

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_RIVERBEND 19-19 PAD**

**RIVERBEND 23-19**

**RIVERBEND 23-19**

**Plan: RIVERBEND 23-19 (wp02)**


## **Standard Planning Report**


**07 June, 2011**



Project: COLORADO NORTHERN ZONE - 83  
 Site: WELD\_RIVERBEND 19-19 PAD  
 Well: RIVERBEND 23-19  
 Wellbore: RIVERBEND 23-19  
 Section:  
 SHL: P\_RIVERBEND 23-19  
 Design: RIVERBEND 23-19 (wp02)  
 Latitude: 40.032156  
 Longitude: -104.825927  
 GL: 4929.00  
 KB: 15' RKB + 4929' GL @ 4944.00ft

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4044.00	4330.74	PK Depth
4670.00	4975.64	SX Depth
7202.00	7509.06	NIO Depth
7549.00	7856.06	CD Depth
7634.00	7941.06	GH Depth
7984.00	8291.06	J Depth





Azimuths to Grid North  
 True North: -0.44°  
 Magnetic North: 8.75°  
 Magnetic Field  
 Strength: 53223.1snT  
 Dip Angle: 66.84°  
 Date: 10/31/2008  
 Model: IGRF200510

#### WELL DETAILS: RIVERBEND 23-19

+N/-S	+E/-W	Northing	Ground Level: Easting	4929.00 Latitude	Longitude	Slot
0.00	0.00	1255277.85	3188753.11	40.032156	-104.825927	

