

PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Ottenhoff 29U-343**

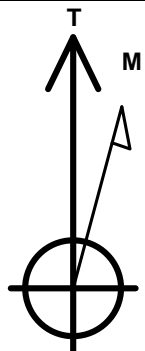
Surface Location: Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4662.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1381166.55	3259764.52	40.375955	-104.567621	

RKB - 23' WELL @ 4685.0ft (RKB - 23')

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 560'FNL & 930'FEL, Sec.29	1.0	0.0	0.0	Point
BHL 2641'FSL & 300'FEL, Sec.32	6727.0	-7354.7	678.4	Point



Azimuths to True North
Magnetic North: 8.12°

Magnetic Field
Strength: 52645.0snT
Dip Angle: 66.90°
Date: 2/26/2016
Model: IGRF2010

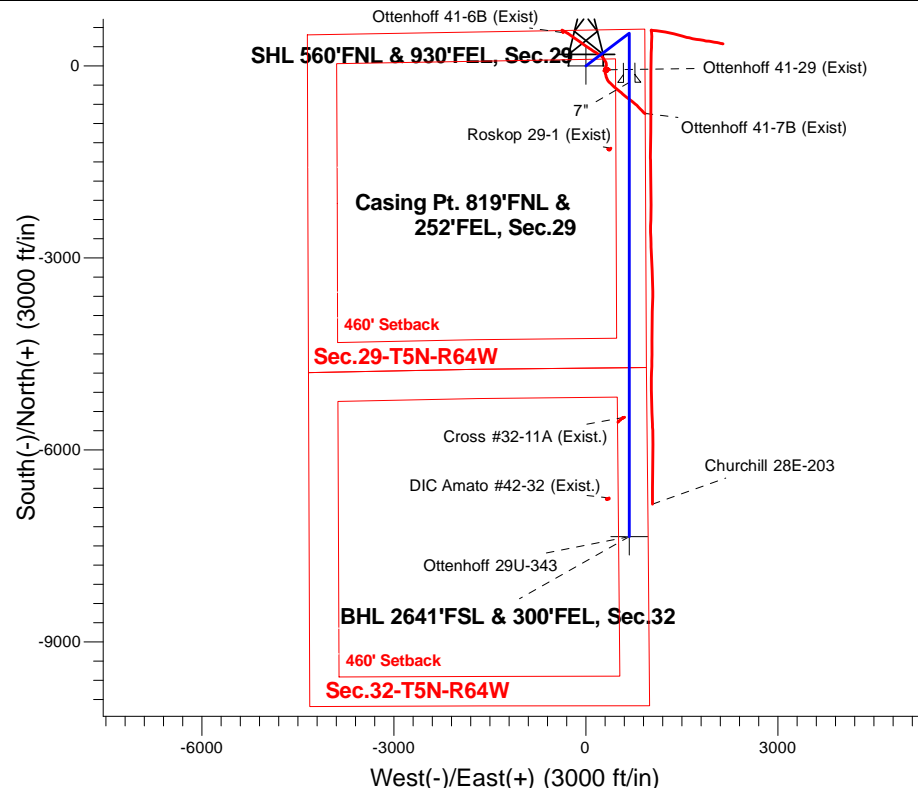
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W
Ottenhoff 29U-343
Plan #1 (3-15-16)
14:56, March 17 2016

ANNOTATIONS

TVD	MD	Annotation
200.0	200.0	KOP - Start Build 1.50
3444.0	3538.3	Start Drop -2.00
6007.7	6111.0	KOP #2 - Start Build 7.50
6771.6	7315.8	Start 7096.1 hold at 7315.8 MD
6727.0	14411.8	TD at 14411.8

South(-)/North(+) (3000 ft/in)

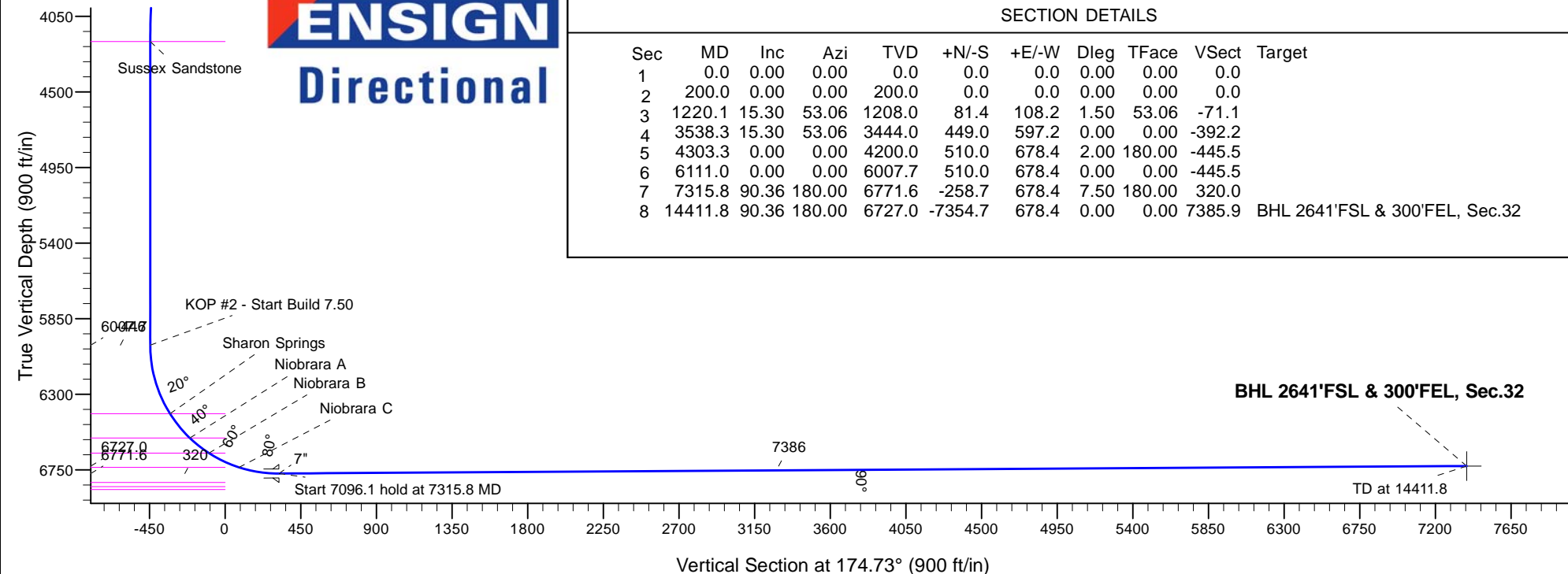
West(-)/East(+) (3000 ft/in)



ENSIGN
Directional

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	1220.1	15.30	53.06	1208.0	81.4	108.2	1.50	53.06	-71.1	
4	3538.3	15.30	53.06	3444.0	449.0	597.2	0.00	0.00	-392.2	
5	4303.3	0.00	0.00	4200.0	510.0	678.4	2.00	180.00	-445.5	
6	6111.0	0.00	0.00	6007.7	510.0	678.4	0.00	0.00	-445.5	
7	7315.8	90.36	180.00	6771.6	-258.7	678.4	7.50	180.00	320.0	
8	14411.8	90.36	180.00	6727.0	-7354.7	678.4	0.00	0.00	7385.9	BHL 2641'FSL & 300'FEL, Sec.32





PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W

Ottenhoff 29U-343

Wellbore #1

Plan: Plan #1 (3-15-16)

Standard Planning Report

17 March, 2016

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-15-16)		

Project	SEC.29-T5N-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		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W			
Site Position:		Northing:	1,381,166.77 usft	Latitude:	40.375956
From:	Lat/Long	Easting:	3,259,749.48 usft	Longitude:	-104.567675
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.60

Well	Ottenhoff 29U-343					
Well Position	+N/-S	-0.4 ft	Northing:	1,381,166.55 usft	Latitude:	40.375955
	+E/-W	15.0 ft	Easting:	3,259,764.53 usft	Longitude:	-104.567621
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	4,662.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/26/2016	8.12	66.90	52,645

Design	Plan #1 (3-15-16)			
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	174.73

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,220.1	15.30	53.06	1,208.0	81.4	108.2	1.50	1.50	0.00	53.06	
3,538.3	15.30	53.06	3,444.0	449.0	597.2	0.00	0.00	0.00	0.00	
4,303.3	0.00	0.00	4,200.0	510.0	678.4	2.00	-2.00	0.00	180.00	
6,111.0	0.00	0.00	6,007.7	510.0	678.4	0.00	0.00	0.00	0.00	
7,315.8	90.36	180.00	6,771.6	-258.7	678.4	7.50	7.50	0.00	180.00	
14,411.8	90.36	180.00	6,727.0	-7,354.7	678.4	0.00	0.00	0.00	0.00	BHL 2641'FSL & 300'

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-15-16)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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 560'FNL & 930'FEL, Sec.29									
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
KOP - Start Build 1.50									
300.0	1.50	53.06	300.0	0.8	1.0	-0.7	1.50	1.50	0.00
400.0	3.00	53.06	399.9	3.1	4.2	-2.7	1.50	1.50	0.00
500.0	4.50	53.06	499.7	7.1	9.4	-6.2	1.50	1.50	0.00
600.0	6.00	53.06	599.3	12.6	16.7	-11.0	1.50	1.50	0.00
700.0	7.50	53.06	698.6	19.6	26.1	-17.2	1.50	1.50	0.00
800.0	9.00	53.06	797.5	28.3	37.6	-24.7	1.50	1.50	0.00
900.0	10.50	53.06	896.1	38.4	51.1	-33.6	1.50	1.50	0.00
1,000.0	12.00	53.06	994.2	50.2	66.7	-43.8	1.50	1.50	0.00
1,100.0	13.50	53.06	1,091.7	63.4	84.4	-55.4	1.50	1.50	0.00
1,200.0	15.00	53.06	1,188.6	78.2	104.0	-68.3	1.50	1.50	0.00
1,220.1	15.30	53.06	1,208.0	81.4	108.2	-71.1	1.50	1.50	0.00
1,300.0	15.30	53.06	1,285.1	94.0	125.1	-82.2	0.00	0.00	0.00
1,400.0	15.30	53.06	1,381.5	109.9	146.2	-96.0	0.00	0.00	0.00
1,500.0	15.30	53.06	1,478.0	125.8	167.3	-109.9	0.00	0.00	0.00
1,600.0	15.30	53.06	1,574.5	141.6	188.4	-123.7	0.00	0.00	0.00
1,700.0	15.30	53.06	1,670.9	157.5	209.5	-137.6	0.00	0.00	0.00
1,800.0	15.30	53.06	1,767.4	173.3	230.5	-151.4	0.00	0.00	0.00
1,900.0	15.30	53.06	1,863.8	189.2	251.6	-165.3	0.00	0.00	0.00
2,000.0	15.30	53.06	1,960.3	205.0	272.7	-179.1	0.00	0.00	0.00
2,100.0	15.30	53.06	2,056.7	220.9	293.8	-193.0	0.00	0.00	0.00
2,200.0	15.30	53.06	2,153.2	236.8	314.9	-206.8	0.00	0.00	0.00
2,300.0	15.30	53.06	2,249.6	252.6	336.0	-220.7	0.00	0.00	0.00
2,400.0	15.30	53.06	2,346.1	268.5	357.1	-234.5	0.00	0.00	0.00
2,500.0	15.30	53.06	2,442.5	284.3	378.2	-248.4	0.00	0.00	0.00
2,600.0	15.30	53.06	2,539.0	300.2	399.3	-262.2	0.00	0.00	0.00
2,700.0	15.30	53.06	2,635.5	316.0	420.4	-276.1	0.00	0.00	0.00
2,800.0	15.30	53.06	2,731.9	331.9	441.5	-290.0	0.00	0.00	0.00
2,900.0	15.30	53.06	2,828.4	347.8	462.6	-303.8	0.00	0.00	0.00
3,000.0	15.30	53.06	2,924.8	363.6	483.7	-317.7	0.00	0.00	0.00
3,100.0	15.30	53.06	3,021.3	379.5	504.8	-331.5	0.00	0.00	0.00
3,200.0	15.30	53.06	3,117.7	395.3	525.8	-345.4	0.00	0.00	0.00
3,300.0	15.30	53.06	3,214.2	411.2	546.9	-359.2	0.00	0.00	0.00
3,400.0	15.30	53.06	3,310.6	427.1	568.0	-373.1	0.00	0.00	0.00
3,500.0	15.30	53.06	3,407.1	442.9	589.1	-386.9	0.00	0.00	0.00
3,538.3	15.30	53.06	3,444.0	449.0	597.2	-392.2	0.00	0.00	0.00
Start Drop -2.00									
3,600.0	14.07	53.06	3,503.7	458.4	609.7	-400.4	2.00	-2.00	0.00
3,627.1	13.53	53.06	3,530.0	462.3	614.9	-403.8	2.00	-2.00	0.00
Parkman Sandstone									
3,700.0	12.07	53.06	3,601.1	472.0	627.8	-412.3	2.00	-2.00	0.00
3,800.0	10.07	53.06	3,699.3	483.5	643.1	-422.4	2.00	-2.00	0.00
3,900.0	8.07	53.06	3,798.0	493.0	655.7	-430.7	2.00	-2.00	0.00
4,000.0	6.07	53.06	3,897.3	500.4	665.5	-437.1	2.00	-2.00	0.00
4,100.0	4.07	53.06	3,996.9	505.7	672.6	-441.8	2.00	-2.00	0.00
4,200.0	2.07	53.06	4,096.7	508.9	676.9	-444.6	2.00	-2.00	0.00
4,300.0	0.07	53.06	4,196.7	510.0	678.4	-445.5	2.00	-2.00	0.00

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Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-15-16)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,303.3	0.00	0.00	4,200.0	510.0	678.4	-445.5	2.00	-2.00	-1,600.48
Sussex Sandstone									
4,400.0	0.00	0.00	4,296.7	510.0	678.4	-445.5	0.00	0.00	0.00
4,500.0	0.00	0.00	4,396.7	510.0	678.4	-445.5	0.00	0.00	0.00
4,600.0	0.00	0.00	4,496.7	510.0	678.4	-445.5	0.00	0.00	0.00
4,700.0	0.00	0.00	4,596.7	510.0	678.4	-445.5	0.00	0.00	0.00
4,800.0	0.00	0.00	4,696.7	510.0	678.4	-445.5	0.00	0.00	0.00
4,900.0	0.00	0.00	4,796.7	510.0	678.4	-445.5	0.00	0.00	0.00
5,000.0	0.00	0.00	4,896.7	510.0	678.4	-445.5	0.00	0.00	0.00
5,100.0	0.00	0.00	4,996.7	510.0	678.4	-445.5	0.00	0.00	0.00
5,200.0	0.00	0.00	5,096.7	510.0	678.4	-445.5	0.00	0.00	0.00
5,300.0	0.00	0.00	5,196.7	510.0	678.4	-445.5	0.00	0.00	0.00
5,400.0	0.00	0.00	5,296.7	510.0	678.4	-445.5	0.00	0.00	0.00
5,500.0	0.00	0.00	5,396.7	510.0	678.4	-445.5	0.00	0.00	0.00
5,600.0	0.00	0.00	5,496.7	510.0	678.4	-445.5	0.00	0.00	0.00
5,700.0	0.00	0.00	5,596.7	510.0	678.4	-445.5	0.00	0.00	0.00
5,800.0	0.00	0.00	5,696.7	510.0	678.4	-445.5	0.00	0.00	0.00
5,900.0	0.00	0.00	5,796.7	510.0	678.4	-445.5	0.00	0.00	0.00
6,000.0	0.00	0.00	5,896.7	510.0	678.4	-445.5	0.00	0.00	0.00
6,100.0	0.00	0.00	5,996.7	510.0	678.4	-445.5	0.00	0.00	0.00
6,111.0	0.00	0.00	6,007.7	510.0	678.4	-445.5	0.00	0.00	0.00
KOP #2 - Start Build 7.50									
6,200.0	6.68	180.00	6,096.5	504.8	678.4	-440.4	7.50	7.50	0.00
6,300.0	14.18	180.00	6,194.8	486.7	678.4	-422.4	7.50	7.50	0.00
6,400.0	21.68	180.00	6,289.8	456.0	678.4	-391.7	7.50	7.50	0.00
6,500.0	29.18	180.00	6,380.1	413.1	678.4	-349.0	7.50	7.50	0.00
6,540.6	32.22	180.00	6,415.0	392.3	678.4	-328.4	7.50	7.50	0.00
Sharon Springs									
6,600.0	36.68	180.00	6,464.0	358.7	678.4	-294.9	7.50	7.50	0.00
6,700.0	44.18	180.00	6,540.0	293.9	678.4	-230.4	7.50	7.50	0.00
6,728.4	46.30	180.00	6,560.0	273.8	678.4	-210.3	7.50	7.50	0.00
Niobrara A									
6,800.0	51.68	180.00	6,607.0	219.8	678.4	-156.5	7.50	7.50	0.00
6,874.0	57.23	180.00	6,650.0	159.6	678.4	-96.6	7.50	7.50	0.00
Niobrara B									
6,900.0	59.18	180.00	6,663.7	137.5	678.4	-74.6	7.50	7.50	0.00
7,000.0	66.68	180.00	6,709.2	48.5	678.4	14.0	7.50	7.50	0.00
7,073.5	72.19	180.00	6,735.0	-20.3	678.4	82.5	7.50	7.50	0.00
Niobrara C									
7,100.0	74.18	180.00	6,742.7	-45.6	678.4	107.8	7.50	7.50	0.00
7,200.0	81.68	180.00	6,763.6	-143.4	678.4	205.1	7.50	7.50	0.00
7,300.0	89.18	180.00	6,771.5	-243.0	678.4	304.3	7.50	7.50	0.00
7,315.8	90.36	180.00	6,771.6	-258.8	678.4	320.0	7.49	7.49	0.00
Start 7096.1 hold at 7315.8 MD - 7"									
7,400.0	90.36	180.00	6,771.1	-343.0	678.4	403.8	0.00	0.00	0.00
7,500.0	90.36	180.00	6,770.4	-443.0	678.4	503.4	0.00	0.00	0.00
7,600.0	90.36	180.00	6,769.8	-543.0	678.4	603.0	0.00	0.00	0.00
7,700.0	90.36	180.00	6,769.2	-643.0	678.4	702.6	0.00	0.00	0.00
7,800.0	90.36	180.00	6,768.5	-743.0	678.4	802.1	0.00	0.00	0.00
7,900.0	90.36	180.00	6,767.9	-843.0	678.4	901.7	0.00	0.00	0.00
8,000.0	90.36	180.00	6,767.3	-943.0	678.4	1,001.3	0.00	0.00	0.00

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Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-15-16)		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,100.0	90.36	180.00	6,766.7	-1,043.0	678.4	1,100.9	0.00	0.00	0.00	
8,200.0	90.36	180.00	6,766.0	-1,143.0	678.4	1,200.4	0.00	0.00	0.00	
8,300.0	90.36	180.00	6,765.4	-1,243.0	678.4	1,300.0	0.00	0.00	0.00	
8,400.0	90.36	180.00	6,764.8	-1,343.0	678.4	1,399.6	0.00	0.00	0.00	
8,500.0	90.36	180.00	6,764.1	-1,442.9	678.4	1,499.2	0.00	0.00	0.00	
8,600.0	90.36	180.00	6,763.5	-1,542.9	678.4	1,598.7	0.00	0.00	0.00	
8,700.0	90.36	180.00	6,762.9	-1,642.9	678.4	1,698.3	0.00	0.00	0.00	
8,800.0	90.36	180.00	6,762.3	-1,742.9	678.4	1,797.9	0.00	0.00	0.00	
8,900.0	90.36	180.00	6,761.6	-1,842.9	678.4	1,897.5	0.00	0.00	0.00	
9,000.0	90.36	180.00	6,761.0	-1,942.9	678.4	1,997.0	0.00	0.00	0.00	
9,100.0	90.36	180.00	6,760.4	-2,042.9	678.4	2,096.6	0.00	0.00	0.00	
9,200.0	90.36	180.00	6,759.7	-2,142.9	678.4	2,196.2	0.00	0.00	0.00	
9,300.0	90.36	180.00	6,759.1	-2,242.9	678.4	2,295.8	0.00	0.00	0.00	
9,400.0	90.36	180.00	6,758.5	-2,342.9	678.4	2,395.3	0.00	0.00	0.00	
9,500.0	90.36	180.00	6,757.9	-2,442.9	678.4	2,494.9	0.00	0.00	0.00	
9,600.0	90.36	180.00	6,757.2	-2,542.9	678.4	2,594.5	0.00	0.00	0.00	
9,700.0	90.36	180.00	6,756.6	-2,642.9	678.4	2,694.1	0.00	0.00	0.00	
9,800.0	90.36	180.00	6,756.0	-2,742.9	678.4	2,793.6	0.00	0.00	0.00	
9,900.0	90.36	180.00	6,755.3	-2,842.9	678.4	2,893.2	0.00	0.00	0.00	
10,000.0	90.36	180.00	6,754.7	-2,942.9	678.4	2,992.8	0.00	0.00	0.00	
10,100.0	90.36	180.00	6,754.1	-3,042.9	678.4	3,092.4	0.00	0.00	0.00	
10,200.0	90.36	180.00	6,753.5	-3,142.9	678.4	3,191.9	0.00	0.00	0.00	
10,300.0	90.36	180.00	6,752.8	-3,242.9	678.4	3,291.5	0.00	0.00	0.00	
10,400.0	90.36	180.00	6,752.2	-3,342.9	678.4	3,391.1	0.00	0.00	0.00	
10,500.0	90.36	180.00	6,751.6	-3,442.9	678.4	3,490.7	0.00	0.00	0.00	
10,600.0	90.36	180.00	6,751.0	-3,542.9	678.4	3,590.2	0.00	0.00	0.00	
10,700.0	90.36	180.00	6,750.3	-3,642.9	678.4	3,689.8	0.00	0.00	0.00	
10,800.0	90.36	180.00	6,749.7	-3,742.9	678.4	3,789.4	0.00	0.00	0.00	
10,900.0	90.36	180.00	6,749.1	-3,842.9	678.4	3,889.0	0.00	0.00	0.00	
11,000.0	90.36	180.00	6,748.4	-3,942.9	678.4	3,988.5	0.00	0.00	0.00	
11,100.0	90.36	180.00	6,747.8	-4,042.9	678.4	4,088.1	0.00	0.00	0.00	
11,200.0	90.36	180.00	6,747.2	-4,142.9	678.4	4,187.7	0.00	0.00	0.00	
11,300.0	90.36	180.00	6,746.6	-4,242.9	678.4	4,287.3	0.00	0.00	0.00	
11,400.0	90.36	180.00	6,745.9	-4,342.9	678.4	4,386.8	0.00	0.00	0.00	
11,500.0	90.36	180.00	6,745.3	-4,442.9	678.4	4,486.4	0.00	0.00	0.00	
11,600.0	90.36	180.00	6,744.7	-4,542.9	678.4	4,586.0	0.00	0.00	0.00	
11,700.0	90.36	180.00	6,744.0	-4,642.9	678.4	4,685.6	0.00	0.00	0.00	
11,800.0	90.36	180.00	6,743.4	-4,742.9	678.4	4,785.1	0.00	0.00	0.00	
11,900.0	90.36	180.00	6,742.8	-4,842.9	678.4	4,884.7	0.00	0.00	0.00	
12,000.0	90.36	180.00	6,742.2	-4,942.9	678.4	4,984.3	0.00	0.00	0.00	
12,100.0	90.36	180.00	6,741.5	-5,042.9	678.4	5,083.9	0.00	0.00	0.00	
12,200.0	90.36	180.00	6,740.9	-5,142.9	678.4	5,183.4	0.00	0.00	0.00	
12,300.0	90.36	180.00	6,740.3	-5,242.9	678.4	5,283.0	0.00	0.00	0.00	
12,400.0	90.36	180.00	6,739.6	-5,342.9	678.4	5,382.6	0.00	0.00	0.00	
12,500.0	90.36	180.00	6,739.0	-5,442.9	678.4	5,482.2	0.00	0.00	0.00	
12,600.0	90.36	180.00	6,738.4	-5,542.9	678.4	5,581.7	0.00	0.00	0.00	
12,700.0	90.36	180.00	6,737.8	-5,642.9	678.4	5,681.3	0.00	0.00	0.00	
12,800.0	90.36	180.00	6,737.1	-5,742.9	678.4	5,780.9	0.00	0.00	0.00	
12,900.0	90.36	180.00	6,736.5	-5,842.9	678.4	5,880.5	0.00	0.00	0.00	
13,000.0	90.36	180.00	6,735.9	-5,942.9	678.4	5,980.0	0.00	0.00	0.00	
13,100.0	90.36	180.00	6,735.2	-6,042.9	678.4	6,079.6	0.00	0.00	0.00	
13,200.0	90.36	180.00	6,734.6	-6,142.9	678.4	6,179.2	0.00	0.00	0.00	

