CONTENTS

25 NOISE, DUST AND AIR QUALITY

25.1 Introduction

This section sets out the existing environment and the potential impacts from air emissions during the construction, operation and decommissioning of the onshore cable and substation extension works for the Thanet Offshore Wind Farm (Thanet) project. In addition, potential noise impacts from the construction activities associated with the offshore elements of the wind farm are also discussed.

25.2 Assessment Methodology

25.2.1 Noise

Construction

The assessment of noise from construction activities has been undertaken following British Standard (BS) 5228: 'Noise and Vibration Control on Construction and Open Sites'. This guidance provides the methodology for undertaking calculations of the potential noise emissions from a site or activity.

The calculation procedure and data used for the estimation of the potential noise emissions during construction activities are provided. The items of equipment identified may alter after appointment of the Installation Contractor, due to alterations in working methods etc. However, a precautionary approach has been taken in the prediction work, such that the assumed 'on-time'[1] for construction plant is high. This results in a predicted noise level that is likely to exceed the actual level that would occur during construction. The results provide a good indication of the potential sensitivity of noise receptors during the construction phase.

Operation

The assessment of noise levels resulting from the operation of the substation extension, the only part of the onshore development that would potentially have any noise emissions, follows British Standard (BS) 4142: 'Rating Industrial Noise Affecting Mixed Residential and Industrial Areas'. This guidance provides the methodology for undertaking calculations of the potential noise emissions from a site or activity, as well as the levels indicative of significance of any potential impact. The substation extension is not, however, expected to emit noise at significant levels, as there would be no requirement for transformers in these works.

25.2.2 Dust and air quality

The assessment of dust and air quality impacts has been undertaken on the basis of professional expertise, and experience of similar projects elsewhere. No direct emissions other than vehicle exhausts would be generated.

25.3 Existing Environment

25.3.1 Noise

The area of the onshore cable route is a predominantly rural environment, with road traffic from the A256 Sandwich Road providing the only significant contribution to background noise levels. Residential properties are situated close to the cable route in the village of Cliffs End and at Little Cliffsend Farm. Potential non-residential receptors include users of the St. Augustine's Golf Course, Stonelees Golf Course and the Pegwell Bay NNR and Country Park. The estimated distances of sensitive receptors from the cable route are presented in **Table 25.1**. The table shows the distance in metres, from the cable route to the front of the nearest building at each receptor site, the distance to the furthest building and the median distance between the two.

Table 25.1 Distance of residential receptors from the onshore cable route

Location	Distance from Cable Route		
	Nearest	Median	Furthest
Little Cliffsend Farm	267m	353.5m	440m
Cliffs End Village	23m	281.5m	540m

25.3.2 Dust and air quality

The semi-rural to rural nature of the area limits the likely emissions to air to those associated with road traffic, primarily influenced by vehicles passing along the A256 Sandwich Road.

25.4 Impacts during Construction

25.4.1 Impacts due to noise

Noise during construction associated with the cable installation would predominantly result from the following construction plant activities:

- Excavation of the cable trench;
- Placement of cables and connecting works;
- Burying cables;
- Resurfacing works by a variety of construction vehicles; and
- Directional drilling if required.

The only construction activity associated with the wind farm that could have a significant effect on sensitive receptors such as residences is noise from the installation of driven monopiles, resulting in a potential low frequency impulsive 'thump' sound.

Cable installation

Table 25.2 presents a list of the predicted machinery to be used on site during construction, and the levels of noise emitted. This work would take place during normal working hours.

Table 25.2 Construction equipment and machinery - total noise emitted at 10m

Vehicles/Plant	BS5228 Reference Table	Assessment Period	dB L_{Aeg} at 10m	On-time (%)	dB L_{Aeg} at 10m corrected for on–time
Dozer (ground excavation)	C.3.no.28	12 hour	92	50	89
Dump truck	C.3.no.60	12 hour	82	75	80
Wheeled excavator/loader	C.3.no.61	12 hour	76	75	74
Trucks x2	C.3.no.44	12 hour	84	40	80
Directional Drilling Rig (if required)		12 hour	76	100	76
Maximum Noise Emission					**90**

Table 25.3 presents the predicted daytime noise levels for receptors in the area of the cable laying activities.

