

Air Quality Representation

Offshore Windfarms

East Anglia ONE North: PINS Ref: EN010077

East Anglia TWO: PINS Ref: EN020078

Client: SEAS

Reference: 4242-2r1

Date: 29th January 2021



Report Issue

Report Title: Air Quality Representation - Offshore Windfarms

Report Reference: 4242-2

Report Version	Issue Date	Issued By	Comments
1	29 th January 2021	Jethro Redmore	-

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Table of Contents

1.0	INTRODUCTION	1
1.1	Author	1
1.2	Scope of Report	1
2.0	AREAS OF CONCERNS	3
2.1	Introduction	3
2.2	Issue 1	3
2.3	Issue 2	4
2.4	Issue 3	5
2.5	Issue 4	5
2.6	Issue 5	6
3.0	SUMMARY	8

1.0 INTRODUCTION

1.1 Author

1.1.1 My name is Jethro Redmore and I am a Director at Redmore Environmental Ltd. I hold a BEng in Energy Engineering from Leeds University and a MSc in Environmental Pollution Control, also from Leeds University. I am a Chartered Environmentalist (CEnv), a Member of the Institute of Air Quality Management (MIAQM), a Member of the Institute of Environmental Sciences (MIEnvSc) and a Practitioner of the Institute of Environmental Management and Assessment (PIEMA). I have previously sat on the council of the IAQM and been involved in working groups for the production of technical guidance. In my role as Director at Redmore Environmental I am responsible for directing the air quality assessments undertaken by the company. I was previously employed as Associate Director by Resource and Environmental Consultants Ltd, Senior Air Quality Consultant by Hyder Consulting, Senior Air Quality Consultant by WYG and Air Quality Technician by RPS.

1.1.2 I have worked as a professional environmental scientist for approximately 16 years. I have been responsible for conducting environmental studies for major road improvement and construction schemes, power stations, oil refineries and other large industrial complexes. In addition, I have carried out numerous air quality assessments of mineral, residential and retail proposals, as well as providing specialist advice in the field of air quality and odour to Local Authorities and National Environmental Agencies.

1.1.3 I have undertaken air quality assessments for a wide variety of energy projects, from single diesel generators to advanced thermal treatment plants. These studies have been carried out for Environmental Statements, planning applications and to investigate potential nuisance issues, and have often made reference to relevant industry guidance produced by the Department for Environment, Food and Rural Affairs (DEFRA) and the IAQM, amongst others.

1.2 Scope of Report

1.2.1 Redmore Environmental Ltd was commissioned by SEAS to comment on the application for development consent for the East Anglia ONE North and East Anglia TWO Offshore Windfarms.

1.2.2 The proposals have the potential to cause atmospheric emissions with associated impacts on existing air quality. These have been considered by Royal HaskoningDHV in the following main documents:

- Preliminary Environmental Information - Chapter 19: Air Quality;
- Environmental Statement Chapter 19: Air Quality and associated appendices;
- Clarification Note dated 2nd November 2020; and,
- Air Quality Deadline 3 Clarification Note dated 15th December 2020.

1.2.3 Air quality matters are also covered by submissions by East Suffolk Council (ESC), Suffolk County Council and SEAS, amongst others.

1.2.4 The relevant documents were reviewed in order to provide consideration of the robustness of the air quality assessment and to identify any areas of concern. Our findings are detailed in the following report.

1.2.5 It should be noted that all Royal HaskoningDHV submissions are intrinsically linked, with the specific issues being explored in differing levels of detail throughout the various documents. They have therefore been considered as one for the purpose of this review (the Air Quality Assessment). Additionally, although separate applications have been made for East Anglia ONE North and East Anglia TWO, the Air Quality Environmental Impact Assessments (EIAs) cover both proposals and therefore have not been considered separately.

2.0 AREAS OF CONCERNS

2.1 Introduction

2.1.1 Following review of baseline conditions throughout the study area and the submitted Air Quality Assessment, the following five areas of concern have been identified which are relevant to both applications:

- Issue 1 - Air quality impacts associated with vessel emissions have not been considered;
- Issue 2 - Air quality impacts associated with ammonia (NH₃) emissions from road traffic and non-road mobile machinery (NRMM) have not been considered;
- Issue 3 - Optimistic assumptions have been adopted in regards generator exhaust positioning within the assessment of NRMM and haul road emissions;
- Issue 4 - The results of the sensitivity analysis of exhaust emission reduction and how these affect predicted pollutant concentrations have not been given any weight when determining the significance of air quality effects; and,
- Issue 5 - As covered separately by SEAS, a number of cumulative developments have not been considered within the Air Quality Assessment.

