



US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
WELD_BERNHARDT 8 PAD 4N67W1
P_BERNHARDT 18-1**

P_BERNHARDT 18-1

Plan: PLAN #1 11-04-09 RHS

Standard Planning Report

04 November, 2009



P. BERNHARDT 18-1
COLORADO NORTHERN ZONE - 83
SECTION 1 T4N R67W
1351 FNL 1989
LAT: 40° 20' 42.396 N
LONG: 104° 50' 28.752 W



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

WELL DETAILS: P_BERNHARDT 18-1

+N/-S	+E/-W	Northing	Ground Level:	Easting	Latitude	Longitude	Slot
0.00	0.00	1369246.13	4825.00	3183596.05	40° 20' 42.396 N	104° 50' 28.752 W	

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2627.00	2653.64	PARKMAN TOP
4355.00	4417.25	SUSSEX TOP
4738.00	4808.14	SHANNON TOP
6949.00	7036.17	NIO A TOP
7272.00	7359.17	CODELL TOP
7722.00	7809.17	JSAND TOP

SECTION DETAILS

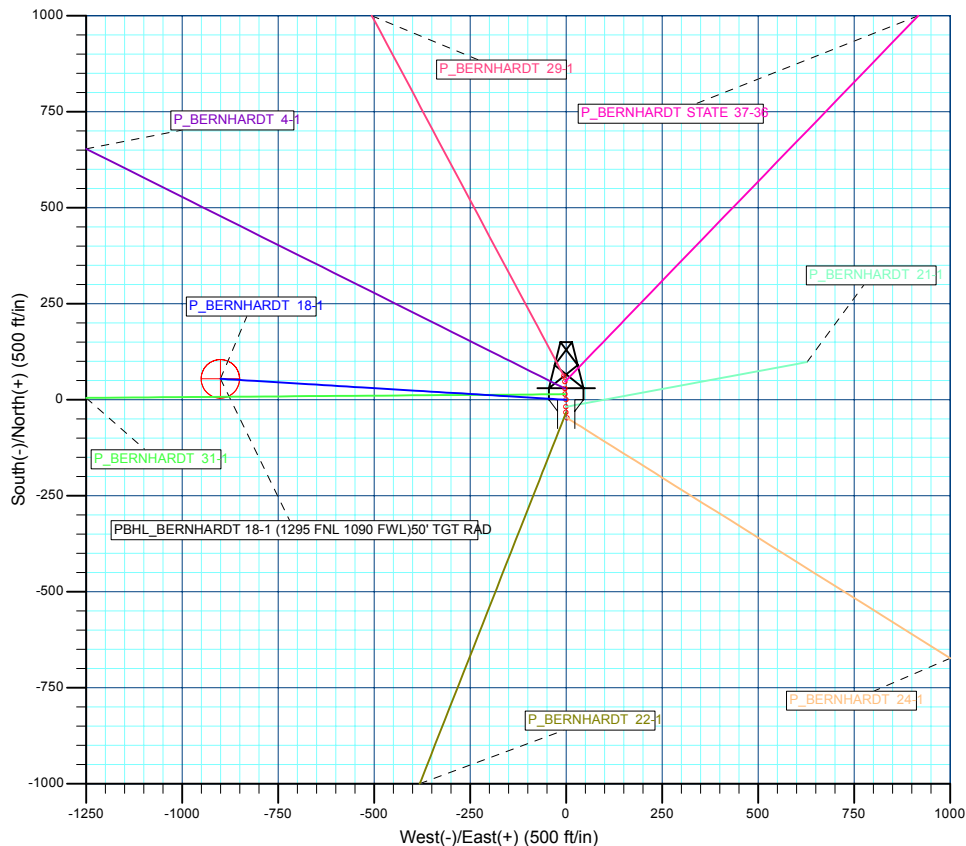
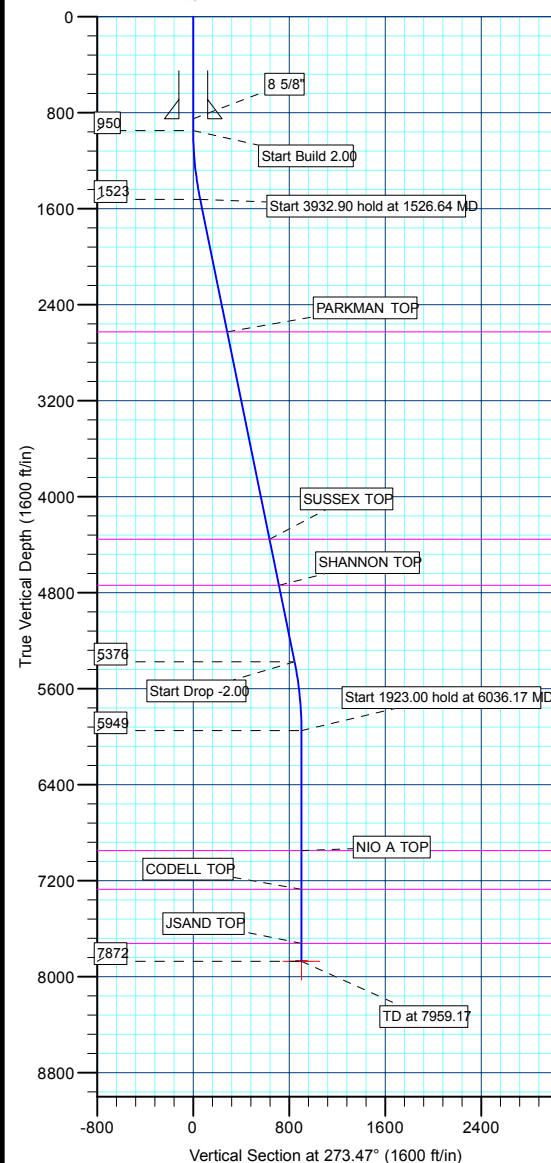
MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	
1526.64	11.53	273.47	1522.75	3.51	-57.73	2.00	273.47	57.84	
5459.54	11.53	273.47	5376.25	51.16	-842.58	0.00	0.00	844.14	
6036.17	0.00	0.00	5949.00	54.66	-900.32	2.00	180.00	901.97	
7959.17	0.00	0.00	7872.00	54.66	-900.32	0.00	0.00	901.97	PBHL_BERNHARDT 18-1 (1295 FNL 1090 FWL)

CASING DETAILS

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



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



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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL	7872.00	54.66	-900.32	1369294.11	3182695.35	40° 20' 42.936 N	104° 50' 40.380 W	Circle (Radius: 50.00)

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 18-1		
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 18-1			
Well Position	+N/-S	0.00 ft	Northing:	1,369,246.13 ft
	+E/-W	0.00 ft	Easting:	3,183,596.05 ft
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft
			Ground Level:	4,825.00 ft

Wellbore	P_BERNHARDT 18-1				
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	273.47

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	
1,526.64	11.53	273.47	1,522.75	3.51	-57.73	2.00	2.00	0.00	273.47	
5,459.54	11.53	273.47	5,376.25	51.16	-842.58	0.00	0.00	0.00	0.00	
6,036.17	0.00	0.00	5,949.00	54.66	-900.32	2.00	-2.00	0.00	180.00	
7,959.17	0.00	0.00	7,872.00	54.66	-900.32	0.00	0.00	0.00	0.00	PBHL_BERNHARD

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 18-1		
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	273.47	1,000.00	0.03	-0.44	0.44	2.00	2.00	0.00
1,100.00	3.00	273.47	1,099.93	0.24	-3.92	3.93	2.00	2.00	0.00
1,200.00	5.00	273.47	1,199.68	0.66	-10.88	10.90	2.00	2.00	0.00
1,300.00	7.00	273.47	1,299.13	1.29	-21.31	21.35	2.00	2.00	0.00
1,400.00	9.00	273.47	1,398.15	2.14	-35.21	35.27	2.00	2.00	0.00
1,500.00	11.00	273.47	1,496.63	3.19	-52.54	52.63	2.00	2.00	0.00
Start 3932.90 hold at 1526.64 MD									
1,526.64	11.53	273.47	1,522.75	3.51	-57.73	57.84	2.00	2.00	0.00
1,600.00	11.53	273.47	1,594.63	4.39	-72.37	72.51	0.00	0.00	0.00
1,700.00	11.53	273.47	1,692.61	5.61	-92.33	92.50	0.00	0.00	0.00
1,800.00	11.53	273.47	1,790.60	6.82	-112.28	112.49	0.00	0.00	0.00
1,900.00	11.53	273.47	1,888.58	8.03	-132.24	132.48	0.00	0.00	0.00
2,000.00	11.53	273.47	1,986.56	9.24	-152.20	152.48	0.00	0.00	0.00
2,100.00	11.53	273.47	2,084.54	10.45	-172.15	172.47	0.00	0.00	0.00
2,200.00	11.53	273.47	2,182.52	11.66	-192.11	192.46	0.00	0.00	0.00
2,300.00	11.53	273.47	2,280.50	12.87	-212.06	212.46	0.00	0.00	0.00
2,400.00	11.53	273.47	2,378.48	14.09	-232.02	232.45	0.00	0.00	0.00
2,500.00	11.53	273.47	2,476.46	15.30	-251.98	252.44	0.00	0.00	0.00
2,600.00	11.53	273.47	2,574.44	16.51	-271.93	272.43	0.00	0.00	0.00
PARKMAN TOP									
2,653.64	11.53	273.47	2,627.00	17.16	-282.64	283.16	0.00	0.00	0.00
2,700.00	11.53	273.47	2,672.42	17.72	-291.89	292.43	0.00	0.00	0.00
2,800.00	11.53	273.47	2,770.41	18.93	-311.85	312.42	0.00	0.00	0.00
2,900.00	11.53	273.47	2,868.39	20.14	-331.80	332.41	0.00	0.00	0.00
3,000.00	11.53	273.47	2,966.37	21.36	-351.76	352.41	0.00	0.00	0.00
3,100.00	11.53	273.47	3,064.35	22.57	-371.71	372.40	0.00	0.00	0.00
3,200.00	11.53	273.47	3,162.33	23.78	-391.67	392.39	0.00	0.00	0.00
3,300.00	11.53	273.47	3,260.31	24.99	-411.63	412.38	0.00	0.00	0.00
3,400.00	11.53	273.47	3,358.29	26.20	-431.58	432.38	0.00	0.00	0.00
3,500.00	11.53	273.47	3,456.27	27.41	-451.54	452.37	0.00	0.00	0.00
3,600.00	11.53	273.47	3,554.25	28.63	-471.49	472.36	0.00	0.00	0.00
3,700.00	11.53	273.47	3,652.24	29.84	-491.45	492.35	0.00	0.00	0.00
3,800.00	11.53	273.47	3,750.22	31.05	-511.41	512.35	0.00	0.00	0.00
3,900.00	11.53	273.47	3,848.20	32.26	-531.36	532.34	0.00	0.00	0.00
4,000.00	11.53	273.47	3,946.18	33.47	-551.32	552.33	0.00	0.00	0.00
4,100.00	11.53	273.47	4,044.16	34.68	-571.27	572.33	0.00	0.00	0.00
4,200.00	11.53	273.47	4,142.14	35.90	-591.23	592.32	0.00	0.00	0.00
4,300.00	11.53	273.47	4,240.12	37.11	-611.19	612.31	0.00	0.00	0.00
4,400.00	11.53	273.47	4,338.10	38.32	-631.14	632.30	0.00	0.00	0.00
SUSSEX TOP									
4,417.25	11.53	273.47	4,355.00	38.53	-634.58	635.75	0.00	0.00	0.00
4,500.00	11.53	273.47	4,436.08	39.53	-651.10	652.30	0.00	0.00	0.00
4,600.00	11.53	273.47	4,534.06	40.74	-671.05	672.29	0.00	0.00	0.00
4,700.00	11.53	273.47	4,632.05	41.95	-691.01	692.28	0.00	0.00	0.00
4,800.00	11.53	273.47	4,730.03	43.16	-710.97	712.28	0.00	0.00	0.00
SHANNON TOP									
4,808.14	11.53	273.47	4,738.00	43.26	-712.59	713.90	0.00	0.00	0.00
4,900.00	11.53	273.47	4,828.01	44.38	-730.92	732.27	0.00	0.00	0.00
5,000.00	11.53	273.47	4,925.99	45.59	-750.88	752.26	0.00	0.00	0.00
5,100.00	11.53	273.47	5,023.97	46.80	-770.83	772.25	0.00	0.00	0.00
5,200.00	11.53	273.47	5,121.95	48.01	-790.79	792.25	0.00	0.00	0.00
5,300.00	11.53	273.47	5,219.93	49.22	-810.75	812.24	0.00	0.00	0.00

