East Anglia ONE North Offshore Windfarm

Appendix 19.3

Construction Dust and Fine Particulate Matter Assessment Methodology

Environmental Statement
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Glossary of Acronyms

HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
PM_{10}	Particulate Matter with a mean aerodynamic diameter of less than 10 µm
PRoW	Public Rights of Way
SAC	Special Area of Conservation
SPA	Special Protected Area
SSSI	Site of Special Scientific Interest

Glossary of Terminology

Applicant	East Anglia ONE North Limited.
Cable sealing end compound	A compound which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Cable sealing end (with circuit breaker) compound	A compound (which includes a circuit breaker) which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Construction consolidation sites	Compounds associated with the onshore works which may include elements such as hard standings, lay down and storage areas for construction materials and equipment, areas for vehicular parking, welfare facilities, wheel washing facilities, workshop facilities and temporary fencing or other means of enclosure.
Development area	The area comprising the onshore development area and the offshore development area (described as the 'order limits' within the Development Consent Order).
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia ONE North windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
HDD temporary working area	Temporary compounds which will contain laydown, storage and work areas for HDD drilling works.
Jointing Bay	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers within the onshore cable route housing electrical earthing links.
Mitigation areas	Areas captured within the onshore development area specifically for mitigating expected or anticipated impacts.

National electricity grid	The high voltage electricity transmission network in England and Wales owned and maintained by National Grid Electricity Transmission
National Grid infrastructure	A National Grid substation, cable sealing end compounds, cable sealing end (with circuit breaker) compound, underground cabling and National Grid overhead line realignment works to facilitate connection to the national electricity grid, all of which will be consented as part of the proposed East Anglia ONE North project Development Consent Order but will be National Grid owned assets.
National Grid overhead line realignment works	Works required to upgrade the existing electricity pylons and overhead lines (including cable sealing end compounds and cable sealing end (with circuit breaker) compound) to transport electricity from the National Grid substation to the national electricity grid.
National Grid overhead line realignment works area	The proposed area for National Grid overhead line realignment works.
National Grid substation	The substation (including all of the electrical equipment within it) necessary to connect the electricity generated by the proposed East Anglia ONE North project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia ONE North project Development Consent Order.
National Grid substation location	The proposed location of the National Grid substation.
Natura 2000 site	A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.
Onshore cable corridor	The corridor within which the onshore cable route will be located.
Onshore cable route	This is the construction swathe within the onshore cable corridor which would contain onshore cables as well as temporary ground required for construction which includes cable trenches, haul road and spoil storage areas.
Onshore cables	The cables which would bring electricity from landfall to the onshore substation. The onshore cable is comprised of up to six power cables (which may be laid directly within a trench, or laid in cable ducts or protective covers), up to two fibre optic cables and up to two distributed temperature sensing cables.
Onshore development area	The area in which the landfall, onshore cable corridor, onshore substation, landscaping and ecological mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located.
Onshore infrastructure	The combined name for all of the onshore infrastructure associated with the proposed East Anglia ONE North project from landfall to the connection to the national electricity grid.
Onshore preparation works	Activities to be undertaken prior to formal commencement of onshore construction such as pre–planting of landscaping works, archaeological investigations, environmental and engineering surveys, diversion and laying of services, and highway alterations.

Onshore substation	The East Anglia ONE North substation and all of the electrical equipment within the onshore substation and connecting to the National Grid infrastructure.
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia ONE North project.
Transition Bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.

19.3 Construction Phase Dust and Fine Particulate Matter Assessment Methodology

1. The following appendix outlines criteria developed by the Institute of Air Quality Management (IAQM 2014) for the assessment of air quality impacts arising from construction activities relating to the proposed East Anglia ONE North project. The assessment procedure is divided into five steps and is summarised below.

19.1 Step 1: Screening the need for a Detailed Assessment

2. An assessment will normally be required where there are human receptors within 350m of the site boundary and/or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s). Ecological receptors within 50m of the site boundary or within 50m of the route(s) used by construction vehicles on the public highway, and up to 500m from the site entrance(s), are also considered at this stage. An ecological receptor refers to any sensitive habitat (which could be affected by dust soiling). For locations with a statutory designation, such as a Site of Specific Scientific Interest (SSSI), Special Area of Conservation (SACs) or Special Protection Areas (SPAs), consideration should be given as to whether the particular site is sensitive to dust. Some non-statutory sites may also be considered if appropriate.

3. Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is 'negligible'.

4. There are human receptors within 350m of the boundary of the onshore infrastructure, but no ecological receptors within 50m (***Figure 19.5***). A Detailed Assessment is therefore required to consider the potential for impacts at human receptors.

19.2 Step 2: Assess the Risk of Dust Impacts

5. A site is allocated to a risk category on the basis of the scale and nature of the works (Step 2A) and the sensitivity of the area to dust impacts (Step 2B). These two factors are combined in Step 2C to determine the risk of dust impacts before the implementation of mitigation measures. The assigned risk categories may be different for each of the four construction activities outlined by the IAQM (demolition, construction, earthworks and trackout).

6. The site can also be divided into zones, for example on a large site where there are differing distances to the nearest receptors.

19.2.1 Step 2A: Define the Potential Dust Emission Magnitude

7. The IAQM guidance recommends that the dust emission magnitude is determined for earthworks, construction and trackout. The dust emission magnitude is based on the scale of the anticipated works. ***Table A19.1*** describes the potential dust emission class criteria for each outlined construction activity. As there is not expected to be any demolition undertaken during the construction phase, impacts associated with demolition have not been considered within the assessment.

Table A19.1 Criteria Used in the Determination of Dust Emission Magnitude

Activity	Criteria used to Determine Dust Emission Class		
	Small	Medium	Large
Earthworks	Total site area <2,500m^2 Potentially dusty soil type (e.g. clay)	Total site area 2,500 – 10,000m^2 Moderately dusty soil type (e.g. silt)	Total site area >10,000m^2 Soil type with large grain size (e.g. sand)
Construction	Total building volume <25,000m^3	Total building volume 25,000 – 100,000m^3	Total building volume >100,000m^3
Trackout	<10 outward Heavy Goods Vehicle (HGV) trips in any one day. Unpaved road length <50m	10-50 outward HGV trips in any one day. Unpaved road length 50-100m	>50 outward HGV trips in any one day. Unpaved road length >100m

8. The potential dust emission magnitude for the proposed East Anglia ONE North project was determined using the criteria detailed in ***Table A19.2.***

19.2.2 Step 2B: Define the Sensitivity of the Area

9. The sensitivity of the area takes into account the following factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of receptors;
- The local background PM_{10} concentration; and
- Site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of windblown dust.

Table A19.2 Criteria for Determining Sensitivity of Receptors

Sensitivity of Receptor	Criteria for Determining Sensitivity (Human Receptors)	
	Dust Soiling Effects	Health Effects of PM10
High	Dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms	Residential properties, hospitals, schools and residential care homes
Medium	Parks, places of work	Office and shop workers not occupationally exposed to PM10
Low	Playing fields, farmland, footpaths, short-term car parks and roads	Public Rights of Way (PRoWs), playing fields, parks and shopping streets

10. The criteria detailed in ***Table A19.3*** and ***Table A19.4*** were used to determine the sensitivity of the area to dust soiling effects and human health impacts. ***Figure 19.4*** details the distance bands, as detailed in ***Table A19.3*** and ***Table A19.4***, from the site boundary for use in the construction phase assessment.

Table A19.3 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table A19.4 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentrations	Number of Receptors	Distance from Source (m)				
			<20	<50	<100	<200	<350
High	>32µg.m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	>28-32µg.m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	>24-28µg.m^3	>100	High	Medium	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} Concentrations	Number of Receptors	Distance from Source (m) <20	<50	<100	<200	<350
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	>24µg.m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

19.2.3 Step 2C: Define the Risk of Impacts

11. The dust emission magnitude and sensitivity of the area are determined by the risk of impacts from each activity (earthworks, construction and trackout) should be determined using the criteria detailed in ***Table A19.5*** to ***Table A19.7***

Table A19.5 Risk of Dust Impacts- Earthworks

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table A19.6 Risk of Dust Impacts- Construction

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table A19.7 Risk of Dust Impacts- Trackout

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

12. The dust emission magnitude is combined with the sensitivity of the area to determine the risk of impacts with no mitigation applied.

