

Vattenfall Wind Power Ltd

Thanet Extension Offshore Wind Farm

Annex A to Appendix 4 of Deadline 4b Submission:
Implications of the SEZ – Seascape, Landscape and
Visual Effects

Relevant Examination Deadline: 4b

Submitted by Vattenfall Wind Power Ltd

Date: April 2019

Revision A

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Date of Approval:	April 2019
Revision:	A

Revision A	Original Document submitted to the Examining Authority
N/A	
N/A	
N/A	

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1 Seascape, landscape and visual

1.1 Background

- 1 As noted in Appendix 4 of this Deadline 4a submission, a revision has been made to the proposed Thanet Extension project which introduces a 'Structures Exclusion Zone' (SEZ). For the purposes of this annex the SEZ means no above sea infrastructure will be placed within the it. This annex has been drafted to consider the implications of this for seascape, landscape and visual effects associated with the proposed project.
- 2 In general terms the worst case as agreed with stakeholders during the pre-application phase has been amended to account for the introduction of the SEZ, whilst applying the same assumptions with regards WTG size etc. Section 1.1 provides further detail regarding the assumptions made in drafting this annex, before a detailed appraisal is then presented in Section 1.2.

1.1 Structures Exclusion Zone Layout - Assumptions

- 3 A SEZ layout scenario has been generated in order to consider the implications of the SEZ with regards to seascape, landscape and visual effects.
- 4 The SEZ layout, shown in **Figure 12.1_SEZ**, consists of 28 x 12MW WTGs sited entirely outside the SEZ, but within the wind farm area of the offshore Red Line Boundary (RLB).
- 5 In defining the parameters of the SEZ layout, similar principles to those applied for the 12MW 'Optimum Space' Rochdale Envelope layout in the Environmental Statement (ES) have been applied to define the worst-case SEZ layout:
 - The WTG locations are sited within the proposed wind farm area of the offshore Order Limits but entirely outside the SEZ, and based on spacing of 1540 m x 1440 m to represent a potential 'optimum' WTG spacing for 12 MW WTGs;
 - A minimum spacing between WTG generators of 716 m x 480 m may be utilised at certain locations, however the SEZ layout reflects a realistic 'optimal' spacing of 1440 m x 1540 m for the 12 MW WTGs;
 - The layout is weighted to have the maximum number of WTGs located in the areas within the RLB, but outside the SEZ, that are closest to the coast. WTGs located in closer proximity to the coast will appear most prominent and largest in scale in views from land;
 - WTGs are also located 'behind' TOWF, because this is realistic - the layout is likely to have WTGs in the part of the site behind TOWF;

- WTGs are located towards the outer edges of site boundary to represent maximum lateral (horizontal) spread of WTGs in views; and
 - WTG locations are based on grid alignment (north-west to south-east) to represent realistic array deployment scenario.
- 6 The primary difference in the 12MW SEZ layout from the 12MW Rochdale Envelope layout considered in the ES, is the reduction in the offshore wind farm area to the west and north-west of the Thanet Offshore Wind Farm (TOWF).
- 7 The implications of the SEZ layout with regards to seascape, landscape and visual effects are considered further as follows in **Section 1.2**.

