Document Ref: 8.46
PINS Ref: EN010082

# Tees CCPP Project

## The Tees Combined Cycle Power Plant Project

## Land at the Wilton International Site, Teesside

### Applicant's Response to Examining Authority's Second Written Questions

### Examination Deadline 5

### The Planning Act 2008 (as amended)

**Applicant:** Sembcorp Utilities (UK) Limited
**Date:** August 2018

## DOCUMENT HISTORY

| | | | |
|---|---|---|---|
| **Document Ref** | 8.46 | | |
| **Revision** | 1.0 | | |
| **Author** | Jake Barnes-Gott (JBG) | | |
| **Signed** | JBG | **Date** | 07.08.18 |
| **Approved By** | Geoff Bullock (GB) | | |
| **Signed** | GB | **Date** | 07.08.18 |
| **Document Owner** | DWD | | |

## GLOSSARY

| **Abbreviation** | **Description** |
|---|---|
| AGI | Above Ground Installation |
| AIL | abnormal indivisible loads |
| AIL | abnormal indivisible loads |
| AOD | above ordnance datum |
| AQMA | Air Quality Management Areas |
| ASI | Accompanied Site Inspection |
| BAT | Best Available Techniques |
| BCA | Bilateral Connection Agreement |
| BCA | Bilateral Connection Agreement |
| CAA | the Civil Aviation Authority |
| CCR | Carbon Capture Readiness |
| CCS | Considerate Constructors Scheme |
| CCS | Considerate Constructors Scheme |
| CEA | cumulative effects assessment |
| CEMP | Construction Environmental Management Plan |
| CEMS | Continuous Emission Monitoring System |
| CEMS | Continuous Emission Monitoring System |
| CHP | Combined Heat and Power |
| CL | Critical Load/Level |
| CoCP | Code of Construction Practice |
| ConsAg | Construction Agreement |
| CTMP | Construction Traffic Management Plan |
| CTMP | Construction Transport Management Plan |
| DCO | Development Consent Order |
| dDCO | draft Development Consent Order |
| DMRB | Design Manual for Roads and Bridges |
| EA | Environment Agency |
| EA | Environment Agency |
| EM | Explanatory Memorandum |
| EMF | electromagnetic fields |
| EN-1 | National Policy Statement for Energy |
| EPC | Engineering, Procurement and Construction |
| ES | Environmental Statement |
| ES | Environmental Statement |
| FRA | Flood Risk Assessment |
| GLVIA3 | Guidelines for Landscape and Visual Impact Assessment, Third Edition |
| HER | Historic Environment Record |
| HIA | Health Impact Assessment |
| HRA | Habitats Regulations Assessment |

| Abbreviation | Description |
|---|---|
| HRSG | heat recovery steam generator |
| HSE | Health and Safety Executive |
| IAQM | Air Quality Management |
| ICNIRP | International Commission on Non-Ionising Radiation Protection |
| IEMA | Institute of Environmental Management and Assessment |
| LAQM | Local Air Quality Management |
| LSE | likely significant effects |
| LVIA | landscape and visual impact assessment |
| MMP | Materials Management Plan |
| NCA | National Character Areas |
| NE | Natural England |
| NE | Natural England |
| NGET | National Grid Electricity Transmission Plc |
| NGG | National Grid Gas |
| $NO_2$ | nitrogen dioxide |
| $NO_x$ | nitrogen |
| NPS | National Policy Statement |
| NPS | National Policy Statement |
| NTS | National Transmission System |
| NTS | National Transmission System |
| PA 2008 | Planning Act 2008 |
| PEC/CL | Predicted Environmental Concentration/Critical Load |
| PEIR | Preliminary Environmental Impact Report |
| RCBC | Redcar and Cleveland Borough Council |
| SNR | Strategic Road Network |
| SPA | Special Protection Area |
| SPD | Supplementary Planning Document |
| SWMP | Site Waste Management Plan |
| SWMP | Site Waste Management Plan |
| TA | Transport Assessment |
| TRA | Transmission Related Agreement |
| TRA | Transmission Related Agreement |
| TVWT | Tees Valley Wildlife Trust |
| WFD | Water Framework Directive |

# CONTENTS



# TABLES

# 1 INTRODUCTION

## Overview

1.1 This document has been prepared on behalf of Sembcorp Utilities (UK) Limited ('SCU' or the 'Applicant') in respect of its application (the 'Application') for a Development Consent Order (a 'DCO'). The Application was accepted for examination by the Secretary of State (the 'SoS') for Business, Energy and Industrial Strategy on 18 December 2017. The 'Examination' began on 10 April 2018.

1.2 SCU is seeking a DCO for the construction, operation and maintenance of a new gas-fired electricity generating station with a nominal net electrical output capacity of up to 1,700 megawatts ('MW') at ISO conditions (the 'Project' or 'Proposed Development'), on the site of the former Teesside Power Station, which forms part of the Wilton International Site, Teesside.

1.3 A DCO is required for the Proposed Development as it falls within the definition and thresholds for a 'Nationally Significant Infrastructure Project' (a 'NSIP') under Sections 14 and 15(2) of the Planning Act 2008 ('PA 2008').

1.4 The DCO, if made by the SoS, would be known as the 'Tees Combined Cycle Power Plant Order' (the 'Order').

## SCU

1.5 SCU provides vital utilities and services to major international process industry customers on the Wilton International site on Teesside. Part of Sembcorp Industries, a Singapore-based group providing energy, water and marine services globally, Sembcorp Utilities UK also owns some of the industrial development land on the near 810 hectares (2,000 acre) site which is marketed to energy intensive industries worldwide.

1.6 SCU owns the land required for the Proposed Development.

## The Project Site

1.7 The Project Site (the 'Site') is on the south west side of the Wilton International Site, adjacent to the A1053. The Site lies entirely within the administrative area of Redcar and Cleveland Borough Council ('RCBC') which is a unitary authority.

1.8 Historically the Site accommodated a 1,875 MW Combined Cycle Gas Turbine power station (the former Teesside Power Station) with the ability to generate steam for utilisation within the wider Wilton International site. The Teesside Power Station ceased generation in 2013 and was demolished between 2013 and 2015.

1.9 SCU has identified the Site, based on its historical land use and the availability of natural gas supply and electricity grid connections and utilities as a suitable location for the Project. In summary, the benefits of the Site include:

- brownfield land that has previously been used for power generation;
- on-site gas connection, supplied from existing National Grid Gas Plc infrastructure;
- on-site electrical connection, utilising existing National Grid Electricity Transmission infrastructure;
- existing internal access roads connecting to a robust public road network;
- availability of a cooling water supply using an existing contracted supply (from the Wilton Site mains) and existing permitted discharge consent for effluent to the site drainage system
- screening provided by an existing southern noise control wall, approximately 6 m in height;
- potential for future Combined Heat and Power ('CHP') and Carbon Capture and Storage ('CCS'); and

- existing services, including drainage.

1.10 A more detailed description of the Site is provided at Chapter 3 'Description of the Site' of the Environmental Statement ('ES') Volume 1 (Application Document Ref. 6.2.3).

## The Proposed Development

1.11 The main components of the 'Proposed Development are summarised below:

- **Work No. 1** – a natural gas fired electricity generating station located on land within the Wilton International site, Teesside, which includes the site of a former CCGT power station, with a nominal net electrical output capacity of up to 1,700 MWe at ISO Conditions; and
- **Work No. 2** – associated development comprising within the meaning of section 115(2) of the 2008 Act in connection with the nationally significant infrastructure project referred to in Work No. 1.

1.12 Please refer to Schedule 1 of the Draft DCO (Application Document Ref. 2.1) for more detail.

1.13 It is anticipated that subject to the DCO having been made by the SoS (and a final investment decision by SCU), construction work on the Project would commence in around the second half of 2019. The construction of the Project could proceed under one of two scenarios, based on SCU's financial modelling, as follows.

- '**Scenario One'**: two CCGT 'trains' of up to 850 MW are built in a single phase of construction to give a total capacity of up to 1,700 MW.
- **'Scenario Two'**: one CCGT train of up to 850 MW is built and commissioned. Within an estimated five years of its commercial operation the construction of a further CCGT train of up to 850 MWe commences.

1.14 The above scenarios have been fully assessed within the ES.

1.15 A more detailed description of the Project is provided at Schedule 1 'Authorised Development' of the draft DCO (Application Document Ref. 2.1) and Chapter 5 'Project Description' of the ES Volume 1 (Application Document Ref. 6.2.5).

## The purpose and structure of this document

1.16 This document forms part of a package of documents submitted by the Applicant for Deadline 5 of the Examination. It sets out the Applicant's responses to the Examining Authority's ('ExA') Second Written Questions – see Section 2 of this report.

# 2 THE APPLICANT'S RESPONSES

2.1 The Applicant’s responses to the Second Written Questions provided by the ExA are set out in **Table 2.1** on the following pages.

