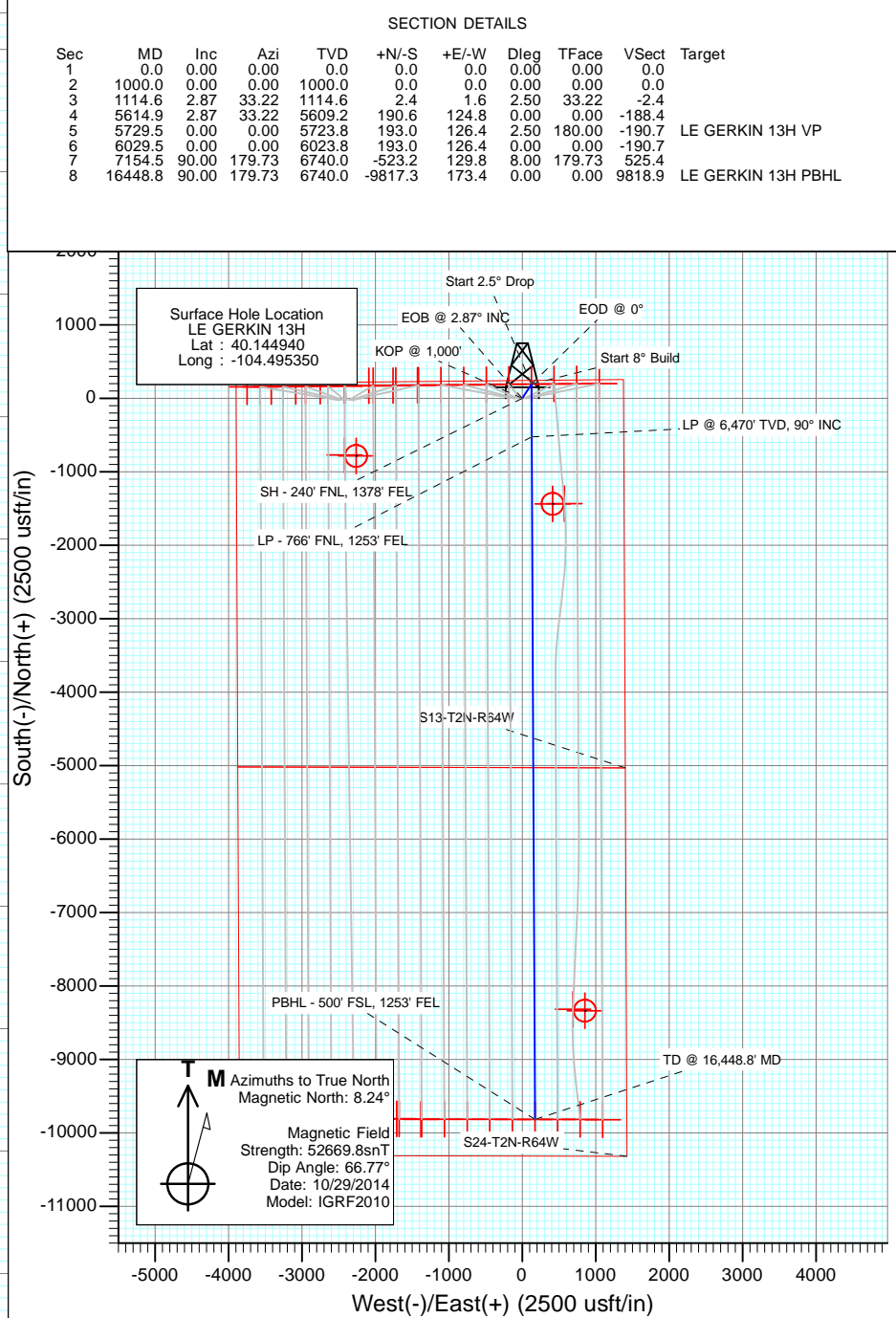
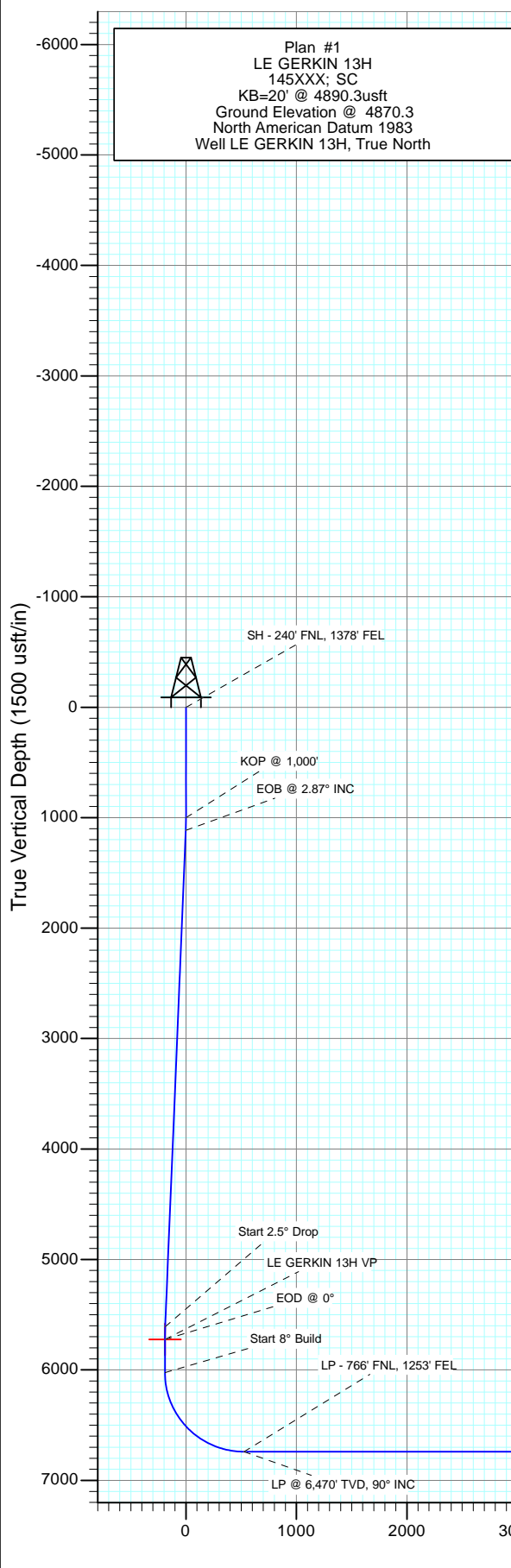


