16-07-65 - Slot DEHAAN S 8X-HC-16-07-65 SHL Grid North

Type	Target	Azimuth	Origin	Type	N/S	E/W	From	TVD
TD	No Target (Freehand)	95.16	Slot		0.00	0.00	0.00	0.00

Name  
DEHAAN S 8X-HC-16-07-65 BHL  
DEHAAN S 8X-HC-16-07-65 LPL

TVD	+N/-S	+E/-W	Latitude	Longitude
7293.00	-850.41	9424.08	40.568338	-104.660491
7293.47	-664.33	-121.51	40.569002	-104.660492

Project: WELD COUNTY, CO  
Site: S17-T7N-R65W (DEHAAN)  
Well: DEHAAN 8X-HC-16-07-65  
Wellbore: OH  
Design: PLAN #2



### WELL DETAILS: DEHAAN 8X-HC-16-07-65

5280.00  
+N/-S 0.00 +E/-W 0.00 Northing 1451841.08 Easting 3223803.86 Latitude 40.570912 Longitude -104.694383

# CATHEDRAL



# **Nickel Road Operating LLC**

**WELD COUNTY, CO**

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

**DEHAAN 8X-HC-16-07-65 - Slot DEHAAN S 8X-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 8X-HC-16-07-65 - Slot DEHAAN S 8X-HC-16-07-65 SHL
<b>Company:</b>	Nickel Road Operating LLC	<b>TVD Reference:</b>	KB @ 5300.00usft
<b>Project:</b>	WELD COUNTY, CO	<b>MD Reference:</b>	KB @ 5300.00usft
<b>Site:</b>	S17-T7N-R65W (DEHAAN)	<b>North Reference:</b>	Grid
<b>Well:</b>	DEHAAN 8X-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 8X-HC-16-07-65 - Slot DEHAAN S 8X-HC-16-07-65 SHL					
Well Position	+N/-S	-2,891.73 usft	Northing:	1,451,841.08 usft	Latitude:	40.570912
	+E/-W	-269.93 usft	Easting:	3,223,803.86 usft	Longitude:	-104.694384
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	5,280.00 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	8.10	67.00	52,391.60000000

<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	95.16

<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	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
997.47	7.95	223.81	996.19	-19.87	-19.06	2.00	2.00	0.00	223.81	
6,624.43	7.95	223.81	6,569.08	-581.47	-557.75	0.00	0.00	0.00	0.00	
7,820.98	90.34	91.08	7,348.33	-675.42	157.90	8.00	6.89	-11.09	-132.41	
17,088.98	90.34	91.08	7,293.00	-850.41	9,424.08	0.00	0.00	0.00	0.00	DEHAAN S 8X-HC-16

