



US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
WELD_BERNHARDT 8 PAD 4N67W1
P_BERNHARDT 22-1**

P_BERNHARDT 22-1

Plan: PLAN #1 11-04-09 RHS

Standard Planning Report

04 November, 2009





Azimuths to True North
Magnetic North: 9.08°
Magnetic Field
Strength: 53283.2snT
Dip Angle: 67.06°
Date: 11/4/2009
Model: IGRF200510

WELL DETAILS: P_BERNHARDT 22-1

+N/-S	+E/-W	Northing	Ground Level:	Easting	Latitude	Longitude	Slot
0.00	0.00	1369213.34	4825.00	3183596.29	40° 20' 42.072 N	104° 50' 28.752 W	

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2647.00	2711.45	PARKMAN TOP
4375.00	4546.15	SUSSEX TOP
4758.00	4952.80	SHANNON TOP
6969.00	7198.23	NIO A TOP
7292.00	7521.23	CODELL TOP
7742.00	7971.23	JSAND TOP

SECTION DETAILS

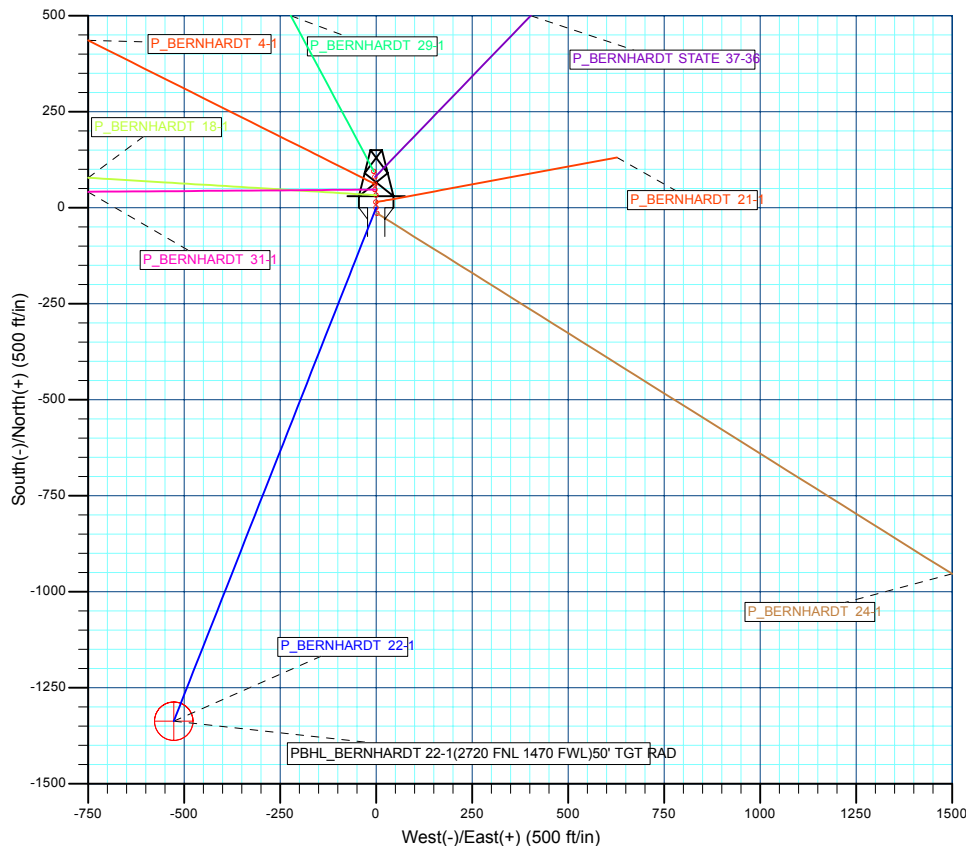
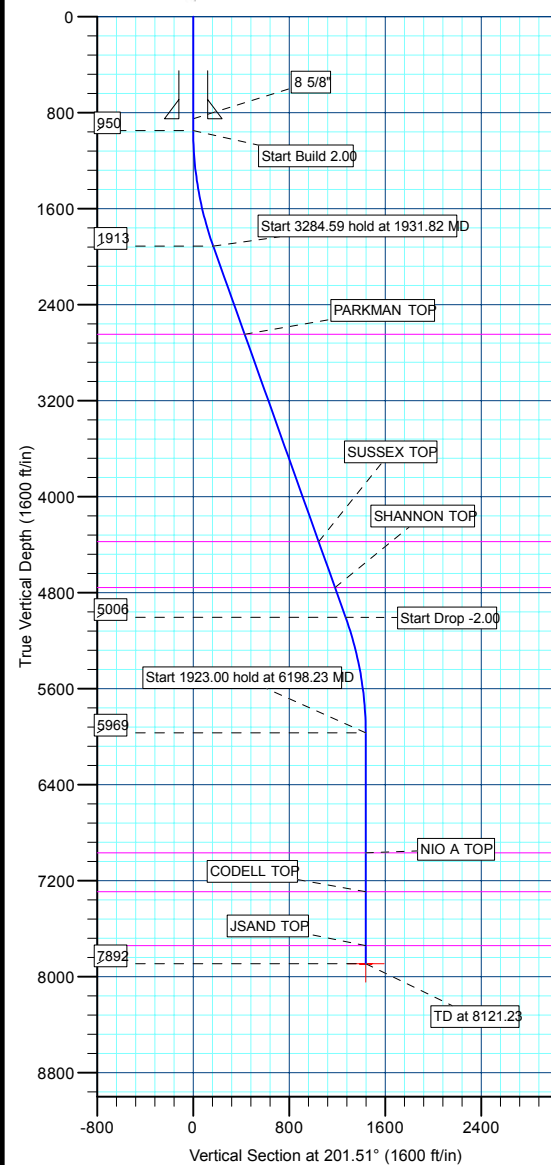
MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	
1931.82	19.64	201.51	1912.71	-155.00	-61.08	2.00	201.51	166.60	
5216.41	19.64	201.51	5006.29	-1181.93	-465.76	0.00	0.00	1270.39	
6198.23	0.00	0.00	5969.00	-1336.94	-526.84	2.00	180.00	1437.00	
8121.23	0.00	0.00	7892.00	-1336.94	-526.84	0.00	0.00	1437.00	PBHL_BERNHARDT 22-1(2720 FNL 1470 FWL)

CASING DETAILS

TVD	MD	Name	Size
850.00	850.00	8 5/8"	8.62



(B ELEV: WELL @ 4840.00ft (Original Well Elev)
iRD ELEV: 4825.00



WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL	7892.00	-1336.94	-526.84	1367872.52	3183079.39	40° 20' 28.860 N	104° 50' 35.556 W	Circle (Radius: 50.00)

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Project:	COLORADO NOTHERN ZONE - 83	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site:	WELD_BERNHARDT 8 PAD 4N67W1	North Reference:	True
Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 22-1		
Design:	PLAN #1 11-04-09 RHS		

Project	COLORADO NOTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	WELD_BERNHARDT 8 PAD 4N67W1, SECTION 1 T4N R67W			
Site Position:		Northing:	1,369,246.13 ft	Latitude: 40° 20' 42.396 N
From:	Lat/Long	Easting:	3,183,596.05 ft	Longitude: 104° 50' 28.752 W
Position Uncertainty:	0.00 ft	Slot Radius:	in	Grid Convergence: 0.43 °

Well	P_BERNHARDT 22-1			
Well Position	+N/-S	-32.80 ft	Northing:	1,369,213.34 ft
	+E/-W	0.00 ft	Easting:	3,183,596.29 ft
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft
			Ground Level:	4,825.00 ft

Wellbore	P_BERNHARDT 22-1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	11/4/2009	9.08	67.06	53,283

Design	PLAN #1 11-04-09 RHS			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	201.51

Plan Sections										
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	
950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,931.82	19.64	201.51	1,912.71	-155.00	-61.08	2.00	2.00	0.00	201.51	
5,216.41	19.64	201.51	5,006.29	-1,181.93	-465.76	0.00	0.00	0.00	0.00	
6,198.23	0.00	0.00	5,969.00	-1,336.94	-526.84	2.00	-2.00	0.00	180.00	
8,121.23	0.00	0.00	7,892.00	-1,336.94	-526.84	0.00	0.00	0.00	0.00	PBHL_BERNHARD

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Project:	COLORADO NOTHERN ZONE - 83	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site:	WELD_BERNHARDT 8 PAD 4N67W1	North Reference:	True
Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 22-1		
Design:	PLAN #1 11-04-09 RHS		

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)
Start Build 2.00									
950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	1.00	201.51	1,000.00	-0.41	-0.16	0.44	2.00	2.00	0.00
1,100.00	3.00	201.51	1,099.93	-3.65	-1.44	3.93	2.00	2.00	0.00
1,200.00	5.00	201.51	1,199.68	-10.14	-4.00	10.90	2.00	2.00	0.00
1,300.00	7.00	201.51	1,299.13	-19.87	-7.83	21.35	2.00	2.00	0.00
1,400.00	9.00	201.51	1,398.15	-32.81	-12.93	35.27	2.00	2.00	0.00
1,500.00	11.00	201.51	1,496.63	-48.97	-19.30	52.63	2.00	2.00	0.00
1,600.00	13.00	201.51	1,594.44	-68.31	-26.92	73.42	2.00	2.00	0.00
1,700.00	15.00	201.51	1,691.46	-90.82	-35.79	97.62	2.00	2.00	0.00
1,800.00	17.00	201.51	1,787.58	-116.46	-45.89	125.18	2.00	2.00	0.00
1,900.00	19.00	201.51	1,882.68	-145.21	-57.22	156.08	2.00	2.00	0.00
Start 3284.59 hold at 1931.82 MD									
1,931.82	19.64	201.51	1,912.71	-155.00	-61.08	166.60	2.00	2.00	0.00
2,000.00	19.64	201.51	1,976.93	-176.32	-69.48	189.52	0.00	0.00	0.00
2,100.00	19.64	201.51	2,071.11	-207.58	-81.80	223.12	0.00	0.00	0.00
2,200.00	19.64	201.51	2,165.30	-238.85	-94.12	256.73	0.00	0.00	0.00
2,300.00	19.64	201.51	2,259.48	-270.12	-106.44	290.33	0.00	0.00	0.00
2,400.00	19.64	201.51	2,353.66	-301.38	-118.76	323.94	0.00	0.00	0.00
2,500.00	19.64	201.51	2,447.85	-332.65	-131.08	357.54	0.00	0.00	0.00
2,600.00	19.64	201.51	2,542.03	-363.91	-143.40	391.15	0.00	0.00	0.00
2,700.00	19.64	201.51	2,636.22	-395.18	-155.72	424.75	0.00	0.00	0.00
PARKMAN TOP									
2,711.45	19.64	201.51	2,647.00	-398.75	-157.14	428.60	0.00	0.00	0.00
2,800.00	19.64	201.51	2,730.40	-426.44	-168.05	458.36	0.00	0.00	0.00
2,900.00	19.64	201.51	2,824.59	-457.71	-180.37	491.96	0.00	0.00	0.00
3,000.00	19.64	201.51	2,918.77	-488.97	-192.69	525.57	0.00	0.00	0.00
3,100.00	19.64	201.51	3,012.96	-520.24	-205.01	559.17	0.00	0.00	0.00
3,200.00	19.64	201.51	3,107.14	-551.50	-217.33	592.78	0.00	0.00	0.00
3,300.00	19.64	201.51	3,201.32	-582.77	-229.65	626.38	0.00	0.00	0.00
3,400.00	19.64	201.51	3,295.51	-614.03	-241.97	659.99	0.00	0.00	0.00
3,500.00	19.64	201.51	3,389.69	-645.30	-254.29	693.59	0.00	0.00	0.00
3,600.00	19.64	201.51	3,483.88	-676.56	-266.61	727.20	0.00	0.00	0.00
3,700.00	19.64	201.51	3,578.06	-707.83	-278.93	760.80	0.00	0.00	0.00
3,800.00	19.64	201.51	3,672.25	-739.09	-291.25	794.41	0.00	0.00	0.00
3,900.00	19.64	201.51	3,766.43	-770.36	-303.57	828.01	0.00	0.00	0.00
4,000.00	19.64	201.51	3,860.62	-801.62	-315.89	861.62	0.00	0.00	0.00
4,100.00	19.64	201.51	3,954.80	-832.89	-328.21	895.22	0.00	0.00	0.00
4,200.00	19.64	201.51	4,048.98	-864.15	-340.53	928.83	0.00	0.00	0.00
4,300.00	19.64	201.51	4,143.17	-895.42	-352.85	962.43	0.00	0.00	0.00
4,400.00	19.64	201.51	4,237.35	-926.68	-365.17	996.04	0.00	0.00	0.00
4,500.00	19.64	201.51	4,331.54	-957.95	-377.49	1,029.64	0.00	0.00	0.00
SUSSEX TOP									
4,546.15	19.64	201.51	4,375.00	-972.38	-383.18	1,045.15	0.00	0.00	0.00
4,600.00	19.64	201.51	4,425.72	-989.21	-389.81	1,063.25	0.00	0.00	0.00
4,700.00	19.64	201.51	4,519.91	-1,020.48	-402.13	1,096.85	0.00	0.00	0.00
4,800.00	19.64	201.51	4,614.09	-1,051.74	-414.46	1,130.46	0.00	0.00	0.00
4,900.00	19.64	201.51	4,708.27	-1,083.01	-426.78	1,164.06	0.00	0.00	0.00
SHANNON TOP									
4,952.80	19.64	201.51	4,758.00	-1,099.51	-433.28	1,181.81	0.00	0.00	0.00
5,000.00	19.64	201.51	4,802.46	-1,114.27	-439.10	1,197.67	0.00	0.00	0.00
5,100.00	19.64	201.51	4,896.64	-1,145.54	-451.42	1,231.27	0.00	0.00	0.00
5,200.00	19.64	201.51	4,990.83	-1,176.80	-463.74	1,264.88	0.00	0.00	0.00

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Project:	COLORADO NOTHERN ZONE - 83	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site:	WELD_BERNHARDT 8 PAD 4N67W1	North Reference:	True
Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 22-1		
Design:	PLAN #1 11-04-09 RHS		