#### CASING DETAILS

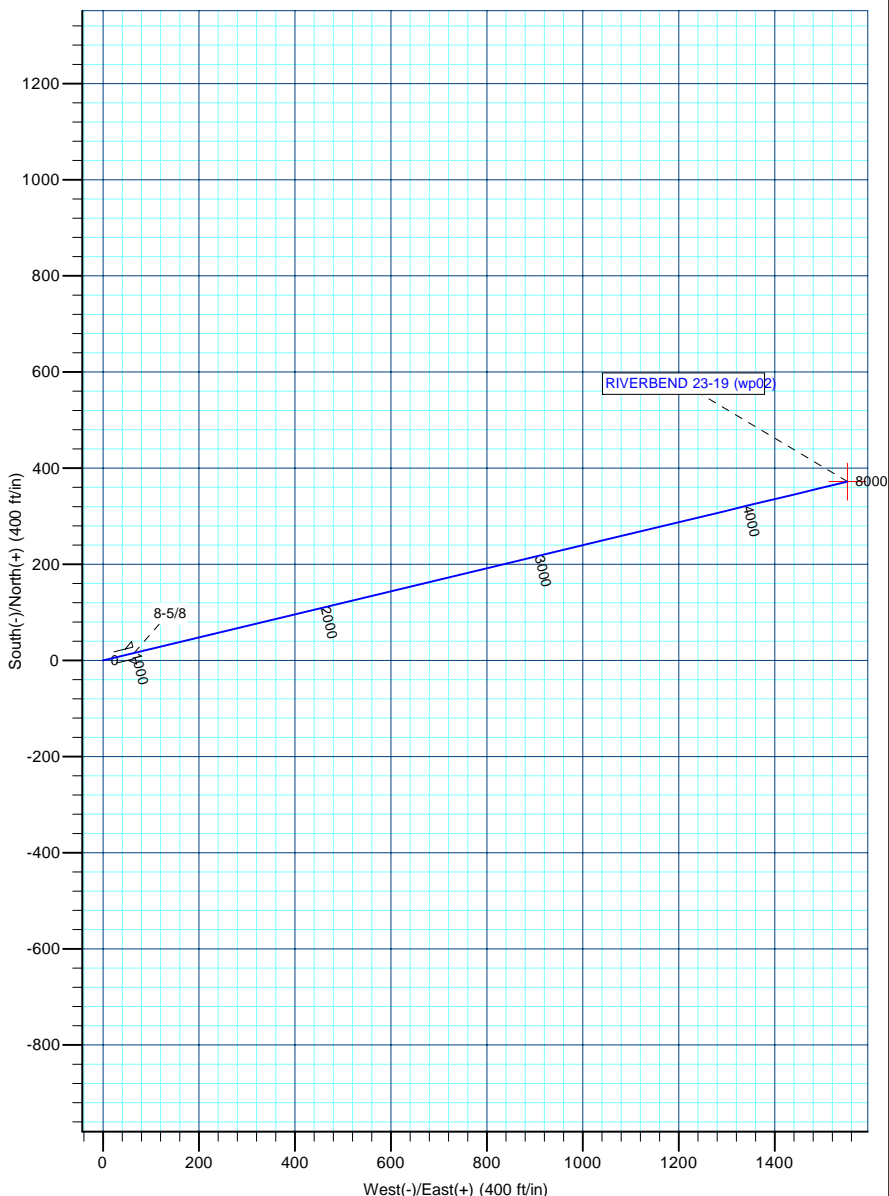
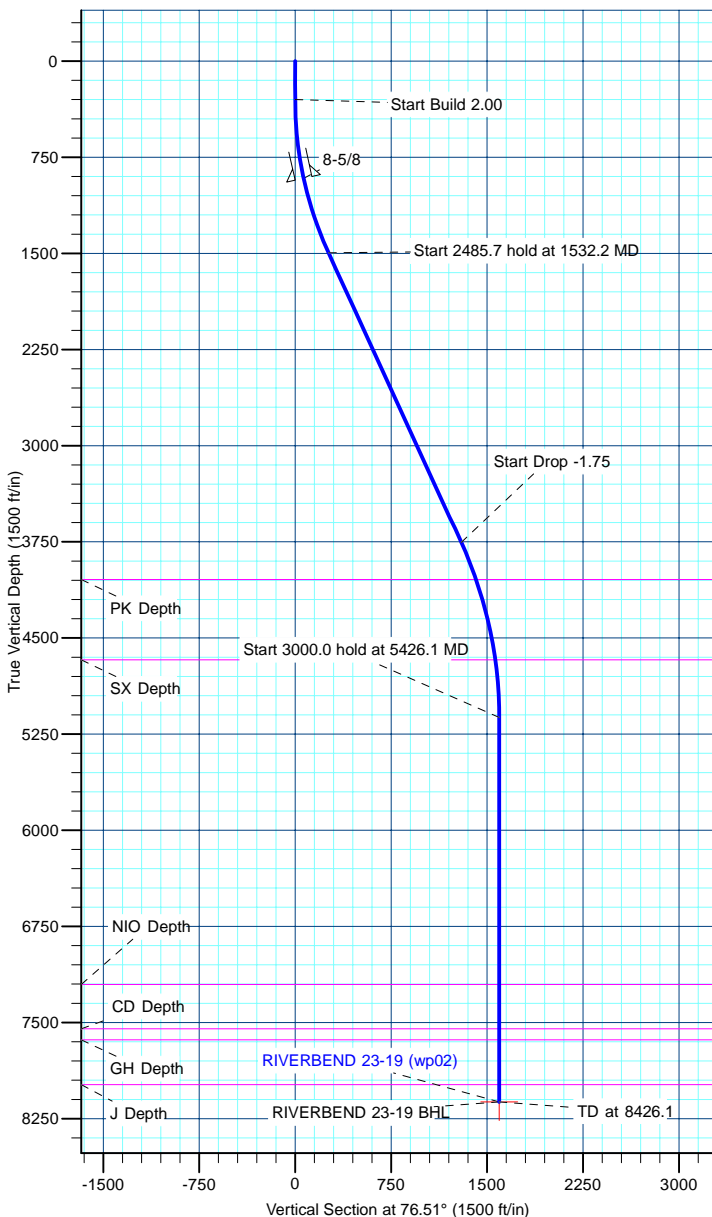
TVD	MD	Name	Size
915.00	919.82	8-5/8	8-5/8

#### DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape Point
RIVERBEND 23-19 BHL	8119.00	372.13	1551.59	1255649.98	3190304.70	40.033145	-104.820376	

#### 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
1532.19	24.64	76.51	1494.55	60.86	253.74	2.00	76.51	260.93
4017.85	24.64	76.51	3753.81	302.58	1261.61	0.00	0.00	1297.39
5426.06	0.00	0.00	5119.00	372.13	1551.59	1.75	180.00	1595.60
8426.06	0.00	0.00	8119.00	372.13	1551.59	0.00	0.00	1595.60



<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well RIVERBEND 23-19
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' RKB + 4929' GL @ 4944.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 4929' GL @ 4944.00ft
<b>Site:</b>	WELD_RIVERBEND 19-19 PAD	<b>North Reference:</b>	Grid
<b>Well:</b>	RIVERBEND 23-19	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	RIVERBEND 23-19		
<b>Design:</b>	RIVERBEND 23-19 (wp02)		

