

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: Brown 2E-232

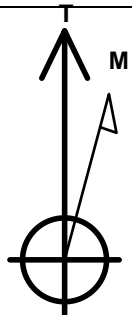
Surface Location: Brown Pad Sec.2-T6N-R63W
North American Datum 1983 , US State Plane 1983 Colorado Northern Zone
Ground Elevation: 4710.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1434022.39	3302429.38	40.519700	-104.412170	

RKB Ensign 32 - 15' WELL @ 4725.0ft (RKB Ensign 32 - 15')

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
HARDLINE SHL 460'FWL (1)	0.0	700.0	210.0	1434724.89	3302630.77	40.521621	-104.411415	Polygon
HARDLINE BHL 460' (1)	1.0	672.4	4510.6	1434750.05	3306931.24	40.521544	-104.395946	Polygon
SECTIONLINE 250'W OF SHL (1)	1.0	700.0	-250.0	1434719.25	3302170.82	40.521621	-104.413069	Polygon
BHL 560'FNL & 500'FEL	6535.0	572.4	4470.6	1434649.57	3306892.46	40.521270	-104.396090	Point



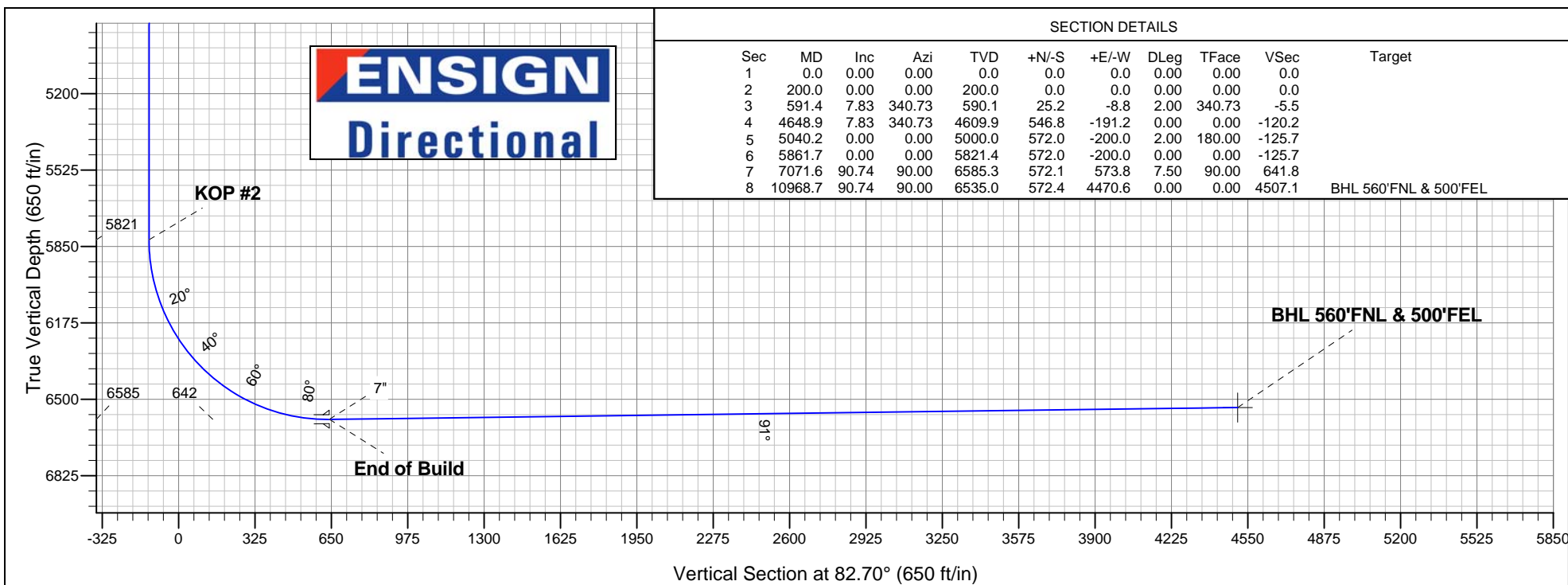
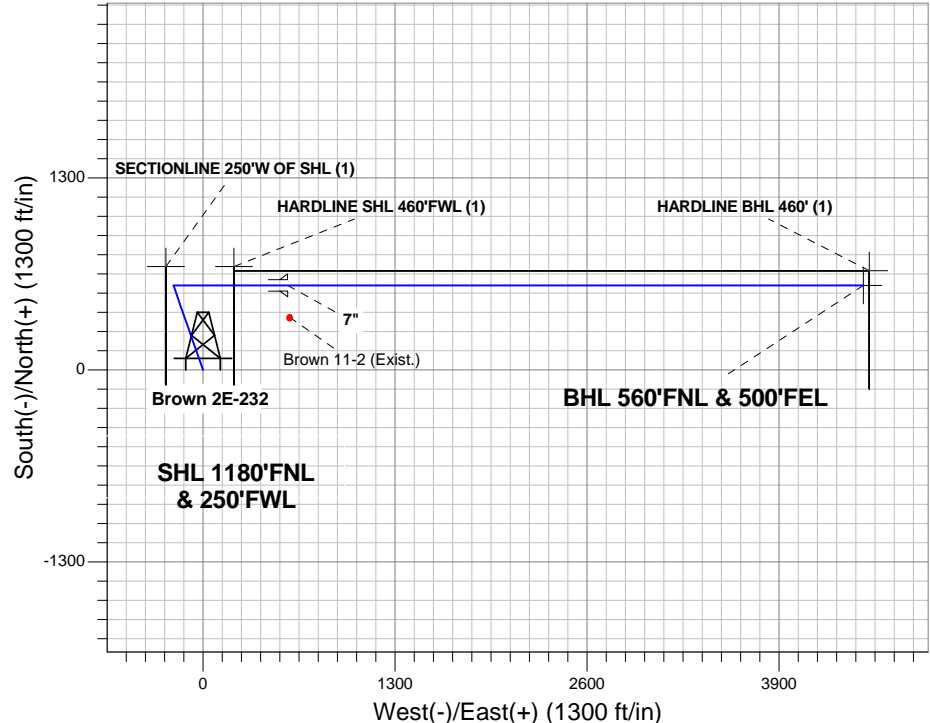
Azimuths to True North
Magnetic North: 8.55°

Magnetic Field
Strength: 53131.5nT
Dip Angle: 67.17°
Date: 5/29/2012
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
200.0	200.0	KOP #1
5821.5	5861.7	KOP #2
6585.3	7071.6	End of Build

Brown Pad Sec.2-T6N-R63W
Brown 2E-232
Plan #1 (5-29-12)
11:30, May 31 2012





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.2-T6N-R63W

Brown Pad Sec.2-T6N-R63W

Brown 2E-232

Wellbore #1

Plan: Plan #1 (5-29-12)

Standard Planning Report

31 May, 2012

Database:	Landmark	Local Co-ordinate Reference:	Well Brown 2E-232
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Project:	SEC.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site:	Brown Pad Sec.2-T6N-R63W	North Reference:	True
Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-29-12)		

Project	SEC.2-T6N-R63W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Brown Pad Sec.2-T6N-R63W		
Site Position:		Northing:	1,433,964.08 ft
From:	Lat/Long	Easting:	3,302,427.32 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40.519540
		Longitude:	-104.412180
		Grid Convergence:	0.70 °

Well	Brown 2E-232		
Well Position	+N/-S	58.3 ft	Northing:
	+E/-W	2.8 ft	Easting:
Position Uncertainty		0.0 ft	Wellhead Elevation:
			ft
			Latitude:
			40.519700
			Longitude:
			-104.412170
			Ground Level:
			4,710.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/29/2012	8.56	67.17	53,131

Design	Plan #1 (5-29-12)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	82.70

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
591.4	7.83	340.73	590.1	25.2	-8.8	2.00	2.00	0.00	340.73	
4,648.9	7.83	340.73	4,609.9	546.8	-191.2	0.00	0.00	0.00	0.00	
5,040.2	0.00	0.00	5,000.0	572.0	-200.0	2.00	-2.00	0.00	180.00	
5,861.7	0.00	0.00	5,821.4	572.0	-200.0	0.00	0.00	0.00	0.00	
7,071.6	90.74	90.00	6,585.3	572.1	573.8	7.50	7.50	0.00	90.00	
10,968.7	90.74	90.00	6,535.0	572.4	4,470.6	0.00	0.00	0.00	0.00	BHL 560'FNL & 50C

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Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Project:	SEC.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site:	Brown Pad Sec.2-T6N-R63W	North Reference:	True
Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-29-12)		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
HARDLINE SHL 460'FWL (1)									
1.0	0.00	0.00	1.0	0.0	0.0	0.0	0.00	0.00	0.00
HARDLINE BHL 460' (1) - SECTIONLINE 250'W OF SHL (1)									
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP #1									
240.0	0.80	340.73	240.0	0.3	-0.1	-0.1	2.00	2.00	0.00
280.0	1.60	340.73	280.0	1.1	-0.4	-0.2	2.00	2.00	0.00
320.0	2.40	340.73	320.0	2.4	-0.8	-0.5	2.00	2.00	0.00
360.0	3.20	340.73	359.9	4.2	-1.5	-0.9	2.00	2.00	0.00
400.0	4.00	340.73	399.8	6.6	-2.3	-1.4	2.00	2.00	0.00
440.0	4.80	340.73	439.7	9.5	-3.3	-2.1	2.00	2.00	0.00
480.0	5.60	340.73	479.6	12.9	-4.5	-2.8	2.00	2.00	0.00
520.0	6.40	340.73	519.3	16.9	-5.9	-3.7	2.00	2.00	0.00
560.0	7.20	340.73	559.1	21.3	-7.5	-4.7	2.00	2.00	0.00
591.4	7.83	340.73	590.1	25.2	-8.8	-5.5	2.00	2.00	0.00
600.0	7.83	340.73	598.7	26.3	-9.2	-5.8	0.00	0.00	0.00
640.0	7.83	340.73	638.3	31.4	-11.0	-6.9	0.00	0.00	0.00
680.0	7.83	340.73	678.0	36.6	-12.8	-8.0	0.00	0.00	0.00
720.0	7.83	340.73	717.6	41.7	-14.6	-9.2	0.00	0.00	0.00
760.0	7.83	340.73	757.2	46.9	-16.4	-10.3	0.00	0.00	0.00
800.0	7.83	340.73	796.8	52.0	-18.2	-11.4	0.00	0.00	0.00
840.0	7.83	340.73	836.5	57.2	-20.0	-12.6	0.00	0.00	0.00
880.0	7.83	340.73	876.1	62.3	-21.8	-13.7	0.00	0.00	0.00
920.0	7.83	340.73	915.7	67.4	-23.6	-14.8	0.00	0.00	0.00
960.0	7.83	340.73	955.3	72.6	-25.4	-16.0	0.00	0.00	0.00
1,000.0	7.83	340.73	995.0	77.7	-27.2	-17.1	0.00	0.00	0.00
1,040.0	7.83	340.73	1,034.6	82.9	-29.0	-18.2	0.00	0.00	0.00
1,080.0	7.83	340.73	1,074.2	88.0	-30.8	-19.3	0.00	0.00	0.00
1,120.0	7.83	340.73	1,113.9	93.2	-32.6	-20.5	0.00	0.00	0.00
1,160.0	7.83	340.73	1,153.5	98.3	-34.4	-21.6	0.00	0.00	0.00
1,200.0	7.83	340.73	1,193.1	103.4	-36.2	-22.7	0.00	0.00	0.00
1,240.0	7.83	340.73	1,232.7	108.6	-38.0	-23.9	0.00	0.00	0.00
1,280.0	7.83	340.73	1,272.4	113.7	-39.8	-25.0	0.00	0.00	0.00
1,320.0	7.83	340.73	1,312.0	118.9	-41.6	-26.1	0.00	0.00	0.00
1,360.0	7.83	340.73	1,351.6	124.0	-43.4	-27.3	0.00	0.00	0.00
1,400.0	7.83	340.73	1,391.2	129.1	-45.2	-28.4	0.00	0.00	0.00
1,440.0	7.83	340.73	1,430.9	134.3	-47.0	-29.5	0.00	0.00	0.00
1,480.0	7.83	340.73	1,470.5	139.4	-48.8	-30.7	0.00	0.00	0.00
1,520.0	7.83	340.73	1,510.1	144.6	-50.6	-31.8	0.00	0.00	0.00
1,560.0	7.83	340.73	1,549.8	149.7	-52.3	-32.9	0.00	0.00	0.00
1,600.0	7.83	340.73	1,589.4	154.9	-54.1	-34.0	0.00	0.00	0.00
1,640.0	7.83	340.73	1,629.0	160.0	-55.9	-35.2	0.00	0.00	0.00
1,680.0	7.83	340.73	1,668.6	165.1	-57.7	-36.3	0.00	0.00	0.00
1,720.0	7.83	340.73	1,708.3	170.3	-59.5	-37.4	0.00	0.00	0.00
1,760.0	7.83	340.73	1,747.9	175.4	-61.3	-38.6	0.00	0.00	0.00
1,800.0	7.83	340.73	1,787.5	180.6	-63.1	-39.7	0.00	0.00	0.00
1,840.0	7.83	340.73	1,827.2	185.7	-64.9	-40.8	0.00	0.00	0.00
1,880.0	7.83	340.73	1,866.8	190.9	-66.7	-42.0	0.00	0.00	0.00

