

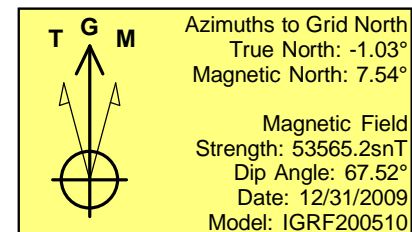
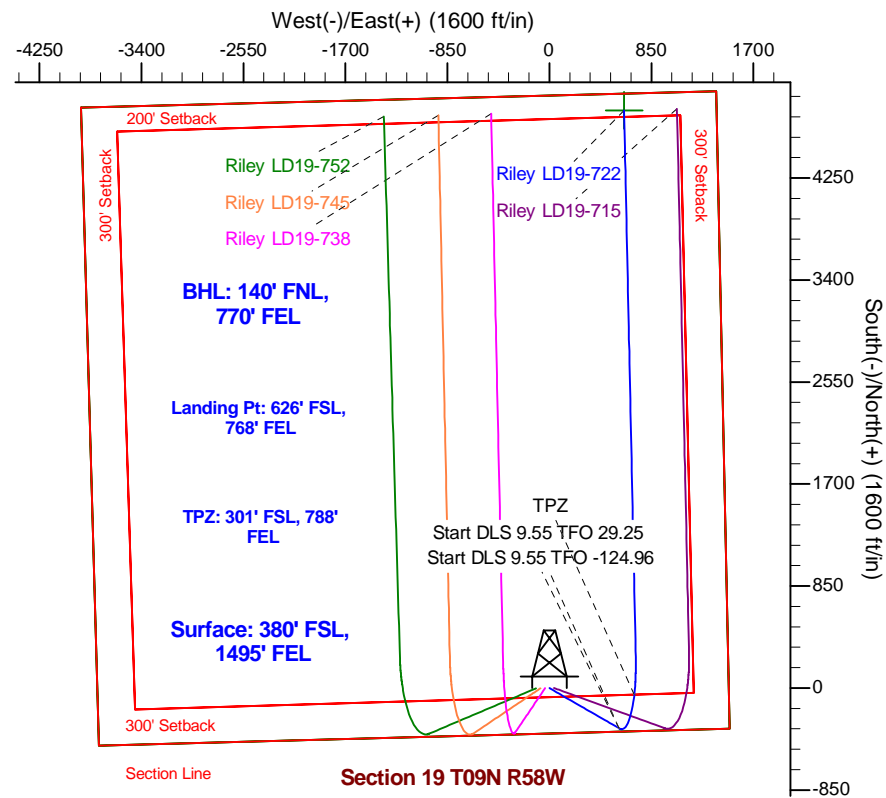
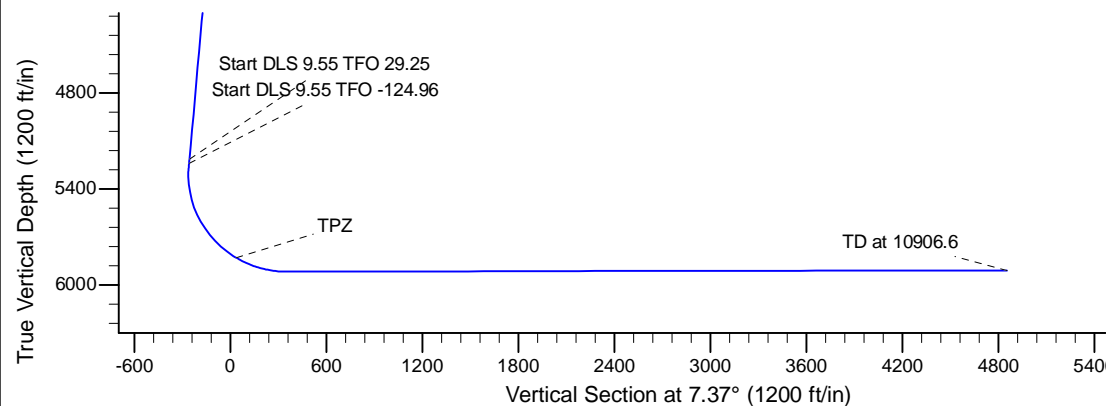
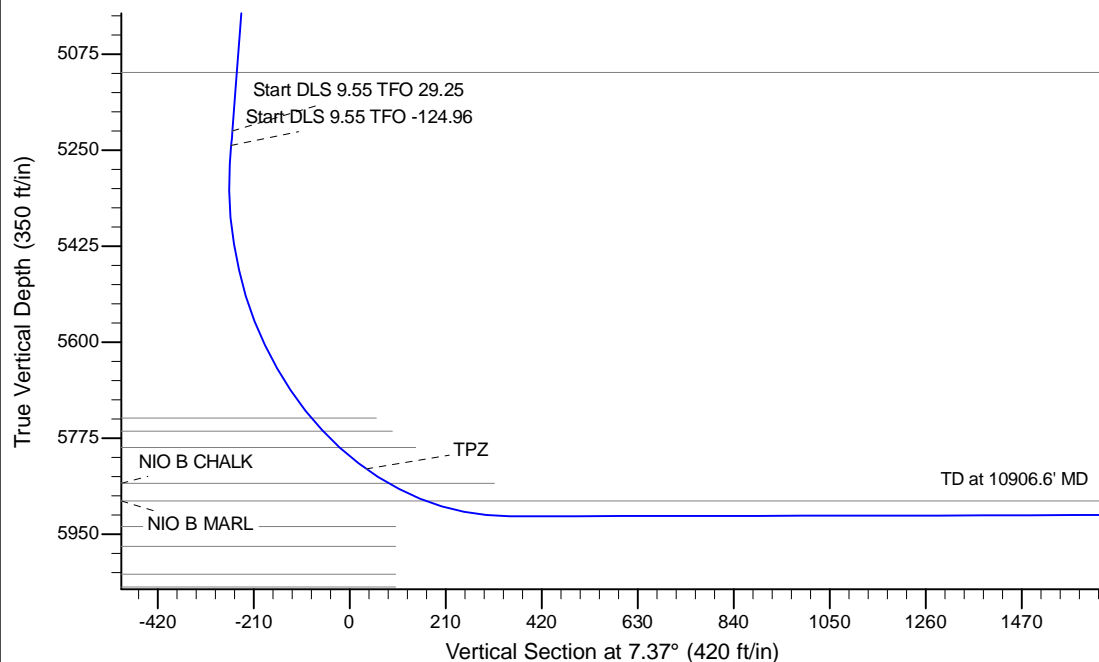
Project: Wattenberg Field  
Site: LD (Sec.19-T09N-R58W) Weld County, CO  
Well: Riley LD19-722  
Wellbore: Original Drilling  
Design: APD - Rev 1

