PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Ottenhoff 29R-423**

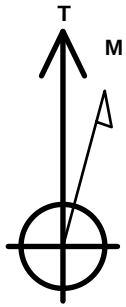
Surface Location: Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W
North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
Ground Elevation: 4662.0

+N/-S	+E/-W	Northing	Easting	Latittude	Longitude	Slot
0.0	0.0	1381166.80	3259719.38	40.375957	-104.567783	

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

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 559'FNL & 975'FEL, Sec.29	1.0	0.0	0.0	Point
BHL 2340'FNL & 980'FEL, Sec.32	6862.0	-7059.9	40.7	Point
LPL 814'FNL & 931'FEL, Sec.29	6862.0	-254.3	45.7	Point



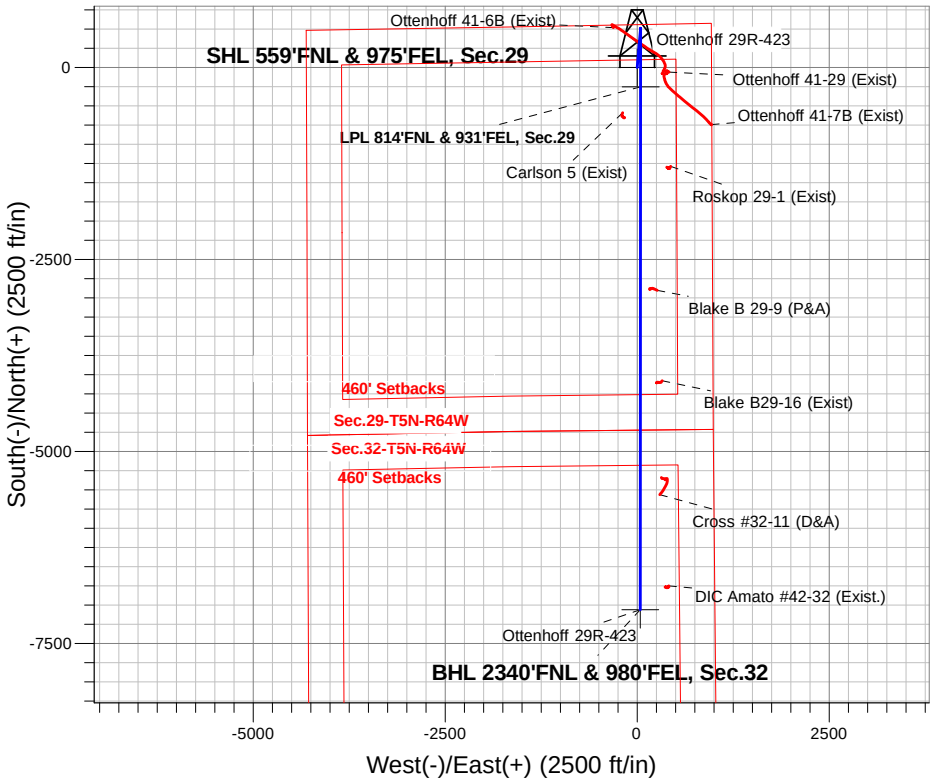
Azimuths to True North
Magnetic North: 8.00°

Magnetic Field
Strength: 52547.3snT
Dip Angle: 66.87°
Date: 1/30/2017
Model: IGRF2010

Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W
Ottenhoff 29R-423
Plan #2 (1-25-17)
9:13, January 30 2017

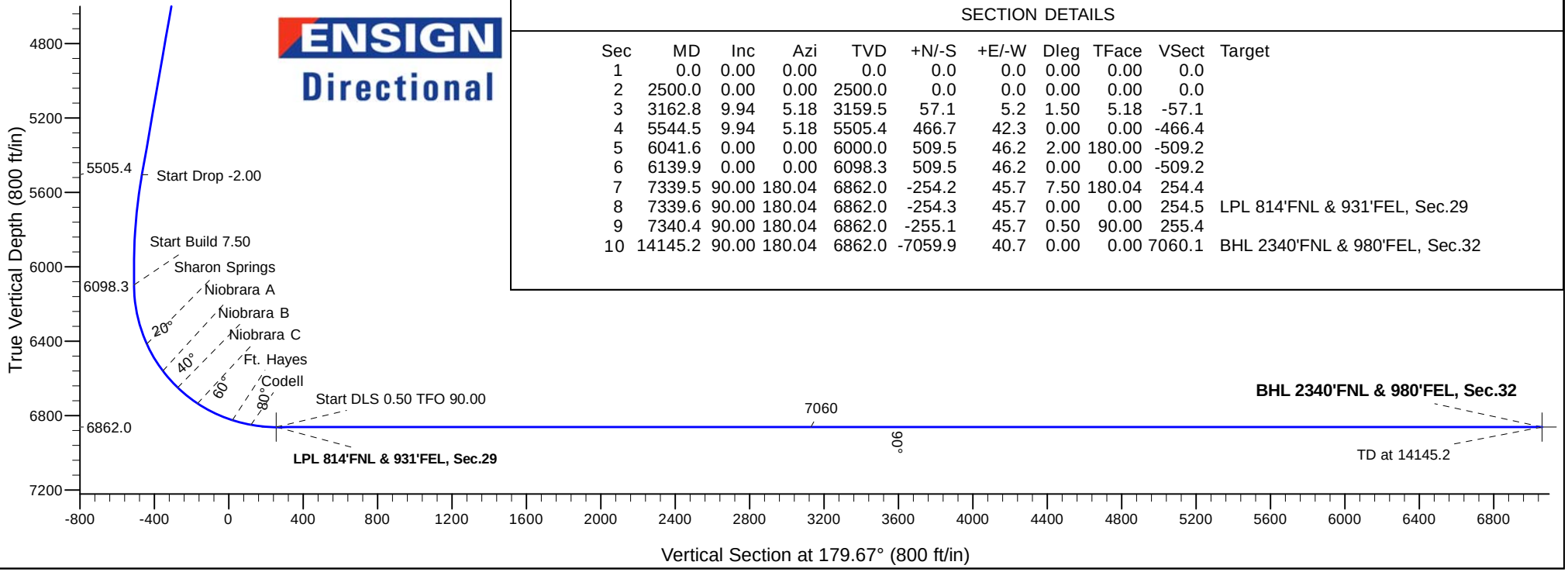
ANNOTATIONS

TVD	MD	Annotation
2500.0	2500.0	KOP - Start Build 1.50
5505.4	5544.5	Start Drop -2.00
6098.3	6139.9	Start Build 7.50
6862.0	7339.6	Start DLS 0.50 TFO 90.00
6862.0	7340.4	Start 6804.8 hold at 7340.4 MD
6862.0	14145.2	TD at 14145.2



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	2500.0	0.00	0.00	2500.0	0.0	0.0	0.00	0.00	0.0	
3	3162.8	9.94	5.18	3159.5	57.1	5.2	1.50	5.18	-57.1	
4	5544.5	9.94	5.18	5505.4	466.7	42.3	0.00	0.00	-466.4	
5	6041.6	0.00	0.00	6000.0	509.5	46.2	2.00	180.00	-509.2	
6	6139.9	0.00	0.00	6098.3	509.5	46.2	0.00	0.00	-509.2	
7	7339.5	90.00	180.04	6862.0	-254.2	45.7	7.50	180.04	254.4	
8	7339.6	90.00	180.04	6862.0	-254.3	45.7	0.00	0.00	254.5	LPL 814'FNL & 931'FEL, Sec.29
9	7340.4	90.00	180.04	6862.0	-255.1	45.7	0.50	90.00	255.4	
10	14145.2	90.00	180.04	6862.0	-7059.9	40.7	0.00	0.00	7060.1	BHL 2340'FNL & 980'FEL, Sec.32



ENSIGN Directional

PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W
Ottenhoff 29R-423

Wellbore #1

Plan: Plan #2 (1-25-17)

Standard Planning Report

30 January, 2017

PDC ENERGY
Growing E&P Value

Database:	US_EDM	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

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 29R-423

Well Position	**+N/-S**	0.3 ft	**Northing:**	1,381,166.80 usft	**Latitude:**	40.375957
	+E/-W	-30.1 ft	**Easting:**	3,259,719.39 usft	**Longitude:**	-104.567783
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	1/30/2017	8.00	66.87	52,547

Design Plan #2 (1-25-17)

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	179.67

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	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,162.8	9.94	5.18	3,159.5	57.1	5.2	1.50	1.50	0.00	5.18	
5,544.5	9.94	5.18	5,505.4	466.7	42.3	0.00	0.00	0.00	0.00	
6,041.6	0.00	0.00	6,000.0	509.5	46.2	2.00	-2.00	0.00	180.00	
6,139.9	0.00	0.00	6,098.3	509.5	46.2	0.00	0.00	0.00	0.00	
7,339.5	90.00	180.04	6,862.0	-254.2	45.7	7.50	7.50	0.00	180.04	
7,339.6	90.00	180.04	6,862.0	-254.3	45.7	0.00	0.00	0.00	0.00	LPL 814'FNL & 931'FI
7,340.4	90.00	180.04	6,862.0	-255.1	45.7	0.50	0.00	0.50	90.00	
14,145.2	90.00	180.04	6,862.0	-7,059.9	40.7	0.00	0.00	0.00	0.00	BHL 2340'FNL & 980'

Database:	US_EDM	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

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
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 1.50									
2,600.0	1.50	5.18	2,600.0	1.3	0.1	-1.3	1.50	1.50	0.00
2,700.0	3.00	5.18	2,699.9	5.2	0.5	-5.2	1.50	1.50	0.00
2,800.0	4.50	5.18	2,799.7	11.7	1.1	-11.7	1.50	1.50	0.00
2,900.0	6.00	5.18	2,899.3	20.8	1.9	-20.8	1.50	1.50	0.00
3,000.0	7.50	5.18	2,998.6	32.5	3.0	-32.5	1.50	1.50	0.00
3,100.0	9.00	5.18	3,097.5	46.8	4.2	-46.8	1.50	1.50	0.00
3,162.8	9.94	5.18	3,159.5	57.1	5.2	-57.1	1.50	1.50	0.00
3,200.0	9.94	5.18	3,196.1	63.5	5.8	-63.5	0.00	0.00	0.00
3,300.0	9.94	5.18	3,294.6	80.7	7.3	-80.7	0.00	0.00	0.00
3,400.0	9.94	5.18	3,393.1	97.9	8.9	-97.9	0.00	0.00	0.00
3,500.0	9.94	5.18	3,491.6	115.1	10.4	-115.0	0.00	0.00	0.00
3,539.0	9.94	5.18	3,530.0	121.8	11.0	-121.7	0.00	0.00	0.00
Parkman Sandstone									
3,600.0	9.94	5.18	3,590.1	132.3	12.0	-132.2	0.00	0.00	0.00
3,700.0	9.94	5.18	3,688.6	149.5	13.6	-149.4	0.00	0.00	0.00
3,800.0	9.94	5.18	3,787.1	166.7	15.1	-166.6	0.00	0.00	0.00
3,900.0	9.94	5.18	3,885.6	183.9	16.7	-183.8	0.00	0.00	0.00
4,000.0	9.94	5.18	3,984.1	201.1	18.2	-201.0	0.00	0.00	0.00
4,100.0	9.94	5.18	4,082.6	218.3	19.8	-218.2	0.00	0.00	0.00
4,200.0	9.94	5.18	4,181.1	235.5	21.4	-235.3	0.00	0.00	0.00
4,219.2	9.94	5.18	4,200.0	238.8	21.7	-238.6	0.00	0.00	0.00
Sussex Sandstone									
4,300.0	9.94	5.18	4,279.6	252.7	22.9	-252.5	0.00	0.00	0.00
4,400.0	9.94	5.18	4,378.1	269.9	24.5	-269.7	0.00	0.00	0.00
4,500.0	9.94	5.18	4,476.6	287.1	26.0	-286.9	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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

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)
4,600.0	9.94	5.18	4,575.1	304.3	27.6	-304.1	0.00	0.00	0.00
4,700.0	9.94	5.18	4,673.6	321.4	29.1	-321.3	0.00	0.00	0.00
4,800.0	9.94	5.18	4,772.1	338.6	30.7	-338.5	0.00	0.00	0.00
4,900.0	9.94	5.18	4,870.6	355.8	32.3	-355.6	0.00	0.00	0.00
5,000.0	9.94	5.18	4,969.1	373.0	33.8	-372.8	0.00	0.00	0.00
5,100.0	9.94	5.18	5,067.6	390.2	35.4	-390.0	0.00	0.00	0.00
5,200.0	9.94	5.18	5,166.1	407.4	36.9	-407.2	0.00	0.00	0.00
5,300.0	9.94	5.18	5,264.6	424.6	38.5	-424.4	0.00	0.00	0.00
5,400.0	9.94	5.18	5,363.1	441.8	40.1	-441.6	0.00	0.00	0.00
5,500.0	9.94	5.18	5,461.6	459.0	41.6	-458.8	0.00	0.00	0.00
5,544.5	9.94	5.18	5,505.4	466.7	42.3	-466.4	0.00	0.00	0.00
Start Drop -2.00									
5,600.0	8.83	5.18	5,560.2	475.7	43.1	-475.4	2.00	-2.00	0.00
5,700.0	6.83	5.18	5,659.2	489.2	44.4	-489.0	2.00	-2.00	0.00
5,800.0	4.83	5.18	5,758.7	499.4	45.3	-499.1	2.00	-2.00	0.00
5,900.0	2.83	5.18	5,858.5	506.0	45.9	-505.7	2.00	-2.00	0.00
6,000.0	0.83	5.18	5,958.4	509.2	46.2	-508.9	2.00	-2.00	0.00
6,041.6	0.00	0.00	6,000.0	509.5	46.2	-509.2	2.00	-2.00	0.00
6,100.0	0.00	0.00	6,058.4	509.5	46.2	-509.2	0.00	0.00	0.00
6,139.9	0.00	0.00	6,098.3	509.5	46.2	-509.2	0.00	0.00	0.00
Start Build 7.50									
6,200.0	4.51	180.04	6,158.4	507.1	46.2	-506.9	7.50	7.50	0.00
6,300.0	12.01	180.04	6,257.3	492.8	46.2	-492.5	7.50	7.50	0.00
6,400.0	19.51	180.04	6,353.4	465.6	46.2	-465.4	7.50	7.50	0.00
6,466.4	24.50	180.04	6,415.0	440.8	46.2	-440.5	7.50	7.50	0.00
Sharon Springs									
6,500.0	27.02	180.04	6,445.2	426.2	46.1	-425.9	7.50	7.50	0.00
6,600.0	34.52	180.04	6,531.1	375.0	46.1	-374.8	7.50	7.50	0.00
6,635.7	37.20	180.04	6,560.0	354.2	46.1	-353.9	7.50	7.50	0.00
Niobrara A									
6,700.0	42.02	180.04	6,609.5	313.2	46.1	-312.9	7.50	7.50	0.00
6,756.4	46.25	180.04	6,650.0	273.9	46.0	-273.6	7.50	7.50	0.00
Niobrara B									
6,800.0	49.52	180.04	6,679.2	241.5	46.0	-241.3	7.50	7.50	0.00
6,892.7	56.48	180.04	6,735.0	167.5	46.0	-167.3	7.50	7.50	0.00
Niobrara C									
6,900.0	57.03	180.04	6,739.0	161.5	46.0	-161.2	7.50	7.50	0.00
7,000.0	64.53	180.04	6,787.8	74.2	45.9	-74.0	7.50	7.50	0.00
7,100.0	72.03	180.04	6,824.8	-18.6	45.9	18.9	7.50	7.50	0.00
7,100.8	72.09	180.04	6,825.0	-19.3	45.8	19.6	7.50	7.50	0.00
Ft. Hayes									
7,200.0	79.54	180.04	6,849.3	-115.5	45.8	115.7	7.50	7.50	0.00
7,203.9	79.83	180.04	6,850.0	-119.3	45.8	119.6	7.50	7.50	0.00
Codell									
7,300.0	87.04	180.04	6,861.0	-214.7	45.7	215.0	7.50	7.50	0.00
7,339.5	90.00	180.04	6,862.0	-254.2	45.7	254.4	7.50	7.50	0.00
7,339.6	90.00	180.04	6,862.0	-254.3	45.7	254.5	0.00	0.00	0.00
Start DLS 0.50 TFO 90.00									
7,340.4	90.00	180.04	6,862.0	-255.1	45.7	255.3	0.52	0.00	0.52
Start 6804.8 hold at 7340.4 MD									
7,400.0	90.00	180.04	6,862.0	-314.7	45.6	314.9	0.00	0.00	0.00

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Well:	Ottenhoff 29R-423	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

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)
7,500.0	90.00	180.04	6,862.0	-414.7	45.6	414.9	0.00	0.00	0.00
7,600.0	90.00	180.04	6,862.0	-514.7	45.5	514.9	0.00	0.00	0.00
7,700.0	90.00	180.04	6,862.0	-614.7	45.4	614.9	0.00	0.00	0.00
7,800.0	90.00	180.04	6,862.0	-714.7	45.4	714.9	0.00	0.00	0.00
7,900.0	90.00	180.04	6,862.0	-814.7	45.3	814.9	0.00	0.00	0.00
8,000.0	90.00	180.04	6,862.0	-914.7	45.2	914.9	0.00	0.00	0.00
8,100.0	90.00	180.04	6,862.0	-1,014.7	45.1	1,014.9	0.00	0.00	0.00
8,200.0	90.00	180.04	6,862.0	-1,114.7	45.1	1,114.9	0.00	0.00	0.00
8,300.0	90.00	180.04	6,862.0	-1,214.7	45.0	1,214.9	0.00	0.00	0.00
8,400.0	90.00	180.04	6,862.0	-1,314.7	44.9	1,314.9	0.00	0.00	0.00
8,500.0	90.00	180.04	6,862.0	-1,414.7	44.8	1,414.9	0.00	0.00	0.00
8,600.0	90.00	180.04	6,862.0	-1,514.7	44.8	1,514.9	0.00	0.00	0.00
8,700.0	90.00	180.04	6,862.0	-1,614.7	44.7	1,614.9	0.00	0.00	0.00
8,800.0	90.00	180.04	6,862.0	-1,714.7	44.6	1,714.9	0.00	0.00	0.00
8,900.0	90.00	180.04	6,862.0	-1,814.7	44.5	1,814.9	0.00	0.00	0.00
9,000.0	90.00	180.04	6,862.0	-1,914.7	44.5	1,914.9	0.00	0.00	0.00
9,100.0	90.00	180.04	6,862.0	-2,014.7	44.4	2,014.9	0.00	0.00	0.00
9,200.0	90.00	180.04	6,862.0	-2,114.7	44.3	2,114.9	0.00	0.00	0.00
9,300.0	90.00	180.04	6,862.0	-2,214.7	44.3	2,214.9	0.00	0.00	0.00
9,400.0	90.00	180.04	6,862.0	-2,314.7	44.2	2,314.9	0.00	0.00	0.00
9,500.0	90.00	180.04	6,862.0	-2,414.7	44.1	2,414.9	0.00	0.00	0.00
9,600.0	90.00	180.04	6,862.0	-2,514.7	44.0	2,514.9	0.00	0.00	0.00
9,700.0	90.00	180.04	6,862.0	-2,614.7	44.0	2,614.9	0.00	0.00	0.00
9,800.0	90.00	180.04	6,862.0	-2,714.7	43.9	2,714.9	0.00	0.00	0.00
9,900.0	90.00	180.04	6,862.0	-2,814.7	43.8	2,814.9	0.00	0.00	0.00
10,000.0	90.00	180.04	6,862.0	-2,914.7	43.7	2,914.9	0.00	0.00	0.00
10,100.0	90.00	180.04	6,862.0	-3,014.7	43.7	3,014.9	0.00	0.00	0.00
10,200.0	90.00	180.04	6,862.0	-3,114.7	43.6	3,114.9	0.00	0.00	0.00
10,300.0	90.00	180.04	6,862.0	-3,214.7	43.5	3,214.9	0.00	0.00	0.00
10,400.0	90.00	180.04	6,862.0	-3,314.7	43.4	3,314.9	0.00	0.00	0.00
10,500.0	90.00	180.04	6,862.0	-3,414.7	43.4	3,414.9	0.00	0.00	0.00
10,600.0	90.00	180.04	6,862.0	-3,514.7	43.3	3,514.9	0.00	0.00	0.00
10,700.0	90.00	180.04	6,862.0	-3,614.7	43.2	3,614.9	0.00	0.00	0.00
10,800.0	90.00	180.04	6,862.0	-3,714.7	43.1	3,714.9	0.00	0.00	0.00
10,900.0	90.00	180.04	6,862.0	-3,814.7	43.1	3,814.9	0.00	0.00	0.00
11,000.0	90.00	180.04	6,862.0	-3,914.7	43.0	3,914.9	0.00	0.00	0.00
11,100.0	90.00	180.04	6,862.0	-4,014.7	42.9	4,014.9	0.00	0.00	0.00
11,200.0	90.00	180.04	6,862.0	-4,114.7	42.9	4,114.9	0.00	0.00	0.00
11,300.0	90.00	180.04	6,862.0	-4,214.7	42.8	4,214.9	0.00	0.00	0.00
11,400.0	90.00	180.04	6,862.0	-4,314.7	42.7	4,314.9	0.00	0.00	0.00
11,500.0	90.00	180.04	6,862.0	-4,414.7	42.6	4,414.9	0.00	0.00	0.00
11,600.0	90.00	180.04	6,862.0	-4,514.7	42.6	4,514.9	0.00	0.00	0.00
11,700.0	90.00	180.04	6,862.0	-4,614.7	42.5	4,614.9	0.00	0.00	0.00
11,800.0	90.00	180.04	6,862.0	-4,714.7	42.4	4,714.9	0.00	0.00	0.00
11,900.0	90.00	180.04	6,862.0	-4,814.7	42.3	4,814.9	0.00	0.00	0.00
12,000.0	90.00	180.04	6,862.0	-4,914.7	42.3	4,914.8	0.00	0.00	0.00
12,100.0	90.00	180.04	6,862.0	-5,014.7	42.2	5,014.8	0.00	0.00	0.00
12,200.0	90.00	180.04	6,862.0	-5,114.7	42.1	5,114.8	0.00	0.00	0.00
12,300.0	90.00	180.04	6,862.0	-5,214.7	42.0	5,214.8	0.00	0.00	0.00
12,400.0	90.00	180.04	6,862.0	-5,314.7	42.0	5,314.8	0.00	0.00	0.00
12,500.0	90.00	180.04	6,862.0	-5,414.7	41.9	5,414.8	0.00	0.00	0.00
12,600.0	90.00	180.04	6,862.0	-5,514.7	41.8	5,514.8	0.00	0.00	0.00

Database:	US_EDM	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

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)
12,700.0	90.00	180.04	6,862.0	-5,614.7	41.8	5,614.8	0.00	0.00	0.00
12,800.0	90.00	180.04	6,862.0	-5,714.7	41.7	5,714.8	0.00	0.00	0.00
12,900.0	90.00	180.04	6,862.0	-5,814.7	41.6	5,814.8	0.00	0.00	0.00
13,000.0	90.00	180.04	6,862.0	-5,914.7	41.5	5,914.8	0.00	0.00	0.00
13,100.0	90.00	180.04	6,862.0	-6,014.7	41.5	6,014.8	0.00	0.00	0.00
13,200.0	90.00	180.04	6,862.0	-6,114.7	41.4	6,114.8	0.00	0.00	0.00
13,300.0	90.00	180.04	6,862.0	-6,214.7	41.3	6,214.8	0.00	0.00	0.00
13,400.0	90.00	180.04	6,862.0	-6,314.7	41.2	6,314.8	0.00	0.00	0.00
13,500.0	90.00	180.04	6,862.0	-6,414.7	41.2	6,414.8	0.00	0.00	0.00
13,600.0	90.00	180.04	6,862.0	-6,514.7	41.1	6,514.8	0.00	0.00	0.00
13,700.0	90.00	180.04	6,862.0	-6,614.7	41.0	6,614.8	0.00	0.00	0.00
13,800.0	90.00	180.04	6,862.0	-6,714.7	40.9	6,714.8	0.00	0.00	0.00
13,900.0	90.00	180.04	6,862.0	-6,814.7	40.9	6,814.8	0.00	0.00	0.00
14,000.0	90.00	180.04	6,862.0	-6,914.7	40.8	6,914.8	0.00	0.00	0.00
14,100.0	90.00	180.04	6,862.0	-7,014.7	40.7	7,014.8	0.00	0.00	0.00
14,145.2	90.00	180.04	6,862.0	-7,059.9	40.7	7,060.0	0.00	0.00	0.00
TD at 14145.2									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL 559'FNL & 975'FEL - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,381,166.82	3,259,719.39	40.375957	-104.567783
LPL 814'FNL & 931'FEL - plan hits target center - Point	0.00	0.00	6,862.0	-254.3	45.7	1,380,913.04	3,259,767.75	40.375259	-104.567619
BHL 2340'FNL & 980'FE - plan hits target center - Point	0.00	0.00	6,862.0	-7,059.9	40.7	1,374,107.98	3,259,834.29	40.356578	-104.567637

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,539.0	3,530.0	Parkman Sandstone		0.00	
4,219.2	4,200.0	Sussex Sandstone		0.00	
6,466.4	6,415.0	Sharon Springs		0.00	
6,635.7	6,560.0	Niobrara A		0.00	
6,756.4	6,650.0	Niobrara B		0.00	
6,892.7	6,735.0	Niobrara C		0.00	
7,100.8	6,825.0	Ft. Hayes		0.00	
7,203.9	6,850.0	Codell		0.00	

Database:	US_EDM	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #2 (1-25-17)		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
2,500.0	2,500.0	0.0	0.0	KOP - Start Build 1.50
5,544.5	5,505.4	57.1	5.2	Start Drop -2.00
6,139.9	6,098.3	466.7	42.3	Start Build 7.50
7,339.6	6,862.0	509.5	46.2	Start DLS 0.50 TFO 90.00
7,340.4	6,862.0	509.5	46.2	Start 6804.8 hold at 7340.4 MD
14,145.2	6,862.0	-254.3	45.7	TD at 14145.2

ENSIGN Directional

PETROLEUM DEVELOPMENT CORP DJ Basin

SEC.29-T5N-R64W
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W
Ottenhoff 29R-423

Wellbore #1
Plan #2 (1-25-17)

Anticollision Report

30 January, 2017

PDC ENERGY
Growing E&P Value

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Reference	Plan #2 (1-25-17)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 800.0 ft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.45 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 1/30/2017

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	14,145.2	Plan #2 (1-25-17) (Wellbore #1)	MWD	MWD - Standard

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Existing Wells Sec.29-T5N-R64W						
Carlson 5 (Exist) - Wellbore #1 - Wellbore #1	7,687.2	6,851.3	238.3	197.5	5.849	CC, ES
Carlson 5 (Exist) - Wellbore #1 - Wellbore #1	7,700.0	6,850.9	238.6	197.7	5.830	SF
Cross #32-11 (D&A) - Wellbore #1 - Wellbore #1	12,628.6	7,008.2	281.0	134.6	1.920	CC, ES, SF
DIC Amato #42-32 (Exist.) - Wellbore #1 - Wellbore #1	13,837.4	6,892.5	369.4	189.7	2.056	CC, ES, SF
Ottenhoff 41-29 (Exist) - Wellbore #1 - Wellbore #1	186.7	160.7	333.2	332.6	505.450	CC
Ottenhoff 41-29 (Exist) - Wellbore #1 - Wellbore #1	7,136.1	6,800.0	361.7	324.0	9.596	ES
Ottenhoff 41-29 (Exist) - Wellbore #1 - Wellbore #1	7,150.0	6,803.0	361.9	324.2	9.582	SF
Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1	3,969.8	3,978.9	135.7	113.9	6.238	CC
Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1	4,000.0	4,008.8	135.8	113.9	6.198	ES
Ottenhoff 41-6B (Exist) - Wellbore #1 - Wellbore #1	4,100.0	4,107.7	138.0	115.6	6.144	SF
Ottenhoff 41-7B (Exist) - Wellbore #1 - Wellbore #1	837.4	826.6	363.9	360.1	95.835	CC
Ottenhoff 41-7B (Exist) - Wellbore #1 - Wellbore #1	1,000.0	985.8	364.5	359.8	77.584	ES
Ottenhoff 41-7B (Exist) - Wellbore #1 - Wellbore #1	2,500.0	2,395.1	488.5	475.3	37.132	SF
Roskop 29-1 (Exist) - Wellbore #1 - Wellbore #1	8,375.1	6,843.5	388.9	182.4	1.883	CC, ES
Roskop 29-1 (Exist) - Wellbore #1 - Wellbore #1	8,400.0	6,843.0	389.7	182.7	1.882	SF
Existing Wells Sec.29-T5N-R64W (GRID)						
Blake B 29-9 (P&A) - Wellbore #1 - Wellbore #1	9,983.2	6,850.1	207.0	117.5	2.312	CC, ES
Blake B 29-9 (P&A) - Wellbore #1 - Wellbore #1	10,000.0	6,850.4	207.7	117.8	2.309	SF
Blake B29-16 (Exist) - Wellbore #1 - Wellbore #1	11,170.2	6,878.1	280.3	161.4	2.358	CC, ES
Blake B29-16 (Exist) - Wellbore #1 - Wellbore #1	11,200.0	6,877.5	281.8	162.3	2.358	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W						
Ottenhoff 29M-203 - Wellbore #1 - Plan #2 (1-25-17)	166.3	167.3	105.0	104.4	163.278	CC
Ottenhoff 29M-203 - Wellbore #1 - Plan #2 (1-25-17)	200.0	200.0	105.1	104.2	127.178	ES
Ottenhoff 29M-203 - Wellbore #1 - Plan #2 (1-25-17)	1,000.0	969.9	183.9	178.7	34.961	SF
Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)	766.0	768.0	75.0	71.0	18.984	CC
Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)	800.0	802.0	75.0	70.8	18.125	ES
Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)	1,100.0	1,096.1	85.8	80.0	14.945	SF
Ottenhoff 29M-423 - Wellbore #1 - Plan #2 (1-25-17)	366.3	367.3	90.0	88.3	51.583	CC
Ottenhoff 29M-423 - Wellbore #1 - Plan #2 (1-25-17)	400.0	400.0	90.0	88.1	46.697	ES
Ottenhoff 29M-423 - Wellbore #1 - Plan #2 (1-25-17)	1,000.0	983.4	134.0	128.8	25.799	SF
Ottenhoff 29R-143 - Wellbore #1 - Plan #2 (1-25-17)	1,166.3	1,167.3	44.9	38.7	7.294	CC
Ottenhoff 29R-143 - Wellbore #1 - Plan #2 (1-25-17)	1,200.0	1,201.0	44.9	38.5	7.081	ES
Ottenhoff 29R-143 - Wellbore #1 - Plan #2 (1-25-17)	14,145.2	13,931.3	726.8	403.7	2.249	SF
Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)	1,966.3	1,967.3	15.0	4.5	1.425	Level 3, CC
Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)	2,100.0	2,100.9	15.5	4.2	1.372	Level 3, ES
Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)	14,145.2	13,982.9	294.4	29.8	1.113	Level 2, SF
Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)	966.3	967.3	59.9	54.9	11.865	CC
Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)	1,000.0	1,001.0	59.9	54.7	11.445	ES
Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)	1,200.0	1,198.2	64.4	58.1	10.218	SF
Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)	1,366.3	1,367.3	29.8	22.6	4.112	CC
Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)	1,400.0	1,401.0	29.8	22.4	4.009	ES
Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)	14,145.2	14,068.8	465.1	133.1	1.401	Level 3, SF
Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)	766.3	767.3	15.0	11.1	3.813	CC
Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)	14,145.2	14,067.7	256.2	-40.7	0.863	Level 1, ES, SF
Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)	366.3	367.3	30.1	28.3	17.248	CC
Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)	400.0	401.0	30.1	28.2	15.592	ES
Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)	14,145.2	14,023.3	500.1	184.2	1.583	SF
Ottenhoff 29U-343 - Wellbore #1 - Plan #2 (1-25-17)	200.0	200.0	45.1	44.3	54.651	CC, ES
Ottenhoff 29U-343 - Wellbore #1 - Plan #2 (1-25-17)	14,145.2	14,123.8	693.5	359.6	2.077	SF

Offset Design Existing Wells Sec.29-T5N-R64W - Carlson 5 (Exist) - Wellbore #1 - Wellbore #1

