

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Becker Ranch 5E-323**

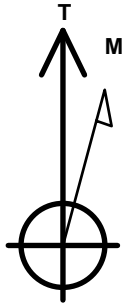
Surface Location: Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W
 North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
 Ground Elevation: 4820.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1339314.54	3256448.24	40.261170	-104.581080	

RKB - 15' WELL @ 4835.0ft (RKB - 15')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 223'FNL & 883'FWL	1.0	0.0	0.0	Point
BHL 500'FSL & 455'FWL	6895.0	-4604.8	-399.2	Point



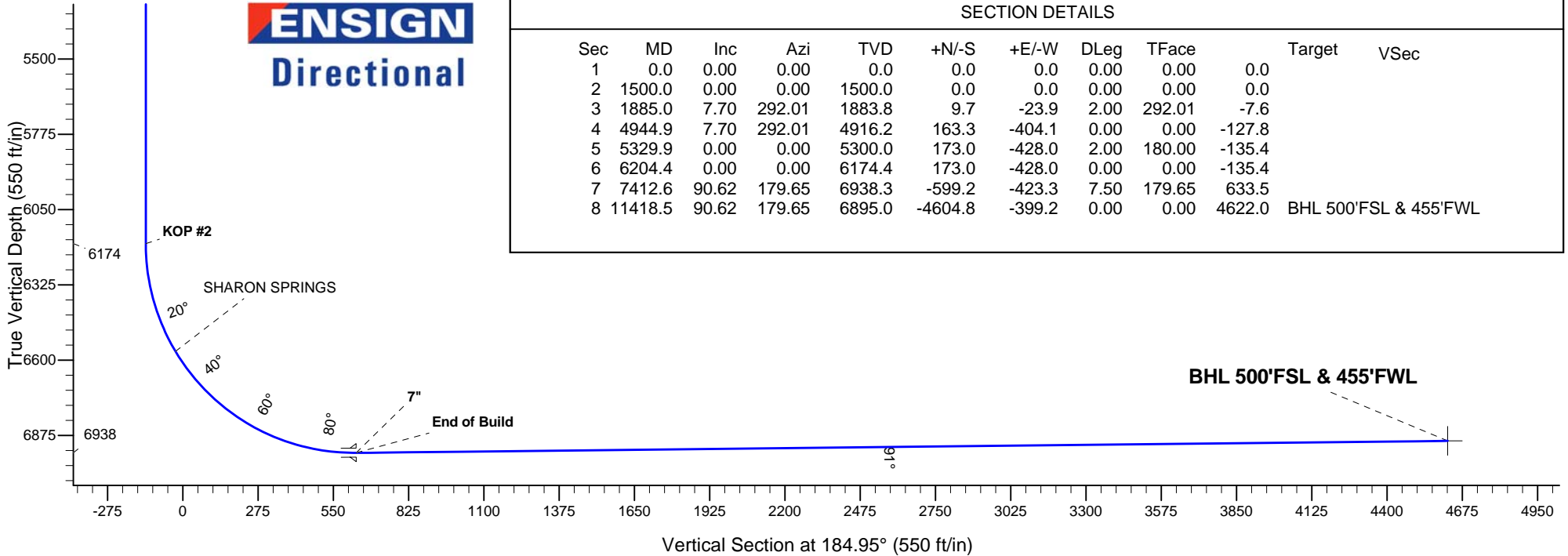
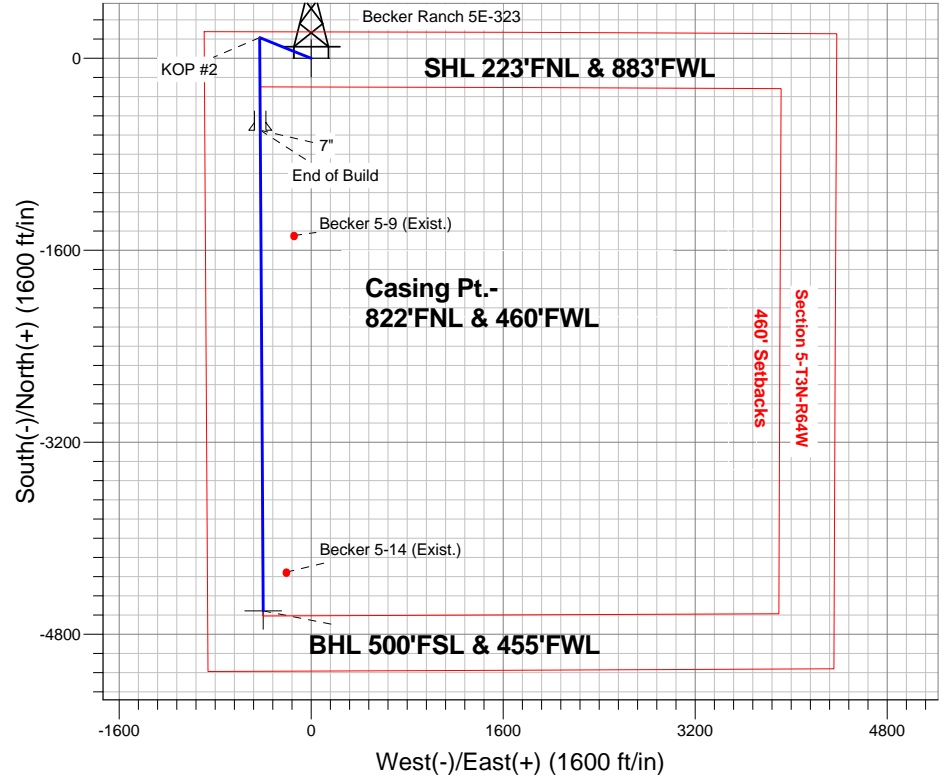
Azimuths to True North
 Magnetic North: 8.42°

Magnetic Field
 Strength: 52821.0snT
 Dip Angle: 66.88°
 Date: 11/22/2013
 Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
1500.0	1500.0	KOP #1
6174.5	6204.4	KOP #2
6938.3	7412.6	End of Build

Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W
 Becker Ranch 5E-323
 Plan #1 (11-22-13)
 10:39, December 12 2013



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	Target	VSec
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1500.0	0.00	0.00	1500.0	0.0	0.0	0.00	0.00	0.0	
3	1885.0	7.70	292.01	1883.8	9.7	-23.9	2.00	292.01	-7.6	
4	4944.9	7.70	292.01	4916.2	163.3	-404.1	0.00	0.00	-127.8	
5	5329.9	0.00	0.00	5300.0	173.0	-428.0	2.00	180.00	-135.4	
6	6204.4	0.00	0.00	6174.4	173.0	-428.0	0.00	0.00	-135.4	
7	7412.6	90.62	179.65	6938.3	-599.2	-423.3	7.50	179.65	633.5	
8	11418.5	90.62	179.65	6895.0	-4604.8	-399.2	0.00	0.00	4622.0	BHL 500'FSL & 455'FWL



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.5-T3N-R64W

Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W

Becker Ranch 5E-323

Wellbore #1

Plan: Plan #1 (11-22-13)

Standard Planning Report

12 December, 2013



Database:	Landmark	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Project:	SEC.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	North Reference:	True
Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-22-13)		

Project	SEC.5-T3N-R64W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W				
Site Position:		Northing:	1,339,314.26ft	Latitude:	40.261170
From:	Lat/Long	Easting:	3,256,420.34ft	Longitude:	-104.581180
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.59 °

Well	Becker Ranch 5E-323					
Well Position	+N/-S	0.0 ft	Northing:	1,339,314.54 ft	Latitude:	40.261170
	+E/-W	27.9 ft	Easting:	3,256,448.24 ft	Longitude:	-104.581080
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,820.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/22/2013	8.43	66.88	52,821

Design	Plan #1 (11-22-13)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	184.95

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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,885.0	7.70	292.01	1,883.8	9.7	-23.9	2.00	2.00	0.00	292.01	
4,944.9	7.70	292.01	4,916.2	163.3	-404.1	0.00	0.00	0.00	0.00	
5,329.9	0.00	0.00	5,300.0	173.0	-428.0	2.00	-2.00	0.00	180.00	
6,204.4	0.00	0.00	6,174.4	173.0	-428.0	0.00	0.00	0.00	0.00	
7,412.6	90.62	179.65	6,938.3	-599.2	-423.3	7.50	7.50	0.00	179.65	
11,418.5	90.62	179.65	6,895.0	-4,604.8	-399.2	0.00	0.00	0.00	0.00	BHL 500'FSL & 45°

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Project:	SEC.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	North Reference:	True
Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-22-13)		

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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00	
SHL 223'FNL & 883'FWL										
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
KOP #1										
1,600.0	2.00	292.01	1,600.0	0.7	-1.6	-0.5	2.00	2.00	0.00	
1,700.0	4.00	292.01	1,699.8	2.6	-6.5	-2.0	2.00	2.00	0.00	
1,800.0	6.00	292.01	1,799.5	5.9	-14.5	-4.6	2.00	2.00	0.00	
1,885.0	7.70	292.01	1,883.8	9.7	-23.9	-7.6	2.00	2.00	0.00	
1,900.0	7.70	292.01	1,898.7	10.4	-25.8	-8.2	0.00	0.00	0.00	
2,000.0	7.70	292.01	1,997.8	15.5	-38.2	-12.1	0.00	0.00	0.00	
2,100.0	7.70	292.01	2,096.9	20.5	-50.7	-16.0	0.00	0.00	0.00	
2,200.0	7.70	292.01	2,196.0	25.5	-63.1	-20.0	0.00	0.00	0.00	
2,300.0	7.70	292.01	2,295.1	30.5	-75.5	-23.9	0.00	0.00	0.00	
2,400.0	7.70	292.01	2,394.2	35.5	-87.9	-27.8	0.00	0.00	0.00	
2,500.0	7.70	292.01	2,493.3	40.6	-100.3	-31.7	0.00	0.00	0.00	
2,600.0	7.70	292.01	2,592.4	45.6	-112.8	-35.7	0.00	0.00	0.00	
2,700.0	7.70	292.01	2,691.5	50.6	-125.2	-39.6	0.00	0.00	0.00	
2,800.0	7.70	292.01	2,790.6	55.6	-137.6	-43.5	0.00	0.00	0.00	
2,900.0	7.70	292.01	2,889.7	60.6	-150.0	-47.5	0.00	0.00	0.00	
3,000.0	7.70	292.01	2,988.8	65.7	-162.5	-51.4	0.00	0.00	0.00	
3,100.0	7.70	292.01	3,087.9	70.7	-174.9	-55.3	0.00	0.00	0.00	
3,200.0	7.70	292.01	3,187.0	75.7	-187.3	-59.2	0.00	0.00	0.00	
3,300.0	7.70	292.01	3,286.1	80.7	-199.7	-63.2	0.00	0.00	0.00	
3,400.0	7.70	292.01	3,385.2	85.7	-212.1	-67.1	0.00	0.00	0.00	
3,500.0	7.70	292.01	3,484.3	90.8	-224.6	-71.0	0.00	0.00	0.00	
3,600.0	7.70	292.01	3,583.4	95.8	-237.0	-75.0	0.00	0.00	0.00	
3,700.0	7.70	292.01	3,682.5	100.8	-249.4	-78.9	0.00	0.00	0.00	
3,717.7	7.70	292.01	3,700.0	101.7	-251.6	-79.6	0.00	0.00	0.00	
PARKMAN										
3,800.0	7.70	292.01	3,781.6	105.8	-261.8	-82.8	0.00	0.00	0.00	
3,900.0	7.70	292.01	3,880.7	110.9	-274.3	-86.8	0.00	0.00	0.00	
4,000.0	7.70	292.01	3,979.8	115.9	-286.7	-90.7	0.00	0.00	0.00	
4,100.0	7.70	292.01	4,078.9	120.9	-299.1	-94.6	0.00	0.00	0.00	
4,200.0	7.70	292.01	4,178.0	125.9	-311.5	-98.5	0.00	0.00	0.00	
4,300.0	7.70	292.01	4,277.1	130.9	-323.9	-102.5	0.00	0.00	0.00	
4,400.0	7.70	292.01	4,376.2	136.0	-336.4	-106.4	0.00	0.00	0.00	
4,424.1	7.70	292.01	4,400.0	137.2	-339.4	-107.3	0.00	0.00	0.00	
SUSSEX										

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Project:	SEC.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	North Reference:	True
Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-22-13)		

