



US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_COTTONWOOD 12-33 PAD

P_COTTONWOOD 34-33

P_COTTONWOOD 34-33

Plan: PLAN #1 2-19-10 RHS

Standard Planning Report

19 February, 2010

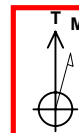




Project: COLORADO NORTHERN ZONE - 83
 Site: WELD_COTTONWOOD 12-33 PAD
 Well: P_COTTONWOOD 34-33
 Wellbore: P_COTTONWOOD 34-33
 Section: SECTION 33 T2N R66W
 SHL: 1787 FSL 868 FWL
 Design: PLAN #1 2-19-10 RHS
 Latitude: 40° 5' 32.168 N
 Longitude: 104° 47' 18.607 W
 GL: 4949.00
 KB: WELL @ 4964.00ft (Original Well Elev)



Weatherford®



Azimuths to True North
 Magnetic North: 9.03°
 Magnetic Field
 Strength: 53104.6nT
 Dip Angle: 66.84°
 Date: 2/19/2010
 Model: IGRF2010

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
4159.00	4406.36	PARKMAN
4665.00	4952.42	SUSSEX
7151.00	7497.93	NIO A
7471.00	7817.93	CODELL
7561.00	7907.93	GRNHRN
7935.00	8281.93	JSAND

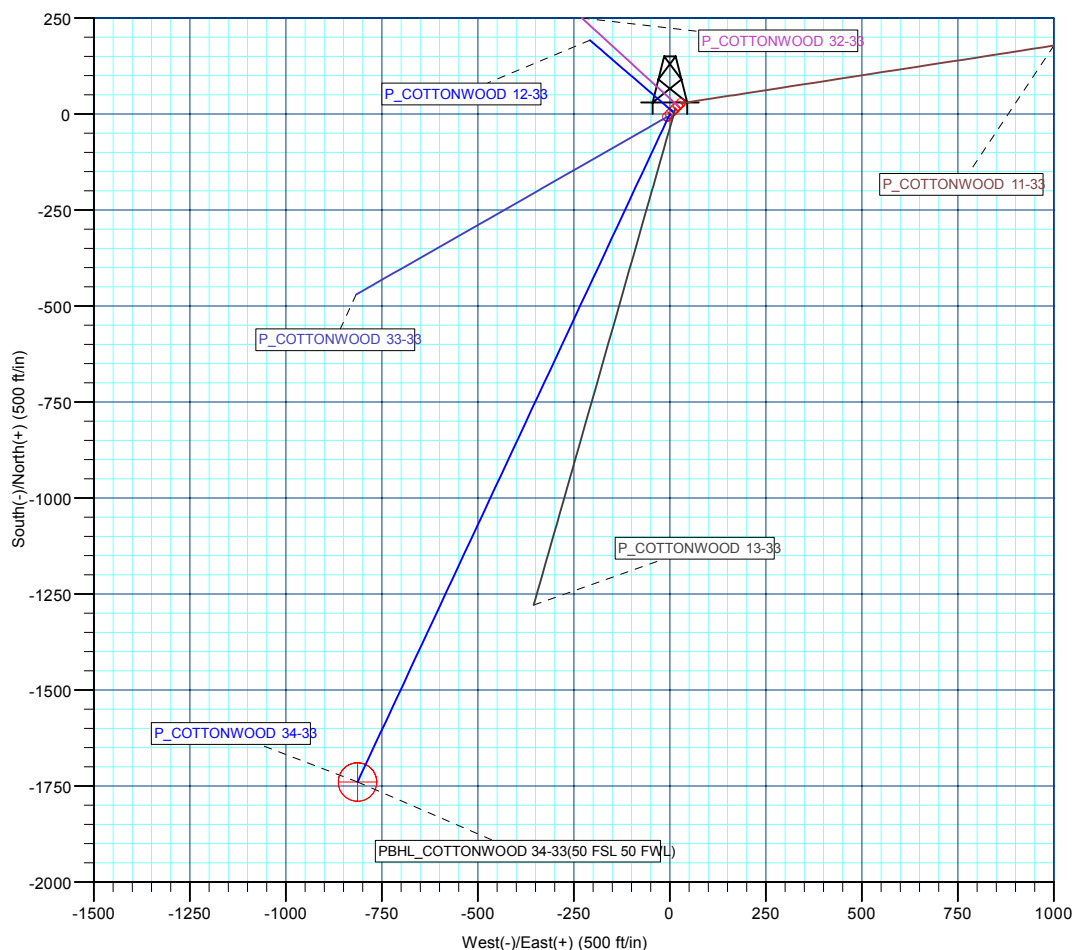
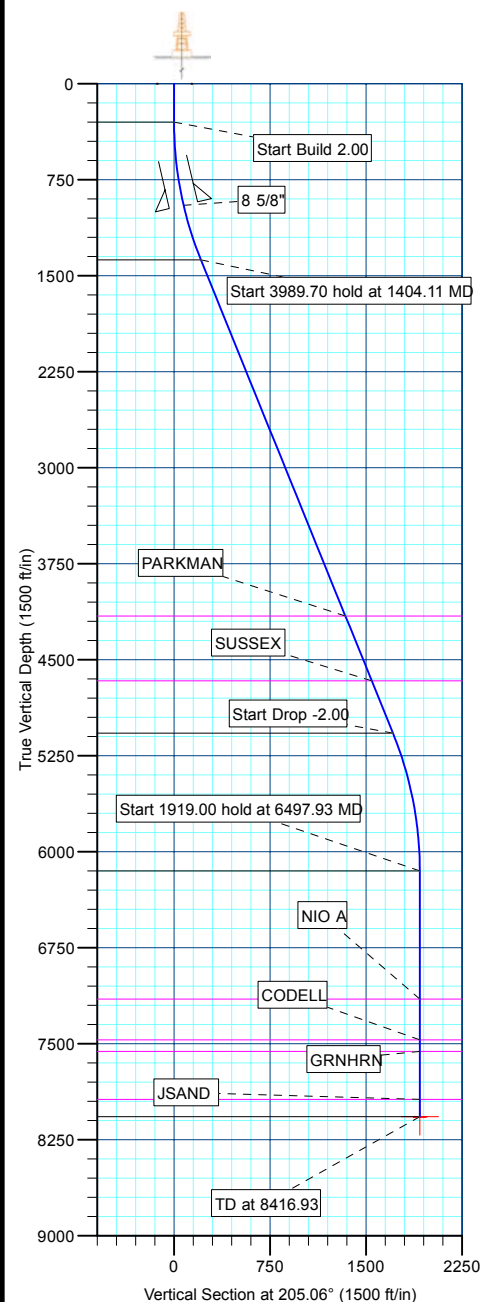
CASING DETAILS			
TVD	MD	Name	Size
950.00	955.71	8 5/8"	8.62

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	
1404.11	22.08	205.06	1376.98	-190.36	-89.02	2.00	205.06	210.15	Start 3989.70 hold at 1404.11 MD	
5393.81	22.08	205.06	5074.02	-1549.04	-724.35	0.00	0.00	1710.03	Start Drop -2.00	
6497.93	0.00	0.00	6151.00	-1739.40	-813.36	2.00	180.00	1920.17	Start 1919.00 hold at 6497.93 MD	
8416.93	0.00	0.00	8070.00	-1739.40	-813.36	0.00	0.00	1920.17	TD at 8416.93	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)							
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape	
PBHL	8070.00	-1739.40	-813.36	40° 5' 14.978 N	104° 47' 29.072 W	Circle (Radius: 50.00)	

WELL DETAILS: P_COTTONWOOD 34-33						
+N/-S	+E/-W	Northing	Ground Level:	4949.00	Longitude	Slot
0.00	0.00	1277256.75	Easting	3199056.90	40° 5' 32.168 N	104° 47' 18.607 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 13-33, P_COTTONWOOD 13-33, 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
—	PLAN #1 2-19-10 RHS



Plan: PLAN #1 2-19-10 RHS (P_COTTONWOOD 34-33/P_COTTONWOOD 34-33)		
Created By:	Robert H. Scott	Date: 10:30, February 19 2010

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 34-33		
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:		Northing:	1,277,285.05 ft	Latitude: 40° 5' 32.446 N
From:	Lat/Long	Easting:	3,199,085.21 ft	Longitude: 104° 47' 18.240 W
Position Uncertainty:	0.00 ft	Slot Radius:	in	Grid Convergence: 0.46 °

Well	P_COTTONWOOD 34-33			
Well Position	+N/-S	-28.07 ft	Northing:	1,277,256.75 ft
	+E/-W	-28.54 ft	Easting:	3,199,056.90 ft
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft
			Ground Level:	4,949.00 ft

Wellbore	P_COTTONWOOD 34-33				
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	205.06

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	
1,404.11	22.08	205.06	1,376.98	-190.36	-89.02	2.00	2.00	0.00	205.06	
5,393.81	22.08	205.06	5,074.02	-1,549.04	-724.35	0.00	0.00	0.00	0.00	
6,497.93	0.00	0.00	6,151.00	-1,739.40	-813.36	2.00	-2.00	0.00	180.00	
8,416.93	0.00	0.00	8,070.00	-1,739.40	-813.36	0.00	0.00	0.00	0.00	PBHL_COTTONW