# Northern Region Drilling - Working

Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Colorado Northern Zone  
System Datum: Mean Sea Level

## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	2000.0	0.00	0.00	2000.0	0.0	0.0	0.00	0.00	0.0	
3	2650.0	13.00	120.00	2644.4	-36.7	63.6	2.00	120.00	-28.3	
4	5288.2	13.00	120.00	5215.0	-333.4	577.5	0.00	0.00	-256.6	
5	5314.8	15.27	124.72	5240.8	-336.9	583.0	9.55	29.25	-259.4	
6	6351.6	90.10	358.77	5917.3	260.0	720.0	9.55	-124.96	350.2	
7	10906.6	90.10	358.78	5909.5	4813.9	622.8	0.00	104.80	4854.1	Riley LD19-722 BHL 140'FNL, 770'FEL



## WELL DETAILS: Riley LD19-722

Ground Level: 4820.0		Latitude		Longitude	
Northing	Easting				
0.0	0.0	1512859.94	3442587.53	40.730250	-103.903010

Plan: APD - Rev 1 (Riley LD19-722/Original Drilling)

Created By: Shailey Jewell Date: 10:27, May 20 2016

Checked: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_

Approved: \_\_\_\_\_ Date: \_\_\_\_\_

# **Northern Region Drilling - Working**

**Wattenberg Field**

**LD (09N-58W)**

**Riley LD19-722**

**Original Drilling**

**Plan: APD - Rev 1**

## **Standard Planning Report**

**20 May, 2016**

## Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Riley LD19-722
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Site:</b>	LD (09N-58W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Riley LD19-722	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 1		

<b>Project</b>	Wattenberg Field, 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		Using geodetic scale factor

Site		LD (09N-58W)			
Site Position:		Northing:	1,523,557.18 usft	Latitude:	40.759270
From:	Lat/Long	Easting:	3,449,341.23 usft	Longitude:	-103.877940
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	1.05 °

Well	Riley LD19-722					
Well Position	+N/-S	-10,697.3 ft	Northing:	1,512,859.95 usft	Latitude:	40.730250
	+E/-W	-6,753.7 ft	Easting:	3,442,587.53 usft	Longitude:	-103.903010
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,820.0 ft

<b>Wellbore</b>	Original Drilling				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	12/31/2009	8.58	67.52	53,565

<b>Design</b>	APD - Rev 1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	7.37

<b>Plan Sections</b>										
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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,650.0	13.00	120.00	2,644.4	-36.7	63.6	2.00	2.00	0.00	120.00	
5,288.2	13.00	120.00	5,215.0	-333.4	577.5	0.00	0.00	0.00	0.00	
5,314.8	15.27	124.72	5,240.8	-336.9	583.0	9.55	8.52	17.73	29.25	
6,351.6	90.10	358.77	5,917.3	260.0	720.0	9.55	7.22	-12.15	-124.96	
10,906.6	90.10	358.78	5,909.5	4,813.9	622.8	0.00	0.00	0.00	104.80	Riley LD19-722 BHL

# Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Riley LD19-722
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Site:</b>	LD (09N-58W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Riley LD19-722	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 1		