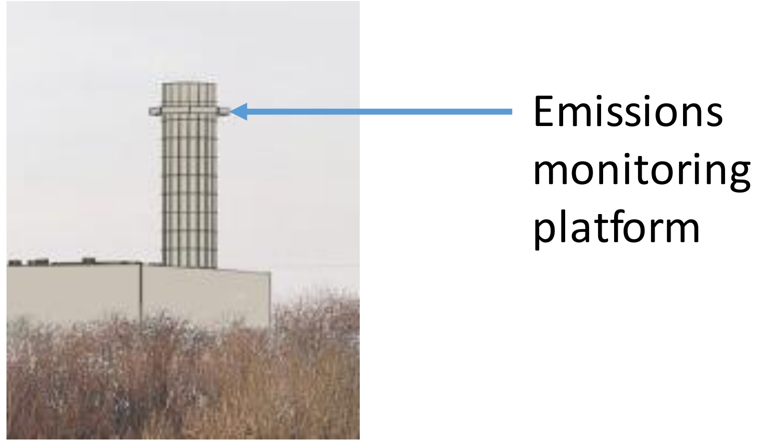
## Table 2.1 - Applicant's Responses to Examining Authority's Second Written Questions

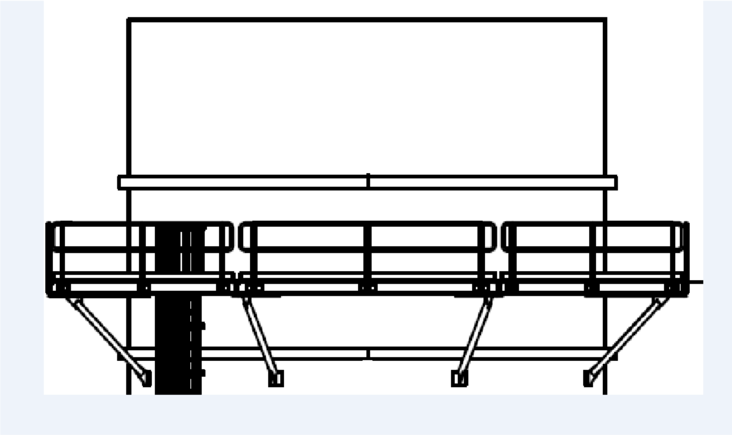
| REF NO. | RESPONDENT | QUESTION | LEAD | RESPONSE |
|---|---|---|---|---|
| **2** | **Air Quality and Emissions** | | | |
| Q2.0.1 | Environment Agency | Is the EA content with the Applicant's explanation (as summarised in [REP4-011]) of why near identical air modelling results occur in the PIER (where the turbine hall building height is 21.3m) and the ES (with a turbine hall building height 31m)? | | |
| Q2.0.2 | Applicant | The ExA understands that the Applicant intends to submit a report on Carbon Capture Readiness (CCR) by Deadline 5.<br><br>In the event of the CCR report finding that additional land is needed outside the order limits, the Applicant is asked to:<br><br>• confirm whether the findings of this report would have any implications for the conclusions of the ES and HRA;<br>• Provide a timetable for the preparation and execution of a S106 obligation within the examination period. | SCU<br>ERM | The Applicant instructed a specialist consultant to produce a report (the 'Report') to further consider the CCR compliance of the Project. Following review of the Report, the Applicant can advise it has received a positive assessment of the CCR compliance of the Project, following a review by J.G. Yao, P.S. Fennell FIChemE and N. Mac Dowell FIChemE of Imperial College Consultants.<br><br>The Report concluded that for a 1,520MWe CCGT power plant there is sufficient space within the Order limits for all of the assumed equipment, including: generation system (including use of auxiliary supply, steam supply), $CO_2$ capture equipment (including column sizing for absorber and stripper, number of trains), cooling systems, $CO_2$ dehydration and compression (including number of compressors per train), additional flue gas treatment (including scope to incorporate within existing facilities), solvent/sorbent storage and $CO_2$ transport details (including pipelines).<br><br>This figure of 1,520MWe is derived on the basis of the original CCGT efficiencies used in UK DECC (now BEIS)'s CCR Guidance as amended by the Imperial College Assessment (Florin and Fennell, 2010). However these efficiencies are outdated; therefore, further assessment is being undertaken to determine the increase in MWe that can be achieved whilst remaining within the Order limits.<br><br>Furthermore, the base case assessments used Air Cooled Condensers; however, it is proposed that the Project would utilise Hybrid Cooling Towers. These would have a considerably smaller footprint, thus enabling larger carbon capture process plant equipment to be installed within the confines of the Order limits and facilitating a further increase in MWe.<br><br>The Applicant fully expects with the further work discussed above that it will be possible to demonstrate that a 1,700MWe power plant can meet the CCR compliance requirements. The Applicant proposes to provide a further CCR report/statement at Deadline 6. |
| Q2.0.3 | Applicant<br>Natural England | The Applicant maintains a position that it is not feasible to undertake a quantitative assessment of in-combination air quality impacts [REP4-011].<br><br>The finding of no likely significant effects with regards to the assessment of in- combination effects lacks authoritative evidence in the form of quantitative data. In absence of such evidence it is not obvious how the Applicant has arrived at the outcome of no likely significant effect. The Wealden judgement clearly demonstrates the importance of addressing this issue as a matter of legal principle.<br><br>It is also important to note that the in-combination assessment suggests that there is a 'widespread reduction in emissions' in the surrounding area. The robustness of this assertion would be increased if the evidence to support it was provided.<br><br>In order to address the points raised above can the Applicant and NE explain what information is available to support the Applicant's position of ongoing improvements to background emission levels? The Applicant should also explain how, in absence of a quantitative in-combination assessment, the findings of no likely significant effect | ERM | The Project, in itself, does not result in significant impacts, with all impacts being below 1% of Long Term Critical Loads and Critical Levels. In combination effects are also anticipated to be insignificant, given that there is only one additional industrial facility that may be operational, that being the Tees Renewable Energy Plant. The EIA for the Tees Renewable Energy Plant has also concluded that in itself there would not be significant effects. The two plants are not co-located, and therefore any impacts are anticipated to arise on different locations and habitats.<br><br>Furthermore, we believe that the process of completing a quantitative in combination effects assessment without the data from an EPC could result in an overly conservative assessment. Once an EPC has been appointed a quantitative assessment would be completed as part of the environmental permitting process. If significant effects are determined the next step would be to undertake further refinement of the dispersion modelling results. At the present time, the most sensitive habitat within each ecological receptor is assumed to coincide with the highest impact. In practice this is unlikely to be the case, as some sites are large. Following this, if significant impacts remain, then initial steps in the Appropriate Assessment process would be initiated. This, initially, comprises consideration of the site condition and species present and verifying whether the potential for an impact to arise in practice is actually possible. Further steps to assess the actual potential for harm to arise would follow.<br><br>Furthermore, the overall air pollution and deposition at the habitat sites would continue to reduce in line with national trends. A key consideration in the Applicant's assessment is that in UK air quality has generally been improving in the long term, with substantial improvements since the 1960's-1980's in sulphur dioxide, oxides of nitrogen and transboundary pollution. This is clearly evidenced in the DEFRA document referred to in **Appendix 1** to this report. This trend is continuing, particularly for industrial sources as the Industrial Emissions Directive |

| REF NO. | RESPONDENT | QUESTION | LEAD | RESPONSE |
|---|---|---|---|---|
| | | have been derived. | | ('IED') captures within it the principles of continuous emissions improvement with the adoption of Best Available Techniques ('BAT') by all permitted industrial facilities. In addition, large historical emission sources, including the UKs fleet of coal fired power stations, have been taken off-line or for the few remaining, emissions have been substantially cut and continue to reduce under IED.<br><br>This long-term downward trend cannot be ignored when considering in-combination effects. The trend is generally continuing with ever-tighter regulation on industrial emissions driving down impacts from existing facilities. In addition, emissions are reducing from road traffic and transboundary sources. Agriculture is a major source of emissions, and is a focal point of the Governments Clean Air Strategy. These measures are fully expected to more than compensate for the marginal increase in impacts that are predicted to arise due to in-combination effects.<br><br>'Wealden District Council v. Secretary of State for Communities and Local Government, Lewes District Council and South Downs National Park Authority' considered the legal requirement to carry out an in-combination assessment. It did not stipulate the manner in which such assessment must be carried out, i.e. whether it should be quantitative as opposed to qualitative. |
| **2.1** | | **Uncertainty, assessment parameters and the DCO** | | |
| Q2.1.1 | Applicant | The proposed DCO as drafted [version 3, REP4-005] does not preclude the final design of the Proposed Development from having a stack height below that which has been assessed in the ES (75m). However, the Applicant's own assessment acknowledges [AS-010] that a stack height below 75m may result in an effect which is greater than that which has been assessed for some receptors [REP2-080] *"the threshold for potential Likely Significant Effects would be exceeded at some habitats with a lower stack height."*<br><br>It is therefore apparent that, in absence of a parameter which precludes a stack height less than 75m the proposed DCO if granted may result in a development that gives rise to likely significant effects which have not, or are different to what has been assessed in the ES. On that basis can the Applicant please explain the extent to which the assessment in the ES supports the development permissible by the proposed DCO if granted? | ERM<br>WBD | The stack height of 75m is the maximum stack height. The dispersion modelling undertaken to date has demonstrated that with this stack height there would be no potential likely significant effects at ecological receptors, and no unacceptable impacts at human receptors. In the event that a lower stack height is considered, the potential impacts of this will be addressed at the environmental permitting ('EP') stage. In the EP process, if required, further assessment steps would be needed initially refining that air quality impact assessment to take into account the exact locations of sensitive habitats within each ecological receptor, and if needed, an Appropriate Assessment ('AA') would be triggered in the event that the potential for likely significant effects remained after the refinement of the air quality impact assessment. If the AA determines that a lower stack height would result in significant impacts to ecological receptors, an EP will not be granted and the stack height would not be permitted to be built at less than 75m.<br><br>The Applicant has added some wording into the DCO to ensure that the stack cannot be built at a height lower than 75m unless and until it has demonstrated that this reduction in stack height does not give rise to any likely significant effects. An updated version of the draft DCO (Version 4) (Application Document Ref: 8.47) has been submitted for Deadline 5 of the Examination. |
| Q2.1.2 | Environment Agency | The Applicant has confirmed in [REP2-080] the stack locations which have been utilised in the air quality assessment, as follows:<br><br>• Western Stack: 456437, 520398<br>• Eastern Stack: 456525, 520438<br><br>The limits of deviation on the Works Plans allow for lateral movement of the stacks; it is proposed that the exact location of the stacks is confirmed at the Environmental Permitting stage.<br><br>The Environment Agency expressed concerns [REP2-079] that changing the locations of the stacks from those specified in the air quality assessment may alter the findings of the assessment, and recommended that their locations are fixed by grid reference.<br><br>In response, the Applicant has stated that movement of the stacks within the lateral limits of deviation would not materially change the outcome of the air quality assessment [REP3-003; REP4-011]. In light of the Applicant's response, can the EA confirm its position as to whether stack locations should be fixed in the draft DCO? | | |