Survey Program: 100-NS-GYRO-MS

Offset Site Error: 0.0 ft
Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-165.51	-652.1	-168.6	673.7				
100.0	100.0	91.4	91.4	0.1	0.1	-165.51	-651.8	-168.4	673.2	672.9	0.29	2,349.023	
200.0	200.0	186.8	186.8	0.4	0.4	-165.51	-651.3	-168.3	672.7	671.9	0.80	844.639	
300.0	300.0	286.8	286.8	0.7	0.6	-165.52	-651.2	-168.2	672.6	671.3	1.27	527.563	
400.0	400.0	387.8	387.8	1.0	0.8	-165.56	-651.1	-167.7	672.4	670.6	1.79	375.101	
440.3	440.3	426.3	426.3	1.1	0.9	-165.56	-651.1	-167.6	672.3	670.3	1.98	338.993	
500.0	500.0	481.9	481.9	1.2	1.0	-165.56	-651.3	-167.7	672.5	670.3	2.25	298.494	
600.0	600.0	581.9	581.9	1.5	1.2	-165.57	-652.0	-167.7	673.2	670.5	2.70	249.782	
700.0	700.0	682.9	682.9	1.8	1.4	-165.60	-652.6	-167.5	673.7	670.6	3.17	212.729	
800.0	800.0	783.6	783.6	2.1	1.6	-165.60	-652.9	-167.7	674.1	670.5	3.66	183.969	
900.0	900.0	882.9	882.9	2.3	1.9	-165.61	-653.4	-167.6	674.5	670.3	4.20	160.741	
1,000.0	1,000.0	980.9	980.9	2.6	2.1	-165.64	-654.0	-167.5	675.1	670.4	4.75	142.267	
1,100.0	1,100.0	1,080.9	1,080.8	2.9	2.4	-165.67	-654.9	-167.3	675.9	670.6	5.31	127.280	
1,200.0	1,200.0	1,181.2	1,181.2	3.2	2.7	-165.70	-655.7	-167.2	676.7	670.8	5.88	114.995	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Carlson 5 (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
1,300.0	1,300.0	1,281.2	1,281.2	3.4	3.0	-165.72	-656.4	-167.1	677.4	670.9	6.46	104.808	
1,400.0	1,400.0	1,382.7	1,382.7	3.7	3.3	-165.75	-657.1	-166.9	678.0	670.9	7.05	96.199	
1,500.0	1,500.0	1,484.4	1,484.4	4.0	3.6	-165.78	-657.6	-166.6	678.3	670.7	7.64	88.835	
1,600.0	1,600.0	1,585.4	1,585.4	4.3	3.9	-165.76	-657.7	-166.8	678.5	670.4	8.15	83.300	
1,700.0	1,700.0	1,686.0	1,686.0	4.5	4.0	-165.69	-657.5	-167.7	678.5	670.0	8.57	79.198	
1,707.6	1,707.6	1,693.7	1,693.7	4.6	4.0	-165.68	-657.5	-167.8	678.5	670.0	8.60	78.910	
1,800.0	1,800.0	1,785.1	1,785.1	4.8	4.2	-165.63	-657.4	-168.5	678.6	669.6	9.01	75.355	
1,900.0	1,900.0	1,886.1	1,886.1	5.1	4.4	-165.59	-657.3	-168.8	678.7	669.2	9.46	71.750	
2,000.0	2,000.0	1,991.5	1,991.4	5.4	4.5	-165.56	-656.9	-169.2	678.3	668.4	9.89	68.618	
2,100.0	2,100.0	2,086.9	2,086.8	5.6	4.7	-165.49	-656.2	-169.8	677.8	667.5	10.31	65.721	
2,200.0	2,200.0	2,186.6	2,186.6	5.9	4.9	-165.40	-655.8	-170.9	677.7	667.0	10.79	62.813	
2,248.9	2,248.9	2,235.0	2,234.9	6.1	5.0	-165.35	-655.7	-171.4	677.7	666.7	11.03	61.426	
2,300.0	2,300.0	2,285.2	2,285.1	6.2	5.1	-165.32	-655.6	-171.8	677.7	666.5	11.29	60.033	
2,400.0	2,400.0	2,384.2	2,384.1	6.5	5.4	-165.28	-655.7	-172.2	678.0	666.1	11.83	57.331	
2,500.0	2,500.0	2,484.4	2,484.4	6.7	5.6	-165.28	-656.0	-172.4	678.2	665.8	12.39	54.761	
2,600.0	2,600.0	2,589.9	2,589.9	7.0	5.9	-170.45	-655.8	-172.6	679.4	666.5	12.89	52.705	
2,700.0	2,699.9	2,686.2	2,686.1	7.3	6.1	-170.48	-655.4	-172.7	682.9	669.6	13.35	51.136	
2,800.0	2,799.7	2,791.2	2,791.1	7.6	6.3	-170.56	-655.1	-172.6	689.1	675.2	13.82	49.861	
2,900.0	2,899.3	2,889.7	2,889.7	7.9	6.4	-170.65	-654.3	-172.6	697.3	683.1	14.21	49.085	
3,000.0	2,998.6	2,985.8	2,985.7	8.1	6.6	-170.74	-653.8	-172.9	708.5	693.9	14.63	48.445	
3,100.0	3,097.5	3,082.1	3,082.0	8.4	6.9	-170.84	-653.7	-173.4	722.7	707.6	15.09	47.882	
3,162.8	3,159.5	3,142.6	3,142.5	8.6	7.0	-170.93	-653.9	-173.5	733.1	717.8	15.39	47.646	
3,200.0	3,196.1	3,178.3	3,178.2	8.7	7.1	-171.01	-654.1	-173.5	739.7	724.1	15.58	47.467	
3,300.0	3,294.6	3,276.8	3,276.8	9.1	7.3	-171.25	-654.7	-173.3	757.3	741.2	16.09	47.072	
3,400.0	3,393.1	3,380.1	3,380.0	9.4	7.5	-171.49	-655.1	-172.8	774.6	758.0	16.56	46.788	
3,500.0	3,491.6	3,478.3	3,478.3	9.8	7.7	-171.70	-655.0	-172.4	791.5	774.5	16.99	46.582	
6,950.0	6,764.8	6,777.8	6,776.7	18.9	15.2	35.88	-604.1	-193.5	761.8	738.2	23.67	32.187	
7,000.0	6,787.8	6,799.3	6,798.2	19.0	15.2	41.55	-603.4	-193.3	719.0	694.0	25.01	28.751	
7,050.0	6,807.8	6,817.8	6,816.7	19.1	15.3	48.33	-602.8	-193.1	675.4	648.4	26.99	25.024	
7,100.0	6,824.8	6,833.2	6,832.1	19.3	15.3	56.17	-602.3	-193.0	631.0	601.6	29.39	21.474	
7,150.0	6,838.6	6,845.5	6,844.3	19.6	15.3	64.76	-601.9	-192.9	586.4	554.6	31.81	18.434	
7,200.0	6,849.3	6,854.5	6,853.4	19.9	15.4	73.52	-601.6	-192.8	541.8	508.0	33.84	16.011	
7,250.0	6,856.8	6,860.4	6,859.3	20.2	15.4	81.72	-601.4	-192.8	497.7	462.5	35.23	14.127	
7,300.0	6,861.0	6,863.0	6,861.8	20.7	15.4	88.76	-601.3	-192.7	454.5	418.5	36.01	12.621	
7,339.5	6,862.0	6,862.7	6,861.6	21.0	15.4	93.26	-601.3	-192.7	421.4	385.0	36.34	11.594	
7,339.6	6,862.0	6,862.7	6,861.6	21.0	15.4	93.26	-601.3	-192.7	421.3	384.9	36.34	11.591	
7,340.4	6,862.0	6,862.7	6,861.5	21.0	15.4	93.25	-601.3	-192.7	420.6	384.2	36.35	11.570	
7,400.0	6,862.0	6,860.7	6,859.6	21.5	15.4	92.78	-601.4	-192.8	373.0	336.2	36.86	10.121	
7,500.0	6,862.0	6,857.4	6,856.3	22.7	15.4	91.99	-601.5	-192.8	303.0	264.9	38.06	7.960	
7,600.0	6,862.0	6,854.1	6,853.0	24.1	15.4	91.21	-601.6	-192.8	253.7	214.3	39.43	6.435	
7,687.2	6,862.0	6,851.3	6,850.2	25.4	15.3	90.52	-601.7	-192.8	238.3	197.5	40.74	5.849	CC, ES
7,700.0	6,862.0	6,850.9	6,849.7	25.6	15.3	90.42	-601.7	-192.8	238.6	197.7	40.93	5.830	SF
7,800.0	6,862.0	6,847.6	6,846.5	27.2	15.3	89.63	-601.8	-192.9	263.6	221.1	42.55	6.196	
7,900.0	6,862.0	6,844.3	6,843.2	28.9	15.3	88.84	-601.9	-192.9	319.4	275.2	44.25	7.218	
8,000.0	6,862.0	6,841.0	6,839.9	30.8	15.3	88.06	-602.0	-192.9	393.1	347.1	46.04	8.539	
8,100.0	6,862.0	6,837.7	6,836.6	32.6	15.3	87.27	-602.1	-193.0	476.5	428.6	47.88	9.951	
8,200.0	6,862.0	6,834.5	6,833.4	34.6	15.3	86.48	-602.2	-193.0	565.2	515.5	49.77	11.356	
8,300.0	6,862.0	6,831.2	6,830.1	36.6	15.3	85.70	-602.4	-193.0	657.2	605.5	51.70	12.711	
8,400.0	6,862.0	6,827.9	6,826.8	38.6	15.3	84.92	-602.5	-193.1	751.2	697.6	53.66	13.999	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W - Cross #32-11 (D&A) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 527-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
11,900.0	6,862.0	6,718.5	6,705.9	117.4	17.1	-62.18	-5,432.2	379.4	725.7	604.1	121.58	5.969	
12,000.0	6,862.0	6,745.9	6,731.0	119.7	17.2	-65.33	-5,442.1	375.0	642.1	515.6	126.51	5.076	
12,100.0	6,862.0	6,794.1	6,774.6	122.0	17.3	-71.29	-5,460.1	364.9	560.9	427.6	133.22	4.210	
12,200.0	6,862.0	6,825.7	6,802.7	124.4	17.3	-75.57	-5,472.6	357.7	484.1	346.0	138.01	3.507	
12,300.0	6,862.0	6,869.0	6,840.7	126.7	17.4	-81.93	-5,490.5	347.2	413.6	270.7	142.95	2.893	
12,400.0	6,862.0	6,915.7	6,881.7	129.0	17.5	-89.56	-5,509.5	335.6	352.4	205.9	146.49	2.405	
12,500.0	6,862.0	6,960.5	6,921.5	131.3	17.6	-97.57	-5,526.7	323.8	305.6	157.9	147.70	2.069	
12,600.0	6,862.0	6,998.1	6,955.1	133.7	17.6	-104.66	-5,540.0	313.8	282.3	135.4	146.91	1.921	
12,628.6	6,862.0	7,008.2	6,964.2	134.3	17.7	-106.59	-5,543.5	311.1	281.0	134.6	146.38	1.920	CC, ES, SF
12,700.0	6,862.0	7,032.2	6,985.9	136.0	17.7	-111.18	-5,551.6	304.6	288.9	144.3	144.59	1.998	
12,800.0	6,862.0	7,065.0	7,015.5	138.3	17.8	-117.37	-5,562.6	295.9	324.1	183.2	140.93	2.300	
12,900.0	6,862.0	7,065.0	7,015.5	140.6	17.8	-117.37	-5,562.6	295.9	381.4	238.4	143.04	2.667	
13,000.0	6,862.0	7,065.0	7,015.5	143.0	17.8	-117.37	-5,562.6	295.9	453.8	308.7	145.15	3.127	
13,100.0	6,862.0	7,065.0	7,015.5	145.3	17.8	-117.37	-5,562.6	295.9	535.2	387.9	147.26	3.634	
13,200.0	6,862.0	7,065.0	7,015.5	147.6	17.8	-117.37	-5,562.6	295.9	622.0	472.6	149.37	4.164	
13,300.0	6,862.0	7,065.0	7,015.5	150.0	17.8	-117.37	-5,562.6	295.9	712.3	560.8	151.48	4.702	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,200.0	6,862.0	6,908.2	6,907.6	147.6	17.2	-92.73	-6,751.9	410.2	736.5	571.9	164.63	4.474	
13,300.0	6,862.0	6,905.7	6,905.1	150.0	17.2	-92.35	-6,752.0	410.2	651.9	484.9	167.00	3.904	
13,400.0	6,862.0	6,903.3	6,902.7	152.3	17.2	-91.97	-6,752.1	410.2	572.4	403.0	169.37	3.379	
13,500.0	6,862.0	6,900.8	6,900.2	154.6	17.2	-91.59	-6,752.1	410.2	500.2	328.5	171.73	2.913	
13,600.0	6,862.0	6,898.4	6,897.8	157.0	17.2	-91.21	-6,752.2	410.2	439.0	264.9	174.09	2.522	
13,700.0	6,862.0	6,895.9	6,895.3	159.3	17.2	-90.83	-6,752.2	410.3	394.1	217.6	176.44	2.233	
13,800.0	6,862.0	6,893.5	6,892.9	161.6	17.2	-90.44	-6,752.3	410.3	371.2	192.5	178.78	2.077	
13,837.4	6,862.0	6,892.5	6,891.9	162.5	17.2	-90.30	-6,752.3	410.3	369.4	189.7	179.66	2.056	CC, ES, SF
13,900.0	6,862.0	6,891.0	6,890.4	164.0	17.2	-90.06	-6,752.4	410.3	374.6	193.5	181.12	2.068	
14,000.0	6,862.0	6,888.5	6,888.0	166.3	17.2	-89.68	-6,752.4	410.3	403.6	220.1	183.45	2.200	
14,100.0	6,862.0	6,886.1	6,885.5	168.6	17.2	-89.30	-6,752.5	410.3	453.2	267.4	185.78	2.439	
14,145.2	6,862.0	6,885.0	6,884.4	169.7	17.2	-89.13	-6,752.5	410.3	480.8	294.0	186.83	2.573	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	103.38	-77.2	324.6	334.7				
100.0	100.0	75.3	75.3	0.1	0.1	103.40	-77.3	324.4	333.5	333.2	0.26	1,281.682	
186.7	186.7	160.7	160.7	0.4	0.3	103.44	-77.4	324.1	333.2	332.6	0.66	505.450	CC
200.0	200.0	173.6	173.6	0.4	0.3	103.44	-77.5	324.1	333.2	332.5	0.72	461.875	
300.0	300.0	273.2	273.2	0.7	0.5	103.45	-77.6	324.4	333.5	332.3	1.22	273.552	
400.0	400.0	370.8	370.8	1.0	0.8	103.50	-78.0	324.8	334.0	332.2	1.77	188.580	
500.0	500.0	469.5	469.5	1.2	1.1	103.64	-79.0	325.8	335.3	332.9	2.35	142.507	
600.0	600.0	568.1	568.1	1.5	1.4	103.75	-80.1	327.1	336.8	333.8	2.94	114.581	
700.0	700.0	666.8	666.8	1.8	1.7	103.86	-81.1	328.8	338.8	335.2	3.52	96.320	
800.0	800.0	765.1	765.0	2.1	2.0	103.81	-81.4	331.1	341.1	337.0	4.08	83.526	
900.0	900.0	864.2	864.1	2.3	2.3	103.76	-81.8	333.9	343.9	339.3	4.66	73.835	
1,000.0	1,000.0	965.4	965.3	2.6	2.6	103.73	-82.3	336.7	346.7	341.5	5.25	66.100	
1,100.0	1,100.0	1,065.4	1,065.2	2.9	2.9	103.69	-82.6	339.1	349.1	343.3	5.83	59.852	
1,200.0	1,200.0	1,166.1	1,165.9	3.2	3.3	103.71	-83.3	341.5	351.6	345.2	6.43	54.690	
1,300.0	1,300.0	1,265.6	1,265.4	3.4	3.6	103.73	-84.0	343.7	353.9	346.9	7.02	50.383	
1,400.0	1,400.0	1,367.2	1,367.0	3.7	3.9	103.73	-84.6	346.0	356.3	348.7	7.62	46.727	
1,500.0	1,500.0	1,467.2	1,466.9	4.0	4.2	103.71	-84.9	347.8	358.1	349.9	8.22	43.569	
1,600.0	1,600.0	1,566.7	1,566.4	4.3	4.6	103.71	-85.4	349.9	360.2	351.4	8.81	40.864	
1,700.0	1,700.0	1,667.0	1,666.6	4.5	4.9	103.70	-85.8	351.9	362.3	352.9	9.41	38.502	
1,800.0	1,800.0	1,766.4	1,766.0	4.8	5.2	103.61	-85.7	354.0	364.3	354.4	9.99	36.457	
1,900.0	1,900.0	1,866.3	1,865.9	5.1	5.5	103.50	-85.5	356.4	366.6	356.0	10.58	34.652	
2,000.0	2,000.0	1,965.6	1,965.2	5.4	5.8	103.39	-85.4	358.7	368.8	357.7	11.16	33.040	
2,100.0	2,100.0	2,066.5	2,066.1	5.6	6.1	103.24	-85.0	361.2	371.2	359.4	11.75	31.601	
2,200.0	2,200.0	2,165.9	2,165.4	5.9	6.4	103.06	-84.3	363.5	373.3	361.0	12.32	30.295	
2,300.0	2,300.0	2,264.6	2,264.1	6.2	6.7	102.89	-83.8	366.2	375.8	362.9	12.90	29.132	
2,400.0	2,400.0	2,363.9	2,363.3	6.5	7.0	102.71	-83.3	369.1	378.5	365.0	13.48	28.072	
2,500.0	2,500.0	2,465.2	2,464.6	6.7	7.3	102.55	-82.8	372.0	381.2	367.2	14.07	27.088	
2,600.0	2,600.0	2,565.2	2,564.6	7.0	7.7	97.35	-82.2	374.5	383.7	369.1	14.66	26.178	
2,700.0	2,699.9	2,666.8	2,666.1	7.3	8.0	97.74	-81.7	377.1	386.6	371.4	15.24	25.361	
2,800.0	2,799.7	2,769.7	2,769.1	7.6	8.3	98.54	-81.1	379.0	389.2	373.3	15.83	24.577	
2,900.0	2,899.3	2,870.1	2,869.4	7.9	8.6	99.77	-80.9	380.0	391.6	375.2	16.43	23.841	
3,000.0	2,998.6	2,970.9	2,970.3	8.1	8.9	101.38	-80.9	380.9	394.6	377.6	17.01	23.198	
3,100.0	3,097.5	3,069.7	3,069.0	8.4	9.2	103.23	-80.4	381.6	398.3	380.7	17.58	22.651	
3,162.8	3,159.5	3,131.7	3,131.0	8.6	9.4	104.54	-80.0	382.2	401.2	383.3	17.94	22.361	
3,200.0	3,196.1	3,168.8	3,168.1	8.7	9.5	105.37	-79.8	382.5	403.1	385.0	18.16	22.197	
3,300.0	3,294.6	3,268.3	3,267.6	9.1	9.7	107.58	-79.1	383.2	408.4	389.7	18.74	21.792	
3,400.0	3,393.1	3,367.7	3,367.0	9.4	10.0	109.75	-78.5	383.6	414.2	394.9	19.31	21.446	
3,500.0	3,491.6	3,465.7	3,465.0	9.8	10.2	111.80	-77.7	384.0	420.4	400.5	19.90	21.129	
3,600.0	3,590.1	3,563.1	3,562.3	10.1	10.5	113.90	-77.8	384.3	427.5	407.0	20.49	20.868	
3,700.0	3,688.6	3,660.2	3,659.4	10.5	10.7	116.00	-78.6	384.5	435.4	414.4	21.04	20.695	
3,800.0	3,787.1	3,757.2	3,756.5	10.9	10.9	118.06	-79.7	384.8	444.3	422.7	21.58	20.589	
3,900.0	3,885.6	3,855.1	3,854.4	11.3	11.1	120.08	-81.2	385.1	453.9	431.8	22.12	20.521	
4,000.0	3,984.1	3,958.1	3,957.3	11.6	11.3	122.07	-82.2	385.4	463.8	441.1	22.67	20.459	
4,100.0	4,082.6	4,066.3	4,065.5	12.0	11.5	123.74	-80.1	386.0	472.5	449.2	23.21	20.354	
4,200.0	4,181.1	4,174.9	4,174.0	12.4	11.7	125.19	-75.4	385.8	479.4	455.7	23.72	20.210	
4,300.0	4,279.6	4,281.3	4,280.2	12.9	11.8	126.48	-69.0	384.7	484.8	460.6	24.21	20.028	
4,400.0	4,378.1	4,381.8	4,380.5	13.3	11.9	127.72	-62.6	382.7	489.5	464.9	24.67	19.843	
4,500.0	4,476.6	4,478.0	4,476.5	13.7	12.0	128.96	-57.1	380.4	494.7	469.6	25.12	19.691	
4,600.0	4,575.1	4,570.2	4,568.6	14.1	12.1	130.18	-52.9	378.6	501.2	475.6	25.57	19.596	
4,700.0	4,673.6	4,664.1	4,662.4	14.5	12.3	131.44	-49.8	377.4	509.2	483.2	26.03	19.560	
4,800.0	4,772.1	4,759.3	4,757.6	15.0	12.4	132.69	-47.3	376.5	518.3	491.8	26.50	19.556	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,870.6	4,852.4	4,850.7	15.4	12.6	133.89	-45.5	376.0	528.5	501.5	27.00	19.574	
5,000.0	4,969.1	4,947.3	4,945.6	15.8	12.8	135.08	-44.6	376.2	540.0	512.5	27.54	19.611	
5,100.0	5,067.6	5,042.8	5,041.1	16.3	13.0	136.20	-43.8	376.7	552.1	524.0	28.12	19.638	
5,200.0	5,166.1	5,135.0	5,133.3	16.7	13.3	137.22	-43.6	377.9	565.5	536.7	28.71	19.693	
5,300.0	5,264.6	5,231.0	5,229.3	17.1	13.6	138.19	-43.9	380.0	579.9	550.6	29.34	19.768	
5,400.0	5,363.1	5,332.8	5,331.0	17.6	13.9	139.17	-44.0	382.2	594.2	564.2	29.97	19.824	
5,500.0	5,461.6	5,429.4	5,427.6	18.0	14.2	140.04	-43.8	384.2	608.4	577.8	30.60	19.886	
5,544.5	5,505.4	5,470.0	5,468.2	18.2	14.3	140.41	-43.9	385.1	615.1	584.2	30.86	19.930	
5,600.0	5,560.2	5,522.9	5,521.0	18.4	14.5	140.96	-44.5	386.2	623.3	592.0	31.21	19.972	
5,700.0	5,659.2	5,622.9	5,621.1	18.8	14.8	141.81	-45.5	388.1	635.9	604.1	31.77	20.012	
5,800.0	5,758.7	5,720.1	5,718.2	19.0	15.1	142.38	-46.7	390.2	646.0	613.7	32.31	19.995	
5,900.0	5,858.5	5,821.6	5,819.7	19.3	15.3	142.75	-48.0	392.1	653.5	620.6	32.82	19.909	
6,000.0	5,958.4	5,924.4	5,922.5	19.5	15.6	142.88	-48.9	393.9	657.7	624.3	33.32	19.738	
6,041.6	6,000.0	5,965.2	5,963.3	19.6	15.8	148.05	-49.2	394.6	658.6	625.0	33.52	19.650	
6,100.0	6,058.4	6,024.1	6,022.2	19.7	15.9	148.01	-49.8	395.6	659.5	625.7	33.82	19.501	
6,139.9	6,098.3	6,066.0	6,064.0	19.8	16.1	147.98	-50.1	396.2	660.1	626.0	34.04	19.390	
6,150.0	6,108.4	6,076.5	6,074.6	19.8	16.1	-32.06	-50.2	396.3	660.2	626.1	34.08	19.371	
6,200.0	6,158.4	6,127.4	6,125.4	19.9	16.2	-32.26	-50.5	396.9	658.7	624.5	34.21	19.259	
6,250.0	6,208.0	6,176.7	6,174.7	19.9	16.4	-32.73	-50.7	397.6	654.6	620.4	34.23	19.123	
6,300.0	6,257.3	6,225.5	6,223.6	19.9	16.5	-33.47	-50.9	398.3	647.8	613.6	34.16	18.962	
6,350.0	6,305.8	6,273.8	6,271.8	19.9	16.7	-34.49	-51.2	398.9	638.3	604.3	34.01	18.769	
6,400.0	6,353.4	6,321.9	6,319.9	19.8	16.8	-35.83	-51.6	399.4	626.4	592.6	33.80	18.531	
6,450.0	6,400.0	6,369.6	6,367.7	19.7	17.0	-37.53	-51.9	399.9	611.9	578.4	33.56	18.232	
6,500.0	6,445.2	6,415.1	6,413.1	19.6	17.1	-39.60	-52.1	400.4	595.2	561.8	33.32	17.860	
6,550.0	6,489.0	6,457.3	6,455.4	19.5	17.2	-42.02	-52.3	400.9	576.5	543.4	33.12	17.407	
6,600.0	6,531.1	6,498.1	6,496.1	19.4	17.3	-44.87	-52.6	401.5	556.1	523.1	33.00	16.852	
6,650.0	6,571.3	6,537.7	6,535.7	19.3	17.5	-48.19	-53.0	402.1	534.3	501.3	33.01	16.185	
6,700.0	6,609.5	6,575.3	6,573.3	19.2	17.6	-51.98	-53.4	402.7	511.5	478.3	33.20	15.406	
6,750.0	6,645.6	6,611.2	6,609.2	19.0	17.7	-56.22	-53.9	403.3	488.0	454.4	33.58	14.535	
6,800.0	6,679.2	6,645.3	6,643.3	19.0	17.8	-60.88	-54.3	403.8	464.4	430.3	34.13	13.607	
6,850.0	6,710.4	6,676.9	6,674.9	18.9	17.9	-65.78	-54.7	404.4	441.2	406.4	34.79	12.681	
6,900.0	6,739.0	6,705.6	6,703.5	18.9	17.9	-70.71	-55.1	404.9	419.3	383.8	35.49	11.815	
6,950.0	6,764.8	6,730.4	6,728.4	18.9	18.0	-75.36	-55.4	405.4	399.5	363.4	36.11	11.063	
7,000.0	6,787.8	6,752.7	6,750.7	19.0	18.1	-79.64	-55.7	405.9	382.9	346.3	36.65	10.448	
7,050.0	6,807.8	6,772.3	6,770.2	19.1	18.1	-83.37	-56.0	406.5	370.5	333.4	37.09	9.991	
7,100.0	6,824.8	6,789.0	6,787.0	19.3	18.2	-86.39	-56.3	407.0	363.3	325.8	37.45	9.701	
7,136.1	6,835.1	6,800.0	6,797.9	19.5	18.2	-88.17	-56.5	407.3	361.7	324.0	37.69	9.596	ES
7,150.0	6,838.6	6,803.0	6,800.9	19.6	18.2	-88.61	-56.5	407.4	361.9	324.2	37.77	9.582	SF
7,200.0	6,849.3	6,814.2	6,812.1	19.9	18.3	-89.96	-56.7	407.8	366.9	328.8	38.11	9.628	
7,250.0	6,856.8	6,822.2	6,820.1	20.2	18.3	-90.33	-56.8	408.1	378.2	339.7	38.50	9.825	
7,300.0	6,861.0	6,827.1	6,825.0	20.7	18.3	-89.71	-56.9	408.2	395.5	356.5	38.94	10.157	
7,339.5	6,862.0	6,828.7	6,826.6	21.0	18.3	-88.51	-56.9	408.3	412.9	373.5	39.31	10.502	
7,339.6	6,862.0	6,828.7	6,826.6	21.0	18.3	-88.51	-56.9	408.3	412.9	373.6	39.31	10.503	
7,340.4	6,862.0	6,828.7	6,826.6	21.0	18.3	-88.51	-56.9	408.3	413.3	374.0	39.32	10.511	
7,400.0	6,862.0	6,829.6	6,827.5	21.5	18.3	-88.66	-57.0	408.3	445.0	405.2	39.82	11.174	
7,500.0	6,862.0	6,831.1	6,829.0	22.7	18.3	-88.89	-57.0	408.4	509.5	468.5	41.02	12.421	
7,600.0	6,862.0	6,832.6	6,830.5	24.1	18.3	-89.13	-57.0	408.4	584.1	541.7	42.39	13.780	
7,700.0	6,862.0	6,834.1	6,832.0	25.6	18.3	-89.36	-57.0	408.5	665.4	621.5	43.90	15.158	
7,800.0	6,862.0	6,835.5	6,833.4	27.2	18.3	-89.60	-57.0	408.5	751.3	705.7	45.53	16.500	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	98.40	-49.9	338.0	341.8				
100.0	100.0	89.3	89.3	0.1	0.1	98.40	-49.9	337.9	341.6	341.3	0.28	1,206.884	
200.0	200.0	189.6	189.6	0.4	0.3	98.42	-50.0	337.8	341.5	340.7	0.72	473.312	
300.0	300.0	289.9	289.9	0.7	0.5	98.44	-50.1	337.5	341.2	340.1	1.16	294.216	
400.0	400.0	390.2	390.2	1.0	0.6	98.47	-50.2	337.2	340.9	339.3	1.60	213.314	
500.0	500.0	490.5	490.5	1.2	0.8	98.51	-50.4	336.8	340.5	338.5	2.04	167.120	
600.0	600.0	589.4	589.4	1.5	1.0	98.47	-50.1	336.5	340.2	337.7	2.51	135.410	
639.0	639.0	628.0	628.0	1.6	1.1	98.41	-49.8	336.5	340.2	337.5	2.70	126.105	
700.0	700.0	687.4	687.4	1.8	1.2	98.29	-49.1	336.8	340.3	337.4	2.95	115.183	
800.0	800.0	784.1	784.1	2.1	1.3	98.05	-47.8	337.9	341.3	337.9	3.35	101.738	
900.0	900.0	882.6	882.5	2.3	1.5	97.73	-46.1	339.8	343.0	339.2	3.81	90.043	
1,000.0	1,000.0	981.6	981.5	2.6	1.7	97.22	-43.3	342.2	345.0	340.8	4.29	80.415	
1,100.0	1,100.0	1,081.2	1,081.0	2.9	1.9	96.52	-39.4	345.0	347.3	342.5	4.83	71.968	
1,200.0	1,200.0	1,182.3	1,181.9	3.2	2.2	95.64	-34.4	347.8	349.5	344.1	5.39	64.897	
1,300.0	1,300.0	1,283.5	1,282.9	3.4	2.5	94.69	-28.7	350.1	351.3	345.4	5.96	58.956	
1,400.0	1,400.0	1,378.4	1,377.5	3.7	2.8	93.66	-22.6	352.9	353.8	347.3	6.52	54.228	
1,500.0	1,500.0	1,473.9	1,472.7	4.0	3.1	92.46	-15.3	357.1	357.8	350.7	7.10	50.432	
1,600.0	1,600.0	1,577.0	1,575.4	4.3	3.4	91.05	-6.6	361.7	362.0	354.3	7.70	47.041	
1,700.0	1,700.0	1,682.6	1,680.4	4.5	3.8	89.50	3.2	365.2	365.3	357.0	8.31	43.960	
1,800.0	1,800.0	1,792.5	1,789.5	4.8	4.1	87.45	16.3	365.9	366.3	357.3	8.94	40.967	
1,900.0	1,900.0	1,900.3	1,896.0	5.1	4.5	84.85	32.8	363.7	365.2	355.7	9.57	38.180	
2,000.0	2,000.0	2,010.8	2,005.0	5.4	4.8	81.98	50.5	358.3	362.2	352.0	10.20	35.514	
2,100.0	2,100.0	2,121.4	2,113.3	5.6	5.2	78.57	70.5	348.6	356.5	345.7	10.83	32.920	
2,200.0	2,200.0	2,223.7	2,213.2	5.9	5.5	75.20	89.1	337.2	349.6	338.2	11.43	30.577	
2,300.0	2,300.0	2,322.4	2,309.6	6.2	5.9	71.86	106.7	325.5	343.2	331.1	12.03	28.529	
2,400.0	2,400.0	2,426.1	2,411.0	6.5	6.2	68.27	124.5	312.4	337.0	324.3	12.64	26.655	
2,500.0	2,500.0	2,532.4	2,514.8	6.7	6.5	64.55	141.3	297.0	329.9	316.6	13.26	24.882	
2,600.0	2,600.0	2,640.4	2,619.8	7.0	6.9	55.60	157.6	278.2	320.5	306.6	13.89	23.066	
2,700.0	2,699.9	2,745.3	2,721.3	7.3	7.2	51.86	173.1	256.5	307.8	293.3	14.50	21.225	
2,800.0	2,799.7	2,843.3	2,815.7	7.6	7.5	48.23	187.6	234.5	293.5	278.4	15.09	19.449	
2,900.0	2,899.3	2,943.1	2,912.3	7.9	7.9	44.93	200.8	213.2	278.6	262.9	15.68	17.765	
3,000.0	2,998.6	3,041.1	3,007.0	8.1	8.2	41.62	213.3	191.3	261.8	245.5	16.26	16.094	
3,100.0	3,097.5	3,136.9	3,099.6	8.4	8.5	38.31	225.7	170.2	244.3	227.5	16.84	14.511	
3,162.8	3,159.5	3,196.7	3,157.7	8.6	8.7	36.40	233.1	157.8	233.2	216.0	17.19	13.560	
3,200.0	3,196.1	3,232.1	3,192.1	8.7	8.9	35.29	237.3	151.0	226.6	209.2	17.42	13.012	
3,300.0	3,294.6	3,329.0	3,287.0	9.1	9.2	32.50	248.0	134.3	210.0	192.0	18.02	11.656	
3,400.0	3,393.1	3,426.9	3,383.5	9.4	9.5	30.16	257.0	120.0	194.1	175.5	18.62	10.424	
3,500.0	3,491.6	3,523.4	3,478.5	9.8	9.8	27.53	266.2	106.4	179.0	159.8	19.22	9.316	
3,600.0	3,590.1	3,621.7	3,574.7	10.1	10.2	23.27	278.0	90.2	165.4	145.6	19.81	8.350	
3,700.0	3,688.6	3,721.1	3,671.6	10.5	10.5	17.38	290.3	71.7	152.5	132.1	20.38	7.482	
3,800.0	3,787.1	3,815.8	3,763.4	10.9	10.9	10.02	303.0	52.2	141.8	120.9	20.90	6.784	
3,900.0	3,885.6	3,910.4	3,854.4	11.3	11.3	0.89	318.0	31.0	136.4	115.0	21.40	6.376	
3,969.8	3,954.3	3,978.9	3,920.0	11.5	11.5	-6.11	329.5	15.4	135.7	113.9	21.75	6.238	CC
4,000.0	3,984.1	4,008.8	3,948.8	11.6	11.6	-9.10	334.4	8.8	135.8	113.9	21.91	6.198	ES
4,100.0	4,082.6	4,107.7	4,044.2	12.0	12.0	-18.52	349.7	-12.3	138.0	115.6	22.47	6.144	SF
4,200.0	4,181.1	4,205.9	4,139.2	12.4	12.4	-27.14	364.4	-32.4	143.1	120.0	23.09	6.198	
4,300.0	4,279.6	4,308.0	4,238.4	12.9	12.8	-35.55	377.8	-52.7	149.3	125.5	23.79	6.276	
4,400.0	4,378.1	4,405.5	4,333.4	13.3	13.2	-42.87	389.4	-71.5	157.0	132.4	24.53	6.399	
4,500.0	4,476.6	4,502.3	4,427.6	13.7	13.5	-49.01	402.1	-89.6	167.4	142.1	25.31	6.614	
4,600.0	4,575.1	4,601.7	4,524.4	14.1	13.9	-54.43	415.2	-107.9	179.6	153.5	26.14	6.871	
4,700.0	4,673.6	4,701.5	4,621.9	14.5	14.3	-59.19	427.6	-125.2	191.6	164.7	26.98	7.104	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,800.0	4,772.1	4,797.4	4,715.4	15.0	14.7	-63.18	439.9	-142.4	205.7	177.9	27.81	7.396	
4,900.0	4,870.6	4,897.0	4,812.7	15.4	15.0	-66.73	452.7	-159.9	220.3	191.6	28.66	7.684	
5,000.0	4,969.1	4,993.1	4,906.4	15.8	15.4	-69.72	465.2	-176.8	235.6	206.1	29.50	7.988	
5,100.0	5,067.6	5,088.6	4,999.4	16.3	15.8	-72.35	477.9	-194.8	252.8	222.5	30.33	8.336	
5,200.0	5,166.1	5,189.2	5,097.2	16.7	16.2	-74.86	490.9	-213.8	270.6	239.4	31.18	8.678	
5,300.0	5,264.6	5,292.8	5,198.6	17.1	16.5	-77.34	502.8	-232.1	287.0	254.9	32.05	8.955	
5,400.0	5,363.1	5,396.9	5,300.8	17.6	16.9	-79.85	512.7	-248.9	301.9	269.0	32.91	9.174	
5,500.0	5,461.6	5,497.5	5,400.0	18.0	17.3	-82.23	520.9	-263.9	315.8	282.0	33.76	9.354	
5,544.5	5,505.4	5,541.6	5,443.4	18.2	17.4	-83.18	524.6	-270.3	322.0	287.9	34.13	9.434	
5,600.0	5,560.2	5,596.8	5,497.8	18.4	17.6	-84.37	529.3	-278.2	329.8	295.3	34.56	9.543	
5,700.0	5,659.2	5,705.2	5,604.9	18.8	18.0	-86.08	538.1	-292.6	343.2	307.9	35.29	9.726	
5,800.0	5,758.7	5,814.9	5,713.8	19.0	18.4	-87.27	545.0	-303.9	353.8	317.8	35.96	9.838	
5,900.0	5,858.5	5,923.3	5,821.8	19.3	18.7	-87.99	549.9	-312.3	361.8	325.2	36.57	9.895	
6,000.0	5,958.4	6,029.9	5,928.1	19.5	19.0	-88.24	553.3	-318.4	367.8	330.7	37.11	9.911	
6,041.6	6,000.0	6,073.3	5,971.5	19.6	19.2	-83.04	554.3	-320.5	369.8	332.5	37.31	9.912	
6,100.0	6,058.4	6,134.9	6,033.0	19.7	19.3	-82.94	555.2	-323.1	372.4	334.8	37.60	9.905	
6,139.9	6,098.3	6,177.1	6,075.2	19.8	19.4	-82.91	555.6	-324.5	373.8	336.0	37.79	9.890	
6,150.0	6,108.4	6,187.8	6,085.9	19.8	19.5	97.04	555.7	-324.9	374.1	336.3	37.84	9.888	
6,200.0	6,158.4	6,240.7	6,138.7	19.9	19.6	97.28	555.8	-326.3	375.8	337.8	38.01	9.885	
6,250.0	6,208.0	6,292.8	6,190.9	19.9	19.7	97.97	555.5	-327.4	377.5	339.4	38.07	9.915	
6,300.0	6,257.3	6,344.6	6,242.6	19.9	19.8	99.09	555.0	-328.1	379.5	341.4	38.06	9.970	
6,350.0	6,305.8	6,395.8	6,293.8	19.9	19.8	100.60	554.2	-328.6	381.9	343.9	37.98	10.055	
6,400.0	6,353.4	6,445.9	6,344.0	19.8	19.9	102.44	553.1	-328.8	385.0	347.3	37.77	10.194	
6,450.0	6,400.0	6,495.1	6,393.1	19.7	19.9	104.56	551.9	-328.7	389.2	351.7	37.47	10.388	
6,500.0	6,445.2	6,543.1	6,441.0	19.6	19.9	106.89	550.6	-328.4	394.8	357.7	37.07	10.649	
6,550.0	6,489.0	6,589.0	6,486.9	19.5	19.9	109.28	549.3	-327.9	402.1	365.5	36.58	10.993	
6,600.0	6,531.1	6,632.9	6,530.9	19.4	19.9	111.65	547.8	-327.4	411.7	375.7	36.00	11.435	
6,650.0	6,571.3	6,675.2	6,573.1	19.3	19.9	113.93	546.4	-326.8	423.8	388.4	35.35	11.989	
6,700.0	6,609.5	6,715.7	6,613.6	19.2	19.9	116.05	544.9	-326.2	438.7	404.1	34.64	12.664	
6,750.0	6,645.6	6,754.9	6,652.7	19.0	19.9	117.99	543.3	-325.5	456.6	422.7	33.91	13.466	
6,800.0	6,679.2	6,791.9	6,689.7	19.0	19.9	119.64	541.7	-324.7	477.5	444.3	33.18	14.390	
6,850.0	6,710.4	6,826.7	6,724.4	18.9	19.9	120.94	540.2	-323.8	501.4	468.9	32.52	15.420	
6,900.0	6,739.0	6,858.9	6,756.6	18.9	19.9	121.83	538.7	-323.0	528.4	496.5	31.97	16.527	
6,950.0	6,764.8	6,888.9	6,786.5	18.9	19.9	122.29	537.2	-322.1	558.3	526.7	31.59	17.671	
7,000.0	6,787.8	6,916.6	6,814.2	19.0	19.9	122.28	535.7	-321.2	590.9	559.5	31.44	18.796	
7,050.0	6,807.8	6,941.5	6,839.0	19.1	19.9	121.70	534.3	-320.4	626.0	594.4	31.57	19.828	
7,100.0	6,824.8	6,963.4	6,860.9	19.3	19.9	120.44	533.0	-319.6	663.4	631.3	32.05	20.699	
7,150.0	6,838.6	6,982.2	6,879.7	19.6	19.9	118.40	531.8	-318.9	702.8	669.9	32.90	21.361	
7,200.0	6,849.3	6,997.8	6,895.2	19.9	19.9	115.42	530.9	-318.3	744.0	709.8	34.13	21.801	
7,250.0	6,856.8	7,009.9	6,907.3	20.2	19.9	111.35	530.0	-317.8	786.7	751.0	35.68	22.051	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	103.58	-86.3	357.5	367.9				
100.0	100.0	89.4	89.4	0.1	0.1	103.60	-86.4	357.4	367.7	367.4	0.26	1,403.050	
200.0	200.0	189.8	189.8	0.4	0.3	103.65	-86.8	357.2	367.5	366.9	0.68	542.969	
300.0	300.0	290.2	290.2	0.7	0.4	103.75	-87.3	356.7	367.3	366.2	1.09	336.405	
400.0	400.0	390.6	390.6	1.0	0.5	103.90	-88.1	356.2	366.9	365.4	1.51	243.522	
500.0	500.0	491.1	491.1	1.2	0.7	104.08	-89.1	355.4	366.4	364.5	1.93	189.384	
600.0	600.0	592.9	592.9	1.5	1.0	104.41	-91.0	354.1	365.6	363.1	2.50	146.425	
700.0	700.0	692.3	692.2	1.8	1.3	104.90	-93.7	352.2	364.5	361.4	3.05	119.583	
800.0	800.0	789.8	789.6	2.1	1.5	105.48	-97.1	350.7	363.9	360.4	3.59	101.374	
837.4	837.4	826.6	826.4	2.2	1.6	105.72	-98.6	350.3	363.9	360.1	3.80	95.835	CC
900.0	900.0	888.4	888.1	2.3	1.8	106.19	-101.5	349.6	364.0	359.9	4.15	87.785	
1,000.0	1,000.0	985.8	985.3	2.6	2.1	107.08	-107.0	348.4	364.5	359.8	4.70	77.584	ES
1,100.0	1,100.0	1,081.0	1,080.4	2.9	2.4	107.92	-112.7	348.3	366.2	361.0	5.24	69.883	
1,200.0	1,200.0	1,176.5	1,175.7	3.2	2.6	108.74	-118.5	349.4	369.2	363.4	5.79	63.782	
1,300.0	1,300.0	1,271.9	1,270.9	3.4	2.9	109.68	-125.6	351.2	373.4	367.1	6.34	58.909	
1,400.0	1,400.0	1,371.6	1,370.2	3.7	3.2	110.72	-133.7	353.4	378.4	371.4	6.93	54.618	
1,500.0	1,500.0	1,471.8	1,470.1	4.0	3.5	111.76	-141.9	355.6	383.3	375.8	7.50	51.107	
1,600.0	1,600.0	1,572.8	1,570.7	4.3	3.8	112.72	-149.8	357.7	388.2	380.1	8.06	48.178	
1,700.0	1,700.0	1,675.5	1,673.1	4.5	4.1	113.63	-157.2	359.4	392.6	384.0	8.60	45.657	
1,800.0	1,800.0	1,770.2	1,767.5	4.8	4.4	114.61	-165.2	360.7	397.3	388.1	9.15	43.394	
1,900.0	1,900.0	1,859.9	1,856.7	5.1	4.7	115.62	-174.1	363.1	403.9	394.2	9.71	41.609	
2,000.0	2,000.0	1,954.4	1,950.6	5.4	5.0	116.61	-184.0	367.3	412.7	402.4	10.28	40.146	
2,100.0	2,100.0	2,048.1	2,043.5	5.6	5.3	117.73	-195.5	372.0	422.7	411.8	10.87	38.888	
2,200.0	2,200.0	2,132.9	2,127.2	5.9	5.7	118.84	-207.7	377.2	435.1	423.6	11.44	38.027	
2,300.0	2,300.0	2,221.2	2,214.0	6.2	6.1	119.99	-222.1	384.8	450.6	438.6	12.03	37.473	
2,400.0	2,400.0	2,309.6	2,300.6	6.5	6.4	121.02	-237.0	394.2	468.4	455.8	12.60	37.169	
2,500.0	2,500.0	2,395.1	2,384.1	6.7	6.8	121.81	-251.4	405.4	488.5	475.3	13.16	37.132	SF
2,600.0	2,600.0	2,482.0	2,468.6	7.0	7.2	116.97	-265.8	419.7	511.7	498.1	13.60	37.627	
2,700.0	2,699.9	2,572.9	2,556.8	7.3	7.7	117.39	-280.7	436.2	537.6	523.5	14.14	38.027	
2,800.0	2,799.7	2,662.9	2,643.9	7.6	8.2	118.01	-296.5	452.6	565.6	550.9	14.67	38.557	
2,900.0	2,899.3	2,753.7	2,731.4	7.9	8.7	118.69	-312.7	470.4	596.1	580.9	15.19	39.234	
3,000.0	2,998.6	2,857.4	2,831.5	8.1	9.2	119.62	-330.7	490.4	627.6	611.8	15.72	39.913	
3,100.0	3,097.5	2,956.7	2,927.9	8.4	9.7	120.55	-346.6	508.3	658.8	642.5	16.24	40.569	
3,162.8	3,159.5	3,013.3	2,982.8	8.6	10.0	121.07	-355.6	518.7	679.3	662.8	16.55	41.037	
3,200.0	3,196.1	3,050.7	3,019.1	8.7	10.2	121.60	-361.6	525.5	691.7	674.9	16.75	41.283	
3,300.0	3,294.6	3,156.4	3,121.9	9.1	10.7	122.99	-377.6	544.2	724.2	706.9	17.30	41.861	
3,400.0	3,393.1	3,259.6	3,222.7	9.4	11.2	124.18	-391.8	561.4	755.3	737.5	17.84	42.332	
3,500.0	3,491.6	3,370.4	3,331.1	9.8	11.7	125.32	-405.7	579.0	785.4	767.0	18.41	42.655	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**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 Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,700.0	6,862.0	6,857.2	6,856.6	25.6	168.8	-91.56	-1,289.8	434.0	779.0	584.9	194.12	4.013	
7,800.0	6,862.0	6,855.2	6,854.6	27.2	168.8	-91.26	-1,289.8	434.0	694.2	498.4	195.75	3.546	
7,900.0	6,862.0	6,853.1	6,852.5	28.9	168.8	-90.96	-1,289.9	433.9	613.9	416.4	197.48	3.109	
8,000.0	6,862.0	6,851.1	6,850.5	30.8	168.7	-90.66	-1,289.9	433.9	540.3	341.0	199.28	2.711	
8,100.0	6,862.0	6,849.1	6,848.5	32.6	168.7	-90.36	-1,290.0	433.9	476.4	275.2	201.15	2.368	
8,200.0	6,862.0	6,847.0	6,846.4	34.6	168.6	-90.06	-1,290.0	433.9	426.5	223.4	203.07	2.100	
8,300.0	6,862.0	6,845.0	6,844.4	36.6	168.6	-89.77	-1,290.0	433.9	396.1	191.1	205.04	1.932	
8,375.1	6,862.0	6,843.5	6,842.9	38.1	168.6	-89.54	-1,290.1	433.9	388.9	182.4	206.54	1.883	CC, ES
8,400.0	6,862.0	6,843.0	6,842.4	38.6	168.6	-89.47	-1,290.1	433.9	389.7	182.7	207.04	1.882	SF
8,500.0	6,862.0	6,841.0	6,840.4	40.6	168.5	-89.17	-1,290.1	433.8	408.5	199.4	209.07	1.954	
8,600.0	6,862.0	6,838.9	6,838.3	42.7	168.5	-88.87	-1,290.2	433.8	449.3	238.1	211.13	2.128	
8,700.0	6,862.0	6,836.9	6,836.3	44.9	168.5	-88.57	-1,290.2	433.8	506.7	293.5	213.20	2.377	
8,800.0	6,862.0	6,834.9	6,834.3	47.0	168.4	-88.27	-1,290.2	433.8	576.0	360.7	215.29	2.675	
8,900.0	6,862.0	6,832.8	6,832.2	49.1	168.4	-87.97	-1,290.3	433.8	653.2	435.8	217.39	3.005	
9,000.0	6,862.0	6,830.8	6,830.2	51.3	168.3	-87.67	-1,290.3	433.8	735.9	516.4	219.51	3.353	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W (GRID) - Blake B 29-9 (P&A) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,300.0	6,862.0	6,835.9	6,834.1	57.9	16.3	-83.40	-2,897.8	249.9	713.8	639.9	73.85	9.665	
9,400.0	6,862.0	6,838.0	6,836.2	60.2	16.3	-83.97	-2,897.8	250.0	618.8	542.6	76.14	8.127	
9,500.0	6,862.0	6,840.0	6,838.3	62.4	16.3	-84.54	-2,897.9	250.1	525.6	447.2	78.43	6.702	
9,600.0	6,862.0	6,842.1	6,840.4	64.6	16.3	-85.11	-2,897.9	250.2	435.5	354.8	80.73	5.395	
9,700.0	6,862.0	6,844.2	6,842.4	66.9	16.3	-85.69	-2,898.0	250.3	350.8	267.8	83.03	4.225	
9,800.0	6,862.0	6,846.3	6,844.5	69.1	16.3	-86.26	-2,898.0	250.4	276.4	191.1	85.34	3.240	
9,900.0	6,862.0	6,848.3	6,846.6	71.4	16.3	-86.83	-2,898.0	250.5	223.1	135.5	87.64	2.546	
9,983.2	6,862.0	6,850.1	6,848.3	73.3	16.4	-87.31	-2,898.1	250.6	207.0	117.5	89.56	2.312	CC, ES
10,000.0	6,862.0	6,850.4	6,848.6	73.7	16.4	-87.41	-2,898.1	250.6	207.7	117.8	89.95	2.309	SF
10,100.0	6,862.0	6,852.5	6,850.7	75.9	16.4	-87.98	-2,898.1	250.7	237.7	145.4	92.25	2.576	
10,200.0	6,862.0	6,854.5	6,852.8	78.2	16.4	-88.55	-2,898.2	250.8	299.7	205.2	94.55	3.170	
10,300.0	6,862.0	6,856.6	6,854.8	80.5	16.4	-89.12	-2,898.2	250.9	378.4	281.5	96.85	3.907	
10,400.0	6,862.0	6,858.7	6,856.9	82.8	16.4	-89.70	-2,898.3	251.0	465.3	366.1	99.15	4.693	
10,500.0	6,862.0	6,860.8	6,859.0	85.1	16.4	-90.27	-2,898.3	251.1	556.6	455.1	101.44	5.487	
10,600.0	6,862.0	6,862.8	6,861.0	87.4	16.4	-90.84	-2,898.3	251.2	650.5	546.7	103.72	6.271	
10,700.0	6,862.0	6,864.9	6,863.1	89.7	16.4	-91.41	-2,898.4	251.2	745.9	639.9	106.00	7.037	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Existing Wells Sec.29-T5N-R64W (GRID) - Blake B29-16 (Exist) - Wellbore #1 - Wellbore #1