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
50.0	0.00	0.00	50.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
150.0	0.00	0.00	150.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
250.0	0.00	0.00	250.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
350.0	0.00	0.00	350.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
450.0	0.00	0.00	450.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
550.0	0.00	0.00	550.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
650.0	0.00	0.00	650.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
750.0	0.00	0.00	750.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
850.0	0.00	0.00	850.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
950.0	0.00	0.00	950.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,050.0	0.00	0.00	1,050.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,150.0	0.00	0.00	1,150.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,250.0	0.00	0.00	1,250.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,350.0	0.00	0.00	1,350.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,450.0	0.00	0.00	1,450.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,550.0	0.00	0.00	1,550.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,650.0	0.00	0.00	1,650.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,750.0	0.00	0.00	1,750.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,850.0	0.00	0.00	1,850.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,950.0	0.00	0.00	1,950.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,050.0	1.00	120.00	2,050.0	-0.2	0.4	-0.2	2.00	2.00	0.00
2,100.0	2.00	120.00	2,100.0	-0.9	1.5	-0.7	2.00	2.00	0.00
2,150.0	3.00	120.00	2,149.9	-2.0	3.4	-1.5	2.00	2.00	0.00
2,200.0	4.00	120.00	2,199.8	-3.5	6.0	-2.7	2.00	2.00	0.00
2,250.0	5.00	120.00	2,249.7	-5.5	9.4	-4.2	2.00	2.00	0.00
2,300.0	6.00	120.00	2,299.5	-7.8	13.6	-6.0	2.00	2.00	0.00
2,350.0	7.00	120.00	2,349.1	-10.7	18.5	-8.2	2.00	2.00	0.00
2,400.0	8.00	120.00	2,398.7	-13.9	24.1	-10.7	2.00	2.00	0.00
2,450.0	9.00	120.00	2,448.2	-17.6	30.5	-13.6	2.00	2.00	0.00
2,500.0	10.00	120.00	2,497.5	-21.8	37.7	-16.7	2.00	2.00	0.00
2,550.0	11.00	120.00	2,546.6	-26.3	45.6	-20.3	2.00	2.00	0.00
2,600.0	12.00	120.00	2,595.6	-31.3	54.2	-24.1	2.00	2.00	0.00
2,650.0	13.00	120.00	2,644.4	-36.7	63.6	-28.3	2.00	2.00	0.00

# Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Riley LD19-722
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Site:</b>	LD (09N-58W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Riley LD19-722	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 1		

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)
2,700.0	13.00	120.00	2,693.2	-42.3	73.3	-32.6	0.00	0.00	0.00
2,750.0	13.00	120.00	2,741.9	-48.0	83.1	-36.9	0.00	0.00	0.00
2,800.0	13.00	120.00	2,790.6	-53.6	92.8	-41.2	0.00	0.00	0.00
2,850.0	13.00	120.00	2,839.3	-59.2	102.5	-45.6	0.00	0.00	0.00
2,900.0	13.00	120.00	2,888.0	-64.8	112.3	-49.9	0.00	0.00	0.00
2,950.0	13.00	120.00	2,936.7	-70.5	122.0	-54.2	0.00	0.00	0.00