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)
4,500.0	7.70	292.01	4,475.3	141.0	-348.8	-110.3	0.00	0.00	0.00
4,600.0	7.70	292.01	4,574.4	146.0	-361.2	-114.3	0.00	0.00	0.00
4,700.0	7.70	292.01	4,673.5	151.0	-373.6	-118.2	0.00	0.00	0.00
4,800.0	7.70	292.01	4,772.6	156.0	-386.1	-122.1	0.00	0.00	0.00
4,900.0	7.70	292.01	4,871.7	161.1	-398.5	-126.0	0.00	0.00	0.00
4,944.9	7.70	292.01	4,916.2	163.3	-404.1	-127.8	0.00	0.00	0.00
5,000.0	6.60	292.01	4,970.8	165.9	-410.4	-129.8	2.00	-2.00	0.00
5,100.0	4.60	292.01	5,070.3	169.5	-419.5	-132.7	2.00	-2.00	0.00
5,129.7	4.00	292.01	5,100.0	170.4	-421.5	-133.3	2.00	-2.00	0.00
SHANNON									
5,200.0	2.60	292.01	5,170.1	171.9	-425.3	-134.5	2.00	-2.00	0.00
5,300.0	0.60	292.01	5,270.1	172.9	-427.9	-135.3	2.00	-2.00	0.00
5,329.9	0.00	0.00	5,300.0	173.0	-428.0	-135.4	2.00	-2.00	0.00
5,400.0	0.00	0.00	5,370.1	173.0	-428.0	-135.4	0.00	0.00	0.00
5,500.0	0.00	0.00	5,470.1	173.0	-428.0	-135.4	0.00	0.00	0.00
5,600.0	0.00	0.00	5,570.1	173.0	-428.0	-135.4	0.00	0.00	0.00
5,700.0	0.00	0.00	5,670.1	173.0	-428.0	-135.4	0.00	0.00	0.00
5,800.0	0.00	0.00	5,770.1	173.0	-428.0	-135.4	0.00	0.00	0.00
5,900.0	0.00	0.00	5,870.1	173.0	-428.0	-135.4	0.00	0.00	0.00
6,000.0	0.00	0.00	5,970.1	173.0	-428.0	-135.4	0.00	0.00	0.00
6,100.0	0.00	0.00	6,070.1	173.0	-428.0	-135.4	0.00	0.00	0.00
6,200.0	0.00	0.00	6,170.1	173.0	-428.0	-135.4	0.00	0.00	0.00
6,204.4	0.00	0.00	6,174.5	173.0	-428.0	-135.4	0.00	0.00	0.00
KOP #2									
6,300.0	7.17	179.65	6,269.8	167.0	-428.0	-129.4	7.50	7.50	0.00
6,400.0	14.67	179.65	6,368.0	148.1	-427.8	-110.6	7.50	7.50	0.00
6,500.0	22.17	179.65	6,462.8	116.5	-427.7	-79.1	7.50	7.50	0.00
6,600.0	29.67	179.65	6,552.6	72.8	-427.4	-35.6	7.50	7.50	0.00
6,617.8	31.01	179.65	6,568.0	63.8	-427.3	-26.7	7.50	7.50	0.00
SHARON SPRINGS									
6,700.0	37.17	179.65	6,636.0	17.8	-427.1	19.2	7.50	7.50	0.00
6,800.0	44.67	179.65	6,711.6	-47.7	-426.7	84.4	7.50	7.50	0.00
6,900.0	52.17	179.65	6,777.9	-122.4	-426.2	158.8	7.50	7.50	0.00
7,000.0	59.67	179.65	6,833.9	-205.2	-425.7	241.2	7.50	7.50	0.00
7,100.0	67.17	179.65	6,878.6	-294.6	-425.2	330.2	7.50	7.50	0.00
7,200.0	74.67	179.65	6,911.2	-389.0	-424.6	424.2	7.50	7.50	0.00
7,300.0	82.17	179.65	6,931.3	-486.9	-424.0	521.7	7.50	7.50	0.00
7,400.0	89.67	179.65	6,938.4	-586.6	-423.4	621.0	7.50	7.50	0.00
7,412.6	90.62	179.65	6,938.3	-599.2	-423.3	633.5	7.50	7.50	0.00
End of Build - 7"									
7,500.0	90.62	179.65	6,937.4	-686.6	-422.8	720.5	0.00	0.00	0.00
7,600.0	90.62	179.65	6,936.3	-786.6	-422.2	820.1	0.00	0.00	0.00
7,700.0	90.62	179.65	6,935.2	-886.6	-421.6	919.7	0.00	0.00	0.00
7,800.0	90.62	179.65	6,934.2	-986.5	-421.0	1,019.2	0.00	0.00	0.00
7,900.0	90.62	179.65	6,933.1	-1,086.5	-420.4	1,118.8	0.00	0.00	0.00
8,000.0	90.62	179.65	6,932.0	-1,186.5	-419.8	1,218.4	0.00	0.00	0.00
8,100.0	90.62	179.65	6,930.9	-1,286.5	-419.2	1,317.9	0.00	0.00	0.00
8,200.0	90.62	179.65	6,929.8	-1,386.5	-418.6	1,417.5	0.00	0.00	0.00
8,300.0	90.62	179.65	6,928.7	-1,486.5	-418.0	1,517.1	0.00	0.00	0.00
8,400.0	90.62	179.65	6,927.7	-1,586.5	-417.4	1,616.6	0.00	0.00	0.00
8,500.0	90.62	179.65	6,926.6	-1,686.5	-416.8	1,716.2	0.00	0.00	0.00
8,600.0	90.62	179.65	6,925.5	-1,786.5	-416.2	1,815.8	0.00	0.00	0.00

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Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	North Reference:	True
Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-22-13)		

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)	
8,700.0	90.62	179.65	6,924.4	-1,886.5	-415.6	1,915.3	0.00	0.00	0.00	
8,800.0	90.62	179.65	6,923.3	-1,986.5	-415.0	2,014.9	0.00	0.00	0.00	
8,900.0	90.62	179.65	6,922.3	-2,086.5	-414.4	2,114.5	0.00	0.00	0.00	
9,000.0	90.62	179.65	6,921.2	-2,186.5	-413.8	2,214.0	0.00	0.00	0.00	
9,100.0	90.62	179.65	6,920.1	-2,286.4	-413.2	2,313.6	0.00	0.00	0.00	
9,200.0	90.62	179.65	6,919.0	-2,386.4	-412.6	2,413.2	0.00	0.00	0.00	
9,300.0	90.62	179.65	6,917.9	-2,486.4	-412.0	2,512.7	0.00	0.00	0.00	
9,400.0	90.62	179.65	6,916.8	-2,586.4	-411.4	2,612.3	0.00	0.00	0.00	
9,500.0	90.62	179.65	6,915.8	-2,686.4	-410.8	2,711.9	0.00	0.00	0.00	
9,600.0	90.62	179.65	6,914.7	-2,786.4	-410.1	2,811.4	0.00	0.00	0.00	
9,700.0	90.62	179.65	6,913.6	-2,886.4	-409.5	2,911.0	0.00	0.00	0.00	
9,800.0	90.62	179.65	6,912.5	-2,986.4	-408.9	3,010.6	0.00	0.00	0.00	
9,900.0	90.62	179.65	6,911.4	-3,086.4	-408.3	3,110.1	0.00	0.00	0.00	
10,000.0	90.62	179.65	6,910.3	-3,186.4	-407.7	3,209.7	0.00	0.00	0.00	
10,100.0	90.62	179.65	6,909.3	-3,286.4	-407.1	3,309.3	0.00	0.00	0.00	
10,200.0	90.62	179.65	6,908.2	-3,386.4	-406.5	3,408.8	0.00	0.00	0.00	
10,300.0	90.62	179.65	6,907.1	-3,486.4	-405.9	3,508.4	0.00	0.00	0.00	
10,400.0	90.62	179.65	6,906.0	-3,586.3	-405.3	3,608.0	0.00	0.00	0.00	
10,500.0	90.62	179.65	6,904.9	-3,686.3	-404.7	3,707.5	0.00	0.00	0.00	
10,600.0	90.62	179.65	6,903.9	-3,786.3	-404.1	3,807.1	0.00	0.00	0.00	
10,700.0	90.62	179.65	6,902.8	-3,886.3	-403.5	3,906.7	0.00	0.00	0.00	
10,800.0	90.62	179.65	6,901.7	-3,986.3	-402.9	4,006.2	0.00	0.00	0.00	
10,900.0	90.62	179.65	6,900.6	-4,086.3	-402.3	4,105.8	0.00	0.00	0.00	
11,000.0	90.62	179.65	6,899.5	-4,186.3	-401.7	4,205.4	0.00	0.00	0.00	
11,100.0	90.62	179.65	6,898.4	-4,286.3	-401.1	4,304.9	0.00	0.00	0.00	
11,200.0	90.62	179.65	6,897.4	-4,386.3	-400.5	4,404.5	0.00	0.00	0.00	
11,300.0	90.62	179.65	6,896.3	-4,486.3	-399.9	4,504.1	0.00	0.00	0.00	
11,400.0	90.62	179.65	6,895.2	-4,586.3	-399.3	4,603.6	0.00	0.00	0.00	
11,418.5	90.62	179.65	6,895.0	-4,604.8	-399.2	4,622.0	0.00	0.00	0.00	
BHL 500'FSL & 455'FWL										

Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude	
SHL 223'FNL & 883'F - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,339,314.55	3,256,448.24	40.261170	-104.581080	
BHL 500'FSL & 455'F - plan hits target center - Point	0.00	0.00	6,895.0	-4,604.8	-399.2	1,334,706.08	3,256,096.82	40.248530	-104.582510	

Casing Points						
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")		
7,412.6	6,938.3	7"	7	7-1/2		

Database:	Landmark	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Project:	SEC.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	North Reference:	True
Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-22-13)		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,717.7	3,700.0	PARKMAN		0.00	
4,424.1	4,400.0	SUSSEX		0.00	
5,129.7	5,100.0	SHANNON		0.00	
6,617.8	6,568.0	SHARON SPRINGS		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,500.0	1,500.0	0.0	0.0	KOP #1
6,204.4	6,174.5	173.0	-428.0	KOP #2
7,412.6	6,938.3	-599.2	-423.3	End of Build



Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.5-T3N-R64W

Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W

Becker Ranch 5E-323

Wellbore #1

Plan #1 (11-22-13)

Anticollision Report

12 December, 2013



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (11-22-13)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date	12/11/2013		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	11,418.5	Plan #1 (11-22-13) (Wellbore #1)	MWD	MWD - Standard

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						
Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W						
Becker Ranch 5E-403 - Wellbore #1 - Plan #1 (11-22-13)	800.0	800.0	27.9	24.5	8.278	CC, ES
Becker Ranch 5E-403 - Wellbore #1 - Plan #1 (11-22-13)	11,418.5	11,546.7	363.3	197.3	2.189	SF
Becker Ranch 5J-103 - Wellbore #1 - Plan #1 (11-22-13)	1,000.0	999.0	61.4	57.1	14.385	CC, ES
Becker Ranch 5J-103 - Wellbore #1 - Plan #1 (11-22-13)	11,418.5	11,248.8	670.1	492.9	3.780	SF
Becker Ranch 5J-443 - Wellbore #1 - Plan #1 (11-22-13)	1,500.0	1,500.0	30.7	24.2	4.710	CC, ES
Becker Ranch 5J-443 - Wellbore #1 - Plan #1 (11-22-13)	11,418.5	11,494.4	360.7	193.4	2.155	SF
Existing Wells Sec.5-T3N-R64W						
Becker 5-14 (Exist.) - Wellbore #1 - Wellbore #1	11,095.4	6,822.5	194.6	-25.9	0.883	Level 1, CC
Becker 5-14 (Exist.) - Wellbore #1 - Wellbore #1	11,100.0	6,822.4	194.6	-25.9	0.883	Level 1, ES, SF
Becker 5-9 (Exist.) - Wellbore #1 - Wellbore #1	8,290.5	6,896.8	275.7	105.3	1.618	CC, ES
Becker 5-9 (Exist.) - Wellbore #1 - Wellbore #1	8,300.0	6,896.7	275.9	105.3	1.618	SF