Offset Site Error: 0.0 ft

Survey Program: 100-NS-GYRO-MS

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,500.0	6,862.0	6,890.9	6,889.9	85.1	18.4	-91.82	-4,084.8	323.3	726.3	622.9	103.40	7.024	
10,600.0	6,862.0	6,889.0	6,888.0	87.4	18.4	-91.43	-4,084.9	323.3	635.2	529.5	105.71	6.009	
10,700.0	6,862.0	6,887.0	6,886.1	89.7	18.4	-91.04	-4,084.9	323.2	547.3	439.3	108.02	5.067	
10,800.0	6,862.0	6,885.1	6,884.2	92.0	18.4	-90.65	-4,084.9	323.2	464.2	353.9	110.33	4.208	
10,900.0	6,862.0	6,883.2	6,882.3	94.3	18.4	-90.26	-4,085.0	323.2	389.2	276.6	112.63	3.456	
11,000.0	6,862.0	6,881.3	6,880.4	96.6	18.4	-89.87	-4,085.0	323.1	327.9	212.9	114.93	2.853	
11,100.0	6,862.0	6,879.4	6,878.5	98.9	18.4	-89.48	-4,085.0	323.1	288.9	171.7	117.23	2.464	
11,170.2	6,862.0	6,878.1	6,877.1	100.5	18.4	-89.21	-4,085.1	323.1	280.3	161.4	118.85	2.358	CC, ES
11,200.0	6,862.0	6,877.5	6,876.6	101.2	18.4	-89.09	-4,085.1	323.1	281.8	162.3	119.53	2.358	SF
11,300.0	6,862.0	6,875.6	6,874.7	103.5	18.4	-88.70	-4,085.1	323.1	308.9	187.0	121.82	2.535	
11,400.0	6,862.0	6,873.7	6,872.8	105.8	18.4	-88.31	-4,085.2	323.0	362.4	238.3	124.11	2.920	
11,500.0	6,862.0	6,871.8	6,870.8	108.1	18.3	-87.92	-4,085.2	323.0	432.8	306.4	126.40	3.424	
11,600.0	6,862.0	6,869.9	6,868.9	110.4	18.3	-87.53	-4,085.2	323.0	513.0	384.4	128.68	3.987	
11,700.0	6,862.0	6,867.9	6,867.0	112.8	18.3	-87.14	-4,085.3	323.0	599.3	468.3	130.96	4.576	
11,800.0	6,862.0	6,866.0	6,865.1	115.1	18.3	-86.75	-4,085.3	322.9	689.3	556.0	133.23	5.173	
11,900.0	6,862.0	6,864.1	6,863.2	117.4	18.3	-86.36	-4,085.3	322.9	781.7	646.2	135.50	5.769	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-203 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-89.40	1.1	-105.0	105.0	105.0	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-89.40	1.1	-105.0	105.0	104.8	0.28	377.738	
166.3	166.3	167.3	167.3	0.3	0.3	-89.40	1.1	-105.0	105.0	104.4	0.64	163.278	CC
200.0	200.0	200.0	200.0	0.4	0.4	-89.40	1.1	-105.0	105.1	104.2	0.83	127.178	ES
300.0	300.0	298.4	298.4	0.7	0.7	-89.20	1.5	-106.2	106.3	104.9	1.36	77.921	
400.0	400.0	395.7	395.6	1.0	0.9	-88.62	2.7	-109.8	110.0	108.1	1.90	57.773	
500.0	500.0	492.7	492.4	1.2	1.2	-87.73	4.6	-115.7	116.1	113.7	2.45	47.382	
600.0	600.0	589.4	588.7	1.5	1.5	-86.65	7.3	-123.9	124.7	121.7	3.00	41.529	
700.0	700.0	685.6	684.3	1.8	1.9	-85.46	10.7	-134.3	135.8	132.2	3.56	38.139	
800.0	800.0	781.1	778.9	2.1	2.2	-84.25	14.8	-147.0	149.4	145.2	4.12	36.229	
900.0	900.0	875.9	872.4	2.3	2.6	-83.08	19.6	-161.7	165.4	160.7	4.69	35.272	
1,000.0	1,000.0	969.9	964.7	2.6	3.1	-81.99	25.1	-178.5	183.9	178.7	5.26	34.961	SF
1,100.0	1,100.0	1,063.0	1,055.7	2.9	3.6	-80.99	31.3	-197.3	204.8	199.0	5.84	35.103	
1,200.0	1,200.0	1,155.0	1,145.1	3.2	4.1	-80.10	38.0	-217.9	228.2	221.8	6.41	35.573	
1,300.0	1,300.0	1,245.9	1,232.9	3.4	4.7	-79.31	45.3	-240.3	253.8	246.8	7.00	36.283	
1,400.0	1,400.0	1,335.6	1,319.0	3.7	5.3	-78.62	53.2	-264.3	281.8	274.2	7.58	37.173	
1,500.0	1,500.0	1,424.1	1,403.2	4.0	5.9	-78.01	61.6	-289.9	312.0	303.9	8.17	38.199	
1,600.0	1,600.0	1,511.6	1,485.9	4.3	6.6	-77.47	70.4	-317.0	344.5	335.7	8.76	39.327	
1,700.0	1,700.0	1,605.8	1,574.7	4.5	7.4	-76.98	80.2	-347.0	377.9	368.5	9.37	40.310	
1,800.0	1,800.0	1,700.0	1,663.4	4.8	8.2	-76.56	90.1	-377.0	411.3	401.3	9.99	41.189	
1,900.0	1,900.0	1,794.2	1,752.2	5.1	9.0	-76.21	99.9	-407.1	444.8	434.2	10.60	41.955	
2,000.0	2,000.0	1,888.4	1,840.9	5.4	9.8	-75.91	109.7	-437.1	478.2	467.0	11.22	42.630	
2,100.0	2,100.0	1,982.6	1,929.7	5.6	10.6	-75.64	119.5	-467.1	511.7	499.9	11.84	43.227	
2,200.0	2,200.0	2,076.8	2,018.4	5.9	11.4	-75.41	129.4	-497.2	545.2	532.7	12.46	43.760	
2,300.0	2,300.0	2,171.0	2,107.2	6.2	12.2	-75.21	139.2	-527.2	578.7	565.6	13.08	44.237	
2,400.0	2,400.0	2,265.2	2,195.9	6.5	13.0	-75.03	149.0	-557.2	612.2	598.5	13.71	44.668	
2,500.0	2,500.0	2,359.4	2,284.7	6.7	13.9	-74.86	158.9	-587.3	645.7	631.4	14.33	45.057	
2,600.0	2,600.0	2,453.7	2,373.5	7.0	14.7	-79.49	168.7	-617.3	679.0	664.1	14.83	45.786	
2,700.0	2,699.9	2,548.1	2,462.5	7.3	15.5	-79.17	178.5	-647.4	711.8	696.4	15.46	46.053	
2,800.0	2,799.7	2,642.6	2,551.5	7.6	16.3	-79.05	188.4	-677.6	744.2	728.1	16.09	46.261	
2,900.0	2,899.3	2,737.1	2,640.5	7.9	17.1	-79.10	198.2	-707.7	776.2	759.5	16.72	46.411	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-323 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	2.0	2.0	0.0	0.0	-89.44	0.7	-74.9	75.0	74.9	0.00	N/A	
100.0	100.0	102.0	102.0	0.1	0.1	-89.44	0.7	-74.9	75.0	74.7	0.28	266.882	
200.0	200.0	202.0	202.0	0.4	0.4	-89.44	0.7	-74.9	75.0	74.1	0.83	90.139	
300.0	300.0	302.0	302.0	0.7	0.7	-89.44	0.7	-74.9	75.0	73.6	1.38	54.227	
400.0	400.0	402.0	402.0	1.0	1.0	-89.44	0.7	-74.9	75.0	73.0	1.93	38.778	
500.0	500.0	502.0	502.0	1.2	1.2	-89.44	0.7	-74.9	75.0	72.5	2.48	30.180	
600.0	600.0	602.0	602.0	1.5	1.5	-89.44	0.7	-74.9	75.0	71.9	3.03	24.702	
700.0	700.0	702.0	702.0	1.8	1.8	-89.44	0.7	-74.9	75.0	71.4	3.58	20.908	
766.0	766.0	768.0	768.0	2.0	2.0	-89.44	0.7	-74.9	75.0	71.0	3.95	18.984	CC
800.0	800.0	802.0	802.0	2.1	2.1	-89.44	0.7	-74.9	75.0	70.8	4.14	18.125	ES
900.0	900.0	900.0	900.0	2.3	2.3	-89.04	1.3	-76.1	76.2	71.5	4.67	16.307	
1,000.0	1,000.0	998.3	998.2	2.6	2.6	-87.92	2.9	-79.6	79.8	74.6	5.20	15.330	
1,100.0	1,100.0	1,096.1	1,095.8	2.9	2.9	-86.28	5.5	-85.4	85.8	80.0	5.74	14.945	SF
1,200.0	1,200.0	1,193.5	1,192.8	3.2	3.1	-84.34	9.2	-93.3	94.2	88.0	6.28	15.008	
1,300.0	1,300.0	1,290.5	1,289.1	3.4	3.4	-82.32	13.9	-103.5	105.2	98.4	6.82	15.420	
1,400.0	1,400.0	1,386.8	1,384.5	3.7	3.8	-80.37	19.6	-115.8	118.7	111.3	7.37	16.106	
1,500.0	1,500.0	1,482.3	1,478.7	4.0	4.1	-78.58	26.3	-130.1	134.8	126.8	7.92	17.009	
1,600.0	1,600.0	1,577.0	1,571.7	4.3	4.5	-76.99	33.8	-146.4	153.3	144.8	8.48	18.082	
1,700.0	1,700.0	1,670.7	1,663.2	4.5	5.0	-75.60	42.3	-164.6	174.3	165.3	9.04	19.291	
1,800.0	1,800.0	1,763.4	1,753.2	4.8	5.4	-74.41	51.5	-184.6	197.8	188.2	9.60	20.606	
1,900.0	1,900.0	1,856.1	1,842.7	5.1	6.0	-73.37	61.7	-206.5	223.6	213.4	10.17	21.991	
2,000.0	2,000.0	1,952.5	1,935.6	5.4	6.5	-72.50	72.5	-229.9	250.1	239.3	10.74	23.281	
2,100.0	2,100.0	2,048.8	2,028.4	5.6	7.1	-71.79	83.4	-253.3	276.7	265.3	11.32	24.439	
2,200.0	2,200.0	2,145.2	2,121.3	5.9	7.7	-71.20	94.2	-276.7	303.3	291.4	11.90	25.480	
2,300.0	2,300.0	2,241.5	2,214.1	6.2	8.4	-70.71	105.0	-300.1	329.9	317.4	12.49	26.420	
2,400.0	2,400.0	2,337.9	2,306.9	6.5	9.0	-70.30	115.9	-323.5	356.6	343.5	13.07	27.271	
2,500.0	2,500.0	2,434.3	2,399.8	6.7	9.6	-69.94	126.7	-346.9	383.2	369.6	13.66	28.045	
2,600.0	2,600.0	2,530.7	2,492.7	7.0	10.3	-74.59	137.6	-370.3	409.6	395.4	14.20	28.847	
2,700.0	2,699.9	2,627.3	2,585.8	7.3	10.9	-74.44	148.4	-393.8	435.3	420.5	14.79	29.423	
2,800.0	2,799.7	2,724.1	2,679.0	7.6	11.5	-74.59	159.3	-417.3	460.3	444.9	15.39	29.903	
2,900.0	2,899.3	2,820.8	2,772.3	7.9	12.2	-75.01	170.2	-440.8	484.7	468.7	16.00	30.293	
3,000.0	2,998.6	2,917.6	2,865.5	8.1	12.9	-75.65	181.1	-464.3	508.6	491.9	16.62	30.599	
3,100.0	3,097.5	3,014.2	2,958.6	8.4	13.5	-76.49	191.9	-487.8	532.0	514.7	17.26	30.824	
3,162.8	3,159.5	3,074.9	3,017.0	8.6	13.9	-77.10	198.8	-502.5	546.5	528.8	17.67	30.924	
3,200.0	3,196.1	3,110.7	3,051.6	8.7	14.2	-77.60	202.8	-511.2	555.1	537.2	17.92	30.971	
3,300.0	3,294.6	3,207.2	3,144.5	9.1	14.8	-78.88	213.6	-534.6	578.4	559.7	18.61	31.077	
3,400.0	3,393.1	3,303.7	3,237.5	9.4	15.5	-80.06	224.5	-558.0	601.9	582.6	19.32	31.153	
3,500.0	3,491.6	3,400.1	3,330.4	9.8	16.2	-81.15	235.3	-581.5	625.6	605.6	20.05	31.205	
3,600.0	3,590.1	3,496.6	3,423.4	10.1	16.8	-82.16	246.2	-604.9	649.6	628.8	20.80	31.236	
3,700.0	3,688.6	3,593.0	3,516.3	10.5	17.5	-83.10	257.0	-628.3	673.8	652.2	21.56	31.250	
3,800.0	3,787.1	3,689.5	3,609.2	10.9	18.1	-83.98	267.9	-651.7	698.1	675.7	22.34	31.249	
3,900.0	3,885.6	3,786.0	3,702.2	11.3	18.8	-84.80	278.7	-675.2	722.5	699.4	23.13	31.238	
4,000.0	3,984.1	3,882.4	3,795.1	11.6	19.5	-85.56	289.6	-698.6	747.1	723.1	23.93	31.217	
4,100.0	4,082.6	3,978.9	3,888.1	12.0	20.1	-86.28	300.4	-722.0	771.8	747.0	24.75	31.188	
4,200.0	4,181.1	4,075.3	3,981.0	12.4	20.8	-86.95	311.3	-745.4	796.6	771.0	25.57	31.154	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29M-423 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-89.53	0.7	-90.0	90.0	90.0	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-89.53	0.7	-90.0	90.0	89.7	0.28	323.626	
200.0	200.0	201.0	201.0	0.4	0.4	-89.53	0.7	-90.0	90.0	89.2	0.83	108.592	
300.0	300.0	301.0	301.0	0.7	0.7	-89.53	0.7	-90.0	90.0	88.6	1.38	65.242	
366.3	366.3	367.3	367.3	0.9	0.9	-89.53	0.7	-90.0	90.0	88.3	1.74	51.583	CC
400.0	400.0	400.0	400.0	1.0	1.0	-89.53	0.7	-90.0	90.0	88.1	1.93	46.697	ES
500.0	500.0	498.8	498.8	1.2	1.2	-89.25	1.2	-91.2	91.2	88.8	2.47	37.003	
600.0	600.0	596.5	596.4	1.5	1.5	-88.46	2.5	-94.7	94.9	91.9	3.00	31.626	
700.0	700.0	693.9	693.6	1.8	1.8	-87.28	4.8	-100.5	100.9	97.4	3.54	28.510	
800.0	800.0	791.0	790.3	2.1	2.1	-85.84	7.9	-108.7	109.5	105.4	4.09	26.786	
900.0	900.0	887.5	886.2	2.3	2.4	-84.31	11.9	-119.0	120.5	115.9	4.64	25.977	
1,000.0	1,000.0	983.4	981.2	2.6	2.7	-82.78	16.7	-131.5	134.0	128.8	5.20	25.799	SF
1,100.0	1,100.0	1,078.6	1,075.1	2.9	3.1	-81.34	22.3	-146.1	150.1	144.3	5.76	26.069	
1,200.0	1,200.0	1,173.0	1,167.7	3.2	3.5	-80.02	28.6	-162.8	168.6	162.3	6.32	26.666	
1,300.0	1,300.0	1,266.4	1,259.0	3.4	4.0	-78.84	35.8	-181.3	189.6	182.7	6.89	27.506	
1,400.0	1,400.0	1,358.7	1,348.7	3.7	4.5	-77.81	43.6	-201.7	212.9	205.5	7.46	28.527	
1,500.0	1,500.0	1,450.0	1,436.8	4.0	5.1	-76.90	52.1	-223.9	238.7	230.6	8.04	29.685	
1,600.0	1,600.0	1,543.9	1,527.0	4.3	5.7	-76.10	61.4	-248.3	266.3	257.7	8.63	30.858	
1,700.0	1,700.0	1,639.9	1,619.1	4.5	6.3	-75.43	71.1	-273.4	294.1	284.9	9.22	31.900	
1,800.0	1,800.0	1,735.9	1,711.3	4.8	7.0	-74.87	80.7	-298.5	321.9	312.1	9.81	32.809	
1,900.0	1,900.0	1,831.9	1,803.5	5.1	7.7	-74.40	90.3	-323.6	349.8	339.4	10.41	33.607	
2,000.0	2,000.0	1,927.9	1,895.6	5.4	8.3	-74.01	99.9	-348.7	377.7	366.7	11.01	34.313	
2,100.0	2,100.0	2,023.9	1,987.8	5.6	9.0	-73.66	109.6	-373.8	405.6	394.0	11.61	34.941	
2,200.0	2,200.0	2,119.9	2,080.0	5.9	9.7	-73.36	119.2	-398.8	433.5	421.3	12.21	35.504	
2,300.0	2,300.0	2,215.9	2,172.1	6.2	10.4	-73.10	128.8	-423.9	461.4	448.6	12.81	36.010	
2,400.0	2,400.0	2,311.9	2,264.3	6.5	11.1	-72.87	138.4	-449.0	489.4	475.9	13.42	36.468	
2,500.0	2,500.0	2,407.9	2,356.5	6.7	11.8	-72.66	148.0	-474.1	517.3	503.3	14.03	36.884	
2,600.0	2,600.0	2,504.0	2,448.7	7.0	12.4	-77.37	157.7	-499.2	545.0	530.4	14.54	37.475	
2,700.0	2,699.9	2,600.2	2,541.1	7.3	13.1	-77.18	167.3	-524.4	572.1	557.0	15.15	37.758	
2,800.0	2,799.7	2,696.5	2,633.5	7.6	13.8	-77.24	177.0	-549.6	598.7	582.9	15.77	37.976	
2,900.0	2,899.3	2,792.8	2,726.0	7.9	14.5	-77.50	186.6	-574.7	624.8	608.4	16.38	38.132	
3,000.0	2,998.6	2,889.0	2,818.4	8.1	15.2	-77.95	196.3	-599.9	650.4	633.4	17.01	38.227	
3,100.0	3,097.5	2,985.1	2,910.6	8.4	15.9	-78.56	205.9	-625.0	675.7	658.0	17.66	38.259	
3,162.8	3,159.5	3,045.4	2,968.5	8.6	16.4	-79.02	211.9	-640.7	691.4	673.3	18.08	38.246	
3,200.0	3,196.1	3,081.0	3,002.7	8.7	16.6	-79.44	215.5	-650.1	700.7	682.4	18.33	38.230	
3,300.0	3,294.6	3,176.9	3,094.7	9.1	17.3	-80.52	225.1	-675.1	725.9	706.9	19.02	38.166	
3,400.0	3,393.1	3,272.8	3,186.8	9.4	18.0	-81.53	234.7	-700.2	751.3	731.6	19.73	38.078	
3,500.0	3,491.6	3,368.7	3,278.8	9.8	18.7	-82.48	244.4	-725.2	776.9	756.5	20.46	37.972	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-143 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-89.52	0.4	-44.9	44.9	44.9	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-89.52	0.4	-44.9	44.9	44.6	0.28	161.312	
200.0	200.0	201.0	201.0	0.4	0.4	-89.52	0.4	-44.9	44.9	44.0	0.83	54.128	
300.0	300.0	301.0	301.0	0.7	0.7	-89.52	0.4	-44.9	44.9	43.5	1.38	32.520	
400.0	400.0	401.0	401.0	1.0	1.0	-89.52	0.4	-44.9	44.9	42.9	1.93	23.242	
500.0	500.0	501.0	501.0	1.2	1.2	-89.52	0.4	-44.9	44.9	42.4	2.48	18.083	
600.0	600.0	601.0	601.0	1.5	1.5	-89.52	0.4	-44.9	44.9	41.8	3.03	14.798	
700.0	700.0	701.0	701.0	1.8	1.8	-89.52	0.4	-44.9	44.9	41.3	3.58	12.523	
800.0	800.0	801.0	801.0	2.1	2.1	-89.52	0.4	-44.9	44.9	40.7	4.13	10.854	
900.0	900.0	901.0	901.0	2.3	2.3	-89.52	0.4	-44.9	44.9	40.2	4.68	9.578	
1,000.0	1,000.0	1,001.0	1,001.0	2.6	2.6	-89.52	0.4	-44.9	44.9	39.6	5.23	8.570	
1,100.0	1,100.0	1,101.0	1,101.0	2.9	2.9	-89.52	0.4	-44.9	44.9	39.1	5.78	7.755	
1,166.3	1,166.3	1,167.3	1,167.3	3.1	3.1	-89.52	0.4	-44.9	44.9	38.7	6.15	7.294	CC
1,200.0	1,200.0	1,201.0	1,201.0	3.2	3.2	-89.52	0.4	-44.9	44.9	38.5	6.34	7.081	ES
1,300.0	1,300.0	1,300.0	1,300.0	3.4	3.4	-88.48	1.2	-45.9	45.9	39.0	6.88	6.673	
1,400.0	1,400.0	1,399.0	1,398.9	3.7	3.7	-85.67	3.7	-48.8	49.0	41.6	7.41	6.611	
1,500.0	1,500.0	1,497.7	1,497.4	4.0	4.0	-81.72	7.8	-53.7	54.4	46.5	7.95	6.843	
1,600.0	1,600.0	1,596.0	1,595.3	4.3	4.3	-77.40	13.5	-60.6	62.3	53.8	8.50	7.336	
1,700.0	1,700.0	1,693.7	1,692.4	4.5	4.5	-73.27	20.8	-69.3	72.9	63.8	9.04	8.058	
1,800.0	1,800.0	1,790.8	1,788.5	4.8	4.9	-69.62	29.7	-79.8	86.1	76.5	9.59	8.974	
1,900.0	1,900.0	1,887.2	1,883.5	5.1	5.2	-66.55	40.0	-92.1	101.9	91.8	10.14	10.051	
2,000.0	2,000.0	1,983.3	1,977.8	5.4	5.6	-64.03	51.7	-106.2	120.4	109.7	10.69	11.253	
2,100.0	2,100.0	2,081.3	2,073.9	5.6	6.0	-62.06	64.2	-121.1	139.7	128.4	11.25	12.414	
2,200.0	2,200.0	2,179.3	2,170.0	5.9	6.4	-60.58	76.7	-136.0	159.1	147.3	11.81	13.474	
2,300.0	2,300.0	2,277.3	2,266.0	6.2	6.9	-59.42	89.1	-150.9	178.7	166.3	12.37	14.441	
2,400.0	2,400.0	2,375.4	2,362.1	6.5	7.3	-58.49	101.6	-165.7	198.3	185.3	12.94	15.326	
2,500.0	2,500.0	2,473.4	2,458.2	6.7	7.8	-57.72	114.1	-180.6	217.9	204.4	13.50	16.138	
2,600.0	2,600.0	2,571.5	2,554.4	7.0	8.2	-62.29	126.6	-195.6	237.0	222.9	14.05	16.869	
2,700.0	2,699.9	2,669.9	2,650.8	7.3	8.7	-62.28	139.1	-210.5	254.8	240.2	14.62	17.433	
2,800.0	2,799.7	2,768.4	2,747.4	7.6	9.2	-62.75	151.6	-225.5	271.5	256.4	15.19	17.872	
2,900.0	2,899.3	2,867.1	2,844.1	7.9	9.7	-63.63	164.2	-240.5	287.1	271.4	15.78	18.198	
3,000.0	2,998.6	2,965.7	2,940.8	8.1	10.2	-64.85	176.8	-255.5	301.7	285.3	16.37	18.425	
3,100.0	3,097.5	3,064.4	3,037.5	8.4	10.7	-66.39	189.3	-270.4	315.4	298.4	16.99	18.562	
3,162.8	3,159.5	3,126.3	3,098.1	8.6	11.0	-67.50	197.2	-279.8	323.6	306.2	17.39	18.606	
3,200.0	3,196.1	3,162.9	3,134.0	8.7	11.2	-68.25	201.8	-285.4	328.5	310.8	17.64	18.621	
3,300.0	3,294.6	3,261.4	3,230.6	9.1	11.7	-70.15	214.4	-300.4	341.7	323.4	18.32	18.658	
3,400.0	3,393.1	3,359.9	3,327.1	9.4	12.2	-71.91	226.9	-315.3	355.3	336.3	19.01	18.688	
3,500.0	3,491.6	3,458.4	3,423.6	9.8	12.7	-73.54	239.4	-330.3	369.2	349.5	19.73	18.712	
3,600.0	3,590.1	3,556.9	3,520.2	10.1	13.2	-75.05	252.0	-345.3	383.4	362.9	20.47	18.731	
3,700.0	3,688.6	3,655.4	3,616.7	10.5	13.7	-76.46	264.5	-360.2	397.8	376.6	21.22	18.744	
3,800.0	3,787.1	3,753.9	3,713.3	10.9	14.2	-77.76	277.1	-375.2	412.5	390.5	21.99	18.754	
3,900.0	3,885.6	3,852.4	3,809.8	11.3	14.7	-78.98	289.6	-390.2	427.3	404.5	22.78	18.760	
4,000.0	3,984.1	3,950.9	3,906.4	11.6	15.2	-80.12	302.1	-405.1	442.3	418.8	23.58	18.763	
4,100.0	4,082.6	4,049.3	4,002.9	12.0	15.8	-81.18	314.7	-420.1	457.5	433.1	24.38	18.763	
4,200.0	4,181.1	4,147.8	4,099.4	12.4	16.3	-82.17	327.2	-435.1	472.8	447.6	25.20	18.762	
4,300.0	4,279.6	4,246.3	4,196.0	12.9	16.8	-83.10	339.7	-450.0	488.3	462.3	26.03	18.760	
4,400.0	4,378.1	4,344.8	4,292.5	13.3	17.3	-83.97	352.3	-465.0	503.9	477.0	26.86	18.756	
4,500.0	4,476.6	4,443.3	4,389.1	13.7	17.8	-84.80	364.8	-480.0	519.5	491.8	27.71	18.751	
4,600.0	4,575.1	4,541.8	4,485.6	14.1	18.3	-85.57	377.3	-494.9	535.3	506.8	28.56	18.746	
4,700.0	4,673.6	4,640.3	4,582.1	14.5	18.9	-86.30	389.9	-509.9	551.2	521.8	29.41	18.740	
4,800.0	4,772.1	4,738.8	4,678.7	15.0	19.4	-86.99	402.4	-524.9	567.1	536.9	30.27	18.735	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-143 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,870.6	4,837.3	4,775.2	15.4	19.9	-87.64	414.9	-539.8	583.2	552.0	31.14	18.729	
5,000.0	4,969.1	4,935.8	4,871.8	15.8	20.4	-88.25	427.5	-554.8	599.3	567.3	32.01	18.723	
5,100.0	5,067.6	5,034.3	4,968.3	16.3	21.0	-88.84	440.0	-569.8	615.4	582.6	32.88	18.717	
5,200.0	5,166.1	5,132.8	5,064.8	16.7	21.5	-89.39	452.5	-584.7	631.7	597.9	33.76	18.711	
5,300.0	5,264.6	5,238.0	5,168.0	17.1	22.0	-89.97	465.8	-600.6	647.8	613.1	34.65	18.693	
5,400.0	5,363.1	5,359.1	5,287.5	17.6	22.5	-90.79	478.6	-615.9	661.4	625.8	35.57	18.595	
5,500.0	5,461.6	5,480.7	5,408.1	18.0	22.9	-91.84	488.2	-627.3	671.8	635.3	36.46	18.426	
5,544.5	5,505.4	5,534.8	5,462.0	18.2	23.0	-92.38	491.4	-631.2	675.4	638.5	36.85	18.328	
5,600.0	5,560.2	5,602.4	5,529.4	18.4	23.2	-93.14	494.5	-634.9	679.0	641.7	37.31	18.197	
5,700.0	5,659.2	5,724.3	5,651.2	18.8	23.4	-94.37	497.5	-638.4	682.9	644.9	38.03	17.959	
5,800.0	5,758.7	5,832.8	5,759.7	19.0	23.6	-95.30	497.8	-638.8	684.0	645.4	38.63	17.707	
5,900.0	5,858.5	5,932.6	5,859.5	19.3	23.8	-95.86	497.8	-638.8	684.7	645.5	39.15	17.487	
6,000.0	5,958.4	6,030.6	5,957.3	19.5	23.8	-96.61	492.1	-638.8	685.1	645.6	39.56	17.317	
6,041.6	6,000.0	6,070.6	5,996.8	19.6	23.9	-91.95	486.2	-638.8	685.4	645.7	39.71	17.259	
6,100.0	6,058.4	6,125.6	6,050.6	19.7	23.8	-92.91	474.7	-638.8	685.9	646.0	39.90	17.190	
6,139.9	6,098.3	6,162.1	6,085.7	19.8	23.8	-93.72	465.0	-638.8	686.6	646.5	40.03	17.149	
6,150.0	6,108.4	6,171.1	6,094.4	19.8	23.8	86.01	462.3	-638.8	686.8	646.7	40.06	17.143	
6,200.0	6,158.4	6,215.7	6,136.5	19.9	23.8	84.86	447.6	-638.8	687.9	647.8	40.17	17.125	
6,250.0	6,208.0	6,259.7	6,177.1	19.9	23.7	83.74	430.8	-638.8	689.4	649.2	40.22	17.141	
6,300.0	6,257.3	6,303.0	6,216.1	19.9	23.6	82.65	411.9	-638.8	691.0	650.8	40.20	17.189	
6,350.0	6,305.8	6,345.8	6,253.5	19.9	23.5	81.60	391.2	-638.8	692.9	652.8	40.13	17.268	
6,400.0	6,353.4	6,388.0	6,289.2	19.8	23.4	80.58	368.6	-638.8	694.9	654.9	40.00	17.374	
6,450.0	6,400.0	6,429.8	6,323.3	19.7	23.3	79.60	344.5	-638.8	697.0	657.2	39.82	17.506	
6,500.0	6,445.2	6,471.1	6,355.6	19.6	23.2	78.67	318.7	-638.9	699.3	659.7	39.60	17.660	
6,550.0	6,489.0	6,512.1	6,386.2	19.5	23.1	77.78	291.6	-638.9	701.6	662.2	39.34	17.833	
6,600.0	6,531.1	6,550.0	6,413.3	19.4	23.0	76.98	265.0	-638.9	703.9	664.8	39.07	18.018	
6,650.0	6,571.3	6,592.9	6,442.2	19.3	22.9	76.15	233.3	-638.9	706.2	667.4	38.77	18.217	
6,700.0	6,609.5	6,632.8	6,467.5	19.2	22.8	75.41	202.5	-638.9	708.5	670.0	38.47	18.414	
6,750.0	6,645.6	6,672.4	6,491.0	19.0	22.7	74.72	170.5	-638.9	710.7	672.5	38.20	18.606	
6,800.0	6,679.2	6,711.8	6,512.7	19.0	22.6	74.09	137.6	-638.9	712.8	674.8	37.95	18.784	
6,850.0	6,710.4	6,750.0	6,532.0	18.9	22.5	73.53	104.7	-639.0	714.8	677.0	37.74	18.940	
6,900.0	6,739.0	6,790.0	6,550.5	18.9	22.4	73.00	69.3	-639.0	716.6	679.0	37.60	19.060	
6,950.0	6,764.8	6,828.8	6,566.7	18.9	22.3	72.54	34.0	-639.0	718.3	680.8	37.54	19.137	
7,000.0	6,787.8	6,867.5	6,580.9	19.0	22.2	72.15	-2.0	-639.0	719.8	682.3	37.56	19.163	
7,050.0	6,807.8	6,906.0	6,593.3	19.1	22.1	71.81	-38.4	-639.0	721.1	683.4	37.69	19.132	
7,100.0	6,824.8	6,950.0	6,605.2	19.3	22.1	71.50	-80.8	-639.1	722.2	684.3	37.96	19.027	
7,150.0	6,838.6	6,982.8	6,612.5	19.6	22.1	71.31	-112.8	-639.1	723.1	684.7	38.31	18.875	
7,200.0	6,849.3	7,021.1	6,619.2	19.9	22.1	71.16	-150.4	-639.1	723.7	684.9	38.81	18.649	
7,250.0	6,856.8	7,059.3	6,624.1	20.2	22.2	71.07	-188.4	-639.1	724.0	684.6	39.42	18.368	
7,300.0	6,861.0	7,100.0	6,627.1	20.7	22.4	71.04	-228.9	-639.1	724.2	684.0	40.18	18.024	
7,303.6	6,861.2	7,100.0	6,627.1	20.7	22.4	71.04	-228.9	-639.1	724.2	683.9	40.21	18.008	
7,339.5	6,862.0	7,122.9	6,627.3	21.0	22.5	71.01	-251.8	-639.2	724.3	683.5	40.77	17.765	
7,339.6	6,862.0	7,122.9	6,627.3	21.0	22.5	71.01	-251.9	-639.2	724.3	683.5	40.77	17.765	
7,340.4	6,862.0	7,123.6	6,627.3	21.0	22.5	71.00	-252.5	-639.2	724.3	683.5	40.78	17.759	
7,400.0	6,862.0	7,186.0	6,626.9	21.5	23.0	70.98	-313.9	-639.2	724.4	682.5	41.87	17.301	
7,500.0	6,862.0	7,286.0	6,626.8	22.7	24.1	70.97	-413.9	-639.3	724.4	680.3	44.16	16.403	
