

## PETROLEUM DEVELOPMENT CORP DJ Basin

Well Name: **Cockroft 19W-214**

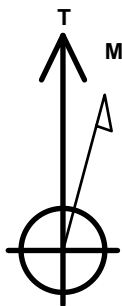
Surface Location: Cockroft 5N63W19C Pad Sec.19-T5N-R63W  
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone  
 Ground Elevation: 4554.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1385890.16	3285845.42	40.388130	-104.473820	

RKB - 13' WELL @ 4567.0ft (RKB - 13')

## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1391'FNL, 1067'FEL, SEC.19	1.0	0.0	0.0	Point
BHL 2408'FNL, 2141'FEL, SEC.24	6443.0	-1001.0	-6326.6	Point
LPL 2392'FNL, 799'FEL, SEC.19	6458.0	-1001.0	268.3	Point



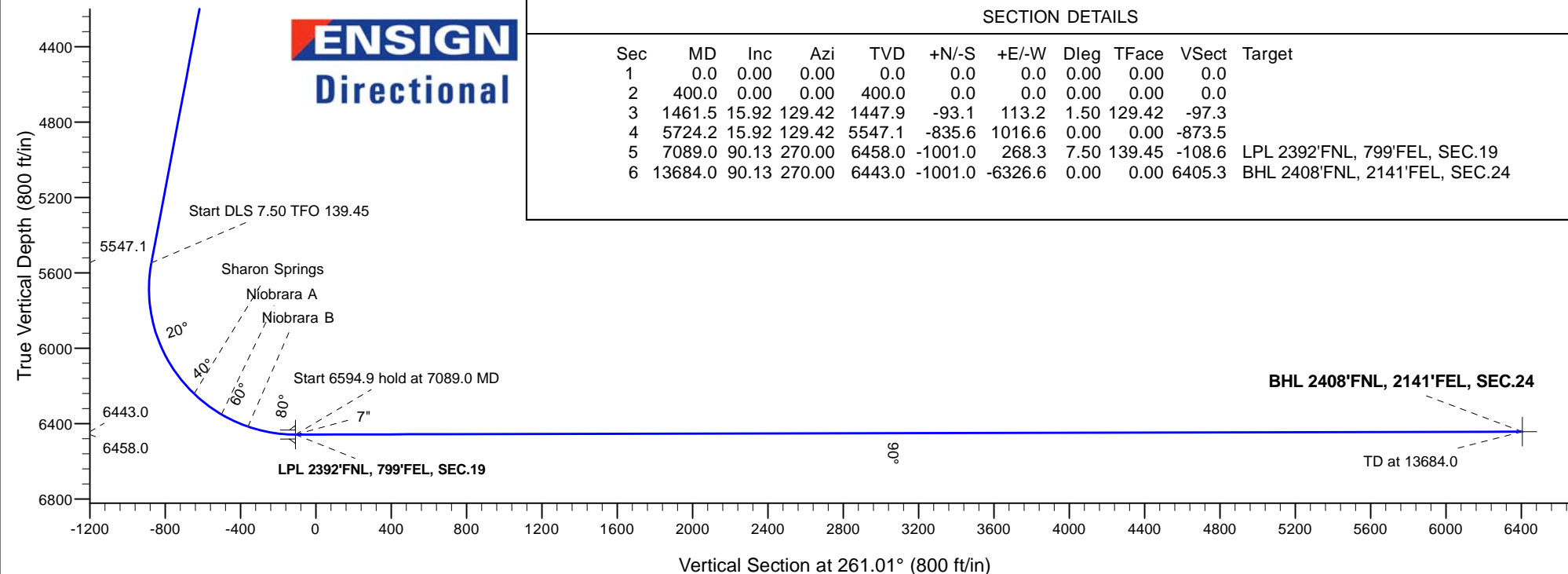
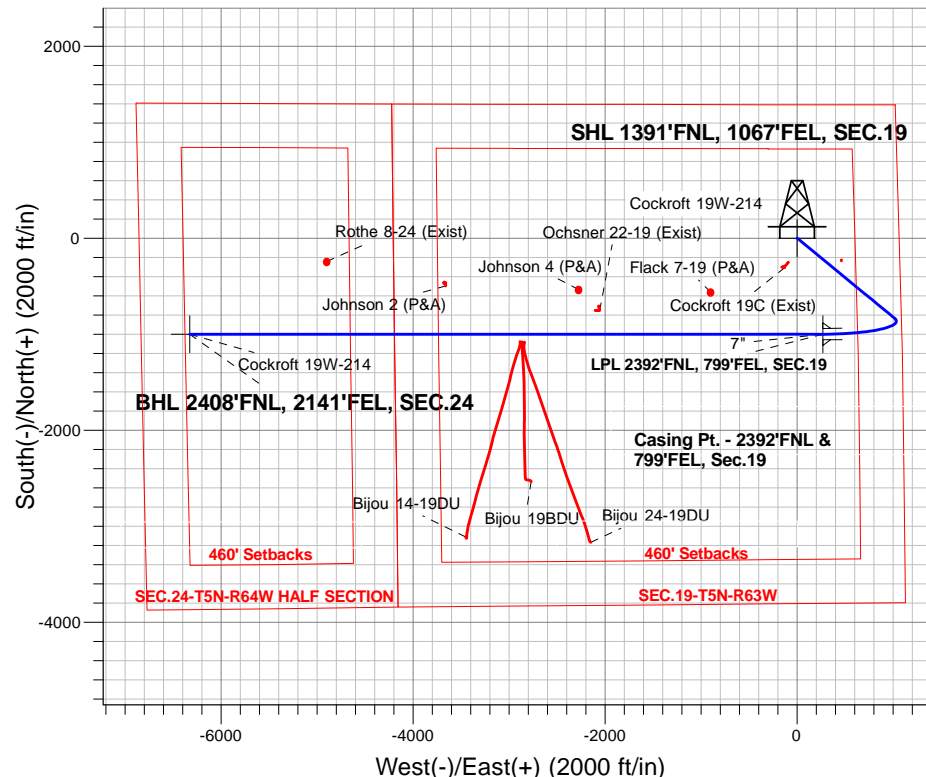
Azimuths to True North  
Magnetic North:  $8.11^\circ$

Magnetic Field  
Strength: 52691.0nT  
Dip Angle: 66.93°  
Date: 11/17/2015  
Model: IGRF2010

Cockroft 5N63W19C Pad Sec.19-T5N-R63W  
Cockroft 19W-214  
Plan #1 (11-13-15)  
12:06, November 17 2015

## ANNOTATIONS

TVD	MD	Annotation
400.0	400.0	KOP - Start Build 1.50
1447.9	1461.5	Start 4262.7 hold at 1461.5 MD
5547.1	5724.2	Start DLS 7.50 TFO 139.45
6458.0	7089.0	Start 6594.9 hold at 7089.0 MD
6443.0	13684.0	TD at 13684.0





## **PETROLEUM DEVELOPMENT CORP DJ Basin**

**SEC.19-T5N-R63W**

**Cockroft 5N63W19C Pad Sec.19-T5N-R63W**

**Cockroft 19W-214**

**Wellbore #1**

**Plan: Plan #1 (11-13-15)**

## **Standard Planning Report**

**17 November, 2015**

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Project:</b>	SEC.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-13-15)		

<b>Project</b>	SEC.19-T5N-R63W, Weld County, Colorado		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

<b>Site</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W		
<b>Site Position:</b>		<b>Northing:</b>	1,385,863.51 usft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,285,745.44 usft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	13-3/16 "
		<b>Latitude:</b>	40.388060
		<b>Longitude:</b>	-104.474180
		<b>Grid Convergence:</b>	0.66 °

<b>Well</b>	Cockroft 19W-214		
<b>Well Position</b>	<b>+N/-S</b>	25.5 ft	<b>Northing:</b>
	<b>+E/-W</b>	100.3 ft	<b>Easting:</b>
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>
			<b>Latitude:</b>
			<b>Longitude:</b>
			<b>Ground Level:</b>

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	11/17/2015	8.11	66.93	52,691

<b>Design</b>	Plan #1 (11-13-15)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	261.01

<b>Plan Sections</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	<b>TFO (°)</b>	<b>Target</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,461.5	15.92	129.42	1,447.9	-93.1	113.2	1.50	1.50	0.00	129.42	
5,724.2	15.92	129.42	5,547.1	-835.6	1,016.6	0.00	0.00	0.00	0.00	
7,089.0	90.13	270.00	6,458.0	-1,001.0	268.3	7.50	5.44	10.30	139.45	LPL 2392'FNL, 799'Fi
13,684.0	90.13	270.00	6,443.0	-1,001.0	-6,326.6	0.00	0.00	0.00	0.00	BHL 2408'FNL, 2141'i

Database:	US_EDM	Local Co-ordinate Reference:	Well Cockroft 19W-214
Company:	PETROLEUM DEVELOPMENT CORP DJ Basin	TVD Reference:	WELL @ 4567.0ft (RKB - 13')
Project:	SEC.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	North Reference:	True
Well:	Cockroft 19W-214	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-13-15)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
SHL 1391'FNL, 1067'FEL, SEC.19									
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
KOP - Start Build 1.50									
500.0	1.50	129.42	500.0	-0.8	1.0	-0.9	1.50	1.50	0.00
600.0	3.00	129.42	599.9	-3.3	4.0	-3.5	1.50	1.50	0.00
700.0	4.50	129.42	699.7	-7.5	9.1	-7.8	1.50	1.50	0.00
800.0	6.00	129.42	799.3	-13.3	16.2	-13.9	1.50	1.50	0.00
900.0	7.50	129.42	898.6	-20.7	25.2	-21.7	1.50	1.50	0.00
1,000.0	9.00	129.42	997.5	-29.9	36.3	-31.2	1.50	1.50	0.00
1,100.0	10.50	129.42	1,096.1	-40.6	49.4	-42.5	1.50	1.50	0.00
1,200.0	12.00	129.42	1,194.2	-53.0	64.5	-55.4	1.50	1.50	0.00
1,300.0	13.50	129.42	1,291.7	-67.0	81.5	-70.1	1.50	1.50	0.00
1,400.0	15.00	129.42	1,388.6	-82.6	100.5	-86.4	1.50	1.50	0.00
1,461.5	15.92	129.42	1,447.9	-93.1	113.2	-97.3	1.50	1.50	0.00
Start 4262.7 hold at 1461.5 MD									
1,500.0	15.92	129.42	1,484.9	-99.8	121.4	-104.3	0.00	0.00	0.00
1,600.0	15.92	129.42	1,581.1	-117.2	142.6	-122.5	0.00	0.00	0.00
1,700.0	15.92	129.42	1,677.2	-134.6	163.8	-140.7	0.00	0.00	0.00
1,800.0	15.92	129.42	1,773.4	-152.0	185.0	-158.9	0.00	0.00	0.00
1,900.0	15.92	129.42	1,869.6	-169.4	206.1	-177.1	0.00	0.00	0.00
2,000.0	15.92	129.42	1,965.7	-186.9	227.3	-195.3	0.00	0.00	0.00
2,100.0	15.92	129.42	2,061.9	-204.3	248.5	-213.5	0.00	0.00	0.00
2,200.0	15.92	129.42	2,158.1	-221.7	269.7	-231.8	0.00	0.00	0.00
2,300.0	15.92	129.42	2,254.2	-239.1	290.9	-250.0	0.00	0.00	0.00
2,400.0	15.92	129.42	2,350.4	-256.5	312.1	-268.2	0.00	0.00	0.00
2,500.0	15.92	129.42	2,446.5	-274.0	333.3	-286.4	0.00	0.00	0.00
2,600.0	15.92	129.42	2,542.7	-291.4	354.5	-304.6	0.00	0.00	0.00
2,700.0	15.92	129.42	2,638.9	-308.8	375.7	-322.8	0.00	0.00	0.00
2,800.0	15.92	129.42	2,735.0	-326.2	396.9	-341.0	0.00	0.00	0.00
2,900.0	15.92	129.42	2,831.2	-343.6	418.1	-359.2	0.00	0.00	0.00
3,000.0	15.92	129.42	2,927.4	-361.1	439.3	-377.4	0.00	0.00	0.00
3,100.0	15.92	129.42	3,023.5	-378.5	460.5	-395.6	0.00	0.00	0.00
3,200.0	15.92	129.42	3,119.7	-395.9	481.7	-413.9	0.00	0.00	0.00
3,300.0	15.92	129.42	3,215.9	-413.3	502.8	-432.1	0.00	0.00	0.00
3,400.0	15.92	129.42	3,312.0	-430.7	524.0	-450.3	0.00	0.00	0.00
3,424.9	15.92	129.42	3,336.0	-435.1	529.3	-454.8	0.00	0.00	0.00
Parkman									
3,500.0	15.92	129.42	3,408.2	-448.1	545.2	-468.5	0.00	0.00	0.00
3,600.0	15.92	129.42	3,504.3	-465.6	566.4	-486.7	0.00	0.00	0.00
3,700.0	15.92	129.42	3,600.5	-483.0	587.6	-504.9	0.00	0.00	0.00
3,800.0	15.92	129.42	3,696.7	-500.4	608.8	-523.1	0.00	0.00	0.00
3,900.0	15.92	129.42	3,792.8	-517.8	630.0	-541.3	0.00	0.00	0.00
4,000.0	15.92	129.42	3,889.0	-535.2	651.2	-559.5	0.00	0.00	0.00
4,100.0	15.92	129.42	3,985.2	-552.7	672.4	-577.8	0.00	0.00	0.00
4,184.1	15.92	129.42	4,066.0	-567.3	690.2	-593.1	0.00	0.00	0.00
Sussex									
4,200.0	15.92	129.42	4,081.3	-570.1	693.6	-596.0	0.00	0.00	0.00
4,300.0	15.92	129.42	4,177.5	-587.5	714.8	-614.2	0.00	0.00	0.00

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Project:	SEC.19-T5N-R63W	MD Reference:	WELL @ 4567.0ft (RKB - 13')
Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	North Reference:	True
Well:	Cockroft 19W-214	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-13-15)		

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)
4,400.0	15.92	129.42	4,273.7	-604.9	736.0	-632.4	0.00	0.00	0.00
4,500.0	15.92	129.42	4,369.8	-622.3	757.2	-650.6	0.00	0.00	0.00
4,600.0	15.92	129.42	4,466.0	-639.8	778.4	-668.8	0.00	0.00	0.00
4,700.0	15.92	129.42	4,562.1	-657.2	799.5	-687.0	0.00	0.00	0.00
4,800.0	15.92	129.42	4,658.3	-674.6	820.7	-705.2	0.00	0.00	0.00
4,900.0	15.92	129.42	4,754.5	-692.0	841.9	-723.4	0.00	0.00	0.00
5,000.0	15.92	129.42	4,850.6	-709.4	863.1	-741.6	0.00	0.00	0.00
5,100.0	15.92	129.42	4,946.8	-726.9	884.3	-759.9	0.00	0.00	0.00
5,200.0	15.92	129.42	5,043.0	-744.3	905.5	-778.1	0.00	0.00	0.00
5,300.0	15.92	129.42	5,139.1	-761.7	926.7	-796.3	0.00	0.00	0.00
5,400.0	15.92	129.42	5,235.3	-779.1	947.9	-814.5	0.00	0.00	0.00
5,500.0	15.92	129.42	5,331.5	-796.5	969.1	-832.7	0.00	0.00	0.00
5,600.0	15.92	129.42	5,427.6	-814.0	990.3	-850.9	0.00	0.00	0.00
5,700.0	15.92	129.42	5,523.8	-831.4	1,011.5	-869.1	0.00	0.00	0.00
5,724.2	15.92	129.42	5,547.1	-835.6	1,016.6	-873.5	0.00	0.00	0.00
Start DLS 7.50 TFO 139.45									
5,800.0	12.16	147.22	5,620.6	-848.9	1,029.0	-883.6	7.50	-4.96	23.48
5,900.0	10.32	185.31	5,718.8	-866.7	1,033.8	-885.7	7.50	-1.85	38.09
6,000.0	13.28	219.79	5,816.8	-884.5	1,025.7	-874.8	7.50	2.96	34.47
6,100.0	18.90	238.02	5,912.9	-901.9	1,004.5	-851.2	7.50	5.63	18.23
6,200.0	25.49	247.63	6,005.5	-918.7	970.9	-815.3	7.50	6.59	9.61
6,300.0	32.45	253.42	6,092.9	-934.6	925.2	-767.8	7.50	6.96	5.79
6,400.0	39.60	257.32	6,173.8	-949.2	868.3	-709.3	7.50	7.14	3.90
6,491.8	46.24	259.98	6,241.0	-961.4	807.0	-646.8	7.50	7.24	2.90
Sharon Springs									
6,500.0	46.84	260.19	6,246.6	-962.5	801.2	-640.9	7.50	7.27	2.54
6,600.0	54.13	262.45	6,310.2	-974.0	725.0	-563.8	7.50	7.30	2.26
6,674.7	59.60	263.87	6,351.0	-981.4	662.9	-501.4	7.50	7.33	1.91
Niobrara A									
6,700.0	61.46	264.32	6,363.5	-983.7	641.0	-479.3	7.50	7.34	1.76
6,800.0	68.82	265.95	6,405.5	-991.4	550.6	-388.9	7.50	7.35	1.63
6,830.7	71.08	266.41	6,416.0	-993.3	521.9	-360.2	7.50	7.36	1.52
Niobrara B									
6,900.0	76.18	267.42	6,435.5	-996.8	455.5	-294.1	7.50	7.37	1.45
7,000.0	83.56	268.80	6,453.1	-1,000.1	357.2	-196.5	7.50	7.38	1.38
7,089.0	90.13	270.00	6,458.0	-1,001.0	268.3	-108.6	7.50	7.38	1.34
Start 6594.9 hold at 7089.0 MD - 7" - LPL 2392'FNL, 799'FEL, SEC.19									
7,100.0	90.13	270.00	6,458.0	-1,001.0	257.3	-97.7	0.03	0.03	0.01
7,200.0	90.13	270.00	6,457.7	-1,001.0	157.3	1.0	0.00	0.00	0.00
7,300.0	90.13	270.00	6,457.5	-1,001.0	57.3	99.8	0.00	0.00	0.00
7,400.0	90.13	270.00	6,457.3	-1,001.0	-42.7	198.6	0.00	0.00	0.00
7,500.0	90.13	270.00	6,457.1	-1,001.0	-142.7	297.3	0.00	0.00	0.00
7,600.0	90.13	270.00	6,456.8	-1,001.0	-242.7	396.1	0.00	0.00	0.00
7,700.0	90.13	270.00	6,456.6	-1,001.0	-342.7	494.9	0.00	0.00	0.00
7,800.0	90.13	270.00	6,456.4	-1,001.0	-442.7	593.7	0.00	0.00	0.00
7,900.0	90.13	270.00	6,456.2	-1,001.0	-542.7	692.4	0.00	0.00	0.00
8,000.0	90.13	270.00	6,455.9	-1,001.0	-642.7	791.2	0.00	0.00	0.00
8,100.0	90.13	270.00	6,455.7	-1,001.0	-742.6	890.0	0.00	0.00	0.00
8,200.0	90.13	270.00	6,455.5	-1,001.0	-842.6	988.7	0.00	0.00	0.00
8,300.0	90.13	270.00	6,455.2	-1,001.0	-942.6	1,087.5	0.00	0.00	0.00
8,400.0	90.13	270.00	6,455.0	-1,001.0	-1,042.6	1,186.3	0.00	0.00	0.00
8,500.0	90.13	270.00	6,454.8	-1,001.0	-1,142.6	1,285.1	0.00	0.00	0.00

