



US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_COTTONWOOD 12-33 PAD

P_COTTONWOOD 13-33

P_COTTONWOOD 13-33

Plan: PLAN #1 2-19--10 RHS

Standard Planning Report

19 February, 2010





Project: COLORADO NORTHERN ZONE - 83
 Site: WELD_COTTONWOOD 12-33 PAD
 Well: P_COTTONWOOD 13-33
 Wellbore: P_COTTONWOOD 13-33
 Section: SECTION 33 T2N R66W
 SHL: 1801 FSL 882 FWL
 Design: PLAN #1 2-19--10 RHS
 Latitude: 40° 5' 32.305 N
 Longitude: 104° 47' 18.424 W
 GL: 4949.00
 KB: WELL @ 4964.00ft (Original Well Elev)



Weatherford®



Azimuths to True North
 Magnetic North: 9.03°
 Magnetic Field
 Strength: 53104.7nT
 Dip Angle: 66.84°
 Date: 2/19/2010
 Model: IGRF2010

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4154.00	4391.05	PARKMAN
4660.00	4899.72	SUSSEX
7146.00	7385.72	NIO A
7466.00	7705.72	CODELL
7556.00	7795.72	GRNHRN
7930.00	8169.72	JSAND

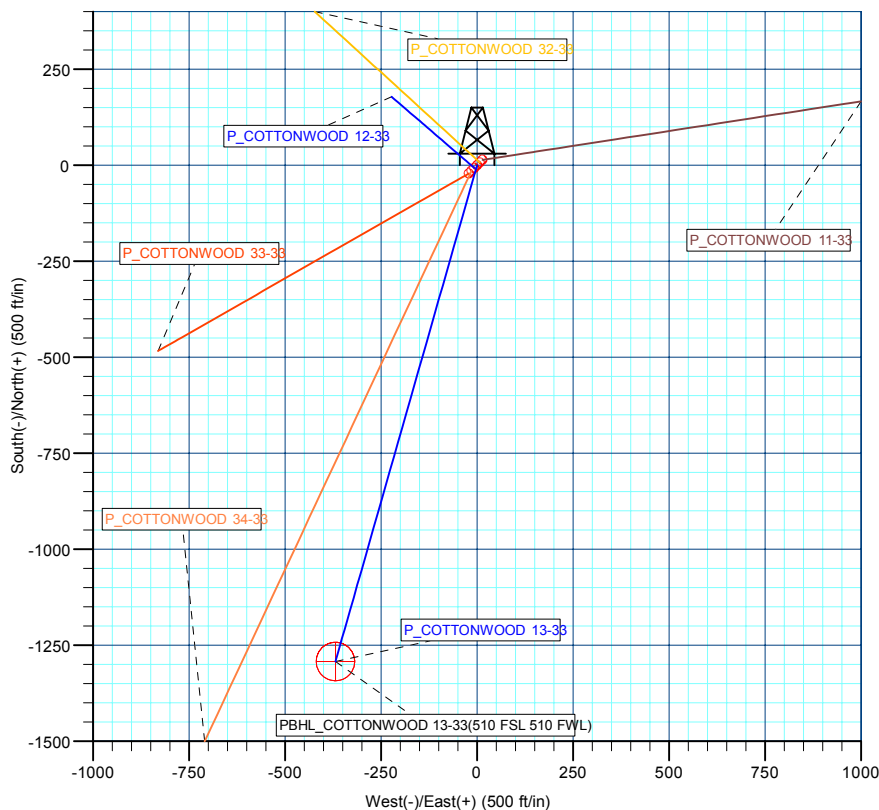
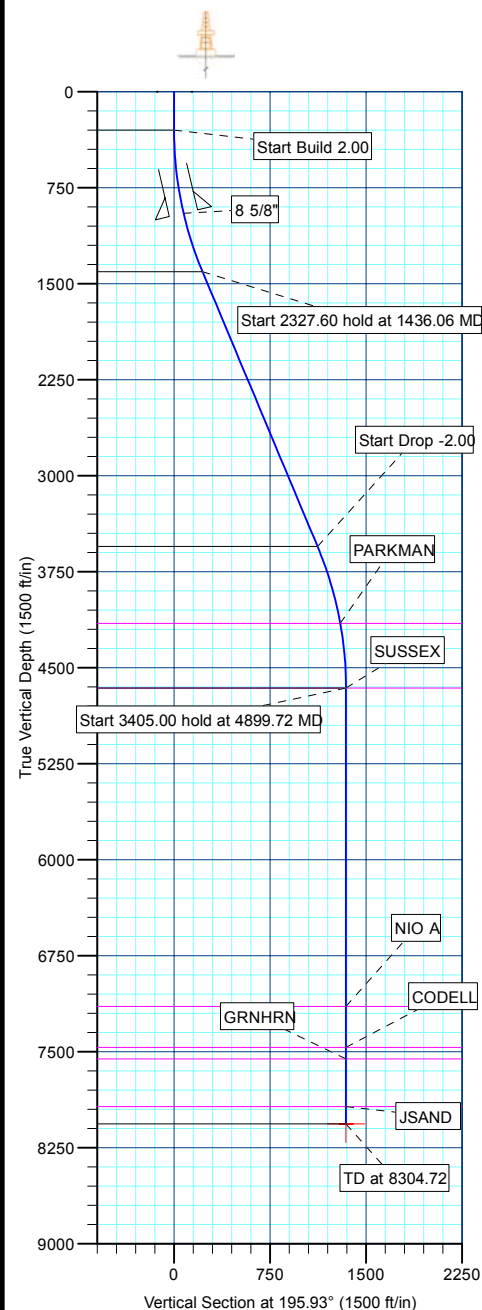
CASING DETAILS			
TVD	MD	Name	Size
950.00	955.71	8 5/8"	8.62

SECTION DETAILS										
MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Annotation	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00	
1436.06	22.72	195.93	1406.51	-213.78	-61.01	2.00	195.93	222.32	Start 2327.60 hold at 1436.06 MD	
3763.66	22.72	195.93	3553.49	-1078.29	-307.75	0.00	0.00	1121.35	Start Drop -2.00	
4899.72	0.00	0.00	4660.00	-1292.08	-368.76	2.00	180.00	1343.67	Start 3405.00 hold at 4899.72 MD	
8304.72	0.00	0.00	8065.00	-1292.08	-368.76	0.00	0.00	1343.67	TD at 8304.72	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)							
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape	
PBHL	8065.00	-1292.08	-368.76	40° 5' 19.536 N	104° 47' 23.168 W	Circle (Radius: 50.00)	

WELL DETAILS: P_COTTONWOOD 13-33						
+N/-S	+E/-W	Northing	Ground Level: Easting	4949.00 Latitude	Longitude	Slot
0.00	0.00	1277270.71	3199071.05	40° 5' 32.305 N	104° 47' 18.424 W	

LEGEND	
P_COTTONWOOD 11-33, P_COTTONWOOD 11-33, PLAN #1 2-19-10 RHS V0	
P_COTTONWOOD 12-33, P_COTTONWOOD 12-33, PLAN #1 2-19-10 RHS V0	
P_COTTONWOOD 32-33, P_COTTONWOOD 32-33, PLAN #1 2-19-10 RHS V0	
P_COTTONWOOD 33-33, P_COTTONWOOD 33-33, PLAN #1 2-19-10 RHS V0	
P_COTTONWOOD 34-33, P_COTTONWOOD 34-33, PLAN #1 2-19-10 RHS V0	
PLAN #1 2-19-10 RHS	



Plan: PLAN #1 2-19--10 RHS (P_COTTONWOOD 13-33/P_COTTONWOOD 13-33)

Created By: Robert H. Scott Date: 10:15, February 19 2010

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 13-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 12-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 13-33		
Design:	PLAN #1 2-19--10 RHS		

Project	COLORADO NORTHERN 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_COTTONWOOD 12-33 PAD, SECTION 33 T2N R66W							
Site Position: From: Position Uncertainty:			Lat/Long 0.00 ft			Northing:		1,277,285.05 ft		Latitude:		40° 5' 32.446 N	
						Easting:		3,199,085.21 ft		Longitude:		104° 47' 18.240 W	
						Slot Radius:		in		Grid Convergence:		0.46 °	

Well	P_COTTONWOOD 13-33					
Well Position	+N/-S	-14.22 ft	Northing:	1,277,270.71 ft	Latitude:	40° 5' 32.305 N
	+E/-W	-14.27 ft	Easting:	3,199,071.05 ft	Longitude:	104° 47' 18.424 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,949.00 ft

Wellbore	P_COTTONWOOD 13-33				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/19/2010	9.03	66.84	53,105

Design	PLAN #1 2-19--10 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	195.93

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	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,436.06	22.72	195.93	1,406.51	-213.78	-61.01	2.00	2.00	0.00	195.93	
3,763.66	22.72	195.93	3,553.49	-1,078.29	-307.75	0.00	0.00	0.00	0.00	
4,899.72	0.00	0.00	4,660.00	-1,292.08	-368.76	2.00	-2.00	0.00	180.00	
8,304.72	0.00	0.00	8,065.00	-1,292.08	-368.76	0.00	0.00	0.00	0.00	PBHL_COTTONW

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 13-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 12-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 13-33		
Design:	PLAN #1 2-19--10 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									
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	2.00	195.93	399.98	-1.68	-0.48	1.75	2.00	2.00	0.00
500.00	4.00	195.93	499.84	-6.71	-1.92	6.98	2.00	2.00	0.00
600.00	6.00	195.93	599.45	-15.09	-4.31	15.69	2.00	2.00	0.00
700.00	8.00	195.93	698.70	-26.81	-7.65	27.88	2.00	2.00	0.00
800.00	10.00	195.93	797.47	-41.85	-11.94	43.52	2.00	2.00	0.00
900.00	12.00	195.93	895.62	-60.20	-17.18	62.60	2.00	2.00	0.00
8 5/8"									
955.71	13.11	195.93	950.00	-71.85	-20.50	74.71	2.00	2.00	0.00
1,000.00	14.00	195.93	993.06	-81.83	-23.35	85.10	2.00	2.00	0.00
1,100.00	16.00	195.93	1,089.64	-106.72	-30.46	110.98	2.00	2.00	0.00
1,200.00	18.00	195.93	1,185.27	-134.83	-38.48	140.21	2.00	2.00	0.00
1,300.00	20.00	195.93	1,279.82	-166.13	-47.42	172.77	2.00	2.00	0.00
1,400.00	22.00	195.93	1,373.17	-200.59	-57.25	208.60	2.00	2.00	0.00
Start 2327.60 hold at 1436.06 MD									
1,436.06	22.72	195.93	1,406.51	-213.78	-61.01	222.32	2.00	2.00	0.00
1,500.00	22.72	195.93	1,465.50	-237.53	-67.79	247.02	0.00	0.00	0.00
1,600.00	22.72	195.93	1,557.73	-274.67	-78.39	285.64	0.00	0.00	0.00
1,700.00	22.72	195.93	1,649.97	-311.82	-88.99	324.27	0.00	0.00	0.00
1,800.00	22.72	195.93	1,742.21	-348.96	-99.59	362.89	0.00	0.00	0.00
1,900.00	22.72	195.93	1,834.45	-386.10	-110.19	401.52	0.00	0.00	0.00
2,000.00	22.72	195.93	1,926.69	-423.24	-120.79	440.14	0.00	0.00	0.00
2,100.00	22.72	195.93	2,018.93	-460.38	-131.39	478.77	0.00	0.00	0.00
2,200.00	22.72	195.93	2,111.17	-497.52	-141.99	517.39	0.00	0.00	0.00
2,300.00	22.72	195.93	2,203.41	-534.67	-152.60	556.01	0.00	0.00	0.00
2,400.00	22.72	195.93	2,295.65	-571.81	-163.20	594.64	0.00	0.00	0.00
2,500.00	22.72	195.93	2,387.89	-608.95	-173.80	633.26	0.00	0.00	0.00
2,600.00	22.72	195.93	2,480.13	-646.09	-184.40	671.89	0.00	0.00	0.00
2,700.00	22.72	195.93	2,572.37	-683.23	-195.00	710.51	0.00	0.00	0.00
2,800.00	22.72	195.93	2,664.61	-720.37	-205.60	749.14	0.00	0.00	0.00
2,900.00	22.72	195.93	2,756.85	-757.51	-216.20	787.76	0.00	0.00	0.00
3,000.00	22.72	195.93	2,849.09	-794.66	-226.80	826.39	0.00	0.00	0.00
3,100.00	22.72	195.93	2,941.33	-831.80	-237.40	865.01	0.00	0.00	0.00
3,200.00	22.72	195.93	3,033.57	-868.94	-248.00	903.64	0.00	0.00	0.00
3,300.00	22.72	195.93	3,125.81	-906.08	-258.60	942.26	0.00	0.00	0.00
3,400.00	22.72	195.93	3,218.05	-943.22	-269.20	980.89	0.00	0.00	0.00
3,500.00	22.72	195.93	3,310.29	-980.36	-279.80	1,019.51	0.00	0.00	0.00
3,600.00	22.72	195.93	3,402.53	-1,017.51	-290.40	1,058.14	0.00	0.00	0.00
3,700.00	22.72	195.93	3,494.77	-1,054.65	-301.00	1,096.76	0.00	0.00	0.00
Start Drop -2.00									
3,763.66	22.72	195.93	3,553.49	-1,078.29	-307.75	1,121.35	0.00	0.00	0.00
3,800.00	21.99	195.93	3,587.09	-1,091.58	-311.54	1,135.17	2.00	-2.00	0.00
3,900.00	19.99	195.93	3,680.45	-1,126.03	-321.37	1,171.00	2.00	-2.00	0.00
4,000.00	17.99	195.93	3,775.00	-1,157.33	-330.31	1,203.54	2.00	-2.00	0.00
4,100.00	15.99	195.93	3,870.63	-1,185.43	-338.33	1,232.77	2.00	-2.00	0.00
4,200.00	13.99	195.93	3,967.22	-1,210.31	-345.43	1,258.64	2.00	-2.00	0.00
4,300.00	11.99	195.93	4,064.65	-1,231.93	-351.60	1,281.12	2.00	-2.00	0.00
PARKMAN									
4,391.05	10.17	195.93	4,154.00	-1,248.76	-356.40	1,298.63	2.00	-2.00	0.00
4,400.00	9.99	195.93	4,162.81	-1,250.27	-356.83	1,300.19	2.00	-2.00	0.00
4,500.00	7.99	195.93	4,261.58	-1,265.30	-361.12	1,315.83	2.00	-2.00	0.00
4,600.00	5.99	195.93	4,360.83	-1,277.01	-364.46	1,328.00	2.00	-2.00	0.00