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-15-16)		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
13,300.0	90.36	180.00	6,734.0	-6,242.9	678.4	6,278.8	0.00	0.00	0.00	
13,400.0	90.36	180.00	6,733.4	-6,342.9	678.4	6,378.3	0.00	0.00	0.00	
13,500.0	90.36	180.00	6,732.7	-6,442.8	678.4	6,477.9	0.00	0.00	0.00	
13,600.0	90.36	180.00	6,732.1	-6,542.8	678.4	6,577.5	0.00	0.00	0.00	
13,700.0	90.36	180.00	6,731.5	-6,642.8	678.4	6,677.1	0.00	0.00	0.00	
13,800.0	90.36	180.00	6,730.8	-6,742.8	678.4	6,776.6	0.00	0.00	0.00	
13,900.0	90.36	180.00	6,730.2	-6,842.8	678.4	6,876.2	0.00	0.00	0.00	
14,000.0	90.36	180.00	6,729.6	-6,942.8	678.4	6,975.8	0.00	0.00	0.00	
14,100.0	90.36	180.00	6,729.0	-7,042.8	678.4	7,075.4	0.00	0.00	0.00	
14,200.0	90.36	180.00	6,728.3	-7,142.8	678.4	7,174.9	0.00	0.00	0.00	
14,300.0	90.36	180.00	6,727.7	-7,242.8	678.4	7,274.5	0.00	0.00	0.00	
14,400.0	90.36	180.00	6,727.1	-7,342.8	678.4	7,374.1	0.00	0.00	0.00	
14,411.8	90.36	180.00	6,727.0	-7,354.6	678.4	7,385.9	0.00	0.00	0.00	
TD at 14411.8 - BHL 2641'FSL & 300'FEL, Sec.32										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
SHL 560'FNL & 930'FEL	0.00	0.00	1.0	0.0	0.0	1,381,166.57	3,259,764.53	40.375955	-104.567621	
- plan hits target center										
- Point										
BHL 2641'FSL & 300'FE	0.00	0.00	6,727.0	-7,354.7	678.4	1,373,819.74	3,260,520.15	40.355767	-104.565187	
- plan hits target center										
- Point										

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
7,315.8	6,771.6	7"	7	8-3/4	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,627.1	3,530.0	Parkman Sandstone		0.00		
4,303.3	4,200.0	Sussex Sandstone		0.00		
6,540.6	6,415.0	Sharon Springs		0.00		
6,728.4	6,560.0	Niobrara A		0.00		
6,874.0	6,650.0	Niobrara B		0.00		
7,073.5	6,735.0	Niobrara C		0.00		

Database:	US_EDM	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Project:	SEC.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	North Reference:	True
Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (3-15-16)		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	KOP - Start Build 1.50
3,538.3	3,444.0	449.0	597.2	Start Drop -2.00
6,111.0	6,007.7	510.0	678.4	KOP #2 - Start Build 7.50
7,315.8	6,771.6	-258.8	678.4	Start 7096.1 hold at 7315.8 MD
14,411.8	6,727.0	-7,354.6	678.4	TD at 14411.8



PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W

Ottenhoff 29U-343

Wellbore #1

Plan #1 (3-15-16)

Anticollision Report

17 March, 2016



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (3-15-16)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	3/17/2016		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	14,411.8	Plan #1 (3-15-16) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Churchill 28J-HZ Pad Sec.28-T5N-R64W						
Churchill 28E-203 - Wellbore #1 - Wellbore #1	6,930.0	6,960.2	339.6	306.9	10.409	CC
Churchill 28E-203 - Wellbore #1 - Wellbore #1	13,905.3	13,913.3	370.4	110.0	1.422	Level 3, ES, SF
Existing Wells Sec.29-T5N-R64W						
Cross #32-11A (Exist.) - Wellbore #1 - Wellbore #1	12,549.3	6,767.3	79.7	-43.3	0.648	Level 1, CC, ES, SF
DIC Amato #42-32 (Exist.) - Wellbore #1 - Wellbore #1	13,812.1	6,757.7	312.5	166.4	2.138	CC, ES, SF
Ottenhoff 41-29 (Exist.) - Wellbore #1 - Wellbore #1	1,351.7	1,304.0	247.5	240.2	33.780	CC
Ottenhoff 41-29 (Exist.) - Wellbore #1 - Wellbore #1	1,400.0	1,351.8	247.7	240.0	32.116	ES
Ottenhoff 41-29 (Exist.) - Wellbore #1 - Wellbore #1	7,111.3	6,728.7	318.2	287.4	10.341	SF
Ottenhoff 41-6B (Exist.) - Wellbore #1 - Wellbore #1	2,180.8	2,160.7	158.0	146.2	13.437	CC, ES
Ottenhoff 41-6B (Exist.) - Wellbore #1 - Wellbore #1	2,200.0	2,178.3	158.2	146.4	13.434	SF
Ottenhoff 41-7B (Exist.) - Wellbore #1 - Wellbore #1	7,803.1	6,851.5	245.1	204.0	5.961	CC, ES, SF
Roskop 29-1 (Exist.) - Wellbore #1 - Wellbore #1	8,348.2	6,752.0	290.4	123.4	1.739	CC, ES, SF
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W						
Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)	200.0	201.0	60.2	59.5	88.962	CC, ES
Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)	14,411.8	14,282.6	897.3	610.1	3.124	SF
Ottenhoff 29R-323 - Wellbore #1 - Plan #1 (3-15-16)	200.0	201.0	30.1	29.4	44.481	CC, ES
Ottenhoff 29R-323 - Wellbore #1 - Plan #1 (3-15-16)	14,411.8	14,359.3	462.9	175.0	1.608	SF
Ottenhoff 29R-423 - Wellbore #1 - Plan #1 (3-15-16)	200.0	200.0	45.1	44.5	66.947	CC, ES
Ottenhoff 29R-423 - Wellbore #1 - Plan #1 (3-15-16)	14,411.8	14,439.9	693.3	409.4	2.442	SF
Ottenhoff 29U-243 - Wellbore #1 - Plan #1 (3-15-16)	200.0	201.0	15.1	14.4	22.245	CC
Ottenhoff 29U-243 - Wellbore #1 - Plan #1 (3-15-16)	14,411.8	14,312.9	231.5	-45.2	0.837	Level 1, ES, SF

