

PDC Energy Inc. DJ Basin

Well Name: **Fern 11W-314**

Surface Location: Fern 5N65W11EJ Pad Sec.11-T5N-R65W
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
 Ground Elevation: 4619.0
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.0 0.0 1397109.31 3240103.69 40.420262 -104.637629
 Original Well Elev WELL @ 4642.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 381'FNL, 688'FWL, SEC.11	1.0	0.0	0.0	Point
BHL 2082'FNL, 2530'FEL, SEC.9	6812.0	-1889.8	-8466.6	Point
LPL 2082'FNL, 0'FEL, SEC.10	6857.0	-1705.8	-681.6	Point



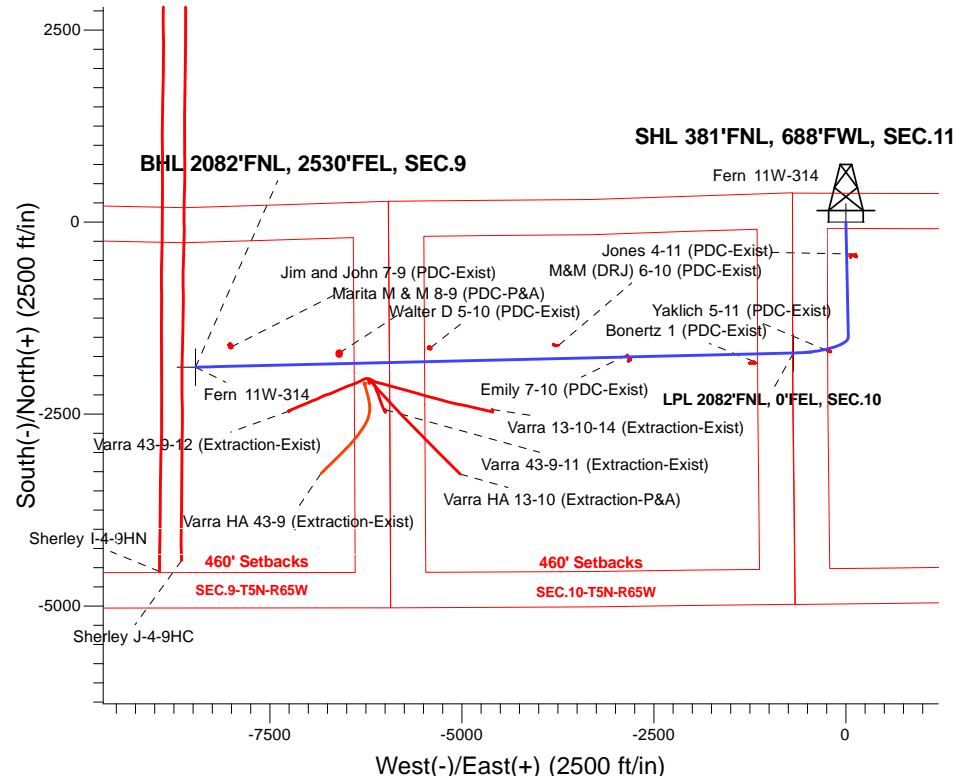
Azimuths to True North
 Magnetic North: 7.99°

Magnetic Field
 Strength: 52529.1snT
 Dip Angle: 66.88°
 Date: 5/30/2017
 Model: IGRF2010

Fern 5N65W11EJ Pad Sec.11-T5N-R65W
 Fern 11W-314
 Plan #3 (8-11-17)
 13:50, August 16 2017