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 12-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 13-33		
Design:	PLAN #1 2-19--10 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)
4,700.00	3.99	195.93	4,460.44	-1,285.38	-366.85	1,336.71	2.00	-2.00	0.00
4,800.00	1.99	195.93	4,560.30	-1,290.41	-368.29	1,341.93	2.00	-2.00	0.00
Start 3405.00 hold at 4899.72 MD - SUSSEX									
4,899.72	0.00	0.00	4,660.00	-1,292.08	-368.76	1,343.67	2.00	-2.00	164.54
4,900.00	0.00	0.00	4,660.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
5,000.00	0.00	0.00	4,760.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
5,100.00	0.00	0.00	4,860.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
5,200.00	0.00	0.00	4,960.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
5,300.00	0.00	0.00	5,060.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
5,400.00	0.00	0.00	5,160.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
5,500.00	0.00	0.00	5,260.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
5,600.00	0.00	0.00	5,360.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
5,700.00	0.00	0.00	5,460.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
5,800.00	0.00	0.00	5,560.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
5,900.00	0.00	0.00	5,660.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
6,000.00	0.00	0.00	5,760.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
6,100.00	0.00	0.00	5,860.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
6,200.00	0.00	0.00	5,960.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
6,300.00	0.00	0.00	6,060.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
6,400.00	0.00	0.00	6,160.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
6,500.00	0.00	0.00	6,260.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
6,600.00	0.00	0.00	6,360.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
6,700.00	0.00	0.00	6,460.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
6,800.00	0.00	0.00	6,560.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
6,900.00	0.00	0.00	6,660.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
7,000.00	0.00	0.00	6,760.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
7,100.00	0.00	0.00	6,860.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
7,200.00	0.00	0.00	6,960.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
7,300.00	0.00	0.00	7,060.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
NIO A									
7,385.72	0.00	0.00	7,146.00	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
7,400.00	0.00	0.00	7,160.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
7,500.00	0.00	0.00	7,260.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
7,600.00	0.00	0.00	7,360.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
7,700.00	0.00	0.00	7,460.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
CODELL									
7,705.72	0.00	0.00	7,466.00	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
GRNHRN									
7,795.72	0.00	0.00	7,556.00	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
7,800.00	0.00	0.00	7,560.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
7,900.00	0.00	0.00	7,660.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
8,000.00	0.00	0.00	7,760.28	-1,292.08	-368.76	1,343.67	0.00	0.00	0.00
8,100.00	0.00	0.00	7,860.28	-1,292.08	-368.76	1,343.67	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_COTTONWOC	0.00	0.00	8,065.00	-1,292.08	-368.76	1,275,975.72	3,198,712.67	40° 5' 19.536 N	104° 47' 23.168 W
- plan misses target center by 204.72ft at 8100.00ft MD (7860.28 TVD, -1292.08 N, -368.76 E)									
- Circle (radius 50.00)									

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 13-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 12-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 13-33		
Design:	PLAN #1 2-19--10 RHS		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
955.71	950.00	8 5/8"	8.62	11.00	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,391.05	4,154.00	PARKMAN				
4,899.72	4,660.00	SUSSEX				
7,385.72	7,146.00	NIO A				
7,705.72	7,466.00	CODELL				
7,795.72	7,556.00	GRNHRN				
8,169.72	7,930.00	JSAND				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
300.00	300.00	0.00	0.00	Start Build 2.00	
1,436.06	1,406.51	-213.78	-61.01	Start 2327.60 hold at 1436.06 MD	
3,763.66	3,553.49	-1,078.29	-307.75	Start Drop -2.00	
4,899.72	4,660.00	-1,292.08	-368.76	Start 3405.00 hold at 4899.72 MD	
8,304.72	8,065.00	-1,292.08	-368.76	TD at 8304.72	



US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
WELD_COTTONWOOD 12-33 PAD
P_COTTONWOOD 13-33**

**P_COTTONWOOD 13-33
PLAN #1 2-19--10 RHS**

Anticollision Report

19 February, 2010



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 13-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 13-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19--10 RHS	Offset TVD Reference:	Offset Datum

Reference	PLAN #1 2-19--10 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 2/19/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	8,304.72	PLAN #1 2-19--10 RHS (P_COTTONWOC	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_COTTONWOOD 12-33 PAD						
P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - F	300.00	300.00	20.15	19.06	18.482	CC, ES
P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - F	400.00	399.35	23.07	21.57	15.359	SF
P_COTTONWOOD 12-33 - P_COTTONWOOD 12-33 - F	521.71	521.49	4.83	2.79	2.371	CC, ES, SF
P_COTTONWOOD 32-3 - P_COTTONWOOD 32-33 - PL	300.00	300.00	10.30	9.21	9.450	CC, ES
P_COTTONWOOD 32-3 - P_COTTONWOOD 32-33 - PL	400.00	399.98	11.86	10.34	7.834	SF
P_COTTONWOOD 33-33 - P_COTTONWOOD 33-33 - F	687.39	686.21	14.65	11.82	5.183	CC, ES
P_COTTONWOOD 33-33 - P_COTTONWOOD 33-33 - F	700.00	698.70	14.75	11.86	5.108	SF
P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - F	300.00	300.00	19.88	18.79	18.236	CC
P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - F	500.00	498.71	20.34	18.47	10.867	ES
P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - F	3,763.66	3,751.19	185.09	139.83	4.090	SF

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - PLAN #1											
Survey Program: 0-MWD											
Reference											
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)
0.00	0.00	0.00	0.00	0.00	0.00	45.09	14.22	14.27	20.15		
100.00	100.00	100.00	100.00	0.10	0.10	45.09	14.22	14.27	20.15	19.96	0.19
200.00	200.00	200.00	200.00	0.32	0.32	45.09	14.22	14.27	20.15	19.51	0.64
300.00	300.00	300.00	300.00	0.55	0.55	45.09	14.22	14.27	20.15	19.06	1.09
400.00	399.98	399.35	399.33	0.74	0.76	-150.39	14.49	15.97	23.07	21.57	1.50
500.00	499.84	498.19	498.03	0.94	0.98	-149.51	15.27	21.04	31.83	29.93	1.90
600.00	599.45	596.03	595.50	1.17	1.21	-148.75	16.56	29.37	46.38	44.05	2.34
700.00	698.70	692.38	691.15	1.45	1.48	-148.18	18.33	40.78	66.63	63.84	2.79
800.00	797.47	786.81	784.47	1.77	1.78	-147.74	20.53	55.05	92.46	89.17	3.28
900.00	895.62	878.91	874.98	2.14	2.12	-147.36	23.14	71.88	123.70	119.90	3.80
1,000.00	993.06	968.34	962.29	2.57	2.49	-147.01	26.09	90.96	160.19	155.83	4.36
1,100.00	1,089.64	1,054.77	1,046.07	3.06	2.89	-146.64	29.34	111.96	201.72	196.78	4.95
1,200.00	1,185.27	1,137.96	1,126.06	3.61	3.32	-146.26	32.83	134.52	248.08	242.52	5.56
1,300.00	1,279.82	1,221.02	1,205.33	4.23	3.79	-145.89	36.62	159.04	298.80	292.58	6.22
1,400.00	1,373.17	1,305.49	1,285.85	4.90	4.29	-145.73	40.52	184.26	352.26	345.34	6.91
1,436.06	1,406.51	1,335.54	1,314.50	5.16	4.47	-145.71	41.91	193.23	372.14	364.97	7.17
1,500.00	1,465.50	1,388.64	1,365.12	5.62	4.79	-146.13	44.36	209.08	407.68	400.02	7.66
											53.235