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 34-33		
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	205.06	399.98	-1.58	-0.74	1.75	2.00	2.00	0.00
500.00	4.00	205.06	499.84	-6.32	-2.96	6.98	2.00	2.00	0.00
600.00	6.00	205.06	599.45	-14.22	-6.65	15.69	2.00	2.00	0.00
700.00	8.00	205.06	698.70	-25.26	-11.81	27.88	2.00	2.00	0.00
800.00	10.00	205.06	797.47	-39.43	-18.44	43.52	2.00	2.00	0.00
900.00	12.00	205.06	895.62	-56.71	-26.52	62.60	2.00	2.00	0.00
8 5/8"									
955.71	13.11	205.06	950.00	-67.68	-31.65	74.71	2.00	2.00	0.00
1,000.00	14.00	205.06	993.06	-77.09	-36.05	85.10	2.00	2.00	0.00
1,100.00	16.00	205.06	1,089.64	-100.53	-47.01	110.98	2.00	2.00	0.00
1,200.00	18.00	205.06	1,185.27	-127.01	-59.39	140.21	2.00	2.00	0.00
1,300.00	20.00	205.06	1,279.82	-156.50	-73.18	172.77	2.00	2.00	0.00
1,400.00	22.00	205.06	1,373.17	-188.96	-88.36	208.60	2.00	2.00	0.00
Start 3989.70 hold at 1404.11 MD									
1,404.11	22.08	205.06	1,376.98	-190.36	-89.02	210.15	2.00	2.00	0.00
1,500.00	22.08	205.06	1,465.83	-223.02	-104.28	246.19	0.00	0.00	0.00
1,600.00	22.08	205.06	1,558.50	-257.07	-120.21	283.79	0.00	0.00	0.00
1,700.00	22.08	205.06	1,651.16	-291.13	-136.13	321.38	0.00	0.00	0.00
1,800.00	22.08	205.06	1,743.83	-325.18	-152.06	358.98	0.00	0.00	0.00
1,900.00	22.08	205.06	1,836.49	-359.23	-167.98	396.57	0.00	0.00	0.00
2,000.00	22.08	205.06	1,929.16	-393.29	-183.91	434.16	0.00	0.00	0.00
2,100.00	22.08	205.06	2,021.82	-427.34	-199.83	471.76	0.00	0.00	0.00
2,200.00	22.08	205.06	2,114.49	-461.40	-215.75	509.35	0.00	0.00	0.00
2,300.00	22.08	205.06	2,207.15	-495.45	-231.68	546.94	0.00	0.00	0.00
2,400.00	22.08	205.06	2,299.81	-529.51	-247.60	584.54	0.00	0.00	0.00
2,500.00	22.08	205.06	2,392.48	-563.56	-263.53	622.13	0.00	0.00	0.00
2,600.00	22.08	205.06	2,485.14	-597.62	-279.45	659.73	0.00	0.00	0.00
2,700.00	22.08	205.06	2,577.81	-631.67	-295.38	697.32	0.00	0.00	0.00
2,800.00	22.08	205.06	2,670.47	-665.72	-311.30	734.91	0.00	0.00	0.00
2,900.00	22.08	205.06	2,763.14	-699.78	-327.23	772.51	0.00	0.00	0.00
3,000.00	22.08	205.06	2,855.80	-733.83	-343.15	810.10	0.00	0.00	0.00
3,100.00	22.08	205.06	2,948.47	-767.89	-359.07	847.69	0.00	0.00	0.00
3,200.00	22.08	205.06	3,041.13	-801.94	-375.00	885.29	0.00	0.00	0.00
3,300.00	22.08	205.06	3,133.80	-836.00	-390.92	922.88	0.00	0.00	0.00
3,400.00	22.08	205.06	3,226.46	-870.05	-406.85	960.48	0.00	0.00	0.00
3,500.00	22.08	205.06	3,319.12	-904.11	-422.77	998.07	0.00	0.00	0.00
3,600.00	22.08	205.06	3,411.79	-938.16	-438.70	1,035.66	0.00	0.00	0.00
3,700.00	22.08	205.06	3,504.45	-972.22	-454.62	1,073.26	0.00	0.00	0.00
3,800.00	22.08	205.06	3,597.12	-1,006.27	-470.54	1,110.85	0.00	0.00	0.00
3,900.00	22.08	205.06	3,689.78	-1,040.32	-486.47	1,148.45	0.00	0.00	0.00
4,000.00	22.08	205.06	3,782.45	-1,074.38	-502.39	1,186.04	0.00	0.00	0.00
4,100.00	22.08	205.06	3,875.11	-1,108.43	-518.32	1,223.63	0.00	0.00	0.00
4,200.00	22.08	205.06	3,967.78	-1,142.49	-534.24	1,261.23	0.00	0.00	0.00
4,300.00	22.08	205.06	4,060.44	-1,176.54	-550.17	1,298.82	0.00	0.00	0.00
4,400.00	22.08	205.06	4,153.10	-1,210.60	-566.09	1,336.41	0.00	0.00	0.00
PARKMAN									
4,406.36	22.08	205.06	4,159.00	-1,212.76	-567.10	1,338.81	0.00	0.00	0.00
4,500.00	22.08	205.06	4,245.77	-1,244.65	-582.01	1,374.01	0.00	0.00	0.00
4,600.00	22.08	205.06	4,338.43	-1,278.71	-597.94	1,411.60	0.00	0.00	0.00
4,700.00	22.08	205.06	4,431.10	-1,312.76	-613.86	1,449.20	0.00	0.00	0.00
4,800.00	22.08	205.06	4,523.76	-1,346.82	-629.79	1,486.79	0.00	0.00	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 34-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 34-33		
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)
4,900.00	22.08	205.06	4,616.43	-1,380.87	-645.71	1,524.38	0.00	0.00	0.00
SUSSEX									
4,952.42	22.08	205.06	4,665.00	-1,398.72	-654.06	1,544.09	0.00	0.00	0.00
5,000.00	22.08	205.06	4,709.09	-1,414.92	-661.64	1,561.98	0.00	0.00	0.00
5,100.00	22.08	205.06	4,801.76	-1,448.98	-677.56	1,599.57	0.00	0.00	0.00
5,200.00	22.08	205.06	4,894.42	-1,483.03	-693.48	1,637.16	0.00	0.00	0.00
5,300.00	22.08	205.06	4,987.08	-1,517.09	-709.41	1,674.76	0.00	0.00	0.00
Start Drop -2.00									
5,393.81	22.08	205.06	5,074.02	-1,549.04	-724.35	1,710.03	0.00	0.00	0.00
5,400.00	21.96	205.06	5,079.75	-1,551.14	-725.33	1,712.35	2.00	-2.00	0.00
5,500.00	19.96	205.06	5,173.13	-1,583.54	-740.48	1,748.11	2.00	-2.00	0.00
5,600.00	17.96	205.06	5,267.70	-1,612.97	-754.24	1,780.60	2.00	-2.00	0.00
5,700.00	15.96	205.06	5,363.35	-1,639.39	-766.60	1,809.77	2.00	-2.00	0.00
5,800.00	13.96	205.06	5,459.95	-1,662.77	-777.53	1,835.58	2.00	-2.00	0.00
5,900.00	11.96	205.06	5,557.40	-1,683.08	-787.03	1,858.00	2.00	-2.00	0.00
6,000.00	9.96	205.06	5,655.57	-1,700.30	-795.08	1,877.01	2.00	-2.00	0.00
6,100.00	7.96	205.06	5,754.35	-1,714.40	-801.68	1,892.58	2.00	-2.00	0.00
6,200.00	5.96	205.06	5,853.61	-1,725.38	-806.81	1,904.70	2.00	-2.00	0.00
6,300.00	3.96	205.06	5,953.23	-1,733.21	-810.47	1,913.34	2.00	-2.00	0.00
6,400.00	1.96	205.06	6,053.09	-1,737.88	-812.65	1,918.50	2.00	-2.00	0.00
Start 1919.00 hold at 6497.93 MD									
6,497.93	0.00	0.00	6,151.00	-1,739.40	-813.36	1,920.17	2.00	-2.00	0.00
6,500.00	0.00	0.00	6,153.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
6,600.00	0.00	0.00	6,253.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
6,700.00	0.00	0.00	6,353.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
6,800.00	0.00	0.00	6,453.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
6,900.00	0.00	0.00	6,553.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
7,000.00	0.00	0.00	6,653.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
7,100.00	0.00	0.00	6,753.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
7,200.00	0.00	0.00	6,853.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
7,300.00	0.00	0.00	6,953.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
7,400.00	0.00	0.00	7,053.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
NIO A									
7,497.93	0.00	0.00	7,151.00	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
7,500.00	0.00	0.00	7,153.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
7,600.00	0.00	0.00	7,253.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
7,700.00	0.00	0.00	7,353.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
7,800.00	0.00	0.00	7,453.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
CODELL									
7,817.93	0.00	0.00	7,471.00	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
7,900.00	0.00	0.00	7,553.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
GRNHRN									
7,907.93	0.00	0.00	7,561.00	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
8,000.00	0.00	0.00	7,653.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00
8,100.00	0.00	0.00	7,753.07	-1,739.40	-813.36	1,920.17	0.00	0.00	0.00

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 34-33		
Design:	PLAN #1 2-19-10 RHS		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
PBHL_COTTONWOC	0.00	0.00	8,070.00	-1,739.40	-813.36	1,275,510.89	3,198,257.52	40° 5' 14.978 N	104° 47' 29.072 W
- plan misses target center by 316.93ft at 8100.00ft MD (7753.07 TVD, -1739.40 N, -813.36 E)									
- Circle (radius 50.00)									

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

Formations						
Measured Depth	Vertical Depth				Dip	Dip Direction
(ft)	(ft)		Name	Lithology	(°)	(°)
4,406.36	4,159.00		PARKMAN			
4,952.42	4,665.00		SUSSEX			
7,497.93	7,151.00		NIO A			
7,817.93	7,471.00		CODELL			
7,907.93	7,561.00		GRNHRN			
8,281.93	7,935.00		JSAND			

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(ft)	(ft)	+N/-S	+E/-W	Comment	
(ft)	(ft)	(ft)	(ft)		
300.00	300.00	0.00	0.00	Start Build 2.00	
1,404.11	1,376.98	-190.36	-89.02	Start 3989.70 hold at 1404.11 MD	
5,393.81	5,074.02	-1,549.04	-724.35	Start Drop -2.00	
6,497.93	6,151.00	-1,739.40	-813.36	Start 1919.00 hold at 6497.93 MD	
8,416.93	8,070.00	-1,739.40	-813.36	TD at 8416.93	



US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
WELD_COTTONWOOD 12-33 PAD
P_COTTONWOOD 34-33**

**P_COTTONWOOD 34-33
PLAN #1 2-19-10 RHS**

Anticollision Report

19 February, 2010



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 34-33	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	8,416.93	PLAN #1 2-19-10 RHS (P_COTTONWOOD)	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
WELD_COTTONWOOD 12-33 PAD						
P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - F	300.00	300.00	40.03	38.94	36.717	CC, ES
P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - F	500.00	497.02	52.17	50.27	27.420	SF
P_COTTONWOOD 12-33 - P_COTTONWOOD 12-33 - F	300.00	300.00	10.04	8.95	9.211	CC, ES
P_COTTONWOOD 12-33 - P_COTTONWOOD 12-33 - F	400.00	399.98	11.68	10.17	7.716	SF
P_COTTONWOOD 13-33 - P_COTTONWOOD 13-33 - F	300.00	300.00	19.88	18.79	18.236	CC
P_COTTONWOOD 13-33 - P_COTTONWOOD 13-33 - F	500.00	501.20	20.35	18.47	10.844	ES
P_COTTONWOOD 13-33 - P_COTTONWOOD 13-33 - F	3,700.00	3,701.26	181.61	137.21	4.090	SF
P_COTTONWOOD 32-3 - P_COTTONWOOD 32-33 - PL	300.00	300.00	30.18	29.09	27.685	CC, ES
P_COTTONWOOD 32-3 - P_COTTONWOOD 32-33 - PL	500.00	499.84	36.80	34.87	19.078	SF
P_COTTONWOOD 33-33 - P_COTTONWOOD 33-33 - F	533.92	533.66	3.25	1.16	1.552	CC, ES, SF

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	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	45.48	28.07	28.54	40.03					
100.00	100.00	100.00	100.00	0.10	0.10	45.48	28.07	28.54	40.03	39.83	0.19	209.503		
200.00	200.00	200.00	200.00	0.32	0.32	45.48	28.07	28.54	40.03	39.39	0.64	62.484		
300.00	300.00	300.00	300.00	0.55	0.55	45.48	28.07	28.54	40.03	38.94	1.09	36.717	CC, ES	
400.00	399.98	398.79	398.77	0.75	0.76	-159.04	28.33	30.22	43.06	41.56	1.50	28.678		
500.00	499.84	497.02	496.87	0.95	0.97	-157.78	29.10	35.23	52.17	50.27	1.90	27.420	SF	
600.00	599.45	594.16	593.65	1.18	1.21	-156.41	30.37	43.45	67.32	64.99	2.33	28.912		
700.00	698.70	689.71	688.51	1.45	1.47	-155.24	32.11	54.69	88.42	85.64	2.78	31.842		
800.00	797.47	783.17	780.88	1.77	1.77	-154.32	34.28	68.71	115.33	112.08	3.25	35.503		
900.00	895.62	874.13	870.29	2.15	2.10	-153.57	36.83	85.20	147.89	144.15	3.75	39.489		
1,000.00	993.06	962.20	956.32	2.58	2.46	-152.95	39.72	103.83	185.90	181.63	4.27	43.564		
1,100.00	1,089.64	1,047.07	1,038.63	3.07	2.85	-152.40	42.87	124.26	229.13	224.31	4.81	47.591		
1,200.00	1,185.27	1,128.47	1,116.97	3.62	3.27	-151.88	46.25	146.10	277.33	271.95	5.38	51.502		
1,300.00	1,279.82	1,208.87	1,193.75	4.24	3.72	-151.38	49.90	169.68	330.14	324.15	5.99	55.146		
1,404.11	1,376.98	1,295.21	1,276.05	4.95	4.23	-151.04	53.89	195.46	388.29	381.64	6.65	58.394		
1,500.00	1,465.83	1,373.84	1,351.01	5.63	4.70	-151.41	57.52	218.93	443.12	435.79	7.33	60.480		
1,600.00	1,558.50	1,455.85	1,429.19	6.36	5.19	-151.71	61.31	243.42	500.31	492.27	8.04	62.212		

