



US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
WELD_BERNHARDT 8 PAD 4N67W1
P_BERNHARDT 29-1**

P_BERNHARDT 29-1

Plan: PLAN #1 11-04-09 RHS

Standard Planning Report

04 November, 2009





P. BERNHARDT 29-1
COLORADO NORTHERN ZONE - 83
SECTION 1 T4N R67W
1287 FNL 1985 FWL
LAT: 40° 20' 43.008 N
LONG: 104° 50' 28.824 W



Azimuths to True North
Magnetic North: 9.08°

Magnetic Field
Strength: 53283.3nT
Dip Angle: 67.06°
Date: 11/4/2009
Model: IGRF200510

WELL DETAILS: P_BERNHARDT 29-1

+N/-S	+E/-W	Northing	Ground Level:	Easting	Latitude	Longitude	Slot
0.00	0.00	1369308.01	4825.00	3183590.01	40° 20' 43.008 N	104° 50' 28.824 W	

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2663.00	2722.98	PARKMAN TOP
4391.00	4545.52	SUSSEX TOP
4774.00	4949.47	SHANNON TOP
6985.00	7192.99	NIO A TOP
7308.00	7515.99	CODELL TOP
7758.00	7965.99	JSAND TOP

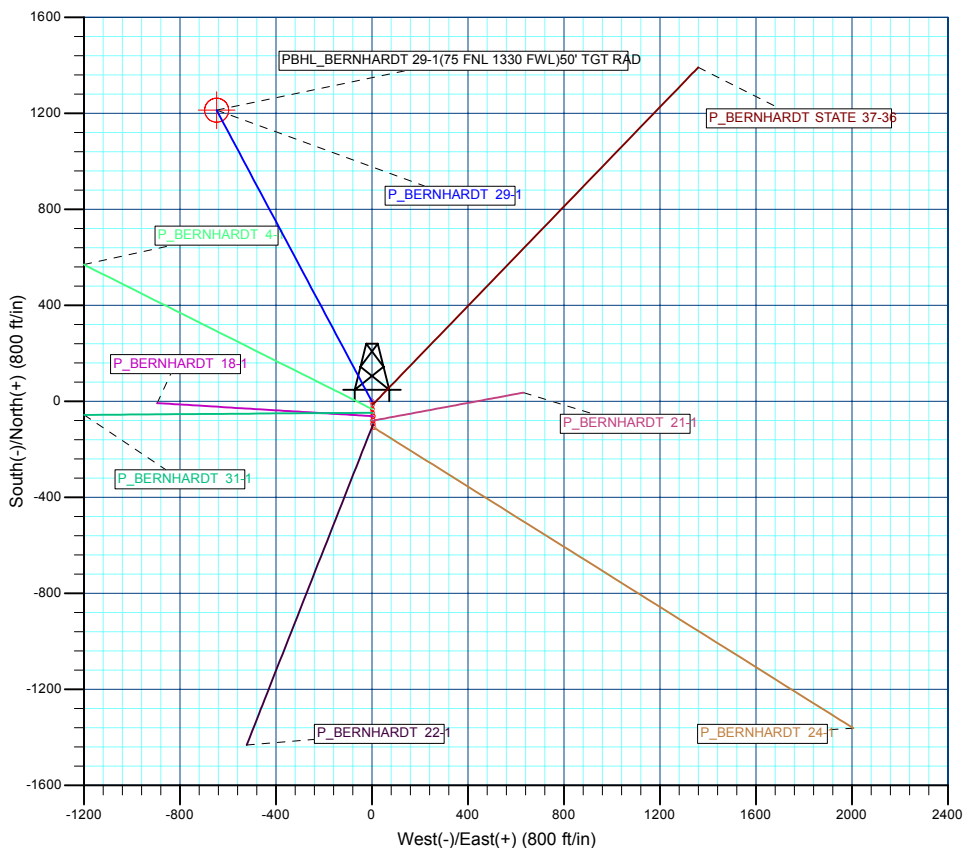
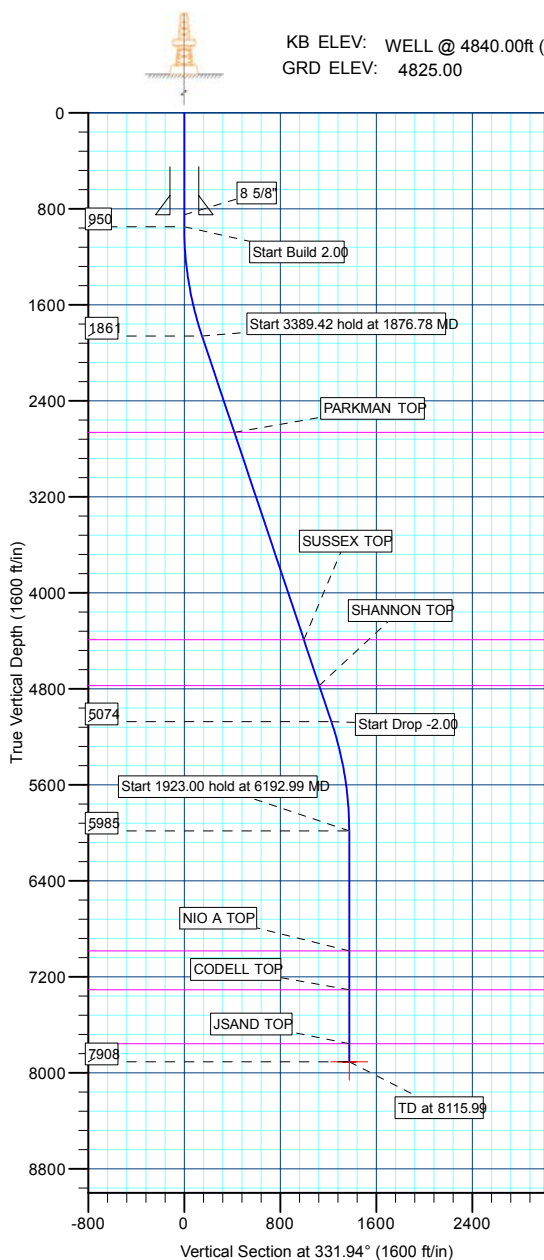
SECTION DETAILS

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	
1876.78	18.54	331.94	1860.70	131.14	-69.90	2.00	331.94	148.61	
5266.20	18.54	331.94	5074.30	1081.98	-576.73	0.00	0.00	1226.09	
6192.99	0.00	0.00	5985.00	1213.12	-646.64	2.00	180.00	1374.70	
8115.99	0.00	0.00	7908.00	1213.12	-646.64	0.00	0.00	1374.70	PBHL_BERNHARDT 29-1(75 FNL 1330 FWL)

CASING DETAILS

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

KB ELEV: WELL @ 4840.00ft (Original Well Elev)
GRD ELEV: 4825.00



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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL	7908.00	1213.12	-646.64	1370516.29	3182934.38	40° 20' 54.996 N	104° 50' 37.176 W	Circle (Radius: 50.00)

Plan: PLAN #1 11-04-09 RHS (P_BERNHARDT 29-1/P_BERNHARDT 29-1)

Created By: Robert H. Scott

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 29-1		
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 29-1			
Well Position	+N/-S	61.92 ft	Northing:	1,369,308.01 ft
	+E/-W	-5.57 ft	Easting:	3,183,590.01 ft
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft
			Ground Level:	4,825.00 ft

Wellbore	P_BERNHARDT 29-1				
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	331.94

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	
1,876.78	18.54	331.94	1,860.70	131.14	-69.90	2.00	2.00	0.00	331.94	
5,266.20	18.54	331.94	5,074.30	1,081.98	-576.73	0.00	0.00	0.00	0.00	
6,192.99	0.00	0.00	5,985.00	1,213.12	-646.64	2.00	-2.00	0.00	180.00	
8,115.99	0.00	0.00	7,908.00	1,213.12	-646.64	0.00	0.00	0.00	0.00	PBHL_BERNHARD

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 29-1		
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	331.94	1,000.00	0.39	-0.21	0.44	2.00	2.00	0.00
1,100.00	3.00	331.94	1,099.93	3.46	-1.85	3.93	2.00	2.00	0.00
1,200.00	5.00	331.94	1,199.68	9.62	-5.13	10.90	2.00	2.00	0.00
1,300.00	7.00	331.94	1,299.13	18.84	-10.04	21.35	2.00	2.00	0.00
1,400.00	9.00	331.94	1,398.15	31.12	-16.59	35.27	2.00	2.00	0.00
1,500.00	11.00	331.94	1,496.63	46.45	-24.76	52.63	2.00	2.00	0.00
1,600.00	13.00	331.94	1,594.44	64.79	-34.54	73.42	2.00	2.00	0.00
1,700.00	15.00	331.94	1,691.46	86.14	-45.92	97.62	2.00	2.00	0.00
1,800.00	17.00	331.94	1,787.58	110.46	-58.88	125.18	2.00	2.00	0.00
Start 3389.42 hold at 1876.78 MD									
1,876.78	18.54	331.94	1,860.70	131.14	-69.90	148.61	2.00	2.00	0.00
1,900.00	18.54	331.94	1,882.71	137.65	-73.37	155.99	0.00	0.00	0.00
2,000.00	18.54	331.94	1,977.53	165.71	-88.33	187.78	0.00	0.00	0.00
2,100.00	18.54	331.94	2,072.34	193.76	-103.28	219.57	0.00	0.00	0.00
2,200.00	18.54	331.94	2,167.15	221.81	-118.23	251.36	0.00	0.00	0.00
2,300.00	18.54	331.94	2,261.96	249.87	-133.19	283.15	0.00	0.00	0.00
2,400.00	18.54	331.94	2,356.78	277.92	-148.14	314.94	0.00	0.00	0.00
2,500.00	18.54	331.94	2,451.59	305.97	-163.09	346.73	0.00	0.00	0.00
2,600.00	18.54	331.94	2,546.40	334.03	-178.05	378.52	0.00	0.00	0.00
2,700.00	18.54	331.94	2,641.21	362.08	-193.00	410.31	0.00	0.00	0.00
PARKMAN TOP									
2,722.98	18.54	331.94	2,663.00	368.52	-196.44	417.61	0.00	0.00	0.00
2,800.00	18.54	331.94	2,736.03	390.13	-207.95	442.09	0.00	0.00	0.00
2,900.00	18.54	331.94	2,830.84	418.18	-222.91	473.88	0.00	0.00	0.00
3,000.00	18.54	331.94	2,925.65	446.24	-237.86	505.67	0.00	0.00	0.00
3,100.00	18.54	331.94	3,020.47	474.29	-252.81	537.46	0.00	0.00	0.00
3,200.00	18.54	331.94	3,115.28	502.34	-267.77	569.25	0.00	0.00	0.00
3,300.00	18.54	331.94	3,210.09	530.40	-282.72	601.04	0.00	0.00	0.00
3,400.00	18.54	331.94	3,304.90	558.45	-297.67	632.83	0.00	0.00	0.00
3,500.00	18.54	331.94	3,399.72	586.50	-312.63	664.62	0.00	0.00	0.00
3,600.00	18.54	331.94	3,494.53	614.56	-327.58	696.41	0.00	0.00	0.00
3,700.00	18.54	331.94	3,589.34	642.61	-342.53	728.20	0.00	0.00	0.00
3,800.00	18.54	331.94	3,684.15	670.66	-357.49	759.99	0.00	0.00	0.00
3,900.00	18.54	331.94	3,778.97	698.72	-372.44	791.78	0.00	0.00	0.00
4,000.00	18.54	331.94	3,873.78	726.77	-387.39	823.57	0.00	0.00	0.00
4,100.00	18.54	331.94	3,968.59	754.82	-402.35	855.36	0.00	0.00	0.00
4,200.00	18.54	331.94	4,063.40	782.87	-417.30	887.15	0.00	0.00	0.00
4,300.00	18.54	331.94	4,158.22	810.93	-432.25	918.94	0.00	0.00	0.00
4,400.00	18.54	331.94	4,253.03	838.98	-447.21	950.73	0.00	0.00	0.00
4,500.00	18.54	331.94	4,347.84	867.03	-462.16	982.52	0.00	0.00	0.00
SUSSEX TOP									
4,545.52	18.54	331.94	4,391.00	879.80	-468.97	996.99	0.00	0.00	0.00
4,600.00	18.54	331.94	4,442.65	895.09	-477.11	1,014.31	0.00	0.00	0.00
4,700.00	18.54	331.94	4,537.47	923.14	-492.07	1,046.10	0.00	0.00	0.00
4,800.00	18.54	331.94	4,632.28	951.19	-507.02	1,077.89	0.00	0.00	0.00
4,900.00	18.54	331.94	4,727.09	979.25	-521.97	1,109.67	0.00	0.00	0.00
SHANNON TOP									
4,949.47	18.54	331.94	4,774.00	993.13	-529.37	1,125.40	0.00	0.00	0.00
5,000.00	18.54	331.94	4,821.90	1,007.30	-536.93	1,141.46	0.00	0.00	0.00
5,100.00	18.54	331.94	4,916.72	1,035.35	-551.88	1,173.25	0.00	0.00	0.00
5,200.00	18.54	331.94	5,011.53	1,063.41	-566.83	1,205.04	0.00	0.00	0.00

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 29-1		
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									
5,266.20	18.54	331.94	5,074.30	1,081.98	-576.73	1,226.09	0.00	0.00	0.00
5,300.00	17.86	331.94	5,106.40	1,091.29	-581.70	1,236.64	2.00	-2.00	0.00
5,400.00	15.86	331.94	5,202.10	1,116.88	-595.34	1,265.65	2.00	-2.00	0.00
5,500.00	13.86	331.94	5,298.75	1,139.51	-607.40	1,291.29	2.00	-2.00	0.00
5,600.00	11.86	331.94	5,396.24	1,159.15	-617.87	1,313.54	2.00	-2.00	0.00
5,700.00	9.86	331.94	5,494.44	1,175.78	-626.73	1,332.38	2.00	-2.00	0.00
5,800.00	7.86	331.94	5,593.24	1,189.37	-633.98	1,347.79	2.00	-2.00	0.00
5,900.00	5.86	331.94	5,692.52	1,199.91	-639.59	1,359.73	2.00	-2.00	0.00
6,000.00	3.86	331.94	5,792.16	1,207.38	-643.58	1,368.20	2.00	-2.00	0.00
6,100.00	1.86	331.94	5,892.03	1,211.79	-645.93	1,373.19	2.00	-2.00	0.00
Start 1923.00 hold at 6192.99 MD									
6,192.99	0.00	0.00	5,985.00	1,213.12	-646.64	1,374.70	2.00	-2.00	30.18
6,200.00	0.00	0.00	5,992.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
6,300.00	0.00	0.00	6,092.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
6,400.00	0.00	0.00	6,192.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
6,500.00	0.00	0.00	6,292.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
6,600.00	0.00	0.00	6,392.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
6,700.00	0.00	0.00	6,492.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
6,800.00	0.00	0.00	6,592.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
6,900.00	0.00	0.00	6,692.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
7,000.00	0.00	0.00	6,792.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
7,100.00	0.00	0.00	6,892.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
NIO A TOP									
7,192.99	0.00	0.00	6,985.00	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
7,200.00	0.00	0.00	6,992.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
7,300.00	0.00	0.00	7,092.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
7,400.00	0.00	0.00	7,192.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
7,500.00	0.00	0.00	7,292.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
CODELL TOP									
7,515.99	0.00	0.00	7,308.00	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
7,600.00	0.00	0.00	7,392.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
7,700.00	0.00	0.00	7,492.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
7,800.00	0.00	0.00	7,592.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
7,900.00	0.00	0.00	7,692.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
JSAND TOP									
7,965.99	0.00	0.00	7,758.00	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
8,000.00	0.00	0.00	7,792.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
8,100.00	0.00	0.00	7,892.01	1,213.12	-646.64	1,374.70	0.00	0.00	0.00
PBHL_BERNHARDT 29-1(75 FNL 1330 FWL)									
8,115.99	0.00	0.00	7,908.00	1,213.12	-646.64	1,374.70	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	7,908.00	1,213.12	-646.64	1,370,516.29	3,182,934.38	40° 20' 54.996 N	104° 50' 37.176 W
- plan hits target center									
- Circle (radius 50.00)									