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference Measured Depth (ft)	Vertical Depth (ft)	Offset Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis			Offset Wellbore Centre		Distance				Warning	
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-89.99	0.0	-27.9	27.9					
100.0	100.0	100.0	100.0	0.1	0.1	-89.99	0.0	-27.9	27.9	27.7	0.22	124.171		
200.0	200.0	200.0	200.0	0.3	0.3	-89.99	0.0	-27.9	27.9	27.2	0.67	41.390		
300.0	300.0	300.0	300.0	0.6	0.6	-89.99	0.0	-27.9	27.9	26.8	1.12	24.834		
400.0	400.0	400.0	400.0	0.8	0.8	-89.99	0.0	-27.9	27.9	26.3	1.57	17.739		
500.0	500.0	500.0	500.0	1.0	1.0	-89.99	0.0	-27.9	27.9	25.9	2.02	13.797		
600.0	600.0	600.0	600.0	1.2	1.2	-89.99	0.0	-27.9	27.9	25.4	2.47	11.288		
700.0	700.0	700.0	700.0	1.5	1.5	-89.99	0.0	-27.9	27.9	25.0	2.92	9.552		
800.0	800.0	800.0	800.0	1.7	1.7	-89.99	0.0	-27.9	27.9	24.5	3.37	8.278	CC, ES	
900.0	900.0	899.0	899.0	1.9	1.9	-89.23	0.4	-29.6	29.6	25.8	3.81	7.768		
1,000.0	1,000.0	997.8	997.6	2.1	2.1	-87.38	1.6	-34.6	34.7	30.4	4.24	8.167		
1,100.0	1,100.0	1,096.1	1,095.6	2.4	2.3	-85.27	3.5	-42.8	43.2	38.5	4.69	9.198		
1,200.0	1,200.0	1,193.7	1,192.5	2.6	2.6	-83.42	6.3	-54.2	55.1	49.9	5.16	10.677		
1,300.0	1,300.0	1,291.5	1,289.2	2.8	2.9	-81.98	9.7	-68.5	70.0	64.4	5.65	12.398		
1,400.0	1,400.0	1,390.3	1,386.7	3.0	3.1	-81.01	13.2	-83.5	85.5	79.4	6.16	13.887		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Offset Design													Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5E-403 - Wellbore #1 - Plan #1 (11-22-13)	Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 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			
1,500.0	1,500.0	1,489.1	1,484.3	3.3	3.5	-80.34	16.8	-98.4	101.0	94.4	6.68	15.121			
1,600.0	1,600.0	1,588.1	1,582.1	3.5	3.8	-11.97	20.3	-113.4	114.9	108.0	6.90	16.656			
1,700.0	1,699.8	1,687.5	1,680.4	3.7	4.1	-12.01	23.9	-128.4	125.3	118.0	7.33	17.102			
1,800.0	1,799.5	1,787.3	1,778.9	3.9	4.5	-12.37	27.5	-143.5	132.4	124.6	7.76	17.061			
1,885.0	1,883.8	1,872.2	1,862.8	4.1	4.7	-12.90	30.5	-156.4	135.7	127.6	8.13	16.700			
1,900.0	1,898.7	1,887.2	1,877.6	4.1	4.8	-13.02	31.1	-158.7	136.1	127.9	8.19	16.607			
2,000.0	1,997.8	1,987.2	1,976.3	4.4	5.1	-13.77	34.7	-173.8	138.6	129.9	8.65	16.016			
2,100.0	2,096.9	2,087.1	2,075.1	4.7	5.5	-14.50	38.3	-188.9	141.1	132.0	9.12	15.477			
2,200.0	2,196.0	2,187.1	2,173.8	4.9	5.8	-15.20	41.9	-204.0	143.6	134.1	9.58	14.986			
2,300.0	2,295.1	2,287.0	2,272.5	5.2	6.2	-15.88	45.5	-219.2	146.2	136.1	10.06	14.536			
2,400.0	2,394.2	2,387.0	2,371.3	5.5	6.6	-16.54	49.0	-234.3	148.8	138.2	10.53	14.122			
2,500.0	2,493.3	2,486.9	2,470.0	5.8	6.9	-17.17	52.6	-249.4	151.4	140.4	11.02	13.741			
2,600.0	2,592.4	2,586.9	2,568.8	6.1	7.3	-17.78	56.2	-264.6	154.0	142.5	11.50	13.388			
2,700.0	2,691.5	2,686.8	2,667.5	6.4	7.6	-18.37	59.8	-279.7	156.6	144.6	11.99	13.062			
2,800.0	2,790.6	2,786.8	2,766.2	6.7	8.0	-18.94	63.4	-294.8	159.3	146.8	12.48	12.758			
2,900.0	2,889.7	2,886.7	2,865.0	7.0	8.4	-19.49	67.0	-309.9	161.9	149.0	12.98	12.476			
3,000.0	2,988.8	2,986.7	2,963.7	7.3	8.7	-20.02	70.6	-325.1	164.6	151.1	13.48	12.212			
3,100.0	3,087.9	3,086.6	3,062.4	7.6	9.1	-20.54	74.2	-340.2	167.3	153.3	13.98	11.966			
3,200.0	3,187.0	3,186.6	3,161.2	8.0	9.5	-21.04	77.8	-355.3	170.0	155.5	14.49	11.735			
3,300.0	3,286.1	3,286.5	3,259.9	8.3	9.8	-21.53	81.4	-370.4	172.7	157.7	15.00	11.518			
3,400.0	3,385.2	3,386.5	3,358.6	8.6	10.2	-22.00	85.0	-385.6	175.5	159.9	15.51	11.314			
3,500.0	3,484.3	3,486.4	3,457.4	8.9	10.6	-22.45	88.6	-400.7	178.2	162.2	16.02	11.122			
3,600.0	3,583.4	3,586.4	3,556.1	9.2	10.9	-22.89	92.2	-415.8	180.9	164.4	16.54	10.941			
3,700.0	3,682.5	3,686.4	3,654.8	9.6	11.3	-23.32	95.8	-431.0	183.7	166.6	17.06	10.770			
3,800.0	3,781.6	3,786.3	3,753.6	9.9	11.7	-23.74	99.4	-446.1	186.5	168.9	17.58	10.608			
3,900.0	3,880.7	3,886.3	3,852.3	10.2	12.0	-24.14	103.0	-461.2	189.3	171.2	18.10	10.455			
4,000.0	3,979.8	3,986.2	3,951.1	10.5	12.4	-24.53	106.6	-476.3	192.0	173.4	18.63	10.309			
4,100.0	4,078.9	4,086.2	4,049.8	10.9	12.8	-24.91	110.2	-491.5	194.8	175.7	19.16	10.171			
4,200.0	4,178.0	4,186.1	4,148.5	11.2	13.1	-25.28	113.8	-506.6	197.7	178.0	19.69	10.039			
4,300.0	4,277.1	4,286.1	4,247.3	11.5	13.5	-25.64	117.4	-521.7	200.5	180.3	20.22	9.914			
4,400.0	4,376.2	4,386.0	4,346.0	11.8	13.9	-25.99	120.9	-536.8	203.3	182.5	20.76	9.794			
4,500.0	4,475.3	4,486.0	4,444.7	12.2	14.3	-26.33	124.5	-552.0	206.1	184.8	21.29	9.680			
4,600.0	4,574.4	4,585.9	4,543.5	12.5	14.6	-26.66	128.1	-567.1	209.0	187.1	21.83	9.572			
4,700.0	4,673.5	4,685.9	4,642.2	12.8	15.0	-26.98	131.7	-582.2	211.8	189.4	22.37	9.468			
4,800.0	4,772.6	4,785.8	4,740.9	13.2	15.4	-27.29	135.3	-597.4	214.7	191.7	22.91	9.368			
4,900.0	4,871.7	4,885.8	4,839.7	13.5	15.7	-27.60	138.9	-612.5	217.5	194.1	23.46	9.273			
4,944.9	4,916.2	4,930.7	4,884.0	13.6	15.9	-27.73	140.5	-619.3	218.8	195.1	23.70	9.231			
5,000.0	4,970.8	4,985.7	4,938.4	13.8	16.1	-27.85	142.5	-627.6	220.8	196.9	23.99	9.207			
5,100.0	5,070.3	5,085.5	5,037.0	14.0	16.5	-27.76	146.1	-642.7	227.0	202.5	24.43	9.289			
5,200.0	5,170.1	5,185.1	5,135.3	14.2	16.8	-27.31	149.7	-657.8	236.1	211.3	24.82	9.515			
5,300.0	5,270.1	5,284.2	5,233.3	14.4	17.2	-26.57	153.3	-672.8	248.5	223.3	25.14	9.883			
5,329.9	5,300.0	5,313.8	5,262.5	14.4	17.3	-94.29	154.3	-677.3	252.8	227.6	25.20	10.031			
5,400.0	5,370.1	5,383.1	5,330.9	14.5	17.6	-93.57	156.8	-687.7	263.2	237.7	25.45	10.342			
5,500.0	5,470.1	5,481.8	5,428.5	14.7	17.9	-92.64	160.4	-702.7	278.1	252.3	25.83	10.769			
5,600.0	5,570.1	5,580.6	5,526.0	14.9	18.3	-91.80	163.9	-717.6	293.1	266.9	26.22	11.181			
5,700.0	5,670.1	5,687.5	5,631.8	15.1	18.7	-91.03	167.5	-732.8	307.2	280.6	26.61	11.545			
5,800.0	5,770.1	5,798.7	5,742.3	15.2	18.9	-90.49	170.3	-744.6	317.8	290.8	27.00	11.774			
5,900.0	5,870.1	5,910.7	5,854.0	15.4	19.1	-90.15	172.1	-752.3	324.7	297.3	27.38	11.858			
6,000.0	5,970.1	6,023.1	5,966.3	15.6	19.3	-90.01	173.0	-755.7	327.7	300.0	27.77	11.801			
6,100.0	6,070.1	6,126.8	6,070.1	15.8	19.4	-90.00	173.0	-755.9	327.9	299.7	28.16	11.643			
6,204.4	6,174.4	6,231.2	6,174.4	16.0	19.6	-90.00	173.0	-755.9	327.9	299.3	28.58	11.474			