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 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 34-33	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
1,700.00	1,651.16	1,537.86	1,507.36	7.09	5.69	-151.94	65.10	267.90	557.51	548.75	8.76	63.610	
1,800.00	1,743.83	1,619.86	1,585.54	7.82	6.19	-152.13	68.89	292.39	614.71	605.22	9.49	64.760	
1,900.00	1,836.49	1,701.87	1,663.71	8.56	6.70	-152.29	72.67	316.87	671.92	661.70	10.22	65.721	
2,000.00	1,929.16	1,783.88	1,741.89	9.30	7.20	-152.42	76.46	341.35	729.13	718.17	10.96	66.535	
2,100.00	2,021.82	1,865.89	1,820.06	10.04	7.71	-152.54	80.25	365.84	786.34	774.65	11.70	67.235	
2,200.00	2,114.49	1,947.89	1,898.24	10.79	8.22	-152.64	84.04	390.32	843.56	831.12	12.43	67.843	
2,300.00	2,207.15	2,029.90	1,976.41	11.53	8.73	-152.72	87.82	414.81	900.77	887.60	13.17	68.377	
2,400.00	2,299.81	2,111.91	2,054.59	12.28	9.24	-152.80	91.61	439.29	957.99	944.08	13.91	68.849	
2,500.00	2,392.48	2,193.91	2,132.76	13.03	9.75	-152.87	95.40	463.77	1,015.21	1,000.55	14.66	69.272	
2,600.00	2,485.14	2,275.92	2,210.94	13.77	10.27	-152.93	99.19	488.26	1,072.43	1,057.03	15.40	69.652	
2,700.00	2,577.81	2,357.93	2,289.11	14.52	10.78	-152.98	102.98	512.74	1,129.65	1,113.51	16.14	69.997	
2,800.00	2,670.47	2,439.94	2,367.29	15.27	11.29	-153.03	106.76	537.23	1,186.87	1,169.99	16.88	70.311	
2,900.00	2,763.14	2,521.94	2,445.46	16.02	11.81	-153.08	110.55	561.71	1,244.09	1,226.47	17.62	70.599	
3,000.00	2,855.80	2,603.95	2,523.64	16.77	12.32	-153.12	114.34	586.19	1,301.31	1,282.95	18.36	70.865	
3,100.00	2,948.47	2,685.96	2,601.81	17.52	12.84	-153.15	118.13	610.68	1,358.53	1,339.43	19.10	71.112	
3,200.00	3,041.13	2,767.97	2,679.99	18.27	13.35	-153.19	121.92	635.16	1,415.75	1,395.91	19.84	71.341	
3,300.00	3,133.80	2,849.97	2,758.16	19.02	13.87	-153.22	125.70	659.65	1,472.98	1,452.39	20.58	71.556	
3,400.00	3,226.46	2,931.98	2,836.34	19.77	14.38	-153.25	129.49	684.13	1,530.20	1,508.87	21.32	71.757	
3,500.00	3,319.12	3,013.99	2,914.52	20.52	14.90	-153.28	133.28	708.61	1,587.42	1,565.36	22.06	71.947	
3,600.00	3,411.79	3,095.99	2,992.69	21.27	15.41	-153.30	137.07	733.10	1,644.65	1,621.84	22.80	72.126	
3,700.00	3,504.45	3,178.00	3,070.87	22.02	15.93	-153.32	140.86	757.58	1,701.87	1,678.33	23.54	72.296	
3,800.00	3,597.12	3,260.01	3,149.04	22.77	16.44	-153.35	144.64	782.07	1,759.09	1,734.81	24.28	72.458	
3,900.00	3,689.78	3,342.02	3,227.22	23.53	16.96	-153.37	148.43	806.55	1,816.32	1,791.30	25.01	72.612	
4,000.00	3,782.45	3,424.02	3,305.39	24.28	17.48	-153.39	152.22	831.03	1,873.54	1,847.79	25.75	72.759	
4,100.00	3,875.11	3,506.03	3,383.57	25.03	17.99	-153.40	156.01	855.52	1,930.76	1,904.28	26.48	72.900	
4,200.00	3,967.78	3,588.04	3,461.74	25.78	18.51	-153.42	159.79	880.00	1,987.99	1,960.77	27.22	73.036	
4,300.00	4,060.44	3,670.04	3,539.92	26.53	19.03	-153.44	163.58	904.49	2,045.21	2,017.26	27.95	73.167	
4,400.00	4,153.10	3,752.05	3,618.09	27.28	19.54	-153.45	167.37	928.97	2,102.44	2,073.74	28.70	73.253	
4,500.00	4,245.77	3,834.06	3,696.27	28.04	20.06	-153.47	171.16	953.45	2,159.66	2,130.21	29.45	73.332	
4,600.00	4,338.43	3,916.07	3,774.44	28.79	20.58	-153.48	174.95	977.94	2,216.88	2,186.68	30.20	73.407	
4,700.00	4,431.10	4,152.14	4,002.05	29.54	21.66	-153.66	184.48	1,039.60	2,271.51	2,240.22	31.28	72.611	
4,800.00	4,523.76	4,420.28	4,265.79	30.29	22.52	-154.20	191.80	1,086.90	2,319.68	2,287.42	32.26	71.904	
4,900.00	4,616.43	4,708.35	4,552.75	31.05	23.06	-155.10	195.43	1,110.35	2,360.62	2,327.54	33.08	71.360	
5,000.00	4,709.09	4,864.70	4,709.09	31.80	23.21	-155.71	195.66	1,111.82	2,395.64	2,361.99	33.66	71.179	
5,100.00	4,801.76	4,957.37	4,801.76	32.55	23.30	-156.07	195.66	1,111.82	2,430.37	2,396.19	34.18	71.109	
5,200.00	4,894.42	5,050.03	4,894.42	33.30	23.39	-156.42	195.66	1,111.82	2,465.18	2,430.48	34.70	71.045	
5,300.00	4,987.08	5,142.69	4,987.08	34.05	23.48	-156.76	195.66	1,111.82	2,500.07	2,464.85	35.22	70.989	
5,393.81	5,074.02	5,229.63	5,074.02	34.76	23.56	-157.07	195.66	1,111.82	2,532.88	2,497.17	35.70	70.943	
5,400.00	5,079.75	5,235.36	5,079.75	34.80	23.57	-157.11	195.66	1,111.82	2,535.04	2,499.29	35.75	70.911	
5,500.00	5,173.13	5,328.74	5,173.13	35.31	23.66	-157.69	195.66	1,111.82	2,568.37	2,531.94	36.44	70.490	
5,600.00	5,267.70	5,423.31	5,267.70	35.79	23.76	-158.20	195.66	1,111.82	2,598.71	2,561.63	37.08	70.082	
5,700.00	5,363.35	5,518.96	5,363.35	36.22	23.86	-158.64	195.66	1,111.82	2,625.99	2,588.31	37.68	69.690	
5,800.00	5,459.95	5,615.56	5,459.95	36.62	23.97	-159.02	195.66	1,111.82	2,650.16	2,611.93	38.23	69.315	
5,900.00	5,557.40	5,713.01	5,557.40	36.97	24.07	-159.34	195.66	1,111.82	2,671.19	2,632.46	38.74	68.957	
6,000.00	5,655.57	5,811.18	5,655.57	37.28	24.18	-159.61	195.66	1,111.82	2,689.03	2,649.85	39.19	68.617	
6,100.00	5,754.35	5,909.96	5,754.35	37.54	24.29	-159.83	195.66	1,111.82	2,703.66	2,664.07	39.59	68.295	
6,200.00	5,853.61	6,009.22	5,853.61	37.76	24.40	-160.00	195.66	1,111.82	2,715.05	2,675.12	39.93	67.988	
6,300.00	5,953.23	6,108.84	5,953.23	37.93	24.52	-160.12	195.66	1,111.82	2,723.18	2,682.95	40.23	67.697	
6,400.00	6,053.09	6,208.70	6,053.09	38.06	24.63	-160.19	195.66	1,111.82	2,728.03	2,687.57	40.46	67.419	
6,497.93	6,151.00	6,306.61	6,151.00	38.15	24.75	44.85	195.66	1,111.82	2,729.61	2,688.95	40.66	67.140	
6,500.00	6,153.07	6,308.68	6,153.07	38.15	24.75	44.85	195.66	1,111.82	2,729.61	2,688.95	40.66	67.131	
6,600.00	6,253.07	6,408.68	6,253.07	38.21	24.87	44.85	195.66	1,111.82	2,729.61	2,688.69	40.92	66.712	