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 29-1		
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 (°)	
2,722.98	2,663.00	PARKMAN TOP				
4,545.52	4,391.00	SUSSEX TOP				
4,949.47	4,774.00	SHANNON TOP				
7,192.99	6,985.00	NIO A TOP				
7,515.99	7,308.00	CODELL TOP				
7,965.99	7,758.00	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	
1,876.78	1,860.70	131.14	-69.90	Start 3389.42 hold at 1876.78 MD	
5,266.20	5,074.30	1,081.98	-576.73	Start Drop -2.00	
6,192.99	5,985.00	1,213.12	-646.64	Start 1923.00 hold at 6192.99 MD	
8,115.99	7,908.00	1,213.12	-646.64	TD at 8115.99	



US ROCKIES REGION PLANNING

**COLORADO NOTHERN ZONE - 83
WELD_BERNHARDT 8 PAD 4N67W1
P_BERNHARDT 29-1**

**P_BERNHARDT 29-1
PLAN #1 11-04-09 RHS**

Anticollision Report

04 November, 2009



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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	8,115.99	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	62.17	58.16	15.495	CC, ES
P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1	1,200.00	1,200.36	70.88	65.79	13.939	SF
P_BERNHARDT 21-1 - P_BERNHARDT 21-1 - PLAN #1	950.00	950.00	80.34	76.33	20.025	CC, ES
P_BERNHARDT 21-1 - P_BERNHARDT 21-1 - PLAN #1	1,200.00	1,199.56	90.35	85.27	17.774	SF
P_BERNHARDT 22-1 - P_BERNHARDT 22-1 - PLAN #1	950.00	950.00	94.88	90.87	23.649	CC, ES
P_BERNHARDT 22-1 - P_BERNHARDT 22-1 - PLAN #1	1,100.00	1,095.31	101.90	97.29	22.119	SF
P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1	200.00	200.00	109.61	108.97	171.106	CC, ES
P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1	950.00	917.91	182.33	177.94	41.522	SF
P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1	317.89	317.92	47.38	46.22	40.863	CC
P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1	400.00	399.84	47.60	46.07	31.245	ES
P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1	700.00	695.43	62.60	59.71	21.699	SF
P_BERNHARDT 4-1 - P_BERNHARDT 4- - PLAN #1 11-	950.00	950.00	32.90	28.89	8.201	CC
P_BERNHARDT 4-1 - P_BERNHARDT 4- - PLAN #1 11-	1,000.00	1,000.30	33.08	28.84	7.815	ES
P_BERNHARDT 4-1 - P_BERNHARDT 4- - PLAN #1 11-	1,200.00	1,201.33	37.55	32.44	7.351	SF
P_BERNHARDT STATE 37-36 - P_BERNHARDT STATI	421.17	421.39	12.13	10.48	7.387	CC, ES
P_BERNHARDT STATE 37-36 - P_BERNHARDT STATI	500.00	499.80	14.08	12.07	6.984	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							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
0.00	0.00	0.00	0.00	0.00	0.00	174.86	-61.92	5.57	62.17					
100.00	100.00	100.00	100.00	0.10	0.10	174.86	-61.92	5.57	62.17	61.98	0.19	325.400		
200.00	200.00	200.00	200.00	0.32	0.32	174.86	-61.92	5.57	62.17	61.53	0.64	97.049		
300.00	300.00	300.00	300.00	0.55	0.55	174.86	-61.92	5.57	62.17	61.08	1.09	57.029		
400.00	400.00	400.00	400.00	0.77	0.77	174.86	-61.92	5.57	62.17	60.63	1.54	40.378		
500.00	500.00	500.00	500.00	0.99	0.99	174.86	-61.92	5.57	62.17	60.18	1.99	31.253		
600.00	600.00	600.00	600.00	1.22	1.22	174.86	-61.92	5.57	62.17	59.73	2.44	25.492		
700.00	700.00	700.00	700.00	1.44	1.44	174.86	-61.92	5.57	62.17	59.28	2.89	21.525		
800.00	800.00	800.00	800.00	1.67	1.67	174.86	-61.92	5.57	62.17	58.83	3.34	18.626		
900.00	900.00	900.00	900.00	1.89	1.89	174.86	-61.92	5.57	62.17	58.38	3.79	16.415		
950.00	950.00	950.00	950.00	2.01	2.01	174.86	-61.92	5.57	62.17	58.16	4.01	15.495	CC, ES	
1,000.00	1,000.00	1,000.16	1,000.16	2.12	2.11	-156.84	-61.89	5.14	62.50	58.28	4.23	14.779		

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 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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
1,100.00	1,099.93	1,100.39	1,100.32	2.34	2.32	-154.98	-61.68	1.64	65.24	60.58	4.65	14.023	
1,200.00	1,199.68	1,200.36	1,200.04	2.57	2.53	-151.69	-61.26	-5.34	70.88	65.79	5.08	13.939 SF	
1,300.00	1,299.13	1,299.89	1,299.02	2.81	2.76	-147.65	-60.62	-15.73	79.67	74.13	5.54	14.389	
1,400.00	1,398.15	1,398.83	1,396.99	3.07	3.02	-143.48	-59.79	-29.45	91.83	85.81	6.02	15.247	
1,500.00	1,496.63	1,497.00	1,493.69	3.36	3.31	-139.60	-58.76	-46.39	107.45	100.90	6.56	16.389	
1,600.00	1,594.44	1,594.85	1,589.59	3.69	3.64	-136.54	-57.59	-65.77	126.40	119.25	7.15	17.687	
1,700.00	1,691.46	1,692.45	1,685.21	4.07	3.99	-135.07	-56.40	-85.25	148.00	140.22	7.78	19.023	
1,800.00	1,787.58	1,789.51	1,780.32	4.51	4.35	-134.72	-55.23	-104.62	172.04	163.59	8.45	20.353	
1,876.78	1,860.70	1,863.60	1,852.91	4.89	4.64	-134.94	-54.33	-119.40	192.12	183.13	8.99	21.363	
1,900.00	1,882.71	1,885.94	1,874.80	5.01	4.72	-135.14	-54.06	-123.86	198.41	189.24	9.17	21.642	
2,000.00	1,977.53	1,982.16	1,969.08	5.55	5.10	-135.87	-52.89	-143.06	225.51	215.57	9.94	22.694	
2,100.00	2,072.34	2,078.39	2,063.36	6.11	5.49	-136.45	-51.73	-162.26	252.63	241.91	10.73	23.554	
2,200.00	2,167.15	2,174.61	2,157.64	6.68	5.88	-136.92	-50.56	-181.47	279.78	268.25	11.53	24.266	
2,300.00	2,261.96	2,270.83	2,251.92	7.27	6.28	-137.30	-49.40	-200.67	306.94	294.59	12.35	24.861	
2,400.00	2,356.78	2,367.05	2,346.20	7.86	6.68	-137.62	-48.23	-219.87	334.11	320.94	13.17	25.365	
2,500.00	2,451.59	2,463.28	2,440.48	8.46	7.09	-137.90	-47.06	-239.07	361.29	347.28	14.01	25.794	
2,600.00	2,546.40	2,559.50	2,534.76	9.07	7.50	-138.13	-45.90	-258.28	388.48	373.63	14.85	26.165	
2,700.00	2,641.21	2,655.72	2,629.04	9.69	7.91	-138.34	-44.73	-277.48	415.67	399.97	15.69	26.486	
2,800.00	2,736.03	2,751.94	2,723.32	10.30	8.32	-138.52	-43.57	-296.68	442.86	426.32	16.54	26.768	
2,900.00	2,830.84	2,848.17	2,817.60	10.92	8.73	-138.67	-42.40	-315.88	470.06	452.66	17.40	27.016	
3,000.00	2,925.65	2,944.39	2,911.88	11.55	9.15	-138.82	-41.24	-335.08	497.26	479.01	18.26	27.235	
3,100.00	3,020.47	3,040.61	3,006.16	12.17	9.57	-138.94	-40.07	-354.29	524.47	505.35	19.12	27.431	
3,200.00	3,115.28	3,136.83	3,100.44	12.80	9.98	-139.06	-38.90	-373.49	551.68	531.69	19.98	27.607	
3,300.00	3,210.09	3,233.06	3,194.72	13.43	10.40	-139.16	-37.74	-392.69	578.88	558.04	20.85	27.765	
3,400.00	3,304.90	3,329.28	3,289.00	14.06	10.82	-139.25	-36.57	-411.89	606.09	584.38	21.72	27.909	
3,500.00	3,399.72	3,425.50	3,383.28	14.69	11.24	-139.34	-35.41	-431.10	633.31	610.72	22.59	28.039	
3,600.00	3,494.53	3,521.72	3,477.56	15.32	11.66	-139.42	-34.24	-450.30	660.52	637.06	23.46	28.157	
3,700.00	3,589.34	3,617.94	3,571.84	15.96	12.09	-139.49	-33.07	-469.50	687.73	663.40	24.33	28.266	
3,800.00	3,684.15	3,714.17	3,666.12	16.59	12.51	-139.56	-31.91	-488.70	714.95	689.74	25.20	28.366	
3,900.00	3,778.97	3,810.39	3,760.40	17.23	12.93	-139.62	-30.74	-507.90	742.16	716.08	26.08	28.458	
4,000.00	3,873.78	3,906.61	3,854.68	17.86	13.35	-139.68	-29.58	-527.11	769.38	742.42	26.96	28.543	
4,100.00	3,968.59	4,002.83	3,948.95	18.50	13.78	-139.73	-28.41	-546.31	796.60	768.76	27.83	28.622	
4,200.00	4,063.40	4,099.06	4,043.23	19.14	14.20	-139.78	-27.25	-565.51	823.81	795.10	28.71	28.695	
4,300.00	4,158.22	4,195.28	4,137.51	19.78	14.63	-139.83	-26.08	-584.71	851.03	821.44	29.59	28.763	
4,400.00	4,253.03	4,291.50	4,231.79	20.41	15.05	-139.87	-24.91	-603.92	878.25	847.78	30.47	28.826	
4,500.00	4,347.84	4,387.72	4,326.07	21.05	15.48	-139.91	-23.75	-623.12	905.47	874.12	31.35	28.886	
4,600.00	4,442.65	4,483.95	4,420.35	21.69	15.90	-139.95	-22.58	-642.32	932.69	900.46	32.23	28.941	
4,700.00	4,537.47	4,580.17	4,514.63	22.33	16.33	-139.99	-21.42	-661.52	959.91	926.80	33.11	28.994	
4,800.00	4,632.28	4,676.39	4,608.91	22.97	16.75	-140.02	-20.25	-680.72	987.13	953.14	33.99	29.043	
4,900.00	4,727.09	4,772.61	4,703.19	23.61	17.18	-140.06	-19.08	-699.93	1,014.35	979.48	34.87	29.089	
5,000.00	4,821.90	4,868.83	4,797.47	24.25	17.60	-140.09	-17.92	-719.13	1,041.57	1,005.82	35.75	29.133	
5,100.00	4,916.72	4,965.06	4,891.75	24.89	18.03	-140.12	-16.75	-738.33	1,068.79	1,032.16	36.63	29.174	
5,200.00	5,011.53	5,061.28	4,986.03	25.53	18.46	-140.15	-15.59	-757.53	1,096.01	1,058.49	37.52	29.213	
5,266.20	5,074.30	5,124.98	5,048.45	25.96	18.74	-140.16	-14.82	-770.25	1,114.03	1,075.93	38.10	29.238	
5,300.00	5,106.40	5,157.54	5,080.35	26.15	18.88	-140.29	-14.42	-776.74	1,123.09	1,084.68	38.41	29.240	
5,400.00	5,202.10	5,254.34	5,175.19	26.61	19.31	-140.55	-13.25	-796.06	1,148.13	1,108.88	39.26	29.247	
5,500.00	5,298.75	5,351.72	5,270.61	27.04	19.74	-140.66	-12.07	-815.49	1,170.57	1,130.48	40.09	29.200	
5,600.00	5,396.24	5,449.57	5,366.48	27.42	20.18	-140.63	-10.88	-835.02	1,190.39	1,149.49	40.90	29.104	
5,700.00	5,494.44	5,552.90	5,468.02	27.75	20.53	-140.53	-9.72	-854.15	1,207.41	1,165.80	41.60	29.022	
5,800.00	5,593.24	5,657.68	5,571.61	28.04	20.82	-140.45	-8.77	-869.82	1,221.32	1,179.14	42.18	28.952	
5,900.00	5,692.52	5,763.18	5,676.42	28.28	21.06	-140.41	-8.04	-881.77	1,232.10	1,189.43	42.67	28.876	
6,000.00	5,792.16	5,869.19	5,782.11	28.48	21.27	-140.40	-7.55	-889.89	1,239.69	1,196.64	43.05	28.796	