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28E-203 - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program:		44-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	
3,300.0	3,214.2	3,459.0	3,386.8	14.9	13.8	36.92	461.8	1,511.9	988.9	969.6	19.28	51.295	
3,400.0	3,310.6	3,538.2	3,464.2	15.5	14.1	37.40	466.6	1,495.3	947.5	927.6	19.91	47.586	
3,500.0	3,407.1	3,623.0	3,547.1	16.0	14.5	38.03	470.7	1,478.4	907.2	886.6	20.57	44.100	
3,600.0	3,503.7	3,723.4	3,645.3	16.5	14.9	38.45	475.9	1,458.3	867.4	846.1	21.30	40.731	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28E-203 - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 44-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
3,700.0	3,601.1	3,823.6	3,742.9	16.9	15.4	38.41	483.4	1,437.0	828.9	806.9	21.95	37.756		
3,800.0	3,699.3	3,916.9	3,833.8	17.2	15.8	38.26	490.1	1,416.7	792.5	769.9	22.55	35.138		
3,900.0	3,798.0	4,000.0	3,914.8	17.5	16.2	38.05	495.4	1,399.0	759.1	736.1	23.08	32.894		
4,000.0	3,897.3	4,090.0	4,002.8	17.8	16.6	37.83	500.4	1,381.0	729.7	706.1	23.57	30.952		
4,100.0	3,996.9	4,203.3	4,113.4	18.0	17.1	37.43	507.3	1,357.2	701.8	677.7	24.09	29.134		
4,200.0	4,096.7	4,292.2	4,200.1	18.2	17.5	36.91	512.5	1,338.5	676.5	652.0	24.49	27.620		
4,300.0	4,196.7	4,391.3	4,296.8	18.3	18.0	36.31	517.0	1,317.4	653.7	628.8	24.88	26.279		
4,400.0	4,296.7	4,492.2	4,395.5	18.4	18.4	89.06	520.2	1,296.7	633.2	608.0	25.25	25.078		
4,500.0	4,396.7	4,591.5	4,492.2	18.5	18.8	88.74	523.1	1,274.1	610.5	584.9	25.63	23.821		
4,600.0	4,496.7	4,696.0	4,594.3	18.6	19.3	88.44	525.6	1,251.7	589.3	563.3	26.02	22.643		
4,700.0	4,596.7	4,789.4	4,685.0	18.7	19.8	88.14	527.9	1,229.9	566.0	539.6	26.40	21.443		
4,800.0	4,696.7	4,900.4	4,793.0	18.8	20.3	87.87	529.6	1,204.6	543.3	516.5	26.82	20.258		
4,900.0	4,796.7	5,002.1	4,891.4	18.9	20.8	87.24	534.1	1,178.7	518.1	490.8	27.23	19.025		
5,000.0	4,896.7	5,091.6	4,977.7	19.1	21.3	86.41	540.0	1,156.2	493.2	465.6	27.62	17.858		
5,100.0	4,996.7	5,175.0	5,058.7	19.2	21.7	85.67	544.7	1,136.8	470.4	442.4	28.00	16.804		
5,200.0	5,096.7	5,265.0	5,146.7	19.3	22.1	84.96	548.8	1,118.1	450.0	421.6	28.39	15.853		
5,300.0	5,196.7	5,355.0	5,235.1	19.4	22.4	84.46	551.0	1,101.7	432.0	403.2	28.77	15.015		
5,400.0	5,296.7	5,446.0	5,324.9	19.6	22.8	84.23	551.3	1,087.0	415.9	386.8	29.14	14.272		
5,500.0	5,396.7	5,536.0	5,414.0	19.7	23.1	84.07	551.1	1,073.9	401.4	371.9	29.50	13.607		
5,600.0	5,496.7	5,637.5	5,514.5	19.8	23.4	83.70	552.1	1,059.4	387.4	357.5	29.90	12.957		
5,700.0	5,596.7	5,731.0	5,607.0	19.9	23.7	83.37	552.8	1,046.7	373.9	343.6	30.28	12.348		
5,800.0	5,696.7	5,824.2	5,699.4	20.1	23.9	82.75	555.4	1,034.9	361.7	331.0	30.67	11.794		
5,900.0	5,796.7	5,909.7	5,784.5	20.2	24.2	82.29	557.2	1,026.8	352.6	321.5	31.03	11.362		
6,000.0	5,896.7	5,998.6	5,873.3	20.4	24.3	82.06	557.9	1,021.7	346.9	315.5	31.38	11.055		
6,100.0	5,996.7	6,086.5	5,961.2	20.5	24.5	81.99	558.0	1,019.7	344.7	313.0	31.71	10.871		
6,120.7	6,017.4	6,106.4	5,981.0	20.5	24.5	-98.04	557.9	1,019.6	344.6	312.9	31.77	10.849		
6,200.0	6,096.5	6,181.8	6,056.5	20.6	24.5	-98.50	556.5	1,020.0	345.6	313.6	31.99	10.803		
6,300.0	6,194.8	6,274.8	6,148.8	20.6	24.6	-99.23	546.6	1,022.8	349.7	317.6	32.09	10.896		
6,400.0	6,289.8	6,409.4	6,276.3	20.5	24.6	-98.83	504.9	1,027.9	353.8	321.8	31.96	11.070		
6,470.5	6,354.1	6,479.8	6,338.4	20.4	24.6	-98.15	472.0	1,028.1	353.3	321.5	31.80	11.109		
6,500.0	6,380.1	6,511.6	6,365.3	20.3	24.6	-97.77	455.1	1,028.5	353.4	321.6	31.74	11.133		
6,600.0	6,464.0	6,625.9	6,456.1	20.1	24.6	-96.42	385.7	1,027.8	351.7	320.1	31.58	11.138		
6,700.0	6,540.0	6,743.1	6,532.2	19.9	24.7	-93.75	296.9	1,026.3	349.2	317.6	31.64	11.036		
6,800.0	6,607.0	6,847.0	6,584.8	19.7	24.9	-90.76	207.7	1,020.7	342.9	311.0	31.96	10.730		
6,900.0	6,663.7	6,934.5	6,615.4	19.4	25.1	-87.43	125.9	1,017.8	339.8	307.3	32.44	10.474		
6,930.0	6,678.6	6,960.2	6,622.1	19.4	25.2	-86.34	101.0	1,017.2	339.6	306.9	32.62	10.409 CC		
7,000.0	6,709.2	7,020.2	6,634.2	19.2	25.4	-83.78	42.3	1,016.8	340.6	307.5	33.02	10.313		
7,100.0	6,742.7	7,116.9	6,645.5	19.2	25.8	-80.00	-53.7	1,016.3	343.3	309.5	33.74	10.175		
7,200.0	6,763.6	7,211.4	6,649.3	19.2	26.4	-77.17	-148.1	1,014.8	345.1	310.6	34.52	9.999		
7,300.0	6,771.5	7,306.5	6,652.2	19.5	27.0	-76.35	-243.1	1,015.3	346.8	311.1	35.67	9.723		
7,400.0	6,771.1	7,408.6	6,650.8	20.0	27.8	-76.17	-345.2	1,014.5	346.2	308.8	37.44	9.247		
7,481.6	6,770.5	7,487.4	6,650.8	20.7	28.4	-76.24	-424.0	1,014.1	345.7	306.6	39.04	8.854		
7,500.0	6,770.4	7,504.6	6,650.9	20.8	28.6	-76.28	-441.2	1,014.2	345.7	306.3	39.41	8.773		
7,600.0	6,769.8	7,606.0	6,650.9	21.8	29.5	-76.40	-542.6	1,014.9	346.2	304.5	41.73	8.298		
7,654.8	6,769.5	7,660.6	6,649.6	22.5	30.1	-76.24	-597.2	1,014.6	346.2	303.1	43.05	8.041		
7,700.0	6,769.2	7,704.2	6,649.1	23.0	30.5	-76.20	-640.8	1,014.6	346.3	302.1	44.15	7.843		
7,800.0	6,768.5	7,803.5	6,649.1	24.2	31.6	-76.33	-740.1	1,015.4	346.9	300.2	46.71	7.426		
7,900.0	6,767.9	7,909.1	6,648.7	25.6	32.8	-76.36	-845.7	1,015.0	346.4	296.9	49.54	6.993		
8,000.0	6,767.3	8,008.0	6,648.3	27.0	34.0	-76.37	-944.6	1,014.4	345.8	293.4	52.41	6.598		
8,100.0	6,766.7	8,109.0	6,646.5	28.4	35.3	-76.14	-1,045.5	1,013.3	344.9	289.6	55.36	6.231		
8,200.0	6,766.0	8,210.3	6,645.2	29.9	36.6	-75.99	-1,146.8	1,012.1	344.0	285.7	58.33	5.897		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28E-203 - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		44-MWD											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
8,300.0	6,765.4	8,309.5	6,645.6	31.5	37.9	-76.11	-1,246.1	1,010.9	342.6	281.2	61.36	5.583			
8,400.0	6,764.8	8,407.4	6,645.1	33.1	39.3	-76.10	-1,343.9	1,010.3	341.9	277.5	64.47	5.304			
8,465.1	6,764.4	8,470.9	6,644.2	34.2	40.2	-76.00	-1,407.5	1,009.9	341.7	275.2	66.51	5.138			
8,500.0	6,764.1	8,504.4	6,644.2	34.7	40.7	-76.04	-1,440.9	1,010.1	341.8	274.2	67.62	5.055			
8,600.0	6,763.5	8,603.2	6,645.8	36.4	42.1	-76.46	-1,539.7	1,011.4	342.6	271.6	70.98	4.827			
8,700.0	6,762.9	8,702.4	6,647.1	38.1	43.6	-76.81	-1,638.9	1,012.8	343.5	269.1	74.38	4.618			
8,800.0	6,762.3	8,802.6	6,647.5	39.8	45.1	-77.04	-1,739.1	1,014.1	344.5	266.7	77.81	4.428			
8,900.0	6,761.6	8,902.8	6,646.6	41.5	46.6	-77.02	-1,839.3	1,015.0	345.5	264.3	81.14	4.257			
9,000.0	6,761.0	9,002.9	6,646.1	43.2	48.1	-77.08	-1,939.4	1,016.0	346.4	261.9	84.46	4.101			
9,100.0	6,760.4	9,102.9	6,645.3	45.0	49.7	-77.09	-2,039.3	1,016.8	347.3	259.4	87.85	3.953			
9,200.0	6,759.7	9,204.0	6,643.9	46.7	51.2	-76.99	-2,140.4	1,017.5	348.1	256.9	91.23	3.816			
9,300.0	6,759.1	9,311.3	6,643.4	48.5	52.8	-76.99	-2,247.7	1,016.9	347.5	252.8	94.67	3.670			
9,400.0	6,758.5	9,413.7	6,643.4	50.3	54.4	-77.03	-2,350.1	1,015.0	345.5	247.4	98.09	3.523			
9,500.0	6,757.9	9,511.9	6,644.5	52.1	56.0	-77.24	-2,448.3	1,013.2	343.4	241.8	101.54	3.381			
9,600.0	6,757.2	9,606.6	6,645.3	53.9	57.5	-77.45	-2,542.9	1,012.6	342.4	237.4	104.98	3.262			
9,608.2	6,757.2	9,614.2	6,645.3	54.0	57.6	-77.45	-2,550.6	1,012.6	342.4	237.1	105.26	3.253			
9,700.0	6,756.6	9,701.2	6,644.5	55.7	59.0	-77.43	-2,637.6	1,013.2	343.1	234.7	108.37	3.166			
9,800.0	6,756.0	9,799.2	6,644.1	57.5	60.6	-77.53	-2,735.5	1,015.2	345.0	233.1	111.87	3.084			
9,900.0	6,755.3	9,894.9	6,644.4	59.3	62.2	-77.77	-2,831.2	1,017.6	347.3	231.9	115.38	3.010			
10,000.0	6,754.7	9,987.8	6,644.6	61.1	63.7	-78.05	-2,924.0	1,021.9	351.7	232.8	118.90	2.958			
10,100.0	6,754.1	10,088.6	6,641.6	63.0	65.4	-77.84	-3,024.6	1,027.1	357.2	234.8	122.37	2.919			
10,200.0	6,753.5	10,188.3	6,640.8	64.8	67.0	-77.98	-3,124.2	1,031.8	361.8	235.9	125.94	2.873			
10,300.0	6,752.8	10,292.4	6,639.8	66.7	68.7	-78.10	-3,228.2	1,036.9	366.7	237.1	129.59	2.830			
10,400.0	6,752.2	10,395.3	6,642.2	68.5	70.4	-78.68	-3,331.0	1,041.0	370.0	236.6	133.39	2.774			
10,500.0	6,751.6	10,504.1	6,643.6	70.4	72.2	-79.08	-3,439.8	1,043.6	371.9	234.7	137.26	2.710			
10,600.0	6,751.0	10,602.1	6,643.0	72.2	73.9	-79.11	-3,537.7	1,044.7	373.1	232.3	140.81	2.650			
10,700.0	6,750.3	10,712.0	6,641.5	74.1	75.8	-78.99	-3,647.6	1,044.7	373.2	228.7	144.49	2.583			
10,800.0	6,749.7	10,821.0	6,640.5	75.9	77.6	-78.85	-3,756.5	1,041.5	370.4	222.3	148.10	2.501			
10,900.0	6,749.1	10,921.2	6,640.4	77.8	79.3	-78.80	-3,856.7	1,037.4	366.3	214.7	151.62	2.416			
11,000.0	6,748.4	11,012.6	6,640.6	79.7	80.8	-78.84	-3,948.1	1,034.8	363.3	208.3	155.05	2.343			
11,100.0	6,747.8	11,108.8	6,639.1	81.5	82.5	-78.67	-4,044.2	1,033.9	362.6	204.1	158.48	2.288			
11,164.9	6,747.4	11,172.0	6,637.9	82.7	83.6	-78.55	-4,107.4	1,033.6	362.4	201.7	160.72	2.255			
11,200.0	6,747.2	11,205.8	6,637.5	83.4	84.2	-78.50	-4,141.2	1,033.6	362.5	200.5	161.94	2.238			
11,300.0	6,746.6	11,306.9	6,636.4	85.3	85.9	-78.45	-4,242.3	1,033.8	362.8	197.3	165.50	2.192			
11,400.0	6,745.9	11,407.3	6,635.6	87.1	87.6	-78.43	-4,342.6	1,033.8	362.8	193.7	169.06	2.146			
11,500.0	6,745.3	11,512.3	6,635.6	89.0	89.4	-78.49	-4,447.7	1,033.0	361.9	189.2	172.75	2.095			
11,600.0	6,744.7	11,613.9	6,636.9	90.9	91.1	-78.76	-4,549.3	1,031.7	360.3	183.8	176.49	2.041			
11,700.0	6,744.0	11,714.4	6,637.7	92.8	92.9	-78.93	-4,649.8	1,029.8	358.2	178.0	180.17	1.988			
11,800.0	6,743.4	11,815.1	6,637.5	94.7	94.6	-78.93	-4,750.5	1,027.8	356.2	172.4	183.78	1.938			
11,900.0	6,742.8	11,916.0	6,637.2	96.5	96.3	-78.91	-4,851.3	1,025.4	353.7	166.3	187.38	1.888			
12,000.0	6,742.2	12,011.0	6,638.4	98.4	98.0	-79.14	-4,946.3	1,023.8	351.7	160.7	191.01	1.841			
12,100.0	6,741.5	12,107.4	6,641.0	100.3	99.7	-79.67	-5,042.6	1,024.0	351.3	156.4	194.85	1.803			
12,104.8	6,741.5	12,112.1	6,641.2	100.4	99.8	-79.70	-5,047.3	1,024.0	351.3	156.2	195.04	1.801			
12,200.0	6,740.9	12,201.7	6,643.0	102.2	101.3	-80.11	-5,136.9	1,025.1	352.0	153.4	198.62	1.772			
12,300.0	6,740.3	12,302.8	6,643.5	104.1	103.1	-80.35	-5,238.0	1,026.9	353.6	151.2	202.39	1.747			
12,400.0	6,739.6	12,394.0	6,643.0	106.0	104.7	-80.42	-5,329.2	1,028.8	355.7	149.7	205.91	1.727			
12,500.0	6,739.0	12,489.9	6,641.1	107.9	106.4	-80.29	-5,425.0	1,032.4	359.6	150.1	209.43	1.717			
12,600.0	6,738.4	12,590.3	6,638.6	109.8	108.1	-80.14	-5,525.3	1,036.9	364.4	151.4	212.98	1.711			
12,700.0	6,737.8	12,694.2	6,637.5	111.6	109.9	-80.19	-5,629.0	1,041.6	368.9	152.2	216.70	1.702			
12,800.0	6,737.1	12,801.8	6,637.1	113.5	111.8	-80.29	-5,736.6	1,044.0	371.0	150.5	220.51	1.682			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Churchill 28J-HZ Pad Sec.28-T5N-R64W - Churchill 28E-203 - Wellbore #1 - Wellbore #1													Offset Site Error:		0.0 ft
Survey Program: 44-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
12,900.0	6,736.5	12,904.0	6,636.0	115.4	113.6	-80.26	-5,838.8	1,045.4	372.4	148.3	224.16	1.661			
13,000.0	6,735.9	13,004.7	6,635.1	117.3	115.3	-80.23	-5,939.5	1,046.1	373.2	145.4	227.78	1.638			
13,100.0	6,735.2	13,109.9	6,634.6	119.2	117.1	-80.26	-6,044.7	1,046.4	373.4	141.9	231.52	1.613			
13,200.0	6,734.6	13,209.9	6,634.3	121.1	118.9	-80.30	-6,144.7	1,045.8	372.8	137.6	235.17	1.585			
13,300.0	6,734.0	13,312.3	6,633.7	123.0	120.7	-80.28	-6,247.1	1,044.8	371.8	132.9	238.84	1.557			
13,400.0	6,733.4	13,411.7	6,632.8	124.9	122.4	-80.22	-6,346.5	1,043.7	370.8	128.3	242.42	1.529			
13,500.0	6,732.7	13,513.7	6,632.3	126.8	124.2	-80.18	-6,448.4	1,042.1	369.2	123.1	246.06	1.500			
13,600.0	6,732.1	13,608.0	6,632.0	128.7	125.9	-80.22	-6,542.7	1,041.1	368.1	118.5	249.61	1.475	Level 3		
13,602.9	6,732.1	13,610.6	6,632.0	128.8	125.9	-80.21	-6,545.4	1,041.1	368.1	118.4	249.71	1.474	Level 3		
13,700.0	6,731.5	13,703.3	6,630.7	130.6	127.6	-80.12	-6,638.0	1,041.9	369.1	115.9	253.11	1.458	Level 3		
13,800.0	6,730.8	13,804.7	6,628.5	132.5	129.4	-79.90	-6,739.4	1,042.7	370.1	113.4	256.63	1.442	Level 3		
13,900.0	6,730.2	13,908.0	6,627.0	134.4	131.2	-79.77	-6,842.6	1,042.9	370.4	110.1	260.22	1.423	Level 3		
13,905.3	6,730.2	13,913.3	6,626.9	134.5	131.3	-79.77	-6,848.0	1,042.8	370.4	110.0	260.41	1.422	Level 3, ES, SF		
14,000.0	6,729.6	13,915.0	6,626.9	136.3	131.3	-79.77	-6,849.7	1,042.8	381.8	119.6	262.22	1.456	Level 3		
14,100.0	6,729.0	13,915.0	6,626.9	138.2	131.3	-79.77	-6,849.7	1,042.8	417.5	153.4	264.10	1.581			
14,200.0	6,728.3	13,915.0	6,626.9	140.1	131.3	-79.77	-6,849.7	1,042.8	472.1	206.1	265.98	1.775			
14,300.0	6,727.7	13,915.0	6,626.9	142.0	131.3	-79.77	-6,849.7	1,042.8	539.8	272.0	267.86	2.015			
14,400.0	6,727.1	13,915.0	6,626.9	143.9	131.3	-79.77	-6,849.7	1,042.8	616.4	346.7	269.74	2.285			
14,411.8	6,727.0	13,915.0	6,626.9	144.2	131.3	-79.77	-6,849.7	1,042.8	625.9	356.0	269.97	2.318			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Cross #32-11A (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:		0.0 ft
Survey Program: 100-NS-GYRO-MS													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			
11,600.0	6,744.7	6,776.0	6,773.8	90.9	14.7	97.25	-5,492.2	598.8	952.6	848.0	104.65	9.103			
11,700.0	6,744.0	6,775.1	6,772.9	92.8	14.7	96.60	-5,492.2	598.8	853.0	746.4	106.62	8.001			
11,800.0	6,743.4	6,774.2	6,772.0	94.7	14.7	95.94	-5,492.2	598.8	753.5	644.9	108.59	6.940			
11,900.0	6,742.8	6,773.3	6,771.1	96.5	14.7	95.29	-5,492.2	598.7	654.2	543.6	110.54	5.918			
12,000.0	6,742.2	6,772.3	6,770.2	98.4	14.7	94.63	-5,492.2	598.7	555.1	442.6	112.49	4.934			
12,100.0	6,741.5	6,771.4	6,769.2	100.3	14.7	93.97	-5,492.2	598.7	456.3	341.9	114.43	3.988			
12,200.0	6,740.9	6,770.5	6,768.3	102.2	14.7	93.31	-5,492.2	598.7	358.3	241.9	116.37	3.079			
12,300.0	6,740.3	6,769.6	6,767.4	104.1	14.7	92.65	-5,492.2	598.7	261.8	143.5	118.29	2.213			
12,400.0	6,739.6	6,768.7	6,766.5	106.0	14.7	91.99	-5,492.2	598.7	169.3	49.1	120.20	1.408	Level 3		
12,500.0	6,739.0	6,767.7	6,765.6	107.9	14.7	91.33	-5,492.2	598.7	93.8	-28.3	122.10	0.768	Level 1		
12,549.3	6,738.7	6,767.3	6,765.1	108.8	14.7	91.01	-5,492.2	598.6	79.7	-43.3	123.03	0.648	Level 1, CC, ES, SF		
12,600.0	6,738.4	6,766.8	6,764.6	109.8	14.7	90.67	-5,492.2	598.6	94.5	-29.5	123.99	0.762	Level 1		
12,700.0	6,737.8	6,765.9	6,763.7	111.6	14.7	90.01	-5,492.2	598.6	170.5	44.6	125.86	1.354	Level 3		
12,800.0	6,737.1	6,765.0	6,762.8	113.5	14.7	89.35	-5,492.2	598.6	263.0	135.3	127.73	2.059			
12,900.0	6,736.5	6,764.1	6,761.9	115.4	14.7	88.69	-5,492.2	598.6	359.6	230.0	129.57	2.775			
13,000.0	6,735.9	6,763.1	6,761.0	117.3	14.7	88.03	-5,492.2	598.6	457.6	326.2	131.41	3.483			
13,100.0	6,735.2	6,762.2	6,760.0	119.2	14.7	87.37	-5,492.2	598.6	556.4	423.2	133.22	4.176			
13,200.0	6,734.6	6,761.3	6,759.1	121.1	14.7	86.72	-5,492.2	598.5	655.5	520.5	135.03	4.855			
13,300.0	6,734.0	6,760.4	6,758.2	123.0	14.7	86.06	-5,492.2	598.5	754.9	618.0	136.81	5.517			
13,400.0	6,733.4	6,759.5	6,757.3	124.9	14.7	85.41	-5,492.2	598.5	854.4	715.8	138.58	6.165			
13,500.0	6,732.7	6,758.5	6,756.4	126.8	14.7	84.75	-5,492.2	598.5	954.0	813.6	140.33	6.798			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - DIC Amato #42-32 (Exist.) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		100-NS-GYRO-MS											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
12,900.0	6,736.5	6,785.8	6,785.3	115.4	13.9	94.84	-6,754.2	365.7	963.7	835.1	128.67	7.490			
13,000.0	6,735.9	6,782.7	6,782.2	117.3	13.9	94.28	-6,754.3	365.7	869.8	739.2	130.63	6.659			
13,100.0	6,735.2	6,779.6	6,779.1	119.2	13.9	93.72	-6,754.4	365.7	777.4	644.8	132.58	5.863			
13,200.0	6,734.6	6,776.6	6,776.0	121.1	13.9	93.15	-6,754.5	365.7	687.0	552.5	134.52	5.107			
13,300.0	6,734.0	6,773.5	6,772.9	123.0	13.9	92.59	-6,754.5	365.8	599.7	463.3	136.45	4.395			
13,400.0	6,733.4	6,770.4	6,769.8	124.9	13.9	92.03	-6,754.6	365.8	517.0	378.7	138.37	3.737			
13,500.0	6,732.7	6,767.3	6,766.8	126.8	13.9	91.46	-6,754.7	365.8	441.6	301.3	140.28	3.148			
13,600.0	6,732.1	6,764.2	6,763.7	128.7	13.9	90.90	-6,754.8	365.8	377.7	235.5	142.18	2.656			
13,700.0	6,731.5	6,761.1	6,760.6	130.6	13.9	90.33	-6,754.8	365.8	332.0	187.9	144.07	2.304			
13,800.0	6,730.8	6,758.0	6,757.5	132.5	13.9	89.77	-6,754.9	365.8	312.8	166.8	145.95	2.143			
13,812.1	6,730.8	6,757.7	6,757.1	132.7	13.9	89.70	-6,754.9	365.8	312.5	166.4	146.18	2.138	CC, ES, SF		
13,900.0	6,730.2	6,755.0	6,754.4	134.4	13.9	89.20	-6,755.0	365.8	324.7	176.8	147.82	2.196			
14,000.0	6,729.6	6,751.9	6,751.3	136.3	13.8	88.64	-6,755.1	365.9	364.6	215.0	149.68	2.436			
14,100.0	6,729.0	6,748.8	6,748.2	138.2	13.8	88.07	-6,755.1	365.9	424.8	273.3	151.52	2.804			
14,200.0	6,728.3	6,745.7	6,745.2	140.1	13.8	87.51	-6,755.2	365.9	498.0	344.7	153.35	3.248			
14,300.0	6,727.7	6,742.6	6,742.1	142.0	13.8	86.94	-6,755.3	365.9	579.2	424.1	155.16	3.733			
14,400.0	6,727.1	6,739.5	6,739.0	143.9	13.8	86.38	-6,755.4	365.9	665.6	508.6	156.97	4.240			
14,411.8	6,727.0	6,739.2	6,738.6	144.2	13.8	86.31	-6,755.4	365.9	676.0	518.9	157.18	4.301			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-29 (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		100-NS-GYRO-MS											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	105.31	-76.5	279.5	290.9						
100.0	100.0	75.1	75.1	0.1	0.1	105.33	-76.6	279.3	289.6	289.4	0.21	1,364.984			
186.1	186.1	160.1	160.1	0.3	0.2	105.38	-76.7	279.0	289.3	288.8	0.54	539.974			
200.0	200.0	173.7	173.7	0.3	0.3	105.38	-76.8	279.0	289.3	288.8	0.59	491.216			
300.0	300.0	273.3	273.3	0.6	0.4	52.54	-76.9	279.2	288.8	287.8	0.99	290.891			
400.0	399.9	371.0	371.0	0.8	0.7	53.23	-77.3	279.6	287.0	285.5	1.44	198.775			
500.0	499.7	469.7	469.7	1.0	0.9	54.45	-78.3	280.7	284.4	282.5	1.93	147.593			
600.0	599.3	568.1	568.1	1.3	1.2	56.10	-79.3	281.9	280.7	278.3	2.43	115.622			
700.0	698.6	666.8	666.7	1.6	1.4	58.25	-80.4	283.7	276.4	273.4	2.94	93.905			
800.0	797.5	764.7	764.6	1.9	1.6	60.72	-80.7	286.0	271.3	267.8	3.48	78.019			
900.0	896.1	862.8	862.7	2.2	1.9	63.76	-81.1	288.7	266.1	262.0	4.05	65.631			
1,000.0	994.2	962.2	962.0	2.6	2.1	67.49	-81.5	291.5	260.6	255.9	4.69	55.603			
1,100.0	1,091.7	1,060.0	1,059.8	3.1	2.4	71.86	-81.9	293.8	255.0	249.6	5.37	47.460			
1,200.0	1,188.6	1,157.4	1,157.2	3.5	2.6	76.97	-82.6	296.2	250.6	244.5	6.12	40.934			
1,300.0	1,285.1	1,254.2	1,254.0	4.0	2.9	82.55	-83.2	298.3	247.9	241.0	6.92	35.845			
1,351.7	1,334.9	1,304.0	1,303.7	4.3	3.0	85.42	-83.5	299.5	247.5	240.2	7.33	33.780 CC			
1,400.0	1,381.5	1,351.8	1,351.5	4.6	3.2	88.18	-83.8	300.6	247.7	240.0	7.71	32.116 ES			
1,500.0	1,478.0	1,449.0	1,448.7	5.1	3.4	93.82	-84.1	302.3	249.6	241.1	8.50	29.370			
1,600.0	1,574.5	1,545.2	1,544.9	5.6	3.7	99.25	-84.5	304.3	254.1	244.9	9.26	27.458			
1,700.0	1,670.9	1,642.5	1,642.2	6.2	3.9	104.51	-85.0	306.3	261.1	251.1	9.98	26.160			
1,800.0	1,767.4	1,740.4	1,740.0	6.7	4.2	109.46	-85.1	308.3	269.8	259.2	10.67	25.297			
1,900.0	1,863.8	1,837.3	1,836.9	7.2	4.4	113.98	-84.9	310.6	280.3	269.0	11.31	24.780			
2,000.0	1,960.3	1,934.2	1,933.8	7.8	4.7	118.17	-84.8	312.8	292.6	280.6	11.92	24.535			
2,100.0	2,056.7	2,032.1	2,031.7	8.3	4.9	122.02	-84.5	315.3	306.1	293.6	12.51	24.473			
2,200.0	2,153.2	2,129.7	2,129.2	8.9	5.1	125.57	-83.9	317.5	320.6	307.6	13.06	24.552			
2,300.0	2,249.6	2,226.4	2,225.9	9.4	5.4	128.74	-83.3	320.0	336.3	322.7	13.59	24.741			
2,400.0	2,346.1	2,323.5	2,323.0	10.0	5.6	131.59	-82.8	322.7	352.9	338.8	14.12	24.995			
2,500.0	2,442.5	2,420.2	2,419.6	10.5	5.9	134.15	-82.3	325.6	370.4	355.8	14.64	25.309			
2,600.0	2,539.0	2,517.9	2,517.3	11.1	6.1	136.56	-81.8	328.2	388.5	373.4	15.14	25.662			
2,700.0	2,635.5	2,614.2	2,613.6	11.6	6.4	138.73	-81.3	330.7	407.3	391.7	15.64	26.050			
2,800.0	2,731.9	2,711.4	2,710.8	12.2	6.6	140.78	-80.7	332.9	426.7	410.5	16.12	26.463			
2,900.0	2,828.4	2,805.2	2,804.5	12.7	6.9	142.68	-80.3	334.2	446.9	430.3	16.59	26.928			
3,000.0	2,924.8	2,900.6	2,899.9	13.3	7.1	144.48	-80.2	335.2	468.0	451.0	17.07	27.417			
3,100.0	3,021.3	2,999.2	2,998.5	13.8	7.3	146.21	-80.0	336.0	489.5	472.0	17.53	27.930			
3,200.0	3,117.7	3,096.9	3,096.2	14.4	7.6	147.80	-79.5	336.8	511.1	493.2	17.97	28.443			
3,300.0	3,214.2	3,194.1	3,193.4	14.9	7.8	149.24	-78.9	337.6	533.0	514.5	18.41	28.945			
3,400.0	3,310.6	3,288.8	3,288.1	15.5	8.0	150.57	-78.3	338.2	555.2	536.3	18.84	29.468			
3,500.0	3,407.1	3,388.3	3,387.6	16.0	8.2	151.87	-77.6	338.6	577.7	558.4	19.25	30.004			
3,600.0	3,503.7	3,480.0	3,479.3	16.5	8.4	153.08	-77.0	338.9	599.9	580.2	19.68	30.487			
3,700.0	3,601.1	3,573.4	3,572.7	16.9	8.6	154.14	-77.2	339.2	620.4	600.3	20.06	30.932			
3,800.0	3,699.3	3,669.0	3,668.3	17.2	8.7	154.98	-77.9	339.4	638.4	618.0	20.40	31.294			
3,900.0	3,798.0	3,765.5	3,764.8	17.5	8.9	155.60	-79.1	339.6	653.7	632.9	20.72	31.542			
4,000.0	3,897.3	3,864.0	3,863.3	17.8	9.1	156.05	-80.7	340.0	666.1	645.0	21.04	31.664			
4,100.0	3,996.9	3,980.7	3,979.9	18.0	9.3	156.41	-81.3	340.4	674.5	653.2	21.35	31.591			
4,200.0	4,096.7	4,094.1	4,093.3	18.2	9.4	156.72	-78.4	340.9	676.9	655.3	21.61	31.333			
4,300.0	4,196.7	4,203.1	4,202.2	18.3	9.6	157.03	-73.1	340.5	674.6	652.8	21.78	30.971			
4,400.0	4,296.7	4,303.8	4,302.7	18.4	9.7	-149.54	-66.8	339.2	669.9	647.9	21.99	30.467			
4,500.0	4,396.7	4,400.0	4,398.7	18.5	9.8	-149.13	-60.8	337.1	665.6	643.4	22.19	29.994			
4,600.0	4,496.7	4,493.5	4,492.0	18.6	9.8	-148.74	-55.6	335.0	662.0	639.7	22.40	29.562			
4,700.0	4,596.7	4,586.9	4,585.3	18.7	9.9	-148.42	-51.6	333.2	659.3	636.7	22.62	29.151			
4,800.0	4,696.7	4,684.9	4,683.3	18.8	10.0	-148.19	-48.5	332.0	657.3	634.4	22.86	28.747			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-29 (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		100-NS-GYRO-MS											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
4,900.0	4,796.7	4,782.1	4,780.4	18.9	10.1	-148.02	-46.0	331.2	655.6	632.5	23.13	28.341			
5,000.0	4,896.7	4,878.2	4,876.5	19.1	10.3	-147.92	-44.5	330.9	654.4	630.9	23.44	27.919			
5,100.0	4,996.7	4,979.0	4,977.3	19.2	10.5	-147.90	-43.6	331.1	653.5	629.7	23.80	27.455			
5,200.0	5,096.7	5,078.0	5,076.3	19.3	10.7	-147.93	-42.9	331.9	652.5	628.3	24.21	26.958			
5,300.0	5,196.7	5,178.3	5,176.5	19.4	11.0	-148.06	-43.0	333.6	651.7	627.0	24.64	26.443			
5,400.0	5,296.7	5,279.4	5,277.6	19.6	11.2	-148.25	-43.3	336.0	650.7	625.6	25.10	25.928			
5,500.0	5,396.7	5,381.1	5,379.3	19.7	11.5	-148.40	-43.1	338.0	649.5	624.0	25.55	25.421			
5,600.0	5,496.7	5,475.4	5,473.6	19.8	11.7	-148.55	-43.3	340.0	648.5	622.5	25.98	24.962			
5,700.0	5,596.7	5,573.2	5,571.3	19.9	11.9	-148.76	-44.3	342.1	648.4	621.9	26.41	24.548			
5,800.0	5,696.7	5,673.1	5,671.2	20.1	12.2	-148.95	-45.4	344.0	648.3	621.4	26.85	24.147			
5,850.1	5,746.8	5,722.7	5,720.8	20.1	12.3	-149.06	-46.0	345.1	648.2	621.2	27.06	23.952			
5,900.0	5,796.7	5,771.4	5,769.5	20.2	12.4	-149.17	-46.7	346.1	648.3	621.0	27.28	23.767			
6,000.0	5,896.7	5,873.8	5,871.9	20.4	12.6	-149.36	-47.9	347.9	648.4	620.7	27.72	23.392			
6,100.0	5,996.7	5,973.1	5,971.1	20.5	12.9	-149.52	-48.6	349.6	648.2	620.0	28.16	23.020			
6,200.0	6,096.5	6,073.1	6,071.1	20.6	13.1	30.73	-49.5	351.1	643.7	615.5	28.17	22.848			
6,300.0	6,194.8	6,173.2	6,171.2	20.6	13.4	32.10	-49.9	352.4	627.9	600.2	27.70	22.670			
6,400.0	6,289.8	6,266.1	6,264.2	20.5	13.6	34.61	-50.4	353.7	601.5	574.7	26.85	22.405			
6,500.0	6,380.1	6,356.8	6,354.8	20.3	13.8	38.64	-51.1	354.6	565.9	540.0	25.85	21.889			
6,600.0	6,464.0	6,441.5	6,439.5	20.1	14.0	44.54	-51.5	355.6	522.0	496.9	25.13	20.770			
6,700.0	6,540.0	6,517.5	6,515.5	19.9	14.2	52.47	-52.1	356.6	472.5	447.3	25.24	18.724			
6,800.0	6,607.0	6,585.0	6,583.0	19.7	14.4	62.43	-52.8	357.7	420.9	394.4	26.46	15.908			
6,900.0	6,663.7	6,642.8	6,640.8	19.4	14.5	73.41	-53.5	358.7	372.4	344.1	28.30	13.162			
7,000.0	6,709.2	6,689.5	6,687.5	19.2	14.6	83.44	-54.1	359.5	335.0	305.2	29.81	11.239			
7,100.0	6,742.7	6,725.4	6,723.4	19.2	14.7	90.72	-54.6	360.2	318.4	287.7	30.69	10.375			
7,111.3	6,745.7	6,728.7	6,726.7	19.1	14.7	91.31	-54.7	360.2	318.2	287.4	30.77	10.341 SF			