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Offset Design													Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5E-403 - Wellbore #1 - Plan #1 (11-22-13)	Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 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			
6,250.0	6,220.1	6,276.8	6,220.1	16.1	19.7	90.58	173.0	-755.9	327.9	299.2	28.75	11.404			
6,300.0	6,269.8	6,326.6	6,269.8	16.1	19.7	91.38	173.0	-755.9	328.0	299.1	28.86	11.364			
6,350.0	6,319.2	6,376.8	6,320.1	16.2	19.8	92.50	171.6	-755.9	328.2	299.3	28.93	11.345			
6,400.0	6,368.0	6,427.6	6,370.6	16.2	19.9	93.61	166.8	-755.9	328.6	299.6	28.98	11.337			
6,450.0	6,415.9	6,478.8	6,421.1	16.3	19.9	94.72	158.6	-755.8	329.0	300.0	29.03	11.335			
6,500.0	6,462.8	6,530.4	6,471.4	16.3	19.9	95.80	147.0	-755.8	329.6	300.6	29.07	11.339			
6,550.0	6,508.4	6,582.5	6,521.2	16.3	20.0	96.86	131.8	-755.7	330.3	301.2	29.12	11.345			
6,600.0	6,552.6	6,635.1	6,570.3	16.4	20.0	97.89	113.1	-755.6	331.1	302.0	29.18	11.350			
6,650.0	6,595.2	6,688.1	6,618.4	16.4	20.0	98.88	90.8	-755.5	332.0	302.8	29.25	11.351			
6,700.0	6,636.0	6,741.5	6,665.3	16.4	20.1	99.84	65.0	-755.4	333.0	303.6	29.35	11.346			
6,750.0	6,674.9	6,795.5	6,710.5	16.5	20.1	100.75	35.8	-755.2	333.9	304.5	29.47	11.330			
6,800.0	6,711.6	6,849.8	6,754.0	16.5	20.1	101.61	3.1	-755.0	335.0	305.3	29.64	11.303			
6,850.0	6,745.9	6,904.6	6,795.3	16.6	20.2	102.41	-32.8	-754.9	336.0	306.2	29.84	11.259			
6,900.0	6,777.9	6,959.8	6,834.2	16.7	20.3	103.16	-71.9	-754.7	337.0	306.9	30.10	11.196			
6,950.0	6,807.2	7,015.4	6,870.5	16.8	20.3	103.85	-114.0	-754.4	338.0	307.6	30.42	11.113			
7,000.0	6,833.9	7,071.3	6,903.8	17.0	20.4	104.47	-159.0	-754.2	339.0	308.2	30.80	11.008			
7,050.0	6,857.7	7,127.5	6,933.8	17.2	20.6	105.02	-206.5	-754.0	339.9	308.7	31.24	10.881			
7,100.0	6,878.6	7,184.1	6,960.5	17.4	20.7	105.51	-256.4	-753.7	340.7	309.0	31.76	10.730			
7,150.0	6,896.4	7,240.9	6,983.4	17.7	20.9	105.91	-308.3	-753.4	341.5	309.1	32.34	10.557			
7,200.0	6,911.2	7,297.9	7,002.5	18.1	21.2	106.25	-362.0	-753.2	342.1	309.1	33.01	10.363			
7,250.0	6,922.9	7,355.1	7,017.6	18.5	21.5	106.51	-417.2	-752.9	342.6	308.8	33.76	10.148			
7,300.0	6,931.3	7,412.5	7,028.5	19.0	21.9	106.68	-473.5	-752.6	342.9	308.3	34.58	9.918			
7,350.0	6,936.5	7,467.4	7,035.2	19.5	22.3	106.81	-527.9	-752.3	343.2	307.8	35.44	9.684			
7,400.0	6,938.4	7,517.2	7,040.4	20.0	22.8	107.26	-577.5	-752.1	344.2	308.0	36.23	9.501			
7,412.6	6,938.3	7,530.3	7,041.8	20.2	22.9	107.45	-590.6	-752.0	344.6	308.2	36.42	9.462			
7,500.0	6,937.4	7,626.5	7,047.3	21.2	23.8	108.49	-686.5	-751.5	346.6	308.3	38.30	9.050			
7,600.0	6,936.3	7,728.4	7,047.3	22.5	24.9	108.66	-788.4	-751.0	347.0	306.2	40.77	8.512			
7,700.0	6,935.2	7,828.4	7,047.2	23.8	26.2	108.80	-888.4	-750.5	347.4	304.0	43.38	8.008			
7,800.0	6,934.2	7,928.4	7,047.1	25.3	27.5	108.94	-988.4	-749.9	347.8	301.7	46.13	7.539			
7,900.0	6,933.1	8,028.4	7,046.9	26.8	28.8	109.08	-1,088.4	-749.4	348.2	299.2	48.99	7.107			
8,000.0	6,932.0	8,128.4	7,046.8	28.3	30.3	109.23	-1,188.4	-748.9	348.6	296.6	51.94	6.711			
8,100.0	6,930.9	8,228.3	7,046.6	29.9	31.8	109.37	-1,288.4	-748.4	349.0	294.0	54.97	6.348			
8,200.0	6,929.8	8,328.3	7,046.5	31.6	33.3	109.51	-1,388.4	-747.9	349.4	291.3	58.06	6.017			
8,300.0	6,928.7	8,428.3	7,046.4	33.2	34.9	109.65	-1,488.4	-747.4	349.8	288.6	61.20	5.715			
8,400.0	6,927.7	8,528.3	7,046.2	34.9	36.5	109.79	-1,588.4	-746.9	350.2	285.8	64.39	5.438			
8,500.0	6,926.6	8,628.3	7,046.1	36.6	38.2	109.93	-1,688.4	-746.4	350.6	283.0	67.61	5.185			
8,600.0	6,925.5	8,728.3	7,045.9	38.4	39.8	110.07	-1,788.3	-745.8	351.0	280.1	70.87	4.953			
8,700.0	6,924.4	8,828.3	7,045.8	40.1	41.5	110.21	-1,888.3	-745.3	351.4	277.2	74.15	4.739			
8,800.0	6,923.3	8,928.3	7,045.7	41.9	43.2	110.35	-1,988.3	-744.8	351.8	274.3	77.45	4.542			
8,900.0	6,922.3	9,028.3	7,045.5	43.6	44.9	110.48	-2,088.3	-744.3	352.2	271.4	80.77	4.360			
9,000.0	6,921.2	9,128.3	7,045.4	45.4	46.7	110.62	-2,188.3	-743.8	352.6	268.5	84.11	4.192			
9,100.0	6,920.1	9,228.3	7,045.2	47.2	48.4	110.76	-2,288.3	-743.3	353.0	265.6	87.46	4.037			
9,200.0	6,919.0	9,328.3	7,045.1	49.0	50.2	110.90	-2,388.3	-742.8	353.5	262.6	90.82	3.892			
9,300.0	6,917.9	9,428.3	7,045.0	50.8	52.0	111.04	-2,488.3	-742.2	353.9	259.7	94.19	3.757			
9,400.0	6,916.8	9,528.3	7,044.8	52.7	53.8	111.17	-2,588.3	-741.7	354.3	256.7	97.56	3.631			
9,500.0	6,915.8	9,628.3	7,044.7	54.5	55.6	111.31	-2,688.3	-741.2	354.7	253.8	100.95	3.514			
9,600.0	6,914.7	9,728.3	7,044.5	56.3	57.4	111.45	-2,788.3	-740.7	355.2	250.8	104.34	3.404			
9,700.0	6,913.6	9,828.3	7,044.4	58.2	59.2	111.58	-2,888.3	-740.2	355.6	247.9	107.73	3.301			
9,800.0	6,912.5	9,928.3	7,044.3	60.0	61.0	111.72	-2,988.3	-739.7	356.0	244.9	111.12	3.204			
9,900.0	6,911.4	10,028.3	7,044.1	61.9	62.8	111.85	-3,088.3	-739.2	356.4	241.9	114.52	3.113			
10,000.0	6,910.3	10,128.3	7,044.0	63.7	64.7	111.99	-3,188.3	-738.6	356.9	239.0	117.91	3.027			

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft		
Survey Program: 0-MWD													Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5E-403 - Wellbore #1 - Plan #1 (11-22-13)		Offset Well Error:	0.0 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				
10,100.0	6,909.3	10,228.3	7,043.8	65.6	66.5	112.12	-3,288.3	-738.1	357.3	236.0	121.31	2.945				
10,200.0	6,908.2	10,328.3	7,043.7	67.4	68.3	112.26	-3,388.3	-737.6	357.8	233.0	124.71	2.869				
10,300.0	6,907.1	10,428.2	7,043.6	69.3	70.2	112.39	-3,488.2	-737.1	358.2	230.1	128.11	2.796				
10,400.0	6,906.0	10,528.2	7,043.4	71.2	72.0	112.53	-3,588.2	-736.6	358.6	227.1	131.51	2.727				
10,500.0	6,904.9	10,628.2	7,043.3	73.1	73.9	112.66	-3,688.2	-736.1	359.1	224.2	134.90	2.662				
10,600.0	6,903.9	10,728.2	7,043.1	74.9	75.7	112.79	-3,788.2	-735.6	359.5	221.2	138.29	2.600				
10,700.0	6,902.8	10,828.2	7,043.0	76.8	77.6	112.92	-3,888.2	-735.1	360.0	218.3	141.69	2.541				
10,800.0	6,901.7	10,928.2	7,042.9	78.7	79.4	113.06	-3,988.2	-734.5	360.4	215.4	145.08	2.484				
10,900.0	6,900.6	11,028.2	7,042.7	80.6	81.3	113.19	-4,088.2	-734.0	360.9	212.4	148.46	2.431				
11,000.0	6,899.5	11,128.2	7,042.6	82.4	83.2	113.32	-4,188.2	-733.5	361.3	209.5	151.85	2.380				
11,100.0	6,898.4	11,228.2	7,042.4	84.3	85.0	113.45	-4,288.2	-733.0	361.8	206.6	155.23	2.331				
11,200.0	6,897.4	11,328.2	7,042.3	86.2	86.9	113.58	-4,388.2	-732.5	362.3	203.7	158.60	2.284				
11,300.0	6,896.3	11,428.2	7,042.2	88.1	88.8	113.71	-4,488.2	-732.0	362.7	200.7	161.98	2.239				
11,400.0	6,895.2	11,528.2	7,042.0	90.0	90.7	113.84	-4,588.2	-731.5	363.2	197.8	165.35	2.196				
11,418.5	6,895.0	11,546.7	7,042.0	90.3	91.0	113.87	-4,606.7	-731.4	363.3	197.3	165.97	2.189 SF				

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Offset Design													Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5J-103 - Wellbore #1 - Plan #1 (11-22-13)	Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 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			
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	61.4	61.4						
100.0	100.0	99.0	99.0	0.1	0.1	90.00	0.0	61.4	61.4	61.2	0.22	274.546			
200.0	200.0	199.0	199.0	0.3	0.3	90.00	0.0	61.4	61.4	60.7	0.67	91.363			
300.0	300.0	299.0	299.0	0.6	0.6	90.00	0.0	61.4	61.4	60.3	1.12	54.745			
400.0	400.0	399.0	399.0	0.8	0.8	90.00	0.0	61.4	61.4	59.8	1.57	39.081			
500.0	500.0	499.0	499.0	1.0	1.0	90.00	0.0	61.4	61.4	59.4	2.02	30.387			
600.0	600.0	599.0	599.0	1.2	1.2	90.00	0.0	61.4	61.4	58.9	2.47	24.857			
700.0	700.0	699.0	699.0	1.5	1.5	90.00	0.0	61.4	61.4	58.5	2.92	21.030			
800.0	800.0	799.0	799.0	1.7	1.7	90.00	0.0	61.4	61.4	58.0	3.37	18.224			
900.0	900.0	899.0	899.0	1.9	1.9	90.00	0.0	61.4	61.4	57.6	3.82	16.079			
1,000.0	1,000.0	999.0	999.0	2.1	2.1	90.00	0.0	61.4	61.4	57.1	4.27	14.385 CC, ES			
1,100.0	1,100.0	1,097.5	1,097.5	2.4	2.4	88.92	1.2	62.6	62.6	57.9	4.71	13.288			
1,200.0	1,200.0	1,196.0	1,195.8	2.6	2.6	85.90	4.7	66.1	66.3	61.2	5.15	12.876			
1,300.0	1,300.0	1,295.8	1,295.4	2.8	2.8	82.54	9.2	70.6	71.3	65.7	5.60	12.724			
1,400.0	1,400.0	1,395.6	1,395.0	3.0	3.0	79.61	13.8	75.1	76.4	70.4	6.06	12.622			
1,500.0	1,500.0	1,495.3	1,494.6	3.3	3.3	77.06	18.3	79.6	81.8	75.2	6.51	12.554			
1,600.0	1,600.0	1,595.1	1,594.1	3.5	3.5	143.42	22.8	84.1	88.6	81.7	6.93	12.795			
1,700.0	1,699.8	1,694.6	1,693.4	3.7	3.7	143.23	27.3	88.5	98.3	90.9	7.35	13.369			
1,800.0	1,799.5	1,793.8	1,792.4	3.9	4.0	144.11	31.8	93.0	110.8	103.0	7.78	14.242			
1,885.0	1,883.8	1,877.8	1,876.2	4.1	4.2	145.41	35.6	96.8	123.6	115.5	8.14	15.191			
1,900.0	1,898.7	1,892.6	1,891.0	4.1	4.2	145.69	36.2	97.4	126.1	117.9	8.20	15.368			
2,000.0	1,997.8	1,991.1	1,989.3	4.4	4.4	147.32	40.7	101.9	142.5	133.9	8.65	16.478			
2,100.0	2,096.9	2,089.7	2,087.7	4.7	4.7	148.62	45.2	106.3	159.1	150.0	9.10	17.479			
2,200.0	2,196.0	2,188.2	2,186.1	4.9	4.9	149.67	49.6	110.7	175.7	166.1	9.56	18.383			
2,300.0	2,295.1	2,286.8	2,284.4	5.2	5.2	150.54	54.1	115.2	192.3	182.3	10.02	19.204			
2,400.0	2,394.2	2,385.4	2,382.8	5.5	5.4	151.27	58.5	119.6	209.0	198.6	10.48	19.950			
2,500.0	2,493.3	2,483.9	2,481.2	5.8	5.6	151.89	63.0	124.0	225.8	214.8	10.94	20.632			
2,600.0	2,592.4	2,582.5	2,579.5	6.1	5.9	152.42	67.4	128.5	242.5	231.1	11.41	21.255			
2,700.0	2,691.5	2,681.1	2,677.9	6.4	6.1	152.89	71.9	132.9	259.3	247.4	11.88	21.828			
2,800.0	2,790.6	2,779.6	2,776.3	6.7	6.4	153.30	76.4	137.3	276.0	263.7	12.35	22.355			
2,900.0	2,889.7	2,878.2	2,874.6	7.0	6.6	153.67	80.8	141.8	292.8	280.0	12.82	22.842			
3,000.0	2,988.8	2,976.8	2,973.0	7.3	6.9	153.99	85.3	146.2	309.6	296.3	13.29	23.293			
3,100.0	3,087.9	3,075.3	3,071.4	7.6	7.1	154.28	89.7	150.6	326.4	312.7	13.77	23.711			
3,200.0	3,187.0	3,173.9	3,169.7	8.0	7.4	154.54	94.2	155.0	343.2	329.0	14.24	24.101			
3,300.0	3,286.1	3,272.5	3,268.1	8.3	7.6	154.78	98.7	159.5	360.0	345.3	14.72	24.464			
3,400.0	3,385.2	3,371.0	3,366.4	8.6	7.8	155.00	103.1	163.9	376.9	361.7	15.19	24.803			
3,500.0	3,484.3	3,469.6	3,464.8	8.9	8.1	155.19	107.6	168.3	393.7	378.0	15.67	25.121			
3,600.0	3,583.4	3,568.2	3,563.2	9.2	8.3	155.38	112.0	172.8	410.5	394.4	16.15	25.419			
3,700.0	3,682.5	3,666.7	3,661.5	9.6	8.6	155.54	116.5	177.2	427.4	410.7	16.63	25.699			
3,800.0	3,781.6	3,765.3	3,759.9	9.9	8.8	155.70	120.9	181.6	444.2	427.1	17.11	25.963			
3,900.0	3,880.7	3,863.9	3,858.3	10.2	9.1	155.84	125.4	186.1	461.1	443.5	17.59	26.211			
4,000.0	3,979.8	3,962.4	3,956.6	10.5	9.3	155.97	129.9	190.5	477.9	459.8	18.07	26.446			
4,100.0	4,078.9	4,061.0	4,055.0	10.9	9.6	156.10	134.3	194.9	494.7	476.2	18.55	26.668			
4,200.0	4,178.0	4,159.5	4,153.4	11.2	9.8	156.22	138.8	199.4	511.6	492.6	19.03	26.879			
4,300.0	4,277.1	4,258.1	4,251.7	11.5	10.1	156.32	143.2	203.8	528.4	508.9	19.52	27.078			
4,400.0	4,376.2	4,356.7	4,350.1	11.8	10.3	156.43	147.7	208.2	545.3	525.3	20.00	27.268			
4,500.0	4,475.3	4,455.2	4,448.5	12.2	10.5	156.52	152.2	212.7	562.2	541.7	20.48	27.448			
4,600.0	4,574.4	4,553.8	4,546.8	12.5	10.8	156.61	156.6	217.1	579.0	558.0	20.96	27.619			
4,700.0	4,673.5	4,652.4	4,645.2	12.8	11.0	156.70	161.1	221.5	595.9	574.4	21.45	27.783			
4,800.0	4,772.6	4,750.9	4,743.6	13.2	11.3	156.78	165.5	226.0	612.7	590.8	21.93	27.939			
4,900.0	4,871.7	4,854.1	4,846.5	13.5	11.5	156.87	170.1	230.5	629.5	607.1	22.42	28.081			