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Site:	Brown Pad Sec.2-T6N-R63W	North Reference:	True
Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-29-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,920.0	7.83	340.73	1,906.4	196.0	-68.5	-43.1	0.00	0.00	0.00
1,960.0	7.83	340.73	1,946.0	201.1	-70.3	-44.2	0.00	0.00	0.00
2,000.0	7.83	340.73	1,985.7	206.3	-72.1	-45.3	0.00	0.00	0.00
2,040.0	7.83	340.73	2,025.3	211.4	-73.9	-46.5	0.00	0.00	0.00
2,080.0	7.83	340.73	2,064.9	216.6	-75.7	-47.6	0.00	0.00	0.00
2,120.0	7.83	340.73	2,104.5	221.7	-77.5	-48.7	0.00	0.00	0.00
2,160.0	7.83	340.73	2,144.2	226.8	-79.3	-49.9	0.00	0.00	0.00
2,200.0	7.83	340.73	2,183.8	232.0	-81.1	-51.0	0.00	0.00	0.00
2,240.0	7.83	340.73	2,223.4	237.1	-82.9	-52.1	0.00	0.00	0.00
2,280.0	7.83	340.73	2,263.1	242.3	-84.7	-53.3	0.00	0.00	0.00
2,320.0	7.83	340.73	2,302.7	247.4	-86.5	-54.4	0.00	0.00	0.00
2,360.0	7.83	340.73	2,342.3	252.6	-88.3	-55.5	0.00	0.00	0.00
2,400.0	7.83	340.73	2,381.9	257.7	-90.1	-56.6	0.00	0.00	0.00
2,440.0	7.83	340.73	2,421.6	262.8	-91.9	-57.8	0.00	0.00	0.00
2,480.0	7.83	340.73	2,461.2	268.0	-93.7	-58.9	0.00	0.00	0.00
2,520.0	7.83	340.73	2,500.8	273.1	-95.5	-60.0	0.00	0.00	0.00
2,560.0	7.83	340.73	2,540.4	278.3	-97.3	-61.2	0.00	0.00	0.00
2,600.0	7.83	340.73	2,580.1	283.4	-99.1	-62.3	0.00	0.00	0.00
2,640.0	7.83	340.73	2,619.7	288.6	-100.9	-63.4	0.00	0.00	0.00
2,680.0	7.83	340.73	2,659.3	293.7	-102.7	-64.6	0.00	0.00	0.00
2,720.0	7.83	340.73	2,699.0	298.8	-104.5	-65.7	0.00	0.00	0.00
2,760.0	7.83	340.73	2,738.6	304.0	-106.3	-66.8	0.00	0.00	0.00
2,800.0	7.83	340.73	2,778.2	309.1	-108.1	-68.0	0.00	0.00	0.00
2,840.0	7.83	340.73	2,817.8	314.3	-109.9	-69.1	0.00	0.00	0.00
2,880.0	7.83	340.73	2,857.5	319.4	-111.7	-70.2	0.00	0.00	0.00
2,920.0	7.83	340.73	2,897.1	324.6	-113.5	-71.3	0.00	0.00	0.00
2,960.0	7.83	340.73	2,936.7	329.7	-115.3	-72.5	0.00	0.00	0.00
3,000.0	7.83	340.73	2,976.3	334.8	-117.1	-73.6	0.00	0.00	0.00
3,040.0	7.83	340.73	3,016.0	340.0	-118.9	-74.7	0.00	0.00	0.00
3,080.0	7.83	340.73	3,055.6	345.1	-120.7	-75.9	0.00	0.00	0.00
3,120.0	7.83	340.73	3,095.2	350.3	-122.5	-77.0	0.00	0.00	0.00
3,160.0	7.83	340.73	3,134.9	355.4	-124.3	-78.1	0.00	0.00	0.00
3,200.0	7.83	340.73	3,174.5	360.5	-126.1	-79.3	0.00	0.00	0.00
3,240.0	7.83	340.73	3,214.1	365.7	-127.9	-80.4	0.00	0.00	0.00
3,280.0	7.83	340.73	3,253.7	370.8	-129.7	-81.5	0.00	0.00	0.00
3,320.0	7.83	340.73	3,293.4	376.0	-131.5	-82.6	0.00	0.00	0.00
3,360.0	7.83	340.73	3,333.0	381.1	-133.3	-83.8	0.00	0.00	0.00
3,400.0	7.83	340.73	3,372.6	386.3	-135.1	-84.9	0.00	0.00	0.00
3,440.0	7.83	340.73	3,412.2	391.4	-136.9	-86.0	0.00	0.00	0.00
3,480.0	7.83	340.73	3,451.9	396.5	-138.7	-87.2	0.00	0.00	0.00
3,520.0	7.83	340.73	3,491.5	401.7	-140.4	-88.3	0.00	0.00	0.00
3,560.0	7.83	340.73	3,531.1	406.8	-142.2	-89.4	0.00	0.00	0.00
3,600.0	7.83	340.73	3,570.8	412.0	-144.0	-90.6	0.00	0.00	0.00
3,640.0	7.83	340.73	3,610.4	417.1	-145.8	-91.7	0.00	0.00	0.00
3,680.0	7.83	340.73	3,650.0	422.3	-147.6	-92.8	0.00	0.00	0.00
3,720.0	7.83	340.73	3,689.6	427.4	-149.4	-93.9	0.00	0.00	0.00
3,760.0	7.83	340.73	3,729.3	432.5	-151.2	-95.1	0.00	0.00	0.00
3,800.0	7.83	340.73	3,768.9	437.7	-153.0	-96.2	0.00	0.00	0.00
3,840.0	7.83	340.73	3,808.5	442.8	-154.8	-97.3	0.00	0.00	0.00
3,880.0	7.83	340.73	3,848.1	448.0	-156.6	-98.5	0.00	0.00	0.00
3,920.0	7.83	340.73	3,887.8	453.1	-158.4	-99.6	0.00	0.00	0.00
3,960.0	7.83	340.73	3,927.4	458.2	-160.2	-100.7	0.00	0.00	0.00
4,000.0	7.83	340.73	3,967.0	463.4	-162.0	-101.9	0.00	0.00	0.00