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)
Start Drop -2.00									
5,216.41	19.64	201.51	5,006.29	-1,181.93	-465.76	1,270.39	0.00	0.00	0.00
5,300.00	17.96	201.51	5,085.41	-1,207.00	-475.64	1,297.33	2.00	-2.00	0.00
5,400.00	15.96	201.51	5,181.05	-1,234.14	-486.33	1,326.51	2.00	-2.00	0.00
5,500.00	13.96	201.51	5,277.66	-1,258.16	-495.80	1,352.33	2.00	-2.00	0.00
5,600.00	11.96	201.51	5,375.10	-1,279.04	-504.02	1,374.76	2.00	-2.00	0.00
5,700.00	9.96	201.51	5,473.27	-1,296.73	-511.00	1,393.78	2.00	-2.00	0.00
5,800.00	7.96	201.51	5,572.05	-1,311.23	-516.71	1,409.36	2.00	-2.00	0.00
5,900.00	5.96	201.51	5,671.30	-1,322.51	-521.15	1,421.49	2.00	-2.00	0.00
6,000.00	3.96	201.51	5,770.92	-1,330.56	-524.33	1,430.14	2.00	-2.00	0.00
6,100.00	1.96	201.51	5,870.78	-1,335.37	-526.22	1,435.31	2.00	-2.00	0.00
Start 1923.00 hold at 6198.23 MD									
6,198.23	0.00	0.00	5,969.00	-1,336.94	-526.84	1,437.00	2.00	-2.00	0.00
6,200.00	0.00	0.00	5,970.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,070.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,170.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,270.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,370.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,470.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,570.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,670.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,770.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
7,100.00	0.00	0.00	6,870.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
NIO A TOP									
7,198.23	0.00	0.00	6,969.00	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
7,200.00	0.00	0.00	6,970.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,070.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,170.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,270.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
CODELL TOP									
7,521.23	0.00	0.00	7,292.00	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,370.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,470.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,570.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
7,900.00	0.00	0.00	7,670.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
JSAND TOP									
7,971.23	0.00	0.00	7,742.00	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
8,000.00	0.00	0.00	7,770.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
8,100.00	0.00	0.00	7,870.77	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00
PBHL_BERNHARDT 22-1(2720 FNL 1470 FWL)									
8,121.23	0.00	0.00	7,892.00	-1,336.94	-526.84	1,437.00	0.00	0.00	0.00

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									
PBHL_BERNHARDT	0.00	0.00	7,892.00	-1,336.94	-526.84	1,367,872.52	3,183,079.39	40° 20' 28.860 N	104° 50' 35.556 W
- plan hits target center									
- Circle (radius 50.00)									

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Project:	COLORADO NOTHERN ZONE - 83	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site:	WELD_BERNHARDT 8 PAD 4N67W1	North Reference:	True
Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 22-1		
Design:	PLAN #1 11-04-09 RHS		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
850.00	850.00	8 5/8"	8.62	11.00	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,711.45	2,647.00	PARKMAN TOP				
4,546.15	4,375.00	SUSSEX TOP				
4,952.80	4,758.00	SHANNON TOP				
7,198.23	6,969.00	NIO A TOP				
7,521.23	7,292.00	CODELL TOP				
7,971.23	7,742.00	JSAND TOP				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
950.00	950.00	0.00	0.00	Start Build 2.00	
1,931.82	1,912.71	-155.00	-61.08	Start 3284.59 hold at 1931.82 MD	
5,216.41	5,006.29	-1,181.93	-465.76	Start Drop -2.00	
6,198.23	5,969.00	-1,336.94	-526.84	Start 1923.00 hold at 6198.23 MD	
8,121.23	7,892.00	-1,336.94	-526.84	TD at 8121.23	



US ROCKIES REGION PLANNING

**COLORADO NOTHERN ZONE - 83
WELD_BERNHARDT 8 PAD 4N67W1
P_BERNHARDT 22-1**

**P_BERNHARDT 22-1
PLAN #1 11-04-09 RHS**

Anticollision Report

04 November, 2009



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Reference	PLAN #1 11-04-09 RHS		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	0.00 to 20,000.00ft	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date	11/4/2009		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	8,121.23	PLAN #1 11-04-09 RHS (P_BERNHARDT	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
WELD_BERNHARDT 8 PAD 4N67W1						
P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1	950.00	950.00	32.80	28.79	8.175	CC, ES
P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1	1,000.00	999.96	33.23	29.02	7.883	SF
P_BERNHARDT 21-1 - P_BERNHARDT 21-1 - PLAN #1	950.00	950.00	14.57	10.56	3.631	CC, ES
P_BERNHARDT 21-1 - P_BERNHARDT 21-1 - PLAN #1	1,000.00	999.94	15.06	10.85	3.573	SF
P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1	200.00	200.00	14.84	14.20	23.160	CC, ES
P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1	400.00	398.98	20.22	18.72	13.470	SF
P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1	950.00	950.00	94.88	90.87	23.649	CC, ES
P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1	1,100.00	1,095.30	101.90	97.29	22.131	SF
P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1	200.00	200.00	47.44	46.80	74.058	CC
P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1	300.00	299.87	47.56	46.48	44.059	ES
P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1	700.00	694.60	65.83	62.92	22.653	SF
P_BERNHARDT 4-1 - P_BERNHARDT 4- - PLAN #1 11-	950.00	950.00	61.99	57.98	15.452	CC, ES
P_BERNHARDT 4-1 - P_BERNHARDT 4- - PLAN #1 11-	1,100.00	1,098.22	67.49	62.89	14.675	SF
P_BERNHARDT STATE 37-36 - P_BERNHARDT STATI	200.00	200.00	80.19	79.55	125.187	CC, ES
P_BERNHARDT STATE 37-36 - P_BERNHARDT STATI	800.00	780.47	130.19	126.69	37.215	SF