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5J-103 - Wellbore #1 - Plan #1 (11-22-13)														
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
4,944.9	4,916.2	4,906.8	4,899.2	13.6	11.6	156.97	171.7	232.1	636.5	613.8	22.63	28.118		
5,000.0	4,970.8	4,971.7	4,964.1	13.8	11.8	157.21	172.8	233.2	643.7	620.8	22.90	28.111		
5,100.0	5,070.3	5,077.0	5,069.3	14.0	12.0	157.62	173.0	233.4	652.9	629.5	23.32	27.990		
5,200.0	5,170.1	5,176.8	5,169.1	14.2	12.1	157.87	173.0	233.4	658.7	634.9	23.73	27.752		
5,300.0	5,270.1	5,276.8	5,269.1	14.4	12.4	157.98	173.0	233.4	661.3	637.1	24.12	27.414		
5,329.9	5,300.0	5,306.7	5,299.0	14.4	12.4	90.00	173.0	233.4	661.4	637.2	24.23	27.301		
5,400.0	5,370.1	5,376.8	5,369.1	14.5	12.6	90.00	173.0	233.4	661.4	636.9	24.51	26.990		
5,500.0	5,470.1	5,476.8	5,469.1	14.7	12.8	90.00	173.0	233.4	661.4	636.5	24.92	26.542		
5,600.0	5,570.1	5,576.8	5,569.1	14.9	13.0	90.00	173.0	233.4	661.4	636.1	25.33	26.107		
5,700.0	5,670.1	5,676.8	5,669.1	15.1	13.2	90.00	173.0	233.4	661.4	635.7	25.75	25.686		
5,800.0	5,770.1	5,776.8	5,769.1	15.2	13.4	90.00	173.0	233.4	661.4	635.2	26.17	25.276		
5,900.0	5,870.1	5,876.8	5,869.1	15.4	13.6	90.00	173.0	233.4	661.4	634.8	26.58	24.879		
6,000.0	5,970.1	5,976.8	5,969.1	15.6	13.8	90.00	173.0	233.4	661.4	634.4	27.00	24.493		
6,049.7	6,019.8	6,026.4	6,018.8	15.7	13.9	90.00	173.0	233.4	661.4	634.2	27.21	24.305		
6,100.0	6,070.1	6,076.6	6,068.9	15.8	14.0	90.08	172.1	233.4	661.4	634.0	27.40	24.135		
6,204.4	6,174.4	6,178.9	6,170.4	16.0	14.1	91.10	160.3	233.5	661.6	633.9	27.74	23.853		
6,250.0	6,220.1	6,222.6	6,213.2	16.1	14.2	-87.85	151.1	233.5	661.9	634.0	27.86	23.761		
6,300.0	6,269.8	6,270.0	6,258.8	16.1	14.2	-87.09	138.4	233.6	662.2	634.3	27.95	23.691		
6,350.0	6,319.2	6,316.9	6,303.1	16.2	14.3	-86.35	123.1	233.7	662.7	634.7	28.04	23.639		
6,400.0	6,368.0	6,363.3	6,346.0	16.2	14.3	-85.63	105.3	233.8	663.3	635.2	28.11	23.599		
6,450.0	6,415.9	6,409.3	6,387.3	16.3	14.3	-84.92	85.1	233.9	664.0	635.8	28.18	23.566		
6,500.0	6,462.8	6,454.9	6,427.0	16.3	14.4	-84.25	62.7	234.0	664.8	636.5	28.25	23.533		
6,550.0	6,508.4	6,500.0	6,464.9	16.3	14.4	-83.59	38.2	234.1	665.6	637.2	28.33	23.496		
6,600.0	6,552.6	6,544.9	6,501.1	16.4	14.5	-82.96	11.6	234.3	666.4	638.0	28.42	23.446		
6,650.0	6,595.2	6,589.5	6,535.4	16.4	14.5	-82.37	-16.7	234.4	667.3	638.8	28.55	23.377		
6,700.0	6,636.0	6,633.7	6,567.8	16.4	14.6	-81.80	-46.8	234.6	668.2	639.5	28.70	23.283		
6,750.0	6,674.9	6,677.6	6,598.2	16.5	14.7	-81.27	-78.5	234.8	669.1	640.2	28.89	23.160		
6,800.0	6,711.6	6,721.2	6,626.5	16.5	14.8	-80.77	-111.7	235.0	670.0	640.9	29.13	23.002		
6,850.0	6,745.9	6,764.7	6,652.8	16.6	15.0	-80.31	-146.3	235.2	670.9	641.5	29.42	22.805		
6,900.0	6,777.9	6,807.9	6,676.9	16.7	15.2	-79.88	-182.1	235.3	671.7	642.0	29.77	22.566		
6,950.0	6,807.2	6,850.0	6,698.5	16.8	15.4	-79.50	-218.3	235.5	672.5	642.4	30.17	22.289		
7,000.0	6,833.9	6,893.7	6,718.7	17.0	15.7	-79.15	-257.1	235.8	673.3	642.6	30.66	21.958		
7,050.0	6,857.7	6,936.4	6,736.3	17.2	16.0	-78.84	-295.9	236.0	673.9	642.7	31.21	21.590		
7,100.0	6,878.6	6,978.9	6,751.6	17.4	16.3	-78.58	-335.6	236.2	674.5	642.7	31.84	21.185		
7,150.0	6,896.4	7,021.3	6,764.6	17.7	16.7	-78.35	-376.0	236.4	675.0	642.5	32.53	20.748		
7,200.0	6,911.2	7,063.7	6,775.4	18.1	17.1	-78.17	-416.9	236.6	675.4	642.1	33.30	20.284		
7,250.0	6,922.9	7,105.9	6,783.9	18.5	17.5	-78.03	-458.3	236.9	675.7	641.6	34.13	19.799		
7,300.0	6,931.3	7,150.0	6,790.3	19.0	18.0	-77.94	-501.9	237.1	675.9	640.9	35.05	19.287		
7,350.0	6,936.5	7,190.3	6,793.9	19.5	18.4	-77.89	-542.1	237.3	676.0	640.1	35.99	18.785		
7,400.0	6,938.4	7,232.5	6,795.5	20.0	18.9	-77.88	-584.2	237.6	676.0	639.0	37.00	18.271		
7,412.6	6,938.3	7,243.9	6,795.5	20.2	19.1	-77.89	-595.6	237.6	676.0	638.7	37.27	18.138		
7,500.0	6,937.4	7,330.4	6,795.0	21.2	20.2	-77.92	-682.1	238.1	675.9	636.5	39.41	17.151		
7,600.0	6,936.3	7,430.4	6,794.4	22.5	21.5	-77.96	-782.1	238.6	675.7	633.7	42.04	16.074		
7,700.0	6,935.2	7,530.4	6,793.7	23.8	22.9	-78.00	-882.1	239.2	675.6	630.7	44.83	15.069		
7,800.0	6,934.2	7,630.4	6,793.1	25.3	24.4	-78.04	-982.1	239.7	675.4	627.7	47.76	14.142		
7,900.0	6,933.1	7,730.4	6,792.5	26.8	26.0	-78.07	-1,082.1	240.3	675.3	624.5	50.80	13.292		
8,000.0	6,932.0	7,830.4	6,791.9	28.3	27.6	-78.11	-1,182.1	240.8	675.1	621.2	53.94	12.516		
8,100.0	6,930.9	7,930.4	6,791.3	29.9	29.2	-78.15	-1,282.1	241.4	675.0	617.8	57.16	11.809		
8,200.0	6,929.8	8,030.4	6,790.7	31.6	30.9	-78.19	-1,382.1	241.9	674.8	614.4	60.44	11.166		
8,300.0	6,928.7	8,130.4	6,790.1	33.2	32.6	-78.23	-1,482.0	242.5	674.7	610.9	63.77	10.579		
8,400.0	6,927.7	8,230.4	6,789.5	34.9	34.3	-78.26	-1,582.0	243.0	674.5	607.4	67.16	10.044		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference													Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5J-103 - Wellbore #1 - Plan #1 (11-22-13)	
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		
8,500.0	6,926.6	8,330.4	6,788.9	36.6	36.0	-78.30	-1,682.0	243.6	674.4	603.8	70.58	9.554		
8,600.0	6,925.5	8,430.4	6,788.2	38.4	37.8	-78.34	-1,782.0	244.1	674.2	600.2	74.05	9.105		
8,700.0	6,924.4	8,530.4	6,787.6	40.1	39.6	-78.38	-1,882.0	244.7	674.1	596.5	77.54	8.693		
8,800.0	6,923.3	8,630.4	6,787.0	41.9	41.3	-78.42	-1,982.0	245.2	673.9	592.9	81.06	8.314		
8,900.0	6,922.3	8,730.4	6,786.4	43.6	43.1	-78.46	-2,082.0	245.8	673.8	589.2	84.60	7.964		
9,000.0	6,921.2	8,830.4	6,785.8	45.4	44.9	-78.49	-2,182.0	246.3	673.6	585.5	88.17	7.641		
9,100.0	6,920.1	8,930.4	6,785.2	47.2	46.8	-78.53	-2,282.0	246.9	673.5	581.7	91.75	7.341		
9,200.0	6,919.0	9,030.4	6,784.6	49.0	48.6	-78.57	-2,382.0	247.4	673.3	578.0	95.35	7.062		
9,300.0	6,917.9	9,130.4	6,784.0	50.8	50.4	-78.61	-2,482.0	248.0	673.2	574.2	98.96	6.803		
9,400.0	6,916.8	9,230.4	6,783.4	52.7	52.3	-78.65	-2,582.0	248.5	673.0	570.5	102.59	6.561		
9,500.0	6,915.8	9,330.4	6,782.7	54.5	54.1	-78.69	-2,682.0	249.1	672.9	566.7	106.23	6.334		
9,600.0	6,914.7	9,430.4	6,782.1	56.3	56.0	-78.72	-2,782.0	249.6	672.7	562.9	109.88	6.123		
9,700.0	6,913.6	9,530.4	6,781.5	58.2	57.8	-78.76	-2,882.0	250.1	672.6	559.1	113.54	5.924		
9,800.0	6,912.5	9,630.4	6,780.9	60.0	59.7	-78.80	-2,982.0	250.7	672.5	555.2	117.21	5.737		
9,900.0	6,911.4	9,730.4	6,780.3	61.9	61.5	-78.84	-3,082.0	251.2	672.3	551.4	120.89	5.561		
10,000.0	6,910.3	9,830.4	6,779.7	63.7	63.4	-78.88	-3,182.0	251.8	672.2	547.6	124.58	5.396		
10,100.0	6,909.3	9,930.4	6,779.1	65.6	65.3	-78.92	-3,282.0	252.3	672.0	543.8	128.27	5.239		
10,200.0	6,908.2	10,030.4	6,778.5	67.4	67.1	-78.96	-3,382.0	252.9	671.9	539.9	131.97	5.091		
10,300.0	6,907.1	10,130.4	6,777.9	69.3	69.0	-78.99	-3,482.0	253.4	671.7	536.1	135.68	4.951		
10,400.0	6,906.0	10,230.3	6,777.2	71.2	70.9	-79.03	-3,582.0	254.0	671.6	532.2	139.39	4.818		
10,500.0	6,904.9	10,330.3	6,776.6	73.1	72.8	-79.07	-3,681.9	254.5	671.4	528.3	143.10	4.692		
10,600.0	6,903.9	10,430.3	6,776.0	74.9	74.6	-79.11	-3,781.9	255.1	671.3	524.5	146.83	4.572		
10,700.0	6,902.8	10,530.3	6,775.4	76.8	76.5	-79.15	-3,881.9	255.6	671.2	520.6	150.55	4.458		
10,800.0	6,901.7	10,630.3	6,774.8	78.7	78.4	-79.19	-3,981.9	256.2	671.0	516.7	154.28	4.349		
10,900.0	6,900.6	10,730.3	6,774.2	80.6	80.3	-79.23	-4,081.9	256.7	670.9	512.9	158.02	4.246		
11,000.0	6,899.5	10,830.3	6,773.6	82.4	82.2	-79.26	-4,181.9	257.3	670.7	509.0	161.76	4.147		
11,100.0	6,898.4	10,930.3	6,773.0	84.3	84.1	-79.30	-4,281.9	257.8	670.6	505.1	165.50	4.052		
11,200.0	6,897.4	11,030.3	6,772.4	86.2	86.0	-79.34	-4,381.9	258.4	670.4	501.2	169.25	3.961		
11,300.0	6,896.3	11,130.3	6,771.8	88.1	87.9	-79.38	-4,481.9	258.9	670.3	497.3	173.00	3.875		
11,400.0	6,895.2	11,230.3	6,771.1	90.0	89.6	-79.42	-4,581.9	259.5	670.2	493.5	176.64	3.794		
11,418.5	6,895.0	11,248.8	6,771.0	90.3	89.9	-79.43	-4,600.4	259.6	670.1	492.9	177.27	3.780 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Offset Design													Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5J-443 - Wellbore #1 - Plan #1 (11-22-13)	Offset Site Error:	0.0 ft
Survey Program: 0-MWD														Offset Well Error:	0.0 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			
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	30.7	30.7						
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	30.7	30.7	30.5	0.22	136.588			
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	30.7	30.7	30.0	0.67	45.529			
300.0	300.0	300.0	300.0	0.6	0.6	90.00	0.0	30.7	30.7	29.6	1.12	27.318			
400.0	400.0	400.0	400.0	0.8	0.8	90.00	0.0	30.7	30.7	29.1	1.57	19.513			
500.0	500.0	500.0	500.0	1.0	1.0	90.00	0.0	30.7	30.7	28.7	2.02	15.176			
600.0	600.0	600.0	600.0	1.2	1.2	90.00	0.0	30.7	30.7	28.2	2.47	12.417			
700.0	700.0	700.0	700.0	1.5	1.5	90.00	0.0	30.7	30.7	27.8	2.92	10.507			
800.0	800.0	800.0	800.0	1.7	1.7	90.00	0.0	30.7	30.7	27.3	3.37	9.106			
900.0	900.0	900.0	900.0	1.9	1.9	90.00	0.0	30.7	30.7	26.9	3.82	8.035			
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	90.00	0.0	30.7	30.7	26.4	4.27	7.189			
1,100.0	1,100.0	1,100.0	1,100.0	2.4	2.4	90.00	0.0	30.7	30.7	26.0	4.72	6.504			
1,200.0	1,200.0	1,200.0	1,200.0	2.6	2.6	90.00	0.0	30.7	30.7	25.5	5.17	5.939			
1,300.0	1,300.0	1,300.0	1,300.0	2.8	2.8	90.00	0.0	30.7	30.7	25.1	5.62	5.464			
1,400.0	1,400.0	1,400.0	1,400.0	3.0	3.0	90.00	0.0	30.7	30.7	24.6	6.07	5.059			
1,500.0	1,500.0	1,500.0	1,500.0	3.3	3.3	90.00	0.0	30.7	30.7	24.2	6.52	4.710 CC, ES			
1,600.0	1,600.0	1,600.0	1,600.0	3.5	3.5	159.14	0.0	30.7	32.3	25.4	6.96	4.647			
1,700.0	1,699.8	1,699.8	1,699.8	3.7	3.7	161.97	0.0	30.7	37.3	29.9	7.38	5.049			
1,800.0	1,799.5	1,799.5	1,799.5	3.9	3.9	165.32	0.0	30.7	45.6	37.8	7.80	5.851			
1,885.0	1,883.8	1,883.8	1,883.8	4.1	4.1	167.93	0.0	30.7	55.5	47.4	8.15	6.812			
1,900.0	1,898.7	1,898.7	1,898.7	4.1	4.2	168.35	0.0	30.7	57.5	49.3	8.21	6.997			
2,000.0	1,997.8	1,997.8	1,997.8	4.4	4.4	170.54	0.0	30.7	70.6	62.0	8.65	8.168			
2,100.0	2,096.9	2,099.1	2,099.1	4.7	4.6	171.33	1.4	29.7	82.6	73.5	9.09	9.087			
2,200.0	2,196.0	2,201.1	2,200.9	4.9	4.8	170.49	5.6	26.4	91.8	82.3	9.53	9.637			
2,300.0	2,295.1	2,301.3	2,300.9	5.2	5.1	168.88	11.8	21.8	99.2	89.3	9.97	9.950			
2,400.0	2,394.2	2,401.0	2,400.2	5.5	5.3	167.47	18.0	17.1	106.6	96.2	10.42	10.232			
2,500.0	2,493.3	2,500.7	2,499.6	5.8	5.5	166.25	24.2	12.4	114.1	103.2	10.88	10.490			
2,600.0	2,592.4	2,600.4	2,599.0	6.1	5.7	165.17	30.4	7.7	121.6	110.3	11.34	10.727			
2,700.0	2,691.5	2,700.1	2,698.4	6.4	6.0	164.22	36.6	3.0	129.2	117.4	11.80	10.945			
2,800.0	2,790.6	2,799.8	2,797.8	6.7	6.2	163.38	42.7	-1.7	136.7	124.5	12.27	11.145			
2,900.0	2,889.7	2,899.5	2,897.2	7.0	6.5	162.62	48.9	-6.4	144.3	131.6	12.74	11.329			
3,000.0	2,988.8	2,999.2	2,996.6	7.3	6.7	161.94	55.1	-11.0	152.0	138.8	13.22	11.498			
3,100.0	3,087.9	3,098.9	3,096.0	7.6	6.9	161.33	61.3	-15.7	159.6	145.9	13.70	11.655			
3,200.0	3,187.0	3,198.6	3,195.4	8.0	7.2	160.77	67.5	-20.4	167.3	153.1	14.18	11.799			
3,300.0	3,286.1	3,298.3	3,294.8	8.3	7.4	160.26	73.7	-25.1	175.0	160.3	14.66	11.933			
3,400.0	3,385.2	3,397.9	3,394.1	8.6	7.7	159.79	79.9	-29.8	182.7	167.5	15.15	12.058			
3,500.0	3,484.3	3,497.6	3,493.5	8.9	7.9	159.36	86.1	-34.5	190.4	174.7	15.64	12.173			
3,600.0	3,583.4	3,597.3	3,592.9	9.2	8.2	158.97	92.3	-39.2	198.1	181.9	16.13	12.281			
3,700.0	3,682.5	3,697.0	3,692.3	9.6	8.4	158.60	98.5	-43.9	205.8	189.2	16.62	12.381			
3,800.0	3,781.6	3,796.7	3,791.7	9.9	8.7	158.26	104.7	-48.6	213.5	196.4	17.12	12.475			
3,900.0	3,880.7	3,896.4	3,891.1	10.2	8.9	157.94	110.9	-53.3	221.2	203.6	17.61	12.563			
4,000.0	3,979.8	3,996.1	3,990.5	10.5	9.2	157.65	117.1	-57.9	229.0	210.9	18.11	12.645			
4,100.0	4,078.9	4,095.8	4,089.9	10.9	9.5	157.37	123.3	-62.6	236.7	218.1	18.61	12.722			
4,200.0	4,178.0	4,195.5	4,189.3	11.2	9.7	157.12	129.4	-67.3	244.5	225.4	19.11	12.794			
4,300.0	4,277.1	4,295.2	4,288.7	11.5	10.0	156.87	135.6	-72.0	252.2	232.6	19.61	12.863			
4,400.0	4,376.2	4,394.9	4,388.1	11.8	10.2	156.65	141.8	-76.7	260.0	239.9	20.11	12.927			
4,500.0	4,475.3	4,494.6	4,487.4	12.2	10.5	156.43	148.0	-81.4	267.8	247.1	20.62	12.988			
4,600.0	4,574.4	4,594.3	4,586.8	12.5	10.7	156.23	154.2	-86.1	275.5	254.4	21.12	13.045			
4,700.0	4,673.5	4,694.0	4,686.2	12.8	11.0	156.04	160.4	-90.8	283.3	261.7	21.63	13.100			
4,800.0	4,772.6	4,793.2	4,785.1	13.2	11.2	155.86	166.6	-95.4	291.1	269.0	22.13	13.154			
4,900.0	4,871.7	4,887.2	4,879.0	13.5	11.4	155.98	171.0	-98.8	300.0	277.4	22.56	13.297			