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Project:	SEC.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site:	Brown Pad Sec.2-T6N-R63W	North Reference:	True
Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-29-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,040.0	7.83	340.73	4,006.7	468.5	-163.8	-103.0	0.00	0.00	0.00
4,080.0	7.83	340.73	4,046.3	473.7	-165.6	-104.1	0.00	0.00	0.00
4,120.0	7.83	340.73	4,085.9	478.8	-167.4	-105.3	0.00	0.00	0.00
4,160.0	7.83	340.73	4,125.5	484.0	-169.2	-106.4	0.00	0.00	0.00
4,200.0	7.83	340.73	4,165.2	489.1	-171.0	-107.5	0.00	0.00	0.00
4,240.0	7.83	340.73	4,204.8	494.2	-172.8	-108.6	0.00	0.00	0.00
4,280.0	7.83	340.73	4,244.4	499.4	-174.6	-109.8	0.00	0.00	0.00
4,320.0	7.83	340.73	4,284.0	504.5	-176.4	-110.9	0.00	0.00	0.00
4,360.0	7.83	340.73	4,323.7	509.7	-178.2	-112.0	0.00	0.00	0.00
4,400.0	7.83	340.73	4,363.3	514.8	-180.0	-113.2	0.00	0.00	0.00
4,440.0	7.83	340.73	4,402.9	520.0	-181.8	-114.3	0.00	0.00	0.00
4,480.0	7.83	340.73	4,442.6	525.1	-183.6	-115.4	0.00	0.00	0.00
4,520.0	7.83	340.73	4,482.2	530.2	-185.4	-116.6	0.00	0.00	0.00
4,560.0	7.83	340.73	4,521.8	535.4	-187.2	-117.7	0.00	0.00	0.00
4,600.0	7.83	340.73	4,561.4	540.5	-189.0	-118.8	0.00	0.00	0.00
4,640.0	7.83	340.73	4,601.1	545.7	-190.8	-119.9	0.00	0.00	0.00
4,648.9	7.83	340.73	4,609.9	546.8	-191.2	-120.2	0.00	0.00	0.00
4,680.0	7.20	340.73	4,640.7	550.6	-192.5	-121.0	2.00	-2.00	0.00
4,720.0	6.40	340.73	4,680.4	555.1	-194.1	-122.0	2.00	-2.00	0.00
4,760.0	5.60	340.73	4,720.2	559.1	-195.5	-122.9	2.00	-2.00	0.00
4,800.0	4.80	340.73	4,760.0	562.5	-196.7	-123.6	2.00	-2.00	0.00
4,840.0	4.00	340.73	4,799.9	565.4	-197.7	-124.3	2.00	-2.00	0.00
4,880.0	3.20	340.73	4,839.8	567.8	-198.5	-124.8	2.00	-2.00	0.00
4,920.0	2.40	340.73	4,879.8	569.6	-199.2	-125.2	2.00	-2.00	0.00
4,960.0	1.60	340.73	4,919.8	570.9	-199.6	-125.5	2.00	-2.00	0.00
5,000.0	0.80	340.73	4,959.8	571.7	-199.9	-125.7	2.00	-2.00	0.00
5,040.0	0.00	340.73	4,999.8	572.0	-200.0	-125.7	2.00	-2.00	0.00
5,040.2	0.00	0.00	5,000.0	572.0	-200.0	-125.7	2.00	-2.00	0.00
5,080.0	0.00	0.00	5,039.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,120.0	0.00	0.00	5,079.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,160.0	0.00	0.00	5,119.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,200.0	0.00	0.00	5,159.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,240.0	0.00	0.00	5,199.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,280.0	0.00	0.00	5,239.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,320.0	0.00	0.00	5,279.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,360.0	0.00	0.00	5,319.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,400.0	0.00	0.00	5,359.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,440.0	0.00	0.00	5,399.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,480.0	0.00	0.00	5,439.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,520.0	0.00	0.00	5,479.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,560.0	0.00	0.00	5,519.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,600.0	0.00	0.00	5,559.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,640.0	0.00	0.00	5,599.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,680.0	0.00	0.00	5,639.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,720.0	0.00	0.00	5,679.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,760.0	0.00	0.00	5,719.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,800.0	0.00	0.00	5,759.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,840.0	0.00	0.00	5,799.8	572.0	-200.0	-125.7	0.00	0.00	0.00
5,861.7	0.00	0.00	5,821.5	572.0	-200.0	-125.7	0.00	0.00	0.00
KOP #2									
5,880.0	1.37	90.00	5,839.8	572.0	-199.8	-125.5	7.51	7.51	0.00
5,920.0	4.37	90.00	5,879.7	572.0	-197.8	-123.5	7.50	7.50	0.00
5,960.0	7.37	90.00	5,919.5	572.0	-193.7	-119.5	7.50	7.50	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Brown 2E-232
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Project:	SEC.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site:	Brown Pad Sec.2-T6N-R63W	North Reference:	True
Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-29-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,000.0	10.37	90.00	5,959.0	572.0	-187.5	-113.4	7.50	7.50	0.00
6,040.0	13.37	90.00	5,998.2	572.0	-179.3	-105.2	7.50	7.50	0.00
6,080.0	16.37	90.00	6,036.8	572.0	-169.0	-95.0	7.50	7.50	0.00
6,120.0	19.37	90.00	6,074.9	572.0	-156.7	-82.8	7.50	7.50	0.00
6,160.0	22.37	90.00	6,112.2	572.0	-142.5	-68.7	7.50	7.50	0.00
6,200.0	25.37	90.00	6,148.8	572.0	-126.3	-52.6	7.50	7.50	0.00
6,240.0	28.37	90.00	6,184.5	572.0	-108.2	-34.7	7.50	7.50	0.00
6,280.0	31.37	90.00	6,219.2	572.0	-88.3	-14.9	7.50	7.50	0.00
6,320.0	34.37	90.00	6,252.8	572.0	-66.6	6.6	7.50	7.50	0.00
6,360.0	37.37	90.00	6,285.2	572.0	-43.2	29.8	7.50	7.50	0.00
6,400.0	40.37	90.00	6,316.3	572.0	-18.1	54.7	7.50	7.50	0.00
6,440.0	43.37	90.00	6,346.1	572.0	8.6	81.2	7.50	7.50	0.00
6,480.0	46.37	90.00	6,374.4	572.0	36.9	109.2	7.50	7.50	0.00
6,520.0	49.37	90.00	6,401.3	572.0	66.5	138.6	7.50	7.50	0.00
6,560.0	52.37	90.00	6,426.5	572.0	97.5	169.4	7.50	7.50	0.00
6,600.0	55.37	90.00	6,450.1	572.0	129.9	201.4	7.50	7.50	0.00
6,640.0	58.37	90.00	6,471.9	572.0	163.3	234.7	7.50	7.50	0.00
6,680.0	61.37	90.00	6,492.0	572.0	197.9	269.0	7.50	7.50	0.00
6,720.0	64.37	90.00	6,510.2	572.0	233.5	304.3	7.50	7.50	0.00
6,760.0	67.37	90.00	6,526.6	572.0	270.0	340.5	7.50	7.50	0.00
6,800.0	70.37	90.00	6,541.0	572.0	307.3	377.5	7.50	7.50	0.00
6,840.0	73.37	90.00	6,553.5	572.0	345.4	415.2	7.50	7.50	0.00
6,880.0	76.37	90.00	6,563.9	572.0	384.0	453.5	7.50	7.50	0.00
6,920.0	79.37	90.00	6,572.3	572.1	423.1	492.3	7.50	7.50	0.00
6,960.0	82.37	90.00	6,578.6	572.1	462.6	531.5	7.50	7.50	0.00
7,000.0	85.37	90.00	6,582.9	572.1	502.3	570.9	7.50	7.50	0.00
7,040.0	88.37	90.00	6,585.1	572.1	542.3	610.5	7.50	7.50	0.00
7,071.6	90.74	90.00	6,585.3	572.1	573.9	641.9	7.49	7.49	0.00
End of Build - 7"									
7,080.0	90.74	90.00	6,585.2	572.1	582.3	650.2	0.00	0.00	0.00
7,120.0	90.74	90.00	6,584.7	572.1	622.3	689.9	0.00	0.00	0.00
7,160.0	90.74	90.00	6,584.2	572.1	662.3	729.5	0.00	0.00	0.00
7,200.0	90.74	90.00	6,583.7	572.1	702.2	769.2	0.00	0.00	0.00
7,240.0	90.74	90.00	6,583.2	572.1	742.2	808.9	0.00	0.00	0.00
7,280.0	90.74	90.00	6,582.6	572.1	782.2	848.6	0.00	0.00	0.00
7,320.0	90.74	90.00	6,582.1	572.1	822.2	888.2	0.00	0.00	0.00
7,360.0	90.74	90.00	6,581.6	572.1	862.2	927.9	0.00	0.00	0.00
7,400.0	90.74	90.00	6,581.1	572.1	902.2	967.6	0.00	0.00	0.00
7,440.0	90.74	90.00	6,580.6	572.1	942.2	1,007.3	0.00	0.00	0.00
7,480.0	90.74	90.00	6,580.1	572.1	982.2	1,046.9	0.00	0.00	0.00
7,520.0	90.74	90.00	6,579.5	572.1	1,022.2	1,086.6	0.00	0.00	0.00
7,560.0	90.74	90.00	6,579.0	572.1	1,062.2	1,126.3	0.00	0.00	0.00
7,600.0	90.74	90.00	6,578.5	572.1	1,102.2	1,165.9	0.00	0.00	0.00
7,640.0	90.74	90.00	6,578.0	572.1	1,142.2	1,205.6	0.00	0.00	0.00
7,680.0	90.74	90.00	6,577.5	572.1	1,182.2	1,245.3	0.00	0.00	0.00
7,720.0	90.74	90.00	6,577.0	572.1	1,222.2	1,285.0	0.00	0.00	0.00
7,760.0	90.74	90.00	6,576.4	572.1	1,262.2	1,324.6	0.00	0.00	0.00
7,800.0	90.74	90.00	6,575.9	572.1	1,302.2	1,364.3	0.00	0.00	0.00
7,840.0	90.74	90.00	6,575.4	572.1	1,342.2	1,404.0	0.00	0.00	0.00
7,880.0	90.74	90.00	6,574.9	572.1	1,382.2	1,443.7	0.00	0.00	0.00
7,920.0	90.74	90.00	6,574.4	572.1	1,422.2	1,483.3	0.00	0.00	0.00
7,960.0	90.74	90.00	6,573.9	572.1	1,462.2	1,523.0	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Brown 2E-232
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Project:	SEC.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site:	Brown Pad Sec.2-T6N-R63W	North Reference:	True
Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-29-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,000.0	90.74	90.00	6,573.3	572.1	1,502.2	1,562.7	0.00	0.00	0.00
8,040.0	90.74	90.00	6,572.8	572.1	1,542.2	1,602.4	0.00	0.00	0.00
8,080.0	90.74	90.00	6,572.3	572.2	1,582.2	1,642.0	0.00	0.00	0.00
8,120.0	90.74	90.00	6,571.8	572.2	1,622.2	1,681.7	0.00	0.00	0.00
8,160.0	90.74	90.00	6,571.3	572.2	1,662.2	1,721.4	0.00	0.00	0.00
8,200.0	90.74	90.00	6,570.8	572.2	1,702.2	1,761.0	0.00	0.00	0.00
8,240.0	90.74	90.00	6,570.2	572.2	1,742.2	1,800.7	0.00	0.00	0.00
8,280.0	90.74	90.00	6,569.7	572.2	1,782.2	1,840.4	0.00	0.00	0.00
8,320.0	90.74	90.00	6,569.2	572.2	1,822.2	1,880.1	0.00	0.00	0.00
8,360.0	90.74	90.00	6,568.7	572.2	1,862.2	1,919.7	0.00	0.00	0.00
8,400.0	90.74	90.00	6,568.2	572.2	1,902.1	1,959.4	0.00	0.00	0.00
8,440.0	90.74	90.00	6,567.7	572.2	1,942.1	1,999.1	0.00	0.00	0.00
8,480.0	90.74	90.00	6,567.1	572.2	1,982.1	2,038.8	0.00	0.00	0.00
8,520.0	90.74	90.00	6,566.6	572.2	2,022.1	2,078.4	0.00	0.00	0.00
8,560.0	90.74	90.00	6,566.1	572.2	2,062.1	2,118.1	0.00	0.00	0.00
8,600.0	90.74	90.00	6,565.6	572.2	2,102.1	2,157.8	0.00	0.00	0.00
8,640.0	90.74	90.00	6,565.1	572.2	2,142.1	2,197.5	0.00	0.00	0.00
8,680.0	90.74	90.00	6,564.6	572.2	2,182.1	2,237.1	0.00	0.00	0.00
8,720.0	90.74	90.00	6,564.0	572.2	2,222.1	2,276.8	0.00	0.00	0.00
8,760.0	90.74	90.00	6,563.5	572.2	2,262.1	2,316.5	0.00	0.00	0.00
8,800.0	90.74	90.00	6,563.0	572.2	2,302.1	2,356.1	0.00	0.00	0.00
8,840.0	90.74	90.00	6,562.5	572.2	2,342.1	2,395.8	0.00	0.00	0.00
8,880.0	90.74	90.00	6,562.0	572.2	2,382.1	2,435.5	0.00	0.00	0.00
8,920.0	90.74	90.00	6,561.5	572.2	2,422.1	2,475.2	0.00	0.00	0.00
8,960.0	90.74	90.00	6,560.9	572.2	2,462.1	2,514.8	0.00	0.00	0.00
9,000.0	90.74	90.00	6,560.4	572.2	2,502.1	2,554.5	0.00	0.00	0.00
9,040.0	90.74	90.00	6,559.9	572.2	2,542.1	2,594.2	0.00	0.00	0.00
9,080.0	90.74	90.00	6,559.4	572.2	2,582.1	2,633.9	0.00	0.00	0.00
9,120.0	90.74	90.00	6,558.9	572.2	2,622.1	2,673.5	0.00	0.00	0.00
9,160.0	90.74	90.00	6,558.4	572.2	2,662.1	2,713.2	0.00	0.00	0.00
9,200.0	90.74	90.00	6,557.8	572.2	2,702.1	2,752.9	0.00	0.00	0.00
9,240.0	90.74	90.00	6,557.3	572.2	2,742.1	2,792.5	0.00	0.00	0.00
9,280.0	90.74	90.00	6,556.8	572.3	2,782.1	2,832.2	0.00	0.00	0.00
9,320.0	90.74	90.00	6,556.3	572.3	2,822.1	2,871.9	0.00	0.00	0.00
9,360.0	90.74	90.00	6,555.8	572.3	2,862.1	2,911.6	0.00	0.00	0.00
9,400.0	90.74	90.00	6,555.3	572.3	2,902.1	2,951.2	0.00	0.00	0.00
9,440.0	90.74	90.00	6,554.7	572.3	2,942.1	2,990.9	0.00	0.00	0.00
9,480.0	90.74	90.00	6,554.2	572.3	2,982.1	3,030.6	0.00	0.00	0.00
9,520.0	90.74	90.00	6,553.7	572.3	3,022.1	3,070.3	0.00	0.00	0.00
9,560.0	90.74	90.00	6,553.2	572.3	3,062.1	3,109.9	0.00	0.00	0.00
9,600.0	90.74	90.00	6,552.7	572.3	3,102.0	3,149.6	0.00	0.00	0.00
9,640.0	90.74	90.00	6,552.2	572.3	3,142.0	3,189.3	0.00	0.00	0.00
9,680.0	90.74	90.00	6,551.6	572.3	3,182.0	3,229.0	0.00	0.00	0.00
9,720.0	90.74	90.00	6,551.1	572.3	3,222.0	3,268.6	0.00	0.00	0.00
9,760.0	90.74	90.00	6,550.6	572.3	3,262.0	3,308.3	0.00	0.00	0.00
9,800.0	90.74	90.00	6,550.1	572.3	3,302.0	3,348.0	0.00	0.00	0.00
9,840.0	90.74	90.00	6,549.6	572.3	3,342.0	3,387.6	0.00	0.00	0.00
9,880.0	90.74	90.00	6,549.1	572.3	3,382.0	3,427.3	0.00	0.00	0.00
9,920.0	90.74	90.00	6,548.5	572.3	3,422.0	3,467.0	0.00	0.00	0.00
9,960.0	90.74	90.00	6,548.0	572.3	3,462.0	3,506.7	0.00	0.00	0.00
10,000.0	90.74	90.00	6,547.5	572.3	3,502.0	3,546.3	0.00	0.00	0.00
10,040.0	90.74	90.00	6,547.0	572.3	3,542.0	3,586.0	0.00	0.00	0.00
10,080.0	90.74	90.00	6,546.5	572.3	3,582.0	3,625.7	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Brown 2E-232
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Project:	SEC.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site:	Brown Pad Sec.2-T6N-R63W	North Reference:	True
Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-29-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,120.0	90.74	90.00	6,546.0	572.3	3,622.0	3,665.4	0.00	0.00	0.00
10,160.0	90.74	90.00	6,545.4	572.3	3,662.0	3,705.0	0.00	0.00	0.00
10,200.0	90.74	90.00	6,544.9	572.3	3,702.0	3,744.7	0.00	0.00	0.00
10,240.0	90.74	90.00	6,544.4	572.3	3,742.0	3,784.4	0.00	0.00	0.00
10,280.0	90.74	90.00	6,543.9	572.3	3,782.0	3,824.1	0.00	0.00	0.00
10,320.0	90.74	90.00	6,543.4	572.3	3,822.0	3,863.7	0.00	0.00	0.00
10,360.0	90.74	90.00	6,542.9	572.3	3,862.0	3,903.4	0.00	0.00	0.00
10,400.0	90.74	90.00	6,542.3	572.3	3,902.0	3,943.1	0.00	0.00	0.00
10,440.0	90.74	90.00	6,541.8	572.4	3,942.0	3,982.7	0.00	0.00	0.00
10,480.0	90.74	90.00	6,541.3	572.4	3,982.0	4,022.4	0.00	0.00	0.00
10,520.0	90.74	90.00	6,540.8	572.4	4,022.0	4,062.1	0.00	0.00	0.00
10,560.0	90.74	90.00	6,540.3	572.4	4,062.0	4,101.8	0.00	0.00	0.00
10,600.0	90.74	90.00	6,539.8	572.4	4,102.0	4,141.4	0.00	0.00	0.00
10,640.0	90.74	90.00	6,539.2	572.4	4,142.0	4,181.1	0.00	0.00	0.00
10,680.0	90.74	90.00	6,538.7	572.4	4,182.0	4,220.8	0.00	0.00	0.00
10,720.0	90.74	90.00	6,538.2	572.4	4,222.0	4,260.5	0.00	0.00	0.00
10,760.0	90.74	90.00	6,537.7	572.4	4,262.0	4,300.1	0.00	0.00	0.00
10,800.0	90.74	90.00	6,537.2	572.4	4,301.9	4,339.8	0.00	0.00	0.00
10,840.0	90.74	90.00	6,536.7	572.4	4,341.9	4,379.5	0.00	0.00	0.00
10,880.0	90.74	90.00	6,536.1	572.4	4,381.9	4,419.2	0.00	0.00	0.00
10,920.0	90.74	90.00	6,535.6	572.4	4,421.9	4,458.8	0.00	0.00	0.00
10,960.0	90.74	90.00	6,535.1	572.4	4,461.9	4,498.5	0.00	0.00	0.00
10,968.7	90.74	90.00	6,535.0	572.4	4,470.6	4,507.1	0.00	0.00	0.00
BHL 560'FNL & 500'FEL									