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well DEHAAN 8X-HC-16-07-65 - Slot DEHAAN S 8X-HC-16-07-65 SHL
<b>Company:</b>	Nickel Road Operating LLC	<b>TVD Reference:</b>	KB @ 5300.00usft
<b>Project:</b>	WELD COUNTY, CO	<b>MD Reference:</b>	KB @ 5300.00usft
<b>Site:</b>	S17-T7N-R65W (DEHAAN)	<b>North Reference:</b>	Grid
<b>Well:</b>	DEHAAN 8X-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	2.00	223.81	699.98	-1.26	-1.21	-1.09	2.00	2.00	0.00	
800.00	4.00	223.81	799.84	-5.04	-4.83	-4.36	2.00	2.00	0.00	
900.00	6.00	223.81	899.45	-11.33	-10.86	-9.80	2.00	2.00	0.00	
997.47	7.95	223.81	996.19	-19.87	-19.06	-17.19	2.00	2.00	0.00	
1,000.00	7.95	223.81	998.70	-20.12	-19.30	-17.41	0.00	0.00	0.00	
1,100.00	7.95	223.81	1,097.74	-30.10	-28.87	-26.05	0.00	0.00	0.00	
1,200.00	7.95	223.81	1,196.78	-40.08	-38.45	-34.69	0.00	0.00	0.00	
1,300.00	7.95	223.81	1,295.82	-50.06	-48.02	-43.33	0.00	0.00	0.00	
1,400.00	7.95	223.81	1,394.86	-60.04	-57.59	-51.96	0.00	0.00	0.00	
1,500.00	7.95	223.81	1,493.90	-70.02	-67.17	-60.60	0.00	0.00	0.00	
1,600.00	7.95	223.81	1,592.94	-80.00	-76.74	-69.24	0.00	0.00	0.00	
1,700.00	7.95	223.81	1,691.98	-89.98	-86.31	-77.88	0.00	0.00	0.00	
1,800.00	7.95	223.81	1,791.01	-99.96	-95.89	-86.51	0.00	0.00	0.00	
1,900.00	7.95	223.81	1,890.05	-109.94	-105.46	-95.15	0.00	0.00	0.00	
2,000.00	7.95	223.81	1,989.09	-119.92	-115.03	-103.79	0.00	0.00	0.00	
2,100.00	7.95	223.81	2,088.13	-129.91	-124.61	-112.43	0.00	0.00	0.00	
2,200.00	7.95	223.81	2,187.17	-139.89	-134.18	-121.06	0.00	0.00	0.00	
2,300.00	7.95	223.81	2,286.21	-149.87	-143.75	-129.70	0.00	0.00	0.00	
2,400.00	7.95	223.81	2,385.25	-159.85	-153.33	-138.34	0.00	0.00	0.00	
2,500.00	7.95	223.81	2,484.29	-169.83	-162.90	-146.98	0.00	0.00	0.00	
2,600.00	7.95	223.81	2,583.33	-179.81	-172.47	-155.62	0.00	0.00	0.00	
2,700.00	7.95	223.81	2,682.37	-189.79	-182.05	-164.25	0.00	0.00	0.00	
2,800.00	7.95	223.81	2,781.41	-199.77	-191.62	-172.89	0.00	0.00	0.00	
2,900.00	7.95	223.81	2,880.44	-209.75	-201.19	-181.53	0.00	0.00	0.00	
3,000.00	7.95	223.81	2,979.48	-219.73	-210.77	-190.17	0.00	0.00	0.00	
3,100.00	7.95	223.81	3,078.52	-229.71	-220.34	-198.80	0.00	0.00	0.00	
3,200.00	7.95	223.81	3,177.56	-239.69	-229.91	-207.44	0.00	0.00	0.00	
3,300.00	7.95	223.81	3,276.60	-249.67	-239.49	-216.08	0.00	0.00	0.00	
3,400.00	7.95	223.81	3,375.64	-259.65	-249.06	-224.72	0.00	0.00	0.00	
3,500.00	7.95	223.81	3,474.68	-269.63	-258.63	-233.35	0.00	0.00	0.00	
3,600.00	7.95	223.81	3,573.72	-279.61	-268.21	-241.99	0.00	0.00	0.00	
3,700.00	7.95	223.81	3,672.76	-289.59	-277.78	-250.63	0.00	0.00	0.00	