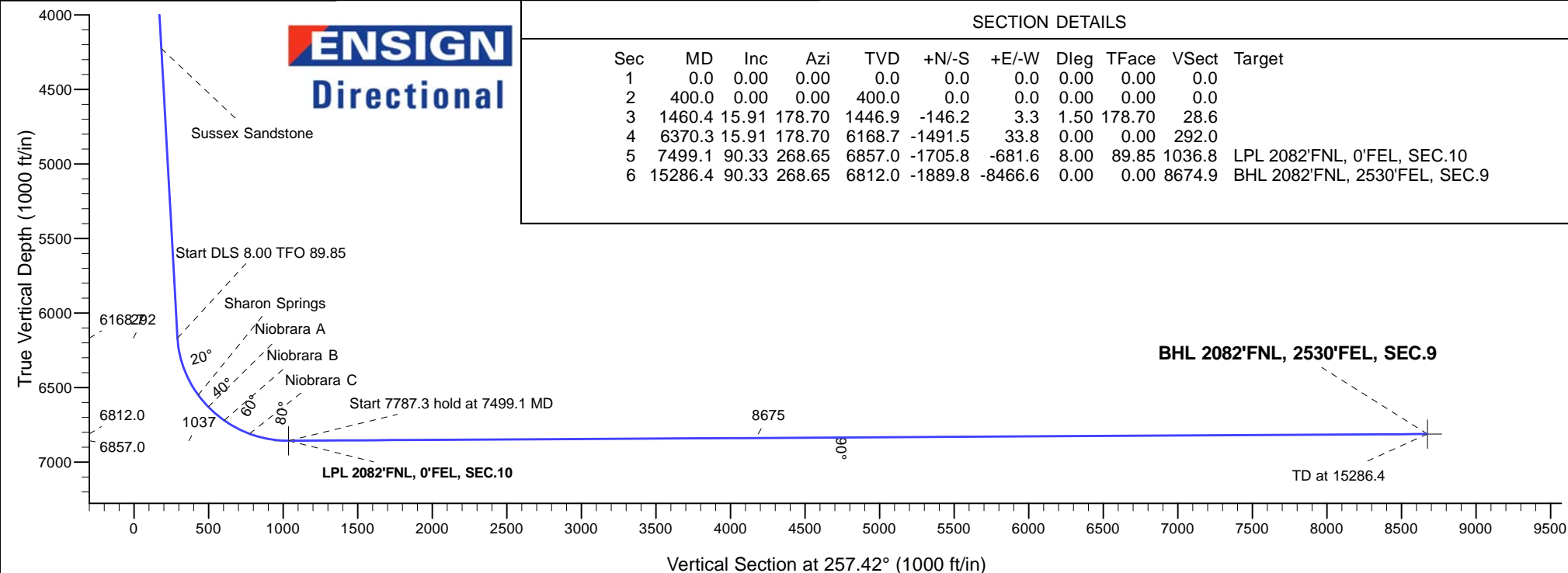
ANNOTATIONS

TVD	MD	Annotation
400.0	400.0	KOP - Start Build 1.50
1446.9	1460.4	Start 4909.9 hold at 1460.4 MD
6168.7	6370.3	Start DLS 8.00 TFO 89.85
6857.0	7499.1	Start 7787.3 hold at 7499.1 MD
6812.0	15286.4	TD at 15286.4



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	
3	1460.4	15.91	178.70	1446.9	-146.2	3.3	1.50	178.70	28.6	
4	6370.3	15.91	178.70	6168.7	-1491.5	33.8	0.00	0.00	292.0	
5	7499.1	90.33	268.65	6857.0	-1705.8	-681.6	8.00	89.85	1036.8	LPL 2082'FNL, 0'FEL, SEC.10
6	15286.4	90.33	268.65	6812.0	-1889.8	-8466.6	0.00	0.00	8674.9	BHL 2082'FNL, 2530'FEL, SEC.9



PDC Energy Inc. DJ Basin

SEC.11-T5N-R65W

Fern 5N65W11EJ Pad Sec.11-T5N-R65W

Fern 11W-314

Wellbore #1

Plan #3 (8-11-17)