Table 25.3 Predicted daytime receiver noise levels

Name	Receiver Noise Level (dB $L_{Aeq, 12hr}$)		
	Nearest	Median	Furthest
Little Cliffsend Farm	56	53	51
Cliffs End Village	83	56	49
100m from site	67	-	-
150m from site	63	-	-
200m from site	59	-	-
250m from site	57	-	-

Note: the attenuated noise levels shown do not include for extra attenuating effects of trees, houses and other potential shielding.

The results of the calculations show that construction noise levels are generally within the range of 49dB(A) to 67dB(A), except at the receptors nearest to the construction works where, for short periods, levels of up to 83dB(A) may be experienced. The Department of the Environment's 'Advisory Leaflet on Potential Impacts of Construction Noise' (AL72) gives a maximum level for noise at the façade of an occupied building as 70dB(A).

High levels of noise associated with the excavation works are predicted at the Cliffs End houses nearest to the A256 Sandwich Road, although this would only be for very short periods when the trenching works are closest.

Consent under Section 61 of the Control of Pollution Act (1974) would be sought from the Local Authority. The consent could include the following mitigation measures:

- All relevant residents within 200m of the works would be informed in writing in advance of the proposed works commencing. This information would include a timetable of works, a schedule of working hours, the extent of works, and a contact name, address and telephone number in case of complaint or problem;
- An information board would be displayed at the site to provide a contact name and telephone number, to which the public can channel their queries, any problems would be attended to as soon as possible;
- Standard noise limits would be applied, as recommended in BS 5228 Parts 1, 2 and 4 BSI, 1997 and 1992, respectively. All plant and machinery would meet the relevant British Standards i.e. all equipment would be maintained in good working order and fitted with the appropriate silencers, mufflers or acoustic covers;
- The movement of vehicles to and from the site would be controlled, and vehicle engines would not be revved or allowed to idle near residential property;
- All personnel involved in the construction works would be made aware of the need to keep noise to a minimum through appropriate training;
- Potentially noisy activities would be kept as far away as possible from noise sensitive locations;
- Equipment that directs noise in a certain direction would be oriented so that the noise that it emits travels away from the noise sensitive sites;
- Equipment would not be left running between work periods;
- Materials would be lowered rather than dropped; and
- Liaison with the Environmental Health Officer would be undertaken to determine acceptable noise limits.

The properties closest to the excavations would experience noise at a level of 83dB (A), 13dB(A) above the limit set in AL72. Although this high level would be experienced at a number of residential dwellings fronting onto the A256 Sandwich Road, they would occur for a very short duration when works are immediately adjacent to the receptors. The levels would decrease significantly with increasing distance. With the implementation of the mitigation measures, and the restriction of activities to normal working hours, an impact of short term nature and of **minor** to **moderate adverse**

significance is predicted to occur while the works associated with cable laying are in the vicinity of Cliffs End.

Any other noisy activities on land, such as those associated with the use of the facilities at the Port of Ramsgate, would be controlled by the Local Planning Authority under the Control of Pollution Act. It is not possible to undertake a quantitative assessment due to the unknown nature of any noise in the area.

Installation of driven monopiles

BS 5228: Part 1: 1997 'Noise and vibration control on construction and open sites' is the Standard normally used to assess the impacts of construction noise upon nearby residential properties, which are considered to be the most sensitive receptor. Given the distance of the wind farm offshore and the distance over which the noise is expected to propagate means that any prediction of site based noise at residential receivers will be extremely unreliable. The Standard states, *"At distances over 300m, noise predictions should be treated with caution…because of the increasing importance of meteorological effects"*. It is probable that more local sources of noise would tend to dominate and influence the ambient noise climate near the receivers.

The following simple, standard calculation can be used to show that with source noise levels of 120 dB(A) L_{eq} from the piling operations, receiver noise levels at landfall some 11km away would be in the region of 31 dB(A), assuming hemispherical propagation of the noise over a hard reflecting surface.