1.2 Structures Exclusion Zone Layout - Appraisal

- 8 A ZTV of the SEZ layout has been generated, as shown in **Figure 12.7_SEZ**, to demonstrate the theoretical visibility of WTGs in the Kent section of the study area (based on the maximum blade tip height of 250 m). When compared to the ZTV of the 12MW Rochdale Envelope layout considered in the ES (Figure 12.7,) there is very limited and no material change, in the extent of the ZTV of the SEZ layout compared to that of the ES Rochdale Envelope layout.
- 9 Wireline visualisations have been produced to enable comparison of the visual effects between the ES Rochdale Envelope layout and the SEZ Layout from key viewpoints. The viewpoints considered in the appraisal, and for which wirelines are included, represent those for which the EIA assessed a significant effect, those have been identified by Interested Parties as being most pertinent in their Local Impact Reports (LIRs) and those requested by the ExA at Issue Specific Hearing 4. All other viewpoints that were assessed as ‘not significant’ in the EIA will remain as such, with no risk of more significant effects being introduced by the SEZ layout.
- 10 Wirelines of the SEZ layout are shown in **Annex 1** of this appraisal for the following viewpoints:
- **Figure 12.27c_SEZ** Viewpoint 1, Reculver Country Park
 - **Figure 12.28c_SEZ** Viewpoint 2, Westbrook (Margate)
 - **Figure 12.30c_SEZ** Viewpoint 4, Kingsgate/North Foreland
 - **Figure 12.31b_SEZ** Viewpoint 5, Broadstairs Promenade
 - **Figure 12.32b_SEZ** Viewpoint 6, Wellington Crescent, Ramsgate
 - **Figure 12.34b_SEZ** Viewpoint 8, Sandwich Bay (Sandwich Bay Estate)

- **Figure 12.36c_SEZ** Viewpoint 10, St Margaret’s at Cliffe
- **Figure 12.37b_SEZ** Viewpoint 11, Joss Bay
- **Figure 12.38b_SEZ** Viewpoint 12, Stone Bay
- **Figure 12.39c_SEZ** Viewpoint 13, Foreness Point
- **Figure 12.40c_SEZ** Viewpoint 14 Walpole Bay (Margate)
- **Figure 12.41c_SEZ** Viewpoint 15 Birchington-on-Sea
- **Figure 12.42c_SEZ** Viewpoint 16 Manston Road, Isle of Thanet
- **Figure 12.43b_SEZ** Viewpoint 17 Broadstairs, Dumpton Gap
- **Annex A-2_SEZ** Viewpoint 1 Calais-Dover Ferry
- **Annex A-2_SEZ** Viewpoint 2 Calais-Dover Ferry

- 11 The wirelines are ordered so that the SEZ layout can be compared for each viewpoint against the ES Rochdale Envelope layout. Each viewpoint has the Rochdale Envelope layout wireline on the first page, followed by the SEZ layout wireline on the subsequent page, allowing comparison of the change in appearance.
- 12 On review of these wireline visualisations, it is evident that although the SEZ layout is unlikely to result in a significant effect viewpoint becoming not significant (with regards the EIA Regulations), the SEZ layout will result in additional mitigation of some of the key landscape and visual effects that are under consideration in this examination. These are described as follows.

Narrowing of lateral spread

- 13 The SEZ layout results in an overall narrowing of the lateral spread of the Offshore WTG Array viewed on the sea skyline.
- 14 This narrowing occurs at the western and north-western side of TOWF, where the lateral extent of the SEZ layout has been reduced, as a result of their being less WTGs in this area to the west and north-west of TOWF.
- 15 Particularly, this is evident in views from the north Kent/Thanet coast, such as Viewpoint 2 (Westbrook, Margate), 4 (Kingsgate), 11 (Joss Bay), 13 (Foreness Point), 14 (Walpole Bay) and 15 (Birchington-on-Sea).
- 16 The SEZ layout forms a relatively small lateral extension to the north-west of TOWF and would maintain more ‘open horizon’ between the existing TOWF and London Array Offshore Wind Farm.

- 17 The Thanet LCA (2017) recognises that views to the north from the ‘North Thanet Coast’ (G2) have more potential to proliferation and linking of OWFs along the Thames Estuary skyline. The relatively smaller lateral spread of TEOWF to the north-west of the existing TOWF ensures that the ‘open horizon’ is maintained between existing OWFs.