| REF NO. | RESPONDENT | QUESTION | LEAD | RESPONSE |
|---|---|---|---|---|
| | | | | |
| Q2.1.3 | Applicant | The Applicant's position is that the stack diameter cannot be fixed until the gas turbine technology is selected; as such it would be determined as part of the Environmental Permitting process. The air quality assessment is based on an 'optimised' 8m stack diameter, with no sensitivity testing having been undertaken.<br><br>It is possible that changing the diameter of the stacks from those specified in the air quality assessment may alter the findings of the assessment. The ExA considers that there must be a clear relationship between what has been assessed in the ES and what would be consented though the DCO. The Applicant is requested to explain the extent to which the assessment in the ES addresses these concerns or alternatively amend the DCO to reflect the relevant parameters in the ES. | ERM | The design and optimum operation of the turbine determines the optimum exit velocity from the stack. This in turn, determines the optimum diameter. Different turbines have slightly different requirements in this respect, and therefore the exit velocity, flow rate and stack diameter would change marginally between turbines. Risk of significant impacts is not a function of diameter, but of plant capacity and stack height overall. Sensitivity testing of stack diameter would offer no material benefit since each turbine will have a slightly different emission profile and therefore stack diameter. In the EP process, the finalised plant design would take this into account and the finalised stack diameter would be used in the assessment. It should be noted however that at this stage any changes to the stack diameter are likely to limited.<br><br>There would be negligible change in impacts as these fine-tunings are marginal in comparison to the overall design. Again, the EP would be based upon the finalised design, and this would have to be compliant with guidance relating to impacts on both human and ecological receptors, otherwise it would not be granted.<br><br>The Applicant has added some wording into the draft DCO to ensure that the stack diameter would be 8m unless the undertaker can demonstrate that a different diameter would not have any new or materially different effects and can be agreed with relevant planning authority in consultation with the EA. An updated version of the draft DCO (Version 4) (Application Document Ref: 8.47) has been submitted for Deadline 5 of the Examination. |
| Q2.1.4 | Applicant | The ES does not refer to the need for Selective Catalytic Reduction (SCR). Given the Applicant's intention to use a turbine which meets Best Available Technology (BAT), can the Applicant confirm if SCR is an option that is being considered? If yes:<br><br>• To what extent has the Applicant considered SCR in the ES and HRA?<br><br>• If SCR is implemented, could it affect the findings of LSE for the EIA or HRA? | ERM<br>SCU | SCR is not required to achieve BAT or sufficiently low NOx emissions to result in acceptable impacts at receptors.<br><br>SCR is not being considered for emissions abatement. The standard gas turbine dry low NOx combustor systems, which are BAT, can meet the required emissions limits. |
| Q2.1.5 | Natural England | The Applicant describes "embedded measures" as turbines that meet current Best Available Technology (BAT) for NOx emissions and stack design to achieve sufficient dispersion [response to Q1.1.20, REP2-080]. The Applicant states that no further mitigation is required.<br><br>a) To what extent does NE agree that BAT and stack design are 'embedded measures' and not avoidance or reduction measures as described in the Sweetman judgement?<br><br>b) The Applicant's position is that the Sweetman judgement does not affect the Applicant's HRA screening exercise, on the basis that no mitigation measures have been relied upon [REP4-011]. Can NE confirm whether or not it is in agreement with the Applicant's position? | | |
| **2.2** | | **Biodiversity, Ecology and Natural Environment** | | |

| REF NO. | RESPONDENT | QUESTION | LEAD | RESPONSE |
|---|---|---|---|---|
| Q2.2.1 | Natural England | Please confirm whether or not NE is content with the Applicant's revised HRA screening matrices [Tables H3.2 – H3.6, REP1-001]. | | |
| Q2.2.2 | Environment Agency<br>Natural England | The EA indicated at the ISH that it would like to run the Applicant's detailed air quality data through its model. The Applicant has now submitted this data to the Examination [REP4-010]. Do they EA or NE have any comments in this regard? | | |
| Q2.2.3 | Environment Agency | The ExA is aware that it is intended to submit an updated SOCG between the Applicant and the Environment Agency. The current version [Paragraph 3.9, REP2-061] states that: *'the EA does not yet agree that the HRA demonstrates that it is unlikely the Project will not have significant effects upon European Designated Sites alone or in combination with other projects and plans'.*<br><br>Can the EA confirm whether there is any change to this position? | | |
| Q2.2.4 | Applicant | For clarity the Applicant is requested to provide updated versions of ES Annex G tables 1.4 to 1.7 (as agreed at the ISH on Environmental Matters), along with updated versions of NSER Tables 1-4, which populate the 'PEC' and 'PEC/CL' metrics. | ERM | Updated versions of ES Annex G Tables 1.4 to 1.7 are included at **Appendix 2** to this report.<br><br>Updated versions of NSER Tables 1-4, which populate the 'PEC' and 'PEC/CL' metrics are also included at **Appendix 2** to this report. |
| Q2.2.5 | Natural England | The Applicant has confirmed [REP1-001; REP4-011] that it is not relying on any mitigation to reach the conclusions of the NSER. The ExA notes that the draft DCO (R13)(2)(f) refers to *'...mitigation measures designed to protect controlled waters',* with such measures described in the Updated Mitigation Summary Table [REP2-006] as primary and/or tertiary mitigation. The Applicant has confirmed that the River Tees is hydrologically connected to the Proposed Development via the existing Wilton International drainage system.<br><br>To what extent does NE agree that the proposed measures to ensure safe discharge of water to the existing drainage system (as described in REP2-006] are 'embedded measures' and not avoidance or reduction measures as described in the Sweetman judgement? | | |
| **2.3** | **Draft Development Consent Order** | | | |
| Q2.3.1 | Applicant | Please provide an up-to–date schedule confirming all documents which are to be certified as forming part of the ES, to include all of the 'supplementary and further information' as described in the definition of the ES in Article 2 of the dDCO. A final version should be submitted by Deadline 8 at the latest. | WBD | This schedule has been prepared and the draft DCO has been amended to reflect updated document references.<br><br>An updated version of the draft DCO (Version 4) (Application Document Ref: 8.47) has been submitted for Deadline 5 of the Examination. |
| Q2.3.2 | Applicant | Please confirm that all document references in Schedule 1, Part 2 'Requirements' reference the most up-to-date versions of the document e.g. 'CEMP', 'CTMP', CHP assessment, CCS proposal. | WBD | The draft DCO has been amended to reflect updated document references.<br><br>An updated version of the draft DCO (Version 4) (Application Document Ref: 8.47) has been submitted for Deadline 5 of the Examination. |
| Q2.3.3 | Environment Agency | Does the EA have any concerns regarding Article 6 of the dDCO [REP4-005], which allows the Applicant to *'deviate vertically to any extent downwards as may be found necessary or convenient'* (noting the Applicant's justification in this regard [Q1.3.12, REP2-080])? | | |
| Q2.3.4 | Redcar and Cleveland Borough Council<br>Environment Agency | An updated version of the Construction Environmental Management Plan (CEMP) has been submitted at Deadline 4 [version 3, REP4-003].<br><br>Please confirm whether you are content with the contents of the updated CEMP and provide any comments you may have. | | |

| REF NO. | RESPONDENT | QUESTION | LEAD | RESPONSE |
|---|---|---|---|---|
| **2.4** | | **Landscape and Visual** | | |
| 2.4.1 | Applicant | Can the Applicant confirm the size and placement of the air emissions monitoring platforms on the stacks? Please explain how these elements have been taken into account in the ES Landscape and Visual Assessment. | ERM<br>SCU | The air emissions monitoring platforms on the stacks are shown on the photomontages [AS-016], as the rings near the tops of the stacks, and they have therefore been taken into account by the assessment of landscape and visual impact in the ES [APP-053]. Please see **Drawing 1** below.<br><br>The precise size and placement of the emissions monitoring platforms will be a matter for detailed design. Environment Agency guidance note M1 on stack testing, states: *"Recommend five hydraulic diameters* upstream and two hydraulic diameters downstream (or five hydraulic diameters from the top of the stack)."*<br><br>In the case of the Project, 5 x hydraulic diameter = 40m, and 2 x hydraulic diameter = 16m.<br><br>Therefore, the platform needs to be positioned ~40 m above the point at which the flue enters the stack. If this is close to ground level, the sampling platform height would be ~50 m above ground level, and no higher than 59 m above ground (i.e. 75 m - 16 m).<br><br>The platform may need to be wider, circa 16 m in diameter, to allow deployment of the circa 4 m long sampling probe, whereas the platforms in the photomontages are approx. 12m. However, although in the photomontage the platforms appear as solid bands, the platforms are actually walkways with handrails around, as shown in **Drawing 2** on the following page.<br><br>It follows that although the actual platforms may be wider, illustrating them as solid rings on the photomontages means that they are more prominent than they actually would be in reality. The platforms have therefore been adequately considered in the overall conclusions of the ES.<br><br>Drawing 1<br><br><br> |

| REF NO. | RESPONDENT | QUESTION | LEAD | RESPONSE |
|---|---|---|---|---|
| | | | | Drawing 2<br> |
| 2.4.2 | Redcar and Cleveland Borough Council | Is the Council content with the amendment to Requirement 5 of the draft DCO [version 3, REP4-005], which secures that the external lighting schemes for both construction and operation of the Proposed Development must accord with the Guidance Notes for the Reduction of Obtrusive Light GN01:2011? | | |
| **2.5** | | **Water Environment** | | |
| 2.5.1 | Environment Agency | Does the EA consider that the Applicant has addressed the points raised in the EA's WR regarding the Water Framework Directive (with the exception of opportunities for enhancement measures, which the ExA understands is to be covered in the forthcoming revision to the SOCG)? | | |
| **2.6** | | **Noise** | | |
| 2.6.1 | Applicant | Can the Applicant confirm what noise monitoring would be undertaken during construction to ensure that the threshold levels within BS5228 (as set out in Table 8.3 of the ES [APP-050]) would not be exceeded? For example, frequency and type of monitoring. | WBD<br>ERM | Details on noise monitoring would be developed in the detailed Construction Environmental Management Plan ('CEMP') – following appointment of an EPC contractor – under provisions of Requirement 13 of the DCO. At this stage a monitoring programme is envisaged to be made up of two types of monitoring. See below for further detail.<br><br>The Applicant has also updated Requirement 13(2)(a)(ii) of the draft DCO to refer specifically to BS5228. The updated draft DCO (Version 4) (Application Document Ref: 8.47) has been submitted for Deadline 5 of the Examination.<br><br>Monitoring:<br><br>1) Monitoring to demonstrate that noise from construction activity during normal working hours is within the BS5228 threshold levels:<br><br>• agreement of noise monitoring locations with an RCBC officer;<br>• development of a programme for the complete construction phase that captures construction activities that are representative of noisy conditions;<br>• agreement with an RCBC officer on frequency of measurement such that representative noisy activity is adequately sampled; and<br>• for any one construction phase that is subject to monitoring, agreement of sampling times with an RCBC officer in terms of times of day and weekday/weekend.<br><br>2) Monitoring to demonstrate that noise from construction activity outside of normal working hours is within the |