Offset Design	WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1 11-04												Offset Site Error:	0.00 ft
Survey Program:	0-MWD												Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis			Distance									Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.80	0.00	32.80					
100.00	100.00	100.00	100.00	0.10	0.10	0.00	32.80	0.00	32.80	32.61	0.19	171.675		
200.00	200.00	200.00	200.00	0.32	0.32	0.00	32.80	0.00	32.80	32.16	0.64	51.201		
300.00	300.00	300.00	300.00	0.55	0.55	0.00	32.80	0.00	32.80	31.71	1.09	30.087		
400.00	400.00	400.00	400.00	0.77	0.77	0.00	32.80	0.00	32.80	31.26	1.54	21.303		
500.00	500.00	500.00	500.00	0.99	0.99	0.00	32.80	0.00	32.80	30.81	1.99	16.489		
600.00	600.00	600.00	600.00	1.22	1.22	0.00	32.80	0.00	32.80	30.36	2.44	13.449		
700.00	700.00	700.00	700.00	1.44	1.44	0.00	32.80	0.00	32.80	29.91	2.89	11.356		
800.00	800.00	800.00	800.00	1.67	1.67	0.00	32.80	0.00	32.80	29.46	3.34	9.827		
900.00	900.00	900.00	900.00	1.89	1.89	0.00	32.80	0.00	32.80	29.01	3.79	8.660		
950.00	950.00	950.00	950.00	2.01	2.01	0.00	32.80	0.00	32.80	28.79	4.01	8.175	CC, ES	
1,000.00	1,000.00	999.96	999.96	2.10	2.11	158.01	32.83	-0.43	33.23	29.02	4.22	7.883	SF	
1,100.00	1,099.93	1,099.75	1,099.69	2.28	2.32	154.61	33.04	-3.91	36.77	32.18	4.59	8.011		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1 11-04												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
1,200.00	1,199.68	1,199.17	1,198.86	2.47	2.53	149.47	33.45	-10.81	44.13	39.15	4.98	8.859	
1,300.00	1,299.13	1,297.97	1,297.12	2.68	2.76	144.35	34.08	-21.07	55.58	50.18	5.40	10.296	
1,400.00	1,398.15	1,395.92	1,394.12	2.91	3.01	140.09	34.90	-34.57	71.20	65.35	5.85	12.167	
1,500.00	1,496.63	1,492.78	1,489.54	3.19	3.30	136.79	35.91	-51.17	90.94	84.59	6.35	14.312	
1,600.00	1,594.44	1,589.46	1,584.31	3.52	3.62	134.56	37.06	-70.27	114.39	107.48	6.91	16.551	
1,700.00	1,691.46	1,686.02	1,678.92	3.90	3.97	133.91	38.23	-89.54	140.36	132.85	7.51	18.682	
1,800.00	1,787.58	1,781.91	1,772.87	4.34	4.32	134.20	39.40	-108.67	168.67	160.52	8.15	20.693	
1,900.00	1,882.68	1,877.00	1,866.04	4.85	4.69	134.99	40.55	-127.65	199.36	190.54	8.82	22.604	
1,931.82	1,912.71	1,907.08	1,895.51	5.03	4.81	135.30	40.91	-133.65	209.63	200.60	9.04	23.196	
2,000.00	1,976.93	1,971.41	1,958.55	5.42	5.06	136.24	41.69	-146.49	231.94	222.40	9.54	24.308	
2,100.00	2,071.11	2,065.77	2,051.00	6.01	5.44	137.32	42.84	-165.32	264.75	254.45	10.30	25.710	
2,200.00	2,165.30	2,160.14	2,143.46	6.61	5.83	138.17	43.98	-184.15	297.62	286.54	11.07	26.877	
2,300.00	2,259.48	2,254.50	2,235.92	7.23	6.21	138.84	45.12	-202.98	330.53	318.67	11.86	27.864	
2,400.00	2,353.66	2,348.86	2,328.38	7.86	6.61	139.40	46.27	-221.82	363.48	350.82	12.66	28.707	
2,500.00	2,447.85	2,443.23	2,420.83	8.50	7.01	139.86	47.41	-240.65	396.45	382.98	13.47	29.435	
2,600.00	2,542.03	2,537.59	2,513.29	9.15	7.40	140.25	48.55	-259.48	429.45	415.16	14.28	30.067	
2,700.00	2,636.22	2,631.95	2,605.75	9.80	7.81	140.59	49.70	-278.31	462.46	447.35	15.10	30.621	
2,800.00	2,730.40	2,726.31	2,698.21	10.45	8.21	140.88	50.84	-297.14	495.48	479.55	15.93	31.109	
2,900.00	2,824.59	2,820.68	2,790.67	11.11	8.62	141.13	51.98	-315.97	528.51	511.75	16.76	31.542	
3,000.00	2,918.77	2,915.04	2,883.12	11.77	9.02	141.36	53.13	-334.80	561.55	543.96	17.59	31.929	
3,100.00	3,012.96	3,009.40	2,975.58	12.43	9.43	141.56	54.27	-353.63	594.59	576.17	18.42	32.276	
3,200.00	3,107.14	3,103.77	3,068.04	13.09	9.84	141.74	55.41	-372.46	627.65	608.39	19.26	32.589	
3,300.00	3,201.32	3,198.13	3,160.50	13.76	10.25	141.90	56.56	-391.30	660.70	640.60	20.10	32.872	
3,400.00	3,295.51	3,292.49	3,252.95	14.42	10.66	142.04	57.70	-410.13	693.76	672.82	20.94	33.130	
3,500.00	3,389.69	3,386.85	3,345.41	15.09	11.07	142.17	58.84	-428.96	726.83	705.05	21.78	33.365	
3,600.00	3,483.88	3,481.22	3,437.87	15.76	11.49	142.30	59.99	-447.79	759.90	737.27	22.63	33.581	
3,700.00	3,578.06	3,575.58	3,530.33	16.43	11.90	142.41	61.13	-466.62	792.97	769.49	23.48	33.779	
3,800.00	3,672.25	3,669.94	3,622.78	17.10	12.31	142.51	62.27	-485.45	826.04	801.72	24.32	33.962	
3,900.00	3,766.43	3,764.30	3,715.24	17.77	12.73	142.60	63.41	-504.28	859.12	833.94	25.17	34.131	
4,000.00	3,860.62	3,858.67	3,807.70	18.44	13.14	142.69	64.56	-523.11	892.19	866.17	26.02	34.288	
4,100.00	3,954.80	3,953.03	3,900.16	19.12	13.56	142.77	65.70	-541.94	925.27	898.40	26.87	34.433	
4,200.00	4,048.98	4,047.39	3,992.61	19.79	13.97	142.84	66.84	-560.78	958.35	930.63	27.72	34.569	
4,300.00	4,143.17	4,141.76	4,085.07	20.46	14.39	142.91	67.99	-579.61	991.43	962.86	28.57	34.696	
4,400.00	4,237.35	4,236.12	4,177.53	21.14	14.81	142.98	69.13	-598.44	1,024.52	995.09	29.43	34.815	
4,500.00	4,331.54	4,330.48	4,269.99	21.81	15.22	143.04	70.27	-617.27	1,057.60	1,027.32	30.28	34.927	
4,600.00	4,425.72	4,424.84	4,362.44	22.49	15.64	143.10	71.42	-636.10	1,090.69	1,059.55	31.13	35.031	
4,700.00	4,519.91	4,519.21	4,454.90	23.16	16.06	143.15	72.56	-654.93	1,123.77	1,091.78	31.99	35.130	
4,800.00	4,614.09	4,613.57	4,547.36	23.84	16.47	143.21	73.70	-673.76	1,156.86	1,124.02	32.84	35.223	
4,900.00	4,708.27	4,707.93	4,639.82	24.51	16.89	143.25	74.85	-692.59	1,189.95	1,156.25	33.70	35.311	
5,000.00	4,802.46	4,802.29	4,732.27	25.19	17.31	143.30	75.99	-711.42	1,223.04	1,188.48	34.55	35.394	
5,100.00	4,896.64	4,896.66	4,824.73	25.86	17.73	143.34	77.13	-730.26	1,256.12	1,220.71	35.41	35.473	
5,200.00	4,990.83	4,991.02	4,917.19	26.54	18.15	143.38	78.28	-749.09	1,289.21	1,252.95	36.27	35.548	
5,216.41	5,006.29	5,006.51	4,932.36	26.65	18.21	143.39	78.47	-752.18	1,294.65	1,258.24	36.41	35.559	
5,300.00	5,085.41	5,085.70	5,009.96	27.12	18.57	143.73	79.42	-767.98	1,321.38	1,284.22	37.16	35.560	
5,400.00	5,181.05	5,181.22	5,103.55	27.55	18.99	144.00	80.58	-787.04	1,350.90	1,312.91	37.99	35.557	
5,500.00	5,277.66	5,277.47	5,197.86	27.95	19.42	144.16	81.75	-806.25	1,377.72	1,338.91	38.81	35.499	
5,600.00	5,375.10	5,374.34	5,292.77	28.30	19.85	144.20	82.92	-825.58	1,401.82	1,362.22	39.61	35.394	
5,700.00	5,473.27	5,473.83	5,390.26	28.62	20.28	144.13	84.13	-845.40	1,423.19	1,382.82	40.38	35.246	
5,800.00	5,572.05	5,589.34	5,503.97	28.89	20.64	143.98	85.35	-865.60	1,441.11	1,400.06	41.05	35.110	
5,900.00	5,671.30	5,706.29	5,619.84	29.12	20.94	143.88	86.31	-881.38	1,455.05	1,413.46	41.60	34.981	
6,000.00	5,770.92	5,824.31	5,737.33	29.31	21.19	143.81	86.98	-892.50	1,464.96	1,422.93	42.04	34.850	
6,100.00	5,870.78	5,943.05	5,855.89	29.45	21.38	143.79	87.37	-898.81	1,470.79	1,428.42	42.37	34.716	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1 11-04												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,198.23	5,969.00	6,056.17	5,969.00	29.56	21.53	-14.69	87.46	-900.32	1,472.55	1,429.95	42.60	34.569	
6,200.00	5,970.77	6,057.94	5,970.77	29.56	21.53	-14.69	87.46	-900.32	1,472.55	1,429.94	42.60	34.566	
6,300.00	6,070.77	6,157.94	6,070.77	29.64	21.66	-14.69	87.46	-900.32	1,472.55	1,429.70	42.84	34.371	
6,400.00	6,170.77	6,257.94	6,170.77	29.72	21.79	-14.69	87.46	-900.32	1,472.55	1,429.46	43.09	34.173	
6,500.00	6,270.77	6,357.94	6,270.77	29.80	21.92	-14.69	87.46	-900.32	1,472.55	1,429.20	43.34	33.975	
6,600.00	6,370.77	6,457.94	6,370.77	29.88	22.06	-14.69	87.46	-900.32	1,472.55	1,428.95	43.60	33.777	
6,700.00	6,470.77	6,557.94	6,470.77	29.97	22.19	-14.69	87.46	-900.32	1,472.55	1,428.69	43.85	33.579	
6,800.00	6,570.77	6,657.94	6,570.77	30.05	22.33	-14.69	87.46	-900.32	1,472.55	1,428.43	44.11	33.381	
6,900.00	6,670.77	6,757.94	6,670.77	30.14	22.47	-14.69	87.46	-900.32	1,472.55	1,428.17	44.38	33.183	
7,000.00	6,770.77	6,857.94	6,770.77	30.23	22.61	-14.69	87.46	-900.32	1,472.55	1,427.90	44.64	32.985	
7,100.00	6,870.77	6,957.94	6,870.77	30.32	22.75	-14.69	87.46	-900.32	1,472.55	1,427.63	44.91	32.787	
7,200.00	6,970.77	7,057.94	6,970.77	30.41	22.90	-14.69	87.46	-900.32	1,472.55	1,427.36	45.18	32.590	
7,300.00	7,070.77	7,157.94	7,070.77	30.50	23.04	-14.69	87.46	-900.32	1,472.55	1,427.09	45.46	32.392	
7,400.00	7,170.77	7,257.94	7,170.77	30.60	23.19	-14.69	87.46	-900.32	1,472.55	1,426.81	45.74	32.196	
7,500.00	7,270.77	7,357.94	7,270.77	30.69	23.33	-14.69	87.46	-900.32	1,472.55	1,426.53	46.02	32.000	
7,600.00	7,370.77	7,457.94	7,370.77	30.79	23.48	-14.69	87.46	-900.32	1,472.55	1,426.25	46.30	31.804	
7,700.00	7,470.77	7,557.94	7,470.77	30.89	23.63	-14.69	87.46	-900.32	1,472.55	1,425.96	46.59	31.609	
7,800.00	7,570.77	7,657.94	7,570.77	30.99	23.78	-14.69	87.46	-900.32	1,472.55	1,425.67	46.87	31.415	
7,900.00	7,670.77	7,757.94	7,670.77	31.09	23.93	-14.69	87.46	-900.32	1,472.55	1,425.38	47.17	31.221	
8,000.00	7,770.77	7,857.94	7,770.77	31.19	24.09	-14.69	87.46	-900.32	1,472.55	1,425.09	47.46	31.028	
8,100.00	7,870.77	7,957.94	7,870.77	31.30	24.24	-14.69	87.46	-900.32	1,472.55	1,424.79	47.75	30.836	
8,121.23	7,892.00	7,959.17	7,872.00	31.32	24.24	-14.69	87.46	-900.32	1,472.68	1,424.90	47.79	30.818	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.57	0.00	14.57				
100.00	100.00	100.00	100.00	0.10	0.10	0.00	14.57	0.00	14.57	14.38	0.19	76.250	
200.00	200.00	200.00	200.00	0.32	0.32	0.00	14.57	0.00	14.57	13.93	0.64	22.741	
300.00	300.00	300.00	300.00	0.55	0.55	0.00	14.57	0.00	14.57	13.48	1.09	13.363	
400.00	400.00	400.00	400.00	0.77	0.77	0.00	14.57	0.00	14.57	13.03	1.54	9.462	
500.00	500.00	500.00	500.00	0.99	0.99	0.00	14.57	0.00	14.57	12.58	1.99	7.323	
600.00	600.00	600.00	600.00	1.22	1.22	0.00	14.57	0.00	14.57	12.13	2.44	5.973	
700.00	700.00	700.00	700.00	1.44	1.44	0.00	14.57	0.00	14.57	11.68	2.89	5.044	
800.00	800.00	800.00	800.00	1.67	1.67	0.00	14.57	0.00	14.57	11.23	3.34	4.364	
900.00	900.00	900.00	900.00	1.89	1.89	0.00	14.57	0.00	14.57	10.78	3.79	3.846	
950.00	950.00	950.00	950.00	2.01	2.01	0.00	14.57	0.00	14.57	10.56	4.01	3.631 CC, ES	
1,000.00	1,000.00	999.94	999.94	2.10	2.11	160.73	14.65	0.43	15.06	10.85	4.22	3.573 SF	
1,100.00	1,099.93	1,099.55	1,099.48	2.28	2.32	174.05	15.28	3.84	19.66	15.07	4.59	4.281	
1,200.00	1,199.68	1,198.33	1,198.01	2.47	2.53	-172.80	16.53	10.57	30.44	25.47	4.97	6.119	
1,300.00	1,299.13	1,295.74	1,294.91	2.68	2.76	-164.72	18.38	20.49	47.77	42.41	5.36	8.905	
1,400.00	1,398.15	1,392.22	1,390.53	2.91	3.01	-160.27	20.72	33.10	71.02	65.25	5.77	12.317	
1,500.00	1,496.63	1,488.50	1,485.89	3.19	3.27	-158.50	23.14	46.09	97.93	91.75	6.18	15.850	
1,600.00	1,594.44	1,583.87	1,580.36	3.52	3.54	-158.00	25.53	58.96	127.98	121.38	6.60	19.387	
1,700.00	1,691.46	1,678.22	1,673.81	3.90	3.82	-158.06	27.90	71.69	161.11	154.08	7.03	22.907	
1,800.00	1,787.58	1,771.42	1,766.14	4.34	4.10	-158.38	30.23	84.27	197.29	189.81	7.47	26.399	
1,900.00	1,882.68	1,863.37	1,857.22	4.85	4.38	-158.83	32.54	96.68	236.49	228.57	7.92	29.859	
1,931.82	1,912.71	1,892.35	1,885.92	5.03	4.47	-158.98	33.27	100.59	249.60	241.54	8.06	30.954	
2,000.00	1,976.93	1,954.29	1,947.27	5.42	4.66	-159.48	34.82	108.94	278.02	269.60	8.42	33.003	
2,100.00	2,071.11	2,045.14	2,037.26	6.01	4.95	-160.05	37.10	121.20	319.73	310.77	8.96	35.672	
2,200.00	2,165.30	2,135.98	2,127.25	6.61	5.23	-160.48	39.38	133.46	361.46	351.95	9.51	38.000	