Reduced enclosure of Sandwich Bay

- 18 The Applicant understands that one of Dover District Council’s (DDC’s) principle concerns, as represented in Viewpoint 8 (Sandwich Bay Estate), relates to the northernmost turbines of the ES Rochdale Envelope layout creating a partial enclosure of Sandwich and Pegwell Bay.
- 19 The SEZ layout provides mitigation to reduce this effect. In particular, the narrowing at the western and north-western side of TOWF, where the lateral extent of the SEZ layout has been reduced, results in less enclosure of Sandwich and Pegwell Bay, as is evident when viewed from Viewpoint 8 (Sandwich Bay).
- 20 There is less enclosure because of the increased separation and distance of WTGs offshore from the coastal headland of Thanet that is visible in the view; and there is a wider area of open sea between the coast and the SEZ layout.
- 21 In the view from Viewpoint 8 Sandwich Bay, there is an area of sea skyline retained between the SEZ layout and the headland of Thanet, such that the SEZ layout is clearly ‘offshore’ and does not appear to be directly ‘linked’ to the terrestrial landform of Thanet and therefore avoids enclosure of the bay.

Increase in separation from the White Cliffs

- 22 The Applicant previously submitted a position statement considering the effect of the proposed development on views toward the White Cliffs from the sea (Appendix 2 to Deadline 3 Submission: Response to ExA Action Points arising from Issue Specific Hearing 4).
- 23 The ES Rochdale Envelope layout was identified as partly extending the spread of WTGs towards the White Cliffs, while still appearing clearly offshore and not appearing to ‘close off’ the seascape space between the cliffs and TOWF.

- 24 The SEZ layout provides further mitigation to reduce this effect. The SEZ layout will result in an increased separation and distance of WTGs offshore from the White Cliffs as viewed from terrestrial areas of the White Cliffs, such as Viewpoint 10 St Margaret's at Cliffe; and in views towards the White Cliffs from the sea, as represented by the Calais-Dover ferry (Annex A-2 Viewpoint 1). The SEZ layout results in a wider area of open sea between the White Cliffs and the Offshore WTG Array; and therefore reduces the effect of the Offshore WTG on views to and from the White Cliffs.
- 25 In views toward the White Cliffs from the sea, the cliffs will remain the primary focus and interest in the view owing to their large scale, dramatic form and colour.

Single row to fore of TOWF

- 26 The SEZ layout results in fewer WTGs around the western side of TOWF being visible to the fore of TOWF, when viewed from the closest areas to the SEZ around the north-east coast of Thanet.
- 27 This has the effect of reducing the prominence of the TOWF WTGs in these views, and the apparent scale difference between TOWF and the SEZ layout WTGs, as evident in Viewpoint 4 (Kingsgate), 5 (Broadstairs), 11 (Joss Bay), 12 (Stone Bay) and 13 (Foreness Point).
- 28 The SEZ layout results in a general reduction in scale and effect of WTGs arising to the north-west of TOWF, without actually leading to reduced level of magnitude of change or threshold of significance assessed for the ES Rochdale Envelope layout.

1.3 Summary

- 29 The SEZ layout, shown in **Figure 12.1_SEZ**, consists of 28 x 12MW WTGs sited entirely outwith the SEZ, but within the wind farm area of the offshore Red Line Boundary (RLB).
- 30 The primary difference in the 12MW SEZ layout from the 12MW Rochdale Envelope layout considered in the ES, is the reduction in the offshore wind farm area to the west and north-west of the Thanet Offshore Wind Farm (TOWF).
- 31 Viewpoints considered in the appraisal represent those for which the EIA assessed a significant effect, those have been identified by Interested Parties as being most pertinent in their Local Impact Reports (LIRs) and those requested by the ExA at Issue Specific Hearing ISH4.