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Site:	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	North Reference:	True
Well:	Cockroft 19W-214	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (11-13-15)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,600.0	90.13	270.00	6,454.6	-1,001.0	-1,242.6	1,383.8	0.00	0.00	0.00
8,700.0	90.13	270.00	6,454.3	-1,001.0	-1,342.6	1,482.6	0.00	0.00	0.00
8,800.0	90.13	270.00	6,454.1	-1,001.0	-1,442.6	1,581.4	0.00	0.00	0.00
8,900.0	90.13	270.00	6,453.9	-1,001.0	-1,542.6	1,680.1	0.00	0.00	0.00
9,000.0	90.13	270.00	6,453.7	-1,001.0	-1,642.6	1,778.9	0.00	0.00	0.00
9,100.0	90.13	270.00	6,453.4	-1,001.0	-1,742.6	1,877.7	0.00	0.00	0.00
9,200.0	90.13	270.00	6,453.2	-1,001.0	-1,842.6	1,976.4	0.00	0.00	0.00
9,300.0	90.13	270.00	6,453.0	-1,001.0	-1,942.6	2,075.2	0.00	0.00	0.00
9,400.0	90.13	270.00	6,452.7	-1,001.0	-2,042.6	2,174.0	0.00	0.00	0.00
9,500.0	90.13	270.00	6,452.5	-1,001.0	-2,142.6	2,272.8	0.00	0.00	0.00
9,600.0	90.13	270.00	6,452.3	-1,001.0	-2,242.6	2,371.5	0.00	0.00	0.00
9,700.0	90.13	270.00	6,452.1	-1,001.0	-2,342.6	2,470.3	0.00	0.00	0.00
9,800.0	90.13	270.00	6,451.8	-1,001.0	-2,442.6	2,569.1	0.00	0.00	0.00
9,900.0	90.13	270.00	6,451.6	-1,001.0	-2,542.6	2,667.8	0.00	0.00	0.00
10,000.0	90.13	270.00	6,451.4	-1,001.0	-2,642.6	2,766.6	0.00	0.00	0.00
10,100.0	90.13	270.00	6,451.2	-1,001.0	-2,742.6	2,865.4	0.00	0.00	0.00
10,200.0	90.13	270.00	6,450.9	-1,001.0	-2,842.6	2,964.2	0.00	0.00	0.00
10,300.0	90.13	270.00	6,450.7	-1,001.0	-2,942.6	3,062.9	0.00	0.00	0.00
10,400.0	90.13	270.00	6,450.5	-1,001.0	-3,042.6	3,161.7	0.00	0.00	0.00
10,500.0	90.13	270.00	6,450.2	-1,001.0	-3,142.6	3,260.5	0.00	0.00	0.00
10,600.0	90.13	270.00	6,450.0	-1,001.0	-3,242.6	3,359.2	0.00	0.00	0.00
10,700.0	90.13	270.00	6,449.8	-1,001.0	-3,342.6	3,458.0	0.00	0.00	0.00
10,800.0	90.13	270.00	6,449.6	-1,001.0	-3,442.6	3,556.8	0.00	0.00	0.00
10,900.0	90.13	270.00	6,449.3	-1,001.0	-3,542.6	3,655.6	0.00	0.00	0.00
11,000.0	90.13	270.00	6,449.1	-1,001.0	-3,642.6	3,754.3	0.00	0.00	0.00
11,100.0	90.13	270.00	6,448.9	-1,001.0	-3,742.6	3,853.1	0.00	0.00	0.00
11,200.0	90.13	270.00	6,448.6	-1,001.0	-3,842.6	3,951.9	0.00	0.00	0.00
11,300.0	90.13	270.00	6,448.4	-1,001.0	-3,942.6	4,050.6	0.00	0.00	0.00
11,400.0	90.13	270.00	6,448.2	-1,001.0	-4,042.6	4,149.4	0.00	0.00	0.00
11,500.0	90.13	270.00	6,448.0	-1,001.0	-4,142.6	4,248.2	0.00	0.00	0.00
11,600.0	90.13	270.00	6,447.7	-1,001.0	-4,242.6	4,347.0	0.00	0.00	0.00
11,700.0	90.13	270.00	6,447.5	-1,001.0	-4,342.6	4,445.7	0.00	0.00	0.00
11,800.0	90.13	270.00	6,447.3	-1,001.0	-4,442.6	4,544.5	0.00	0.00	0.00
11,900.0	90.13	270.00	6,447.1	-1,001.0	-4,542.6	4,643.3	0.00	0.00	0.00
12,000.0	90.13	270.00	6,446.8	-1,001.0	-4,642.6	4,742.0	0.00	0.00	0.00
12,100.0	90.13	270.00	6,446.6	-1,001.0	-4,742.6	4,840.8	0.00	0.00	0.00
12,200.0	90.13	270.00	6,446.4	-1,001.0	-4,842.6	4,939.6	0.00	0.00	0.00
12,300.0	90.13	270.00	6,446.1	-1,001.0	-4,942.6	5,038.4	0.00	0.00	0.00
12,400.0	90.13	270.00	6,445.9	-1,001.0	-5,042.6	5,137.1	0.00	0.00	0.00
12,500.0	90.13	270.00	6,445.7	-1,001.0	-5,142.6	5,235.9	0.00	0.00	0.00
12,600.0	90.13	270.00	6,445.5	-1,001.0	-5,242.6	5,334.7	0.00	0.00	0.00
12,700.0	90.13	270.00	6,445.2	-1,001.0	-5,342.6	5,433.4	0.00	0.00	0.00
12,800.0	90.13	270.00	6,445.0	-1,001.0	-5,442.6	5,532.2	0.00	0.00	0.00
12,900.0	90.13	270.00	6,444.8	-1,001.0	-5,542.6	5,631.0	0.00	0.00	0.00
13,000.0	90.13	270.00	6,444.6	-1,001.0	-5,642.6	5,729.7	0.00	0.00	0.00
13,100.0	90.13	270.00	6,444.3	-1,001.0	-5,742.6	5,828.5	0.00	0.00	0.00
13,200.0	90.13	270.00	6,444.1	-1,001.0	-5,842.6	5,927.3	0.00	0.00	0.00
13,300.0	90.13	270.00	6,443.9	-1,001.0	-5,942.6	6,026.1	0.00	0.00	0.00
13,400.0	90.13	270.00	6,443.6	-1,001.0	-6,042.6	6,124.8	0.00	0.00	0.00
13,500.0	90.13	270.00	6,443.4	-1,001.0	-6,142.6	6,223.6	0.00	0.00	0.00
13,600.0	90.13	270.00	6,443.2	-1,001.0	-6,242.6	6,322.4	0.00	0.00	0.00
13,684.0	90.13	270.00	6,443.0	-1,001.0	-6,326.6	6,405.3	0.00	0.00	0.00
TD at 13684.0 - BHL 2408'FNL, 2141'FEL, SEC.24									

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Project:</b>	SEC.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>North Reference:</b>	True
<b>Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (11-13-15)		

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)

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 1391'FNL, 1067'FE - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,385,890.17	3,285,845.42	40.388130	-104.473820
BHL 2408'FNL, 2141'FE - plan hits target center - Point	0.00	0.00	6,443.0	-1,001.0	-6,326.6	1,384,816.02	3,279,531.10	40.385380	-104.496530
LPL 2392'FNL, 799'FEL, - plan hits target center - Point	0.00	0.00	6,458.0	-1,001.0	268.3	1,384,892.38	3,286,125.28	40.385382	-104.472857

Casing Points							
Measured Depth (ft)	Vertical Depth (ft)	Name				Casing Diameter (")	Hole Diameter (")
7,089.0	6,458.0	7"				7	8-3/4

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,424.9	3,336.0	Parkman		0.00		
4,184.1	4,066.0	Sussex		0.00		
6,491.8	6,241.0	Sharon Springs		0.00		
6,674.7	6,351.0	Niobrara A		0.00		
6,830.7	6,416.0	Niobrara B		0.00		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
400.0	400.0	0.0	0.0	KOP - Start Build 1.50	
1,461.5	1,447.9	-93.1	113.2	Start 4262.7 hold at 1461.5 MD	
5,724.2	5,547.1	-835.6	1,016.6	Start DLS 7.50 TFO 139.45	
7,089.0	6,458.0	-1,001.0	268.3	Start 6594.9 hold at 7089.0 MD	
13,684.0	6,443.0	-1,001.0	-6,326.6	TD at 13684.0	

# **PETROLEUM DEVELOPMENT CORP DJ Basin**

**SEC.19-T5N-R63W**

**Cockroft 5N63W19C Pad Sec.19-T5N-R63W**

**Cockroft 19W-214**

**Wellbore #1**

**Plan #1 (11-13-15)**

## **Anticollision Report**

**17 November, 2015**



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #1 (11-13-15)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	Stations	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 800.0 ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	11/17/2015		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	13,684.0	Plan #1 (11-13-15) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
<b>Offset Well - Wellbore - Design</b>						
Bijou Pad Sec.19-T5N-R63W						
Bijou 14-19DU - Wellbore #1 - Wellbore #1						Out of range
Bijou 19BDU - Wellbore #1 - Wellbore #1						Out of range
Bijou 24-19DU - Wellbore #1 - Wellbore #1						Out of range
Cockroft 5N63W19C Pad Sec.19-T5N-R63W						
Cockroft 19U-334 - Wellbore #1 - Plan #1 (11-13-15)	400.0	400.0	14.4	12.8	9.151	CC, ES
Cockroft 19U-334 - Wellbore #1 - Plan #1 (11-13-15)	600.0	599.9	18.0	15.5	7.404	SF
Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15)	200.0	200.0	17.1	16.4	25.367	CC, ES
Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15)	500.0	498.3	26.9	24.9	13.440	SF
Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15)	400.0	401.0	89.1	87.5	56.537	CC, ES
Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15)	4,800.0	4,773.2	790.7	753.4	21.163	SF
Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)	400.0	400.0	43.2	41.6	27.452	CC, ES
Cockroft 19V-214 - Wellbore #1 - Plan #1 (11-13-15)	800.0	799.3	58.0	54.7	17.474	SF
Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)	400.0	400.0	74.7	73.1	47.468	CC, ES
Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)	13,684.0	13,631.7	761.4	365.5	1.923	SF
Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)	400.0	401.0	103.5	101.9	65.674	CC, ES
Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)	5,700.0	5,707.8	798.8	750.3	16.445	SF
Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)	400.0	400.0	60.3	58.7	38.318	CC, ES
Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)	900.0	898.6	84.0	80.2	22.200	SF
Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)	400.0	400.0	28.8	27.2	18.301	CC
Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)	13,684.0	13,720.4	235.0	-147.1	0.615	Level 1, ES, SF
Existing Wells Sec.19-T5N-R63W						
Christenson 8-19 (Exist) - Wellbore #1 - Wellbore #1	2,752.3	2,683.2	119.1	53.9	1.827	CC
Christenson 8-19 (Exist) - Wellbore #1 - Wellbore #1	2,800.0	2,729.0	119.9	53.5	1.807	ES, SF
Cockroft 19C (Exist) - Wellbore #1 - Wellbore #1	1,220.0	1,200.1	255.2	250.2	50.740	CC, ES
Cockroft 19C (Exist) - Wellbore #1 - Wellbore #1	7,700.0	6,451.5	724.9	674.9	14.495	SF
Flack 7-19 (P&A) - Wellbore #1 - Wellbore #1	8,259.9	6,443.3	440.0	261.1	2.460	CC, ES
Flack 7-19 (P&A) - Wellbore #1 - Wellbore #1	8,300.0	6,443.2	441.8	262.0	2.457	SF
Johnson 2 (P&A) - Wellbore #1 - Wellbore #1	11,017.9	6,457.0	508.6	373.6	3.766	CC, ES
Johnson 2 (P&A) - Wellbore #1 - Wellbore #1	11,100.0	6,456.9	515.2	377.9	3.752	SF
Johnson 4 (P&A) - Wellbore #1 - Wellbore #1	9,633.3	6,440.2	465.6	250.9	2.169	CC, ES, SF
Ochsner 22-19 (Exist) - Wellbore #1 - Wellbore #1	9,416.0	6,441.4	246.9	154.5	2.672	CC, ES, SF
Rothe 8-24 (Exist) - Wellbore #1 - Wellbore #1	12,257.5	6,440.2	757.4	470.6	2.641	CC, ES
Rothe 8-24 (Exist) - Wellbore #1 - Wellbore #1	12,300.0	6,440.1	758.6	470.6	2.634	SF