7,200.0	6,763.6	6,748.8	6,746.8	19.2	14.8	93.95	-54.9	360.7	329.9	298.6	31.28	10.544			
7,300.0	6,771.5	6,758.8	6,756.8	19.5	14.8	92.51	-55.1	361.0	369.0	337.1	31.92	11.561			
7,400.0	6,771.1	6,759.9	6,757.9	20.0	14.8	91.99	-55.1	361.0	428.7	395.9	32.71	13.103			
7,500.0	6,770.4	6,760.9	6,758.8	20.8	14.8	92.16	-55.1	361.0	501.3	467.6	33.69	14.879			
7,600.0	6,769.8	6,761.9	6,759.8	21.8	14.8	92.33	-55.1	361.0	582.2	547.4	34.81	16.725			
7,700.0	6,769.2	6,762.8	6,760.8	23.0	14.8	92.51	-55.2	361.1	668.2	632.2	36.04	18.541			
7,800.0	6,768.5	6,763.8	6,761.8	24.2	14.8	92.69	-55.2	361.1	757.7	720.3	37.37	20.276			
7,900.0	6,767.9	6,764.8	6,762.7	25.6	14.8	92.87	-55.2	361.1	849.5	810.7	38.78	21.908			
8,000.0	6,767.3	6,765.8	6,763.7	27.0	14.8	93.05	-55.2	361.2	943.0	902.7	40.25	23.428			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft	
Survey Program: 488-NS-GYRO-MS													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
0.0	0.0	0.0	0.0	0.0	0.0	99.54	-49.2	292.8	297.1					
100.0	100.0	89.2	89.2	0.1	0.1	99.54	-49.2	292.8	296.9	296.7	0.23	1,285.276		
200.0	200.0	189.5	189.5	0.3	0.3	99.55	-49.3	292.7	296.8	296.2	0.59	504.010		
300.0	300.0	289.8	289.8	0.6	0.4	46.71	-49.4	292.4	295.6	294.7	0.94	313.150		
400.0	399.9	389.9	389.9	0.8	0.5	47.34	-49.5	292.1	292.7	291.4	1.30	224.695		
500.0	499.7	489.9	489.9	1.0	0.7	48.41	-49.7	291.6	287.9	286.2	1.67	172.263		
600.0	599.3	588.8	588.8	1.3	0.8	49.81	-49.4	291.4	281.6	279.5	2.08	135.399		
700.0	698.6	686.7	686.7	1.6	1.0	51.52	-48.4	291.6	274.1	271.6	2.48	110.527		
800.0	797.5	783.4	783.4	1.9	1.1	53.65	-47.1	292.7	266.1	263.2	2.87	92.716		
900.0	896.1	881.7	881.6	2.2	1.2	56.26	-45.4	294.7	257.6	254.2	3.34	77.191		
1,000.0	994.2	980.3	980.2	2.6	1.4	59.32	-42.7	297.1	248.4	244.5	3.87	64.198		
1,100.0	1,091.7	1,079.5	1,079.2	3.1	1.6	62.90	-38.8	299.8	238.4	233.9	4.50	53.024		
1,200.0	1,188.6	1,178.8	1,178.4	3.5	1.8	67.15	-33.8	302.5	227.9	222.7	5.20	43.800		
1,300.0	1,285.1	1,277.9	1,277.3	4.0	2.0	72.03	-28.4	304.8	217.5	211.5	5.98	36.385		
1,400.0	1,381.5	1,374.8	1,374.0	4.6	2.3	76.92	-22.1	307.6	208.6	201.8	6.78	30.782		
1,500.0	1,478.0	1,472.4	1,471.2	5.1	2.5	81.72	-14.7	311.9	201.7	194.1	7.59	26.581		
1,600.0	1,574.5	1,573.1	1,571.4	5.6	2.8	86.81	-6.3	316.4	195.8	187.3	8.41	23.275		
1,700.0	1,670.9	1,674.9	1,672.7	6.2	3.1	92.33	3.1	319.8	190.2	180.9	9.22	20.618		
1,800.0	1,767.4	1,781.0	1,778.1	6.7	3.3	98.72	15.4	320.8	183.2	173.2	10.01	18.308		
1,900.0	1,863.8	1,884.0	1,880.0	7.2	3.6	105.69	31.0	319.1	174.1	163.4	10.71	16.264		
2,000.0	1,960.3	1,983.6	1,978.2	7.8	3.9	113.79	46.6	314.8	166.4	155.2	11.27	14.771		
2,100.0	2,056.7	2,083.9	2,076.6	8.3	4.2	123.62	64.1	307.2	160.4	148.7	11.63	13.787		
2,180.8	2,134.6	2,160.7	2,151.7	8.8	4.4	132.27	78.7	299.2	158.0	146.2	11.76	13.437 CC, ES		
2,200.0	2,153.2	2,178.3	2,168.8	8.9	4.4	134.30	81.9	297.2	158.2	146.4	11.77	13.434 SF		
2,300.0	2,249.6	2,272.3	2,260.7	9.4	4.6	145.00	98.3	286.4	163.6	151.8	11.77	13.893		
2,400.0	2,346.1	2,365.5	2,351.7	10.0	4.9	154.91	115.1	275.0	174.8	163.0	11.77	14.851		
2,500.0	2,442.5	2,456.2	2,440.4	10.5	5.1	163.30	130.1	263.1	192.7	180.8	11.87	16.232		
2,600.0	2,539.0	2,545.7	2,527.7	11.1	5.4	170.38	144.1	249.7	216.2	204.1	12.11	17.858		
2,700.0	2,635.5	2,632.9	2,612.6	11.6	5.6	176.25	157.2	234.4	244.8	232.4	12.48	19.624		
2,800.0	2,731.9	2,719.0	2,696.0	12.2	5.8	-178.82	169.9	217.0	277.9	265.0	12.95	21.464		
2,900.0	2,828.4	2,806.9	2,780.6	12.7	6.1	-174.55	183.1	197.4	314.3	300.8	13.51	23.269		
3,000.0	2,924.8	2,899.0	2,869.6	13.3	6.3	-171.20	195.8	177.6	351.9	337.8	14.12	24.921		
3,100.0	3,021.3	2,984.7	2,952.6	13.8	6.5	-168.77	206.8	158.8	390.9	376.2	14.73	26.548		
3,200.0	3,117.7	3,076.3	3,041.0	14.4	6.8	-166.57	218.6	138.3	431.0	415.7	15.37	28.049		
3,300.0	3,214.2	3,173.8	3,135.4	14.9	7.1	-164.72	231.0	117.3	470.8	454.7	16.03	29.370		
3,400.0	3,310.6	3,278.1	3,237.0	15.5	7.4	-163.30	243.3	97.6	508.9	492.2	16.70	30.479		
3,500.0	3,407.1	3,382.0	3,339.1	16.0	7.6	-162.43	253.7	81.2	545.0	527.7	17.33	31.442		
3,600.0	3,503.7	3,478.4	3,434.2	16.5	7.9	-162.01	262.3	67.9	579.2	561.2	17.95	32.266		
3,700.0	3,601.1	3,565.0	3,519.3	16.9	8.1	-161.49	271.8	54.7	611.1	592.6	18.53	32.976		
3,800.0	3,699.3	3,648.9	3,601.3	17.2	8.4	-160.81	282.1	40.2	641.6	622.5	19.10	33.588		
3,900.0	3,798.0	3,732.0	3,682.2	17.5	8.6	-160.08	292.3	24.4	670.6	651.0	19.64	34.141		
4,000.0	3,897.3	3,820.0	3,767.5	17.8	8.9	-159.14	304.3	6.1	698.1	677.9	20.19	34.573		
4,100.0	3,996.9	3,910.2	3,854.1	18.0	9.2	-157.96	318.7	-14.1	723.8	703.0	20.75	34.879		
4,200.0	4,096.7	4,011.9	3,951.8	18.2	9.5	-156.55	335.6	-37.1	746.8	725.4	21.34	34.995		
4,300.0	4,196.7	4,117.3	4,053.5	18.3	9.9	-155.16	351.9	-59.4	766.0	744.1	21.90	34.970		
4,400.0	4,296.7	4,215.7	4,148.7	18.4	10.2	-150.72	366.6	-79.5	783.4	760.9	22.48	34.853		
4,500.0	4,396.7	4,315.5	4,245.7	18.5	10.5	-99.54	379.4	-99.3	800.9	777.9	23.03	34.775		
4,600.0	4,496.7	4,419.1	4,346.5	18.6	10.8	-98.43	391.8	-119.2	818.2	794.6	23.59	34.690		
4,700.0	4,596.7	4,520.0	4,444.8	18.7	11.1	-97.32	405.2	-138.0	835.0	810.9	24.14	34.597		
4,800.0	4,696.7	4,624.3	4,546.5	18.8	11.4	-96.23	418.8	-157.1	851.9	827.2	24.69	34.496		
4,900.0	4,796.7	4,721.9	4,641.8	18.9	11.7	-95.31	430.8	-173.9	867.9	842.7	25.21	34.422		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		488-NS-GYRO-MS											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,000.0	4,896.7	4,818.4	4,735.9	19.1	12.0	-94.38	443.3	-191.3	885.0	859.3	25.73	34.395			
5,100.0	4,996.7	4,919.2	4,834.3	19.2	12.3	-93.46	456.3	-208.9	901.7	875.4	26.26	34.336			
5,200.0	5,096.7	5,008.0	4,920.9	19.3	12.6	-92.67	467.9	-224.7	918.9	892.2	26.74	34.362			
5,300.0	5,196.7	5,098.5	5,009.0	19.4	12.9	-91.87	480.0	-241.8	937.4	910.2	27.23	34.428			
5,400.0	5,296.7	5,205.5	5,113.1	19.6	13.2	-91.00	493.6	-262.0	956.2	928.4	27.77	34.438			
5,500.0	5,396.7	5,318.6	5,223.8	19.7	13.6	-90.23	506.1	-281.5	973.4	945.1	28.30	34.396			
5,600.0	5,496.7	5,434.5	5,337.9	19.8	13.9	-89.62	516.5	-299.7	989.2	960.4	28.82	34.324			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-7B (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:		0.0 ft
Survey Program: 482-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	105.33	-85.6	312.3	324.0						
100.0	100.0	89.3	89.3	0.1	0.1	105.35	-85.7	312.3	323.8	323.6	0.21	1,518.879			
200.0	200.0	189.6	189.6	0.3	0.2	105.42	-86.0	312.0	323.7	323.1	0.55	587.416			
300.0	300.0	290.0	290.0	0.6	0.3	52.67	-86.6	311.6	322.6	321.7	0.89	362.678			
400.0	399.9	390.2	390.2	0.8	0.4	53.42	-87.4	311.0	319.9	318.7	1.23	259.478			
500.0	499.7	490.3	490.2	1.0	0.6	54.65	-88.4	310.3	315.6	314.0	1.60	197.275			
600.0	599.3	590.8	590.8	1.3	0.8	56.50	-90.2	309.0	309.8	307.7	2.08	148.805			
700.0	698.6	689.1	689.0	1.6	1.0	59.01	-92.9	307.1	302.7	300.1	2.57	117.571			
800.0	797.5	785.3	785.2	1.9	1.2	62.11	-96.3	305.7	295.6	292.5	3.09	95.715			
900.0	896.1	881.5	881.2	2.2	1.5	65.89	-100.4	304.5	289.0	285.3	3.65	79.246			
1,000.0	994.2	976.4	976.0	2.6	1.7	70.43	-105.8	303.4	283.5	279.2	4.25	66.725			
1,100.0	1,091.7	1,070.1	1,069.5	3.1	1.9	75.41	-111.3	303.2	280.2	275.3	4.90	57.240			
1,161.6	1,151.5	1,127.4	1,126.7	3.3	2.0	78.63	-114.7	303.6	279.6	274.3	5.32	52.519			
1,200.0	1,188.6	1,162.7	1,162.0	3.5	2.1	80.70	-116.9	304.1	279.9	274.3	5.59	50.052			
1,300.0	1,285.1	1,254.2	1,253.1	4.0	2.3	86.22	-123.5	305.7	283.5	277.2	6.32	44.863			
1,400.0	1,381.5	1,348.6	1,347.2	4.6	2.6	91.77	-131.1	307.8	291.1	284.1	7.06	41.231			
1,500.0	1,478.0	1,443.9	1,442.2	5.1	2.8	97.08	-138.9	309.9	301.7	293.9	7.78	38.760			
1,600.0	1,574.5	1,540.8	1,538.8	5.6	3.0	102.10	-146.6	311.9	314.5	306.1	8.46	37.160			
1,700.0	1,670.9	1,638.1	1,635.8	6.2	3.3	106.74	-153.8	313.7	329.2	320.1	9.11	36.123			
1,800.0	1,767.4	1,729.0	1,726.4	6.7	3.5	110.79	-160.6	314.9	345.8	336.0	9.73	35.519			
1,900.0	1,863.8	1,818.1	1,815.1	7.2	3.7	114.42	-169.2	316.5	366.2	355.8	10.34	35.407			
2,000.0	1,960.3	1,909.9	1,906.4	7.8	3.9	117.50	-178.4	320.1	388.8	377.8	10.94	35.528			
2,100.0	2,056.7	1,998.1	1,993.9	8.3	4.2	120.08	-188.4	324.3	413.7	402.2	11.53	35.866			
2,200.0	2,153.2	2,083.5	2,078.5	8.9	4.5	122.26	-199.6	328.8	441.2	429.1	12.13	36.388			
2,300.0	2,249.6	2,168.0	2,161.7	9.4	4.8	123.98	-212.7	334.9	471.6	458.9	12.72	37.060			
2,400.0	2,346.1	2,259.2	2,251.2	10.0	5.1	125.40	-227.8	343.5	503.5	490.1	13.34	37.731			
2,500.0	2,442.5	2,353.3	2,343.3	10.5	5.4	126.44	-243.7	354.5	535.9	521.9	13.99	38.317			
2,600.0	2,539.0	2,451.0	2,438.5	11.1	5.8	127.04	-260.0	369.2	568.1	553.4	14.67	38.718			
2,700.0	2,635.5	2,545.6	2,530.3	11.6	6.2	127.30	-275.4	386.0	599.9	584.5	15.39	38.978			
2,800.0	2,731.9	2,631.8	2,613.8	12.2	6.5	127.48	-290.3	401.7	632.6	616.5	16.11	39.261			
2,900.0	2,828.4	2,726.7	2,705.3	12.7	7.0	127.57	-307.2	419.9	665.8	648.9	16.88	39.441			
3,000.0	2,924.8	2,824.5	2,799.7	13.3	7.4	127.62	-324.4	439.0	698.8	681.2	17.66	39.572			
3,100.0	3,021.3	2,929.5	2,901.5	13.8	7.8	127.78	-341.5	458.2	730.7	712.2	18.45	39.607			
3,200.0	3,117.7	3,023.8	2,993.0	14.4	8.2	127.92	-356.6	475.5	762.1	742.9	19.22	39.652			
3,300.0	3,214.2	3,126.3	3,092.6	14.9	8.6	128.09	-372.5	493.9	793.2	773.2	20.02	39.619			
3,400.0	3,310.6	3,233.5	3,197.1	15.5	9.0	128.34	-387.6	511.9	823.0	802.2	20.82	39.529			
3,500.0	3,407.1	3,338.3	3,299.6	16.0	9.4	128.63	-401.1	528.9	851.6	830.0	21.61	39.416			
3,600.0	3,503.7	3,430.6	3,390.2	16.5	9.8	129.18	-412.3	542.8	879.3	857.0	22.33	39.382			
3,700.0	3,601.1	3,512.0	3,469.9	16.9	10.1	129.67	-423.3	555.5	906.2	883.3	22.94	39.497			
3,800.0	3,699.3	3,593.7	3,549.3	17.2	10.5	129.90	-435.9	569.7	932.8	909.2	23.56	39.588			
3,900.0	3,798.0	3,685.0	3,637.6	17.5	11.0	129.82	-450.9	587.3	958.1	933.9	24.22	39.559			
4,000.0	3,897.3	3,778.9	3,728.1	17.8	11.4	129.50	-466.8	606.6	981.8	956.9	24.88	39.466			
6,800.0	6,607.0	6,687.5	6,593.6	19.7	21.0	-22.17	-746.3	923.2	996.6	970.8	25.82	38.596			
6,900.0	6,663.7	6,746.0	6,652.1	19.4	21.1	-28.38	-746.4	923.4	917.2	892.5	24.71	37.121			
7,000.0	6,709.2	6,793.9	6,700.0	19.2	21.2	-38.06	-746.3	923.5	831.8	805.9	25.86	32.169			
7,100.0	6,742.7	6,828.8	6,734.9	19.2	21.2	-52.52	-746.2	923.5	742.2	712.4	29.81	24.896			
7,200.0	6,763.6	6,850.1	6,756.2	19.2	21.2	-71.15	-746.1	923.5	650.7	616.4	34.25	18.995			
7,300.0	6,771.5	6,857.7	6,763.8	19.5	21.3	-89.08	-746.0	923.5	559.6	523.9	35.72	15.667			
7,400.0	6,771.1	6,856.6	6,762.7	20.0	21.3	-91.20	-746.1	923.5	471.8	435.4	36.37	12.971			
7,500.0	6,770.4	6,855.3	6,761.4	20.8	21.3	-90.90	-746.1	923.5	389.8	352.4	37.36	10.433			
7,600.0	6,769.8	6,854.0	6,760.1	21.8	21.3	-90.60	-746.1	923.5	318.3	279.8	38.49	8.270			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.29-T5N-R64W - Ottenhoff 41-7B (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.0 ft
Survey Program:		482-MWD											Offset Well Error:		0.0 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)				
7,700.0	6,769.2	6,852.7	6,758.8	23.0	21.2	-90.31	-746.1	923.5	265.9	226.2	39.74	6.692			
7,800.0	6,768.5	6,851.5	6,757.6	24.2	21.2	-90.02	-746.1	923.5	245.1	204.1	41.08	5.968			
7,803.1	6,768.5	6,851.5	6,757.6	24.3	21.2	-90.01	-746.1	923.5	245.1	204.0	41.12	5.961	CC, ES, SF		
7,900.0	6,767.9	6,850.3	6,756.4	25.6	21.2	-89.73	-746.1	923.5	263.6	221.1	42.50	6.202			
8,000.0	6,767.3	6,849.1	6,755.2	27.0	21.2	-89.45	-746.1	923.5	314.4	270.4	43.99	7.147			
8,100.0	6,766.7	6,847.9	6,754.0	28.4	21.2	-89.17	-746.1	923.5	385.0	339.4	45.53	8.455			
8,200.0	6,766.0	6,846.7	6,752.8	29.9	21.2	-88.89	-746.1	923.5	466.4	419.3	47.12	9.899			
8,300.0	6,765.4	6,845.5	6,751.6	31.5	21.2	-88.62	-746.1	923.5	554.0	505.3	48.75	11.365			
8,400.0	6,764.8	6,844.3	6,750.4	33.1	21.2	-88.35	-746.1	923.5	645.2	594.8	50.41	12.800			
8,500.0	6,764.1	6,843.2	6,749.3	34.7	21.2	-88.08	-746.1	923.5	738.7	686.6	52.09	14.180			
8,600.0	6,763.5	6,842.1	6,748.2	36.4	21.2	-87.81	-746.1	923.5	833.7	779.9	53.80	15.495			
8,700.0	6,762.9	6,840.9	6,747.0	38.1	21.2	-87.55	-746.1	923.5	929.7	874.2	55.53	16.742			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Roskop 29-1 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-UNKNOWN													Offset Well Error:	0.0 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)			
7,400.0	6,771.1	6,777.2	6,776.6	20.0	136.6	95.42	-1,290.7	388.2	991.4	837.2	154.20	6.429		
7,500.0	6,770.4	6,774.6	6,774.0	20.8	136.5	94.90	-1,290.8	388.2	896.3	741.1	155.19	5.775		
7,600.0	6,769.8	6,771.9	6,771.3	21.8	136.5	94.37	-1,290.8	388.1	802.4	646.1	156.32	5.133		
7,700.0	6,769.2	6,769.2	6,768.6	23.0	136.4	93.85	-1,290.9	388.1	710.1	552.6	157.54	4.507		
7,800.0	6,768.5	6,766.6	6,766.0	24.2	136.4	93.33	-1,290.9	388.1	620.2	461.4	158.85	3.905		
7,900.0	6,767.9	6,763.9	6,763.3	25.6	136.3	92.81	-1,291.0	388.1	534.0	373.7	160.23	3.332		
8,000.0	6,767.3	6,761.3	6,760.7	27.0	136.3	92.28	-1,291.0	388.1	453.3	291.7	161.66	2.804		
8,100.0	6,766.7	6,758.6	6,758.0	28.4	136.3	91.76	-1,291.1	388.0	382.0	218.8	163.14	2.341		
8,200.0	6,766.0	6,756.0	6,755.4	29.9	136.2	91.24	-1,291.1	388.0	326.0	161.4	164.66	1.980		
8,300.0	6,765.4	6,753.3	6,752.7	31.5	136.2	90.71	-1,291.2	388.0	294.4	128.2	166.20	1.771		
8,348.2	6,765.1	6,752.0	6,751.4	32.3	136.2	90.46	-1,291.2	388.0	290.4	123.4	166.95	1.739	CC, ES, SF	
8,400.0	6,764.8	6,750.6	6,750.1	33.1	136.1	90.19	-1,291.2	388.0	295.0	127.2	167.76	1.758		
8,500.0	6,764.1	6,748.0	6,747.4	34.7	136.1	89.66	-1,291.3	388.0	327.6	158.3	169.34	1.935		
8,600.0	6,763.5	6,745.3	6,744.7	36.4	136.1	89.14	-1,291.3	387.9	384.3	213.3	170.93	2.248		
8,700.0	6,762.9	6,742.7	6,742.1	38.1	136.0	88.62	-1,291.4	387.9	456.0	283.5	172.53	2.643		
8,800.0	6,762.3	6,740.0	6,739.4	39.8	136.0	88.09	-1,291.5	387.9	536.9	362.8	174.14	3.083		
8,900.0	6,761.6	6,737.4	6,736.8	41.5	135.9	87.57	-1,291.5	387.9	623.3	447.6	175.74	3.547		
9,000.0	6,761.0	6,734.7	6,734.1	43.2	135.9	87.05	-1,291.6	387.9	713.3	536.0	177.35	4.022		
9,100.0	6,760.4	6,732.0	6,731.5	45.0	135.8	86.53	-1,291.6	387.8	805.6	626.7	178.95	4.502		
9,200.0	6,759.7	6,729.4	6,728.8	46.7	135.8	86.01	-1,291.7	387.8	899.6	719.1	180.55	4.983		
9,300.0	6,759.1	6,726.7	6,726.1	48.5	135.8	85.49	-1,291.7	387.8	994.7	812.6	182.14	5.461		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)											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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	1.0	1.0	0.0	0.0	-89.31	0.7	-60.2	60.2	60.2	0.00	N/A			
100.0	100.0	101.0	101.0	0.1	0.1	-89.31	0.7	-60.2	60.2	60.0	0.23	265.123			
200.0	200.0	201.0	201.0	0.3	0.3	-89.31	0.7	-60.2	60.2	59.5	0.68	88.962	CC, ES		
300.0	300.0	301.0	301.0	0.6	0.6	-143.11	0.7	-60.2	61.2	60.1	1.13	54.306			
400.0	399.9	400.9	400.9	0.8	0.8	-145.18	0.7	-60.2	64.4	62.8	1.58	40.677			
500.0	499.7	500.7	500.7	1.0	1.0	-148.20	0.7	-60.2	69.9	67.8	2.05	34.152			
600.0	599.3	600.3	600.3	1.3	1.2	-151.69	0.7	-60.2	77.8	75.3	2.51	30.950			
700.0	698.6	699.6	699.6	1.6	1.5	-155.24	0.7	-60.2	88.3	85.4	2.99	29.594			
800.0	797.5	798.5	798.5	1.9	1.7	-158.55	0.7	-60.2	101.6	98.1	3.46	29.374			
900.0	896.1	897.1	897.1	2.2	1.9	-161.49	0.7	-60.2	117.5	113.6	3.93	29.899			
1,000.0	994.2	995.2	995.2	2.6	2.1	-164.01	0.7	-60.2	136.2	131.8	4.40	30.931			
1,100.0	1,091.7	1,092.7	1,092.7	3.1	2.3	-166.14	0.7	-60.2	157.6	152.7	4.87	32.320			
1,200.0	1,188.6	1,189.6	1,189.6	3.5	2.6	-167.92	0.7	-60.2	181.6	176.2	5.35	33.964			
1,300.0	1,285.1	1,286.1	1,286.1	4.0	2.8	-169.43	0.7	-60.2	207.4	201.6	5.82	35.663			
1,400.0	1,381.5	1,382.5	1,382.5	4.6	3.0	-170.62	0.7	-60.2	233.5	227.2	6.29	37.111			
1,500.0	1,478.0	1,479.0	1,479.0	5.1	3.2	-171.57	0.7	-60.2	259.5	252.8	6.77	38.348			
1,600.0	1,574.5	1,575.5	1,575.5	5.6	3.4	-172.34	0.7	-60.2	285.7	278.4	7.25	39.413			
1,700.0	1,670.9	1,671.9	1,671.9	6.2	3.6	-172.99	0.7	-60.2	311.9	304.2	7.73	40.338			
1,800.0	1,767.4	1,768.4	1,768.4	6.7	3.9	-173.53	0.7	-60.2	338.1	329.9	8.22	41.147			
1,900.0	1,863.8	1,864.8	1,864.8	7.2	4.1	-174.00	0.7	-60.2	364.3	355.6	8.70	41.860			
2,000.0	1,960.3	1,961.3	1,961.3	7.8	4.3	-174.40	0.7	-60.2	390.6	381.4	9.19	42.493			
2,100.0	2,056.7	2,059.4	2,059.4	8.3	4.5	-174.70	1.2	-60.3	416.8	407.1	9.69	43.032			
2,200.0	2,153.2	2,158.9	2,158.9	8.9	4.7	-174.66	3.9	-61.2	442.4	432.2	10.18	43.437			
2,300.0	2,249.6	2,258.7	2,258.5	9.4	5.0	-174.30	9.1	-62.8	467.3	456.6	10.69	43.719			
2,400.0	2,346.1	2,358.6	2,358.1	10.0	5.2	-173.68	16.8	-65.1	491.7	480.5	11.20	43.883			
2,500.0	2,442.5	2,458.5	2,457.4	10.5	5.4	-172.82	27.0	-68.3	515.5	503.8	11.73	43.932			
2,600.0	2,539.0	2,558.3	2,556.3	11.1	5.7	-171.77	39.7	-72.1	538.9	526.6	12.28	43.869			
2,700.0	2,635.5	2,656.2	2,653.0	11.6	5.9	-170.61	54.1	-76.6	562.0	549.2	12.85	43.727			
2,800.0	2,731.9	2,752.8	2,748.5	12.2	6.2	-169.53	68.5	-81.0	585.3	571.9	13.44	43.559			
2,900.0	2,828.4	2,849.5	2,844.0	12.7	6.4	-168.53	83.0	-85.4	608.8	594.8	14.04	43.378			
3,000.0	2,924.8	2,946.2	2,939.4	13.3	6.7	-167.61	97.4	-89.9	632.5	617.8	14.65	43.184			
3,100.0	3,021.3	3,042.8	3,034.9	13.8	7.0	-166.75	111.9	-94.3	656.3	641.0	15.27	42.984			
3,200.0	3,117.7	3,139.5	3,130.4	14.4	7.3	-165.95	126.3	-98.8	680.2	664.3	15.90	42.781			
3,300.0	3,214.2	3,236.2	3,225.9	14.9	7.6	-165.21	140.8	-103.2	704.2	687.7	16.54	42.578			
3,400.0	3,310.6	3,332.9	3,321.4	15.5	7.9	-164.51	155.2	-107.6	728.4	711.2	17.19	42.377			
3,500.0	3,407.1	3,429.5	3,416.9	16.0	8.2	-163.86	169.6	-112.1	752.6	734.8	17.84	42.179			
3,600.0	3,503.7	3,526.3	3,512.5	16.5	8.5	-163.32	184.1	-116.5	776.3	757.8	18.53	41.907			
3,700.0	3,601.1	3,623.7	3,608.7	16.9	8.8	-162.79	198.7	-121.0	797.1	777.9	19.18	41.549			
3,800.0	3,699.3	3,721.7	3,705.4	17.2	9.1	-162.20	213.3	-125.5	814.7	794.9	19.83	41.094			
3,900.0	3,798.0	3,820.1	3,802.6	17.5	9.4	-161.54	228.0	-130.0	829.2	808.7	20.45	40.553			
4,000.0	3,897.3	3,918.7	3,900.0	17.8	9.8	-160.82	242.7	-134.5	840.5	819.5	21.05	39.936			
4,100.0	3,996.9	4,017.6	3,997.7	18.0	10.1	-160.02	257.5	-139.1	848.7	827.1	21.62	39.250			
4,200.0	4,096.7	4,116.5	4,095.4	18.2	10.4	-159.13	272.3	-143.6	853.9	831.7	22.18	38.503			
4,300.0	4,196.7	4,215.3	4,193.0	18.3	10.8	-158.16	287.1	-148.1	856.1	833.3	22.71	37.695			
4,400.0	4,296.7	4,314.1	4,290.6	18.4	11.1	-104.06	301.8	-152.7	856.7	833.4	23.30	36.769			
4,500.0	4,396.7	4,412.9	4,388.1	18.5	11.4	-103.03	316.6	-157.2	857.7	833.8	23.90	35.885			
4,600.0	4,496.7	4,511.6	4,485.7	18.6	11.8	-102.01	331.3	-161.7	859.0	834.5	24.50	35.053			
4,700.0	4,596.7	4,610.4	4,583.2	18.7	12.1	-100.98	346.1	-166.3	860.5	835.4	25.11	34.271			
4,800.0	4,696.7	4,709.2	4,680.8	18.8	12.5	-99.96	360.9	-170.8	862.3	836.6	25.71	33.536			
4,900.0	4,796.7	4,807.9	4,778.3	18.9	12.8	-98.94	375.6	-175.3	864.4	838.1	26.32	32.845			
5,000.0	4,896.7	4,906.7	4,875.9	19.1	13.1	-97.93	390.4	-179.9	866.8	839.9	26.92	32.196			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)											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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor					
Depth (ft)	Depth (ft)	Depth (ft)	Depth (ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
5,100.0	4,996.7	5,005.5	4,973.5	19.2	13.5	-96.93	405.1	-184.4	869.5	841.9	27.53	31.586					
5,200.0	5,096.7	5,104.3	5,071.0	19.3	13.8	-95.93	419.9	-188.9	872.4	844.3	28.13	31.014					
5,300.0	5,196.7	5,203.0	5,168.6	19.4	14.2	-94.94	434.7	-193.5	875.6	846.8	28.73	30.478					
5,400.0	5,296.7	5,301.8	5,266.1	19.6	14.5	-93.95	449.4	-198.0	879.0	849.7	29.33	29.974					
5,500.0	5,396.7	5,400.6	5,363.7	19.7	14.9	-92.98	464.2	-202.5	882.8	852.8	29.92	29.502					
5,600.0	5,496.7	5,501.1	5,462.9	19.8	15.2	-92.00	479.1	-207.1	886.7	856.2	30.51	29.060					
5,700.0	5,596.7	5,609.3	5,570.2	19.9	15.5	-91.12	492.6	-211.3	890.2	859.2	31.03	28.689					
5,800.0	5,696.7	5,718.4	5,678.9	20.1	15.7	-90.50	502.3	-214.2	892.8	861.4	31.49	28.352					
5,900.0	5,796.7	5,828.1	5,788.4	20.2	15.9	-90.13	508.0	-216.0	894.4	862.5	31.90	28.041					
6,000.0	5,896.7	5,937.4	5,897.7	20.4	16.1	-90.02	509.7	-216.5	894.9	862.6	32.25	27.749					
6,046.2	5,942.9	5,983.6	5,943.9	20.4	16.2	-90.02	509.7	-216.5	894.9	862.5	32.40	27.620					
6,100.0	5,996.7	6,037.3	5,997.5	20.5	16.3	-90.14	507.8	-216.5	894.9	862.4	32.54	27.501					
6,200.0	6,096.5	6,136.1	6,095.3	20.6	16.3	-89.32	494.3	-216.5	895.0	862.3	32.63	27.431					
6,300.0	6,194.8	6,233.8	6,189.6	20.6	16.2	-88.79	468.7	-216.5	895.1	862.6	32.50	27.544					
6,400.0	6,289.8	6,330.6	6,279.0	20.5	16.1	-88.28	431.7	-216.5	895.3	863.1	32.20	27.801					
6,500.0	6,380.1	6,426.5	6,362.2	20.3	15.9	-87.80	384.3	-216.5	895.6	863.8	31.80	28.160					
6,600.0	6,464.0	6,521.5	6,438.2	20.1	15.7	-87.36	327.3	-216.5	895.9	864.5	31.36	28.563					
6,700.0	6,540.0	6,615.8	6,506.0	19.9	15.5	-86.97	261.8	-216.5	896.2	865.2	30.97	28.934					
6,800.0	6,607.0	6,709.5	6,564.9	19.7	15.4	-86.62	189.1	-216.5	896.5	865.8	30.71	29.190					
6,900.0	6,663.7	6,802.7	6,614.2	19.4	15.3	-86.33	110.1	-216.5	896.7	866.1	30.67	29.242					
7,000.0	6,709.2	6,895.4	6,653.4	19.2	15.4	-86.10	26.1	-216.5	897.0	866.1	30.91	29.018					
7,100.0	6,742.7	6,987.8	6,682.0	19.2	15.7	-85.93	-61.7	-216.5	897.2	865.7	31.49	28.488					
7,200.0	6,763.6	7,080.0	6,699.8	19.2	16.2	-85.82	-152.1	-216.5	897.3	864.9	32.43	27.671					
7,300.0	6,771.5	7,172.1	6,706.6	19.5	16.9	-85.79	-243.9	-216.5	897.3	863.6	33.69	26.632					
7,400.0	6,771.1	7,270.8	6,706.1	20.0	17.8	-85.79	-342.6	-216.5	897.3	862.0	35.37	25.370					
7,500.0	6,770.4	7,370.8	6,705.5	20.8	18.8	-85.79	-442.6	-216.5	897.3	860.0	37.36	24.017					
7,600.0	6,769.8	7,470.8	6,704.9	21.8	20.0	-85.79	-542.5	-216.5	897.3	857.7	39.62	22.646					
7,700.0	6,769.2	7,570.8	6,704.2	23.0	21.3	-85.79	-642.5	-216.5	897.3	855.2	42.12	21.307					
7,800.0	6,768.5	7,670.8	6,703.6	24.2	22.6	-85.79	-742.5	-216.5	897.3	852.5	44.80	20.032					
7,900.0	6,767.9	7,770.8	6,703.0	25.6	24.1	-85.79	-842.5	-216.5	897.3	849.7	47.63	18.838					
8,000.0	6,767.3	7,870.8	6,702.3	27.0	25.6	-85.79	-942.5	-216.5	897.3	846.7	50.60	17.733					
8,100.0	6,766.7	7,970.8	6,701.7	28.4	27.1	-85.79	-1,042.5	-216.5	897.3	843.6	53.68	16.716					
8,200.0	6,766.0	8,070.8	6,701.1	29.9	28.7	-85.79	-1,142.5	-216.5	897.3	840.5	56.85	15.784					
8,300.0	6,765.4	8,170.8	6,700.5	31.5	30.4	-85.79	-1,242.5	-216.5	897.3	837.2	60.10	14.931					
8,400.0	6,764.8	8,270.8	6,699.8	33.1	32.0	-85.79	-1,342.5	-216.5	897.3	833.9	63.41	14.151					
8,500.0	6,764.1	8,370.8	6,699.2	34.7	33.7	-85.79	-1,442.5	-216.5	897.3	830.6	66.78	13.438					
8,600.0	6,763.5	8,470.8	6,698.6	36.4	35.5	-85.79	-1,542.5	-216.5	897.3	827.1	70.19	12.784					
8,700.0	6,762.9	8,570.8	6,697.9	38.1	37.2	-85.79	-1,642.5	-216.5	897.3	823.7	73.65	12.184					
8,800.0	6,762.3	8,670.8	6,697.3	39.8	39.0	-85.79	-1,742.5	-216.5	897.3	820.2	77.14	11.633					
8,900.0	6,761.6	8,770.8	6,696.7	41.5	40.7	-85.79	-1,842.5	-216.5	897.3	816.7	80.66	11.125					
9,000.0	6,761.0	8,870.8	6,696.1	43.2	42.5	-85.79	-1,942.5	-216.5	897.3	813.1	84.21	10.656					
9,100.0	6,760.4	8,970.8	6,695.4	45.0	44.3	-85.79	-2,042.5	-216.5	897.3	809.5	87.78	10.222					
9,200.0	6,759.7	9,070.8	6,694.8	46.7	46.1	-85.79	-2,142.5	-216.5	897.3	806.0	91.38	9.820					
9,300.0	6,759.1	9,170.8	6,694.2	48.5	47.9	-85.79	-2,242.5	-216.5	897.3	802.3	94.99	9.447					
9,400.0	6,758.5	9,270.8	6,693.5	50.3	49.7	-85.79	-2,342.5	-216.5	897.3	798.7	98.62	9.099					
9,500.0	6,757.9	9,370.8	6,692.9	52.1	51.6	-85.79	-2,442.5	-216.5	897.3	795.1	102.26	8.775					
9,600.0	6,757.2	9,470.8	6,692.3	53.9	53.4	-85.79	-2,542.5	-216.5	897.3	791.4	105.92	8.472					
9,700.0	6,756.6	9,570.8	6,691.7	55.7	55.2	-85.79	-2,642.5	-216.5	897.3	787.7	109.59	8.188					
9,800.0	6,756.0	9,670.8	6,691.0	57.5	57.1	-85.79	-2,742.5	-216.5	897.3	784.1	113.27	7.922					
9,900.0	6,755.3	9,770.8	6,690.4	59.3	58.9	-85.79	-2,842.5	-216.5	897.3	780.4	116.96	7.672					