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 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 34-33	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	6,353.07	6,508.68	6,353.07	38.27	24.99	44.85	195.66	1,111.82	2,729.61	2,688.43	41.18	66.292	
6,800.00	6,453.07	6,608.68	6,453.07	38.34	25.11	44.85	195.66	1,111.82	2,729.61	2,688.17	41.44	65.872	
6,900.00	6,553.07	6,708.68	6,553.07	38.40	25.23	44.85	195.66	1,111.82	2,729.61	2,687.91	41.70	65.453	
7,000.00	6,653.07	6,808.68	6,653.07	38.47	25.36	44.85	195.66	1,111.82	2,729.61	2,687.64	41.97	65.034	
7,100.00	6,753.07	6,908.68	6,753.07	38.53	25.48	44.85	195.66	1,111.82	2,729.61	2,687.37	42.24	64.616	
7,200.00	6,853.07	7,008.68	6,853.07	38.60	25.61	44.85	195.66	1,111.82	2,729.61	2,687.09	42.52	64.199	
7,300.00	6,953.07	7,108.68	6,953.07	38.67	25.74	44.85	195.66	1,111.82	2,729.61	2,686.81	42.80	63.783	
7,400.00	7,053.07	7,208.68	7,053.07	38.74	25.87	44.85	195.66	1,111.82	2,729.61	2,686.53	43.08	63.368	
7,500.00	7,153.07	7,308.68	7,153.07	38.81	26.00	44.85	195.66	1,111.82	2,729.61	2,686.25	43.36	62.955	
7,600.00	7,253.07	7,408.68	7,253.07	38.88	26.13	44.85	195.66	1,111.82	2,729.61	2,685.96	43.64	62.542	
7,700.00	7,353.07	7,508.68	7,353.07	38.96	26.27	44.85	195.66	1,111.82	2,729.61	2,685.68	43.93	62.132	
7,800.00	7,453.07	7,608.68	7,453.07	39.03	26.40	44.85	195.66	1,111.82	2,729.61	2,685.39	44.22	61.723	
7,900.00	7,553.07	7,708.68	7,553.07	39.11	26.54	44.85	195.66	1,111.82	2,729.61	2,685.09	44.52	61.316	
8,000.00	7,653.07	7,808.68	7,653.07	39.19	26.68	44.85	195.66	1,111.82	2,729.61	2,684.80	44.81	60.910	
8,100.00	7,753.07	7,908.68	7,753.07	39.26	26.81	44.85	195.66	1,111.82	2,729.61	2,684.50	45.11	60.507	
8,200.00	7,853.07	8,008.68	7,853.07	39.34	26.95	44.85	195.66	1,111.82	2,729.61	2,684.20	45.41	60.106	
8,300.00	7,953.07	8,108.68	7,953.07	39.42	27.09	44.85	195.66	1,111.82	2,729.61	2,683.89	45.72	59.707	
8,365.61	8,018.68	8,174.29	8,018.68	39.48	27.19	44.85	195.66	1,111.82	2,729.61	2,683.69	45.92	59.446	
8,400.00	8,053.07	8,205.61	8,050.00	39.51	27.23	44.85	195.66	1,111.82	2,729.61	2,683.59	46.02	59.317	
8,416.93	8,070.00	8,205.61	8,050.00	39.52	27.23	44.85	195.66	1,111.82	2,729.68	2,683.64	46.04	59.289	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 34-33	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	46.42	6.92	7.27	10.04				
100.00	100.00	100.00	100.00	0.10	0.10	46.42	6.92	7.27	10.04	9.85	0.19	52.555	
200.00	200.00	200.00	200.00	0.32	0.32	46.42	6.92	7.27	10.04	9.40	0.64	15.674	
300.00	300.00	300.00	300.00	0.55	0.55	46.42	6.92	7.27	10.04	8.95	1.09	9.211 CC, ES	
400.00	399.98	399.98	399.98	0.75	0.77	-161.75	6.92	7.27	11.68	10.17	1.51	7.716 SF	
500.00	499.84	499.84	499.84	0.95	0.99	-167.35	6.92	7.27	16.73	14.81	1.93	8.677	
600.00	599.45	599.45	599.45	1.18	1.22	-171.65	6.92	7.27	25.31	22.96	2.35	10.751	
700.00	698.70	698.70	698.70	1.45	1.44	-174.33	6.92	7.27	37.41	34.62	2.79	13.429	
800.00	797.47	797.47	797.47	1.77	1.66	-175.98	6.92	7.27	53.00	49.78	3.22	16.451	
900.00	895.62	895.62	895.62	2.15	1.88	-177.03	6.92	7.27	72.05	68.39	3.66	19.682	
1,000.00	993.06	993.06	993.06	2.58	2.10	-177.71	6.92	7.27	94.52	90.42	4.10	23.040	
1,100.00	1,089.64	1,089.24	1,089.24	3.07	2.32	-178.32	7.10	7.07	120.45	115.91	4.54	26.507	
1,200.00	1,185.27	1,183.45	1,183.41	3.62	2.52	-179.73	8.95	4.92	150.42	145.44	4.98	30.202	
1,300.00	1,279.82	1,275.74	1,275.51	4.24	2.73	178.37	12.72	0.54	184.63	179.21	5.42	34.048	
1,404.11	1,376.98	1,371.44	1,370.88	4.95	2.95	176.49	17.93	-5.51	224.49	218.59	5.90	38.053	
1,500.00	1,465.83	1,459.17	1,458.29	5.63	3.16	175.32	22.73	-11.09	262.93	256.52	6.41	41.042	
1,600.00	1,558.50	1,550.66	1,549.46	6.36	3.38	174.41	27.73	-16.90	303.09	296.15	6.95	43.635	
1,700.00	1,651.16	1,642.14	1,640.62	7.09	3.60	173.71	32.73	-22.71	343.31	335.81	7.49	45.805	
1,800.00	1,743.83	1,733.63	1,731.79	7.82	3.83	173.16	37.73	-28.52	383.55	375.50	8.05	47.643	
1,900.00	1,836.49	1,825.12	1,822.96	8.56	4.06	172.71	42.74	-34.33	423.82	415.21	8.61	49.214	
2,000.00	1,929.16	1,916.61	1,914.12	9.30	4.29	172.34	47.74	-40.14	464.11	454.93	9.18	50.570	
2,100.00	2,021.82	2,008.09	2,005.29	10.04	4.53	172.03	52.74	-45.95	504.41	494.66	9.75	51.751	
2,200.00	2,114.49	2,099.58	2,096.45	10.79	4.76	171.77	57.74	-51.77	544.72	534.40	10.32	52.786	
2,300.00	2,207.15	2,191.07	2,187.62	11.53	5.00	171.54	62.74	-57.58	585.04	574.15	10.89	53.700	
2,400.00	2,299.81	2,282.56	2,278.79	12.28	5.24	171.34	67.75	-63.39	625.37	613.90	11.47	54.513	
2,500.00	2,392.48	2,374.05	2,369.95	13.03	5.48	171.17	72.75	-69.20	665.70	653.65	12.05	55.240	
2,600.00	2,485.14	2,465.53	2,461.12	13.77	5.72	171.02	77.75	-75.01	706.04	693.41	12.63	55.893	
2,700.00	2,577.81	2,557.02	2,552.28	14.52	5.96	170.88	82.75	-80.82	746.38	733.17	13.21	56.484	
2,800.00	2,670.47	2,648.51	2,643.45	15.27	6.20	170.75	87.76	-86.63	786.73	772.93	13.80	57.020	
2,900.00	2,763.14	2,740.00	2,734.62	16.02	6.44	170.64	92.76	-92.45	827.07	812.69	14.38	57.508	
3,000.00	2,855.80	2,831.49	2,825.78	16.77	6.68	170.54	97.76	-98.26	867.42	852.46	14.97	57.955	
3,100.00	2,948.47	2,922.97	2,916.95	17.52	6.93	170.45	102.76	-104.07	907.78	892.22	15.55	58.365	
3,200.00	3,041.13	3,014.46	3,008.11	18.27	7.17	170.37	107.77	-109.88	948.13	931.99	16.14	58.742	
3,300.00	3,133.80	3,105.95	3,099.28	19.02	7.42	170.29	112.77	-115.69	988.48	971.76	16.73	59.091	
3,400.00	3,226.46	3,197.44	3,190.45	19.77	7.66	170.22	117.77	-121.50	1,028.84	1,011.52	17.32	59.414	
3,500.00	3,319.12	3,288.93	3,281.61	20.52	7.90	170.15	122.77	-127.31	1,069.20	1,051.29	17.91	59.714	
3,600.00	3,411.79	3,380.41	3,372.78	21.27	8.15	170.09	127.78	-133.13	1,109.56	1,091.06	18.49	59.994	
3,700.00	3,504.45	3,471.90	3,463.94	22.02	8.39	170.03	132.78	-138.94	1,149.92	1,130.83	19.08	60.255	
3,800.00	3,597.12	3,563.39	3,555.11	22.77	8.64	169.98	137.78	-144.75	1,190.28	1,170.60	19.67	60.499	
3,900.00	3,689.78	3,654.88	3,646.28	23.53	8.88	169.93	142.78	-150.56	1,230.64	1,210.37	20.26	60.728	
4,000.00	3,782.45	3,746.37	3,737.44	24.28	9.13	169.88	147.79	-156.37	1,271.00	1,250.14	20.86	60.943	
4,100.00	3,875.11	3,837.85	3,828.61	25.03	9.38	169.84	152.79	-162.18	1,311.36	1,289.92	21.45	61.145	
4,200.00	3,967.78	3,929.34	3,919.77	25.78	9.62	169.80	157.79	-167.99	1,351.73	1,329.69	22.04	61.335	
4,300.00	4,060.44	4,020.83	4,010.94	26.53	9.87	169.76	162.79	-173.81	1,392.09	1,369.46	22.63	61.515	
4,400.00	4,153.10	4,112.32	4,102.11	27.28	10.12	169.72	167.79	-179.62	1,432.45	1,409.23	23.22	61.686	
4,500.00	4,245.77	4,203.81	4,193.27	28.04	10.36	169.69	172.80	-185.43	1,472.82	1,449.01	23.81	61.847	
4,600.00	4,338.43	4,295.29	4,284.44	28.79	10.61	169.66	177.80	-191.24	1,513.18	1,488.78	24.41	61.999	
4,700.00	4,431.10	4,386.78	4,375.60	29.54	10.86	169.63	182.80	-197.05	1,553.55	1,528.55	25.00	62.144	
4,800.00	4,523.76	4,480.78	4,478.28	30.29	11.12	169.61	188.17	-203.28	1,593.78	1,568.18	25.60	62.253	
4,900.00	4,616.43	4,610.94	4,599.30	31.05	11.34	169.73	191.79	-207.49	1,632.66	1,606.50	26.16	62.416	
5,000.00	4,709.09	4,720.74	4,709.09	31.80	11.53	169.97	192.36	-208.15	1,670.03	1,643.36	26.67	62.617	
5,100.00	4,801.76	4,813.41	4,801.76	32.55	11.71	170.19	192.36	-208.15	1,707.14	1,679.96	27.18	62.808	