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-334 - Wellbore #1 - Plan #1 (11-13-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-104.66	-3.6	-13.9	14.4	14.4	0.00	N/A		
100.0	100.0	100.0	100.0	0.1	0.1	-104.66	-3.6	-13.9	14.4	14.2	0.22	64.054		
200.0	200.0	200.0	200.0	0.3	0.3	-104.66	-3.6	-13.9	14.4	13.7	0.67	21.351		
300.0	300.0	300.0	300.0	0.6	0.6	-104.66	-3.6	-13.9	14.4	13.3	1.12	12.811		
400.0	400.0	400.0	400.0	0.8	0.8	-104.66	-3.6	-13.9	14.4	12.8	1.57	9.151 CC, ES		
500.0	500.0	500.0	500.0	1.0	1.0	129.91	-3.6	-13.9	15.2	13.2	2.00	7.589		
600.0	599.9	599.9	599.9	1.2	1.2	139.53	-3.6	-13.9	18.0	15.5	2.43	7.404 SF		
700.0	699.7	700.0	700.0	1.4	1.5	152.61	-2.8	-13.0	22.6	19.7	2.86	7.881		
800.0	799.3	799.9	799.8	1.6	1.7	167.20	-0.1	-10.1	29.4	26.1	3.30	8.896		
900.0	898.6	899.3	899.0	1.9	1.9	179.92	4.3	-5.3	39.5	35.7	3.75	10.524		
1,000.0	997.5	998.1	997.4	2.2	2.1	-170.31	10.4	1.4	53.3	49.1	4.22	12.619		
1,100.0	1,096.1	1,096.1	1,094.7	2.6	2.4	-163.11	18.1	9.8	70.8	66.1	4.73	14.978		
1,200.0	1,194.2	1,193.2	1,190.8	3.0	2.7	-157.78	27.4	20.0	92.0	86.7	5.27	17.438		
1,300.0	1,291.7	1,289.2	1,285.4	3.4	3.0	-153.76	38.2	31.8	116.6	110.7	5.86	19.882		
1,400.0	1,388.6	1,383.9	1,378.4	3.9	3.3	-150.64	50.5	45.2	144.5	138.0	6.50	22.234		
1,461.5	1,447.9	1,441.5	1,434.7	4.2	3.5	-149.04	58.7	54.2	163.4	156.4	6.92	23.611		
1,500.0	1,484.9	1,477.3	1,469.6	4.4	3.7	-148.21	64.1	60.1	175.6	168.4	7.19	24.418		
1,600.0	1,581.1	1,569.7	1,559.4	4.9	4.1	-146.10	79.0	76.4	208.2	200.3	7.94	26.233		
1,700.0	1,677.2	1,661.2	1,647.6	5.5	4.5	-144.07	95.3	94.1	242.0	233.3	8.73	27.709		
1,800.0	1,773.4	1,753.2	1,735.8	6.0	5.0	-142.14	112.8	113.3	276.9	267.4	9.57	28.951		
1,900.0	1,869.6	1,846.4	1,825.2	6.6	5.5	-140.56	130.8	133.0	312.2	301.8	10.42	29.952		
2,000.0	1,965.7	1,939.7	1,914.5	7.2	6.0	-139.31	148.8	152.6	347.7	336.4	11.29	30.791		
2,100.0	2,061.9	2,032.9	2,003.9	7.8	6.5	-138.29	166.8	172.3	383.3	371.1	12.17	31.498		
2,200.0	2,158.1	2,126.2	2,093.3	8.3	7.0	-137.44	184.8	191.9	419.0	405.9	13.05	32.102		
2,300.0	2,254.2	2,219.5	2,182.6	8.9	7.5	-136.73	202.8	211.6	454.7	440.7	13.94	32.622		
2,400.0	2,350.4	2,312.7	2,272.0	9.5	8.0	-136.11	220.8	231.3	490.5	475.6	14.83	33.073		
2,500.0	2,446.5	2,406.0	2,361.4	10.1	8.6	-135.59	238.8	250.9	526.3	510.6	15.73	33.469		
2,600.0	2,542.7	2,499.2	2,450.7	10.7	9.1	-135.12	256.8	270.6	562.2	545.6	16.62	33.817		
2,700.0	2,638.9	2,592.5	2,540.1	11.2	9.6	-134.72	274.8	290.2	598.1	580.5	17.52	34.127		
2,800.0	2,735.0	2,685.7	2,629.5	11.8	10.2	-134.36	292.8	309.9	634.0	615.6	18.43	34.404		
2,900.0	2,831.2	2,779.0	2,718.8	12.4	10.7	-134.04	310.8	329.6	669.9	650.6	19.33	34.652		
3,000.0	2,927.4	2,872.3	2,808.2	13.0	11.2	-133.75	328.9	349.2	705.9	685.6	20.24	34.877		
3,100.0	3,023.5	2,965.5	2,897.6	13.6	11.8	-133.49	346.9	368.9	741.9	720.7	21.15	35.081		
3,200.0	3,119.7	3,058.8	2,986.9	14.2	12.3	-133.25	364.9	388.6	777.8	755.8	22.06	35.266		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19U-404 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	77.73	3.6	16.7	17.1	17.1	0.00	N/A		
100.0	100.0	100.0	100.0	0.1	0.1	77.73	3.6	16.7	17.1	16.9	0.22	76.101		
200.0	200.0	200.0	200.0	0.3	0.3	77.73	3.6	16.7	17.1	16.4	0.67	25.367 CC, ES		
300.0	300.0	299.6	299.6	0.6	0.6	75.29	4.6	17.6	18.2	17.0	1.12	16.220		
400.0	400.0	399.1	399.0	0.8	0.8	69.46	7.5	20.1	21.5	19.9	1.57	13.714		
500.0	500.0	498.3	498.0	1.0	1.0	-68.85	12.4	24.4	26.9	24.9	2.00	13.440 SF		
600.0	599.9	597.1	596.3	1.2	1.3	-79.73	19.2	30.3	34.7	32.3	2.43	14.278		
700.0	699.7	695.2	693.8	1.4	1.5	-89.68	27.8	37.8	45.8	43.0	2.89	15.868		
800.0	799.3	792.4	790.1	1.6	1.9	-97.63	38.2	46.9	60.6	57.2	3.38	17.952		
900.0	898.6	888.7	885.0	1.9	2.2	-103.63	50.3	57.4	79.2	75.3	3.90	20.283		
1,000.0	997.5	983.8	978.3	2.2	2.5	-108.11	64.0	69.4	101.4	96.9	4.47	22.685		
1,100.0	1,096.1	1,077.6	1,069.9	2.6	2.9	-111.47	79.2	82.7	127.1	122.0	5.08	25.044		
1,200.0	1,194.2	1,169.9	1,159.5	3.0	3.4	-114.00	95.9	97.3	156.3	150.6	5.73	27.297		
1,300.0	1,291.7	1,260.6	1,247.0	3.4	3.8	-115.93	113.8	113.0	188.9	182.5	6.42	29.409		
1,400.0	1,388.6	1,353.1	1,335.9	3.9	4.3	-117.59	133.2	129.9	224.1	216.9	7.17	31.242		
1,461.5	1,447.9	1,410.2	1,390.7	4.2	4.6	-118.58	145.2	140.3	246.5	238.8	7.65	32.228		
1,500.0	1,484.9	1,445.9	1,425.0	4.4	4.8	-119.35	152.6	146.9	260.7	252.7	7.96	32.755		
1,600.0	1,581.1	1,538.4	1,513.9	4.9	5.3	-121.01	172.0	163.8	297.7	288.9	8.77	33.940		
1,700.0	1,677.2	1,631.0	1,602.8	5.5	5.8	-122.30	191.5	180.8	334.9	325.3	9.59	34.900		
1,800.0	1,773.4	1,723.6	1,691.8	6.0	6.4	-123.33	210.9	197.7	372.2	361.7	10.43	35.690		
1,900.0	1,869.6	1,816.2	1,780.7	6.6	6.9	-124.18	230.3	214.7	409.6	398.3	11.27	36.349		
2,000.0	1,965.7	1,908.8	1,869.6	7.2	7.4	-124.88	249.7	231.6	447.0	434.9	12.11	36.905		
2,100.0	2,061.9	2,001.4	1,958.6	7.8	7.9	-125.48	269.1	248.6	484.5	471.6	12.96	37.381		
2,200.0	2,158.1	2,094.0	2,047.5	8.3	8.4	-125.99	288.5	265.5	522.1	508.2	13.81	37.791		
2,300.0	2,254.2	2,186.6	2,136.4	8.9	9.0	-126.43	307.9	282.5	559.6	545.0	14.67	38.149		
2,400.0	2,350.4	2,279.2	2,225.4	9.5	9.5	-126.82	327.3	299.5	597.2	581.7	15.53	38.462		
2,500.0	2,446.5	2,371.8	2,314.3	10.1	10.0	-127.16	346.7	316.4	634.9	618.5	16.39	38.740		
2,600.0	2,542.7	2,464.4	2,403.2	10.7	10.5	-127.46	366.1	333.4	672.5	655.2	17.25	38.987		
2,700.0	2,638.9	2,557.0	2,492.2	11.2	11.1	-127.73	385.6	350.3	710.1	692.0	18.11	39.208		
2,800.0	2,735.0	2,649.5	2,581.1	11.8	11.6	-127.97	405.0	367.3	747.8	728.8	18.98	39.407		
2,900.0	2,831.2	2,742.1	2,670.0	12.4	12.1	-128.19	424.4	384.2	785.5	765.6	19.84	39.587		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-204 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program:		0-MWD												
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	1.0	1.0	0.0	0.0	-104.20	-21.9	-86.4	89.1	89.1	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	-104.20	-21.9	-86.4	89.1	88.9	0.23	392.401		
200.0	200.0	201.0	201.0	0.3	0.3	-104.20	-21.9	-86.4	89.1	88.4	0.68	131.670		
300.0	300.0	301.0	301.0	0.6	0.6	-104.20	-21.9	-86.4	89.1	88.0	1.13	79.107		
400.0	400.0	401.0	401.0	0.8	0.8	-104.20	-21.9	-86.4	89.1	87.5	1.58	56.537 CC, ES		
500.0	500.0	501.0	501.0	1.0	1.0	127.04	-21.9	-86.4	89.9	87.9	2.01	44.816		
600.0	599.9	600.9	600.9	1.2	1.2	128.96	-21.9	-86.4	92.3	89.9	2.43	37.998		
700.0	699.7	700.7	700.7	1.4	1.5	131.93	-21.9	-86.4	96.5	93.7	2.87	33.649		
800.0	799.3	800.3	800.3	1.6	1.7	135.65	-21.9	-86.4	102.9	99.6	3.32	30.954		
900.0	898.6	899.6	899.6	1.9	1.9	139.77	-21.9	-86.4	111.6	107.8	3.79	29.447		
1,000.0	997.5	998.5	998.5	2.2	2.1	143.98	-21.9	-86.4	122.9	118.7	4.26	28.833		
1,100.0	1,096.1	1,097.1	1,097.1	2.6	2.4	148.01	-21.9	-86.4	137.1	132.3	4.74	28.906		
1,200.0	1,194.2	1,195.2	1,195.2	3.0	2.6	151.72	-21.9	-86.4	154.0	148.8	5.22	29.512		
1,300.0	1,291.7	1,292.7	1,292.7	3.4	2.8	155.03	-21.9	-86.4	173.9	168.2	5.69	30.530		
1,400.0	1,388.6	1,389.6	1,389.6	3.9	3.0	157.91	-21.9	-86.4	196.5	190.4	6.17	31.867		
1,461.5	1,447.9	1,448.9	1,448.9	4.2	3.1	159.49	-21.9	-86.4	211.9	205.4	6.46	32.815		
1,500.0	1,484.9	1,485.9	1,485.9	4.4	3.2	160.44	-21.9	-86.4	221.9	215.2	6.64	33.408		
1,600.0	1,581.1	1,582.1	1,582.1	4.9	3.4	162.56	-21.9	-86.4	248.0	240.9	7.12	34.833		
1,700.0	1,677.2	1,683.2	1,683.2	5.5	3.7	164.46	-21.7	-85.5	273.6	266.0	7.59	36.036		
1,800.0	1,773.4	1,786.3	1,786.2	6.0	3.9	166.36	-21.1	-81.9	297.4	289.4	8.05	36.930		
1,900.0	1,869.6	1,890.2	1,889.9	6.6	4.1	168.28	-20.1	-75.5	319.4	310.9	8.51	37.508		
2,000.0	1,965.7	1,994.7	1,994.0	7.2	4.3	170.25	-18.6	-66.3	339.5	330.5	8.98	37.807		
2,100.0	2,061.9	2,099.6	2,098.2	7.8	4.6	172.30	-16.6	-54.2	357.9	348.4	9.45	37.859		
2,200.0	2,158.1	2,204.9	2,202.4	8.3	4.8	174.44	-14.2	-39.2	374.7	364.7	9.94	37.684		
2,300.0	2,254.2	2,310.4	2,306.3	8.9	5.1	176.70	-11.2	-21.4	389.9	379.5	10.46	37.295		
2,400.0	2,350.4	2,415.8	2,409.6	9.5	5.5	179.07	-7.9	-0.7	403.8	392.8	11.00	36.701		
2,500.0	2,446.5	2,521.1	2,512.2	10.1	5.8	-178.43	-4.0	22.7	416.5	404.9	11.60	35.904		
2,600.0	2,542.7	2,626.1	2,613.8	10.7	6.3	-175.80	0.2	48.8	428.2	415.9	12.26	34.914		
2,700.0	2,638.9	2,730.6	2,714.2	11.2	6.7	-173.02	4.9	77.6	439.1	426.1	13.01	33.746		
2,800.0	2,735.0	2,834.1	2,812.7	11.8	7.2	-170.12	10.0	108.7	449.4	435.6	13.85	32.443		
2,900.0	2,831.2	2,931.0	2,904.7	12.4	7.7	-167.40	14.9	138.9	460.2	445.4	14.75	31.193		
3,000.0	2,927.4	3,028.0	2,996.7	13.0	8.3	-164.80	19.9	169.2	472.0	456.2	15.72	30.027		
3,100.0	3,023.5	3,125.0	3,088.7	13.6	8.8	-162.33	24.8	199.4	484.7	467.9	16.74	28.953		
3,200.0	3,119.7	3,221.9	3,180.7	14.2	9.4	-159.99	29.8	229.6	498.3	480.5	17.81	27.973		
3,300.0	3,215.9	3,318.9	3,272.7	14.8	9.9	-157.77	34.7	259.9	512.7	493.8	18.93	27.088		
3,400.0	3,312.0	3,415.8	3,364.7	15.4	10.5	-155.67	39.6	290.1	527.9	507.8	20.08	26.293		
3,500.0	3,408.2	3,512.8	3,456.6	15.9	11.1	-153.68	44.6	320.4	543.7	522.4	21.25	25.583		
3,600.0	3,504.3	3,609.7	3,548.6	16.5	11.7	-151.81	49.5	350.6	560.2	537.7	22.45	24.951		
3,700.0	3,600.5	3,706.7	3,640.6	17.1	12.3	-150.04	54.5	380.9	577.2	553.5	23.66	24.390		
3,800.0	3,696.7	3,803.7	3,732.6	17.7	12.9	-148.37	59.4	411.1	594.7	569.8	24.89	23.892		
3,900.0	3,792.8	3,900.6	3,824.6	18.3	13.5	-146.79	64.3	441.3	612.8	586.6	26.13	23.451		
4,000.0	3,889.0	3,997.6	3,916.6	18.9	14.1	-145.31	69.3	471.6	631.2	603.8	27.37	23.060		
4,100.0	3,985.2	4,094.5	4,008.6	19.5	14.8	-143.90	74.2	501.8	650.1	621.5	28.62	22.714		
4,200.0	4,081.3	4,191.5	4,100.6	20.1	15.4	-142.58	79.2	532.1	669.3	639.4	29.87	22.406		
4,300.0	4,177.5	4,288.4	4,192.5	20.7	16.0	-141.32	84.1	562.3	688.8	657.7	31.12	22.133		
4,400.0	4,273.7	4,385.4	4,284.5	21.2	16.6	-140.14	89.1	592.6	708.7	676.3	32.37	21.891		
4,500.0	4,369.8	4,482.4	4,376.5	21.8	17.2	-139.02	94.0	622.8	728.9	695.2	33.62	21.676		
4,600.0	4,466.0	4,579.3	4,468.5	22.4	17.9	-137.96	98.9	653.0	749.3	714.4	34.87	21.485		
4,700.0	4,562.1	4,676.3	4,560.5	23.0	18.5	-136.95	103.9	683.3	769.9	733.8	36.12	21.314		
4,800.0	4,658.3	4,773.2	4,652.5	23.6	19.1	-136.00	108.8	713.5	790.7	753.4	37.37	21.163 SF		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference	Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-214 - Wellbore #1 - Plan #1 (11-13-15)													
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				Warning	
				Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-104.66	-10.9	-41.8	43.2					
100.0	100.0	100.0	100.0	0.1	0.1	-104.66	-10.9	-41.8	43.2	43.0	0.22	192.161		
200.0	200.0	200.0	200.0	0.3	0.3	-104.66	-10.9	-41.8	43.2	42.5	0.67	64.054		
300.0	300.0	300.0	300.0	0.6	0.6	-104.66	-10.9	-41.8	43.2	42.1	1.12	38.432		
400.0	400.0	400.0	400.0	0.8	0.8	-104.66	-10.9	-41.8	43.2	41.6	1.57	27.452 CC, ES		
500.0	500.0	500.0	500.0	1.0	1.0	127.30	-10.9	-41.8	44.0	42.0	2.00	21.954		
600.0	599.9	599.9	599.9	1.2	1.2	131.12	-10.9	-41.8	46.5	44.0	2.43	19.144		
700.0	699.7	699.7	699.7	1.4	1.5	136.61	-10.9	-41.8	51.0	48.1	2.87	17.789		
800.0	799.3	799.3	799.3	1.6	1.7	142.76	-10.9	-41.8	58.0	54.7	3.32	17.474 SF		
900.0	898.6	898.6	898.6	1.9	1.9	148.70	-10.9	-41.8	67.7	64.0	3.78	17.931		
1,000.0	997.5	997.5	997.5	2.2	2.1	153.93	-10.9	-41.8	80.4	76.1	4.24	18.959		
1,100.0	1,096.1	1,097.8	1,097.8	2.6	2.3	158.89	-10.3	-40.7	95.1	90.4	4.69	20.259		
1,200.0	1,194.2	1,197.9	1,197.8	3.0	2.6	163.96	-8.6	-37.2	111.1	105.9	5.13	21.646		
1,300.0	1,291.7	1,297.6	1,297.3	3.4	2.8	168.92	-5.6	-31.5	128.8	123.2	5.57	23.121		
1,400.0	1,388.6	1,396.9	1,396.2	3.9	3.0	173.67	-1.4	-23.5	148.5	142.5	6.02	24.684		
1,461.5	1,447.9	1,457.6	1,456.5	4.2	3.2	176.45	1.7	-17.5	161.7	155.4	6.30	25.670		
1,500.0	1,484.9	1,495.6	1,494.2	4.4	3.3	178.13	3.9	-13.3	170.2	163.8	6.49	26.250		
1,600.0	1,581.1	1,594.1	1,591.8	4.9	3.5	-177.72	10.4	-0.9	192.3	185.3	7.00	27.475		
1,700.0	1,677.2	1,692.5	1,688.7	5.5	3.8	-173.78	18.0	13.7	214.4	206.8	7.56	28.339		
1,800.0	1,773.4	1,790.4	1,784.8	6.0	4.1	-170.00	26.8	30.4	236.6	228.4	8.19	28.880		
1,900.0	1,869.6	1,887.9	1,879.9	6.6	4.5	-166.34	36.6	49.3	259.2	250.3	8.89	29.142		
2,000.0	1,965.7	1,984.7	1,973.9	7.2	4.9	-162.79	47.5	70.1	282.3	272.7	9.67	29.187		
2,100.0	2,061.9	2,080.9	2,066.5	7.8	5.3	-159.33	59.4	92.9	306.2	295.7	10.53	29.075		
2,200.0	2,158.1	2,176.2	2,158.1	8.3	5.8	-156.20	71.7	116.4	331.0	319.6	11.45	28.913		
2,300.0	2,254.2	2,271.6	2,249.7	8.9	6.3	-153.50	83.9	139.9	356.7	344.3	12.39	28.776		
2,400.0	2,350.4	2,366.9	2,341.3	9.5	6.8	-151.16	96.2	163.4	382.9	369.6	13.36	28.665		
2,500.0	2,446.5	2,462.3	2,432.9	10.1	7.3	-149.12	108.5	186.9	409.8	395.4	14.34	28.579		
2,600.0	2,542.7	2,557.6	2,524.4	10.7	7.8	-147.32	120.8	210.4	437.0	421.7	15.33	28.515		
2,700.0	2,638.9	2,653.0	2,616.0	11.2	8.3	-145.73	133.1	233.9	464.6	448.3	16.32	28.469		
2,800.0	2,735.0	2,748.3	2,707.6	11.8	8.8	-144.32	145.3	257.4	492.5	475.2	17.32	28.439		
2,900.0	2,831.2	2,843.7	2,799.2	12.4	9.3	-143.06	157.6	280.9	520.7	502.3	18.32	28.422		
3,000.0	2,927.4	2,939.0	2,890.8	13.0	9.8	-141.93	169.9	304.4	549.0	529.7	19.32	28.414		
3,100.0	3,023.5	3,034.4	2,982.4	13.6	10.4	-140.91	182.2	327.9	577.6	557.2	20.33	28.415		
3,200.0	3,119.7	3,129.7	3,074.0	14.2	10.9	-139.98	194.4	351.4	606.2	584.9	21.33	28.422		
3,300.0	3,215.9	3,225.1	3,165.6	14.8	11.4	-139.14	206.7	374.9	635.1	612.7	22.34	28.433		
3,400.0	3,312.0	3,320.4	3,257.2	15.4	12.0	-138.37	219.0	398.5	664.0	640.7	23.34	28.449		
3,500.0	3,408.2	3,415.8	3,348.7	15.9	12.5	-137.66	231.3	422.0	693.1	668.7	24.35	28.467		
3,600.0	3,504.3	3,511.1	3,440.3	16.5	13.1	-137.01	243.5	445.5	722.2	696.9	25.35	28.488		
3,700.0	3,600.5	3,606.5	3,531.9	17.1	13.6	-136.41	255.8	469.0	751.4	725.1	26.36	28.510		
3,800.0	3,696.7	3,701.8	3,623.5	17.7	14.1	-135.86	268.1	492.5	780.7	753.3	27.36	28.534		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program:		Reference		Offset		Semi Major Axis		Distance					
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-104.12	-18.2	-72.4	74.7				
100.0	100.0	100.0	100.0	0.1	0.1	-104.12	-18.2	-72.4	74.7	74.5	0.22	332.279	
200.0	200.0	200.0	200.0	0.3	0.3	-104.12	-18.2	-72.4	74.7	74.0	0.67	110.760	
300.0	300.0	300.0	300.0	0.6	0.6	-104.12	-18.2	-72.4	74.7	73.6	1.12	66.456	
400.0	400.0	400.0	400.0	0.8	0.8	-104.12	-18.2	-72.4	74.7	73.1	1.57	47.468	CC, ES
500.0	500.0	500.0	500.0	1.0	1.0	127.25	-18.2	-72.4	75.5	73.5	2.00	37.680	
600.0	599.9	599.9	599.9	1.2	1.2	129.52	-18.2	-72.4	77.9	75.5	2.43	32.109	
700.0	699.7	699.7	699.7	1.4	1.5	132.99	-18.2	-72.4	82.2	79.4	2.87	28.686	
800.0	799.3	799.3	799.3	1.6	1.7	137.24	-18.2	-72.4	88.7	85.4	3.32	26.719	
900.0	898.6	898.6	898.6	1.9	1.9	141.83	-18.2	-72.4	97.7	93.9	3.79	25.810	
1,000.0	997.5	997.5	997.5	2.2	2.1	146.36	-18.2	-72.4	109.4	105.1	4.26	25.699	
1,100.0	1,096.1	1,096.1	1,096.1	2.6	2.4	150.58	-18.2	-72.4	123.9	119.2	4.73	26.197	
1,200.0	1,194.2	1,194.2	1,194.2	3.0	2.6	154.35	-18.2	-72.4	141.3	136.1	5.20	27.163	
1,300.0	1,291.7	1,291.7	1,291.7	3.4	2.8	157.61	-18.2	-72.4	161.5	155.8	5.67	28.483	
1,400.0	1,388.6	1,388.6	1,388.6	3.9	3.0	160.39	-18.2	-72.4	184.6	178.4	6.14	30.074	
1,461.5	1,447.9	1,450.4	1,450.4	4.2	3.1	161.97	-18.3	-72.1	199.8	193.4	6.42	31.131	
1,500.0	1,484.9	1,489.7	1,489.7	4.4	3.2	162.96	-18.4	-71.4	209.3	202.7	6.60	31.726	
1,600.0	1,581.1	1,592.4	1,592.3	4.9	3.4	165.27	-19.0	-67.6	232.3	225.2	7.05	32.969	
1,700.0	1,677.2	1,696.2	1,695.9	5.5	3.6	167.36	-20.1	-61.1	253.0	245.5	7.50	33.738	
1,800.0	1,773.4	1,801.0	1,800.2	6.0	3.9	169.33	-21.6	-51.7	271.5	263.6	7.96	34.099	
1,900.0	1,869.6	1,906.5	1,905.0	6.6	4.1	171.26	-23.6	-39.3	287.7	279.3	8.43	34.111	
2,000.0	1,965.7	2,012.7	2,010.1	7.2	4.4	173.20	-26.1	-24.0	301.6	292.7	8.92	33.824	
2,100.0	2,061.9	2,119.4	2,115.1	7.8	4.7	175.19	-29.1	-5.8	313.4	303.9	9.42	33.270	
2,200.0	2,158.1	2,226.3	2,219.9	8.3	5.0	177.26	-32.6	15.4	322.9	312.9	9.94	32.475	
2,300.0	2,254.2	2,333.5	2,324.2	8.9	5.4	179.47	-36.5	39.6	330.3	319.8	10.50	31.469	
2,400.0	2,350.4	2,440.6	2,427.8	9.5	5.9	-178.18	-40.9	66.6	335.8	324.7	11.10	30.254	
2,500.0	2,446.5	2,546.6	2,529.5	10.1	6.4	-175.65	-45.7	96.1	339.4	327.7	11.76	28.868	
2,600.0	2,542.7	2,645.5	2,624.0	10.7	6.9	-173.25	-50.4	124.7	342.8	330.3	12.46	27.512	
2,700.0	2,638.9	2,744.4	2,718.6	11.2	7.4	-170.90	-55.1	153.3	346.7	333.5	13.21	26.236	
2,800.0	2,735.0	2,843.3	2,813.2	11.8	7.9	-168.60	-59.7	181.8	351.2	337.2	14.03	25.035	
2,900.0	2,831.2	2,942.2	2,907.7	12.4	8.5	-166.37	-64.4	210.4	356.3	341.4	14.90	23.912	
3,000.0	2,927.4	3,041.1	3,002.3	13.0	9.0	-164.20	-69.1	239.0	361.9	346.1	15.83	22.868	
3,100.0	3,023.5	3,140.0	3,096.8	13.6	9.6	-162.09	-73.7	267.6	368.0	351.2	16.80	21.905	
3,200.0	3,119.7	3,238.9	3,191.4	14.2	10.1	-160.06	-78.4	296.1	374.7	356.8	17.82	21.019	
3,300.0	3,215.9	3,337.8	3,286.0	14.8	10.7	-158.10	-83.1	324.7	381.7	362.8	18.89	20.209	
3,400.0	3,312.0	3,436.7	3,380.5	15.4	11.3	-156.21	-87.7	353.3	389.2	369.3	19.99	19.471	
3,500.0	3,408.2	3,535.6	3,475.1	15.9	11.9	-154.39	-92.4	381.8	397.2	376.0	21.13	18.800	
3,600.0	3,504.3	3,634.5	3,569.7	16.5	12.5	-152.65	-97.1	410.4	405.5	383.2	22.29	18.191	
3,700.0	3,600.5	3,733.3	3,664.2	17.1	13.0	-150.97	-101.7	439.0	414.1	390.7	23.48	17.640	
3,800.0	3,696.7	3,832.2	3,758.8	17.7	13.6	-149.37	-106.4	467.6	423.2	398.5	24.69	17.141	
3,900.0	3,792.8	3,931.1	3,853.4	18.3	14.2	-147.83	-111.0	496.1	432.5	406.6	25.91	16.689	
4,000.0	3,889.0	4,030.0	3,947.9	18.9	14.8	-146.35	-115.7	524.7	442.1	415.0	27.16	16.281	
4,100.0	3,985.2	4,128.9	4,042.5	19.5	15.4	-144.94	-120.4	553.3	452.0	423.6	28.41	15.912	
4,200.0	4,081.3	4,227.8	4,137.0	20.1	16.0	-143.60	-125.0	581.9	462.2	432.6	29.67	15.578	
4,300.0	4,177.5	4,326.7	4,231.6	20.7	16.6	-142.30	-129.7	610.4	472.7	441.7	30.94	15.275	
4,400.0	4,273.7	4,425.6	4,326.2	21.2	17.2	-141.07	-134.4	639.0	483.3	451.1	32.22	15.000	
4,500.0	4,369.8	4,524.5	4,420.7	21.8	17.8	-139.89	-139.0	667.6	494.2	460.7	33.50	14.751	
4,600.0	4,466.0	4,623.4	4,515.3	22.4	18.5	-138.75	-143.7	696.1	505.2	470.5	34.78	14.525	
4,700.0	4,562.1	4,722.3	4,609.9	23.0	19.1	-137.67	-148.4	724.7	516.5	480.4	36.07	14.319	
4,800.0	4,658.3	4,821.2	4,704.4	23.6	19.7	-136.63	-153.0	753.3	527.9	490.6	37.36	14.131	
4,900.0	4,754.5	4,920.1	4,799.0	24.2	20.3	-135.64	-157.7	781.9	539.5	500.9	38.65	13.960	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)		Offset Site Error:		0.0 ft
Survey Program:		0-MWD											Offset Well Error:		0.0 ft		
Reference		Offset		Semi Major Axis			Distance							Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor					
5,000.0	4,850.6	5,019.0	4,893.5	24.8	20.9	-134.69	-162.4	810.4	551.3	511.4	39.94	13.804					
5,100.0	4,946.8	5,117.9	4,988.1	25.4	21.5	-133.78	-167.0	839.0	563.2	522.0	41.22	13.662					
5,200.0	5,043.0	5,216.8	5,082.7	26.0	22.1	-132.90	-171.7	867.6	575.2	532.7	42.51	13.532					
5,300.0	5,139.1	5,315.7	5,177.2	26.6	22.7	-132.07	-176.4	896.1	587.4	543.6	43.79	13.412					
5,400.0	5,235.3	5,414.6	5,271.8	27.1	23.3	-131.26	-181.0	924.7	599.7	554.6	45.08	13.303					
5,500.0	5,331.5	5,513.5	5,366.4	27.7	23.9	-130.49	-185.7	953.3	612.1	565.7	46.36	13.202					
5,600.0	5,427.6	5,612.4	5,460.9	28.3	24.6	-129.75	-190.3	981.9	624.6	576.9	47.64	13.110					
5,700.0	5,523.8	5,710.8	5,556.2	28.9	25.0	-129.46	-195.0	1,005.8	637.2	588.5	48.63	13.101					
5,724.2	5,547.1	5,734.6	5,579.6	29.1	25.1	-129.56	-196.2	1,009.8	640.3	591.5	48.80	13.121					
5,750.0	5,571.9	5,759.9	5,604.7	29.2	25.1	-134.80	-197.4	1,013.2	643.6	594.7	48.86	13.171					
5,800.0	5,620.6	5,808.7	5,653.3	29.4	25.2	-147.98	-199.8	1,017.4	650.0	601.1	48.90	13.292					
5,850.0	5,669.6	5,857.4	5,701.9	29.5	25.3	-165.82	-202.2	1,018.5	656.5	607.7	48.87	13.435					
5,900.0	5,718.8	5,905.9	5,750.2	29.6	25.3	173.14	-204.6	1,016.5	663.1	614.3	48.77	13.596					
5,950.0	5,767.9	5,954.2	5,798.2	29.7	25.3	153.34	-207.0	1,011.5	669.6	621.0	48.62	13.773					
6,000.0	5,816.8	6,002.4	5,845.7	29.8	25.3	137.94	-209.3	1,003.5	676.1	627.7	48.42	13.964					
6,050.0	5,865.2	6,050.0	5,892.0	29.8	25.2	126.94	-211.6	992.7	682.6	634.4	48.19	14.165					
6,100.0	5,912.9	6,098.3	5,938.2	29.8	25.1	119.08	-213.9	978.7	688.9	641.0	47.92	14.376					
6,150.0	5,959.7	6,146.2	5,983.0	29.8	25.1	113.32	-216.1	962.1	695.2	647.6	47.64	14.592					
6,200.0	6,005.5	6,193.9	6,026.5	29.7	24.9	108.95	-218.3	942.7	701.3	654.0	47.35	14.810					
6,250.0	6,049.9	6,241.5	6,068.7	29.7	24.8	105.53	-220.4	920.7	707.2	660.2	47.07	15.026					
6,300.0	6,092.9	6,289.0	6,109.3	29.6	24.7	102.79	-222.4	896.1	713.0	666.2	46.80	15.236					
6,350.0	6,134.3	6,336.5	6,148.3	29.5	24.6	100.53	-224.3	869.1	718.5	671.9	46.55	15.434					
6,400.0	6,173.8	6,384.0	6,185.5	29.4	24.5	98.66	-226.1	839.7	723.8	677.4	46.35	15.615					
6,450.0	6,211.3	6,431.4	6,220.8	29.2	24.4	97.07	-227.9	808.2	728.8	682.6	46.20	15.773					
6,500.0	6,246.6	6,478.7	6,254.1	29.1	24.4	95.73	-229.5	774.5	733.5	687.3	46.12	15.902					
6,550.0	6,279.6	6,526.1	6,285.2	29.0	24.3	94.58	-231.1	738.8	737.9	691.7	46.13	15.996					
6,600.0	6,310.2	6,573.4	6,314.0	28.9	24.3	93.60	-232.5	701.3	741.9	695.7	46.23	16.050					
6,650.0	6,338.2	6,620.8	6,340.4	28.8	24.4	92.76	-233.8	662.0	745.6	699.2	46.43	16.058					
6,700.0	6,363.5	6,668.1	6,364.4	28.7	24.5	92.06	-235.0	621.2	749.0	702.2	46.76	16.019					
6,750.0	6,385.9	6,715.5	6,385.8	28.6	24.6	91.47	-236.0	579.0	752.0	704.8	47.21	15.929					
6,800.0	6,405.5	6,762.9	6,404.6	28.5	24.8	90.98	-237.0	535.5	754.5	706.8	47.78	15.791					
6,850.0	6,422.0	6,810.3	6,420.6	28.4	25.1	90.60	-237.8	490.9	756.7	708.2	48.49	15.606					
6,900.0	6,435.5	6,857.8	6,433.8	28.4	25.4	90.31	-238.4	445.3	758.5	709.2	49.32	15.379					
6,950.0	6,445.9	6,905.2	6,444.2	28.4	25.8	90.11	-238.9	399.0	759.8	709.6	50.27	15.116					
7,000.0	6,453.1	6,952.8	6,451.8	28.4	26.2	89.99	-239.3	352.1	760.8	709.4	51.32	14.823					
7,050.0	6,457.1	7,000.0	6,456.3	28.5	26.7	89.96	-239.6	305.1	761.3	708.8	52.47	14.508					
7,089.0	6,458.0	7,037.5	6,457.9	28.6	27.2	89.99	-239.6	267.6	761.4	707.9	53.44	14.248					
7,100.0	6,458.0	7,048.0	6,458.0	28.6	27.3	90.00	-239.6	257.1	761.4	707.7	53.69	14.181					
7,127.7	6,457.9	7,075.5	6,457.9	28.7	27.6	90.00	-239.6	229.6	761.4	707.0	54.39	13.997					
7,200.0	6,457.7	7,147.8	6,457.8	29.1	28.6	90.00	-239.6	157.4	761.4	705.0	56.33	13.516					
7,300.0	6,457.5	7,247.8	6,457.6	30.1	30.1	90.00	-239.6	57.4	761.4	702.0	59.36	12.826					
7,400.0	6,457.3	7,347.8	6,457.3	31.4	31.7	90.00	-239.6	-42.6	761.4	698.6	62.75	12.133					
7,500.0	6,457.1	7,447.8	6,457.1	33.0	33.6	90.00	-239.6	-142.6	761.4	694.9	66.45	11.458					
7,600.0	6,456.8	7,547.8	6,456.9	34.9	35.5	90.00	-239.6	-242.6	761.4	691.0	70.40	10.816					
7,700.0	6,456.6	7,647.8	6,456.6	37.0	37.6	90.00	-239.6	-342.6	761.4	686.8	74.56	10.211					
7,800.0	6,456.4	7,747.8	6,456.4	39.1	39.8	90.00	-239.6	-442.6	761.4	682.5	78.91	9.649					
7,900.0	6,456.2	7,847.8	6,456.2	41.4	42.0	90.00	-239.6	-542.6	761.4	678.0	83.40	9.129					
8,000.0	6,455.9	7,947.8	6,456.0	43.7	44.3	90.00	-239.6	-642.6	761.4	673.3	88.03	8.649					
8,100.0	6,455.7	8,047.8	6,455.7	46.1	46.7	90.00	-239.6	-742.6	761.4	668.6	92.77	8.207					
8,200.0	6,455.5	8,147.8	6,455.5	48.6	49.1	90.00	-239.6	-842.6	761.4	663.8	97.60	7.801					
8,300.0	6,455.2	8,247.8	6,455.3	51.0	51.6	90.00	-239.6	-942.6	761.4	658.9	102.51	7.427					