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
HARDLINE BHL 460'	0.00	0.00	1.0	672.4	4,510.6	1,434,750.05	3,306,931.24	40.521544	-104.395946
- plan misses target center by 4560.4ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			1.0	0.0	0.0	1,434,750.05	3,306,931.24		
Point 2			1.0	0.0	-4,300.0	1,434,697.30	3,302,631.71		
Point 3			1.0	0.0	0.0	1,434,750.05	3,306,931.24		
Point 4			1.0	-800.0	0.0	1,433,950.14	3,306,941.05		
HARDLINE SHL 460'f	0.00	0.00	0.0	700.0	210.0	1,434,724.89	3,302,630.77	40.521621	-104.411415
- plan misses target center by 730.8ft at 0.0ft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			0.0	0.0	0.0	1,434,724.89	3,302,630.77		
Point 2			0.0	-800.0	0.0	1,433,924.98	3,302,640.59		
SECTIONLINE 250'W	0.00	0.00	1.0	700.0	-250.0	1,434,719.25	3,302,170.82	40.521621	-104.413069
- plan misses target center by 743.3ft at 1.0ft MD (1.0 TVD, 0.0 N, 0.0 E)									
- Polygon									
Point 1			1.0	0.0	0.0	1,434,719.25	3,302,170.82		
Point 2			1.0	-800.0	0.0	1,433,919.34	3,302,180.64		
BHL 560'FNL & 500'F	0.00	0.00	6,535.0	572.4	4,470.6	1,434,649.57	3,306,892.46	40.521270	-104.396090
- plan hits target center									
- Point									

Database:	Landmark	Local Co-ordinate Reference:	Well Brown 2E-232
Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Project:	SEC.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site:	Brown Pad Sec.2-T6N-R63W	North Reference:	True
Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (5-29-12)		

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,071.6	6,585.3	7"	7	7-1/2

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
200.0	200.0	0.0	0.0	KOP #1
5,861.7	5,821.5	572.0	-200.0	KOP #2
7,071.6	6,585.3	572.1	573.9	End of Build



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.2-T6N-R63W

Brown Pad Sec.2-T6N-R63W

Brown 2E-232

Wellbore #1

Plan #1 (5-29-12)

Anticollision Report

31 May, 2012



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 2E-232
Project:	SEC.2-T6N-R63W	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Reference Site:	Brown Pad Sec.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-29-12)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (5-29-12)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date 5/31/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	10,968.0	Plan #1 (5-29-12) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Brown Pad Sec.2-T6N-R63W						
Brown 11-2 (Exist.) - Wellbore #1 - Design #1	7,084.4	6,580.0	215.1	177.1	5.659	CC, ES
Brown 11-2 (Exist.) - Wellbore #1 - Design #1	7,100.0	6,580.0	215.7	177.3	5.624	SF
Brown 2F-202 - Wellbore #1 - Plan #2 (5-29-12)	200.0	200.0	61.9	61.3	91.850	CC, ES
Brown 2F-202 - Wellbore #1 - Plan #2 (5-29-12)	10,968.7	10,915.9	750.6	496.7	2.956	SF
Brown 2F-412 - Wellbore #1 - Plan #1 (5-29-12)	200.0	200.0	32.8	32.1	48.645	CC, ES
Brown 2F-412 - Wellbore #1 - Plan #1 (5-29-12)	10,968.7	11,084.1	388.9	157.4	1.680	SF

Offset Design Brown Pad Sec.2-T6N-R63W - Brown 11-2 (Exist.) - Wellbore #1 - Design #1													Offset Site Error:	0.0ft
Survey Program: 0-MWD													Offset Well Error:	0.0ft
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	58.67	357.0	586.6	686.7					
100.0	100.0	100.0	100.0	0.1	0.1	58.67	357.0	586.6	686.7	686.5	0.22	3,055.360		
200.0	200.0	200.0	200.0	0.3	0.3	58.67	357.0	586.6	686.7	686.1	0.67	1,018.453		
300.0	300.0	300.0	300.0	0.6	0.6	78.10	357.0	586.6	686.4	685.3	1.12	610.841		
400.0	399.8	399.8	399.8	0.8	0.8	78.54	357.0	586.6	685.3	683.7	1.58	433.813		
500.0	499.5	499.5	499.5	1.0	1.0	79.29	357.0	586.6	683.6	681.6	2.05	332.722		
600.0	598.7	598.7	598.7	1.3	1.2	80.33	357.0	586.6	681.5	678.9	2.56	266.198		
700.0	697.8	697.8	697.8	1.6	1.5	81.45	357.0	586.6	679.3	676.2	3.09	219.884		
800.0	796.8	796.8	796.8	2.0	1.7	82.58	357.0	586.6	677.4	673.8	3.63	186.668		
900.0	895.9	895.9	895.9	2.3	1.9	83.71	357.0	586.6	675.7	671.6	4.17	161.879		
1,000.0	995.0	995.0	995.0	2.6	2.1	84.85	357.0	586.6	674.4	669.6	4.72	142.762		
1,100.0	1,094.0	1,094.0	1,094.0	2.9	2.3	86.00	357.0	586.6	673.3	668.0	5.28	127.619		
1,200.0	1,193.1	1,193.1	1,193.1	3.3	2.6	87.14	357.0	586.6	672.5	666.6	5.83	115.360		
1,300.0	1,292.2	1,292.2	1,292.2	3.6	2.8	88.29	357.0	586.6	671.9	665.5	6.38	105.254		
1,400.0	1,391.2	1,391.2	1,391.2	3.9	3.0	89.44	357.0	586.6	671.6	664.7	6.94	96.797		
1,448.4	1,439.2	1,439.2	1,439.2	4.1	3.1	90.00	357.0	586.6	671.6	664.4	7.21	93.182		
1,500.0	1,490.3	1,490.3	1,490.3	4.3	3.2	90.59	357.0	586.6	671.6	664.1	7.49	89.629		
1,600.0	1,589.4	1,589.4	1,589.4	4.6	3.5	91.74	357.0	586.6	671.9	663.9	8.05	83.486		
1,700.0	1,688.5	1,688.5	1,688.5	4.9	3.7	92.89	357.0	586.6	672.5	663.9	8.60	78.173		
1,800.0	1,787.5	1,787.5	1,787.5	5.3	3.9	94.04	357.0	586.6	673.3	664.1	9.16	73.540		
1,900.0	1,886.6	1,886.6	1,886.6	5.6	4.1	95.18	357.0	586.6	674.4	664.7	9.71	69.471		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 2E-232
Project:	SEC.2-T6N-R63W	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Reference Site:	Brown Pad Sec.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-29-12)	Offset TVD Reference:	Offset Datum

Offset Design Brown Pad Sec.2-T6N-R63W - Brown 11-2 (Exist.) - Wellbore #1 - Design #1													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
2,000.0	1,985.7	1,985.7	1,985.7	5.9	4.4	96.32		357.0	586.6	675.8	665.5	10.26	65.875	
2,100.0	2,084.7	2,084.7	2,084.7	6.3	4.6	97.46		357.0	586.6	677.4	666.6	10.81	62.680	
2,200.0	2,183.8	2,183.8	2,183.8	6.6	4.8	98.59		357.0	586.6	679.4	668.0	11.36	59.826	
2,300.0	2,282.9	2,282.9	2,282.9	6.9	5.0	99.71		357.0	586.6	681.5	669.6	11.90	57.266	
2,400.0	2,381.9	2,381.9	2,381.9	7.3	5.2	100.82		357.0	586.6	684.0	671.5	12.45	54.960	
2,500.0	2,481.0	2,481.0	2,481.0	7.6	5.5	101.93		357.0	586.6	686.7	673.7	12.99	52.877	
2,600.0	2,580.1	2,580.1	2,580.1	7.9	5.7	103.03		357.0	586.6	689.7	676.1	13.53	50.988	
2,700.0	2,679.1	2,679.1	2,679.1	8.3	5.9	104.11		357.0	586.6	692.9	678.8	14.06	49.270	
2,800.0	2,778.2	2,778.2	2,778.2	8.6	6.1	105.19		357.0	586.6	696.4	681.8	14.60	47.704	
2,900.0	2,877.3	2,877.3	2,877.3	9.0	6.4	106.26		357.0	586.6	700.1	685.0	15.13	46.273	
3,000.0	2,976.3	2,976.3	2,976.3	9.3	6.6	107.31		357.0	586.6	704.1	688.4	15.66	44.962	
3,100.0	3,075.4	3,075.4	3,075.4	9.6	6.8	108.35		357.0	586.6	708.3	692.1	16.19	43.759	
3,200.0	3,174.5	3,174.5	3,174.5	10.0	7.0	109.39		357.0	586.6	712.7	696.0	16.71	42.653	
3,300.0	3,273.5	3,273.5	3,273.5	10.3	7.2	110.40		357.0	586.6	717.4	700.1	17.23	41.634	
3,400.0	3,372.6	3,372.6	3,372.6	10.6	7.5	111.41		357.0	586.6	722.3	704.5	17.75	40.693	
3,500.0	3,471.7	3,471.7	3,471.7	11.0	7.7	112.40		357.0	586.6	727.4	709.1	18.27	39.825	
3,600.0	3,570.8	3,570.8	3,570.8	11.3	7.9	113.38		357.0	586.6	732.7	714.0	18.78	39.021	
3,700.0	3,669.8	3,669.8	3,669.8	11.6	8.1	114.34		357.0	586.6	738.3	719.0	19.29	38.276	
3,800.0	3,768.9	3,768.9	3,768.9	12.0	8.4	115.29		357.0	586.6	744.0	724.3	19.80	37.585	
3,900.0	3,868.0	3,868.0	3,868.0	12.3	8.6	116.22		357.0	586.6	750.0	729.7	20.30	36.944	
4,000.0	3,967.0	3,967.0	3,967.0	12.6	8.8	117.14		357.0	586.6	756.2	735.4	20.80	36.348	
4,100.0	4,066.1	4,066.1	4,066.1	13.0	9.0	118.04		357.0	586.6	762.5	741.2	21.30	35.793	
4,200.0	4,165.2	4,165.2	4,165.2	13.3	9.2	118.93		357.0	586.6	769.1	747.3	21.80	35.277	
4,300.0	4,264.2	4,264.2	4,264.2	13.7	9.5	119.81		357.0	586.6	775.8	753.5	22.30	34.795	
4,400.0	4,363.3	4,363.3	4,363.3	14.0	9.7	120.67		357.0	586.6	782.7	759.9	22.79	34.346	
4,500.0	4,462.4	4,462.4	4,462.4	14.3	9.9	121.51		357.0	586.6	789.8	766.5	23.28	33.927	
4,600.0	4,561.4	4,561.4	4,561.4	14.7	10.1	122.34		357.0	586.6	797.0	773.3	23.77	33.535	
4,700.0	4,660.6	4,660.6	4,660.6	15.0	10.4	123.19		357.0	586.6	804.2	780.0	24.24	33.180	
4,800.0	4,760.0	4,760.0	4,760.0	15.2	10.6	123.88		357.0	586.6	809.8	785.2	24.65	32.856	
4,900.0	4,859.8	4,859.8	4,859.8	15.4	10.8	124.33		357.0	586.6	813.5	788.5	25.04	32.495	
5,000.0	4,959.8	4,959.8	4,959.8	15.6	11.0	124.54		357.0	586.6	815.3	789.9	25.40	32.094	
5,100.0	5,059.8	5,059.8	5,059.8	15.7	11.3	105.28		357.0	586.6	815.5	790.9	24.54	33.235	
5,200.0	5,159.8	5,159.8	5,159.8	15.9	11.5	105.28		357.0	586.6	815.5	790.5	24.95	32.688	
5,300.0	5,259.8	5,259.8	5,259.8	16.0	11.7	105.28		357.0	586.6	815.5	790.1	25.36	32.157	
5,400.0	5,359.8	5,359.8	5,359.8	16.2	11.9	105.28		357.0	586.6	815.5	789.7	25.77	31.642	
5,500.0	5,459.8	5,459.8	5,459.8	16.3	12.2	105.28		357.0	586.6	815.5	789.3	26.19	31.141	
5,600.0	5,559.8	5,559.8	5,559.8	16.5	12.4	105.28		357.0	586.6	815.5	788.9	26.60	30.656	
5,700.0	5,659.8	5,659.8	5,659.8	16.6	12.6	105.28		357.0	586.6	815.5	788.5	27.02	30.183	
5,800.0	5,759.8	5,759.8	5,759.8	16.8	12.8	105.28		357.0	586.6	815.5	788.0	27.43	29.725	
5,900.0	5,859.7	5,859.7	5,859.7	17.0	13.1	15.32		357.0	586.6	814.5	785.7	28.87	28.215	
6,000.0	5,959.0	5,959.0	5,959.0	17.1	13.3	15.77		357.0	586.6	803.4	774.6	28.81	27.885	
6,100.0	6,055.9	6,055.9	6,055.9	17.2	13.5	16.77		357.0	586.6	780.0	751.6	28.35	27.510	
6,200.0	6,148.8	6,148.8	6,148.8	17.2	13.7	18.46		357.0	586.6	744.6	717.1	27.53	27.049	
6,300.0	6,236.1	6,236.1	6,236.1	17.2	13.9	21.08		357.0	586.6	698.2	671.8	26.44	26.409	
6,400.0	6,316.3	6,316.3	6,316.3	17.3	14.1	25.02		357.0	586.6	641.8	616.5	25.28	25.386	
6,500.0	6,388.0	6,388.0	6,388.0	17.3	14.2	30.92		357.0	586.6	576.7	552.2	24.47	23.569	
6,600.0	6,450.1	6,450.1	6,450.1	17.5	14.4	39.64		357.0	586.6	504.8	480.1	24.74	20.407	
6,700.0	6,501.4	6,501.4	6,501.4	17.9	14.5	51.81		357.0	586.6	428.8	401.9	26.87	15.959	
6,800.0	6,541.0	6,541.0	6,541.0	18.9	14.6	66.43		357.0	586.6	352.5	322.0	30.47	11.567	
6,900.0	6,568.3	6,568.3	6,568.3	20.4	14.7	79.86		357.0	586.6	282.5	248.6	33.85	8.345	
7,000.0	6,582.9	6,580.0	6,580.0	22.2	14.7	87.42		357.0	586.6	231.0	194.7	36.27	6.369	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 2E-232
Project:	SEC.2-T6N-R63W	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Reference Site:	Brown Pad Sec.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-29-12)	Offset TVD Reference:	Offset Datum