Anticollision Summary Report

16 August, 2017

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Fern 11W-314
Project:	SEC.11-T5N-R65W	TVD Reference:	WELL @ 4642.0ft (Original Well Elev)
Reference Site:	Fern 5N65W11EJ Pad Sec.11-T5N-R65W	MD Reference:	WELL @ 4642.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Fern 11W-314	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.45 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #3 (8-11-17)	Offset TVD Reference:	Offset Datum

Reference	Plan #3 (8-11-17)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,000.0 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.45 Sigma	Casing Method:	Not applied

Survey Tool Program	Date 8/16/2017			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	15,286.4	Plan #3 (8-11-17) (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						
Existing Wells Sec.10-T5N-R65W						
Bonertz 1 (PDC-Exist) - Wellbore #1 - Wellbore #1	8,017.0	6,832.2	100.1	37.0	1.588	CC, ES, SF
Emily 7-10 (PDC-Exist) - Wellbore #1 - Wellbore #1	9,656.4	6,824.0	13.3	-99.6	0.118	Level 1, CC, ES, SF
M&M (DRJ) 6-10 (PDC-Exist) - Wellbore #1 - Wellbore #	10,555.8	6,819.7	172.2	26.9	1.185	Level 2, CC, ES, SF
Walter D 5-10 (PDC-Exist) - Wellbore #1 - Wellbore #1	12,222.9	6,811.4	177.5	-24.1	0.881	Level 1, CC, ES, SF
Existing Wells Sec.11-T5N-R65W						
Jones 4-11 (PDC-Exist) - Wellbore #1 - Wellbore #1	2,538.1	2,456.6	43.1	24.1	2.276	CC, ES, SF
Yaklich 5-11 (PDC-Exist) - Wellbore #1 - Wellbore #1	7,024.8	6,686.5	17.5	-24.2	0.420	Level 1, CC, ES, SF
Existing Wells Sec.9-T5N-R65W						
Jim and John 7-9 (PDC-Exist) - Wellbore #1 - Wellbore #	14,817.9	6,816.7	250.6	-38.0	0.868	Level 1, CC, ES, SF
Marita M & M 8-9 (PDC-P&A) - Wellbore #1 - Wellbore #	13,412.5	6,807.8	136.3	-256.0	0.347	Level 1, CC, ES, SF
Fern 5N65W11EJ Pad Sec.11-T5N-R65W						
Fern 11U-204 - Wellbore #1 - Plan #3 (8-10-17)	400.0	400.0	119.9	117.9	62.189	CC, ES
Fern 11U-204 - Wellbore #1 - Plan #3 (8-10-17)	1,100.0	1,096.1	183.8	178.1	32.370	SF
Fern 11U-334 - Wellbore #1 - Plan #4 (8-10-17)	400.0	400.0	90.0	88.1	46.686	CC, ES
Fern 11U-334 - Wellbore #1 - Plan #4 (8-10-17)	1,000.0	997.5	137.0	131.9	26.721	SF
Fern 11U-434 - Wellbore #1 - Plan #3 (8-10-17)	400.0	400.0	104.9	103.0	54.439	CC, ES
Fern 11U-434 - Wellbore #1 - Plan #3 (8-10-17)	1,000.0	997.5	151.9	146.8	29.635	SF
Fern 11V-204 - Wellbore #1 - Plan #3 (8-10-17)	400.0	400.0	44.8	42.9	23.249	CC, ES
Fern 11V-204 - Wellbore #1 - Plan #3 (8-10-17)	15,286.4	15,075.2	694.9	119.9	1.209	Level 2, SF
Fern 11V-214 - Wellbore #1 - Plan #4 (8-11-17)	400.0	400.0	74.7	72.8	38.750	CC, ES
Fern 11V-214 - Wellbore #1 - Plan #4 (8-11-17)	900.0	898.6	107.3	102.8	23.447	SF
Fern 11V-234 - Wellbore #1 - Plan #3 (8-11-17)	400.0	400.0	14.9	13.0	7.749	CC
Fern 11V-234 - Wellbore #1 - Plan #3 (8-11-17)	15,286.4	15,169.3	243.6	-303.8	0.445	Level 1, ES, SF
Fern 11V-304 - Wellbore #1 - Plan #3 (8-11-17)	400.0	400.0	59.7	57.8	30.999	CC, ES
Fern 11V-304 - Wellbore #1 - Plan #3 (8-11-17)	15,286.4	15,116.5	920.4	341.3	1.589	SF
Fern 11V-334 - Wellbore #1 - Plan #3 (8-11-17)	400.0	400.0	29.9	27.9	15.500	CC
Fern 11V-334 - Wellbore #1 - Plan #3 (8-11-17)	15,286.4	15,192.4	460.2	-119.1	0.794	Level 1, ES, SF
Fern 11W-214 - Wellbore #1 - Plan #3 (8-11-17)	200.0	200.0	15.3	14.5	18.529	CC
Fern 11W-214 - Wellbore #1 - Plan #3 (8-11-17)	15,286.4	15,288.1	316.3	-247.7	0.561	Level 1, ES, SF
Sherley Pad Sec.4-T5N-R65W						
Sherley I-4-9HN - Wellbore #1 - Wellbore #1	15,286.4	14,261.4	445.0	292.4	2.916	CC, ES, SF
Sherley J-4-9HC - Wellbore #1 - Wellbore #1	15,286.4	14,501.2	279.2	127.6	1.841	CC, ES, SF