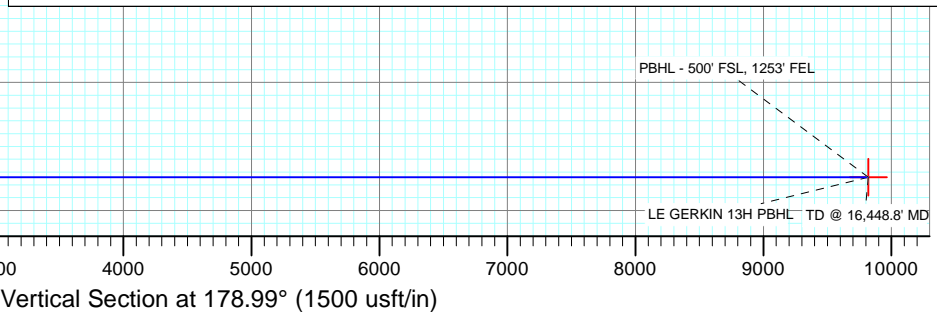


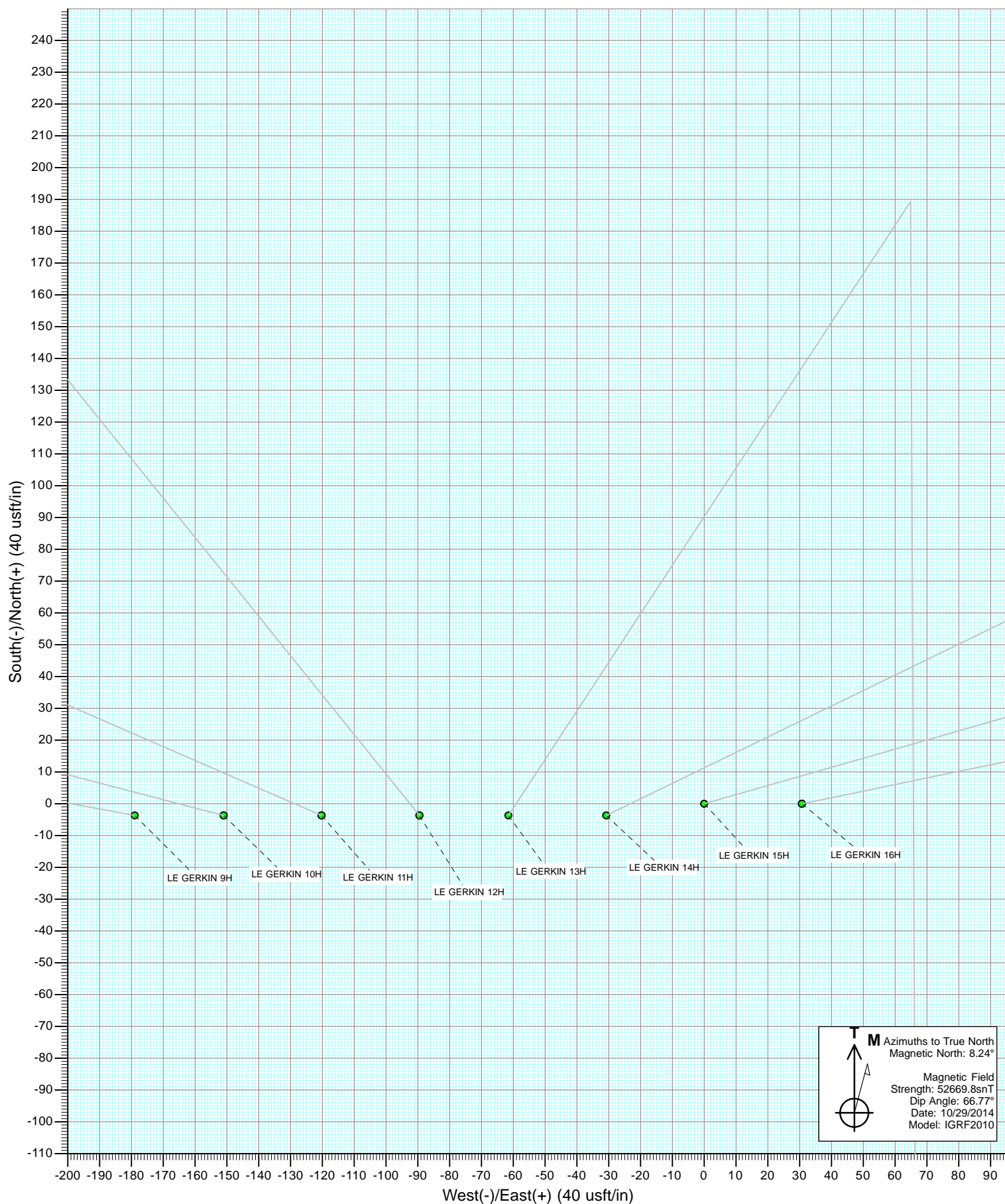
Project: Weld County, Colorado  
 Site: S13-T2N-R64W (LE GERKIN PADS)  
 Well: LE GERKIN 13H  
 Wellbore: HZ  
 Design: Plan #1

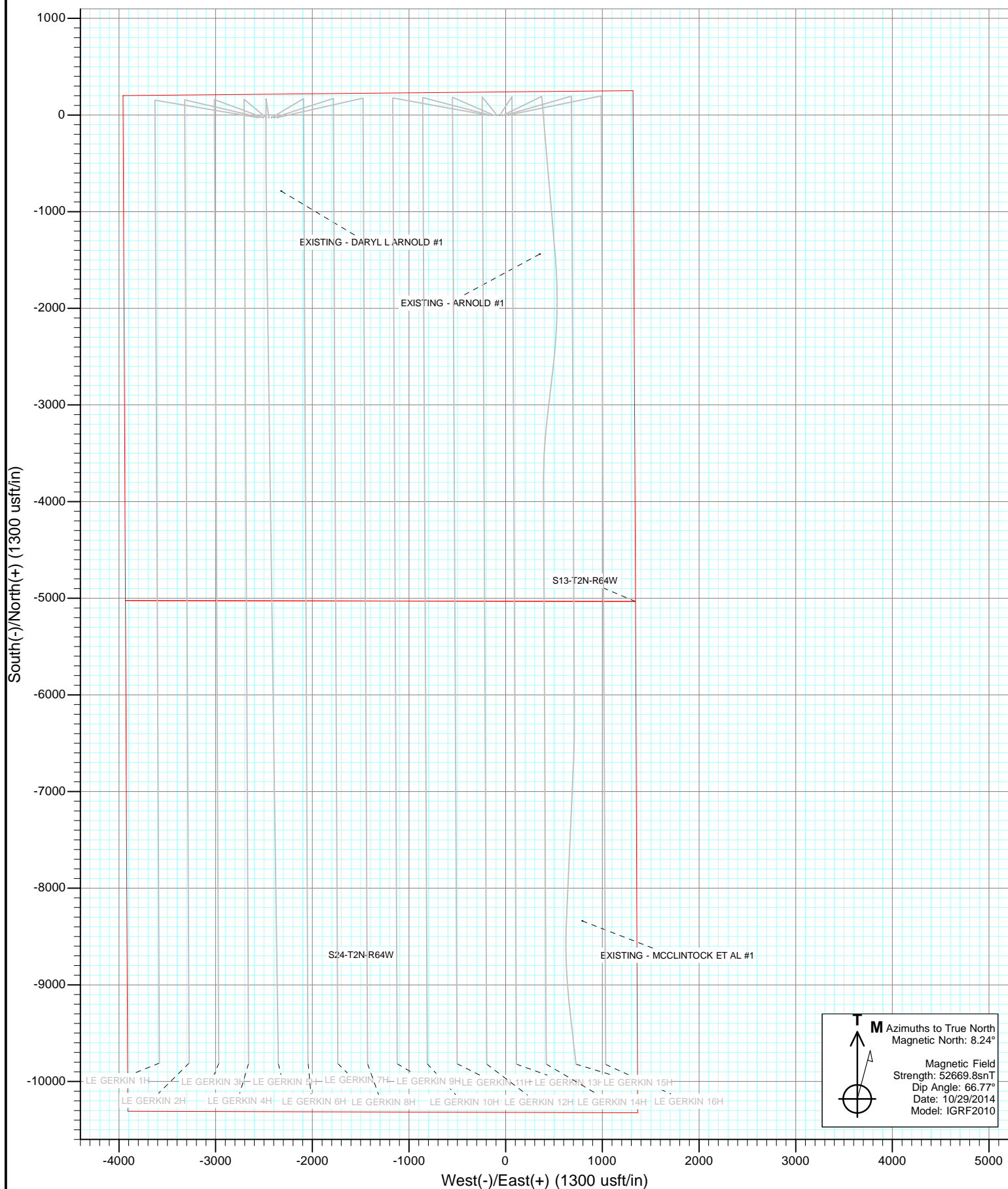


DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
LE GERKIN 13H VP	193.0	126.4	1297430.51	3280976.32	40.145470	-104.494898
LE GERKIN 13H PBHL	-9817.3	173.4	1287421.36	3281136.72	40.117990	-104.494730







# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well LE GERKIN 13H
<b>Company:</b>	Red Hawk Petroleum	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Project:</b>	Weld County, Colorado	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>North Reference:</b>	True
<b>Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	Plan #1		

<b>Project</b>	Weld County, Colorado		
<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		S13-T2N-R64W (LE GERKIN PADS)			
Site Position:		Northing:	1,297,185.96 usft	Latitude:	40.144880
From:	Lat/Long	Easting:	3,278,344.88 usft	Longitude:	-104.504320
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.64 °

Well	LE GERKIN 13H					
Well Position	+N/-S	0.0 usft	Northing:	1,297,236.09 usft	Latitude:	40.144940
	+E/-W	0.0 usft	Easting:	3,280,852.11 usft	Longitude:	-104.495350
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	4,870.3 usft

<b>Wellbore</b>	HZ				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	10/29/2014	8.24	66.77	52,670

<b>Design</b>	Plan #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	178.99

<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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,114.6	2.87	33.22	1,114.6	2.4	1.6	2.50	2.50	0.00	33.22	
5,614.9	2.87	33.22	5,609.2	190.6	124.8	0.00	0.00	0.00	0.00	
5,729.5	0.00	0.00	5,723.8	193.0	126.4	2.50	-2.50	0.00	180.00	LE GERKIN 13H VP
6,029.5	0.00	0.00	6,023.8	193.0	126.4	0.00	0.00	0.00	0.00	
7,154.5	90.00	179.73	6,740.0	-523.2	129.8	8.00	8.00	15.98	179.73	
16,448.8	90.00	179.73	6,740.0	-9,817.3	173.4	0.00	0.00	0.00	0.00	LE GERKIN 13H PBH

# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well LE GERKIN 13H
<b>Company:</b>	Red Hawk Petroleum	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Project:</b>	Weld County, Colorado	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>North Reference:</b>	True
<b>Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	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	
0.5	0.00	0.00	0.5	0.0	0.0	0.0	0.00	0.00	SH - 240' FNL, 1378' FEL
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	KOP @ 1,000'
1,100.0	2.50	33.22	1,100.0	1.8	1.2	-1.8	2.50	2.50	
1,114.6	2.87	33.22	1,114.6	2.4	1.6	-2.4	2.50	2.50	EOB @ 2.87° INC
1,200.0	2.87	33.22	1,199.8	6.0	3.9	-5.9	0.00	0.00	
1,300.0	2.87	33.22	1,299.7	10.1	6.6	-10.0	0.00	0.00	
1,400.0	2.87	33.22	1,399.6	14.3	9.4	-14.2	0.00	0.00	
1,500.0	2.87	33.22	1,499.5	18.5	12.1	-18.3	0.00	0.00	
1,600.0	2.87	33.22	1,599.3	22.7	14.9	-22.4	0.00	0.00	
1,700.0	2.87	33.22	1,699.2	26.9	17.6	-26.6	0.00	0.00	
1,800.0	2.87	33.22	1,799.1	31.1	20.3	-30.7	0.00	0.00	
1,900.0	2.87	33.22	1,899.0	35.2	23.1	-34.8	0.00	0.00	
2,000.0	2.87	33.22	1,998.8	39.4	25.8	-39.0	0.00	0.00	
2,100.0	2.87	33.22	2,098.7	43.6	28.6	-43.1	0.00	0.00	
2,200.0	2.87	33.22	2,198.6	47.8	31.3	-47.2	0.00	0.00	
2,300.0	2.87	33.22	2,298.5	52.0	34.0	-51.4	0.00	0.00	
2,400.0	2.87	33.22	2,398.3	56.2	36.8	-55.5	0.00	0.00	
2,500.0	2.87	33.22	2,498.2	60.3	39.5	-59.6	0.00	0.00	
2,600.0	2.87	33.22	2,598.1	64.5	42.3	-63.8	0.00	0.00	
2,700.0	2.87	33.22	2,698.0	68.7	45.0	-67.9	0.00	0.00	
2,800.0	2.87	33.22	2,797.8	72.9	47.7	-72.0	0.00	0.00	
2,900.0	2.87	33.22	2,897.7	77.1	50.5	-76.2	0.00	0.00	
3,000.0	2.87	33.22	2,997.6	81.2	53.2	-80.3	0.00	0.00	
3,100.0	2.87	33.22	3,097.5	85.4	55.9	-84.4	0.00	0.00	
3,200.0	2.87	33.22	3,197.3	89.6	58.7	-88.6	0.00	0.00	
3,300.0	2.87	33.22	3,297.2	93.8	61.4	-92.7	0.00	0.00	
3,400.0	2.87	33.22	3,397.1	98.0	64.2	-96.8	0.00	0.00	
3,500.0	2.87	33.22	3,497.0	102.2	66.9	-101.0	0.00	0.00	
3,600.0	2.87	33.22	3,596.8	106.3	69.6	-105.1	0.00	0.00	
3,700.0	2.87	33.22	3,696.7	110.5	72.4	-109.2	0.00	0.00	
3,800.0	2.87	33.22	3,796.6	114.7	75.1	-113.4	0.00	0.00	
3,900.0	2.87	33.22	3,896.5	118.9	77.9	-117.5	0.00	0.00	
4,000.0	2.87	33.22	3,996.3	123.1	80.6	-121.6	0.00	0.00	
4,100.0	2.87	33.22	4,096.2	127.2	83.3	-125.8	0.00	0.00	
4,200.0	2.87	33.22	4,196.1	131.4	86.1	-129.9	0.00	0.00	
4,300.0	2.87	33.22	4,296.0	135.6	88.8	-134.0	0.00	0.00	
4,400.0	2.87	33.22	4,395.8	139.8	91.6	-138.2	0.00	0.00	
4,500.0	2.87	33.22	4,495.7	144.0	94.3	-142.3	0.00	0.00	
4,600.0	2.87	33.22	4,595.6	148.2	97.0	-146.4	0.00	0.00	
4,700.0	2.87	33.22	4,695.5	152.3	99.8	-150.6	0.00	0.00	
4,800.0	2.87	33.22	4,795.3	156.5	102.5	-154.7	0.00	0.00	
4,900.0	2.87	33.22	4,895.2	160.7	105.2	-158.8	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 LE GERKIN 13H
<b>Company:</b>	Red Hawk Petroleum	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Project:</b>	Weld County, Colorado	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>North Reference:</b>	True
<b>Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	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	2.87	33.22	4,995.1	164.9	108.0	-163.0	0.00	0.00	
5,100.0	2.87	33.22	5,095.0	169.1	110.7	-167.1	0.00	0.00	
5,200.0	2.87	33.22	5,194.8	173.3	113.5	-171.2	0.00	0.00	
5,300.0	2.87	33.22	5,294.7	177.4	116.2	-175.4	0.00	0.00	
5,400.0	2.87	33.22	5,394.6	181.6	118.9	-179.5	0.00	0.00	
5,500.0	2.87	33.22	5,494.5	185.8	121.7	-183.6	0.00	0.00	
5,600.0	2.87	33.22	5,594.3	190.0	124.4	-187.8	0.00	0.00	
5,614.9	2.87	33.22	5,609.2	190.6	124.8	-188.4	0.00	0.00	Start 2.5° Drop
5,700.0	0.74	33.22	5,694.3	192.8	126.3	-190.6	2.50	-2.50	
5,729.5	0.00	0.00	5,723.8	193.0	126.4	-190.7	2.50	-2.50	EOD @ 0°
5,800.0	0.00	0.00	5,794.3	193.0	126.4	-190.7	0.00	0.00	
5,900.0	0.00	0.00	5,894.3	193.0	126.4	-190.7	0.00	0.00	
6,000.0	0.00	0.00	5,994.3	193.0	126.4	-190.7	0.00	0.00	
6,029.5	0.00	0.00	6,023.8	193.0	126.4	-190.7	0.00	0.00	Start 8° Build
6,050.0	1.64	179.73	6,044.3	192.7	126.4	-190.4	8.00	8.00	
6,100.0	5.64	179.73	6,094.2	189.5	126.4	-187.3	8.00	8.00	
6,150.0	9.64	179.73	6,143.7	182.9	126.4	-180.6	8.00	8.00	
6,200.0	13.64	179.73	6,192.7	172.8	126.5	-170.5	8.00	8.00	
6,250.0	17.64	179.73	6,240.8	159.3	126.6	-157.1	8.00	8.00	
6,300.0	21.64	179.73	6,287.9	142.5	126.6	-140.3	8.00	8.00	
6,350.0	25.64	179.73	6,333.7	122.5	126.7	-120.2	8.00	8.00	
6,400.0	29.64	179.73	6,378.0	99.3	126.8	-97.0	8.00	8.00	
6,450.0	33.64	179.73	6,420.5	73.1	127.0	-70.8	8.00	8.00	
6,500.0	37.64	179.73	6,461.2	43.9	127.1	-41.7	8.00	8.00	
6,550.0	41.64	179.73	6,499.7	12.1	127.2	-9.8	8.00	8.00	
6,600.0	45.64	179.73	6,535.8	-22.4	127.4	24.7	8.00	8.00	
6,650.0	49.64	179.73	6,569.5	-59.4	127.6	61.6	8.00	8.00	
6,700.0	53.64	179.73	6,600.5	-98.6	127.8	100.8	8.00	8.00	
6,750.0	57.64	179.73	6,628.8	-139.8	128.0	142.1	8.00	8.00	
6,800.0	61.64	179.73	6,654.0	-183.0	128.2	185.2	8.00	8.00	
6,850.0	65.64	179.73	6,676.2	-227.8	128.4	230.0	8.00	8.00	
6,900.0	69.64	179.73	6,695.2	-274.0	128.6	276.2	8.00	8.00	
6,950.0	73.64	179.73	6,711.0	-321.4	128.8	323.7	8.00	8.00	
7,000.0	77.64	179.73	6,723.4	-369.9	129.0	372.1	8.00	8.00	
7,050.0	81.64	179.73	6,732.4	-419.0	129.3	421.3	8.00	8.00	
7,100.0	85.64	179.73	6,737.9	-468.7	129.5	470.9	8.00	8.00	
7,154.5	90.00	179.73	6,740.0	-523.2	129.8	525.4	8.00	8.00	LP - 766' FNL, 1253' FEL - LP @ 6,470' TVD, 9
7,200.0	90.00	179.73	6,740.0	-568.7	130.0	570.9	0.00	0.00	
7,300.0	90.00	179.73	6,740.0	-668.7	130.4	670.9	0.00	0.00	
7,400.0	90.00	179.73	6,740.0	-768.7	130.9	770.9	0.00	0.00	
7,500.0	90.00	179.73	6,740.0	-868.7	131.4	870.8	0.00	0.00	
7,600.0	90.00	179.73	6,740.0	-968.7	131.9	970.8	0.00	0.00	
7,700.0	90.00	179.73	6,740.0	-1,068.7	132.3	1,070.8	0.00	0.00	
7,800.0	90.00	179.73	6,740.0	-1,168.7	132.8	1,170.8	0.00	0.00	
7,900.0	90.00	179.73	6,740.0	-1,268.7	133.3	1,270.8	0.00	0.00	
8,000.0	90.00	179.73	6,740.0	-1,368.7	133.7	1,370.8	0.00	0.00	
8,100.0	90.00	179.73	6,740.0	-1,468.7	134.2	1,470.8	0.00	0.00	
8,200.0	90.00	179.73	6,740.0	-1,568.7	134.7	1,570.8	0.00	0.00	
8,300.0	90.00	179.73	6,740.0	-1,668.7	135.1	1,670.8	0.00	0.00	
8,400.0	90.00	179.73	6,740.0	-1,768.7	135.6	1,770.8	0.00	0.00	
8,500.0	90.00	179.73	6,740.0	-1,868.7	136.1	1,870.8	0.00	0.00	
8,600.0	90.00	179.73	6,740.0	-1,968.7	136.5	1,970.8	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 LE GERKIN 13H
<b>Company:</b>	Red Hawk Petroleum	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Project:</b>	Weld County, Colorado	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>North Reference:</b>	True
<b>Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	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
8,700.0	90.00	179.73	6,740.0	-2,068.6	137.0	2,070.7	0.00	0.00	
8,800.0	90.00	179.73	6,740.0	-2,168.6	137.5	2,170.7	0.00	0.00	
8,900.0	90.00	179.73	6,740.0	-2,268.6	138.0	2,270.7	0.00	0.00	
9,000.0	90.00	179.73	6,740.0	-2,368.6	138.4	2,370.7	0.00	0.00	
9,100.0	90.00	179.73	6,740.0	-2,468.6	138.9	2,470.7	0.00	0.00	
9,200.0	90.00	179.73	6,740.0	-2,568.6	139.4	2,570.7	0.00	0.00	
9,300.0	90.00	179.73	6,740.0	-2,668.6	139.8	2,670.7	0.00	0.00	
9,400.0	90.00	179.73	6,740.0	-2,768.6	140.3	2,770.7	0.00	0.00	
9,500.0	90.00	179.73	6,740.0	-2,868.6	140.8	2,870.7	0.00	0.00	
9,600.0	90.00	179.73	6,740.0	-2,968.6	141.2	2,970.7	0.00	0.00	
9,700.0	90.00	179.73	6,740.0	-3,068.6	141.7	3,070.7	0.00	0.00	
9,800.0	90.00	179.73	6,740.0	-3,168.6	142.2	3,170.7	0.00	0.00	
9,900.0	90.00	179.73	6,740.0	-3,268.6	142.7	3,270.6	0.00	0.00	
10,000.0	90.00	179.73	6,740.0	-3,368.6	143.1	3,370.6	0.00	0.00	
10,100.0	90.00	179.73	6,740.0	-3,468.6	143.6	3,470.6	0.00	0.00	
10,200.0	90.00	179.73	6,740.0	-3,568.6	144.1	3,570.6	0.00	0.00	
10,300.0	90.00	179.73	6,740.0	-3,668.6	144.5	3,670.6	0.00	0.00	
10,400.0	90.00	179.73	6,740.0	-3,768.6	145.0	3,770.6	0.00	0.00	
10,500.0	90.00	179.73	6,740.0	-3,868.6	145.5	3,870.6	0.00	0.00	
10,600.0	90.00	179.73	6,740.0	-3,968.6	145.9	3,970.6	0.00	0.00	
10,700.0	90.00	179.73	6,740.0	-4,068.6	146.4	4,070.6	0.00	0.00	
10,800.0	90.00	179.73	6,740.0	-4,168.6	146.9	4,170.6	0.00	0.00	
10,900.0	90.00	179.73	6,740.0	-4,268.6	147.3	4,270.6	0.00	0.00	
11,000.0	90.00	179.73	6,740.0	-4,368.6	147.8	4,370.6	0.00	0.00	
11,100.0	90.00	179.73	6,740.0	-4,468.6	148.3	4,470.5	0.00	0.00	
11,200.0	90.00	179.73	6,740.0	-4,568.6	148.8	4,570.5	0.00	0.00	
11,300.0	90.00	179.73	6,740.0	-4,668.6	149.2	4,670.5	0.00	0.00	
11,400.0	90.00	179.73	6,740.0	-4,768.6	149.7	4,770.5	0.00	0.00	
11,500.0	90.00	179.73	6,740.0	-4,868.6	150.2	4,870.5	0.00	0.00	
11,600.0	90.00	179.73	6,740.0	-4,968.6	150.6	4,970.5	0.00	0.00	
11,700.0	90.00	179.73	6,740.0	-5,068.6	151.1	5,070.5	0.00	0.00	
11,800.0	90.00	179.73	6,740.0	-5,168.6	151.6	5,170.5	0.00	0.00	
11,900.0	90.00	179.73	6,740.0	-5,268.6	152.0	5,270.5	0.00	0.00	
12,000.0	90.00	179.73	6,740.0	-5,368.6	152.5	5,370.5	0.00	0.00	
12,100.0	90.00	179.73	6,740.0	-5,468.6	153.0	5,470.5	0.00	0.00	
12,200.0	90.00	179.73	6,740.0	-5,568.6	153.4	5,570.5	0.00	0.00	
12,300.0	90.00	179.73	6,740.0	-5,668.6	153.9	5,670.4	0.00	0.00	
12,400.0	90.00	179.73	6,740.0	-5,768.6	154.4	5,770.4	0.00	0.00	
12,500.0	90.00	179.73	6,740.0	-5,868.6	154.9	5,870.4	0.00	0.00	
12,600.0	90.00	179.73	6,740.0	-5,968.6	155.3	5,970.4	0.00	0.00	
12,700.0	90.00	179.73	6,740.0	-6,068.6	155.8	6,070.4	0.00	0.00	
12,800.0	90.00	179.73	6,740.0	-6,168.6	156.3	6,170.4	0.00	0.00	
12,900.0	90.00	179.73	6,740.0	-6,268.6	156.7	6,270.4	0.00	0.00	
13,000.0	90.00	179.73	6,740.0	-6,368.6	157.2	6,370.4	0.00	0.00	
13,100.0	90.00	179.73	6,740.0	-6,468.6	157.7	6,470.4	0.00	0.00	
13,200.0	90.00	179.73	6,740.0	-6,568.6	158.1	6,570.4	0.00	0.00	
13,300.0	90.00	179.73	6,740.0	-6,668.6	158.6	6,670.4	0.00	0.00	
13,400.0	90.00	179.73	6,740.0	-6,768.6	159.1	6,770.4	0.00	0.00	
13,500.0	90.00	179.73	6,740.0	-6,868.6	159.6	6,870.3	0.00	0.00	
13,600.0	90.00	179.73	6,740.0	-6,968.6	160.0	6,970.3	0.00	0.00	
13,700.0	90.00	179.73	6,740.0	-7,068.6	160.5	7,070.3	0.00	0.00	
13,800.0	90.00	179.73	6,740.0	-7,168.6	161.0	7,170.3	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 LE GERKIN 13H
<b>Company:</b>	Red Hawk Petroleum	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Project:</b>	Weld County, Colorado	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>North Reference:</b>	True
<b>Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	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
13,900.0	90.00	179.73	6,740.0	-7,268.6	161.4	7,270.3	0.00	0.00	
14,000.0	90.00	179.73	6,740.0	-7,368.6	161.9	7,370.3	0.00	0.00	
14,100.0	90.00	179.73	6,740.0	-7,468.6	162.4	7,470.3	0.00	0.00	
14,200.0	90.00	179.73	6,740.0	-7,568.6	162.8	7,570.3	0.00	0.00	
14,300.0	90.00	179.73	6,740.0	-7,668.6	163.3	7,670.3	0.00	0.00	
14,400.0	90.00	179.73	6,740.0	-7,768.6	163.8	7,770.3	0.00	0.00	
14,500.0	90.00	179.73	6,740.0	-7,868.6	164.2	7,870.3	0.00	0.00	
14,600.0	90.00	179.73	6,740.0	-7,968.6	164.7	7,970.3	0.00	0.00	
14,700.0	90.00	179.73	6,740.0	-8,068.6	165.2	8,070.2	0.00	0.00	
14,800.0	90.00	179.73	6,740.0	-8,168.6	165.7	8,170.2	0.00	0.00	
14,900.0	90.00	179.73	6,740.0	-8,268.6	166.1	8,270.2	0.00	0.00	
15,000.0	90.00	179.73	6,740.0	-8,368.6	166.6	8,370.2	0.00	0.00	
15,100.0	90.00	179.73	6,740.0	-8,468.6	167.1	8,470.2	0.00	0.00	
15,200.0	90.00	179.73	6,740.0	-8,568.6	167.5	8,570.2	0.00	0.00	
15,300.0	90.00	179.73	6,740.0	-8,668.6	168.0	8,670.2	0.00	0.00	
15,400.0	90.00	179.73	6,740.0	-8,768.6	168.5	8,770.2	0.00	0.00	
15,500.0	90.00	179.73	6,740.0	-8,868.6	168.9	8,870.2	0.00	0.00	
15,600.0	90.00	179.73	6,740.0	-8,968.6	169.4	8,970.2	0.00	0.00	
15,700.0	90.00	179.73	6,740.0	-9,068.6	169.9	9,070.2	0.00	0.00	
15,800.0	90.00	179.73	6,740.0	-9,168.6	170.3	9,170.2	0.00	0.00	
15,900.0	90.00	179.73	6,740.0	-9,268.6	170.8	9,270.1	0.00	0.00	
16,000.0	90.00	179.73	6,740.0	-9,368.6	171.3	9,370.1	0.00	0.00	
16,100.0	90.00	179.73	6,740.0	-9,468.6	171.8	9,470.1	0.00	0.00	
16,200.0	90.00	179.73	6,740.0	-9,568.6	172.2	9,570.1	0.00	0.00	
16,300.0	90.00	179.73	6,740.0	-9,668.6	172.7	9,670.1	0.00	0.00	
16,400.0	90.00	179.73	6,740.0	-9,768.6	173.2	9,770.1	0.00	0.00	
16,448.8	90.00	179.73	6,740.0	-9,817.3	173.4	9,818.9	0.00	0.00	PBHL - 500' FSL, 1253' FEL - TD @ 16,448.8' M