Offset Design Brown Pad Sec.2-T6N-R63W - Brown 11-2 (Exist.) - Wellbore #1 - Design #1												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
Reference	Offset	Reference	Offset	Reference	Offset		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
7,084.4	6,586.4	6,580.0	6,580.0	23.9	14.7	88.30	357.0	586.6	215.1	177.1	38.01	5.659	CC, ES
7,100.0	6,585.0	6,580.0	6,580.0	24.2	14.7	88.62	357.0	586.6	215.7	177.3	38.34	5.624	SF
7,200.0	6,583.7	6,580.0	6,580.0	26.4	14.7	88.62	357.0	586.6	244.2	203.7	40.52	6.027	
7,300.0	6,582.4	6,580.0	6,580.0	28.6	14.7	88.62	357.0	586.6	304.5	261.7	42.80	7.115	
7,400.0	6,581.1	6,580.0	6,580.0	31.0	14.7	88.62	357.0	586.6	381.9	336.7	45.17	8.455	
7,500.0	6,579.8	6,579.8	6,579.8	33.4	14.7	88.57	357.0	586.6	467.9	420.3	47.61	9.829	
7,600.0	6,578.5	6,578.5	6,578.5	35.9	14.7	88.23	357.0	586.6	558.6	508.6	50.08	11.154	
7,700.0	6,577.2	6,577.2	6,577.2	38.4	14.7	87.88	357.0	586.6	652.1	599.5	52.60	12.397	
7,800.0	6,575.9	6,575.9	6,575.9	40.9	14.7	87.54	357.0	586.6	747.2	692.0	55.15	13.548	
7,900.0	6,574.6	6,574.6	6,574.6	43.5	14.7	87.20	357.0	586.6	843.4	785.7	57.73	14.611	
8,000.0	6,573.3	6,573.3	6,573.3	46.1	14.7	86.85	357.0	586.6	940.5	880.2	60.32	15.591	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 2E-232
Project:	SEC.2-T6N-R63W	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Reference Site:	Brown Pad Sec.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-29-12)	Offset TVD Reference:	Offset Datum

Offset Design Brown Pad Sec.2-T6N-R63W - Brown 2F-202 - Wellbore #1 - Plan #2 (5-29-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.0	0.0	-180.00	-61.9	0.0	61.9					
100.0	100.0	100.0	100.0	0.1	0.1	-180.00	-61.9	0.0	61.9	61.7	0.22	275.550		
200.0	200.0	200.0	200.0	0.3	0.3	-180.00	-61.9	0.0	61.9	61.3	0.67	91.850 CC, ES		
300.0	300.0	300.0	300.0	0.6	0.6	-161.24	-61.9	0.0	63.6	62.5	1.13	56.239		
400.0	399.8	399.8	399.8	0.8	0.8	-162.61	-61.9	0.0	68.6	67.0	1.59	43.069		
500.0	499.5	499.5	499.5	1.0	1.0	-164.51	-61.9	0.0	76.9	74.9	2.05	37.433		
600.0	598.7	598.7	598.7	1.3	1.2	-166.56	-61.9	0.0	88.7	86.2	2.52	35.226		
700.0	697.8	697.8	697.8	1.6	1.5	-168.34	-61.9	0.0	102.0	99.0	2.97	34.314		
800.0	796.8	796.8	796.8	2.0	1.7	-169.70	-61.9	0.0	115.4	112.0	3.43	33.639		
900.0	895.9	895.9	895.9	2.3	1.9	-170.78	-61.9	0.0	128.8	124.9	3.89	33.122		
1,000.0	995.0	995.0	995.0	2.6	2.1	-171.66	-61.9	0.0	142.3	137.9	4.35	32.713		
1,100.0	1,094.0	1,094.0	1,094.0	2.9	2.3	-172.39	-61.9	0.0	155.8	151.0	4.81	32.382		
1,200.0	1,193.1	1,193.1	1,193.1	3.3	2.6	-173.00	-61.9	0.0	169.3	164.0	5.27	32.109		
1,300.0	1,292.2	1,292.2	1,292.2	3.6	2.8	-173.52	-61.9	0.0	182.8	177.1	5.73	31.880		
1,400.0	1,391.2	1,391.2	1,391.2	3.9	3.0	-173.97	-61.9	0.0	196.3	190.1	6.20	31.685		
1,500.0	1,490.3	1,490.3	1,490.3	4.3	3.2	-174.36	-61.9	0.0	209.9	203.2	6.66	31.516		
1,600.0	1,589.4	1,589.4	1,589.4	4.6	3.5	-174.70	-61.9	0.0	223.5	216.3	7.12	31.370		
1,700.0	1,688.5	1,688.5	1,688.5	4.9	3.7	-175.01	-61.9	0.0	237.0	229.4	7.59	31.242		
1,800.0	1,787.5	1,787.5	1,787.5	5.3	3.9	-175.28	-61.9	0.0	250.6	242.5	8.05	31.128		
1,900.0	1,886.6	1,886.6	1,886.6	5.6	4.1	-175.52	-61.9	0.0	264.2	255.7	8.51	31.026		
2,000.0	1,985.7	1,985.7	1,985.7	5.9	4.4	-175.74	-61.9	0.0	277.7	268.8	8.98	30.935		
2,100.0	2,084.7	2,084.7	2,084.7	6.3	4.6	-175.94	-61.9	0.0	291.3	281.9	9.44	30.853		
2,200.0	2,183.8	2,183.8	2,183.8	6.6	4.8	-176.12	-61.9	0.0	304.9	295.0	9.91	30.778		
2,300.0	2,282.9	2,282.9	2,282.9	6.9	5.0	-176.29	-61.9	0.0	318.5	308.1	10.37	30.710		
2,400.0	2,381.9	2,381.9	2,381.9	7.3	5.2	-176.44	-61.9	0.0	332.1	321.3	10.84	30.648		
2,500.0	2,481.0	2,481.0	2,481.0	7.6	5.5	-176.58	-61.9	0.0	345.7	334.4	11.30	30.591		
2,600.0	2,580.1	2,580.1	2,580.1	7.9	5.7	-176.71	-61.9	0.0	359.3	347.5	11.77	30.538		
2,700.0	2,679.1	2,679.1	2,679.1	8.3	5.9	-176.83	-61.9	0.0	372.9	360.7	12.23	30.489		
2,800.0	2,778.2	2,778.2	2,778.2	8.6	6.1	-176.94	-61.9	0.0	386.5	373.8	12.69	30.444		
2,900.0	2,877.3	2,880.4	2,880.4	9.0	6.4	-176.89	-61.9	-1.1	399.8	386.6	13.16	30.386		
3,000.0	2,976.3	2,983.6	2,983.5	9.3	6.6	-176.36	-61.9	-5.9	412.1	398.5	13.61	30.274		
3,100.0	3,075.4	3,086.7	3,086.2	9.6	6.8	-175.37	-61.9	-14.3	423.6	409.5	14.08	30.087		
3,200.0	3,174.5	3,186.2	3,185.2	10.0	7.0	-174.18	-61.9	-24.7	434.6	420.0	14.55	29.870		
3,300.0	3,273.5	3,285.2	3,283.6	10.3	7.2	-173.05	-61.9	-35.1	445.8	430.8	15.03	29.662		
3,400.0	3,372.6	3,384.2	3,382.1	10.6	7.4	-171.98	-61.9	-45.5	457.2	441.6	15.52	29.462		
3,500.0	3,471.7	3,483.2	3,480.5	11.0	7.7	-170.96	-61.9	-55.8	468.7	452.7	16.01	29.271		
3,600.0	3,570.8	3,582.2	3,579.0	11.3	7.9	-169.99	-61.9	-66.2	480.3	463.8	16.51	29.088		
3,700.0	3,669.8	3,681.1	3,677.4	11.6	8.1	-169.06	-61.9	-76.6	492.1	475.1	17.02	28.912		
3,800.0	3,768.9	3,780.1	3,775.9	12.0	8.4	-168.18	-61.9	-86.9	504.0	486.5	17.53	28.745		
3,900.0	3,868.0	3,879.1	3,874.3	12.3	8.6	-167.34	-61.9	-97.3	516.0	498.0	18.05	28.585		
4,000.0	3,967.0	3,978.1	3,972.8	12.6	8.9	-166.53	-61.9	-107.7	528.2	509.6	18.58	28.433		
4,100.0	4,066.1	4,077.1	4,071.2	13.0	9.1	-165.77	-61.9	-118.0	540.4	521.3	19.10	28.287		
4,200.0	4,165.2	4,176.1	4,169.7	13.3	9.4	-165.03	-61.9	-128.4	552.7	533.1	19.63	28.149		
4,300.0	4,264.2	4,275.1	4,268.1	13.7	9.6	-164.33	-61.9	-138.8	565.1	544.9	20.17	28.017		
4,400.0	4,363.3	4,374.1	4,366.6	14.0	9.9	-163.66	-61.9	-149.1	577.6	556.9	20.71	27.891		
4,500.0	4,462.4	4,473.1	4,465.0	14.3	10.2	-163.02	-61.9	-159.5	590.1	568.9	21.25	27.772		
4,600.0	4,561.4	4,572.1	4,563.5	14.7	10.4	-162.40	-61.9	-169.9	602.8	581.0	21.79	27.657		
4,700.0	4,660.6	4,671.1	4,661.9	15.0	10.7	-161.83	-61.9	-180.2	615.0	592.7	22.34	27.530		
4,800.0	4,760.0	4,770.3	4,760.6	15.2	10.9	-161.28	-61.9	-190.0	624.5	601.6	22.82	27.367		
4,900.0	4,859.8	4,869.8	4,859.9	15.4	11.2	-160.92	-61.9	-196.6	630.7	607.5	23.22	27.161		
5,000.0	4,959.8	4,969.7	4,959.8	15.6	11.3	-160.74	-61.9	-199.7	633.7	610.1	23.56	26.896		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 2E-232
Project:	SEC.2-T6N-R63W	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Reference Site:	Brown Pad Sec.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-29-12)	Offset TVD Reference:	Offset Datum