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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 18-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 18-1		
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)
5,400.00	11.53	273.47	5,317.91	50.43	-830.70	832.23	0.00	0.00	0.00
Start Drop -2.00									
5,459.54	11.53	273.47	5,376.25	51.16	-842.58	844.14	0.00	0.00	0.00
5,500.00	10.72	273.47	5,415.95	51.63	-850.38	851.95	2.00	-2.00	0.00
5,600.00	8.72	273.47	5,514.51	52.65	-867.24	868.83	2.00	-2.00	0.00
5,700.00	6.72	273.47	5,613.60	53.47	-880.65	882.27	2.00	-2.00	0.00
5,800.00	4.72	273.47	5,713.09	54.07	-890.60	892.24	2.00	-2.00	0.00
5,900.00	2.72	273.47	5,812.88	54.46	-897.09	898.74	2.00	-2.00	0.00
6,000.00	0.72	273.47	5,912.83	54.65	-900.09	901.75	2.00	-2.00	0.00
Start 1923.00 hold at 6036.17 MD									
6,036.17	0.00	0.00	5,949.00	54.66	-900.32	901.97	2.00	-2.00	0.00
6,100.00	0.00	0.00	6,012.83	54.66	-900.32	901.97	0.00	0.00	0.00
6,200.00	0.00	0.00	6,112.83	54.66	-900.32	901.97	0.00	0.00	0.00
6,300.00	0.00	0.00	6,212.83	54.66	-900.32	901.97	0.00	0.00	0.00
6,400.00	0.00	0.00	6,312.83	54.66	-900.32	901.97	0.00	0.00	0.00
6,500.00	0.00	0.00	6,412.83	54.66	-900.32	901.97	0.00	0.00	0.00
6,600.00	0.00	0.00	6,512.83	54.66	-900.32	901.97	0.00	0.00	0.00
6,700.00	0.00	0.00	6,612.83	54.66	-900.32	901.97	0.00	0.00	0.00
6,800.00	0.00	0.00	6,712.83	54.66	-900.32	901.97	0.00	0.00	0.00
6,900.00	0.00	0.00	6,812.83	54.66	-900.32	901.97	0.00	0.00	0.00
7,000.00	0.00	0.00	6,912.83	54.66	-900.32	901.97	0.00	0.00	0.00
NIO A TOP									
7,036.17	0.00	0.00	6,949.00	54.66	-900.32	901.97	0.00	0.00	0.00
7,100.00	0.00	0.00	7,012.83	54.66	-900.32	901.97	0.00	0.00	0.00
7,200.00	0.00	0.00	7,112.83	54.66	-900.32	901.97	0.00	0.00	0.00
7,300.00	0.00	0.00	7,212.83	54.66	-900.32	901.97	0.00	0.00	0.00
CODELL TOP									
7,359.17	0.00	0.00	7,272.00	54.66	-900.32	901.97	0.00	0.00	0.00
7,400.00	0.00	0.00	7,312.83	54.66	-900.32	901.97	0.00	0.00	0.00
7,500.00	0.00	0.00	7,412.83	54.66	-900.32	901.97	0.00	0.00	0.00
7,600.00	0.00	0.00	7,512.83	54.66	-900.32	901.97	0.00	0.00	0.00
7,700.00	0.00	0.00	7,612.83	54.66	-900.32	901.97	0.00	0.00	0.00
7,800.00	0.00	0.00	7,712.83	54.66	-900.32	901.97	0.00	0.00	0.00
JSAND TOP									
7,809.17	0.00	0.00	7,722.00	54.66	-900.32	901.97	0.00	0.00	0.00
7,900.00	0.00	0.00	7,812.83	54.66	-900.32	901.97	0.00	0.00	0.00
PBHL_BERNHARDT 18-1 (1295 FNL 1090 FWL)									
7,959.17	0.00	0.00	7,872.00	54.66	-900.32	901.97	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	7,872.00	54.66	-900.32	1,369,294.11	3,182,695.35	40° 20' 42.936 N	104° 50' 40.380 W
- plan hits target center									
- Circle (radius 50.00)									

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 18-1		
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 (°)	
2,653.64	2,627.00	PARKMAN TOP				
4,417.25	4,355.00	SUSSEX TOP				
4,808.14	4,738.00	SHANNON TOP				
7,036.17	6,949.00	NIO A TOP				
7,359.17	7,272.00	CODELL TOP				
7,809.17	7,722.00	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	
1,526.64	1,522.75	3.51	-57.73	Start 3932.90 hold at 1526.64 MD	
5,459.54	5,376.25	51.16	-842.58	Start Drop -2.00	
6,036.17	5,949.00	54.66	-900.32	Start 1923.00 hold at 6036.17 MD	
7,959.17	7,872.00	54.66	-900.32	TD at 7959.17	



US ROCKIES REGION PLANNING

**COLORADO NOTHERN ZONE - 83
WELD_BERNHARDT 8 PAD 4N67W1
P_BERNHARDT 18-1**

**P_BERNHARDT 18-1
PLAN #1 11-04-09 RHS**

Anticollision Report

04 November, 2009



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	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	7,959.17	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 21-1 - P_BERNHARDT 21-1 - PLAN #1	1,006.91	1,006.95	18.20	13.94	4.278	CC, ES
P_BERNHARDT 21-1 - P_BERNHARDT 21-1 - PLAN #1	1,100.00	1,099.77	19.38	14.75	4.183	SF
P_BERNHARDT 22-1 - P_BERNHARDT 22-1 - PLAN #1	950.00	950.00	32.80	28.79	8.175	CC, ES
P_BERNHARDT 22-1 - P_BERNHARDT 22-1 - PLAN #1	1,000.00	999.47	33.23	29.01	7.883	SF
P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1	200.00	200.00	47.45	46.81	74.077	CC, ES
P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1	700.00	690.40	80.34	77.33	26.771	SF
P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1	950.00	950.00	62.17	58.16	15.495	CC, ES
P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1	1,200.00	1,194.67	70.67	65.59	13.900	SF
P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1	200.00	200.00	14.82	14.18	23.141	CC
P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1	300.00	299.87	15.24	14.16	14.129	ES
P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1	400.00	399.49	17.48	15.96	11.502	SF
P_BERNHARDT 4-1 - P_BERNHARDT 4- - PLAN #1 11-	950.00	950.00	29.26	25.25	7.294	CC
P_BERNHARDT 4-1 - P_BERNHARDT 4- - PLAN #1 11-	1,000.00	999.73	29.43	25.20	6.963	ES
P_BERNHARDT 4-1 - P_BERNHARDT 4- - PLAN #1 11-	1,200.00	1,198.58	33.36	28.29	6.571	SF
P_BERNHARDT STATE 37-36 - P_BERNHARDT STATI	200.00	200.00	47.43	46.79	74.038	CC, ES
P_BERNHARDT STATE 37-36 - P_BERNHARDT STATI	700.00	689.63	82.68	79.68	27.571	SF

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	
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	-180.00	-18.23	0.00	18.23						
100.00	100.00	100.00	100.00	0.10	0.10	-180.00	-18.23	0.00	18.23	18.04	0.19	95.425			
200.00	200.00	200.00	200.00	0.32	0.32	-180.00	-18.23	0.00	18.23	17.59	0.64	28.460			
300.00	300.00	300.00	300.00	0.55	0.55	-180.00	-18.23	0.00	18.23	17.14	1.09	16.724			
400.00	400.00	400.00	400.00	0.77	0.77	-180.00	-18.23	0.00	18.23	16.69	1.54	11.841			
500.00	500.00	500.00	500.00	0.99	0.99	-180.00	-18.23	0.00	18.23	16.24	1.99	9.165			
600.00	600.00	600.00	600.00	1.22	1.22	-180.00	-18.23	0.00	18.23	15.79	2.44	7.476			
700.00	700.00	700.00	700.00	1.44	1.44	-180.00	-18.23	0.00	18.23	15.34	2.89	6.312			
800.00	800.00	800.00	800.00	1.67	1.67	-180.00	-18.23	0.00	18.23	14.89	3.34	5.462			
900.00	900.00	900.00	900.00	1.89	1.89	-180.00	-18.23	0.00	18.23	14.44	3.79	4.814			
950.00	950.00	950.00	950.00	2.01	2.01	-180.00	-18.23	0.00	18.23	14.22	4.01	4.544			
1,000.00	1,000.00	1,000.04	1,000.04	2.11	2.11	-96.20	-18.15	0.43	18.20	13.97	4.22	4.307			

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 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	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)	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	
1,006.91	1,006.90	1,006.95	1,006.95	2.13	2.13	-97.01	-18.13	0.56	18.20	13.94	4.25	4.278 CC, ES		
1,100.00	1,099.93	1,099.77	1,099.70	2.32	2.32	-117.04	-17.52	3.85	19.38	14.75	4.63	4.183 SF		
1,200.00	1,199.68	1,198.43	1,198.12	2.53	2.53	-144.95	-16.26	10.58	27.38	22.34	5.04	5.436		
1,300.00	1,299.13	1,295.34	1,294.51	2.76	2.76	-162.50	-14.43	20.44	44.86	39.43	5.43	8.265		
1,400.00	1,398.15	1,390.92	1,389.23	3.03	3.00	-171.39	-12.11	32.93	70.17	64.36	5.81	12.071		
1,500.00	1,496.63	1,486.15	1,483.56	3.32	3.26	-175.81	-9.72	45.78	100.01	93.81	6.20	16.133		
1,526.64	1,522.75	1,511.33	1,508.51	3.41	3.33	-176.60	-9.09	49.17	108.58	102.28	6.30	17.231		
1,600.00	1,594.63	1,580.58	1,577.10	3.66	3.53	-178.27	-7.35	58.52	132.58	125.96	6.62	20.039		
1,700.00	1,692.61	1,674.97	1,670.60	4.02	3.81	-179.76	-4.98	71.25	165.40	158.34	7.05	23.454		
1,800.00	1,790.60	1,769.36	1,764.10	4.39	4.09	-179.24	-2.62	83.99	198.28	190.79	7.49	26.458		
1,900.00	1,888.58	1,863.75	1,857.60	4.78	4.38	-178.53	-0.25	96.73	231.20	223.26	7.94	29.112		
2,000.00	1,986.56	1,958.15	1,951.09	5.17	4.67	-177.99	2.12	109.46	264.15	255.75	8.39	31.469		
2,100.00	2,084.54	2,052.54	2,044.59	5.58	4.97	-177.57	4.49	122.20	297.11	288.26	8.85	33.572		
2,200.00	2,182.52	2,146.93	2,138.09	5.99	5.27	-177.24	6.86	134.94	330.08	320.77	9.31	35.458		
2,300.00	2,280.50	2,241.32	2,231.59	6.40	5.57	-176.96	9.22	147.67	363.07	353.29	9.77	37.157		
2,400.00	2,378.48	2,335.71	2,325.09	6.82	5.88	-176.74	11.59	160.41	396.05	385.82	10.24	38.695		
2,500.00	2,476.46	2,430.10	2,418.59	7.25	6.18	-176.54	13.96	173.15	429.05	418.34	10.70	40.091		
2,600.00	2,574.44	2,524.50	2,512.08	7.67	6.49	-176.38	16.33	185.88	462.04	450.87	11.17	41.365		
2,700.00	2,672.42	2,618.89	2,605.58	8.10	6.80	-176.23	18.70	198.62	495.04	483.40	11.64	42.531		
2,800.00	2,770.41	2,713.28	2,699.08	8.53	7.11	-176.11	21.06	211.35	528.04	515.93	12.11	43.601		
2,900.00	2,868.39	2,807.67	2,792.58	8.96	7.42	-176.00	23.43	224.09	561.05	548.46	12.58	44.587		
3,000.00	2,966.37	2,902.06	2,886.08	9.39	7.74	-175.90	25.80	236.83	594.05	581.00	13.06	45.499		
3,100.00	3,064.35	2,996.45	2,979.58	9.82	8.05	-175.81	28.17	249.56	627.06	613.53	13.53	46.343		
3,200.00	3,162.33	3,090.85	3,073.07	10.26	8.36	-175.73	30.53	262.30	660.07	646.06	14.01	47.126		
3,300.00	3,260.31	3,185.24	3,166.57	10.70	8.68	-175.66	32.90	275.04	693.08	678.59	14.48	47.856		
3,400.00	3,358.29	3,279.63	3,260.07	11.13	8.99	-175.59	35.27	287.77	726.09	711.13	14.96	48.538		
3,500.00	3,456.27	3,374.02	3,353.57	11.57	9.31	-175.54	37.64	300.51	759.10	743.66	15.44	49.175		
3,600.00	3,554.25	3,468.41	3,447.07	12.01	9.63	-175.48	40.01	313.25	792.11	776.19	15.91	49.772		
3,700.00	3,652.24	3,562.80	3,540.57	12.45	9.94	-175.43	42.37	325.98	825.12	808.73	16.39	50.332		
3,800.00	3,750.22	3,657.19	3,634.06	12.89	10.26	-175.38	44.74	338.72	858.13	841.26	16.87	50.860		
3,900.00	3,848.20	3,751.59	3,727.56	13.33	10.58	-175.34	47.11	351.46	891.15	873.79	17.35	51.357		
4,000.00	3,946.18	3,845.98	3,821.06	13.77	10.90	-175.30	49.48	364.19	924.16	906.33	17.83	51.826		
4,100.00	4,044.16	3,940.37	3,914.56	14.21	11.21	-175.26	51.85	376.93	957.17	938.86	18.31	52.269		
4,200.00	4,142.14	4,034.76	4,008.06	14.65	11.53	-175.23	54.21	389.66	990.19	971.39	18.79	52.689		
4,300.00	4,240.12	4,129.15	4,101.56	15.09	11.85	-175.20	56.58	402.40	1,023.20	1,003.93	19.27	53.087		
4,400.00	4,338.10	4,223.54	4,195.05	15.53	12.17	-175.17	58.95	415.14	1,056.21	1,036.46	19.76	53.465		
4,500.00	4,436.08	4,317.94	4,288.55	15.97	12.49	-175.14	61.32	427.87	1,089.23	1,068.99	20.24	53.824		
4,600.00	4,534.06	4,412.33	4,382.05	16.41	12.81	-175.11	63.69	440.61	1,122.24	1,101.53	20.72	54.166		
4,700.00	4,632.05	4,506.72	4,475.55	16.86	13.13	-175.09	66.05	453.35	1,155.26	1,134.06	21.20	54.491		
4,800.00	4,730.03	4,601.11	4,569.05	17.30	13.45	-175.06	68.42	466.08	1,188.28	1,166.59	21.68	54.802		
4,900.00	4,828.01	4,695.50	4,662.55	17.74	13.77	-175.04	70.79	478.82	1,221.29	1,199.13	22.17	55.098		
5,000.00	4,925.99	4,789.89	4,756.05	18.19	14.09	-175.02	73.16	491.56	1,254.31	1,231.66	22.65	55.382		
5,100.00	5,023.97	4,884.29	4,849.54	18.63	14.41	-175.00	75.53	504.29	1,287.32	1,264.19	23.13	55.653		
5,200.00	5,121.95	4,978.68	4,943.04	19.07	14.73	-174.98	77.89	517.03	1,320.34	1,296.72	23.61	55.912		
5,300.00	5,219.93	5,073.07	5,036.54	19.52	15.05	-174.96	80.26	529.77	1,353.35	1,329.26	24.10	56.161		
5,400.00	5,317.91	5,167.46	5,130.04	19.96	15.37	-174.94	82.63	542.50	1,386.37	1,361.79	24.58	56.400		
5,459.54	5,376.25	5,223.66	5,185.70	20.22	15.56	-174.93	84.04	550.08	1,406.03	1,381.16	24.87	56.537		
5,500.00	5,415.95	5,261.94	5,223.63	20.38	15.69	-174.95	85.00	555.25	1,419.12	1,394.01	25.11	56.517		
5,600.00	5,514.51	5,357.32	5,318.10	20.67	16.01	-174.98	87.39	568.12	1,449.15	1,423.49	25.66	56.472		
5,700.00	5,613.60	5,453.68	5,413.55	20.93	16.34	-174.99	89.81	581.12	1,475.84	1,449.67	26.18	56.374		
5,800.00	5,713.09	5,550.91	5,509.86	21.14	16.67	-174.98	92.25	594.24	1,499.18	1,472.51	26.66	56.227		
5,900.00	5,812.88	5,705.57	5,663.31	21.32	17.09	-174.93	95.76	613.11	1,518.15	1,490.96	27.20	55.824		