| REF NO. | RESPONDENT | QUESTION | LEAD | RESPONSE |
| --- | --- | --- | --- | --- |
| | | | | BS5228 threshold levels or whatever other levels may have been agreed with an RCBC officer:<br>• agreement of noise monitoring location(s) with an RCBC officer based on an assessment of the risk of potential impact;<br>• attended noise monitoring while the out of hours activity is taking place; and<br>• communication between monitoring team and site so that activity can be instructed to cease if necessary.<br>The following will be common to all monitoring activity:<br>• equipment used for noise monitoring will conform to the latest version of BS EN 61672-1:2013;<br>• Electroacoustics;<br>• Sound level meters;<br>• Specifications;<br>• Noise monitoring will be undertaken by a suitably qualified person;<br>• Measurements will be undertaken during working hours, avoiding meal breaks and times when construction works are not occurring;<br>• Monitoring will be undertaken for a minimum of 1 hour at each measurement location during each monitoring period; and<br>• If the noise monitoring shows that noise threshold levels are being exceeded on a regular basis, the works will be subject to an audit to confirm that best practicable means are being used to ensure that noise is being reduced as far as is reasonably practicable, and the need for further monitoring or mitigation will be established in consultation with the RCBC officer. |

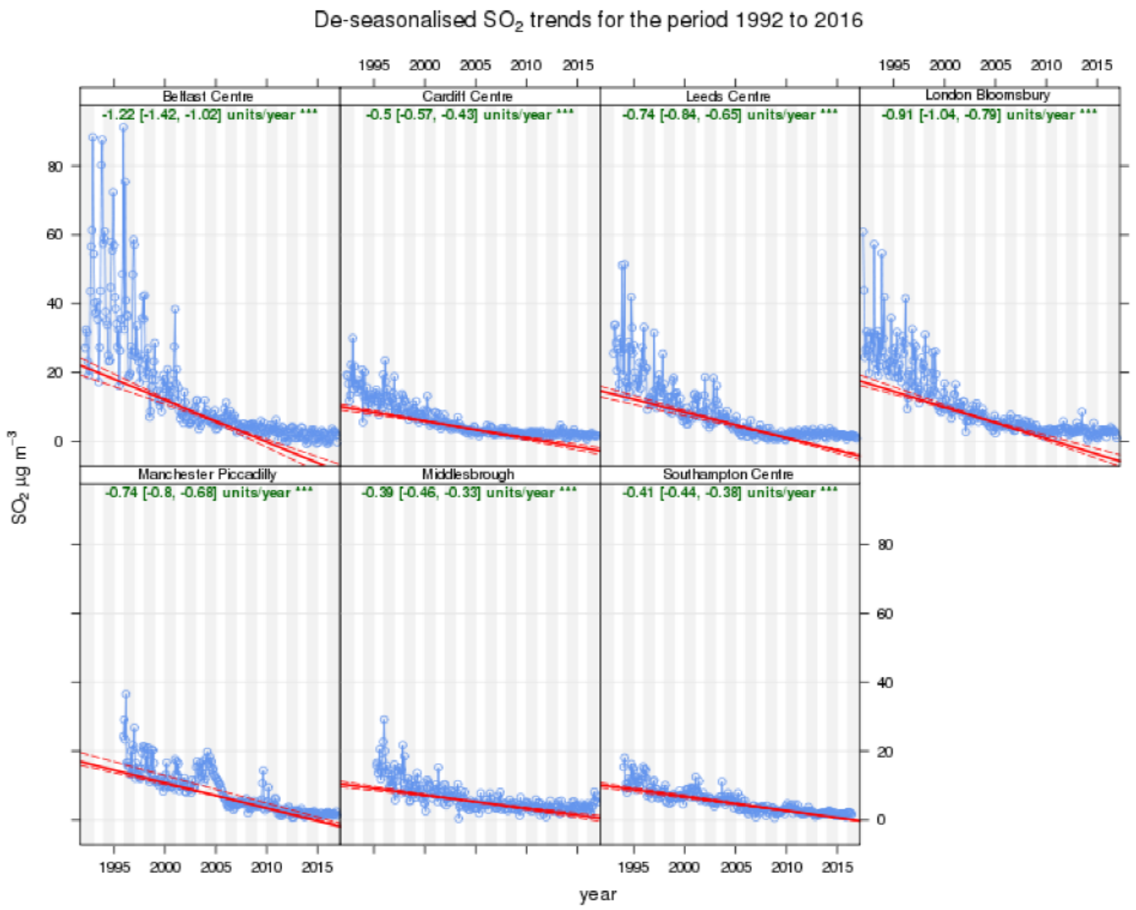
## APPENDIX 1: SUPPORTING INFORMATION FOR QUESTION 2.0.3

As discussed in the response to Question 2.0.3, emissions to air have reduced markedly and air quality substantially improved as a result. These reductions began to be realised in the 1950's and 1960's with the introduction of the Clean Air Acts. The trend towards reduced emissions continued in the 1980's and 1990's with ever more stringent emission limits on industry and the adoption of emission limits on road vehicles. From the 1990's to the present day, there has been continued, marked reductions in emissions as ever more stringent emission limits are brought in through the Industrial Emissions Directive, industrial technology is continually improved, road vehicle emissions decrease and coal is phased out of power generation and domestic homes. This is a trend that will continue into the future, with ever lower industrial emissions being driven by the adoption of BAT Reference Notes (Bref Notes) and ever more stringent vehicle emissions limits, and uptake of non-fossil fuelled vehicles.

Defra published 'Air Pollution in the UK 2016' in September 2017[1]. This document contains historical information on the trends in both emissions and ambient air quality. These data are very helpful to understand just how much improvement has been realised since the early 1990's, and the effect of these pollution reduction measures. Set out below are figures replicated from the Defra document, illustrating changes in both nitrogen dioxide and sulphur dioxide. The latter is included as the health of ecological sites is dependent upon both of these key pollutants acting together.

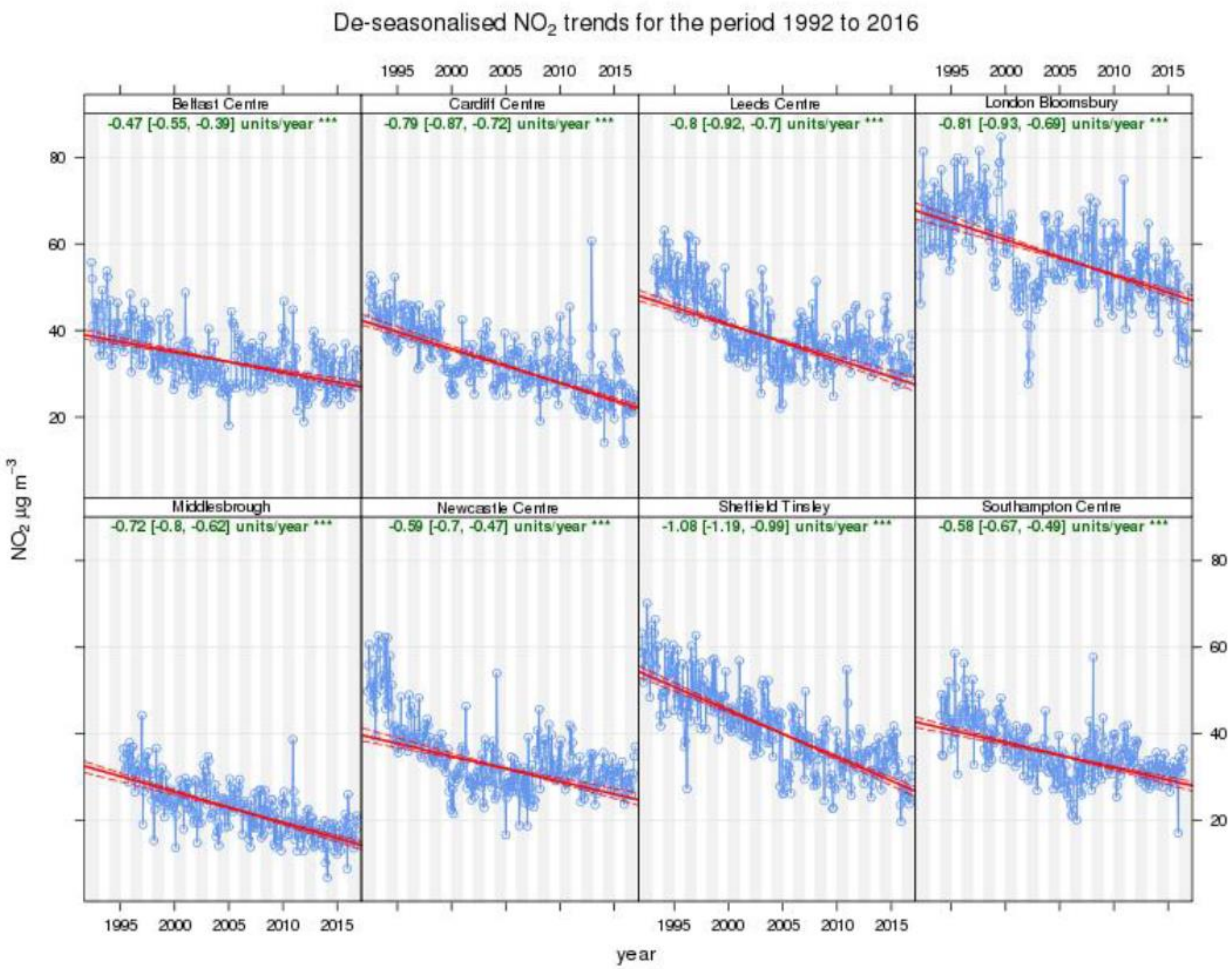
**Figure 1: De-seasonalised trends in $SO_2$ concentration, 1992 to 2016 at 7 long running Automatic Urban and Rural Ambient Air Quality Monitoring sites**

**Figure 5-3 De-seasonalised Trends in $SO_2$ Concentration, 1992-2016 at 7 Long-running AURN Sites**




[1] Department for Environment, Food and Rural Affairs (2017) Air Pollution in the UK 2016 https://uk-air.defra.gov.uk/assets/documents/annualreport/air_pollution_uk_2016_issue_1.pdf

**Figure 2: De-seasonalised trends in $NO_2$ concentration, 1992 to 2016 at 8 long running Automatic Urban and Rural Ambient Air Quality Monitoring sites**




In both cases, the decrease over the period of 1992-2016 is clear and is apparent at all the sites, irrespective of the absolute concentrations. Of particular interest are the results from Middlesborough, noting that this site is close to the Sembcorp facility.