Offset Design Brown Pad Sec.2-T6N-R63W - Brown 2F-202 - Wellbore #1 - Plan #2 (5-29-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,059.8	5,069.7	5,059.8	15.7	11.5	180.00		-61.9	-200.0	633.9	607.7	26.19	24.205	
5,200.0	5,159.8	5,169.7	5,159.8	15.9	11.7	180.00		-61.9	-200.0	633.9	607.4	26.56	23.868	
5,300.0	5,259.8	5,269.7	5,259.8	16.0	11.9	180.00		-61.9	-200.0	633.9	607.0	26.94	23.534	
5,400.0	5,359.8	5,369.7	5,359.8	16.2	12.2	180.00		-61.9	-200.0	633.9	606.6	27.32	23.208	
5,500.0	5,459.8	5,469.7	5,459.8	16.3	12.4	180.00		-61.9	-200.0	633.9	606.2	27.70	22.889	
5,600.0	5,559.8	5,569.7	5,559.8	16.5	12.6	180.00		-61.9	-200.0	633.9	605.9	28.08	22.577	
5,700.0	5,659.8	5,669.7	5,659.8	16.6	12.8	180.00		-61.9	-200.0	633.9	605.5	28.46	22.273	
5,800.0	5,759.8	5,769.7	5,759.8	16.8	13.0	180.00		-61.9	-200.0	633.9	605.1	28.85	21.975	
5,835.5	5,795.3	5,805.2	5,795.3	16.9	13.1	90.03		-61.9	-200.0	633.9	607.0	26.93	23.542	
5,900.0	5,859.7	5,868.8	5,858.9	17.0	13.2	89.98		-62.0	-198.8	634.0	606.8	27.17	23.331	
6,000.0	5,959.0	5,966.7	5,956.0	17.1	13.3	89.92		-62.3	-187.1	634.3	606.8	27.45	23.107	
6,100.0	6,055.9	6,064.6	6,050.8	17.2	13.5	89.86		-62.9	-163.1	634.9	607.2	27.67	22.947	
6,200.0	6,148.8	6,162.5	6,141.8	17.2	13.6	89.81		-63.7	-127.2	635.8	607.9	27.88	22.802	
6,300.0	6,236.1	6,260.4	6,227.4	17.2	13.7	89.76		-64.9	-80.0	637.0	608.8	28.19	22.598	
6,400.0	6,316.3	6,358.3	6,306.4	17.3	14.0	89.71		-66.4	-22.1	638.5	609.8	28.71	22.238	
6,500.0	6,388.0	6,456.4	6,377.4	17.3	14.5	89.66		-68.1	45.4	640.2	610.6	29.60	21.627	
6,600.0	6,450.1	6,554.6	6,439.2	17.5	15.2	89.63		-70.0	121.6	642.1	611.1	31.01	20.710	
6,700.0	6,501.4	6,652.9	6,490.8	17.9	16.2	89.59		-72.0	205.2	644.2	611.2	33.03	19.506	
6,800.0	6,541.0	6,751.5	6,531.4	18.9	17.5	89.57		-74.3	294.9	646.5	610.8	35.70	18.111	
6,900.0	6,568.3	6,850.0	6,560.0	20.4	19.2	89.55		-76.6	389.0	648.9	609.9	38.96	16.657	
7,000.0	6,582.9	6,949.2	6,576.4	22.2	21.0	89.54		-79.1	486.8	651.3	608.6	42.71	15.252	
7,100.0	6,585.0	7,048.5	6,580.0	24.2	23.1	89.55		-81.5	585.9	653.8	607.0	46.79	13.973	
7,200.0	6,583.7	7,148.4	6,578.8	26.4	25.3	89.55		-84.0	685.8	656.3	605.2	51.17	12.827	
7,300.0	6,582.4	7,248.4	6,577.5	28.6	27.6	89.55		-86.5	785.8	658.8	603.1	55.76	11.816	
7,400.0	6,581.1	7,348.4	6,576.2	31.0	30.0	89.56		-89.0	885.7	661.3	600.8	60.52	10.927	
7,500.0	6,579.8	7,448.4	6,574.9	33.4	32.5	89.56		-91.5	985.6	663.8	598.4	65.42	10.147	
7,600.0	6,578.5	7,548.3	6,573.6	35.9	35.0	89.56		-94.0	1,085.5	666.3	595.9	70.43	9.461	
7,700.0	6,577.2	7,648.3	6,572.3	38.4	37.5	89.56		-96.5	1,185.5	668.8	593.3	75.52	8.856	
7,800.0	6,575.9	7,748.3	6,571.0	40.9	40.1	89.56		-99.0	1,285.4	671.3	590.6	80.69	8.320	
7,900.0	6,574.6	7,848.2	6,569.7	43.5	42.7	89.56		-101.5	1,385.3	673.8	587.9	85.91	7.843	
8,000.0	6,573.3	7,948.2	6,568.4	46.1	45.4	89.57		-104.0	1,485.3	676.3	585.1	91.18	7.417	
8,100.0	6,572.0	8,048.2	6,567.1	48.8	48.0	89.57		-106.4	1,585.2	678.8	582.3	96.49	7.035	
8,200.0	6,570.8	8,148.1	6,565.8	51.4	50.7	89.57		-108.9	1,685.1	681.3	579.5	101.83	6.691	
8,300.0	6,569.5	8,248.1	6,564.6	54.1	53.4	89.57		-111.4	1,785.0	683.8	576.6	107.20	6.379	
8,400.0	6,568.2	8,348.1	6,563.3	56.8	56.1	89.57		-113.9	1,885.0	686.3	573.7	112.60	6.095	
8,500.0	6,566.9	8,448.0	6,562.0	59.5	58.8	89.57		-116.4	1,984.9	688.8	570.8	118.02	5.837	
8,600.0	6,565.6	8,548.0	6,560.7	62.2	61.6	89.57		-118.9	2,084.8	691.3	567.9	123.45	5.600	
8,700.0	6,564.3	8,648.0	6,559.4	64.9	64.3	89.58		-121.4	2,184.8	693.8	564.9	128.90	5.383	
8,800.0	6,563.0	8,747.9	6,558.1	67.6	67.0	89.58		-123.9	2,284.7	696.3	562.0	134.37	5.182	
8,900.0	6,561.7	8,847.9	6,556.8	70.3	69.8	89.58		-126.4	2,384.6	698.8	559.0	139.85	4.997	
9,000.0	6,560.4	8,947.9	6,555.5	73.1	72.5	89.58		-128.9	2,484.6	701.3	556.0	145.33	4.826	
9,100.0	6,559.1	9,047.9	6,554.2	75.8	75.3	89.58		-131.4	2,584.5	703.8	553.0	150.83	4.666	
9,200.0	6,557.8	9,147.8	6,552.9	78.5	78.0	89.58		-133.8	2,684.4	706.3	550.0	156.34	4.518	
9,300.0	6,556.6	9,247.8	6,551.6	81.3	80.8	89.58		-136.3	2,784.3	708.8	547.0	161.85	4.379	
9,400.0	6,555.3	9,347.8	6,550.4	84.0	83.6	89.59		-138.8	2,884.3	711.3	544.0	167.38	4.250	
9,500.0	6,554.0	9,447.7	6,549.1	86.8	86.3	89.59		-141.3	2,984.2	713.8	540.9	172.91	4.128	
9,600.0	6,552.7	9,547.7	6,547.8	89.6	89.1	89.59		-143.8	3,084.1	716.3	537.9	178.44	4.014	
9,700.0	6,551.4	9,647.7	6,546.5	92.3	91.9	89.59		-146.3	3,184.1	718.8	534.9	183.98	3.907	
9,800.0	6,550.1	9,747.6	6,545.2	95.1	94.6	89.59		-148.8	3,284.0	721.3	531.8	189.52	3.806	
9,900.0	6,548.8	9,847.6	6,543.9	97.9	97.4	89.59		-151.3	3,383.9	723.8	528.8	195.07	3.711	
10,000.0	6,547.5	9,947.6	6,542.6	100.6	100.2	89.59		-153.8	3,483.8	726.3	525.7	200.62	3.620	

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 2E-232
Project:	SEC.2-T6N-R63W	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Reference Site:	Brown Pad Sec.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-29-12)	Offset TVD Reference:	Offset Datum

Offset Design Brown Pad Sec.2-T6N-R63W - Brown 2F-202 - Wellbore #1 - Plan #2 (5-29-12)												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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,100.0	6,546.2	10,047.5	6,541.3	103.4	103.0	89.60	-156.3	3,583.8	728.8	522.7	206.18	3.535	
10,200.0	6,544.9	10,147.5	6,540.0	106.2	105.8	89.60	-158.8	3,683.7	731.3	519.6	211.74	3.454	
10,300.0	6,543.6	10,247.5	6,538.7	108.9	108.6	89.60	-161.3	3,783.6	733.8	516.5	217.30	3.377	
10,400.0	6,542.3	10,347.4	6,537.4	111.7	111.3	89.60	-163.7	3,883.6	736.3	513.5	222.87	3.304	
10,500.0	6,541.1	10,447.4	6,536.2	114.5	114.1	89.60	-166.2	3,983.5	738.8	510.4	228.44	3.234	
10,600.0	6,539.8	10,547.4	6,534.9	117.3	116.9	89.60	-168.7	4,083.4	741.3	507.3	234.01	3.168	
10,700.0	6,538.5	10,647.4	6,533.6	120.1	119.7	89.60	-171.2	4,183.4	743.8	504.3	239.58	3.105	
10,800.0	6,537.2	10,747.3	6,532.3	122.8	122.5	89.61	-173.7	4,283.3	746.3	501.2	245.16	3.044	
10,900.0	6,535.9	10,847.3	6,531.0	125.6	125.3	89.61	-176.2	4,383.2	748.8	498.1	250.74	2.987	
10,968.7	6,535.0	10,915.9	6,530.1	126.9	127.2	89.61	-177.9	4,451.8	750.6	496.7	253.89	2.956 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 2E-232
Project:	SEC.2-T6N-R63W	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Reference Site:	Brown Pad Sec.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-29-12)	Offset TVD Reference:	Offset Datum