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_COTTONWOOD 13-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 13-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19--10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - PLAN #1												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
1,600.00	1,557.73	1,471.69	1,444.29	6.36	5.29	-146.65	48.20	233.88	463.28	454.85	8.43	54.940	
1,700.00	1,649.97	1,554.74	1,523.46	7.10	5.80	-147.06	52.03	258.67	518.91	509.69	9.21	56.315	
1,800.00	1,742.21	1,637.79	1,602.63	7.85	6.30	-147.39	55.87	283.47	574.55	564.55	10.00	57.444	
1,900.00	1,834.45	1,720.84	1,681.79	8.60	6.82	-147.67	59.71	308.26	630.20	619.41	10.79	58.386	
2,000.00	1,926.69	1,803.89	1,760.96	9.36	7.33	-147.89	63.54	333.06	685.86	674.27	11.59	59.184	
2,100.00	2,018.93	1,886.94	1,840.13	10.11	7.84	-148.09	67.38	357.85	741.53	729.14	12.39	59.869	
2,200.00	2,111.17	1,969.99	1,919.30	10.87	8.36	-148.26	71.21	382.65	797.20	784.02	13.18	60.464	
2,300.00	2,203.41	2,053.04	1,998.47	11.63	8.88	-148.40	75.05	407.44	852.88	838.89	13.98	60.986	
2,400.00	2,295.65	2,136.09	2,077.64	12.39	9.39	-148.53	78.89	432.24	908.56	893.77	14.79	61.447	
2,500.00	2,387.89	2,219.13	2,156.80	13.15	9.91	-148.64	82.72	457.03	964.24	948.65	15.59	61.859	
2,600.00	2,480.13	2,302.18	2,235.97	13.91	10.43	-148.74	86.56	481.83	1,019.92	1,003.53	16.39	62.229	
2,700.00	2,572.37	2,385.23	2,315.14	14.67	10.95	-148.83	90.39	506.62	1,075.61	1,058.42	17.19	62.565	
2,800.00	2,664.61	2,468.28	2,394.31	15.43	11.47	-148.91	94.23	531.42	1,131.30	1,113.30	17.99	62.870	
2,900.00	2,756.85	2,551.33	2,473.48	16.20	11.99	-148.99	98.07	556.22	1,186.99	1,168.19	18.80	63.150	
3,000.00	2,849.09	2,634.38	2,552.65	16.96	12.51	-149.06	101.90	581.01	1,242.68	1,223.08	19.60	63.408	
3,100.00	2,941.33	2,717.43	2,631.81	17.72	13.03	-149.12	105.74	605.81	1,298.37	1,277.97	20.40	63.646	
3,200.00	3,033.57	2,800.48	2,710.98	18.49	13.56	-149.17	109.57	630.60	1,354.06	1,332.86	21.20	63.867	
3,300.00	3,125.81	2,883.53	2,790.15	19.25	14.08	-149.22	113.41	655.40	1,409.76	1,387.75	22.00	64.074	
3,400.00	3,218.05	2,966.58	2,869.32	20.02	14.60	-149.27	117.25	680.19	1,465.45	1,442.65	22.80	64.268	
3,500.00	3,310.29	3,049.62	2,948.49	20.78	15.12	-149.32	121.08	704.99	1,521.15	1,497.54	23.60	64.450	
3,600.00	3,402.53	3,132.67	3,027.66	21.54	15.64	-149.36	124.92	729.78	1,576.84	1,552.44	24.40	64.622	
3,700.00	3,494.77	3,215.72	3,106.82	22.31	16.17	-149.40	128.75	754.58	1,632.54	1,607.34	25.20	64.784	
3,763.66	3,553.49	3,268.59	3,157.22	22.80	16.50	-149.42	131.20	770.36	1,667.99	1,642.29	25.71	64.883	
3,800.00	3,587.09	3,298.88	3,186.10	23.03	16.69	-149.67	132.60	779.40	1,688.07	1,662.03	26.04	64.833	
3,900.00	3,680.45	3,383.35	3,266.62	23.54	17.22	-150.28	136.50	804.62	1,741.58	1,714.70	26.88	64.784	
4,000.00	3,775.00	3,469.37	3,348.62	24.01	17.76	-150.77	140.47	830.31	1,792.51	1,764.80	27.72	64.676	
4,100.00	3,870.63	3,556.84	3,432.00	24.46	18.31	-151.16	144.51	856.42	1,840.81	1,812.27	28.54	64.506	
4,200.00	3,967.22	3,645.65	3,516.66	24.86	18.87	-151.46	148.61	882.93	1,886.41	1,857.07	29.34	64.291	
4,300.00	4,064.65	3,735.69	3,602.49	25.22	19.44	-151.67	152.77	909.82	1,929.29	1,899.17	30.12	64.055	
4,400.00	4,162.81	3,826.85	3,689.39	25.54	20.01	-151.80	156.98	937.03	1,969.41	1,938.55	30.86	63.808	
4,500.00	4,261.58	3,919.02	3,777.26	25.81	20.59	-151.86	161.24	964.55	2,006.74	1,975.17	31.57	63.557	
4,600.00	4,360.83	4,132.82	3,983.24	26.04	21.59	-151.50	169.97	1,020.98	2,038.57	2,006.02	32.55	62.620	
4,700.00	4,460.44	4,361.02	4,207.13	26.22	22.36	-151.24	176.67	1,064.28	2,061.53	2,028.18	33.35	61.807	
4,800.00	4,560.30	4,597.24	4,441.80	26.36	22.90	-151.10	180.71	1,090.42	2,075.10	2,041.13	33.97	61.088	
4,899.72	4,660.00	4,815.61	4,660.00	26.46	23.17	44.85	181.82	1,097.55	2,079.04	2,044.68	34.37	60.497	
5,000.00	4,760.28	4,915.89	4,760.28	26.54	23.26	44.85	181.82	1,097.55	2,079.04	2,044.45	34.60	60.092	
5,100.00	4,860.28	5,015.89	4,860.28	26.61	23.35	44.85	181.82	1,097.55	2,079.04	2,044.22	34.83	59.694	
5,200.00	4,960.28	5,115.89	4,960.28	26.68	23.45	44.85	181.82	1,097.55	2,079.04	2,043.98	35.06	59.295	
5,300.00	5,060.28	5,215.89	5,060.28	26.75	23.55	44.85	181.82	1,097.55	2,079.04	2,043.74	35.30	58.894	
5,400.00	5,160.28	5,315.89	5,160.28	26.82	23.65	44.85	181.82	1,097.55	2,079.04	2,043.50	35.54	58.492	
5,500.00	5,260.28	5,415.89	5,260.28	26.90	23.76	44.85	181.82	1,097.55	2,079.04	2,043.25	35.79	58.088	
5,600.00	5,360.28	5,515.89	5,360.28	26.98	23.86	44.85	181.82	1,097.55	2,079.04	2,043.00	36.04	57.684	
5,700.00	5,460.28	5,615.89	5,460.28	27.06	23.97	44.85	181.82	1,097.55	2,079.04	2,042.75	36.30	57.280	
5,800.00	5,560.28	5,715.89	5,560.28	27.14	24.07	44.85	181.82	1,097.55	2,079.04	2,042.49	36.55	56.875	
5,900.00	5,660.28	5,815.89	5,660.28	27.22	24.18	44.85	181.82	1,097.55	2,079.04	2,042.23	36.82	56.471	
6,000.00	5,760.28	5,915.89	5,760.28	27.30	24.30	44.85	181.82	1,097.55	2,079.04	2,041.96	37.08	56.066	
6,100.00	5,860.28	6,015.89	5,860.28	27.39	24.41	44.85	181.82	1,097.55	2,079.04	2,041.69	37.35	55.662	
6,200.00	5,960.28	6,115.89	5,960.28	27.48	24.52	44.85	181.82	1,097.55	2,079.04	2,041.42	37.62	55.259	
6,300.00	6,060.28	6,215.89	6,060.28	27.56	24.64	44.85	181.82	1,097.55	2,079.04	2,041.14	37.90	54.857	
6,400.00	6,160.28	6,315.89	6,160.28	27.65	24.76	44.85	181.82	1,097.55	2,079.04	2,040.87	38.18	54.456	
6,500.00	6,260.28	6,415.89	6,260.28	27.75	24.88	44.85	181.82	1,097.55	2,079.04	2,040.58	38.46	54.056	
6,600.00	6,360.28	6,515.89	6,360.28	27.84	25.00	44.85	181.82	1,097.55	2,079.04	2,040.30	38.75	53.658	