- 32 On review of the wireline visualisations of the SEZ layout from these viewpoints, it is evident that although the SEZ layout is unlikely to result in reduced levels of overall significance on seascape, landscape and visual receptors (in EIA terms), the SEZ layout will result in additional mitigation of some of the key landscape and visual effects that are under consideration in this examination. In particular, the SEZ layout results in:
- an overall narrowing of the lateral spread of the Offshore WTG Array viewed on the sea skyline;
 - reduced cumulative effects by maintaining more ‘open horizon’ between the existing TOWF and London Array Offshore Wind Farm;
 - less ‘enclosure’ of Sandwich and Pegwell Bay when viewed from Sandwich Bay, due to the larger area of sea visible between the coast and the SEZ layout;
 - increase separation and therefore reduced effect on the White Cliffs in views toward the White Cliffs from the sea and as viewed from terrestrial areas of Dover;
 - a general reduction in prominence and scale differences of WTGs arising to the north-west from the closest areas of Thanet, when the SEZ layout WTGs are reduced in number around the western side of TOWF.
- 33 The SEZ layout does not change the ES assessment regarding the overall "shape" of the development. The SEZ layout still involves an ‘envelope’ or ‘doughnut’ form where the existing TOWF is contained inside Thanet Extension, with larger WTGs in front of and behind smaller WTGs. The change occurring from the SEZ layout will be a narrowing or tightening of this ‘envelope’ form on the western/north-western side of the Offshore WTG Array.
- 34 All other seascape, landscape and visual receptors that were assessed as ‘not significant’ in the EIA will remain as such, with no risk of additional significant seascape, landscape and visual effects being introduced by the SEZ layout.

THANET EXTENSION OFFSHORE WIND FARM

Figure 12.1a SEZ Structures Exclusion Zone Layout (28 x 12MW)

Legend

- Indicative WTG location
- ▲ Indicative Offshore Meteorological Mast
- Indicative Offshore Substation Platform
- ⋈ TOWF
- Offshore Red Line Boundary
- Structures Exclusion Zone

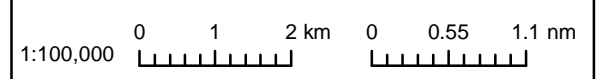
Turbine Coordinates
Projection: ETRS 1989 UTM Zone 31N