The reduction in airborne pollution are directly correlated to emissions, as illustrated in the following figures.

**Figure 3: Estimated annual UK emissions of $SO_2$ (kt) 1992-2015 from the UK National Atmospheric Emissions Inventory**

**Figure 5-4 Estimated Annual UK Emissions of $SO_2$ (kt), 1992 – 2015 Source: NAEI**

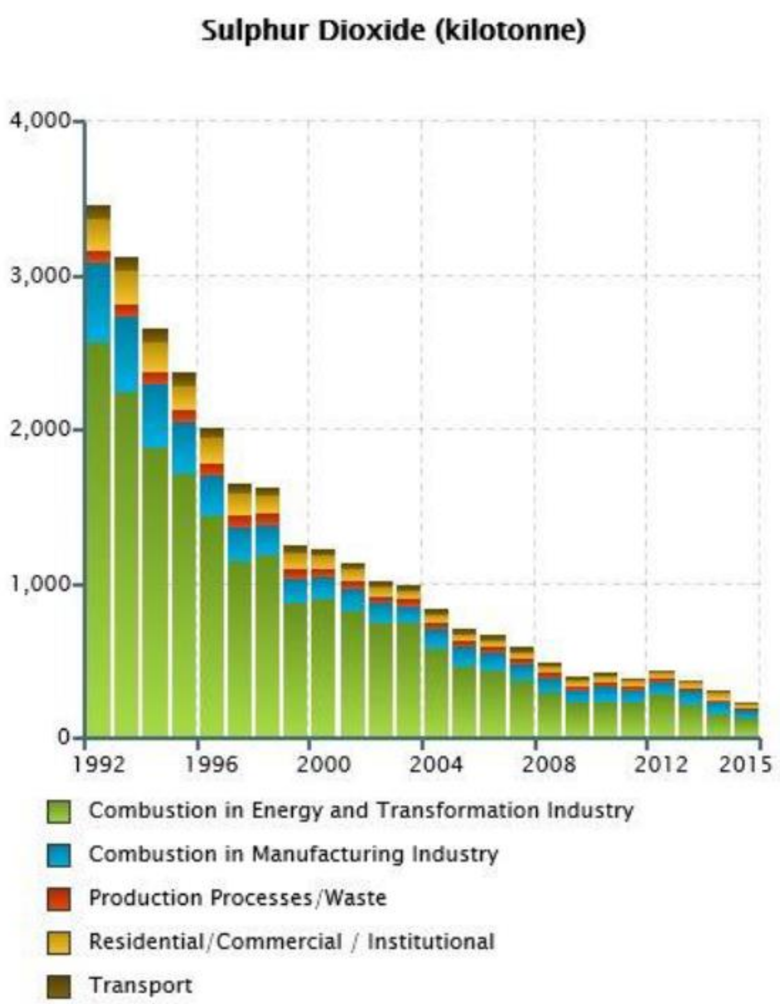
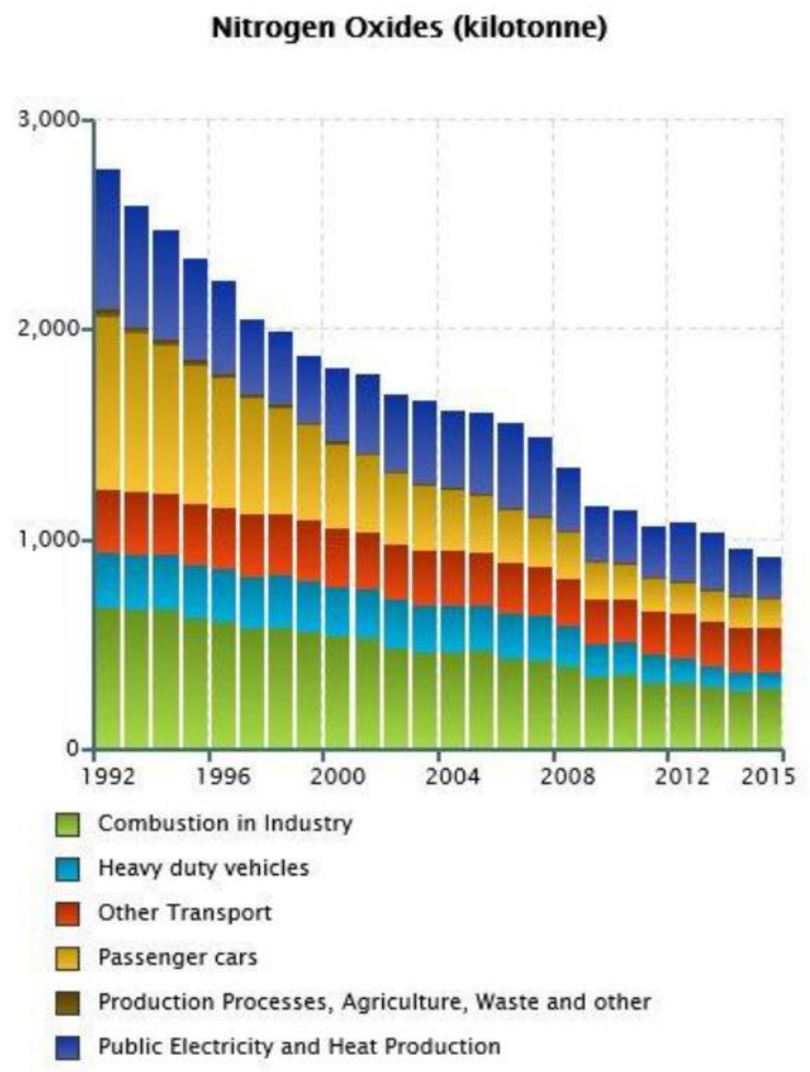


**Figure 4: Estimated annual UK emissions of $NO_x$ (kt) 1992-2015 from the UK National Atmospheric Emissions Inventory**

**Figure 5-9 Estimated Annual UK Emissions of Nitrogen Oxides (kt), 1992 – 2015 Source: NAEI**



## APPENDIX 2: ES ANNEX G TABLES 1.4-1.7 AND NSER TABLES 1-4

sembcorp

PINS Ref: EN010082

# Tees CCPP Project

The Tees Combined Cycle Power Plant Project
Land at the Wilton International Site, Teesside

## Volume 2 - Annex G1

Regulations – 6(1)(b) and 8(1)

Updated Annex G Tables 1.4 to 1.7

Applicant: Sembcorp Utilities UK
Date: August 2018

Annex G1

# Effects of Air Quality on Nationally and Locally Designated Sites

# Updated Annex G1 Tables 1.4 to 1.7

*Table G1.4 Predicted Nutrient Nitrogen Deposition at Ecological Receptors (Annual Mean) – for most sensitive qualifying feature of each site*

| Designated Site | Most Sensitive Habitat Feature | Critical Load (CL) for Nutrient Nitrogen Deposition (kgN ha | | Process Contribution (PC) (kgN ha | PC/CL (%) | | Background Nutrient Nitrogen Deposition (kgN ha | | PEC/CL (%) | | Background/CL | | Potential Significant Effect (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Min | Max | | Min | Max | Min | Max | Min | Max | Min | Max | |
| Lovell Hill Pools SSSI | *Coenagrion pulchellum* variable damselfly | Sensitive but no CL | | 0.0252 | n/a | n/a | 15.12 | n/a | n/a | n/a | n/a | n/a | n/a |
| Tees & Hartlepool Foreshore & Wetlands SSSI | Littoral sediment supporting *Calidris alba* sanderling | 20 | 30 | 0.0152 | 0.076% | 0.051% | 17.92 | 17.9 | 90% | 60% | 90% | 60% | No |
| South Gare & Coatham Sands SSSI | Supralittoral sediment (acidic type) supporting *Sterna albifrons* little tern | 8 | 10 | 0.044 | 0.55% | 0.44% | 12.74 | 12.8 | 160% | 128% | 159% | 127% | No |
| Seal Sands SSSI | Littoral sediment supporting *Calidris canutus* knot | 20 | 30 | 0.0203 | 0.10% | 0.068% | 13.86 | 13.9 | 69% | 46% | 69% | 46% | No |
| Redcar Rocks SSSI | Littoral sediment supporting *Charadrius hiaticula* ringed plover | 20 | 30 | 0.0375 | 0.19% | 0.13% | 15.68 | 15.7 | 79% | 52% | 78% | 52% | No |
| Seaton Dunes & Common SSSI | Supralittoral sediment (acidic type) supporting *Charadrius hiaticula* ringed plover | 8 | 10 | 0.024 | 0.30% | 0.24% | 12.74 | 12.8 | 160% | 128% | 159% | 127% | No |
| Cowpen Marsh SSSI | Neutral grassland (*Festuca rubra - Agrostis stolonifera - Potentilla anserina* grassland) | 20 | 30 | 0.086 | 0.43% | 0.29% | 18.48 | 18.6 | 93% | 62% | 92% | 62% | No |
| North York Moors SSSI | Bogs (*Calluna vulgaris - Eriophorum vaginatum* blanket mire) | 5 | 10 | 0.0318 | 0.64% | 0.32% | 23.52 | 23.6 | 471% | 236% | 470% | 235% | No |
| Saltburn Gill SSSI | Broad-leaved, mixed and yew woodland (*Fraxinus excelsior - Acer campestre - Mercurialis perennis* woodland) | 15 | 20 | 0.0274 | 0.18% | 0.14% | 34.72 | 34.7 | 232% | 174% | 231% | 174% | No |
| Pinkney and Gerrick Woods SSSI | Broad-leaved, mixed and yew woodland (*Alnus glutinosa - Fraxinus excelsior - Lysimachia nemorum* woodland) | 10 | 20 | 0.0257 | 0.26% | 0.13% | 27.86 | 27.9 | 279% | 139% | 279% | 139% | No |
| Wilton Woods Complex LWS | Broadleaved, mixed and yew woodland - *Acidophilous Quercus*-dominated woodland ) | 10 | 15 | 0.1868 | 1.9% | 1.2% | 32.90 | 33.1 | 331% | 221% | 329% | 219% | No |
| Eston Moor LWS | Fen, marsh and swamp – valley mires, poor fens and transition mires | 10 | 15 | 0.12 | 1.2% | 0.80% | 20.02 | 20.1 | 201% | 134% | 200% | 133% | No |