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

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Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #1 (3-14-16)										Offset Site Error:		0.0 ft
Survey Program:		0-MWD										Offset Well Error:		0.0 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)			
10,000.0	6,754.7	9,870.8	6,689.8	61.1	60.8	85.79	-2,942.5	-216.5	897.3	776.7	120.66	7.437		
10,100.0	6,754.1	9,970.8	6,689.1	63.0	62.6	85.79	-3,042.5	-216.5	897.3	773.0	124.36	7.216		
10,200.0	6,753.5	10,070.8	6,688.5	64.8	64.5	85.79	-3,142.5	-216.5	897.3	769.3	128.07	7.006		
10,300.0	6,752.8	10,170.8	6,687.9	66.7	66.4	85.79	-3,242.5	-216.5	897.3	765.5	131.79	6.809		
10,400.0	6,752.2	10,270.8	6,687.3	68.5	68.2	85.79	-3,342.5	-216.5	897.3	761.8	135.52	6.621		
10,500.0	6,751.6	10,370.8	6,686.6	70.4	70.1	85.79	-3,442.5	-216.5	897.3	758.1	139.25	6.444		
10,600.0	6,751.0	10,470.8	6,686.0	72.2	72.0	85.79	-3,542.5	-216.5	897.3	754.3	142.99	6.276		
10,700.0	6,750.3	10,570.8	6,685.4	74.1	73.9	85.79	-3,642.5	-216.5	897.3	750.6	146.73	6.115		
10,800.0	6,749.7	10,670.8	6,684.7	75.9	75.7	85.79	-3,742.5	-216.5	897.3	746.9	150.48	5.963		
10,900.0	6,749.1	10,770.8	6,684.1	77.8	77.6	85.79	-3,842.5	-216.5	897.3	743.1	154.23	5.818		
11,000.0	6,748.4	10,870.8	6,683.5	79.7	79.5	85.79	-3,942.5	-216.5	897.3	739.4	157.98	5.680		
11,100.0	6,747.8	10,970.8	6,682.9	81.5	81.4	85.79	-4,042.5	-216.5	897.3	735.6	161.74	5.548		
11,200.0	6,747.2	11,070.8	6,682.2	83.4	83.3	85.79	-4,142.5	-216.5	897.3	731.8	165.50	5.422		
11,300.0	6,746.6	11,170.8	6,681.6	85.3	85.2	85.79	-4,242.5	-216.5	897.3	728.1	169.27	5.301		
11,400.0	6,745.9	11,270.8	6,681.0	87.1	87.0	85.79	-4,342.5	-216.5	897.3	724.3	173.03	5.186		
11,500.0	6,745.3	11,370.8	6,680.3	89.0	88.9	85.79	-4,442.5	-216.5	897.3	720.5	176.80	5.075		
11,600.0	6,744.7	11,470.8	6,679.7	90.9	90.8	85.79	-4,542.5	-216.5	897.3	716.8	180.58	4.969		
11,700.0	6,744.0	11,570.8	6,679.1	92.8	92.7	85.79	-4,642.5	-216.5	897.3	713.0	184.35	4.868		
11,800.0	6,743.4	11,670.8	6,678.5	94.7	94.6	85.79	-4,742.5	-216.5	897.3	709.2	188.13	4.770		
11,900.0	6,742.8	11,770.8	6,677.8	96.5	96.5	85.79	-4,842.5	-216.5	897.3	705.4	191.91	4.676		
12,000.0	6,742.2	11,870.8	6,677.2	98.4	98.4	85.79	-4,942.5	-216.5	897.3	701.7	195.69	4.586		
12,100.0	6,741.5	11,970.8	6,676.6	100.3	100.3	85.79	-5,042.5	-216.5	897.3	697.9	199.47	4.499		
12,200.0	6,740.9	12,070.8	6,675.9	102.2	102.2	85.79	-5,142.5	-216.5	897.3	694.1	203.26	4.415		
12,300.0	6,740.3	12,170.8	6,675.3	104.1	104.1	85.79	-5,242.5	-216.5	897.3	690.3	207.04	4.334		
12,400.0	6,739.6	12,270.8	6,674.7	106.0	106.0	85.79	-5,342.5	-216.5	897.3	686.5	210.83	4.256		
12,500.0	6,739.0	12,370.8	6,674.1	107.9	107.9	85.79	-5,442.5	-216.5	897.3	682.7	214.62	4.181		
12,600.0	6,738.4	12,470.8	6,673.4	109.8	109.8	85.79	-5,542.5	-216.5	897.3	678.9	218.41	4.108		
12,700.0	6,737.8	12,570.8	6,672.8	111.6	111.7	85.79	-5,642.4	-216.5	897.3	675.1	222.21	4.038		
12,800.0	6,737.1	12,670.8	6,672.2	113.5	113.6	85.79	-5,742.4	-216.5	897.3	671.3	226.00	3.971		
12,900.0	6,736.5	12,770.8	6,671.5	115.4	115.5	85.79	-5,842.4	-216.5	897.3	667.5	229.79	3.905		
13,000.0	6,735.9	12,870.8	6,670.9	117.3	117.4	85.79	-5,942.4	-216.5	897.3	663.8	233.59	3.842		
13,100.0	6,735.2	12,970.8	6,670.3	119.2	119.3	85.79	-6,042.4	-216.5	897.3	660.0	237.39	3.780		
13,200.0	6,734.6	13,070.8	6,669.7	121.1	121.2	85.79	-6,142.4	-216.6	897.3	656.2	241.19	3.721		
13,300.0	6,734.0	13,170.8	6,669.0	123.0	123.1	85.79	-6,242.4	-216.6	897.3	652.4	244.99	3.663		
13,400.0	6,733.4	13,270.8	6,668.4	124.9	125.0	85.79	-6,342.4	-216.6	897.3	648.6	248.79	3.607		
13,500.0	6,732.7	13,370.8	6,667.8	126.8	126.9	85.79	-6,442.4	-216.6	897.3	644.8	252.59	3.553		
13,600.0	6,732.1	13,470.8	6,667.2	128.7	128.8	85.79	-6,542.4	-216.6	897.3	641.0	256.39	3.500		
13,700.0	6,731.5	13,570.8	6,666.5	130.6	130.7	85.79	-6,642.4	-216.6	897.3	637.2	260.19	3.449		
13,800.0	6,730.8	13,670.8	6,665.9	132.5	132.6	85.79	-6,742.4	-216.6	897.3	633.3	264.00	3.399		
13,900.0	6,730.2	13,770.8	6,665.3	134.4	134.5	85.79	-6,842.4	-216.6	897.3	629.5	267.80	3.351		
14,000.0	6,729.6	13,870.8	6,664.6	136.3	136.4	85.79	-6,942.4	-216.6	897.3	625.7	271.61	3.304		
14,100.0	6,729.0	13,970.8	6,664.0	138.2	138.4	85.79	-7,042.4	-216.6	897.3	621.9	275.41	3.258		
14,200.0	6,728.3	14,070.8	6,663.4	140.1	140.3	85.79	-7,142.4	-216.6	897.3	618.1	279.22	3.214		
14,300.0	6,727.7	14,170.8	6,662.8	142.0	142.2	85.79	-7,242.4	-216.6	897.3	614.3	283.03	3.171		
14,400.0	6,727.1	14,270.8	6,662.1	143.9	144.1	85.79	-7,342.4	-216.6	897.3	610.5	286.83	3.128		
14,411.8	6,727.0	14,282.6	6,662.1	144.2	144.3	85.79	-7,354.2	-216.6	897.3	610.1	287.28	3.124 SF		