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



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)											Offset Site Error:		0.0 ft
Survey Program:		0-MWD											Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
8,400.0	6,455.0	8,347.8	6,455.1	53.6	54.0	90.00	-239.6	-1,042.6	761.4	653.9	107.49	7.083			
8,500.0	6,454.8	8,447.8	6,454.8	56.1	56.6	90.00	-239.6	-1,142.6	761.4	648.8	112.54	6.766			
8,600.0	6,454.6	8,547.8	6,454.6	58.7	59.1	90.00	-239.6	-1,242.6	761.4	643.7	117.63	6.473			
8,700.0	6,454.3	8,647.8	6,454.4	61.2	61.7	90.00	-239.6	-1,342.6	761.4	638.6	122.77	6.202			
8,800.0	6,454.1	8,747.8	6,454.1	63.8	64.3	90.00	-239.6	-1,442.6	761.4	633.4	127.95	5.951			
8,900.0	6,453.9	8,847.8	6,453.9	66.5	66.9	90.00	-239.6	-1,542.6	761.4	628.2	133.17	5.717			
9,000.0	6,453.7	8,947.8	6,453.7	69.1	69.5	90.00	-239.6	-1,642.6	761.4	623.0	138.42	5.501			
9,100.0	6,453.4	9,047.8	6,453.5	71.7	72.1	90.00	-239.6	-1,742.6	761.4	617.7	143.69	5.299			
9,200.0	6,453.2	9,147.8	6,453.2	74.4	74.8	90.00	-239.6	-1,842.6	761.4	612.4	148.99	5.110			
9,300.0	6,453.0	9,247.8	6,453.0	77.1	77.4	90.00	-239.6	-1,942.6	761.4	607.1	154.32	4.934			
9,400.0	6,452.7	9,347.8	6,452.8	79.8	80.1	90.00	-239.6	-2,042.6	761.4	601.7	159.66	4.769			
9,500.0	6,452.5	9,447.8	6,452.6	82.4	82.8	90.00	-239.6	-2,142.6	761.4	596.4	165.03	4.614			
9,600.0	6,452.3	9,547.8	6,452.3	85.1	85.5	90.00	-239.6	-2,242.6	761.4	591.0	170.41	4.468			
9,700.0	6,452.1	9,647.8	6,452.1	87.8	88.2	90.00	-239.6	-2,342.6	761.4	585.6	175.80	4.331			
9,800.0	6,451.8	9,747.8	6,451.9	90.5	90.9	90.00	-239.6	-2,442.6	761.4	580.2	181.21	4.202			
9,900.0	6,451.6	9,847.8	6,451.6	93.3	93.6	90.00	-239.6	-2,542.6	761.4	574.8	186.63	4.080			
10,000.0	6,451.4	9,947.8	6,451.4	96.0	96.3	90.00	-239.6	-2,642.6	761.4	569.3	192.06	3.964			
10,100.0	6,451.2	10,047.8	6,451.2	98.7	99.0	90.00	-239.6	-2,742.6	761.4	563.9	197.51	3.855			
10,200.0	6,450.9	10,147.8	6,451.0	101.4	101.7	90.00	-239.6	-2,842.6	761.4	558.4	202.96	3.751			
10,300.0	6,450.7	10,247.8	6,450.7	104.2	104.5	90.00	-239.6	-2,942.6	761.4	553.0	208.42	3.653			
10,400.0	6,450.5	10,347.8	6,450.5	106.9	107.2	90.00	-239.6	-3,042.6	761.4	547.5	213.89	3.560			
10,500.0	6,450.2	10,447.8	6,450.3	109.6	109.9	90.00	-239.6	-3,142.6	761.4	542.0	219.37	3.471			
10,600.0	6,450.0	10,547.8	6,450.1	112.4	112.7	90.00	-239.6	-3,242.6	761.4	536.5	224.85	3.386			
10,700.0	6,449.8	10,647.8	6,449.8	115.1	115.4	90.00	-239.6	-3,342.6	761.4	531.0	230.34	3.305			
10,800.0	6,449.6	10,747.8	6,449.6	117.9	118.2	90.00	-239.6	-3,442.6	761.4	525.5	235.84	3.228			
10,900.0	6,449.3	10,847.8	6,449.4	120.6	120.9	90.00	-239.6	-3,542.6	761.4	520.0	241.34	3.155			
11,000.0	6,449.1	10,947.8	6,449.1	123.4	123.7	90.00	-239.6	-3,642.6	761.4	514.5	246.85	3.084			
11,100.0	6,448.9	11,047.8	6,448.9	126.1	126.4	90.00	-239.6	-3,742.6	761.4	509.0	252.37	3.017			
11,200.0	6,448.6	11,147.8	6,448.7	128.9	129.2	90.00	-239.6	-3,842.6	761.4	503.5	257.88	2.952			
11,300.0	6,448.4	11,247.8	6,448.5	131.7	131.9	90.00	-239.6	-3,942.6	761.4	498.0	263.41	2.891			
11,400.0	6,448.2	11,347.8	6,448.2	134.4	134.7	90.00	-239.6	-4,042.6	761.4	492.5	268.93	2.831			
11,500.0	6,448.0	11,447.8	6,448.0	137.2	137.5	90.00	-239.6	-4,142.6	761.4	486.9	274.46	2.774			
11,600.0	6,447.7	11,547.8	6,447.8	139.9	140.2	90.00	-239.6	-4,242.6	761.4	481.4	280.00	2.719			
11,700.0	6,447.5	11,647.8	6,447.5	142.7	143.0	90.00	-239.6	-4,342.6	761.4	475.9	285.53	2.667			
11,800.0	6,447.3	11,747.8	6,447.3	145.5	145.8	90.00	-239.6	-4,442.6	761.4	470.3	291.08	2.616			
11,900.0	6,447.1	11,847.8	6,447.1	148.3	148.5	90.00	-239.6	-4,542.6	761.4	464.8	296.62	2.567			
12,000.0	6,446.8	11,947.8	6,446.9	151.0	151.3	90.00	-239.6	-4,642.6	761.4	459.2	302.17	2.520			
12,100.0	6,446.6	12,047.8	6,446.6	153.8	154.1	90.00	-239.6	-4,742.6	761.4	453.7	307.71	2.474			
12,200.0	6,446.4	12,147.8	6,446.4	156.6	156.9	90.00	-239.6	-4,842.6	761.4	448.1	313.27	2.431			
12,300.0	6,446.1	12,247.8	6,446.2	159.4	159.6	90.00	-239.6	-4,942.6	761.4	442.6	318.82	2.388			
12,400.0	6,445.9	12,347.8	6,446.0	162.1	162.4	90.00	-239.6	-5,042.6	761.4	437.0	324.38	2.347			
12,500.0	6,445.7	12,447.8	6,445.7	164.9	165.2	90.00	-239.6	-5,142.6	761.4	431.5	329.94	2.308			
12,600.0	6,445.5	12,547.8	6,445.5	167.7	168.0	90.00	-239.6	-5,242.6	761.4	425.9	335.50	2.269			
12,700.0	6,445.2	12,647.8	6,445.3	170.5	170.8	90.00	-239.6	-5,342.6	761.4	420.3	341.06	2.232			
12,800.0	6,445.0	12,747.8	6,445.0	173.3	173.5	90.00	-239.6	-5,442.6	761.4	414.8	346.62	2.197			
12,900.0	6,444.8	12,847.8	6,444.8	176.0	176.3	90.00	-239.6	-5,542.6	761.4	409.2	352.19	2.162			
13,000.0	6,444.6	12,947.8	6,444.6	178.8	179.1	90.00	-239.6	-5,642.6	761.4	403.7	357.76	2.128			
13,100.0	6,444.3	13,047.8	6,444.4	181.6	181.9	90.00	-239.6	-5,742.6	761.4	398.1	363.33	2.096			
13,200.0	6,444.1	13,147.8	6,444.1	184.4	184.7	90.00	-239.6	-5,842.6	761.4	392.5	368.90	2.064			
13,300.0	6,443.9	13,247.8	6,443.9	187.2	187.5	90.00	-239.6	-5,942.6	761.4	386.9	374.47	2.033			
13,400.0	6,443.6	13,347.8	6,443.7	190.0	190.2	90.00	-239.6	-6,042.6	761.4	381.4	380.05	2.003			