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference													Warning	
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		
4,944.9	4,916.2	4,929.3	4,921.0	13.6	11.5	156.19	172.1	-99.6	304.6	281.8	22.74	13.394		
5,000.0	4,970.8	4,980.8	4,972.6	13.8	11.6	156.57	172.9	-100.2	310.3	287.3	22.96	13.513		
5,100.0	5,070.3	5,078.6	5,070.3	14.0	11.8	157.31	173.0	-100.3	319.2	295.8	23.34	13.678		
5,200.0	5,170.1	5,178.4	5,170.1	14.2	12.0	157.78	173.0	-100.3	325.0	301.3	23.72	13.703		
5,300.0	5,270.1	5,278.3	5,270.1	14.4	12.2	157.98	173.0	-100.3	327.6	303.5	24.08	13.602		
5,329.9	5,300.0	5,308.2	5,300.0	14.4	12.2	90.00	173.0	-100.3	327.7	303.5	24.17	13.555		
5,400.0	5,370.1	5,378.3	5,370.1	14.5	12.4	90.00	173.0	-100.3	327.7	303.2	24.46	13.399		
5,500.0	5,470.1	5,478.3	5,470.1	14.7	12.6	90.00	173.0	-100.3	327.7	302.8	24.87	13.175		
5,600.0	5,570.1	5,578.3	5,570.1	14.9	12.8	90.00	173.0	-100.3	327.7	302.4	25.29	12.957		
5,700.0	5,670.1	5,678.3	5,670.1	15.1	13.0	90.00	173.0	-100.3	327.7	302.0	25.71	12.746		
5,800.0	5,770.1	5,778.3	5,770.1	15.2	13.2	90.00	173.0	-100.3	327.7	301.6	26.13	12.541		
5,900.0	5,870.1	5,878.3	5,870.1	15.4	13.5	90.00	173.0	-100.3	327.7	301.1	26.55	12.342		
6,000.0	5,970.1	5,978.3	5,970.1	15.6	13.7	90.00	173.0	-100.3	327.7	300.7	26.97	12.149		
6,100.0	6,070.1	6,078.3	6,070.1	15.8	13.9	90.00	173.0	-100.3	327.7	300.3	27.40	11.961		
6,204.4	6,174.4	6,182.7	6,174.4	16.0	14.1	90.00	173.0	-100.3	327.7	299.9	27.84	11.771		
6,250.0	6,220.1	6,228.3	6,220.1	16.1	14.2	-89.89	173.0	-100.3	327.7	299.7	28.04	11.687		
6,259.3	6,229.3	6,237.6	6,229.3	16.1	14.2	-90.00	173.0	-100.3	327.7	299.6	28.08	11.671		
6,300.0	6,269.8	6,278.1	6,269.8	16.1	14.3	-90.69	173.0	-100.3	327.7	299.5	28.25	11.602		
6,350.0	6,319.2	6,328.1	6,319.8	16.2	14.4	-91.82	171.6	-100.3	327.9	299.4	28.43	11.532		
6,400.0	6,368.0	6,378.6	6,370.1	16.2	14.5	-92.94	166.9	-100.3	328.1	299.6	28.58	11.480		
6,450.0	6,415.9	6,429.5	6,420.4	16.3	14.5	-94.05	158.8	-100.2	328.5	299.8	28.71	11.441		
6,500.0	6,462.8	6,480.9	6,470.4	16.3	14.6	-95.15	147.2	-100.1	329.1	300.2	28.82	11.416		
6,550.0	6,508.4	6,532.7	6,520.0	16.3	14.6	-96.22	132.2	-100.0	329.7	300.8	28.91	11.403		
6,600.0	6,552.6	6,585.0	6,568.9	16.4	14.7	-97.27	113.7	-99.9	330.4	301.4	28.99	11.398		
6,650.0	6,595.2	6,637.8	6,616.8	16.4	14.7	-98.29	91.6	-99.8	331.2	302.2	29.06	11.398		
6,700.0	6,636.0	6,691.0	6,663.5	16.4	14.8	-99.27	66.1	-99.6	332.1	303.0	29.13	11.400		
6,750.0	6,674.9	6,744.6	6,708.6	16.5	14.8	-100.21	37.1	-99.4	333.1	303.9	29.23	11.397		
6,800.0	6,711.6	6,798.7	6,752.0	16.5	14.9	-101.10	4.7	-99.2	334.1	304.7	29.34	11.385		
6,850.0	6,745.9	6,853.3	6,793.2	16.6	14.9	-101.94	-30.9	-99.0	335.1	305.6	29.50	11.357		
6,900.0	6,777.9	6,908.2	6,832.1	16.7	15.0	-102.73	-69.7	-98.8	336.1	306.4	29.73	11.307		
6,950.0	6,807.2	6,963.6	6,868.4	16.8	15.1	-103.45	-111.5	-98.5	337.1	307.1	30.02	11.230		
7,000.0	6,833.9	7,019.3	6,901.8	17.0	15.4	-104.11	-156.1	-98.2	338.1	307.7	30.40	11.123		
7,050.0	6,857.7	7,075.4	6,932.0	17.2	15.6	-104.71	-203.3	-97.9	339.0	308.1	30.87	10.981		
7,100.0	6,878.6	7,131.8	6,958.8	17.4	16.0	-105.24	-252.9	-97.6	339.8	308.4	31.45	10.804		
7,150.0	6,896.4	7,188.4	6,981.9	17.7	16.4	-105.70	-304.6	-97.3	340.6	308.4	32.15	10.594		
7,200.0	6,911.2	7,245.3	7,001.3	18.1	16.8	-106.08	-358.1	-96.9	341.3	308.3	32.96	10.352		
7,250.0	6,922.9	7,302.4	7,016.6	18.5	17.3	-106.38	-413.1	-96.6	341.8	307.9	33.90	10.083		
7,300.0	6,931.3	7,359.7	7,027.9	19.0	17.9	-106.61	-469.2	-96.2	342.2	307.3	34.94	9.793		
7,350.0	6,936.5	7,415.1	7,034.8	19.5	18.5	-106.77	-524.2	-95.8	342.5	306.5	36.08	9.495		
7,400.0	6,938.4	7,465.0	7,040.0	20.0	19.1	-107.23	-573.8	-95.5	343.5	306.3	37.19	9.237		
7,412.6	6,938.3	7,477.7	7,041.4	20.2	19.2	-107.42	-586.4	-95.5	343.9	306.5	37.47	9.179		
7,500.0	6,937.4	7,573.8	7,047.2	21.2	20.4	-108.51	-682.4	-94.8	345.9	306.4	39.50	8.757		
7,600.0	6,936.3	7,676.1	7,047.3	22.5	21.7	-108.70	-784.6	-94.2	346.3	304.3	42.04	8.238		
7,700.0	6,935.2	7,776.1	7,047.2	23.8	23.2	-108.84	-884.6	-93.5	346.6	301.9	44.71	7.753		
7,800.0	6,934.2	7,876.1	7,047.1	25.3	24.6	-108.99	-984.6	-92.9	347.0	299.5	47.51	7.304		
7,900.0	6,933.1	7,976.1	7,046.9	26.8	26.2	-109.13	-1,084.6	-92.3	347.3	296.9	50.41	6.890		
8,000.0	6,932.0	8,076.1	7,046.8	28.3	27.7	-109.28	-1,184.6	-91.6	347.7	294.3	53.39	6.512		
8,100.0	6,930.9	8,176.1	7,046.6	29.9	29.4	-109.42	-1,284.6	-91.0	348.0	291.6	56.45	6.165		
8,200.0	6,929.8	8,276.1	7,046.5	31.6	31.0	-109.57	-1,384.6	-90.4	348.4	288.8	59.57	5.848		
8,300.0	6,928.7	8,376.1	7,046.4	33.2	32.7	-109.71	-1,484.6	-89.7	348.7	286.0	62.73	5.559		
8,400.0	6,927.7	8,476.1	7,046.2	34.9	34.4	-109.85	-1,584.6	-89.1	349.1	283.1	65.94	5.294		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W - Becker Ranch 5J-443 - Wellbore #1 - Plan #1 (11-22-13)														
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		
8,500.0	6,926.6	8,576.1	7,046.1	36.6	36.1	-110.00	-1,684.6	-88.4	349.4	280.2	69.18	5.051		
8,600.0	6,925.5	8,676.0	7,045.9	38.4	37.9	-110.14	-1,784.6	-87.8	349.8	277.3	72.45	4.828		
8,700.0	6,924.4	8,776.0	7,045.8	40.1	39.7	-110.28	-1,884.6	-87.2	350.1	274.4	75.74	4.623		
8,800.0	6,923.3	8,876.0	7,045.7	41.9	41.4	-110.43	-1,984.5	-86.5	350.5	271.4	79.06	4.433		
8,900.0	6,922.3	8,976.0	7,045.5	43.6	43.2	-110.57	-2,084.5	-85.9	350.9	268.5	82.39	4.258		
9,000.0	6,921.2	9,076.0	7,045.4	45.4	45.0	-110.71	-2,184.5	-85.2	351.2	265.5	85.74	4.096		
9,100.0	6,920.1	9,176.0	7,045.2	47.2	46.8	-110.85	-2,284.5	-84.6	351.6	262.5	89.10	3.946		
9,200.0	6,919.0	9,276.0	7,045.1	49.0	48.7	-110.99	-2,384.5	-84.0	352.0	259.5	92.46	3.806		
9,300.0	6,917.9	9,376.0	7,045.0	50.8	50.5	-111.13	-2,484.5	-83.3	352.3	256.5	95.84	3.676		
9,400.0	6,916.8	9,476.0	7,044.8	52.7	52.3	-111.27	-2,584.5	-82.7	352.7	253.5	99.23	3.555		
9,500.0	6,915.8	9,576.0	7,044.7	54.5	54.2	-111.41	-2,684.5	-82.1	353.1	250.5	102.61	3.441		
9,600.0	6,914.7	9,676.0	7,044.5	56.3	56.0	-111.55	-2,784.5	-81.4	353.5	247.5	106.01	3.334		
9,700.0	6,913.6	9,776.0	7,044.4	58.2	57.9	-111.69	-2,884.5	-80.8	353.8	244.4	109.40	3.234		
9,800.0	6,912.5	9,876.0	7,044.3	60.0	59.7	-111.83	-2,984.5	-80.1	354.2	241.4	112.80	3.140		
9,900.0	6,911.4	9,976.0	7,044.1	61.9	61.6	-111.97	-3,084.5	-79.5	354.6	238.4	116.20	3.052		
10,000.0	6,910.3	10,076.0	7,044.0	63.7	63.4	-112.11	-3,184.5	-78.9	355.0	235.4	119.61	2.968		
10,100.0	6,909.3	10,176.0	7,043.8	65.6	65.3	-112.25	-3,284.5	-78.2	355.4	232.4	123.01	2.889		
10,200.0	6,908.2	10,276.0	7,043.7	67.4	67.2	-112.39	-3,384.5	-77.6	355.8	229.4	126.41	2.814		
10,300.0	6,907.1	10,376.0	7,043.6	69.3	69.0	-112.53	-3,484.4	-76.9	356.2	226.4	129.81	2.744		
10,400.0	6,906.0	10,476.0	7,043.4	71.2	70.9	-112.67	-3,584.4	-76.3	356.6	223.4	133.21	2.677		
10,500.0	6,904.9	10,576.0	7,043.3	73.1	72.8	-112.80	-3,684.4	-75.7	357.0	220.3	136.61	2.613		
10,600.0	6,903.9	10,676.0	7,043.1	74.9	74.7	-112.94	-3,784.4	-75.0	357.4	217.4	140.00	2.553		
10,700.0	6,902.8	10,776.0	7,043.0	76.8	76.6	-113.08	-3,884.4	-74.4	357.8	214.4	143.39	2.495		
10,800.0	6,901.7	10,875.9	7,042.9	78.7	78.4	-113.21	-3,984.4	-73.8	358.2	211.4	146.78	2.440		
10,900.0	6,900.6	10,975.9	7,042.7	80.6	80.3	-113.35	-4,084.4	-73.1	358.6	208.4	150.17	2.388		
11,000.0	6,899.5	11,075.9	7,042.6	82.4	82.2	-113.48	-4,184.4	-72.5	359.0	205.4	153.55	2.338		
11,100.0	6,898.4	11,175.9	7,042.4	84.3	84.1	-113.62	-4,284.4	-71.8	359.4	202.4	156.93	2.290		
11,200.0	6,897.4	11,275.9	7,042.3	86.2	86.0	-113.76	-4,384.4	-71.2	359.8	199.5	160.31	2.244		
11,300.0	6,896.3	11,375.9	7,042.2	88.1	87.9	-113.89	-4,484.4	-70.6	360.2	196.5	163.68	2.201		
11,400.0	6,895.2	11,475.9	7,042.0	90.0	89.5	-114.03	-4,584.4	-69.9	360.6	193.8	166.78	2.162		
11,418.5	6,895.0	11,494.4	7,042.0	90.3	89.8	-114.05	-4,602.9	-69.8	360.7	193.4	167.34	2.155 SF		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.5-T3N-R64W - Becker 5-14 (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 7154-UNKNOWN													Offset Well Error:	0.0 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		
10,200.0	6,908.2	6,832.2	6,832.2	67.4	136.6	-92.85	-4,280.6	-206.6	916.3	712.7	203.61	4.500		
10,300.0	6,907.1	6,831.1	6,831.1	69.3	136.6	-92.53	-4,280.6	-206.6	818.8	613.3	205.50	3.985		
10,400.0	6,906.0	6,830.0	6,830.0	71.2	136.6	-92.21	-4,280.6	-206.6	722.1	514.7	207.39	3.482		
10,500.0	6,904.9	6,828.9	6,828.9	73.1	136.6	-91.90	-4,280.6	-206.6	626.4	417.1	209.28	2.993		
10,600.0	6,903.9	6,827.9	6,827.9	74.9	136.6	-91.58	-4,280.6	-206.6	532.2	321.1	211.16	2.521		
10,700.0	6,902.8	6,826.8	6,826.8	76.8	136.5	-91.26	-4,280.6	-206.6	440.7	227.6	213.04	2.069		
10,800.0	6,901.7	6,825.7	6,825.7	78.7	136.5	-90.94	-4,280.6	-206.6	353.7	138.8	214.92	1.646		
10,900.0	6,900.6	6,824.6	6,824.6	80.6	136.5	-90.62	-4,280.6	-206.6	275.8	59.0	216.79	1.272	Level 3	
11,000.0	6,899.5	6,823.5	6,823.5	82.4	136.5	-90.30	-4,280.6	-206.6	216.7	-2.0	218.66	0.991	Level 1	
11,095.4	6,898.5	6,822.5	6,822.5	84.2	136.4	-90.00	-4,280.6	-206.6	194.6	-25.9	220.44	0.883	Level 1, CC	
11,100.0	6,898.4	6,822.4	6,822.4	84.3	136.4	-89.99	-4,280.6	-206.6	194.6	-25.9	220.52	0.883	Level 1, ES, SF	
11,200.0	6,897.4	6,821.4	6,821.4	86.2	136.4	-89.67	-4,280.6	-206.6	220.9	-1.5	222.38	0.993	Level 1	
11,300.0	6,896.3	6,820.3	6,820.3	88.1	136.4	-89.35	-4,280.6	-206.6	282.3	58.1	224.23	1.259	Level 3	
11,400.0	6,895.2	6,819.2	6,819.2	90.0	136.4	-89.03	-4,280.6	-206.6	361.4	135.3	226.08	1.599		
11,418.5	6,895.0	6,819.0	6,819.0	90.3	136.4	-88.97	-4,280.6	-206.6	377.1	150.7	226.42	1.666		