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 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	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
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
6,000.00	5,912.83	5,915.29	5,872.56	21.46	17.49	174.89	98.18	626.15	1,527.39	1,499.64	27.75	55.043	
6,036.17	5,949.00	5,991.73	5,949.00	21.50	17.60	88.36	98.37	627.15	1,528.10	1,500.16	27.94	54.695	
6,100.00	6,012.83	6,055.56	6,012.83	21.58	17.70	88.36	98.37	627.15	1,528.10	1,499.92	28.18	54.233	
6,200.00	6,112.83	6,155.56	6,112.83	21.71	17.86	88.36	98.37	627.15	1,528.10	1,499.54	28.56	53.509	
6,300.00	6,212.83	6,255.56	6,212.83	21.85	18.02	88.36	98.37	627.15	1,528.10	1,499.16	28.94	52.800	
6,400.00	6,312.83	6,355.56	6,312.83	21.98	18.19	88.36	98.37	627.15	1,528.10	1,498.77	29.33	52.107	
6,500.00	6,412.83	6,455.56	6,412.83	22.11	18.35	88.36	98.37	627.15	1,528.10	1,498.38	29.71	51.428	
6,600.00	6,512.83	6,555.56	6,512.83	22.25	18.51	88.36	98.37	627.15	1,528.10	1,497.99	30.10	50.764	
6,700.00	6,612.83	6,655.56	6,612.83	22.39	18.68	88.36	98.37	627.15	1,528.10	1,497.60	30.49	50.114	
6,800.00	6,712.83	6,755.56	6,712.83	22.53	18.85	88.36	98.37	627.15	1,528.10	1,497.21	30.88	49.479	
6,900.00	6,812.83	6,855.56	6,812.83	22.67	19.01	88.36	98.37	627.15	1,528.10	1,496.82	31.28	48.856	
7,000.00	6,912.83	6,955.56	6,912.83	22.81	19.18	88.36	98.37	627.15	1,528.10	1,496.42	31.67	48.247	
7,100.00	7,012.83	7,055.56	7,012.83	22.96	19.35	88.36	98.37	627.15	1,528.10	1,496.03	32.07	47.651	
7,200.00	7,112.83	7,155.56	7,112.83	23.10	19.53	88.36	98.37	627.15	1,528.10	1,495.63	32.47	47.067	
7,300.00	7,212.83	7,255.56	7,212.83	23.25	19.70	88.36	98.37	627.15	1,528.10	1,495.23	32.87	46.495	
7,400.00	7,312.83	7,355.56	7,312.83	23.40	19.87	88.36	98.37	627.15	1,528.10	1,494.83	33.27	45.936	
7,500.00	7,412.83	7,455.56	7,412.83	23.54	20.05	88.36	98.37	627.15	1,528.10	1,494.43	33.67	45.388	
7,600.00	7,512.83	7,555.56	7,512.83	23.69	20.22	88.36	98.37	627.15	1,528.10	1,494.03	34.07	44.851	
7,700.00	7,612.83	7,655.56	7,612.83	23.85	20.40	88.36	98.37	627.15	1,528.10	1,493.62	34.47	44.326	
7,800.00	7,712.83	7,755.56	7,712.83	24.00	20.58	88.36	98.37	627.15	1,528.10	1,493.22	34.88	43.811	
7,900.00	7,812.83	7,855.56	7,812.83	24.15	20.76	88.36	98.37	627.15	1,528.10	1,492.81	35.29	43.307	
7,959.17	7,872.00	7,914.73	7,872.00	24.24	20.86	88.36	98.37	627.15	1,528.10	1,492.57	35.53	43.013	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	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							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	-180.00	-32.80	0.00	32.80						
100.00	100.00	100.00	100.00	0.10	0.10	-180.00	-32.80	0.00	32.80	32.61	0.19	171.675			
200.00	200.00	200.00	200.00	0.32	0.32	-180.00	-32.80	0.00	32.80	32.16	0.64	51.201			
300.00	300.00	300.00	300.00	0.55	0.55	-180.00	-32.80	0.00	32.80	31.71	1.09	30.087			
400.00	400.00	400.00	400.00	0.77	0.77	-180.00	-32.80	0.00	32.80	31.26	1.54	21.303			
500.00	500.00	500.00	500.00	0.99	0.99	-180.00	-32.80	0.00	32.80	30.81	1.99	16.489			
600.00	600.00	600.00	600.00	1.22	1.22	-180.00	-32.80	0.00	32.80	30.36	2.44	13.449			
700.00	700.00	700.00	700.00	1.44	1.44	-180.00	-32.80	0.00	32.80	29.91	2.89	11.356			
800.00	800.00	800.00	800.00	1.67	1.67	-180.00	-32.80	0.00	32.80	29.46	3.34	9.827			
900.00	900.00	900.00	900.00	1.89	1.89	-180.00	-32.80	0.00	32.80	29.01	3.79	8.660			
950.00	950.00	950.00	950.00	2.01	2.01	-180.00	-32.80	0.00	32.80	28.79	4.01	8.175 CC, ES			
1,000.00	1,000.00	999.47	999.47	2.11	2.10	-93.94	-33.20	-0.16	33.23	29.01	4.22	7.883 SF			
1,100.00	1,099.93	1,098.28	1,098.21	2.32	2.28	-97.25	-36.37	-1.41	36.73	32.14	4.59	7.998			
1,200.00	1,199.68	1,196.73	1,196.42	2.53	2.46	-102.23	-42.68	-3.89	44.02	39.03	4.99	8.823			
1,300.00	1,299.13	1,294.57	1,293.74	2.76	2.66	-107.12	-52.05	-7.59	55.35	49.94	5.41	10.226			
1,400.00	1,398.15	1,391.58	1,389.83	3.03	2.89	-111.11	-64.40	-12.45	70.81	64.94	5.87	12.056			
1,500.00	1,496.63	1,487.53	1,484.38	3.32	3.16	-114.08	-79.58	-18.43	90.35	83.97	6.38	14.154			
1,526.64	1,522.75	1,512.88	1,509.27	3.41	3.23	-114.72	-84.08	-20.21	96.24	89.71	6.53	14.739			
1,600.00	1,594.63	1,582.35	1,577.23	3.66	3.46	-116.10	-97.47	-25.48	113.48	106.52	6.95	16.318			
1,700.00	1,692.61	1,676.16	1,668.41	4.02	3.81	-116.60	-117.97	-33.56	138.96	131.39	7.57	18.352			
1,800.00	1,790.60	1,768.81	1,757.71	4.39	4.20	-116.15	-140.93	-42.61	166.63	158.40	8.23	20.247			
1,900.00	1,888.58	1,860.12	1,844.89	4.78	4.65	-115.20	-166.17	-52.56	196.48	187.56	8.92	22.023			
2,000.00	1,986.56	1,950.99	1,930.77	5.17	5.14	-113.97	-193.80	-63.44	228.50	218.86	9.64	23.699			
2,100.00	2,084.54	2,045.35	2,019.64	5.58	5.68	-112.85	-223.30	-75.07	261.30	250.90	10.40	25.127			
2,200.00	2,182.52	2,139.72	2,108.52	5.99	6.25	-111.99	-252.80	-86.70	294.16	282.99	11.17	26.336			
2,300.00	2,280.50	2,234.08	2,197.39	6.40	6.82	-111.29	-282.30	-98.32	327.07	315.12	11.95	27.367			
2,400.00	2,378.48	2,328.44	2,286.27	6.82	7.41	-110.73	-311.81	-109.95	360.02	347.27	12.74	28.255			
2,500.00	2,476.46	2,422.80	2,375.14	7.25	8.01	-110.26	-341.31	-121.57	392.99	379.45	13.54	29.025			
2,600.00	2,574.44	2,517.17	2,464.02	7.67	8.61	-109.86	-370.81	-133.20	425.98	411.64	14.34	29.699			
2,700.00	2,672.42	2,611.53	2,552.89	8.10	9.22	-109.52	-400.31	-144.83	458.99	443.84	15.15	30.292			
2,800.00	2,770.41	2,705.89	2,641.77	8.53	9.84	-109.22	-429.82	-156.45	492.01	476.04	15.97	30.814			
2,900.00	2,868.39	2,800.26	2,730.64	8.96	10.45	-108.97	-459.32	-168.08	525.04	508.25	16.79	31.270			
3,000.00	2,966.37	2,894.62	2,819.52	9.39	11.07	-108.74	-488.82	-179.70	558.08	540.46	17.62	31.678			
3,100.00	3,064.35	2,988.98	2,908.39	9.82	11.69	-108.54	-518.32	-191.33	591.12	572.67	18.45	32.044			
3,200.00	3,162.33	3,083.34	2,997.27	10.26	12.32	-108.35	-547.83	-202.95	624.17	604.89	19.28	32.375			
3,300.00	3,260.31	3,177.71	3,086.14	10.70	12.94	-108.19	-577.33	-214.58	657.23	637.12	20.11	32.675			
3,400.00	3,358.29	3,272.07	3,175.02	11.13	13.57	-108.05	-606.83	-226.21	690.29	669.34	20.95	32.948			
3,500.00	3,456.27	3,366.43	3,263.89	11.57	14.20	-107.91	-636.33	-237.83	723.36	701.57	21.79	33.197			
3,600.00	3,554.25	3,460.79	3,352.77	12.01	14.83	-107.79	-665.84	-249.46	756.42	733.79	22.63	33.426			
3,700.00	3,652.24	3,555.16	3,441.64	12.45	15.46	-107.68	-695.34	-261.08	789.49	766.02	23.47	33.636			
3,800.00	3,750.22	3,649.52	3,530.52	12.89	16.09	-107.58	-724.84	-272.71	822.57	798.25	24.31	33.831			
3,900.00	3,848.20	3,743.88	3,619.39	13.33	16.72	-107.48	-754.35	-284.34	855.64	830.48	25.16	34.010			
4,000.00	3,946.18	3,838.25	3,708.27	13.77	17.36	-107.39	-783.85	-295.96	888.72	862.71	26.00	34.177			
4,100.00	4,044.16	3,932.61	3,797.14	14.21	17.99	-107.31	-813.35	-307.59	921.80	894.95	26.85	34.332			
4,200.00	4,142.14	4,026.97	3,886.02	14.65	18.62	-107.24	-842.85	-319.21	954.88	927.18	27.70	34.477			
4,300.00	4,240.12	4,121.33	3,974.89	15.09	19.26	-107.17	-872.36	-330.84	987.96	959.41	28.54	34.612			
4,400.00	4,338.10	4,215.70	4,063.77	15.53	19.89	-107.10	-901.86	-342.47	1,021.04	991.65	29.39	34.739			
4,500.00	4,436.08	4,310.06	4,152.64	15.97	20.53	-107.04	-931.36	-354.09	1,054.13	1,023.88	30.24	34.858			
4,600.00	4,534.06	4,404.42	4,241.52	16.41	21.17	-106.98	-960.86	-365.72	1,087.21	1,056.12	31.09	34.969			
4,700.00	4,632.05	4,498.78	4,330.39	16.86	21.80	-106.92	-990.37	-377.34	1,120.30	1,088.36	31.94	35.074			
4,800.00	4,730.03	4,593.15	4,419.27	17.30	22.44	-106.87	-1,019.87	-388.97	1,153.38	1,120.59	32.79	35.174			
4,900.00	4,828.01	4,687.51	4,508.14	17.74	23.08	-106.82	-1,049.37	-400.60	1,186.47	1,152.83	33.64	35.267			