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



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-234 - Wellbore #1 - Plan #1 (11-13-15)		Offset Site Error:		0.0 ft
Survey Program: 0-MWD															Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning			
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor					
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
13,500.0	6,443.4	13,447.8	6,443.5	192.7	193.0	90.00	-239.6	-6,142.6	761.4	375.8	385.62	1.975					
13,600.0	6,443.2	13,547.8	6,443.2	195.5	195.8	90.00	-239.6	-6,242.6	761.4	370.2	391.20	1.946					
13,684.0	6,443.0	13,631.7	6,443.0	197.9	198.2	90.00	-239.6	-6,326.6	761.4	365.5	395.88	1.923 SF					

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)											Offset Site Error:		0.0 ft
Survey Program: 0-MWD													Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
0.0	0.0	1.0	1.0	0.0	0.0	-104.27	-25.5	-100.3	103.5	103.5	0.00	N/A			
100.0	100.0	101.0	101.0	0.1	0.1	-104.27	-25.5	-100.3	103.5	103.3	0.23	455.819			
200.0	200.0	201.0	201.0	0.3	0.3	-104.27	-25.5	-100.3	103.5	102.8	0.68	152.949			
300.0	300.0	301.0	301.0	0.6	0.6	-104.27	-25.5	-100.3	103.5	102.4	1.13	91.892			
400.0	400.0	401.0	401.0	0.8	0.8	-104.27	-25.5	-100.3	103.5	101.9	1.58	65.674	CC, ES		
500.0	500.0	501.0	501.0	1.0	1.0	126.88	-25.5	-100.3	104.3	102.3	2.01	51.995			
600.0	599.9	600.9	600.9	1.2	1.2	128.54	-25.5	-100.3	106.7	104.2	2.43	43.920			
700.0	699.7	700.7	700.7	1.4	1.5	131.14	-25.5	-100.3	110.9	108.0	2.87	38.644			
800.0	799.3	800.3	800.3	1.6	1.7	134.44	-25.5	-100.3	117.1	113.8	3.32	35.226			
900.0	898.6	899.6	899.6	1.9	1.9	138.17	-25.5	-100.3	125.6	121.8	3.79	33.128			
1,000.0	997.5	998.5	998.5	2.2	2.1	142.07	-25.5	-100.3	136.7	132.4	4.27	32.019			
1,100.0	1,096.1	1,097.1	1,097.1	2.6	2.4	145.90	-25.5	-100.3	150.5	145.7	4.75	31.672			
1,200.0	1,194.2	1,195.2	1,195.2	3.0	2.6	149.51	-25.5	-100.3	167.0	161.8	5.23	31.920			
1,300.0	1,291.7	1,292.7	1,292.7	3.4	2.8	152.80	-25.5	-100.3	186.5	180.8	5.71	32.634			
1,400.0	1,388.6	1,389.6	1,389.6	3.9	3.0	155.73	-25.5	-100.3	208.8	202.6	6.19	33.712			
1,461.5	1,447.9	1,448.9	1,448.9	4.2	3.1	157.35	-25.5	-100.3	223.9	217.4	6.49	34.521			
1,500.0	1,484.9	1,485.9	1,485.9	4.4	3.2	158.35	-25.5	-100.3	233.8	227.1	6.67	35.035			
1,600.0	1,581.1	1,582.1	1,582.1	4.9	3.4	160.57	-25.5	-100.3	259.6	252.4	7.15	36.284			
1,700.0	1,677.2	1,678.2	1,678.2	5.5	3.7	162.40	-25.5	-100.3	285.7	278.1	7.64	37.414			
1,800.0	1,773.4	1,774.4	1,774.4	6.0	3.9	163.91	-25.5	-100.3	312.0	303.9	8.12	38.435			
1,900.0	1,869.6	1,876.7	1,876.7	6.6	4.1	165.33	-25.5	-99.5	337.9	329.3	8.60	39.293			
2,000.0	1,965.7	1,982.3	1,982.2	7.2	4.3	166.77	-25.5	-95.9	361.6	352.6	9.07	39.887			
2,100.0	2,061.9	2,088.9	2,088.6	7.8	4.5	168.23	-25.6	-89.4	383.1	373.6	9.53	40.189			
2,200.0	2,158.1	2,196.3	2,195.6	8.3	4.8	169.74	-25.6	-79.7	402.4	392.4	10.00	40.224			
2,300.0	2,254.2	2,304.4	2,303.0	8.9	5.0	171.33	-25.7	-67.0	419.4	409.0	10.48	40.022			
2,400.0	2,350.4	2,413.1	2,410.5	9.5	5.3	172.99	-25.8	-51.2	434.4	423.4	10.97	39.603			
2,500.0	2,446.5	2,522.1	2,517.8	10.1	5.6	174.76	-26.0	-32.2	447.3	435.8	11.47	38.981			
2,600.0	2,542.7	2,631.3	2,624.8	10.7	5.9	176.65	-26.1	-10.2	458.2	446.2	12.00	38.180			
2,700.0	2,638.9	2,740.5	2,731.0	11.2	6.3	178.66	-26.3	14.9	467.2	454.6	12.56	37.187			
2,800.0	2,735.0	2,849.5	2,836.4	11.8	6.7	179.17	-26.5	43.0	474.5	461.3	13.17	36.015			
2,900.0	2,831.2	2,958.2	2,940.6	12.4	7.2	176.85	-26.7	74.0	480.2	466.3	13.85	34.669			
3,000.0	2,927.4	3,066.4	3,043.3	13.0	7.8	174.36	-27.0	107.7	484.5	469.9	14.61	33.164			
3,100.0	3,023.5	3,166.4	3,137.7	13.6	8.3	171.94	-27.2	140.8	488.2	472.8	15.42	31.659			
3,200.0	3,119.7	3,264.2	3,229.9	14.2	8.9	169.61	-27.4	173.2	492.8	476.5	16.30	30.239			
3,300.0	3,215.9	3,362.0	3,322.2	14.8	9.4	167.32	-27.7	205.6	498.2	480.9	17.24	28.898			
3,400.0	3,312.0	3,459.7	3,414.5	15.4	10.0	165.08	-27.9	238.0	504.4	486.1	18.25	27.641			
3,500.0	3,408.2	3,557.5	3,506.7	15.9	10.6	162.90	-28.1	270.4	511.3	492.0	19.32	26.474			
3,600.0	3,504.3	3,655.3	3,599.0	16.5	11.2	160.77	-28.3	302.8	519.1	498.6	20.44	25.398			
3,700.0	3,600.5	3,753.1	3,691.3	17.1	11.9	158.71	-28.6	335.2	527.5	505.9	21.61	24.411			
3,800.0	3,696.7	3,850.9	3,783.6	17.7	12.5	156.72	-28.8	367.6	536.6	513.8	22.82	23.512			
3,900.0	3,792.8	3,948.7	3,875.8	18.3	13.1	154.79	-29.0	400.0	546.4	522.3	24.07	22.696			
4,000.0	3,889.0	4,046.5	3,968.1	18.9	13.8	152.92	-29.3	432.4	556.8	531.4	25.36	21.957			
4,100.0	3,985.2	4,144.3	4,060.4	19.5	14.4	151.13	-29.5	464.8	567.7	541.0	26.67	21.290			
4,200.0	4,081.3	4,242.1	4,152.6	20.1	15.1	149.40	-29.7	497.2	579.2	551.2	28.00	20.689			
4,300.0	4,177.5	4,339.9	4,244.9	20.7	15.7	147.74	-29.9	529.6	591.2	561.9	29.34	20.148			
4,400.0	4,273.7	4,437.7	4,337.2	21.2	16.4	146.15	-30.2	562.0	603.7	573.0	30.71	19.662			
4,500.0	4,369.8	4,535.5	4,429.4	21.8	17.0	144.62	-30.4	594.4	616.7	584.6	32.08	19.226			
4,600.0	4,466.0	4,633.3	4,521.7	22.4	17.7	143.15	-30.6	626.8	630.1	596.6	33.46	18.833			
4,700.0	4,562.1	4,731.1	4,614.0	23.0	18.3	141.74	-30.9	659.2	643.9	609.0	34.84	18.481			
4,800.0	4,658.3	4,828.9	4,706.2	23.6	19.0	140.39	-31.1	691.7	658.0	621.8	36.23	18.164			
4,900.0	4,754.5	4,926.7	4,798.5	24.2	19.7	139.10	-31.3	724.1	672.5	634.9	37.61	17.879			