7,600.0	6,862.0	7,386.0	6,626.6	24.1	25.4	70.96	-513.9	-639.3	724.5	677.7	46.78	15.486	
7,700.0	6,862.0	7,486.0	6,626.5	25.6	26.9	70.95	-613.9	-639.4	724.5	674.8	49.66	14.588	
7,800.0	6,862.0	7,586.0	6,626.3	27.2	28.5	70.94	-713.9	-639.4	724.5	671.8	52.77	13.730	
7,900.0	6,862.0	7,686.0	6,626.2	28.9	30.2	70.92	-813.9	-639.5	724.6	668.5	56.06	12.924	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-143 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,000.0	6,862.0	7,786.0	6,626.0	30.8	31.9	70.91	-913.9	-639.6	724.6	665.1	59.51	12.176	
8,100.0	6,862.0	7,886.0	6,625.9	32.6	33.8	70.90	-1,013.9	-639.6	724.6	661.5	63.09	11.486	
8,200.0	6,862.0	7,986.0	6,625.8	34.6	35.7	70.89	-1,113.9	-639.7	724.7	657.9	66.77	10.853	
8,300.0	6,862.0	8,086.0	6,625.6	36.6	37.6	70.88	-1,213.9	-639.7	724.7	654.2	70.55	10.272	
8,400.0	6,862.0	8,186.0	6,625.5	38.6	39.6	70.87	-1,313.9	-639.8	724.7	650.3	74.41	9.740	
8,500.0	6,862.0	8,286.0	6,625.3	40.6	41.6	70.86	-1,413.9	-639.9	724.8	646.5	78.33	9.253	
8,600.0	6,862.0	8,386.0	6,625.2	42.7	43.7	70.84	-1,513.9	-639.9	724.8	642.5	82.30	8.807	
8,700.0	6,862.0	8,486.0	6,625.0	44.9	45.7	70.83	-1,613.9	-640.0	724.8	638.5	86.33	8.397	
8,800.0	6,862.0	8,586.0	6,624.9	47.0	47.8	70.82	-1,713.9	-640.0	724.9	634.5	90.39	8.019	
8,900.0	6,862.0	8,686.0	6,624.7	49.1	50.0	70.81	-1,813.9	-640.1	724.9	630.4	94.50	7.671	
9,000.0	6,862.0	8,786.0	6,624.6	51.3	52.1	70.80	-1,913.9	-640.2	725.0	626.3	98.63	7.350	
9,100.0	6,862.0	8,886.0	6,624.4	53.5	54.3	70.79	-2,013.9	-640.2	725.0	622.2	102.80	7.053	
9,200.0	6,862.0	8,986.0	6,624.3	55.7	56.4	70.78	-2,113.9	-640.3	725.0	618.0	106.98	6.777	
9,300.0	6,862.0	9,086.0	6,624.1	57.9	58.6	70.77	-2,213.9	-640.3	725.1	613.9	111.19	6.521	
9,400.0	6,862.0	9,186.0	6,624.0	60.2	60.8	70.75	-2,313.9	-640.4	725.1	609.7	115.42	6.282	
9,500.0	6,862.0	9,286.0	6,623.8	62.4	63.0	70.74	-2,413.9	-640.5	725.1	605.5	119.67	6.059	
9,600.0	6,862.0	9,386.0	6,623.7	64.6	65.3	70.73	-2,513.9	-640.5	725.2	601.2	123.93	5.851	
9,700.0	6,862.0	9,486.0	6,623.5	66.9	67.5	70.72	-2,613.9	-640.6	725.2	597.0	128.21	5.657	
9,800.0	6,862.0	9,586.0	6,623.4	69.1	69.7	70.71	-2,713.9	-640.6	725.2	592.7	132.49	5.474	
9,900.0	6,862.0	9,686.0	6,623.3	71.4	72.0	70.70	-2,813.9	-640.7	725.3	588.5	136.79	5.302	
10,000.0	6,862.0	9,786.0	6,623.1	73.7	74.2	70.69	-2,913.9	-640.8	725.3	584.2	141.10	5.140	
10,100.0	6,862.0	9,886.0	6,623.0	75.9	76.5	70.67	-3,013.9	-640.8	725.3	579.9	145.42	4.988	
10,200.0	6,862.0	9,986.0	6,622.8	78.2	78.7	70.66	-3,113.9	-640.9	725.4	575.6	149.75	4.844	
10,300.0	6,862.0	10,086.0	6,622.7	80.5	81.0	70.65	-3,213.9	-640.9	725.4	571.3	154.08	4.708	
10,400.0	6,862.0	10,186.0	6,622.5	82.8	83.3	70.64	-3,313.9	-641.0	725.5	567.0	158.42	4.579	
10,500.0	6,862.0	10,286.0	6,622.4	85.1	85.5	70.63	-3,413.9	-641.1	725.5	562.7	162.77	4.457	
10,600.0	6,862.0	10,386.0	6,622.2	87.4	87.8	70.62	-3,513.9	-641.1	725.5	558.4	167.12	4.341	
10,700.0	6,862.0	10,486.0	6,622.1	89.7	90.1	70.61	-3,613.9	-641.2	725.6	554.1	171.48	4.231	
10,800.0	6,862.0	10,586.0	6,621.9	92.0	92.4	70.60	-3,713.9	-641.2	725.6	549.8	175.84	4.126	
10,900.0	6,862.0	10,686.0	6,621.8	94.3	94.7	70.58	-3,813.9	-641.3	725.6	545.4	180.21	4.027	
11,000.0	6,862.0	10,786.0	6,621.6	96.6	97.0	70.57	-3,913.9	-641.4	725.7	541.1	184.58	3.931	
11,100.0	6,862.0	10,886.0	6,621.5	98.9	99.3	70.56	-4,013.9	-641.4	725.7	536.7	188.96	3.841	
11,200.0	6,862.0	10,986.0	6,621.3	101.2	101.6	70.55	-4,113.9	-641.5	725.7	532.4	193.34	3.754	
11,300.0	6,862.0	11,086.0	6,621.2	103.5	103.9	70.54	-4,213.9	-641.5	725.8	528.1	197.72	3.671	
11,400.0	6,862.0	11,186.0	6,621.0	105.8	106.2	70.53	-4,313.9	-641.6	725.8	523.7	202.11	3.591	
11,500.0	6,862.0	11,286.0	6,620.9	108.1	108.5	70.52	-4,413.9	-641.7	725.9	519.4	206.49	3.515	
11,600.0	6,862.0	11,386.0	6,620.8	110.4	110.8	70.51	-4,513.9	-641.7	725.9	515.0	210.88	3.442	
11,700.0	6,862.0	11,486.0	6,620.6	112.8	113.1	70.49	-4,613.9	-641.8	725.9	510.6	215.28	3.372	
11,800.0	6,862.0	11,586.0	6,620.5	115.1	115.4	70.48	-4,713.9	-641.8	726.0	506.3	219.67	3.305	
11,900.0	6,862.0	11,686.0	6,620.3	117.4	117.7	70.47	-4,813.9	-641.9	726.0	501.9	224.07	3.240	
12,000.0	6,862.0	11,786.0	6,620.2	119.7	120.0	70.46	-4,913.9	-642.0	726.0	497.6	228.47	3.178	
12,100.0	6,862.0	11,886.0	6,620.0	122.0	122.3	70.45	-5,013.9	-642.0	726.1	493.2	232.87	3.118	
12,200.0	6,862.0	11,986.0	6,619.9	124.4	124.6	70.44	-5,113.9	-642.1	726.1	488.8	237.27	3.060	
12,300.0	6,862.0	12,086.0	6,619.7	126.7	127.0	70.43	-5,213.9	-642.1	726.1	484.5	241.68	3.005	
12,400.0	6,862.0	12,186.0	6,619.6	129.0	129.3	70.41	-5,313.9	-642.2	726.2	480.1	246.08	2.951	
12,500.0	6,862.0	12,286.0	6,619.4	131.3	131.6	70.40	-5,413.9	-642.3	726.2	475.7	250.49	2.899	
12,600.0	6,862.0	12,386.0	6,619.3	133.7	133.9	70.39	-5,513.9	-642.3	726.3	471.4	254.89	2.849	
12,700.0	6,862.0	12,486.0	6,619.1	136.0	136.2	70.38	-5,613.9	-642.4	726.3	467.0	259.30	2.801	
12,800.0	6,862.0	12,586.0	6,619.0	138.3	138.6	70.37	-5,713.9	-642.4	726.3	462.6	263.71	2.754	
12,900.0	6,862.0	12,686.0	6,618.8	140.6	140.9	70.36	-5,813.9	-642.5	726.4	458.2	268.12	2.709	
13,000.0	6,862.0	12,786.0	6,618.7	143.0	143.2	70.35	-5,913.9	-642.5	726.4	453.9	272.54	2.665	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-143 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,100.0	6,862.0	12,886.0	6,618.5	145.3	145.5	70.34	-6,013.9	-642.6	726.4	449.5	276.95	2.623	
13,200.0	6,862.0	12,986.0	6,618.4	147.6	147.9	70.32	-6,113.9	-642.7	726.5	445.1	281.36	2.582	
13,300.0	6,862.0	13,086.0	6,618.3	150.0	150.2	70.31	-6,213.9	-642.7	726.5	440.7	285.78	2.542	
13,400.0	6,862.0	13,186.0	6,618.1	152.3	152.5	70.30	-6,313.9	-642.8	726.5	436.4	290.19	2.504	
13,500.0	6,862.0	13,286.0	6,618.0	154.6	154.8	70.29	-6,413.9	-642.8	726.6	432.0	294.61	2.466	
13,600.0	6,862.0	13,386.0	6,617.8	157.0	157.2	70.28	-6,513.9	-642.9	726.6	427.6	299.02	2.430	
13,700.0	6,862.0	13,486.0	6,617.7	159.3	159.5	70.27	-6,613.9	-643.0	726.7	423.2	303.44	2.395	
13,800.0	6,862.0	13,586.0	6,617.5	161.6	161.8	70.26	-6,713.9	-643.0	726.7	418.8	307.85	2.361	
13,900.0	6,862.0	13,686.0	6,617.4	164.0	164.2	70.25	-6,813.9	-643.1	726.7	414.5	312.27	2.327	
14,000.0	6,862.0	13,786.0	6,617.2	166.3	166.5	70.23	-6,913.9	-643.1	726.8	410.1	316.69	2.295	
14,100.0	6,862.0	13,886.0	6,617.1	168.6	168.8	70.22	-7,013.9	-643.2	726.8	405.7	321.11	2.263	
14,145.2	6,862.0	13,931.3	6,617.0	169.7	169.9	70.22	-7,059.2	-643.2	726.8	403.7	323.10	2.249	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-89.97	0.0	-15.0	15.0	15.0	0.00	9,291.718	
100.0	100.0	101.0	101.0	0.1	0.1	-89.97	0.0	-15.0	15.0	14.8	0.28	54.103	
200.0	200.0	201.0	201.0	0.4	0.4	-89.97	0.0	-15.0	15.0	14.2	0.83	18.154	
300.0	300.0	301.0	301.0	0.7	0.7	-89.97	0.0	-15.0	15.0	13.7	1.38	10.907	
400.0	400.0	401.0	401.0	1.0	1.0	-89.97	0.0	-15.0	15.0	13.1	1.93	7.795	
500.0	500.0	501.0	501.0	1.2	1.2	-89.97	0.0	-15.0	15.0	12.6	2.48	6.065	
600.0	600.0	601.0	601.0	1.5	1.5	-89.97	0.0	-15.0	15.0	12.0	3.03	4.963	
700.0	700.0	701.0	701.0	1.8	1.8	-89.97	0.0	-15.0	15.0	11.5	3.58	4.200	
800.0	800.0	801.0	801.0	2.1	2.1	-89.97	0.0	-15.0	15.0	10.9	4.13	3.640	
900.0	900.0	901.0	901.0	2.3	2.3	-89.97	0.0	-15.0	15.0	10.4	4.68	3.212	
1,000.0	1,000.0	1,001.0	1,001.0	2.6	2.6	-89.97	0.0	-15.0	15.0	9.8	5.23	2.874	
1,100.0	1,100.0	1,101.0	1,101.0	2.9	2.9	-89.97	0.0	-15.0	15.0	9.3	5.78	2.601	
1,200.0	1,200.0	1,201.0	1,201.0	3.2	3.2	-89.97	0.0	-15.0	15.0	8.7	6.34	2.375	
1,300.0	1,300.0	1,301.0	1,301.0	3.4	3.4	-89.97	0.0	-15.0	15.0	8.2	6.89	2.185	
1,400.0	1,400.0	1,401.0	1,401.0	3.7	3.7	-89.97	0.0	-15.0	15.0	7.6	7.44	2.023	
1,500.0	1,500.0	1,501.0	1,501.0	4.0	4.0	-89.97	0.0	-15.0	15.0	7.1	7.99	1.884	
1,600.0	1,600.0	1,601.0	1,601.0	4.3	4.3	-89.97	0.0	-15.0	15.0	6.5	8.54	1.762	
1,700.0	1,700.0	1,701.0	1,701.0	4.5	4.5	-89.97	0.0	-15.0	15.0	6.0	9.09	1.655	
1,800.0	1,800.0	1,801.0	1,801.0	4.8	4.8	-89.97	0.0	-15.0	15.0	5.4	9.64	1.561	
1,900.0	1,900.0	1,901.0	1,901.0	5.1	5.1	-89.97	0.0	-15.0	15.0	4.9	10.19	1.476	Level 3
1,966.3	1,966.3	1,967.3	1,967.3	5.3	5.3	-89.97	0.0	-15.0	15.0	4.5	10.56	1.425	Level 3, CC
2,000.0	2,000.0	2,001.0	2,001.0	5.4	5.4	-89.97	0.0	-15.0	15.0	4.3	10.74	1.401	Level 3
2,100.0	2,100.0	2,100.9	2,100.8	5.6	5.6	-85.25	1.3	-15.4	15.5	4.2	11.29	1.372	Level 3, ES
2,200.0	2,200.0	2,200.6	2,200.5	5.9	5.9	-73.06	5.0	-16.6	17.3	5.5	11.84	1.464	Level 3
2,300.0	2,300.0	2,300.0	2,299.7	6.2	6.2	-58.59	11.3	-18.5	21.7	9.3	12.38	1.750	
2,400.0	2,400.0	2,399.1	2,398.4	6.5	6.5	-46.61	19.9	-21.1	29.1	16.2	12.93	2.254	
2,500.0	2,500.0	2,497.6	2,496.2	6.7	6.8	-38.27	31.0	-24.4	39.8	26.3	13.48	2.948	
2,600.0	2,600.0	2,595.6	2,593.2	7.0	7.1	-38.66	44.4	-28.5	52.3	38.2	14.03	3.726	
2,700.0	2,699.9	2,694.9	2,691.3	7.3	7.4	-36.77	59.1	-33.0	64.1	49.6	14.57	4.401	
2,800.0	2,799.7	2,794.4	2,789.6	7.6	7.7	-36.65	73.9	-37.4	73.9	58.8	15.12	4.891	
2,900.0	2,899.3	2,894.1	2,888.1	7.9	8.0	-37.65	88.7	-41.9	81.7	66.0	15.66	5.215	
3,000.0	2,998.6	2,993.9	2,986.7	8.1	8.4	-39.56	103.5	-46.4	87.4	71.2	16.21	5.390	
3,100.0	3,097.5	3,093.7	3,085.3	8.4	8.8	-42.32	118.3	-50.9	91.2	74.5	16.77	5.439	
3,162.8	3,159.5	3,156.4	3,147.2	8.6	9.0	-44.52	127.6	-53.7	92.8	75.7	17.14	5.414	
3,200.0	3,196.1	3,193.5	3,183.9	8.7	9.1	-45.92	133.1	-55.4	93.6	76.2	17.38	5.385	
3,300.0	3,294.6	3,293.3	3,282.5	9.1	9.5	-49.58	147.9	-59.9	95.9	77.9	18.02	5.323	
3,400.0	3,393.1	3,393.1	3,381.0	9.4	9.9	-53.05	162.7	-64.4	98.7	80.0	18.70	5.278	
3,500.0	3,491.6	3,492.9	3,479.6	9.8	10.3	-56.32	177.5	-68.9	101.8	82.4	19.39	5.247	
3,600.0	3,590.1	3,592.7	3,578.2	10.1	10.7	-59.39	192.3	-73.4	105.2	85.0	20.12	5.227	
3,700.0	3,688.6	3,692.5	3,676.8	10.5	11.0	-62.27	207.1	-77.9	108.8	88.0	20.86	5.217	
3,800.0	3,787.1	3,792.3	3,775.4	10.9	11.4	-64.95	221.9	-82.4	112.8	91.1	21.63	5.214	
3,900.0	3,885.6	3,892.0	3,874.0	11.3	11.8	-67.44	236.7	-86.9	116.9	94.5	22.41	5.217	
4,000.0	3,984.1	3,991.8	3,972.5	11.6	12.3	-69.76	251.5	-91.4	121.3	98.1	23.21	5.226	
4,100.0	4,082.6	4,091.6	4,071.1	12.0	12.7	-71.91	266.4	-95.8	125.9	101.8	24.03	5.238	
4,200.0	4,181.1	4,191.4	4,169.7	12.4	13.1	-73.91	281.2	-100.3	130.6	105.7	24.85	5.254	
4,300.0	4,279.6	4,291.2	4,268.3	12.9	13.5	-75.77	296.0	-104.8	135.4	109.8	25.69	5.273	
4,400.0	4,378.1	4,391.0	4,366.9	13.3	13.9	-77.50	310.8	-109.3	140.4	113.9	26.53	5.294	
4,500.0	4,476.6	4,490.8	4,465.4	13.7	14.3	-79.11	325.6	-113.8	145.6	118.2	27.38	5.316	
4,600.0	4,575.1	4,590.6	4,564.0	14.1	14.7	-80.61	340.4	-118.3	150.8	122.6	28.24	5.340	
4,700.0	4,673.6	4,690.3	4,662.6	14.5	15.1	-82.01	355.2	-122.8	156.1	127.0	29.10	5.365	
4,800.0	4,772.1	4,790.1	4,761.2	15.0	15.6	-83.31	370.0	-127.3	161.5	131.6	29.97	5.390	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,870.6	4,889.9	4,859.8	15.4	16.0	-84.53	384.8	-131.8	167.0	136.2	30.84	5.416	
5,000.0	4,969.1	4,989.7	4,958.3	15.8	16.4	-85.68	399.6	-136.3	172.6	140.9	31.71	5.442	
5,100.0	5,067.6	5,089.5	5,056.9	16.3	16.8	-86.75	414.4	-140.8	178.2	145.6	32.59	5.468	
5,200.0	5,166.1	5,189.3	5,155.5	16.7	17.3	-87.75	429.2	-145.3	183.9	150.4	33.47	5.494	
5,300.0	5,264.6	5,289.1	5,254.1	17.1	17.7	-88.70	444.1	-149.8	189.6	155.3	34.35	5.521	
5,400.0	5,363.1	5,388.9	5,352.7	17.6	18.1	-89.58	458.9	-154.2	195.4	160.2	35.23	5.547	
5,500.0	5,461.6	5,488.8	5,451.4	18.0	18.5	-90.42	473.7	-158.7	201.2	165.1	36.11	5.572	
5,544.5	5,505.4	5,534.3	5,496.4	18.2	18.7	-90.91	480.0	-160.7	203.7	167.2	36.47	5.584	
5,600.0	5,560.2	5,591.2	5,552.8	18.4	18.9	-91.67	487.0	-162.8	206.4	169.5	36.89	5.595	
5,700.0	5,659.2	5,693.5	5,654.6	18.8	19.2	-92.93	496.7	-165.7	210.3	172.8	37.54	5.603	
5,800.0	5,758.7	5,795.8	5,756.7	19.0	19.4	-94.11	503.0	-167.6	213.0	174.9	38.11	5.589	
5,900.0	5,858.5	5,897.9	5,858.8	19.3	19.6	-95.21	505.8	-168.5	214.4	175.8	38.60	5.554	
6,000.0	5,958.4	5,998.5	5,959.3	19.5	19.8	-96.08	505.8	-168.5	214.7	175.7	39.02	5.503	
6,041.6	6,000.0	6,039.8	6,000.6	19.6	19.9	-91.51	503.8	-168.5	214.8	175.7	39.16	5.485	
6,100.0	6,058.4	6,097.1	6,057.6	19.7	19.9	-93.23	497.4	-168.6	215.1	175.8	39.34	5.467	
6,139.9	6,098.3	6,135.6	6,095.5	19.8	19.9	-95.02	490.7	-168.6	215.6	176.2	39.44	5.467	
6,150.0	6,108.4	6,145.3	6,104.9	19.8	19.9	84.43	488.7	-168.6	215.8	176.3	39.46	5.469	
6,200.0	6,158.4	6,192.6	6,150.9	19.9	19.9	81.88	477.2	-168.6	217.0	177.5	39.49	5.495	
6,250.0	6,208.0	6,239.5	6,195.5	19.9	19.8	79.41	463.1	-168.6	218.6	179.2	39.44	5.543	
6,300.0	6,257.3	6,285.8	6,238.7	19.9	19.7	77.02	446.5	-168.6	220.6	181.3	39.29	5.613	
6,350.0	6,305.8	6,331.7	6,280.5	19.9	19.6	74.74	427.5	-168.6	222.9	183.8	39.07	5.704	
6,400.0	6,353.4	6,377.0	6,320.6	19.8	19.5	72.57	406.2	-168.6	225.4	186.6	38.77	5.814	
6,450.0	6,400.0	6,422.0	6,359.0	19.7	19.4	70.51	382.9	-168.6	228.2	189.8	38.39	5.944	
6,500.0	6,445.2	6,466.6	6,395.6	19.6	19.3	68.58	357.5	-168.7	231.1	193.2	37.95	6.090	
6,550.0	6,489.0	6,510.8	6,430.5	19.5	19.2	66.77	330.3	-168.7	234.1	196.7	37.45	6.253	
6,600.0	6,531.1	6,554.6	6,463.4	19.4	19.1	65.09	301.4	-168.7	237.2	200.3	36.90	6.430	
6,650.0	6,571.3	6,600.0	6,495.7	19.3	19.0	63.49	269.5	-168.7	240.4	204.1	36.30	6.621	
6,700.0	6,609.5	6,641.4	6,523.5	19.2	18.9	62.12	238.8	-168.7	243.4	207.7	35.71	6.816	
6,750.0	6,645.6	6,684.4	6,550.5	19.0	18.8	60.82	205.4	-168.8	246.4	211.3	35.11	7.018	
6,800.0	6,679.2	6,727.2	6,575.4	19.0	18.8	59.64	170.7	-168.8	249.3	214.8	34.53	7.219	
6,850.0	6,710.4	6,769.7	6,598.3	18.9	18.8	58.58	134.8	-168.8	252.0	218.0	33.99	7.414	
6,900.0	6,739.0	6,812.0	6,619.1	18.9	18.8	57.64	97.9	-168.9	254.6	221.1	33.52	7.595	
6,950.0	6,764.8	6,854.2	6,637.7	18.9	18.8	56.81	60.1	-168.9	256.9	223.8	33.13	7.755	
7,000.0	6,787.8	6,900.0	6,655.5	19.0	18.9	56.04	17.9	-168.9	259.0	226.2	32.84	7.887	
7,050.0	6,807.8	6,938.0	6,668.3	19.1	19.0	55.49	-17.9	-168.9	260.8	228.1	32.70	7.976	
7,100.0	6,824.8	6,979.8	6,680.4	19.3	19.2	54.99	-57.9	-169.0	262.4	229.7	32.70	8.023	
7,150.0	6,838.6	7,021.5	6,690.2	19.6	19.5	54.59	-98.4	-169.0	263.6	230.8	32.86	8.023	
7,200.0	6,849.3	7,063.1	6,697.7	19.9	19.8	54.30	-139.3	-169.0	264.5	231.4	33.19	7.972	
7,250.0	6,856.8	7,104.6	6,703.1	20.2	20.1	54.11	-180.5	-169.1	265.2	231.5	33.68	7.873	
7,300.0	6,861.0	7,150.0	6,706.3	20.7	20.5	54.01	-225.7	-169.1	265.5	231.1	34.38	7.723	
7,313.4	6,861.6	7,157.3	6,706.6	20.8	20.6	54.01	-233.0	-169.1	265.5	230.9	34.56	7.683	
7,339.5	6,862.0	7,178.9	6,707.0	21.0	20.8	54.01	-254.7	-169.1	265.5	230.5	34.99	7.587	
7,339.6	6,862.0	7,179.0	6,707.0	21.0	20.8	54.01	-254.8	-169.1	265.5	230.5	34.99	7.587	
7,340.4	6,862.0	7,179.7	6,707.0	21.0	20.8	54.01	-255.4	-169.1	265.5	230.5	35.00	7.584	
7,343.4	6,862.0	7,182.2	6,707.0	21.1	20.8	54.02	-257.9	-169.1	265.5	230.4	35.05	7.574	
7,400.0	6,862.0	7,237.8	6,706.7	21.5	21.4	53.95	-313.5	-169.2	265.7	229.7	35.98	7.384	
7,500.0	6,862.0	7,337.8	6,706.0	22.7	22.6	53.84	-413.5	-169.2	266.1	228.0	38.06	6.992	
7,600.0	6,862.0	7,437.8	6,705.3	24.1	24.0	53.73	-513.5	-169.3	266.5	226.1	40.40	6.595	
7,700.0	6,862.0	7,537.8	6,704.7	25.6	25.5	53.61	-613.5	-169.4	266.9	223.9	42.97	6.210	
7,800.0	6,862.0	7,637.8	6,704.0	27.2	27.2	53.50	-713.5	-169.5	267.3	221.5	45.73	5.845	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,900.0	6,862.0	7,737.8	6,703.4	28.9	28.9	53.38	-813.5	-169.6	267.7	219.0	48.63	5.504	
8,000.0	6,862.0	7,837.8	6,702.7	30.8	30.7	53.27	-913.5	-169.6	268.1	216.4	51.66	5.189	
8,100.0	6,862.0	7,937.7	6,702.0	32.6	32.6	53.16	-1,013.5	-169.7	268.5	213.7	54.79	4.900	
8,200.0	6,862.0	8,037.7	6,701.4	34.6	34.5	53.05	-1,113.4	-169.8	268.9	210.9	58.00	4.636	
8,300.0	6,862.0	8,137.7	6,700.7	36.6	36.5	52.94	-1,213.4	-169.9	269.3	208.0	61.27	4.395	
8,400.0	6,862.0	8,237.7	6,700.0	38.6	38.6	52.82	-1,313.4	-170.0	269.7	205.1	64.61	4.174	
8,500.0	6,862.0	8,337.7	6,699.4	40.6	40.6	52.71	-1,413.4	-170.0	270.1	202.1	67.99	3.973	
8,600.0	6,862.0	8,437.7	6,698.7	42.7	42.7	52.60	-1,513.4	-170.1	270.5	199.1	71.40	3.788	
8,700.0	6,862.0	8,537.7	6,698.1	44.9	44.9	52.49	-1,613.4	-170.2	270.9	196.0	74.85	3.619	
8,800.0	6,862.0	8,637.7	6,697.4	47.0	47.0	52.38	-1,713.4	-170.3	271.3	193.0	78.33	3.464	
8,900.0	6,862.0	8,737.7	6,696.7	49.1	49.2	52.27	-1,813.4	-170.3	271.7	189.9	81.82	3.321	
9,000.0	6,862.0	8,837.7	6,696.1	51.3	51.3	52.16	-1,913.4	-170.4	272.1	186.8	85.34	3.189	
9,100.0	6,862.0	8,937.7	6,695.4	53.5	53.5	52.05	-2,013.4	-170.5	272.5	183.7	88.87	3.067	
9,200.0	6,862.0	9,037.7	6,694.8	55.7	55.7	51.94	-2,113.4	-170.6	272.9	180.5	92.41	2.954	
9,300.0	6,862.0	9,137.7	6,694.1	57.9	57.9	51.83	-2,213.4	-170.7	273.3	177.4	95.95	2.849	
9,400.0	6,862.0	9,237.7	6,693.4	60.2	60.2	51.73	-2,313.4	-170.7	273.8	174.2	99.51	2.751	
9,500.0	6,862.0	9,337.7	6,692.8	62.4	62.4	51.62	-2,413.4	-170.8	274.2	171.1	103.07	2.660	
9,600.0	6,862.0	9,437.7	6,692.1	64.6	64.7	51.51	-2,513.4	-170.9	274.6	167.9	106.64	2.575	
9,700.0	6,862.0	9,537.7	6,691.4	66.9	66.9	51.40	-2,613.4	-171.0	275.0	164.8	110.21	2.495	
9,800.0	6,862.0	9,637.7	6,690.8	69.1	69.2	51.30	-2,713.4	-171.0	275.4	161.6	113.78	2.421	
9,900.0	6,862.0	9,737.7	6,690.1	71.4	71.4	51.19	-2,813.4	-171.1	275.8	158.5	117.35	2.351	
10,000.0	6,862.0	9,837.7	6,689.5	73.7	73.7	51.08	-2,913.4	-171.2	276.3	155.3	120.93	2.285	
10,100.0	6,862.0	9,937.7	6,688.8	75.9	76.0	50.98	-3,013.4	-171.3	276.7	152.2	124.50	2.222	
10,200.0	6,862.0	10,037.7	6,688.1	78.2	78.3	50.87	-3,113.4	-171.4	277.1	149.0	128.07	2.164	
10,300.0	6,862.0	10,137.7	6,687.5	80.5	80.5	50.77	-3,213.4	-171.4	277.5	145.9	131.63	2.108	
10,400.0	6,862.0	10,237.7	6,686.8	82.8	82.8	50.66	-3,313.4	-171.5	277.9	142.7	135.20	2.056	
10,500.0	6,862.0	10,337.7	6,686.1	85.1	85.1	50.56	-3,413.3	-171.6	278.4	139.6	138.76	2.006	
10,600.0	6,862.0	10,437.7	6,685.5	87.4	87.4	50.45	-3,513.3	-171.7	278.8	136.5	142.32	1.959	
10,700.0	6,862.0	10,537.7	6,684.8	89.7	89.7	50.35	-3,613.3	-171.8	279.2	133.4	145.87	1.914	
10,800.0	6,862.0	10,637.7	6,684.2	92.0	92.0	50.24	-3,713.3	-171.8	279.6	130.2	149.42	1.872	
10,900.0	6,862.0	10,737.7	6,683.5	94.3	94.3	50.14	-3,813.3	-171.9	280.1	127.1	152.96	1.831	
11,000.0	6,862.0	10,837.7	6,682.8	96.6	96.6	50.04	-3,913.3	-172.0	280.5	124.0	156.51	1.792	
11,100.0	6,862.0	10,937.7	6,682.2	98.9	98.9	49.94	-4,013.3	-172.1	280.9	120.9	160.04	1.755	
11,200.0	6,862.0	11,037.7	6,681.5	101.2	101.2	49.83	-4,113.3	-172.1	281.4	117.8	163.57	1.720	
11,300.0	6,862.0	11,137.7	6,680.9	103.5	103.5	49.73	-4,213.3	-172.2	281.8	114.7	167.09	1.686	
11,400.0	6,862.0	11,237.7	6,680.2	105.8	105.8	49.63	-4,313.3	-172.3	282.2	111.6	170.61	1.654	
11,500.0	6,862.0	11,337.7	6,679.5	108.1	108.2	49.53	-4,413.3	-172.4	282.7	108.5	174.13	1.623	
11,600.0	6,862.0	11,437.7	6,678.9	110.4	110.5	49.43	-4,513.3	-172.5	283.1	105.5	177.63	1.594	
11,700.0	6,862.0	11,537.7	6,678.2	112.8	112.8	49.33	-4,613.3	-172.5	283.5	102.4	181.13	1.565	
11,800.0	6,862.0	11,637.7	6,677.5	115.1	115.1	49.22	-4,713.3	-172.6	284.0	99.3	184.63	1.538	
11,900.0	6,862.0	11,737.7	6,676.9	117.4	117.4	49.12	-4,813.3	-172.7	284.4	96.3	188.12	1.512	
12,000.0	6,862.0	11,837.7	6,676.2	119.7	119.7	49.02	-4,913.3	-172.8	284.8	93.2	191.60	1.487	Level 3
12,100.0	6,862.0	11,937.7	6,675.6	122.0	122.1	48.92	-5,013.3	-172.9	285.3	90.2	195.07	1.462	Level 3
12,200.0	6,862.0	12,037.7	6,674.9	124.4	124.4	48.83	-5,113.3	-172.9	285.7	87.2	198.54	1.439	Level 3
12,300.0	6,862.0	12,137.7	6,674.2	126.7	126.7	48.73	-5,213.3	-173.0	286.2	84.2	202.00	1.417	Level 3
12,400.0	6,862.0	12,237.7	6,673.6	129.0	129.0	48.63	-5,313.3	-173.1	286.6	81.1	205.46	1.395	Level 3
12,500.0	6,862.0	12,337.7	6,672.9	131.3	131.4	48.53	-5,413.3	-173.2	287.0	78.1	208.90	1.374	Level 3
12,600.0	6,862.0	12,437.6	6,672.3	133.7	133.7	48.43	-5,513.3	-173.2	287.5	75.1	212.35	1.354	Level 3
12,700.0	6,862.0	12,537.6	6,671.6	136.0	136.0	48.33	-5,613.3	-173.3	287.9	72.1	215.78	1.334	Level 3
12,800.0	6,862.0	12,637.6	6,670.9	138.3	138.3	48.24	-5,713.2	-173.4	288.4	69.2	219.21	1.316	Level 3
12,900.0	6,862.0	12,737.6	6,670.3	140.6	140.7	48.14	-5,813.2	-173.5	288.8	66.2	222.63	1.297	Level 3