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LE GERKIN 13H VP - hit/miss target - Shape - Point	0.00	0.00	5,723.8	193.0	126.4	1,297,430.51	3,280,976.32	40.145470	-104.494898
LE GERKIN 13H PBHL - plan hits target center - Point	0.00	0.00	6,740.0	-9,817.3	173.4	1,287,421.36	3,281,136.72	40.117990	-104.494730



# Cathedral Energy Services

## Planning Report

<b>Database:</b>	USA EDM 5000 Multi Users DB	<b>Local Co-ordinate Reference:</b>	Well LE GERKIN 13H
<b>Company:</b>	Red Hawk Petroleum	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Project:</b>	Weld County, Colorado	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>North Reference:</b>	True
<b>Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	HZ		
<b>Design:</b>	Plan #1		

### Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.5	0.5	0.0	0.0	SH - 240' FNL, 1378' FEL
1,000.0	1,000.0	0.0	0.0	KOP @ 1,000'
1,114.6	1,114.6	2.4	1.6	EOB @ 2.87° INC
5,614.9	5,609.2	190.6	124.8	Start 2.5° Drop
5,729.5	5,723.8	193.0	126.4	EOD @ 0°
6,029.5	6,023.8	193.0	126.4	Start 8° Build
7,154.5	6,740.0	-523.2	129.8	LP - 766' FNL, 1253' FEL
7,154.5	6,740.0	-523.2	129.8	LP @ 6,470' TVD, 90° INC
16,448.8	6,740.0	-9,817.3	173.4	PBHL - 500' FSL, 1253' FEL
16,448.8	6,740.0	-9,817.3	173.4	TD @ 16,448.8' MD

# **Red Hawk Petroleum**

**Weld County, Colorado**

**S13-T2N-R64W (LE GERKIN PADS)**

**LE GERKIN 13H**

**HZ**

**Plan #1**

## **Anticollision Report**

**30 October, 2014**

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Red Hawk Petroleum	<b>Local Co-ordinate Reference:</b>	Well LE GERKIN 13H
<b>Project:</b>	Weld County, Colorado	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Reference Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 200.0usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date	10/30/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	16,448.8	Plan #1 (HZ)	Geolink MWD	Geolink MWD	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
S13-T2N-R64W (LE GERKIN PADS)						
EXISTING - ARNOLD #1 - EXISTING - EXISTING - NO S						Out of range
EXISTING - DARYL L ARNOLD #1 - EXISTING - EXISTI						Out of range
EXISTING - MCCLINTOCK ET AL #1 - EXISTING - EXIS						Out of range
LE GERKIN 10H - HZ - Plan #1	1,000.0	1,000.0	89.5	86.0	26.151	CC, ES
LE GERKIN 10H - HZ - Plan #1	1,100.0	1,096.2	92.7	88.9	24.628	SF
LE GERKIN 11H - HZ - Plan #1	1,000.0	1,000.0	58.7	55.3	17.162	CC, ES
LE GERKIN 11H - HZ - Plan #1	1,100.0	1,097.6	61.9	58.1	16.425	SF
LE GERKIN 12H - HZ - Plan #1	1,000.0	1,000.0	28.0	24.5	8.172	CC, ES
LE GERKIN 12H - HZ - Plan #1	1,100.0	1,099.2	30.5	26.7	8.093	SF
LE GERKIN 14H - HZ - Plan #1	1,000.0	1,000.0	30.8	27.3	8.989	CC, ES
LE GERKIN 14H - HZ - Plan #1	1,100.0	1,098.8	31.5	27.7	8.360	SF
LE GERKIN 15H - HZ - Plan #1	1,000.0	1,000.0	61.6	58.2	18.010	CC, ES
LE GERKIN 15H - HZ - Plan #1	1,200.0	1,194.7	65.8	61.6	15.983	SF
LE GERKIN 16H - HZ - Plan #1	1,000.0	1,000.0	92.3	88.9	26.989	CC, ES
LE GERKIN 16H - HZ - Plan #1	1,300.0	1,287.8	104.1	99.6	23.347	SF
LE GERKIN 1H - HZ - Plan #3						Out of range
LE GERKIN 2H - HZ - Plan #3						Out of range
LE GERKIN 3H - HZ - Plan #3						Out of range
LE GERKIN 4H - HZ - Plan #3						Out of range
LE GERKIN 5H - HZ - Plan #3						Out of range
LE GERKIN 6H - HZ - Plan #3						Out of range
LE GERKIN 7H - HZ - Plan #3						Out of range
LE GERKIN 8H - HZ - Plan #3						Out of range
LE GERKIN 9H - HZ - Plan #1	1,000.0	1,000.0	117.4	114.0	34.323	CC, ES
LE GERKIN 9H - HZ - Plan #1	1,200.0	1,189.6	129.5	125.4	31.560	SF

