

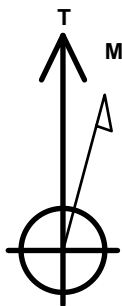
PDC Energy Inc. DJ Basin

Well Name: **Josephine 19M-404**

Surface Location: Josephine 5N64W19N Pad Sec.19-T5N-R64W
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
 Ground Elevation: 4626.0
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.0 0.0 1385201.67 3253128.43 40.387220 -104.591290
 Original Well Elev WELL @ 4649.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 1699'FNL, 2215'FEL, SEC.19	1.0	0.0	0.0	Point
BHL 50'FNL, 2471'FEL, SEC.24	6898.0	1658.2	-5420.7	Point
LPL 130'FNL, 2042'FEL, SEC.19	6898.0	1566.7	164.1	Point
WP #1 (19m-404)	6898.0	1630.0	-1435.9	Point



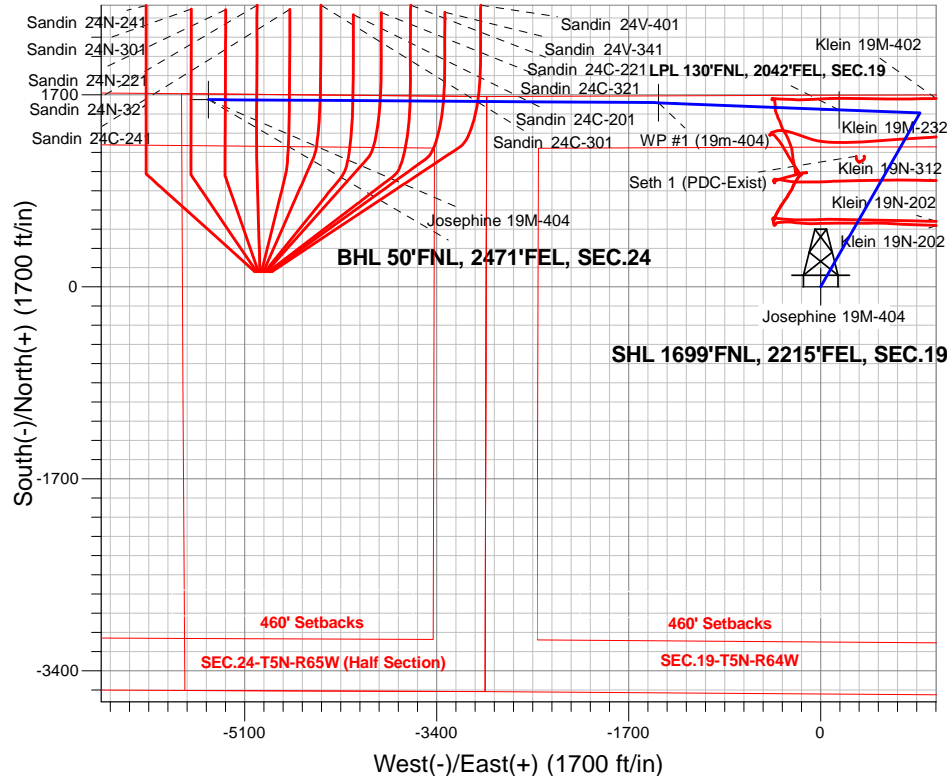
Azimuths to True North
 Magnetic North: 8.00°

Magnetic Field
 Strength: 52540.2snT
 Dip Angle: 66.87°
 Date: 3/9/2017
 Model: IGRF2010

Josephine 5N64W19N Pad Sec.19-T5N-R64W
 Josephine 19M-404
 Plan #3 (3-09-17)
 14:19, March 09 2017