19.3 Step 3: Site Specific Mitigation

13. Step three of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to whether the site is a low, medium or high-risk site. Mitigation for the proposed East Anglia ONE North project is detailed in ***section 19.6*** of ***Chapter 19 Air Quality*****.**

19.4 Step 4: Determine Significant Effects

14. With the implementation of mitigation measures (outline in ***section 19.3*** and ***section 19.6*** of ***Chapter 19 Air Quality***), the residual impacts from the construction phase are considered to be **not significant**, in accordance with IAQM guidance.

19.5 References

Institute of Air Quality of Management (IAQM), (2014) Guidance on the Assessment of Dust from Demolition and Construction.

Annex 1 Traffic Data

A summary of the traffic data used in the air quality assessment are detailed in the table below.

Link	Link Description	2018 base		Future Baseline 2023 'Without Project'		Project Alone Assessment 2023 'With Project'		Scenario 1[1] 2023 'With Projects'		Future Baseline 2026 'Without Projects'	
		AADT	HGV	AADT	HGV	AADT	HGV	AADT	HGV	AADT	HGV
1	A12 north of the B1122	12,598	999	13,529	1,058	13,803	1,223	13,876	1,270	14,111	1,095
2	A12 between the B1122 and A1094	11,279	976	12,111	1,033	12,335	1,198	12,392	1,245	12,632	1,070
3	A12 south of the A1094	17,208	1,046	18,485	1,107	18,765	1,272	18,840	1,320	19,284	1,147
4	B1122 from the A12 to Lover's Lane	2,589	190	2,772	201	2,989	291	3,051	321	2,887	208
6	A1094 from the A12 to the B1121/B1069	7,523	397	8,082	420	8,349	582	8,416	622	8,432	435
9	B1069 from the A1094 to Coldfair Green	4,525	185	4,846	196	5,258	363	5,367	404	5,049	203
11	Lover's Lane	1,862	159	1,993	168	2,206	258	2,261	288	2,079	174
12	Sizewell Gap	2,655	82	2,844	87	3,057	177	3,112	207	2,963	90

[1] Scenario 1 refers to the cumulative scenario of constructing the proposed East Anglia TWO project and the proposed East Anglia ONE North project simultaneously. Please refer to ***Appendix 19.2*** for details of the cumulative assessment.

Annex 2 Background Pollutant Concentrations

Background pollutant concentrations obtained from 2019-based Defra mapping at each receptor considered in the assessment are detailed in the table below.

Receptor	Grid Square	Background Pollutant Concentration (µg.m^{-3})					
		2023			2026		
		NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R1	635500,259500	7.12	13.82	8.41	6.53	13.51	8.14
R2	634500,258500	7.18	14.81	8.71	6.60	14.50	8.45
R3	635500,260500	6.88	13.70	8.32	6.34	13.38	8.06
R4	639500,268500	7.02	13.71	8.34	6.45	13.40	8.08
R5	639500,268500	7.02	13.71	8.34	6.45	13.40	8.08
R6	640500,269500	6.94	15.10	8.60	6.38	14.79	8.33
R7	640500,269500	6.94	15.10	8.60	6.38	14.79	8.33
R8	637500,263500	7.07	14.25	8.56	6.51	13.93	8.30
R9	640500,268500	6.67	13.82	8.23	6.16	13.51	7.97
R10	641500,267500	6.54	14.53	8.40	6.05	14.22	8.14
R11	646500,262500	6.55	13.30	8.11	6.07	12.99	7.85
R12	645500,262500	7.00	13.75	8.37	6.49	13.43	8.11
R13	639500,259500	6.86	14.21	8.47	6.31	13.90	8.21
R14	637500,260500	7.28	15.00	8.69	6.66	14.69	8.43
R15	643500,260500	6.56	13.12	8.08	6.06	12.81	7.82
R16	643500,260500	6.56	13.12	8.08	6.06	12.81	7.82
R17	643500,265500	6.51	14.28	8.36	6.02	13.96	8.09

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