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 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 34-33	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						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	
5,200.00	4,894.42	4,906.07	4,894.42	33.30	11.90	170.40	192.36	-208.15	1,744.27	1,716.58	27.69	62.991	
5,300.00	4,987.08	4,998.74	4,987.08	34.05	12.08	170.60	192.36	-208.15	1,781.42	1,753.22	28.20	63.166	
5,393.81	5,074.02	5,085.67	5,074.02	34.76	12.25	170.78	192.36	-208.15	1,816.29	1,787.61	28.68	63.323	
5,400.00	5,079.75	5,091.40	5,079.75	34.80	12.27	170.80	192.36	-208.15	1,818.58	1,789.86	28.72	63.315	
5,500.00	5,173.13	5,184.78	5,173.13	35.31	12.45	171.10	192.36	-208.15	1,853.96	1,824.63	29.34	63.199	
5,600.00	5,267.70	5,279.35	5,267.70	35.79	12.64	171.35	192.36	-208.15	1,886.11	1,856.20	29.91	63.058	
5,700.00	5,363.35	5,375.00	5,363.35	36.22	12.83	171.57	192.36	-208.15	1,914.98	1,884.53	30.45	62.895	
5,800.00	5,459.95	5,471.60	5,459.95	36.62	13.03	171.76	192.36	-208.15	1,940.53	1,909.59	30.94	62.714	
5,900.00	5,557.40	5,569.05	5,557.40	36.97	13.23	171.92	192.36	-208.15	1,962.74	1,931.35	31.39	62.520	
6,000.00	5,655.57	5,667.22	5,655.57	37.28	13.43	172.05	192.36	-208.15	1,981.57	1,949.77	31.80	62.313	
6,100.00	5,754.35	5,766.00	5,754.35	37.54	13.63	172.15	192.36	-208.15	1,997.00	1,964.84	32.16	62.095	
6,200.00	5,853.61	5,865.26	5,853.61	37.76	13.83	172.23	192.36	-208.15	2,009.00	1,976.53	32.47	61.869	
6,300.00	5,953.23	5,964.88	5,953.23	37.93	14.04	172.29	192.36	-208.15	2,017.57	1,984.83	32.73	61.635	
6,400.00	6,053.09	6,064.74	6,053.09	38.06	14.24	172.32	192.36	-208.15	2,022.68	1,989.74	32.95	61.393	
6,497.93	6,151.00	6,162.65	6,151.00	38.15	14.45	17.40	192.36	-208.15	2,024.34	1,991.23	33.11	61.131	
6,500.00	6,153.07	6,164.72	6,153.07	38.15	14.45	17.40	192.36	-208.15	2,024.34	1,991.22	33.12	61.118	
6,600.00	6,253.07	6,264.72	6,253.07	38.21	14.66	17.40	192.36	-208.15	2,024.34	1,990.88	33.46	60.505	
6,700.00	6,353.07	6,364.72	6,353.07	38.27	14.87	17.40	192.36	-208.15	2,024.34	1,990.55	33.80	59.899	
6,800.00	6,453.07	6,464.72	6,453.07	38.34	15.07	17.40	192.36	-208.15	2,024.34	1,990.21	34.14	59.302	
6,900.00	6,553.07	6,564.72	6,553.07	38.40	15.28	17.40	192.36	-208.15	2,024.34	1,989.86	34.48	58.713	
7,000.00	6,653.07	6,664.72	6,653.07	38.47	15.49	17.40	192.36	-208.15	2,024.34	1,989.52	34.82	58.132	
7,100.00	6,753.07	6,764.72	6,753.07	38.53	15.70	17.40	192.36	-208.15	2,024.34	1,989.17	35.17	57.559	
7,200.00	6,853.07	6,864.72	6,853.07	38.60	15.91	17.40	192.36	-208.15	2,024.34	1,988.82	35.52	56.994	
7,300.00	6,953.07	6,964.72	6,953.07	38.67	16.12	17.40	192.36	-208.15	2,024.34	1,988.47	35.87	56.437	
7,400.00	7,053.07	7,064.72	7,053.07	38.74	16.33	17.40	192.36	-208.15	2,024.34	1,988.12	36.22	55.887	
7,500.00	7,153.07	7,164.72	7,153.07	38.81	16.54	17.40	192.36	-208.15	2,024.34	1,987.77	36.58	55.346	
7,600.00	7,253.07	7,264.72	7,253.07	38.88	16.76	17.40	192.36	-208.15	2,024.34	1,987.41	36.93	54.812	
7,700.00	7,353.07	7,364.72	7,353.07	38.96	16.97	17.40	192.36	-208.15	2,024.34	1,987.05	37.29	54.286	
7,800.00	7,453.07	7,464.72	7,453.07	39.03	17.18	17.40	192.36	-208.15	2,024.34	1,986.69	37.65	53.767	
7,900.00	7,553.07	7,564.72	7,553.07	39.11	17.39	17.40	192.36	-208.15	2,024.34	1,986.33	38.01	53.256	
8,000.00	7,653.07	7,664.72	7,653.07	39.19	17.61	17.40	192.36	-208.15	2,024.34	1,985.97	38.37	52.752	
8,100.00	7,753.07	7,764.72	7,753.07	39.26	17.82	17.40	192.36	-208.15	2,024.34	1,985.60	38.74	52.255	
8,200.00	7,853.07	7,864.72	7,853.07	39.34	18.03	17.40	192.36	-208.15	2,024.34	1,985.24	39.11	51.766	
8,300.00	7,953.07	7,964.72	7,953.07	39.42	18.25	17.40	192.36	-208.15	2,024.34	1,984.87	39.47	51.283	
8,400.00	8,053.07	8,064.72	8,053.07	39.51	18.46	17.40	192.36	-208.15	2,024.34	1,984.50	39.84	50.808	
8,416.93	8,070.00	8,081.65	8,070.00	39.52	18.50	17.40	192.36	-208.15	2,024.34	1,984.44	39.91	50.728	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 34-33	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 13-33 - P_COTTONWOOD 13-33 - 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)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	45.87	13.84	14.27	19.88					
100.00	100.00	100.00	100.00	0.10	0.10	45.87	13.84	14.27	19.88	19.69	0.19	104.055		
200.00	200.00	200.00	200.00	0.32	0.32	45.87	13.84	14.27	19.88	19.24	0.64	31.034		
300.00	300.00	300.00	300.00	0.55	0.55	45.87	13.84	14.27	19.88	18.79	1.09	18.236 CC		
400.00	399.98	400.60	400.58	0.75	0.75	-158.45	12.14	13.78	19.99	18.50	1.49	13.416		
500.00	499.84	501.20	501.04	0.95	0.95	-156.28	7.05	12.33	20.35	18.47	1.88	10.844 ES		
600.00	599.45	601.79	601.23	1.18	1.18	-152.85	-1.43	9.91	21.00	18.69	2.30	9.115		
700.00	698.70	702.36	701.04	1.45	1.45	-148.40	-13.28	6.53	22.02	19.24	2.78	7.917		
800.00	797.47	802.91	800.33	1.77	1.78	-143.30	-28.50	2.18	23.51	20.18	3.34	7.047		
900.00	895.62	903.44	898.98	2.15	2.16	-137.93	-47.05	-3.11	25.55	21.55	4.00	6.388		
1,000.00	993.06	1,003.93	996.87	2.58	2.59	-132.65	-68.90	-9.35	28.18	23.39	4.80	5.877		
1,100.00	1,089.64	1,104.38	1,093.86	3.07	3.09	-127.71	-94.04	-16.52	31.45	25.71	5.74	5.479		
1,200.00	1,185.27	1,204.80	1,189.83	3.62	3.64	-123.25	-122.42	-24.62	35.37	28.53	6.84	5.174		
1,300.00	1,279.82	1,305.17	1,284.67	4.24	4.26	-119.34	-154.00	-33.63	39.93	31.85	8.08	4.942		
1,404.11	1,376.98	1,409.62	1,382.08	4.95	4.97	-115.81	-190.23	-43.97	45.33	35.81	9.52	4.762		
1,500.00	1,465.83	1,505.44	1,470.52	5.63	5.66	-112.39	-225.71	-54.10	50.47	39.51	10.97	4.602		
1,600.00	1,558.50	1,605.25	1,562.58	6.36	6.40	-109.37	-262.78	-64.68	55.97	43.47	12.50	4.479		
1,700.00	1,651.16	1,705.06	1,654.64	7.09	7.14	-106.90	-299.85	-75.26	61.59	47.56	14.03	4.390		
1,800.00	1,743.83	1,804.87	1,746.71	7.82	7.89	-104.84	-336.92	-85.84	67.31	51.75	15.57	4.324		
1,900.00	1,836.49	1,904.68	1,838.77	8.56	8.64	-103.11	-374.00	-96.42	73.10	56.00	17.10	4.275		
2,000.00	1,929.16	2,004.49	1,930.84	9.30	9.39	-101.63	-411.07	-107.00	78.95	60.32	18.63	4.238		
2,100.00	2,021.82	2,104.30	2,022.90	10.04	10.14	-100.36	-448.14	-117.58	84.84	64.68	20.16	4.209		
2,200.00	2,114.49	2,204.11	2,114.96	10.79	10.90	-99.26	-485.21	-128.16	90.77	69.09	21.69	4.186		
2,300.00	2,207.15	2,303.92	2,207.03	11.53	11.66	-98.29	-522.28	-138.74	96.73	73.52	23.21	4.168		
2,400.00	2,299.81	2,403.73	2,299.09	12.28	12.42	-97.43	-559.35	-149.32	102.71	77.98	24.73	4.153		
2,500.00	2,392.48	2,503.54	2,391.16	13.03	13.18	-96.66	-596.42	-159.90	108.72	82.47	26.25	4.141		
2,600.00	2,485.14	2,603.35	2,483.22	13.77	13.94	-95.98	-633.49	-170.48	114.74	86.97	27.77	4.132		
2,700.00	2,577.81	2,703.16	2,575.28	14.52	14.70	-95.37	-670.56	-181.06	120.77	91.49	29.29	4.124		
2,800.00	2,670.47	2,802.97	2,667.35	15.27	15.46	-94.81	-707.63	-191.64	126.82	96.02	30.80	4.117		
2,900.00	2,763.14	2,902.78	2,759.41	16.02	16.22	-94.30	-744.70	-202.22	132.88	100.56	32.32	4.112		
3,000.00	2,855.80	3,002.59	2,851.48	16.77	16.98	-93.84	-781.78	-212.80	138.95	105.12	33.83	4.107		
3,100.00	2,948.47	3,102.40	2,943.54	17.52	17.74	-93.42	-818.85	-223.38	145.03	109.68	35.34	4.103		
3,200.00	3,041.13	3,202.21	3,035.60	18.27	18.50	-93.03	-855.92	-233.96	151.11	114.25	36.86	4.100		
3,300.00	3,133.80	3,302.02	3,127.67	19.02	19.27	-92.67	-892.99	-244.54	157.20	118.83	38.37	4.097		
3,400.00	3,226.46	3,401.83	3,219.73	19.77	20.03	-92.34	-930.06	-255.12	163.30	123.42	39.88	4.095		
3,500.00	3,319.12	3,501.64	3,311.80	20.52	20.79	-92.03	-967.13	-265.70	169.40	128.01	41.39	4.093		
3,600.00	3,411.79	3,601.45	3,403.86	21.27	21.56	-91.74	-1,004.20	-276.28	175.50	132.61	42.89	4.091		
3,700.00	3,504.45	3,701.26	3,495.93	22.02	22.32	-91.48	-1,041.27	-286.86	181.61	137.21	44.40	4.090 SF		
3,800.00	3,597.12	3,801.38	3,588.37	22.77	23.04	-91.30	-1,078.24	-297.41	187.70	141.83	45.87	4.092		
3,900.00	3,689.78	3,901.99	3,682.32	23.53	23.55	-91.97	-1,112.84	-307.29	193.44	146.29	47.15	4.102		
4,000.00	3,782.45	4,002.37	3,777.25	24.28	24.03	-93.61	-1,144.19	-316.24	198.88	150.47	48.42	4.108		
4,100.00	3,875.11	4,102.27	3,872.81	25.03	24.46	-96.13	-1,172.19	-324.23	204.30	154.71	49.60	4.119		
4,200.00	3,967.78	4,201.46	3,968.64	25.78	24.86	-99.44	-1,196.81	-331.26	210.13	159.52	50.61	4.152		
4,300.00	4,060.44	4,300.00	4,064.65	26.53	25.22	-103.43	-1,218.09	-337.33	216.89	165.51	51.38	4.221		
4,400.00	4,153.10	4,396.82	4,159.68	27.28	25.53	-107.93	-1,235.90	-342.41	225.20	173.39	51.81	4.347		
4,500.00	4,245.77	4,492.56	4,254.22	28.04	25.79	-112.81	-1,250.46	-346.57	235.67	183.83	51.84	4.546		
4,600.00	4,338.43	4,586.78	4,347.68	28.79	26.01	-117.87	-1,261.81	-349.81	248.88	197.41	51.46	4.836		
4,700.00	4,431.10	4,679.30	4,439.80	29.54	26.19	-122.93	-1,270.08	-352.17	265.29	214.58	50.71	5.231		
4,800.00	4,523.76	4,769.98	4,530.31	30.29	26.32	-127.84	-1,275.41	-353.69	285.26	235.58	49.67	5.743		
4,900.00	4,616.43	4,858.70	4,618.99	31.05	26.42	-132.48	-1,277.95	-354.41	308.95	260.51	48.45	6.377		
5,000.00	4,709.09	4,948.81	4,709.09	31.80	26.50	-136.88	-1,278.23	-354.49	336.18	289.09	47.10	7.138		
5,100.00	4,801.76	5,041.47	4,801.76	32.55	26.57	-140.80	-1,278.23	-354.49	365.41	319.60	45.81	7.977		