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-203 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,000.0	6,862.0	12,837.6	6,669.6	143.0	143.0	48.04	-5,913.2	-173.6	289.3	63.2	226.04	1.280	Level 3
13,100.0	6,862.0	12,937.6	6,668.9	145.3	145.3	47.94	-6,013.2	-173.6	289.7	60.3	229.45	1.263	Level 3
13,200.0	6,862.0	13,037.6	6,668.3	147.6	147.7	47.85	-6,113.2	-173.7	290.2	57.3	232.85	1.246	Level 2
13,300.0	6,862.0	13,137.6	6,667.6	150.0	150.0	47.75	-6,213.2	-173.8	290.6	54.4	236.24	1.230	Level 2
13,400.0	6,862.0	13,237.6	6,667.0	152.3	152.3	47.66	-6,313.2	-173.9	291.1	51.4	239.62	1.215	Level 2
13,500.0	6,862.0	13,337.6	6,666.3	154.6	154.7	47.56	-6,413.2	-174.0	291.5	48.5	243.00	1.200	Level 2
13,600.0	6,862.0	13,437.6	6,665.6	157.0	157.0	47.47	-6,513.2	-174.0	292.0	45.6	246.37	1.185	Level 2
13,700.0	6,862.0	13,537.6	6,665.0	159.3	159.3	47.37	-6,613.2	-174.1	292.4	42.7	249.73	1.171	Level 2
13,800.0	6,862.0	13,637.6	6,664.3	161.6	161.7	47.28	-6,713.2	-174.2	292.9	39.8	253.09	1.157	Level 2
13,900.0	6,862.0	13,737.6	6,663.6	164.0	164.0	47.18	-6,813.2	-174.3	293.3	36.9	256.44	1.144	Level 2
14,000.0	6,862.0	13,837.6	6,663.0	166.3	166.3	47.09	-6,913.2	-174.3	293.8	34.0	259.78	1.131	Level 2
14,100.0	6,862.0	13,937.6	6,662.3	168.6	168.7	46.99	-7,013.2	-174.4	294.2	31.1	263.11	1.118	Level 2
14,145.2	6,862.0	13,982.9	6,662.0	169.7	169.7	46.95	-7,058.4	-174.5	294.4	29.8	264.62	1.113	Level 2, SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-89.65	0.4	-59.9	59.9	59.9	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-89.65	0.4	-59.9	59.9	59.6	0.28	215.413	
200.0	200.0	201.0	201.0	0.4	0.4	-89.65	0.4	-59.9	59.9	59.1	0.83	72.282	
300.0	300.0	301.0	301.0	0.7	0.7	-89.65	0.4	-59.9	59.9	58.5	1.38	43.427	
400.0	400.0	401.0	401.0	1.0	1.0	-89.65	0.4	-59.9	59.9	58.0	1.93	31.037	
500.0	500.0	501.0	501.0	1.2	1.2	-89.65	0.4	-59.9	59.9	57.4	2.48	24.147	
600.0	600.0	601.0	601.0	1.5	1.5	-89.65	0.4	-59.9	59.9	56.9	3.03	19.761	
700.0	700.0	701.0	701.0	1.8	1.8	-89.65	0.4	-59.9	59.9	56.3	3.58	16.723	
800.0	800.0	801.0	801.0	2.1	2.1	-89.65	0.4	-59.9	59.9	55.8	4.13	14.495	
900.0	900.0	901.0	901.0	2.3	2.3	-89.65	0.4	-59.9	59.9	55.2	4.68	12.791	
966.3	966.3	967.3	967.3	2.5	2.5	-89.65	0.4	-59.9	59.9	54.9	5.05	11.865	CC
1,000.0	1,000.0	1,001.0	1,001.0	2.6	2.6	-89.65	0.4	-59.9	59.9	54.7	5.23	11.445	ES
1,100.0	1,100.0	1,100.0	1,100.0	2.9	2.9	-89.02	1.0	-61.0	61.0	55.3	5.77	10.572	
1,200.0	1,200.0	1,198.2	1,198.1	3.2	3.1	-87.30	3.0	-64.3	64.4	58.1	6.31	10.218	SF
1,300.0	1,300.0	1,296.4	1,296.1	3.4	3.4	-84.83	6.3	-69.7	70.2	63.4	6.84	10.257	
1,400.0	1,400.0	1,394.3	1,393.6	3.7	3.7	-81.98	10.9	-77.3	78.4	71.0	7.38	10.619	
1,500.0	1,500.0	1,491.6	1,490.3	4.0	4.0	-79.12	16.7	-86.9	89.2	81.3	7.93	11.248	
1,600.0	1,600.0	1,588.3	1,586.0	4.3	4.3	-76.45	23.8	-98.6	102.5	94.0	8.48	12.096	
1,700.0	1,700.0	1,684.3	1,680.6	4.5	4.7	-74.09	32.0	-112.2	118.5	109.4	9.03	13.123	
1,800.0	1,800.0	1,779.4	1,774.0	4.8	5.0	-72.05	41.4	-127.7	136.9	127.4	9.58	14.294	
1,900.0	1,900.0	1,873.5	1,865.9	5.1	5.5	-70.34	51.8	-145.0	157.9	147.8	10.14	15.582	
2,000.0	2,000.0	1,970.0	1,959.8	5.4	5.9	-68.89	63.3	-164.1	180.6	169.9	10.70	16.880	
2,100.0	2,100.0	2,067.3	2,054.5	5.6	6.4	-67.75	75.0	-183.3	203.4	192.2	11.27	18.058	
2,200.0	2,200.0	2,164.6	2,149.2	5.9	6.9	-66.85	86.6	-202.6	226.3	214.5	11.83	19.124	
2,300.0	2,300.0	2,261.9	2,243.8	6.2	7.5	-66.11	98.3	-221.8	249.3	236.8	12.41	20.090	
2,400.0	2,400.0	2,359.2	2,338.5	6.5	8.0	-65.49	109.9	-241.1	272.2	259.2	12.98	20.970	
2,500.0	2,500.0	2,456.5	2,433.1	6.7	8.5	-64.97	121.5	-260.3	295.2	281.6	13.56	21.774	
2,600.0	2,600.0	2,553.9	2,527.9	7.0	9.1	-69.61	133.2	-279.6	317.8	303.7	14.10	22.541	
2,700.0	2,699.9	2,651.5	2,622.9	7.3	9.6	-69.54	144.9	-298.9	339.4	324.7	14.68	23.123	
2,800.0	2,799.7	2,749.3	2,718.0	7.6	10.2	-69.84	156.5	-318.2	360.2	345.0	15.27	23.597	
2,900.0	2,899.3	2,847.1	2,813.1	7.9	10.8	-70.47	168.2	-337.6	380.2	364.4	15.86	23.971	
3,000.0	2,998.6	2,944.9	2,908.3	8.1	11.3	-71.38	179.9	-356.9	399.5	383.0	16.47	24.253	
3,100.0	3,097.5	3,042.6	3,003.4	8.4	11.9	-72.53	191.6	-376.3	418.1	401.0	17.10	24.451	
3,162.8	3,159.5	3,103.9	3,063.0	8.6	12.3	-73.36	199.0	-388.4	429.6	412.1	17.51	24.534	
3,200.0	3,196.1	3,140.2	3,098.3	8.7	12.5	-73.97	203.3	-395.6	436.3	418.6	17.76	24.572	
3,300.0	3,294.6	3,237.8	3,193.3	9.1	13.1	-75.51	215.0	-414.9	454.7	436.3	18.44	24.659	
3,400.0	3,393.1	3,335.4	3,288.2	9.4	13.6	-76.93	226.6	-434.2	473.4	454.2	19.14	24.728	
3,500.0	3,491.6	3,433.0	3,383.1	9.8	14.2	-78.24	238.3	-453.5	492.3	472.5	19.87	24.780	
3,600.0	3,590.1	3,530.5	3,478.1	10.1	14.8	-79.46	250.0	-472.8	511.5	490.9	20.61	24.818	
3,700.0	3,688.6	3,628.1	3,573.0	10.5	15.4	-80.59	261.7	-492.1	530.9	509.5	21.37	24.844	
3,800.0	3,787.1	3,725.7	3,667.9	10.9	16.0	-81.63	273.3	-511.4	550.5	528.3	22.14	24.859	
3,900.0	3,885.6	3,823.3	3,762.9	11.3	16.5	-82.61	285.0	-530.7	570.2	547.3	22.93	24.867	
4,000.0	3,984.1	3,920.8	3,857.8	11.6	17.1	-83.53	296.7	-550.0	590.1	566.4	23.73	24.867	
4,100.0	4,082.6	4,018.4	3,952.7	12.0	17.7	-84.38	308.3	-569.3	610.2	585.6	24.54	24.862	
4,200.0	4,181.1	4,116.0	4,047.7	12.4	18.3	-85.18	320.0	-588.6	630.3	605.0	25.36	24.853	
4,300.0	4,279.6	4,213.6	4,142.6	12.9	18.9	-85.93	331.7	-607.9	650.6	624.4	26.19	24.840	
4,400.0	4,378.1	4,311.2	4,237.5	13.3	19.5	-86.63	343.4	-627.2	670.9	643.9	27.03	24.824	
4,500.0	4,476.6	4,408.7	4,332.5	13.7	20.1	-87.30	355.0	-646.5	691.4	663.5	27.87	24.806	
4,600.0	4,575.1	4,506.3	4,427.4	14.1	20.7	-87.92	366.7	-665.8	711.9	683.2	28.72	24.786	
4,700.0	4,673.6	4,603.9	4,522.3	14.5	21.3	-88.51	378.4	-685.2	732.6	703.0	29.58	24.766	
4,800.0	4,772.1	4,701.5	4,617.3	15.0	21.8	-89.07	390.0	-704.5	753.3	722.8	30.44	24.744	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-243 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,870.6	4,799.1	4,712.2	15.4	22.4	-89.60	401.7	-723.8	774.0	742.7	31.31	24.722	
5,000.0	4,969.1	4,896.6	4,807.1	15.8	23.0	-90.10	413.4	-743.1	794.8	762.6	32.18	24.699	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	-89.30	0.4	-29.8	29.8	29.8	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	-89.30	0.4	-29.8	29.8	29.5	0.28	107.212	
200.0	200.0	201.0	201.0	0.4	0.4	-89.30	0.4	-29.8	29.8	29.0	0.83	35.975	
300.0	300.0	301.0	301.0	0.7	0.7	-89.30	0.4	-29.8	29.8	28.4	1.38	21.614	
400.0	400.0	401.0	401.0	1.0	1.0	-89.30	0.4	-29.8	29.8	27.9	1.93	15.447	
500.0	500.0	501.0	501.0	1.2	1.2	-89.30	0.4	-29.8	29.8	27.3	2.48	12.018	
600.0	600.0	601.0	601.0	1.5	1.5	-89.30	0.4	-29.8	29.8	26.8	3.03	9.835	
700.0	700.0	701.0	701.0	1.8	1.8	-89.30	0.4	-29.8	29.8	26.2	3.58	8.323	
800.0	800.0	801.0	801.0	2.1	2.1	-89.30	0.4	-29.8	29.8	25.7	4.13	7.214	
900.0	900.0	901.0	901.0	2.3	2.3	-89.30	0.4	-29.8	29.8	25.1	4.68	6.366	
1,000.0	1,000.0	1,001.0	1,001.0	2.6	2.6	-89.30	0.4	-29.8	29.8	24.6	5.23	5.696	
1,100.0	1,100.0	1,101.0	1,101.0	2.9	2.9	-89.30	0.4	-29.8	29.8	24.0	5.78	5.154	
1,200.0	1,200.0	1,201.0	1,201.0	3.2	3.2	-89.30	0.4	-29.8	29.8	23.5	6.34	4.706	
1,300.0	1,300.0	1,301.0	1,301.0	3.4	3.4	-89.30	0.4	-29.8	29.8	22.9	6.89	4.330	
1,366.3	1,366.3	1,367.3	1,367.3	3.6	3.6	-89.30	0.4	-29.8	29.8	22.6	7.25	4.112 CC	
1,400.0	1,400.0	1,401.0	1,401.0	3.7	3.7	-89.30	0.4	-29.8	29.8	22.4	7.44	4.009 ES	
1,500.0	1,500.0	1,500.5	1,500.5	4.0	4.0	-87.34	1.4	-30.6	30.6	22.7	7.98	3.839	
1,600.0	1,600.0	1,600.0	1,599.9	4.3	4.3	-82.15	4.5	-33.0	33.3	24.8	8.52	3.905	
1,700.0	1,700.0	1,699.0	1,698.7	4.5	4.5	-75.25	9.7	-36.8	38.2	29.1	9.07	4.210	
1,800.0	1,800.0	1,797.7	1,796.9	4.8	4.8	-68.23	16.9	-42.3	45.7	36.1	9.61	4.752	
1,900.0	1,900.0	1,895.8	1,894.4	5.1	5.1	-62.10	26.0	-49.2	56.0	45.8	10.16	5.511	
2,000.0	2,000.0	1,993.3	1,990.9	5.4	5.4	-57.17	37.1	-57.5	69.2	58.4	10.71	6.456	
2,100.0	2,100.0	2,091.6	2,088.0	5.6	5.8	-53.44	49.6	-67.0	84.4	73.1	11.26	7.489	
2,200.0	2,200.0	2,190.3	2,185.4	5.9	6.1	-50.83	62.3	-76.5	99.9	88.1	11.82	8.452	
2,300.0	2,300.0	2,289.0	2,282.8	6.2	6.5	-48.93	75.0	-86.0	115.6	103.2	12.37	9.340	
2,400.0	2,400.0	2,387.7	2,380.3	6.5	6.8	-47.48	87.6	-95.6	131.3	118.4	12.93	10.157	
2,500.0	2,500.0	2,486.4	2,477.7	6.7	7.2	-46.35	100.3	-105.1	147.1	133.7	13.49	10.910	
2,600.0	2,600.0	2,585.3	2,575.2	7.0	7.6	-50.79	113.0	-114.7	162.2	148.2	14.04	11.556	
2,700.0	2,699.9	2,684.4	2,673.0	7.3	8.0	-50.84	125.7	-124.2	175.6	161.0	14.60	12.031	
2,800.0	2,799.7	2,783.6	2,771.0	7.6	8.4	-51.50	138.4	-133.8	187.4	172.3	15.16	12.363	
2,900.0	2,899.3	2,883.0	2,869.1	7.9	8.8	-52.69	151.2	-143.5	197.7	182.0	15.73	12.568	
3,000.0	2,998.6	2,982.4	2,967.2	8.1	9.3	-54.35	163.9	-153.1	206.5	190.2	16.31	12.663	
3,100.0	3,097.5	3,081.8	3,065.3	8.4	9.7	-56.45	176.7	-162.7	214.1	197.1	16.91	12.661	
3,162.8	3,159.5	3,144.2	3,126.9	8.6	9.9	-57.99	184.7	-168.7	218.2	200.9	17.30	12.618	
3,200.0	3,196.1	3,181.1	3,163.3	8.7	10.1	-58.97	189.4	-172.3	220.6	203.1	17.54	12.581	
3,300.0	3,294.6	3,280.4	3,261.3	9.1	10.5	-61.51	202.1	-181.9	227.4	209.2	18.20	12.494	
3,400.0	3,393.1	3,379.7	3,359.3	9.4	11.0	-63.90	214.9	-191.5	234.6	215.7	18.89	12.420	
3,500.0	3,491.6	3,478.9	3,457.3	9.8	11.4	-66.14	227.6	-201.1	242.1	222.5	19.60	12.356	
3,600.0	3,590.1	3,578.2	3,555.3	10.1	11.8	-68.25	240.3	-210.7	250.1	229.7	20.33	12.302	
3,700.0	3,688.6	3,677.5	3,653.3	10.5	12.3	-70.22	253.1	-220.2	258.3	237.2	21.07	12.256	
3,800.0	3,787.1	3,776.8	3,751.2	10.9	12.7	-72.08	265.8	-229.8	266.8	245.0	21.84	12.217	
3,900.0	3,885.6	3,876.0	3,849.2	11.3	13.1	-73.81	278.5	-239.4	275.6	253.0	22.62	12.183	
4,000.0	3,984.1	3,975.3	3,947.2	11.6	13.6	-75.44	291.3	-249.0	284.6	261.2	23.42	12.155	
4,100.0	4,082.6	4,074.6	4,045.2	12.0	14.0	-76.97	304.0	-258.6	293.8	269.6	24.22	12.131	
4,200.0	4,181.1	4,173.9	4,143.2	12.4	14.4	-78.40	316.7	-268.2	303.3	278.2	25.04	12.112	
4,300.0	4,279.6	4,273.1	4,241.2	12.9	14.9	-79.75	329.5	-277.8	312.9	287.0	25.87	12.096	
4,400.0	4,378.1	4,372.4	4,339.2	13.3	15.3	-81.02	342.2	-287.4	322.7	296.0	26.70	12.084	
4,500.0	4,476.6	4,471.7	4,437.1	13.7	15.8	-82.21	354.9	-297.0	332.6	305.0	27.54	12.074	
4,600.0	4,575.1	4,571.0	4,535.1	14.1	16.2	-83.33	367.7	-306.6	342.6	314.2	28.39	12.067	
4,700.0	4,673.6	4,670.2	4,633.1	14.5	16.7	-84.39	380.4	-316.2	352.8	323.6	29.25	12.063	
4,800.0	4,772.1	4,769.5	4,731.1	15.0	17.1	-85.39	393.1	-325.8	363.1	333.0	30.11	12.060	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,870.6	4,868.8	4,829.1	15.4	17.5	-86.34	405.9	-335.4	373.5	342.5	30.97	12.060	
5,000.0	4,969.1	4,968.1	4,927.1	15.8	18.0	-87.23	418.6	-345.0	384.0	352.1	31.84	12.061	
5,100.0	5,067.6	5,067.3	5,025.0	16.3	18.4	-88.08	431.3	-354.6	394.6	361.8	32.71	12.063	
5,200.0	5,166.1	5,166.6	5,123.0	16.7	18.9	-88.88	444.1	-364.2	405.2	371.6	33.58	12.067	
5,300.0	5,264.6	5,265.9	5,221.0	17.1	19.3	-89.64	456.8	-373.8	415.9	381.5	34.46	12.072	
5,400.0	5,363.1	5,365.2	5,319.0	17.6	19.8	-90.36	469.5	-383.4	426.7	391.4	35.33	12.077	
5,500.0	5,461.6	5,473.0	5,425.6	18.0	20.2	-91.24	482.3	-393.0	436.8	400.7	36.19	12.071	
5,544.5	5,505.4	5,522.0	5,474.3	18.2	20.3	-91.75	487.1	-396.6	440.6	404.0	36.56	12.050	
5,600.0	5,560.2	5,583.2	5,535.2	18.4	20.5	-92.50	492.2	-400.4	444.6	407.6	37.00	12.016	
5,700.0	5,659.2	5,693.5	5,645.2	18.8	20.8	-93.73	498.6	-405.3	450.0	412.3	37.68	11.941	
5,800.0	5,758.7	5,803.9	5,755.4	19.0	21.0	-94.82	501.7	-407.6	452.9	414.6	38.28	11.831	
5,900.0	5,858.5	5,907.9	5,859.5	19.3	21.2	-95.69	502.0	-407.8	453.7	414.9	38.79	11.695	
6,000.0	5,958.4	6,007.8	5,959.4	19.5	21.4	-96.09	502.0	-407.8	454.0	414.8	39.25	11.568	
6,041.6	6,000.0	6,049.4	6,001.0	19.6	21.5	-90.95	502.0	-407.8	454.1	414.7	39.42	11.518	
6,052.5	6,010.9	6,060.4	6,011.9	19.6	21.5	-90.95	502.0	-407.8	454.1	414.6	39.47	11.504	
6,100.0	6,058.4	6,107.5	6,059.0	19.7	21.6	-91.06	501.1	-407.8	454.1	414.4	39.65	11.451	
6,139.9	6,098.3	6,146.8	6,098.2	19.8	21.6	-91.42	498.3	-407.8	454.2	414.3	39.81	11.409	
6,150.0	6,108.4	6,156.6	6,108.0	19.8	21.6	88.42	497.2	-407.8	454.2	414.3	39.84	11.401	
6,200.0	6,158.4	6,205.4	6,156.3	19.9	21.6	87.81	490.3	-407.8	454.3	414.4	39.95	11.372	
6,250.0	6,208.0	6,254.0	6,203.8	19.9	21.6	87.21	480.3	-407.8	454.5	414.5	40.00	11.363	
6,300.0	6,257.3	6,302.2	6,250.3	19.9	21.6	86.63	467.4	-407.8	454.8	414.8	39.99	11.373	
6,350.0	6,305.8	6,350.0	6,295.5	19.9	21.5	86.06	451.8	-407.8	455.1	415.2	39.91	11.402	
6,400.0	6,353.4	6,397.9	6,339.6	19.8	21.4	85.51	433.3	-407.8	455.4	415.6	39.78	11.447	
6,450.0	6,400.0	6,445.3	6,382.2	19.7	21.3	84.98	412.3	-407.9	455.8	416.1	39.61	11.507	
6,500.0	6,445.2	6,492.6	6,423.2	19.6	21.2	84.47	388.9	-407.9	456.1	416.7	39.40	11.578	
6,550.0	6,489.0	6,539.6	6,462.4	19.5	21.1	83.98	363.0	-407.9	456.5	417.4	39.16	11.658	
6,600.0	6,531.1	6,586.4	6,499.9	19.4	21.0	83.52	335.0	-407.9	456.9	418.0	38.90	11.745	
6,650.0	6,571.3	6,633.0	6,535.4	19.3	20.9	83.09	304.8	-407.9	457.3	418.7	38.65	11.833	
6,700.0	6,609.5	6,679.5	6,568.9	19.2	20.7	82.69	272.6	-407.9	457.7	419.3	38.40	11.918	
6,750.0	6,645.6	6,725.8	6,600.3	19.0	20.6	82.32	238.6	-407.9	458.1	419.9	38.18	11.997	
6,800.0	6,679.2	6,771.9	6,629.4	19.0	20.5	81.97	202.8	-408.0	458.5	420.5	38.01	12.063	
6,850.0	6,710.4	6,817.9	6,656.3	18.9	20.4	81.66	165.5	-408.0	458.8	420.9	37.88	12.111	
6,900.0	6,739.0	6,863.8	6,680.8	18.9	20.3	81.39	126.7	-408.0	459.1	421.3	37.83	12.137	
6,950.0	6,764.8	6,909.6	6,702.9	18.9	20.2	81.15	86.6	-408.0	459.4	421.6	37.86	12.135	
7,000.0	6,787.8	6,955.3	6,722.5	19.0	20.1	80.94	45.3	-408.0	459.7	421.7	37.98	12.102	
7,050.0	6,807.8	7,000.0	6,739.3	19.1	20.0	80.77	3.9	-408.1	459.9	421.7	38.21	12.037	
7,100.0	6,824.8	7,046.4	6,754.1	19.3	19.9	80.63	-40.1	-408.1	460.0	421.5	38.55	11.933	
7,150.0	6,838.6	7,091.9	6,766.0	19.6	19.8	80.53	-84.0	-408.1	460.2	421.2	39.01	11.795	
7,200.0	6,849.3	7,137.4	6,775.3	19.9	20.0	80.47	-128.5	-408.1	460.2	420.7	39.60	11.624	
7,250.0	6,856.8	7,182.9	6,781.9	20.2	20.4	80.44	-173.5	-408.1	460.3	420.0	40.29	11.424	
7,300.0	6,861.0	7,228.3	6,785.8	20.7	20.8	80.46	-218.8	-408.2	460.3	419.2	41.09	11.200	
7,339.5	6,862.0	7,264.2	6,787.0	21.0	21.2	80.49	-254.7	-408.2	460.2	418.4	41.80	11.010	
7,339.6	6,862.0	7,264.3	6,787.0	21.0	21.2	80.49	-254.8	-408.2	460.2	418.4	41.80	11.010	
7,340.4	6,862.0	7,265.1	6,787.0	21.0	21.2	80.49	-255.5	-408.2	460.2	418.4	41.81	11.006	
7,350.8	6,862.0	7,274.8	6,787.0	21.1	21.3	80.49	-265.2	-408.2	460.2	418.2	41.99	10.959	
7,400.0	6,862.0	7,323.6	6,786.8	21.5	21.9	80.47	-314.1	-408.2	460.2	417.3	42.89	10.730	
7,500.0	6,862.0	7,423.6	6,786.3	22.7	23.1	80.41	-414.1	-408.3	460.3	415.0	45.24	10.174	
7,600.0	6,862.0	7,523.6	6,785.9	24.1	24.5	80.36	-514.1	-408.3	460.3	412.4	47.92	9.606	
7,700.0	6,862.0	7,623.6	6,785.5	25.6	26.1	80.30	-614.1	-408.4	460.4	409.5	50.89	9.047	
7,800.0	6,862.0	7,723.6	6,785.0	27.2	27.7	80.25	-714.1	-408.4	460.5	406.4	54.09	8.513	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,900.0	6,862.0	7,823.6	6,784.6	28.9	29.4	80.20	-814.1	-408.5	460.5	403.0	57.49	8.011	
8,000.0	6,862.0	7,923.6	6,784.1	30.8	31.2	80.14	-914.1	-408.6	460.6	399.5	61.05	7.545	
8,100.0	6,862.0	8,023.6	6,783.7	32.6	33.1	80.09	-1,014.1	-408.6	460.6	395.9	64.74	7.115	
8,200.0	6,862.0	8,123.6	6,783.3	34.6	35.0	80.03	-1,114.1	-408.7	460.7	392.1	68.55	6.720	
8,300.0	6,862.0	8,223.6	6,782.8	36.6	37.0	79.98	-1,214.1	-408.7	460.8	388.3	72.46	6.359	
8,400.0	6,862.0	8,323.6	6,782.4	38.6	39.0	79.92	-1,314.1	-408.8	460.8	384.4	76.44	6.029	
8,500.0	6,862.0	8,423.6	6,781.9	40.6	41.0	79.87	-1,414.1	-408.9	460.9	380.4	80.49	5.726	
8,600.0	6,862.0	8,523.6	6,781.5	42.7	43.1	79.81	-1,514.1	-408.9	461.0	376.3	84.61	5.448	
8,700.0	6,862.0	8,623.6	6,781.0	44.9	45.2	79.76	-1,614.1	-409.0	461.0	372.3	88.77	5.194	
8,800.0	6,862.0	8,723.6	6,780.6	47.0	47.3	79.71	-1,714.1	-409.0	461.1	368.1	92.97	4.959	
8,900.0	6,862.0	8,823.6	6,780.2	49.1	49.5	79.65	-1,814.1	-409.1	461.1	363.9	97.21	4.744	
9,000.0	6,862.0	8,923.6	6,779.7	51.3	51.7	79.60	-1,914.1	-409.2	461.2	359.7	101.48	4.545	
9,100.0	6,862.0	9,023.6	6,779.3	53.5	53.8	79.54	-2,014.1	-409.2	461.3	355.5	105.79	4.360	
9,200.0	6,862.0	9,123.6	6,778.8	55.7	56.0	79.49	-2,114.0	-409.3	461.3	351.2	110.11	4.190	
9,300.0	6,862.0	9,223.6	6,778.4	57.9	58.2	79.44	-2,214.0	-409.3	461.4	347.0	114.46	4.031	
9,400.0	6,862.0	9,323.6	6,778.0	60.2	60.4	79.38	-2,314.0	-409.4	461.5	342.7	118.83	3.884	
9,500.0	6,862.0	9,423.6	6,777.5	62.4	62.7	79.33	-2,414.0	-409.5	461.5	338.3	123.21	3.746	
9,600.0	6,862.0	9,523.6	6,777.1	64.6	64.9	79.27	-2,514.0	-409.5	461.6	334.0	127.61	3.617	
9,700.0	6,862.0	9,623.6	6,776.6	66.9	67.1	79.22	-2,614.0	-409.6	461.7	329.7	132.02	3.497	
9,800.0	6,862.0	9,723.6	6,776.2	69.1	69.4	79.16	-2,714.0	-409.6	461.7	325.3	136.45	3.384	
9,900.0	6,862.0	9,823.6	6,775.8	71.4	71.6	79.11	-2,814.0	-409.7	461.8	320.9	140.88	3.278	
10,000.0	6,862.0	9,923.6	6,775.3	73.7	73.9	79.06	-2,914.0	-409.7	461.9	316.6	145.32	3.178	
10,100.0	6,862.0	10,023.6	6,774.9	75.9	76.2	79.00	-3,014.0	-409.8	462.0	312.2	149.78	3.084	
10,200.0	6,862.0	10,123.6	6,774.4	78.2	78.4	78.95	-3,114.0	-409.9	462.0	307.8	154.24	2.996	
10,300.0	6,862.0	10,223.6	6,774.0	80.5	80.7	78.89	-3,214.0	-409.9	462.1	303.4	158.71	2.912	
10,400.0	6,862.0	10,323.6	6,773.5	82.8	83.0	78.84	-3,314.0	-410.0	462.2	299.0	163.18	2.832	
10,500.0	6,862.0	10,423.6	6,773.1	85.1	85.3	78.79	-3,414.0	-410.0	462.2	294.6	167.66	2.757	
10,600.0	6,862.0	10,523.6	6,772.7	87.4	87.6	78.73	-3,514.0	-410.1	462.3	290.2	172.14	2.686	
10,700.0	6,862.0	10,623.6	6,772.2	89.7	89.9	78.68	-3,614.0	-410.2	462.4	285.8	176.63	2.618	
10,800.0	6,862.0	10,723.6	6,771.8	92.0	92.1	78.62	-3,714.0	-410.2	462.5	281.3	181.12	2.553	
10,900.0	6,862.0	10,823.6	6,771.3	94.3	94.4	78.57	-3,814.0	-410.3	462.5	276.9	185.62	2.492	
11,000.0	6,862.0	10,923.6	6,770.9	96.6	96.7	78.52	-3,914.0	-410.3	462.6	272.5	190.12	2.433	
11,100.0	6,862.0	11,023.6	6,770.5	98.9	99.0	78.46	-4,014.0	-410.4	462.7	268.1	194.62	2.377	
11,200.0	6,862.0	11,123.6	6,770.0	101.2	101.3	78.41	-4,114.0	-410.5	462.8	263.6	199.12	2.324	
11,300.0	6,862.0	11,223.6	6,769.6	103.5	103.6	78.35	-4,214.0	-410.5	462.8	259.2	203.63	2.273	
11,400.0	6,862.0	11,323.6	6,769.1	105.8	106.0	78.30	-4,314.0	-410.6	462.9	254.8	208.14	2.224	
11,500.0	6,862.0	11,423.6	6,768.7	108.1	108.3	78.25	-4,414.0	-410.6	463.0	250.3	212.65	2.177	
11,600.0	6,862.0	11,523.6	6,768.3	110.4	110.6	78.19	-4,514.0	-410.7	463.1	245.9	217.16	2.132	
11,700.0	6,862.0	11,623.6	6,767.8	112.8	112.9	78.14	-4,614.0	-410.8	463.1	241.5	221.67	2.089	
11,800.0	6,862.0	11,723.6	6,767.4	115.1	115.2	78.09	-4,714.0	-410.8	463.2	237.0	226.18	2.048	
11,900.0	6,862.0	11,823.6	6,766.9	117.4	117.5	78.03	-4,814.0	-410.9	463.3	232.6	230.70	2.008	
12,000.0	6,862.0	11,923.6	6,766.5	119.7	119.8	77.98	-4,914.0	-410.9	463.4	228.1	235.21	1.970	
12,100.0	6,862.0	12,023.6	6,766.0	122.0	122.2	77.92	-5,014.0	-411.0	463.4	223.7	239.73	1.933	
12,200.0	6,862.0	12,123.6	6,765.6	124.4	124.5	77.87	-5,114.0	-411.0	463.5	219.3	244.25	1.898	
12,300.0	6,862.0	12,223.6	6,765.2	126.7	126.8	77.82	-5,214.0	-411.1	463.6	214.8	248.76	1.864	
12,400.0	6,862.0	12,323.6	6,764.7	129.0	129.1	77.76	-5,314.0	-411.2	463.7	210.4	253.28	1.831	
12,500.0	6,862.0	12,423.6	6,764.3	131.3	131.4	77.71	-5,414.0	-411.2	463.8	206.0	257.80	1.799	
12,600.0	6,862.0	12,523.6	6,763.8	133.7	133.8	77.66	-5,514.0	-411.3	463.8	201.5	262.32	1.768	
12,700.0	6,862.0	12,623.6	6,763.4	136.0	136.1	77.60	-5,614.0	-411.3	463.9	197.1	266.83	1.739	
12,800.0	6,862.0	12,723.6	6,763.0	138.3	138.4	77.55	-5,714.0	-411.4	464.0	192.6	271.35	1.710	
12,900.0	6,862.0	12,823.6	6,762.5	140.6	140.7	77.50	-5,814.0	-411.5	464.1	188.2	275.87	1.682	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-303 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,000.0	6,862.0	12,923.6	6,762.1	143.0	143.1	77.44	-5,914.0	-411.5	464.2	183.8	280.38	1.655	
13,100.0	6,862.0	13,023.6	6,761.6	145.3	145.4	77.39	-6,014.0	-411.6	464.2	179.3	284.90	1.629	
13,200.0	6,862.0	13,123.6	6,761.2	147.6	147.7	77.33	-6,114.0	-411.6	464.3	174.9	289.42	1.604	
13,300.0	6,862.0	13,223.6	6,760.8	150.0	150.0	77.28	-6,214.0	-411.7	464.4	170.5	293.93	1.580	
13,400.0	6,862.0	13,323.6	6,760.3	152.3	152.4	77.23	-6,314.0	-411.8	464.5	166.0	298.44	1.556	
13,500.0	6,862.0	13,423.6	6,759.9	154.6	154.7	77.17	-6,414.0	-411.8	464.6	161.6	302.96	1.533	
13,600.0	6,862.0	13,523.6	6,759.4	157.0	157.0	77.12	-6,514.0	-411.9	464.7	157.2	307.47	1.511	
13,700.0	6,862.0	13,623.6	6,759.0	159.3	159.4	77.07	-6,614.0	-411.9	464.7	152.8	311.98	1.490	Level 3
13,800.0	6,862.0	13,723.6	6,758.5	161.6	161.7	77.01	-6,714.0	-412.0	464.8	148.3	316.49	1.469	Level 3
13,900.0	6,862.0	13,823.6	6,758.1	164.0	164.0	76.96	-6,814.0	-412.1	464.9	143.9	321.00	1.448	Level 3
14,000.0	6,862.0	13,923.6	6,757.7	166.3	166.4	76.91	-6,914.0	-412.1	465.0	139.5	325.51	1.428	Level 3
14,100.0	6,862.0	14,023.6	6,757.2	168.6	168.7	76.85	-7,014.0	-412.2	465.1	135.1	330.02	1.409	Level 3
14,145.2	6,862.0	14,068.8	6,757.0	169.7	169.8	76.83	-7,059.2	-412.2	465.1	133.1	332.06	1.401	Level 3, SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	91.34	-0.4	15.0	15.0	15.0	0.00	9,294.259	
100.0	100.0	101.0	101.0	0.1	0.1	91.34	-0.4	15.0	15.0	14.8	0.28	54.118	
200.0	200.0	201.0	201.0	0.4	0.4	91.34	-0.4	15.0	15.0	14.2	0.83	18.159	
300.0	300.0	301.0	301.0	0.7	0.7	91.34	-0.4	15.0	15.0	13.7	1.38	10.910	
400.0	400.0	401.0	401.0	1.0	1.0	91.34	-0.4	15.0	15.0	13.1	1.93	7.797	
500.0	500.0	501.0	501.0	1.2	1.2	91.34	-0.4	15.0	15.0	12.6	2.48	6.066	
600.0	600.0	601.0	601.0	1.5	1.5	91.34	-0.4	15.0	15.0	12.0	3.03	4.964	
700.0	700.0	701.0	701.0	1.8	1.8	91.34	-0.4	15.0	15.0	11.5	3.58	4.201	
766.3	766.3	767.3	767.3	2.0	2.0	91.34	-0.4	15.0	15.0	11.1	3.95	3.813 CC	
800.0	800.0	801.0	801.0	2.1	2.1	91.34	-0.4	15.0	15.0	10.9	4.13	3.642	
900.0	900.0	900.8	900.8	2.3	2.3	86.90	0.8	15.6	15.6	11.0	4.68	3.343	
1,000.0	1,000.0	1,000.5	1,000.4	2.6	2.6	75.81	4.4	17.3	17.9	12.7	5.23	3.422	
1,100.0	1,100.0	1,100.0	1,099.7	2.9	2.9	63.07	10.2	20.2	22.7	16.9	5.78	3.921	
1,200.0	1,200.0	1,198.9	1,198.2	3.2	3.2	52.67	18.4	24.1	30.4	24.1	6.33	4.807	
1,300.0	1,300.0	1,297.4	1,295.9	3.4	3.5	45.36	28.8	29.1	41.2	34.3	6.89	5.987	
1,400.0	1,400.0	1,395.2	1,392.8	3.7	3.8	40.43	41.3	35.2	54.9	47.4	7.44	7.373	
1,500.0	1,500.0	1,492.2	1,488.4	4.0	4.2	37.07	56.0	42.3	71.3	63.3	8.00	8.905	
1,600.0	1,600.0	1,589.0	1,583.4	4.3	4.6	34.73	72.6	50.3	90.1	81.5	8.56	10.523	
1,700.0	1,700.0	1,687.0	1,679.5	4.5	5.0	33.13	90.0	58.8	109.6	100.5	9.12	12.018	
1,800.0	1,800.0	1,785.1	1,775.6	4.8	5.4	32.02	107.5	67.2	129.2	119.6	9.69	13.342	
1,900.0	1,900.0	1,883.1	1,871.8	5.1	5.9	31.19	124.9	75.6	148.9	138.6	10.25	14.520	
2,000.0	2,000.0	1,981.1	1,967.9	5.4	6.3	30.57	142.3	84.0	168.5	157.7	10.82	15.573	
2,100.0	2,100.0	2,079.2	2,064.0	5.6	6.8	30.07	159.7	92.4	188.2	176.8	11.39	16.519	
2,200.0	2,200.0	2,177.2	2,160.1	5.9	7.3	29.66	177.1	100.9	207.9	195.9	11.97	17.373	
2,300.0	2,300.0	2,275.2	2,256.2	6.2	7.8	29.33	194.5	109.3	227.6	215.0	12.54	18.147	
2,400.0	2,400.0	2,373.3	2,352.3	6.5	8.2	29.05	211.9	117.7	247.3	234.1	13.12	18.852	
2,500.0	2,500.0	2,471.3	2,448.4	6.7	8.7	28.81	229.3	126.1	267.0	253.3	13.69	19.496	
2,600.0	2,600.0	2,569.6	2,544.7	7.0	9.2	23.42	246.8	134.6	285.5	271.2	14.28	19.996	
2,700.0	2,699.9	2,668.3	2,641.5	7.3	9.7	23.43	264.3	143.0	301.6	286.8	14.86	20.293	
2,800.0	2,799.7	2,767.3	2,738.6	7.6	10.2	23.64	281.9	151.5	315.4	300.0	15.45	20.417	
2,900.0	2,899.3	2,866.6	2,835.9	7.9	10.7	24.03	299.5	160.1	326.8	310.8	16.03	20.387	
3,000.0	2,998.6	2,966.1	2,933.5	8.1	11.2	24.58	317.2	168.6	335.9	319.3	16.61	20.220	
3,100.0	3,097.5	3,065.8	3,031.2	8.4	11.7	25.30	334.9	177.2	342.7	325.5	17.19	19.929	
3,162.8	3,159.5	3,128.4	3,092.6	8.6	12.1	25.84	346.0	182.6	345.7	328.2	17.56	19.687	
3,200.0	3,196.1	3,165.5	3,129.0	8.7	12.2	26.19	352.6	185.8	347.3	329.5	17.79	19.520	
3,300.0	3,294.6	3,265.3	3,226.8	9.1	12.8	27.12	370.3	194.3	351.5	333.1	18.42	19.089	
3,400.0	3,393.1	3,365.0	3,324.6	9.4	13.3	28.02	388.0	202.9	355.9	336.8	19.05	18.681	
3,500.0	3,491.6	3,464.8	3,422.4	9.8	13.8	28.90	405.8	211.5	360.3	340.6	19.69	18.295	
3,600.0	3,590.1	3,564.5	3,520.1	10.1	14.3	29.76	423.5	220.0	364.8	344.5	20.35	17.930	
3,700.0	3,688.6	3,664.3	3,617.9	10.5	14.8	30.60	441.2	228.6	369.4	348.4	21.01	17.583	
3,800.0	3,787.1	3,764.0	3,715.7	10.9	15.3	31.41	458.9	237.2	374.1	352.4	21.68	17.254	
3,900.0	3,885.6	3,875.7	3,825.4	11.3	15.8	32.35	477.4	246.1	377.5	355.2	22.35	16.894	
4,000.0	3,984.1	3,990.2	3,938.7	11.6	16.2	33.44	492.5	253.4	377.3	354.3	23.01	16.395	
4,100.0	4,082.6	4,104.4	4,052.3	12.0	16.5	34.71	503.4	258.7	373.3	349.6	23.68	15.762	
4,200.0	4,181.1	4,217.9	4,165.6	12.4	16.8	36.18	510.2	262.0	365.6	341.2	24.36	15.009	
4,300.0	4,279.6	4,330.4	4,278.0	12.9	17.0	37.92	513.0	263.3	354.3	329.3	25.05	14.147	
4,400.0	4,378.1	4,431.5	4,379.1	13.3	17.2	39.73	513.0	263.3	340.9	315.1	25.74	13.241	
4,500.0	4,476.6	4,530.0	4,477.6	13.7	17.4	41.65	513.0	263.3	327.7	301.2	26.47	12.378	
4,600.0	4,575.1	4,628.5	4,576.1	14.1	17.5	43.72	513.0	263.3	314.9	287.7	27.23	11.564	
4,700.0	4,673.6	4,727.0	4,674.6	14.5	17.7	45.96	513.0	263.3	302.6	274.6	28.02	10.797	
4,800.0	4,772.1	4,825.5	4,773.1	15.0	17.9	48.39	513.0	263.3	290.8	261.9	28.85	10.079	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,870.6	4,924.0	4,871.6	15.4	18.1	51.01	513.0	263.3	279.5	249.8	29.71	9.408	
5,000.0	4,969.1	5,022.5	4,970.1	15.8	18.3	53.85	513.0	263.3	268.9	238.3	30.60	8.785	
5,100.0	5,067.6	5,121.0	5,068.6	16.3	18.5	56.90	513.0	263.3	258.9	227.4	31.53	8.212	
5,200.0	5,166.1	5,219.5	5,167.1	16.7	18.7	60.18	513.0	263.3	249.8	217.3	32.50	7.688	
5,300.0	5,264.6	5,318.0	5,265.6	17.1	18.9	63.69	513.0	263.3	241.6	208.1	33.49	7.215	
5,400.0	5,363.1	5,416.5	5,364.1	17.6	19.1	67.43	513.0	263.3	234.4	199.9	34.49	6.794	
5,500.0	5,461.6	5,515.0	5,462.6	18.0	19.3	71.38	513.0	263.3	228.2	192.7	35.51	6.427	
5,544.5	5,505.4	5,558.8	5,506.4	18.2	19.3	73.21	513.0	263.3	225.8	189.9	35.96	6.280	
5,600.0	5,560.2	5,613.6	5,561.2	18.4	19.5	75.35	513.0	263.3	223.4	186.9	36.48	6.124	
5,700.0	5,659.2	5,712.7	5,660.2	18.8	19.7	78.69	513.0	263.3	220.3	183.0	37.27	5.911	
5,800.0	5,758.7	5,812.1	5,759.7	19.0	19.9	81.26	513.0	263.3	218.5	180.5	37.94	5.758	
5,900.0	5,858.5	5,911.9	5,859.5	19.3	20.1	82.98	513.0	263.3	217.6	179.1	38.52	5.648	
6,000.0	5,958.4	6,011.9	5,959.4	19.5	20.3	83.80	513.0	263.3	217.2	178.2	39.00	5.570	
6,041.6	6,000.0	6,053.4	6,001.0	19.6	20.4	89.06	513.0	263.3	217.2	178.0	39.17	5.545	
6,100.0	6,058.4	6,112.0	6,059.6	19.7	20.5	89.52	511.3	263.3	217.2	177.7	39.41	5.511	
6,124.3	6,082.7	6,136.2	6,083.7	19.8	20.5	90.04	509.3	263.3	217.1	177.6	39.51	5.496	
6,139.9	6,098.3	6,151.8	6,099.1	19.8	20.5	90.49	507.6	263.3	217.1	177.6	39.58	5.486	
6,150.0	6,108.4	6,161.8	6,109.0	19.8	20.5	-89.23	506.4	263.3	217.2	177.5	39.63	5.480	
6,200.0	6,158.4	6,211.0	6,157.6	19.9	20.5	-87.69	498.3	263.3	217.3	177.5	39.77	5.464	
6,250.0	6,208.0	6,259.9	6,205.3	19.9	20.5	-86.16	487.2	263.3	217.6	177.8	39.85	5.462	
6,300.0	6,257.3	6,308.5	6,251.7	19.9	20.4	-84.65	473.2	263.3	218.1	178.3	39.84	5.474	
6,350.0	6,305.8	6,356.7	6,296.9	19.9	20.3	-83.18	456.4	263.3	218.7	178.9	39.77	5.499	
6,400.0	6,353.4	6,404.6	6,340.7	19.8	20.2	-81.75	437.0	263.3	219.4	179.8	39.63	5.538	
6,450.0	6,400.0	6,452.1	6,382.8	19.7	20.1	-80.37	415.0	263.3	220.3	180.8	39.42	5.588	
6,500.0	6,445.2	6,500.0	6,423.8	19.6	20.0	-79.02	390.2	263.2	221.2	182.0	39.16	5.649	
6,550.0	6,489.0	6,546.4	6,461.9	19.5	19.9	-77.77	363.8	263.2	222.2	183.4	38.85	5.720	
6,600.0	6,531.1	6,593.1	6,498.6	19.4	19.7	-76.55	334.9	263.2	223.3	184.8	38.51	5.799	
6,650.0	6,571.3	6,639.6	6,533.3	19.3	19.6	-75.41	304.0	263.2	224.4	186.3	38.14	5.884	
6,700.0	6,609.5	6,685.8	6,565.9	19.2	19.5	-74.33	271.2	263.2	225.6	187.8	37.77	5.972	
6,750.0	6,645.6	6,731.9	6,596.3	19.0	19.4	-73.33	236.7	263.1	226.7	189.3	37.40	6.061	
6,800.0	6,679.2	6,777.7	6,624.5	19.0	19.3	-72.39	200.6	263.1	227.8	190.8	37.06	6.148	
6,850.0	6,710.4	6,823.3	6,650.4	18.9	19.2	-71.53	163.0	263.1	228.9	192.2	36.77	6.227	
6,900.0	6,739.0	6,868.8	6,673.8	18.9	19.1	-70.75	124.0	263.0	230.0	193.5	36.53	6.296	
6,950.0	6,764.8	6,914.1	6,694.9	18.9	19.0	-70.05	83.9	263.0	231.0	194.6	36.38	6.349	
7,000.0	6,787.8	6,959.3	6,713.4	19.0	19.0	-69.42	42.7	263.0	231.9	195.6	36.33	6.384	
7,050.0	6,807.8	7,004.3	6,729.5	19.1	19.0	-68.87	0.6	262.9	232.7	196.4	36.39	6.396	
7,100.0	6,824.8	7,050.0	6,743.2	19.3	19.2	-68.40	-42.9	262.9	233.5	196.9	36.58	6.382	
7,150.0	6,838.6	7,094.2	6,754.0	19.6	19.4	-68.02	-85.7	262.9	234.1	197.2	36.91	6.343	
7,200.0	6,849.3	7,139.0	6,762.4	19.9	19.7	-67.70	-129.7	262.8	234.6	197.2	37.38	6.276	
7,250.0	6,856.8	7,183.7	6,768.2	20.2	20.1	-67.47	-174.1	262.8	235.0	197.0	37.99	6.185	
7,300.0	6,861.0	7,228.4	6,771.4	20.7	20.5	-67.32	-218.7	262.8	235.2	196.5	38.74	6.072	
7,339.5	6,862.0	7,263.7	6,772.0	21.0	20.8	-67.26	-253.9	262.7	235.4	195.9	39.43	5.969	
7,339.6	6,862.0	7,263.8	6,772.0	21.0	20.8	-67.26	-254.0	262.7	235.4	195.9	39.43	5.969	
7,340.4	6,862.0	7,264.5	6,772.0	21.0	20.8	-67.25	-254.8	262.7	235.4	195.9	39.44	5.967	
7,400.0	6,862.0	7,324.0	6,771.6	21.5	21.4	-67.17	-314.2	262.7	235.5	195.1	40.44	5.824	
7,500.0	6,862.0	7,424.0	6,771.0	22.7	22.6	-67.02	-414.2	262.6	235.8	193.1	42.67	5.525	
7,600.0	6,862.0	7,524.0	6,770.3	24.1	24.0	-66.87	-514.2	262.6	236.0	190.8	45.22	5.219	
7,700.0	6,862.0	7,624.0	6,769.6	25.6	25.5	-66.72	-614.2	262.5	236.3	188.3	48.03	4.920	
7,800.0	6,862.0	7,724.0	6,769.0	27.2	27.2	-66.58	-714.2	262.4	236.5	185.5	51.04	4.634	
7,900.0	6,862.0	7,824.0	6,768.3	28.9	28.9	-66.43	-814.2	262.3	236.8	182.6	54.24	4.366	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,000.0	6,862.0	7,924.0	6,767.6	30.8	30.7	-66.28	-914.2	262.3	237.1	179.5	57.57	4.118	
8,100.0	6,862.0	8,024.0	6,767.0	32.6	32.6	-66.14	-1,014.2	262.2	237.3	176.3	61.03	3.889	
8,200.0	6,862.0	8,124.0	6,766.3	34.6	34.5	-65.99	-1,114.2	262.1	237.6	173.0	64.59	3.679	
8,300.0	6,862.0	8,224.0	6,765.7	36.6	36.5	-65.85	-1,214.2	262.0	237.9	169.7	68.22	3.487	
8,400.0	6,862.0	8,324.0	6,765.0	38.6	38.5	-65.70	-1,314.2	262.0	238.2	166.2	71.92	3.311	
8,500.0	6,862.0	8,424.0	6,764.3	40.6	40.6	-65.56	-1,414.2	261.9	238.4	162.7	75.68	3.150	
8,600.0	6,862.0	8,524.0	6,763.7	42.7	42.7	-65.41	-1,514.2	261.8	238.7	159.2	79.49	3.003	
8,700.0	6,862.0	8,624.0	6,763.0	44.9	44.8	-65.27	-1,614.2	261.8	239.0	155.6	83.33	2.868	
8,800.0	6,862.0	8,724.0	6,762.4	47.0	46.9	-65.12	-1,714.2	261.7	239.3	152.1	87.21	2.743	
8,900.0	6,862.0	8,824.0	6,761.7	49.1	49.1	-64.98	-1,814.2	261.6	239.5	148.4	91.12	2.629	
9,000.0	6,862.0	8,924.0	6,761.0	51.3	51.2	-64.84	-1,914.2	261.5	239.8	144.8	95.04	2.523	
9,100.0	6,862.0	9,024.0	6,760.4	53.5	53.4	-64.69	-2,014.2	261.5	240.1	141.1	98.99	2.426	
9,200.0	6,862.0	9,124.0	6,759.7	55.7	55.6	-64.55	-2,114.2	261.4	240.4	137.4	102.95	2.335	
9,300.0	6,862.0	9,224.0	6,759.0	57.9	57.8	-64.41	-2,214.2	261.3	240.7	133.8	106.92	2.251	
9,400.0	6,862.0	9,324.0	6,758.4	60.2	60.1	-64.27	-2,314.2	261.2	241.0	130.1	110.91	2.173	
9,500.0	6,862.0	9,424.0	6,757.7	62.4	62.3	-64.13	-2,414.1	261.2	241.3	126.4	114.90	2.100	
9,600.0	6,862.0	9,523.9	6,757.1	64.6	64.5	-63.99	-2,514.1	261.1	241.5	122.6	118.90	2.031	
9,700.0	6,862.0	9,623.9	6,756.4	66.9	66.8	-63.84	-2,614.1	261.0	241.8	118.9	122.90	1.968	
9,800.0	6,862.0	9,723.9	6,755.7	69.1	69.0	-63.70	-2,714.1	261.0	242.1	115.2	126.91	1.908	
9,900.0	6,862.0	9,823.9	6,755.1	71.4	71.3	-63.56	-2,814.1	260.9	242.4	111.5	130.92	1.852	
10,000.0	6,862.0	9,923.9	6,754.4	73.7	73.6	-63.42	-2,914.1	260.8	242.7	107.8	134.93	1.799	
10,100.0	6,862.0	10,023.9	6,753.8	75.9	75.8	-63.28	-3,014.1	260.7	243.0	104.1	138.94	1.749	
10,200.0	6,862.0	10,123.9	6,753.1	78.2	78.1	-63.15	-3,114.1	260.7	243.3	100.4	142.96	1.702	
10,300.0	6,862.0	10,223.9	6,752.4	80.5	80.4	-63.01	-3,214.1	260.6	243.6	96.6	146.97	1.658	
10,400.0	6,862.0	10,323.9	6,751.8	82.8	82.7	-62.87	-3,314.1	260.5	243.9	92.9	150.97	1.616	
10,500.0	6,862.0	10,423.9	6,751.1	85.1	85.0	-62.73	-3,414.1	260.4	244.2	89.2	154.98	1.576	
10,600.0	6,862.0	10,523.9	6,750.4	87.4	87.3	-62.59	-3,514.1	260.4	244.5	85.5	158.98	1.538	
10,700.0	6,862.0	10,623.9	6,749.8	89.7	89.6	-62.46	-3,614.1	260.3	244.8	81.8	162.98	1.502	
10,800.0	6,862.0	10,723.9	6,749.1	92.0	91.9	-62.32	-3,714.1	260.2	245.1	78.2	166.98	1.468	Level 3
10,900.0	6,862.0	10,823.9	6,748.5	94.3	94.2	-62.18	-3,814.1	260.2	245.4	74.5	170.97	1.436	Level 3
11,000.0	6,862.0	10,923.9	6,747.8	96.6	96.5	-62.05	-3,914.1	260.1	245.8	70.8	174.96	1.405	Level 3
11,100.0	6,862.0	11,023.9	6,747.1	98.9	98.8	-61.91	-4,014.1	260.0	246.1	67.1	178.94	1.375	Level 3
11,200.0	6,862.0	11,123.9	6,746.5	101.2	101.1	-61.77	-4,114.1	259.9	246.4	63.5	182.92	1.347	Level 3
11,300.0	6,862.0	11,223.9	6,745.8	103.5	103.4	-61.64	-4,214.1	259.9	246.7	59.8	186.89	1.320	Level 3
11,400.0	6,862.0	11,323.9	6,745.2	105.8	105.7	-61.50	-4,314.1	259.8	247.0	56.2	190.85	1.294	Level 3
11,500.0	6,862.0	11,423.9	6,744.5	108.1	108.0	-61.37	-4,414.1	259.7	247.3	52.5	194.81	1.270	Level 3
11,600.0	6,862.0	11,523.9	6,743.8	110.4	110.3	-61.23	-4,514.1	259.6	247.6	48.9	198.77	1.246	Level 2
11,700.0	6,862.0	11,623.9	6,743.2	112.8	112.6	-61.10	-4,614.1	259.6	248.0	45.3	202.71	1.223	Level 2
11,800.0	6,862.0	11,723.9	6,742.5	115.1	115.0	-60.97	-4,714.0	259.5	248.3	41.6	206.65	1.201	Level 2
11,900.0	6,862.0	11,823.9	6,741.8	117.4	117.3	-60.83	-4,814.0	259.4	248.6	38.0	210.59	1.181	Level 2
12,000.0	6,862.0	11,923.9	6,741.2	119.7	119.6	-60.70	-4,914.0	259.4	248.9	34.4	214.51	1.160	Level 2
12,100.0	6,862.0	12,023.9	6,740.5	122.0	121.9	-60.57	-5,014.0	259.3	249.3	30.8	218.43	1.141	Level 2
12,200.0	6,862.0	12,123.9	6,739.9	124.4	124.2	-60.44	-5,114.0	259.2	249.6	27.2	222.35	1.123	Level 2
12,300.0	6,862.0	12,223.9	6,739.2	126.7	126.6	-60.30	-5,214.0	259.1	249.9	23.7	226.25	1.105	Level 2
12,400.0	6,862.0	12,323.9	6,738.5	129.0	128.9	-60.17	-5,314.0	259.1	250.2	20.1	230.15	1.087	Level 2
12,500.0	6,862.0	12,423.9	6,737.9	131.3	131.2	-60.04	-5,414.0	259.0	250.6	16.5	234.04	1.071	Level 2
12,600.0	6,862.0	12,523.9	6,737.2	133.7	133.5	-59.91	-5,514.0	258.9	250.9	13.0	237.92	1.055	Level 2
12,700.0	6,862.0	12,623.9	6,736.6	136.0	135.9	-59.78	-5,614.0	258.8	251.2	9.4	241.80	1.039	Level 2
12,800.0	6,862.0	12,723.9	6,735.9	138.3	138.2	-59.65	-5,714.0	258.8	251.6	5.9	245.67	1.024	Level 2
12,900.0	6,862.0	12,823.9	6,735.2	140.6	140.5	-59.52	-5,814.0	258.7	251.9	2.4	249.53	1.010	Level 2
13,000.0	6,862.0	12,923.9	6,734.6	143.0	142.8	-59.39	-5,914.0	258.6	252.2	-1.1	253.38	0.996	Level 1