<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 19-19 PAD			
Site Position:		Northing:	1,255,293.55 ft	Latitude:	40.032199
From:	Lat/Long	Easting:	3,188,756.35 ft	Longitude:	-104.825915
Position Uncertainty:	0.00 ft	Slot Radius:	0 "	Grid Convergence:	0.44

Well	RIVERBEND 23-19					
Well Position	+N-S	-15.70 ft	Northing:	1,255,277.84 ft	Latitude:	40.032156
	+E-W	-3.24 ft	Easting:	3,188,753.11 ft	Longitude:	-104.825927
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	4,929.00 ft

<b>Wellbore</b>	RIVERBEND 23-19				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	10/31/2008	9.18	66.84	53,223

<b>Design</b>	RIVERBEND 23-19 (wp02)			
<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	76.51

<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	
1,532.19	24.64	76.51	1,494.55	60.86	253.74	2.00	2.00	0.00	76.51	
4,017.85	24.64	76.51	3,753.81	302.58	1,261.61	0.00	0.00	0.00	0.00	
5,426.06	0.00	0.00	5,119.00	372.13	1,551.59	1.75	-1.75	0.00	180.00	
8,426.06	0.00	0.00	8,119.00	372.13	1,551.59	0.00	0.00	0.00	0.00	RIVERBEND 23-19

<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well RIVERBEND 23-19
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' RKB + 4929' GL @ 4944.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 4929' GL @ 4944.00ft
<b>Site:</b>	WELD_RIVERBEND 19-19 PAD	<b>North Reference:</b>	Grid
<b>Well:</b>	RIVERBEND 23-19	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	RIVERBEND 23-19		
<b>Design:</b>	RIVERBEND 23-19 (wp02)		

