

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_RIVERBEND 4-13 PAD**

**Riverbend 14-12**

**Riverbend 14-12**

**Plan: Riverbend 14-12 (wp01)**

## **Standard Planning Report**

**11 July, 2011**



Project: COLORADO NORTHERN ZONE - 83  
 Site: WELD\_RIVERBEND 4-13 PAD  
 Well: Riverbend 14-12  
 Wellbore: Riverbend 14-12  
 Section:  
 SHL:  
 Design: Riverbend 14-12 (wp01)  
 Latitude: 40.056126  
 Longitude: -104.847382  
 GL: 4952.00  
 KB: 15' GL + 4952' RKB @ 4967.00ft

FORMATION TOP DETAILS		
TVDPATH	MDPATH	FORMATION
4053.00	4329.34	PK Depth
4634.00	4964.58	SX Depth
7166.00	7593.95	NIO Depth
7513.00	7940.95	CD Depth
7598.00	8025.95	GH Depth
7948.00	8375.95	J Depth



Azimuths to True North  
 Magnetic North: 8.87°

Magnetic Field  
 Strength: 52932.7snT  
 Dip Angle: 66.76°  
 Date: 7/11/2011  
 Model: IGRF2010

#### WELL DETAILS: Riverbend 14-12

+N/-S	+E/-W	Northing	Ground Level: Easting	4952.00 Latitude	Longitude	Slot
0.00	0.00	1263964.37	3182681.16	40.056126	-104.847382	