2,300.00	2,259.48	2,226.83	2,217.24	7.23	5.53	-160.83	41.66	145.72	403.20	393.13	10.07	40.044	
2,400.00	2,353.66	2,317.68	2,307.22	7.86	5.82	-161.11	43.94	157.98	444.96	434.32	10.63	41.847	
2,500.00	2,447.85	2,408.52	2,397.21	8.50	6.11	-161.35	46.22	170.23	486.72	475.51	11.20	43.447	
2,600.00	2,542.03	2,499.37	2,487.20	9.15	6.41	-161.54	48.50	182.49	528.48	516.71	11.78	44.874	
2,700.00	2,636.22	2,590.22	2,577.18	9.80	6.71	-161.71	50.77	194.75	570.25	557.90	12.36	46.153	
2,800.00	2,730.40	2,681.06	2,667.17	10.45	7.01	-161.86	53.05	207.01	612.03	599.09	12.94	47.305	
2,900.00	2,824.59	2,771.91	2,757.16	11.11	7.31	-161.98	55.33	219.27	653.80	640.28	13.52	48.348	
3,000.00	2,918.77	2,862.75	2,847.14	11.77	7.61	-162.10	57.61	231.52	695.58	681.47	14.11	49.295	
3,100.00	3,012.96	2,953.60	2,937.13	12.43	7.91	-162.19	59.89	243.78	737.37	722.66	14.70	50.158	
3,200.00	3,107.14	3,044.45	3,027.12	13.09	8.21	-162.28	62.17	256.04	779.15	763.86	15.29	50.949	
3,300.00	3,201.32	3,135.29	3,117.10	13.76	8.51	-162.36	64.45	268.30	820.93	805.05	15.89	51.674	
3,400.00	3,295.51	3,226.14	3,207.09	14.42	8.82	-162.43	66.73	280.56	862.72	846.24	16.48	52.342	
3,500.00	3,389.69	3,316.99	3,297.08	15.09	9.12	-162.50	69.01	292.81	904.50	887.43	17.08	52.960	
3,600.00	3,483.88	3,407.83	3,387.06	15.76	9.42	-162.56	71.29	305.07	946.29	928.61	17.68	53.532	
3,700.00	3,578.06	3,498.68	3,477.05	16.43	9.73	-162.61	73.56	317.33	988.08	969.80	18.28	54.063	
3,800.00	3,672.25	3,589.53	3,567.04	17.10	10.03	-162.66	75.84	329.59	1,029.87	1,010.99	18.88	54.557	
3,900.00	3,766.43	3,680.37	3,657.02	17.77	10.34	-162.71	78.12	341.85	1,071.66	1,052.18	19.48	55.018	
4,000.00	3,860.62	3,771.22	3,747.01	18.44	10.64	-162.75	80.40	354.10	1,113.45	1,093.37	20.08	55.450	
4,100.00	3,954.80	3,862.07	3,837.00	19.12	10.95	-162.79	82.68	366.36	1,155.24	1,134.55	20.68	55.854	
4,200.00	4,048.98	3,952.91	3,926.98	19.79	11.26	-162.83	84.96	378.62	1,197.03	1,175.74	21.29	56.233	
4,300.00	4,143.17	4,043.76	4,016.97	20.46	11.56	-162.86	87.24	390.88	1,238.82	1,216.93	21.89	56.590	
4,400.00	4,237.35	4,134.60	4,106.96	21.14	11.87	-162.89	89.52	403.14	1,280.61	1,258.11	22.50	56.926	
4,500.00	4,331.54	4,225.45	4,196.94	21.81	12.18	-162.92	91.80	415.39	1,322.40	1,299.30	23.10	57.244	
4,600.00	4,425.72	4,316.30	4,286.93	22.49	12.48	-162.95	94.08	427.65	1,364.19	1,340.49	23.71	57.543	
4,700.00	4,519.91	4,407.14	4,376.92	23.16	12.79	-162.98	96.35	439.91	1,405.99	1,381.67	24.31	57.827	
4,800.00	4,614.09	4,497.99	4,466.90	23.84	13.10	-163.00	98.63	452.17	1,447.78	1,422.86	24.92	58.096	
4,900.00	4,708.27	4,588.84	4,556.89	24.51	13.41	-163.02	100.91	464.43	1,489.57	1,464.04	25.53	58.352	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
5,000.00	4,802.46	4,679.68	4,646.88	25.19	13.71	-163.05	103.19	476.68	1,531.37	1,505.23	26.14	58.594	
5,100.00	4,896.64	4,770.53	4,736.86	25.86	14.02	-163.07	105.47	488.94	1,573.16	1,546.42	26.74	58.825	
5,200.00	4,990.83	4,861.38	4,826.85	26.54	14.33	-163.09	107.75	501.20	1,614.95	1,587.60	27.35	59.045	
5,216.41	5,006.29	4,876.29	4,841.62	26.65	14.38	-163.09	108.12	503.21	1,621.81	1,594.36	27.45	59.080	
5,300.00	5,085.41	4,952.70	4,917.31	27.12	14.64	-163.31	110.04	513.52	1,655.68	1,627.62	28.06	59.001	
5,400.00	5,181.05	5,045.32	5,009.05	27.55	14.95	-163.51	112.36	526.02	1,693.37	1,664.63	28.74	58.918	
5,500.00	5,277.66	5,139.12	5,101.97	27.95	15.27	-163.65	114.72	538.68	1,727.95	1,698.56	29.39	58.792	
5,600.00	5,375.10	5,234.02	5,195.96	28.30	15.59	-163.74	117.10	551.48	1,759.37	1,729.36	30.01	58.630	
5,700.00	5,473.27	5,329.87	5,290.91	28.62	15.92	-163.78	119.50	564.42	1,787.59	1,757.00	30.59	58.438	
5,800.00	5,572.05	5,426.58	5,386.70	28.89	16.25	-163.77	121.93	577.46	1,812.60	1,781.46	31.13	58.220	
5,900.00	5,671.30	5,524.01	5,483.21	29.12	16.58	-163.71	124.37	590.61	1,834.36	1,802.72	31.64	57.980	
6,000.00	5,770.92	5,645.33	5,603.44	29.31	16.95	-163.57	127.34	606.59	1,852.70	1,820.57	32.13	57.656	
6,100.00	5,870.78	5,838.70	5,796.04	29.45	17.36	-163.38	130.42	623.14	1,864.18	1,831.54	32.64	57.113	
6,198.23	5,969.00	6,011.73	5,969.00	29.56	17.63	38.17	131.17	627.15	1,867.36	1,834.36	33.00	56.579	
6,200.00	5,970.77	6,013.50	5,970.77	29.56	17.64	38.17	131.17	627.15	1,867.36	1,834.35	33.01	56.569	
6,300.00	6,070.77	6,113.50	6,070.77	29.64	17.80	38.17	131.17	627.15	1,867.36	1,834.04	33.32	56.040	
6,400.00	6,170.77	6,213.50	6,170.77	29.72	17.96	38.17	131.17	627.15	1,867.36	1,833.72	33.64	55.515	
6,500.00	6,270.77	6,313.50	6,270.77	29.80	18.12	38.17	131.17	627.15	1,867.36	1,833.41	33.95	54.996	
6,600.00	6,370.77	6,413.50	6,370.77	29.88	18.28	38.17	131.17	627.15	1,867.36	1,833.09	34.28	54.481	
6,700.00	6,470.77	6,513.50	6,470.77	29.97	18.44	38.17	131.17	627.15	1,867.36	1,832.76	34.60	53.972	
6,800.00	6,570.77	6,613.50	6,570.77	30.05	18.61	38.17	131.17	627.15	1,867.36	1,832.44	34.93	53.468	
6,900.00	6,670.77	6,713.50	6,670.77	30.14	18.78	38.17	131.17	627.15	1,867.36	1,832.11	35.25	52.969	
7,000.00	6,770.77	6,813.50	6,770.77	30.23	18.94	38.17	131.17	627.15	1,867.36	1,831.78	35.59	52.476	
7,100.00	6,870.77	6,913.50	6,870.77	30.32	19.11	38.17	131.17	627.15	1,867.36	1,831.44	35.92	51.988	
7,200.00	6,970.77	7,013.50	6,970.77	30.41	19.28	38.17	131.17	627.15	1,867.36	1,831.10	36.26	51.505	
7,300.00	7,070.77	7,113.50	7,070.77	30.50	19.45	38.17	131.17	627.15	1,867.36	1,830.77	36.59	51.029	
7,400.00	7,170.77	7,213.50	7,170.77	30.60	19.63	38.17	131.17	627.15	1,867.36	1,830.43	36.94	50.557	
7,500.00	7,270.77	7,313.50	7,270.77	30.69	19.80	38.17	131.17	627.15	1,867.36	1,830.08	37.28	50.092	
7,600.00	7,370.77	7,413.50	7,370.77	30.79	19.97	38.17	131.17	627.15	1,867.36	1,829.74	37.62	49.632	
7,700.00	7,470.77	7,513.50	7,470.77	30.89	20.15	38.17	131.17	627.15	1,867.36	1,829.39	37.97	49.177	
7,800.00	7,570.77	7,613.50	7,570.77	30.99	20.32	38.17	131.17	627.15	1,867.36	1,829.04	38.32	48.729	
7,900.00	7,670.77	7,713.50	7,670.77	31.09	20.50	38.17	131.17	627.15	1,867.36	1,828.69	38.67	48.286	
8,000.00	7,770.77	7,813.50	7,770.77	31.19	20.68	38.17	131.17	627.15	1,867.36	1,828.33	39.03	47.848	
8,100.00	7,870.77	7,913.50	7,870.77	31.30	20.86	38.17	131.17	627.15	1,867.36	1,827.98	39.38	47.416	
8,121.23	7,892.00	7,934.73	7,892.00	31.32	20.90	38.17	131.17	627.15	1,867.36	1,827.90	39.46	47.325	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	169.17	-14.57	2.79	14.84				
100.00	100.00	100.00	100.00	0.10	0.10	169.17	-14.57	2.79	14.84	14.64	0.19	77.654	
200.00	200.00	200.00	200.00	0.32	0.32	169.17	-14.57	2.79	14.84	14.20	0.64	23.160 CC, ES	
300.00	300.00	299.61	299.59	0.55	0.53	164.64	-15.49	4.25	16.07	15.00	1.07	14.995	
400.00	400.00	398.98	398.82	0.77	0.74	154.66	-18.24	8.64	20.22	18.72	1.50	13.470 SF	
500.00	500.00	497.87	497.33	0.99	0.99	145.11	-22.79	15.90	27.91	25.97	1.94	14.385	
600.00	600.00	596.05	594.79	1.22	1.27	138.27	-29.09	25.95	39.33	36.94	2.39	16.465	
700.00	700.00	693.31	690.87	1.44	1.60	133.79	-37.08	38.68	54.36	51.51	2.85	19.096	
800.00	800.00	789.43	785.28	1.67	1.97	130.84	-46.67	53.98	72.86	69.54	3.32	21.970	
900.00	900.00	884.23	877.74	1.89	2.39	128.86	-57.77	71.69	94.72	90.92	3.80	24.918	
950.00	950.00	931.07	923.16	2.01	2.62	128.11	-63.85	81.39	106.88	102.83	4.05	26.391	
1,000.00	1,000.00	977.54	968.03	2.10	2.86	-73.97	-70.28	91.64	119.71	115.50	4.21	28.417	
1,100.00	1,099.93	1,069.29	1,056.01	2.28	3.38	-75.67	-84.09	113.68	147.14	142.51	4.63	31.754	
1,200.00	1,199.68	1,159.32	1,141.49	2.47	3.94	-77.71	-99.10	137.61	177.06	171.99	5.07	34.908	
1,300.00	1,299.13	1,247.45	1,224.27	2.68	4.54	-79.81	-115.16	163.23	209.63	204.09	5.54	37.858	
1,400.00	1,398.15	1,333.53	1,304.18	2.91	5.18	-81.83	-132.15	190.32	244.97	238.93	6.04	40.553	
1,500.00	1,496.63	1,417.43	1,381.12	3.19	5.85	-83.69	-149.93	218.68	283.14	276.54	6.59	42.949	
1,600.00	1,594.44	1,504.53	1,460.14	3.52	6.60	-85.53	-169.39	249.72	323.70	316.48	7.22	44.807	
1,700.00	1,691.46	1,594.35	1,541.54	3.90	7.38	-87.41	-189.55	281.87	364.87	356.93	7.95	45.913	
1,800.00	1,787.58	1,683.61	1,622.44	4.34	8.16	-89.22	-209.58	313.83	406.62	397.85	8.77	46.361	
1,900.00	1,882.68	1,772.20	1,702.73	4.85	8.93	-90.98	-229.47	345.54	449.11	439.43	9.68	46.387	
1,931.82	1,912.71	1,800.23	1,728.14	5.03	9.18	-91.52	-235.76	355.58	462.81	452.82	9.99	46.330	
2,000.00	1,976.93	1,860.21	1,782.50	5.42	9.71	-93.23	-249.22	377.05	492.45	481.74	10.70	46.007	
2,100.00	2,071.11	1,948.18	1,862.23	6.01	10.49	-95.41	-268.96	408.54	536.50	524.72	11.78	45.528	
2,200.00	2,165.30	2,036.15	1,941.97	6.61	11.26	-97.27	-288.71	440.03	581.11	568.21	12.89	45.072	
2,300.00	2,259.48	2,124.12	2,021.70	7.23	12.05	-98.87	-308.45	471.53	626.15	612.12	14.02	44.655	
2,400.00	2,353.66	2,212.09	2,101.43	7.86	12.83	-100.26	-328.20	503.02	671.53	656.37	15.17	44.281	
2,500.00	2,447.85	2,300.06	2,181.16	8.50	13.61	-101.47	-347.94	534.51	717.20	700.88	16.32	43.950	
2,600.00	2,542.03	2,388.03	2,260.89	9.15	14.39	-102.55	-367.69	566.00	763.10	745.62	17.48	43.658	
2,700.00	2,636.22	2,476.00	2,340.62	9.80	15.18	-103.50	-387.43	597.50	809.18	790.54	18.64	43.400	
2,800.00	2,730.40	2,563.97	2,420.36	10.45	15.96	-104.35	-407.18	628.99	855.43	835.62	19.81	43.172	
2,900.00	2,824.59	2,651.94	2,500.09	11.11	16.75	-105.12	-426.92	660.48	901.82	880.83	20.99	42.971	
3,000.00	2,918.77	2,739.91	2,579.82	11.77	17.53	-105.81	-446.67	691.98	948.32	926.16	22.16	42.793	
3,100.00	3,012.96	2,827.88	2,659.55	12.43	18.32	-106.44	-466.41	723.47	994.92	971.58	23.34	42.635	
3,200.00	3,107.14	2,915.85	2,739.28	13.09	19.11	-107.01	-486.16	754.96	1,041.60	1,017.09	24.51	42.495	
3,300.00	3,201.32	3,003.82	2,819.01	13.76	19.89	-107.53	-505.90	786.45	1,088.36	1,062.67	25.69	42.369	
3,400.00	3,295.51	3,091.79	2,898.75	14.42	20.68	-108.01	-525.65	817.95	1,135.19	1,108.32	26.86	42.256	
3,500.00	3,389.69	3,179.76	2,978.48	15.09	21.47	-108.46	-545.39	849.44	1,182.07	1,154.03	28.04	42.156	
3,600.00	3,483.88	3,267.73	3,058.21	15.76	22.25	-108.86	-565.14	880.93	1,229.01	1,199.79	29.22	42.065	
3,700.00	3,578.06	3,355.70	3,137.94	16.43	23.04	-109.24	-584.88	912.43	1,275.99	1,245.60	30.39	41.984	
3,800.00	3,672.25	3,443.68	3,217.67	17.10	23.83	-109.60	-604.63	943.92	1,323.01	1,291.44	31.57	41.910	
3,900.00	3,766.43	3,531.65	3,297.40	17.77	24.62	-109.93	-624.37	975.41	1,370.07	1,337.33	32.74	41.844	
4,000.00	3,860.62	3,619.62	3,377.14	18.44	25.41	-110.23	-644.12	1,006.90	1,417.16	1,383.24	33.92	41.783	
4,100.00	3,954.80	3,707.59	3,456.87	19.12	26.19	-110.52	-663.86	1,038.40	1,464.28	1,429.19	35.09	41.729	
4,200.00	4,048.98	3,795.56	3,536.60	19.79	26.98	-110.79	-683.60	1,069.89	1,511.43	1,475.17	36.26	41.680	
4,300.00	4,143.17	3,883.53	3,616.33	20.46	27.77	-111.04	-703.35	1,101.38	1,558.60	1,521.17	37.44	41.635	
4,400.00	4,237.35	3,971.50	3,696.06	21.14	28.56	-111.28	-723.09	1,132.87	1,605.80	1,567.19	38.61	41.594	
4,500.00	4,331.54	4,059.47	3,775.79	21.81	29.35	-111.51	-742.84	1,164.37	1,653.01	1,613.24	39.78	41.557	
4,600.00	4,425.72	4,147.44	3,855.53	22.49	30.14	-111.72	-762.58	1,195.86	1,700.25	1,659.30	40.95	41.524	