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Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - Wellbore #1 - Plan #1 (3-15-16)													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	1.0	1.0	0.0	0.0	-89.30	0.4	-30.1	30.1	30.1	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-89.30	0.4	-30.1	30.1	29.9	0.23	132.562		
200.0	200.0	201.0	201.0	0.3	0.3	-89.30	0.4	-30.1	30.1	29.4	0.68	44.481 CC, ES		
300.0	300.0	301.0	301.0	0.6	0.6	-143.82	0.4	-30.1	31.1	30.0	1.13	27.617		
400.0	399.9	400.9	400.9	0.8	0.8	-147.66	0.4	-30.1	34.4	32.8	1.58	21.704		
500.0	499.7	500.7	500.7	1.0	1.0	-152.63	0.4	-30.1	40.1	38.0	2.05	19.565		
600.0	599.3	600.3	600.3	1.3	1.2	-157.57	0.4	-30.1	48.4	45.9	2.52	19.234		
700.0	698.6	699.6	699.6	1.6	1.5	-161.84	0.4	-30.1	59.4	56.4	2.98	19.914		
800.0	797.5	798.5	798.5	1.9	1.7	-165.29	0.4	-30.1	73.2	69.7	3.45	21.203		
900.0	896.1	898.9	898.9	2.2	1.9	-167.50	1.5	-29.5	88.7	84.8	3.92	22.638		
1,000.0	994.2	999.5	999.4	2.6	2.1	-168.42	5.1	-27.8	104.8	100.5	4.39	23.908		
1,100.0	1,091.7	1,100.5	1,100.2	3.1	2.4	-168.54	11.0	-25.0	121.5	116.6	4.86	24.995		
1,200.0	1,188.6	1,201.7	1,200.9	3.5	2.6	-168.14	19.4	-20.9	138.6	133.2	5.35	25.916		
1,300.0	1,285.1	1,303.3	1,301.8	4.0	2.9	-167.36	30.2	-15.7	155.4	149.5	5.86	26.536		
1,400.0	1,381.5	1,405.4	1,402.9	4.6	3.1	-166.16	43.5	-9.3	170.3	163.9	6.40	26.624		
1,500.0	1,478.0	1,508.0	1,504.0	5.1	3.5	-164.57	59.3	-1.7	183.2	176.3	6.97	26.278		
1,600.0	1,574.5	1,608.7	1,602.8	5.6	3.8	-162.77	76.8	6.8	194.7	187.1	7.59	25.656		
1,700.0	1,670.9	1,707.9	1,700.0	6.2	4.1	-161.15	94.2	15.2	206.2	198.0	8.23	25.047		
1,800.0	1,767.4	1,807.0	1,797.3	6.7	4.5	-159.71	111.6	23.6	217.9	209.0	8.90	24.477		
1,900.0	1,863.8	1,906.2	1,894.6	7.2	4.9	-158.41	129.1	32.0	229.7	220.1	9.59	23.947		
2,000.0	1,960.3	2,005.4	1,991.8	7.8	5.3	-157.23	146.5	40.4	241.6	231.3	10.30	23.458		
2,100.0	2,056.7	2,104.6	2,089.1	8.3	5.6	-156.17	163.9	48.8	253.5	242.5	11.02	23.008		
2,200.0	2,153.2	2,203.7	2,186.4	8.9	6.0	-155.21	181.3	57.2	265.6	253.8	11.75	22.596		
2,300.0	2,249.6	2,302.9	2,283.7	9.4	6.4	-154.32	198.7	65.6	277.7	265.2	12.50	22.217		
2,400.0	2,346.1	2,402.1	2,380.9	10.0	6.8	-153.51	216.2	74.0	289.9	276.6	13.25	21.869		
2,500.0	2,442.5	2,501.3	2,478.2	10.5	7.2	-152.77	233.6	82.4	302.1	288.1	14.02	21.550		
2,600.0	2,539.0	2,600.5	2,575.5	11.1	7.6	-152.09	251.0	90.8	314.4	299.6	14.79	21.256		
2,700.0	2,635.5	2,699.6	2,672.7	11.6	8.0	-151.45	268.4	99.2	326.7	311.1	15.57	20.986		
2,800.0	2,731.9	2,798.8	2,770.0	12.2	8.4	-150.86	285.9	107.6	339.0	322.7	16.35	20.737		
2,900.0	2,828.4	2,898.0	2,867.3	12.7	8.8	-150.32	303.3	116.0	351.4	334.3	17.14	20.506		
3,000.0	2,924.8	2,997.2	2,964.6	13.3	9.3	-149.81	320.7	124.4	363.8	345.9	17.93	20.292		
3,100.0	3,021.3	3,096.3	3,061.8	13.8	9.7	-149.33	338.1	132.8	376.3	357.6	18.73	20.094		
3,200.0	3,117.7	3,195.5	3,159.1	14.4	10.1	-148.89	355.5	141.2	388.8	369.2	19.53	19.910		
3,300.0	3,214.2	3,294.7	3,256.4	14.9	10.5	-148.47	373.0	149.6	401.2	380.9	20.33	19.738		
3,400.0	3,310.6	3,393.9	3,353.6	15.5	10.9	-148.08	390.4	158.1	413.8	392.6	21.13	19.578		
3,500.0	3,407.1	3,493.0	3,450.9	16.0	11.3	-147.71	407.8	166.5	426.3	404.3	21.94	19.428		
3,600.0	3,503.7	3,592.3	3,548.2	16.5	11.7	-147.39	425.2	174.9	438.3	415.5	22.75	19.263		
3,700.0	3,601.1	3,691.7	3,645.8	16.9	12.1	-146.89	442.7	183.3	447.6	424.0	23.54	19.012		
3,800.0	3,699.3	3,791.1	3,743.3	17.2	12.6	-146.14	460.2	191.7	454.0	429.7	24.34	18.653		
3,900.0	3,798.0	3,883.7	3,834.4	17.5	12.8	-145.40	475.1	198.9	458.5	433.5	25.00	18.341		
4,000.0	3,897.3	3,976.5	3,926.1	17.8	13.1	-144.75	487.3	204.8	461.8	436.2	25.58	18.053		
4,100.0	3,996.9	4,069.5	4,018.5	18.0	13.3	-144.19	496.9	209.4	463.7	437.6	26.07	17.785		
4,200.0	4,096.7	4,162.6	4,111.3	18.2	13.5	-143.71	503.8	212.7	464.4	437.9	26.49	17.532		
4,300.0	4,196.7	4,255.9	4,204.5	18.3	13.7	-143.32	507.9	214.8	463.7	436.8	26.82	17.291		
4,400.0	4,296.7	4,349.3	4,297.8	18.4	13.8	-90.08	509.4	215.4	462.9	435.8	27.12	17.071		
4,434.1	4,330.8	4,383.2	4,331.8	18.4	13.9	-90.08	509.4	215.4	462.9	435.7	27.21	17.011		
4,500.0	4,396.7	4,449.1	4,397.7	18.5	14.0	-90.08	509.4	215.4	462.9	435.5	27.40	16.893		
4,600.0	4,496.7	4,549.1	4,497.7	18.6	14.1	-90.08	509.4	215.4	462.9	435.2	27.70	16.714		
4,700.0	4,596.7	4,649.1	4,597.7	18.7	14.3	-90.08	509.4	215.4	462.9	434.9	27.99	16.536		
4,800.0	4,696.7	4,749.1	4,697.7	18.8	14.4	-90.08	509.4	215.4	462.9	434.6	28.30	16.360		
4,900.0	4,796.7	4,849.1	4,797.7	18.9	14.6	-90.08	509.4	215.4	462.9	434.3	28.60	16.185		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - Wellbore #1 - Plan #1 (3-15-16)													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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)					
5,000.0	4,896.7	4,949.1	4,897.7	19.1	14.7	-90.08	509.4	215.4	462.9	434.0	28.91	16.012				
5,100.0	4,996.7	5,049.1	4,997.7	19.2	14.9	-90.08	509.4	215.4	462.9	433.7	29.22	15.840				
5,200.0	5,096.7	5,149.1	5,097.7	19.3	15.1	-90.08	509.4	215.4	462.9	433.4	29.54	15.670				
5,300.0	5,196.7	5,249.1	5,197.7	19.4	15.2	-90.08	509.4	215.4	462.9	433.1	29.86	15.502				
5,400.0	5,296.7	5,349.1	5,297.7	19.6	15.4	-90.08	509.4	215.4	462.9	432.7	30.18	15.336				
5,500.0	5,396.7	5,449.1	5,397.7	19.7	15.5	-90.08	509.4	215.4	462.9	432.4	30.51	15.172				
5,600.0	5,496.7	5,549.1	5,497.7	19.8	15.7	-90.08	509.4	215.4	462.9	432.1	30.84	15.010				
5,700.0	5,596.7	5,649.1	5,597.7	19.9	15.9	-90.08	509.4	215.4	462.9	431.7	31.17	14.850				
5,800.0	5,696.7	5,749.1	5,697.7	20.1	16.0	-90.08	509.4	215.4	462.9	431.4	31.51	14.692				
5,900.0	5,796.7	5,849.1	5,797.7	20.2	16.2	-90.08	509.4	215.4	462.9	431.1	31.85	14.535				
6,000.0	5,896.7	5,949.1	5,897.7	20.4	16.4	-90.08	509.4	215.4	462.9	430.7	32.19	14.381				
6,100.0	5,996.7	6,049.1	5,997.7	20.5	16.6	-90.08	509.4	215.4	462.9	430.4	32.53	14.230				
6,200.0	6,096.5	6,149.0	6,097.4	20.6	16.7	89.91	504.1	215.4	462.9	430.2	32.74	14.137				
6,300.0	6,194.8	6,248.9	6,195.6	20.6	16.7	89.89	485.9	215.4	462.9	430.2	32.72	14.148				
6,400.0	6,289.8	6,348.8	6,290.5	20.5	16.6	89.88	455.1	215.4	462.9	430.4	32.50	14.243				
6,500.0	6,380.1	6,448.7	6,380.6	20.3	16.4	89.87	412.2	215.4	462.9	430.8	32.14	14.403				
6,600.0	6,464.0	6,548.5	6,464.3	20.1	16.2	89.86	357.9	215.4	462.9	431.2	31.70	14.601				
6,700.0	6,540.0	6,648.4	6,540.2	19.9	15.9	89.86	293.1	215.4	462.9	431.6	31.28	14.799				
6,800.0	6,607.0	6,748.2	6,607.1	19.7	15.7	89.86	219.1	215.4	462.9	432.0	30.97	14.950				
6,900.0	6,663.7	6,848.1	6,663.7	19.4	15.6	89.86	136.9	215.4	462.9	432.1	30.86	15.001				
7,000.0	6,709.2	6,947.9	6,709.1	19.2	15.5	89.86	48.1	215.4	462.9	431.9	31.05	14.909				
7,100.0	6,742.7	7,047.8	6,742.6	19.2	15.6	89.86	-45.9	215.4	462.9	431.3	31.60	14.648				
7,200.0	6,763.6	7,147.6	6,763.5	19.2	16.1	89.87	-143.5	215.4	462.9	430.4	32.54	14.225				
7,300.0	6,771.5	7,247.5	6,771.5	19.5	16.9	89.88	-243.0	215.4	462.9	429.1	33.86	13.672				
7,304.9	6,771.6	7,252.4	6,771.6	19.5	16.9	89.88	-247.9	215.4	462.9	429.0	33.94	13.641				
7,400.0	6,771.1	7,347.5	6,771.1	20.0	17.8	89.88	-343.0	215.4	462.9	427.4	35.54	13.024				
7,500.0	6,770.4	7,447.5	6,770.5	20.8	18.8	89.88	-443.0	215.4	462.9	425.4	37.53	12.336				
7,600.0	6,769.8	7,547.5	6,769.8	21.8	20.0	89.88	-543.0	215.4	462.9	423.1	39.78	11.636				
7,700.0	6,769.2	7,647.5	6,769.2	23.0	21.3	89.88	-643.0	215.4	462.9	420.7	42.27	10.952				
7,800.0	6,768.5	7,747.5	6,768.6	24.2	22.6	89.88	-743.0	215.4	462.9	418.0	44.94	10.300				
7,900.0	6,767.9	7,847.5	6,767.9	25.6	24.1	89.88	-843.0	215.4	462.9	415.1	47.78	9.689				
8,000.0	6,767.3	7,947.5	6,767.3	27.0	25.6	89.88	-943.0	215.4	462.9	412.2	50.75	9.122				
8,100.0	6,766.7	8,047.5	6,766.7	28.4	27.1	89.88	-1,042.9	215.4	462.9	409.1	53.82	8.601				
8,200.0	6,766.0	8,147.5	6,766.1	29.9	28.7	89.88	-1,142.9	215.4	462.9	405.9	56.99	8.122				
8,300.0	6,765.4	8,247.5	6,765.4	31.5	30.3	89.88	-1,242.9	215.4	462.9	402.7	60.24	7.684				
8,400.0	6,764.8	8,347.5	6,764.8	33.1	32.0	89.88	-1,342.9	215.4	462.9	399.4	63.56	7.284				
8,500.0	6,764.1	8,447.5	6,764.2	34.7	33.7	89.88	-1,442.9	215.4	462.9	396.0	66.93	6.917				
8,600.0	6,763.5	8,547.5	6,763.5	36.4	35.4	89.88	-1,542.9	215.4	462.9	392.6	70.35	6.581				
8,700.0	6,762.9	8,647.5	6,762.9	38.1	37.1	89.88	-1,642.9	215.4	462.9	389.1	73.81	6.272				
8,800.0	6,762.3	8,747.5	6,762.3	39.8	38.9	89.88	-1,742.9	215.4	462.9	385.6	77.30	5.988				
8,900.0	6,761.6	8,847.5	6,761.7	41.5	40.6	89.88	-1,842.9	215.4	462.9	382.1	80.83	5.727				
9,000.0	6,761.0	8,947.5	6,761.0	43.2	42.4	89.88	-1,942.9	215.4	462.9	378.5	84.39	5.486				
9,100.0	6,760.4	9,047.5	6,760.4	45.0	44.2	89.88	-2,042.9	215.4	462.9	375.0	87.96	5.263				
9,200.0	6,759.7	9,147.5	6,759.8	46.7	46.0	89.88	-2,142.9	215.4	462.9	371.4	91.56	5.056				
9,300.0	6,759.1	9,247.5	6,759.1	48.5	47.8	89.88	-2,242.9	215.4	462.9	367.7	95.18	4.864				
9,400.0	6,758.5	9,347.5	6,758.5	50.3	49.6	89.88	-2,342.9	215.4	462.9	364.1	98.82	4.685				
9,500.0	6,757.9	9,447.5	6,757.9	52.1	51.5	89.88	-2,442.9	215.4	462.9	360.5	102.47	4.518				
9,600.0	6,757.2	9,547.5	6,757.3	53.9	53.3	89.88	-2,542.9	215.4	462.9	356.8	106.13	4.362				
9,700.0	6,756.6	9,647.5	6,756.6	55.7	55.1	89.88	-2,642.9	215.4	462.9	353.1	109.81	4.216				
9,800.0	6,756.0	9,747.5	6,756.0	57.5	57.0	89.88	-2,742.9	215.4	462.9	349.4	113.49	4.079				

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - Wellbore #1 - Plan #1 (3-15-16)										Offset Site Error:		0.0 ft
Survey Program:		0-MWD										Offset Well Error:		0.0 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)			
9,900.0	6,755.3	9,847.5	6,755.4	59.3	58.8	89.88	-2,842.9	215.4	462.9	345.7	117.19	3.950		
10,000.0	6,754.7	9,947.5	6,754.7	61.1	60.7	89.88	-2,942.9	215.4	462.9	342.0	120.89	3.829		
10,100.0	6,754.1	10,047.5	6,754.1	63.0	62.5	89.88	-3,042.9	215.4	462.9	338.3	124.61	3.715		
10,200.0	6,753.5	10,147.5	6,753.5	64.8	64.4	89.88	-3,142.9	215.4	462.9	334.6	128.33	3.607		
10,300.0	6,752.8	10,247.5	6,752.9	66.7	66.3	89.88	-3,242.9	215.4	462.9	330.9	132.06	3.506		
10,400.0	6,752.2	10,347.5	6,752.2	68.5	68.1	89.88	-3,342.9	215.4	462.9	327.1	135.79	3.409		
10,500.0	6,751.6	10,447.5	6,751.6	70.4	70.0	89.88	-3,442.9	215.4	462.9	323.4	139.53	3.318		
10,600.0	6,751.0	10,547.5	6,751.0	72.2	71.9	89.88	-3,542.9	215.4	462.9	319.6	143.27	3.231		
10,700.0	6,750.3	10,647.5	6,750.3	74.1	73.7	89.88	-3,642.9	215.4	462.9	315.9	147.02	3.149		
10,800.0	6,749.7	10,747.5	6,749.7	75.9	75.6	89.88	-3,742.9	215.4	462.9	312.1	150.78	3.070		
10,900.0	6,749.1	10,847.5	6,749.1	77.8	77.5	89.88	-3,842.9	215.4	462.9	308.4	154.54	2.996		
11,000.0	6,748.4	10,947.5	6,748.5	79.7	79.4	89.88	-3,942.9	215.4	462.9	304.6	158.30	2.924		
11,100.0	6,747.8	11,047.5	6,747.8	81.5	81.3	89.88	-4,042.9	215.4	462.9	300.9	162.07	2.856		
11,200.0	6,747.2	11,147.5	6,747.2	83.4	83.1	89.88	-4,142.9	215.4	462.9	297.1	165.83	2.791		
11,300.0	6,746.6	11,247.5	6,746.6	85.3	85.0	89.88	-4,242.9	215.4	462.9	293.3	169.61	2.729		
11,400.0	6,745.9	11,347.5	6,745.9	87.1	86.9	89.88	-4,342.9	215.4	462.9	289.5	173.38	2.670		
11,500.0	6,745.3	11,447.5	6,745.3	89.0	88.8	89.88	-4,442.9	215.4	462.9	285.8	177.16	2.613		
11,600.0	6,744.7	11,547.5	6,744.7	90.9	90.7	89.88	-4,542.9	215.4	462.9	282.0	180.94	2.558		
11,700.0	6,744.0	11,647.5	6,744.1	92.8	92.6	89.88	-4,642.9	215.4	462.9	278.2	184.73	2.506		
11,800.0	6,743.4	11,747.5	6,743.4	94.7	94.5	89.88	-4,742.9	215.4	462.9	274.4	188.51	2.456		
11,900.0	6,742.8	11,847.5	6,742.8	96.5	96.4	89.88	-4,842.9	215.4	462.9	270.6	192.30	2.407		
12,000.0	6,742.2	11,947.5	6,742.2	98.4	98.3	89.88	-4,942.9	215.4	462.9	266.8	196.09	2.361		
12,100.0	6,741.5	12,047.5	6,741.6	100.3	100.2	89.88	-5,042.9	215.4	462.9	263.0	199.88	2.316		
12,200.0	6,740.9	12,147.5	6,740.9	102.2	102.1	89.88	-5,142.9	215.4	462.9	259.3	203.67	2.273		
12,300.0	6,740.3	12,247.5	6,740.3	104.1	104.0	89.88	-5,242.9	215.4	462.9	255.5	207.47	2.231		
12,400.0	6,739.6	12,347.5	6,739.7	106.0	105.9	89.88	-5,342.9	215.4	462.9	251.7	211.26	2.191		
12,500.0	6,739.0	12,447.5	6,739.0	107.9	107.7	89.88	-5,442.9	215.4	462.9	247.9	215.06	2.153		
12,600.0	6,738.4	12,547.5	6,738.4	109.8	109.6	89.88	-5,542.9	215.4	462.9	244.1	218.86	2.115		
12,700.0	6,737.8	12,647.5	6,737.8	111.6	111.5	89.88	-5,642.9	215.4	462.9	240.3	222.66	2.079		
12,800.0	6,737.1	12,747.5	6,737.2	113.5	113.4	89.88	-5,742.9	215.4	462.9	236.5	226.47	2.044		
12,900.0	6,736.5	12,847.5	6,736.5	115.4	115.4	89.88	-5,842.9	215.4	462.9	232.7	230.27	2.010		
13,000.0	6,735.9	12,947.5	6,735.9	117.3	117.3	89.88	-5,942.9	215.4	462.9	228.9	234.07	1.978		
13,100.0	6,735.2	13,047.5	6,735.3	119.2	119.2	89.88	-6,042.9	215.4	462.9	225.0	237.88	1.946		
13,200.0	6,734.6	13,147.5	6,734.6	121.1	121.1	89.88	-6,142.8	215.4	462.9	221.2	241.69	1.915		
13,300.0	6,734.0	13,247.5	6,734.0	123.0	123.0	89.88	-6,242.8	215.4	462.9	217.4	245.50	1.886		
13,400.0	6,733.4	13,347.5	6,733.4	124.9	124.9	89.88	-6,342.8	215.4	462.9	213.6	249.30	1.857		
13,500.0	6,732.7	13,447.5	6,732.8	126.8	126.8	89.88	-6,442.8	215.4	462.9	209.8	253.11	1.829		
13,600.0	6,732.1	13,547.5	6,732.1	128.7	128.7	89.88	-6,542.8	215.4	462.9	206.0	256.92	1.802		
13,700.0	6,731.5	13,647.5	6,731.5	130.6	130.6	89.88	-6,642.8	215.4	462.9	202.2	260.74	1.775		
13,800.0	6,730.8	13,747.5	6,730.9	132.5	132.5	89.88	-6,742.8	215.4	462.9	198.4	264.55	1.750		
13,900.0	6,730.2	13,847.5	6,730.2	134.4	134.4	89.88	-6,842.8	215.4	462.9	194.6	268.36	1.725		
14,000.0	6,729.6	13,947.5	6,729.6	136.3	136.3	89.88	-6,942.8	215.4	462.9	190.8	272.18	1.701		
14,100.0	6,729.0	14,047.5	6,729.0	138.2	138.2	89.88	-7,042.8	215.4	462.9	186.9	275.99	1.677		
14,200.0	6,728.3	14,147.5	6,728.4	140.1	140.1	89.88	-7,142.8	215.4	462.9	183.1	279.81	1.654		
14,300.0	6,727.7	14,247.5	6,727.7	142.0	142.0	89.88	-7,242.8	215.4	462.9	179.3	283.62	1.632		
14,400.0	6,727.1	14,347.5	6,727.1	143.9	143.9	89.88	-7,342.8	215.4	462.9	175.5	287.44	1.611		
14,411.8	6,727.0	14,359.3	6,727.0	144.2	144.2	89.88	-7,354.7	215.4	462.9	175.0	287.89	1.608 SF		