Offset Design Brown Pad Sec.2-T6N-R63W - Brown 2F-412 - Wellbore #1 - Plan #1 (5-29-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
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	-180.00	-32.8	0.0	32.8					
100.0	100.0	100.0	100.0	0.1	0.1	-180.00	-32.8	0.0	32.8	32.6	0.22	145.934		
200.0	200.0	200.0	200.0	0.3	0.3	-180.00	-32.8	0.0	32.8	32.1	0.67	48.645 CC, ES		
300.0	300.0	300.0	300.0	0.6	0.6	-161.68	-32.8	0.0	34.5	33.3	1.13	30.472		
400.0	399.8	399.8	399.8	0.8	0.8	-164.04	-32.8	0.0	39.5	37.9	1.59	24.784		
500.0	499.5	499.5	499.5	1.0	1.0	-166.87	-32.8	0.0	47.9	45.8	2.05	23.310		
600.0	598.7	598.7	598.7	1.3	1.2	-169.48	-32.8	0.0	59.8	57.3	2.52	23.765		
700.0	697.8	697.8	697.8	1.6	1.5	-171.42	-32.8	0.0	73.3	70.3	2.97	24.666		
800.0	796.8	796.8	796.8	2.0	1.7	-172.76	-32.8	0.0	86.7	83.3	3.43	25.322		
900.0	895.9	899.0	899.0	2.3	1.9	-173.35	-31.5	-1.1	98.8	94.9	3.88	25.431		
1,000.0	995.0	1,002.0	1,001.8	2.6	2.1	-172.98	-27.2	-4.4	107.6	103.2	4.35	24.754		
1,100.0	1,094.0	1,105.4	1,104.8	2.9	2.4	-171.83	-20.0	-10.0	113.2	108.4	4.82	23.469		
1,200.0	1,193.1	1,208.7	1,207.3	3.3	2.6	-169.93	-9.9	-18.0	115.7	110.4	5.32	21.752		
1,300.0	1,292.2	1,308.6	1,306.2	3.6	2.9	-167.79	1.1	-26.6	116.9	111.1	5.82	20.083		
1,400.0	1,391.2	1,408.5	1,405.1	3.9	3.2	-165.70	12.0	-35.2	118.3	112.0	6.34	18.661		
1,500.0	1,490.3	1,508.4	1,504.0	4.3	3.5	-163.66	23.0	-43.8	119.9	113.0	6.88	17.441		
1,600.0	1,589.4	1,608.3	1,603.0	4.6	3.8	-161.68	34.0	-52.4	121.6	114.2	7.42	16.386		
1,700.0	1,688.5	1,708.1	1,701.9	4.9	4.1	-159.75	45.0	-61.0	123.5	115.5	7.98	15.468		
1,800.0	1,787.5	1,808.0	1,800.8	5.3	4.4	-157.88	55.9	-69.6	125.5	116.9	8.56	14.664		
1,900.0	1,886.6	1,907.9	1,899.7	5.6	4.8	-156.07	66.9	-78.2	127.6	118.5	9.14	13.956		
2,000.0	1,985.7	2,007.8	1,998.6	5.9	5.1	-154.33	77.9	-86.8	129.9	120.1	9.74	13.330		
2,100.0	2,084.7	2,107.7	2,097.5	6.3	5.4	-152.64	88.9	-95.4	132.2	121.9	10.35	12.775		
2,200.0	2,183.8	2,207.6	2,196.5	6.6	5.7	-151.02	99.9	-104.0	134.7	123.7	10.97	12.280		
2,300.0	2,282.9	2,307.5	2,295.4	6.9	6.1	-149.45	110.8	-112.7	137.3	125.7	11.60	11.837		
2,400.0	2,381.9	2,407.4	2,394.3	7.3	6.4	-147.94	121.8	-121.3	140.0	127.7	12.23	11.441		
2,500.0	2,481.0	2,507.3	2,493.2	7.6	6.7	-146.49	132.8	-129.9	142.7	129.9	12.88	11.084		
2,600.0	2,580.1	2,607.2	2,592.1	7.9	7.1	-145.10	143.8	-138.5	145.6	132.1	13.53	10.762		
2,700.0	2,679.1	2,707.1	2,691.1	8.3	7.4	-143.76	154.7	-147.1	148.5	134.4	14.19	10.471		
2,800.0	2,778.2	2,807.0	2,790.0	8.6	7.7	-142.47	165.7	-155.7	151.6	136.7	14.85	10.208		
2,900.0	2,877.3	2,906.9	2,888.9	9.0	8.1	-141.24	176.7	-164.3	154.7	139.1	15.52	9.968		
3,000.0	2,976.3	3,006.8	2,987.8	9.3	8.4	-140.05	187.7	-172.9	157.8	141.6	16.19	9.750		
3,100.0	3,075.4	3,106.7	3,086.7	9.6	8.7	-138.91	198.6	-181.5	161.1	144.2	16.86	9.551		
3,200.0	3,174.5	3,204.2	3,183.5	10.0	9.0	-138.22	208.4	-189.2	165.0	147.5	17.46	9.446		
3,300.0	3,273.5	3,300.0	3,278.8	10.3	9.2	-138.51	215.5	-194.7	170.5	152.6	17.94	9.508		
3,400.0	3,372.6	3,398.0	3,376.6	10.6	9.4	-139.72	220.1	-198.4	177.8	159.5	18.33	9.704		
3,500.0	3,471.7	3,494.1	3,472.7	11.0	9.6	-141.66	222.1	-199.9	187.0	168.4	18.63	10.037		
3,600.0	3,570.8	3,592.2	3,570.8	11.3	9.7	-144.04	222.2	-200.0	197.8	178.9	18.90	10.467		
3,700.0	3,669.8	3,691.2	3,669.8	11.6	9.9	-146.23	222.2	-200.0	209.1	189.9	19.20	10.888		
3,800.0	3,768.9	3,790.3	3,768.9	12.0	10.1	-148.19	222.2	-200.0	220.5	201.0	19.51	11.301		
3,900.0	3,868.0	3,889.4	3,868.0	12.3	10.3	-149.96	222.2	-200.0	232.3	212.4	19.84	11.705		
4,000.0	3,967.0	3,988.5	3,967.0	12.6	10.4	-151.56	222.2	-200.0	244.2	224.0	20.18	12.098		
4,100.0	4,066.1	4,087.5	4,066.1	13.0	10.6	-153.00	222.2	-200.0	256.2	235.7	20.53	12.480		
4,200.0	4,165.2	4,186.6	4,165.2	13.3	10.8	-154.32	222.2	-200.0	268.5	247.6	20.89	12.850		
4,300.0	4,264.2	4,285.7	4,264.2	13.7	11.0	-155.52	222.2	-200.0	280.8	259.6	21.26	13.208		
4,400.0	4,363.3	4,384.7	4,363.3	14.0	11.2	-156.62	222.2	-200.0	293.3	271.7	21.64	13.553		
4,500.0	4,462.4	4,483.8	4,462.4	14.3	11.4	-157.63	222.2	-200.0	305.9	283.8	22.02	13.887		
4,600.0	4,561.4	4,582.9	4,561.4	14.7	11.6	-158.57	222.2	-200.0	318.5	296.1	22.42	14.209		
4,700.0	4,660.6	4,682.0	4,660.6	15.0	11.7	-159.44	222.2	-200.0	330.8	308.0	22.80	14.507		
4,800.0	4,760.0	4,781.5	4,760.0	15.2	11.9	-160.10	222.2	-200.0	340.3	317.2	23.15	14.701		
4,900.0	4,859.8	4,881.2	4,859.8	15.4	12.1	-160.52	222.2	-200.0	346.6	323.1	23.48	14.758		
5,000.0	4,959.8	4,981.2	4,959.8	15.6	12.3	-160.71	222.2	-200.0	349.5	325.7	23.80	14.684		

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

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 2E-232
Project:	SEC.2-T6N-R63W	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Reference Site:	Brown Pad Sec.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-29-12)	Offset TVD Reference:	Offset Datum

Offset Design Brown Pad Sec.2-T6N-R63W - Brown 2F-412 - Wellbore #1 - Plan #1 (5-29-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	5,059.8	5,081.2	5,059.8	15.7	12.5	180.00		222.2	-200.0	349.8	322.5	27.25	12.836	
5,200.0	5,159.8	5,181.2	5,159.8	15.9	12.7	180.00		222.2	-200.0	349.8	322.2	27.61	12.669	
5,300.0	5,259.8	5,281.2	5,259.8	16.0	12.9	180.00		222.2	-200.0	349.8	321.8	27.97	12.505	
5,400.0	5,359.8	5,381.2	5,359.8	16.2	13.1	180.00		222.2	-200.0	349.8	321.5	28.34	12.344	
5,500.0	5,459.8	5,481.2	5,459.8	16.3	13.3	180.00		222.2	-200.0	349.8	321.1	28.71	12.186	
5,600.0	5,559.8	5,581.2	5,559.8	16.5	13.5	180.00		222.2	-200.0	349.8	320.7	29.07	12.031	
5,700.0	5,659.8	5,681.2	5,659.8	16.6	13.7	180.00		222.2	-200.0	349.8	320.4	29.45	11.880	
5,800.0	5,759.8	5,781.2	5,759.8	16.8	13.9	180.00		222.2	-200.0	349.8	320.0	29.82	11.731	
5,852.9	5,812.7	5,834.1	5,812.7	16.9	14.0	90.12		222.2	-200.0	349.8	322.5	27.27	12.828	
5,900.0	5,859.7	5,881.2	5,859.7	17.0	14.1	90.16		222.2	-200.0	349.8	322.3	27.46	12.737	
6,000.0	5,959.0	5,980.4	5,959.0	17.1	14.3	92.02		222.2	-200.0	350.0	322.1	27.94	12.530	
6,100.0	6,055.9	6,081.6	6,059.9	17.2	14.5	94.93		222.2	-193.5	351.1	322.8	28.39	12.369	
6,200.0	6,148.8	6,185.4	6,161.6	17.2	14.6	97.78		222.2	-173.1	353.1	324.4	28.74	12.287	
6,300.0	6,236.1	6,291.9	6,262.0	17.2	14.7	100.49		222.2	-138.0	355.9	326.9	29.02	12.264	
6,400.0	6,316.3	6,401.2	6,359.0	17.3	14.7	103.02		222.2	-87.9	359.2	329.9	29.31	12.255	
6,500.0	6,388.0	6,513.2	6,450.0	17.3	14.8	105.30		222.2	-22.7	362.9	333.1	29.78	12.184	
6,600.0	6,450.1	6,627.8	6,532.2	17.5	15.1	107.29		222.2	57.1	366.6	335.9	30.64	11.963	
6,700.0	6,501.4	6,744.9	6,602.9	17.9	16.0	108.95		222.3	150.3	370.0	337.9	32.12	11.521	
6,800.0	6,541.0	6,864.1	6,659.3	18.9	17.4	110.24		222.3	255.1	372.9	338.5	34.38	10.847	
6,900.0	6,568.3	6,984.9	6,699.2	20.4	19.2	111.14		222.3	369.0	375.0	337.6	37.46	10.010	
7,000.0	6,582.9	7,105.8	6,720.7	22.2	21.4	111.61		222.3	487.9	376.2	334.9	41.28	9.114	
7,100.0	6,585.0	7,205.4	6,731.1	24.2	23.5	112.66		222.3	587.0	379.4	334.4	44.95	8.440	
7,200.0	6,583.7	7,316.1	6,739.7	26.4	25.9	114.04		222.4	697.3	383.0	334.2	48.82	7.845	
7,300.0	6,582.4	7,422.6	6,739.7	28.6	28.3	114.22		222.4	803.8	383.5	330.4	53.08	7.224	
7,400.0	6,581.1	7,522.6	6,738.8	31.0	30.7	114.27		222.4	903.8	383.6	326.2	57.41	6.683	
7,500.0	6,579.8	7,622.6	6,737.8	33.4	33.2	114.31		222.4	1,003.7	383.8	321.9	61.85	6.205	
7,600.0	6,578.5	7,722.6	6,736.9	35.9	35.7	114.36		222.4	1,103.7	383.9	317.5	66.40	5.782	
7,700.0	6,577.2	7,822.6	6,735.9	38.4	38.2	114.41		222.4	1,203.7	384.0	313.0	71.02	5.408	
7,800.0	6,575.9	7,922.6	6,735.0	40.9	40.8	114.45		222.4	1,303.7	384.2	308.5	75.70	5.075	
7,900.0	6,574.6	8,022.6	6,734.0	43.5	43.4	114.50		222.4	1,403.7	384.3	303.9	80.44	4.778	
8,000.0	6,573.3	8,122.6	6,733.1	46.1	46.0	114.55		222.4	1,503.7	384.5	299.3	85.22	4.512	
8,100.0	6,572.0	8,222.6	6,732.1	48.8	48.7	114.59		222.4	1,603.7	384.6	294.6	90.04	4.272	
8,200.0	6,570.8	8,322.6	6,731.2	51.4	51.3	114.64		222.4	1,703.7	384.8	289.9	94.88	4.055	
8,300.0	6,569.5	8,422.6	6,730.2	54.1	54.0	114.69		222.4	1,803.7	384.9	285.2	99.75	3.859	
8,400.0	6,568.2	8,522.6	6,729.3	56.8	56.7	114.73		222.4	1,903.7	385.1	280.4	104.64	3.680	
8,500.0	6,566.9	8,622.6	6,728.3	59.5	59.4	114.78		222.5	2,003.7	385.2	275.7	109.54	3.516	
8,600.0	6,565.6	8,722.6	6,727.4	62.2	62.1	114.83		222.5	2,103.7	385.3	270.9	114.46	3.367	
8,700.0	6,564.3	8,822.6	6,726.4	64.9	64.8	114.87		222.5	2,203.7	385.5	266.1	119.39	3.229	
8,800.0	6,563.0	8,922.6	6,725.5	67.6	67.6	114.92		222.5	2,303.7	385.6	261.3	124.34	3.102	
8,900.0	6,561.7	9,022.6	6,724.5	70.3	70.3	114.97		222.5	2,403.7	385.8	256.5	129.29	2.984	
9,000.0	6,560.4	9,122.6	6,723.6	73.1	73.0	115.01		222.5	2,503.7	385.9	251.7	134.25	2.875	
9,100.0	6,559.1	9,222.6	6,722.6	75.8	75.8	115.06		222.5	2,603.7	386.1	246.9	139.21	2.773	
9,200.0	6,557.8	9,322.6	6,721.7	78.5	78.5	115.10		222.5	2,703.7	386.2	242.0	144.18	2.679	
9,300.0	6,556.6	9,422.6	6,720.7	81.3	81.3	115.15		222.5	2,803.7	386.4	237.2	149.16	2.590	
9,400.0	6,555.3	9,522.6	6,719.8	84.0	84.0	115.20		222.5	2,903.7	386.5	232.4	154.13	2.508	
9,500.0	6,554.0	9,622.6	6,718.9	86.8	86.8	115.24		222.5	3,003.6	386.7	227.5	159.11	2.430	
9,600.0	6,552.7	9,722.6	6,717.9	89.6	89.6	115.29		222.5	3,103.6	386.8	222.7	164.10	2.357	
9,700.0	6,551.4	9,822.6	6,717.0	92.3	92.3	115.33		222.5	3,203.6	387.0	217.9	169.08	2.289	
9,800.0	6,550.1	9,922.6	6,716.0	95.1	95.1	115.38		222.6	3,303.6	387.1	213.0	174.07	2.224	
9,900.0	6,548.8	10,022.6	6,715.1	97.9	97.9	115.43		222.6	3,403.6	387.2	208.2	179.05	2.163	
10,000.0	6,547.5	10,122.6	6,714.1	100.6	100.6	115.47		222.6	3,503.6	387.4	203.4	184.04	2.105	