4,700.00	4,519.91	4,235.41	3,935.26	23.16	30.93	-111.92	-782.33	1,227.35	1,747.50	1,705.39	42.12	41.493	
4,800.00	4,614.09	4,323.38	4,014.99	23.84	31.72	-112.11	-802.07	1,258.85	1,794.77	1,751.49	43.28	41.466	
4,900.00	4,708.27	4,411.35	4,094.72	24.51	32.50	-112.29	-821.82	1,290.34	1,842.05	1,797.60	44.45	41.441	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1 11-04												Offset Well Error:	0.00 ft
Survey Program: 0-MWD													
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,802.46	4,499.32	4,174.45	25.19	33.29	-112.46	-841.56	1,321.83	1,889.35	1,843.73	45.62	41.418	
5,100.00	4,896.64	4,587.29	4,254.19	25.86	34.08	-112.62	-861.31	1,353.32	1,936.65	1,889.87	46.78	41.398	
5,200.00	4,990.83	4,675.26	4,333.92	26.54	34.87	-112.78	-881.05	1,384.82	1,983.97	1,936.03	47.95	41.379	
5,216.41	5,006.29	4,689.70	4,347.00	26.65	35.00	-112.80	-884.29	1,389.99	1,991.74	1,943.60	48.14	41.376	
5,300.00	5,085.41	4,763.50	4,413.90	27.12	35.66	-113.71	-900.86	1,416.41	2,030.88	1,981.53	49.35	41.148	
5,400.00	5,181.05	4,852.45	4,494.51	27.55	36.46	-114.65	-920.82	1,448.25	2,076.56	2,025.89	50.67	40.979	
5,500.00	5,277.66	4,942.01	4,575.69	27.95	37.27	-115.46	-940.92	1,480.31	2,120.95	2,069.01	51.94	40.838	
5,600.00	5,375.10	5,032.07	4,657.31	28.30	38.07	-116.15	-961.14	1,512.55	2,163.99	2,110.86	53.13	40.727	
5,700.00	5,473.27	5,122.52	4,739.29	28.62	38.89	-116.71	-981.44	1,544.93	2,205.67	2,151.41	54.27	40.646	
5,800.00	5,572.05	5,213.26	4,821.53	28.89	39.70	-117.16	-1,001.80	1,577.42	2,245.97	2,190.65	55.32	40.597	
5,900.00	5,671.30	5,304.16	4,903.91	29.12	40.52	-117.51	-1,022.21	1,609.96	2,284.89	2,228.58	56.31	40.581	
6,000.00	5,770.92	5,395.12	4,986.36	29.31	41.33	-117.76	-1,042.62	1,642.52	2,322.43	2,265.22	57.21	40.598	
6,100.00	5,870.78	5,486.03	5,068.75	29.45	42.15	-117.92	-1,063.03	1,675.07	2,358.62	2,300.60	58.02	40.649	
6,198.23	5,969.00	5,575.18	5,149.55	29.56	42.95	83.52	-1,083.04	1,706.98	2,392.89	2,334.14	58.75	40.727	
6,200.00	5,970.77	5,576.78	5,151.00	29.56	42.96	83.53	-1,083.40	1,707.55	2,393.49	2,334.73	58.76	40.732	
6,300.00	6,070.77	5,667.41	5,233.15	29.64	43.78	84.13	-1,103.74	1,740.00	2,427.87	2,368.65	59.22	40.995	
6,400.00	6,170.77	5,758.05	5,315.29	29.72	44.59	84.71	-1,124.08	1,772.45	2,462.49	2,402.81	59.68	41.264	
6,500.00	6,270.77	6,070.17	5,604.62	29.80	46.57	86.40	-1,186.07	1,871.32	2,493.53	2,433.02	60.51	41.208	
6,600.00	6,370.77	6,420.42	5,942.17	29.88	48.13	87.65	-1,235.27	1,949.79	2,515.49	2,454.33	61.16	41.129	
6,700.00	6,470.77	6,789.48	6,307.25	29.97	49.05	88.32	-1,263.04	1,994.08	2,527.30	2,465.66	61.65	40.997	
6,800.00	6,570.77	7,053.22	6,570.77	30.05	49.31	88.43	-1,267.65	2,001.43	2,529.22	2,467.27	61.95	40.828	
6,900.00	6,670.77	7,153.22	6,670.77	30.14	49.37	88.43	-1,267.65	2,001.43	2,529.22	2,467.10	62.12	40.714	
7,000.00	6,770.77	7,253.22	6,770.77	30.23	49.43	88.43	-1,267.65	2,001.43	2,529.22	2,466.93	62.29	40.601	
7,100.00	6,870.77	7,353.22	6,870.77	30.32	49.49	88.43	-1,267.65	2,001.43	2,529.22	2,466.75	62.47	40.487	
7,200.00	6,970.77	7,453.22	6,970.77	30.41	49.55	88.43	-1,267.65	2,001.43	2,529.22	2,466.57	62.65	40.372	
7,300.00	7,070.77	7,553.22	7,070.77	30.50	49.61	88.43	-1,267.65	2,001.43	2,529.22	2,466.39	62.83	40.255	
7,400.00	7,170.77	7,653.22	7,170.77	30.60	49.67	88.43	-1,267.65	2,001.43	2,529.22	2,466.21	63.01	40.138	
7,500.00	7,270.77	7,753.22	7,270.77	30.69	49.74	88.43	-1,267.65	2,001.43	2,529.22	2,466.02	63.20	40.019	
7,600.00	7,370.77	7,853.22	7,370.77	30.79	49.80	88.43	-1,267.65	2,001.43	2,529.22	2,465.83	63.39	39.900	
7,700.00	7,470.77	7,953.22	7,470.77	30.89	49.87	88.43	-1,267.65	2,001.43	2,529.22	2,465.64	63.58	39.779	
7,800.00	7,570.77	8,053.22	7,570.77	30.99	49.94	88.43	-1,267.65	2,001.43	2,529.22	2,465.45	63.78	39.658	
7,900.00	7,670.77	8,153.22	7,670.77	31.09	50.00	88.43	-1,267.65	2,001.43	2,529.22	2,465.25	63.97	39.536	
8,000.00	7,770.77	8,253.22	7,770.77	31.19	50.07	88.43	-1,267.65	2,001.43	2,529.22	2,465.05	64.17	39.412	
8,100.00	7,870.77	8,353.22	7,870.77	31.30	50.14	88.43	-1,267.65	2,001.43	2,529.22	2,464.85	64.38	39.289	
8,107.24	7,878.00	8,360.45	7,878.00	31.30	50.15	88.43	-1,267.65	2,001.43	2,529.22	2,464.83	64.39	39.280	
8,121.23	7,892.00	8,369.92	7,887.47	31.32	50.16	88.43	-1,267.65	2,001.43	2,529.23	2,464.81	64.41	39.265	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	-3.37	94.72	-5.57	94.88				
100.00	100.00	100.00	100.00	0.10	0.10	-3.37	94.72	-5.57	94.88	94.69	0.19	496.621	
200.00	200.00	200.00	200.00	0.32	0.32	-3.37	94.72	-5.57	94.88	94.24	0.64	148.115	
300.00	300.00	300.00	300.00	0.55	0.55	-3.37	94.72	-5.57	94.88	93.79	1.09	87.037	
400.00	400.00	400.00	400.00	0.77	0.77	-3.37	94.72	-5.57	94.88	93.34	1.54	61.625	
500.00	500.00	500.00	500.00	0.99	0.99	-3.37	94.72	-5.57	94.88	92.89	1.99	47.698	
600.00	600.00	600.00	600.00	1.22	1.22	-3.37	94.72	-5.57	94.88	92.44	2.44	38.906	
700.00	700.00	700.00	700.00	1.44	1.44	-3.37	94.72	-5.57	94.88	91.99	2.89	32.850	
800.00	800.00	800.00	800.00	1.67	1.67	-3.37	94.72	-5.57	94.88	91.54	3.34	28.426	
900.00	900.00	900.00	900.00	1.89	1.89	-3.37	94.72	-5.57	94.88	91.09	3.79	25.052	
950.00	950.00	950.00	950.00	2.01	2.01	-3.37	94.72	-5.57	94.88	90.87	4.01	23.649 CC, ES	
1,000.00	1,000.00	998.53	998.53	2.10	2.11	155.12	95.08	-5.77	95.66	91.44	4.22	22.677	
1,100.00	1,099.93	1,095.30	1,095.24	2.28	2.33	155.10	97.97	-7.31	101.90	97.29	4.60	22.131 SF	
1,200.00	1,199.68	1,191.24	1,190.95	2.47	2.55	155.05	103.67	-10.35	114.33	109.33	4.99	22.891	
1,300.00	1,299.13	1,285.80	1,285.03	2.68	2.77	154.98	112.06	-14.82	132.87	127.48	5.39	24.659	
1,400.00	1,398.15	1,378.49	1,376.89	2.91	3.01	154.87	122.94	-20.62	157.39	151.60	5.79	27.201	
1,500.00	1,496.63	1,468.84	1,466.01	3.19	3.27	154.74	136.06	-27.61	187.73	181.54	6.19	30.326	
1,600.00	1,594.44	1,556.45	1,551.93	3.52	3.54	154.56	151.15	-35.66	223.71	217.11	6.60	33.882	
1,700.00	1,691.46	1,640.97	1,634.29	3.90	3.85	154.35	167.89	-44.58	265.10	258.08	7.02	37.740	
1,800.00	1,787.58	1,722.09	1,712.78	4.34	4.17	154.10	185.98	-54.22	311.66	304.21	7.46	41.796	
1,900.00	1,882.68	1,800.00	1,787.58	4.85	4.51	153.80	205.18	-64.46	363.14	355.24	7.90	45.957	
1,931.82	1,912.71	1,823.47	1,810.00	5.03	4.63	153.69	211.32	-67.73	380.51	372.46	8.05	47.289	
2,000.00	1,976.93	1,876.78	1,860.70	5.42	4.89	153.82	225.86	-75.48	418.68	410.26	8.41	49.761	
2,100.00	2,071.11	1,955.63	1,935.46	6.01	5.31	153.93	247.98	-87.27	475.36	466.39	8.97	52.966	
2,200.00	2,165.30	2,038.00	2,013.56	6.61	5.76	154.01	271.08	-99.58	532.06	522.50	9.56	55.657	
2,300.00	2,259.48	2,120.37	2,091.65	7.23	6.22	154.08	294.19	-111.90	588.76	578.60	10.16	57.960	
2,400.00	2,353.66	2,202.74	2,169.75	7.86	6.70	154.14	317.30	-124.22	645.46	634.69	10.77	59.945	
2,500.00	2,447.85	2,285.11	2,247.85	8.50	7.18	154.19	340.41	-136.54	702.16	690.77	11.39	61.661	
2,600.00	2,542.03	2,367.48	2,325.94	9.15	7.67	154.23	363.51	-148.85	758.86	746.85	12.02	63.159	
2,700.00	2,636.22	2,449.85	2,404.04	9.80	8.16	154.27	386.62	-161.17	815.56	802.91	12.65	64.474	
2,800.00	2,730.40	2,532.22	2,482.14	10.45	8.66	154.30	409.73	-173.49	872.26	858.97	13.29	65.636	
2,900.00	2,824.59	2,614.59	2,560.24	11.11	9.16	154.32	432.84	-185.80	928.96	915.03	13.93	66.667	
3,000.00	2,918.77	2,696.96	2,638.33	11.77	9.67	154.35	455.94	-198.12	985.67	971.08	14.58	67.586	
3,100.00	3,012.96	2,779.33	2,716.43	12.43	10.17	154.37	479.05	-210.44	1,042.37	1,027.13	15.24	68.409	
3,200.00	3,107.14	2,861.70	2,794.53	13.09	10.69	154.39	502.16	-222.76	1,099.07	1,083.17	15.89	69.150	
3,300.00	3,201.32	2,944.07	2,872.63	13.76	11.20	154.40	525.26	-235.07	1,155.77	1,139.22	16.55	69.819	
3,400.00	3,295.51	3,026.44	2,950.72	14.42	11.71	154.42	548.37	-247.39	1,212.47	1,195.26	17.22	70.428	
3,500.00	3,389.69	3,108.81	3,028.82	15.09	12.23	154.43	571.48	-259.71	1,269.17	1,251.29	17.88	70.982	
3,600.00	3,483.88	3,191.18	3,106.92	15.76	12.74	154.45	594.59	-272.02	1,325.88	1,307.33	18.55	71.487	
3,700.00	3,578.06	3,273.55	3,185.01	16.43	13.26	154.46	617.69	-284.34	1,382.58	1,363.36	19.22	71.951	
3,800.00	3,672.25	3,355.92	3,263.11	17.10	13.78	154.47	640.80	-296.66	1,439.28	1,419.39	19.89	72.377	
3,900.00	3,766.43	3,438.29	3,341.21	17.77	14.30	154.48	663.91	-308.97	1,495.98	1,475.42	20.56	72.771	
4,000.00	3,860.62	3,520.66	3,419.31	18.44	14.82	154.49	687.02	-321.29	1,552.68	1,531.45	21.23	73.134	
4,100.00	3,954.80	3,603.03	3,497.40	19.12	15.34	154.50	710.12	-333.61	1,609.39	1,587.48	21.90	73.472	
4,200.00	4,048.98	3,685.40	3,575.50	19.79	15.86	154.51	733.23	-345.93	1,666.09	1,643.51	22.58	73.785	
4,300.00	4,143.17	3,767.77	3,653.60	20.46	16.39	154.51	756.34	-358.24	1,722.79	1,699.53	23.26	74.077	
4,400.00	4,237.35	3,850.14	3,731.70	21.14	16.91	154.52	779.45	-370.56	1,779.49	1,755.56	23.93	74.349	
4,500.00	4,331.54	3,932.51	3,809.79	21.81	17.43	154.53	802.55	-382.88	1,836.19	1,811.58	24.61	74.604	
4,600.00	4,425.72	4,014.88	3,887.89	22.49	17.96	154.54	825.66	-395.19	1,892.90	1,867.60	25.29	74.843	
4,700.00	4,519.91	4,097.25	3,965.99	23.16	18.48	154.54	848.77	-407.51	1,949.60	1,923.63	25.97	75.067	
4,800.00	4,614.09	4,179.62	4,044.08	23.84	19.01	154.55	871.87	-419.83	2,006.30	1,979.65	26.65	75.277	
4,900.00	4,708.27	4,261.99	4,122.18	24.51	19.53	154.55	894.98	-432.14	2,063.00	2,035.67	27.33	75.476	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1 11-04												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,802.46	4,344.36	4,200.28	25.19	20.06	154.56	918.09	-444.46	2,119.70	2,091.69	28.02	75.663	
5,100.00	4,896.64	4,426.73	4,278.38	25.86	20.59	154.56	941.20	-456.78	2,176.41	2,147.71	28.70	75.840	
5,200.00	4,990.83	4,509.10	4,356.47	26.54	21.11	154.57	964.30	-469.10	2,233.11	2,203.73	29.38	76.007	
5,216.41	5,006.29	4,522.62	4,369.29	26.65	21.20	154.57	968.10	-471.12	2,242.41	2,212.92	29.49	76.034	
5,300.00	5,085.41	4,592.09	4,435.15	27.12	21.64	155.03	987.58	-481.51	2,288.90	2,258.69	30.21	75.766	
5,400.00	5,181.05	4,676.76	4,515.43	27.55	22.18	155.50	1,011.34	-494.17	2,342.07	2,311.05	31.02	75.514	
5,500.00	5,277.66	4,763.03	4,597.22	27.95	22.74	155.89	1,035.54	-507.07	2,392.53	2,360.73	31.80	75.244	
5,600.00	5,375.10	4,850.79	4,680.44	28.30	23.30	156.21	1,060.16	-520.19	2,440.22	2,407.67	32.55	74.967	
5,700.00	5,473.27	4,939.95	4,764.97	28.62	23.87	156.45	1,085.17	-533.52	2,485.09	2,451.81	33.27	74.691	
5,800.00	5,572.05	5,030.38	4,850.71	28.89	24.45	156.63	1,110.54	-547.04	2,527.09	2,493.14	33.96	74.422	
5,900.00	5,671.30	5,121.99	4,937.57	29.12	25.03	156.76	1,136.24	-560.74	2,566.20	2,531.60	34.60	74.166	
6,000.00	5,770.92	5,214.66	5,025.43	29.31	25.63	156.82	1,162.23	-574.60	2,602.37	2,567.16	35.20	73.925	
6,100.00	5,870.78	5,314.22	5,312.56	29.45	27.09	156.34	1,237.21	-614.56	2,633.93	2,597.60	36.32	72.511	
6,198.23	5,969.00	6,095.89	5,887.92	29.56	28.62	-2.70	1,306.38	-651.44	2,647.50	2,609.84	37.66	70.302	
6,200.00	5,970.77	6,106.60	5,898.63	29.56	28.64	-2.70	1,306.69	-651.60	2,647.55	2,609.87	37.68	70.271	