3,800.00	7.95	223.81	3,771.80	-299.57	-287.35	-259.27	0.00	0.00	0.00	
3,900.00	7.95	223.81	3,870.84	-309.55	-296.93	-267.90	0.00	0.00	0.00	
4,000.00	7.95	223.81	3,969.87	-319.54	-306.50	-276.54	0.00	0.00	0.00	
4,100.00	7.95	223.81	4,068.91	-329.52	-316.07	-285.18	0.00	0.00	0.00	
4,200.00	7.95	223.81	4,167.95	-339.50	-325.65	-293.82	0.00	0.00	0.00	
4,300.00	7.95	223.81	4,266.99	-349.48	-335.22	-302.46	0.00	0.00	0.00	
4,400.00	7.95	223.81	4,366.03	-359.46	-344.79	-311.09	0.00	0.00	0.00	
4,500.00	7.95	223.81	4,465.07	-369.44	-354.37	-319.73	0.00	0.00	0.00	
4,600.00	7.95	223.81	4,564.11	-379.42	-363.94	-328.37	0.00	0.00	0.00	
4,700.00	7.95	223.81	4,663.15	-389.40	-373.51	-337.01	0.00	0.00	0.00	
4,800.00	7.95	223.81	4,762.19	-399.38	-383.09	-345.64	0.00	0.00	0.00	
4,900.00	7.95	223.81	4,861.23	-409.36	-392.66	-354.28	0.00	0.00	0.00	
5,000.00	7.95	223.81	4,960.27	-419.34	-402.23	-362.92	0.00	0.00	0.00	
5,100.00	7.95	223.81	5,059.30	-429.32	-411.81	-371.56	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 8X-HC-16-07-65 - Slot DEHAAN S 8X-HC-16-07-65 SHL
<b>Company:</b>	Nickel Road Operating LLC	<b>TVD Reference:</b>	KB @ 5300.00usft
<b>Project:</b>	WELD COUNTY, CO	<b>MD Reference:</b>	KB @ 5300.00usft
<b>Site:</b>	S17-T7N-R65W (DEHAAN)	<b>North Reference:</b>	Grid
<b>Well:</b>	DEHAAN 8X-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)	
5,200.00	7.95	223.81	5,158.34	-439.30	-421.38	-380.19	0.00	0.00	0.00	
5,300.00	7.95	223.81	5,257.38	-449.28	-430.95	-388.83	0.00	0.00	0.00	
5,400.00	7.95	223.81	5,356.42	-459.26	-440.53	-397.47	0.00	0.00	0.00	
5,500.00	7.95	223.81	5,455.46	-469.24	-450.10	-406.11	0.00	0.00	0.00	
5,600.00	7.95	223.81	5,554.50	-479.22	-459.67	-414.75	0.00	0.00	0.00	
5,700.00	7.95	223.81	5,653.54	-489.20	-469.25	-423.38	0.00	0.00	0.00	
5,800.00	7.95	223.81	5,752.58	-499.18	-478.82	-432.02	0.00	0.00	0.00	
5,900.00	7.95	223.81	5,851.62	-509.16	-488.39	-440.66	0.00	0.00	0.00	
6,000.00	7.95	223.81	5,950.66	-519.15	-497.97	-449.30	0.00	0.00	0.00	
6,100.00	7.95	223.81	6,049.69	-529.13	-507.54	-457.93	0.00	0.00	0.00	
6,200.00	7.95	223.81	6,148.73	-539.11	-517.11	-466.57	0.00	0.00	0.00	
6,300.00	7.95	223.81	6,247.77	-549.09	-526.69	-475.21	0.00	0.00	0.00	
6,400.00	7.95	223.81	6,346.81	-559.07	-536.26	-483.85	0.00	0.00	0.00	
6,500.00	7.95	223.81	6,445.85	-569.05	-545.84	-492.48	0.00	0.00	0.00	
6,600.00	7.95	223.81	6,544.89	-579.03	-555.41	-501.12	0.00	0.00	0.00	
6,624.43	7.95	223.81	6,569.08	-581.47	-557.75	-503.23	0.00	0.00	0.00	