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29R-323 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,100.0	6,862.0	13,023.9	6,733.9	145.3	145.2	-59.26	-6,014.0	258.6	252.6	-4.6	257.22	0.982	Level 1
13,200.0	6,862.0	13,123.9	6,733.2	147.6	147.5	-59.13	-6,114.0	258.5	252.9	-8.1	261.06	0.969	Level 1
13,300.0	6,862.0	13,223.9	6,732.6	150.0	149.8	-59.01	-6,214.0	258.4	253.3	-11.6	264.89	0.956	Level 1
13,400.0	6,862.0	13,323.9	6,731.9	152.3	152.2	-58.88	-6,314.0	258.3	253.6	-15.1	268.71	0.944	Level 1
13,500.0	6,862.0	13,423.9	6,731.3	154.6	154.5	-58.75	-6,414.0	258.3	253.9	-18.6	272.52	0.932	Level 1
13,600.0	6,862.0	13,523.9	6,730.6	157.0	156.8	-58.62	-6,514.0	258.2	254.3	-22.0	276.32	0.920	Level 1
13,700.0	6,862.0	13,623.9	6,729.9	159.3	159.2	-58.50	-6,614.0	258.1	254.6	-25.5	280.12	0.909	Level 1
13,800.0	6,862.0	13,723.9	6,729.3	161.6	161.5	-58.37	-6,714.0	258.0	255.0	-28.9	283.90	0.898	Level 1
13,900.0	6,862.0	13,823.9	6,728.6	164.0	163.8	-58.24	-6,814.0	258.0	255.3	-32.3	287.68	0.888	Level 1
14,000.0	6,862.0	13,923.9	6,728.0	166.3	166.2	-58.12	-6,914.0	257.9	255.7	-35.8	291.45	0.877	Level 1
14,100.0	6,862.0	14,023.8	6,727.3	168.6	168.5	-57.99	-7,013.9	257.8	256.0	-39.2	295.21	0.867	Level 1
14,145.2	6,862.0	14,067.7	6,727.0	169.7	169.5	-57.94	-7,057.7	257.8	256.2	-40.7	296.89	0.863	Level 1, ES, SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	90.67	-0.4	30.1	30.1	30.1	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	90.67	-0.4	30.1	30.1	29.8	0.28	108.213	
200.0	200.0	201.0	201.0	0.4	0.4	90.67	-0.4	30.1	30.1	29.3	0.83	36.311	
300.0	300.0	301.0	301.0	0.7	0.7	90.67	-0.4	30.1	30.1	28.7	1.38	21.815	
366.3	366.3	367.3	367.3	0.9	0.9	90.67	-0.4	30.1	30.1	28.3	1.74	17.248	CC
400.0	400.0	401.0	401.0	1.0	1.0	90.67	-0.4	30.1	30.1	28.2	1.93	15.592	ES
500.0	500.0	500.4	500.4	1.2	1.2	88.85	0.6	31.0	31.0	28.5	2.48	12.522	
600.0	600.0	600.0	599.9	1.5	1.5	84.04	3.5	33.6	33.8	30.8	3.02	11.194	
700.0	700.0	698.8	698.5	1.8	1.8	77.72	8.3	38.0	38.9	35.4	3.57	10.901	
800.0	800.0	797.5	796.7	2.1	2.1	71.32	14.9	44.0	46.7	42.6	4.13	11.307	
900.0	900.0	895.6	894.2	2.3	2.4	65.74	23.3	51.8	57.2	52.5	4.69	12.200	
1,000.0	1,000.0	993.0	990.7	2.6	2.8	61.24	33.5	61.1	70.5	65.2	5.25	13.427	
1,100.0	1,100.0	1,089.7	1,086.0	2.9	3.2	57.74	45.5	72.0	86.5	80.7	5.81	14.881	
1,200.0	1,200.0	1,185.6	1,180.0	3.2	3.6	55.04	59.0	84.4	105.1	98.8	6.38	16.487	
1,300.0	1,300.0	1,281.9	1,274.1	3.4	4.1	52.96	74.2	98.3	126.1	119.1	6.95	18.144	
1,400.0	1,400.0	1,379.5	1,369.5	3.7	4.6	51.43	89.8	112.6	147.4	139.9	7.52	19.610	
1,500.0	1,500.0	1,477.2	1,464.8	4.0	5.1	50.29	105.4	126.9	168.8	160.8	8.09	20.872	
1,600.0	1,600.0	1,574.8	1,560.1	4.3	5.6	49.40	121.0	141.1	190.3	181.6	8.66	21.965	
1,700.0	1,700.0	1,672.4	1,655.4	4.5	6.1	48.69	136.5	155.4	211.8	202.6	9.24	22.919	
1,800.0	1,800.0	1,770.0	1,750.7	4.8	6.6	48.12	152.1	169.7	233.4	223.5	9.82	23.757	
1,900.0	1,900.0	1,867.7	1,846.0	5.1	7.2	47.64	167.7	183.9	254.9	244.5	10.40	24.499	
2,000.0	2,000.0	1,965.3	1,941.4	5.4	7.7	47.23	183.3	198.2	276.5	265.5	10.99	25.160	
2,100.0	2,100.0	2,062.9	2,036.7	5.6	8.3	46.89	198.9	212.5	298.1	286.5	11.57	25.753	
2,200.0	2,200.0	2,160.6	2,132.0	5.9	8.8	46.59	214.5	226.7	319.6	307.5	12.16	26.286	
2,300.0	2,300.0	2,258.2	2,227.3	6.2	9.3	46.33	230.1	241.0	341.2	328.5	12.75	26.769	
2,400.0	2,400.0	2,355.8	2,322.6	6.5	9.9	46.10	245.7	255.3	362.8	349.5	13.34	27.208	
2,500.0	2,500.0	2,453.4	2,417.9	6.7	10.4	45.89	261.3	269.5	384.5	370.5	13.93	27.608	
2,600.0	2,600.0	2,551.3	2,513.5	7.0	11.0	40.45	276.9	283.8	405.1	390.6	14.52	27.892	
2,700.0	2,699.9	2,649.5	2,609.3	7.3	11.5	40.44	292.6	298.2	423.8	408.6	15.13	28.012	
2,800.0	2,799.7	2,748.1	2,705.6	7.6	12.1	40.67	308.3	312.6	440.5	424.8	15.73	27.998	
2,900.0	2,899.3	2,846.9	2,802.0	7.9	12.6	41.10	324.1	327.0	455.3	439.0	16.34	27.865	
3,000.0	2,998.6	2,945.8	2,898.6	8.1	13.2	41.73	339.9	341.5	468.2	451.3	16.95	27.622	
3,100.0	3,097.5	3,044.9	2,995.4	8.4	13.8	42.54	355.7	356.0	479.3	461.7	17.57	27.278	
3,162.8	3,159.5	3,107.2	3,056.2	8.6	14.1	43.15	365.6	365.1	485.4	467.4	17.97	27.013	
3,200.0	3,196.1	3,144.0	3,092.2	8.7	14.3	43.56	371.5	370.5	488.8	470.5	18.21	26.840	
3,300.0	3,294.6	3,243.2	3,188.9	9.1	14.9	44.64	387.4	384.9	498.0	479.1	18.87	26.390	
3,400.0	3,393.1	3,342.3	3,285.7	9.4	15.4	45.68	403.2	399.4	507.4	487.9	19.55	25.959	
3,500.0	3,491.6	3,441.5	3,382.5	9.8	16.0	46.68	419.0	413.9	517.0	496.8	20.24	25.547	
3,600.0	3,590.1	3,540.6	3,479.3	10.1	16.6	47.65	434.8	428.4	526.7	505.8	20.94	25.152	
3,700.0	3,688.6	3,639.7	3,576.1	10.5	17.1	48.58	450.7	442.9	536.6	514.9	21.66	24.773	
3,800.0	3,787.1	3,738.9	3,672.9	10.9	17.7	49.48	466.5	457.4	546.6	524.2	22.39	24.411	
3,900.0	3,885.6	3,859.3	3,790.9	11.3	18.2	50.58	484.1	473.5	555.0	531.8	23.16	23.959	
4,000.0	3,984.1	3,981.8	3,911.9	11.6	18.7	51.80	498.3	486.5	559.4	535.5	23.93	23.378	
4,100.0	4,082.6	4,104.3	4,033.6	12.0	19.0	53.15	508.6	495.9	559.9	535.2	24.70	22.671	
4,200.0	4,181.1	4,226.3	4,155.3	12.4	19.3	54.64	515.0	501.8	556.5	531.1	25.47	21.855	
4,300.0	4,279.6	4,347.4	4,276.3	12.9	19.5	56.32	517.7	504.2	549.5	523.2	26.24	20.937	
4,400.0	4,378.1	4,450.2	4,379.1	13.3	19.7	57.89	517.7	504.3	540.1	513.1	26.99	20.006	
4,500.0	4,476.6	4,548.7	4,477.6	13.7	19.8	59.45	517.7	504.3	531.0	503.2	27.76	19.130	
4,600.0	4,575.1	4,647.2	4,576.1	14.1	20.0	61.06	517.7	504.3	522.3	493.8	28.54	18.304	
4,700.0	4,673.6	4,745.7	4,674.6	14.5	20.2	62.73	517.7	504.3	514.1	484.8	29.33	17.526	
4,800.0	4,772.1	4,844.2	4,773.1	15.0	20.3	64.44	517.7	504.3	506.3	476.2	30.15	16.795	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,870.6	4,942.7	4,871.6	15.4	20.5	66.21	517.7	504.3	499.0	468.0	30.97	16.111	
5,000.0	4,969.1	5,041.2	4,970.1	15.8	20.6	68.02	517.7	504.3	492.2	460.4	31.82	15.471	
5,100.0	5,067.6	5,139.7	5,068.6	16.3	20.8	69.89	517.7	504.3	485.9	453.3	32.67	14.874	
5,200.0	5,166.1	5,238.2	5,167.1	16.7	21.0	71.80	517.7	504.3	480.2	446.7	33.53	14.319	
5,300.0	5,264.6	5,336.7	5,265.6	17.1	21.2	73.75	517.7	504.3	475.0	440.6	34.41	13.805	
5,400.0	5,363.1	5,435.2	5,364.1	17.6	21.3	75.74	517.7	504.3	470.4	435.1	35.29	13.331	
5,500.0	5,461.6	5,533.7	5,462.6	18.0	21.5	77.76	517.7	504.3	466.4	430.2	36.17	12.895	
5,544.5	5,505.4	5,577.5	5,506.4	18.2	21.6	78.68	517.7	504.3	464.8	428.2	36.56	12.713	
5,600.0	5,560.2	5,632.3	5,561.2	18.4	21.7	79.73	517.7	504.3	463.1	426.1	37.00	12.514	
5,700.0	5,659.2	5,731.3	5,660.2	18.8	21.9	81.33	517.7	504.3	460.8	423.1	37.70	12.223	
5,800.0	5,758.7	5,830.8	5,759.7	19.0	22.1	82.55	517.7	504.3	459.4	421.1	38.32	11.988	
5,900.0	5,858.5	5,930.6	5,859.5	19.3	22.2	83.36	517.7	504.3	458.6	419.7	38.86	11.800	
6,000.0	5,958.4	6,030.7	5,959.6	19.5	22.4	83.77	517.6	504.3	458.2	418.9	39.32	11.654	
6,041.6	6,000.0	6,072.7	6,001.5	19.6	22.5	89.25	515.5	504.3	458.1	418.7	39.47	11.606	
6,097.8	6,056.2	6,128.7	6,057.2	19.7	22.5	90.04	509.2	504.3	458.1	418.4	39.70	11.539	
6,100.0	6,058.4	6,130.9	6,059.4	19.7	22.5	90.08	508.8	504.3	458.1	418.4	39.71	11.536	
6,139.9	6,098.3	6,170.0	6,097.8	19.8	22.5	90.95	501.9	504.3	458.1	418.3	39.88	11.489	
6,150.0	6,108.4	6,179.8	6,107.4	19.8	22.5	-88.84	499.9	504.3	458.2	418.3	39.92	11.477	
6,200.0	6,158.4	6,227.9	6,154.0	19.9	22.5	-87.61	488.1	504.3	458.5	418.4	40.07	11.443	
6,250.0	6,208.0	6,275.3	6,199.2	19.9	22.4	-86.40	473.5	504.3	459.0	418.9	40.14	11.435	
6,300.0	6,257.3	6,322.3	6,242.9	19.9	22.3	-85.21	456.5	504.2	459.8	419.6	40.15	11.451	
6,350.0	6,305.8	6,368.7	6,285.0	19.9	22.2	-84.04	437.0	504.2	460.7	420.6	40.09	11.490	
6,400.0	6,353.4	6,414.6	6,325.4	19.8	22.1	-82.91	415.2	504.2	461.7	421.8	39.97	11.550	
6,450.0	6,400.0	6,460.1	6,364.1	19.7	22.0	-81.82	391.3	504.2	462.9	423.1	39.80	11.631	
6,500.0	6,445.2	6,505.1	6,400.9	19.6	21.9	-80.76	365.3	504.2	464.3	424.7	39.58	11.730	
6,550.0	6,489.0	6,550.0	6,436.0	19.5	21.7	-79.75	337.4	504.2	465.7	426.4	39.32	11.845	
6,600.0	6,531.1	6,594.0	6,468.8	19.4	21.6	-78.79	308.1	504.1	467.2	428.2	39.03	11.972	
6,650.0	6,571.3	6,638.0	6,499.8	19.3	21.5	-77.87	276.9	504.1	468.8	430.0	38.72	12.107	
6,700.0	6,609.5	6,681.6	6,528.7	19.2	21.3	-77.01	244.3	504.1	470.3	431.9	38.41	12.246	
6,750.0	6,645.6	6,724.9	6,555.6	19.0	21.2	-76.20	210.4	504.1	471.9	433.8	38.11	12.383	
6,800.0	6,679.2	6,767.9	6,580.3	19.0	21.1	-75.45	175.2	504.1	473.5	435.6	37.84	12.513	
6,850.0	6,710.4	6,810.7	6,602.9	18.9	20.9	-74.75	138.8	504.0	475.0	437.4	37.61	12.629	
6,900.0	6,739.0	6,850.0	6,621.8	18.9	20.8	-74.15	104.4	504.0	476.5	439.0	37.45	12.724	
6,950.0	6,764.8	6,895.6	6,641.5	18.9	20.7	-73.54	63.3	504.0	477.8	440.5	37.36	12.790	
7,000.0	6,787.8	6,937.8	6,657.6	19.0	20.6	-73.02	24.2	503.9	479.1	441.7	37.37	12.820	
7,050.0	6,807.8	6,979.8	6,671.3	19.1	20.5	-72.57	-15.4	503.9	480.2	442.7	37.49	12.811	
7,100.0	6,824.8	7,021.7	6,682.9	19.3	20.5	-72.18	-55.7	503.9	481.2	443.5	37.71	12.760	
7,150.0	6,838.6	7,063.4	6,692.2	19.6	20.5	-71.85	-96.4	503.9	482.1	444.0	38.09	12.656	
7,200.0	6,849.3	7,105.1	6,699.2	19.9	20.6	-71.59	-137.5	503.8	482.8	444.2	38.57	12.517	
7,250.0	6,856.8	7,150.0	6,704.3	20.2	20.8	-71.38	-182.1	503.8	483.4	444.2	39.22	12.326	
7,300.0	6,861.0	7,188.3	6,706.6	20.7	21.1	-71.25	-220.3	503.8	483.7	443.8	39.95	12.109	
7,339.5	6,862.0	7,221.5	6,707.0	21.0	21.4	-71.19	-253.5	503.8	483.9	443.3	40.62	11.912	
7,339.6	6,862.0	7,221.6	6,707.0	21.0	21.4	-71.19	-253.6	503.8	483.9	443.3	40.62	11.911	
7,340.4	6,862.0	7,222.4	6,707.0	21.0	21.4	-71.19	-254.4	503.7	483.9	443.3	40.64	11.908	
7,400.0	6,862.0	7,282.0	6,706.6	21.5	22.0	-71.15	-314.0	503.7	484.0	442.4	41.62	11.631	
7,500.0	6,862.0	7,382.0	6,705.9	22.7	23.2	-71.07	-414.0	503.6	484.2	440.4	43.87	11.039	
7,600.0	6,862.0	7,482.0	6,705.3	24.1	24.6	-71.00	-514.0	503.6	484.4	438.0	46.47	10.426	
7,700.0	6,862.0	7,582.0	6,704.6	25.6	26.1	-70.92	-614.0	503.5	484.7	435.3	49.33	9.824	
7,800.0	6,862.0	7,682.0	6,703.9	27.2	27.7	-70.85	-714.0	503.4	484.9	432.5	52.42	9.249	
7,900.0	6,862.0	7,782.0	6,703.3	28.9	29.4	-70.78	-814.0	503.3	485.1	429.4	55.70	8.709	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,000.0	6,862.0	7,882.0	6,702.6	30.8	31.2	-70.70	-914.0	503.2	485.3	426.2	59.13	8.207	
8,100.0	6,862.0	7,982.0	6,702.0	32.6	33.0	-70.63	-1,014.0	503.2	485.5	422.8	62.69	7.745	
8,200.0	6,862.0	8,082.0	6,701.3	34.6	34.9	-70.55	-1,114.0	503.1	485.7	419.4	66.35	7.321	
8,300.0	6,862.0	8,182.0	6,700.6	36.6	36.9	-70.48	-1,214.0	503.0	486.0	415.9	70.11	6.932	
8,400.0	6,862.0	8,282.0	6,700.0	38.6	38.9	-70.41	-1,314.0	502.9	486.2	412.2	73.94	6.576	
8,500.0	6,862.0	8,382.0	6,699.3	40.6	40.9	-70.33	-1,414.0	502.9	486.4	408.6	77.83	6.250	
8,600.0	6,862.0	8,482.0	6,698.6	42.7	43.0	-70.26	-1,513.9	502.8	486.6	404.8	81.78	5.951	
8,700.0	6,862.0	8,582.0	6,698.0	44.9	45.1	-70.19	-1,613.9	502.7	486.8	401.1	85.77	5.676	
8,800.0	6,862.0	8,682.0	6,697.3	47.0	47.2	-70.11	-1,713.9	502.6	487.1	397.3	89.80	5.424	
8,900.0	6,862.0	8,782.0	6,696.7	49.1	49.3	-70.04	-1,813.9	502.6	487.3	393.4	93.86	5.191	
9,000.0	6,862.0	8,882.0	6,696.0	51.3	51.5	-69.97	-1,913.9	502.5	487.5	389.6	97.96	4.977	
9,100.0	6,862.0	8,982.0	6,695.3	53.5	53.7	-69.89	-2,013.9	502.4	487.7	385.7	102.08	4.778	
9,200.0	6,862.0	9,082.0	6,694.7	55.7	55.8	-69.82	-2,113.9	502.3	488.0	381.7	106.22	4.594	
9,300.0	6,862.0	9,182.0	6,694.0	57.9	58.0	-69.75	-2,213.9	502.3	488.2	377.8	110.38	4.423	
9,400.0	6,862.0	9,282.0	6,693.4	60.2	60.2	-69.68	-2,313.9	502.2	488.4	373.9	114.55	4.264	
9,500.0	6,862.0	9,382.0	6,692.7	62.4	62.5	-69.60	-2,413.9	502.1	488.6	369.9	118.74	4.115	
9,600.0	6,862.0	9,482.0	6,692.0	64.6	64.7	-69.53	-2,513.9	502.0	488.9	365.9	122.94	3.976	
9,700.0	6,862.0	9,581.9	6,691.4	66.9	66.9	-69.46	-2,613.9	502.0	489.1	361.9	127.15	3.847	
9,800.0	6,862.0	9,681.9	6,690.7	69.1	69.2	-69.39	-2,713.9	501.9	489.3	358.0	131.38	3.725	
9,900.0	6,862.0	9,781.9	6,690.1	71.4	71.4	-69.31	-2,813.9	501.8	489.6	354.0	135.61	3.610	
10,000.0	6,862.0	9,881.9	6,689.4	73.7	73.7	-69.24	-2,913.9	501.7	489.8	350.0	139.84	3.502	
10,100.0	6,862.0	9,981.9	6,688.7	75.9	75.9	-69.17	-3,013.9	501.7	490.0	345.9	144.09	3.401	
10,200.0	6,862.0	10,081.9	6,688.1	78.2	78.2	-69.10	-3,113.9	501.6	490.3	341.9	148.33	3.305	
10,300.0	6,862.0	10,181.9	6,687.4	80.5	80.5	-69.02	-3,213.9	501.5	490.5	337.9	152.58	3.215	
10,400.0	6,862.0	10,281.9	6,686.7	82.8	82.7	-68.95	-3,313.9	501.4	490.7	333.9	156.84	3.129	
10,500.0	6,862.0	10,381.9	6,686.1	85.1	85.0	-68.88	-3,413.9	501.4	491.0	329.9	161.10	3.048	
10,600.0	6,862.0	10,481.9	6,685.4	87.4	87.3	-68.81	-3,513.9	501.3	491.2	325.8	165.36	2.971	
10,700.0	6,862.0	10,581.9	6,684.8	89.7	89.6	-68.73	-3,613.9	501.2	491.4	321.8	169.62	2.897	
10,800.0	6,862.0	10,681.9	6,684.1	92.0	91.9	-68.66	-3,713.9	501.1	491.7	317.8	173.89	2.828	
10,900.0	6,862.0	10,781.9	6,683.4	94.3	94.2	-68.59	-3,813.8	501.1	491.9	313.8	178.16	2.761	
11,000.0	6,862.0	10,881.9	6,682.8	96.6	96.5	-68.52	-3,913.8	501.0	492.2	309.7	182.42	2.698	
11,100.0	6,862.0	10,981.9	6,682.1	98.9	98.8	-68.45	-4,013.8	500.9	492.4	305.7	186.69	2.638	
11,200.0	6,862.0	11,081.9	6,681.5	101.2	101.1	-68.38	-4,113.8	500.8	492.6	301.7	190.96	2.580	
11,300.0	6,862.0	11,181.9	6,680.8	103.5	103.4	-68.30	-4,213.8	500.7	492.9	297.7	195.23	2.525	
11,400.0	6,862.0	11,281.9	6,680.1	105.8	105.7	-68.23	-4,313.8	500.7	493.1	293.6	199.49	2.472	
11,500.0	6,862.0	11,381.9	6,679.5	108.1	108.0	-68.16	-4,413.8	500.6	493.4	289.6	203.76	2.421	
11,600.0	6,862.0	11,481.9	6,678.8	110.4	110.3	-68.09	-4,513.8	500.5	493.6	285.6	208.03	2.373	
11,700.0	6,862.0	11,581.9	6,678.1	112.8	112.6	-68.02	-4,613.8	500.4	493.9	281.6	212.29	2.326	
11,800.0	6,862.0	11,681.9	6,677.5	115.1	114.9	-67.95	-4,713.8	500.4	494.1	277.5	216.55	2.282	
11,900.0	6,862.0	11,781.9	6,676.8	117.4	117.2	-67.88	-4,813.8	500.3	494.4	273.5	220.82	2.239	
12,000.0	6,862.0	11,881.9	6,676.2	119.7	119.6	-67.81	-4,913.8	500.2	494.6	269.5	225.08	2.197	
12,100.0	6,862.0	11,981.9	6,675.5	122.0	121.9	-67.73	-5,013.8	500.1	494.8	265.5	229.34	2.158	
12,200.0	6,862.0	12,081.9	6,674.8	124.4	124.2	-67.66	-5,113.8	500.1	495.1	261.5	233.60	2.119	
12,300.0	6,862.0	12,181.9	6,674.2	126.7	126.5	-67.59	-5,213.8	500.0	495.3	257.5	237.85	2.083	
12,400.0	6,862.0	12,281.9	6,673.5	129.0	128.8	-67.52	-5,313.8	499.9	495.6	253.5	242.11	2.047	
12,500.0	6,862.0	12,381.9	6,672.9	131.3	131.1	-67.45	-5,413.8	499.8	495.8	249.5	246.36	2.013	
12,600.0	6,862.0	12,481.9	6,672.2	133.7	133.5	-67.38	-5,513.8	499.8	496.1	245.5	250.61	1.980	
12,700.0	6,862.0	12,581.9	6,671.5	136.0	135.8	-67.31	-5,613.8	499.7	496.4	241.5	254.85	1.948	
12,800.0	6,862.0	12,681.9	6,670.9	138.3	138.1	-67.24	-5,713.8	499.6	496.6	237.5	259.10	1.917	
12,900.0	6,862.0	12,781.9	6,670.2	140.6	140.4	-67.17	-5,813.8	499.5	496.9	233.5	263.34	1.887	
13,000.0	6,862.0	12,881.9	6,669.5	143.0	142.8	-67.10	-5,913.8	499.5	497.1	229.5	267.58	1.858	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-243 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,100.0	6,862.0	12,981.9	6,668.9	145.3	145.1	-67.03	-6,013.7	499.4	497.4	225.6	271.82	1.830	
13,200.0	6,862.0	13,081.9	6,668.2	147.6	147.4	-66.96	-6,113.7	499.3	497.6	221.6	276.05	1.803	
13,300.0	6,862.0	13,181.9	6,667.6	150.0	149.7	-66.89	-6,213.7	499.2	497.9	217.6	280.28	1.776	
13,400.0	6,862.0	13,281.9	6,666.9	152.3	152.1	-66.82	-6,313.7	499.2	498.1	213.6	284.51	1.751	
13,500.0	6,862.0	13,381.9	6,666.2	154.6	154.4	-66.75	-6,413.7	499.1	498.4	209.7	288.74	1.726	
13,600.0	6,862.0	13,481.9	6,665.6	157.0	156.7	-66.68	-6,513.7	499.0	498.7	205.7	292.96	1.702	
13,700.0	6,862.0	13,581.9	6,664.9	159.3	159.1	-66.61	-6,613.7	498.9	498.9	201.7	297.18	1.679	
13,800.0	6,862.0	13,681.9	6,664.3	161.6	161.4	-66.54	-6,713.7	498.9	499.2	197.8	301.40	1.656	
13,900.0	6,862.0	13,781.9	6,663.6	164.0	163.7	-66.47	-6,813.7	498.8	499.4	193.8	305.61	1.634	
14,000.0	6,862.0	13,881.9	6,662.9	166.3	166.1	-66.40	-6,913.7	498.7	499.7	189.9	309.82	1.613	
14,100.0	6,862.0	13,981.9	6,662.3	168.6	168.4	-66.33	-7,013.7	498.6	500.0	185.9	314.03	1.592	
14,145.2	6,862.0	14,023.3	6,662.0	169.7	169.4	-66.30	-7,055.2	498.6	500.1	184.2	315.85	1.583	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-343 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.91	-0.7	45.1	45.1				
100.0	100.0	100.0	100.0	0.1	0.1	90.91	-0.7	45.1	45.1	44.9	0.28	163.952	
200.0	200.0	200.0	200.0	0.4	0.4	90.91	-0.7	45.1	45.1	44.3	0.83	54.651	CC, ES
300.0	300.0	299.1	299.0	0.7	0.7	89.92	0.1	46.2	46.2	44.8	1.37	33.708	
400.0	400.0	398.0	397.9	1.0	1.0	87.20	2.4	49.2	49.3	47.4	1.92	25.715	
500.0	500.0	496.7	496.4	1.2	1.2	83.39	6.3	54.3	54.8	52.3	2.47	22.150	
600.0	600.0	594.9	594.2	1.5	1.6	79.20	11.7	61.3	62.7	59.7	3.03	20.680	
700.0	700.0	692.7	691.3	1.8	1.9	75.18	18.6	70.3	73.2	69.6	3.59	20.378	
800.0	800.0	789.8	787.4	2.1	2.3	71.64	26.9	81.2	86.5	82.3	4.16	20.787	
900.0	900.0	886.1	882.4	2.3	2.7	68.65	36.7	93.9	102.3	97.6	4.73	21.649	
1,000.0	1,000.0	981.6	976.1	2.6	3.1	66.19	47.8	108.3	120.8	115.5	5.30	22.809	
1,100.0	1,100.0	1,076.1	1,068.4	2.9	3.6	64.20	60.2	124.5	141.8	136.0	5.87	24.167	
1,200.0	1,200.0	1,169.5	1,159.1	3.2	4.1	62.57	73.8	142.2	165.3	158.9	6.44	25.657	
1,300.0	1,300.0	1,263.1	1,249.4	3.4	4.7	61.24	88.7	161.6	191.2	184.2	7.03	27.202	
1,400.0	1,400.0	1,359.4	1,342.3	3.7	5.3	60.17	104.4	182.1	217.7	210.1	7.61	28.590	
1,500.0	1,500.0	1,455.8	1,435.1	4.0	6.0	59.33	120.1	202.5	244.2	236.0	8.20	29.779	
1,600.0	1,600.0	1,552.2	1,528.0	4.3	6.6	58.66	135.8	222.9	270.8	262.0	8.79	30.799	
1,700.0	1,700.0	1,648.5	1,620.9	4.5	7.2	58.11	151.5	243.4	297.4	288.0	9.39	31.684	
1,800.0	1,800.0	1,744.9	1,713.7	4.8	7.9	57.64	167.1	263.8	324.0	314.0	9.98	32.457	
1,900.0	1,900.0	1,841.2	1,806.6	5.1	8.5	57.25	182.8	284.2	350.6	340.1	10.58	33.137	
2,000.0	2,000.0	1,937.6	1,899.4	5.4	9.2	56.91	198.5	304.7	377.3	366.1	11.18	33.741	
2,100.0	2,100.0	2,034.0	1,992.3	5.6	9.8	56.62	214.2	325.1	404.0	392.2	11.78	34.279	
2,200.0	2,200.0	2,130.3	2,085.1	5.9	10.5	56.36	229.9	345.5	430.6	418.3	12.39	34.762	
2,300.0	2,300.0	2,226.7	2,178.0	6.2	11.1	56.14	245.6	366.0	457.3	444.3	12.99	35.197	
2,400.0	2,400.0	2,323.0	2,270.8	6.5	11.8	55.94	261.3	386.4	484.0	470.4	13.60	35.591	
2,500.0	2,500.0	2,419.4	2,363.7	6.7	12.4	55.76	276.9	406.9	510.7	496.5	14.21	35.950	
2,600.0	2,600.0	2,516.0	2,456.7	7.0	13.1	50.21	292.7	427.3	536.6	521.8	14.82	36.208	
2,700.0	2,699.9	2,613.0	2,550.2	7.3	13.7	50.09	308.5	447.9	560.9	545.4	15.45	36.310	
2,800.0	2,799.7	2,710.3	2,644.0	7.6	14.4	50.18	324.3	468.5	583.5	567.4	16.08	36.298	
2,900.0	2,899.3	2,807.9	2,738.1	7.9	15.1	50.45	340.2	489.2	604.6	587.8	16.71	36.182	
3,000.0	2,998.6	2,905.8	2,832.3	8.1	15.7	50.90	356.1	510.0	624.0	606.7	17.35	35.968	
3,100.0	3,097.5	3,003.7	2,926.7	8.4	16.4	51.51	372.1	530.8	642.0	624.0	18.00	35.661	
3,162.8	3,159.5	3,065.3	2,986.1	8.6	16.8	51.97	382.1	543.8	652.5	634.1	18.42	35.421	
3,200.0	3,196.1	3,101.8	3,021.2	8.7	17.1	52.33	388.0	551.5	658.6	640.0	18.67	35.271	
3,300.0	3,294.6	3,199.8	3,115.7	9.1	17.7	53.26	404.0	572.3	675.1	655.8	19.36	34.870	
3,400.0	3,393.1	3,297.8	3,210.1	9.4	18.4	54.15	419.9	593.1	691.8	671.7	20.06	34.477	
3,500.0	3,491.6	3,395.9	3,304.6	9.8	19.1	54.99	435.9	613.9	708.6	687.8	20.78	34.093	
3,600.0	3,590.1	3,493.9	3,399.1	10.1	19.7	55.80	451.9	634.7	725.5	704.0	21.52	33.717	
3,700.0	3,688.6	3,613.0	3,514.2	10.5	20.5	56.75	470.6	659.1	741.7	719.4	22.32	33.229	
3,800.0	3,787.1	3,745.7	3,643.7	10.9	21.1	57.84	488.1	681.9	753.9	730.8	23.13	32.589	
3,900.0	3,885.6	3,879.3	3,775.3	11.3	21.6	58.99	502.0	700.0	761.8	737.8	23.95	31.810	
4,000.0	3,984.1	4,013.4	3,908.3	11.6	22.0	60.22	512.2	713.3	765.3	740.6	24.76	30.911	
4,100.0	4,082.6	4,147.2	4,041.7	12.0	22.3	61.54	518.6	721.7	764.5	739.0	25.56	29.908	
4,200.0	4,181.1	4,280.2	4,174.6	12.4	22.5	62.99	521.2	725.0	759.5	733.2	26.36	28.808	
4,300.0	4,279.6	4,385.2	4,279.6	12.9	22.7	64.23	521.3	725.1	751.8	724.7	27.10	27.747	
4,400.0	4,378.1	4,483.7	4,378.1	13.3	22.8	65.41	521.3	725.1	744.4	716.6	27.83	26.749	
4,500.0	4,476.6	4,582.2	4,476.6	13.7	22.9	66.61	521.3	725.1	737.3	708.7	28.58	25.800	
4,600.0	4,575.1	4,680.7	4,575.1	14.1	23.1	67.84	521.3	725.1	730.5	701.2	29.34	24.899	
4,700.0	4,673.6	4,779.2	4,673.6	14.5	23.2	69.09	521.3	725.1	724.1	694.0	30.11	24.045	
4,800.0	4,772.1	4,877.7	4,772.1	15.0	23.3	70.36	521.3	725.1	718.0	687.1	30.90	23.236	
4,900.0	4,870.6	4,976.2	4,870.6	15.4	23.5	71.65	521.3	725.1	712.3	680.6	31.70	22.471	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-343 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,969.1	5,074.7	4,969.1	15.8	23.6	72.96	521.3	725.1	707.0	674.5	32.51	21.748	
5,100.0	5,067.6	5,173.2	5,067.6	16.3	23.8	74.29	521.3	725.1	702.1	668.8	33.33	21.066	
5,200.0	5,166.1	5,271.7	5,166.1	16.7	23.9	75.63	521.3	725.1	697.5	663.4	34.15	20.423	
5,300.0	5,264.6	5,370.2	5,264.6	17.1	24.1	77.00	521.3	725.1	693.4	658.4	34.99	19.819	
5,400.0	5,363.1	5,468.7	5,363.1	17.6	24.2	78.37	521.3	725.1	689.7	653.8	35.83	19.250	
5,500.0	5,461.6	5,567.2	5,461.6	18.0	24.4	79.77	521.3	725.1	686.3	649.7	36.67	18.716	
5,544.5	5,505.4	5,611.0	5,505.4	18.2	24.4	80.39	521.3	725.1	685.0	648.0	37.05	18.490	
5,600.0	5,560.2	5,665.8	5,560.2	18.4	24.5	81.10	521.3	725.1	683.5	646.1	37.47	18.242	
5,700.0	5,659.2	5,764.8	5,659.2	18.8	24.7	82.18	521.3	725.1	681.5	643.4	38.14	17.871	
5,800.0	5,758.7	5,864.3	5,758.7	19.0	24.9	83.00	521.3	725.1	680.2	641.5	38.73	17.562	
5,900.0	5,858.5	5,964.1	5,858.5	19.3	25.0	83.54	521.3	725.1	679.4	640.2	39.25	17.309	
6,000.0	5,958.4	6,064.0	5,958.4	19.5	25.2	83.80	521.3	725.1	679.1	639.4	39.70	17.105	
6,041.6	6,000.0	6,105.6	6,000.0	19.6	25.3	89.01	521.3	725.1	679.0	639.2	39.86	17.037	
6,100.0	6,058.4	6,164.7	6,059.1	19.7	25.3	89.15	519.6	725.1	679.0	638.9	40.09	16.939	
6,139.9	6,098.3	6,204.9	6,099.1	19.8	25.4	89.47	515.8	725.1	679.0	638.7	40.25	16.868	
6,150.0	6,108.4	6,215.0	6,109.2	19.8	25.4	-90.47	514.6	725.1	679.0	638.7	40.29	16.850	
6,196.4	6,154.8	6,261.3	6,154.8	19.9	25.4	-90.01	507.1	725.1	678.9	638.5	40.42	16.796	
6,200.0	6,158.4	6,264.9	6,158.3	19.9	25.4	-89.97	506.4	725.1	678.9	638.5	40.43	16.793	
6,250.0	6,208.0	6,314.3	6,206.4	19.9	25.3	-89.48	495.1	725.1	679.0	638.5	40.50	16.765	
6,300.0	6,257.3	6,363.3	6,253.3	19.9	25.3	-88.98	480.8	725.1	679.0	638.5	40.50	16.765	
6,350.0	6,305.8	6,412.0	6,298.9	19.9	25.2	-88.50	463.8	725.1	679.2	638.7	40.45	16.791	
6,400.0	6,353.4	6,460.4	6,343.0	19.8	25.1	-88.02	443.9	725.1	679.3	639.0	40.34	16.841	
6,450.0	6,400.0	6,508.4	6,385.5	19.7	25.0	-87.55	421.6	725.1	679.6	639.4	40.18	16.913	
6,500.0	6,445.2	6,556.1	6,426.2	19.6	24.9	-87.09	396.7	725.1	679.8	639.8	39.98	17.003	
6,550.0	6,489.0	6,603.5	6,465.0	19.5	24.8	-86.65	369.5	725.0	680.1	640.4	39.76	17.107	
6,600.0	6,531.1	6,650.0	6,501.4	19.4	24.6	-86.23	340.6	725.0	680.4	640.9	39.51	17.220	
6,650.0	6,571.3	6,697.5	6,536.7	19.3	24.5	-85.81	308.9	725.0	680.8	641.5	39.26	17.339	
6,700.0	6,609.5	6,744.1	6,569.3	19.2	24.3	-85.41	275.6	725.0	681.2	642.1	39.02	17.456	
6,750.0	6,645.6	6,790.4	6,599.7	19.0	24.2	-85.04	240.7	725.0	681.5	642.7	38.80	17.564	
6,800.0	6,679.2	6,836.5	6,627.8	19.0	24.1	-84.68	204.1	725.0	681.9	643.3	38.62	17.656	
6,850.0	6,710.4	6,882.4	6,653.5	18.9	23.9	-84.35	166.0	724.9	682.3	643.8	38.49	17.724	
6,900.0	6,739.0	6,928.1	6,676.8	18.9	23.8	-84.04	126.7	724.9	682.7	644.2	38.43	17.763	
6,950.0	6,764.8	6,973.7	6,697.6	18.9	23.7	-83.76	86.2	724.9	683.0	644.6	38.45	17.764	
7,000.0	6,787.8	7,019.1	6,715.9	19.0	23.6	-83.50	44.7	724.9	683.4	644.8	38.56	17.722	
7,050.0	6,807.8	7,064.3	6,731.7	19.1	23.5	-83.26	2.3	724.8	683.7	644.9	38.77	17.633	
7,100.0	6,824.8	7,109.4	6,744.9	19.3	23.5	-83.06	-40.9	724.8	684.0	644.9	39.09	17.497	
7,150.0	6,838.6	7,154.5	6,755.5	19.6	23.5	-82.87	-84.6	724.8	684.3	644.7	39.54	17.307	
7,200.0	6,849.3	7,200.0	6,763.6	19.9	23.5	-82.72	-129.4	724.8	684.5	644.4	40.09	17.073	
7,250.0	6,856.8	7,244.2	6,768.9	20.2	23.6	-82.60	-173.3	724.7	684.7	643.9	40.76	16.797	
7,300.0	6,861.0	7,289.0	6,771.6	20.7	23.8	-82.50	-218.0	724.7	684.9	643.3	41.55	16.484	
7,339.5	6,862.0	7,325.0	6,772.0	21.0	23.9	-82.45	-254.0	724.7	684.9	642.7	42.25	16.214	
7,339.6	6,862.0	7,325.1	6,772.0	21.0	23.9	-82.45	-254.1	724.7	684.9	642.7	42.25	16.213	
7,340.4	6,862.0	7,325.9	6,772.0	21.0	23.9	-82.45	-254.9	724.7	684.9	642.7	42.26	16.207	
7,400.0	6,862.0	7,385.5	6,771.6	21.5	24.3	-82.41	-314.5	724.7	685.0	641.7	43.35	15.803	
7,500.0	6,862.0	7,485.5	6,770.9	22.7	25.2	-82.36	-414.5	724.6	685.1	639.4	45.67	15.002	
7,600.0	6,862.0	7,585.5	6,770.2	24.1	26.4	-82.30	-514.5	724.5	685.2	636.9	48.33	14.179	
7,700.0	6,862.0	7,685.5	6,769.6	25.6	27.8	-82.25	-614.5	724.5	685.3	634.1	51.27	13.366	
7,800.0	6,862.0	7,785.5	6,768.9	27.2	29.3	-82.19	-714.5	724.4	685.4	631.0	54.46	12.586	
7,900.0	6,862.0	7,885.5	6,768.2	28.9	30.9	-82.14	-814.5	724.4	685.5	627.7	57.85	11.851	
8,000.0	6,862.0	7,985.5	6,767.6	30.8	32.6	-82.08	-914.4	724.3	685.6	624.2	61.40	11.167	