2.1.2 The above issues are discussed further in the following Sections.

2.2 Issue 1

2.2.1 Air quality impacts associated with vessel emissions have not been considered. Shipping is a significant source of atmospheric emissions, particularly oxides of nitrogen (NO_x), sulphur dioxide (SO₂) and particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀). As such, the additional movements associated with the transport of materials to allow construction of the wind turbines in offshore locations have the potential to impact on air quality at both human and ecological receptors. However, as these have not been considered, it is not possible to determine whether the effects are likely to be significant in accordance with the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations (2017).

2.3 **Issue 2**

2.3.1 Air quality impacts associated with NH₃ emissions from road traffic NRMM have not been considered.

2.3.2 In petrol vehicles, NO_x emissions are typically controlled using a three-way catalyst, which is designed to oxidise hydrocarbons and carbon monoxide to form water and carbon dioxide while reducing NO_x to form unreactive nitrogen. However, if the conditions for these reactions are not optimal, then nitric oxide (NO) can be reduced to NH₃, which is emitted via the exhaust gases. This typically occurs when an engine runs with a high fuel to air ratio, which is often when engines are cold and/or under particularly heavy load. In diesel vehicles, NO_x emissions are typically controlled using either a Lean NO_x Trap (LNT) or Selective Catalytic Reduction (SCR). The LNT requires the periodic removal of stored NO_x by operating with excess fuel. This can result in NO being reduced to NH₃. SCR relies on deliberately generating NH₃. For example, the additive AdBlue is composed of urea in water, which is injected into the exhaust system. The NH₃ then reacts with NO_x, but it is possible for unreacted NH₃ to 'slip' and join the exhaust gases.

2.3.3 Emissions of NH₃ have been shown to contribute between 40% and 70% of the road increment of nitrogen deposition¹. This is likely to increase in the future as NO_x emission standards are tightened in accordance with current legislation and a greater number of vehicles use the methods outlined above to control releases.

2.3.4 Without consideration of road vehicle and NRMM emissions in the assessment, impacts at ecological receptors in terms of increased NH₃ concentrations, nitrogen deposition and acid deposition, may be significantly underestimated. This is of particular concern in relation to results presented within the Air Quality Deadline 3 Clarification Note produced by Royal HaskoningDHV², which indicates exceedences of the relevant critical loads for the protection of sensitive habitats at the Leiston-Aldeburgh Site of Special Scientific Interest (SSSI) and Sandlings Special Protection Area (SPA) without NH₃ emissions included within the results. Should these emissions be considered then substantially greater exceedences of the relevant standards would be predicted. This may affect both the

¹ Ammonia Emissions from Roads for Assessing Impacts on Nitrogen-sensitive Habitats, Air Quality Consultants Ltd, 2020.

² Air Quality Deadline 3 Clarification Note, Royal HaskoningDHV, 2020.

conclusions of the EIA and Habitats Regulations Assessment. As such, without this information, it is not possible to determine whether the effects are likely to be significant.

2.4 Issue 3

2.4.1 Optimistic assumptions have been adopted in regards generator exhaust positioning within the assessment of NRMM and haul road emissions. Within the Air Quality Deadline 3 Clarification Note³ it has been assumed that all generator exhausts emit vertically. This is often not the case, with horizontal flues fitted on many units. Emissions at this angle disperse poorly, with considerably greater ground level impacts than vertical discharges. Given that the actual plant to be used on site is unknown at this stage of the project, worst-case assumptions should be adopted to ensure a robust assessment. As this was not the case, and coupled with the non-inclusion of NH₃ emissions, effects on the Leiston-Aldeburgh SSSI and Sandlings SPA may be significantly underestimated.