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	76.51	399.98	0.41	1.70	1.75	2.00	2.00	0.00
500.00	4.00	76.51	499.84	1.63	6.79	6.98	2.00	2.00	0.00
600.00	6.00	76.51	599.45	3.66	15.26	15.69	2.00	2.00	0.00
700.00	8.00	76.51	698.70	6.50	27.11	27.88	2.00	2.00	0.00
800.00	10.00	76.51	797.47	10.15	42.32	43.52	2.00	2.00	0.00
900.00	12.00	76.51	895.62	14.60	60.88	62.60	2.00	2.00	0.00
919.82	12.40	76.51	915.00	15.58	64.95	66.79	2.00	2.00	0.00
<b>8-5/8</b>									
1,000.00	14.00	76.51	993.06	19.85	82.75	85.10	2.00	2.00	0.00
1,100.00	16.00	76.51	1,089.64	25.88	107.92	110.98	2.00	2.00	0.00
1,200.00	18.00	76.51	1,185.27	32.70	136.35	140.21	2.00	2.00	0.00
1,300.00	20.00	76.51	1,279.82	40.29	168.00	172.77	2.00	2.00	0.00
1,400.00	22.00	76.51	1,373.17	48.65	202.85	208.60	2.00	2.00	0.00
1,500.00	24.00	76.51	1,465.21	57.76	240.84	247.67	2.00	2.00	0.00
1,532.19	24.64	76.51	1,494.55	60.86	253.74	260.93	2.00	2.00	0.00
<b>Start 2485.7 hold at 1532.2 MD</b>									
1,600.00	24.64	76.51	1,556.18	67.45	281.23	289.21	0.00	0.00	0.00
1,700.00	24.64	76.51	1,647.07	77.18	321.78	330.90	0.00	0.00	0.00
1,800.00	24.64	76.51	1,737.96	86.90	362.33	372.60	0.00	0.00	0.00
1,900.00	24.64	76.51	1,828.86	96.63	402.87	414.30	0.00	0.00	0.00
2,000.00	24.64	76.51	1,919.75	106.35	443.42	456.00	0.00	0.00	0.00
2,100.00	24.64	76.51	2,010.64	116.08	483.97	497.69	0.00	0.00	0.00
2,200.00	24.64	76.51	2,101.53	125.80	524.52	539.39	0.00	0.00	0.00
2,300.00	24.64	76.51	2,192.42	135.53	565.06	581.09	0.00	0.00	0.00
2,400.00	24.64	76.51	2,283.32	145.25	605.61	622.79	0.00	0.00	0.00
2,500.00	24.64	76.51	2,374.21	154.98	646.16	664.48	0.00	0.00	0.00
2,600.00	24.64	76.51	2,465.10	164.70	686.71	706.18	0.00	0.00	0.00
2,700.00	24.64	76.51	2,555.99	174.43	727.25	747.88	0.00	0.00	0.00
2,800.00	24.64	76.51	2,646.88	184.15	767.80	789.58	0.00	0.00	0.00
2,900.00	24.64	76.51	2,737.77	193.87	808.35	831.27	0.00	0.00	0.00
3,000.00	24.64	76.51	2,828.67	203.60	848.90	872.97	0.00	0.00	0.00
3,100.00	24.64	76.51	2,919.56	213.32	889.45	914.67	0.00	0.00	0.00
3,200.00	24.64	76.51	3,010.45	223.05	929.99	956.37	0.00	0.00	0.00
3,300.00	24.64	76.51	3,101.34	232.77	970.54	998.06	0.00	0.00	0.00
3,400.00	24.64	76.51	3,192.23	242.50	1,011.09	1,039.76	0.00	0.00	0.00
3,500.00	24.64	76.51	3,283.13	252.22	1,051.64	1,081.46	0.00	0.00	0.00
3,600.00	24.64	76.51	3,374.02	261.95	1,092.18	1,123.16	0.00	0.00	0.00
3,700.00	24.64	76.51	3,464.91	271.67	1,132.73	1,164.85	0.00	0.00	0.00
3,800.00	24.64	76.51	3,555.80	281.40	1,173.28	1,206.55	0.00	0.00	0.00
3,900.00	24.64	76.51	3,646.69	291.12	1,213.83	1,248.25	0.00	0.00	0.00
4,000.00	24.64	76.51	3,737.58	300.85	1,254.37	1,289.95	0.00	0.00	0.00
4,017.85	24.64	76.51	3,753.81	302.58	1,261.61	1,297.39	0.00	0.00	0.00
<b>Start Drop -1.75</b>									
4,100.00	23.21	76.51	3,828.90	310.36	1,294.01	1,330.70	1.75	-1.75	0.00
4,200.00	21.46	76.51	3,921.39	319.22	1,330.95	1,368.70	1.75	-1.75	0.00
4,300.00	19.71	76.51	4,015.01	327.41	1,365.14	1,403.85	1.75	-1.75	0.00
4,330.74	19.17	76.51	4,044.00	329.80	1,375.08	1,414.08	1.75	-1.75	0.00
<b>PK Depth</b>									
4,400.00	17.96	76.51	4,109.65	334.94	1,396.52	1,436.13	1.75	-1.75	0.00

<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well RIVERBEND 23-19
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' RKB + 4929' GL @ 4944.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 4929' GL @ 4944.00ft
<b>Site:</b>	WELD_RIVERBEND 19-19 PAD	<b>North Reference:</b>	Grid
<b>Well:</b>	RIVERBEND 23-19	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	RIVERBEND 23-19		
<b>Design:</b>	RIVERBEND 23-19 (wp02)		