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-304 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,000.0	4,850.6	5,024.4	4,890.8	24.8	20.4	-137.86	-31.5	756.5	687.3	648.3	39.00	17.623		
5,100.0	4,946.8	5,122.2	4,983.0	25.4	21.0	-136.67	-31.8	788.9	702.5	662.1	40.39	17.393		
5,200.0	5,043.0	5,220.0	5,075.3	26.0	21.7	-135.53	-32.0	821.3	717.9	676.2	41.77	17.186		
5,300.0	5,139.1	5,317.8	5,167.6	26.6	22.4	-134.44	-32.2	853.7	733.6	690.5	43.15	17.000		
5,400.0	5,235.3	5,415.6	5,259.9	27.1	23.0	-133.40	-32.5	886.1	749.6	705.0	44.53	16.832		
5,500.0	5,331.5	5,513.4	5,352.1	27.7	23.7	-132.40	-32.7	918.5	765.8	719.9	45.91	16.681		
5,600.0	5,427.6	5,611.2	5,444.4	28.3	24.4	-131.43	-32.9	950.9	782.2	734.9	47.28	16.545		
5,700.0	5,523.8	5,707.8	5,535.7	28.9	25.0	-130.57	-33.1	982.3	798.8	750.3	48.58	16.445 SF		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19V-314 - Wellbore #1 - Plan #1 (11-13-15)													Offset Well Error:	0.0 ft
Survey Program: 0-MWD														
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-103.99	-14.6	-58.5	60.3					
100.0	100.0	100.0	100.0	0.1	0.1	-103.99	-14.6	-58.5	60.3	60.1	0.22	268.228		
200.0	200.0	200.0	200.0	0.3	0.3	-103.99	-14.6	-58.5	60.3	59.6	0.67	89.409		
300.0	300.0	300.0	300.0	0.6	0.6	-103.99	-14.6	-58.5	60.3	59.2	1.12	53.646		
400.0	400.0	400.0	400.0	0.8	0.8	-103.99	-14.6	-58.5	60.3	58.7	1.57	38.318 CC, ES		
500.0	500.0	500.0	500.0	1.0	1.0	127.57	-14.6	-58.5	61.1	59.1	2.00	30.494		
600.0	599.9	599.9	599.9	1.2	1.2	130.34	-14.6	-58.5	63.5	61.1	2.43	26.189		
700.0	699.7	699.7	699.7	1.4	1.5	134.50	-14.6	-58.5	68.0	65.1	2.87	23.710		
800.0	799.3	799.3	799.3	1.6	1.7	139.44	-14.6	-58.5	74.7	71.4	3.32	22.492		
900.0	898.6	898.6	898.6	1.9	1.9	144.57	-14.6	-58.5	84.0	80.2	3.78	22.200 SF		
1,000.0	997.5	997.5	997.5	2.2	2.1	149.43	-14.6	-58.5	96.1	91.8	4.25	22.605		
1,100.0	1,096.1	1,096.1	1,096.1	2.6	2.4	153.77	-14.6	-58.5	111.0	106.3	4.72	23.537		
1,200.0	1,194.2	1,194.2	1,194.2	3.0	2.6	157.49	-14.6	-58.5	128.8	123.7	5.18	24.862		
1,300.0	1,291.7	1,294.5	1,294.5	3.4	2.8	161.00	-14.2	-57.4	148.7	143.0	5.64	26.368		
1,400.0	1,388.6	1,394.9	1,394.8	3.9	3.0	164.54	-12.9	-53.8	169.5	163.4	6.08	27.891		
1,461.5	1,447.9	1,456.6	1,456.4	4.2	3.1	166.70	-11.7	-50.4	182.9	176.6	6.35	28.821		
1,500.0	1,484.9	1,495.2	1,494.9	4.4	3.2	168.07	-10.7	-47.8	191.4	184.9	6.52	29.361		
1,600.0	1,581.1	1,595.7	1,595.0	4.9	3.4	171.48	-7.7	-39.2	212.7	205.7	6.97	30.493		
1,700.0	1,677.2	1,696.5	1,695.1	5.5	3.7	174.79	-3.7	-28.2	233.0	225.5	7.45	31.287		
1,800.0	1,773.4	1,797.3	1,794.9	6.0	4.0	178.06	1.1	-14.6	252.5	244.5	7.95	31.774		
1,900.0	1,869.6	1,898.1	1,894.2	6.6	4.3	-178.67	6.9	1.4	271.3	262.9	8.49	31.976		
2,000.0	1,965.7	1,998.6	1,992.8	7.2	4.6	-175.37	13.5	19.8	289.7	280.6	9.08	31.910		
2,100.0	2,061.9	2,098.9	2,090.6	7.8	4.9	-172.03	20.9	40.6	307.9	298.1	9.74	31.600		
2,200.0	2,158.1	2,198.6	2,187.3	8.3	5.3	-168.66	29.2	63.7	326.0	315.5	10.49	31.081		
2,300.0	2,254.2	2,297.0	2,282.0	8.9	5.8	-165.31	38.2	88.7	344.3	333.0	11.32	30.418		
2,400.0	2,350.4	2,393.3	2,374.6	9.5	6.2	-162.26	47.1	113.7	363.6	351.3	12.21	29.781		
2,500.0	2,446.5	2,489.6	2,467.2	10.1	6.7	-159.52	56.1	138.7	383.7	370.6	13.14	29.201		
2,600.0	2,542.7	2,585.9	2,559.8	10.7	7.2	-157.05	65.0	163.7	404.6	390.5	14.11	28.684		
2,700.0	2,638.9	2,682.3	2,652.3	11.2	7.7	-154.82	74.0	188.7	426.2	411.1	15.10	28.230		
2,800.0	2,735.0	2,778.6	2,744.9	11.8	8.2	-152.80	83.0	213.7	448.4	432.3	16.11	27.834		
2,900.0	2,831.2	2,874.9	2,837.5	12.4	8.7	-150.97	91.9	238.7	471.1	454.0	17.14	27.490		
3,000.0	2,927.4	2,971.2	2,930.1	13.0	9.2	-149.30	100.9	263.7	494.2	476.0	18.17	27.193		
3,100.0	3,023.5	3,067.5	3,022.7	13.6	9.7	-147.78	109.8	288.7	517.6	498.4	19.22	26.937		
3,200.0	3,119.7	3,163.8	3,115.2	14.2	10.3	-146.40	118.8	313.7	541.4	521.2	20.27	26.716		
3,300.0	3,215.9	3,260.2	3,207.8	14.8	10.8	-145.12	127.8	338.7	565.5	544.2	21.32	26.525		
3,400.0	3,312.0	3,356.5	3,300.4	15.4	11.3	-143.96	136.7	363.7	589.8	567.4	22.37	26.360		
3,500.0	3,408.2	3,452.8	3,393.0	15.9	11.9	-142.88	145.7	388.7	614.3	590.9	23.43	26.218		
3,600.0	3,504.3	3,549.1	3,485.6	16.5	12.4	-141.88	154.6	413.7	639.0	614.5	24.49	26.094		
3,700.0	3,600.5	3,645.4	3,578.2	17.1	13.0	-140.96	163.6	438.7	663.9	638.3	25.55	25.987		
3,800.0	3,696.7	3,741.7	3,670.7	17.7	13.5	-140.10	172.5	463.7	688.9	662.3	26.61	25.894		
3,900.0	3,792.8	3,838.1	3,763.3	18.3	14.0	-139.31	181.5	488.7	714.1	686.4	27.66	25.813		
4,000.0	3,889.0	3,934.4	3,855.9	18.9	14.6	-138.57	190.5	513.7	739.4	710.6	28.72	25.743		
4,100.0	3,985.2	4,030.7	3,948.5	19.5	15.1	-137.87	199.4	538.7	764.8	735.0	29.78	25.682		
4,200.0	4,081.3	4,127.0	4,041.1	20.1	15.7	-137.22	208.4	563.7	790.3	759.4	30.83	25.629		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design		Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)											Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Distance								Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-104.66	-7.3	-27.9	28.8					
100.0	100.0	100.0	100.0	0.1	0.1	-104.66	-7.3	-27.9	28.8	28.6	0.22	128.108		
200.0	200.0	200.0	200.0	0.3	0.3	-104.66	-7.3	-27.9	28.8	28.1	0.67	42.703		
300.0	300.0	300.0	300.0	0.6	0.6	-104.66	-7.3	-27.9	28.8	27.7	1.12	25.622		
400.0	400.0	400.0	400.0	0.8	0.8	-104.66	-7.3	-27.9	28.8	27.2	1.57	18.301	CC	
500.0	500.0	500.0	500.0	1.0	1.0	127.97	-7.3	-27.9	29.6	27.6	2.00	14.769		
600.0	599.9	599.9	599.9	1.2	1.2	133.46	-7.3	-27.9	32.1	29.7	2.43	13.245		
700.0	699.7	699.7	699.7	1.4	1.5	140.79	-7.3	-27.9	37.0	34.1	2.87	12.889		
800.0	799.3	799.3	799.3	1.6	1.7	148.20	-7.3	-27.9	44.4	41.1	3.32	13.392		
900.0	898.6	899.9	899.9	1.9	1.9	154.29	-8.0	-26.7	53.6	49.8	3.75	14.275		
1,000.0	997.5	1,000.9	1,000.8	2.2	2.1	158.89	-10.0	-23.3	63.0	58.8	4.17	15.096		
1,100.0	1,096.1	1,102.1	1,101.7	2.6	2.3	162.57	-13.5	-17.7	72.6	68.0	4.60	15.772		
1,200.0	1,194.2	1,203.5	1,202.8	3.0	2.5	165.64	-18.3	-9.7	82.3	77.3	5.04	16.328		
1,300.0	1,291.7	1,305.3	1,303.8	3.4	2.8	168.29	-24.6	0.7	92.1	86.6	5.49	16.787		
1,400.0	1,388.6	1,407.3	1,404.8	3.9	3.1	170.64	-32.3	13.3	102.0	96.1	5.94	17.162		
1,461.5	1,447.9	1,470.2	1,466.7	4.2	3.3	171.97	-37.7	22.3	108.1	101.9	6.23	17.355		
1,500.0	1,484.9	1,509.6	1,505.6	4.4	3.4	172.76	-41.4	28.3	111.8	105.3	6.41	17.423		
1,600.0	1,581.1	1,612.4	1,606.3	4.9	3.7	174.63	-52.0	45.7	119.5	112.5	6.91	17.291		
1,700.0	1,677.2	1,715.5	1,706.7	5.5	4.2	176.37	-64.0	65.4	124.6	117.2	7.42	16.789		
1,800.0	1,773.4	1,818.8	1,806.7	6.0	4.6	178.09	-77.4	87.5	127.1	119.2	7.95	16.000		
1,900.0	1,869.6	1,920.1	1,904.2	6.6	5.1	179.85	-91.7	111.1	127.6	119.1	8.49	15.030		
2,000.0	1,965.7	2,020.0	2,000.3	7.2	5.6	-178.42	-106.0	134.5	127.9	118.8	9.04	14.140		
2,100.0	2,061.9	2,119.9	2,096.4	7.8	6.2	-176.69	-120.2	157.9	128.3	118.7	9.62	13.336		
2,200.0	2,158.1	2,219.9	2,192.5	8.3	6.7	-174.98	-134.4	181.3	128.9	118.7	10.23	12.606		
2,300.0	2,254.2	2,319.8	2,288.6	8.9	7.3	-173.28	-148.7	204.7	129.6	118.7	10.85	11.938		
2,400.0	2,350.4	2,419.7	2,384.7	9.5	7.8	-171.61	-162.9	228.1	130.4	118.9	11.51	11.324		
2,500.0	2,446.5	2,519.6	2,480.8	10.1	8.4	-169.95	-177.1	251.6	131.3	119.1	12.20	10.759		
2,600.0	2,542.7	2,619.6	2,576.9	10.7	8.9	-168.32	-191.4	275.0	132.3	119.3	12.92	10.236		
2,700.0	2,638.9	2,719.5	2,673.0	11.2	9.5	-166.72	-205.6	298.4	133.4	119.7	13.68	9.753		
2,800.0	2,735.0	2,819.4	2,769.1	11.8	10.1	-165.14	-219.8	321.8	134.6	120.1	14.46	9.306		
2,900.0	2,831.2	2,919.3	2,865.2	12.4	10.6	-163.59	-234.1	345.2	135.9	120.6	15.29	8.892		
3,000.0	2,927.4	3,019.3	2,961.3	13.0	11.2	-162.08	-248.3	368.6	137.3	121.2	16.14	8.508		
3,100.0	3,023.5	3,119.2	3,057.4	13.6	11.8	-160.59	-262.5	392.0	138.8	121.8	17.03	8.153		
3,200.0	3,119.7	3,219.1	3,153.5	14.2	12.4	-159.14	-276.7	415.4	140.4	122.5	17.95	7.825		
3,300.0	3,215.9	3,319.0	3,249.6	14.8	13.0	-157.72	-291.0	438.8	142.1	123.2	18.90	7.521		
3,400.0	3,312.0	3,418.9	3,345.7	15.4	13.5	-156.34	-305.2	462.3	143.9	124.0	19.88	7.240		
3,500.0	3,408.2	3,518.9	3,441.8	15.9	14.1	-154.99	-319.4	485.7	145.8	124.9	20.88	6.980		
3,600.0	3,504.3	3,618.8	3,537.9	16.5	14.7	-153.67	-333.7	509.1	147.7	125.8	21.91	6.739		
3,700.0	3,600.5	3,718.7	3,633.9	17.1	15.3	-152.39	-347.9	532.5	149.7	126.7	22.97	6.517		
3,800.0	3,696.7	3,818.6	3,730.0	17.7	15.9	-151.14	-362.1	555.9	151.8	127.7	24.04	6.312		
3,900.0	3,792.8	3,918.6	3,826.1	18.3	16.5	-149.93	-376.4	579.3	153.9	128.8	25.14	6.122		
4,000.0	3,889.0	4,018.5	3,922.2	18.9	17.0	-148.75	-390.6	602.7	156.1	129.9	26.26	5.947		
4,100.0	3,985.2	4,118.4	4,018.3	19.5	17.6	-147.61	-404.8	626.1	158.4	131.0	27.39	5.784		
4,200.0	4,081.3	4,218.3	4,114.4	20.1	18.2	-146.50	-419.0	649.5	160.8	132.2	28.54	5.633		
4,300.0	4,177.5	4,318.3	4,210.5	20.7	18.8	-145.42	-433.3	673.0	163.2	133.5	29.70	5.494		
4,400.0	4,273.7	4,418.2	4,306.6	21.2	19.4	-144.37	-447.5	696.4	165.6	134.8	30.88	5.364		
4,500.0	4,369.8	4,518.1	4,402.7	21.8	20.0	-143.35	-461.7	719.8	168.2	136.1	32.06	5.244		
4,600.0	4,466.0	4,618.0	4,498.8	22.4	20.6	-142.36	-476.0	743.2	170.7	137.5	33.26	5.133		
4,700.0	4,562.1	4,718.0	4,594.9	23.0	21.1	-141.41	-490.2	766.6	173.3	138.9	34.47	5.029		
4,800.0	4,658.3	4,817.9	4,691.0	23.6	21.7	-140.48	-504.4	790.0	176.0	140.3	35.68	4.932		
4,900.0	4,754.5	4,917.8	4,787.1	24.2	22.3	-139.58	-518.7	813.4	178.7	141.8	36.90	4.843		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
Reference				Offset			Semi Major Axis		Distance				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.0	4,850.6	5,017.7	4,883.2	24.8	22.9	-138.70	-532.9	836.8	181.4	143.3	38.13	4.759	
5,100.0	4,946.8	5,117.7	4,979.3	25.4	23.5	-137.86	-547.1	860.2	184.2	144.9	39.36	4.680	
5,200.0	5,043.0	5,217.6	5,075.4	26.0	24.1	-137.04	-561.3	883.6	187.1	146.5	40.60	4.607	
5,300.0	5,139.1	5,317.5	5,171.5	26.6	24.7	-136.24	-575.6	907.1	189.9	148.1	41.84	4.539	
5,400.0	5,235.3	5,417.4	5,267.6	27.1	25.3	-135.46	-589.8	930.5	192.8	149.7	43.09	4.475	
5,500.0	5,331.5	5,517.4	5,363.7	27.7	25.9	-134.71	-604.0	953.9	195.8	151.4	44.34	4.415	
5,600.0	5,427.6	5,617.3	5,459.8	28.3	26.4	-133.99	-618.3	977.3	198.7	153.1	45.59	4.359	
5,700.0	5,523.8	5,717.2	5,555.9	28.9	27.0	-133.28	-632.5	1,000.7	201.7	154.9	46.85	4.306	
5,724.2	5,547.1	5,741.4	5,579.1	29.1	27.2	-133.11	-635.9	1,006.4	202.5	155.3	47.15	4.294	
5,750.0	5,571.9	5,766.9	5,603.7	29.2	27.3	-137.79	-639.6	1,012.1	203.2	155.8	47.43	4.285	
5,800.0	5,620.6	5,816.3	5,651.8	29.4	27.5	-149.87	-646.7	1,020.9	204.8	156.9	47.88	4.276	
5,850.0	5,669.6	5,865.8	5,700.4	29.5	27.6	-166.63	-653.9	1,026.6	206.3	158.1	48.26	4.275	
5,900.0	5,718.8	5,915.4	5,749.4	29.6	27.7	173.41	-661.2	1,029.0	207.9	159.3	48.56	4.281	
5,950.0	5,767.9	5,965.0	5,798.5	29.7	27.8	154.67	-668.4	1,028.3	209.5	160.7	48.78	4.294	
6,000.0	5,816.8	6,014.8	5,847.6	29.8	27.9	140.32	-675.7	1,024.3	211.0	162.1	48.93	4.313	
6,050.0	5,865.2	6,064.8	5,896.4	29.8	27.9	130.33	-682.9	1,017.0	212.6	163.6	49.01	4.338	
6,100.0	5,912.9	6,114.8	5,944.8	29.8	27.9	123.46	-690.1	1,006.5	214.2	165.2	49.03	4.369	
6,150.0	5,959.7	6,164.9	5,992.5	29.8	27.8	118.66	-697.2	992.8	215.7	166.8	48.99	4.404	
6,200.0	6,005.5	6,215.2	6,039.3	29.7	27.8	115.22	-704.1	976.0	217.3	168.4	48.89	4.444	
6,250.0	6,049.9	6,265.5	6,085.0	29.7	27.7	112.68	-710.9	956.0	218.8	170.0	48.75	4.488	
6,300.0	6,092.9	6,316.0	6,129.5	29.6	27.6	110.79	-717.5	932.9	220.3	171.7	48.58	4.534	
6,350.0	6,134.3	6,366.6	6,172.4	29.5	27.5	109.34	-723.8	906.9	221.7	173.3	48.38	4.582	
6,400.0	6,173.8	6,417.3	6,213.6	29.4	27.4	108.22	-730.0	878.0	223.1	174.9	48.18	4.631	
6,450.0	6,211.3	6,468.2	6,252.9	29.2	27.2	107.36	-735.8	846.3	224.4	176.4	47.97	4.677	
6,500.0	6,246.6	6,519.1	6,290.1	29.1	27.1	106.68	-741.3	812.0	225.7	177.9	47.80	4.721	
6,550.0	6,279.6	6,570.1	6,325.0	29.0	27.0	106.16	-746.5	775.1	226.8	179.2	47.66	4.760	
6,600.0	6,310.2	6,621.2	6,357.5	28.9	26.9	105.75	-751.3	736.0	227.9	180.4	47.57	4.791	
6,650.0	6,338.2	6,672.5	6,387.3	28.8	26.8	105.43	-755.7	694.6	229.0	181.4	47.57	4.814	
6,700.0	6,363.5	6,723.8	6,414.4	28.7	26.7	105.19	-759.8	651.2	229.9	182.3	47.65	4.825	
6,750.0	6,385.9	6,775.2	6,438.6	28.6	26.7	105.02	-763.4	606.0	230.7	182.9	47.84	4.823	
6,800.0	6,405.5	6,826.6	6,459.8	28.5	26.7	104.89	-766.5	559.2	231.5	183.3	48.15	4.808	
6,850.0	6,422.0	6,878.2	6,477.8	28.4	26.7	104.81	-769.2	511.0	232.1	183.5	48.59	4.777	
6,900.0	6,435.5	6,929.8	6,492.6	28.4	26.8	104.77	-771.4	461.7	232.7	183.5	49.16	4.733	
6,950.0	6,445.9	6,981.4	6,504.1	28.4	26.9	104.76	-773.1	411.3	233.1	183.2	49.87	4.674	
7,000.0	6,453.1	7,033.1	6,512.1	28.4	27.1	104.78	-774.3	360.3	233.4	182.7	50.71	4.602	
7,050.0	6,457.1	7,084.9	6,516.8	28.5	27.4	104.82	-775.0	308.8	233.6	181.9	51.68	4.520	
7,089.0	6,458.0	7,125.3	6,518.0	28.6	27.7	104.88	-775.2	268.4	233.6	181.1	52.51	4.450	
7,100.0	6,458.0	7,136.4	6,518.0	28.6	27.7	104.88	-775.2	257.3	233.7	180.9	52.77	4.428	
7,200.0	6,457.7	7,236.4	6,517.8	29.1	28.7	104.90	-775.2	157.3	233.7	178.3	55.35	4.222	
7,300.0	6,457.5	7,336.4	6,517.7	30.1	29.9	104.92	-775.2	57.3	233.7	175.4	58.30	4.008	
7,400.0	6,457.3	7,436.4	6,517.5	31.4	31.4	104.94	-775.2	-42.7	233.7	172.1	61.59	3.794	
7,500.0	6,457.1	7,536.4	6,517.4	33.0	33.2	104.96	-775.2	-142.7	233.7	168.6	65.17	3.586	
7,600.0	6,456.8	7,636.4	6,517.2	34.9	35.1	104.97	-775.2	-242.7	233.8	164.8	69.00	3.388	
7,700.0	6,456.6	7,736.4	6,517.1	37.0	37.1	104.99	-775.2	-342.7	233.8	160.7	73.03	3.201	
7,800.0	6,456.4	7,836.4	6,516.9	39.1	39.3	105.01	-775.2	-442.7	233.8	156.6	77.23	3.027	
7,900.0	6,456.2	7,936.4	6,516.8	41.4	41.6	105.03	-775.2	-542.7	233.8	152.2	81.57	2.866	
8,000.0	6,455.9	8,036.4	6,516.6	43.7	43.9	105.04	-775.2	-642.7	233.8	147.8	86.04	2.718	
8,100.0	6,455.7	8,136.4	6,516.5	46.1	46.2	105.06	-775.2	-742.7	233.9	143.2	90.62	2.581	
8,200.0	6,455.5	8,236.4	6,516.3	48.6	48.7	105.08	-775.2	-842.7	233.9	138.6	95.28	2.455	
8,300.0	6,455.2	8,336.4	6,516.2	51.0	51.1	105.10	-775.2	-942.7	233.9	133.9	100.02	2.338	
8,400.0	6,455.0	8,436.4	6,516.0	53.6	53.6	105.12	-775.2	-1,042.7	233.9	129.1	104.83	2.231	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Cockroft 5N63W19C Pad Sec.19-T5N-R63W - Cockroft 19W-314 - Wellbore #1 - Plan #1 (11-13-15)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
8,500.0	6,454.8	8,536.4	6,515.9	56.1	56.2	105.13	-775.2	-1,142.7	233.9	124.2	109.70	2.133		
8,600.0	6,454.6	8,636.4	6,515.7	58.7	58.7	105.15	-775.2	-1,242.7	234.0	119.3	114.61	2.041		
8,700.0	6,454.3	8,736.4	6,515.6	61.2	61.3	105.17	-775.2	-1,342.7	234.0	114.4	119.57	1.957		
8,800.0	6,454.1	8,836.4	6,515.4	63.8	63.9	105.19	-775.2	-1,442.7	234.0	109.4	124.57	1.879		
8,900.0	6,453.9	8,936.4	6,515.3	66.5	66.5	105.21	-775.2	-1,542.7	234.0	104.4	129.60	1.806		
9,000.0	6,453.7	9,036.4	6,515.1	69.1	69.1	105.22	-775.2	-1,642.7	234.0	99.4	134.66	1.738		
9,100.0	6,453.4	9,136.4	6,515.0	71.7	71.8	105.24	-775.2	-1,742.7	234.1	94.3	139.75	1.675		
9,200.0	6,453.2	9,236.4	6,514.8	74.4	74.4	105.26	-775.2	-1,842.7	234.1	89.2	144.86	1.616		
9,300.0	6,453.0	9,336.4	6,514.7	77.1	77.1	105.28	-775.2	-1,942.7	234.1	84.1	149.99	1.561		
9,400.0	6,452.7	9,436.4	6,514.5	79.8	79.8	105.29	-775.2	-2,042.7	234.1	79.0	155.14	1.509		
9,500.0	6,452.5	9,536.4	6,514.4	82.4	82.5	105.31	-775.2	-2,142.7	234.1	73.8	160.31	1.461	Level 3	
9,600.0	6,452.3	9,636.4	6,514.2	85.1	85.2	105.33	-775.2	-2,242.7	234.2	68.7	165.50	1.415	Level 3	
9,700.0	6,452.1	9,736.4	6,514.0	87.8	87.9	105.35	-775.2	-2,342.7	234.2	63.5	170.69	1.372	Level 3	
9,800.0	6,451.8	9,836.4	6,513.9	90.5	90.6	105.37	-775.2	-2,442.7	234.2	58.3	175.91	1.331	Level 3	
9,900.0	6,451.6	9,936.4	6,513.7	93.3	93.3	105.38	-775.2	-2,542.7	234.2	53.1	181.13	1.293	Level 3	
10,000.0	6,451.4	10,036.4	6,513.6	96.0	96.0	105.40	-775.2	-2,642.7	234.3	47.9	186.36	1.257	Level 3	
10,100.0	6,451.2	10,136.4	6,513.4	98.7	98.7	105.42	-775.2	-2,742.7	234.3	42.7	191.60	1.223	Level 2	
10,200.0	6,450.9	10,236.4	6,513.3	101.4	101.4	105.44	-775.2	-2,842.7	234.3	37.4	196.85	1.190	Level 2	
10,300.0	6,450.7	10,336.4	6,513.1	104.2	104.2	105.46	-775.2	-2,942.7	234.3	32.2	202.11	1.159	Level 2	
10,400.0	6,450.5	10,436.4	6,513.0	106.9	106.9	105.47	-775.2	-3,042.7	234.3	27.0	207.38	1.130	Level 2	
10,500.0	6,450.2	10,536.4	6,512.8	109.6	109.6	105.49	-775.2	-3,142.7	234.4	21.7	212.65	1.102	Level 2	
10,600.0	6,450.0	10,636.4	6,512.7	112.4	112.4	105.51	-775.2	-3,242.7	234.4	16.5	217.93	1.076	Level 2	
10,700.0	6,449.8	10,736.4	6,512.5	115.1	115.1	105.53	-775.2	-3,342.7	234.4	11.2	223.21	1.050	Level 2	
10,800.0	6,449.6	10,836.4	6,512.4	117.9	117.9	105.54	-775.2	-3,442.7	234.4	5.9	228.50	1.026	Level 2	
10,900.0	6,449.3	10,936.4	6,512.2	120.6	120.6	105.56	-775.2	-3,542.7	234.4	0.7	233.79	1.003	Level 2	
11,000.0	6,449.1	11,036.4	6,512.1	123.4	123.4	105.58	-775.2	-3,642.7	234.5	-4.6	239.09	0.981	Level 1	
11,100.0	6,448.9	11,136.4	6,511.9	126.1	126.1	105.60	-775.2	-3,742.7	234.5	-9.9	244.39	0.959	Level 1	
11,200.0	6,448.6	11,236.4	6,511.8	128.9	128.9	105.62	-775.2	-3,842.7	234.5	-15.2	249.70	0.939	Level 1	
11,300.0	6,448.4	11,336.4	6,511.6	131.7	131.7	105.63	-775.2	-3,942.7	234.5	-20.5	255.01	0.920	Level 1	
11,400.0	6,448.2	11,436.4	6,511.5	134.4	134.4	105.65	-775.2	-4,042.7	234.5	-25.8	260.32	0.901	Level 1	
11,500.0	6,448.0	11,536.4	6,511.3	137.2	137.2	105.67	-775.2	-4,142.7	234.6	-31.1	265.63	0.883	Level 1	
11,600.0	6,447.7	11,636.4	6,511.2	139.9	140.0	105.69	-775.2	-4,242.7	234.6	-36.4	270.95	0.866	Level 1	
11,700.0	6,447.5	11,736.4	6,511.0	142.7	142.7	105.70	-775.2	-4,342.7	234.6	-41.7	276.27	0.849	Level 1	
11,800.0	6,447.3	11,836.4	6,510.9	145.5	145.5	105.72	-775.2	-4,442.7	234.6	-47.0	281.59	0.833	Level 1	
11,900.0	6,447.1	11,936.4	6,510.7	148.3	148.3	105.74	-775.2	-4,542.7	234.7	-52.3	286.92	0.818	Level 1	
12,000.0	6,446.8	12,036.4	6,510.6	151.0	151.0	105.76	-775.2	-4,642.7	234.7	-57.6	292.24	0.803	Level 1	
12,100.0	6,446.6	12,136.4	6,510.4	153.8	153.8	105.78	-775.2	-4,742.7	234.7	-62.9	297.57	0.789	Level 1	
12,200.0	6,446.4	12,236.4	6,510.3	156.6	156.6	105.79	-775.2	-4,842.7	234.7	-68.2	302.90	0.775	Level 1	
12,300.0	6,446.1	12,336.4	6,510.1	159.4	159.4	105.81	-775.2	-4,942.7	234.7	-73.5	308.23	0.762	Level 1	
12,400.0	6,445.9	12,436.4	6,510.0	162.1	162.1	105.83	-775.2	-5,042.7	234.8	-78.8	313.56	0.749	Level 1	
12,500.0	6,445.7	12,536.4	6,509.8	164.9	164.9	105.85	-775.2	-5,142.7	234.8	-84.1	318.90	0.736	Level 1	
12,600.0	6,445.5	12,636.4	6,509.7	167.7	167.7	105.86	-775.2	-5,242.7	234.8	-89.4	324.23	0.724	Level 1	
12,700.0	6,445.2	12,736.4	6,509.5	170.5	170.5	105.88	-775.2	-5,342.7	234.8	-94.7	329.57	0.713	Level 1	
12,800.0	6,445.0	12,836.4	6,509.3	173.3	173.3	105.90	-775.2	-5,442.7	234.9	-100.1	334.90	0.701	Level 1	
12,900.0	6,444.8	12,936.4	6,509.2	176.0	176.0	105.92	-775.2	-5,542.7	234.9	-105.4	340.24	0.690	Level 1	
13,000.0	6,444.6	13,036.4	6,509.0	178.8	178.8	105.94	-775.2	-5,642.7	234.9	-110.7	345.58	0.680	Level 1	
13,100.0	6,444.3	13,136.4	6,508.9	181.6	181.6	105.95	-775.2	-5,742.7	234.9	-116.0	350.92	0.669	Level 1	
13,200.0	6,444.1	13,236.4	6,508.7	184.4	184.4	105.97	-775.2	-5,842.7	234.9	-121.3	356.26	0.659	Level 1	
13,300.0	6,443.9	13,336.4	6,508.6	187.2	187.2	105.99	-775.2	-5,942.7	235.0	-126.6	361.60	0.650	Level 1	
13,400.0	6,443.6	13,436.4	6,508.4	190.0	190.0	106.01	-775.2	-6,042.7	235.0	-132.0	366.94	0.640	Level 1	
13,500.0	6,443.4	13,536.4	6,508.3	192.7	192.8	106.02	-775.2	-6,142.7	235.0	-137.3	372.28	0.631	Level 1	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
13,600.0	6,443.2	13,636.4	6,508.1	195.5	195.5	106.04	-775.2	-6,242.7	235.0	-142.6	377.62	0.622	Level 1	
13,684.0	6,443.0	13,720.4	6,508.0	197.9	197.9	106.06	-775.2	-6,326.7	235.0	-147.1	382.11	0.615	Level 1, ES, SF	