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_COTTONWOOD 13-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 13-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19--10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - PLAN #1												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
6,700.00	6,460.28	6,615.89	6,460.28	27.93	25.12	44.85	181.82	1,097.55	2,079.04	2,040.01	39.03	53.261	
6,800.00	6,560.28	6,715.89	6,560.28	28.03	25.24	44.85	181.82	1,097.55	2,079.04	2,039.72	39.33	52.866	
6,900.00	6,660.28	6,815.89	6,660.28	28.13	25.37	44.85	181.82	1,097.55	2,079.04	2,039.42	39.62	52.473	
7,000.00	6,760.28	6,915.89	6,760.28	28.23	25.49	44.85	181.82	1,097.55	2,079.04	2,039.13	39.92	52.082	
7,100.00	6,860.28	7,015.89	6,860.28	28.33	25.62	44.85	181.82	1,097.55	2,079.04	2,038.83	40.22	51.694	
7,200.00	6,960.28	7,115.89	6,960.28	28.43	25.75	44.85	181.82	1,097.55	2,079.04	2,038.52	40.52	51.307	
7,300.00	7,060.28	7,215.89	7,060.28	28.53	25.88	44.85	181.82	1,097.55	2,079.04	2,038.22	40.83	50.923	
7,400.00	7,160.28	7,315.89	7,160.28	28.64	26.01	44.85	181.82	1,097.55	2,079.04	2,037.91	41.14	50.541	
7,500.00	7,260.28	7,415.89	7,260.28	28.74	26.14	44.85	181.82	1,097.55	2,079.04	2,037.60	41.45	50.162	
7,600.00	7,360.28	7,515.89	7,360.28	28.85	26.28	44.85	181.82	1,097.55	2,079.04	2,037.28	41.76	49.785	
7,700.00	7,460.28	7,615.89	7,460.28	28.96	26.41	44.85	181.82	1,097.55	2,079.04	2,036.97	42.08	49.412	
7,800.00	7,560.28	7,715.89	7,560.28	29.07	26.55	44.85	181.82	1,097.55	2,079.04	2,036.65	42.39	49.041	
7,900.00	7,660.28	7,815.89	7,660.28	29.18	26.69	44.85	181.82	1,097.55	2,079.04	2,036.33	42.72	48.672	
8,000.00	7,760.28	7,915.89	7,760.28	29.29	26.82	44.85	181.82	1,097.55	2,079.04	2,036.01	43.04	48.307	
8,100.00	7,860.28	8,015.89	7,860.28	29.41	26.96	44.85	181.82	1,097.55	2,079.04	2,035.68	43.36	47.945	
8,200.00	7,960.28	8,115.89	7,960.28	29.52	27.11	44.85	181.82	1,097.55	2,079.04	2,035.35	43.69	47.585	
8,263.98	8,024.26	8,179.87	8,024.26	29.60	27.20	44.85	181.82	1,097.55	2,079.04	2,035.14	43.90	47.357	
8,304.72	8,065.00	8,205.61	8,050.00	29.65	27.23	44.85	181.82	1,097.55	2,079.10	2,035.09	44.01	47.241	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 13-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 13-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19--10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 12-33 - P_COTTONWOOD 12-33 - PLAN #1												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-134.70	-6.92	-6.99	9.84				
100.00	100.00	100.00	100.00	0.10	0.10	-134.70	-6.92	-6.99	9.84	9.65	0.19	51.504	
200.00	200.00	200.00	200.00	0.32	0.32	-134.70	-6.92	-6.99	9.84	9.20	0.64	15.361	
300.00	300.00	300.00	300.00	0.55	0.55	-134.70	-6.92	-6.99	9.84	8.75	1.09	9.027	
400.00	399.98	399.98	399.98	0.74	0.77	35.26	-6.92	-6.99	8.36	6.85	1.51	5.525	
500.00	499.84	499.84	499.84	0.94	0.99	71.74	-6.92	-6.99	5.08	3.15	1.94	2.626	
521.71	521.49	521.49	521.49	0.99	1.04	90.00	-6.92	-6.99	4.83	2.79	2.04	2.371 CC, ES, SF	
600.00	599.45	599.45	599.45	1.17	1.22	145.72	-6.92	-6.99	8.60	6.24	2.37	3.636	
700.00	698.70	698.70	698.70	1.45	1.44	165.83	-6.92	-6.99	19.90	17.11	2.79	7.134	
800.00	797.47	797.47	797.47	1.77	1.66	172.02	-6.92	-6.99	35.28	32.06	3.22	10.949	
900.00	895.62	895.62	895.62	2.14	1.88	174.78	-6.92	-6.99	54.24	50.58	3.66	14.821	
1,000.00	993.06	993.06	993.06	2.57	2.10	176.28	-6.92	-6.99	76.67	72.57	4.10	18.697	
1,100.00	1,089.64	1,089.00	1,089.00	3.06	2.32	177.05	-6.75	-7.20	102.64	98.10	4.54	22.599	
1,200.00	1,185.27	1,182.42	1,182.37	3.61	2.52	176.53	-4.93	-9.31	133.17	128.19	4.98	26.744	
1,300.00	1,279.82	1,273.63	1,273.40	4.23	2.72	175.32	-1.23	-13.61	168.46	163.03	5.42	31.053	
1,400.00	1,373.17	1,364.92	1,364.37	4.90	2.93	174.05	3.73	-19.37	207.99	202.11	5.89	35.338	
1,436.06	1,406.51	1,397.66	1,397.00	5.16	3.01	173.71	5.52	-21.45	223.05	216.99	6.05	36.843	
1,500.00	1,465.50	1,455.57	1,454.70	5.62	3.15	173.27	8.69	-25.13	250.12	243.73	6.39	39.114	
1,600.00	1,557.73	1,546.13	1,544.94	6.36	3.37	172.75	13.64	-30.88	292.48	285.55	6.93	42.176	
1,700.00	1,649.97	1,636.68	1,635.18	7.10	3.59	172.36	18.59	-36.63	334.86	327.37	7.48	44.750	
1,800.00	1,742.21	1,727.24	1,725.42	7.85	3.81	172.06	23.54	-42.38	377.24	369.20	8.04	46.939	
1,900.00	1,834.45	1,817.80	1,815.66	8.60	4.04	171.82	28.49	-48.14	419.63	411.04	8.60	48.819	
2,000.00	1,926.69	1,908.36	1,905.90	9.36	4.27	171.62	33.44	-53.89	462.03	452.87	9.16	50.448	
2,100.00	2,018.93	1,998.91	1,996.14	10.11	4.50	171.45	38.40	-59.64	504.43	494.70	9.72	51.870	
2,200.00	2,111.17	2,089.47	2,086.38	10.87	4.74	171.32	43.35	-65.39	546.83	536.54	10.29	53.123	
2,300.00	2,203.41	2,180.03	2,176.62	11.63	4.97	171.20	48.30	-71.14	589.24	578.37	10.87	54.232	
2,400.00	2,295.65	2,270.59	2,266.85	12.39	5.21	171.09	53.25	-76.90	631.64	620.20	11.44	55.222	
2,500.00	2,387.89	2,361.14	2,357.09	13.15	5.44	171.00	58.20	-82.65	674.05	662.04	12.01	56.110	
2,600.00	2,480.13	2,451.70	2,447.33	13.91	5.68	170.93	63.15	-88.40	716.46	703.87	12.59	56.910	
2,700.00	2,572.37	2,542.26	2,537.57	14.67	5.92	170.85	68.10	-94.15	758.87	745.70	13.17	57.635	
2,800.00	2,664.61	2,632.82	2,627.81	15.43	6.16	170.79	73.06	-99.91	801.28	787.54	13.75	58.294	
2,900.00	2,756.85	2,723.37	2,718.05	16.20	6.40	170.74	78.01	-105.66	843.70	829.37	14.33	58.896	
3,000.00	2,849.09	2,813.93	2,808.29	16.96	6.64	170.68	82.96	-111.41	886.11	871.20	14.91	59.448	
3,100.00	2,941.33	2,904.49	2,898.53	17.72	6.88	170.64	87.91	-117.16	928.52	913.03	15.49	59.956	
3,200.00	3,033.57	2,995.05	2,988.77	18.49	7.12	170.60	92.86	-122.92	970.94	954.87	16.07	60.424	
3,300.00	3,125.81	3,085.60	3,079.01	19.25	7.36	170.56	97.81	-128.67	1,013.35	996.70	16.65	60.857	
3,400.00	3,218.05	3,176.16	3,169.24	20.02	7.60	170.52	102.76	-134.42	1,055.76	1,038.53	17.23	61.260	
3,500.00	3,310.29	3,266.72	3,259.48	20.78	7.84	170.49	107.72	-140.17	1,098.18	1,080.36	17.82	61.634	
3,600.00	3,402.53	3,357.28	3,349.72	21.54	8.09	170.46	112.67	-145.92	1,140.59	1,122.19	18.40	61.983	
3,700.00	3,494.77	3,447.83	3,439.96	22.31	8.33	170.43	117.62	-151.68	1,183.01	1,164.02	18.99	62.309	
3,763.66	3,553.49	3,505.48	3,497.41	22.80	8.48	170.41	120.77	-155.34	1,210.01	1,190.65	19.36	62.506	
3,800.00	3,587.09	3,538.49	3,530.29	23.03	8.57	170.46	122.58	-157.44	1,225.22	1,205.61	19.60	62.496	
3,900.00	3,680.45	3,630.26	3,621.74	23.54	8.82	170.55	127.59	-163.26	1,264.92	1,244.68	20.25	62.476	
4,000.00	3,775.00	3,723.33	3,714.49	24.01	9.07	170.60	132.68	-169.18	1,301.45	1,280.58	20.86	62.380	
4,100.00	3,870.63	3,817.59	3,808.42	24.46	9.32	170.62	137.84	-175.16	1,334.74	1,313.29	21.45	62.220	
4,200.00	3,967.22	3,912.94	3,903.43	24.86	9.58	170.61	143.05	-181.22	1,364.78	1,342.77	22.01	62.004	
4,300.00	4,064.65	4,009.24	3,999.39	25.22	9.84	170.56	148.32	-187.34	1,391.52	1,368.98	22.54	61.739	
4,400.00	4,162.81	4,106.38	4,096.19	25.54	10.10	170.49	153.63	-193.51	1,414.94	1,391.90	23.03	61.431	
4,500.00	4,261.58	4,204.25	4,193.71	25.81	10.36	170.38	158.98	-199.72	1,435.00	1,411.51	23.49	61.084	
4,600.00	4,360.83	4,302.72	4,291.84	26.04	10.63	170.25	164.36	-205.98	1,451.70	1,427.79	23.92	60.702	
4,700.00	4,460.44	4,401.68	4,390.45	26.22	10.90	170.08	169.77	-212.27	1,465.02	1,440.72	24.30	60.285	
4,800.00	4,560.30	4,526.00	4,514.43	26.36	11.19	169.86	175.76	-219.22	1,474.44	1,449.76	24.67	59.759	