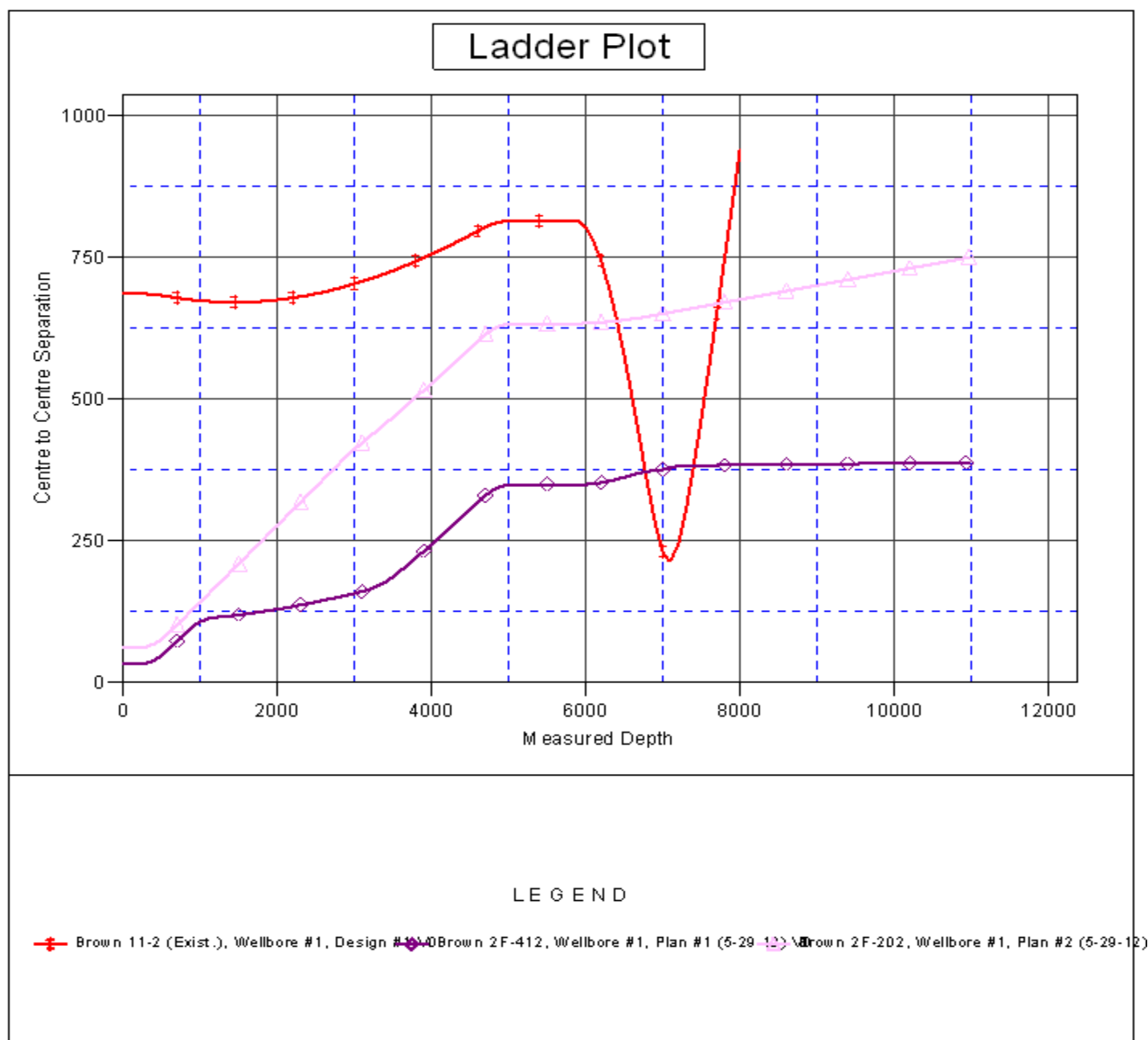
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 2E-232
Project:	SEC.2-T6N-R63W	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Reference Site:	Brown Pad Sec.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-29-12)	Offset TVD Reference:	Offset Datum

Offset Design Brown Pad Sec.2-T6N-R63W - Brown 2F-412 - Wellbore #1 - Plan #1 (5-29-12)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
Reference	Offset	Reference	Offset	Reference	Offset		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
10,100.0	6,546.2	10,222.6	6,713.2	103.4	103.4	115.52	222.6	3,603.6	387.5	198.5	189.03	2.050	
10,200.0	6,544.9	10,322.6	6,712.2	106.2	106.2	115.56	222.6	3,703.6	387.7	193.7	194.01	1.998	
10,300.0	6,543.6	10,422.6	6,711.3	108.9	109.0	115.61	222.6	3,803.6	387.8	188.8	199.00	1.949	
10,400.0	6,542.3	10,522.6	6,710.3	111.7	111.8	115.66	222.6	3,903.6	388.0	184.0	203.99	1.902	
10,500.0	6,541.1	10,622.6	6,709.4	114.5	114.5	115.70	222.6	4,003.6	388.1	179.2	208.97	1.857	
10,600.0	6,539.8	10,722.6	6,708.4	117.3	117.3	115.75	222.6	4,103.6	388.3	174.3	213.96	1.815	
10,700.0	6,538.5	10,822.6	6,707.5	120.1	120.1	115.79	222.6	4,203.6	388.4	169.5	218.94	1.774	
10,800.0	6,537.2	10,922.6	6,706.5	122.8	122.9	115.84	222.6	4,303.6	388.6	164.7	223.92	1.735	
10,900.0	6,535.9	11,022.6	6,705.6	125.6	125.7	115.88	222.6	4,403.6	388.7	159.8	228.90	1.698	
10,933.9	6,535.4	11,056.5	6,705.3	126.2	126.6	115.90	222.6	4,437.5	388.8	158.5	230.28	1.688	
10,968.7	6,535.0	11,084.1	6,705.0	126.9	127.4	115.91	222.6	4,465.1	388.9	157.4	231.52	1.680 SF	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 2E-232
Project:	SEC.2-T6N-R63W	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Reference Site:	Brown Pad Sec.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-29-12)	Offset TVD Reference:	Offset Datum

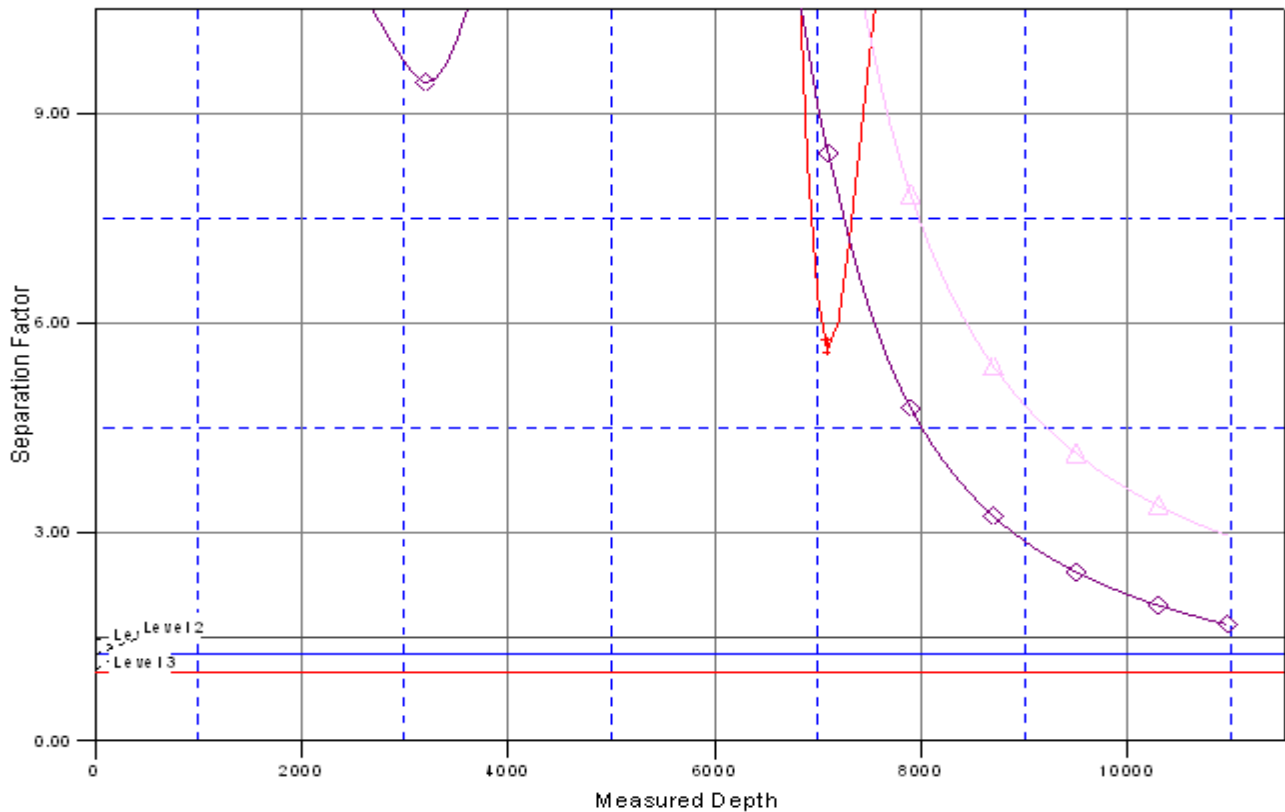
Reference Depths are relative to WELL @ 4725.0ft (RKB Ensign 32 - 1 Coordinates are relative to: Brown 2E-232
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.70°



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Brown 2E-232
Project:	SEC.2-T6N-R63W	TVD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Reference Site:	Brown Pad Sec.2-T6N-R63W	MD Reference:	WELL @ 4725.0ft (RKB Ensign 32 - 15')
Site Error:	0.0ft	North Reference:	True
Reference Well:	Brown 2E-232	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (5-29-12)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4725.0ft (RKB Ensign 32 - 1 Coordinates are relative to: Brown 2E-232
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.70°

Separation Factor Plot



LEGEND

— Brown 11-2 (Exist.), Wellbore #1, Design #11-2-12 — Brown 2F-412, Wellbore #1, Plan #1 (5-29-12) — Brown 2F-202, Wellbore #1, Plan #2 (5-29-12)