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 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	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	4,925.99	4,781.87	4,597.02	18.19	23.71	-106.78	-1,078.87	-412.22	1,219.56	1,185.07	34.49	35.356	
5,100.00	5,023.97	4,876.24	4,685.89	18.63	24.35	-106.73	-1,108.38	-423.85	1,252.65	1,217.30	35.35	35.440	
5,200.00	5,121.95	4,970.60	4,774.77	19.07	24.99	-106.69	-1,137.88	-435.47	1,285.74	1,249.54	36.20	35.520	
5,300.00	5,219.93	5,064.96	4,863.64	19.52	25.63	-106.65	-1,167.38	-447.10	1,318.83	1,281.78	37.05	35.595	
5,400.00	5,317.91	5,159.32	4,952.52	19.96	26.27	-106.62	-1,196.88	-458.73	1,351.92	1,314.02	37.90	35.667	
5,459.54	5,376.25	5,215.50	5,005.43	20.22	26.65	-106.59	-1,214.45	-465.65	1,371.62	1,333.21	38.41	35.709	
5,500.00	5,415.95	5,277.45	5,063.99	20.38	27.00	-106.83	-1,233.25	-473.05	1,384.61	1,345.75	38.87	35.625	
5,600.00	5,514.51	5,435.38	5,215.13	20.67	27.69	-107.33	-1,275.80	-489.82	1,413.10	1,373.29	39.81	35.494	
5,700.00	5,613.60	5,597.66	5,372.82	20.93	28.29	-107.70	-1,311.38	-503.85	1,436.23	1,395.59	40.65	35.334	
5,800.00	5,713.09	5,763.52	5,535.95	21.14	28.79	-107.96	-1,339.11	-514.77	1,453.82	1,412.46	41.36	35.149	
5,900.00	5,812.88	5,932.06	5,703.21	21.32	29.18	-108.12	-1,358.24	-522.31	1,465.68	1,423.73	41.95	34.941	
6,000.00	5,912.83	6,102.28	5,873.06	21.46	29.45	-108.18	-1,368.24	-526.25	1,471.72	1,429.32	42.40	34.711	
6,036.17	5,949.00	6,164.06	5,934.83	21.50	29.52	165.30	-1,369.55	-526.77	1,472.45	1,429.92	42.53	34.622	
6,100.00	6,012.83	6,242.06	6,012.83	21.58	29.59	165.31	-1,369.74	-526.84	1,472.55	1,429.85	42.70	34.485	
6,200.00	6,112.83	6,342.06	6,112.83	21.71	29.67	165.31	-1,369.74	-526.84	1,472.55	1,429.60	42.95	34.288	
6,300.00	6,212.83	6,442.06	6,212.83	21.85	29.75	165.31	-1,369.74	-526.84	1,472.55	1,429.35	43.20	34.090	
6,400.00	6,312.83	6,542.06	6,312.83	21.98	29.83	165.31	-1,369.74	-526.84	1,472.55	1,429.10	43.45	33.892	
6,500.00	6,412.83	6,642.06	6,412.83	22.11	29.92	165.31	-1,369.74	-526.84	1,472.55	1,428.84	43.70	33.694	
6,600.00	6,512.83	6,742.06	6,512.83	22.25	30.00	165.31	-1,369.74	-526.84	1,472.55	1,428.58	43.96	33.496	
6,700.00	6,612.83	6,842.06	6,612.83	22.39	30.09	165.31	-1,369.74	-526.84	1,472.55	1,428.32	44.22	33.298	
6,800.00	6,712.83	6,942.06	6,712.83	22.53	30.18	165.31	-1,369.74	-526.84	1,472.55	1,428.06	44.49	33.100	
6,900.00	6,812.83	7,042.06	6,812.83	22.67	30.27	165.31	-1,369.74	-526.84	1,472.55	1,427.79	44.76	32.902	
7,000.00	6,912.83	7,142.06	6,912.83	22.81	30.36	165.31	-1,369.74	-526.84	1,472.55	1,427.52	45.03	32.704	
7,100.00	7,012.83	7,242.06	7,012.83	22.96	30.45	165.31	-1,369.74	-526.84	1,472.55	1,427.25	45.30	32.507	
7,200.00	7,112.83	7,342.06	7,112.83	23.10	30.54	165.31	-1,369.74	-526.84	1,472.55	1,426.97	45.58	32.310	
7,300.00	7,212.83	7,442.06	7,212.83	23.25	30.64	165.31	-1,369.74	-526.84	1,472.55	1,426.69	45.85	32.113	
7,400.00	7,312.83	7,542.06	7,312.83	23.40	30.73	165.31	-1,369.74	-526.84	1,472.55	1,426.41	46.14	31.917	
7,500.00	7,412.83	7,642.06	7,412.83	23.54	30.83	165.31	-1,369.74	-526.84	1,472.55	1,426.13	46.42	31.722	
7,600.00	7,512.83	7,742.06	7,512.83	23.69	30.93	165.31	-1,369.74	-526.84	1,472.55	1,425.84	46.71	31.527	
7,700.00	7,612.83	7,842.06	7,612.83	23.85	31.03	165.31	-1,369.74	-526.84	1,472.55	1,425.55	47.00	31.333	
7,800.00	7,712.83	7,942.06	7,712.83	24.00	31.13	165.31	-1,369.74	-526.84	1,472.55	1,425.26	47.29	31.140	
7,900.00	7,812.83	8,042.06	7,812.83	24.15	31.24	165.31	-1,369.74	-526.84	1,472.55	1,424.96	47.58	30.947	
7,959.17	7,872.00	8,101.23	7,872.00	24.24	31.30	165.31	-1,369.74	-526.84	1,472.55	1,424.79	47.76	30.834	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	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	-47.37	2.79	47.45				
100.00	100.00	100.00	100.00	0.10	0.10	176.63	-47.37	2.79	47.45	47.26	0.19	248.375	
200.00	200.00	200.00	200.00	0.32	0.32	176.63	-47.37	2.79	47.45	46.81	0.64	74.077 CC, ES	
300.00	300.00	299.01	298.99	0.55	0.53	174.98	-48.28	4.24	48.48	47.41	1.07	45.296	
400.00	400.00	397.78	397.62	0.77	0.74	170.46	-51.00	8.57	51.77	50.26	1.50	34.436	
500.00	500.00	496.09	495.56	0.99	0.98	164.16	-55.49	15.74	57.85	55.89	1.96	29.472	
600.00	600.00	593.70	592.46	1.22	1.27	157.42	-61.72	25.67	67.27	64.81	2.46	27.357	
700.00	700.00	690.40	688.00	1.44	1.59	151.20	-69.61	38.26	80.34	77.33	3.00	26.771 SF	
800.00	800.00	785.98	781.90	1.67	1.96	145.98	-79.09	53.39	97.13	93.53	3.59	27.027	
900.00	900.00	880.26	873.88	1.89	2.37	141.79	-90.07	70.89	117.56	113.33	4.24	27.743	
950.00	950.00	926.85	919.08	2.01	2.60	140.05	-96.09	80.49	129.11	124.53	4.58	28.197	
1,000.00	1,000.00	972.96	963.62	2.11	2.84	-134.91	-102.43	90.60	141.80	137.54	4.26	33.297	
1,100.00	1,099.93	1,063.20	1,050.20	2.32	3.34	-137.80	-115.93	112.14	171.57	166.89	4.69	36.607	
1,200.00	1,199.68	1,150.43	1,133.09	2.53	3.88	-140.39	-130.35	135.14	207.18	202.07	5.11	40.549	
1,300.00	1,299.13	1,234.25	1,211.93	2.76	4.45	-142.57	-145.47	159.25	248.49	242.96	5.53	44.966	
1,400.00	1,398.15	1,314.35	1,286.46	3.03	5.03	-144.34	-161.05	184.11	295.30	289.37	5.94	49.724	
1,500.00	1,496.63	1,390.48	1,356.51	3.32	5.63	-145.74	-176.88	209.36	347.35	341.00	6.35	54.703	
1,526.64	1,522.75	1,410.06	1,374.40	3.41	5.79	-146.06	-181.12	216.11	362.05	355.60	6.46	56.058	
1,600.00	1,594.63	1,464.76	1,424.09	3.66	6.25	-147.34	-193.26	235.48	403.64	396.85	6.79	59.440	
1,700.00	1,692.61	1,546.15	1,497.86	4.02	6.96	-148.87	-211.53	264.62	460.96	453.69	7.27	63.365	
1,800.00	1,790.60	1,627.54	1,571.62	4.39	7.67	-150.06	-229.80	293.75	518.46	510.69	7.77	66.730	
1,900.00	1,888.58	1,708.93	1,645.39	4.78	8.38	-151.02	-248.06	322.89	576.08	567.80	8.27	69.624	
2,000.00	1,986.56	1,790.31	1,719.15	5.17	9.09	-151.80	-266.33	352.03	633.79	625.00	8.79	72.127	
2,100.00	2,084.54	1,871.70	1,792.92	5.58	9.81	-152.45	-284.60	381.16	691.56	682.25	9.31	74.309	
2,200.00	2,182.52	1,953.09	1,866.69	5.99	10.53	-153.01	-302.87	410.30	749.38	739.55	9.83	76.225	
2,300.00	2,280.50	2,034.48	1,940.45	6.40	11.25	-153.48	-321.13	439.44	807.25	796.89	10.36	77.919	
2,400.00	2,378.48	2,115.87	2,014.22	6.82	11.97	-153.89	-339.40	468.57	865.14	854.25	10.89	79.424	
2,500.00	2,476.46	2,197.26	2,087.99	7.25	12.69	-154.25	-357.67	497.71	923.06	911.64	11.43	80.769	
2,600.00	2,574.44	2,278.65	2,161.75	7.67	13.42	-154.57	-375.94	526.85	981.01	969.04	11.97	81.974	
2,700.00	2,672.42	2,360.03	2,235.52	8.10	14.14	-154.85	-394.20	555.98	1,038.97	1,026.46	12.51	83.062	
2,800.00	2,770.41	2,441.42	2,309.29	8.53	14.87	-155.10	-412.47	585.12	1,096.94	1,083.89	13.05	84.047	
2,900.00	2,868.39	2,522.81	2,383.05	8.96	15.59	-155.33	-430.74	614.26	1,154.93	1,141.34	13.60	84.944	
3,000.00	2,966.37	2,604.20	2,456.82	9.39	16.32	-155.53	-449.01	643.39	1,212.93	1,198.79	14.14	85.763	
3,100.00	3,064.35	2,685.59	2,530.58	9.82	17.05	-155.72	-467.27	672.53	1,270.94	1,256.25	14.69	86.512	
3,200.00	3,162.33	2,766.98	2,604.35	10.26	17.78	-155.89	-485.54	701.67	1,328.96	1,313.72	15.24	87.201	
3,300.00	3,260.31	2,848.37	2,678.12	10.70	18.50	-156.05	-503.81	730.80	1,386.98	1,371.19	15.79	87.837	
3,400.00	3,358.29	2,929.76	2,751.88	11.13	19.23	-156.19	-522.08	759.94	1,445.01	1,428.67	16.34	88.424	
3,500.00	3,456.27	3,011.14	2,825.65	11.57	19.96	-156.32	-540.34	789.08	1,503.05	1,486.15	16.89	88.969	
3,600.00	3,554.25	3,092.53	2,899.42	12.01	20.69	-156.45	-558.61	818.21	1,561.09	1,543.64	17.45	89.476	
3,700.00	3,652.24	3,173.92	2,973.18	12.45	21.42	-156.56	-576.88	847.35	1,619.13	1,601.13	18.00	89.947	
3,800.00	3,750.22	3,255.31	3,046.95	12.89	22.14	-156.67	-595.15	876.48	1,677.18	1,658.63	18.56	90.388	
3,900.00	3,848.20	3,336.70	3,120.72	13.33	22.87	-156.76	-613.41	905.62	1,735.24	1,716.13	19.11	90.800	
4,000.00	3,946.18	3,418.09	3,194.48	13.77	23.60	-156.86	-631.68	934.76	1,793.29	1,773.63	19.67	91.187	
4,100.00	4,044.16	3,499.48	3,268.25	14.21	24.33	-156.94	-649.95	963.89	1,851.35	1,831.13	20.22	91.550	
4,200.00	4,142.14	3,580.87	3,342.01	14.65	25.06	-157.02	-668.22	993.03	1,909.41	1,888.63	20.78	91.891	
4,300.00	4,240.12	3,662.25	3,415.78	15.09	25.79	-157.10	-686.48	1,022.17	1,967.48	1,946.14	21.34	92.213	
4,400.00	4,338.10	3,743.64	3,489.55	15.53	26.52	-157.17	-704.75	1,051.30	2,025.54	2,003.65	21.89	92.517	
4,500.00	4,436.08	3,825.03	3,563.31	15.97	27.25	-157.24	-723.02	1,080.44	2,083.61	2,061.16	22.45	92.805	
4,600.00	4,534.06	3,906.42	3,637.08	16.41	27.98	-157.31	-741.29	1,109.58	2,141.68	2,118.67	23.01	93.077	
4,700.00	4,632.05	3,987.81	3,710.85	16.86	28.71	-157.37	-759.55	1,138.71	2,199.75	2,176.18	23.57	93.335	
4,800.00	4,730.03	4,069.20	3,784.61	17.30	29.44	-157.43	-777.82	1,167.85	2,257.83	2,233.70	24.13	93.581	
4,900.00	4,828.01	4,150.59	3,858.38	17.74	30.17	-157.48	-796.09	1,196.99	2,315.90	2,291.21	24.69	93.814	