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_COTTONWOOD 13-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 13-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19--10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 12-33 - P_COTTONWOOD 12-33 - PLAN #1												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
4,899.72	4,660.00	4,667.44	4,655.79	26.46	11.43	5.68	178.49	-222.39	1,477.84	1,452.88	24.96	59.204	
5,000.00	4,760.28	4,771.93	4,760.28	26.54	11.63	5.68	178.51	-222.42	1,477.85	1,452.55	25.30	58.402	
5,100.00	4,860.28	4,871.93	4,860.28	26.61	11.83	5.68	178.51	-222.42	1,477.85	1,452.21	25.64	57.634	
5,200.00	4,960.28	4,971.93	4,960.28	26.68	12.03	5.68	178.51	-222.42	1,477.85	1,451.87	25.98	56.879	
5,300.00	5,060.28	5,071.93	5,060.28	26.75	12.23	5.68	178.51	-222.42	1,477.85	1,451.53	26.33	56.137	
5,400.00	5,160.28	5,171.93	5,160.28	26.82	12.43	5.68	178.51	-222.42	1,477.85	1,451.18	26.67	55.409	
5,500.00	5,260.28	5,271.93	5,260.28	26.90	12.63	5.68	178.51	-222.42	1,477.85	1,450.83	27.02	54.693	
5,600.00	5,360.28	5,371.93	5,360.28	26.98	12.83	5.68	178.51	-222.42	1,477.85	1,450.48	27.37	53.990	
5,700.00	5,460.28	5,471.93	5,460.28	27.06	13.03	5.68	178.51	-222.42	1,477.85	1,450.13	27.73	53.300	
5,800.00	5,560.28	5,571.93	5,560.28	27.14	13.23	5.68	178.51	-222.42	1,477.85	1,449.77	28.08	52.623	
5,900.00	5,660.28	5,671.93	5,660.28	27.22	13.44	5.68	178.51	-222.42	1,477.85	1,449.41	28.44	51.959	
6,000.00	5,760.28	5,771.93	5,760.28	27.30	13.64	5.68	178.51	-222.42	1,477.85	1,449.05	28.80	51.307	
6,100.00	5,860.28	5,871.93	5,860.28	27.39	13.85	5.68	178.51	-222.42	1,477.85	1,448.69	29.17	50.667	
6,200.00	5,960.28	5,971.93	5,960.28	27.48	14.05	5.68	178.51	-222.42	1,477.85	1,448.32	29.53	50.039	
6,300.00	6,060.28	6,071.93	6,060.28	27.56	14.26	5.68	178.51	-222.42	1,477.85	1,447.95	29.90	49.423	
6,400.00	6,160.28	6,171.93	6,160.28	27.65	14.47	5.68	178.51	-222.42	1,477.85	1,447.58	30.27	48.819	
6,500.00	6,260.28	6,271.93	6,260.28	27.75	14.67	5.68	178.51	-222.42	1,477.85	1,447.21	30.64	48.226	
6,600.00	6,360.28	6,371.93	6,360.28	27.84	14.88	5.68	178.51	-222.42	1,477.85	1,446.83	31.02	47.644	
6,700.00	6,460.28	6,471.93	6,460.28	27.93	15.09	5.68	178.51	-222.42	1,477.85	1,446.46	31.39	47.074	
6,800.00	6,560.28	6,571.93	6,560.28	28.03	15.30	5.68	178.51	-222.42	1,477.85	1,446.08	31.77	46.514	
6,900.00	6,660.28	6,671.93	6,660.28	28.13	15.51	5.68	178.51	-222.42	1,477.85	1,445.70	32.15	45.966	
7,000.00	6,760.28	6,771.93	6,760.28	28.23	15.72	5.68	178.51	-222.42	1,477.85	1,445.32	32.53	45.427	
7,100.00	6,860.28	6,871.93	6,860.28	28.33	15.93	5.68	178.51	-222.42	1,477.85	1,444.94	32.92	44.899	
7,200.00	6,960.28	6,971.93	6,960.28	28.43	16.14	5.68	178.51	-222.42	1,477.85	1,444.55	33.30	44.381	
7,300.00	7,060.28	7,071.93	7,060.28	28.53	16.35	5.68	178.51	-222.42	1,477.85	1,444.17	33.69	43.873	
7,400.00	7,160.28	7,171.93	7,160.28	28.64	16.56	5.68	178.51	-222.42	1,477.85	1,443.78	34.07	43.374	
7,500.00	7,260.28	7,271.93	7,260.28	28.74	16.77	5.68	178.51	-222.42	1,477.85	1,443.39	34.46	42.885	
7,600.00	7,360.28	7,371.93	7,360.28	28.85	16.98	5.68	178.51	-222.42	1,477.85	1,443.00	34.85	42.405	
7,700.00	7,460.28	7,471.93	7,460.28	28.96	17.20	5.68	178.51	-222.42	1,477.85	1,442.61	35.24	41.934	
7,800.00	7,560.28	7,571.93	7,560.28	29.07	17.41	5.68	178.51	-222.42	1,477.85	1,442.22	35.64	41.472	
7,900.00	7,660.28	7,671.93	7,660.28	29.18	17.62	5.68	178.51	-222.42	1,477.85	1,441.82	36.03	41.018	
8,000.00	7,760.28	7,771.93	7,760.28	29.29	17.83	5.68	178.51	-222.42	1,477.85	1,441.43	36.42	40.573	
8,100.00	7,860.28	7,871.93	7,860.28	29.41	18.05	5.68	178.51	-222.42	1,477.85	1,441.03	36.82	40.136	
8,200.00	7,960.28	7,971.93	7,960.28	29.52	18.26	5.68	178.51	-222.42	1,477.85	1,440.63	37.22	39.708	
8,304.72	8,065.00	8,076.65	8,065.00	29.65	18.49	5.68	178.51	-222.42	1,477.85	1,440.22	37.64	39.267	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 13-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 13-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19--10 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	44.92	7.29	7.27	10.30				
100.00	100.00	100.00	100.00	0.10	0.10	44.92	7.29	7.27	10.30	10.11	0.19	53.919	
200.00	200.00	200.00	200.00	0.32	0.32	44.92	7.29	7.27	10.30	9.66	0.64	16.081	
300.00	300.00	300.00	300.00	0.55	0.55	44.92	7.29	7.27	10.30	9.21	1.09	9.450 CC, ES	
400.00	399.98	399.98	399.98	0.74	0.77	-155.08	7.29	7.27	11.86	10.34	1.51	7.834 SF	
500.00	499.84	499.84	499.84	0.94	0.99	-162.62	7.29	7.27	16.75	14.82	1.93	8.691	
600.00	599.45	599.45	599.45	1.17	1.22	-168.51	7.29	7.27	25.20	22.85	2.35	10.713	
700.00	698.70	698.70	698.70	1.45	1.44	-172.22	7.29	7.27	37.23	34.44	2.78	13.372	
800.00	797.47	797.47	797.47	1.77	1.66	-174.49	7.29	7.27	52.77	49.55	3.22	16.391	
900.00	895.62	895.62	895.62	2.14	1.88	-175.92	7.29	7.27	71.79	68.13	3.66	19.623	
1,000.00	993.06	993.06	993.06	2.57	2.10	-176.87	7.29	7.27	94.24	90.14	4.10	22.986	
1,100.00	1,089.64	1,088.97	1,088.97	3.06	2.32	-177.64	7.47	7.08	120.20	115.66	4.54	26.471	
1,200.00	1,185.27	1,182.30	1,182.25	3.61	2.52	-179.09	9.36	5.02	150.63	145.66	4.98	30.277	
1,300.00	1,279.82	1,273.37	1,273.14	4.23	2.72	-179.07	13.17	0.85	185.80	180.39	5.41	34.321	
1,400.00	1,373.17	1,361.80	1,361.19	4.90	2.93	-177.15	18.73	-5.23	225.73	219.87	5.86	38.505	
1,436.06	1,406.51	1,392.98	1,392.16	5.16	3.00	-176.47	21.13	-7.86	241.28	235.26	6.03	40.038	
1,500.00	1,465.50	1,447.58	1,446.31	5.62	3.14	-175.32	25.88	-13.05	269.73	263.36	6.37	42.370	
1,600.00	1,557.73	1,531.58	1,529.32	6.36	3.37	-173.60	34.55	-22.53	315.51	308.60	6.91	45.632	
1,700.00	1,649.97	1,613.80	1,610.17	7.10	3.62	-171.96	44.62	-33.53	362.91	355.42	7.49	48.473	
1,800.00	1,742.21	1,694.18	1,688.76	7.85	3.88	-170.40	55.97	-45.95	411.95	403.86	8.09	50.947	
1,900.00	1,834.45	1,772.64	1,765.00	8.60	4.17	-168.93	68.48	-59.63	462.63	453.91	8.71	53.104	
2,000.00	1,926.69	1,856.95	1,846.60	9.36	4.52	-167.51	82.80	-75.28	514.35	504.97	9.39	54.801	
2,100.00	2,018.93	1,941.88	1,928.80	10.11	4.88	-166.34	97.23	-91.06	566.28	556.21	10.08	56.207	
2,200.00	2,111.17	2,026.81	2,010.99	10.87	5.25	-165.36	111.65	-106.83	618.36	607.59	10.77	57.390	
2,300.00	2,203.41	2,111.74	2,093.18	11.63	5.64	-164.53	126.08	-122.61	670.55	659.07	11.48	58.395	
2,400.00	2,295.65	2,196.67	2,175.38	12.39	6.03	-163.82	140.51	-138.39	722.82	710.63	12.20	59.258	
2,500.00	2,387.89	2,281.60	2,257.57	13.15	6.44	-163.21	154.94	-154.16	775.17	762.25	12.92	60.002	
2,600.00	2,480.13	2,366.53	2,339.77	13.91	6.85	-162.67	169.36	-169.94	827.57	813.93	13.64	60.654	
2,700.00	2,572.37	2,451.45	2,421.96	14.67	7.26	-162.20	183.79	-185.71	880.02	865.65	14.37	61.228	
2,800.00	2,664.61	2,536.38	2,504.15	15.43	7.68	-161.78	198.22	-201.49	932.51	917.41	15.10	61.737	
2,900.00	2,756.85	2,621.31	2,586.35	16.20	8.10	-161.40	212.65	-217.27	985.03	969.19	15.84	62.191	
3,000.00	2,849.09	2,706.24	2,668.54	16.96	8.52	-161.07	227.08	-233.04	1,037.58	1,021.01	16.58	62.599	
3,100.00	2,941.33	2,791.17	2,750.74	17.72	8.95	-160.76	241.50	-248.82	1,090.15	1,072.84	17.31	62.966	
3,200.00	3,033.57	2,876.10	2,832.93	18.49	9.38	-160.48	255.93	-264.59	1,142.75	1,124.69	18.05	63.297	
3,300.00	3,125.81	2,961.03	2,915.12	19.25	9.81	-160.23	270.36	-280.37	1,195.36	1,176.56	18.80	63.599	
3,400.00	3,218.05	3,045.96	2,997.32	20.02	10.24	-160.00	284.79	-296.14	1,247.98	1,228.44	19.54	63.875	
3,500.00	3,310.29	3,130.89	3,079.51	20.78	10.68	-159.79	299.22	-311.92	1,300.62	1,280.34	20.28	64.128	
3,600.00	3,402.53	3,215.81	3,161.71	21.54	11.11	-159.59	313.64	-327.70	1,353.27	1,332.25	21.03	64.361	
3,700.00	3,494.77	3,300.74	3,243.90	22.31	11.55	-159.41	328.07	-343.47	1,405.93	1,384.16	21.77	64.576	
3,763.66	3,553.49	3,354.81	3,296.22	22.80	11.83	-159.30	337.26	-353.51	1,439.46	1,417.22	22.25	64.704	
3,800.00	3,587.09	3,385.78	3,326.20	23.03	11.99	-159.39	342.52	-359.27	1,458.42	1,435.87	22.55	64.677	
3,900.00	3,680.45	3,472.11	3,409.74	23.54	12.43	-159.60	357.18	-375.30	1,508.68	1,485.34	23.34	64.644	
4,000.00	3,775.00	3,559.95	3,494.76	24.01	12.89	-159.73	372.11	-391.62	1,556.11	1,531.99	24.11	64.534	
4,100.00	3,870.63	3,649.22	3,581.15	24.46	13.35	-159.80	387.27	-408.20	1,600.65	1,575.78	24.87	64.363	
4,200.00	3,967.22	3,739.79	3,668.81	24.86	13.82	-159.81	402.66	-425.03	1,642.27	1,616.67	25.60	64.145	
4,300.00	4,064.65	3,831.56	3,757.63	25.22	14.30	-159.76	418.25	-442.07	1,680.94	1,654.63	26.31	63.889	
4,400.00	4,162.81	3,924.42	3,847.49	25.54	14.78	-159.66	434.02	-459.32	1,716.62	1,689.63	26.99	63.605	
4,500.00	4,261.58	4,018.24	3,938.30	25.81	15.27	-159.51	449.96	-476.75	1,749.29	1,721.65	27.64	63.299	
4,600.00	4,360.83	4,112.93	4,029.94	26.04	15.76	-159.31	466.05	-494.34	1,778.94	1,750.69	28.25	62.976	
4,700.00	4,460.44	4,208.36	4,122.29	26.22	16.26	-159.06	482.26	-512.06	1,805.55	1,776.72	28.82	62.643	
4,800.00	4,560.30	4,304.42	4,215.25	26.36	16.76	-158.76	498.58	-529.91	1,829.11	1,799.75	29.36	62.302	
4,899.72	4,660.00	4,400.71	4,308.45	26.46	17.27	-5.66	514.94	-547.79	1,849.58	1,819.72	29.86	61.941	