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-343 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,100.0	6,862.0	8,085.5	6,766.9	32.6	34.4	-82.03	-1,014.4	724.3	685.8	620.7	65.09	10.535	
8,200.0	6,862.0	8,185.5	6,766.3	34.6	36.2	-81.98	-1,114.4	724.2	685.9	617.0	68.90	9.955	
8,300.0	6,862.0	8,285.5	6,765.6	36.6	38.1	-81.92	-1,214.4	724.2	686.0	613.2	72.81	9.422	
8,400.0	6,862.0	8,385.5	6,764.9	38.6	40.0	-81.87	-1,314.4	724.1	686.1	609.3	76.80	8.934	
8,500.0	6,862.0	8,485.5	6,764.3	40.6	42.0	-81.81	-1,414.4	724.0	686.2	605.3	80.86	8.486	
8,600.0	6,862.0	8,585.5	6,763.6	42.7	44.0	-81.76	-1,514.4	724.0	686.3	601.3	84.98	8.076	
8,700.0	6,862.0	8,685.5	6,762.9	44.9	46.1	-81.70	-1,614.4	723.9	686.4	597.3	89.15	7.699	
8,800.0	6,862.0	8,785.5	6,762.3	47.0	48.2	-81.65	-1,714.4	723.9	686.5	593.2	93.37	7.353	
8,900.0	6,862.0	8,885.5	6,761.6	49.1	50.3	-81.59	-1,814.4	723.8	686.6	589.0	97.63	7.033	
9,000.0	6,862.0	8,985.5	6,760.9	51.3	52.4	-81.54	-1,914.4	723.8	686.8	584.8	101.92	6.739	
9,100.0	6,862.0	9,085.5	6,760.3	53.5	54.5	-81.48	-2,014.4	723.7	686.9	580.6	106.23	6.466	
9,200.0	6,862.0	9,185.4	6,759.6	55.7	56.7	-81.43	-2,114.4	723.6	687.0	576.4	110.58	6.213	
9,300.0	6,862.0	9,285.4	6,759.0	57.9	58.8	-81.37	-2,214.4	723.6	687.1	572.2	114.95	5.978	
9,400.0	6,862.0	9,385.4	6,758.3	60.2	61.0	-81.32	-2,314.4	723.5	687.2	567.9	119.33	5.759	
9,500.0	6,862.0	9,485.4	6,757.6	62.4	63.2	-81.27	-2,414.4	723.5	687.3	563.6	123.74	5.555	
9,600.0	6,862.0	9,585.4	6,757.0	64.6	65.4	-81.21	-2,514.4	723.4	687.5	559.3	128.16	5.364	
9,700.0	6,862.0	9,685.4	6,756.3	66.9	67.6	-81.16	-2,614.4	723.4	687.6	555.0	132.60	5.186	
9,800.0	6,862.0	9,785.4	6,755.6	69.1	69.8	-81.10	-2,714.4	723.3	687.7	550.7	137.04	5.018	
9,900.0	6,862.0	9,885.4	6,755.0	71.4	72.1	-81.05	-2,814.4	723.2	687.8	546.3	141.50	4.861	
10,000.0	6,862.0	9,985.4	6,754.3	73.7	74.3	-80.99	-2,914.4	723.2	687.9	542.0	145.97	4.713	
10,100.0	6,862.0	10,085.4	6,753.7	75.9	76.5	-80.94	-3,014.4	723.1	688.1	537.6	150.45	4.573	
10,200.0	6,862.0	10,185.4	6,753.0	78.2	78.8	-80.89	-3,114.3	723.1	688.2	533.2	154.93	4.442	
10,300.0	6,862.0	10,285.4	6,752.3	80.5	81.1	-80.83	-3,214.3	723.0	688.3	528.9	159.43	4.317	
10,400.0	6,862.0	10,385.4	6,751.7	82.8	83.3	-80.78	-3,314.3	723.0	688.4	524.5	163.93	4.200	
10,500.0	6,862.0	10,485.4	6,751.0	85.1	85.6	-80.72	-3,414.3	722.9	688.5	520.1	168.43	4.088	
10,600.0	6,862.0	10,585.4	6,750.3	87.4	87.8	-80.67	-3,514.3	722.9	688.7	515.7	172.95	3.982	
10,700.0	6,862.0	10,685.4	6,749.7	89.7	90.1	-80.61	-3,614.3	722.8	688.8	511.3	177.46	3.881	
10,800.0	6,862.0	10,785.4	6,749.0	92.0	92.4	-80.56	-3,714.3	722.7	688.9	506.9	181.98	3.786	
10,900.0	6,862.0	10,885.4	6,748.3	94.3	94.7	-80.51	-3,814.3	722.7	689.0	502.5	186.51	3.694	
11,000.0	6,862.0	10,985.4	6,747.7	96.6	97.0	-80.45	-3,914.3	722.6	689.2	498.1	191.04	3.608	
11,100.0	6,862.0	11,085.4	6,747.0	98.9	99.2	-80.40	-4,014.3	722.6	689.3	493.7	195.57	3.525	
11,200.0	6,862.0	11,185.4	6,746.4	101.2	101.5	-80.34	-4,114.3	722.5	689.4	489.3	200.10	3.445	
11,300.0	6,862.0	11,285.4	6,745.7	103.5	103.8	-80.29	-4,214.3	722.5	689.6	484.9	204.64	3.370	
11,400.0	6,862.0	11,385.4	6,745.0	105.8	106.1	-80.24	-4,314.3	722.4	689.7	480.5	209.18	3.297	
11,500.0	6,862.0	11,485.4	6,744.4	108.1	108.4	-80.18	-4,414.3	722.3	689.8	476.1	213.72	3.228	
11,600.0	6,862.0	11,585.4	6,743.7	110.4	110.7	-80.13	-4,514.3	722.3	689.9	471.7	218.26	3.161	
11,700.0	6,862.0	11,685.4	6,743.0	112.8	113.0	-80.07	-4,614.3	722.2	690.1	467.3	222.81	3.097	
11,800.0	6,862.0	11,785.4	6,742.4	115.1	115.3	-80.02	-4,714.3	722.2	690.2	462.8	227.35	3.036	
11,900.0	6,862.0	11,885.4	6,741.7	117.4	117.6	-79.97	-4,814.3	722.1	690.3	458.4	231.90	2.977	
12,000.0	6,862.0	11,985.4	6,741.0	119.7	119.9	-79.91	-4,914.3	722.1	690.5	454.0	236.45	2.920	
12,100.0	6,862.0	12,085.4	6,740.4	122.0	122.3	-79.86	-5,014.3	722.0	690.6	449.6	241.00	2.866	
12,200.0	6,862.0	12,185.4	6,739.7	124.4	124.6	-79.80	-5,114.3	721.9	690.7	445.2	245.55	2.813	
12,300.0	6,862.0	12,285.4	6,739.1	126.7	126.9	-79.75	-5,214.3	721.9	690.9	440.8	250.10	2.762	
12,400.0	6,862.0	12,385.4	6,738.4	129.0	129.2	-79.70	-5,314.3	721.8	691.0	436.4	254.65	2.714	
12,500.0	6,862.0	12,485.4	6,737.7	131.3	131.5	-79.64	-5,414.2	721.8	691.1	431.9	259.21	2.666	
12,600.0	6,862.0	12,585.4	6,737.1	133.7	133.8	-79.59	-5,514.2	721.7	691.3	427.5	263.76	2.621	
12,700.0	6,862.0	12,685.4	6,736.4	136.0	136.1	-79.53	-5,614.2	721.7	691.4	423.1	268.31	2.577	
12,800.0	6,862.0	12,785.4	6,735.7	138.3	138.5	-79.48	-5,714.2	721.6	691.6	418.7	272.86	2.534	
12,900.0	6,862.0	12,885.4	6,735.1	140.6	140.8	-79.43	-5,814.2	721.6	691.7	414.3	277.42	2.493	
13,000.0	6,862.0	12,985.4	6,734.4	143.0	143.1	-79.37	-5,914.2	721.5	691.8	409.9	281.97	2.454	
13,100.0	6,862.0	13,085.4	6,733.8	145.3	145.4	-79.32	-6,014.2	721.4	692.0	405.4	286.52	2.415	