#### CASING DETAILS

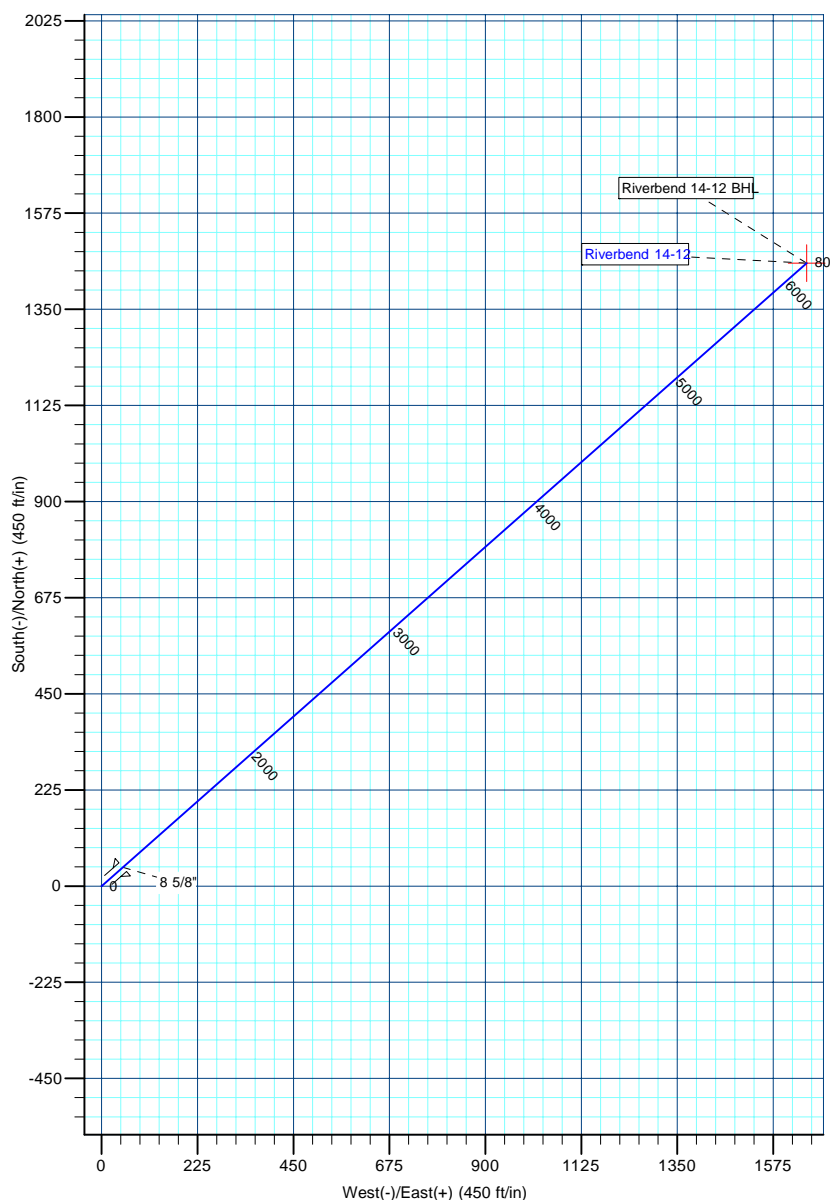
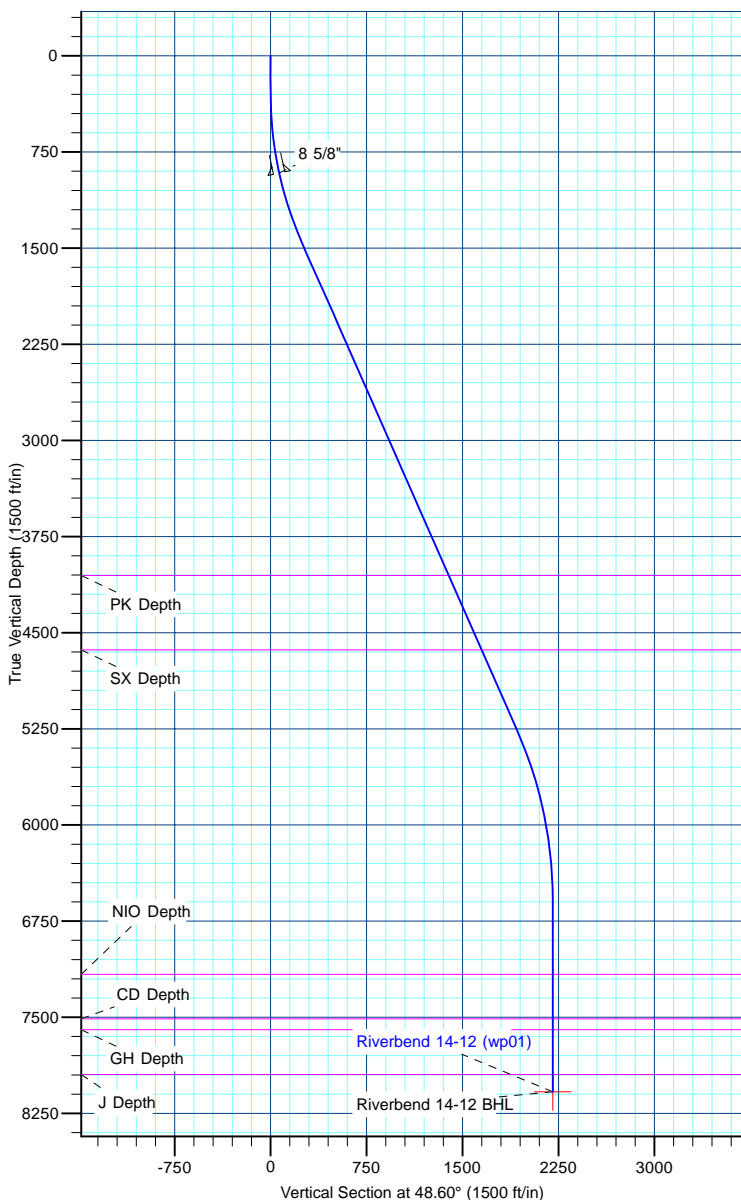
TVD	MD	Name	Size
915.00	919.82	8 5/8"	8-5/8

#### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape Point
Riverbend 14-12 BHL	8083.00	1457.89	1653.41	1265434.38	3184323.79	40.060128	-104.841475	

#### SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00
1492.39	23.85	48.60	1458.26	161.76	183.46	2.00	48.60	244.59
5648.22	23.85	48.60	5259.27	1273.02	1443.74	0.00	0.00	1924.83
7010.95	0.00	0.00	6583.00	1457.89	1653.41	1.75	180.00	2204.36
8510.95	0.00	0.00	8083.00	1457.89	1653.41	0.00	0.00	2204.36



<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well Riverbend 14-12
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' GL + 4952' RKB @ 4967.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' GL + 4952' RKB @ 4967.00ft
<b>Site:</b>	WELD_RIVERBEND 4-13 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Riverbend 14-12	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Riverbend 14-12		
<b>Design:</b>	Riverbend 14-12 (wp01)		