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-423 - Wellbore #1 - Plan #1 (3-15-16)											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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	-89.09	0.7	-45.1	45.1						
100.0	100.0	100.0	100.0	0.1	0.1	-89.09	0.7	-45.1	45.1	44.9	0.22	200.842			
200.0	200.0	200.0	200.0	0.3	0.3	-89.09	0.7	-45.1	45.1	44.5	0.67	66.947	CC, ES		
300.0	300.0	300.0	300.0	0.6	0.6	-143.14	0.7	-45.1	46.2	45.1	1.13	41.042			
400.0	399.9	399.9	399.9	0.8	0.8	-145.84	0.7	-45.1	49.4	47.8	1.58	31.223			
500.0	499.7	499.7	499.7	1.0	1.0	-149.63	0.7	-45.1	54.9	52.9	2.04	26.859			
600.0	599.3	599.3	599.3	1.3	1.2	-153.79	0.7	-45.1	63.0	60.5	2.51	25.071			
700.0	698.6	698.6	698.6	1.6	1.5	-157.76	0.7	-45.1	73.7	70.7	2.98	24.719			
800.0	797.5	797.5	797.5	1.9	1.7	-161.26	0.7	-45.1	87.2	83.7	3.45	25.248			
900.0	896.1	896.1	896.1	2.2	1.9	-164.21	0.7	-45.1	103.4	99.5	3.92	26.349			
1,000.0	994.2	994.2	994.2	2.6	2.1	-166.63	0.7	-45.1	122.3	117.9	4.39	27.833			
1,100.0	1,091.7	1,091.7	1,091.7	3.1	2.3	-168.59	0.7	-45.1	143.9	139.0	4.86	29.582			
1,200.0	1,188.6	1,188.6	1,188.6	3.5	2.6	-170.19	0.7	-45.1	168.1	162.8	5.33	31.516			
1,300.0	1,285.1	1,285.1	1,285.1	4.0	2.8	-171.50	0.7	-45.1	194.1	188.3	5.80	33.451			
1,400.0	1,381.5	1,381.5	1,381.5	4.6	3.0	-172.51	0.7	-45.1	220.3	214.0	6.28	35.093			
1,500.0	1,478.0	1,478.0	1,478.0	5.1	3.2	-173.31	0.7	-45.1	246.5	239.7	6.75	36.492			
1,600.0	1,574.5	1,574.5	1,574.5	5.6	3.4	-173.96	0.7	-45.1	272.7	265.5	7.23	37.694			
1,700.0	1,670.9	1,670.9	1,670.9	6.2	3.6	-174.49	0.7	-45.1	299.0	291.3	7.72	38.737			
1,800.0	1,767.4	1,767.4	1,767.4	6.7	3.9	-174.94	0.7	-45.1	325.3	317.1	8.20	39.648			
1,900.0	1,863.8	1,863.8	1,863.8	7.2	4.1	-175.32	0.7	-45.1	351.6	342.9	8.69	40.451			
2,000.0	1,960.3	1,960.3	1,960.3	7.8	4.3	-175.64	0.7	-45.1	377.9	368.7	9.18	41.163			
2,100.0	2,056.7	2,056.7	2,056.7	8.3	4.5	-175.93	0.7	-45.1	404.2	394.5	9.67	41.798			
2,200.0	2,153.2	2,153.2	2,153.2	8.9	4.7	-176.18	0.7	-45.1	430.5	420.4	10.16	42.369			
2,300.0	2,249.6	2,249.6	2,249.6	9.4	4.9	-176.40	0.7	-45.1	456.9	446.2	10.65	42.883			
2,400.0	2,346.1	2,346.1	2,346.1	10.0	5.2	-176.59	0.7	-45.1	483.2	472.1	11.15	43.349			
2,500.0	2,442.5	2,442.5	2,442.5	10.5	5.4	-176.77	0.7	-45.1	509.6	497.9	11.64	43.773			
2,600.0	2,539.0	2,542.8	2,542.8	11.1	5.6	-176.91	1.0	-45.1	535.8	523.6	12.14	44.121			
2,700.0	2,635.5	2,649.2	2,649.2	11.6	5.8	-176.85	3.6	-44.9	560.6	547.9	12.66	44.288			
2,800.0	2,731.9	2,756.5	2,756.3	12.2	6.1	-176.56	9.3	-44.4	583.7	570.6	13.18	44.297			
2,900.0	2,828.4	2,864.5	2,863.9	12.7	6.3	-176.06	18.0	-43.7	605.2	591.5	13.71	44.157			
3,000.0	2,924.8	2,973.0	2,971.8	13.3	6.6	-175.37	29.9	-42.6	625.0	610.7	14.24	43.877			
3,100.0	3,021.3	3,081.9	3,079.6	13.8	6.8	-174.50	44.8	-41.4	643.2	628.4	14.80	43.459			
3,200.0	3,117.7	3,187.9	3,184.2	14.4	7.1	-173.50	62.2	-39.9	659.9	644.5	15.37	42.941			
3,300.0	3,214.2	3,286.0	3,280.8	14.9	7.4	-172.57	79.0	-38.4	676.4	660.4	15.93	42.445			
3,400.0	3,310.6	3,384.0	3,377.4	15.5	7.6	-171.68	95.9	-37.0	693.0	676.5	16.52	41.958			
3,500.0	3,407.1	3,482.1	3,474.0	16.0	7.9	-170.83	112.7	-35.6	709.8	692.6	17.11	41.482			
3,600.0	3,503.7	3,580.2	3,570.6	16.5	8.2	-170.05	129.6	-34.1	726.0	708.3	17.74	40.924			
3,700.0	3,601.1	3,678.8	3,667.7	16.9	8.5	-169.27	146.5	-32.7	739.3	721.0	18.36	40.276			
3,800.0	3,699.3	3,777.6	3,765.1	17.2	8.8	-168.46	163.5	-31.2	749.3	730.4	18.96	39.532			
3,900.0	3,798.0	3,876.7	3,862.7	17.5	9.1	-167.60	180.5	-29.8	756.1	736.6	19.54	38.703			
4,000.0	3,897.3	3,975.9	3,960.4	17.8	9.4	-166.69	197.5	-28.3	759.7	739.6	20.10	37.797			
4,100.0	3,996.9	4,075.0	4,058.0	18.0	9.7	-165.71	214.5	-26.9	760.1	739.5	20.64	36.819			
4,200.0	4,096.7	4,174.0	4,155.5	18.2	10.1	-164.65	231.5	-25.4	757.4	736.2	21.17	35.774			
4,300.0	4,196.7	4,272.7	4,252.7	18.3	10.4	-163.49	248.5	-24.0	751.5	729.9	21.68	34.661			
4,400.0	4,296.7	4,371.2	4,349.8	18.4	10.7	-109.24	265.4	-22.5	744.2	722.0	22.27	33.417			
4,500.0	4,396.7	4,469.7	4,446.8	18.5	11.1	-108.03	282.3	-21.1	737.3	714.4	22.88	32.221			
4,600.0	4,496.7	4,568.2	4,543.8	18.6	11.4	-106.80	299.2	-19.6	730.7	707.2	23.50	31.086			
4,700.0	4,596.7	4,666.7	4,640.9	18.7	11.7	-105.55	316.1	-18.2	724.4	700.2	24.14	30.011			
4,800.0	4,696.7	4,765.2	4,737.9	18.8	12.1	-104.28	333.1	-16.7	718.5	693.7	24.78	28.993			
4,900.0	4,796.7	4,863.7	4,834.9	18.9	12.4	-102.99	350.0	-15.3	712.9	687.5	25.43	28.031			
5,000.0	4,896.7	4,962.2	4,931.9	19.1	12.8	-101.68	366.9	-13.9	707.7	681.6	26.09	27.123			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-423 - Wellbore #1 - Plan #1 (3-15-16)											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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
5,100.0	4,996.7	5,060.7	5,029.0	19.2	13.1	-100.35	383.8	-12.4	703.0	676.2	26.76	26.266			
5,200.0	5,096.7	5,159.2	5,126.0	19.3	13.5	-99.01	400.7	-11.0	698.6	671.1	27.44	25.459			
5,300.0	5,196.7	5,257.7	5,223.0	19.4	13.8	-97.65	417.6	-9.5	694.6	666.4	28.12	24.700			
5,400.0	5,296.7	5,356.2	5,320.1	19.6	14.2	-96.27	434.5	-8.1	691.0	662.2	28.81	23.987			
5,500.0	5,396.7	5,454.7	5,417.1	19.7	14.5	-94.88	451.5	-6.6	687.8	658.3	29.50	23.318			
5,600.0	5,496.7	5,552.9	5,513.9	19.8	14.9	-93.49	468.3	-5.2	685.0	654.9	30.18	22.695			
5,700.0	5,596.7	5,648.6	5,608.4	19.9	15.2	-92.27	482.9	-3.9	682.9	652.2	30.77	22.192			
5,800.0	5,696.7	5,745.2	5,704.3	20.1	15.4	-91.31	494.5	-3.0	681.5	650.2	31.30	21.777			
5,900.0	5,796.7	5,842.5	5,801.2	20.2	15.6	-90.60	502.8	-2.2	680.7	648.9	31.76	21.431			
6,000.0	5,896.7	5,940.2	5,898.8	20.4	15.8	-90.17	507.9	-1.8	680.2	648.0	32.16	21.147			
6,100.0	5,996.7	6,038.2	5,996.8	20.5	16.0	-90.02	509.7	-1.7	680.0	647.5	32.51	20.917			
6,135.2	6,031.9	6,073.3	6,031.9	20.5	16.0	90.04	509.7	-1.7	680.0	647.4	32.61	20.852			
6,200.0	6,096.5	6,137.9	6,096.5	20.6	16.1	90.41	509.7	-1.7	680.0	647.2	32.84	20.710			
6,300.0	6,194.8	6,238.7	6,196.9	20.6	16.2	91.40	503.3	-1.7	680.2	647.2	33.03	20.595			
6,400.0	6,289.8	6,341.0	6,297.2	20.5	16.2	92.37	483.3	-1.7	680.6	647.6	33.00	20.627			
6,500.0	6,380.1	6,445.0	6,395.5	20.3	16.1	93.30	449.5	-1.7	681.2	648.4	32.76	20.790			
6,600.0	6,464.0	6,550.6	6,489.6	20.1	15.9	94.19	401.7	-1.7	681.9	649.5	32.39	21.055			
6,700.0	6,540.0	6,657.9	6,577.6	19.9	15.7	95.00	340.5	-1.7	682.6	650.7	31.94	21.373			
6,800.0	6,607.0	6,766.7	6,657.1	19.7	15.5	95.73	266.4	-1.7	683.5	651.9	31.54	21.670			
6,900.0	6,663.7	6,876.8	6,726.1	19.4	15.4	96.36	180.7	-1.7	684.2	652.9	31.31	21.853			
7,000.0	6,709.2	6,988.1	6,782.6	19.2	15.5	96.86	84.9	-1.7	684.9	653.6	31.38	21.825			
7,100.0	6,742.7	7,100.4	6,824.9	19.2	15.8	97.24	-19.0	-1.7	685.5	653.6	31.86	21.514			
7,200.0	6,763.6	7,213.4	6,851.6	19.2	16.3	97.48	-128.7	-1.7	685.9	653.0	32.82	20.896			
7,300.0	6,771.5	7,326.7	6,861.9	19.5	17.1	97.57	-241.5	-1.7	686.0	651.8	34.24	20.032			
7,400.0	6,771.1	7,428.3	6,862.0	20.0	18.0	97.62	-343.0	-1.7	686.1	650.1	35.95	19.086			
7,500.0	6,770.4	7,528.3	6,862.0	20.8	19.0	97.67	-443.0	-1.7	686.2	648.2	37.93	18.091			
7,600.0	6,769.8	7,628.2	6,862.0	21.8	20.1	97.72	-543.0	-1.7	686.2	646.1	40.17	17.083			
7,700.0	6,769.2	7,728.2	6,862.0	23.0	21.4	97.77	-643.0	-1.7	686.3	643.7	42.64	16.096			
7,800.0	6,768.5	7,828.2	6,862.0	24.2	22.7	97.83	-743.0	-1.7	686.4	641.1	45.29	15.155			
7,900.0	6,767.9	7,928.2	6,862.0	25.6	24.2	97.88	-843.0	-1.7	686.5	638.4	48.10	14.272			
8,000.0	6,767.3	8,028.2	6,862.0	27.0	25.7	97.93	-943.0	-1.7	686.6	635.6	51.04	13.453			
8,100.0	6,766.7	8,128.2	6,862.0	28.4	27.2	97.98	-1,043.0	-1.7	686.7	632.6	54.08	12.697			
8,200.0	6,766.0	8,228.2	6,862.0	29.9	28.8	98.03	-1,143.0	-1.7	686.8	629.5	57.22	12.003			
8,300.0	6,765.4	8,328.2	6,862.0	31.5	30.4	98.08	-1,243.0	-1.7	686.9	626.4	60.43	11.366			
8,400.0	6,764.8	8,428.2	6,862.0	33.1	32.1	98.14	-1,342.9	-1.7	686.9	623.2	63.71	10.783			
8,500.0	6,764.1	8,528.2	6,862.0	34.7	33.8	98.19	-1,442.9	-1.7	687.0	620.0	67.04	10.248			
8,600.0	6,763.5	8,628.2	6,862.0	36.4	35.5	98.24	-1,542.9	-1.7	687.1	616.7	70.42	9.758			
8,700.0	6,762.9	8,728.2	6,862.0	38.1	37.2	98.29	-1,642.9	-1.7	687.2	613.4	73.84	9.307			
8,800.0	6,762.3	8,828.2	6,862.0	39.8	39.0	98.34	-1,742.9	-1.7	687.3	610.0	77.29	8.893			
8,900.0	6,761.6	8,928.2	6,862.0	41.5	40.7	98.40	-1,842.9	-1.7	687.4	606.6	80.77	8.510			
9,000.0	6,761.0	9,028.2	6,862.0	43.2	42.5	98.45	-1,942.9	-1.7	687.5	603.2	84.28	8.157			
9,100.0	6,760.4	9,128.2	6,862.0	45.0	44.3	98.50	-2,042.9	-1.7	687.6	599.8	87.82	7.830			
9,200.0	6,759.7	9,228.2	6,862.0	46.7	46.1	98.55	-2,142.9	-1.7	687.7	596.3	91.37	7.526			
9,300.0	6,759.1	9,328.2	6,862.0	48.5	47.9	98.60	-2,242.9	-1.7	687.8	592.8	94.94	7.244			
9,400.0	6,758.5	9,428.2	6,862.0	50.3	49.7	98.65	-2,342.9	-1.7	687.9	589.3	98.53	6.981			
9,500.0	6,757.9	9,528.2	6,862.0	52.1	51.6	98.71	-2,442.9	-1.7	688.0	585.8	102.13	6.736			
9,600.0	6,757.2	9,628.2	6,862.0	53.9	53.4	98.76	-2,542.9	-1.7	688.1	582.3	105.75	6.507			
9,700.0	6,756.6	9,728.2	6,862.0	55.7	55.2	98.81	-2,642.9	-1.7	688.1	578.8	109.37	6.292			
9,800.0	6,756.0	9,828.2	6,862.0	57.5	57.1	98.86	-2,742.9	-1.7	688.2	575.2	113.01	6.090			
9,900.0	6,755.3	9,928.2	6,862.0	59.3	58.9	98.91	-2,842.9	-1.7	688.3	571.7	116.65	5.901			

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design		Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-423 - Wellbore #1 - Plan #1 (3-15-16)											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			
10,000.0	6,754.7	10,028.2	6,862.0	61.1	60.8	98.96	-2,942.9	-1.7	688.4	568.1	120.31	5.722			
10,100.0	6,754.1	10,128.2	6,862.0	63.0	62.6	99.02	-3,042.9	-1.7	688.5	564.6	123.96	5.554			
10,200.0	6,753.5	10,228.2	6,862.0	64.8	64.5	99.07	-3,142.9	-1.7	688.6	561.0	127.63	5.396			
10,300.0	6,752.8	10,328.2	6,862.0	66.7	66.4	99.12	-3,242.9	-1.7	688.7	557.4	131.30	5.245			
10,400.0	6,752.2	10,428.2	6,862.0	68.5	68.2	99.17	-3,342.9	-1.7	688.8	553.9	134.98	5.103			
10,500.0	6,751.6	10,528.2	6,862.0	70.4	70.1	99.22	-3,442.9	-1.7	688.9	550.3	138.66	4.968			
10,600.0	6,751.0	10,628.2	6,862.0	72.2	72.0	99.27	-3,542.9	-1.7	689.0	546.7	142.35	4.840			
10,700.0	6,750.3	10,728.2	6,862.0	74.1	73.9	99.33	-3,642.9	-1.7	689.1	543.1	146.04	4.719			
10,800.0	6,749.7	10,828.2	6,862.0	75.9	75.7	99.38	-3,742.9	-1.7	689.2	539.5	149.73	4.603			
10,900.0	6,749.1	10,928.2	6,862.0	77.8	77.6	99.43	-3,842.9	-1.7	689.3	535.9	153.43	4.493			
11,000.0	6,748.4	11,028.2	6,862.0	79.7	79.5	99.48	-3,942.9	-1.7	689.4	532.3	157.13	4.388			
11,100.0	6,747.8	11,128.2	6,862.0	81.5	81.4	99.53	-4,042.9	-1.7	689.6	528.7	160.83	4.287			
11,200.0	6,747.2	11,228.2	6,862.0	83.4	83.3	99.58	-4,142.9	-1.7	689.7	525.1	164.54	4.191			
11,300.0	6,746.6	11,328.2	6,862.0	85.3	85.2	99.63	-4,242.9	-1.7	689.8	521.5	168.25	4.100			
11,400.0	6,745.9	11,428.2	6,862.0	87.1	87.0	99.69	-4,342.9	-1.7	689.9	517.9	171.96	4.012			
11,500.0	6,745.3	11,528.2	6,862.0	89.0	88.9	99.74	-4,442.9	-1.7	690.0	514.3	175.67	3.928			
11,600.0	6,744.7	11,628.2	6,862.0	90.9	90.8	99.79	-4,542.9	-1.7	690.1	510.7	179.38	3.847			
11,700.0	6,744.0	11,728.2	6,862.0	92.8	92.7	99.84	-4,642.9	-1.7	690.2	507.1	183.09	3.770			
11,800.0	6,743.4	11,828.2	6,862.0	94.7	94.6	99.89	-4,742.9	-1.7	690.3	503.5	186.81	3.695			
11,900.0	6,742.8	11,928.2	6,862.0	96.5	96.5	99.94	-4,842.9	-1.7	690.4	499.9	190.52	3.624			
12,000.0	6,742.2	12,028.2	6,862.0	98.4	98.4	99.99	-4,942.9	-1.7	690.5	496.3	194.24	3.555			
12,100.0	6,741.5	12,128.2	6,862.0	100.3	100.3	100.05	-5,042.9	-1.7	690.6	492.7	197.96	3.489			
12,200.0	6,740.9	12,228.2	6,862.0	102.2	102.2	100.10	-5,142.9	-1.7	690.7	489.1	201.68	3.425			
12,300.0	6,740.3	12,328.2	6,862.0	104.1	104.1	100.15	-5,242.9	-1.7	690.8	485.4	205.39	3.363			
12,400.0	6,739.6	12,428.2	6,862.0	106.0	106.0	100.20	-5,342.9	-1.7	691.0	481.8	209.11	3.304			
12,500.0	6,739.0	12,528.2	6,862.0	107.9	107.9	100.25	-5,442.9	-1.7	691.1	478.2	212.83	3.247			
12,600.0	6,738.4	12,628.2	6,862.0	109.8	109.8	100.30	-5,542.9	-1.7	691.2	474.6	216.55	3.192			
12,700.0	6,737.8	12,728.1	6,862.0	111.6	111.7	100.35	-5,642.9	-1.7	691.3	471.0	220.27	3.138			
12,800.0	6,737.1	12,828.1	6,862.0	113.5	113.6	100.40	-5,742.9	-1.7	691.4	467.4	223.99	3.087			
12,900.0	6,736.5	12,928.1	6,862.0	115.4	115.5	100.46	-5,842.9	-1.7	691.5	463.8	227.72	3.037			
13,000.0	6,735.9	13,028.1	6,862.0	117.3	117.4	100.51	-5,942.9	-1.7	691.6	460.2	231.44	2.988			
13,100.0	6,735.2	13,128.1	6,862.0	119.2	119.3	100.56	-6,042.9	-1.7	691.7	456.6	235.16	2.942			
13,200.0	6,734.6	13,228.1	6,862.0	121.1	121.2	100.61	-6,142.9	-1.7	691.9	453.0	238.88	2.896			
13,300.0	6,734.0	13,328.1	6,862.0	123.0	123.1	100.66	-6,242.9	-1.7	692.0	449.4	242.60	2.852			
13,400.0	6,733.4	13,428.1	6,862.0	124.9	125.0	100.71	-6,342.9	-1.7	692.1	445.8	246.32	2.810			
13,500.0	6,732.7	13,528.1	6,862.0	126.8	126.9	100.76	-6,442.8	-1.7	692.2	442.2	250.04	2.768			
13,600.0	6,732.1	13,628.1	6,862.0	128.7	128.8	100.81	-6,542.8	-1.7	692.3	438.6	253.76	2.728			
13,700.0	6,731.5	13,728.1	6,862.0	130.6	130.7	100.87	-6,642.8	-1.7	692.4	435.0	257.47	2.689			
13,800.0	6,730.8	13,828.1	6,862.0	132.5	132.6	100.92	-6,742.8	-1.7	692.6	431.4	261.19	2.652			
13,900.0	6,730.2	13,928.1	6,862.0	134.4	134.5	100.97	-6,842.8	-1.7	692.7	427.8	264.91	2.615			
14,000.0	6,729.6	14,028.1	6,862.0	136.3	136.4	101.02	-6,942.8	-1.7	692.8	424.2	268.63	2.579			
14,100.0	6,729.0	14,128.1	6,862.0	138.2	138.3	101.07	-7,042.8	-1.7	692.9	420.6	272.35	2.544			
14,200.0	6,728.3	14,228.1	6,862.0	140.1	140.3	101.12	-7,142.8	-1.7	693.0	417.0	276.06	2.510			
14,300.0	6,727.7	14,328.1	6,862.0	142.0	142.2	101.17	-7,242.8	-1.7	693.2	413.4	279.78	2.478			
14,400.0	6,727.1	14,428.1	6,862.0	143.9	144.1	101.22	-7,342.8	-1.7	693.3	409.8	283.49	2.446			
14,411.8	6,727.0	14,439.9	6,862.0	144.2	144.3	101.23	-7,354.7	-1.7	693.3	409.4	283.93	2.442 SF			

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - Wellbore #1 - Plan #1 (3-15-16)													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	1.0	1.0	0.0	0.0	-88.60	0.4	-15.0	15.1	15.0	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-88.60	0.4	-15.0	15.1	14.8	0.23	66.296		
200.0	200.0	201.0	201.0	0.3	0.3	-88.60	0.4	-15.0	15.1	14.4	0.68	22.245 CC		
300.0	300.0	301.0	301.0	0.6	0.6	-144.54	0.4	-15.0	16.1	15.0	1.13	14.274		
400.0	399.9	400.9	400.9	0.8	0.8	-151.25	0.4	-15.0	19.4	17.8	1.59	12.253		
500.0	499.7	501.2	501.2	1.0	1.0	-156.70	1.4	-14.1	24.2	22.2	2.04	11.860		
600.0	599.3	601.7	601.6	1.3	1.2	-159.47	4.3	-11.4	29.4	26.9	2.50	11.749		
700.0	698.6	702.3	702.0	1.6	1.5	-160.69	9.1	-6.9	34.8	31.8	2.97	11.719		
800.0	797.5	803.0	802.2	1.9	1.7	-160.95	16.0	-0.6	40.3	36.9	3.44	11.714		
900.0	896.1	903.8	902.4	2.2	2.0	-160.60	24.7	7.5	46.0	42.1	3.93	11.706		
1,000.0	994.2	1,004.8	1,002.2	2.6	2.3	-159.83	35.4	17.4	52.0	47.5	4.45	11.681		
1,100.0	1,091.7	1,105.8	1,101.8	3.1	2.6	-158.78	48.1	29.1	58.1	53.1	4.99	11.626		
1,200.0	1,188.6	1,207.0	1,201.0	3.5	3.0	-157.55	62.7	42.6	64.4	58.8	5.58	11.538		
1,300.0	1,285.1	1,307.0	1,298.7	4.0	3.4	-156.38	78.4	57.1	70.9	64.7	6.20	11.434		
1,400.0	1,381.5	1,406.8	1,396.2	4.6	3.8	-155.43	94.0	71.6	77.5	70.7	6.85	11.315		
1,500.0	1,478.0	1,506.5	1,493.6	5.1	4.3	-154.63	109.7	86.0	84.1	76.6	7.51	11.193		
1,600.0	1,574.5	1,606.3	1,591.1	5.6	4.7	-153.94	125.3	100.5	90.7	82.5	8.20	11.072		
1,700.0	1,670.9	1,706.1	1,688.6	6.2	5.1	-153.35	140.9	114.9	97.4	88.5	8.89	10.957		
1,800.0	1,767.4	1,805.9	1,786.1	6.7	5.6	-152.83	156.6	129.4	104.0	94.4	9.59	10.848		
1,900.0	1,863.8	1,905.6	1,883.5	7.2	6.0	-152.37	172.2	143.9	110.7	100.4	10.30	10.747		
2,000.0	1,960.3	2,005.4	1,981.0	7.8	6.4	-151.97	187.9	158.3	117.4	106.3	11.02	10.653		
2,100.0	2,056.7	2,105.2	2,078.5	8.3	6.9	-151.61	203.5	172.8	124.0	112.3	11.74	10.566		
2,200.0	2,153.2	2,204.9	2,175.9	8.9	7.3	-151.29	219.2	187.3	130.7	118.2	12.46	10.485		
2,300.0	2,249.6	2,304.7	2,273.4	9.4	7.8	-150.99	234.8	201.7	137.4	124.2	13.19	10.411		
2,400.0	2,346.1	2,404.5	2,370.9	10.0	8.2	-150.73	250.4	216.2	144.0	130.1	13.93	10.342		
2,500.0	2,442.5	2,504.3	2,468.4	10.5	8.7	-150.49	266.1	230.7	150.7	136.1	14.66	10.278		
2,600.0	2,539.0	2,604.0	2,565.8	11.1	9.1	-150.27	281.7	245.1	157.4	142.0	15.40	10.219		
2,700.0	2,635.5	2,703.8	2,663.3	11.6	9.6	-150.06	297.4	259.6	164.1	148.0	16.14	10.164		
2,800.0	2,731.9	2,803.6	2,760.8	12.2	10.1	-149.88	313.0	274.0	170.8	153.9	16.89	10.113		
2,900.0	2,828.4	2,903.4	2,858.3	12.7	10.5	-149.71	328.7	288.5	177.5	159.8	17.63	10.066		
3,000.0	2,924.8	3,003.1	2,955.7	13.3	11.0	-149.54	344.3	303.0	184.2	165.8	18.38	10.021		
3,100.0	3,021.3	3,102.9	3,053.2	13.8	11.4	-149.40	359.9	317.4	190.9	171.7	19.13	9.979		
3,200.0	3,117.7	3,202.7	3,150.7	14.4	11.9	-149.26	375.6	331.9	197.6	177.7	19.87	9.940		
3,300.0	3,214.2	3,302.5	3,248.2	14.9	12.3	-149.13	391.2	346.4	204.3	183.6	20.62	9.904		
3,400.0	3,310.6	3,402.2	3,345.6	15.5	12.8	-149.01	406.9	360.8	210.9	189.6	21.37	9.869		
3,500.0	3,407.1	3,502.0	3,443.1	16.0	13.2	-148.89	422.5	375.3	217.6	195.5	22.13	9.836		
3,600.0	3,503.7	3,601.8	3,540.6	16.5	13.7	-148.73	438.2	389.8	223.8	200.9	22.88	9.778		
3,700.0	3,601.1	3,701.7	3,638.2	16.9	14.1	-148.16	453.8	404.2	227.2	203.5	23.67	9.597		
3,800.0	3,699.3	3,800.0	3,734.3	17.2	14.6	-147.18	469.0	418.2	227.9	203.4	24.48	9.309		
3,823.6	3,722.5	3,821.2	3,755.1	17.3	14.6	-146.97	472.0	421.0	227.9	203.3	24.64	9.250		
3,900.0	3,798.0	3,893.4	3,826.2	17.5	14.9	-146.27	481.4	429.7	227.9	202.7	25.17	9.054		
4,000.0	3,897.3	3,988.0	3,919.7	17.8	15.1	-145.42	491.7	439.3	227.4	201.6	25.79	8.818		
4,100.0	3,996.9	4,082.7	4,013.7	18.0	15.4	-144.64	499.8	446.8	226.4	200.1	26.33	8.600		
4,200.0	4,096.7	4,177.4	4,108.1	18.2	15.6	-143.93	505.6	452.2	225.0	198.2	26.79	8.397		
4,300.0	4,196.7	4,272.3	4,202.8	18.3	15.7	-143.28	509.2	455.4	223.0	195.8	27.18	8.206		
4,400.0	4,296.7	4,367.2	4,297.8	18.4	15.8	-89.91	510.4	456.5	221.8	194.3	27.51	8.063		
4,434.1	4,330.8	4,401.3	4,331.8	18.4	15.9	-89.90	510.4	456.5	221.8	194.2	27.61	8.036		
4,500.0	4,396.7	4,467.1	4,397.7	18.5	16.0	-89.90	510.4	456.5	221.8	194.0	27.79	7.982		
4,600.0	4,496.7	4,567.1	4,497.7	18.6	16.1	-89.90	510.4	456.5	221.8	193.8	28.08	7.900		
4,700.0	4,596.7	4,667.1	4,597.7	18.7	16.2	-89.90	510.4	456.5	221.8	193.5	28.37	7.819		
4,800.0	4,696.7	4,767.1	4,697.7	18.8	16.4	-89.90	510.4	456.5	221.8	193.2	28.67	7.739		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - Wellbore #1 - Plan #1 (3-15-16)													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		
4,900.0	4,796.7	4,867.1	4,797.7	18.9	16.5	-89.90	510.4	456.5	221.8	192.9	28.97	7.659		
5,000.0	4,896.7	4,967.1	4,897.7	19.1	16.6	-89.90	510.4	456.5	221.8	192.6	29.27	7.579		
5,100.0	4,996.7	5,067.1	4,997.7	19.2	16.8	-89.90	510.4	456.5	221.8	192.3	29.58	7.501		
5,200.0	5,096.7	5,167.1	5,097.7	19.3	16.9	-89.90	510.4	456.5	221.8	192.0	29.89	7.423		
5,300.0	5,196.7	5,267.1	5,197.7	19.4	17.1	-89.90	510.4	456.5	221.8	191.6	30.20	7.346		
5,400.0	5,296.7	5,367.1	5,297.7	19.6	17.2	-89.90	510.4	456.5	221.8	191.3	30.52	7.270		
5,500.0	5,396.7	5,467.1	5,397.7	19.7	17.4	-89.90	510.4	456.5	221.8	191.0	30.84	7.194		
5,600.0	5,496.7	5,567.1	5,497.7	19.8	17.5	-89.90	510.4	456.5	221.8	190.7	31.16	7.119		
5,700.0	5,596.7	5,667.1	5,597.7	19.9	17.7	-89.90	510.4	456.5	221.8	190.4	31.49	7.045		
5,800.0	5,696.7	5,767.1	5,697.7	20.1	17.8	-89.90	510.4	456.5	221.8	190.0	31.82	6.972		
5,900.0	5,796.7	5,867.1	5,797.7	20.2	18.0	-89.90	510.4	456.5	221.8	189.7	32.15	6.900		
6,000.0	5,896.7	5,967.1	5,897.7	20.4	18.1	-89.90	510.4	456.5	221.8	189.4	32.49	6.829		
6,062.7	5,959.4	6,029.8	5,960.4	20.4	18.2	-89.96	510.2	456.5	221.8	189.2	32.68	6.788		
6,100.0	5,996.7	6,067.1	5,997.6	20.5	18.2	-90.42	508.4	456.5	221.8	189.2	32.70	6.785		
6,200.0	6,096.5	6,165.9	6,095.5	20.6	18.3	87.41	494.9	456.5	222.1	189.7	32.42	6.851		
6,300.0	6,194.8	6,263.8	6,189.8	20.6	18.2	85.27	469.3	456.5	222.6	190.7	31.94	6.969		
6,400.0	6,289.8	6,360.6	6,279.2	20.5	18.1	83.23	432.3	456.5	223.4	192.1	31.35	7.127		
6,500.0	6,380.1	6,456.5	6,362.4	20.3	17.9	81.32	384.7	456.5	224.4	193.7	30.70	7.310		
6,600.0	6,464.0	6,551.6	6,438.4	20.1	17.6	79.58	327.7	456.5	225.6	195.5	30.07	7.502		
6,700.0	6,540.0	6,646.0	6,506.3	19.9	17.4	78.03	262.1	456.5	226.8	197.3	29.52	7.682		
6,800.0	6,607.0	6,739.7	6,565.1	19.7	17.2	76.68	189.3	456.5	228.0	198.9	29.13	7.825		
6,900.0	6,663.7	6,832.9	6,614.4	19.4	17.0	75.56	110.3	456.5	229.1	200.1	28.96	7.910		
7,000.0	6,709.2	6,925.7	6,653.5	19.2	16.8	74.66	26.2	456.5	230.0	201.0	29.06	7.915		
7,100.0	6,742.7	7,018.1	6,682.1	19.2	16.7	74.01	-61.6	456.5	230.8	201.3	29.48	7.827		
7,200.0	6,763.6	7,110.3	6,699.8	19.2	16.8	73.60	-152.0	456.5	231.3	201.0	30.22	7.653		
7,300.0	6,771.5	7,202.4	6,706.6	19.5	17.4	73.44	-243.8	456.5	231.4	200.2	31.29	7.397		
7,400.0	6,771.1	7,301.1	6,706.1	20.0	18.3	73.43	-342.6	456.5	231.5	198.6	32.84	7.048		
7,500.0	6,770.4	7,401.1	6,705.4	20.8	19.3	73.43	-442.6	456.5	231.5	196.7	34.74	6.663		
7,600.0	6,769.8	7,501.1	6,704.8	21.8	20.5	73.43	-542.6	456.5	231.5	194.5	36.91	6.270		
7,700.0	6,769.2	7,601.1	6,704.2	23.0	21.7	73.43	-642.5	456.5	231.5	192.1	39.32	5.887		
7,800.0	6,768.5	7,701.1	6,703.6	24.2	23.1	73.43	-742.5	456.5	231.5	189.5	41.91	5.523		
7,900.0	6,767.9	7,801.1	6,702.9	25.6	24.5	73.43	-842.5	456.5	231.5	186.8	44.66	5.182		
8,000.0	6,767.3	7,901.1	6,702.3	27.0	26.0	73.43	-942.5	456.5	231.5	183.9	47.54	4.868		
8,100.0	6,766.7	8,001.1	6,701.7	28.4	27.5	73.43	-1,042.5	456.5	231.5	180.9	50.53	4.581		
8,200.0	6,766.0	8,101.1	6,701.0	29.9	29.1	73.43	-1,142.5	456.5	231.5	177.8	53.60	4.318		
8,300.0	6,765.4	8,201.1	6,700.4	31.5	30.7	73.44	-1,242.5	456.5	231.5	174.7	56.76	4.078		
8,400.0	6,764.8	8,301.1	6,699.8	33.1	32.3	73.44	-1,342.5	456.5	231.5	171.5	59.97	3.859		
8,500.0	6,764.1	8,401.1	6,699.2	34.7	34.0	73.44	-1,442.5	456.5	231.5	168.2	63.24	3.660		
8,600.0	6,763.5	8,501.1	6,698.5	36.4	35.7	73.44	-1,542.5	456.5	231.5	164.9	66.55	3.478		
8,700.0	6,762.9	8,601.1	6,697.9	38.1	37.4	73.44	-1,642.5	456.5	231.5	161.5	69.91	3.311		
8,800.0	6,762.3	8,701.1	6,697.3	39.8	39.1	73.44	-1,742.5	456.5	231.5	158.2	73.29	3.158		
8,900.0	6,761.6	8,801.1	6,696.6	41.5	40.9	73.44	-1,842.5	456.5	231.5	154.7	76.71	3.017		
9,000.0	6,761.0	8,901.1	6,696.0	43.2	42.7	73.44	-1,942.5	456.5	231.5	151.3	80.15	2.888		
9,100.0	6,760.4	9,001.1	6,695.4	45.0	44.4	73.44	-2,042.5	456.5	231.5	147.8	83.62	2.768		
9,200.0	6,759.7	9,101.1	6,694.8	46.7	46.2	73.44	-2,142.5	456.5	231.5	144.4	87.10	2.657		
9,300.0	6,759.1	9,201.1	6,694.1	48.5	48.0	73.44	-2,242.5	456.5	231.5	140.9	90.60	2.555		
9,400.0	6,758.5	9,301.1	6,693.5	50.3	49.8	73.44	-2,342.5	456.5	231.5	137.3	94.12	2.459		
9,500.0	6,757.9	9,401.1	6,692.9	52.1	51.6	73.44	-2,442.5	456.5	231.5	133.8	97.65	2.370		
9,600.0	6,757.2	9,501.1	6,692.2	53.9	53.5	73.44	-2,542.5	456.5	231.5	130.3	101.19	2.287		
9,700.0	6,756.6	9,601.1	6,691.6	55.7	55.3	73.44	-2,642.5	456.5	231.5	126.7	104.74	2.210		