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 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 34-33	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						
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
5,200.00	4,894.42	5,134.14	4,894.42	33.30	26.63	-144.15	-1,278.23	-354.49	396.05	351.32	44.73	8.854	
5,300.00	4,987.08	5,226.80	4,987.08	34.05	26.70	-147.04	-1,278.23	-354.49	427.80	383.96	43.84	9.757	
5,393.81	5,074.02	5,313.73	5,074.02	34.76	26.76	-149.40	-1,278.23	-354.49	458.39	415.23	43.16	10.620	
5,400.00	5,079.75	5,319.47	5,079.75	34.80	26.76	-149.56	-1,278.23	-354.49	460.43	417.32	43.11	10.680	
5,500.00	5,173.13	5,412.85	5,173.13	35.31	26.83	-151.96	-1,278.23	-354.49	492.13	449.77	42.37	11.616	
5,600.00	5,267.70	5,507.42	5,267.70	35.79	26.90	-153.89	-1,278.23	-354.49	521.39	479.56	41.83	12.466	
5,700.00	5,363.35	5,603.07	5,363.35	36.22	26.98	-155.45	-1,278.23	-354.49	547.96	506.52	41.44	13.224	
5,800.00	5,459.95	5,699.67	5,459.95	36.62	27.06	-156.71	-1,278.23	-354.49	571.69	530.53	41.16	13.890	
5,900.00	5,557.40	5,797.12	5,557.40	36.97	27.13	-157.73	-1,278.23	-354.49	592.44	551.48	40.96	14.463	
6,000.00	5,655.57	5,895.29	5,655.57	37.28	27.21	-158.54	-1,278.23	-354.49	610.13	569.30	40.83	14.945	
6,100.00	5,754.35	5,994.07	5,754.35	37.54	27.30	-159.16	-1,278.23	-354.49	624.67	583.94	40.73	15.337	
6,200.00	5,853.61	6,093.33	5,853.61	37.76	27.38	-159.63	-1,278.23	-354.49	636.02	595.36	40.66	15.643	
6,300.00	5,953.23	6,192.95	5,953.23	37.93	27.47	-159.95	-1,278.23	-354.49	644.14	603.53	40.61	15.862	
6,400.00	6,053.09	6,292.81	6,053.09	38.06	27.56	-160.14	-1,278.23	-354.49	648.99	608.42	40.57	15.995	
6,497.93	6,151.00	6,390.72	6,151.00	38.15	27.65	44.86	-1,278.23	-354.49	650.56	610.00	40.56	16.039	
6,500.00	6,153.07	6,392.79	6,153.07	38.15	27.65	44.86	-1,278.23	-354.49	650.56	610.00	40.57	16.037	
6,600.00	6,253.07	6,492.79	6,253.07	38.21	27.74	44.86	-1,278.23	-354.49	650.56	609.76	40.81	15.942	
6,700.00	6,353.07	6,592.79	6,353.07	38.27	27.83	44.86	-1,278.23	-354.49	650.56	609.51	41.05	15.848	
6,800.00	6,453.07	6,692.79	6,453.07	38.34	27.93	44.86	-1,278.23	-354.49	650.56	609.27	41.30	15.753	
6,900.00	6,553.07	6,792.79	6,553.07	38.40	28.02	44.86	-1,278.23	-354.49	650.56	609.02	41.55	15.658	
7,000.00	6,653.07	6,892.79	6,653.07	38.47	28.12	44.86	-1,278.23	-354.49	650.56	608.76	41.80	15.563	
7,100.00	6,753.07	6,992.79	6,753.07	38.53	28.22	44.86	-1,278.23	-354.49	650.56	608.50	42.06	15.467	
7,200.00	6,853.07	7,092.79	6,853.07	38.60	28.32	44.86	-1,278.23	-354.49	650.56	608.24	42.32	15.372	
7,300.00	6,953.07	7,192.79	6,953.07	38.67	28.42	44.86	-1,278.23	-354.49	650.56	607.98	42.58	15.277	
7,400.00	7,053.07	7,292.79	7,053.07	38.74	28.53	44.86	-1,278.23	-354.49	650.56	607.71	42.85	15.182	
7,500.00	7,153.07	7,392.79	7,153.07	38.81	28.63	44.86	-1,278.23	-354.49	650.56	607.44	43.12	15.087	
7,600.00	7,253.07	7,492.79	7,253.07	38.88	28.74	44.86	-1,278.23	-354.49	650.56	607.17	43.39	14.992	
7,700.00	7,353.07	7,592.79	7,353.07	38.96	28.84	44.86	-1,278.23	-354.49	650.56	606.90	43.67	14.898	
7,800.00	7,453.07	7,692.79	7,453.07	39.03	28.95	44.86	-1,278.23	-354.49	650.56	606.62	43.95	14.803	
7,900.00	7,553.07	7,792.79	7,553.07	39.11	29.06	44.86	-1,278.23	-354.49	650.56	606.34	44.23	14.709	
8,000.00	7,653.07	7,892.79	7,653.07	39.19	29.17	44.86	-1,278.23	-354.49	650.56	606.05	44.51	14.615	
8,100.00	7,753.07	7,992.79	7,753.07	39.26	29.29	44.86	-1,278.23	-354.49	650.56	605.77	44.80	14.522	
8,200.00	7,853.07	8,092.79	7,853.07	39.34	29.40	44.86	-1,278.23	-354.49	650.56	605.48	45.09	14.429	
8,300.00	7,953.07	8,192.79	7,953.07	39.42	29.52	44.86	-1,278.23	-354.49	650.56	605.19	45.38	14.336	
8,400.00	8,053.07	8,292.79	8,053.07	39.51	29.63	44.86	-1,278.23	-354.49	650.56	604.89	45.67	14.244	
8,403.92	8,056.99	8,296.71	8,056.99	39.51	29.64	44.86	-1,278.23	-354.49	650.56	604.88	45.69	14.240	
8,416.93	8,070.00	8,304.72	8,065.00	39.52	29.65	44.86	-1,278.23	-354.49	650.58	604.87	45.72	14.231	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 34-33	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 32-3 - P_COTTONWOOD 32-33 - PLAN #1 2													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	45.55	21.14	21.54	30.18					
100.00	100.00	100.00	100.00	0.10	0.10	45.55	21.14	21.54	30.18	29.99	0.19	157.969		
200.00	200.00	200.00	200.00	0.32	0.32	45.55	21.14	21.54	30.18	29.54	0.64	47.113		
300.00	300.00	300.00	300.00	0.55	0.55	45.55	21.14	21.54	30.18	29.09	1.09	27.685 CC, ES		
400.00	399.98	399.98	399.98	0.75	0.77	-160.60	21.14	21.54	31.82	30.31	1.51	21.014		
500.00	499.84	499.84	499.84	0.95	0.99	-163.28	21.14	21.54	36.80	34.87	1.93	19.078 SF		
600.00	599.45	599.45	599.45	1.18	1.22	-166.42	21.14	21.54	45.22	42.86	2.36	19.197		
700.00	698.70	698.70	698.70	1.45	1.44	-169.25	21.14	21.54	57.14	54.35	2.79	20.491		
800.00	797.47	797.47	797.47	1.77	1.66	-171.50	21.14	21.54	72.57	69.34	3.23	22.500		
900.00	895.62	895.62	895.62	2.15	1.88	-173.22	21.14	21.54	91.49	87.82	3.67	24.962		
1,000.00	993.06	993.06	993.06	2.58	2.10	-174.52	21.14	21.54	113.86	109.75	4.11	27.721		
1,100.00	1,089.64	1,089.21	1,089.21	3.07	2.32	-175.60	21.32	21.34	139.71	135.16	4.55	30.712		
1,200.00	1,185.27	1,183.30	1,183.25	3.62	2.52	-177.29	23.23	19.25	169.59	164.61	4.98	34.029		
1,300.00	1,279.82	1,275.41	1,275.18	4.24	2.73	-179.37	27.12	15.00	203.75	198.33	5.42	37.577		
1,404.11	1,376.98	1,368.83	1,368.17	4.95	2.95	178.36	33.10	8.46	243.96	238.07	5.89	41.416		
1,500.00	1,465.83	1,452.97	1,451.64	5.63	3.16	176.34	40.23	0.66	283.75	277.35	6.40	44.355		
1,600.00	1,558.50	1,539.34	1,536.96	6.36	3.39	174.30	49.27	-9.22	326.54	319.59	6.95	46.958		
1,700.00	1,651.16	1,624.18	1,620.34	7.09	3.65	172.34	59.84	-20.78	370.72	363.18	7.54	49.151		
1,800.00	1,743.83	1,707.37	1,701.62	7.82	3.93	170.47	71.81	-33.87	416.36	408.19	8.16	50.996		
1,900.00	1,836.49	1,789.59	1,781.41	8.56	4.24	168.67	85.20	-48.50	463.50	454.67	8.83	52.512		
2,000.00	1,929.16	1,876.45	1,865.47	9.30	4.60	167.00	99.95	-64.64	511.44	501.90	9.54	53.617		
2,100.00	2,021.82	1,963.30	1,949.52	10.04	4.97	165.61	114.71	-80.77	559.66	549.39	10.27	54.508		
2,200.00	2,114.49	2,050.16	2,033.58	10.79	5.36	164.44	129.46	-96.90	608.10	597.09	11.01	55.235		
2,300.00	2,207.15	2,137.01	2,117.64	11.53	5.76	163.44	144.22	-113.04	656.71	644.95	11.76	55.836		
2,400.00	2,299.81	2,223.86	2,201.69	12.28	6.16	162.58	158.97	-129.17	705.45	692.93	12.52	56.341		
2,500.00	2,392.48	2,310.72	2,285.75	13.03	6.58	161.83	173.73	-145.30	754.29	741.01	13.29	56.769		
2,600.00	2,485.14	2,397.57	2,369.81	13.77	7.00	161.17	188.48	-161.44	803.23	789.17	14.06	57.136		
2,700.00	2,577.81	2,484.42	2,453.86	14.52	7.42	160.58	203.24	-177.57	852.24	837.40	14.83	57.452		
2,800.00	2,670.47	2,571.28	2,537.92	15.27	7.85	160.06	217.99	-193.70	901.31	885.69	15.61	57.728		
2,900.00	2,763.14	2,658.13	2,621.98	16.02	8.28	159.59	232.75	-209.84	950.43	934.03	16.39	57.972		
3,000.00	2,855.80	2,744.98	2,706.03	16.77	8.72	159.17	247.50	-225.97	999.59	982.41	17.18	58.188		
3,100.00	2,948.47	2,831.84	2,790.09	17.52	9.15	158.78	262.25	-242.10	1,048.79	1,030.83	17.96	58.381		
3,200.00	3,041.13	2,918.69	2,874.15	18.27	9.59	158.43	277.01	-258.24	1,098.02	1,079.27	18.75	58.554		
3,300.00	3,133.80	3,005.54	2,958.20	19.02	10.04	158.11	291.76	-274.37	1,147.29	1,127.74	19.54	58.711		
3,400.00	3,226.46	3,092.40	3,042.26	19.77	10.48	157.82	306.52	-290.50	1,196.57	1,176.24	20.33	58.852		
3,500.00	3,319.12	3,179.25	3,126.32	20.52	10.92	157.55	321.27	-306.64	1,245.88	1,224.76	21.12	58.980		
3,600.00	3,411.79	3,266.10	3,210.37	21.27	11.37	157.30	336.03	-322.77	1,295.21	1,273.29	21.92	59.098		
3,700.00	3,504.45	3,352.96	3,294.43	22.02	11.82	157.07	350.78	-338.90	1,344.55	1,321.84	22.71	59.206		
3,800.00	3,597.12	3,439.81	3,378.49	22.77	12.26	156.86	365.54	-355.03	1,393.92	1,370.41	23.50	59.305		
3,900.00	3,689.78	3,526.66	3,462.54	23.53	12.71	156.66	380.29	-371.17	1,443.29	1,418.99	24.30	59.397		
4,000.00	3,782.45	3,613.52	3,546.60	24.28	13.16	156.47	395.05	-387.30	1,492.68	1,467.58	25.09	59.482		
4,100.00	3,875.11	3,700.37	3,630.66	25.03	13.61	156.29	409.80	-403.43	1,542.08	1,516.18	25.89	59.560		
4,200.00	3,967.78	3,787.22	3,714.71	25.78	14.06	156.13	424.56	-419.57	1,591.48	1,564.80	26.69	59.634		
4,300.00	4,060.44	3,874.08	3,798.77	26.53	14.52	155.98	439.31	-435.70	1,640.90	1,613.42	27.48	59.702		
4,400.00	4,153.10	3,960.93	3,882.83	27.28	14.97	155.83	454.07	-451.83	1,690.33	1,662.05	28.28	59.766		
4,500.00	4,245.77	4,047.78	3,966.88	28.04	15.42	155.69	468.82	-467.97	1,739.76	1,710.68	29.08	59.826		
4,600.00	4,338.43	4,134.64	4,050.94	28.79	15.87	155.56	483.58	-484.10	1,789.20	1,759.33	29.88	59.883		
4,700.00	4,431.10	4,221.49	4,135.00	29.54	16.33	155.44	498.33	-500.23	1,838.65	1,807.98	30.68	59.936		
4,800.00	4,523.76	4,308.34	4,219.05	30.29	16.78	155.32	513.09	-516.37	1,888.11	1,856.63	31.48	59.986		
4,900.00	4,616.43	4,395.20	4,303.11	31.05	17.24	155.21	527.84	-532.50	1,937.57	1,905.29	32.28	60.033		
5,000.00	4,709.09	4,482.05	4,387.17	31.80	17.69	155.11	542.60	-548.63	1,987.03	1,953.96	33.07	60.077		
5,100.00	4,801.76	4,568.90	4,471.22	32.55	18.15	155.01	557.35	-564.77	2,036.50	2,002.63	33.87	60.120		