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 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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
6,100.00	5,892.03	5,975.52	5,888.35	28.63	21.43	-140.42	-7.30	-894.10	1,244.09	1,200.76	43.33	28.710	
6,192.99	5,985.00	6,072.17	5,985.00	28.73	21.55	-168.51	-7.26	-894.74	1,245.34	1,201.83	43.51	28.620	
6,200.00	5,992.01	6,079.19	5,992.01	28.73	21.56	-168.51	-7.26	-894.74	1,245.34	1,201.81	43.53	28.609	
6,300.00	6,092.01	6,179.19	6,092.01	28.83	21.69	-168.51	-7.26	-894.74	1,245.34	1,201.55	43.79	28.440	
6,400.00	6,192.01	6,279.19	6,192.01	28.93	21.82	-168.51	-7.26	-894.74	1,245.34	1,201.29	44.05	28.270	
6,500.00	6,292.01	6,379.19	6,292.01	29.03	21.95	-168.51	-7.26	-894.74	1,245.34	1,201.02	44.32	28.100	
6,600.00	6,392.01	6,479.19	6,392.01	29.13	22.09	-168.51	-7.26	-894.74	1,245.34	1,200.75	44.59	27.930	
6,700.00	6,492.01	6,579.19	6,492.01	29.23	22.22	-168.51	-7.26	-894.74	1,245.34	1,200.48	44.86	27.761	
6,800.00	6,592.01	6,679.19	6,592.01	29.34	22.36	-168.51	-7.26	-894.74	1,245.34	1,200.21	45.14	27.591	
6,900.00	6,692.01	6,779.19	6,692.01	29.44	22.50	-168.51	-7.26	-894.74	1,245.34	1,199.93	45.41	27.423	
7,000.00	6,792.01	6,879.19	6,792.01	29.55	22.64	-168.51	-7.26	-894.74	1,245.34	1,199.65	45.69	27.254	
7,100.00	6,892.01	6,979.19	6,892.01	29.66	22.78	-168.51	-7.26	-894.74	1,245.34	1,199.36	45.98	27.086	
7,200.00	6,992.01	7,079.19	6,992.01	29.77	22.93	-168.51	-7.26	-894.74	1,245.34	1,199.08	46.26	26.919	
7,300.00	7,092.01	7,179.19	7,092.01	29.88	23.07	-168.51	-7.26	-894.74	1,245.34	1,198.79	46.55	26.752	
7,400.00	7,192.01	7,279.19	7,192.01	29.99	23.22	-168.51	-7.26	-894.74	1,245.34	1,198.50	46.84	26.586	
7,500.00	7,292.01	7,379.19	7,292.01	30.11	23.37	-168.51	-7.26	-894.74	1,245.34	1,198.20	47.14	26.420	
7,600.00	7,392.01	7,479.19	7,392.01	30.22	23.51	-168.51	-7.26	-894.74	1,245.34	1,197.91	47.43	26.255	
7,700.00	7,492.01	7,579.19	7,492.01	30.34	23.66	-168.51	-7.26	-894.74	1,245.34	1,197.61	47.73	26.091	
7,800.00	7,592.01	7,679.19	7,592.01	30.45	23.81	-168.51	-7.26	-894.74	1,245.34	1,197.31	48.03	25.927	
7,900.00	7,692.01	7,779.19	7,692.01	30.57	23.97	-168.51	-7.26	-894.74	1,245.34	1,197.01	48.33	25.765	
8,000.00	7,792.01	7,879.19	7,792.01	30.69	24.12	-168.51	-7.26	-894.74	1,245.34	1,196.70	48.64	25.603	
8,058.33	7,850.34	7,937.51	7,850.34	30.76	24.21	-168.51	-7.26	-894.74	1,245.34	1,196.52	48.82	25.509	
8,100.00	7,892.01	7,959.17	7,872.00	30.81	24.24	-168.51	-7.26	-894.74	1,245.50	1,196.58	48.92	25.462	
8,115.99	7,908.00	7,959.17	7,872.00	30.83	24.24	-168.51	-7.26	-894.74	1,245.86	1,196.92	48.94	25.456	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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 21-1 - P_BERNHARDT 21-1 - 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)	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	176.02	-80.15	5.57	80.34				
100.00	100.00	100.00	100.00	0.10	0.10	176.02	-80.15	5.57	80.34	80.15	0.19	420.527	
200.00	200.00	200.00	200.00	0.32	0.32	176.02	-80.15	5.57	80.34	79.70	0.64	125.421	
300.00	300.00	300.00	300.00	0.55	0.55	176.02	-80.15	5.57	80.34	79.25	1.09	73.701	
400.00	400.00	400.00	400.00	0.77	0.77	176.02	-80.15	5.57	80.34	78.80	1.54	52.182	
500.00	500.00	500.00	500.00	0.99	0.99	176.02	-80.15	5.57	80.34	78.35	1.99	40.390	
600.00	600.00	600.00	600.00	1.22	1.22	176.02	-80.15	5.57	80.34	77.90	2.44	32.945	
700.00	700.00	700.00	700.00	1.44	1.44	176.02	-80.15	5.57	80.34	77.45	2.89	27.817	
800.00	800.00	800.00	800.00	1.67	1.67	176.02	-80.15	5.57	80.34	77.00	3.34	24.071	
900.00	900.00	900.00	900.00	1.89	1.89	176.02	-80.15	5.57	80.34	76.55	3.79	21.214	
950.00	950.00	950.00	950.00	2.01	2.01	176.02	-80.15	5.57	80.34	76.33	4.01	20.025 CC, ES	
1,000.00	1,000.00	1,000.15	1,000.15	2.12	2.11	-156.35	-80.07	6.01	80.69	76.46	4.23	19.075	
1,100.00	1,099.93	1,100.21	1,100.14	2.34	2.32	-159.68	-79.43	9.45	83.66	79.00	4.66	17.972	
1,200.00	1,199.68	1,199.56	1,199.25	2.57	2.54	-165.57	-78.16	16.26	90.35	85.27	5.08	17.774 SF	
1,300.00	1,299.13	1,297.75	1,296.89	2.81	2.77	-172.78	-76.30	26.30	101.87	96.35	5.52	18.469	
1,400.00	1,398.15	1,394.96	1,393.23	3.07	3.02	-179.84	-73.93	39.05	118.98	113.02	5.95	19.984	
1,500.00	1,496.63	1,491.78	1,489.14	3.36	3.28	174.82	-71.50	52.11	140.98	134.59	6.39	22.050	
1,600.00	1,594.44	1,587.81	1,584.26	3.69	3.55	171.06	-69.09	65.07	167.18	160.35	6.83	24.461	
1,700.00	1,691.46	1,682.91	1,678.47	4.07	3.83	168.47	-66.70	77.90	197.13	189.85	7.28	27.084	
1,800.00	1,787.58	1,776.99	1,771.65	4.51	4.11	166.70	-64.34	90.59	230.55	222.83	7.73	29.840	
1,876.78	1,860.70	1,848.45	1,842.43	4.89	4.33	165.73	-62.55	100.24	258.45	250.38	8.07	32.012	
1,900.00	1,882.71	1,869.94	1,863.73	5.01	4.40	165.53	-62.01	103.14	267.18	258.98	8.20	32.596	
2,000.00	1,977.53	1,962.55	1,955.45	5.55	4.69	164.82	-59.69	115.63	304.78	296.04	8.74	34.889	
2,100.00	2,072.34	2,055.15	2,047.18	6.11	4.98	164.25	-57.36	128.13	342.41	333.13	9.29	36.870	
2,200.00	2,167.15	2,147.75	2,138.90	6.68	5.27	163.80	-55.04	140.62	380.07	370.22	9.85	38.593	
2,300.00	2,261.96	2,240.35	2,230.63	7.27	5.57	163.43	-52.72	153.12	417.74	407.32	10.42	40.097	
2,400.00	2,356.78	2,332.95	2,322.35	7.86	5.87	163.13	-50.40	165.61	455.43	444.43	11.00	41.420	
2,500.00	2,451.59	2,425.55	2,414.08	8.46	6.17	162.87	-48.07	178.11	493.13	481.55	11.58	42.589	
2,600.00	2,546.40	2,518.15	2,505.80	9.07	6.47	162.64	-45.75	190.60	530.83	518.66	12.17	43.628	
2,700.00	2,641.21	2,610.76	2,597.53	9.69	6.77	162.45	-43.43	203.10	568.54	555.78	12.76	44.556	
2,800.00	2,736.03	2,703.36	2,689.25	10.30	7.08	162.28	-41.10	215.59	606.25	592.89	13.36	45.388	
2,900.00	2,830.84	2,795.96	2,780.98	10.92	7.38	162.13	-38.78	228.09	643.97	630.01	13.96	46.138	
3,000.00	2,925.65	2,888.56	2,872.70	11.55	7.69	161.99	-36.46	240.58	681.69	667.13	14.56	46.817	
3,100.00	3,020.47	2,981.16	2,964.43	12.17	8.00	161.87	-34.13	253.08	719.42	704.25	15.17	47.434	
3,200.00	3,115.28	3,073.76	3,056.15	12.80	8.31	161.77	-31.81	265.57	757.14	741.37	15.77	47.997	
3,300.00	3,210.09	3,166.36	3,147.88	13.43	8.62	161.67	-29.49	278.06	794.87	778.49	16.39	48.512	
3,400.00	3,304.90	3,258.97	3,239.60	14.06	8.92	161.58	-27.17	290.56	832.60	815.61	17.00	48.985	
3,500.00	3,399.72	3,351.57	3,331.33	14.69	9.23	161.50	-24.84	303.05	870.34	852.72	17.61	49.421	
3,600.00	3,494.53	3,444.17	3,423.05	15.32	9.54	161.43	-22.52	315.55	908.07	889.84	18.23	49.823	
3,700.00	3,589.34	3,536.77	3,514.78	15.96	9.86	161.36	-20.20	328.04	945.80	926.96	18.84	50.196	
3,800.00	3,684.15	3,629.37	3,606.51	16.59	10.17	161.29	-17.87	340.54	983.54	964.08	19.46	50.542	
3,900.00	3,778.97	3,721.97	3,698.23	17.23	10.48	161.24	-15.55	353.03	1,021.28	1,001.20	20.08	50.864	
4,000.00	3,873.78	3,814.57	3,789.96	17.86	10.79	161.18	-13.23	365.53	1,059.01	1,038.32	20.70	51.165	
4,100.00	3,968.59	3,907.18	3,881.68	18.50	11.10	161.13	-10.90	378.02	1,096.75	1,075.43	21.32	51.446	
4,200.00	4,063.40	3,999.78	3,973.41	19.14	11.41	161.08	-8.58	390.52	1,134.49	1,112.55	21.94	51.709	
4,300.00	4,158.22	4,092.38	4,065.13	19.78	11.73	161.04	-6.26	403.01	1,172.23	1,149.67	22.56	51.956	
4,400.00	4,253.03	4,184.98	4,156.86	20.41	12.04	161.00	-3.94	415.51	1,209.97	1,186.79	23.18	52.188	
4,500.00	4,347.84	4,277.58	4,248.58	21.05	12.35	160.96	-1.61	428.00	1,247.71	1,223.91	23.81	52.407	
4,600.00	4,442.65	4,370.18	4,340.31	21.69	12.67	160.92	0.71	440.50	1,285.45	1,261.02	24.43	52.613	
4,700.00	4,537.47	4,462.79	4,432.03	22.33	12.98	160.89	3.03	452.99	1,323.20	1,298.14	25.06	52.808	
4,800.00	4,632.28	4,555.39	4,523.76	22.97	13.29	160.86	5.36	465.49	1,360.94	1,335.26	25.68	52.993	
4,900.00	4,727.09	4,647.99	4,615.48	23.61	13.61	160.83	7.68	477.98	1,398.68	1,372.37	26.31	53.168	