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5	403979	5694404
6	403043	5695493
7	402105	5696585
8	401167	5697677
9	400229	5698769
10	400333	5700770
11	405525	5694792
12	406471	5693704
13	408905	5692960
14	407962	5694046
15	401038	5702016
16	402057	5702900
17	409294	5694569
18	409846	5695991
19	404020	5702698
20	405481	5703012
21	406418	5701921
22	407356	5700830
23	408294	5699738
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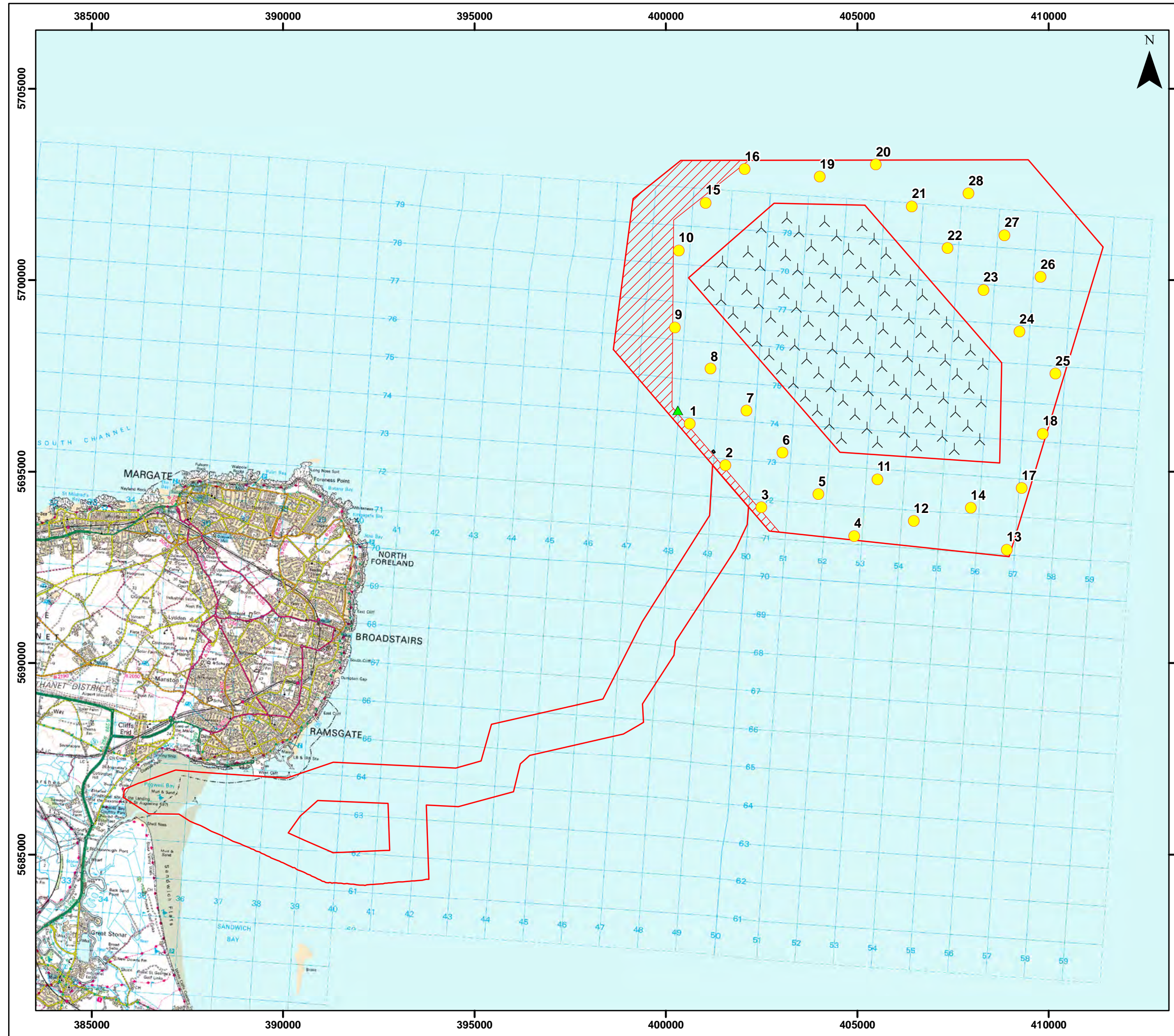
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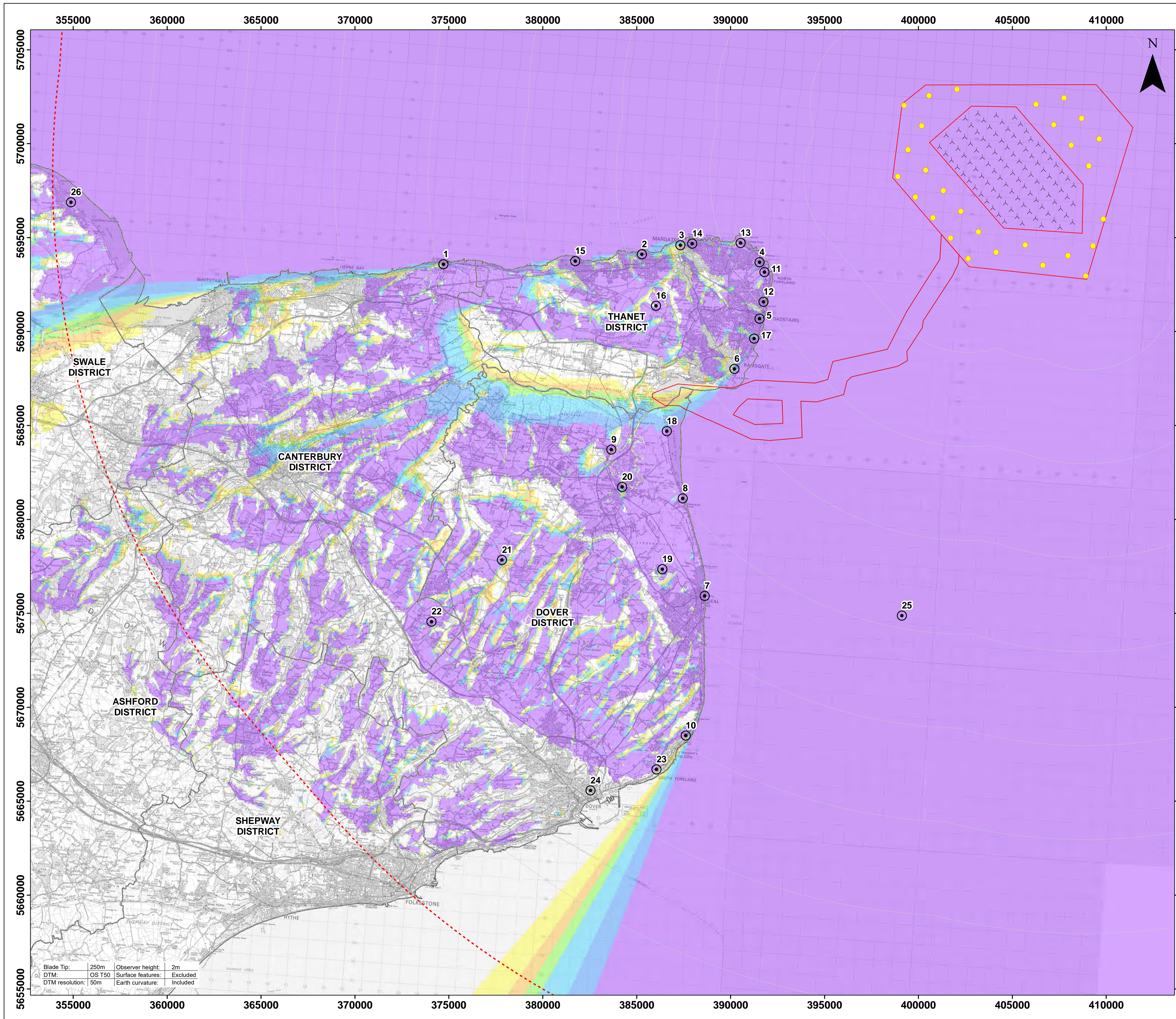