2.5 Issue 4

2.5.1 The results of the sensitivity analysis of exhaust emission reduction and how these affect predicted pollutant concentrations have not been given any weight. As outlined in Appendix 19.4 of the Environmental Statement, exceedences of the annual mean Air Quality Objective (AQO) for nitrogen dioxide (NO₂) are predicted at residential properties when more conservative assumptions are adopted. This would lead to impacts classified as significant using the methodology outlined within the IAQM guidance 'Land-Use Planning & Development Control: Planning for Air Quality'⁴, as adopted for use by Royal HaskoningDHV throughout the Air Quality Assessment.

2.5.2 It is understood that previous research has shown better correlation between vehicle emission performance and the DEFRA Emissions Factor Toolkit (EFT) in recent years. However, there is always uncertainty when predicting future conditions and a precautionary approach should be adopted when undertaking environmental assessment. This position is supported by Appeal Decisions APP/V2255/W/15/3067553 & APP/V2255/W/16/3148140 which indicate that although it is accepted that emissions will

³ Air Quality Deadline 3 Clarification Note, Royal HaskoningDHV, 2020.

⁴ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

reduce in the future, the rate of improvement is difficult to predict and should therefore be viewed with caution.

2.5.3 Robust assumptions regarding future emissions are particularly important due to the effects of COVID-19 on vehicle purchasing habits and associated impact on fleet mix. As fewer new cars are purchased a greater proportion of older models with higher emissions are likely to be utilised in the future than previously anticipated. By disregarding the results of the sensitivity analysis, this eventuality has not been considered. As such, effects on human receptors and ecological designations may be underestimated.

2.6 Issue 5

2.6.1 As covered separately by SEAS within 'SEAS Campaign Group Deadline 1 Submission - Written Representation'⁵ (reference: REP1-328), specifically ExQ1-1.14.5 – Potential use of National Grid Substation and ExQ1-1.14.6 – Other Projects, a number of cumulative developments have not been considered within the Air Quality Assessment. Of particular note is Sizewell C, where only a qualitative analysis was provided despite the substantial size of the scheme.

2.6.2 Traffic associated with the proposals, as well as Sizewell C and any other relevant committed developments not considered within the Air Quality Assessment, will travel through the Air Quality Management Area (AQMA) located along the A12 in Stratford St Andrew. This has been declared by ESC due to exceedences of the statutory AQO for annual mean NO₂ concentrations. Additional vehicle emissions in this area will increase pollutant concentrations and potentially affect how quickly compliance with the AQO can be achieved. This contradicts the requirements of paragraph 181 of the National Planning Policy Framework (NPPF)⁶, which states:

"181. Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas."

⁵ SEAS Campaign Group Deadline 1 Submission - Written Representation, SEAS, 2020.

⁶ NPPF, Ministry of Housing, Communities and Local Government, 2019.

2.6.3 When considered in the context of the potentially overly optimistic representation of future emissions and the sensitivity of human receptors within the Stratford St Andrew AQMA, the utilised future traffic flows may have led to a significant underestimation of cumulative air quality impacts within the vicinity of the access route.

3.0 SUMMARY

3.1.1 Redmore Environmental Ltd was commissioned by SEAS to comment on the application for development consent for the East Anglia ONE North and East Anglia TWO Offshore Windfarms.

3.1.2 The following five areas of concern have been identified which are relevant to both applications:

- Issue 1 - Air quality impacts associated with vessel emissions have not been considered;
- Issue 2 - Air quality impacts associated with ammonia emissions from road traffic and NRMM have not been considered;
- Issue 3 - Optimistic assumptions have been adopted in regards generator exhaust positioning within the assessment of NRMM and haul road emissions;
- Issue 4 - The results of the sensitivity analysis of exhaust emission reduction and how these affect predicted pollutant concentrations have not been given any weight; and,
- Issue 5 - A number of cumulative developments have not been considered within the Air Quality Assessment.

3.1.3 As outlined above, the review of the Air Quality Assessment indicated a number of areas which have not been considered in sufficient detail to allow a conclusion on potential effects to be reached. As such, without submission of additional detailed analysis, it is not clear how the planning authority can be confident that significant air quality impacts will not occur at human and ecological receptors based on the evidence provided to date. It is therefore considered that without this information and the incorporation of any required effective mitigation into the proposal, the application should be refused.