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 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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 21-1 - P_BERNHARDT 21-1 - 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	4,821.90	4,740.59	4,707.21	24.25	13.92	160.80	10.00	490.48	1,436.42	1,409.49	26.93	53.334	
5,100.00	4,916.72	4,833.19	4,798.93	24.89	14.23	160.77	12.33	502.97	1,474.17	1,446.61	27.56	53.491	
5,200.00	5,011.53	4,925.79	4,890.66	25.53	14.55	160.74	14.65	515.47	1,511.91	1,483.72	28.19	53.641	
5,266.20	5,074.30	4,987.10	4,951.38	25.96	14.76	160.73	16.19	523.74	1,536.90	1,508.30	28.60	53.736	
5,300.00	5,106.40	5,018.46	4,982.45	26.15	14.86	160.80	16.97	527.97	1,549.48	1,520.63	28.85	53.700	
5,400.00	5,202.10	5,112.06	5,075.16	26.61	15.18	160.99	19.32	540.60	1,584.65	1,555.09	29.56	53.607	
5,500.00	5,298.75	5,206.73	5,168.94	27.04	15.50	161.11	21.70	553.38	1,616.72	1,586.48	30.24	53.471	
5,600.00	5,396.24	5,302.38	5,263.68	27.42	15.83	161.16	24.10	566.28	1,645.64	1,614.77	30.88	53.298	
5,700.00	5,494.44	5,398.87	5,359.26	27.75	16.15	161.16	26.52	579.30	1,671.40	1,639.92	31.48	53.094	
5,800.00	5,593.24	5,496.10	5,455.57	28.04	16.48	161.10	28.96	592.42	1,693.98	1,661.93	32.05	52.861	
5,900.00	5,692.52	5,593.95	5,552.49	28.28	16.82	160.99	31.41	605.62	1,713.35	1,680.78	32.57	52.603	
6,000.00	5,792.16	5,746.00	5,703.57	28.48	17.18	160.77	34.52	622.37	1,728.03	1,694.92	33.11	52.196	
6,100.00	5,892.03	5,902.21	5,859.49	28.63	17.47	160.66	36.19	631.35	1,736.24	1,702.71	33.53	51.779	
6,192.99	5,985.00	6,027.73	5,985.00	28.73	17.66	132.61	36.45	632.73	1,738.20	1,704.40	33.80	51.428	
6,200.00	5,992.01	6,034.75	5,992.01	28.73	17.67	132.61	36.45	632.73	1,738.20	1,704.37	33.82	51.394	
6,300.00	6,092.01	6,134.75	6,092.01	28.83	17.83	132.61	36.45	632.73	1,738.20	1,704.05	34.14	50.906	
6,400.00	6,192.01	6,234.75	6,192.01	28.93	17.99	132.61	36.45	632.73	1,738.20	1,703.72	34.47	50.423	
6,500.00	6,292.01	6,334.75	6,292.01	29.03	18.15	132.61	36.45	632.73	1,738.20	1,703.39	34.80	49.945	
6,600.00	6,392.01	6,434.75	6,392.01	29.13	18.31	132.61	36.45	632.73	1,738.20	1,703.06	35.13	49.473	
6,700.00	6,492.01	6,534.75	6,492.01	29.23	18.48	132.61	36.45	632.73	1,738.20	1,702.73	35.47	49.005	
6,800.00	6,592.01	6,634.75	6,592.01	29.34	18.64	132.61	36.45	632.73	1,738.20	1,702.39	35.81	48.543	
6,900.00	6,692.01	6,734.75	6,692.01	29.44	18.81	132.61	36.45	632.73	1,738.20	1,702.05	36.15	48.087	
7,000.00	6,792.01	6,834.75	6,792.01	29.55	18.98	132.61	36.45	632.73	1,738.20	1,701.71	36.49	47.635	
7,100.00	6,892.01	6,934.75	6,892.01	29.66	19.15	132.61	36.45	632.73	1,738.20	1,701.36	36.83	47.190	
7,200.00	6,992.01	7,034.75	6,992.01	29.77	19.32	132.61	36.45	632.73	1,738.20	1,701.01	37.18	46.749	
7,300.00	7,092.01	7,134.75	7,092.01	29.88	19.49	132.61	36.45	632.73	1,738.20	1,700.66	37.53	46.315	
7,400.00	7,192.01	7,234.75	7,192.01	29.99	19.66	132.61	36.45	632.73	1,738.20	1,700.31	37.88	45.885	
7,500.00	7,292.01	7,334.75	7,292.01	30.11	19.84	132.61	36.45	632.73	1,738.20	1,699.96	38.23	45.461	
7,600.00	7,392.01	7,434.75	7,392.01	30.22	20.01	132.61	36.45	632.73	1,738.20	1,699.61	38.59	45.043	
7,700.00	7,492.01	7,534.75	7,492.01	30.34	20.19	132.61	36.45	632.73	1,738.20	1,699.25	38.95	44.630	
7,800.00	7,592.01	7,634.75	7,592.01	30.45	20.36	132.61	36.45	632.73	1,738.20	1,698.89	39.31	44.222	
7,900.00	7,692.01	7,734.75	7,692.01	30.57	20.54	132.61	36.45	632.73	1,738.20	1,698.53	39.67	43.820	
8,000.00	7,792.01	7,834.75	7,792.01	30.69	20.72	132.61	36.45	632.73	1,738.20	1,698.17	40.03	43.423	
8,100.00	7,892.01	7,934.75	7,892.01	30.81	20.90	132.61	36.45	632.73	1,738.20	1,697.80	40.39	43.031	
8,105.30	7,897.32	7,940.05	7,897.32	30.82	20.91	132.61	36.45	632.73	1,738.20	1,697.78	40.41	43.011	
8,115.99	7,908.00	7,949.73	7,907.00	30.83	20.92	132.61	36.45	632.73	1,738.20	1,697.75	40.45	42.971	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 29-1
Project:	COLORADO NORTHERN 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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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	176.63	-94.72	5.57	94.88				
100.00	100.00	100.00	100.00	0.10	0.10	176.63	-94.72	5.57	94.88	94.69	0.19	496.621	
200.00	200.00	200.00	200.00	0.32	0.32	176.63	-94.72	5.57	94.88	94.24	0.64	148.115	
300.00	300.00	300.00	300.00	0.55	0.55	176.63	-94.72	5.57	94.88	93.79	1.09	87.037	
400.00	400.00	400.00	400.00	0.77	0.77	176.63	-94.72	5.57	94.88	93.34	1.54	61.625	
500.00	500.00	500.00	500.00	0.99	0.99	176.63	-94.72	5.57	94.88	92.89	1.99	47.698	
600.00	600.00	600.00	600.00	1.22	1.22	176.63	-94.72	5.57	94.88	92.44	2.44	38.906	
700.00	700.00	700.00	700.00	1.44	1.44	176.63	-94.72	5.57	94.88	91.99	2.89	32.850	
800.00	800.00	800.00	800.00	1.67	1.67	176.63	-94.72	5.57	94.88	91.54	3.34	28.426	
900.00	900.00	900.00	900.00	1.89	1.89	176.63	-94.72	5.57	94.88	91.09	3.79	25.052	
950.00	950.00	950.00	950.00	2.01	2.01	176.63	-94.72	5.57	94.88	90.87	4.01	23.649	CC, ES
1,000.00	1,000.00	998.53	998.53	2.12	2.10	-155.31	-95.10	5.42	95.66	91.44	4.22	22.675	
1,100.00	1,099.93	1,095.31	1,095.25	2.34	2.27	-155.27	-98.14	4.22	101.90	97.29	4.61	22.119	SF
1,200.00	1,199.68	1,191.25	1,190.96	2.57	2.45	-155.21	-104.16	1.85	114.33	109.33	5.00	22.872	
1,300.00	1,299.13	1,285.82	1,285.05	2.81	2.65	-155.11	-113.01	-1.63	132.87	127.47	5.39	24.631	
1,400.00	1,398.15	1,378.51	1,376.91	3.07	2.86	-154.99	-124.48	-6.15	157.39	151.60	5.80	27.159	
1,500.00	1,496.63	1,468.86	1,466.03	3.36	3.10	-154.84	-138.31	-11.61	187.74	181.54	6.20	30.269	
1,600.00	1,594.44	1,556.48	1,551.96	3.69	3.38	-154.65	-154.22	-17.87	223.72	217.10	6.62	33.807	
1,700.00	1,691.46	1,640.99	1,634.31	4.07	3.67	-154.43	-171.87	-24.83	265.11	258.07	7.04	37.646	
1,800.00	1,787.58	1,722.12	1,712.81	4.51	4.00	-154.16	-190.94	-32.34	311.67	304.19	7.48	41.683	
1,876.78	1,860.70	1,781.97	1,770.32	4.89	4.26	-153.93	-206.32	-38.41	350.78	342.96	7.82	44.858	
1,900.00	1,882.71	1,800.00	1,787.58	5.01	4.34	-153.98	-211.18	-40.32	363.08	355.14	7.94	45.735	
2,000.00	1,977.53	1,874.52	1,858.56	5.55	4.72	-154.06	-232.31	-48.65	417.31	408.84	8.46	49.300	
2,100.00	2,072.34	1,949.40	1,929.27	6.11	5.13	-154.00	-255.21	-57.67	473.42	464.41	9.01	52.547	
2,200.00	2,167.15	2,031.77	2,006.85	6.68	5.60	-153.91	-280.97	-67.82	530.12	520.53	9.59	55.261	
2,300.00	2,261.96	2,114.14	2,084.43	7.27	6.09	-153.84	-306.72	-77.97	586.82	576.63	10.19	57.594	
2,400.00	2,356.78	2,196.51	2,162.01	7.86	6.59	-153.79	-332.47	-88.12	643.52	632.72	10.80	59.606	
2,500.00	2,451.59	2,278.88	2,239.58	8.46	7.10	-153.74	-358.23	-98.27	700.22	688.81	11.41	61.348	
2,600.00	2,546.40	2,361.25	2,317.16	9.07	7.62	-153.70	-383.98	-108.41	756.92	744.88	12.04	62.871	
2,700.00	2,641.21	2,443.62	2,394.74	9.69	8.14	-153.66	-409.73	-118.56	813.62	800.95	12.67	64.210	
2,800.00	2,736.03	2,525.99	2,472.32	10.30	8.67	-153.63	-435.49	-128.71	870.32	857.01	13.31	65.392	
2,900.00	2,830.84	2,608.36	2,549.90	10.92	9.20	-153.60	-461.24	-138.86	927.03	913.07	13.95	66.443	
3,000.00	2,925.65	2,690.73	2,627.48	11.55	9.74	-153.58	-486.99	-149.01	983.73	969.13	14.60	67.379	
3,100.00	3,020.47	2,773.10	2,705.06	12.17	10.27	-153.56	-512.75	-159.16	1,040.43	1,025.18	15.25	68.218	
3,200.00	3,115.28	2,855.47	2,782.64	12.80	10.81	-153.54	-538.50	-169.30	1,097.13	1,081.22	15.91	68.974	
3,300.00	3,210.09	2,937.84	2,860.22	13.43	11.36	-153.52	-564.25	-179.45	1,153.83	1,137.27	16.56	69.658	
3,400.00	3,304.90	3,020.21	2,937.80	14.06	11.90	-153.50	-590.00	-189.60	1,210.53	1,193.31	17.22	70.278	
3,500.00	3,399.72	3,102.58	3,015.38	14.69	12.44	-153.49	-615.76	-199.75	1,267.24	1,249.35	17.89	70.844	
3,600.00	3,494.53	3,184.95	3,092.96	15.32	12.99	-153.48	-641.51	-209.90	1,323.94	1,305.38	18.55	71.360	
3,700.00	3,589.34	3,267.32	3,170.54	15.96	13.54	-153.47	-667.26	-220.05	1,380.64	1,361.42	19.22	71.833	
3,800.00	3,684.15	3,349.69	3,248.12	16.59	14.09	-153.45	-693.02	-230.19	1,437.34	1,417.45	19.89	72.269	
3,900.00	3,778.97	3,432.06	3,325.70	17.23	14.64	-153.44	-718.77	-240.34	1,494.04	1,473.48	20.56	72.671	
4,000.00	3,873.78	3,514.43	3,403.28	17.86	15.19	-153.43	-744.52	-250.49	1,550.74	1,529.51	21.23	73.043	
4,100.00	3,968.59	3,596.80	3,480.86	18.50	15.74	-153.43	-770.28	-260.64	1,607.45	1,585.54	21.90	73.387	
4,200.00	4,063.40	3,679.17	3,558.44	19.14	16.29	-153.42	-796.03	-270.79	1,664.15	1,641.57	22.58	73.707	
4,300.00	4,158.22	3,761.54	3,636.02	19.78	16.84	-153.41	-821.78	-280.94	1,720.85	1,697.60	23.25	74.005	
4,400.00	4,253.03	3,843.91	3,713.60	20.41	17.39	-153.40	-847.54	-291.09	1,777.55	1,753.62	23.93	74.284	
4,500.00	4,347.84	3,926.28	3,791.18	21.05	17.95	-153.40	-873.29	-301.23	1,834.25	1,809.65	24.61	74.544	
4,600.00	4,442.65	4,008.65	3,868.76	21.69	18.50	-153.39	-899.04	-311.38	1,890.96	1,865.67	25.28	74.788	
4,700.00	4,537.47	4,091.02	3,946.34	22.33	19.06	-153.38	-924.80	-321.53	1,947.66	1,921.70	25.96	75.017	
4,800.00	4,632.28	4,173.39	4,023.92	22.97	19.61	-153.38	-950.55	-331.68	2,004.36	1,977.72	26.64	75.233	
4,900.00	4,727.09	4,255.76	4,101.50	23.61	20.16	-153.37	-976.30	-341.83	2,061.06	2,033.74	27.32	75.436	