Sound pressure level @ receiver dB(A):

= sound power level - 20 Log_{10} (Distance) – 8

= 120 – 20 Log_{10} (11,000 m) - 8

= **31 dB(A) L_{eq}**

These noise levels would be well below normal rural background (L_{A90}) noise levels in the UK, which are normally in a range from the 35-45 dB(A). In addition, the UK is predominantly subject to southerly or southwesterly winds, which would tend to significantly reduce noise levels upwind of the source.

It may be possible, under extremely calm conditions and with a temperature inversion or with a gentle prevailing easterly wind that the low frequency impulsive 'thump' associated with this type of activity, would be audible at these distances. However, the energy level and hence perceived loudness of any received noise would be very low indeed and would certainly not be the cause of nuisance.

Other construction activities would tend to be 5-30dB quieter than the piling noise and will not possess the intrusive, impulsive noise of pile driving. These other construction noises are unlikely to be audible, or the cause of nuisance on land, at distances exceeding 11km, under normal meteorological conditions. Other closer construction activities include use of the cable plough across Pegwell Bay, however, due to the short term nature of this activity it is not anticipated that this noise would be intrusive. Overall, the noise impacts associated with the construction of the wind farm are anticipated to be **negligible**.

25.4.2 Impacts on dust and air quality

Emissions of pollutants to air from construction vehicles are dependent on the number of vehicles present, the extent or on time of use, and the condition of the vehicles. As all vehicles would conform to road standards, as well as the British Standards identified in BS5228, the emissions from these vehicles would be no worse than for Heavy Goods Vehicles. As it is envisaged that the number of vehicles used on site at any one time would be less than ten, only limited emissions would be expected to occur. Although some properties are situated close to the works, the low number of vehicle movements involved and the short term nature of the works, indicate that impacts on air quality would be of **negligible** significance.

As the trenching work would mainly be carried out along the A256 Sandwich Road, it is anticipated that the potential for significant release of dust and particulate matter is limited. However, due to the exposure of bare soil during the works, there is a potential for dust to be emitted to the atmosphere, causing nuisance to residents. Release of dust can occur during periods of dry weather, and in instances where large areas of soil are exposed. If works are undertaken in dry weather, water spraying would be undertaken if necessary on bare disturbed areas in order to minimise the potential emission of dust into the air. Given these measures, and due to the short term nature of the works and the limited quantities of soil to be disturbed, an impact of **negligible** significance is predicted.

25.5 Impacts during Operation

25.5.1 Impacts due to noise

Substation

The proposed substation extension at the disused Richborough Power Station would be the only potential source of noise associated with the operation of the Thanet project. As the substation extension is located within the grounds of the disused power station, a substantial distance from the nearest sensitive receptor at 590m away, and does not require transformers, it is anticipated that operational noise from the substation extension would have **no impact** on background noise levels in the area.

Operational wind farm

Given the distance of the turbines offshore, there would be **no impact** on sensitive noise receptors from the operation of the wind turbines.

25.5.2 Impacts on dust and air quality

There would be **no impact** on dust and air quality once the Thanet project is operational.

25.6 Impacts during Decommissioning

It is anticipated that, when the Thanet project is decommissioned, the cables would be disconnected from the substation extension and left in situ. No disturbance would occur and, therefore, **no impact** in the form of increased noise and dust and decreased air quality would occur.

25.7 Summary

Noise during the construction phase of the onshore cable route could arise from plant and machinery involved in the excavation of the cable trench. There are a number of sensitive receptors in the form of residents of the village of Cliffs End that front onto the A256 Sandwich Road, which comprises the onshore cable route. Exposure to elevated noise levels at these locations is anticipated for the very short duration while excavation works are adjacent to the receptor. The levels would decrease significantly with increasing distance.

Given the implementation of the construction noise mitigation measures, including daytime working within normal working hours and liaison with local residents who would potentially be affected, a highly localised **minor adverse** impact is anticipated.

The only construction activity associated with the wind farm that could have a significant effect on sensitive receptors such as residences is noise from the installation of driven monopiles, resulting in a potential low frequency impulsive 'thump' sound. A standard noise calculation can be used to show that receiver noise levels at landfall, some 11km away, would be well below normal rural background noise levels in the UK, which are normally in a range of 35-45 dB(A).

Impacts of **negligible** significance are anticipated during construction.

No impact on either noise or air quality is anticipated during either the operational or decommissioning phases of the Thanet project.