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)
4,500.00	16.21	76.51	4,205.24	341.79	1,425.08	1,465.50	1.75	-1.75	0.00
4,600.00	14.46	76.51	4,301.68	347.96	1,450.79	1,491.94	1.75	-1.75	0.00
4,700.00	12.71	76.51	4,398.88	353.44	1,473.63	1,515.42	1.75	-1.75	0.00
4,800.00	10.96	76.51	4,496.75	358.22	1,493.56	1,535.92	1.75	-1.75	0.00
4,900.00	9.21	76.51	4,595.20	362.30	1,510.58	1,553.42	1.75	-1.75	0.00
4,975.64	7.88	76.51	4,670.00	364.92	1,521.51	1,564.66	1.75	-1.75	0.00
<b>SX Depth</b>									
5,000.00	7.46	76.51	4,694.14	365.68	1,524.67	1,567.91	1.75	-1.75	0.00
5,100.00	5.71	76.51	4,793.48	368.35	1,535.82	1,579.37	1.75	-1.75	0.00
5,200.00	3.96	76.51	4,893.12	370.32	1,544.01	1,587.79	1.75	-1.75	0.00
5,300.00	2.21	76.51	4,992.97	371.57	1,549.23	1,593.17	1.75	-1.75	0.00
5,400.00	0.46	76.51	5,092.94	372.11	1,551.49	1,595.49	1.75	-1.75	0.00
5,426.06	0.00	0.00	5,119.00	372.13	1,551.59	1,595.60	1.75	-1.75	0.00
<b>Start 3000.0 hold at 5426.1 MD</b>									
5,500.00	0.00	0.00	5,192.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
5,600.00	0.00	0.00	5,292.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
5,700.00	0.00	0.00	5,392.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
5,800.00	0.00	0.00	5,492.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
5,900.00	0.00	0.00	5,592.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
6,000.00	0.00	0.00	5,692.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
6,100.00	0.00	0.00	5,792.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
6,200.00	0.00	0.00	5,892.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
6,300.00	0.00	0.00	5,992.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
6,400.00	0.00	0.00	6,092.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
6,500.00	0.00	0.00	6,192.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
6,600.00	0.00	0.00	6,292.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
6,700.00	0.00	0.00	6,392.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
6,800.00	0.00	0.00	6,492.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
6,900.00	0.00	0.00	6,592.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
7,000.00	0.00	0.00	6,692.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
7,100.00	0.00	0.00	6,792.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
7,200.00	0.00	0.00	6,892.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
7,300.00	0.00	0.00	6,992.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
7,400.00	0.00	0.00	7,092.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
7,500.00	0.00	0.00	7,192.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
7,509.06	0.00	0.00	7,202.00	372.13	1,551.59	1,595.60	0.00	0.00	0.00
<b>NIO Depth</b>									
7,600.00	0.00	0.00	7,292.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
7,700.00	0.00	0.00	7,392.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
7,800.00	0.00	0.00	7,492.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
7,856.06	0.00	0.00	7,549.00	372.13	1,551.59	1,595.60	0.00	0.00	0.00
<b>CD Depth</b>									
7,900.00	0.00	0.00	7,592.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
7,941.06	0.00	0.00	7,634.00	372.13	1,551.59	1,595.60	0.00	0.00	0.00
<b>GH Depth</b>									
8,000.00	0.00	0.00	7,692.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
8,032.06	0.00	0.00	7,725.00	372.13	1,551.59	1,595.60	0.00	0.00	0.00
<b>PBHL_RIVERBEND 23-19</b>									
8,100.00	0.00	0.00	7,792.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
8,200.00	0.00	0.00	7,892.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
8,291.06	0.00	0.00	7,984.00	372.13	1,551.59	1,595.60	0.00	0.00	0.00
<b>J Depth</b>									
8,300.00	0.00	0.00	7,992.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00

<b>Database:</b>	edm5000p	<b>Local Co-ordinate Reference:</b>	Well RIVERBEND 23-19
<b>Company:</b>	US ROCKIES REGION PLANNING	<b>TVD Reference:</b>	15' RKB + 4929' GL @ 4944.00ft
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>MD Reference:</b>	15' RKB + 4929' GL @ 4944.00ft
<b>Site:</b>	WELD_RIVERBEND 19-19 PAD	<b>North Reference:</b>	Grid
<b>Well:</b>	RIVERBEND 23-19	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	RIVERBEND 23-19		
<b>Design:</b>	RIVERBEND 23-19 (wp02)		

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)
8,400.00	0.00	0.00	8,092.94	372.13	1,551.59	1,595.60	0.00	0.00	0.00
8,426.06	0.00	0.00	8,119.00	372.13	1,551.59	1,595.60	0.00	0.00	0.00
TD at 8426.1 - RIVERBEND 23-19 BHL									

Design Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	
	- Shape								Latitude Longitude
RIVERBEND 23-19 B	- plan hits target center	0.00	0.00	8,119.00	372.13	1,551.59	1,255,649.98	3,190,304.71	40.033145 -104.820376
	- 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 (°)	
4,330.74	4,044.00	PK Depth				
4,975.64	4,670.00	SX Depth				
7,509.06	7,202.00	NIO Depth				
7,856.06	7,549.00	CD Depth				
7,941.06	7,634.00	GH Depth				
8,291.06	7,984.00	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
1,532.19	1,494.55	60.86	253.74	Start 2485.7 hold at 1532.2 MD
4,017.85	3,753.81	302.58	1,261.61	Start Drop -1.75
5,426.06	5,119.00	372.13	1,551.59	Start 3000.0 hold at 5426.1 MD
8,426.06	8,119.00	372.13	1,551.59	TD at 8426.1