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_COTTONWOOD 13-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 13-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19--10 RHS	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 32-3 - P_COTTONWOOD 32-33 - PLAN #1 2												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	4,760.28	4,497.76	4,402.37	26.54	17.77	-6.17	531.42	-565.82	1,868.71	1,838.29	30.42	61.423	
5,100.00	4,860.28	4,594.54	4,496.04	26.61	18.28	-6.67	547.86	-583.80	1,887.93	1,856.96	30.98	60.950	
5,200.00	4,960.28	4,691.32	4,589.70	26.68	18.79	-7.15	564.31	-601.78	1,907.30	1,875.77	31.52	60.503	
5,300.00	5,060.28	4,788.10	4,683.37	26.75	19.30	-7.63	580.75	-619.75	1,926.79	1,894.72	32.07	60.081	
5,400.00	5,160.28	4,884.88	4,777.03	26.82	19.80	-8.10	597.19	-637.73	1,946.42	1,913.81	32.61	59.683	
5,500.00	5,260.28	4,981.66	4,870.69	26.90	20.31	-8.56	613.63	-655.71	1,966.17	1,933.02	33.15	59.306	
5,600.00	5,360.28	5,078.44	4,964.36	26.98	20.82	-9.01	630.07	-673.68	1,986.05	1,952.36	33.69	58.950	
5,700.00	5,460.28	5,175.22	5,058.02	27.06	21.33	-9.46	646.51	-691.66	2,006.04	1,971.82	34.23	58.613	
5,800.00	5,560.28	5,272.00	5,151.68	27.14	21.84	-9.89	662.95	-709.64	2,026.15	1,991.39	34.76	58.294	
5,900.00	5,660.28	5,368.78	5,245.35	27.22	22.35	-10.32	679.39	-727.62	2,046.37	2,011.09	35.29	57.993	
6,000.00	5,760.28	5,465.56	5,339.01	27.30	22.86	-10.73	695.83	-745.59	2,066.70	2,030.89	35.81	57.708	
6,100.00	5,860.28	5,562.34	5,432.67	27.39	23.36	-11.14	712.28	-763.57	2,087.14	2,050.80	36.34	57.438	
6,200.00	5,960.28	5,785.94	5,650.84	27.48	24.21	-11.94	745.16	-799.52	2,105.14	2,068.01	37.13	56.699	
6,300.00	6,060.28	6,035.58	5,898.05	27.56	24.87	-12.48	768.20	-824.72	2,116.35	2,078.54	37.81	55.967	
6,400.00	6,160.28	6,289.36	6,151.45	27.65	25.27	-12.67	776.65	-833.96	2,120.40	2,082.05	38.35	55.295	
6,500.00	6,260.28	6,398.20	6,260.28	27.75	25.39	-12.67	776.67	-833.98	2,120.41	2,081.78	38.63	54.888	
6,600.00	6,360.28	6,498.20	6,360.28	27.84	25.51	-12.67	776.67	-833.98	2,120.41	2,081.49	38.92	54.477	
6,700.00	6,460.28	6,598.20	6,460.28	27.93	25.63	-12.67	776.67	-833.98	2,120.41	2,081.19	39.22	54.067	
6,800.00	6,560.28	6,698.20	6,560.28	28.03	25.75	-12.67	776.67	-833.98	2,120.41	2,080.90	39.52	53.660	
6,900.00	6,660.28	6,798.20	6,660.28	28.13	25.87	-12.67	776.67	-833.98	2,120.41	2,080.60	39.82	53.255	
7,000.00	6,760.28	6,898.20	6,760.28	28.23	26.00	-12.67	776.67	-833.98	2,120.41	2,080.29	40.12	52.853	
7,100.00	6,860.28	6,998.20	6,860.28	28.33	26.12	-12.67	776.67	-833.98	2,120.41	2,079.99	40.43	52.453	
7,200.00	6,960.28	7,098.20	6,960.28	28.43	26.25	-12.67	776.67	-833.98	2,120.41	2,079.68	40.73	52.055	
7,300.00	7,060.28	7,198.20	7,060.28	28.53	26.38	-12.67	776.67	-833.98	2,120.41	2,079.37	41.04	51.661	
7,400.00	7,160.28	7,298.20	7,160.28	28.64	26.51	-12.67	776.67	-833.98	2,120.41	2,079.05	41.36	51.269	
7,500.00	7,260.28	7,398.20	7,260.28	28.74	26.64	-12.67	776.67	-833.98	2,120.41	2,078.74	41.67	50.880	
7,600.00	7,360.28	7,498.20	7,360.28	28.85	26.77	-12.67	776.67	-833.98	2,120.41	2,078.42	41.99	50.494	
7,700.00	7,460.28	7,598.20	7,460.28	28.96	26.90	-12.67	776.67	-833.98	2,120.41	2,078.10	42.31	50.111	
7,800.00	7,560.28	7,698.20	7,560.28	29.07	27.04	-12.67	776.67	-833.98	2,120.41	2,077.77	42.64	49.731	
7,900.00	7,660.28	7,798.20	7,660.28	29.18	27.17	-12.67	776.67	-833.98	2,120.41	2,077.45	42.96	49.354	
8,000.00	7,760.28	7,898.20	7,760.28	29.29	27.31	-12.67	776.67	-833.98	2,120.41	2,077.12	43.29	48.980	
8,100.00	7,860.28	7,998.20	7,860.28	29.41	27.44	-12.67	776.67	-833.98	2,120.41	2,076.79	43.62	48.609	
8,200.00	7,960.28	8,098.20	7,960.28	29.52	27.58	-12.67	776.67	-833.98	2,120.41	2,076.46	43.95	48.242	
8,304.72	8,065.00	8,202.91	8,065.00	29.65	27.73	-12.67	776.67	-833.98	2,120.41	2,076.11	44.30	47.861	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 13-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 13-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19--10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 33-33 - P_COTTONWOOD 33-33 - PLAN #1													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	-134.82	-21.13	-21.26	29.98					
100.00	100.00	100.00	100.00	0.10	0.10	-134.82	-21.13	-21.26	29.98	29.78	0.19	156.896		
200.00	200.00	200.00	200.00	0.32	0.32	-134.82	-21.13	-21.26	29.98	29.33	0.64	46.794		
300.00	300.00	300.00	300.00	0.55	0.55	-134.82	-21.13	-21.26	29.98	28.89	1.09	27.497		
400.00	399.98	399.98	399.98	0.74	0.77	30.99	-21.13	-21.26	28.47	26.95	1.51	18.805		
500.00	499.84	499.84	499.84	0.94	0.99	37.45	-21.13	-21.26	24.13	22.20	1.93	12.499		
600.00	599.45	599.45	599.45	1.17	1.22	54.62	-21.13	-21.26	18.00	15.62	2.38	7.566		
687.39	686.21	686.21	686.21	1.41	1.41	90.00	-21.13	-21.26	14.65	11.82	2.83	5.183 CC, ES		
700.00	698.70	698.70	698.70	1.45	1.44	96.66	-21.13	-21.26	14.75	11.86	2.89	5.108 SF		
800.00	797.47	797.47	797.47	1.77	1.66	139.43	-21.13	-21.26	22.72	19.41	3.31	6.861		
900.00	895.62	895.62	895.62	2.14	1.88	157.67	-21.13	-21.26	39.28	35.57	3.71	10.577		
1,000.00	993.06	993.06	993.06	2.57	2.10	165.63	-21.13	-21.26	60.74	56.60	4.14	14.679		
1,100.00	1,089.64	1,090.35	1,090.35	3.06	2.31	169.68	-21.27	-21.51	85.92	81.35	4.57	18.814		
1,200.00	1,185.27	1,188.61	1,188.56	3.61	2.50	170.99	-22.79	-24.17	113.00	108.01	4.99	22.646		
1,300.00	1,279.82	1,287.12	1,286.85	4.23	2.70	170.86	-25.99	-29.78	141.42	135.99	5.44	26.007		
1,400.00	1,373.17	1,385.78	1,385.01	4.90	2.91	169.97	-30.87	-38.33	171.18	165.26	5.92	28.919		
1,436.06	1,406.51	1,421.37	1,420.33	5.16	2.99	169.54	-33.05	-42.14	182.25	176.14	6.10	29.857		
1,500.00	1,465.50	1,484.71	1,483.05	5.62	3.15	168.72	-37.45	-49.85	201.65	195.17	6.48	31.116		
1,600.00	1,557.73	1,584.54	1,581.45	6.36	3.43	167.10	-45.78	-64.45	230.54	223.42	7.12	32.377		
1,700.00	1,649.97	1,682.60	1,677.57	7.10	3.74	165.30	-55.40	-81.30	258.01	250.19	7.82	32.998		
1,800.00	1,742.21	1,778.52	1,771.51	7.85	4.07	163.81	-65.01	-98.13	285.46	276.91	8.55	33.388		
1,900.00	1,834.45	1,874.44	1,865.45	8.60	4.42	162.58	-74.61	-114.95	313.06	303.75	9.31	33.636		
2,000.00	1,926.69	1,970.35	1,959.39	9.36	4.78	161.55	-84.22	-131.77	340.77	330.69	10.09	33.785		
2,100.00	2,018.93	2,066.27	2,053.33	10.11	5.16	160.68	-93.82	-148.59	368.57	357.69	10.88	33.868		
2,200.00	2,111.17	2,162.19	2,147.27	10.87	5.54	159.92	-103.42	-165.42	396.44	384.75	11.69	33.906		
2,300.00	2,203.41	2,258.10	2,241.21	11.63	5.93	159.27	-113.03	-182.24	424.37	411.85	12.51	33.912		
2,400.00	2,295.65	2,354.02	2,335.15	12.39	6.33	158.70	-122.63	-199.06	452.33	438.99	13.34	33.898		
2,500.00	2,387.89	2,449.94	2,429.09	13.15	6.73	158.19	-132.24	-215.88	480.34	466.16	14.18	33.869		
2,600.00	2,480.13	2,545.86	2,523.03	13.91	7.13	157.74	-141.84	-232.71	508.37	493.35	15.03	33.832		
2,700.00	2,572.37	2,641.77	2,616.97	14.67	7.54	157.34	-151.44	-249.53	536.44	520.56	15.88	33.789		
2,800.00	2,664.61	2,737.69	2,710.91	15.43	7.95	156.97	-161.05	-266.35	564.52	547.79	16.73	33.742		
2,900.00	2,756.85	2,833.61	2,804.85	16.20	8.37	156.64	-170.65	-283.17	592.62	575.03	17.59	33.693		
3,000.00	2,849.09	2,929.52	2,898.79	16.96	8.78	156.34	-180.25	-300.00	620.74	602.29	18.45	33.644		
3,100.00	2,941.33	3,025.44	2,992.73	17.72	9.20	156.07	-189.86	-316.82	648.87	629.56	19.31	33.595		
3,200.00	3,033.57	3,121.36	3,086.67	18.49	9.62	155.82	-199.46	-333.64	677.02	656.84	20.18	33.546		
3,300.00	3,125.81	3,217.27	3,180.61	19.25	10.04	155.59	-209.07	-350.47	705.18	684.13	21.05	33.499		
3,400.00	3,218.05	3,313.19	3,274.55	20.02	10.46	155.38	-218.67	-367.29	733.34	711.42	21.92	33.452		
3,500.00	3,310.29	3,409.11	3,368.50	20.78	10.88	155.18	-228.27	-384.11	761.52	738.72	22.79	33.407		
3,600.00	3,402.53	3,505.03	3,462.44	21.54	11.31	155.00	-237.88	-400.93	789.70	766.03	23.67	33.364		
3,700.00	3,494.77	3,600.94	3,556.38	22.31	11.73	154.83	-247.48	-417.76	817.89	793.35	24.55	33.322		
3,763.66	3,553.49	3,662.00	3,616.18	22.80	12.00	154.72	-253.60	-428.47	835.84	810.74	25.10	33.296		
3,800.00	3,587.09	3,696.91	3,650.37	23.03	12.15	154.75	-257.09	-434.59	845.89	820.46	25.43	33.265		
3,900.00	3,680.45	3,793.52	3,744.99	23.54	12.58	154.74	-266.76	-451.53	871.47	845.18	26.28	33.158		
4,000.00	3,775.00	3,890.82	3,840.29	24.01	13.02	154.61	-276.51	-468.60	894.00	866.87	27.13	32.948		
4,100.00	3,870.63	3,988.70	3,936.15	24.46	13.45	154.38	-286.31	-485.76	913.49	885.51	27.98	32.647		
4,200.00	3,967.22	4,087.04	4,032.46	24.86	13.89	154.05	-296.15	-503.01	929.93	901.11	28.82	32.267		
4,300.00	4,064.65	4,185.71	4,129.10	25.22	14.33	153.61	-306.03	-520.32	943.35	913.70	29.65	31.817		
4,400.00	4,162.81	4,284.60	4,225.95	25.54	14.77	153.07	-315.93	-537.66	953.77	923.30	30.47	31.302		
4,500.00	4,261.58	4,383.59	4,322.90	25.81	15.21	152.42	-325.85	-555.02	961.22	929.94	31.28	30.731		
4,600.00	4,360.83	4,482.56	4,419.82	26.04	15.66	151.66	-335.75	-572.38	965.75	933.67	32.08	30.107		
4,700.00	4,460.44	4,581.38	4,516.61	26.22	16.10	150.78	-345.65	-589.71	967.43	934.56	32.87	29.435		
4,800.00	4,560.30	4,679.93	4,613.13	26.36	16.54	149.79	-355.52	-607.00	966.33	932.68	33.65	28.720		