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 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	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
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	4,925.99	4,231.98	3,932.15	18.19	30.90	-157.53	-814.36	1,226.12	2,373.98	2,348.73	25.25	94.035	
5,100.00	5,023.97	4,313.36	4,005.91	18.63	31.63	-157.58	-832.62	1,255.26	2,432.05	2,406.25	25.81	94.247	
5,200.00	5,121.95	4,394.75	4,079.68	19.07	32.36	-157.63	-850.89	1,284.40	2,490.13	2,463.77	26.36	94.449	
5,300.00	5,219.93	4,476.14	4,153.45	19.52	33.09	-157.68	-869.16	1,313.53	2,548.21	2,521.29	26.93	94.641	
5,400.00	5,317.91	4,557.53	4,227.21	19.96	33.82	-157.72	-887.43	1,342.67	2,606.29	2,578.81	27.49	94.825	
5,459.54	5,376.25	4,605.99	4,271.13	20.22	34.25	-157.74	-898.30	1,360.02	2,640.87	2,613.05	27.82	94.931	
5,500.00	5,415.95	4,639.07	4,301.12	20.38	34.55	-157.97	-905.73	1,371.86	2,664.16	2,636.00	28.15	94.627	
5,600.00	5,514.51	4,722.14	4,376.40	20.67	35.29	-158.48	-924.37	1,401.60	2,719.83	2,690.89	28.94	93.993	
5,700.00	5,613.60	4,806.96	4,453.28	20.93	36.05	-158.91	-943.41	1,431.96	2,772.78	2,743.08	29.70	93.372	
5,800.00	5,713.09	4,893.44	4,531.66	21.14	36.83	-159.27	-962.82	1,462.92	2,822.93	2,792.50	30.43	92.775	
5,900.00	5,812.88	4,981.47	4,611.45	21.32	37.62	-159.57	-982.58	1,494.44	2,870.24	2,839.11	31.13	92.211	
6,000.00	5,912.83	5,070.94	4,692.54	21.46	38.42	-159.81	-1,002.66	1,526.47	2,914.65	2,882.86	31.79	91.683	
6,036.17	5,949.00	5,103.64	4,722.18	21.50	38.72	113.59	-1,010.00	1,538.18	2,929.99	2,897.97	32.02	91.495	
6,100.00	6,012.83	5,161.49	4,774.61	21.58	39.23	113.66	-1,022.98	1,558.88	2,956.72	2,924.38	32.33	91.450	
6,200.00	6,112.83	5,252.13	4,856.76	21.71	40.05	113.78	-1,043.33	1,591.33	2,998.60	2,965.78	32.82	91.365	
6,300.00	6,212.83	5,342.76	4,938.90	21.85	40.86	113.90	-1,063.67	1,623.78	3,040.49	3,007.18	33.31	91.280	
6,400.00	6,312.83	5,433.40	5,021.05	21.98	41.67	114.01	-1,084.01	1,656.22	3,082.40	3,048.60	33.80	91.197	
6,500.00	6,412.83	5,524.03	5,103.20	22.11	42.49	114.12	-1,104.36	1,688.67	3,124.31	3,090.02	34.29	91.114	
6,600.00	6,512.83	5,614.67	5,185.34	22.25	43.30	114.22	-1,124.70	1,721.12	3,166.23	3,131.45	34.78	91.032	
6,700.00	6,612.83	5,695.28	5,267.83	22.39	43.93	115.03	-1,300.45	2,001.43	3,202.57	3,164.28	38.29	83.631	
6,800.00	6,712.83	5,785.28	5,358.83	22.53	44.56	115.03	-1,300.45	2,001.43	3,202.57	3,163.98	38.59	82.986	
6,900.00	6,812.83	5,875.28	5,449.83	22.67	45.19	115.03	-1,300.45	2,001.43	3,202.57	3,163.68	38.89	82.346	
7,000.00	6,912.83	5,965.28	5,540.83	22.81	45.82	115.03	-1,300.45	2,001.43	3,202.57	3,163.38	39.19	81.710	
7,100.00	7,012.83	6,055.28	5,631.83	22.96	46.45	115.03	-1,300.45	2,001.43	3,202.57	3,163.07	39.50	81.079	
7,200.00	7,112.83	6,145.28	5,722.83	23.10	47.08	115.03	-1,300.45	2,001.43	3,202.57	3,162.76	39.81	80.451	
7,300.00	7,212.83	6,235.28	5,813.83	23.25	47.71	115.03	-1,300.45	2,001.43	3,202.57	3,162.45	40.12	79.829	
7,400.00	7,312.83	6,325.28	5,904.83	23.40	48.34	115.03	-1,300.45	2,001.43	3,202.57	3,162.14	40.43	79.211	
7,500.00	7,412.83	6,415.28	5,995.83	23.54	48.97	115.03	-1,300.45	2,001.43	3,202.57	3,161.82	40.75	78.598	
7,600.00	7,512.83	6,505.28	6,086.83	23.69	49.60	115.03	-1,300.45	2,001.43	3,202.57	3,161.51	41.06	77.990	
7,700.00	7,612.83	6,595.28	6,177.83	23.85	50.23	115.03	-1,300.45	2,001.43	3,202.57	3,161.19	41.38	77.387	
7,800.00	7,712.83	6,685.28	6,268.83	24.00	50.86	115.03	-1,300.45	2,001.43	3,202.57	3,160.86	41.71	76.789	
7,900.00	7,812.83	6,775.28	6,359.83	24.15	51.49	115.03	-1,300.45	2,001.43	3,202.57	3,160.54	42.03	76.196	
7,959.17	7,872.00	6,834.45	6,419.00	24.24	52.12	115.03	-1,300.45	2,001.43	3,202.57	3,160.35	42.22	75.847	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1 11-04													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Distance										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	-5.14	61.92	-5.57	62.17					
100.00	100.00	100.00	100.00	0.10	0.10	-5.14	61.92	-5.57	62.17	61.98	0.19	325.400		
200.00	200.00	200.00	200.00	0.32	0.32	-5.14	61.92	-5.57	62.17	61.53	0.64	97.049		
300.00	300.00	300.00	300.00	0.55	0.55	-5.14	61.92	-5.57	62.17	61.08	1.09	57.029		
400.00	400.00	400.00	400.00	0.77	0.77	-5.14	61.92	-5.57	62.17	60.63	1.54	40.378		
500.00	500.00	500.00	500.00	0.99	0.99	-5.14	61.92	-5.57	62.17	60.18	1.99	31.253		
600.00	600.00	600.00	600.00	1.22	1.22	-5.14	61.92	-5.57	62.17	59.73	2.44	25.492		
700.00	700.00	700.00	700.00	1.44	1.44	-5.14	61.92	-5.57	62.17	59.28	2.89	21.525		
800.00	800.00	800.00	800.00	1.67	1.67	-5.14	61.92	-5.57	62.17	58.83	3.34	18.626		
900.00	900.00	900.00	900.00	1.89	1.89	-5.14	61.92	-5.57	62.17	58.38	3.79	16.415		
950.00	950.00	950.00	950.00	2.01	2.01	-5.14	61.92	-5.57	62.17	58.16	4.01	15.495 CC, ES		
1,000.00	1,000.00	999.02	999.01	2.11	2.12	81.61	62.29	-5.77	62.50	58.27	4.23	14.784		
1,100.00	1,099.93	1,096.97	1,096.90	2.32	2.33	83.38	65.24	-7.35	65.17	60.52	4.65	14.017		
1,200.00	1,199.68	1,194.67	1,194.37	2.53	2.56	86.48	71.13	-10.49	70.67	65.59	5.08	13.900 SF		
1,300.00	1,299.13	1,291.97	1,291.16	2.76	2.79	90.29	79.91	-15.16	79.26	73.71	5.54	14.301		
1,400.00	1,398.15	1,388.70	1,386.99	3.03	3.04	94.17	91.50	-21.34	91.12	85.09	6.03	15.101		
1,500.00	1,496.63	1,484.71	1,481.62	3.32	3.31	97.74	105.83	-28.98	106.37	99.80	6.57	16.181		
1,526.64	1,522.75	1,510.15	1,506.59	3.41	3.39	98.60	110.09	-31.25	111.01	104.28	6.73	16.502		
1,600.00	1,594.63	1,579.96	1,574.89	3.66	3.62	100.65	122.79	-38.02	124.85	117.68	7.17	17.413		
1,700.00	1,692.61	1,674.47	1,666.77	4.02	3.97	102.03	142.33	-48.43	145.90	138.09	7.81	18.679		
1,800.00	1,790.60	1,768.07	1,757.00	4.39	4.37	102.29	164.29	-60.15	169.25	160.76	8.49	19.928		
1,900.00	1,888.58	1,860.58	1,845.32	4.78	4.81	101.83	188.55	-73.07	194.83	185.62	9.21	21.157		
2,000.00	1,986.56	1,956.02	1,935.82	5.17	5.31	101.09	215.29	-87.33	221.89	211.92	9.97	22.257		
2,100.00	2,084.54	2,052.24	2,027.05	5.58	5.84	100.49	242.28	-101.71	249.02	238.27	10.75	23.159		
2,200.00	2,182.52	2,148.46	2,118.29	5.99	6.38	100.01	269.27	-116.10	276.16	264.61	11.55	23.908		
2,300.00	2,280.50	2,244.68	2,209.52	6.40	6.94	99.62	296.27	-130.49	303.32	290.96	12.36	24.537		
2,400.00	2,378.48	2,340.90	2,300.75	6.82	7.51	99.29	323.26	-144.88	330.49	317.31	13.18	25.070		
2,500.00	2,476.46	2,437.13	2,391.98	7.25	8.08	99.01	350.25	-159.27	357.67	343.66	14.01	25.527		
2,600.00	2,574.44	2,533.35	2,483.21	7.67	8.67	98.77	377.25	-173.66	384.85	370.01	14.85	25.921		
2,700.00	2,672.42	2,629.57	2,574.44	8.10	9.25	98.56	404.24	-188.04	412.04	396.36	15.69	26.263		
2,800.00	2,770.41	2,725.79	2,665.67	8.53	9.84	98.38	431.23	-202.43	439.24	422.70	16.54	26.563		
2,900.00	2,868.39	2,822.02	2,756.90	8.96	10.44	98.22	458.23	-216.82	466.44	449.05	17.39	26.828		
3,000.00	2,966.37	2,918.24	2,848.13	9.39	11.04	98.07	485.22	-231.21	493.64	475.40	18.24	27.063		
3,100.00	3,064.35	3,014.46	2,939.36	9.82	11.64	97.95	512.21	-245.60	520.84	501.75	19.10	27.273		
3,200.00	3,162.33	3,110.68	3,030.59	10.26	12.24	97.83	539.21	-259.99	548.05	528.09	19.96	27.461		
3,300.00	3,260.31	3,206.91	3,121.83	10.70	12.84	97.73	566.20	-274.37	575.26	554.44	20.82	27.631		
3,400.00	3,358.29	3,303.13	3,213.06	11.13	13.45	97.63	593.19	-288.76	602.47	580.78	21.68	27.784		
3,500.00	3,456.27	3,399.35	3,304.29	11.57	14.05	97.54	620.19	-303.15	629.68	607.13	22.55	27.924		
3,600.00	3,554.25	3,495.57	3,395.52	12.01	14.66	97.46	647.18	-317.54	656.89	633.47	23.42	28.052		
3,700.00	3,652.24	3,591.80	3,486.75	12.45	15.27	97.39	674.17	-331.93	684.11	659.82	24.29	28.168		
3,800.00	3,750.22	3,688.02	3,577.98	12.89	15.88	97.32	701.17	-346.32	711.32	686.16	25.16	28.275		
3,900.00	3,848.20	3,784.24	3,669.21	13.33	16.49	97.26	728.16	-360.70	738.54	712.51	26.03	28.374		
4,000.00	3,946.18	3,880.46	3,760.44	13.77	17.10	97.20	755.15	-375.09	765.75	738.85	26.90	28.466		
4,100.00	4,044.16	3,976.68	3,851.67	14.21	17.72	97.15	782.15	-389.48	792.97	765.19	27.77	28.550		
4,200.00	4,142.14	4,072.91	3,942.90	14.65	18.33	97.10	809.14	-403.87	820.19	791.54	28.65	28.629		
4,300.00	4,240.12	4,169.13	4,034.13	15.09	18.94	97.05	836.13	-418.26	847.40	817.88	29.52	28.702		
4,400.00	4,338.10	4,265.35	4,125.36	15.53	19.56	97.00	863.13	-432.65	874.62	844.22	30.40	28.771		
4,500.00	4,436.08	4,361.57	4,216.60	15.97	20.17	96.96	890.12	-447.04	901.84	870.57	31.28	28.835		
4,600.00	4,534.06	4,457.80	4,307.83	16.41	20.78	96.92	917.11	-461.42	929.06	896.91	32.15	28.895		
4,700.00	4,632.05	4,554.02	4,399.06	16.86	21.40	96.89	944.11	-475.81	956.28	923.25	33.03	28.951		
4,800.00	4,730.03	4,650.24	4,490.29	17.30	22.01	96.85	971.10	-490.20	983.50	949.59	33.91	29.004		
4,900.00	4,828.01	4,746.46	4,581.52	17.74	22.63	96.82	998.09	-504.59	1,010.72	975.93	34.79	29.054		