*Table G1.5 Predicted Acid Deposition at Ecological Receptors (Annual Mean) – for most sensitive qualifying feature of each site*

| Designated Site | Most Sensitive Habitat Feature | Critical Load (CL) for Acid Deposition (keq ha | | | Background Acid Deposition (keq ha | | PC total as % of CL total | | PEC total as % of CL total | | Baseline as % of CL | | Potential Significant Effect (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CL max S | CL min N | CL max N | S baseline | N baseline | Low | High | Low | High | Low | High | |
| Lovell Hill Pools SSSI | *Coenagrion pulchellum* variable damselfly | Sensitive but no CL | | | 0.33 | 1.08 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| Tees & Hartlepool Foreshore & Wetlands SSSI | Standing open water and canals supporting *Anas clypeata* shoveler | Sensitive but no CL | | | 0.47 | 0.78 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| South Gare & Coatham Sands SSSI | Supralittoral sediment (acidic type) supporting *Sterna albifrons* little tern | 4.6 | 0.223 | 4.283 | 0.48 | 0.91 | 0.073% | 0.070% | 33% | 31% | 32% | 31% | No |
| Seal Sands SSSI | Neutral grassland - acid grassland supporting *Tringa totanus* - redshank | 4.6 | 0.438 | 4.498 | 0.45 | 0.99 | 0.032% | 0.032% | 32% | 31% | 32% | 31% | No |
| Redcar Rocks SSSI | Littoral sediment supporting *Charadrius hiaticula* ringed plover | Not sensitive | | | 0.4 | 1.12 | n/a | n/a | n/a | n/a | n/a | n/a | No |
| Seaton Dunes & Common SSSI | Supralittoral sediment (acidic type) supporting *Charadrius hiaticula* ringed plover | 1.56 | 0.223 | 1.998 | 0.45 | 0.91 | 0.086% | 0.038% | 68% | 30% | 68% | 30% | No |
| Cowpen Marsh SSSI | Neutral grassland (*Festuca rubra - Agrostis stolonifera - Potentilla anserina* grassland) | 1.56 | 0.438 | 1.998 | 0.45 | 1.32 | 0.031% | 0.013% | 89% | 39% | 89% | 39% | No |
| North York Moors SSSI | Bogs (*Calluna vulgaris - Eriophorum vaginatum* blanket mire) | 0.183 | 0.321 | 0.54 | 0.47 | 1.68 | 0.42% | 0.30% | 415% | 298% | 415% | 297% | No |
| Saltburn Gill SSSI | Broad-leaved, mixed and yew woodland (*Fraxinus excelsior - Acer campestre - Mercurialis perennis* woodland) | 2.448 | 0.142 | 2.639 | 0.44 | 2.48 | 0.074% | 0.069% | 111% | 104% | 111% | 104% | No |
| Pinkney and Gerrick Woods SSSI | Broad-leaved, mixed and yew woodland (*Alnus glutinosa - Fraxinus excelsior - Lysimachia nemorum* woodland) | 2.435 | 0.357 | 2.792 | 0.41 | 1.99 | 0.066% | 0.054% | 86% | 70% | 86% | 70% | No |
| Wilton Woods Complex LWS | Broadleaved, mixed and yew woodland | 0.92 | 0.14 | 1.06 | 0.33 | 2.35 | 1.3% | 1.3% | 254% | 254% | 253% | 253% | No |
| Eston Moor LWS | Dwarf shrub heath | 1.59 | 0.71 | 2.3 | 0.27 | 1.43 | 0.37% | 0.37% | 74% | 74% | 74% | 74% | No |

*Table G1.6 Predicted NOx at Ecological Receptors (Annual Mean)*

| Designated Site | Critical Level ( (µg m-3) | Background Conditions (µg m-3) | PC (µg m-3) | PC / CL (%) | PEC (µg m-3) | PEC / CL(%) | Background/CL (%) | Potential Significant Effect (Yes/No) |
|---|---|---|---|---|---|---|---|---|
| Lovell Hill Pools SSSI | 30 | 15.8 | 0.175 | 0.58% | 16.0 | 53% | 53% | No |
| Tees & Hartlepool Foreshore & Wetlands SSSI | 30 | 31.8 | 0.105 | 0.35% | 31.9 | 106% | 106% | No |
| South Gare & Coatham Sands SSSI | 30 | 31.8 | 0.306 | 1.0% | 32.1 | 107% | 106% | No |
| Seal Sands SSSI | 30 | 31.8 | 0.141 | 0.47% | 31.9 | 106% | 106% | No |
| Redcar Rocks SSSI | 30 | 18.9 | 0.261 | 0.87% | 19.2 | 64% | 63% | No |
| Seaton Dunes & Common SSSI | 30 | 31.8 | 0.167 | 0.56% | 32.0 | 107% | 106% | No |
| Cowpen Marsh SSSI | 30 | 31.8 | 0.06 | 0.20% | 31.9 | 106% | 106% | No |
| North York Moors SSSI | 30 | 11.3 | 0.221 | 0.74% | 11.5 | 38% | 38% | No |
| Saltburn Gill SSSI | 30 | 11.8 | 0.095 | 0.32% | 11.9 | 40% | 39% | No |
| Pinkney and Gerrick Woods SSSI | 30 | 7.92 | 0.089 | 0.30% | 8.01 | 27% | 26% | No |
| Wilton Woods Complex LWS | 30 | 16.2 | 0.649 | 2.2% | 16.8 | 56% | 54% | No |
| Eston Moor LWS | 30 | 16.2 | 0.834 | 2.8% | 17.0 | 57% | 54% | No |

*Table G1.7 Predicted NOx at Ecological Receptors (24hr Mean)*

| Designated Site | Critical Level (µg m-3) | Background Conditions (µg $m^{-3}$) | PC (µg $m^{-3}$) | PC / CL (%) | PEC (µg $m^{-3}$) | PEC / CL(%) | Potential Significant Effect (Yes/No) |
|---|---|---|---|---|---|---|---|
| Lovell Hill Pools SSSI | 75 | 31.5 | 3.40 | 4.5% | 34.9 | 47% | No |
| Tees & Hartlepool Foreshore & Wetlands SSSI | 75 | 63.6 | 3.29 | 4.4% | 66.9 | 89% | No |
| South Gare & Coatham Sands SSSI | 75 | 63.6 | 3.18 | 4.2% | 66.8 | 89% | No |
| Seal Sands SSSI | 75 | 63.6 | 2.57 | 3.4% | 66.2 | 88% | No |
| Redcar Rocks SSSI | 75 | 37.8 | 1.98 | 2.6% | 39.8 | 53% | No |
| Seaton Dunes & Common SSSI | 75 | 63.6 | 1.96 | 2.6% | 65.6 | 87% | No |
| Cowpen Marsh SSSI | 75 | 63.6 | 1.34 | 1.8% | 64.9 | 87% | No |
| North York Moors SSSI | 75 | 22.6 | 9.19 | 12% | 31.8 | 42% | No |
| Saltburn Gill SSSI | 75 | 23.6 | 1.40 | 1.9% | 25.0 | 33% | No |
| Pinkney and Gerrick Woods SSSI | 75 | 15.8 | 3.60 | 4.8% | 19.4 | 26% | No |
| Wilton Woods Complex LWS | 75 | 32.4 | 23.8 | 32% | 56.2 | 75% | No |
| Eston Moor LWS | 75 | 32.4 | 29.8 | 40% | 62.2 | 83% | No |

PINS Ref: EN010082

# Tees CCPP Project

The Tees Combined Cycle Power Plant Project
Land at the Wilton International Site, Teesside

## Volume 2 - Annex H

Regulations – 6(1)(b) and 8(1)