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 29-1
Project:	COLORADO NORTHERN 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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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 22-1 - P_BERNHARDT 22-1 - 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	4,821.90	4,338.13	4,179.08	24.25	20.72	-153.37	-1,002.05	-351.98	2,117.77	2,089.76	28.00	75.627	
5,100.00	4,916.72	4,420.50	4,256.66	24.89	21.28	-153.36	-1,027.81	-362.12	2,174.47	2,145.78	28.68	75.808	
5,200.00	5,011.53	4,502.87	4,334.24	25.53	21.83	-153.36	-1,053.56	-372.27	2,231.17	2,201.80	29.37	75.979	
5,266.20	5,074.30	4,557.40	4,385.60	25.96	22.20	-153.36	-1,070.61	-378.99	2,268.71	2,238.89	29.82	76.087	
5,300.00	5,106.40	4,585.34	4,411.91	26.15	22.39	-153.56	-1,079.35	-382.43	2,287.73	2,257.62	30.11	75.979	
5,400.00	5,202.10	4,669.15	4,490.85	26.61	22.95	-154.09	-1,105.55	-392.76	2,342.25	2,311.33	30.92	75.749	
5,500.00	5,298.75	4,754.59	4,571.32	27.04	23.53	-154.53	-1,132.26	-403.29	2,394.11	2,362.41	31.71	75.504	
5,600.00	5,396.24	4,841.56	4,653.23	27.42	24.12	-154.89	-1,159.45	-414.00	2,443.27	2,410.80	32.47	75.255	
5,700.00	5,494.44	4,929.95	4,736.48	27.75	24.72	-155.18	-1,187.09	-424.89	2,489.65	2,456.46	33.19	75.009	
5,800.00	5,593.24	5,019.64	4,820.96	28.04	25.32	-155.40	-1,215.13	-435.94	2,533.23	2,499.35	33.88	74.772	
5,900.00	5,692.52	5,110.55	4,906.58	28.28	25.94	-155.55	-1,243.55	-447.14	2,573.96	2,539.43	34.53	74.549	
6,000.00	5,792.16	5,202.54	4,993.22	28.48	26.56	-155.65	-1,272.31	-458.48	2,611.79	2,576.66	35.13	74.343	
6,100.00	5,892.03	5,294.10	5,081.17	28.63	27.16	-155.70	-1,301.69	-469.80	2,649.43	2,603.66	35.78	74.195	
6,192.99	5,985.00	5,384.23	5,169.00	28.73	27.77	-155.79	-1,331.65	-481.27	2,687.74	2,641.94	36.41	74.066	
6,200.00	5,992.01	5,392.25	5,177.01	28.73	27.77	-155.79	-1,331.65	-481.27	2,687.74	2,641.94	36.41	74.066	
6,300.00	6,092.01	5,492.25	5,277.01	28.83	28.37	-155.89	-1,361.65	-492.27	2,727.74	2,681.94	37.04	73.937	
6,400.00	6,192.01	5,592.25	5,377.01	28.93	28.97	-155.99	-1,391.65	-503.27	2,767.74	2,711.94	37.67	73.808	
6,500.00	6,292.01	5,692.25	5,477.01	29.03	29.57	-156.09	-1,421.65	-514.27	2,807.74	2,751.94	38.30	73.679	
6,600.00	6,392.01	5,792.25	5,577.01	29.13	30.17	-156.19	-1,451.65	-525.27	2,847.74	2,791.94	38.93	73.550	
6,700.00	6,492.01	5,892.25	5,677.01	29.23	30.77	-156.29	-1,481.65	-536.27	2,887.74	2,831.94	39.56	73.421	
6,800.00	6,592.01	5,992.25	5,777.01	29.34	31.37	-156.39	-1,511.65	-547.27	2,927.74	2,871.94	40.19	73.292	
6,900.00	6,692.01	6,092.25	5,877.01	29.44	31.97	-156.49	-1,541.65	-558.27	2,967.74	2,911.94	40.82	73.163	
7,000.00	6,792.01	6,192.25	5,977.01	29.55	32.57	-156.59	-1,571.65	-569.27	3,007.74	2,951.94	41.45	73.034	
7,100.00	6,892.01	6,292.25	6,077.01	29.66	33.17	-156.69	-1,601.65	-580.27	3,047.74	2,991.94	42.08	72.905	
7,200.00	6,992.01	6,392.25	6,177.01	29.77	33.77	-156.79	-1,631.65	-591.27	3,087.74	3,031.94	42.71	72.776	
7,300.00	7,092.01	6,492.25	6,277.01	29.88	34.37	-156.89	-1,661.65	-602.27	3,127.74	3,071.94	43.34	72.647	
7,400.00	7,192.01	6,592.25	6,377.01	29.99	34.97	-156.99	-1,691.65	-613.27	3,167.74	3,111.94	43.97	72.518	
7,500.00	7,292.01	6,692.25	6,477.01	30.11	35.57	-157.09	-1,721.65	-624.27	3,207.74	3,151.94	44.60	72.389	
7,600.00	7,392.01	6,792.25	6,577.01	30.22	36.17	-157.19	-1,751.65	-635.27	3,247.74	3,191.94	45.23	72.260	
7,700.00	7,492.01	6,892.25	6,677.01	30.34	36.77	-157.29	-1,781.65	-646.27	3,287.74	3,231.94	45.86	72.131	
7,800.00	7,592.01	6,992.25	6,777.01	30.45	37.37	-157.39	-1,811.65	-657.27	3,327.74	3,271.94	46.49	72.002	
7,900.00	7,692.01	7,092.25	6,877.01	30.57	37.97	-157.49	-1,841.65	-668.27	3,367.74	3,311.94	47.12	71.873	
8,000.00	7,792.01	7,192.25	6,977.01	30.69	38.57	-157.59	-1,871.65	-679.27	3,407.74	3,351.94	47.75	71.744	
8,066.66	7,858.68	7,258.91	7,043.68	30.77	38.65	-157.66	-1,881.65	-684.27	3,417.74	3,361.94	47.83	71.707	
8,100.00	7,892.01	7,282.23	7,077.00	30.81	38.69	-157.70	-1,886.65	-689.27	3,422.74	3,366.94	47.87	71.693	
8,115.99	7,908.00	7,298.22	7,093.00	30.83	38.71	-157.72	-1,888.65	-691.27	3,424.74	3,368.94	47.89	71.689	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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 24-1 - P_BERNHARDT 24-1 - 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)	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	175.62	-109.29	8.36	109.61				
100.00	100.00	100.00	100.00	0.10	0.10	175.62	-109.29	8.36	109.61	109.42	0.19	573.707	
200.00	200.00	200.00	200.00	0.32	0.32	175.62	-109.29	8.36	109.61	108.97	0.64	171.106 CC, ES	
300.00	300.00	297.74	297.72	0.55	0.52	174.93	-110.17	9.77	110.63	109.56	1.07	103.507	
400.00	400.00	395.25	395.10	0.77	0.73	172.93	-112.82	14.00	113.79	112.29	1.50	75.669	
500.00	500.00	492.31	491.80	0.99	0.97	169.85	-117.20	20.99	119.35	117.38	1.97	60.686	
600.00	600.00	588.70	587.51	1.22	1.25	166.03	-123.27	30.67	127.64	125.19	2.46	51.900	
700.00	700.00	684.22	681.92	1.44	1.57	161.84	-130.97	42.95	139.02	136.04	2.98	46.622	
800.00	800.00	778.66	774.73	1.67	1.93	157.63	-140.23	57.71	153.73	150.20	3.53	43.543	
900.00	900.00	871.84	865.70	1.89	2.34	153.64	-150.94	74.80	171.92	167.82	4.10	41.921	
950.00	950.00	917.91	910.42	2.01	2.56	151.77	-156.82	84.18	182.33	177.94	4.39	41.522 SF	
1,000.00	1,000.00	963.51	954.50	2.12	2.79	178.07	-163.01	94.05	194.05	189.70	4.34	44.676	
1,100.00	1,099.93	1,052.79	1,040.25	2.34	3.28	174.92	-176.22	115.11	222.54	217.74	4.81	46.314	
1,200.00	1,199.68	1,139.16	1,122.43	2.57	3.81	172.30	-190.33	137.62	257.54	252.29	5.25	49.045	
1,300.00	1,299.13	1,222.23	1,200.67	2.81	4.36	170.16	-205.14	161.25	298.67	292.99	5.68	52.578	
1,400.00	1,398.15	1,300.00	1,273.17	3.07	4.92	168.47	-220.10	185.10	345.56	339.47	6.09	56.767	
1,500.00	1,496.63	1,377.27	1,344.42	3.36	5.53	167.02	-235.98	210.44	397.81	391.32	6.49	61.279	
1,600.00	1,594.44	1,449.74	1,410.47	3.69	6.12	165.83	-251.81	235.68	455.08	448.20	6.87	66.209	
1,700.00	1,691.46	1,527.75	1,481.18	4.07	6.80	164.77	-269.32	263.60	516.11	508.84	7.27	70.988	
1,800.00	1,787.58	1,604.77	1,550.99	4.51	7.47	163.91	-286.60	291.18	579.81	572.15	7.66	75.700	
1,876.78	1,860.70	1,662.45	1,603.27	4.89	7.97	163.34	-299.55	311.83	630.47	622.51	7.95	79.261	
1,900.00	1,882.71	1,679.70	1,618.90	5.01	8.12	163.30	-303.42	318.00	646.00	637.93	8.07	80.034	
2,000.00	1,977.53	1,753.98	1,686.23	5.55	8.77	163.15	-320.09	344.59	712.94	704.35	8.59	83.039	
2,100.00	2,072.34	1,828.27	1,753.55	6.11	9.43	163.03	-336.77	371.19	779.87	770.77	9.11	85.613	
2,200.00	2,167.15	1,902.55	1,820.88	6.68	10.08	162.92	-353.44	397.78	846.81	837.17	9.64	87.833	
2,300.00	2,261.96	1,976.83	1,888.20	7.27	10.74	162.83	-370.11	424.37	913.75	903.57	10.18	89.752	
2,400.00	2,356.78	2,051.12	1,955.53	7.86	11.40	162.75	-386.78	450.97	980.69	969.97	10.73	91.430	
2,500.00	2,451.59	2,125.40	2,022.86	8.46	12.06	162.68	-403.46	477.56	1,047.63	1,036.36	11.28	92.906	
2,600.00	2,546.40	2,199.68	2,090.18	9.07	12.72	162.62	-420.13	504.15	1,114.58	1,102.75	11.83	94.212	
2,700.00	2,641.21	2,273.97	2,157.51	9.69	13.38	162.57	-436.80	530.75	1,181.52	1,169.13	12.39	95.369	
2,800.00	2,736.03	2,348.25	2,224.84	10.30	14.04	162.52	-453.48	557.34	1,248.46	1,235.51	12.95	96.404	
2,900.00	2,830.84	2,422.53	2,292.16	10.92	14.70	162.48	-470.15	583.93	1,315.41	1,301.89	13.51	97.334	
3,000.00	2,925.65	2,496.82	2,359.49	11.55	15.36	162.44	-486.82	610.52	1,382.35	1,368.27	14.08	98.173	
3,100.00	3,020.47	2,571.10	2,426.82	12.17	16.03	162.41	-503.49	637.12	1,449.30	1,434.65	14.65	98.932	
3,200.00	3,115.28	2,645.38	2,494.14	12.80	16.69	162.38	-520.17	663.71	1,516.24	1,501.02	15.22	99.622	
3,300.00	3,210.09	2,719.67	2,561.47	13.43	17.35	162.35	-536.84	690.30	1,583.19	1,567.39	15.79	100.252	
3,400.00	3,304.90	2,793.95	2,628.80	14.06	18.02	162.32	-553.51	716.90	1,650.13	1,633.76	16.37	100.828	
3,500.00	3,399.72	2,868.23	2,696.12	14.69	18.68	162.30	-570.18	743.49	1,717.08	1,700.14	16.94	101.358	
3,600.00	3,494.53	2,942.52	2,763.45	15.32	19.34	162.27	-586.86	770.08	1,784.02	1,766.50	17.52	101.846	
3,700.00	3,589.34	3,016.80	2,830.78	15.96	20.01	162.25	-603.53	796.67	1,850.97	1,832.87	18.09	102.297	
3,800.00	3,684.15	3,091.08	2,898.10	16.59	20.67	162.23	-620.20	823.27	1,917.91	1,899.24	18.67	102.714	
3,900.00	3,778.97	3,165.37	2,965.43	17.23	21.34	162.21	-636.88	849.86	1,984.86	1,965.61	19.25	103.102	
4,000.00	3,873.78	3,239.65	3,032.76	17.86	22.00	162.20	-653.55	876.45	2,051.80	2,031.97	19.83	103.463	
4,100.00	3,968.59	3,313.93	3,100.08	18.50	22.67	162.18	-670.22	903.05	2,118.75	2,098.34	20.41	103.800	
4,200.00	4,063.40	3,388.22	3,167.41	19.14	23.33	162.17	-686.89	929.64	2,185.70	2,164.70	20.99	104.115	
4,300.00	4,158.22	3,462.50	3,234.74	19.78	24.00	162.15	-703.57	956.23	2,252.64	2,231.07	21.58	104.409	
4,400.00	4,253.03	3,536.78	3,302.06	20.41	24.66	162.14	-720.24	982.83	2,319.59	2,297.43	22.16	104.686	
4,500.00	4,347.84	3,611.07	3,369.39	21.05	25.33	162.13	-736.91	1,009.42	2,386.54	2,363.80	22.74	104.947	
4,600.00	4,442.65	3,685.35	3,436.72	21.69	26.00	162.11	-753.59	1,036.01	2,453.48	2,430.16	23.32	105.192	
4,700.00	4,537.47	3,759.63	3,504.04	22.33	26.66	162.10	-770.26	1,062.60	2,520.43	2,496.52	23.91	105.423	
4,800.00	4,632.28	3,833.92	3,571.37	22.97	27.33	162.09	-786.93	1,089.20	2,587.38	2,562.88	24.49	105.641	
4,900.00	4,727.09	3,908.20	3,638.69	23.61	27.99	162.08	-803.60	1,115.79	2,654.32	2,629.25	25.08	105.848	