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 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1 11-04												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,925.99	4,842.69	4,672.75	18.19	23.25	96.79	1,025.09	-518.98	1,037.94	1,002.28	35.67	29.101	
5,100.00	5,023.97	4,938.91	4,763.98	18.63	23.86	96.76	1,052.08	-533.37	1,065.16	1,028.62	36.55	29.146	
5,200.00	5,121.95	5,035.13	4,855.21	19.07	24.48	96.73	1,079.07	-547.75	1,092.38	1,054.96	37.43	29.188	
5,300.00	5,219.93	5,131.35	4,946.44	19.52	25.09	96.70	1,106.07	-562.14	1,119.61	1,081.30	38.31	29.228	
5,400.00	5,317.91	5,227.57	5,037.67	19.96	25.71	96.68	1,133.06	-576.53	1,146.83	1,107.64	39.19	29.266	
5,459.54	5,376.25	5,293.33	5,100.06	20.22	26.11	96.66	1,151.40	-586.31	1,162.97	1,123.23	39.74	29.268	
5,500.00	5,415.95	5,350.29	5,154.40	20.38	26.38	96.88	1,166.45	-594.33	1,173.37	1,133.24	40.13	29.238	
5,600.00	5,514.51	5,493.05	5,292.01	20.67	27.01	97.32	1,199.96	-612.19	1,196.19	1,155.20	40.99	29.183	
5,700.00	5,613.60	5,638.33	5,433.80	20.93	27.54	97.66	1,227.80	-627.03	1,214.79	1,173.05	41.74	29.104	
5,800.00	5,713.09	5,785.66	5,579.05	21.14	28.00	97.89	1,249.53	-638.61	1,229.06	1,186.68	42.38	29.000	
5,900.00	5,812.88	5,934.56	5,726.92	21.32	28.35	98.02	1,264.76	-646.73	1,238.90	1,196.00	42.90	28.879	
6,000.00	5,912.83	6,084.47	5,876.51	21.46	28.60	98.05	1,273.22	-651.24	1,244.25	1,200.96	43.30	28.738	
6,036.17	5,949.00	6,138.84	5,930.86	21.50	28.67	11.51	1,274.58	-651.97	1,245.08	1,201.67	43.41	28.683	
6,100.00	6,012.83	6,220.81	6,012.83	21.58	28.75	11.49	1,275.04	-652.21	1,245.34	1,201.76	43.58	28.575	
6,200.00	6,112.83	6,320.81	6,112.83	21.71	28.85	11.49	1,275.04	-652.21	1,245.34	1,201.50	43.84	28.405	
6,300.00	6,212.83	6,420.81	6,212.83	21.85	28.95	11.49	1,275.04	-652.21	1,245.34	1,201.23	44.11	28.235	
6,400.00	6,312.83	6,520.81	6,312.83	21.98	29.05	11.49	1,275.04	-652.21	1,245.34	1,200.97	44.37	28.065	
6,500.00	6,412.83	6,620.81	6,412.83	22.11	29.15	11.49	1,275.04	-652.21	1,245.34	1,200.70	44.64	27.895	
6,600.00	6,512.83	6,720.81	6,512.83	22.25	29.26	11.49	1,275.04	-652.21	1,245.34	1,200.42	44.92	27.725	
6,700.00	6,612.83	6,820.81	6,612.83	22.39	29.36	11.49	1,275.04	-652.21	1,245.34	1,200.15	45.19	27.556	
6,800.00	6,712.83	6,920.81	6,712.83	22.53	29.47	11.49	1,275.04	-652.21	1,245.34	1,199.87	45.47	27.387	
6,900.00	6,812.83	7,020.81	6,812.83	22.67	29.57	11.49	1,275.04	-652.21	1,245.34	1,199.59	45.75	27.219	
7,000.00	6,912.83	7,120.81	6,912.83	22.81	29.68	11.49	1,275.04	-652.21	1,245.34	1,199.30	46.04	27.051	
7,100.00	7,012.83	7,220.81	7,012.83	22.96	29.79	11.49	1,275.04	-652.21	1,245.34	1,199.02	46.32	26.884	
7,200.00	7,112.83	7,320.81	7,112.83	23.10	29.90	11.49	1,275.04	-652.21	1,245.34	1,198.73	46.61	26.717	
7,300.00	7,212.83	7,420.81	7,212.83	23.25	30.02	11.49	1,275.04	-652.21	1,245.34	1,198.44	46.90	26.551	
7,400.00	7,312.83	7,520.81	7,312.83	23.40	30.13	11.49	1,275.04	-652.21	1,245.34	1,198.14	47.20	26.386	
7,500.00	7,412.83	7,620.81	7,412.83	23.54	30.25	11.49	1,275.04	-652.21	1,245.34	1,197.85	47.49	26.221	
7,600.00	7,512.83	7,720.81	7,512.83	23.69	30.36	11.49	1,275.04	-652.21	1,245.34	1,197.55	47.79	26.057	
7,700.00	7,612.83	7,820.81	7,612.83	23.85	30.48	11.49	1,275.04	-652.21	1,245.34	1,197.25	48.09	25.894	
7,800.00	7,712.83	7,920.81	7,712.83	24.00	30.60	11.49	1,275.04	-652.21	1,245.34	1,196.94	48.40	25.731	
7,900.00	7,812.83	8,020.81	7,812.83	24.15	30.72	11.49	1,275.04	-652.21	1,245.34	1,196.64	48.70	25.570	
7,959.17	7,872.00	8,079.99	7,872.00	24.24	30.79	11.49	1,275.04	-652.21	1,245.34	1,196.45	48.89	25.474	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	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	-10.84	14.56	-2.79	14.82				
100.00	100.00	100.00	100.00	0.10	0.10	-10.84	14.56	-2.79	14.82	14.63	0.19	77.591	
200.00	200.00	200.00	200.00	0.32	0.32	-10.84	14.56	-2.79	14.82	14.18	0.64	23.141 CC	
300.00	300.00	299.87	299.85	0.55	0.53	-17.29	14.55	-4.53	15.24	14.16	1.08	14.129 ES	
400.00	400.00	399.49	399.33	0.77	0.76	-33.85	14.51	-9.73	17.48	15.96	1.52	11.502 SF	
500.00	500.00	498.63	498.09	0.99	1.01	-51.78	14.44	-18.34	23.42	21.43	1.99	11.759	
600.00	600.00	597.06	595.79	1.22	1.29	-64.63	14.35	-30.26	33.75	31.24	2.51	13.454	
700.00	700.00	694.56	692.11	1.44	1.62	-72.58	14.24	-45.37	48.20	45.12	3.08	15.668	
800.00	800.00	790.91	786.73	1.67	1.99	-77.48	14.10	-63.51	66.40	62.70	3.70	17.961	
900.00	900.00	885.93	879.40	1.89	2.41	-80.63	13.94	-84.51	88.10	83.72	4.37	20.151	
950.00	950.00	932.88	924.91	2.01	2.64	-81.79	13.85	-96.02	100.20	95.47	4.73	21.170	
1,000.00	1,000.00	979.54	969.96	2.11	2.88	3.77	13.76	-108.19	112.71	108.44	4.27	26.403	
1,100.00	1,099.93	1,072.32	1,058.90	2.32	3.40	2.31	13.56	-134.57	137.59	132.86	4.72	29.120	
1,200.00	1,199.68	1,164.39	1,146.28	2.53	3.98	1.24	13.34	-163.58	162.26	157.07	5.19	31.251	
1,300.00	1,299.13	1,255.78	1,232.04	2.76	4.61	0.40	13.10	-195.14	186.69	181.02	5.67	32.923	
1,400.00	1,398.15	1,348.27	1,317.81	3.03	5.29	-0.31	12.84	-229.73	210.74	204.57	6.16	34.185	
1,500.00	1,496.63	1,445.90	1,408.04	3.32	6.05	-0.92	12.56	-267.01	232.24	225.55	6.69	34.733	
1,526.64	1,522.75	1,472.02	1,432.19	3.41	6.25	-1.06	12.48	-276.99	237.40	230.57	6.83	34.772	
1,600.00	1,594.63	1,544.04	1,498.75	3.66	6.82	-1.44	12.27	-304.49	251.27	244.04	7.23	34.760	
1,700.00	1,692.61	1,642.22	1,589.48	4.02	7.59	-1.89	11.99	-341.98	270.19	262.41	7.78	34.715	
1,800.00	1,790.60	1,740.39	1,680.22	4.39	8.37	-2.28	11.71	-379.47	289.13	280.78	8.34	34.651	
1,900.00	1,888.58	1,838.56	1,770.95	4.78	9.15	-2.63	11.42	-416.96	308.08	299.17	8.91	34.574	
2,000.00	1,986.56	1,936.73	1,861.68	5.17	9.93	-2.93	11.14	-454.45	327.04	317.55	9.48	34.490	
2,100.00	2,084.54	2,034.91	1,952.41	5.58	10.72	-3.20	10.85	-491.93	346.00	335.94	10.06	34.402	
2,200.00	2,182.52	2,133.08	2,043.15	5.99	11.51	-3.45	10.57	-529.42	364.97	354.34	10.64	34.314	
2,300.00	2,280.50	2,231.25	2,133.88	6.40	12.29	-3.66	10.29	-566.91	383.95	372.73	11.22	34.226	
2,400.00	2,378.48	2,329.42	2,224.61	6.82	13.08	-3.86	10.00	-604.40	402.94	391.13	11.80	34.140	
2,500.00	2,476.46	2,427.60	2,315.35	7.25	13.87	-4.04	9.72	-641.89	421.92	409.53	12.39	34.056	
2,600.00	2,574.44	2,525.77	2,406.08	7.67	14.66	-4.21	9.43	-679.37	440.91	427.94	12.98	33.975	
2,700.00	2,672.42	2,623.94	2,496.81	8.10	15.45	-4.36	9.15	-716.86	459.91	446.34	13.57	33.897	
2,800.00	2,770.41	2,722.11	2,587.54	8.53	16.24	-4.50	8.87	-754.35	478.91	464.75	14.16	33.822	
2,900.00	2,868.39	2,820.29	2,678.28	8.96	17.03	-4.63	8.58	-791.84	497.91	483.15	14.75	33.750	
3,000.00	2,966.37	2,918.46	2,769.01	9.39	17.82	-4.74	8.30	-829.33	516.91	501.56	15.35	33.681	
3,100.00	3,064.35	3,016.63	2,859.74	9.82	18.62	-4.86	8.01	-866.82	535.91	519.97	15.94	33.615	
3,200.00	3,162.33	3,114.81	2,950.47	10.26	19.41	-4.96	7.73	-904.30	554.92	538.38	16.54	33.552	
3,300.00	3,260.31	3,212.98	3,041.21	10.70	20.20	-5.05	7.45	-941.79	573.93	556.79	17.14	33.491	
3,400.00	3,358.29	3,311.15	3,131.94	11.13	20.99	-5.14	7.16	-979.28	592.93	575.20	17.73	33.433	
3,500.00	3,456.27	3,409.32	3,222.67	11.57	21.79	-5.23	6.88	-1,016.77	611.95	593.61	18.33	33.378	
3,600.00	3,554.25	3,507.50	3,313.40	12.01	22.58	-5.31	6.59	-1,054.26	630.96	612.02	18.93	33.325	
3,700.00	3,652.24	3,605.67	3,404.14	12.45	23.37	-5.38	6.31	-1,091.74	649.97	630.44	19.53	33.274	
3,800.00	3,750.22	3,703.84	3,494.87	12.89	24.17	-5.45	6.03	-1,129.23	668.98	648.85	20.13	33.226	
3,900.00	3,848.20	3,802.01	3,585.60	13.33	24.96	-5.52	5.74	-1,166.72	688.00	667.26	20.74	33.179	
4,000.00	3,946.18	3,900.19	3,676.33	13.77	25.75	-5.58	5.46	-1,204.21	707.01	685.67	21.34	33.134	
4,100.00	4,044.16	3,998.36	3,767.07	14.21	26.55	-5.64	5.17	-1,241.70	726.03	704.09	21.94	33.092	
4,200.00	4,142.14	4,096.53	3,857.80	14.65	27.34	-5.70	4.89	-1,279.19	745.05	722.50	22.54	33.050	
4,300.00	4,240.12	4,194.70	3,948.53	15.09	28.13	-5.75	4.61	-1,316.67	764.06	740.92	23.15	33.011	
4,400.00	4,338.10	4,292.88	4,039.27	15.53	28.93	-5.80	4.32	-1,354.16	783.08	759.33	23.75	32.973	
4,500.00	4,436.08	4,391.05	4,130.00	15.97	29.72	-5.85	4.04	-1,391.65	802.10	777.75	24.35	32.936	
4,600.00	4,534.06	4,489.22	4,220.73	16.41	30.52	-5.90	3.75	-1,429.14	821.12	796.16	24.96	32.901	
4,700.00	4,632.05	4,587.39	4,311.46	16.86	31.31	-5.94	3.47	-1,466.63	840.14	814.58	25.56	32.868	
4,800.00	4,730.03	4,685.57	4,402.20	17.30	32.11	-5.99	3.19	-1,504.11	859.16	832.99	26.17	32.835	
4,900.00	4,828.01	4,783.74	4,492.93	17.74	32.90	-6.03	2.90	-1,541.60	878.18	851.41	26.77	32.804	

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 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	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 31-1 - P_BERNHARDT 31-1 - 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	4,925.99	4,881.91	4,583.66	18.19	33.69	-6.07	2.62	-1,579.09	897.20	869.82	27.38	32.773	
5,100.00	5,023.97	4,980.08	4,674.39	18.63	34.49	-6.10	2.33	-1,616.58	916.22	888.24	27.98	32.744	
5,200.00	5,121.95	5,078.26	4,765.13	19.07	35.28	-6.14	2.05	-1,654.07	935.24	906.66	28.59	32.716	
5,300.00	5,219.93	5,176.43	4,855.86	19.52	36.08	-6.17	1.77	-1,691.55	954.27	925.07	29.19	32.689	
5,400.00	5,317.91	5,316.54	4,986.33	19.96	36.96	-6.23	1.38	-1,742.57	971.52	941.63	29.89	32.499	
5,459.54	5,376.25	5,405.98	5,070.86	20.22	37.45	-6.27	1.16	-1,771.81	979.40	949.09	30.31	32.308	
5,500.00	5,415.95	5,467.11	5,129.13	20.38	37.75	-6.31	1.02	-1,790.27	983.98	953.43	30.55	32.210	
5,600.00	5,514.51	5,618.99	5,275.51	20.67	38.44	-6.39	0.71	-1,830.71	994.03	962.98	31.05	32.011	
5,700.00	5,613.60	5,771.86	5,424.80	20.93	38.99	-6.46	0.46	-1,863.53	1,002.25	970.78	31.47	31.847	
5,800.00	5,713.09	5,925.55	5,576.44	21.14	39.43	-6.51	0.27	-1,888.45	1,008.59	976.79	31.80	31.716	
5,900.00	5,812.88	6,079.84	5,729.79	21.32	39.75	-6.54	0.15	-1,905.25	1,013.04	980.99	32.04	31.617	
6,000.00	5,912.83	6,234.52	5,884.22	21.46	39.96	-6.55	0.08	-1,913.78	1,015.56	983.37	32.19	31.549	
6,036.17	5,949.00	6,290.54	5,940.22	21.50	40.00	-93.08	0.07	-1,914.81	1,016.00	983.78	32.23	31.528	
6,100.00	6,012.83	6,363.14	6,012.83	21.58	40.05	-93.08	0.07	-1,914.92	1,016.07	983.63	32.44	31.324	
6,200.00	6,112.83	6,463.14	6,112.83	21.71	40.12	-93.08	0.07	-1,914.92	1,016.07	983.31	32.76	31.015	
6,300.00	6,212.83	6,563.14	6,212.83	21.85	40.19	-93.08	0.07	-1,914.92	1,016.07	982.98	33.09	30.709	
6,400.00	6,312.83	6,663.14	6,312.83	21.98	40.27	-93.08	0.07	-1,914.92	1,016.07	982.65	33.42	30.407	
6,500.00	6,412.83	6,763.14	6,412.83	22.11	40.34	-93.08	0.07	-1,914.92	1,016.07	982.32	33.75	30.109	
6,600.00	6,512.83	6,863.14	6,512.83	22.25	40.42	-93.08	0.07	-1,914.92	1,016.07	981.99	34.08	29.813	
6,700.00	6,612.83	6,963.14	6,612.83	22.39	40.50	-93.08	0.07	-1,914.92	1,016.07	981.65	34.42	29.522	
6,800.00	6,712.83	7,063.14	6,712.83	22.53	40.57	-93.08	0.07	-1,914.92	1,016.07	981.31	34.76	29.234	
6,900.00	6,812.83	7,163.14	6,812.83	22.67	40.65	-93.08	0.07	-1,914.92	1,016.07	980.97	35.10	28.950	
7,000.00	6,912.83	7,263.14	6,912.83	22.81	40.73	-93.08	0.07	-1,914.92	1,016.07	980.63	35.44	28.669	
7,100.00	7,012.83	7,363.14	7,012.83	22.96	40.81	-93.08	0.07	-1,914.92	1,016.07	980.28	35.79	28.392	
7,200.00	7,112.83	7,463.14	7,112.83	23.10	40.90	-93.08	0.07	-1,914.92	1,016.07	979.93	36.14	28.118	
7,300.00	7,212.83	7,563.14	7,212.83	23.25	40.98	-93.08	0.07	-1,914.92	1,016.07	979.58	36.49	27.849	
7,400.00	7,312.83	7,663.14	7,312.83	23.40	41.06	-93.08	0.07	-1,914.92	1,016.07	979.23	36.84	27.582	
7,500.00	7,412.83	7,763.14	7,412.83	23.54	41.15	-93.08	0.07	-1,914.92	1,016.07	978.88	37.19	27.319	
7,600.00	7,512.83	7,863.14	7,512.83	23.69	41.24	-93.08	0.07	-1,914.92	1,016.07	978.52	37.55	27.060	
7,700.00	7,612.83	7,963.14	7,612.83	23.85	41.32	-93.08	0.07	-1,914.92	1,016.07	978.16	37.91	26.805	
7,800.00	7,712.83	8,063.14	7,712.83	24.00	41.41	-93.08	0.07	-1,914.92	1,016.07	977.80	38.27	26.552	
7,900.00	7,812.83	8,163.14	7,812.83	24.15	41.50	-93.08	0.07	-1,914.92	1,016.07	977.44	38.63	26.304	
7,959.17	7,872.00	8,222.31	7,872.00	24.24	41.56	-93.08	0.07	-1,914.92	1,016.07	977.23	38.84	26.158	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 4-1 - P_BERNHARDT 4- - PLAN #1 11-04-09													Offset Site Error: 0.00 ft
Survey Program: 0-MWD													Offset Well Error: 0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-5.47	29.13	-2.79	29.26				
100.00	100.00	100.00	100.00	0.10	0.10	-5.47	29.13	-2.79	29.26	29.07	0.19	153.175	
200.00	200.00	200.00	200.00	0.32	0.32	-5.47	29.13	-2.79	29.26	28.62	0.64	45.684	
300.00	300.00	300.00	300.00	0.55	0.55	-5.47	29.13	-2.79	29.26	28.17	1.09	26.845	
400.00	400.00	400.00	400.00	0.77	0.77	-5.47	29.13	-2.79	29.26	27.72	1.54	19.007	
500.00	500.00	500.00	500.00	0.99	0.99	-5.47	29.13	-2.79	29.26	27.28	1.99	14.712	
600.00	600.00	600.00	600.00	1.22	1.22	-5.47	29.13	-2.79	29.26	26.83	2.44	12.000	
700.00	700.00	700.00	700.00	1.44	1.44	-5.47	29.13	-2.79	29.26	26.38	2.89	10.132	
800.00	800.00	800.00	800.00	1.67	1.67	-5.47	29.13	-2.79	29.26	25.93	3.34	8.768	
900.00	900.00	900.00	900.00	1.89	1.89	-5.47	29.13	-2.79	29.26	25.48	3.79	7.727	
950.00	950.00	950.00	950.00	2.01	2.01	-5.47	29.13	-2.79	29.26	25.25	4.01	7.294 CC	
1,000.00	1,000.00	999.73	999.73	2.11	2.11	81.18	29.32	-3.17	29.43	25.20	4.23	6.963 ES	
1,100.00	1,099.93	1,099.17	1,099.11	2.32	2.33	82.09	30.87	-6.26	30.73	26.09	4.64	6.621	
1,200.00	1,199.68	1,198.58	1,198.27	2.53	2.55	83.68	33.96	-12.42	33.36	28.29	5.08	6.571 SF	
1,300.00	1,299.13	1,297.91	1,297.06	2.76	2.78	85.65	38.58	-21.65	37.34	31.80	5.55	6.734	
1,400.00	1,398.15	1,397.14	1,395.33	3.03	3.04	87.68	44.73	-33.93	42.70	36.64	6.06	7.044	
1,500.00	1,496.63	1,496.25	1,492.95	3.32	3.34	89.57	52.38	-49.21	49.44	42.80	6.65	7.440	
1,526.64	1,522.75	1,522.63	1,518.82	3.41	3.42	90.04	54.67	-53.79	51.47	44.65	6.82	7.550	
1,600.00	1,594.63	1,595.21	1,589.77	3.66	3.67	90.42	61.53	-67.48	57.55	50.25	7.31	7.878	
1,700.00	1,692.61	1,693.90	1,685.57	4.02	4.06	88.47	72.14	-88.66	67.01	58.98	8.02	8.350	
1,800.00	1,790.60	1,792.09	1,780.01	4.39	4.50	84.77	84.15	-112.65	78.06	69.27	8.78	8.886	
1,900.00	1,888.58	1,889.54	1,872.79	4.78	5.00	80.18	97.51	-139.31	91.13	81.57	9.56	9.529	
2,000.00	1,986.56	1,986.61	1,964.18	5.17	5.56	75.35	112.16	-168.57	106.59	96.24	10.35	10.300	
2,100.00	2,084.54	2,084.91	2,056.41	5.58	6.17	71.38	127.38	-198.96	123.21	112.08	11.13	11.068	
2,200.00	2,182.52	2,183.20	2,148.64	5.99	6.80	68.35	142.60	-229.35	140.28	128.37	11.91	11.779	
2,300.00	2,280.50	2,281.50	2,240.87	6.40	7.44	65.99	157.82	-259.74	157.65	144.96	12.68	12.428	
2,400.00	2,378.48	2,379.79	2,333.10	6.82	8.09	64.10	173.04	-290.13	175.22	161.76	13.46	13.020	
2,500.00	2,476.46	2,478.09	2,425.33	7.25	8.75	62.55	188.26	-320.53	192.95	178.72	14.23	13.557	
2,600.00	2,574.44	2,576.38	2,517.56	7.67	9.42	61.26	203.48	-350.92	210.79	195.78	15.01	14.045	
2,700.00	2,672.42	2,674.67	2,609.79	8.10	10.10	60.17	218.70	-381.31	228.72	212.93	15.78	14.490	
2,800.00	2,770.41	2,772.97	2,702.02	8.53	10.78	59.24	233.92	-411.70	246.71	230.15	16.56	14.897	
2,900.00	2,868.39	2,871.26	2,794.25	8.96	11.46	58.44	249.14	-442.09	264.77	247.43	17.34	15.270	
3,000.00	2,966.37	2,969.56	2,886.48	9.39	12.15	57.74	264.36	-472.49	282.86	264.74	18.12	15.612	
3,100.00	3,064.35	3,067.85	2,978.71	9.82	12.83	57.13	279.58	-502.88	300.99	282.09	18.90	15.927	
3,200.00	3,162.33	3,166.15	3,070.94	10.26	13.53	56.58	294.81	-533.27	319.15	299.47	19.68	16.217	
3,300.00	3,260.31	3,264.44	3,163.17	10.70	14.22	56.09	310.03	-563.66	337.34	316.88	20.46	16.487	
3,400.00	3,358.29	3,362.73	3,255.40	11.13	14.91	55.66	325.25	-594.05	355.54	334.30	21.24	16.737	
3,500.00	3,456.27	3,461.03	3,347.63	11.57	15.61	55.26	340.47	-624.45	373.77	351.74	22.03	16.970	
3,600.00	3,554.25	3,559.32	3,439.86	12.01	16.31	54.90	355.69	-654.84	392.01	369.20	22.81	17.187	
3,700.00	3,652.24	3,657.62	3,532.09	12.45	17.00	54.58	370.91	-685.23	410.26	386.67	23.59	17.390	
3,800.00	3,750.22	3,755.91	3,624.32	12.89	17.70	54.28	386.13	-715.62	428.53	404.15	24.38	17.580	
3,900.00	3,848.20	3,854.21	3,716.55	13.33	18.40	54.01	401.35	-746.01	446.80	421.64	25.16	17.757	
4,000.00	3,946.18	3,952.50	3,808.78	13.77	19.10	53.75	416.57	-776.40	465.09	439.13	25.95	17.920	
4,100.00	4,044.16	4,050.79	3,901.01	14.21	19.80	53.52	431.79	-806.80	483.38	456.63	26.75	18.073	
4,200.00	4,142.14	4,149.09	3,993.24	14.65	20.51	53.30	447.01	-837.19	501.68	474.14	27.54	18.218	
4,300.00	4,240.12	4,247.38	4,085.48	15.09	21.21	53.10	462.23	-867.58	519.99	491.66	28.33	18.354	
4,400.00	4,338.10	4,345.68	4,177.71	15.53	21.91	52.91	477.45	-897.97	538.30	509.17	29.13	18.482	
4,500.00	4,436.08	4,443.97	4,269.94	15.97	22.61	52.74	492.68	-928.36	556.62	526.70	29.92	18.604	
4,600.00	4,534.06	4,542.27	4,362.17	16.41	23.32	52.58	507.90	-958.76	574.94	544.23	30.71	18.719	
4,700.00	4,632.05	4,640.56	4,454.40	16.86	24.02	52.42	523.12	-989.15	593.27	561.76	31.51	18.829	
4,800.00	4,730.03	4,738.85	4,546.63	17.30	24.73	52.28	538.34	-1,019.54	611.60	579.29	32.30	18.933	
4,900.00	4,828.01	4,837.15	4,638.86	17.74	25.43	52.14	553.56	-1,049.93	629.93	596.83	33.10	19.032	