<b>Project</b>	COLORADO NORTHERN ZONE - 83		
<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		WELD_RIVERBEND 4-13 PAD			
Site Position:		Northing:	1,263,964.36 ft	Latitude:	40.056126
From:	Lat/Long	Easting:	3,182,681.16 ft	Longitude:	-104.847382
Position Uncertainty:	0.00 ft	Slot Radius:	0 "	Grid Convergence:	0.42

Well	Riverbend 14-12					
Well Position	+N-S	0.00 ft	Northing:	1,263,964.36 ft	Latitude:	40.056126
	+E-W	0.00 ft	Easting:	3,182,681.16 ft	Longitude:	-104.847382
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	4,952.00 ft

<b>Wellbore</b>	Riverbend 14-12				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	7/11/2011	8.87	66.76	52,933

<b>Design</b>	Riverbend 14-12 (wp01)			
<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) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	48.60

<b>Plan Sections</b>										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,492.39	23.85	48.60	1,458.26	161.76	183.46	2.00	2.00	0.00	48.60	
5,648.22	23.85	48.60	5,259.27	1,273.02	1,443.74	0.00	0.00	0.00	0.00	
7,010.95	0.00	0.00	6,583.00	1,457.89	1,653.41	1.75	-1.75	0.00	180.00	
8,510.95	0.00	0.00	8,083.00	1,457.89	1,653.41	0.00	0.00	0.00	0.00	Riverbend 14-12 Bt

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<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' GL + 4952' RKB @ 4967.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' GL + 4952' RKB @ 4967.00ft
<b>Site:</b>	WELD_RIVERBEND 4-13 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Riverbend 14-12	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Riverbend 14-12		
<b>Design:</b>	Riverbend 14-12 (wp01)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
<b>Start Build 2.00</b>									
400.00	2.00	48.60	399.98	1.15	1.31	1.75	2.00	2.00	0.00
500.00	4.00	48.60	499.84	4.62	5.23	6.98	2.00	2.00	0.00
600.00	6.00	48.60	599.45	10.38	11.77	15.69	2.00	2.00	0.00
700.00	8.00	48.60	698.70	18.44	20.91	27.88	2.00	2.00	0.00
800.00	10.00	48.60	797.47	28.78	32.64	43.52	2.00	2.00	0.00
900.00	12.00	48.60	895.62	41.40	46.96	62.60	2.00	2.00	0.00
919.82	12.40	48.60	915.00	44.17	50.10	66.79	2.00	2.00	0.00
<b>8 5/8"</b>									
1,000.00	14.00	48.60	993.06	56.28	63.83	85.10	2.00	2.00	0.00
1,100.00	16.00	48.60	1,089.64	73.40	83.24	110.98	2.00	2.00	0.00
1,200.00	18.00	48.60	1,185.27	92.73	105.17	140.21	2.00	2.00	0.00
1,300.00	20.00	48.60	1,279.82	114.26	129.59	172.77	2.00	2.00	0.00
1,400.00	22.00	48.60	1,373.17	137.96	156.47	208.60	2.00	2.00	0.00
1,492.39	23.85	48.60	1,458.26	161.76	183.46	244.59	2.00	2.00	0.00
<b>Start 4155.83 hold at 1492.39 MD</b>									
1,500.00	23.85	48.60	1,465.22	163.80	185.76	247.66	0.00	0.00	0.00
1,600.00	23.85	48.60	1,556.68	190.54	216.09	288.10	0.00	0.00	0.00
1,700.00	23.85	48.60	1,648.14	217.28	246.42	328.53	0.00	0.00	0.00
1,800.00	23.85	48.60	1,739.61	244.02	276.74	368.96	0.00	0.00	0.00
1,900.00	23.85	48.60	1,831.07	270.76	307.07	409.39	0.00	0.00	0.00
2,000.00	23.85	48.60	1,922.53	297.50	337.39	449.82	0.00	0.00	0.00
2,100.00	23.85	48.60	2,013.99	324.23	367.72	490.25	0.00	0.00	0.00
2,200.00	23.85	48.60	2,105.45	350.97	398.04	530.68	0.00	0.00	0.00
2,300.00	23.85	48.60	2,196.92	377.71	428.37	571.11	0.00	0.00	0.00
2,400.00	23.85	48.60	2,288.38	404.45	458.70	611.54	0.00	0.00	0.00
2,500.00	23.85	48.60	2,379.84	431.19	489.02	651.97	0.00	0.00	0.00
2,600.00	23.85	48.60	2,471.30	457.93	519.35	692.40	0.00	0.00	0.00
2,700.00	23.85	48.60	2,562.77	484.67	549.67	732.84	0.00	0.00	0.00
2,800.00	23.85	48.60	2,654.23	511.41	580.00	773.27	0.00	0.00	0.00
2,900.00	23.85	48.60	2,745.69	538.15	610.32	813.70	0.00	0.00	0.00
3,000.00	23.85	48.60	2,837.15	564.89	640.65	854.13	0.00	0.00	0.00
3,100.00	23.85	48.60	2,928.61	591.63	670.98	894.56	0.00	0.00	0.00
3,200.00	23.85	48.60	3,020.08	618.37	701.30	934.99	0.00	0.00	0.00
3,300.00	23.85	48.60	3,111.54	645.11	731.63	975.42	0.00	0.00	0.00
3,400.00	23.85	48.60	3,203.00	671.85	761.95	1,015.85	0.00	0.00	0.00
3,500.00	23.85	48.60	3,294.46	698.59	792.28	1,056.28	0.00	0.00	0.00
3,600.00	23.85	48.60	3,385.93	725.33	822.60	1,096.71	0.00	0.00	0.00
3,700.00	23.85	48.60	3,477.39	752.07	852.93	1,137.15	0.00	0.00	0.00
3,800.00	23.85	48.60	3,568.85	778.81	883.26	1,177.58	0.00	0.00	0.00
3,900.00	23.85	48.60	3,660.31	805.55	913.58	1,218.01	0.00	0.00	0.00
4,000.00	23.85	48.60	3,751.77	832.29	943.91	1,258.44	0.00	0.00	0.00
4,100.00	23.85	48.60	3,843.24	859.03	974.23	1,298.87	0.00	0.00	0.00
4,200.00	23.85	48.60	3,934.70	885.77	1,004.56	1,339.30	0.00	0.00	0.00
4,300.00	23.85	48.60	4,026.16	912.51	1,034.89	1,379.73	0.00	0.00	0.00
4,329.34	23.85	48.60	4,053.00	920.35	1,043.78	1,391.59	0.00	0.00	0.00
<b>PK Depth</b>									
4,400.00	23.85	48.60	4,117.62	939.25	1,065.21	1,420.16	0.00	0.00	0.00
4,500.00	23.85	48.60	4,209.09	965.99	1,095.54	1,460.59	0.00	0.00	0.00
4,600.00	23.85	48.60	4,300.55	992.73	1,125.86	1,501.02	0.00	0.00	0.00