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Existing Wells Sec.19-T5N-R63W - Christenson 8-19 (Exist) - Wellbore #1 - Wellbore #1												Offset Well Error:	0.0 ft
Survey Program: 6732-UNKNOWN													
Reference				Offset				Semi Major Axis				Distance	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	116.03	-225.9	462.4	514.7				
100.0	100.0	94.0	94.0	0.1	1.9	116.03	-225.9	462.4	514.6	512.7	1.99	258.281	
200.0	200.0	194.0	194.0	0.3	3.9	116.03	-225.9	462.4	514.6	510.4	4.22	122.031	
300.0	300.0	294.0	294.0	0.6	5.9	116.03	-225.9	462.4	514.6	508.2	6.44	79.888	
400.0	400.0	394.0	394.0	0.8	7.9	116.03	-225.9	462.4	514.6	506.0	8.67	59.381	
500.0	500.0	494.0	494.0	1.0	9.9	-13.42	-225.9	462.4	513.4	502.5	10.87	47.236	
600.0	599.9	593.9	593.9	1.2	11.9	-13.54	-225.9	462.4	509.6	496.5	13.05	39.044	
700.0	699.7	693.7	693.7	1.4	13.9	-13.74	-225.9	462.4	503.2	488.0	15.23	33.042	
800.0	799.3	793.3	793.3	1.6	15.9	-14.02	-225.9	462.4	494.3	476.9	17.40	28.416	
900.0	898.6	892.6	892.6	1.9	17.9	-14.40	-225.9	462.4	482.9	463.4	19.54	24.708	
1,000.0	997.5	991.5	991.5	2.2	19.8	-14.89	-225.9	462.4	469.0	447.4	21.67	21.641	
1,100.0	1,096.1	1,090.1	1,090.1	2.6	21.8	-15.51	-225.9	462.4	452.7	428.9	23.78	19.039	
1,200.0	1,194.2	1,188.2	1,188.2	3.0	23.8	-16.28	-225.9	462.4	433.9	408.0	25.85	16.782	
1,300.0	1,291.7	1,285.7	1,285.7	3.4	25.7	-17.23	-225.9	462.4	412.7	384.8	27.90	14.790	
1,400.0	1,388.6	1,382.6	1,382.6	3.9	27.7	-18.41	-225.9	462.4	389.2	359.3	29.93	13.002	
1,461.5	1,447.9	1,441.9	1,441.9	4.2	28.8	-19.28	-225.9	462.4	373.6	342.5	31.17	11.986	
1,500.0	1,484.9	1,478.9	1,478.9	4.4	29.6	-19.83	-225.9	462.4	363.6	331.6	32.02	11.356	
1,600.0	1,581.1	1,575.1	1,575.1	4.9	31.5	-21.40	-225.9	462.4	337.8	303.6	34.24	9.865	
1,700.0	1,677.2	1,671.2	1,671.2	5.5	33.4	-23.23	-225.9	462.4	312.3	275.8	36.50	8.556	
1,800.0	1,773.4	1,767.4	1,767.4	6.0	35.3	-25.37	-225.9	462.4	287.1	248.3	38.80	7.400	
1,900.0	1,869.6	1,863.6	1,863.6	6.6	37.3	-27.92	-225.9	462.4	262.4	221.3	41.16	6.376	
2,000.0	1,965.7	1,959.7	1,959.7	7.2	39.2	-30.98	-225.9	462.4	238.3	194.7	43.59	5.467	
2,100.0	2,061.9	2,055.9	2,055.9	7.8	41.1	-34.70	-225.9	462.4	215.0	168.9	46.12	4.662	
2,200.0	2,158.1	2,152.1	2,152.1	8.3	43.0	-39.27	-225.9	462.4	192.8	144.0	48.77	3.952	
2,300.0	2,254.2	2,248.2	2,248.2	8.9	45.0	-44.96	-225.9	462.4	172.0	120.4	51.58	3.335	
2,400.0	2,350.4	2,344.4	2,344.4	9.5	46.9	-52.04	-225.9	462.4	153.4	98.8	54.57	2.811	
2,500.0	2,446.5	2,440.5	2,440.5	10.1	48.8	-60.81	-225.9	462.4	137.8	80.1	57.71	2.388	
2,600.0	2,542.7	2,536.7	2,536.7	10.7	50.7	-71.36	-225.9	462.4	126.3	65.4	60.89	2.074	
2,700.0	2,638.9	2,632.9	2,632.9	11.2	52.7	-83.39	-225.9	462.4	120.0	56.2	63.85	1.880	
2,752.3	2,689.2	2,683.2	2,683.2	11.6	53.7	-90.00	-225.9	462.4	119.1	53.9	65.22	1.827 CC	
2,800.0	2,735.0	2,729.0	2,729.0	11.8	54.6	-96.02	-225.9	462.4	119.9	53.5	66.33	1.807 ES, SF	
2,900.0	2,831.2	2,825.2	2,825.2	12.4	56.5	-108.11	-225.9	462.4	125.8	57.6	68.27	1.843	
3,000.0	2,927.4	2,921.4	2,921.4	13.0	58.4	-118.74	-225.9	462.4	137.2	67.3	69.82	1.964	
3,100.0	3,023.5	3,017.5	3,017.5	13.6	60.4	-127.59	-225.9	462.4	152.6	81.4	71.20	2.143	
3,200.0	3,119.7	3,113.7	3,113.7	14.2	62.3	-134.75	-225.9	462.4	171.1	98.5	72.59	2.357	
3,300.0	3,215.9	3,209.9	3,209.9	14.8	64.2	-140.49	-225.9	462.4	191.7	117.7	74.06	2.589	
3,400.0	3,312.0	3,306.0	3,306.0	15.4	66.1	-145.11	-225.9	462.4	213.9	138.3	75.64	2.828	
3,500.0	3,408.2	3,402.2	3,402.2	15.9	68.0	-148.87	-225.9	462.4	237.2	159.9	77.32	3.068	
3,600.0	3,504.3	3,498.3	3,498.3	16.5	70.0	-151.95	-225.9	462.4	261.3	182.2	79.09	3.304	
3,700.0	3,600.5	3,594.5	3,594.5	17.1	71.9	-154.52	-225.9	462.4	286.0	205.1	80.92	3.534	
3,800.0	3,696.7	3,690.7	3,690.7	17.7	73.8	-156.68	-225.9	462.4	311.1	228.3	82.80	3.757	
3,900.0	3,792.8	3,786.8	3,786.8	18.3	75.7	-158.52	-225.9	462.4	336.6	251.9	84.73	3.973	
4,000.0	3,889.0	3,883.0	3,883.0	18.9	77.7	-160.10	-225.9	462.4	362.4	275.7	86.70	4.180	
4,100.0	3,985.2	3,979.2	3,979.2	19.5	79.6	-161.47	-225.9	462.4	388.4	299.7	88.69	4.380	
4,200.0	4,081.3	4,075.3	4,075.3	20.1	81.5	-162.67	-225.9	462.4	414.6	323.9	90.71	4.571	
4,300.0	4,177.5	4,171.5	4,171.5	20.7	83.4	-163.73	-225.9	462.4	441.0	348.2	92.74	4.755	
4,400.0	4,273.7	4,267.7	4,267.7	21.2	85.4	-164.67	-225.9	462.4	467.4	372.7	94.79	4.931	
4,500.0	4,369.8	4,363.8	4,363.8	21.8	87.3	-165.51	-225.9	462.4	494.0	397.2	96.85	5.101	
4,600.0	4,466.0	4,460.0	4,460.0	22.4	89.2	-166.26	-225.9	462.4	520.7	421.8	98.92	5.263	
4,700.0	4,562.1	4,556.1	4,556.1	23.0	91.1	-166.94	-225.9	462.4	547.4	446.4	101.01	5.420	
4,800.0	4,658.3	4,652.3	4,652.3	23.6	93.0	-167.56	-225.9	462.4	574.2	471.1	103.09	5.570	

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>												Offset Site Error:	0.0 ft
Survey Program: 6732-UNKNOWN												Offset Well Error:	0.0 ft
Existing Wells Sec.19-T5N-R63W - Christenson 8-19 (Exist) - Wellbore #1 - Wellbore #1													
Reference		Offset		Semi Major Axis		Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
4,900.0	4,754.5	4,748.5	4,748.5	24.2	95.0	-168.12	-225.9	462.4	601.1	495.9	105.19	5.714	
5,000.0	4,850.6	4,844.6	4,844.6	24.8	96.9	-168.64	-225.9	462.4	628.0	520.7	107.29	5.853	
5,100.0	4,946.8	4,940.8	4,940.8	25.4	98.8	-169.11	-225.9	462.4	655.0	545.6	109.39	5.987	
5,200.0	5,043.0	5,037.0	5,037.0	26.0	100.7	-169.55	-225.9	462.4	682.0	570.5	111.50	6.116	
5,300.0	5,139.1	5,133.1	5,133.1	26.6	102.7	-169.95	-225.9	462.4	709.0	595.4	113.61	6.240	
5,400.0	5,235.3	5,229.3	5,229.3	27.1	104.6	-170.32	-225.9	462.4	736.0	620.3	115.73	6.360	
5,500.0	5,331.5	5,325.5	5,325.5	27.7	106.5	-170.67	-225.9	462.4	763.1	645.3	117.85	6.476	
5,600.0	5,427.6	5,421.6	5,421.6	28.3	108.4	-170.99	-225.9	462.4	790.2	670.3	119.97	6.587	
6,600.0	6,310.2	6,304.2	6,304.2	28.9	126.1	83.03	-225.9	462.4	792.9	646.7	146.20	5.423	
6,650.0	6,338.2	6,332.2	6,332.2	28.8	126.6	84.74	-225.9	462.4	785.1	637.5	147.64	5.318	
6,700.0	6,363.5	6,357.5	6,357.5	28.7	127.1	86.36	-225.9	462.4	778.6	629.6	148.95	5.227	
6,750.0	6,385.9	6,379.9	6,379.9	28.6	127.6	87.84	-225.9	462.4	773.6	623.5	150.11	5.154	
6,800.0	6,405.5	6,399.5	6,399.5	28.5	128.0	89.09	-225.9	462.4	770.6	619.4	151.11	5.099	
6,845.8	6,420.8	6,414.8	6,414.8	28.4	128.3	90.00	-225.9	462.4	769.6	617.7	151.93	5.066	
6,850.0	6,422.0	6,416.0	6,416.0	28.4	128.3	90.07	-225.9	462.4	769.6	617.6	152.00	5.063	
6,900.0	6,435.5	6,429.5	6,429.5	28.4	128.6	90.74	-225.9	462.4	771.0	618.2	152.79	5.046	
6,950.0	6,445.9	6,439.9	6,439.9	28.4	128.8	91.06	-225.9	462.4	774.9	621.4	153.52	5.047	
7,000.0	6,453.1	6,447.1	6,447.1	28.4	128.9	91.01	-225.9	462.4	781.3	627.1	154.23	5.066	
7,050.0	6,457.1	6,451.1	6,451.1	28.5	129.0	90.58	-225.9	462.4	790.3	635.4	154.91	5.102	
7,089.0	6,458.0	6,452.0	6,452.0	28.6	129.0	89.97	-225.9	462.4	799.1	643.7	155.41	5.142	

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Cockroft 19C (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 500-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-159.91	-251.4	-91.9	268.0					
100.0	100.0	86.8	86.8	0.1	0.1	-159.91	-251.4	-91.9	267.7	267.5	0.21	1,273.119		
200.0	200.0	186.6	186.6	0.3	0.2	-159.92	-251.5	-91.9	267.8	267.3	0.55	489.325		
300.0	300.0	286.3	286.3	0.6	0.3	-159.93	-251.7	-92.0	268.0	267.1	0.88	303.069		
400.0	400.0	386.1	386.1	0.8	0.4	-159.95	-252.0	-92.0	268.3	267.1	1.22	219.679		
500.0	500.0	485.8	485.8	1.0	0.5	70.88	-252.4	-92.0	268.3	266.7	1.54	174.524		
600.0	599.9	585.8	585.8	1.2	0.7	71.66	-252.9	-92.1	267.4	265.5	1.92	139.065		
700.0	699.7	685.4	685.4	1.4	0.9	72.97	-253.3	-92.1	265.9	263.5	2.34	113.615		
800.0	799.3	785.0	785.0	1.6	1.1	74.85	-253.9	-92.1	263.8	261.0	2.79	94.693		
900.0	898.6	884.6	884.6	1.9	1.3	77.35	-254.3	-92.2	261.4	258.1	3.26	80.206		
1,000.0	997.5	983.8	983.8	2.2	1.5	80.41	-254.7	-92.1	258.9	255.2	3.77	68.750		
1,100.0	1,096.1	1,083.8	1,083.8	2.6	1.8	84.17	-254.8	-92.1	256.7	252.4	4.31	59.497		
1,200.0	1,194.2	1,180.9	1,180.9	3.0	2.0	88.43	-254.6	-92.0	255.3	250.3	4.90	52.056		
1,220.0	1,213.7	1,200.1	1,200.1	3.0	2.0	89.35	-254.6	-92.1	255.2	250.2	5.03	50.740 CC, ES		
1,300.0	1,291.7	1,278.7	1,278.7	3.4	2.2	93.30	-254.6	-92.3	255.7	250.2	5.54	46.171		
1,400.0	1,388.6	1,375.4	1,375.3	3.9	2.4	98.54	-254.6	-92.3	258.4	252.2	6.21	41.611		
1,461.5	1,447.9	1,434.0	1,434.0	4.2	2.5	101.90	-254.7	-92.4	261.5	254.9	6.63	39.417		
1,500.0	1,484.9	1,470.6	1,470.6	4.4	2.6	104.03	-254.8	-92.5	264.1	257.2	6.90	38.271		
1,600.0	1,581.1	1,566.1	1,566.0	4.9	2.8	109.41	-255.1	-93.0	273.0	265.4	7.58	36.001		
1,700.0	1,677.2	1,661.7	1,661.7	5.5	3.0	114.43	-255.5	-93.7	284.5	276.2	8.24	34.538		
1,800.0	1,773.4	1,757.2	1,757.2	6.0	3.2	119.06	-256.0	-94.5	298.2	289.4	8.86	33.673		
1,900.0	1,869.6	1,852.7	1,852.7	6.6	3.4	123.28	-256.5	-95.5	314.0	304.6	9.45	33.243		
2,000.0	1,965.7	1,948.2	1,948.2	7.2	3.6	127.09	-257.1	-96.6	331.5	321.5	10.01	33.131		
2,100.0	2,061.9	2,043.8	2,043.7	7.8	3.8	130.51	-257.8	-97.9	350.6	340.1	10.55	33.242		
2,200.0	2,158.1	2,139.7	2,139.6	8.3	4.0	133.56	-258.8	-99.2	370.8	359.8	11.07	33.495		
2,300.0	2,254.2	2,235.7	2,235.6	8.9	4.2	136.24	-260.1	-100.5	392.0	380.5	11.58	33.842		
2,400.0	2,350.4	2,331.8	2,331.7	9.5	4.4	138.61	-261.7	-101.8	414.0	401.9	12.09	34.245		
2,500.0	2,446.5	2,428.0	2,427.9	10.1	4.7	140.70	-263.7	-103.1	436.6	424.0	12.59	34.678		
2,600.0	2,542.7	2,524.3	2,524.1	10.7	4.9	142.55	-266.0	-104.4	459.7	446.6	13.09	35.124		
2,700.0	2,638.9	2,620.4	2,620.2	11.2	5.1	144.21	-268.4	-105.8	483.2	469.6	13.58	35.579		
2,800.0	2,735.0	2,716.4	2,716.2	11.8	5.3	145.72	-270.8	-107.1	507.1	493.0	14.07	36.038		
2,900.0	2,831.2	2,812.5	2,812.2	12.4	5.5	147.09	-273.2	-108.5	531.3	516.8	14.56	36.495		
3,000.0	2,927.4	2,908.5	2,908.2	13.0	5.7	148.35	-275.5	-109.9	555.9	540.8	15.04	36.947		
3,100.0	3,023.5	3,000.0	2,999.6	13.6	5.9	149.45	-277.8	-111.3	580.7	565.2	15.53	37.401		
3,200.0	3,119.7	3,098.8	3,098.4	14.2	6.1	150.54	-280.1	-113.0	605.9	589.9	16.01	37.842		
3,300.0	3,215.9	3,192.9	3,192.5	14.8	6.3	151.52	-282.1	-114.9	631.6	615.1	16.49	38.301		
3,400.0	3,312.0	3,286.9	3,286.4	15.4	6.5	152.43	-283.9	-117.0	657.7	640.8	16.97	38.765		
3,500.0	3,408.2	3,380.7	3,380.2	15.9	6.7	153.28	-285.6	-119.4	684.3	666.9	17.44	39.232		
3,600.0	3,504.3	3,474.3	3,473.7	16.5	6.9	154.08	-287.0	-122.0	711.4	693.5	17.92	39.701		
3,700.0	3,600.5	3,568.9	3,568.3	17.1	7.2	154.83	-288.4	-124.8	738.8	720.4	18.40	40.156		
3,800.0	3,696.7	3,664.0	3,663.4	17.7	7.4	155.53	-289.8	-127.8	766.4	747.5	18.88	40.590		
3,900.0	3,792.8	3,759.1	3,758.4	18.3	7.6	156.16	-291.4	-130.9	794.2	774.9	19.37	41.008		
7,100.0	6,458.0	6,466.4	6,464.8	28.6	13.1	91.71	-306.7	-134.8	797.6	758.0	39.64	20.121		
7,200.0	6,457.7	6,463.9	6,462.3	29.1	13.1	91.51	-306.7	-134.9	753.5	712.6	40.94	18.406		
7,300.0	6,457.5	6,461.5	6,459.9	30.1	13.1	91.30	-306.7	-134.9	720.6	678.2	42.44	16.979		
7,400.0	6,457.3	6,459.0	6,457.4	31.4	13.1	91.10	-306.6	-135.0	700.6	656.5	44.13	15.876		
7,492.3	6,457.1	6,456.7	6,455.1	32.9	13.1	90.91	-306.6	-135.0	694.5	648.7	45.83	15.155		
7,500.0	6,457.1	6,456.5	6,454.9	33.0	13.1	90.89	-306.6	-135.0	694.6	648.6	45.97	15.109		
7,600.0	6,456.8	6,454.0	6,452.4	34.9	13.1	90.69	-306.5	-135.1	702.8	654.9	47.94	14.661		
7,700.0	6,456.6	6,451.5	6,449.9	37.0	13.1	90.48	-306.5	-135.1	724.9	674.9	50.01	14.495 SF		
7,800.0	6,456.4	6,448.9	6,447.3	39.1	13.1	90.27	-306.5	-135.2	759.6	707.4	52.17	14.559		