6,700.00	5.90	174.63	6,644.16	-589.11	-561.00	-505.79	8.00	-2.71	-65.07	
6,800.00	10.45	124.94	6,743.23	-599.44	-553.08	-496.97	8.00	4.55	-49.69	
6,900.00	17.64	109.95	6,840.21	-609.81	-531.37	-474.41	8.00	7.19	-14.99	
7,000.00	25.31	103.65	6,933.21	-620.05	-496.30	-438.56	8.00	7.67	-6.30	
7,100.00	33.13	100.17	7,020.42	-629.93	-448.55	-390.12	8.00	7.82	-3.49	
7,200.00	41.01	97.89	7,100.15	-639.27	-389.06	-330.03	8.00	7.88	-2.27	
7,300.00	48.93	96.25	7,170.85	-647.90	-318.97	-259.45	8.00	7.92	-1.65	
7,400.00	56.86	94.96	7,231.13	-655.63	-239.66	-179.77	8.00	7.93	-1.29	
7,500.00	64.81	93.88	7,279.82	-662.33	-152.67	-92.53	8.00	7.94	-1.07	
7,534.07	67.52	93.55	7,293.59	-664.35	-121.57	-61.37	8.00	7.95	-0.98	
DEHAAN S 8X-HC-16-07-65 LPL										
7,600.00	72.76	92.94	7,315.99	-667.85	-59.69	0.57	8.00	7.95	-0.92	
7,700.00	80.71	92.08	7,338.91	-672.10	37.47	97.72	8.00	7.96	-0.86	
7,800.00	88.67	91.25	7,348.15	-674.99	136.92	197.03	8.00	7.96	-0.83	
7,820.98	90.34	91.08	7,348.33	-675.42	157.90	217.96	8.00	7.96	-0.82	
7,900.00	90.34	91.08	7,347.86	-676.91	236.90	296.78	0.00	0.00	0.00	
8,000.00	90.34	91.08	7,347.26	-678.80	336.88	396.52	0.00	0.00	0.00	
8,100.00	90.34	91.08	7,346.67	-680.68	436.86	496.27	0.00	0.00	0.00	
8,200.00	90.34	91.08	7,346.07	-682.57	536.84	596.01	0.00	0.00	0.00	
8,300.00	90.34	91.08	7,345.47	-684.46	636.82	695.76	0.00	0.00	0.00	
8,400.00	90.34	91.08	7,344.87	-686.35	736.80	795.50	0.00	0.00	0.00	
8,500.00	90.34	91.08	7,344.28	-688.24	836.78	895.25	0.00	0.00	0.00	
8,600.00	90.34	91.08	7,343.68	-690.13	936.76	994.99	0.00	0.00	0.00	
8,700.00	90.34	91.08	7,343.08	-692.01	1,036.74	1,094.74	0.00	0.00	0.00	
8,800.00	90.34	91.08	7,342.49	-693.90	1,136.72	1,194.49	0.00	0.00	0.00	
8,900.00	90.34	91.08	7,341.89	-695.79	1,236.70	1,294.23	0.00	0.00	0.00	
9,000.00	90.34	91.08	7,341.29	-697.68	1,336.68	1,393.98	0.00	0.00	0.00	
9,100.00	90.34	91.08	7,340.70	-699.57	1,436.66	1,493.72	0.00	0.00	0.00	
9,200.00	90.34	91.08	7,340.10	-701.45	1,536.64	1,593.47	0.00	0.00	0.00	
9,300.00	90.34	91.08	7,339.50	-703.34	1,636.62	1,693.21	0.00	0.00	0.00	
9,400.00	90.34	91.08	7,338.90	-705.23	1,736.61	1,792.96	0.00	0.00	0.00	
9,500.00	90.34	91.08	7,338.31	-707.12	1,836.59	1,892.70	0.00	0.00	0.00	
9,600.00	90.34	91.08	7,337.71	-709.01	1,936.57	1,992.45	0.00	0.00	0.00	
9,700.00	90.34	91.08	7,337.11	-710.90	2,036.55	2,092.19	0.00	0.00	0.00	
9,800.00	90.34	91.08	7,336.52	-712.78	2,136.53	2,191.94	0.00	0.00	0.00	
9,900.00	90.34	91.08	7,335.92	-714.67	2,236.51	2,291.69	0.00	0.00	0.00	
10,000.00	90.34	91.08	7,335.32	-716.56	2,336.49	2,391.43	0.00	0.00	0.00	