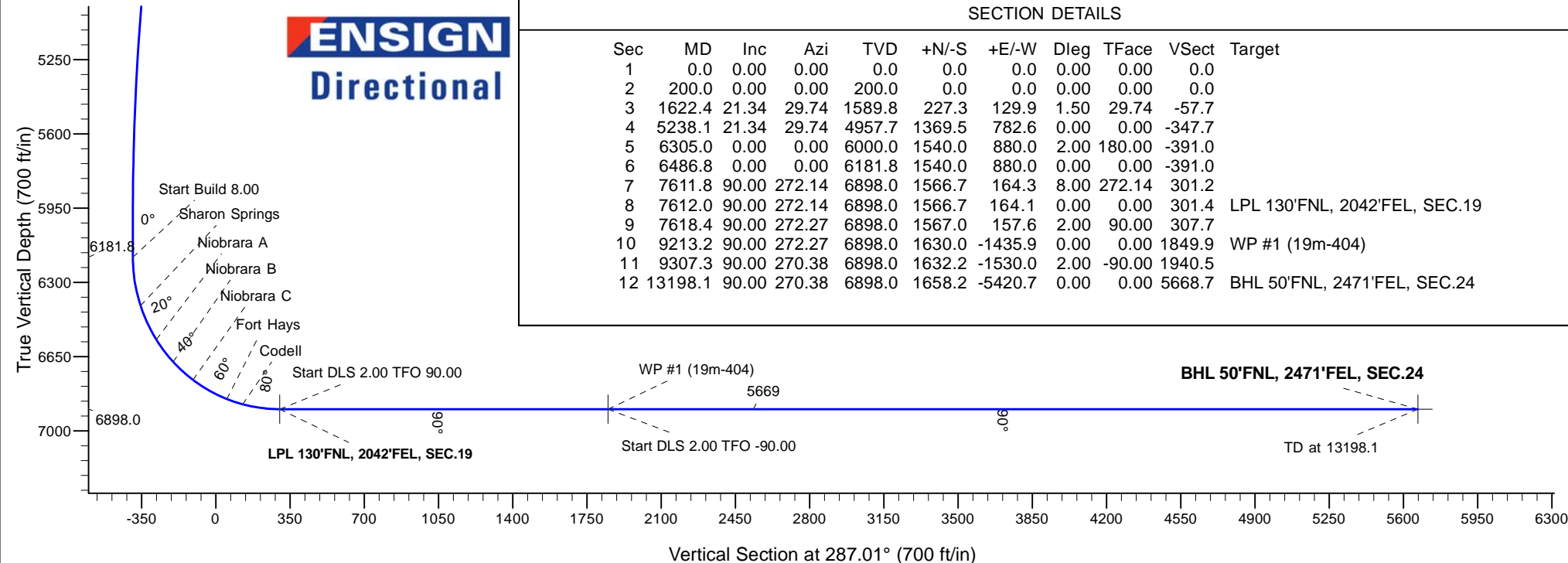
ANNOTATIONS

TVD	MD	Annotation
200.0	200.0	KOP - Start Build 1.50
4957.6	5238.1	Start Drop -2.00
6181.8	6486.8	Start Build 8.00
6898.0	7612.0	Start DLS 2.00 TFO 90.00
6898.0	9213.2	Start DLS 2.00 TFO -90.00
6898.0	13198.1	TD at 13198.1



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	1622.4	21.34	29.74	1589.8	227.3	129.9	1.50	29.74	-57.7	
4	5238.1	21.34	29.74	4957.7	1369.5	782.6	0.00	0.00	-347.7	
5	6305.0	0.00	0.00	6000.0	1540.0	880.0	2.00	180.00	-391.0	
6	6486.8	0.00	0.00	6181.8	1540.0	880.0	0.00	0.00	-391.0	
7	7611.8	90.00	272.14	6898.0	1566.7	164.3	8.00	272.14	301.2	
8	7612.0	90.00	272.14	6898.0	1566.7	164.1	0.00	0.00	301.4	LPL 130'FNL, 2042'FEL, SEC.19
9	7618.4	90.00	272.27	6898.0	1567.0	157.6	2.00	90.00	307.7	
10	9213.2	90.00	272.27	6898.0	1630.0	-1435.9	0.00	0.00	1849.9	WP #1 (19m-404)
11	9307.3	90.00	270.38	6898.0	1632.2	-1530.0	2.00	-90.00	1940.5	
12	13198.1	90.00	270.38	6898.0	1658.2	-5420.7	0.00	0.00	5668.7	BHL 50'FNL, 2471'FEL, SEC.24



PDC Energy Inc. DJ Basin

SEC.19-T5N-R64W

Josephine 5N64W19N Pad Sec.19-T5N-R64W

Josephine 19M-404

Wellbore #1

Plan #3 (3-09-17)