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<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' GL + 4952' RKB @ 4967.00ft
<b>Site:</b>	WELD_RIVERBEND 4-13 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Riverbend 14-12	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Riverbend 14-12		
<b>Design:</b>	Riverbend 14-12 (wp01)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,700.00	23.85	48.60	4,392.01	1,019.47	1,156.19	1,541.45	0.00	0.00	0.00
4,800.00	23.85	48.60	4,483.47	1,046.21	1,186.51	1,581.89	0.00	0.00	0.00
4,900.00	23.85	48.60	4,574.93	1,072.94	1,216.84	1,622.32	0.00	0.00	0.00
4,964.58	23.85	48.60	4,634.00	1,090.21	1,236.42	1,648.43	0.00	0.00	0.00
<b>SX Depth</b>									
5,000.00	23.85	48.60	4,666.40	1,099.68	1,247.17	1,662.75	0.00	0.00	0.00
5,100.00	23.85	48.60	4,757.86	1,126.42	1,277.49	1,703.18	0.00	0.00	0.00
5,200.00	23.85	48.60	4,849.32	1,153.16	1,307.82	1,743.61	0.00	0.00	0.00
5,300.00	23.85	48.60	4,940.78	1,179.90	1,338.14	1,784.04	0.00	0.00	0.00
5,400.00	23.85	48.60	5,032.25	1,206.64	1,368.47	1,824.47	0.00	0.00	0.00
5,500.00	23.85	48.60	5,123.71	1,233.38	1,398.79	1,864.90	0.00	0.00	0.00
5,600.00	23.85	48.60	5,215.17	1,260.12	1,429.12	1,905.33	0.00	0.00	0.00
5,648.22	23.85	48.60	5,259.27	1,273.02	1,443.74	1,924.83	0.00	0.00	0.00
<b>Start Drop -1.75</b>									
5,700.00	22.94	48.60	5,306.80	1,286.61	1,459.16	1,945.39	1.75	-1.75	0.00
5,800.00	21.19	48.60	5,399.47	1,311.46	1,487.34	1,982.96	1.75	-1.75	0.00
5,900.00	19.44	48.60	5,493.24	1,334.42	1,513.38	2,017.67	1.75	-1.75	0.00
6,000.00	17.69	48.60	5,588.03	1,355.48	1,537.27	2,049.51	1.75	-1.75	0.00
6,100.00	15.94	48.60	5,683.75	1,374.61	1,558.96	2,078.44	1.75	-1.75	0.00
6,200.00	14.19	48.60	5,780.31	1,391.80	1,578.46	2,104.44	1.75	-1.75	0.00
6,300.00	12.44	48.60	5,877.62	1,407.04	1,595.74	2,127.47	1.75	-1.75	0.00
6,400.00	10.69	48.60	5,975.59	1,420.30	1,610.78	2,147.52	1.75	-1.75	0.00
6,500.00	8.94	48.60	6,074.12	1,431.57	1,623.56	2,164.57	1.75	-1.75	0.00
6,600.00	7.19	48.60	6,173.12	1,440.85	1,634.09	2,178.60	1.75	-1.75	0.00
6,700.00	5.44	48.60	6,272.51	1,448.13	1,642.34	2,189.60	1.75	-1.75	0.00
6,800.00	3.69	48.60	6,372.19	1,453.39	1,648.31	2,197.56	1.75	-1.75	0.00
6,900.00	1.94	48.60	6,472.07	1,456.64	1,652.00	2,202.48	1.75	-1.75	0.00
7,000.00	0.19	48.60	6,572.05	1,457.88	1,653.39	2,204.34	1.75	-1.75	0.00
7,010.95	0.00	0.00	6,583.00	1,457.89	1,653.41	2,204.36	1.75	-1.75	0.00
<b>Start 1500.00 hold at 7010.95 MD</b>									
7,100.00	0.00	0.00	6,672.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
7,200.00	0.00	0.00	6,772.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
7,300.00	0.00	0.00	6,872.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
7,400.00	0.00	0.00	6,972.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
7,500.00	0.00	0.00	7,072.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
7,593.95	0.00	0.00	7,166.00	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
<b>NIO Depth</b>									
7,600.00	0.00	0.00	7,172.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
7,700.00	0.00	0.00	7,272.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
7,800.00	0.00	0.00	7,372.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
7,900.00	0.00	0.00	7,472.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
7,940.95	0.00	0.00	7,513.00	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
<b>CD Depth</b>									
8,000.00	0.00	0.00	7,572.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
8,025.95	0.00	0.00	7,598.00	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
<b>GH Depth</b>									
8,100.00	0.00	0.00	7,672.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
8,200.00	0.00	0.00	7,772.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
8,300.00	0.00	0.00	7,872.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
8,375.95	0.00	0.00	7,948.00	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
<b>J Depth</b>									
8,400.00	0.00	0.00	7,972.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
8,500.00	0.00	0.00	8,072.05	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00