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

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**Offset TVD Reference:**	Offset Datum

Offset Design Ottenhoff 5N64W29CR Pad Sec.29-T5N-R64W - Ottenhoff 29U-343 - Wellbore #1 - Plan #2 (1-25-17)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

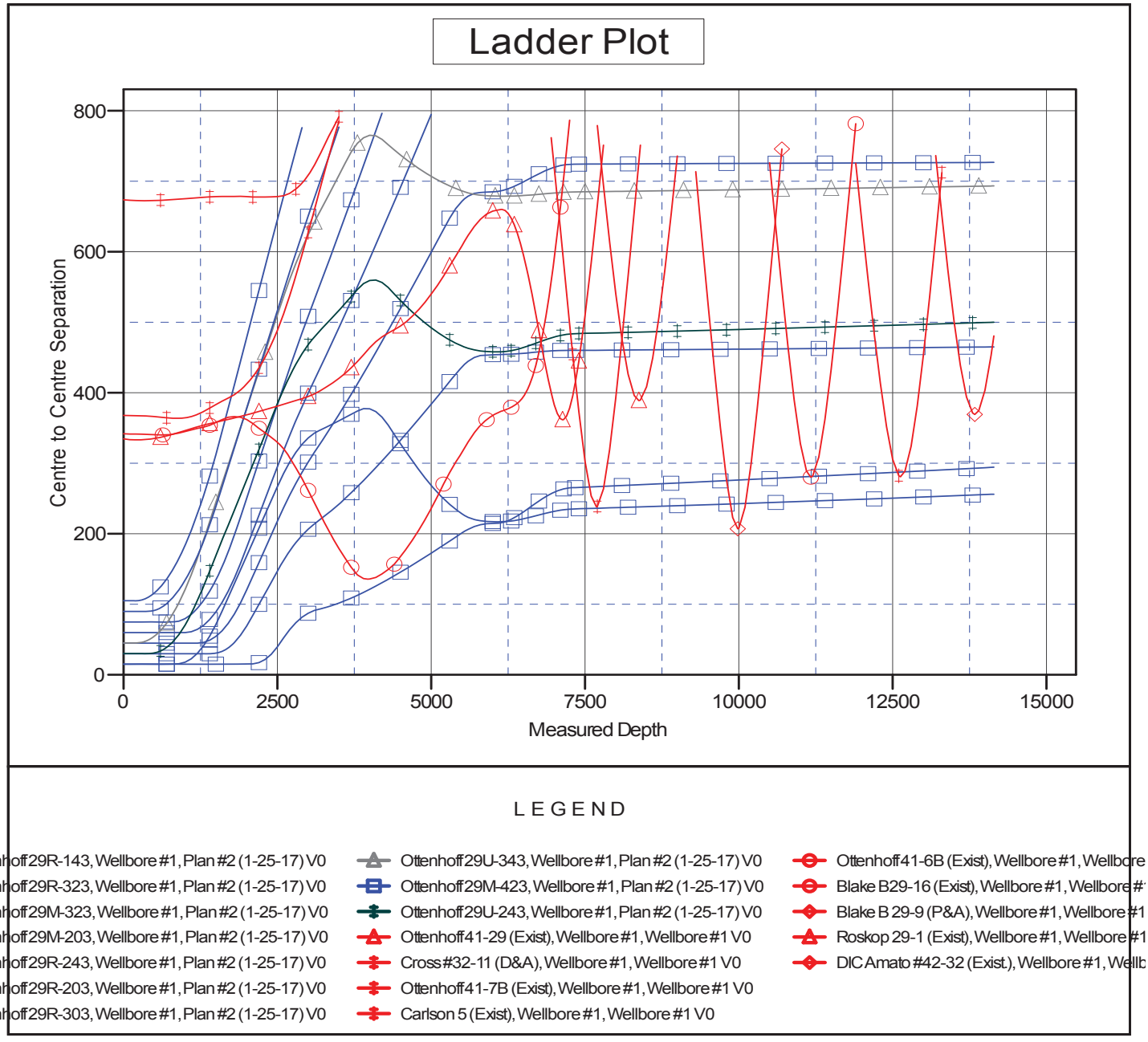
Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,200.0	6,862.0	13,185.4	6,733.1	147.6	147.7	-79.27	-6,114.2	721.4	692.1	401.0	291.07	2.378	
13,300.0	6,862.0	13,285.4	6,732.4	150.0	150.1	-79.21	-6,214.2	721.3	692.2	396.6	295.63	2.342	
13,400.0	6,862.0	13,385.4	6,731.8	152.3	152.4	-79.16	-6,314.2	721.3	692.4	392.2	300.18	2.307	
13,500.0	6,862.0	13,485.4	6,731.1	154.6	154.7	-79.10	-6,414.2	721.2	692.5	387.8	304.73	2.273	
13,600.0	6,862.0	13,585.4	6,730.4	157.0	157.0	-79.05	-6,514.2	721.2	692.7	383.4	309.28	2.240	
13,700.0	6,862.0	13,685.3	6,729.8	159.3	159.4	-79.00	-6,614.2	721.1	692.8	379.0	313.83	2.208	
13,800.0	6,862.0	13,785.3	6,729.1	161.6	161.7	-78.94	-6,714.2	721.0	693.0	374.6	318.38	2.177	
13,900.0	6,862.0	13,885.3	6,728.4	164.0	164.0	-78.89	-6,814.2	721.0	693.1	370.2	322.93	2.146	
14,000.0	6,862.0	13,985.3	6,727.8	166.3	166.3	-78.84	-6,914.2	720.9	693.2	365.8	327.48	2.117	
14,100.0	6,862.0	14,085.3	6,727.1	168.6	168.7	-78.78	-7,014.2	720.9	693.4	361.4	332.02	2.088	
14,116.5	6,862.0	14,101.9	6,727.0	169.0	169.1	-78.77	-7,030.7	720.9	693.4	360.6	332.77	2.084	
14,145.2	6,862.0	14,123.8	6,726.9	169.7	169.6	-78.76	-7,052.6	720.9	693.5	359.6	333.93	2.077	SF

Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**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 29R-423
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°



Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	**Local Co-ordinate Reference:**	Well Ottenhoff 29R-423
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 29R-423	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 ft	**Output errors are at**	2.45 sigma
Reference Wellbore	Wellbore #1	**Database:**	US_EDM
Reference Design:	Plan #2 (1-25-17)	**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 29R-423
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.60°