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Reference Design:	Plan #3 (8-11-17)	Offset TVD Reference:	Offset Datum

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						
Varra 43-9-11 Pad Sec.9-T5N-R65W						
Varra 13-10-14 (Extraction-Exist) - Wellbore #1 - Wellbor	11,435.2	7,103.9	656.7	458.6	3.315	CC, ES
Varra 13-10-14 (Extraction-Exist) - Wellbore #1 - Wellbor	11,500.0	7,103.9	659.9	459.6	3.294	SF
Varra 43-9-11 (Extraction-Exist) - Wellbore #1 - Wellbore	12,830.9	6,851.8	617.9	394.9	2.770	CC, ES
Varra 43-9-11 (Extraction-Exist) - Wellbore #1 - Wellbore	12,900.0	6,850.7	621.8	396.4	2.758	SF
Varra 43-9-12 (Extraction-Exist) - Wellbore #1 - Wellbore	14,082.8	6,937.7	601.9	323.7	2.164	CC
Varra 43-9-12 (Extraction-Exist) - Wellbore #1 - Wellbore	14,100.0	6,937.5	602.2	323.4	2.160	ES, SF
Varra HA 13-10 (Extraction-P&A) - Wellbore #1 - Wellbor	12,600.0	6,465.0	774.7	604.5	4.551	SF
Varra HA 13-10 (Extraction-P&A) - Wellbore #1 - Wellbor	12,741.7	6,419.5	763.7	596.6	4.572	CC, ES
Varra HA 43-9 (Extraction-Exist) - Wellbore #1 - Wellbore	13,068.6	6,479.2	852.2	648.3	4.180	CC
Varra HA 43-9 (Extraction-Exist) - Wellbore #1 - Wellbore	13,100.0	6,485.4	852.8	647.2	4.148	ES
Varra HA 43-9 (Extraction-Exist) - Wellbore #1 - Wellbore	13,300.0	6,532.1	881.5	664.6	4.063	SF

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Reference Depths are relative to WELL @ 4642.0ft (Original Well Elev)