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<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' GL + 4952' RKB @ 4967.00ft
<b>Site:</b>	WELD_RIVERBEND 4-13 PAD	<b>North Reference:</b>	True
<b>Well:</b>	Riverbend 14-12	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Riverbend 14-12		
<b>Design:</b>	Riverbend 14-12 (wp01)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,510.95	0.00	0.00	8,083.00	1,457.89	1,653.41	2,204.36	0.00	0.00	0.00
TD at 8510.95 - Riverbend 14-12 BHL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Riverbend 14-12 BHL	0.00	0.00	8,083.00	1,457.89	1,653.41	1,265,434.38	3,184,323.79	40.060128	-104.841475
- plan hits target center									
- Point									

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

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,329.34	4,053.00	PK Depth				
4,964.58	4,634.00	SX Depth				
7,593.95	7,166.00	NIO Depth				
7,940.95	7,513.00	CD Depth				
8,025.95	7,598.00	GH Depth				
8,375.95	7,948.00	J Depth				

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
300.00	300.00	0.00	0.00	Start Build 2.00
1,492.39	1,458.26	161.76	183.46	Start 4155.83 hold at 1492.39 MD
5,648.22	5,259.27	1,273.02	1,443.74	Start Drop -1.75
7,010.95	6,583.00	1,457.89	1,653.41	Start 1500.00 hold at 7010.95 MD
8,510.95	8,083.00	1,457.89	1,653.41	TD at 8510.95