3,000.0	13.00	120.00	2,985.5	-76.1	131.8	-58.5	0.00	0.00	0.00
3,050.0	13.00	120.00	3,034.2	-81.7	141.5	-62.9	0.00	0.00	0.00
3,100.0	13.00	120.00	3,082.9	-87.3	151.3	-67.2	0.00	0.00	0.00
3,150.0	13.00	120.00	3,131.6	-92.9	161.0	-71.5	0.00	0.00	0.00
3,200.0	13.00	120.00	3,180.3	-98.6	170.7	-75.9	0.00	0.00	0.00
3,250.0	13.00	120.00	3,229.1	-104.2	180.5	-80.2	0.00	0.00	0.00
3,300.0	13.00	120.00	3,277.8	-109.8	190.2	-84.5	0.00	0.00	0.00
3,350.0	13.00	120.00	3,326.5	-115.4	200.0	-88.8	0.00	0.00	0.00
3,400.0	13.00	120.00	3,375.2	-121.1	209.7	-93.2	0.00	0.00	0.00
3,450.0	13.00	120.00	3,423.9	-126.7	219.4	-97.5	0.00	0.00	0.00
3,500.0	13.00	120.00	3,472.7	-132.3	229.2	-101.8	0.00	0.00	0.00
3,550.0	13.00	120.00	3,521.4	-137.9	238.9	-106.1	0.00	0.00	0.00
3,600.0	13.00	120.00	3,570.1	-143.6	248.7	-110.5	0.00	0.00	0.00
3,650.0	13.00	120.00	3,618.8	-149.2	258.4	-114.8	0.00	0.00	0.00
3,700.0	13.00	120.00	3,667.5	-154.8	268.1	-119.1	0.00	0.00	0.00
3,750.0	13.00	120.00	3,716.2	-160.4	277.9	-123.5	0.00	0.00	0.00
3,800.0	13.00	120.00	3,765.0	-166.1	287.6	-127.8	0.00	0.00	0.00
3,850.0	13.00	120.00	3,813.7	-171.7	297.4	-132.1	0.00	0.00	0.00
3,900.0	13.00	120.00	3,862.4	-177.3	307.1	-136.4	0.00	0.00	0.00
3,950.0	13.00	120.00	3,911.1	-182.9	316.8	-140.8	0.00	0.00	0.00
4,000.0	13.00	120.00	3,959.8	-188.6	326.6	-145.1	0.00	0.00	0.00
4,050.0	13.00	120.00	4,008.6	-194.2	336.3	-149.4	0.00	0.00	0.00
4,100.0	13.00	120.00	4,057.3	-199.8	346.1	-153.7	0.00	0.00	0.00
4,150.0	13.00	120.00	4,106.0	-205.4	355.8	-158.1	0.00	0.00	0.00
4,200.0	13.00	120.00	4,154.7	-211.0	365.5	-162.4	0.00	0.00	0.00
4,250.0	13.00	120.00	4,203.4	-216.7	375.3	-166.7	0.00	0.00	0.00
4,300.0	13.00	120.00	4,252.1	-222.3	385.0	-171.1	0.00	0.00	0.00
4,350.0	13.00	120.00	4,300.9	-227.9	394.8	-175.4	0.00	0.00	0.00
4,400.0	13.00	120.00	4,349.6	-233.5	404.5	-179.7	0.00	0.00	0.00
4,450.0	13.00	120.00	4,398.3	-239.2	414.3	-184.0	0.00	0.00	0.00
4,500.0	13.00	120.00	4,447.0	-244.8	424.0	-188.4	0.00	0.00	0.00
4,550.0	13.00	120.00	4,495.7	-250.4	433.7	-192.7	0.00	0.00	0.00
4,600.0	13.00	120.00	4,544.5	-256.0	443.5	-197.0	0.00	0.00	0.00
4,650.0	13.00	120.00	4,593.2	-261.7	453.2	-201.4	0.00	0.00	0.00
4,700.0	13.00	120.00	4,641.9	-267.3	463.0	-205.7	0.00	0.00	0.00
4,750.0	13.00	120.00	4,690.6	-272.9	472.7	-210.0	0.00	0.00	0.00
4,800.0	13.00	120.00	4,739.3	-278.5	482.4	-214.3	0.00	0.00	0.00
4,850.0	13.00	120.00	4,788.1	-284.2	492.2	-218.7	0.00	0.00	0.00
4,900.0	13.00	120.00	4,836.8	-289.8	501.9	-223.0	0.00	0.00	0.00
4,950.0	13.00	120.00	4,885.5	-295.4	511.7	-227.3	0.00	0.00	0.00
5,000.0	13.00	120.00	4,934.2	-301.0	521.4	-231.6	0.00	0.00	0.00
5,050.0	13.00	120.00	4,982.9	-306.7	531.1	-236.0	0.00	0.00	0.00
5,100.0	13.00	120.00	5,031.6	-312.3	540.9	-240.3	0.00	0.00	0.00
5,150.0	13.00	120.00	5,080.4	-317.9	550.6	-244.6	0.00	0.00	0.00
5,200.0	13.00	120.00	5,129.1	-323.5	560.4	-249.0	0.00	0.00	0.00
5,250.0	13.00	120.00	5,177.8	-329.1	570.1	-253.3	0.00	0.00	0.00
5,288.2	13.00	120.00	5,215.0	-333.4	577.5	-256.6	0.00	0.00	0.00
5,300.0	14.00	122.28	5,226.5	-334.9	579.9	-257.7	9.55	8.42	19.29

# Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Riley LD19-722
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Site:</b>	LD (09N-58W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Riley LD19-722	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 1		

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)
5,314.8	15.27	124.72	5,240.8	-336.9	583.0	-259.4	9.55	8.59	16.48
5,350.0	13.62	112.96	5,274.9	-341.2	590.6	-262.6	9.55	-4.69	-33.45
5,400.0	12.49	92.30	5,323.6	-343.7	601.5	-263.7	9.55	-2.26	-41.32
5,450.0	13.09	70.77	5,372.4	-342.1	612.2	-260.7	9.55	1.20	-43.05
5,500.0	15.21	53.17	5,420.9	-336.3	622.8	-253.6	9.55	4.25	-35.20
5,550.0	18.34	40.61	5,468.8	-326.4	633.2	-242.4	9.55	6.26	-25.13
5,600.0	22.05	31.86	5,515.7	-312.4	643.3	-227.3	9.55	7.42	-17.49
5,650.0	26.10	25.62	5,561.4	-294.5	653.0	-208.3	9.55	8.09	-12.49
5,700.0	30.34	20.98	5,605.4	-272.8	662.3	-185.6	9.55	8.49	-9.27
5,750.0	34.71	17.40	5,647.6	-247.4	671.1	-159.2	9.55	8.74	-7.16
5,800.0	39.17	14.54	5,687.5	-218.5	679.3	-129.5	9.55	8.91	-5.73
5,850.0	43.68	12.18	5,725.0	-186.3	686.9	-96.7	9.55	9.02	-4.72
5,900.0	48.23	10.18	5,759.8	-151.1	693.8	-60.8	9.55	9.11	-4.00
5,950.0	52.82	8.45	5,791.6	-113.0	700.1	-22.2	9.55	9.17	-3.46
6,000.0	57.42	6.91	5,820.2	-72.4	705.5	18.8	9.55	9.21	-3.07
6,050.0	62.04	5.53	5,845.4	-29.4	710.2	61.9	9.55	9.25	-2.77
6,100.0	66.68	4.26	5,867.0	15.5	714.0	106.9	9.55	9.27	-2.54
6,150.0	71.32	3.08	5,884.9	62.0	717.0	153.5	9.55	9.29	-2.37
6,200.0	75.98	1.96	5,899.0	109.9	719.1	201.3	9.55	9.30	-2.24
6,250.0	80.63	0.88	5,909.1	158.9	720.3	250.0	9.55	9.31	-2.15
6,300.0	85.29	359.84	5,915.2	208.5	720.6	299.2	9.55	9.32	-2.09
6,350.0	89.95	358.80	5,917.3	258.4	720.0	348.7	9.55	9.32	-2.07
6,351.6	90.10	358.77	5,917.3	260.0	720.0	350.2	9.55	9.32	-2.06
6,400.0	90.10	358.77	5,917.2	308.4	719.0	398.1	0.00	0.00	0.00
6,450.0	90.10	358.77	5,917.1	358.4	717.9	447.5	0.00	0.00	0.00
6,500.0	90.10	358.77	5,917.0	408.4	716.8	497.0	0.00	0.00	0.00
6,550.0	90.10	358.77	5,917.0	458.4	715.7	546.4	0.00	0.00	0.00
6,600.0	90.10	358.77	5,916.9	508.4	714.7	595.9	0.00	0.00	0.00
6,650.0	90.10	358.77	5,916.8	558.4	713.6	645.3	0.00	0.00	0.00
6,700.0	90.10	358.77	5,916.7	608.3	712.5	694.7	0.00	0.00	0.00
6,750.0	90.10	358.77	5,916.6	658.3	711.5	744.2	0.00	0.00	0.00
6,800.0	90.10	358.77	5,916.5	708.3	710.4	793.6	0.00	0.00	0.00
6,850.0	90.10	358.77	5,916.4	758.3	709.3	843.0	0.00	0.00	0.00
6,900.0	90.10	358.77	5,916.3	808.3	708.2	892.5	0.00	0.00	0.00
6,950.0	90.10	358.77	5,916.3	858.3	707.2	941.9	0.00	0.00	0.00
7,000.0	90.10	358.77	5,916.2	908.3	706.1	991.4	0.00	0.00	0.00
7,050.0	90.10	358.77	5,916.1	958.3	705.0	1,040.8	0.00	0.00	0.00
7,100.0	90.10	358.77	5,916.0	1,008.3	703.9	1,090.2	0.00	0.00	0.00
7,150.0	90.10	358.77	5,915.9	1,058.2	702.9	1,139.7	0.00	0.00	0.00
7,200.0	90.10	358.77	5,915.8	1,108.2	701.8	1,189.1	0.00	0.00	0.00
7,250.0	90.10	358.77	5,915.7	1,158.2	700.7	1,238.6	0.00	0.00	0.00
7,300.0	90.10	358.77	5,915.7	1,208.2	699.7	1,288.0	0.00	0.00	0.00
7,350.0	90.10	358.77	5,915.6	1,258.2	698.6	1,337.4	0.00	0.00	0.00
7,400.0	90.10	358.77	5,915.5	1,308.2	697.5	1,386.9	0.00	0.00	0.00
7,450.0	90.10	358.77	5,915.4	1,358.2	696.5	1,436.3	0.00	0.00	0.00
7,500.0	90.10	358.77	5,915.3	1,408.2	695.4	1,485.7	0.00	0.00	0.00
7,550.0	90.10	358.77	5,915.2	1,458.1	694.3	1,535.2	0.00	0.00	0.00
7,600.0	90.10	358.77	5,915.1	1,508.1	693.2	1,584.6	0.00	0.00	0.00
7,650.0	90.10	358.77	5,915.0	1,558.1	692.2	1,634.1	0.00	0.00	0.00
7,700.0	90.10	358.77	5,915.0	1,608.1	691.1	1,683.5	0.00	0.00	0.00
7,750.0	90.10	358.77	5,914.9	1,658.1	690.0	1,732.9	0.00	0.00	0.00
7,800.0	90.10	358.77	5,914.8	1,708.1	689.0	1,782.4	0.00	0.00	0.00
7,850.0	90.10	358.77	5,914.7	1,758.1	687.9	1,831.8	0.00	0.00	0.00
7,900.0	90.10	358.77	5,914.6	1,808.1	686.8	1,881.2	0.00	0.00	0.00

# Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Riley LD19-722
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Site:</b>	LD (09N-58W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Riley LD19-722	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 1		

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)	
7,950.0	90.10	358.77	5,914.5	1,858.1	685.8	1,930.7	0.00	0.00	0.00	
8,000.0	90.10	358.78	5,914.4	1,908.0	684.7	1,980.1	0.00	0.00	0.00	
8,050.0	90.10	358.78	5,914.4	1,958.0	683.6	2,029.6	0.00	0.00	0.00	
8,100.0	90.10	358.78	5,914.3	2,008.0	682.6	2,079.0	0.00	0.00	0.00	
8,150.0	90.10	358.78	5,914.2	2,058.0	681.5	2,128.4	0.00	0.00	0.00	
8,200.0	90.10	358.78	5,914.1	2,108.0	680.4	2,177.9	0.00	0.00	0.00	
8,250.0	90.10	358.78	5,914.0	2,158.0	679.3	2,227.3	0.00	0.00	0.00	
8,300.0	90.10	358.78	5,913.9	2,208.0	678.3	2,276.8	0.00	0.00	0.00	
8,350.0	90.10	358.78	5,913.8	2,258.0	677.2	2,326.2	0.00	0.00	0.00	
8,400.0	90.10	358.78	5,913.8	2,308.0	676.1	2,375.6	0.00	0.00	0.00	
8,450.0	90.10	358.78	5,913.7	2,357.9	675.1	2,425.1	0.00	0.00	0.00	
8,500.0	90.10	358.78	5,913.6	2,407.9	674.0	2,474.5	0.00	0.00	0.00	
8,550.0	90.10	358.78	5,913.5	2,457.9	672.9	2,523.9	0.00	0.00	0.00	
8,600.0	90.10	358.78	5,913.4	2,507.9	671.9	2,573.4	0.00	0.00	0.00	
8,650.0	90.10	358.78	5,913.3	2,557.9	670.8	2,622.8	0.00	0.00	0.00	
8,700.0	90.10	358.78	5,913.2	2,607.9	669.7	2,672.3	0.00	0.00	0.00	
8,750.0	90.10	358.78	5,913.2	2,657.9	668.7	2,721.7	0.00	0.00	0.00	
8,800.0	90.10	358.78	5,913.1	2,707.9	667.6	2,771.1	0.00	0.00	0.00	
8,850.0	90.10	358.78	5,913.0	2,757.9	666.5	2,820.6	0.00	0.00	0.00	
8,900.0	90.10	358.78	5,912.9	2,807.8	665.5	2,870.0	0.00	0.00	0.00	
8,950.0	90.10	358.78	5,912.8	2,857.8	664.4	2,919.5	0.00	0.00	0.00	
9,000.0	90.10	358.78	5,912.7	2,907.8	663.3	2,968.9	0.00	0.00	0.00	
9,050.0	90.10	358.78	5,912.6	2,957.8	662.3	3,018.3	0.00	0.00	0.00	
9,100.0	90.10	358.78	5,912.6	3,007.8	661.2	3,067.8	0.00	0.00	0.00	
9,150.0	90.10	358.78	5,912.5	3,057.8	660.1	3,117.2	0.00	0.00	0.00	
9,200.0	90.10	358.78	5,912.4	3,107.8	659.1	3,166.6	0.00	0.00	0.00	
9,250.0	90.10	358.78	5,912.3	3,157.8	658.0	3,216.1	0.00	0.00	0.00	
9,300.0	90.10	358.78	5,912.2	3,207.7	656.9	3,265.5	0.00	0.00	0.00	
9,350.0	90.10	358.78	5,912.1	3,257.7	655.9	3,315.0	0.00	0.00	0.00	
9,400.0	90.10	358.78	5,912.0	3,307.7	654.8	3,364.4	0.00	0.00	0.00	
9,450.0	90.10	358.78	5,912.0	3,357.7	653.8	3,413.8	0.00	0.00	0.00	
9,500.0	90.10	358.78	5,911.9	3,407.7	652.7	3,463.3	0.00	0.00	0.00	
9,550.0	90.10	358.78	5,911.8	3,457.7	651.6	3,512.7	0.00	0.00	0.00	
9,600.0	90.10	358.78	5,911.7	3,507.7	650.6	3,562.2	0.00	0.00	0.00	
9,650.0	90.10	358.78	5,911.6	3,557.7	649.5	3,611.6	0.00	0.00	0.00	
9,700.0	90.10	358.78	5,911.5	3,607.7	648.4	3,661.0	0.00	0.00	0.00	
9,750.0	90.10	358.78	5,911.5	3,657.6	647.4	3,710.5	0.00	0.00	0.00	
9,800.0	90.10	358.78	5,911.4	3,707.6	646.3	3,759.9	0.00	0.00	0.00	
9,850.0	90.10	358.78	5,911.3	3,757.6	645.2	3,809.4	0.00	0.00	0.00	
9,900.0	90.10	358.78	5,911.2	3,807.6	644.2	3,858.8	0.00	0.00	0.00	
9,950.0	90.10	358.78	5,911.1	3,857.6	643.1	3,908.2	0.00	0.00	0.00	
10,000.0	90.10	358.78	5,911.0	3,907.6	642.0	3,957.7	0.00	0.00	0.00	
10,050.0	90.10	358.78	5,910.9	3,957.6	641.0	4,007.1	0.00	0.00	0.00	
10,100.0	90.10	358.78	5,910.9	4,007.6	639.9	4,056.5	0.00	0.00	0.00	
10,150.0	90.10	358.78	5,910.8	4,057.6	638.9	4,106.0	0.00	0.00	0.00	
10,200.0	90.10	358.78	5,910.7	4,107.5	637.8	4,155.4	0.00	0.00	0.00	
10,250.0	90.10	358.78	5,910.6	4,157.5	636.7	4,204.9	0.00	0.00	0.00	
10,300.0	90.10	358.78	5,910.5	4,207.5	635.7	4,254.3	0.00	0.00	0.00	
10,350.0	90.10	358.78	5,910.4	4,257.5	634.6	4,303.7	0.00	0.00	0.00	
10,400.0	90.10	358.78	5,910.4	4,307.5	633.5	4,353.2	0.00	0.00	0.00	
10,450.0	90.10	358.78	5,910.3	4,357.5	632.5	4,402.6	0.00	0.00	0.00	
10,500.0	90.10	358.78	5,910.2	4,407.5	631.4	4,452.1	0.00	0.00	0.00	
10,550.0	90.10	358.78	5,910.1	4,457.5	630.4	4,501.5	0.00	0.00	0.00	
10,600.0	90.10	358.78	5,910.0	4,507.5	629.3	4,550.9	0.00	0.00	0.00	

## Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Riley LD19-722
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Site:</b>	LD (09N-58W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Riley LD19-722	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 1		