6,300.00	6,070.77	6,278.75	6,070.77	29.64	28.81	-2.71	1,307.83	-652.21	2,647.74	2,609.70	38.04	69.600	
6,400.00	6,170.77	6,378.75	6,170.77	29.72	28.91	-2.71	1,307.83	-652.21	2,647.74	2,609.42	38.32	69.090	
6,500.00	6,270.77	6,478.75	6,270.77	29.80	29.01	-2.71	1,307.83	-652.21	2,647.74	2,609.14	38.61	68.583	
6,600.00	6,370.77	6,578.75	6,370.77	29.88	29.11	-2.71	1,307.83	-652.21	2,647.74	2,608.85	38.89	68.077	
6,700.00	6,470.77	6,678.75	6,470.77	29.97	29.21	-2.71	1,307.83	-652.21	2,647.74	2,608.56	39.18	67.574	
6,800.00	6,570.77	6,778.75	6,570.77	30.05	29.32	-2.71	1,307.83	-652.21	2,647.74	2,608.27	39.48	67.073	
6,900.00	6,670.77	6,878.75	6,670.77	30.14	29.42	-2.71	1,307.83	-652.21	2,647.74	2,607.97	39.77	66.574	
7,000.00	6,770.77	6,978.75	6,770.77	30.23	29.53	-2.71	1,307.83	-652.21	2,647.74	2,607.67	40.07	66.078	
7,100.00	6,870.77	7,078.75	6,870.77	30.32	29.64	-2.71	1,307.83	-652.21	2,647.74	2,607.37	40.37	65.585	
7,200.00	6,970.77	7,178.75	6,970.77	30.41	29.75	-2.71	1,307.83	-652.21	2,647.74	2,607.07	40.67	65.095	
7,300.00	7,070.77	7,278.75	7,070.77	30.50	29.86	-2.71	1,307.83	-652.21	2,647.74	2,606.76	40.98	64.608	
7,400.00	7,170.77	7,378.75	7,170.77	30.60	29.97	-2.71	1,307.83	-652.21	2,647.74	2,606.45	41.29	64.124	
7,500.00	7,270.77	7,478.75	7,270.77	30.69	30.08	-2.71	1,307.83	-652.21	2,647.74	2,606.14	41.60	63.643	
7,600.00	7,370.77	7,578.75	7,370.77	30.79	30.20	-2.71	1,307.83	-652.21	2,647.74	2,605.83	41.92	63.166	
7,700.00	7,470.77	7,678.75	7,470.77	30.89	30.31	-2.71	1,307.83	-652.21	2,647.74	2,605.51	42.23	62.692	
7,800.00	7,570.77	7,778.75	7,570.77	30.99	30.43	-2.71	1,307.83	-652.21	2,647.74	2,605.19	42.55	62.222	
7,900.00	7,670.77	7,878.75	7,670.77	31.09	30.55	-2.71	1,307.83	-652.21	2,647.74	2,604.87	42.87	61.756	
8,000.00	7,770.77	7,978.75	7,770.77	31.19	30.67	-2.71	1,307.83	-652.21	2,647.74	2,604.54	43.20	61.293	
8,100.00	7,870.77	8,078.75	7,870.77	31.30	30.79	-2.71	1,307.83	-652.21	2,647.74	2,604.22	43.52	60.834	
8,121.23	7,892.00	8,099.99	7,892.00	31.32	30.81	-2.71	1,307.83	-652.21	2,647.74	2,604.15	43.59	60.737	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	-3.37	47.36	-2.79	47.44				
100.00	100.00	100.00	100.00	0.10	0.10	-3.37	47.36	-2.79	47.44	47.25	0.19	248.311	
200.00	200.00	200.00	200.00	0.32	0.32	-3.37	47.36	-2.79	47.44	46.80	0.64	74.058 CC	
300.00	300.00	299.87	299.85	0.55	0.53	-5.46	47.34	-4.53	47.56	46.48	1.08	44.059 ES	
400.00	400.00	399.51	399.35	0.77	0.76	-11.62	47.31	-9.73	48.30	46.78	1.52	31.688	
500.00	500.00	498.66	498.12	0.99	1.01	-21.22	47.24	-18.34	50.71	48.73	1.99	25.546	
600.00	600.00	597.10	595.83	1.22	1.29	-32.70	47.15	-30.26	56.18	53.73	2.45	22.933	
700.00	700.00	694.60	692.15	1.44	1.62	-43.97	47.04	-45.38	65.83	62.92	2.91	22.653 SF	
800.00	800.00	790.96	786.78	1.67	1.99	-53.56	46.90	-63.52	80.06	76.71	3.35	23.882	
900.00	900.00	885.99	879.45	1.89	2.41	-61.06	46.74	-84.52	98.75	94.95	3.80	25.973	
950.00	950.00	932.94	924.97	2.01	2.64	-64.09	46.65	-96.03	109.66	105.63	4.03	27.188	
1,000.00	1,000.00	979.54	969.95	2.10	2.88	91.73	46.56	-108.19	121.57	117.15	4.42	27.524	
1,100.00	1,099.93	1,071.69	1,058.30	2.28	3.40	88.23	46.36	-134.38	148.01	143.17	4.85	30.529	
1,200.00	1,199.68	1,162.35	1,144.35	2.47	3.96	86.37	46.15	-162.91	177.43	172.12	5.31	33.400	
1,300.00	1,299.13	1,251.37	1,227.93	2.68	4.57	85.49	45.91	-193.55	209.50	203.68	5.82	36.018	
1,400.00	1,398.15	1,339.96	1,310.13	2.91	5.23	85.22	45.66	-226.56	244.02	237.64	6.37	38.292	
1,500.00	1,496.63	1,433.45	1,396.54	3.19	5.95	85.53	45.39	-262.26	279.20	272.19	7.02	39.791	
1,600.00	1,594.44	1,526.81	1,482.83	3.52	6.68	86.28	45.12	-297.91	314.26	306.53	7.74	40.621	
1,700.00	1,691.46	1,619.94	1,568.89	3.90	7.42	87.33	44.85	-333.47	349.35	340.81	8.54	40.907	
1,800.00	1,787.58	1,712.71	1,654.63	4.34	8.15	88.59	44.58	-368.90	384.64	375.20	9.43	40.777	
1,900.00	1,882.68	1,805.01	1,739.94	4.85	8.88	90.00	44.32	-404.14	420.30	409.89	10.42	40.355	
1,931.82	1,912.71	1,834.26	1,766.98	5.03	9.12	90.47	44.23	-415.32	431.76	421.01	10.75	40.177	
2,000.00	1,976.93	1,896.88	1,824.85	5.42	9.62	91.93	44.05	-439.23	456.51	445.00	11.51	39.654	
2,100.00	2,071.11	1,988.72	1,909.73	6.01	10.35	93.82	43.79	-474.30	493.24	480.58	12.66	38.957	
2,200.00	2,165.30	2,080.56	1,994.61	6.61	11.08	95.44	43.52	-509.37	530.37	516.54	13.83	38.346	
2,300.00	2,259.48	2,172.41	2,079.49	7.23	11.82	96.86	43.25	-544.44	567.84	552.82	15.02	37.815	
2,400.00	2,353.66	2,264.25	2,164.38	7.86	12.56	98.11	42.99	-579.51	605.56	589.35	16.21	37.354	
2,500.00	2,447.85	2,356.09	2,249.26	8.50	13.30	99.21	42.72	-614.58	643.51	626.10	17.41	36.955	
2,600.00	2,542.03	2,447.93	2,334.14	9.15	14.03	100.19	42.46	-649.65	681.65	663.03	18.62	36.607	
2,700.00	2,636.22	2,539.77	2,419.02	9.80	14.77	101.06	42.19	-684.72	719.93	700.10	19.83	36.303	
2,800.00	2,730.40	2,631.62	2,503.90	10.45	15.51	101.85	41.93	-719.79	758.35	737.31	21.04	36.037	
2,900.00	2,824.59	2,723.46	2,588.78	11.11	16.25	102.57	41.66	-754.86	796.88	774.62	22.26	35.802	
3,000.00	2,918.77	2,815.30	2,673.67	11.77	16.99	103.21	41.40	-789.93	835.51	812.03	23.47	35.594	
3,100.00	3,012.96	2,907.14	2,758.55	12.43	17.73	103.81	41.13	-825.01	874.22	849.53	24.69	35.410	
3,200.00	3,107.14	2,998.98	2,843.43	13.09	18.47	104.35	40.86	-860.08	913.00	887.09	25.90	35.245	
3,300.00	3,201.32	3,090.82	2,928.31	13.76	19.22	104.84	40.60	-895.15	951.84	924.72	27.12	35.098	
3,400.00	3,295.51	3,182.67	3,013.19	14.42	19.96	105.30	40.33	-930.22	990.75	962.41	28.33	34.966	
3,500.00	3,389.69	3,274.51	3,098.07	15.09	20.70	105.73	40.07	-965.29	1,029.70	1,000.15	29.55	34.846	
3,600.00	3,483.88	3,366.35	3,182.96	15.76	21.44	106.12	39.80	-1,000.36	1,068.70	1,037.93	30.76	34.739	
3,700.00	3,578.06	3,458.19	3,267.84	16.43	22.18	106.49	39.54	-1,035.43	1,107.74	1,075.76	31.98	34.641	
3,800.00	3,672.25	3,550.03	3,352.72	17.10	22.92	106.83	39.27	-1,070.50	1,146.81	1,113.62	33.19	34.552	
3,900.00	3,766.43	3,641.88	3,437.60	17.77	23.67	107.15	39.00	-1,105.57	1,185.92	1,151.51	34.40	34.471	
4,000.00	3,860.62	3,733.72	3,522.48	18.44	24.41	107.45	38.74	-1,140.64	1,225.05	1,189.44	35.61	34.398	
4,100.00	3,954.80	3,825.56	3,607.36	19.12	25.15	107.73	38.47	-1,175.71	1,264.21	1,227.39	36.82	34.330	
4,200.00	4,048.98	3,917.40	3,692.25	19.79	25.89	107.99	38.21	-1,210.78	1,303.40	1,265.36	38.03	34.269	
4,300.00	4,143.17	4,009.24	3,777.13	20.46	26.64	108.24	37.94	-1,245.85	1,342.61	1,303.36	39.24	34.212	
4,400.00	4,237.35	4,101.08	3,862.01	21.14	27.38	108.47	37.68	-1,280.92	1,381.84	1,341.38	40.45	34.160	
4,500.00	4,331.54	4,192.93	3,946.89	21.81	28.12	108.69	37.41	-1,315.99	1,421.08	1,379.42	41.66	34.112	
4,600.00	4,425.72	4,284.77	4,031.77	22.49	28.86	108.90	37.14	-1,351.07	1,460.35	1,417.48	42.87	34.068	
4,700.00	4,519.91	4,376.61	4,116.65	23.16	29.61	109.10	36.88	-1,386.14	1,499.62	1,455.55	44.07	34.028	
4,800.00	4,614.09	4,468.45	4,201.54	23.84	30.35	109.29	36.61	-1,421.21	1,538.92	1,493.64	45.28	33.990	
4,900.00	4,708.27	4,560.29	4,286.42	24.51	31.09	109.47	36.35	-1,456.28	1,578.22	1,531.75	46.48	33.956	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1 11-04													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Distance										Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,000.00	4,802.46	4,652.14	4,371.30	25.19	31.83	109.64	36.08	-1,491.35	1,617.54	1,569.86	47.68	33.924		
5,100.00	4,896.64	4,743.98	4,456.18	25.86	32.58	109.80	35.82	-1,526.42	1,656.87	1,607.99	48.88	33.894		
5,200.00	4,990.83	4,835.82	4,541.06	26.54	33.32	109.95	35.55	-1,561.49	1,696.22	1,646.13	50.08	33.867		
5,216.41	5,006.29	4,850.89	4,554.99	26.65	33.44	109.98	35.51	-1,567.25	1,702.67	1,652.39	50.28	33.863		
5,300.00	5,085.41	4,927.86	4,626.13	27.12	34.07	110.72	35.28	-1,596.64	1,735.18	1,683.74	51.44	33.730		
5,400.00	5,181.05	5,020.42	4,711.68	27.55	34.81	111.47	35.02	-1,631.98	1,773.02	1,720.32	52.69	33.648		
5,500.00	5,277.66	5,113.39	4,797.60	27.95	35.57	112.08	34.75	-1,667.48	1,809.67	1,755.79	53.89	33.583		
5,600.00	5,375.10	5,217.92	4,894.24	28.30	36.37	112.53	34.45	-1,707.30	1,845.08	1,790.03	55.05	33.517		
5,700.00	5,473.27	5,391.11	5,056.75	28.62	37.37	112.72	33.99	-1,767.13	1,876.75	1,820.49	56.26	33.357		
5,800.00	5,572.05	5,570.30	5,228.36	28.89	38.23	112.87	33.60	-1,818.59	1,903.05	1,845.74	57.31	33.206		
5,900.00	5,671.30	5,754.60	5,407.86	29.12	38.94	112.97	33.29	-1,860.22	1,923.72	1,865.53	58.18	33.063		
6,000.00	5,770.92	5,942.91	5,593.65	29.31	39.47	113.05	33.06	-1,890.75	1,938.55	1,879.68	58.87	32.929		
6,100.00	5,870.78	6,133.98	5,783.79	29.45	39.84	113.09	32.92	-1,909.18	1,947.40	1,888.03	59.37	32.800		
6,198.23	5,969.00	6,319.31	5,969.00	29.56	40.02	-45.38	32.87	-1,914.92	1,950.16	1,890.47	59.70	32.667		
6,200.00	5,970.77	6,321.08	5,970.77	29.56	40.03	-45.38	32.87	-1,914.92	1,950.16	1,890.46	59.70	32.665		
6,300.00	6,070.77	6,421.08	6,070.77	29.64	40.09	-45.38	32.87	-1,914.92	1,950.16	1,890.30	59.87	32.574		
6,400.00	6,170.77	6,521.08	6,170.77	29.72	40.16	-45.38	32.87	-1,914.92	1,950.16	1,890.12	60.04	32.480		
6,500.00	6,270.77	6,621.08	6,270.77	29.80	40.24	-45.38	32.87	-1,914.92	1,950.16	1,889.95	60.22	32.386		
6,600.00	6,370.77	6,721.08	6,370.77	29.88	40.31	-45.38	32.87	-1,914.92	1,950.16	1,889.77	60.39	32.290		
6,700.00	6,470.77	6,821.08	6,470.77	29.97	40.39	-45.38	32.87	-1,914.92	1,950.16	1,889.59	60.58	32.194		
6,800.00	6,570.77	6,921.08	6,570.77	30.05	40.46	-45.38	32.87	-1,914.92	1,950.16	1,889.41	60.76	32.097		
6,900.00	6,670.77	7,021.08	6,670.77	30.14	40.54	-45.38	32.87	-1,914.92	1,950.16	1,889.22	60.95	31.999		
7,000.00	6,770.77	7,121.08	6,770.77	30.23	40.62	-45.38	32.87	-1,914.92	1,950.16	1,889.03	61.13	31.900		
7,100.00	6,870.77	7,221.08	6,870.77	30.32	40.70	-45.38	32.87	-1,914.92	1,950.16	1,888.84	61.33	31.800		
7,200.00	6,970.77	7,321.08	6,970.77	30.41	40.78	-45.38	32.87	-1,914.92	1,950.16	1,888.64	61.52	31.699		
7,300.00	7,070.77	7,421.08	7,070.77	30.50	40.86	-45.38	32.87	-1,914.92	1,950.16	1,888.45	61.72	31.598		
7,400.00	7,170.77	7,521.08	7,170.77	30.60	40.94	-45.38	32.87	-1,914.92	1,950.16	1,888.25	61.92	31.496		
7,500.00	7,270.77	7,621.08	7,270.77	30.69	41.03	-45.38	32.87	-1,914.92	1,950.16	1,888.04	62.12	31.393		
7,600.00	7,370.77	7,721.08	7,370.77	30.79	41.11	-45.38	32.87	-1,914.92	1,950.16	1,887.84	62.33	31.290		
7,700.00	7,470.77	7,821.08	7,470.77	30.89	41.20	-45.38	32.87	-1,914.92	1,950.16	1,887.63	62.53	31.186		
7,800.00	7,570.77	7,921.08	7,570.77	30.99	41.29	-45.38	32.87	-1,914.92	1,950.16	1,887.42	62.74	31.081		
7,900.00	7,670.77	8,021.08	7,670.77	31.09	41.37	-45.38	32.87	-1,914.92	1,950.16	1,887.21	62.96	30.976		
8,000.00	7,770.77	8,121.08	7,770.77	31.19	41.46	-45.38	32.87	-1,914.92	1,950.16	1,886.99	63.17	30.870		
8,100.00	7,870.77	8,221.08	7,870.77	31.30	41.55	-45.38	32.87	-1,914.92	1,950.16	1,886.77	63.39	30.764		
8,107.51	7,878.28	8,228.59	7,878.28	31.30	41.56	-45.38	32.87	-1,914.92	1,950.16	1,886.76	63.41	30.756		
8,121.23	7,892.00	8,238.31	7,888.00	31.32	41.57	-45.38	32.87	-1,914.92	1,950.17	1,886.74	63.43	30.744		