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_COTTONWOOD 13-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 13-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19--10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 33-33 - P_COTTONWOOD 33-33 - PLAN #1												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
4,899.72	4,660.00	4,777.82	4,709.01	26.46	16.98	-15.41	-365.32	-624.17	962.55	928.13	34.42	27.962	
5,000.00	4,760.28	4,876.04	4,805.20	26.54	17.42	-16.56	-375.15	-641.39	957.65	922.37	35.28	27.147	
5,100.00	4,860.28	4,973.98	4,901.12	26.61	17.86	-17.72	-384.96	-658.57	953.16	917.04	36.12	26.387	
5,200.00	4,960.28	5,071.92	4,997.04	26.68	18.30	-18.89	-394.77	-675.75	949.08	912.11	36.97	25.672	
5,300.00	5,060.28	5,169.86	5,092.97	26.75	18.74	-20.06	-404.57	-692.92	945.42	907.60	37.82	24.999	
5,400.00	5,160.28	5,267.80	5,188.89	26.82	19.18	-21.25	-414.38	-710.10	942.17	903.50	38.66	24.368	
5,500.00	5,260.28	5,365.74	5,284.81	26.90	19.62	-22.45	-424.18	-727.28	939.35	899.84	39.51	23.775	
5,600.00	5,360.28	5,463.68	5,380.73	26.98	20.06	-23.65	-433.99	-744.46	936.95	896.60	40.35	23.220	
5,700.00	5,460.28	5,561.62	5,476.65	27.06	20.50	-24.85	-443.80	-761.63	934.98	893.79	41.19	22.700	
5,800.00	5,560.28	5,659.56	5,572.57	27.14	20.94	-26.06	-453.60	-778.81	933.45	891.43	42.02	22.214	
5,900.00	5,660.28	5,756.16	5,667.47	27.22	21.26	-27.17	-462.56	-794.51	932.42	889.71	42.71	21.833	
6,000.00	5,760.28	5,853.81	5,763.95	27.30	21.53	-28.09	-470.00	-807.54	931.85	888.56	43.29	21.526	
6,100.00	5,860.28	5,952.38	5,861.80	27.39	21.77	-28.82	-475.86	-817.79	931.58	887.79	43.79	21.274	
6,200.00	5,960.28	6,051.65	5,960.71	27.48	21.96	-29.34	-480.06	-825.16	931.48	887.27	44.21	21.069	
6,300.00	6,060.28	6,151.40	6,060.32	27.56	22.13	-29.65	-482.57	-829.56	931.46	886.92	44.55	20.909	
6,345.69	6,105.98	6,197.07	6,105.98	27.60	22.19	-29.72	-483.15	-830.57	931.46	886.78	44.68	20.848	
6,400.00	6,160.28	6,251.38	6,160.28	27.65	22.26	-29.75	-483.37	-830.95	931.46	886.65	44.81	20.785	
6,500.00	6,260.28	6,351.38	6,260.28	27.75	22.38	-29.75	-483.37	-830.95	931.46	886.41	45.05	20.677	
6,600.00	6,360.28	6,451.38	6,360.28	27.84	22.50	-29.75	-483.37	-830.95	931.46	886.18	45.29	20.568	
6,700.00	6,460.28	6,551.38	6,460.28	27.93	22.62	-29.75	-483.37	-830.95	931.46	885.94	45.53	20.459	
6,800.00	6,560.28	6,651.38	6,560.28	28.03	22.75	-29.75	-483.37	-830.95	931.46	885.69	45.77	20.350	
6,900.00	6,660.28	6,751.38	6,660.28	28.13	22.87	-29.75	-483.37	-830.95	931.46	885.44	46.02	20.241	
7,000.00	6,760.28	6,851.38	6,760.28	28.23	23.00	-29.75	-483.37	-830.95	931.46	885.19	46.27	20.131	
7,100.00	6,860.28	6,951.38	6,860.28	28.33	23.13	-29.75	-483.37	-830.95	931.46	884.94	46.52	20.022	
7,200.00	6,960.28	7,051.38	6,960.28	28.43	23.26	-29.75	-483.37	-830.95	931.46	884.68	46.78	19.912	
7,300.00	7,060.28	7,151.38	7,060.28	28.53	23.39	-29.75	-483.37	-830.95	931.46	884.42	47.04	19.802	
7,400.00	7,160.28	7,251.38	7,160.28	28.64	23.53	-29.75	-483.37	-830.95	931.46	884.16	47.30	19.693	
7,500.00	7,260.28	7,351.38	7,260.28	28.74	23.66	-29.75	-483.37	-830.95	931.46	883.90	47.57	19.583	
7,600.00	7,360.28	7,451.38	7,360.28	28.85	23.80	-29.75	-483.37	-830.95	931.46	883.63	47.83	19.473	
7,700.00	7,460.28	7,551.38	7,460.28	28.96	23.94	-29.75	-483.37	-830.95	931.46	883.36	48.10	19.364	
7,800.00	7,560.28	7,651.38	7,560.28	29.07	24.08	-29.75	-483.37	-830.95	931.46	883.09	48.38	19.255	
7,900.00	7,660.28	7,751.38	7,660.28	29.18	24.22	-29.75	-483.37	-830.95	931.46	882.81	48.65	19.146	
8,000.00	7,760.28	7,851.38	7,760.28	29.29	24.36	-29.75	-483.37	-830.95	931.46	882.53	48.93	19.037	
8,100.00	7,860.28	7,951.38	7,860.28	29.41	24.50	-29.75	-483.37	-830.95	931.46	882.25	49.21	18.928	
8,200.00	7,960.28	8,051.38	7,960.28	29.52	24.64	-29.75	-483.37	-830.95	931.46	881.97	49.49	18.820	
8,304.72	8,065.00	8,156.09	8,065.00	29.65	24.80	-29.75	-483.37	-830.95	931.46	881.67	49.79	18.707	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 13-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 13-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19--10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - PLAN #1													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	
0.00	0.00	0.00	0.00	0.00	0.00	-134.13	-13.84	-14.27	19.88					
100.00	100.00	100.00	100.00	0.10	0.10	-134.13	-13.84	-14.27	19.88	19.69	0.19	104.055		
200.00	200.00	200.00	200.00	0.32	0.32	-134.13	-13.84	-14.27	19.88	19.24	0.64	31.034		
300.00	300.00	300.00	300.00	0.55	0.55	-134.13	-13.84	-14.27	19.88	18.79	1.09	18.236 CC		
400.00	399.98	399.35	399.33	0.74	0.74	30.66	-15.40	-15.00	19.99	18.50	1.49	13.436		
500.00	499.84	498.71	498.55	0.94	0.94	32.79	-20.08	-17.19	20.34	18.47	1.87	10.867 ES		
600.00	599.45	598.05	597.51	1.17	1.17	36.16	-27.87	-20.83	20.98	18.68	2.30	9.138		
700.00	698.70	697.38	696.11	1.45	1.44	40.53	-38.77	-25.92	21.99	19.22	2.77	7.936		
800.00	797.47	796.70	794.21	1.77	1.76	45.53	-52.75	-32.46	23.46	20.14	3.32	7.062		
900.00	895.62	896.00	891.71	2.14	2.13	50.80	-69.80	-40.43	25.46	21.48	3.98	6.400		
1,000.00	993.06	995.27	988.47	2.57	2.56	55.99	-89.90	-49.83	28.06	23.29	4.77	5.886		
1,100.00	1,089.64	1,094.53	1,084.38	3.06	3.04	60.84	-113.01	-60.64	31.28	25.58	5.70	5.486		
1,200.00	1,185.27	1,193.75	1,179.32	3.61	3.59	65.20	-139.11	-72.85	35.14	28.35	6.79	5.178		
1,300.00	1,279.82	1,292.94	1,273.18	4.23	4.20	69.03	-168.17	-86.43	39.63	31.61	8.01	4.945		
1,400.00	1,373.17	1,392.10	1,365.84	4.90	4.87	72.32	-200.14	-101.38	44.74	35.36	9.38	4.769		
1,436.06	1,406.51	1,428.01	1,399.13	5.16	5.12	73.50	-212.34	-107.09	46.69	36.78	9.91	4.712		
1,500.00	1,465.50	1,491.83	1,458.27	5.62	5.57	75.83	-234.08	-117.25	50.10	39.23	10.88	4.607		
1,600.00	1,557.73	1,591.64	1,550.75	6.36	6.30	78.89	-268.07	-133.15	55.59	43.19	12.40	4.482		
1,700.00	1,649.97	1,691.45	1,643.24	7.10	7.03	81.39	-302.06	-149.04	61.21	47.27	13.94	4.392		
1,800.00	1,742.21	1,791.26	1,735.73	7.85	7.76	83.47	-336.05	-164.93	66.92	51.45	15.47	4.326		
1,900.00	1,834.45	1,891.07	1,828.22	8.60	8.50	85.23	-370.04	-180.83	72.71	55.71	17.00	4.277		
2,000.00	1,926.69	1,990.88	1,920.71	9.36	9.23	86.72	-404.03	-196.72	78.55	60.02	18.53	4.239		
2,100.00	2,018.93	2,090.69	2,013.19	10.11	9.98	88.00	-438.02	-212.62	84.44	64.38	20.06	4.210		
2,200.00	2,111.17	2,190.50	2,105.68	10.87	10.72	89.12	-472.01	-228.51	90.37	68.78	21.58	4.187		
2,300.00	2,203.41	2,290.31	2,198.17	11.63	11.46	90.10	-505.99	-244.40	96.32	73.22	23.11	4.169		
2,400.00	2,295.65	2,390.12	2,290.66	12.39	12.21	90.96	-539.98	-260.30	102.31	77.68	24.63	4.154		
2,500.00	2,387.89	2,489.93	2,383.15	13.15	12.95	91.73	-573.97	-276.19	108.31	82.16	26.15	4.142		
2,600.00	2,480.13	2,589.74	2,475.64	13.91	13.70	92.42	-607.96	-292.09	114.33	86.66	27.67	4.132		
2,700.00	2,572.37	2,689.55	2,568.12	14.67	14.44	93.04	-641.95	-307.98	120.36	91.18	29.18	4.124		
2,800.00	2,664.61	2,789.36	2,660.61	15.43	15.19	93.60	-675.94	-323.87	126.41	95.71	30.70	4.118		
2,900.00	2,756.85	2,889.17	2,753.10	16.20	15.94	94.11	-709.93	-339.77	132.47	100.26	32.21	4.112		
3,000.00	2,849.09	2,988.98	2,845.59	16.96	16.69	94.57	-743.92	-355.66	138.54	104.81	33.73	4.108		
3,100.00	2,941.33	3,088.79	2,938.08	17.72	17.44	95.00	-777.91	-371.56	144.61	109.37	35.24	4.104		
3,200.00	3,033.57	3,188.60	3,030.56	18.49	18.18	95.39	-811.90	-387.45	150.70	113.95	36.75	4.101		
3,300.00	3,125.81	3,288.41	3,123.05	19.25	18.93	95.75	-845.89	-403.34	156.79	118.53	38.26	4.098		
3,400.00	3,218.05	3,388.22	3,215.54	20.02	19.68	96.08	-879.88	-419.24	162.88	123.11	39.77	4.096		
3,500.00	3,310.29	3,488.03	3,308.03	20.78	20.43	96.39	-913.87	-435.13	168.98	127.70	41.28	4.094		
3,600.00	3,402.53	3,587.84	3,400.52	21.54	21.18	96.68	-947.86	-451.03	175.09	132.30	42.79	4.092		
3,700.00	3,494.77	3,687.65	3,493.01	22.31	21.93	96.95	-981.85	-466.92	181.20	136.90	44.29	4.091		
3,763.66	3,553.49	3,751.19	3,551.88	22.80	22.41	97.11	-1,003.49	-477.04	185.09	139.83	45.25	4.090 SF		
3,800.00	3,587.09	3,787.46	3,585.50	23.03	22.68	97.18	-1,015.84	-482.82	187.28	141.52	45.76	4.093		
3,900.00	3,680.45	3,887.26	3,677.98	23.54	23.43	96.64	-1,049.83	-498.71	193.03	145.98	47.05	4.103		
4,000.00	3,775.00	3,986.96	3,770.36	24.01	24.18	95.13	-1,083.78	-514.58	198.47	150.16	48.31	4.108		
4,100.00	3,870.63	4,086.42	3,862.53	24.46	24.93	92.74	-1,117.65	-530.42	203.87	154.37	49.50	4.119		
4,200.00	3,967.22	4,185.53	3,954.37	24.86	25.67	89.56	-1,151.40	-546.20	209.64	159.11	50.53	4.149		
4,300.00	4,064.65	4,284.16	4,045.76	25.22	26.41	85.69	-1,184.99	-561.91	216.32	165.00	51.31	4.216		
4,400.00	4,162.81	4,382.20	4,136.61	25.54	27.15	81.25	-1,218.38	-577.52	224.52	172.76	51.76	4.338		
4,500.00	4,261.58	4,479.52	4,226.79	25.81	27.88	76.43	-1,251.52	-593.02	234.90	183.10	51.80	4.535		
4,600.00	4,360.83	4,576.01	4,316.20	26.04	28.61	71.39	-1,284.38	-608.39	248.08	196.67	51.41	4.826		
4,700.00	4,460.44	4,671.55	4,404.73	26.22	29.33	66.33	-1,316.91	-623.60	264.61	214.00	50.61	5.228		
4,800.00	4,560.30	4,766.02	4,492.28	26.36	30.04	61.41	-1,349.09	-638.64	284.89	235.42	49.47	5.759		
4,899.72	4,660.00	4,859.05	4,578.48	26.46	30.74	-107.30	-1,380.77	-653.46	309.13	261.03	48.10	6.426		