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

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Flack 7-19 (P&A) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 6701-UNKNOWN													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
7,600.0	6,456.8	6,444.8	6,444.8	34.9	128.9	90.20	-561.0	-902.6	793.2	629.4	163.77	4.843		
7,700.0	6,456.6	6,444.6	6,444.6	37.0	128.9	90.17	-561.0	-902.6	712.1	546.3	165.85	4.294		
7,800.0	6,456.4	6,444.4	6,444.4	39.1	128.9	90.14	-561.0	-902.6	636.5	468.5	168.02	3.788		
7,900.0	6,456.2	6,444.2	6,444.2	41.4	128.9	90.11	-561.0	-902.6	568.5	398.2	170.27	3.339		
8,000.0	6,455.9	6,443.9	6,443.9	43.7	128.9	90.08	-561.0	-902.6	511.0	338.4	172.59	2.961		
8,100.0	6,455.7	6,443.7	6,443.7	46.1	128.9	90.05	-561.0	-902.6	468.1	293.2	174.95	2.676		
8,200.0	6,455.5	6,443.5	6,443.5	48.6	128.9	90.02	-561.0	-902.6	444.0	266.7	177.37	2.504		
8,259.9	6,455.3	6,443.3	6,443.3	50.0	128.9	90.00	-561.0	-902.6	440.0	261.1	178.84	2.460 CC, ES		
8,300.0	6,455.2	6,443.2	6,443.2	51.0	128.9	89.99	-561.0	-902.6	441.8	262.0	179.82	2.457 SF		
8,400.0	6,455.0	6,443.0	6,443.0	53.6	128.9	89.96	-561.0	-902.6	461.7	279.4	182.31	2.533		
8,500.0	6,454.8	6,442.8	6,442.8	56.1	128.9	89.93	-561.0	-902.6	501.2	316.4	184.83	2.712		
8,600.0	6,454.6	6,442.6	6,442.6	58.7	128.9	89.90	-561.0	-902.6	556.1	368.7	187.38	2.968		
8,700.0	6,454.3	6,442.3	6,442.3	61.2	128.8	89.87	-561.0	-902.6	622.3	432.3	189.95	3.276		
8,800.0	6,454.1	6,442.1	6,442.1	63.8	128.8	89.84	-561.0	-902.6	696.6	504.1	192.53	3.618		
8,900.0	6,453.9	6,441.9	6,441.9	66.5	128.8	89.81	-561.0	-902.6	776.7	581.6	195.14	3.980		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Johnson 2 (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		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
10,500.0	6,450.2	6,457.4	6,456.3	109.6	11.4	91.71	-492.6	-3,660.6	725.9	605.1	120.83	6.007		
10,600.0	6,450.0	6,457.3	6,456.2	112.4	11.4	91.70	-492.6	-3,660.6	658.3	534.7	123.58	5.327		
10,700.0	6,449.8	6,457.2	6,456.1	115.1	11.4	91.70	-492.6	-3,660.6	599.8	473.5	126.32	4.748		
10,800.0	6,449.6	6,457.2	6,456.0	117.9	11.4	91.69	-492.6	-3,660.6	553.3	424.3	129.07	4.287		
10,900.0	6,449.3	6,457.1	6,456.0	120.6	11.4	91.68	-492.6	-3,660.6	522.1	390.3	131.82	3.961		
11,000.0	6,449.1	6,457.0	6,455.9	123.4	11.4	91.67	-492.6	-3,660.6	508.9	374.4	134.58	3.782		
11,017.9	6,449.1	6,457.0	6,455.9	123.9	11.4	91.67	-492.6	-3,660.6	508.6	373.6	135.07	3.766 CC, ES		
11,100.0	6,448.9	6,456.9	6,455.8	126.1	11.4	91.66	-492.6	-3,660.6	515.2	377.9	137.33	3.752 SF		
11,200.0	6,448.6	6,456.8	6,455.7	128.9	11.4	91.65	-492.6	-3,660.6	540.2	400.1	140.09	3.856		
11,300.0	6,448.4	6,456.8	6,455.6	131.7	11.4	91.64	-492.6	-3,660.6	581.6	438.8	142.85	4.071		
11,400.0	6,448.2	6,456.7	6,455.6	134.4	11.4	91.63	-492.6	-3,660.6	636.2	490.5	145.61	4.369		
11,500.0	6,448.0	6,456.6	6,455.5	137.2	11.4	91.62	-492.6	-3,660.6	700.8	552.4	148.38	4.723		
11,600.0	6,447.7	6,456.5	6,455.4	139.9	11.4	91.61	-492.6	-3,660.6	773.0	621.9	151.15	5.114		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Johnson 4 (P&A) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 6700-UNKNOWN													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
9,000.0	6,453.7	6,441.7	6,441.7	69.1	128.8	90.18	-535.4	-2,276.0	786.0	588.3	197.78	3.974		
9,100.0	6,453.4	6,441.4	6,441.4	71.7	128.8	90.15	-535.4	-2,276.0	708.0	507.5	200.41	3.532		
9,200.0	6,453.2	6,441.2	6,441.2	74.4	128.8	90.12	-535.4	-2,276.0	636.0	433.0	203.06	3.132		
9,300.0	6,453.0	6,441.0	6,441.0	77.1	128.8	90.09	-535.4	-2,276.0	572.6	366.9	205.72	2.783		
9,400.0	6,452.7	6,440.7	6,440.7	79.8	128.8	90.07	-535.4	-2,276.0	520.8	312.4	208.39	2.499		
9,500.0	6,452.5	6,440.5	6,440.5	82.4	128.8	90.04	-535.4	-2,276.0	484.3	273.2	211.07	2.295		
9,600.0	6,452.3	6,440.3	6,440.3	85.1	128.8	90.01	-535.4	-2,276.0	466.8	253.0	213.75	2.184		
9,633.3	6,452.2	6,440.2	6,440.2	86.0	128.8	90.00	-535.4	-2,276.0	465.6	250.9	214.65	2.169	CC, ES, SF	
9,700.0	6,452.1	6,440.1	6,440.1	87.8	128.8	89.98	-535.4	-2,276.0	470.3	253.9	216.45	2.173		
9,800.0	6,451.8	6,439.8	6,439.8	90.5	128.8	89.95	-535.4	-2,276.0	494.5	275.4	219.15	2.257		
9,900.0	6,451.6	6,439.6	6,439.6	93.3	128.8	89.93	-535.4	-2,276.0	536.5	314.7	221.86	2.418		
10,000.0	6,451.4	6,439.4	6,439.4	96.0	128.8	89.90	-535.4	-2,276.0	592.6	368.1	224.57	2.639		
10,100.0	6,451.2	6,439.2	6,439.2	98.7	128.8	89.87	-535.4	-2,276.0	659.2	431.9	227.29	2.900		
10,200.0	6,450.9	6,438.9	6,438.9	101.4	128.8	89.84	-535.4	-2,276.0	733.4	503.4	230.01	3.189		

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design Existing Wells Sec.19-T5N-R63W - Ochsner 22-19 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 500-NS-GYRO-MS													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
8,700.0	6,454.3	6,452.9	6,450.6	61.2	12.4	92.30	-754.1	-2,058.5	757.3	683.7	73.56	10.295		
8,800.0	6,454.1	6,451.4	6,449.2	63.8	12.4	91.96	-754.1	-2,058.5	663.6	587.4	76.15	8.714		
8,900.0	6,453.9	6,449.9	6,447.7	66.5	12.4	91.61	-754.1	-2,058.6	572.0	493.2	78.76	7.263		
9,000.0	6,453.7	6,448.4	6,446.1	69.1	12.4	91.25	-754.1	-2,058.6	483.7	402.3	81.38	5.944		
9,100.0	6,453.4	6,446.8	6,444.5	71.7	12.4	90.88	-754.1	-2,058.6	401.0	317.0	84.01	4.773		
9,200.0	6,453.2	6,445.1	6,442.9	74.4	12.4	90.50	-754.1	-2,058.6	328.0	241.4	86.65	3.786		
9,300.0	6,453.0	6,443.4	6,441.2	77.1	12.4	90.11	-754.1	-2,058.7	272.8	183.5	89.30	3.055		
9,400.0	6,452.7	6,441.7	6,439.5	79.8	12.4	89.71	-754.1	-2,058.7	247.4	155.4	91.96	2.690		
9,416.0	6,452.7	6,441.4	6,439.2	80.2	12.4	89.64	-754.2	-2,058.7	246.9	154.5	92.38	2.672	CC, ES, SF	
9,500.0	6,452.5	6,439.9	6,437.7	82.4	12.4	89.30	-754.2	-2,058.7	260.7	166.1	94.62	2.756		
9,600.0	6,452.3	6,438.1	6,435.8	85.1	12.4	88.87	-754.2	-2,058.7	307.9	210.6	97.28	3.165		
9,700.0	6,452.1	6,436.2	6,433.9	87.8	12.4	88.43	-754.2	-2,058.8	376.2	276.3	99.94	3.765		
9,800.0	6,451.8	6,434.2	6,432.0	90.5	12.4	87.97	-754.2	-2,058.8	456.4	353.8	102.60	4.448		
9,900.0	6,451.6	6,432.2	6,430.0	93.3	12.4	87.51	-754.2	-2,058.8	543.2	437.9	105.26	5.161		
10,000.0	6,451.4	6,430.1	6,427.9	96.0	12.4	87.02	-754.2	-2,058.9	633.9	526.0	107.92	5.874		
10,100.0	6,451.2	6,428.0	6,425.7	98.7	12.4	86.53	-754.2	-2,058.9	727.0	616.5	110.57	6.576		



<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Existing Wells Sec.19-T5N-R63W - Rothe 8-24 (Exist) - Wellbore #1 - Wellbore #1		Offset Site Error:		0.0 ft
Survey Program: 6735-UNKNOWN													Offset Well Error:		0.0 ft		
Reference		Offset		Semi Major Axis			Distance							Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor					
12,000.0	6,446.8	6,440.8	6,440.8	151.0	128.8	90.04	-243.6	-4,900.1	800.0	520.3	279.68	2.860	2.641 CC, ES 2.634 SF				
12,100.0	6,446.6	6,440.6	6,440.6	153.8	128.8	90.03	-243.6	-4,900.1	773.6	491.2	282.45	2.739					
12,200.0	6,446.4	6,440.4	6,440.4	156.6	128.8	90.01	-243.6	-4,900.1	759.6	474.4	285.22	2.663					
12,257.5	6,446.2	6,440.2	6,440.2	158.2	128.8	90.00	-243.6	-4,900.1	757.4	470.6	286.81	2.651					
12,300.0	6,446.1	6,440.1	6,440.1	159.4	128.8	89.99	-243.6	-4,900.1	758.6	470.6	287.99	2.651					
12,400.0	6,445.9	6,439.9	6,439.9	162.1	128.8	89.98	-243.6	-4,900.1	770.7	480.0	290.77	2.651					
12,500.0	6,445.7	6,439.7	6,439.7	164.9	128.8	89.96	-243.6	-4,900.1	795.3	501.8	293.54	2.709					

<b>Company:</b>	PETROLEUM DEVELOPMENT CORP DJ Basin	<b>Local Co-ordinate Reference:</b>	Well Cockroft 19W-214
<b>Project:</b>	SEC.19-T5N-R63W	<b>TVD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Reference Site:</b>	Cockroft 5N63W19C Pad Sec.19-T5N-R63W	<b>MD Reference:</b>	WELL @ 4567.0ft (RKB - 13')
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Cockroft 19W-214	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (11-13-15)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4567.0ft (RKB - 13')

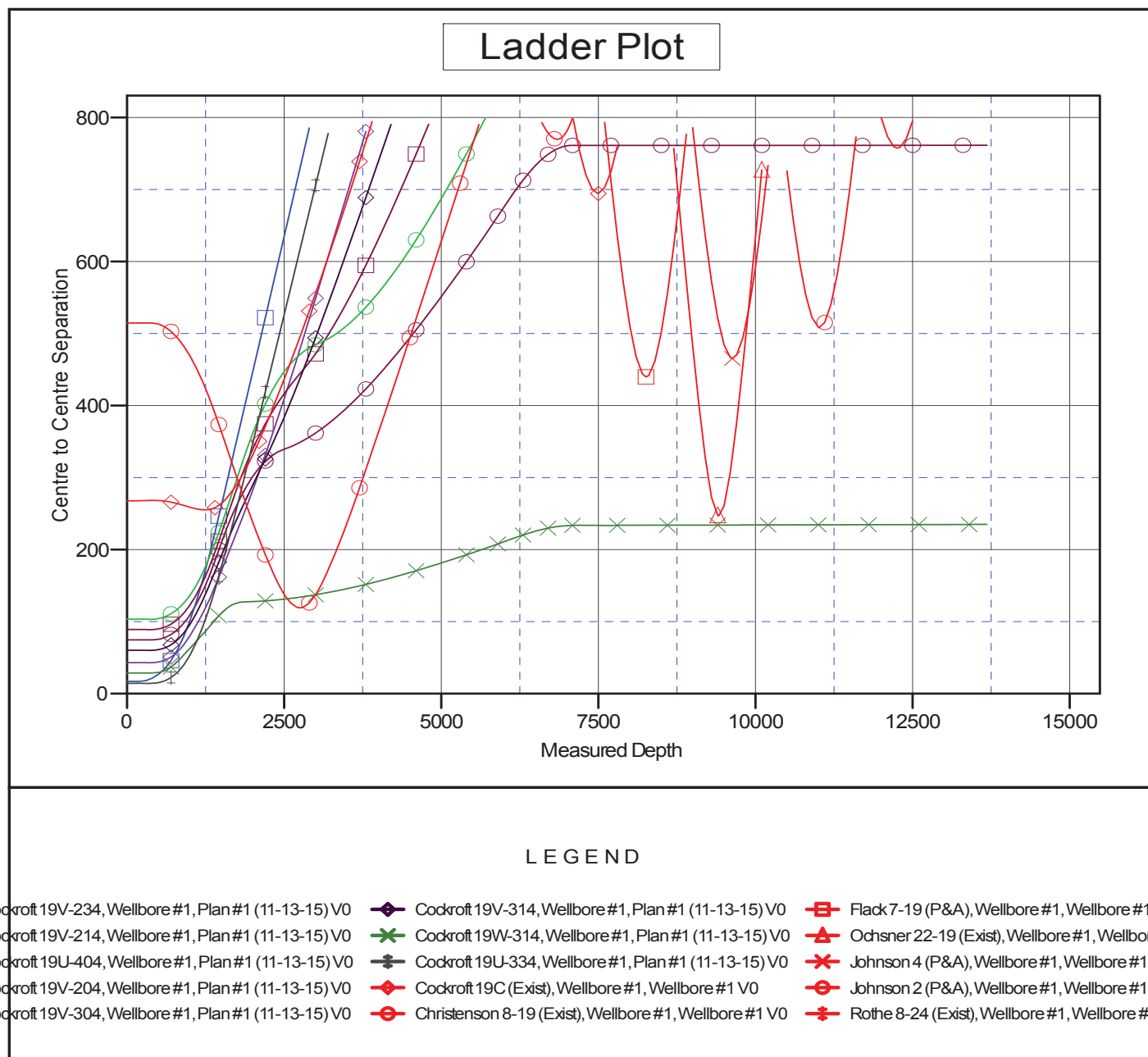
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000

Coordinates are relative to: Cockroft 19W-214

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.66°



Coordinates are relative to: Cockroft 19W-214  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.66°