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 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 34-33	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
5,200.00	4,894.42	4,655.76	4,555.28	33.30	18.60	154.91	572.11	-580.90	2,085.97	2,051.30	34.67	60.160	
5,300.00	4,987.08	4,742.61	4,639.34	34.05	19.06	154.82	586.86	-597.03	2,135.45	2,099.98	35.47	60.198	
5,393.81	5,074.02	4,824.09	4,718.19	34.76	19.48	154.74	600.70	-612.17	2,181.87	2,145.65	36.22	60.232	
5,400.00	5,079.75	4,829.47	4,723.40	34.80	19.51	154.77	601.62	-613.17	2,184.93	2,148.65	36.28	60.221	
5,500.00	5,173.13	4,917.15	4,808.26	35.31	19.97	155.12	616.51	-629.46	2,232.86	2,195.70	37.16	60.086	
5,600.00	5,267.70	5,006.23	4,894.47	35.79	20.44	155.40	631.65	-646.00	2,278.00	2,239.98	38.02	59.918	
5,700.00	5,363.35	5,096.60	4,981.93	36.22	20.92	155.61	647.00	-662.79	2,320.30	2,281.45	38.85	59.724	
5,800.00	5,459.95	5,188.16	5,070.54	36.62	21.40	155.75	662.55	-679.80	2,359.72	2,320.07	39.65	59.511	
5,900.00	5,557.40	5,280.78	5,160.18	36.97	21.88	155.84	678.29	-697.00	2,396.23	2,355.82	40.42	59.286	
6,000.00	5,655.57	5,374.36	5,250.75	37.28	22.38	155.86	694.18	-714.38	2,429.80	2,388.66	41.15	59.052	
6,100.00	5,754.35	5,468.79	5,342.13	37.54	22.87	155.83	710.23	-731.92	2,460.41	2,418.58	41.83	58.814	
6,200.00	5,853.61	5,563.94	5,434.22	37.76	23.37	155.74	726.39	-749.60	2,488.04	2,445.56	42.48	58.573	
6,300.00	5,953.23	5,781.91	5,646.88	37.93	24.20	155.28	758.51	-784.72	2,510.61	2,467.22	43.39	57.863	
6,400.00	6,053.09	6,024.32	5,886.85	38.06	24.85	154.94	781.31	-809.65	2,524.68	2,480.57	44.10	57.243	
6,497.93	6,151.00	6,266.64	6,128.72	38.15	25.25	-0.14	790.35	-819.54	2,529.86	2,485.30	44.56	56.779	
6,500.00	6,153.07	6,271.78	6,133.87	38.15	25.25	-0.14	790.39	-819.58	2,529.87	2,485.31	44.57	56.768	
6,600.00	6,253.07	6,390.99	6,253.07	38.21	25.38	-0.14	790.52	-819.71	2,529.92	2,485.10	44.82	56.449	
6,700.00	6,353.07	6,490.99	6,353.07	38.27	25.50	-0.14	790.52	-819.71	2,529.92	2,484.86	45.06	56.143	
6,800.00	6,453.07	6,590.99	6,453.07	38.34	25.62	-0.14	790.52	-819.71	2,529.92	2,484.61	45.31	55.834	
6,900.00	6,553.07	6,690.99	6,553.07	38.40	25.74	-0.14	790.52	-819.71	2,529.92	2,484.36	45.56	55.525	
7,000.00	6,653.07	6,790.99	6,653.07	38.47	25.86	-0.14	790.52	-819.71	2,529.92	2,484.10	45.82	55.216	
7,100.00	6,753.07	6,890.99	6,753.07	38.53	25.99	-0.14	790.52	-819.71	2,529.92	2,483.85	46.08	54.907	
7,200.00	6,853.07	6,990.99	6,853.07	38.60	26.11	-0.14	790.52	-819.71	2,529.92	2,483.58	46.34	54.598	
7,300.00	6,953.07	7,090.99	6,953.07	38.67	26.24	-0.14	790.52	-819.71	2,529.92	2,483.32	46.60	54.289	
7,400.00	7,053.07	7,190.99	7,053.07	38.74	26.37	-0.14	790.52	-819.71	2,529.92	2,483.05	46.87	53.980	
7,500.00	7,153.07	7,290.99	7,153.07	38.81	26.50	-0.14	790.52	-819.71	2,529.92	2,482.78	47.14	53.672	
7,600.00	7,253.07	7,390.99	7,253.07	38.88	26.63	-0.14	790.52	-819.71	2,529.92	2,482.51	47.41	53.364	
7,700.00	7,353.07	7,490.99	7,353.07	38.96	26.76	-0.14	790.52	-819.71	2,529.92	2,482.24	47.68	53.057	
7,800.00	7,453.07	7,590.99	7,453.07	39.03	26.89	-0.14	790.52	-819.71	2,529.92	2,481.96	47.96	52.750	
7,900.00	7,553.07	7,690.99	7,553.07	39.11	27.03	-0.14	790.52	-819.71	2,529.92	2,481.68	48.24	52.444	
8,000.00	7,653.07	7,790.99	7,653.07	39.19	27.16	-0.14	790.52	-819.71	2,529.92	2,481.40	48.52	52.139	
8,100.00	7,753.07	7,890.99	7,753.07	39.26	27.30	-0.14	790.52	-819.71	2,529.92	2,481.11	48.81	51.835	
8,200.00	7,853.07	7,990.99	7,853.07	39.34	27.44	-0.14	790.52	-819.71	2,529.92	2,480.83	49.09	51.531	
8,300.00	7,953.07	8,090.99	7,953.07	39.42	27.57	-0.14	790.52	-819.71	2,529.92	2,480.54	49.38	51.229	
8,400.00	8,053.07	8,190.99	8,053.07	39.51	27.71	-0.14	790.52	-819.71	2,529.92	2,480.25	49.68	50.928	
8,416.93	8,070.00	8,207.91	8,070.00	39.52	27.74	-0.14	790.52	-819.71	2,529.92	2,480.20	49.73	50.877	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 34-33	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
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis 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	-136.17	-7.29	-6.99	10.10				
100.00	100.00	100.00	100.00	0.10	0.10	-136.17	-7.29	-6.99	10.10	9.91	0.19	52.863	
200.00	200.00	200.00	200.00	0.32	0.32	-136.17	-7.29	-6.99	10.10	9.46	0.64	15.766	
300.00	300.00	300.00	300.00	0.55	0.55	-136.17	-7.29	-6.99	10.10	9.01	1.09	9.265	
400.00	399.98	399.98	399.98	0.75	0.77	22.59	-7.29	-6.99	8.47	6.95	1.51	5.590	
500.00	499.84	499.84	499.84	0.95	0.99	51.58	-7.29	-6.99	4.15	2.22	1.93	2.146	
533.92	533.66	533.66	533.66	1.02	1.07	89.69	-7.29	-6.99	3.25	1.16	2.09	1.552 CC, ES, SF	
600.00	599.45	599.45	599.45	1.18	1.22	151.94	-7.29	-6.99	6.94	4.58	2.36	2.935	
700.00	698.70	698.70	698.70	1.45	1.44	169.84	-7.29	-6.99	18.60	15.81	2.79	6.670	
800.00	797.47	797.47	797.47	1.77	1.66	174.45	-7.29	-6.99	34.12	30.89	3.22	10.585	
900.00	895.62	895.62	895.62	2.15	1.88	176.42	-7.29	-6.99	53.14	49.48	3.66	14.514	
1,000.00	993.06	993.06	993.06	2.58	2.10	177.46	-7.29	-6.99	75.60	71.50	4.10	18.428	
1,100.00	1,089.64	1,090.79	1,090.79	3.07	2.31	177.99	-7.43	-7.25	101.24	96.70	4.54	22.294	
1,200.00	1,185.27	1,190.30	1,190.24	3.62	2.50	177.57	-8.99	-9.98	128.05	123.08	4.96	25.791	
1,300.00	1,279.82	1,290.30	1,290.02	4.24	2.70	176.52	-12.28	-15.74	155.58	150.17	5.41	28.779	
1,404.11	1,376.98	1,394.91	1,394.07	4.95	2.93	175.08	-17.57	-25.00	185.06	179.17	5.89	31.411	
1,500.00	1,465.83	1,492.07	1,490.32	5.63	3.17	173.56	-24.16	-36.56	211.49	205.07	6.43	32.908	
1,600.00	1,558.50	1,594.59	1,591.32	6.36	3.46	171.74	-32.87	-51.81	236.69	229.65	7.03	33.661	
1,700.00	1,651.16	1,693.85	1,688.58	7.09	3.78	169.88	-42.69	-69.01	260.05	252.37	7.68	33.864	
1,800.00	1,743.83	1,790.81	1,783.54	7.82	4.11	168.33	-52.40	-86.01	283.46	275.11	8.36	33.926	
1,900.00	1,836.49	1,887.77	1,878.50	8.56	4.47	167.02	-62.10	-103.02	307.04	297.98	9.06	33.896	
2,000.00	1,929.16	1,984.73	1,973.46	9.30	4.84	165.89	-71.81	-120.02	330.74	320.96	9.78	33.806	
2,100.00	2,021.82	2,081.68	2,068.42	10.04	5.22	164.92	-81.52	-137.03	354.56	344.03	10.53	33.679	
2,200.00	2,114.49	2,178.64	2,163.38	10.79	5.61	164.06	-91.23	-154.03	378.45	367.17	11.29	33.531	
2,300.00	2,207.15	2,275.60	2,258.34	11.53	6.00	163.31	-100.94	-171.04	402.42	390.36	12.06	33.372	
2,400.00	2,299.81	2,372.56	2,353.30	12.28	6.40	162.64	-110.64	-188.04	426.44	413.60	12.84	33.209	
2,500.00	2,392.48	2,469.51	2,448.26	13.03	6.81	162.05	-120.35	-205.05	450.52	436.88	13.63	33.046	
2,600.00	2,485.14	2,566.47	2,543.22	13.77	7.22	161.51	-130.06	-222.05	474.63	460.20	14.43	32.887	
2,700.00	2,577.81	2,663.43	2,638.18	14.52	7.63	161.03	-139.77	-239.06	498.78	483.54	15.24	32.732	
2,800.00	2,670.47	2,760.39	2,733.14	15.27	8.05	160.59	-149.48	-256.06	522.96	506.91	16.05	32.584	
2,900.00	2,763.14	2,857.35	2,828.10	16.02	8.47	160.19	-159.18	-273.07	547.17	530.30	16.87	32.442	
3,000.00	2,855.80	2,954.30	2,923.06	16.77	8.89	159.82	-168.89	-290.07	571.40	553.71	17.69	32.307	
3,100.00	2,948.47	3,051.26	3,018.02	17.52	9.31	159.48	-178.60	-307.08	595.65	577.14	18.51	32.178	
3,200.00	3,041.13	3,148.22	3,112.98	18.27	9.74	159.17	-188.31	-324.09	619.92	600.58	19.34	32.057	
3,300.00	3,133.80	3,245.18	3,207.94	19.02	10.16	158.89	-198.02	-341.09	644.20	624.04	20.17	31.941	
3,400.00	3,226.46	3,342.13	3,302.90	19.77	10.59	158.62	-207.73	-358.10	668.50	647.50	21.00	31.831	
3,500.00	3,319.12	3,439.09	3,397.86	20.52	11.01	158.37	-217.43	-375.10	692.81	670.98	21.84	31.727	
3,600.00	3,411.79	3,536.05	3,492.82	21.27	11.44	158.14	-227.14	-392.11	717.14	694.46	22.67	31.629	
3,700.00	3,504.45	3,633.01	3,587.78	22.02	11.87	157.93	-236.85	-409.11	741.47	717.96	23.51	31.535	
3,800.00	3,597.12	3,729.97	3,682.74	22.77	12.30	157.72	-246.56	-426.12	765.81	741.46	24.35	31.446	
3,900.00	3,689.78	3,826.92	3,777.70	23.53	12.73	157.53	-256.27	-443.12	790.16	764.97	25.19	31.362	
4,000.00	3,782.45	3,923.88	3,872.66	24.28	13.16	157.36	-265.97	-460.13	814.52	788.48	26.04	31.282	
4,100.00	3,875.11	4,020.84	3,967.62	25.03	13.59	157.19	-275.68	-477.13	838.89	812.00	26.88	31.206	
4,200.00	3,967.78	4,117.80	4,062.58	25.78	14.03	157.03	-285.39	-494.14	863.26	835.53	27.73	31.133	
4,300.00	4,060.44	4,214.75	4,157.54	26.53	14.46	156.88	-295.10	-511.14	887.64	859.06	28.57	31.064	
4,400.00	4,153.10	4,311.71	4,252.50	27.28	14.89	156.74	-304.81	-528.15	912.02	882.60	29.42	30.998	
4,500.00	4,245.77	4,408.67	4,347.46	28.04	15.33	156.60	-314.51	-545.15	936.41	906.14	30.27	30.935	
4,600.00	4,338.43	4,505.63	4,442.42	28.79	15.76	156.48	-324.22	-562.16	960.80	929.68	31.12	30.875	
4,700.00	4,431.10	4,602.59	4,537.38	29.54	16.19	156.36	-333.93	-579.16	985.20	953.23	31.97	30.817	
4,800.00	4,523.76	4,699.54	4,632.34	30.29	16.63	156.24	-343.64	-596.17	1,009.60	976.78	32.82	30.762	
4,900.00	4,616.43	4,796.50	4,727.30	31.05	17.06	156.13	-353.35	-613.17	1,034.00	1,000.33	33.67	30.709	
5,000.00	4,709.09	4,893.46	4,822.26	31.80	17.50	156.02	-363.05	-630.18	1,058.41	1,023.89	34.52	30.659	