Anticollision Report

09 March, 2017

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Josephine 19M-404
Project:	SEC.19-T5N-R64W	TVD Reference:	WELL @ 4649.0ft (Original Well Elev)
Reference Site:	Josephine 5N64W19N Pad Sec.19-T5N-R64W	MD Reference:	WELL @ 4649.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Josephine 19M-404	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 (3-09-17)	Offset TVD Reference:	Offset Datum

Reference	Plan #3 (3-09-17)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 500.0 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.45 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	3/9/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	13,198.1	Plan #3 (3-09-17) (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.19-T5N-R64W						
Seth 1 (PDC-Exist) - Wellbore #1 - Wellbore #1	4,009.9	3,788.3	241.9	202.8	6.198	CC, ES
Seth 1 (PDC-Exist) - Wellbore #1 - Wellbore #1	4,100.0	3,871.4	244.4	204.4	6.113	SF
Josephine 5N64W19N Pad Sec.19-T5N-R64W						
Josephine 19M-234 - Wellbore #1 - Plan #3 (3-09-17)	200.0	200.0	14.6	13.8	17.652	CC
Josephine 19M-234 - Wellbore #1 - Plan #3 (3-09-17)	13,198.1	13,093.1	247.0	-130.2	0.655	Level 1, ES, SF
Josephine 19M-334 - Wellbore #1 - Plan #3 (3-09-17)	200.0	200.0	29.1	28.3	35.284	CC, ES
Josephine 19M-334 - Wellbore #1 - Plan #3 (3-09-17)	13,198.1	13,051.1	448.5	46.7	1.116	Level 2, SF
Josephine 19N-204 - Wellbore #1 - Plan #3 (3-09-17)	200.0	200.0	91.1	90.3	110.262	CC, ES
Josephine 19N-204 - Wellbore #1 - Plan #3 (3-09-17)	900.0	896.1	150.0	145.2	30.990	SF
Josephine 19N-214 - Wellbore #1 - Plan #3 (3-09-17)	200.0	200.0	47.4	46.5	57.331	CC, ES
Josephine 19N-214 - Wellbore #1 - Plan #3 (3-09-17)	4,300.0	4,322.0	493.2	450.8	11.615	SF
Josephine 19N-314 - Wellbore #1 - Plan #3 (3-09-17)	200.0	200.0	61.9	61.1	74.983	CC, ES
Josephine 19N-314 - Wellbore #1 - Plan #3 (3-09-17)	3,300.0	3,325.9	497.6	471.5	19.081	SF
Josephine 19N-334 - Wellbore #1 - Plan #3 (3-09-17)	200.0	200.0	105.7	104.8	127.904	CC, ES
Josephine 19N-334 - Wellbore #1 - Plan #3 (3-09-17)	1,000.0	994.2	182.9	177.4	33.689	SF
Josephine 19N-404 - Wellbore #1 - Plan #3 (3-09-17)	200.0	200.0	76.5	75.7	92.620	CC, ES
Josephine 19N-404 - Wellbore #1 - Plan #3 (3-09-17)	900.0	896.1	135.8	131.0	28.077	SF
Josephine 19O-204 - Wellbore #1 - Plan #3 (3-09-17)	200.0	200.0	149.4	148.6	180.861	CC, ES
Josephine 19O-204 - Wellbore #1 - Plan #3 (3-09-17)	1,100.0	1,068.0	271.9	265.9	44.897	SF
Josephine 19O-214 - Wellbore #1 - Plan #3 (3-09-17)	200.0	200.0	120.2	119.4	145.550	CC, ES
Josephine 19O-214 - Wellbore #1 - Plan #3 (3-09-17)	1,100.0	1,091.7	218.2	212.2	36.255	SF
Josephine 19O-314 - Wellbore #1 - Plan #3 (3-09-17)	200.0	200.0	134.8	134.0	163.187	CC, ES
Josephine 19O-314 - Wellbore #1 - Plan #3 (3-09-17)	1,100.0	1,089.9	232.8	226.8	38.768	SF
Klein 19MN-HZ Pad Sec.19-T5N-R64W						
Klein 19M-232 - Wellbore #1 - Wellbore #1	6,900.0	7,661.1	243.9	172.8	3.430	SF
Klein 19M-232 - Wellbore #1 - Wellbore #1	6,950.0	7,632.9	238.3	169.6	3.468	ES
Klein 19M-232 - Wellbore #1 - Wellbore #1	6,963.2	7,625.0	238.0	170.0	3.501	CC
Klein 19M-402 - Wellbore #1 - Wellbore #1	7,410.1	7,343.2	107.5	51.2	1.911	CC, ES, SF
Klein 19N-202 - Wellbore #1 - Wellbore #1						Out of range
Klein 19N-202 - Wellbore #2 - Sidetrack - Wellbore #2 - S						Out of range
Klein 19N-312 - Wellbore #1 - Wellbore #1						Out of range