Updated NSER Tables 1-4

**Applicant:** Sembcorp Utilities UK
**Date:** August 2018

Annex H

# Habitats Regulations Assessment (HRA) – No Significant Effects Report (NSER)

## Updated NSER Tables 1-4

*APPENDIX A – AIR QUALITY MODELLING TABLES*

## *Table 1 Nutrient Nitrogen Deposition*

| Designated Site | Designation | Habitat Feature | Critical Load (CL) for Nutrient Nitrogen Deposition (kgN ha$^{-1}$ yr$^{-1}$) | | Process Contribution (PC) (kgN ha$^{-1}$ yr$^{-1}$) | PC/CL (%) | | Background Nutrient Nitrogen Deposition (kgN ha$^{-1}$ yr$^{-1}$) | PEC (kgN ha$^{-1}$ yr$^{-1}$) | PEC/CL (%) | | Background /CL | | Potential Significant Effect (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Max | | Min | Max | | | Min | Max | Min | Max | |
| Teesmouth and Cleveland Coast | SPA | Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern - Supralittoral sediment (acidic type) | 8 | 10 | 0.0392 | 0.49% | 0.39% | 18.48 | 18.5 | 231% | 185% | 231% | 185% | No |
| | SPA | Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern - Supralittoral sediment (calcareous type) | 10 | 15 | 0.0392 | 0.39% | 0.26% | 18.48 | 18.5 | 185% | 123% | 185% | 123% | No |
| | SPA | Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern - Supralittoral sediment | 15 | 20 | 0.0392 | 0.26% | 0.20% | 18.48 | 18.5 | 123% | 93% | 123% | 92% | No |
| | SPA | Sterna albifrons (Eastern Atlantic - breeding) - Little tern - Supralittoral sediment (acidic type) | 8 | 10 | 0.0392 | 0.49% | 0.39% | 18.48 | 18.5 | 231% | 185% | 231% | 185% | No |
| | SPA | Sterna albifrons (Eastern Atlantic - breeding) - Little tern - Supralittoral sediment (calcareous type) | 10 | 15 | 0.0392 | 0.39% | 0.26% | 18.48 | 18.5 | 185% | 123% | 185% | 123% | No |
| | SPA | Sterna albifrons (Eastern Atlantic - breeding) - Little tern - Supralittoral sediment | 15 | 20 | 0.0392 | 0.26% | 0.20% | 18.48 | 18.5 | 123% | 93% | 123% | 92% | No |
| | SPA | Tadorna tadorna (North-western Europe) - Common shelduck | 20 | 30 | 0.0392 | 0.20% | 0.13% | 18.48 | 18.5 | 93% | 62% | 92% | 62% | No |
| | SPA | Anas crecca (North-western Europe) - Eurasian teal - Littoral sediment | 20 | 30 | 0.0392 | 0.20% | 0.13% | 18.48 | 18.5 | 93% | 62% | 92% | 62% | No |
| | SPA | Anas crecca (North-western Europe) - Eurasian teal - Stranding open water and canals | Sensitive but no CL | 0 | 0.0392 | | | | | | | | | No |
| | SPA | Anas clypeata (North-western/Central Europe) - Northern shoveler | Sensitive but no CL | 0 | 0.0392 | | | | | | | | | No |
| | SPA | Calidris canutus (North-eastern Canada/Greenland/Iceland/North-western Europe) - Red knot | 20 | 30 | 0.0392 | 0.20% | 0.13% | 18.48 | 18.5 | 93% | 62% | 92% | 62% | No |
| | SPA | Calidris alba (Eastern Atlantic/Western & Southern Africa - wintering) - Sanderling | 20 | 30 | 0.0392 | 0.20% | 0.13% | 18.48 | 18.5 | 93% | 62% | 92% | 62% | No |
| | SPA | Tringa totanus (Eastern Atlantic - wintering) - Common redshank | 20 | 30 | 0.0392 | 0.20% | 0.13% | 18.48 | 18.5 | 93% | 62% | 92% | 62% | No |
| | SPA | Phalacrocorax carbo (North-western Europe) - Great cormorant | Sensitive but no CL | 0 | 0.0392 | | | | | | | | | No |
| Teesside pSPA | SPA | Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern - Supralittoral sediment (acidic type) | 8 | 10 | 0.0407 | 0.51% | 0.41% | 18.48 | 18.5 | 232% | 185% | 231% | 185% | No |

| Designated Site | Designation | Habitat Feature | Critical Load (CL) for Nutrient Nitrogen Deposition (kgN ha-1 yr-1) | | Process Contribution (PC) (kgN ha-1 yr-1) | PC/CL (%) | | Background Nutrient Nitrogen Deposition (kgN ha-1 yr-1) | PEC (kgN ha-1 yr-1) | PEC/CL (%) | | Background /CL | | Potential Significant Effect (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SPA | Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern - Supralittoral sediment (calcareous type) | 10 | 15 | 0.0407 | 0.41% | 0.27% | 18.48 | 18.5 | 185% | 123% | 185% | 123% | No |
| | SPA | Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern - Supralittoral sediment | 15 | 20 | 0.0407 | 0.27% | 0.20% | 18.48 | 18.5 | 123% | 93% | 123% | 92% | No |
| | SPA | Sterna albifrons (Eastern Atlantic - breeding) - Little tern - Supralittoral sediment (acidic type) | 8 | 10 | 0.0407 | 0.51% | 0.41% | 18.48 | 18.5 | 232% | 185% | 231% | 185% | No |
| | SPA | Sterna albifrons (Eastern Atlantic - breeding) - Little tern - Supralittoral sediment (calcareous type) | 10 | 15 | 0.0407 | 0.41% | 0.27% | 18.48 | 18.5 | 185% | 123% | 185% | 123% | No |
| | SPA | Sterna albifrons (Eastern Atlantic - breeding) - Little tern - Supralittoral sediment | 15 | 20 | 0.0407 | 0.27% | 0.20% | 18.48 | 18.5 | 123% | 93% | 123% | 92% | No |
| | SPA | Tadorna tadorna (North-western Europe) - Common shelduck | 20 | 30 | 0.0407 | 0.20% | 0.14% | 18.48 | 18.5 | 93% | 62% | 92% | 62% | No |
| | SPA | Anas crecca (North-western Europe) - Eurasian teal - Littoral sediment | 20 | 30 | 0.0407 | 0.20% | 0.14% | 18.48 | 18.5 | 93% | 62% | 92% | 62% | No |
| | SPA | Anas crecca (North-western Europe) - Eurasian teal - Stranding open water and canals | Sensitive but no CL | 0 | 0.0407 | | | | | | | | | No |
| | SPA | Anas clypeata (North-western/Central Europe) - Northern shoveler | Sensitive but no CL | 0 | 0.0407 | | | | | | | | | No |
| | SPA | Calidris canutus (North-eastern Canada/Greenland/Iceland/North-western Europe) - Red knot | 20 | 30 | 0.0407 | 0.20% | 0.14% | 18.48 | 18.5 | 93% | 62% | 92% | 62% | No |
| | SPA | Calidris alba (Eastern Atlantic/Western & Southern Africa - wintering) - Sanderling | 20 | 30 | 0.0407 | 0.20% | 0.14% | 18.48 | 18.5 | 93% | 62% | 92% | 62% | No |
| | SPA | Tringa totanus (Eastern Atlantic - wintering) - Common redshank | 20 | 30 | 0.0407 | 0.20% | 0.14% | 18.48 | 18.5 | 93% | 62% | 92% | 62% | No |
| | SPA | Phalacrocorax carbo (North-western Europe) - Great cormorant | Sensitive but no CL | 0 | 0.0407 | | | | | | | | | No |
| | SPA | avocet (Recurvirostra avosetta) - Littoral sediment | 20 | 30 | 0.0407 | 0.20% | 0.14% | 18.48 | 18.5 | 93% | 62% | 92% | 62% | No |
| | SPA | common tern (Sterna hirundo) - Supralittoral sediment (acidic type) | 8 | 10 | 0.0407 | 0.51% | 0.41% | 18.48 | 18.5 | 232% | 185% | 231% | 185% | No |
| | SPA | common tern (Sterna hirundo) - Supralittoral sediment (calcareous type) | 10 | 15 | 0.0407 | 0.41% | 0.27% | 18.48 | 18.5 | 185% | 123% | 185% | 123% | No |
| | SPA | common tern (Sterna hirundo) - Supralittoral sediment | 10 | 20 | 0.0407 | 0.41% | 0.20% | 18.48 | 18.5 | 185% | 93% | 185% | 92% | No |
| | SPA | common tern (Sterna hirundo) - Standing open water and canals | Sensitive but no CL | 0 | 0.0407 | | | | | | | | | No |

| Designated Site | Designation | Habitat Feature | Critical Load (CL) for Nutrient Nitrogen Deposition (kgN ha$^{-1}$ yr$^{-1}$) | | Process Contribution (PC) (kgN ha$^{-1}$ yr$^{-1}$) | PC/CL (%) | | Background Nutrient Nitrogen Deposition (kgN ha$^{-1}$ yr$^{-1}$) | PEC (kgN ha$^{-1}$ yr$^{-1}$) | PEC/CL (%) | | Background /CL | | Potential Significant Effect (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| North York Moors | SAC | Blanket bogs (* if active bog) | 5 | 10 | 0.0318 | 0.64% | 0.32% | 23.52 | 23.6 | 471% | 236% | 470% | 235% | No |
| | SAC | Northern Atlantic wet heaths with Erica tetralix | 10 | 20 | 0.0318 | 0.32% | 0.16% | 23.52 | 23.6 | 236% | 118% | 235% | 118% | No |
| | SAC | European dry heaths | 10 | 20 | 0.0318 | 0.32% | 0.16% | 23.52 | 23.6 | 236% | 118% | 235% | 118% | No |
| North York Moors | SPA | Pluvialis apricaria [North-western Europe - breeding] - European golden plover - Bogs | 5 | 10 | 0.0318 | 0.64% | 0.32% | 23.52 | 23.6 | 471% | 236% | 470% | 235% | No |
| | SPA | Pluvialis apricaria [North-western Europe - breeding] - European golden plover - Dwarf Shrub Heath | 10 | 20 | 0.0318 | 0.32% | 0.16% | 23.52 | 23.6 | 236% | 118% | 235% | 118% | No |
| | SPA | Pluvialis apricaria [North-western Europe - breeding] - European golden plover - Montane Habitats | 5 | 10 | 0.0318 | 0.64% | 0.32% | 23.52 | 23.6 | 471% | 236% | 470% | 235% | No |
| | SPA | Falco columbarius - Merlin - Dwarf shrub heath | 10 | 20 | 0.0318 | 0.32% | 0.16% | 23.52 | 23.6 | 236% | 118% | 235% | 118% | No |