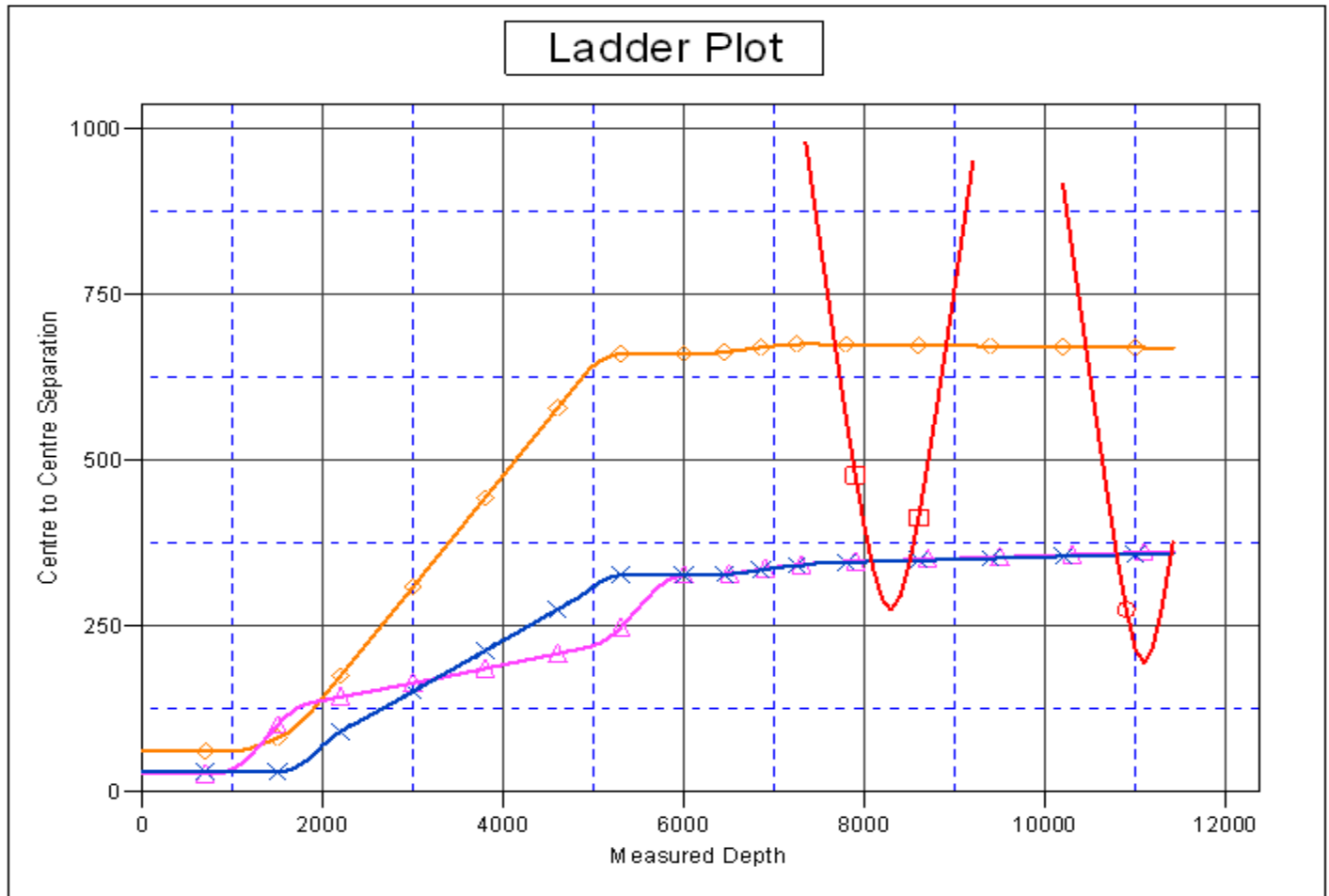
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 7175-UNKNOWN													Offset Well Error:	0.0 ft
Existing Wells Sec.5-T3N-R64W - Becker 5-9 (Exist.) - Wellbore #1 - Wellbore #1														
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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
7,350.0	6,936.5	6,904.5	6,904.5	19.5	138.1	-76.37	-1,475.4	-142.3	980.1	828.0	152.03	6.447		
7,400.0	6,938.4	6,906.4	6,906.4	20.0	138.1	-88.95	-1,475.4	-142.3	932.2	775.1	157.12	5.933		
7,412.6	6,938.3	6,906.3	6,906.3	20.2	138.1	-91.97	-1,475.4	-142.3	920.2	762.9	157.28	5.851		
7,500.0	6,937.4	6,905.4	6,905.4	21.2	138.1	-91.78	-1,475.4	-142.3	837.2	678.9	158.35	5.287		
7,600.0	6,936.3	6,904.3	6,904.3	22.5	138.1	-91.55	-1,475.4	-142.3	743.5	583.9	159.67	4.657		
7,700.0	6,935.2	6,903.2	6,903.2	23.8	138.1	-91.33	-1,475.4	-142.3	651.7	490.7	161.08	4.046		
7,800.0	6,934.2	6,902.2	6,902.2	25.3	138.0	-91.10	-1,475.4	-142.3	562.7	400.2	162.54	3.462		
7,900.0	6,933.1	6,901.1	6,901.1	26.8	138.0	-90.88	-1,475.4	-142.3	478.1	314.0	164.07	2.914		
8,000.0	6,932.0	6,900.0	6,900.0	28.3	138.0	-90.65	-1,475.4	-142.3	400.5	234.9	165.64	2.418		
8,100.0	6,930.9	6,898.9	6,898.9	29.9	138.0	-90.43	-1,475.4	-142.3	335.2	167.9	167.24	2.004		
8,200.0	6,929.8	6,897.8	6,897.8	31.6	138.0	-90.20	-1,475.4	-142.3	290.2	121.3	168.88	1.718		
8,290.5	6,928.8	6,896.8	6,896.8	33.1	137.9	-90.00	-1,475.4	-142.3	275.7	105.3	170.39	1.618	CC, ES	
8,300.0	6,928.7	6,896.7	6,896.7	33.2	137.9	-89.98	-1,475.4	-142.3	275.9	105.3	170.55	1.618	SF	
8,400.0	6,927.7	6,895.7	6,895.7	34.9	137.9	-89.75	-1,475.4	-142.3	296.6	124.4	172.23	1.722		
8,500.0	6,926.6	6,894.6	6,894.6	36.6	137.9	-89.53	-1,475.4	-142.3	346.2	172.3	173.94	1.990		
8,600.0	6,925.5	6,893.5	6,893.5	38.4	137.9	-89.30	-1,475.4	-142.3	414.4	238.8	175.66	2.359		
8,700.0	6,924.4	6,892.4	6,892.4	40.1	137.8	-89.08	-1,475.4	-142.3	493.6	316.2	177.39	2.782		
8,800.0	6,923.3	6,891.3	6,891.3	41.9	137.8	-88.85	-1,475.4	-142.3	579.2	400.1	179.13	3.233		
8,900.0	6,922.3	6,890.3	6,890.3	43.6	137.8	-88.63	-1,475.4	-142.3	668.9	488.0	180.88	3.698		
9,000.0	6,921.2	6,889.2	6,889.2	45.4	137.8	-88.41	-1,475.4	-142.3	761.1	578.4	182.64	4.167		
9,100.0	6,920.1	6,888.1	6,888.1	47.2	137.8	-88.18	-1,475.4	-142.3	855.0	670.6	184.41	4.637		
9,200.0	6,919.0	6,887.0	6,887.0	49.0	137.7	-87.96	-1,475.4	-142.3	950.2	764.1	186.18	5.104		