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Drg No	...1a_SEZ_Layout T28_12MW			Figure 12.1a SEZ
Rev	0.2	Date	01/04/2019	
By	JM	Layout	THET2018	





THANET EXTENSION OFFSHORE WIND FARM

Figure 12.7 Blade Tip ZTV - Kent

- Legend**
- Indicative WTG location
 - ⋈ TOWF
 - Offshore Red Line Boundary
 - 5km Radii
 - - - 45km SLVIA Study Area
 - Local Authority Boundary

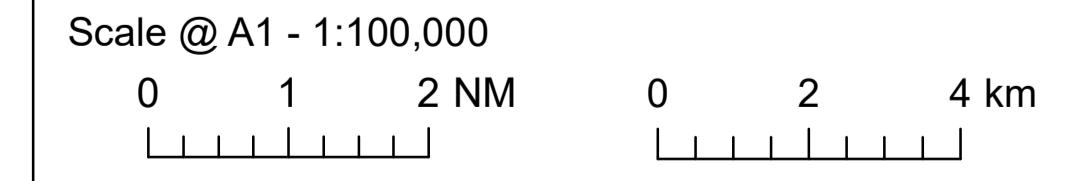
Blade Tip ZTV
No. of Blade Tips Visible

1 - 5	11 - 14	20 - 25
6 - 10	15 - 19	26 - 28

- ⊙ Viewpoint Location:
- 1 - Reculver Country Park, Thanet Coastal Path
 - 2 - West Brook POS (Margate)/Thanet Coastal Path
 - 3 - Margate Harbour Wall (Turner Arts Gallery)
 - 4 - Kingsgate/North Foreland, Coastal Path
 - 5 - Broadstairs Promenade
 - 6 - Wellington Crescent, Ramsgate
 - 7 - Deal Pier/Promenade
 - 8 - King's Avenue/Princes Drive, Sandwich Bay Estate
 - 9 - Richborough Castle
 - 10 - St. Margaret's at Cliffe (Coastguard Memorial)
 - 11 - Joss Bay/North Foreland
 - 12 - Stone Bay
 - 13 - Foreness Point/Palm Bay
 - 14 - Walpole Bay (Margate)
 - 15 - Birchington-on-Sea
 - 16 - Manston Road, Isle of Thanet
 - 17 - Broadstairs, Dumpton Gap
 - 18 - England Coastal Path, Sandwich Flats
 - 19 - Betteshanger Country Park
 - 20 - St Peter's Church, Sandwich
 - 21 - Chillenden Mill, PRoW
 - 22 - North Downs Way (Kent Downs AONB)
 - 23 - South Foreland Lighthouse
 - 24 - Dover Castle
 - 25 - Trinity Beacon, Goodwin Sands
 - 26 - Leysdown on Sea / Warden, Isle of Sheppy