## *Table 2 Acid Deposition*

| Designated Site | Designation | Habitat Feature | Critical Load (CL) for Acid Deposition (keq ha$^{-1}$ yr$^{-1}$) | | | Background Acid Deposition (keq ha$^{-1}$ yr$^{-1}$) | | PC total as % of CL total | | PEC total as % of CL total | | Baseline as % of CL | | Potential Significant Effect (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low Range | | | S baseline | N baseline | Low | High | Low | High | Low | High | |
| | | | CL max S | CL min N | CL max N | | | | | | | | | |
| Teesmouth and Cleveland Coast pSPA | SPA | Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern - Supralittoral sediment (acidic type) | 1.56 | 0.223 | 1.998 | 0.48 | 1.38 | 0.14% | 0.06% | 93% | 41% | 93% | 41% | No |
| | SPA | Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern - Supralittoral sediment (calcareous type) | 4 | 0.856 | 4.856 | 0.48 | 1.38 | 0.06% | 0.00% | 38% | 12% | 38% | 33% | No |
| | SPA | Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern - Supralittoral sediment | Not sensitive | | | | | | | | | | | No |
| | SPA | Sterna albifrons (Eastern Atlantic - breeding) - Little tern - Supralittoral sediment (acidic type) | 1.56 | 0.223 | 1.998 | 0.48 | 1.38 | 0.14% | 0.06% | 93% | 41% | 93% | 41% | No |
| | SPA | Sterna albifrons (Eastern Atlantic - breeding) - Little tern - Supralittoral sediment (calcareous type) | 4 | 0.856 | 4.856 | 0.48 | 1.38 | 0.06% | 0.00% | 38% | 12% | 38% | 33% | No |
| | SPA | Sterna albifrons (Eastern Atlantic - breeding) - Little tern - Supralittoral sediment | Not sensitive | | | | | | | | | | | No |
| | SPA | Tadorna tadorna (North-western Europe) - Common shelduck | Not sensitive | | | | | | | | | | | No |
| | SPA | Anas crecca (North-western Europe) - Eurasian teal - Littoral sediment | Not sensitive | | | | | | | | | | | No |
| | SPA | Anas crecca (North-western Europe) - Eurasian teal - Stranding open water and canals | No information | | | | | | | | | | | No |
| | SPA | Anas clypeata (North-western/Central Europe) - Northern shoveler | Sensitive but no CL | | | | | | | | | | | No |
| | SPA | Calidris canutus (North-eastern Canada/Greenland/Iceland/North-western Europe) - Red knot | Not sensitive | | | | | | | | | | | No |
| | SPA | Calidris alba (Eastern Atlantic/Western & Southern Africa - wintering) - Sanderling | Not sensitive | | | | | | | | | | | No |
| | SPA | Tringa totanus (Eastern Atlantic - wintering) - Common redshank | Not sensitive | | | | | | | | | | | No |
| | SPA | Phalacrocorax carbo (North-western Europe) - Great cormorant | Sensitive but no CL | | | | | | | | | | | No |

| Designated Site | Designation | Habitat Feature | Critical Load (CL) for Acid Deposition (keq $ha^{-1}$ $yr^{-1}$) | | | Background Acid Deposition (keq $ha^{-1}$ $yr^{-1}$) | | PC total as % of CL total | | PEC total as % of CL total | | Baseline as % of CL | | Potential Significant Effect (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low Range | | | S baseline | N baseline | Low | High | Low | High | Low | High | |
| | | | CL max S | CL min N | CL max N | | | | | | | | | |
| | SPA | Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern - Supralittoral sediment (acidic type) | 1.56 | 0.223 | 1.998 | 0.48 | 1.38 | 0.15% | 0.06% | 93% | 41% | 93% | 41% | No |
| | SPA | Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern - Supralittoral sediment (calcareous type) | 4 | 0.856 | 4.856 | 0.48 | 1.38 | 0.06% | 0.00% | 38% | 12% | 38% | 33% | No |
| | SPA | Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern - Supralittoral sediment | Not sensitive | | | | | | | | | | | No |
| | SPA | Sterna albifrons (Eastern Atlantic - breeding) - Little tern - Supralittoral sediment (acidic type) | 1.56 | 0.223 | 1.998 | 0.48 | 1.38 | 0.15% | 0.06% | 93% | 41% | 93% | 41% | No |
| | SPA | Sterna albifrons (Eastern Atlantic - breeding) - Little tern - Supralittoral sediment (calcareous type) | 4 | 0.856 | 4.856 | 0.48 | 1.38 | 0.06% | 0.00% | 38% | 12% | 38% | 33% | No |
| | SPA | Sterna albifrons (Eastern Atlantic - breeding) - Little tern - Supralittoral sediment | Not sensitive | | | | | | | | | | | No |
| | SPA | Tadorna tadorna (North-western Europe) - Common shelduck | Not sensitive | | | | | | | | | | | No |
| | SPA | Anas crecca (North-western Europe) - Eurasian teal - Littoral sediment | Not sensitive | | | | | | | | | | | No |
| | SPA | Anas crecca (North-western Europe) - Eurasian teal - Stranding open water and canals | No information | | | | | | | | | | | No |
| | SPA | Anas clypeata (North-western/Central Europe) - Northern shoveler | Sensitive but no CL | | | | | | | | | | | No |
| | SPA | Calidris canutus (North-eastern Canada/Greenland/Iceland/North-western Europe) - Red knot | Not sensitive | | | | | | | | | | | No |
| | SPA | Calidris alba (Eastern Atlantic/Western & Southern Africa - wintering) - Sanderling | Not sensitive | | | | | | | | | | | No |
| | SPA | Tringa totanus (Eastern Atlantic - wintering) - Common redshank | Not sensitive | | | | | | | | | | | No |
| | SPA | Phalacrocorax carbo (North-western Europe) - Great cormorant | Sensitive but no CL | | | | | | | | | | | No |
| | SPA | avocet (Recurvirostra avosetta) - Littoral sediment | Not sensitive | | | | | | | | | | | No |
| Teesmouth and | SPA | common tern (Sterna hirundo) - Supralittoral sediment (acidic type) | 1.56 | 0.223 | 1.998 | 0.48 | 1.38 | 0.15% | 0.06% | 93% | 41% | 93% | 41% | No |

| Designated Site | Designation | Habitat Feature | Critical Load (CL) for Acid Deposition (keq ha-1 yr-1) | | | Background Acid Deposition (keq ha-1 yr-1) | | PC total as % of CL total | | PEC total as % of CL total | | Baseline as % of CL | | Potential Significant Effect (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low Range | | | S baseline | N baseline | Low | High | Low | High | Low | High | |
| | | | CL max S | CL min N | CL max N | | | | | | | | | |
| Cleveland Coast Ramsar | SPA | common tern (Sterna hirundo) - Supralittoral sediment (calcareous type) | 4 | 0.856 | 4.856 | 0.48 | 1.38 | 0.06% | 0.00% | 38% | 12% | 38% | 33% | No |
| | SPA | common tern (Sterna hirundo) - Supralittoral sediment | Sensitive but no CL | | | | | | | | | | | No |
| | SPA | common tern (Sterna hirundo) - Standing open water and canals | Sensitive but no CL | | | | | | | | | | | No |
| North York Moors SAC | SAC | Pluvialis apricaria [North-western Europe - breeding] - European golden plover - Bogs | 0.183 | 0.321 | 0.54 | 0.47 | 1.77 | 0.42% | 0.30% | 415% | 298% | 415% | 297% | No |
| | SAC | Pluvialis apricaria [North-western Europe - breeding] - European golden plover - Dwarf Shrub Heath | 0.15 | 0.499 | 0.792 | 0.47 | 1.77 | 0.29% | 0.05% | 283% | 45% | 283% | 45% | No |
| | SAC | Pluvialis apricaria [North-western Europe - breeding] - European golden plover - Montane Habitats | 0.15 | 0.178 | 0.471 | 0.47 | 1.77 | 0.29% | 0.05% | 283% | 45% | 283% | 45% | No |
| | SAC | Falco columbarius - Merlin - Dwarf shrub heath | 0.15 | 0.499 | 0.792 | 0 | 0 | 0.00% | 0.00% | 0% | 0% | 0% | 0% | No |
| North York Moors SPA | SPA | Pluvialis apricaria [North-western Europe - breeding] - European golden plover - Bogs | 0.183 | 0.321 | 0.54 | 0.47 | 1.77 | 0.42% | 0.30% | 415% | 298% | 415% | 297% | No |
| | SPA | Pluvialis apricaria [North-western Europe - breeding] - European golden plover - Dwarf Shrub Heath | 0.15 | 0.499 | 0.792 | 0.47 | 1.77 | 0.29% | 0.05% | 283% | 45% | 283% | 45% | No |
| | SPA | Pluvialis apricaria [North-western Europe - breeding] - European golden plover - Montane Habitats | 0.15 | 0.178 | 0.471 | 0.47 | 1.77 | 0.48% | 0.05% | 476% | 53% | 476% | 53% | No |
| | SPA | Falco columbarius - Merlin - Dwarf shrub heath | 0.15 | 0.499 | 0.792 | 0.47 | 1.77 | 0.29% | 0.05% | 283% | 45% | 283% | 45% | No |

*Table 3 NOx Annual Mean*

| Designated Site | Designation | Critical Level (µg m-3) | Background Conditions (µg m-3) | PC (µg m-3) | PC / CL (%) | PEC (µg m-3) | PEC / CL(%) | Background/ CL (%) | Potential Significant Effect (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|
| Teesmouth and Cleveland Coast SPA | SPA | 30 | 31.8 | 0.272 | 0.91% | 32.1 | 107% | 106% | No |
| Teesmouth and Cleveland Coast pSPA | SPA | 30 | 31.8 | 0.283 | 0.94% | 32.1 | 107% | 106% | No |
| Teesmouth & Cleveland Coast | Ramsar | 30 | 31.8 | 0.272 | 0.91% | 32.1 | 107% | 106% | No |
| North York Moors | SAC | 30 | 11.28 | 0.221 | 0.74% | 11.5 | 38% | 38% | No |
| North York Moors | SPA | 30 | 11.28 | 0.221 | 0.74% | 11.5 | 38% | 38% | No |

*Table 4 NOx 24 Hour mean*

| Designated Site | Designation | Critical Level (µg m-3) | Background Conditions (µg m-3) | PC (µg m-3) | PC / CL (%) | PEC (µg m-3) | PEC / CL(%) | Background/ CL (%) | Potential Significant Effect (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|
| Teesmouth and Cleveland Coast | SPA | 75 | 63.6 | 3.29 | 4% | 66.9 | 89% | 85% | No |
| Teesmouth and Cleveland Coast pSPA | SPA | 75 | 18.5 | 4.89 | 7% | 68.5 | 91% | 85% | No |
| Teesmouth & Cleveland Coast | Ramsar | 75 | 63.6 | 3.29 | 4% | 66.9 | 89% | 85% | No |
| North York Moors | SAC | 75 | 22.56 | 9.19 | 12% | 31.8 | 42% | 30% | No |
| North York Moors | SPA | 75 | 22.56 | 9.19 | 12% | 31.8 | 42% | 30% | No |