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 4-1 - P_BERNHARDT 4- - PLAN #1 11-04-09												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-2.58	61.93	-2.79	61.99				
100.00	100.00	100.00	100.00	0.10	0.10	-2.58	61.93	-2.79	61.99	61.80	0.19	324.481	
200.00	200.00	200.00	200.00	0.32	0.32	-2.58	61.93	-2.79	61.99	61.35	0.64	96.775	
300.00	300.00	300.00	300.00	0.55	0.55	-2.58	61.93	-2.79	61.99	60.90	1.09	56.868	
400.00	400.00	400.00	400.00	0.77	0.77	-2.58	61.93	-2.79	61.99	60.45	1.54	40.264	
500.00	500.00	500.00	500.00	0.99	0.99	-2.58	61.93	-2.79	61.99	60.00	1.99	31.165	
600.00	600.00	600.00	600.00	1.22	1.22	-2.58	61.93	-2.79	61.99	59.55	2.44	25.420	
700.00	700.00	700.00	700.00	1.44	1.44	-2.58	61.93	-2.79	61.99	59.10	2.89	21.464	
800.00	800.00	800.00	800.00	1.67	1.67	-2.58	61.93	-2.79	61.99	58.65	3.34	18.573	
900.00	900.00	900.00	900.00	1.89	1.89	-2.58	61.93	-2.79	61.99	58.21	3.79	16.369	
950.00	950.00	950.00	950.00	2.01	2.01	-2.58	61.93	-2.79	61.99	57.98	4.01	15.452 CC, ES	
1,000.00	1,000.00	999.47	999.47	2.10	2.11	155.73	62.12	-3.17	62.60	58.38	4.22	14.843	
1,100.00	1,099.93	1,098.22	1,098.15	2.28	2.32	154.37	63.65	-6.21	67.49	62.89	4.60	14.675 SF	
1,200.00	1,199.68	1,196.38	1,196.08	2.47	2.54	152.16	66.67	-12.25	77.34	72.35	4.99	15.493	
1,300.00	1,299.13	1,293.60	1,292.78	2.68	2.77	149.71	71.15	-21.19	92.21	86.81	5.40	17.075	
1,400.00	1,398.15	1,389.51	1,387.79	2.91	3.02	147.43	77.00	-32.87	112.09	106.26	5.83	19.226	
1,500.00	1,496.63	1,483.78	1,480.70	3.19	3.30	145.46	84.13	-47.12	136.91	130.62	6.29	21.771	
1,600.00	1,594.44	1,576.11	1,571.14	3.52	3.61	143.81	92.45	-63.72	166.55	159.77	6.78	24.558	
1,700.00	1,691.46	1,666.23	1,658.79	3.90	3.95	142.42	101.81	-82.42	200.87	193.56	7.32	27.457	
1,800.00	1,787.58	1,753.88	1,743.37	4.34	4.33	141.22	112.11	-102.97	239.70	231.80	7.89	30.365	
1,900.00	1,882.68	1,838.88	1,824.69	4.85	4.74	140.17	123.19	-125.10	282.86	274.34	8.52	33.206	
1,931.82	1,912.71	1,865.34	1,849.85	5.03	4.87	139.85	126.86	-132.43	297.47	288.74	8.73	34.087	
2,000.00	1,976.93	1,921.32	1,902.81	5.42	5.18	139.59	134.96	-148.61	329.62	320.40	9.22	35.748	
2,100.00	2,071.11	2,005.53	1,981.93	6.01	5.68	139.06	147.88	-174.42	378.01	368.01	10.00	37.814	
2,200.00	2,165.30	2,092.87	2,063.88	6.61	6.22	138.59	161.41	-201.42	426.62	415.80	10.82	39.438	
2,300.00	2,259.48	2,180.22	2,145.84	7.23	6.78	138.22	174.93	-228.43	475.25	463.59	11.66	40.762	
2,400.00	2,353.66	2,267.56	2,227.79	7.86	7.35	137.92	188.46	-255.43	523.89	511.38	12.52	41.856	
2,500.00	2,447.85	2,354.90	2,309.74	8.50	7.93	137.67	201.98	-282.44	572.55	559.16	13.39	42.770	
2,600.00	2,542.03	2,442.24	2,391.70	9.15	8.51	137.46	215.51	-309.44	621.21	606.94	14.27	43.542	
2,700.00	2,636.22	2,529.58	2,473.65	9.80	9.10	137.28	229.03	-336.45	669.87	654.71	15.16	44.200	
2,800.00	2,730.40	2,616.93	2,555.61	10.45	9.70	137.13	242.56	-363.45	718.54	702.49	16.05	44.767	
2,900.00	2,824.59	2,704.27	2,637.56	11.11	10.30	136.99	256.08	-390.46	767.21	750.26	16.95	45.252	
3,000.00	2,918.77	2,791.61	2,719.51	11.77	10.91	136.87	269.61	-417.47	815.89	798.02	17.87	45.669	
3,100.00	3,012.96	2,878.95	2,801.47	12.43	11.51	136.76	283.13	-444.47	864.56	845.78	18.78	46.034	
3,200.00	3,107.14	2,966.29	2,883.42	13.09	12.12	136.67	296.66	-471.48	913.24	893.54	19.70	46.356	
3,300.00	3,201.32	3,053.64	2,965.37	13.76	12.73	136.58	310.18	-498.48	961.93	941.30	20.62	46.641	
3,400.00	3,295.51	3,140.98	3,047.33	14.42	13.35	136.51	323.71	-525.49	1,010.61	989.06	21.55	46.895	
3,500.00	3,389.69	3,228.32	3,129.28	15.09	13.96	136.44	337.23	-552.49	1,059.29	1,036.81	22.48	47.122	
3,600.00	3,483.88	3,315.66	3,211.23	15.76	14.58	136.37	350.76	-579.50	1,107.98	1,084.57	23.41	47.327	
3,700.00	3,578.06	3,403.00	3,293.19	16.43	15.20	136.31	364.28	-606.50	1,156.66	1,132.32	24.34	47.512	
3,800.00	3,672.25	3,490.35	3,375.14	17.10	15.82	136.26	377.81	-633.51	1,205.35	1,180.07	25.28	47.679	
3,900.00	3,766.43	3,577.69	3,457.10	17.77	16.44	136.21	391.33	-660.52	1,254.04	1,227.82	26.22	47.831	
4,000.00	3,860.62	3,665.03	3,539.05	18.44	17.06	136.17	404.86	-687.52	1,302.73	1,275.57	27.16	47.970	
4,100.00	3,954.80	3,752.37	3,621.00	19.12	17.68	136.12	418.38	-714.53	1,351.42	1,323.32	28.10	48.098	
4,200.00	4,048.98	3,839.71	3,702.96	19.79	18.30	136.08	431.91	-741.53	1,400.11	1,371.07	29.04	48.215	
4,300.00	4,143.17	3,927.06	3,784.91	20.46	18.92	136.05	445.43	-768.54	1,448.80	1,418.82	29.98	48.323	
4,400.00	4,237.35	4,014.40	3,866.86	21.14	19.54	136.01	458.96	-795.54	1,497.49	1,466.56	30.92	48.423	
4,500.00	4,331.54	4,101.74	3,948.82	21.81	20.17	135.98	472.48	-822.55	1,546.18	1,514.31	31.87	48.516	
4,600.00	4,425.72	4,189.08	4,030.77	22.49	20.79	135.95	486.01	-849.55	1,594.87	1,562.06	32.81	48.602	
4,700.00	4,519.91	4,276.42	4,112.73	23.16	21.42	135.92	499.53	-876.56	1,643.56	1,609.80	33.76	48.682	
4,800.00	4,614.09	4,363.77	4,194.68	23.84	22.04	135.89	513.05	-903.57	1,692.25	1,657.55	34.71	48.757	
4,900.00	4,708.27	4,451.11	4,276.63	24.51	22.67	135.87	526.58	-930.57	1,740.95	1,705.29	35.66	48.827	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 4-1 - P_BERNHARDT 4- - PLAN #1 11-04-09												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
5,000.00	4,802.46	4,538.45	4,358.59	25.19	23.29	135.84	540.10	-957.58	1,789.64	1,753.04	36.60	48.892	
5,100.00	4,896.64	4,625.79	4,440.54	25.86	23.92	135.82	553.63	-984.58	1,838.33	1,800.78	37.55	48.954	
5,200.00	4,990.83	4,713.13	4,522.49	26.54	24.54	135.80	567.15	-1,011.59	1,887.02	1,848.52	38.50	49.011	
5,216.41	5,006.29	4,727.47	4,535.94	26.65	24.65	135.80	569.37	-1,016.02	1,895.02	1,856.36	38.66	49.021	
5,300.00	5,085.41	4,800.89	4,604.83	27.12	25.17	136.38	580.74	-1,038.72	1,934.95	1,895.38	39.57	48.897	
5,400.00	5,181.05	4,889.73	4,688.20	27.55	25.81	136.96	594.50	-1,066.19	1,980.67	1,940.09	40.58	48.809	
5,500.00	5,277.66	4,979.58	4,772.50	27.95	26.45	137.42	608.41	-1,093.97	2,024.13	1,982.57	41.56	48.704	
5,600.00	5,375.10	5,070.33	4,857.65	28.30	27.10	137.78	622.47	-1,122.03	2,065.28	2,022.78	42.50	48.590	
5,700.00	5,473.27	5,161.86	4,943.53	28.62	27.76	138.02	636.64	-1,150.33	2,104.11	2,060.70	43.41	48.472	
5,800.00	5,572.05	5,253.56	5,037.42	28.89	28.64	138.03	656.65	-1,180.29	2,140.30	2,095.88	44.43	48.177	
5,900.00	5,671.30	5,350.23	5,130.14	29.12	29.65	137.76	683.83	-1,244.56	2,170.17	2,124.67	45.50	47.697	
6,000.00	5,770.92	5,446.65	5,226.40	29.31	30.46	137.54	705.02	-1,286.86	2,192.25	2,145.86	46.39	47.257	
6,100.00	5,870.78	5,545.27	5,325.82	29.45	31.05	137.38	718.97	-1,314.73	2,206.13	2,159.06	47.08	46.862	
6,198.23	5,969.00	5,643.82	5,424.95	29.56	31.40	-21.20	724.80	-1,326.37	2,211.52	2,163.97	47.54	46.515	
6,200.00	5,970.77	5,645.07	5,426.07	29.56	31.40	-21.20	724.83	-1,326.43	2,211.54	2,163.99	47.55	46.508	
6,300.00	6,070.77	5,743.65	5,524.77	29.64	31.51	-21.20	724.99	-1,326.75	2,211.65	2,163.86	47.79	46.280	
6,400.00	6,170.77	5,843.65	5,624.77	29.72	31.61	-21.20	724.99	-1,326.75	2,211.65	2,163.64	48.01	46.066	
6,500.00	6,270.77	5,943.65	5,724.77	29.80	31.70	-21.20	724.99	-1,326.75	2,211.65	2,163.42	48.24	45.851	
6,600.00	6,370.77	6,043.65	5,824.77	29.88	31.80	-21.20	724.99	-1,326.75	2,211.65	2,163.19	48.46	45.634	
6,700.00	6,470.77	6,143.65	5,924.77	29.97	31.89	-21.20	724.99	-1,326.75	2,211.65	2,162.96	48.70	45.417	
6,800.00	6,570.77	6,243.65	6,024.77	30.05	31.99	-21.20	724.99	-1,326.75	2,211.65	2,162.72	48.93	45.199	
6,900.00	6,670.77	6,343.65	6,124.77	30.14	32.09	-21.20	724.99	-1,326.75	2,211.65	2,162.48	49.17	44.980	
7,000.00	6,770.77	6,443.65	6,224.77	30.23	32.19	-21.20	724.99	-1,326.75	2,211.65	2,162.24	49.41	44.761	
7,100.00	6,870.77	6,543.65	6,324.77	30.32	32.29	-21.20	724.99	-1,326.75	2,211.65	2,162.00	49.65	44.541	
7,200.00	6,970.77	6,643.65	6,424.77	30.41	32.40	-21.20	724.99	-1,326.75	2,211.65	2,161.75	49.90	44.321	
7,300.00	7,070.77	6,743.65	6,524.77	30.50	32.50	-21.20	724.99	-1,326.75	2,211.65	2,161.50	50.15	44.101	
7,400.00	7,170.77	6,843.65	6,624.77	30.60	32.61	-21.20	724.99	-1,326.75	2,211.65	2,161.25	50.40	43.880	
7,500.00	7,270.77	6,943.65	6,724.77	30.69	32.71	-21.20	724.99	-1,326.75	2,211.65	2,161.00	50.66	43.660	
7,600.00	7,370.77	7,043.65	6,824.77	30.79	32.82	-21.20	724.99	-1,326.75	2,211.65	2,160.74	50.91	43.439	
7,700.00	7,470.77	7,143.65	6,924.77	30.89	32.93	-21.20	724.99	-1,326.75	2,211.65	2,160.48	51.17	43.218	
7,800.00	7,570.77	7,243.65	7,024.77	30.99	33.04	-21.20	724.99	-1,326.75	2,211.65	2,160.22	51.44	42.997	
7,900.00	7,670.77	7,343.65	7,124.77	31.09	33.15	-21.20	724.99	-1,326.75	2,211.65	2,159.95	51.70	42.776	
8,000.00	7,770.77	7,443.65	7,224.77	31.19	33.27	-21.20	724.99	-1,326.75	2,211.65	2,159.68	51.97	42.556	
8,100.00	7,870.77	7,543.65	7,324.77	31.30	33.38	-21.20	724.99	-1,326.75	2,211.65	2,159.41	52.24	42.335	
8,121.23	7,892.00	7,565.88	7,346.00	31.32	33.41	-21.20	724.99	-1,326.75	2,211.65	2,159.35	52.30	42.289	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT STATE 37-36 - P_BERNHARDT STATE 37-36													Offset Site Error: 0.00 ft
Survey Program: 0-MWD													Offset Well Error: 0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-1.99	80.14	-2.79	80.19				
100.00	100.00	100.00	100.00	0.10	0.10	-1.99	80.14	-2.79	80.19	80.00	0.19	419.746	
200.00	200.00	200.00	200.00	0.32	0.32	-1.99	80.14	-2.79	80.19	79.55	0.64	125.187 CC, ES	
300.00	300.00	298.05	298.03	0.55	0.54	-1.14	81.35	-1.62	81.39	80.31	1.08	75.130	
400.00	400.00	395.88	395.73	0.77	0.76	1.26	84.96	1.86	85.09	83.56	1.53	55.541	
500.00	500.00	493.25	492.74	0.99	1.01	4.79	90.93	7.63	91.54	89.55	2.00	45.857	
600.00	600.00	589.94	588.74	1.22	1.28	8.94	99.21	15.62	101.06	98.58	2.48	40.759	
700.00	700.00	685.75	683.43	1.44	1.59	13.21	109.70	25.74	113.90	110.92	2.98	38.206	
800.00	800.00	780.47	776.51	1.67	1.94	17.22	122.31	37.92	130.19	126.69	3.50	37.215 SF	
900.00	900.00	873.93	867.73	1.89	2.33	20.80	136.92	52.01	149.98	145.95	4.03	37.232	
950.00	950.00	920.13	912.57	2.01	2.54	22.40	144.92	59.74	161.16	156.87	4.30	37.514	
1,000.00	1,000.00	965.84	956.75	2.10	2.77	-177.63	153.36	67.88	173.62	169.29	4.33	40.110	
1,100.00	1,099.93	1,055.31	1,042.66	2.28	3.24	-175.08	171.33	85.23	203.50	198.76	4.73	43.007	
1,200.00	1,199.68	1,141.78	1,124.91	2.47	3.74	-173.05	190.52	103.76	239.73	234.60	5.13	46.723	
1,300.00	1,299.13	1,224.84	1,203.12	2.68	4.27	-171.46	210.64	123.17	281.98	276.45	5.52	51.067	
1,400.00	1,398.15	1,304.18	1,277.05	2.91	4.81	-170.21	231.36	143.18	329.89	323.99	5.90	55.904	
1,500.00	1,496.63	1,384.17	1,350.84	3.19	5.40	-169.17	253.56	164.60	382.87	376.59	6.28	60.930	
1,600.00	1,594.44	1,466.81	1,426.98	3.52	6.01	-168.35	276.68	186.92	439.08	432.40	6.67	65.798	
1,700.00	1,691.46	1,547.50	1,501.32	3.90	6.62	-167.72	299.26	208.71	498.09	491.03	7.05	70.608	
1,800.00	1,787.58	1,626.15	1,573.78	4.34	7.22	-167.21	321.26	229.95	559.83	552.40	7.43	75.359	
1,900.00	1,882.68	1,702.67	1,644.27	4.85	7.80	-166.79	342.67	250.62	624.21	616.41	7.80	80.053	
1,931.82	1,912.71	1,726.55	1,666.28	5.03	7.98	-166.67	349.35	257.07	645.23	637.32	7.91	81.528	
2,000.00	1,976.93	1,777.48	1,713.19	5.42	8.37	-166.70	363.60	270.82	690.56	682.31	8.25	83.701	
2,100.00	2,071.11	1,852.17	1,782.01	6.01	8.94	-166.73	384.50	291.00	757.05	748.30	8.75	86.496	
2,200.00	2,165.30	1,926.87	1,850.83	6.61	9.51	-166.76	405.40	311.17	823.54	814.27	9.26	88.905	
2,300.00	2,259.48	2,001.56	1,919.64	7.23	10.09	-166.79	426.30	331.34	890.02	880.24	9.78	90.996	
2,400.00	2,353.66	2,076.26	1,988.46	7.86	10.66	-166.81	447.20	351.52	956.51	946.20	10.31	92.817	
2,500.00	2,447.85	2,150.96	2,057.28	8.50	11.24	-166.82	468.10	371.69	1,023.00	1,012.16	10.83	94.419	
2,600.00	2,542.03	2,225.65	2,126.09	9.15	11.82	-166.84	489.00	391.86	1,089.48	1,078.11	11.37	95.837	
2,700.00	2,636.22	2,300.35	2,194.91	9.80	12.39	-166.85	509.90	412.04	1,155.97	1,144.06	11.91	97.098	
2,800.00	2,730.40	2,375.04	2,263.73	10.45	12.97	-166.86	530.80	432.21	1,222.46	1,210.01	12.45	98.223	
2,900.00	2,824.59	2,449.74	2,332.54	11.11	13.55	-166.88	551.70	452.38	1,288.94	1,275.95	12.99	99.234	
3,000.00	2,918.77	2,524.43	2,401.36	11.77	14.13	-166.89	572.60	472.56	1,355.43	1,341.90	13.53	100.147	
3,100.00	3,012.96	2,599.13	2,470.18	12.43	14.70	-166.89	593.50	492.73	1,421.92	1,407.83	14.08	100.975	
3,200.00	3,107.14	2,673.83	2,538.99	13.09	15.28	-166.90	614.40	512.90	1,488.40	1,473.77	14.63	101.727	
3,300.00	3,201.32	2,748.52	2,607.81	13.76	15.86	-166.91	635.30	533.08	1,554.89	1,539.71	15.18	102.414	
3,400.00	3,295.51	2,823.22	2,676.62	14.42	16.44	-166.92	656.20	553.25	1,621.38	1,605.64	15.73	103.044	
3,500.00	3,389.69	2,897.91	2,745.44	15.09	17.02	-166.92	677.10	573.42	1,687.86	1,671.58	16.29	103.623	
3,600.00	3,483.88	2,972.61	2,814.26	15.76	17.60	-166.93	697.99	593.60	1,754.35	1,737.51	16.84	104.156	
3,700.00	3,578.06	3,047.31	2,883.07	16.43	18.18	-166.93	718.89	613.77	1,820.84	1,803.44	17.40	104.650	
3,800.00	3,672.25	3,122.00	2,951.89	17.10	18.76	-166.94	739.79	633.94	1,887.33	1,869.37	17.96	105.108	
3,900.00	3,766.43	3,196.70	3,020.71	17.77	19.34	-166.94	760.69	654.12	1,953.81	1,935.30	18.51	105.533	
4,000.00	3,860.62	3,271.39	3,089.52	18.44	19.92	-166.95	781.59	674.29	2,020.30	2,001.23	19.07	105.929	
4,100.00	3,954.80	3,346.09	3,158.34	19.12	20.50	-166.95	802.49	694.46	2,086.79	2,067.16	19.63	106.299	
4,200.00	4,048.98	3,420.78	3,227.16	19.79	21.08	-166.96	823.39	714.64	2,153.27	2,133.08	20.19	106.645	
4,300.00	4,143.17	3,495.48	3,295.97	20.46	21.66	-166.96	844.29	734.81	2,219.76	2,199.01	20.75	106.970	
4,400.00	4,237.35	3,570.18	3,364.79	21.14	22.24	-166.96	865.19	754.98	2,286.25	2,264.94	21.31	107.275	
4,500.00	4,331.54	3,644.87	3,433.61	21.81	22.82	-166.97	886.09	775.16	2,352.73	2,330.86	21.87	107.561	
4,600.00	4,425.72	3,719.57	3,502.42	22.49	23.40	-166.97	906.99	795.33	2,419.22	2,396.79	22.44	107.832	
4,700.00	4,519.91	3,794.26	3,571.24	23.16	23.98	-166.97	927.89	815.50	2,485.71	2,462.71	23.00	108.087	
4,800.00	4,614.09	3,868.96	3,640.06	23.84	24.56	-166.98	948.79	835.68	2,552.20	2,528.64	23.56	108.328	
4,900.00	4,708.27	3,943.66	3,708.87	24.51	25.14	-166.98	969.69	855.85	2,618.68	2,594.56	24.12	108.556	