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 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
5,000.00	4,925.99	4,935.44	4,731.09	18.19	26.14	52.01	568.78	-1,080.32	648.27	614.37	33.89	19.126	
5,100.00	5,023.97	5,033.74	4,823.32	18.63	26.84	51.89	584.00	-1,110.72	666.61	631.92	34.69	19.216	
5,200.00	5,121.95	5,132.03	4,915.55	19.07	27.55	51.78	599.22	-1,141.11	684.95	649.46	35.49	19.301	
5,300.00	5,219.93	5,232.77	5,010.08	19.52	28.26	51.67	614.81	-1,172.24	703.28	666.99	36.29	19.380	
5,400.00	5,317.91	5,358.76	5,129.38	19.96	28.97	51.66	632.94	-1,208.43	719.40	682.26	37.13	19.373	
5,459.54	5,376.25	5,434.45	5,201.86	20.22	29.33	51.76	642.69	-1,227.90	727.18	689.54	37.64	19.319	
5,500.00	5,415.95	5,486.09	5,251.63	20.38	29.56	51.93	648.85	-1,240.21	731.87	693.91	37.97	19.277	
5,600.00	5,514.51	5,614.23	5,376.15	20.67	30.08	52.27	662.40	-1,267.25	742.26	703.62	38.64	19.209	
5,700.00	5,613.60	5,743.05	5,502.55	20.93	30.51	52.52	673.49	-1,289.40	750.89	711.67	39.21	19.149	
5,800.00	5,713.09	5,872.41	5,630.48	21.14	30.87	52.69	682.05	-1,306.50	757.73	718.05	39.68	19.096	
5,900.00	5,812.88	6,002.21	5,759.58	21.32	31.15	52.78	688.04	-1,318.45	762.76	722.72	40.04	19.050	
6,000.00	5,912.83	6,132.33	5,889.47	21.46	31.34	52.78	691.40	-1,325.17	765.96	725.67	40.29	19.011	
6,036.17	5,949.00	6,179.45	5,936.57	21.50	31.39	-33.76	691.97	-1,326.30	766.67	726.31	40.36	18.997	
6,100.00	6,012.83	6,255.71	6,012.83	21.58	31.46	-33.78	692.19	-1,326.75	767.00	726.48	40.53	18.926	
6,200.00	6,112.83	6,355.71	6,112.83	21.71	31.55	-33.78	692.19	-1,326.75	767.00	726.21	40.80	18.801	
6,300.00	6,212.83	6,455.71	6,212.83	21.85	31.64	-33.78	692.19	-1,326.75	767.00	725.93	41.07	18.674	
6,400.00	6,312.83	6,555.71	6,312.83	21.98	31.74	-33.78	692.19	-1,326.75	767.00	725.65	41.35	18.548	
6,500.00	6,412.83	6,655.71	6,412.83	22.11	31.84	-33.78	692.19	-1,326.75	767.00	725.37	41.64	18.422	
6,600.00	6,512.83	6,755.71	6,512.83	22.25	31.93	-33.78	692.19	-1,326.75	767.00	725.08	41.92	18.296	
6,700.00	6,612.83	6,855.71	6,612.83	22.39	32.03	-33.78	692.19	-1,326.75	767.00	724.79	42.21	18.171	
6,800.00	6,712.83	6,955.71	6,712.83	22.53	32.13	-33.78	692.19	-1,326.75	767.00	724.50	42.50	18.047	
6,900.00	6,812.83	7,055.71	6,812.83	22.67	32.23	-33.78	692.19	-1,326.75	767.00	724.21	42.80	17.923	
7,000.00	6,912.83	7,155.71	6,912.83	22.81	32.34	-33.78	692.19	-1,326.75	767.00	723.91	43.09	17.799	
7,100.00	7,012.83	7,255.71	7,012.83	22.96	32.44	-33.78	692.19	-1,326.75	767.00	723.61	43.39	17.676	
7,200.00	7,112.83	7,355.71	7,112.83	23.10	32.55	-33.78	692.19	-1,326.75	767.00	723.31	43.69	17.554	
7,300.00	7,212.83	7,455.71	7,212.83	23.25	32.65	-33.78	692.19	-1,326.75	767.00	723.00	44.00	17.433	
7,400.00	7,312.83	7,555.71	7,312.83	23.40	32.76	-33.78	692.19	-1,326.75	767.00	722.70	44.31	17.312	
7,500.00	7,412.83	7,655.71	7,412.83	23.54	32.87	-33.78	692.19	-1,326.75	767.00	722.39	44.61	17.192	
7,600.00	7,512.83	7,755.71	7,512.83	23.69	32.98	-33.78	692.19	-1,326.75	767.00	722.08	44.93	17.072	
7,700.00	7,612.83	7,855.71	7,612.83	23.85	33.09	-33.78	692.19	-1,326.75	767.00	721.76	45.24	16.954	
7,800.00	7,712.83	7,955.71	7,712.83	24.00	33.20	-33.78	692.19	-1,326.75	767.00	721.45	45.56	16.836	
7,900.00	7,812.83	8,055.71	7,812.83	24.15	33.31	-33.78	692.19	-1,326.75	767.00	721.13	45.88	16.719	
7,959.17	7,872.00	8,114.88	7,872.00	24.24	33.38	-33.78	692.19	-1,326.75	767.00	720.94	46.06	16.651	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 11-04-09 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT STATE 37-36 - P_BERNHARDT STATE 37-36													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Tooface (")	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	-3.37	47.35	-2.79	47.43					
100.00	100.00	100.00	100.00	0.10	0.10	-3.37	47.35	-2.79	47.43	47.24	0.19	248.246		
200.00	200.00	200.00	200.00	0.32	0.32	-3.37	47.35	-2.79	47.43	46.79	0.64	74.038 CC, ES		
300.00	300.00	298.85	298.83	0.55	0.54	-1.89	48.57	-1.60	48.61	47.53	1.08	44.847		
400.00	400.00	397.47	397.31	0.77	0.77	2.12	52.24	1.94	52.35	50.82	1.53	34.216		
500.00	500.00	495.62	495.09	0.99	1.01	7.62	58.31	7.80	59.03	57.04	1.99	29.672		
600.00	600.00	593.08	591.85	1.22	1.29	13.41	66.72	15.91	69.07	66.60	2.48	27.905		
700.00	700.00	689.63	687.25	1.44	1.60	18.71	77.38	26.20	82.68	79.68	3.00	27.571 SF		
800.00	800.00	785.07	781.01	1.67	1.95	23.15	90.18	38.56	99.90	96.33	3.57	28.002		
900.00	900.00	879.22	872.87	1.89	2.35	26.73	105.01	52.87	120.66	116.47	4.18	28.836		
950.00	950.00	925.75	918.01	2.01	2.57	28.22	113.13	60.72	132.32	127.81	4.51	29.337		
1,000.00	1,000.00	971.82	962.51	2.11	2.80	115.99	121.70	68.98	145.01	140.70	4.31	33.647		
1,100.00	1,099.93	1,062.16	1,049.20	2.32	3.28	118.63	139.99	86.63	174.08	169.33	4.75	36.682		
1,200.00	1,199.68	1,149.78	1,132.48	2.53	3.79	121.20	159.59	105.56	208.17	202.99	5.18	40.194		
1,300.00	1,299.13	1,234.34	1,212.01	2.76	4.33	123.49	180.24	125.49	247.31	241.70	5.61	44.059		
1,400.00	1,398.15	1,315.54	1,287.56	3.03	4.89	125.44	201.65	146.16	291.42	285.37	6.05	48.157		
1,500.00	1,496.63	1,398.96	1,364.47	3.32	5.51	127.22	224.90	168.59	339.88	333.37	6.52	52.168		
1,526.64	1,522.75	1,421.71	1,385.43	3.41	5.68	127.67	231.26	174.74	353.23	346.59	6.64	53.164		
1,600.00	1,594.63	1,484.23	1,443.03	3.66	6.14	129.38	248.75	191.62	390.37	383.36	7.02	55.642		
1,700.00	1,692.61	1,569.45	1,521.54	4.02	6.79	131.26	272.60	214.64	441.34	433.80	7.54	58.525		
1,800.00	1,790.60	1,654.67	1,600.05	4.39	7.43	132.76	296.44	237.65	492.59	484.51	8.08	60.944		
1,900.00	1,888.58	1,739.89	1,678.56	4.78	8.08	133.98	320.29	260.67	544.05	535.41	8.64	62.990		
2,000.00	1,986.56	1,825.10	1,757.07	5.17	8.73	134.99	344.13	283.69	595.66	586.46	9.20	64.735		
2,100.00	2,084.54	1,910.32	1,835.58	5.58	9.39	135.84	367.97	306.70	647.38	637.61	9.77	66.235		
2,200.00	2,182.52	1,995.54	1,914.09	5.99	10.04	136.56	391.82	329.72	699.19	688.84	10.35	67.533		
2,300.00	2,280.50	2,080.76	1,992.61	6.40	10.70	137.19	415.66	352.73	751.08	740.14	10.94	68.665		
2,400.00	2,378.48	2,165.98	2,071.12	6.82	11.36	137.73	439.50	375.75	803.02	791.49	11.53	69.660		
2,500.00	2,476.46	2,251.20	2,149.63	7.25	12.01	138.21	463.35	398.76	855.00	842.88	12.12	70.540		
2,600.00	2,574.44	2,336.41	2,228.14	7.67	12.67	138.63	487.19	421.78	907.03	894.31	12.72	71.323		
2,700.00	2,672.42	2,421.63	2,306.65	8.10	13.33	139.01	511.04	444.79	959.09	945.77	13.32	72.023		
2,800.00	2,770.41	2,506.85	2,385.16	8.53	13.99	139.35	534.88	467.81	1,011.17	997.26	13.92	72.653		
2,900.00	2,868.39	2,592.07	2,463.67	8.96	14.65	139.66	558.72	490.82	1,063.28	1,048.76	14.52	73.221		
3,000.00	2,966.37	2,677.29	2,542.18	9.39	15.31	139.94	582.57	513.84	1,115.41	1,100.29	15.13	73.736		
3,100.00	3,064.35	2,762.51	2,620.69	9.82	15.97	140.19	606.41	536.85	1,167.56	1,151.83	15.73	74.205		
3,200.00	3,162.33	2,847.72	2,699.20	10.26	16.63	140.42	630.25	559.87	1,219.72	1,203.38	16.34	74.633		
3,300.00	3,260.31	2,932.94	2,777.71	10.70	17.29	140.63	654.10	582.88	1,271.90	1,254.95	16.95	75.027		
3,400.00	3,358.29	3,018.16	2,856.22	11.13	17.95	140.83	677.94	605.90	1,324.09	1,306.52	17.56	75.389		
3,500.00	3,456.27	3,103.38	2,934.73	11.57	18.61	141.01	701.78	628.91	1,376.28	1,358.11	18.18	75.723		
3,600.00	3,554.25	3,188.60	3,013.25	12.01	19.28	141.18	725.63	651.93	1,428.49	1,409.70	18.79	76.032		
3,700.00	3,652.24	3,273.82	3,091.76	12.45	19.94	141.33	749.47	674.94	1,480.71	1,461.30	19.40	76.318		
3,800.00	3,750.22	3,359.03	3,170.27	12.89	20.60	141.48	773.32	697.96	1,532.93	1,512.91	20.02	76.585		
3,900.00	3,848.20	3,444.25	3,248.78	13.33	21.26	141.61	797.16	720.98	1,585.16	1,564.53	20.63	76.834		
4,000.00	3,946.18	3,529.47	3,327.29	13.77	21.92	141.74	821.00	743.99	1,637.39	1,616.15	21.25	77.066		
4,100.00	4,044.16	3,614.69	3,405.80	14.21	22.59	141.86	844.85	767.01	1,689.63	1,667.77	21.86	77.284		
4,200.00	4,142.14	3,699.91	3,484.31	14.65	23.25	141.97	868.69	790.02	1,741.88	1,719.40	22.48	77.488		
4,300.00	4,240.12	3,785.13	3,562.82	15.09	23.91	142.08	892.53	813.04	1,794.13	1,771.03	23.10	77.680		
4,400.00	4,338.10	3,870.34	3,641.33	15.53	24.57	142.18	916.38	836.05	1,846.39	1,822.67	23.71	77.861		
4,500.00	4,436.08	3,955.56	3,719.84	15.97	25.24	142.27	940.22	859.07	1,898.64	1,874.31	24.33	78.031		
4,600.00	4,534.06	4,040.78	3,798.35	16.41	25.90	142.36	964.06	882.08	1,950.91	1,925.96	24.95	78.192		
4,700.00	4,632.05	4,126.00	3,876.86	16.86	26.56	142.44	987.91	905.10	2,003.17	1,977.60	25.57	78.345		
4,800.00	4,730.03	4,211.22	3,955.37	17.30	27.22	142.52	1,011.75	928.11	2,055.44	2,029.25	26.19	78.489		
4,900.00	4,828.01	4,296.44	4,033.88	17.74	27.89	142.60	1,035.60	951.13	2,107.71	2,080.90	26.81	78.626		