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 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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	4,821.90	3,982.48	3,706.02	24.25	28.66	162.07	-820.28	1,142.38	2,721.27	2,695.61	25.66	106.043	
5,100.00	4,916.72	4,056.77	3,773.35	24.89	29.33	162.06	-836.95	1,168.98	2,788.22	2,761.97	26.25	106.229	
5,200.00	5,011.53	4,131.05	3,840.67	25.53	29.99	162.05	-853.62	1,195.57	2,855.16	2,828.33	26.83	106.405	
5,266.20	5,074.30	4,180.23	3,885.25	25.96	30.43	162.05	-864.66	1,213.17	2,899.48	2,872.26	27.22	106.517	
5,300.00	5,106.40	4,205.46	3,908.12	26.15	30.66	162.23	-870.32	1,222.21	2,921.97	2,894.44	27.53	106.142	
5,400.00	5,202.10	4,281.57	3,977.09	26.61	31.34	162.71	-887.41	1,249.45	2,986.82	2,958.41	28.40	105.164	
5,500.00	5,298.75	4,359.77	4,047.97	27.04	32.04	163.12	-904.96	1,277.45	3,049.09	3,019.84	29.25	104.247	
5,600.00	5,396.24	4,439.97	4,120.66	27.42	32.76	163.48	-922.96	1,306.16	3,108.73	3,078.66	30.07	103.397	
5,700.00	5,494.44	4,522.07	4,195.08	27.75	33.50	163.77	-941.39	1,335.55	3,165.64	3,134.79	30.85	102.617	
5,800.00	5,593.24	4,605.98	4,271.12	28.04	34.25	164.01	-960.22	1,365.59	3,219.78	3,188.19	31.60	101.907	
5,900.00	5,692.52	4,691.58	4,348.71	28.28	35.02	164.21	-979.43	1,396.23	3,271.08	3,238.78	32.30	101.266	
6,000.00	5,792.16	4,778.78	4,427.74	28.48	35.80	164.37	-999.00	1,427.45	3,319.48	3,286.51	32.97	100.693	
6,100.00	5,892.03	4,867.47	4,508.13	28.63	36.60	164.49	-1,018.91	1,459.20	3,364.93	3,331.34	33.59	100.187	
6,192.99	5,985.00	4,951.18	4,584.00	28.73	37.35	136.50	-1,037.70	1,489.17	3,404.50	3,370.38	34.12	99.774	
6,200.00	5,992.01	4,957.54	4,589.76	28.73	37.40	136.49	-1,039.13	1,491.45	3,407.39	3,373.23	34.16	99.760	
6,300.00	6,092.01	5,048.17	4,671.90	28.83	38.22	136.32	-1,059.47	1,523.89	3,448.56	3,413.91	34.65	99.528	
6,400.00	6,192.01	5,138.81	4,754.05	28.93	39.03	136.15	-1,079.81	1,556.34	3,489.75	3,454.61	35.14	99.304	
6,500.00	6,292.01	5,229.44	4,836.20	29.03	39.84	135.98	-1,100.15	1,588.78	3,530.97	3,495.33	35.64	99.087	
6,600.00	6,392.01	5,320.08	4,918.34	29.13	40.66	135.82	-1,120.50	1,621.23	3,572.21	3,536.08	36.13	98.876	
6,700.00	6,492.01	5,410.71	5,000.49	29.23	41.47	135.66	-1,140.84	1,653.68	3,613.47	3,576.85	36.62	98.671	
6,800.00	6,592.01	5,501.35	5,082.64	29.34	42.28	135.51	-1,161.18	1,686.12	3,654.76	3,617.65	37.11	98.473	
6,900.00	6,692.01	5,591.98	5,164.78	29.44	43.10	135.35	-1,181.53	1,718.57	3,696.07	3,658.46	37.61	98.280	
7,000.00	6,792.01	5,682.61	5,247.91	29.55	43.91	135.19	-1,201.87	1,750.91	3,737.30	3,699.58	38.11	98.087	
7,100.00	6,892.01	5,773.24	5,331.04	29.66	44.72	135.03	-1,222.21	1,783.25	3,778.43	3,740.71	38.61	97.894	
7,200.00	6,992.01	5,863.87	5,414.17	29.77	45.53	134.87	-1,242.55	1,815.59	3,819.56	3,781.84	39.11	97.701	
7,300.00	7,092.01	5,955.50	5,497.30	29.88	46.34	134.71	-1,262.89	1,847.93	3,860.69	3,822.97	39.61	97.508	
7,400.00	7,192.01	6,048.13	5,580.43	29.99	47.15	134.55	-1,283.23	1,880.27	3,901.82	3,864.10	40.11	97.315	
7,500.00	7,292.01	6,140.76	5,663.56	30.10	47.96	134.39	-1,303.57	1,912.61	3,942.95	3,905.23	40.61	97.122	
7,600.00	7,392.01	6,233.39	5,746.69	30.21	48.77	134.23	-1,323.91	1,944.95	3,984.08	3,946.36	41.11	96.929	
7,700.00	7,492.01	6,326.02	5,829.82	30.32	49.58	134.07	-1,344.25	1,977.29	4,025.21	3,987.49	41.61	96.736	
7,800.00	7,592.01	6,418.65	5,912.95	30.43	50.39	133.91	-1,364.59	2,009.63	4,066.34	4,028.62	42.11	96.543	
7,900.00	7,692.01	6,511.28	5,996.08	30.54	51.20	133.75	-1,384.93	2,041.97	4,107.47	4,069.75	42.61	96.350	
8,000.00	7,792.01	6,603.91	6,079.21	30.65	52.01	133.59	-1,405.27	2,074.31	4,148.60	4,110.88	43.11	96.157	
8,065.08	7,857.09	6,668.99	6,144.29	30.76	52.82	133.43	-1,425.61	2,106.65	4,189.73	4,152.01	43.61	95.964	
8,100.00	7,892.01	6,703.62	6,189.82	30.87	53.63	133.27	-1,445.95	2,138.99	4,230.86	4,193.14	44.11	95.771	
8,115.99	7,908.00	6,719.61	6,205.81	30.88	53.64	133.26	-1,446.94	2,140.00	4,231.87	4,194.15	44.12	95.772	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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-MWMD												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	176.63	-47.36	2.79	47.44				
100.00	100.00	100.00	100.00	0.10	0.10	176.63	-47.36	2.79	47.44	47.25	0.19	248.311	
200.00	200.00	200.00	200.00	0.32	0.32	176.63	-47.36	2.79	47.44	46.80	0.64	74.058	
300.00	300.00	300.04	300.02	0.55	0.53	178.74	-47.37	1.04	47.38	46.30	1.08	43.882	
317.89	317.89	317.92	317.89	0.59	0.58	179.56	-47.38	0.36	47.38	46.22	1.16	40.863 CC	
400.00	400.00	399.84	399.68	0.77	0.76	-174.96	-47.41	-4.18	47.60	46.07	1.52	31.245 ES	
500.00	500.00	499.16	498.62	0.99	1.01	-164.89	-47.48	-12.82	49.20	47.22	1.98	24.846	
600.00	600.00	597.76	596.49	1.22	1.30	-152.48	-47.57	-24.78	53.75	51.31	2.44	22.054	
700.00	700.00	695.43	692.96	1.44	1.62	-140.05	-47.68	-39.94	62.60	59.71	2.88	21.699 SF	
800.00	800.00	791.94	787.74	1.67	2.00	-129.43	-47.82	-58.15	76.28	72.95	3.33	22.913	
900.00	900.00	887.11	880.54	1.89	2.42	-121.20	-47.98	-79.22	94.64	90.85	3.78	25.013	
950.00	950.00	934.13	926.12	2.01	2.65	-117.91	-48.07	-90.76	105.44	101.42	4.02	26.240	
1,000.00	1,000.00	980.81	971.18	2.12	2.89	-86.98	-48.16	-102.96	117.24	112.86	4.38	26.770	
1,100.00	1,099.93	1,073.18	1,059.73	2.34	3.41	-83.21	-48.36	-129.25	143.30	138.45	4.85	29.533	
1,200.00	1,199.68	1,164.17	1,146.07	2.57	3.98	-81.20	-48.58	-157.93	172.08	166.73	5.35	32.180	
1,300.00	1,299.13	1,253.65	1,230.06	2.81	4.59	-80.24	-48.81	-188.80	203.22	197.35	5.87	34.610	
1,400.00	1,398.15	1,343.02	1,312.97	3.07	5.25	-79.92	-49.06	-222.16	236.53	230.09	6.44	36.734	
1,500.00	1,496.63	1,437.11	1,399.92	3.36	5.98	-80.23	-49.33	-258.09	270.12	263.04	7.08	38.147	
1,600.00	1,594.44	1,531.19	1,486.87	3.69	6.72	-81.01	-49.61	-294.01	303.29	295.50	7.79	38.927	
1,700.00	1,691.46	1,625.15	1,573.71	4.07	7.46	-82.12	-49.88	-329.89	336.17	327.59	8.58	39.178	
1,800.00	1,787.58	1,718.86	1,660.32	4.51	8.20	-83.46	-50.15	-365.67	368.94	359.48	9.46	39.008	
1,876.78	1,860.70	1,790.59	1,726.61	4.89	8.77	-84.62	-50.36	-393.06	394.15	383.96	10.20	38.660	
1,900.00	1,882.71	1,812.24	1,746.62	5.01	8.94	-85.13	-50.42	-401.33	401.81	391.37	10.44	38.501	
2,000.00	1,977.53	1,905.50	1,832.81	5.55	9.68	-87.14	-50.69	-436.94	435.09	423.59	11.50	37.835	
2,100.00	2,072.34	1,998.75	1,919.00	6.11	10.43	-88.87	-50.96	-472.55	468.79	456.19	12.60	37.219	
2,200.00	2,167.15	2,092.01	2,005.19	6.68	11.18	-90.37	-51.23	-508.16	502.82	489.11	13.71	36.662	
2,300.00	2,261.96	2,185.26	2,091.38	7.27	11.92	-91.68	-51.50	-543.78	537.12	522.27	14.85	36.167	
2,400.00	2,356.78	2,278.52	2,177.57	7.86	12.67	-92.84	-51.77	-579.39	571.65	555.65	16.00	35.727	
2,500.00	2,451.59	2,371.78	2,263.76	8.46	13.42	-93.86	-52.04	-615.00	606.36	589.20	17.16	35.337	
2,600.00	2,546.40	2,465.03	2,349.94	9.07	14.17	-94.78	-52.31	-650.61	641.22	622.89	18.33	34.991	
2,700.00	2,641.21	2,558.29	2,436.13	9.69	14.92	-95.60	-52.58	-686.22	676.21	656.71	19.50	34.682	
2,800.00	2,736.03	2,651.55	2,522.32	10.30	15.67	-96.34	-52.85	-721.83	711.31	690.64	20.67	34.407	
2,900.00	2,830.84	2,744.80	2,608.51	10.92	16.42	-97.01	-53.12	-757.44	746.51	724.66	21.85	34.161	
3,000.00	2,925.65	2,838.06	2,694.70	11.55	17.18	-97.62	-53.39	-793.05	781.79	758.76	23.03	33.939	
3,100.00	3,020.47	2,931.31	2,780.89	12.17	17.93	-98.18	-53.66	-828.66	817.14	792.93	24.22	33.739	
3,200.00	3,115.28	3,024.57	2,867.08	12.80	18.68	-98.69	-53.93	-864.27	852.56	827.15	25.41	33.558	
3,300.00	3,210.09	3,117.83	2,953.27	13.43	19.43	-99.17	-54.20	-899.88	888.03	861.44	26.59	33.393	
3,400.00	3,304.90	3,211.08	3,039.46	14.06	20.19	-99.60	-54.47	-935.49	923.55	895.77	27.78	33.243	
3,500.00	3,399.72	3,304.34	3,125.64	14.69	20.94	-100.00	-54.74	-971.10	959.11	930.14	28.97	33.105	
3,600.00	3,494.53	3,397.60	3,211.83	15.32	21.69	-100.38	-55.01	-1,006.72	994.71	964.55	30.16	32.979	
3,700.00	3,589.34	3,490.85	3,298.02	15.96	22.45	-100.73	-55.28	-1,042.33	1,030.35	999.00	31.35	32.863	
3,800.00	3,684.15	3,584.11	3,384.21	16.59	23.20	-101.05	-55.55	-1,077.94	1,066.02	1,033.47	32.54	32.755	
3,900.00	3,778.97	3,677.36	3,470.40	17.23	23.95	-101.36	-55.82	-1,113.55	1,101.71	1,067.98	33.74	32.656	
4,000.00	3,873.78	3,770.62	3,556.59	17.86	24.71	-101.65	-56.08	-1,149.16	1,137.43	1,102.50	34.93	32.564	
4,100.00	3,968.59	3,863.88	3,642.78	18.50	25.46	-101.91	-56.35	-1,184.77	1,173.18	1,137.06	36.12	32.478	
4,200.00	4,063.40	3,957.13	3,728.97	19.14	26.21	-102.17	-56.62	-1,220.38	1,208.94	1,171.63	37.32	32.398	
4,300.00	4,158.22	4,050.39	3,815.15	19.78	26.97	-102.40	-56.89	-1,255.99	1,244.73	1,206.22	38.51	32.323	
4,400.00	4,253.03	4,143.64	3,901.34	20.41	27.72	-102.63	-57.16	-1,291.60	1,280.53	1,240.83	39.70	32.253	
4,500.00	4,347.84	4,236.90	3,987.53	21.05	28.48	-102.84	-57.43	-1,327.21	1,316.35	1,275.45	40.90	32.188	
4,600.00	4,442.65	4,330.16	4,073.72	21.69	29.23	-103.04	-57.70	-1,362.82	1,352.18	1,310.09	42.09	32.126	
4,700.00	4,537.47	4,423.41	4,159.91	22.33	29.98	-103.23	-57.97	-1,398.43	1,388.03	1,344.75	43.28	32.068	
4,800.00	4,632.28	4,516.67	4,246.10	22.97	30.74	-103.42	-58.24	-1,434.04	1,423.89	1,379.42	44.48	32.014	

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 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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						
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
4,900.00	4,727.09	4,609.93	4,332.29	23.61	31.49	-103.59	-58.51	-1,469.66	1,459.77	1,414.09	45.67	31.962	
5,000.00	4,821.90	4,703.18	4,418.48	24.25	32.25	-103.75	-58.78	-1,505.27	1,495.65	1,448.78	46.87	31.913	
5,100.00	4,916.72	4,796.44	4,504.67	24.89	33.00	-103.91	-59.05	-1,540.88	1,531.54	1,483.48	48.06	31.867	
5,200.00	5,011.53	4,889.69	4,590.85	25.53	33.76	-104.06	-59.32	-1,576.49	1,567.45	1,518.19	49.25	31.823	
5,266.20	5,074.30	4,951.43	4,647.91	25.96	34.26	-104.15	-59.50	-1,600.06	1,591.22	1,541.17	50.05	31.795	
5,300.00	5,106.40	4,982.97	4,677.07	26.15	34.51	-104.44	-59.59	-1,612.11	1,603.31	1,552.80	50.51	31.744	
5,400.00	5,202.10	5,076.55	4,763.55	26.61	35.27	-105.20	-59.86	-1,647.84	1,638.54	1,586.78	51.76	31.655	
5,500.00	5,298.75	5,170.42	4,850.31	27.04	36.03	-105.82	-60.13	-1,683.69	1,672.92	1,619.97	52.95	31.595	
5,600.00	5,396.24	5,316.16	4,985.98	27.42	36.96	-106.21	-60.54	-1,736.87	1,705.32	1,651.12	54.20	31.463	
5,700.00	5,494.44	5,482.52	5,143.88	27.75	37.83	-106.51	-60.93	-1,789.15	1,733.08	1,677.72	55.36	31.304	
5,800.00	5,593.24	5,653.30	5,308.86	28.04	38.57	-106.75	-61.27	-1,833.19	1,755.87	1,699.50	56.37	31.150	
5,900.00	5,692.52	5,827.75	5,479.79	28.28	39.17	-106.94	-61.53	-1,867.96	1,773.52	1,716.31	57.21	31.000	
6,000.00	5,792.16	6,005.01	5,655.30	28.48	39.62	-107.08	-61.72	-1,892.56	1,785.86	1,727.98	57.88	30.855	
6,100.00	5,892.03	6,184.08	5,833.81	28.63	39.90	-107.17	-61.82	-1,906.34	1,792.79	1,734.43	58.36	30.718	
6,192.99	5,985.00	6,335.31	5,985.00	28.73	40.04	-135.28	-61.84	-1,909.34	1,794.43	1,735.78	58.64	30.598	
6,200.00	5,992.01	6,342.33	5,992.01	28.73	40.04	-135.28	-61.84	-1,909.34	1,794.43	1,735.77	58.66	30.592	
6,300.00	6,092.01	6,442.33	6,092.01	28.83	40.11	-135.28	-61.84	-1,909.34	1,794.43	1,735.58	58.84	30.495	
6,400.00	6,192.01	6,542.33	6,192.01	28.93	40.18	-135.28	-61.84	-1,909.34	1,794.43	1,735.39	59.04	30.396	
6,500.00	6,292.01	6,642.33	6,292.01	29.03	40.25	-135.28	-61.84	-1,909.34	1,794.43	1,735.19	59.23	30.296	
6,600.00	6,392.01	6,742.33	6,392.01	29.13	40.33	-135.28	-61.84	-1,909.34	1,794.43	1,735.00	59.43	30.195	
6,700.00	6,492.01	6,842.33	6,492.01	29.23	40.40	-135.28	-61.84	-1,909.34	1,794.43	1,734.80	59.63	30.093	
6,800.00	6,592.01	6,942.33	6,592.01	29.34	40.48	-135.28	-61.84	-1,909.34	1,794.43	1,734.59	59.83	29.991	
6,900.00	6,692.01	7,042.33	6,692.01	29.44	40.56	-135.28	-61.84	-1,909.34	1,794.43	1,734.39	60.04	29.888	
7,000.00	6,792.01	7,142.33	6,792.01	29.55	40.64	-135.28	-61.84	-1,909.34	1,794.43	1,734.18	60.25	29.785	
7,100.00	6,892.01	7,242.33	6,892.01	29.66	40.72	-135.28	-61.84	-1,909.34	1,794.43	1,733.97	60.46	29.681	
7,200.00	6,992.01	7,342.33	6,992.01	29.77	40.80	-135.28	-61.84	-1,909.34	1,794.43	1,733.75	60.67	29.577	
7,300.00	7,092.01	7,442.33	7,092.01	29.88	40.88	-135.28	-61.84	-1,909.34	1,794.43	1,733.54	60.89	29.472	
7,400.00	7,192.01	7,542.33	7,192.01	29.99	40.96	-135.28	-61.84	-1,909.34	1,794.43	1,733.32	61.11	29.366	
7,500.00	7,292.01	7,642.33	7,292.01	30.11	41.05	-135.28	-61.84	-1,909.34	1,794.43	1,733.10	61.33	29.260	
7,600.00	7,392.01	7,742.33	7,392.01	30.22	41.13	-135.28	-61.84	-1,909.34	1,794.43	1,732.87	61.55	29.154	
7,700.00	7,492.01	7,842.33	7,492.01	30.34	41.22	-135.28	-61.84	-1,909.34	1,794.43	1,732.65	61.78	29.047	
7,800.00	7,592.01	7,942.33	7,592.01	30.45	41.31	-135.28	-61.84	-1,909.34	1,794.43	1,732.42	62.01	28.940	
7,900.00	7,692.01	8,042.33	7,692.01	30.57	41.39	-135.28	-61.84	-1,909.34	1,794.43	1,732.19	62.24	28.832	
8,000.00	7,792.01	8,142.33	7,792.01	30.69	41.48	-135.28	-61.84	-1,909.34	1,794.43	1,731.96	62.47	28.725	
8,065.27	7,857.29	8,207.60	7,857.29	30.77	41.54	-135.28	-61.84	-1,909.34	1,794.43	1,731.80	62.62	28.654	
8,100.00	7,892.01	8,238.31	7,888.00	30.81	41.57	-135.28	-61.84	-1,909.34	1,794.43	1,731.73	62.70	28.619	
8,115.99	7,908.00	8,238.31	7,888.00	30.83	41.57	-135.28	-61.84	-1,909.34	1,794.54	1,731.82	62.72	28.611	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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	
0.00	0.00	0.00	0.00	0.00	0.00	175.14	-32.79	2.79	32.90				
100.00	100.00	100.00	100.00	0.10	0.10	175.14	-32.79	2.79	32.90	32.71	0.19	172.230	
200.00	200.00	200.00	200.00	0.32	0.32	175.14	-32.79	2.79	32.90	32.26	0.64	51.367	
300.00	300.00	300.00	300.00	0.55	0.55	175.14	-32.79	2.79	32.90	31.81	1.09	30.185	
400.00	400.00	400.00	400.00	0.77	0.77	175.14	-32.79	2.79	32.90	31.37	1.54	21.372	
500.00	500.00	500.00	500.00	0.99	0.99	175.14	-32.79	2.79	32.90	30.92	1.99	16.542	
600.00	600.00	600.00	600.00	1.22	1.22	175.14	-32.79	2.79	32.90	30.47	2.44	13.493	
700.00	700.00	700.00	700.00	1.44	1.44	175.14	-32.79	2.79	32.90	30.02	2.89	11.393	
800.00	800.00	800.00	800.00	1.67	1.67	175.14	-32.79	2.79	32.90	29.57	3.34	9.858	
900.00	900.00	900.00	900.00	1.89	1.89	175.14	-32.79	2.79	32.90	29.12	3.79	8.688	
950.00	950.00	950.00	950.00	2.01	2.01	175.14	-32.79	2.79	32.90	28.89	4.01	8.201 CC	
1,000.00	1,000.00	1,000.30	1,000.30	2.12	2.12	-156.45	-32.59	2.39	33.08	28.84	4.23	7.815 ES	
1,100.00	1,099.93	1,100.87	1,100.80	2.34	2.33	-153.74	-31.01	-0.76	34.50	29.83	4.67	7.394	
1,200.00	1,199.68	1,201.33	1,201.01	2.57	2.55	-148.98	-27.85	-7.06	37.55	32.44	5.11	7.351 SF	
1,300.00	1,299.13	1,301.62	1,300.74	2.81	2.79	-143.17	-23.14	-16.48	42.50	36.93	5.57	7.630	
1,400.00	1,398.15	1,401.68	1,399.81	3.07	3.06	-137.31	-16.87	-28.98	49.60	43.53	6.07	8.169	
1,500.00	1,496.63	1,501.43	1,498.03	3.36	3.35	-132.02	-9.09	-44.52	58.97	52.34	6.63	8.890	
1,600.00	1,594.44	1,600.82	1,595.24	3.69	3.69	-127.54	0.18	-63.03	70.63	63.35	7.27	9.712	
1,700.00	1,691.46	1,699.79	1,691.26	4.07	4.08	-123.87	10.90	-84.45	84.53	76.53	8.00	10.560	
1,800.00	1,787.58	1,798.28	1,785.94	4.51	4.53	-120.89	23.04	-108.69	100.63	91.78	8.84	11.379	
1,876.78	1,860.70	1,873.55	1,857.64	4.89	4.92	-118.98	33.30	-129.17	114.43	104.86	9.57	11.959	
1,900.00	1,882.71	1,896.25	1,879.14	5.01	5.04	-118.50	36.56	-135.68	118.81	109.01	9.80	12.124	
2,000.00	1,977.53	1,993.93	1,971.05	5.55	5.61	-115.98	51.37	-165.25	137.96	127.09	10.87	12.691	
2,100.00	2,072.34	2,091.86	2,062.94	6.11	6.21	-113.80	66.54	-195.53	157.43	145.44	12.00	13.125	
2,200.00	2,167.15	2,189.79	2,154.82	6.68	6.84	-112.11	81.70	-225.81	177.08	163.93	13.15	13.467	
2,300.00	2,261.96	2,287.73	2,246.71	7.27	7.48	-110.75	96.87	-256.09	196.84	182.52	14.32	13.741	
2,400.00	2,356.78	2,385.66	2,338.60	7.86	8.13	-109.64	112.03	-286.37	216.70	201.18	15.52	13.965	
2,500.00	2,451.59	2,483.59	2,430.49	8.46	8.79	-108.71	127.19	-316.65	236.62	219.89	16.72	14.149	
2,600.00	2,546.40	2,581.52	2,522.38	9.07	9.46	-107.93	142.36	-346.93	256.58	238.64	17.94	14.302	
2,700.00	2,641.21	2,679.45	2,614.27	9.69	10.13	-107.27	157.52	-377.21	276.59	257.43	19.16	14.432	
2,800.00	2,736.03	2,777.38	2,706.16	10.30	10.81	-106.69	172.69	-407.49	296.63	276.23	20.40	14.543	
2,900.00	2,830.84	2,875.31	2,798.05	10.92	11.49	-106.18	187.85	-437.77	316.69	295.06	21.63	14.639	
3,000.00	2,925.65	2,973.24	2,889.94	11.55	12.17	-105.74	203.02	-468.05	336.78	313.90	22.88	14.722	
3,100.00	3,020.47	3,071.17	2,981.83	12.17	12.86	-105.34	218.18	-498.33	356.88	332.76	24.12	14.795	
3,200.00	3,115.28	3,169.10	3,073.72	12.80	13.55	-104.99	233.35	-528.61	377.00	351.62	25.37	14.859	
3,300.00	3,210.09	3,267.03	3,165.61	13.43	14.24	-104.67	248.51	-558.89	397.12	370.50	26.62	14.916	
3,400.00	3,304.90	3,364.96	3,257.50	14.06	14.93	-104.39	263.67	-589.17	417.26	389.38	27.88	14.967	
3,500.00	3,399.72	3,462.90	3,349.39	14.69	15.62	-104.13	278.84	-619.45	437.41	408.28	29.14	15.013	
3,600.00	3,494.53	3,560.83	3,441.27	15.32	16.32	-103.89	294.00	-649.73	457.57	427.17	30.40	15.054	
3,700.00	3,589.34	3,658.76	3,533.16	15.96	17.01	-103.67	309.17	-680.01	477.73	446.07	31.66	15.091	
3,800.00	3,684.15	3,756.69	3,625.05	16.59	17.71	-103.48	324.33	-710.29	497.90	464.98	32.92	15.125	
3,900.00	3,778.97	3,854.62	3,716.94	17.23	18.41	-103.29	339.50	-740.57	518.07	483.89	34.18	15.156	
4,000.00	3,873.78	3,952.55	3,808.83	17.86	19.10	-103.12	354.66	-770.85	538.25	502.81	35.45	15.185	
4,100.00	3,968.59	4,050.48	3,900.72	18.50	19.80	-102.96	369.83	-801.12	558.44	521.72	36.71	15.211	
4,200.00	4,063.40	4,148.41	3,992.61	19.14	20.50	-102.82	384.99	-831.40	578.62	540.64	37.98	15.235	
4,300.00	4,158.22	4,246.34	4,084.50	19.78	21.20	-102.68	400.16	-861.68	598.81	559.57	39.25	15.257	
4,400.00	4,253.03	4,344.27	4,176.39	20.41	21.90	-102.55	415.32	-891.96	619.01	578.49	40.52	15.278	
4,500.00	4,347.84	4,442.20	4,268.28	21.05	22.60	-102.43	430.48	-922.24	639.20	597.42	41.79	15.297	
4,600.00	4,442.65	4,540.13	4,360.17	21.69	23.30	-102.32	445.65	-952.52	659.40	616.35	43.06	15.315	
4,700.00	4,537.47	4,638.07	4,452.06	22.33	24.00	-102.21	460.81	-982.80	679.60	635.28	44.33	15.332	
4,800.00	4,632.28	4,736.00	4,543.95	22.97	24.71	-102.11	475.98	-1,013.08	699.81	654.21	45.60	15.348	
4,900.00	4,727.09	4,833.93	4,635.83	23.61	25.41	-102.02	491.14	-1,043.36	720.01	673.14	46.87	15.362	