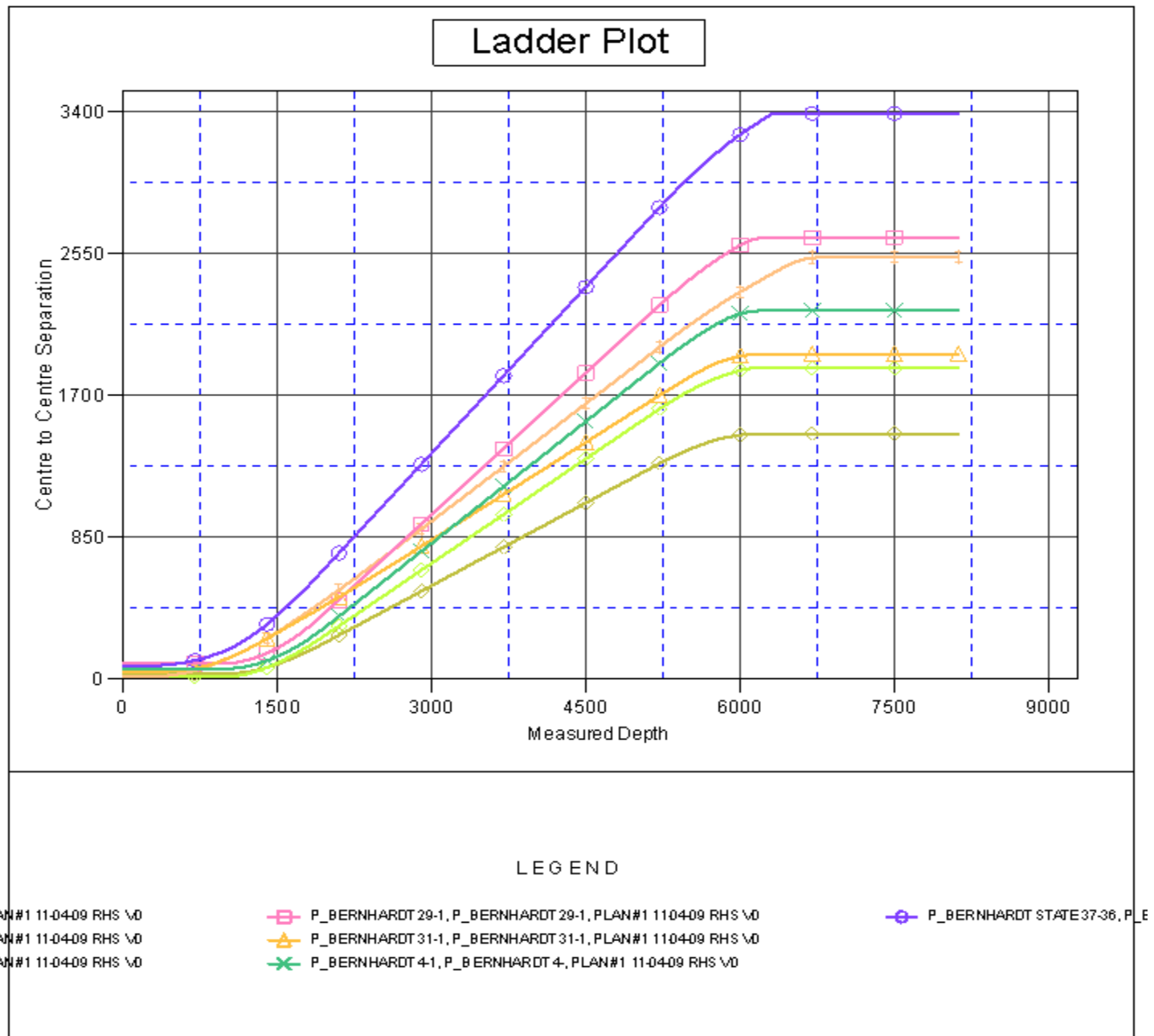
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,802.46	4,018.35	3,777.69	25.19	25.72	-166.98	990.59	876.02	2,685.17	2,660.48	24.69	108.773	
5,100.00	4,896.64	4,093.05	3,846.50	25.86	26.30	-166.98	1,011.49	896.20	2,751.66	2,726.41	25.25	108.978	
5,200.00	4,990.83	4,167.74	3,915.32	26.54	26.89	-166.99	1,032.39	916.37	2,818.14	2,792.33	25.81	109.173	
5,216.41	5,006.29	4,180.00	3,926.62	26.65	26.98	-166.99	1,035.82	919.68	2,829.06	2,803.15	25.91	109.204	
5,300.00	5,085.41	4,243.22	3,984.86	27.12	27.47	-167.30	1,053.51	936.76	2,883.74	2,857.12	26.62	108.346	
5,400.00	5,181.05	4,320.85	4,056.38	27.55	28.08	-167.63	1,075.23	957.72	2,946.76	2,919.33	27.42	107.456	
5,500.00	5,277.66	4,400.57	4,129.83	27.95	28.70	-167.91	1,097.53	979.25	3,007.09	2,978.89	28.20	106.616	
5,600.00	5,375.10	4,482.29	4,205.11	28.30	29.33	-168.15	1,120.40	1,001.32	3,064.67	3,035.72	28.96	105.831	
5,700.00	5,473.27	4,565.90	4,282.14	28.62	29.98	-168.34	1,143.79	1,023.90	3,119.43	3,089.75	29.68	105.101	
5,800.00	5,572.05	4,651.30	4,360.81	28.89	30.65	-168.50	1,167.68	1,046.97	3,171.30	3,140.94	30.37	104.427	
5,900.00	5,671.30	4,738.38	4,441.05	29.12	31.33	-168.63	1,192.05	1,070.49	3,220.23	3,189.21	31.02	103.810	
6,000.00	5,770.92	4,827.05	4,522.74	29.31	32.02	-168.73	1,216.86	1,094.43	3,266.14	3,234.51	31.63	103.248	
6,100.00	5,870.78	4,917.19	4,605.78	29.45	32.72	-168.80	1,242.08	1,118.78	3,309.01	3,276.80	32.21	102.740	
6,198.23	5,969.00	5,007.07	4,688.59	29.56	33.42	32.67	1,267.23	1,143.05	3,348.09	3,315.35	32.74	102.265	
6,200.00	5,970.77	5,008.70	4,690.09	29.56	33.43	32.67	1,267.68	1,143.49	3,348.76	3,316.01	32.75	102.260	
6,300.00	6,070.77	5,100.83	4,774.97	29.64	34.15	32.80	1,293.46	1,168.37	3,387.01	3,353.80	33.21	101.985	
6,400.00	6,170.77	6,535.44	6,170.77	29.72	39.09	33.68	1,486.37	1,354.58	3,392.76	3,356.31	36.45	93.085	
6,500.00	6,270.77	6,635.44	6,270.77	29.80	39.16	33.68	1,486.37	1,354.58	3,392.76	3,356.02	36.74	92.357	
6,600.00	6,370.77	6,735.44	6,370.77	29.88	39.24	33.68	1,486.37	1,354.58	3,392.76	3,355.73	37.03	91.632	
6,700.00	6,470.77	6,835.44	6,470.77	29.97	39.31	33.68	1,486.37	1,354.58	3,392.76	3,355.44	37.32	90.911	
6,800.00	6,570.77	6,935.44	6,570.77	30.05	39.39	33.68	1,486.37	1,354.58	3,392.76	3,355.14	37.62	90.194	
6,900.00	6,670.77	7,035.44	6,670.77	30.14	39.46	33.68	1,486.37	1,354.58	3,392.76	3,354.84	37.92	89.481	
7,000.00	6,770.77	7,135.44	6,770.77	30.23	39.54	33.68	1,486.37	1,354.58	3,392.76	3,354.54	38.22	88.772	
7,100.00	6,870.77	7,235.44	6,870.77	30.32	39.62	33.68	1,486.37	1,354.58	3,392.76	3,354.23	38.52	88.068	
7,200.00	6,970.77	7,335.44	6,970.77	30.41	39.70	33.68	1,486.37	1,354.58	3,392.76	3,353.92	38.83	87.368	
7,300.00	7,070.77	7,435.44	7,070.77	30.50	39.79	33.68	1,486.37	1,354.58	3,392.76	3,353.61	39.14	86.674	
7,400.00	7,170.77	7,535.44	7,170.77	30.60	39.87	33.68	1,486.37	1,354.58	3,392.76	3,353.30	39.46	85.984	
7,500.00	7,270.77	7,635.44	7,270.77	30.69	39.95	33.68	1,486.37	1,354.58	3,392.76	3,352.98	39.77	85.300	
7,600.00	7,370.77	7,735.44	7,370.77	30.79	40.04	33.68	1,486.37	1,354.58	3,392.76	3,352.66	40.09	84.621	
7,700.00	7,470.77	7,835.44	7,470.77	30.89	40.12	33.68	1,486.37	1,354.58	3,392.76	3,352.34	40.41	83.948	
7,800.00	7,570.77	7,935.44	7,570.77	30.99	40.21	33.68	1,486.37	1,354.58	3,392.76	3,352.02	40.74	83.281	
7,900.00	7,670.77	8,035.44	7,670.77	31.09	40.30	33.68	1,486.37	1,354.58	3,392.76	3,351.69	41.07	82.619	
8,000.00	7,770.77	8,135.44	7,770.77	31.19	40.39	33.68	1,486.37	1,354.58	3,392.76	3,351.36	41.39	81.963	
8,100.00	7,870.77	8,235.44	7,870.77	31.30	40.48	33.68	1,486.37	1,354.58	3,392.76	3,351.03	41.72	81.314	
8,121.23	7,892.00	8,256.67	7,892.00	31.32	40.50	33.68	1,486.37	1,354.58	3,392.76	3,350.96	41.79	81.176	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4840.00ft (Original Well Elev) Coordinates are relative to: P_BERNHARDT 22-1
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W ° Grid Convergence at Surface is: 0.43°



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 22-1
Project:	COLORADO NOTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 22-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 22-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4840.00ft (Original Well Elev) Coordinates are relative to: P_BERNHARDT 22-1
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W ° Grid Convergence at Surface is: 0.43°