Company:	PDC Energy Inc. DJ Basin	Local Co-ordinate Reference:	Well Josephine 19M-404
Project:	SEC.19-T5N-R64W	TVD Reference:	WELL @ 4649.0ft (Original Well Elev)
Reference Site:	Josephine 5N64W19N Pad Sec.19-T5N-R64W	MD Reference:	WELL @ 4649.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Josephine 19M-404	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 (3-09-17)	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						
Sandin Farms 5N65W24N Pad Sec.24-T5N-R65W						
Sandin 24C-201 - Wellbore #1 - Plan #1 (12-20-16)	11,917.7	7,250.0	148.1	86.1	2.388	CC, ES, SF
Sandin 24C-221 - Wellbore #1 - Plan #1 (12-20-16)	11,411.0	7,319.8	148.7	88.5	2.470	CC, ES, SF
Sandin 24C-241 - Wellbore #1 - Plan #1 (12-21-16)	12,480.0	7,212.1	139.4	70.7	2.030	CC, ES, SF
Sandin 24C-301 - Wellbore #1 - Plan #1 (12-20-16)	12,207.7	7,194.5	89.8	3.4	1.039	Level 2, CC, ES, SF
Sandin 24C-321 - Wellbore #1 - Plan #1 (12-20-16)	11,675.5	7,242.8	99.1	18.3	1.226	Level 2, CC, ES, SF
Sandin 24N-221 - Wellbore #1 - Plan #1 (12-21-16)	13,048.1	7,216.3	135.5	62.2	1.849	CC, ES, SF
Sandin 24N-241 - Wellbore #1 - Plan #1 (12-21-16)						Out of range
Sandin 24N-301 - Wellbore #1 - Plan #1 (12-21-16)	13,198.1	7,305.7	163.1	86.8	2.139	CC, ES, SF
Sandin 24N-321 - Wellbore #1 - Plan #1 (12-21-16)	12,770.0	7,176.3	91.0	-2.7	0.971	Level 1, CC, ES, SF
Sandin 24V-341 - Wellbore #1 - Plan #1 (12-20-16)	11,100.0	7,338.8	103.5	26.9	1.351	Level 3, SF
Sandin 24V-341 - Wellbore #1 - Plan #1 (12-20-16)	11,114.9	7,337.9	102.4	26.7	1.352	Level 3, CC, ES
Sandin 24V-401 - Wellbore #1 - Plan #1 (12-20-16)	10,800.0	7,390.2	61.8	-31.4	0.663	Level 1, ES, SF
Sandin 24V-401 - Wellbore #1 - Plan #1 (12-20-16)	10,810.4	7,389.1	60.9	-30.1	0.669	Level 1, CC