# Cathedral Energy Services

## Planning Report

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<b>Company:</b>	Nickel Road Operating LLC	<b>TVD Reference:</b>	KB @ 5300.00usft
<b>Project:</b>	WELD COUNTY, CO	<b>MD Reference:</b>	KB @ 5300.00usft
<b>Site:</b>	S17-T7N-R65W (DEHAAN)	<b>North Reference:</b>	Grid
<b>Well:</b>	DEHAAN 8X-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)
10,100.00	90.34	91.08	7,334.73	-718.45	2,436.47	2,491.18	0.00	0.00	0.00
10,200.00	90.34	91.08	7,334.13	-720.34	2,536.45	2,590.92	0.00	0.00	0.00
10,300.00	90.34	91.08	7,333.53	-722.22	2,636.43	2,690.67	0.00	0.00	0.00
10,400.00	90.34	91.08	7,332.93	-724.11	2,736.41	2,790.41	0.00	0.00	0.00
10,500.00	90.34	91.08	7,332.34	-726.00	2,836.39	2,890.16	0.00	0.00	0.00
10,600.00	90.34	91.08	7,331.74	-727.89	2,936.37	2,989.90	0.00	0.00	0.00
10,700.00	90.34	91.08	7,331.14	-729.78	3,036.35	3,089.65	0.00	0.00	0.00
10,800.00	90.34	91.08	7,330.55	-731.66	3,136.33	3,189.40	0.00	0.00	0.00
10,900.00	90.34	91.08	7,329.95	-733.55	3,236.31	3,289.14	0.00	0.00	0.00
11,000.00	90.34	91.08	7,329.35	-735.44	3,336.29	3,388.89	0.00	0.00	0.00
11,100.00	90.34	91.08	7,328.76	-737.33	3,436.27	3,488.63	0.00	0.00	0.00
11,200.00	90.34	91.08	7,328.16	-739.22	3,536.25	3,588.38	0.00	0.00	0.00
11,300.00	90.34	91.08	7,327.56	-741.11	3,636.23	3,688.12	0.00	0.00	0.00
11,400.00	90.34	91.08	7,326.96	-742.99	3,736.21	3,787.87	0.00	0.00	0.00
11,500.00	90.34	91.08	7,326.37	-744.88	3,836.19	3,887.61	0.00	0.00	0.00
11,600.00	90.34	91.08	7,325.77	-746.77	3,936.17	3,987.36	0.00	0.00	0.00
11,700.00	90.34	91.08	7,325.17	-748.66	4,036.15	4,087.10	0.00	0.00	0.00
11,800.00	90.34	91.08	7,324.58	-750.55	4,136.13	4,186.85	0.00	0.00	0.00
11,900.00	90.34	91.08	7,323.98	-752.43	4,236.11	4,286.60	0.00	0.00	0.00
12,000.00	90.34	91.08	7,323.38	-754.32	4,336.10	4,386.34	0.00	0.00	0.00
12,100.00	90.34	91.08	7,322.79	-756.21	4,436.08	4,486.09	0.00	0.00	0.00
12,200.00	90.34	91.08	7,322.19	-758.10	4,536.06	4,585.83	0.00	0.00	0.00
12,300.00	90.34	91.08	7,321.59	-759.99	4,636.04	4,685.58	0.00	0.00	0.00
12,400.00	90.34	91.08	7,320.99	-761.88	4,736.02	4,785.32	0.00	0.00	0.00
12,500.00	90.34	91.08	7,320.40	-763.76	4,836.00	4,885.07	0.00	0.00	0.00
12,600.00	90.34	91.08	7,319.80	-765.65	4,935.98	4,984.81	0.00	0.00	0.00
12,700.00	90.34	91.08	7,319.20	-767.54	5,035.96	5,084.56	0.00	0.00	0.00
12,800.00	90.34	91.08	7,318.61	-769.43	5,135.94	5,184.31	0.00	0.00	0.00
12,900.00	90.34	91.08	7,318.01	-771.32	5,235.92	5,284.05	0.00	0.00	0.00
13,000.00	90.34	91.08	7,317.41	-773.20	5,335.90	5,383.80	0.00	0.00	0.00
13,100.00	90.34	91.08	7,316.82	-775.09	5,435.88	5,483.54	0.00	0.00	0.00
13,200.00	90.34	91.08	7,316.22	-776.98	5,535.86	5,583.29	0.00	0.00	0.00
13,300.00	90.34	91.08	7,315.62	-778.87	5,635.84	5,683.03	0.00	0.00	0.00
13,400.00	90.34	91.08	7,315.02	-780.76	5,735.82	5,782.78	0.00	0.00	0.00
13,500.00	90.34	91.08	7,314.43	-782.64	5,835.80	5,882.52	0.00	0.00	0.00
13,600.00	90.34	91.08	7,313.83	-784.53	5,935.78	5,982.27	0.00	0.00	0.00
13,700.00	90.34	91.08	7,313.23	-786.42	6,035.76	6,082.01	0.00	0.00	0.00
13,800.00	90.34	91.08	7,312.64	-788.31	6,135.74	6,181.76	0.00	0.00	0.00
13,900.00	90.34	91.08	7,312.04	-790.20	6,235.72	6,281.51	0.00	0.00	0.00