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

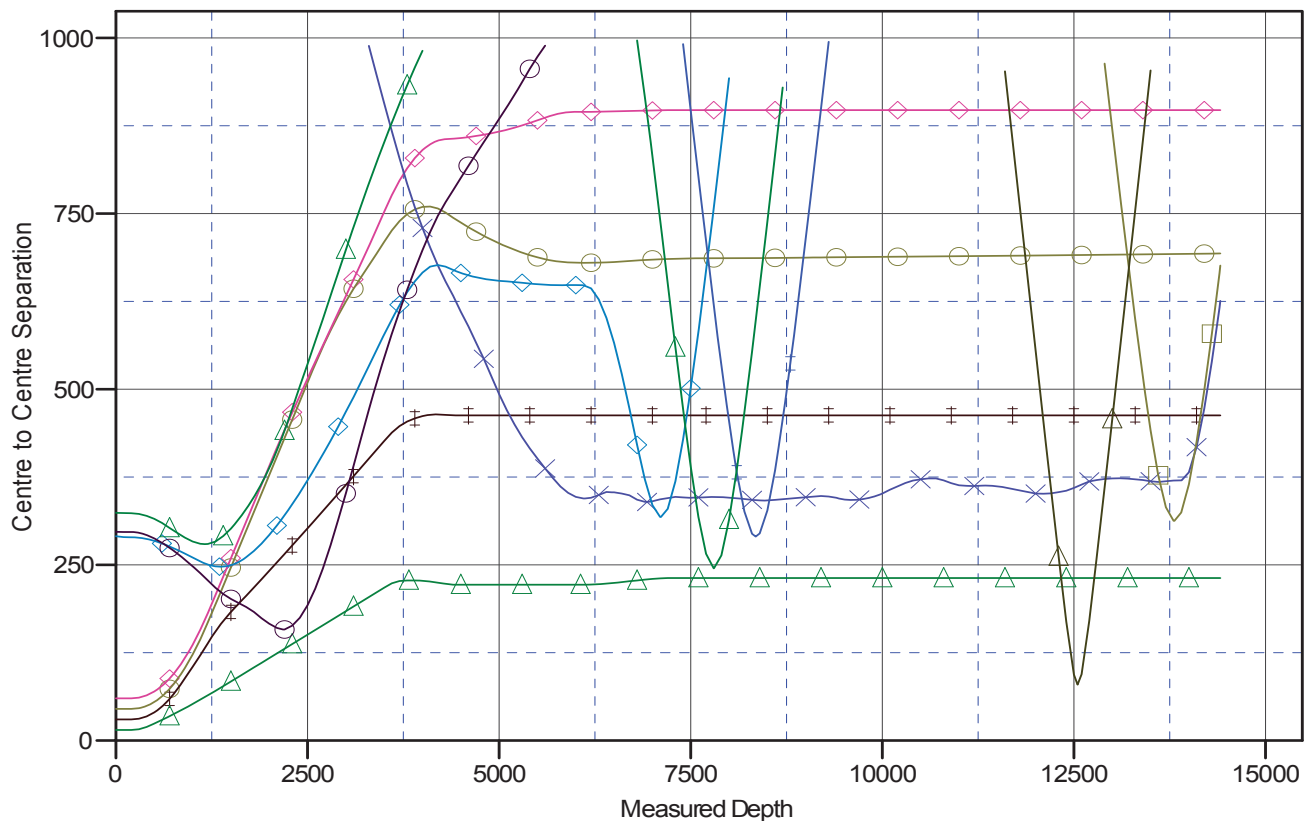
Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - Wellbore #1 - Plan #1 (3-15-16)												Offset Site Error: 0.0 ft	
Survey Program: 0-MWD												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance					Warning	
Measured Depth (ft)	Vertical Depth (ft)	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
9,800.0	6,756.0	9,701.1	6,691.0	57.5	57.1	73.44	-2,742.5	456.5	231.5	123.1	108.31	2.137	
9,900.0	6,755.3	9,801.1	6,690.4	59.3	59.0	73.44	-2,842.5	456.5	231.5	119.6	111.88	2.069	
10,000.0	6,754.7	9,901.1	6,689.7	61.1	60.8	73.44	-2,942.5	456.5	231.5	116.0	115.46	2.005	
10,100.0	6,754.1	10,001.1	6,689.1	63.0	62.7	73.44	-3,042.5	456.5	231.5	112.4	119.05	1.944	
10,200.0	6,753.5	10,101.1	6,688.5	64.8	64.5	73.44	-3,142.5	456.5	231.5	108.8	122.65	1.887	
10,300.0	6,752.8	10,201.1	6,687.8	66.7	66.4	73.44	-3,242.5	456.5	231.5	105.2	126.25	1.833	
10,400.0	6,752.2	10,301.1	6,687.2	68.5	68.2	73.44	-3,342.5	456.5	231.5	101.6	129.85	1.782	
10,500.0	6,751.6	10,401.1	6,686.6	70.4	70.1	73.44	-3,442.5	456.5	231.5	98.0	133.47	1.734	
10,600.0	6,751.0	10,501.1	6,686.0	72.2	71.9	73.44	-3,542.5	456.5	231.5	94.4	137.08	1.688	
10,700.0	6,750.3	10,601.1	6,685.3	74.1	73.8	73.44	-3,642.5	456.5	231.5	90.7	140.71	1.645	
10,800.0	6,749.7	10,701.1	6,684.7	75.9	75.7	73.44	-3,742.5	456.5	231.5	87.1	144.33	1.604	
10,900.0	6,749.1	10,801.1	6,684.1	77.8	77.6	73.44	-3,842.5	456.5	231.5	83.5	147.96	1.564	
11,000.0	6,748.4	10,901.1	6,683.5	79.7	79.4	73.44	-3,942.5	456.5	231.5	79.9	151.60	1.527	
11,100.0	6,747.8	11,001.1	6,682.8	81.5	81.3	73.44	-4,042.5	456.5	231.5	76.2	155.23	1.491 Level 3	
11,200.0	6,747.2	11,101.1	6,682.2	83.4	83.2	73.44	-4,142.5	456.5	231.5	72.6	158.87	1.457 Level 3	
11,300.0	6,746.6	11,201.1	6,681.6	85.3	85.1	73.44	-4,242.5	456.5	231.5	68.9	162.52	1.424 Level 3	
11,400.0	6,745.9	11,301.1	6,680.9	87.1	87.0	73.44	-4,342.5	456.5	231.5	65.3	166.16	1.393 Level 3	
11,500.0	6,745.3	11,401.1	6,680.3	89.0	88.8	73.44	-4,442.5	456.5	231.5	61.6	169.81	1.363 Level 3	
11,600.0	6,744.7	11,501.1	6,679.7	90.9	90.7	73.44	-4,542.5	456.5	231.5	58.0	173.46	1.334 Level 3	
11,700.0	6,744.0	11,601.1	6,679.1	92.8	92.6	73.44	-4,642.5	456.5	231.5	54.3	177.11	1.307 Level 3	
11,800.0	6,743.4	11,701.1	6,678.4	94.7	94.5	73.44	-4,742.5	456.5	231.5	50.7	180.77	1.280 Level 3	
11,900.0	6,742.8	11,801.1	6,677.8	96.5	96.4	73.44	-4,842.5	456.5	231.5	47.0	184.42	1.255 Level 3	
12,000.0	6,742.2	11,901.1	6,677.2	98.4	98.3	73.44	-4,942.5	456.5	231.5	43.4	188.08	1.231 Level 2	
12,100.0	6,741.5	12,001.1	6,676.5	100.3	100.2	73.44	-5,042.5	456.5	231.5	39.7	191.74	1.207 Level 2	
12,200.0	6,740.9	12,101.1	6,675.9	102.2	102.1	73.44	-5,142.5	456.5	231.5	36.1	195.40	1.184 Level 2	
12,300.0	6,740.3	12,201.1	6,675.3	104.1	104.0	73.44	-5,242.5	456.5	231.5	32.4	199.07	1.163 Level 2	
12,400.0	6,739.6	12,301.1	6,674.7	106.0	105.9	73.44	-5,342.5	456.5	231.5	28.7	202.73	1.142 Level 2	
12,500.0	6,739.0	12,401.1	6,674.0	107.9	107.8	73.44	-5,442.5	456.5	231.5	25.1	206.40	1.121 Level 2	
12,600.0	6,738.4	12,501.1	6,673.4	109.8	109.7	73.44	-5,542.5	456.5	231.5	21.4	210.06	1.102 Level 2	
12,700.0	6,737.8	12,601.1	6,672.8	111.6	111.6	73.44	-5,642.5	456.5	231.5	17.7	213.73	1.083 Level 2	
12,800.0	6,737.1	12,701.1	6,672.1	113.5	113.4	73.44	-5,742.4	456.5	231.5	14.1	217.40	1.065 Level 2	
12,900.0	6,736.5	12,801.1	6,671.5	115.4	115.3	73.44	-5,842.4	456.5	231.5	10.4	221.07	1.047 Level 2	
13,000.0	6,735.9	12,901.1	6,670.9	117.3	117.2	73.44	-5,942.4	456.5	231.5	6.7	224.74	1.030 Level 2	
13,100.0	6,735.2	13,001.1	6,670.3	119.2	119.1	73.44	-6,042.4	456.5	231.5	3.0	228.42	1.013 Level 2	
13,200.0	6,734.6	13,101.1	6,669.6	121.1	121.0	73.44	-6,142.4	456.5	231.5	-0.6	232.09	0.997 Level 1	
13,300.0	6,734.0	13,201.1	6,669.0	123.0	123.0	73.44	-6,242.4	456.5	231.5	-4.3	235.77	0.982 Level 1	
13,400.0	6,733.4	13,301.1	6,668.4	124.9	124.9	73.44	-6,342.4	456.5	231.5	-8.0	239.44	0.967 Level 1	
13,500.0	6,732.7	13,401.1	6,667.7	126.8	126.8	73.44	-6,442.4	456.5	231.5	-11.7	243.12	0.952 Level 1	
13,600.0	6,732.1	13,501.1	6,667.1	128.7	128.7	73.44	-6,542.4	456.5	231.5	-15.3	246.80	0.938 Level 1	
13,700.0	6,731.5	13,601.1	6,666.5	130.6	130.6	73.44	-6,642.4	456.5	231.5	-19.0	250.47	0.924 Level 1	
13,800.0	6,730.8	13,701.1	6,665.9	132.5	132.5	73.44	-6,742.4	456.5	231.5	-22.7	254.15	0.911 Level 1	
13,900.0	6,730.2	13,801.1	6,665.2	134.4	134.4	73.44	-6,842.4	456.5	231.5	-26.4	257.83	0.898 Level 1	
14,000.0	6,729.6	13,901.1	6,664.6	136.3	136.3	73.44	-6,942.4	456.5	231.5	-30.1	261.51	0.885 Level 1	
14,100.0	6,729.0	14,001.1	6,664.0	138.2	138.2	73.44	-7,042.4	456.5	231.5	-33.7	265.19	0.873 Level 1	
14,200.0	6,728.3	14,101.1	6,663.3	140.1	140.1	73.44	-7,142.4	456.5	231.5	-37.4	268.87	0.861 Level 1	
14,300.0	6,727.7	14,201.1	6,662.7	142.0	142.0	73.44	-7,242.4	456.5	231.5	-41.1	272.56	0.849 Level 1	
14,400.0	6,727.1	14,301.1	6,662.1	143.9	143.9	73.44	-7,342.4	456.5	231.5	-44.8	276.24	0.838 Level 1	
14,411.8	6,727.0	14,312.9	6,662.0	144.2	144.1	73.44	-7,354.3	456.5	231.5	-45.2	276.68	0.837 Level 1, ES, SF	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4685.0ft (RKB - 23')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Ottenhoff 29U-343
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°

Ladder Plot



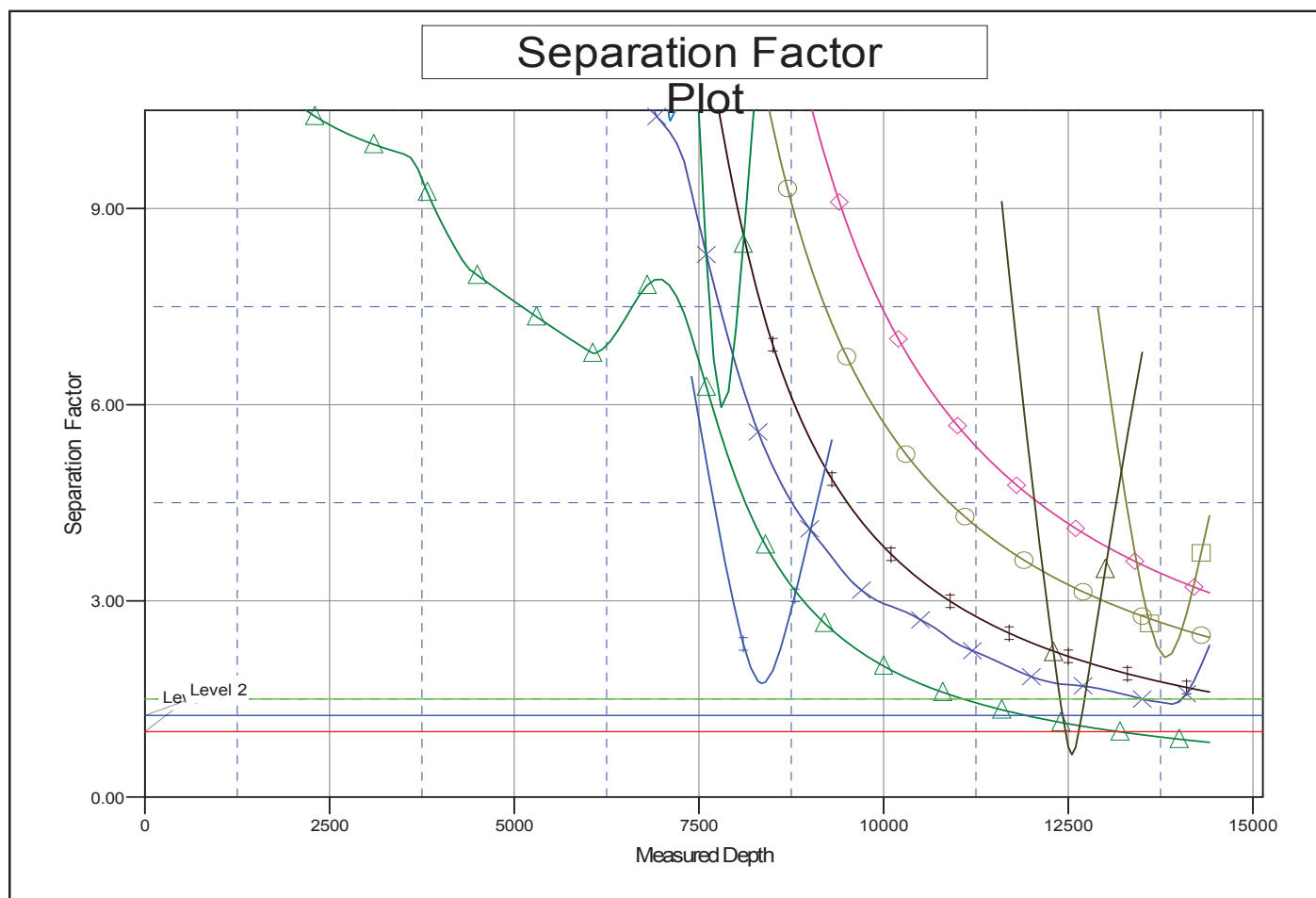
LEGEND

ntoff29R-323, Wellbore #1, Plan #1 (3-15-16) V0	✕ Churchill 28E-203, Wellbore #1, Wellbore #1 V0	■ DIC Amato #42-32 (Exist), Wellbore #1, Wellbore #1 V0
ntoff29R-423, Wellbore #1, Plan #1 (3-15-16) V0	◆ Ottenhoff 41-29 (Exist), Wellbore #1, Wellbore #1 V0	▲ Cross #32-11A (Exist), Wellbore #1, Wellbore #1 V0
ntoff29R-203, Wellbore #1, Plan #1 (3-14-16) V0	● Ottenhoff 41-6B (Exist), Wellbore #1, Wellbore #1 V0	▲ Ottenhoff 41-7B (Exist), Wellbore #1, Wellbore #1 V0
ntoff29U-243, Wellbore #1, Plan #1 (3-15-16) V0	✕ Roskop 29-1 (Exist), Wellbore #1, Wellbore #1 V0	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	Local Co-ordinate Reference:	Well Ottenhoff 29U-343
Project:	SEC.29-T5N-R64W	TVD Reference:	WELL @ 4685.0ft (RKB - 23')
Reference Site:	Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W	MD Reference:	WELL @ 4685.0ft (RKB - 23')
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Ottenhoff 29U-343	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (3-15-16)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4685.0ft (RKB - 23')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000

Coordinates are relative to: Ottenhoff 29U-343
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°



LEGEND

ntoff 29R-323, Wellbore #1, Plan #1 (3-15-16) V0	✕ Churchill 28E-203, Wellbore #1, Wellbore #1 V0	■ DIC Amato #42-32 (Exist), Wellbore #1, Wellbore #1 V0
ntoff 29R-423, Wellbore #1, Plan #1 (3-15-16) V0	◆ Ottenhoff 41-29 (Exist), Wellbore #1, Wellbore #1 V0	▲ Cross #32-11A (Exist), Wellbore #1, Wellbore #1 V0
ntoff 29R-203, Wellbore #1, Plan #1 (3-14-16) V0	● Ottenhoff 41-6B (Exist), Wellbore #1, Wellbore #1 V0	▲ Ottenhoff 41-7B (Exist), Wellbore #1, Wellbore #1 V0
ntoff 29U-243, Wellbore #1, Plan #1 (3-15-16) V0	✕ Roskop 29-1 (Exist), Wellbore #1, Wellbore #1 V0	