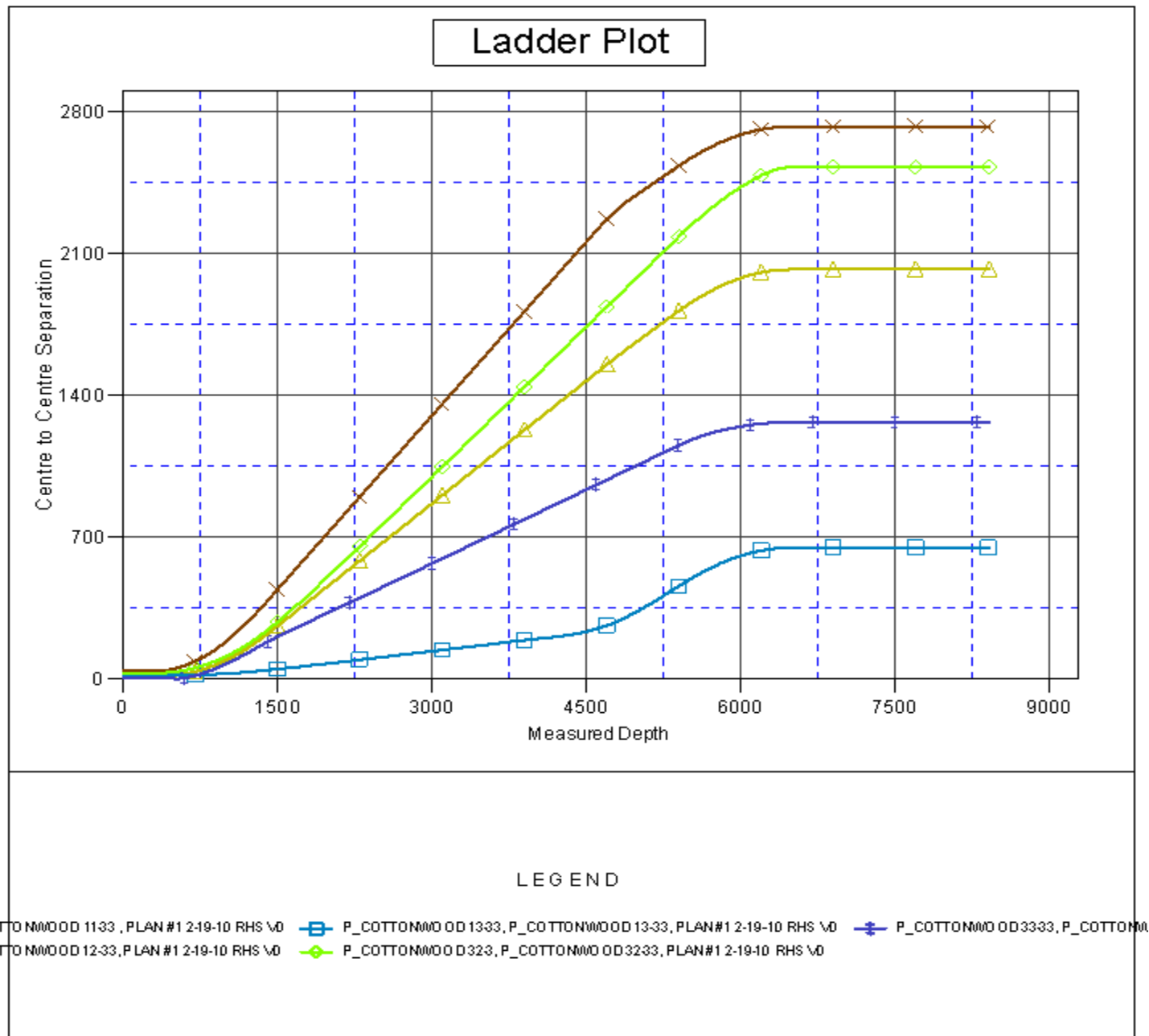
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 34-33	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
5,100.00	4,801.76	4,990.42	4,917.22	32.55	17.93	155.92	-372.76	-647.18	1,082.82	1,047.44	35.37	30.610	
5,200.00	4,894.42	5,087.37	5,012.18	33.30	18.37	155.83	-382.47	-664.19	1,107.23	1,071.01	36.23	30.564	
5,300.00	4,987.08	5,184.33	5,107.14	34.05	18.80	155.74	-392.18	-681.19	1,131.65	1,094.57	37.08	30.519	
5,393.81	5,074.02	5,275.29	5,196.23	34.76	19.21	155.65	-401.29	-697.15	1,154.56	1,116.68	37.88	30.479	
5,400.00	5,079.75	5,281.29	5,202.10	34.80	19.24	155.66	-401.89	-698.20	1,156.06	1,118.13	37.94	30.474	
5,500.00	5,173.13	5,378.65	5,297.45	35.31	19.68	155.73	-411.63	-715.28	1,178.75	1,139.96	38.78	30.393	
5,600.00	5,267.70	5,476.63	5,393.42	35.79	20.12	155.70	-421.45	-732.46	1,198.33	1,158.71	39.63	30.242	
5,700.00	5,363.35	5,575.12	5,489.87	36.22	20.56	155.59	-431.31	-749.73	1,214.80	1,174.34	40.46	30.025	
5,800.00	5,459.95	5,672.29	5,585.05	36.62	20.99	155.39	-441.03	-766.77	1,228.17	1,186.90	41.27	29.760	
5,900.00	5,557.40	5,753.63	5,664.97	36.97	21.26	155.23	-448.51	-779.86	1,239.27	1,197.40	41.88	29.594	
6,000.00	5,655.57	5,835.17	5,745.49	37.28	21.48	155.10	-454.87	-791.00	1,248.68	1,206.29	42.39	29.457	
6,100.00	5,754.35	5,916.87	5,826.50	37.54	21.69	154.99	-460.10	-800.17	1,256.38	1,213.56	42.82	29.342	
6,200.00	5,853.61	6,000.00	5,909.21	37.76	21.87	154.90	-464.24	-807.43	1,262.36	1,219.19	43.17	29.244	
6,300.00	5,953.23	6,080.64	5,989.64	37.93	22.02	154.84	-467.13	-812.48	1,266.60	1,223.19	43.42	29.174	
6,400.00	6,053.09	6,162.65	6,071.57	38.06	22.14	154.80	-468.91	-815.60	1,269.11	1,225.53	43.58	29.120	
6,497.93	6,151.00	6,247.09	6,156.00	38.15	22.25	-0.15	-469.52	-816.68	1,269.89	1,226.21	43.68	29.071	
6,500.00	6,153.07	6,247.09	6,156.00	38.15	22.25	-0.15	-469.52	-816.68	1,269.88	1,226.20	43.68	29.069	
6,534.34	6,187.41	6,278.50	6,187.41	38.17	22.29	-0.15	-469.52	-816.68	1,269.88	1,226.12	43.76	29.018	
6,600.00	6,253.07	6,344.16	6,253.07	38.21	22.37	-0.15	-469.52	-816.68	1,269.88	1,225.96	43.92	28.916	
6,700.00	6,353.07	6,444.16	6,353.07	38.27	22.49	-0.15	-469.52	-816.68	1,269.88	1,225.72	44.15	28.760	
6,800.00	6,453.07	6,544.16	6,453.07	38.34	22.61	-0.15	-469.52	-816.68	1,269.88	1,225.48	44.40	28.603	
6,900.00	6,553.07	6,644.16	6,553.07	38.40	22.74	-0.15	-469.52	-816.68	1,269.88	1,225.24	44.64	28.446	
7,000.00	6,653.07	6,744.16	6,653.07	38.47	22.87	-0.15	-469.52	-816.68	1,269.88	1,224.99	44.89	28.288	
7,100.00	6,753.07	6,844.16	6,753.07	38.53	22.99	-0.15	-469.52	-816.68	1,269.88	1,224.74	45.14	28.131	
7,200.00	6,853.07	6,944.16	6,853.07	38.60	23.12	-0.15	-469.52	-816.68	1,269.88	1,224.48	45.40	27.973	
7,300.00	6,953.07	7,044.16	6,953.07	38.67	23.25	-0.15	-469.52	-816.68	1,269.88	1,224.22	45.65	27.815	
7,400.00	7,053.07	7,144.16	7,053.07	38.74	23.38	-0.15	-469.52	-816.68	1,269.88	1,223.96	45.91	27.657	
7,500.00	7,153.07	7,244.16	7,153.07	38.81	23.52	-0.15	-469.52	-816.68	1,269.88	1,223.70	46.18	27.499	
7,600.00	7,253.07	7,344.16	7,253.07	38.88	23.65	-0.15	-469.52	-816.68	1,269.88	1,223.43	46.44	27.342	
7,700.00	7,353.07	7,444.16	7,353.07	38.96	23.79	-0.15	-469.52	-816.68	1,269.88	1,223.16	46.71	27.184	
7,800.00	7,453.07	7,544.16	7,453.07	39.03	23.93	-0.15	-469.52	-816.68	1,269.88	1,222.89	46.99	27.027	
7,900.00	7,553.07	7,644.16	7,553.07	39.11	24.07	-0.15	-469.52	-816.68	1,269.88	1,222.62	47.26	26.870	
8,000.00	7,653.07	7,744.16	7,653.07	39.19	24.21	-0.15	-469.52	-816.68	1,269.88	1,222.34	47.54	26.714	
8,100.00	7,753.07	7,844.16	7,753.07	39.26	24.35	-0.15	-469.52	-816.68	1,269.88	1,222.06	47.82	26.557	
8,200.00	7,853.07	7,944.16	7,853.07	39.34	24.49	-0.15	-469.52	-816.68	1,269.88	1,221.78	48.10	26.401	
8,300.00	7,953.07	8,044.16	7,953.07	39.42	24.63	-0.15	-469.52	-816.68	1,269.88	1,221.49	48.38	26.246	
8,400.00	8,053.07	8,144.16	8,053.07	39.51	24.78	-0.15	-469.52	-816.68	1,269.88	1,221.21	48.67	26.091	
8,416.93	8,070.00	8,161.09	8,070.00	39.52	24.80	-0.15	-469.52	-816.68	1,269.88	1,221.16	48.72	26.065	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 34-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

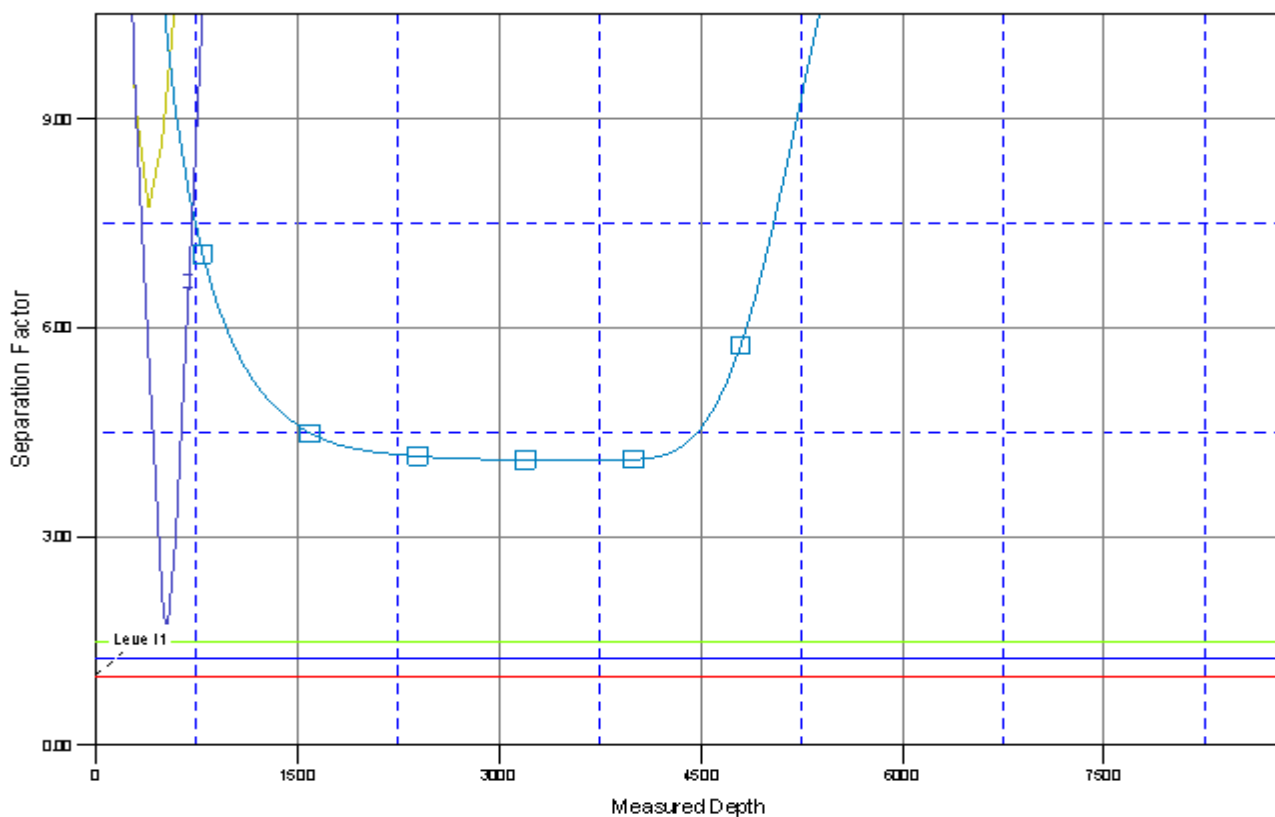
Reference Depths are relative to WELL @ 4964.00ft (Original Well Elev) Coordinates are relative to: P_COTTONWOOD 34-33
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W ° Grid Convergence at Surface is: 0.46°



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 34-33
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 34-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 34-33	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 34-33
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

COTTONWOOD 11-33, PLAN #1 2-19-10 RHS W/D P_COTTONWOOD 13-33, P_COTTONWOOD 13-33, PLAN #1 2-19-10 RHS W/D P_COTTONWOOD 33-33, P_COTTONWOOD 33-33, PLAN #1 2-19-10 RHS W/D
 COTTONWOOD 12-33, PLAN #1 2-19-10 RHS W/D P_COTTONWOOD 32-33, P_COTTONWOOD 32-33, PLAN #1 2-19-10 RHS W/D