14,000.00	90.34	91.08	7,311.44	-792.09	6,335.70	6,381.25	0.00	0.00	0.00
14,100.00	90.34	91.08	7,310.84	-793.97	6,435.68	6,481.00	0.00	0.00	0.00
14,200.00	90.34	91.08	7,310.25	-795.86	6,535.66	6,580.74	0.00	0.00	0.00
14,300.00	90.34	91.08	7,309.65	-797.75	6,635.64	6,680.49	0.00	0.00	0.00
14,400.00	90.34	91.08	7,309.05	-799.64	6,735.62	6,780.23	0.00	0.00	0.00
14,500.00	90.34	91.08	7,308.46	-801.53	6,835.61	6,879.98	0.00	0.00	0.00
14,600.00	90.34	91.08	7,307.86	-803.41	6,935.59	6,979.72	0.00	0.00	0.00
14,700.00	90.34	91.08	7,307.26	-805.30	7,035.57	7,079.47	0.00	0.00	0.00
14,800.00	90.34	91.08	7,306.67	-807.19	7,135.55	7,179.21	0.00	0.00	0.00
14,900.00	90.34	91.08	7,306.07	-809.08	7,235.53	7,278.96	0.00	0.00	0.00
15,000.00	90.34	91.08	7,305.47	-810.97	7,335.51	7,378.71	0.00	0.00	0.00
15,100.00	90.34	91.08	7,304.87	-812.86	7,435.49	7,478.45	0.00	0.00	0.00
15,200.00	90.34	91.08	7,304.28	-814.74	7,535.47	7,578.20	0.00	0.00	0.00
15,300.00	90.34	91.08	7,303.68	-816.63	7,635.45	7,677.94	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 8X-HC-16-07-65 - Slot DEHAAN S 8X-HC-16-07-65 SHL
<b>Company:</b>	Nickel Road Operating LLC	<b>TVD Reference:</b>	KB @ 5300.00usft
<b>Project:</b>	WELD COUNTY, CO	<b>MD Reference:</b>	KB @ 5300.00usft
<b>Site:</b>	S17-T7N-R65W (DEHAAN)	<b>North Reference:</b>	Grid
<b>Well:</b>	DEHAAN 8X-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)	
15,400.00	90.34	91.08	7,303.08	-818.52	7,735.43	7,777.69	0.00	0.00	0.00	
15,500.00	90.34	91.08	7,302.49	-820.41	7,835.41	7,877.43	0.00	0.00	0.00	
15,600.00	90.34	91.08	7,301.89	-822.30	7,935.39	7,977.18	0.00	0.00	0.00	
15,700.00	90.34	91.08	7,301.29	-824.18	8,035.37	8,076.92	0.00	0.00	0.00	
15,800.00	90.34	91.08	7,300.70	-826.07	8,135.35	8,176.67	0.00	0.00	0.00	
15,900.00	90.34	91.08	7,300.10	-827.96	8,235.33	8,276.42	0.00	0.00	0.00	
16,000.00	90.34	91.08	7,299.50	-829.85	8,335.31	8,376.16	0.00	0.00	0.00	
16,100.00	90.34	91.08	7,298.90	-831.74	8,435.29	8,475.91	0.00	0.00	0.00	
16,200.00	90.34	91.08	7,298.31	-833.62	8,535.27	8,575.65	0.00	0.00	0.00	
16,300.00	90.34	91.08	7,297.71	-835.51	8,635.25	8,675.40	0.00	0.00	0.00	
16,400.00	90.34	91.08	7,297.11	-837.40	8,735.23	8,775.14	0.00	0.00	0.00	
16,500.00	90.34	91.08	7,296.52	-839.29	8,835.21	8,874.89	0.00	0.00	0.00	
16,600.00	90.34	91.08	7,295.92	-841.18	8,935.19	8,974.63	0.00	0.00	0.00	
16,700.00	90.34	91.08	7,295.32	-843.07	9,035.17	9,074.38	0.00	0.00	0.00	
16,800.00	90.34	91.08	7,294.73	-844.95	9,135.15	9,174.12	0.00	0.00	0.00	
16,900.00	90.34	91.08	7,294.13	-846.84	9,235.13	9,273.87	0.00	0.00	0.00	
17,000.00	90.34	91.08	7,293.53	-848.73	9,335.11	9,373.62	0.00	0.00	0.00	
17,088.98	90.34	91.08	7,293.00	-850.41	9,424.08	9,462.37	0.00	0.00	0.00	
DEHAAN S 8X-HC-16-07-65 BHL										

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
DEHAAN S 8X-HC-16-0	0.00	0.00	7,293.00	-850.41	9,424.08	1,450,990.67	3,233,227.94	40.568338	-104.660491
- plan hits target center									
- Point									
DEHAAN S 8X-HC-16-0	0.00	0.00	7,293.47	-664.33	-121.51	1,451,176.75	3,223,682.35	40.569092	-104.694843
- plan misses target center by 0.14usft at 7534.09usft MD (7293.60 TVD, -664.35 N, -121.56 E)									
- Point									