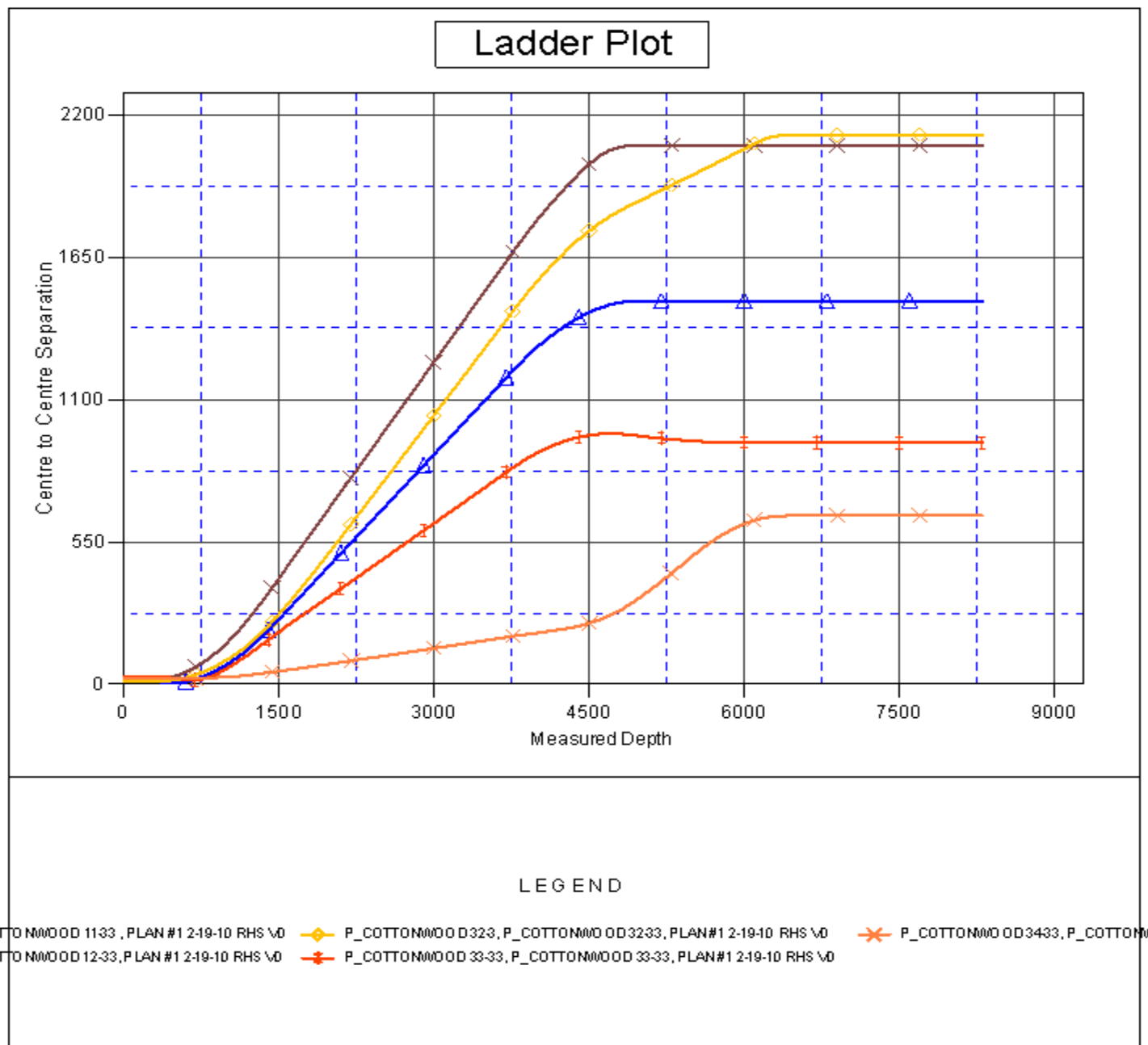
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 13-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 13-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19--10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - PLAN #1												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	4,760.28	4,951.98	4,664.59	26.54	31.44	-111.89	-1,412.41	-668.26	336.65	290.09	46.56	7.231	
5,100.00	4,860.28	5,044.64	4,750.46	26.61	32.13	-115.80	-1,443.97	-683.01	365.90	320.74	45.16	8.102	
5,200.00	4,960.28	5,137.31	4,836.32	26.68	32.83	-119.14	-1,475.53	-697.77	396.57	352.58	43.99	9.015	
5,300.00	5,060.28	5,229.97	4,922.19	26.75	33.53	-122.02	-1,507.08	-712.52	428.33	385.32	43.01	9.959	
5,400.00	5,160.28	5,322.63	5,008.06	26.82	34.23	-124.52	-1,538.64	-727.28	460.98	418.78	42.20	10.924	
5,500.00	5,260.28	5,419.22	5,097.60	26.90	34.90	-126.77	-1,571.44	-742.62	494.24	452.75	41.49	11.911	
5,600.00	5,360.28	5,530.84	5,202.18	26.98	35.46	-128.87	-1,606.77	-759.14	525.77	484.94	40.82	12.879	
5,700.00	5,460.28	5,645.59	5,311.18	27.06	35.98	-130.56	-1,639.23	-774.32	554.28	513.90	40.37	13.728	
5,800.00	5,560.28	5,763.24	5,424.34	27.14	36.47	-131.91	-1,668.37	-787.94	579.48	539.38	40.10	14.451	
5,900.00	5,660.28	5,883.47	5,541.24	27.22	36.91	-132.98	-1,693.78	-799.83	601.12	561.16	39.96	15.042	
6,000.00	5,760.28	6,005.94	5,661.42	27.30	37.29	-133.80	-1,715.07	-809.78	619.02	579.09	39.94	15.500	
6,100.00	5,860.28	6,130.25	5,784.33	27.39	37.61	-134.42	-1,731.90	-817.65	633.02	593.02	40.00	15.827	
6,200.00	5,960.28	6,255.96	5,909.32	27.48	37.86	-134.83	-1,743.99	-823.31	642.99	602.86	40.13	16.022	
6,300.00	6,060.28	6,382.62	6,035.73	27.56	38.04	-135.07	-1,751.14	-826.65	648.85	608.52	40.33	16.090	
6,400.00	6,160.28	6,507.21	6,160.28	27.65	38.16	-135.14	-1,753.24	-827.63	650.56	609.98	40.58	16.030	
6,500.00	6,260.28	6,607.21	6,260.28	27.75	38.22	-135.14	-1,753.24	-827.63	650.56	609.74	40.82	15.935	
6,600.00	6,360.28	6,707.21	6,360.28	27.84	38.28	-135.14	-1,753.24	-827.63	650.56	609.50	41.07	15.841	
6,700.00	6,460.28	6,807.21	6,460.28	27.93	38.34	-135.14	-1,753.24	-827.63	650.56	609.25	41.32	15.746	
6,800.00	6,560.28	6,907.21	6,560.28	28.03	38.41	-135.14	-1,753.24	-827.63	650.56	609.00	41.57	15.651	
6,900.00	6,660.28	7,007.21	6,660.28	28.13	38.47	-135.14	-1,753.24	-827.63	650.56	608.74	41.82	15.556	
7,000.00	6,760.28	7,107.21	6,760.28	28.23	38.54	-135.14	-1,753.24	-827.63	650.56	608.49	42.08	15.461	
7,100.00	6,860.28	7,207.21	6,860.28	28.33	38.61	-135.14	-1,753.24	-827.63	650.56	608.23	42.34	15.365	
7,200.00	6,960.28	7,307.21	6,960.28	28.43	38.68	-135.14	-1,753.24	-827.63	650.56	607.96	42.60	15.270	
7,300.00	7,060.28	7,407.21	7,060.28	28.53	38.75	-135.14	-1,753.24	-827.63	650.56	607.69	42.87	15.175	
7,400.00	7,160.28	7,507.21	7,160.28	28.64	38.82	-135.14	-1,753.24	-827.63	650.56	607.42	43.14	15.080	
7,500.00	7,260.28	7,607.21	7,260.28	28.74	38.89	-135.14	-1,753.24	-827.63	650.56	607.15	43.41	14.985	
7,600.00	7,360.28	7,707.21	7,360.28	28.85	38.96	-135.14	-1,753.24	-827.63	650.56	606.88	43.69	14.891	
7,700.00	7,460.28	7,807.21	7,460.28	28.96	39.04	-135.14	-1,753.24	-827.63	650.56	606.60	43.97	14.797	
7,800.00	7,560.28	7,907.21	7,560.28	29.07	39.11	-135.14	-1,753.24	-827.63	650.56	606.32	44.25	14.702	
7,900.00	7,660.28	8,007.21	7,660.28	29.18	39.19	-135.14	-1,753.24	-827.63	650.56	606.03	44.53	14.609	
8,000.00	7,760.28	8,107.21	7,760.28	29.29	39.27	-135.14	-1,753.24	-827.63	650.56	605.75	44.82	14.515	
8,100.00	7,860.28	8,207.21	7,860.28	29.41	39.35	-135.14	-1,753.24	-827.63	650.56	605.46	45.11	14.422	
8,200.00	7,960.28	8,307.21	7,960.28	29.52	39.43	-135.14	-1,753.24	-827.63	650.56	605.16	45.40	14.329	
8,304.72	8,065.00	8,411.93	8,065.00	29.65	39.52	-135.14	-1,753.24	-827.63	650.56	604.86	45.71	14.233	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 13-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 13-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19--10 RHS	Offset TVD Reference:	Offset Datum

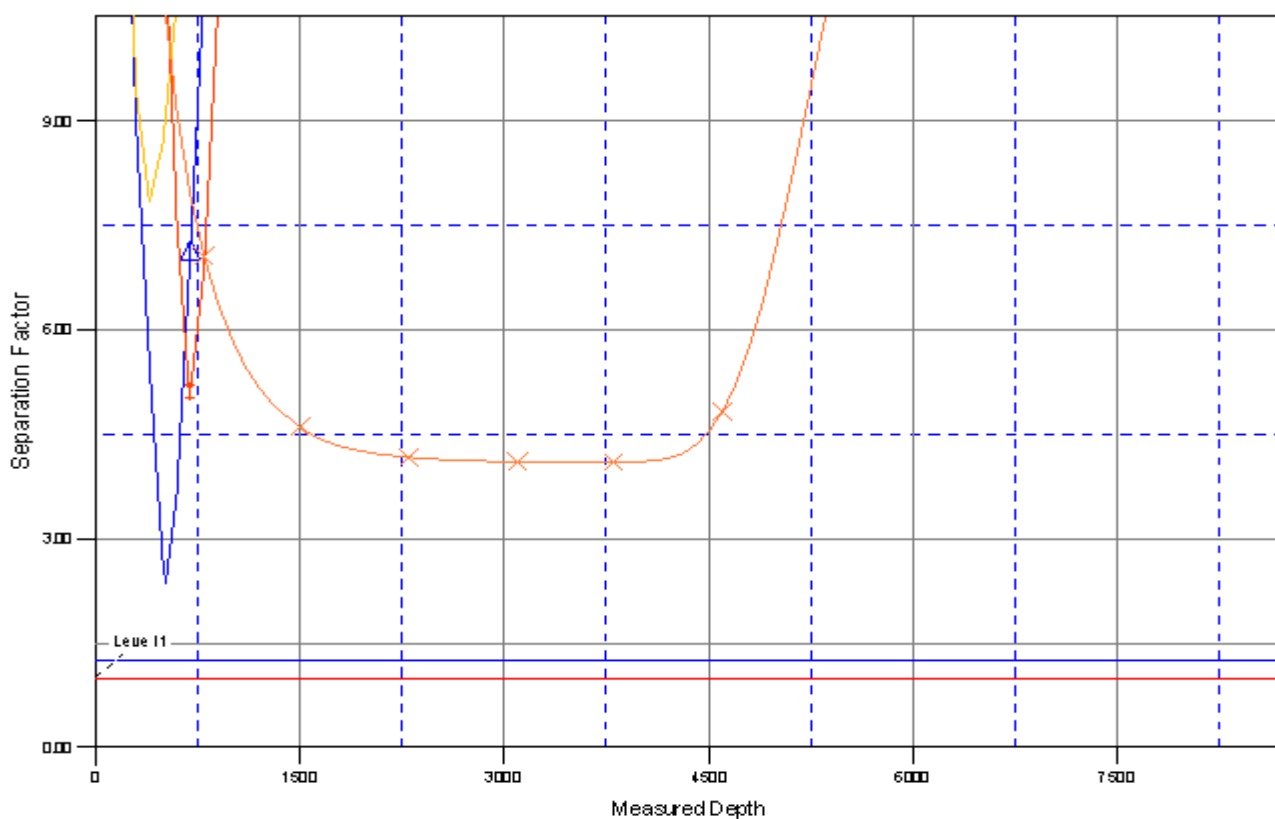
Reference Depths are relative to WELL @ 4964.00ft (Original Well Elev) Coordinates are relative to: P_COTTONWOOD 13-33
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W ° Grid Convergence at Surface is: 0.46°



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 13-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 13-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 13-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19--10 RHS	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4964.00ft (Original Well Elev) Coordinates are relative to: P_COTTONWOOD 13-33
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: 0.46°

Separation Factor Plot



LEGEND

x P_COTTONWOOD 13-33, PLAN #1 2-19-10 RHS \0 x P_COTTONWOOD 13-33, PLAN #1 2-19-10 RHS \0
x P_COTTONWOOD 12-33, PLAN #1 2-19-10 RHS \0 x P_COTTONWOOD 12-33, PLAN #1 2-19-10 RHS \0