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Red Hawk Petroleum	<b>Local Co-ordinate Reference:</b>	Well LE GERKIN 13H
<b>Project:</b>	Weld County, Colorado	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Reference Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 10H - HZ - Plan #1													Offset Site Error: 0.0 usft	
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft	
Offset				Semi Major Axis				Distance					Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Total Uncertainty	Separation			
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	+N/-S (usft)	+E/-W (usft)	(usft)	(usft)	Axis	Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-89.5	89.5					
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-89.5	89.5	89.2	0.28	320.350		
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-89.5	89.5	88.8	0.63	142.378		
300.0	300.0	300.0	300.0	0.5	0.5	-90.00	0.0	-89.5	89.5	88.5	0.98	91.529		
400.0	400.0	400.0	400.0	0.7	0.7	-90.00	0.0	-89.5	89.5	88.1	1.33	67.442		
500.0	500.0	500.0	500.0	0.8	0.8	-90.00	0.0	-89.5	89.5	87.8	1.68	53.392		
600.0	600.0	600.0	600.0	1.0	1.0	-90.00	0.0	-89.5	89.5	87.4	2.02	44.186		
700.0	700.0	700.0	700.0	1.2	1.2	-90.00	0.0	-89.5	89.5	87.1	2.37	37.688		
800.0	800.0	800.0	800.0	1.4	1.4	-90.00	0.0	-89.5	89.5	86.7	2.72	32.856		
900.0	900.0	900.0	900.0	1.5	1.5	-90.00	0.0	-89.5	89.5	86.4	3.07	29.123		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-90.00	0.0	-89.5	89.5	86.0	3.42	26.151	CC, ES	
1,100.0	1,100.0	1,096.2	1,096.2	1.9	1.9	-123.93	0.5	-91.4	92.7	88.9	3.76	24.628	SF	
1,200.0	1,199.8	1,191.9	1,191.7	2.1	2.1	-125.23	2.0	-97.2	101.5	97.4	4.11	24.713		
1,300.0	1,299.7	1,286.8	1,286.1	2.2	2.3	-125.75	4.5	-106.8	114.4	110.0	4.46	25.673		
1,400.0	1,399.6	1,382.1	1,380.4	2.4	2.5	-125.64	8.0	-120.2	131.2	126.4	4.81	27.281		
1,500.0	1,499.5	1,478.8	1,475.7	2.6	2.7	-125.32	12.0	-135.7	149.9	144.7	5.17	29.023		
1,600.0	1,599.3	1,577.0	1,572.5	2.8	3.0	-125.06	16.2	-151.5	168.7	163.1	5.53	30.515		
1,700.0	1,699.2	1,675.2	1,669.4	3.0	3.3	-124.86	20.3	-167.3	187.4	181.5	5.89	31.816		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Red Hawk Petroleum	<b>Local Co-ordinate Reference:</b>	Well LE GERKIN 13H
<b>Project:</b>	Weld County, Colorado	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Reference Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 11H - HZ - Plan #1													Offset Site Error: 0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-58.7	58.7				
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-58.7	58.7	58.4	0.28	210.229	
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-58.7	58.7	58.1	0.63	93.435	
300.0	300.0	300.0	300.0	0.5	0.5	-90.00	0.0	-58.7	58.7	57.7	0.98	60.066	
400.0	400.0	400.0	400.0	0.7	0.7	-90.00	0.0	-58.7	58.7	57.4	1.33	44.259	
500.0	500.0	500.0	500.0	0.8	0.8	-90.00	0.0	-58.7	58.7	57.0	1.68	35.038	
600.0	600.0	600.0	600.0	1.0	1.0	-90.00	0.0	-58.7	58.7	56.7	2.02	28.997	
700.0	700.0	700.0	700.0	1.2	1.2	-90.00	0.0	-58.7	58.7	56.3	2.37	24.733	
800.0	800.0	800.0	800.0	1.4	1.4	-90.00	0.0	-58.7	58.7	56.0	2.72	21.562	
900.0	900.0	900.0	900.0	1.5	1.5	-90.00	0.0	-58.7	58.7	55.6	3.07	19.112	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-90.00	0.0	-58.7	58.7	55.3	3.42	17.162 CC, ES	
1,100.0	1,100.0	1,097.6	1,097.6	1.9	1.9	-124.04	0.8	-60.6	61.9	58.1	3.77	16.425 SF	
1,200.0	1,199.8	1,194.7	1,194.5	2.1	2.1	-125.19	3.3	-66.3	70.5	66.3	4.12	17.121	
1,300.0	1,299.7	1,292.7	1,292.0	2.2	2.3	-125.04	7.2	-75.2	82.3	77.8	4.47	18.416	
1,400.0	1,399.6	1,392.0	1,390.7	2.4	2.5	-124.81	11.3	-84.7	94.6	89.7	4.83	19.581	
1,500.0	1,499.5	1,491.2	1,489.4	2.6	2.7	-124.63	15.4	-94.2	106.8	101.6	5.19	20.575	
1,600.0	1,599.3	1,590.5	1,588.1	2.8	2.9	-124.49	19.5	-103.6	119.1	113.5	5.56	21.433	
1,700.0	1,699.2	1,689.7	1,686.8	3.0	3.1	-124.38	23.7	-113.1	131.3	125.4	5.92	22.179	
1,800.0	1,799.1	1,788.9	1,785.5	3.2	3.4	-124.28	27.8	-122.6	143.6	137.3	6.29	22.835	
1,900.0	1,899.0	1,888.2	1,884.2	3.4	3.6	-124.20	31.9	-132.0	155.9	149.2	6.66	23.414	
2,000.0	1,998.8	1,987.4	1,982.9	3.6	3.8	-124.13	36.0	-141.5	168.1	161.1	7.03	23.929	
2,100.0	2,098.7	2,086.7	2,081.6	3.8	4.1	-124.08	40.1	-151.0	180.4	173.0	7.40	24.391	
2,200.0	2,198.6	2,185.9	2,180.4	3.9	4.3	-124.02	44.2	-160.4	192.6	184.9	7.77	24.807	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Red Hawk Petroleum	<b>Local Co-ordinate Reference:</b>	Well LE GERKIN 13H
<b>Project:</b>	Weld County, Colorado	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Reference Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 12H - HZ - Plan #1													Offset Site Error:	0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-28.0	28.0					
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-28.0	28.0	27.7	0.28	100.109		
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-28.0	28.0	27.3	0.63	44.493		
300.0	300.0	300.0	300.0	0.5	0.5	-90.00	0.0	-28.0	28.0	27.0	0.98	28.603		
400.0	400.0	400.0	400.0	0.7	0.7	-90.00	0.0	-28.0	28.0	26.6	1.33	21.076		
500.0	500.0	500.0	500.0	0.8	0.8	-90.00	0.0	-28.0	28.0	26.3	1.68	16.685		
600.0	600.0	600.0	600.0	1.0	1.0	-90.00	0.0	-28.0	28.0	25.9	2.02	13.808		
700.0	700.0	700.0	700.0	1.2	1.2	-90.00	0.0	-28.0	28.0	25.6	2.37	11.778		
800.0	800.0	800.0	800.0	1.4	1.4	-90.00	0.0	-28.0	28.0	25.2	2.72	10.268		
900.0	900.0	900.0	900.0	1.5	1.5	-90.00	0.0	-28.0	28.0	24.9	3.07	9.101		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-90.00	0.0	-28.0	28.0	24.5	3.42	8.172 CC, ES		
1,100.0	1,100.0	1,099.2	1,099.1	1.9	1.9	-123.43	1.7	-29.3	30.5	26.7	3.77	8.093 SF		
1,200.0	1,199.8	1,198.8	1,198.6	2.1	2.1	-123.54	5.7	-32.5	36.5	32.4	4.12	8.844		
1,300.0	1,299.7	1,298.6	1,298.3	2.2	2.2	-123.57	9.8	-35.9	42.5	38.1	4.48	9.489		
1,400.0	1,399.6	1,398.4	1,398.0	2.4	2.4	-123.59	13.9	-39.2	48.6	43.8	4.85	10.031		
1,500.0	1,499.5	1,498.3	1,497.7	2.6	2.6	-123.61	18.0	-42.5	54.7	49.5	5.21	10.494		
1,600.0	1,599.3	1,598.1	1,597.3	2.8	2.8	-123.62	22.2	-45.8	60.7	55.2	5.57	10.893		
1,700.0	1,699.2	1,697.9	1,697.0	3.0	3.0	-123.63	26.3	-49.1	66.8	60.8	5.94	11.240		
1,800.0	1,799.1	1,797.7	1,796.7	3.2	3.2	-123.64	30.4	-52.5	72.9	66.5	6.31	11.545		
1,900.0	1,899.0	1,897.5	1,896.4	3.4	3.4	-123.65	34.5	-55.8	78.9	72.2	6.68	11.814		
2,000.0	1,998.8	1,997.3	1,996.0	3.6	3.6	-123.66	38.6	-59.1	85.0	77.9	7.05	12.053		
2,100.0	2,098.7	2,097.2	2,095.7	3.8	3.8	-123.66	42.7	-62.4	91.0	83.6	7.42	12.267		
2,200.0	2,198.6	2,197.0	2,195.4	3.9	4.0	-123.67	46.8	-65.8	97.1	89.3	7.79	12.460		
2,300.0	2,298.5	2,296.8	2,295.1	4.1	4.1	-123.67	51.0	-69.1	103.2	95.0	8.17	12.635		
2,400.0	2,398.3	2,396.6	2,394.8	4.3	4.3	-123.68	55.1	-72.4	109.2	100.7	8.54	12.794		
2,500.0	2,498.2	2,496.4	2,494.4	4.5	4.5	-123.68	59.2	-75.7	115.3	106.4	8.91	12.938		
2,600.0	2,598.1	2,596.2	2,594.1	4.7	4.7	-123.68	63.3	-79.0	121.4	112.1	9.28	13.071		