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4835.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Becker Ranch 5E-323
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.59°



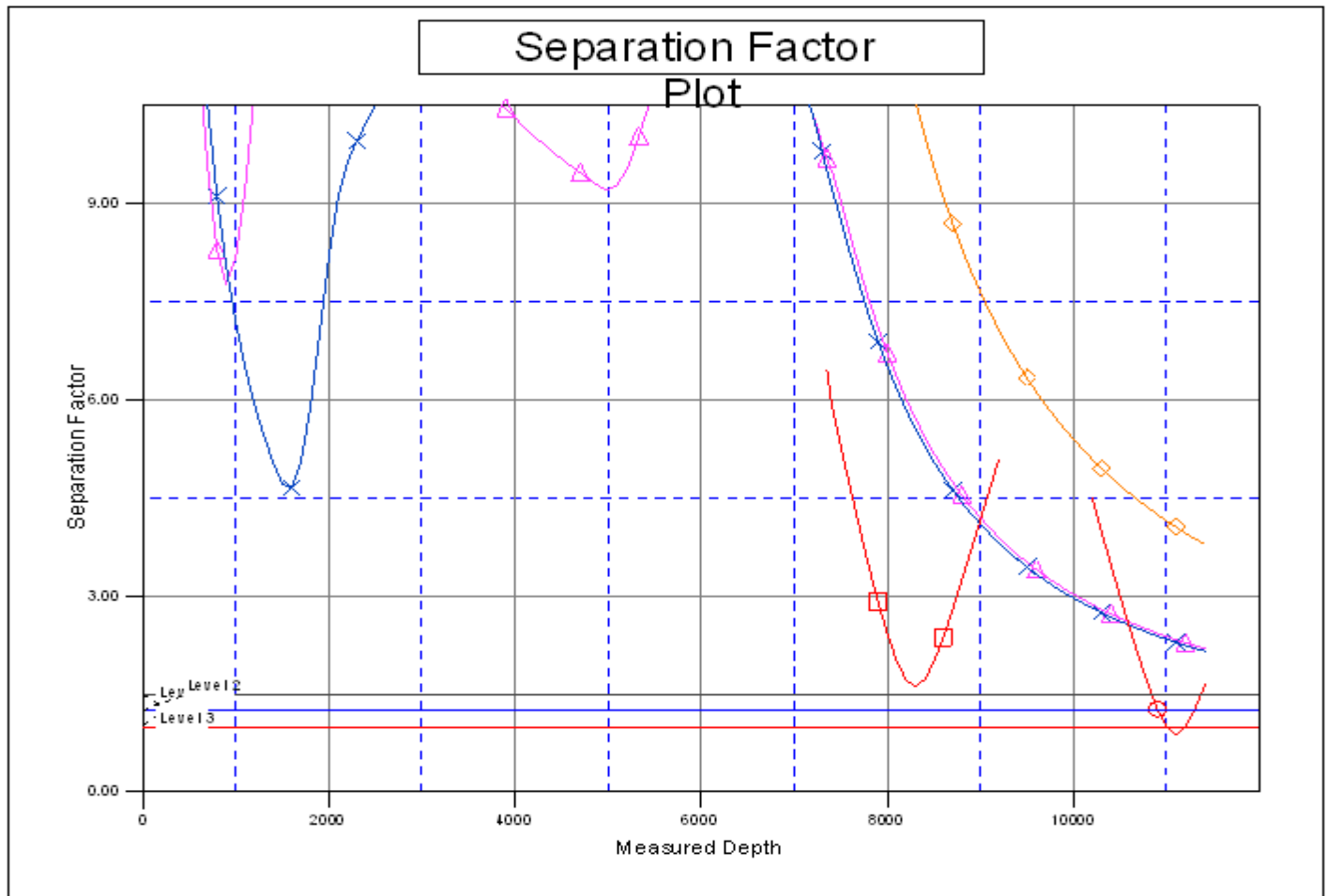
LEGEND

5J-103, Wellbore #1, Plan #1 (11-22-13) 5J-403, Wellbore #1, Plan #1 (11-22-13) 5J-443, Wellbore #1, Plan #1 (11-22-13) 5E-403, Wellbore #1, Plan #1 (11-22-13) Becker 5-9 (Exist.), Wellbore #1, Wellbore #1 Becker 5-14 (Exist.), Wellbore #1, Wellbore #1

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Becker Ranch 5E-323
Project:	SEC.5-T3N-R64W	TVD Reference:	WELL @ 4835.0ft (RKB - 15')
Reference Site:	Becker Ranch 5J-HZ Pad Sec.5-T3N-R64W	MD Reference:	WELL @ 4835.0ft (RKB - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Becker Ranch 5E-323	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (11-22-13)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4835.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Becker Ranch 5E-323
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.59°



LEGEND

h 5J-103, Wellbore #1, Plan #1 (11-22-13) W x Becker Ranch 5J-443, Wellbore #1, Plan #1 (11-22-13) W □ Becker 5-9 (Exist.), Wellbore #1, We
h 5E-403, Wellbore #1, Plan #1 (11-22-13) W △ Becker 5-14 (Exist.), Wellbore #1, Wellbore #1 W ○