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 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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 4-1 - P_BERNHARDT 4- - PLAN #1 11-04-09												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	4,821.90	4,931.86	4,727.72	24.25	26.11	-101.93	506.31	-1,073.64	740.22	692.08	48.14	15.376	
5,100.00	4,916.72	5,029.79	4,819.61	24.89	26.81	-101.85	521.47	-1,103.92	760.43	711.02	49.41	15.389	
5,200.00	5,011.53	5,127.72	4,911.50	25.53	27.52	-101.77	536.64	-1,134.20	780.64	729.95	50.69	15.401	
5,266.20	5,074.30	5,192.55	4,972.33	25.96	27.98	-101.72	546.68	-1,154.25	794.02	742.49	51.53	15.409	
5,300.00	5,106.40	5,226.16	5,003.87	26.15	28.22	-101.81	551.88	-1,164.63	800.81	748.86	51.95	15.414	
5,400.00	5,202.10	5,335.92	5,107.63	26.61	28.86	-102.03	567.91	-1,196.64	819.67	766.62	53.06	15.449	
5,500.00	5,298.75	5,446.49	5,213.45	27.04	29.39	-102.22	582.25	-1,225.27	836.41	782.39	54.02	15.483	
5,600.00	5,396.24	5,557.77	5,321.12	27.42	29.86	-102.38	594.82	-1,250.38	850.99	796.10	54.89	15.504	
5,700.00	5,494.44	5,669.68	5,430.42	27.75	30.27	-102.51	605.56	-1,271.83	863.36	807.71	55.65	15.514	
5,800.00	5,593.24	5,782.12	5,541.09	28.04	30.63	-102.62	614.43	-1,289.53	873.51	817.21	56.31	15.514	
5,900.00	5,692.52	5,894.99	5,652.89	28.28	30.92	-102.69	621.36	-1,303.38	881.42	824.56	56.86	15.502	
6,000.00	5,792.16	6,008.20	5,765.55	28.48	31.16	-102.74	626.33	-1,313.30	887.05	829.75	57.30	15.481	
6,100.00	5,892.03	6,121.63	5,878.77	28.63	31.33	-102.77	629.31	-1,319.24	890.40	832.77	57.63	15.450	
6,192.99	5,985.00	6,227.20	5,984.32	28.73	31.44	-130.83	630.27	-1,321.17	891.46	833.61	57.85	15.410	
6,200.00	5,992.01	6,234.89	5,992.01	28.73	31.45	-130.83	630.28	-1,321.17	891.46	833.60	57.86	15.407	
6,300.00	6,092.01	6,334.89	6,092.01	28.83	31.53	-130.83	630.28	-1,321.17	891.46	833.41	58.05	15.356	
6,400.00	6,192.01	6,434.89	6,192.01	28.93	31.63	-130.83	630.28	-1,321.17	891.46	833.21	58.25	15.304	
6,500.00	6,292.01	6,534.89	6,292.01	29.03	31.72	-130.83	630.28	-1,321.17	891.46	833.01	58.45	15.251	
6,600.00	6,392.01	6,634.89	6,392.01	29.13	31.82	-130.83	630.28	-1,321.17	891.46	832.81	58.66	15.198	
6,700.00	6,492.01	6,734.89	6,492.01	29.23	31.91	-130.83	630.28	-1,321.17	891.46	832.60	58.86	15.145	
6,800.00	6,592.01	6,834.89	6,592.01	29.34	32.01	-130.83	630.28	-1,321.17	891.46	832.39	59.07	15.091	
6,900.00	6,692.01	6,934.89	6,692.01	29.44	32.11	-130.83	630.28	-1,321.17	891.46	832.18	59.28	15.037	
7,000.00	6,792.01	7,034.89	6,792.01	29.55	32.21	-130.83	630.28	-1,321.17	891.46	831.97	59.50	14.983	
7,100.00	6,892.01	7,134.89	6,892.01	29.66	32.32	-130.83	630.28	-1,321.17	891.46	831.75	59.71	14.929	
7,200.00	6,992.01	7,234.89	6,992.01	29.77	32.42	-130.83	630.28	-1,321.17	891.46	831.53	59.93	14.874	
7,300.00	7,092.01	7,334.89	7,092.01	29.88	32.52	-130.83	630.28	-1,321.17	891.46	831.31	60.16	14.819	
7,400.00	7,192.01	7,434.89	7,192.01	29.99	32.63	-130.83	630.28	-1,321.17	891.46	831.08	60.38	14.764	
7,500.00	7,292.01	7,534.89	7,292.01	30.11	32.74	-130.83	630.28	-1,321.17	891.46	830.86	60.61	14.709	
7,600.00	7,392.01	7,634.89	7,392.01	30.22	32.85	-130.83	630.28	-1,321.17	891.46	830.63	60.84	14.653	
7,700.00	7,492.01	7,734.89	7,492.01	30.34	32.96	-130.83	630.28	-1,321.17	891.46	830.39	61.07	14.597	
7,800.00	7,592.01	7,834.89	7,592.01	30.45	33.07	-130.83	630.28	-1,321.17	891.46	830.16	61.31	14.541	
7,900.00	7,692.01	7,934.89	7,692.01	30.57	33.18	-130.83	630.28	-1,321.17	891.46	829.92	61.54	14.485	
8,000.00	7,792.01	8,034.89	7,792.01	30.69	33.29	-130.83	630.28	-1,321.17	891.46	829.68	61.78	14.429	
8,100.00	7,892.01	8,134.89	7,892.01	30.81	33.41	-130.83	630.28	-1,321.17	891.46	829.44	62.02	14.373	
8,115.99	7,908.00	8,150.88	7,908.00	30.83	33.42	-130.83	630.28	-1,321.17	891.46	829.40	62.06	14.364	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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	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	
300.00	300.00	300.26	300.24	0.55	0.54	163.25	-13.31	4.01	13.90	12.81	1.09	12.776	
400.00	400.00	400.27	400.11	0.77	0.77	141.28	-9.54	7.65	12.22	10.68	1.54	7.931	
421.17	421.17	421.39	421.17	0.82	0.83	133.98	-8.42	8.73	12.13	10.48	1.64	7.387 CC, ES	
500.00	500.00	499.80	499.25	0.99	1.02	103.55	-3.30	13.67	14.08	12.07	2.02	6.984 SF	
600.00	600.00	598.60	597.32	1.22	1.30	76.35	5.35	22.02	22.81	20.32	2.50	9.139	
700.00	700.00	696.47	693.98	1.44	1.62	63.42	16.30	32.59	36.93	33.95	2.98	12.394	
800.00	800.00	793.17	788.94	1.67	1.99	56.96	29.45	45.28	55.14	51.67	3.48	15.864	
900.00	900.00	888.52	881.91	1.89	2.39	53.32	44.67	59.97	76.94	72.95	3.99	19.300	
950.00	950.00	935.64	927.58	2.01	2.62	52.07	53.01	68.02	89.11	84.86	4.25	20.969	
1,000.00	1,000.00	982.38	972.69	2.12	2.85	79.11	61.82	76.52	102.02	97.72	4.29	23.761	
1,100.00	1,099.93	1,074.77	1,061.24	2.34	3.35	78.50	80.78	94.82	129.69	124.92	4.77	27.202	
1,200.00	1,199.68	1,165.55	1,147.38	2.57	3.89	78.95	101.40	114.73	159.76	154.51	5.26	30.397	
1,300.00	1,299.13	1,254.60	1,230.94	2.81	4.47	79.89	123.52	136.08	192.25	186.48	5.77	33.342	
1,400.00	1,398.15	1,341.77	1,311.78	3.07	5.08	81.03	146.98	158.72	227.19	220.89	6.31	36.031	
1,500.00	1,496.63	1,434.38	1,397.11	3.36	5.77	82.45	172.89	183.74	263.37	256.45	6.92	38.075	
1,600.00	1,594.44	1,526.99	1,482.42	3.69	6.47	84.06	198.80	208.75	299.49	291.90	7.59	39.466	
1,700.00	1,691.46	1,619.28	1,567.45	4.07	7.16	85.76	224.62	233.67	335.75	327.42	8.33	40.304	
1,800.00	1,787.58	1,711.13	1,652.07	4.51	7.86	87.54	250.32	258.48	372.35	363.20	9.15	40.693	
1,876.78	1,860.70	1,781.31	1,716.72	4.89	8.40	88.92	269.96	277.43	400.80	390.97	9.84	40.750	
1,900.00	1,882.71	1,802.47	1,736.22	5.01	8.56	89.51	275.88	283.15	409.48	399.42	10.06	40.711	
2,000.00	1,977.53	1,893.63	1,820.21	5.55	9.26	91.82	301.39	307.77	447.27	436.23	11.04	40.502	
2,100.00	2,072.34	1,984.79	1,904.19	6.11	9.96	93.77	326.89	332.39	485.60	473.54	12.06	40.266	
2,200.00	2,167.15	2,075.95	1,988.18	6.68	10.66	95.44	352.40	357.01	524.35	511.25	13.10	40.029	
2,300.00	2,261.96	2,167.11	2,072.16	7.27	11.36	96.89	377.90	381.63	563.43	549.27	14.16	39.804	
2,400.00	2,356.78	2,258.27	2,156.15	7.86	12.07	98.15	403.41	406.25	602.78	587.56	15.22	39.597	
2,500.00	2,451.59	2,349.43	2,240.13	8.46	12.77	99.25	428.92	430.87	642.36	626.06	16.30	39.409	
2,600.00	2,546.40	2,440.59	2,324.12	9.07	13.48	100.23	454.42	455.49	682.11	664.73	17.38	39.240	
2,700.00	2,641.21	2,531.75	2,408.10	9.69	14.18	101.11	479.93	480.11	722.01	703.54	18.47	39.088	
2,800.00	2,736.03	2,622.92	2,492.09	10.30	14.89	101.89	505.44	504.73	762.05	742.48	19.56	38.952	
2,900.00	2,830.84	2,714.08	2,576.07	10.92	15.59	102.59	530.94	529.35	802.19	781.53	20.66	38.829	
3,000.00	2,925.65	2,805.24	2,660.06	11.55	16.30	103.23	556.45	553.97	842.42	820.67	21.76	38.719	
3,100.00	3,020.47	2,896.40	2,744.04	12.17	17.01	103.81	581.95	578.59	882.74	859.88	22.86	38.619	
3,200.00	3,115.28	2,987.56	2,828.03	12.80	17.71	104.34	607.46	603.21	923.13	899.17	23.96	38.530	
3,300.00	3,210.09	3,078.72	2,912.01	13.43	18.42	104.83	632.97	627.83	963.57	938.51	25.06	38.448	
3,400.00	3,304.90	3,169.88	2,996.00	14.06	19.13	105.28	658.47	652.45	1,004.07	977.91	26.17	38.374	
3,500.00	3,399.72	3,261.04	3,079.98	14.69	19.84	105.69	683.98	677.07	1,044.62	1,017.35	27.27	38.307	
3,600.00	3,494.53	3,352.20	3,163.97	15.32	20.55	106.07	709.49	701.69	1,085.21	1,056.83	28.38	38.245	
3,700.00	3,589.34	3,443.36	3,247.95	15.96	21.25	106.43	734.99	726.31	1,125.83	1,096.35	29.48	38.189	
3,800.00	3,684.15	3,534.52	3,331.94	16.59	21.96	106.76	760.50	750.93	1,166.49	1,135.91	30.59	38.137	
3,900.00	3,778.97	3,625.68	3,415.93	17.23	22.67	107.06	786.00	775.55	1,207.19	1,175.49	31.69	38.089	
4,000.00	3,873.78	3,716.84	3,499.91	17.86	23.38	107.35	811.51	800.17	1,247.90	1,215.10	32.80	38.045	
4,100.00	3,968.59	3,808.00	3,583.90	18.50	24.09	107.62	837.02	824.79	1,288.65	1,254.74	33.91	38.004	
4,200.00	4,063.40	3,899.16	3,667.88	19.14	24.80	107.87	862.52	849.41	1,329.41	1,294.40	35.02	37.966	
4,300.00	4,158.22	3,990.32	3,751.87	19.78	25.51	108.11	888.03	874.03	1,370.20	1,334.07	36.12	37.931	
4,400.00	4,253.03	4,081.48	3,835.85	20.41	26.21	108.34	913.54	898.65	1,411.00	1,373.77	37.23	37.898	
4,500.00	4,347.84	4,172.64	3,919.84	21.05	26.92	108.55	939.04	923.27	1,451.82	1,413.48	38.34	37.868	
4,600.00	4,442.65	4,263.80	4,003.82	21.69	27.63	108.75	964.55	947.89	1,492.66	1,453.21	39.45	37.839	
4,700.00	4,537.47	4,354.96	4,087.81	22.33	28.34	108.94	990.05	972.51	1,533.51	1,492.96	40.56	37.813	
4,800.00	4,632.28	4,446.12	4,171.79	22.97	29.05	109.12	1,015.56	997.13	1,574.38	1,532.71	41.66	37.788	