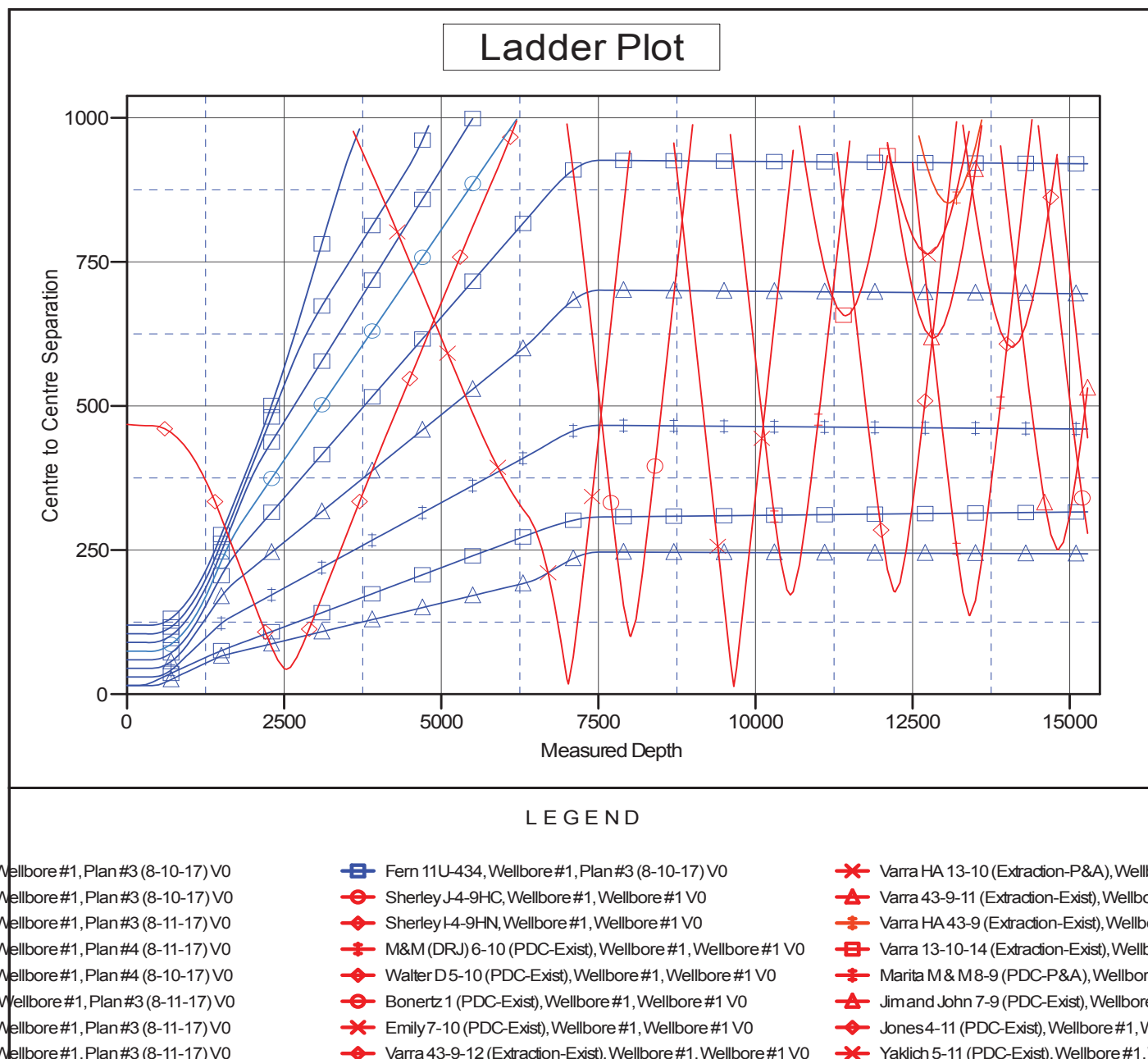
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000

Coordinates are relative to: Fern 11W-314

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.56°



Reference Depths are relative to WELL @ 4642.0ft (Original Well Elev)	Coordinates are relative to: Fern 11W-314
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000	Grid Convergence at Surface is: 0.56°