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)	
10,650.0	90.10	358.78	5,909.9	4,557.4	628.2	4,600.4	0.00	0.00	0.00	
10,700.0	90.10	358.78	5,909.8	4,607.4	627.2	4,649.8	0.00	0.00	0.00	
10,750.0	90.10	358.78	5,909.8	4,657.4	626.1	4,699.3	0.00	0.00	0.00	
10,800.0	90.10	358.78	5,909.7	4,707.4	625.1	4,748.7	0.00	0.00	0.00	
10,850.0	90.10	358.78	5,909.6	4,757.4	624.0	4,798.1	0.00	0.00	0.00	
10,900.0	90.10	358.78	5,909.5	4,807.4	622.9	4,847.6	0.00	0.00	0.00	
10,906.6	90.10	358.78	5,909.5	4,813.9	622.8	4,854.1	0.01	0.00	0.01	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
Section 19	0.00	0.00	-38.0	10,697.3	6,753.8	1,523,557.18	3,449,341.23	40.759270	-103.877940	
- plan misses target center by 10371.9ft at 10906.6ft MD (5909.5 TVD, 4813.9 N, 622.8 E)										
- Polygon										
Point 1			-38.0	-5,858.2	-10,656.7	1,517,699.04	3,438,684.64			
Point 2			-38.0	-5,723.4	-5,364.0	1,517,833.84	3,443,977.29			
Point 3			-38.0	-11,036.8	-5,251.0	1,512,520.50	3,444,090.29			
Point 4			-38.0	-11,176.8	-10,508.5	1,512,380.50	3,438,832.84			
Point 5			-38.0	-5,858.2	-10,656.7	1,517,699.04	3,438,684.64			
Setback	0.00	0.00	-38.0	10,697.3	6,753.8	1,523,557.18	3,449,341.23	40.759270	-103.877940	
- plan misses target center by 10371.9ft at 10906.6ft MD (5909.5 TVD, 4813.9 N, 622.8 E)										
- Polygon										
Point 1			-38.0	-6,058.2	-10,356.7	1,517,499.04	3,438,984.64			
Point 2			-38.0	-5,923.4	-5,664.0	1,517,633.84	3,443,677.29			
Point 3			-38.0	-10,736.8	-5,551.0	1,512,820.49	3,443,790.29			
Point 4			-38.0	-10,876.8	-10,208.5	1,512,680.49	3,439,132.84			
Point 5			-38.0	-6,058.2	-10,356.7	1,517,499.04	3,438,984.64			
Riley LD19-722 BHL 140	0.00	0.00	5,909.5	4,813.9	622.8	1,517,673.83	3,443,210.31	40.743430	-103.900450	
- plan hits target center										
- Point										

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
807.0	807.0	PIERRE		0.00		
877.0	877.0	UPPER PIERRE AQUIFER TOP		0.00		
1,462.0	1,462.0	UPPER PIERRE AQUIFER BASE		0.00		
3,412.1	3,387.0	PARKMAN		0.00		
3,968.4	3,929.0	SUSSEX		0.00		
4,551.3	4,497.0	SHANNON		0.00		
5,178.4	5,108.0	TEEPEE BUTTES		0.00		
5,868.2	5,738.0	SHARON SPRINGS		0.00		
5,903.3	5,762.0	NIO A CHALK		0.00		
5,950.7	5,792.0	NIO A MARL		0.00		
6,075.9	5,857.0	NIO B CHALK		0.00		
6,163.2	5,889.0	NIO B MARL		0.00		



## Planning Report

<b>Database:</b>	EDM01P	<b>Local Co-ordinate Reference:</b>	Well Riley LD19-722
<b>Company:</b>	Northern Region Drilling - Working	<b>TVD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Project:</b>	Wattenberg Field	<b>MD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Site:</b>	LD (09N-58W)	<b>North Reference:</b>	Grid
<b>Well:</b>	Riley LD19-722	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Original Drilling		
<b>Design:</b>	APD - Rev 1		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,000.0	2,000.0	0.0	0.0	KOPStart Build 2.00
5,288.2	5,215.0	-333.4	577.5	Start DLS 9.55 TFO 29.25
5,314.8	5,240.8	-336.9	583.0	Start DLS 9.55 TFO -124.96
6,020.0	5,830.7	-55.4	707.5	TPZ
10,906.6	5,909.5	4,813.9	622.8	TD at 10906.6

# **Northern Region Drilling - Working**

**Wattenberg Field  
LD (09N-58W)  
Riley LD19-722**

**Original Drilling  
APD - Rev 1**

## **Anticollision Summary Report**

**20 May, 2016**

## Anticollision Summary Report

<b>Company:</b>	Northern Region Drilling - Working	<b>Local Co-ordinate Reference:</b>	Well Riley LD19-722
<b>Project:</b>	Wattenberg Field	<b>TVD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Reference Site:</b>	LD (09N-58W)	<b>MD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Riley LD19-722	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Original Drilling	<b>Database:</b>	EDM01P
<b>Reference Design:</b>	APD - Rev 1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	APD - Rev 1		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 50.0ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 10,000.0 ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	5/20/2016		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	10,906.6	APD - Rev 1 (Original Drilling)	MWD	MWD - Standard