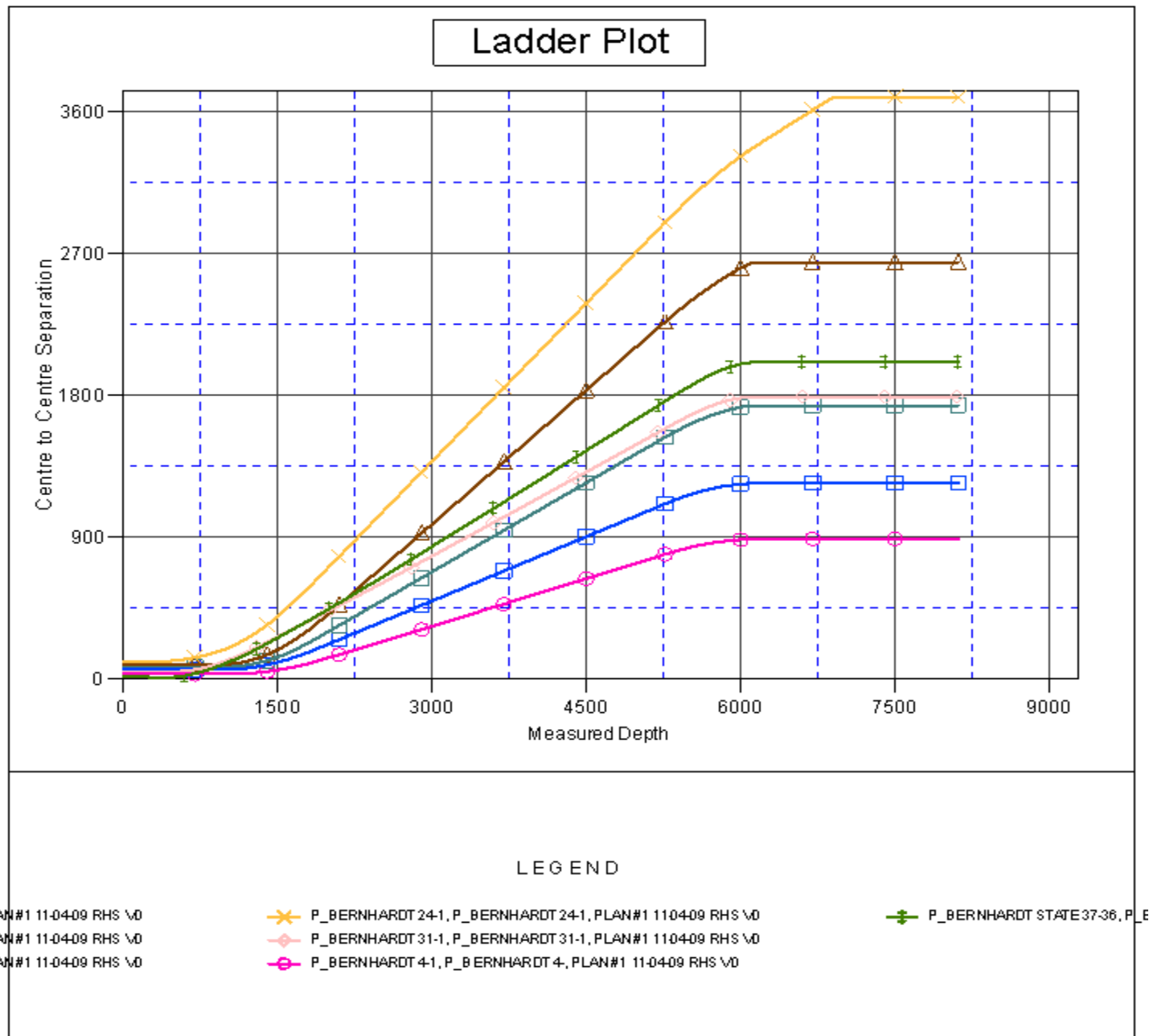
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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
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	
4,900.00	4,727.09	4,537.29	4,255.78	23.61	29.76	109.29	1,041.07	1,021.75	1,615.25	1,572.48	42.77	37.764	
5,000.00	4,821.90	4,628.45	4,339.76	24.25	30.47	109.45	1,066.57	1,046.37	1,656.14	1,612.26	43.88	37.742	
5,100.00	4,916.72	4,719.61	4,423.75	24.89	31.18	109.60	1,092.08	1,070.99	1,697.04	1,652.05	44.99	37.721	
5,200.00	5,011.53	4,810.77	4,507.73	25.53	31.89	109.75	1,117.59	1,095.61	1,737.95	1,691.85	46.10	37.701	
5,266.20	5,074.30	4,871.12	4,563.33	25.96	32.36	109.85	1,134.47	1,111.91	1,765.04	1,718.20	46.83	37.689	
5,300.00	5,106.40	4,901.96	4,591.75	26.15	32.60	110.17	1,143.10	1,120.24	1,778.80	1,731.53	47.27	37.630	
5,400.00	5,202.10	4,993.60	4,676.18	26.61	33.31	111.03	1,168.74	1,144.99	1,818.80	1,770.33	48.47	37.521	
5,500.00	5,298.75	5,085.72	4,761.04	27.04	34.03	111.74	1,194.52	1,169.87	1,857.64	1,808.02	49.62	37.438	
5,600.00	5,396.24	5,178.20	4,846.25	27.42	34.75	112.32	1,220.39	1,194.85	1,895.30	1,844.60	50.71	37.379	
5,700.00	5,494.44	5,332.61	4,989.48	27.75	35.78	112.62	1,261.86	1,234.87	1,930.79	1,878.86	51.93	37.178	
5,800.00	5,593.24	5,526.70	5,173.50	28.04	36.76	112.77	1,306.16	1,277.63	1,960.63	1,907.54	53.09	36.930	
5,900.00	5,692.52	5,727.95	5,368.26	28.28	37.60	112.88	1,342.52	1,312.73	1,984.20	1,930.12	54.09	36.685	
6,000.00	5,792.16	5,934.94	5,571.76	28.48	38.26	112.94	1,369.57	1,338.84	2,001.21	1,946.31	54.90	36.451	
6,100.00	5,892.03	6,145.93	5,781.44	28.63	38.72	112.97	1,386.18	1,354.87	2,011.43	1,955.92	55.51	36.234	
6,192.99	5,985.00	6,344.01	5,979.33	28.73	38.95	84.92	1,391.64	1,360.14	2,014.71	1,958.81	55.89	36.046	
6,200.00	5,992.01	6,356.69	5,992.01	28.73	38.96	84.92	1,391.65	1,360.15	2,014.71	1,958.80	55.91	36.034	
6,300.00	6,092.01	6,456.69	6,092.01	28.83	39.03	84.92	1,391.65	1,360.15	2,014.71	1,958.61	56.10	35.912	
6,400.00	6,192.01	6,556.69	6,192.01	28.93	39.10	84.92	1,391.65	1,360.15	2,014.71	1,958.42	56.30	35.788	
6,500.00	6,292.01	6,656.69	6,292.01	29.03	39.18	84.92	1,391.65	1,360.15	2,014.71	1,958.22	56.49	35.663	
6,600.00	6,392.01	6,756.69	6,392.01	29.13	39.25	84.92	1,391.65	1,360.15	2,014.71	1,958.02	56.69	35.538	
6,700.00	6,492.01	6,856.69	6,492.01	29.23	39.33	84.92	1,391.65	1,360.15	2,014.71	1,957.82	56.89	35.411	
6,800.00	6,592.01	6,956.69	6,592.01	29.34	39.40	84.92	1,391.65	1,360.15	2,014.71	1,957.61	57.10	35.284	
6,900.00	6,692.01	7,056.69	6,692.01	29.44	39.48	84.92	1,391.65	1,360.15	2,014.71	1,957.41	57.31	35.156	
7,000.00	6,792.01	7,156.69	6,792.01	29.55	39.56	84.92	1,391.65	1,360.15	2,014.71	1,957.20	57.52	35.027	
7,100.00	6,892.01	7,256.69	6,892.01	29.66	39.64	84.92	1,391.65	1,360.15	2,014.71	1,956.98	57.73	34.897	
7,200.00	6,992.01	7,356.69	6,992.01	29.77	39.72	84.92	1,391.65	1,360.15	2,014.71	1,956.77	57.95	34.767	
7,300.00	7,092.01	7,456.69	7,092.01	29.88	39.80	84.92	1,391.65	1,360.15	2,014.71	1,956.55	58.17	34.636	
7,400.00	7,192.01	7,556.69	7,192.01	29.99	39.89	84.92	1,391.65	1,360.15	2,014.71	1,956.33	58.39	34.505	
7,500.00	7,292.01	7,656.69	7,292.01	30.11	39.97	84.92	1,391.65	1,360.15	2,014.71	1,956.10	58.61	34.373	
7,600.00	7,392.01	7,756.69	7,392.01	30.22	40.06	84.92	1,391.65	1,360.15	2,014.71	1,955.87	58.84	34.241	
7,700.00	7,492.01	7,856.69	7,492.01	30.34	40.14	84.92	1,391.65	1,360.15	2,014.71	1,955.65	59.07	34.108	
7,800.00	7,592.01	7,956.69	7,592.01	30.45	40.23	84.92	1,391.65	1,360.15	2,014.71	1,955.41	59.30	33.974	
7,900.00	7,692.01	8,056.69	7,692.01	30.57	40.32	84.92	1,391.65	1,360.15	2,014.71	1,955.18	59.54	33.841	
8,000.00	7,792.01	8,156.69	7,792.01	30.69	40.41	84.92	1,391.65	1,360.15	2,014.71	1,954.94	59.77	33.707	
8,100.00	7,892.01	8,256.69	7,892.01	30.81	40.50	84.92	1,391.65	1,360.15	2,014.71	1,954.70	60.01	33.572	
8,115.99	7,908.00	8,272.67	7,908.00	30.83	40.51	84.92	1,391.65	1,360.15	2,014.71	1,954.67	60.05	33.551	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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 29-1
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 29-1
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 29-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 29-1	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 29-1
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°