2,700.0	2,698.0	2,696.0	2,693.8	4.9	4.9	-123.69	67.4	-82.4	127.4	117.8	9.66	13.193		
2,800.0	2,797.8	2,795.9	2,793.5	5.1	5.1	-123.69	71.5	-85.7	133.5	123.4	10.03	13.305		
2,900.0	2,897.7	2,895.7	2,893.1	5.3	5.3	-123.69	75.6	-89.0	139.5	129.1	10.41	13.409		
3,000.0	2,997.6	2,995.5	2,992.8	5.5	5.5	-123.69	79.8	-92.3	145.6	134.8	10.78	13.506		
3,100.0	3,097.5	3,095.3	3,092.5	5.7	5.7	-123.70	83.9	-95.6	151.7	140.5	11.16	13.596		
3,200.0	3,197.3	3,195.1	3,192.2	5.9	5.9	-123.70	88.0	-99.0	157.7	146.2	11.53	13.680		
3,300.0	3,297.2	3,294.9	3,291.8	6.1	6.1	-123.70	92.1	-102.3	163.8	151.9	11.91	13.758		
3,400.0	3,397.1	3,394.8	3,391.5	6.3	6.3	-123.70	96.2	-105.6	169.9	157.6	12.28	13.831		
3,500.0	3,497.0	3,494.6	3,491.2	6.5	6.5	-123.70	100.3	-108.9	175.9	163.3	12.66	13.900		
3,600.0	3,596.8	3,594.4	3,590.9	6.6	6.7	-123.70	104.5	-112.2	182.0	169.0	13.03	13.965		
3,700.0	3,696.7	3,694.2	3,690.5	6.8	6.9	-123.71	108.6	-115.6	188.0	174.6	13.41	14.026		
3,800.0	3,796.6	3,794.0	3,790.2	7.0	7.1	-123.71	112.7	-118.9	194.1	180.3	13.78	14.083		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Red Hawk Petroleum	<b>Local Co-ordinate Reference:</b>	Well LE GERKIN 13H
<b>Project:</b>	Weld County, Colorado	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Reference Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 14H - HZ - Plan #1													Offset Site Error: 0.0 usft	
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	30.8	30.8					
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	30.8	30.8	30.5	0.28	110.120		
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	30.8	30.8	30.1	0.63	48.942		
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	30.8	30.8	29.8	0.98	31.463		
400.0	400.0	400.0	400.0	0.7	0.7	90.00	0.0	30.8	30.8	29.4	1.33	23.183		
500.0	500.0	500.0	500.0	0.8	0.8	90.00	0.0	30.8	30.8	29.1	1.68	18.353		
600.0	600.0	600.0	600.0	1.0	1.0	90.00	0.0	30.8	30.8	28.7	2.02	15.189		
700.0	700.0	700.0	700.0	1.2	1.2	90.00	0.0	30.8	30.8	28.4	2.37	12.955		
800.0	800.0	800.0	800.0	1.4	1.4	90.00	0.0	30.8	30.8	28.0	2.72	11.294		
900.0	900.0	900.0	900.0	1.5	1.5	90.00	0.0	30.8	30.8	27.7	3.07	10.011		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	90.00	0.0	30.8	30.8	27.3	3.42	8.989 CC, ES		
1,100.0	1,100.0	1,098.8	1,098.8	1.9	1.9	58.35	0.9	32.7	31.5	27.7	3.77	8.360 SF		
1,200.0	1,199.8	1,197.5	1,197.3	2.1	2.1	60.36	3.7	38.4	34.7	30.5	4.12	8.409		
1,300.0	1,299.7	1,296.9	1,296.2	2.2	2.3	59.72	7.9	47.1	40.7	36.2	4.48	9.074		
1,400.0	1,399.6	1,396.7	1,395.5	2.4	2.5	59.12	12.3	56.0	46.8	42.0	4.84	9.670		
1,500.0	1,499.5	1,496.5	1,494.8	2.6	2.7	58.67	16.6	64.9	53.0	47.8	5.21	10.180		
1,600.0	1,599.3	1,596.3	1,594.1	2.8	2.9	58.31	20.9	73.8	59.2	53.6	5.58	10.620		
1,700.0	1,699.2	1,696.1	1,693.4	3.0	3.1	58.02	25.3	82.7	65.4	59.5	5.94	11.004		
1,800.0	1,799.1	1,795.9	1,792.8	3.2	3.3	57.78	29.6	91.6	71.6	65.3	6.31	11.341		
1,900.0	1,899.0	1,895.8	1,892.1	3.4	3.6	57.57	33.9	100.5	77.8	71.1	6.68	11.639		
2,000.0	1,998.8	1,995.6	1,991.4	3.6	3.8	57.40	38.3	109.5	84.0	76.9	7.05	11.905		
2,100.0	2,098.7	2,095.4	2,090.7	3.8	4.0	57.25	42.6	118.4	90.2	82.7	7.43	12.143		
2,200.0	2,198.6	2,195.2	2,190.0	3.9	4.3	57.12	46.9	127.3	96.4	88.6	7.80	12.358		
2,300.0	2,298.5	2,295.0	2,289.3	4.1	4.5	57.01	51.2	136.2	102.6	94.4	8.17	12.552		
2,400.0	2,398.3	2,394.8	2,388.7	4.3	4.7	56.90	55.6	145.1	108.8	100.2	8.54	12.729		
2,500.0	2,498.2	2,494.6	2,488.0	4.5	5.0	56.81	59.9	154.0	114.9	106.0	8.92	12.891		
2,600.0	2,598.1	2,594.4	2,587.3	4.7	5.2	56.73	64.2	162.9	121.1	111.9	9.29	13.039		
2,700.0	2,698.0	2,694.2	2,686.6	4.9	5.5	56.66	68.6	171.8	127.3	117.7	9.66	13.176		
2,800.0	2,797.8	2,794.0	2,785.9	5.1	5.7	56.59	72.9	180.7	133.5	123.5	10.04	13.302		
2,900.0	2,897.7	2,893.8	2,885.2	5.3	5.9	56.53	77.2	189.6	139.7	129.3	10.41	13.419		
3,000.0	2,997.6	2,993.6	2,984.5	5.5	6.2	56.48	81.5	198.6	145.9	135.1	10.79	13.527		
3,100.0	3,097.5	3,093.4	3,083.9	5.7	6.4	56.43	85.9	207.5	152.1	141.0	11.16	13.628		
3,200.0	3,197.3	3,193.3	3,183.2	5.9	6.7	56.38	90.2	216.4	158.3	146.8	11.54	13.722		
3,300.0	3,297.2	3,293.1	3,282.5	6.1	6.9	56.34	94.5	225.3	164.5	152.6	11.91	13.811		
3,400.0	3,397.1	3,392.9	3,381.8	6.3	7.1	56.30	98.9	234.2	170.7	158.4	12.29	13.893		
3,500.0	3,497.0	3,492.7	3,481.1	6.5	7.4	56.26	103.2	243.1	176.9	164.2	12.66	13.971		
3,600.0	3,596.8	3,592.5	3,580.4	6.6	7.6	56.22	107.5	252.0	183.1	170.1	13.04	14.044		
3,700.0	3,696.7	3,692.3	3,679.7	6.8	7.9	56.19	111.9	260.9	189.3	175.9	13.41	14.113		
3,800.0	3,796.6	3,792.1	3,779.1	7.0	8.1	56.16	116.2	269.8	195.5	181.7	13.79	14.178		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Red Hawk Petroleum	<b>Local Co-ordinate Reference:</b>	Well LE GERKIN 13H
<b>Project:</b>	Weld County, Colorado	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Reference Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 15H - HZ - Plan #1													Offset Site Error:	0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty Axis			
0.0	0.0	0.0	0.0	0.0	0.0	86.61	3.6	61.5	61.6					
100.0	100.0	100.0	100.0	0.1	0.1	86.61	3.6	61.5	61.6	61.3	0.28	220.626		
200.0	200.0	200.0	200.0	0.3	0.3	86.61	3.6	61.5	61.6	61.0	0.63	98.056		
300.0	300.0	300.0	300.0	0.5	0.5	86.61	3.6	61.5	61.6	60.6	0.98	63.036		
400.0	400.0	400.0	400.0	0.7	0.7	86.61	3.6	61.5	61.6	60.3	1.33	46.448		
500.0	500.0	500.0	500.0	0.8	0.8	86.61	3.6	61.5	61.6	59.9	1.68	36.771		
600.0	600.0	600.0	600.0	1.0	1.0	86.61	3.6	61.5	61.6	59.6	2.02	30.431		
700.0	700.0	700.0	700.0	1.2	1.2	86.61	3.6	61.5	61.6	59.2	2.37	25.956		
800.0	800.0	800.0	800.0	1.4	1.4	86.61	3.6	61.5	61.6	58.9	2.72	22.628		
900.0	900.0	900.0	900.0	1.5	1.5	86.61	3.6	61.5	61.6	58.5	3.07	20.057		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	86.61	3.6	61.5	61.6	58.2	3.42	18.010 CC, ES		
1,100.0	1,100.0	1,097.4	1,097.4	1.9	1.9	54.52	4.2	63.5	62.4	58.6	3.77	16.569		
1,200.0	1,199.8	1,194.7	1,194.5	2.1	2.1	56.66	5.9	69.4	65.8	61.6	4.11	15.983 SF		
1,300.0	1,299.7	1,291.6	1,290.8	2.2	2.3	57.62	8.7	79.3	73.2	68.8	4.47	16.393		
1,400.0	1,399.6	1,388.5	1,386.6	2.4	2.5	57.57	12.7	93.0	84.6	79.8	4.82	17.549		
1,500.0	1,499.5	1,487.6	1,484.5	2.6	2.7	57.30	17.1	108.3	97.3	92.1	5.18	18.772		
1,600.0	1,599.3	1,586.8	1,582.4	2.8	3.0	57.10	21.4	123.6	110.0	104.5	5.55	19.829		
1,700.0	1,699.2	1,686.0	1,680.3	3.0	3.3	56.93	25.8	138.9	122.7	116.8	5.92	20.750		
1,800.0	1,799.1	1,785.2	1,778.2	3.2	3.6	56.80	30.2	154.2	135.4	129.2	6.28	21.561		
1,900.0	1,899.0	1,884.4	1,876.1	3.4	3.9	56.69	34.6	169.5	148.2	141.5	6.65	22.278		
2,000.0	1,998.8	1,983.6	1,974.0	3.6	4.2	56.60	39.0	184.8	160.9	153.8	7.02	22.918		
2,100.0	2,098.7	2,082.8	2,071.9	3.8	4.5	56.52	43.4	200.1	173.6	166.2	7.39	23.491		
2,200.0	2,198.6	2,182.0	2,169.8	3.9	4.8	56.45	47.8	215.3	186.3	178.5	7.76	24.008		
2,300.0	2,298.5	2,281.2	2,267.8	4.1	5.1	56.39	52.1	230.6	199.0	190.9	8.13	24.476		



# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Red Hawk Petroleum	<b>Local Co-ordinate Reference:</b>	Well LE GERKIN 13H
<b>Project:</b>	Weld County, Colorado	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Reference Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 16H - HZ - Plan #1													Offset Site Error: 0.0 usft	
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	87.74	3.6	92.3	92.3					
100.0	100.0	100.0	100.0	0.1	0.1	87.74	3.6	92.3	92.3	92.0	0.28	330.618		
200.0	200.0	200.0	200.0	0.3	0.3	87.74	3.6	92.3	92.3	91.7	0.63	146.941		
300.0	300.0	300.0	300.0	0.5	0.5	87.74	3.6	92.3	92.3	91.3	0.98	94.462		
400.0	400.0	400.0	400.0	0.7	0.7	87.74	3.6	92.3	92.3	91.0	1.33	69.604		
500.0	500.0	500.0	500.0	0.8	0.8	87.74	3.6	92.3	92.3	90.7	1.68	55.103		
600.0	600.0	600.0	600.0	1.0	1.0	87.74	3.6	92.3	92.3	90.3	2.02	45.603		
700.0	700.0	700.0	700.0	1.2	1.2	87.74	3.6	92.3	92.3	90.0	2.37	38.896		
800.0	800.0	800.0	800.0	1.4	1.4	87.74	3.6	92.3	92.3	89.6	2.72	33.910		
900.0	900.0	900.0	900.0	1.5	1.5	87.74	3.6	92.3	92.3	89.3	3.07	30.056		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	87.74	3.6	92.3	92.3	88.9	3.42	26.989	CC, ES	
1,100.0	1,100.0	1,096.2	1,096.1	1.9	1.9	55.35	4.1	94.2	93.1	89.4	3.76	24.748		
1,200.0	1,199.8	1,192.2	1,191.9	2.1	2.1	57.03	5.3	100.1	96.6	92.4	4.11	23.495		
1,300.0	1,299.7	1,287.8	1,287.0	2.2	2.3	58.09	7.3	109.9	104.1	99.6	4.46	23.347	SF	
1,400.0	1,399.6	1,382.7	1,380.9	2.4	2.5	58.53	10.1	123.5	115.7	110.9	4.81	24.051		
1,500.0	1,499.5	1,476.6	1,473.1	2.6	2.8	58.48	13.6	140.6	131.2	126.1	5.16	25.419		
1,600.0	1,599.3	1,572.0	1,566.2	2.8	3.1	58.12	17.9	161.3	150.2	144.7	5.52	27.214		
1,700.0	1,699.2	1,670.1	1,661.7	3.0	3.4	57.80	22.4	183.1	169.7	163.9	5.88	28.846		
1,800.0	1,799.1	1,768.1	1,757.2	3.2	3.8	57.54	26.9	204.9	189.3	183.0	6.25	30.283		