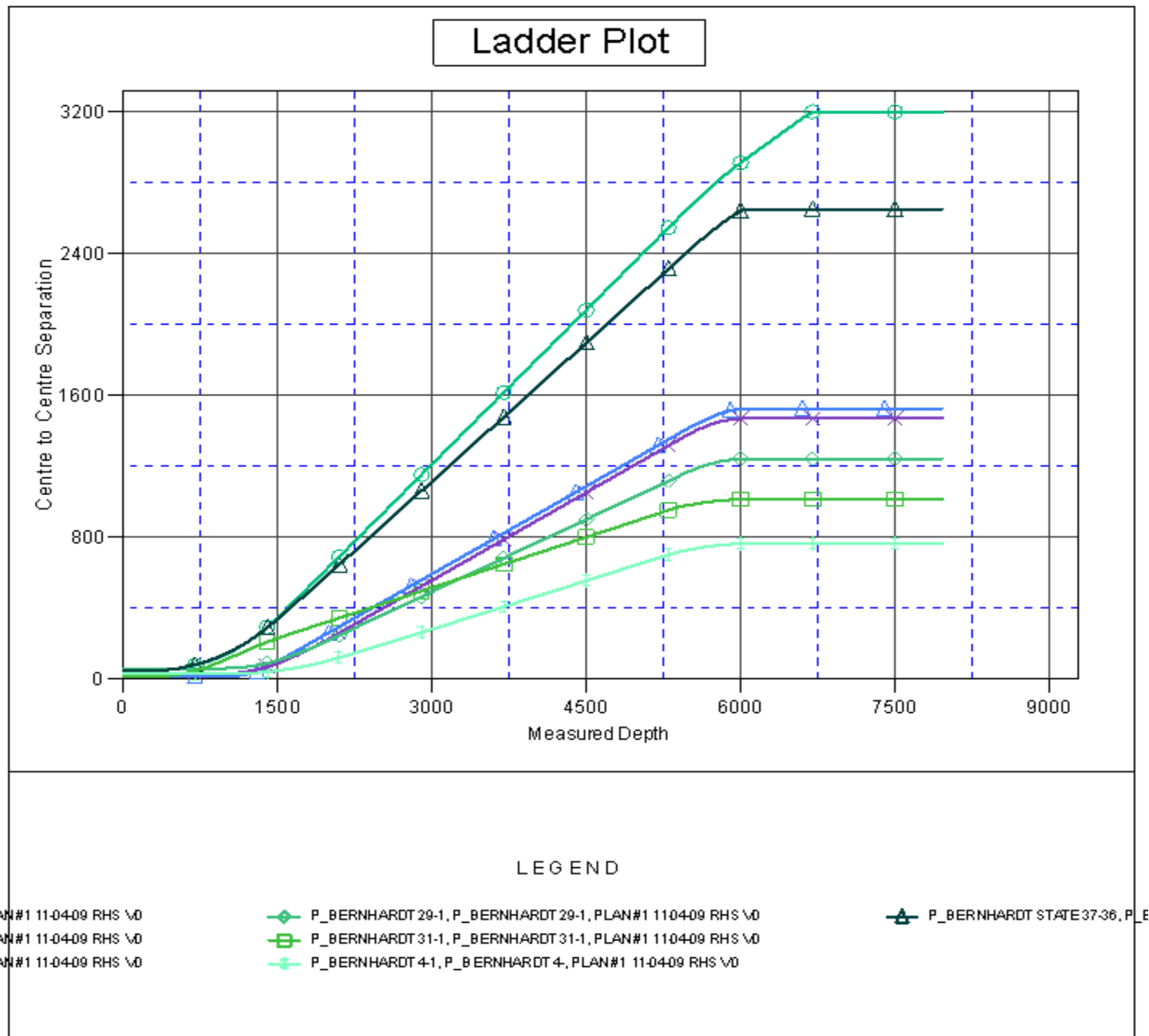
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	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						
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	4,925.99	4,381.65	4,112.40	18.19	28.55	142.67	1,059.44	974.14	2,159.98	2,132.56	27.43	78.756	
5,100.00	5,023.97	4,466.87	4,190.91	18.63	29.21	142.74	1,083.28	997.16	2,212.26	2,184.21	28.05	78.880	
5,200.00	5,121.95	4,552.09	4,269.42	19.07	29.88	142.81	1,107.13	1,020.17	2,264.54	2,235.87	28.67	78.998	
5,300.00	5,219.93	4,637.31	4,347.93	19.52	30.54	142.87	1,130.97	1,043.19	2,316.82	2,287.53	29.29	79.110	
5,400.00	5,317.91	4,722.53	4,426.44	19.96	31.20	142.93	1,154.81	1,066.20	2,369.10	2,339.20	29.91	79.217	
5,459.54	5,376.25	4,773.26	4,473.18	20.22	31.60	142.97	1,169.01	1,079.91	2,400.23	2,369.95	30.28	79.279	
5,500.00	5,415.95	4,807.87	4,505.06	20.38	31.87	143.28	1,178.69	1,089.25	2,421.19	2,390.57	30.62	79.060	
5,600.00	5,514.51	4,894.40	4,584.78	20.67	32.54	143.97	1,202.90	1,112.62	2,471.30	2,439.86	31.44	78.603	
5,700.00	5,613.60	4,982.30	4,665.76	20.93	33.22	144.55	1,227.50	1,136.36	2,518.94	2,486.72	32.22	78.169	
5,800.00	5,713.09	5,071.44	4,747.89	21.14	33.92	145.04	1,252.44	1,160.44	2,564.07	2,531.10	32.97	77.766	
5,900.00	5,812.88	5,161.73	4,831.07	21.32	34.62	145.43	1,277.70	1,184.82	2,606.64	2,572.97	33.68	77.403	
6,000.00	5,912.83	5,615.44	5,258.95	21.46	37.16	145.12	1,385.33	1,288.71	2,643.69	2,608.37	35.32	74.846	
6,036.17	5,949.00	5,955.39	5,592.01	21.50	38.31	58.33	1,433.58	1,335.29	2,650.81	2,614.64	36.17	73.297	
6,100.00	6,012.83	6,377.50	6,012.83	21.58	38.98	58.19	1,453.57	1,354.58	2,653.58	2,616.69	36.90	71.919	
6,200.00	6,112.83	6,477.50	6,112.83	21.71	39.05	58.19	1,453.57	1,354.58	2,653.58	2,616.40	37.19	71.358	
6,300.00	6,212.83	6,577.50	6,212.83	21.85	39.12	58.19	1,453.57	1,354.58	2,653.58	2,616.10	37.48	70.798	
6,400.00	6,312.83	6,677.50	6,312.83	21.98	39.19	58.19	1,453.57	1,354.58	2,653.58	2,615.80	37.78	70.241	
6,500.00	6,412.83	6,777.50	6,412.83	22.11	39.27	58.19	1,453.57	1,354.58	2,653.58	2,615.50	38.08	69.688	
6,600.00	6,512.83	6,877.50	6,512.83	22.25	39.34	58.19	1,453.57	1,354.58	2,653.58	2,615.20	38.38	69.137	
6,700.00	6,612.83	6,977.50	6,612.83	22.39	39.42	58.19	1,453.57	1,354.58	2,653.58	2,614.90	38.69	68.591	
6,800.00	6,712.83	7,077.50	6,712.83	22.53	39.50	58.19	1,453.57	1,354.58	2,653.58	2,614.59	39.00	68.048	
6,900.00	6,812.83	7,177.50	6,812.83	22.67	39.58	58.19	1,453.57	1,354.58	2,653.58	2,614.28	39.31	67.509	
7,000.00	6,912.83	7,277.50	6,912.83	22.81	39.66	58.19	1,453.57	1,354.58	2,653.58	2,613.96	39.62	66.974	
7,100.00	7,012.83	7,377.50	7,012.83	22.96	39.74	58.19	1,453.57	1,354.58	2,653.58	2,613.64	39.94	66.444	
7,200.00	7,112.83	7,477.50	7,112.83	23.10	39.82	58.19	1,453.57	1,354.58	2,653.58	2,613.33	40.26	65.917	
7,300.00	7,212.83	7,577.50	7,212.83	23.25	39.90	58.19	1,453.57	1,354.58	2,653.58	2,613.00	40.58	65.395	
7,400.00	7,312.83	7,677.50	7,312.83	23.40	39.99	58.19	1,453.57	1,354.58	2,653.58	2,612.68	40.90	64.877	
7,500.00	7,412.83	7,777.50	7,412.83	23.54	40.07	58.19	1,453.57	1,354.58	2,653.58	2,612.35	41.23	64.364	
7,600.00	7,512.83	7,877.50	7,512.83	23.69	40.16	58.19	1,453.57	1,354.58	2,653.58	2,612.03	41.56	63.856	
7,700.00	7,612.83	7,977.50	7,612.83	23.85	40.25	58.19	1,453.57	1,354.58	2,653.58	2,611.70	41.89	63.352	
7,800.00	7,712.83	8,077.50	7,712.83	24.00	40.34	58.19	1,453.57	1,354.58	2,653.58	2,611.36	42.22	62.852	
7,900.00	7,812.83	8,177.50	7,812.83	24.15	40.43	58.19	1,453.57	1,354.58	2,653.58	2,611.03	42.55	62.358	
7,959.17	7,872.00	8,236.67	7,872.00	24.24	40.48	58.19	1,453.57	1,354.58	2,653.58	2,610.83	42.75	62.067	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	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 18-1
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 18-1
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 18-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 18-1	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 18-1
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°