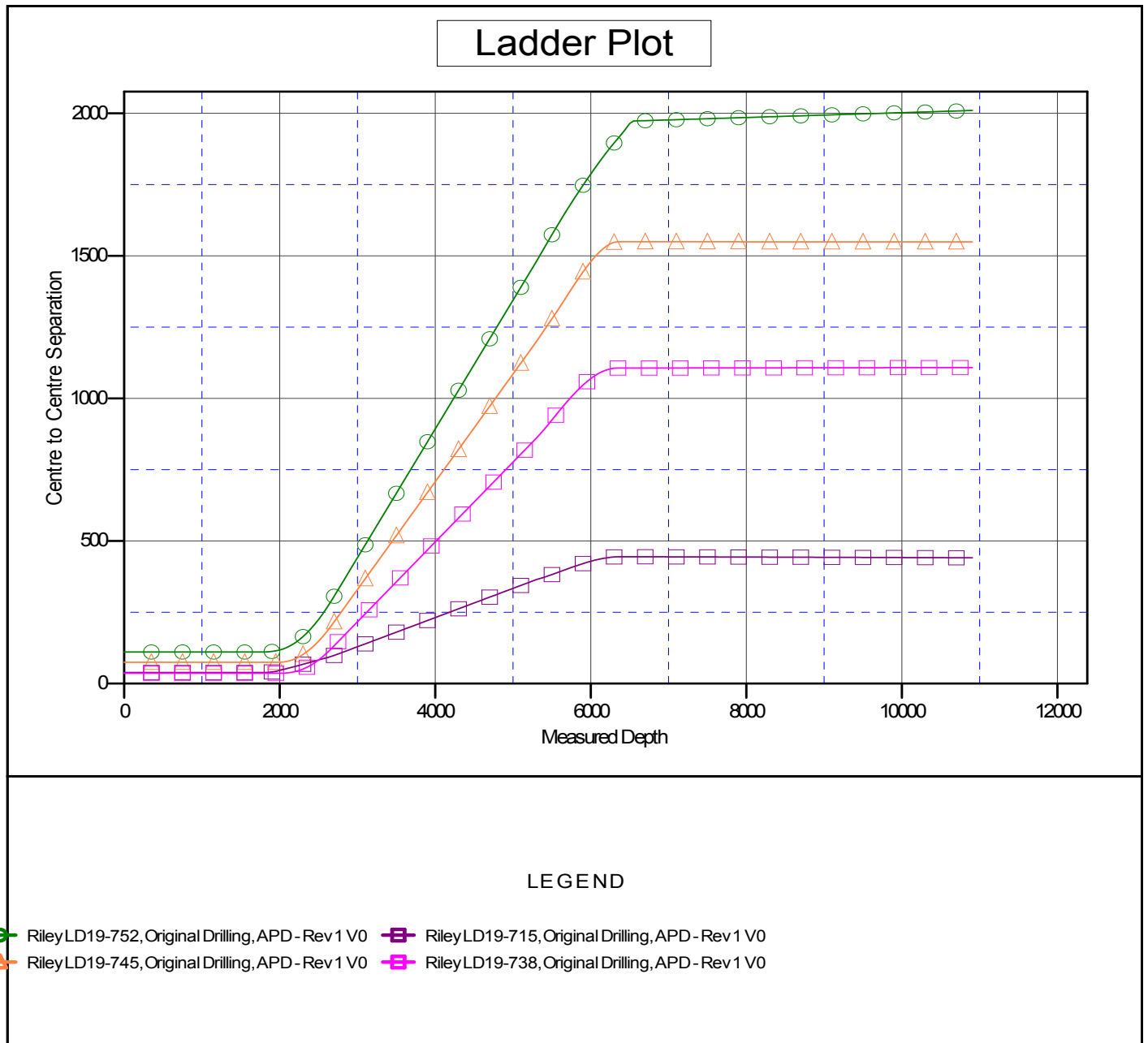
<b>Summary</b>						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
<b>Offset Well - Wellbore - Design</b>						
LD (09N-58W)						
Riley LD19-715 - Original Drilling - APD - Rev 1	1,778.6	1,789.6	38.8	31.1	5.013	CC
Riley LD19-715 - Original Drilling - APD - Rev 1	1,800.0	1,810.9	38.8	31.0	4.955	ES
Riley LD19-715 - Original Drilling - APD - Rev 1	10,906.6	10,981.9	441.2	253.2	2.346	SF
Riley LD19-738 - Original Drilling - APD - Rev 1	2,000.0	2,000.0	36.0	27.3	4.130	CC, ES
Riley LD19-738 - Original Drilling - APD - Rev 1	2,050.0	2,050.0	36.4	27.5	4.074	SF
Riley LD19-745 - Original Drilling - APD - Rev 1	1,978.6	1,989.6	74.8	66.2	8.662	CC
Riley LD19-745 - Original Drilling - APD - Rev 1	2,000.0	2,010.8	74.8	66.1	8.571	ES
Riley LD19-745 - Original Drilling - APD - Rev 1	10,906.6	10,912.6	1,549.1	1,361.2	8.244	SF
Riley LD19-752 - Original Drilling - APD - Rev 1	1,778.6	1,789.6	110.9	103.1	14.323	CC
Riley LD19-752 - Original Drilling - APD - Rev 1	1,800.0	1,810.6	110.9	103.0	14.155	ES
Riley LD19-752 - Original Drilling - APD - Rev 1	10,906.6	11,132.8	2,010.1	1,823.4	10.762	SF

## Anticollision Summary Report

<b>Company:</b>	Northern Region Drilling - Working	<b>Local Co-ordinate Reference:</b>	Well Riley LD19-722
<b>Project:</b>	Wattenberg Field	<b>TVD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Reference Site:</b>	LD (09N-58W)	<b>MD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Riley LD19-722	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Original Drilling	<b>Database:</b>	EDM01P
<b>Reference Design:</b>	APD - Rev 1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4839.0ft (Original Well Elev)  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000

Coordinates are relative to: Riley LD19-722  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 1.03°



## Anticollision Summary Report

<b>Company:</b>	Northern Region Drilling - Working	<b>Local Co-ordinate Reference:</b>	Well Riley LD19-722
<b>Project:</b>	Wattenberg Field	<b>TVD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Reference Site:</b>	LD (09N-58W)	<b>MD Reference:</b>	WELL @ 4839.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	Grid
<b>Reference Well:</b>	Riley LD19-722	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Original Drilling	<b>Database:</b>	EDM01P
<b>Reference Design:</b>	APD - Rev 1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4839.0ft (Original Well Elev)  
 Offset Depths are relative to Offset Datum  
 Central Meridian is -105.500000

Coordinates are relative to: Riley LD19-722  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: 1.03°