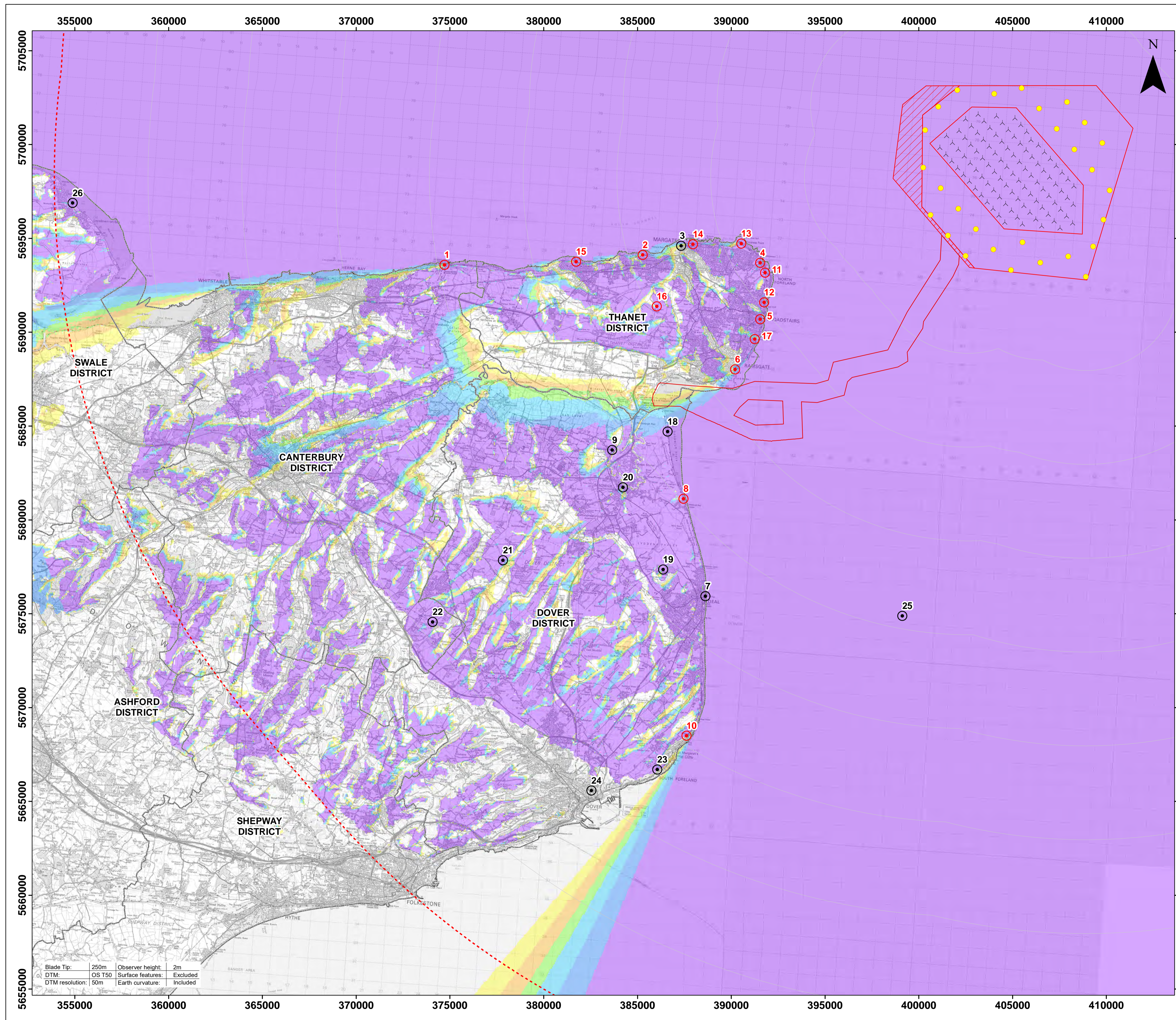


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Drg No	..IA_Fig12-7_ZTV_BT_Kent_A1	Figure 12.7	
Rev	0.2	Date	17/05/2018
By	JM	Layout	THET2018

Blade Tip: 250m Observer height: 2m
 DTM: OS T50 Surface features: Excluded
 DTM resolution: 50m Earth curvature: Included



THANET EXTENSION OFFSHORE WIND FARM

Figure 12.7 SEZ Blade Tip ZTV - Kent

- Legend**
- Indicative WTG location
 - ⋈ TOWF
 - Offshore Red Line Boundary
 - ▨ Structures Exclusion Zone
 - 5km Radii
 - ⋯ 45km SLVIA Study Area
 - Local Authority Boundary

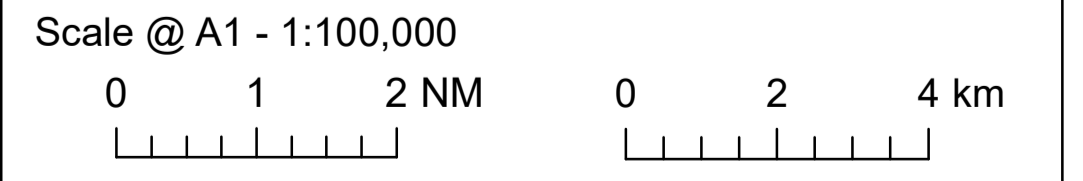
Blade Tip ZTV
 No. of Blade Tips Visible

1 - 5	11 - 14	20 - 25
6 - 10	15 - 19	26 - 28

- ⊙ Viewpoint Location:
- 1 - Reculver Country Park, Thanet Coastal Path
 - 2 - West Brook POS (Margate)/Thanet Coastal Path
 - 3 - Margate Harbour Wall (Turner Arts Gallery)
 - 4 - Kingsgate/North Foreland, Coastal Path
 - 5 - Broadstairs Promenade
 - 6 - Wellington Crescent, Ramsgate
 - 7 - Deal Pier/Promenade
 - 8 - King's Avenue/Princes Drive, Sandwich Bay Estate
 - 9 - Richborough Castle
 - 10 - St. Margaret's at Cliffe (Coastguard Memorial)
 - 11 - Joss Bay/North Foreland
 - 12 - Stone Bay
 - 13 - Foreness Point/Palm Bay
 - 14 - Walpole Bay (Margate)
 - 15 - Birchington-on-Sea
 - 16 - Manston Road, Isle of Thanet
 - 17 - Broadstairs, Dumpton Gap
 - 18 - England Coastal Path, Sandwich Flats
 - 19 - Betteshanger Country Park
 - 20 - St Peter's Church, Sandwich
 - 21 - Chillenden Mill, PRoW
 - 22 - North Downs Way (Kent Downs AONB)
 - 23 - South Foreland Lighthouse
 - 24 - Dover Castle
 - 25 - Trinity Beacon, Goodwin Sands
 - 26 - Leysdown on Sea / Warden, Isle of Sheppy



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Blade Tip:	250m	Observer height:	2m
DTM:	OS T50	Surface features:	Excluded
DTM resolution:	50m	Earth curvature:	Included

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Rev	0.2	Date	05/04/2019
By	JM	Layout	THET2018