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Red Hawk Petroleum	<b>Local Co-ordinate Reference:</b>	Well LE GERKIN 13H
<b>Project:</b>	Weld County, Colorado	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Reference Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 9H - HZ - Plan #1													Offset Site Error: 0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-117.4	117.4				
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-117.4	117.4	117.1	0.28	420.459	
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-117.4	117.4	116.8	0.63	186.871	
300.0	300.0	300.0	300.0	0.5	0.5	-90.00	0.0	-117.4	117.4	116.4	0.98	120.131	
400.0	400.0	400.0	400.0	0.7	0.7	-90.00	0.0	-117.4	117.4	116.1	1.33	88.518	
500.0	500.0	500.0	500.0	0.8	0.8	-90.00	0.0	-117.4	117.4	115.7	1.68	70.077	
600.0	600.0	600.0	600.0	1.0	1.0	-90.00	0.0	-117.4	117.4	115.4	2.02	57.994	
700.0	700.0	700.0	700.0	1.2	1.2	-90.00	0.0	-117.4	117.4	115.0	2.37	49.466	
800.0	800.0	800.0	800.0	1.4	1.4	-90.00	0.0	-117.4	117.4	114.7	2.72	43.124	
900.0	900.0	900.0	900.0	1.5	1.5	-90.00	0.0	-117.4	117.4	114.3	3.07	38.224	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-90.00	0.0	-117.4	117.4	114.0	3.42	34.323 CC, ES	
1,100.0	1,100.0	1,095.1	1,095.1	1.9	1.9	-123.81	0.4	-119.4	120.7	116.9	3.76	32.076	
1,200.0	1,199.8	1,189.6	1,189.4	2.1	2.1	-125.02	1.4	-125.1	129.5	125.4	4.10	31.560 SF	
1,300.0	1,299.7	1,283.3	1,282.6	2.2	2.2	-125.74	3.1	-134.6	142.5	138.0	4.45	32.026	
1,400.0	1,399.6	1,376.0	1,374.3	2.4	2.5	-126.02	5.5	-147.7	159.3	154.5	4.79	33.237	
1,500.0	1,499.5	1,467.2	1,464.0	2.6	2.7	-125.96	8.5	-164.1	180.0	174.9	5.14	35.028	

# Cathedral Energy Services

## Anticollision Report

<b>Company:</b>	Red Hawk Petroleum	<b>Local Co-ordinate Reference:</b>	Well LE GERKIN 13H
<b>Project:</b>	Weld County, Colorado	<b>TVD Reference:</b>	KB=20' @ 4890.3usft
<b>Reference Site:</b>	S13-T2N-R64W (LE GERKIN PADS)	<b>MD Reference:</b>	KB=20' @ 4890.3usft
<b>Site Error:</b>	0.0usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LE GERKIN 13H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	HZ	<b>Database:</b>	USA EDM 5000 Multi Users DB
<b>Reference Design:</b>	Plan #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to KB=20' @ 4890.3usft  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000 °

Coordinates are relative to: LE GERKIN 13H  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.65°