Offset Design													Offset Site Error:	0.0 ft
Existing Wells Sec.19-T5N-R64W - Seth 1 (PDC-Exist) - Wellbore #1 - Wellbore #1													Offset Well Error:	0.0 ft
Survey Program:		100-NS-GYRO-MS												
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	
2,900.0	2,779.8	2,760.3	2,759.9	18.4	8.0	-29.95	1,120.7	373.9	489.9	469.7	20.28	24.160		
3,000.0	2,872.9	2,851.9	2,851.4	19.3	8.2	-32.28	1,120.5	372.8	458.1	436.7	21.41	21.393		
3,100.0	2,966.1	2,946.6	2,946.1	20.2	8.4	-35.07	1,120.3	371.4	426.9	404.2	22.69	18.816		
3,200.0	3,059.2	3,040.4	3,039.9	21.1	8.7	-38.22	1,119.5	370.3	396.4	372.2	24.12	16.430		
3,300.0	3,152.4	3,131.9	3,131.4	22.0	9.0	-41.66	1,119.0	369.8	367.1	341.5	25.66	14.305		
3,400.0	3,245.5	3,223.6	3,223.2	22.8	9.2	-45.68	1,118.8	369.0	340.0	312.6	27.33	12.440		
3,500.0	3,338.7	3,318.8	3,318.3	23.7	9.4	-50.59	1,118.2	367.7	314.5	285.3	29.20	10.769		
3,600.0	3,431.8	3,412.6	3,412.1	24.6	9.7	-56.30	1,116.8	366.2	291.0	259.8	31.25	9.312		
3,700.0	3,525.0	3,502.6	3,502.1	25.5	10.0	-62.68	1,115.4	363.9	271.3	237.9	33.34	8.136		
3,800.0	3,618.1	3,596.6	3,596.0	26.4	10.3	-70.28	1,113.6	361.1	256.0	220.6	35.47	7.218		
3,900.0	3,711.2	3,688.4	3,687.7	27.2	10.5	-78.34	1,111.7	358.6	245.9	208.5	37.37	6.579		
4,000.0	3,804.4	3,779.3	3,778.6	28.1	10.8	-86.57	1,110.4	356.4	241.9	203.0	38.90	6.219		
4,009.9	3,813.6	3,788.3	3,787.6	28.2	10.8	-87.38	1,110.3	356.2	241.9	202.8	39.03	6.198	CC, ES	
4,100.0	3,897.5	3,871.4	3,870.7	29.0	11.1	-94.93	1,109.4	354.0	244.4	204.4	39.97	6.113	SF	
4,200.0	3,990.7	3,964.9	3,964.2	29.9	11.3	-103.15	1,108.1	351.5	252.6	212.0	40.57	6.226		
4,300.0	4,083.8	4,059.2	4,058.5	30.8	11.6	-110.72	1,107.3	349.9	265.6	224.8	40.76	6.514		
4,400.0	4,177.0	4,151.5	4,150.7	31.7	11.9	-117.34	1,106.8	348.7	282.6	241.9	40.70	6.944		
4,500.0	4,270.1	4,244.3	4,243.5	32.6	12.1	-123.23	1,106.4	347.2	303.7	263.2	40.47	7.504		
4,600.0	4,363.3	4,337.7	4,336.9	33.4	12.4	-128.51	1,105.5	346.1	327.3	287.1	40.17	8.148		
4,700.0	4,456.4	4,429.3	4,428.5	34.3	12.7	-133.07	1,104.3	344.9	353.7	313.8	39.89	8.866		
4,800.0	4,549.6	4,523.2	4,522.4	35.2	13.0	-137.04	1,103.6	343.7	381.7	342.1	39.65	9.627		
4,900.0	4,642.7	4,613.5	4,612.7	36.1	13.2	-140.32	1,103.1	342.2	411.6	372.1	39.51	10.416		
5,000.0	4,735.9	4,707.4	4,706.6	37.0	13.5	-143.22	1,103.0	340.5	442.7	403.3	39.42	11.230		
5,100.0	4,829.0	4,799.5	4,798.6	37.9	13.7	-145.70	1,102.8	338.8	474.6	435.2	39.42	12.042		
7,150.0	6,754.2	6,738.3	6,736.2	42.3	16.4	-69.04	1,154.4	315.1	484.8	448.1	36.66	13.224		
7,200.0	6,782.9	6,765.3	6,763.3	42.1	16.4	-73.61	1,154.7	315.0	463.5	425.1	38.39	12.075		
7,250.0	6,808.6	6,789.7	6,787.7	41.9	16.5	-77.98	1,154.8	314.9	444.3	404.2	40.09	11.083		
7,300.0	6,831.2	6,812.5	6,810.5	41.8	16.5	-82.10	1,154.9	314.9	428.1	386.5	41.65	10.280		
7,350.0	6,850.7	6,832.8	6,830.8	41.6	16.5	-85.74	1,155.0	314.9	415.7	372.7	42.94	9.680		

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